GENERAL DESCRIPTION

The G308 Operator Interface Terminal combines unique capabilities normally expected from high-end units with a very affordable price. It is built around a high performance core with integrated functionality. This core allows the G308 to perform many of the normal features of the Paradigm range of Operator Interfaces while improving and adding new features.

The G308 is able to communicate with many different types of hardware using high-speed RS232/422/485 communications ports and Ethernet 10 Base T/100 Base-TX communications. In addition, the G308 features USB for fast downloads of configuration files and access to trending and data logging. A CompactFlash socket is provided so that Flash cards can be used to collect your trending and data logging information as well as to store larger configuration files.

In addition to accessing and controlling of external resources, the G308 allows a user to easily view and enter information. Users can enter data through the touchscreen or front panel 7-button keypad.

SAFETY SUMMARY

All safety related regulations, local codes and instructions that appear in the manual or on equipment must be observed to ensure personal safety and to prevent damage to either the instrument or equipment connected to it. If equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

Do not use the controller to directly command motors, valves, or other actuators not equipped with safeguards. To do so can be potentially harmful to persons or equipment in the event of a fault to the controller.

The protective conductor terminal is bonded to conductive parts of the equipment for safety purposes and must be connected to an external protective earthing system.

WARNING - EXPLOSION HAZARD - SUBSTITUTION OF COMPONENTS MAY IMPAIR SUITABILITY FOR CLASS I, DIVISION 2/CLASS II, DIVISION 2/CLASS III, DIVISION 2

CONTENT OF PACKAGE

- G308 Operator Interface.
- Panel Gasket.
- This hardware bulletin.
- Template for panel cutout.
- Hardware packet for mounting unit into panel.
- Terminal block for connecting power.

ORDERING INFORMATION

MODEL NO. DESCRIPTION PART NUMBER
G308 7.7" DSTN Display Operator Interface (indoor), No USB Host, non-isolated comms G308C100
8.4" TFT Display Operator Interface (indoor), USB Host, Isolated Comms G308A210
8.4" TFT Display Operator Interface (indoor), Dual Ethernet, USB Host, Isolated Comms G308A230
G3CF CompactFlash Card 5 G3CFxxxx
G3RS RS 232/485 Optional Communication Card G3RS0000
G3CN CANopen Optional Communication Card G3CN0000
G3DN DeviceNet Optional Communication Card G3DN0000
G3PBD Profibus DP Optional Communication Card G3PBDP00
SFCRM Crimson 2 SFCRM
CBL RS-232 Programming Cable CBLPRG0
USB Cable CBLUSB00
Communications Cables 1 CBLxxxxx
DR DIN Rail Mountable Adapter Products 3 DRxxxxxx
Replacement Battery 4 BNL2000
G308A Backlight Replacement G3BR08A0
G3FILM Protective Films G3FILM08

1 Contact your Red Lion distributor or visit our website for complete selection.
2 Use this part number to purchase Crimson on CD with a printed manual, USB cable, and RS-232 cable. Otherwise, download for free from www.redlion.net.
3 Red Lion offers RJ modular jack adapters. Refer to the DR literature for complete details.
4 Battery type is lithium coin type CR2025.
5 Industrial grade two million write cycles. SMART Modular Technologies model SG9CF (UL Listed Directory Category NWGQ).

MODEL G308C1/A2 - 8" COLOR TOUCHSCREEN

- CONFIGURED USING CRIMSON® SOFTWARE (VERSION 2.0 OR LATER)
- UP TO 5 RS-232/422/485 COMMUNICATIONS PORTS (2 RS-232 AND 1 RS-422/485 ON BOARD, 1 RS-232 AND 1 RS-422/485 ON OPTIONAL COMMUNICATIONS CARD)
- 10 BASE T/100 BASE-TX ETHERNET PORT TO NETWORK UNITS AND HOST WEB PAGES (2ND ETHERNET PORT OPTIONAL-G308A2 ONLY)
- USB PORT TO DOWNLOAD THE UNIT'S CONFIGURATION FROM A PC OR FOR DATA TRANSFERS TO A PC
- UNIT’S CONFIGURATION IS STORED IN NON-VOLATILE MEMORY (32MBYTE FLASH)
- COMPACTFLASH® SOCKET TO INCREASE MEMORY CAPACITY
- 7.7” DSTN OR 8.4-INCH TFT 32K VGA 640X480 PIXEL LCD
- 7-BUTTON KEYPAD FOR ON-SCREEN MENUS
- THREE FRONT PANEL LEDS
- POWER UNIT FROM 24VDC ±20% SUPPLY
- RESISTIVE ANALOG TOUCHSCREEN
1. **POWER REQUIREMENTS:**
   - G308C1: +24 VDC ±20% @ 15 W maximum.
   - G308A2: +24 VDC ±20% @ 27 W maximum.
   Must use NEC Class 2 or Limited Power source (LPS) rated power supply.
   Power connection via removable three position terminal block.

   **Note:**
   1. The G308’s circuit common is not connected to the enclosure of the unit. See “Connecting to Earth Ground” in the section “Installing and Powering the G308.”

2. **BATTERY:** Lithium coin cell CR2025. Typical lifetime of 10 years.

3. **LCD MODULE DISPLAYS:**
   - **MODEL**
     - G308A2
     - G308C1
   - **SIZE**
     - 8.4-inch
     - 7.7-inch
   - **TYPE**
     - TFT
     - DSTN
   - **COLORS**
     - 32K
     - 256
   - **PIXELS**
     - 640 x 480
     - 640 x 480
   - **BRIGHTNESS**
     - 450 cd/m²
     - 120 cd/m²
   - **BACKLIGHT**
     - 40,000 HR TYP.
     - 40,000 HR TYP.

   *Lifetime at room temperature. Refer to “Display” in the “Software/Unit Operation” section.

4. **7-KEY KEYPAD:** for on-screen menus.

5. **TOUCHSCREEN:** Resistive analog

6. **MEMORY:**
   - On Board User Memory: 32 Mbyte of onboard non-volatile Flash memory.
   - Memory Card: CompactFlash Type II slot for Type I and Type II CompactFlash cards.

7. **COMMUNICATIONS:**
   - **USB Port:** Adheres to USB 2.0 specification full speed only via Type B connection.
   - **USB Host Ports:** Comply with Universal Serial Bus Specification Rev 2.0. Support data transfers at full-speed. Hardware over current protected (0.5 A max per port).
   - **Serial Ports:** Serial ports on the G308A are individually isolated. Ports on the G308C are not isolated. Format and Baud Rates for each port are individually software programmable up to 115,200 baud.
   - PGM Port: RS232 port via RJ12.
   - DH485 TXEN: Transmit enable; open collector, \( V_{OH} = 15 \) VDC, \( V_{OL} = 0.5 \) V @ 25 mA max.

   **Note:** For additional information on the communications or signal common and connections to earth ground please see the “Connecting to Earth Ground” in the section “Installing and Powering the G308.”

   - **Ethernet Ports:** 10 BASE-T / 100 BASE-TX
   - RJ45 jack is wired as a NIC (Network Interface Card). The jack shield is electrically connected to Earth ground.
   - A secondary ethernet port (with its own Mac ID) is available as an option on the G308A2 only.

8. **ENVIRONMENTAL CONDITIONS:**
   - **Operating Temperature Range:** 0 to 50°C
   - **Storage Temperature Range:** -20 to 70°C
   - **Operating and Storage Humidity:** 80% maximum relative humidity (non-condensing) from 0 to 50°C.

9. **CERTIFICATIONS AND COMPLIANCES:**
   - **SAFETY**
     - UL Listed, File #E179259, UL61010-1, CSA 22.2 No.61010-1
     - Listed by Und. Lab. Inc. to U.S. and Canadian safety standards
     - Type 4X Indoor Enclosure rating (Face only), UL50
     - IECEE CB Scheme Test Report #E179259-A1-CB-2
     - Issued by Underwriters Laboratories Inc.
     - IEC 61010-1, EN 61010-1: Safety requirements for electrical equipment for measurement, control, and laboratory use, Part 1.
     - IP66 Enclosure rating (Face only), IEC 529
   - **ELECTROMAGNETIC COMPATIBILITY**
     - Emission to Industrial Locations:
       - Electrostatic discharge EN 61000-4-2 Criterion A
       - 4 kV contact discharge
       - 8 kV air discharge
       - Electromagnetic RF fields EN 61000-4-3 Criterion A
       - 10 V/m (80 MHz to 1 GHz)
       - 3 V/m (1.4 GHz to 2 GHz)
       - 1 V/m (2 GHz to 2.7 GHz)
       - Fast transients (burst) EN 61000-4-4 Criterion B
       - 2 kV power
       - 1 kV I/O signal
       - Surge EN 61000-4-5 Criterion B
       - 1 kV L to L, 2 kV L to G
       - 1 kV
     - RF conducted interference EN 61000-4-6 Criterion A
     - 3 Vrms
     - Power freq. magnetic field EN 61000-4-8 Criterion A
     - 30 A/m
   - **Emissions:**
     - EN 55011 Class A
   - **Notes:**
     2. Criterion B: Temporary loss of performance from which the unit self-recovers.

10. **CONNECTIONS:** Compression cage-clamp terminal block.
    - Wire Gage: 12-30 AWG copper wire
    - Torque: 5-7 inch-pounds (56-79 N-cm)

11. **CONSTRUCTION:** Steel rear metal enclosure with NEMA 4X/IP66 aluminum front plate for indoor use only when correctly fitted with the gasket provided. Installation Category II, Pollution Degree 2.

12. **MOUNTING REQUIREMENTS:** Maximum panel thickness is 0.25” (6.3 mm). For NEMA 4X/IP66 sealing, a steel panel with a minimum thickness of 0.125” (3.17 mm) is recommended.
    - Maximum Mounting Stud Torque: 17 inch-pounds (1.92 N-m)

13. **WEIGHT:** 4.20 lbs (1.91 Kg)

---

**DIENSIONS** in inches (mm)

<table>
<thead>
<tr>
<th></th>
<th>G308C1</th>
<th>G308A2</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>2.46 (63)</td>
<td>2.9 (73)</td>
</tr>
<tr>
<td>b</td>
<td>8.72 (222)</td>
<td>8.96 (228)</td>
</tr>
<tr>
<td>c</td>
<td>6.46 (164)</td>
<td>6.77 (172)</td>
</tr>
</tbody>
</table>
INSTALLING AND POWERING THE G308

MOUNTING INSTRUCTIONS

This operator interface is designed for through-panel mounting. A panel cut-out diagram and a template are provided. Care should be taken to remove any loose material from the mounting cut-out to prevent that material from falling into the operator interface during installation. A gasket is provided to enable sealing to NEMA 4X/IP66 specification. Install the 14 kep nuts provided and tighten evenly for uniform gasket compression.

Note: Tightening the kep nuts beyond a maximum of 17 inch-pounds (1.92 N-m) may cause damage to the front panel.

All tolerances ±0.010” (±0.25 mm).

POWER SUPPLY REQUIREMENTS

The G308C1 requires a 24 VDC power supply rated at 15 W, and the G308A2 requires a 24 VDC power supply rated at 27 W. Your unit may draw considerably less the rated power depending upon the options being used. As additional features are used your unit will draw increasing amounts of power. Items that could cause increases in current are additional communications, optional communications card, CompactFlash card, and other features programmed through Crimson.

In any case, it is very important that the power supply is mounted correctly if the unit is to operate reliably. Please take care to observe the following points:

- The power supply must be mounted close to the unit, with usually not more than 6 feet (1.8 m) of cable between the supply and the operator interface. Ideally, the shortest length possible should be used.
- The wire used to connect the operator interface’s power supply should be at least 22-gage wire. If a longer cable run is used, a heavier gage wire should be used. The routing of the cable should be kept away from large contactors, inverters, and other devices which may generate significant electrical noise.
- A power supply with an NEC Class 2 or Limited Power Source (LPS) and SELV rating is to be used. This type of power supply provides isolation to accessible circuits from hazardous voltage levels generated by a mains power supply due to single faults. SELV is an acronym for “safety extra-low voltage.” Safety extra-low voltage circuits shall exhibit voltages safe to touch both under normal operating conditions and after a single fault, such as a breakdown of a layer of basic insulation or after the failure of a single component has occurred.

Communicating with the G308

CONFIGURING A G308

The G308 is configured using Crimson software. Crimson is available as a free download from Red Lion’s website, or it can be purchased on CD. Updates to Crimson for new features and drivers are posted on the website as they become available. By configuring the G308 using the latest version of Crimson, you are assured that your unit has the most up to date feature set. Crimson software can configure the G308 through the RS232 PGM port, USB port, or CompactFlash.

The USB port is connected using a standard USB cable with a Type B connector. The driver needed to use the USB port will be installed with Crimson. If this driver has not been installed, it can be downloaded from the website.

The RS232 PGM port uses a programming cable made by Red Lion to connect to the DB9 COM port of your computer. If you choose to make your own cable, use the “G308 Port Pin Out Diagram” for wiring information.

The CompactFlash can be used to program a G3 by placing a configuration file and firmware on the CompactFlash card. The card is then inserted into the target G3 and powered. Refer to the Crimson literature for more information on the proper names and locations of the files.

CABLES AND DRIVERS

Red Lion has a wide range of cables and drivers for use with many different communication types. A list of these drivers and cables along with pin outs is available from Red Lion’s website. New cables and drivers are added on a regular basis. If making your own cable, refer to the “G308 Port Pin Outs” for wiring information.

ACCESSING THE COMPACTFLASH CARD VIA A USB DEVICE PORT

In order to access data from the CompactFlash card via the USB device port, a driver must be installed on your computer. This driver is installed with Crimson and is located in the folder C:\Program Files\Red Lion Controls\Crimson 2.0\Device\ after Crimson is installed. This may have already been accomplished if your G308 was configured using the USB port.

Once the driver is installed, connect the G308 to your PC with a USB cable, and follow the “Mounting the CompactFlash” instructions found in the Crimson user manual.
ETHERNET COMMUNICATIONS

Ethernet communications can be established at either 10 BASE-T or 100 BASE-TX. The G308 unit’s RJ45 jack is wired as a NIC (Network Interface Card). For example, when wiring to a hub or switch use a straight-through cable, but when connecting to another NIC use a crossover cable.

RS232 PORTS

The G308 has two RS232 ports. The G308A ports are individually isolated, while the G308C ports are not isolated. There is the PGM port and the COMMS port. Although only one of these ports can be used for programming, both ports can be used for communications with a PLC.

The RS232 PGM port can be used for either master or slave protocols with any G308 configuration.

Examples of RS232 communications could involve another Red Lion product or a PC. By using a cable with RJ12 ends on it, and a twist in the cable, RS232 communications with another G3 product or the Modular Controller can be established. Red Lion part numbers for cables with a twist in them are CBLPROG0 1, CBLRLC01 2, or CBLRC02 3.

G3 RS232 to a PC

<table>
<thead>
<tr>
<th>Connections</th>
<th>G3: RJ12</th>
<th>Name</th>
<th>PC: DB9</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>COMM</td>
<td>1</td>
<td>DCD</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Tx</td>
<td>2</td>
<td>Rx</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Rx</td>
<td>3</td>
<td>Tx</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>COM</td>
<td>4</td>
<td>DTR</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>N/C</td>
<td>5</td>
<td>GND</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>RTS</td>
<td>7</td>
<td>CTS</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>N/C</td>
<td>9</td>
<td>RI</td>
<td></td>
</tr>
</tbody>
</table>

The Ethernet connector contains two LEDs. A yellow LED in the upper right, and a bi-color green/amber LED in the upper left. The LEDs represent the following statuses.

<table>
<thead>
<tr>
<th>LED COLOR</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>YELLOW solid</td>
<td>Link established.</td>
</tr>
<tr>
<td>YELLOW flashing</td>
<td>Data being transferred.</td>
</tr>
<tr>
<td>GREEN</td>
<td>10 BASE-T Communications</td>
</tr>
<tr>
<td>AMBER</td>
<td>100 BASE-TX Communications</td>
</tr>
</tbody>
</table>

The Crimson manual contains additional information on Ethernet communications.

1 CBLPROG0 can also be used to communicate with either a PC or an ICM5.
2 DB9 adapter not included, 1 foot long.
3 DB9 adapter not included, 10 feet long.
RS422/485 COMMS PORT

The G308 has one RS422/485 port. The G308A port is isolated, while the G308C port is not isolated. This port can be configured to act as either RS422 or RS485.

**Note:** All Red Lion devices connect A to A and B to B, except for Paradigm devices. Refer to www.redlion.net for additional information.

![RS422/485 4-WIRE CONNECTIONS](image1)

![RS485 2-WIRE CONNECTIONS](image2)

**Examples of RS485 2-Wire Connections**

**G3 to Red Lion RJ11 (CBLRLC00)**

<table>
<thead>
<tr>
<th>Connections</th>
<th>Name</th>
<th>RLC: RJ11</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>TxEN</td>
<td>2</td>
<td>TxEN</td>
</tr>
<tr>
<td>6</td>
<td>COM</td>
<td>3</td>
<td>COM</td>
</tr>
<tr>
<td>1</td>
<td>TxB</td>
<td>5</td>
<td>B-</td>
</tr>
<tr>
<td>2</td>
<td>TxA</td>
<td>4</td>
<td>A+</td>
</tr>
</tbody>
</table>

**G3 to Modular Controller (CBLRLC05)**

<table>
<thead>
<tr>
<th>Connections</th>
<th>Name</th>
<th>Modular Controller</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>1, 4</td>
<td>TxB</td>
<td>1, 4</td>
<td>TxB</td>
</tr>
<tr>
<td>4, 1</td>
<td>RxA</td>
<td>4, 1</td>
<td>RxA</td>
</tr>
<tr>
<td>2, 3</td>
<td>TxA</td>
<td>2, 3</td>
<td>TxA</td>
</tr>
<tr>
<td>3, 2</td>
<td>RxA</td>
<td>3, 2</td>
<td>RxA</td>
</tr>
<tr>
<td>5</td>
<td>TxEN</td>
<td>5</td>
<td>TxEN</td>
</tr>
<tr>
<td>6</td>
<td>COM</td>
<td>6</td>
<td>COM</td>
</tr>
<tr>
<td>7</td>
<td>TxB</td>
<td>7</td>
<td>TxB</td>
</tr>
<tr>
<td>8</td>
<td>TxA</td>
<td>8</td>
<td>TxA</td>
</tr>
</tbody>
</table>

DH485 COMMUNICATIONS

The G308’s RS422/485 COMMS port can also be used for Allen Bradley DH485 communications.

**WARNING:** DO NOT use a standard DH485 cable to connect this port to Allen Bradley equipment. A cable and wiring diagram are available from Red Lion.

**G3 to AB SLC 500 (CBLAB003)**

<table>
<thead>
<tr>
<th>Connections</th>
<th>Name</th>
<th>RJ45: A-B</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>TxB</td>
<td>1</td>
<td>A</td>
</tr>
<tr>
<td>2</td>
<td>TxA</td>
<td>2</td>
<td>B</td>
</tr>
<tr>
<td>3, 8</td>
<td>RxA</td>
<td>-</td>
<td>24V</td>
</tr>
<tr>
<td>4, 7</td>
<td>RxB</td>
<td>-</td>
<td>COMM</td>
</tr>
<tr>
<td>5</td>
<td>TxEN</td>
<td>5</td>
<td>TxEN</td>
</tr>
<tr>
<td>6</td>
<td>COMM</td>
<td>4</td>
<td>SHIELD</td>
</tr>
<tr>
<td>4, 7</td>
<td>TxB</td>
<td>-</td>
<td>COMM</td>
</tr>
<tr>
<td>3, 8</td>
<td>TxA</td>
<td>-</td>
<td>24V</td>
</tr>
</tbody>
</table>

**POWER SUPPLY ISOLATION BLOCK DIAGRAM (G308A2 ONLY)**
SOFTWARE/ UNIT OPERATION

CRIMSON SOFTWARE
Crimson software is available as a free download from Red Lion’s website or it can be purchased on a CD, see “Ordering Information” for part number. The latest version of the software is always available from the website, and updating your copy is free.

DISPLAY
This operator interface uses a liquid crystal display (LCD) for displaying text and graphics. The backlight can be dimmed for low light conditions.

Display backlights have a limited lifetime. Backlight lifetime is based upon the amount of time the display is turned on at full intensity. Turning the backlight off when the display is not in use can extend the lifetime of your backlight. This can be accomplished through the Crimson software when configuring your unit.

BACKLIGHT REPLACEMENT

CCFL Backlight
Backlight is not field replaceable for hazardous location applications. Unit must be returned to Red Lion Controls for repair.
The backlight assembly for the G308A only is field replaceable in non-hazardous locations only. Refer to the instructions included in the appropriate backlight replacement kit.

FRONT PANEL LEDS
There are three front panel LEDs. Shown below is the default status of the LEDs.

<table>
<thead>
<tr>
<th>LED</th>
<th>INDICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>RED (TOP, LABELED “PWR”)</td>
<td>FLASHING Unit is in the boot loader, no valid configuration is loaded.¹</td>
</tr>
<tr>
<td></td>
<td>STEADY Unit is powered and running an application.</td>
</tr>
<tr>
<td>YELLOW (MIDDLE)</td>
<td>OFF No CompactFlash card is present.</td>
</tr>
<tr>
<td></td>
<td>STEADY Valid CompactFlash card present.</td>
</tr>
<tr>
<td></td>
<td>FLASHING RAPIDLY CompactFlash card being checked.</td>
</tr>
<tr>
<td></td>
<td>FLICKERING Unit is writing to the CompactFlash, either because it is storing data, or because the PC connected via the USB port has locked the drive.²</td>
</tr>
<tr>
<td></td>
<td>FLASHING SLOWLY Incorrectly formatted CompactFlash card present.</td>
</tr>
<tr>
<td>GREEN (BOTTOM)</td>
<td>FLASHING A tag is in an alarm state.</td>
</tr>
<tr>
<td></td>
<td>STEADY Valid configuration is loaded and there are no alarms present.</td>
</tr>
</tbody>
</table>

1. The operator interface is shipped without a configuration. After downloading a configuration, if the light remains in the flashing state continuously, try cycling power. If the LED still continues to flash, try downloading a configuration again.
2. Do not turn off power to the unit while this light is flickering. The unit writes data in two minute intervals. Later Microsoft operating systems will not lock the drive unless they need to write data; Windows 98 may lock the drive any time it is mounted, thereby interfering with logging. Refer to “Mounting the CompactFlash” in the Crimson User Manual.

KEYPAD
The G308 keypad consists of seven keys for on-screen menus.

TOUCHSCREEN
This operator interface utilizes a resistive analog touchscreen for user input. The unit will only produce an audible tone (beep) when a touch on an active touchscreen cell is sensed. The touchscreen is fully functional as soon as the operator interface is initialized, and can be operated with gloved hands.

TROUBLESHOOTING YOUR G308
If for any reason you have trouble operating, connecting, or simply have questions concerning your new G308, contact Red Lion’s technical support. For contact information, refer to the back page of this bulletin for phone and fax numbers.

EMAIL: techsupport@redlion.net
Web Site: http://www.redlion.net

1. Unit is writing to the CompactFlash, either because it is storing data, or because the PC connected via the USB port has locked the drive.
2. Incorrectly formatted CompactFlash card present.
A battery is used to keep time when the unit is without power. Typical accuracy of the G308 time keeping is less than one minute per month drift. The battery of a G308 unit does not affect the unit’s memory, all configurations and data is stored in non-volatile memory.

**CAUTION: RISK OF ELECTRIC SHOCK**

The inverter board supplies the high voltage to operate the backlight. Touching the inverter board may result in injury to personnel.

**CAUTION:** The circuit board contains static sensitive components. Before handling the operator interface without the rear cover attached, discharge static charges from your body by touching a grounded bare metal object. Ideally, handle the operator interface at a static controlled clean workstation. Also, do not touch the surface areas of the circuit board. Dirt, oil, or other contaminants may adversely affect circuit operation.

To change the battery of a G308, remove power, cabling, and then the rear cover of the unit. To remove the cover, remove the five screws designated by the arrows on the rear of the unit. Then, by lifting the top side, hinge the cover, thus providing clearance for the connectors on the bottom side of the PCB as shown in the illustration below. Install in the reverse manner.

Remove the old battery* from the holder and replace with the new battery. Replace the rear cover, cables, and re-apply power. Using Crimson or the unit’s keypad, enter the correct time and date.

* Please note that the old battery must be disposed of in a manner that complies with your local waste regulations. Also, the battery must not be disposed of in fire, or in a manner whereby it may be damaged and its contents come into contact with human skin.

The battery used by the G308 is a lithium type CR2025.
LIMITED WARRANTY

The Company warrants the products it manufactures against defects in materials and workmanship for a period limited to two years from the date of shipment, provided the products have been stored, handled, installed, and used under proper conditions.

The Company’s liability under this limited warranty shall extend only to the repair or replacement of a defective product, at The Company’s option. The Company disclaims all liability for any affirmation, promise or representation with respect to the products.

The customer agrees to hold Red Lion Controls harmless from, defend, and indemnify RLC against damages, claims, and expenses arising out of subsequent sales of RLC products or products containing components manufactured by RLC and based upon personal injuries, deaths, property damage, lost profits, and other matters which Buyer, its employees, or sub-contractors are or may be to any extent liable, including without limitation penalties imposed by the Consumer Product Safety Act (P.L. 92-573) and liability imposed upon any person pursuant to the Magnuson-Moss Warranty Act (P.L. 93-637), as now in effect or as amended hereafter.

No warranties expressed or implied are created with respect to The Company’s products except those expressly contained herein. The Customer acknowledges the disclaimers and limitations contained herein and relies on no other warranties or affirmations.

OPTIONAL FEATURES AND ACCESSORIES

COMPACTFLASH SOCKET

CompactFlash socket is a Type II socket that can accept either Type I or II cards. Use cards with a minimum of 4 Mbytes and a maximum of 2 Gbytes with the G308’s CompactFlash socket. Cards are available at most computer and office supply retailers.

CompactFlash can be used for configuration transfers, larger configurations, data logging, and trending.

NOTE

For reliable operation of this and other Red Lion products, one of the following brands of CompactFlash card must be used...

SimpleTech SMART® Modular
SanDisk® Silicon Systems

Not all of the above manufacturers offer CompactFlash cards recognized to UL standards, which may be required for your application.

OPTIONAL COMMUNICATION CARD

Red Lion offers optional communication cards for fieldbus communications. These communication cards will allow your G308 to communicate with many of the popular fieldbus protocols.

Red Lion is also offering a communications card for additional RS232 and RS422/485 communications. Visit Red Lion’s website for information and availability of these cards.

CUSTOM LOGO

Each G3 operator interface has an embossed area containing the Red Lion logo. Red Lion can provide custom logos to apply to this area. Contact your distributor for additional information and pricing.

NOTE

For reliable operation of this and other Red Lion products, one of the following brands of CompactFlash card must be used...

SimpleTech SMART® Modular
SanDisk® Silicon Systems

Not all of the above manufacturers offer CompactFlash cards recognized to UL standards, which may be required for your application.
**GENERAL DESCRIPTION**

The G310 Operator Interface Terminal combines unique capabilities normally expected from high-end units with a very affordable price. It is built around a high performance core with integrated functionality. This core allows the G310 to perform many of the normal features of the Paradigm range of Operator Interfaces while improving and adding new features.

The G310 is able to communicate with many different types of hardware using high-speed RS232/422/485 communications ports and Ethernet 10 Base T/100 Base-TX communications. In addition, the G310 features USB for fast downloads of configuration files and access to trending and data logging. A CompactFlash socket is provided so that Flash cards can be used to collect your trending and data logging information as well as to store larger configuration files.

In addition to accessing and controlling of external resources, the G310 allows a user to easily view and enter information. Users can enter data through the touchscreen or front panel 8-button keypad.

**SAFETY SUMMARY**

All safety related regulations, local codes and instructions that appear in the manual or on equipment must be observed to ensure personal safety and to prevent damage to either the instrument or equipment connected to it. If equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

Do not use the controller to directly command motors, valves, or other actuators not equipped with safeguards. To do so can be potentially harmful to persons or equipment in the event of a fault to the controller.

The protective conductor terminal is bonded to conductive parts of the equipment for safety purposes and must be connected to an external protective earthing system.

**WARNING - EXPLOSION HAZARD - SUBSTITUTION OF ANY COMPONENT MAY IMPAIR SUITABILITY FOR CLASS I, DIVISION 2**

**CONTENTS OF PACKAGE**

- G310 Operator Interface.
- Panel Gasket.
- This hardware bulletin.
- Template for panel cutout.
- Hardware packet for mounting unit into panel.
- Terminal block for connecting power.

**ORDERING INFORMATION**

**MODEL NO.** | **DESCRIPTION** | **PART NUMBER**
---|---|---
G310C210 | 10.4" TFT VGA Display Operator Interface (indoor), USB Host, Isolated Comm's | G310C210
G310C230 | 10.4" TFT VGA Display Operator Interface (indoor), Dual Ethernet, USB Host, Isolated Comm's | G310C230
G310R210 | 10.4" TFT SVGA Display Operator Interface (indoor), USB Host, Isolated Comm's | G310R210
G310R230 | 10.4" TFT SVGA Display Operator Interface (indoor), Dual Ethernet, USB Host, Isolated Comm's | G310R230
G310S210 | 10.4" TFT VGA Display Operator Interface (indoor or outdoor), Glossy Finish, USB Host, Isolated Comm's | G310S210
G310S230 | 10.4" TFT VGA Display Operator Interface (indoor or outdoor), Glossy Finish, Dual Ethernet, USB Host, Isolated Comm's | G310S230
G3CF | CompactFlash Card | G3CFxxxx
G3RS | RS 232/485 Optional Communication Card | G3RS0000
G3CN | CANopen Optional Communication Card | G3CN0000
G3DN | DeviceNet Optional Communication Card | G3DN0000
G3PBDP | ProBus DP Optional Communication Card | G3PBDP00
SFCRM | Crimson | SFCRM
CBL | RS-232 Programming Cable | CBLPROG0
USB Cable | CBULUSB800
Communications Cables | CBULxxx
DR | DIN Rail Mountable Adapter Products | DRRxxxxx
Replacement Battery | BNL20000
G310C Backlight Replacement | G3BR10C1
G3FILM | Protective Films | G3FILM10

1. Contact your Red Lion distributor or visit our website for complete selection.
2. Use this part number to purchase Crimson on CD with a printed manual, USB cable, and RS-232 cable. Otherwise, download for free from www.redlion.net.
3. Red Lion offers RJ modular jack adapters. Refer to the DR literature for complete details.
4. Battery type is lithium coin type CR2025
5. Industrial grade two million write cycles. SMART Modular Technologies model SG9CF (UL Listed Directory Category NWGQ).
6. For use in non-hazardous locations only.
7. LED backlight is not field replaceable.
1. **POWER REQUIREMENTS**: +24 VDC ±20% @ 30 W maximum. Must use NEC Class 2 or Limited Power Source (LPS) rated power supply. Power connection via removable three position terminal block.

   **Note**: I. The G310's circuit common is not connected to the enclosure of the unit. See “Connecting to Earth Ground” in the section “Installing and Powering the G310.”

2. **BATTERY**: Lithium coin cell CR2025. Typical lifetime of 10 years.

3. **LCD MODULE DISPLAYS**:

<table>
<thead>
<tr>
<th>MODEL</th>
<th>G310C2</th>
<th>G310R2</th>
<th>G310S2</th>
</tr>
</thead>
<tbody>
<tr>
<td>SIZE</td>
<td>10.4-inch</td>
<td>10.4-inch</td>
<td>10.4-inch</td>
</tr>
<tr>
<td>TYPE</td>
<td>TFT</td>
<td>TFT</td>
<td>TFT</td>
</tr>
<tr>
<td>COLORS</td>
<td>32K</td>
<td>32K</td>
<td>32K</td>
</tr>
<tr>
<td>PICTURES</td>
<td>640 X 480</td>
<td>800 X 600</td>
<td>640 X 480</td>
</tr>
<tr>
<td>BRIGHTNESS</td>
<td>450 cd/m²</td>
<td>400 cd/m²</td>
<td>1000 cd/m²</td>
</tr>
<tr>
<td>BACKLIGHT LIFETIME *</td>
<td>50,000 HR typ.</td>
<td>40,000 HR typ.</td>
<td>50,000 HR typ.</td>
</tr>
<tr>
<td>BACKLIGHT TYPE</td>
<td>CCFL</td>
<td>CCFL</td>
<td>LED</td>
</tr>
</tbody>
</table>

   * Lifetime at room temperature. Refer to “Display” in the “Software/Unit Operation” section.

4. **8-KEY KEYPAD**: for on-screen menus.

5. **TOUCHSCREEN**: Resistive analog

6. **MEMORY**:
   - On Board User Memory: 32 Mbyte of onboard non-volatile Flash memory.
   - Memory Card: CompactFlash Type II slot for Type I and Type II CompactFlash cards.

7. **COMMUNICATIONS**:
   - **USB Port**: Adheres to USB 2.0 specification full speed only via Type B connection.
   - **USB Host Ports**: Comply with Universal Serial Bus Specification Rev 2.0. Support data transfers at full-speed. Hardware over current protected (0.5 A max per port).
   - **Serial Ports**: Ports are individually isolated. Format and Baud Rates for each port are individually software programmable up to 115,200 baud.
   - **PGM Port**: RS232 port via RJ12.
   - **COMMS Ports**: RS422/485 port via RJ45, and RS232 port via RJ12.
   - **DH485 TXEN**: Transmit enable; open collector, \( V_{OH} = 15 \) VDC, \( V_{OL} = 0.5 \) V @ 25 mA max.
   - **Ethernet Ports**: 10 BASE-T / 100 BASE-TX
     - RJ45 jack is wired as a NIC (Network Interface Card). The jack shield is electrically connected to Earth ground.
     - A secondary ethernet port (with its own Mac ID) is available as an option.

8. **ENVIRONMENTAL CONDITIONS**:
   - **Operating Temperature Range**: 0 to 50°C
   - **Storage Temperature Range**: -20 to 70°C
   - **Operating and Storage Humidity**: 80% maximum relative humidity (non-condensing) from 0 to 50°C.
   - **Altitude**: Up to 2000 meters.

9. **CERTIFICATIONS AND COMPLIANCES**:
   - **SAFETY**
     - UL Listed, File #E179259, UL61010-1, CSA 22.2 No.61010-1
     - LISTED by Und. Lab. Inc. to U.S. and Canadian safety standards
     - Type 4X Enclosure rating (Face only), UL50
     - IECEE CB Scheme Test Report #E179259-A1-CB-2
     - Issued by Underwriters Laboratories Inc.
     - IEC 61010-1, EN 61010-1: Safety requirements for electrical equipment for measurement, control, and laboratory use, Part 1.
     - IP66 Enclosure rating (Face only), IEC 529
   - **ELECTROMAGNETIC COMPATIBILITY**
     - **Immunity to Industrial Locations**:
       - Electrostatic discharge EN 61000-4-2 Criterion A
       - Electromagnetic RF fields EN 61000-4-3 Criterion A
         - 4kV contact discharge
         - 8kV air discharge
         - 10V/m (80 MHz to 1 GHz)
         - 3 V/m (1.4 GHz to 2 GHz)
       - Fast transients (burst) EN 61000-4-4 Criterion B
         - 1 V/m (2 GHz to 2.7 GHz)
         - 2kV power
         - 1kV I/O signal
       - Surge EN 61000-4-5 Criterion B
         - 1 kV L to L, 2 kV L to G
         - 1 kV
       - RF conducted interference EN 61000-4-6 Criterion A
         - 3 Vms
         - 30 A/m
   - **Emissions**
     - Emissions EN55011 Class A
   - **Notes**:
     - 2. Criterion B: Temporary loss of performance from which the unit self-recovers.

10. **CONNECTIONS**: Compression cage-clamp terminal block.
   - Wire Gage: 12-30 AWG copper wire
   - Torque: 5-7 inch-pounds (56-79 N-cm)

11. **CONSTRUCTION**:
   - Steel rear metal enclosure with NEMA 4X/IP66 aluminum front plate for when correctly fitted with the gasket provided.
   - Installation Category II, Pollution Degree 2.

12. **MOUNTING REQUIREMENTS**: Maximum panel thickness is 0.25" (6.3 mm). For NEMA 4X/IP66 sealing, a steel panel with a minimum thickness of 0.125" (3.17 mm) is recommended.

13. **WEIGHT**: 5.44 lbs (2.47 Kg)
INSTALLING AND POWERING THE G310

MOUNTING INSTRUCTIONS
This operator interface is designed for through-panel mounting. A panel cut-out diagram and a template are provided. Care should be taken to remove any loose material from the mounting cut-out to prevent that material from falling into the operator interface during installation. A gasket is provided to enable sealing to NEMA 4X/IP66 specification. Install the 14 kep nuts provided and tighten evenly for uniform gasket compression.

Note: Tightening the kep nuts beyond a maximum of 17 inch-pounds (1.92 N·m) may cause damage to the front panel.

All tolerances ±0.010" (±0.25 mm).

WARNING - EXPLOSION HAZARD - DO NOT DISCONNECT EQUIPMENT WHILE THE CIRCUIT IS LIVE OR UNLESS THE AREA IS KNOWN TO BE FREE OF IGNITABLE CONCENTRATIONS.

CONNECTING TO EARTH GROUND
The protective conductor terminal is bonded to conductive parts of the equipment for safety purposes and must be connected to an external protective earthing system.

Each G310 has a chassis ground terminal on the back of the unit. Your unit should be connected to earth ground (protective earth).

COMMUNICATING WITH THE G310

CONFIGURING A G310
The G310 is configured using Crimson software. Crimson is available as a free download from Red Lion’s website, or it can be purchased on CD. Updates to Crimson for new features and drivers are posted on the website as they become available. By configuring the G310 using the latest version of Crimson, you are assured that your unit has the most up to date feature set. Crimson software can configure the G310 through the RS232 PGM port, USB port, or CompactFlash.

The USB port is connected using a standard USB cable with a Type B connector. The driver needed to use the USB port will be included with Crimson. If this driver has not been installed, it can be downloaded from the website.

The RS232 PGM port uses a programming cable made by Red Lion to connect to the DB9 COM port of your computer. If you choose to make your own cable, use the “G310 Port Pin Out Diagram” for wiring information.

The CompactFlash can be used to program a G3 by placing a configuration file and firmware on the CompactFlash card. The card is then inserted into the operator interface. Ideally, the shortest length possible should be used. The wire used to connect the operator interface’s power supply should be at least 22-gage wire. If a longer cable run is used, a heavier gage wire should be used. The wiring of the cable should be kept away from large contactors, inverters, and other devices which may generate significant electrical noise.

A power supply with an NEC Class 2 or Limited Power Source (LPS) and SELV rating is to be used. This type of power supply provides isolation to accessible circuits from hazardous voltage levels generated by a mains power supply due to single faults. SELV is an acronym for “safety extra-low voltage.” Safety extra-low voltage circuits shall exhibit voltages safe to touch both under normal operating conditions and after a single fault, such as a breakdown of a layer of basic insulation or after the failure of a single component has occurred.

POWER SUPPLY REQUIREMENTS
The units require a 24 VDC power supply rated at 30 W. Your unit may draw considerably less than the rated power depending upon the options being used. As additional features are used your unit will draw increasing amounts of power. Items that could cause increases in current are additional communications, optional communications card, CompactFlash card, and other features programmed through Crimson.

In any case, it is very important that the power supply is mounted correctly if the unit is to operate reliably. Please take care to observe the following points:

- The power supply must be mounted close to the unit, with usually not more than 6 feet (1.8 m) of cable between the supply and the operator interface. Ideally, the shortest length possible should be used.
- The wire used to connect the operator interface’s power supply should be at least 22-gage wire. If a longer cable run is used, a heavier gage wire should be used. The routing of the cable should be kept away from large contactors, inverters, and other devices which may generate significant electrical noise.
- A power supply with an NEC Class 2 or Limited Power Source (LPS) and SELV rating is to be used. This type of power supply provides isolation to accessible circuits from hazardous voltage levels generated by a mains power supply due to single faults. SELV is an acronym for “safety extra-low voltage.” Safety extra-low voltage circuits shall exhibit voltages safe to touch both under normal operating conditions and after a single fault, such as a breakdown of a layer of basic insulation or after the failure of a single component has occurred.

COMMUNICATING WITH THE G310

ACCESSING THE COMPACTFLASH CARD VIA A USB DEVICE PORT

In order to access data from the CompactFlash card via the USB device port, a driver must be installed on your computer. This driver is installed with Crimson and is located in the folder C:\Program Files\Red Lion Controls\Crimson 2.0\Device\ after Crimson is installed. This may have already been accomplished if your G310 was configured using the USB port.

Once the driver is installed, connect the G310 to your PC with a USB cable, and follow the “Mounting the CompactFlash” instructions found in the Crimson user manual.

CABLES AND DRIVERS
Red Lion has a wide range of cables and drivers for use with many different communication types. A list of these drivers and cables along with pin outs is available from Red Lion’s website. New cables and drivers are added on a regular basis. If making your own cable, refer to the “G310 Port Pin Outs” for wiring information.
ETHERNET COMMUNICATIONS

Ethernet communications can be established at either 10 BASE-T or 100 BASE-TX. The G310 unit's RJ45 jack is wired as a NIC (Network Interface Card). For example, when wiring to a hub or switch use a straight-through cable, but when connecting to another NIC use a crossover cable.

RS232 PORTS

The G310 has two individually isolated RS232 ports. There is the PGM port and the COMMS port. Although only one of these ports can be used for programming, both ports can be used for communications with a PLC.

The RS232 PGM port can be used for either master or slave protocols with any G310 configuration.

Examples of RS232 communications could involve another Red Lion product or a PC. By using a cable with RJ12 ends on it, and a twist in the cable, RS232 communications with another G3 product or the Modular Controller can be established. Red Lion part numbers for cables with a twist in them are CBLPROG0\(^1\), CBLRLC01\(^2\), or CBLRC02\(^3\).

The Ethernet connector contains two LEDs. A yellow LED in the upper right, and a bi-color green/amber LED in the upper left. The LEDs represent the following statuses.

<table>
<thead>
<tr>
<th>LED COLOR</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>YELLOW solid</td>
<td>Link established.</td>
</tr>
<tr>
<td>YELLOW flashing</td>
<td>Data being transferred.</td>
</tr>
<tr>
<td>GREEN</td>
<td>10 BASE-T Communications</td>
</tr>
<tr>
<td>AMBER</td>
<td>100 BASE-TX Communications</td>
</tr>
</tbody>
</table>

The Crimson manual contains additional information on Ethernet communications.

**CONNECTING A G310 OPERATOR INTERFACE TO AN ICM5**

G3 RS232 to a PC

<table>
<thead>
<tr>
<th>Connections</th>
<th>G3: RJ12</th>
<th>Name</th>
<th>PC: DB9</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>COMM</td>
<td>1</td>
<td>DCD</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Tx</td>
<td>2</td>
<td>Rx</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Rx</td>
<td>3</td>
<td>Tx</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>COM</td>
<td>4</td>
<td>DTR</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>N/C</td>
<td>5</td>
<td>GND</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>N/C</td>
<td>6</td>
<td>DSR</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>CTS</td>
<td>7</td>
<td>RTS</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>RTS</td>
<td>8</td>
<td>CTS</td>
<td></td>
</tr>
<tr>
<td>N/C</td>
<td>9</td>
<td></td>
<td>RI</td>
<td></td>
</tr>
</tbody>
</table>

\(^1\) CBLPROG0 can also be used to communicate with either a PC or an ICM5.

\(^2\) DB9 adapter not included, 1 foot long.

\(^3\) DB9 adapter not included, 10 feet long.

---

**G310 PORT PIN OUTS**

- POWER CONNECTOR
- PROTECTIVE EARTH GROUND
- COMMS PORT
- PGM PORT
- ETHERNET (NIC)
- AUXILIARY ETHERNET (OPTIONAL)
- USB TYPE B
- USB HOST
- RS485
- RS232
- POWER (PIN 1)
- COM (PIN 2)
- RX (PIN 3)
- RTS (PIN 6)
- CTS (PIN 1)
- GND (PIN 5)
- TX (PIN 8)
RS422/485 COMMS PORT
The G310 has one isolated RS422/485 port. This port can be configured to act as either RS422 or RS485.

Note: All Red Lion devices connect A to A and B to B, except for Paradigm devices. Refer to www.redlion.net for additional information.

Examples of RS485 2-Wire Connections

G3 to Red Lion RJ11 (CBLRLC00)
DLC, IAMS, ITMS, PAXCDC4C

<table>
<thead>
<tr>
<th>G3: RJ45</th>
<th>Name</th>
<th>RLC: RJ11</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>TxEN</td>
<td>2</td>
<td>TxEN</td>
</tr>
<tr>
<td>6</td>
<td>COM</td>
<td>3</td>
<td>COM</td>
</tr>
<tr>
<td>1</td>
<td>TxB</td>
<td>5</td>
<td>B-</td>
</tr>
<tr>
<td>2</td>
<td>TxA</td>
<td>4</td>
<td>A+</td>
</tr>
</tbody>
</table>

G3 to Modular Controller (CBLRLC05)

<table>
<thead>
<tr>
<th>G3</th>
<th>Name</th>
<th>Modular Controller</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,4</td>
<td>TxB</td>
<td>1,4</td>
<td>TxB</td>
</tr>
<tr>
<td>4,1</td>
<td>RxB</td>
<td>4,1</td>
<td>RxB</td>
</tr>
<tr>
<td>2,3</td>
<td>TxA</td>
<td>2,3</td>
<td>TxA</td>
</tr>
<tr>
<td>3,2</td>
<td>RxA</td>
<td>3,2</td>
<td>RxA</td>
</tr>
<tr>
<td>5</td>
<td>TxEN</td>
<td>5</td>
<td>TxEN</td>
</tr>
<tr>
<td>6</td>
<td>COM</td>
<td>6</td>
<td>COM</td>
</tr>
<tr>
<td>7</td>
<td>TxB</td>
<td>7</td>
<td>TxB</td>
</tr>
<tr>
<td>8</td>
<td>TxA</td>
<td>8</td>
<td>TxA</td>
</tr>
</tbody>
</table>

DH485 COMMUNICATIONS
The G310’s RS422/485 COMMS port can also be used for Allen Bradley DH485 communications.

WARNING: DO NOT use a standard DH485 cable to connect this port to Allen Bradley equipment. A cable and wiring diagram are available from Red Lion.

G3 to AB SLC 500 (CBLAB003)

<table>
<thead>
<tr>
<th>Connections</th>
</tr>
</thead>
<tbody>
<tr>
<td>RJ45: RLC</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>3, 8</td>
</tr>
<tr>
<td>4, 7</td>
</tr>
<tr>
<td>5</td>
</tr>
<tr>
<td>6</td>
</tr>
<tr>
<td>3, 8</td>
</tr>
</tbody>
</table>

POWER SUPPLY ISOLATION BLOCK DIAGRAM

24VDC
SOFTWARE/UNIT OPERATION

CRIMSON SOFTWARE
Crimson software is available as a free download from Red Lion’s website or it can be purchased on a CD, see “Ordering Information” for part number. The latest version of the software is always available from the website, and updating your copy is free.

DISPLAY
This operator interface uses a liquid crystal display (LCD) for displaying text and graphics. The G310C2 and G310R2 displays utilize a cold cathode fluorescent tube (CCFL) for lighting the display. The G310S2 units use an LED backlight. The backlight can be dimmed for low light conditions.

Display backlights have a limited lifetime. Backlight lifetime is based upon the amount of time the display is turned on at full intensity. Turning the backlight off when the display is not in use can extend the lifetime of your backlight. This can be accomplished through the Crimson software when configuring your unit.

BACKLIGHT REPLACEMENT

LED Backlight
The LED backlight is not field replaceable. Unit must be returned to Red Lion Controls for repair.

CCFL Backlight
Backlight is not field replaceable for hazardous location applications. Unit must be returned to Red Lion Controls for repair.

The backlight assembly is field replaceable in non-hazardous locations only. Refer to the instructions included in the appropriate backlight replacement kit.

FRONT PANEL LEDS
There are three front panel LEDs. Shown below is the default status of the LEDs.

<table>
<thead>
<tr>
<th>LED</th>
<th>INDICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>RED (TOP, LABELED &quot;PWR&quot;)</td>
<td></td>
</tr>
<tr>
<td>FLASHING</td>
<td>Unit is in the boot loader, no valid configuration is loaded. 1</td>
</tr>
<tr>
<td>STEADY</td>
<td>Unit is powered and running an application.</td>
</tr>
<tr>
<td>YELLOW (MIDDLE)</td>
<td></td>
</tr>
<tr>
<td>OFF</td>
<td>No CompactFlash card is present.</td>
</tr>
<tr>
<td>STEADY</td>
<td>Valid CompactFlash card present.</td>
</tr>
<tr>
<td>FLASHING RAPIDLY</td>
<td>CompactFlash card being checked.</td>
</tr>
<tr>
<td>FLICKERING</td>
<td>Unit is writing to the CompactFlash, either because it is storing data, or because the PC connected via the USB port has locked the drive. 2</td>
</tr>
<tr>
<td>FLASHING SLOWLY</td>
<td>Incorrectly formatted CompactFlash card present.</td>
</tr>
<tr>
<td>GREEN (BOTTOM)</td>
<td></td>
</tr>
<tr>
<td>FLASHING</td>
<td>A tag is in an alarm state.</td>
</tr>
<tr>
<td>STEADY</td>
<td>Valid configuration is loaded and there are no alarms present.</td>
</tr>
</tbody>
</table>

1. The operator interface is shipped without a configuration. After downloading a configuration, if the light remains in the flashing state continuously, try cycling power. If the LED still continues to flash, try downloading a configuration again.

2. Do not turn off power to the unit while this light is flickering. The unit writes data in two minute intervals. Later Microsoft operating systems will not lock the drive unless they need to write data; Windows 98 may lock the drive any time it is mounted, thereby interfering with logging. Refer to “Mounting the CompactFlash” in the Crimson User Manual.

EMAIL: techsupport@redlion.net
Web Site: http://www.redlion.net

KEYPAD
The G310 keypad consists of eight keys for on-screen menus.

TOUCHSCREEN
This operator interface utilizes a resistive analog touchscreen for user input. The unit will only produce an audible tone (beep) when a touch on an active touchscreen cell is sensed. The touchscreen is fully functional as soon as the operator interface is initialized, and can be operated with gloved hands.

TROUBLESHOOTING YOUR G310
If for any reason you have trouble operating, connecting, or simply have questions concerning your new G310, contact Red Lion’s technical support. For contact information, refer to the back page of this bulletin for phone and fax numbers.
A battery is used to keep time when the unit is without power. Typical accuracy of the G310 time keeping is less than one minute per month drift. The battery of a G310 unit does not affect the unit’s memory, all configurations and data is stored in non-volatile memory.

**CAUTION:** The circuit board contains static sensitive components. Before handling the operator interface without the rear cover attached, discharge static charges from your body by touching a grounded bare metal object. Ideally, handle the operator interface at a static controlled clean workstation. Also, do not touch the surface areas of the circuit board. Dirt, oil, or other contaminants may adversely affect circuit operation.

To change the battery of a G310, remove power, cabling, and then the rear cover of the unit. To remove the cover, remove the five screws designated by the arrows on the rear of the unit. Then, by lifting the top side, hinge the cover, thus providing clearance for the connectors on the bottom side of the PCB as shown in the illustration below. Install in the reverse manner.

Remove the old battery* from the holder and replace with the new battery. Replace the rear cover, cables, and re-apply power. Using Crimson or the unit’s keypad, enter the correct time and date.

* Please note that the old battery must be disposed of in a manner that complies with your local waste regulations. Also, the battery must not be disposed of in fire, or in a manner whereby it may be damaged and its contents come into contact with human skin.

The battery used by the G310 is a lithium type CR2025.
OPTIONAL FEATURES AND ACCESSORIES

INDOOR VERSUS OUTDOOR
The G310C2x0 and the G310R2x0 use an overlay with a textured finish and keys that are embossed. This overlay is not rated for outdoor use.
The G310S2x0 uses an overlay with a glossy finish that uses a UV rated material for outdoor use. The keys on this overlay are not embossed. The display is significantly brighter than the G310C2x0.

OPTIONAL COMMUNICATION CARD
Red Lion offers optional communication cards for fieldbus communications. These communication cards will allow your G310 to communicate with many of the popular fieldbus protocols.
Red Lion is also offering a communications card for additional RS232 and RS422/485 communications. Visit Red Lion’s website for information and availability of these cards.

CUSTOM LOGO
Each G3 operator interface has an embossed area containing the Red Lion logo. Red Lion can provide custom logos to apply to this area. Contact your distributor for additional information and pricing.

COMPACTFLASH SOCKET
CompactFlash socket is a Type II socket that can accept either Type I or II cards. Use cards with a minimum of 4 Mbytes and a maximum of 2 Gbytes with the G310’s CompactFlash socket. Cards are available at most computer and office supply retailers.
CompactFlash can be used for configuration transfers, larger configurations, data logging, and trending.

Information stored on a CompactFlash card by a G310 can be read by a card reader attached to a PC. This information is stored in IBM (Windows®) PC compatible FAT16 file format.

NOTE
For reliable operation of this and other Red Lion products, one of the following brands of CompactFlash card must be used...
SimpleTech SMART® Modular
SanDisk® Silicon Systems

Not all of the above manufacturers offer CompactFlash cards recognized to UL standards, which may be required for your application.

LIMITED WARRANTY
The Company warrants the products it manufactures against defects in materials and workmanship for a period limited to two years from the date of shipment, provided the products have been stored, handled, installed, and used under proper conditions.
The Company’s liability under this limited warranty shall extend only to the repair or replacement of a defective product, at The Company’s option. The Company disclaims all liability for any affirmation, promise or representation with respect to the products.
The customer agrees to hold Red Lion Controls harmless from, defend, and indemnify RLC against damages, claims, and expenses arising out of subsequent sales of RLC products or products containing components manufactured by RLC and based upon personal injuries, deaths, property damage, lost profits, and other matters which Buyer, its employees, or sub-contractors are or may be to any extent liable, including without limitation penalties imposed by the Consumer Product Safety Act (P.L. 92-573) and liability imposed upon any person pursuant to the Magnuson-Moss Warranty Act (P.L. 93-637), as now in effect or as amended hereafter.
No warranties expressed or implied are created with respect to The Company’s products except those expressly contained herein. The Customer acknowledges the disclaimers and limitations contained herein and relies on no other warranties or affirmations.
GENERAL DESCRIPTION

The G315C Operator Interface combines powerful features normally found only in PC-based HMIs, with the reliability of a dedicated operating system. It is built around a high performance core with integrated features, allowing it to provide SCADA-like functionality at a fraction of the cost.

The G315C is able to act as a multiple protocol converter using four high-speed RS232/422/485 communications ports and an Ethernet 10/100 Base-TX port. The Ethernet port supports up to four protocols simultaneously, allowing dissimilar Ethernet based products to communicate with one another.

The G315C’s USB port allows fast downloads of configuration files and access to trending and data logging. A CompactFlash socket is provided so that standard CompactFlash cards can be used to collect your trending and data logging information as well as to store configuration files. The built-in web server allows processes to be controlled remotely.

The G315C’s large, high-resolution display allows users to easily view and enter information. Data can be manipulated through the touchscreen and/or the 10-button keypad.

SAFETY SUMMARY

All safety related regulations, local codes and instructions that appear in the manual or on equipment must be observed to ensure personal safety and to prevent damage to either the instrument or equipment connected to it. If equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

Do not use the controller to directly command motors, valves, or other actuators not equipped with safeguards. To do so can be potentially harmful to persons or equipment in the event of a fault to the controller.

The protective conductor terminal is bonded to conductive parts of the equipment for safety purposes and must be connected to an external protective earthing system.

CONTENT OF PACKAGE

- G315C2 Operator Interface.
- Panel gasket.
- Template for panel cutout.
- Hardware packet for mounting unit into panel.
- Terminal block for connecting power.

ORDERING INFORMATION

<table>
<thead>
<tr>
<th>MODEL NO.</th>
<th>DESCRIPTION</th>
<th>PART NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>G315C2</td>
<td>15&quot; TFT XGA Display Operator Interface (indoor), USB Host</td>
<td>G315C210</td>
</tr>
<tr>
<td>G315C2</td>
<td>15&quot; TFT XGA Display Operator Interface (indoor), Dual Ethernet, USB Host</td>
<td>G315C230</td>
</tr>
<tr>
<td>G3CF</td>
<td>CompactFlash Card 5</td>
<td>G3CFxxxx</td>
</tr>
<tr>
<td>G3RS</td>
<td>RS232/485 Optional Communication Card</td>
<td>G3RS0000</td>
</tr>
<tr>
<td>G3CN</td>
<td>CANopen Optional Communication Card</td>
<td>G3CN0000</td>
</tr>
<tr>
<td>G3DN</td>
<td>DeviceNet option card for G3 operator interfaces with isolated high speed communications ports</td>
<td>G3DN0000</td>
</tr>
<tr>
<td>G3PBDP</td>
<td>Profinet DP Optional Communication Card</td>
<td>G3PBDP00</td>
</tr>
<tr>
<td>SFCRM2</td>
<td>Crimson 2.0 2</td>
<td>SFCRM200</td>
</tr>
<tr>
<td>CBL</td>
<td>RS-232 Programming Cable</td>
<td>CBLPROG0</td>
</tr>
<tr>
<td></td>
<td>USB Cable</td>
<td>CBLUSB00</td>
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<td>CBLxxxxx</td>
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<tr>
<td>DR</td>
<td>DIN Rail Mountable Adapter Products 3</td>
<td>DRxxxxxx</td>
</tr>
<tr>
<td></td>
<td>Replacement Battery 4</td>
<td>BNL20000</td>
</tr>
</tbody>
</table>

1 Contact your Red Lion distributor or visit our website for complete selection.
2 Use this part number to purchase Crimson on CD with a printed manual, USB cable, and RS-232 cable. Otherwise, download for free from www.redlion.net.
3 Red Lion offers RJ modular jack adapters. Refer to the DR literature for complete details.
4 Battery type is lithium coin type CR2025.
5 Industrial grade two million write cycles. SMART Modular Technologies model SG9CF (UL Listed Directory Category NWGQ).
SPECIFICATIONS

1. POWER REQUIREMENTS:
   Must use NEC Class 2 or Limited Power Source (LPS) rated power supply.
   Power connection via removable three position terminal block.
   Supply Voltage:  +24 VDC ±20%
   Typical Power: 38 W
   Maximum Power: 46 W
   Notes:
   1. Typical power with +24 VDC, RS232/485 communications, Ethernet communications, CompactFlash card installed, flash drive installed in one USB Host port, and display at full brightness.
   2. Maximum power is consumed when all features and comm ports are used at the same time. Refer to “Power Supply Requirements” under “Installing and Powering the G315C.”
   3. The G315C’s circuit common is not connected to the enclosure of the unit. See “Connecting to Earth Ground” in the section “Installing and Powering the G315C.”
   4. Read “Power Supply Requirements” in the section “Installing and Powering the G315C” for additional power supply information.

2. BATTERY:
   Lithium coin cell. Typical lifetime of 10 years.

3. LCD DISPLAY:
<table>
<thead>
<tr>
<th>SIZE</th>
<th>15-inch</th>
</tr>
</thead>
<tbody>
<tr>
<td>TYPE</td>
<td>TFT</td>
</tr>
<tr>
<td>COLORS</td>
<td>32K</td>
</tr>
<tr>
<td>PIXELS</td>
<td>1024 X 768</td>
</tr>
<tr>
<td>BRIGHTNESS</td>
<td>600 cd/m²</td>
</tr>
<tr>
<td>BACKLIGHT</td>
<td>50,000 HR TYP.</td>
</tr>
</tbody>
</table>
   *Lifetime at room temperature. Refer to “Display” in “Software/Unit Operation”

4. 10-KEY KEYPAD:
   for on-screen menus.

5. TOUCHSCREEN:
   Resistive analog

6. MEMORY:
   On Board User Memory: 64 MByte non-volatile Flash memory.
   Memory Card: CompactFlash Type II slot for Type I and Type II CompactFlash cards.

7. COMMUNICATIONS:
   USB Device Port: Adheres to USB 2.0 Specification supporting high speed and full speed via Type B connection.
   USB Host Ports: Comply with Universal Serial Bus Specification Rev 2.0. Support data transfers at full-speed. Hardware over current protected (0.5 A max per port).
   Serial Ports: Format and Baud Rates for each port are individually software programmable up to 115,200 baud.
   PGM Port: RS232 port via RJ12.
   DH485 TXEN: Transmit enable; open collector, VOH = 15 VDC, VOL = 0.5 V @ 25 mA max.
   Note: For additional information on the communications or signal common and connections to earth ground please see the “Connecting to Earth Ground” in the section “Installing and Powering the G315C.”
   Port to port isolation: 500 Vrms for 1 minutes signal isolation : 50V
   Ethernet Port: 10 BASE-T / 100 BASE-TX
   RJ45 jack is wired as a NIC (Network Interface Card).
   Isolation from Ethernet network to G3 operator interface: 1500 Vrms

8. ENVIRONMENTAL CONDITIONS:
   Operating Temperature Range: 0 to 50 °C
   Storage Temperature Range: -20 to 70 °C
   Operating and Storage Humidity: 80% maximum relative humidity (non-condensing) from 0 to 50°C.
   Vibration according to IEC 68-2-6:
   Operational 5 to 150 Hz, in X, Y, Z direction for 1.5 hours, 2 g’s.
   Shock according to IEC 68-2-27:
   Operational 35 g’s, 9 msec in 3 directions.
   Altitude: Up to 2000 meters.

9. CERTIFICATIONS AND COMPLIANCES:
   SAFETY
   UL Listed, File #E179259, UL61010-1, CSA 22.2 No.61010-1
   Listed by Underwriters Laboratories Inc.
   CE Marked
   IEC 61010-1, EN 61010-1: Safety requirements for electrical equipment for measurement, control, and laboratory use, Part 1.
   Type 4X Indoor Enclosure rating (Face only), UL50
   IP66 Enclosure rating (Face only), IEC 529
   ELECTROMAGNETIC COMPATIBILITY
   Immunity to Industrial Locations:
   Electrostatic discharge EN 61000-4-2
   Criterion A 4 kV contact discharge
   8 kV air discharge
   Electromagnetic RF fields
   EN 61000-4-3
   Criterion A
   10 V/m (80 MHz to 1 GHz)
   3 V/m (1.4 GHz to 2 GHz)
   1 V/m (2 GHz to 2.7 GHz)
   Fast transients (burst)
   EN 61000-4-4
   Criterion A
   2 kV power
   1 kV I/O signal
   Surge
   EN 61000-4-5
   Criterion B
   1 kV L to L, 2 kV L to G
   1 kV signal
   RF conducted interference
   EN 61000-4-6
   Criterion A
   3 Vrms
   Power freq. magnetic field
   EN 61000-4-8
   Criterion A
   30 A/m
   AC power
   EN 61000-4-11
   Voltage dip
   0% during 1 cycle
   40% during 10/12 cycle
   70% during 25/30 cycle
   Short interruptions
   0% during 250/300 cycles

10. CONNECTIONS:
   Compression cage-clamp terminal block.
   Wire Gage: 12-22 AWG copper wire
   Torque: 5-7 inch-pounds (56-79 N-cm)

11. CONSTRUCTION:
   Steel rear metal enclosure with NEMA 4X/IP66 aluminum front plate for indoor use only when correctly fitted with the gasket provided. Installation Category II, Pollution Degree 2.

12. MOUNTING REQUIREMENTS:
   Maximum panel thickness is 0.25” (6.3 mm).
   For NEMA 4X/IP66 sealing, a steel panel with a minimum thickness of 0.125” (3.17 mm) is recommended.
   Maximum Mounting Stud Torque: 17 inch-pounds (1.92 N-m)

13. WEIGHT:
   11.41 lbs (5.17 Kg)
INSTALLING AND POWERING THE G315C

MOUNTING INSTRUCTIONS
This operator interface is designed for through-panel mounting. A panel cut-out diagram and a template are provided. Care should be taken to remove any loose material from the mounting cut-out to prevent that material from falling into the operator interface during installation. A gasket is provided to enable sealing to NEMA 4X/IP66 specification. Install the 22 kep nuts provided and tighten evenly for uniform gasket compression.

Note: Tightening the kep nuts beyond a maximum of 17 inch-pounds (1.92 N-m) may cause damage to the front panel.

CONNECTING TO EARTH GROUND
The protective conductor terminal is bonded to conductive parts of the equipment for safety purposes and must be connected to an external protective earthing system.

Each G315C has a chassis ground terminal on the back of the unit. Your unit should be connected to earth ground (protective earth).

The chassis ground is not connected to signal common of the unit. Maintaining isolation between earth ground and signal common is not required to operate your unit. But, other equipment connected to this unit may require isolation between signal common and earth ground. To maintain isolation between signal common and earth ground care must be taken when connections are made to the unit. For example, a power supply with isolation between its signal common and earth ground must be used. Also, plugging in a USB cable may connect signal common and earth ground.¹

¹ USB’s shield may be connected to earth ground at the host. USB’s shield in turn may also be connected to signal common.

POWER SUPPLY REQUIREMENTS
The G315C requires a 24 VDC power supply. Your unit may draw considerably less than the maximum rated power depending upon the options being used. As additional features are used your unit will draw increasing amounts of power. Items that could cause increases in current are additional communications, optional communications card, CompactFlash card, and other features programmed through Crimson.

In any case, it is very important that the power supply is mounted correctly if the unit is to operate reliably. Please take care to observe the following points:
– The power supply must be mounted close to the unit, with usually not more than 6 feet (1.8 m) of cable between the supply and the operator interface. Ideally, the shortest length possible should be used.
– The wire used to connect the operator interface’s power supply should be at least 22-gage wire. If a longer cable run is used, a heavier gauge wire should be used. The routing of the cable should be kept away from large contactors, inverters, and other devices which may generate significant electrical noise.
– A power supply with an NEC Class 2 or Limited Power Source (LPS) and SELV rating is to be used. This type of power supply provides isolation to accessible circuits from hazardous voltage levels generated by a mains power supply due to single faults. SELV is an acronym for “safety extra-low voltage.” Safety extra-low voltage circuits shall exhibit voltages safe to touch both under normal operating conditions and after a single fault, such as a breakdown of a layer of basic insulation or after the failure of a single component has occurred.

A disconnect device must be provided by the end-user.
CONFIGURING A G315C

The G315C is configured using Crimson® software. Crimson is available as a free download from Red Lion’s website, or it can be purchased on CD. Updates to Crimson for new features and drivers are posted on the website as they become available. By configuring the G315C using the latest version of Crimson, you are assured that your unit has the most up to date feature set. Crimson software can configure the G315C through the RS232 PGM port, USB port, Ethernet port, or CompactFlash.

The USB port is connected using a standard USB cable with a Type B connector. The driver needed to use the USB port will be installed with Crimson. The RS232 PGM port uses a programming cable made by Red Lion to connect to the DB9 COM port of your computer. If you choose to make your own cable, use the “G315C Port Pin Out Diagram” for wiring information.

The CompactFlash can be used to program a G3 by placing a configuration file and firmware on the CompactFlash card. The card is then inserted into the target G3, and the G3 is then powered up. Refer to the Crimson literature for more information on the proper names and locations of the files.

USB, DATA TRANSFERS FROM THE COMPACTFLASH CARD

In order to transfer data from the CompactFlash card via the USB port, a driver must be installed on your computer. This driver is installed with Crimson and is located in the folder C:\Program Files\Red Lion Controls\Crimson 2.0\Device\ after Crimson is installed. This may have already been accomplished if your G315C was configured using the USB port.

Once the driver is installed, connect the G315C to your PC with a USB cable, and follow “Mounting the CompactFlash” instructions in the Crimson 2 user manual.

CABLES AND DRIVERS

Red Lion has a wide range of cables and drivers for use with many different communication types. A list of these drivers and cables along with pin outs is available from Red Lion’s website. New cables and drivers are added on a regular basis. If making your own cable, refer to the “G315C Port Pin Outs” for wiring information.

ETHERNET COMMUNICATIONS

Ethernet communications can be established at either 10 BASE-T or 100 BASE-TX. The G315C unit’s RJ45 jack is wired as a NIC (Network Interface Card). For example, when wiring to a hub or switch use a straight-through cable, but when connecting to another NIC use a crossover cable.

The Ethernet connector contains two LEDs. A yellow LED in the upper right, and a bi-color green/amber LED in the upper left. The LEDs represent the following statuses:

<table>
<thead>
<tr>
<th>LED COLOR</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>GREEN</td>
<td>10 BASE-T Communications</td>
</tr>
<tr>
<td>AMBER</td>
<td>100 BASE-TX Communications</td>
</tr>
</tbody>
</table>

On the rear of each unit is a unique 12-digit MAC address and a block for marking the unit with an IP address. Refer to the Crimson manual and Red Lion’s website for additional information on Ethernet communications.

WIRING THE G315C

![G315C PORT PIN OUTS Diagram](image-url)

Legend:
- **POWER CONNECTOR**
- **RS485 PORT B**
- **RS232 PORT B**
- **RS485 PORT A**
- **RS232 PORT A PGM PORT**
- **ETHERNET (NIC)**
- **AUXILIARY ETHERNET (NIC)**
- **STATUS**
- **USB HOST**
- **USB TYPE B**

**LED COLOR**

<table>
<thead>
<tr>
<th>LED COLOR</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>YELLOW solid</td>
<td>Link established.</td>
</tr>
<tr>
<td>YELLOW flashing</td>
<td>Data being transferred.</td>
</tr>
<tr>
<td>GREEN</td>
<td>10 BASE-T Communications</td>
</tr>
<tr>
<td>AMBER</td>
<td>100 BASE-TX Communications</td>
</tr>
</tbody>
</table>

**Protection Earth Ground**

- **TxA (PIN 8)**
- **TxB (PIN 1)**
- **TxA**
- **RxA**
- **RxB**
- **TxEN COMM**
- **RxA**
- **RxB**
- **TxEN COMM**
- **RTS (PIN 6)**
- **CTS (PIN 1)**

**POWER CONNECTOR**

- **24V + 20%**
- **24V - 20%**
- **COMMON**

**RS485 PORT B**

- **Rx**
- **Tx**

**RS232 PORT B**

- **TxA (PIN 8)**
- **TxB (PIN 1)**
- **TxA**
- **RxA**
- **RxB**
- **TxEN COMM**
- **RTS (PIN 6)**
- **CTS (PIN 1)**

**RS485 PORT A**

- **Rx**
- **Tx**

**RS232 PORT A PGM PORT**

- **TxA (PIN 8)**
- **TxB (PIN 1)**
- **TxA**
- **RxA**
- **RxB**
- **TxEN COMM**
- **RTS (PIN 6)**
- **CTS (PIN 1)**

**ETHERNET (NIC)**

- **ETHERNET (NIC)**
- **AUXILIARY ETHERNET (NIC)**
- **USB HOST**
- **USB TYPE B**

**LED COLOR**

- **YELLOW solid**: Link established.
- **YELLOW flashing**: Data being transferred.
- **GREEN**: 10 BASE-T Communications
- **AMBER**: 100 BASE-TX Communications
RS232 PORTS
The G315C has two isolated RS232 ports. The port marked “RS232/PORT A/PGM PORT” may be used for programming as well as communications, while the port marked RS232/PORT B may only be used for communications.
Both ports can be used for either master or slave protocols.

RS232 CONNECTIONS

RS422/ 485 COMMS PORT
The G315C has two isolated RS422/485 ports. These ports can be configured to act as either RS422 or RS485.

Note: All Red Lion devices connect A to A and B to B, except for Paradigm devices. Refer to www.redlion.net for additional information.

Examples of RS485 2-Wire Connections

G3 to Red Lion RJ11 (CBLRLC00)
DLC, IAMS, ITMS, PAXCDC4C

<table>
<thead>
<tr>
<th>Connections</th>
<th>G3: RJ45</th>
<th>Name</th>
<th>RLC: RJ11</th>
<th>Name</th>
</tr>
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<tbody>
<tr>
<td>5</td>
<td>TxEN</td>
<td>2</td>
<td>TxEN</td>
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<tr>
<td>6</td>
<td>COM</td>
<td>3</td>
<td>COM</td>
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<tr>
<td>1</td>
<td>TxB</td>
<td>5</td>
<td>B-</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>TxA</td>
<td>4</td>
<td>A+</td>
<td></td>
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G3 to Modular Controller (CBLRLC05)

<table>
<thead>
<tr>
<th>Connections</th>
<th>G3</th>
<th>Name</th>
<th>Modular Controller</th>
<th>Name</th>
</tr>
</thead>
<tbody>
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<td>1,4</td>
<td>TxB</td>
<td>1,4</td>
<td>TxB</td>
<td></td>
</tr>
<tr>
<td>4,1</td>
<td>RxB</td>
<td>4,1</td>
<td>RxB</td>
<td></td>
</tr>
<tr>
<td>2,3</td>
<td>TxA</td>
<td>2,3</td>
<td>TxA</td>
<td></td>
</tr>
<tr>
<td>3,2</td>
<td>RxA</td>
<td>3,2</td>
<td>RxA</td>
<td></td>
</tr>
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<td>5</td>
<td>TxEN</td>
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<td>COM</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>TxB</td>
<td>7</td>
<td>TxB</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>TxA</td>
<td>8</td>
<td>TxA</td>
<td></td>
</tr>
</tbody>
</table>

DH485 Connections
The G315C’s RS422/485 COMMS port can also be used for Allen Bradley DH485 communications.

WARNING: DO NOT use a standard DH485 cable to connect this port to Allen Bradley equipment. A cable and wiring diagram are available from Red Lion.

G3 to AB SLC 500 (CBLAB003)

<table>
<thead>
<tr>
<th>Connections</th>
<th>RJ45: RLC</th>
<th>Name</th>
<th>RJ45: A-B</th>
<th>Name</th>
</tr>
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<tr>
<td>1</td>
<td>TxB</td>
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<td>A</td>
<td></td>
</tr>
<tr>
<td>2</td>
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</tr>
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<td>3, 8</td>
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<td>-</td>
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<td>5</td>
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<td></td>
</tr>
<tr>
<td>6</td>
<td>COMM</td>
<td>4</td>
<td>SHIELD</td>
<td></td>
</tr>
<tr>
<td>4, 7</td>
<td>TxB</td>
<td>-</td>
<td>COMM</td>
<td></td>
</tr>
<tr>
<td>3, 8</td>
<td>TxA</td>
<td>-</td>
<td>24V</td>
<td></td>
</tr>
</tbody>
</table>
SOFTWARE/ UNIT OPERATION

BATTERY & TIME KEEPING

A battery is used to keep time when the unit is without power. Typical accuracy of the G315C time keeping is less than one minute per month drift. The battery of a G315C unit does not affect the unit’s memory, all configurations and data is stored in non-volatile memory.

DI PLAY

This operator interface uses a liquid crystal display (LCD) for displaying text and graphics. The display utilizes a cold cathode fluorescent tube (CCFL) for lighting the display. The CCFL tubes can be dimmed for low light conditions.

These CCFL tubes have a limited lifetime. Backlight lifetime is based upon the amount of time the display is turned on at full intensity. Turning the backlight off when the display is not in use can extend the lifetime of your backlight. This can be accomplished through the Crimson software when configuring your unit.

KEYPAD

The G315C keypad consists of ten keys that can be used for on-screen menus.

TOUCHSCREEN

This operator interface utilizes a resistive analog touchscreen for user input. The unit will only produce an audible tone (beep) when a touch on an active touchscreen cell is sensed. The touchscreen is fully functional as soon as the operator interface is initialized, and can be operated with gloved hands.

TROUBLESHOOTING YOUR G315C

If for any reason you have trouble operating, connecting, or simply have questions concerning your new G315C, contact Red Lion’s technical support. For contact information, refer to the back page of this bulletin for phone and fax numbers.

EMAIL: techsupport@redlion.net
Web Site: http://www.redlion.net
General Troubleshooting Tech Note:
http://www.redlion.net/TechNotes/TN0135.html

FRONT PANEL LEDS

There are three front panel LEDs. Shown below is the default status of the LEDs.

<table>
<thead>
<tr>
<th>LED</th>
<th>INDICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>GREEN (TOP, LABELED “PWR”)</td>
<td>Unit is in the boot loader, no valid configuration is loaded.</td>
</tr>
<tr>
<td>STEADY</td>
<td>Unit is powered and running an application.</td>
</tr>
<tr>
<td>YELLOW (MIDDLE)</td>
<td>Off: No CompactFlash card is present.</td>
</tr>
<tr>
<td></td>
<td>Steady: Valid CompactFlash card present.</td>
</tr>
<tr>
<td></td>
<td>Flashing Rapidly: CompactFlash card being checked.</td>
</tr>
<tr>
<td></td>
<td>Flickering: Unit is writing to the CompactFlash, either because it is storing data, or because the PC connected via the USB port has locked the drive.</td>
</tr>
<tr>
<td></td>
<td>Flashing Slowly: Incorrectly formatted CompactFlash card present.</td>
</tr>
<tr>
<td></td>
<td>Flashing: A tag is in an alarm state.</td>
</tr>
<tr>
<td></td>
<td>Steady: Valid configuration is loaded and there are no alarms present.</td>
</tr>
</tbody>
</table>

1. The operator interface is shipped without a configuration. After downloading a configuration, if the light remains in the flashing state continuously, try cycling power. If the LED still continues to flash, try downloading a configuration again.

2. Do not turn off power to the unit while this light is flickering. The unit writes data in two minute intervals. Later Microsoft operating systems will not lock the drive unless they need to write data; Windows 98 may lock the drive any time it is mounted, thereby interfering with logging. Refer to “Mounting the CompactFlash” in the Crimson 2 User Manual.

CAUTION: RISK OF ELECTRIC SHOCK

The inverter board, attached to the mounting plate, supplies the high voltage to operate the backlight. Touching the inverter board may result in injury to personnel.

CAUTION: The circuit board contains static sensitive components. Before handling the operator interface without the rear cover attached, discharge static charges from your body by touching a grounded bare metal object. Ideally, handle the operator interface at a static controlled clean workstation. Also, do not touch the surface areas of the circuit board. Dirt, oil, or other contaminants may adversely affect circuit operation.
To change the battery of a G315C, remove power, cabling, and then the rear cover of the unit. To remove the cover, remove the 16 screws on the rear of the unit. Then, by lifting the top side, hinge the cover, thus providing clearance for the connectors on the bottom side of the PCB as shown in the illustration below. Install in the reverse manner.

Remove the old battery* from the holder and replace with the new battery. Replace the rear cover, cables, and re-apply power. Using Crimson or the unit’s keypad, enter the correct time and date.

* Please note that the old battery must be disposed of in a manner that complies with your local waste regulations. Also, the battery must not be disposed of in fire, or in a manner whereby it may be damaged and its contents come into contact with human skin.

The battery used by the G315C is a lithium type CR2025.

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**OPTIONAL FEATURES AND ACCESSORIES**

**COMPACTFLASH SOCKET**

CompactFlash socket is a Type II socket that can accept either Type I or II cards. Use cards with a minimum of 4Mbytes with the G315C’s CompactFlash socket. Cards are available at most computer and office supply retailers.

CompactFlash can be used for configuration transfers, larger configurations, data logging, and trending.

Information stored on a CompactFlash card by a G315C can be read by a card reader attached to a PC. This information is stored in IBM (Windows®) PC compatible FAT16 file format.

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**OPTIONAL COMMUNICATION CARD**

Red Lion offers optional communication cards for fieldbus communications. These communication cards will allow your G315C to communicate with many of the popular fieldbus protocols.

Red Lion is also offering a communications card for additional RS232 and RS422/485 communications. Visit Red Lion’s website for information and availability of these cards.

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**NOTE**

For reliable operation of this and other Red Lion products, one of the following brands of CompactFlash card must be used...

- SimpleTech SMART® Modular
- SanDisk® Silicon Systems

Not all of the above manufacturers offer CompactFlash cards recognized to UL standards, which may be required for your application.
LIMITED WARRANTY

The Company warrants the products it manufactures against defects in materials and workmanship for a period limited to two years from the date of shipment, provided the products have been stored, handled, installed, and used under proper conditions. The Company’s liability under this limited warranty shall extend only to the repair or replacement of a defective product, at The Company’s option. The Company disclaims all liability for any affirmation, promise or representation with respect to the products.

The customer agrees to hold Red Lion Controls harmless from, defend, and indemnify RLC against damages, claims, and expenses arising out of subsequent sales of RLC products or products containing components manufactured by RLC and based upon personal injuries, deaths, property damage, lost profits, and other matters which Buyer, its employees, or sub-contractors are or may be to any extent liable, including without limitation penalties imposed by the Consumer Product Safety Act (P.L. 92-573) and liability imposed upon any person pursuant to the Magnuson-Moss Warranty Act (P.L. 93-637), as now in effect or as amended hereafter.

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