AY-x20 Family

Multi-format Proximity Readers

Installation Manual

1. Introduction

The AY-x20 is a family of RFID proximity card readers to be installed for use with access control systems. The AY-x20 family reads the proximity card and transmits its data to the access control system, using common multi-format Wiegand outputs.

Figure 1: AY-x20 Family

AY-M20 AY-H20 AY-L20 AY-J20 AY-K20 AY-Q20

1.1 Key Features

- Selectable Wiegand 26-Bit, Clock & Data
- Reads 26-Bit EM or Rosslare format cards
- Waterproof
- Green LED control line
- Red LED control line
- Buzzer control line
- Hold control line
- Optical tamper sensor
- Tamper output line
- UV-protected polycarbonate housing

2. Technical Specifications

2.1 Electrical Characteristics

Specification	AY-M20	AY-J20	AY-H20	AY-L20	AY-K20	AY-Q20
Power Supply Type	Linear type (recommended)					
Operating Voltage Range*	5–16 VDC					
Absolute Maximum (non-operating)	18 VDC					
Current @ 12V	Standby: 85 mA Maximum: 100 mA					
Read Range**	10 cm (3.9 in.)				8 cm (3.2 in.)	4 cm (1.6 in.)
LED Control Input	Dry Contact, N.O.					
Tamper Output	Open collector, active low, max. sink current 16 mA					
Maximum Cable Distance to Controller	150 m (500 ft)					
RF Modulation	ASK, 125 KHz					
Bit Rate	106 KHz					

* All input voltages should be limited to 1 A maximum. For VAC, the voltage range is peak-to-peak.

** Measured using a Rosslare proximity card or equivalent. Range also depends on electrical environment and proximity to metal.

2.2 Environmental Characteristics

Specification	AY-M20	AY-J20	AY-H20	AY-L20	AY-K20	AY-Q20
Operating Temp. Range	-31°C to 63°C (-25°F to 145°F)					
Operating Humidity Range	0 to 95% (non-condensing)					

2.3 Physical Characteristics

Model	Dimensions (H x W x D)	Weight
AY-M20	88.9 x 88.9 x 15 mm (3.5 x 3.5 x 0.6 in.)	109 g (3.9 oz.)
AY-J20	120.0 x 42.0 x 14 mm (4.7 x 1.7 x 0.6 in.)	88.5 g (3.1 oz.)
AY-H20	109.9 x 74.9 x 15 mm (4.3 x 3.0 x 0.6 in.)	100 g (3.5 oz)
AY-L20	144.9 x 42.9 x 20 mm (5.7 x 1.7 x 0.8 in.)	116 g (4.1 oz)
AY-K20	79.9 x 39.9 x 12.8 mm (3.2 x 1.6 x 0.5 in.)	70.5 g (2.5 oz)
AY-Q20	120 x 76 x 20 mm (4.7 x 3.0 x 0.8 in.)	480 g (17.0 oz)

3. Installation

3.1 Installation Kit

The installation kit consists of the following items to be used during the installation procedure:

- One mounting template
- Two pan head screws and wall plugs
- One L-shaped security screw tool
- One security screw

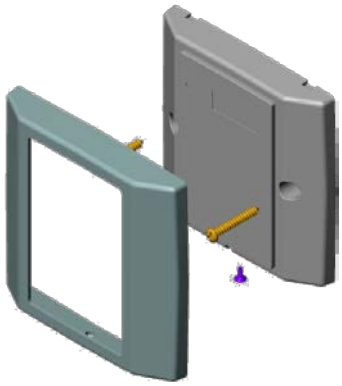
3.2 Mounting the AY-x20 Reader

Before mounting, you should determine the best location for the reader.

To mount the reader:

1. Peel off the back of the self-adhesive mounting label template and place it at the required mounting location.
2. Using the template as a guide, drill two holes (sizes indicated on the template) used for mounting the reader onto the surface.
3. Insert a suitable wall plug into each hole.
4. Drill a 10-mm (7/16") hole for the cable. If mounting on metal, place a grommet or electrical tape around the edge of the hole.
5. Wire the reader to the controller as described in Section 4. A linear type power supply is recommended.
6. Remove the reader's snap-off front cover to reveal the two screw holes (see Figure 2).

Figure 2: Removing the Top Cover



7. Align the two holes of the reader with those drilled in the wall and firmly attach the reader to the wall with two screws, whose size is indicated on the template.
8. Relocate the front cover onto the reader.

Note: The reader can also be mounted using strong epoxy glue. After application, the reader should be firmly held in place until the glue dries.

Note: Card readers are to be used with control panels whose power supply is UL Listed Class 2 or equivalent.

4. Wiring

The AY-x20 is supplied with a 10-conductor 18" pigtail.

To connect the reader to the controller:

1. Prepare the reader cable by cutting its jacket back about 3 cm (1¼") and strip the insulation from the wires about 1.2 cm (½").
2. Prepare the controller cable by cutting its jacket back 3 cm (1¼") and strip the insulation from the wires about 1.2 cm (½").
3. Splice the reader's pigtail wires to the corresponding controller wires (as indicated in Table 1) and cover each joint with insulating tape.
4. If the tamper output is being utilized, connect the purple wire to the correct input on the controller.
5. Trim and cover all unused conductors.

Note:
- The individual wires from the reader are color-coded according the Wiegand standard.
- When using a separate power supply for the reader, this supply and that of the controller must have a common ground.
- The reader's cable shield wire should be preferably attached to an earth ground, or a signal ground connection at the panel, or power supply end of the cable. This configuration is best for shielding the reader cable from external interference.

Table 1: Wiring

Wire Color	Wiegand 26-Bit Output Mode	Clock & Data Output Mode
Red	+DC	+DC
Black	Ground	Ground
Green	Data 0	Data
White	Data 1	Clock
Orange	Green LED	Green LED
Brown	Red LED	Red LED
Yellow	Buzzer	Buzzer
Blue	Hold	Hold
Purple	Tamper	Tamper
Grey	Open Input	Connected to GND

5. Operation Instructions

5.1 Testing

Once the reader is wired to a power supply and to the controller, you should test the reader.

To test the reader:

1. Power up the reader.

   The LED and beeper activate one time. This indicates that the reader is working properly.

2. Present the appropriate type of proximity card to the reader.

   The LED momentarily flashes green and a short beep is emitted indicating that the card was read properly by the reader.

   After the card data is processed by the controller, the controller can then turn the LED green. Refer to the controller description of the LED operation if the reader LED is controlled by the controller.

5.2 Output Selection

- For Wiegand 26-bit operation, the grey wire should be held not connected.
- For Clock & Data operation, the grey wire should be connected to the ground

5.3 LED Control

If the LED control wires (orange and brown) are not used (open), the reader LED remains red continuously, and flashes green momentarily when successfully reading a card.

The bi-color LED color can be controlled using the orange and brown wires.

- When the orange wire is grounded, the LED is green
- When the brown wire is grounded, the LED is red
- When both the brown and orange wires are grounded, the LED is amber.

5.4 Buzzer Control

If the buzzer control wire (yellow) is not used (open), the buzzer beeps only when a card is read successfully. The buzzer can also be controlled using the yellow wire. When the yellow wire is grounded, the buzzer sounds.

5.5 Hold Control

The reading of cards can be disabled using the hold wire (blue). If the blue wire is grounded, the reader ignores all cards placed in its field. If the blue wire is open, the reader reads cards normally.

5.6 Tamper Output

This reader has an optical tamper sensor.

- When the sensor detects light, the tamper output is grounded.
- When the sensor does not detect light, the tamper output is held to the high open collector.

Declaration of Conformity

- 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.
- 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 or more 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.

Limited Warranty

The full ROSSLARE Limited Warranty Statement is available in the Quick Links section on the ROSSLARE website at www.rosslaresecurity.com.

Rosslare considers any use of this product as agreement to the Warranty Terms even if you do not review them.

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