LS2400

User Manual

- DRAFT -

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Version 1.00

FCC ID/DOC for the LS2400T Controller:

FCC ID: JM7-HWHY-662110
IC: 2683A-662110

Compliance Statement (Part 15.19)
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.

Warning (Part 15.21)
Changes or modification not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This device complies with Industry 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'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

FCC ID/DOC for the LS2400T Sensor:

FCC ID: JM7-IGWT-662002
IC: 2683A-662002

Compliance Statement (Part 15.19)
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.

FCC ID/DOC for the S-TAD:

FCC ID: JM7-IGWT-662008
Canada IC: 2683A-662008

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.

Contents

- DRAFT -

User Manual

Chapter 1:

LS2400 System

IMPORTANT:

No Security System can replace human vigilance. Creating a safe environment requires the combined efforts of nursing, physicians, security, and patients. Global policies, procedures, and processes on patient care should be discussed and disseminated. Education, communication, and coordination are key. No level of security can replace an informed and knowledgeable staff. Any electronic or physical security system should be considered as a supplemental deterrent, but by no means an end-all.

- DRAFT -

The LS2400 System

- Alarms
- How Accutech Systems Work
- Addressing Alarms
- Escorting

The function of the LS2400 System is to alert facility personnel of the possible egress of a monitored resident.

The LS2400 can be utilized for special care residents suffering from wandering malady or tendencies of straying into unauthorized areas or leaving a facility, pediatric patients, asset security, and/or infant security. The system is designed so that each monitored zone is a stand-alone system.

When a Tag enters a monitored zone, the system can automatically:

- lock doors
- deactivate elevators
- sound alarms
- flash strobe lights
- trigger visual displays

Virtually any hallway, doorway, stairwell, or elevator can be made to sense a Tag and then trigger audial and/or visual alarms to prompt a staff response.

By adding options, most egress opportunities can be eliminated without restricting staff, visitors, and non-monitored residents movement.

Additional options that further enhance your ability to prevent unescorted egress include:

- Magnetic Lock(s)
- Elevator Deactivation Unit(s)
- Central Alarm
- Loiter Alarm
- Door Ajar alarm
- Staff Alert Panels (SAPs)
- Graphic Displays Panels (GDPs)

Alarms

- Egress
- Door Ajar (Optional)
- Loiter (Optional)
- Supervisor
- Tamper

NOTE: In this manual, Egress alarms are referred to as "Alarms." Other alarm types are referred to by name (i.e., Door Ajar, Loiter, Supervisor, Band Alarm).

Egress

An alarm (i.e., an Egress alarm) occurs whenever a Tag enters a monitored zone ***and*** the door is opened *or* a PIR is tripped.

Door Ajar (Optional)

A Door Ajar alarm occurs when a door is open for longer than the preset time (adjustable).

Loiter (Optional)

A Loiter alarm occurs when a Tag lingers in a monitored zone for longer than the preset time (adjustable).

Supervisor

A Supervisor alarm occurs when the performance of the system has been altered due to tampering or inadvertent acts such as cut wires, antenna damage, or interference.

Tamper

The LS2400 System cover panel has been tampered, removed, or obstructed.

How Accutech Systems Work

- Double-conditioning
- Door zones
- Elevator zones
- Hallway zones

This section explains how Accutech Systems react to a Tag entering a monitored door, elevator, or hallway as well as alarm definitions.

Double conditioning

At most zones, two conditions are required to generate an alarm. For example, at a door zone, a Tag must be detected in the zone *and* the door opened or, in hallway zones, a Tag must be detected in the zone *and* PIR detection to generate an alarm. Double conditioning (set during installation) helps prevent nuisance alarms.

Door zones

When a Tag enters a monitored door zone, the system will detect the Tag. At that moment (provided the door is closed, has a Magnetic Lock(s), and the Lock is unobstructed) the Magnetic Lock will energize, locking the door. The Lock will remain locked for as long as the Tag is in the monitored zone. When the Tag leaves the monitored zone, the door will unlock after an adjustable period of time (unless it is set to latch when an alarm occurs).

Egress
If a Tag enters a monitored door zone with or without a Magnetic Lock(s) and the door is already open (or is opened while the Tag is in the zone), the LS2400 System will go into alarm.

Loiter
An optional Loiter function is available to alert staff personnel if a Tag is lingering in a monitored zone. The time setting is adjustable (10-110 seconds) and is factory set for approximately 15 seconds.

Door Ajar
An optional Door Ajar function is also available to alert staff personnel if the door in a monitored zone has been held open for too long. The time range can be set for immediate or from 10 to 110 seconds and is factory set for approximately 15 seconds.

Elevator zones

Elevator Deactivation Circuitry restricts the wearer of a Tag from using an elevator.

Egress
If a Tag enters a monitored elevator zone, the elevator's call button on that floor will be deactivated (Call buttons on other floors are unaffected and no one is restricted from coming to the floor).

When a Tag is in the zone and the elevator doors are closed, the doors will remained closed. When a Tag is in the zone (or approaches the zone) and the elevator doors are open, the doors will remain open and an alarm will sound.

If the elevator car is en route to the floor when a Tag approaches the zone, the elevator will arrive on the floor, the door(s) will open, and the system will alarm.

Hallway zones

Egress
If a Tag enters a monitored hallway zone, the system will detect the Tag and the PIR will detect motion. The system can then sound alarms, trigger visual displays and, in special circumstances, lock nearby doors.

Addressing Alarms

- Addressing Egress alarms
- Addressing Door Ajar alarms
- Addressing Loiter alarms
- Addressing Supervisor alarms
- Addressing Tamper alarms

NOTE:
Whenever an alarm occurs, always **go to the alarm location** to address the alarm.

Addressing Egress alarms

An Egress alarm occurs whenever a Tag enters a monitored zone ***and*** the door is opened *or* a PIR is tripped.

When an Egress alarm occurs:

1. Go to the alarm location and take appropriate action.
2. After taking appropriate action, you may clear the alarm by entering a valid code into the zone Keypad and, if necessary, clear the alarm on the PC.

Addressing Door Ajar alarms

A Door Ajar alarm occurs when a door is open for longer than the preset allotted time.

When a Door Ajar alarm occurs:

1. Go to the alarm location and check to see if the door is propped open or not completely closed.
2. Close the door completely.
3. The system may automatically reset or, if necessary, enter a valid code into the zone Keypad and/or clear the alarm on the PC.

Addressing Loiter alarms

A Loiter alarm occurs when a Tag lingers in a monitored zone for longer than the preset allotted time.

When a Loiter alarm occurs:

1. Go to the alarm location and check the following:
    a. If a person is loitering in that zone's Tag Activation Field?
    b. Is a Tag from an adjacent room being activated by this zone? If so, call your service technician for help in addressing this issue.
    c. Is there is a misplaced Tag in the zone?
2. After removing the cause, the system may automatically reset or, if necessary, enter a valid code into the Keypad and/or clear the alarm on the PC.

Addressing Supervisor alarms

A Supervisor alarm occurs when the performance of the system has been altered due to tampering or inadvertent acts such as cut wires, antenna damage, or interference.

When a Supervisor alarm occurs:

1. Go to the alarm location and look for visible damage to the Accutech equipment.
2. Check for and remove any objects near the zone equipment that may be causing interference (metal carts, monitors or other medical equipment as well as personnel using wireless communication devices).
3. If you locate and correct the cause, the Supervisor alarm will cease. If necessary, clear the alarm on the PC.
4. If not, call your service technician for further assistance.
   NOTE: Receiver-related supervise events can be reset by the Keypad for the duration of the supervise interval. This will silence the alarm for up to 16 hours.

Addressing Tamper alarms

A Loiter alarm occurs when the LS2400 cover panel has been tampered, removed, or obstructed. Inspect the case for proper installation.

Escorting

DISCLAIMER:

The following instructions are intended as a guidance document only. Each facility should review these recommendations and modify as necessary to meet their own unique security requirements.

NOTICE:

While escorting Tags, be aware of "tailgating." Tailgating is the practice of Tags lingering near a monitored zone (usually an exit point) until an authorized escort passes through the zone then immediately following behind through the zone.

To prevent tailgating, be aware of all traffic near a monitored zone and once you are through the monitored zone wait until the escort time has timed-out before proceeding.

To escort Tags through a monitored zone, use the following instructions:

1. Enter a valid code into the zone's Keypad. This will invoke the Keypad's Escort function. The Keypad's Escort function will allow the Tag to pass through the monitored zone for the designated Escort time. The duration of the Escort function is adjustable from 0 to 98 seconds (factory set at 15 seconds).
2. Escort the Tag through the zone.
   NOTE: For slower moving residents, you may have to invoke the Escort function again. However, if this is the case, an alarm may sound. Therefore, take into consideration the Escort time duration at that zone. If the door handles slow moving residents often, consider extending the Escort time or using a wheelchair to escort residents.
3. To prevent tailgating, once you are through the zone wait until the escort time has timed-out before proceeding (the green LED will extinguish).

- DRAFT -

User Manual

Chapter 2:

Tags

- DRAFT -

LS2400 System Tags

- Tag barcodes
- Visual Pulse LED
- Attaching Tags
- Tag and Band Maintenance

LS2400 System Tags (Figure 2.1 and 2.2) are small wristwatch-sized devices worn by a resident or attached to an asset. When a resident or patient enters the Tx Activation Field of the LS2400T and the LS2400T processes this information for appropriate control action or response (such as sounding alarms, locking doors, and/or deactivating elevators).

Tags also contain a visual pulse LED to indicate when they are active. Tags are activated/deactivated with an S-TAD unit.

The LS2400 System Tag band is made of nylon-reinforced vinyl with nylon mesh. The band is designed to resist tearing caused by pulling or chewing on the band. However, if the band becomes frayed or torn it will need to be replaced. In long-term applications, the band should be replaced periodically for cleanliness.

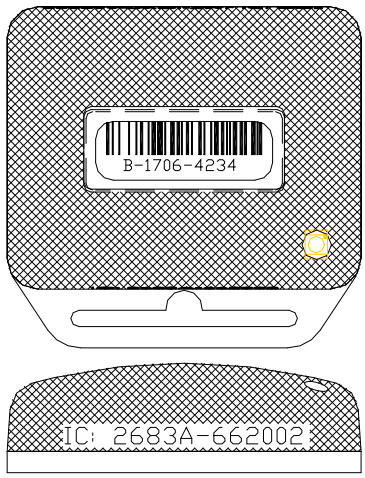

Figure 2.1 SB Tag case style

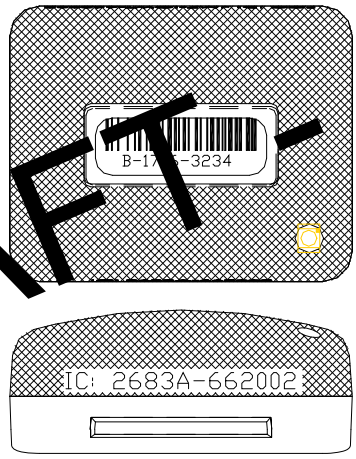

Figure 2.2 LT Tag case style

Tag barcodes

Tag barcodes (Figure 2.3) contain a Tag's manufacturing history.

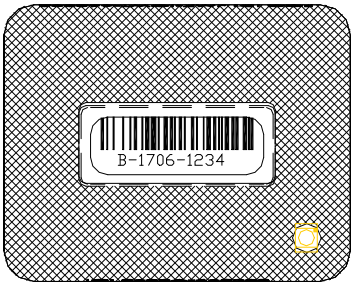

Figure 2.3 Tag barcode example

The coding scheme is as follows:

M-WWYY-TSSS

"**M**" is the manufacturer designator.

"**WWYY**" is the date code.
("1706" would mean the 17th week of 2006)

"**T**" is the tag type designator

- 3 is for LT (Long Term)
- 4 is for SB (Slotted Back)

"**SSS**" is the serial number for that tag type manufactured during that week.

Visual Pulse LED

The Visual Pulse LED indicates the Tag's current mode (see Table 2.1)

Table 2.1 Visual Pulse LED status

LED Light Pattern ○ off ● on	Tag LED Status
LT, SB Tags	
None	Tag is off.
○●○●○●○●○●○●○●○●○●○●	Active, not in zone
●●●●●●●●●●●●●●●●●●●	Active, in zone

Attaching LT/SB Tags

Note:
LT (Long Term) Tags are used for resident care.
SB (Slotted Back) Tags are used on small infants and assets.

All Tag bands are for one-time use only. For cleanliness and sanitary reasons, Accutech recommends replacing applied bands on a semi-monthly basis with a maximum of one month between changes.

1. For LT Tags, with the snaps pointing in the same direction as the Accutech logo, slide the plastic band through the Slot. (see Figure 2.4)

2. Adjust the band length to the nearest accommodating hole for a comfortable fit around the patient's extremity.
   Note: Once the band is secured it cannot be adjusted.

3. Put the male part of the Snap through the selected hole (see Figure 2.5).

4. Fold over the female part of the Snap and secure to the male part by squeezing until they snap together.

5. Using scissors, carefully trim any excess band material

6. Using an S-TAD, activate the Tag.

7. Follow the same procedure for SB Tags.

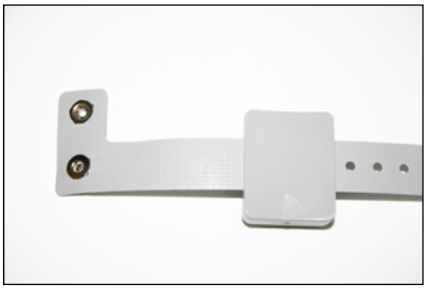

Figure 2.4: LT Tag with band

Figure 2.5: LT Tag with band

Figure 2.6: LT Tag with band secured

Figure 2.7: SB Tag with band secured

Tag and Band Maintenance

Testing Tags

Accutech Tags operate by internal battery. Over the course of normal operation, Tags eventually lose battery power and the Tags will need to be replaced. The Tag battery is not replaceable. For maximum protection of residents or assets, Accutech recommends that Tags be tested on a weekly basis. There are many ways that you can test Tags:

- Enter a monitored zone (Software will report.)
- With a S-TAD
- The Keypad's Auxiliary LED (Yellow) will light when a Tag is detected (Optional; additional wire required).
- Check Visual Pulse LED if present

Cleaning Tags

All Tags are reusable but they **must** be cleaned and sanitized between applications. In long-term applications, periodically replace the bands and clean the Tags. There are a few methods that can be used to clean and sanitize Tags:

HOWEVER, DO NOT:

- **DO NOT** submerge Tags in water
- **DO NOT** soak Tags in water
- **DO NOT** submerge Tags in cleaning solutions
- **DO NOT** soak Tags in cleaning solutions
- **DO NOT** use solvents
- **DO NOT** use abrasive cleaners or cloths
- **DO NOT** put Tags in an *AutoClave*
- **DO NOT** put Tags in a dishwasher
- **DO NOT** steam clean Tags
- **DO NOT** put Tags in a washing machine or dryer

Acceptable Tag Cleaning Methods:

- Wipe down with 3% hydrogen peroxide with water solution then rinse with a water-dampened cloth towel and wipe dry. (wipe only, **DO NOT** soak, submerge or place under running water)
- Wipe down with isopropyl alcohol wipes then rinse with a water-dampened cloth towel and wipe dry. (wipe only, **DO NOT** soak, submerge or place under running water)

Cleaning Bands

All Tag bands are for one-time use only. For cleanliness and sanitary reasons, Accutech recommends replacing applied bands on a semi-monthly basis with a maximum of one month between changes.

Storing Tags

To preserve battery life, Tags **must be turned off** with an S-TAD during storage or periods of non-use. In addition, Tags should be stored away from sources of electrical noise (see example list below) and stored in a clean plastic container with lid.

Do not store Tags within 3 feet of any of the following sources of electrical noise:

- Computer monitors
- Unshielded computer cables
- Television sets
- Medical Monitoring Equipment
- X-ray and other imaging equipment
- Fluorescent Lighting

Storing Bands

Extra Tag bands should be stored in clean and dry environment.

User Manual

Chapter 3:

The S-TAD

- DRAFT -

The S-TAD

- Powering the S-TAD On/Off
- Unlocking the S-TAD
- Activating/Deactivating Tags
- Programming Mode

Note: The S-TAD has not been evaluated by UL.

The S-TAD (Secure Tag Activator/Deactivator) is used to check the functionality of an Accutech Tag. Accutech Tags operate by internal battery. Over the course of normal operation, Tags eventually lose battery power and the Tags will need to be replaced. The Tag battery is not replaceable. The S-TAD is used to determine if a Tag has sufficient battery power to respond to an activating signal. The S-TAD requires a 9-volt lithium battery to operate.

Powering the S-TAD On/Off

The S-TAD includes a built-in power saving feature that automatically turns off the S-TAD after a period of inactivity.

1. Press the Power/Clear button. The Power/Clear LED illuminates (solid **green** with wink).

   The LED will remain lit for 1 minute. While nearing the 1 minute mark, the LED will begin to pulse until the LED turns faster pulsing **red** and then extinguishes while powering off the S-TAD.

   To extend the length of time, press the Power/Clear button again anytime before the LED turns off. Each press will extend by 1 minute (up to 5 minutes maximum).

2. Conversely you may manually power off the S-TAD by pressing and holding the Power/Clear button until the LED turns solid **red** then let go and the Power LED will extinguish.

Unlocking the S-TAD

For added security, access to activating/deactivating Tags is locked via 4-digit user codes. See Programming Mode for more information about user codes.

1. Press the Power/Clear button. The Power/Clear LED illuminates (solid **green** with wink).

2. Using the number keypad, enter a valid 4-digit user code. Entering a valid code will illuminate the Enter LED (solid **green**) for about 5 seconds. Once the Enter LED illuminates, press the Enter button again. The WAIT LED will illuminate (**red**) for 2 seconds to confirm activation/deactivation action.

   The Enter LED will then remain lit for 1 minute for the purpose of activating/deactivating Tags.

   Notes:

   - The default user code is 7139. See the Programming Mode section to change the default user code.
   - Entering an invalid code will illuminate the Enter LED red. Verify your user code is valid. Press Power/Clear before reentering your code to clear any inadvertent previous entries.
   - Once lit, each time you press the Enter button will extend the Enter LED life briefly (up to 1 minute by default).
   - Pressing the Power/Clear button will clear out the user code. Otherwise, after 1 minute of inactivity the Enter LED will extinguish automatically.

Activating/Deactivating Tags

The S-TAD can activate and deactivate Tags preserving Tag battery life and preventing nuisance alarms.

ACTIVATING

1. Unlock the S-TAD using your unique 4-digit user code.
2. On the back of the S-TAD, place the inactive Tag in the correct orientation within the Tag receptacle. On the front of the S-TAD, the Tag graphic's LED is off (just like the physical Tag's LED is off).
3. Press the Enter button (**green** LED lit). The Wait LED will illuminate (**red**) for 2 seconds. The Tag graphic's LED on the S-TAD will illuminate (pulsing **yellow**) indicating the Tag is active (just like the physical Tag's LED will illuminate).
4. If a Low Tag Battery condition is detected, the Low Tag Battery LED will illuminate **red**.
5. If a band alarm condition is detected, the Band LED will illuminate **red**. Likewise, if a band compromise condition is detected, the Band LED will illuminate half **green** and half **red**. ***Note***: Band alarm, band compromise, and cut band conditions always take precedence over a Low Tag Battery condition, therefore, be sure to handle the band-sensing Tag appropriately to truly check for a Low Tag Battery condition.
6. The S-TAD will still detect active Tags and Low Battery conditions in the area even after the Enter LED extinguishes. However, you will have to unlock the S-TAD again to be able to activate/deactivate a Tag. Remember the S-TAD will automatically lock after 1 minute of inactivity (by default).

DEACTIVATING

1. Unlock the S-TAD using your unique 4-digit user code.
2. On the back of the S-TAD, place the active Tag in the correct orientation within the Tag receptacle. On the front of the S-TAD, the Tag graphic's LED will be pulsing **yellow** (just like the physical Tag's LED will be pulsing).
3. Press the Enter button (**green** LED lit). The Wait LED will illuminate (**red**) for 2 seconds. The Tag graphic's LED on the S-TAD will extinguish indicating the Tag is deactivated (just like the physical Tag's LED will extinguish).

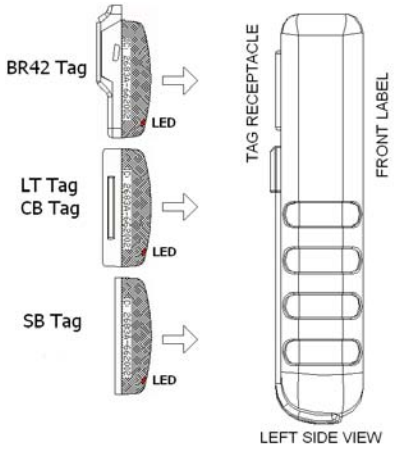

Figure 6.9 S-TAD Tag Orientation

Programming Mode

While in programming mode, the Enter button's LED winks quickly. In addition, the Enter button LED will also indicate if a programming step was completed successfully.

If the Enter button LED flashes green slowly the operation completed correctly. 3 flashes on the first entry, 5 flashes on the verify entry.

If the Enter button LED flashes red or yellow, an entry error has occurred. If an entry error occurs, press the Power/Clear button to cancel out and start over.

To enter programming mode:

1. Press: Enter, Enter, Master Code, Enter, Enter
   Note: 198237645 is the default master code.
2. While in programming mode, the Enter button's green LED winks quickly.

To exit programming mode:

1. Press: Power/Clear
2. Press: 0, Enter, 0, Enter
   Programming mode exits and the Enter button LED extinguishes.

Set Unlock Timeout:

1. Enter Programming Mode
2. Press: 5, Enter, 5, Enter
   (3 slow green flashes)
3. Press: 1 through 5 for 1 to 5 minute timeout
   (5 slow green flashes confirms
4. Exit Programming Mode

To change the master code:

1. Enter Programming Mode
2. Press: 1, Enter, 1, Enter
   (3 slow green flashes)
3. Press: The current 9-digit master code to change, then Enter
   (1 slow green flash if correct)
4. Press: New 9-digit master code, then Enter
   (1 slow green flash if correct)
5. Press: Same new 9-digit master code to verify, then Enter
   (5 slow green flashes confirms)
6. Exit Programming Mode

To add a user code:

1. Enter Programming Mode
2. Press: 2, Enter, 2, Enter
   (3 slow green flashes)
3. Press: 4 digit user code to add, then Enter
   (1 slow green flash if correct)
   Note: Maximum 121 codes.
4. Press: same 4-digit user code to verify, then Enter
   (5 slow green flashes confirms)
5. Repeat steps 3 & 4 to add another code. When finished, exit Programming Mode.

To delete a user code:

1. Enter Programming Mode
2. Press: 3, Enter, 3 Enter
   (3 slow green flashes)
3. Press: 4 digit user code to delete, then Enter
   (1 slow green flash if correct)
4. Press: same 4-digit user code to verify, then Enter
   (5 slow green flashes confirms)
5. Repeat steps 3 & 4 to delete another code. When finished, exit Programming Mode

Summary of LEDs

WAIT LED
Tag is in the process of being turned on or off or during S-TAD unlocking.

LOW TAG BATTERY LED

A low tag battery is detected. Replace Tag.

TAG LED

An active Tag is nearby.

POWER/CLEAR LED

S-TAD is powered.

ENTER LED

S-TAD unlocked.

Cleaning and Care

The S-TAD should be cleaned periodically using antibacterial wipes (wipe, do not soak).

Do not use any abrasive cleaners or cloths.

When not in use the S-TAD should be stored in a clean and dry environment.

The S-TAD requires a 9-volt lithium battery to operate. Remove the protective boot to access the battery compartment. Using the embossed orientation guide, replace the 9-volt lithium battery as needed.

- DRAFT -