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Interlogix Concord Installation Guide - Verizon VoLTE

The LTE Module for Concord 4 enables wireless reporting of all alarms and other system events from the Interlogix Concord 4 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 Concord 4 LTE module also features integrated support for Alarm.com's emPowerTM solution with built-in Z-Wave capabilities.

The module interfaces with the Concord panel data bus and is powered by the panel battery or an auxiliary 12 VDC power supply. Status LEDs on the LTE module indicate bus and cellular network communications.

Compatibility

The module can be used on Concord 4.0 and higher to enable Alarm.com's interactive suite of services. This module is not compatible with Concord 3.x panels or below.

Specifications

Compatibility	Concord panels with software versions 4.0 and higher
Power requirements	12 V nominal, 65 mA (continuous) 1600 mA (instantaneous peaks) maximum (from panel or auxiliary power supply)
Cellular network	Verizon LTE
Power/data bus	One 4-wire SuperBus 2000 auto addressing power communication data bus
Indicators	One module/panel communication status LED, one module power LED, one automation LED, three wireless communication status LEDs

Operating Temperature	32 to 120°F (0 to 49°C)
Storage Temperature	-30 to 140°F (-34 to 60°C)
Humidity	90% relative humidity non-condensing
Case color	Belgian gray
Case material	High-impact, ABS plastic

Main module components
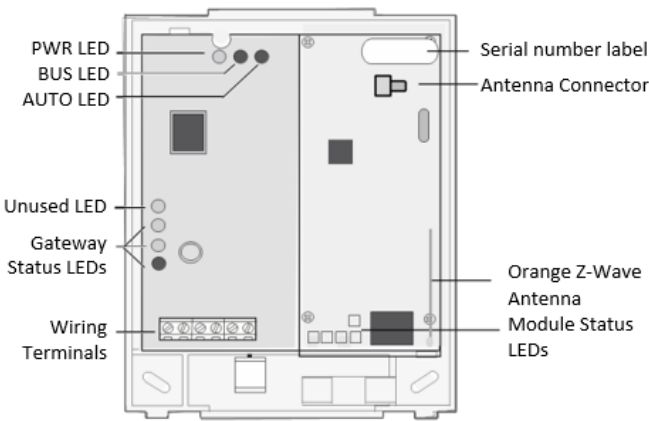
Components description

| Component	Function
PWR LED	Indicates module power status.

Component	Function
BUS LED	Indicates data bus activity between the panel and module.
AUTO LED	Indicates module/data transceiver communication.
Gateway status LEDs	Indicates the current signal and status of the wireless gateway module. Only the lower three LEDs are used. For more information, see Gateway status LEDs.
Wiring terminals	Provides wiring connection to the panel.
Antenna Connectors	Snap-in MMCX antenna connectors. The larger antenna connects to connector 1, the smaller antenna connects to connector 2.
Module status LEDs	Indicates communication with the LTE network, report errors, and signal strength.
Serial number	A 15-digit number found on the module.
SIM Card	Required for LTE communication.

Module status LED functions

For more information, see Module status LEDs.

The following image is where the L1-L5 status LEDs are found:
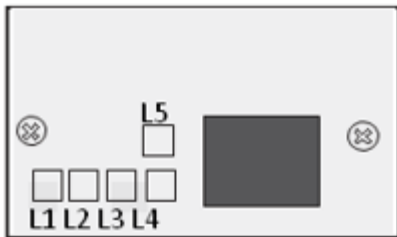
Bottom of LTE Module

The following table describes the LED functions:

LED	Function
L1	Error LED: L1 will flash one to eight times in a four-second interval to indicate specific error conditions such as a network error, panel communication error, or LTE radio error. For a list of errors indicated by L1, see LED L1 (red).
L2	Panel communication LED: L2 flashes every time a data packet is received from the panel
L3	LTE communication LED: L3 flashes every time a data packet is received from the LTE radio.
L4	LTE signal level LED: L4 flashes zero to five times indicating the module signal strength, or toggles on/off when communicating with the Alarm.com servers.
L5	Z-Wave Error LED: Fore more information, see LED L5 (yellow).

Account creation

Before installing the Alarm.com LTE Module in a Concord system, a new customer account needs to be created with Alarm.com. It is recommended to creating the account at least 24 hours in advance of installation to ensure that the radio is activated prior to installation.

To activate an account go to www.alarm.com/dealer and login. In *Customers*, click **Create New Customer**. The following customer information is required to create the account:

- Customer Name
- Customer Address
- Customer Phone Number
- Customer E-mail
- Preferred login name for the customer
- Alarm.com Module Serial Number

At the end of the account creation process, there is the option to print a Welcome Letter for the customer that has their login information and temporary password for the Alarm.com website.

Installation overview and guidelines

Before beginning the module installation, get familiar with the following installation guidelines and the location of the module. The troubleshooting LEDs and their function are shown in Main module components and are referenced throughout this guide. Using these tips will help guarantee a successful module installation.

1. Create the customer account on the Partner Portal at least 24 hours before installation. For more information, see Account Creation.
2. Turn off the Access Code Lock feature on the panel. This feature must be off for the system to communicate with Alarm.com.
3. Installation includes finding a mounting location for optimal wireless signal strength, mounting the module, wiring the module, and installing a case tamper (if necessary). Use the LTE Status LEDs on the module to check the signal strength before permanently mounting the module to avoid signaling issues after the installation is complete.
4. Power the module off of the battery, not off of the panel. For more information, see Wiring.
5. Perform a manual phone test (Comm Test) to initiate communication. For more information, see Power up.
6. Observe panel power limitations as stipulated below:
   - The module draws a maximum of 65 mA (continuous) in PowerSave Mode and 100 mA (continuous) in Idle Mode and Connected Mode from the panel. The module can draw up to 1600 mA (instantaneous peaks) from the panel.
   - Do not exceed the panel total output power when using panel power for bus devices and hardwired sensors (refer to panel documentation).
   - Use four-conductor, 22 or 18 gauge stranded wire to connect the module to the panel. The following table shows the maximum wire length for each gauge.

Gauge	Maximum Wire Length
22 gauge	40 feet (12.2 meters)
18 gauge	90 feet (27.4 meters)

Module installation

Tools and supplies needed

The following tools and supplies are needed:

- Small blade and Phillips screwdriver
- Drill and bits for screws and/or anchors
- Wirecutter/stripper
- Four-conductor, 22-gauge or larger stranded wire
- #6 panhead screws (4 included)
- Wall anchors (4 included)
- 2 KΩ EOL resistor (included)

Module location guidelines

Prior to beginning installation, use the following guidelines to choose a location for the module:

- Check the signal strength before choosing a location. Perform a walking signal strength test by powering the module off the battery directly (connect the GND and +12V terminals). After two minutes, LTE status LED L4 will flash between one and five times to indicate the LTE signal strength level (where five is the strongest signal).

  Note: Alarm.com recommends a signal level of two or higher for proper operation of the LTE Module.

- Avoid mounting the module in areas with excessive metal or electrical wiring, such as furnace or utility rooms.
- Locate the module near an outside wall, preferably on an upper level.
- Do not mount the module gateway inside of the panel's metal box. Doing so will negatively impact Z-Wave performance.
- For homes or businesses located in canyons or with hills nearby, it is necessary to place the antenna higher in the building.
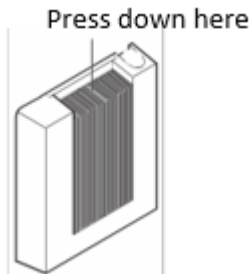
Mounting the module and connecting the antenna

Caution: Be free of static electricity before handling electronic components. Touch a grounded metal surface before touching the circuit board.
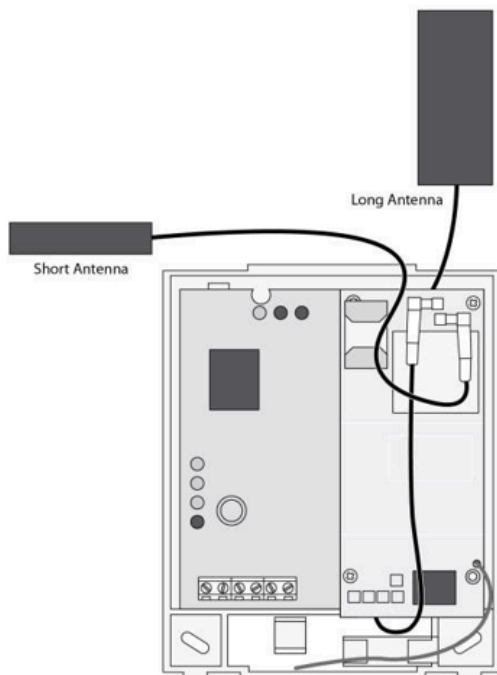
To mount the module:

1. Press down on the top of the enclosure cover as shown in the following image, and set it aside.

Press down here

2. The LTE module requires 2 antennas for proper operation. Both antennas are pre-installed for convenience. The larger antenna will be connected to antenna connector 1 and the smaller antenna will be connected to antenna connector 2.

3. For optimal signal strength the antennas should be placed as far away from the module as possible and as far away from each other as possible, as shown in the *Figure 4*.

Figure 4: Antenna connections

Long Antenna

Short Antenna

4. Place the module back plate on the wall at the desired mounting location, check for level, and mark the three mounting holes and the wire access area (Figure 4). Leave room above the back plate to route the antennas.

5. Set the back plate aside and drill holes at the mounting and wire access area locations.

6. Use wall anchors where studs are not present and secure the back plate to the wall with the enclosed screws.

Wiring

To wire the module to the panel, do the following:

1. Remove panel AC Power and disconnect the backup battery. This is necessary to prevent damaging the panel or module while making wiring connections.

2. Wire the module to the panel bus and to the battery terminals for power as shown in *Figure 5*.

   Note: The module can also be powered off the SuperBus2000 two amp power supply (600-1019), but should not be powered directly off the panel.

Figure 5: Wiring Terminals
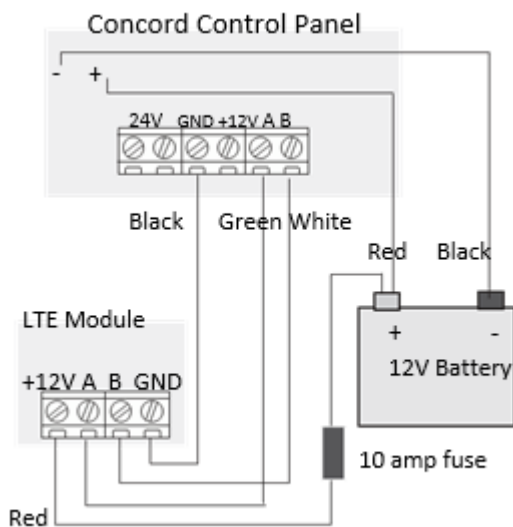
3. If required, connect an input device to the module *Z1* and *ZCOM* terminals.

Case tamper switch installation (optional)

If the module is easily accessible, there is the option to add case tamper detection to activate an alarm or trouble (depending on panel programming) when the cover is removed.

To install the tamper switch, see F*igure 6* and do the following:

1. Slide the reed switch into the plastic holder on the module back plate.

2. Connect a UL Listed reed switch (with a 2 KΩ EOL resistor 01-022) to the module zone input or to any unused hardwired input on the panel.

3. Insert the magnet into the nibs on the top cover and press the magnet clip down over the magnet until it clicks into place into the cover.

Figure 6: Case tamper switch installation
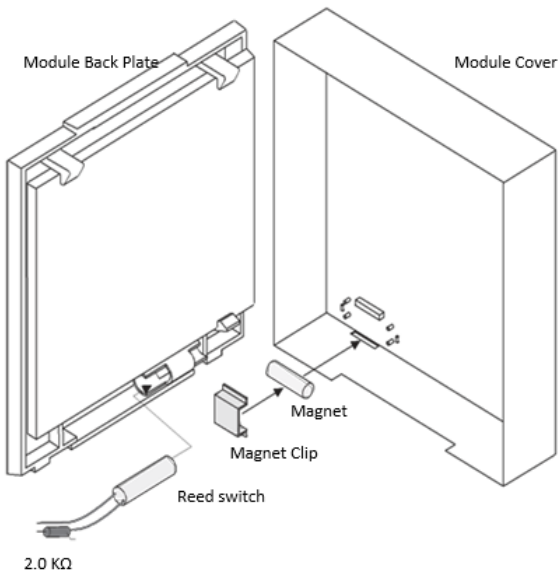
Power Up

To power up the module and panel and start communication between them, do the following:

1. Verify that all wiring between the panel and module is correct.

2. Connect the backup battery and restore AC power to the panel.

   Note: Whenever the module is added or changed, remove panel power and reapply it for the panel and module to communicate successfully.

3. Enter installer program mode and turn off the Access Code Lock feature (Security menu). This must be set to off for the system to communicate with Alarm.com. The module PWR LED should turn on. After a few seconds, the module BUS and AUTO LEDs should flash to indicate successful communication with the panel.

4. Verify that LTE status LED L1 is not flashing any errors (see Module Status LEDs on page 4). Also, verify that LED L4 is flashing an LTE signal level of two or higher. Otherwise, relocate the module. If LED L1 and LED L4 are not flashing, and LED L2 and LED L3 are flashing together, the module is in PowerSave Mode and the battery needs to be charged.

Perform an installer LTE manual phone test

To perform a phone test using the system touchpad:

1. Press **[8]**.

2. Enter the installer code.

3. Press **[3]** to send the test.
4. Press **[1]** and enter the installer code to disarm the panel within 10 seconds of starting the phone test. Before doing the manual phone test, the bottom red status LED should be on and the yellow status LED should be flashing. The yellow LED will stay on solid once the manual phone test is completed.

Note: Do not press any system touchpad buttons during the five to eight minutes or the time will not set. During this time, the keypad will go in and out of programming mode and will beep several times.

Gateway status LEDs

The status LEDs, located on the left side of the module, indicate the current signal and status of the Wireless Gateway Module. The bottom red LED indicates if the module is in range and if it is registered. The yellow and green LEDs indicate the message status. The top LED is not used.

Red LED

On: The module is in range and registered with the network.

Off: The module is out of range and not registered with the network.

Blinks: The module is registered with the network, but out of range.

Yellow LED

On: LED on after the first message has been sent by the module and received by Alarm.com.

Off: LED off until a message has been sent by the module.

Blinks: The first message is being sent by the module.

Green LED

Off: The LED is off as soon as Alarm.com receives a message from the module (off most of the time).

Blinks: A message is being sent by the module.

Gateway LED status condition patterns

Condition Number	Red LED	Yellow LED	Green LED	Condition
1	Off	Off	Off	Module not powered up/not working

Condition Number	Red LED	Yellow LED	Green LED	Condition
2	On	Off	Off	Module in range, first message not sent, not currently sending message.
3	On	On	Off	Module in range, first message sent, not currently sending message.
4	On	On	Blinks	Module in range, first message sent, currently sending message.
5	On	Blinks	Blinks	Module in range, sending first message, currently sending message.
6	Blinks	On	Blinks	Module out of range, first message sent, currently sending message.
7	Blinks	On	Off	Module out of range, first message sent, not currently sending message.
8	Blinks	Blinks	Blinks	Module out of range, sending first message, currently sending message.

Module status LEDs

There are five small LTE status LEDs, located at the base of the module. For more information about the location, see [Main module components](#).

LED L1 (red)

LED 1 flashes when an error is encountered. The number of flashes is the error number. If there are two or more errors at the same time, the errors will be flashes one after the other. The LED will stay off for at least four seconds between errors. Table 5 describes the errors indicated by LED L1.

The following table describes the errors indicated by LED L1:

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 two bars, change the panel's location or use a remote antenna option.
4	The module is registered on the LTE network but could not connect with Alarm.com. Contact Alarm.com Technical Support.

Number of Flashes	Error and Solution
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 five times.
6	This is an error only if it persists for more than a minute. Otherwise, it's an indication that the module is fixing an unusual condition regarding communication with the LTE network.
7	Access Code Lock On: This option must be turned off at the panel (System Programming - 0003) for module to communicate.
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.

The following table shows a description of various possibilities:

LED pattern	Device status or error	Description
4-blink	Add mode (lasts 120 seconds or until a device is added)	This mode 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)	This mode 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 HSPA 3G Module for one minute. Locks must be left next to the module for four minutes.
Solid with one blink	Add node attempt failed because node already in network (lasts 60 seconds)	The device is already in a network, and must be "deleted" before it can join a new network.

LED L3 (green or 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 L2.

LED L4 (green or yellow)

L4 indicates the LTE signal level as a number of flashes (zero to five 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 LED L4 is continuously flashing, the module provisioning process is in progress. The signal level indication will resume after the process completes.

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 two 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. The possible signals and what they indicate is shown in the following table.

LED pattern	Device Status or Error	Description
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. See above for instructions on how to add devices.
5-blink	Learn mode error (lasts 60 seconds).	The device you attempted to add into a Z-Wave network was not successfully added.
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.

Module states (modes)

There are three module states (modes).

Idle

In Idle Mode, the AC power is up, the battery level is greater than 11.5 volts, and the module is not currently connected to the Alarm.com servers. This is normal for the module and the most common state.

L1 - Flashes errors, if any.

L2 - Communication with panel.

L3 - Communication with radio unit.

L4 - Signal level (zero to five bars).

L5 – Flashes errors, if any.

PowerSave

In PowerSave Mode, the module just powered up, AC power is down, or

battery level is less than 11.5 volts. The radio part of the module draws 10 mA in PowerSave Mode. It is fully functional and will go into Connected Mode as soon as a signal needs to be sent. Performing a manual phone test will switch the module into Idle Mode and update the signal level reading.

L1 - Inactive

L2 - Communication with panel L3 - Same flashing pattern as L2 L4 - Inactive

L5 – Inactive

Connected

In Connected Mode, the module is connected to the Alarm.com servers and reported an alarm or other condition. The module stays in Connected Mode for at least six minutes after the last message is exchanged. Entering Installer Programming mode will cause the module to go into 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.

Troubleshooting/Testing

Tips

- Check LTE status LED L1 to see if it is flashing any errors. For descriptions of the errors indicated, see LED L1 (red).
- If the power LEDs (the green LED at the top of the module shown in Main module components) is not on, turn off the panel power and verify that all wiring is correct.
- If the Module status LEDs (on the left side of the module in Main module components) do not turn on immediately after initial power up, verify enough time is given for the module to initiate communication with Alarm.com. Wait five to eight minutes after power up for the module to communicate with Alarm.com.
- Verify that the Access Code Lock feature in panel memory is turned off. Access Code Lock must be turned off for correct operation.

Sensors 94, 95, 96

If sensors 94, 95, and 96 are not learned in, after doing a manual phone test, the text for these sensors will display important information for troubleshooting purposes. Alarm.com Technical Support staff may request this information during service calls.

- Sensor 94 text: IMSI number.
- Sensor 95 text: Type of central station reports enabled. See *Table 7* for a reference of the codes displayed.
- Sensor 96 text: Module serial number.

Table 7: Central Station Reporting Bits

Reporting bit	Description
B	Phone Test
E	Alarms
F	System trouble
G	Sensor trouble
H	Arming/disarming
J	Sensor bypass
K	AC power failure
L	Phone failure (phone failure will always be reported for alarms and cancels)
M	Panel programming
N	Tamper
O	Cancels

Reporting bit	Description
P	Normal activity
Q	Modem on line
R	Pings
V	Panel low battery

FCC compliance

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

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.

Operation is subject to the following two conditions:

- This device may not cause interference
- This device must accept any interference, including interference that may cause undesired operation of the device

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.

Regulatory Information

Listings	FCC ID: YL6-143450L, IC: 9111A-143450L

This device contains

FCC ID: RI7LE910SV, IC: 5131A-LE910SV