9  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 30x20, according to the 6th line in the table.

For a module size of, for instance, 0.3 mm

\( (0.3 \times 20) \text{ mm} \times (0.3 \times 20) \text{ mm} = 6 \text{ mm} \times 6 \text{ mm} \) 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 dot/inch = 1 dot/25.4 mm = 0.039 dot/mm

5 dot/0.3 mm = 5 dot/0.3 x 0.039 inch = 423 dpi

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</th>
<th>Total Codewords</th>
<th>Reed-Solomon Block</th>
<th>Inter-leafed Blocks</th>
<th>Data Capacity</th>
<th>Error Correction</th>
<th>Max. Correctable Codeword</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Data Size</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Number</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Row Col</td>
<td>8x8 1</td>
<td>8x8</td>
<td>3</td>
<td>5</td>
<td></td>
<td>6</td>
<td>3</td>
<td>62.5%</td>
</tr>
<tr>
<td>10 10</td>
<td>10x10 1</td>
<td>10x10</td>
<td>5</td>
<td>7</td>
<td></td>
<td>10</td>
<td>6</td>
<td>58.3%</td>
</tr>
<tr>
<td>12 12</td>
<td>12x12 1</td>
<td>12x12</td>
<td>8</td>
<td>10</td>
<td></td>
<td>16</td>
<td>10</td>
<td>55.6%</td>
</tr>
<tr>
<td>14 14</td>
<td>14x14 1</td>
<td>14x14</td>
<td>12</td>
<td>12</td>
<td></td>
<td>24</td>
<td>16</td>
<td>50%</td>
</tr>
<tr>
<td>16 16</td>
<td>16x16 1</td>
<td>16x16</td>
<td>18</td>
<td>14</td>
<td></td>
<td>36</td>
<td>25</td>
<td>43.8%</td>
</tr>
<tr>
<td>18 18</td>
<td>18x18 1</td>
<td>18x18</td>
<td>22</td>
<td>18</td>
<td></td>
<td>44</td>
<td>31</td>
<td>45%</td>
</tr>
<tr>
<td>20 20</td>
<td>20x20 1</td>
<td>20x20</td>
<td>30</td>
<td>20</td>
<td></td>
<td>60</td>
<td>43</td>
<td>40%</td>
</tr>
<tr>
<td>22 22</td>
<td>22x22 1</td>
<td>22x22</td>
<td>36</td>
<td>24</td>
<td></td>
<td>72</td>
<td>52</td>
<td>40%</td>
</tr>
<tr>
<td>24 24</td>
<td>24x24 1</td>
<td>24x24</td>
<td>44</td>
<td>28</td>
<td></td>
<td>88</td>
<td>64</td>
<td>38.9%</td>
</tr>
<tr>
<td>26 26</td>
<td>26x26 1</td>
<td>26x26</td>
<td>62</td>
<td>36</td>
<td></td>
<td>124</td>
<td>91</td>
<td>36.7%</td>
</tr>
<tr>
<td>28 28</td>
<td>28x28 1</td>
<td>28x28</td>
<td>86</td>
<td>42</td>
<td></td>
<td>172</td>
<td>127</td>
<td>32.8%</td>
</tr>
<tr>
<td>30 30</td>
<td>30x30 1</td>
<td>30x30</td>
<td>114</td>
<td>48</td>
<td></td>
<td>228</td>
<td>169</td>
<td>29.6%</td>
</tr>
<tr>
<td>32 32</td>
<td>32x32 1</td>
<td>32x32</td>
<td>144</td>
<td>56</td>
<td></td>
<td>288</td>
<td>214</td>
<td>28%</td>
</tr>
<tr>
<td>34 34</td>
<td>34x34 1</td>
<td>34x34</td>
<td>174</td>
<td>68</td>
<td></td>
<td>348</td>
<td>259</td>
<td>28.1%</td>
</tr>
<tr>
<td>36 36</td>
<td>36x36 1</td>
<td>36x36</td>
<td>204</td>
<td>84</td>
<td></td>
<td>408</td>
<td>304</td>
<td>29.2%</td>
</tr>
<tr>
<td>38 38</td>
<td>38x38 1</td>
<td>38x38</td>
<td>280</td>
<td>112</td>
<td></td>
<td>560</td>
<td>418</td>
<td>28.6%</td>
</tr>
<tr>
<td>40 40</td>
<td>40x40 1</td>
<td>40x40</td>
<td>368</td>
<td>144</td>
<td></td>
<td>736</td>
<td>550</td>
<td>28.1%</td>
</tr>
<tr>
<td>42 42</td>
<td>42x42 1</td>
<td>42x42</td>
<td>456</td>
<td>192</td>
<td></td>
<td>912</td>
<td>682</td>
<td>29.6%</td>
</tr>
<tr>
<td>44 44</td>
<td>44x44 1</td>
<td>44x44</td>
<td>576</td>
<td>224</td>
<td></td>
<td>1152</td>
<td>862</td>
<td>28%</td>
</tr>
<tr>
<td>46 46</td>
<td>46x46 1</td>
<td>46x46</td>
<td>696</td>
<td>272</td>
<td></td>
<td>1392</td>
<td>1042</td>
<td>28.1%</td>
</tr>
<tr>
<td>48 48</td>
<td>48x48 1</td>
<td>48x48</td>
<td>816</td>
<td>336</td>
<td></td>
<td>1632</td>
<td>1222</td>
<td>29.2%</td>
</tr>
<tr>
<td>50 50</td>
<td>50x50 1</td>
<td>50x50</td>
<td>960</td>
<td>390</td>
<td></td>
<td>2100</td>
<td>1573</td>
<td>28%</td>
</tr>
<tr>
<td>52 52</td>
<td>52x52 1</td>
<td>52x52</td>
<td>1152</td>
<td>574</td>
<td></td>
<td>2608</td>
<td>1954</td>
<td>27.6%</td>
</tr>
<tr>
<td>54 54</td>
<td>54x54 1</td>
<td>54x54</td>
<td>1368</td>
<td>756</td>
<td></td>
<td>3116</td>
<td>2335</td>
<td>28.5%</td>
</tr>
</tbody>
</table>

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**: Imager - Focal Point 102 mm
- **Far Field Optimal**: Imager - Focal Point 229 mm

### Read range Data capacity

<table>
<thead>
<tr>
<th>Symbology</th>
<th>Module width</th>
<th>Near field</th>
<th>Neutral field</th>
<th>Far field</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.51 mm PDF 417</td>
<td>0.5 mm (50 characters)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.19 mm MicroPDF 417</td>
<td>0.19 mm (10 characters)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.15 mm PDF 417</td>
<td>0.15 mm (12 characters)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.53 mm Data Matrix</td>
<td>0.53 mm (10 characters)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.60 mm Data Matrix</td>
<td>0.60 mm (12 characters)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.19 mm Data Matrix</td>
<td>0.19 mm (10 characters)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.15 mm Data Matrix</td>
<td>0.15 mm (50 characters)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.11 mm Code 39</td>
<td>0.11 mm (8 characters)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.15 mm Code 39</td>
<td>0.15 mm (8 characters)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.20 mm Maxicode</td>
<td>0.20 mm (8 characters)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.19 mm Code 128</td>
<td>0.19 mm (10 characters)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.32 mm EAN 8</td>
<td>0.32 mm (8 characters)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.36 mm Code 128</td>
<td>0.36mm (8 characters)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.53 mm Code 39</td>
<td>0.53 mm (8 characters)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.53 mm Data Matrix</td>
<td>0.53 mm (10 characters)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Data Matrix

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>Page</td>
<td>232</td>
<td>234</td>
<td>236-240</td>
</tr>
</tbody>
</table>

General data

- **Read distance**: 50 ... 500 mm dependence on code symbology
- **Depth of focus**: -50 mm / 240 mm
- **Read field**: max. 125 mm x 200 mm

- **Object speed**: Standstill, triggered ≤ 0.5 m/s
- **Display/controls**: LEDs: Trigger, Good/Bad reading

- **Nominal ratings**: Processor: Pulse frequency 400 MHz

- **Interfaces**: RS 232

- **Displays and controls**: Pushbuttons: 2 freely programmable trigger buttons (3 freely programmable trigger buttons with mounted handle)

- **Models**: ODT-MAC344-RED, ODT-MAC344-WHITE

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>Page</td>
<td>246</td>
<td>242</td>
<td>244</td>
</tr>
</tbody>
</table>

General data

- **Read distance**: 20 ... 150 mm dependence on code symbology
- **Read field**: max. 80 mm x 100 mm


- **Interface**: Camera system

- **Displays and controls**: Pushbuttons: 2 freely programmable trigger buttons

- **Models**: ODT-HH-MAH120-HD, ODT-HH-MAH120-WD-HD, ODT-HH-MAH200, ODT-HH-MAH200-B15, ODT-HH-MAH300, ODT-HH-MAH300-B15

Subject to modifications without notice

Copyright Pepperl+Fuchs
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>Designation</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>ODT-HH-MAH120-*</td>
<td></td>
</tr>
<tr>
<td>ODT-HH-MAH200</td>
<td></td>
</tr>
<tr>
<td>ODT-HH-MAH200/300</td>
<td></td>
</tr>
<tr>
<td>ODT-HH-MAH300</td>
<td></td>
</tr>
<tr>
<td>ODT-HH-MAH300-B15</td>
<td></td>
</tr>
</tbody>
</table>

### Handles

- **ODZ-MAH-GRIP1**: Handle with trigger button and battery compartment cover
- **ODZ-MAH-GRIP2**: Handle with trigger button and integrated battery (1950 mAh)
- **ODZ-MAH-GRIP3**: Handle with trigger button and integrated battery (3900 mAh)

### Lithium ion battery

- **ODZ-MAH-BAT**: Lithium ion battery (1950 mAh)
- **ODZ-MAH-BLANK**: Battery compartment cover

### Chargers

- **ODZ-MAH200-CHARGER**: Charger for ODT-HH-MAH200
- **ODZ-MAH200/300-CHARGER**: Charger for ODT-HH-MAH200/300
- **ODZ-MAH-CHARGER**: Charger for ODT-HH-MAH* with mounted handle

### Power supplies

- **ODZ-MAH200-SUPPLY**: Power supply
- **ODZ-MAC-PWR-24V**: Power supply 24 V DC
- **ODZ-MAC-CAB-24V-R2-2M**: Connection cable for power supply/RS 232

### Cables

- **ODZ-MAH-CAB-CHARGE**: Cable for power supply
- **ODZ-MAC-CAB-15POL-2.5M**: Connecting cable, sub-D connector, 15-pin
- **ODZ-MAC-CAB-B14**: USB interface connecting cable
- **ODZ-MAC-CAB-R6**: PS/2 interface connecting cable
- **ODZ-MAC-CAB-R2**: RS connecting cable 232 interface
- **ODZ-MAC-CAB-VIDEO**: VGA video cable

### Brackets

- **ODZ-MAH300-BRACKET**: Brackets for readers with displays
- **ODZ-MAC200-BRACKET**: Bracket for ODT-HH-MAH200
- **ODZ-MAH120-BRACKET-W**: Wall-mounting bracket for ODT-HH-MAH120

### Interface accessories

- **ODZ-MAH-B15-M3**: Bluetooth modem, configured to USB
- **ODZ-MAH200-B15-B14**: Bluetooth-USB dongle
- **ODZ-TRIGGERBOX**: Triggerbox for stationary readers

### Software

- **ODZ-MAH200-CODEROUTER**: Code-router software
- **ODS-MAH-B15-ENCRYPT**: Software for encrypted Bluetooth monitoring
- **ODS-MAH-RULERUNNER**: Rule Runner Java Script license

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.
<table>
<thead>
<tr>
<th>Technology</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data Matrix</td>
<td></td>
</tr>
<tr>
<td>RFID Stand-alone</td>
<td>2.45 GHz</td>
</tr>
<tr>
<td>RFID Stand-alone</td>
<td>125 KHz</td>
</tr>
<tr>
<td>RFID Handhelds</td>
<td>2.45 GHz</td>
</tr>
<tr>
<td>RFID Accessories</td>
<td>868 MHz</td>
</tr>
<tr>
<td>RFID</td>
<td>13.56 MHz</td>
</tr>
<tr>
<td>RFID</td>
<td>250 KHz</td>
</tr>
<tr>
<td>RFID</td>
<td>125 KHz</td>
</tr>
<tr>
<td>RFID</td>
<td>2,45 GHz</td>
</tr>
<tr>
<td>RFID</td>
<td>125 KHz</td>
</tr>
<tr>
<td>RFID</td>
<td>2,45 GHz</td>
</tr>
<tr>
<td>RFID</td>
<td>125 KHz</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
Data Matrix read device

ODT-MAC333

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)

40
85
Sub D
15 pin
20
17
17

448x774
### 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

#### General specifications

<table>
<thead>
<tr>
<th>Feature</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<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>Module 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 lighting (red)</td>
</tr>
<tr>
<td>Target velocity</td>
<td>Standsill</td>
</tr>
</tbody>
</table>

#### Data Matrix

- Symbol size: rectangular up to 144 x 144 modules, rectangular up to 16 x 48 modules
- Orientation: omnidirectional

#### 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** \( U_{th} \): 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

- **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
- **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
- **Material**: anodised aluminium
- **Mass**: approx. 175 g

### Accessories

- **ODZ-MAC-CAB-24V-R2-2M**
  - Connecting cable for power supply/RS 232
- **ODZ-TRIGGERBOX-SK**
  - Trigger box for fixed mounted readers
- **ODS-MAH-RULERUNNER**
  - Rule Runner Java Script license

---

*Courtesy of Steven Engineering, Inc.*

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*Edition: 2009-03-01*  
*Catalogue Identification Systems 2009*  
*Germany: +49 621 776-4411*  
*Subject to modifications without notice*  
*Copyright Pepperl+Fuchs*
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
### Technical data

#### ODT-MAC344-RED

<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 (red)</td>
</tr>
<tr>
<td>Evaluation frequency</td>
<td>25 Hz</td>
</tr>
<tr>
<td>Target velocity</td>
<td>triggered &lt; 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>triggered &lt; 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
- **Image recording**: real-time, Program-controlled or triggered externally

#### 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_o**: 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**: anodised aluminium
- **Mass**: approx. 750 g

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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*
Stationary read device

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 focussing via laser pointers
• Integrated error image memory

Dimensions

![Dimensions Diagram]
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

<table>
<thead>
<tr>
<th>Accessory</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ODZ-MAC-CAB-VIDEO</td>
<td>Video cable VGA</td>
</tr>
<tr>
<td>ODZ-MAC-CAB-24V-R2-2M</td>
<td>Connecting cable for power supply/RS 232</td>
</tr>
<tr>
<td>ODZ-MAC-CAB-15POL-2,5M-FEMALE</td>
<td>Connecting cable Sub-D jack, 15-pin</td>
</tr>
<tr>
<td>ODZ-MAC-CAB-15POL-5M-FEMALE</td>
<td>Connecting cable Sub-D jack, 15-pin</td>
</tr>
<tr>
<td>ODZ-TRIGGERBOX-SK</td>
<td>Trigger box for fixed mounted readers</td>
</tr>
<tr>
<td>V45-G-10M-V45-G</td>
<td>Network cable RJ-45, Category 5</td>
</tr>
<tr>
<td>ODZ-MAC-PWR-24V</td>
<td>Netzteil 24 V DC</td>
</tr>
</tbody>
</table>

Technical data

<table>
<thead>
<tr>
<th>General specifications</th>
<th>Reading distance 60 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depth of focus ± 5 mm</td>
<td>Reading field 30 mm x 20 mm</td>
</tr>
<tr>
<td>Modul size ≥ 0.2 mm</td>
<td>Sensor principle Camera system</td>
</tr>
<tr>
<td>Light type Integrated LED lightning (red)</td>
<td>Evaluation frequency 60 Hz</td>
</tr>
<tr>
<td>码头 voltage-triggered ≤ 20 m/s</td>
<td>Data Matrix</td>
</tr>
<tr>
<td>Symbologies Data Matrix ECC 200</td>
<td>Symbol size rectangular up to 48 x 48 modules</td>
</tr>
<tr>
<td></td>
<td>rectangular up to 16 x 48 modules</td>
</tr>
<tr>
<td></td>
<td>Data format ASCII, C40, Text, X12, Edifact, Base 256 , all according to ISO 646</td>
</tr>
<tr>
<td></td>
<td>Data capacity 348 numerical, 259 ASCII, 172 Byte</td>
</tr>
</tbody>
</table>

Nominal ratings

<table>
<thead>
<tr>
<th>Camera</th>
<th>Type CMOS, Global shutter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of pixels 752 x 480 pixels</td>
<td>Grey scale 256</td>
</tr>
<tr>
<td>Image recording real-time</td>
<td>Processor Clock pulse frequency 600 Mhz</td>
</tr>
<tr>
<td>Power consumption P0 6 W</td>
<td>Speed of computation 4800 MIPS</td>
</tr>
<tr>
<td>Digital resolution 32 Bit</td>
<td>Digital resolution 32 Bit</td>
</tr>
</tbody>
</table>

Electrical specifications

| Operating voltage Ua 24 V DC ± 15% , PELV | No-load supply current I0 max. 250 mA |
| Cable length max. 30 m                   | Power consumption P0 6 W              |

Interface

| Interface type Ethernet               | Physical RS 232                           |
| Protocol ASCII                        | Protocol ASCII                            |
| Transfer rate 9600 ... 115200 Bit/s   | Transfer rate 100 MBit/s                 |
| Cable length max. 30 m                | 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

| Output 2 electronisch 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 EN 61326-1 , EN 61000-6-4 |
| Standard conformity EN 61326-1 |
| Interference rejection EN 61000-6-4 |
| Emitted interference EN 60529 |
| Protection degree IEC 60825-1 |
| Laser class ISO 646 |
| 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 12 |
| Material Housing diecast zinc, powder coated |
| Mass approx. 730 g |
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
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

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
Netztteil 24 V DC

ODZ-MAC-CAB-24V-R2-2M
Connecting cable for power supply/RS 232

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
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 \( U_\text{a} \) 24 V DC ± 15 % PELV
No-load supply current \( I_\text{a} \) max. 250 mA
Power consumption \( P_\text{O} \) 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 MBit/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 M12
Material Housing diecast zinc, powder coated
Mass approx. 760 g
Stationary read device

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

Code reading distance

Reading distance

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. 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-15POL-2,5M-FEMALE**
Connecting cable Sub-D jack, 15-pin

**ODZ-MAC-CAB-15POL-5M-FEMALE**
Connecting cable Sub-D jack, 15-pin

**ODZ-MAC-CAB-24V-R2-2M**
Connecting cable for power supply/RS 232

**ODZ-MAC-CAB-VIDEO**
Video cable VGA

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

**ODZ-TRIGGERBOX-SK**
Trigger box for fixed mounted readers

**ODZ-MAC-PWR-24V**
Netzteill 24 V DC

### Technical data

#### General specifications

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reading distance</td>
<td>100 mm</td>
</tr>
<tr>
<td>Depth of focus</td>
<td>± 5 mm</td>
</tr>
<tr>
<td>Reading field</td>
<td>50 mm x 30 mm</td>
</tr>
<tr>
<td>Modul size</td>
<td>&gt; 0.33 mm</td>
</tr>
<tr>
<td>Sensor principle</td>
<td>Camera system</td>
</tr>
<tr>
<td>Light type</td>
<td>Integrated LED lighting (red)</td>
</tr>
<tr>
<td>Evaluation frequency</td>
<td>30 Hz</td>
</tr>
<tr>
<td>Target velocity</td>
<td>triggered &lt; 10 ms</td>
</tr>
<tr>
<td>Data Matrix</td>
<td>Symbol size: rectangular up to 48 x 48 modules</td>
</tr>
<tr>
<td></td>
<td>Speed of computation: 4800 MIPS</td>
</tr>
<tr>
<td></td>
<td>Digital resolution: 32 Bit</td>
</tr>
<tr>
<td></td>
<td>Indicators/operating means: LED indicator for good/poor reading</td>
</tr>
<tr>
<td></td>
<td>Electrical specifications: Operating voltage U₀: 24 V DC ± 15%, PELV</td>
</tr>
<tr>
<td></td>
<td>Power consumption P₀: 6 W</td>
</tr>
<tr>
<td></td>
<td>Transfer rate: 9600 ... 115200 Bit/s</td>
</tr>
<tr>
<td></td>
<td>Cable length: max. 30 m</td>
</tr>
<tr>
<td></td>
<td>Input: Input voltage: to be applied externally 24 V ± 15% PELV</td>
</tr>
<tr>
<td></td>
<td>Number/Type: 1 Trigger input, optional up to 4 inputs</td>
</tr>
<tr>
<td></td>
<td>Input current: approx. 1 mA at 24 V DC</td>
</tr>
<tr>
<td></td>
<td>Cable length: max. 30 m</td>
</tr>
<tr>
<td></td>
<td>Output: Number/Type: 2 electronic outputs, PNP, optically decoupled</td>
</tr>
<tr>
<td></td>
<td>Switching voltage: to be applied externally 24 V ± 15% PELV</td>
</tr>
<tr>
<td></td>
<td>Switching current: 100 mA each output</td>
</tr>
<tr>
<td></td>
<td>Cable length: max. 30 m</td>
</tr>
<tr>
<td></td>
<td>Output type: Video output, RGB (75 Ohm), 1 Vpp</td>
</tr>
<tr>
<td></td>
<td>Resolution: VGA, 640 x 480 pixels</td>
</tr>
</tbody>
</table>

#### Compliance with standards and directives

<table>
<thead>
<tr>
<th>Directive conformity</th>
<th>Standard conformity</th>
<th>Interference rejection</th>
<th>Emitted interference</th>
<th>Protection degree</th>
<th>Laser class</th>
<th>Ambient conditions</th>
<th>Mechanical specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>EMC Directive 2004/108/EC</td>
<td>EN 61326-1 , EN 61000-6-4</td>
<td>EN 61326-1</td>
<td>EN 61000-6-4</td>
<td>EN 60529</td>
<td>IEC 60825-1</td>
<td>Ambient temperature: 0 ... 45 °C (273 ... 318 K)</td>
<td>Protection degree: IP20</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Storage temperature: -20 ... 60 °C (253 ... 333 K)</td>
<td>Connection: Video: socket, 7-pin</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Material: diecast zinc, powder coated</td>
<td>Housing: approx. 760 g</td>
</tr>
</tbody>
</table>
**ODT-HH-MAH200**

### Handheld

**Model Number**

**ODT-HH-MAH200**  
**ODT-HH-MAH200-B15**  
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.
### Accessories

<table>
<thead>
<tr>
<th>Product Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ODT-MAH-B15-M3</td>
<td>Bluetooth modem, configured for USB</td>
</tr>
<tr>
<td>ODT-MAH200-BRACKET</td>
<td>Bracket for ODT-HH-MAH200</td>
</tr>
<tr>
<td>ODT-MAH-GRIP1</td>
<td>Handle with trigger button</td>
</tr>
<tr>
<td>ODT-MAH-GRIP2</td>
<td>Handle with trigger switch and 1950 mAh battery</td>
</tr>
<tr>
<td>ODT-MAH-GRIP3</td>
<td>Handle with trigger switch and 3900 mAh battery</td>
</tr>
<tr>
<td>ODT-MAH-SUPPLY</td>
<td>Power supply</td>
</tr>
<tr>
<td>ODT-MAH-CHARGER</td>
<td>Charging tray for ODT-MAH-GRIP2/GRIP3</td>
</tr>
<tr>
<td>ODT-MAH-CHARGER-SINGLE</td>
<td>Charger for ODT-HH-MAH200/300/I*T-HH20</td>
</tr>
<tr>
<td>ODT-MAH200-CHARGER</td>
<td>Charger for ODT-HH-MAH200/ODT-MAH-BAT</td>
</tr>
<tr>
<td>ODT-MAH-CAB-CHARGE</td>
<td>Cable for power supply unit</td>
</tr>
<tr>
<td>ODT-MAH-BAT</td>
<td>Lithium ion battery 1950 mAh</td>
</tr>
<tr>
<td>ODT-MAH-BLANK</td>
<td>Battery blank</td>
</tr>
<tr>
<td>ODT-MAH-CAB-R2</td>
<td>Connection cable RS 232 interface</td>
</tr>
<tr>
<td>ODT-MAH-CAB-R6</td>
<td>Connecting cable PS/2 interface</td>
</tr>
<tr>
<td>ODT-MAH-CAB-B14</td>
<td>Connecting cable, USB interface</td>
</tr>
<tr>
<td>ODS-MAH-RULERUNNER</td>
<td>Rule Runner Java Script license.</td>
</tr>
<tr>
<td>ODT-MAH200-CODEROUTER</td>
<td>Code Router Software</td>
</tr>
<tr>
<td>ODS-MAH-B15-ENCRYPT</td>
<td>Software for encrypted Bluetooth transfer</td>
</tr>
</tbody>
</table>

### Technical data

#### ODT-HH-MAH200

- **General specifications**
  - Laser class: 2M
  - Reading distance: 50 ... 500 mm Depending on code symbology
  - Reading field: max. 125 mm x 200 mm
  - Modul size: ≥ 0.15 mm
  - Sensor principle: Camera system
  - Light type: Integrated LED lightning (red)
  - Target velocity: Standstill
- **Data Matrix**
  - Symbol size: rectangular up to 144 x 144 modules
  - Orientation: omnidirectional
- **Nominal ratings**
  - Camera: 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
  - Protocol: ASCII
  - Compliance with standards and directives
  - Directive conformity: EN 55024
  - Standard conformity: EN 61000-4-2/3/4/6, EN 55022
  - Emitted interference: EN 5522
  - 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

#### ODT-HH-MAH200-B15

- **General specifications**
  - Laser class: 2M
  - Reading distance: 50 ... 500 mm Depending on code symbology
  - Reading field: max. 125 mm x 200 mm
  - Modul size: ≥ 0.15 mm
  - Sensor principle: Camera system
  - Light type: Integrated LED lightning (red)
  - Target velocity: Standstill
**Model Number**

ODT-HH-MAH300  
ODT-HH-MAH300-B15

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 seconds  
- 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

**Dimensions**

![Dimensions Diagram]
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><strong>General specifications</strong></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>
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<tr>
<td><strong>Symbols</strong></td>
<td></td>
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<tr>
<td><strong>Data Matrix</strong></td>
<td></td>
</tr>
<tr>
<td>Symbol size</td>
<td>rectangular up to 144 x 144 modules</td>
</tr>
<tr>
<td>Orientation</td>
<td>omnidirectional</td>
</tr>
<tr>
<td><strong>Nominal ratings</strong></td>
<td></td>
</tr>
<tr>
<td>Camera</td>
<td>CMOS</td>
</tr>
<tr>
<td>Type</td>
<td>Number of pixels</td>
</tr>
<tr>
<td>Grey scale</td>
<td>1024 x 640 pixels per focus point</td>
</tr>
<tr>
<td>Image recording</td>
<td>256</td>
</tr>
<tr>
<td>Processor</td>
<td>real-time , manually triggered</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>Non-volatile memory</td>
</tr>
<tr>
<td></td>
<td>4 MByte</td>
</tr>
<tr>
<td><strong>Indicators/operating means</strong></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><strong>Electrical specifications</strong></td>
<td></td>
</tr>
<tr>
<td>Supply</td>
<td>from interface or deployed rechargeable battery</td>
</tr>
<tr>
<td><strong>Interface</strong></td>
<td></td>
</tr>
<tr>
<td>Physical</td>
<td>USB 1.1 , RS 232 or PS/2</td>
</tr>
<tr>
<td>Protocol</td>
<td>Bluetooth , USB 1.1 , RS 232 or PS/2</td>
</tr>
<tr>
<td><strong>Compliance with standards and directives</strong></td>
<td></td>
</tr>
<tr>
<td>Standard conformity</td>
<td>EN 61000-4-2/3/4/6, EN 55022</td>
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<tr>
<td>Interference rejection</td>
<td>EN 61000-4-2/3/4/6, EN 55022</td>
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<td>Emitted interference</td>
<td>EN 60529</td>
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<td>Laser class</td>
<td>IEC 60825-1</td>
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<td>Ambient conditions</td>
<td>Ambient temperature</td>
</tr>
<tr>
<td></td>
<td>0 ... 40 °C (273 ... 313 K)</td>
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<tr>
<td>Storage temperature</td>
<td>-20 ... 60 °C (253 ... 333 K)</td>
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<td><strong>Mechanical specifications</strong></td>
<td></td>
</tr>
<tr>
<td>Protection degree</td>
<td>IP20</td>
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<tr>
<td>Connection</td>
<td>System connector for connecting cable or handle</td>
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<tr>
<td>Material</td>
<td>plastic</td>
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<tr>
<td>Housing</td>
<td>approx. 180 g</td>
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<tr>
<td>Mass</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-MAH200/300/1*T-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
Handheld

ODT-HH-MAH120-~

Technical data

<table>
<thead>
<tr>
<th>General specifications</th>
<th>ODT-HH-MAH120-HD</th>
<th>ODT-HH-MAH120-WH-HD</th>
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</thead>
<tbody>
<tr>
<td>Reading distance</td>
<td>20 ... 150 mm</td>
<td>Depending on code symbology</td>
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<tr>
<td>Reading field</td>
<td>max. 80 mm x 100 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>Integrated LED lightning (white)</td>
</tr>
<tr>
<td>Target velocity</td>
<td>Standstill</td>
<td></td>
</tr>
</tbody>
</table>

Data Matrix

<table>
<thead>
<tr>
<th>Symbol size</th>
<th>ODT-HH-MAH120-HD</th>
<th>ODT-HH-MAH120-WH-HD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Symbol size</td>
<td>rectangular up to 144 x 144 modules</td>
<td>rectangular up to 16 x 48 modules</td>
</tr>
<tr>
<td>Orientation</td>
<td>omnidirectional</td>
<td></td>
</tr>
</tbody>
</table>

Nominal ratings

| Camera                  | Type CMOS        |                     |
|                        | Number of pixels | 1024 x 1280 pixels |
|                        | Grey scale       | 256                |
|                        | Image recording  | real-time, manually triggered |
| Processor              | Clock pulse frequency | 400 MHz               |
|                        | Digital resolution | 8 Bit               |

Electrical specifications

| Supply                  | via cable        |                     |
| Interface               | Physical         | USB 2.0, RS 232 or PS/2 |
| Protocol                | ASCII            |                     |

Compliance with standards and directives

| Directive conformity   | EN 55024         |                     |
| Standard conformity    | EN 61000-4-2/3/4/6, EN 55022 |
| Emitted interference   | EN 55022         |                     |
| Protection degree      | EN 60529         |                     |
| Laser class            | IEC 60825-1     |                     |
| Ambient conditions     | 0 ... -5 °C (273 ... 238 K) |
|                        | 0 ... -10 °C (253 ... 333 K) |

Mechanical specifications

| Protection degree      | IP20              |                     |
| Material               | plastic           |                     |
| Housing                | approx. 185 g     |                     |

Function

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

#### Indicators/operating means
- **Operating display**: LED green
- **LED indicator**: Trigger, good/poor reading
- **Key**: 3 inputs
- **Toggle switch**: RS 232 interface

#### Electrical specifications
- **Operating voltage \( U_D \)**: 24 V DC ± 15 % PELV
- **Operating current**: max. 50 mA

#### Interface
- **Physical**: 2 x RS 232
- **Protocol**: ASCII
- **Transfer rate**: 9600 Bit/s ... 115200 Bit/s

#### Input
- **Input voltage**: 24 V DC ± 15 % PELV
- **Number/Type**: 3 inputs for 2- or 3-wire sensors (PNP), DC
- **Input current**: approx. 10 mA at 24 V DC

#### Output
- **Number/Type**: 2 electronic outputs, PNP, overload and short-circuit proof optically decoupled
- **Switching voltage**: to be applied externally 24 V +/- 15 % PELV
- **Switching current**: 100 mA

#### Compliance with standards and directives
- **Directive conformity**: EMC Directive 89/336/EEC EN 61326, EN 61000-6-4
- **Standard conformity**: Interference rejection EN 61326:2002-03
- **Protection degree**: EN 60529

#### Mechanical specifications
- **Protective degree**: IP20
- **Connection**: Supply/interfaces/in- and outputs: 15-pin Sub-D connector or terminals
  - Interface 1: Sub-D socket, 9-pin
  - Interface 2: Sub-D socket, 9-pin
  - Trigger: M12 socket 5-pin

#### Material
- **Housing**: anodised aluminium
- **Installation**: DIN rail mounting
- **Mass**: approx. 320 g

---

**Model Number**

**ODZ-TRIGGERBOX**

Trigger box for fixed mounted readers

**Accessories**

**ODZ-MAC-CAB-15POL-2,5M**
Connecting cable Sub-D jack, 15-pin

**ODZ-MAC-CAB-15POL-2,5M- FEMALE**
Connecting cable Sub-D jack, 15-pin

**ODZ-MAC-CAB-9POL-1,8M**
Connecting cable Sub-D jack, 9-pin

**ODZ-MAC-PWR-24V**
Netzteil 24 V DC
Model Number
ODZ-MAH-GRIP1
Handle with trigger button

Accessories
ODZ-MAH-CHARGER
Charging tray for ODZ-MAH-GRIP2/GRIP3

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
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

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-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.

Function
The ODZ-MAH-GRIP2 is an extremely robust handle for handhelds of the product families ODT-HH-MAH and "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.

[Image of ODZ-MAH-GRIP3]
### Model Number

**ODZ-MAH200-BRACKET**  
Bracket for ODT-HH-MAH200

### Technical data

<table>
<thead>
<tr>
<th>General specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reading angle</td>
</tr>
<tr>
<td>Operating distance</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mechanical specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions</td>
</tr>
</tbody>
</table>

### Model Number

**ODZ-MAH300-BRACKET**  
Bracket for hand-held units with displays

### Technical data

<table>
<thead>
<tr>
<th>General specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reading angle</td>
</tr>
<tr>
<td>Operating distance</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mechanical specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions</td>
</tr>
</tbody>
</table>
Model Number
ODZ-MAH120-BRACKET-W
Bracket for ODT-HH-MAH120

Features
• Mounting bracket
• Simple and fast mounting

Dimensions

Technical data
Mechanical specifications
<table>
<thead>
<tr>
<th>Material</th>
<th>Clear Plexiglas</th>
</tr>
</thead>
<tbody>
<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**
- Directive conformity: EN 60950
- EMC Directive 89/336/EEC

**Ambient conditions**
- Ambient temperature: 0 ... 40 °C (273 ... 313 K)
- Storage temperature: -20 ... 85 °C (253 ... 358 K)

**Mechanical specifications**
- Protection degree: IP20
- Connection: Supply voltage: 5.5 mm hollow connector, power plug
- Mass: approx. 135 g
- Dimensions: 72 mm x 52 mm x 35 mm

### 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
- **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
- **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
- **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.
### Data Matrix Accessories

**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>
</tbody>
</table>

| Supply voltage: 5.5 mm hollow socket |

<table>
<thead>
<tr>
<th>Cable length</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.85 m</td>
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---

### 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>
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<td>0.14 mm²</td>
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<table>
<thead>
<tr>
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<tbody>
<tr>
<td>2x Sub-D-Buchse, 15-pin</td>
</tr>
</tbody>
</table>

<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>
</tbody>
</table>

| Supply voltage: 5.5 mm hollow socket |

<table>
<thead>
<tr>
<th>Cable length</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.85 m</td>
</tr>
</tbody>
</table>
Model Number
ODZ-MAC-CAB-VIDEO
Video cable VGA

Technical data
Mechanical specifications
Cable length 2 m

Model Number
ODZ-MAC-PWR-24V
Netzteil 24 V DC

Technical data
Input
Input voltage 100 V AC ... 240 V AC
50 ... 60 Hz
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
**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 kB/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 kB/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
  - RS 232 configured for USB
- **Dimensions**: 81 mm x 70 mm x 25 mm

---

*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
**ODZ-MAH200-CODEROUTER**  
Code Router Software

### Technical data
**General specifications**

<table>
<thead>
<tr>
<th>Description</th>
<th>Software for establishing a reliable connection and serial/key-board input converter</th>
</tr>
</thead>
</table>

**System requirements**

<table>
<thead>
<tr>
<th>Operating system</th>
<th>Microsoft Windows 3.1, 98, Me, NT, 2000, or XP</th>
</tr>
</thead>
</table>

### Model Number
**ODS-MAH-B15-ENCRYPT**  
Software for encrypted Bluetooth transfer

### Technical data
**General specifications**

<table>
<thead>
<tr>
<th>Description</th>
<th>Software for encrypted Bluetooth transfer</th>
</tr>
</thead>
</table>

### Model Number
**ODS-MAH-RULERUNNER**  
Rule Runner Java Script license.

### Technical data
**General specifications**

<table>
<thead>
<tr>
<th>Description</th>
<th>Rule Runner Java Script license. This software allows the use of Java Script.</th>
</tr>
</thead>
</table>

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<th>Singapore: +65 6779 9091</th>
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</tbody>
</table>

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