ELK-AEXCELLV
Alarm Engine Cellular Communicator for Verizon Network

APPLICATION:

The ELK-AEXCELLV enables Alarm Engine controls to communicate with Central Stations equipped with a Surgard IP receiver and provides a pathway for system communication via the Verizon LTE cellular network. It connects to the RS-485 data bus, with activation and setup managed through the ElkConnect portal. If the IP pathway becomes unavailable, the E27 control automatically communicates over the cellular pathway provided by the AEXCELLV.

SPECIFICATIONS:

Features or Specifications subject to change without notice.

- Operating Power: 13.8 VDC
- Current draw: 60mA normal, 150mA peak
- Includes two antennas, size: 5.375” x 0.938” x 0.438”
- Housing Size: 6.402" x 4.352" x 1.188"

IMPORTANT!
REQUIRES E27 CONTROL FIRMWARE VERSION 0.6.2 OR LATER!

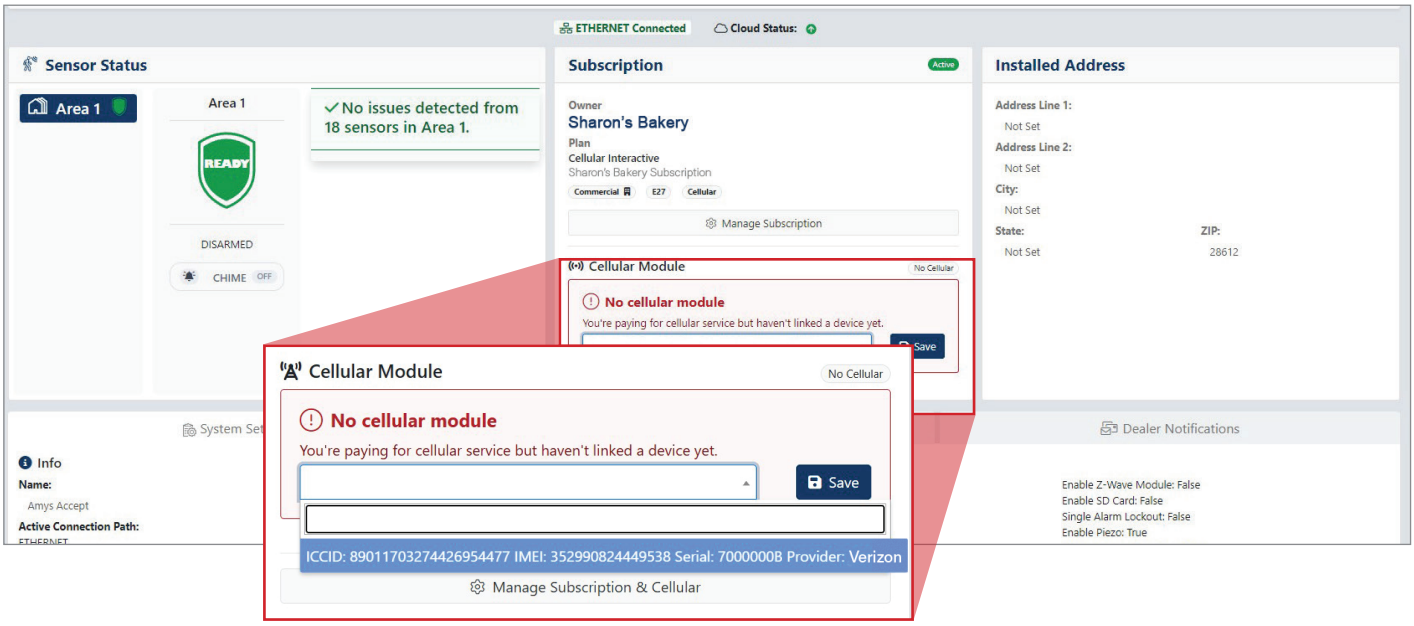
Ensure E27 Control Firmware in up-to-date prior to installation & activation of the ELK-AEXCELLV

CLAIM AND ACTIVATE:

The AEXCELLV requires an E27 with an active subscription in ElkConnect—specifically, a IP Interactive with Cellular plan. For details on creating subscription plans and activating the E27, refer to the E27 & ElkConnect Reference Guide.

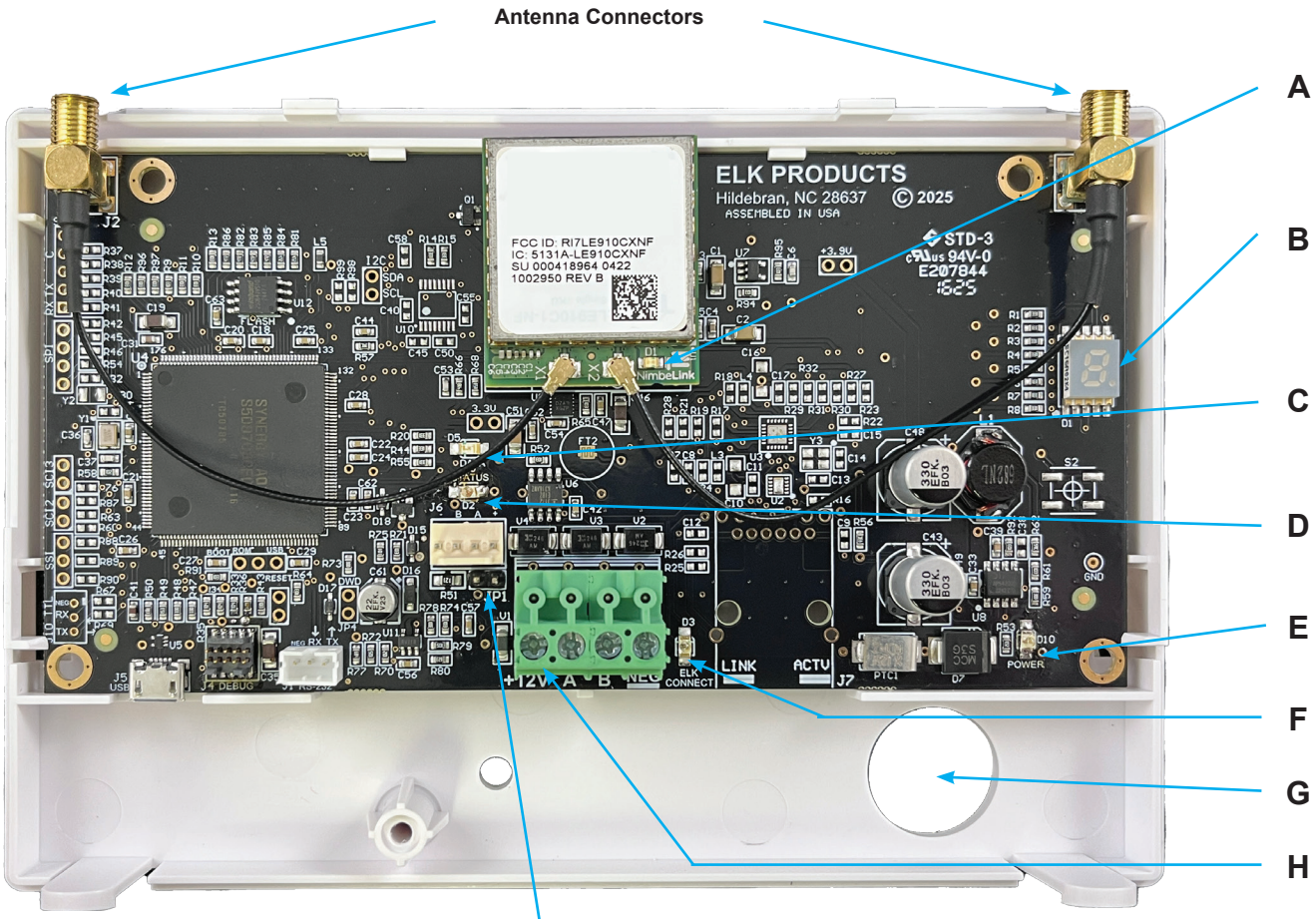
Follow the steps below to claim and activate the cellular communicator in the ElkConnect Portal:

1. Log in to elkconnect.com with Installer credentials.
2. Click Claim New Device.
3. On the Device Registration page, select the Cellular Module tab.
4. Locate the Device Identification label on the AEXCELLV. This label displays the module identification numbers required for registration: Serial Number and Key.
5. Enter the Serial Number and Key into the corresponding fields. Verify the Serial Number and Key have been entered exactly as shown on the device identification label. Then click Register and Setup.



Next, associate the cellular communicator with the E27:

1. Go to the Account page and click on the E27 unit to be associated with the AEXCELLV.
2. When prompted, enter the Installer PIN to authenticate with the E27.
3. Locate the Subscriptions area. If a Cellular Interactive plan has not been activated for this account, click the Add Cellular button and choose a Cellular Interactive plan in the Upgrade to Cellular section. Click the confirmation check button to apply the new plan.
4. If a Cellular Interactive plan has already been selected for this E27, locate the Cellular Module dropdown in the red section of the Subscriptions area and select the desired module (listed by ICCID, IMEI and Serial number). If necessary, use the search field to filter by IMEI, ICCID or serial number. Then click Save to finalize the cellular module activation.



ELK-AEXCELLV BOARD

HARDWARE OVERVIEW:

A. Cell Service Green LED
ON solid = Cell tower within range and unit has established connection
Blinking = limited or no cell service

B. 7 Segment Display
Sequentially displays 1 character at a time to indicate signal strength and error codes. Data is grouped in short packets with a key letter prefix. See Table 1 for details.

C. Data Green LED
Blinking = Cell Communicator enrolled and communicating with E27
ON solid/OFF = Not enrolled and/or not communicating with E27

D. Status Red LED
Blinking = Normal state
ON solid/OFF = Processor trouble

E. Power Red LED
ON solid = Unit is powered on

F. ElkConnect Yellow LED
ON solid = Unit is providing cloud connection via cell to the control

G. Wire Routing Hole

H. RS485 Data Bus Terminals

I. Data Bus Terminating Jumper (JP1)

Table 1
Seven Segment Display Details

Indicator	Description
b	Number of bars will follow, indicating cellular signal strength
d	Cellular module is defaulting
E	Error code will follow

Error Code	Description
E.no	No Errors
E.02	Cellular Radio Not Powered
E.03	SIM Card Error
E.04	Inactive Account
E.06	Not Registered on Cellular Network
E.07	RS485 Data Bus Communication Trouble
E.08	Cellular Modem Not Responding
E.09	No Data over Cellular
E.10	Cloud Trouble
E.11	No Packet Memory

Before installing the Cellular Communicator,
TURN THE E27 MASTER POWER SWITCH OFF.

INSTALLATION INSTRUCTIONS:

See page 5 for Mounting Template and Instructions

ANTENNA INSTALLATION

The AEXCELLV includes two 5G cellular LTE antennas with hinged blades and SMA male connectors. Both antennas are required for proper operation of the communicator. Do not operate the unit with only one antenna installed.

1. Locate the two antenna connectors at the top of the communicator circuit board—one in each corner.
2. Position the first supplied antenna over one connector and carefully thread it onto the connector by hand. Turn clockwise until it is finger-tight. Do not over tighten.
3. Repeat the process with the second supplied antenna on the opposite corner connector.
4. Once both antennas are installed, adjust them as needed using the built-in hinge. The antenna hinges are designed for limited adjustment. Do not force them past their normal range of motion, as this may damage the antenna. For best signal performance, position the antennas vertically and ensure they are not touching metal surfaces or other wiring.

DATA BUS WIRING

CAT5 or CAT6 wire (4 pair, 8 conductor) is highly recommended for all data bus cables and the extra wires may be required for data return paths where multiple home runs or devices are installed. Use 4 conductors to connect terminals BUS +12V, Data A, Data B, and Neg from control to terminals +12V, A, B, and Neg on the AEXCELLV.

Refer to information in the E27 manual for important guidelines for proper termination and wiring of systems with multiple home run connections for data bus devices. Minimum conductor size is 22 or 24 gauge. Maximum resistance per wire is 25 Ohms. **Long wire runs can result in voltage drop that can prevent the AEXCELLV from functioning correctly. If an E02 error occurs, an auxiliary power supply may be required.** Device placement beyond 1000' is not recommended.

POWERING UP FOR THE FIRST TIME

When powered on for the first time, the cellular communicator must complete an initialization process to properly activate the cellular module.

THIS PROCESS IS AUTOMATIC AND MAY TAKE UP TO 10 MINUTES TO COMPLETE.

Please be patient and watch the Cell Service LED and 7 Segment display for indicators of progress as described below.

CELLULAR COMMUNICATOR INITIALIZATION PROCESS

When powered up for the first time, the cellular communicator must complete an initialization process to activate the cellular module. During this process, the module progresses through several stages and communicates with the cellular network to complete activation. Initialization typically takes approximately 3 minutes, but may take up to 10 minutes depending on network conditions. The Cell Service LED and 7-segment display provide visual status indicators throughout this process.

Initialization Stages and Indicators

Initial Default Process
Shortly after power-up, the cellular module is performing its initial default process. This stage may last from 30 seconds to several minutes. The 7-segment display shows a lowercase "d". The Cell Service LED blinks slowly

Countdown Stage
After the initial default process completes, the Cell Service LED continues to blink slowly. The 7-segment display shows a countdown from 5

Network Registration and Configuration
After the countdown completes, the Cell Service LED turns off. The 7-segment display cycles through a series of codes, which may include E02, E06, and E09. During this stage, the Cell Service LED may turn on and off or blink in both fast and slow patterns. The 7-segment display continues cycling error/status codes and may display "b" followed by 0. These indications are normal while the communicator completes network registration and configuration. This stage may last several minutes.

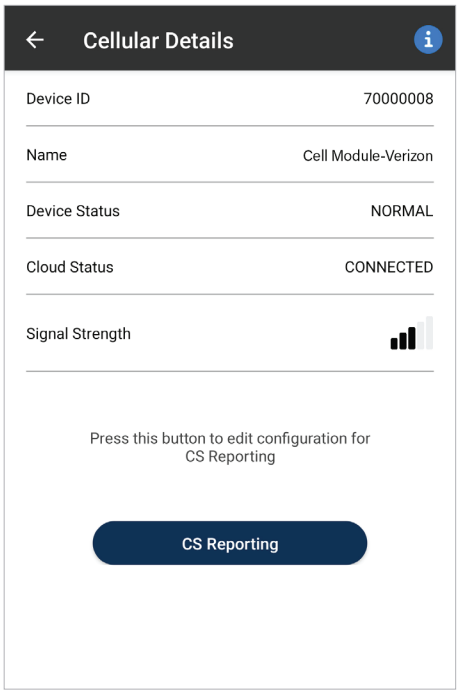
Initialization Complete
Initialization is complete when the Cell Service LED turns on solid and remains on. The 7-segment display shows E.no and "b" followed by a number indicating signal strength. A minimum signal strength of 2 bars is required for reliable operation.

Troubleshooting
If initialization does not complete after 10 minutes, or if the signal strength is less than 2 bars, relocate the cellular communicator to a different location where improved cellular signal can be obtained.

DATA BUS ENROLLMENT

The AEXCELLV will automatically enroll upon power up. Follow the steps below to verify enrollment and view status info.

1. Connect to the E27 panel. Go to Bus Devices from the main menu.
2. Under the Communicators heading, the AEXCELLV should be listed as Cell Module-Verizon.
3. Tap Cell Module-Verizon to view Cellular Details and confirm the Device ID matches the serial number.



The Cellular Details screen displays other helpful information as outlined below:

Device Status: This indicates the current status of the cellular module.

NORMAL:	Cellular module is connected to cellular network
OFFLINE:	Cellular module is unable to connect to cellular network
DEACTIVATED:	Cellular module has not been activated or has been deactivated
UNKNOWN:	Status of cellular module is unknown

Cloud Status: This indicates the current status of the cloud connectivity.

STANDBY:	E27 is connected to the cloud via LAN/Wi-Fi. Cellular communicator is ready to provide cloud connection if LAN/Wi-Fi is lost.
CONNECTED:	E27 is connected to cloud via cellular
OFFLINE:	E27 is not connected to cloud
UNKNOWN:	Cloud status is unknown

Signal Strength: This indicates the current signal strength cellular module in bars.

0 = No Signal
1 = Poor
2 = Fair
3 = Good
4 = Very Good
5 = Excellent

RESETTING THE CELLULAR MODULE

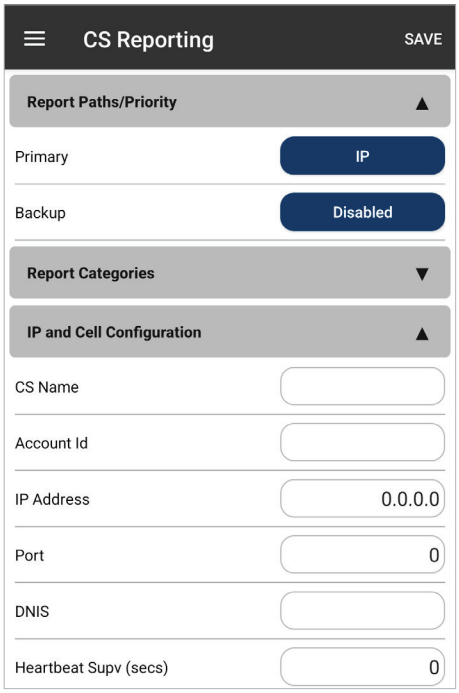
While rare, it may be necessary to reset the cellular module on the AEXCELLV to restore functionality after an unexpected error or fault condition. This operation should be executed only when instructed by Technical Support.

1. Go to Bus Devices from the main menu and select Cell Module-Verizon.
2. On the Cellular Details page, tap the “i” icon in upper right corner
3. On the Details page, tap the Reset Cellular Module button.
4. A confirmation pop-up will appear. To proceed, tap OK. This process can take up to 10 minutes to complete.

CENTRAL STATION REPORTING CONFIGURATION

The AEXCELLV requires no special configuration in the E27. The E27 will automatically detect if the IP path is unavailable and switch over to communicate via the cellular pathway provided by the AEXCELLV.

1. In the CS Reporting section of the ElkConnect App, set the Primary Reporting Path to IP.
2. Review the Reporting Categories to confirm the desired categories are enabled.
3. Under IP and Cell Configuration, verify that the Account ID, CS Receiver IP address/port, and DNIS entries are correct. This information is provided by the Central Station.



For additional details, refer to the CS Reporting section of the E27 & ElkConnect Reference Guide.

LIMITED WARRANTY

The ELK-AEXCELLV Cellular Communicator is warranted to be free from defects and workmanship for a period of 2 years from date of manufacture. Elk makes no warranty, express or implied, including that of merchantability or fitness for any particular purpose with regard to batteries used with wireless devices. Refer to Elk’s website for full warranty statement and details.

FCC AND IC COMPLIANCE STATEMENT:

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.

Changes or modifications not expressly approved by the party responsible for compliance could 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 of the following measures:

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

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada’s licence-exempt RSS(s). 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

L’émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d’Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence. L’exploitation est autorisée aux deux conditions suivantes :

- L’appareil ne doit pas produire de brouillage;
- L’appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d’en compromettre le fonctionnement.

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

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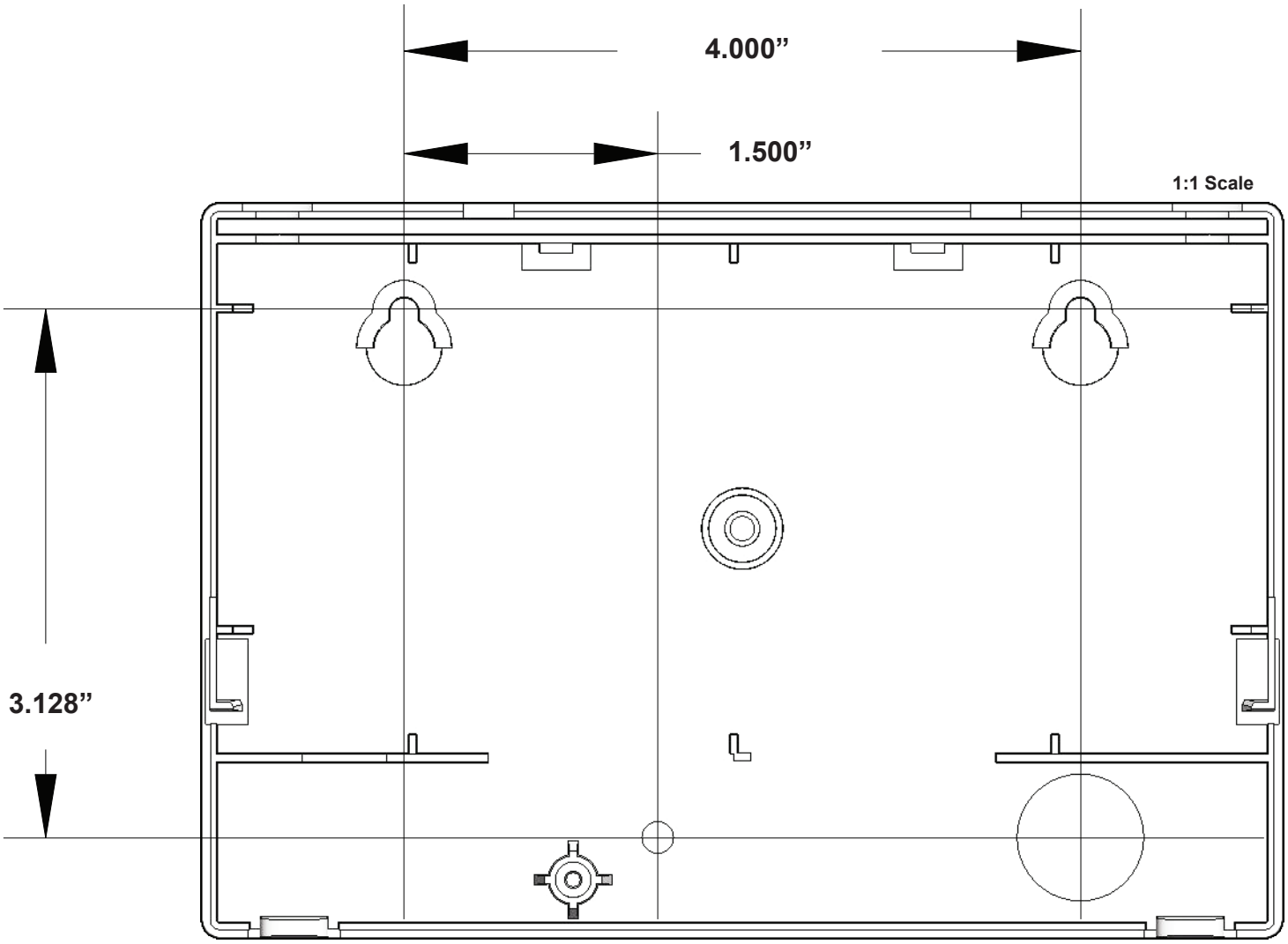
Mounting Template & Instructions for ELK-AEXCELLV Housing



Mounting Location Guidelines

When choosing an appropriate mounting location for the Cellular Communicator, please consider the following guidelines.

- **Environmental conditions:** Mount indoors in a protected area. Avoid areas with excessive heat, humidity, or vibration. Do not mount near HVAC ducts or in direct sunlight.
- **Cellular reception:** Choose a location with strong signal strength. Higher placement in the room generally improves reception. Avoid basements, metal enclosures, or locations surrounded by concrete/brick.
- **Antenna clearance:** Ensure the antennas have adequate space and are not blocked or shielded by metal objects.
- **Distance from interference sources:** Avoid mounting near AC power lines, circuit breakers, fluorescent lights, motors, or other devices that generate electrical noise or RF interference.
- **Accessibility for service:** Install the unit where it can be easily accessed for future maintenance, troubleshooting, or antenna adjustments.
- **Mounting surface:** Choose a solid, stable wall or surface that can support the device and ensure secure screw anchoring.

Follow the steps below for mounting the AEXCELLV housing.

1. Gather tools & parts: the provided hardware pack (containing screws and anchors), drill and appropriate drill bits, screwdriver, pencil, tape measure, and a small level.
2. Remove the front cover from the AEXCELLV housing by locating the two oval-shaped latches on the bottom of the unit. Press inward on both latches while pulling the cover away from the backplate.
3. Hold the backplate in the desired mounting location to get a general reference of where the mounting keyholes will be located. Take into account required clearances and the location of any wiring that needs to come in through the backplate. Using the supplied template or measure directly, mark the two upper screw locations spaced 4.00” (4 inches) apart horizontally. Use a level so those two marks are perfectly horizontal. Mark the lower mounting hole.
4. Drill pilot holes appropriate for the surface and the anchors you will use:
   - For mounting into a stud or solid wood, drill a pilot hole sized for the supplied screws (#6 x 3/4” pan head sheet metal screws)
   - For drywall or masonry walls, install supplied wall anchors (#6 x 0.75” plastic anchors).
5. Install the two upper screws into the top pilot holes/anchors, leaving the screw heads protruding approximately 3/16” (about 5 mm) from the wall — enough for the keyhole slots to catch, but not so far they hold the backplate from the wall.
6. Route any required wiring through the hole in the backplate. Hang the backplate by engaging the keyhole slots over the two screw heads and sliding the plate down until the screws seat in the narrow portion of the keyholes. Make any necessary adjustments to the mounting screws to ensure the backplate is hanging flat with the wall and the screws are not too tight when engaging the keyholes. Ensure that any wiring routed through the backplate is not pinched. Check that the backplate is level.
7. With the backplate hanging and level, install the lower screw through the standard lower hole into the wall or anchor. Tighten this lower screw until the backplate is pulled snug to the wall — do not over tighten (tighten by hand or with light torque to avoid cracking the plastic).
8. After completing wiring and installation, replace the front cover. If desired, secure the front cover to the backplate using the remaining #6 x 3/4” screw. The screw recess is located just below the label on the front cover.