

AC-225x Family

Advanced Scalable Networked Access Controller

Hardware Installation Manual

Models:

AC-225E, AC-225IPU

AC-225U, AC-225IPU

AC-225L, AC-225IPL

AC-225 PCBA, AC-225IP PCBA



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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.

- The system must not be used for purposes other than those for which it was designed.
- The use of the software associated with the system and/or product, if applicable, is subject to the terms of the license provided as part of the purchase documents.
- ROSSLARE ENTERPRISES LIMITED and/or its related companies and/or subsidiaries' (hereafter: "ROSSLARE") exclusive warranty and liability is limited to the warranty and liability statement provided in an appendix at the end of this document.
- This manual describes the maximum configuration of the system with the maximum number of functions, including future options. Therefore, not all functions described in this manual may be available in the specific system and/or product configuration you purchased.
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1. Introduction

The AC-225 and AC-225IP family of access control panels are state-of-the-art networked access controllers, employing the latest technology to meet the requirements of the market.

Table 1 summarizes the family of AC-225 and AC-225IP models and their respective descriptions.

Table 1: Description of Family of AC-225 and AC-225IP Panels

Model Name	Description
AC-225-E	AC-225, no on-board IP, supplied with 230 VAC transformer
AC-225-U	AC-225, no on-board IP, FCC approved and UL-294 listed, Transformer Not Supplied
AC-225-L	AC-225, no on-board IP, supplied with 110 VAC transformer
AC-225-PCBA	AC-225, no on-board IP, PCB only
AC-225IP-E	AC-225IP with on-board IP, supplied with 230 VAC transformer
AC-225IP-U	AC-225IP with on-board IP, FCC approved and UL-294 listed, Transformer Not Supplied
AC-225IP-L	AC-225IP with on-board IP, supplied with 110 VAC transformer
AC-225IP-PCBA	AC-225IP with on-board IP, PCB only



Note

- The IP models also includes on-board support for communications across a TCP/IP network.
- The U models are for US installations, and have been approved by UL for use as standalone units only.

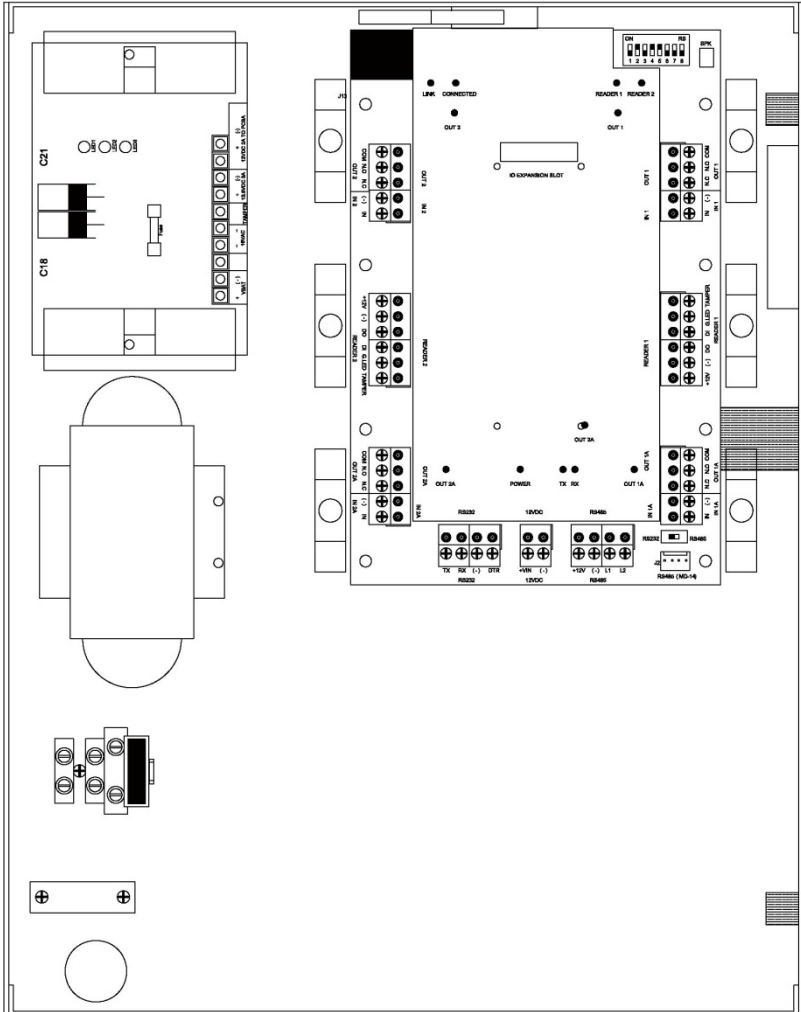
When used in combination with Rosslare's AxTraxNG™ software system, the AC-225 gives you full control over access to your premises. The system can control both single and double door entrances and up to four doors, with MD-D02 two Door expansion module. AC-225 supports up to 30,000 users and uses flash memory to enable easy firmware upgrades. For more information on the AxTraxNG™ system, refer to the AxTraxNG™ Software Manual.

The AC-225 consists of the following components:

- AC-225 controller board
- Panel enclosure
- PS-33 power supply
- Power Transformer (as described in Table 1)
- 4 x 2.2K and 4 x 8.2K resistors for the supervised inputs.

Figure 1 shows the general layout of the AC-225 panel.

Figure 1: AC-225 Panel



Introduction

1.1 Features

The AC-225 is a powerful and adaptable access control solution with a range of powerful features.

- Controls 1-2 doors (DIP switch controlled) or 2-4 doors when optional MD-D02 installed
- Two IN/OUT readers, with tamper switch and LED control
- Four inputs, selectable as supervised or non-supervised
- Form-C relay outputs (rated 5 A)
- Optional MD-IO84 with an additional 4 relay outputs and 8 inputs, selectable as supervised or non-supervised
- Optional MD-D02 with 2 readers, 4 relay outputs, and 4 inputs selectable as supervised or non-supervised
- 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 or 128 door network when optional MD-D02 installed)
- 30,000 users
- 20,000 log events
- RS-232 or RS-485 serial communication (up to 115200 bps)
- On-board TCP/IP communication (IP models only)
- Remote firmware upgrades
- Removable terminal blocks

1.2 AxTraxNG™

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

Table 2 presents the AxTraxNG™ software capabilities:

Table 2: AxTraxNG™ Capabilities

Users capacity	30000
Unauthorized Users	30000
Access groups	30000
Number of panels in system	1023
Number of doors in system	4092



Note

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

1.2.1 Client-Server Structure

AxTraxNG™ operates through a dedicated AxTrax server computer, which communicates with the access control panels and can serve an unlimited number of network clients.

The server also runs the system's SQL database, which contains settings and definitions for access control across the entire facility. Clients can define new employees and control access permissions. The system includes tools for database backup, input and export of previous configurations and automatic backing-up on a periodic basis.

AxTraxNG™ supports all panel types and offers scalability and flexibility in addition to a range of advanced control features.

1.2.2 Configurable Links

The system's configurable links model makes it possible to trigger any chosen output automatically or report a configurable alarm, based on a selected input. This allows easy integration with other access systems such as intruder alarms, CCTV systems and elevator controls.

AxTraxNG™ can also define a selected set of operations (defined in configurable links) when a panel registers a specified user or group of users. This can be useful, for example, in elevator control systems. The system can assign users with counters, allowing a limited number of entries to each panel.

1.2.3 Fingerprint Recognition

AxTrax can share user details with Rosslare's BioTrax software system. The BioTrax system can then download all selected users information to an AYC-W6500 fingerprint reader.



Fingerprint recognition was not evaluated by UL.

1.2.4 Compatible Readers

For UL-compliant installations, use any of the following UL-listed PIN and PROX card readers made by Rosslare: AY-H12, AY-J12, AY-K12, AY-L12, AY-M12, AY-Q12, AYC-F54, AYC-F64, AYC-G54, AYC-G64, AYC-Q54B, or AYC-Q64B.

2. Technical Specifications

Electrical Characteristics	
Operating Voltage	13.8 VDC 1.5 A from PS-33
Maximum Input Current	AC-225 Standby: 80 mA Maximum: 325 mA
	AC-225IP Standby: 120 mA Maximum: 370 mA
General Inputs	4 supervised high impedance inputs. 8 or 12 supervised inputs when using MD-D02 or MD-IO84 expansion boards Maximum voltage: 5 VDC
Relay Outputs	4 Relay outputs 8 supervised outputs when using MD-D02 or MD-IO84 expansion boards 5 A Relay N.O. and N.C. options
Reader Ports	Standard: 2 reader ports With MD-D02: 4 reader ports Output voltage: 12 VDC Max. current: 245 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 (for w/12V battery)

Communication Characteristics	
RS-232	Terminal Block
RS-485	Molex and Terminal Block
TCP/IP	On-board RJ-45 connector (AC-225IP and AC-225IPU have an internal IP module)
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 inch (264 x 334 x 84.5 mm)	
Weight	AC-225	8.38 lbs. (3.80 kg)
	AC-225IP	8.40 lbs. (3.81 kg)
	AC-225U	5.95 lbs. (2.70 kg)
	AC-225IPU	5.97lbs. (2.71 kg)

Transformer (for IP models only)

AC Transformer	AC transformer 120/220 VAC/16 VAC 3A (50 VA), class 2 (not included)
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PS-33 Power Supply Specifications

Input Voltage	16.5 VAC, 3 A
Backup Battery Charger Output	12 VDC, 300 mA
To access control panel – Output Voltage 1	13.8 VDC, 1.5 A
To Relay Outputs – Output Voltage 2	13.8 VDC, 0.9 A

PS-33 Power Supply Indication

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

PS-33 Power LEDs

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



Note

For models: AC-225U and AC-225IPU

These models come without a transformer. When using a third-party transformer, please make sure that it is rated for at least 50 W (16.5 VAC @ 3A).

AC-225U and AC-225IPU have a maximum 50 W power consumption, which means that it requires 3.0 A. This rated power is divided in the system, as follows:

- 1) 300 mA for the Lead Acid Battery Charger
- 2) 980 mA total for four readers (when MD-D02 is used)
- 3) 900 mA total for the four outputs

In cases where the installation requires more power (for example high rated magnetic locks), we recommend using an external power supply for the lock.



Note

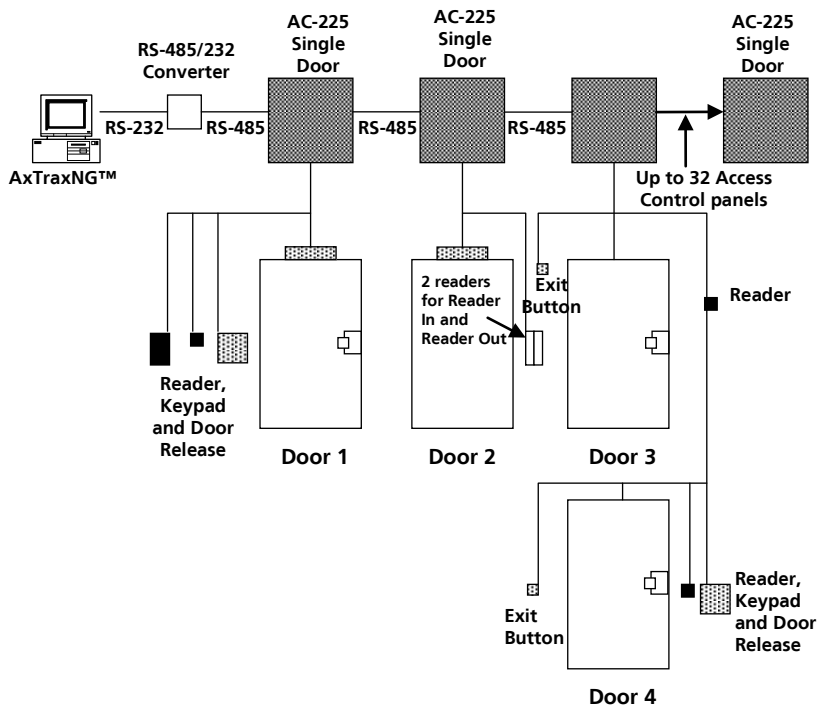
UL-listed panic hardware must be used to allow emergency exit from the protected area.


3. AC-225 Panel Setup

Every AC-225 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-225 access control panels.

Figure 2: Sample AC-225 Configuration



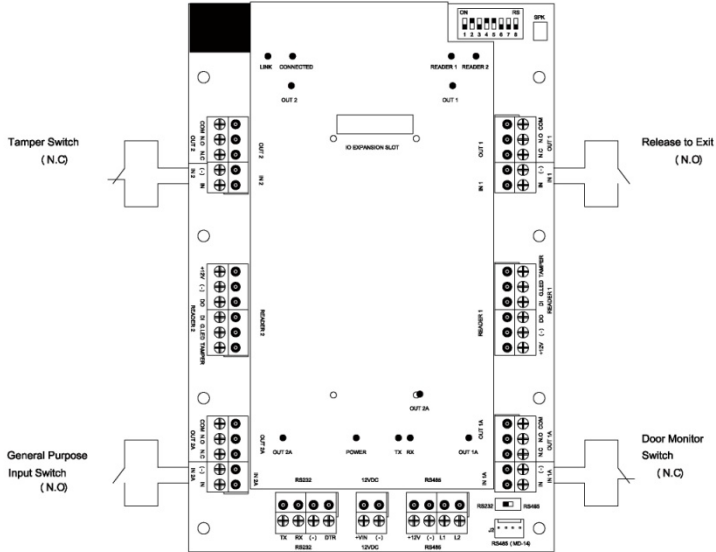
 The use of bushings is required for any conductors leaving the enclosure through the provided openings.

Note

3.1 Inputs Wiring – Non-Supervised Inputs

Figure 3 presents a detailed view of the non-supervised inputs and their connection options.

Figure 3: Inputs Wiring – Non-supervised Inputs



3.2 Inputs Wiring – Supervised Inputs

When wiring the AC-225 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

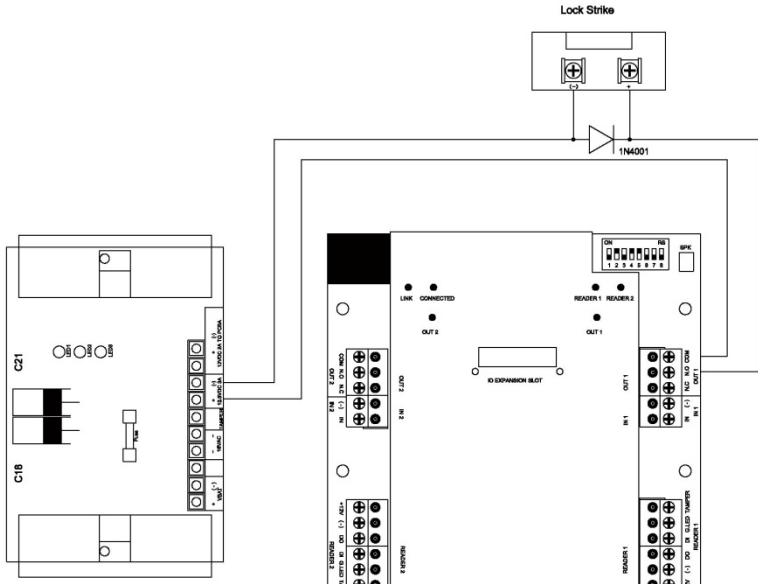
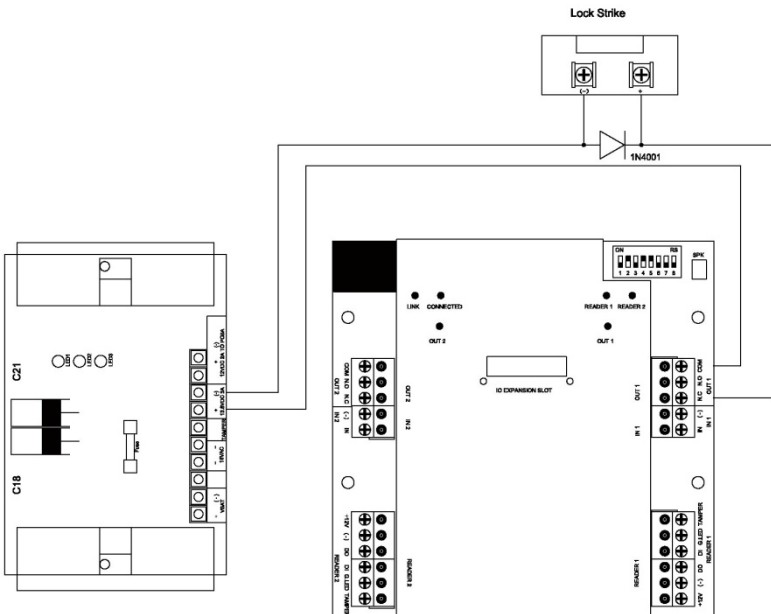


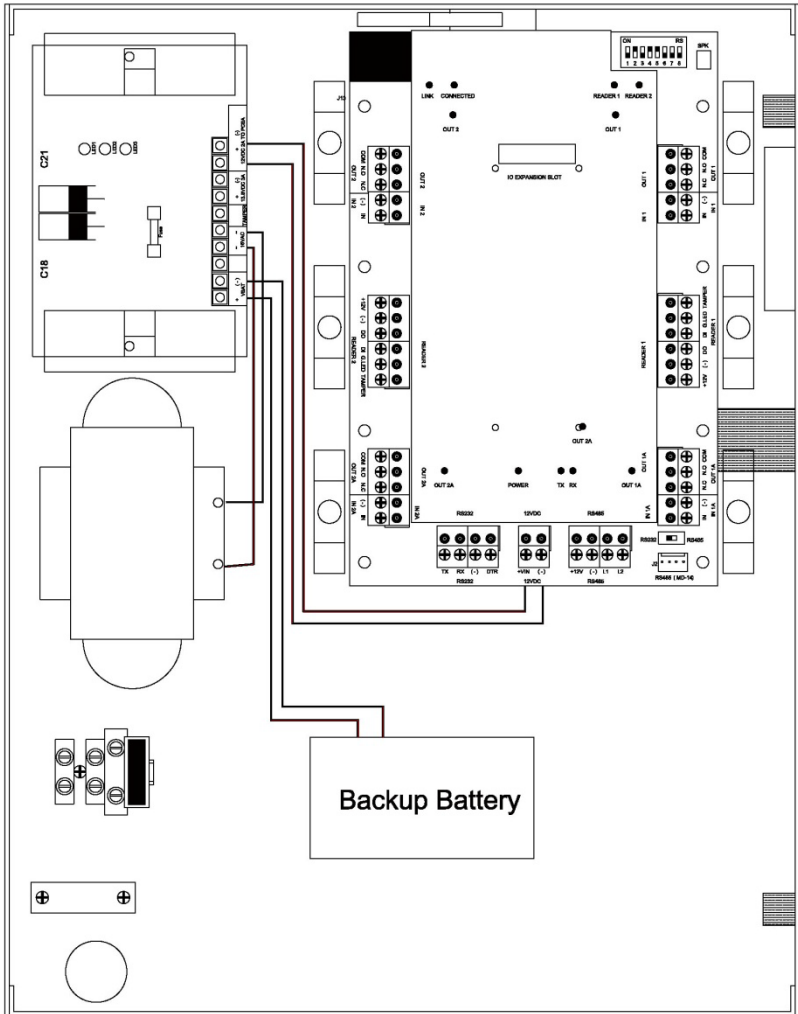
Figure 5: Door Lock – Failed Open



3.4 Power Supply

Figure 6 illustrates wiring between the PS-33 power supply and the AC-225. 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-33, whose load ratings are 1.5 A / 0.9 A / 0.3 A; otherwise support your power supply according to the output requirements. A 12-V, 7 Ah battery provides 3 hours of backup operation. For further information, see Section 4.3.

Figure 6: Wiring Between PS-33 and AC-225

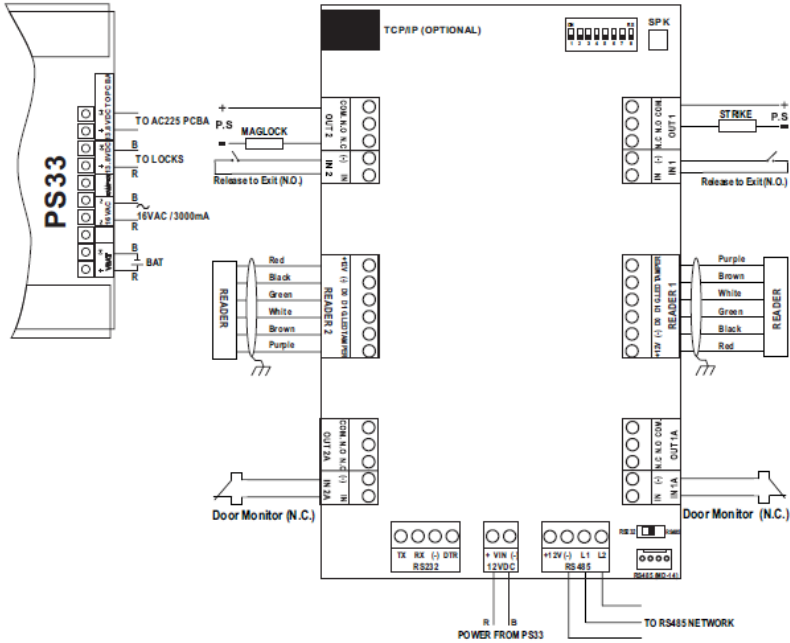


AC-225 Panel Setup

3.5 AC-225 Wiring Communications


Figure 7 presents a detailed view of the access control panel with all its wiring communications.

Figure 7: AC-225 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 (Figure 8).



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

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

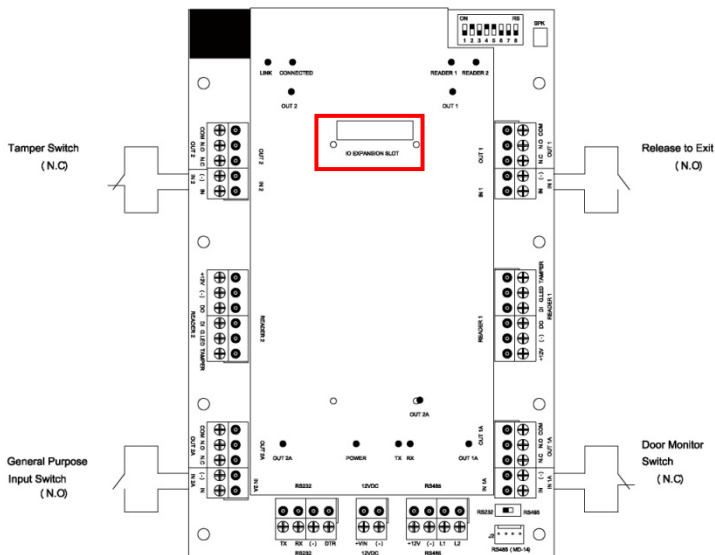
Figure 8: Reader Wiring



3.7 MD-IO84

The MD-IO84 is an optional I/O expansion board which adds four relay outputs and eight supervised inputs to the Access Control Panel. Attach the MD-IO84 to the AC-225's expansion slot, as marked in red in Figure 9.

Figure 9: Connector Location for MD-IO84 or MD-D02



For more information, see the MD-IO84 Installation and User Guide.

3.8 MD-D02

The MD-D02 is an optional reader expansion board which adds 2 readers, four relay outputs and four supervised inputs to the Access Control Panel. Attach the MD-D02 to the AC-225's expansion slot, as marked in red in Figure 9.

For more information, see the MD-D02 Installation and User Guide.

4. Input and Output Connections

This chapter describes the AC-225 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

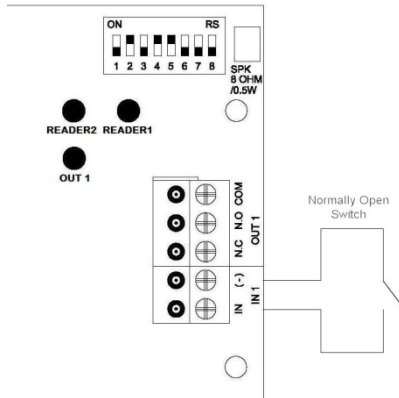
The Trouble state is caused by either tampering with the input circuit or by faulty hardware installation. Once configured as supervised input, add a resistor of 2.2K, of 8.2K or both on the input circuit. See the figures in the following subsections.

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 10: Normally Open Input Connection

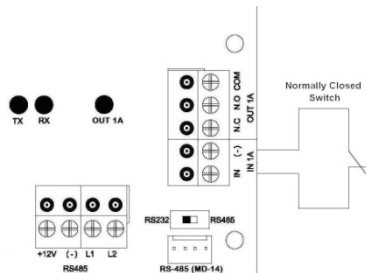


4.1.2 Normally Closed Input Connection

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 11: Normally Closed Input Connection



4.1.3 Normally Open Supervised Single Resistor Input Connection

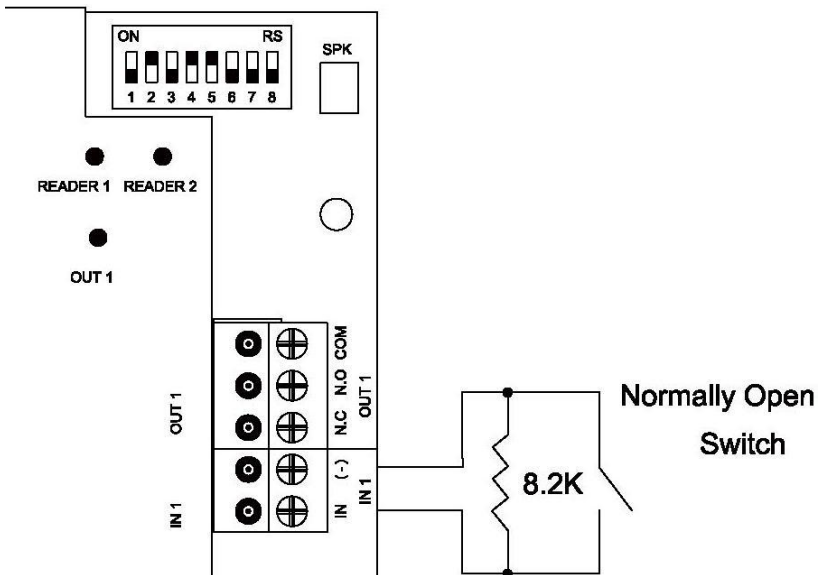
Connect an 8.2 K resistor in parallel to the input switch contacts.

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 12: Normally Open Supervised Input (Single Resistor)



4.1.4 Normally Open Supervised Double Resistor Input Connection

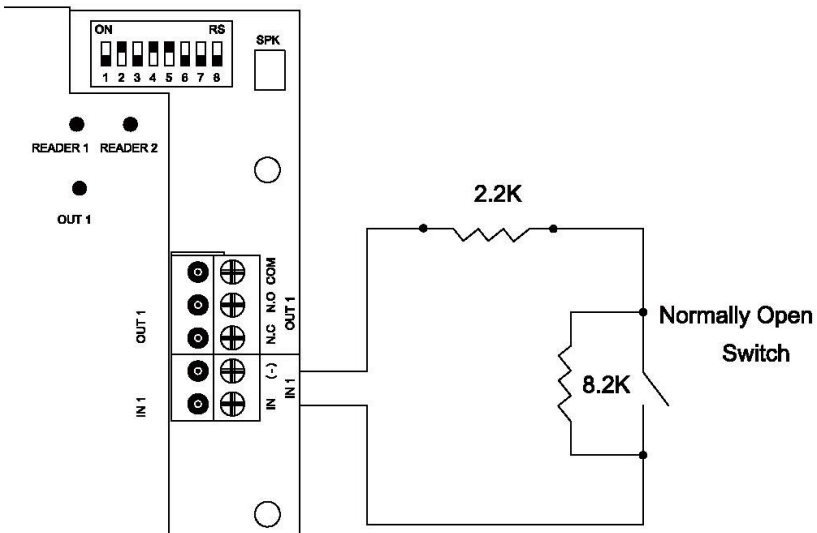
Connect a 2.2 K resistor in series to the input switch contacts.

Connect an 8.2 K resistor parallel to the input switch contacts.

Normally Open Supervised Input has 3 states:

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

Figure 13: Normally Open Supervised Input (Double Resistor)



4.1.5 Normally Closed Supervised Single Resistor Input Connection

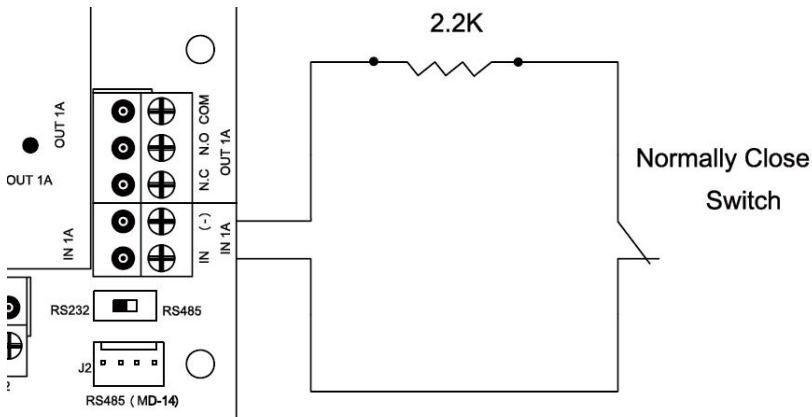
Connect a 2.2K resistor in series to the input switch contacts.

Normally Closed Supervised Input has 3 states:

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

Input and Output Connections

Figure 14: Normally Closed Supervised Input (Single Resistor)



4.1.6 Normally Closed Supervised Double Resistor Input Connection

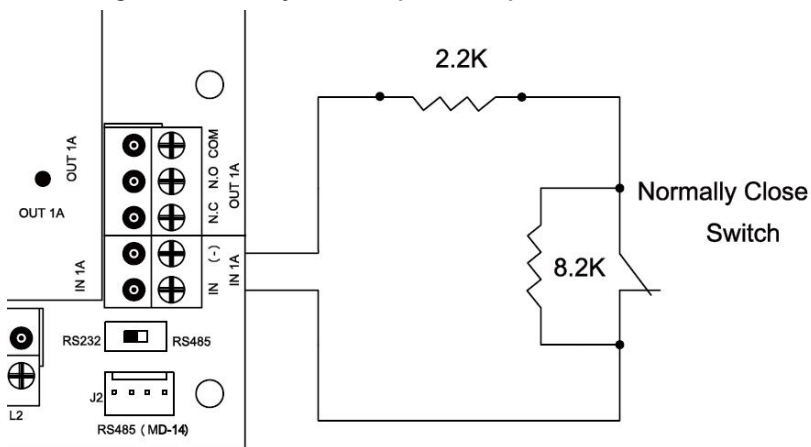
Connect a 2.2K resistor in series to the input switch contacts.

Connect an 8.2K resistor parallel to the input switch contacts.

Normally Closed Supervised Input has 3 states:

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

Figure 15: 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

REX Inputs functions when using MD-D02:

Double door controller: (each door has two readers)	Door 1 – IN1 Door 2 – IN5
Four door controller (each door has one reader)	Door 1 – IN1 Door 2 – IN2 Door 3 – IN5 Door 4 – IN7

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 – IN1A Door 2 – IN2A

Dedicated Inputs functions when using MD-D02:

Double door controller: (each door has two readers)	Door 1 – IN1A Door 2 – IN6
Four door controller: (each door has one reader)	Door 1 – IN1A Door 2 – IN2A Door 3 – IN6 Door 4 – IN8

Input and Output Connections

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 – IN2 Door 1 – INA
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.

General purpose inputs functions when using MD-IO84 or MD-D02:

MD-IO84:	IN5 to IN12
MD-D02:	IN5 to IN8 except the dedicated inputs

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

Door outputs when using MD-D02:

Double door controller: (each door has two readers)	Door 1 – OUT 1 Door 2 – OUT 5
Four door controller: (each door has one reader)	Door 1 – OUT 1 Door 2 – OUT 2 Door 3 – OUT 5 Door 4 – OUT 7

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



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 or 4 readers when using MD-D02. 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)".

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

When using the MD-D02, the following should be defined:

Double door controller: (each door has two readers)	Reader 1 – Door 1 IN/OUT Reader 2 – Door 1 OUT/IN Reader 3 – Door 2 IN/OUT Reader 4 – Door 2 OUT/IN
Four door controller: (each door has one reader)	Reader 1 – Door 1 IN/OUT Reader 2 – Door 2 IN/OUT Reader 3 – Door 3 IN/OUT Reader 4 – Door 4 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-225 Hardware Settings

Each AC-225 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. Access control panels configured with the MD-D02 expansion as either double door or four-door controllers have four readers.

Table 3 summarizes the possible hardware settings.

Table 3: 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)
Double door with 4 readers (MD-D02):		
Outputs	Door1 Lock output	(OUT 1)
	General purpose output	(OUT 1A)
	General purpose output	(OUT 2)
	General purpose output	(OUT 2A)
	Door2 Lock output	(OUT 5)
	General purpose output	(OUT 6)
	General purpose output	(OUT 7)
	General purpose output	(OUT 8)
Inputs	Door1 Request to exit	(IN 1)
	Door1 monitor input	(IN 1A)
	General purpose input	(IN 2)
	General purpose input	(IN 2A)
	Door2 Request to exit	(IN 5)
	Door2 monitor input	(IN 6)
	General purpose input	(IN 7)
	General purpose input	(IN 8)

AC-225 Hardware Settings

Readers	Reader1	(Door1 IN/OUT)
	Reader2	(Door1 OUT/IN)
	Reader3	(Door2 IN/OUT)
	Reader4	(Door2 OUT/IN)

Four door with 4 readers (MD-D02):

Outputs	Door1 Lock output	(OUT 1)
	General purpose output	(OUT 1A)
	Door2 Lock output	(OUT 2)
	General purpose output	(OUT 2A)
	Door3 Lock output	(OUT 5)
	General purpose output	(OUT 6)
	Door4 Lock output	(OUT 7)
	General purpose output	(OUT 8)
Inputs	Door1 Request to exit	(IN 1)
	Door1 monitor input	(IN 1A)
	Door2 Request to exit	(IN 2)
	Door2 monitor input	(IN 2A)
	Door3 Request to exit	(IN 5)
	Door3 monitor input	(IN 6)
	Door4 Request to exit	(IN 7)
	Door4 monitor input	(IN 8)
Readers	Reader1	(Door1 IN/OUT)
	Reader2	(Door2 IN/OUT)
	Reader3	(Door3 IN/OUT)
	Reader4	(Door4 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 16).

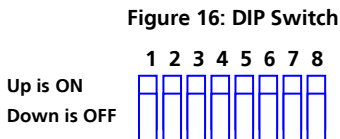



Table 4 shows a list of DIP switch numbers and their functions:

Table 4: 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.

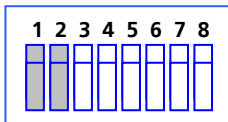


Figure 17: DIP Switch with Baud Rate Setting

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

Table 5: Switch Baud Rates

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

AC-225 Hardware Settings



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

Note

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.

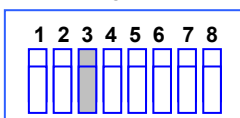


Figure 18: DIP Switch for Door Setting

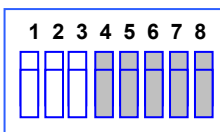
- **Off** – Defines using two readers for each door. Panel controls one door or two doors when MD-D02 is installed.
- **On** – Using one reader for each door. Panel controls two doors or four doors when MD-D02 installed.

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 19: DIP Switch with Internal Network Address Setting



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

Note

Table 6 displays the 32 address settings available:

Table 6: 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

Address	Switch 4	Switch 5	Switch 6	Switch 7	Switch 8
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 9600bps 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 7: 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.

Note

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.

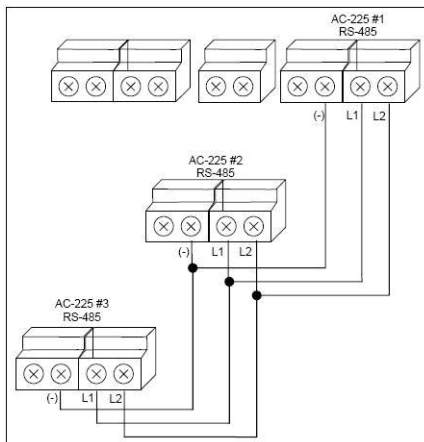
The Access control panel supports the two-wire RS-485 interface. RS-485 interface enables the distance between the Access control panel and PC to be extended up to 4000 feet (1219) meters. The data line wiring must be in daisy chain formatting with one control unit following another. The first Access 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. The maximum distance from the PC to the last panel in the chain is 4,000 ft (1,219 m).

Figure 20: Daisy Chaining



Communications

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-225IP 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-225IP panel can support up to 31 AC-225 panels.

To connect to a TCP/IP network using other AC-225 models, add Rosslare's MD-N32 TCP/IP to RS-232 gateway converter.



Note

For more information on operating an MD-N32, refer to the MD-N32 User Manual.

6.2.1 LAN and WAN Requirements

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

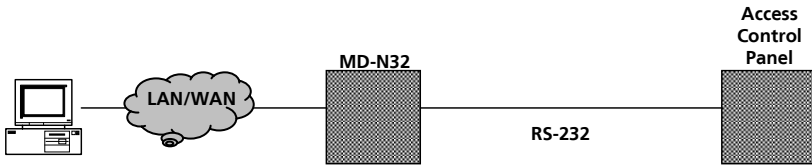
Use a TCP/IP connection when a LAN network already exists and the long RS-485 network is not required. The following schematic illustrates the connection of a single AC-225 to a computer via a LAN network.

The maximum distance from the Ethernet port of the panel to the LAN/WAN connection is 328 ft (99.97 m).

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 configuring instructions in the software manual).

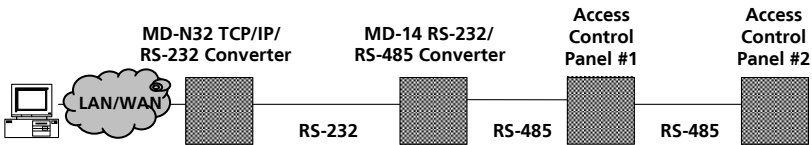
Figure 21: MD-N32 Configuration Connecting a Single Panel



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.

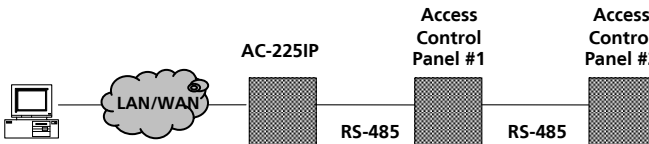
To connect an MD-N32 to more than one panel (up to 32 panels), Rosslare's MD-14 RS-485 converter must be used. Connect the MD-14 between the RS-485 access control panel network and the MD-N32 converter.


Figure 22: Connecting Multiple Access Control Panels with MD-N32



The MD-14 is not required when using the AC-225IP.

Figure 23: Connecting Multiple Access Control Panels with AC-225IP



 For more information on operating an MD-N32, refer to the MD-N32 User Manual.

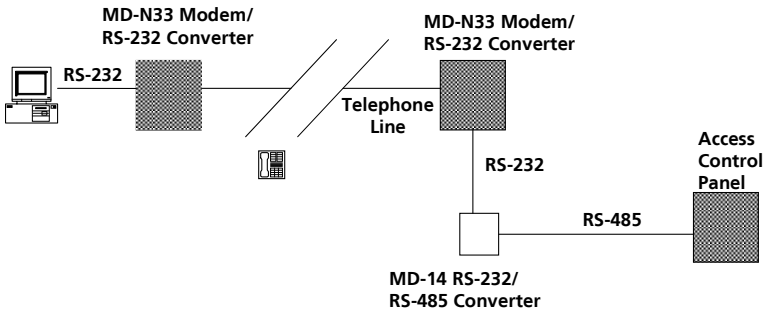
6.3 Modem Network Connection

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-225.

Figure 24: Remote Site Modem Configuration



Note

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

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-225 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-225 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-225 RS-485 outlet to the MD-14 4 wires cable. Make sure the J1 switch (on the AC-225) is set to RS-485 Mode.

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