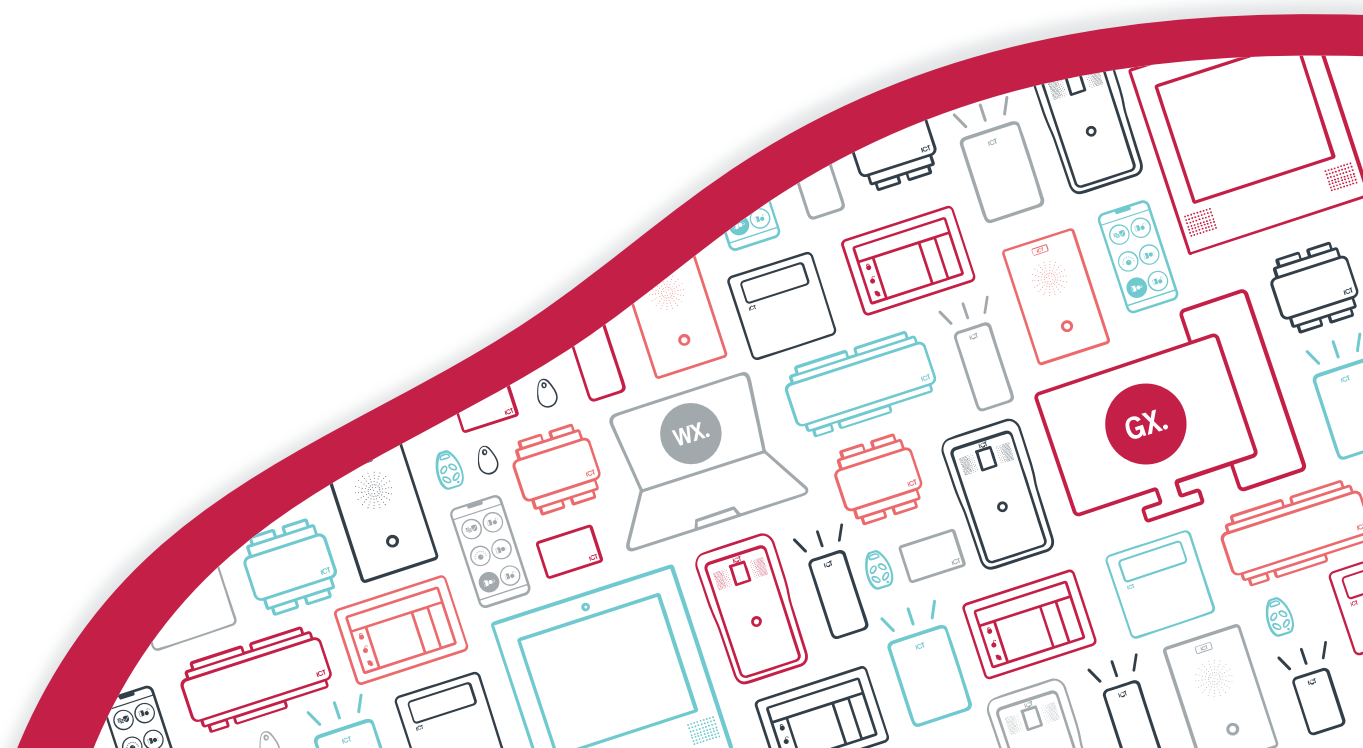
RF-RCVR-433

Wireless 433MHz Receiver

Installation Manual



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Introduction

The Wireless 433MHz Receiver provides a fast and simple integration of ICT 4 and 2 button remote transmitters into any alarm or access control system. The standalone functionality allows for easy, secure operation of gates and other access areas where convenience is required.

Features of the wireless receiver include:

- 3 operating configurations: Wiegand, RS-232 and standalone
- 600 user (Transmitter ID) capacity in standalone configuration
- Unlimited user capacity in Wiegand pass through configuration
- Programmable reception sensitivity for each channel
- 4 open collector programmable outputs
- 1 Form C relay output

Operating Configurations

The wireless receiver has a number of operating configurations, allowing integration with ICT and third-party systems or standalone operation.

- **Wiegand pass through**: When a button is pressed on a wireless transmitter, the receiver passes the data through to a connected control panel in standard Wiegand format. The control panel determines whether the user has access, and if so unlocks the door. This allows access control of up to two doors.

  The relay output on the wireless receiver can be wired to an input on the control panel, allowing users to trigger a panic alarm.
- **RS-232 pass through**: As above, but the data is transmitted over an RS-232 connection instead of Wiegand.
- **Standalone**: When a button is pressed on the wireless transmitter, the receiver determines whether the user has access. This can be based on a range of transmitter IDs or specifically programmed transmitter IDs. If access is permitted, the receiver activates the relay to unlock the door.

  This option is particularly useful when the door is situated a long distance from the main control equipment, such as a carpark gate.

In any configuration, spare Wiegand outputs which are not used for communication can be used as open collector outputs. For example, the receiver may sound a buzzer and activate a green light when the door is unlocked. Alternatively, outputs may be connected to the inputs of another system to provide further detection or automation functions, such as a 'man down' switch or panic button.

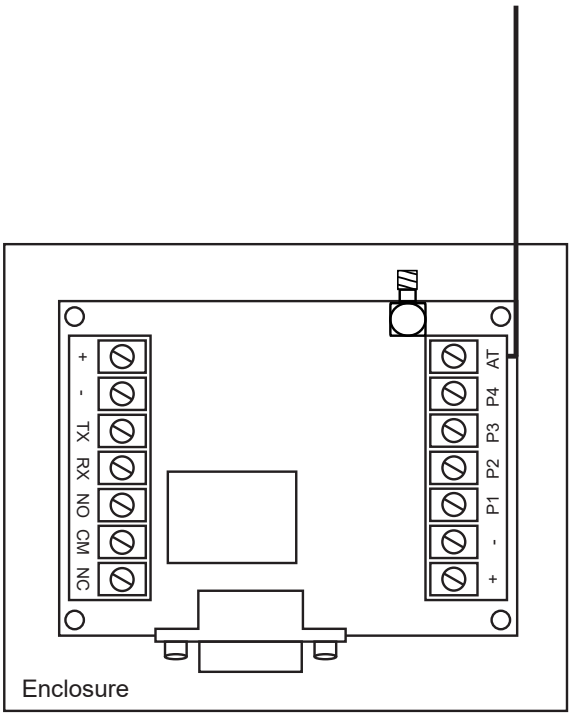
Mounting

When using the whip wire antenna which comes supplied with the wireless receiver, it must be connected to the antenna (AT) port as shown below.

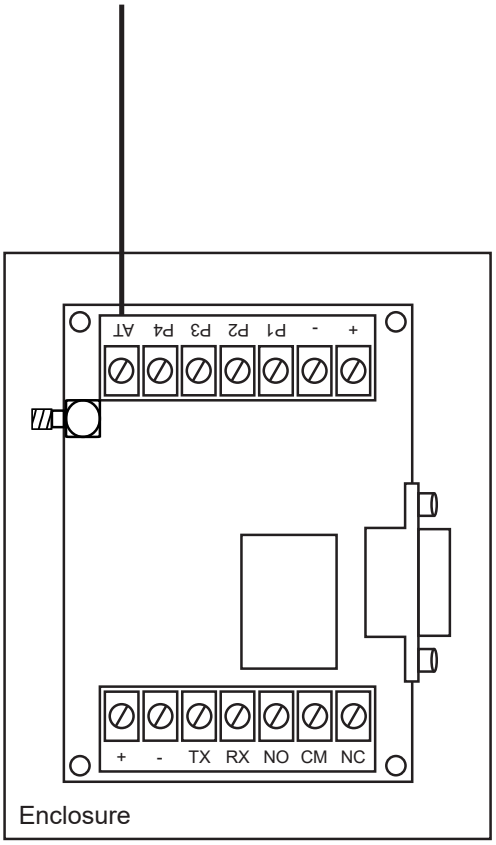
The wireless receiver must be mounted so that the antenna is vertical. If you are mounting the board on its side (as shown in mounting option 2), turn the antenna 180 degrees so it is pointing up.

Ensure that the module is not mounted within or behind any metal barriers, which can block the RF signal.

Mounting Option 1



Mounting Option 2



Mounting with SMA Antenna

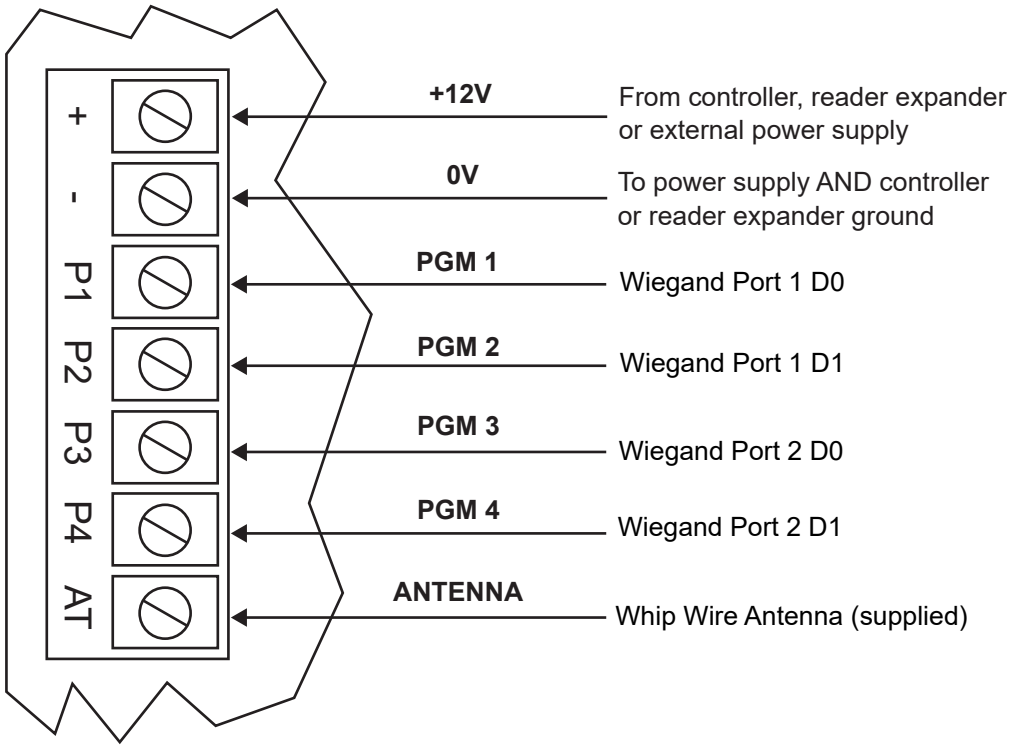
When using the optional SMA antenna accessory, connect it to the SMA connector on the receiver unit and run the cable to a suitable location. The SMA antenna has a magnetic base for ease of mounting. Alternatively, affix the provided bracket to a wall with appropriate screws.

Ensure that the antenna is not mounted within or behind any metal barriers, which can block the RF signal.

Connect only one antenna. When using the SMA antenna do not connect the supplied whip wire antenna.

Installation Wiring

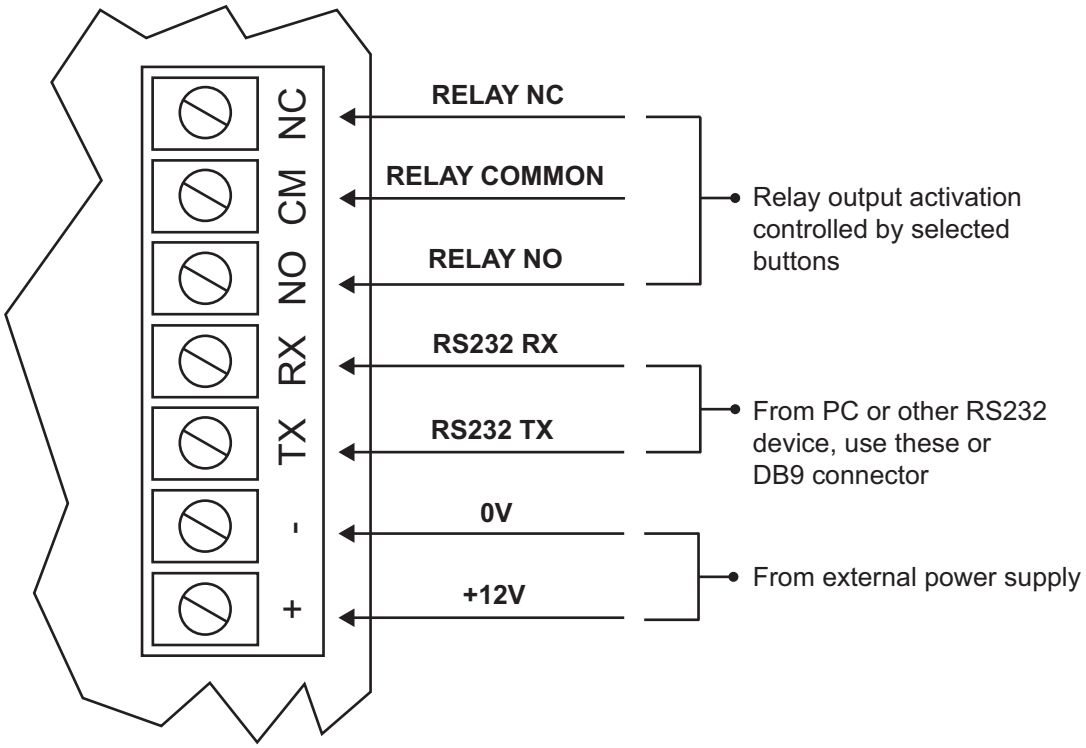
Output and Antenna Connection Wiring



When the receiver is integrated with an access control system, the 0V terminal must be connected to the ground of the controller or reader expander to provide a reference for the Wiegand signals. If the receiver is powered by an external power supply, it must be connected to the controller/expander ground as well.

When used as open collector outputs, the P1-P4 outputs will drive a 50mA load to ground.

Power and Relay Output Connection Wiring



System Settings

Default Operation

The wireless receiver is pre-programmed to work with most access control systems out of the box, using Wiegand pass through configuration. The factory defaults will provide the following functionality:

- All ICT wireless transmitter signals received will be passed through Wiegand Port 1, with the same site code and a unique user code for each button.
- The relay will activate for 2 seconds when button **4** is pressed.

To immediately use this functionality:

- Connect **Wiegand Port 1** as shown in the Installation Wiring section (see page 6).
- Optionally, connect the **Relay NO** to a digital input and the **Relay CM** to your system's input common, for use as a panic/pendant alarm on button **4**.
- The receiver will pass a unique standard 26 bit Wiegand code to your access control system for each remote button. Use these to control doors or other functions.

Default Configuration

The default programmed settings are indicated in the table below:

Option	Setting
Default Receiver Mode	ICT Pass Through
RS-232 Default Settings	
Baud Rate	9600
Data Bits	8
Parity	None
Stop Bits	1
Flow Control	None
Wiegand Default Settings	
Wiegand Port 1	26 Bit Unique User
Wiegand Port 2	26 Bit Unique User
Button Default Settings	
Button 1	Wiegand Port 1
Button 2	Wiegand Port 1
Button 3	Wiegand Port 1
Button 4	Relay
Button 5-10 (button combinations)	None

Programming Custom Operation

To customize the operation of a wireless receiver unit to match your requirements:

- Connect a terminal program such as HyperTerminal with the RS-232 settings shown above.
- Press **Esc** to display the main programming menu.

Receiver Mode Menu

To enter the mode menu, type the shortcut: **Esc, E, Enter**

Type **1, Enter** to toggle between the following receiver modes:

- **ICT Pass Through Mode (default mode)**: This setting allows the receiver to pass credential data over the Wiegand or RS-232 ports. The receiver will accept and pass on button presses from all ICT wireless transmitter devices.
- **Custom Site Code Mode**: The receiver will pass through credential data over the Wiegand or RS-232 ports, but will replace the site code received from the remote with a fixed site code (programmed in the **Site Code** menu). This enables any ICT remote to function with third-party access control systems which require a specific site code.
- **Individual User Mode**: The receiver will operate in standalone configuration. Only button presses from specifically programmed transmitters are accepted. Users can be programmed in the **User Programming** menu, or by reading remotes (quick user programming).

User Menu

This menu is only available when the receiver mode is set to **Individual User Mode**.

To enter the user menu, type the shortcut: **Esc, F, Enter**

The wireless receiver can store up to 600 individual Transmitter ID numbers for standalone use.

Adding/Editing Users

1. Type **1, Enter** to add or edit a user.
2. To add a new user, type an unused user number (from 1-600). To edit an existing user, type the user number for that user then press **Enter**.
3. To assign a transmitter to the user, press any button on the transmitter or type in the Transmitter ID.

   To delete a user, type **0** instead of a Transmitter ID.
4. Press **Enter** to save your settings.
5. Enter the next user number, or press **Esc** to stop programming.

The module will not display previously programmed user numbers. It is recommended that you make a record of these when programming.

Configuring Range Mode

The wireless receiver also has a range mode, which restricts the receiver to accept only Transmitter IDs within a specified range. This allows you to quickly define which transmitters will be accepted by the module in standalone configuration, without programming all of the individual users.

To program range mode:

1. Type **2** then **Enter** to enable range mode.

   Range mode is disabled by default. When it is enabled the message **Range Mode: On** will appear at the top of the user menu.

2. User 1 is the start user, i.e. the lower bound of the range. To program the start user:
   - Type **1, Enter** to edit a user.
   - Type **1, Enter** to select user 1.
   - Assign the lowest Transmitter ID in the range to this user (by pressing a button on the transmitter, or typing in the Transmitter ID).
   - Pres **Enter**.
3. User 2 is the end user, i.e. the upper bound of the range. To program the end user:
   - Type **1, Enter** to edit a user.
   - Type **2, Enter** to select user 2.
   - Assign the highest Transmitter ID in the range to this user (by pressing a button on the transmitter, or typing in the Transmitter ID).
   - Press **Enter**.

Quick User Programming

This feature is only available when the receiver mode is set to **Individual User Mode**.

To add new remotes:

1. Hold down the **PRG** button (on the bottom right hand side of the unit)
2. Press any button on the new transmitter, and check that the **RF** light flashes when doing so.
3. The user has now been added at the next available slot in the user list.

Site Code Menu

This menu is only available when the receiver mode is set to **Custom Site Code Mode**.

To enter the site code menu, type the shortcut: **Esc, F, Enter**

In this mode the wireless receiver will replace the site code received from the remotes with a fixed site code. For example, if the fixed site code is 95, a remote with the credential 200:70 will be sent to the access control system as 95:70.

Adding/Editing the Site Code

1. Type **1, Enter** to edit the site code.
2. Type the new site code then press **Enter**.
3. Press **Esc** to finish programming.

Button Menu

To enter the button menu, type the shortcut: **Esc, D, Enter**

For each button or combination of buttons, type the button number and press **Enter** to select from:

- **Off**: Pressing the button has no effect.
- **Wiegand Port 1 (P1/P2)**: Send credential data on Wiegand port 1 (P1 and P2).
- **Wiegand Port 2 (P3/P4)**: Send credential data on Wiegand port 2 (P3 and P4).

- **Relay**: Activate the relay output for 2 seconds.
- **P1 / P2 / P3 / P4**: Activate the selected programmable output for 2 seconds.

Wiegand Menu

To enter the Wiegand menu, type the shortcut: **Esc, B, Enter**

The wireless receiver can output standard 26 or 34 bit Wiegand. Select a port by typing **1** or **2**, then press **Enter** to toggle between the following options:

- **26 Bit**: Standard 26 bit Wiegand format. Each button on the remote will use the same code.
- **26 Bit Unique User**: Standard 26 bit Wiegand format. The buttons on the remote will use the same site code but different card numbers, so that each button has a unique 26 bit code.
- **34 Bit**: Standard 34 bit Wiegand format. Each button on the remote will use the same code.
- **34 Bit Unique User**: Standard 34 bit Wiegand format. The buttons on the remote will use the same site code but different card numbers, so that each button has a unique 34 bit code.

The 'Unique User' operation multiplies the remote's encoded card number by 16 and then adds 1 for each button. For example, a 4-button remote with card number 10 would have output card numbers of 161, 162, 163 and 164. Therefore, the maximum encoded card number should not exceed 4095.

If this number is exceeded the output card number for each button will be truncated, which may cause duplicate codes.

PGM Menu

To enter the PGM menu, type the shortcut: **Esc, C, Enter**

The auxiliary outputs (P1, P2, P3, P4) and relay output can be programmed to change state based on receiving a button press from a transmitter.

Type the number corresponding to the output to be changed and press **Enter**, which will toggle the state between the following three options:

- **Off**: The output will remain disabled.
- **Off, pulse On at valid Receive**: The output is normally off, and is pulsed on for 2 seconds.
- **On, pulse Off at valid Receive**: The output is normally on, and is pulsed off for 2 seconds.

Signal Strength Menu

To enter the signal strength menu, type the shortcut: **Esc, G, Enter**

The reception range can be limited for each button, ideal for situations where multiple buttons operate different doors on a site.

1. To determine the required signal strength, stand just outside of the desired range and press the button on the transmitter.
2. Note the RSSI number displayed on the terminal output. This is a good starting point for the minimum signal strength.
3. In the signal strength menu, type in the button number and press **Enter**.
4. Type the minimum signal strength noted above and press **Enter**.
5. Confirm that the button operates correctly in the desired area. Adjust the minimum signal strength as required.

Technical Specifications

The following specifications are important and vital to the correct operation of this product. Failure to adhere to the specifications will result in any warranty or guarantee that was provided becoming null and void.

Ordering Information	
RF-RCVR-433	Wireless 433MHz Receiver
RF-RCVR-433-ANT	SMA Antenna Accessory
Power Supply	
Operating Voltage	12VDC
Operating Current	55mA
Receiver	
Receiver Type	Synthesized PLL
Demodulation	AM/ASK
Frequency	433.92MHz
Sensitivity	-121dBm
Output Code Combinations	10
Modulation	AM/ASK
Rated ERP	58-100mW
Range in Free Space	100-200m (328-656ft)
Outputs	
Programmable Outputs	4 (50mA Max) Open Collector
Relay Outputs	1 Form C Relay - 7A N.O/N.C. at 30 VAC/DC resistive/inductive
Dimensions	
Dimensions (L x W x H)	78 x 58 x 25mm (3.1 x 2.3 x 0.98")
Net Weight	70g (2.5oz)
Gross Weight	100g (3.5oz)
SMA Antenna Length	3.21m (10.5') total length, 3.05m (10.0') cable only
SMA Antenna Net Weight	90g (3.2oz)
SMA Antenna Gross Weight	120g (4.2oz)
Operating Conditions	
Operating Temperature	-20°-70°C (-4°-158°F)
Humidity	0%-85% (non condensing)

The wireless receiver is only compatible with ICT wireless transmitters (RF-REM2-433 and RF-REM4-433).

The size of conductor used for the supply of power to the unit should be adequate to prevent voltage drop at the terminals of no more than 5% of the rated supply voltage.

Integrated Control Technology continually strives to increase the performance of its products. As a result these specifications may change without notice. We recommend consulting our website (www.ict.co) for the latest documentation and product information.

New Zealand and Australia

Intentional Transmitter Product Statement

The R-NZ compliance label indicates that the supplier of the device asserts that it complies with all applicable standards.

R-NZ

European Standards

CE Statement CE

Conforms where applicable to European Union (EU) Low Voltage Directive (LVD) 2014/35/EU, Electromagnetic Compatibility (EMC) Directive 2014/30/EU, Radio Equipment Directive (RED)2014/53/EU and RoHS Recast (RoHS2) Directive: 2011/65/EU + Amendment Directive (EU) 2015/863.

This equipment complies with the rules, of the Official Journal of the European Union, for governing the Self Declaration of the CE Marking for the European Union as specified in the above directive(s).

WEEE 

Information on Disposal for Users of Waste Electrical & Electronic Equipment

This symbol on the product(s) and / or accompanying documents means that used electrical and electronic products should not be mixed with general household waste. For proper treatment, recovery and recycling, please take this product(s) to designated collection points where it will be accepted free of charge.

Alternatively, in some countries you may be able to return your products to your local retailer upon purchase of an equivalent new product.

Disposing of this product correctly will help save valuable resources and prevent any potential negative effects on human health and the environment, which could otherwise arise from inappropriate waste handling.

Please contact your local authority for further details of your nearest designated collection point.

Penalties may be applicable for incorrect disposal of this waste, in accordance with your national legislation.

For business users in the European Union

If you wish to discard electrical and electronic equipment, please contact your dealer or supplier for further information.

Information on Disposal in other Countries outside the European Union

This symbol is only valid in the European Union. If you wish to discard this product please contact your local authorities or dealer and ask for the correct method of disposal.

UK Conformity Assessment Mark

General Product Statement

The UKCA Compliance Label indicates that the supplier of the device asserts that it complies with all applicable standards.

FCC Compliance Statements

FCC PART 15, WARNINGS: INFORMATION TO USER

This equipment complies with the limits for a Class A 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:

- Re-orient 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.
- Changes or modifications not authorized by the party responsible for compliance could void the user's authority to operate this product.

This device complies with Part 15 of the FCC rules.

Operation is subject to the following two conditions:

- This device may not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operation.

NOTE: THE GRANTEE 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.

Industry Canada Statement

This class A digital apparatus complies with Canadian ICES-003.
Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

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

Designers & manufacturers of integrated electronic access control, security and automation products.
Designed & manufactured by Integrated Control Technology Ltd.