AC-425x-B Series

**Expandable 4–Reader Networked
Access Control Panel**

Hardware Installation and User Guide

ROSSLARE
SECURITY PRODUCTS

Table of Contents

Table of Contents

List of Figures

List of Tables

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 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.

- Incorrect operation or installation, or failure of the user to effectively maintain the system, relieves the manufacturer (and seller) from all or any responsibility for consequent non-compliance, damage, or injury.

- The text, images and graphics contained in the manual are for the purpose of illustration and reference only.

- All data contained herein subject to change without prior notice.

- In no event shall manufacturer be liable for any special, direct, indirect, incidental, consequential, exemplary, or punitive damages (including, without limitation, any and all damages from business interruption, loss of profits or revenue, cost of capital or loss of use of any property or capital or injury).

- All graphics in this manual are for reference only, some deviation between the image(s) and the actual product may occur.

- All wiring diagrams are intended for reference only, the photograph or graphic of the PCB(s) are intended for clearer illustration and understanding of the product and may differ from the actual PCB(s).

1.   Introduction

> **Note**
> In this manual, unless otherwise stated, "AC-425x-B" refers to both the regular AC-425-B and the AC-425IP-B moels.

The AC-425x-B access control panel is a state-of-the-art networked access controller, employing the latest technology to meet the requirements of the market.

The state-of-the-art dual/quad door AC-425x-B networked access controller is the backbone of medium scale security systems handling up to 30,000 users and 8184 doors.

Each AC-425x-B access control unit (ACU) supports four readers (In/Out) of various formats including standard Wiegand 26-bit. Installations can also have one reader per door.

The AC-425x-B comes in two models:

▪   AC-425-B – standard model

▪   AC-425IP-B – supports TCP/IP connection

Driven by Rosslare's powerful, flexible and easy-to-use AxTraxNG™ software, the system provides an ideal, modular and expandable solution for commercial and institutional needs. It provides seamless integration with Rosslare's range of RFID proximity, PIN, Proximity & PIN, smartcard and biometric readers with Rosslare's selection of RFID credentials.

The AC-425x-B is ready for installation with a mountable & lockable metal enclosure integrated with transformer, power supply/charger, sounder and control board.

Using onboard RS-232/485, Ethernet TCP/IP (AC-425IP-B model only), multiple local or remote sites, door sub-networks can connect to the AxTraxNG Client/Server PC software running on Microsoft® Windows® 98/ME & NT/2000/XP/7 operating systems.

The AC-425x-B consists of the following components:

▪   AC-425x-B controller board

▪   Panel enclosure

▪   PM-10 management board

▪   Power transformer

▪   4 x 2.2 kΩ and 4 x 8.2 kΩ resistors for the supervised inputs

Introduction

Figure 1 shows the layout of the AC-425x-B panel.

Figure 1: AC-425x-B Panel Layout

1.1   AxTraxNG

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

It offers the following capabilities:

Parameter	Value
Users capacity	30,000
Unauthorized users	30,000
Access groups	30,000
Number of panels in system	1023
Number of doors in system	8184

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

Introduction

1.1.1 Client-Server Structure

AxTraxNG operates through a dedicated AxTraxNG 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. System users can define new cards holders and users, and control access permissions. The system includes tools for database backup, input, and export of previous configurations and automatic backup on a periodic basis.

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

1.1.2 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, which are 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.

1.1.3 Fingerprint Recognition

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

> **Note**
> Fingerprint recognition was not evaluated by UL.

2.   Technical Specifications

2.1   AC-425x-DIN

Technical Specifications

Electrical Characteristics

Operating Voltage	12 VDC, 1.5 A from a regulated power supply	
Maximum Input Current	AC-425	Standby: 80 mA
		Maximum: 325 mA
	AC-425IP	Standby: 120 mA
		Maximum: 370 mA
General Inputs	• 4 supervised high impedance inputs • 8 or 12 supervised inputs when using MD-D02B or MD-IO84B expansion boards • Maximum voltage: 5 VDC	
Relay Outputs	• 4 Form C 5 Amp relay outputs • 8 outputs when using MD-D02B or MD-IO84B expansion boards	
Reader Ports	• 2 reader ports, 4 reader ports when using MD-D02B • Communication: Wiegand (D0, D1) or Clock & Data (C, D) • Output voltage to reader: 12 VDC • Max. current to reader: 245 mA • LED control output and Tamper Input	
Visual Indicators	11 LEDs for outputs and communication status	
Audio	Sounder output for use with compatible speakers provide chime, bell and siren signals	
Battery Standby Time	3 hours with a 12 V, 7 Ah lead acid battery	

Communication Characteristics

RS-485 / RS-232	• RS-485 or optional RS-232 • RS-485 connection by terminal block or MD-14U connector • RS-232 connection by terminal block
RS-232	Terminal Block
RS-485	Molex and Terminal Block
TCP/IP	On-board RJ-45 connector (functional on AC-425IP models only)
Selectable Communication Speed	9600, 19200, 57600, 115200 bps

Environmental Characteristics

Operating Temperature Range	0°C to 49°C (32°F to 120°F)
Operating Humidity Range	0 to 85% (non-condensing)

Dimensions

Height x Width x Depth	193 x 136.5 x 39 mm (7.6 x 5.4 x 1.5 in.)
Weight	0.36 kg (12.7 oz)

2.2   AC–425x–B Installed in ME–1015

Technical Specifications

Electrical Characteristics – Switch Mode Power Supply	
Operating Voltage	90 ~ 265 VAC, 50 ~ 60 Hz from mains power
Maximum Input Current	1.5 A
Output Power	15 VDC, 4 A (60 Watts) to the power management board

Electrical Characteristics – Power Management Board (PM-10)	
Input Power	15 VDC, 4 A to the power management board
Output Power	Two PTC fused outputs, each provides 13.8 VDC, 2 A One output for controller and readers One output for locks
Battery Charger	13.8 VDC, 300 mA for 12 VDC, 7 Ah Lead Acid Battery
Speaker	0.5 Watt, 8 Ohm
Light Bar	0.3 Watt for LED light

Environmental Characteristics	
Operating Temperature Range	0°C to 49°C (32°F to 120°F)
Operating Humidity Range	0 to 85% (non-condensing)

Dimensions	
Height x Width x Depth	365 x 264 x 97 mm (14.4 x 10.4 x 3.8 in.)
Weight	3.4 kg (7.5 lb)

3.   AC-425x-B Panel Setup

Each AC-425x-B panel controls 2 or 4 doors (up to 8 doors with MD-D04B). 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-425x-B access control panels.

Figure 2: Sample AC-425x-B Configuration

> Bushings are needed for any conductors leaving the enclosure through the provided openings.
>
> Note
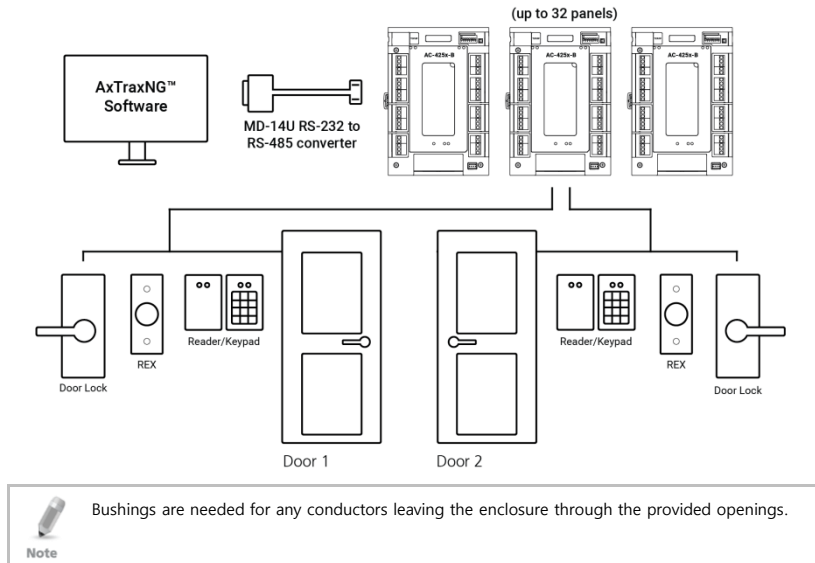
AC-425x-B Panel Setup

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
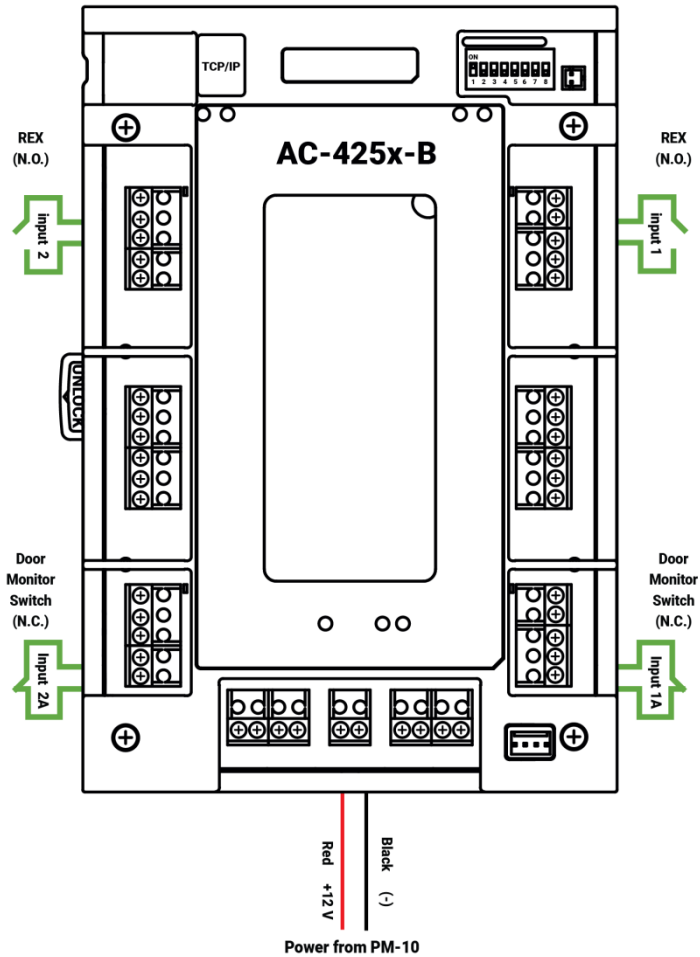
AC-425x-B Panel Setup

3.2   Inputs Wiring – Supervised Inputs

When wiring the AC-425x-B for supervised inputs, resistors should be placed on the input switch and not on the terminal block.

For more details, refer to 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
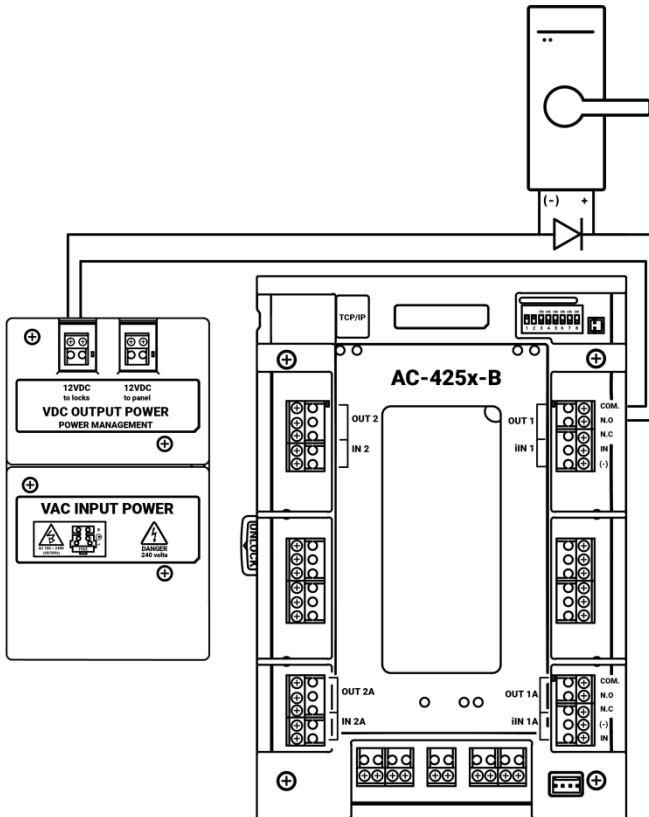
Figure 5: Door Lock – Failed Open
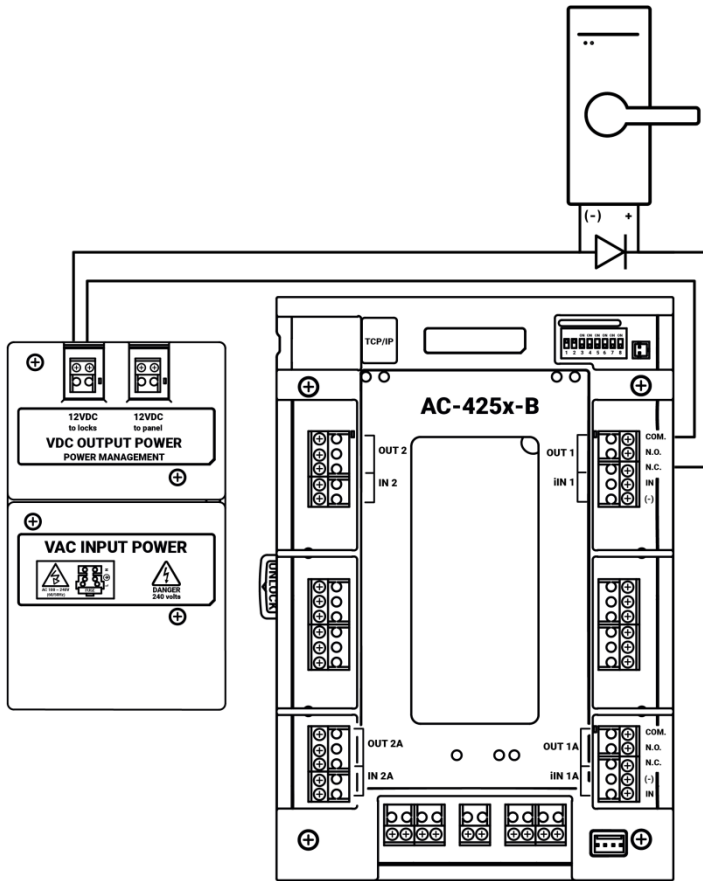
3.4   Power Supply

Figure 6 illustrates wiring between the PM-10 power management board and the AC-425x-B. Make sure the connection polarity is correct, (+) to (+) and (-) to (-). Connect the power to the input power terminals of the control panel. It is recommended to add a 12 VDC lead acid backup battery (requires the ME-1015 Power Management Enclosure) to have uninterrupted operation in case main power supply fails. A 12 V, 7 AH battery provides 3 hours of backup operation.

AC-425x-B Panel Setup

Figure 6: Wiring Between PM-10 and AC-425x-B
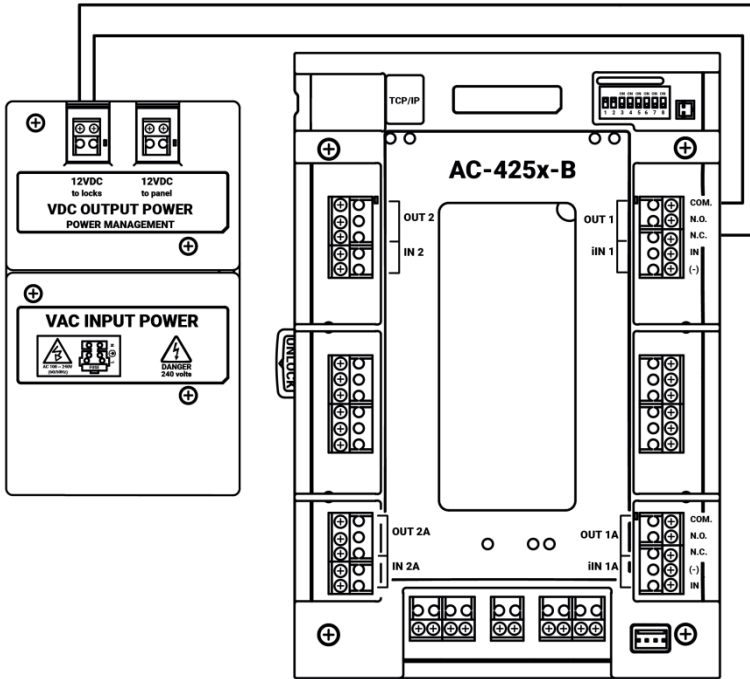
AC-425x-B Panel Setup

3.5   AC–425x–B Wiring Communications

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

Figure 7: AC-425x-B Wiring Communications
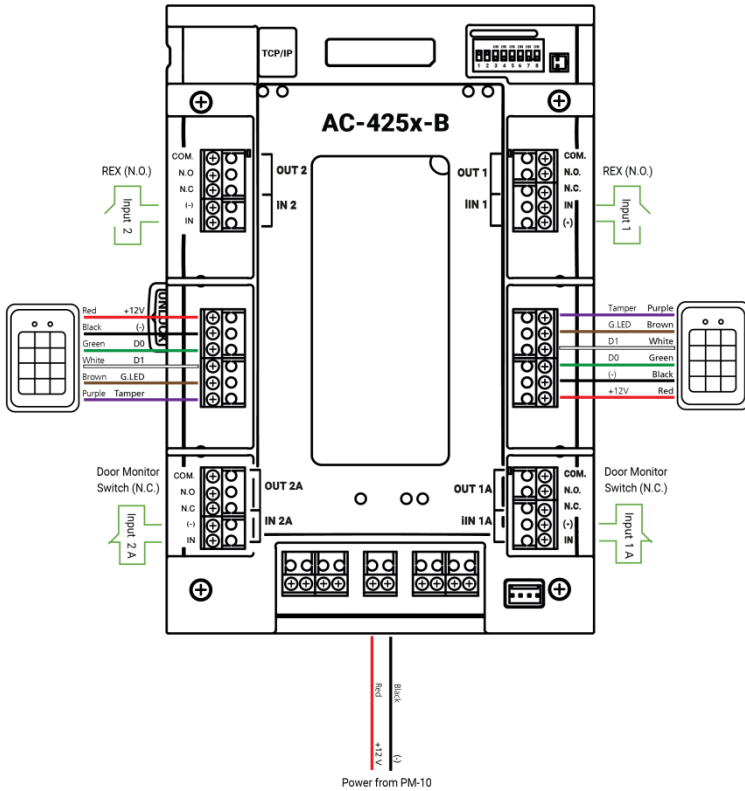
3.6   Readers

Proximity and keypad readers are supplied with a limited cable. The color of the cable cover represents the cable's function according to Wiegand standards (Figure 8).

> 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).

AC-425x-B Panel Setup

Figure 8: Reader Wiring
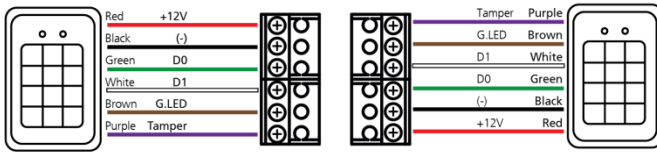
3.7   MD–IO84B

The MD-IO84B is an optional I/O expansion board that adds 4 relay outputs and 8 supervised inputs to the Access Control Panel. Attach the MD-IO84B to the AC-425x-B's expansion slot, as marked in red in Figure 9).

Figure 9: Connector Location for MD-IO84B or MD-D04B Expansions
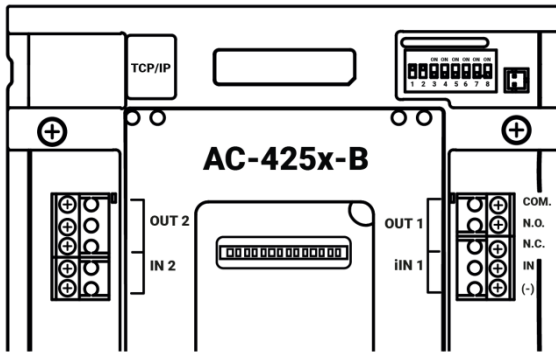
For more information, see the *MD-IO84B Installation and User Guide*.

3.8   MD–D04B

The MD-D04B is an optional reader expansion board that adds 4 readers, 4 relay outputs and 4 supervised inputs to the access control panel. Attach the MD-D04B to the AC-425x-B's expansion slot, as marked in red in Figure 9.

For more information, see the *MD-D04B Installation and User Guide*.

4.   Input and Output Connections

This chapter describes the AC-425x-B access control panel's input and output connections.

4.1   Input Types

There are four input types:

- Normally Closed (N.C.)
- Normally Open (N.O.)
- Single EOL resistor
- Double EOL resistor

Inputs IN1, IN2, IN3, and IN4 may be configured individually as either supervised or non-supervised inputs. Use the AxTraxNG system to configure each input separately.

Non-supervised inputs have two states:

- Normal
- Abnormal

Supervised inputs have three states:

- Normal
- Abnormal
- Trouble

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

4.1.1   Normally Open Input Connection

A Normally Open Input has 2 states:

- Switch Open – Normal State:

  Loop resistance = Infinite (open circuit)

- Switch Closed – Abnormal State:

  Loop resistance = 0 (short circuit)

Input and Output Connections

Figure 10: Normally Open Input Connection
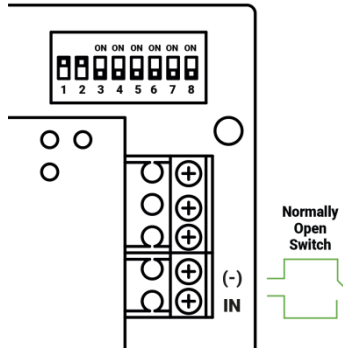
4.1.2 Normally Closed Input Connection

A 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
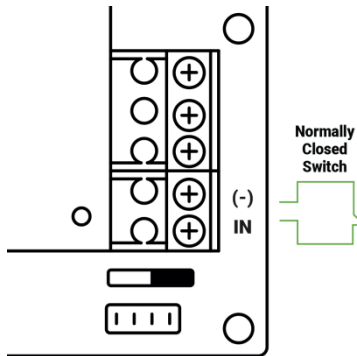
4.1.3 Normally Open Supervised Single EOL Resistor Input Connection

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

A Normally Open Supervised Input has 3 states:

- Switch Open – Normal State:

    Loop resistance = 8.2 kΩ

- Switch Closed – Abnormal State:

Input and Output Connections

Loop resistance = 0 (short circuit)

▪ Open circuit across input terminals – Trouble State:

Loop resistance = Infinite (open circuit).

Figure 12: Normally Open Supervised Input (Single Resistor)
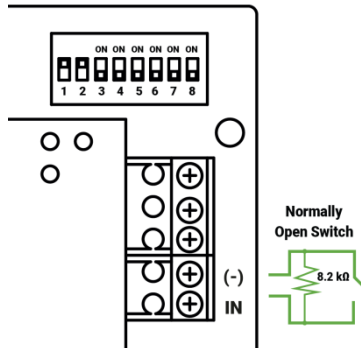
4.1.4 Normally Open Supervised Double EOL Resistor Input Connection

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

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

A Normally Open Supervised Input has 3 states:

▪ Switch Open – Normal State:

Loop resistance = 10.4 kΩ

▪ Switch Closed – Abnormal State:

Loop resistance = 2.2 kΩ

▪ Open circuit (infinite loop resistance) or short circuit (0 resistance) across input terminals – Trouble State

Figure 13: Normally Open Supervised Input (Double Resistor)
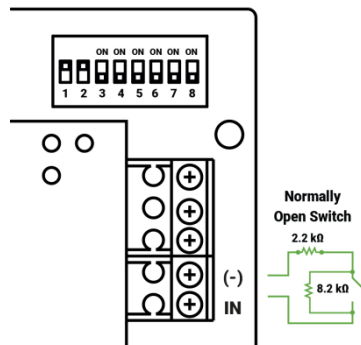
Input and Output Connections

4.1.5   Normally Closed Supervised Single EOL Resistor Input Connection

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

A Normally Closed Supervised Input has 3 states:

▪ Switch Closed – Normal State:

Loop resistance = 2.2 kΩ

▪ Switch Open – Abnormal State:

Loop resistance = Infinite (open circuit)

▪ Short circuit across input terminals – Trouble State:

Loop resistance = 0 (short circuit)

Figure 14: Normally Closed Supervised Input (Single Resistor)
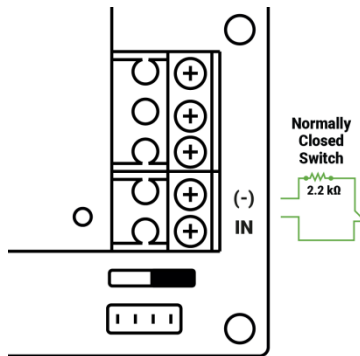
4.1.6   Normally Closed Supervised Double EOL Resistor Input Connection

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

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

A Normally Closed Supervised Input has 3 states:

▪ Switch Closed – Normal State:

Loop resistance = 2.2 kΩ

▪ Switch Open – Abnormal State:

Loop resistance = 10.4 kΩ

▪ Open circuit (infinite loop resistance) or short circuit (0 resistance) across input terminals – Trouble State

Input and Output Connections

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.

Scenario	Setting
Two readers per door	Door 1 – IN 1
	Door 2 – IN 2
One reader per door	Door 1 – IN 1
	Door 2 – IN 2
	Door 3 – IN 3
	Door 4 – IN 4

REX input functions when using MD-D04B:

Scenario	Setting
Two readers per door	Door 1 – IN1
	Door 2 – IN2
	Door 5 – IN5
	Door 6 – IN6
One reader per door	Door 1 – IN1
	Door 2 – IN2
	Door 3 – IN3
	Door 4 – IN4
	Door 5 – IN5
	Door 6 – IN6
	Door 7 – IN7

Input and Output Connections

	Door 8 – IN8

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. Door monitor feature is only available when the system is defined as a two reader per door. The following should be defined:

Scenario	Setting
Two readers per door	Door 1 – IN3
	Door 1 – IN4

Dedicated Input functions when using MD-D04B:

Scenario	Setting
Two readers per door	Door 1 – IN3
	Door 2 – IN4
	Door 3 – IN7
	Door 4 – IN8

4.2.3   General Purpose Inputs

These are free inputs that can be used for various functions. This function is only available with the MD-IO84B expansion. The following should be defined:

Scenario	Setting
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 to monitor a power supply failure.

General purpose input functions when using MD-IO84B or MD-D04B:

Unit	Expansions
MD-IO84B	IN5 to IN12
MD-D04B	IN5 to IN8 except the dedicated inputs

Input and Output Connections

4.3 Outputs

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

4.3.1 Door Lock

There are two types of door locking devices:

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

The following should be defined:

Scenario	Setting
Two readers per door	Door 1 – OUT 1
	Door 2 – OUT 2
One reader per door	Door 1 – OUT 1
	Door 2 – OUT 2
	Door 3 – OUT 3
	Door 4 – OUT 4

Door outputs when using MD-D04B:

Scenario	Setting
Two readers per door	Door 1 – OUT 1
	Door 2 – OUT 2
	Door 3 – OUT 5
	Door 4 – OUT 6
One reader per door	Door 1 – OUT 1
	Door 2 – OUT 2
	Door 3 – OUT 3
	Door 4 – OUT 4
	Door 5 – OUT 5
	Door 6 – OUT 6
	Door 7 – OUT 7
	Door 8 – OUT 8

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.

Input and Output Connections

4.4 Card Readers and Keypads

Each access control panel can be connected to a maximum of four readers or 8 readers when using MD-D04B. 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:

Scenario	Setting
Two readers per door	Door 1 – Reader 1 IN/OUT
	Door 1 – Reader 3 IN/OUT
	Door 2 – Reader 2 IN/OUT
	Door 2 – Reader 4 IN/OUT
One readers per door	Door 1 – Reader 1 IN/OUT
	Door 2 – Reader 2 IN/OUT
	Door 3 – Reader 3 IN/OUT
	Door 4 – Reader 4 IN/OUT

When using the MD-D04B, the following should be defined:

Scenario	Setting
Two readers per door:	Door 1 – Reader 1 IN/OUT
	Door 1 – Reader 3 IN/OUT
	Door 2 – Reader 2 IN/OUT
	Door 2 – Reader 4 IN/OUT
	Door 3 – Reader 5 IN/OUT
	Door 3 – Reader 7 IN/OUT
	Door 4 – Reader 6 IN/OUT
	Door 4 – Reader 8 IN/OUT
One readers per door:	Door 1 – Reader 1 IN/OUT
	Door 2 – Reader 2 IN/OUT
	Door 3 – Reader 3 IN/OUT
	Door 4 – Reader 4 IN/OUT
	Door 5 – Reader 5 IN/OUT
	Door 6 – Reader 6 IN/OUT
	Door 7 – Reader 7 IN/OUT

Input and Output Connections

Scenario	Setting
	Door 8 – Reader 8 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-425x-B Hardware Settings

5.1   DIP Switch Configuration

The DIP switches in the access control panel determine the baud rates for serial communication, control panel type, and the device address, as summarized in Table 1.

Table 1: 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.

In general, the up position is ON and the down position is OFF as demonstrated in Figure 16.

Figure 16: DIP Switches

1 2 3 4 5 6 7 8
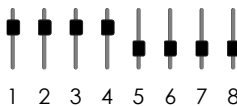
5.2   AC-425x-B Panel Baud Rate

The AC-425x-B panel serial port baud rate, set in DIP switches 1 and 2, defines the communication speed for connecting with a PC in a network connection.

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

Table 2 lists the status of Switches 1 and 2 and the baud rate:

Table 2: Switch Baud Rates

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

> The access control panel baud rate must be identical to the AxTraxNG Network configuration of baud rate.
>
> Note

5.3   AC-425x-B Panel Type

The AC-425x-B panel type is defined using the third DIP switch. There are two panel types: a panel with one reader per each door or a panel with two readers per each door. This DIP switch setting influences the number of readers per door in the panel.

The default AC-425x-B panel setting is for two readers per each door.

- **Off** – Defines using two readers for each door. Panel controls two or four doors when MD-D04B is installed.

- **On** – Using one reader for each door. Panel controls four doors or eight doors when MD-D04B installed.

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-D04B expansion as either double door or four-door controllers have four readers.

Table 3: Possible Hardware Settings

Connectors	Description	Setup
Two readers per door:		
Outputs	Door 1 Lock output	(OUT 1)
	Door 2 Lock output	(OUT 2)
	General purpose output	(OUT 3)

AC-425x-B Hardware Settings

Connectors	Description		Setup
	General purpose output		(OUT 4)
Inputs	Door 1:	Request to exit	(IN 1)
		Door monitor input	(IN 3)
	Door 2:	Request to exit	(IN 2)
		Door monitor input	(IN 4)
Readers	Reader1 – Door1		Door Entry or Exit
	Reader2 – Door2		Door Exit or Entry
	Reader3 – Door1		Door Entry or Exit
	Reader4 – Door2		Door Exit or Entry
One reader per door:			
Outputs	Door1 Lock output		(OUT 1)
	Door2 Lock output		(OUT 2)
	Door3 Lock output		(OUT 3)
	Door4 Lock output		(OUT 4)
Inputs	Door1 Request to exit		(IN 1)
	Door2 Request to exit		(IN 2)
	Door3 Request to exit		(IN 3)
	Door4 Request to exit		(IN 4)
Readers	Reader1		(Door1 IN/OUT)
	Reader2		(Door2 IN/OUT)
	Reader3		(Door3 IN/OUT)
	Reader4		(Door4 IN/OUT)
Two readers per door with 8 readers (MD-D04B):			
Outputs	Door1 Lock output		(OUT 1)
	Door2 Lock output		(OUT 2)
	Door3 Lock output		(OUT 5)
	Door4 Lock output		(OUT 6)
Inputs	Door1 Request to exit		(IN 1)
	Door1 monitor input		(IN 3)
	Door2 Request to exit		(IN 2)
	Door2 monitor input		(IN 4)
	Door3 Request to exit		(IN 5)
	Door3 monitor input		(IN 7)
	Door4 Request to exit		(IN 6)
	Door4 monitor input		(IN 8)

AC-425x-B Hardware Settings

Connectors	Description	Setup
Readers	Reader1	(Door1 IN/OUT)
	Reader2	(Door2 OUT/IN)
	Reader3	(Door1 IN/OUT)
	Reader4	(Door2 OUT/IN)
	Reader5	(Door3 IN/OUT)
	Reader6	(Door4 OUT/IN)
	Reader7	(Door3 IN/OUT)
	Reader8	(Door4 OUT/IN)
One reader per door with 8 readers (MD-D04B)		
Outputs	Door1 Lock output	(OUT 1)
	Door2 Lock output	(OUT 2)
	Door3 Lock output	(OUT 3)
	Door4 Lock output	(OUT 4)
	Door5 Lock output	(OUT 5)
	Door6 Lock output	(OUT 6)
	Door7 Lock output	(OUT 7)
	Door8 Lock output	(OUT 8)
Inputs	Door1 Request to exit	(IN 1)
	Door2 Request to exit	(IN 2)
	Door3 Request to exit	(IN 3)
	Door4 Request to exit	(IN 4)
	Door5 Request to exit	(IN 5)
	Door6 Request to exit	(IN 6)
	Door7 Request to exit	(IN 7)
	Door8 Request to exit	(IN 8)
Readers	Reader1	(Door1 IN/OUT)
	Reader2	(Door2 OUT /IN)
	Reader3	(Door3 IN/OUT)
	Reader4	(Door4 OUT /IN)
	Reader5	(Door5 IN/OUT)
	Reader6	(Door6 OUT /IN)
	Reader7	(Door7 IN/OUT)
	Reader8	(Door8 OUT /IN)

AC-425x-B Hardware Settings

5.4 AC–425x–B Panel Address

The last five 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".

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

Table 4 displays the 32 address settings available:

AC-425x-B Hardware Settings

Table 4: 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

AC-425x-B Hardware Settings

	The AC-425x-B panel address is defined in the AxTraxNG software.
Note	The DIP switch and the software must be set to the same address.

6. Communications

Communication lines are used to upload and download information between the AC-425x-B panel and the AxTraxNG server. 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

> ***Note***   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 with RS-232

▪ Serial Network with RS-485

▪ TCP/IP Network (AC-425IP-B model only)

6.1 Serial Network Connection

The computer serial port controlling the access control panel is set from within the AxTraxNG server. The default bitrate 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 connection if you wish to connect additional panels to the primary control panel already connected to the COM port.

> ***Note***   The J1 switch must be set to the correct position to select the RS-232 communication.
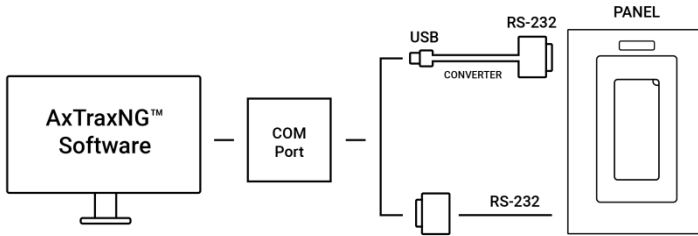
6.1.1 RS–232 Connection to the Computer

Set the J1 switch to the RS-232 position.

The RS-232 connection can only connect a single access control panel to the computer (Figure 17).

Figure 17: RS-232 Panel Connection to PC

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).

Table 5: 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

6.1.2   RS–485 Connection to the Computer

Set the J1 switch to the RS-485 position.

Using the RS-485, up to 32 access control panels can be linked together and connected to a single communication port on the computer (Figure 18).

Figure 18: RS-485 Panel Connection to PC
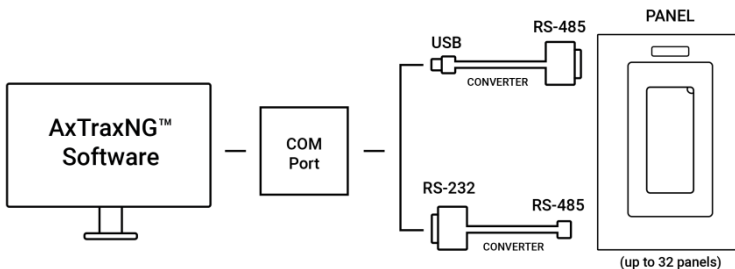
Use the RS-485 interface for situations where there are multiple controllers connected. The serial port used to control the access control panel is assigned within the AxTraxNG software.

The AC-425x-B supports the 2-wire RS-485 interface, which can significantly increase the distance between the server and the last panel. To use the RS-485 interface, the panels must be connected in a daisy-chain formation with an MD-14U RS-485 to RS-232 adapter (Section 6.1.3).
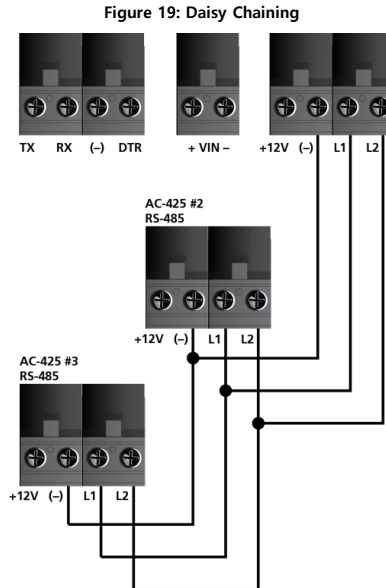
Communications

6.1.3 Daisy Chaining

You can connect up to 32 panels to a single serial line using a daisy-chain formation, which is done by drop-down RS-485 wiring (Figure 19).

Figure 19: Daisy Chaining

This can increase the maximum distance from the PC to the last panel in the chain to 4,000 ft (1,219.2 m).

The first panel is connected directly to the server using an MD-14U converter, while the second panel connects to the first panel. Additional panels are connected in the same way, one after another. The server identifies each panel on the RS-485 network by its address.

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 100–120 Ω may be required. Apply the resistor across the L1 and L2 connections.

> **Note** These termination resistors are especially important in long cable runs.

Communications

6.2 TCP/IP Network Connection

> **Note**
> This section applies to the AC-425IP-B model only.

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-425x-B panels connect to the TCP/IP network (LAN or WAN) directly, using an onboard 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.

6.2.1 LAN and WAN Requirements

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

The AC-425IP-B panels connect to the TCP/IP network (LAN or WAN) directly, using an onboard network module. For each AC-425IP-B panel connected on a TCP/IP port, up to 31 subnetworked panels can be connected via an RS-485 bus, which means that one IP port can support up to 32 AC-425IP-B panels (Figure 20).

Figure 20: MD-N32 Configuration Connecting a Single Panel
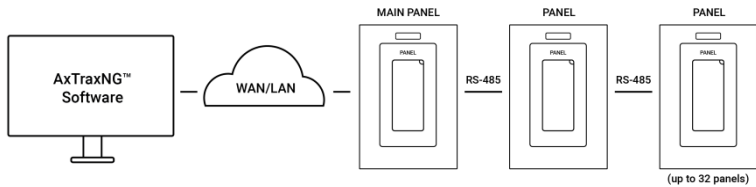
To connect to a TCP/IP network using AC-425 non-IP models, add Rosslare's MD-N32 TCP/IP to RS-232 gateway converter.

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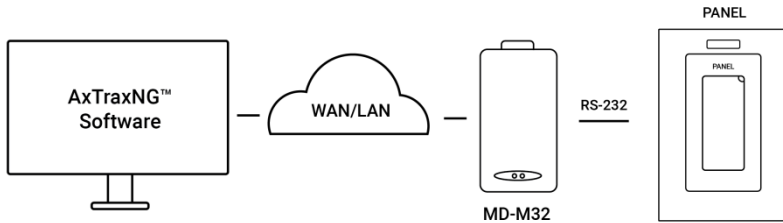
Communications

6.2.2 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. Figure 21 illustrates the connection of a single AC-425IP-B to a computer via a LAN network.

Figure 21: Connecting a Single Control Panel with MD-N32

The maximum distance from the Ethernet port of the panel to the LAN/WAN connection is 100 m (330 ft).

When the TCP/IP connection is implemented over a 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 AxTraxNG Software Manual).

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

To connect an MD-N32 to more than one panel (up to 32 panels), Rosslare's MD-14U RS-485 to RS-232 converter must be used. Connect the MD-14U between the RS-485 access control panel network and the MD-N32 converter (Figure 22).

Figure 22: Connecting Multiple Access Control Panels with MD-N32
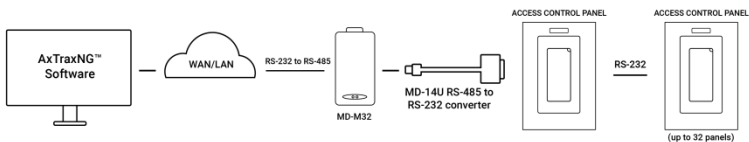
A.   Declaration of Conformity

FCC ID = GCD-AC215x xxxx

- This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

    - This device may not cause harmful interference.

    - This device must accept any interference received, including interference that may cause undesired operation.

- Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.

- Increase the separation between the equipment and receiver.

- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

- Consult the dealer or an experienced radio/TV technician for help.

B.   Radio Equipment Directive (RED)

Under our sole responsibility that the following labeled AC-425-Bx, AC-425-DIN, AC-4215IP-Bx, and AC-425IP-DIN are tested to conform to the EU Radio Equipment Directive – RED 2014/53/EU – in electrical and electronic equipment.

C.   RoHS Directive

Under our sole responsibility that the following labeled AC-425-Bx, AC-4215-DIN, AC-425IP-Bx, and AC-425IP-DIN are tested to conform to the Restriction of Hazardous Substances (RoHS) directive – 2011/65/EU – in electrical and electronic equipment

D.   Limited Warranty

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

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

Asia Pacific, Middle East, Africa

Rosslare Enterprises Ltd.

Kowloon Bay, Hong Kong

Tel: +852 2795-5630

Fax: +852 2795-1508

support.apac@rosslaresecurity.com

United States and Canada

Rosslare Security Products, Inc.

Southlake, TX, USA

Toll Free: +1-866-632-1101

Local: +1-817-305-0006

Fax: +1-817-305-0069

support.na@rosslaresecurity.com

Europe

Rosslare Israel Ltd.

22 Ha'Melacha St., P.O.B. 11407

Rosh HaAyin, Israel

Tel: +972 3 938-6838

Fax: +972 3 938-6830

support.eu@rosslaresecurity.com

Latin America

Rosslare Latin America

Buenos Aires, Argentina

Tel: +54-11-4001-3104

support.la@rosslaresecurity.com

China

Rosslare Electronics (Shenzhen) Ltd.

Shenzhen, China

Tel: +86 755 8610 6842

Fax: +86 755 8610 6101

support.cn@rosslaresecurity.com

India

Rosslare Electronics India Pvt Ltd.

Tel/Fax: +91 20 40147830

Mobile: +91 9975768824

sales.in@rosslaresecurity.com

ROSSLARE
SECURITY PRODUCTS