

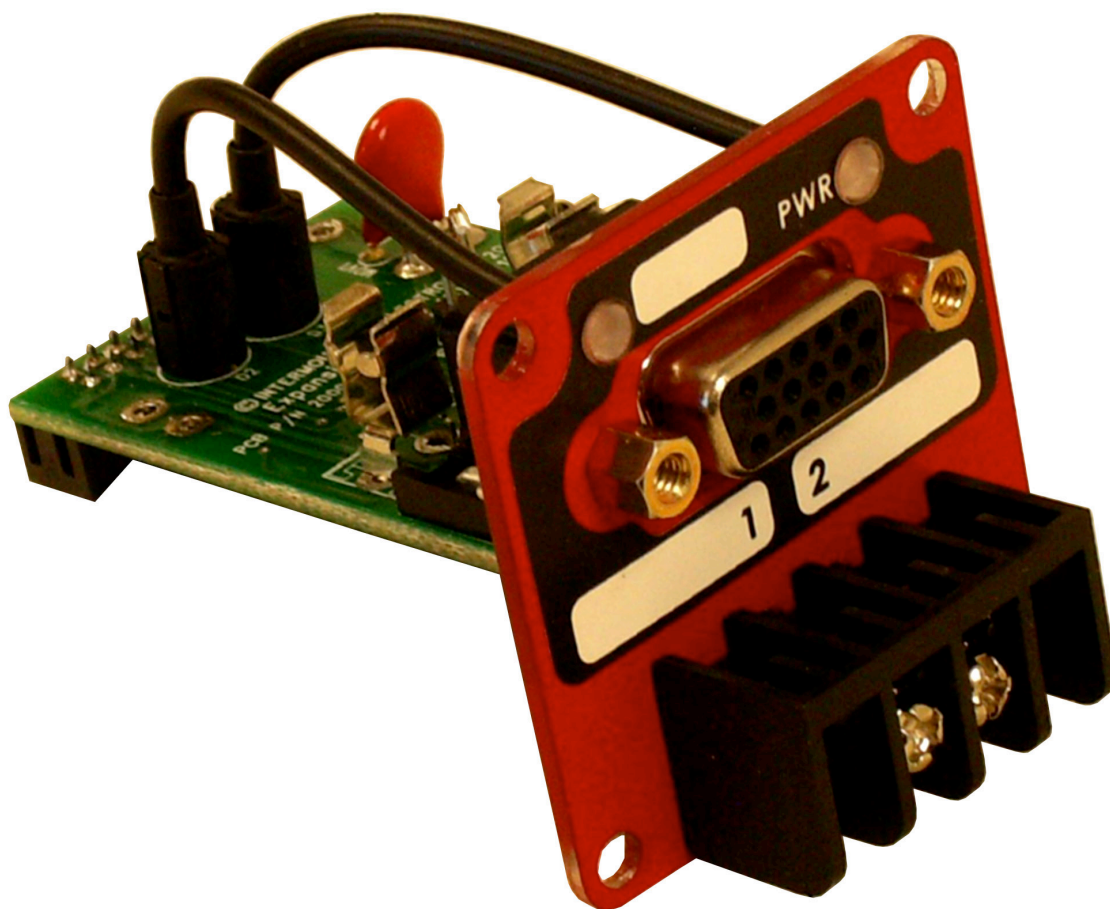


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1100-7100

**IE Expansion Module
With D-Sub and Barrier Strip**



Operation Manual & Data Sheet

IMPORTANT NOTICE

This document contains information intended to aid in the proper installation, operation, and maintenance of the product described. Although this document includes a great deal of information that will prove useful to the properly trained/qualified user, it is not possible to cover every possible situation, product variation, installation contingency or other detail.

It is imperative that proper engineering and techniques are adhered to in the installation, operation, and maintenance of this product. It is the responsibility of the user to ensure that any system utilizing this product is safe, and that all personnel involved with the design, installation, maintenance, and use of this product are properly qualified and trained. This product must not be used in situations where its electrical ratings are exceeded.

If additional information is needed, please contact Intermountain Electronics, Inc.

While every effort has been made to make sure the information in this document is accurate, IE cannot guarantee that there are no errors. Users of this product should verify any aspects of the product that are critical to their application, and in particular, to any aspects that may affect the safety of the overall system or installation.

Product design and specifications may change without notice.

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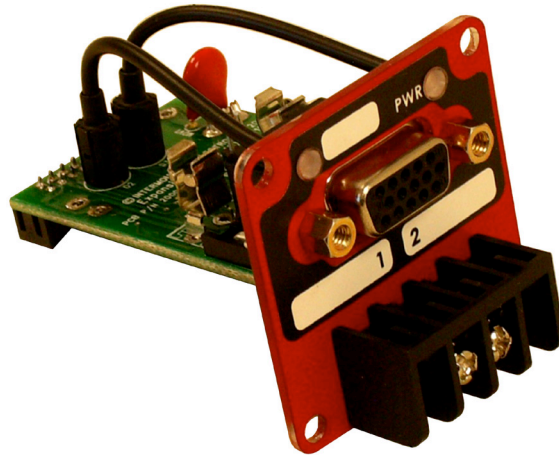
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I: GENERAL INFORMATION



The 1100-7100 Expansion Module is a plug-in accessory that greatly enhances the flexibility and interconnectivity options for compatible Intermountain Electronics products.

In many cases, using the expansion module simplifies the overall system that the product is used in, and reduces external circuits required. In other cases, the module makes possible new features that would not be feasible otherwise.

When installed in a product, the expansion module adds a 15-pin D-Sub connector and a 2-pin barrier strip that provide additional connections that would normally not be available. The use of these connections varies from product to product. Depending on the product, they may be used as inputs, outputs, or power supply connections to supply low-power external circuits.

In general, the barrier strip is used for higher voltage/current signals, such as relay contacts, while the D-Sub is used for low voltage/current applications, such as analog and control signals.

The expansion module also has two indicator LEDs. One indicator is green, and is used as a power indicator. The other indicator is red, and this can be used for different purposes, depending on the product. For example, a typical use for the red LED would be to indicate a relay trip.

Information about installing and using the 1100-7100 Expansion Module is included in the following sections.

II: FEATURES, CONTROLS & CONNECTIONS

The schematic diagram for the 1100-7100 Expansion Module is shown in the figure below.

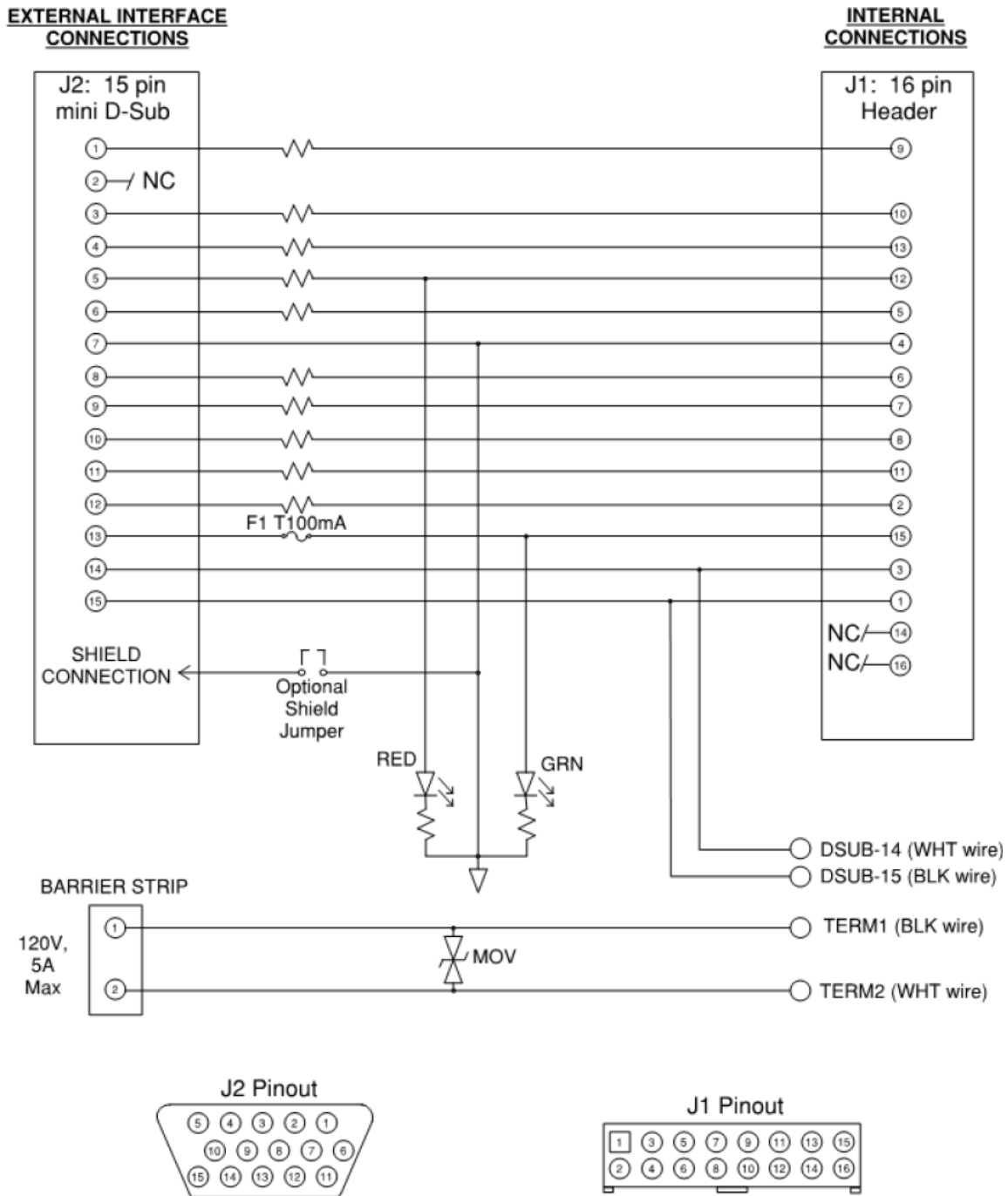


Figure 1: Schematic Diagram

On the left of the schematic diagram are the connectors that are used for external connections. These connectors include a 15-pin mini D-SUB connector (J2) and a 2-pin barrier strip. On the right side of the schematic is the 16-pin header (J1) that connects the module to the product that it is installed in. Also on the right are four wires (DSUB-14, DSUB-15, TERM1, TERM2) that can also be used to connect to the product.

The signals on the D-SUB connector (J2) are routed to the product that the module is installed into through the 16-pin header (J1). Most of these signals are general purpose and may be used as inputs or outputs (to the product). There are also several special function pins: a ground pin, a supply pin (which is coupled to the green power indicator LED), a line coupled to the red indicator LED, and two pins connected to DSUB-14 and DSUB-15 wires. Most of the general purpose input/output lines on the D-Sub include a 470 ohm series resistance to provide buffering.

Pin 5 on J2 is set up to be an output (only) from the product, and is also coupled to a red LED. This LED is ON when this line is high.

Pin 13 is a fused power supply output line meant to be used to supply external circuits with modest supply requirements. This supply may not be provided with all products, and, when it is available, the supply voltage may vary between models. (Refer to the product-specific information in the appendix of this document for details.) This line is fused to provide up to 95mA of supply current. A green LED on the module is ON when the module is receiving power from the product.

Pin 7 is a circuit ground that is the return for the supply line (pin 13), and also the reference for any analog signals on the D-Sub connector. A jumper (provided) can be used to connect this circuit ground to the shell of the D-Sub connector.

Note: The shell grounding jumper should normally NOT be used, and the module is shipped without this jumper installed. The shell should generally be grounded ONLY at the opposite end of the cable from the module. For example, if a PLC is connected to this module, the cable shell should be grounded at the PLC only.

Pins 14 and 15 are general purpose inputs/ outputs, but they differ from other lines in that they are routed to 2 wires (DSUB-14 and D-SUB 15) in addition to the 16 pin header (J2). Neither of these lines have buffering resistors.

The barrier strip, is generally used for signals requiring higher voltage or current ratings (rated at 120V, 5A) such as relay or switch contacts. The two pins on the barrier strip are routed directly to wires TERM1 and TERM2, which can be connected to the product. The two signals on the barrier strip (TERM1 and TERM2) are protected with a 175V MOV between them.



III: INSTALLATION INFORMATION

The 1100-7100 Expansion Module is installed into a compatible IE product by making necessary electrical connections between the module and the product and then by mounting the module into the accessory port with four screws. Electrical connections are made using the 16-pin header and/or the four wires attached to the circuit board.

A dust cover for the D-Sub connector is included, with a tether that should be attached to one of the screws to make sure the cover does not get misplaced.

A ribbon cable is included that connects between the 16 pin header (J1) on the module and a similar header in the product. This header is keyed to prevent a backward connection.

A set of loose wires with different lengths and terminations is provided. Included are wires appropriate for products compatible with this module. The correct wires are to be selected for the product, and crimped onto the corresponding wires coming from the PCB.

Once the correct electrical connections have been made (make sure to route them through the accessory port), the wires should be neatly and safely secured in place with wire ties, and then the module can be mounted into the accessory port using four 4-40 screws. The tether for the D-Sub dust cap should be secured with one of these screws.

The label on the outside surface of the module's mounting plate includes white areas near the barrier strip pins and the red LED indicator. These areas can be written on (a fine-tip permanent marker is recommended) to indicate the signal assignments of the pins and indicator. These signal assignments will vary depending on the product that the module is installed into.

Product specific instructions for installation and use of the module are included in the appendix. Refer to the appendix when installing the module to determine which electrical connections need to be made during installation.

Once the module is installed, refer to the appendix to determine what signals are available on the external D-Sub and barrier strip connectors.

IV: SPECIFICATIONS

D-SUB Connector (Pins 1-15)

Series Resistance: (Pins 1, 3-6, 8-12)	470 Ohms, 1/8W
Series Resistance: (Pins 14, 15)	Approx. zero ohms
Max External Supply Current: (D-Sub pin 6, 13)	95mA RMS
Supply Voltage: (D-Sub Pin 13)	Depends on product that module is installed into
Max current, voltage: (Pins 1, 3-6, 8-15)	Depends on product that module is installed into. Must not over-stress 470 ohm resistors.
Suggested Min load Resistance: (pins 1, 3-6, 8-13)	10 kOhm
Min load Resistance: (Pins 14, 15)	Depends on product that module is installed into

Barrier Strip (Signals: TERM1, TERM2)

Max Voltage:	120V NOM (175V protection MOV between TERM1/ TERM2)
Max Current:	5A RMS

Mechanical

Weight:	2 Oz
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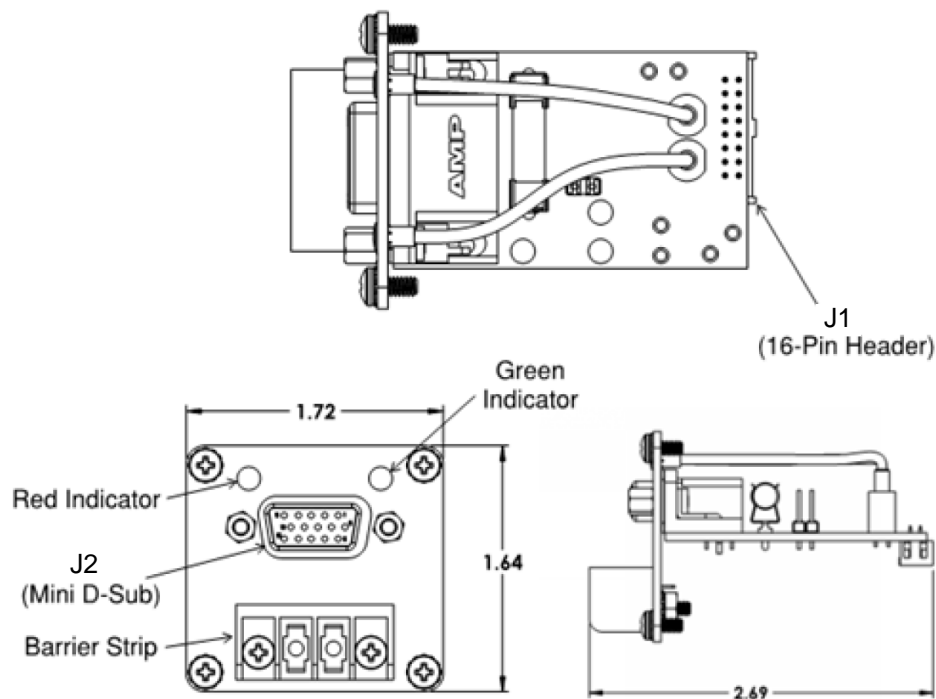


Figure 2: Mechanical Dimensions & Layout

APPENDIX: PRODUCT-SPECIFIC INFORMATION

The following pages include information necessary for installing and using the module with various compatible products. These are arranged in alphabetical order by model name/number.

Installation of this module should only be attempted by qualified personnel. The user must ensure that the module and product are installed and used in a proper and safe manner.

Intermountain Electronics strongly recommends that installations be performed in our facility. Please contact Intermountain Electronics with any questions.

GLT-500 / GLT-500-1 GROUND MONITORS

Installation:

1. Remove the access port cover on the GLT-500 / GLT-500-1. For the GLT-500, also remove the top cover by removing 3 screws on each side of the unit, the top 4 screws on the rear panel, and the top 6 hex-cap screws on the front panel.
2. The TERM1 and TERM2 wires (one black and one white) on the module can connect to either the NC relay contacts, or the circuit breaker AUX contacts (GLT-500-1 does not have a circuit breaker), depending on which signal is to be monitored.

For connection to NC relay contacts:

- Crimp 3.25" wires (white & black) with .110 quick-connects to the TERM1/TERM2 wires.
- Connect the .110 quick-connects to the .110 quick-connect spades on the main PCB of the GLT-500 / GLT-500-1 (near the relay, labeled P7 and P8).

For connection to Circuit Breaker AUX contacts:

- Crimp 8" wires (white & black) with right-angle .187 quick connects to the TERM1/TERM2 wires.
- Connect the right-angle quick-connects to the quick-connect spades on the circuit breaker. One goes to the common spade, and one goes to either NC or NO, whichever is desired.
Note: For the GLT-500, it is necessary to loosen the bottom two hex-cap screws on the front panel to allow the panel to bend outwards, making room to attach the quick-connects.

3. Install the 3" ribbon cable through the access port between J1 on the module, and the header on the main circuit board of the GLT-500 / GLT-500-1. Make sure that all header pins are in the sockets. The ribbon must connect to the GLT main board as shown in Figure A.
4. Carefully route the wires and secure them with wire ties. This is a tight fit in the GLT-500, and care must be taken in orienting the wires.
5. Orient the module in the GLT-500 or GLT-500-1 as shown in the figures below. Attach the module in place using four 4-40 SEMS screws. Attach the tether of the provided D-Sub dust cover with one of the four screws.

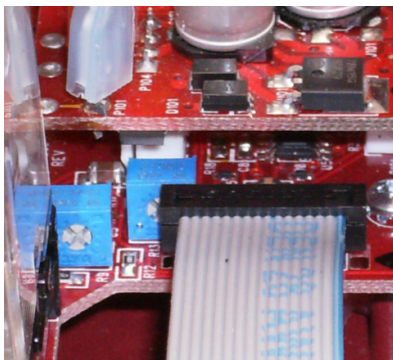


Figure A: Ribbon cable attachment to main PCB

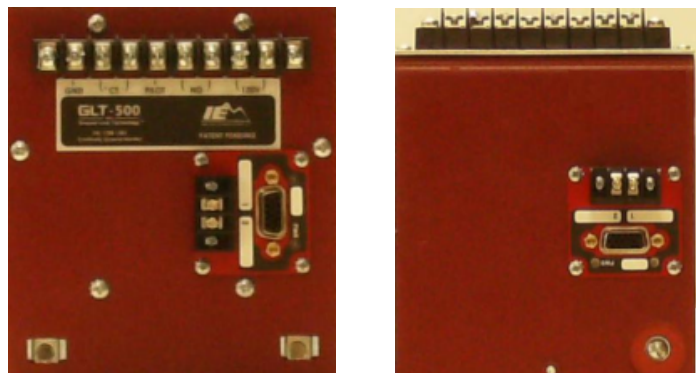


Figure B: Module orientation: GLT-500 (left), GLT-500-1 (right)

Electrical Interface and Indicator Information (GLT-500 / GLT-500-1)

D-Sub Connector	Signal Name	Description	Electrical Characteristics
1	Hall Effect Sense	Voltage proportional to instantaneous GND current sensed by the HES. Half-wave AC if working properly	Op-amp output through 1.47 kOhm. Referenced to GND (7)
2	Not Used		
3	HES Det 2	Output of Hall Effect Current Detector #2. +13.5V = low current (Trip), -13.5V = high current (OK)	Op-amp output through 1.47 kOhm. Referenced to GND (7)
4	HES Det 1	Output of Hall Effect Current Detector #1. +13.5V = low current (Trip), -13.5V = high current (OK)	Op-amp output through 1.47 kOhm. Referenced to GND (7)
5	TRIP LED	Turns on RED LED. +11V = on, -13.5V = off. Same logic as GM_TRIP, but with different levels	Op-amp output through 1.47 kOhm. Referenced to GND (7)
6	CT Sense	Voltage prop. to instantaneous GND current sensed in Current Xfmr. Half-wave AC if working properly	Op-amp output through 1.47 kOhm. Referenced to GND (7)
7	GND	Ref for analog signals, Pwr supply (pin 13) return	Ground line
8	GM_TRIP	Ground monitor TRIP signal. +24V = trip. Approx 1V = OK	24V or 1V through 10.5 kOhm
9	CT Det 2	Output of CT current Detector #2. -13.5V = low current (Trip), +13.5V = high current (OK)	Op-amp output through 1.47 kOhm. Referenced to GND (7)
10	CT Det 1	Output of CT current Detector #1. -13.5V = low current (Trip), +13.5V = high current (OK)	Op-amp output through 1.47 kOhm. Referenced to GND (7)
11	Current LVL	Voltage proportional to average DC current sensed by the HES. $V < 6.9V = OK$, $V > 6.9V =$ causes trip.	Op-amp output through 1.47 kOhm. Referenced to GND (7)
12	Curr LVL Det	Output of average DC current detector. -13.5V = OK, +13.5V = high current (trip)	Op-amp output through 1.47 kOhm. Referenced to GND (7)
13	+24V DC	Un-regulated +24V DC (has ripple)	Pwr Supply for ext. circuits. Fused: 95mARMS. Ref to GND.
14	Not Used		
15	Not Used		

Barrier Strip	Signal Name	Description	Electrical Characteristics
1	Relay NC1 or CB Aux1	NC relay contacts for Ground Monitor Relay, or circuit breaker aux contacts (NO or NC—user choice)	120V Nominal, 5A contacts (Relay or CB Aux)
2	Relay NC2 or CB Aux2	NC relay contacts for Ground Monitor Relay, or circuit breaker aux contacts (NO or NC—user choice)	120V Nominal, 5A contacts (Relay or CB Aux)

Indicators	Signal Name	Description	Electrical Characteristics
RED	GM TRIP	Red LED on when GLT-500/ GLT-500-1 is tripped (see TRIP LED on D-Sub pin 5)	Red LED
GREEN	POWER	Green LED on when GLT-500 / GLT-500-1 is on	Green LED

