



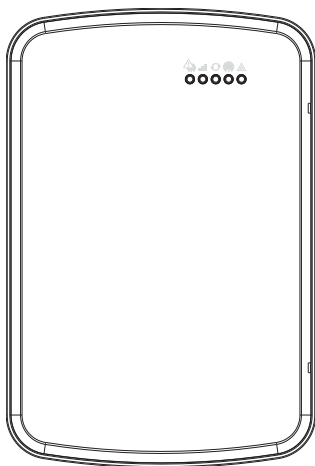
Digital Security Controls

TL880LTB Dual Path Controller

TL880LEB Dual Path Controller

TL880LEAT-LAT Dual Path Controller

TL880LEAT-PE Dual Path Controller



WARNING: This manual contains information on limitations regarding product use and function and information on the limitations as to liability of the manufacturer. The entire manual should be carefully read.



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Warning: Installer Please Read Carefully

Note to installers

The warnings on this page contain vital information. As the only individual in contact with system users, it is the installer's responsibility to bring each item in this warning to the attention of all users of this system.

System failures

This system has been carefully designed to be as effective as possible. There are circumstances, however, involving fire, burglary, or other types of emergencies where it may not provide protection. Any alarm system of any type may be compromised deliberately or may fail to operate as expected for a variety of reasons. Some, but not all, of the reasons may be:

Access by intruders

Intruders may enter through an unprotected access point, circumvent a sensing device, evade detection by moving through an area of insufficient coverage, disconnect a warning device, or interfere with or prevent the proper operation of the system.

Component failure

Although every effort has been made to make this system as reliable as possible, the system may fail to function as intended due to the failure of a component.

Compromise of radio frequency (Wireless)

A device's signals may not reach the receiver under all circumstances, which could include: metal objects placed on or near the radio path, deliberate jamming or other inadvertent radio signal interference.

Criminal knowledge

This system contains security features which were known to be effective at the time of manufacture. It is possible for persons with criminal intent to develop techniques which reduce the effectiveness of these features. It is important that your security system be reviewed periodically to ensure that its features remain effective and that it is updated or replaced if it is found that it does not provide the protection expected.

Failure of replaceable batteries

This system's wireless transmitters have been designed to provide several years of battery life under normal conditions. The expected battery life is a function of the device environment, usage, and type. Ambient conditions such as high humidity, high or low temperatures, or large temperature fluctuations may reduce the expected battery life. While each transmitting device has a low battery monitor which identifies when the batteries need to be replaced, this monitor may fail to operate as expected. Regular testing and maintenance will keep the system in good operating condition.

Inadequate installation

A security system must be installed properly in order to provide adequate protection. Every installation should be evaluated by a security professional to ensure that all access points and areas are covered. Locks and latches on windows and doors must be secure and operate as intended. Windows, doors, walls, ceilings and other building materials must be of sufficient strength and construction to provide the level of protection expected. A reevaluation must be done during and after any construction activity. An evaluation by the fire and/or police department is highly recommended if this service is available.

Inadequate testing

Most problems that would prevent an alarm system from operating as intended can be found by regular testing and maintenance. The complete system should be tested weekly and immediately after a break-in, an attempted break-in, a fire, a storm, an earthquake, an accident, or any kind of construction activity inside or outside the premises. The testing should include all sensing devices, keypads, consoles, alarm indicating devices, and any other operational devices that are part of the system.

Insufficient time

There may be circumstances when the system will operate as intended, yet the occupants will not be protected from an emergency due to their inability to respond to the warnings in a timely manner. If the system is remotely monitored, the response may not occur in time to protect the occupants or their belongings.

Motion detectors

Motion detectors can only detect motion within the designated areas as shown in their respective installation instructions. They cannot discriminate between intruders and intended occupants. Motion detectors do not provide volumetric area protection. They have multiple beams of detection and motion can only be detected in unobstructed areas covered by these beams. They cannot detect motion which occurs behind walls, ceilings, floors, closed doors, glass partitions, glass doors or windows. Any type of tampering whether intentional or unintentional such as masking, painting, or spraying of any material on the lenses, mirrors, windows or any other part of the detection system will impair its proper operation. Passive infrared motion detectors operate by sensing changes in temperature. However their effectiveness can be reduced when the ambient temperature rises near or above body temperature or if there are intentional or unintentional sources of heat in or near the detection area. Some of these heat sources could be heaters, radiators, stoves, barbecues, fireplaces, sunlight, steam vents, lighting and so on.

Power failure

Control units, intrusion detectors, smoke detectors and many other security devices require an adequate power supply for proper operation. If a device operates from batteries, it is possible for the batteries to fail. Even if the batteries have not failed, they must be charged, in good condition and installed correctly. If a device operates only by AC power, any interruption, however brief, will render that device inoperative while it does not have power. Power interruptions of any length are often accompanied by voltage fluctuations which may damage electronic equipment such as a security system. After a power interruption has occurred, immediately conduct a complete system test to ensure that the system operates as intended.

Security and insurance

Regardless of its capabilities, an alarm system is not a substitute for property or life insurance. An alarm system also is not a substitute for property owners, renters, or other occupants to act prudently to prevent or minimize the harmful effects of an emergency situation.

Smoke detectors

Smoke detectors that are a part of this system may not properly alert occupants of a fire for a number of reasons, some of which follow. The smoke detectors may have been improperly installed or positioned. Smoke may not be able to reach the smoke detectors, such as when the fire is in a chimney, walls or roofs, or on the other side of closed doors. Smoke detectors may not detect smoke from fires on another level of the residence or building. Every fire is different in the amount of smoke produced and the rate of burning. Smoke detectors cannot sense all types of fires equally well. Smoke detectors may not provide timely warning of fires caused by carelessness or safety hazards such as smoking in bed, violent explosions, escaping gas, improper storage of flammable materials, overloaded electrical circuits, children playing with matches, or arson. Even if the smoke detector operates as intended, there may be circumstances when there is insufficient warning to allow all occupants to escape in time to avoid injury or death.

Telephone lines

If telephone lines are used to transmit alarms, they may be out of service or busy for certain periods of time. Also an intruder may cut the telephone line or defeat its operation by more sophisticated means which may be difficult to detect.

Warning devices

Warning devices such as sirens, bells, horns, or strobes may not warn people or waken someone sleeping if there is an intervening wall or door. If warning devices are located on a different level of the residence or premise, then it is less likely that the occupants will be alerted or awakened. Audible warning devices may be interfered with by other noise sources such as stereos, radios, televisions, air conditioners, other appliances, or passing traffic. Audible warning devices, however loud, may not be heard by a hearing-impaired person.

IMPORTANT

This installation manual shall be used in conjunction with the control panel installation manual available online from the DSC website at www.dsc.com. All the safety instructions specified within that manual shall be observed. The control panel is referenced as the “panel” throughout this document. This installation guide provides the basic wiring, programming and troubleshooting information.

The alarm communicator is a fixed, wall-mounted unit, and shall be installed in the location specified in these instructions. The equipment enclosure must be fully assembled and closed, with all the necessary screws/tabs, and secured to a wall before operation. Internal wiring must be routed in a manner that prevents:

- Excessive strain on wire and on terminal connections.
- Interference between power limited and non power limited wiring.
- Loosening of terminal connections.
- Damage to the conductor insulation.

Safety information

The installer must instruct the system user on each of the following:

- Do not attempt to service this product. Opening or removing covers may expose the user to dangerous voltages or other risks.
- Any servicing shall be referred to skilled persons only.
- Use authorized accessories only with this equipment.
- Do not stay close to the equipment during device operation.
- Do not touch the external antenna.

Safety instructions for skilled workers

When using equipment connected to the telephone network, always follow the basic safety instructions provided with this product. Save these instructions for future reference.

Follow all WARNINGS AND INSTRUCTIONS specified within the manual of the alarm controller.

Do NOT connect this equipment to electrical outlets controlled by wall switches or automatic timers.

AVOID installing equipment near heaters, air conditioners, ventilators, and refrigerators.

AVOID locating equipment close to or on top of large metal objects, for example wall studs.

Safety precautions required during installation

NEVER install this equipment during a lightning storm.

Position cables so that accidents cannot occur.

This equipment must be installed and used within an environment that provides the pollution degree max 2 and over-voltages category II NONHAZARDOUS LOCATIONS, indoor only. The equipment is designed to be installed, serviced and/or repaired by Skilled Persons only; (skilled person is defined as a person having the appropriate technical training and experience necessary to be aware of hazards to which that person may be exposed in performing a task and of measures to minimize the risks to that person or other persons).

Before installing/servicing, DISCONNECT the power and the telephone line of the alarm controller.

These safety instructions should not prevent you from contacting the distributor and/or the manufacturer to obtain any further clarification and/or answers to your concerns.

Introduction

This guide provides installation and operating instructions for the Alarm.com communicator module. The following sections offer you a brief overview of its capabilities. Some capabilities and features vary based on the Alarm.com service plan selected. Visit www.alarm.com/Dealer or contact Alarm.com for more information.

Note: The Dual Path IP/LTE module is available in the model TL880LTB/TL880LEB/TL880LEAT-LAT/TL880LEAT-PE.

The module contains the IP/Radio subassembly model ADC-620T and the PC-Link to RS422 conversion interface. The module is compatible with PowerSeries Neo Alarm Control Unit models HS2128, HS2064, HS2032 and HS2016 software versions 1.1 and above and PowerSeries Pro Alarm Control Unit models HS3032, HS3128, and HS3248 software versions 1.0 and above.

The module enables wireless reporting of all alarms and other system events from the PowerSeries Neo and PowerSeries Pro control panel using an all-digital, LTE wireless (cellular) network or an Ethernet network. The module can be used as the primary communication path for all alarm signaling, or as a backup to a telephone connection to the central monitoring station. The wireless alarm signaling and routing service is operated by Alarm.com. The module also features integrated support for Alarm.com's home automation solution with built-in Z-Wave capabilities.

Note: Alarm.com's home automation solution with built-in Z-Wave capabilities is not UL evaluated.

Contact information

For additional information and support on Alarm.com modules, initial account setup, home automation, and all other Alarm.com products and services, please visit: www.Alarm.com/dealer or contact Alarm.com technical support at: 1-866-834-0470.

Features

- 128-bit AES encryption via cellular and Internet.
 - Models TL880LTB and TL880LEAT-LAT have NIST validation certificate number 4684.
 - Models TL880LEB and TL880LEAT-PE have NIST validation certificate number 5100.
- Back up or primary cellular alarm communication and Ethernet.
- Remote firmware upgrade via cellular or Internet using Alarm.com management portal.
- Full event reporting to central station.
- Cellular periodic test transmission.
- Integrated call routing.
- Panel remote uploading/downloading support via cellular or Internet.
- PC-LINK connection.
- Programmable labels.
- SIA and Contact ID (CID) formats supported.
- Signal strength and trouble display LEDs.
- Subscriber Identity Module (SIM) card included with communicator.

- Supervision heartbeats over Ethernet path or over the Cellular path, when the Ethernet path is known to be in a trouble condition.
- 2-way audio capable when used with audio module HSM2955(R) - Refer to HSM2955(R) manual.

Communicator ratings

Model	TL880LTB and TL880LEAT-LAT	TL880LEB and TL880LEAT-PE
Power supply ratings		
Input Voltage	11.3V - 12.5V DC (provided by compatible DSC control panel)	
Current consumption		
Standby Current (Average Value)	150mA	
Alarm (Transmitting) Current (Peak Value)	400mA	
Cellular Network	TL880LTB: LTE Verizon TL880LEAT-LAT: LTE AT&T	TL880LEB: LTE AT&T/Telus TL880LEAT-PE: LTE AT&T
Operating Frequency	TL880LTB: 700 / AWS1700 MHz TL880LEAT-LAT: LTE bands 1, 2, 3, 4, 5, 7, 28	TL880LEB: 1700/1900 AWS700/850 MHz TL880LEAT-PE: LTE bands 1, 2, 3, 4, 5, 7, 28
Environmental specifications		
Operating Temperature	32°F to 120°F (0°C to 49°C)	
Storage Temperature	-34°C to 60°C	
Humidity	93% RH non-condensing	
Mechanical specifications		
Dimensions	6" x 8.9" x 1.3"	
Weight	365g	

Communicator compatibility

Communicator	Receiver/ Panel	Description
TL880LTB TL880LEB TL880LEAT-LAT TL880LEAT-PE	Receiver	• Sur-Gard System I-IP Receiver, version 1.13+ • Sur-Gard System II Receiver, version 2.10+ • Sur-Gard SG-DRL3-IP, version 2.30+ (for Sur-Gard System III Receiver) • Sur-Gard SG-DRL4-IP version 1.20+ (for Sur-Gard System IV Receiver) • Sur-Gard SG-DRL5-IP version 1.00+ (for Sur-Gard System 5 Receiver)
	Panel	• HS2016, version 1.1+ • HS2032, version 1.1+ • HS2064, version 1.1+ • HS2128, version 1.1+ • HS3032, version 1.0+ • HS3128, version 1.0+ • HS3248, version 1.0+

Note: Enter [*][8][Installer Code][900][000] at keypad to view the panel version number.

Products or components of products, which perform communications functions only shall comply with the requirements applicable to communications equipment as specified in UL60950-1, Information Technology Equipment - Safety - Part 1: General Requirements. Such components include, but are not limited to: hubs; routers; NIDs; third-party communications service providers; DSL modems; and cable modems.

UL Installation Requirements

Note: For equipment used at the protected premises and intended to facilitate IP communications (hubs, routers, NIDs, Digital Subscriber Line (DSL), cable models), 24-hour back-up power is required. Where such cannot be facilitated, a secondary (back-up) communication channel is required.

Domain Name Service (DNS) programming is not permitted in UL1610 and ULC-S304 listed systems.

INSTALLATION

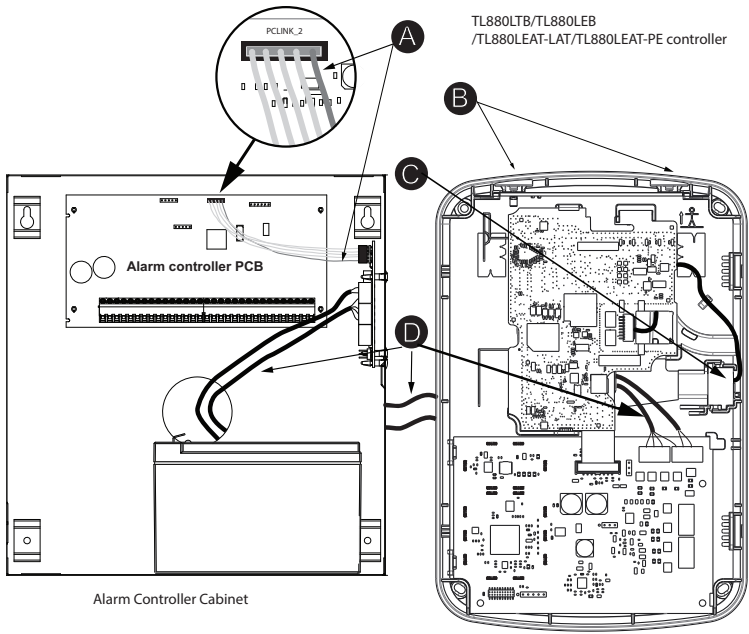
Follow these guidelines during installation.

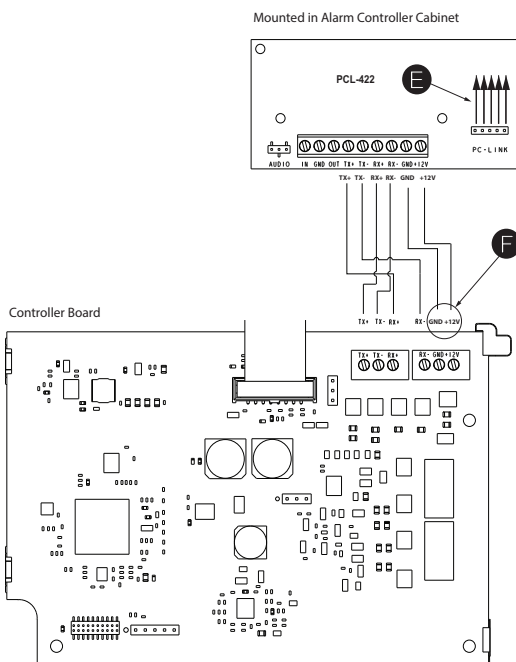
- Before affixing the communicator to a wall, verify the LTE signal level at the installation location. On a keypad, press and hold the 5 key for 2 seconds to view the LTE signal level. An installation location with a sustained signal level of two or more bars is recommended.
- When using panel power for the module, do not exceed the panel's maximum rated total output power. Refer to the specific panel installation instructions for details. Only one module can be used per panel.
- Do not mount the module inside of the metal alarm panel enclosure.

Tools and supplies required

You will need the following tools and supplies:

- Small flat-head and Phillips screwdrivers
- Screws (included)
- Antenna (included)
- 16 pin ribbon cable (included)





A	Red wire on alarm controller PCLink2 Header
B	Antenna access ports
C	Ethernet cable
D	Quad cables (100' / 30m maximum)
E	Red wire on PCL-422 PCLink Header
F	LTE Controller Board power terminals. Can be connected to power supply module.

Step 1: Enable module

For the Alarm.com module to communicate with the panel, section [382] option 5 at the panel must be set to ON. This section is OFF by default and must be enabled for the system to function properly. This should be done before connecting the PC-Link cable to power up the module to ensure all initialization commands are processed properly.

Step 2: Connecting the module

Caution: Power down the alarm panel by removing both AC and the battery prior to connecting the module.

1: Connect data bus

The maximum cable length permitted for the data bus is 100ft/30m.

- Connect the **RX+** terminal on the module to the **TX+** terminal on the PCL-422
- Connect the **RX-** terminal on the module to the **TX-** terminal on the PCL-422
- Connect the **TX-** terminal on the module to the **RX-** terminal on the PCL-422
- Connect the **TX+** terminal on the module to the **RX+** terminal on the PCL-422

2: Connect power

The maximum cable length permitted for the power connection is 100ft/30m.

- Connect the **GND** terminal on the module to the **GND** terminal on the PCL-422
- Connect the **+12V** terminal on the module to the **+12V** terminal on the PCL-422

3: Connect the PC-Link cable

Note: To ensure correct orientation, refer to items A and D in the wiring diagrams for the proper position of the red wire on the PC-link cable.

- Connect one end of the supplied PC-Link cable to the PC-Link header on the PCL-422
- Connect the other end of the PC-Link cable to the PC-LINK_2 header on the alarm panel

4: Connect Ethernet (optional)

Note: Refer to item C in the wiring diagram for the correct placement of the Ethernet cable.

- Connect one end of the Ethernet cable to the Ethernet port on the communicator
- Connect the other end of the Ethernet cable to the Ethernet port on the router

5: Connect remote external antennas (optional)

Remote external antennas are available for the module if there is inadequate cellular reception at the preferred mounting location. Contact DSC technical support for antenna options.

The module has two covered access ports on the top of the enclosure. Remove the plastic tab covering the desired port and either mount the antenna on the enclosure or use the opening to pass through the antenna cable.

Note: Due to the curvature of the enclosure, the plastic port covers are NOT interchangeable. Ensure that any unused ports are covered with their original plastic tab.

Warning: The external antenna must be installed in a manner to prevent end users from accessing any conductive part of the antenna or antenna cable (i.e., recessed mounting or equivalent).

6: Power up

Connect panel battery and AC power.

Step 3: Verify installer code to activate Alarm.com module

Alarms and other signals will not be sent to Alarm.com until the installer code is verified. To activate the account, perform the following steps:

1. Press [*][8] to enter Installer Programming.
2. Enter the installer code.
3. Press [#] to exit Installer Programming.

To remotely activate a system that is already signaling, perform the following steps:

1. Go to www.alarm.com/dealer.
2. Go to the customer's account.
3. Select the error message at the top of the page.
4. Enter the installer code.

Step 4: Perform dual-path test (module registration)

To initiate module communication with Alarm.com and the cellular network for the first time, perform a "Dual-Path phone test". Note that the test can also be used at any time by the installer to force communication with Alarm.com. To test the cellular path, press and hold [3] for two seconds. To test the broadband path, press and hold [4] for two seconds. A Dual-Path test can also be completed through the Interactive Services menu. To perform the Dual-Path test, press [*][6] followed by the master code and [04].

The panel indicates when the test has completed by activating the siren output on medium volume for 2 seconds followed by full volume for 2 seconds. However, if the test was initiated via the [3] or [4] key, or through the Interactive Services menu, the siren will not sound. All display lights and LCD pixels turn on. This indicates that Alarm.com has received and acknowledged the signal. This does not guarantee that the signal went through to a central station; it confirms that Alarm.com's Network Operations Center received the signal. The central station should be contacted directly to verify that the signal was received on the correct account and that the central station routing settings have been set up correctly. If the signal does not go through to the central station, the panel displays a "Failure to Communicate" message. Double check the account's central station Forwarding Settings on Alarm.com and contact technical support if the trouble persists.

Step 5: Allow module to auto-program

After a successful dual-path test, wait 2 minutes for the module to automatically program and initialize before entering the Installer Programming menus. Entering Installer Programming during module initialization will cancel the process. LCD keypads display a message indicating when auto-programming is occurring and when it has completed. During the auto-programming session, the module automatically programs panel settings required for proper functionality with Alarm.com as noted in the "Panel Settings" section.

Panel settings

Central station and telephone line settings

Central Station (CS) and telephone line settings will be automatically configured through the CS Forwarding Settings page of the Alarm.com Dealer Site. The following are the panel settings that are configured through the Dealer Site page (when required) and should not be configured in the panel:

Section	Option	Description
015	7	Telephone line monitoring
300 [001]	--	Panel Communication Path - Receiver 1
300 [002]	--	Panel Communication Path - Receiver 2
300 [003]	--	Panel Communication Path - Receiver 3
300 [004]	--	Panel Communication Path - Receiver 4
301 [001]	--	Communication telephone number 1
301 [002]	--	Communication telephone number 2
301 [003]	--	Communication telephone number 3
301 [004]	--	Communication telephone number 4
309 [001]	--	System Call Direction - Maintenance
309 [002]	--	System Call Direction - Test Transmission
310 [000]	--	System account number
310 [001]	--	Partition 1 account number
310 [002]	--	Partition 2 account number
310 [003]	--	Partition 3 account number
310 [004]	--	Partition 4 account number
310 [005]	--	Partition 5 account number
310 [006]	--	Partition 6 account number
310 [007]	--	Partition 7 account number
310 [008]	--	Partition 8 account number

Section	Option	Description
311 [001]	–	Partition 1 Call Direction - Alarm/Restore
311 [002]	–	Partition 1 Call Direction - Tamper/Restore
311 [003]	–	Partition 1 Call Direction - Opening/Closing
312 [001]	–	Partition 2 Call Direction - Alarm/Restore
312 [002]	–	Partition 2 Call Direction - Tamper/Restore
312 [003]	–	Partition 2 Call Direction - Opening/Closing
313 [001]	–	Partition 3 Call Direction - Alarm/Restore
313 [002]	–	Partition 3 Call Direction - Tamper/Restore
313 [003]	–	Partition 3 Call Direction - Opening/Closing
314 [001]	–	Partition 4 Call Direction - Alarm/Restore
314 [002]	–	Partition 4 Call Direction - Tamper/Restore
314 [003]	–	Partition 4 Call Direction - Opening/Closing
315 [001]	–	Partition 5 Call Direction - Alarm/Restore
315 [002]	–	Partition 5 Call Direction - Tamper/Restore
315 [003]	–	Partition 5 Call Direction - Opening/Closing
316 [001]	–	Partition 6 Call Direction - Alarm/Restore
316 [002]	–	Partition 6 Call Direction - Tamper/Restore
316 [003]	–	Partition 6 Call Direction - Opening/Closing
317 [001]	–	Partition 7 Call Direction - Alarm/Restore
317 [002]	–	Partition 7 Call Direction - Tamper/Restore
317 [003]	–	Partition 7 Call Direction - Opening/Closing
318 [001]	–	Partition 8 Call Direction - Alarm/Restore
318 [002]	–	Partition 8 Call Direction - Tamper/Restore
318 [003]	–	Partition 8 Call Direction - Opening/Closing
350 [001]	–	Receiver 1 communicator format
350 [002]	–	Receiver 2 communicator format
384	2	Communicator backup options

Notifications

The following panel settings may alter the behavior of customer notifications:

Section	Option	Description
015	4	If this option is ON, keyfob arming notifications will not be associated with a specific user.

Panel settings changed automatically

Some panel settings are changed automatically when the module is connected to the control panel. These settings should not be altered. They are:

Section	Option	Value	Description
015	6	OFF	Master code is not changeable and must be OFF to ensure the module communicates the correct master code.

Section	Option	Value	Description
017	6	OFF	Daylights saving time must be disabled to ensure panel time is accurate.
019	6	Set according to dealer's Alarm.com setting	Enables Duress Code changes from Alarm.com.
024	5	OFF	Realtime clock must be disabled to ensure panel time is accurate.
377	Swinger Shutdown (Maintenance)	010	Swinger Shutdown for maintenance signals must be set to 010 to ensure trouble notifications can be sent.
377	AC Failure Communication Delay	Random value between 001 and 030	AC Failure Communication Delay should be set between 001 and 030 to ensure notifications for power failures are received.
377	Wireless Device Low Battery Transmission Delay	001	Wireless Device Low Battery Transmission Delay should be set to 001 to ensure notifications for low batteries are received.
380	1	ON	Communications must be enabled for the module to communicate with the panel.
380	2	OFF	System should transmit alarm restores immediately when the zone is restored.
380	5	OFF	The redundant communications method must be set as backup.
382	6	OFF	AC Failure Transmission Delay should be in minutes.
804 [sensor #]	003	Five minute delay [07]	High Traffic Shutdown should be set to five minutes for devices being used with Alarm.com's Activity Monitoring. Note: This feature may reduce the battery life of wireless PIR sensors. In order to avoid this, hardwired PIR sensors may be used instead.

Clock

The module sets the panel clock when it connects to Alarm.com and then updates it every 18 hours. It is important to select the correct panel time zone on the Alarm.com website, or the panel time will not be accurate. If a system is powered up before the customer account has been created, the time zone will default to **Eastern Standard Time**.

TROUBLESHOOTING

Module status information

Module status information for verifying and troubleshooting the module connection status or errors can be found through the Interactive Services menus. To access these, press [*][8][**Installer Code**][851]. See the following table for potential module states.

Status	Description
Idle	Most common state. Module is not actively sending data and no errors are present.
Roaming	Roaming on partner network.
SIM Missing	The SIM card is missing.
PowerSave Mode	AC power is down.
Registering...	The module is trying to register on the LTE network.
Connection Error	The module is registered on the LTE network but cannot connect with Alarm.com. Contact Alarm.com technical support for more information.
Radio Error	Radio portion of the module is not operating correctly. Power cycle the panel and call Alarm.com technical support if the trouble persists.
Server Error	Identifies a server error. If it persists, the account may have been set up incorrectly.
Connected	Currently connected and transmitting information to the Alarm.com servers.
Connecting...	In the process of connecting to Alarm.com.
Updating...	Updating signal level.

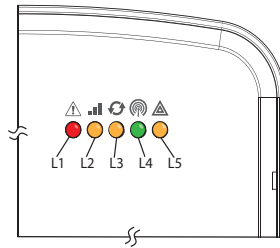
In addition, some of the information can be retrieved via long key presses from the keypad. Press and hold the following panel keys for 2 seconds to display the given information on the panel display. Most messages are displayed for less than 30 seconds but can be cut short by pressing the 0 Key for 2 seconds.

Status keys	Description
1 key	10-digit module serial number needed to create the Alarm.com customer account.
2 key	Module firmware version (e.g., 181a).
3 key	Initiate communication test over the cellular path. Important: This test is required to correctly complete the installation.
4 key	Initiate communication test over the broadband path.
5 key	Wireless signal strength level and module status or error, if any. The panel will display the signal level in bars (0 to 5) and as a numerical value (0 to 31) followed by the connection mode.
6 key	Battery voltage as read by the module, to two decimal places, and the AC power status. (e.g., Battery: 6.79v, AC Power OK).
7 key	Use only when instructed by Alarm.com Technical Support.
8 key	LTE frequency used by the module.

Troubleshooting LEDs

Status LEDs indicate network and module status. The following figure shows the location of the status LEDs on the module.

Status LEDs



LED functions

LED	Function
1	General & Cellular Error LED. Flashes 1 to 8 times in an 8-second interval to indicate specific error. See section "LED L1 (red)" for errors and common fixes.
2	Broadband Errors & Panel Communication. Flashes 2 to 8 times in an 8-second interval to indicate a specific error on the broadband path. Also flashes once every time the module communicates with the panel. See section "LED L2 (yellow)" for errors and common fixes.
3	Cellular Communication. Flashes every time the cellular signal level is checked and when packets are exchanged with Alarm.com
4	Cellular Signal Strength Level. Flashes 0 to 5 times to indicate signal strength or toggles on/off slowly when communicating with Alarm.com servers
5	Z-Wave Status & Error LED. See section "LED L5 (yellow)" for patterns.

LED details

LED L1 (red)

L1 flashes when there is a general error or an error on the cellular path. 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.

Number of flashes	Error and solution
1	Module cannot communicate with the panel. Ensure section [382] option [5] is ON. Verify panel software is version 1.1 or higher. Check the connectors (between the panel and communicator) and powercycle the panel. If the error persists, there may be an issue with the module or panel.
2	The SIM card is missing. The SIM card holder can be found on the module. Verify that the SIM card holder is closed securely and that there is a SIM card in the holder.
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 with the LTE network. Check L4 for signal level. If signal level is lower than 2 "bars", change the panel's location or use a remote antenna option. If the signal is good, the module may be roaming on a LTE network that does not partner with our LTE providers, or the SIM card was not activated yet because the Alarm.com account was not created correctly.

Number of flashes	Error and solution
4	The module is registered on the LTE network but cannot connect with Alarm.com. Power down the module, wait one minute, restore power and perform a communications test. Verify signal strength and try a different location for the module/antenna. If the problem persists, 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 is 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)

LED L2 indicates an error on the Broadband path and also flashes with every communication between the module and the panel when there is no error condition present. Normal pattern calls for a series of quick flashes every two seconds in Idle mode or four seconds in PowerSave mode.

Number of flashes	Error and solution
1	Flashes for each communication with the panel, except when LED is displaying a broadband error. This is normal behavior.
2	The module cannot establish a connection with the router. Verify the physical connection/wiring to the router. Verify MAC filtering is disabled on the router or add the module's MAC to the allowed list of MACs on the router. Verify that DHCP is enabled on the router.
3	The module cannot establish a connection with the internet. Verify other devices on the same network can connect, that the panel has AC power, and that there are no special firewall or network management settings running on the router.
4	The module cannot establish communication with Alarm.com. Contact Alarm.com Tech Support.
6	The Alarm.com backend cannot reach module due to an error with the local firewall blocking signals from reaching the module.

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

Note: In Connected Mode, the LED toggles on and off.

LED L5 (yellow)

LED L5 indicates Z-Wave state and errors. See the table below for more information.

Number of flashes	Device status or error
1	Successfully added/removed node (last 60 seconds)
2	Delete Mode
3	Add node attempt failed (last 60 seconds) because device already in network
4	Add Mode
5	Replicate Mode
6	Learn Mode Error (lasts 60 seconds)
7	No Node Info
8	No other nodes are in the network

Various module states (modes)

There are four module states, or modes, as described in the following:

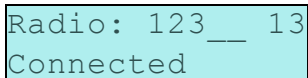
Mode	Description
Idle	AC power is okay and the module is not currently talking to Alarm.com. L1 - Flashes general or cellular errors, if any L2 - Flashes broadband errors, if any; Communication with panel L3 - Communication with radio unit L4 - Signal level (0 to 5 bars) L5 - Flashes Z-Wave state or errors, if any
PowerSave	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 2 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	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 general or cellular errors, if any L2 - Flashes broadband errors, if any; Communication with panel L3 - Communication with Alarm.com L4 - Alternates two seconds on, then two seconds off L5 - Flashes Z-Wave state or errors, if any
Sleep	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 module is powered down for a short period of time, buffered messages from Alarm.com may be received when module power is restored.

Improving wireless signal strength

As you make changes to the module location to improve signal strength, request updated signal readings to verify changes. To request an updated reading, press and hold the “5” key for 2 seconds. In the image below,

the radio has 3 out of 5 bars or 13/31 and is connected to the network.



```
Radio: 123__ 13
Connected
```

Guidelines for optimal wireless signal strength:

- Install the module above ground level, as high up as possible within the structure.
- Install the module near or adjacent to an exterior-facing wall of the structure.
- Do not install the module inside a metal structure or close to large metal objects or ducts.
- Upgrade the antenna. Contact DSC technical support for antenna options.

Walking the customer through new user setup on the web

This section describes how to help your customer set up their website account, and only applies to customers on an interactive service plan with an online account. (Skip this step for customers using the module for wireless signaling only).

Before the customer can configure their website account, the Alarm.com account for that customer must be created on the Dealer Site, and the LTE module associated with the account must be installed successfully.

To log in and access their account, the customer can go to www.alarm.com (or custom dealer website address) to complete the new subscriber setup procedure.

The customer will need the following:

- The web site login and temporary password included on the Alarm.com Welcome Letter, which is generated when the account was created by the dealer
- A list of their system sensors with corresponding zone IDs
- At least one phone number and e-mail address where notifications can be sent

Note: At least one sensor must be learned into the panel to complete the new subscriber setup. If not all sensors and touch screens were learned in before powering up the module, an updated sensor list must be requested by performing a LTE phone test or requesting an updated equipment list from the Dealer Site.

INTERACTIVE SERVICE MENU

Interactive menus

The “Interactive Services” menu can be used to access information about the module, install or remove Z-Wave devices and configure or troubleshoot other interactive features.

The menu will time out after 20 minutes. Refer to the following tables for the menu options.

Installer programming

Press [*][8][Installer Code][851] to enter Interactive Services menu.

Menu	Description
--Alarm.com Module Status	Scroll down through the various Alarm.com module information screens.
--Radio	Signal level, connection status, roaming status, and errors (if any)
--LTE Freq.	LTE frequency used by the module
--SN	Module serial number. Needed to create or troubleshoot an Alarm.com account
--SIM Card	SIM card number. Sometimes needed to troubleshoot an account. Not applicable to CDMA radios
--Version	Module firmware version and sub-version. Example: 181a; 181 = module firmware version, a = subversion
--Advanced - Network	Use only when instructed by Alarm.com Technical Support.
--Z-Wave Setup ¹	This menu is used to add, remove, and troubleshoot Z-Wave devices and networks. To control Z-Wave devices via the Alarm.com website and smart phone apps, you will also need to enable Z-Wave services on the account
--Number of Z-Wave Devices ²	The total number of Z-Wave devices currently known to the module
--Add Z-Wave Device ¹	Press [*] to enter Z-Wave Add Mode. Make sure the device being added is powered up and within 3 to 6 feet of the panel. Refer to the manufacturer's instructions for button presses required to enroll devices
--Remove Z-Wave Device ¹	Press [*] to remove an existing Z-Wave device, or to “reset” a Z-Wave device that was previously learned into a different Z-Wave network. Previously enrolled devices must be reset before they can be enrolled into the module
--Z-Wave Home ID ¹	Press [*] to query the Z-Wave network Home ID. If the ID is 0, verify that the module has communicated with Alarm.com and that the Alarm.com account is set up for Z-Wave.
--Extended Range Option	Press [*] to enable/disable extended range
--Communications Test	Press [*] to perform ADC communication test

User functions

Press [*][6][Master Code] to enter User Functions menu. Then scroll to Interactive Services.

Menu	Description
--Alarm.com Module Status	See Installer Programming section
--Radio	See Installer Programming section
--LTE Freq.	See Installer Programming section

Menu	Description
--SN	See Installer Programming section
--SIM card	See Installer Programming section
--Version	See Installer Programming section
--Advanced - Network	See Installer Programming section
--Z-Wave Setup ¹	See Installer Programming section
--Number of Z-Wave Devices ¹	See Installer Programming section
--Add Z-Wave Device ¹	See Installer Programming section
--Remove Z-Wave Device ¹	See Installer Programming section
--Z-Wave Home ID ¹	See Installer Programming section
--Communication Test	See Installer Programming section

¹ Refer to the Home Automation installation instructions and guides on the Alarm.com Dealer Site for more information on Z-Wave enrollment and troubleshooting.

Limited Warranty

Digital Security Controls warrants the original purchaser that for a period of twelve months from the date of purchase, the product shall be free of defects in materials and workmanship under normal use. During the warranty period, Digital Security Controls shall, at its option, repair or replace any defective product upon return of the product to its factory, at no charge for labour and materials. Any replacement and/or repaired parts are warranted for the remainder of the original warranty or ninety (90) days, whichever is longer. The original purchaser must promptly notify Digital Security Controls in writing that there is defect in material or workmanship, such written notice to be received in all events prior to expiration of the warranty period. There is absolutely no warranty on software and all software products are sold as a user license under the terms of the software license agreement included with the product. The Customer assumes all responsibility for the proper selection, installation, operation and maintenance of any products purchased from DSC. Custom products are only warranted to the extent that they do not function upon delivery. In such cases, DSC can replace or credit at its option.

International Warranty

The warranty for international customers is the same as for any customer within Canada and the United States, with the exception that Digital Security Controls shall not be responsible for any customs fees, taxes, or VAT that may be due.

Warranty Procedure

To obtain service under this warranty, please return the item(s) in question to the point of purchase. All authorized distributors and dealers have a warranty program. Anyone returning goods to Digital Security Controls must first obtain an authorization number. Digital Security Controls will not accept any shipment whatsoever for which prior authorization has not been obtained.

Conditions to Void Warranty

This warranty applies only to defects in parts and workmanship relating to normal use. It does not cover:

- damage incurred in shipping or handling;
- damage caused by disaster such as fire, flood, wind, earthquake or lightning;
- damage due to causes beyond the control of Digital Security Controls such as excessive voltage, mechanical shock or water damage;
- damage caused by unauthorized attachment, alterations, modifications or foreign objects;
- damage caused by peripherals (unless such peripherals were supplied by Digital Security Controls);
- defects caused by failure to provide a suitable installation environment for the products;
- damage caused by use of the products for purposes other than those for which it was designed;
- damage from improper maintenance;
- damage arising out of any other abuse, mishandling or improper application of the products.

Items Not Covered by Warranty

In addition to the items which void the Warranty, the following items shall not be covered by Warranty: (i) freight cost to the repair centre; (ii) products which are not identified with DSC's product label and lot number or serial number; (iii) products disassembled or repaired in such a manner as to adversely affect performance or prevent adequate inspection or testing to verify any warranty claim. Access cards or tags returned for replacement under warranty will be credited or replaced at DSC's option. Products not covered by this warranty, or otherwise out of warranty due to age, misuse, or damage shall be evaluated, and a repair estimate shall be provided. No repair work will be performed

until a valid purchase order is received from the Customer and a Return Merchandise Authorisation number (RMA) is issued by DSC's Customer Service.

Digital Security Controls's liability for failure to repair the product under this warranty after a reasonable number of attempts will be limited to a replacement of the product, as the exclusive remedy for breach of warranty. Under no circumstances shall Digital Security Controls be liable for any special, incidental, or consequential damages based upon breach of warranty, breach of contract, negligence, strict liability, or any other legal theory. Such damages include, but are not limited to, loss of profits, loss of the product or any associated equipment, cost of capital, cost of substitute or replacement equipment, facilities or services, down time, purchaser's time, the claims of third parties, including customers, and injury to property. The laws of some jurisdictions limit or do not allow the disclaimer of consequential damages. If the laws of such a jurisdiction apply to any claim by or against DSC, the limitations and disclaimers contained here shall be to the greatest extent permitted by law. Some states do not allow the exclusion or limitation of incidental or consequential damages, so that the above may not apply to you.

Disclaimer of Warranties

This warranty contains the entire warranty and shall be in lieu of any and all other warranties, whether expressed or implied (including all implied warranties of merchantability or fitness for a particular purpose) And of all other obligations or liabilities on the part of Digital Security Controls Digital Security Controls neither assumes responsibility for, nor authorizes any other person purporting to act on its behalf to modify or to change this warranty, nor to assume for it any other warranty or liability concerning this product.

This disclaimer of warranties and limited warranty are governed by the laws of the province of Ontario, Canada.

Digital Security Controls recommends that the entire system be completely tested on a regular basis. However, despite frequent testing, and due to, but not limited to, criminal tampering or electrical disruption, it is possible for this product to fail to perform as expected.

Installer's Lockout

Any products returned to DSC which have the Installer's Lockout option enabled and exhibit no other problems will be subject to a service charge.

Out of Warranty Repairs

Digital Security Controls will at its option repair or replace out-of-warranty products which are returned to its factory according to the following conditions. Anyone returning goods to Digital Security Controls must first obtain an authorization number. Digital Security Controls will not accept any shipment whatsoever for which prior authorization has not been obtained.

Products which Digital Security Controls determines to be repairable will be repaired and returned. A set fee which Digital Security Controls has predetermined and which may be revised from time to time, will be charged for each unit repaired.

Products which Digital Security Controls determines not to be repairable will be replaced by the nearest equivalent product available at that time. The current market price of the replacement product will be charged for each replacement unit.

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LIMITED WARRANTY

NO WARRANTY - DSC PROVIDES THE SOFTWARE "AS IS" WITHOUT WARRANTY. DSC DOES NOT WARRANT THAT THE SOFTWARE WILL MEET YOUR REQUIREMENTS OR THAT OPERATION OF THE SOFTWARE WILL BE UNINTERRUPTED OR ERROR-FREE.

CHANGES IN OPERATING ENVIRONMENT - DSC shall not be responsible for problems caused by changes in the operating characteristics of the HARDWARE, or for problems in the interaction of the SOFTWARE PRODUCT with non-DSC-SOFTWARE or HARDWARE PRODUCTS.

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DSC recommends that the entire system be completely tested on a regular basis. However, despite frequent testing, and due to, but not limited to, criminal tampering or electrical disruption, it is possible for this SOFTWARE PRODUCT to fail to perform as expected.

Regulatory Information

FCC MODIFICATION STATEMENT

Digital Security Controls has not approved any changes or modifications to this device by the user. Any changes or modifications could void the user's authority to operate the equipment.

Digital Security Controls n'approuve aucune modification apportée à l'appareil par l'utilisateur, quelle qu'en soit la nature. Tout changement ou modification peuvent annuler le droit d'utilisation de l'appareil par l'utilisateur.

ISED CANADA INTERFERENCE STATEMENT

This device complies with Part 15 of the FCC Rules and ISED Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'ISED Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, éme si le brouillage est susceptible d'en compromettre le fonctionnement.

FCC CLASS B DIGITAL DEVICE NOTICE

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 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 experienced radio/television technician for help.

CAN ICES-3 (B) / NMB-3 (B)

FCC/ISED CANADA WIRELESS NOTICE

This equipment complies with FCC and ISED Canada radiation exposure limits set forth for an uncontrolled environment. The antenna should be installed and operated with minimum distance of 20 m between the radiator and your body. The antenna(s) used for this transmitter must not be co-located or operating in conjunction with any other antenna or transmitter, except as described in this user manual.

Cet appareil est conforme aux limites d'exposition aux rayonnements de la IC pour un environnement non contrôlé. L'antenne doit être installée de façon à garder une distance minimale de 20 centimètres entre la source de rayonnements et votre corps. L'antenne (s) utilisée pour cet émetteur ne doit pas être situé ou opérant en conjonction avec une autre antenne ou émetteur, sauf tel que décrit dans ce mode d'emploi.

Antenna gain must be below/Gain de l'antenne doit être ci-dessous:

Carrier	Frequency band (MHz)	Antenna Gain (dBm)
LTE Verizon	700 (B13)	6.94
	AWS1700 (B4)	6.00
LTE AT&T/Telus	1700/1900	3.20
	AWS700/850	4.40

Warning: To satisfy FCC RF exposure requirements for mobile transmitting devices, a separation distance of 20cm or more must be maintained between the antenna of this device and persons during device operation.

For UL/ULC Listed installation the products are intended to be installed in accordance with the following:

- A. NFPA 70, "National Electrical Code."
- B. NFPA 72, "National Fire Alarm Code."
- C. UL 1641, "Installation and Classification of Residential Burglar Alarm Systems."
- D. National Building Code (NBC);
- E. CSA C22.1 - Canadian Electrical Code, Part I;
- F. CAN/ULC-S302 - Standard for Installation and Classification of Burglar Alarm Systems for Financial and Commercial Premises, Safes and Vaults;
- G. CAN/ULC-S540 - Standard for the Installation of Residential Fire Warning Systems;
- H. CAN/ULC- S310 - Standard for the Installation and Classification of Residential Burglary Alarm Systems.
- I. CAN/ULC S301 - Standard for the Signal Receiving Centre Burglar Alarm Systems and Operations
- J. Local Authorities Having Jurisdiction (AHJ).
- K. Manufacturer's Installation Instructions.

For UL Residential Fire and Burglary installations, the TL880LT/TL880LE is listed as a sole means of communication or as a back up when used in conjunction with a POTS line (dialer).

For UL Commercial Burglary installations, the TL880LT/TL880LE is listed as a sole means of communication (supervision window of 200s required at monitoring station) or as a back-up when used in conjunction with a POTS line (dialer).

For ULC Commercial Burglary installations the TL880LE is listed as an active communication system with line security level A1-A4 (90 second check-in signal enabled and 180 second supervision window enabled at monitoring receiver and encryption enabled) and as a passive communication system with communication line security level P1 when used alone or as P2-P3 when used in conjunction with the integrated POTS line (dialer) in the compatible NEO Alarm Control

panels HS2128/HS2064/HS2032/HS2016. The TL880LE can be used in commercial burglary applications up to Security Level IV. For ULC Listed installations refer also to ULC Installation Guide P/N 29002157.

Notes for using Private, Corporate and High Speed Data Networks when using TL880LE: Network access and domain access policies shall be set to restrict unauthorized network access, and "spoofing" or "denial of service" attacks. Select the internet service providers that have redundant servers/systems, back-up power, routers with firewalls enabled and methods to identify and protect against "denial of service" attacks (i.e. via "spoofing").

For ULC Residential Fire and Burglary installations the TL880LE is listed as a sole means of communication or as a back-up when used in conjunction with a POTS line (dialer).

The TL880LT/TL880LE shall be powered from the compatible listed control unit HS2128/HS2064/HS2032/HS2016 or compatible listed power supply HSM2204/HSM2300 that complies with the ratings specified in this manual.

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