Identification systems

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Edition: 2009-03-01
Catalogue Identification Systems 2009

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1 Introduction

1.1 What is an identification system?

Automatic object identification has found its way into many areas of industrial production. It provides information about goods, commodities and people, and therefore enables a correlation between data and material flow. For example, identifications systems are used for the following tasks:

- Automation of production processes
- Simple inventory control and material posting
- Protection against theft and product counterfeiting
- Networking of supply chains

We offer a comprehensive product range with various technologies.

**RFID systems** (RFID = radio frequency identification) are predominantly applied in harsh industrial environments, as robust and chemically resistant transponders are available for this. Various frequency ranges are applied in these systems. Pepperl+Fuchs offers inductive systems (125 and 250 kHz and 13.56 MHz), UHF systems of 868 MHz, and microwave systems of 2.45 GHz. Each frequency range has special features, which is why the relevant application determines the optimum identification system.

**Optical identification systems** such as barcode and Data Matrix systems work with laser light or digital photo technology. Pepperl+Fuchs has a wide product range of readers for one dimensional (barcode) and two dimensional (Data Matrix) codes for a variety of applications.

With the **OIT identification system for high temperatures**, Pepperl+Fuchs offers an optical identification system working with methods of industrial image processing, which is applied within automated manufacturing processes.

For the identification system for high temperatures, read only tags of solid metal plates with a perforated matrix are applied, which are designed for use in temperatures up to 500°C and suitable for high mechanical stress.
1.2 Why an identification system is worthwhile

Identification systems save time and money in automated production and provide smooth processes thanks to their integration into the logistics concept. Product tracking and identification is possible during the entire production process. Sometimes the transponder even remains on the final product like a barcode and shows the entire chain right up to the end customers. New cost-effective designs of transponders and entire logistics concepts open up new uses here.

1.3 Data security

Data security can be endangered by external influence on the transponder as well as by faulty data transfer.

Barcode and Matrix Code systems have very high data security. This can be increased significantly by multiple readings.

Electromagnetic identification systems with encapsulated EEPROM or FRAM memories in the transponders are electrically and mechanically robust and offer almost 100% read out security with a data hold time of over 10 years.

1.4 Network connection

All common fieldbus interfaces where command control takes place are available for the identification systems. A defined restart after a system crash with data loss is possible with redundant data storage in the transponders on site.

1.5 Specifications, standards and directives

The AIM (Association for Automatic Identification and Mobility), of which Pepperl+Fuchs is a member, promotes the application and standardization of identification technology. More information is available at www.aim-d.de.

The R&TTE (1999/5/EC) Directive on radio equipment also covers RFID identification systems. This prescribes requirements that are in compliance with the following standards. The relevant standards cover the topics of health (e.g. EN 50371), EMC (e.g. EN 301489), use of the radio frequencies spectrum (e.g. EN 300330/EN 300440) and electric safety of plants (e.g. EN 60950).
## 2 Selecting suitable technology

Whether you decide to go for an RFID system or an optical system, essentially depends on the requirements of your application and costs. Both systems have advantages depending on the place and conditions of use.

### RFID systems

<table>
<thead>
<tr>
<th>Inductive</th>
<th>Microwave</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Inductive RFID System" /></td>
<td><img src="image" alt="Microwave RFID System" /></td>
</tr>
</tbody>
</table>

- **Inductive** systems operate in accordance with the transformer near field principle. The frequencies used are between 125 kHz and 13.56 MHz. Higher frequencies enable faster communication. The 125 kHz systems offer the advantage that many robust read/write tag designs are available on the market which are ideal for automation in industrial applications; even installation in metal is possible by means of a read/write tag with an integrated ferrite core, and as a rule are chosen if a robust read/write tag with a higher degree of protection is required, if the read-in and read-out of data takes place in the process and if many read/write tags are needed at a low price.

- **Microwave** systems operate in accordance with the Hertzian dipole principle with detached waves. The transmission frequency is 2.45 GHz. The read/write tags contain a battery that supplies the internal electronic system. Therefore no energy needs to be transferred via the transmission signal in the read/write tag. In this respect, long sensing ranges of several meters can be achieved with this technology. The communication is passive, in which the waves from the read/write tag are reflected or absorbed (backscattering). For the detection of larger objects or with an object position not precisely defined, microwave systems are offered and as a rule are chosen if larger distances need to be bridged and if data is exchanged and again stored in the read/write tag.

These systems are particularly suitable for applications in the automation sphere, material flow control in production technology, and in the acquisition of operating data or the identification of objects such as storage vessels, pallets or workpiece carriers.

Typical applications include the identification of larger objects such as, for example, in automotive manufacture, in logistics, in barrier control for vehicles and for focused identification of several goods on one conveying unit.
Optical systems

<table>
<thead>
<tr>
<th>Barcode</th>
<th>Data Matrix</th>
<th>Code sheet</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="Barcode Image" /></td>
<td><img src="image2.png" alt="Data Matrix Image" /></td>
<td><img src="image3.png" alt="Code Sheet Image" /></td>
</tr>
</tbody>
</table>

- **Barcode**: ...scan barcode and relay the information contained in it. The scan takes place according to the reflection principle with red light. Compatible gateways are available to relay the information to the higher level fieldbus. These compact readers can be used both for close range as well as up to a distance of approx. 250 cm at 100 to 1200 scans per second and as a rule are selected for a purely read only system if the costs of the read only tags must be minimal and if no soiling, moisture or mechanical stress is to be expected.

- **Data Matrix**: ...also read two-dimensional codes. Compared to barcodes, these can contain very large amounts of data in a very small space. Up to 1.5 kByte can be encoded in a Data Matrix code with in-built error correction. The bit code set in a chess board style fashion is quickly recorded in an image, internally evaluated and relayed as encoded information.

- **Code sheet**: ...evaluate the hole pattern in solid metal plates, which are designed for use in temperatures up to 500°C and suitable for high mechanical stress. The code can be similar to Data Matrix code or be individually defined. The data can be redundant and thus fault tolerant. Dirt and overpainting do not interfere with the code since contrast on a defined background is always optimal with the integrated infrared LED illumination.

- **The systems are used in storage technology, open cycles and supply chains.**

- **Typical areas of application are identification of individual parts in production, documentation handling, traceability and pharmaceuticals.**

- **The systems are used in drying plants that harden adhesive bonds and painting lines that make tough demands on the attached read only tags.**
2.1 Identification systems overview

**IDENTControl** control interface and **IDENTControl Compact**

<table>
<thead>
<tr>
<th>Interface</th>
<th>Ethernet</th>
<th>PROFIBUS</th>
<th>Serial RS 232/485</th>
<th>DeviceNet</th>
<th>INTERBUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protocol</td>
<td>Ethernet/IP MODBUS/TCP PROFINET IO TCP/IP (Port 10000) SMTP, HTTP</td>
<td>PROFIBUS DP</td>
<td>ASCII</td>
<td>DeviceNet CIP</td>
<td>INTERBUS remote bus</td>
</tr>
</tbody>
</table>

Order code

- IC-KP-B12-V45
- IC-KP-B6-V15B
- IC-KP-B6-SUBD
- IC-KP-R2-V1
- IC-KP-B7-V95
- IC-KP-B5-V23

Page

44-45 48-53 56-57 54-55 46-47

<table>
<thead>
<tr>
<th>Interface</th>
<th>Ethernet</th>
<th>PROFIBUS</th>
<th>Serial RS 232/485</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protocol</td>
<td>Ethernet/IP MODBUS/TCP PROFINET IO TCP/IP (Port 10000) SMTP, HTTP</td>
<td>PROFIBUS DP</td>
<td>ASCII</td>
</tr>
</tbody>
</table>

Order code

- IC-KP2-2HB17-2V1D
- IC-KP2-1HB17-2V1D
- IC-KP2-2HB6-V15B
- IC-KP2-1HB6-V15B
- IC-KP2-2HRX-2V1
- IC-KP2-1HRX-2V1

Page

36-39 32-35 40-43

125 kHz R/W heads

Sensing range

- Read distance 1 ... 50 mm 1 ... 65 mm 2 ... 45 mm 1 ... 75 mm 0 ... 100 mm 0 ... 100 mm 2 ... 155 mm
- Write range 0 ... 40 mm 1 ... 55 mm 2 ... 35 mm 2 ... 65 mm 0 ... 80 mm 0 ... 80 mm 2 ... 140 mm
- Width max. 40 mm 55 mm 65 mm 60 mm 80 mm 80 mm 145 mm
- Housing size Ø 18 x 66 mm Ø 30 x 66 mm 80 x 28 x 12 mm 67 x 40 x 40 mm 113 x 80 x 40 mm 103 x 80 x 40 mm 190 x 140 x 40 mm

Order code

- IPH-18GM-V1
- IPH-30GM-V1
- IPH-F61-V1
- IPH-L2-V1
- IPH-FP-V1
- IPH-FP7V4A
- IPH-F15-V1

Page

62 63 64 65 66 67 68

Courtesy of Steven Engineering, Inc.-230 Ryan Way, South San Francisco, CA 94080-6370-Main Office: (650) 588-9200-Outside Local Area: (800) 258-9200-www.stevenengineering.com
### 125 kHz - RFID Transponder

**Special features**
- Glass tube
- Higher temperature range by the use of epoxy housing
- Flat wheel shape
- Very thin
- Transparent
- Key fob
- Various colors

**Housing size**
- Ø 3.15 x 13 mm
- Ø 12.4 x 2.2 mm
- Ø 16 x 3 mm
- Ø 20 x 3 mm
- Ø 20 x 0.6 mm
- 46.5 x 35 x 5 mm

**Order code**
- **Read only tag**
  - IPC02-3GL
  - IPC02-12
  - IPC02-16
  - IPC02-20P
  - IPC02-20CD

**Tag**
- IPC03-20P
- IPC03-20K*

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- 69
- 70+79
- 71
- 72+89
- 73
- 86+87

---

**Special features**
- ISO credit card format
- Mounting hole
- Mounting hole
- Mounting hole
- Mounting hole
- Mounting hole

**Housing size**
- 85.6 x 54 x 0.8 mm
- Ø 26 x 4 mm
- Ø 30 x 3 mm
- Ø 50 x 5 mm
- Ø 68 x 11.5 mm
- Ø 100 x 1.6 mm

**Order code**
- **Read only tag**
  - IPC02-C1
  - IPC02-26-T6
  - IPC02-30P
  - IPC02-50P
  - IPC02-68-T7

**Tag**
- IPC03-C1
- IPC03-30P
- IPC03-50P
- IPC03-100

**Page**
- 78+94
- 74
- 75+80+90
- 76+81+92
- 77
- 93

---

### 125 kHz - RFID Transponder for mounting in or on metal

**Special features**
- Installable in metal
- For press-fitting
- Installable in metal
- External thread for screw-in
- Installable in metal
- Mounting hole
- Large memory capacity

**Housing size**
- Ø 12.2 x 6 mm
- Ø 24 x 11 mm
- Ø 16 x 6 mm
- Ø 30 x 21 mm
- Ø 58 x 20.1 mm
- Ø 58 x 20.1 mm

**Order code**
- **Read only tag**
  - IPC03-12.4
  - IPC03-24
  - IPC03-16GK
  - IPC03-30GK
  - IPC03-58
  - IPC12-58-64k

**Tag**
- IPC03-12.4
- IPC03-24
- IPC03-16GK
- IPC03-30GK
- IPC03-58
- IPC12-58-64k

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- 82
- 83
- 84
- 85
- 92
- 88

* enables defining read only code that will be stored once or alternatively can be modified.
Identification systems – Selection

250 kHz R/W heads

<table>
<thead>
<tr>
<th>Operating distance max.</th>
<th>42 mm</th>
<th>66 mm</th>
<th>100 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Housing size</td>
<td>Ø 18 x 66 mm</td>
<td>80 x 28 x 12 mm</td>
<td>103 x 80 x 40 mm</td>
</tr>
<tr>
<td>Order code</td>
<td>ISH-18GM-V1</td>
<td>ISH-F61-V1</td>
<td>ISH-FP-V1</td>
</tr>
<tr>
<td>Page</td>
<td>98</td>
<td>99</td>
<td>100</td>
</tr>
</tbody>
</table>

250 kHz RFID transponder

<table>
<thead>
<tr>
<th>Special features</th>
<th>• Smallest models flush mountable</th>
<th>• Standard for machine tools</th>
<th>• Epoxy housing</th>
<th>• Shell forms for moisture protection</th>
<th>• Shell forms for moisture protection</th>
<th>• External thread for screw-in</th>
<th>• For press-fitting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Housing size</td>
<td>Ø 8 x 5 mm</td>
<td>Ø 10 x 4.5 mm</td>
<td>Ø 12 x 6 mm</td>
<td>Ø 12.4 x 6 mm</td>
<td>Ø 15 x 9 mm</td>
<td>Ø 16 x 6 mm</td>
<td>Ø 24 x 11 mm</td>
</tr>
<tr>
<td>Tag</td>
<td>IDC-8-1K</td>
<td>IDC-10-1K</td>
<td>IDC-12-1K</td>
<td>IDC-15-1K</td>
<td>IDC-16GKA-1K</td>
<td>IDC-24-1K</td>
<td></td>
</tr>
<tr>
<td>Page</td>
<td>101+105</td>
<td>105</td>
<td>101+106</td>
<td>102</td>
<td>106</td>
<td>102+103</td>
<td>107</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Special features</th>
<th>• External thread for screw-in</th>
<th>• Protective caps available</th>
<th>• Mounting flange</th>
<th>• Mounting hole</th>
<th>• 5 Mounting holes</th>
<th>• Flat structure</th>
<th>• Mounting hole \ integrated spacer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Housing size</td>
<td>Ø 30 x 21 mm</td>
<td>Ø 30 x 21 mm</td>
<td>Ø 31 x 17 mm</td>
<td>Ø 50 x 7 mm</td>
<td>50 x 50 x 8 mm</td>
<td>Ø 58 x 20.1 mm</td>
<td></td>
</tr>
<tr>
<td>①-read only tag</td>
<td>ICC-30GK-EXIA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>②-read/write tag</td>
<td>IDC-30GK-EXIA-1K</td>
<td>IDC-30F-EXIA-1K</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Page</td>
<td>103+111+112</td>
<td>103+109</td>
<td>107+113</td>
<td>104+108</td>
<td>108</td>
<td>110</td>
<td></td>
</tr>
</tbody>
</table>
## 13.56 MHz R/W heads

<table>
<thead>
<tr>
<th>Sensing range</th>
<th>Read/write range</th>
<th>Width max.</th>
<th>Housing size</th>
<th>Order code</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0 ... 55 mm</td>
<td>45 mm</td>
<td>Ø 18 x 66 mm</td>
<td>IQH1-18GM-V1</td>
<td>118</td>
</tr>
<tr>
<td></td>
<td>0 ... 50 mm</td>
<td>45 mm</td>
<td>80 x 28 x 12 mm</td>
<td>IQH1-F61-V1</td>
<td>119</td>
</tr>
<tr>
<td></td>
<td>0 ... 130 mm</td>
<td>100 mm</td>
<td>103 x 80 x 40 mm</td>
<td>IQH1-FP-V1</td>
<td>120</td>
</tr>
<tr>
<td></td>
<td>0 ... 300 mm</td>
<td>320 mm</td>
<td>298 x 298 x 33.5 mm</td>
<td>IQH-F100-V1</td>
<td>121</td>
</tr>
</tbody>
</table>

## 13.56 MHz RFID transponder

<table>
<thead>
<tr>
<th>Special features</th>
<th>• Mounting hole</th>
<th>• Mounting hole</th>
<th>• Mounting hole</th>
<th>• Installable on metal</th>
<th>• ISO credit card format</th>
<th>• Small credit card format</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Housing size</td>
<td>Ø 30 x 3 mm</td>
<td>Ø 50 x 5 mm</td>
<td>50.8 x 50.8 x 7.3 mm</td>
<td>Ø 58 x 20.1 mm</td>
<td>85.6 x 54 x 0.8 mm</td>
<td>42.3 x 30 x 0.6 mm</td>
</tr>
<tr>
<td>Order code</td>
<td>IQC21-30P</td>
<td>IQC21-50P</td>
<td>IQC21-50F-T10*</td>
<td>IQC21-58</td>
<td>IQC22-C1</td>
<td>IQC22-C5</td>
</tr>
<tr>
<td>Page</td>
<td>122</td>
<td>123</td>
<td>124</td>
<td>125</td>
<td>126</td>
<td>128</td>
</tr>
</tbody>
</table>

* transponders with T1, T3, T9 or T10 in the order code have an increased temperature range.
### 868 MHz R/W heads + RFID transponder

<table>
<thead>
<tr>
<th>868 MHz R/W heads</th>
<th>868 MHz read/write tag</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensing range</td>
<td></td>
</tr>
<tr>
<td>Read/write range</td>
<td>0 ... 5 m</td>
</tr>
<tr>
<td>Housing size</td>
<td>180 x 320 x 110 mm</td>
</tr>
<tr>
<td><strong>Order code</strong></td>
<td><strong>IUH-F117-V1</strong></td>
</tr>
<tr>
<td><strong>Page</strong></td>
<td><strong>136</strong></td>
</tr>
</tbody>
</table>

### 2.45 GHz R/W heads + RFID transponder

<table>
<thead>
<tr>
<th>2.45 GHz R/W heads</th>
<th>2.45 GHz read/write tag</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensing range</td>
<td></td>
</tr>
<tr>
<td>Read/write range</td>
<td>0 ... 0.5 m 0.2 ... 2 m</td>
</tr>
<tr>
<td>Housing size</td>
<td>190 x 140 x 40 mm 190 x 140 x 40 mm 90 x 60 x 19 mm</td>
</tr>
<tr>
<td><strong>Order code</strong></td>
<td><strong>MVH500-F15-V1 MVH2000-F15-V1 MVC-60B-64K</strong></td>
</tr>
<tr>
<td><strong>Page</strong></td>
<td><strong>140 141 142</strong></td>
</tr>
</tbody>
</table>

### Handhelds

<table>
<thead>
<tr>
<th>Operating frequency</th>
<th>Suitable for transponder types</th>
<th>Housing size</th>
<th><strong>Order code</strong></th>
<th><strong>Page</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>125 kHz</td>
<td>IPC02-... IPC03-... IPC11-... IPC12-...</td>
<td>111 x 46 x 42 mm</td>
<td><strong>IPT-HH20</strong></td>
<td><strong>170</strong></td>
</tr>
<tr>
<td>250 kHz</td>
<td>ICC-... IDC-...</td>
<td>111 x 46 x 42 mm</td>
<td><strong>IST-HH20</strong></td>
<td><strong>171</strong></td>
</tr>
<tr>
<td>13.56 MHz</td>
<td>IQC21-... IQC22-... IQC33-...</td>
<td>111 x 46 x 42 mm</td>
<td><strong>IQT1-HH20</strong></td>
<td><strong>172</strong></td>
</tr>
</tbody>
</table>

Accessories can be found on page 143.
### 125 kHz R/W system (System IP)

#### R/W head:

<table>
<thead>
<tr>
<th>Operating distance</th>
<th>Max. 100 mm</th>
<th>Max. 100 mm</th>
<th>Max. 100 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Housing size</td>
<td>80 x 80 x 49 mm</td>
<td>80 x 80 x 49 mm</td>
<td>80 x 80 x 49 mm</td>
</tr>
<tr>
<td>Order code</td>
<td>IPT1-FP</td>
<td>IPT-FP</td>
<td>IPT-FP3A6-R2</td>
</tr>
<tr>
<td>Page</td>
<td>176</td>
<td>177</td>
<td>189</td>
</tr>
</tbody>
</table>

#### Lower section with interface:

<table>
<thead>
<tr>
<th>Interface</th>
<th>Physical</th>
<th>Protocol</th>
<th>Order code</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>RS 232/ RS 485</td>
<td>ASCII</td>
<td>U-P3-RX</td>
<td>178</td>
</tr>
<tr>
<td></td>
<td>RS 232/ RS 485</td>
<td>ASCII</td>
<td>U-P3V4A-RX</td>
<td>179</td>
</tr>
<tr>
<td></td>
<td>RS 485, addressable, up to 30 lower sections, address 1-30</td>
<td>ASCII</td>
<td>U-P3-R4</td>
<td>180</td>
</tr>
<tr>
<td></td>
<td>RS 485, addressable, up to 30 lower sections, address 1-30</td>
<td>ASCII</td>
<td>U-P3-R4-V15</td>
<td>181</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Interface</th>
<th>Physical</th>
<th>Protocol</th>
<th>Order code</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>RS 485</td>
<td>PROFIBUS DP</td>
<td>U-P6-B6</td>
<td>182</td>
</tr>
<tr>
<td></td>
<td>RS 485</td>
<td>PROFIBUS DP</td>
<td>U-P6V4A-B6</td>
<td>183</td>
</tr>
<tr>
<td></td>
<td>RS 485</td>
<td>PROFIBUS DP</td>
<td>U-P6-B6-V15B</td>
<td>184</td>
</tr>
<tr>
<td></td>
<td>RS 485</td>
<td>INTERBUS remote bus</td>
<td>U-P6-B5</td>
<td>185</td>
</tr>
<tr>
<td></td>
<td>RS 485</td>
<td>INTERBUS remote bus</td>
<td>U-P6-B5-V</td>
<td>186</td>
</tr>
<tr>
<td></td>
<td>RS 485, addressable, up to 30 lower sections, address 1-30</td>
<td>ASCII</td>
<td>U-P7V4A-R4</td>
<td>187</td>
</tr>
</tbody>
</table>

RFID transponders can be found on page 188 or from page 69.

Accessories for all lower sections and interfaces can be found on page 143.
### 2.45 GHz R/W system (MT system)

**R/W system:**

<table>
<thead>
<tr>
<th>Operating distance</th>
<th>Max. 6 m</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interface</td>
<td>Physical Ethernet</td>
</tr>
<tr>
<td>Protocol</td>
<td>TCP/IP</td>
</tr>
<tr>
<td><strong>Order code</strong></td>
<td>MTT6000-F120-B12-V45</td>
</tr>
</tbody>
</table>

**RFID transponders:**

<table>
<thead>
<tr>
<th>Read speed</th>
<th>dependent on the operating mode and number of read/write tags in the read zone between 80 ms and 2700 ms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Write speed times</td>
<td>- dependent on the operating mode between 200 ms and 6000 ms</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Order code</th>
<th>MTO-C1</th>
<th>MTO-C2</th>
<th>MTM-C1</th>
<th>MTM-C2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Page</td>
<td>194</td>
<td>195</td>
<td>196</td>
<td>197</td>
</tr>
</tbody>
</table>

Accessories can be found on page 198.

### Barcodes

<table>
<thead>
<tr>
<th>Read distance</th>
<th>up to 240 mm</th>
<th>35 ... 305 mm</th>
<th>10 ... 220 mm</th>
<th>40 ... 600 mm</th>
<th>500 ... 2500 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scan rate</td>
<td>800/sec or 1200/sec</td>
<td>270/sec</td>
<td>350/sec or 500/sec</td>
<td>500 ... 1000/sec</td>
<td>600 ... 1200/sec</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Order code</th>
<th>VB6-240</th>
<th>VB8-305</th>
<th>VB14N-***</th>
<th>VB34-2500</th>
</tr>
</thead>
<tbody>
<tr>
<td>Page</td>
<td>202</td>
<td>204</td>
<td>206+208</td>
<td>210+212</td>
</tr>
</tbody>
</table>
Data Matrix: Static devices

| Read distance | 50 ... 500 mm dependent on code symbology | 32 mm | 60 mm |
| Read field   | max. 125 mm x 200 mm | 29 mm x 24 mm | 30 mm x 20 mm ... 50 mm x 40 mm |
| Interface:   | Physical RS 232 | RS 232 | RS 232, Ethernet |
|              | Protocol ASCII | ASCII | ASCII, TCP/IP |
| Order code   | ODT-MAC333 | ODT-MAC344-* | ODT-MAC4* |
| Page         | 230 | 232 | 234-239 |

Data Matrix: Handheld Devices

| Module size | min. 0.15 mm | min. 0.15 mm | min. 0.15 mm |
| Operating mode | wired | wired/wireless | wired/wireless |
| Order code | ODT-HH-MAH120-* | ODT-HH-MAH200-* | ODT-HH-MAH300-* |
| Page | 244 | 240 | 242 |

Accessories can be found on page 227.

Identification systems for high temperatures

Read device

| Read distance | adjustable, 200 mm - 450 mm |
| Interface:   | Physical Ethernet |
| Protocol:    | TCP/IP |
| Order code   | OIT300-F113-B12-CB OIT500-F113-B12-CB |
| Page         | 258-260 |

Read only tag

| Read distance | 250 ... 450 mm | 250 ... 450 mm | 150 ... 250 mm |
| Material:    | Stainless steel V2A | Steel Fe360 | Stainless steel V4A |
| Housing size | 130 x 80 x 20 mm | 130 x 80 x 20 mm | 80 x 38 x 13 mm |
| Order code   | OIC-C10V2A-CB1 | OIC-C10ST-CB1 | OIC-C10V4A-CB1 |
| Page         | 262 | 262 | 262 |

Accessories can be found on page 263.
3 Planning an RFID system

3.1 Components of an identification system

Identification systems are as a rule composed of a control interface, R/W heads and transponders.

**Read only tags** contain a worldwide unique code of typically 40 Bit \(2^{40} = 1,099,511,627,776\) possibilities. **Read/write tags** have a freely usable memory area, which can be repeatedly overwritten. Additionally, read/write tags often have another read only memory in order that in addition to the storage of application specific information (data range), another unique identifier (read only code) can be implemented. The memories are typically 1 kBit to a maximum 64 kBit in size. The read only codes can be read from the **R/W heads** and the data range from read/write tags can be read and written. This happens based on commands that are sent from the control interface to the R/W heads. Several R/W heads can be connected to a control interface where this simultaneously serves as the interface for higher level control. Communication is carried out via common fieldbuses, such as Ethernet, PROFIBUS, DeviceNet, Interbus or via a serial interface.

The **Wiring** between the control interface and R/W head is via screened signal lines, to reduce the influence of possible interference sources.

Several hundred reading/writing points (ID points) in a system can be realized via fieldbus and the corresponding number of control interfaces and a control interface unit can be connected.

![Typical structure of an RFID system](image)

3.2 Transfer frequencies

In the sphere of RFID systems, various frequency ranges are available. Each frequency band has specific advantages and special application areas. It is therefore crucial to choose the right frequency for your application.

Inductive identification systems (125 kHz – 13.56 MHz) operate according to the transformer principle in the near field, i.e. the read/write lobe is limited to the range from a few centimeters to approximately half a meter. The energy for the transponder is transferred inductively from the R/W head.

These systems are particularly suitable for applications in the sphere of automation, material flow control in production technology, and the acquisition of operating data or the identification of objects such as storage vessels, pallets, workpiece carriers etc.

Microwave identification systems (approx. 2.45 GHz) operate according to the backscatter principle in the far-field, and thus offer the possibility to achieve larger read/write ranges. Typical ranges are several meters here. The transponders have their own power source to supply the internal electric components.
Typical applications include the identification of larger objects such as, for example, in automotive manufacture, in logistics, for barrier control, for vehicles and for focused identification of several goods on one conveying unit.

**125 kHz and 250 kHz systems**

The low frequency systems typically have a very small read range, are almost immune to metal in the environment, and penetrate water, grease and other non-metallic materials. The wound coils for the transponder have multiple uses and therefore make the transponder cost-effective. This frequency range is ideal for factory automation, tool identification, tool management in closed circuits, animal identification and inventory control.

**13.56 MHz system**

In this frequency range, stamped or pressed coils can be used, which make the tags more cost-effective. It is frequently used in logistics applications, asset logging and certain factory applications. Due to the low costs, this frequency is ideal for applications where many read/write tags are used. The read/write tags cannot be embedded in metal and are not suitable for tool identification. They are not only cost-effective, but due to the high frequency are 3 to 4 times faster than the low frequency versions.

**868 MHz system**

Systems with an 865 to 868 MHz operating frequency work with detached electromagnetic waves. The transponders can be passive as well as active (with battery) and use a specially-shaped rod antenna as the resonance element. The passive transponders can be produced very cheaply and have a range of several meters. However, UHF systems are very susceptible to moisture. Conductive items in the immediate vicinity can reflect waves and cause read gaps as a result of interference. It therefore makes sense to read UHF transponders while they are moving or when they are located at a previously tested position. As material handling and the automotive sector require ranges of 1 to 5 meters, this system represents a low-cost alternative to microwave systems, particularly because of its low transponder costs. The high carrier frequency facilitates large data volumes and extremely short read times.

**2.45 GHz systems**

This system from Pepperl+Fuchs operates with 2.45 GHz in the same range as Bluetooth, microwave ovens, some cordless telephones and WiFi 802.11 b/g (WLAN) access points. Active transponders achieve high sensing ranges. The installed batteries have a service life of 5-7 years and can be changed. The perfect scope of application is in automotive assembly, machine control, large container management and mobile equipment.

<table>
<thead>
<tr>
<th></th>
<th>125 kHz</th>
<th>250 kHz</th>
<th>13.56 MHz</th>
<th>868 MHz</th>
<th>2.45 GHz</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Wavelength</strong></td>
<td>2400 m</td>
<td>1200 m</td>
<td>22 m</td>
<td>0.34 m</td>
<td>0.12 m</td>
</tr>
<tr>
<td><strong>Transponders mountable in metal</strong></td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td><strong>Metallic environment possible</strong></td>
<td>Yes</td>
<td>Yes</td>
<td>Partially</td>
<td>Partially</td>
<td>Partially</td>
</tr>
<tr>
<td><strong>Interference from moisture</strong></td>
<td>None</td>
<td>None</td>
<td>Medium</td>
<td>Strong</td>
<td>Strong</td>
</tr>
<tr>
<td><strong>Reflections</strong></td>
<td>None</td>
<td>None</td>
<td>Weak</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td><strong>Resistance to EMC interference</strong></td>
<td>Very high</td>
<td>Very high</td>
<td>High</td>
<td>Medium</td>
<td>Low</td>
</tr>
<tr>
<td><strong>Transfer rate</strong></td>
<td>2 kBit/s</td>
<td>7.8/20 kBit/s</td>
<td>26 kBit/s</td>
<td>80 kBit/s</td>
<td>76 kBit/s</td>
</tr>
<tr>
<td><strong>Sensing range</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Reading</strong></td>
<td>150 mm</td>
<td>100 mm</td>
<td>300 mm</td>
<td>6000 mm</td>
<td>4000 mm</td>
</tr>
<tr>
<td><strong>Writing</strong></td>
<td>140 mm</td>
<td>75 mm</td>
<td>250 mm</td>
<td>2000 mm</td>
<td>4000 mm</td>
</tr>
</tbody>
</table>
3.3 Criteria for system selection

Amongst other things, the following should be considered when planning an identification system:

Number of read/write cycles

Inductive passive read only tags can often be read in any order and have a virtually unlimited service life. However, read/write tags based on EEPROM can only be written to a limited number of times (typically 100,000 times). If the read/write tag operates at approximately 25°C and a data hold time of only a month is required, then typically considerably more than 1 million write cycles can be achieved. On the other hand, FRAM tags can be read and written to as often as required.

Microwave read/write tags are active components that contain a battery. These are also limited by battery life. However, the batteries can be exchanged and the read/write tags used further.

Data processing

It needs to calculate,

• which quantities of data can be generated by the system (number of reading points × data quantity read × repeat rate),

• which quantities of data are retrieved via the fieldbus system (data quantity per cycle/cycle time) and

• can be processed in the programmable logic controller (PLC) (secured data processing time < cycle time?).

If there is a capacity bottleneck to above, this can lead to data loss and therefore to process problems.

Read/write range and tolerances

The read and write ranges indicated in the range table must be observed in the application. Mechanical tolerances must also be observed to avoid read gaps and double reads. The R/W head and transponder should be of as a similar size as possible (e.g. FP head with a coil size greater than approximately 70 mm diameter and transponder with 50 mm diameter), so that the inductive coupling in the near field is at its optimum.

Metals in the vicinity of the reading head and transponder reduce the possible read/write ranges. Therefore, other minimum ranges must be observed as “in air” or special transponders installed which are constructed for the purpose. The following range table indicates in which installation arrangement at least 75% of the maximum read range is attained.
Installation/mounting conditions on metal for greater than 75% read range:
(valid for IDENTControl)

<table>
<thead>
<tr>
<th>Housing diameter</th>
<th>x</th>
<th>y</th>
<th>z(^1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>M18</td>
<td>&gt; 14  mm</td>
<td>Height of plastic cap</td>
<td>&gt; 180 mm</td>
</tr>
<tr>
<td>M30</td>
<td>&gt; 15  mm</td>
<td>Height of plastic cap</td>
<td>&gt; 270 mm</td>
</tr>
<tr>
<td>F61</td>
<td>&gt; 30  mm</td>
<td>Structure only</td>
<td>&gt; 290 mm</td>
</tr>
<tr>
<td>L2</td>
<td>&gt; 50  mm</td>
<td>Structure only</td>
<td>&gt; 450 mm</td>
</tr>
<tr>
<td>FP</td>
<td>0 mm</td>
<td>Flush</td>
<td>&gt; 550 mm</td>
</tr>
<tr>
<td>F15</td>
<td>&gt; 100 mm</td>
<td>Structure only</td>
<td>&gt; 1100 mm</td>
</tr>
</tbody>
</table>

1) The range is observed during parallel (simultaneously active) operation of the R/W heads. In selecting “multiplexed mode” the R/W heads can be mounted a few centimeters away.

Inductive sensors can interfere with communication between the RFID transponder and the R/W head as similar operating frequencies are often used. To reduce the influence, distances between the R/W head and sensor should be observed at typically 10x the maximum sensing range of the R/W head.

The read/write ranges in the relevant R/W head data sheet are maximum limits.

Example of a read curve

If transponders are mounted on or near metal, the maximum attainable ranges decrease, depending on the metal:

R/W head designs

There may be many requirements regarding the design of the heads and transponders. On the one hand, these devices should be installed in or mounted on existing parts and there may be limits to mechanical dimensions. On the other hand, one frequently wants to achieve the greatest sensing ranges possible. As the size of the heads also leads to increased sensing ranges, a suitable compromise needs to be found. Cylindrical housings are available, which are easily installed into sheet metal with holes, as well as block shaped housings, which are easily screwed to surfaces.
Maximum travel speed

Certain minimum times are required for the transponder detection and data reading. The retention time of the transponder in the read range is greater for large R/W heads, so higher travel speeds are achieved. The recommended area (30 to 80% of the max. read range) indicates a reliably useable read range.

Cable routing and electromagnetic compatibility guidelines

Signal cables are as a rule screened, but nevertheless particularly sensitive to external electromagnetic fields. In this respect, no power transmission cables should be laid in parallel, e.g. 230 V AC power supply, 3-phase or heavy consumers, such as motors.

Moreover, it should be observed that the positioning of the power supply, including distribution in the control cabinet, is separate from the signal and bus lines.

The grounding instructions on the devices and in the manuals must be carefully observed. Both the reading head and control interface units must be connected to ground potential on both sides.

For more detailed information, we have prepared a manual for you on all current electromagnetic capability topics, available under order number #104880 or on our website.

System features

In the following table, the systems with your features are listed. The application related information below provides further decision guidance.

<table>
<thead>
<tr>
<th>Frequency</th>
<th>125 kHz</th>
<th>250 kHz</th>
<th>13.56 MHz</th>
<th>868 MHz</th>
<th>2.45 GHz (MV)</th>
<th>2.45 GHz (MT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. travel speed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Read read-only code</td>
<td>2.5 m/s</td>
<td>10 m/s</td>
<td>5 m/s</td>
<td>&gt; 10 m/s</td>
<td>&gt; 30 m/s</td>
<td>25 m/s</td>
</tr>
<tr>
<td>- Read (4 byte) data</td>
<td>0.5 m/s</td>
<td>2 m/s</td>
<td>6.7 m/s</td>
<td>&gt; 10 m/s</td>
<td>&gt; 30 m/s</td>
<td>25 m/s</td>
</tr>
<tr>
<td>- Write (4 byte) data*</td>
<td>0.4 m/s</td>
<td>0.2 m/s</td>
<td>3.3 m/s</td>
<td>&gt; 10 m/s</td>
<td>&gt; 30 m/s</td>
<td>1 m/s</td>
</tr>
<tr>
<td>Max. memory volumes</td>
<td>64 kBit</td>
<td>1 kBit</td>
<td>16 kBit</td>
<td>2 kBit</td>
<td>64 kBit</td>
<td>574 bit</td>
</tr>
<tr>
<td>Possible read ranges</td>
<td>≤ 140 mm</td>
<td>≤ 100 mm</td>
<td>≤ 300 mm</td>
<td>&lt; 6 m</td>
<td>≤ 2000 mm</td>
<td>≤ 4000 mm</td>
</tr>
<tr>
<td>Possible write ranges</td>
<td>≤ 80 mm</td>
<td>≤ 68 mm</td>
<td>≤ 300 mm</td>
<td>&lt; 6 m</td>
<td>≤ 2000 mm</td>
<td>≤ 500 mm</td>
</tr>
<tr>
<td>Mounting the transponder</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- in metal</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>- on metal</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Transponder degree of protection</td>
<td>IP68/IP69k</td>
<td>IP68/IP69k</td>
<td>IP68</td>
<td>IP67</td>
<td>IP67</td>
<td>IP67</td>
</tr>
<tr>
<td>Bus interfaces</td>
<td>Serial PROFIBUS INTERBUS DeviceNet Ethernet</td>
<td>Serial PROFIBUS INTERBUS DeviceNet Ethernet</td>
<td>Serial PROFIBUS INTERBUS DeviceNet Ethernet</td>
<td>Serial PROFIBUS Ethernet</td>
<td>Serial PROFIBUS INTERBUS DeviceNet Ethernet</td>
<td>Ethernet</td>
</tr>
<tr>
<td>Special features</td>
<td>Low cost read/write tags</td>
<td>Particularly EMC stable</td>
<td>Read only tags in label form</td>
<td>Read only tags in label form</td>
<td>High data transfer rate</td>
<td>Multi-tag capable, relay output</td>
</tr>
</tbody>
</table>

* We recommend only writing data during standstill.
4 System IDENTControl

4.1 System description

The brand name IDENTControl represents an innovative identification system. IDENTControl facilitates the connection of RFID R/W heads working at different operating frequencies.

The fact that the instruction set for all the systems connected to the control unit is more or less identical makes implementation in the PLC program remarkably easy.

The "RFIDControl" PC demo/configuring software for devices with serial or Ethernet interfaces supplements the system IDENTControl and makes life much easier for the user. This software is provided free of charge on every documentation CD.

Various versions are available to meet the requirements for varying degrees of distributed control:
- IDENTControl for up to 4 R/W heads
- IDENTControl Compact for 1 or 2 R/W heads

4.2 Advantages of the system IDENTControl

- The system is completely shielded and can simply be connected to the earth potential. The read head cables are also shielded to provide the highest degree of EMC safety.
- Up to 4 R/W heads can be connected and both inductive heads and microwave antennas can be used at the same time.
- Trigger sensors to start read/write commands can be connected.
- Where an Ethernet connection is present, web server functionality, e.g., configuring, command inputs or the notification of process malfunctions by cell phone, can be provided.
- All component are of plugin design to enable easy connection and quick replacement.
- The 24 V DC energy supply is implemented via a separate M12 connector; reversed polarity is indicated by a red LED.
- The rugged aluminum housing can be fitted to the DIN rail in the control cabinet using the integral snap-fits (IDENTControl) or a suitable mounting aid (IDENTControl Compact). A simple 3-point screw mounting provides IP67 protection for field applications.
**IDENTControl**

- The IDENTControl has a graphical LC display with 2 lines of 12 characters each. Data can be displayed and other information, e.g. the status of the device, shown in the form of icons. A plain text display and function keys on the IDENTControl mean that function tests can be performed as soon as the device is installed, even if no PLC programs are loaded.

- Operation and configuring on the IDENTControl using function keys (e.g. to send read commands, set bus address, IP address, type of read/write tag, etc.).

---

**Connection of microwave antennas**, **Connection of inductive R/W heads**  
**Connection of trigger sensors via M12 connectors**

---

**Metal housing provides ideal EMC characteristics**

---

**Degree of protection: IP67**

---

**Latches for DIN mounting rail installation**

---

**Fastening for field installation**

---

**Various types of plugin bus connection, Ethernet in this case**

---

**5 LEDs for supply voltage and bus communication**

---

**2-line LC display for data and messages**

---

**Display showing connected R/W heads in the form of icons**

---

**4 function keys permit direct control**

---

**4 LEDs show the active read/write command**

---

**Power supply**

---

**Grounding screw**
IDENTControl Compact

The new smaller version of the IDENTControl, the IDENTControl Compact, offers a high level of distributed control and is ideally suited for economic installation in the field. The robust metal housing ensures a long service life under harsh ambient conditions, with plug-in connections.

Many applications require 2 R/W heads at one location. In such cases the 2-channel IDENTControl Compact is the right choice. The distribution of IDENT points, e.g. for switch control and on machine tools, demands an even higher degree of distributed control in transport technology, which we provide with the single-channel IDENTControl Compact. Since various R/W head types and different frequency systems can be connected, the flexibility provided by the modular structure is perfect for customer-specific system solutions.

- The IDENTControl Compact has separate LEDs for displaying connected R/W heads, the status of the R/W heads and for bus communication and diagnosis.
- The IDENTControl Compact is addressed using mechanical rotary switches.
- The IDENTControl Compact with Ethernet interface contains a real time switch. This enables these devices to be flexibly integrated into an existing Ethernet network with line or ring topology. A connected PC can communicate with the integrated web server in the device via any browser, in order to set parameters, for example, or to activate commands. No software needs to be installed for this purpose.
4.3 Features and Operating Options

Control Cabinet and Field Solution
Two fastening options enable the device to be installed in a control cabinet or in the field. The IDENTControl has snap-fits on the rear for fitting on a DIN mounting rail. Its L-shaped housing means the device and its bus connector can fit into a 120 mm grid in the control cabinet. With an installation depth of just 70 mm, it can also be installed in shallow junction boxes that are only 100 mm deep. Three mounting holes enable it to be installed in the field with M6 screw connections.

The IDENTControl Compact also has three mounting holes to enable it to be installed in the field with M6 screw connections. A mounting aid enables the device to be fitted to the DIN mounting rail as well.

Multiplex Mode
Interference may occur if a number of R/W heads are operating at the same frequency in close proximity to one another and read/write commands are issued at the same time. To prevent this happening, multiplex mode can be activated from the function keys or from the control interface. Multiplex mode synchronizes the execution of commands to completely eliminate interference.

Note: Using inductive sensors, for example, in close proximity (~10 x read range) can also result in interference, as these devices also often share the same frequency range.

Command Input and Commissioning
A crucial advantage of the IDENTControl system is the ability to configure and operate it easily directly from the device. Information is output visually via LEDs or on the display. Errors can therefore be located straight away and communication optimized without the need for a higher-level fieldbus and having some software running in the control interface. This allows the functional verification of individual sections of the plant to be documented.

Suitable R/W Heads
The IDENTControl system can drive up to four R/W heads regardless of the transmission principle being used. Heads operating at frequencies of 125 kHz, 250 kHz, 13.56 MHz, 868 MHz and 2.45 GHz can be connected and operated simultaneously, although the transponder must have a frequency matching the R/W head. With inductive systems, the R/W head should ideally be the same size as the transponder. This will give you the best link and consequently a large read/write range.

Various types of R/W heads are available for the IDENTControl system:
- M18 (dia. 18 mm) and M30 series (dia. 30 mm)
- F61 low-profile housing (76 mm x 28 mm x 12 mm)
- VariKont L model (40 mm x 40 mm x 55 mm)
- FP compact housing (80 mm x 80 mm x 60 mm)
- F15 low-profile housing (140 mm x 140 mm)
- F100 low-profile housing (300 mm x 300 mm)
- F117 low-profile housing (300 mm x 180 mm)

With its 4 LEDs, the VariKont L model provides an excellent view of the operating voltage indicator and the display for "Read head active"/"Data read/written successfully".
Transponder

Transponders are available in a wide variety of construction types. The application and how the transponders are installed or attached often dictate which type to use. Special solutions are available for high temperatures, chemically aggressive environments, high degree of protection requirements, price-critical applications and for installation on or in metal.

For installations in metallic objects (e.g. workpiece carriers) Pepperl+Fuchs offers models for the 125 kHz and 250 kHz families in which the coil is embedded in a ferrite core that screens the coil and allows the focused inductive field to enter from the front.

Fieldbus Connection

Die IDENTControl provides integrated interfaces for standard fieldbus systems such as PROFIBUS, Ethernet (supported protocols: TCP/IP, Ethernet/IP, PROFINET, MODBUS/TCP), DeviceNet, INTERBUS and serial connections (RS 232 and RS 485). The common control unit means the command structure and the operating philosophy are very similar.

- Ethernet IP "maps" the data in much the same way as a standard I/O card, so that no special configuration software is required.
- When using the TCP/IP protocol, port 10000 is used as the standard socket for the exchange of data. The integrated web server function makes configuring and testing easy. The integrated SMTP server even enables alarms to be sent by e-mail in the event of an error.
- The MODBUS/TCP protocol is simple to use and has a number of powerful features. Several control interfaces can therefore communicate with the IDENTControl at the same time.
- PROFINET and PROFIBUS are very similar in the way they are used, but have different hardware. GSD files (General Station Description) or GSDML files in XML format are used for the device data.
- PROFINET and PROFIBUS support automatic configuring via the host and diagnostic messages can be sent easily to the host.
- Owing to their low current consumption levels, DeviceNet connections can support cable lengths greater than 100 m with more than 50 read/write stations. DeviceNet offers automatic configuring when a device is being replaced.
- The serial interface is used to facilitate distributed PC solutions and to allow the software to be adapted very easily to take account of changing circumstances. This allows large amounts of data to be exported in one go and written to the transponders.
Selecting the Right IDENTControl for your Control Interface

Normally, the PC or the control interface detects which IDENTControl you have connected. This works better with some PLCs and certain bus interfaces than with others. Generally, you can choose whichever bus system you want, although more programming may be required and you may need a network adapter.

We therefore recommend some bus protocols for the various control interfaces:

<table>
<thead>
<tr>
<th>Control Interface manufacturer</th>
<th>PLC model</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Siemens</td>
<td>S7-200/300/400 ET-200</td>
<td>PROFIBUS: IC-KP-B6-...</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ethernet: IC-KP-B12-V45</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ethernet: IC-KP2-...HB17-2V1D</td>
</tr>
<tr>
<td>Schneider Electric</td>
<td>Momentum</td>
<td>Ethernet: IC-KP-B12-V45</td>
</tr>
<tr>
<td></td>
<td>Premium</td>
<td>Ethernet: IC-KP2-...HB17-2V1D</td>
</tr>
<tr>
<td></td>
<td>Quantum</td>
<td>PROFIBUS: IC-KP-B6-...</td>
</tr>
<tr>
<td>Allen-Bradley</td>
<td>SLC 5/03, SLC 5/04 SLC 5/05</td>
<td>Ethernet: IC-KP-B7-V95</td>
</tr>
<tr>
<td></td>
<td>ControlLogix</td>
<td>PROFIBUS: IC-KP-B6-...</td>
</tr>
<tr>
<td></td>
<td>CompactLogix</td>
<td></td>
</tr>
<tr>
<td></td>
<td>MicroLogix</td>
<td></td>
</tr>
<tr>
<td></td>
<td>PLC5/80E</td>
<td></td>
</tr>
<tr>
<td>Omron</td>
<td>CS1</td>
<td>Devicenet: IC-KP-B7-V95</td>
</tr>
<tr>
<td></td>
<td>CJ1</td>
<td>PROFIBUS: IC-KP-B6-...</td>
</tr>
<tr>
<td>GE</td>
<td>90-30</td>
<td>Ethernet: IC-KP-B12-V45</td>
</tr>
<tr>
<td></td>
<td>90-70</td>
<td>Ethernet: IC-KP2-...HB17-2V1D</td>
</tr>
<tr>
<td></td>
<td>VersaMax</td>
<td>PROFIBUS: IC-KP-B6-...</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Devicenet: IC-KP-B7-V95</td>
</tr>
<tr>
<td>Mitsubishi</td>
<td>A/QnA</td>
<td>Devicenet: IC-KP-B7-V95</td>
</tr>
<tr>
<td></td>
<td>AnSH</td>
<td>PROFIBUS: IC-KP-B6-...</td>
</tr>
</tbody>
</table>

Web Server Functionality

With an Ethernet connection an existing network can often be used. High transmission rates and new functions are then possible. This renders intermediate bus systems superfluous. If required, web server functionality can even send an SMS directly to a cell phone stating whether the system is currently in a fault condition, what spare parts are required, what type of response is needed. This shortens downtimes and also permits remote configuring, protected by an access code or on-site enabling.
## 4.4 Overview of IDENTControl Control Units

### 4.4.1 IDENTControl Compact for 1 or 2 R/W heads

<table>
<thead>
<tr>
<th>Order code</th>
<th>Page</th>
<th>Number of R/W heads</th>
<th>Interface 1</th>
<th>Interface 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>IC-KP2-1HB6-V15B</td>
<td>32</td>
<td>1 max. 2</td>
<td>RS 485</td>
<td>RS 232 Diagnostic Interface</td>
</tr>
<tr>
<td>IC-KP2-2HB6-V15B</td>
<td>34</td>
<td></td>
<td>Ethernet</td>
<td>RS 232</td>
</tr>
<tr>
<td>IC-KP2-1HB17-2V1D</td>
<td>36</td>
<td></td>
<td>Ethernet</td>
<td>RS 232</td>
</tr>
<tr>
<td>IC-KP2-2HB17-2V1D</td>
<td>38</td>
<td></td>
<td>Ethernet</td>
<td>RS 232</td>
</tr>
<tr>
<td>IC-KP2-1HRX-2V1</td>
<td>40</td>
<td></td>
<td>RS 485</td>
<td>RS 232</td>
</tr>
<tr>
<td>IC-KP2-2HRX-2V1</td>
<td>42</td>
<td></td>
<td>RS 485</td>
<td>RS 232</td>
</tr>
</tbody>
</table>

#### Protocol
- PROFIBUS DP
- PROFIBUS:
  - SMTP, HTTP, TCP/IP (Port 10000), MODBUS/TCP, Ethernet/IP, PROFINET IO
  - SMTP, HTTP, TCP/IP (Port 10000), MODBUS/TCP, Ethernet/IP, PROFINET IO

#### Physical
- RS 485
- Ethernet
- RS 485
- Ethernet

#### Transfer rate
- 9.6; 19.2; 93.75; 187.5; 500; 1500 kbit/s
- 3; 6; 12 Mbit/s self-synchronizing
- 10 MBit/s or 100 MBit/s

#### Interface 2

#### Electrical data
- Power consumption P₀
  - 2 W without R/W heads
  - 3.5 W without R/W heads
  - 2 W without R/W heads

#### Mechanical data
- Degree of protection IP67
- Connection PROFIBUS:
  - M12 connector, B-coded
  - Ethernet: M12 connector, D-coded
  - RS 232/RS 485: M12 connector, A-coded
- R/W heads: shielded, 4-pin, M12 connector
- Power supply M12 connector
- Ground M4 grounding screw

### 4.4.2 IDENTControl for up to 4 R/W heads

<table>
<thead>
<tr>
<th>Order code</th>
<th>Page</th>
<th>Interface</th>
</tr>
</thead>
<tbody>
<tr>
<td>IC-KP-B12-V45</td>
<td>44</td>
<td></td>
</tr>
<tr>
<td>IC-KP-B5-V23</td>
<td>46</td>
<td></td>
</tr>
<tr>
<td>IC-KP-B6-SUBD</td>
<td>48</td>
<td></td>
</tr>
<tr>
<td>IC-KP-B6-V15B</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>IC-KP-B6-2V15B</td>
<td>52</td>
<td></td>
</tr>
<tr>
<td>IC-KP-B7-V95</td>
<td>54</td>
<td></td>
</tr>
<tr>
<td>IC-KP-R2-V1</td>
<td>56</td>
<td></td>
</tr>
</tbody>
</table>

#### Protocol
- SMTP, HTTP, TCP/IP, CIP
- MODBUS/TCP, Ethernet/IP, PROFINET IO
- INTERBUS
- DeviceNet

#### Physical
- Ethernet
- RS 485
- DeviceNet
- RS 232

#### Transfer rate
- 10 MBit/s or 100 MBit/s
- 500 kBit/s or 2 MBit/s adjustable
- 9.6; 19.2; 93.75; 187.5; 500; 1500 kBit/s
- 3; 6; 12 MBit/s self-synchronizing
- 125, 250, 500 kBit/s
- 1200; 2400; 4800; 9600; 19200; 38400 bits/s

#### Electrical data
- Power consumption P₀
  - 3.5 W without R/W heads
  - 3.5 W without R/W heads
  - 3.5 W without R/W heads
  - 3.5 W without R/W heads

#### Mechanical data
- Degree of protection IP67
- Connection Ethernet: RJ-45
- PROFIBUS:
  - Sub-D connector, 3-pin
  - M12 connector, B-coded
  - M12 connector, A-coded
- R/W heads: shielded, 4-pin, M12 connector
- Power supply M12 connector
- Ground M6 grounding screw
**Model Number**

IC-KP2-1HB6-V15B

Control interface unit IDENTControl Compact with interface for PROFIBUS DP

**Features**

- LED status indicator of bus communication and read/write head

**Accessories**

- **V1-G-5M-PUR-ABG-V1-W**
  Connecting cable, M12 to M12, PUR cable 4-pin, shielded

- **V1-G-10M-PUR-ABG-V1-W**
  Connecting cable, M12 to M12, PUR cable 4-pin, shielded

- **ICZ-3T-0,2M-PUR ABG-V15B-G**
  Y- Connection cable for PROFIBUS

- **ICZ-2T/TR-0,2M-PUR ABG-V15B-G**
  Terminal cable for PROFIBUS with terminal resistor

- **V15B-G-5M-PUR ABG-V15B-G**
  Bus cable PROFIBUS, M12 to M12, PUR cable

- **V15B-G-10M-PUR ABG-V15B-G**
  Bus cable PROFIBUS, M12 to M12, PUR cable

- **V15B-G**
  Cable socket, M12, for PROFIBUS, adjustable

- **V15SB-G**
  Cable connector, M12, for PROFIBUS, adjustable

- **ICZ-MH05-SACB-8**
  Mounting aid for DIN rail

**Dimensions**

- Width: 107 mm
- Height: 42 mm
- Depth: 36 mm

**Electrical connection**

- **RS 232**
  - Pin 1: NC
  - Pin 2: RxD
  - Pin 3: GND
  - Pin 4: TxD
  - Pin 5: NC

- **PROFIBUS**
  - Pin 1: +24 V
  - Pin 2: RxD/TxD-N
  - Pin 3: GND
  - Pin 4: RxD/TxD-P
  - Pin 5: NC

**Indicating / Operating means**

- PWR/ERR
- BUS/ERR
- BUS
- Diag

**BUS Address**

- High Nibble
  - 0
  - 8
  - C
  - 4
  - F
  - 7
  - B
  - 3
  - E
  - 6
  - A
  - 2
  - D
  - 5

- Low Nibble
  - 0
  - 8
  - C
  - 4
  - F
  - 7
  - B
  - 3
  - E
  - 6
  - A
  - 2
  - D
  - 5

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### Technical data

**General specifications**
- Number of read/write heads: max. 1

**Indicators/operating means**
- **LED BUS**
  - green: Slave is at state "Data Exchange"
  - red: Bus error
- **LED Diag**
  - green: flashes in rhythm of receiving data
  - yellow: flashes in rhythm with the transmitted data
- **LED 1**
  - Status indicator for read/write head
  - green: command at read/write head active
  - yellow: approx. 1 second long, if command was successfully executed
- **LED CH1**
  - Status indicator for read/write head
  - green: command at read/write head active
  - yellow: approx. 1 second long, if command was successfully executed
- **LED PWR/ERR**
  - green: power on
  - red: Hardware fault
- **Rotary switch**
  - Address setting: 00 ... 7E, FF (hexadecimal)
  - BUS Address (high nibble): 0 ... 7, F
  - BUS Address (low nibble): 0 ... F

**Electrical specifications**
- **Rated operational voltage** $U_e$: 20 ... 30 V DC, PELV
- **Ripple** $\leq 10\%$ at 30 V DC
- **Current consumption** $\leq 2$ A incl. read/write head
- **Power consumption** $P_0$: 2 W Without read/write head
- **Electrical isolation** basic insulation acc. to DIN EN 50178, rated insulation voltage of 50 Veff

**Interface 1**
- **Interface type**: PROFIBUS
- **Physical**: RS 485
- **Protocol**: PROFIBUS DP acc. to EN 50170
- **Transfer rate**: 9.6; 19.2; 93.75; 187.5; 500; 1500 kBit/s
  - 3; 6; 12 MBit/s self-synchronizing

**Interface 2**
- **Interface type**: Diagnostic Interface
- **Physical**: RS 232
- **Protocol**: ASCII
- **Transfer rate**: 38.4 kBit/s

**Compliance with standards and directives**
- **Standard conformity**
  - Electromagnetic compatibility: EN 61000-6-2, EN 61000-6-4
  - Protection degree: EN 60529

**Ambient conditions**
- **Ambient temperature**: -25 ... 70 °C (248 ... 343 K)
- **Storage temperature**: -40 ... 85 °C (233 ... 358 K)
- **Climatic conditions**
  - air humidity: max. 96 %
  - Salt spray resistant to EN 60068-2-52
- **Shock and impact resistance**
  - Oscillation (Sine): 5 g, 10 - 1000 Hz to EN 60068-2-6
  - Shock (Half-sine): 30 g, 11 ms in accordance with EN 60068-2-27

**Mechanical specifications**
- **Protection degree**: IP67
- **Connection**
  - Read/write head: M12 plug connection, 4-pin, screened
  - Power supply: M12 plug connection
  - Protective earths: M4 earthing screw
  - Diagnostic RS 232: M12 plug connection
  - PROFIBUS: M12 plug connection, B-coded

**Material**
- **Housing**: Zinc, powder-coated
- **Installation**: screw fixing
- **Mass**: approx. 500 g
Model Number
IC-KP2-2HB6-V15B
Control interface unit IDENTControl Compact with interface for PROFIBUS DP

Features
- LED status indicator of bus communication and read/write heads
- Max. 2 read/write heads can be connected
- Alternatively 1 read/write head and 1 trigger sensor can be connected

Electrical connection
- 1 = +24 V
- 2 = NC
- 3 = GND
- 4 = NC
- 5 = +24 V

Indicating / Operating means
Accessories

V1-G-5M-PUR-ABG-V1-W  
Connecting cable, M12 to M12, PUR cable 4-pin, shielded

V1-G-10M-PUR-ABG-V1-W  
Connecting cable, M12 to M12, PUR cable 4-pin, shielded

ICZ-3T-0.2M-PUR ABG-V15B-G  
Y-connection cable for PROFIBUS

ICZ-2T/TR-0.2M-PUR ABG-V15B-G  
Terminal cable for PROFIBUS with terminal resistor

V15B-G-5M-PUR ABG-V15B-G  
Bus cable PROFIBUS, M12 to M12, PUR cable

V15B-G-10M-PUR ABG-V15B-G  
Bus cable PROFIBUS, M12 to M12, PUR cable

V15B-G  
Cable socket, M12, for PROFIBUS, adjustable

V155B-G  
Cable connector, M12, for PROFIBUS, adjustable

ICZ-MH05-SACB-8  
Mounting aid for DIN rail

Technical data

General specifications

Number of read/write heads: max. 2
Alternatively 1 read/write head and 1 trigger sensor

Indicators/operating means

LED BUS: green: Slave is at state “Data Exchange”  
red: Bus error

LED Diag: green: flashes in rhythm of receiving data  
yellow: flashes in rhythm with the transmitted data

LEDs 1, 2: Status indicator for read/write heads  
green: command at read/write head active  
yellow: approx. 1 second long, if command was successfully executed

LEDs CH1, CH2: green: read head detected  
red: Configuration error

LED PWR/ERR: green: power on  
red: Hardware fault

Rotary switch: Address setting 00 ... 7E, FF (hexadecimal): 0 ... 7, F  
BUS Address (high nibble): 0 ... 7, F  
BUS Address (low nibble): 0 ... F

Electrical specifications

Rated operational voltage $U_e$: 20 ... 30 V DC, PELV  
Ripple: $\leq 10\%$ at 30 V DC

Current consumption: $\leq 2$ A incl. read/write heads

Power consumption $P_0$: 2 W Without read/write heads  
Electrical isolation: basic insulation acc. to DIN EN 50178, rated insulation voltage of 50 Veff

Interface 1

Interface type: PROFIBUS

Physical: RS 485

Protocol: PROFIBUS DP acc. to EN 50170  
Transfer rate: 9.6; 19.2; 93.75; 187.5; 500; 1500 kBit/s  
3; 6; 12 MBit/s self-synchronizing

Interface 2

Interface type: Diagnostic Interface

Physical: RS 232

Protocol: ASCII  
Transfer rate: 38.4 kBit/s

Compliance with standards and directives

Standard conformity

Electromagnetic compatibility: EN 61000-6-2, EN 61000-6-4

Protection degree: EN 60529

Ambient conditions

Ambient temperature: -25 ... 70 °C (248 ... 343 K)

Storage temperature: -40 ... 85 °C (233 ... 358 K)

Climatic conditions: air humidity max. 96%  
Salt spray resistant to EN 60068-2-52

Shock and impact resistance: Oscillation (Sine): 5 g, 10 - 1000 Hz to EN 60068-2-6  
Shock (Half-sine): 30 g, 11 ms in accordance with EN 60068-2-27

Mechanical specifications

Protection degree: IP67

Connection: Read/write heads: M12 plug connection, 4-pin, screened  
Power supply: M12 plug connection  
Protective earth: M4 earthing screw  
Diagnostic RS 232: M12 plug connection  
PROFIBUS: M12 plug connection, B-coded

Material

Housing: Zinc, powder-coated

Installation: screw fixing

Mass: approx. 500 g
Model Number
IC-KP2-1HB17-2V1D
Control interface unit IDENTControl Compact with Ethernet interface

Features
- LED status indicator of bus communication and read/write head
- Network loop through by means of integrated 2 port switch

Accessories
V1-G-5M-PUR-ABG-V1-W Connecting cable, M12 to M12, PUR cable 4-pin, shielded
ICZ-MH05-SACB-8 Mounting aid for DIN rail
V1SD-G-5M-PUR-ABG-V45-G Connection cable, M12 to RJ-45, PUR cable 4-pin, CAT5e

Electrical connection
- Power supply
- Ethernet socket at housing read/write head

Indicating / Operating means
- LED status indicator of bus communication and read/write head

Dimensions
- Width: 42 mm
- Height: 136.6 mm
- Depth: 61.4 mm
- Mounting hole: 107 mm x 15 mm

Address configuration
- Address state

Address state
- Link/Traffic
- Link/Traffic
**Technical data**

### General specifications

- **Number of read/Write heads**: max. 1

### Indicators/operating means

- **LED Link/Traffic**: green: network connection, yellow: flashes in rhythm with the transmitted data
- **LED 1**: Status indicator for read/write head, green: command at read/write head active, yellow: approx. 1 second long, if command was successfully executed
- **LED CH1**: green: read head detected, red: Configuration error
- **LED PWR/ERR**: green: power on, red: Hardware fault

### Rotary switch

- **Address setting**

### Electrical specifications

- **Rated operational voltage** $U_{\text{a}}$ 20 ... 30 V DC, PELV
- **Ripple**: $\leq 10\%$ at 30 V DC
- **Current consumption**: $\leq 2$ A incl. read/write head
- **Power consumption** $P_0$ 3.5 W Without read/write heads
- **Electrical isolation**: basic insulation acc. to DIN EN 50178, rated insulation voltage of $50\ V_{\text{rel}}$

### Interface 1

- **Physical**: Ethernet
- **Protocol**: SMTP, HTTP, TCP/IP (Port 10000), MODBUS/TCP, EtherNet/IP, PROFINET IO
- **Transfer rate**: 10 MBit/s or 100 MBit/s

### Interface 2

- **Physical**: Ethernet
- **Protocol**: SMTP, HTTP, TCP/IP (Port 10000), MODBUS/TCP, EtherNet/IP, PROFINET IO
- **Transfer rate**: 10 MBit/s or 100 MBit/s

### Compliance with standards and directives

- **Standard conformity**: EN 61000-6-2, EN 61000-6-4
- **Protection degree**: EN 60529
- **Electromagnetic compatibility**: EN 61000-6-2, EN 61000-6-4
- **Protection degree**: EN 60529
- **Ambient conditions**
  - **Ambient temperature**: $-25 \ldots 70 \degree C$ (248 ... 343 K)
  - **Storage temperature**: $-40 \ldots 85 \degree C$ (233 ... 358 K)
  - **Climatic conditions**: air humidity max. 96 %, Salt spray resistant to EN 60068-2-52
  - **Shock and impact resistance**: Oscillation (Sine): 5 g, 10 - 1000 Hz to EN 60068-2-6, Shock (Half-sine): 30 g, 11 ms in accordance with EN 60068-2-27

### Mechanical specifications

- **Protection degree**: IP67
- **Connection**: Read/write heads: M12 plug connection, 4-pin, screened, Power supply: M12 plug connection, Protective earth: M4 earthing screw, Ethernet: M12 plug connection
- **Material**
  - **Housing**: Zinc, powder-coated
  - **Installation**: Screw fixing
  - **Mass**: approx. 500 g
**Model Number**

IC-KP2-2HB17-2V1D  
Control interface unit IDENTControl Compact with Ethernet interface

**Features**

- LED status indicator of bus communication and read/write heads
- Network loop through by means of integrated 2 port switch
- Max. 2 read/write heads can be connected
- Alternatively 1 read/write head and 1 trigger sensor can be connected

**Accessories**

- V1-G-5M-PUR-ABG-V1-W  
Connecting cable, M12 to M12, PUR cable 4-pin, shielded
- ICZ-MH05-SACB-8  
Mounting aid for DIN rail
- V1SD-G-5M-PUR-ABG-V45-G  
Connection cable, M12 to RJ-45, PUR cable 4-pin, CAT5e

**Electrical connection**

- socket at housing
- read/write head
- trigger sensor
- trigger switch

**Indicating / Operating means**

- CH1
- CH2
- PWR/ERR
- Link/ Traffic
- Address configuration
- Address state
## Technical data

### General specifications
- Number of read/write heads: max. 2
  - alternatively 1 read/write head and 1 trigger sensor

### Indicators/operating means
- **LED Link/Traffic**
  - green: network connection
  - yellow: flashes in rhythm with the transmitted data
- **LEDs 1, 2**
  - Status indicator for read/write heads
  - green: command at read/write head active
  - yellow: approx. 1 second long, if command was successfully executed
- **LEDs CH1, CH2**
  - green: read head detected
  - red: Configuration error
- **LED PWR/ERR**
  - green: power on
  - red: Hardware fault
- **Rotary switch**
  - Address setting

### Electrical specifications
- **Rated operational voltage** $U_e$
  - 20 ... 30 V DC , PELV
- **Ripple**
  - $\leq 10\%$ at 30 V DC
- **Current consumption**
  - $\leq 4$ A incl. read/write heads
- **Power consumption** $P_0$
  - 3.5 W Without read/write heads
- **Electrical isolation**
  - basic insulation acc. to DIN EN 50178, rated insulation voltage of 50 Veff

### Interface 1
- **Physical**
  - Ethernet
- **Protocol**
  - SMTP
  - HTTP
  - TCP/IP (Port 10000)
  - MODBUS/TCP
  - EtherNet/IP
  - PROFINET IO
- **Transfer rate**
  - 10 MB/s or 100 MB/s

### Interface 2
- **Physical**
  - Ethernet
- **Protocol**
  - SMTP
  - HTTP
  - TCP/IP (Port 10000)
  - MODBUS/TCP
  - EtherNet/IP
  - PROFINET IO
- **Transfer rate**
  - 10 MB/s or 100 MB/s

### Compliance with standards and directives
- **Standard conformity**
  - EN 61000-6-2, EN 61000-6-4
  - EN 60529
- **Ambient conditions**
  - **Ambient temperature**
    - -25 ... 70 °C (248 ... 343 K)
  - **Storage temperature**
    - -40 ... 85 °C (233 ... 358 K)
  - **Climatic conditions**
    - air humidity max. 96 %
    - Salt spray resistant to EN 60068-2-52
  - **Shock and impact resistance**
    - Oscillation (Sine): 5 g, 10 - 1000 Hz to EN 60068-2-27
    - Shock (Half-sine): 30 g, 11 ms in accordance with EN 60068-2-2

### Mechanical specifications
- **Protection degree**
  - IP67
- **Connection**
  - read/write heads: M12 plug connection, 4-pin, screened
  - Power supply: M12 plug connection
  - Protective earth: M4 earthing screw
  - Ethernet: M12 plug connection
- **Material**
  - Housing: Zinc, powder-coated
- **Installation**
  - screw fixing
- **Mass**
  - approx. 500 g
Model Number
IC-KP2-1HRX-2V1
Control interface unit IDENTControl Compact with serial interface

Features
- LED status indicator of bus communication and read/write head

Accessories
- V1-G-5M-PUR-ABG-V1-W Connecting cable, M12 to M12, PUR cable 4-pin, shielded
- V1-G-10M-PUR-ABG-V1-W Connecting cable, M12 to M12, PUR cable 4-pin, shielded
- V1S-G-0,15M-PUR-SUBD Adapter M12 on Sub-D for PC connection with null modem cable
- ICZ-MH05-SACB-8 Mounting aid for DIN rail
- RFIDControl Software for RFID identification systems

Electrical connection
- RS 485
  - 1 = NC
  - 2 = A
  - 3 = DGND
  - 4 = B
  - 5 = NC
- RS 232
  - 1 = NC
  - 2 = RxD
  - 3 = GND
  - 4 = TxD
  - 5 = NC

Indicating / Operating means
- PWR/ERR
- TxD
- RxD
## Technical data

### General specifications
- **Number of read/write heads**: max. 1

### Indicators/operating means
- **LED 1**: Status indicator for read/write head
  - green: command at read/write head active
  - yellow: approx. 1 second long, if command was successfully executed
- **LED CH1**: green: read head detected
  - red: Configuration error
- **LED PWR/ERR**: green: power on
  - red: Hardware fault
- **LED TxD**: green: flashes in rhythm with the transmitted data
- **LED RxD**: green: flashes in rhythm of receiving data

### Electrical specifications
- **Rated operational voltage** $U_e$: $20 \ldots 30$ V DC, PELV
- **Ripple**: $\leq 10$ % at 30 V DC
- **Current consumption**: $\leq 2$ A incl. read/write head
- **Power consumption $P_0$**: 2 W Without read/write head
- **Electrical isolation**: basic insulation acc. to DIN EN 50178, rated insulation voltage of $50 V_{eff}$

### Interface 1
- **Interface type**: serial
- **Physical**: RS 485
- **Protocol**: ASCII
- **Transfer rate**: 1200; 2400; 4800; 9600; 19200; 38400 Bit/s

### Interface 2
- **Interface type**: serial
- **Physical**: RS 232
- **Protocol**: ASCII
- **Transfer rate**: 1200; 2400; 4800; 9600; 19200; 38400 Bit/s

### Compliance with standards and directives
- **Standard conformity**: Electromagnetic compatibility EN 61000-6-2, EN 61000-6-4
- **Protection degree**: EN 60529

### Ambient conditions
- **Ambient temperature**: $-25 \ldots 70$ °C (248 ... 343 K)
- **Storage temperature**: $-40 \ldots 85$ °C (233 ... 358 K)
- **Climatic conditions**: air humidity max. 96 %
  - Salt spray resistant to EN 60068-2-52
- **Shock and impact resistance**: Oscillation (Sine): 5 g, 10 - 1000 Hz to EN 60068-2-6
  - Shock (Half-sine): 30 g, 11 ms in accordance with EN 60068-2-27

### Mechanical specifications
- **Protection degree**: IP67
- **Connection**: read/write head: M12 plug connection, 4-pin, screened
  - Power supply: M12 plug connection
  - Protective earth: M4 earthing screw
  - RS 232: M12 plug connection
  - RS 485: M12 plug connection

### Material
- **Housing**: Zinc, powder-coated
- **Installation**: screw fixing
- **Mass**: approx. 500 g
IC-KP2-2HRX-2V1
Control interface unit
IDENTControl Compact
with serial interface

Features
• LED status indicator of bus communication and read/write heads
• Max. 2 read/write heads can be connected
• Alternatively 1 read/write head and 1 trigger sensor can be connected

Accessories
V1-G-5M-PUR-ABG-V1-W
Connecting cable, M12 to M12, PUR cable 4-pin, shielded
V1-G-10M-PUR-ABG-V1-W
Connecting cable, M12 to M12, PUR cable 4-pin, shielded
V1S-G-0,15M-PUR-SUBD
Adapter M12 on Sub-D for PC connection with null modem cable
ICZ-MH05-SACB-8
Mounting aid for DIN rail
RFIDControl
Software for RFID identification systems

Dimensions

Electrical connection

Indicating / Operating means

Subject to modifications without notice

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Catalogue Identification Systems 2009

Courtesy of Steven Engineering, Inc.-230 Ryan Way, South San Francisco, CA 94080-6370-Main Office: (650) 588-9200-Outside Local Area: (800) 258-9200-www.stevenengineering.com
## Technical data

### General specifications
- **Number of read/write heads**: max. 2, alternatively 1 read/write head and 1 trigger sensor

### Indicators/operating means
- **LEDs 1, 2**: green: read head detected, red: Configuration error
- **LEDs CH1, CH2**: green: power on, red: Hardware fault
- **LED TxD**: green: flashes in rhythm with the transmitted data
- **LED RxD**: green: flashes in rhythm of receiving data

### Electrical specifications
- **Rated operational voltage** $U_e$: 20 ... 30 V DC, PELV
- **Ripple**: $\leq 10 %$ at 30 V DC
- **Current consumption**: $\leq 2$ A incl. read/write heads
- **Power consumption** $P_0$: 2 W Without read/write heads
- **Basic insulation acc. to DIN EN 50178**: rated insulation voltage of $50 V_{eff}$

### Interface 1
- **Interface type**: serial
- **Physical**: RS 485
- **Protocol**: ASCII
- **Transfer rate**: 1200; 2400; 4800; 9600; 19200; 38400 Bit/s

### Interface 2
- **Interface type**: serial
- **Physical**: RS 232
- **Protocol**: ASCII
- **Transfer rate**: 1200; 2400; 4800; 9600; 19200; 38400 Bit/s

### Compliance with standards and directives
- **Standard conformity**: EN 61000-6-2, EN 61000-6-4
- **Protection degree**: EN 60529

### Ambient conditions
- **Ambient temperature**: -25 ... 70 °C (248 ... 343 K)
- **Storage temperature**: -40 ... 85 °C (233 ... 358 K)
- **Climatic conditions**: air humidity max. 96 %
- **Salt spray resistant to EN 60068-2-52
- **Shock and impact resistance**: Oscillation (Sine): 5 g, 10 - 1000 Hz to EN 60068-2-6
  Shock (Half-sine): 30 g, 11 ms in accordance with EN 60068-2-27

### Mechanical specifications
- **Protection degree**: IP67
- **Connection**: read/write heads: M12 plug connection, 4-pin, screened,
  Power supply: M12 plug connection
- **Protective earth**: M4 earthing screw
- **RS 232**: M12 plug connection
- **RS 485**: M12 plug connection

### Material
- **Housing**: Zinc, powder-coated
- **Installation**: screw fixing
- **Mass**: approx. 500 g
**Model Number**

IC-KP-B12-V45

Control interface unit IDENTControl with Ethernet interface

**Features**

- Max. 4 read/write heads connectable
- Alternative 2 read/write heads and 2 trigger sensors can be connected
- LC display with background lightning
- Direct operation via 4 keys
- LED status indicator of bus communication and read/write heads
- TCP/IP, MODBUS/TCP, EtherNet/IP and PROFINET IO protocol

**Dimensions**

- **Electrical connection**

  - socket at housing
  - read/write head
  - trigger sensor
  - trigger switch
  - voltage supply
  - Ethernet

- **Indicating / Operating means**

  - ESC
  - U
  - D
  - L

---

Courtesy of Steven Engineering, Inc.-230 Ryan Way, South San Francisco, CA 94080-6370-Main Office: (650) 588-9200-Outside Local Area: (800) 258-9200-www.stevenengineering.com
**Function**

The innovative concept of the RFID identification system IDENTControl from Pepperl+Fuchs has many advantages in comparison to other systems. The core piece of the system is the evaluation unit IDENTControl.

Thanks to the integrated interfaces for all standard field bus systems such as PROFIBUS, EtherNet, PROFINET IO, DeviceNet, serial connections (RS 232/RS 485/RS 422) and numerous connection options for induc- 
tive write/read heads as well as microwave antennas, the evaluation unit IDENTControl can be adjusted to your needs in a flexible and easy manner.

4 function keys and a double-sided illuminated LC display facilitate easy system configuration, parameter assignment and entering commands. Further LEDs indicate operating power and bus communication, connected write/read heads and active write/read commands.

Mounting the unit onto DIN mounting rails is easy thanks to the snap-fits on the back of the housing of the evaluation unit IDENTControl.

With its L-shaped housing, the evaluation unit including bus connector fits into a 120 mm grid in the switch cabinet. The mounting depth of 70 mm furthermore enables installation in flat switch boxes with a depth of only 100 mm.

There are 3 further mounting holes for field mounting.

**Accessories**

- **V1-G-5M-PUR-ABG-V1-W**
  - Connecting cable, M12 to M12, PUR cable 4-pin, shielded

- **V45-G-10M-V45-G**
  - Network cable RJ-45, Category 5

- **V45-G**
  - Non pre-wired cable connector

- **ICZ-V45**
  - Ethernet connections accessories for increasing of protection degree of the RJ-45 connector

- **V1-G-5M-PUR**
  - Cable socket, M12, 4-pin, PUR cable

---

**Technical data**

### General specifications

<table>
<thead>
<tr>
<th>Number of read/write heads</th>
<th>max. 4</th>
</tr>
</thead>
</table>

**Indicators/operating means**

- **LEDs 1, 2, 3, 4**
  - Status indicator for read/write heads
  - green: command at read/write head active
  - yellow: approx. 1 second long, if command was successfully executed

- **LED PWR/ERR**
  - green: power on
  - red: Hardware fault

- **LED State**
  - green: interface OK
  - Off: Not ready for operation

- **LED Link/Act**
  - green: network connection
  - green flashing: bus active

- **LED Traffic**
  - green: flashes in rhythm of sending/receiving data
  - yellow: transfer rate 100 MBit/s
  - Off: transfer rate 10 MBit/s

- **LED 100 MBit**
  - yellow: interface OK
  - green: command at read/write head active
  - Off: transfer rate 10 MBit/s

- **LC display**
  - two-line multi-function display with 12 characters per line, connected read/write heads as additional pictograms; easy and direct selection of operating commands and addressing

**Button**

- 4 keys: ESC, up, down and return

### Electrical specifications

- **Rated operational voltage**
  - \( U_0 = 20 \ldots 30 \text{ V DC} \), PELV

- **Current consumption**
  - \( \leq 2 \text{ A incl. read/write heads} \)

- **Rated operational voltage**
  - \( U_e = 20 \ldots 30 \text{ V DC} \)

- **Power consumption**
  - \( P_0 = 2 \text{ A incl. read/write heads} \)

### Interface

- **Physical**
  - Ethernet

- **Protocol**
  - SMTP
  - HTTP
  - TCP/IP (Port 10000)
  - MODBUS/TCP
  - EtherNet/IP
  - PROFINET IO

- **Transfer rate**
  - 10 MBit/s or 100 MBit/s

### Compliance with standards and directives

- **Standard conformity**
  - EN 61326
  - EN 60529

### Ambient conditions

- **Ambient temperature**
  - \(-25 \ldots 70 \text{ °C (248 \ldots 343 K)}\)

- **Storage temperature**
  - \(-30 \ldots 80 \text{ °C (243 \ldots 353 K)}\)

- **Climatic conditions**
  - air humidity max. 96 %
  - Salt spray resistant to EN 60068-2-52

- **Shock and impact resistance**
  - Oscillation (Sine): 5 g, 10 - 1000 Hz to EN 60068-2-6
  - Shock (Half-sine): 30 g, 11 ms in accordance with EN 60068-2-27

### Mechanical specifications

- **Protection degree**
  - IP67

- **Connection**
  - M12 plug connection, 4-pin, screened

- **Material**
  - Housing: aluminium, powder coated

- **Installation**
  - Snap-on to 35 mm standard rail or screw fixing

- **Mass**
  - approx. 1000 g
**Model Number**

IC-KP-B5-V23

Control interface unit IDENTControl with interface for INTERBUS

**Features**

- Max. 4 read/write heads connectable
- Alternative 2 read/write heads and 2 trigger sensors can be connected
- LC display with background lightning
- Direct operation via 4 keys
- LED status indicator of bus communication and read/write heads

**Dimensions**

![Dimensions Diagram]

**Electrical connection**

![Electrical Connection Diagram]

**Indicating / Operating means**

![Indicating Operating Means Diagram]
The innovative concept of the RFID identification system IDENTControl from Pepperl+Fuchs has many advantages in comparison to other systems. The core piece of the system is the evaluation unit IDENTControl.

Thanks to the integrated interfaces for all standard field bus systems such as PROFIBUS, EtherNet, PROFINET IO, DeviceNet, serial connections (RS 232/RS 485/RS 422) and numerous connection options for inductive write/read heads as well as microwave antennas, the evaluation unit IDENTControl can be adjusted to your needs in a flexible and easy manner.

4 function keys and a double-spaced illuminated LC display facilitate easy system configuration, parameter assignment and entering commands. Further LEDs indicate operating power and bus communication, connected write/read heads and active write/read commands.

Mounting the unit onto DIN mounting rails is easy thanks to the snap-fits on the back of the housing of the evaluation unit IDENTControl.

With its L-shaped housing, the evaluation unit including bus connector fits into a 120 mm grid in the switch cabinet. The mounting depth of 70 mm furthermore enables installation in flat switch boxes with a depth of only 100 mm.

There are 3 further mounting holes for field mounting.

### Accessories

**V1-G-5M-PUR-ABG-V1-W**
Connecting cable, M12 to M12, PUR cable 4-pin, shielded

**V1-G-5M-PUR**
Cable socket, M12, 4-pin, PUR cable
IC-KP-B6-SUBD
Control interface unit IDENTControl with interface for PROFIBUS DP

Features
- Max. 4 read/write heads connectable
- Alternative 2 read/write heads and 2 trigger sensors can be connected
- LC display with background lightning
- Direct operation via 4 keys
- LED status indicator of bus communication and read/write heads

Dimensions

Electrical connection

Indicating / Operating means

Courtesy of Steven Engineering, Inc.-230 Ryan Way, South San Francisco, CA 94080-6370-Main Office: (650) 588-9200-Outside Local Area: (800) 258-9200-www.stevenengineering.com
Function

The innovative concept of the RFID identification system IDENTControl from Pepperl+Fuchs has many advantages in comparison to other systems. The core piece of the system is the evaluation unit IDENTControl.

Thanks to the integrated interfaces for all standard field bus systems such as PROFI-BUS, EtherNet, PROFINET IO, DeviceNet, serial connections (RS 232/RS 485/RS 422) and numerous connection options for inductive write/read heads as well as microwave antennas, the evaluation unit IDENTControl can be adjusted to your needs in a flexible and easy manner.

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There are 3 further mounting holes for field mounting.

Accessories

V1-G-5M-PUR-ABG-V1-W Connecting cable, M12 to M12, PUR cable 4-pin, shielded

V1-G-5M-PUR Cable socket, M12, 4-pin, PUR cable

VAZ-PB-DB9-W PROFI-BUS Sub-D Connector with switchable terminal resistance

Technical data

<table>
<thead>
<tr>
<th>General specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of read/write heads</td>
</tr>
<tr>
<td>alternative 2 read/write heads and 2 trigger sensors</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Indicators/operating means</th>
</tr>
</thead>
<tbody>
<tr>
<td>LEDs 1, 2, 3, 4</td>
</tr>
<tr>
<td>Status indicator for read/write heads</td>
</tr>
<tr>
<td>green: command at read/write head active</td>
</tr>
<tr>
<td>yellow: approx. 1 second long, if command was successfully executed</td>
</tr>
<tr>
<td>green: power on</td>
</tr>
<tr>
<td>red: Hardware fault</td>
</tr>
<tr>
<td>green: Interface Power On/OK</td>
</tr>
<tr>
<td>red: Bus error</td>
</tr>
<tr>
<td>green: Slave is at state ”Data Exchange”</td>
</tr>
<tr>
<td>Yellow: not used</td>
</tr>
</tbody>
</table>

| LC display |
| two-line multi-function display with 12 characters per line |
| configuration of the control interface and display of connected read/write heads as additional pictograms; easy and direct selection of operating commands and addressing |

| Button |
| 4 keys: ESC, up, down and return |

<table>
<thead>
<tr>
<th>Electrical specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated operational voltage Ue</td>
</tr>
<tr>
<td>Ripple</td>
</tr>
<tr>
<td>Current consumption</td>
</tr>
<tr>
<td>Power consumption P0</td>
</tr>
<tr>
<td>Electrical isolation</td>
</tr>
</tbody>
</table>

| Interface |
| Physical | RS 485 |
| Protocol | PROFI-BUS DP acc. to EN 50170 |
| Transfer rate | 9.6; 19.2; 93.75; 187.5; 500; 1500 kBit/s; 3; 6; 12 MBit/s self-synchronizing |

| Compliance with standards and directives |
| Standard conformity |
| Electromagnetic compatibility | EN 61326 |
| Protection degree | EN 60529 |

<table>
<thead>
<tr>
<th>Ambient conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambient temperature</td>
</tr>
<tr>
<td>Storage temperature</td>
</tr>
<tr>
<td>Climatic conditions</td>
</tr>
<tr>
<td>Shock and impact resistance</td>
</tr>
<tr>
<td>Oscillation (Sine): 5 g, 10 - 1000 Hz to EN 60068-2-6</td>
</tr>
<tr>
<td>Shock (Half-sine): 30 g, 11 ms in accordance with EN 60068-2-27</td>
</tr>
</tbody>
</table>

| Mechanical specifications |
| Protection degree | IP40 |
| Connection | read/write heads: M12 plug connection, 4-pin, screened, Power supply: M12 plug connection |
| Protection earth: M6 earthing screw |
| PROFI-BUS: Sub-D connector, 9-pin |

| Material |
| Housing | aluminium, powder coated |
| Installation | snap-on to 35 mm standard rail or screw fixing |
| Mass | approx. 1000 g |
**Model Number**

IC-KP-B6-V15B

Control interface unit IDENTControl with interface for PROFIBUS DP

**Features**

- Max. 4 read/write heads connectable
- Alternative 2 read/write heads and 2 trigger sensors can be connected
- LC display with background lightning
- Direct operation via 4 keys
- LED status indicator of bus communication and read/write heads

**Dimensions**

![Dimensions Diagram]

**Electrical connection**

- Socket at housing
- Read/write head
- Trigger sensor
- Trigger switch
- Voltage supply

**Indicating / Operating means**

- UL
- Bus Error
- Data Exch
- PROFIBUS

Subject to modifications without notice

Copyright Pepperl+Fuchs
**Technical data**

### General specifications
- Number of read/write heads: max. 4, alternative 2 read/write heads and 2 trigger sensors

### Indicators/operating means
- **LEDs 1, 2, 3, 4**
  - Status indicator for read/write heads
  - Power consumption: P0
  - Current consumption: I
  - Transfer rate: 9.6; 19.2; 93.75; 187.5; 500; 1500 kBit/s

### Electrical specifications
- Rated operational voltage: U
- Ripple: ≤ 10 % at 30 V DC
- Power consumption: P0
- Power supply: M12 plug connection
- Electrical isolation: basic insulation acc. to DIN EN 50178, rated insulation voltage of 50 V<sub>eff</sub>

### Mechanical specifications
- Protection degree: IP67
- Current consumption: ≤ 2 A incl. read/write heads
- Shock and impact resistance:
  - Oscillation (Sine): 5 g, 10 - 1000 Hz to EN 60068-2-6
  - Shock (Half-sine): 30 g, 11 ms in accordance with EN 60068-2-27

### Compliance with standards and directives
- Electromagnetic compatibility: EN 61326
- Protection degree: EN 60529
- Standard conformity: EN 61326-3; 6; 12 MBit/s self-synchronizing

### Interface
- **Physical**
  - RS 485
- **Protocol**
  - PROFIBUS DP acc. to EN 50170
- **Transfer rate**
  - 9.6; 19.2; 93.75; 1875; 500; 1500 kBit/s

### Ambient conditions
- **Temperature**
  - Storage temperature: -30 ... 80 °C (243 ... 353 K)
  - Climatic conditions: air humidity max. 96 %
  - Salt spray resistant to EN 60068-2-52
- **Shock and impact resistance**
  - Oscillation (Sine): 5 g, 10 - 1000 Hz to EN 60068-2-6
  - Shock (Half-sine): 30 g, 11 ms in accordance with EN 60068-2-27

### Connection read/write heads
- **Read/write heads**
  - M12 plug connection, 4-pin, screened

### Power supply
- **PROFIBUS**
  - M12 plug connection

### Standard field bus systems
- PROFIBUS, DeviceNet, SPANet, CAN, MODBUS, BACnet, Interbus, Profinet io, Serielle Feldbusse, CAN

### Operating commands
- **Command**
  - EXEC: Execute command
  - BUS: Bus command
  - BUS ERR: Bus error
  - LED: LED status
  - LED BUS EXCH: LED status
  - LED DPV1: LED status
  - LED ICZ-3T: LED status
  - LED ICZ-4T: LED status
  - LED PWR/ERR: LED status
  - LED UL: LED status

---

**Function**

The innovative concept of the RFID identification system IDENTControl from Pepperl+Fuchs has many advantages in comparison to other systems. The core piece of the system is the evaluation unit IDENTControl.

Thanks to the integrated interfaces for all standard field bus systems such as PROFIBUS, EtherNet, DeviceNet, serial connections (RS 232/RS 485/RS 422) and numerous connection options for inductive read/write heads as well as microwave antennas, the evaluation unit IDENTControl can be adjusted to your needs in a flexible and easy manner.

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With its L-shaped housing, the evaluation unit including bus connector fits into a 120 mm grid in the switch cabinet. The mounting depth of 70 mm furthermore enables installation in flat switch boxes with a depth of only 100 mm.

There are 3 further mounting holes for field mounting.

**Accessories**

- **V1-G-5M-PUR-ABG-V1-W**
  - Connecting cable, M12 to M12, PUR cable
  - Shielded

- **ICZ-3T-0,2M-PUR-ABG-V15B-G**
  - Y: Connection cable for PROFIBUS

- **ICZ-2TTR-0,2M-PUR-ABG-V15B-G**
  - Terminal cable for PROFIBUS with terminal resistor

- **V15B-G-5M-PUR-ABG-V15B-G**
  - Bus cable PROFIBUS, M12 to M12, PUR cable

- **V15B-G**
  - Cable socket, M12, for PROFIBUS, adjustable

- **V15SB-G**
  - Cable connector, M12, for PROFIBUS, adjustable

- **V1-G-5M-PUR**
  - Cable socket, M12, 4-pin, PUR cable
**Model Number**

IC-KP-B6-2V15B

Control interface unit IDENTControl with interface for PROFIBUS DP

**Features**

- Max. 4 read/write heads connectable
- Alternative 2 read/write heads and 2 trigger sensors can be connected
- LC display with background lightning
- Direct operation via 4 keys
- LED status indicator of bus communication and read/write heads

**Electrical connection**

<table>
<thead>
<tr>
<th>Socket at Housing</th>
<th>Read/write head</th>
<th>Trigger sensor</th>
<th>Trigger switch</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>A</td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>5</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
</tbody>
</table>

**Indicating / Operating means**
### Technical data

**General specifications**
- Number of read/write heads: max. 4
- Alternative 2 read/write heads and 2 trigger sensors

**Indicators/operating means**
- **LEDs 1, 2, 3, 4**
  - Status indicator for read/write heads
  - green: command at read/write head active
  - yellow: approx. 1 second long, if command was successfully executed
- LED PWQ/ERR
  - green: power on
  - red: Hardware fault
- LED UL
  - green: Interface Power ON/OK
- LED Bus Error
  - red: Bus error
- LED Data Exch
  - green: Slave is at state "Data Exchange"
- LED DPV1
  - yellow: not used
- LC display
  - Two-line multi-function display with 12 characters per line

**Button**
- 4 keys: ESC, up, down and return

### Electrical specifications
- **Rated operational voltage** $U_{op}$
  - 20 ... 30 V DC, PELV
- **Ripple**
  - $\leq 10\%$ at 30 V DC
- **Current consumption** $P_0$
  - 3.5 W Without read/write heads
- **Power consumption** $P_0$
  - 2 A incl. read/write heads
- **Electrical isolation**
  - Basic insulation acc. to DIN EN 50178, rated insulation voltage of 50 V<sub>air</sub>

**Interface**
- **Physical**
  - RS 485
- **Protocol**
  - PROFIBUS DP acc. to EN 50170
- **Transfer rate**
  - 9.6; 19.2; 38.4; 144; 720 kBit/s
  - 3; 6; 12 MBit/s self-synchronizing

### Compliance with standards and directives
- **Standard conformity**
  - Electromagnetic compatibility
    - EN 61326
  - Protection degree
    - EN 60529

### Ambient conditions
- **Ambient temperature**
  - $-25 \ldots 70^\circ C$ (248 ... 343 K)
- **Storage temperature**
  - $-30 \ldots 80^\circ C$ (243 ... 353 K)
- **Climatic conditions**
  - Air humidity max. 96 %
  - Salt spray resistant to EN 60068-2-52
  - Shock and impact resistance
    - Oscillation (Sine): 5 g, 10 - 100 Hz
    - Shock (Half-sine): 30 g, 11 ms
    - EN 60068-2-27

### Mechanical specifications
- **Protection degree**
  - IP67
- **Connection**
  - read/write heads: M12 plug connection, 4-pin, screened
  - Power supply: M12 plug connection
  - Protection earth: M6 earthing screw
  - PROFIBUS: 2x M12 plug connection, B-coded
- **Material**
  - Housing: aluminium, powder coated
- **Installation**
  - Snap-on to 35 mm standard rail or screw fixing
- **Mass**
  - approx. 1000 g

---

**FUNCTION**

The innovative concept of the RFID identification system IDENTControl from Pepperl+Fuchs has many advantages in comparison to other systems. The core piece of the system is the evaluation unit IDENTControl.

Thanks to the integrated interfaces for all standard field bus systems such as PROFIBUS, EtherNet, PROFINET IO, DeviceNet, serial connections (RS 232/RS 485/RS 422) and numerous connection options for inductive read/write heads as well as microwave antennas, the evaluation unit IDENTControl can be adjusted to your needs in a flexible and easy manner.

4 function keys and a double-spaced illuminated LC display facilitate easy system configuration, parameter assignment and entering commands. Further LEDs indicate operating power and bus communication, connected read/write heads and active write/read commands.

Mounting the unit onto DIN mounting rails is easy thanks to the snap-fits on the back of the housing of the evaluation unit IDENTControl. With its L-shaped housing, the evaluation unit including bus connector fits into a 120 mm grid in the switch cabinet. The mounting depth of 70 mm furthermore enables installation in flat switch boxes with a depth of only 100 mm.

There are 3 further mounting holes for field mounting.

**ACCESSORIES**

- **V1-G-5M-PUR-ABG-V1-W**
  - Connecting cable, M12 to M12, PUR cable 4-pin, shielded

- **V15B-G-5M-PUR ABG-V15B-G**
  - Bus cable PROFIBUS, M12 to M12, PUR cable

- **ICZ-TR-V15B**
  - Terminating resistor for PROFIBUS

- **V15B-G**
  - Cable socket, M12, for PROFIBUS, adjustable

- **V15SB-G**
  - Cable connector, M12, for PROFIBUS, adjustable

- **V1-G-5M-PUR**
  - Cable socket, M12, 4-pin, PUR cable
**Model Number**

IC-KP-B7-V95

Control interface unit IDENTControl with interface for DeviceNet

**Features**

- Max. 4 read/write heads connectable
- Alternative 2 read/write heads and 2 trigger sensors can be connected
- LC display with background lightning
- Direct operation via 4 keys
- LED status indicator of bus communication and read/write heads

**Dimensions**

**Electrical connection**

- socket at housing
- read/write head
- trigger sensor
- trigger switch

**Indicating / Operating means**

- DeviceNet
- Protection earth
- Connection area

---

**IC-KP-B7-V95**

Part No. 130985

Network Status
- Com
- Pwr

Status
- Network
- Pwr

ESC
Function

The innovative concept of the RFID identification system IDENTControl from Pepperl+Fuchs has many advantages in comparison to other systems. The core piece of the system is the evaluation unit IDENTControl.

Thanks to the integrated interfaces for all standard field bus systems such as PROFIBUS, EtherCAT, DeviceNet, serial connections (RS 232/RS 485/RS 422) and numerous connection options for inductive read/write heads as well as microwave antennas, the evaluation unit IDENTControl can be adjusted to your needs in a flexible and easy manner.

4 function keys and a double-spaced illuminated LCD display facilitate easy system configuration, parameter assignment and entering commands. Further LEDs indicate operating power and bus communication, connected read/write heads and active write/read commands.

Mounting the unit onto DIN mounting rails is easy thanks to the snap-fits on the back of the housing of the evaluation unit IDENTControl.

With its L-shaped housing, the evaluation unit including bus connector fits into a 120 mm grid in the switch cabinet. The mounting depth of 70 mm furthermore enables installation in flat switch boxes with a depth of only 100 mm.

There are 3 further mounting holes for field mounting.

Accessories

DNV95-G-0M-T-0M-V95-G-L
T-Distributor for DeviceNet

DNV95-G-TERM
Bus termination for DeviceNet

V1-G-5M-PUR
Cable socket, M12, 4-pin, PUR cable

V1-G-5M-PUR-ABG-V1-W
Connecting cable, M12 to M12, PUR cable 4-pin, shielded

DNV95-G-5M-PVC-V95-G
Connection cable, DeviceNet, 7/8” on 7/8”, PVC cable

Technical data

<table>
<thead>
<tr>
<th>General specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of read/write heads</td>
</tr>
<tr>
<td>alternative 2 read/write heads and 2 trigger sensors</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Indicators/operating means</th>
</tr>
</thead>
<tbody>
<tr>
<td>LEDs 1, 2, 3, 4</td>
</tr>
<tr>
<td>Status indicator for read/write heads</td>
</tr>
<tr>
<td>green: command at read/write head active</td>
</tr>
<tr>
<td>yellow: approx. 1 second long, if command was successfully executed</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>LED PWR/ERR</th>
</tr>
</thead>
<tbody>
<tr>
<td>green: power on</td>
</tr>
<tr>
<td>red: Hardware fault</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>LED Module Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>green: normal operation</td>
</tr>
<tr>
<td>red: flashing, recovery fault</td>
</tr>
<tr>
<td>red: unre coverable fault</td>
</tr>
<tr>
<td>red/green flashing: LED test</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>LED Network Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>green: on-line, connected</td>
</tr>
<tr>
<td>red flashing: connection timeout</td>
</tr>
<tr>
<td>red/green flashing: LED test</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>LED Network Pwr</th>
</tr>
</thead>
<tbody>
<tr>
<td>green flashing at startup: LED test</td>
</tr>
<tr>
<td>green: network power available</td>
</tr>
<tr>
<td>red flashing: data exchange</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>LED COM</th>
</tr>
</thead>
<tbody>
<tr>
<td>yellow flashing at startup: LED test</td>
</tr>
<tr>
<td>yellow: data exchange</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>LC display</th>
</tr>
</thead>
<tbody>
<tr>
<td>two-line multi-function display with 12 characters per line configuration of the control interface and display of connected read/write heads as additional pictograms; easy and direct selection of operating commands and addressing</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Button</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 keys: ESC, up, down and return</td>
</tr>
</tbody>
</table>

Electrical specifications

<table>
<thead>
<tr>
<th>Rated operational voltage Ua</th>
<th>20 ... 30 V DC, PELV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ripple</td>
<td>≤ 10 % at 30 V DC</td>
</tr>
<tr>
<td>Current consumption</td>
<td>≤ 2 A incl. read/write heads</td>
</tr>
<tr>
<td>Power consumption P0</td>
<td>2.5 W Without read/write heads</td>
</tr>
<tr>
<td>Network voltage</td>
<td>11 ... 25 V DC, PELV</td>
</tr>
<tr>
<td>Network current consumption</td>
<td>≤ 40 mA</td>
</tr>
<tr>
<td>Electrical isolation</td>
<td>basic insulation acc. to DIN EN 50178, rated insulation voltage of 50 Vur</td>
</tr>
</tbody>
</table>

Interface

Physical | DeviceNet |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Protocol</td>
<td>CIP</td>
</tr>
<tr>
<td>Transfer rate</td>
<td>125, 250, 500 kBit/s</td>
</tr>
</tbody>
</table>

Compliance with standards and directives

<table>
<thead>
<tr>
<th>Standard conformity</th>
</tr>
</thead>
<tbody>
<tr>
<td>EN 61326</td>
</tr>
<tr>
<td>EN 60529</td>
</tr>
</tbody>
</table>

Ambient conditions

| Ambient temperature | -25 ... 70 °C (248 ... 343 K) |
| Storage temperature | -30 ... 80 °C (243 ... 353 K) |
| Climatic conditions | air humidity max. 96 % |
| Shock and impact resistance | Oscillation (Sine): 5 g, 10 - 1000 Hz to EN 60068-2-6 |
|                       | Shock (Half-sine): 30 g, 11 ms in accordance with EN 60068-2-27 |

Mechanical specifications

| Protection degree | IP67 |
| Connection | read/write heads; M12 plug connection, 4-pin, screened, Power supply: M12 plug connection, protection earth: M6 earthing screw DeviceNet: Mini-Style |

<table>
<thead>
<tr>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>Housing</td>
</tr>
<tr>
<td>Installation</td>
</tr>
<tr>
<td>Mass</td>
</tr>
</tbody>
</table>
Model Number
IC-KP-R2-V1
Control interface unit IDENTControl with serial interface

Features
- Max. 4 read/write heads connectable
- Alternative 2 read/write heads and 2 trigger sensors can be connected
- LC display with background lightning
- Direct operation via 4 keys
- LED status indicator of bus communication and read/write heads

Dimensions

Electrical connection

Indicating / Operating means
Function

The innovative concept of the RFID identification system IDENTControl from Pepperl+Fuchs has many advantages in comparison to other systems. The core piece of the system is the evaluation unit IDENTControl. Thanks to the integrated interfaces for all standard field bus systems such as PROFIBUS, EtherNet, PROFINET IO, DeviceNet, serial connections (RS 232/RS 485/RS 422) and numerous connection options for inductive write/read heads as well as microwave antennas, the evaluation unit IDENTControl can be adjusted to your needs in a flexible and easy manner. 4 function keys and a double-spaced illuminated LC display facilitate easy system configuration, parameter assignment and entering commands. Further LEDs indicate operating power and bus communication, connected write/read heads and active write/read commands. Mounting the unit onto DIN mounting rails is easy thanks to the snap-fits on the back of the housing of the evaluation unit IDENTControl. With its L-shaped housing, the evaluation unit including bus connector fits into a 120 mm grid in the switch cabinet. The mounting depth of 70 mm furthermore enables installation in flat switch boxes with a depth of only 100 mm. There are 3 further mounting holes for field mounting.

Accessories

V1-G-5M-PUR-ABG-V1-W Connecting cable, M12 to M12, PUR cable 4-pin, shielded
V1S-G-0,15M-PUR-SUBD Adapter M12 on Sub-D for PC connection with null modem cable
IVZ-K-R2 Null modem cable
V1-G-5M-PUR Cable socket, M12, 4-pin, PUR cable
RFIDControl Software for RFID identification systems

Technical data

General specifications

<table>
<thead>
<tr>
<th>Number of read/Write heads</th>
<th>max. 4</th>
<th>alternative 2 read/write heads and 2 trigger sensors</th>
</tr>
</thead>
</table>

Indicators/operating means

| LEDs 1, 2, 3, 4 | Status indicator for read/write heads | green: command at read/write head active yellow: approx. 1 second long, if command was successfully executed |

LED PWR/ERR

| green: power on red: Hardware fault |

LED UL

| green: Interface Power ON/OK |

LED TxD

| green: flashes in rhythm with the transmitted data |

LED RxD

| green: flashes in rhythm of receiving data |

LC display

| two-line multi-function display with 12 characters per line; easy and direct selection of operating commands |

Button

| 4 keys: ESC, up, down and return |

Electrical specifications

<table>
<thead>
<tr>
<th>Rated operational voltage $U_e$</th>
<th>20 ... 30 V DC, PELV</th>
</tr>
</thead>
</table>

| Ripple | $\leq 10 \%$ at 30 V DC |
| Current consumption | $\leq 2 A$ incl. read/write heads |

| Power consumption $P_0$ | 2.5 W Without read/write heads |

| Electrical isolation | basic insulation acc. to DIN EN 50178, rated insulation voltage of $50 \text{ V}_{\text{eff}}$ |

Interface

| Physical protocol | RS 232 |

| ASCII |

| Transfer rate | 1200; 2400; 4800; 9600; 19200; 38400 Bit/s |

Compliance with standards and directives

Standard conformity

| Electromagnetic compatibility | EN 61326 |

| Protection degree | EN 60529 |

Ambient conditions

| Ambient temperature | -25 ... 70 °C (248 ... 343 K) |

| Storage temperature | -30 ... 80 °C (243 ... 353 K) |

| Climatic conditions | air humidity max. 96 % |

| Salt spray resistant to EN 60068-2-52 |

| Shock and impact resistance | Oscillation (Sine): 5 g; 10 - 1000 Hz to EN 60068-2-6 Shock (Half-sine): 30 g; 11 ms in accordance with EN 60068-2-27 |

Mechanical specifications

| Protection degree | IP67 |

| Connection | read/write heads: M12 plug connection, 4-pin, screened, Power supply: M12 plug connection protection earth: M6 earthing screw RS 232: M12 plug connection |

| Material | aluminium, powder coated |

| Housing | snap-on to 35 mm standard rail or screw fixing |

| Mass | approx. 1000 g |
4.5 125 MHz R/W heads and transponders for IDENTControl

Identification systems with an operating frequency of 125 kHz are the most versatile and are most frequently used in automation technology.

This is due to the large choice of available transponders in the most varied designs and sizes, for high temperatures, in chemical-resistant housings, for installation in and on metal and to degree of protection IP69k.

High temperature
In many industrial applications, transponders are subjected to high temperatures. Transponder IPC02-68-T7 can withstand up to 300°C for a short time.
Transponders with an increased temperature class are marked with -T* in the order code.

High sensing range at low frequency
You attain maximum sensing ranges in the 125 kHz frequency through combinations of a large transponder (IPC03-100 with Ø100 mm) and large R/W head (IPH-F15-V1 with Ø140 mm). Sensing ranges of greater than 10 cm are not possible in a metal environment or with spacers.

Memory segmentation
All read/write tags (re-writable transponders) have 32 bit memory blocks. Most of these read/write tags are based on EEPROM technology and allow at least 100000 write cycles. The memory segmentation in 32 bit memory blocks allows you to simply move to the next memory block of the same read/write tag after 100,000 write cycles. 100,000 write cycles are at your disposal again in each memory block.

With this procedure, IPC03 type read/write tags can be written to at least 2,900,000 times if all memory blocks are used consecutively.

Ferromagnetic FRAM transponder IPC12-58-64K provides an almost unlimited number of write cycles (10¹²).

IPC02 Read only tag
IPC02 type read only tags (read only transponders) have a worldwide unique code of 40 bit length. They are part of the cost-effective RFID solution in the market and are pre-programmed by the manufacturer with a fixed read only code.

Read/write tag with make read only code function
IPC11 special tag types (write once transponders) can emulate a read only tag with its own read only code. The freely programmable read only code can be protected against further change and as a result, the tag achieves reading speeds similar to those of a real read only tag.

The evaluation or assignment of read only code can be simplified considerably in the PLC program.
### Calculation example of travel speeds

The following formula is valid for the calculation of the maximum possible travel speed:

$$\text{speed} = \frac{\text{read range (in m)}}{\text{read time (in s)}} \Rightarrow v_{\text{max}}$$

In practice, a correct reading should also result if a read attempt is unsuccessful due to EMC influence, for example. For practical application therefore, only a half of the speed is recommended so a repeat reading is taken into consideration:

$$v_{\text{praxis}} = \frac{v_{\text{max}}}{2}$$

The following examples show how you can calculate the travel speed of your application. For the example calculation, the following assumptions are made:

- R/W head in F15 construction type (140 mm edge length)
- Read/write tag with 100 mm diameter
- Reading/writing times (in ms):

<table>
<thead>
<tr>
<th>Read read only code</th>
<th>IPC02</th>
<th>IPC03</th>
</tr>
</thead>
<tbody>
<tr>
<td>N (\xi) Read 4 byte data</td>
<td>40</td>
<td>(N (\xi) 30) + 100</td>
</tr>
<tr>
<td>N (\xi) Write 4 byte data</td>
<td>40</td>
<td>(N (\xi) 100) + 100</td>
</tr>
</tbody>
</table>

#### Read read only code (IPC02/IPC11)

Read time t = 40 ms = 0.04 s

\[ s = 140 \text{ mm} = 0.14 \text{ m} \]

#### Read 4 bytes (IPC03)

Read time t = (1 \(\xi\) 30 ms) + 100 ms

\[ t = 130 \text{ ms} = 0.13 \text{ s} \]

\[ s = 140 \text{ mm} = 0.14 \text{ m} \]

#### Read 8 bytes (IPC03)

As the reading can only be executed in 4 byte blocks, 2 \(\xi\) 4 byte blocks must be read.

Read time t = (2 \(\xi\) 30 ms) + 100 ms

\[ t = 160 \text{ ms} = 0.16 \text{ s} \]

\[ s = 140 \text{ mm} = 0.14 \text{ m} \]

In the following tables, the travel speeds attainable in practice are shown for various R/W heads. In the process, a repeat reading is taken into consideration. (All data in m/s)

<table>
<thead>
<tr>
<th>(v_{\text{actual}}) [in m/s]</th>
<th>IPH-18GM-V1</th>
<th>IPH-30GM-V1</th>
<th>IPH-F61-V1</th>
<th>IPH-L2-V1</th>
<th>IPH-FP*-V1</th>
<th>IPH-F15-V1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Read read only code</td>
<td>0.03</td>
<td>0.05</td>
<td>0.05</td>
<td>0.07</td>
<td>0.13</td>
<td>0.2</td>
</tr>
<tr>
<td>Read 4 byte data</td>
<td>0.07</td>
<td>0.1</td>
<td>0.1</td>
<td>0.15</td>
<td>0.3</td>
<td>0.5</td>
</tr>
<tr>
<td>Read 8 byte data</td>
<td>0.06</td>
<td>0.09</td>
<td>0.09</td>
<td>0.125</td>
<td>0.25</td>
<td>0.4</td>
</tr>
<tr>
<td>Write 4 byte data</td>
<td>0.03</td>
<td>0.05</td>
<td>0.05</td>
<td>0.07</td>
<td>0.13</td>
<td>0.2</td>
</tr>
</tbody>
</table>

1) at 30-80% of max. sensing range
Identification systems: IDENTControl

R/W heads

Order code | IPH-18GM-V1 | IPH-30GM-V1 | IPH-F61-V1 | IPH-L2-V1 | IPH-FP-V1 | IPH-FP7V4A | IPH-F15-V1
---|---|---|---|---|---|---|---
Page | 62 | 63 | 64 | 65 | 66 | 67 | 68

General data
- Operating frequency: 125 kHz
- Transfer rate: 2 kBit/s
- Sensing range:
  - Read distance: 1–50 mm
  - Write distance: 0–40 mm
- Width:
  - Max. 50 mm
- Operating distance:
  - Max. 50 mm

Electrical data
- Power consumption: $P_0 \leq 1.2$ W

Mechanical data
- Degree of protection:
  - IP67
- Connection:
  - M12x1 connector
- Material:
  - Housing:
    - PBT/Stainless steel
    - ABS
    - PA-GF35/Stainless steel
    - PBT
    - Stainless steel/V4A
    - PBT/Stainless steel/Aluminum
- Weight:
  - Approx. 40 g
  - Approx. 75 g
  - Approx. 50 g
  - Approx. 210 g
  - Approx. 380 g
  - Approx. 700 g
  - Approx. 1200 g

Read only tag

Order code | IPC02-12 | IPC02-16 | IPC02-20P | IPC02-20CD | IPC02-26-T6 | IPC02-30P | IPC02-50P | IPC02-68-T7
---|---|---|---|---|---|---|---|---
Page | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77

General data
- Operating frequency: 125 kHz
- Transfer rate: 2 kBit/s
- Memory:
  - Type/size: ROM 64 bit (40 bit code, 24 bit data protection)
- Data hold time: unlimited
- Ambient conditions
  - Ambient temperature: 25–85°C
  - Storage temperature: -40–130°C (233–403 K)

Mechanical data
- Degree of protection:
  - IP68
- Material:
  - Housing:
    - Epoxy (black)
    - Epoxy (black)
    - PC (polycarbonate)
    - PC (polycarbonate)
    - LCP
- Casting compound/hardener: Epoxy

Zumutbare Änderungen aufgrund technischer Verbesserungen vorbehalten

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Issue date: 01.03.2009
## Read/write tags

<table>
<thead>
<tr>
<th>Order code</th>
<th>Page</th>
<th>General data</th>
<th>Memory</th>
<th>Special form transponders</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Operating frequency</td>
<td>Type/size</td>
<td>Type/size</td>
</tr>
<tr>
<td></td>
<td></td>
<td>125 kHz</td>
<td>EEPROM 928 Bit</td>
<td>EEPROM 928 Bit</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Transfer rate</td>
<td>ROM 32 bit</td>
<td>ROM 32/40 bit</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 kbit/s</td>
<td>(of which 40 bits are usable as special fixed code)</td>
<td>FRAM 64 kBit, read only code</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Read cycles</td>
<td>Write cycles</td>
<td>Data hold time</td>
</tr>
<tr>
<td></td>
<td></td>
<td>unlimited</td>
<td>&gt; 100000</td>
<td>10 years at 55°C</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ambient conditions</td>
<td>Ambient conditions</td>
<td>Ambient conditions</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Operating frequency</td>
<td>125 kHz</td>
<td>125 kHz</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Transfer rate</td>
<td>2 kbit/s</td>
<td>2 kbit/s</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Memory</td>
<td>Type/size</td>
<td>Type/size</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Type/size</td>
<td>EEPROM 928 Bit</td>
<td>EEPROM 928 Bit</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ROM 32 bit</td>
<td>ROM 32/40 bit</td>
<td>FRAM 64 kBit, read only code</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(of which 40 bits are usable as special fixed code)</td>
<td>FRAM 64 kBit, read only code</td>
<td>FRAM 64 kBit, read only code</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Read cycles</td>
<td>Write cycles</td>
<td>Data hold time</td>
</tr>
<tr>
<td></td>
<td></td>
<td>unlimited</td>
<td>&gt; 100000</td>
<td>10 years at 55°C</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ambient conditions</td>
<td>Ambient conditions</td>
<td>Ambient conditions</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Operating frequency</td>
<td>125 kHz</td>
<td>125 kHz</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Transfer rate</td>
<td>2 kbit/s</td>
<td>2 kbit/s</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Memory</td>
<td>Type/size</td>
<td>Type/size</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Type/size</td>
<td>EEPROM 928 Bit</td>
<td>EEPROM 928 Bit</td>
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<tr>
<td></td>
<td></td>
<td>ROM 32 bit</td>
<td>ROM 32/40 bit</td>
<td>FRAM 64 kBit, read only code</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(of which 40 bits are usable as special fixed code)</td>
<td>FRAM 64 kBit, read only code</td>
<td>FRAM 64 kBit, read only code</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Read cycles</td>
<td>Write cycles</td>
<td>Data hold time</td>
</tr>
<tr>
<td></td>
<td></td>
<td>unlimited</td>
<td>&gt; 100000</td>
<td>10 years at 55°C</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ambient conditions</td>
<td>Ambient conditions</td>
<td>Ambient conditions</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Operating frequency</td>
<td>125 kHz</td>
<td>125 kHz</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Transfer rate</td>
<td>2 kbit/s</td>
<td>2 kbit/s</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Memory</td>
<td>Type/size</td>
<td>Type/size</td>
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<td>Type/size</td>
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<td></td>
<td></td>
<td>unlimited</td>
<td>&gt; 100000</td>
<td>10 years at 55°C</td>
</tr>
</tbody>
</table>
Model Number
IPH-18GM-V1

Read/write head for IDENTControl

Features
• Read/write head with thread M18 x 1
• Connection via plug connection V1 (M12 x 1)
• Multihole-LED for function display
• Protection degree IP67

Accessories
V1-G-5M-PUR-ABG-V1-W
Connecting cable, M12 to M12, PUR cable 4-pin, shielded

V1-G-10M-PUR-ABG-V1-W
Connecting cable, M12 to M12, PUR cable 4-pin, shielded

Electrical connection

Technical data

General specifications
- Operating frequency: 125 kHz
- Transfer rate: 2 kBit/s
- Sensing range:
  - Reading distance: 1 ... 50 mm
  - Writing distance: 0 ... 40 mm
- Width: max. 40 mm
- Operating distance: maximum: 50 mm

Indicators/operating means
- LED green/yellow:
  - Multihole-LED:
    - green: power on
    - green flashing: read/write attempt performed
    - yellow: read/write tag detected

Electrical specifications
- Power consumption P0 ≤ 1.2 W
- Supply: from the IDENTControl

Compliance with standards and directives

Directive conformity
- EN 301489-1, EN 301489-3, EN 300330-2, EN 60950-1

Standard conformity
- Electromagnetic compatibility: EN 61326
- Protection degree: EN 60529

Ambient conditions
- Ambient temperature: -25 ... 70 °C (248 ... 343 K)
- Storage temperature: -40 ... 85 °C (233 ... 358 K)

Mechanical specifications
- Protection degree: IP67
- Connection: Connector M12 x 1
- Housing: PBT/stainless steel
- Encapsulation compound: Fermadur
- Installation: not embeddable
- Distance between two heads:
  - Multiplex on: ≥ 30 mm
  - Multiplex off: ≥ 180 mm
- Mass: approx. 40 g

Dimensions
Model Number
IPH-30GM-V1

Read/write head for IDENTControl

Features

- Read/write head with thread M30 x 1.5
- Connection via plug connection V1 (M12 x 1)
- Multihole-LED for function display
- Protection degree IP67

Accessories

V1-G-5M-PUR-ABG-V1-W
Connecting cable, M12 to M12, PUR cable 4-pin, shielded

V1-G-10M-PUR-ABG-V1-W
Connecting cable, M12 to M12, PUR cable 4-pin, shielded

Dimensions

Electrical connection

Technical data

General specifications
- Operating frequency: 125 kHz
- Transfer rate: 2 kBit/s
- Sensing range:
  - Reading distance: 1 ... 65 mm
  - Writing distance: 1 ... 55 mm
  - Width: max. 55 mm
  - Operating distance: maximum 70 mm

Indicators/operating means
- LED green/yellow
- Multihole-LED:
  - green: power on
  - green flashing: read/write attempt performed
  - yellow: read/write tag detected

Electrical specifications
- Power consumption P0 ≤ 1.2 W
- Supply from the IDENTControl

Compliance with standards and directives
- Directive conformity
  - EN 301489-1, EN 301489-3, EN 300330-2, EN 60950-1
- Standard conformity
  - Electromagnetic compatibility: EN 61326
  - Protection degree: EN 60529

Ambient conditions
- Ambient temperature: -25 ... 70 °C (248 ... 343 K)
- Storage temperature: -40 ... 85 °C (233 ... 358 K)

Mechanical specifications
- Protection degree: IP67
- Connection: Connector M12 x 1
- Material
  - Housing: PBT/stainless steel
  - Encapsulation compound: Fermadur
  - Installation: not embeddable
- Distance between two heads: Multiplex on: ≥ 50 mm
  - Multiplex off: ≥ 270 mm
- Mass: approx. 75 g

Special features
- High Temperature IDENT System
- Data Matrix

Edition: 2009-03-01
Catalogue Identification Systems 2009
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**Model Number**

**IPH-F61-V1**

Read/write head

for IDENTControl

**Features**

- Particularly flat construction
- Connection cable with V1 plug (M12 x 1)
- Protection degree IP67
- Can be mounted on metal

**Accessories**

**V1-G-5M-PUR-ABG-V1-W**

Connecting cable, M12 to M12, PUR cable 4-pin, shielded

**V1-G-10M-PUR-ABG-V1-W**

Connecting cable, M12 to M12, PUR cable 4-pin, shielded

**Dimensions**

- Operating distance maximum: 70 mm
- Power consumption $P_0 \leq 1.2$ W
- Supply from the IDENTControl

**Technical data**

**General specifications**

- Operating frequency 125 kHz
- Transfer rate 2 kBit/s
- Sensing range
  - Reading distance 2 ... 45 mm
  - Writing distance 2 ... 35 mm
  - Width max. 65 mm
- Operating distance maximum: 70 mm

**Electrical specifications**

- Power consumption $P_0 \leq 1.2$ W
- Supply from the IDENTControl

**Compliance with standards and directives**

- Directive conformity
- Standard conformity
  - Electromagnetic compatibility EN 61326
- Protection degree EN 60529

**Ambient conditions**

- Ambient temperature -25 ... 70 °C (248 ... 343 K)
- Storage temperature -40 ... 85 °C (233 ... 358 K)

**Mechanical specifications**

- Protection degree IP67
- Connection Connector M12 x 1
- Material
  - Housing ABS
  - Encapsulation compound CY 221/HY 2966
- Installation
  - Distance between two heads Multiplex on: ≥ 50 mm
  - Multiplex off: ≥ 290 mm
- Mass approx. 50 g
- Cable length 20 cm
Model Number

IPH-L2-V1

Read/write head for IDENTControl

Features

- Varifont L™ Type with variable alignment capability in 15° steps and front face in 90° steps
- 4 x dual LEDs on the corners for visibility on all sides
- Protection degree IP67
- Connection via plug connection V1 (M12 x 1)

Accessories

V1-G-5M-PUR-ABG-V1-W
Connecting cable, M12 to M12, PUR cable 4-pin, shielded

V1-G-10M-PUR-ABG-V1-W
Connecting cable, M12 to M12, PUR cable 4-pin, shielded

Technical data

General specifications
- Operating frequency: 125 kHz
- Transfer rate: 2 kBit/s
- Sensing range
  - Reading distance: 1 ... 75 mm
  - Writing distance: 2 ... 65 mm
- Width: max. 60 mm
- Operating distance: maximum: 80 mm

Indicators/operating means
- LED green/yellow:
  - green: power on
  - green flashing: read/write attempt performed
  - yellow: read/write tag detected

Electrical specifications
- Power consumption $P_0 \leq 1.2 W$
- Supply: from the IDENTControl

Compliance with standards and directives
- Directive conformity
  - EN 301489-1, EN 301489-3, EN 300330-2, EN 60950-1
- Standard conformity
  - Electromagnetic compatibility
    - EN 61326
  - Protection degree
    - EN 60529
- Ambient conditions
  - Ambient temperature: -25 ... 70 °C (248 ... 343 K)
  - Storage temperature: -40 ... 85 °C (233 ... 358 K)

Mechanical specifications
- Protection degree: IP67
- Connection: Connector M12 x 1
- Material: Housing PA-GF35
- Encapsulation compound: Fermadur
- Installation: not embeddable in metal
- Distance between two heads:
  - Multiplex on: ≥ 60 mm
  - Multiplex off: ≥ 450 mm
- Mass: approx. 210 g
Model Number
IPH-FP-V1
Read/write head for IDENTControl

Features
- Connection via plug connection V1 (M12 x 1)
- Dual-LED for function display
- Protection degree IP67

Accessories
V1-G-5M-PUR-ABG-V1-W
Connecting cable, M12 to M12, PUR cable 4-pin, shielded

V1-G-10M-PUR-ABG-V1-W
Connecting cable, M12 to M12, PUR cable 4-pin, shielded

Technical data

General specifications
- Operating frequency: 125 kHz
- Transfer rate: 2 kBit/s
- Sensing range:
  - Reading distance: 0 ... 100 mm
  - Writing distance: 0 ... 80 mm
  - Width: max. 80 mm
  - Operating distance:
    - Maximum: 100 mm

Indicators/operating means
- LED green/yellow:
  - Green: power on
  - Green flashing: read/write attempt performed
  - Yellow: read/write tag detected

Electrical specifications
- Power consumption $P_0 \leq 1.2$ W
- Supply: from the IDENTControl

Compliance with standards and directives
- Directive conformity
  - R&TTE Directive 1995/5/EC:
    - EN 301489-1, EN 301489-3, EN 300330-2, EN 60950-1
- Standard conformity
  - Electromagnetic compatibility: EN 61326
  - Protection degree: EN 60529

Ambient conditions
- Ambient temperature: -25 ... 70 °C (248 ... 343 K)
- Storage temperature: -40 ... 85 °C (233 ... 358 K)

Mechanical specifications
- Protection degree: IP67
- Connection: Connector M12 x 1
- Material: PBT
- Lower section: aluminium diecasting
- Encapsulation compound: Fermadur
- Distance between two heads:
  - Multiplex on: ≥ 100 mm
  - Multiplex off: ≥ 550 mm
- Mass: approx. 380 g
**Model Number**

**IPH-FP7V4A**

Write/read head

Lower section stainless-steel version for IDENTControl

**Features**

- Dual-LED for function display
- Stainless steel housing
- Resistant against cleaning material
- Connection via terminal compartment
- Protection degree IP67 / IP68 / IP69K

**Technical data**

**General specifications**

- Operating frequency: 125 kHz
- Transfer rate: 2 kBit/s
- Sensing range:
  - Reading distance: 0 ... 100 mm
  - Writing distance: 0 ... 80 mm
  - Width: max. 80 mm
  - Operating distance: maximum: 100 mm

**Indicators/operating means**

- LED green/yellow:
  - green: power on
  - green flashing: read/write attempt performed
  - yellow: read/write tag detected

**Electrical specifications**

- Power consumption $P_0 \leq 1.2$ W
- Supply: from the IDENTControl

**Compliance with standards and directives**

**Directive conformity**

- EN 301489-1, EN 301489-3, EN 300330-2, EN 60950-1

**Standard conformity**

- Electromagnetic compatibility: EN 61326
- Protection degree: EN 60529

**Ambient conditions**

- Ambient temperature: -25 ... 70 °C (248 ... 343 K)
- Storage temperature: -40 ... 85 °C (233 ... 358 K)

**Mechanical specifications**

- Protection degree: IP69K
- Connection: terminal compartment, ≤ 2.5 mm² conductor csa
- Material:
  - Housing: PBT
  - Lower section: stainless steel V4A
  - Encapsulation compound: Fermadur
- Installation:
  - Distance between two heads: Multiplex on: ≥ 100 mm
  - Multiplex off: ≥ 550 mm
  - Mass: approx. 700 g
Model Number

IPH-F15-V1
Read/write head for IDENTControl

Features

• Dual-LED for function display
• Connection via plug connection V1 (M12 x 1)
• Protection degree IP67
• Including robust stainless steel mounting plate with only 2 mounting points

Accessories

V1-G-5M-PUR-ABG-V1-W
Connecting cable, M12 to M12, PUR cable 4-pin, shielded

V1-G-10M-PUR-ABG-V1-W
Connecting cable, M12 to M12, PUR cable 4-pin, shielded

Technical data

General specifications

<table>
<thead>
<tr>
<th>Operating frequency</th>
<th>125 kHz</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transfer rate</td>
<td>2 kBit/s</td>
</tr>
<tr>
<td>Sensing range</td>
<td></td>
</tr>
<tr>
<td>Reading distance</td>
<td>2 ... 155 mm</td>
</tr>
<tr>
<td>Writing distance</td>
<td>2 ... 140 mm</td>
</tr>
<tr>
<td>Width</td>
<td>145 mm</td>
</tr>
<tr>
<td>Operating distance</td>
<td>maximum: 140 mm</td>
</tr>
</tbody>
</table>

Indicators/operating means

- LED green/yellow
  - green: power on
  - green flashing: read/write attempt performed
  - yellow: read/write tag detected

Electrical specifications

- Power consumption $P_0 \leq 1.2 W$
- Supply from the IDENTControl

Compliance with standards and directives

<table>
<thead>
<tr>
<th>Directive conformity</th>
<th>EN 301489-1, EN 301489-3, EN 300330-2, EN 60950-1</th>
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<tr>
<td>Standard conformity</td>
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<tr>
<td>Electromagnetic compatibility</td>
<td>EN 61000-6-3</td>
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<td>Protection degree</td>
<td>EN 60529</td>
</tr>
</tbody>
</table>

Ambient conditions

- Ambient temperature: -25 ... 70 °C (248 ... 343 K)
- Storage temperature: -40 ... 85 °C (233 ... 358 K)

Mechanical specifications

- Protection degree: IP67
- Connector M12 x 1
- Housing: PBT/stainless steel/aluminium
- Encapsulatation compound: Fermadur
- Multiplex on: ≥ 180 mm
- Multiplex off: ≥ 1100 mm
- Mass: approx. 1200 g
RFID

<table>
<thead>
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<th>125 kHz</th>
</tr>
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<tbody>
<tr>
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</table>

### Memory

<table>
<thead>
<tr>
<th>Chip Type</th>
<th>EM4102 Unique (EM Microelectronic)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type/Size</td>
<td>ROM 64 Bit (40 Bit code, 24 bit data security)</td>
</tr>
<tr>
<td>Read cycles</td>
<td>unlimited</td>
</tr>
</tbody>
</table>

### Ambient conditions

<table>
<thead>
<tr>
<th>Ambient temperature</th>
<th>-25 ... 70 °C (248 ... 343 K)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storage temperature</td>
<td>-40 ... 90 °C (233 ... 363 K)</td>
</tr>
</tbody>
</table>

### Mechanical specifications

<table>
<thead>
<tr>
<th>Diameter of the housing</th>
<th>3.15 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protection degree</td>
<td>IP68</td>
</tr>
<tr>
<td>Material</td>
<td>glass</td>
</tr>
</tbody>
</table>

### Notes

- The transponder can be read from both sides.

---

**Model Number**

IPC02-3GL

**Read only tag**

**Features**

- Battery-free read only tag
- 40 bit fixcode
- Mounting in metal due to ferrite core
- Protection degree IP68

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**Technical data**

**General specifications**

<table>
<thead>
<tr>
<th>Operating frequency</th>
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</thead>
<tbody>
<tr>
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**Ambient conditions**

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<tbody>
<tr>
<td>Storage temperature</td>
<td>-40 ... 90 °C (233 ... 363 K)</td>
</tr>
</tbody>
</table>

**Mechanical specifications**

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<tbody>
<tr>
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<td>IP68</td>
</tr>
<tr>
<td>Material</td>
<td>glass</td>
</tr>
</tbody>
</table>
RFID Transponder

### Model Number

**IPC02-12**

Read only tag

### Features

- Battery-free read only tag
- 40 bit fixcode
- Readable from both sides
- Protection degree IP68

### Technical data

#### General specifications

- Operating frequency: 125 kHz
- Transfer rate: 2 kBit/s

#### Memory

- Chip Type: EM4102 Unique (EM Microelectronic)
- Type/Size: ROM 64 Bit (40 Bit code, 24 bit data security)
- Read cycles: unlimited

#### Ambient conditions

- Ambient temperature: -25 ... 85 °C (248 ... 358 K)
- Storage temperature: -40 ... 130 °C (233 ... 403 K)

#### Mechanical specifications

- Diameter of the housing: 12.4 mm
- Protection degree: IP68
- Material: Housing Epoxy (black)
Model Number

IPC02-16

Read only tag

Features

- Battery-free read only tag
- 40 bit fixcode
- Readable from both sides
- Protection degree IP68

Technical data

General specifications
- Operating frequency: 125 kHz
- Transfer rate: 2 kBit/s
- Memory
  - Chip Type: EM4102 Unique (EM Microelectronic)
  - Type/Size: ROM 64 Bit (40 Bit code, 24 bit data security)
- Read cycles: unlimited
- Ambient conditions
  - Ambient temperature: -25 ... 85 °C (248 ... 358 K)
  - Storage temperature: -25 ... 100 °C (248 ... 373 K)
- Mechanical specifications
  - Diameter of the housing: 16 mm
  - Protection degree: IP68
- Material: Housing Epoxy (black)

Read-/write range

<table>
<thead>
<tr>
<th>Offset [mm]</th>
<th>Distance [mm]</th>
<th>Read distance in air IPC02-16</th>
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</thead>
<tbody>
<tr>
<td>-40</td>
<td>0</td>
<td>80</td>
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<tr>
<td>-30</td>
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<td>70</td>
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<tr>
<td>-20</td>
<td>20</td>
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<td>-10</td>
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<tr>
<td>0</td>
<td>40</td>
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</table>

<table>
<thead>
<tr>
<th>Offset [mm]</th>
<th>Distance [mm]</th>
<th>Reading range on steel IPC02-16</th>
</tr>
</thead>
<tbody>
<tr>
<td>-40</td>
<td>0</td>
<td>80</td>
</tr>
<tr>
<td>-30</td>
<td>10</td>
<td>70</td>
</tr>
<tr>
<td>-20</td>
<td>20</td>
<td>60</td>
</tr>
<tr>
<td>-10</td>
<td>30</td>
<td>50</td>
</tr>
<tr>
<td>0</td>
<td>40</td>
<td>40</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Offset [mm]</th>
<th>Distance [mm]</th>
<th>Reading range on aluminium IPC02-16</th>
</tr>
</thead>
<tbody>
<tr>
<td>-40</td>
<td>0</td>
<td>80</td>
</tr>
<tr>
<td>-30</td>
<td>10</td>
<td>70</td>
</tr>
<tr>
<td>-20</td>
<td>20</td>
<td>60</td>
</tr>
<tr>
<td>-10</td>
<td>30</td>
<td>50</td>
</tr>
<tr>
<td>0</td>
<td>40</td>
<td>40</td>
</tr>
</tbody>
</table>
RFID Transponder

### Model Number

**IPC02-20P**

Read only tag

### Features

- Battery-free read only tag
- 40 bit fixcode
- Readable from both sides
- Potted housing
- Protection degree IP67 / IP68 / IP69K

### Technical data

#### General specifications

- **Operating frequency**: 125 kHz
- **Transfer rate**: 2 kBit/s

#### Memory

- **Chip Type**: EM4102 Unique (EM Microelectronic)
- **Type/Size**: ROM 64 Bit (40 Bit code, 24 bit data security)
- **Read cycles**: unlimited
- **Data retention period**: > 10 years

#### Ambient conditions

- **Ambient temperature**: -20 ... 85 °C (253 ... 358 K)
- **Storage temperature**: -20 ... 85 °C (253 ... 358 K)

#### Mechanical specifications

- **Diameter of the housing**: 20 mm
- **Protection degree**: IP68 / IP69K
- **Material**
  - Housing: PC (Polycarbonate)
  - Encapsulation compound: Epoxy
Model Number
IPC02-20CD

Read only tag

Features
- Battery-free read only tag
- 40 bit fixcode
- Readable from both sides
- Protection degree IP67

Technical data

General specifications
- Operating frequency: 125 kHz
- Transfer rate: 2 kBit/s

Memory
- Chip Type: EM4102 Unique (EM Microelectronic)
- Type/Size: ROM 64 Bit (40 Bit code, 24 bit data security)
- Read cycles unlimited

Ambient conditions
- Ambient temperature: -20 ... 60 °C (253 ... 333 K)

Mechanical specifications
- Diameter of the housing: 20 mm
- Protection degree: IP67
- Material: Housing
  - PE/PES, transparent

Dimensions
RFID Transponder

Model Number
IPC02-26-T6
Read only tag

Features
• Protection degree IP68
• Battery-free high temperature read only tag
• 40 bit fixcode
• Readable from both sides
• Mounting holes for simple installation

Dimensions

Technical data

General specifications
- Operating frequency: 125 kHz
- Transfer rate: 2 kBit/s

Memory
- Chip Type: EM4102 Unique (EM Microelectronic)
- Type/Size: ROM 64 Bit (40 Bit code, 24 bit data security)
- Read cycles: unlimited

Ambient conditions
- Ambient temperature: -25 ... 85 °C (248 ... 358 K) for 100 x 5 minuten with transposition every 30 Sekunden
- Storage temperature: -25 ... 140 °C (248 ... 413 K) for 1000 hours
- 200 °C (473 K) for 5 x 35 minutes

Mechanical specifications
- Diameter of the housing: 26 mm
- Protection degree: IP68 (24 hours in 1 m of water)

Material
- Housing: PA
RFID Transponder

IPC02-30P

Model Number
IPC02-30P
Read only tag

Features
• Battery-free read only tag
• 40 bit fixcode
• Readable from both sides
• Mounting holes for simple installation
• Protection degree IP68

Technical data

General specifications
- Operating frequency: 125 kHz
- Transfer rate: 2 kBit/s

Memory
- Chip Type: EM4102 Unique (EM Microelectronic)
- Type/Size: ROM 64 Bit (40 Bit code, 24 bit data security)
- Read cycles: unlimited
- Data retention period: > 10 years

Ambient conditions
- Ambient temperature: -20 ... 100 °C (253 ... 373 K)
- Storage temperature: -20 ... 100 °C (253 ... 373 K)

Mechanical specifications
- Diameter of the housing: 30 mm
- Protection degree: IP68
- Material
  - Housing: PC (Polycarbonate)

Read-/write range

Reading range in air IPC02-30...

Reading range on steel IPC02-30...

Reading range on aluminium IPC02-30...

Dimensions

Technical data

General specifications
- Operating frequency: 125 kHz
- Transfer rate: 2 kBit/s

Memory
- Chip Type: EM4102 Unique (EM Microelectronic)
- Type/Size: ROM 64 Bit (40 Bit code, 24 bit data security)
- Read cycles: unlimited
- Data retention period: > 10 years

Ambient conditions
- Ambient temperature: -20 ... 100 °C (253 ... 373 K)
- Storage temperature: -20 ... 100 °C (253 ... 373 K)

Mechanical specifications
- Diameter of the housing: 30 mm
- Protection degree: IP68
- Material
  - Housing: PC (Polycarbonate)
**Model Number**

**IPC02-50P**

Read only tag

**Features**

- Battery-free read only tag
- 40 bit fixcode
- Readable from both sides
- Mounting holes for simple installation
- Protection degree IP68

**Technical data**

**General specifications**

- Operating frequency: 125 kHz
- Transfer rate: 2 kBit/s

**Memory**

- Chip Type: EM4102 Unique (EM Microelectronic)
- Type/Size: ROM 64 Bit (40 Bit code, 24 bit data security)
- Read cycles: > 100000
- Data retention period: > 10 years

**Ambient conditions**

- Ambient temperature: -20 ... 85 °C (253 ... 358 K)
- Storage temperature: -20 ... 85 °C (253 ... 358 K)

**Mechanical specifications**

- Diameter of the housing: 50 mm
- Protection degree: IP68
- Material:
  - Housing: PC (Polycarbonate)
  - Encapsulation compound: Epoxy

**Read-/write range**

Reading range in air IPC02-50...

Reading range on steel IPC02-50...

Reading range on aluminium IPC02-50...

---

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**Model Number**

**IPC02-68-T7**

Read only tag

**Features**

- Battery-free high temperature read only tag
- Temperature cycles up to 200 °C
- 40 bit fixcode
- Readable from both sides
- Mounting holes for simple installation
- Protection degree IP67

**Technical data**

**General specifications**
- Operating frequency: 125 kHz
- Transfer rate: 2 kBit/s

**Memory**
- Chip Type: EM4102 Unique (EM Microelectronic)
- Type/Size: ROM 64 Bit (40 Bit code, 24 bit data security)
- Read cycles: unlimited

**Ambient conditions**
- Ambient temperature:
  - -40 ... 140 °C (233 ... 413 K) for 60 min
  - 200 °C (473 K) for 10 min
  - 300 °C (573 K) for 5 min
  - -40 ... 200 °C (233 ... 473 K) for 100 cycles x 10 min (1000 °C/min)
  - 20 ... 200 °C (293 ... 473 K) for 500 cycles x 35 min
- Storage temperature:
  - -40 ... 85 °C (233 ... 358 K)
  - -40 ... 160 °C (233 ... 433 K) for 1000 h

**Mechanical specifications**
- Diameter of the housing: 68 mm
- Protection degree: IP67
- Material: LCP
- Housing: LCP

**Dimensions**

![RFID Transponder Dimensions Diagram]
# RFID Transponder

## IPC02-C1

### Model Number

| IPC02-C1 | Read only tag |

### Features

- Battery-free read only tag
- 40 bit fixcode
- Readable from both sides
- Protection degree IP67
- ISO credit card format

### Technical data

#### General specifications

<table>
<thead>
<tr>
<th>Operating frequency</th>
<th>125 kHz</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transfer rate</td>
<td>2 kBit/s</td>
</tr>
</tbody>
</table>

#### Memory

<table>
<thead>
<tr>
<th>Chip Type</th>
<th>EM4102 Unique (EM Microelectronic)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type/Size</td>
<td>ROM 64 Bit (40 Bit code, 24 bit data security)</td>
</tr>
<tr>
<td>Read cycles</td>
<td>unlimited</td>
</tr>
</tbody>
</table>

#### Ambient conditions

<table>
<thead>
<tr>
<th>Ambient temperature</th>
<th>0 ... 50 °C (273 ... 323 K)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storage temperature</td>
<td>-40 ... 70 °C (233 ... 343 K)</td>
</tr>
</tbody>
</table>

#### Mechanical specifications

<table>
<thead>
<tr>
<th>Protection degree</th>
<th>IP67</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material</td>
<td>PVC, white</td>
</tr>
</tbody>
</table>

### Dimensions

![Dimensions Diagram](image)

- **Width**: 74.6 mm
- **Height**: 54 mm
- **Thickness**: 0.8 mm

---

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---

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### Model Number

**IPC11-12**

**read/write tag**

### Features

- Battery-free read/write tag
- 40 bit fixcode free programmable
- Readable and writable from both sides
- Protection degree IP68

### Technical data

#### General specifications
- Operating frequency: 125 kHz
- Transfer rate: 2 kBit/s

#### Memory
- Chip Type: Q5 (Sokymat)
- Type/Size: EEPROM 264 Bit
  - (40 Bit can be used as special fix code)
- Read cycles: unlimited

#### Ambient conditions
- Ambient temperature: -25 ... 85 °C (248 ... 358 K)
- Storage temperature: -40 ... 130 °C (233 ... 403 K) for 1000 hours
  - ≤ 150 °C (423 K) for 24 hours
  - -20 ... 160 °C (253 ... 433 K) for 100 x 10 minutes with transposition in 30 seconds

#### Mechanical specifications
- Diameter of the housing: 12.4 mm
- Protection degree: IP68
- Material: Housing PPS and Epoxy (black)
**RFID Transponder**

**IPC11-30**

### Model Number

IPC11-30

#### read/write tag

### Features

- Battery-free read/write tag
- 40 bit fixcode free programmable
- Readable from both sides
- Mounting holes for simple installation
- Protection degree IP67

### Technical data

**General specifications**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating frequency</td>
<td>125 kHz</td>
</tr>
<tr>
<td>Transfer rate</td>
<td>2 kBit/s</td>
</tr>
</tbody>
</table>

**Memory**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chip Type</td>
<td>Q5 (Sokymat)</td>
</tr>
<tr>
<td>Type/Size</td>
<td>EEPROM 264 Bit (40 Bit can be used as special fix code)</td>
</tr>
<tr>
<td>Read cycles</td>
<td>unlimited</td>
</tr>
</tbody>
</table>

**Ambient conditions**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambient temperature</td>
<td>-25 ... 70 °C (248 ... 343 K)</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>-40 ... 85 °C (233 ... 358 K)</td>
</tr>
</tbody>
</table>

**Mechanical specifications**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diameter of the housing</td>
<td>30 mm</td>
</tr>
<tr>
<td>Protection degree</td>
<td>IP67</td>
</tr>
<tr>
<td>Material</td>
<td>PC (Polycarbonate)</td>
</tr>
</tbody>
</table>

### Dimensions

![Dimensions Diagram]

---

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### Dimensions

<table>
<thead>
<tr>
<th>Φ40</th>
<th>Φ50</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

### Technical data

**General specifications**
- Operating frequency: 125 kHz
- Transfer rate: 2 kBit/s

**Memory**
- Chip Type: QS (Sokymat)
- Type/Size: EEPROM 264 Bit (40 Bit can be used as special fix code)
- Read cycles: unlimited

**Ambient conditions**
- Ambient temperature: -25 ... 70 °C (248 ... 343 K)
- Storage temperature: -40 ... 85 °C (233 ... 358 K)

**Mechanical specifications**
- Diameter of the housing: 50 mm
- Protection degree: IP67
- Material: Housing PC (Polycarbonate)

### Features
- Battery-free read/write tag
- 40 bit fixcode free programmable
- Readable from both sides
- Mounting holes for simple installation
- Protection degree IP67
### Model Number
**IPC03-12.4**
read/write tag

### Features
- Battery-free read/write tag
- 32 bit fixcode
- 928 bits computer memory available
- Embeddable mountable in metal
- Protection degree IP67

### Technical data

#### General specifications
- **Operating frequency**: 125 kHz
- **Transfer rate**: 2 kBit/s

#### Memory
- **Chip Type**: EM4450 Titan (EM Microelectronic)
- **Type/Size**: EEPROM 928 Bit, ROM 32 Bit
- **Read cycles**: unlimited
- **Write cycles**: > 100000
- **Data retention period**: 10 years at 55 °C

#### Ambient conditions
- **Ambient temperature**: -25 ... 70 °C (248 ... 343 K)
- **Storage temperature**: -40 ... 85 °C (233 ... 358 K)

#### Mechanical specifications
- **Diameter of the housing**: 12.1 mm + 0.2 mm
- **Protection degree**: IP67
- **Housing material**: PBT
- **Encapsulation compound**: CY 221/HY 2966

### Dimensions

![Dimensions Diagram](image-url)

---

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## Model Number

**IPC03-24**

**read/write tag**

### Features

- Battery-free read/write tag
- 32 bit fixcode
- 928 bits computer memory available
- Embeddable mountable in metal
- Protection degree IP67

## Technical data

### General specifications

**Operating frequency**

125 kHz

**Transfer rate**

2 kBit/s

### Memory

**Chip Type**

EM4450 Titan (EM Microelectronic)

**Type/Size**

EEPROM 928 Bit, ROM 32 Bit

**Read cycles**

unlimited

**Write cycles**

> 100000

**Data retention period**

10 years at 55 °C

### Ambient conditions

**Ambient temperature**

-25 ... 70 °C (248 ... 343 K)

**Storage temperature**

-40 ... 85 °C (233 ... 358 K)

### Mechanical specifications

**Diameter of the housing**

24 mm - 0.15 mm

**Protection degree**

IP67

### Material

**Housing**

PBT

**Encapsulation compound**

CY 221/HY 2966

## Read-/write range

### Reading range in air IPC03-24

![Reading range in air IPC03-24](image)

### Reading range mounted flush in steel IPC03-24

![Reading range mounted flush in steel IPC03-24](image)

### Reading range mounted flush in aluminium IPC03-24

![Reading range mounted flush in aluminium IPC03-24](image)

### Writing range in air IPC03-24

![Writing range in air IPC03-24](image)

### Writing range mounted flush in steel IPC03-24

![Writing range mounted flush in steel IPC03-24](image)

### Writing range mounted flush in aluminium IPC03-24

![Writing range mounted flush in aluminium IPC03-24](image)
**Model Number**

**IPC03-30GK**

**Read/write tag**

**Features**

- Battery-free read/write tag
- 32 bit fixcode
- 928 bits computer memory available
- Embeddable mountable in metal
- Protection degree IP67
- Protective cap ICS-30GK available

**Technical data**

**General specifications**

- Operating frequency: 125 kHz
- Transfer rate: 2 kBit/s

**Memory**

- Chip Type: EM4450 Titan (EM Microelectronic)
- Type/Size: EEPROM 928 Bit, ROM 32 Bit
- Read cycles: unlimited
- Write cycles: > 100000
- Data retention period: 10 years at 55 °C

**Ambient conditions**

- Ambient temperature: -25 ... 70 °C (248 ... 343 K)
- Storage temperature: -40 ... 85 °C (233 ... 358 K)

**Mechanical specifications**

- Diameter of the housing: 30 mm
- Protection degree: IP67
- Material: Housing PP
- Encapsulation compound: CY 221/HY 2966

**Read-/write range**

**Dimensions**

- Offset [mm]
- Distance [mm]
### Technical data

**General specifications**
- Operating frequency: 125 kHz
- Transfer rate: 2 kBit/s

**Memory**
- Chip Type: EM4450 Titan (EM Microelectronic)
- Type/Size: EEPROM 928 Bit, ROM 32 Bit
- Read cycles: unlimited
- Write cycles: > 100000
- Data retention period: 10 years at 55 °C

**Ambient conditions**
- Ambient temperature: -25 ... 70 °C (248 ... 343 K)
- Storage temperature: -40 ... 85 °C (233 ... 358 K)

**Mechanical specifications**
- Diameter of the housing: 16 mm
- Protection degree: IP67
- Material: Housing PBT
- Encapsulation compound: CY 221/HY 2966

### Read/write range

**Reading range mounted flush in steel IPC03-16GK**

**Writing range mounted flush in steel IPC03-16GK**

**Reading range mounted flush in aluminium IPC03-16GK**

**Writing range mounted flush in aluminium IPC03-16GK**
**Model Number**

IPC03-20K1

**Read/write tag**

**Features**

- Battery-free read/write tag
- 32 bit fixcode
- 928 bits computer memory available
- Readable and writable from both sides
- Protection degree IP67
- Key fob

**Technical data**

**General specifications**

- Operating frequency: 125 kHz
- Transfer rate: 2 kBit/s

**Memory**

- Chip Type: EM4450 Titan (EM Microelectronic)
- Type/Size: EEPROM 928 Bit
- ROM 32 Bit
- Read cycles: unlimited
- Write cycles: > 100000
- Data retention period: 10 years at 55 °C

**Ambient conditions**

- Ambient temperature: -25 ... 70 °C (248 ... 343 K)
- Storage temperature: -40 ... 90 °C (233 ... 363 K)

**Mechanical specifications**

- Protection degree: IP67
- Material: PC (Polycarbonate)

**Dimensions**

- Dimensions: 31 mm x 4.5 mm
### Model Number

<table>
<thead>
<tr>
<th>Model Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>IPC03-20K2</td>
</tr>
<tr>
<td>IPC03-20K3</td>
</tr>
<tr>
<td>IPC03-20K4</td>
</tr>
<tr>
<td>IPC03-20K5</td>
</tr>
<tr>
<td>IPC03-20K6</td>
</tr>
</tbody>
</table>

---

### Technical Data

#### General Specifications
- **Operating frequency**: 125 kHz
- **Transfer rate**: 2 kBit/s
- **Colour**: red

#### Memory
- **Chip Type**: EM4450 Titan (EM Microelectronic)
- **Type/Size**: EEPROM 928 Bit, ROM 32 Bit
- **Read cycles**: unlimited
- **Write cycles**: > 10000
- **Data retention period**: > 10 years

#### Ambient Conditions
- **Ambient temperature**: -20 ... 80 °C (253 ... 353 K)
- **Storage temperature**: -20 ... 80 °C (253 ... 353 K)

#### Mechanical Specifications
- **Protection degree**: IP67
- **Material**: Housing: PC (Polycarbonate)

---

### Features
- Battery-free read/write tag
- 32 bit fixcode
- 928 bits computer memory available
- Readable and writable from both sides
- Protection degree IP67
- Key fob

---

### Dimensions

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Width</th>
<th>Height</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ø 30</td>
<td>35</td>
<td>5</td>
</tr>
</tbody>
</table>

---

**IPC03-20K**

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**Catalogue Identification Systems 2009**

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RFID Transponder

**Model Number**

IPC03-20P

Read/write tag

**Features**

- Battery-free read/write tag
- 32 bit fixcode
- 928 bits computer memory available
- Readable and writable from both sides
- Potted housing
- Protection degree IP67 / IP68 / IP69K

**Technical data**

**General specifications**

- Operating frequency: 125 kHz
- Transfer rate: 2 kBit/s

**Memory**

- Chip Type: EM4450 Titan (EM Microelectronic)
- Type/Size: EEPROM 928 Bit, ROM 32 Bit
- Read cycles: unlimited
- Write cycles: > 100000
- Data retention period: 10 years at 55 °C

**Ambient conditions**

- Ambient temperature: -20 ... 85 °C (253 ... 358 K)
- Storage temperature: -20 ... 85 °C (253 ... 358 K)

**Mechanical specifications**

- Diameter of the housing: 20 mm
- Protection degree: IP68 / IP69K
- Material:
  - Housing: PC (Polycarbonate)
  - Encapsulation compound: Epoxy

**Read/write range**

**Dimensions**

- Dimensions: Ø20

---

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1. IPH-18GM-V1
2. IPH-61
3. IPH-FP-V1
4. IPT1-FP-V1
5. IPH-30GM-V1
6. IPH-L2-V1
7. IPH-F15-V1

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Model Number

IPC03-30P

Read/write tag

Features

- Battery-free read/write tag
- 32 bit fixcode
- 928 bits computer memory available
- Readable and writable from both sides
- Mounting holes for simple installation
- Protection degree IP67 / IP68 / IP69K

Technical data

General specifications
- Operating frequency: 125 kHz
- Transfer rate: 2 kBit/s

Memory
- Chip Type: EM4450 Titan (EM Microelectronic)
- Type/Size: EEPROM 928 Bit, ROM 32 Bit
- Read cycles: unlimited
- Write cycles: > 100000
- Data retention period: 10 years at 55 °C

Ambient conditions
- Ambient temperature: -20 ... 100 °C (253 ... 373 K)
- Storage temperature: -20 ... 100 °C (253 ... 373 K)

Mechanical specifications
- Diameter of the housing: 30 mm
- Protection degree: IP67 / IP68 / IP69K
- Material: PC (Polycarbonate)

Read-/write range

Reading range in air IPC03-30...

Reading range on steel IPC03-30...

Reading range on aluminium IPC03-30...

Writing range in air IPC03-30...

Writing range on steel IPC03-30...

Writing range on aluminium IPC03-30...
**Model Number**

- IPC03-50P

**Read/write tag**

**Features**

- Battery-free read/write tag
- 32 bit fixcode
- 928 bits computer memory available
- Readable and writable from both sides
- Mounting holes for simple installation
- Protection degree IP68

**Technical data**

### General specifications

- **Operating frequency**: 125 kHz
- **Transfer rate**: 2 kBit/s

**Memory**

- **Chip Type**: EM4450 Titan (EM Microelectronic)
- **Type/Size**: EEPROM 928 Bit, ROM 32 Bit
- **Read cycles**: unlimited
- **Write cycles**: > 100000
- **Data retention period**: 10 years at 55 °C

### Ambient conditions

- **Ambient temperature**: -25 ... 70 °C (248 ... 343 K)
- **Storage temperature**: -40 ... 90 °C (233 ... 363 K)

### Mechanical specifications

- **Diameter of the housing**: 50 mm
- **Protection degree**: IP68
- **Material**
  - Housing: PC (Polycarbonate)
  - Encapsulation compound: Epoxy

### Dimensions

- **Diameter**: 50 mm

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**Model Number**

**IPC03-58**

**Read/write tag**

**Features**

- Battery-free read/write tag
- 32 bit fixcode
- 928 bits computer memory available
- Protection degree IP67
- Mounting holes for simple installation
- High resistance against water, chemicals, transformer oil, petrol and heating oil

**Technical data**

**General specifications**

- Operating frequency: 125 kHz
- Transfer rate: 2 kBit/s

**Memory**

- Chip Type: EM4450 Titan (EM Microelectronic)
- Type/Size: EEPROM 928 Bit, ROM 32 Bit
- Read cycles: unlimited
- Write cycles: > 100000
- Data retention period: 10 years at 55 °C

**Ambient conditions**

- Ambient temperature: -25 ... 85 °C (248 ... 358 K)
- Storage temperature: -25 ... 120 °C (248 ... 393 K)

**Mechanical specifications**

- Diameter of the housing: 58 mm
- Protection degree: IP67
- Material:
  - Housing: PA 6 (Polyamid)
  - Encapsulation compound: Polyurethane (PUR)

**Read/write range**

**Dimensions**
**Movement Number**

IPC03-100

**Read/write tag**

**Features**

- Battery-free read/write tag
- 32 bit fixcode
- 928 bits computer memory available
- Readable and writable from both sides
- Mounting holes for simple installation
- Protection degree IP66

**Technical data**

**General specifications**

- Operating frequency: 125 kHz
- Transfer rate: 2 kBit/s

**Memory**

- Chip Type: EM4450 Titan (EM Microelectronic)
- Type/Size: EEPROM 928 Bit, ROM 32 Bit
- Read cycles: unlimited
- Write cycles: > 100000
- Data retention period: 10 years at 55 °C

**Ambient conditions**

- Ambient temperature: -40 ... 85 °C (233 ... 358 K)
- Storage temperature: -55 ... 95 °C (218 ... 368 K)

**Mechanical specifications**

- Diameter of the housing: 100 mm
- Protection degree: IP66

**Material**

- Housing: Epoxy (black)

**Read/write range**

- Reading range in air IPC03-100
- Reading range on steel IPC03-100
- Reading range on aluminium IPC03-100

- Writing range in air IPC03-100
- Writing range on steel IPC03-100
- Writing range on aluminium IPC03-100
Model Number
IPC03-C1
Read/write tag

Features
• Battery-free read/write tag
• 32 bit fixcode
• 928 bits computer memory available
•Readable and writable from both sides
• Protection degree IP67
• ISO credit card format

Technical data

<table>
<thead>
<tr>
<th>General specifications</th>
<th>125 kHz</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating frequency</td>
<td></td>
</tr>
<tr>
<td>Transfer rate</td>
<td>2 kBit/s</td>
</tr>
<tr>
<td>Memory</td>
<td></td>
</tr>
<tr>
<td>Chip Type</td>
<td>EM4450 Titan (EM Microelectronic)</td>
</tr>
<tr>
<td>Type/Size</td>
<td>EEPROM 928 Bit, ROM 32 Bit</td>
</tr>
<tr>
<td>Read cycles</td>
<td>unlimited</td>
</tr>
<tr>
<td>Write cycles</td>
<td>&gt; 100000</td>
</tr>
<tr>
<td>Data retention period</td>
<td>10 years at 55 °C</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ambient conditions</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambient temperature</td>
<td>0 ... 50 °C (273 ... 323 K)</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>-40 ... 70 °C (233 ... 343 K)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mechanical specifications</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Protection degree</td>
<td>IP67</td>
</tr>
<tr>
<td>Material</td>
<td></td>
</tr>
<tr>
<td>Housing</td>
<td>PVC, white</td>
</tr>
</tbody>
</table>

Dimensions

- Dimensions of the device:
  - Length: 54 mm
  - Width: 85.6 mm
  - Thickness: 0.8 mm

- Technical specifications:
  - Operating frequency: 125 kHz
  - Transfer rate: 2 kBit/s
  - Chip Type: EM4450 Titan (EM Microelectronic)
  - Memory: EEPROM 928 Bit, ROM 32 Bit
  - Read cycles: unlimited
  - Write cycles: > 100000
  - Data retention period: 10 years at 55 °C
  - Ambient temperature: 0 ... 50 °C (273 ... 323 K)
  - Storage temperature: -40 ... 70 °C (233 ... 343 K)
  - Protection degree: IP67
  - Housing: PVC, white
**RFID Transponder**

**IPC12-58-64K**

### Model Number
IPC12-58-64K

### Read/write tag

### Features
- Battery-free read/write tag
- 64 kbit FRAM, 32 Bit fixcode
- Protection degree IP67
- Sturdy housing with integrated distance retainer
- Mounting holes for simple installation
- Compatible with IPC03
- Unlimited writability

### Technical data

#### General specifications
- Operating frequency: 125 kHz
- Transfer rate: 2 kBit/s

#### Memory
- Chip Type: P+F FRAM
- Type/Size: FRAM 64 kBit, fixcode 32 Bit
- Read cycles: unlimited
- Write cycles: unlimited
- Data retention period: 10 years

#### Ambient conditions
- Ambient temperature: -25 ... 85 °C (248 ... 358 K)
- Storage temperature: -25 ... 85 °C (248 ... 358 K)

#### Mechanical specifications
- Diameter of the housing: 58 mm
- Protection degree: IP67
- Material: Housing PA 6 (Polyamid), Encapsulation compound WEVO 403FL/300

### Dimensions

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ø 58</td>
<td></td>
</tr>
<tr>
<td>Ø 6.5</td>
<td></td>
</tr>
<tr>
<td>5 x 45°</td>
<td></td>
</tr>
<tr>
<td>Ø 12.4</td>
<td></td>
</tr>
</tbody>
</table>

---

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Identification systems: IDENT

4.6 250 kHz R/W heads and transponders for IDENTControl

The R/W heads in the frequency range above 250 kHz use frequency modulation. They are particularly resilient to external electromagnetic interference, as powerful motors or frequency converters normally cause voltage peaks over several discrete frequencies. Modulation across a bandwidth of approximately 200 to 300 kHz enables these influences to be filtered out very effectively.

Depending on the model, the range of the R/W heads can extend up to 100 mm. Read only tags with 28 bits and tags up to 1 kBit are available. The data transmission rate is 20 kBit/s. Special transponders with ferrite cores for installing in metal and tags capable of operating at temperatures of up to 130 °C are available.

Calculation example of travel speeds

The following examples show you how you can calculate the travel speed of your application. For the example calculation, the following assumptions are made:

- FP R/W head (80 mm edge length)
- Read/write times (in ms):

<table>
<thead>
<tr>
<th>Operation</th>
<th>Time (ms)</th>
<th>Read/Write Times</th>
</tr>
</thead>
<tbody>
<tr>
<td>Read only code</td>
<td>7</td>
<td>N x 13</td>
</tr>
<tr>
<td>Read 4 byte data</td>
<td></td>
<td>N x 13</td>
</tr>
<tr>
<td>Write 4 byte data</td>
<td></td>
<td>(N+1) x 50</td>
</tr>
<tr>
<td>Read 3 bytes with &quot;special read&quot;</td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

Read only code
Read time = 7 ms = 0.007 s
s = 80 mm = 0.08 m

\[ v_{praxis} = \frac{0.08 \text{ m}}{(2 \times 0.007 \text{ s})} = 5.7 \text{ m/s} \]

Read 8 bytes
Read time = 2 x 13 ms = 26 ms = 0.026 s
s = 80 mm = 0.08 m

praxis = \[ \frac{0.08 \text{ m}}{(2 \times 0.026 \text{ s})} = 1.5 \text{ m/s} \]

Write 4 bytes
Write time = 2 x 50 ms = 100 ms = 0.1 s
s = 80 mm = 0.08 m

\[ v_{praxis} = \frac{0.08 \text{ m}}{(2 \times 0.1 \text{ s})} = 0.4 \text{ m/s} \]

In the following tables, the travel speed attainable in practice is shown for various R/W heads. In the process, a repeat reading is taken into consideration. (All data in m/s)

<table>
<thead>
<tr>
<th>Operation</th>
<th>ISH-18GM-V1</th>
<th>ISH-F61-V1</th>
<th>ISH-FP-V1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Read only code 1)</td>
<td>1.2</td>
<td>2.1</td>
<td>5.7</td>
</tr>
<tr>
<td>Read 4 byte data 1)</td>
<td>0.69</td>
<td>1.1</td>
<td>3.0</td>
</tr>
<tr>
<td>3 byte special read 1)</td>
<td>1.7</td>
<td>2.9</td>
<td>8</td>
</tr>
<tr>
<td>Read 8 byte data 1)</td>
<td>0.34</td>
<td>0.57</td>
<td>1.5</td>
</tr>
<tr>
<td>Write 4 byte data 1)</td>
<td>0.09</td>
<td>0.15</td>
<td>0.4</td>
</tr>
</tbody>
</table>

1) at 30-80% of max. sensing range
2) "Special read" mode enables a predefined 3-byte block to be transferred even faster.
## R/W heads

<table>
<thead>
<tr>
<th>Order code</th>
<th>ISH-18GM-V1</th>
<th>ISH-F61-V1</th>
<th>ISH-FP-V1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Page</td>
<td>98</td>
<td>99</td>
<td>100</td>
</tr>
</tbody>
</table>

### General data
- Operating frequency: 250 kHz
- Transfer rate: 20 kBit/s
- Operating distance: Maximum: 42 mm / Maximum: 66 mm / Maximum: 100 mm

### Electrical data
- Power consumption $P_0$: ≤ 1.8 W

### Mechanical data
- Degree of protection:
  - ISH-18GM-V1: IP67
  - ISH-F61-V1: IP67
  - ISH-FP-V1: IP67
- Connection:
  - ISH-18GM-V1: M12x1 connector
  - ISH-F61-V1: M12x1 connector
  - ISH-FP-V1: M12x1 connector
- Enclosure:
  - ISH-18GM-V1: PBT/Stainless steel
  - ISH-F61-V1: ABS
  - ISH-FP-V1: PBT
- Weight:
  - ISH-18GM-V1: Approx. 40 g
  - ISH-F61-V1: Approx. 50 g
  - ISH-FP-V1: Approx. 380 g

## Read only tag for flush installation

### Order code
- ICC-8A
- ICC-12A
- ICC-12A-T1
- ICC-16GKA
- ICC-30GKA-T1
- ICC-30GKA-T3

### General data
- Operating frequency: 250 kHz
- Transfer rate: 7.8 kBit/s

### Memory
- Type/size: ROM 64 bit (28 bit code, 36 bit data protection)
- Read cycles: unlimited

### Ambient conditions
- Ambient temperature: -25 ... 70°C
- Storage temperature: -40 ... 85°C

### Mechanical data
- Degree of protection: IP67
- Enclosure:
  - ICC-8A: PBT
  - ICC-12A: Epoxy molding compound
  - ICC-12A-T1: Ryton R4
  - ICC-16GKA: PBT
  - ICC-30GKA-T1: PA
  - ICC-30GKA-T3: PP

## Tag for the hazardous area Ex II 2G EEx ia IIC T4

### Order code
- ICC-30GK-EXIA
- IDC-30GK-EXIA-1K
- IDC-30F-EXIA-1K

### General data
- Operating frequency: 250 kHz
- Transfer rate: 7.8 kBit/s

### Memory
- Type/size:
  - ICC-30GK-EXIA: ROM 64 bit (28 bit code, 36 bit data protection)
  - IDC-30GK-EXIA-1K: EEPROM 1 kBit
- Read cycles: unlimited

### Ambient conditions
- Ambient temperature: -25 ... 70°C
- Storage temperature: -25 ... 100 °C

### Mechanical data
- Degree of protection: IP67
- Enclosure:
  - ICC-30GK-EXIA: PP
  - IDC-30GK-EXIA-1K: PP
  - IDC-30F-EXIA-1K: PBT
- Casting compound:
  - CY 221/HY 2966

---

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Tag for flush installation

<table>
<thead>
<tr>
<th>Order code</th>
<th>IDC-8-1K</th>
<th>IDC-10-1K</th>
<th>IDC-12-1K</th>
<th>IDC-15-1K</th>
<th>IDC-24-1K</th>
<th>IDC-16GK-1K</th>
<th>IDC-30GK-1K</th>
<th>IDC-30GK-1K-T1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Page</td>
<td>105</td>
<td>105</td>
<td>106</td>
<td>106</td>
<td>107</td>
<td>109</td>
<td>109</td>
<td>105</td>
</tr>
</tbody>
</table>

**General data**
- Operating frequency: 250 kHz
- Transfer rate: 7.8 kBit/s

**Memory**
- Type/size: EEPROM 1 kBit
- Read cycles: unlimited
- Write cycles: > 500,000 at 25 °C
- Data hold time: 110 years at 25 °C, 18 years at 50 °C

**Ambient conditions**
- Ambient temperature: -25 ... 70°C
- Storage temperature: -40 ... 85°C

**Mechanical data**
- Degree of protection: IP67
- Material: PBT PBT Epoxy molding PBT compound PP PBT PBT PA

Tag with mounting holes

<table>
<thead>
<tr>
<th>Order code</th>
<th>ICC-50A</th>
<th>IDC-30F-1K</th>
<th>IDC-50-1K</th>
<th>IDC-50F-1K</th>
<th>IDC-58-1K</th>
</tr>
</thead>
<tbody>
<tr>
<td>Page</td>
<td>105</td>
<td>107</td>
<td>108</td>
<td>108</td>
<td>110</td>
</tr>
</tbody>
</table>

**General data**
- Operating frequency: 250 kHz
- Transfer rate: 7.8 kBit/s

**Memory**
- Type/size: ROM 64 bit (28 bit code, 36 bit data protection) EEPROM 1 kBit
- Read cycles: unlimited
- Write cycles: > 500,000
- Data hold time: 110 years at 25 °C, 10 years at 50 °C

**Ambient conditions**
- Ambient temperature: -25 ... 70°C
- Storage temperature: -40 ... 85°C

**Mechanical data**
- Degree of protection: IP67
- Material: PBT PBT PBT PBT ABS
### Model Number
ISH-18GM-V1
Read/write head for IDENTControl

### Features
- Read/write head with thread M18 x 1
- Connection via plug connection V1 (M12 x 1)
- Multihole-LED for function display
- Protection degree IP67

### Accessories

**V1-G-5M-PUR-ABG-V1-W**
Connecting cable, M12 to M12, PUR cable 4-pin, shielded

**V1-G-10M-PUR-ABG-V1-W**
Connecting cable, M12 to M12, PUR cable 4-pin, shielded

### Technical data

#### General specifications
- Operating frequency: 250 kHz
- Transfer rate: 20 kBit/s
- Operating distance: maximum: 42 mm

#### Indicators/operating means

- LED green/yellow: Multihole-LED
  - green: power on
  - green flashing: read/write attempt performed
  - yellow: read/write tag detected

#### Electrical specifications
- Power consumption $P_0 \leq 1.8$ W
- Supply: from the IDENTControl

#### Compliance with standards and directives
- EN 301489-1, EN 301489-3, EN 300330-2, EN 60950-1

#### Ambient conditions
- Ambient temperature: $-25 \ldots 70$ °C (248 ... 343 K)
- Storage temperature: $-40 \ldots 85$ °C (233 ... 358 K)

#### Mechanical specifications
- Protection degree: IP67
- Connection: Connector M12 x 1
- Material: Housing: PBT/stainless steel, Encapsulation compound: Fermadur
- Installation: not embeddable
- Distance between two heads: Multiplex on: $\geq 155$ mm, Multiplex off: $\geq 350$ mm
- Mass: approx. 40 g
Model Number
ISH-F61-V1
Read/write head for IDENTControl

Features
- Particularly flat construction
- Connection cable with V1 plug (M12 x 1)
- Protection degree IP67
- Can be mounted on metal

Accessories
V1-G-5M-PUR-ABG-V1-W
Connecting cable, M12 to M12, PUR cable 4-pin, shielded
V1-G-10M-PUR-ABG-V1-W
Connecting cable, M12 to M12, PUR cable 4-pin, shielded

Dimensions

Electrical connection

Technical data
General specifications
- Operating frequency: 250 kHz
- Transfer rate: 20 kBit/s
- Operating distance: maximum: 66 mm
- Power consumption $P_0 \leq 1.8$ W
- Supply: from the IDENTControl

Compliance with standards and directives
- Standard conformity: EN 301489-1, EN 301489-3, EN 300330-2, EN 60950-1
- Electromagnetic compatibility: EN 61326
- Protection degree: EN 60529

Ambient conditions
- Ambient temperature: -25 ... 70 °C (248 ... 343 K)
- Storage temperature: -40 ... 85 °C (233 ... 358 K)

Mechanical specifications
- Protection degree: IP67
- Connection: Connector M12 x 1
- Housing: ABS
- Encapsulation compound: CY 221/HY 2966
- Distance between two heads: Multiplex on: ≥ 225 mm
- Multiplex off: ≥ 810 mm
- Cable length: 20 cm
- Mass: approx. 50 g

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**Model Number**
ISH-FP-V1
Read/write head for IDENTControl

**Features**
- Connection via plug connection V1 (M12 x 1)
- Dual-LED for function display
- Protection degree IP67

**Accessories**
V1-G-5M-PUR-ABG-V1-W
Connecting cable, M12 to M12, PUR cable 4-pin, shielded

V1-G-10M-PUR-ABG-V1-W
Connecting cable, M12 to M12, PUR cable 4-pin, shielded

**Technical data**

<table>
<thead>
<tr>
<th>General specifications</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating frequency</td>
<td>250 kHz</td>
<td></td>
</tr>
<tr>
<td>Transfer rate</td>
<td>20 kBit/s</td>
<td></td>
</tr>
<tr>
<td>Operating distance</td>
<td>maximum: 100 mm</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Indicators/operating means</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>LED green/yellow</td>
<td>green: power on</td>
<td></td>
</tr>
<tr>
<td></td>
<td>green flashing: read/write attempt performed</td>
<td></td>
</tr>
<tr>
<td></td>
<td>yellow: read/write tag detected</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Electrical specifications</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Power consumption P₀</td>
<td>≤ 1.8 W</td>
<td></td>
</tr>
<tr>
<td>Supply</td>
<td>from the IDENTControl</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Compliance with standards and directives</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard conformity</td>
<td>EN 61326</td>
<td></td>
</tr>
<tr>
<td>Electromagnetic compatibility</td>
<td>EN 61326</td>
<td></td>
</tr>
<tr>
<td>Protection degree</td>
<td>EN 60529</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ambient conditions</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambient temperature</td>
<td>-25 ... 70 °C (248 ... 343 K)</td>
<td></td>
</tr>
<tr>
<td>Storage temperature</td>
<td>-40 ... 85 °C (233 ... 358 K)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mechanical specifications</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Protection degree</td>
<td>IP67</td>
<td></td>
</tr>
<tr>
<td>Connection</td>
<td>Connector M12 x 1</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Material</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Housing</td>
<td>PBT</td>
<td></td>
</tr>
<tr>
<td>Lower section</td>
<td>aluminium diecasting</td>
<td></td>
</tr>
<tr>
<td>Encapsulation compound</td>
<td>Fermadur</td>
<td></td>
</tr>
<tr>
<td>Installation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Distance between two heads</td>
<td>Multiplex on: ≥ 225 mm</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Multiplex off: ≥ 940 mm</td>
<td></td>
</tr>
<tr>
<td>Mass</td>
<td>approx. 380 g</td>
<td></td>
</tr>
</tbody>
</table>
### Model Number

**ICC-8A**  
Read only tag

**Features**
- Battery-free read only tag
- 28 bit fixcode
- Readable from the printed side
- Embeddable mountable in metal
- Protection degree IP67

### Technical data

<table>
<thead>
<tr>
<th>General specifications</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating frequency</td>
<td>250 kHz</td>
</tr>
<tr>
<td>Transfer rate</td>
<td>7.8 kBit/s</td>
</tr>
<tr>
<td>Memory</td>
<td></td>
</tr>
<tr>
<td>Chip Type</td>
<td>P+F</td>
</tr>
<tr>
<td>Type/Size</td>
<td>ROM 64 bit (28 bit code, 36 bit data security)</td>
</tr>
<tr>
<td>Read cycles</td>
<td>unlimited</td>
</tr>
<tr>
<td>Ambient conditions</td>
<td></td>
</tr>
<tr>
<td>Ambient temperature</td>
<td>-25 ... 70 °C (248 ... 343 K)</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>-40 ... 85 °C (233 ... 358 K)</td>
</tr>
<tr>
<td>Mechanical specifications</td>
<td></td>
</tr>
<tr>
<td>Diameter of the housing</td>
<td>8 mm - 0.103 mm</td>
</tr>
<tr>
<td>Protection degree</td>
<td>IP67</td>
</tr>
<tr>
<td>Material</td>
<td></td>
</tr>
<tr>
<td>Housing</td>
<td>PBT</td>
</tr>
<tr>
<td>Encapsulation compound</td>
<td>CY 221/HY 2966</td>
</tr>
</tbody>
</table>

### Dimensions

![Dimension Diagram](image)

---

### Model Number

**ICC-12A**  
Read only tag

**Features**
- Battery-free read only tag
- 28 bit fixcode
- Readable from the printed side
- Embeddable mountable in metal
- Protection degree IP67

### Technical data

<table>
<thead>
<tr>
<th>General specifications</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating frequency</td>
<td>250 kHz</td>
</tr>
<tr>
<td>Transfer rate</td>
<td>7.8 kBit/s</td>
</tr>
<tr>
<td>Memory</td>
<td></td>
</tr>
<tr>
<td>Chip Type</td>
<td>P+F</td>
</tr>
<tr>
<td>Type/Size</td>
<td>ROM 64 bit (28 bit code, 36 bit data security)</td>
</tr>
<tr>
<td>Read cycles</td>
<td>unlimited</td>
</tr>
<tr>
<td>Ambient conditions</td>
<td></td>
</tr>
<tr>
<td>Ambient temperature</td>
<td>-25 ... 70 °C (248 ... 343 K)</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>-40 ... 85 °C (233 ... 358 K)</td>
</tr>
<tr>
<td>Mechanical specifications</td>
<td></td>
</tr>
<tr>
<td>Diameter of the housing</td>
<td>12 mm ± 0.1 mm</td>
</tr>
<tr>
<td>Protection degree</td>
<td>IP67</td>
</tr>
<tr>
<td>Material</td>
<td></td>
</tr>
<tr>
<td>Housing</td>
<td>Epoxy moulding compound</td>
</tr>
</tbody>
</table>

### Dimensions

![Dimension Diagram](image)
## Code carrier

### Model Number

**ICC-12A-T1**

- Read only tag

### Features

- Battery-free read only tag
- 28 bit fixcode
- Readable from the printed side
- Embeddable mountable in metal
- Protection degree IP67
- With extended temperature range up to 130 °C

### Technical data

**General specifications**

- Operating frequency: 250 kHz
- Transfer rate: 7.8 kBit/s

**Memory**

- Chip Type: P+F
- Type/Size: ROM 64 bit (28 bit code, 36 bit data security)
- Read cycles: unlimited

**Ambient conditions**

- Ambient temperature: -25 ... 130 °C (248 ... 403 K)
- Storage temperature: -40 ... 150 °C (233 ... 423 K)

**Mechanical specifications**

- Diameter of the housing: 12.1 mm + 0.2 mm
- Protection degree: IP67
- Material: Ryton R4
- Encapsulation compound: CY 221/HY 2966

### Dimensions

**Model Number**

**ICC-16GKA**

- Read only tag

### Features

- Battery-free read only tag
- 28 bit fixcode
- Readable from the printed side
- Embeddable mountable in metal
- Protection degree IP67
- With thread M16 x 1

### Technical data

**General specifications**

- Operating frequency: 250 kHz
- Transfer rate: 7.8 kBit/s

**Memory**

- Chip Type: P+F
- Type/Size: ROM 64 bit (28 bit code, 36 bit data security)
- Read cycles: unlimited

**Ambient conditions**

- Ambient temperature: -25 ... 70 °C (248 ... 343 K)
- Storage temperature: -40 ... 85 °C (233 ... 358 K)

**Mechanical specifications**

- Diameter of the housing: 16 mm
- Protection degree: IP67
- Material: PBT
- Encapsulation compound: CY 221/HY 2966

### Dimensions
**Model Number**

**ICC-30GKA-T1**
Read only tag

**Features**
- Battery-free read only tag
- 28 bit fixcode
- Readable from the printed side
- Embeddable mountable in metal
- Mounting with thread M30 x 1.5
- Protection degree IP67
- With extended temperature range up to 130 °C
- Protective cap ICS-30GK available

**Technical data**

**General specifications**
- Operating frequency: 250 kHz
- Transfer rate: 7.8 kBit/s

**Memory**
- Chip Type: P+F
- Type/Size: ROM 64 bit (28 bit code, 36 bit data security)
- Read cycles: unlimited

**Ambient conditions**
- Ambient temperature: -25 ... 130 °C (248 ... 403 K)
- Storage temperature: -40 ... 150 °C (233 ... 423 K)

**Mechanical specifications**
- Diameter of the housing: 30 mm
- Protection degree: IP67
- Material
  - Housing: PA
  - Encapsulation compound: CY 221/HY 2966

**Dimensions**

![Diagram of the model](image1.png)

**Model number**

**ICC-30GKA-T3**
Read only tag

**Features**
- Battery-free read only tag
- 28 bit fixcode
- Readable from the printed side
- Embeddable mountable in metal
- Mounting with thread M30 x 1.5
- Protection degree IP68
- With extended temperature range up to 110 °C
- High chemical resistance
- Protective cap ICS-30GK available

**Technical data**

**General specifications**
- Operating frequency: 250 kHz
- Transfer rate: 7.8 kBit/s

**Memory**
- Chip Type: P+F
- Type/Size: ROM 64 bit (28 bit code, 36 bit data security)
- Read cycles: unlimited

**Ambient conditions**
- Ambient temperature: -25 ... 110 °C (248 ... 383 K)
- Storage temperature: -40 ... 110 °C (233 ... 383 K)

**Mechanical specifications**
- Diameter of the housing: 30 mm
- Protection degree: IP68 (1 week in a water depth of 1 m)
- Material
  - Housing: PP
  - Encapsulation compound: CY 221/HY 2966

**Dimensions**

![Diagram of the model](image2.png)
### RFID Transponder

#### Model Number

**ICC-50A**

Read only tag

#### Features

- Battery-free read only tag
- 28 bit fixcode
- Reading is possible from both sides
- Protection degree IP67

#### Technical data

**General specifications**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating frequency</td>
<td>250 kHz</td>
</tr>
<tr>
<td>Transfer rate</td>
<td>7.8 kBit/s</td>
</tr>
</tbody>
</table>

**Memory**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chip Type</td>
<td>P+F</td>
</tr>
<tr>
<td>Type/Size</td>
<td>ROM 64 bit (28 bit code, 36 bit data security)</td>
</tr>
<tr>
<td>Read cycles</td>
<td>unlimited</td>
</tr>
</tbody>
</table>

**Ambient conditions**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambient temperature</td>
<td>-25 ... 70 °C (248 ... 343 K)</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>-40 ... 85 °C (233 ... 358 K)</td>
</tr>
</tbody>
</table>

**Mechanical specifications**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diameter of the housing</td>
<td>50 mm</td>
</tr>
<tr>
<td>Protection degree</td>
<td>IP67</td>
</tr>
</tbody>
</table>

**Housing**

- PBT

**Encapsulation compound**

- CY 221/HY 2966

#### Dimensions

![Dimensions Diagram](image)

**Dimensions**

- Diameter: 50 mm
- Counterbore: 90°
### Technical data

#### General specifications
- **Operating frequency**: 250 kHz
- **Transfer rate**: 7.8 kBit/s

#### Memory
- **Chip Type**: P+F
- **Type/Size**: EEPROM 1 kBit
- **Read cycles**: unlimited
- **Write cycles**: > 500000
- **Data retention period**: 110 years at 25 °C, 18 years at 50 °C

#### Ambient conditions
- **Ambient temperature**: -25 ‚Äì 70 °C (248 ‚Äì 343 K)
- **Storage temperature**: -40 ‚Äì 85 °C (233 ‚Äì 358 K)

#### Mechanical specifications
- **Diameter of the housing**: 8 mm - 0.103 mm
- **Protection degree**: IP67
- **Material**
  - **Housing**: PBT
  - **Encapsulation compound**: CY 221/HY 2966

---

### Technical data

#### General specifications
- **Operating frequency**: 250 kHz
- **Transfer rate**: 7.8 kBit/s

#### Memory
- **Chip Type**: P+F
- **Type/Size**: EEPROM 1 kBit
- **Read cycles**: unlimited
- **Write cycles**: > 500000
- **Data retention period**: 110 years at 25 °C, 18 years at 50 °C

#### Ambient conditions
- **Ambient temperature**: -25 ‚Äì 70 °C (248 ‚Äì 343 K)
- **Storage temperature**: -40 ‚Äì 85 °C (233 ‚Äì 358 K)

#### Mechanical specifications
- **Diameter of the housing**: 10 mm - 0.13 mm
- **Protection degree**: IP67
- **Material**
  - **Housing**: PBT
  - **Encapsulation compound**: CY 221/HY 2966
### Code carrier

#### Model Number
- **IDC-12-1K**
  - Read/write tag

#### Features
- Battery-free read/write tag
- 1 kBit memory
- Readable and writable from the printed side
- Embeddable mountable in metal
- Protection degree IP67

#### Technical data
**General specifications**
- Operating frequency: 250 kHz
- Transfer rate: 7.8 kBit/s

**Memory**
- Chip Type: P+F
- Type/Size: EEPROM 1 kBit
- Read cycles: unlimited
- Write cycles: > 500000
- Data retention period: 110 years at 25 °C, 18 years at 50 °C

**Ambient conditions**
- Ambient temperature: -25 ... 70 °C (248 ... 343 K)
- Storage temperature: -40 ... 85 °C (233 ... 358 K)

**Mechanical specifications**
- Diameter of the housing: 12 mm ± 0.1 mm
- Protection degree: IP67
- Material: Housing Epoxy moulding compound

#### Model number
- **IDC-15-1K**
  - Read/write tag

#### Features
- Battery-free read/write tag
- 1 kBit memory
- Readable and writable from the printed side
- Embeddable mountable in metal
- Protection degree IP67

#### Technical data
**General specifications**
- Operating frequency: 250 kHz
- Transfer rate: 7.8 kBit/s

**Memory**
- Chip Type: P+F
- Type/Size: EEPROM 1 kBit
- Read cycles: unlimited
- Write cycles: > 500000
- Data retention period: 110 years at 25 °C, 18 years at 50 °C

**Ambient conditions**
- Ambient temperature: -25 ... 70 °C (248 ... 343 K)
- Storage temperature: -40 ... 85 °C (233 ... 358 K)

**Mechanical specifications**
- Diameter of the housing: 15 mm ± 0.15 mm
- Protection degree: IP67
- Material: Housing PBT
- Encapsulation compound: CY 221/HY 2966
## Technical data

### General specifications
- **Operating frequency**: 250 kHz
- **Transfer rate**: 7.8 kBit/s

### Memory
- **Chip Type**: P+F
- **Type/Size**: EEPROM 1 kBit
- **Read cycles**: unlimited
- **Write cycles**: > 500000
- **Data retention period**: 110 years at 25 °C, 18 years at 50 °C

### Ambient conditions
- **Ambient temperature**: -25 ... 70 °C (248 ... 343 K)
- **Storage temperature**: -40 ... 85 °C (233 ... 358 K)

### Mechanical specifications
- **Diameter of the housing**: 24 mm - 0.15 mm
- **Protection degree**: IP67
- **Material**: Housing PBT
- **Encapsulation compound**: CY 221/HY 2966

## Dimensions

### Technical data

### General specifications
- **Operating frequency**: 250 kHz
- **Transfer rate**: 7.8 kBit/s

### Memory
- **Chip Type**: P+F
- **Type/Size**: EEPROM 1 kBit
- **Read cycles**: unlimited
- **Write cycles**: > 500000
- **Data retention period**: 110 years at 25 °C, 10 years at 50 °C

### Ambient conditions
- **Ambient temperature**: -25 ... 70 °C (248 ... 343 K)
- **Storage temperature**: -40 ... 85 °C (233 ... 358 K)

### Mechanical specifications
- **Diameter of the housing**: 30 mm
- **Protection degree**: IP67
- **Material**: Housing PBT
- **Encapsulation compound**: CY 221/HY 2966
### Code carrier

#### Model Number

**IDC-50F-1K**

#### Read/write tag

<table>
<thead>
<tr>
<th>Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Battery-free read/write tag</td>
</tr>
<tr>
<td>• 1 kBit memory</td>
</tr>
<tr>
<td>• Reading and writing is possible from both sides</td>
</tr>
<tr>
<td>• Protection degree IP67</td>
</tr>
</tbody>
</table>

#### Technical data

<table>
<thead>
<tr>
<th>General specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating frequency: 250 kHz</td>
</tr>
<tr>
<td>Transfer rate: 7.8 kBit/s</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chip Type: P+F</td>
</tr>
<tr>
<td>Type/Size: EEPROM 1 kBit</td>
</tr>
<tr>
<td>Read cycles: unlimited</td>
</tr>
<tr>
<td>Write cycles: &gt; 500000</td>
</tr>
<tr>
<td>Data retention period: 110 years at 25 °C, 18 years at 50 °C</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ambient conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambient temperature: -25 ... 70 °C (248 ... 343 K)</td>
</tr>
<tr>
<td>Storage temperature: -40 ... 85 °C (233 ... 358 K)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mechanical specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diameter of the housing: 50 mm</td>
</tr>
<tr>
<td>Protection degree: IP67</td>
</tr>
<tr>
<td>Material: Housing: PBT</td>
</tr>
<tr>
<td>Encapsulation compound: CY 221/HY 2966</td>
</tr>
</tbody>
</table>

#### Dimensions

![Dimensions Diagram](Image)

<table>
<thead>
<tr>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Counterbores 90°</td>
</tr>
<tr>
<td>Ø4.5</td>
</tr>
<tr>
<td>Ø50</td>
</tr>
<tr>
<td>+0.5</td>
</tr>
</tbody>
</table>

---

### Code carrier

#### Model Number

**IDC-50-1K**

#### Read/write tag

<table>
<thead>
<tr>
<th>Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Battery-free read/write tag</td>
</tr>
<tr>
<td>• 1 kBit memory</td>
</tr>
<tr>
<td>• Reading and writing is possible from both sides</td>
</tr>
<tr>
<td>• Protection degree IP67</td>
</tr>
</tbody>
</table>

#### Technical data

<table>
<thead>
<tr>
<th>General specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating frequency: 250 kHz</td>
</tr>
<tr>
<td>Transfer rate: 7.8 kBit/s</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chip Type: P+F</td>
</tr>
<tr>
<td>Type/Size: EEPROM 1 kBit</td>
</tr>
<tr>
<td>Read cycles: unlimited</td>
</tr>
<tr>
<td>Write cycles: &gt; 500000</td>
</tr>
<tr>
<td>Data retention period: 110 years at 25 °C, 18 years at 50 °C</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ambient conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambient temperature: -25 ... 70 °C (248 ... 343 K)</td>
</tr>
<tr>
<td>Storage temperature: -40 ... 85 °C (233 ... 358 K)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mechanical specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diameter of the housing: 50 mm</td>
</tr>
<tr>
<td>Protection degree: IP67</td>
</tr>
<tr>
<td>Material: Housing: PBT</td>
</tr>
<tr>
<td>Encapsulation compound: CY 221/HY 2966</td>
</tr>
</tbody>
</table>

#### Dimensions

![Dimensions Diagram](Image)

<table>
<thead>
<tr>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Counterbores 90°</td>
</tr>
<tr>
<td>Ø4.5</td>
</tr>
<tr>
<td>Ø50</td>
</tr>
<tr>
<td>+0.5</td>
</tr>
</tbody>
</table>
### Technical data

#### General specifications
- **Operating frequency**: 250 kHz
- **Transfer rate**: 7.8 kBit/s

#### Memory
- **Chip Type**: P+F
- **Type/Size**: EEPROM 1 kBit
- **Read cycles**: unlimited
- **Write cycles**: > 500000
- **Data retention period**: 110 years at 25 °C, 18 years at 50 °C

#### Ambient conditions
- **Ambient temperature**: -25 ... 70 °C (248 ... 343 K)
- **Storage temperature**: -40 ... 85 °C (233 ... 358 K)

#### Mechanical specifications
- **Diameter of the housing**: 16 mm
- **Protection degree**: IP67
- **Material**: Housing: PBT
- **Encapsulation compound**: CY 221/HY 2966

### Dimensions

![Diagram of the RFID tag]

#### Technical data

#### General specifications
- **Operating frequency**: 250 kHz
- **Transfer rate**: 7.8 kBit/s

#### Memory
- **Chip Type**: P+F
- **Type/Size**: EEPROM 1 kBit
- **Read cycles**: unlimited
- **Write cycles**: > 500000
- **Data retention period**: 110 years at 25 °C, 18 years at 50 °C

#### Ambient conditions
- **Ambient temperature**: -25 ... 70 °C (248 ... 343 K)
- **Storage temperature**: -40 ... 85 °C (233 ... 358 K)

#### Mechanical specifications
- **Diameter of the housing**: 30 mm
- **Protection degree**: IP67
- **Material**: Housing: PP
- **Encapsulation compound**: CY 221/HY 2966

### Model number
- **IDC-16GK-1K**
- **IDC-30GK-1K**
# RFID Transponder

## Model Number
IDC-58-1K

## Read/write tag

### Features
- Battery-free read/write tag
- 1 kBit memory
- Reading and writing is possible from both sides
- Protection degree IP67

## Technical data

### General specifications
- Operating frequency: 250 kHz
- Transfer rate: 7.8 kBit/s

### Memory
- Chip Type: P+F
- Type/Size: EEPROM 1 kBit
- Read cycles: unlimited
- Write cycles: > 500000
- Data retention period: 110 years at 25 °C, 18 years at 50 °C

### Ambient conditions
- Ambient temperature: -25 ... 70 °C (248 ... 343 K)
- Storage temperature: -40 ... 85 °C (233 ... 358 K)

### Mechanical specifications
- Diameter of the housing: 58 mm
- Protection degree: IP67
- Material:
  - Housing: ABS
  - Encapsulation compound: CY 221/HY 2966

## Dimensions

![Dimensions Diagram](image-url)
Model Number
ICC-30GK-EXIA
Read only tag for Ex-area

Features
- Battery-free read only tag for use in hazardous areas
- 28 bit fixcode
- Readable from the printed side
- Protection degree IP67
- Intrinsically safe
- Certificate of conformity
- Mounting with thread M30 x 1.5
- Protective cap ICS-30GK available

Dimensions

Technical data
General specifications
Operating frequency 250 kHz
Transfer rate 7.8 kBit/s
Memory
Type/Size ROM 64 bit (28 bit code, 36 bit data security)
Read cycles unlimited
Ambient conditions
Ambient temperature -25 ... 70 °C (248 ... 343 K)
Storage temperature -25 ... 100 °C (248 ... 373 K)
Mechanical specifications
Protection degree IP67 according to EN 60529
Material Housing PP
Encapsulation compound CY 221/HY 2966
ATEX
Data for Ex areas
Marking II 2G EEx ia IIC T4
EC-Type Examination Certificate DMT 00 ATEX E 007

Operating instructions for use in hazardous areas
Installation, commissioning
This product, which is categorised as intrinsically-safe, has been developed and approved for use in hazardous areas in accordance with EN 50014 and EN 50020.
The prototype test certificate and the national regulations relating to the installation of such equipment must be complied with.
Appropriate associated apparatus can be found in the Sensor Systems 1/Identification Systems catalogue from Pepperl+Fuchs GmbH.
The device must be protected from strong electromagnetic fields and mechanical damage.

Maintenance and repairs
Devices, which are operated in hazardous areas, must not be modified in any way. It is not possible to carry out repairs on these devices.
Model Number
IDC-30GK-EXIA-1K
Read/write tag for hazardous area

Features
• Battery-free read/write tag for use in hazardous areas
• 1 kBit memory
• Readable and writable from the printed side
• Embeddable mountable in metal
• Intrinsically safe
• Certificate of conformity
• Protection degree IP67
• Mounting with thread M30 x 1.5
• Protective cap ICS-30GK available

Dimensions

Technical data

General specifications
- Operating frequency: 250 kHz
- Transfer rate: 7.8 kBit/s

Memory
- Type/Size: EEPROM 1 kBit
- Read cycles: unlimited
- Write cycles: > 500000
- Data retention period: 110 years at 25 °C, 10 years at 50 °C

Ambient conditions
- Ambient temperature: -25 ... 70 °C (248 ... 343 K)
- Storage temperature: -25 ... 85 °C (248 ... 358 K)

Mechanical specifications
- Protection degree: IP67 according to EN 60529
- Material: Housing PP
- Encapsulation compound: CY 221/HY 2966

ATEX
- Data for Ex areas
- Marking: II 2G Ex ia IIC T4
- EC-Type Examination Certificate: DMT 00 ATEX E 007

Notes
The surface containing the text must face the read/write head.

Operating instructions for use in hazardous areas

Installation, commissioning
This product, which is categorised as intrinsically-safe, has been developed and approved for use in hazardous areas in accordance with EN 50014 and EN 50020.
The prototype test certificate and the national regulations relating to the installation of such equipment must be complied with.
Appropriate associated apparatus can be found in the Sensor Systems 1/Identification Systems catalogue from Pepperl+Fuchs GmbH.
The device must be protected from strong electromagnetic fields and mechanical damage.

Maintenance and repairs
Devices, which are operated in hazardous areas, must not be modified in any way. It is not possible to carry out repairs on these devices.
**Model Number**

IDC-30F-EXIA-1K

**Read/write tag for hazardous area**

**Features**

- Battery-free read/write tag for use in hazardous areas
- 1 kBit memory
- Readable and writable from the printed side
- Embeddable mountable in metal
- Intrinsically safe
- Certificate of conformity
- Protection degree IP67
- With mounting flange

**Technical data**

**General specifications**
- Operating frequency: 250 kHz
- Transfer rate: 7.8 kBit/s

**Memory**
- Type/Size: EEPROM 1 kBit
- Read cycles: unlimited
- Write cycles: > 500000
- Data retention period: 110 years at 25 °C, 10 years at 50 °C

**Ambient conditions**
- Ambient temperature: -25 ... 70 °C (248 ... 343 K)
- Storage temperature: -25 ... 85 °C (248 ... 358 K)

**Mechanical specifications**
- Protection degree: IP67 according to EN 60529
- Housing: PBT
- Encapsulation compound: CY 221/HY 2966

**ATEX**
- Data for Ex areas
- Marking: II 2G Ex ia IIC T4
- EC-Type Examination Certificate: DMT 00 ATEX E 007

**Notes**

The surface containing the text must face the read/write head.

**Operating instructions for use in hazardous areas**

**Installation, commissioning**

This product, which is categorised as intrinsically-safe, has been developed and approved for use in hazardous areas in accordance with EN 50014 and EN 50020.

The prototype test certificate and the national regulations relating to the installation of such equipment must be complied with.

Appropriate associated apparatus can be found in the Sensor Systems 1/Identification Systems catalogue from Pepperl+Fuchs GmbH.

The device must be protected from strong electromagnetic fields and mechanical damage.

**Maintenance and repairs**

Devices, which are operated in hazardous areas, must not be modified in any way. It is not possible to carry out repairs on these devices.
4.7 13.56 MHz R/W heads and transponders for IDENTControl

13.56 MHz R/W heads are well-defined according to ISO and IEC Standards worldwide. Due to manufacturer specific deviations in chips and certain freedoms in the standards, only the UID code is reliably read by all standard systems.

The higher carrier frequency means a lower number of turns of the receiver/transmitter coil are required for tuning. Thus, the coil geometry can be punched as a meander and simply and cost-effectively connected with the silicon chip in a smart label transponder and then, for example, be laminated in credit card format. If however, there are different requirements, such as a high degree of protection, a mechanically robust industrial model or high temperature application, the price does not significantly differ from that of other systems.

The installation or mounting on metal is complicated by the fact that corresponding spacers are introduced. The alignment of the field with ferrite core is not possible due to the low number of turns. A minimum of 15 mm should be used as a benchmark for the distance from metal. For some types, this spacer is already integrated into the housing. This must be taken into consideration during project planning of 13.56 MHz systems. With the large antenna, a read range up to 300 mm can be achieved.

13.56 MHz transponders typically have 64 bit UID code and also a different size data range.

Calculation example of travel speeds

The following formula is valid for the calculation of the maximum possible travel speed:

\[ \text{speed} = \frac{\text{read range (in m)}}{\text{execution time (in s)}} \Rightarrow v_{\text{max}} \]

In practice, a correct reading should also result if a read attempt is unsuccessful due to EMC influence, for example. For practical application therefore, only a third of the speed is recommended:

\[ v_{\text{praxis}} = \frac{v_{\text{max}}}{3} \]

The following examples show you how you can calculate the travel speed of your application.

Read read only code

R/W head IQH1-FP-V1: Read range \( s = 80 \text{ mm} = 0.08 \text{ m} \)
Transponder IQC21/22/33: Execution time \( t = 9.5 \text{ ms} = 0.0095 \text{ s} \)

\[ v_{\text{praxis}} = \frac{0.08 \text{ m}}{3 \times 0.0095 \text{ s}} = 2.7 \text{ m/s} \]

Read 1 block with 4 bytes

R/W head IQH1-FP-V1: Read range \( s = 80 \text{ mm} = 0.08 \text{ m} \)
Transponder IQC21/22: Execution time \( t = (1 \times 1.3 \text{ ms}) + 6.7 \text{ ms} = 8 \text{ ms} = 0.008 \text{ s} \)

\[ v_{\text{praxis}} = \frac{0.08 \text{ m}}{3 \times 0.008 \text{ s}} = 3.3 \text{ m/s} \]

Write 1 block with 4 bytes

R/W head IQH1-FP-V1: Read range \( s = 80 \text{ mm} = 0.08 \text{ m} \)
Transponder IQC21: Execution time \( t = (1 \times 20.3 \text{ ms}) + 1.1 \text{ ms} = 21.4 \text{ ms} = 0.022 \text{ s} \)

\[ v_{\text{praxis}} = \frac{0.08 \text{ m}}{3 \times 0.022 \text{ s}} = 1.2 \text{ m/s} \]

Write 1 block with 4 bytes

R/W head IQH1-FP-V1: Read range \( s = 80 \text{ mm} = 0.08 \text{ m} \)
Transponder IQC33: Execution time \( t = (1 \times 14 \text{ ms}) + 16 \text{ ms} = 30 \text{ ms} = 0.03 \text{ s} \)

\[ v_{\text{praxis}} = \frac{0.08 \text{ m}}{3 \times 0.03 \text{ s}} = 0.89 \text{ m/s} \]

Read 1 block with 8 bytes

R/W head IQH1-FP-V1: Read range \( s = 80 \text{ mm} = 0.08 \text{ m} \)
Transponder IQC33: Execution time \( t = (1 \times 28 \text{ ms}) + 16 \text{ ms} = 44 \text{ ms} = 0.044 \text{ s} \)

\[ v_{\text{praxis}} = \frac{0.08 \text{ m}}{3 \times 0.044 \text{ s}} = 0.6 \text{ m/s} \]
In the following tables, the travel speed attainable in practice is shown for various R/W heads. (All data in m/s for IQC21/IQC22)

<table>
<thead>
<tr>
<th>[m/s]</th>
<th>IQH1-18GM-V1</th>
<th>IQH1-F61-V1</th>
<th>IQH1-FP-V1</th>
<th>IQH-F100-V1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Read read only code 1)</td>
<td>0.7</td>
<td>1.0</td>
<td>2.7</td>
<td>5.0</td>
</tr>
<tr>
<td>Read 4 byte data 1)</td>
<td>0.8</td>
<td>1.2</td>
<td>3.3</td>
<td>6.6</td>
</tr>
<tr>
<td>Read 8 byte data 1)</td>
<td>0.6</td>
<td>0.9</td>
<td>2.4</td>
<td>5.0</td>
</tr>
<tr>
<td>Write 4 byte data 1)</td>
<td>0.4</td>
<td>0.6</td>
<td>1.5</td>
<td>4.3</td>
</tr>
</tbody>
</table>

1) at 30-80% of max. sensing range

**R/W heads**

<table>
<thead>
<tr>
<th>Order code</th>
<th>IQH1-18GM-V1</th>
<th>IQH1-F61-V1</th>
<th>IQH1-FP-V1</th>
<th>IQH-F100-V1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Page</td>
<td>118</td>
<td>119</td>
<td>120</td>
<td>121</td>
</tr>
</tbody>
</table>

**General data**

<table>
<thead>
<tr>
<th>Operating frequency</th>
<th>13.56 MHz</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transfer rate</td>
<td>26 kBit/s</td>
</tr>
</tbody>
</table>

**Sensing range**

<table>
<thead>
<tr>
<th>Read distance</th>
<th>0–55 mm</th>
<th>0–50 mm</th>
<th>0–130 mm</th>
<th>0–300 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Write range</td>
<td>0–55 mm</td>
<td>0–50 mm</td>
<td>0–130 mm</td>
<td>0–300 mm</td>
</tr>
</tbody>
</table>

**Width**

<table>
<thead>
<tr>
<th>Max. 45 mm</th>
<th>Max. 45 mm</th>
<th>Max. 100 mm</th>
<th>Max. 320 mm</th>
</tr>
</thead>
</table>

**Electric data**

<table>
<thead>
<tr>
<th>Power consumption P0</th>
<th>≤ 1.2 W</th>
<th>≤ 1.3 W</th>
<th>≤ 1.3 W</th>
<th>≤ 2 W</th>
</tr>
</thead>
</table>

**Mechanical data**

<table>
<thead>
<tr>
<th>Degree of protection</th>
<th>IP67</th>
<th>IP67</th>
<th>IP67</th>
<th>IP54</th>
</tr>
</thead>
</table>

**Connection**

M12x1 connector

**Material**

<table>
<thead>
<tr>
<th>Housing</th>
<th>PBT/Stainless steel</th>
<th>ABS</th>
<th>PBT</th>
<th>ABS, black</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lower section</td>
<td>-</td>
<td>-</td>
<td>Aluminum, die-cast</td>
<td>-</td>
</tr>
</tbody>
</table>

**Weight**

| Approx. 40 g          | Approx. 50 g        | Approx. 380 g | Approx. 1000 g |

---

1) Courtesy of Steven Engineering, Inc.-230 Ryan Way, South San Francisco, CA 94080-6370-Main Office: (650) 588-9200-Outside Local Area: (800) 258-9200-www.stevenengineering.com
Transponders

The following transponders are supported by Pepperl+Fuchs read and write heads:

<table>
<thead>
<tr>
<th>Order code</th>
<th>Chip type</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>IQC20</td>
<td>All ISO 15693 compliant tags</td>
<td>IQC-20 is not an actual tag type, but is used to read the UID (read only code) of all ISO 15693 compliant read/write tags.</td>
</tr>
<tr>
<td>IQC21</td>
<td>I-CODE SLI (NXP)</td>
<td></td>
</tr>
<tr>
<td>IQC22</td>
<td>Tag-it HF-I Plus (Texas Instruments)</td>
<td></td>
</tr>
<tr>
<td>IQC23</td>
<td>my-d SRF 56V02P (Infineon)</td>
<td>Not in catalog</td>
</tr>
<tr>
<td>IQC24</td>
<td>my-d SRF 56V10P (Infineon)</td>
<td>Not in catalog</td>
</tr>
<tr>
<td>IQC33</td>
<td>FRAM MB89R118 (Fujitsu)</td>
<td>You can only use the tag IQC33 in combination with R/W head IQH1-...</td>
</tr>
<tr>
<td>IQC35</td>
<td>I-CODE SLI-S (NXP)</td>
<td>Not in catalog</td>
</tr>
</tbody>
</table>

---|------|----------|----------|--------------|----------|----------|----------|----------
|      |       | 122      | 123      | 124          | 125      | 126      | 127      | 128      |

General data
- Operating frequency: 13.56 MHz
- Transfer rate: 26 kBit/s

Memory
- Type/size: EEPROM 2 kBit, ROM 64 bit
- Read cycles: unlimited
- Write cycles: > 100000
- Data hold time: 10 years at 55°C

Ambient conditions
- Ambient temperature: -20–100°C
- Storage temperature: -30–100°C

Mechanical data
- Degree of protection: IP67
- Material: PC (polycarbonate)

Order code | Page | IQC22-22-T9 | IQC22-39 | IQC33-20 | IQC33-30 | IQC33-50
---|------|------------|----------|---------|---------|---------
|      |       | 129        | 130      | 131     | 132     | 133     |

General data
- Operating frequency: 13.56 MHz
- Transfer rate: 26 kBit/s

Memory
- Type/size: FRAM 16 kBit, read only code 64 bit
- Read cycles: unlimited
- Write cycles: > 100000
- Data hold time: 10 years

Ambient conditions
- Ambient temperature: -25–90°C
- Storage temperature: -25–90°C

Mechanical data
- Degree of protection: IP68
- Material: PPS (ABS, PVC, ABS, PET)
IQH1-18GM-V1

Read/write head for IDENTControl

Features

- Operating frequency 13.56 MHz
- Conformal coated with ISO 15693
- Suitable for FRAM transponder
- Read/write head with thread M18 x 1
- Connection via plug connection V1 (M12 x 1)
- Multihole-LED for function display
- Protection degree IP67

Accessories

- IQC21-50P Read/write tag
- IQC21-58 Read/write tag
- IQC22-C5 Read/write tag
- IQC33-20 Read/write tag
- IQC33-30 Read/write tag
- IQC33-50 Read/write tag
- V1-G-5M-PUR-ABG-V1-W Connecting cable, M12 to M12, PUR cable 4-pin, shielded
- V1-G-10M-PUR-ABG-V1-W Connecting cable, M12 to M12, PUR cable 4-pin, shielded

Technical data

General specifications
- Operating frequency 13.56 MHz
- Transfer rate 26 kBit/s
- Sensing range
  - Reading distance 0 ... 55 mm
  - Writing distance 0 ... 55 mm
- Width max. 45 mm

Indicators/operating means
- LED green/yellow
  - Multihole-LED: green: power on, green flashing: read/write attempt performed, yellow: read/write tag detected

Electrical specifications
- Power consumption $P_0 \leq 1.2$ W
- Supply from the IDENTControl

Compliance with standards and directives
- Directive conformity
- Standard conformity
- Electromagnetic compatibility EN 61000-6-2, EN 61000-6-4
- Protection degree EN 60529
- RFID

Ambient conditions
- Ambient temperature -25 ... 70 °C (248 ... 343 K)
- Storage temperature -40 ... 85 °C (233 ... 358 K)

Mechanical specifications
- Protection degree IP67
- Connection Connector M12 x 1
- Material
  - Housing PBT/stainless steel
  - Encapsulation compound CY 221/HY 2966
  - Installation not embeddable
  - Distance between two heads Multiply on: $\geq 30$ mm
    - Multiply off: $\geq 80$ mm
- Mass approx. 40 g
Model Number
IQH1-F61-V1
Read/write head for IDENTControl

Features
- Operating frequency 13.56 MHz
- Conformal coated with ISO 15693
- Suitable for FRAM transponder
- Particularly flat construction
- Connection cable with V1 plug (M12 x 1)
- Protection degree IP67
- Can be mounted on metal

Accessories
- IQC21-50P Read/write tag
- IQC21-58 Read/write tag
- IQC22-C5 Read/write tag
- IQC33-20 Read/write tag
- IQC33-30 Read/write tag
- IQC33-50 Read/write tag
- V1-G-5M-PUR-ABG-V1-W Connecting cable, M12 to M12, PUR cable 4-pin, shielded
- V1-G-10M-PUR-ABG-V1-W Connecting cable, M12 to M12, PUR cable 4-pin, shielded

Technical data

General specifications
- Operating frequency 13.56 MHz
- Transfer rate 26 kBit/s
- Sensing range
  - Reading distance 0 ... 50 mm
  - Writing distance 0 ... 50 mm
- Width max. 45 mm

Electrical specifications
- Power consumption $P_0 \leq 1.3$ W
- Supply from the IDENTControl

Compliance with standards and directives
- Directive conformity
  - R&TTE Directive 1995/5/EC EN 301489-1, EN 301489-3, EN 300330-2, EN 60950-1
- Standard conformity
  - Electromagnetic compatibility EN 61000-6-2, EN 61000-6-4
- Protection degree EN 60529

Ambient conditions
- Ambient temperature -25 ... 70 °C (248 ... 343 K)
- Storage temperature -40 ... 85 °C (233 ... 358 K)

Mechanical specifications
- Protection degree IP67
- Connection Connector M12 x 1
- Material Housing ABS
- Encapsulation compound WEVO 403FL/300
- Distance between two heads Multiplex on: $\geq 100$ mm
  Multiplex off: $\geq 150$ mm
- Cable length 20 cm
- Mass approx. 50 g
**Model Number**
IQH1-FP-V1

**Read/write head**
for IDENTControl

**Features**
- Operating frequency 13.56 MHz
- Conformal coated with ISO 15693
- Suitable for FRAM transponder
- Dual-LED for function display
- Connection via plug connection V1 (M12 x 1)
- Protection degree IP67

**Accessories**
- IQC21-50P Read/write tag
- IQC21-58 Read/write tag
- IQC22-C5 Read/write tag
- IQC33-20 Read/write tag
- IQC33-30 Read/write tag
- IQC33-50 Read/write tag
- V1-G-5M-PUR-ABG-V1-W Connecting cable, M12 to M12, PUR cable 4-pin, shielded
- V1-G-10M-PUR-ABG-V1-W Connecting cable, M12 to M12, PUR cable 4-pin, shielded

**Dimensions**

**Electrical connection**

**Technical data**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>General specifications</strong></td>
<td></td>
</tr>
<tr>
<td>Operating frequency</td>
<td>13.56 MHz</td>
</tr>
<tr>
<td>Transfer rate</td>
<td>26 kBit/s</td>
</tr>
<tr>
<td>Sensing range</td>
<td></td>
</tr>
<tr>
<td>Reading distance</td>
<td>0 ... 130 mm</td>
</tr>
<tr>
<td>Writing distance</td>
<td>0 ... 130 mm</td>
</tr>
<tr>
<td>Width</td>
<td>max. 100 mm</td>
</tr>
<tr>
<td><strong>Indicators/operating means</strong></td>
<td></td>
</tr>
<tr>
<td>LED green/yellow</td>
<td>Power on</td>
</tr>
<tr>
<td></td>
<td>green flashing: read/write attempt performed</td>
</tr>
<tr>
<td></td>
<td>yellow: read/write tag detected</td>
</tr>
<tr>
<td><strong>Electrical specifications</strong></td>
<td></td>
</tr>
<tr>
<td>Power consumption P0</td>
<td>≤ 1.3 W</td>
</tr>
<tr>
<td>Supply</td>
<td>from the IDENTControl</td>
</tr>
<tr>
<td><strong>Compliance with standards and directives</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>EN 301489-1, EN 301489-3, EN 300330-2, EN 60950-1</td>
</tr>
<tr>
<td>Standard conformity</td>
<td>EN 61000-6-2, EN 61000-6-4</td>
</tr>
<tr>
<td>Electromagnetic compatibility</td>
<td>EN 60529</td>
</tr>
<tr>
<td><strong>Ambient conditions</strong></td>
<td></td>
</tr>
<tr>
<td>Ambient temperature</td>
<td>-25 ... 70 °C (248 ... 343 K)</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>-40 ... 85 °C (233 ... 358 K)</td>
</tr>
<tr>
<td><strong>Mechanical specifications</strong></td>
<td></td>
</tr>
<tr>
<td>Protection degree</td>
<td>IP67</td>
</tr>
<tr>
<td>Connection</td>
<td>Connector M12 x 1</td>
</tr>
<tr>
<td>Material</td>
<td>Housing: PBT</td>
</tr>
<tr>
<td></td>
<td>Lower section: aluminium diecasting</td>
</tr>
<tr>
<td></td>
<td>Encapsulation compound: CY 221/HY 2966</td>
</tr>
<tr>
<td>Installation</td>
<td>Distance between two heads:</td>
</tr>
<tr>
<td></td>
<td>Multiplex on: ≥ 100 mm</td>
</tr>
<tr>
<td></td>
<td>Multiplex off: ≥ 150 mm</td>
</tr>
<tr>
<td>Mass</td>
<td>approx. 380 g</td>
</tr>
</tbody>
</table>
**Model Number**

IQH-F100-V1

**Read/write head**

for IDENT Control

**Features**

- Operating frequency 13.56 MHz
- Conformal coated with ISO 15693
- Suitable for the connection to all IDENT Control interface units
- Connection via plug connection V1 (M12 x 1)
- Protection degree IP54

**Accessories**

IQC21-50P

Read/write tag

IQC21-58

Read/write tag

IQC22-C1

Read/write tag

IQC22-C4

Read/write tag

IQC22-C5

Read/write tag

V1-G-5M-PUR-ABG-V1-W

Connecting cable, M12 to M12, PUR cable 4-pin, shielded

V1-G-10M-PUR-ABG-V1-W

Connecting cable, M12 to M12, PUR cable 4-pin, shielded

**Technical data**

**General specifications**

- Operating frequency: 13.56 MHz
- Transfer rate: 26 kBit/s
- Sensing range:
  - Reading distance: 0 ... 300 mm
  - Writing distance: 0 ... 300 mm
- Width: max. 320 mm

**Indicators/operating means**

- LED green: Operating display
- LED yellow: Read/write tag read
- Button: Start of adjustment
- Rotary switch: Adjustment to the surroundings

**Electrical specifications**

- Power consumption $P_0 \leq 2$ W
- Supply: from the IDENT Control

**Compliance with standards and directives**

- Directive conformity:
  - R&TTE Directive 1995/5/EC (EN 301489-1, EN 301489-3, EN 300330-2, EN 60950-1)
- Standard conformity:
  - Electromagnetic compatibility: EN 61326
  - Protection degree: EN 60529

**Ambient conditions**

- Ambient temperature: -20 ... 70 °C (253 ... 343 K)
- Storage temperature: -40 ... 85 °C (233 ... 358 K)

**Mechanical specifications**

- Protection degree: IP54
- Connection: Connector M12 x 1
- Material: Housing ABS, black
- Installation:
  - Distance between two heads: Multiplex on: ≥ 180 mm
    Multiplex off: ≥ 500 mm
  - Cable length: 20 cm
  - Mass: approx. 1000 g
IQC21-30P

Model Number

**IQC21-30P**
Read/write tag

**Features**
- Operating frequency 13.56 MHz
- 64 bit Fixcode
- 896 bits memory available
- Readable and writable from both sides
- Protection degree IP67
- Mounting holes for simple installation

**Technical data**

**General specifications**
- Operating frequency 13.56 MHz
- Transfer rate 26 kBit/s

**Memory**
- Chip Type: I-CODE SLI (NXP)
- Type/Size: EEPROM 896 Bit
  ROM 64 Bit
- Read cycles: unlimited
- Write cycles: > 100000
- Data retention period: 10 years at 55 °C

**Compliance with standards and directives**
- Standard conformity
  Protection degree: EN 60529

**Ambient conditions**
- Ambient temperature: -20 ... 100 °C (253 ... 373 K)
- Storage temperature: -30 ... 100 °C (243 ... 373 K)

**Mechanical specifications**
- Diameter of the housing: 30 mm
- Protection degree: IP67
- Material: Housing: PC (Polycarbonate)

**Read-/write range**

Lesobereich in Luft IQC21-30P

Dimensions

![Diagram of dimensions](image)
RFID Transponder

IQC21-50P

Model Number
IQC21-50P
Read/write tag

Features
- Operating frequency 13.56 MHz
- Conformal coated with ISO 15693
- 64 bit Fixcode
- 896 bits memory available
- Readable and writable from both sides
- Protection degree IP67
- Mounting holes for simple installation

Technical data

General specifications
- Operating frequency 13.56 MHz
- Transfer rate 26 kBit/s

Memory
- Chip Type: I-CODE SLI (NXP)
- Type/Size: EEPROM 896 Bit, ROM 64 Bit
- Read cycles: unlimited
- Write cycles: > 100000
- Data retention period: 10 years at 55 °C

Compliance with standards and directives
- Standard conformity: EN 60529

Ambient conditions
- Ambient temperature: -25 ... 70 °C (248 ... 343 K)
- Storage temperature: -25 ... 85 °C (248 ... 358 K)

Mechanical specifications
- Diameter of the housing: 50 mm
- Protection degree: IP67
- Material: Housing PC (Polycarbonate)
- Encapsulation compound: Epoxy

Read/write range

Reading range in an IQC21-50P
**Model Number**

IQC21-50F-T10

**Read/write tag**

**Features**

- Operating frequency 13.56 MHz
- Conformal coated with ISO 15693
- 896 bits memory available
- Readable and writable from both sides
- Protection degree IP68
- With extended temperature range up to 200 °C
- Mounting holes for simple installation

**Technical data**

**General specifications**

- Operating frequency: 13.56 MHz
- Transfer rate: 26 kBit/s

**Memory**

- Chip Type: I-CODE SLI (NXP)
- Type/Size: EEPROM 896 Bit
- ROM 64 Bit
- Read cycles: unlimited
- Write cycles: > 100000
- Data retention period: 10 years at 55 °C

**Compliance with standards and directives**

- Protection degree: EN 60529
- RFID: ISO/IEC 15693-1, ISO/IEC 15693-2, ISO/IEC 15693-3,
  ISO/IEC 18000-3

**Ambient conditions**

- Ambient temperature: -40 ... 93 °C (233 ... 366 K)
- Storage temperature: -40 ... 200 °C (233 ... 473 K)
- Climatic conditions: 100 % non-condensing

**Mechanical specifications**

- Diameter of the housing
- Protection degree: IP68/NEMA 6P/12
- Material: PPS

**Read/write range**

Reading range in air IQC21-50F-T10

<table>
<thead>
<tr>
<th>Offset [mm]</th>
<th>Distance [mm]</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>45</td>
<td>45</td>
</tr>
<tr>
<td>60</td>
<td>60</td>
</tr>
<tr>
<td>-15</td>
<td>15</td>
</tr>
<tr>
<td>-30</td>
<td>30</td>
</tr>
<tr>
<td>-45</td>
<td>45</td>
</tr>
<tr>
<td>-60</td>
<td>60</td>
</tr>
</tbody>
</table>

**Qualified for**

- IQH1-18GM-V1
- IQH1-F61-V1
- IQH1-PP-V1
- IQH-F100-V1
Model Number

IQC21-58
Read/write tag

Features

- Operating frequency 13.56 MHz
- Conformal coated with ISO 15693
- 64 bit Fixcode
- 896 bits memory available
- Protection degree IP67
- Mounting holes for simple installation
- High resistance against water, chemicals, transformer oil, petrol and heating oil

Technical data

General specifications
- Operating frequency: 13.56 MHz
- Transfer rate: 26 kBit/s

Memory
- Chip Type: I-CODE SLI (NXP)
- Type/Size: EEPROM 896 Bit, ROM 64 Bit
- Read cycles: unlimited
- Write cycles: > 100000
- Data retention period: 10 years at 55 °C

Compliance with standards and directives
- Standard conformity: EN 60529

Ambient conditions
- Ambient temperature: -25 ... 85 °C (248 ... 358 K)
- Storage temperature: -25 ... 85 °C (248 ... 358 K)

Mechanical specifications
- Diameter of the housing: 58 mm
- Protection degree: IP67
- Material: Housing ABS

Read-/write range

IQH1-18GM-V1  IQH1-F61-V1  IQH1-FP-V1
IQH-F100-V1

Dimensions
**Model Number**

IQC22-C1

Read/write tag

**Features**

- Operating frequency 13.56 MHz
- conformal coated with ISO 15693
- 64 bit Fixcode
- 2 kBit memory available
- Readable and writable from both sides
- Protection degree IP67
- ISO credit card format

**Technical data**

- **General specifications**
  - Operating frequency: 13.56 MHz
  - Transfer rate: 26 kBit/s
- **Memory**
  - Chip Type: Tag-it HF-I Plus (Texas Instruments)
  - Type/Size: EEPROM 2 kBit, ROM 64 Bit
  - Read cycles: unlimited
  - Write cycles: > 100000
  - Data retention period: 10 years
- **Compliance with standards and directives**
  - Standard conformity
  - Protection degree: EN 60529
- **Ambient conditions**
  - Ambient temperature: -20 ... 50 °C (253 ... 323 K)
  - Storage temperature: -20 ... 50 °C (253 ... 323 K)
- **Mechanical specifications**
  - Diameter of the housing
  - Protection degree: IP67
  - Material: PVC
  - Housing: PVC

**Dimensions**

- IQC22-C1

**Read-/write range**

Reading range in air IQC22-C1

---

Subject to modifications without notice.

Edition: 2009-03-01

Catalogue Identification Systems 2009

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Model Number
IQC22-C4
Read/write tag

Features
- Operating frequency 13.56 MHz
- Conformal coated with ISO 15693
- 64 bit Fixcode
- 2 kBit memory available
- Readable and writable from both sides
- Mounting holes for simple installation

Technical data
General specifications
- Operating frequency 13.56 MHz
- Transfer rate 26 kBit/s

Memory
- Chip Type: Tag-it HF-I Plus (Texas Instruments)
- Type/Size: EEPROM 2 kBit, ROM 64 Bit
- Read cycles: unlimited
- Write cycles: > 100000
- Data retention period: 10 years at 55 °C

Compliance with standards and directives
- Environmental conditions:
  - Ambient temperature: -25 ... 70 °C (248 ... 343 K)
  - Storage temperature: -25 ... 85 °C (248 ... 358 K)

Mechanical specifications
- Diameter of the housing: IP20

Material
- Housing: ABS
**IQC22-C5 RFID Transponder**

**Features**
- Operating frequency 13.56 MHz
- Conformal coated with ISO 15693
- 64 bit Fixcode
- 2 kBit memory available
- Readable and writable from both sides
- Protection degree IP67

**Technical data**

<table>
<thead>
<tr>
<th>General specifications</th>
<th>13.56 MHz</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transfer rate</td>
<td>26 kBit/s</td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>Memory</th>
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</thead>
<tbody>
<tr>
<td>Chip Type</td>
</tr>
<tr>
<td>Type/Size</td>
</tr>
<tr>
<td>Read cycles</td>
</tr>
<tr>
<td>Write cycles</td>
</tr>
<tr>
<td>Data retention period</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Compliance with standards and directives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard conformity</td>
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<tr>
<td>Protection degree</td>
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<tr>
<th>Ambient conditions</th>
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<tbody>
<tr>
<td>Ambient temperature</td>
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<td>Storage temperature</td>
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</table>

<table>
<thead>
<tr>
<th>Mechanical specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diameter of the housing</td>
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<tr>
<td>Material</td>
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**Read/write range**

Reading range in air IQC22-C5

<table>
<thead>
<tr>
<th>Distance [mm]</th>
<th>Offset [mm]</th>
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<tbody>
<tr>
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<td>-60 to 60</td>
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<td>115</td>
<td>-60 to 60</td>
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<td>-60 to 60</td>
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<td>-60 to 60</td>
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<table>
<thead>
<tr>
<th>IQH1-18GM-V1</th>
<th>IQH1-F61-V1</th>
<th>IQH1-FP-V1</th>
</tr>
</thead>
<tbody>
<tr>
<td>IQH-F100-V1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
RFID Transponder

**Model Number**

IQC22-22-T9

Read/write tag

**Features**

- Operating frequency 13.56 MHz
- Conformal coated with ISO 15693
- 64 bit Fixcode
- 2 kBit memory available
- Readable and writable from both sides
- Protection degree IP68
- With extended temperature range up to 220 °C
- Fix code lasered onto housing

**Technical data**

**General specifications**

- Operating frequency: 13.56 MHz
- Transfer rate: 26 kBit/s

**Memory**

- Chip Type: Tag-it HF-I Plus (Texas Instruments)
- Type/Size: EEPROM 2 kBit, ROM 64 Bit
- Read cycles: unlimited
- Write cycles: > 100000
- Data retention period: 10 years at 25 °C

**Compliance with standards and directives**

- Protection degree: EN 60529

**Ambient conditions**

- Ambient temperature: -25 ... 90 °C (248 ... 363 K)
- Storage temperature: -25 ... 120 °C (248 ... 393 K)
  - 160 °C (433 K) for 50 hours
  - 220 °C (493 K) for 30 seconds
- Climatic conditions: Isostatic water pressure: 45 bar for 10 hours
- Shock and impact resistance: Oscillation (sinus): 10 g, 10 - 2000 Hz in accordance with EN 60068-2-6
  - Shock (semi-sinus): 100 g, 6 ms in accordance with EN 60068-2-27

**Mechanical specifications**

- Diameter of the housing: 22 mm
- Protection degree: IP68
- Material: PPS
- Housing: 1.6 g ± 0.3 g

**Read/write range**

Reading range in air IQC22-22-T9
**Model Number**

**IQC22-39**

Read/write tag

**Features**

- Operating frequency 13.56 MHz
- Conformal coated with ISO 15693
- 64 bit Fixcode
- 2 kBit memory available
- Protection degree IP67

**Technical data**

**General specifications**

- Operating frequency: 13.56 MHz
- Transfer rate: 26 kBit/s

**Memory**

- Chip Type: Tag-it HF-I Plus (Texas Instruments)
- Type/Size: EEPROM 2 kBit
- ROM 64 Bit
- Read cycles: unlimited
- Write cycles: > 100000
- Data retention period: 10 years

**Compliance with standards and directives**

- Standard conformity: EN 60529

**Ambient conditions**

- Ambient temperature: -25 ... 70 °C (248 ... 343 K)
- Storage temperature: -40 ... 85 °C (233 ... 358 K)

**Mechanical specifications**

- Diameter of the housing: 39 mm
- Protection degree: IP67
- Material: Housing ABS
- Encapsulation compound: WEVO 403FL/300

**Dimensions**

- **Reading range in air IQC22-39**

<table>
<thead>
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<th>Offset [mm]</th>
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</thead>
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<tr>
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<td>55</td>
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<tr>
<td>60</td>
<td>120</td>
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---

**Courtesy of Steven Engineering, Inc.-230 Ryan Way, South San Francisco, CA 94080-6370-Main Office: (650) 588-9200-Outside Local Area: (800) 258-9200-www.stevenengineering.com**
### Model Number

**IQC33-20**

**read/write tag**

### Features

- Operating frequency 13.56 MHz
- Conformal coated with ISO 15693
- 16 kbit memory available
- 64 bit Fixcode
- Protection degree IP68
- Readable and writable from both sides

### Technical Data

**General Specifications**

- Operating frequency: 13.56 MHz
- Transfer rate: 26 kBit/s

**Memory**

- Chip Type: FRAM MB89R118 (Fujitsu)
- Type/Size: FRAM 16 kBit, fixcode 64 Bit
- Read cycles: unlimited
- Write cycles: unlimited
- Data retention period: 10 years

**Compliance with Standards and Directives**

- Standard conformity: EN 60529
- Shock and Impact resistance: IEC 68-2-6, IEC 68-2-29

**Ambient Conditions**

- Ambient temperature: -20 ... 85 °C (253 ... 358 K)
- Storage temperature: -40 ... 90 °C (233 ... 363 K) for 1000 h
- Shock and Impact resistance: Oscillation (sinus): 10 g, 10 - 2000 Hz, in all 3 spatial axes, 2.5 hours shock (continuous shocks): 40 g, 18 ms, in all 6 spatial directions, 2000 shocks

**Mechanical Specifications**

- Diameter of the housing: 20 mm ± 0.5 mm
- Protection degree: IP68
- Housing: PA 6 modified
- Mass: 1.3 g

### Read/write range

**Reading range in air IQC33-20**

![Reading range in air IQC33-20](image-url)
Model Number

IQC33-30
Read/write tag

Features

- Operating frequency 13.56 MHz
- conformally coated with ISO 15693
- 16 kbit memory available
- 64 bit Fixcode
- Protection degree IP68
- Readable and writable from both sides
- Mounting holes for simple installation

Technical data

General specifications
- Operating frequency 13.56 MHz
- Transfer rate 26 kBit/s
- Chip Type FRAM MB89R118 (Fujitsu)
- Memory Type/Size FRAM 16 kBit, Fixcode 64 Bit
- Read cycles unlimited
- Write cycles unlimited
- Data retention period 10 years

Compliance with standards and directives
- Standard conformity
  - Protection degree EN 60529
  - Shock and impact resistance IEC 68-2-6, IEC 68-2-29

Ambient conditions
- Ambient temperature: -20 ... +85 °C (253 ... 358 K)
- Storage temperature: -40 ... +50 °C (233 ... 323 K) for 1000 h
  -40 ... +140 °C (233 ... 413 K) for 100 h
- Shock and impact resistance Oscillation (sinus): 10 g, 10 - 2000 Hz, in all 3 spatial axes, 2.5 hours
  - Shock (continuous shocks): 40 g, 10 - 2000 Hz, in all 6 spatial directions, 2000 shocks

Mechanical specifications
- Diameter of the housing 30 mm ± 0.5 mm
- Protection degree IP68
- Material Housing PA 6 modified
- Mass 3 g

Read-/write range

Reading range in air IQC33-30

Dimensions
Model Number

IQC33-50

Read/write tag

Features

- Operating frequency 13.56 MHz
- Conformal coated with ISO 15693
- 16 kbit memory available
- 64 bit Fixcode
- Protection degree IP68
- Readable and writable from both sides
- Mounting holes for simple installation

Technical data

General specifications

- Operating frequency: 13.56 MHz
- Transfer rate: 26 kBit/s

Memory

- Chip Type: FRAM MB89R118 (Fujitsu)
- Type/Size: FRAM 16 kBit, Fixcode 64 Bit
- Read cycles: unlimited
- Write cycles: unlimited
- Data retention period: 10 years

Compliance with standards and directives

- Standard conformity: EN 60529
- Shock and impact resistance: IEC 68-2-6, IEC 68-2-29

Ambient conditions

- Ambient temperature: -20 ... 85 °C (253 ... 358 K)
- Storage temperature: -40 ... 90 °C (233 ... 363 K) for 1000 hours
- Shock and impact resistance: Oscillation (sinus): 10 g, 10 - 2000 Hz, in all 3 spatial axes, 2.5 hours; shock (continuous shocks): 40 g, 18 ms, in all 6 spatial directions, 2000 shocks

Mechanical specifications

- Diameter of the housing: 50 mm ± 0.5 mm
- Protection degree: IP68
- Material: Housing PA 6 modified
- Mass: 9.5 g

Dimensions

Read/write range

Reading range in air IQC33-50

<table>
<thead>
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<th>Distance [mm]</th>
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</thead>
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<tr>
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<td>100</td>
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<td>50</td>
<td>110</td>
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<tr>
<td>60</td>
<td>120</td>
</tr>
</tbody>
</table>

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Subject to modifications without notice
4.8 868 MHz R/W heads and transponders for IDENTControl

R/W heads operating in the frequency range 865 to 868 MHz work with electromagnetic waves in the far field. The transponders can be passive as well as active (= with battery) and use a specially-shaped rod antenna as the resonance element. The passive transponders can be produced very cheaply and have a range of several meters.

However, UHF systems are very susceptible to moisture and metal items within the read range. Conductive items in the immediate vicinity can reflect waves and cause read gaps as a result of interference. It therefore makes sense to read UHF transponders while they are moving or when they are located at a previously tested position.

As conveyor technology and the automotive sector requires ranges of 1 to 5 meters, this system represents a low-cost alternative to microwave systems, particularly because of its low transponder costs. The high carrier frequency supports large data volumes and extremely short read times.

Read/Write Heads and Transponders

<table>
<thead>
<tr>
<th>Order code</th>
<th>IUH-F117-V1</th>
</tr>
</thead>
<tbody>
<tr>
<td>General data</td>
<td></td>
</tr>
<tr>
<td>Operating frequency</td>
<td>865.6 ... 867.6 MHz</td>
</tr>
<tr>
<td>Emitted power</td>
<td>2 W ERP</td>
</tr>
<tr>
<td>Operating distance</td>
<td>Maximum 6 m</td>
</tr>
<tr>
<td>Electrical data</td>
<td></td>
</tr>
<tr>
<td>Power consumption $P_0$</td>
<td>$\leq 30$ W</td>
</tr>
<tr>
<td>Mechanical data</td>
<td></td>
</tr>
<tr>
<td>Degree of protection</td>
<td>IP54</td>
</tr>
<tr>
<td>Connection</td>
<td>M12x1 connector</td>
</tr>
<tr>
<td>Material</td>
<td></td>
</tr>
<tr>
<td>Enclosure</td>
<td>Aluminum / ABS</td>
</tr>
<tr>
<td>Weight</td>
<td>Approx. 2 kg</td>
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<table>
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<th>Order code</th>
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</thead>
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</tr>
<tr>
<td>Operating frequency</td>
<td>865 ... 868 MHz</td>
</tr>
<tr>
<td>Memory</td>
<td></td>
</tr>
<tr>
<td>Type/size</td>
<td>2048 bit</td>
</tr>
<tr>
<td>Read cycles</td>
<td>unlimited</td>
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<tr>
<td>Write cycles</td>
<td>&gt; 100000</td>
</tr>
<tr>
<td>Data hold time</td>
<td>10 years</td>
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<tr>
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</tr>
<tr>
<td>Ambient temperature</td>
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<tr>
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<td>-20 ... 85°C</td>
</tr>
<tr>
<td>190°C for 25 mins.</td>
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</tr>
<tr>
<td>220 °C short-term</td>
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<tr>
<td>Mechanical data</td>
<td></td>
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<td>Degree of protection</td>
<td>IP67</td>
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<tr>
<td>Material</td>
<td></td>
</tr>
<tr>
<td>Enclosure</td>
<td>PPS (polyphenylene sulfide)</td>
</tr>
</tbody>
</table>
Read/write head

**Model Number**

IUH-F117-V1

Read/write head for IDENTControl Compact

**Features**

- 3 LEDs for function indication
- Connection via plug connection V1 (M12 x 1)

**Function**

The IUH-F117-V1 read/write head was developed to read passive data carriers referred to as “Smart Labels” at an operating frequency in the UHF range (865 - 928 MHz). A highly sensitive built-in transmitter and receiver unit permits a recording range of up to 6 meters for data carriers and allows for transponder protocols as specified by EPC Gen2 as well as optional ISO 18000-6-B and ISO 18000-6-C. Special blocking options support operation with read/write heads in close proximity to each other.

The powerful integrated decoding module decodes FM0-coded transponder signals between 40 ... 320 kbps and side-band-coded transponder signals (dense reader mode) with 64 kbps (EU). Buffered read mode and notification function also facilitate advanced data filtering and storage.

The write/read head is connected via an M12 connector to the IDENTControl control interface and is protected against faults including antenna short circuit and electrostatic discharge.

**Accessories**

IUC71-F150-T11

Read/write tag

V1-G-5M-PUR-ABG-V1-W

Connecting cable, M12 to M12, PUR cable 4-pin, shielded

V1-G-10M-PUR-ABG-V1-W

Connecting cable, M12 to M12, PUR cable 4-pin, shielded

**Dimensions**

**Electrical connection**

**Technical data**

**General specifications**

- Operating frequency: 865.6 ... 867.6 MHz
- Emitted power: 2 W ERP
- Operating distance: maximum: 6 m

**Indicators/operating means**

- LED green/yellow: green: power on
  - green flashing: read/write attempt performed
  - yellow: read/write tag detected

**Electrical specifications**

- Power consumption $P_0 \leq 30$ W
- Supply: from the IDENTControl

**Compliance with standards and directives**

- Directive conformity
  - EN 301489-1, EN 301489-3, EN 302208, EN 60950-1

- Standard conformity
  - Electromagnetic compatibility
    - EN 61326
  - Protection degree
    - EN 60529

**Ambient conditions**

- Ambient temperature: -25 ... 55 °C (248 ... 328 K)
- Storage temperature: -25 ... 85 °C (248 ... 358 K)

**Mechanical specifications**

- Protection degree: IP54
- Connector: M12 x 1
- Material: Housing: aluminium / ABS
- Mass: approx. 2.7 kg

---

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### Model Number
**IUC71-F150-T11**

**Read/write tag**

### Features
- Operating frequency 868 MHz
- Conformal coated with ISO 18000-6 B
- 2 kBit memory available
- Sturdy housing, suitable for rough industrial use
- With an increased temperature range of up to 220 °C

### Technical data
#### General specifications
- **Operating frequency**: 865 ... 868 MHz

#### Memory
- **Type/Size**: 2048 Bit
- **Read cycles**: unlimited
- **Write cycles**: > 100000
- **Data retention period**: 10 years

#### Compliance with standards and directives
- **EN 301489-1, EN 301489-3, EN 302208, EN 60950-1**
- **Standard conformity**: RFID ISO/IEC 18000-6B

#### Ambient conditions
- **Ambient temperature**: -20 ... 85 °C (253 ... 358 K)
- **Storage temperature**: -20 ... 85 °C (253 ... 358 K)
- **190 °C (463 K) for 25 min**
- **220 °C (493 K) briefly**
- **Temperature cycles**: 1000 x (25 min. at 190 °C)

#### Mechanical specifications
- **Protection degree**: IP67
- **Material**: Housing PPS (Polyphenylenesulfide)
- **Mass**: 150 g

### Function
The IUC71-F150-T11 data carrier is a passive high temperature UHF transponder (868 MHz) for mounting on electrically-conductive surfaces and was designed especially for applications in the automobile industry. In this way, it can be used for the identification of skids and other transport fixtures in high temperature processes, such as e.g. in painting lines or galvanic coating systems.

For the area of application, the housing materials and housing structure (hps technology) were aligned to each other so that in spite of a low structural volume, the effects of high temperature of 190 °C for approx. 25 minutes and even 220 °C for a short time do not leave any damage on the transponder inlay or even a loss of data. Furthermore, the housing design is characterised by a high level of mechanical stability, high housing protection class and through the variety of possibilities for attachment. In addition, the data carrier is resistant against diluted mineral acids, lyes, aliphatic/aromatic hydrocarbons, fat, oil and is hydrolysis-resistant.

The design of the transponder antenna enables direct attachment to electrically-conductive surfaces without incurring a reduction in reading range. The data carrier can read from a distance of more than 4 m and, depending on settings, it can be written from a distance of more than 3 m. Up to 2048 Bits can be stored in the data carrier, depending on the application. Furthermore, the working frequency in the UHF range enables a fast group recording of data carriers, which can all be found in the read field of the antenna at the same time.
4.9 2.45 GHz R/W heads and tags for IDENTControl

In contrast to inductive R/W heads, microwave antennas work with detached waves whose signals are reflected back and modulated by an active tag. The high carrier frequency provides the system with a data transmission rate of 76.8 kBaud. As the read range of several meters is also very large, this system is equally suitable for very high-speed applications (30 m/s).

Although the frequency of 2.45 GHz has been standardized across the globe, there are nevertheless differences with respect to permitted emitted power. The simultaneous use of this frequency band by Bluetooth, microwave ovens or WiFi 802.11b/g can lead to interference during signal transmission. Metal surfaces within the read range also cause reflections and interference that can have detrimental effects in the shape of zero settings or over-ranging.

Because of the short wave lengths, the energy cannot be induced in the tag using the transformer principle. For its power supply the tag therefore has a replaceable battery with a typical service life of 5 years. The battery charge status can be transmitted as a type of diagnostic function from the tag to the control unit.

The tag has about 8 kB of memory (7552 bytes available for user data), communication electronics and uses an LED to indicate the read status directly on the tag.

Calculation example of travel speeds

The formula on page 59 is valid for the calculation of the maximum possible travel speed.

The following examples show you how you can calculate the travel speed of your application. For the example calculation, the following assumptions are made:

- MVH2000 R/W head (1.5 m range/detection range)
- Read/write times (in ms):
  - Read read only code
  - Read 4 byte data
  - Write 4 byte data

Read read only code
Read time \( t = 8 \) ms = 0.008 s
\( s = 1.5 \) m
\( v_{\text{praxis}} = \frac{1.5 \text{ m}}{(2 \times 0.008 \text{ s})} = 94 \text{ m/s} \)

Read 8 bytes
Read time \( t = 2 \times 17 \) ms = 0.034 s
\( s = 1.5 \) m
\( v_{\text{praxis}} = \frac{1.5 \text{ m}}{(2 \times 0.034 \text{ s})} = 22 \text{ m/s} \)

Write 8 bytes
Write time \( t = 2 \times 30 \) ms = 0.06 s
\( s = 1.5 \) m
\( v_{\text{praxis}} = \frac{1.5 \text{ m}}{(2 \times 0.06 \text{ s})} = 12.5 \text{ m/s} \)

In the following tables, the travel speed attainable in practice is shown for various R/W heads. In the process, a repeat reading is taken into consideration. (All data in m/s)

<table>
<thead>
<tr>
<th></th>
<th>MVH500</th>
<th>MVH2000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Read read only code 1)</td>
<td>31</td>
<td>94</td>
</tr>
<tr>
<td>Read 4 byte data 1)</td>
<td>15</td>
<td>44</td>
</tr>
<tr>
<td>Read 5 byte data 1)</td>
<td>7.35</td>
<td>22</td>
</tr>
<tr>
<td>Write 4 byte data 1)</td>
<td>8.3</td>
<td>25</td>
</tr>
</tbody>
</table>

1) at 30-80% of max. sensing range
## R/W heads

<table>
<thead>
<tr>
<th>Order code</th>
<th>MVH500-F15-V1</th>
<th>MVH2000-F15-V1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Page</td>
<td>140</td>
<td>141</td>
</tr>
</tbody>
</table>

### General data
- **Operating frequency**: 2.45 GHz ± 200 kHz
- **Transfer rate**: 76.8 kBit/s
- **Operating distance**: 0 ... 0.5 m, maximum 1.5 m; 0.2 ... 2 m, maximum 4 m

### Electrical data
- **Power consumption $P_0$**: ≤ 7 W

### Mechanical data
- **Degree of protection**: IP65
- **Connection**: M12x1 connector
- **Material**: Enclosure: PBT/Stainless steel/Aluminum

## Tag

<table>
<thead>
<tr>
<th>Order code</th>
<th>MVC-60B-64K</th>
</tr>
</thead>
<tbody>
<tr>
<td>Page</td>
<td>142</td>
</tr>
</tbody>
</table>

### General data
- **Operating frequency**: 2.45 GHz ± 200 kHz
- **Transfer rate**: 76.8 kBit/s
- **Memory capacity**: 8 kByte (7552 bytes available for user data)
- **Battery life**: Approx. 5 years without any read or write operations or approx. 15 million read operations of 64 bytes each time, battery can be changed

### Ambient conditions
- **Ambient temperature**: -20 ... 70°C
- **Storage temperature**: -20 ... 70°C

### Mechanical data
- **Degree of protection**: IP65
- **Material**: Enclosure: POM
- **Battery compartment cover**: PBT
- **Weight**: Approx. 100 g

## Accessories

<table>
<thead>
<tr>
<th>Order code</th>
<th>MVC-SH1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Page</td>
<td>162</td>
</tr>
</tbody>
</table>

### General data
- **Cap for tag**

### Mechanical data
- **Material**: POM

## Handheld

<table>
<thead>
<tr>
<th>Order code</th>
<th>MVT-HH12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Page</td>
<td>162</td>
</tr>
</tbody>
</table>

### General data
- **Operating frequency**: 2.45 GHz ± 200 kHz
- **Emitted power**: 1.54 mW (1.9 dBm)
- **Read distance**: 0 ... 100 mm
- **Write range**: 0 ... 100 mm

### Ambient conditions
- **Ambient temperature**: 5 ... 40°C
- **Storage temperature**: 20 ... 40°C

### Electrical data
- **Power supply**: NiMH battery

### Mechanical data
- **Dimensions**: 100 mm x 272 mm x 38 mm (H x W x D) (without antenna cable)
- **Weight**: Approx. 1370 g
### Model Number

**MVH500-F15-V1**

Read/write head for IDENTControl

### Features

- 3 LEDs for function indication
- Connection via plug connection V1 (M12 x 1)
- Protection degree IP65

### Accessories

**V1-G-5M-PUR-ABG-V1-W**
Connecting cable, M12 to M12, PUR cable 4-pin, shielded

**V1-G-10M-PUR-ABG-V1-W**
Connecting cable, M12 to M12, PUR cable 4-pin, shielded

**V1-G-20M-PUR-ABG-V1-W**
Connecting cable, M12 to M12, PUR cable 4-pin, shielded

### Dimensions

![Dimensions Diagram]

### Electrical connection

![Electrical Connection Diagram]

### Technical data

<table>
<thead>
<tr>
<th>General specifications</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating frequency</td>
<td>2.45 GHz ± 200 kHz</td>
</tr>
<tr>
<td>Transfer rate</td>
<td>76.8 kBit/s</td>
</tr>
<tr>
<td>Emitted power</td>
<td>2.7 mW (4.3 dBm)</td>
</tr>
<tr>
<td>Operating distance</td>
<td>0 ... 0.5 m, maximum 1.5 m</td>
</tr>
</tbody>
</table>

#### Indicators/operating means

- LED green/yellow: power on
- LED green flashing: read/write attempt performed
- LED yellow: read/write tag detected
- LED Tx: communication
- LED OK Power on

#### Electrical specifications

- Power consumption $P_0 \leq 7$ W
- Supply from the IDENTControl

#### Standard conformity

- Electromagnetic compatibility: EN 61326, EN 301489-1, EN 301489-3, EN 300440-1
- Standards: EN 60950-1

#### Ambient conditions

- Ambient temperature: -20 ... 70 °C (253 ... 343 K)
- Storage temperature: -20 ... 70 °C (253 ... 343 K)
- Shock and impact resistance: 50 g, 11 ms, in all 3 spatial axes, with 3 positive and negative accelerations on each, according to IEC 68-2-27 and IEC 68-2-47

#### Mechanical specifications

- Protection degree: IP65 according to EN 60529
- Connector: M12 x 1
- Material: PBT/stainless steel/aluminium
- Housing: PBT/stainless steel/aluminium
- Installation: approx. 1200 g
- Distance between two heads: 2 m at operating distance 0.5 m

### Notes

**Max. cable length:**

- 100 m for wire cross section 4 x 0.34 mm²
- 150 m for wire cross section 4 x 0.50 mm²
- 200 m for wire cross section 4 x 0.75 mm²
### Model Number
MVH2000-F15-V1
Read/write head for IDENTControl

### Features
- 3 LEDs for function indication
- Connection via plug connection V1 (M12 x 1)
- Protection degree IP65

### Accessories
V1-G-5M-PUR-ABG-V1-W
Connecting cable, M12 to M12, PUR cable 4-pin, shielded

V1-G-10M-PUR-ABG-V1-W
Connecting cable, M12 to M12, PUR cable 4-pin, shielded

### Technical data
**General specifications**
- Operating frequency: 2.45 GHz ± 200 kHz
- Transfer rate: 76.8 kBit/s
- Emitted power: 10 mW (10 dBm)
- Operating distance: 0.2 ... 2 m, maximum 4 m

**Indicators/operating means**
- LED green/yellow: power on, green flashing: read/write attempt performed, yellow: read/write tag detected
- LED Tx: communication
- LED OK: Power on

**Electrical specifications**
- Power consumption: $P_0 \leq 7$ W
- Supply: from the IDENTControl

**Standard conformity**
- Electromagnetic compatibility: EN 61326, EN 301489-1, EN 301489-3, EN 300440-1
- Standards: EN 60950-1

**Ambient conditions**
- Ambient temperature: -20 ... 70 °C (253 ... 343 K)
- Storage temperature: -20 ... 70 °C (253 ... 343 K)
- Shock and impact resistance: 50 g, 11 ms, in all 3 spatial axes, with 3 positive and negative accelerations on each, according to IEC 68-2-27 and IEC 68-2-47

**Mechanical specifications**
- Protection degree: IP65 according to EN 60529
- Connection: Connector M12 x 1
- Material: Housing: PBT/stainless steel/aluminium
- Installation: Distance between two heads: 8 m at operating distance 2 m
- Mass: approx. 1200 g

**Notes**
- Max. cable length:
  - 100 m for wire cross section 4 x 0.34 mm²
  - 150 m for wire cross section 4 x 0.50 mm²
  - 200 m for wire cross section 4 x 0.75 mm²
**Technical data**

**General specifications**
- Operating frequency: 2.45 GHz ± 200 kHz
- Transfer rate: 76.8 kBit/s

**Memory**
- Capacity: 8 kByte (7552 Bytes available for user data)
- Battery life: approx. 5 years without read or write operations or approx. 15 mill. read operations on 64 bytes per access, battery is replaceable

**Indicators/operating means**
- LED yellow lights during the data transfer (can be switched off)

**Ambient conditions**
- Ambient temperature: -20 ... 70 °C (253 ... 343 K)
- Storage temperature: -20 ... 70 °C (253 ... 343 K)
- Shock and impact resistance: 100 G, 13 ms on all 3 spatial axes, with 3 positive and negative accelerations on each, according to IEC 68-2-27

**Mechanical specifications**
- Protection degree: IP65 according to EN 60529
- Material: Housing: sPS
- Cover of battery box: PBT
- Installation: horizontal and vertical ±45° arbitrary rotation
- Mass: approx. 100 g

---

**Dimensions**

![Dimensions Diagram](image-url)

---

**Model Number**
- MVC-60B-64K

**Read/write tag**

**Features**
- Replaceable battery
- 7552 bytes memory available
- Disconnectable LED

**Accessories**

**MVC-60B-64K-BC**
- Read/write tag battery change

**MVC-SH**
- Protective cover for read/write tag MVC-60B-64K
4.10 IDENTControl System Accessories

Power Supply Accessories

The cable connectors for the power supply are available in various lengths and are made from PUR and PVC.

<table>
<thead>
<tr>
<th>General data</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of pins</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Connector 1</td>
<td>Socket</td>
<td>Socket</td>
</tr>
<tr>
<td>Structure 1</td>
<td>straight</td>
<td>straight</td>
</tr>
<tr>
<td>Thread 1</td>
<td>M12</td>
<td>M12</td>
</tr>
<tr>
<td>Connector 2</td>
<td>cable end</td>
<td>cable end</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mechanical data</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Material</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cables</td>
<td>PVC</td>
<td>PUR</td>
</tr>
<tr>
<td>Length</td>
<td>2 m</td>
<td>5 m</td>
</tr>
<tr>
<td>Order code</td>
<td>V1-G-2M-PVC</td>
<td>V1-G-5M-PVC</td>
</tr>
</tbody>
</table>

R/W Head Accessories

The cables for connecting the R/W heads are shielded PUR lines. The shield connected to the union nut is part of the EMC concept for the entire IDENTControl system.

The use of customizable cable connectors and plugs allows you to assemble application-specific lengths of cable for the R/W heads. The cable connectors and plugs have a metallic housing to guarantee continuous shielding in angled and straight configurations. Note the cable requirements specified on the data sheets.

<table>
<thead>
<tr>
<th>General data</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of pins</td>
<td>4 + shield</td>
<td>4 + shield</td>
</tr>
<tr>
<td>Connector 1</td>
<td>Socket</td>
<td>Socket</td>
</tr>
<tr>
<td>Structure 1</td>
<td>straight</td>
<td>angled</td>
</tr>
<tr>
<td>Thread 1</td>
<td>M12</td>
<td>-</td>
</tr>
<tr>
<td>Connector 2</td>
<td>Plug</td>
<td>-</td>
</tr>
<tr>
<td>Structure 2</td>
<td>angled</td>
<td>-</td>
</tr>
<tr>
<td>Thread 2</td>
<td>M12</td>
<td>-</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mechanical data</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Material</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cables</td>
<td>PUR</td>
<td>-</td>
</tr>
<tr>
<td>Grip</td>
<td>TPU</td>
<td>Metal</td>
</tr>
<tr>
<td>Cables</td>
<td>fine wire, flexible</td>
<td>-</td>
</tr>
<tr>
<td>Length</td>
<td>3.6 m ... 80 m</td>
<td>5 m</td>
</tr>
</tbody>
</table>

Please contact Pepperl+Fuchs for other cable lengths.
Identification systems: IDENTControl

Ethernet Accessories
The shielded CAT5 cable and the shielding of the RJ-45 plug permit the use of the IDENTControl in an industrial environment.

<table>
<thead>
<tr>
<th>Network cable</th>
<th>Connector cover</th>
<th>Plug</th>
</tr>
</thead>
<tbody>
<tr>
<td>Order code</td>
<td>Page</td>
<td></td>
</tr>
<tr>
<td>V45-G-10M-V45-G</td>
<td>152</td>
<td></td>
</tr>
<tr>
<td>ICZ-V45</td>
<td>154</td>
<td></td>
</tr>
<tr>
<td>V45-G</td>
<td>154</td>
<td></td>
</tr>
</tbody>
</table>

For IDENTControl Compact

<table>
<thead>
<tr>
<th>Connection cable, on RJ45</th>
<th>Connection cable, crossover</th>
<th>Plug</th>
<th>Plug</th>
</tr>
</thead>
<tbody>
<tr>
<td>Order code</td>
<td>Page</td>
<td></td>
<td></td>
</tr>
<tr>
<td>V1SD-G-2M-PUR-ABG-V45-G</td>
<td>152</td>
<td>154</td>
<td>154</td>
</tr>
<tr>
<td>V1SD-G-ABG-PG9</td>
<td>153</td>
<td>152</td>
<td>153</td>
</tr>
</tbody>
</table>

PROFIBUS Accessories
You can choose between various M12 plugin connections to connect the IDENTControl to PROFIBUS.

<table>
<thead>
<tr>
<th>Connection cable</th>
<th>Socket</th>
<th>Plug</th>
<th>T distributor</th>
<th>Terminator</th>
<th>Y-connection cable</th>
<th>Termination cable with terminator</th>
</tr>
</thead>
<tbody>
<tr>
<td>Order code</td>
<td>Page</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>V15B-G-2M-PUR-ABG-V15B-G</td>
<td>156</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>V15B-G-ABG-PG9</td>
<td>157</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>V15BB-G-ABG-PG9</td>
<td></td>
<td>159</td>
<td>ICZ-TR-V15B</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ICZ-3T-V15B</td>
<td></td>
<td>158</td>
<td>ICZ-2T/TR-0.2M-PUR-ABG-V15B-G</td>
<td>158</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ICZ-2T/0.2M-PUR-ABG-V15B-G</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ICZ-3T-0.2M-PUR-ABG-V15B-G</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ICZ-2T-TR-0.2M-PUR-ABG-V15B-G</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Serial Interface Accessories
These accessories enable you to connect the IDENTControl to a serial interface, e.g. a PC, using a Sub-D.

<table>
<thead>
<tr>
<th>Null modem cable</th>
<th>Adapter</th>
<th>Plug</th>
</tr>
</thead>
<tbody>
<tr>
<td>Order code</td>
<td>Page</td>
<td></td>
</tr>
<tr>
<td>IVZ-K-R2</td>
<td>160</td>
<td>151</td>
</tr>
<tr>
<td>M12 x 1 on Sub-D</td>
<td>V1S-G-0.15M-PUR-SUBD</td>
<td>V1S-G-ABG-PG9</td>
</tr>
</tbody>
</table>
IDENTControl Compact Installation Accessories

Special transponder accessories help you during installation and protect the products from damage and external influences.

<table>
<thead>
<tr>
<th>Order code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ICZ-MH05-SACB-8</td>
<td>Mounting aid for DIN rails</td>
</tr>
</tbody>
</table>

Transponder Installation Accessories

Special transponder accessories help you during installation and protect the products from damage and external influences.

<table>
<thead>
<tr>
<th>Order code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ICZ-MH05-SACB-8</td>
<td>Mounting aid for DIN rails</td>
</tr>
</tbody>
</table>

Software RFIDControl

The RFIDControl demo program enables you to enter and execute all the most important commands via the command window of a PC.

See page 165 for details.
# Cable connector V1-G-*M-PVC

## Dimensions

![Dimensions Diagram]

## Technical data

### General specifications
- Number of poles: 4

### Electrical specifications
- Operating voltage $U_B$: max. 300 V DC
- Operating current: max. 4 A
- Volume resistance: < 5 MΩ

### Ambient conditions
- Ambient temperature: -25 ... 100 °C (248 ... 373 K) for temperatures over 80 °C (353 K) reduced elongation at tear
- Degree of soiling: 3

### Mechanical specifications
- Contact elements: spring-loaded contact socket
- Pin diameter: 1 mm
- Protection degree: IP67 / IP68 / IP69K
- Contacts: CuSn / Au
- Contact surface: Au
- Handle: TPU, green
- Cable: PVC
- Slotted nut: Diecast zinc
- Core isolation: PVC
- Cable: fine-strand, flexible
- Sheath diameter: Ø4.8 mm
- Bend radius: > 10 x cable diameter, appropriate for conveyor chains
- Colour: grey
- Cores: 4 x 0.34 mm²
- Length L:
  - V1-G-2M-PVC: 2 m
  - V1-G-5M-PVC: 5 m
  - V1-G-10M-PVC: 10 m
- Flammability:
  - Contact material: 94 V-2
  - Housing: 94 V-2
  - Wire: flame-resistant

## Electrical connection 1

![Electrical Connection 1 Diagram]
Cable connector V1-G-*M-PUR

Model Number
V1-G-*M-PUR
Cable socket, M12, 4-pin, PUR cable

Features
- Knurled nut suitable for tool assembly
- Immunity to vibration, with mechanical latching
- Gold plated contacts
- Protection degree IP67 / IP68 / IP69K
- Halogen-free
- Suitable for 2-, 3- and 4-wire technology

Technical data

Dimensions

Technical data

General specifications
- Number of poles: 4

Electrical specifications
- Operating voltage $U_{\text{op}}$: max. 300 V DC
- Operating current: max. 4 A
- Volume resistance: $< 5 \, \text{m} \Omega$

Ambient conditions
- Ambient temperature: $-25 \ldots 100 \, ^{\circ} \text{C} (248 \ldots 373 \, \text{K})$
- Degree of soiling: 3

Mechanical specifications
- Contact elements: spring-loaded contact socket
- Pin diameter: 1 mm
- Protection degree: IP67 / IP68 / IP69K
- Contacts: CuSn / Au
- Contact surface: Au
- Handle: TPU, green
- Cable: PUR
- Slotted nut: Diecast zinc
- Core isolation: PP
- Cable: fine-strand, flexible
- Sheath diameter: Ø4.8 mm
- Bend radius: $> 10 \times$ cable diameter, appropriate for conveyor chains
- Colour: grey
- Cores: $4 \times 0.34 \, \text{mm}^2$
- Length L:
  - V1-G-2M-PUR: 2 m
  - V1-G-5M-PUR: 5 m
  - V1-G-10M-PUR: 10 m

Flammability
- Contact material: 94 V-2
- Housing: 94 V-2

Electrical connection 1

1 BN
4 BK
2 WH
3 BU
Model Number

V1-G-*M-PUR-ABG-V1-W

Connecting cable, M12 to M12, PUR cable 4-pin, shielded

Features

- Knurled nut suitable for tool assembly
- Immunity to vibration, with mechanical latching
- Shield attached to coupling nut
- Gold plated contacts
- Protection degree IP67 / IP68 / IP69K
- Halogen-free
- Suitable for 2-, 3- and 4-wire technology

Technical data

General specifications

- Number of poles: 4 + shield

Electrical specifications

- Operating voltage $U_B$: max. 300 V DC
- Operating current: max. 4 A
- Volume resistance: $< 5 \, \Omega$

Ambient conditions

- Ambient temperature: $-25 \ldots 100 \, ^\circ\text{C} (248 \ldots 373 \, \text{K})$
- Degree of soiling: 3

Mechanical specifications

- Contact elements: spring-loaded contact socket
- Pin diameter: 1 mm
- Protection degree: IP67 / IP68 / IP69K

Material

- Contacts: CuSn / Au
- Contact surface: Au
- Handle: TPU, green
- Cable: PUR
- Slotted nut: diecast zinc
- Core isolation: PP
- Cable: fine-strand, flexible
- Sheath diameter: 04.8 mm
- Bend radius: $> 10 \times$ cable diameter, appropriate for conveyor chains
- Colour: grey
- Cores: $4 \times 0.34 \, \text{mm}^2$

Length $L$

- V1-G-2M-PUR-ABG-V1-W: 2 m
- V1-G-5M-PUR-ABG-V1-W: 5 m
- V1-G-10M-PUR-ABG-V1-W: 10 m

Flammability

- Contact material: 94 V-2
- Housing: 94 V-2

Electrical connection 1

![Electrical connection 1 diagram]

Electrical connection 2

![Electrical connection 2 diagram]
Connection cable V1-W-5M-PUR-ABG-V1-W

Model Number
V1-W-5M-PUR-ABG-V1-W
Connecting cable, M12 to M12, PUR cable 4-pin, shielded

Features
- Knurled nut suitable for tool assembly
- Immunity to vibration, with mechanical latching
- Shield attached to coupling nut
- Gold plated contacts
- Protection degree IP67 / IP68 / IP69K
- Halogen-free
- Suitable for 2-, 3- and 4-wire technology

Dimensions

Technical data

General specifications
- Number of poles: 4 + shield

Electrical specifications
- Operating voltage \( U_{\text{op}} \): max. 300 V DC
- Operating current: max. 4 A
- Volume resistance: < 5 m\( \Omega \)

Ambient conditions
- Ambient temperature: \(-25 \ldots 100 \, ^{\circ}\text{C} \) (248 ... 373 K) for temperatures over 80 \( ^{\circ}\text{C} \) reduced elongation at tear
- Degree of soiling: 3

Mechanical specifications
- Contact elements: spring-loaded contact socket
- Pin diameter: 1 mm
- Protection degree: IP67 / IP68 / IP69K
- Material: Contacts CuSn / Au, Contact surface Au, Handle TPU, green, Cable PUR, Slotted nut diecast zinc, Core isolation PP, Cable fine-strand, flexible
- Sheath diameter: Ø4.8 mm
- Bend radius: > 10 x cable diameter, appropriate for conveyor chains
- Colour: grey
- Cores: 4 x 0.34 mm²
- Length \( L \): 5 m
- Flammability: Contact material 94 V-2, Housing 94 V-2

Electrical connection 1

Electrical connection 2
### Model Number

**V1-W-ABG-PG9**

Cable socket, M12, 4-pin, screened, ready to make up

### Features

- Manufacturable, screenable
- Metal housing
- Iris spring screening
- Cable socket for read/write heads with V1 plug connection

### Model Number

**V1S-W-ABG-PG9**

Cable connector, M12, 4-pin, screened, ready to make up

### Features

- Manufacturable, screenable
- Metal housing
- Iris spring screening

### Technical Data

#### General Specifications

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of poles</td>
<td>4</td>
</tr>
<tr>
<td>Connection 1</td>
<td>Connector, female</td>
</tr>
<tr>
<td>Construction type 1</td>
<td>angled</td>
</tr>
<tr>
<td>Threading 1</td>
<td>M12</td>
</tr>
</tbody>
</table>

#### Electrical Specifications

- **Operating current**: 4 A
- **Volume resistance**: < 3 mΩ
- **Rated operational voltage U₀**: 250 V

#### Ambient Conditions

- **Ambient temperature**: -25 ... 85 °C (248 ... 358 K)
- **Degree of soiling**: 3

#### Mechanical Specifications

- **Protection degree**: IP67
- **Connection**: Screw terminals for max. 0.75 mm² PG9 screwed connection
- **Material**
  - Contacts: CuZn
  - Contact surface: Au
  - Handle: Zinc die-casting, nickel-plated
  - Slotted nut: Zinc die-casting, nickel-plated
  - Cable: Zinc die-casting, nickel-plated

### Dimensions

#### Dimensions

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cable socket</td>
<td>M12 x 1</td>
</tr>
<tr>
<td>Sheath diameter</td>
<td>5 ... 8 mm</td>
</tr>
</tbody>
</table>
Model Number
V1-G-ABG-PG9
Cable socket, M12, 4-pin, screened, ready to make up

Features
- Manufacturable, screenable
- Metal housing
- Iris spring screening
- Cable socket for read/write heads with V1 plug connection

---

Model Number
V1S-G-ABG-PG9
Cable connector, M12, 4-pin, screened, ready to make up

Features
- Manufacturable, screenable
- Metal housing
- Iris spring screening

---

**Technical data**

**General specifications**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
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<tbody>
<tr>
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</tr>
<tr>
<td>Construction type 1</td>
<td>straight</td>
</tr>
<tr>
<td>Threading 1</td>
<td>M12</td>
</tr>
</tbody>
</table>

**Electrical specifications**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating current</td>
<td>4 A</td>
</tr>
<tr>
<td>Volume resistance</td>
<td>&lt; 3 mΩ</td>
</tr>
<tr>
<td>Rated operational voltage</td>
<td>250 V</td>
</tr>
</tbody>
</table>

**Ambient conditions**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
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<tbody>
<tr>
<td>Ambient temperature</td>
<td>-25 ... 85 °C (248 ... 358 K)</td>
</tr>
<tr>
<td>Degree of soiling</td>
<td>3</td>
</tr>
</tbody>
</table>

**Mechanical specifications**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protection degree</td>
<td>IP67</td>
</tr>
<tr>
<td>Connection</td>
<td>Screw terminals for max. 0.75 mm²</td>
</tr>
<tr>
<td></td>
<td>PG9 screwed connection</td>
</tr>
<tr>
<td>Material</td>
<td></td>
</tr>
<tr>
<td>Contacts</td>
<td>CuZn</td>
</tr>
<tr>
<td>Contact surface</td>
<td>Au</td>
</tr>
<tr>
<td>Handle</td>
<td>Zinc die-casting, nickel-plated</td>
</tr>
<tr>
<td>Slotted nut</td>
<td>Zinc die-casting, nickel-plated</td>
</tr>
<tr>
<td>Cable</td>
<td></td>
</tr>
<tr>
<td>Sheath diameter</td>
<td>5 ... 8 mm</td>
</tr>
</tbody>
</table>

---

**Dimensions**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

**Technical data**

**General specifications**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of poles</td>
<td>4</td>
</tr>
<tr>
<td>Connection 1</td>
<td>Connector, male</td>
</tr>
<tr>
<td>Construction type 1</td>
<td>straight</td>
</tr>
<tr>
<td>Threading 1</td>
<td>M12</td>
</tr>
</tbody>
</table>

**Electrical specifications**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating current</td>
<td>4 A</td>
</tr>
<tr>
<td>Volume resistance</td>
<td>&lt; 3 mΩ</td>
</tr>
<tr>
<td>Rated operational voltage</td>
<td>250 V</td>
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</table>

**Ambient conditions**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
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<td>-25 ... 85 °C (248 ... 358 K)</td>
</tr>
<tr>
<td>Degree of soiling</td>
<td>3</td>
</tr>
</tbody>
</table>

**Mechanical specifications**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protection degree</td>
<td>IP67</td>
</tr>
<tr>
<td>Connection</td>
<td>Screw terminals for max. 0.75 mm²</td>
</tr>
<tr>
<td></td>
<td>PG9 screwed connection</td>
</tr>
<tr>
<td>Material</td>
<td></td>
</tr>
<tr>
<td>Contacts</td>
<td>CuZn</td>
</tr>
<tr>
<td>Contact surface</td>
<td>Au</td>
</tr>
<tr>
<td>Connector</td>
<td>Zinc die-casting, nickel-plated</td>
</tr>
<tr>
<td>Handle</td>
<td>Zinc die-casting, nickel-plated</td>
</tr>
<tr>
<td>Cable</td>
<td></td>
</tr>
<tr>
<td>Sheath diameter</td>
<td>5 ... 8 mm</td>
</tr>
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</table>
### Technical data

<table>
<thead>
<tr>
<th>Mechanical specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connection</td>
</tr>
<tr>
<td>Cable</td>
</tr>
</tbody>
</table>

### Model Number

**V45-G-10M-V45-G**

Network cable RJ-45, Category 5

### Features

- Patch cable
- up to 100 MHz

---

### Technical data

<table>
<thead>
<tr>
<th>General specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of poles</td>
</tr>
<tr>
<td>Connection 1</td>
</tr>
<tr>
<td>Construction type 1</td>
</tr>
<tr>
<td>Threading 1</td>
</tr>
<tr>
<td>Connection 2</td>
</tr>
<tr>
<td>Construction type 2</td>
</tr>
<tr>
<td>Threading 2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Electrical specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating voltage U_B</td>
</tr>
<tr>
<td>Test voltage</td>
</tr>
<tr>
<td>Volume resistance</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ambient conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambient temperature</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mechanical specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protection degree</td>
</tr>
<tr>
<td>Connection</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>Handle</td>
</tr>
<tr>
<td>Cable</td>
</tr>
<tr>
<td>Core isolation</td>
</tr>
<tr>
<td>Cable</td>
</tr>
<tr>
<td>Sheath diameter</td>
</tr>
<tr>
<td>Bend radius</td>
</tr>
<tr>
<td>Colour</td>
</tr>
<tr>
<td>Cores</td>
</tr>
<tr>
<td>Conductor construction</td>
</tr>
<tr>
<td>Shield</td>
</tr>
<tr>
<td>Length L</td>
</tr>
</tbody>
</table>

### Model Number

**V1SD-G-2M-PUR-ABG-V1SD-G**

Ethernet bus cable, M12 to M12, PUR cable 4-pin, CAT5e

### Features

- D coding for Ethernet
- Hard-wearing PUR cable
- Cat 5/Cat 5e cable
**Technical data**

**Model Number**

**V1SD-G-2M-PUR-ABG-V45-G**
Connection cable, M12 to RJ-45, PUR cable 4-pin, CAT5e

**Features**

- Ethernet Crossover cable
- Hard-wearing PUR cable
- Cat 5/Cat 5e cable

<table>
<thead>
<tr>
<th>Technical data</th>
<th>General specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of poles</td>
<td>4</td>
</tr>
<tr>
<td>Connection 1</td>
<td>Connector, male</td>
</tr>
<tr>
<td>Construction type 1</td>
<td>straight</td>
</tr>
<tr>
<td>Threading 1</td>
<td>M12</td>
</tr>
<tr>
<td>Connection 2</td>
<td>Connector, male</td>
</tr>
<tr>
<td>Construction type 2</td>
<td>straight</td>
</tr>
<tr>
<td>Threading 2</td>
<td>RJ-45</td>
</tr>
<tr>
<td>Operating voltage $U_{o2}$</td>
<td>max. 125 V</td>
</tr>
<tr>
<td>Test voltage</td>
<td>1000 V</td>
</tr>
<tr>
<td>Volume resistance</td>
<td>150 mΩ/m</td>
</tr>
<tr>
<td>Ambient conditions</td>
<td></td>
</tr>
<tr>
<td>Ambient temperature</td>
<td>-20 ... 60 °C (253 ... 333 K), stationary</td>
</tr>
<tr>
<td></td>
<td>0 ... 50 °C (273 ... 323 K), moving</td>
</tr>
<tr>
<td>Mechanical specifications</td>
<td></td>
</tr>
<tr>
<td>Protection degree</td>
<td>IP67 / IP20</td>
</tr>
<tr>
<td>Connection</td>
<td>M12 x 1 connector, 4-pin, D-coded RJ-45 Category 5, up to 100 MHz</td>
</tr>
<tr>
<td>Material</td>
<td>Handle: TPU, black / PA</td>
</tr>
<tr>
<td>Cable</td>
<td>PUR</td>
</tr>
<tr>
<td>Core isolation</td>
<td>PE</td>
</tr>
<tr>
<td>Cable</td>
<td>2 pairs with 2 wires each with 2 fillers for the core</td>
</tr>
<tr>
<td>Sheath diameter</td>
<td>6.7 mm</td>
</tr>
<tr>
<td>Bend radius</td>
<td>&gt; 35 mm</td>
</tr>
<tr>
<td>Colour</td>
<td>water blue (RAL 5021)</td>
</tr>
<tr>
<td>Cores</td>
<td>4 x 0.14 mm²</td>
</tr>
<tr>
<td>Conductor construction</td>
<td>7 x 0.15 mm Ø</td>
</tr>
<tr>
<td>Shield</td>
<td>Tinned copper braiding, 65 % coverage</td>
</tr>
<tr>
<td>Length L</td>
<td>2 m</td>
</tr>
</tbody>
</table>

**Model Number**

**V1SD-G-2M-PUR-ABG-V45X-G**
Connection cable, M12 to RJ-45, PUR cable 4-pin, CAT5e

**Features**

- Ethernet Crossover cable
- Hard-wearing PUR cable
- Cat 5/Cat 5e cable

<table>
<thead>
<tr>
<th>Technical data</th>
<th>General specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of poles</td>
<td>4</td>
</tr>
<tr>
<td>Connection 1</td>
<td>Connector, male</td>
</tr>
<tr>
<td>Construction type 1</td>
<td>straight</td>
</tr>
<tr>
<td>Threading 1</td>
<td>M12</td>
</tr>
<tr>
<td>Connection 2</td>
<td>Connector, male</td>
</tr>
<tr>
<td>Construction type 2</td>
<td>straight</td>
</tr>
<tr>
<td>Threading 2</td>
<td>RJ-45</td>
</tr>
<tr>
<td>Operating voltage $U_{o2}$</td>
<td>max. 125 V</td>
</tr>
<tr>
<td>Test voltage</td>
<td>1000 V</td>
</tr>
<tr>
<td>Volume resistance</td>
<td>150 mΩ/m</td>
</tr>
<tr>
<td>Ambient conditions</td>
<td></td>
</tr>
<tr>
<td>Ambient temperature</td>
<td>-20 ... 60 °C (253 ... 333 K), stationary</td>
</tr>
<tr>
<td></td>
<td>0 ... 50 °C (273 ... 323 K), moving</td>
</tr>
<tr>
<td>Mechanical specifications</td>
<td></td>
</tr>
<tr>
<td>Protection degree</td>
<td>IP67 / IP20</td>
</tr>
<tr>
<td>Connection</td>
<td>M12 x 1 connector, 4-pin, D-coded RJ-45 Category 5, up to 100 MHz</td>
</tr>
<tr>
<td>Material</td>
<td>Handle: TPU, black / PA</td>
</tr>
<tr>
<td>Cable</td>
<td>PUR</td>
</tr>
<tr>
<td>Core isolation</td>
<td>PE</td>
</tr>
<tr>
<td>Cable</td>
<td>2 pairs with 2 wires each with 2 fillers for the core</td>
</tr>
<tr>
<td>Sheath diameter</td>
<td>6.7 mm</td>
</tr>
<tr>
<td>Bend radius</td>
<td>&gt; 35 mm</td>
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<tr>
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</tr>
<tr>
<td>Cores</td>
<td>4 x 0.14 mm²</td>
</tr>
<tr>
<td>Conductor construction</td>
<td>7 x 0.15 mm Ø</td>
</tr>
<tr>
<td>Shield</td>
<td>Tinned copper braiding, 65 % coverage</td>
</tr>
<tr>
<td>Length L</td>
<td>2 m</td>
</tr>
</tbody>
</table>
Model Number

ICZ-V45

Ethernet connections accessories for increasing of protection degree of the RJ-45 connector

Features

• Increasing of protection degree to IP67

Technical data

Mechanical specifications

Protection degree

IP67 (completely fitted) according to EN 60529

Model Number

V45-G

Non pre-wired cable connector

Features

•

Dimensions

Technical data

General specifications

Connection 1

Connector, male

Construction type 1

straight

Ambient conditions

Ambient temperature

-40 ... 70 °C (233 ... 343 K)

Mechanical specifications

Cable diameter

6.5 ... 8.6 mm

Protection degree

IP20

Connection

RJ-45
Model Number
V1SD-W-ABG-PG9

Features
- D coding for Ethernet
- Manufacturable, screenable
- Metal housing
- Iris spring screening

Model Number
V1SD-G-ABG-PG9

Features
- D coding for Ethernet
- Manufacturable, screenable
- Metal housing
- Iris spring screening

Technical data

General specifications
- Number of poles: 4
- Connection 1: Connector, male
- Construction type 1: straight
- Threading 1: M12

Electrical specifications
- Operating current: 4 A
- Volume resistance: < 3 mΩ
- Rated operational voltage $U_e$: 250 V

Ambient conditions
- Ambient temperature: -25 ... 85 °C (248 ... 358 K)
- Degree of soiling: 3

Mechanical specifications
- Protection degree: IP67
- Connection: Screw terminals for max. 0.75 mm²
- PG9 screwed connection
- Material: Contacts CuZn, Contact surface Au, Connector Zinc die-casting, nickel-plated, Handle Zinc die-casting, nickel-plated, Cable Sheath diameter 5 ... 8 mm

Dimensions

---

Do not hallucinate.
### Model Number

**V15B-G-*M-PUR ABG-V15B-G**

Bus cable PROFIBUS, M12 to M12, PUR cable

### Features
- Shield attached to coupling nut
- Data transmission up to 12 MBaud
- Identification sleeves
- Halogen-free

### Technical data

#### General specifications
- Number of poles: 2 + shield

#### Electrical specifications
- Operating voltage $U_B$: max. 250 V
- Operating current: max. 4 A
- Volume resistance: $\leq 5 \, \text{m} \Omega$

#### Ambient conditions
- Ambient temperature:
  - Cable, moving: -20 ... 80 °C (253 ... 353 K)
  - Cable, fixed: -40 ... 80 °C (233 ... 353 K)

#### Mechanical specifications
- Protection degree: IP65 / IP67 / IP69K
- Material:
  - Contacts: CuSn
  - Contact surface: Ni/Au
  - Handle: TPU, black
  - Cable: PUR
  - Slotted nut: Zinc die-casting, nickel-plated
  - Seal: NBR
  - Core isolation: PE
- Cable:
  - Number of cores with 2 fillers to the core: 2
- Sheath diameter: 7.8 mm
- Bend radius: > 10 x cable diameter, appropriate for conveyor chains
- Colour: violet
- Cores: 2 x 0.25 mm²
- Length $L$:
  - V15B-G-2M-PUR ABG-V15B-G: 2 m
  - V15B-G-5M-PUR ABG-V15B-G: 5 m
  - V15B-G-10M-PUR ABG-V15B-G: 10 m

### Dimensions

![Dimensions Diagram](image]

### Electrical connection 1 and 2

#### Electrical connection 1

![Electrical Connection 1 Diagram](image]

#### Electrical connection 2

![Electrical Connection 2 Diagram](image]
Model Number
V15B-G-ABG-PG9
Cable socket, M12, for PROFIBUS, adjustable

Features
- M12 round connection for BUS (B-coded)
- Manufacturable, screenable
- Metal housing
- Thread-locking ring made of metal

Model Number
V15SB-G-ABG-PG9
Cable connector, M12, for PROFIBUS, adjustable

Features
- M12 round connection for BUS (B-coded)
- Manufacturable, screenable
- Metal housing
- Thread-locking ring made of metal

Technical data
General specifications
Number of poles: 5
Construction type: Connector, straight

Electrical specifications
Operating voltage $U_R$: max. 125 V DC
Operating current: max. 4 A

Ambient conditions
Ambient temperature: -40 ... 85 °C (233 ... 358 K)
Degree of soiling: 3

Mechanical specifications
Protection degree: IP67
Connection: M12 x 1 connector, 5-pin, B-coded
Material Contacts: CuZn
Handle: metal
Cable Sheath diameter: 5 ... 8 mm
Cores Max. cross-section 0.75 mm²

Dimensions
- Length: 100 mm
- Diameter: 20 mm
- Connector width: 25 mm

Technical data
General specifications
Number of poles: 5
Construction type: Connector, straight

Electrical specifications
Operating voltage $U_R$: max. 125 V DC
Operating current: max. 4 A

Ambient conditions
Ambient temperature: -40 ... 85 °C (233 ... 358 K)
Degree of soiling: 3

Mechanical specifications
Protection degree: IP67
Connection: M12 x 1 connector, 5-pin, B-coded
Material Contacts: CuSn
Handle: metal
Cable Sheath diameter: 5 ... 8 mm
Cores Max. cross-section 0.75 mm²

Dimensions
- Length: 100 mm
- Diameter: 20 mm
- Connector width: 25 mm
### Model Number
ICZ-3T-0,2M-PUR ABG-V15B-G

**Y- Connection cable for PROFIBUS**

### Features
- Replacement of devices without bus interruption possible
- Identification sleeves
- Screen put on the slotted nut and Pin 5
- Data transmission up to 12 MBaud

### Model Number
ICZ-2T/TR-0,2M-PUR ABG-V15B-G

**Terminal cable for PROFIBUS with terminal resistor**

### Features
- Labelling cover
- Screen put on the slotted nut and Pin 5
- Data transmission up to 12 MBaud

---

### Technical data - General specifications
- **Number of poles**: 2 + 1 x screen
- **Transfer rate**: max. 12 MB/s
- **Ambient conditions**
  - **Ambient temperature**: -40 ... 85 °C (233 ... 358 K)

### Technical data - Mechanical specifications
- **Protection degree**: IP65
- **Connection**: M12 connector/socket, 4-pin, B-coded for PROFIBUS
- **Material**
  - **Contacts**: CuZn, gold-plated
  - **Handle**: PUR / PA 66
  - **Cable**: PUR
  - **Slotted nut**: CuZn, nickel-plated
- **Cable**
  - **Sheath diameter**: Ø 8 mm
  - **Colour**: violet
  - **Cores**: 2 x 0.64 mm²
  - **Length L**: approx. 28 cm
  - **Mass**: approx. 90 g

---

### Technical data - General specifications
- **Number of poles**: 2 + 1 x screen
- **Transfer rate**: max. 12 MB/s
- **Ambient conditions**
  - **Ambient temperature**: -40 ... 85 °C (233 ... 358 K)

### Technical data - Mechanical specifications
- **Protection degree**: IP65
- **Connection**: M12 connector/socket, 4-pin, B-coded for PROFIBUS
- **Material**
  - **Contacts**: CuZn, gold-plated
  - **Handle**: PUR / PA 66
  - **Cable**: PUR
  - **Slotted nut**: CuZn, nickel-plated
- **Cable**
  - **Sheath diameter**: Ø 8 mm
  - **Colour**: violet
  - **Cores**: 2 x 0.64 mm²
  - **Length L**: approx. 28 cm
  - **Mass**: approx. 90 g

---

**Dimensions**

![Diagram](attachment:dimensions.png)
**Model Number**

ICZ-3T-V15B

T-Distributor for PROFIBUS

**Features**

- Direct coupling of t-pieces
- Completeley screened
- M12 round connection for BUS (B-coded)
- Immunity to vibration
- Data transmission up to 12 MBaud

**Technical data**

**General specifications**

- Number of poles: 5
- Transfer rate: up to 12 MBit/s

**Ambient conditions**

- Ambient temperature: -40 ... 80 °C (233 ... 353 K)
- Short-time up to 250 °C

**Mechanical specifications**

- Protection degree: IP67
- Connection: M12 connector/socket, 5-pin, B-coded for PROFIBUS
- Material:
  - Contacts: CuZn, gold-plated
  - Housing: PUR, oil resistant
  - Slotted nut: CuZn, nickel-plated

---

**Model Number**

ICZ-TR-V15B

Terminating resistor for PROFIBUS

**Features**

- Immunity to vibration
- M12 round connection for BUS (B-coded)

**Technical data**

**Mechanical specifications**

- Connection: M12 connector, 4-pin, B-coded for PROFIBUS
### Model Number

**IVZ-K-R2**

 Null modem cable

### Features

- Null modem cable for connection to RS 232

### Technical data

#### General specifications
- **Construction type**
  - 9-pin Sub-D installation plug connector (female)
  - 9-pin Sub-D installation plug connector (female)

#### Mechanical specifications
- **Cable**
  - **Colour**
    - grey
  - **Length L**
    - 2 m

---

### Model Number

**V1S-G-0,15M-PUR-SUBD**

 Adapter M12 on Sub-D for PC connection with null modem cable

### Features

- Adapter M12 on Sub-D (for connection of a null modem cable)

### Technical data

#### General specifications
- **Number of poles**
  - 3
- **Construction type**
  - M12 connector, straight
  - 9-pin Sub-D connector (male)

#### Mechanical specifications
- **Material**
  - Cable: PUR
- **Cable**
  - **Colour**
    - black
  - **Cores**
    - 3 x 0.34 mm²
    - 1 x screen put on M12 connector and Sub-D housing
  - **Length L**
    - 0.15 m
Model Number
IVZ-16G-EW

Features
• Threading tool for code and read/write tags with threadings M16 x 1

Model Number
IVZ-30G-EW

Features
• Threading tool for code and read/write tags with threadings M30 x 1.5

Technical data
Mechanical specifications
Material metal
### Model Number

ICS-30GK  
Protective cover

### Features

- Protective cover with thread M30 x 1.5
- For temperatures up to 150 °C

---

### Model Number

MVC-SH1  
Protective cover for read/write tag  
MVC-60B-64K

### Features

- Protection against mechanical damage and welding splash

---

### Technical data

**Ambient conditions**

- Storage temperature: -40 ... 150 °C (233 ... 423 K)

**Mechanical specifications**

- Material: Delrin

---

### Technical data

**Mechanical specifications**

- Material: POM
- Mass: approx. 40 g
RFID 125 KHz
RFID 250 KHz
RFID 868 MHz
RFID 13.56 MHz
RFID 2.45 GHz

Handhelds
Accessories
Barcode
High Temperature
IDENT System
Stand-alone
125 KHz
Stand-alone
2.45 GHz
Data Matrix

Model Number
ICZ-MH05-SACB-8
Mounting aid for DIN rail

Features

- Dimensions

Model Number
IVZ-MH15
Mounting aid for code/read/write tags

Features

- Simple and fast mounting
- Suited for all read/write tags with a diameter of 15 mm, e.g. IDC-15-1K
Accessories

**Model Number**

**IPZ-MH50**

Flat housing

**Features**

- Suitable as distance retainer for code or read/write tag IDENT-I System P und System V for mounting on metal

**Dimensions**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ø4.5</td>
<td>Counterbores 90°</td>
</tr>
<tr>
<td>Ø50</td>
<td></td>
</tr>
</tbody>
</table>

**Technical data**

- **Ambient conditions**
  - Storage temperature: -40 ... 85 °C (233 ... 358 K)

- **Mechanical specifications**
  - **Material** Housing: PBT

---

**Model Number**

**ICZ-MH30-25-T10**

Spacers for code/read/write tag

**Features**

- For temperatures up to 250 °C
- Free of paint coating substances
- All edges deburred/chamfered

**Dimensions**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ø 13</td>
<td>90°</td>
</tr>
<tr>
<td>Ø 25</td>
<td></td>
</tr>
<tr>
<td>Ø 30</td>
<td></td>
</tr>
</tbody>
</table>

**Technical data**

- **Ambient conditions**
  - Storage temperature: -40 ... 250 °C (233 ... 523 K)

- **Mechanical specifications**
  - **Material** PTFE (Teflon)
Description

The Demo Program RFIDControl enables you to input and execute all essential commands via a command window. The interface monitor logs the entire communication.

This program runs in Windows 95/98/NT/2000/XP and has extensive online help. Installation is straightforward and the connected identification system is automatically detected. All essential commands can be entered via the command window and processed by means of this program.

Model Number

RFIDControl

Software for RFID identification systems

Features

- Demo-Software
5 RFID Handhelds

5.1 Product description

Our handheld devices represent an extension of IDENTControl. They are used for identification of RFID transponders in various frequency ranges. They can be both operated wirelessly via Bluetooth as well as connected to a computer, and thus write data directly to a database. This flexible use as well as many other features, e.g. adding a time stamp or checksum, enable optimum application in production and logistics. Moreover, a switchable menu language allows use in a multi-language workplace.

Wireless communication

The handheld device can ideally communicate with a PC wirelessly via Bluetooth. The handheld additionally has a batch mode, where read data can be written to the internal memory of the device.

LCD and keyboard

The design like a cell phone enables intuitive operation. The handheld device has a keyboard and is equipped with a multiline display.

Operating frequencies

There are three versions of the handheld devices for 125 kHz, 250 KHz und 13.56 MHz.

Customized functions

With the help of JavaScript, all commands can be executed in a routine, the soft keys allocated and display controlled. If you wish to create your own user interface, please contact Pepperl+Fuchs.

Interfaces

The handheld device has a number of different interfaces via which it can communicate with a PC. As well as the wireless Bluetooth interface, the handheld device has wired RS 232, PS/2 and USB interfaces. You set the parameters of the individual interfaces directly via the user interface of the handheld device. Compatible interface accessories can be obtained from Pepperl+Fuchs.

Power supply

A lithium ion battery provides the power supply for the handheld device. The battery is automatically charged once the handheld device is linked via an interface cable to a computer connected to a mains supply. A battery is not normally required for cable operation via USB. However, this depends on the current strength that the computer supplies via the USB connection. Batteries and chargers are optionally available from Pepperl+Fuchs.
### 5.2 Accessories’ overview

There are accessories optionally available for the handheld devices in the I*T-HH20 product family:

<table>
<thead>
<tr>
<th>Handles</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>ODZ-MAH-GRIP1</td>
<td>Handle without battery</td>
<td>248</td>
</tr>
<tr>
<td>ODZ-MAH-GRIP2</td>
<td>Handle with integrated lithium ion battery (capacitance: 1950 mAh)</td>
<td>248</td>
</tr>
<tr>
<td>ODZ-MAH-GRIP3</td>
<td>Handle with integrated lithium ion battery (capacitance: 3900 mAh)</td>
<td>249</td>
</tr>
</tbody>
</table>

**Accumulators and batteries**

<table>
<thead>
<tr>
<th>Handles</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>ODZ-MAH-BAT</td>
<td>Lithium ion battery (capacitance: 1950 mAh)</td>
<td>252</td>
</tr>
<tr>
<td>ODZ-MAH-BLANK</td>
<td>Battery compartment cover (during cable operation)</td>
<td>252</td>
</tr>
</tbody>
</table>

**Chargers**

<table>
<thead>
<tr>
<th>Handles</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>ODZ-MAH200-CHARGER</td>
<td>Battery charger for 2 lithium ion batteries</td>
<td>253</td>
</tr>
<tr>
<td>ODZ-MAH-CHARGER</td>
<td>Battery charger for handle with integrated lithium ion battery</td>
<td>253</td>
</tr>
<tr>
<td>ODZ-MAH200-SUPPLY + ODZ-MAH-CAB-CHARGE</td>
<td>plugin power supply with cable for direct handheld device connection</td>
<td>252+255</td>
</tr>
<tr>
<td>ODZ-MAH-CHARGER-SINGLE</td>
<td>Charger for connection with built-in battery</td>
<td>253</td>
</tr>
</tbody>
</table>

**Connecting cable**

<table>
<thead>
<tr>
<th>Handles</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>ODZ-MAH-CAB-B14</td>
<td>USB interface connecting cable, length approx. 180 cm</td>
<td>254</td>
</tr>
<tr>
<td>ODZ-MAH-CAB-R2</td>
<td>RS 232 interface connecting cable, length approx. 120 cm</td>
<td>254</td>
</tr>
<tr>
<td>ODZ-MAH-CAB-R6</td>
<td>PS/2 interface connecting cable, length approx. 120 cm</td>
<td>254</td>
</tr>
</tbody>
</table>

**Interface accessories**

<table>
<thead>
<tr>
<th>Handles</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>ODZ-MAH-B15-M3</td>
<td>Bluetooth modem (without cable), USB configurable</td>
<td>257</td>
</tr>
</tbody>
</table>
**Model Number**

IPT-HH20

Handheld (125 kHz) for System IDENTControl

**Features**

- Suitable for IPC read/write tag
- Keypad for entry of alphanumeric characters
- LCD display
- Free programming with JavaScript
- Communication via Bluetooth, USB, RS 232, or PS/2 interfaces

**Function**

The handheld is used to identify RFID code and data carriers in the specified frequency range. The handheld is the ideal addition to the IDENT Control system of Pepperl+Fuchs: You can use it for manual quality control, for example, or to record maintenance work.

The design is similar to the keypad on a mobile phone, which makes control intuitive. You can also assign frequently used actions to two function keys or adjust the range of functionality to your needs with custom JavaScript applications.

A rechargeable lithium battery, 4 MB of user-programmable memory, and optionally available wireless communication with Bluetooth ensure full mobility. Data stored in the handheld can also be easily transferred to a PC via USB, RS 232, or PS/2 interface. A large selection of other accessories is also available.

**Matching system components**

ODZ-MAH-BAT

Lithium ion battery 1950 mAh

---

**Technical data**

**General specifications**

- Operating frequency: 125 kHz
- Reading distance: 0 ... 40 mm
- Writing distance: 0 ... 30 mm

**Nominal ratings**

- Processor: RMI Alchemy Au1100
- Clock pulse frequency: 400 MHz
- Memory: 4 MByte

**Indicators/operating means**

- Display: LC-Display 128 x 128 Pixel, monochrom
- Keyboard: Keypad for entering alphanumeric characters
- Key: Programmable function keys

**Electrical specifications**

- Supply: From interface or deployed Li-Ion rechargeable battery
- Interface: Physical Bluetooth, USB 2.0, RS 232 or PS/2
- Protocol: ASCII

**Compliance with standards and directives**

- Standard conformity: EN 60529
- Ambient conditions: Ambient temperature 0 ... 40 °C (273 ... 313 K) Storage temperature -20 ... 60 °C (253 ... 333 K)

**Mechanical specifications**

- Protection degree: IP20
- Connection: System connector for connecting cable or handle
- Material: Housing plastic
- Mass: approx. 180 g
- Dimensions: 112 mm x 46 mm x 41 mm
Model Number
IST-HH20
Handheld (250 kHz)
for System IDENT Control

Features
• Suitable for IDC/ICC read/write tag
• Keypad for entry of alphanumerical characters
• LCD display
• Free programming with JavaScript
• Communication via Bluetooth, USB, RS 232, or PS/2 interfaces

Function
The handheld is used to identify RFID code
and data carriers in the specified frequency
range. The handheld is the ideal addition to
the IDENT Control system of Pepperl+Fuchs: You can use it for manual quality
control, for example, or to record maintenance work.

The design is similar to the keypad on a
mobile phone, which makes control intuitive.
You can also assign frequently used actions
to two function keys or adjust the range of
functionality to your needs with custom Java-
Script applications.

A rechargeable lithium battery, 4 MB of user-
programmable memory, and optionally avail-
able wireless communication with Bluetooth
ensure full mobility. Data stored in the hand-
held can also be easily transferred to a PC
via USB, RS 232, or PS/2 interface.

A large selection of other accessories is also available.

Matching system components
ODZ-MAH-BAT
Lithium ion battery 1950 mAh

Technical data
General specifications
- Operating frequency: 250 kHz
- Reading distance: 0 ... 40 mm
- Writing distance: 0 ... 35 mm

Nominal ratings
- Processor: RMI Alchemy Au1100
- Clock pulse frequency: 400 MHz
- Memory: Non-volatile memory 4 MByte

Indicators/operating means
- Display: LCD Display 128 x 128 Pixel, monochrom
- Keyboard: Keypad for entering alphanumerical characters
- Key: Programmable function keys

Electrical specifications
- Supply: From interface or deployed Li-Ion rechargeable battery
- Interface: Physical Bluetooth, USB 2.0, RS 232 or PS/2
- Protocol: ASCII

Compliance with standards and directives
- Standard conformity: EN 60529
- Ambient conditions: Ambient temperature 0 ... 40 °C (273 ... 313 K)
- Mechanical specifications: Protection degree IP20

Material
- Housing: plastic
- Mass: approx. 180 g
- Dimensions: 112 mm x 46 mm x 41 mm
Model Number
IQT1-HH20

Handheld (13.56 MHz) for System IDENTControl

Features
- Suitable for IQC read/write tag
- Keypad for entry of alphanumeric characters
- LCD display
- Free programming with JavaScript
- Communication via Bluetooth, USB, RS 232, or PS/2 interfaces

Function
The handheld is used to identify RFID code and data carriers in the specified frequency range. The handheld is the ideal addition to the IDENT Control system of Pepperl+Fuchs: You can use it for manual quality control, for example, or to record maintenance work. The design is similar to the keypad on a mobile phone, which makes control intuitive. You can also assign frequently used actions to two function keys or adjust the range of functionality to your needs with custom JavaScript applications.

A rechargeable lithium battery, 4 MB of user-programmable memory, and optionally available wireless communication with Bluetooth ensure full mobility. Data stored in the handheld can also be easily transferred to a PC via USB, RS 232, or PS/2 interface. A large selection of other accessories is also available.

Matching system components
ODZ-MAH-BAT
Lithium ion battery 1950 mAh

Technical data

<table>
<thead>
<tr>
<th>General specifications</th>
<th>13.56 MHz</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating frequency</td>
<td></td>
</tr>
<tr>
<td>Reading distance</td>
<td>0 ... 45 mm</td>
</tr>
<tr>
<td>Writing distance</td>
<td>0 ... 45 mm</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Nominal ratings</th>
<th>RMI Alchemy Au1100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clock pulse frequency</td>
<td>400 MHz</td>
</tr>
<tr>
<td>Memory</td>
<td>4 MByte</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Indicators/operating means</th>
</tr>
</thead>
<tbody>
<tr>
<td>Display</td>
</tr>
<tr>
<td>Keyboard</td>
</tr>
<tr>
<td>Key</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Electrical specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply</td>
</tr>
<tr>
<td>Interface</td>
</tr>
<tr>
<td>Protocol</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Compliance with standards and directives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard conformity</td>
</tr>
<tr>
<td>Protection degree</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ambient conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambient temperature</td>
</tr>
<tr>
<td>Storage temperature</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mechanical specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protection degree</td>
</tr>
<tr>
<td>Connection</td>
</tr>
<tr>
<td>Material</td>
</tr>
<tr>
<td>Housing</td>
</tr>
<tr>
<td>Dimensions</td>
</tr>
</tbody>
</table>
6 125 kHz R/W system
(System IP)

6.1 System description

If the IDENT read points are spaced over long distances in the plant, then the IPT1-FP system is offered. This R/W system combines the evaluation and fieldbus interface as well as the actual R/W head in one device. These devices are designed for demanding industrial conditions, fulfill degree of protection IP67 and can be connected directly to higher level control. Serial interfaces are available for a simple point-to-point connection, addressable RS 485 interfaces to build a simple bus system and fieldbus interfaces for the PROFIBUS and INTERBUS.

Special stainless steel versions are also available for use in the food industry. Because the installation and wiring is particularly simple, this R/W system is frequently used especially in material handling. The mounting can take place with 2 or 4 mounting screws and the address setting via DIP switches that are accessible through a covering plate. For electrical connection, versions with a plugin connection or with terminal compartment connection via cable glands are available.

Depending on requirements, the INTERBUS version can be set at a baud rate of 500 kHz or 2 MHz.

The PROFIBUS version supports auto-syncronizing the data communication up to 12 MBaud. 7 x 32 bit can be transferred in one PROFIBUS cycle. The terminator can be connected to the device. The connection takes place via an M12 plug for PROFIBUS and the power supply or via EMC cable glands.

6.2 Features and advantages of the IP system

- R/W system with integrated evaluation
- Simple and cost-effective system solution
- Operating frequency 125 kHz, amplitude modulated
- Cost-effective, battery-free read only and read/write tags, ideal for applications with a large number of tags
- A huge range of designs of read only and read only and read/write tags
- Read only code with 40 bits (64 bit total)
- Memory capacity up to 116 bytes
- Read range up to 80 mm
- Write range up to 45 mm
- Transfer rate up to 3.9 kbaud
- Degree of protection: IP67

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### 6.3 Product overview

<table>
<thead>
<tr>
<th>Order code</th>
<th>Interface</th>
<th>Bus connection</th>
<th>Features</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>IPT1-FP</strong> / <strong>IPT-FP</strong></td>
<td>-</td>
<td>-</td>
<td>R/W head for lower sections P3/P6/P7</td>
</tr>
<tr>
<td><strong>U-P3-RX</strong></td>
<td>RS 232/RS 485</td>
<td>Screw terminals</td>
<td>Multidrop, stainless steel housing, terminator switchable</td>
</tr>
<tr>
<td><strong>U-P3V4A-RX</strong></td>
<td>RS 232/RS 485</td>
<td>Screw terminals</td>
<td>Multidrop, terminator switchable</td>
</tr>
<tr>
<td><strong>U-P3-R4</strong></td>
<td>RS 485</td>
<td>Screw terminals</td>
<td>Multidrop, terminator switchable</td>
</tr>
<tr>
<td><strong>U-P3-R4-V15</strong></td>
<td>RS 485</td>
<td>Plug connector M12 x 1, 5-pin</td>
<td>Multidrop, terminator switchable</td>
</tr>
<tr>
<td><strong>U-P6-B6</strong></td>
<td>PROFIBUS DP</td>
<td>Screw terminals</td>
<td>Terminator switchable</td>
</tr>
<tr>
<td><strong>U-P6V4A-B6</strong></td>
<td>PROFIBUS DP</td>
<td>Screw terminals</td>
<td>Stainless steel housing, terminator switchable</td>
</tr>
<tr>
<td><strong>U-P6-B6-V15B</strong></td>
<td>PROFIBUS DP</td>
<td>Device plug M12x1, 4-pin (power supply) M12 x 1 connector, 5-pin, B-coded (BUS)</td>
<td>Terminator switchable</td>
</tr>
<tr>
<td><strong>U-P6-B5</strong></td>
<td>INTERBUS</td>
<td>Screw terminals</td>
<td>Switchable baud rate 500 kbd/2 MBd, sliding switch for last node</td>
</tr>
<tr>
<td><strong>U-P6-B5-V</strong></td>
<td>INTERBUS</td>
<td>Screw terminals</td>
<td>Switchable baud rate 500 kbd/2 MBd,</td>
</tr>
<tr>
<td><strong>U-P7V4A-R4</strong></td>
<td>RS 485</td>
<td>Screw terminals</td>
<td>Stainless steel housing</td>
</tr>
</tbody>
</table>
Accessories for IP system

<table>
<thead>
<tr>
<th>Order code</th>
<th>IPT-HH20</th>
<th>IPT-FP3A6-R2</th>
<th>IPG-G4-B7-V15</th>
</tr>
</thead>
<tbody>
<tr>
<td>Page</td>
<td>170-172</td>
<td>189</td>
<td>190</td>
</tr>
<tr>
<td>Features</td>
<td>Handheld</td>
<td>Stand-alone R/W system</td>
<td>DeviceNet bus coupler</td>
</tr>
</tbody>
</table>

The technical data for the transponder can be found on page 69.

6.4 Read/write ranges

Read/write range in air (at 25°C)

<table>
<thead>
<tr>
<th>R/W head</th>
<th>IPT*-FP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Read only tag</td>
<td>Reading</td>
</tr>
<tr>
<td>IPC02-12</td>
<td>0–22</td>
</tr>
<tr>
<td>IPC02-16</td>
<td>0–15</td>
</tr>
<tr>
<td>IPC02-20W</td>
<td>0–40</td>
</tr>
<tr>
<td>IPC02-20CD</td>
<td>0–40</td>
</tr>
<tr>
<td>IPC02-30W</td>
<td>0–50</td>
</tr>
<tr>
<td>IPC02-50W</td>
<td>0–80</td>
</tr>
<tr>
<td>IPC02-68-T7</td>
<td>0–50</td>
</tr>
<tr>
<td>IPC02-3GL</td>
<td>-</td>
</tr>
<tr>
<td>IPC02-C1</td>
<td>0–80</td>
</tr>
</tbody>
</table>

Legend: - Combination not recommended

Read/write speed times

The times theoretically attainable between the transponder and R/W head at the transfer rate of 3.9 kBit/s can in practice be exceeded due to various influences such as interference. On this, see calculation examples on page 59.
Model Number

IPT1-FP
Read/write station

Features

- With integrated control interface unit
- Serial interfaces and field-bus interfaces selectable through lower part
- Read distance of up to 100 mm
- Write distance of up to 50 mm
- 3 LEDs for function indication
- Protection degree IP67
- Optimised reading speed for fixed codes
- Suited for writing of IPC11

Function

The IPT1-FP read/write station is used in combination with a base which contains the interface for connecting to a computer. Through the choice of base, either serial interfaces or field-bus interfaces may be selected. The analysis system is integrated in the device and simplifies the system construction. Protection class IP67 allows the device to be installed directly in the field.

Dimensions

Technical data

General specifications

<table>
<thead>
<tr>
<th>Operating frequency</th>
<th>125 kHz</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transfer rate</td>
<td>2 kBit/s</td>
</tr>
<tr>
<td>Operating distance</td>
<td>maximum: 100 mm</td>
</tr>
</tbody>
</table>

Indicators/operating means

<table>
<thead>
<tr>
<th>LED green</th>
<th>Power on</th>
</tr>
</thead>
<tbody>
<tr>
<td>LED yellow</td>
<td>IPC detected</td>
</tr>
<tr>
<td>LED red</td>
<td>bus fault (when using fieldbus interfaces)</td>
</tr>
</tbody>
</table>

Electrical specifications

<table>
<thead>
<tr>
<th>Rated operational voltage $U_{e}$</th>
<th>20 ... 30 V DC , ripple 10 %SS , PELV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power consumption $P_{0}$ max.</td>
<td>5 W , in connection with the base</td>
</tr>
</tbody>
</table>

Electrical isolation

| Operating voltage/interface     | functional insulation acc. to DIN EN 50178, rated insulation voltage $50 \ V_{eff}$ |

Interface

| Physical                  | Interface type depends on used base |

Ambient conditions

<table>
<thead>
<tr>
<th>Ambient temperature</th>
<th>-25 ... 70 °C (248 ... 343 K)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storage temperature</td>
<td>-40 ... 85 °C (233 ... 358 K)</td>
</tr>
</tbody>
</table>

Mechanical specifications

<table>
<thead>
<tr>
<th>Protection degree</th>
<th>IP67 according to EN 60529, with base</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material</td>
<td>Housing PBT</td>
</tr>
</tbody>
</table>

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Model Number

IPT-FP

Read/write station

Features

- With integrated control interface unit
- Serial interfaces and field-bus interfaces selectable through lower part
- Read distance of up to 100 mm
- Write distance of up to 50 mm
- 3 LEDs for function indication
- Protection degree IP67
- Suitable for applications together with inductive energy transfer

Function

The IPT-FP read/write station is used in combination with a base which contains the interface for connecting to a computer. Through the choice of base, either serial interfaces or field-bus interfaces may be selected. The analysis system is integrated in the device and simplifies the system construction. Protection class IP67 allows the device to be installed directly in the field.

Technical data

<table>
<thead>
<tr>
<th>General specifications</th>
<th>Operating frequency</th>
<th>125 kHz</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Transfer rate</td>
<td>2 kBit/s</td>
</tr>
<tr>
<td></td>
<td>Operating distance</td>
<td>maximum: 100 mm</td>
</tr>
<tr>
<td>Indicators/operating means</td>
<td>LED green</td>
<td>Power on</td>
</tr>
<tr>
<td></td>
<td>LED yellow</td>
<td>IPC detected</td>
</tr>
<tr>
<td></td>
<td>LED red</td>
<td>bus fault (when using fieldbus interfaces)</td>
</tr>
<tr>
<td>Electrical specifications</td>
<td>Rated operational voltage $U_p$</td>
<td>20 ... 30 V DC , ripple 10 %, PELV</td>
</tr>
<tr>
<td></td>
<td>Power consumption $P_0$</td>
<td>max. 5 W , in connection with the base</td>
</tr>
<tr>
<td>Operating voltage/interface</td>
<td>functional insulation acc. to DIN EN 50178, rated insulation voltage 50 Veff</td>
<td></td>
</tr>
<tr>
<td>Interface</td>
<td>Physical</td>
<td>Interface type depends on used base</td>
</tr>
<tr>
<td>Ambient conditions</td>
<td>Ambient temperature</td>
<td>-25 ... 70 °C (248 ... 343 K)</td>
</tr>
<tr>
<td></td>
<td>Storage temperature</td>
<td>-40 ... 85 °C (233 ... 358 K)</td>
</tr>
<tr>
<td>Mechanical specifications</td>
<td>Protection degree</td>
<td>IP67 according to EN 60529, with base</td>
</tr>
<tr>
<td></td>
<td>Material</td>
<td>PBT</td>
</tr>
<tr>
<td>Housing</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Dimensions
# U-P3-RX

## Model Number

**U-P3-RX**

Base with serial interfaces RS 232 and RS 485

## Features

- Protection degree IP67
- With serial interfaces RS 232 and RS 485

## Function

The base is used in combination with an upper part, the IPT*-FP read/write station. Either an RS 232- or an RS 485-interface is available.

The read/write station is connected to a higher-order control system via the serial interface and receives the commands for writing and/or reading code or data carriers via this interface.

## Software

Communication with the identification system is very easy with the demo program IDENT 2005. It shows the system options and simplifies commissioning.

The demo program is included in the scope of delivery.

## Matching system components

**IPT-FP**
Read/write station

**IPT1-FP**
Read/write station

## Accessories

**RFIDControl**
Software for RFID identification systems

---

### Technical data

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated operational voltage U_e</td>
<td>20 ... 30 V DC, ripple 10 %, PELV</td>
</tr>
<tr>
<td>Power consumption P_0</td>
<td>max. 4 W with read/write head IPT*-FP</td>
</tr>
<tr>
<td>Operating voltage/interface</td>
<td>functional insulation acc. to DIN EN 50178, rated insulation voltage 50 V eff</td>
</tr>
<tr>
<td>Interface</td>
<td>Physical RS 232/RS 485</td>
</tr>
<tr>
<td>Protocol</td>
<td>ASCII</td>
</tr>
<tr>
<td>Transfer rate</td>
<td>1200; 2400; 4800; 9600; 19200; 38400</td>
</tr>
<tr>
<td>Cable length</td>
<td>≤ 15 m at RS 232</td>
</tr>
<tr>
<td>Ambient conditions</td>
<td>≤ 1200 m at RS 485</td>
</tr>
<tr>
<td>Ambient temperature</td>
<td>-25 ... 70 °C (248 ... 343 K)</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>-40 ... 85 °C (233 ... 358 K)</td>
</tr>
<tr>
<td>Protection degree</td>
<td>IP67 according to EN 60529 with IPT*-FP</td>
</tr>
<tr>
<td>Connection</td>
<td>screw terminals</td>
</tr>
<tr>
<td>Interface cable</td>
<td>3 conductor, acc. to RS 232 or 2 acc. to RS 485</td>
</tr>
<tr>
<td>Supply</td>
<td>up to 3 x 1.5 mm²</td>
</tr>
<tr>
<td>Material</td>
<td>aluminium diecasting</td>
</tr>
</tbody>
</table>

---

![Diagram](image.png)

**Dimensions**

- **30**
- **60 x 1.5**
- **ø5.3**
- **80**

**Electrical connection**

- **RS 485**
- **RS 232**
- **PE**
- **RXD**
- **GND**
- **TXD**

<table>
<thead>
<tr>
<th>Connector</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>+24 V DC</td>
<td>PE</td>
</tr>
<tr>
<td>-24 V DC</td>
<td>RXD</td>
</tr>
<tr>
<td>RS 485</td>
<td>PE</td>
</tr>
<tr>
<td></td>
<td>GND</td>
</tr>
<tr>
<td></td>
<td>TXD</td>
</tr>
</tbody>
</table>

---

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Main Office: (650) 588-9200
Outside Local Area: (800) 258-9200
www.stevenengineering.com
**Model Number**
U-P3V4A-RX

**Features**
- high-grade steel housing V4A
- With serial interfaces RS 232 and RS 485
- Protection degree IP67
- Resistant against cleaning material

**Function**
The base is used in combination with an upper part, the IPT*-FP read/write station. Either a RS 232 or RS 485 interface is available.
The read/write station is connected to a higher-order control system via the serial interface and receives the commands for writing and/or reading code or data carriers via this interface.

**Software**
Communication with the identification system is very easy with the demo program IDENT 2005. It shows the system options and simplifies commissioning.
The demo program is included in the scope of delivery.

**Matching system components**
- **IPT-FP**
  Read/write station
- **IPT1-FP**
  Read/write station

**Accessories**
- **RFIDControl**
  Software for RFID identification systems

---

**Dimensions**

**Technical data**

**Electrical specifications**
- Rated operational voltage $U_e$: 20 ... 30 V DC, ripple $10\%_{PE}$, PELV
- Power consumption $P_0$: max. 4 W with read/write head IPT*-FP

**Electrical isolation**
- Operating voltage/interface: functional insulation acc. to DIN EN 50178, rated insulation voltage $50$ Veff

**Interface**
- Physical: RS 232/RS 485
- Protocol: ASCII
- Transfer rate: 1200; 2400; 4800; 9600; 19200; 38400 Bit/s
- Cable length: ≤ 15 m at RS 232
- ≤ 1200 m at RS 485

**Ambient conditions**
- Ambient temperature: -25 ... 70 °C (248 ... 343 K)
- Storage temperature: -40 ... 85 °C (233 ... 358 K)

**Mechanical specifications**
- Protection degree: IP67 (only in connection with write/read head or cover)
- Connection: screw terminals
- Interface cable: 3 conductor, acc. to RS 232 or 2 acc. to RS 485
- Supply: up to 3 x 1.5 mm²
- Material: stainless steel V4A

---

**Dimensions**

**Electrical connection**

---

**Model Number**
U-P3V4A-RX

**Base with serial interfaces RS 232 and RS 485, stainless steel version V4A**

---

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**www.stevenengineering.com**
**Model Number**

**U-P3-R4**

Base with addressable serial Interface RS 485

**Features**

- Protection degree IP67
- Simple bus system with up to 30 units
- Serial interface RS 485, addressable

**Function**

The base is used in combination with an upper part, the IPT*-FP read/write station. An addressable RS 485 interface is available. It is thus possible to create a simple bus connection with up to 30 subscribers. The address is set and the terminating resistor for the bus is connected via DIP switches. The read/write station is connected to a higher-order control system via the serial interface and receives the commands for writing and/or reading code or data carriers via this interface.

**Matching system components**

- **IPT-FP**  
  Read/write station
- **IPT1-FP**  
  Read/write station
- **IPG-G4-B7-V15**  
  DeviceNet Bus coupler for IDENT-I System P

**Dimensions**

![Dimensions Diagram]

**Electrical connection**

<table>
<thead>
<tr>
<th>DIP-switch address</th>
<th>PE</th>
</tr>
</thead>
<tbody>
<tr>
<td>OFF</td>
<td>ON</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Terminating resistor</th>
</tr>
</thead>
<tbody>
<tr>
<td>24 V DC</td>
</tr>
</tbody>
</table>

**Technical data**

**Indicators/operating means**

<table>
<thead>
<tr>
<th>DIP-switch</th>
<th>Setting the station address</th>
</tr>
</thead>
<tbody>
<tr>
<td>bus connection</td>
<td></td>
</tr>
<tr>
<td>ON = active</td>
<td>OFF = non-active</td>
</tr>
</tbody>
</table>

**Electrical specifications**

- Rated operational voltage $U_{d}$  
  $20 \ldots 30$ V DC, ripple 10 %, PELV
- Power consumption $P_{0}$  
  max. 4 W with read/write head IPT*-FP
- Electrical isolation  
  Operating voltage/interface functional insulation acc. to DIN EN 50178, rated insulation voltage 50 V$_{eff}$

**Interface**

- Physical  
  RS 485, addressable, up to 30 bases, address 1 ... 30
- Protocol  
  ASCII
- Transfer rate  
  1200; 2400; 4800; 9600; 19200; 38400 Bit/s
- Cable length  
  $\leq 1200$ m

**Ambient conditions**

- Ambient temperature  
  $-25 \ldots 70$ °C (248 ... 343 K)
- Storage temperature  
  $-40 \ldots 85$ °C (233 ... 358 K)

**Mechanical specifications**

- Protection degree  
  IP67 according to EN 60529 with IPT*-FP
- Connection  
  screw terminals
- Interface cable  
  2 conductor, acc. to RS 485
- Supply  
  up to 3 x 1.5 mm²
- Material  
  aluminium diecasting
**Model Number**

U-P3-R4-V15

Base with addressable serial Interface RS 485

**Features**

- Protection degree IP67
- Simple bus system with up to 30 units
- Serial interface RS 485, addressable

**Function**

The base is used in combination with an upper part, the IPT*-FP read/write station. An addressable RS 485 interface is available. It is thus possible to create a simple bus connection with up to 30 subscribers. The address is set and the terminating resistor for the bus is connected via DIP switches. The read/write station is connected to a higher-order control system via the serial interface and receives the commands for writing and/or reading code or data carriers via this interface.

**Matching system components**

- IPG-G4-B7-V15
  DeviceNet Bus coupler for IDENT-I System P
- IPT1-FP
  Read/write station
- IPT-FP
  Read/write station

**Dimensions**

**Electrical connection**

**Technical data**

<table>
<thead>
<tr>
<th>Indicators/operating means</th>
<th>DIP-switch</th>
<th>Setting the station address</th>
<th>bus connection</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ON = active</td>
<td>OFF = non-active</td>
<td></td>
</tr>
</tbody>
</table>

**Electrical specifications**

- Rated operational voltage $U_e$: 20 ... 30 V DC, ripple 10 %, PELV
- Power consumption $P_0$: max. 4 W with read/write head IPT*-FP

**Electrical isolation**

- Operating voltage/interface: functional insulation acc. to DIN EN 50178, rated insulation voltage $50 \text{ V}_{\text{eff}}$

**Interface**

- Physical: RS 485, addressable, up to 30 bases, address 1 ... 30
- Protocol: ASCII
- Transfer rate: 1200; 2400; 4800; 9600; 19200; 38400 Bit/s
- Cable length: $\leq 1200 \text{ m}$

**Ambient conditions**

- Ambient temperature: $-25 \ldots 70 \, ^\circ\text{C} (248 \ldots 343 \, ^\circ\text{K})$
- Storage temperature: $-40 \ldots 85 \, ^\circ\text{C} (233 \ldots 358 \, ^\circ\text{K})$

**Mechanical specifications**

- Protection degree: IP67 according to EN 60529 with IPT*-FP
- Connection: connector M12 x 1, 5-pin
- Material: aluminium diecasting
- Housing: aluminium diecasting
Model Number
U-P6-B6
Base for PROFIBUS DP

Features
• PROFIBUS DP acc. to EN 50170
• 2 PG screw fittings for IN and OUT supply
2 EMV PG screw fittings for BUS IN and OUT
• Complete read/write functionality via the PROFIBUS DP
• Transmission of up to 7 double words, 32 bit each, in one cycle
• Connectable bus termination
• Field device with protection class IP67

Function
The base is used in combination with an upper part, the IPT*-FP read/write station. The device is operated as a slave on the PROFIBUS DP. The device makes available the complete read/write functionality. Up to 32 bytes are transmitted per cycle. Of these, up to 7 double words, each with 32 bits, are available to the user.
The address is set and the terminating resistor for the bus is connected via DIP switches. While the bus termination is switched on, the subsequent subscribers which are connected to the terminals (P, N out) are disconnected from the bus.

Matching system components
IPT-FP
Read/write station
IPT1-FP
Read/write station

Dimensions

Electrical connection

Technical data

Indicators/operating means
DIP-switch Setting the station address
bus connection
ON = active OFF = non-active

Electrical specifications
Rated operational voltage \( U_e \)
20 ... 30 V DC, ripple 10 %SS, PELV
Power consumption \( P_0 \)
max. 5 W with read/write head IPT*-FP
Operating voltage/interface functional insulation acc. to DIN EN 50178, rated insulation voltage 50 V_{eff}

Interface
Physical RS 485
Protocol PROFIBUS DP acc. to EN 50170
Transfer rate 9.6; 19.2; 93.75; 187.5; 500; 1500 kBit/s
3; 6; 12 MBit/s self-synchronizing

Ambient conditions
Ambient temperature -25 ... 70 °C (248 ... 343 K)
Storage temperature -40 ... 85 °C (233 ... 358 K)

Mechanical specifications
Protection degree IP67 according to EN 60529 with IPT*-FP
Connection screw terminals
Interface cable 2 x 0.64 mm², double screened, acc. to PROFIBUS standard EN 50170
Supply up to 3 x 1.5 mm²
Material aluminium, black anodised

Material
Housing aluminium, black anodised
Model Number
U-P6V4A-B6
Base for PROFIBUS DP, stainless steel version

Features
- PROFIBUS DP acc. to EN 50170
- 2 PG screw fittings for IN and OUT supply, 2 EMV PG screw fittings for BUS IN and OUT
- Complete read/write functionality via the PROFIBUS DP
- Transmission of up to 7 double words, 32 bit each, in one cycle
- Connectable bus termination
- Field device with protection class IP67
- high-grade steel housing V4A
- Resistant against cleaning material

Function
The base is used in combination with an upper part, the IPT*-FP read/write station. The device makes available the complete read/write functionality. Up to 32 bytes are transmitted per cycle. Of these, up to 7 double words, each with 32 bits, are available to the user. The address is set and the terminating resistor for the bus is connected via DIP switches. While the bus termination is switched on, the subsequent subscribers which are connected to the terminals (P N out) are disconnected from the bus.

Matching system components
IPT1-FP
Read/write station
IPT-FP
Read/write station

Dimensions

Electrical connection

Technical data
Indicators/operating means
DIP-switch Setting the station address
bus connection
ON = active OFF = non-active

Electrical specifications
Rated operational voltage $U_e$ 20 ... 30 V DC , ripple 10 % , PELV
Power consumption $P_0$ max. 5 W with read/write head IPT*-FP

Electrical isolation
Operating voltage/interface functional insulation acc. to DIN EN 50178, rated insulation voltage 50 V eff

Interface
Physical RS 485
Protocol PROFIBUS DP acc. to EN 50170
Transfer rate 9.6; 19.2; 93.75; 187.5; 500; 1500 kBit/s
3; 6; 12 MBit/s self-synchronizing

Ambient conditions
Ambient temperature -25 ... 70 °C (248 ... 343 K)
Storage temperature -40 ... 85 °C (233 ... 358 K)

Mechanical specifications
Protection degree IP67 (only in connection with write/read head or cover )
Connection screw terminals
Interface cable 2 x 0.64 mm², double screened, acc. to PROFIBUS standard EN 50170
Supply up to 3 x 1.5 mm²
Material
Housing stainless steel V4A

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Base for read/write station

Model Number

U-P6-B6-V15B
Base for PROFIBUS DP, plugin connection

Features

- PROFIBUS DP acc. to EN 50170
- M12 round connection for supply
- M12 round connection for BUS (B-coded)
- Complete read/write functionality via the PROFIBUS DP
- Transmission of up to 7 double words, 32 bit each, in one cycle
- Connectable bus termination
- Field device with protection class IP67

Function

The base is used in combination with an upper part, the IPT*-FP read/write station. The device is operated as a slave on the PROFIBUS DP. The device makes available the complete read/write functionality. Up to 32 bytes are transmitted per cycle. Of these, up to 7 double words, each with 32 bits, are available to the user. The rounded connector M12 for BUS and supply allows a rapid assembly.

Matching system components

IPT-FP
Read/write station

IPT1-FP
Read/write station

Dimensions

Electrical connection

Indicators/operating means

DIP-switch
Setting the station address
bus connection
ON = active OFF = non-active

Electrical specifications

Rated operational voltage \( U_e \)
20 ... 30 V DC, ripple \( 10\%_{\text{SS}} \), PELV
Power consumption \( P_0 \)
max. 5 W with read/write head IPT*-FP

Electrical isolation

Operating voltage/interface functional insulation acc. to DIN EN 50178, rated insulation voltage \( 50 V_{\text{eff}} \)

Interface

Physical
RS 485
Protocol
PROFIBUS DP acc. to EN 50170
Transfer rate
9.6; 19.2; 93.75; 187.5; 500; 1500 kBit/s
3; 6; 12 MBit/s self-synchronizing

Ambient conditions

Ambient temperature
-25 ... 70 °C (248 ... 343 K)
Storage temperature
-40 ... 85 °C (233 ... 358 K)
Climatic conditions
air humidity max. 95 %

Mechanical specifications

Protection degree
IP67 according to EN 60529 with IPT*-FP
Connection
connector M12 x 1, 4-pin for supply; M12 x 1 device socket, 5-pin, B-coded for PROFIBUS
Material
Housing
aluminium, black anodised
Base for read/write station

**Model Number**

U-P6-B5

Base for INTERBUS

**Features**

- INTERBUS-remote bus subscriber
- 2 PG screw fittings for IN and OUT supply
- Complete read/write functionality via the INTERBUS
- Transfer of 10 bytes of data in one cycle
- DIP switch for ring termination
- Field device with protection class IP67

**Function**

The base is used in combination with an upper part, the IPT*-FP read/write station. The device is operated as a slave on the INTERBUS remote bus. The device makes available the complete read/write functionality. Up to 10 bytes are transmitted per cycle. The continuing bus is activated via DIP switch.

**Matching system components**

IPT-FP

Read/write station

IPT1-FP

Read/write station

**Dimensions**

![Diagram of dimensions]

**Electrical connection**

![Diagram of electrical connection]

**Indicating / Operating means**

- Slide switch to select the transfer rate
- 2 MBit/s
- 500 kBit/s
- Slide switch for the last bus station

**Technical data**

**Indicators/operating means**

<table>
<thead>
<tr>
<th>DIP-switch</th>
<th>ring termination</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 = closed</td>
<td>1 = bus continued</td>
</tr>
</tbody>
</table>

**Electrical specifications**

- Rated operational voltage $U_e$: 20 ... 30 V DC, ripple 10 %, PELV
- Power consumption $P_0$: max. 5 W with read/write head IPT*-FP
- Electrical isolation: functional insulation acc. to DIN EN 50178, rated insulation voltage 50 Veff

**Interface**

- Physical: RS 485
- Protocol: INTERBUS remote bus
- ID code: 03
- Transfer rate: 500 kBit/s or 2 MBit/s internally switchable

**Ambient conditions**

- Ambient temperature: -25 ... 70 °C (248 ... 343 K)
- Storage temperature: -40 ... 85 °C (233 ... 358 K)

**Mechanical specifications**

- Protection degree: IP67 according to EN 60529 with IPT*-FP
- Connection: screw terminals
- Interface cable: up to 1.5 mm²
- Supply: up to 3 x 1.5 mm²
- Material: aluminium, black anodised
Base for read/write station  U-P6-B5-V

**Model Number**
U-P6-B5-V  
Base for INTERBUS, plugin connection

**Features**
- Bus subscriber for INTERBUS installation
- 500 kBit/s or 2 MBit/s transfer rate (switchable)
- M23 round connection for BUS and supply
- Complete read/write functionality via the INTERBUS
- Transfer of 10 bytes of data in one cycle
- Field device with protection class IP67

**Function**
The base is used in combination with an upper part, the IPT*-FP read/write station. The device is operated as a slave at the INTERBUS installation remote bus. The device offers the full read/write functionality. Up to 10 byte per cycle can be transferred. By means of an internal slide switch the transfer rate can be switched over between 500 kbit/s and 2 Mbit/s. The rounded connector M23 for BUS and supply allows a rapid assembly.

**Matching system components**
- IPT-FP  
  Read/write station
- IPT1-FP  
  Read/write station

---

**Dimensions**

**Electrical connection**

**Indicating / Operating means**

**Technical data**

**Electrical specifications**
- Rated operational voltage $U_a$  
  20 ... 30 V DC, ripple 10 %, PELV
- Power consumption $P_0$  
  max. 5 W with read/write head IPT*-FP
- Operating voltage/interface  
  functional insulation acc. to DIN EN 50178, rated insulation voltage $50 \text{ V}_{	ext{eff}}$

**Interface**
- Physical  
  RS 485
- Protocol  
  INTERBUS remote bus
- ID code  
  03
- Transfer rate  
  500 kBit/s or 2 MBit/s internally switchable

**Ambient conditions**
- Ambient temperature  
  -25 ... 70 °C (248 ... 343 K)
- Storage temperature  
  -40 ... 85 °C (233 ... 358 K)

**Mechanical specifications**
- Protection degree  
  IP67 according to EN 60529 with IPT*-FP
- Connection  
  Round connector M23, 8×1 Pin
- Interface cable  
  up to 1.5 mm²
- Supply  
  up to 3 x 1.5 mm²
- Material  
  aluminium, black anodised

---

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Model Number

U-P7V4A-R4

Base with addressable serial Interface RS 485, stainless steel version

Features

- Simple bus system with up to 30 units
- high-grade steel housing V4A
- Serial interface RS 485, addressable
- Protection degree IP67
- Resistant against cleaning material

Function

The base is used in combination with an upper part, the IPT*-FP read/write station. An addressable RS 485 interface is available. It is thus possible to create a simple bus connection with up to 30 subscribers. The address is set and the terminating resistor for the bus is connected via DIP switches. The read/write station is connected to a higher-order control system via the serial interface and receives the commands for writing and/or reading code or data carriers via this interface.

Dimensions

Electrical connection

DIP-switch address

Terminating resistor

Cable gland

Technical data

Indicators/operating means

DIP-switch Setting the station address

bus connection

ON = active OFF = non-active

Electrical specifications

Rated operational voltage $U_e$ 20 ... 30 V DC, ripple 10%, PELV

Power consumption $P_0$ max. 4 W with read/write head IPT*-FP

Electrical isolation

Operating voltage/interface functional insulation acc. to DIN EN 50178, rated insulation voltage 50 V eff

Interface

Physical RS 485, addressable, up to 30 bases, address 1 ... 30

Protocol ASCII

Transfer rate 1200; 2400; 4800; 9600; 19200; 38400 Bit/s

Cable length $\leq 1200$ m

Ambient conditions

Ambient temperature -25 ... 70 °C (248 ... 343 K)

Storage temperature -40 ... 85 °C (233 ... 358 K)

Mechanical specifications

Protection degree IP67 (only in connection with write/read head or cover)

Connection screw terminals

Interface cable 2 conductor, acc. to RS 485

Supply up to 3 x 1.5 mm²

Material

Housing stainless steel V4A
IPT-FP3A6-R2

Model Number
IPT-FP3A6-R2
read/write station, completely ready-manufactured as configuration- and test station

Features
- All necessary components are included in delivery
- With integrated control interface unit
- Separate plug mains unit
- Serial interface RS 232
- 2 LEDs as function indicators
- Read distance of up to 100 mm
- Write distance of up to 50 mm

Function
The read/write station IPT-FP3A6-R2 is the connection between the inductive read/write head and the base, which contains a serial interface for connection to a computer. The complete device contains the evaluation and receives commands for reading or writing code carriers or data carriers via the interface. Due to the integration of the voltage supply and the pluggable connection of the interface, as simple system configuration is possible.

Software
Communication with the identification system is very easy with the demo program IDENT 2005. It shows the system options and simplifies commissioning. The demo program is included in the scope of delivery.

Technical data

<table>
<thead>
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<th>General specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating frequency</td>
</tr>
<tr>
<td>Transfer rate</td>
</tr>
<tr>
<td>Operating distance</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Indicators/operating means</th>
</tr>
</thead>
<tbody>
<tr>
<td>LED green</td>
</tr>
<tr>
<td>LED yellow</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Electrical specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating voltage U_B</td>
</tr>
<tr>
<td>Operating current</td>
</tr>
<tr>
<td>Power consumption P_0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Interface</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical</td>
</tr>
<tr>
<td>Protocol</td>
</tr>
<tr>
<td>Transfer rate</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Standard conformity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electromagnetic compatibility</td>
</tr>
<tr>
<td>Standards</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Ambient conditions</th>
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<tbody>
<tr>
<td>Ambient temperature</td>
</tr>
<tr>
<td>Storage temperature</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mechanical specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protection degree</td>
</tr>
<tr>
<td>Connection</td>
</tr>
<tr>
<td>Interface cable</td>
</tr>
<tr>
<td>Supply</td>
</tr>
<tr>
<td>Material</td>
</tr>
</tbody>
</table>

Dimensions
**Model Number**
IPG-G4-B7-V15
DeviceNet Bus coupler for IDENT-I System P

**Features**
- 2 read/write stations can be connected
- Connection to bus and of read/write stations via EMC proven plug connection
- LED status indicator of bus communication and read/write stations

**Matching system components**
- **IPT-FP**
  Read/write station
- **IPT1-FP**
  Read/write station
- **U-P3-R4**
  Base with addressable serial Interface RS 485
- **U-P3-R4-V15**
  Base with addressable serial Interface RS 485
- **U-P3V4A-R4**
  Base with addressable serial Interface RS 485, stainless steel version

**Accessories**
- **V15-G-YE*M-PVC-V15-G-ABG**
  Connection cable

**Electrical connection**
- Port 1
  - Bus +
  - Bus -
  - CAN-H
  - CAN-L
- Port 2
  - CAN-H
  - CAN-L

**Indicating / Operating means**
- Port 1 Port 2
  - Status net
  - Status bus coupler

**Technical data**

<table>
<thead>
<tr>
<th>Specifications</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Electrical</strong></td>
<td></td>
</tr>
<tr>
<td>Rated operational voltage $U_a$</td>
<td>11 ... 26 V DC</td>
</tr>
<tr>
<td>Current consumption</td>
<td>≤ 160 mA at $U_a = 11$ V DC, ≤ 100 mA at $U_a = 24$ V DC</td>
</tr>
<tr>
<td><strong>Interface</strong></td>
<td></td>
</tr>
<tr>
<td>Connection</td>
<td>DeviceNet</td>
</tr>
<tr>
<td>Transfer rate</td>
<td>125, 250, 500 kBit/s selectable via BCD switch</td>
</tr>
<tr>
<td>Address setting</td>
<td>selectable via BCD switch</td>
</tr>
<tr>
<td>Cable length</td>
<td>1 m</td>
</tr>
<tr>
<td><strong>Ambient conditions</strong></td>
<td></td>
</tr>
<tr>
<td>Ambient temperature</td>
<td>-25 ... 70 °C (248 ... 343 K)</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>-40 ... 85 °C (233 ... 358 K)</td>
</tr>
<tr>
<td>Climatic conditions</td>
<td>air humidity max. 90 %</td>
</tr>
<tr>
<td><strong>Mechanical specifications</strong></td>
<td></td>
</tr>
<tr>
<td>Protection degree</td>
<td>IP67</td>
</tr>
<tr>
<td>Connection</td>
<td>Read/write stations: M12 plug connection, 5-pin, screened DeviceNet: 5-pin CombiCon connector according to DeviceNet specification</td>
</tr>
<tr>
<td>Material</td>
<td>PBT</td>
</tr>
<tr>
<td>Housing</td>
<td></td>
</tr>
<tr>
<td>Installation</td>
<td>snap-on to 35 mm standard rail or screw fixing</td>
</tr>
</tbody>
</table>
7 2.45 GHz read/write station (MT system)

7.1 System description

The MT system consists of a handheld read/write device and the read only tag or read/write tag. The read only tags and read/write tags contain a non-variable code that acts as a memory bank for variable data. The read/write device takes on the data transfer to the read only tags and read/write tags and can be connected directly to a higher-level computer, such as a PC or PLC, via Ethernet, USB or a serial interface. The read/write device can also be operated in stand-alone mode.

The MT system’s microprocessor-run read/write device operates at 2.45 GHz with adjustable channels, so several stations that are right next to each other can provide for the trouble-free transfer of encrypted data.

The read/write device is addressed via Ethernet, USB or a serial RS 232/485 interface, but can also operate independent of the control interface through application software. Three semiconductor inputs, two semiconductor outputs and a relay output are also provided. The system can communicate with several read/write tags in the read range (multitag capable) and analyze movement direction as well as speed. Read distances of up to 6 m and write distances of 0.3 m are achieved. The connection is made via cord grips.

A typical application area for this system is identification for access control or of very fast moving objects.

Read/write device

The read/write device MTT6000-F120-B12-V45 is a communications arrangement between the read/write tags themselves and the computer. It receives its orders from a computer or an Ethernet interface. As computers, a PC and PLC will usually do.

The data exchange between the MTM C1/C2 read/write tags, the MTO C1/C2 read only tags and the read/write device takes place with the help of microwaves in the range of 2.435 ... 2.465 GHz. The transmitted microwaves are polarized circularly and are vertically emitted through the front cover in the form of a club.

The read/write device detects moving objects such as persons or vehicles. It can register approaches as well as departures.

All cable connections are easily accessible after opening the housing. There is furthermore a service panel with three LEDs, two push buttons for various settings, and a buzzer.
RFID Stand-alone 2.45 GHz

**Code/Tag**

**Communication**

The code/tags repeatedly reflect information on any transmitting read/write device, independent of which frequency between 2.435 and 2.465 GHz is being used. If different write/read devices simultaneously scan the tag, they will all yield trouble-free and reliable reads.

The data provided consists of a mark that is encoded at the plant, an 8-digit decimal number from the code memory including a 32-bit checksum, data from the read/write memory and a status field. A sequence, consisting of mark/checksum, data and status, is called an ID frame. This ID frame is transmitted with a constant or a random interval, in accordance with the formatting of the read/write tag. The notion of information time has been selected for two consecutive ID frames with an embedded interval. Several read/write tags can be evaluated within the read range, provided that the read/write tags are set to random mode.

The maximum information time ($T_{max}$) is always less than 150 ms, at an average of 80 ms. This means that the read only tag can reflect the ID frame 12 times per second. (see image left)

**Multiple detections**

Several read only tags and read/write tags can be evaluated within the read range, provided that the read only tags and read/write tags are set to random mode, as can be gathered from the image on the left. When collisions take place, a check-sum algorithm in the read/write device deletes this ID frame. In the least suitable situation, for example, if all read/write tags were at a long distance or under strong interference, the probability of an error from an incorrect interpretation would be less than 1 to 5, thanks to the 32-bit checksum $\times 10^9$. 

![Diagram of RFID Stand-alone 2.45 GHz system](image)
Read time

The chart shows the time needed to read all read only tags and read/write tags in read range.

Operating modes

The formatting commands for the different modes are transmitted by microwaves, and indeed to the same distance at which the read/write tags can still be described. The memory size, interval type, interval length and data transfer speed to be applied are the parameters.

Formatting can achieve an optimization of various application features. The different memory modes optimize memory allocation with regard to speed. The two interval types can establish whether multiple detections, i.e. the evaluation of several read/write tags in the read range, should take place. Multiple detections are only possible in random mode. Interval length and the selected data-transfer speed influence transfer time. The read range is linked to the transfer speed.

The letters M, Q, F etc. are abbreviations that are further explained in the text and that must be provided for programming.

Memory modes

M - mini (low capacity), 46 bit, 14 data bit plus checksum
Q - quarter (one fourth capacity), 186 bit, 154 data bit plus checksum
F - full (full capacity), 606 bit, 574 data bit plus checksum

Interval length

0 - zero i.e. uninterrupted
4 - small i.e. 4 times in the ID frame time
8 - mid i.e. 8 times in the ID frame time

Interval type

C - constant the interval together with the ID frame is always constant
R - random the interval changes randomly (random mode)

Transfer speed

L - low read and write with 4 Kbyte/s
H - high read with 16 Kbyte/s, write with 4 Kbyte/s
The modes are designated with \textbf{MC0L}, \textbf{MR4H}, \textbf{FC0H} and so forth. Interval 16 modes are also available, but the modes described above are sufficient for most applications.

The read times depend on the selected operating mode. The table lists the maximum read times for the different operating modes, shown for high and low data-transfer speeds. The battery life for the selected operating mode is also given.

<table>
<thead>
<tr>
<th>Memory Mini</th>
<th>Read time in [ms] at transfer speed</th>
<th>Battery life [years]</th>
</tr>
</thead>
<tbody>
<tr>
<td>MC0-H/L</td>
<td>High: 50 Low: 130</td>
<td>6</td>
</tr>
<tr>
<td>MC4-H/L</td>
<td>100 Low: 360</td>
<td>6</td>
</tr>
<tr>
<td>MC8-H/L</td>
<td>170 Low: 660</td>
<td>10</td>
</tr>
<tr>
<td>MR4-H/L</td>
<td>170 Low: 660</td>
<td>9</td>
</tr>
<tr>
<td>Memory Quarter</td>
<td>QC0-H/L 70 Low: 240</td>
<td>6</td>
</tr>
<tr>
<td>QC4-H/L</td>
<td>180 Low: 700</td>
<td>9</td>
</tr>
<tr>
<td>QC8-H/L</td>
<td>350 Low: -</td>
<td>10</td>
</tr>
<tr>
<td>QR4-H/L</td>
<td>350 Low: 1300</td>
<td>9</td>
</tr>
<tr>
<td>Memory Full</td>
<td>FC0-H/L 140 Low: 520</td>
<td>6</td>
</tr>
<tr>
<td>FC4-H/L</td>
<td>370 Low: 1400</td>
<td>6</td>
</tr>
<tr>
<td>FC8-H/L</td>
<td>750 Low: -</td>
<td>10</td>
</tr>
<tr>
<td>FR4-H/L</td>
<td>750 Low: -</td>
<td>10</td>
</tr>
</tbody>
</table>

**Write range**

The write area has a club-shaped design. It depends on the microwave field and the sensitivity of the read/write tag. For the MTM-C1 read/write tag there is a secure write area within a club of 0 to 0.3 m.

**Write time**

Write time depends on the formatting of the read/write tag and has a statistically-assured size. It stands at, for instance, 200 for MC0H formatting, 300 for QC0H and 400 for FC0H ms in standard cases. At a desired write security of 99.999, these times increase %, i.e. 1 error in 100,000 write operations to 600, 800 and 3000 ms.

**Write security**

The read/write tag has been provided with a backup memory in the event that it were accidently removed from the write area as it received the data to be written from the microwaves. It automatically stores the old data. The “write-error bit” is placed into the status register of the read/write tag. This bit provides the system with an automatic warning.
### Status register

- The status register contains 7 bits.
- Bit 7 = 1, battery life expired
- Bit 7 = 0, battery OK
- Bit 6 = 1, unsuccessful write attempt
- Bit 6 = 0, successful write attempt
- Bit 5 and 4 = 1, Monitor input 1 open
- Bit 5 and 4 = 0, Monitor input 1 in mass
- Bit 3, 2 and 1 = 1, Monitor input 2 open
- Bit 3, 2 and 1 = 0, Monitor input 2 in mass

### Read/write ranges

Read/write range in air (at 25°C, in m)

<table>
<thead>
<tr>
<th>Read/write device</th>
<th>MTT6000-F120-B12-V45</th>
</tr>
</thead>
<tbody>
<tr>
<td>Code / Tag</td>
<td>Reading</td>
</tr>
<tr>
<td>MTO-C1</td>
<td>…6.0</td>
</tr>
<tr>
<td>MTO-C2</td>
<td>…6.0</td>
</tr>
<tr>
<td>MTM-C1</td>
<td>…6.0</td>
</tr>
<tr>
<td>MTM-C2</td>
<td>…6.0</td>
</tr>
</tbody>
</table>
RFID Stand-alone 2.45 GHz

- 125 KHz RFID
- 250 KHz RFID
- 868 MHz RFID
- 13.56 MHz RFID
- 2.45 GHz RFID

Handhelds
Accessories

Courtesy of Steven Engineering, Inc.
230 Ryan Way, South San Francisco, CA 94080
Main Office: (650) 588-9200
Outside Local Area: (800) 258-9200
www.stevenengineering.com
Model Number

MTT6000-F120-B12-V45

Read/write device

Features

• High reading distance 6 m
• Serial interfaces RS 232 and RS 485
• Ethernet interface with TCP/IP
• USB interface for PC connection
• Stand-alone functionality
• Frequency hopping (FHSS)
• Multi-tag capability (93 frequency channels)
• Integrated buzzer
• Protection degree IP65

Dimensions

Electrical connection

<table>
<thead>
<tr>
<th>Pin</th>
<th>Signal</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>TX</td>
<td>Transmitted data (from Device to Host)</td>
</tr>
<tr>
<td>2</td>
<td>RX</td>
<td>Received data (from Host to Device)</td>
</tr>
<tr>
<td>3</td>
<td>GND</td>
<td>Ground</td>
</tr>
<tr>
<td>4</td>
<td>RX+</td>
<td>Received data (from Host to Device)</td>
</tr>
<tr>
<td>5</td>
<td>RX-</td>
<td>n.c.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pin</th>
<th>Signal</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>TX+</td>
<td>Transmitted data (from Device to Host)</td>
</tr>
<tr>
<td>2</td>
<td>TX−</td>
<td>Transmitted/Received data</td>
</tr>
<tr>
<td>3</td>
<td>GND</td>
<td>Ground</td>
</tr>
<tr>
<td>4</td>
<td>RX+</td>
<td>Received data (from Host to Device)</td>
</tr>
<tr>
<td>5</td>
<td>RX−</td>
<td>n.c.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pin</th>
<th>Signal</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,3</td>
<td>SPL</td>
<td>Positive DC supply input</td>
</tr>
<tr>
<td>2,4</td>
<td>RTN</td>
<td>Negative DC supply input</td>
</tr>
</tbody>
</table>
Function

The read/write device MTT6000-F120-B12-V45 establishes a link between the code/data carriers of the RFID system MT and a higher-level computer (such as an industrial PC or PLC). The read/write device communicates with the computer via the interfaces Ethernet (TCP/IP), USB 2.0, RS 232 or RS 485 (2 or 4 wire). The maximum range for reading/read/write devices in the frequency range 2.45 GHz is 6 m.

In addition to offering many innovative functions, the read/write device also features frequency hopping (FHSS). This function enables the read/write device to "jump" between frequencies within the specified frequency band. This significantly reduces communication interference, especially when several read/write devices are used in close proximity to one another.

The system is also multi-tag capable, i.e. several code or data carriers are identified within the sensing range. The read/write device can partition the specified frequency band into 93 different channels, thus making it compatible with older systems.

The read/write device works with the operating system Linux and features an open development platform for the development of own applications.

For direct connections, the read/write device has been provided with a relay output, 3 optocoupler inputs, 2 open collector outputs as well as interface for Wiegand/magnet strip protocols.

The status of the read/write device is indicated by several integrated LEDs and a buzzer. For further information, please refer to the system and device manuals.

Accessories

RFIDControl

Software for RFID identification systems

Technical data

<table>
<thead>
<tr>
<th>Category</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>General specifications</td>
<td>Operating frequency: 2.402 ... 2.482 GHz, Polarization: circular</td>
</tr>
<tr>
<td>Transfer rate</td>
<td>read: 4 kBit/s, write: 4 kBit/s</td>
</tr>
<tr>
<td>Operating distance</td>
<td>maximum: 6 m</td>
</tr>
<tr>
<td>Memory</td>
<td>Type/Size: Flash 16 MByte, RAM 32 MByte</td>
</tr>
<tr>
<td>Indicators/operating means</td>
<td>LED green/yellow/red, controllable per software</td>
</tr>
<tr>
<td>Electrical specifications</td>
<td>Rated operational voltage U₀: 10 ... 30 V DC</td>
</tr>
<tr>
<td>Current consumption</td>
<td>at 24 V: 150 mAh, at 12 V: 500 mA</td>
</tr>
<tr>
<td>Interface</td>
<td>Physical: Ethernet, Protocol: TCP/IP, Transfer rate: 10/100 MBit/s</td>
</tr>
<tr>
<td>Interface 1</td>
<td>Physical: USB, Protocol: ASCII, Transfer rate: max. 12 MBit/s</td>
</tr>
<tr>
<td>Interface 2</td>
<td>Physical: RS 232 or RS 485; Protocol: ASCII, Transfer rate: 1.2 ... 115.2 kBit/s</td>
</tr>
<tr>
<td>Input</td>
<td>Optocoupler: 3 inputs, Input level: ON: ≥ 2.4 V, OFF: ≥ 0 V, max. 0.2 V</td>
</tr>
<tr>
<td>Output</td>
<td>Electronic: output 1: open-collector; output 2: open-collector, max. 100 mA</td>
</tr>
<tr>
<td>Relay</td>
<td>switching current ≤ 2 A, Pmax = 50 W, switching voltage ≤ 220 V, 48 V AC</td>
</tr>
</tbody>
</table>

Compliance with standards and directives

Standard conformity: Protection degree EN 60529

Ambient conditions

Ambient temperature: -20 ... 60 °C (253 ... 333 K)
Storage temperature: -20 ... 60 °C (253 ... 333 K)

Mechanical specifications

Protection degree: IP65
Material: Plastic
Mass: 3 kg
Dimensions: 290 mm x 165 mm x 56 mm (W x H x D)
Model Number

**MTO-C1**

Read only tag

**Features**

- 8-digit decimal number as fixcode
- Battery life expectancy 6 years
- Battery life independent of the read/write operations
- Credit card size
- Protection degree IP67

**Function**

The code carrier can still be safely read from a distance of more than 3 m, even when several code carriers are located in the read zone.

Each code carrier is delivered ex works with an invariable and unique 8-digit decimal number and a 32-bit test check sum which detects the data carrier unambiguously and thus unmistakably. An ecologically friendly lithium cell assures a long action time regardless of the number of read processes. Towards the end of the capacity, one bit which can be evaluated by means of the read/write device during the next data transfer, is set in the status register of the code carrier.

The MTO-C1 code carrier can either be fixed with a clip, a card retainer, magnetically or with adhesive tape. In addition, it is provided with holes for M3 screws.

The code carrier is vibration resistant, corrosion resistant, UV-stable, waterproof and resistant to chemicals.

**Accessories**

- **MTA-C1V1** Card holder with fixing clip
- **MTA-C1V2** Card holder for window mounting in vehicles

---

**Technical data**

**General specifications**

- Operating frequency: 2.435 ... 2.465 GHz, channel separation 300 kHz
- Reading speed: depending on the operating mode and the number of read/write tags in the read zone between 80 ms and 2700 ms
- Memory: an 8-digit decimal number as fix code and 32-bit checksum
- Battery life: typically 6 years, independent of the number of read operations

**Ambient conditions**

- Ambient temperature: -20 ... 85 °C (253 ... 358 K)
- Storage temperature: -20 ... 85 °C (253 ... 358 K)
- Shock and impact resistance: shock: 500 G, 1 ms on all 3 spatial axes 100x according to IEC 68-2-27
  Impact: 40 G, 6 ms on all 3 spatial axes 1000x according to IEC 68-2-29 Eb

**Mechanical specifications**

- Protection degree: IP67 according to EN 60529
- Material: Polymer
- Housing: Polymeric
- Mass: 15 g

---

**Dimensions**

![Dimensions Diagram]
Model Number
MTO-C2
Read only tag

Features
- 8-digit decimal number as fixcode
- Battery life 10 years
- Battery life independent of the read/write operations
- Sturdy housing
- Protection degree IP67

Function
The code carrier can still be safely read from a distance of more than 3 m, even when several code carriers are located in the read zone. Each code carrier is delivered with an invariable and unique 8-digit decimal number and a 32-bit test check sum, which detects the data carrier unambiguously and thus unmistakably. An ecologically friendly lithium cell assures a long action time regardless of the number of read processes. Towards the end of the capacity, one bit which can be evaluated by means of the read/write device during the next data transfer, is set in the status register of the code carrier.

The MTO-C2 code carrier is fixed with 2 M4 screws.

The C2 housing type is especially robust allowing for application in rough operating conditions.

The code carrier is vibration resistant, corrosion resistant, UV-stable, waterproof and resistant to chemicals.
**Model Number**

MTM-C1

**read/write tag**

**Features**

- Memory 574 bits plus 8-digit decimal number as fix code
- Battery life expectancy 6-10 years
- Battery life independent of the read/write operations
- Protection degree IP67

**Function**

The data carrier can be read from a distance of 4 m and safely inscribed from a distance of 0.5 m dependent on different settings. A max. of 606 bits (82 7-bit-ASCII characters and a 32-bit test check sum) can be stored in the data carrier. Thus 574 bit are available for application specific data. In addition, each data carrier is delivered ex works with an invariable and unique 8-digit decimal number, which detects the data carrier unambiguously.

By means of microwaves, formatting and the setting of various possible operating modes takes place. The same conditions are applicable as for the writing of data. The distance to the read/write device can be up to 0.5 m.

The life of the internal lithium cells depends on the operating mode of the data carrier. When the voltage drops towards the end of the capacity, one bit is set in the status register, and transmitted to the read/write device during each read procedure. The data carrier is vibration resistant, corrosion resistant, UV-stable, waterproof and resistant to chemicals.

**Accessories**

MTA-C1V1
Card holder with fixing clip

MTA-C1V2
Card holder for window mounting in vehicles

---

**Dimensions**

---

**Technical data**

**General specifications**

- Operating frequency: 2.435 ... 2.465 GHz, channel separation 300 kHz
- Reading speed: depending on operating mode and number of read/write tags in the read zone, between 50 ms and 2000 ms
- Writing speed: depending on the operating mode, between 200 ms and 6000 ms

**Memory**

- Capacitance: 606 Bit R/W (584 bits available for user data)
- 8-digit decimal number as fix code
- Battery life: typical: 6 ... 10 years, independent of the number of read and write processes, but dependent on the selected modes

**Ambient conditions**

- Ambient temperature: -20 ... 85 °C (253 ... 358 K)
- Storage temperature: -20 ... 85 °C (253 ... 358 K)
- Shock and impact resistance: shock: 500 G, 1 ms on all 3 spatial axes 100x according to IEC 68-2-27
  Impact: 40 G, 6 ms on all 3 spatial axes 1000x according to IEC 68-2-29

**Mechanical specifications**

- Protection degree: IP67 according to EN 60529
- Material: Polymer
- Housing: Mass: 15 g
Data carrier

**Model Number**

MTM-C2

read/write tag

**Features**

- Memory 574 bits plus 8-digit decimal number as fix code
- Battery life expectancy 6-10 years
- Battery life independent of the read/write operations
- sturdy housing
- Protection degree IP67

**Function**

The data carrier can be read from a distance of 4 m and safely inscribed from a distance of 0.5 m dependent on different settings. A max. of 606 bits (82 7-bit-ASCII characters and a 32-bit test check sum) can be stored in the data carrier. Thus 574 bit are available for application specific data. In addition, each data carrier is delivered ex works with an invariable and unique 8-digit decimal number, which detects the data carrier unambiguously.

By means of microwaves, formatting and the setting of various possible operating modes takes place. The same conditions are applicable as for the writing of data. The distance to the read/write device can be up to 0.5 m. The life of the internal lithium cells depends on the operating mode of the data carrier. When the voltage drops towards the end of the capacity, one bit is set in the status register, and transmitted to the read/write device during each read procedure. The C2 housing type is especially robust allowing for application in rough operating conditions.

The data carrier is vibration resistant, corrosion resistant, UV-stable, waterproof and resistant to chemicals.

---

**Technical data**

<table>
<thead>
<tr>
<th>General specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating frequency: 2.435 ... 2.465 GHz, channel separation 300 kHz</td>
</tr>
<tr>
<td>Reading speed: depending on operating mode and number of read/write tags in the read zone, between 50 ms and 2000 ms</td>
</tr>
<tr>
<td>Writing speed: depending on the operating mode, between 200 ms and 6000 ms</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capacitance: 606 Bit R/W (584 bits available for user data)</td>
</tr>
<tr>
<td>Battery life: typical: 6 ... 10 years, independent of the number of read and write processes, but dependent on the selected modes</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ambient conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambient temperature: -40 ... 85 °C (233 ... 358 K)</td>
</tr>
<tr>
<td>Storage temperature: -40 ... 85 °C (233 ... 358 K)</td>
</tr>
<tr>
<td>Shock and impact resistance: shock: 500 G, 1 ms on all 3 spatial axes 100x according to IEC 68-2-27 impact: 40 G, 6 ms on all 3 spatial axes 1000x according to IEC 68-2-29 Eb</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mechanical specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protection degree: IP67 according to EN 60529</td>
</tr>
<tr>
<td>Material: Polymer</td>
</tr>
<tr>
<td>Housing: Polymer</td>
</tr>
<tr>
<td>Mass: 60 g</td>
</tr>
</tbody>
</table>
Model Number

MTA-C1V1
Card holder with fixing clip

Features

- Card holder for read only tag and read/write tag MTO-C1 and MTM-C1
- With mounting flange

Dimensions

Technical data

Material: support: polycarbonate
clip: polycarbonate

Mass:
- without clip: 7 g
- with clip: 10 g

Dimensions:
92 mm x 64 mm x 9 mm (W x H x D) including Clip

Model Number

MTA-C1V2
Card holder for window mounting in vehicles

Features

- Card holder for read only tag and read/write tag MTO-C1 and MTM-C1
- Window installation in vehicles by means of adhesive strips

Dimensions

Technical data

Material: support: polycarbonate
clip: metal

Mass:
- (window version): 7 g
- with clip: 11 g
Barcodes enable printed data to be read by machine. The barcode is used in almost every area of industry, trade, public authorities and everyday life. The information encrypted in a barcode is scanned optically with the help of a special reader and made available to a computer via a standardized interface. With a barcode imager, you can detect the code from a certain distance in a still position or while moving. Due to automatic barcode reading and the capability of modern computers, industry has better possibilities for acquisition of operating data and control of conveying, production and storage systems.
### 8.1 Overview of the 1D barcode scanner

<table>
<thead>
<tr>
<th>Order code</th>
<th>VB6-240</th>
<th>VB8-305</th>
<th>VB12-***</th>
<th>VB14N-***</th>
<th>VB34-2500**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Page</td>
<td>204</td>
<td>206</td>
<td>208+210</td>
<td>212+214</td>
<td>216+218</td>
</tr>
</tbody>
</table>

#### General data
- **Order code**: VB6-240, VB8-305, VB12-***, VB14N-***, VB34-2500**
- **Page**: 204, 206, 208+210, 212+214, 216+218
- **Read distance**: up to 240 mm, 35–305 mm, 10–220 mm, 40–600 mm, 500–2500 mm
- **Scan rate**: 800/sec or 1200/sec, 270/sec, 350/sec or 500/sec, 500–1000/sec, 600–1200/sec
- **Resolution**: 0.15 mm (6 mils), 0.076 mm (3 mils), 0.12 mm (5 mils)–0.2 mm (8 mils), 0.2 mm (8 mils)–0.35 mm (14 mils)
- **Max**: 0.2 mm (8 mils)
- **Type of light**: Laser diode 658 nm, 4 red LEDs, 630 nm
- **Semiconductor laser, 655 nm**
- **Semiconductor laser, 630–880 nm**
- **Semiconductor laser, 655 nm**
- **Laser class**: Class 2 - EN 60825-1, Class II - CDRH
- **Interface**: 2 x RS 232 or 1 x RS 485 (full or half duplex) selectable through software
- **Programmable interface**: Programmable via serial interface
- **Programmable via serial interface**: Programmable via serial interface
- **Programmable via serial interface**: Programmable via serial interface
- **Programmable via serial interface**: Programmable via serial interface
- **Connection**: 1 m connecting cable with 15-pin Sub-D plug
- **Mechanical data**: 1 m connecting cable with 25-pin Sub-D socket
- **Material**: ZAMA (zinc, aluminum, magnesium alloy), Plastic ABS, Magnesium, polycarbonate, Aluminum

### Connection modules for barcode scanners

<table>
<thead>
<tr>
<th>Order code</th>
<th>CBX100</th>
<th>CBX500</th>
</tr>
</thead>
<tbody>
<tr>
<td>Page</td>
<td>220</td>
<td>222</td>
</tr>
</tbody>
</table>

#### Interface
- **Order code**: CBX100, CBX500
- **Page**: 220, 222
- **Connection interface**: RS 232/RS 485 modular expandable (e.g. PROFIBUS, Ethernet, DeviceNet)
- **Programmable interface**: Programmable via serial interface
- **Programmable interface**: Programmable via serial interface
- **Programmable interface**: Programmable via serial interface
- **Programmable interface**: Programmable via serial interface
- **Connection**: 25-pin Sub-D socket for barcode scanner, M16 cord grip for system connection (4x)
- **Connection**: 25-pin Sub-D socket for barcode scanner, M16 cord grip for system connection (5x)
- **Weight**: 380 g, 780 g
Model Number

VB6-240
Barcode scanner

Features

- Extremely compact dimensions
- Up to 1200 scans/s
- ACB™ (Advanced Code Builder) reconstructor
- IP65 rugged industrial housing
- Test function with display of reader
- Engine control (On/Off) possible

Technical data

<table>
<thead>
<tr>
<th>General specifications</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Laser class</td>
<td>Class 2 - EN 60825-1, Class II - CDRH</td>
</tr>
<tr>
<td>Scan rate</td>
<td>800 s⁻¹ or 1200 s⁻¹</td>
</tr>
<tr>
<td>Reading distance</td>
<td>up to 240 mm</td>
</tr>
<tr>
<td>Light type</td>
<td>Visible laser diode 658 nm</td>
</tr>
<tr>
<td>Optical face</td>
<td>frontal</td>
</tr>
<tr>
<td>Resolution</td>
<td>0.15 mm (6 mils)</td>
</tr>
<tr>
<td>Symbologies</td>
<td>EAN/UPC (including Add-on 5), 2/5 Interleaved. Code 39 (Standard and Full ASCII), Code 93, Code 128, EAN 128, ISBM 128, Pharmacode</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Indicators/operating means</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating display</td>
<td>&quot;Power on /100 %&quot;, &quot;Good Read /80&quot;, &quot;Ext. Trig /80 %&quot;, &quot;TX Data /40 %&quot;, &quot;Laser on /20 %&quot;</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Electrical specifications</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating voltage U₀</td>
<td>5 V DC ± 5 %</td>
</tr>
<tr>
<td>Power consumption P₀</td>
<td>2 W max.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Interface</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Interface type</td>
<td>2 x RS 232 or 1 x RS 485 (full or half duplex) selectable via software</td>
</tr>
<tr>
<td>Programming interface</td>
<td>via serial port programmable (VisoSetup)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Input</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Input signal</td>
<td>1 digital input</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Output</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Signal output</td>
<td>2 digital outputs programmable</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ambient conditions</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambient temperature</td>
<td>0 ... 45 °C (273 ... 318 K)</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>-20 ... 70 °C (253 ... 343 K)</td>
</tr>
<tr>
<td>Relative humidity</td>
<td>90 %, non-condensing</td>
</tr>
<tr>
<td>Shock resistance</td>
<td>IEC 68-2-27 Test EA 30G, 11 ms; 3 impacts on each axis</td>
</tr>
<tr>
<td>Vibration resistance</td>
<td>IEC 68-2-6 Test FC 1.5 mm; 10 ... 55 Hz; 2 hours on each axis</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mechanical specifications</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Protection degree</td>
<td>IP65</td>
</tr>
<tr>
<td>Connection</td>
<td>15-pin Sub-D plug</td>
</tr>
<tr>
<td>Material</td>
<td>ZAMA (zinc, aluminium, magnesium alloy)</td>
</tr>
<tr>
<td>Housing</td>
<td></td>
</tr>
<tr>
<td>Cable</td>
<td></td>
</tr>
<tr>
<td>Length L</td>
<td>100 cm</td>
</tr>
<tr>
<td>Dimensions</td>
<td>40 mm x 30 mm x 22 mm</td>
</tr>
</tbody>
</table>
Function

The combination of extremely compact dimensions and powerful high speed reading capabilities makes the VB6 scanner ideal for demanding OEM applications. In fact, VB6 miniaturization allows easy integration into OEM equipment and automatic machinery. The high scan rate and sophisticated electronic design effectively addresses difficult reading conditions. Availability of embedded ACB™ (Advanced Code Builder) reconstruction SW algorithm allows consistent decoding of damaged or mis-applied labels (resulting in high tilt angles).

VB6 installation and configuration is easy and simple thanks to compact size and to the new test operating mode with bar-graph. Test mode is activated by means of a pushbutton on the scanner (external PC not required) and the LED bargraph shows the readability. This feature increases the scanner ease of installation and re-positioning during product changeovers in automated machinery. VB6 operates at a speed up to 1200 scan/s, extending the application range also to high speed document handling, paper inserting, label rewinding and packaging machines. Additionally, the scanner motor can be switched ON and OFF via SW command. This feature is useful in very low throughput application or when the machine sits idle for long periods. A simple software command allows a prompt restoration of full operation when needed.

VB6, the best answer for reduced space and high performance integration barcode reading needs.

Electrical connection

15-pin Sub-D connector pinout

<table>
<thead>
<tr>
<th>Pin</th>
<th>Name</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>VS</td>
<td>Power Supply Input Voltage +</td>
</tr>
<tr>
<td>5</td>
<td>GND</td>
<td>Power Supply Input Voltage -</td>
</tr>
<tr>
<td>8</td>
<td>PE</td>
<td>Protective Earth Ground</td>
</tr>
<tr>
<td>13</td>
<td>SHIELD</td>
<td>Cable Shield</td>
</tr>
<tr>
<td>9</td>
<td>EXT</td>
<td>External Trigger -</td>
</tr>
<tr>
<td>7</td>
<td>OUT1 +</td>
<td>Output 1 +</td>
</tr>
<tr>
<td>14</td>
<td>OUT2 +</td>
<td>Output 2 +</td>
</tr>
<tr>
<td>11, 12, 15</td>
<td>NC</td>
<td>Not connected</td>
</tr>
</tbody>
</table>

Pin Name RS 232          RS 485 full duplex RS 485 half duplex
2    Serial interface     Tx Main   Tx-   Tx/Rx-
3    signals             Rx Main   Rx+   Tx/Rx+
6    Tx AUX              Tx+     Tx+   Tx/Rx+
10   Rx AUX              Rx-     Rx-   Tx/Rx+
4    SGND                SGND    SGND  SGND

Curves / Diagrams

Reading characteristics

![Reading characteristics graph](image)
## Barcode scanner

### VB8-305

#### Model Number
VB8-305

CCD barcode scanner

#### Features
- CCD line scanner
- Small, compact design
- Programmable via Windows software

#### Technical data

<table>
<thead>
<tr>
<th>General specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scan rate</td>
</tr>
<tr>
<td>Reading distance</td>
</tr>
<tr>
<td>Light type</td>
</tr>
<tr>
<td>Optical face</td>
</tr>
<tr>
<td>Resolution</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Nominal ratings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Camera Type</td>
</tr>
<tr>
<td>Number of pixels</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Indicators/operating means</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating display</td>
</tr>
<tr>
<td>Function display</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Electrical specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating voltage $U_D$</td>
</tr>
<tr>
<td>Power consumption $P_0$</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Interface</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interface type</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Input</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input voltage</td>
</tr>
<tr>
<td>Number/Type</td>
</tr>
<tr>
<td>Input type</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number/Type</td>
</tr>
<tr>
<td>Switching voltage</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ambient conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambient temperature</td>
</tr>
<tr>
<td>Storage temperature</td>
</tr>
<tr>
<td>Relative humidity</td>
</tr>
<tr>
<td>Shock resistance</td>
</tr>
<tr>
<td>Vibration resistance</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mechanical specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protection degree</td>
</tr>
<tr>
<td>Connection</td>
</tr>
<tr>
<td>Material</td>
</tr>
<tr>
<td>Cable Length</td>
</tr>
</tbody>
</table>

#### Dimensions

![Dimensions Diagram](image-url)
Function

The VB8-305 compact CCD scanner is the entry level solution for many OEM applications. Thanks to its unique combination of technical characteristics it is ideally suited for installation in machinery and sets new standards for the OEM sector.

The VB8-305 excels through optimal reading characteristics. It can scan codes directly at the read window due to its wide reading field and improved depth focus.

Lightweight and compact the scanner also reduces the overall dimensions and weight of a complete system.

For cost-saving measures the immunity against external light (100000 Lux) and the excellent reading characteristics are useful. In addition the VB8-305 minimizes the maintenance costs, dependent on down-time, with a warranted 240,000 hours MTBF.

The VB8-305 can be programmed through software commands via RS 232 or using the configuration software.

Optionally available is the 80° passive reflector with lateral readings. It reduces the overall space requirement and makes even contact readings possible.

Accessories

DM-VB8
Deviation mirror for barcode scanner series VB8

25-pin Sub-D connector pinout

<table>
<thead>
<tr>
<th>Pin</th>
<th>Name</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>9, 13</td>
<td>VCC+</td>
<td>Power supply input voltage +</td>
</tr>
<tr>
<td>25</td>
<td>GND</td>
<td>Power supply input voltage -</td>
</tr>
<tr>
<td>1</td>
<td>Shield</td>
<td>Earth Ground</td>
</tr>
<tr>
<td>2, 21</td>
<td>TX</td>
<td>RS 232 Transmit Data</td>
</tr>
<tr>
<td>3, 20</td>
<td>RX</td>
<td>RS 232 Receive Data</td>
</tr>
<tr>
<td>4</td>
<td>RTS</td>
<td>RS 232 Request to Send</td>
</tr>
<tr>
<td>5</td>
<td>CTS</td>
<td>RS 232 Clear to Send</td>
</tr>
<tr>
<td>7</td>
<td>SGND</td>
<td>Signal Ground</td>
</tr>
<tr>
<td>11</td>
<td>OUT+</td>
<td>Output +</td>
</tr>
<tr>
<td>10, 12, 22</td>
<td>OUT-</td>
<td>Output -</td>
</tr>
<tr>
<td>18</td>
<td>Ext. TRIG. +</td>
<td>External Trigger +</td>
</tr>
<tr>
<td>19</td>
<td>Ext. TRIG. -</td>
<td>External Trigger -</td>
</tr>
<tr>
<td>6, 8, 14, 15</td>
<td>NC</td>
<td>Not connected</td>
</tr>
<tr>
<td>16, 17, 23</td>
<td>NC</td>
<td>Not connected</td>
</tr>
<tr>
<td>24</td>
<td>NC</td>
<td>Not connected</td>
</tr>
</tbody>
</table>

Curves / Diagrams

Reading characteristics

<table>
<thead>
<tr>
<th>Read field width in mm</th>
<th>Read range in mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.13 mm</td>
<td>120</td>
</tr>
<tr>
<td>0.20 mm</td>
<td>100</td>
</tr>
<tr>
<td>0.50 mm</td>
<td>80</td>
</tr>
<tr>
<td>0.70 mm</td>
<td>60</td>
</tr>
<tr>
<td>0.90 mm</td>
<td>40</td>
</tr>
<tr>
<td>1.10 mm</td>
<td>20</td>
</tr>
<tr>
<td>1.30 mm</td>
<td>0.0</td>
</tr>
</tbody>
</table>

Electrical connection
### Barcode scanner

#### VB12-*

**Technical data**

<table>
<thead>
<tr>
<th></th>
<th>VB12-110</th>
<th>VB12-110-S</th>
<th>VB12-220</th>
<th>VB12-220-S</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>General specifications</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Laser class</td>
<td>2 - IEC825-1; class II - CDRH</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scan rate</td>
<td>350 s⁻¹ or 500 s⁻¹</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reading angle</td>
<td>70 °</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reading distance</td>
<td>10 ... 110 mm</td>
<td>30 ... 220 mm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Light type</td>
<td>semi-conductor laser 655 nm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Optical face</td>
<td>frontal (Narrow side)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lateral (broad side at angle of 78°)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Resolution</td>
<td>0.12 mm (5 mils)</td>
<td>0.2 mm (8 mils)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Indicators/operating means</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating display</td>
<td>LED red: Power on (POWER ON), LED green: Laser on (LASER ON), LED yellow: external trigger signal applied (EXT. TRIG.)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Data flow display</td>
<td>LED green flashing; Data transfer carried out (TX-DATA)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Function display</td>
<td>LED red: signals the successful read-in of a barcode (GOOD READ)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Electrical specifications</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating voltage U₀</td>
<td>10 ... 30 V DC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power consumption P₀</td>
<td>1.5 W</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Interface</strong></td>
<td>serial, RS 232 and RS 485 up to 115.2 kBit/s</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Input 1</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Input type</td>
<td>External triggering</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Input 2</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Input type</td>
<td>Digital input programmable</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Output</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Signal output</td>
<td>2 outputs programmable</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Switching voltage</td>
<td>max. 50 V DC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Switching current</td>
<td>max. 50 mA</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Voltage drop U₉</td>
<td>0.3 V at load current ≤ 10 mA</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Standard conformity</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Standards</td>
<td>EN 60947-5-2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Ambient conditions</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ambient temperature</td>
<td>0 ... 45 °C (273 ... 318 K)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Storage temperature</td>
<td>-20 ... 70 °C (253 ... 343 K)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relative humidity</td>
<td>90 %, non-condensing</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shock resistance</td>
<td>IEC 68-2-27 Test EA 30G, 11 ms; 3 impacts on each axis</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vibration resistance</td>
<td>IEC 68-2-6 Test FC 1.5 mm; 10 ... 55 Hz; 2 hours on each axis</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Mechanical specifications</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Protection degree</td>
<td>IP65 according to DIN 40050</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Connection</td>
<td>25-pin Sub-D connector</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Material</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Housing</td>
<td>Magnesium, Polycarbonate</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cable</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Length L</td>
<td>100 cm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mass</td>
<td>100 g</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Model Number

VB12-110  
VB12-110-S  
VB12-220  
VB12-220-S  

#### Features

- Line scanner  
- Optimal price/power ratio  
- Large reading angle  
- Flat housing  
- Engine control (On/Off) possible  
- Side light outlet enables installation when space is at a premium

#### Accessories

CBX100  
Connector box for barcode scanner

---

**Courtesty of Steven Engineering, Inc. - 230 Ryan Way, South San Francisco, CA 94080-6370 - Main Office: (650) 588-9200 - Outside Local Area: (800) 258-9200 - www.stevenengineering.com**
## Dimensions

![Dimensions Diagram](image)

### Electrical connection

**25-pin D-sub connector pinout**

<table>
<thead>
<tr>
<th>Pin</th>
<th>Name</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>9, 13</td>
<td>10 V ... 30 V DC</td>
<td>Power supply input voltage +</td>
</tr>
<tr>
<td>25</td>
<td>GND</td>
<td>Power supply input voltage -</td>
</tr>
<tr>
<td>1*</td>
<td>CHASSIS</td>
<td>Chassis ground</td>
</tr>
<tr>
<td>2, 21</td>
<td>TX232</td>
<td>TX RS232 aux. Interface</td>
</tr>
<tr>
<td>3, 20</td>
<td>RX232</td>
<td>RX RS232 aux. Interface</td>
</tr>
<tr>
<td>4</td>
<td>RTX485-</td>
<td>RTX- RS485 main interface</td>
</tr>
<tr>
<td>5</td>
<td>RTX485+</td>
<td>RTX+RS485 main interface</td>
</tr>
<tr>
<td>7</td>
<td>SGND</td>
<td>Signal ground</td>
</tr>
<tr>
<td>8</td>
<td>OUT1+</td>
<td>Output 1 +</td>
</tr>
<tr>
<td>11</td>
<td>OUT2+</td>
<td>Output 2 +</td>
</tr>
<tr>
<td>19</td>
<td>Ext. TRIG. -</td>
<td>External trigger -</td>
</tr>
<tr>
<td>12, 22</td>
<td>GND</td>
<td>Input/Output reference (Mass)</td>
</tr>
<tr>
<td>18</td>
<td>IN1-</td>
<td>Input 1 -</td>
</tr>
<tr>
<td>6, 10, 14, 15, 16, 17, 23, 24</td>
<td>NC</td>
<td>Not connected</td>
</tr>
</tbody>
</table>

* Pin 1 and pin 25 are internally interconnected.

### Curves / Diagrams

**Reading characteristics**

- **VB12-110**
- **VB12-220**

![Reading Characteristics VB12-110](image)

![Reading Characteristics VB12-220](image)
**Model Number**
- VB12-110-R
- VB12-110-S-R
- VB12-220-R
- VB12-220-S-R

**Features**
- Grid scanner
- Optimal price/power ratio
- Large reading angle
- Flat housing
- Engine control (On/Off) possible
- Side light outlet enables installation when space is at a premium

**Accessories**
- CBX100 Connector box for barcode scanner

**Technical data**

<table>
<thead>
<tr>
<th>VB12-110-R</th>
<th>VB12-110-S-R</th>
<th>VB12-220-R</th>
<th>VB12-220-S-R</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>General specifications</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Laser class</td>
<td>2-IEC825-1; class II - CDRH</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scan rate</td>
<td>350 s⁻¹ or 500 s⁻¹</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reading angle</td>
<td>70 °</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reading distance</td>
<td>10 ... 110 mm</td>
<td>30 ... 220 mm</td>
<td></td>
</tr>
<tr>
<td>Light type</td>
<td>semi-conductor laser 655 nm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Optical face</td>
<td>frontal (Narrow side)</td>
<td>Lateral (broad side at angle of 78°)</td>
<td>frontal (Narrow side)</td>
</tr>
<tr>
<td>Resolution</td>
<td>0.12 mm (5 mils)</td>
<td>0.2 mm (8 mils)</td>
<td></td>
</tr>
<tr>
<td><strong>Indicators/operating means</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating display</td>
<td>LED red: Power on (POWER ON), LED green: Laser on (LASER ON), LED yellow: external trigger signal applied (EXT. TRIG.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Data flow display</td>
<td>LED green flashing: Data transfer carried out (TX-DATA)</td>
<td></td>
<td></td>
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<tr>
<td>Function display</td>
<td>LED red: signals the successful read-in of a barcode (GOOD READ)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Electrical specifications</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating voltage U_B</td>
<td>10 ... 30 V DC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power consumption P_0</td>
<td>1.5 W</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interface</td>
<td>serial, RS 232 and RS 485 up to 115.2 kBit/s</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Input 1</td>
<td>Input type</td>
<td>External triggering</td>
<td></td>
</tr>
<tr>
<td>Input 2</td>
<td>Input type</td>
<td>Digital input programmable</td>
<td></td>
</tr>
<tr>
<td>Output</td>
<td>Signal output</td>
<td>2 outputs programmable</td>
<td></td>
</tr>
<tr>
<td>Switching voltage</td>
<td>max. 50 V DC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Switching current</td>
<td>max. 50 mA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Voltage drop U_0</td>
<td>0.3 V at load current ≤ 10 mA</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Standard conformity</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Standards</td>
<td>EN 60947-5-2</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Ambient conditions</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ambient temperature</td>
<td>0 ... 45 °C (273 ... 318 K)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Storage temperature</td>
<td>-20 ... 70 °C (253 ... 343 K)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relative humidity</td>
<td>90 %, non-condensing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shock resistance</td>
<td>IEC 68-2-27 Test EA 30G; 11 ms; 3 impacts on each axis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vibration resistance</td>
<td>IEC 68-2-6 Test FC 1.5 mm; 10 ... 55 Hz; 2 hours on each axis</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Mechanical specifications</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Protection degree</td>
<td>IP65 according to DIN 40050</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Connection</td>
<td>25-pin Sub-D connector</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Material</td>
<td>Housing: Magnesium, Polycarbonate</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Cable</strong></td>
<td>Length L</td>
<td>100 cm</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mass</td>
<td>100 g</td>
<td></td>
</tr>
</tbody>
</table>
### Dimensions

![Diagram](image)

### Electrical connection

25-pin D-sub connector pinout

<table>
<thead>
<tr>
<th>Pin</th>
<th>Name</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>9, 13</td>
<td>10 V ... 30 V DC</td>
<td>Power supply input voltage +</td>
</tr>
<tr>
<td>25</td>
<td>GND</td>
<td>Power supply input voltage -</td>
</tr>
<tr>
<td>1*</td>
<td>CHASSIS</td>
<td>Chassis ground</td>
</tr>
<tr>
<td>2, 21</td>
<td>TX232</td>
<td>TX RS232 aux. Interface</td>
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<td>3, 20</td>
<td>RX232</td>
<td>RX RS232 aux. Interface</td>
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<td>RTX485+</td>
<td>RTX+RS485 main Interface</td>
</tr>
<tr>
<td>7</td>
<td>SGND</td>
<td>Signal ground</td>
</tr>
<tr>
<td>8</td>
<td>OUT1+</td>
<td>Output 1 +</td>
</tr>
<tr>
<td>11</td>
<td>OUT2+</td>
<td>Output 2 +</td>
</tr>
<tr>
<td>19</td>
<td>Ext. TRIG. -</td>
<td>External trigger -</td>
</tr>
<tr>
<td>12, 22</td>
<td>GND</td>
<td>Input/Output reference (Mass)</td>
</tr>
<tr>
<td>18</td>
<td>IN1-</td>
<td>Input 1 -</td>
</tr>
<tr>
<td>6, 10, 14, 15, 16, 17, 23, 24</td>
<td>NC</td>
<td>Not connected</td>
</tr>
</tbody>
</table>

* Pin 1 and pin 25 are internally interconnected.

### Curves / Diagrams

#### Reading characteristics

**VB12-110**

![Reading Characteristics VB12-110](image)

**VB12-220**

![Reading Characteristics VB12-220](image)
Barcode scanner

Model Number

VB14N-300  
VB14N-600

Barcode scanner

Features

• Line scanner
• Simple operation via function keys: test mode, code teaching and code optimization
• AČB™ (Advanced Code Builder) reconstructor
• Connect up to 32 scanners
• Robust aluminium housing
• Two serial interfaces RS 232 / RS 485
• Engine control (On/Off) possible
• Protection degree IP65

Function

The VB14N-600 is a line scanner for 1D barcodes and offers a high reliability when reading hard to detect 1D barcodes due to its high performance optics and the AČB™ reconstruction technology implemented. A key function and several LEDs on the barcode scanner give support with parameterization, teaching barcodes and testing. In Live mode the LEDs give information on the respective read status.

You have the option to network the VB14N-600 with up to 32 barcode scanners with each other via a high speed connection. This enables a faster and more efficient data collection, without the necessity of an external multiplexer.

Simple parameterization using PC software is possible.

<table>
<thead>
<tr>
<th>Technical data</th>
<th>VB14N-300</th>
<th>VB14N-600</th>
</tr>
</thead>
<tbody>
<tr>
<td>Approvals</td>
<td>CE, cULus</td>
<td></td>
</tr>
<tr>
<td>Laser class</td>
<td>2 -IEC825-1; class II - CDRH</td>
<td></td>
</tr>
<tr>
<td>Scan rate</td>
<td>500 ... 800 s⁻¹</td>
<td>600 ... 1000 s⁻¹</td>
</tr>
<tr>
<td>Reading distance</td>
<td>40 ... 300 mm</td>
<td>190 ... 600 mm</td>
</tr>
<tr>
<td>Light type</td>
<td>semiconductor laser 630 ... 680 nm</td>
<td></td>
</tr>
<tr>
<td>Angle of divergence</td>
<td>60 °</td>
<td>50 °</td>
</tr>
<tr>
<td>Optical face</td>
<td>Front or side (with deviation mirror)</td>
<td></td>
</tr>
<tr>
<td>Resolution</td>
<td>0.2 mm ( 8 mils )</td>
<td>0.35 mm ( 14 mils )</td>
</tr>
<tr>
<td>Indicators/operating means</td>
<td>Operating display</td>
<td>LED blue: Power on, LED green: Ready to read (READY), LED green: Read successfully (GOOD), LED yellow: External trigger signal pending (TRIGGER), LED yellow: Communication active (COM), LED red: &quot;no read&quot; (STATUS)</td>
</tr>
<tr>
<td>Operating display</td>
<td>Operating voltage $U_D$</td>
<td>10 ... 30 V DC</td>
</tr>
<tr>
<td>Power consumption $P_D$</td>
<td>max. 3 W</td>
<td>max. 5 W</td>
</tr>
<tr>
<td>Interface type</td>
<td>serial, RS 232 and RS 485 up to 115.2 kBit/s</td>
<td>ID-NET™ up to 1Mbit/s</td>
</tr>
<tr>
<td>Input 1</td>
<td>Input type</td>
<td>External triggering</td>
</tr>
<tr>
<td>Output</td>
<td>Signal output</td>
<td>2, programmable, optocoupled</td>
</tr>
<tr>
<td>Switching voltage</td>
<td>max. 40 V DC</td>
<td></td>
</tr>
<tr>
<td>Switching current</td>
<td>max. 40 mA</td>
<td></td>
</tr>
<tr>
<td>Voltage drop $U_D$</td>
<td>1 V at load current ≤ 10 mA</td>
<td></td>
</tr>
<tr>
<td>Standard conformity</td>
<td>Standards</td>
<td>EN 60947-5-2</td>
</tr>
<tr>
<td>Ambient conditions</td>
<td>Ambient temperature</td>
<td>0 ... 45 °C (273 ... 318 K)</td>
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<td></td>
</tr>
<tr>
<td>Relative humidity</td>
<td>-90 % , non-condensing</td>
<td></td>
</tr>
<tr>
<td>Shock resistance</td>
<td>IEC 68-2-27 Test EA 30G, 11 ms, 3 impacts on each axis</td>
<td></td>
</tr>
<tr>
<td>Vibration resistance</td>
<td>IEC 68-2-6 Test FC 1.5 mm; 10 ... 55 Hz; 2 hours on each axis</td>
<td></td>
</tr>
<tr>
<td>Mechanical specifications</td>
<td>Protection degree</td>
<td>IP65 according to DIN 40050</td>
</tr>
<tr>
<td>Connection</td>
<td>1 m connecting cable with 25-pin Sub-D connector</td>
<td></td>
</tr>
<tr>
<td>Material</td>
<td>Housing</td>
<td>aluminium</td>
</tr>
<tr>
<td>Mass</td>
<td>330 g</td>
<td></td>
</tr>
</tbody>
</table>

Dimensions

![Barcode scanner dimensions diagram]
### Accessories

- **CBX500-KIT-B19-IP65**
  - Connector box for barcode scanner

- **CBX500-KIT-B6**
  - Connector box for barcode scanner

- **OM-VB14A**
  - Oscillating mirror for the VB14A barcode scanner series

- **CBX100**
  - Connector box for barcode scanner

- **CBX500**
  - Connector box for barcode scanner

- **DM-VB14A**
  - Deviation mirror for barcode scanner series VB14 sensors

### Electrical connection

#### 25-pin D-sub connector pinout

<table>
<thead>
<tr>
<th>Pin</th>
<th>Name</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>GND</td>
<td>Power supply input voltage -</td>
</tr>
<tr>
<td>2</td>
<td>IN1</td>
<td>Power supply input voltage +</td>
</tr>
<tr>
<td>3</td>
<td>IN2</td>
<td>Cable shield connected to chassis</td>
</tr>
<tr>
<td>4</td>
<td>OUT</td>
<td>External Trigger A</td>
</tr>
<tr>
<td>5</td>
<td>OUT1</td>
<td>Input2 -</td>
</tr>
<tr>
<td>6</td>
<td>OUT2</td>
<td>Input2 +</td>
</tr>
<tr>
<td>7</td>
<td>RXAU</td>
<td>Auxiliary RS232</td>
</tr>
<tr>
<td>8</td>
<td>TXAU</td>
<td>Auxiliary RS232</td>
</tr>
<tr>
<td>9</td>
<td>TXAUX</td>
<td>High speed internal network +</td>
</tr>
<tr>
<td>10</td>
<td>RXAUX</td>
<td>High speed internal network -</td>
</tr>
<tr>
<td>11</td>
<td>TXAUX</td>
<td>Not connected</td>
</tr>
<tr>
<td>12</td>
<td>TXAUX</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>TXAUX</td>
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<tr>
<td>14</td>
<td>TXAUX</td>
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<td>15</td>
<td>TXAUX</td>
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<tr>
<td>16</td>
<td>TXAUX</td>
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<td>17</td>
<td>TXAUX</td>
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<tr>
<td>18</td>
<td>RXAUX</td>
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<td>19</td>
<td>RXAUX</td>
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<td>22</td>
<td>RXAUX</td>
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<td>23</td>
<td>RXAUX</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>RXAUX</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>RXAUX</td>
<td></td>
</tr>
</tbody>
</table>

#### Curves / Diagrams

- **Reading characteristics**
  - **Read field width in mm**
  - **Read range in mm**

- **VB14N-300**

- **VB14N-600**

### Barcode scanner

- **VB14N-*
  - *Available in different models*
### Model Number

**VB14N-300-R**

**VB14N-600-R**

Barcode scanner

### Features

- Grid scanner
- Simple operation via function keys: test mode, code teaching and code optimization
- ACB™ (Advanced Code Builder) reconstructor
- Connect up to 32 scanners
- Sturdy aluminium housing
- Two serial interfaces RS 232 / RS 485
- Engine control (On/Off) possible
- Protection degree IP65

### Function

The VB14N-_*-R is a raster scanner for 1D barcodes. It grants high reliability when reading difficult to detect 1D barcodes thanks to its high performance optics and the use of ACB™ reconstruction technology. A function key and multiple LEDs on the reader assist you in setting parameters, teaching in barcodes and performing tests. In live mode, the LEDs provide information on the respective reading status.

The VB14N-300-R can be networked with up to 32 readers among each other via a high speed connection. This enables faster and more efficient data acquisition without the need for an external Multiplexer.

Setting parameters is easy by means of PC software.

### Technical data

<table>
<thead>
<tr>
<th>Parameter</th>
<th>VB14N-300-R</th>
<th>VB14N-600-R</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>General specifications</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Approvals</td>
<td>CE, cULus</td>
<td></td>
</tr>
<tr>
<td>Laser class</td>
<td>2 - IEC825-1; class II - CDRH</td>
<td></td>
</tr>
<tr>
<td>Scan rate</td>
<td>500 ... 800 s⁻¹</td>
<td>600 ... 1000 s⁻¹</td>
</tr>
<tr>
<td>Reading distance</td>
<td>40 ... 300 mm</td>
<td>190 ... 600 mm</td>
</tr>
<tr>
<td>Light type</td>
<td>semiconductor laser</td>
<td>630 ... 680 nm</td>
</tr>
<tr>
<td>Angle of divergence</td>
<td>60 °</td>
<td>50 °</td>
</tr>
<tr>
<td>Resolution</td>
<td>0.2 mm (8 mils)</td>
<td>0.35 mm (14 mils)</td>
</tr>
<tr>
<td><strong>Indicators/operating means</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating display</td>
<td>LED blue: Power on, LED green: Ready to read (READY), LED green: Read successfully (GOOD), LED yellow: External trigger</td>
<td>signal pending (TRIGGER), LED yellow: Communication active (COM), LED red: “no read” (STATUS)</td>
</tr>
<tr>
<td><strong>Electrical specifications</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating voltage (U_{B})</td>
<td>10 ... 30 V DC</td>
<td>10 ... 30 V DC</td>
</tr>
<tr>
<td>Power consumption (P_{0}) max.</td>
<td>3 W</td>
<td>max. 5 W</td>
</tr>
<tr>
<td><strong>Input 1</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Input type</td>
<td>External triggering</td>
<td></td>
</tr>
<tr>
<td><strong>Output</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Signal output</td>
<td>2, programmable, optocoupled</td>
<td></td>
</tr>
<tr>
<td>Switching voltage</td>
<td>max. 40 V DC</td>
<td></td>
</tr>
<tr>
<td>Switching current</td>
<td>max. 40 mA</td>
<td></td>
</tr>
<tr>
<td>Voltage drop (U_{D})</td>
<td>1 V at load current ≤ 10 mA</td>
<td></td>
</tr>
<tr>
<td><strong>Standard conformity</strong></td>
<td>Standards</td>
<td>EN 60947-5-2</td>
</tr>
<tr>
<td><strong>Ambient conditions</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ambient temperature</td>
<td>0 ... 45 °C (273 ... 318 K)</td>
<td></td>
</tr>
<tr>
<td>Storage temperature</td>
<td>-20 ... 70 °C (253 ... 343 K)</td>
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</tr>
<tr>
<td>Relative humidity</td>
<td>90 % , non-condensing</td>
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</tr>
<tr>
<td>Shock resistance</td>
<td>IEC 68-2-27 Test EA 30G; 11 ms; 3 impacts on each axis</td>
<td></td>
</tr>
<tr>
<td>Vibration resistance</td>
<td>IEC 68-2-6 Test FC 1.5 mm; 10 ... 55 Hz; 2 hours on each axis</td>
<td></td>
</tr>
<tr>
<td><strong>Mechanical specifications</strong></td>
<td>Protection degree</td>
<td>IP65 according to DIN 40050</td>
</tr>
<tr>
<td></td>
<td>Material</td>
<td>Housing: aluminium</td>
</tr>
<tr>
<td>Connection</td>
<td>1 m connecting cable with 25-pin Sub-D connector</td>
<td></td>
</tr>
<tr>
<td><strong>Dimensions</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

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**Barcode scanner**

### Accessories

- **CBX500-KIT-B19-IP65**
  Connector box for barcode scanner
- **CBX500-KIT-B6**
  Connector box for barcode scanner
- **OM-VB14A**
  Oscillating mirror for the VB14A barcode scanner series
- **CBX100**
  Connector box for barcode scanner
- **CBX500**
  Connector box for barcode scanner
- **DM-VB14A**
  Deviation mirror for barcode scanner series VB14 sensors

### Electrical connection

#### 25-pin D-sub connector pinout

<table>
<thead>
<tr>
<th>Pin</th>
<th>Name</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>9, 13</td>
<td>VS</td>
<td>Power supply input voltage +</td>
</tr>
<tr>
<td>25</td>
<td>GND</td>
<td>Power supply input voltage -</td>
</tr>
<tr>
<td>1</td>
<td>CHASSIS</td>
<td>Cable shield connected to chassis</td>
</tr>
<tr>
<td>18</td>
<td>EXT TRG A</td>
<td>External Trigger A</td>
</tr>
<tr>
<td>19</td>
<td>EXT TRG B</td>
<td>External Trigger B</td>
</tr>
<tr>
<td>10</td>
<td>IN2 -</td>
<td>Input2 -</td>
</tr>
<tr>
<td>8</td>
<td>OUT1 +</td>
<td>Output1 +</td>
</tr>
<tr>
<td>22</td>
<td>OUT1 -</td>
<td>Output1 -</td>
</tr>
<tr>
<td>11</td>
<td>OUT2 +</td>
<td>Output2 +</td>
</tr>
<tr>
<td>12</td>
<td>OUT2 -</td>
<td>Output2 -</td>
</tr>
<tr>
<td>20</td>
<td>RXAUX</td>
<td>Auxiliary RS232</td>
</tr>
<tr>
<td>21</td>
<td>TXAUX</td>
<td>Auxiliary RS232</td>
</tr>
<tr>
<td>23</td>
<td>ID-NET +</td>
<td>High speed internal network +</td>
</tr>
<tr>
<td>24</td>
<td>ID-NET -</td>
<td>High speed internal network -</td>
</tr>
<tr>
<td>6, 14, 15, 17</td>
<td>NC</td>
<td>Not connected</td>
</tr>
</tbody>
</table>

#### Pin Name Function

- **Pin**
  - 2: Main interface signals
  - 3: Main interface signals
  - 4: Interface signals
  - 5: Interface signals
  - 7: Interface signals

#### Curves / Diagrams

**Reading characteristics**

- **VB14N-300**
  - Read field width in mm
  - Read range in mm

- **VB14N-600**
  - Read field width in mm
  - Read range in mm

**Curves / Diagrams**

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fa-info@sg.pepperl-fuchs.com
**Barcode scanner**

### Model Number

**VB34-2500**
**VB34-2500-P**

Barcode scanner

### Features

- Optimised for the requirements of the automobile industry
- Dynamic focusing system
- Fast Lonworks interface for master/slave configurations
- Display and keypad for parameter settings

### Technical data

<table>
<thead>
<tr>
<th>General specifications</th>
<th>VB34-2500</th>
<th>VB34-2500-P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laser class</td>
<td>2 -IEC825-1: class II - CDRH</td>
<td></td>
</tr>
<tr>
<td>Scan rate</td>
<td>600 ... 1200 s⁻¹ , programmable</td>
<td></td>
</tr>
<tr>
<td>Reading distance</td>
<td>500 ... 2500 mm</td>
<td></td>
</tr>
<tr>
<td>Light type</td>
<td>semi-conductor laser 655 nm</td>
<td></td>
</tr>
<tr>
<td>Resolution</td>
<td>max. 0.2 mm ( 8 mils )</td>
<td></td>
</tr>
</tbody>
</table>

**Indicators/operating means**
- Operating display: LED green: Power on, LED yellow: Trigger phase active (PHASE ON)
- Data flow display: LED green flashing: Data transfer carried out (TX-DATA)
- Operating elements: Keypad (3 membrane keys) for parameter settings on the LCD display
- Parameterization display: LC display

**Electrical specifications**
- Operating voltage $U_B$: 15 ... 30 V DC
- Power consumption $P_0$: max. 20 W

**Interface**
- Interface type: serial, RS 232 and RS 485 up to 115.2 kBit/s, PROFIBUS

**Input 1**
- Input type: 3 digital inputs and external trigger

**Output**
- Switching voltage: max. 30 V DC
- Switching current: max. 50 mA
- Voltage drop $U_d$: 0.3 V at load current ≤ 10 mA

**Standard conformity**
- Standards: EN 60947-5-2

**Ambient conditions**
- Ambient temperature: 0 ... 40 °C (273 ... 313 K)
- Storage temperature: -20 ... 70 °C (253 ... 343 K)
- Relative humidity: 90 %, non-condensing
- Shock resistance: IEC 68-2-27 Test EA 30G; 11 ms; 3 impacts on each axis
- Vibration resistance: IEC 68-2-6 Test FC 1.5 mm; 10 ... 55 Hz; 2 hours on each axis

**Mechanical specifications**
- Protection degree: IP64
- Connection: Interface (primary, secondary): 25-pin Sub-D connector, Lonworks: Sub-D socket, 9-pin, 9-pin Sub-D connector
- Interface (primary, secondary): 26-pin Sub-D plug, Lonworks: Sub-D socket, 9-pin, PROFIBUS: Sub-D socket, 9-pin
- Material: Housing aluminium
- Mass: 1500 g

**Dimensions**

![Barcode scanner dimensions diagram]

---

Edition: 2009-03-01
Catalogue Identification Systems 2009
### Electrical connection

![Diagram of electrical connection](image)

<table>
<thead>
<tr>
<th>Pin</th>
<th>Name</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Schirm</td>
<td>The shield is interfaced with chassis ground via a capacitor internally.</td>
</tr>
<tr>
<td>20</td>
<td>RXAUX</td>
<td>Receive data of RS232 interface (earth-related)</td>
</tr>
<tr>
<td>21</td>
<td>TXAUX</td>
<td>Transmission data of RS232 interface (earth-related)</td>
</tr>
<tr>
<td>8</td>
<td>Out1+</td>
<td>Plus lead of digital output 1</td>
</tr>
<tr>
<td>11</td>
<td>Out1-</td>
<td>Minus lead of digital output 1</td>
</tr>
<tr>
<td>13</td>
<td>Out2+</td>
<td>Plus lead of digital output 2</td>
</tr>
<tr>
<td>17</td>
<td>Out2-</td>
<td>Minus lead of digital output 2</td>
</tr>
<tr>
<td>16</td>
<td>Out3A</td>
<td>Digital output 3 - polarity commutable</td>
</tr>
<tr>
<td>17</td>
<td>Out3B</td>
<td>Digital output 3 - polarity commutable</td>
</tr>
<tr>
<td>18</td>
<td>Ext_TRIG.A</td>
<td>External trigger (polarity commutable)</td>
</tr>
<tr>
<td>19</td>
<td>Ext_TRIG.B</td>
<td>External trigger (polarity commutable)</td>
</tr>
<tr>
<td>6</td>
<td>IN 2A</td>
<td>Input signal 2 (polarity commutable)</td>
</tr>
<tr>
<td>10</td>
<td>IN 2B</td>
<td>Input signal 2 (polarity commutable)</td>
</tr>
<tr>
<td>14</td>
<td>IN 3A</td>
<td>Input signal 3 (polarity commutable)</td>
</tr>
<tr>
<td>15</td>
<td>IN 4A</td>
<td>Input signal 4 (polarity commutable)</td>
</tr>
<tr>
<td>24</td>
<td>IN_REF</td>
<td>Common earth reference for IN3 and IN4 (polarity commutable)</td>
</tr>
<tr>
<td>9, 13</td>
<td>VS</td>
<td>Supply voltage - plus</td>
</tr>
<tr>
<td>23, 25</td>
<td>GND</td>
<td>Supply voltage - minus (earth)</td>
</tr>
</tbody>
</table>

#### Electrical connections of the connector for primary interface

<table>
<thead>
<tr>
<th>Pin</th>
<th>RS232</th>
<th>RS485 full-duplex</th>
<th>RS485 half-duplex</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>TX</td>
<td>TX485 +</td>
<td>RTX485 +</td>
</tr>
<tr>
<td>3</td>
<td>RX</td>
<td>RX485 +</td>
<td>RTX485 -</td>
</tr>
<tr>
<td>4</td>
<td>RTS</td>
<td>TX485 -</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>CTS</td>
<td>RX485 -</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>GND_ISO</td>
<td>GND_ISO</td>
<td></td>
</tr>
</tbody>
</table>

### Curves / Diagrams

**Reading characteristics**

**VB34**

- **NOTE:** (0.0) is the center of the laser beam output window.

**Reading characteristics**

**VB34**

- **NOTE:** (0.0) is the center of the laser beam output window.

**Reading characteristics**

**VB34**

- **NOTE:** (0.0) is the center of the laser beam output window.
**Barcode scanner**

Model Number

- **VB34-2500-OM**
- **VB34-2500-OM-P**

Barcode scanner

### Features

- Version with integrated oscillating mirror
- Optimised for the requirements of the automobile industry
- Dynamic focusing system
- Fast Lonworks interface for master/slave configurations
- Display and keypad for parameter settings

### Technical data

<table>
<thead>
<tr>
<th>VB34-2500-OM</th>
<th>VB34-2500-OM-P</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>General specifications</strong></td>
<td><strong>General specifications</strong></td>
</tr>
<tr>
<td>Laser class</td>
<td>2 - IEC60825-1, class II - CDRH</td>
</tr>
<tr>
<td>Scan rate</td>
<td>600 ... 1200 s⁻¹, programmable</td>
</tr>
<tr>
<td>Reading distance</td>
<td>450 ... 2500 mm</td>
</tr>
<tr>
<td>Oscillating mirror</td>
<td>Deflection: -2.5° ... 37.5°, programmable Oscillation frequency: 0 ... 19 Hz, programmable</td>
</tr>
<tr>
<td>Light type</td>
<td>semi-conductor laser 655 nm</td>
</tr>
<tr>
<td>Resolution</td>
<td>max. 0.2 mm (8 mils)</td>
</tr>
<tr>
<td><strong>Indicators/operating means</strong></td>
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<td>Data flow display</td>
<td>LED green flashing: Data transfer carried out (TX-DATA)</td>
</tr>
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<td>Operating elements</td>
<td>Keypad (3 membrane keys) for parameter settings on the LCD display</td>
</tr>
<tr>
<td>Parameterization display</td>
<td>LC display</td>
</tr>
<tr>
<td><strong>Electrical specifications</strong></td>
<td><strong>Electrical specifications</strong></td>
</tr>
<tr>
<td>Operating voltage U₀</td>
<td>15 ... 30 V DC</td>
</tr>
<tr>
<td>Power consumption P₀</td>
<td>max. 20 W</td>
</tr>
<tr>
<td>Interface</td>
<td>serial, RS 232 and RS 485 up to 115.2 kB/s</td>
</tr>
<tr>
<td><strong>Input 1</strong></td>
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</tr>
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<td><strong>Output</strong></td>
</tr>
<tr>
<td>Switching voltage</td>
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<td>IP64</td>
</tr>
<tr>
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</tr>
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<td></td>
<td>Interface (primary, secondary): 26-pin Sub-D plug, Lonworks: Sub-D socket, 9-pin, PROFIBUS: Sub-D socket, 9-pin</td>
</tr>
<tr>
<td>Material</td>
<td>Housing: aluminium</td>
</tr>
<tr>
<td>Mass</td>
<td>2000 g</td>
</tr>
</tbody>
</table>

### Dimensions
Electrical connection

<table>
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</table>

Electrical connections of the connector for primary interface

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Curves / Diagrams

**Reading characteristics**

- **VBA41**
- **VBA41 CMF**
- **VBA41 CMF**

**NOTE**

(0.0) is the center of the laser beam output window.

Focal point = 60 cm
Global read zone read characteristics at resolution: 0.20 mm (8 mils)

Focal point = 115 cm
Global read zone read characteristics at resolution: 0.5 mm (20 mils)

Focal point = 115 cm
Global read zone read characteristics at resolution: 0.375 mm (15 mils)

Focal point = 115 cm
Global read zone read characteristics at resolution: 0.5 mm (20 mils)
Connector box

**Model Number**

CBX100

Connector box for barcode scanner

**Features**

- Connect up to 32 scanners to a network with ID-Net™
- Option of upgrading with memory module
- Easy scanner connection by means of clamp terminals
- Protection degree IP65

**Function**

The devices of the CBX* series are connection boxes for industrial use which enable quick connection of barcode readers as well as their configuration and maintenance. Thanks to a reduction of the installation time and equipment downtime (when a device is replaced) your operating expenses will be considerably lower.

Installation is simple thanks to easily reachable through mounting holes and the removable housing lid.

The standardized pin configuration of the terminal block and all other connections as well as the simple fastening of the cable ends using spring-type terminals ensure an easy installation of the cables.

You can save the configuration of the connected scanner using backup modules and can be used again.

**Technical data**

<table>
<thead>
<tr>
<th>Indicators/operating means</th>
</tr>
</thead>
<tbody>
<tr>
<td>Display elements</td>
</tr>
<tr>
<td>Optional: LC display (20 characters/4 lines)</td>
</tr>
<tr>
<td>5 LEDs (POWER, TRIGGER, IN 2, OUT 1, OUT 2)</td>
</tr>
<tr>
<td>Operating elements</td>
</tr>
<tr>
<td>3 Operating buttons</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Electrical specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating voltage $U_B$</td>
</tr>
<tr>
<td>10 ... 30 V DC</td>
</tr>
<tr>
<td>Current consumption $I$</td>
</tr>
<tr>
<td>max. 2.5 A</td>
</tr>
<tr>
<td>Power consumption $P_0$</td>
</tr>
<tr>
<td>max. 0.5 W</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Interface</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interface type</td>
</tr>
<tr>
<td>RS 232/RS 485</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Standard conformity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standards</td>
</tr>
<tr>
<td>EN 60947-5-2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ambient conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambient temperature</td>
</tr>
<tr>
<td>-10 ... 50 °C (263 ... 323 K)</td>
</tr>
<tr>
<td>Storage temperature</td>
</tr>
<tr>
<td>-20 ... 70 °C (253 ... 343 K)</td>
</tr>
<tr>
<td>Relative humidity</td>
</tr>
<tr>
<td>90 %, non-condensing</td>
</tr>
<tr>
<td>Shock resistance</td>
</tr>
<tr>
<td>EN 60068-2-27 30G 11 ms; 3 impacts on each axis</td>
</tr>
<tr>
<td>Vibration resistance</td>
</tr>
<tr>
<td>EN 60068-2-6 1.5 mm 10 ... 55 Hz; 2 hours on each axis</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mechanical specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protection degree</td>
</tr>
<tr>
<td>IP65</td>
</tr>
<tr>
<td>Connection</td>
</tr>
<tr>
<td>25-pin Sub-D socket for Barcode scanner, Cable screwed connection M16 for system connection (4x)</td>
</tr>
<tr>
<td>Material</td>
</tr>
<tr>
<td>Housing</td>
</tr>
<tr>
<td>PC (Polycarbonate)</td>
</tr>
<tr>
<td>Mass</td>
</tr>
<tr>
<td>380 g</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>138 x 62 x 43.3 mm</td>
</tr>
<tr>
<td>40.4 x 43.3 mm</td>
</tr>
</tbody>
</table>

---

Subject to modifications without notice

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Edition: 2009-03-01
Catalogue Identification Systems 2009

![Image of CBX100 Connector box](image-url)
CBX500

Connector box for barcode scanner

Features

- Connect up to 32 scanners to a network with ID-Net™
- Option of upgrading with Profinet, Ethernet and DeviceNet module as well as memory module
- Easy scanner connection by means of clamp terminals
- Protection degree IP65

Function

The devices of the CBX* series are connection boxes for industrial use which enable quick connection of barcode readers as well as their configuration and maintenance. Thanks to a large number of connection options, you can - depending on the purpose - connect modules for all commonly available field bus systems without problems. Thanks to a reduction of the installation time and equipment downtime (when a device is replaced), your operating expenses will be considerably lower.

Installation is simple thanks to easily reachable through mounting holes and the removable housing lid.

The standardized pin configuration of the terminal block and all other connections as well as the simple fastening of the cable ends using spring-type terminals ensure an easy installation of the cables. You can save the configuration of the connected scanner using backup modules and can be used again.

Technical data

Indicators/operating means

<table>
<thead>
<tr>
<th>Display elements</th>
<th>optional: LC display (20 characters/4 lines)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating elements</td>
<td>3 Operating buttons</td>
</tr>
</tbody>
</table>

Electrical specifications

<table>
<thead>
<tr>
<th>Operating voltage U_B</th>
<th>10 ... 30 V DC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current consumption P_0</td>
<td>max. 2.5 A</td>
</tr>
<tr>
<td>Power consumption P_0</td>
<td>max. 0.5 W</td>
</tr>
</tbody>
</table>

Interface

| Interface type | Modular upgrade option (e.g. PROFIBUS, Ethernet, DeviceNet) |

Standard conformity

| Standards | EN 60947-5-2 |

Ambient conditions

| Ambient temperature | -10 ... 50 °C (263 ... 323 K) |
| Storage temperature | -20 ... 70 °C (253 ... 343 K) |
| Relative humidity | 90 %, non-condensing |
| Shock resistance | EN 60068-2-27 30G 11 ms ; 3 impacts on each axis |
| Vibration resistance | EN 60068-2-6 1.5 mm 10 ... 55 Hz ; 2 hours on each axis |

Mechanical specifications

| Protection degree | IP65 |
| Connection | 25-pin Sub-D socket for Barcode scanner, Cable screwed connection M16 for system connection (5x) |

Material

| Housing | PC (Polycarbonate) |
| Mass | 780 g |

Dimensions

| Dimensions |

Model Number

CBX500

Connector box for barcode scanner

Connectors/operating means

- Display elements: optional LC display (20 characters/4 lines)
- Operating elements: 3 operating buttons

Electrical specifications

- Operating voltage: 10 ... 30 V DC
- Current consumption: max. 2.5 A
- Power consumption: max. 0.5 W

Interface

- Modular upgrade option (e.g. PROFIBUS, Ethernet, DeviceNet)

Standard conformity

| Standards | EN 60947-5-2 |

Ambient conditions

- Ambient temperature: -10 ... 50 °C (263 ... 323 K)
- Storage temperature: -20 ... 70 °C (253 ... 343 K)
- Relative humidity: 90 %, non-condensing
- Shock resistance: EN 60068-2-27 30G 11 ms ; 3 impacts on each axis
- Vibration resistance: EN 60068-2-6 1.5 mm 10 ... 55 Hz ; 2 hours on each axis

Mechanical specifications

- Protection degree: IP65
- Connection: 25-pin Sub-D socket for Barcode scanner, Cable screwed connection M16 for system connection (5x)

Material

- Housing: PC (Polycarbonate)
- Mass: 780 g

Dimensions

| Dimensions |
Inside View

1. Power switch (on/off)
2. Adjustment of Chassis grounding via Jumper
3. Mounting Holes (2x)
4. Remote I/O Extension Module Connector
5. Backup Module Connector
6. LEDs
7. RS485 Terminator Switch
8. ID-NET Terminator Switch
9. Serial Interface (SUB-D, 9-pin)
10. IP65 Fieldbus Module Connector
11. Standard Fieldbus Module Connector
12. Terminal Block
13. Adjustment of Shield to Protection Earth via Jumper
14. External Power Source (on/off)
Data Matrix code

The Data Matrix code intelligently advances the barcode. Along with the advantages of the barcode, it also provides the following improved features:

- higher volumes of data at low memory requirements
- Standardized Data Matrix codes
- Omni-directional reading
- Reading on uneven surfaces
- Automatic error correction without data loss
- Possible to laser inscribe material

Data Matrix Fundamentals

Data Matrix codes are “two-dimensional barcodes” in which data is not encoded by variably thick, parallel-arranged black and white lines, as in barcodes, but rather by the arrangement of modules in a square or rectangular base area within a border.

Data Matrix codes always consist of three main components:

- **Finder Pattern**: Defines the overall height of the Data Matrix code, provides orientation while reading, and enables recognition of any distortions.
- **Alternating Pattern**: Determines the number of modules within the code matrix.
- **Data Region**: Contains the data, furnished with an error correction process, which detects errors and corrects them within certain constraints.

The symbol size of a Data Matrix code is defined by the number of its modules and represents the data content of the Data Matrix codes. In the example to the left, the symbol size of the Data Matrix code is 10 x 10 modules, but the Data Region only 8 x 8 modules (depending on Finder Pattern and Alternating Pattern).

In theory, Data Matrix codes are fully scalable. Yet in practice, the actual size is dependent on the read device used, the resolution of the Data Matrix code and the print quality.

The smallest Data Matrix codes are achieved with laser inscription.
9.1 Functional principle of Data Matrix readers

With the help of a camera, Data Matrix readers take a snapshot of the code, which is then evaluated by an integrated signal processor.

Illumination

Integrated LED flashes as well as external illumination units precisely correlate image-capture time and trigger signal. This is how images are ideally illuminated. Disruptions to operating personnel are avoided, heat generation is reduced, and high travel speeds are enabled.

Reflecting surfaces

An optical anti-reflection system means it is usually unnecessary to tilt the reader and thus prevents distortions and problems of depth of focus.

Speed

A digital signal processor enables up to 1.2 billion instructions per second and assesses the images taken in real time. A Data Matrix ECC 200 code achieves a travel speed of 10 m/s and 60 reads per second at a symbol size of 16 x 16 modules and a module size of 0.35.

Position-independent reading

It is not absolutely necessary to align the codes. Distortions that are brought on, for example, by applying codes to round surfaces, are automatically corrected by the reader. The trigger signal can even be completely dispensed with a low travel speed through the “Finder Pattern” in the code.

Software tools

Every reader includes a CD that contains Windows-based parameterization and diagnosis software for configuring and diagnosing, as well as software that simply converts ASCII characters into printable Data Matrix codes. These software tools can be found at www.pepperl-fuchs.com.
9.2 Data Matrix code ECC 200 symbol sizes and data contents

Example:

In order to encode 40 numerical characters, a matrix size of 18 x 18 is needed and, due to the additional pattern, a symbol size of 30 x 20, according to the 6th line in the table.

For a module size of, for instance, 0.3 mm

\((0.3 \times 20) \text{ mm x } (0.3 \times 20) \text{ mm} = 6 \text{ mm x } 6 \text{ mm}\) plus a quiet zone of at least 2 module widths around the code is the required space.

A module should consist of at least 5 pixels.

An example for calculating printer resolution:

\[ 1 \text{ dot/inch} = \frac{1 \text{ dot}}{25.4 \text{ mm}} = \frac{0.039 \text{ dot}}{\text{mm}} \]

\[ 0.3 \text{ mm.} \]

The example illustrates that a print resolution of 423 dpi is needed for printing the smallest-possible codes of 0.3 mm.

<table>
<thead>
<tr>
<th>Symbol Size</th>
<th>Data Region</th>
<th>Mapping Matrix Size</th>
<th>Total Data Codewords</th>
<th>Reed-Solomon Block Data Len</th>
<th>Inter-leaved Blocks Num.</th>
<th>Error Correctable Blocks</th>
<th>Data Capacity Error Overhead</th>
<th>Max. Correctable Codeword</th>
</tr>
</thead>
<tbody>
<tr>
<td>Row</td>
<td>Col</td>
<td>Size</td>
<td>Number</td>
<td>Mapping Matrix Size</td>
<td>Total Data Codewords</td>
<td>Reed-Solomon Block Data Len</td>
<td>Inter-leaved Blocks Num.</td>
<td>Error Correctable Blocks</td>
</tr>
<tr>
<td>10</td>
<td>10</td>
<td>8x8</td>
<td>1</td>
<td>8x8</td>
<td>3</td>
<td>5</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>12</td>
<td>12</td>
<td>10x10</td>
<td>1</td>
<td>10x10</td>
<td>5</td>
<td>7</td>
<td>7</td>
<td>1</td>
</tr>
<tr>
<td>14</td>
<td>14</td>
<td>12x12</td>
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<td>12x12</td>
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<td>14x14</td>
<td>10</td>
<td>12</td>
<td>12</td>
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<td>16x16</td>
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<td>16x16</td>
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<td>14</td>
<td>14</td>
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<td>18x18</td>
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<td>18x18</td>
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<td>18</td>
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<td>1</td>
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<td>22</td>
<td>22</td>
<td>20x20</td>
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<td>20x20</td>
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<td>1</td>
</tr>
<tr>
<td>24</td>
<td>24</td>
<td>22x22</td>
<td>1</td>
<td>22x22</td>
<td>24</td>
<td>24</td>
<td>24</td>
<td>1</td>
</tr>
<tr>
<td>26</td>
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<td>24x24</td>
<td>1</td>
<td>24x24</td>
<td>28</td>
<td>28</td>
<td>28</td>
<td>1</td>
</tr>
<tr>
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<td>28</td>
<td>26x26</td>
<td>1</td>
<td>26x26</td>
<td>32</td>
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<td>1</td>
</tr>
<tr>
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<td>30</td>
<td>28x28</td>
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<td>28x28</td>
<td>32</td>
<td>32</td>
<td>32</td>
<td>1</td>
</tr>
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<td>1</td>
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<td>1</td>
</tr>
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<td>44x44</td>
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<td>68</td>
<td>68</td>
<td>1</td>
</tr>
<tr>
<td>48</td>
<td>48</td>
<td>46x46</td>
<td>1</td>
<td>46x46</td>
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<td>72</td>
<td>72</td>
<td>1</td>
</tr>
<tr>
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<td>48x48</td>
<td>1</td>
<td>48x48</td>
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<td>76</td>
<td>76</td>
<td>1</td>
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<tr>
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<td>50x50</td>
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<td>1</td>
</tr>
<tr>
<td>54</td>
<td>54</td>
<td>52x52</td>
<td>1</td>
<td>52x52</td>
<td>84</td>
<td>84</td>
<td>84</td>
<td>1</td>
</tr>
<tr>
<td>56</td>
<td>56</td>
<td>54x54</td>
<td>1</td>
<td>54x54</td>
<td>88</td>
<td>88</td>
<td>88</td>
<td>1</td>
</tr>
</tbody>
</table>

1 Note: Symbol size does not include quiet zone.

* Note: In the largest symbol (144x144), the first eight Reed-Solomon blocks shall be 218 codewords long encoding 156 data codewords. The last two blocks shall encode 217 codewords (155 data codewords). All the blocks have 62 error correction codewords.

** Note: Does not apply

9.3 Read range of the ODT-HH-MAH200-* and ODT-MAC333

Depending on the reader’s focal point and symbology, the following read ranges result:

- **Near Field Optimal**: 102 mm
- **Focal Point**: 229 mm
- **Far Field Optimal**:
  - 0.051 mm PDF 417 (50 characters)
  - 0.19 mm MicroPDF 417 (10 characters)
  - 0.15 mm PDF 417 (12 characters)
  - 0.03 mm Data Matrix (10 characters)
  - 0.60 mm Data Matrix (12 characters)
  - 0.19 mm Data Matrix (10 characters)
  - 0.15 mm Data Matrix (50 characters)
  - 0.11 mm Code 39 (8 characters)
  - 0.15 mm Code 39 (8 characters)
  - 0.20 mm Maxicode
  - 0.19 mm Code 128 (10 characters)
  - 0.32 mm EAN 8
  - 0.36 mm Code 128 (6 characters)
  - 0.53 mm Code 39 (8 characters)

**Read range**
- Near field
- Neutral field
- Far field

**Data capacity**
- 0.53 mm Data Matrix (10 characters)

**Module width**
- 0.53 mm Data Matrix (10 characters)

**Symbology**
9.4 Overview of stationary readers

<table>
<thead>
<tr>
<th>Order code</th>
<th>ODT-MAC333</th>
<th>ODT-MAC344-*</th>
<th>ODT-MAC4*-</th>
</tr>
</thead>
<tbody>
<tr>
<td>General data</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Read distance</td>
<td>50 ... 500 mm</td>
<td>32 mm</td>
<td>60 mm</td>
</tr>
<tr>
<td>Depth of focus</td>
<td>-50 mm/240 mm</td>
<td>± 3 mm</td>
<td>± 5 mm</td>
</tr>
</tbody>
</table>
| Read field       | max. 125 mm x 200 mm | 29 mm x 24 mm | 30 mm x 20 mm ...
| Object speed     | Standstill | triggered ≤3 m/s | triggered ≤3 m/s |
| Interfaces       | RS 232    | RS 232      | RS 232, Ethernet |
| Display/controls | LED        | Trigger, Good/Bad reading | Good/Bad reading |
| Nominal ratings  | Processor  | Pulse frequency | 150 MHz | 600 MHz |
| Models           | -          | ODT-MAC344-RED | ODT-MAC400-N-RD |

9.5 Overview of handheld Data Matrix readers

<table>
<thead>
<tr>
<th>Order code</th>
<th>ODT-HH-MAH120-*</th>
<th>ODT-HH-MAH200-*</th>
<th>ODT-HH-MAH300-*</th>
</tr>
</thead>
<tbody>
<tr>
<td>General data</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Read distance</td>
<td>20 ... 150 mm</td>
<td>50 ... 500 mm</td>
<td></td>
</tr>
<tr>
<td>Read field</td>
<td>max. 80 mm x 100 mm</td>
<td>max. 125 mm x 200 mm</td>
<td></td>
</tr>
<tr>
<td>Sensor system</td>
<td>Camera system</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interface</td>
<td>USB 2.0, RS 232 or PS/2</td>
<td>USB 1.1, PS/2, RS 232</td>
<td>ASCII</td>
</tr>
<tr>
<td>Displays and controls</td>
<td>Pushbuttons</td>
<td>2 freely programmable trigger buttons (3 freely programmable trigger buttons with mounted handle)</td>
<td></td>
</tr>
<tr>
<td>Models</td>
<td>ODT-HH-MAH120-HD</td>
<td>ODT-HH-MAH200</td>
<td>ODT-HH-MAH300-HD</td>
</tr>
</tbody>
</table>
9.6 Overview of accessories for handheld devices

Pepperl+Fuchs provides various accessories for readers from the ODT-HH-MAH* product line. The following table shows the accessories that go with each reader.

<table>
<thead>
<tr>
<th>Handles</th>
<th>Designation</th>
<th>ODTH-HH-MAH120-*</th>
<th>ODTH-HH-MAH200</th>
<th>ODTH-HH-MAH200-B15</th>
<th>ODTH-HH-MAH300</th>
<th>ODTH-HH-MAH300-B15</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>ODZ-MAH-GRIP1</td>
<td>Handle with trigger button and battery compartment cover</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ODZ-MAH-GRIP2</td>
<td>Handle with trigger button and integrated battery (1950 mAh)</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ODZ-MAH-GRIP3</td>
<td>Handle with trigger button and integrated battery (3900 mAh)</td>
<td>✔</td>
<td>✔</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Lithium ion battery**

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**Power supplies**

| ODZ-MAH200-SUPPLY | Power supply | | ✔ | ✔ | ✔ | | 252 |
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**Cables**

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| ODZ-MAH-CAB-B14 | USB interface connecting cable | | | | | | 254 |
| ODZ-MAH-CAB-R6 | PS/2 interface connecting cable | | | | | | 254 |
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| ODZ-TRIGGERBOX | Triggerbox for stationary readers | | | | | | 247 |

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**Graphic assistance with selection**
9.7 Data Matrix in different applications

Depending on your application needs, Pepperl+Fuchs supplies device versions that are optimized:
- for high movement speeds and low cycle times
- for required read distance and positioning accuracy (depth of focus)
- for the applied symbology, module and code size
- for different read only tag contrasts and materials

Pharmaceutical industry

Data Matrix ensures the safe allocation of box, patient information leaflets and the drug in the blister pack.

Lettershop

Document tracking at shipment immediately confirms whether a letter has been sent yet or not. Even postage can already be paid per Data Matrix code, which is often used.

Factory automation

Data Matrix codes can even be affixed to circuit boards with little space. This means that the production as well as the fitting of components can be controlled and ensures traceability for the customer.

Medical technology

Even a Data Matrix code that has been directly inscribed by laser can be reliably read and thus provides for reliable hygiene and instrument changes in hospitals.
Model Number

ODT-MAC333

Stationary read device for standstill reads of all common 1D, 2D and Pharmacodes with variable read distance up to 500 mm

Features

- All common 1D or 2D codes can be read
- 3 readings per seconds
- Omni-directional reading
- evaluation of up to 256 grey values with adaptive grey value threshold

Dimensions

Mounting: 4x thread M5, depth max. 8 mm conductive connection with machine

Read field at 100 mm approx. 35 mm (h) and 44 mm (v)

Read field at 200 mm approx. 70 mm (h) and 44 mm (v)
Function
The ODT-MAC333 is a stationary scanner for identification or online data acquisition of products with all commonly used 1D and 2D barcodes.

The ODT-MAC333 has a 1.3-million-pixel CMOS sensor and a 400-MHz processor. This combination has served as the basis for a scanning system with performance features that include the following:

- Decoding of all commonly used 1D codes (barcodes) and 2D codes (stacked codes and matrix codes)
- Omnidirectional reading of all codes with high evaluation speed
- Reads high-density as well as medium and low-density codes
- Large scanning range for both surface and distance

The device optical system is divided into two parts. This results in a field of vision that is subdivided into a close range for smaller 2D codes and a remote range for larger 1D codes. The two field of vision ranges are evaluated simultaneously with the aid of the processors integrated into the scanner.

The optimum scanning distance for close range (2D codes) is 10 cm, for remote range (1D codes) 23 cm. To scan larger symbols, you can mount the ODT-MAC333 at a greater distance from the code.

Technical data

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<th>Data Matrix</th>
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<tr>
<td>Symbol size</td>
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<tr>
<td>Orientation</td>
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</tbody>
</table>

Nominal ratings

Camera
- Type: CMOS
- Number of pixels: 1024 x 640 pixels per focus point
- Grey scale: 256
- Image recording: real-time, program controlled or external triggered
- Processor
- Clock pulse frequency: 400 MHz
- Digital resolution: 8 Bit

Electrical specifications

- Operating voltage $U_{B}$: 24 V DC ± 15 %, PELV
- Operating current: max. 100 mA

Interface
- Physical: RS 232
- Protocol: ASCII
- Transfer rate: 9600 ... 115200 Bit/s

Input
- Input voltage: 24 V DC ± 15 % PELV
- Number/Type: 1 Trigger input
- Input current: approx. 1 mA at 24 V DC

Output
- Number/Type: 1 electronic output, PNP, optically decoupled
- Switching voltage: to be applied externally 24 V +/- 15 % PELV
- Switching current: 100 mA

Compliance with standards and directives

- Directive conformity: EN 61326, EN 61000-6-4
- Standard conformity: EN 61326:2002-03
- Interference rejection: EN 61000-6-4:2001
- Protection degree: EN 60529
- Laser class: IEC 60825-1

Ambient conditions
- Ambient temperature: 0 ... 40 °C (273 ... 313 K)
- Storage temperature: -20 ... 60 °C (253 ... 333 K)

Mechanical specifications
- Protection degree: IP20
- Connection: Supply/interfaces/in- and outputs: 15-pin Sub-D connector
- Material: anodised aluminium
- Mass: approx. 175 g

Accessories

- ODS-MAC-CAB-24V-R2-2M Connecting cable for power supply/RS 232
- ODS-TRIGGERBOX-SK Trigger box for fixed mounted readers
- ODS-MAC-MAH-RULERUNNER Rule Runner Java Script license.

Registered Trademarks

- ODT
- MAC
- Data Matrix

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Model Number

ODT-MAC344-RED
ODT-MAC344-WHITE

Stationary read device with offset control unit for Data Matrix ECC 200 and Pharmacode

Features

• 25 readings per second
• 6 m/s motion speed
• Omni-directional reading
• Progressive scan
• Evaluation of up to 256 grey values with adaptive grey value threshold
• VGA output
• Compact design and remote evaluation unit for easy mounting in confined spaces

Accessories

ODZ-MAC-CAB-VIDEO
Video cable VGA

ODZ-MAC-CAB-24V-R2-2M
Connecting cable for power supply/RS 232

Dimensions

Sensor part

Evaluating processor unit

Space clear of piece parts

LED to result display
## Technical data

### ODT-MAC344-RED

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
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</thead>
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<td>Reading distance</td>
<td>32 mm</td>
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<tr>
<td>Depth of focus</td>
<td>3 mm</td>
</tr>
<tr>
<td>Reading field</td>
<td>29 mm x 24 mm</td>
</tr>
<tr>
<td>Modul size</td>
<td>≥ 0.25 mm</td>
</tr>
<tr>
<td>Sensor principle</td>
<td>Camera system</td>
</tr>
<tr>
<td>Light type</td>
<td>Integrated LED lightning (red)</td>
</tr>
<tr>
<td>Evaluation frequency</td>
<td>25 Hz</td>
</tr>
<tr>
<td>Target velocity</td>
<td>≤ 6 m/s</td>
</tr>
<tr>
<td>Symbologies</td>
<td>Pharma code , Data Matrix ECC 200</td>
</tr>
<tr>
<td>Symbol size</td>
<td>rectangular up to 48 x 48 modules</td>
</tr>
<tr>
<td>Data format</td>
<td>ASCII, C40, Text, X12, Edifact, Base 256 , all according to ISO 646</td>
</tr>
<tr>
<td>Data capacity</td>
<td>348 numerical, 259 ASCII, 172 Byte</td>
</tr>
<tr>
<td>Orientation</td>
<td>omnidirectional</td>
</tr>
</tbody>
</table>

### ODT-MAC344-WHITE

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reading distance</td>
<td>32 mm</td>
</tr>
<tr>
<td>Depth of focus</td>
<td>3 mm</td>
</tr>
<tr>
<td>Reading field</td>
<td>29 mm x 24 mm</td>
</tr>
<tr>
<td>Modul size</td>
<td>≥ 0.25 mm</td>
</tr>
<tr>
<td>Sensor principle</td>
<td>Camera system</td>
</tr>
<tr>
<td>Light type</td>
<td>Integrated LED lightning (white)</td>
</tr>
<tr>
<td>Evaluation frequency</td>
<td>25 Hz</td>
</tr>
<tr>
<td>Target velocity</td>
<td>≤ 6 m/s</td>
</tr>
<tr>
<td>Symbologies</td>
<td>Pharma code , Data Matrix ECC 200</td>
</tr>
<tr>
<td>Symbol size</td>
<td>rectangular up to 16 x 48 modules</td>
</tr>
<tr>
<td>Data format</td>
<td>ASCII, C40, Text, X12, Edifact, Base 256 , all according to ISO 646</td>
</tr>
<tr>
<td>Data capacity</td>
<td>348 numerical, 259 ASCII, 172 Byte</td>
</tr>
<tr>
<td>Orientation</td>
<td>omnidirectional</td>
</tr>
</tbody>
</table>

### Nominal ratings

**Camera**

- Type: progressive scan CCD
- Chip size: 1/3 " ( 5.84 mm x 4.94 mm )
- Number of pixels: 640 x 480 pixels
- Grey scale: 256

**Processor**

- Clock pulse frequency: 150 MHz
- Speed of computation: 1200 MIPS
- Digital resolution: 8 Bit

**Indicators/operating means**

- LED indicator: Trigger, good/poor reading

### Electrical specifications

**Operating voltage** $U_{B}$

- 24 V DC ± 15 % , PELV

**Operating current**

- max. 250 mA

**Interface**

- Physical: RS 232
- Protocol: ASCII
- Transfer rate: 9600 ... 115200 Bit/s

**Input**

- Input voltage: 24 V DC ± 15 % PELV
- Number/Type: 1 Trigger input, optional up to 4 inputs
- Input current: approx. 1 mA at 24 V DC

**Output**

- Number/Type: 2 electronic outputs, PNP , optically decoupled, optional up to 4 outputs
- Switching voltage: to be applied externally 24 V +/- 15 % PELV
- Switching current: 100 mA each output

### Compliance with standards and directives

**Directive conformity**

- EMC Directive 89/336/EEC EN 61326, EN 61000-6-4
- Standard conformity: EN 61326:2002-03
- Emitted interference: EN 61000-6-4:2001
- Protection degree: EN 60529

**Ambient conditions**

- Ambient temperature: 0 ... 45 °C (273 ... 318 K)

### Mechanical specifications

**Protection degree**

- IP20

**Connection**

- Video: socket, 15-pin
- Supply/Interfaces/In- and outputs: 15-pin Sub-D connector

**Material**

- Housing: anodised aluminium

**Mass**

- approx. 750 g
Model Number

ODT-MAC400-ND-RD

Stationary high-speed read device for code speeds up to 20 m/s and 60 fps, Data Matrix ECC 200 Code, straight line of sight, VGA resolution, Ethernet, RS 232

Features

- Up to 60 readings per second
- Movement speeds of up to 20 m/s
- Omni-directional reading
- Evaluation of up to 256 grey values with adaptive grey value threshold
- VGA output
- Simple focusing via laser pointers
- Integrated error image memory
Function

The stationary reader ODT-MAC400-ND-RD is a reading system for the recognition of data matrix codes. With a powerful signal processor and optimized decoding algorithms, the device delivers extremely high reading speeds. Within the system family, several models are available to select from for optimum process integration:

1. with normal or high resolution imagesensor
2. in straight or angled viewing orientation

The configuration is easy and comfortable via the standard Ethernet interface using a standard web browser or via serial port. The device is supported by an integrated laser pointer and the VGA video output. In addition, the device has an integrated error image memory and can be expanded with standard MMC memory cards.

Typical operative range of stationary readers are:
- Document handling
- Printing machines
- Identification in packaging and warehousing technology
- Detection of PCBs

Accessories

**ODZ-MAC-CAB-VIDEO**
Video cable VGA

**ODZ-MAC-CAB-24V-R2-2M**
Connecting cable for power supply/RS 232

**ODZ-MAC-CAB-15POL-2,5M-FEMALE**
Connecting cable Sub-D jack, 15-pin

**ODZ-TRIGGERBOX-SK**
Trigger box for fixed mounted readers

**V45-G-10M-V45-G**
Network cable RJ-45, Category 5

**ODZ-MAC-PWR-24V**
Netzteil 24 V DC

Technical data

**General specifications**
- Reading distance: 60 mm
- Depth of focus: ± 5 mm
- Reading field: 30 mm x 20 mm
- Modul size: ≥ 0.2 mm
- Sensor principle: Camera system
- Light type: Integrated LED lightning (red)
- Evaluation frequency: 60 Hz
- Target velocity: triggered ≤ 20 m/s
- Symbologies: Data Matrix ECC 200
- Data Matrix: Symbol size rectangular up to 48 x 48 modules rectangular up to 16 x 48 modules
- Data format: ASCII, C40, Text, X12, Edifact, Base 256 , all according to ISO 646
- Data capacity: 348 numerical, 259 ASCII, 172 Byte

**Nominal ratings**
- Camera
  - Type: CMOS , Global shutter
  - Number of pixels: 752 x 480 pixels
  - Grey scale: 256
  - Image recording: real-time , Program-controlled or triggered externally
- Processor
  - Clock pulse frequency: 600 Mhz
  - Speed of computation: 4800 MIPS
  - Digital resolution: 32 Bit
- LED indicator for good/poor reading

**Electrical specifications**
- Operating voltage: U₀ 24 V DC ± 15 % , PELV
- No-load supply current: I₀ max. 250 mA
- Power consumption: P₀ 6 W

**Input**
- Input voltage: to be applied externally 24 V ± 15 % PELV
- Number/Type: 1 Trigger input optional up to 4 inputs
- Input current: approx. 1 mA at 24 V DC
- Cable length: max. 30 m

**Output**
- Number/Type: 2 electronic outputs, PNP , optically decoupled optional up to 4 outputs
- Switching voltage: to be applied externally 24 V ± 15 % PELV
- Switching current: 100 mA each output
- Cable length: max. 30 m

**Interface 1**
- Interface type: Ethernet
- Protocol: TCP/IP
- Transfer rate: 100 MBit/s
- Cable length: max. 30 m

**Interface**
- Physical: RS 232
- Protocol: ASCII
- Transfer rate: 9600 ... 115200 Bit/s
- Cable length: max. 30 m

**Compliance with standards and directives**
- Standard conformity: EN 61326-1
- Interference rejection: EN 61000-6-4
- Emitted interference: EN 60529
- Laser class: IEC 60825-1
- Ambient conditions: 0 ... 45 °C (273 ... 338 K)
- Storage temperature: -20 ... 60 °C (253 ... 333 K)

**Mechanical specifications**
- Protection degree: IP20
- Connection: Video: socket, 7-pin
- Material: Housing diecast zinc, powder coated
- Mass: approx. 730 g

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Edition: 2009-03-01
Catalogue Identification Systems 2009
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Stationary read device

ODT-MAC401-ND-RD

Model Number
ODT-MAC401-ND-RD
Stationary high-speed read device for code speeds up to 20 m/s and 60 fps, Data Matrix ECC 200 Code, angled line of sight, VGA resolution, Ethernet, RS 232

Features
- Up to 60 readings per second
- Movement speeds of up to 20 m/s
- Omni-directional reading
- Evaluation of up to 256 grey values with adaptive grey value threshold
- VGA output
- Simple focusing via laser pointers
- Integrated error image memory

Dimensions

[Diagram of dimensions]
Function

The stationary reader ODT-MAC401-ND-RD is a reading system for the recognition of data matrix codes. With a powerful signal processor and optimized decoding algorithms, the device delivers extremely high reading speeds. Several models within the system family are available to select from for the optimum process integration:

1. with normal or high resolution image sensor
2. in straight or angled viewing orientation

The configuration is easy and comfortable via the standard Ethernet interface using a standard web browser or via serial port. The device is supported by an integrated laser pointer and the VGA video output. In addition, the device has an integrated error image memory and can be expanded with standard MMC memory cards.

Typical operative range of stationary readers are:
- Document handling
- Printing machines
- Identification in packaging and warehousing technology
- Detection of PCBs

Technical data

General specifications

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<tr>
<td>Reading field</td>
<td>30 mm x 20 mm</td>
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<tr>
<td>Modul size</td>
<td>≥ 0.2 mm</td>
</tr>
<tr>
<td>Sensor principle</td>
<td>Camera system</td>
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<td>Light type</td>
<td>Integrated LED lightning (red)</td>
</tr>
<tr>
<td>Evaluation frequency</td>
<td>60 Hz</td>
</tr>
<tr>
<td>Target velocity</td>
<td>triggered ≤ 20 m/s</td>
</tr>
<tr>
<td>Symbologies</td>
<td>Data Matrix ECC 200</td>
</tr>
</tbody>
</table>

Data Matrix

| Symbol size             | rectangular up to 48 x 48 modules |
|                        | rectangular up to 16 x 48 modules  |

Data format

ASCII, C40, Text, X12, Edifact, Base 256 , all according to ISO 646

Data capacity

348 numerical, 259 ASCII, 172 Byte

Orientation

omnidirectional

Nominal ratings

Camera

Type CMOS , Global shutter
Number of pixels 752 x 480 pixels
Grey scale 256
Image recording real-time , Program-controlled or triggered externally

Processor

Clock pulse frequency 600 MHz
Speed of computation 4800 MIPS
Digital resolution 32 Bit

Indicators/operating means

LED indicator for good/poor reading

Electrical specifications

Operating voltage Ub 24 V DC ± 15 % PELV
No-load supply current Io max. 250 mA
Power consumption Po 6 W

Interface

Physical RS 232
Protocol ASCII
Transfer rate 9600 ... 115200 Bit/s
Cable length max. 30 m

Interface 1

Interface type Ethernet
Protocol TCP/IP
Transfer rate 100 MB/s
Cable length max. 30 m

Input

Input voltage to be applied externally 24 V ± 15 % PELV
Number/Type 1 Trigger input optional up to 4 inputs
Input current approx. 1 mA at 24 V DC
Cable length max. 30 m

Output

Number/Type 2 electronic outputs, PNP , optically decoupled optional up to 4 outputs
Switching voltage to be applied externally 24 V ± 15 % PELV
Switching current 100 mA each output
Cable length max. 30 m

Output 1

Output type Video output, RGB (75 Ohm), 1 Vpp
Resolution VGA, 640 x 480 pixels

Compliance with standards and directives

Directive conformity

EMC Directive 2004/108/EC EN 61326-1 , EN 61000-6-4
Standard conformity

Interference rejection EN 61326-1
Emitted interference EN 61000-6-4
Protection degree EN 60529
Laser class IEC 60825-1

Ambient conditions

Ambient temperature 0 ... 45 °C (273 ... 318 K)
Storage temperature -20 ... 60 °C (253 ... 333 K)

Mechanical specifications

Protection degree IP20
Connection Video: socket, 7-pin
Supply/interfaces/in- and outputs: 15-pin Sub-D connector or RJ45
Material Housing diecast zinc, powder coated
Mass approx. 760 g

Accessories

ODZ-MAC-CAB-VIDEO Video cable VGA
ODZ-MAC-CAB-15POL-2,5M-FEMALE Connecting cable Sub-D jack, 15-pin
V45-G-10M-V45-G Network cable RJ-45, Category 5
ODZ-MAC-CAB-15POL-5M-FEMALE Connecting cable Sub-D jack, 15-pin
ODZ-TRIGGERBOX-SK Trigger box for fixed mounted readers
ODZ-MAC-PWR-24V Netzteil 24 V DC
ODZ-MAC-CAB-24V-R2-2M Connecting cable for power supply/RS 232

Subject to modifications without notice

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ODT-MAC401-LD-RD-MC

Model Number

ODT-MAC401-LD-RD-MC

Stationary multicode read device for all common 1D, 2D and Pharmacodes at speeds of 10 m/s, angled line-of-sight, VGA resolution, Ethernet, RS 232

Features

• 30 scans per second
• 10 m/s motion speed
• All common 1D or 2D codes can be read
• Omni-directional reading
• Evaluation of up to 256 grey values with adaptive grey value threshold
• VGA output
• Simple focusing via laser pointers
• Integrated error image memory

Dimensions

Reading distance

[Diagram of dimensions]
**Function**

The stationary reader ODT-MAC401-LD-RD-MC is a reading system for the recognition of data matrix codes. With a powerful signal processor and optimized decoding algorithms, the device delivers extremely high reading speeds. Several models within the system family are available to select from for the optimum process integration:

1. with normal or high resolution image sensor
2. in straight or angled viewing orientation

The configuration is easy and comfortable via the standard Ethernet interface using a standard web browser or via serial port. The device is supported by an integrated laser pointer and the VGA video output. In addition, the device has an integrated error image memory and can be expanded with standard MMC memory cards.

Typical operative range of stationary readers are:
- Document handling
- Printing machines
- Identification in packaging and warehousing technology
- Detection of PCBs

**Accessories**

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<thead>
<tr>
<th>Accessory</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ODT-MAC-CAB-15POL-2,5M-FEMALE</td>
<td>Connecting cable Sub-D jack, 15-pin</td>
</tr>
<tr>
<td>ODT-MAC-CAB-15POL-5M-FEMALE</td>
<td>Connecting cable Sub-D jack, 15-pin</td>
</tr>
<tr>
<td>ODT-MAC-CAB-24V-R2-2M</td>
<td>Connecting cable for power supply/RS 232</td>
</tr>
<tr>
<td>ODT-MAC-CAB-VID-15M-V45-G</td>
<td>Video cable VGA</td>
</tr>
<tr>
<td>V45-G-10M-V45-G</td>
<td>Network cable RJ-45, Category 5</td>
</tr>
<tr>
<td>ODT-TRIGGERBOX-SK</td>
<td>Trigger box for fixed mounted readers</td>
</tr>
<tr>
<td>ODT-MAC-PWR-24V</td>
<td>Netzteil 24 V DC</td>
</tr>
</tbody>
</table>

**Technical data**

**General specifications**
- Reading distance: 100 mm
- Depth of focus: ± 5 mm
- Reading field: 50 mm x 30 mm
- Modul size: ≥ 0.33 mm
- Sensor principle: Camera system
- Light type: Integrated LED lighting (red)
- Evaluation frequency: 30 Hz
- Target velocity: triggered ≤ 10 m/s

**Data Matrix**
- Symbol size: rectangular up to 48 x 48 modules
- Data format: ASCII, C40, Text, X12, Edifact, Base 256, all according to ISO 646
- Data capacity: 348 numerical, 259 ASCII, 172 Byte
- Orientation: omnidirectional

**Nominal ratings**
- Camera:
  - Type: CMOS, Global shutter
  - Number of pixels: 752 x 480 pixels
  - Grey scale: 256
  - Image recording: real-time, Program-controlled or triggered externally
  - Processor:
    - Clock pulse frequency: 600 MHz
    - Speed of computation: 4800 MIPS
  - Digital resolution: 32 Bit
- Indicators/operating means:
  - LED indicator: for good/poor reading

**Electrical specifications**
- Operating voltage: U₀
  - 24 V DC ± 15 % PELV
- No-load supply current: I₀
  - max. 250 mA
- Power consumption: P₀
  - 6 W

**Interface**
- Physical:
  - Protocol: ASCII
  - Transfer rate: 9600 ... 115200 Bit/s
  - Cable length: max. 30 m
- Interface 1:
  - Interface type: Ethernet
  - Protocol: TCP/IP
  - Transfer rate: 100 MB/s
  - Cable length: max. 30 m

**Input**
- Input voltage:
  - to be applied externally 24 V ± 15 % PELV
- Number/Type:
  - 1 Trigger input
  - optional up to 4 inputs
- Input current:
  - approx. 1 mA at 24 V DC
  - Cable length: max. 30 m

**Output**
- Number/Type:
  - 2 electronic outputs, PNP, optically decoupled
  - optional up to 4 outputs
  - Switching voltage:
    - to be applied externally 24 V ± 15 % PELV
  - Switching current:
    - 100 mA each output
  - Cable length:
    - max. 30 m

**Output 1**
- Output type: Video output, RGB (75 Ohm), 1 Vpp
- Resolution: VGA, 640 x 480 pixels

**Compliance with standards and directives**
- Directive conformity:
  - EMC Directive 2004/108/EC
  - EN 61326-1, EN 61000-6-4
  - Standard conformity
  - Interference rejection: EN 61326-1
  - Emitted interference: EN 61000-6-4
  - Protection degree: EN 60529
  - Laser class: IEC 60825-1
- Ambient conditions:
  - Ambient temperature: 0 ... +45 °C (273 ... 318 K)
  - Storage temperature:
    - -20 ... +60 °C (253 ... 333 K)
- Mechanical specifications:
  - Protection degree: IP20
  - Connection: Video socket, 7-pin
  - Material:
    - Housing: diecast zinc, powder coated
  - Weight:
    - approx. 760 g
ODT-HH-MAH200

Handheld Data Matrix reader for all current 1D and 2D barcodes, for wired and wireless operation

**Features**
- All common 1D or 2D codes can be read
- 3 readings per seconds
- Omni-directional reading
- Evaluation of up to 256 grey values with adaptive grey value threshold
- Wireless Bluetooth connection

**Function**

The ODT-HH-MAH200 is a handheld, which is used to identify objects with 1D and 2D barcodes. With this, the handheld sets a new benchmark: Thanks to the CMOS-Sensor, with a resolution of 1.3 million pixels, an innovative lens coverage with 2 reading ranges and a 400 MHz processor, the light and quick handheld device is presented with the ODT-HH-MAH200, fulfilling all the requirements of an object identifier, comparable to that of a stationary reading device.

The unique Dynamic Optimization Technology (DOT) continuously adapts the resolution, illumination and reading range to enable fast identification and decoding of a wide range of symbology types, sizes, recording surfaces and ambient lighting. With DOT, the ODT-HH-MAH200 can decode 2D barcodes at speeds similar to those achieved when decoding 1D barcodes.

Data stored on the handheld can be smoothly transferred to a PC with a USB, RS 232 or PS/2 interface. For this purpose, an optimal accessory has been made available.

---

**Dimensions**

![Dimensions Diagram]

**Model Number**

ODT-HH-MAH200
ODT-HH-MAH200-B15

Laser Class 2M
**Accessories**

- **ODZ-MAH-B15-M3**
  Bluetooth modem, configured for USB
- **ODZ-MAH200-BRACKET**
  Bracket for ODT-HH-MAH200
- **ODZ-MAH-GRIP1**
  Handle with trigger button
- **ODZ-MAH-GRIP2**
  Handle with trigger switch and 1950 mAh battery
- **ODZ-MAH-GRIP3**
  Handle with trigger switch and 3900 mAh battery
- **ODZ-MAH-SUPPLY**
  Power supply
- **ODZ-MAH-CHARGER**
  Charging tray for ODZ-MAH-GRIP2/GRIP3
- **ODZ-MAH-CHARGER-SINGLE**
  Charger for ODT-HH-MAH200/300/I*T-HH20
- **ODZ-MAH200-CHARGER**
  Charger for ODT-HH-MAH200/ODZ-MAH-BAT
- **ODZ-MAH-CAB-CHARGE**
  Cable for power supply unit
- **ODZ-MAH-BAT**
  Lithium ion battery 1950 mAh
- **ODZ-MAH-BLANK**
  Battery blank
- **ODZ-MAH-CAB-R2**
  Connection cable RS 232 interface
- **ODZ-MAH-CAB-R6**
  Connecting cable PS/2 interface
- **ODZ-MAH-CAB-B14**
  Connecting cable, USB interface
- **ODS-MAH-RULERUNNER**
  Rule Runner Java Script license.
- **ODZ-MAH200-CODEROUTER**
  Code Router Software
- **ODS-MAH-B15-ENCRYPT**
  Software for encrypted Bluetooth transfer

**Technical data**

**ODT-HH-MAH200**

<table>
<thead>
<tr>
<th>General specifications</th>
<th>ODT-HH-MAH200</th>
<th>ODT-HH-MAH200-B15</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laser class</td>
<td>2M</td>
<td></td>
</tr>
<tr>
<td>Reading distance</td>
<td>50 ... 500 mm depending on code symbology</td>
<td></td>
</tr>
<tr>
<td>Reading field</td>
<td>max. 125 mm x 200 mm</td>
<td></td>
</tr>
<tr>
<td>Modul size</td>
<td>≥ 0.15 mm</td>
<td></td>
</tr>
<tr>
<td>Sensor principle</td>
<td>Camera system</td>
<td></td>
</tr>
<tr>
<td>Light type</td>
<td>Integrated LED lightning (red)</td>
<td></td>
</tr>
<tr>
<td>Target velocity</td>
<td>Standstill</td>
<td></td>
</tr>
<tr>
<td>Data Matrix</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Symbol size</td>
<td>rectangular up to 144 x 144 modules</td>
<td></td>
</tr>
<tr>
<td>Orientation</td>
<td>omnidirectional</td>
<td></td>
</tr>
</tbody>
</table>

**Nominal ratings**

**Camera**

- Type: CMOS
- Number of pixels: 1024 x 640 pixels per focus point
- Grey scale: 256
- Image recording: real-time, manually triggered

**Processor**

- Clock pulse frequency: 400 MHz
- Digital resolution: 8 Bit

**Indicators/operating means**

- Key: 2 programmable function keys

**Electrical specifications**

**Supply**

- from USB or integrated accumulator

**Interface**

- Physical: USB 1.1, RS 232 or PS/2, Bluetooth, USB 1.1, RS 232 or PS/2
- Protocol: ASCII

**Compliance with standards and directives**

**Directive conformity**

- EMC Directive 89/336/EEC EN 55024

**Standard conformity**

- Interference rejection: EN 61000-4-2/3/4/6, EN 55022
- Emitted interference: EN 55022
- Protection degree: EN 60529
- Laser class: IEC 60825-1

**Ambient conditions**

- Ambient temperature: 0 ... 40 °C (273 ... 313 K)
- Storage temperature: -20 ... 60 °C (253 ... 333 K)

**Mechanical specifications**

- Protection degree: IP20
- Connection: System connector for connecting cable or handle
- Material: Housing - plastic, Mass - approx. 50 g
- Dimensions: 109 mm x 46 mm x 33 mm
Handheld Data Matrix reader for all current 1D and 2D barcodes, for wired and wireless operation, with keypad and LCD

Features
- All common 1D or 2D codes can be read
- 3 readings per second
- Omni-directional reading
- Evaluation of up to 256 grey values with adaptive grey value threshold
- Keypad for entry of alphanumeric characters
- LCD display
- Free programming with JavaScript
- Wireless Bluetooth connection
Handheld ODT-HH-MAH300*

Function

The ODT-HH-MAH200 is a handheld, which is used to identify objects with 1D and 2D barcodes. The ODT-HH-MAH300 uses the same ergonomic platform as the very successful ODT-HH-MAH200 and increases mobile reading of 1D and 2D barcodes to a graphic display and enables data entry or changes via the keyboard.

The unique Dynamic Optimization Technology (DOT) continuously adapts the resolution, illumination and reading range to enable fast identification and decoding of a wide range of symbology types, sizes, recording surfaces and ambient lighting. With DOT, the ODT-HH-MAH300 can decode 2D barcodes at speeds similar to those achieved when decoding 1D barcodes.

Data stored on the handheld can be smoothly transferred to a PC with a USB, RS 232 or PS/2 interface. For this purpose, an optimal accessory has been made available.

Technical data

<table>
<thead>
<tr>
<th>ODT-HH-MAH300</th>
<th>ODT-HH-MAH300-B15</th>
</tr>
</thead>
<tbody>
<tr>
<td>General specifications</td>
<td></td>
</tr>
<tr>
<td>Laser class</td>
<td>2M</td>
</tr>
<tr>
<td>Reading distance</td>
<td>50 ... 500 mm Depending on code symbology</td>
</tr>
<tr>
<td>Reading field</td>
<td>max. 125 mm x 200 mm</td>
</tr>
<tr>
<td>Modul size</td>
<td>≥ 0.15 mm</td>
</tr>
<tr>
<td>Sensor principle</td>
<td>Camera system</td>
</tr>
<tr>
<td>Light type</td>
<td>Integrated LED lightning (red)</td>
</tr>
<tr>
<td>Target velocity</td>
<td>Standstill</td>
</tr>
<tr>
<td>Data Matrix</td>
<td>Rectangular up to 144 x 144 modules</td>
</tr>
<tr>
<td>Symbol size</td>
<td>Rectangular up to 16 x 48 modules</td>
</tr>
<tr>
<td>Orientation</td>
<td>Omnidirectional</td>
</tr>
<tr>
<td>Nominal ratings</td>
<td></td>
</tr>
<tr>
<td>Camera</td>
<td></td>
</tr>
<tr>
<td>Type</td>
<td>CMOS</td>
</tr>
<tr>
<td>Number of pixels</td>
<td>1024 x 640 pixels per focus point</td>
</tr>
<tr>
<td>Grey scale</td>
<td>256</td>
</tr>
<tr>
<td>Image recording</td>
<td>Real-time, manually triggered</td>
</tr>
<tr>
<td>Processor</td>
<td></td>
</tr>
<tr>
<td>Clock pulse frequency</td>
<td>400 MHz</td>
</tr>
<tr>
<td>Digital resolution</td>
<td>8 Bit</td>
</tr>
<tr>
<td>Memory</td>
<td></td>
</tr>
<tr>
<td>Non-volatile memory</td>
<td>4 MByte</td>
</tr>
<tr>
<td>Indicators/operating means</td>
<td></td>
</tr>
<tr>
<td>Display</td>
<td>LC-Display 128 x 128 Pixel, monochrom</td>
</tr>
<tr>
<td>Keyboard</td>
<td>Keypad for entering alphanumerical characters</td>
</tr>
<tr>
<td>Key</td>
<td>2 programmable function keys</td>
</tr>
<tr>
<td>Electrical specifications</td>
<td></td>
</tr>
<tr>
<td>Supply</td>
<td>from interface or deployed rechargeable battery</td>
</tr>
<tr>
<td>Interface</td>
<td></td>
</tr>
<tr>
<td>Physical</td>
<td>USB 1.1, RS 232 or PS/2</td>
</tr>
<tr>
<td>Bluetooth</td>
<td>USB 1.1, RS 232 or PS/2</td>
</tr>
<tr>
<td>Protocol</td>
<td>ASCII</td>
</tr>
<tr>
<td>Compliance with standards and directives</td>
<td></td>
</tr>
<tr>
<td>Standard conformity</td>
<td>Interference rejection EN 61000-4-2/3/4/6, EN 55022</td>
</tr>
<tr>
<td>Emitted interference</td>
<td>EN 55022</td>
</tr>
<tr>
<td>Protection degree</td>
<td>EN 60529</td>
</tr>
<tr>
<td>Laser class</td>
<td>IEC 60825-1</td>
</tr>
<tr>
<td>Ambient conditions</td>
<td></td>
</tr>
<tr>
<td>Ambient temperature</td>
<td>0 ... 40 °C (273 ... 313 K)</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>-20 ... 60 °C (253 ... 333 K)</td>
</tr>
<tr>
<td>Mechanical specifications</td>
<td></td>
</tr>
<tr>
<td>Protection degree</td>
<td>IP20</td>
</tr>
<tr>
<td>Connection</td>
<td>System connector for connecting cable or handle</td>
</tr>
<tr>
<td>Material</td>
<td></td>
</tr>
<tr>
<td>Housing</td>
<td>Plastic</td>
</tr>
<tr>
<td>Mass</td>
<td>approx. 180 g</td>
</tr>
<tr>
<td>Dimensions</td>
<td>112 mm x 46 mm x 41 mm</td>
</tr>
</tbody>
</table>

Accessories

| ODZ-MAH300-BRACKET |
| Bracket for hand-held units with displays |
| ODZ-MAH-B15-M3 |
| Bluetooth modem, configured for USB |
| ODZ-MAH-GRIP1 |
| Handle with trigger button |
| ODZ-MAH-GRIP2 |
| Handle with trigger switch and 1950 mAh battery |
| ODZ-MAH-GRIP3 |
| Handle with trigger switch and 3900 mAh battery |
| ODZ-MAH-SUPPLY |
| Power supply |
| ODZ-MAH-CHARGER |
| Charging tray for ODZ-MAH-GRIP2/GRIP3 |
| ODZ-MAH-CHARGER-SINGLE |
| Charger for ODT-HH-MAH200/300/IT-HH20 |
| ODZ-MAH-CAB-CHARGE |
| Cable for power supply unit |
| ODZ-MAH-BAT |
| Lithium ion battery 1950 mAh |
| ODZ-MAH-BLANK |
| Battery blank |
| ODZ-MAH-CAB-R2 |
| Connection cable RS 232 interface |
| ODZ-MAH-CAB-R6 |
| Connecting cable PS/2 interface |
| ODZ-MAH-CAB-B14 |
| Connecting cable, USB interface |
| ODZ-MAH200-CODEROUTER |
| Code Router Software |
| ODS-MAH-B15-ENCRYPT |
| Software for encrypted Bluetooth transfer |
The ODT-HH-MAH120-HD is a robust and inexpensive handheld for all current 1D and 2D barcodes. What is more, it is suitable for capturing high resolution data matrix codes. The megapixel CMOS image converter together with a specially developed optics permits an extremely large reading area both with regard to the reading distance and the image window. The reading area starts as low as 2 cm and ranges up to approx. 25 cm depending on the size of the code or the modules.

Thanks to its automated dynamic optimization, the handheld recognizes a wide variety of different codes and enables you to work efficiently.

As a guide to orientation there is a color-differentiated target projection in the form of a sectional drawing to support the optimal guidance visually during positioning. The use of the reader under difficult ambient conditions is simplified by the stable design of the ODT-HH-MAH120, which can survive a fall from a height of 2m to a solid floor without affecting its functionality. Successful reading feedback is optical, acoustic or tactile (vibration motor).

Standard USB interfaces, such as the RS232 or PS/2, can be used - depending on which connection cable you choose. With the help of a simple program or configuration code, the handheld can be programmed. Optionally, a client-specific solution can be created using a JavaScript editor. The Linux core of the operation system makes additional options available to you.
### Technical data

<table>
<thead>
<tr>
<th>Indicators/operating means</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating display</td>
<td>LED green</td>
</tr>
<tr>
<td>LED indicator</td>
<td>Trigger, good/poor reading</td>
</tr>
<tr>
<td>Key</td>
<td>3 inputs</td>
</tr>
<tr>
<td>Toggle switch</td>
<td>RS 232 interface</td>
</tr>
</tbody>
</table>

### Electrical specifications

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating voltage $U_p$</td>
<td>$24 \text{ V DC} \pm 15 % \text{ PELV}$</td>
</tr>
<tr>
<td>Operating current</td>
<td>max. $50 \text{ mA}$</td>
</tr>
</tbody>
</table>

### Interface

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical</td>
<td>2 x RS 232</td>
</tr>
<tr>
<td>Protocol</td>
<td>ASCII</td>
</tr>
<tr>
<td>Transfer rate</td>
<td>9600 Bit/s ... 115200 Bit/s</td>
</tr>
</tbody>
</table>

### Input

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Input voltage</td>
<td>$24 \text{ V DC} \pm 15 % \text{ PELV}$</td>
</tr>
<tr>
<td>Number/Type</td>
<td>3 inputs for 2- or 3-wire sensors (PNP), DC</td>
</tr>
<tr>
<td>Input current</td>
<td>approx. $10 \text{ mA}$ at $24 \text{ V DC}$</td>
</tr>
</tbody>
</table>

### Output

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Number/Type</td>
<td>2 electronic outputs, PNP, overload and short-circuit proof optically decoupled</td>
</tr>
<tr>
<td>Switching voltage</td>
<td>to be applied externally $24 \text{ V} \pm 15 % \text{ PELV}$</td>
</tr>
<tr>
<td>Switching current</td>
<td>$100 \text{ mA}$</td>
</tr>
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</table>

### Compliance with standards and directives

<table>
<thead>
<tr>
<th>Directive conformity</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>EMC Directive 89/336/EEC</td>
<td>EN 61326, EN 61000-6-4</td>
</tr>
<tr>
<td>Standard conformity</td>
<td></td>
</tr>
<tr>
<td>Interference rejection</td>
<td>EN 61326:2002-03</td>
</tr>
<tr>
<td>Emitted interference</td>
<td>EN 61000-6-4:2001</td>
</tr>
<tr>
<td>Protection degree</td>
<td>EN 60529</td>
</tr>
</tbody>
</table>

### Ambient conditions

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambient temperature</td>
<td>$0 \ldots 40 \text{ °C} (273 \ldots 313 \text{ K})$</td>
</tr>
</tbody>
</table>

### Mechanical specifications

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Protection degree</td>
<td>IP20</td>
</tr>
<tr>
<td>Connection</td>
<td>Supply/interfaces/in- and outputs: 15-pin Sub-D connector or terminals</td>
</tr>
<tr>
<td>Interface 1: Sub-D socket, 9-pin</td>
<td></td>
</tr>
<tr>
<td>Interface 2: Sub-D socket, 9-pin</td>
<td></td>
</tr>
<tr>
<td>Trigger: M12 socket 5-pin</td>
<td></td>
</tr>
<tr>
<td>Material</td>
<td></td>
</tr>
<tr>
<td>Housing</td>
<td>anodised aluminium</td>
</tr>
<tr>
<td>Installation</td>
<td>DIN rail mounting</td>
</tr>
<tr>
<td>Mass</td>
<td>approx. $320 \text{ g}$</td>
</tr>
</tbody>
</table>
Data Matrix Accessories

Model Number

ODZ-MAH-GRIP1
Handle with trigger button

Accessories

ODZ-MAH-CHARGER
Charging tray for ODZ-MAH-GRIP2/GRIP3

Technical data

Mechanical specifications

Connection
System connector for connecting cable
USB 1.1
RS 232
PS/2

Installation
Push into position and clip on, additional 4 fixing holes for Handheld
2 mounting holes for Connecting cable

Mass
approx. 113 g

Dimensions
127 mm x 51 mm x 140 mm

Function

The ODZ-MAH-GRIP1 is an extremely robust handle for applications with cable connections. 4 attachment holes facilitate the safe attachment of the handheld device and the used connection cable to the handle. The hard wearing material and ergonomic design of the ODZ-MAH-GRIP1 handle guarantee stability and comfort in daily use. In addition, the overhanging rubber border ensures that the handheld is protected should it be dropped.

Model Number

ODZ-MAH-GRIP2
Handle with trigger switch and 1950 mAh battery

Accessories

ODZ-MAH-CHARGER
Charging tray for ODZ-MAH-GRIP2/GRIP3

Technical data

Electrical specifications

Capacitance
1950 mAh

Mechanical specifications

Installation
Push into position and clip on, additional 2 fixing holes for Handheld

Mass
approx. 136 g

Dimensions
102 mm x 51 mm x 140 mm

Function

The ODZ-MAH-GRIP2 is an extremely robust handle for handhelds of the product families ODT-HH-MAH* and I*T-HH20. The integrated Lithium-Ion batteries with a capacity of 1950 mAh enable you to work mobile and without annoying cables. Thanks to the exterior contact, the handle with the mounted handheld can be charged in the charger tray ODZ-MAH-CHARGER in a simple and uncomplicated manner. 2 attachment holes facilitate the safe attachment of the handheld to the handle. The hard wearing material and ergonomic design of the ODZ-MAH-GRIP2 handle guarantee stability and comfort in daily use. In addition, the overhanging rubber border ensures that the handheld is protected should it be dropped.
**Model Number**

ODZ-MAH-GRIP3
Handle with trigger switch and 3900 mAh battery

**Accessories**

ODZ-MAH-CHARGER
Charging tray for ODZ-MAH-GRIP2/GRIP3

**Technical data**

**Electrical specifications**
- Capacitance: 3900 mAh

**Mechanical specifications**
- Installation: Push into position and clip on, additional 2 fixing holes for Handheld
- Mass: approx. 181 g
- Dimensions: 102 mm x 51 mm x 140 mm

**Function**

The ODZ-MAH-GRIP3 is an extremely robust handle for handhelds of the product families ODT-HH-MAH* and I*T-HH20. The integrated Lithium-Ion batteries with a capacity of 3900 mAh enable you to work mobile and without annoying cables. Thanks to the exterior contact, the handle with the mounted handheld can be charged in the charger tray ODZ-MAH-CHARGER in a simple and uncomplicated manner. 2 attachment holes facilitate the safe attachment of the handheld to the handle. The hard wearing material and ergonomic design of the ODZ-MAH-GRIP3 handle guarantee stability and comfort in daily use. In addition, the overhanging rubber border ensures that the handheld is protected should it be dropped...
Model Number

ODZ-MAH200-BRACKET
Bracket for ODT-HH-MAH200

Technical data

General specifications
- Reading angle: approx. 10°
- Operating distance: 65 ... 190 mm

Mechanical specifications
- Dimensions: approx. (152 x 152 x 334) mm

Model Number

ODZ-MAH300-BRACKET
Bracket for hand-held units with displays

Technical data

General specifications
- Reading angle: approx. 10°
- Operating distance: 65 ... 190 mm

Mechanical specifications
- Dimensions: approx. (152 x 152 x 334) mm
Model Number

ODZ-MAH120-BRACKET-W
Bracket for ODT-HH-MAH120

Features

- Mounting bracket
- Simple and fast mounting

Dimensions

[Diagram showing dimensions]

Technical data

<table>
<thead>
<tr>
<th>Mechanical specifications</th>
<th>Clear Plexiglas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material</td>
<td></td>
</tr>
<tr>
<td>Mass</td>
<td>approx. 110 g</td>
</tr>
</tbody>
</table>
### Model Number
**ODZ-MAH-BAT**
Lithium ion battery 1950 mAh

### Technical data
#### Electrical specifications
- **Capacitance**: 1950 mAh

#### Mechanical specifications
- **Mass**: approx. 60 g
- **Dimensions**: approx. (45 x 60 x 19) mm

### Model Number
**ODZ-MAH-BLANK**
Battery blank

### Technical data
#### Mechanical specifications
- **Mass**: approx. 20 g
- **Dimensions**: approx. (45 x 60 x 19) mm

### Model Number
**ODZ-MAH200-SUPPLY**
Power supply

### Technical data
#### Input
- **Input voltage**: 100 V AC ... 240 V AC
- **Input current**: 0.5 A

#### Output
- **Output rated operating current**: 1200 mA, short-circuit proof
- **Output voltage**: 5 V DC / 5 %

#### Compliance with standards and directives
- **EMC Directive 89/336/EEC EN 60950**

#### Ambient conditions
- **Ambient temperature**: 0 ... 40 °C (273 ... 313 K)
- **Storage temperature**: -20 ... 85 °C (253 ... 358 K)

#### Mechanical specifications
- **Protection degree**: IP20

#### Function
ODZ-MAH200-SUPPLY is suitable as a stationary power supply source for handhelds belonging to the product families ODT-HH-MAH* and I*T-HH20 without a lithium-ion battery. You also need to use the power supply cable ODZ-MAH-CAB-CHARGE for the connection to the handheld.
### Model Number

**ODZ-MAH-CHARGER**  
Charging tray for ODZ-MAH-GRIP2/GRIP3

#### Technical data

**Indicators/operating means**
- LED red/green
  - Off: battery not detected / battery defective
  - Red: battery is charging
  - Green: battery is fully charged

**Input**
- Input voltage: 100 V AC ... 240 V AC  
  50 ... 60 Hz
- Input current: approx. 0.2 mA

**Output**
- Output rated operating current: 400 ... 1200 mA
- Output voltage: 5 V DC pulsing

**Mechanical specifications**
- Connection: power plug
- Mass: 136 g
- Dimensions: 230 mm x 86 mm x 51 mm

#### Function

With the charger tray ODZ-MAH-CHARGER, you can charge the batteries of the handles, ODZ-MAH-GRIP2 and ODZ-MAH-GRIP3. The battery charger tray also features space for the bluetooth modem ODZ-MAH-B15 and can be attached to the wall.

---

### Model Number

**ODZ-MAH-CHARGER-SINGLE**  
Charger for ODT-HH-MAH200/300/I*T-HH20

#### Technical data

**Indicators/operating means**
- LED red/green
  - Off: battery not detected / battery defective
  - Red: battery is charging
  - Green: battery is fully charged

**Input**
- Input voltage: 100 V AC ... 240 V AC  
  50 ... 60 Hz
- Input current: approx. 0.2 mA

**Output**
- Output rated operating current: 400 ... 1200 mA
- Output voltage: 5 V DC pulsing

**Mechanical specifications**
- Connection: power plug

#### Function

The battery charger ODZ-MAH-CHARGER-SINGLE can charge handhelds from the product families ODT-HH-MAH* and I*T-HH20. Beyond this, the battery charger can be attached to the wall.

---

### Model Number

**ODZ-MAH200-CHARGER**  
Charger for ODT-HH-MAH200/ODZ-MAH-BAT

#### Technical data

**Indicators/operating means**
- LED red/green
  - Off: battery not detected / battery defective
  - Red: battery is charging
  - Green: battery is fully charged

**Input**
- Input voltage: 100 V AC ... 240 V AC  
  50 ... 60 Hz
- Input current: approx. 0.2 mA

**Output**
- Output rated operating current: 400 ... 1200 mA
- Output voltage: 5 V DC pulsing

**Mechanical specifications**
- Connection: power plug

#### Function

The battery charger ODZ-MAH200-CHARGER offers you the possibility of charging ODT-HH-MAH200 handhelds. An adapter included with the charger also makes it possible to recharge ODZ-MAH-BAT rechargeable batteries for handhelds of product families ODT-HH-MAH* and I*T-HH20.
Model Number
ODZ-MAH-CAB-R6
Connecting cable PS/2 interface

Technical data
Mechanical specifications
Connection | PS/2
Cable length | ca. 2.4 m Spiral Cable

Function
ODZ-MAH-CAB-R6 is a cable for connecting handhelds belonging to the product families ODT-HH-MAH* and "I"-HH20 to the PS/2 interface of a computer. You can also connect a PS/2 keyboard directly with the connection cable.

Model Number
ODZ-MAH-CAB-R2
Connection cable RS 232 interface

Technical data
Mechanical specifications
Connection | RS 232: 9-pin Sub-D socket
Cable length | ca. 2.4 m Spiral Cable

Function
ODZ-MAH-CAB-R2 is a cable for connecting handhelds belonging to the product families ODT-HH-MAH* and "I"-HH20 to the RS 232 interface of a computer. You also need the power supply unit ODZ-MAH200-SUPPLY for external power supply.

Model Number
ODZ-MAH-CAB-B14
Connecting cable, USB interface

Technical data
Mechanical specifications
Connection | USB-Male Connector Typ A (Standard)
Cable length | 1.85 m

Function
ODZ-MAH-CAB-B14 is a cable for connecting handhelds belonging to the product families ODT-HH-MAH* and "I"-HH20 to the USB interface of a computer.
### Model Number

**ODZ-MAC-CAB-24V-R2-2M**  
Connecting cable for power supply/RS 232

### Technical data

<table>
<thead>
<tr>
<th>Mechanical specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connection</td>
</tr>
<tr>
<td>Sub-D-Buchse, 15-pin</td>
</tr>
<tr>
<td>RS 232: Sub-D connector, 9-pin</td>
</tr>
<tr>
<td>Supply voltage: 5.5 mm hollow socket</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cable length</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.85 m</td>
</tr>
</tbody>
</table>

### Model Number

**ODZ-MAC-CAB-15POL-2,5M**  
Connecting cable Sub-D jack, 15-pin

### Technical data

<table>
<thead>
<tr>
<th>Mechanical specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core cross-section</td>
</tr>
<tr>
<td>0.14 mm²</td>
</tr>
</tbody>
</table>

| Connection                |
| 2x Sub-D-Buchse, 15-pin   |

<table>
<thead>
<tr>
<th>Cable length</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.5 m</td>
</tr>
</tbody>
</table>

### Model Number

**ODZ-MAH-CAB-CHARGE**  
Cable for power supply unit

### Technical data

<table>
<thead>
<tr>
<th>Mechanical specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connection</td>
</tr>
<tr>
<td>DIN connector, 8-pin</td>
</tr>
<tr>
<td>Supply voltage: 5.5 mm hollow socket</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cable length</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.85 m</td>
</tr>
</tbody>
</table>
Data Matrix Accessories

<table>
<thead>
<tr>
<th>Model Number</th>
<th>Technical data</th>
</tr>
</thead>
<tbody>
<tr>
<td>ODZ-MAC-CAB-VIDEO</td>
<td>Video cable VGA</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Model Number</td>
<td>Technical data</td>
</tr>
<tr>
<td>ODZ-MAC-PWR-24V</td>
<td>Netzteil 24 V DC</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Technical data**

**Model Number:** ODZ-MAC-CAB-VIDEO

- **Video cable VGA**

**Model Number:** ODZ-MAC-PWR-24V

- **Netzteil 24 V DC**

**Technical data**

**Mechanical specifications**

- **Cable length:** 2 m

**Technical data**

**Input**

- **Input voltage:** 100 V AC ... 240 V AC
- **Input current:** approx. 1.5 mA

**Output**

- **Output rated operating current:** 1.88 A
- **Output voltage:** 24 V DC pulsing

**Mechanical specifications**

- **Connection:** power plug
- **Supply voltage:** 5.5 mm hollow connector

---

**Subject to modifications without notice**

**Copyright Pepperl+Fuchs**

**Edition:** 2009-07-08  Catalogue Identification Systems 2009
Model Number
ODZ-MAH-B15-M3
Bluetooth modem, configured for USB

Technical data
General specifications
Operating frequency 2.4 GHz (ISM band)

Indicators/operating means
Function display Bluetooth (LED blue)
flashing: no connection
permanent ON: active connection

Interface
Physical Bluetooth v1.2
Profil SSP (Serial Port Profile)
Detection range up to 100 m
Transfer rate max. 115 kBit/s

System requirements
Hardware requirements 1 free USB slot, RS 232
Operating system Microsoft Windows 2000, NT, or XP
MAC OS, Linux, UNIX, or other

Ambient conditions
Ambient temperature 0 ... 70 °C (273 ... 343 K)
Storage temperature -15 ... 80 °C (258 ... 353 K)

Mechanical specifications
Connection System connector for connecting cable
USB 1.1
RS 232 configured for USB
Dimensions 81 mm x 70 mm x 25 mm

Function
The Bluetooth Modem ODZ-MAH-B15-M3 offers you the possibility of the wireless connection of Bluetooth-compatible devices from the ODT-HH-MAH* and I*T-HH20 product families with your computer and the transfer of the read data by radiotelegraphy.

Due to the simple installation and a range of up to 100 m the Bluetooth Modem ODZ-MAH-B15-M3 is ideal for this purpose, provided your Bluetooth-compatible device is mobile and its cables are not prone to interference.

The modem is already pre-configured ex-works for the cabling of the USB interface of the computer.

Note: The USB connection cable is not included in the delivery package.

Model Number
ODZ-MAH200-B15-B14
Bluetooth Dongle USB for PC

Technical data
General specifications
Operating frequency 2.4 GHz (ISM band)

Interface
Physical Bluetooth v1.1
Profil SSP (Serial Port Profile)
Detection range up to 100 m
Transfer rate max. 115 kBit/s

System requirements
Hardware requirements 1 free USB slot
Operating system Microsoft Windows 98 SE, Me, 2000, or XP
MAC OS X v10.2 or higher

Ambient conditions
Ambient temperature 0 ... 50 °C (273 ... 323 K)
Storage temperature -15 ... 55 °C (258 ... 328 K)

Mechanical specifications
Connection USB-Male Connector Typ A (Standard) USB 1.1
Mass 8.5 g
Dimensions (64 x 22 x 8) mm
### Model Number
**ODZ-MAH200-CODEROUTER**  
Code Router Software

### Technical data
**General specifications**
- **Description:** Software for establishing a reliable connection and serial/keyboard input converter

**System requirements**
- **Operating system:** Microsoft Windows 3.1, 98, Me, NT, 2000, or XP

---

### Model Number
**ODS-MAH-B15-ENCRYPT**  
Software for encrypted Bluetooth transfer

### Technical data
**General specifications**
- **Description:** Software for encrypted Bluetooth transfer

---

### Model Number
**ODS-MAH-RULERUNNER**  
Rule Runner Java Script license.

### Technical data
**General specifications**
- **Description:** Rule Runner Java Script license. This software allows the use of Java Script.
10 Identification System for High Temperatures

The kind of ambient conditions that prevail in drying plants and painting lines hamper and make the use of identification systems such as RFID or electric read/write tags more costly. The high temperatures in drying plants that harden adhesive bonds after exiting the painting line make tough demands on the read only tags. They must be able to withstand temperatures of up to 250 °C for years in cyclic alternation. In the long run, electronic components or batteries in the read/write tag are not up to this task.

Hence Pepperl+Fuchs has developed a new identification system that not only stands up to temperatures of up to 500 °C, but is also easy to operate, maintenance-free and durable.

10.1 Functional principle identification system for high temperatures

A unique code is stamped into a special, heat-resistant metal read only tag for the identification of individual objects. These codes can be made similar to Data Matrix codes or individually defined codes. The data content in the code can be redundant and thus error tolerant.

The identification system for high temperatures uses digital camera technology to take a shot of the read only tag, while an integrated infrared illumination provides for the correct lighting of the read only tag. Even dirty or overpainted read only tags can thus still be read very well, since contrast on a defined background is always optimal.

The perforated matrix in the image taken is evaluated and the extracted data transferred to system control via an Ethernet interface.

10.2 Software OITControl

OITControl provides you with an user-friendly interface for convenient and easy identification system for high temperatures operation. With the use of an XML configuration file, OITControl can be adapted to the particular requirements of your plant.

Tasks of OITControl include establishing connections to identification systems for high temperatures, the programming of operating parameters and identification system maintenance, as well as the transfer and display of data and error diagnostics.

The software includes the following functions:
• Display of transmitted data and control bits
• Operator terminal for trouble-shooting incorrect reads
• Parameterization and maintenance of the identification system for high temperatures
• Diagnosis of the identification system for high temperatures
High temperature identification system

**Model Number**

**OIT500-F113-B12-CB**

Optical high temperature identification system, 200 to 450 mm

**Features**

- High-temperature read only tag up to 500 °C
- Sturdy and compact design
- Integrated illumination
- Large detection range
- Large sensing range
- High depth of focus

**Dimensions**

![Dimensions Diagram]

**Notes**

- **4xM6**
- **200 - 450 mm**
- **370 - 620 mm**
- **170 mm**
Function

The stationary scanner OIT500-F113-B12-CB is an optical identification system using the methods of industrial image processing, which finds application in automated manufacturing processes. In particular with body-shell work, there are harsh ambient conditions, which complicate or render impossible the application of code carriers with electronic components due to cyclical changes in temperature, for example. For this reason, the high-temperature identification system OIT is fitted with code carriers with massive metal plates provided with a perforated matrix, which can withstand temperatures up to 500 °C and high mechanical loads. Simple installation as well as commissioning without complicated and long-winded TEACH-IN enable fast application. Plug-in connections for fast exchange of devices and the control with simple command sets through an Ethernet interface ensure very easy operation. A scratch resistant quartz glass pane, which can be replaced, if and when required, as well as the stable metal housing turn the OIT500-F113-B12-CB into a robust and powerful identification system.

Accessories

OIC-C10V2A-CB1
Read only tag for optical high-temperature identification system, stainless steel

V45-G
Non pre-wired cable connector

V8HAN-G-10M-PVC-ABG
Cable box, Harting, 8-pin, shielded, PUR cable

V45-GP
Non pre-wired “Push-Pull” cable connector

V45-GP-10M-PUR-ABG-V45-G
Connecting cable, RJ-45 to RJ-45, PUR cable

Technical data

<table>
<thead>
<tr>
<th>General specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Light source</td>
</tr>
<tr>
<td>Reading distance</td>
</tr>
<tr>
<td>Depth of focus</td>
</tr>
<tr>
<td>Reading field</td>
</tr>
<tr>
<td>Sensor principle</td>
</tr>
<tr>
<td>Light type</td>
</tr>
<tr>
<td>Evaluation frequency</td>
</tr>
<tr>
<td>Target velocity</td>
</tr>
<tr>
<td>Symbologies</td>
</tr>
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<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Indicators/operating means</th>
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</thead>
<tbody>
<tr>
<td>Operating display</td>
</tr>
<tr>
<td>Function display</td>
</tr>
<tr>
<td>Yellow LED: trigger</td>
</tr>
<tr>
<td>Red LED: pre-fault</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Electrical specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating voltage $U_D$</td>
</tr>
<tr>
<td>Operating current</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Interface</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical</td>
</tr>
<tr>
<td>Protocol</td>
</tr>
<tr>
<td>Transfer rate</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Input</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input voltage</td>
</tr>
<tr>
<td>Number/Type</td>
</tr>
<tr>
<td>Input current</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number/Type</td>
</tr>
<tr>
<td>Switching voltage</td>
</tr>
<tr>
<td>Switching current</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Compliance with standards and directives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Directive conformity</td>
</tr>
<tr>
<td>EMC Directive 2004/108/EC</td>
</tr>
<tr>
<td>Standard conformity</td>
</tr>
<tr>
<td>Interference rejection</td>
</tr>
<tr>
<td>Emitted interference</td>
</tr>
<tr>
<td>Protection degree</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ambient conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambient temperature</td>
</tr>
<tr>
<td>Storage temperature</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mechanical specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protection degree</td>
</tr>
<tr>
<td>Connection</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>Housing</td>
</tr>
<tr>
<td>Mass</td>
</tr>
</tbody>
</table>
High temperature identification system

OIT300-F113-B12-CB2

Model Number
OIT300-F113-B12-CB2
Optical high temperature identification system, 100 to 270 mm

Features
- High-temperature read only tag up to 500 °C
- Sturdy and compact design
- Integrated illumination
- Large sensing range
- High depth of focus

Notes

Dimensions

<table>
<thead>
<tr>
<th>10</th>
<th>68</th>
<th>20</th>
</tr>
</thead>
<tbody>
<tr>
<td>75</td>
<td>75</td>
<td>75</td>
</tr>
</tbody>
</table>

Notes

4xM6

Dimensions

| 100-270 mm |
| 270-440 mm |
| 170 mm |
**Function**

The stationary scanner OIT300-F113-B12-CB2 is an optical identification system using the methods of industrial image processing, which finds application in automated manufacturing processes.

For this reason, the high-temperature identification system OIT is fitted with code carriers with massive metal plates provided with a perforated matrix, which can withstand temperatures up to 500 °C and high mechanical loads.

Simple installation as well as commissioning without complicated and long-winded TEACH-IN enable fast application. Plug-in connections for fast exchange of devices and the control with simple command sets through an Ethernet interface ensure very easy operation. A scratch resistant quartz glass pane, which can be replaced, if and when required, as well as the stable metal housing turn the OIT300-F113-B12-CB2 into a robust and powerful identification system.

**Technical data**

<table>
<thead>
<tr>
<th>General specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Light source</td>
</tr>
<tr>
<td>Integrated LED lighting</td>
</tr>
<tr>
<td>Reading distance</td>
</tr>
<tr>
<td>adjustable 100 ... 270 mm</td>
</tr>
<tr>
<td>Depth of focus</td>
</tr>
<tr>
<td>± 50 mm</td>
</tr>
<tr>
<td>Reading field</td>
</tr>
<tr>
<td>210 mm x 160 mm at max. reading distance</td>
</tr>
<tr>
<td>Sensor principle</td>
</tr>
<tr>
<td>Camera system</td>
</tr>
<tr>
<td>Light type</td>
</tr>
<tr>
<td>Infrared</td>
</tr>
<tr>
<td>Evaluation frequency</td>
</tr>
<tr>
<td>5 Hz</td>
</tr>
<tr>
<td>Target velocity</td>
</tr>
<tr>
<td>triggered ≤ 0.5 m/s</td>
</tr>
<tr>
<td>Symbologies</td>
</tr>
<tr>
<td>Hole matrix</td>
</tr>
<tr>
<td>Value range: 4-digit numerical, between 1 and 4095</td>
</tr>
<tr>
<td>Read only tag size: 80 mm x 36 mm</td>
</tr>
</tbody>
</table>

**Indicators/operating means**

| Operating display                        |
| Green LED: supply                        |
| Green LED: ready                         |
| Function display                         |
| Yellow LED: trigger                      |
| Yellow LED: code read                    |
| Red LED: pre-fault                       |
| Red LED: group error                     |

**Electrical specifications**

| Operating voltage U<sub>B</sub>          |
| 24 V DC ± 15 % , PELV                   |
| Operating current                       |
| 250 mA without output drivers           |

**Interface**

| Physical Protocol                        |
| Ethernet                                 |
| Protocol TCP/IP                          |
| Transfer rate                            |
| 100 MBit/s                               |

**Input**

| Input voltage                            |
| to be applied externally 24 V ± 15 % PELV|
| Number/Type                              |
| 1 Trigger input 2 control unit inputs , optically decoupled |
| Input current                            |
| approx. 1 mA at 24 V DC                  |

**Output**

| Number/Type                             |
| 1 electronic output, PNP, optically decoupled |
| Switching voltage                        |
| to be applied externally 24 V ± 15 % PELV  |
| Switching current                        |
| 100 mA each output                       |

**Compliance with standards and directives**

| Directive conformity                     |
| EMC Directive 2004/108/EC                |
| EN 61326-1, EN 61000-6-4                 |
| Standard conformity                      |
| Interference rejection                   |
| EN 61326-1                               |
| Emitted interference                     |
| EN 61000-6-4:2001                        |
| Protection degree                        |
| EN 60529                                 |

**Ambient conditions**

| Ambient temperature                       |
| 0 ... 45 °C (273 ... 318 K)               |
| Storage temperature                       |
| -20 ... 60 °C (253 ... 333 K)             |

**Mechanical specifications**

| Protection degree                        |
| IP64                                     |
| Connection                               |
| Hartling HAN, 8-pin RJ-45, 2 x M12 socket 5-pin |
| Material                                 |
| aluminium diecasting powder coated       |
| Mass                                     |
| approx. 4000 g                            |
OIT Accessories

Model Number
OIC-C10V2A-CB1
Read only tag for optical high-temperature identification system, stainless steel

Dimensions

Technical data

General specifications
Reading distance 250 ... 450 mm dependent on the respective reader
Data storage Range of values: 6-character numerical, between 000.000 and 999.999 plus 1 check digit

Ambient conditions
Ambient temperature -25 ... 500 °C (248 ... 773 K)

Mechanical specifications
Material thickness 2 mm
Material
Housing Stainless steel V2A
Installation Parallel to the reader at the respective reading distance
Tilt angle max. 10°
Mass approx. 320 g
Hole diameter 5 mm

Function
Code carrier OIC-C10V2A-CB1 is used together with high temperature identification systems of the OIT product family for identification purposes in especially harsh industrial environments.
The code carrier is extremely sturdy, suitable for use in environments up to 500 °C, and is not sensitive to paint or lacquer. It can also be cleaned with aggressive and abrasive agents.

Model Number
OIC-C11V4A-CB2
Read only tag for optical high-temperature identification system, stainless steel

Dimensions

Technical data

General specifications
Reading distance 150 ... 250 mm at OIT300
Data storage Value range: 4-digit numerical, between 1 and 4095

Ambient conditions
Ambient temperature -25 ... 500 °C (248 ... 773 K)

Mechanical specifications
Material thickness 1.5 mm
Material
Housing stainless steel V4A
Installation Parallel to reading device at appropriate reading distance to avoid reflected light
Tilt angle max. 10°
Mass approx. 41 g
Hole diameter 3 mm

Function
Code carrier OIC-C11V4A-CB2 is used together with high temperature identification systems of the OIT product family for identification purposes in especially harsh industrial environments.
The code carrier is extremely sturdy, suitable for use in environments up to 500 °C, and is not sensitive to paint or lacquer. It can also be cleaned with aggressive and abrasive agents.
Model Number

OIC-C10ST-CB1
Code support for visual high-temperature identification system

Model Number

V45-GP-10M-PUR-ABG-V45-G
Connecting cable, RJ-45 to RJ-45, PUR cable

Technical data

General specifications
- Reading distance: 250 ... 450 mm dependent on the respective reader
- Data storage: Range of values: 6-character numerical, between 000.000 and 999.999 plus 1 check digit

Ambient conditions
- Ambient temperature: -25 ... 500 °C (248 ... 773 K)

Function
Code carrier OIC-C10ST-CB1 is used together with high-temperature identification systems of the OIT product family for identification purposes in especially harsh industrial environments. The code carrier is extremely sturdy, suitable for use in environments up to 500 °C, and is not sensitive to paint or lacquer. It can also be cleaned with aggressive and abrasive agents.

Dimensions

Technical data

General specifications
- Reading distance: 250 ... 450 mm dependent on the respective reader
- Data storage: Range of values: 6-character numerical, between 000.000 and 999.999 plus 1 check digit

Ambient conditions
- Ambient temperature: -25 ... 500 °C (248 ... 773 K)

Function
Code carrier OIC-C10ST-CB1 is used together with high-temperature identification systems of the OIT product family for identification purposes in especially harsh industrial environments. The code carrier is extremely sturdy, suitable for use in environments up to 500 °C, and is not sensitive to paint or lacquer. It can also be cleaned with aggressive and abrasive agents.

Dimensions

Technical data

General specifications
- Reading distance: 250 ... 450 mm dependent on the respective reader
- Data storage: Range of values: 6-character numerical, between 000.000 and 999.999 plus 1 check digit

Ambient conditions
- Ambient temperature: -25 ... 500 °C (248 ... 773 K)

Function
Code carrier OIC-C10ST-CB1 is used together with high-temperature identification systems of the OIT product family for identification purposes in especially harsh industrial environments. The code carrier is extremely sturdy, suitable for use in environments up to 500 °C, and is not sensitive to paint or lacquer. It can also be cleaned with aggressive and abrasive agents.
Model Number

V45-G
Non pre-wired cable connector

Dimensions

Technical data

General specifications
Connection 1 Connector, male
Construction type 1 straight

Ambient conditions
Ambient temperature -40 ... 70 °C (233 ... 343 K)

Mechanical specifications
Cable diameter 6.5 ... 7.2 mm
Protection degree IP67
Connection RJ-45

Model Number

V45-GP
Non pre-wired “Push-Pull” cable connector

Dimensions

Technical data

General specifications
Connection 1 Connector, male
Construction type 1 straight

Ambient conditions
Ambient temperature -40 ... 70 °C (233 ... 343 K)

Mechanical specifications
Cable diameter 6.5 ... 8.6 mm
Protection degree IP20
Connection RJ-45
## Model Number

**V8HAN-G-10M-PVC-ABG**

Cable box, Harting, 8-pin, shielded, PUR cable

### Dimensions

![Dimensions Diagram](image)

### Technical data

#### General specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of poles</td>
<td>8</td>
</tr>
<tr>
<td>Connector type</td>
<td>Female</td>
</tr>
<tr>
<td>Construction type</td>
<td>Straight</td>
</tr>
<tr>
<td>Connection 2</td>
<td>Free cable end</td>
</tr>
</tbody>
</table>

#### Electrical specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating voltage U_in</td>
<td>50 V</td>
</tr>
<tr>
<td>Operating current</td>
<td>10 A</td>
</tr>
<tr>
<td>Volume resistance</td>
<td>&lt; 3 mΩ</td>
</tr>
<tr>
<td>Rated operational voltage U_e</td>
<td>230/400 V</td>
</tr>
</tbody>
</table>

#### Compliance with standards and directives

- Standard conformity: EN 60529
- Ambient conditions:
  - Ambient temperature: -40 ... 80 °C (233 ... 353 K) (fixed cable)
  - Pollution Degree: 3

#### Mechanical specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>pin diameter</td>
<td>1 mm</td>
</tr>
<tr>
<td>Protection degree</td>
<td>IP65/IP67</td>
</tr>
<tr>
<td>Connection</td>
<td>8 jacks, Harting 8 D, size 3A</td>
</tr>
<tr>
<td>Material Contact</td>
<td>Cu alloy</td>
</tr>
<tr>
<td>Contact surface</td>
<td>Au</td>
</tr>
<tr>
<td>Handle</td>
<td>aluminium and polycarbonate</td>
</tr>
<tr>
<td>Cable</td>
<td>PVC</td>
</tr>
<tr>
<td>Sheath diameter</td>
<td>Ø8.7 mm</td>
</tr>
<tr>
<td>Bend radius</td>
<td>&gt; 10 x cable diameter, moving</td>
</tr>
<tr>
<td>Colour</td>
<td>Grey</td>
</tr>
<tr>
<td>Cores</td>
<td>8 x 0.5 mm²</td>
</tr>
<tr>
<td>Shield</td>
<td>Braided</td>
</tr>
<tr>
<td>Length L</td>
<td>10 m</td>
</tr>
<tr>
<td>Flammability</td>
<td>94 V-0</td>
</tr>
<tr>
<td>Housing</td>
<td>94 V-0</td>
</tr>
</tbody>
</table>

---

*Courtesy of Steven Engineering, Inc.* - 230 Ryan Way, South San Francisco, CA 94080-6370
Main Office: (650) 588-9200
Outside Local Area: (800) 258-9200
www.stevenengineering.com
Model Number

**V8HAN-G**

Cable box, Harting, 8-pin, easy to assemble

### Technical data

#### General specifications

- **Number of poles**: 8
- **Construction type**: Jack, straight Harting Han 8D, size 3 A

#### Electrical specifications

- **Operating voltage** $U_B$: 50 V
- **Operating current**: 10 A
- **Volume resistance**: $< 3 \text{ m} \Omega$
- **Rated operational voltage** $U_e$: 230/400 V

#### Compliance with standards and directives

- **Standard conformity**: EN 60529
- **Ambient temperature**: $-40 \ldots 125 \degree C (233 \ldots 398 K)$
- **Pollution Degree**: 3

#### Mechanical specifications

- **Pin diameter**: 1 mm
- **Protection degree**: IP65/IP67
- **Connection**: 8 jacks, Harting 8 D Crimp connection for max. Ø1.1 mm, 8 mm insulation stripping PG11 screwed gland

- **Material**
  - **Contacts**: Cu alloy
  - **Contact surface**: Au
  - **Handle**: aluminium and polycarbonate
  - **Flammability**: 94 V-0
  - **Housing**: 94 V-0
<table>
<thead>
<tr>
<th>Frequency</th>
<th>Description</th>
<th>Accessories</th>
</tr>
</thead>
<tbody>
<tr>
<td>125 KHz</td>
<td>RFID Stand-alone</td>
<td>RFID Handhelds</td>
</tr>
<tr>
<td>250 KHz</td>
<td>RFID Stand-alone</td>
<td>RFID Accessories</td>
</tr>
<tr>
<td>868 MHz</td>
<td>RFID</td>
<td></td>
</tr>
<tr>
<td>13.56 MHz</td>
<td>RFID</td>
<td></td>
</tr>
<tr>
<td>2.45 GHz</td>
<td>RFID</td>
<td></td>
</tr>
</tbody>
</table>
11 Appendix

11.1 IP Ratings

(DIN EN 60529)

<table>
<thead>
<tr>
<th>Degree of protection against contact and entrance of solid foreign bodies</th>
<th>Degree of protection against ingress of liquid</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - No protection</td>
<td>0 - No protection</td>
</tr>
<tr>
<td>1 - Protected against solid objects over 50mm (e.g. accidental touch by hands).</td>
<td>1 - Protected against vertically falling drops of water.</td>
</tr>
<tr>
<td>2 - Protected against solid objects over 12mm (e.g. fingers).</td>
<td>2 - Protected against direct sprays up to 15° from the vertical</td>
</tr>
<tr>
<td>3 - Protected against solids objects over 2.5 mm (e.g. tools and wires).</td>
<td>3 - Protected against direct sprays up to 60° from the vertical.</td>
</tr>
<tr>
<td>4 - Protected against solids objects over 1mm (e.g. tools, wires and small wires).</td>
<td>4 - Protected against sprays from all directions - limited ingress permitted.</td>
</tr>
<tr>
<td>5(K) - Protected against dust - limited ingress (no harmful deposit).</td>
<td>4k - Protected against sprays from all directions.</td>
</tr>
<tr>
<td>6(K) - Totally protected against dust.</td>
<td>5 - Protected against water projected from a nozzle from all directions.</td>
</tr>
<tr>
<td></td>
<td>6 - Protected against heavy seas, or powerful jets of water.</td>
</tr>
<tr>
<td></td>
<td>6k - Protected against high pressure water jets from any direction.</td>
</tr>
<tr>
<td></td>
<td>7 - Protected against the effects of temporary immersion between 15 cm and 1 m. Duration of test 30 minutes</td>
</tr>
<tr>
<td></td>
<td>8 - Protected against complete, continuous submersion in water.</td>
</tr>
<tr>
<td></td>
<td>9k - Protected against steam jet cleaning.</td>
</tr>
</tbody>
</table>

Explanatory notes:

An "x" is used for one of the digits if there is only one class of protection.

Devices marked with the second digit 7 or 8 don't need to fulfill the requirements for the second digit 5 or 6, unless the device is marked with a double rating (e.g. IPX6/IPX7).

The letter K is used for road vehicles, especially those that need regular intensive cleaning.
11.2 Chemical resistivity charts

The chemical resistance chart rates the effect of chemicals on materials used in the construction of Pepperl+Fuchs identification systems. The standard materials are:

- V2A stainless steel
- ABS (Acrylbutadienstyrrol)
- Epoxy-casting compound
- PBT (Polybutylene terephthalate, Crastin)
- PC (Polycarbonate, Makrolon)
- POM (Polyoxymethylen, Polyacetal, Delrin)
- PP (Polypropylene, Hostalen)
- PPS (Polyphenylene sulphideBE, Ryton)
- PS (Polystere)

<table>
<thead>
<tr>
<th>V2A</th>
<th>ABS</th>
<th>Epoxy</th>
<th>PBT</th>
<th>PC</th>
<th>POM</th>
<th>PP</th>
<th>PPS</th>
<th>PS</th>
<th>PVC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acetic acid</td>
<td>20 °C</td>
<td>25 %</td>
<td>0</td>
<td>+</td>
<td>10 %</td>
<td>10 %</td>
<td>70 %</td>
<td>+</td>
<td>50 %</td>
</tr>
<tr>
<td>Acetone</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Ammonia</td>
<td>+</td>
<td>25 %</td>
<td>0</td>
<td>10 %</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>0</td>
</tr>
<tr>
<td>Benzene</td>
<td>+</td>
<td>25 %</td>
<td>+</td>
<td>+</td>
<td>0</td>
<td>+</td>
<td>-</td>
<td>-</td>
<td>+</td>
</tr>
<tr>
<td>Benzol</td>
<td>+</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>+</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Botanol</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>+</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Brake fluid</td>
<td>0</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Butane</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>Calcium chloride</td>
<td>+</td>
<td>10 °C</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>60 °C</td>
</tr>
<tr>
<td>Carbon disulphideBE</td>
<td>+</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>0</td>
</tr>
<tr>
<td>Caustic potash</td>
<td>50 %</td>
<td>0</td>
<td>3 %</td>
<td>-</td>
<td>+</td>
<td>50 %</td>
<td>50 %</td>
<td>60 °C</td>
<td></td>
</tr>
<tr>
<td>Caustic soda</td>
<td>20 °C</td>
<td>50 %</td>
<td>3 %</td>
<td>-</td>
<td>+</td>
<td>+</td>
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<td>-</td>
<td>-</td>
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<td>-</td>
<td>+</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Citric acid</td>
<td>20 °C</td>
<td>+</td>
<td>+</td>
<td>10 %</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>Diesel oil</td>
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<td>+</td>
<td>0</td>
<td>+</td>
<td>60 °C</td>
<td>+</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Formaldehyde</td>
<td>30 %</td>
<td>50 %</td>
<td>30 %</td>
<td>+</td>
<td>40 %</td>
<td>37 %</td>
<td>40 %</td>
<td>+</td>
<td>60 °C</td>
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<td>+</td>
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<td>-</td>
<td>-</td>
<td>55 %</td>
<td>0</td>
<td>40 %</td>
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<td>+</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Fruit juice</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>0</td>
<td>60 °C</td>
<td>+</td>
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<td>-</td>
</tr>
<tr>
<td>Fuel oil</td>
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<td>+</td>
<td>+</td>
<td>0</td>
<td>60 °C</td>
<td>+</td>
<td>-</td>
<td>-</td>
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<tr>
<td>Glycerin</td>
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<td>+</td>
<td>+</td>
<td>+</td>
<td>0</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>60 °C</td>
</tr>
<tr>
<td>Hydraulic oil</td>
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<td>-</td>
<td>+</td>
<td>10 %</td>
<td>20 %</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>10 %</td>
</tr>
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<td>Hydrochloric acid</td>
<td>20 °C</td>
<td>80 %</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>80 %</td>
<td>0</td>
<td>60 °C</td>
</tr>
<tr>
<td>Lactic acid</td>
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<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
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<td>+</td>
</tr>
<tr>
<td>Linseed oil</td>
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<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Lubricating oil</td>
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<td>0/+</td>
<td>+</td>
<td>+</td>
<td>+</td>
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<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
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</tr>
<tr>
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<td>+</td>
<td>-</td>
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</tr>
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<td>Methylene chloride</td>
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<td>-</td>
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<td>0</td>
<td>0</td>
<td>+</td>
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<td>-</td>
</tr>
<tr>
<td>Mineral oil</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>Motor oil</td>
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<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>0</td>
<td>60 °C</td>
</tr>
<tr>
<td>Nitric acid</td>
<td>66 %</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>10 %</td>
<td>-</td>
<td>25 %</td>
<td>10 %</td>
<td>+</td>
</tr>
<tr>
<td>Potassium chloride</td>
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<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>60 °C</td>
</tr>
<tr>
<td>Potassium hydrate</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Scavenger</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Seawater (cold)</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Soap sud</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>0</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Sodium carbonate</td>
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<td>+</td>
<td>+</td>
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<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Sodium hydroxide</td>
<td>20 °C</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Sulphuric acid</td>
<td>50 %</td>
<td>28 %</td>
<td>50 %</td>
<td>-</td>
<td>80 %</td>
<td>50 %</td>
<td>50 %</td>
<td>70 %</td>
<td>60 °C</td>
</tr>
<tr>
<td>Tartaric acid</td>
<td>20 °C</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>10 %</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>60 °C</td>
</tr>
<tr>
<td>Tetrachlorinated hydrocarbon</td>
<td>-</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0</td>
</tr>
<tr>
<td>Trichloroethylene</td>
<td>+</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Turpentine oil</td>
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<td>+</td>
<td>0</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Water</td>
<td>+</td>
<td>+</td>
<td>68 °C</td>
<td>68 °C</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>60 °C</td>
</tr>
<tr>
<td>Xylol</td>
<td>+</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Zinc sulphateBE</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
</tbody>
</table>

+ : resistive
0 : moderate
- : nonresistive
These charts are a general guide and do not guarantee chemical compatibility. The compatibility was tested at room temperature unless otherwise specified. Pepperl+Fuchs assumes no responsibility for the use of this information.
### 11.3 Read/write ranges

**Read/write ranges in air (125 kHz read/write tag at 25 °C, in mm)**

<table>
<thead>
<tr>
<th>R/W head</th>
<th>IPH-18GM-V1</th>
<th>IPH-30GM-V1</th>
<th>IPH-F61-V1</th>
<th>IPH-L2-V1</th>
<th>IPH-FP-V1</th>
<th>IPH-F15-V1</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Read only / Read/write tag</strong></td>
<td>IPH02-3GL</td>
<td>IPH02-12</td>
<td>IPH02-16</td>
<td>IPH02-20P</td>
<td>IPH02-20CD</td>
<td>IPH02-26-T6</td>
</tr>
<tr>
<td>Read only</td>
<td>0–10</td>
<td>-</td>
<td>0–15</td>
<td>-</td>
<td>0–15</td>
<td>-</td>
</tr>
<tr>
<td>Writing</td>
<td>-</td>
<td>0–18</td>
<td>-</td>
<td>0–18</td>
<td>-</td>
<td>0–30</td>
</tr>
<tr>
<td><strong>Legend - Combination not recommended</strong></td>
<td><strong>IPC02-3GL</strong></td>
<td><strong>IPC02-12</strong></td>
<td><strong>IPC02-16</strong></td>
<td><strong>IPC02-20P</strong></td>
<td><strong>IPC02-20CD</strong></td>
<td><strong>IPC02-26-T6</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>R/W head</th>
<th>IPH02-30P</th>
<th>IPH02-50P</th>
<th>IPH02-68-T7</th>
<th>IPH02-C1</th>
<th>IPC11-12</th>
<th>IPC11-30</th>
<th>IPC11-50</th>
</tr>
</thead>
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<tr>
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<td><strong>IPC02-C1</strong></td>
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<th>IPC03-20K2</th>
<th>IPC03-20P</th>
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<th>IPC03-58</th>
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</table>

**Legend - Combination not recommended**

---

**Courtesy of Steven Engineering, Inc.**
230 Ryan Way, South San Francisco, CA 94080-6370
Main Office: (650) 588-9200
Outside Local Area: (800) 258-9200
www.stevenengineering.com
## Read/write ranges in air (250 kHz read/write tag at 25 °C, in mm)

<table>
<thead>
<tr>
<th>R/W head</th>
<th>ISH-18GM-V1</th>
<th>ISH-F61-V1</th>
<th>ISH-FP-V1</th>
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</tr>
<tr>
<td>ICC-12A-T1</td>
<td>1–19</td>
<td>-</td>
<td>1–18</td>
</tr>
<tr>
<td>ICC-16GKA</td>
<td>1–14</td>
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Legend: - Combination not recommended
# Read/write ranges in air (13.56 kHz read/write tag at 25 °C, in mm)

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<th>R/W head</th>
<th>IQH1-18GM-V1</th>
<th>IQH1-F61-V1</th>
<th>IQH1-FP-V1</th>
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**Legend** - Combination not recommended
### Read/write range, flush installation in steel (125 kHz read/write tag at 25 °C, in mm)

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<th>IPC03-16K</th>
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<tr>
<td>Writing</td>
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<td>0–20</td>
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<td>0–7</td>
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### Read/write range, flush installation in steel (250 kHz read/write tag at 25 °C, in mm)

<table>
<thead>
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<th>R/W head</th>
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<tr>
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<td>ICC-8A</td>
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</tr>
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</tr>
<tr>
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</tr>
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<td>IDC-15-1K</td>
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</tr>
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<td>IDC-24-1K</td>
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<td>5–18</td>
</tr>
<tr>
<td>IDC-30F-1K</td>
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</tr>
<tr>
<td>IDC-16GK-1K</td>
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<td>ICC-16GKA</td>
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Legend - Combination not recommended
### Read/write range, directly on steel (125 kHz read/write tag at 25 °C, in mm)

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<th>IPC-30GM-V1</th>
<th>IPC-F61-V1</th>
<th>IPC-L2-V1</th>
<th>IPC-FP-V1</th>
<th>IPC-F15-V1</th>
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<td>0–13</td>
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### Read/write range, directly on steel (250 kHz read/write tag at 25 °C, in mm)

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</table>

Legend - Combination not recommended

![Installing the transponder in aluminum reduces the read and write range by a further 30 % compared to steel mounting.](image)
### Read/write range, directly on steel with 10 mm range (125 kHz read/write tag at 25 °C, in mm)

<table>
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<th>R/W head</th>
<th>IPH-18GM-V1</th>
<th>IPH-30GM-V1</th>
<th>IPH-F61-V1</th>
<th>IPH-L2-V1</th>
<th>IPH-FP-V1</th>
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</tbody>
</table>

### Read/write range, directly on steel with 10 mm range (250 kHz read/write tag at 25 °C, in mm)

<table>
<thead>
<tr>
<th>R/W head</th>
<th>ISH-18GM-V1</th>
<th>ISH-F61-V1</th>
<th>ISH-FP-V1</th>
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<tr>
<td>IDC-50F-1K</td>
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<td>0–19</td>
<td>10–45</td>
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</table>

**Legend** - Combination not recommended
<table>
<thead>
<tr>
<th>Country</th>
<th>Company Name</th>
<th>Phone Number</th>
<th>Email Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ireland</td>
<td>Inteco Ltd.</td>
<td>+353-214-883798</td>
<td><a href="mailto:info@inteco.iol.ie">info@inteco.iol.ie</a></td>
</tr>
<tr>
<td>Iceland</td>
<td>Iskraft</td>
<td>+354-5351210</td>
<td><a href="mailto:iskraft@iskraft.is">iskraft@iskraft.is</a></td>
</tr>
<tr>
<td>Israel</td>
<td>Kama Ltd.</td>
<td>+972-3-5567747</td>
<td><a href="mailto:Kama@netvision.net.il">Kama@netvision.net.il</a></td>
</tr>
<tr>
<td>Italy</td>
<td>Pepperl+Fuchs Elcón srl</td>
<td>+39-039-62921</td>
<td><a href="mailto:support@it.pepperl-fuchs.com">support@it.pepperl-fuchs.com</a></td>
</tr>
<tr>
<td>Japan</td>
<td>Pepperl+Fuchs K.K.</td>
<td>+81-45-9397802</td>
<td><a href="mailto:sales@jp.pepperl-fuchs.com">sales@jp.pepperl-fuchs.com</a></td>
</tr>
<tr>
<td>Jordan</td>
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