

# Advanced Diagnostic Charger Board / With Wireless NEXUS Option

## OWNERS'S MANUAL

### NOTE TO INSTALLER

*This manual must be turned over to owner on completion of installation.*

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### 1. Installer

This manual must be turned over to owner on completion of installation.



#### **WARNING:**

- Please RESET the system whenever you add or change lamp load (refer to section 2.2.2.1)
- This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
  - (1) this device may not cause harmful interference
  - (2) this device must accept any interference received, including interference that may cause undesired operation.

### IMPORTANT SAFEGUARDS

1. For product regulatory information see Section 6
2. When using electrical equipment, basic safety precautions should always be followed including the following:

### READ AND FOLLOW ALL SAFETY INSTRUCTIONS

3. Do not use outdoors.
4. Do not let power supply cords touch hot surfaces.
5. Do not mount near gas or electric heaters.
6. Use caution when handling batteries. Avoid possible shorting
7. Equipment should be mounted in locations and at heights where it will not readily be subjected to tampering by unauthorized personnel.
8. The use of accessory equipment not recommended by the manufacturer may cause an unsafe condition.
9. Caution: if optional halogen cycle lamp(s), symbol (H--), are used in this equipment, to avoid shattering: do not operate lamp in excess of rated voltage, protect lamp against abrasion and scratches and against liquids when lamp is operating, dispose of lamp with care.
10. Halogen cycle lamps operate at high temperatures. Do not store or place flammable materials near lamp.
11. Do not use this equipment for other than intended use.

12. All servicing should be performed by qualified service personnel.

### SAVE THESE INSTRUCTIONS

### 2. Operation

#### 2.1 General

- High power 8-bit microcontroller (MCU)
- Annual test sequence
- 120/277/347 volts 60 Hz input standard
- Temperature compensated
- Status indicator bi-color LED
- Low voltage battery disconnect
- Brownout detection
- Lockout
- Modular RF Nexus Modem

#### 2.2 System operation

- The diagnostic/charger is a fully self-contained, fully automatic microcontroller based system.
- When the installation is completed and the unit is powered, the system is automatically functional. There is no need to have the AC present at this time, only the battery needs to be connected. The unit goes directly in lockout mode and waits for AC to be restored.

#### 2.3 Test / Silence test button

- Alarms are acknowledged by pushing the "TEST" switch less than one half second. This action turns off the audible alarm. Alarm indication can only be restored by correcting the fault or by a system re-initialization.
- Manual forced tests are initiated by pushing and holding the "TEST" switch more than one second. The 1 minute test will start.
- System initialization is done by holding the "TEST" switch for at least 6 seconds

**2.4 Diagnostic**

Any fault condition produces an audible warning, if activated, that consists of an intermittent beep, one second on, one second off.

**Status LED**

See table

Indicator	Meaning
Steady green	AC On
Blinking green	In Test
Steady red	Battery disconnect OR load disconnect
1 red blinks, pause of 5 seconds	Battery failure
2 red blinks, pause of 4 seconds	Charger failure
3 red blinks, pause of 3 seconds	Lamp failure
4 red blinks, pause of 2 seconds	LED strip failure (combo version)
	<b>Nexus Status</b>
Blinking yellow	Wink mode
Blinking between yellow and green	Unit not commissioned
Steady yellow	Server failure

**2.4.1 Open or short battery circuit**

The status indicator displays steady red LED if the battery circuit is opened or shorted.

**2.4.2 Transfer module**

When a transfer is initiated (brown-out, manual test or auto-test), and the system fails to energize the lamp circuits, a system failure is detected and the bi-color displayed a load disconnect indication.

**2.4.3 Battery failure**

This is a multi-function indicator all related to battery condition. The status indicator displays 1 red blink and a pause of 5 seconds when a wrong battery (ex: 12V battery on a 6V system). It will also be displayed if the battery has failed a timed or forced test (reached LVD level before the end of the test).

**2.4.4 Charger monitoring**

The status indicator displays 2 red blinks and a pause of 4 seconds if the charging current does not fall within limits corresponding to the charger command state.

**2.4.5 Lamp testing (incandescent only)**

The test is fully automatic and because of that, there are some limitations. To maintain accurate data, some conditions are to be fulfilled prior to acquiring values from an all-good lamp circuit:

- The battery has to be at or nears full power. The program will delay data capture for a minimum of 48 hours following any discharge or reset.
- The charger will also wait for the charger to be in hysteresis mode. Both conditions must be fulfilled.

**2.4.5.1 Lamp capture sequence**

The capture sequence is initiated only by a reset of the system. This is done by holding the “TEST” switch for at least 6 seconds. The reset also initializes the main counter. After 12 periods of 30 days, lamp capture data is renewed. This renewal takes place to compensate for system variations when the unit ages. Renewal is not allowed if there is a lamp failure alarm.

**3. Options**

**3.1 Automatic unit test (30-day test)**

Every 30 days, while in charging mode, the sequence generator will generate a command to energize the transfer relay on the emergency lighting circuit for a variable test period depending on the yearly sequence.

	Canadian (minutes)	American (minutes)
Monthly test	1	1
6 <sup>th</sup> month test	10	30
12 <sup>th</sup> month test	30	90

- If the battery fails to complete the discharge test, the charger will display a battery failure and the test will abort
- The 30 days automatic test sequence is reset every time the lamps have been turned on included the manual test.

**3.2 Lamp disconnect (battery energy saver)**

When in energy mode, because of a power failure or a brown-out condition, lamps can be turned “OFF” by pushing the “TEST” switch. If LVD has not been detected, lamps can be turned back “ON” by again pushing the “TEST” switch.

**3.3 Audible alarm**

This option can be activated or not in the field. Refer to the drawing on Figure 1 page 3 for positioning.

**3.4 Remote diagnostic (Nexus)**

Charger compatible with the Nexus communication system that allows to monitor, in real time, the status of each unit from a computer.

## 4. Electrical specifications

### 4.1 Lamp filament detection

Resolution is 10% of the full-load circuit or 10 watts in a 100 watt load (i.e.: one lamp out of ten). No more than 5% voltage drop is allowed in the remote lead wires.

**IMPORTANT:** Reset the system after a load change. See section 2.3 (Test / Silence test button) for explanation.

### 4.2 LVD

Low voltage battery disconnects automatically shuts down lamp load and circuitry when battery reaches 87% of nominal battery voltage preventing deep discharge and permanent damage to the battery.

### 4.3 Voltage drop protection

When remote fixtures are connected to emergency lighting units of less than 50 volts, circuit runs must be sufficient size to maintain a proper operating voltage to all lamps. The maximum allowable voltage drop should no exceed 5%. For more information, please contact the factory.

### 4.4 Advanced Diagnostic Charger / Microcontroller Board

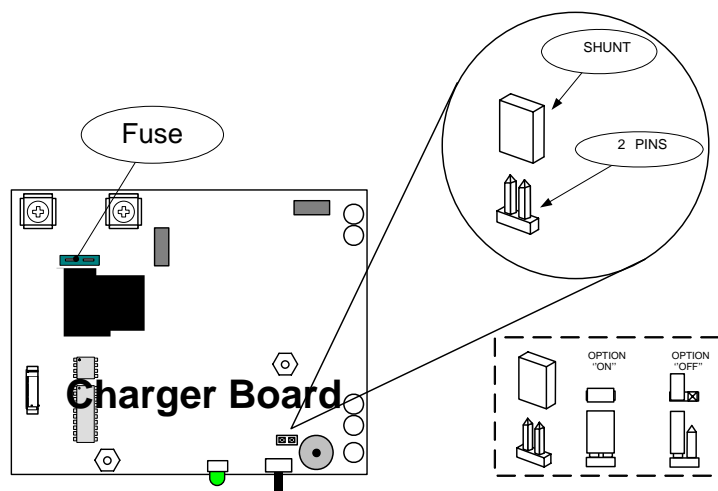


Figure 1

To select the option:

1. Remove all power sources to the board (AC and battery)
2. With long-nose pliers, pull on the shunt (little black box) until it is free from the pins.
3. Put the shunt back in place according to the option selection.
4. Reconnect the AC and the battery.

### 4.4.1 Wireless Nexus option

1. When provided with the Wireless Nexus RF option, the unit will automatically join the local Nexus RF Mesh network on power-up. All diagnostic functions will be then monitored through the network by the centralized Area Controller.
2. The Wireless Nexus system operates in the 915MHz ISM band providing superior penetration through building materials and ensuring network integrity.
3. A yellow/green flashing status LED indicates an un-commissioned unit waiting to join the network.
4. For commissioning and networking details see the Wireless Nexus manual.

### 4.4.2 Wiring Diagram for AD charger

See picture Figure 4 (Typical wiring diagram) on next page

### 4.5 Name Plate for Advanced Diagnostic Charger and Nexus version

INDICATOR	DESCRIPTION	INDICATOR	DESCRIPTION
●	AC ON	●	AC ON
- ●	IN TEST	- ●	IN TEST
●	BATTERY / LAMP DISCONNECT	●	BATTERY / LAMP DISCONNECT
- ●	BATTERY FAILURE	- ●	BATTERY FAILURE
●-●	CHARGER FAILURE	●-●	CHARGER FAILURE
●-●-●	LAMP FAILURE	●-●-●	LAMP FAILURE
		●	NEXUS
STATUS ○		STATUS ○	
		NEXUS	

Figure 2

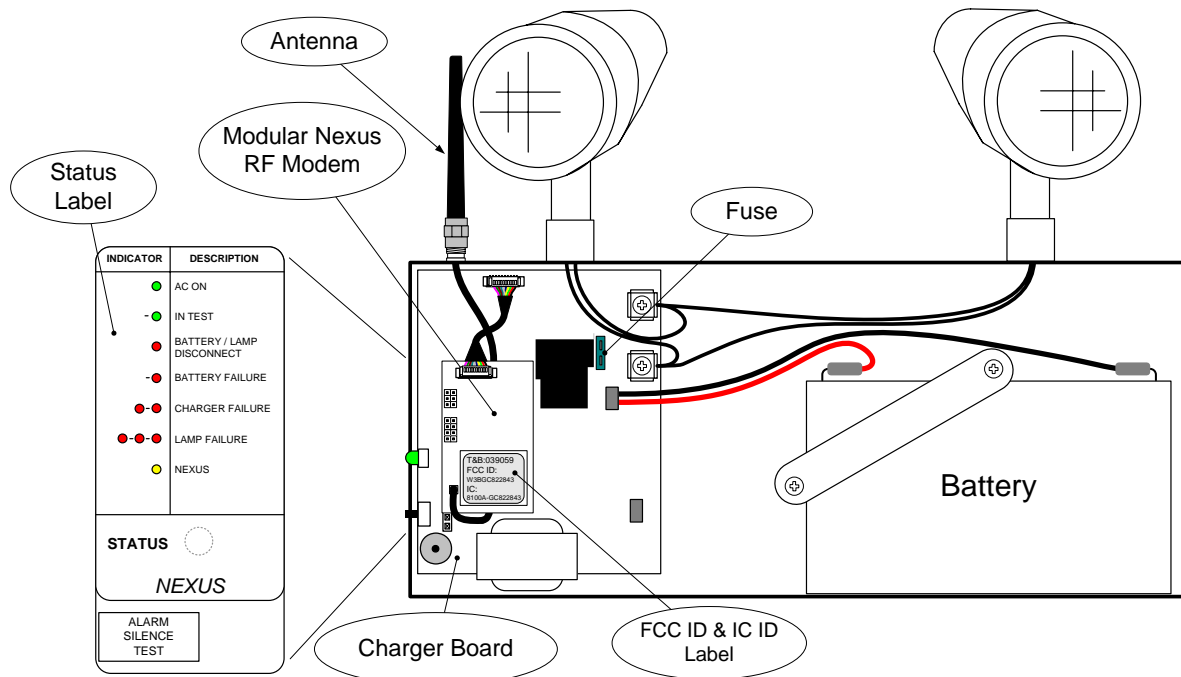


Figure 3 (Typical unit assembly)

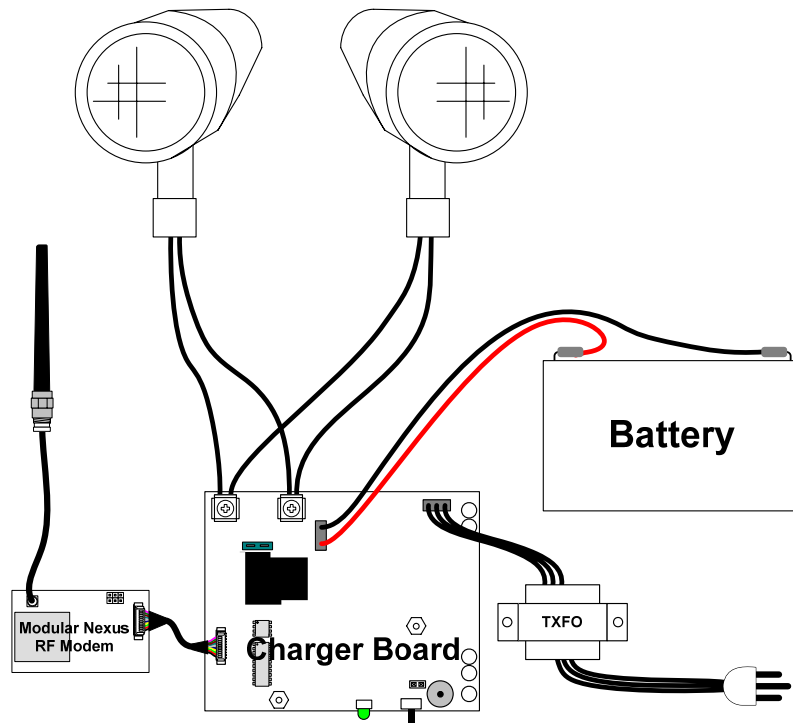


Figure 4 (Typical wiring diagram)

## **5. Radio operations modes basic characteristics.**

### **5.1 Mesh Network Mode (this is the normal mode of operation of the Wireless Nexus System)**

- Lowest channel frequency: 918.6 MHz
- Highest channel frequency: 925.8 MHz
- Modulation Mode: GFSK
- Modulation frequency deviation: 19KHz
- Data Rate: 38 Kbits/s
- Maximum Output Power: -5.6 dBm

### **5.2 Backdoor Mode (used for close range communication for service purposes, using a mobile Area Controller)**

- Channel frequency: 918.0 MHz
- Modulation Mode: MSK
- Data Rate: 125 Kbits/s
- Maximum Output Power: -14.4 dBm

## 6. Product Regulatory Information

### FCC Statement

This device complies with part 15 of the FCC rules.

**FCC ID: W3BGC822843**

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.



**IMPORTANT** Changes or modifications not covered in this manual must be approved in writing by the manufacturer's Regulatory Engineering Department. Changes or modifications made without written approval may void the user's authority to operate this equipment.

### Industry Canada

The term "IC:" before the certification/registration number only signifies that the Industry Canada technical specifications were met.

**IC: 8100A-GC822843**

### Canadian Wireless Regulatory Notice

This Class B digital apparatus meets all the requirements of the Canadian Interference Causing Equipment Regulations. Operation is subject to the following two conditions: a) this device may not cause any interference, and b) this device must accept any interference, including interference that may cause undesired operation of the device. To prevent radio interference to the licensed service, this device is intended to be operated indoors, and away from windows to prevent maximum shielding. Equipment (or its transmit antenna) that is installed outdoors is subject to licensing.

### Antenna Care/Unauthorized Modifications

Use only the supplied integral antenna. Unauthorized antenna modifications or attachments could damage the unit and may violate FCC regulations. Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.