

ES100 Aperio®

Wireless Integrated Electric Strike & Card Reader



ASSA ABLOY

Installation & Operating Instructions

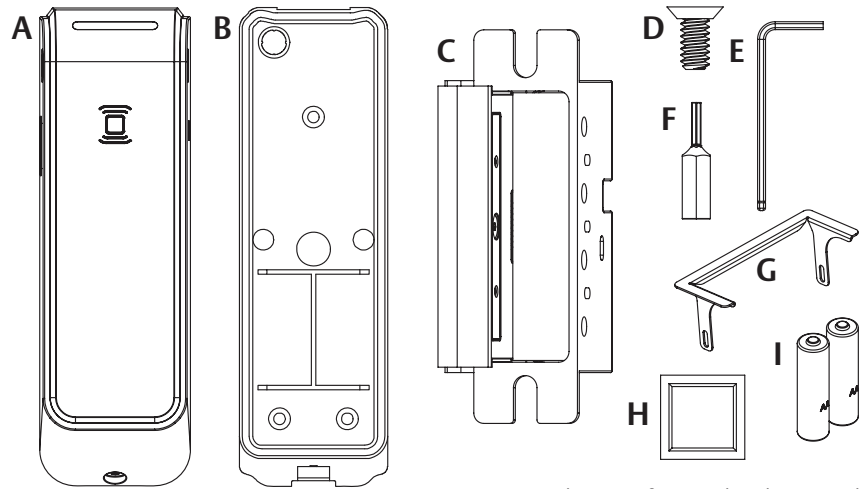
Experience a safer
and more open world

Product Components

- A ES100 Reader
- B ES100 Floor
- C ES100 15/16 Strike Body
- D Torx T8 4-40 x 1/4" Security Screw
- E 5/64" Hex Wrench
- F Torx T8 Driver Security Bit
- G Trim Enhancer
- H Alcohol Swab
- I AA Lithium Batteries

• **Security Variant:** LM/DPS Kit (Not shown)

• **Wholesale Kit:** Pre-paired Wiegand 1:1 Hub (Not Shown)



Product Specifications listed in Appendix

Faceplate Options

Inches [Millimeters] 4-7/8" x 1-1/4" Square Opening CL = center line of faceplate (2nd line = center line of faceplate opening)

1J For Use With: Cylindrical Locksets with up to 3/4" throw and all locksets with center-lined bolts Compatible: All brands of cylindrical latchbolts	1K For Use With: Mortise locksets with up to 3/4" throw latchbolt Compatible: Baldwin, Marks, PDQ	1KD For Use With: Mortise locksets with up to 3/4" throw latchbolt Compatible: Dorma 9500, Jackson, Sargent 7700 / 8100, Schlage, ASSA ABLOY ACCENTRA™ 8700 (formerly Yale Commercial)	1KM For Use With: Mortise locksets with up to 3/4" throw latchbolt Compatible: Accurate, Arrow, Best, Corbin Russwin, Falcon, Sargent 7800 / 8200 / 9200, ASSA ABLOY ACCENTRA™ 8700 (formerly Yale Commercial)
1N For Use With: Mortise locksets with deadbolt for night latch function only Compatible: Accurate, Baldwin, Marks, Omnia, PDQ, Schlage	1ND For Use With: Mortise locksets with deadbolt for night latch function only Compatible: Sargent 7700 / 8100, Schlage, ASSA ABLOY ACCENTRA™ 8700 (formerly Yale Commercial)	1NM For Use With: Mortise locksets with deadbolt for night latch function only Compatible: Accurate, Arrow, Baldwin, Best, Corbin Russwin, Falcon 45H / 47H / 34H / 37H, Marks, Sargent 7800 / 8200 / 9200, ASSA ABLOY ACCENTRA™ 8800 (formerly Yale Commercial)	1NTD For Use With: Mortise locksets with a normally extended 1" deadbolt and center-lined deadlatch Compatible: Accurate, Arrow, Baldwin, Marks, Omnia, PDQ, Schlage

Installation

Reader Installation

- 1 **PERFORM** a site survey to ensure the opening is appropriate for the ES100 installation and the RF capability is optimal. **NOTE:** See RF statement in product specifications for factors to consider.
- 2 **REMOVE** the reader from the backplate.
- 3 **LEVEL** and **MARK** the desired placement. **NOTE:** Prior to modifying the frame or mounting area, confirm product cable length is able to accommodate the installation.
- 4 **MARK** and **CENTER-PUNCH** the wire exit hole. **NOTE:** See installation Step 8 for screw mounting option.
- 5 **DRILL** a 3/8" hole for the reader exit wire harness. **NOTE:** Ensure harness channel is deep enough to reach the strike body harness.
- 6 **REMOVE** excess material from the mounting surface and clean/prep for mounting. **NOTE:** An alcohol swab is provided to clean the mounting surface prior to installation.
- 7 **REMOVE** the adhesive backing when ready to install.
- 8 **MOUNT** the backplate to the marked location and apply moderate pressure (15 psi) directly over the adhesive area for at least 1 minute to ensure proper adhesion. **NOTE:** Screws may be used as an alternative mounting method. When mounting this way, the VHB tape must still be used and 1/8" holes should be drilled in the 3 locations noted in Diagram 3. The reader should be secured using material appropriate, #4 flat head mounting screws and **MUST** be used in conjunction with an RTV/Sealant to prevent moisture/debris ingress.
- 9 **INSTALL** batteries (Diagram 4).
- 10 **SECURE** reader to backplate using the provided tamper resistant torx screw and torx bit. **NOTE:** Ensure reader is fully seated against the backplate and the screw hole is properly aligned before securing.

Strike Installation

- 1 **PREP** the frame for the electric strike based on PREPARING THE FRAME section. **NOTE:** If using a DPS, be sure to prep the hole so that the wire harness can reach the back of the electric strike.
- 2 **MONITORING AND REX:** Latch monitoring is a factory installed option and is properly configured from the factory. **NON-MONITORED OR EXTERNAL REX** strikes have factory installed jumpers in the monitoring positions (Diagram 6). **NOTE:** Latch and DPS monitoring are field installable using the OPT-1LM kit. Simply remove the jumpers and install/connect the kit to the strike per Diagram 6. If monitoring is not used, ensure the jumpers are properly seated prior to installation.
- 3 **IF USING A DPS**, remove the factory installed jumper and **CONNECT** the DPS harness in its place (Diagram 6). **NOTE:** DPS can only be used in conjunction with latch monitoring. If a DPS is not being used, ensure the jumper is connected. If using an external REX device refer to Diagram 6a.
- 4 **CONNECT** the electric strike to the reader main power cable and tuck the excess wire into the frame before mounting. **NOTE:** Ensure the distance between strike and reader can be accommodated without straining the cables and connection.
- 5 **SECURE** the strike body and faceplate to the frame using the provided mounting hardware.
- 6 **CHECK** latch engagement and adjust the shim accordingly.

Diagram 2 Remove Back Cover and Mark Placement

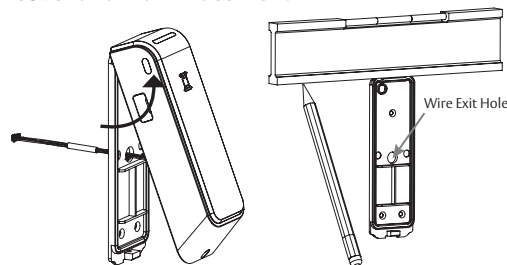


Diagram 3 Placement & Mounting

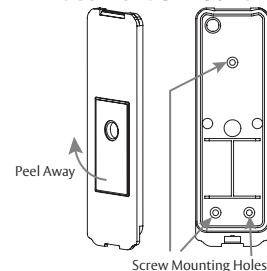


Diagram 4 Install Batteries & Secure Reader

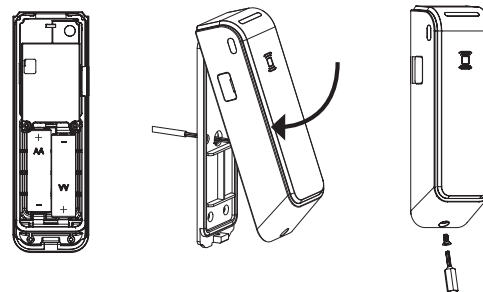


Diagram 5 Assembly

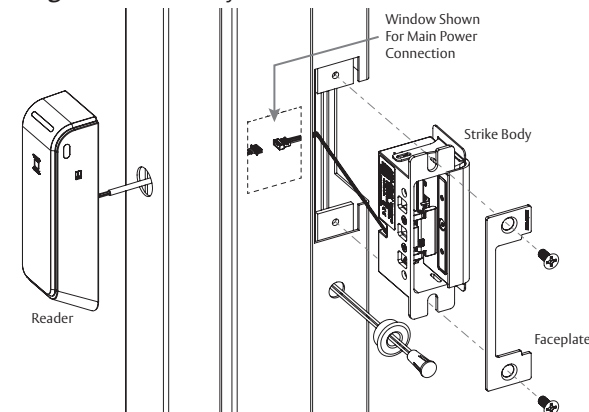


Diagram 6 Wiring

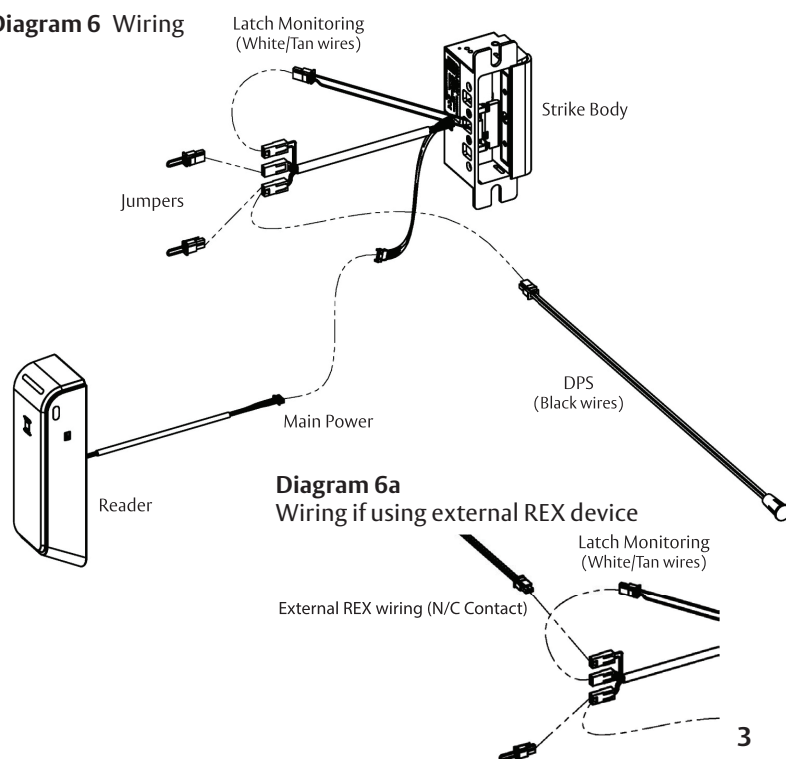
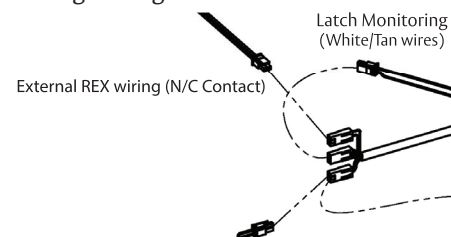


Diagram 6a Wiring if using external REX device

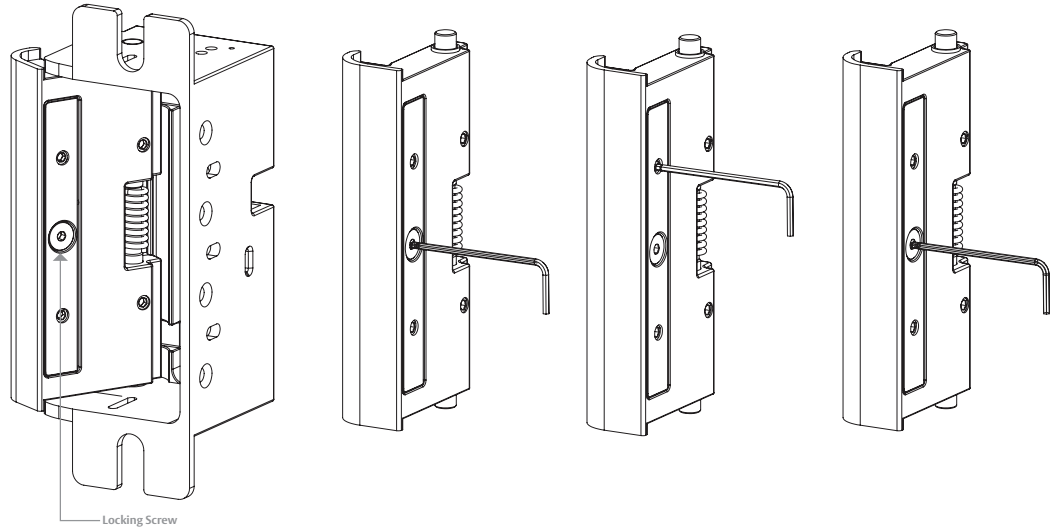


Adjusting the Horizontal

NOTE: To adjust the shim height, it is necessary to power the electric strike to open keeper.

- 1 LOOSEN the locking screw with the 5/64" Hex Wrench.
- 2 ADJUST the shim height to the desired level by turning the upper and lower set screws (clockwise to raise and counterclockwise to lower).
- 3 TIGHTEN the locking screw to lock position.

Diagram 7 Adjusting the Horizontal



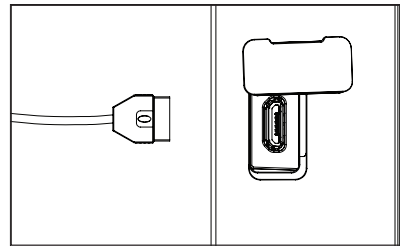
Micro USB Port

For emergency power & local (hard wired) firmware updates, use micro USB port located on the side of the R100 reader.

NOTE: Any 5V power jump device can power the ES100.

Micro USB Port Power Draw:
136 mA Peak at 5 VDC.

Diagram 8 Micro USB



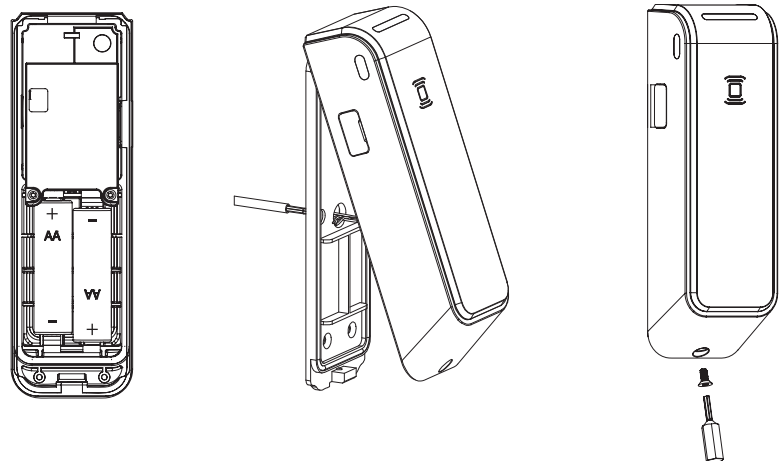
Replacing the Batteries

- 1 REMOVE the secure screw on the bottom of the unit using a tamper resistant T8 bit or driver (Diagram 9).
- 2 REMOVE the reader cover from the backplate (Diagram 9).

NOTE: Be careful to not damage the main power cable harness during separation.

- 3 CAREFULLY REMOVE both AA lithium batteries and dispose of the used batteries promptly.
- 4 INSTALL new AA lithium batteries based on proper polarity.
- 5 REVERSE steps 2 and 1 to secure the cover to the backplate.

Diagram 9 Install Batteries & Secure Reader



Warranty For information on warranty coverage and replacement options, please visit hesinnovations.com/warranty

Aperio Hub Specifications

- **Approvals** CE, ETL, FCC, IC, C-Tick
- **Safety & Emissions** FCC 47CFR Part 15 subpart B and subpart C; IC RSS-210 EN ETSI 301 489-17 v2.1.1; EN ETSI 300 328 v1.7.1; EN 60950-1 ed.2 2007
- **Dimensions** 82mm x 82mm x 37mm
- **Power Supply** 8-24 VDC
- **Current** 250 mA minimum
- **Internal Antenna** 2 cross polarized dipoles
- **External Antenna (Part No. EXT-10-ANT)** One reverse polarity SMA external antenna connector. Optional antenna type dipole with max antenna gain of 3.9 dBi.
- **Radio Standard** IEEE 802.15.4(2.4GHz) – 15 channels (11-25)
- **Encryption (Radio Communications)** AES 128 bits
- **Wireless Operating Range** Up to 50 ft
- **Receiver Sensitivity** -100dBm 20% PER
- **Wireless Transmit Power** 10 dBm/MHz
- **Class of Protection** IP 20
- **Operating temperature** 41°F to 95°F [5°C to 35°C]
- **Humidity** <95% non-condensing
- **Status** LED (red/green/yellow)
NOTE: This hub has not been evaluated by UL.

LED Codes

Aperio LED LOCK Codes		
(1) ONE Yellow Flash		Card read
(1) ONE Green Flash		Access Granted
(5) FIVE Yellow (1) ONE Red		Force Closed (in open mode)
Continuous Yellow Flashes (.25 sec every second)		Comhub busy
(1) ONE Red Flash		Access Denied (AC Online)
(3) THREE Red Flash		Access Denied (AC Offline)
Continuous Red Flashes (.125 sec every second)		Lock is Blocked (when closing)
(10) TEN Red Flashes		Error in Lock
Continuous Yellow Flashes (.25 sec every 5 seconds)		Low Battery
Continuous Red Flashes (.25 sec every 5 seconds)		Dead Battery

Aperio LED HUB Codes		
Steady Green		Online
Steady Green + (1) ONE Red Flash		Lock Offline
Steady Green + (2) TWO Red Flashes		Access Control Offline
Steady Green + (3) Three Red Flashes		Access Control & Lock Offline
Flashing Yellow		UHF Communication

Connecting the Hub

The following applies only to Aperio factory paired kits with AH20 Hubs.

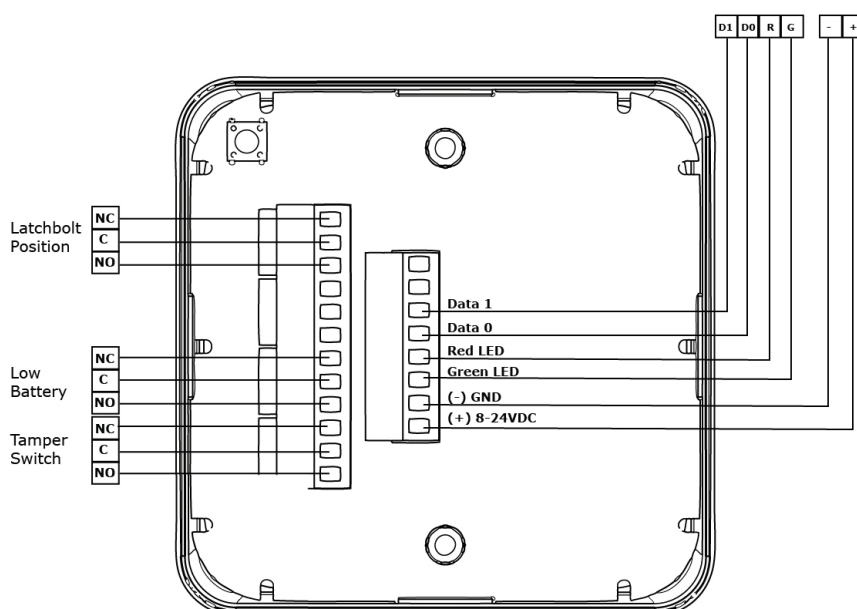
1. Connect the Wiegand D1, D0, red, and green LED signals.

NOTE: The Green LED input is used to grant access to the electric strike. If the Green LED signal is not available to indicate approved access, the approval input can be activated by a relay with “NO” attached to Green LED and “C” to GND. The Red LED input is used to indicate access denied. If the RED LED signal is not connected, the lock will flash RED three times when a non-approved card is presented indicating loss of connection to the hub rather than access denied. Any other codes may be reference on the LED reference card.

For questions regarding installation of the hub such as hub placement, coverage area, or materials that may interfere or reduce range, please review the hub installation instructions:



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Product Specifications

- **Approvals** CE, FCC, IC
- **Wireless Frequency** 2.4GHz, IEEE 802.15.4, using AES 128-bit encryption
- **AA Lithium** Energizer L91 Rated 1.5 VDC, 3 Ah
NOTE: Replace Battery With Energizer L91 batteries only. Use of another battery may present a risk of fire or explosion.



WARNING: Risk of fire and burns. DO NOT recharge, disassemble, heat above operating temperature or incinerate. Keep battery out of reach of children and in original package until ready to use. Dispose of used batteries promptly.

- **Battery Life** 2+ years (45,000 cycles)*
*All battery life claims are approximate and based on a set configuration profile. Battery performance is based on pre-defined system settings such as battery chemistry and battery model used, credential presentation settings (LED/buzzer), UHF polling period, UHF status intervals, and operations per day. Actual battery performance will vary and depends on the factors above.

- **HID® multiCLASS SE® technology Credentials Supported**
 - **High Frequency (13.56 MHz)**
 - » HID iCLASS®
 - » HID iCLASS SE® (SIO-enabled)
 - » HID iCLASS® Seos™
 - » HID MIFARE® SE
 - » HID DESfire® EV1 SE
 - » MIFARE CLASSIC
 - » DESfire® EV1
 - **Low Frequency (125 kHz)**
HID Prox®, AWID, EM4102, ioProx
 - **NFC/BLE®** Mobile – enabled credentials
Reader is compatible with HID Mobile Access version 3.76 and later using mobile devices with BLE version 4.2 and later

Environmental

- **Operating Temperature** -13° to 140° F (-25° to 60° C)
- **Humidity** 30° C at 95% +/- 5%
- **Strike Bodies ES100 15/16** For Indoor Use ONLY
- **ES100 Reader**

UL Listings

- **UL 1034** (CVXY.BP7059)
 - » Static Strength 1,500 lbs
 - » Dynamic Impact 70 ft-lbs
 - » Endurance 250,000 cycles
- **UL 10C** 3 Hr (GXAY(7);R9483)
- **UL 294**
 - » Destructive Attack Level I (No attack test)
 - » Line Security Level I (No Line Security)
 - » Endurance Level IV (100,000 cycles)
 - » Standby Power Level I (No secondary power source)
- **Windstorm** (ZHEM.R27043)

Safety and Emissions

- **FCC 47CFR Part 15, subpart C**
- **IC RSS-102**
- **RSS-210**
- **RSS-247**
- **RE Directive 2014/53/EU** EN 301 489-1, EN 301 489-3, EN 300 440, EN 300 330, EN 300 328, EN 62368-1, EN 62479

NOTE: The effective operational range/distance (RF performance) of any wireless device is dependent on a variety of factors including but not limited to metalized reflective surfaces, absorbing materials, building materials, coexistence with nearby transmitters, adjacent band harmonics, etc. For example, if the application requires the Aperio ES100 Reader to communicate through glass with metalized (solar) film applied to reach the hub, the maximum distance may be reduced to as much as 50 feet (15 meters) depending on these factors. Please perform an RF site survey before installation.

WARNING

FCC Statement

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:

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

Operation with non-approved equipment is likely to result in interference to radio and TV reception. The user is cautioned that changes and modifications made to the equipment without the approval of manufacturer could void the user's authority to operate this equipment. To comply with FCC and Industry Canada RF radiation exposure limits for general population, the module must be installed to provide a separation distance of at least 20cm from all persons and must not be colocated or operating in conjunction with any other antenna or transmitter.

This module is labeled with its own FCC ID and IC Certification Number. If the FCC ID and IC Certification Number are not visible when the module is installed inside another device, then the outside of the device into which the module is installed must also display a label referring to the enclosed module. In that case, the final end product must be labeled in a visible area with the following:

Contains FCC ID: VC3-R100V3

Contains IC: 7160A-R100V3

IC Statement

This device complies with Industry Canada license-exempt RSS standards(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.

Conformité aux normes IC

Cet appareil est conforme avec Industrie Canada exempt de licence RSS standard(s). Son fonctionnement est soumis aux deux conditions suivantes:

- (1) cet appareil ne peut causer d'interférences, et
- (2) cet appareil doit accepter toute interférence, y compris des interférences qui peuvent provoquer un fonctionnement indésirable du périphérique.

CE Declaration of Conformity

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