Appendix L: Manual

Please refer to the following pages.

Alarm.com LTE Module
Reference Manual

Introduction

The Alarm.com LTE Module enables wireless reporting of all alarms and other system events from the Alarm.com System Enhancement Module control panel using the LTE wireless (cellular) network. The module can be used as the primary communication path for all alarm signaling, or as a backup to a telephone line connection to the central monitoring station. The wireless alarm signaling and routing service is operated by Alarm.com. The LTE Module also features integrated support for Alarm.com's emPower™ solution with built-in Z-Wave capabilities and for Alarm.com's Image Sensor when the Image Sensor daughter board is added (if available).

Contact Information

For additional information and support on Alarm.com products and services, please visit www.alarm.com/dealer or contact Alarm.com technical support at 1-866-834-0470.

Compatibility

The LTE module is compatible with the Alarm.com System Enhancement Module.

Power Up

Reconnect panel battery and AC power. When an LTE Module is connected to a powered control panel, the LEDs at the bottom of the module will become active (see Table 1 on page 4). It may take a few moments after power up for the LEDs to become active. If the LEDs do not light up at all, ensure that the module has been fully inserted into the connector beneath it then perform a full power cycle by following these steps:

1) Disconnect the battery leads and unplug the panel power transformer from AC power.
2) Verify that the module is inserted securely and that the antenna is snapped-in completely.
3) Connect battery leads to the battery. Make sure to observe polarity and to keep the wires outside of the tab holding them in place.
4) Plug the panel power transformer into the AC outlet.

Troubleshooting LEDs

Status LEDs indicate network and module status. Figure 1 below shows the location of the status LEDs on the LTE module.

Figure 1: Status LEDs
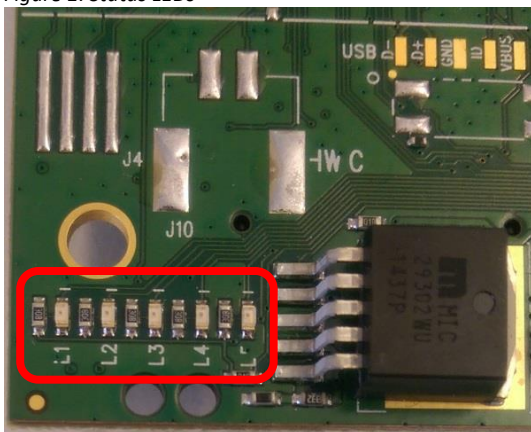
Table 1 describes the LED functions.

Table 1: LED Functions

LED	Function
L1	Error LED. Flashes 1 to 8 times in an 8-second interval to indicate specific error. See *Table 2* for errors and common fixes.
L2	Panel Communication and Z-Wave status messages. Flashes every time the module communicates with the panel and flashes in patterns to indicate Z-Wave status.
L3	LTE Communication. Flashes every time the LTE signal level is checked and when packets are exchanged with Alarm.com.
L4	LTE Signal Level. Flashes 0 to 5 times to indicate signal strength, or toggles on/off slowly when communicating with Alarm.com servers.
L5	Z-Wave Error LED. See *Table 3* for error descriptions.

LED Details

LED L1 (red)

L1 flashes when there is an error. The number of flashes indicates the error number. If there are two or more errors at the same time, the errors will flash one after the other. The LED will stay off for at least four seconds between errors.

Table 2: Errors flashed on L1 (red)

Number of flashes	Error and solution
1	Module cannot communicate with the panel. Perform a power cycle on the panel. If the error persists lift the module out of the panel and re-insert it. If the error is still observed try a different module. Finally, if that does not fix the problem try a different panel.
2 then 4	The module provisioning process could not be completed.
2 then 5	The module provisioning process could not be completed because the module is currently roaming on the carrier's network.
3	The module is trying to register on the LTE network. If it persists for more than a few minutes, the module is having problems registering. Check L4 for signal level. If signal level is lower than 2 "bars", change the panel's location or use a remote antenna option.
4	The module is registered on the LTE network but cannot connect with Alarm.com. Contact Alarm.com Technical Support.
5	Radio portion of the module is not working correctly. If this persists for more than a few minutes the module may need to be replaced. This error is extremely rare so verify that the module is flashing 5 times.
6	This is an error only if it persists for more than a minute. Otherwise, it's just an indication that the module is fixing an unusual condition regarding communication with the LTE network.
7	The module is not compatible with this panel type. Please insert a compatible module.
8	If it persists, the account may have been set up incorrectly. Contact Alarm.com Technical Support. You will be asked to check the serial number of the module.

LED L2 (yellow)

L2 flashes with every communication between the module and the panel. Normal pattern calls for a series of quick flashes every two seconds in Idle

Mode or four seconds in PowerSave Mode. It also occasionally flashes in patterns to indicate Z-Wave status. See the table below for a description of various possibilities.

Table 3: Z-wave LED status indicators

LED 2	LED 5	Device status or error	Description
4-blink		Add Mode (lasts 120 seconds or until a device is added)	In this mode you can add a device to the local Z-Wave network. Devices cannot be added to a network if they are already a part of a network
2-blink		Delete Mode (lasts 120 seconds or until a device is deleted)	In this mode you can delete a device from a Z-Wave network. A device can only be in one network at a time, and must receive a "delete" command before it can be learned into a new network
Solid		Successful add node/remove node/replication (lasts 60 seconds)	After receiving this signal leave all devices by the LTE module for 1 minute. Locks must be left next to the module for 4 minutes
Solid with one blink		Add node attempt failed because node already in network (lasts 60 seconds)	Device you attempted to add to a network is already in a network, and must be "deleted" before it can join a new network
	2-blink	No other nodes are in the network (lasts until a device is added to the network)	No devices have been added that can be controlled by the LTE module yet. See above for instructions on how to add devices
	5-blink	Learn mode error (lasts 60 seconds)	The device was not successfully added to the Z-Wave network.
	6-blink	No Home ID present (lasts until the module connects to Alarm.com and is configured)	When the LTE module first connects to Alarm.com it is configured with a necessary unique network ID

LED L3 (yellow)

L3 flashes with every communication between the module and its radio unit in Idle Mode, and with every communication with Alarm.com in Connected Mode. In PowerSave Mode, this LED flashes in unison with LED 2.

LED L4 (green)

L4 indicates the LTE signal level as a number of flashes (0 to 5 bars). The number of bars may not correspond to the bars shown on your cell phone. A level of 5 bars is obtained only in the strongest signal conditions.

Signal level is updated every ten seconds if it fluctuates, or every 30 seconds if it is fairly stable.

If L4 is not flashing it indicates one of the following states:
- The module is in PowerSave Mode
- The module just powered up
- There is no LTE coverage in the area. Alarm.com recommends a steady signal level of 2 or higher for proper operation of the module.

In Connected Mode, the LED toggles on and off.

LED L5 (yellow)

L5 indicates Z-Wave errors. See *Table 2* above for more details.

Various Module States (modes)

There are three module states, or modes, as described below:

Idle Mode. AC power is OK and the module is not currently talking to Alarm.com.

L1 - Flashes errors, if any.

L2 - Communication with panel.

L3 - Communication with radio unit.

L4 - Signal level (0 to 5 bars).

L5 – Flashes errors, if any

PowerSave Mode. The module just powered up, AC power is down, or AC power was recently restored and the battery is recharging. The module is fully functional and will go into Connected Mode as soon as a signal needs to be sent. Press and hold the 5 Key for 10 seconds to switch the module into Idle Mode and update the signal level reading. The system will go into Idle Mode every 2 hours to check for any incoming messages.

L1 - Inactive.

L2 - Communication with panel.

L3 - Same flashing pattern as L2.

L4 - Inactive.

L5 - Inactive

Connected Mode. The module is currently talking to Alarm.com. The module stays in Connected Mode for at least four minutes after reporting an event to Alarm.com, unless the 5 Key is pressed and held for 10 seconds, which will cause the module to go back to Idle Mode.

L1 - Flashes errors, if any.

L2 - Communication with panel.

L3 - Communication with Alarm.com.

L4 - Alternates two seconds on, then two seconds off.

L5 - Inactive

Sleep Mode. The panel is not connected to AC power, or there is an AC power failure, and the battery level is low. The module will connect to Alarm.com to send a signal, but will otherwise draw almost no power.

Note: If the LTE module is powered down for a short period of time, buffered messages from Alarm.com may be received when module power is restored.

Specifications

Compatible	Alarm.com System Enhancement Module
Power requirements	5V DC nominal
Standby current	30mA (10mA in PowerSave Mode)
Peak current	1.7 A
Operating temperature	32 to 120°F (0 to 49°C)
Storage temperature	-30 to 140°F (-34 to 60°C)
Max. relative humidity	90% non-condensing
Cellular network	LTE Category 1
Dimensions	(H x W) 4 1/16 x 1 7/8 in.

Regulatory Information

Listings	FCC ID: YL6-143460L
This device contains	FCC ID: 2AAGMVZ120Q

➢ Changes or modifications not expressly approved by Alarm.com can void the user's authority to operate the equipment.

➢ 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, and
(2) this device must accept any interference received, including interference that may cause undesired operation.

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 form that which the receiver is connected
- Consult the dealer or an experienced radio/TV technician for help.

This equipment complies with the FCC RF radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and your body.