ELK-6040
Wireless Glass Break Sensor

Installation and Setup Guide

APPLICATION & OVERVIEW

The ELK-6040 Wireless Glass Break Sensor is designed for use with control/transceivers that accept Elk's two-way technology; such as the ELK-M1XRFTW. It incorporates many features designed to ensure its reliable performance.

The 6040 listens for actual patterns of breaking glass across the full audio band using Pattern Recognition Technology™. The factory set recognition patterns make it possible to detect the difference between breaking glass of framed perimeter windows in a building vs. a drinking glass breaking within a room.

The built-in two-way radio (RF) transmits alarm, supervisory, and low battery messages to the control/receiver. Each sensor has a unique TXID number that is enrolled into the control during installation. With its two-way capability, the sensor listens after every transmission for a positive acknowledgment from the control. This makes it very energy efficient since it does not waste energy repeating transmissions unless they are not acknowledged.

A simple hand clap test feature lets the user confirm that the sensor is operational. A handheld glass break tester (not supplied) can be used to place the sensor into range and functional test mode.

The product is suitable for use in quiet occupied areas on a perimeter defined zone. It is intended for residential indoor dwelling unit applications and other areas approved by the authority having jurisdiction (AHJ). It is not intended for use in industrial applications.

ABOUT THIS GUIDE

This Guide describes the installation, operation, and maintenance of this product. Keep this document in a handy location and refer to it for answers regarding the products functions or features. Reading this guide is the only way to learn how to use your product wisely and to know how to react in the event of an alarm.

PACKAGE CONTENTS

  6040 Wireless Glass Break sensor
  CR123A Lithium Battery
  Mounting Screws and Anchors
  Installation Guide

FEATURES

• Pattern Recognition Technology™
• Wireless two-way communication
• Operation Alarm LED - RED (viewable from front)
• RF Acknowledge LED - Bi-Color (viewable with cover off)
• Long life Lithium battery {supplied}
• Low battery trouble signal
• Periodic Supervisory check-in

SPECIFICATIONS

• Dimensions: 4.25"W x 3.13"H x 1.70"D
• Sensor: Omni-directional Microphone, 360° Detection Range
• Detection Range: 20 ft. (6m) x 360°
• Min. Distance from Glass: 4 ft. (1.2m)
• Glass Thickness:
    Plate   3/32 to 1/4 in. (2.4 to 6.4mm)
    Tempered 1/8 to 1/4 in. (3.2 to 6.4mm)
    Wired   1/4 in. (6.4mm)
    Laminated 1/8 to 1/4 in. (3.2 to 6.4mm)
• Power: One CR123 3.0 VDC Lithium Bttery
• Quiescent Current: 25 μA (typically)
• Battery Life: 5 years
• RF Frequency: 902 - 928 Mhz channel hopping
• Supervisory check-in interval: ~64 minutes
• Storage temperature: -4 to +140° F (-20 to 60° C)
• Operating Environment: 32° to +120° F (0 to 49° C)
• Relative Humidity: 93% RH (max.), non-condensing

™ Pattern Recognition Technology is a registered trademark of Edwards, a UTC Fire and Security company.

ELK
PRODUCTS, INC.

1. GUIDELINES FOR USE

This sensor is a member of a reliable, high-quality product family using the latest technology available. Please review the information in this section to ensure you get the most out of the product.

The sensor must always be in direct line of sight of all windows to be protected. It is not possible for the sensor to consistently detect breaking glass around corners or in another room.

Wall mount

For wall applications mount the sensor on a wall facing (opposite) the glass to be protected. Direct line of sight is important. Do not exceed the max. operating distance. An adjoining perpendicular (90°) wall which conforms to same criteria may also be used. Orientation of the sensor (sideways, upside down, etc.) is not critical.

Ceiling mount

For ceiling applications mount the sensor so that it has a direct line of sight to the glass being protected. However, since sound travels directionally out from a broken window, a position of around 8 ft. (2.4 m) into the room provides better detection.
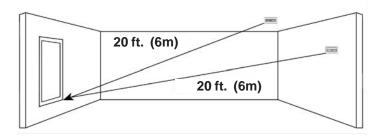
Use the following guidelines to determine the best mounting location:
- Mount the sensor at least 3.3 ft. (1 m) from the windows being protected and at least 4 ft. (1.2 m) from noise sources such as TVs, speakers, sinks, and doors.
- Mount the sensor in the direct line of sight of the glass to be protected.
- Mount the sensor in a suitable environment: see specifications for temperature and humidity ranges..
- Mount the sensor on a stable surface no greater than 25 ft. (7.6 m) from the farthest point on the glass surface.

2. RECOMMENDED LOCATIONS AND OPERATING RANGE

The sensor is omni-directional, providing 360° coverage. Coverage range is measured from the sensor to the point on the glass farthest from the sensor. The sensor can be mounted as close as 3.3 ft. (1 m) from the glass. The maximum range may vary depending on the type of glass being protected:

- **Plate, tempered, laminated, & wired glass** - Mount sensor on ceiling or the opposite/adjoining wall, maximum range is 20 ft. (6 m).

20 ft. (6m)

20 ft. (6m)

LOCATIONS TO AVOID

Improper location can affect the sensitive electronic components in this product. To avoid causing damage to the product, to provide optimum performance, and to prevent unnecessary nuisance alarms:
- Avoid rooms smaller than 10 x 10 ft. (3m x 3m).
- Avoid locations where lined, insulating, or sound-deadening drapes or closed wooden shutters are used.
- Avoid mounting in the corner of a room.
- Do not install the sensor in humid rooms. Excess moisture on the circuit board can eventually cause a short and a false alarm.
- Avoid locations that might expose the sensor to possible false alarm sources such as:
  - glass airlocks and vestibule areas
  - kitchens and bathrooms
  - corner mounting
  - residential car garages
  - small utility rooms
  - stairwells
  - small acoustically live rooms
  - locations exposed to white noise, such as air compressors, etc.

It is recommended that the ELK-6040 be located within 100 feet of the M1 Control or M1XRFTW Transceiver. While an open-air range of 400 feet or more is possible, adverse indoor and environmental conditions can significantly reduce the actual transmission range. Small changes to the sensor's mounting can often make a big difference in transmission range.

DO NOT mount a wireless sensor near metal duct work or other large metallic surfaces that might shield or adversely affect the RF signals. Prior to permanent mounting, we recommended a walk test be performed with the control/transceiver to verify acceptable operation of the wireless sensor at its intended location.

3. MOUNTING THE SENSOR

This product can be wall mounted or ceiling mounted.

3.1 Disconnect any alarm notification appliances, service related devices, and extinguishing systems. Functionally test the sensor in its intended location to verify the communications between it and the M1 Control. It is very important to confirm that the sensor is within adequate range of the M1 Control/Transceiver prior to permanently mounting.

Refer to **Test Method #3 - Functional Test** later in this guide.
- Hold the product in the intended mounting location or temporarily mount it using some form of removable fastener.
- Confirm that the test signals from the sensor reach the control. If no signal is received or if the RF signal is low, try relocating the sensor to another location and retest.

3.2 After testing has been confirmed, mount the sensor and sensor base as follows:
- Remove the screw located in the front.
- Remove the top cover by using a flat bladed tool in the screw location to pry open the top cover.
- Locate the mounting location and drill holes in base per the mounting impression in the base.
- Use the anchors and screws to secure the product to the mounting surface.

3.3 Replace the product's top cover:
- Snap the top onto the base.
- Replace the screw into the front location.

4. BASIC OPERATION

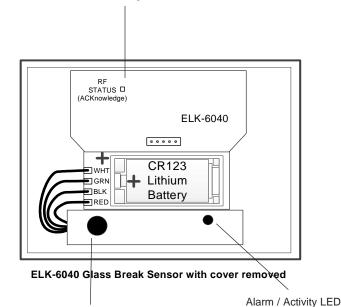This product is equipped with an intuitive normal mode operation.

- In normal operation, the red LED will generally remain OFF.
- The wake up test will cause the red LED to illuminate two blinks.
- In response to an alarm the red LED will stay ON for approximately 4 seconds. The RF transmitter will send the alarm to the Control.
- In a trouble or maintenance required condition the red LED will not illuminate in response to the wake up test.
- In a trouble condition such as low battery the sensor will send an RF transmission to the Control.

<u>**RF ACKNOWLEDGE LED**</u>

This bi-color LED IS located on the bare circuit board near the upper left side. It provides visual confirmation of the two-way acknowledge (response) from the control/transceiver and can only be viewed by removing the sensor cover.

GREEN blink = Sensor successfully transmitted a violation (alarm) and that signal was received and acknowledged by the transceiver. A green blink is not provided for a sensor restore transmission..

ORG/RED blink = Sensor was not successful and did not get acknowledged by the transceiver. **POSSIBLE CAUSES:** a) the Control or M1XRFTW is powered off. b) the M1XRFTW is not enrolled with control. c) the sensor is not enrolled. d) the distance between the sensor and the transceiver is too great. Check the following:

A. Verify that the M1 Control is powered on.
B. Verify that the M1XRFTW Transceiver is powered on and that it is enrolled with the M1.
C. Verify that the sensor is properly enrolled.
D. Trip another wireless sensor to see it can successfully communicate.
E. If above steps are OK, temporarily move the failed sensor closer to the transceiver and retest. If sensor successfully communicates at the closer range then it may be necessary to:

- Relocate the transceiver to a closer and more central location to this and all other sensors.
                    OR
- Purchase and install an additional "remote" transceiver to cover the area where this sensor was mounted.

5.   INSTALLING / REPLACING BATTERY

The 6040 sensor uses a single CR123A Lithium battery. The estimated service life is 5 years in a typical residential installation.

The Battery is supervised for low voltage. When the sensor detects the voltage has reached 2.6 VDC or less (under load), a Sensor Low Battery trouble will be transmitted to the control/transceiver. This trouble will be attached to all future transmissions until a fresh battery is installed.

When the Control indicates that it is time to replace the sensor battery, remove the old battery and <u>WAIT AT LEAST 20 seconds before installing new battery</u>. This time is necessary to clear and reset the low battery condition from the sensor memory. After the new battery has been installed, trip the sensor a couple of times. This should send an "all good" to the Control and clear the low battery trouble.

Use only approved 3V Lithiums. Replacements can be obtained from any local Alarm Distributor.

Note: Place the control panel into sensor test mode prior to replacing the battery. If the control panel is not in sensor test mode during battery replacement, an alarm condition may be indicated.

5.1 Remove the product top cover.
5.2 Remove the old battery and properly dispose of it as recommended by the battery manufacturer.
5.3 **WAIT AT LEAST 20 SECONDS** before installing new battery.
5.4 **Observe correct polarity** when installing the new battery. Insert the battery positive (+) terminal so that it points towards the (+) symbol printed on the circuit board. Be careful not to bend or damage the metal battery holder contacts.
5.5 Replace the top cover.
5.6 Replace the front screw.
5.7 Re-test sensor operation with the control.

Approved 3.0 Lithium Batteries are:
- Panasonic CR123A
- Duracell DL123A
- Varta CR123A.

RF ACKnowledge LED

RF
STATUS ☐
(ACKnowledge)

ELK-6040

WHT
GRN
BLK
RED

CR123
Lithium
Battery

ELK-6040 Glass Break Sensor with cover removed

Alarm / Activity LED

Sensor Microphone

6.   ENROLLING A SENSOR USING THE M1 KEYPAD

6.1   Make sure the M1XRFTW Transceiver is powered and enrolled with the M1 Control.

6.2   Enter **M1 Keypad Installer Programming** and go to Menu: **14-Wireless Setup**

6.3   Scroll up to sub-menu:**3:Learn Sel Wireless Transmtr** and press **Sel**ect (right arrow).

6.4   Scroll to and select an unassigned **WZone** (wireless zone) and press **Learn** (right arrow) to enroll.

6.5   Insert the Battery into the sensor when the keypad displays: **Push Transmitter Button** and the M1G speaks; "Press transmitter button for zone xx"). Upon successful enrollment the Keypad will chime and briefly display the 6 digit TXID printed on the sensor. If the TXID of the sensor does not display then enrollment was unsuccessful. **To attempt enrollment again you must remove the battery and wait at least 20 seconds before re-inserting.**

Rapid-Enroll will auto advance to the next wireless zone in sequence and wait for a new sensor. Repeat the previous step for each sensor.

6.6   After all wireless sensors are enrolled, press the ELK or Select Wireless key to stop Rapid-Enroll.

6.7   Set the Loop ID. Scroll to each 6040 wireless zone and press the HW (left arrow) button. An 8 digit number (TXID in decimal) will display followed by Loop = 0. Move the cursor to the right (press RIGHT arrow) and **enter a "2" for the Loop ID** . This is VERY IMPORTANT! Press the ELK key to return back to the wireless zone display. Loop ID informs the M1 how to handle the input transmission. The 6040 Glass Break sensor MUST be set as Loop "2". NOTE: The M1 default for all wireless zones is Loop "0".

6.8   Set Supervision Type - Set this to "1" (Normal Supervision). Press the ELK or the Select Wireless key to locate Sub-Menu: **2:Xmit Transmitter Opt**. Scroll to the desired wireless zone and press Select (right arrow). Scroll to Option **2: Supervision Type** and set it to "1". The control will now expect a supervisory check-in report every 64 minutes. If set to "0" the control will not expect a supervisory check-in from the sensor. NOTE: A separate M1 option sets the number of missed supervisory check-ins before a sensor is declared missing.

6.9   PIR Auto Restore - **DISREGARD**

6.10   **PROGRAM THE ZONE DEFINITION** - This must be done from Keypad Menu **5 - Zone Definitions**.

7.   ENROLLING A SENSOR USING ELKRP

7.1   Launch the ElkRP PC software and open the Customer Account file.

7.2   Click the "+" next to Zones (Inputs) to expand the view. Look for any existing wireless zone groups. If there are none it will be necessary to add or create a new group. To create a wireless group, right click on **Zones (Inputs)** and click **New Wireless Zones**. Place a check mark in the box to be added, starting with Group 2. Click OK. Repeat if more wireless groups are required.

NOTE: The M1 Control requires all expanded zones to be defined in groups of 16. E.G. Zones 17-32 = Group 2, zones 33-48 = Group 3, etc. **Since the first M1XRFTW Two-Way Transceiver must always be enrolled at databus address 2 (the first expander),** this means that the first group of wireless sensors should be defined as group 2. Since M1 allows a maximum of 144 wireless zones, the last potential wireless zone can never be higher than Zone 160. If a large number wireless zones is anticipated, it would be a good idea to avoid conflict with any future Hardwired Zones in the 17 to 160 range by NOT enrolling any Hardwired Zone Expanders (M1XIN) at any data bus addresses below 10.

7.3   Double click on **Wireless - Group** _ (the group just added) and double click one zone at a time to define the Zone Name, Definition, Type, Attributes, etc.

7.4   The next step is to enter the sensor's TXID and the other wireless setup data. This may be done directly from each zone definition screen (click the **Wireless Setup** button) OR from the separate Wireless Setup menu accessed from the folders column.

7.5   Place a check mark in the **Enabled** box.

7.6   Set Supervision type to "1" (Normal Supervision) for the 6040 Sensor. A setting of "0" means the control will not expect a supervisory check-in from the sensor. For additional details refer to paragraph 6.8.

7.7   PIR Auto Restore - **DISREGARD**

7.8   Skip to the **TXID** box and enter the Sensor TXID that is printed on the small label attached to the sensor.

7.9   Skip to the **LOOP** box and enter a 2.

7.10   Click **Save**. Repeat the entire step 4 for each additional Wireless Zone and Sensor.

7.11   **PROGRAM THE ZONE DEFINITION**

8. TESTING

It is imperative that this sensor be tested during and after installation. In addition, it should be tested in its installed location at least annually.

⚠ WARNING: The M1 Control should be placed into the Walk Test mode prior to conducting any sensor tests. This will aid in the testing as well as help prevent false alarms and unintentional central station reporting.

M1 Walk Test mode is activated via Keypad User Menu **3 - Walk Test Area**. As each sensor is tripped the keypad will chime and display the zone number and name description.

There are two (2) methods for testing this sensor

8.1 Test Method #1 - Wake Up Test

A loud hand clap in the immediate vicinity of the detector is designed to cause a wake up of the electronics and provide two (2) quick blinks of the LED for confirmation. This quick test only verifies that the sensor is receiving power and its microphone and circuitry are working. This test does not trigger an alarm or cause any RF transmission to the Control and it does not significantly affect the battery life.

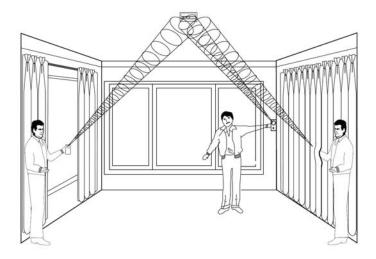### 8.2 Test Method #2 - Functional Test

This test requires a UTC 5709C (or equivalent) handheld glass break tester. The sensor must be placed into a special glass break test mode using the tester and the steps outlined below.

Note: This sensor is designed to detect the breaking of framed glass mounted in an outside wall, separating the inside environment from the outside. The sensor typically does not trip to glass being broken inside the room or the premises. It should also be noted that breaking of unframed glass, bottles, etc. typically does not trip the sensor and is definitely not recommended for testing purposes. The sensor's Pattern Recognition Technology™ is intentionally designed to ignore most false alarm sounds, including that of glass break testers. In fact, the sensor must be placed into a special test mode prior to using the glass break tester. This special test mode disables the glass break pattern processing in the upper and lower frequencies, restricting the sensor to listening only for the mid-range frequencies that the 5709C hand-held tester reproduces. It is the mid-range frequencies that determine the sensor range.

Activate the sensor's **built-in Glass Break tester mode** as follows:

A. Turn on the M1 Walk Test mode from the M1 Keypad. This is local only and will not transmit signals to the monitoring station.

B. Set the 5709C tester to the tempered glass mode setting.

C. Hold the speaker on the handheld tester close to the sensor microphone and press the test button labeled "Single."
This should cause the sensor to go into alarm and the LED to illuminate for 2-3 secs. If not, press the test button again.

D. The M1 Walk Test mode should cause the Keypad to beep and display the zone number/name belonging to this sensor.

E. The LED on the sensor will blink for the one (1) minute duration of the glass break tester mode. The one (1) minute time will restart with each activation of the glass break tester.

F. Hold the 5709C Tester near the surface of the glass that is within the coverage range of the sensor. Aim the speaker at the sensor. Make sure the tester is at the point on the glass farthest from the detector. If closed drapes or curtains are present, hold the tester behind them.

NOTE: The 5709C tester has a settings for three (3) types of glass. Set the tester for tempered or laminated glass unless you are certain that all the glass to be protected is plate glass.

G. Press the handheld tester button labeled "Single."
   The expected and proper results are:
   - The LED on the sensor should illuminate SOLID ON for 4 seconds.
   - The M1 Keypad should beep and display the sensor zone number.

   If these results do not occur:
   - Check the battery strength in the handheld tester. A fresh new battery in the handheld tester will often improve results.
   - Move the sensor mounting location closer to the glass

                    OR

   - Adding additional glass break sensors may be required in order to to achieve adequate coverage

H. When satisfied with the test results press the " * " button on the M1 Keypad to exit the Walk Test mode. The sensor will automatically return to normal mode approximately one (1) minute after it hears the last test activation from the handheld tester. In normal mode the sensor LED does not blink unless it hears a loud sound. In normal mode the sensor will not trip to the tester, unless the tester is held very close to the sensor. Each time the sensor alarms, it also goes into the test mode for one (1) minute.

Note: Room acoustics can affect the sensor range and even artificially extend it beyond the specified maximum range during on-site testing. The maximum range of the sensor has been established for worst-case conditions. While the sensor might occasionally function at additional range, it could also miss a breakage event, particularly if the output volume were minimum. The room acoustic might also change at some future time and cause the range to be decreased back to its specified range. DO NOT EXCEED the specified range of the sensor, regardless of what the on-site testing results may show.

9. MAINTENANCE

This product is design for a long service life. While the Control generally provides indications when it is time to service this product, several annual and random checks or tests are recommended.

Annual   -   Perform a Glass Break Functional Test

Random   -   Visually check that the Alarm LED flashes when activated by the Wake Up Test

Besides Alarm indications the Control also provides Missing Transmitter and Transmitter Low Battery indications.

Missing
Transmitter - The supervisory check-in signal from the sensor has not reached the Control within the assigned supervisory check interval. This could mean that the sensor has been removed from the premises, or its battery has been removed, or that it is experiencing some other type of fault condition. Technical service and/or corrective action is required.

Transmitter
Low Battery - The Battery voltage has reached a low voltage threshold and must be replaced soon in order to maintain proper operation.

In General
To keep this product in good working order:
- Vacuum or dust the cover of the product once a month to remove accumulated dust.
- NEVER use detergents or solvents to clean the product. Chemicals can permanently damage or temporarily contaminate the sensor.
- Avoid spraying air fresheners, hair spray, paint, or other aerosols near the product.
- NEVER paint the product. Paint will seal the sensor opening and interfere with proper sensor operation.

10. TROUBLESHOOTING

Product does not power up properly or reports low battery
- Check the battery to make sure it is fully seated within the battery compartment and that the polarity is correct.
- Check the battery voltage (3.0 VDC nominal).

Control Panel does not respond
- Check the control panel programming to verify that the sensor is enrolled (TXID number) and the zone is defined.
- Check another wireless sensor to see if the control responds to it.
- Verify that the control and transceiver are powered up and operating properly.

Alarm/open condition does not restore
- Check the battery and/or battery voltage.
- Does the sensor Alarm LED react to a Walk Up Test? (see test Method #1 from section 8.1)
  If so, remove the sensor cover and perform a Functional Test (see test method #2 from section 8.2) while observing the RF Status (ACKnowledge) LED. This will require a UTC 5709C (or equivalent) handheld glass break tester. Each time the test is performed the RF Status LED should blink once for the alarm transmission/reply, and a second blink a few seconds later. This second blink is the sensor restoral transmission/reply.
- Check the control panel programming to verify that the sensor is enrolled (TXID number) and the zone is defined.

11. DELETING THE SENSOR FROM THE CONTROL

Deleting a sensor from the Control removes it from being monitored by the customer's system. This is not the same as bypassing a sensor. You should delete a sensor only if it is being permanently removed from the premises.

To delete a sensor from the Control there are three (3) steps in the Control programming sections that must be addressed:

11.1 In the Zone Definitions menu locate the zone to which the sensor belongs and change the Zone definition to "0 - Unused"

11.2 In the Wireless programming menu locate the "Enable Transmitter" option for the sensor and uncheck (clear) that option.

11.3 In the Wireless programming menu locate the TXID for the sensor and clear it (make it all zeros).

NOTE: If this sensor's zone was faulted (in a violated state) before it was deleted then the zone will likely still be faulted. Exiting from the keypad programming mode generally causes a restart and should clear the fault. If it does not, power cycling the control is another way to clear it.

LIMITATIONS
While the 6040 Wireless Glass Break sensor is a highly reliable intrusion detection device, it does not offer guaranteed protection against burglary. Any intrusion detection device is subject to compromise or failure to warn for a variety of reasons:

Glassbreak sensors cannot consistently detect glass breaking around corners or in other rooms.

The radio transceiver only provides communications. It does not have anything to do with detecting the breaking of glass.

The 6040 Wireless Glassbreak is not a Life Safety device.

LIMITED WARRANTY
The 6040 Wireless Glass Break Sensor is warranted to be free from defects and workmanship for a period of 2 years from date of manufacture. Batteries used with wireless devices are not warranted. 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.

BATTERY WARNING: Risk of fire, explosion and burns. Do not attempt to recharge or disassemble. Do not incinerate or expose to heat above 212° F (100° C). Dispose of used batteries properly. Keep away from children.

FCC AND IC COMPLIANCE STATEMENT:
This device complies with Part 15 of the FCC Rules and Industry Canada License-Exempt RSS Standards. 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.

Le présent appareil est conforme aux CNR d'Industrie 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, même si le brouillage est susceptible d'en compromettre le fonctionnement.

ELK-6040 Wireless Glass Break   **FCC ID: TMAELK-6040**
                                              IC: 4353A-6040

NOTE: ELK PRODUCTS IS NOT RESPONSIBLE FOR ANY CHANGES OR MODIFICATIONS NOT EXPRESSLY APPROVED BY THE PARTY RESPONSIBLE FOR COMPLIANCE. SUCH MODIFICATIONS COULD VOID THE USER'S AUTHORITY TO OPERATE THE EQUIPMENT.

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Page 6   ELK-6040 Glass Break Installation Manual