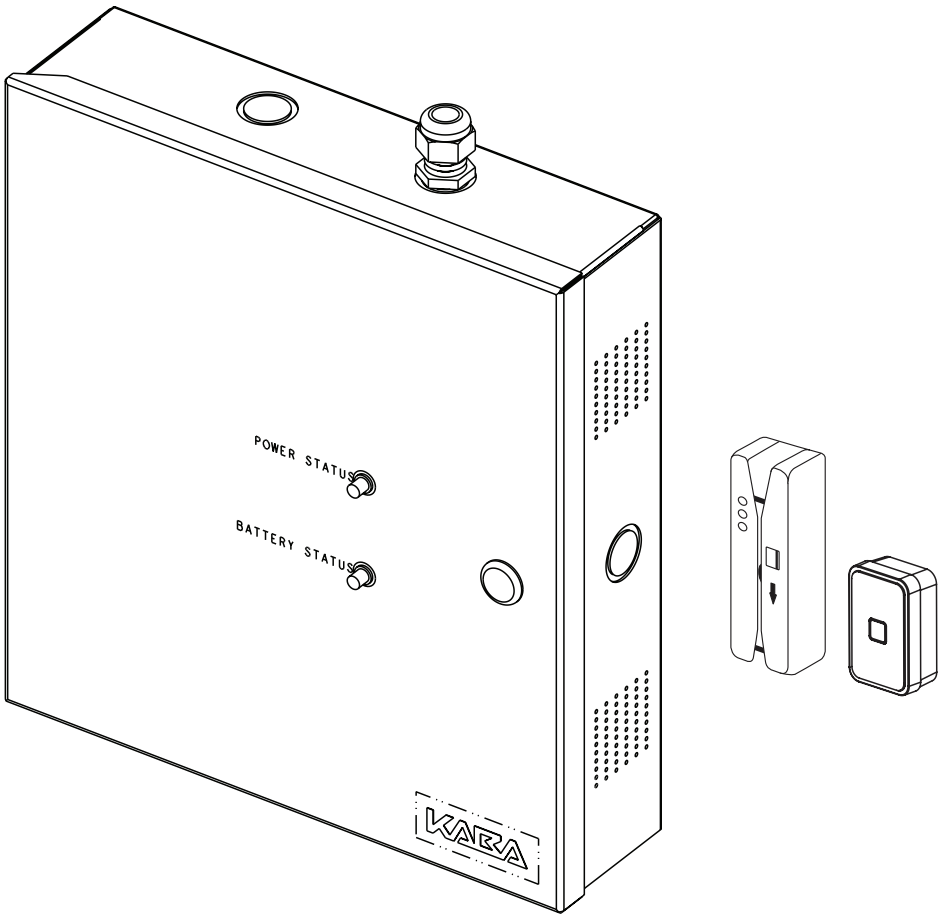

BEYOND SECURITY

KABA®

INSTALLATION GUIDE

ILCO Remote Access Controller - RAC 4XT

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1.0 Introduction and Disclaimers

Target Audience

Please read and follow all directions carefully. These instructions are designed for use by qualified installers or individuals with knowledge of common safety practices and the competence to perform the steps described herein.

Kaba Ilco is not responsible for damage or malfunction due to incorrect installation.

Warnings and Cautions

Carefully inspect windows, doorframes, doors, etc. to ensure that the installation procedures will not cause any damage. Kaba Ilco's standard warranty does not cover damages caused by installation.

The RAC 4XT should always be installed in a secured room or facility with controlled access to prevent access to the system.

Installation of card readers or other peripherals within elevators must only be done with prior consultation of the elevator manufacturer. A technician from the manufacturer should be present at all times for installation.

If installing the RAC 4 in an elevator cage environment, or in proximity to any other equipment that may generate high levels of electromagnetic interference, follow the installation requirements as indicated in Annex C to prevent any operational instability.

Safety Procedures

Installation is to be done following standard safety procedures, and using adequate equipment and protection as prescribed. Power is to be off during the installation process as well as for any maintenance procedures.

CAUTION:
Wear safety glasses when using any tools.

Technical Support

For technical assistance, call:
(800) 906-4526 / (514) 340-9025

OR

Visit the Kaba Support Website:
www.kabalodgingsupport.com

NOTE:

This equipment has been tested and found to comply with 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.
- Consult the dealer or an experienced radio/TV technician for help.

Statement according to FCC part 15.21

Modifications not expressly approved by Kaba Ilco could void the user's authority to operate the equipment.

Statement according to FCC 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.

2.0 Product Description

2.1 Features

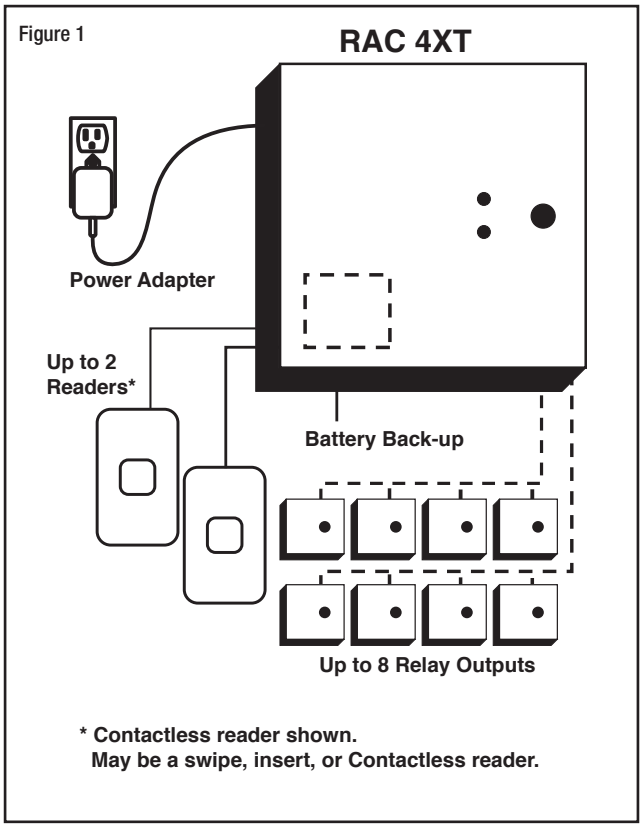
The RAC 4XT is designed to operate electrical locking or control devices where a stand-alone electronic lock is not practical. It provides ingress & egress access control that can be programmed with the full range of Solitaire 710 / 710-II, Generation 760 / 770 / 790, or System 700 features

The system can control any door or access point up to 500 feet (150m) away when using a swipe, insert or extended range contactless reader, and up to 40 feet (12m) away when using a contactless reader R79-1N1.

The Swipe & Contactless Card Reader can be mounted directly on doorframes as narrow as 2 inches (5.1 cm), while the insert reader can only be installed in an elevator panel.

The RAC 4XT is an access control solution that can operate 2 individual card readers, provides multiple relays, a battery back-up option, and much more as per the feature list below. See figure 1 for a typical configuration.

Figure 1

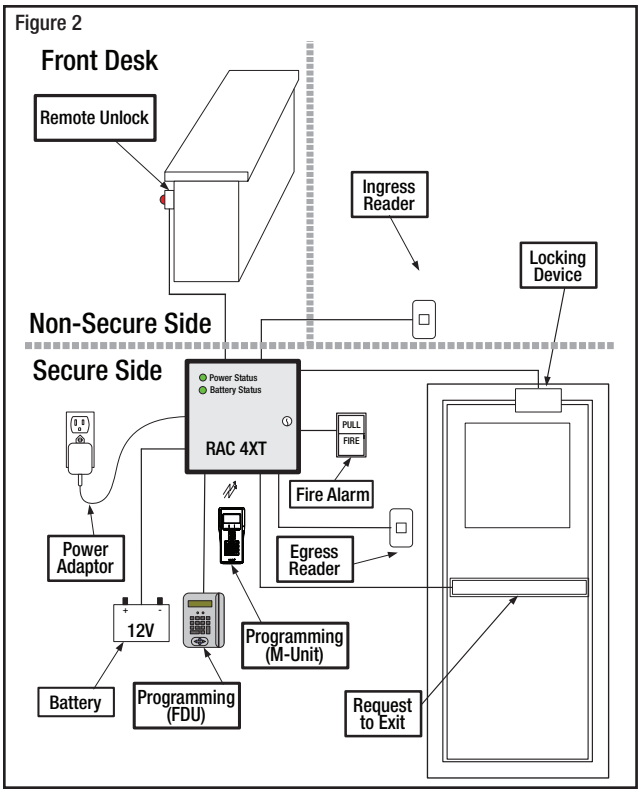


Feature List:

Feature	RAC 4XT
Relay Outputs	Single (Standard) or 8 (Optional)
Variable access delay	Standard
Hotel ID re-initialization feature	Standard
Power failure 3-day auto-recovery; real time clock (RTC)	Standard
Simple serial programming & auditing	Standard
Relay bypassing (passage function)	Standard
Control up to two card readers	Standard
RS-232 Interface for programming	Standard
Unlock delay programmable by Dip Switches	Standard
Fire Alarm Input	Standard
Tamper Alarm Input	Standard
Power Status LEDs feedback	Standard
Remote Unlock input	Standard
Request to Exit (REX) input	Standard
Battery Back-up	Optional
Relay Expansion Board with up to 8 relays	Optional

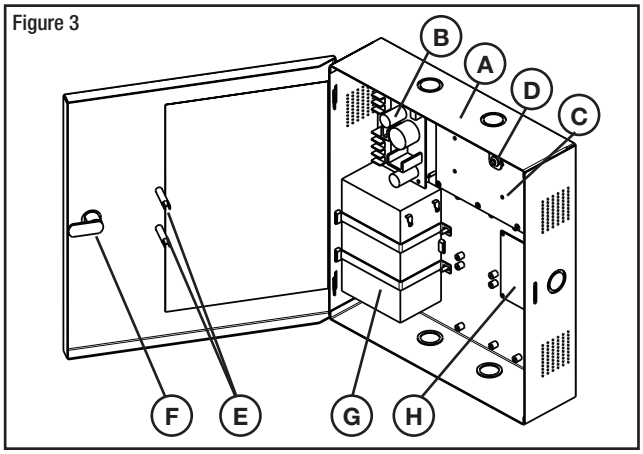
2.2 Components

Figure 2



2.2.1 Controller box

Figure 3



(A) RAC 4XT Enclosure & Access Door: holds the controller board (PCB), power supply, relay expansion board (optional), and battery back-up (optional). Knockouts are available on 3 sides for routing of peripheral cables.

(B) Power Supply: provides the DC power required for operation of the controller PCB and all peripherals.

(C) Controller Board (PCB): controls all the features of the RAC 4XT system.

(D) Tamper Switch: attached to the RAC 4XT enclosure to generate an alarm if the box is opened during operation.

(E) Power & Battery Status LEDs: provides visual indication of the operational status of the RAC 4XT system. Battery status LED is only used on battery back-up equipped systems.

(F) Cam-lock with Key: to provide secure locking and to control access to the RAC 4XT enclosure.

Optional components:

(G) Battery Back-up: 12 VDC battery providing up to 4 hours of operation in the event of a power failure.

(H) Relay Expansion Board: interface board providing 8 relay outputs that can be used to control relay-equipped equipment. As example, it can be used with an elevator to call the elevator or to provide access only to specific floors for certain guests or staffs.

Not shown:

(I) Cables: cables required for connections of the LEDs, power supply and controller PCB. If equipped, will also include cable for connection of battery back-up and / or relay expansion board.

2.2.2 Card readers

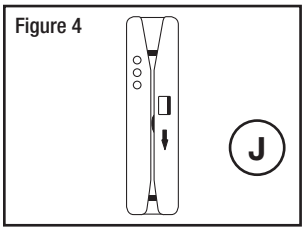
Card readers (J) are used with keycards to grant access to the controlled areas such as pool, gym, staff rooms, etc. Various card reader types are available depending on the location and type of locks used on the property.

2.2.2.1 Magnetic stripe card readers

Two types of readers are available for use with standard magstripe-based keycards.

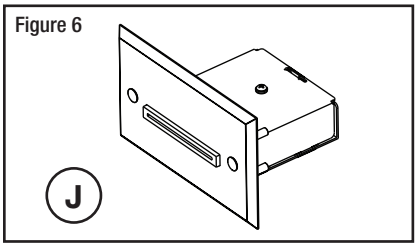
1- Swipe Card Reader: a small vertical swipe unit that protrudes from the wall.

Figure 4



2- Insert Reader: a small wall-enclosed horizontal card reader that comes in a satin stainless steel finish. For use in elevator panels only, where enough space permits (minimum 4.5” depth required).

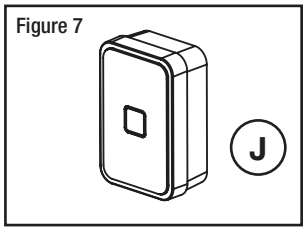
Figure 6



2.2.2.2 Contactless Card Reader

The Contactless Card Reader is a small vertically mounted unit that protrudes from the wall and is used with RFID-based keycards

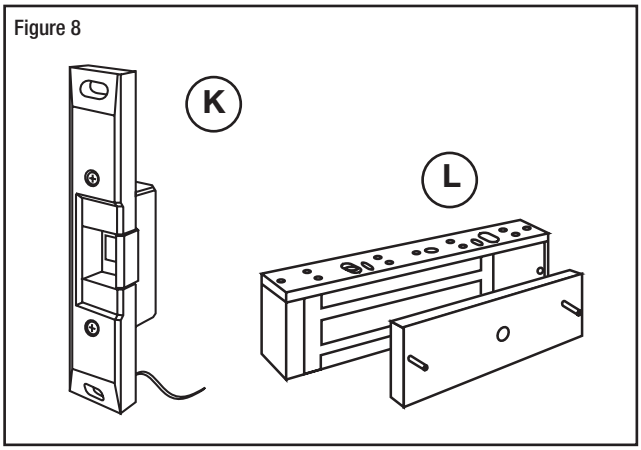
Figure 7



2.2.3 Locking devices

The RAC 4XT controller PCB can provide one, or multiple (when used with a relay expansion board), relay outputs that can be used to control Electric Strikes (K) or Electromagnetic Locks (L) as shown in Figure 8.

Figure 8



2.2.4 Optional peripherals

The RAC 4XT can also be used with the following types of peripherals:

- Exit Devices
- Motion Detectors
- Panic Bars
- Request to Exit (REX) button
- Remote Unlock Button
- Remote Programming Interface.

3.0 Checklist and Exploded Views

3.1 Parts and Tools List

NOTE:
- Some items are dependant on the options or configuration purchased. Please ensure all parts ordered & required for installation are available before beginning.
- Parts are subject to change without notice.
- For letter designations refer to Figure 9.

RAC 4XT Enclosure:

NOTE: All items above come factory installed.

(A) RAC 4XT enclosure with access door
(B) Power supply: 24 VAC / 24 VDC input, 12 VDC output
(C) Controller PCB
(D)Tamper switch
(E) 2 panel-mounted LEDs (green) for power & battery status
(F) Cam-lock

Battery back-up (optional):

NOTE: All items come factory installed where ordered with initial system.

(G) 1x lead acid battery including:
- 2x strapping bracket
- 2x flat washer (#8)
- 2x split washer (#8)
- 2x nut (#8-32)
- Power supply cabling (1x red, 1x black – 18 AWG, ~10")

Relay Expansion Board (optional):

NOTE: All items come factory installed where ordered with initial system.

(H) Relay expansion PCB board including 4x 6-32 x 3/8" SS screw with washer & controller PCB connection cable (not shown)

Cables (not shown):

NOTE: Some items come factory installed.

(I) System cables:
- Power supply to LEDs
- Power supply to controller PCB
- Controller PCB jumpers (card reader type dependent)

Card Reader(s):

NOTE: Type of card reader(s) dependent on system configuration ordered.

(J) Swipe reader (see Figure 4)

(J) Insert reader (see Figure 6) – may require additional tools as per PK3166 included with the reader.

(J) Contactless reader (see Figure 7)

Locking Device

NOTE: Locking device(s) dependent on system configuration ordered.
(K) Electric strike
(L) Electromagnetic Lock

Power Adaptor includes:

NOTE: Dependent on country's electrical power requirements.

(M) 1x International 24 VDC output adaptor with integrated 6 foot (1.8 m) power cable and interchangeable AC outlet prongs. Input power requirements of 220-240 VAC, 50-60 Hz.

or

(N) 1x North America 24 VAC output power adaptor, with 2 separate 10 foot (3 m) power cable assembly (2x 18 AWG cables terminated on one end with fork terminals). Input power requirements of 110-120 VAC, 60 Hz.

Other Peripherals (optional):

(O) Request to Exit button

(P) Remote Programming Interface (RPI)

(Q) Remote Unlock (Not shown)

Programming Device

NOTE: Purchased separately, dependent on hotel configuration.

IMPORTANT:
Programming of the RAC 4XT can only be done with the following versions of programming device software:

- ATLAS: software version 1.0 or higher
- Kaba Ilco 780 FDU: software version 6.40 or higher
- Kaba Ilco FDU 4 (G4): all versions

(R) Front Desk Unit (FDU)

(R) ATLAS with Infra-red Programming Module (IPM)

3.0 Checklist and Exploded Views

Installation Hardware Bag:

(S) 4x Philips wood screw, #8 x 1–1/4”
(T) 4x Nylon anchor, #6–10
(U) 4x Concrete anchor, #7–9
(V) 2x Strain relief connector with locking nut
(W) 2x Diode-rectifier
(X) 5x Steel flat washer, #8
(Y) 3x Crimp terminal B connector
(Z) 2x Crimp fork terminals, 18–22 AWG

Tools required (not supplied):

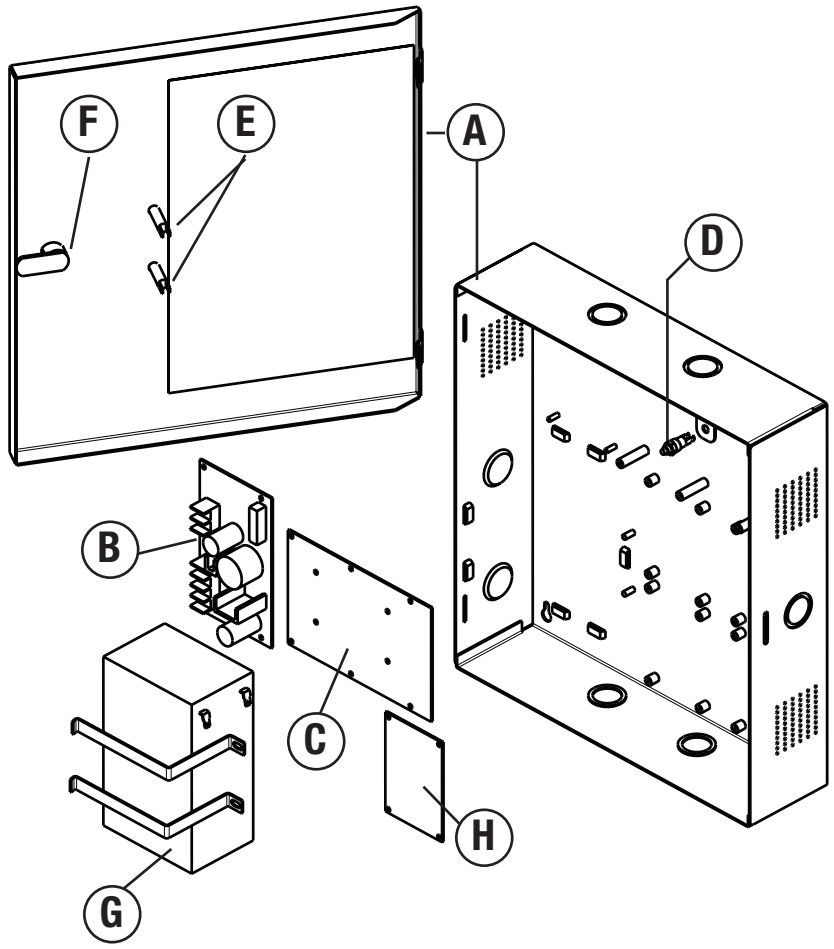
Additional tools may be required dependent on the peripherals being installed. The list below covers the installation of the RAC 4XT enclosure only.

- Safety glasses
- Ink marker
- Electric drill
- 9/64” (3.5 mm) drill bit
- 7/32” (5.5 mm) drill bit
- 1/4” (6.5 mm) drill bit
- 3/8” (9.5 mm) drill bit
- Philips screwdriver – #2
- Slotted screwdriver – 3/32” tip width
- Adjustable wrenches
- Crimp tool – 18-22 AWG
- Pliers
- Wire cutter / stripper
- FDU/ATLAS programmed “Test Lock” keycard
- Hammer or rubber mallet
- Awl or center punch

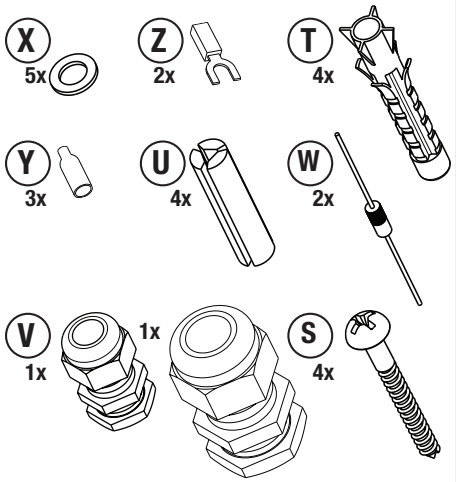
3.2 Exploded View

Figure 9

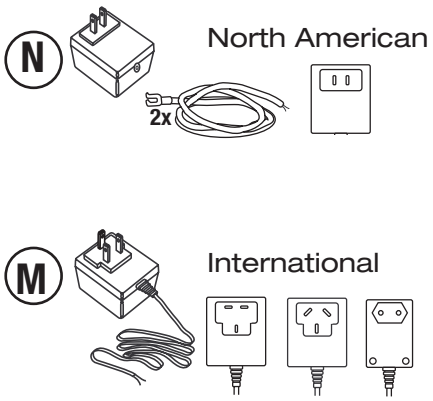
Controller Box



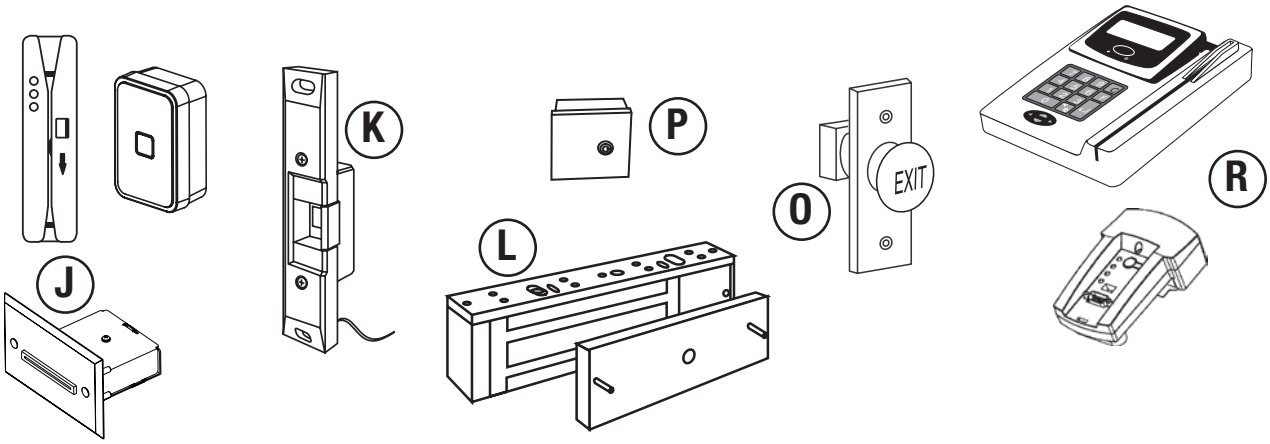
Hardware Bag



Power Adaptor



Peripherals / Optional Devices



4.0 System Installation Overview

Before starting installation:

- Ensure all components ordered and materials / tools required are available.
- Ensure all cabling is available for the peripherals / components being installed.

IMPORTANT:
All installations & wiring of RAC 4XT enclosure and peripherals must comply with all applicable local building codes and regulations

CAUTION:
Do not connect power to the enclosure until the end of the installation.

If installing the RAC 4 in an elevator cage environment, or in proximity to any other equipment that may generate high levels of electromagnetic interference, follow the installation requirements as indicated in Annex C to prevent any operational instability.

4.1 Pre-Installation Procedures

Step 1: Identify a secure location for the RAC 4XT enclosure

IMPORTANT:

- Access to the RAC 4XT enclosure must be restricted to authorized personnel.
- AC power must be available within 6 feet (1.8 m) of the RAC 4XT enclosure.
- The location temperature must be from 32°F to 120°F (0°C to 49°C) and sheltered against weather hazards and dripping water.
- The enclosure must be installed using the hardware supplied.

Identify the location for the RAC 4XT enclosure based on the following:

- Enclosure should be mounted at a workable height with clearance to completely open the access door.
- The enclosure can be placed either horizontally in the ceiling or vertically on a concrete, wood, or plaster wall.

Step 2: Identify location(s) for card readers and peripherals

Swipe, insert and extended range contactless card readers must be placed within 500 feet (150 m) from the RAC 4XT enclosure, while contactless card readers R79-1N1 must be placed within 40 feet (12 m) of the reader power source.

Readers should be installed in an obvious location at an ergonomic height near the access door or elevator being controlled.

Swipe card reader:
The space to use the swipe reader must be large enough to allow for adequate swipe clearance.

Insert card reader:
The insert reader must be enclosed in the elevator wall panel, so the location should be in an area with workable access.

NOTE: The minimum depth required for mounting of the insert card reader is 4.5”.

Contactless card reader:
The space to use the contactless reader must be large enough to allow for adequate clearance for the card being presented to the reader.

Remaining peripherals:
Determine the location(s) required for any other RAC 4XT system peripherals (REX, motion detector, etc) and ensure that all required cabling is available as required in following steps. Install as per manufacturer’s instructions and route wires to the RAC 4XT enclosure for connection to the controller PCB.

Step 3: Set the desired access delay

The default factory setting for the delay on access devices is 3 seconds. To change this value configure the controller PCB dip switch SW2 settings as per Annex A, Table 2.

Step 4: Install strain relief

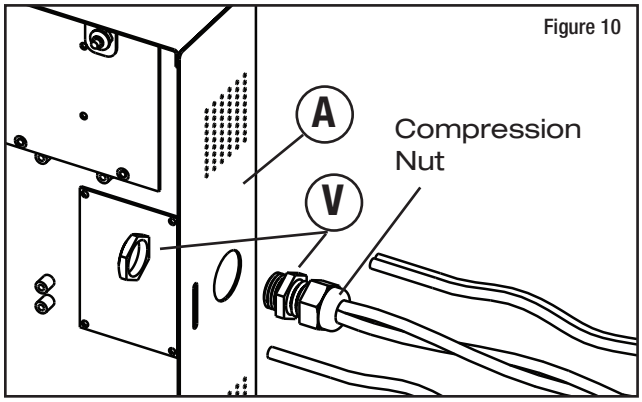
Strain reliefs are provided in the hardware bag to secure the wires leading into the enclosure and to help prevent the possibility of wire tampering.

1. Determine the routing needed for all wiring of the RAC 4XT card readers and peripherals and select the enclosure knock-out(s) to be removed for installation of the strain relief(s).
2. Remove the selected knock-out(s) using

a hammer & screwdriver / awl, and from the inner side of the enclosure tap out the small metal disk.

3. Based on the amount of wires to be routed, attach the appropriate strain relief to the enclosure as shown in Figure 10. **Do not attempt to route an excessive amount of wires. If extra strain reliefs are required please contact Kaba Ilco.**

Figure 10



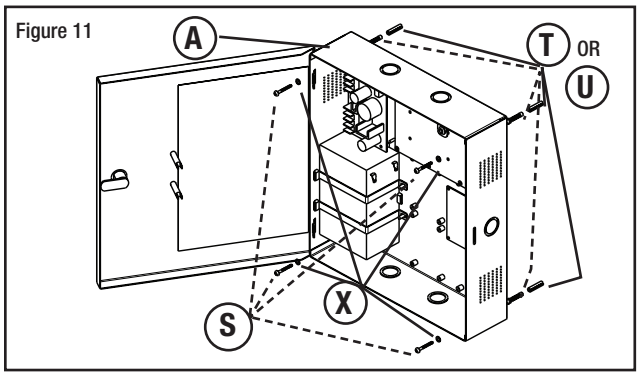
4.2 *Installation & Wiring Procedures*

Step 5: Mounting the RAC 4XT enclosure

Install the enclosure in the desired location using the appropriate items from the hardware bag.

NOTE: For easier access it is recommended to remove the access door before installation.

Figure 11



Step 6: Mounting and wiring card reader(s)

For installation of the card reader(s) follow the appropriate steps listed below, depending on the type of card reader and configuration being installed.

CAUTION:
Do not exceed the maximum cable length indicated by the manufacturer of the products being connected.

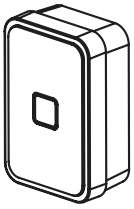
CAUTION:
Refer to the wiring label on the access door, the wiring diagram & tables in Annex A, or the detailed peripherals connections in Annex B.

IMPORTANT:

Every wire must pass through a strain relief as connected in step 4.

Model R79K-XXX Contactless card reader installation

Figure 12



1. Remove the back plate and use it to mark the holes for the cables and screws.

   Alternatively, the drilling template DT-514800 included with the reader can be used.

NOTE: Do not use the actual drawing from Annex H of this manual to mark the hole locations as this drawing is not to scale.

2. Drill the holes in the wall according to the diameters indicated on the drilling template in Annex H, based on the type of surface the reader is being installed on.

   Metal surface mounting: install the back plate onto the wall with the metal screws provided in the installation hardware bag.

   Drywall surface mounting: tap the wall inserts (provided in the installation hardware bag) into the wall using a rubber mallet. Install the back plate onto the wall with the wood screws provided.

3. Connect the included cable to the terminal block of the reader as shown in Annex A, Table 1. Ensure that the correct wire color is attached to the correct terminal block connection.

4. Route the card reader's wire through the grommet of the back plate and assemble the front of the reader onto the back plate. Assemble together by tightening down the screw (provided in the card reader's installation bag) on the bottom of the card reader.

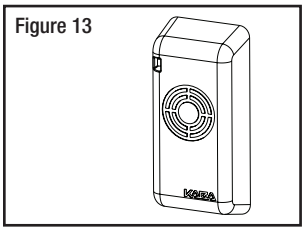
5. Connect the card reader wire to the terminal blocks of the controller PCB as per Annex A, Table 1, or refer to Annex B, Figure 1.

   IMPORTANT:
   Ensure that the jumper wires are also connected on the controller PCB.

NOTE: If required to differentiate between ingress & egress, ensure that the appropriate connector on the controller PCB is used.

Model R79-1N1 Contactless card reader installation

Figure 13



1. Remove the back plate and use it to mark the holes for the cables and screws.

   Alternatively, the drilling template DT-512650 included with the reader can be used.

NOTE: Do not use the actual drawing from Annex G of this manual to mark the hole locations as this drawing is not to scale.

2. Drill the holes in the wall according to the diameters indicated on the drilling template in Annex G, based on the type of surface the reader is being installed on.

   Metal surface mounting: install the back plate onto the wall with the metal screws provided in the installation hardware bag.

   Drywall surface mounting: tap the wall inserts (provided in the installation hardware bag) into the wall using a rubber mallet. Install the back plate onto the wall with the wood screws provided.

3. Connect the included cable to the terminal block of the reader as shown in Annex A, Table 1. Ensure that the correct wire color is attached to the correct terminal block connection.

NOTE: For additional strain relief it is recommended to make a knot in the cable close to the terminal block of the reader.

4. Route the card reader's wire through the grommet of the back plate and assemble the front of the reader onto the back plate. Assemble together by tightening down the screw (provided in the card reader's installation bag) on the bottom of the card reader.

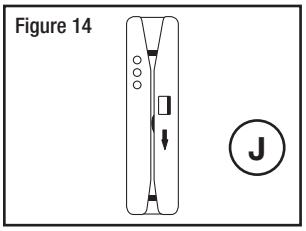
5. Connect the card reader wire to the terminal blocks of the controller PCB as per Annex A, Table 1, or refer to Annex B, Figure 2.

   IMPORTANT:
   Ensure that the jumper wires are also connected on the controller PCB.

NOTE: If required to differentiate between ingress & egress, ensure that the appropriate connector on the controller PCB is used.

Model R71-6XX swipe card reader

Figure 14



1. Identify the location for the card reader and drill a hole for the cable as per the drilling template DT-512738 shown in Annex E, or included with the card reader.

2. Remove the reader's enclosure, and route the card reader wire through the hole. Use the back plate of the reader to mark the holes for the screws.

   Alternatively the drilling template DT-512738 included with the reader can be used.

NOTE: Do not use the actual drawing from Annex E of this manual to mark the hole locations as the drawing is not to scale.

3. Based on the type of surface the reader is being installed on; drill the holes in the wall according to the diameters indicated on the drilling template DT-512738.

   Metal surface mounting: install the back plate onto the wall with the metal screws provided in the installation hardware bag.

   Drywall surface mounting: tap the wall inserts (provided in the installation hardware bag) into the wall using a rubber mallet. Install the back plate onto the wall with the wood screws provided.

4. Hook the reader enclosure onto the top of the back plate and click into place.

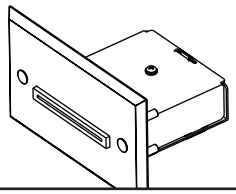
5. Tighten down the supplied set-screw (M3 x 0.5) on the bottom of the reader to secure the reader cover.

6. Connect the card reader wire to the terminal blocks of the controller PCB as per Annex A, Table 1, or refer to Annex B, Figure 3.

NOTE: If required to differentiate between ingress & egress, ensure that the appropriate connector on the controller PCB is used.

Model R71-4XX Insert card reader installation

Figure 15



NOTE: The minimum depth required for mounting of the insert card reader is 4.5".

1. Ensure all tools are available as indicated in manual PK3166-T, included with the insert card reader.

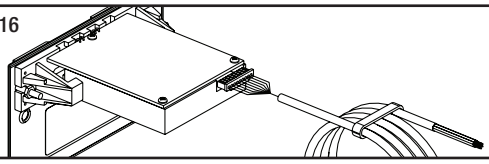
2. Referencing the drilling template DT-512152 included with the reader, mark the location of the holes to be drilled and the rectangular cut-out to be made.

NOTE: Do not use the actual drawing from Annex F of this manual to mark the hole locations as the drawing is not to scale.

3. Using the appropriate tools, cut out the rectangular hole for the reader and drill the screw holes as per drilling template DT-512152 indications.

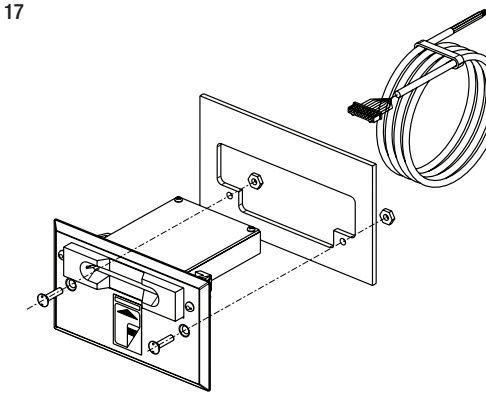
4. Attach the end of the wire with the connector to the connector at the back of the insert reader.

Figure 16



5. Mount the insert reader to the panel by sliding the insert reader inside the cavity and using the 2 spanner screws (6-32 x 3/4") and the two hexagon lock nuts (6-32), to screw the insert reader into the panel.

Figure 17



6. Route the wire and connect to the RAC 4XT enclosure as per connections shown in Annex A, Table 1, or refer to Annex B, Figure 3.

NOTE: If required to differentiate between ingress & egress, ensure that the appropriate connector on the controller PCB is used.

Step 7: Connect peripheral wiring

CAUTION:
Do not exceed the maximum cable length indicated by the manufacturer of the products being connected. In addition, the wire used to connect the peripherals to controller PCB must be of the proper gauge and type as specified by the

manufacturer.

CAUTION:
Refer to the wiring label on the access door, the wiring diagram & tables in Annex A, or the detailed peripherals connections in Annex B.

IMPORTANT:
Every wire must pass through a strain relief as connected in step 4.

Follow the indications below for the different peripherals being connected. The actual items to connect will vary based on the system configuration ordered.

NOTE: Refer to detailed wiring diagrams provided in Annex B.

1. **Electric strike or electromagnetic lock (locking device)**

Refer to Annex B, Figure 4,5,6 & 7 for detailed wiring.

IMPORTANT:
Kaba Ilco does not provide technical or field support for 3rd party locking devices. Please consult the device manufacturer for support.

The following table indicates the maximum recommended wire lengths that can be used for typical locking devices, based on wire gauge.

Locking Device Type	Typical Current (A)	Maximum Recommended Wire Length, One-Way (feet)			
		AWG 18	AWG 16	AWG 14	AWG 12
Electromag. Lock	0.28	170	265	425	675
Electric Strike	0.45	105	165	265	420
Double Electro. Lock	0.56	90	145	230	365
Other Devices	0.75	65	100	160	250

NOTE: The Maximum Recommended Wire Length is the approximate wire length that causes a 5% voltage loss in the wire, using a 12-volt locking device at the rated current included.

CAUTION:
This table is for reference only. Actual wiring requirements for specific devices may differ. Always follow the locking device manufacturer's wiring recommendations as well as local building codes.

1.1 Install and route a 2-conductor cable from the controller PCB to the desired location of the electric strike or electromagnetic lock.

1.2 If installing an electric strike, install the diode across the terminals of the locking device, using the crimp connectors provided in the hardware bag if needed.

IMPORTANT:
Do not reverse the diode polarity as indicated on the wiring diagram.

CAUTION:
To prevent a possible short, the diode must not be in contact with electric strike. If required cut the diode ends shorter.

1.3 Mount the locking device in the desired location and connect as per manufacturer's instructions. For connections between locking device and controller PCB refer to Annex A, Table 3.

2. **Request to Exit button (REX)**

Refer to Annex B, Figure 8 for detailed wiring.

Mount the device at the desired location and run a 2-conductor cable from the request to exit button to controller PCB connector J8, pins 3 & 4. Connect as per Annex A, Table 3.

3. **Remote Unlock button**

Refer to Annex B, Figure 8 for detailed wiring.

Mount the device at the desired location and run a 2-conductor cable from the remote unlock button to the controller PCB connector J8, pins 1 & 2. Connect as per Annex A, Table 3.

4. **Motion Detector**

Refer to Annex B, Figure 9 for detailed wiring.

Mount the device at the desired location and run a 4-conductor cable from the motion detector relay's terminal block to controller PCB connector J8, pins 3 & 4.

To power the motion detector, connect the +12V input of the motion detector to the red wire connecting the +DC OUT terminal on the power supply and the 12V input of the controller PCB (J16, pin 1), as shown in Figure 8 of Annex B. Then connect the GND input of the motion detector to the black wire connecting the -DC OUT terminal on the power supply and the GND input on the controller PCB (J16, pin 2). The use of wire connectors / caps is recommended to ensure reliable electrical connections.

NOTE: If the Egress reader is not used on RAC 4XT, the motion detector can also be powered from J14, pin 3 (12 V) and J14, pin 2 (GND).

5. Remote Programming Interface (RPI)

Refer to Annex B, Figure 10 for detailed wiring.

Run a 4-conductor cable from the RPI to terminal block J6 on the controller PCB. Connect as per Annex A, Table 3.

6. Fire Alarm Panel

Refer to Annex B, Figure 11 for detailed wiring.

Remove the jumper wire connected between pins 3 and 4 of connector J18 on the controller PCB and complete the fire panel installation as per manufacturer's indications.

7. Tamper Switch to Premise Alarm System

To wire the tamper switch to the premise alarm system disconnect the wires on controller PCB connector J7 pins 1 & 2, and run a 2-connector cable from the switch to the premise alarm system.

IMPORTANT:
The tamper alarm switch's polarity is such that when the door is closed the switch itself is also in a closed state. Ensure that the wiring to the premise alarm system is done accordingly to prevent false alarms.

Step 8: Relay Expansion Board outputs wiring

Refer to Annex B, Figure 12 for sample wiring diagram.

The relay expansion board provides 8 relay contacts for wiring & control of relay-enabled peripherals, such as an elevator. The board only provides normally open or normally closed dry contacts, so no power is provided by the board for peripherals.

When a relay expansion board is connected, the controller PCB's on-board single relay output is disabled and any wiring of external equipment must be done to the expansion board.

As wiring of relay-controlled equipment may vary between products please refer to the product manufacturer's instruction booklet for proper instructions.

NOTE: Refer to Annex A, table 4 for specific relay expansion board bypass switches.

- If bypass switches are 'ON', the relays are bypassed and the green LED associated with that relay is turned OFF.
- If bypass switches are 'OFF' the controller PCB can activate the relays. The associated LEDs turn OFF during relay activation.

NOTE: When the power to the RAC 4XT is too low (power failure, low voltage in battery back-up) the controller PCB stops functioning and the relays on the controller PCB or the expansion board will return to their normal state. Any peripheral connected to the relays will then be either in a normally open (NO) or normally closed (NC) state, dependent on the wiring.

Elevator Controller Installation:

The most common application for a relay expansion board is to control an elevator. As the board contains 8 dry relay contacts, 8 common areas can be controlled. The relay outputs are at the wiring input of each three terminal connector (NO, COM, NC) on the expansion PCB as well as being indicated on the label on the inside of the door. Several floors can be controlled by one relay (one common area).

The relays in the RAC 4XT are UL rated and are capable of a maximum switching of 30 VDC @ 1A.

For time duration of relay state change, please refer to the Access Delay Table in Annex A, Table 2.

Step 9: Power adaptor connection

NOTE: Dependent on country's electrical power requirements follow the directions below for the power adaptor required.

Refer to Annex B, Figure 13 for detailed wiring.

International power adaptor

1. Attach the appropriate AC outlet prong to the power adaptor.
2. Route the power adaptor wires into the enclosure and secure the wire (recommended with tie wraps).
3. From the inside of the enclosure, crimp the fork terminals supplied in the hardware bag to the end of each wire.
4. Connect the fork-terminated wires to the power supply inputs as shown in Annex A, Table 8.

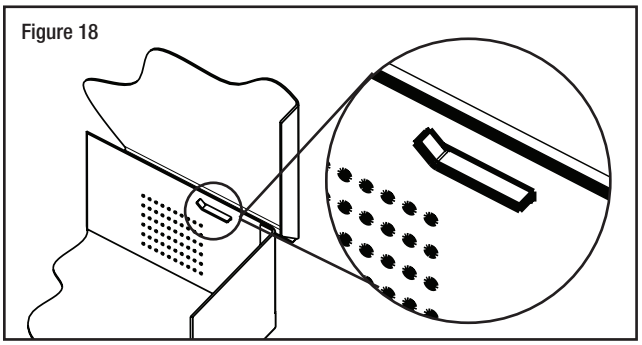
North America power adaptor

1. From the inside of the enclosure, connect one end of the fork-terminated wires to the power supply inputs as shown in Annex A, Table 8.
2. Route the wires out of the enclosure to the AC power source and secure the wires (recommended with tie wraps).
3. Crimp the fork terminals supplied in the hardware bag to the end of the wires and connect them to the power adaptor screw terminals.

Step 10: Completing the installation

1. If the access door was removed, reinstall the door to the RAC 4XT enclosure.
2. Bend the two tabs to a maximum of 30 degrees as shown in Figure 18.

Figure 18



3. Connect the LED wire harness from the power supply to the access door LEDs as indicated below and in Annex A, Table 7.

NOTE: The wires must be connected with the proper polarity. Once the terminals are installed they are designed to have a tight fit so removal may damage the LEDs.

LED Description	Location on door	'+' terminal connection	'-' terminal connection
Power status	Top	Red	Orange
Battery status	Bottom	Red	Yellow

4. If a battery is part of the system, connect the red (+) and black (-) wires from the power supply to the battery.

IMPORTANT:
Ensure that the proper connections are made (ie: red to red, black to black).

5. Plug the power adaptor into the AC power source and / or turn on the main AC power to the system.

5.0 Settings and Operation

5.1 Testing

1. Connect the AC power adaptor and / or turn on the AC current.
2. Verify that the Power Status LED on the access door is ON.
3. If equipped, verify that the Battery Status LED on the access door is ON.

NOTE: Battery status LED may be off if the battery is completely discharged or if the connections are reversed. A properly connected battery may take up to 12 hours to charge and the LED to turn on.

4. Verify that the Func1 (D45) & Func2 (D46) LEDs on the controller PCB blink continuously.
5. Activate the Bypass switch (SW3) on the controller PCB.
6. Verify that the locking device is activated. If it is not activated verify that the Fire Alarm input is properly connected or that a jumper wire is connected on J18 pins 3 & 4.
7. Deactivate the bypass switch (SW3) on the controller PCB.
8. As per the FDU or ATLAS manuals make a test card and use it on the card reader(s) connected. If the RAC 4XT has never been initialized, the door will unlock. The unlock time will correspond to the delay set by the DIP switches as per Annex A, Table 2.
9. If a REX button is connected, press it and verify that the door unlocks.
10. If a Remote Unlock button is connected, press it and verify that the door unlocks.
11. If a Motion Detector is connected, pass in front of it to verify that the door unlocks.
12. If the RAC 4XT is connected to a fire panel verify that the electromagnetic lock or a fail-safe electric strike is deactivated when the fire alarm is active (open input).
13. If a battery back-up is equipped, when fully charged remove the main AC power adaptor and verify proper RAC 4XT operation.

5.2 Hotel ID Initialization

1. Create an initialization keycard with the hotel's FDU or ATLAS system.
2. Use the programmed initialization keycard on the connected card reader(s). Depending on the type of card reader the LED(s) will react as indicated below. Additionally for all situations the controller PCB can be verified to ensure that LED D41 is ON.

Swipe card reader:

The red and green LEDs should flash in sequence: red & green once, followed by green once.

Insert card reader:

The red and green LEDs should flash in sequence: red & green once, followed by green once.

Contactless card reader:

The green LED on the reader should flash in sequence: rapid green twice, followed by normal green once.

5.3 Hotel ID Re-initialization

In the event the Hotel ID of the premises is changed or a problem is suspected with the current configuration, the RAC 4XT will need to re-initialize its Hotel ID.

1. NOTE down the current delay setting as indicated on SW2 of the controller PCB.
2. Set the DIP switches on SW2 of the controller PCB to CFG #16 (OFF, OFF, OFF, OFF) as per Annex A, Table 2.
3. Verify that the initialization LED (D41) is OFF.
4. Set the DIP switch positions back to the chosen delay settings as NOTEd above, or select a new setting as per Annex A, Table 2.
5. Follow the steps as per section 5.2 "Hotel ID Initialization" above.

5.4 Programming and Auditing

IMPORTANT:
Programming of the RAC 4XT can only be done with the following versions of programming device software:

- ATLAS: software version 1.0 or higher
- Kaba Ilco 780 FDU: software version 6.40 or higher
- Kaba Ilco FDU 4 (G4): all versions

The RAC 4XT can be programmed using either an FDU or ATLAS system. Refer to the appropriate steps below based on the hotel's programming system.

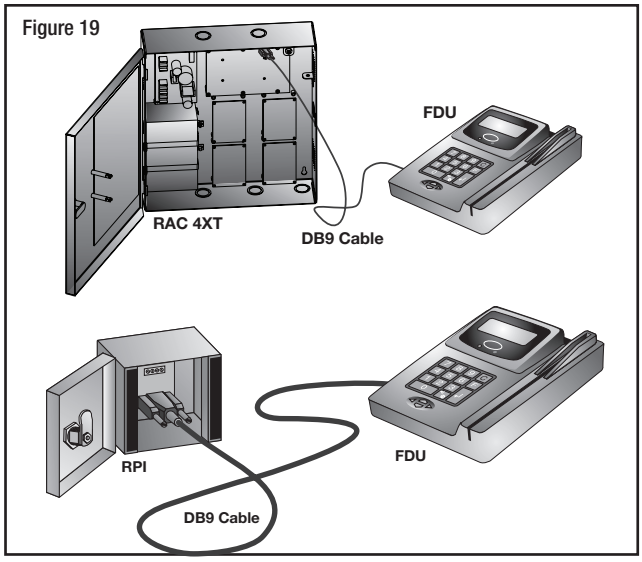
NOTE:

- If a Remote Programming Interface (RPI) is connected the RAC 4XT can be programmed directly via the connector in the RPI.
- Unlike Kaba's electronic locks a Programming keycard is not required for the RAC 4XT as the system is already in programming mode.

FDU Programming

1. Link the FDU to the DB1 in the RPI box, or to the DB9 connector (serial port J5) on the controller PCB. Refer to figure 19 for the positions of the relevant connectors.
2. For step-by-step programming instructions refer to the Kaba Ilco Lodging Access Control Reference Manual.

Figure 19



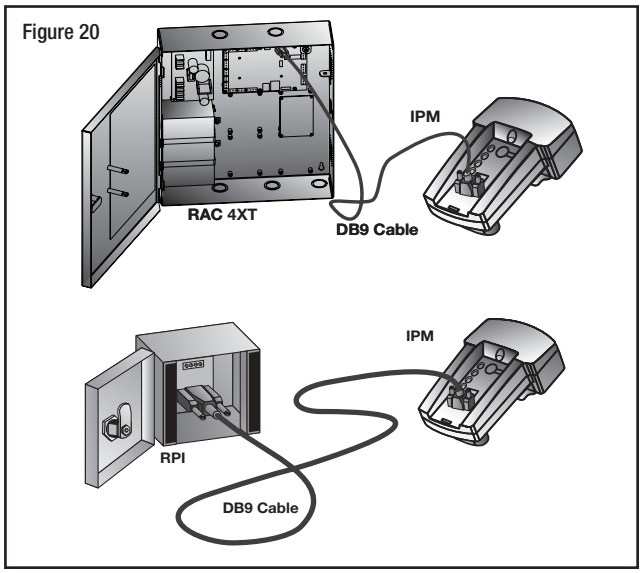
ATLAS Programming

For ease of programming the IPM kit for RAC (PN 064-511161) can be used by attaching the IPM to the RAC with the Velcro provided in the kit.

- Cut a piece of each type of Velcro from the strip provided.
- Depending on the configuration of the system attach one side of the Velcro to either the side of the RPI, or to the side of the RAC 4XT enclosure.
- Attach the other side to the side of the IPM.

1. Connect one side of the DB-9 serial cable to the IPM.
2. Connect the other side to the DB-9 connector (serial port J5) on the controller PCB of the RAC 4XT.
3. For step-by-step programming instructions refer to the ATLAS on-line help or the ATLAS Administration manual.

Figure 20



5.5 Battery Back-up Replacement

NOTE: For preventive maintenance, the battery back-up should be replaced every 2 to 3 years, and tested every 6 months by removing the main AC power.

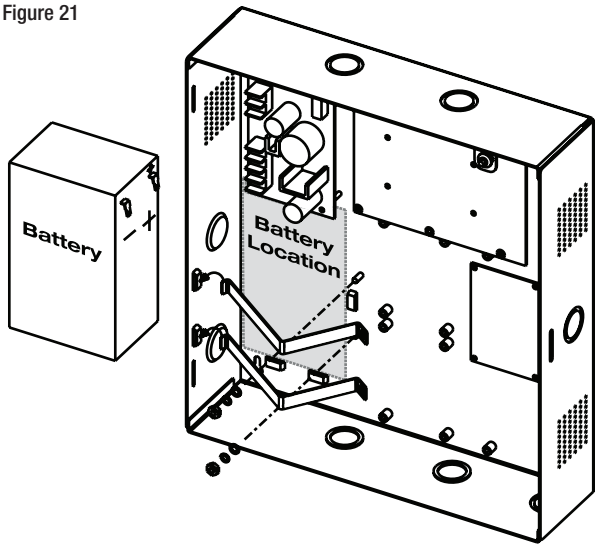
1. Turn off the main AC power to the RAC 4XT or disconnect the power adaptor from the wall outlet.

2. Disconnect the red & black wires from the battery.

3. Remove the hardware holding the down the battery brackets.

4. Rotate the battery brackets upwards to remove them from the anchoring slots as shown in Figure 21.

Figure 21



5. Replace the used battery with the same type gelled lead acid cell 12 V, 7.0 Ah (Ampere-hours).

CAUTION:
Dispose of used battery according to local regulations

6. Place the new battery in the RAC 4XT enclosure as shown in Figure 21 ensuring that the orientation and terminal polarities are as shown.

7. In order, install the battery brackets, flat washer, split washers, and nuts.

8. Reconnect the wires from the power supply to the battery, ensuring that the red wire connects to the positive '+' terminal and the black wire connects to the negative '-' terminal.

9. Reconnect the power adaptor and / or turn on the main AC power to the RAC 4XT.

5.6 New Battery Back-up Installation

If the original system did not have a battery back-up but one is desired later, order kit 064-511889-K and follow the steps below.

1. Turn off the main AC power to the RAC 4XT or disconnect the power adaptor.

2. Connect and secure the fork-crimp terminal end of the red wire to the '+' terminal on the power supply terminal block BAT.

3. Connect and secure the fork-crimp terminal end of the black wire to the '-' terminal on the power supply terminal block BAT.

4. Place the battery back-up in the enclosure as shown in Figure 18 (sec 5.5).

5. In order, install the battery brackets, flat washer, split washers, and nuts.

6. Connect the wires from the power supply to the battery ensuring that the red wire connects to the '+' terminal and the black wire connects to the '-' terminal.

7. Reconnect the power adaptor and / or main AC power to the RAC 4XT.

NOTE: For preventive maintenance, the battery back-up should be replaced every 2 to 3 years, and tested every 6 months by removing the main AC power.

5.7 Power Failure

In the event of an electrical failure the RAC 4XT system will recover its configuration automatically if power is restored within 3 days.

When electrical power is restored after a power failure, verify the status of the LED D41 on the controller PCB. If the LED is OFF use an initialization card with the reader and perform a time reset on the RAC 4XT as per the FDU or ATLAS manuals.

NOTE: When the power to the RAC 4XT is too low (power failure, low voltage in battery back-up) the controller PCB stops functioning and the relays on the controller PCB or the expansion board will return to their normal state. Any peripheral connected to the relays will then be either in a normally open (NO) or normally closed (NC) state, dependent on the wiring.

5.8 Loading Recommendations

CAUTION:
Do not exceed the load limitations of the RAC 4XT system.

The maximum recommended load for all output relays in the RAC 4XT system is 1 Amp at 30 VDC. The tamper switch rating is 1 Amp at 30 VDC.

The current supplied by the controller PCB is for the locking device used is 0.75 Amps from connector J18, pin 1. Refer to Annex A, Table 3.

5.9 System Deactivation

In order to deactivate the RAC 4XT system, disconnect both terminals from the battery back-up (if equipped), then disconnect the AC power either by removing the power adaptor from the wall outlet, or by shutting off the main power to the electrical outlet the system is connected to.

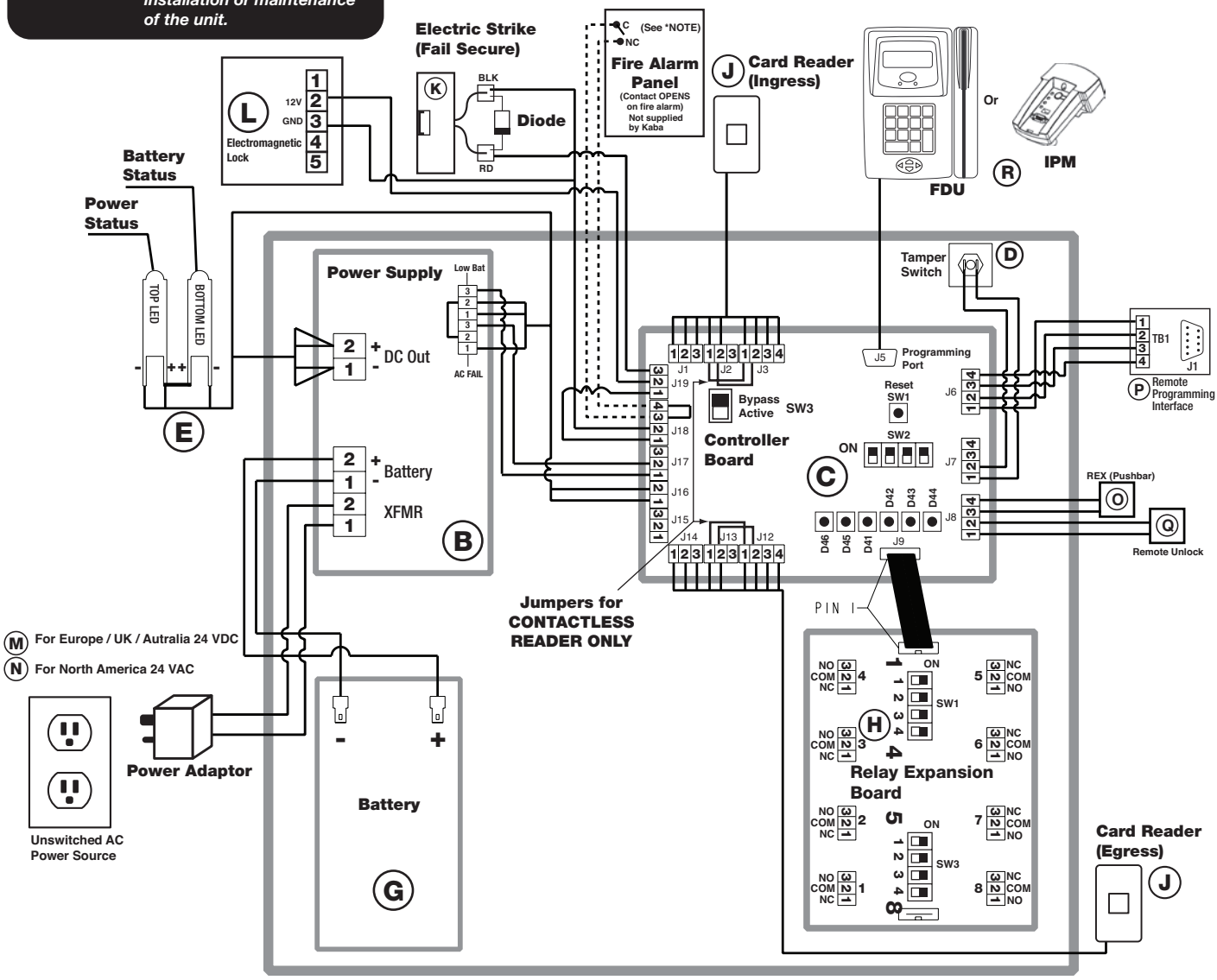
Remote Access Controller - RAC 4XT

*NOTE: Remove short from connector J18, pins 3 and 4, if fire panel contact remote interface is used

FRONT PANEL INDICATORS:
Green ON = Power Status OK
Green ON = Battery Status OK

Exit Device for Push Bar Pannex and Motion Detector (See Instruction Booklet)

IMPORTANT: *Read manual before installation or maintenance of the unit.*



*** For readers refer to reader install sheets.**

Note: Connections required are dependant on system options purchased.
Part numbers indicated subject to change.
Please refer to ordering guide for current numbering.
See detailed peripheral connections in Annex B.
For latest part numbers please refer to the latest ordering guide or contact Kaba Customer Support.

Table 1

Controller Board - RAC 4 Card Reader Connections

Controller Board		Swipe	Insert	Contactless					
		R71-6XXX	R71-4XXX	R79K-1XX-XX		R79-1N1		R79-1E1	
Signal	Reader Config Ingress	Wire Color	Wire Color	Wire Color	Term Block	Wire Color	Term Block	Wire Color	Term Block
Vcc (5V)	J1 pin 1	-	-	-	-	RED	TB-2		
GND	J1 pin 2	PURPLE / BLACK	PURPLE / BLACK	BLACK	J4-2	BLACK	TB-1	BLACK	TB-7
12V	J1 pin 3	PURPLE	PURPLE	RED	J4-1	-	-	RED	TB-6
Data +	J2 pin 1	WHITE	WHITE	WHITE	J5-2	WHITE	TB-4	WHITE	TB-4
Data -	J2 pin 2	WHITE / BLACK	WHITE / BLACK	GREEN	J5-1	GREEN	TB-3	GREEN	TB-3
-	J2 pin 3	-	-	-	-	-	-	-	-
Green LED +	J3 pin 1	RED	RED	-	-	-	-	-	-
Green LED -	J3 pin 2	RED / BLACK	RED / BLACK	-	-	-	-	-	-
Red LED +	J3 pin 3	YELLOW	YELLOW	-	-	-	-	-	-
Red LED -	J3 pin 4	YELLOW / BLACK	YELLOW / BLACK	-	-	-	-	-	-

(1) Verify correct swipe reader model before connecting wires.

(2) Contactless reader jumper wires must be installed as per wiring diagram:
J2 pin 1 to J3 pin 1 & J2 pin 2 to J3 pin 2 for Ingress
J12 pin 1 to J13 pin 1 & J12 pin 2 to J13 pin 2 for Egress.

(3) Wire connection to back of contactless card reader.

(4) TB-1 (BLACK)
TB-2 (RED)
TB-5 (YELLOW)
Factory Connected

Table 2

Access Delay (SW2 on Controller Board)

CFG	1	2	3	4	Sec.
1	ON	ON	ON	ON	8
2	OFF	ON	ON	ON	1
3	ON	OFF	ON	ON	3
4	OFF	OFF	ON	ON	5
5	ON	ON	OFF	ON	10
6	OFF	ON	OFF	ON	15
7	ON	OFF	OFF	ON	20
8	OFF	OFF	OFF	ON	25
9	ON	ON	ON	OFF	30
10	OFF	ON	ON	OFF	35
11	ON	OFF	ON	OFF	40
12	OFF	OFF	ON	OFF	50
13	ON	ON	OFF	OFF	60
14	OFF	ON	OFF	OFF	90
15	ON	OFF	OFF	OFF	120
16	OFF	OFF	OFF	OFF	RE-INIT

Table 3

Controller Board - RAC 4 Peripherals Connections

Peripheral			Controller Board	
Wire / Conn.	Description	Item*	Signal	PCB Conn.
-	Programming	-	DB9	J5
TB1 pin 1	Remote Programming Interface	(P)	GND	J6 pin 1
TB1 pin 2			RX	J6 pin 2
TB1 pin 3			TX	J6 pin 3
TB1 pin 4			CGND	J6 pin 4
-	Relay Exp. Bd.	(H)	Relay Exp.	J9
-	Remote unlock	(Q)	REM UNL	J8 pin 1
-			GND	J8 pin 2
-	Request to Exit	(O)	REX	J8 pin 3
-			GND	J8 pin 4
Black	Fire Alarm	-	FIRE ALM	J18 pin 3
Black			GND	J18 pin 4
-	Strike or Maglock	(K) - Strike (L) - Maglock	12V LCK	J18 pin 1
-			GND	J18 pin 2
-			COM	J19 pin 1
-			NC	J19 pin 2
-			NO	J19 pin 3

*Denotes component identifier in wiring diagram of previous page.

Table 4

Relay Expansion Board

Terminal	State	Bypass	Terminal	State	Bypass
1-1	NC	SW1-1	5-1	NC	SW3-1
1-2	COM		5-2	COM	
1-3	NO		5-3	NO	
2-1	NC	SW1-2	6-1	NC	SW3-2
2-2	COM		6-2	COM	
2-3	NO		6-3	NO	
3-1	NC	SW1-3	7-1	NC	SW3-3
3-2	COM		7-2	COM	
3-3	NO		7-3	NO	
4-1	NC	SW1-4	8-1	NC	SW3-4
4-2	COM		8-2	COM	
4-3	NO		8-3	NO	

Caution: **If bypass switches are "ON" - Relays are bypassed & GREEN LEDs are "OFF".**
If bypass switches are "OFF" - GREEN LEDs are "ON" & Controller Board can activate relays.

Table 5

PCB Status LEDs

LED	Description
D41	Initialization
D42	Programming
D43	Access
D44	Relay 0
D45	Functionality 1
D46	Functionality 2

Table 6

Controller Board to RAC 4XT Power Supply

Description	Controller Board			Power Supply	
	Wire Color	Connector	ID	Signal	ID
DC Power	RED	J16 pin 1	12V	DC OUT-2	+
	BLACK	J16 pin 2	GND	DC OUT-1	-
AC Fail	BROWN	J17 pin 1	Low Batt	Low BAT-3	NO
	WHITE	J17 pin 2	AC Fail	AC Fail-3	NO
	-	J17 pin 3	GND	-	-

Table 7

Power Supply to RAC 4XT LEDs

Description	Power Supply		LEDs	
	Signal	ID	Wire Color	Signal
Power Status	AC Fail-1	NC	ORANGE	(-)
	-	-	RED*	(+)
Battery Status	LOW BAT-1	NC	YELLOW	(-)
	DC OUT-2	(+)	RED	(+)
	-	-	RED*	(+)

Table 8

Power Supply to Power Adaptor

Adaptor		P. Supply	
Type	Wire Color	Signal	ID
International	BLACK	XFMR-1	1
	BLACK / WHITE	XFMR-2	2
North America	-	XFMR-1	1
	-	XFMR-2	2

6.0 Annex B Peripheral Wiring Diagrams

Figure 1: Contactless Reader Wiring

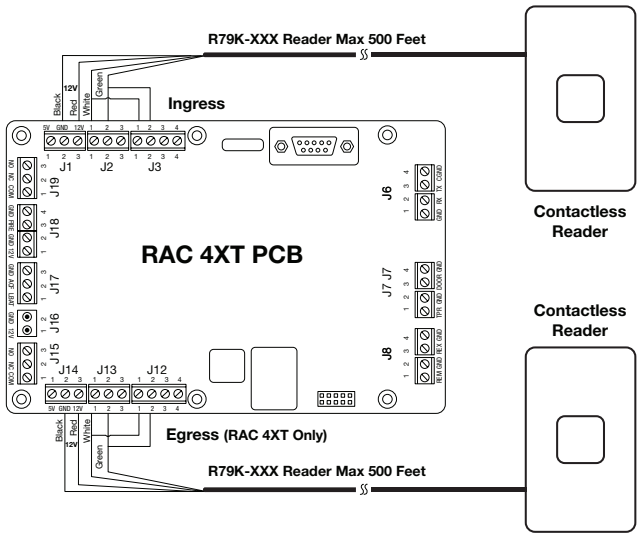


Figure 2: Contactless Reader Wiring

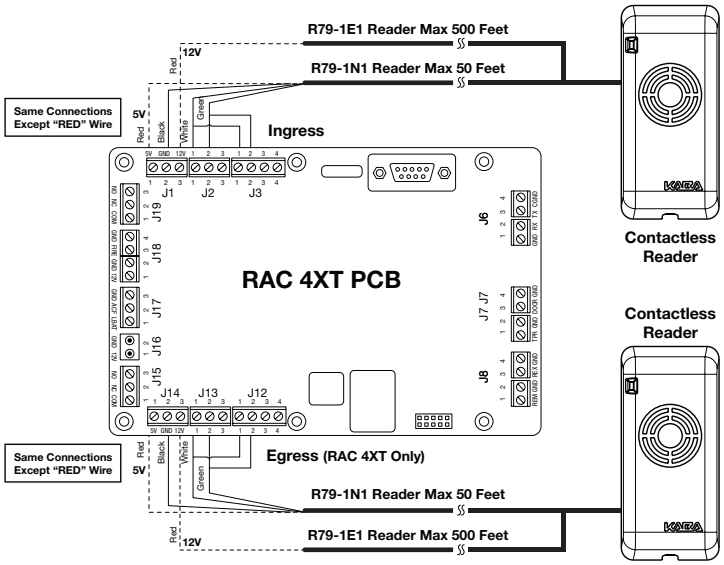


Figure 3: Insert and Swipe Reader Wiring

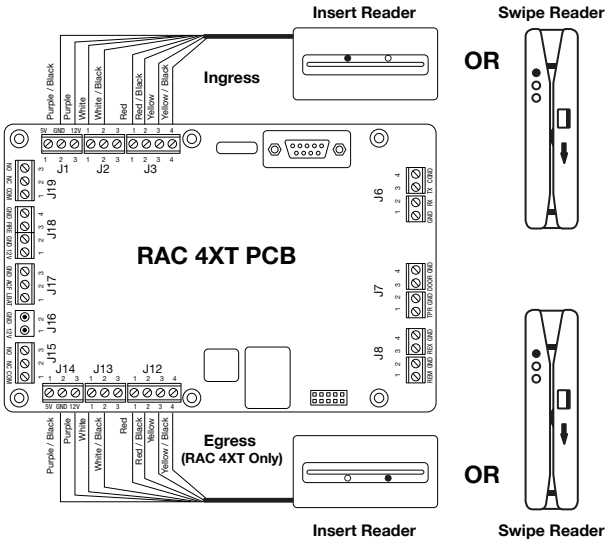
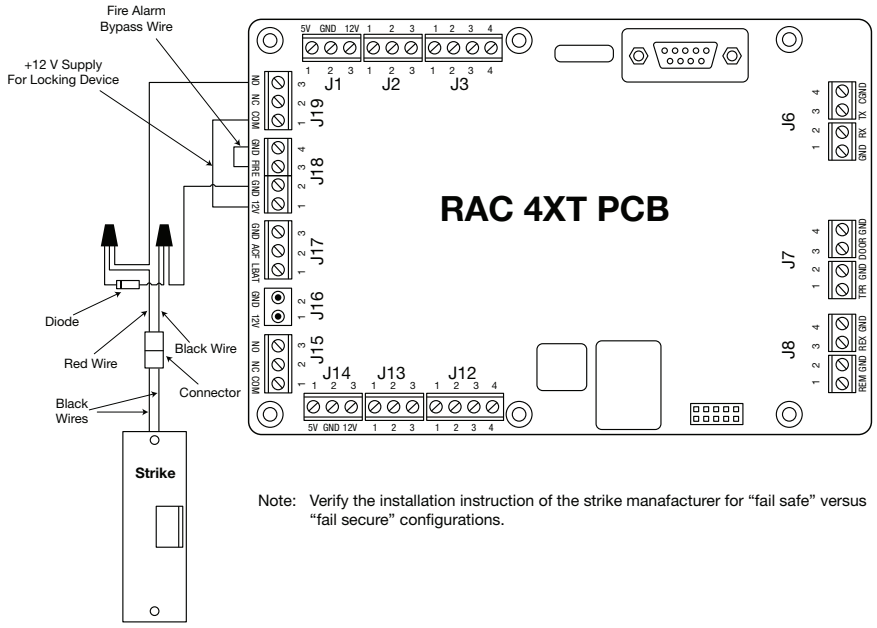
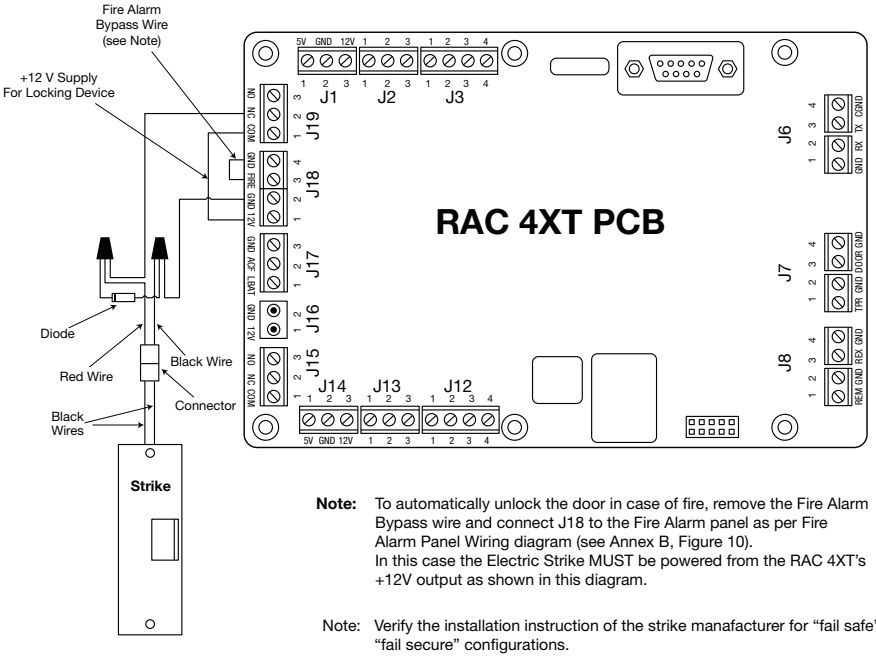


Figure 4: Strike Wiring (Fail Secure)



Note: Verify the installation instruction of the strike manafacturer for “fail safe” versus “fail secure” configurations.

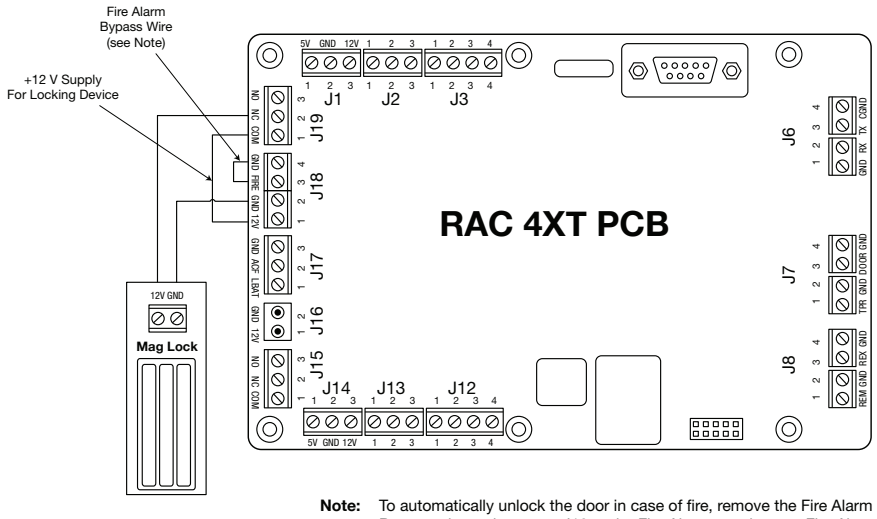
Figure 5: Strike Wiring (Fail Safe)



Note: To automatically unlock the door in case of fire, remove the Fire Alarm Bypass wire and connect J18 to the Fire Alarm panel as per Fire Alarm Panel Wiring diagram (see Annex B, Figure 10).
In this case the Electric Strike MUST be powered from the RAC 4XT’s +12V output as shown in this diagram.

Note: Verify the installation instruction of the strike manafacturer for “fail safe” versus “fail secure” configurations.

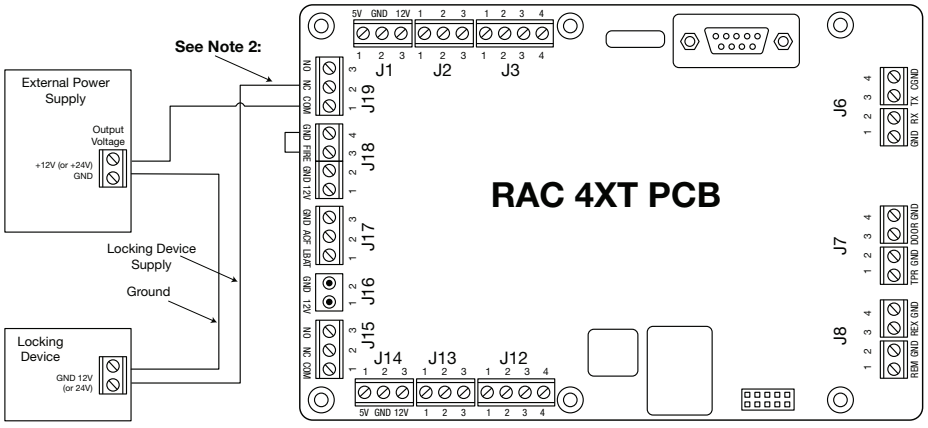
Figure 6: Electromagnetic Lock Wiring



Note: To automatically unlock the door in case of fire, remove the Fire Alarm Bypass wire and connect J18 to the Fire Alarm panel as per Fire Alarm Panel Wiring diagram (see Annex B, Figure 10).
In this case the Electromagnetic Lock MUST be powered from the RAC 4XT's +12V output as shown in this diagram.

Figure 7: Externally Powered Locking Device Wiring (+12 volts or + 24 volts)

IMPORTANT: Kaba does not provide Technical or Field Support on 3rd party locking devices. Please contact the device manufacturer for assistance on installation or functional issues.

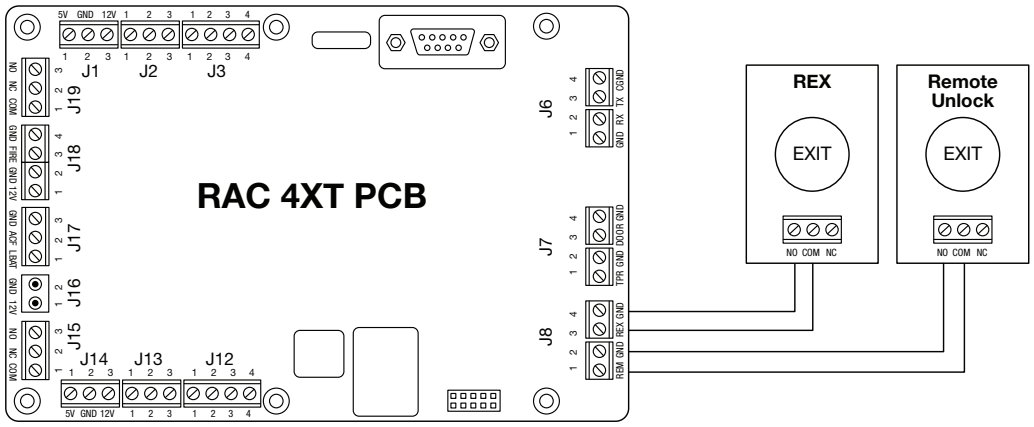


Note 1: If the locking device is inductive (such as a strike) place a diode across the locking device's terminals as shown in the strike wiring diagrams.

Note 2: Dependent on locking device type, may connect to Normally Open (NO) or Normally Closed (NC)

6.0 Annex B Peripheral Wiring Diagrams

Figure 8: Request to Exit (REX) or Remote Unlock Button Wiring



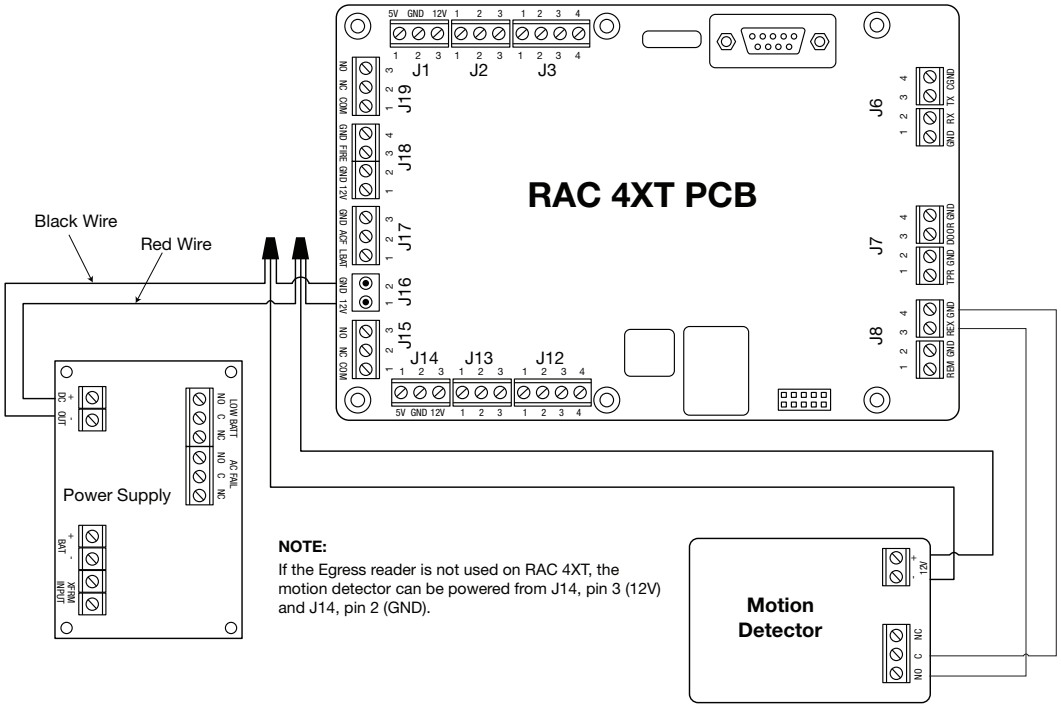
The Remote Unlock input (J8, pins 1 & 2) unlocks the door only for the delay set by the DIP switches, EVEN if the button stays pressed.

The REX input (J8, pins 3 & 4) unlocks the door for as long as the button is pressed PLUS the delay set by the DIP switches.

The Exit Button can be connected to either the Remote Unlock or the REX input, depending on the required functionality. In both cases, the wires should be connected to the Normally Open contact of the Exit button.

In general, a Motion Detector or a maual override should be connected to the REX input (J8, pins 3 & 4).

Figure 9: Motion Detector Wiring



6.0 Annex B Peripheral Wiring Diagrams

Figure 10: Remote Programming Interface (RPI) Wiring

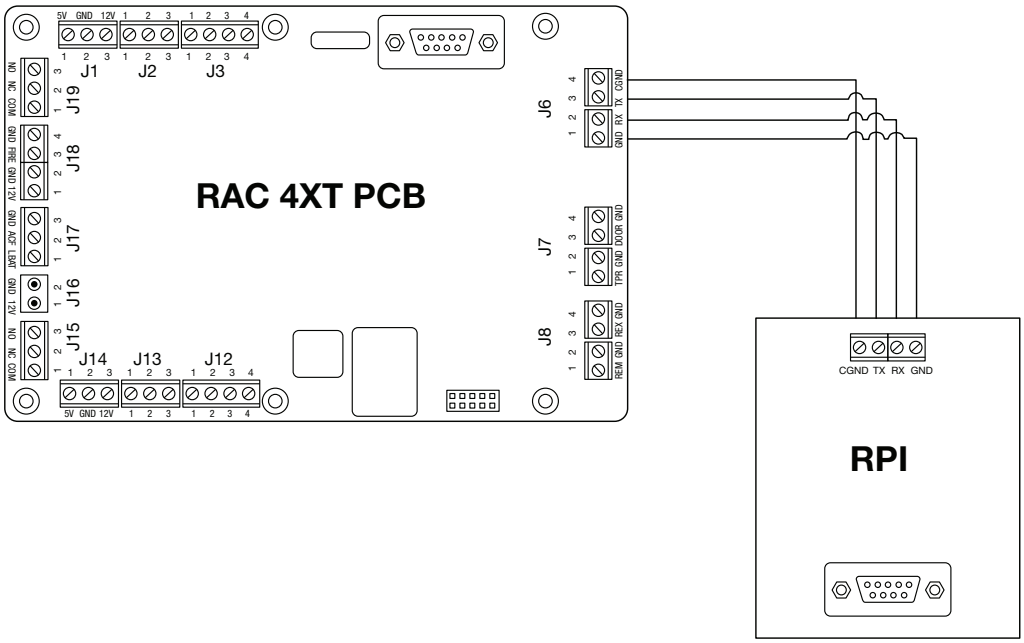
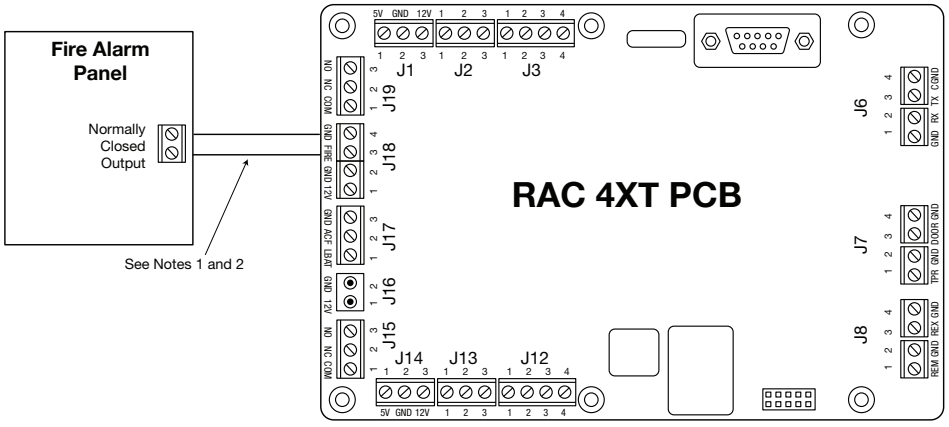


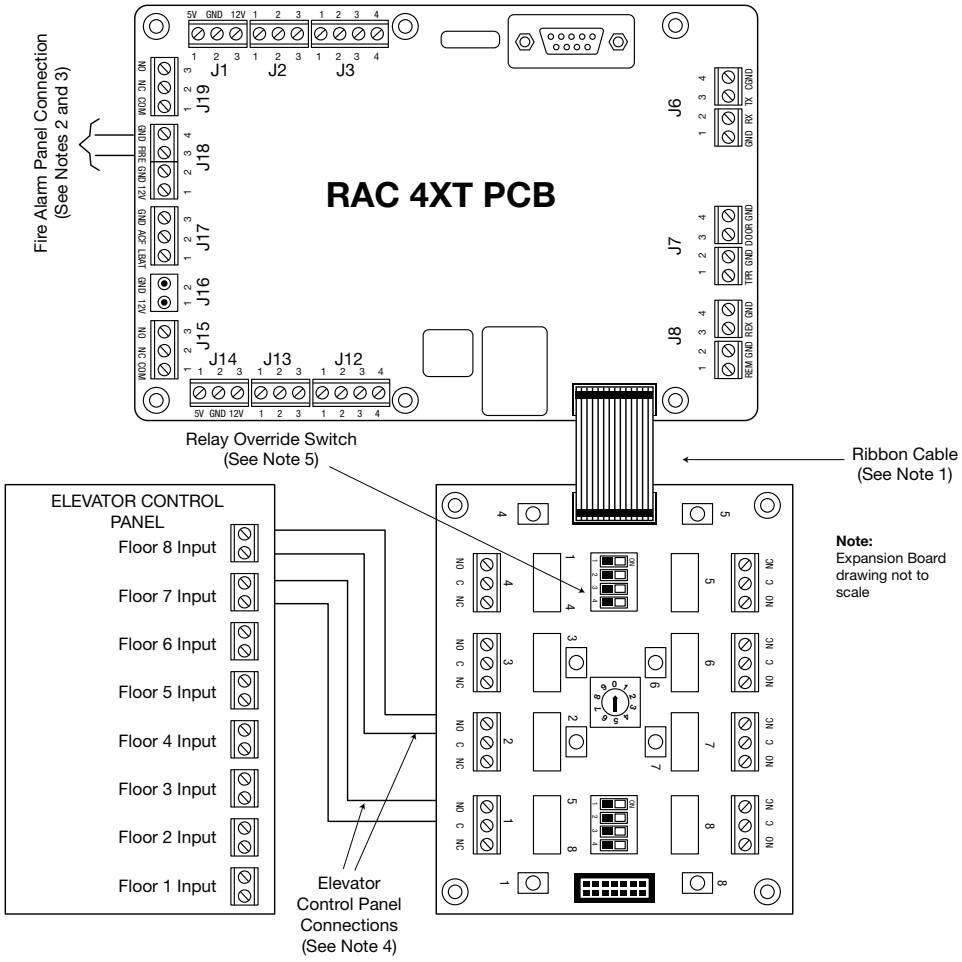
Figure 11: Fire Alarm Panel Wiring



Note 1: When the RAC 4/4XT is connected to a Fire Alarm Panel, it must be connected to a Normally Closed dry contact output.

Note 2: If the Fire Alarm Panel connection is not required, place a jumper wire between pin 3 and 4 of J18.

Figure 12: Relay Expansion Board Outputs Wiring



Note 1: Make sure all the wiring is complete, including the ribbon cable, before applying power to the RAC 4XT to ensure proper Relay Expansion Board functionality.

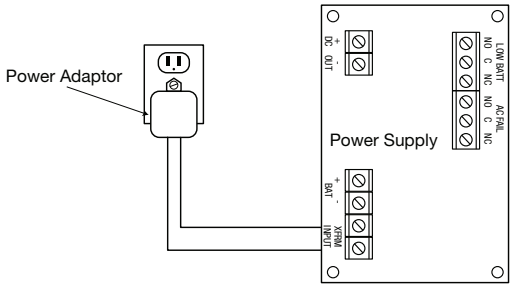
Note 2: The relay outputs are "fail safe". Accordingly, they are energized in their normal state and the relay status LED is ON. Upon power failure, or when the Fire alarm input is activated (when connected to a Fire Alarm panel), the relay state will change and access will be automatically granted. The relay status written (NC or NO) is correct when unit is powered.

Note 3: If the Fire Alarm Panel connection is not required, place a jumper wire between pin 3 and 4 of J18.

Note 4: In this example, the Normally Open relay outputs are used. Relay 2 controls access to Floor 7 and Relay 3 controls access to Floor 8. Actual wiring is specific to each application.

Note 5: For normal operation, set the relay override switches to the Off position (the relay status LED will be ON). Set the relay override switch to ON to override the relay (the relay status LED will be OFF).

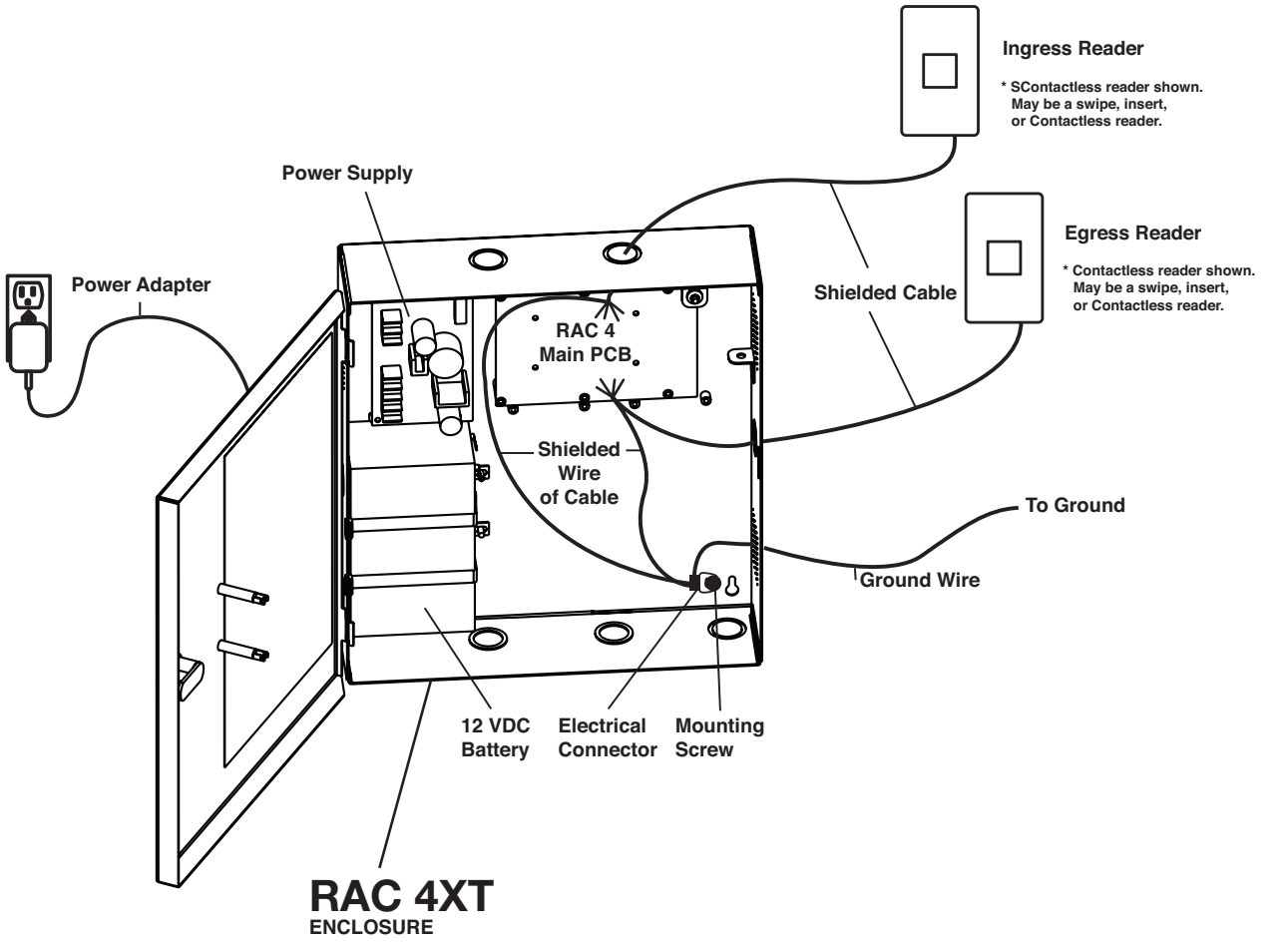
Figure 13: Power Adaptor to Power Supply PCB Wiring



6.0 Annex C Protection from Electromagnetic Interference

As per any other electronic equipment, the RAC 4XT can be affected by electromagnetic interference caused by industrial electrical equipment such as elevator motors.

To prevent the unit from operational instability such as "freezing" or losing programming, sheilded cables should be used and connections made as per the diagram below.



1- Use shielded cables for the readers

2- Connect the shield wire of the reader cable to the Ground wire

3- Connect the wires to the Mounting screw of the RAC.
(Remove the paint under the mounting screw of good electrical contact.)

4- Ensure the Relay Expansion Board (if applicable) has no more than 30VDC from elevator or other power source.

6.0 Annex D Quick Troubleshooting Guide

The following sections show basic troubleshooting for some common problems that may occur during installation. Each section relates to a specific type of problem, namely:

- Power Troubleshooting
- Card Reading Troubleshooting
- External Inputs Troubleshooting
- Locking Device Troubleshooting
- Relay Expansion Board Troubleshooting
- Programming and Auditing Troubleshooting

For detailed assistance, please contact Technical Support as indicated at the start of this manual.

1. Power Troubleshooting

Symptom	Action
Power adaptor LED is OFF	- Verify that the AC supply is not turned off. - Verify that the adaptor output is not shorted.
Power supply AC ON green LED is OFF	- Verify that the wiring to the power wall-mount adaptor is correct. - If using the 24 VDC international adaptor, verify that the polarity is correct.
Power supply DC ON red LED is OFF	- Verify the wiring between the power supply and the RAC 4XT controller. - Verify that the power supply output is not shorted.
RAC 4XT enclosure's panel door "Power Status" LED is OFF	- Verify that the power supply is powered (both AC ON and DC ON LEDs are on). - Verify the LED wiring to the power supply.
RAC 4XT enclosure's panel door "Battery Status" LED is OFF	- Verify the wiring polarity to the battery. If correct, the battery may be discharged. After charging for a few hour, the Battery Status LED should turn green. Full charge may take up to 12 hours. - If the Battery Status LED is still OFF after 12 hours, the battery may need to be replaced.
All RAC 4XT LEDs are OFF	- Verify that the DC ON LED on the power supply is on. - Verify that the AC power is active for the wall mount power adaptor. - Verify that the RAC 4XT controller is connected properly to the power supply as per Annex A, Table 7. - If qualified, with a multi-meter verify that 24 VAC (North American power adaptor) or 24 VDC (international power adaptor) is present across power supply terminal block XFMR_1 and XFMR_2 as per Annex A, Table 5..

6.0 Annex D Quick Troubleshooting Guide

2. Card Reading Troubleshooting

Symptom	Action
Swipe reader green Arrow LED is OFF	- Verify that the RAC 4XT is powered. - Verify the wiring to the card reader.
Initialization card not accepted	- If the Initialization LED (D41) on the RAC 4XT controller is ON: • The RAC 4XT has already been initialized. To re-initialize the reader, follow the procedure described in section 5.3 “Hotel ID Re-initialization”. - If the Initialization LED (D41) on the RAC 4XT controller is OFF: • As per section 5.2 “Hotel ID Initialization”, create a new Initialization card with the FDU or ATLAS and swipe it in the card reader. The Initialization LED (D41) should now be on.
No feedback on reader when using a programmed card.	- Verify that the RAC 4XT controller is active: the Functionality 1 (D45) and Functionality 2 (D46) LEDs should blink. If not, reset the RAC 4XT Controller: press the Reset switch (SW1) or disconnect and reconnect the power. - Verify the wiring to the reader. - As a card is being used with the reader, verify that the data present LED (D34 - Ingress, D35 - Egress) illuminates during use. - Verify that the card is encoded properly. - Verify that the time is correct, both on the RAC 4XT and the FDU (or Atlas). If not, do a Reset Lock Time. - Re-program the RAC 4XT.
No response to valid Contactless keycard LED stays solid green.	- Verify that the Contactless reader is wired properly including the required jumper wires as per Annex A, Table 9.

3. External Inputs Troubleshooting

Symptom	Action
Request to Exit does not work	- Verify that the REX LED (D33) on the RAC 4XT controller turns on when the button is pressed. If not, verify the wiring to the Request to Exit button.
Remote Unlock does not work	- Verify that the Remote Unlock LED (D36) on the RAC 4XT controller turns on when the button is pressed. If not, verify the wiring to the Remote Unlock button.
Tamper Alarm is not audited	- Verify that the Tamper Alarm LED (D53) on the RAC 4XT controller turns on when the button is pressed. If not, verify the wiring to the Tamper Switch.

6.0 Annex D Quick Troubleshooting Guide

4. Locking Device Troubleshooting

Symptom	Action
Locking Device always unlocked	- If the Locking Device Relay LED (D31) on the RAC4XT controller is ON: • Verify that the delay setting of the DIP switch (SW2) is correct. • Verify that the lock is in not Passage Mode. - If the Locking Device Relay LED (D31) on the RAC4XT controller is OFF: • Verify that the Bypass switch is not active (Bypass LED, D21, is OFF). • Verify that the Fire Alarm input not active (Input contact closed, Fire Alarm LED, D47, is ON). • Verify the wiring to the locking device.
Locking device does not unlock	- If the Locking Device Relay LED (D31) turns on: • Verify that the Fire Alarm input is not active (Input contact closed, Fire Alarm LED, D47, is on). • Verify the wiring to the locking device. • If a diode is installed on the locking device, verify the polarity. - If the locking device Relay LED (D31) does not turn on: • Verify that the Request to Exit or Remote Unlock activation unlocks the door. • Verify that the card is encoded properly. • Verify that the RAC 4XT is not in Lockout mode. • Verify that the RAC 4XT is programmed properly.
Fire Alarm does not Unlock door	- Verify that the Fire Alarm input is connected to a Normally Closed contact. - Verify that the Fire Alarm LED (D47) is normally on and turns off when the Fire Alarm is present. - Verify that the 12V_Lock output of the RAC 4XT controller is connected to the COMMON of the locking device relay.
RAC 4XT Controller PCB resets when relay is activated	- Verify that there is no short-circuit on the locking device wiring. - If a diode is installed on the locking device, verify the polarity.

6.0 Annex D Quick Troubleshooting Guide

5. Relay Expansion Board Troubleshooting

CAUTION:
The power for the RAC 4XT must be turned off before connecting or disconnecting the Relay Expansion Board. If the system is equipped with the optional battery back-up, it should also be disconnected.

NOTE: The Relay Expansion Board relay outputs are designed to be "Fail Safe" during a power failure or fire alarm: the Normally Open contact will be closed, and the Normally Closed contact will be open.

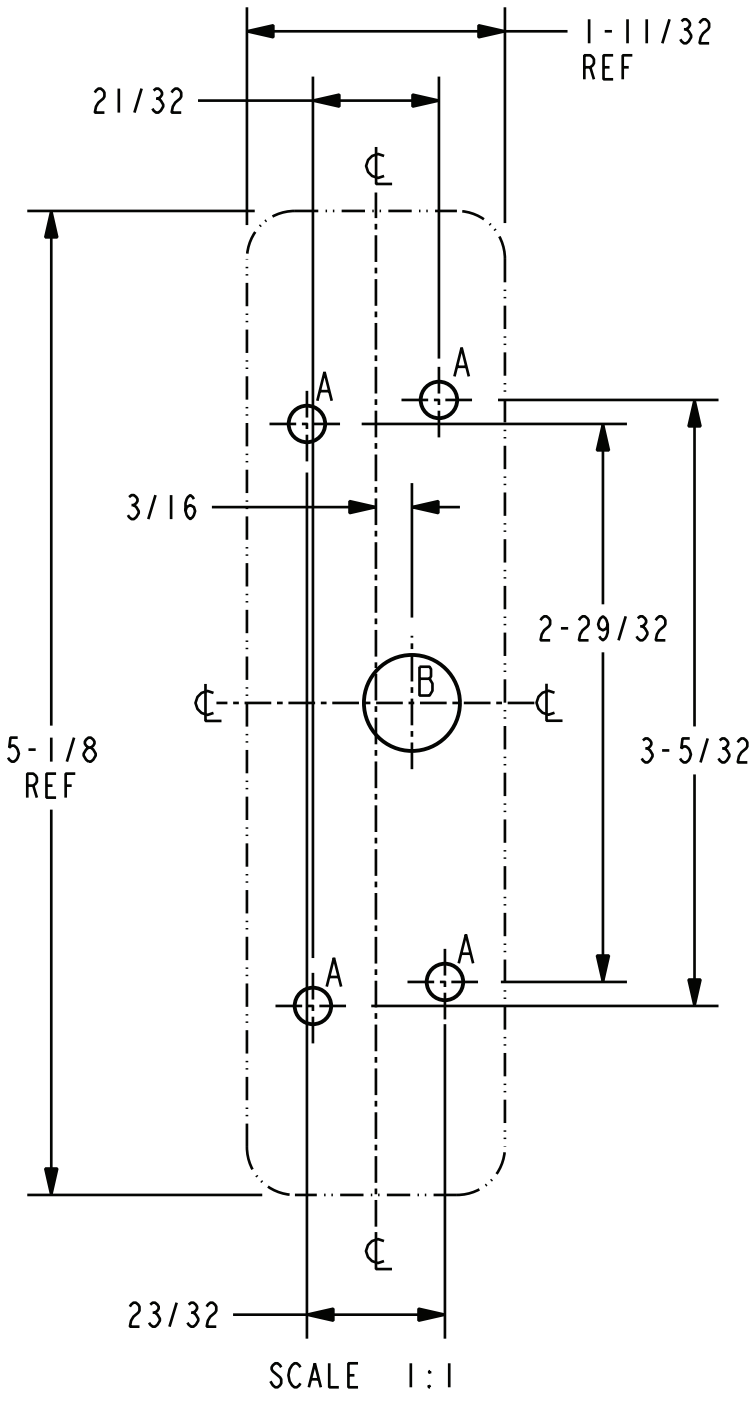
Symptom	Action
LEDs on the Relay Expansion Board are off	- Verify that the ribbon cable between the RAC 4XT controller and the Relay Expansion Board is connected properly. If it is not connected, turn the power off, connect the cable, and turn the power back on. - Verify that the Fire Alarm input is not active (Input contact closed, Fire Alarm LED, D47, is on). - Verify that the relays are not bypassed (the bypass switches SW1 and SW4 on the Relay Expansion Board should be off). - Verify that the RAC 4XT is not in passage mode.
Relay Expansion Board relays do not activate	- Activate the manual bypass switches SW1 and SW3 on the Relay Expansion Board and verify that the relays are activated and the corresponding LEDs turn off. De-activate the manual bypass. - Verify that the address of the Relay Expansion Board selected by the rotary switch SW2 is correct (The default should be at position 0). - Verify that the RAC 4XT controller is active: the Functionality 1 (D45) and Functionality 2 (D46) LEDs should blink. If not, reset the RAC 4XT Controller: press the Reset switch (SW1) or disconnect and reconnect the power. - Activate the Request to Exit by shorting J8-3 to J8-4. All the relays on the Relay Expansion Board should activate. If not, reset the RAC 4XT Controller: press the Reset switch (SW1) or disconnect and reconnect the power. - Verify that the RAC 4XT controller is programmed properly. - Verify that the card is encoded properly.

6.0 Annex D Quick Troubleshooting Guide

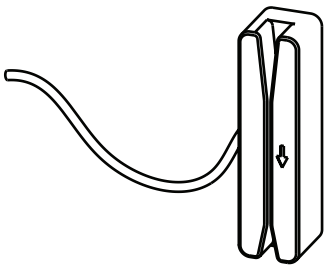
6. Programming and Auditing Troubleshooting

Symptom	Action
Cannot program or audit the RAC 4XT	- Verify that the RAC 4XT controller is active: the Functionality 1 (D45) and Functionality 2 (D46) LEDs should blink. If not, reset the RAC 4XT Controller: press the Reset switch (SW1) or disconnect and reconnect the power. - Verify that the cable between the RAC 4XT and the FDU or IPM is connected properly. - If the RAC 4XT is not initialized (Initialization LED, D41, is OFF): • Follow the instructions in Section 5.2 "Hotel ID Initialization". - If the RAC 4XT was already initialized, it may need to be re-initialized: • Follow the instructions in section 5.3 “Hotel ID Re-Initialization”.

6.0 Annex E Drilling Templates for Swipe Card Reader



HOLE ID	DIM INCH	DIM mm	COMMENTS
A	INSTALLATION WITH DRYWALL INSERT		
	Ø7/32	Ø5,5	↧1-1/2 (38,1mm) INSTALL 2 SCREWS
	INSTALLATION WITH METAL SCREW		
	Ø9/64	Ø3,5	↧1/2 (12,7mm) INSTALL 2 SCREWS
B	Ø1/2	Ø12,7	-



DRILLING TEMPLATE

SWIPE READER R71-6XX

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H4P 2G7
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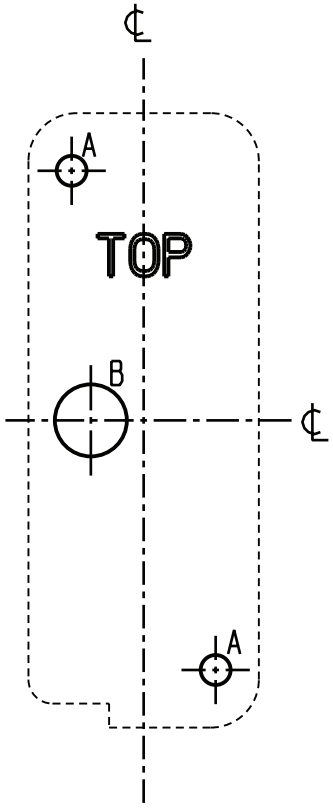
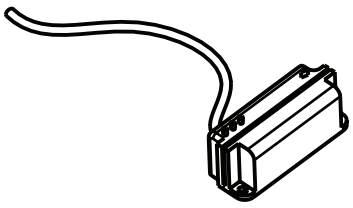
1 OF 1	13MA08		
	ECN 12857	DT-512738	REV-1

NOTE:
If swipe reader is model R71-2XX with 4 mounting holes, please contact Technical Support)



Not to scale

HOLE ID	DIM INCH	DIM mm	COMMENTS
A	INSTALLATION WITH DRYWALL INSERT		
	Ø7/32	Ø5,5	↧ 1-1/2 (38,1mm)
	INSTALLATION WITH METAL SCREWS		
	Ø9/64	Ø3,5	↧ 1-1/2 (38,1mm)
B	Ø3/8	Ø9,5	-
UNLESS OTHERWISE NOTED: PART IS SYMETRICAL ABOUT ℄.			



DRILLING TEMPLATE
SWIPE READER

2 HOLES PATTERN

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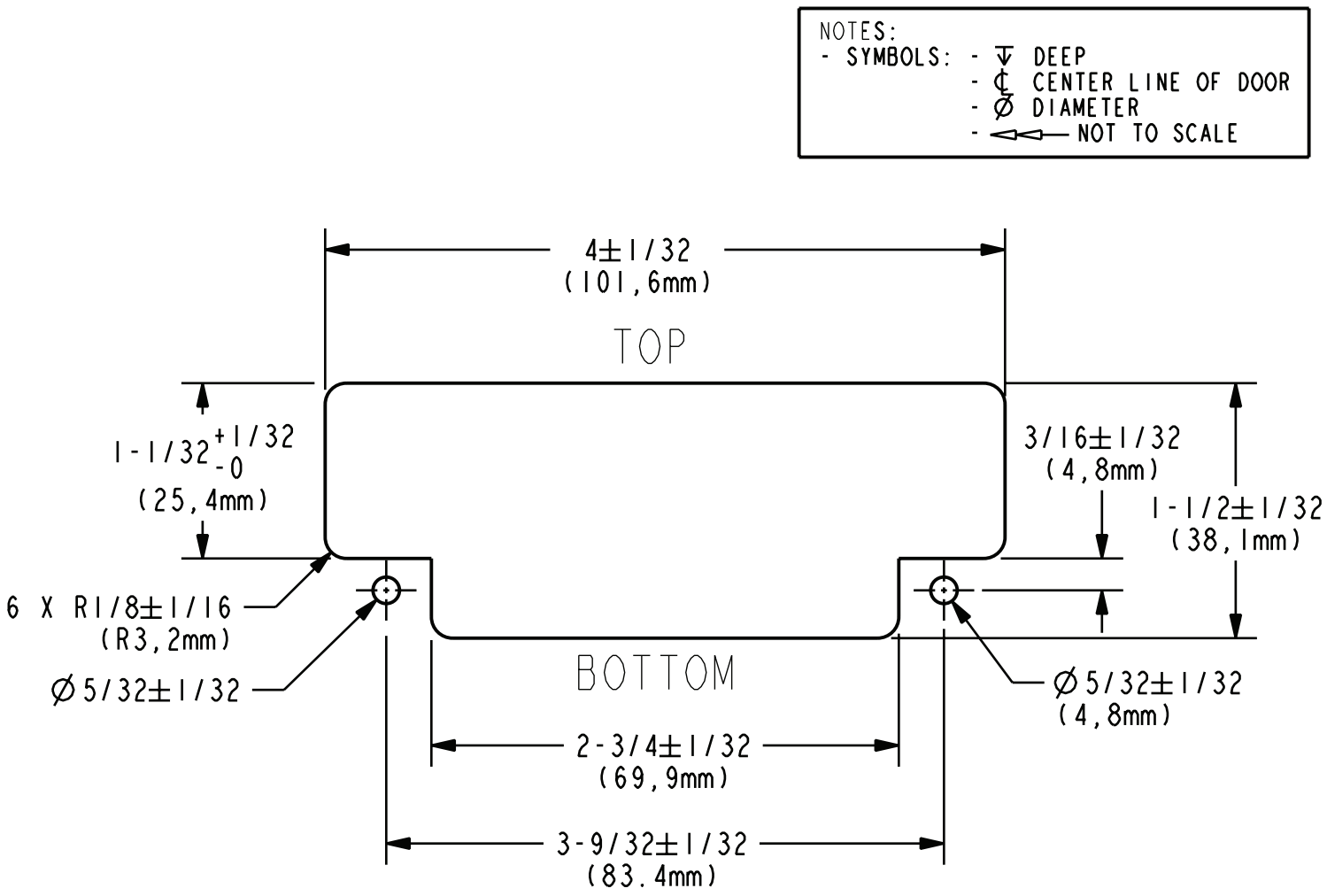
SHEET	ECN		
1 OF 1	12070	DT-511968	REV-1

6.0 Annex F Drilling Template for Insert Card Reader



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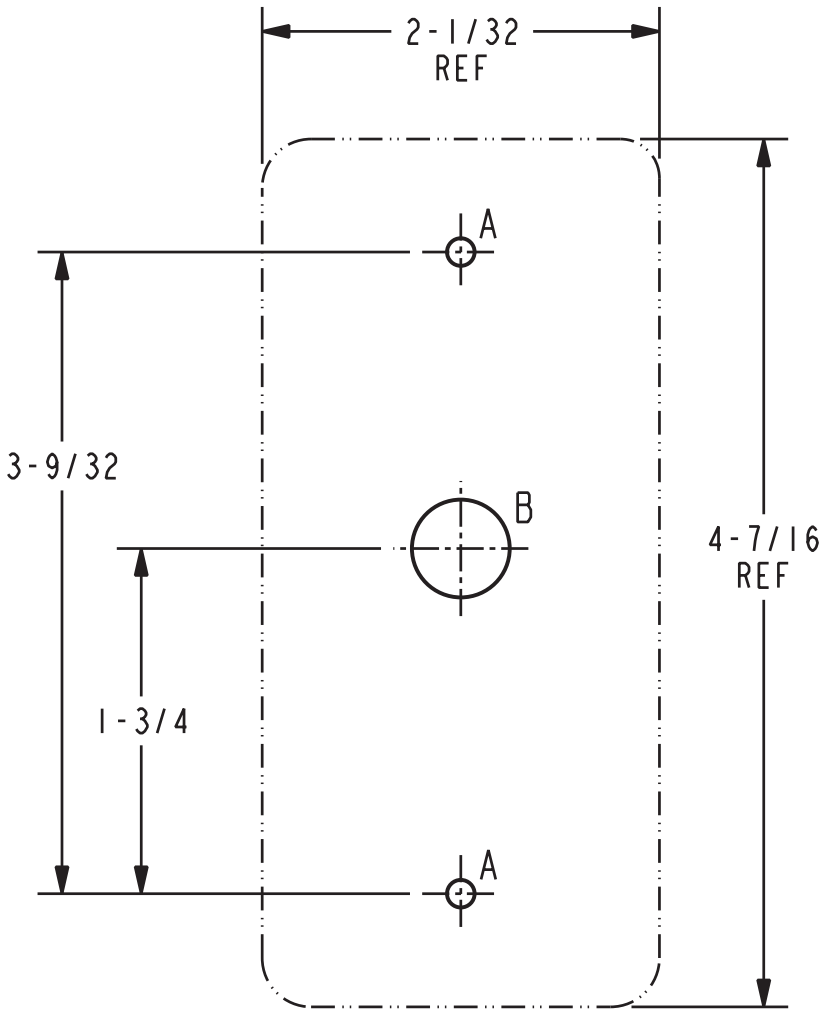
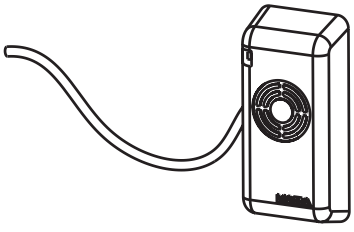
DRILLING TEMPLATE
R71-4 INSERT READER

DT-512152	SHEET 1 OF 1	REV-2	ECN 12449

6.0 Annex G Drilling Template for Contactless Card Reader



HOLE ID	DIM INCH	DIM mm	COMMENTS
A	INSTALLATION WITH DRYWALL INSERT		
	Ø7/32	Ø5,5	↧1-1/2 (38,1mm)
	INSTALLATION WITH METAL SCREW		
	Ø9/64	Ø3,5	↧1/2 (12,7mm)
B	Ø1/2	Ø12,7	-



DRILLING TEMPLATE
790 LOCK SERIES

WALL MOUNT MODULE

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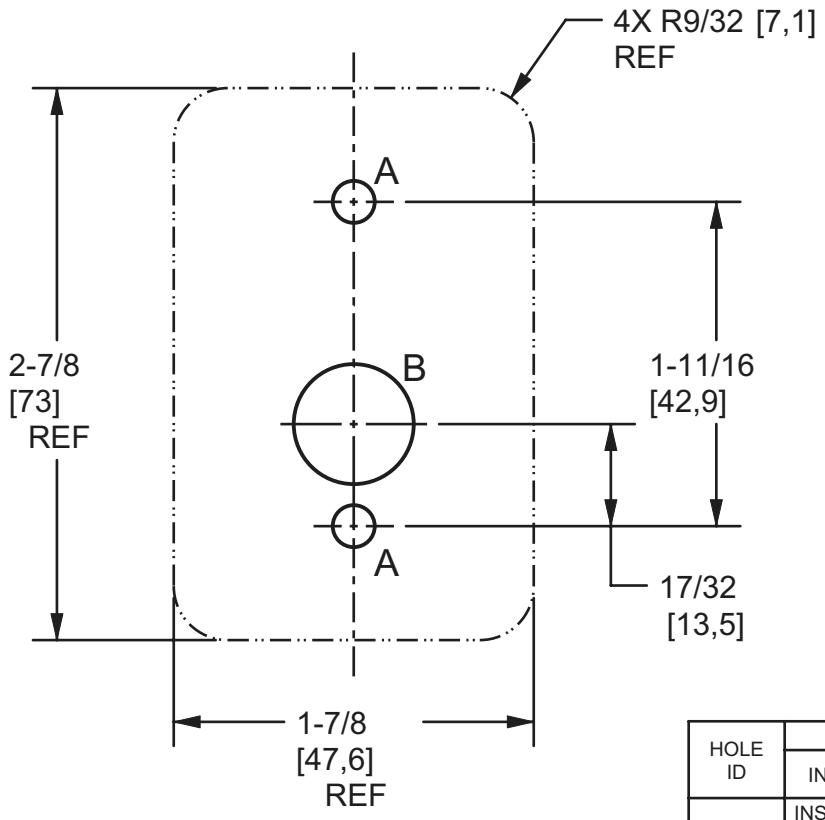
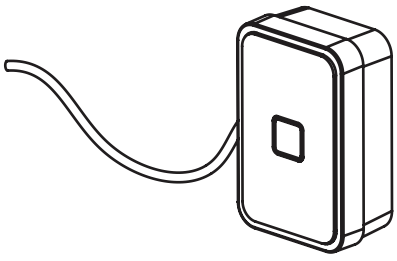
	ECN 12795		

6.0 Annex H Drilling Template for Contactless Card Reader



HOLE ID	DIM		COMMENTS INCH[mm]
	INCH	[mm]	
A	INSTALLATION WITH DRYWALL INSERT		
	Ø 7/32	Ø 5,6	↧ 1-1/2 [38,1]
	INSTALLATION WITH METAL SCREW		
	Ø 9/64	Ø 3,6	↧ 1/2 [12,7]
B	Ø 5/8	Ø 15.9	-



DRILLING TEMPLATE
RFID WALL READER R79K

SURFACE MOUNT MODULE

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