

AC-215IP

Single and Double Door Access Control Unit Installation Manual



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SECURITY PRODUCTS

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Notice and Disclaimer

This manual's sole purpose is to assist installers and/or users in the safe and efficient installation and usage of the system and/or product, and/or software described herein.

BEFORE ATTEMPTING TO INSTALL AND/OR USE THE SYSTEM, THE INSTALLER AND THE USER MUST READ THIS MANUAL AND BECOME FAMILIAR WITH ALL SAFETY REQUIREMENTS AND OPERATING PROCEDURES.

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1. Introduction

AC-215IP access control panels are state-of-the-art networked access controllers, employing the latest technology to meet the requirements of the market.

When used in combination with Rosslare's AxTraxNG™ software system, the AC-215IP gives you full control over access to your premises. The system can control both single and double door entrances. AC-215IP supports up to 30,000 users and uses flash memory to enable easy firmware upgrades.

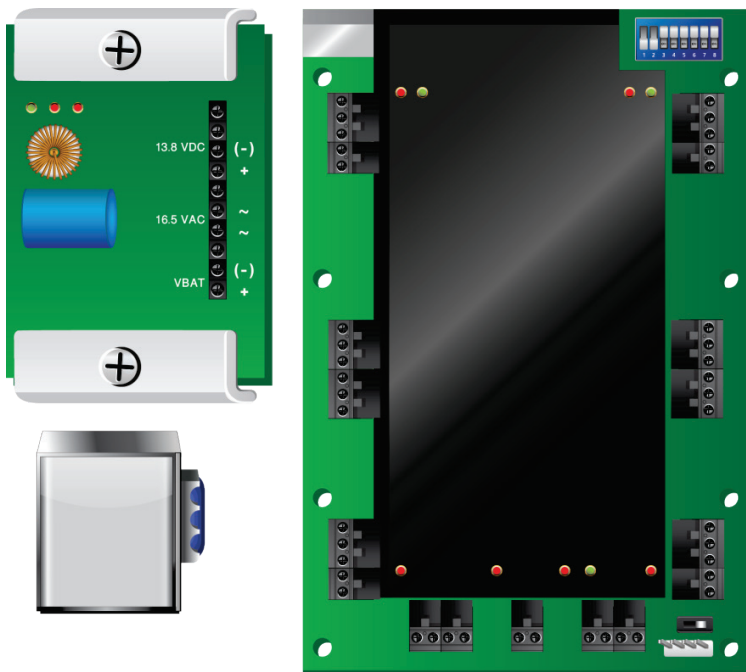
For more information on the AxTraxNG™ system, refer to the AxTraxNG™ Access Control Software Manual.

The AC-215IP consists of the following components:

- AC-215IP controller board
- Panel enclosure
- PS-14 power supply
- Power Transformer (not included with the AC-215U)
- 4 x 2.2 K and 4 x 8.2 K resistors for the supervised inputs.

The AC-215IP also includes on-board support for communications across a TCP/IP network.

Figure 1: AC-215IP Panel



1.1 Features

The AC-215IP is a powerful and adaptable access control solution with a range of powerful features.

- Controls 1-2 doors (DIP switch controlled)
- Two IN/OUT readers, with tamper switch and LED control/buzzer
- Four inputs, selectable as supervised or non-supervised
- Four relay outputs (rated 5 A)
- Built-in sounder generator for chime, bell and siren signals
- Panel configuration DIP switch
- Up to 32 access control panels in every network (64 doors in every network)
- 30,000 users
- 20,000 log events
- RS-232 or RS-485 serial communication (up to 115200 bps)
- On-board TCP/IP communication
- Remote firmware upgrades
- Removable terminal blocks

Introduction

1.2 AxTraxNG™

The AxTraxNG™ software system is custom designed to set up, manage, and supervise all aspects of an access panel network.

Table 1 presents the AxTraxNG™ software capabilities:

Table 1: AxTraxNG™ Capabilities

Users capacity	30000
Unauthorized Users	30000
Access groups	30000
Number of panels in system	1023
Number of doors in system	2046



These options are software and firmware dependent, and may change in later releases or revisions.

2. Technical Specifications

Electrical Characteristics	
Operating Voltage	12 VDC 2 A from PS-14
Maximum Input Current	Standby: 120 mA Maximum: 370 mA
General Inputs	4 supervised high impedance inputs. Maximum voltage: 5 VDC
Relay Outputs	4 Relay outputs 5 A Relay N.O. and N.C. options
Reader Ports	2 reader ports Output voltage: 12 VDC Max. current: 300 mA LED control output D0/D1, tamper input
Visual Indicators	11 LEDs
Audio	Built in sounder (bell, chime and siren)
Battery Standby Time	3 hours (with 12 V, 7 Ah battery)
Communication Characteristics	
RS-232	Terminal Block
RS-485	Molex and Terminal Block
TCP/IP	On-board RJ-45 connector
Speed Options	9600 bps 19200 bps 57600 bps 115200 bps
Environmental Characteristics	
Operating Temperature Range	32°F to 120°F (0°C to 49°C)
Operating Humidity	0 to 85% (non-condensing)
Dimensions	
Height x Width x Depth	10.4 x 13.2 x 3.4 in. (264 x 334 x 84.5 mm)
Weight	8.38 lbs. (3.81 kg)
Transformer (for AC-215IP only)	
AC Transformer	120/220 VAC, 16 VAC 2.5 A (60 VA)

Technical Specifications

Power Supply Specifications

Input Voltage	16 VAC, 4 A
From Transformer – Backup Battery Charger	12 VDC Lead Acid battery up to 7 Ah
From Transformer – Output Voltage 1	12 VDC, 0.5 A
Access control panel – Output Voltage 2	13.8 VDC, 1.5 A

Power Supply Indication

Tamper Output (open collector)	Indicates faulty power
--------------------------------	------------------------

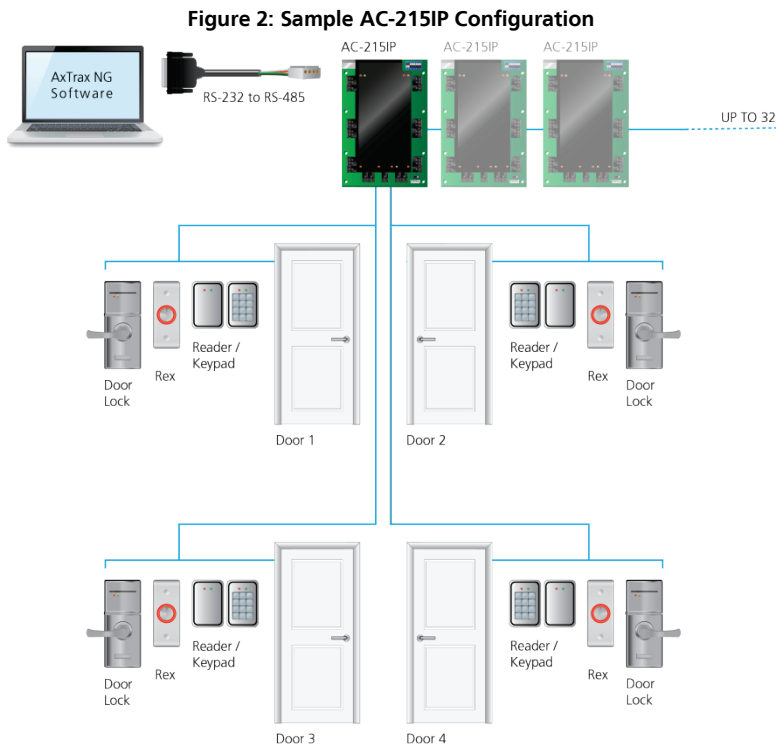
Power LEDs

Power In (AC) – Green LED1	Main power
Power Out (DC) – Red LED2	Low voltage
Low Battery – Red LED3	Backup battery low voltage

3. AC-215IP Panel Setup

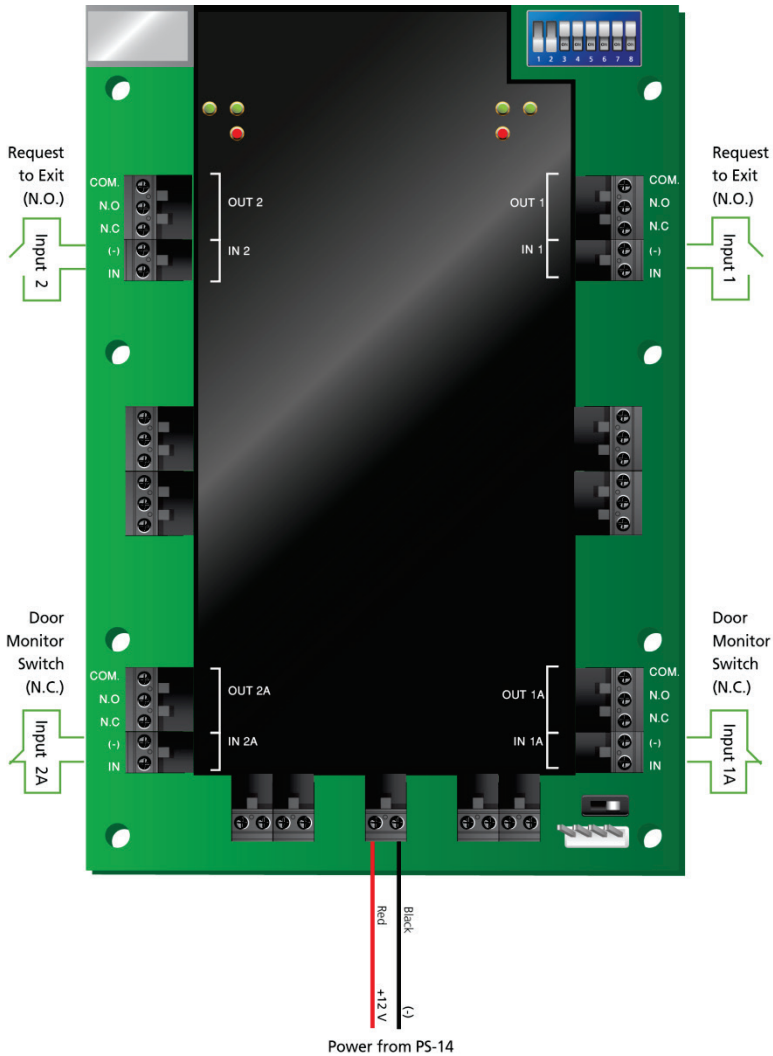
Every AC-215IP panel controls one or two doors (up to 4 doors with MD-D02). The panels connect together in a network and are controlled by a central server computer, running the AxTraxNG™ software system.

Figure 2 shows an example setup for a network of AC-215IP access control panels.



3.1 Inputs Wiring – Non-Supervised Inputs

Figure 3: Inputs Wiring – Non-supervised Inputs



3.2 Inputs Wiring – Supervised Inputs

When wiring the AC-215IP for supervised inputs, resistors should be placed on the input switch and not on the terminal block.

For further details, see Chapter 4.

3.3 Outputs Wiring

Figure 4 and Figure 5 illustrate wiring for two main types of 12 VDC electrical release mechanisms. Other electrical devices can be switched using the voltage free relay contacts.

Figure 4: Door Lock – Failed Close

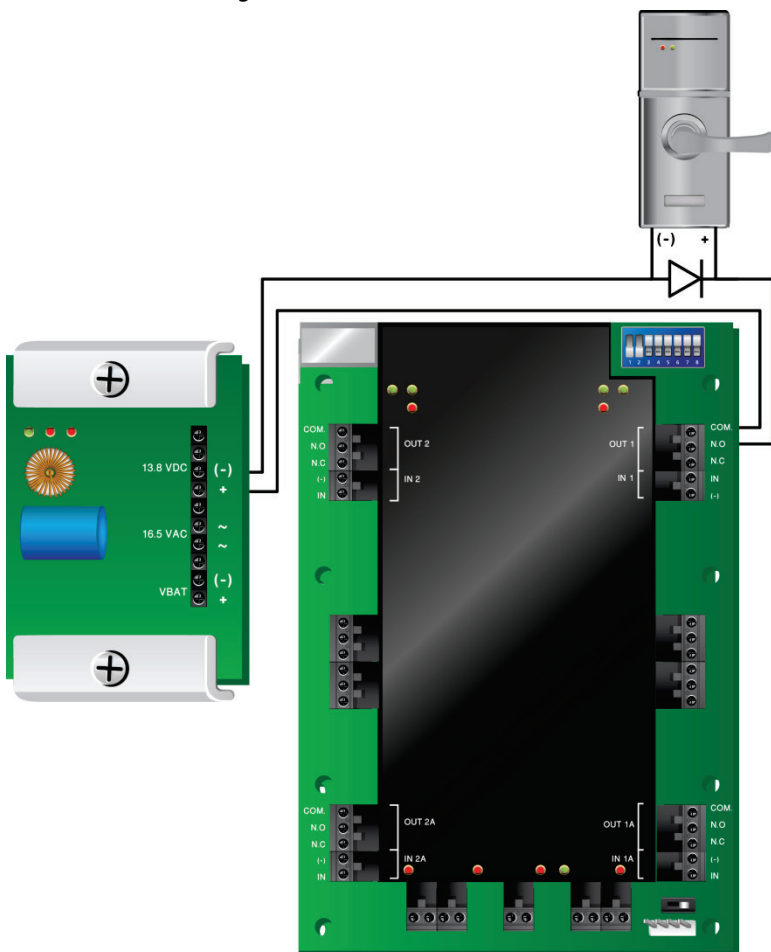
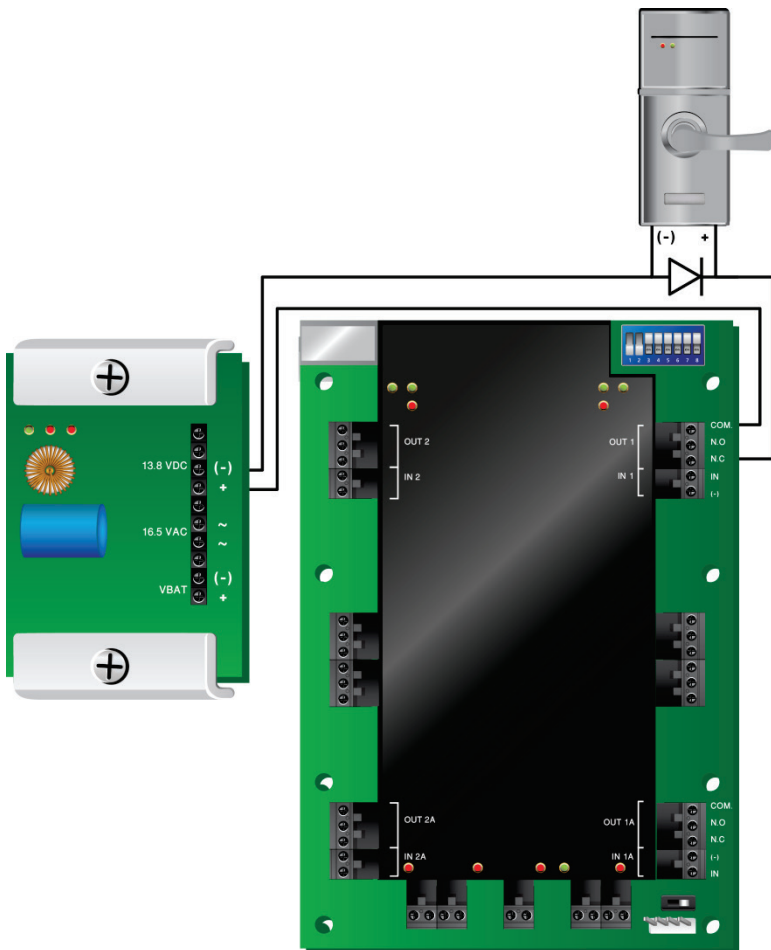


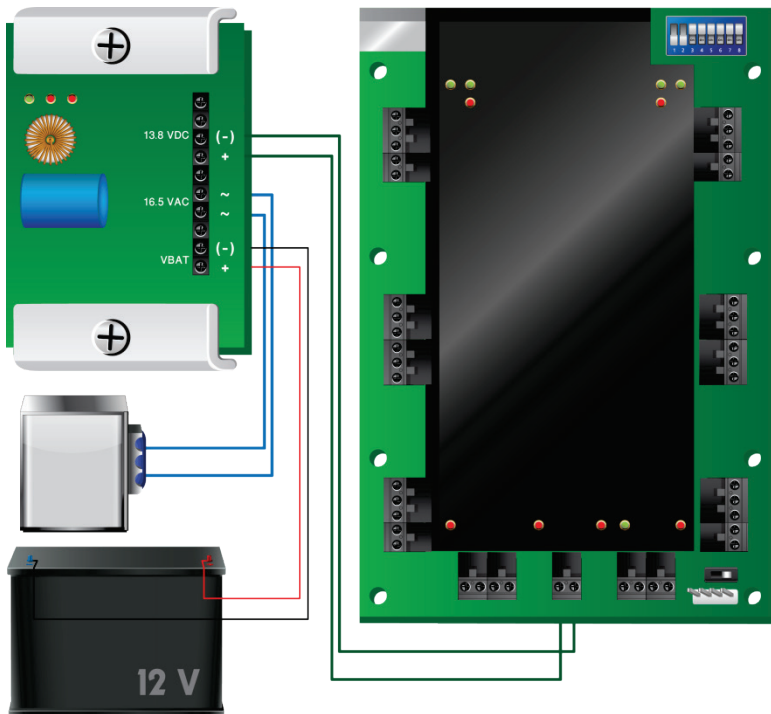
Figure 5: Door Lock – Failed Open



3.4 Power Supply

Figure 6 illustrates wiring between the PS-14 power supply and the AC-215IP. It is recommended to add a 12 VDC lead acid backup battery if the main power supply fails. If the main output is 12 VDC, wire it to the PS-14; otherwise support your power supply according to the output requirements. For further information, see Section 4.3.

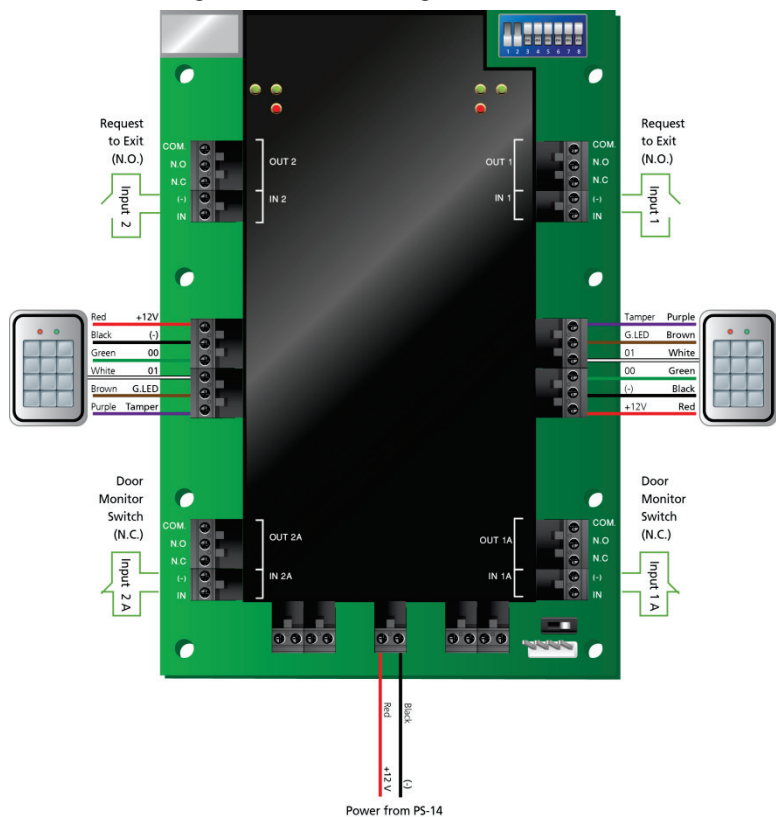
Figure 6: Wiring Between PS-14 and AC-215IP



3.5 AC-215IP Access Control Panel Diagram

Figure 7 presents a complete view of the AC-215IP control panel’s PCB, including all connector buttons and LED schematics (not to scale).

Figure 7: AC-215IP Wiring Communications



3.6 Reader

Proximity and keypad readers are supplied with a limited cable. The color of the cable cover represents the cable’s function.

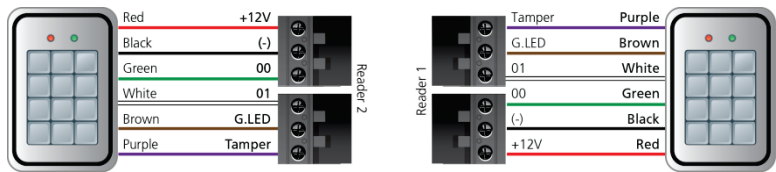


When extending the cable distance, be careful with the color of the cable cover.

Note

Refer to the reader specifications for the maximum cable length (typically 150 m with an 18 AWG cable).

Figure 8: Reader Wiring



4. Input and Output Connections

This chapter describes the AC-215IP access control panel's input and output connections.

4.1 Input Types

There are four input types – Normally Open, Normally Closed, Normally Open Supervised 1 or 2 resistors, and Normally Closed Supervised 1 or 2 resistors.

Inputs IN1, IN1A, IN2 and IN2A may be configured individually as either supervised or non-supervised inputs. Configure each input separately via the AxTraxNG™ system.

Non-supervised inputs have two states:

- Normal State
- Abnormal State

Supervised inputs have three states:

- Normal State
- Abnormal State
- Trouble State

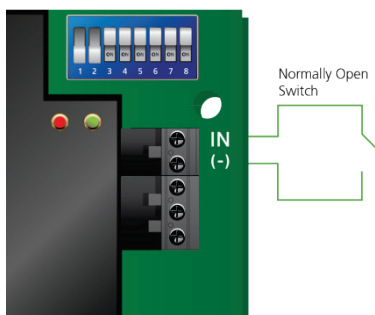
The Trouble state is caused by either tampering with the input circuit or by faulty hardware installation. Once configured as supervised input, add a resistor of 2.2 K, of 8.2 K, or both on the input circuit. See the figures in the following subsections.

4.1.1 Normally Open Input Connection:

Normally Open Input has 2 states:

- Switch Open – Normal State:
Loop resistance = Infinite (open circuit)
- Switch Closed – Abnormal State:
Loop resistance = 0 (short circuit)

Figure 9: Normally Open Input Connection

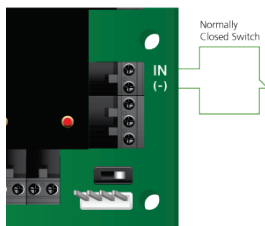


4.1.2 Normally Closed Input Connection

Normally Closed Input has two states:

- Switch Closed – Normal State:
Loop resistance = 0 (short circuit)
- Switch Open – Abnormal State:
Loop resistance = Infinite (open circuit)

Figure 10: Normally Closed Input Connection



4.1.3 Normally Open Supervised Single Resistor Input Connection

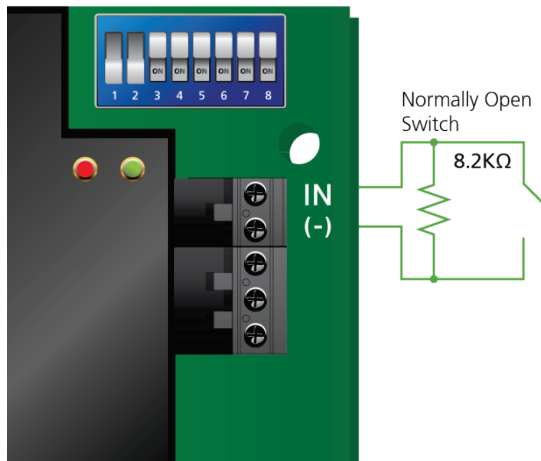
Connect a resistor of 8.2 K in parallel to the input switch contacts.

Normally Open Supervised Input has 3 states:

- Switch Open – Normal State:
Loop resistance = 8.2 K
- Switch Closed – Abnormal State:
Loop resistance = 0 (short circuit).
- Open circuit across input terminals – Trouble State:
Loop resistance = Infinite (open circuit).

Input and Output Connections

Figure 11: Normally Open Supervised Input (Single Resistor)



4.1.4 Normally Open Supervised Double Resistor Input Connection

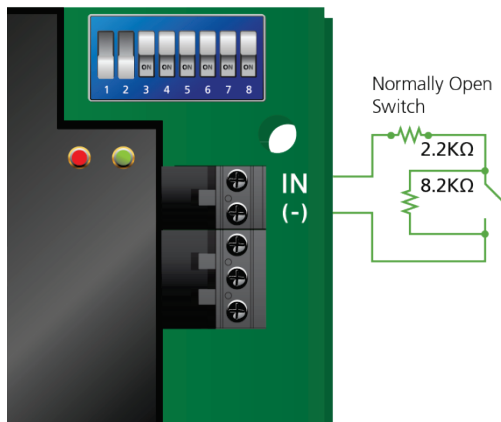
Connect a resistor of 2.2 K in series to the input switch contacts.

Connect a resistor of 8.2 K parallel to the input switch contacts.

Normally Open Supervised Input has 3 states:

- Switch Open – Normal State:
Loop resistance = 10.4 K
- Switch Closed – Abnormal State:
Loop resistance = 2.2 K
- Open circuit (infinite loop resistance) or short circuit (0 resistance) across input terminals – Trouble State

Figure 12: Normally Open Supervised Input (Double Resistor)



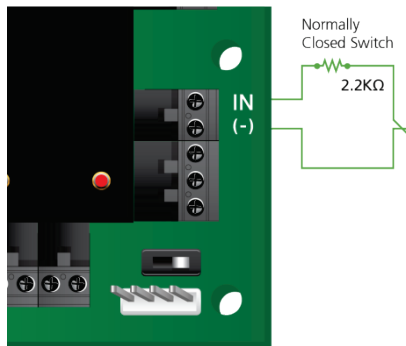
4.1.5 Normally Closed Supervised Single Resistor Input Connection

Connect a resistor of 2.2 K in series to the input switch contacts.

Normally Closed Supervised Input has 3 states:

- Switch Closed – Normal State:
Loop resistance = 2.2 K
- Switch Open – Abnormal State:
Loop resistance = Infinite (open circuit)
- Short circuit across input terminals – Trouble State:
Loop resistance = 0 (short circuit)

Figure 13: Normally Closed Supervised Input (Single Resistor)



4.1.6 Normally Closed Supervised Double Resistor Input Connection

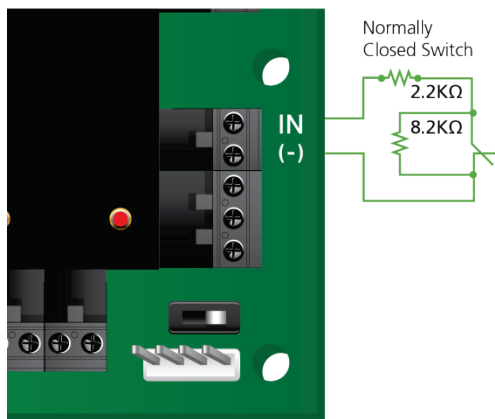
Connect a resistor of 2.2 K in series to the input switch contacts.

Connect a resistor of 8.2 K parallel to the input switch contacts.

Normally Closed Supervised Input has 3 states:

- Switch Closed – Normal State:
Loop resistance = 2.2 K
- Switch Open – Abnormal State:
Loop resistance = 10.4 K
- Open circuit (Infinite loop resistance) or short circuit (0 resistance) across input terminals – Trouble State

Figure 14: Normally Closed Supervised Input (Double Resistor)



4.2 Inputs Description

4.2.1 Request to Exit Button (REX) Input

Use the REX Input to open a door directly. Typically, the REX input is connected to a Normally Open push button that is located inside the premises. The push button is generally located in an easy-to-access position and opens a door without reading a proximity card or PIN code.

Single door controller:	Door 1 – IN1
Double door controller:	Door 1 – IN 1 Door 2 – IN 2

4.2.2 Door Monitor Input

The Door Monitor Input typically connects to a Normally Closed door sensing micro-switch for door status monitoring. Using Door Monitor enables many advanced options such as door forced alarm, door held open warnings, interlocking doors and more. The following should be defined:

Single door controller:	Door 1 – IN1A
Double door controller:	Door 1 – IN 1A Door 2 – IN 2A

4.2.3 General Purpose Inputs

These are free inputs that can be used for various functions. The following should be defined:

Single door controller:	Door 1 – IN 2 Door 1 – IN 2A
Double door controller:	No general purpose inputs available

General purpose inputs are suitable for most uses. For example, they might be used to detect tampering, to activate alarm sensors or for monitoring power supply failure.

4.3 Outputs

Rosslare Security recommends the use of suppression diodes for all outputs that activate an inductive load.

Door Lock

There are two types of door locking devices:

- Fail open (fail secure)
- Fail close (fail safe)

The following should be defined:

Single door controller:	Door 1 – OUT 1
Double door controller:	Door 1 – OUT 1 Door 2 – OUT 2

The output can sink current from any power supply (see Section 3.4).



Note

For UL installations, the installer must configure the system as fail-safe to comply with NFPA (National Fire Protection Association) regulations.

4.4 Card Readers and Keypads

Each access control panel can be connected to a maximum of two readers. There are three available types of reader:

- Card readers
- Keypads
- Dual keypad card readers

A keypad is required for any reader mode that requires PIN code entries, such as "Card or PIN", "PIN Only" or "Card and PIN (Secured mode)".

Input and Output Connections

When connecting a reader, the following should be defined:

Single door controller:	Door 1 – Reader 1 IN/OUT
	Door 1 – Reader 2 OUT/ IN
Double door controller:	Door 1 – Reader 1 IN/OUT
	Door 2 – Reader 2 IN/OUT

Use the AxTraxNG™ software to set the readers for IN or OUT use and to set the data transmission format for each reader.

The reader's tamper output connects to the access control panel's Reader-Tamper input. If the reader is interfered with, an alarm can be generated.

The panel's Reader G.LED output activates the reader's green LED input when operating in "Card and PIN" secure mode. While this mode is in force, users must enter a PIN on the keypad immediately after entering the card.

The controller activates the LED control for 2 seconds when an access granted event occurs.

5. AC-215IP Hardware Settings

Each AC-215IP panel controls an entrance. The behavior of the panel is controlled by DIP switch settings.

Select the appropriate DIP switch setting to operate the panel as either a single door, a double door, or four doors (see Section 5.3).

Access control panels configured as either single door or double door controllers have two readers, IN or OUT.

Table 2 summarizes the possible hardware settings.

Table 2: Possible Hardware Settings

Single Door:		
Outputs	Door Lock output	(OUT 1)
	General purpose output	(OUT 1A)
	General purpose output	(OUT 2)
	General purpose output	(OUT 2A)
Inputs	Request to exit	(IN 1)
	Door monitor input	(IN 1A)
	General purpose input	(IN 2)
	General purpose input	(IN 2A)
Readers	Reader1	Door Entry or Exit
	Reader2	Door Exit or Entry
Double door:		
Outputs	Door1 Lock output	(OUT 1)
	General purpose output	(OUT 1A)
	Door2 Lock output	(OUT 2)
	General purpose output	(OUT 2A)
Inputs	Door1 Request to exit	(IN 1)
	Door1 monitor input	(IN 1A)
	Door2 Request to exit	(IN 2)
	Door2 monitor input	(IN 2A)
Readers	Reader1	(Door1 IN/OUT)
	Reader2	(Door2 IN/OUT)

5.1 DIP Switch Configuration

The access control panel DIP switch controls a number of operating parameters including the device address and baud rates for serial communication.

Figure 15: DIP Switch

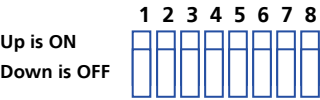


Table 3 shows a list of DIP switch numbers and their functions:

Table 3: DIP Switches and their Functions

DIP Switch	Function
1	The panel's communication baud rate
2	
3	The panel type – Defines the number of readers for each door – one or two readers per door. This also affects the number of doors controlled by the panel.
4	The access control panel's RS-485 network address
5	
6	
7	
8	



Note

Power down the access control panel before changing the DIP switch settings.

After changes have been made, restart the panel. The new settings are automatically defined after power up.

5.2 Access Control Panel Baud Rate

The Access control panel serial port baud rate, set in dip switches one and two, defines the communication speed for connecting with a PC in a network connection.

The default baud rate is set to 9600 bits per second.

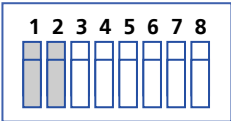


Figure 16: DIP Switch with Baud Rate Setting

The following lists Switch 1 and 2 status and baud rate:

Table 4: Switch Baud Rates

Switch 1	Switch 2	Baud Rate
Off	Off	9600
Off	On	19200
On	Off	115200
On	On	57600

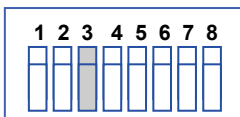
**Note**

The access control panel baud rate must be identical to the AxTrax Network configuration of baud rate.

5.3 Access Control Panel Type

The access control panel type is defined using the third Dipswitch. There are two panel types, a panel with one reader per each door or a panel with two readers per each door. This Dipswitch setting influences the number of doors in the panel.

The default access control panel setting is for two readers per each door.

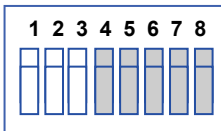
Figure 17: DIP Switch for Door Setting

- **Off** – Uses two readers for each door
- **On** – Uses one reader for each door

5.4 Access Control Panel Addressing

The last 5 DIP switches are used to set the binary code of the access control panel internal network address.

The default access control panel address is "1".

Figure 18: DIP Switch with Internal Network Address Setting**Note**

For successful communications, the DIP switch must match the address set in the AxTraxNG™ software.

AC-215IP Hardware Settings

Table 5 displays the 32 address settings available:

Table 5: Available Panel Addresses

Address	Switch 4	Switch 5	Switch 6	Switch 7	Switch 8
1	Off	Off	Off	Off	Off
2	Off	Off	Off	Off	On
3	Off	Off	Off	On	Off
4	Off	Off	Off	On	On
5	Off	Off	On	Off	Off
6	Off	Off	On	Off	On
7	Off	Off	On	On	Off
8	Off	Off	On	On	On
9	Off	On	Off	Off	Off
10	Off	On	Off	Off	On
11	Off	On	Off	On	Off
12	Off	On	Off	On	On
13	Off	On	On	Off	Off
14	Off	On	On	Off	On
15	Off	On	On	On	Off
16	Off	On	On	On	On
17	On	Off	Off	Off	Off
18	On	Off	Off	Off	On
19	On	Off	Off	On	Off
20	On	Off	Off	On	On
21	On	Off	On	Off	Off
22	On	Off	On	Off	On
23	On	Off	On	On	Off
24	On	Off	On	On	On
25	On	On	Off	Off	Off
26	On	On	Off	Off	On
27	On	On	Off	On	Off
28	On	On	Off	On	On
29	On	On	On	Off	Off
30	On	On	On	Off	On
31	On	On	On	On	Off
32	On	On	On	On	On

6. Communications

Communication lines are used to upload and download information between the access control panel and the AxTraxNG™ software. When the access control panel and the computer are communicating, the system's two LEDs flash accordingly.

- The RX LED flashes when the controller receives data
- The TX LED flashes when the controller transmits data



The access control panel address is defined in the AxTraxNG™ software. It is important that the DIP switch and the software are set to the same address.

There are three connection modes:

- Serial Network (RS-232 or RS-485)
- Modem Network
- TCP/IP Network

6.1 Serial Network Connection

The computer serial port controlling the access control panel is set from within the AxTraxNG™ software. The default is 9600 bps for direct connection to the computer.

When using an RS-232 connector, only one access control panel can be linked to each communication port on the computer. Use an RS-485 if you wish to connect more than one panel on one communication port.



The J1 switch must be in the correct position to select the RS-232 communication.

6.1.1 RS-232 Connection to the Computer

Set the J1 switch to the RS-232 position.

Table 6: RS-232 Connection

Access Control Panel	DB9 Connector	DB25 Connector
GND	Pin 5	Pin 7
Tx	Pin 2	Pin 3
Rx	Pin 3	Pin 2



The RS-232 connection can only connect a single access control panel to the computer.

The distance between the computer and the access control panel must be no more than 150 feet (50 meters).

If the baud rate is increased to 57600 or beyond, the distance must be no more than 30 feet (10 meters).

6.1.2 RS-485 Connection to the Computer

Set the J1 switch to the RS-485 position.

Up to 32 access control panel's can be linked together and connected to a single communication port on the computer.

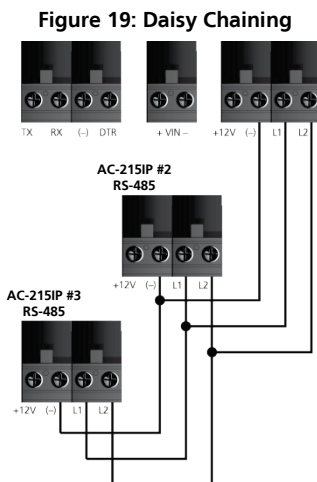
Use the RS-485 interface for situations where there are multiple controllers connected. The serial port used to control the access control panel is assigned within the AxTraxNG™ software.

The access control panel supports the two-wire RS-485 interface. RS-485 interface enables the distance between the Access control panel and PC to be extended up to 4000 feet (1219) meters. The data line wiring must be in daisy chain formatting with one control unit following another. The first Access control panel connecting to the PC must use the MD-14 RS-485 to RS-232 adaptor.

6.1.3 Daisy Chaining

Daisy chaining allows many panels to connect to the computer along a single serial line.

The first panel is connected directly to the computer and a second panel connects to the first panel. Additional panels connect in the same way, one after another.



At each end of the data line, both where the panel connects to the computer and on the last panel in the network, a termination resistor of 120 Ω may be required. Apply the resistor across the L1 and L2 connections.



Note

These termination resistors are especially important in long cable runs.

6.2 TCP/IP Network Connection

The computer running the AxTraxNG™ software can communicate with the access control panels via a TCP/IP network. The connection settings are controlled within the AxTraxNG™ software.

AC-215IP panels connect to the TCP/IP network (LAN or WAN) directly, using an on-board network module. When an access control panel network is connected using RS-485, up to 32 panels can be connected on each TCP/IP network. This means that one AC-215IP panel can support up to 31 AC-215/225/425 panels.

6.2.1 LAN and WAN Requirements

The devices can be connected to a TCP/IP network using any valid network address.

Use a TCP/IP connection when a LAN network already exists and the long RS-485 network is not required. The following schematic illustrates the connection of a single AC-215IP to a computer via a LAN network.

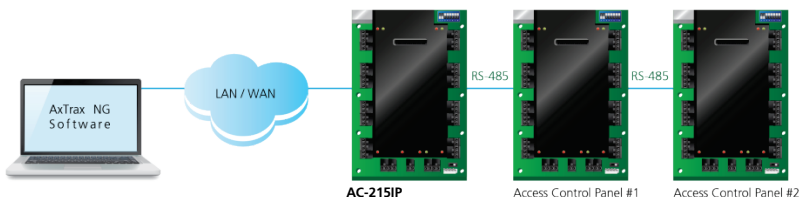
When the TCP/IP connection is implemented over a Wide Area Network (WAN) it becomes possible to connect through the Internet. This makes it possible to control multiple access control panels worldwide, all from a single computer.

Before connecting a panel by TCP/IP connection for the first time, the AxTraxNG™ software must configure the device. Settings then remain stored in non-volatile memory on the device (see the Software Manual configuring instructions).

When using an MD-N32, for a single panel, either an RS-232 cable or Rosslare's MD-14 RS-485 converter can be used.

To connect an MD-N32 to more than one panel (up to 32 panels), Rosslare's MD-14 RS-485 converter must be used. Connect the MD-14 between the RS-485 access control panel network and the MD-N32 converter.

Figure 20: Connecting Multiple Access Control Panels with AC-215IP



6.3 Modem Network Connection

Access control panels can be controlled from the computer's modem. The modem is assigned from within the AxTraxNG™ software.

Use a modem when the access control panel is too far from the computer to use a serial connection and an alternative RS-232/RS-485 network or TCP/IP network is unavailable.

The following diagram illustrates remote site modem configuration with AC-215IP.

Figure 21: Remote Site Modem Configuration



For more information on modem connections, refer to the MD-N33 User Manual and the AxTraxNG™ software manual.

Note

6.3.1 Hardware Requirements

- 2 Standard Telephone cables – RJ11 plugs in both sides
- Crossed 9-pin RS-232 cable (female jack on both sides)
- Rosslare MD-14 (RS-232 to RS-485 converter)
- 2 Rosslare MD-N33 (Modem to serial gateway)
- Rosslare AC-215IP panel

6.3.2 Prerequisites

Before performing permanent modem installations, the modem that will be connected to the panel must be initialized from the computer running the AxTraxNG™ software.

6.3.3 Computer Connections

The MD-N33 must connect to the computer via a serial port.

To connect to the PC:

1. Connect a 9 VDC adapter to the first MD-N33. Make sure that the power LED (Red) is on.
2. Connect the PC, using an available COM port, to the MD-N33 with the crossed 9-pin RS-232 cable.
3. Connect the MD-N33's RJ11 jack to the telephone line using the telephone cable.

6.3.4 AC-215IP Panel Connections

1. Connect a 9 VDC adapter to the second MD-N33. Make sure that the power LED (Red) is on.
2. Connect the MD-N33's RJ11 jack to the telephone wall mount using the telephone cable.
3. Connect the MD-N33 DB9 female jack to the MD-14 DB9 female jack.
4. Connect the AC-215IP RS-485 outlet to the MD-14 4 wires cable. Make sure the J1 switch (on the AC-215IP) is set to RS-485 Mode.

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