
KEYSCAN
ACCESS
CONTROL
SYSTEMS
FROM KEYSCAN INC.

Keyscan Inc.
901 Burns Street East
Whitby, Ontario
Canada
L1N 6A6
Phone: 1-888-539-7226 (Toll Free Canada/USA)
Phone: 905-430-7226
Fax: 905-430-7275
Web Site: www.keyscan.ca

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Foreword

Keyscan systems are designed for use in various environments and applications. As such, care must be exercised to ensure proper cable, power, ground, and environment specifications are followed for reliable and safe operation of the equipment.

Approved Standards

Keyscan CA 200, CA 4000 and CA 8000 access control units conform to the following approved standards:

- UL STD 294 – Access Control Systems Units
- CSA STD C22.2 No. 205-M1983 – Signal Equipment

Product Listings

The certification record can be viewed at http://directories.csa-international.org.

Enter 110441_0_000 in the File Number box.

About This Guide

This *Technical Guide* is designed to provide general information for installing Keyscan access control systems. This guide assumes the installer has knowledge of electrical, electronic, mechanical, and computer concepts, as well as having familiarity with access control systems and associated components. The guide is divided into 4 sections:

- Requirements
- Installation Guidelines
- Mounting and Connecting System Components
- Appendices

We have tried to organize the technical guide in a manner that allows for quick referencing based on installation tasks with pertinent diagrams.

Requirements

The following is a review of power, cable, and ground requirements for the access control system.

Power

Each access control unit requires two dedicated Class 2 transformers. The following transformers are acceptable:

- 16V 40VA transformer
- 16.5V 37VA transformer

Any deviation from a specified transformer or the use of a single transformer to power multiple access control units will cause faulty system operation. All warranties are voided if non CLASS 2 transformers or incorrect voltages are used.

Standby batteries with their duration times for access control and reader power are listed on page 18.

Important

The power supply included with each access control unit is for the exclusive use of the ACU circuit boards and the readers. It should not be used to power external devices such as door strikes or magnetic locks.

Electrical Precautions

Be sure that all circuit breakers powering the system are switched off before commencing installation or modifying wiring connections. Do not apply power before the installation is completed otherwise damage to the equipment may result. Connect earth grounds to all enclosures ensuring proper and safe operation of the system.

Tools

We recommend having the following tools on hand to complete the installation of the access control system:

- Digital Voltmeter
- Wire Cutters & Needle Nose Pliers
- Soldering Iron & Tape
- Set of Screwdrivers
- Drill & Drill Bits
- Laptop Computer (optional)

Cables

The following table outlines system cable requirements. Please be sure to review grounding guidelines for safe system operation. Avoid running access control system cables parallel with AC wires or across florescent light fixtures. This can cause AC induction or transmission interference.

Table 1 - Cable Requirements

Standard Device Wiring	Signal Protocol	Maximum Distance	Cable Type	Notes
Readers to ACU (includes HID iClass – Rev B)	Wiegand	500 ft 152.4 m	3 pairs shielded 22AWG	Overall shielded cable accepted. CAT5 cable not acceptable with Wiegand signal protocol.
Exception Readers to ACU – PX-620, HID-5375, MR-10, MR-20, HID-iClass (Rev A), and elevator readers	Wiegand	500 ft 152.4 m	3 pairs shielded 18AWG	Overall shielded cable accepted. CAT5 cable not acceptable with Wiegand signal protocol.
Door Strikes & Electro Magnets to ACU	n/a	500 ft 152.4 m	1 pair 18AWG	Shielded wire not required.
Contacts & Exit Devices	n/a	500 ft 152.4 m	1 pair 22AWG	Shielded wire not required.
Motion Sensors (PIR)	n/a	500 ft 152.4 m	2 pairs 22AWG	Shielded wire not required
CB-485	RS485	2000 ft 609 m	CAT5 – 2 twisted pairs	Maximum distance @ 9600 BPS between units Maximum baud rate is 56K BPS
CB-485M	RS485	2000 ft 609 m	CAT5 – 3 twisted pairs	Maximum distance @ 9600 BPS between units Maximum baud rate is 19.2K BPS
CPB-10 (9600 baud) Not recommended for use with Rev. 11 boards.	EIA/TIA-562	2000 ft 609 m	4 conductors shielded 22AWG	Overall shielded cable accepted. CAT5 cable not acceptable with EIA/TIA-562 signal protocol. Maximum distance between units. Overall maximum is 4000 ft (1219.2 m)
CPB-10 (19200 baud) Not recommended for use with Rev. 11 boards.	EIA/TIA-562	200 ft 61 m	4 conductors shielded 22AWG	Overall shielded cable accepted. CAT5 cable not acceptable with EIA/TIA-562 signal protocol. Maximum between units and overall distance.
ACU/PC/Modem/CB-485/ NETCOM/CPB-10	RS-232 (9600 BPS)	100 ft 30 m	5 conductors shielded 22AWG	Overall shielded cable accepted. CAT5 cable not acceptable with RS-232 signal protocol.
COMMEX Extender Kit (PC Extender)	n/a	4000 ft 1219.2 m	CAT 5 - 2 twisted pairs communication	Shielded wire not required. Kit includes 1 transmitter & 1 receiver.
WIEEX Extender Kit (Wiegand Protocol Extender)	n/a	4000 ft 1219.2 m	CAT 5 – 1 twisted pair communication. 1 pair 18AWG power to TX.	If powering transmitter locally, 18 AWG power wiring is not required. Kit includes 1 transmitter & 1 receiver.
CWIEEX Extender Kit (Coax Extender)	n/a	500 ft 152.4 m	RG59U	Coax cable required. Kit includes 1 transmitter & 1 receiver.

Grounding

Ground all access control units and shielded cables to a cold water pipe. For multiple access control units, all shielding should be connected to a single point earth ground.

It is important to ground the shields of the readers and communication cables to a single point cold water pipe at the access control panel. Failing to ground the shields or using incorrect cables may cause noise or interference and result in improper card reads.

Figure 1 - Grounding Access Control Units and Cables with CB-485s

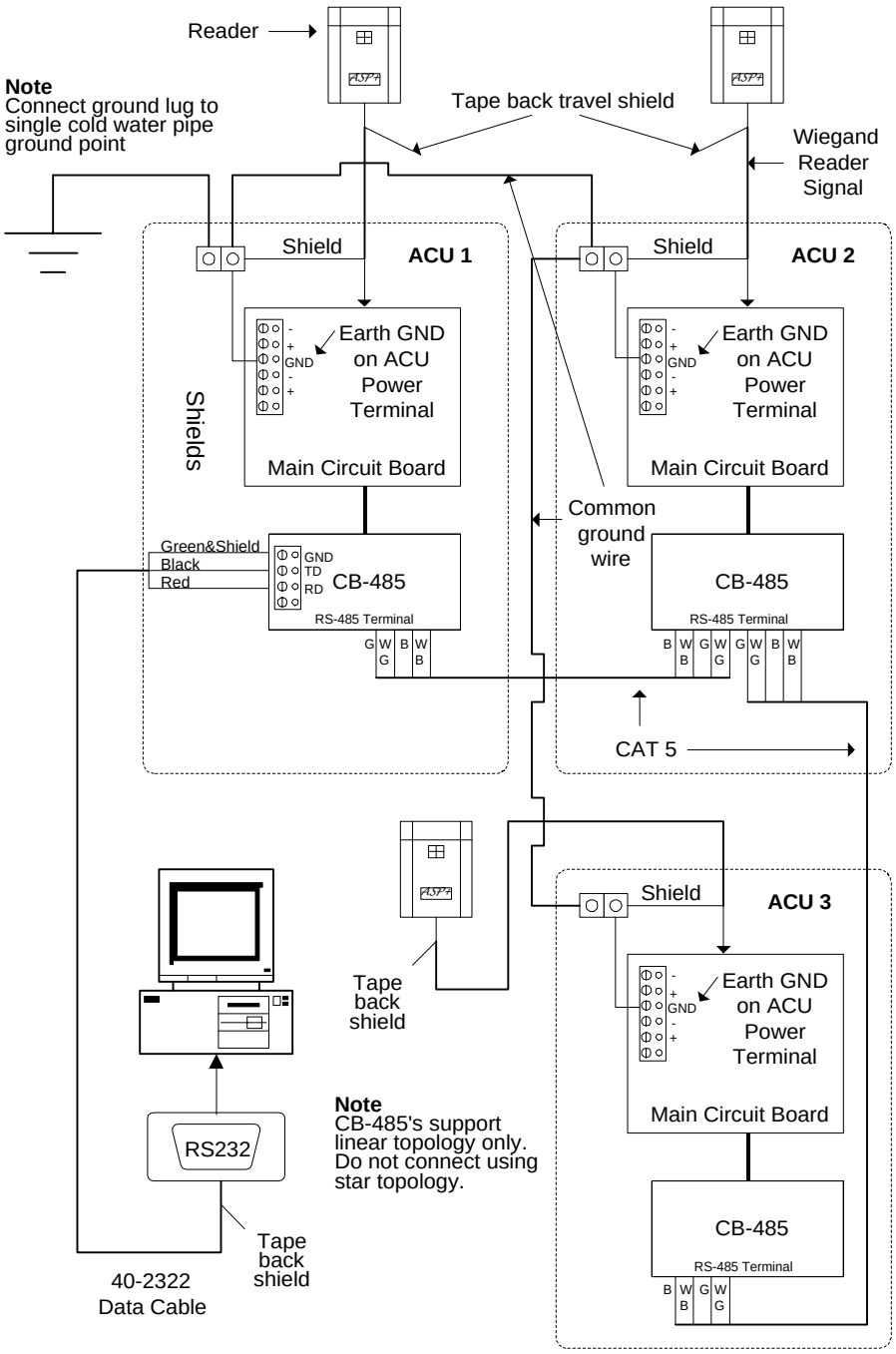
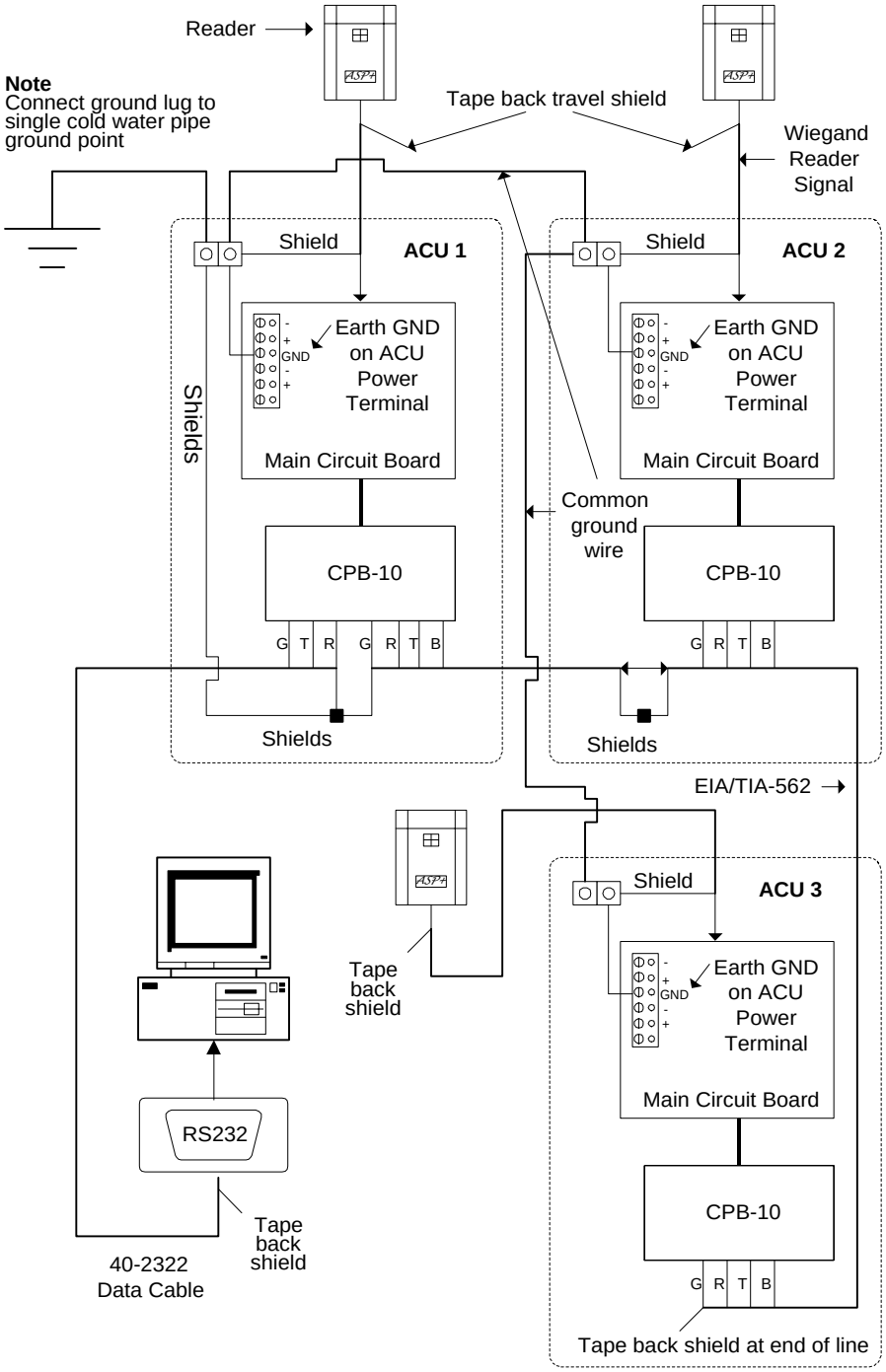


Figure 2 - Grounding Access Control Units and Cables with CPB-10s



General Installation Guidelines

Mounting Access Control Units and Components

Identify and mount all hardware including access control units and power supplies in a convenient and suitable location. Do not mount access control units close to high voltage equipment. Comply with all local and regional codes.

Each access control unit requires two dedicated Class 2 transformers. The following transformers are acceptable:

- 16V 40VA transformer
- 16.5V 37VA transformer

Record the serial number and the model number listed on the ACU's main circuit board. The serial number is a required entry in the Client software.

Mounting Readers and Door Hardware

Install all door hardware. Be sure to position readers on the door latch side and at a convenient height. Using a battery for power, ensure the door operates properly – alignment, holding, activation, de-activation – before connecting to the Keyscan access control unit. Where applicable, comply with all fire and safety codes for the installation of door strikes and magnetic locks.

If a door/reader is located beyond the maximum cable length to the ACU, use a Keyscan WIEEX Extender Kit to a maximum distance of 4000 feet (1219.2 m).

Cables

Run all cables between components. Label cables as they are installed. Do not connect cables at the ACU until all hardware has been tested and is operating correctly. Cable routes should avoid potential sources of electrical noise from fluorescent light fixtures, high voltage equipment, high voltage lines, and radio transmission equipment that may impede access control system communications.

Be sure to comply with proper cable types and do not exceed maximum distances.

Elevators

Elevator installations require licensed 3rd party technicians. Not all readers operate properly in elevators. Use suitable readers.

Terminate Wiring at the ACU

Terminate reader, lock, input, elevator floor, and elevator input wiring to the designated input terminals on the appropriate ACU circuit boards.

All Keyscan circuit board relays use Form C contacts rated at 5 Amps, 24VAC or 32VDC maximum.

Use a separate power supply for door locking devices. The DPS12 power supply included with ACU/ECU is intended for powering the circuit boards and readers.

Be sure to ground the shields of reader and communication cables to a single point cold water pipe ground at the ACU enclosure. See Grounding on page 12. Failing to ground the shields may result in incorrect card reads caused by noise or interference.

Jumpers

Keyscan factory defaults all circuit board jumper settings before they are shipped. As such no adjustments are required with the exception of momentarily shorting jumper J1 which is reviewed in the power up instructions. In the case of card reader retro-fits, however, you may have to adjust jumper settings so the circuit boards are in tune with system components.

Communication

Communication must be established between the personal computers (PCs) with the Keyscan software and the ACUs. Communication is divided into 2 segments:

- Single panel communication
- Multiple panel communication

Test the communication ports on the PC(s) before connecting to the access control system.

When the span between the PC and the ACU is greater than the maximum allowable cable distance, use a Keyscan COMMex extender kit.

Power Up and Test Voltages

Be sure that all necessary power supplies have been installed. The DPS12 power supply powers only the ACU main circuit board and the readers. A separate power supply must be used for door lock devices. Before applying power, verify all cable connections, ensure no short circuits exist when measuring voltages, and verify DC polarity is correct for all equipment.

Mounting ACUs/Circuit Boards/Power Supplies

The following sub-sections review mounting access control units, circuit boards, and power supplies:

UL STD 294 and CSA STD C22.2

To be in compliance with UL STD 294 and CSA STD C22.2 standards, please adhere to the following practices:

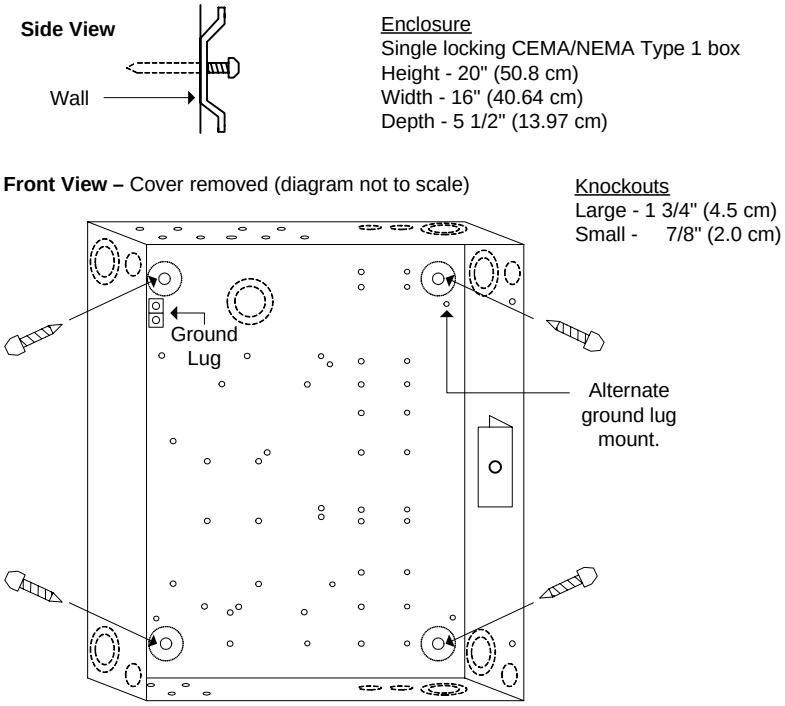
- use the Keyscan enclosure with the CSA label on the inside of the panel cover
- mount circuit boards with the standoffs supplied
- secure the enclosure cover with the 4 screws supplied
- connect tamper switch to an auxiliary input on the main circuit board
- use Keyscan power supply DPS-12 to power access control unit and readers
- Keyscan power supply DPS-12 requires 2 x 16V 40VA transformers or 2 x 16.5V 37VA transformers
- transformers must be located within 30 feet (9.144 m) of Keyscan power supply DPS-12
- do not use Keyscan power supply DPS-12 to power door strikes or auxiliary equipment
- use standby battery with sufficient amp hours (minimum is 12V 7.0 Ah) connected to the Keyscan power supply DPS-12
- connect proper ground wire from ground lug inside enclosure to a cold water pipe ground (earth ground)
- connect the ACU enclosure ground strap to the designated studs on the ACU cover and ACU enclosure (CSA 22.2)

Any deviations or alterations will result in non-compliance of these standards.

Mounting the Access Control Unit

The ACU has 4 pre-drilled holes for mounting the enclosure to the wall. Connect the unit's ground lug to a true earth ground. Ensure the unit is not close to high voltage equipment and the cables will not exceed maximum distances when locating mounting areas. Door ACU models – CA 200, CA 4000, and CA 8000 – can be mixed and matched in one communication loop.

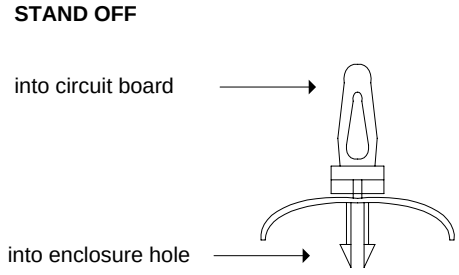
Figure 3 - Mounting the Access Control Enclosure



Stand Offs

Use the stand offs when mounting power supplies and circuit boards to the ACUs. Stand offs are pre-mounted on most power supplies and circuit boards. In cases where stand offs are not pre-mounted, insert the double pronged end of the stand off in the enclosure hole first. Then mount the circuit board to the stand offs.

Figure 4 - Stand Off



Mounting Power Supplies

A 13.5VDC dual linear regulated power supply rated at 2 x 1.2 amps maximum is provided to power the access control unit circuit boards and the readers. This power supply requires one of the following CLASS 2 CSA/UL approved transformers and a standby battery with sufficient amp hours.

- 2 x 16V 40VA
- 2 x 16.5V 37VA

The purpose of two transformers is to comply with UL STD 294 and CSA STD C22.2 and charge the battery circuit. The transformers must be located within 30 feet of the Keyscan power supply. All warranties are voided if non CLASS 2 transformers or incorrect voltages are used. The system may operate erratically if the voltage is lower than 12VDC.

Power supplies are mounted inside at the top left or bottom left of the ACU enclosure as shown on page 19. For power supply connections refer to Figure 78 on page 99.

The DC Common must be connected to a cold water pipe ground (earth ground).

Important

Do not use this supply to power door strikes or auxiliary equipment.

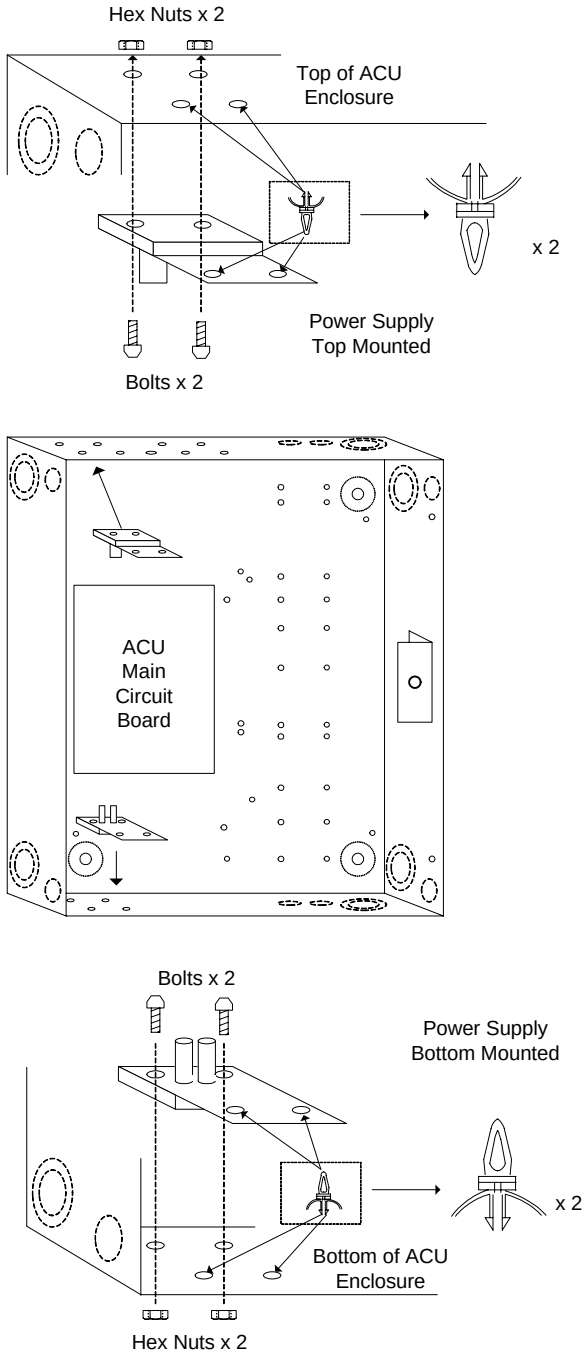
Select a battery with enough amp hours to operate the system for the total hours specified. The following table lists power duration times:

Table 2 - Battery Duration Times

Amp-hour Battery	Amps	Power Duration
8.0	1.4	5.71 hours
7.5 *	1.4	5.36 hours
7.0 *	1.4	5.00 hours

* Indicates the two most commonly used backup batteries.

Figure 5 - Mounting Power Supplies



Mounting Circuit Boards

The following diagrams illustrate the mounting positions for access control models CA 200, CA 4000, CA 8000, EC 1000 and EC 2000 units. Illustrations also show mounting positions for communication boards and output control boards (OCB-8), where applicable.

Important

Do not mount access control units close to high voltage equipment.

Figure 6 - CA 200 with Circuit Board Mounting Positions

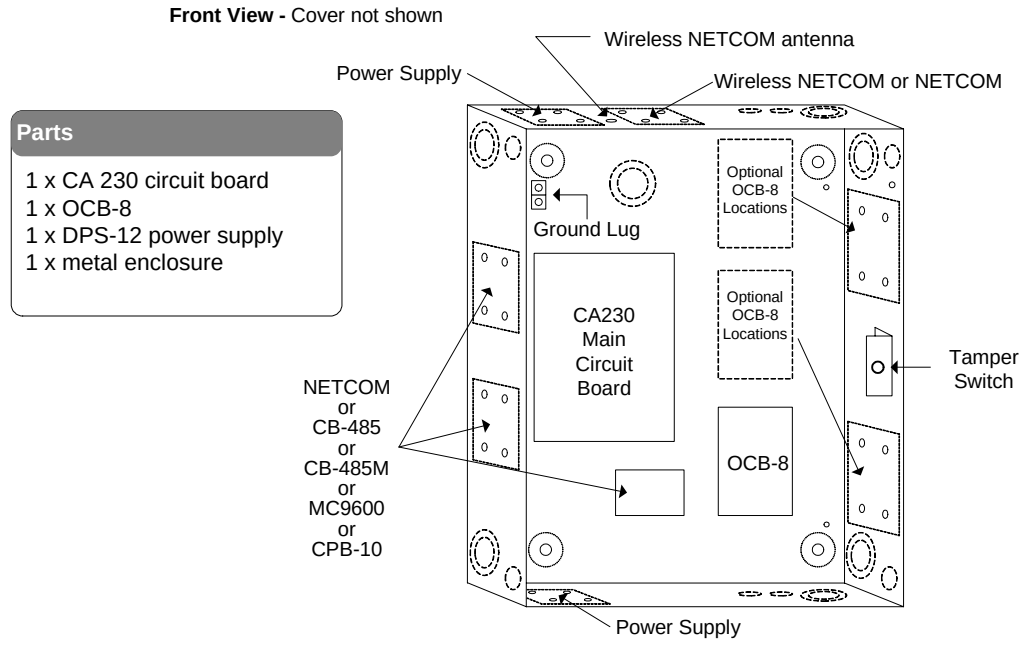


Figure 7 - CA 4000 with Circuit Board Mounting Positions

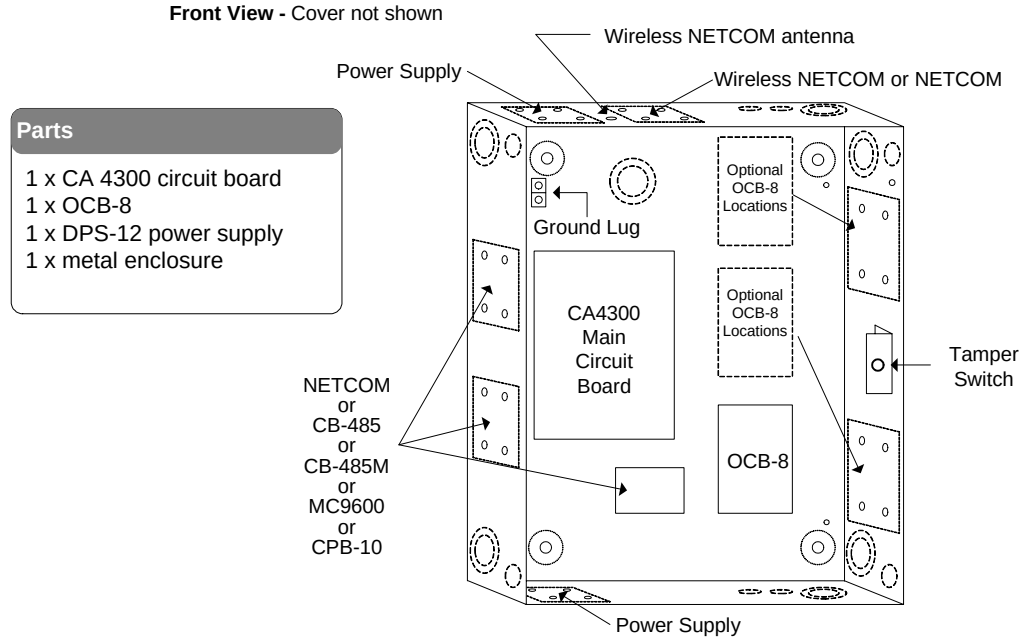


Figure 8 - CA 8000 with Circuit Board Mounting Positions

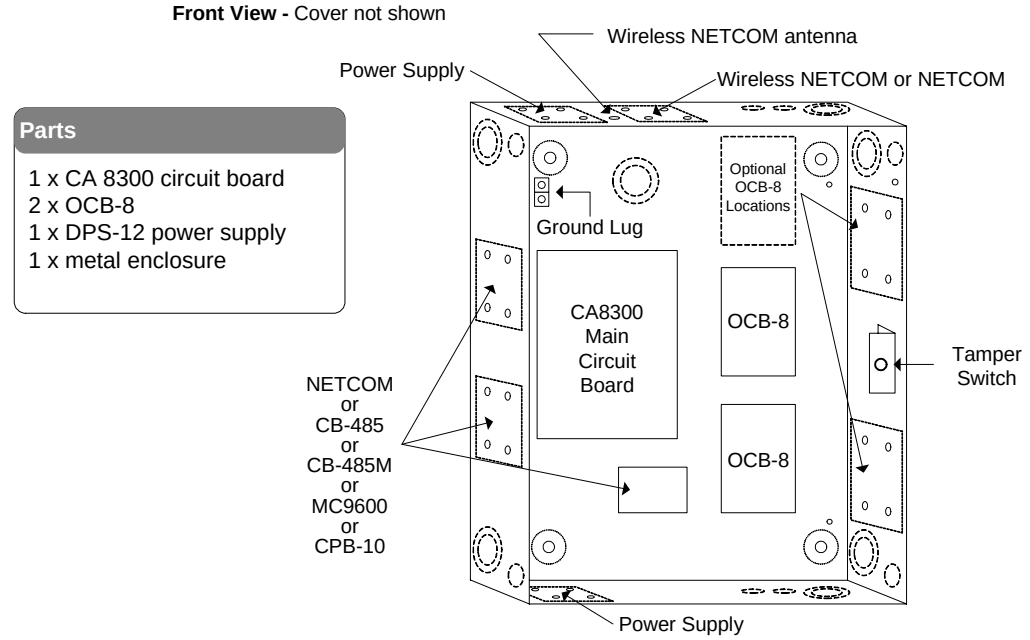


Figure 9 - EC 1000 with Circuit Board Mounting Positions

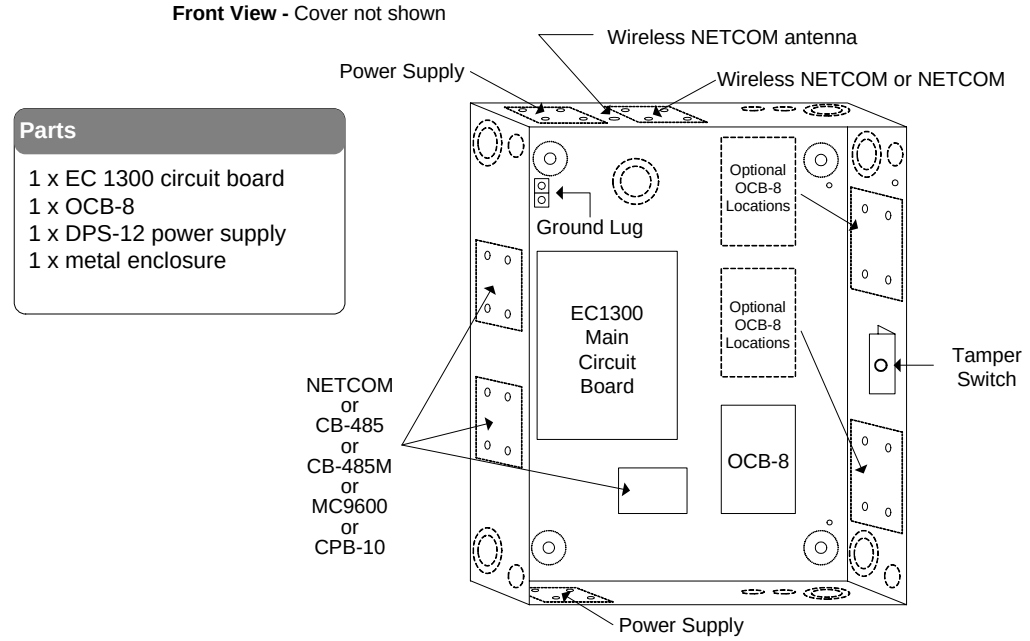
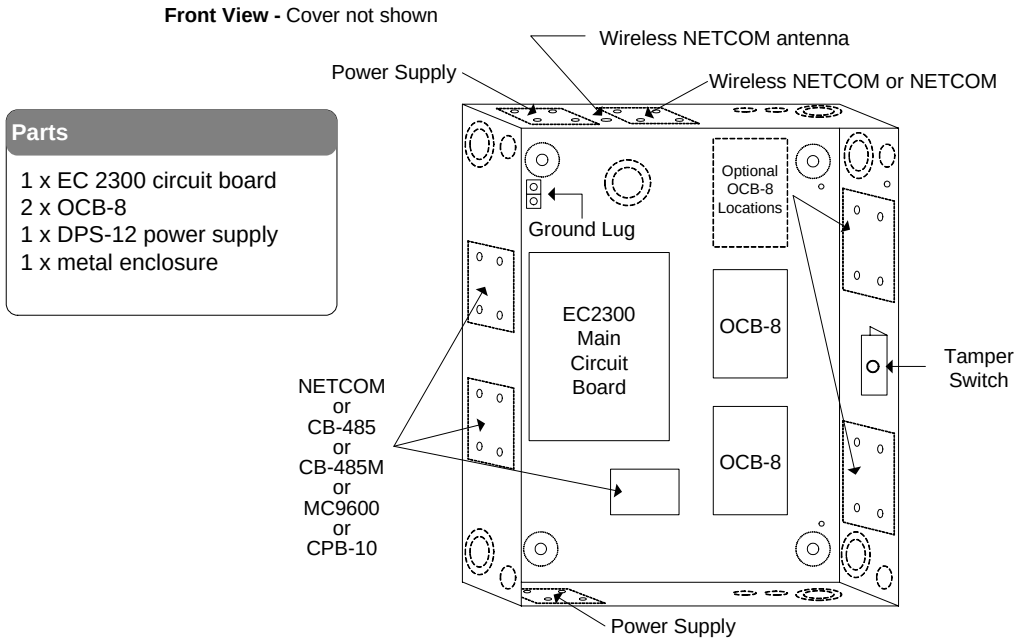


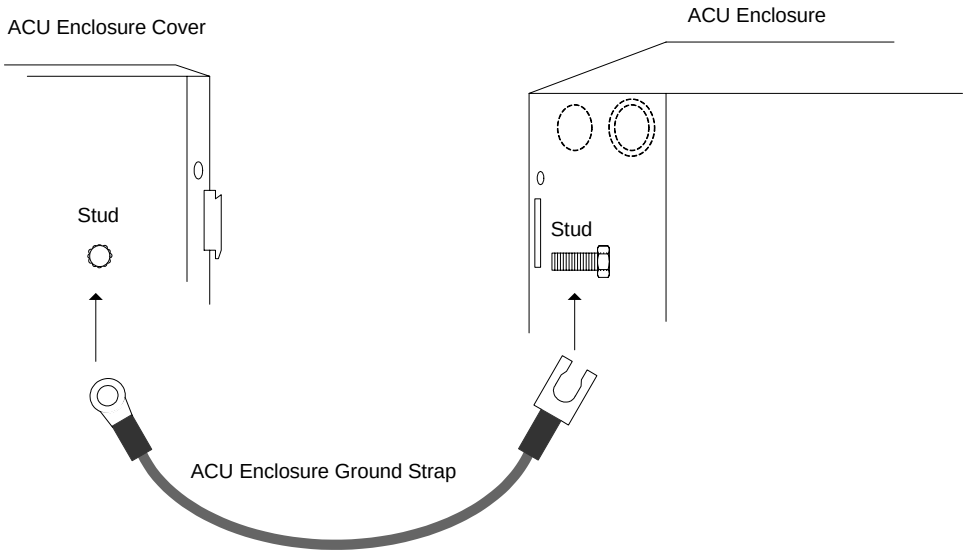
Figure 10 - EC 2000 with Circuit Board Mounting Positions



ACU Enclosure Ground Strap

Ensure that the ACU Enclosure Ground Strap is connected to the designated studs on both the ACU cover and ACU enclosure. Be sure the cable lug is positioned between two star washers and securely tightened with a nut as illustrated in the diagram below.

Figure 11 - ACU Enclosure Ground Strap Connection



Use enclosed star washers and nuts to secure both ends of cable to studs as shown below.

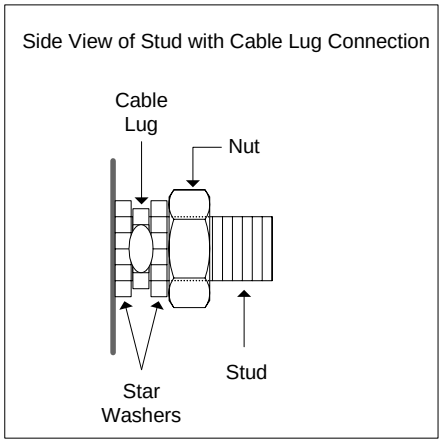
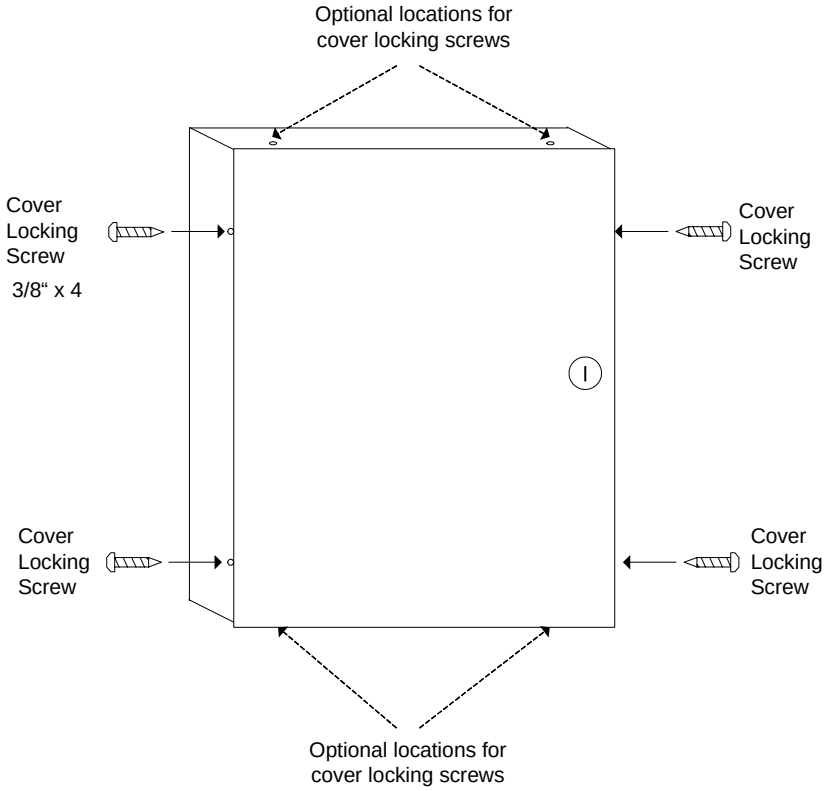


Figure 12 - Securing the Enclosure Cover

Front View of Enclosure with Cover



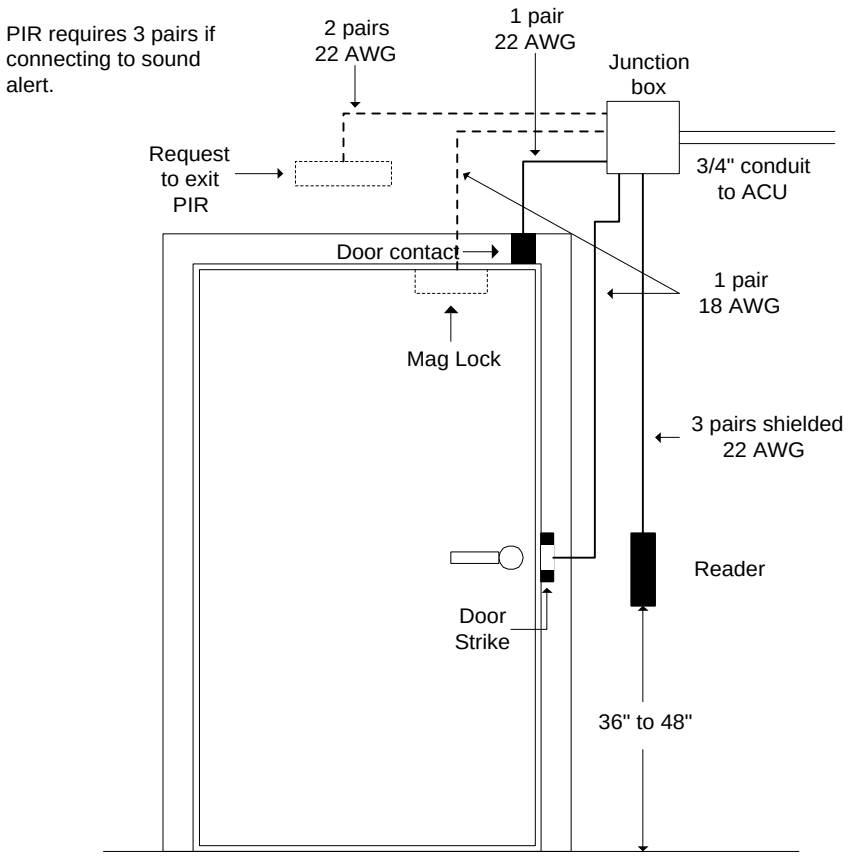
Mounting Readers & Door Hardware

The following sub-sections review door components and related diagrams. Refer to the lock manufacturer's documentation for more detailed information on mounting door hardware. Some jurisdictions require a qualified locksmith for installation of lock hardware. Consult with local authorities.

- door lock hardware – page 26
- door contacts, exit buttons, auxiliary inputs – page 27
- readers – page 28

The following diagram shows a single conduit to the access control unit. For high voltage readers greater than 150mA, avoid running the communication cables in the same conduit with the door lock cables.

Figure 13 – Typical Door Layout



Door Lock Hardware

Consult with the manufacturer's documentation for mounting door lock hardware. For instructions on terminating the lock hardware connections at the access control unit, refer to Terminate Lock Wiring on page 29.

The lock must be appropriate for the barrier and meet all applicable fire and safety codes. If necessary, consult with local officials such as the fire department to ensure the installation conforms to municipal, state, or provincial safety regulations. Permits may be required before installing magnetic locks.

Use a battery for temporary power to ensure the door operates properly – alignment, holding, activation, de-activation – before connecting to the Keyscan access control unit.

Figure 14 - Typical Door Strike Connection

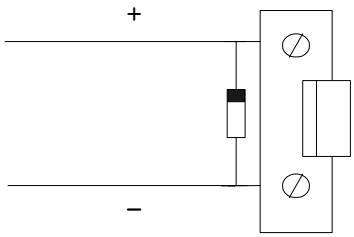
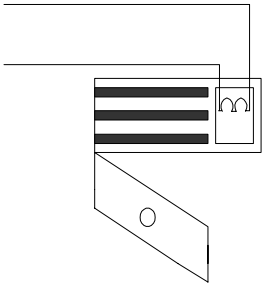


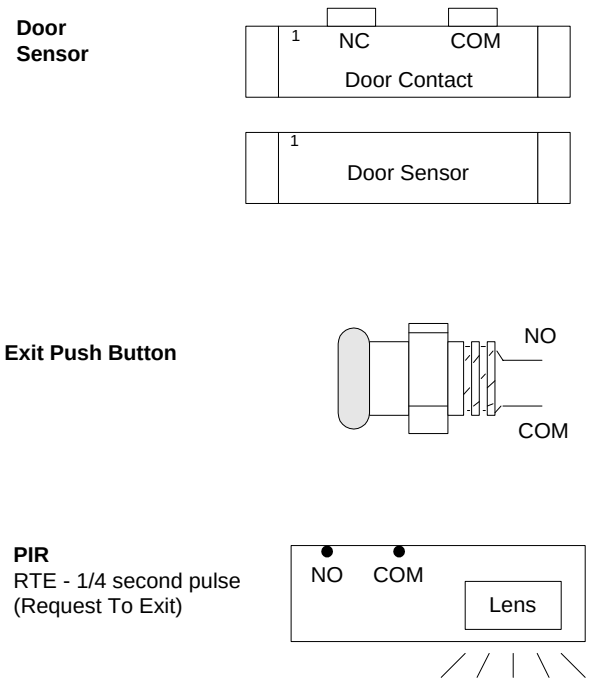
Figure 15 - Typical Door Maglock Connection



Door Contacts, Exit Buttons, Auxiliary Inputs

The following diagram illustrates the door contacts, exit buttons, PIRs, and auxiliary inputs. See the manufacturer's documentation for mounting instructions. Avoid running cables parallel with AC wiring or across florescent light fixtures. This causes AC induction and transmission interference.

Figure 16 - Door Contacts, Exit Buttons, PIRs, & Auxiliary Inputs



NO = Normally Open
NC = Normally Closed

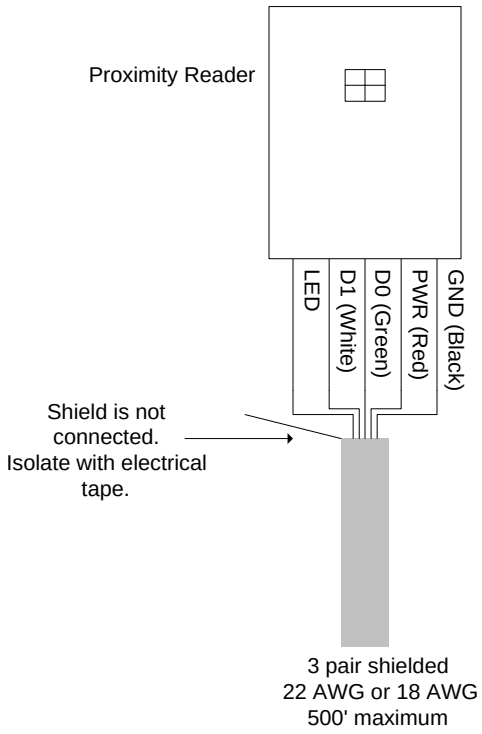
Readers

Never mount readers close to high voltage equipment. For convenient entry, readers should be mounted on the latch side of doors. When mounting proximity readers for monitoring in and out activity at the same door, space the readers at a distance greater than the combined radio signal read ranges.

As an example, if the read range is 4 inches, mount the two readers at a distance greater than 8 inches from each other.

For mounting readers to a metal surface, consult with the manufacturer's documentation.

Figure 17 - Door Reader Connection



Terminate Wiring at the ACU

The following sub-sections review terminating system wiring at the access control units:

Terminate Lock Wiring

A separate power supply must be used for door strikes and other 12VDC equipment. The power supply should have battery backup for continued operation during a power failure. When adding equipment to an existing system, be sure the power supply can withstand the increased current consumption.

To calculate total current requirements for power supplies, use the following formula which includes a 30% tolerance factor:

- Total Current = (Device A amps + Device B amps + Device C amps, etc.) x 1.30

Example

An installation calls for 1 magnetic lock and 3 door strikes requiring 12VDC:

Mag Lock 100mA + Door Strike A 200mA + Door Strike B 200mA + Door Strike C 200mA x 1.30 = 910mA

In this example, a separate 1-amp power supply is sufficient.

Important

The total current of the devices must not be greater than the current of the power supply.

Relay Status Jumpers

Relay boards have jumpers that may be set to “Normal” or “Reversed”. Each relay has an LED that indicates the relay status:

- Normal – LED on circuit board is not illuminated when door is locked
- Reversed – LED on the circuit board is illuminated when door is locked

Diodes are supplied with Keyscan access control panel(s). Diodes must be installed across all D.C. door strikes as shown in Figure 21 on page 33. The anode of the diode is connected to the positive side of the strike at the door. The cathode of the diode is connected to the common return wire.

Diodes must be installed for proper operation.

Fail Safe/Fail Secure Lock Devices

The power supply's positive output must be connected to the common door relay outputs, which are labeled on the relay board.

For 'fail-safe' and 'fail-secure' door strikes, observe the following relay connections:

- 'Fail-Safe' – Connect the positive terminal on the door strike to the 'Normally Closed' position on the board relay. Connect the return wire to the Common on the DC power supply via the ground lug on the ACU enclosure.
- 'Fail-Secure' – Connect the positive terminal on the door strike to the 'Normally Open' position on the board relay. Connect the return wire to the Common on the DC power supply via the ground lug on the ACU enclosure.

Figure 18 - Lock State - Fail Safe Device

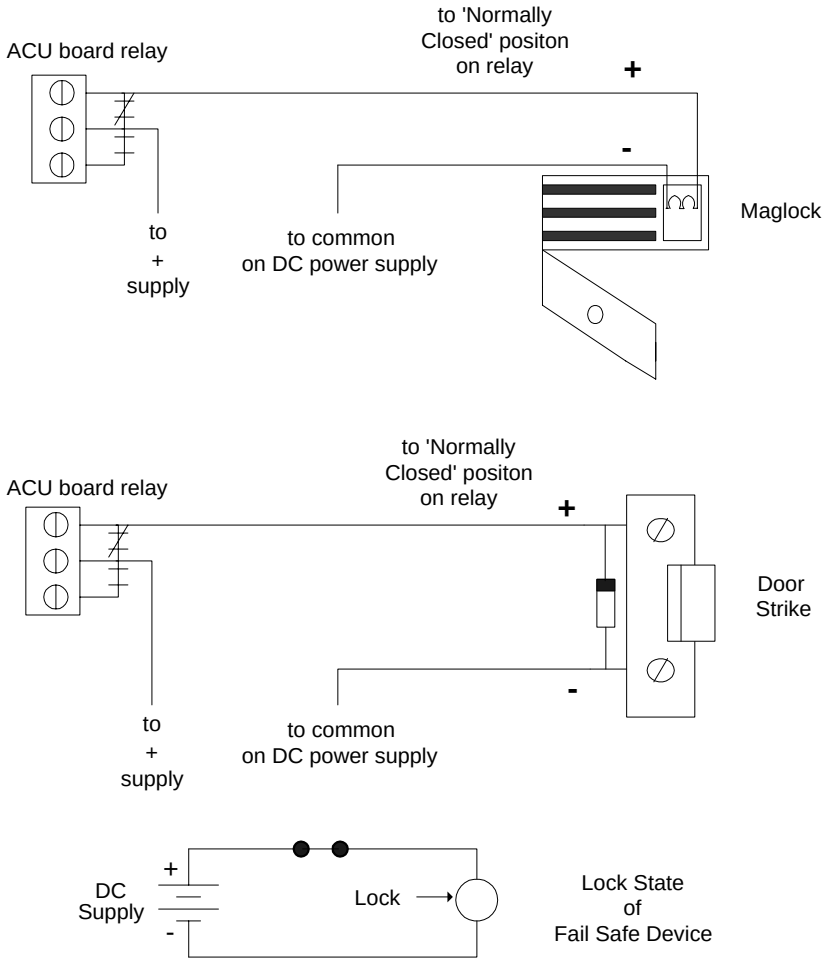
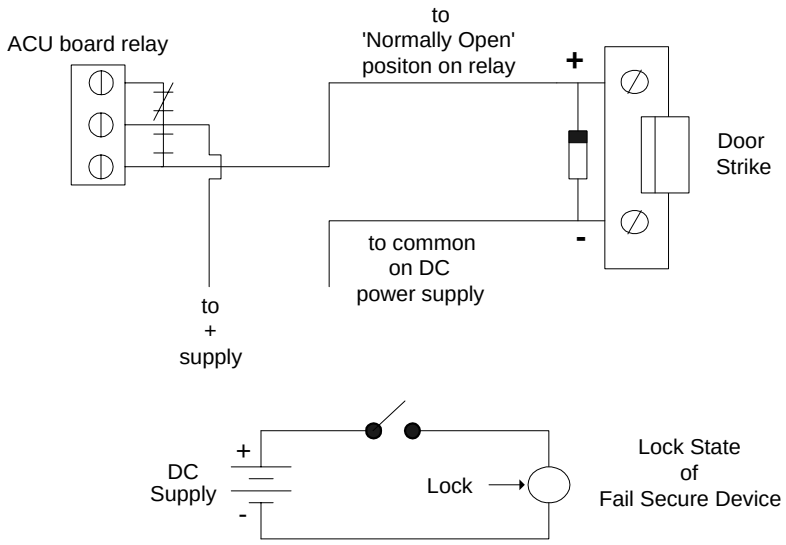


Figure 19 - Lock State - Fail Secure Device



Warning

Before securing any exit, please ensure all wiring to electrical door hardware conforms to federal, state, provincial, or municipal fire and building codes.

Figure 20 - Terminate Lock Wiring CA 230

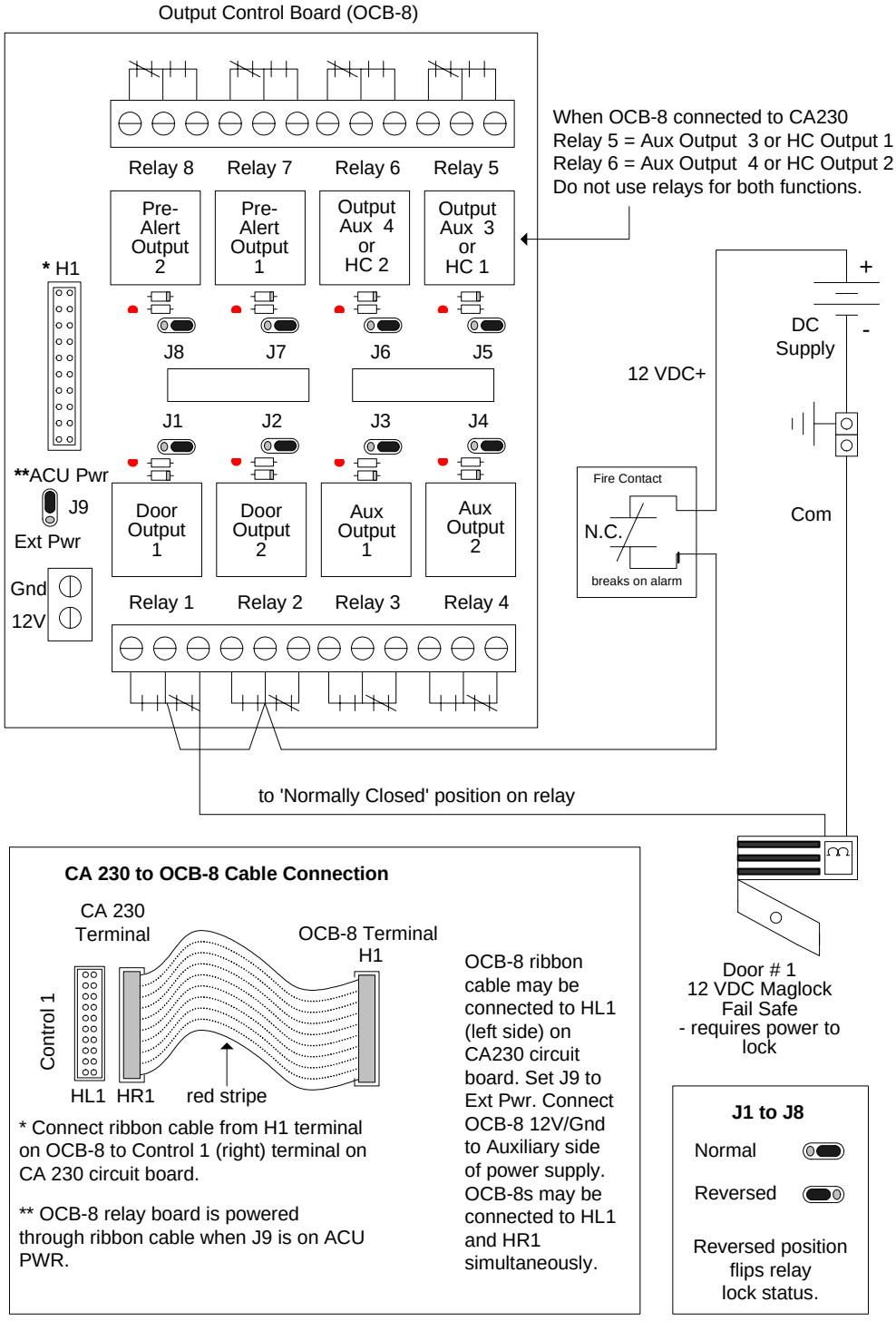
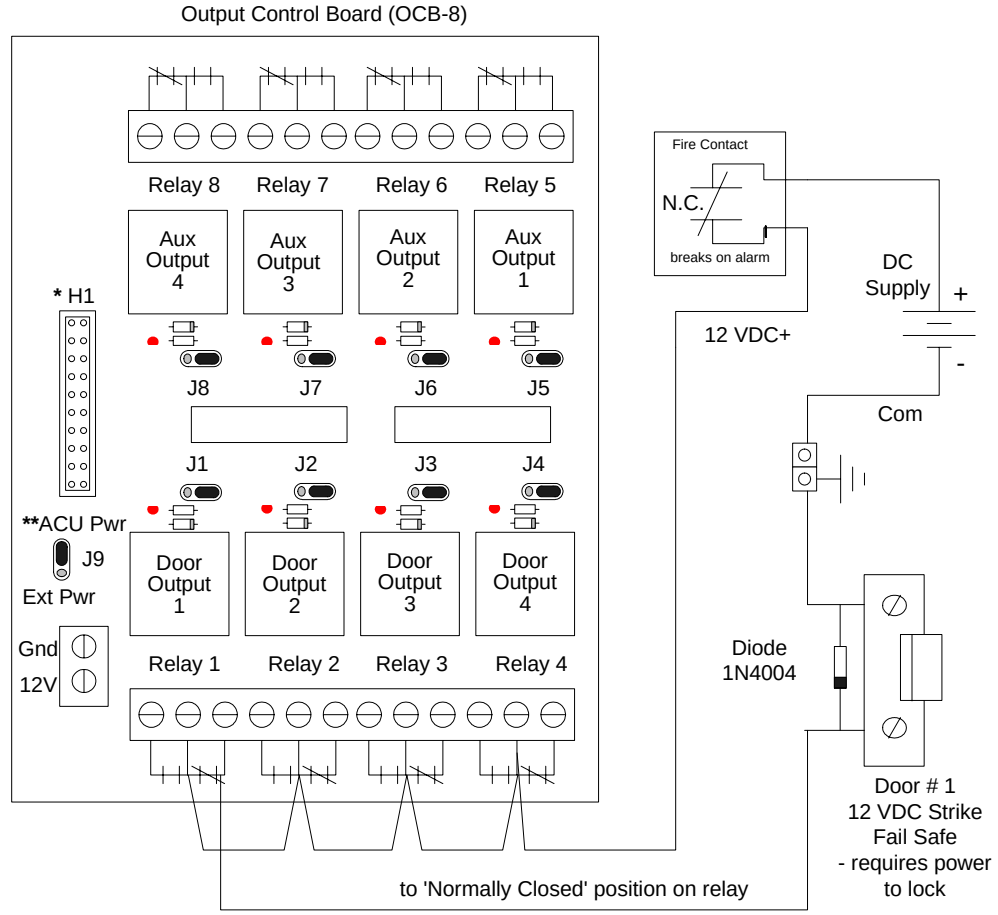
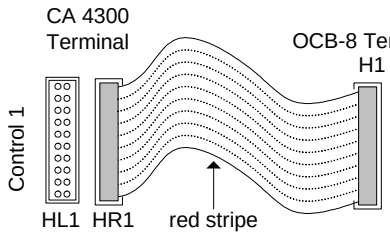


Figure 21 - Terminate Lock Wiring CA 4300



CA 4300 to OCB-8 Cable Connection



* Connect ribbon cable from H1 terminal on OCB-8 to Control 1 (right) terminal on CA 4300 circuit board.

** OCB-8 relay board is powered through ribbon cable when J9 is on ACU PWR.

OCB-8 ribbon cable may be connected to HL1 (left side) on CA 4300 circuit board. Set J9 to Ext Pwr. Connect OCB-8 12V/Gnd to Auxiliary side of power supply. OCB-8s may be connected to HL1 and HR1 simultaneously.

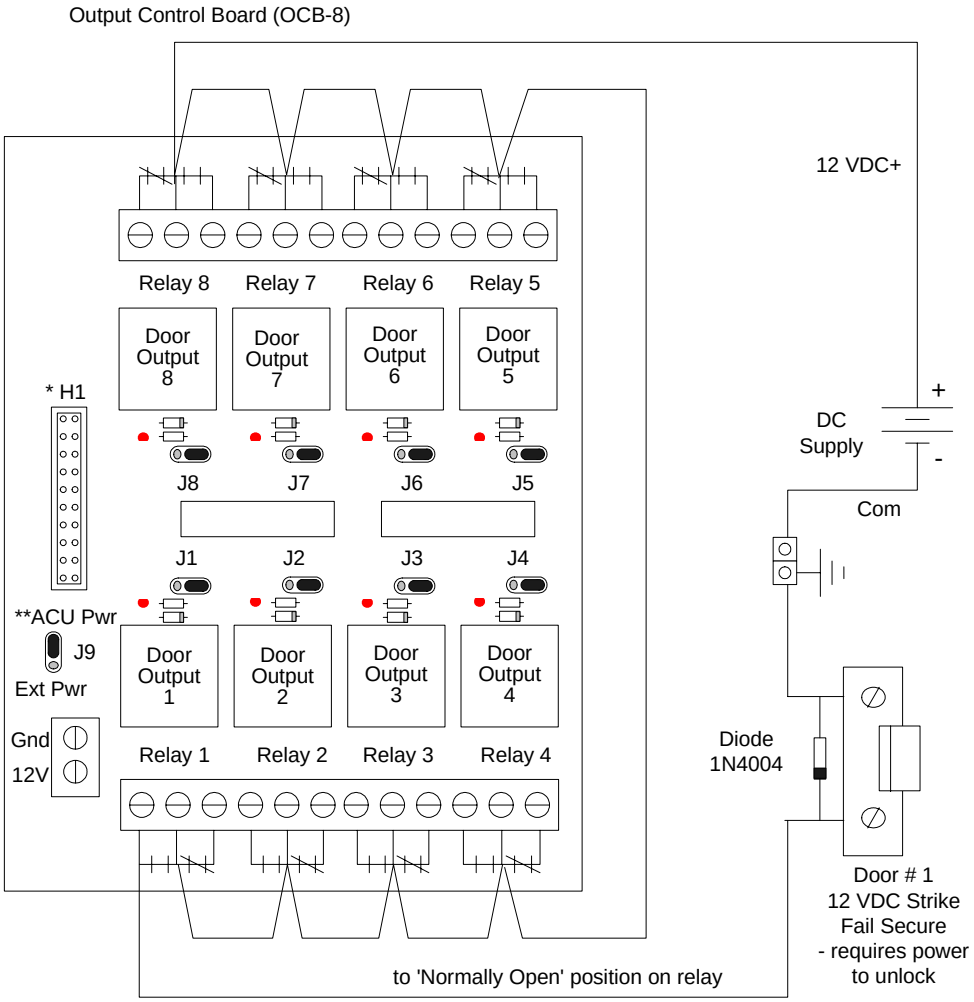
J1 to J8

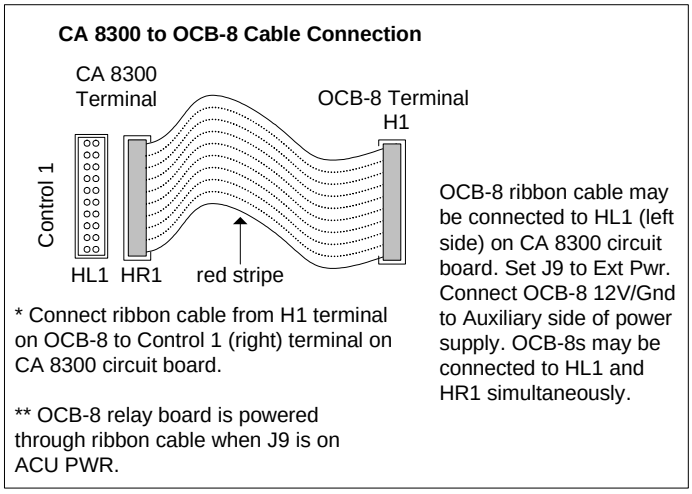
Normal

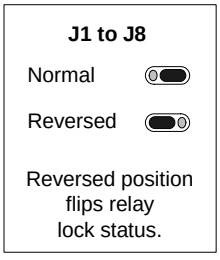
Reversed

Reversed position flips relay lock status.

Figure 22 - Terminate Lock Wiring CA 8300







Terminate Input Wiring

The following sub-topics review termination of door, exit, and auxiliary alarm input wiring.

Door Monitoring Connections

A normally-closed door contact is for monitoring door security. Door inputs are shunted during the door relay unlock time.

Exit Device Connections

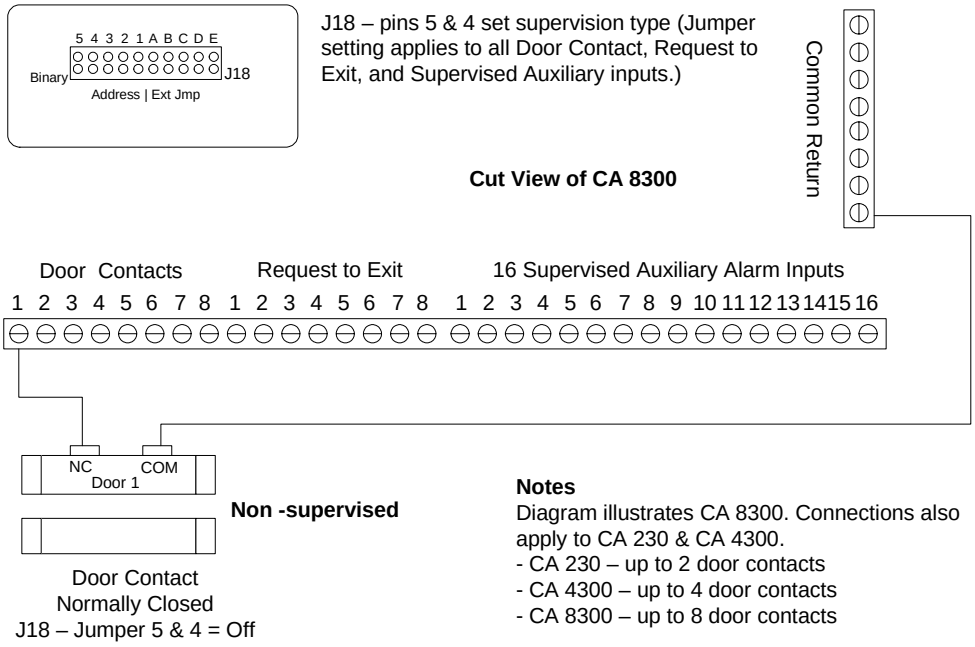
A normally-open exit device contact unlocks its assigned door for its defined door relay unlock time and overrides the alarm input during its defined door held open time. Examples of exit devices are exit push buttons or motion sensors (PIR) etc.

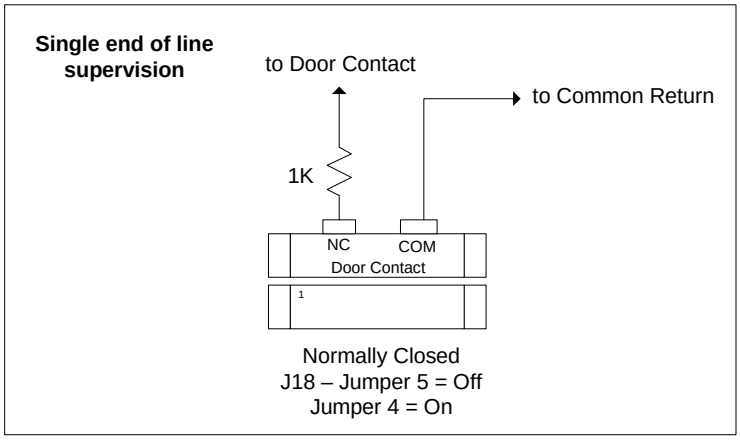
Keyscan recommends a PIR with a pulse output of ¼ second and suited to its environment.

Security Monitoring Connections

A normally-closed device may be connected to an auxiliary alarm input for monitoring stairwell or interior doors, or windows. The auxiliary alarm inputs may be connected to infrared sensors or to an existing alarm system with a normally-closed auxiliary output relay contact.

Figure 23 - Terminate Input Wiring – Door Contacts CA 230 / CA 4300 / CA 8300





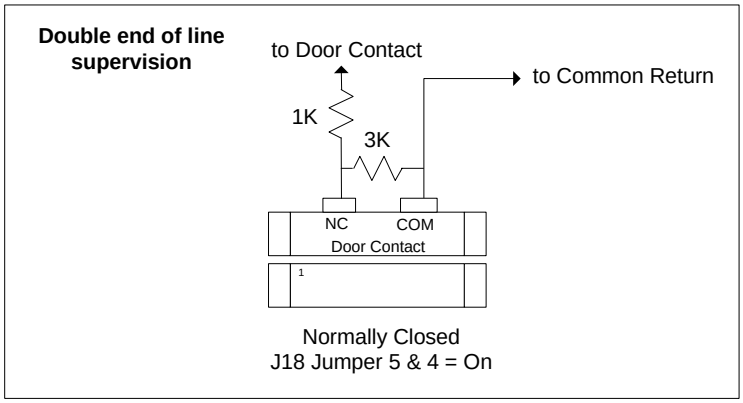
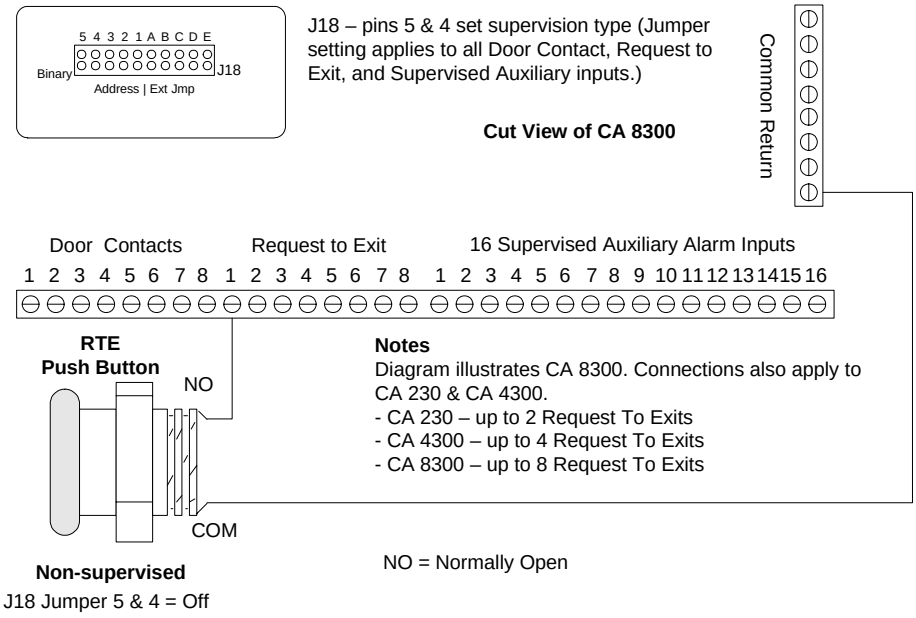
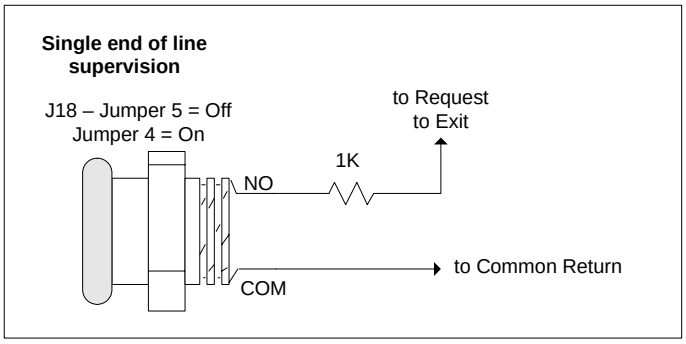


Figure 24 - Terminate Input Wiring – RTE Push Button CA 230 / CA 4300 / CA 8300





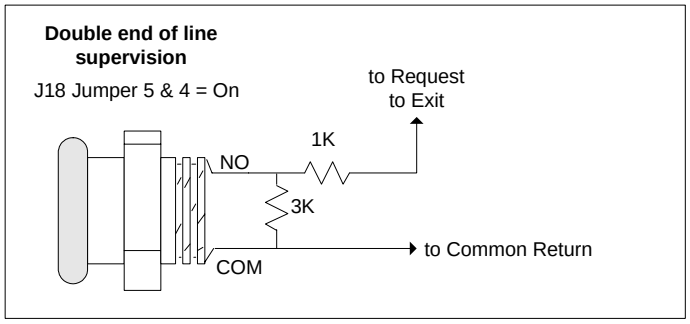


Figure 25 - Terminate Input Wiring – RTE PIR Motion Sensor CA 230 / CA 4300 / CA 8300

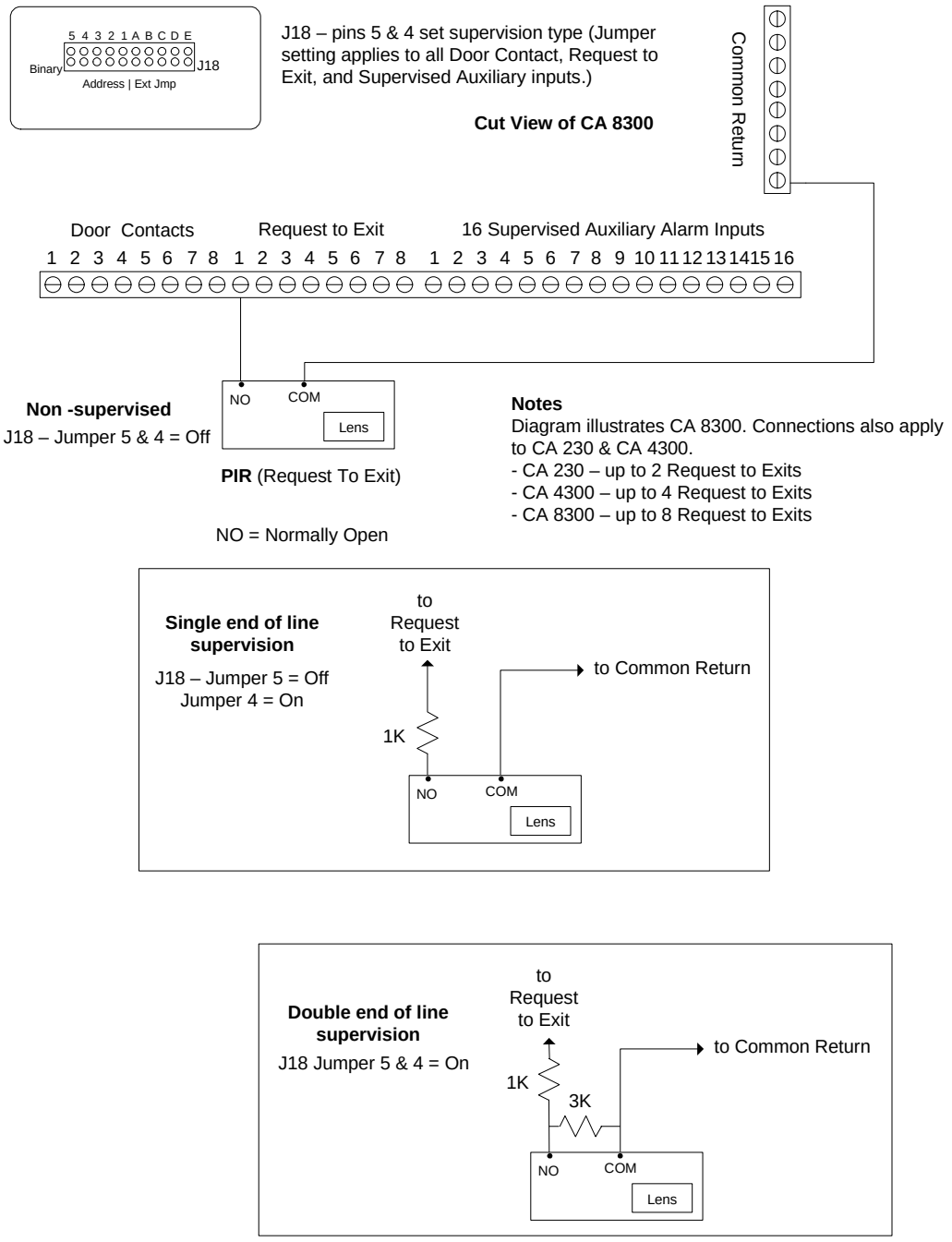
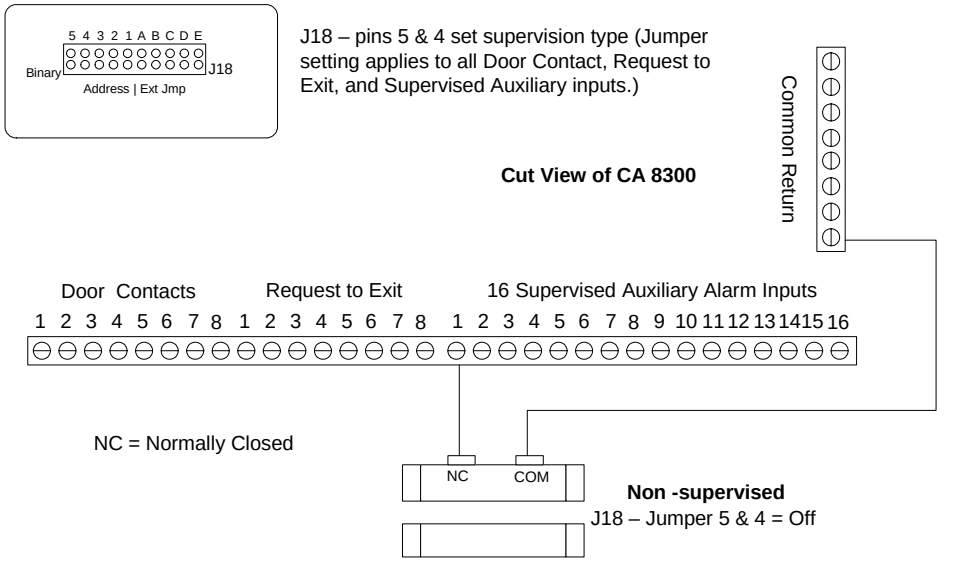
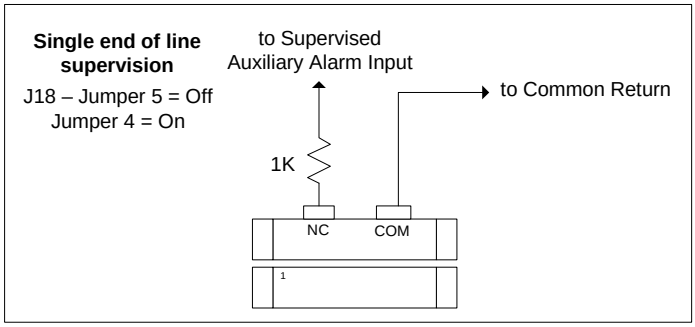
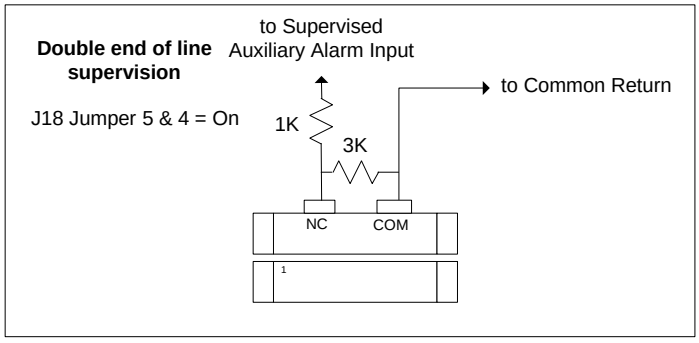


Figure 26 - Terminate Input Wiring – Auxiliary/Supervised Inputs CA 230 / CA 4300 / CA 8300



Notes
Diagram illustrates CA 8300.
Connections also apply to CA 230 & CA 4300.
- CA 230 – up to 8 Supervised Auxiliary Alarm Inputs
- CA 4300 – up to 16 Supervised Auxiliary Alarm Inputs
- CA 8300 – up to 16 Supervised Auxiliary Inputs





Terminate Elevator Floor Wiring

If the elevator control unit (ECU) regulates more than 8 floors, multiple output control boards (OCB-8) are required. See the following table for ribbon cable elevator/floor assignments from the OCB-8 terminal to the ECU terminal.

OCB-8 Jumper Settings

- J1 to J8 set to Reversed position
- J9 set to EXT PWR

Note

Verify all floor hardware conforms to federal, state, provincial or municipal fire codes.

Table 3 – OCB-8 to EC 1300 Ribbon Cable Connections

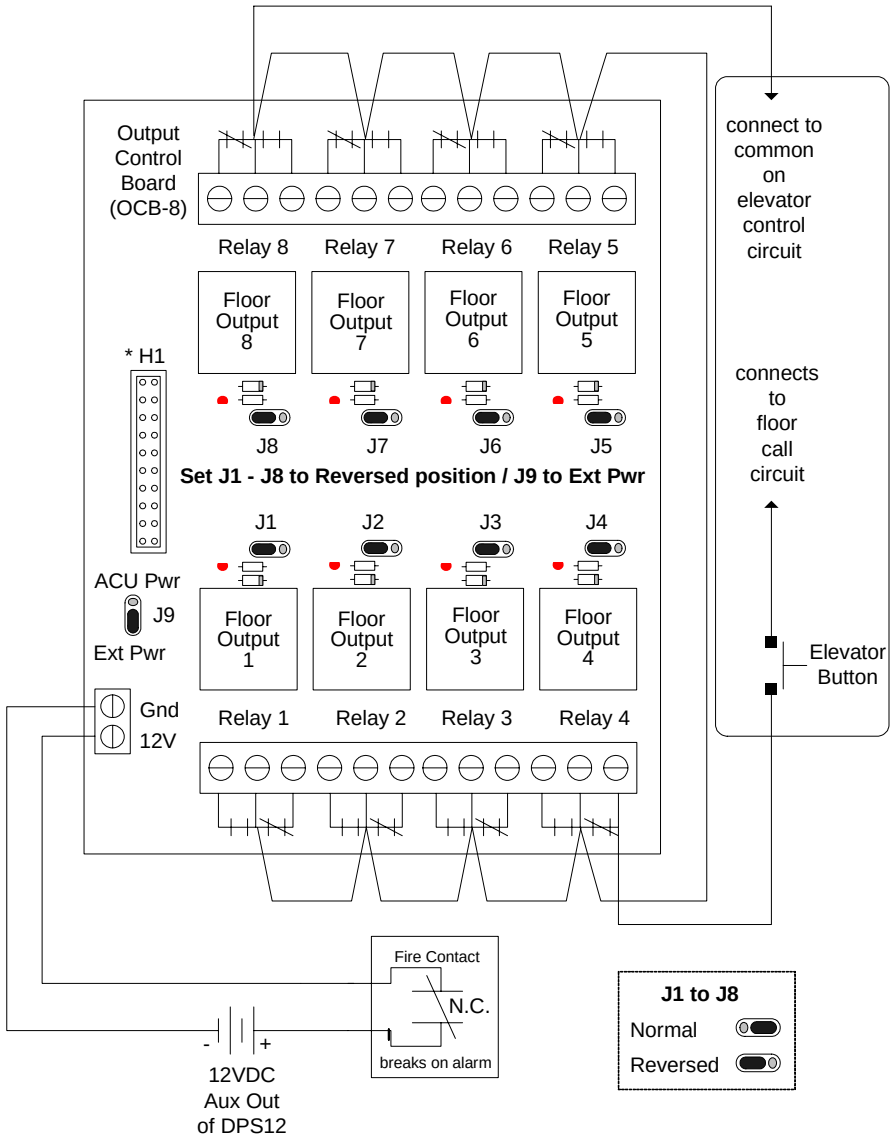
OCB Terminal	ECU Terminal	Elevator	Floors
1st OCB-8 – H1	Control 1	1	1 – 8
*2nd OCB-8 – H1	Control 2	1	9 – 16
*3rd OCB-8 – H1	Control 3	1	17 – 24
*4th OCB-8 – H1	Control 4	1	25 – 32
*5th OCB-8 – H1	Control 5	1	33 – 40

Table 4 – OCB-8 to EC 2300 Ribbon Cable Connections

OCB Terminal	ECU Terminal	Elevator	Reader	Floors
1st OCB-8 – H1	Control 1	1	1	1 – 8
*2nd OCB-8 – H1	Control 2	1	1	9 – 16
3rd OCB-8 – H1	Control 3	2	2	1 – 8
*4th OCB-8 – H1	Control 4	2	2	9 – 16

* Optional OCB-8's must be purchased separately.

Figure 27 - Terminate Floor Wiring EC 1300



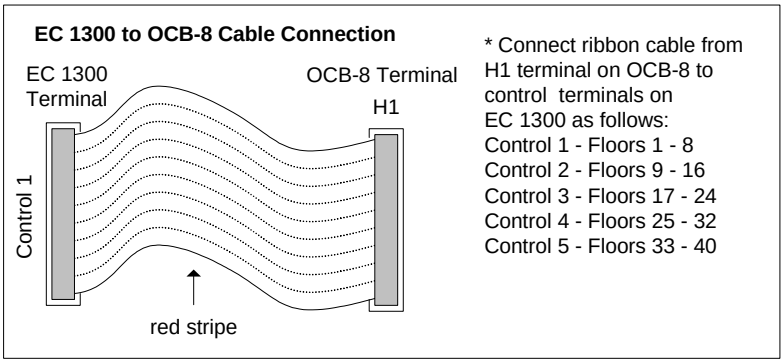
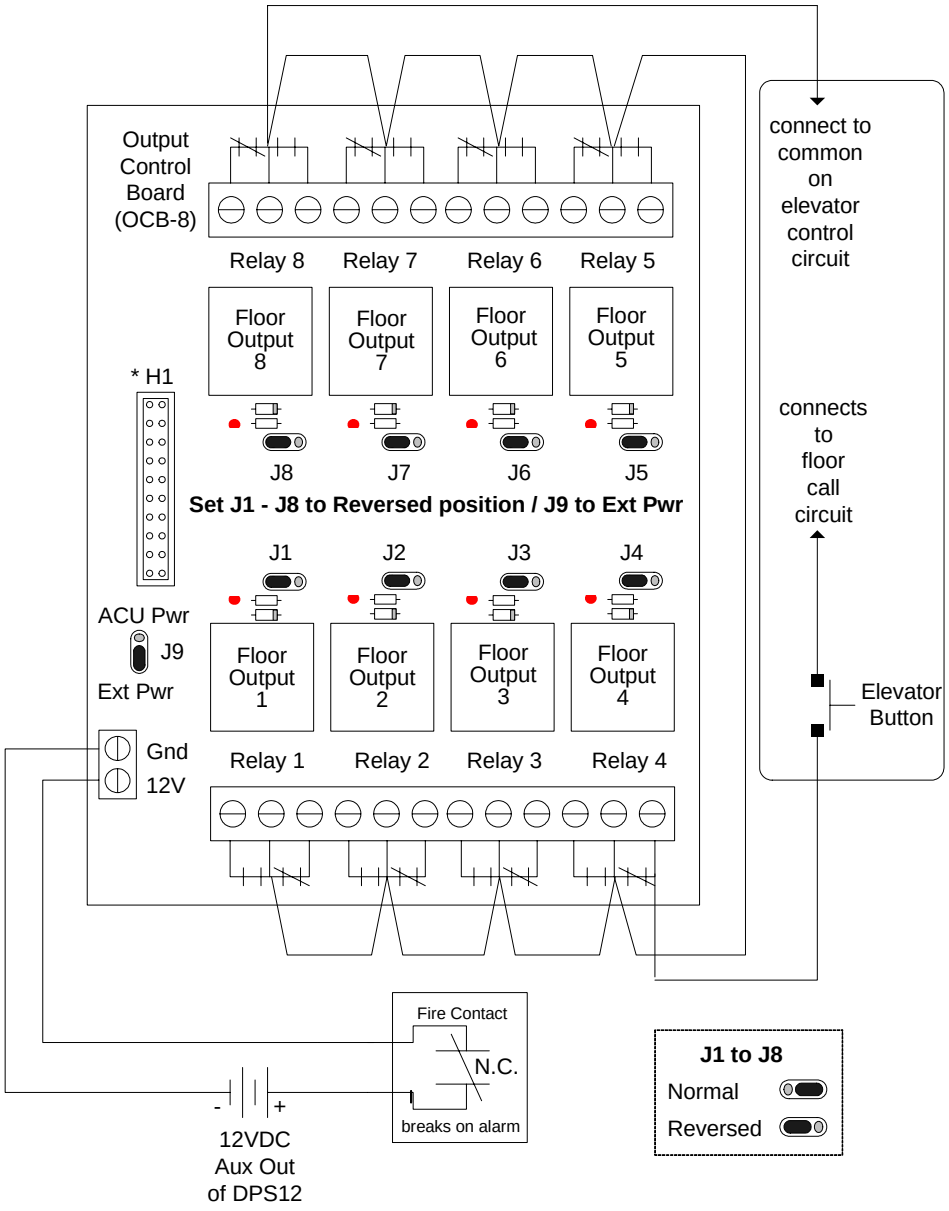
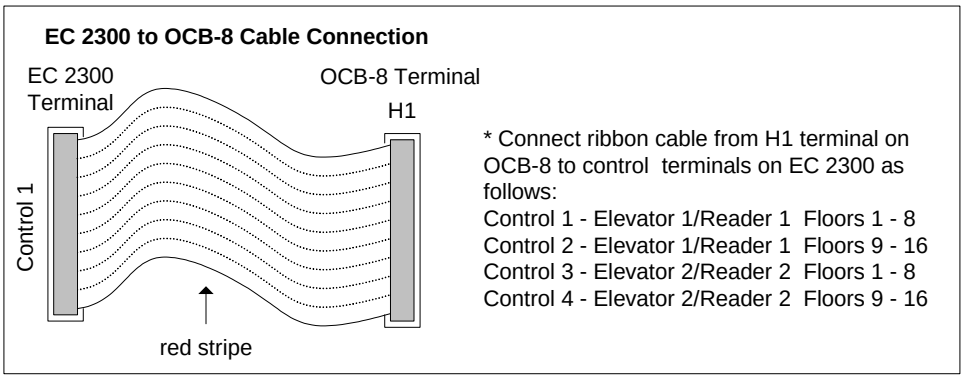


Figure 28 - Terminate Floor Wiring EC 2300





Terminate Floor Input Wiring

The EC 1000 with 5 output control boards can regulate up to 40 floors; however, the maximum number of floors monitored is 32.

The EC 1000 and EC 2000 do not have floor status with supervision.

Figure 29 - Terminate Floor Input Wiring EC 1300

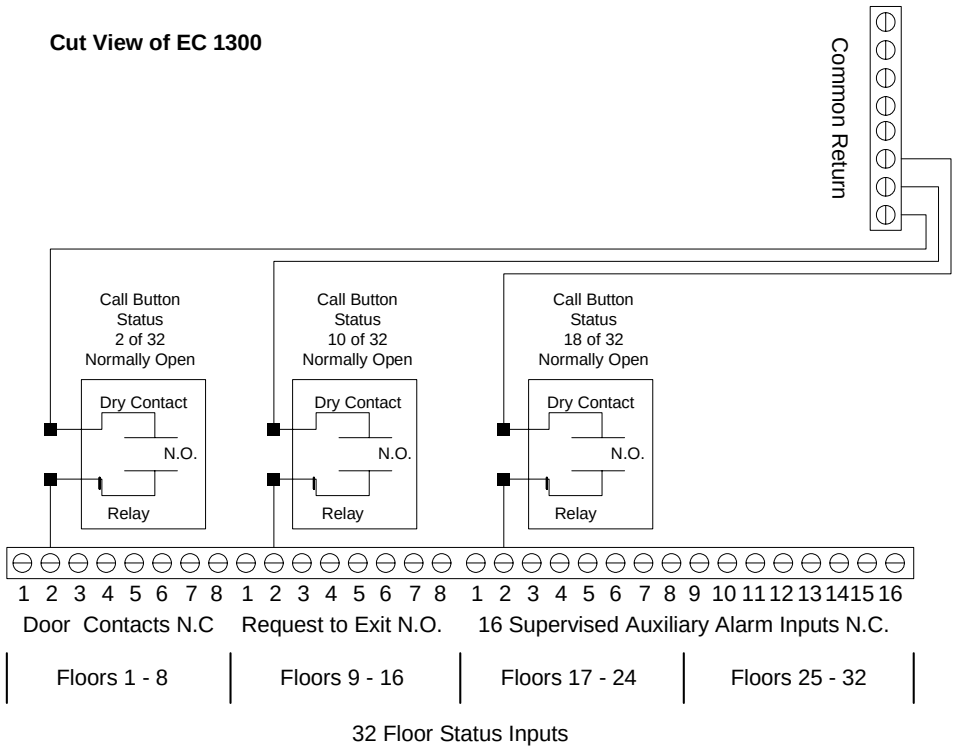
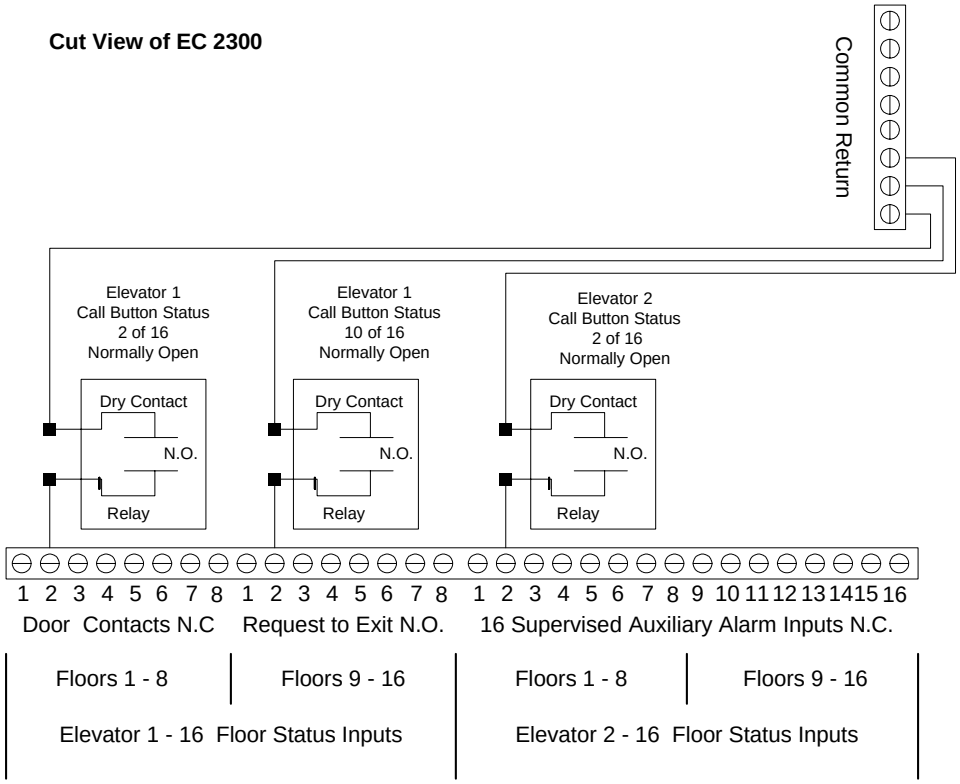


Figure 30 - Terminate Floor Input Wiring EC 2300



Terminate Reader Wiring at ACU

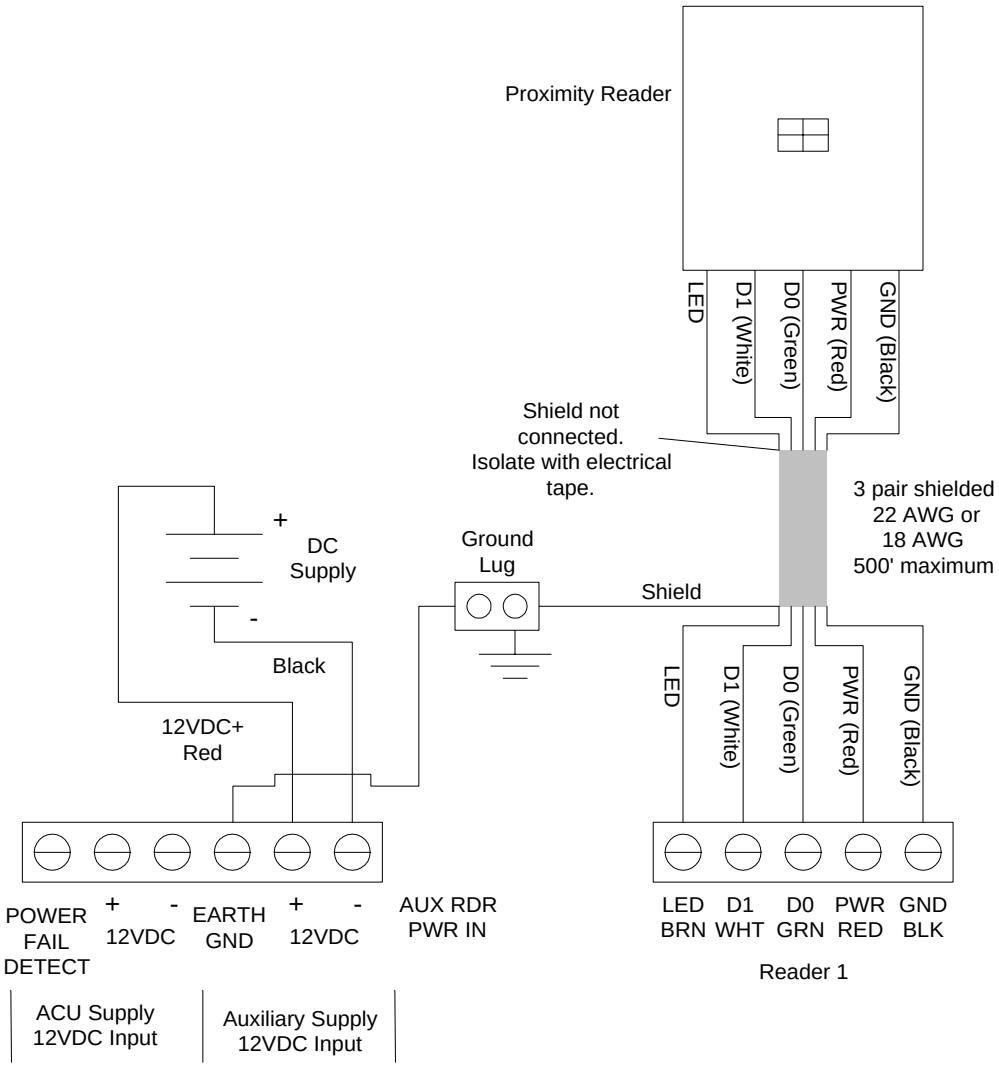
The reader cable should be 3 pair 22AWG shielded or a cable with overall shielding. 18 AWG is acceptable for current demanding readers such as the Indala PX620 or the HID5375. The shielding wire from each pair must be connected to the earth ground lug at the ACU and isolated and taped at the reader. The maximum reader distance is 500 feet (152.4 m) from the controller when transmitting a Wiegand signal protocol. If the distance is greater than 500 feet (152.4 m), install one WIEEX per reader, which extends the distance to 4000 feet (1219.2 m). See Appendix F – Wiegand Extenders WIEEX and CWIEEX on page 133.

Reader Wiring

- Red – Positive DC Power. Each reader port is fused at 12VDC at 120 mA. For readers that draw more current, connect the red wire directly to the power supply.
- Black – Ground (GND)
- Brown – Light Emitting Diode (LED) on reader
- Green – Data output bit 0
- White – Data output bit 1

For specific reader wiring review the appendices listed in the Table of Contents.

Figure 31 - Terminate Reader Wiring



Terminate Auxiliary Outputs with Hardware/Alarms

Door and auxiliary inputs can be programmed to trip auxiliary output relays on an alarm event. This excludes pre-alert relays. Auxiliary output relays can be connected to alarm panels, CCTV systems etc.

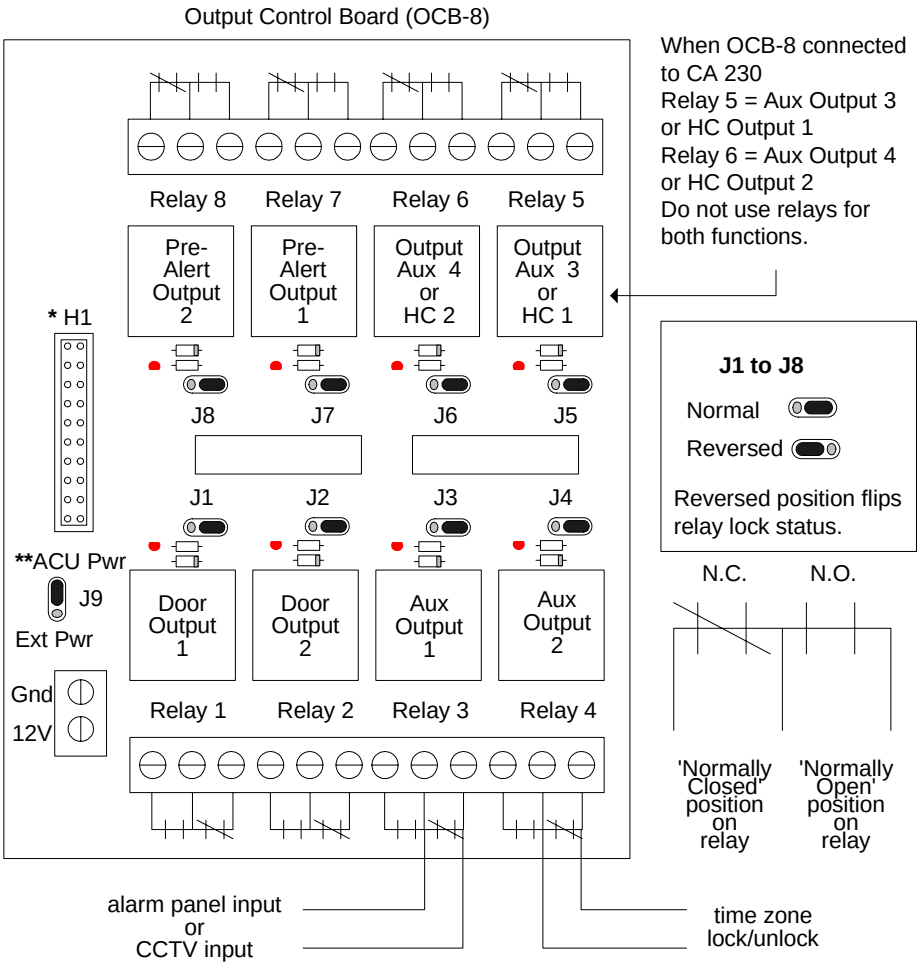
As an example, a forced entry detected by a door input could be programmed to trip an auxiliary output which initiates a CCTV system to record the intrusion at the door.

Auxiliary output relays may also be used to control hardware with an associated time zone, such as scheduling the locking/unlocking of a door, which does not have a reader, to a defined time zone.

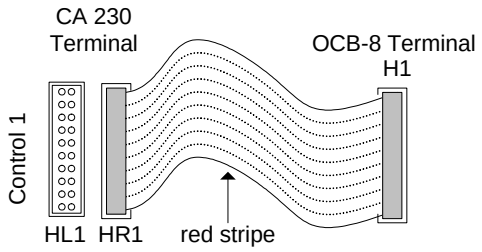
Important

Do not assign a time zone to an auxiliary output if the output has previously been assigned to an alarm event. The alarm has priority over the time zone.

Figure 32 - Terminate Auxiliary Outputs CA 230



CA 230 to OCB-8 Cable Connection



* Connect ribbon cable from H1 terminal on OCB-8 to Control 1 (right) terminal on CA 230 circuit board.

** OCB-8 relay board is powered through ribbon cable when J9 is on ACU PWR.

OCB-8 ribbon cable may be connected to HL1 (left side) on CA 230 circuit board. Set J9 to Ext Pwr. Connect OCB-8 12V/Gnd to Auxiliary side of power supply. OCB-8s may be connected to HL1 and HR1 simultaneously.

Figure 33 - Terminate Auxiliary Outputs CA 4300

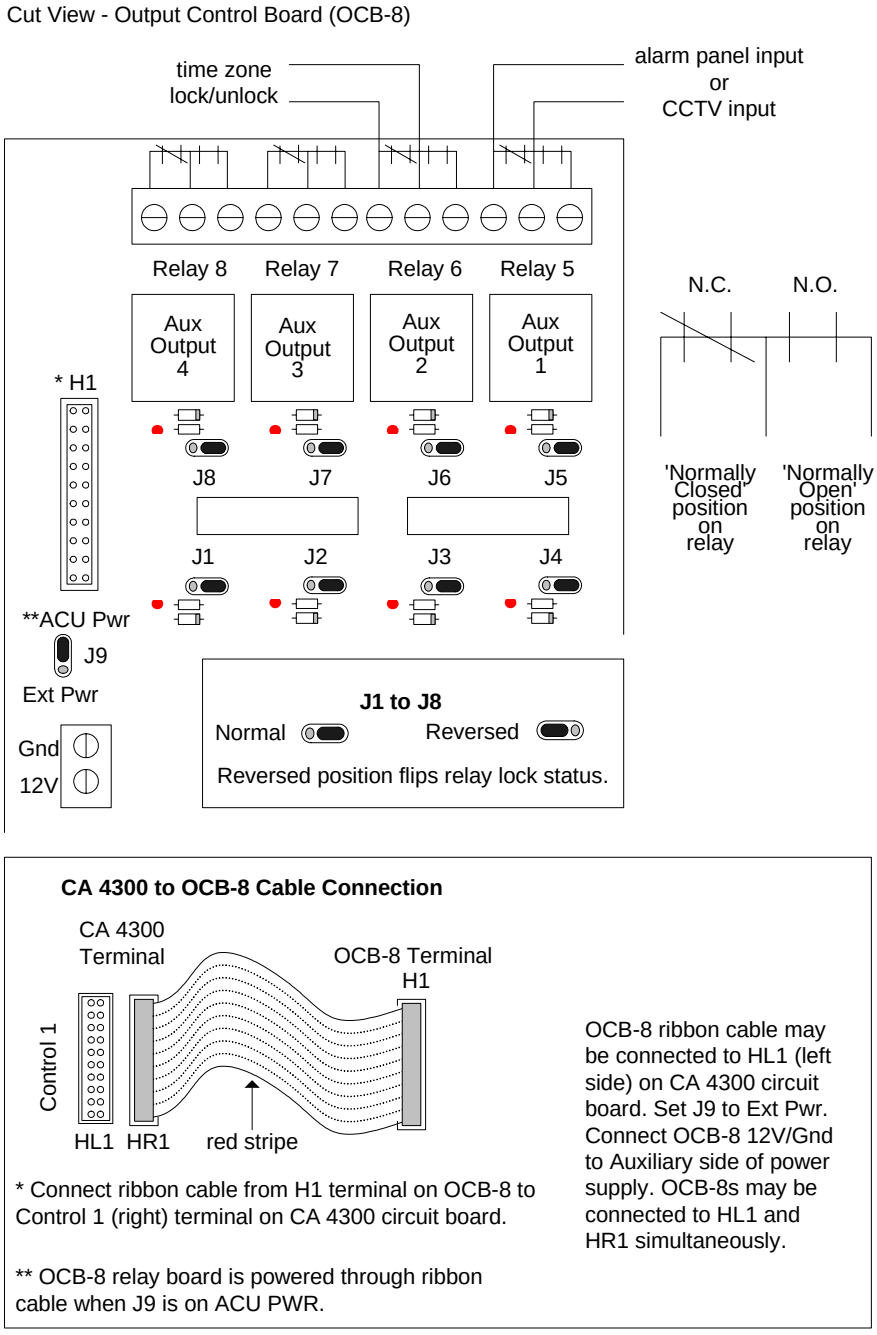
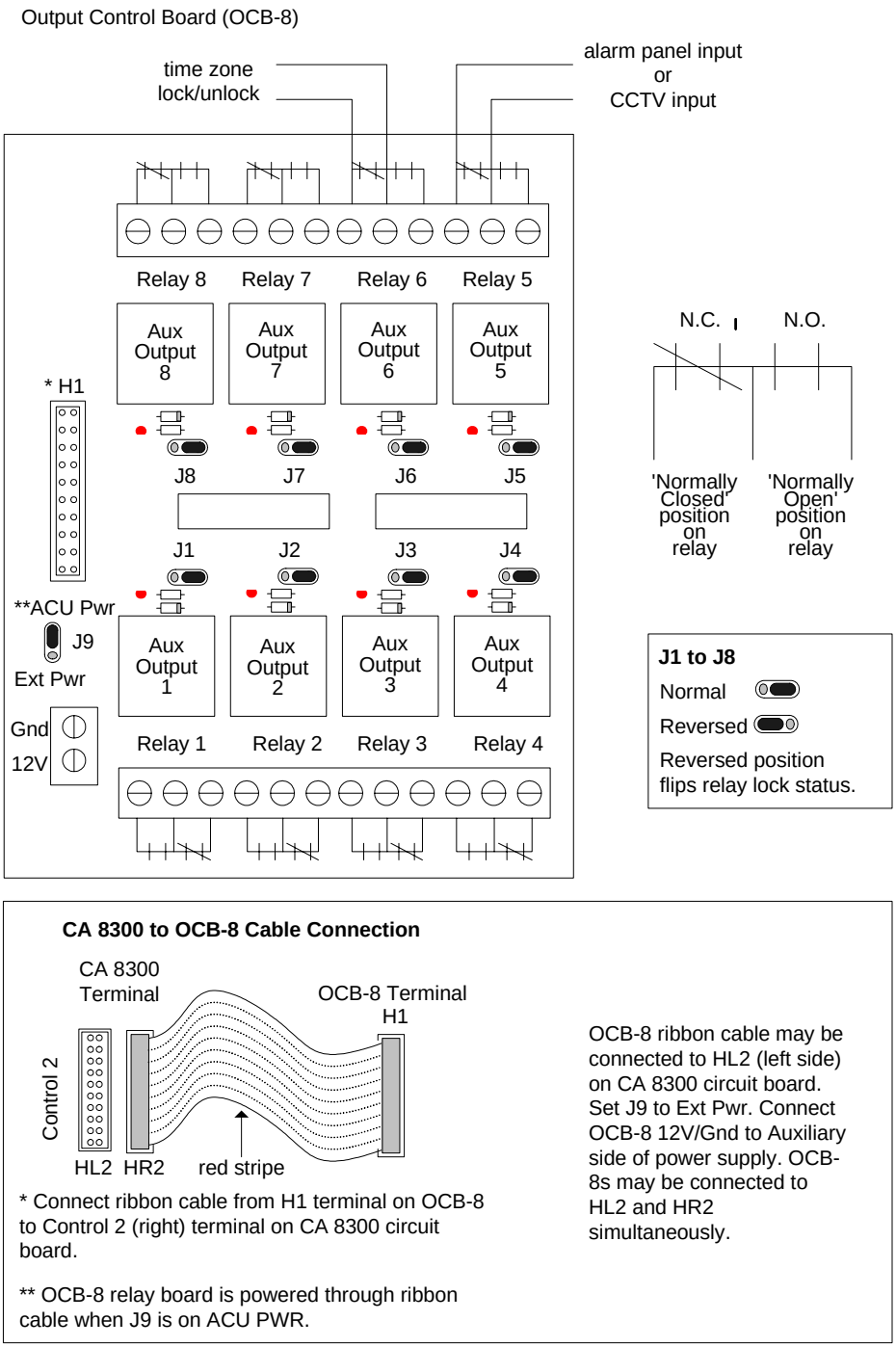


Figure 34 - Terminate Auxiliary Output CA 8300



CA 8300 to OCB-8 Cable Connection

* Connect ribbon cable from H1 terminal on OCB-8 to Control 2 (right) terminal on CA 8300 circuit board.

** OCB-8 relay board is powered through ribbon cable when J9 is on ACU PWR.

OCB-8 ribbon cable may be connected to HL2 (left side) on CA 8300 circuit board. Set J9 to Ext Pwr. Connect OCB-8 12V/Gnd to Auxiliary side of power supply. OCB-8s may be connected to HL2 and HR2 simultaneously.

ACU/ECU Jumper Settings

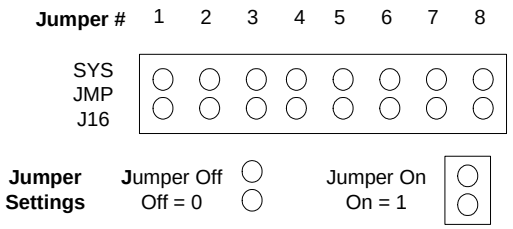
The following sub-sections outline jumper settings on ACU and ECU circuit boards:

- communications, card name storage, reader LEDs, card count, SI inputs jumper J16 – page 50
- software version selection jumper J17 – page 53
- reader technology selection jumper J3 – page 54
- address / external jumper J18 – page 57
- clear ACU memory jumper J1 – page 60

System Settings – Jumper J16

The following outlines configurations for system settings jumper J16.

Figure 35 - System Jumper J16



Modem Communication with Multiple ACUs

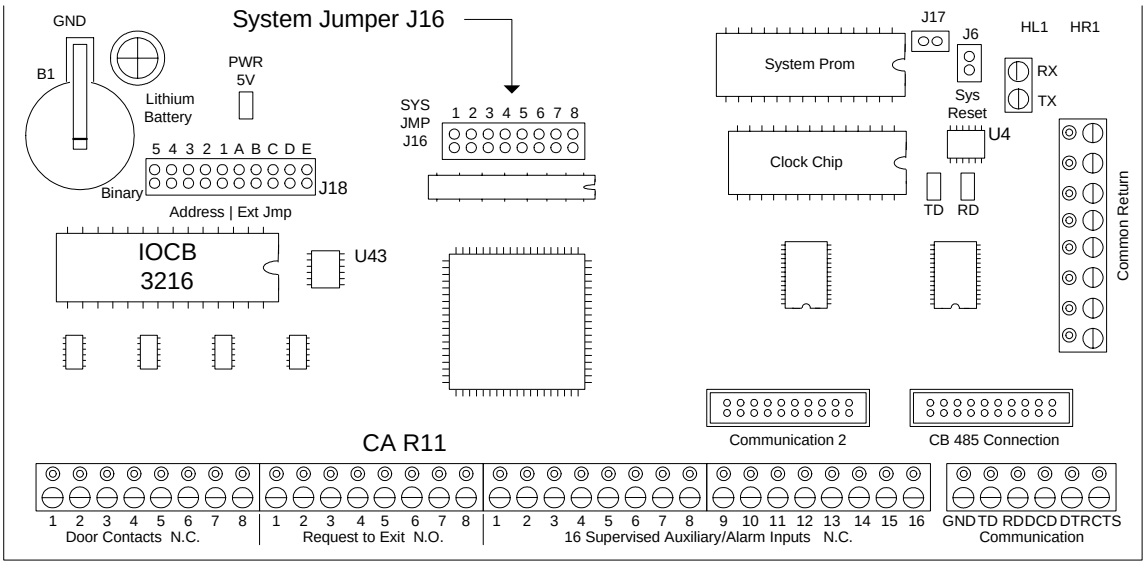
On the ACU that is connected to the modem, set the main circuit board's communication jumpers to the correct modem baud rate. On the remaining ACUs connected by CPB-10s, set communication jumpers to serial with a baud rate that corresponds to the modem's baud rate. You can only have one ACU dial-out modem on a communication bus otherwise you will experience communication difficulties.

Table 5 - System Jumper J16 Settings

Jumper Name	Jumper Function		Jumper #	Jumper Settings
Communication Jumpers	Baud	ASC Type		
	9600	Serial	1 & 2 & 6	0 0 0
	19200	Serial	1 & 2 & 6	0 1 0
Not supported on CPB-10	57600	Serial	1 & 2 & 6	0 0 1
Not supported on CPB-10 or CB-485	115200	Serial	1 & 2 & 6	0 1 1
Communication Jumpers	Baud	ASC Type		
	9600	Modem	1 & 2 & 6	1 1 0

Jumper Name	Jumper Function		Jumper #	Jumper Settings
Not supported with CPB-10	19200	Modem	1 & 2 & 6	1 0 0
	For future use		1 & 2 & 6	1 1 1
	For future use		1 & 2 & 6	1 0 1
			3	n/a
Card Name Storage in ACU Option (Prom version 6.2.X or higher)	System V or VII software - names stored in ACU - 24,000 card capacity		4	1
	System V or VII software – names not stored in ACU – 32,000 card capacity (Disaster recovery utility unable to retrieve names from ACU in the event database is lost or corrupted when this option selected)		4	0
Reader LED (condition on door lock status)	Red & Green LED type reader (board revs 9.8b or higher)		5	1
	Red LED type reader		5	0
Enable/Disable Temporary Card Countdown	Enable Temporary Card Countdown (Prom version 6.07 or higher)		7	1
	Disable Temporary Card Countdown		7	0
Enable/Disable SI Inputs				
Firmware 7.30 to 8.11 & greater	Disable IOCB1616		8	1
	Enable IOCB1616		8	0
Firmware 6.07 to 7.04 (does not support IOCB1616)	Enable AL32/64		8	1
	Disable AL32/64		8	0
Firmware 7.11 to 7.25 (custom)	Enable IOCB1616		8	1
	Enable AL32/64		8	0
Firmware 7.05 to 7.10 (custom)	Enable IOCB1616		8	1
	Disable IOCB1616		8	0

Figure 36 - System Jumper J16 Location on ACU/ECU Circuit Boards



Software Selection – Jumper J17

Jumper J17 selects the Keyscan software. If jumper J17 is altered, you must clear memory to reset ACU board settings. In the event of a software version upgrade, jumper J17 does not have to be changed. Refer to the table below for jumper settings.

Important

When installing the ACU/ECU circuit board or changing jumper J17, you must clear the ACU memory by momentarily shorting Clear Memory jumper J1.

Figure 37 - Software Jumper J17

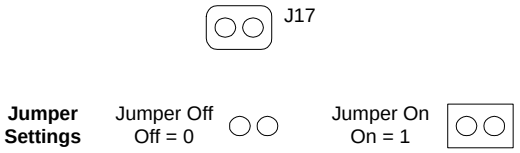
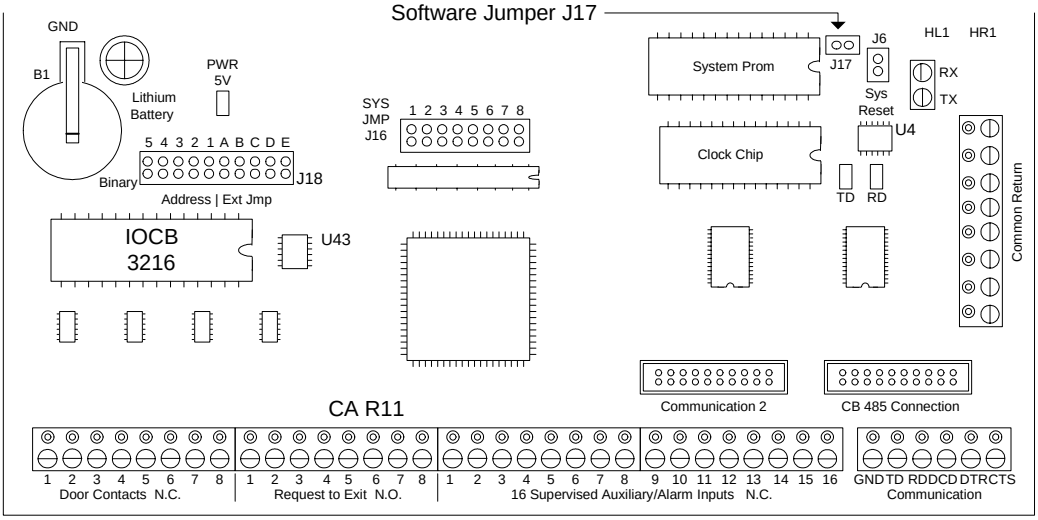


Table 6 - Software Jumper J17

Software Version	PROM Version	ACU/ECU Version	Jumper Settings
System V or System VII	7.4.0 or higher	Rev. 11.x	0
System V or System VII	7.x.x to 7.3.9	Rev. 10.x	0
System V or System VII	6.5.0	Rev.10.x	1
System V or System VII	6.11 to 6.22	Rev. 9.x	0

Current ACU hardware no longer supports System 3 or 3 Plus software. Please contact Keyscan technical support.

Figure 38 - Software Jumper J17 Location on CA & EC boards



Reader Formats – Jumper J3

Jumper J3 sets the ACU or ECU main circuit board to the corresponding reader format. The table below lists the reader format, the corresponding jumper setting and the security level of the card/reader format.

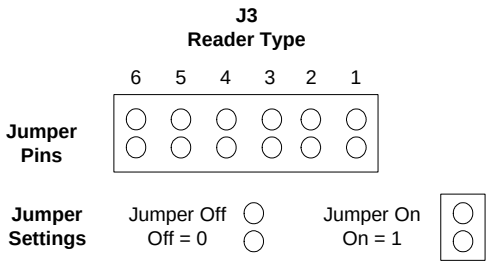
26-bit cards and tags are not secure. Duplicate card numbers exist in this format so a facility is vulnerable to unauthorized access. KEYSCAN assumes no responsibility for liability should any 26-bit card format be enabled in a KEYSCAN system. Further, Keyscan assumes no responsibility for liability for any other format except Keyscan's proprietary 36-bit format.

KEYSCAN systems are factory defaulted to use KEYSCAN's proprietary 36-bit Wiegand format cards and tags. KEYSCAN's 36-bit proprietary Wiegand format ensures no duplicate cards or tags exist offering a high level of security.

Waiver of Liability

Installing dealers should have an authorized end-user sign a waiver of liability before enabling 26-bit cards. Keyscan has enclosed a Waiver of Liability on page 57.

Figure 39 - Reader Type Jumper J3



Note

Reader formats apply to PROM version 2.23 or greater. Keyscan 36 bit format is a proprietary format.

Table 7 - Reader Type Jumper J3

Ref #	Reader Format	Security Level	Jumper Settings Pins 6 - 1	Batch Code Notes
0	Keyscan 36 bit only	High	0 0 0 0 0 0	Batch code and facility code are the same for cards or tags
	Formats Not Recommended			
1	Standard 26 bit & Keyscan 36 bit	Low	0 0 0 0 0 1	"

Ref #	Reader Format	Security Level	Jumper Settings Pins 6 - 1	Batch Code Notes
2	Northern 34 bit, Standard 26 bit & Keyscan 36 bit,	Low	0 0 0 0 1 0	"
3	Corby 30 bit & Keyscan 36 bit	Medium	0 0 0 0 1 1	"
4	Kantech 32 bit & Keyscan 36 bit	Medium	0 0 0 1 0 0	"
5	DSX 33 bit & Keyscan 36 bit	Medium	0 0 0 1 0 1	"
6	Intercon 32 bit & Keyscan 36 bit	Medium	0 0 0 1 1 0	"
7	Chubb 36 bit (5 & 6 digit cards) & Keyscan 36 bit	Medium	0 0 0 1 1 1	"
8	Keyscan 36 bit with zero batch number	Medium	0 0 1 0 0 0	The batch number is programmed with 0 to ignore the card facility code.
9	Standard 26 bit & Keyscan 36 bit	Low	0 0 1 0 0 1	The 36 bit batch number is the card facility code. The 26 bit batch number is programmed with 0 to ignore the card facility code.
10	Northern 34 bit & Keyscan 36 bit	Medium	0 0 1 0 1 0	The 36 bit batch number is the card facility code. The 34 bit batch number is programmed with 0 to ignore the card facility code.
11	Corby 30 bit & Keyscan 36 bit	Medium	0 0 1 0 1 1	The 36 bit batch number is the card facility code. The 30 bit batch number is programmed with 0 to ignore the card facility code.
12	Casi – Rusco Prox-Lite 40 bit	Medium	0 0 1 1 0 0	The 40 bit batch number is the card facility code.
13	Keyscan 36 bit & 37 bit	Medium	0 0 1 1 0 1	Batch code and facility code are the same for cards or tags
14	Keyscan England 36 bit with no manufacturer's code check	Low	0 0 1 1 1 0	"
15	HID 35 bit & Keyscan 36 bit	Medium	0 0 1 1 1 1	"
16	HID Computrol 34 bit & Keyscan 36 bit	Medium	0 1 0 0 0 0	"
17	Unassigned		0 1 0 0 0 1	
18	Chubb 36 bit & Keyscan 36 bit	Medium	0 1 0 0 1 0	No parity check on Chubb card.
19	Honeywell 40 bit & Keyscan 36 bit	Medium	0 1 0 0 1 1	Batch code and facility code are the same for cards or tags
20	Unassigned		0 1 0 1 0 0	"
21	Unassigned		0 1 0 1 0 1	"
22	ITI 29 bit & 26 bit & Keyscan 36 bit	Low	0 1 0 1 1 0	"
23	Standard 26 bit & Keyscan 36 bit & 37 bit	Low	0 1 0 1 1 1	"
24	Kantech XSF 36 bit IO Prox & Keyscan 36 bit	Medium	0 1 1 0 0 0	"
25	CardKey 34 bit & Keyscan 36 bit	Medium	0 1 1 0 0 1	"

Ref #	Reader Format	Security Level	Jumper Settings Pins 6 - 1	Batch Code Notes
26	Keyscan 36 bit & 26 bit with no parity checking format (Example Keri part # SM-2000X, 05454-030)	Low	0 1 1 0 1 0	"
27	Modern 30 bit & 26 bit & Keyscan 36 bit	Low	0 1 1 0 1 1	"
28	Intercon 32 bit & Keyscan 36 bit & Standard 26 bit		0 1 1 1 0 0	Both batch and card require programming
29	Indala 27 bit (format 10251) & Keyscan 36 bit		0 1 1 1 0 1	
30	Cards between 26 bit & 40 bit read as 26 bit card location with parity check	Very Low	0 1 1 1 1 0	Batch or facility codes are read as a 26 bit batch location
31	Diagnostic - evaluates cards between 26 bit & 40 bit for Keyscan engineers only.	Display Only	0 1 1 1 1 1	Cards do not unlock door relays. Evaluation mode only.

For other custom Wiegand protocol firmware or development, contact Keyscan technical support.

ACU/ECU Circuit Board LED Wiegand Bit Counters

ACU & ECU circuit boards have Wiegand bit counter LEDs – L1 and L2 – for determining card binary bits. To verify the binary bits, present the card or tag at the reader. You must be able to observe the ACU/ECU circuit board when you present the card or tag at the reader. Count the number of times each LED blinks.

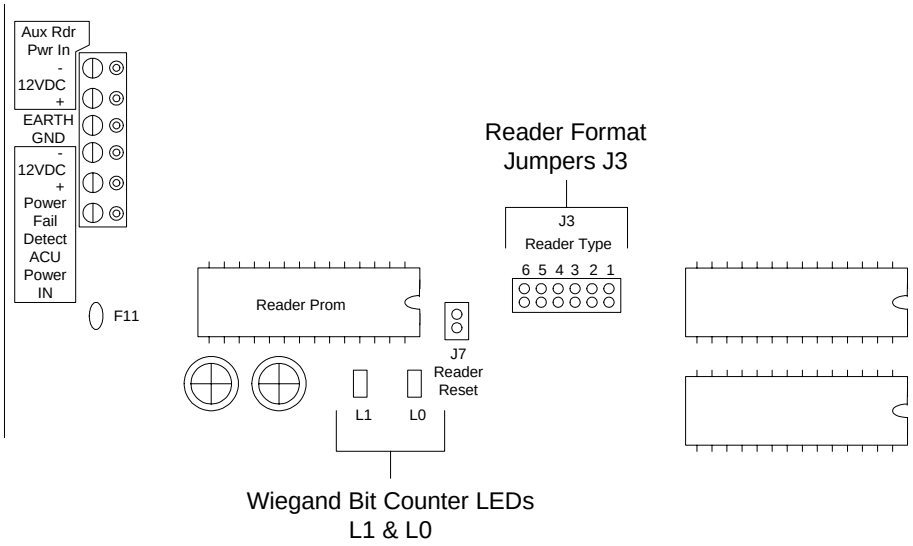
- L1 counts the 1st binary digit
- L0 counts the 2nd binary digit

Example

If L1 blinks 2 times and L0 blinks 6 times, the card has 26 binary bits (26 bit Wiegand card).

Figure 40 - Reader Format Jumper J3 and Wiegand Bit Counter LEDs

(For all CA & EC control panels)



Liability Warning – 26 Bit Wiegand Card Format

KEYSCAN systems are factory defaulted for KEYSCAN's proprietary 36-bit Wiegand format cards.

KEYSCAN systems can be modified to recognize a wide range of additional access card formats. Some of these formats are proprietary to other system manufacturers. Some other formats, notably 26-bit Wiegand, are “open”. This means that card manufacturers will supply any card number sequence requested. The “open” 26-bit format means duplicate cards exist.

Installing dealers and end-users should be aware of the risk. Because the 26-bit format is unregulated, duplicated card numbers can be easily obtained and could be used to gain unauthorized access to a facility.

KEYSCAN strongly recommends that installing dealers apprise the end user customer of the risks posed by 26-bit cards and have the end user customer acknowledge they understand the risk by signing the “Waiver of Liability”.

Waiver of Liability

Keyscan system end user (End User Name -) acknowledges that he/she has been advised that the KEYSCAN system installed by (Dealer Name -) in the end-user premises has been modified from the factory original settings to accept Wiegand 26 bit format cards.

End user acknowledges that he/she is aware that duplicate cards may exist in this format and that a duplicate card could be used to gain illegal access to his/her facility.

(Dealer Name -) SHALL NOT BE RESPONSIBLE FOR ANY CONSEQUENTIAL, CONTINGENT, SPECIAL OR INCIDENTAL DAMAGES whatsoever, except as specifically set forth in the LIMITED WARRANTY, caused by illegal use of duplicate 26 bit access cards.

DEALER NAME:	**END USER NAME:**
PER:	**PER:**
SIGNED:	**SIGNED:**
DATED:	**DATED:**

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Address/External Jumper J18

Pins 5 and 4 on jumper J18 on the ACU circuit boards currently set the input supervision type. Please note that J18 – pins 5 & 4 – set the input type universally for door contacts, request to exits, and auxiliary/supervised alarm inputs on each controller. All inputs must be the same type.

Figure 41 - Address/External Jumper J18

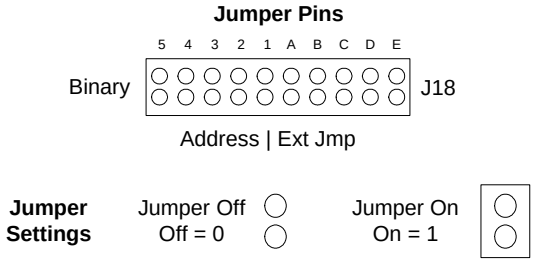
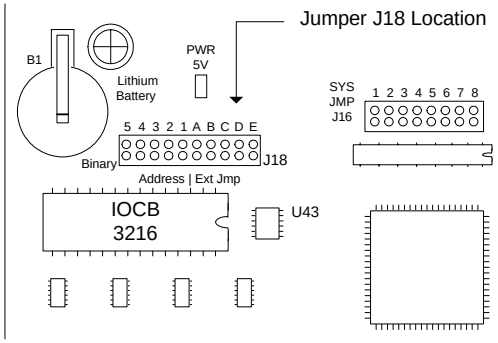


Table 8 - J18 Jumper Settings

Supervised Input Selection	**Jumper Settings** **Pins 5 - 4**	**Note**
Non-supervised input or digital input	0 0	Pins 3, 2, 1,C, D & E are for future use.
Single end of line supervision	0 1	
Double end of line supervision	1 1	
Alternate Panel Serial # Selection	**Pins A – B**	
Default Serial #	0 0	Leave on Default Serial # setting - pins OFF - unless prompted in the Client software when inputting panel data in the Site Unit Setup form.
Aternate Serial # 1	0 1	
Alternate Serial # 2	1 0	
Alternate Serial # 3	1 1	

Figure 42 - Jumper J18 Location – CA 230 / CA 4300 / CA 8300

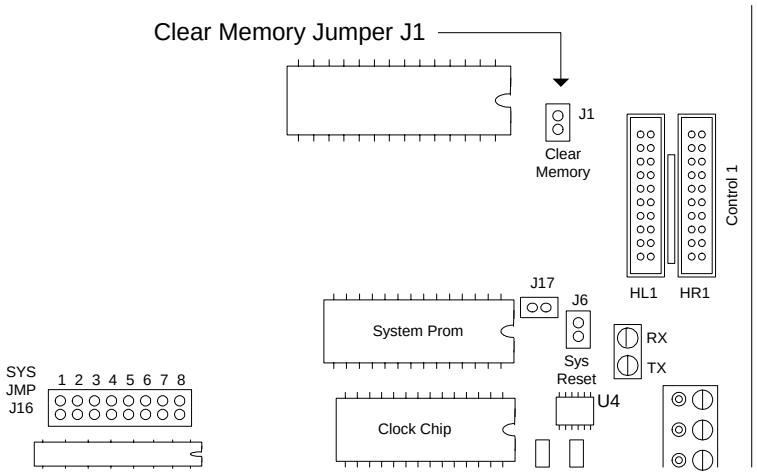


Clear ACU Memory – Jumper J1

The purpose of clearing the memory is to factory load the circuit boards.

To clear ACU memory, momentarily short the two pins on jumper Clear Memory J1 while the ACU is powered.

Figure 43 - Clear Memory Jumper J1 - All CA & EC boards



Communication – Single & Multiple ACUs

This section outlines ACU to PC communication and ACU to ACU communication. Keyscan supports the following connectivity modes:

- Serial
- USB (USB 1.1 & USB 2.0 supported)
- Network (TCP/IP)
- Wireless Network (TCP/IP)
- Modem

Communication is divided into 2 parts:

- Single ACU Communication
- Multiple ACU Communication

Each section reviews the supported communication modes, applicable communication devices and connection diagrams.

Important

Do not mix CPB-10 boards with CB-485 boards on the same communication loop.

Refer to page 50 for setting communication ACU baud rates. Be sure the correct baud rate of the PC's communication port is set in the Client software. Verify the PC communication port is active and is dedicated for access control communication.

Modem Communication

Modem communication requires independent analog phone lines and modems at both the PC and the remote ACU location.

We recommend using either the CB-485M or MC9600 and the MC33H modem because they are manufactured by Keyscan specifically for our access control systems. Setup strings for the modems are defaulted in the Keyscan software. Other 3rd party modems may be used; however, you may encounter problems.

Do not connect a CB-485M, MC9600 or MC33H modem to a digital phone line. If digital phone lines are in use, contact your phone service provider for converter equipment.

Single ACU Communication

The following table reviews supported communication modes, devices, and applicable wiring diagrams/parts list.

Table 9 - Single ACU Communication

Mode	Devices	Wiring Diagram/Parts List
Serial	Direct serial connection to PC	Figure 44
Serial	CB-485	Figure 45
Serial	CPB-10	Figure 46
USB	USB Adaptor	Figure 47
USB	USB Adaptor/CB-485 (RS-232)	Figure 48
USB	USB Adaptor/CB-485 (RS-485)	Figure 49
USB	USB Adaptor/CPB-10	Figure 50
Network (TCP/IP)	NETCOM2P or NETCOM6P/CB485	Figure 51
Network (TCP/IP)	NETCOM2 or NETCOM6/CB-485	Figure 52
Network (TCP/IP)	NETCOM2 or NETCOM6/ACU (direct connection)	Figure 53
Network (TCP/IP)	NETCOM2 or NETCOM6/CPB-10	Figure 54
Wireless Network (TCP/IP)	NETCOM2WH or NETCOM6WH/CB-485	Figure 55
Wireless Network (TCP/IP)	NETCOM2WH or NETCOM6WH/CPB-10	Figure 56
Wireless Network (TCP/IP)	NETCOM2WH or NETCOM6WH/ACU (direct connection)	Figure 57
Modem	CB-485M/MC33H	Figure 58
Modem	MC9600/MC33H	Figure 59
Modem	MC9600/MC33H/CPB-10	Figure 60

Figure 44 - Single ACU Communication - Direct Serial

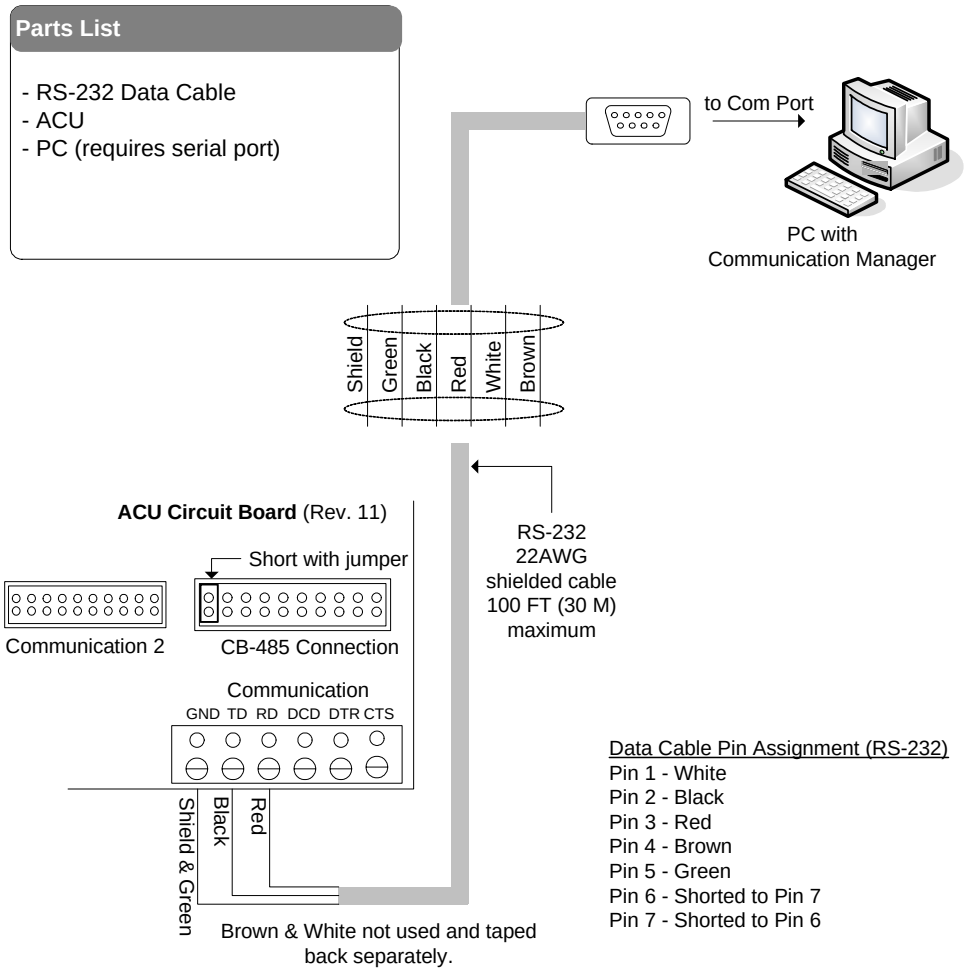


Figure 45 - Single ACU Communication – Serial CB-485

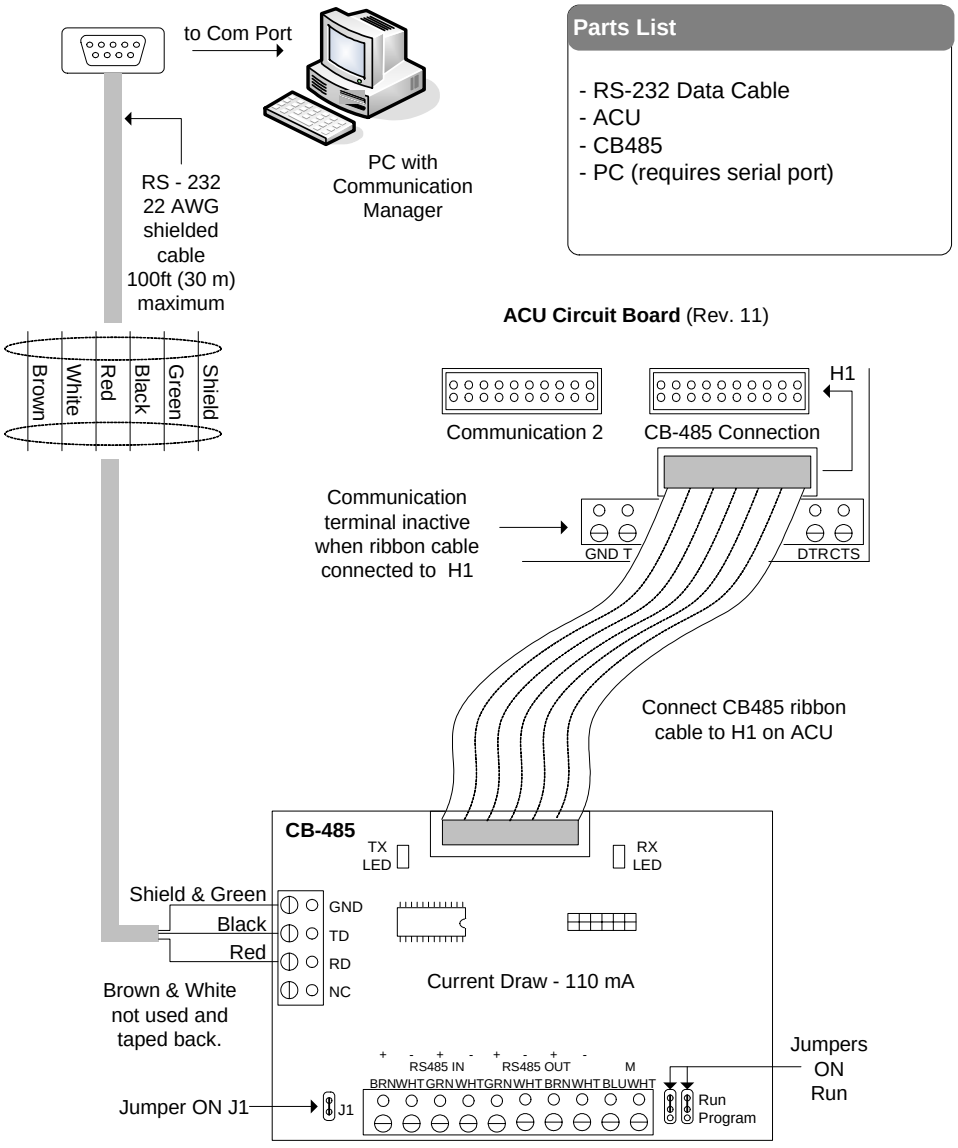


Figure 46 - Single ACU Communication - Serial CPB-10

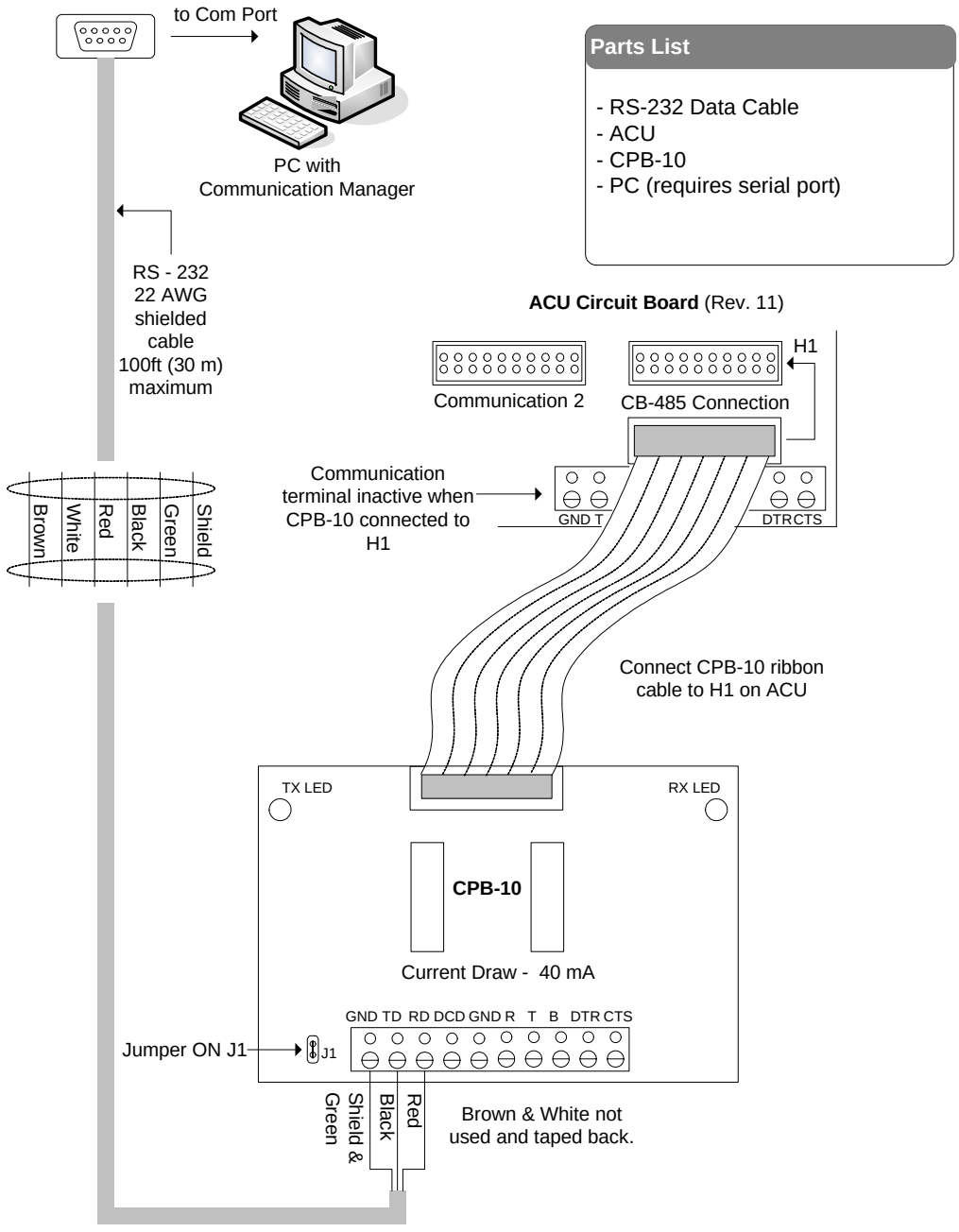


Figure 47 – Single ACU Communication - USB Adaptor

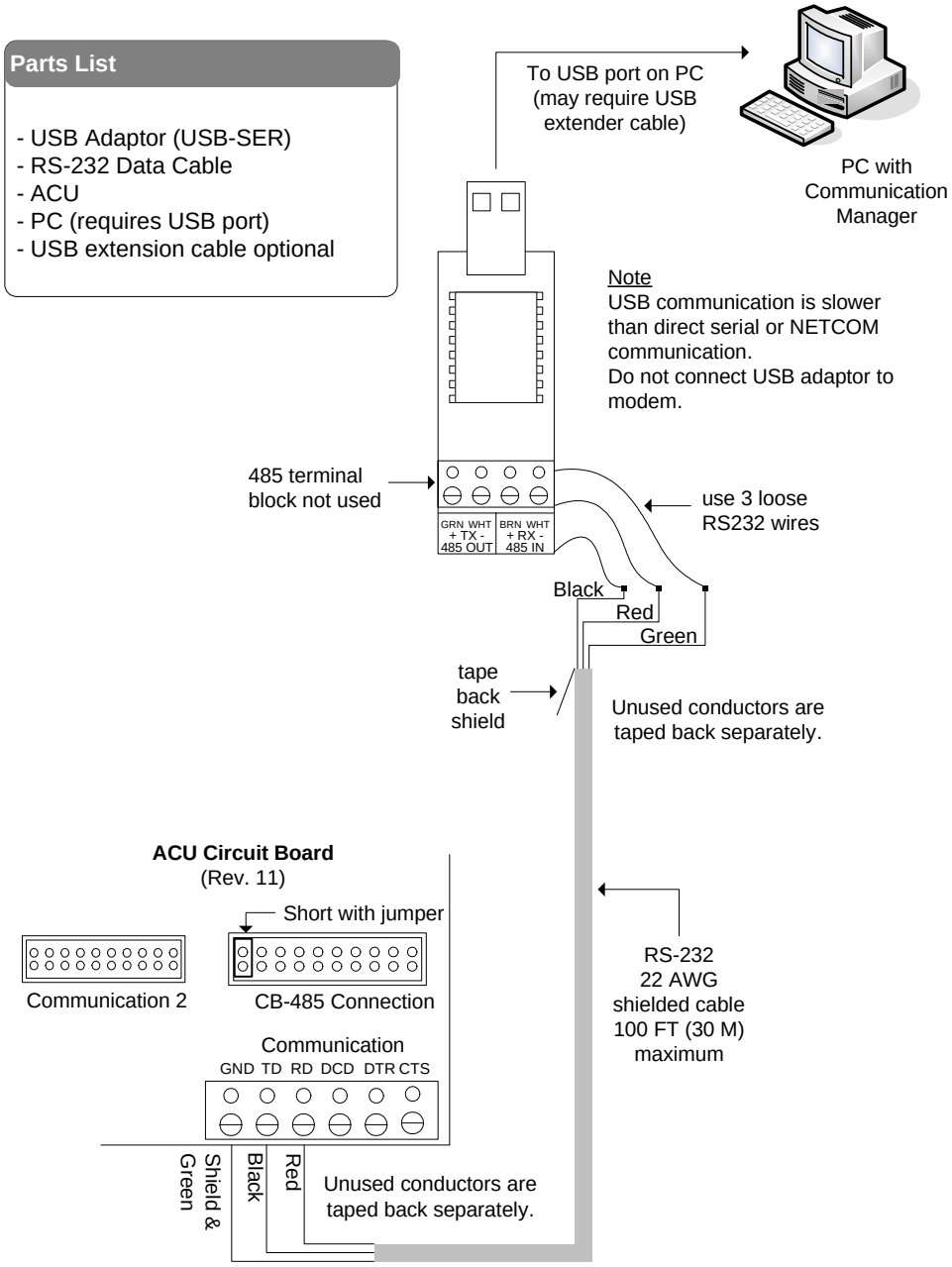


Figure 48 - Single ACU Communication - USB Adaptor/CB-485 (RS232)

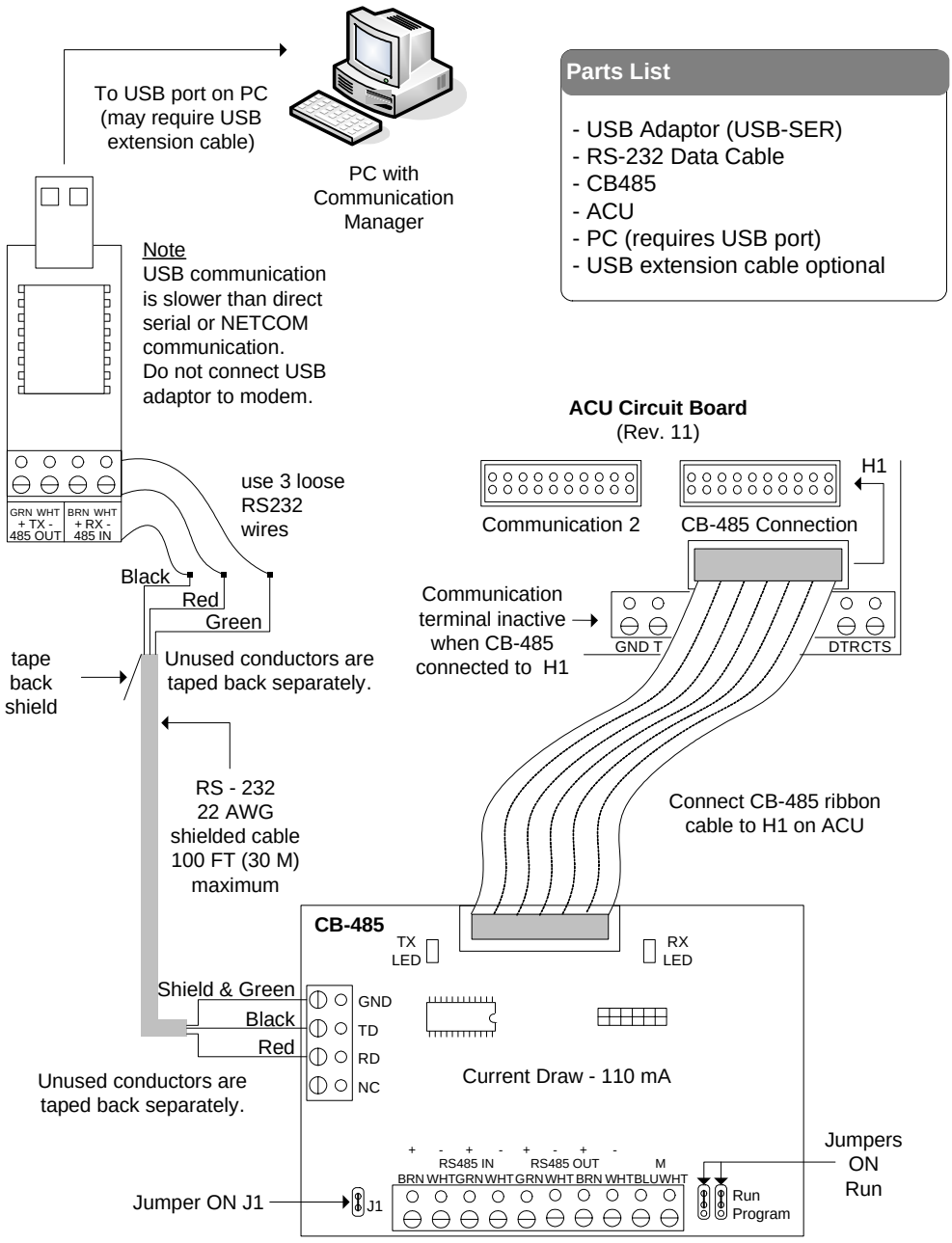


Figure 49 - Single ACU Communication - USB Adaptor/CB-485 (RS485)

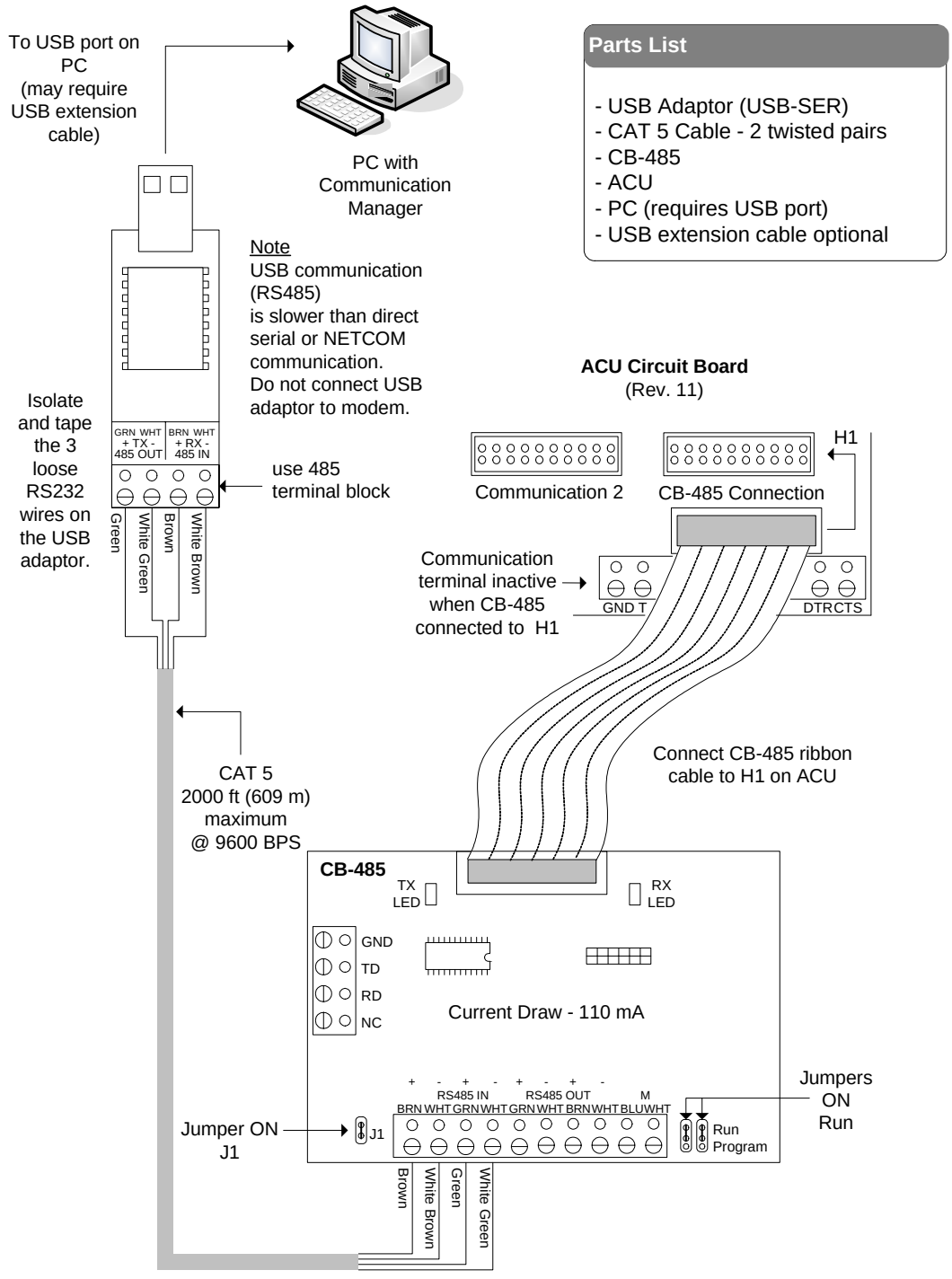


Figure 50 - Single ACU Communication - USB Adaptor/CPB-10 (RS232)

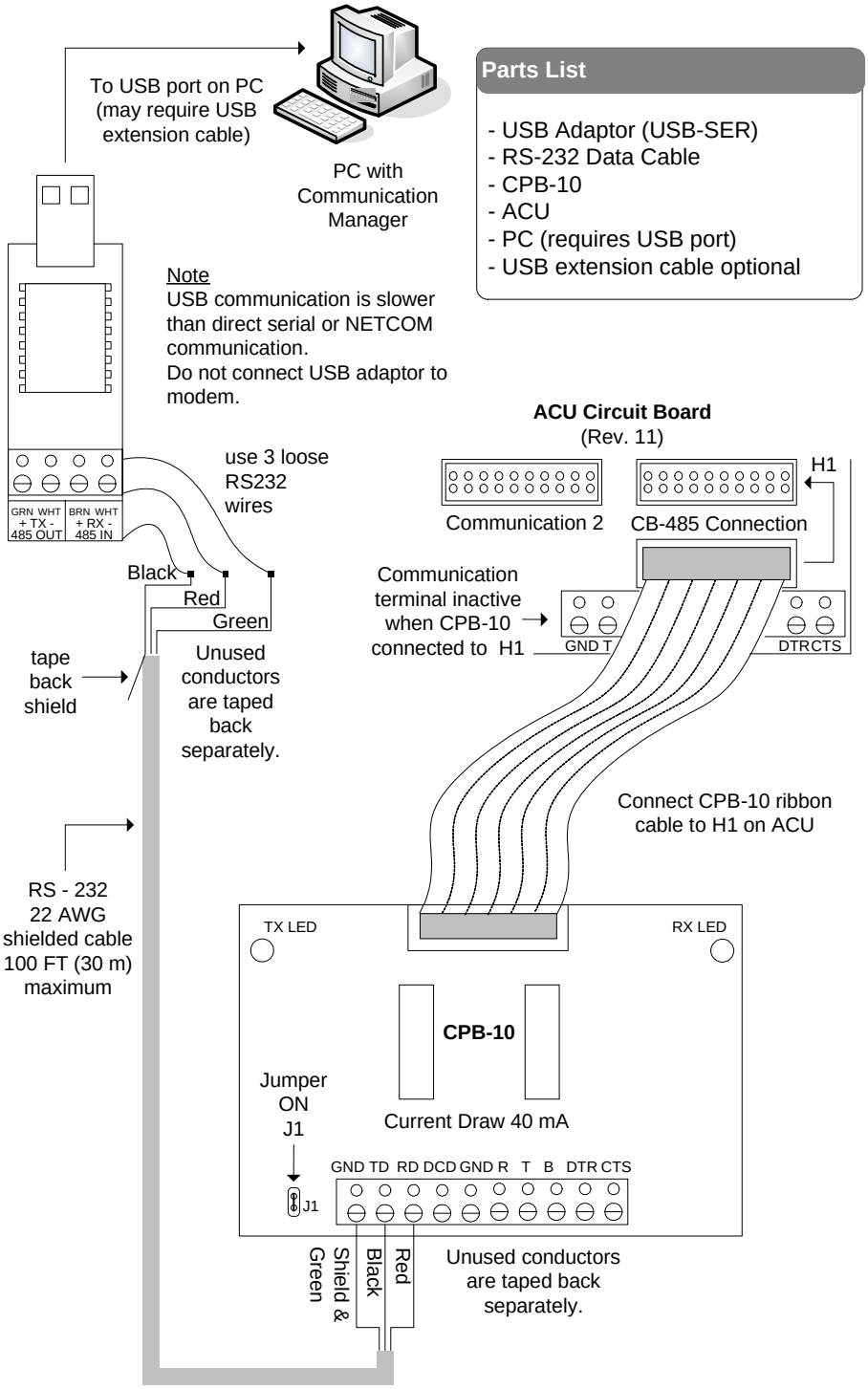


Figure 51 - Single ACU Communication - NETCOM2P or NETCOM6P/CB-485

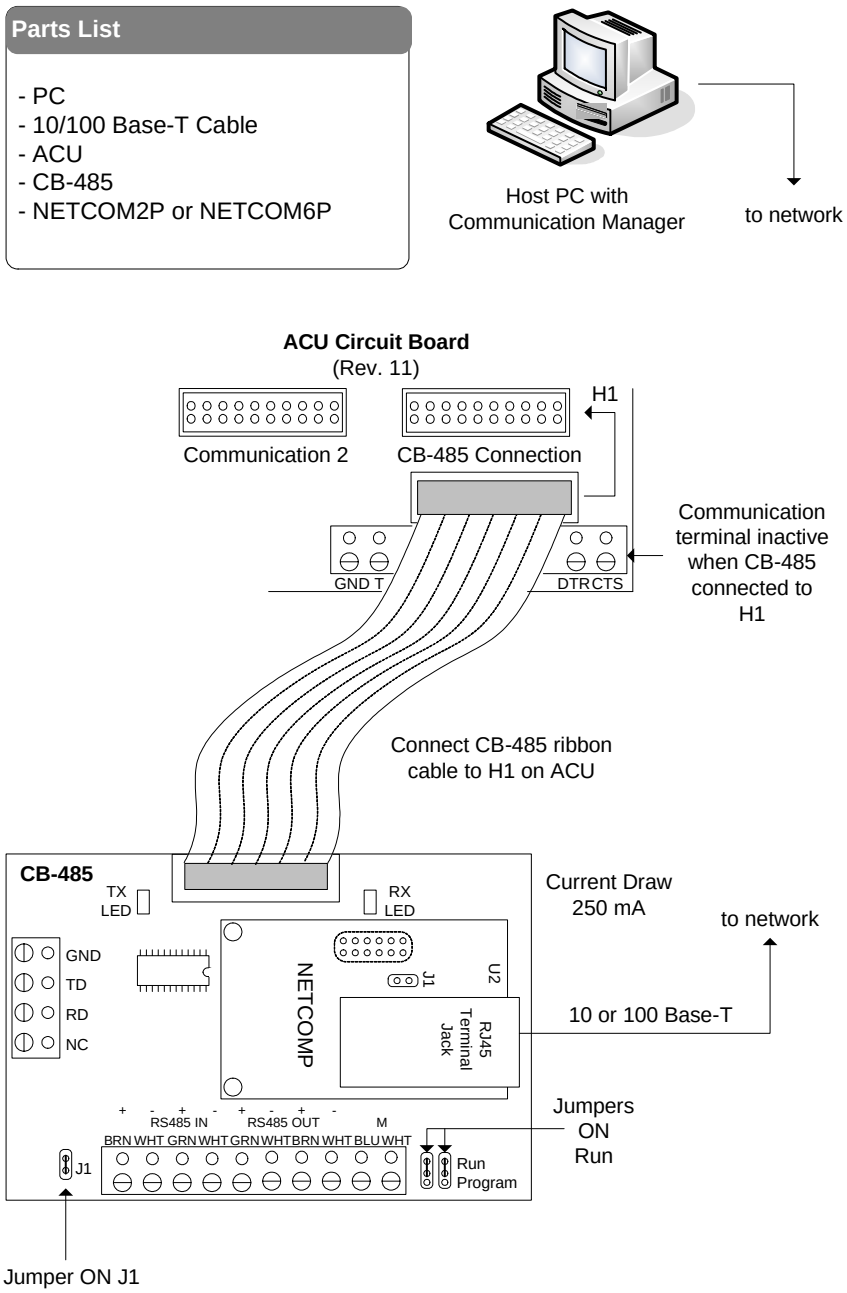


Figure 52 - NETCOM2 or NETCOM6/CB-485

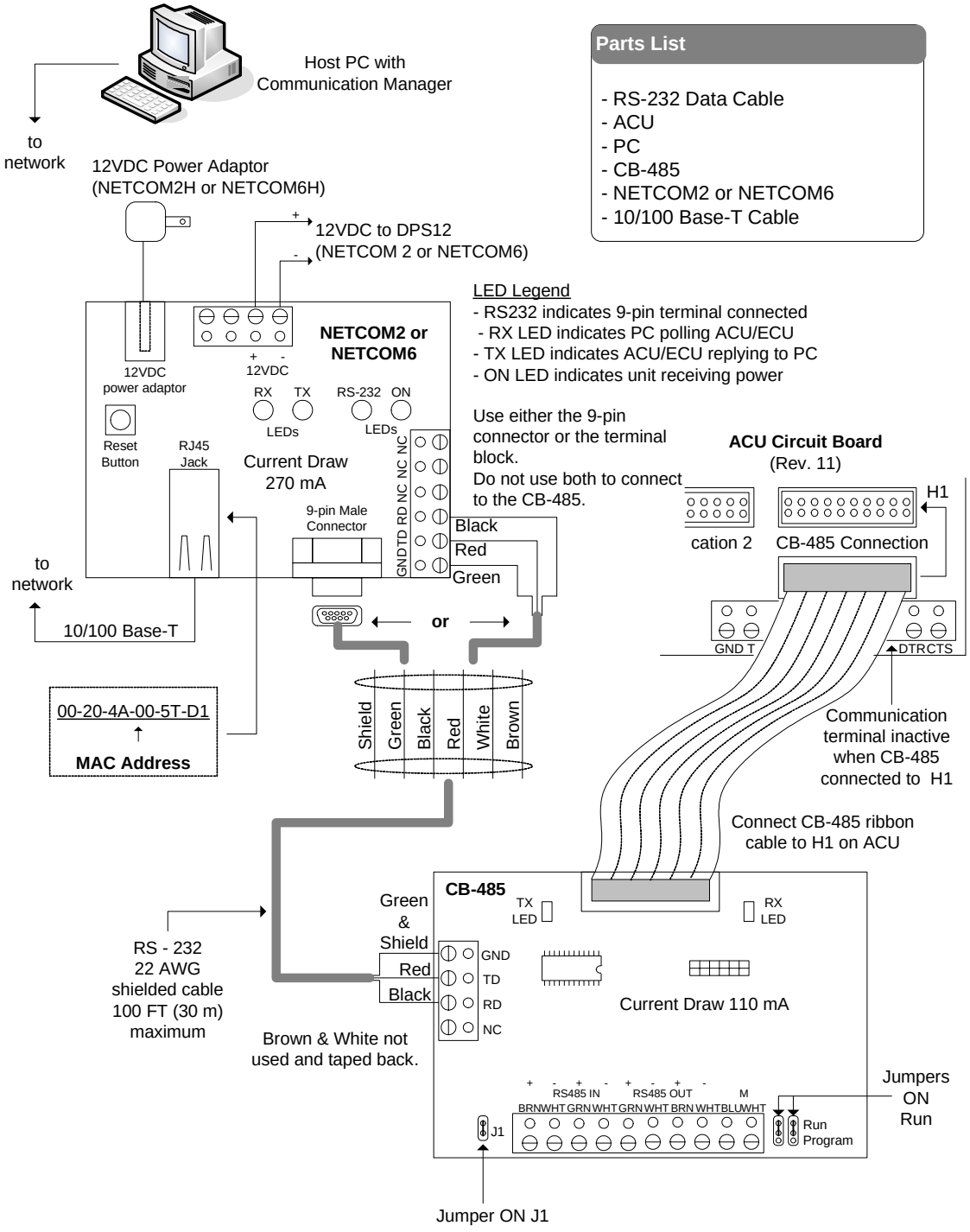


Figure 53 - Single ACU Communication - NETCOM2 or NETCOM6

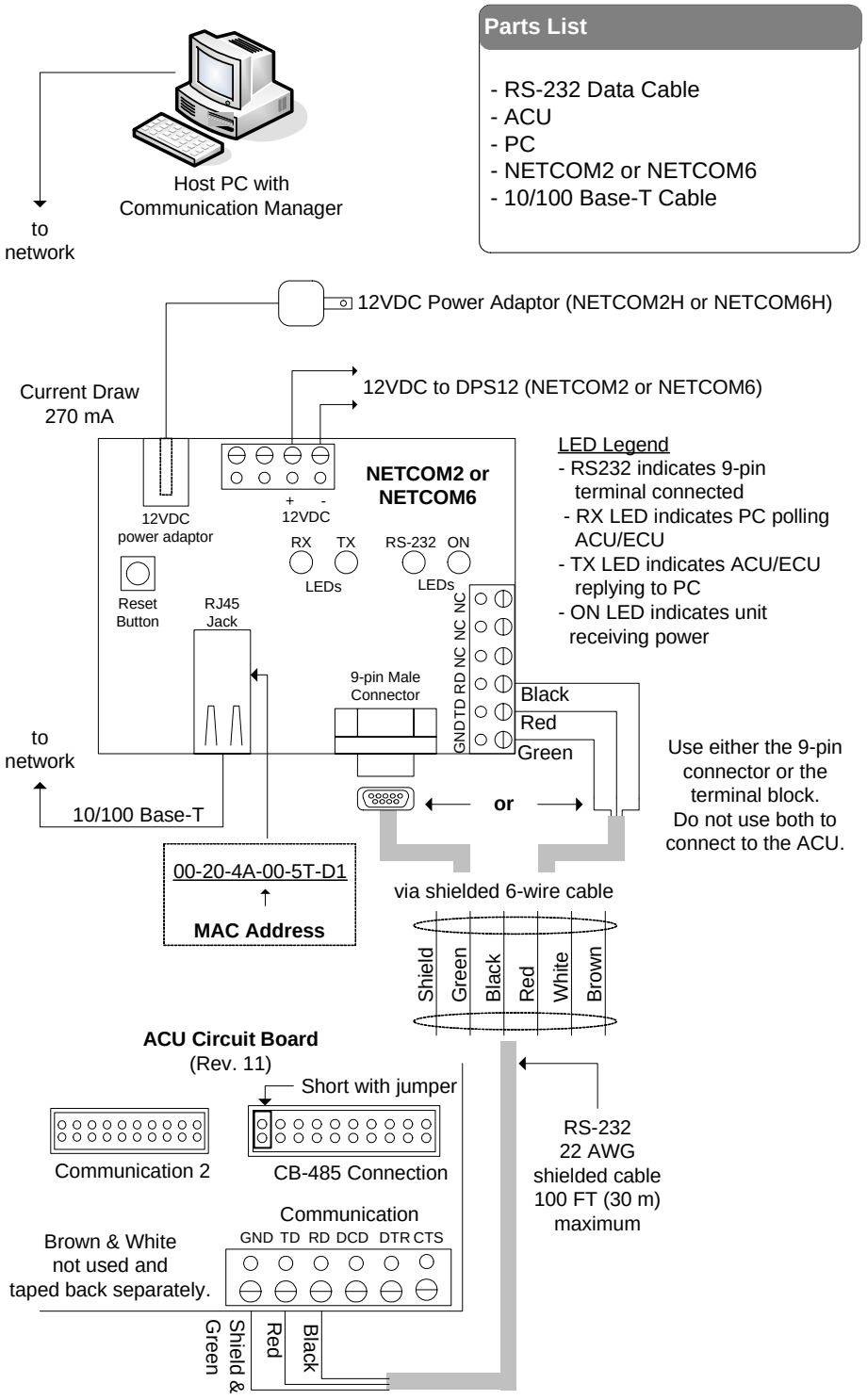


Figure 54 - Single ACU Communication - NETCOM2 or NETCOM6/CPB-10

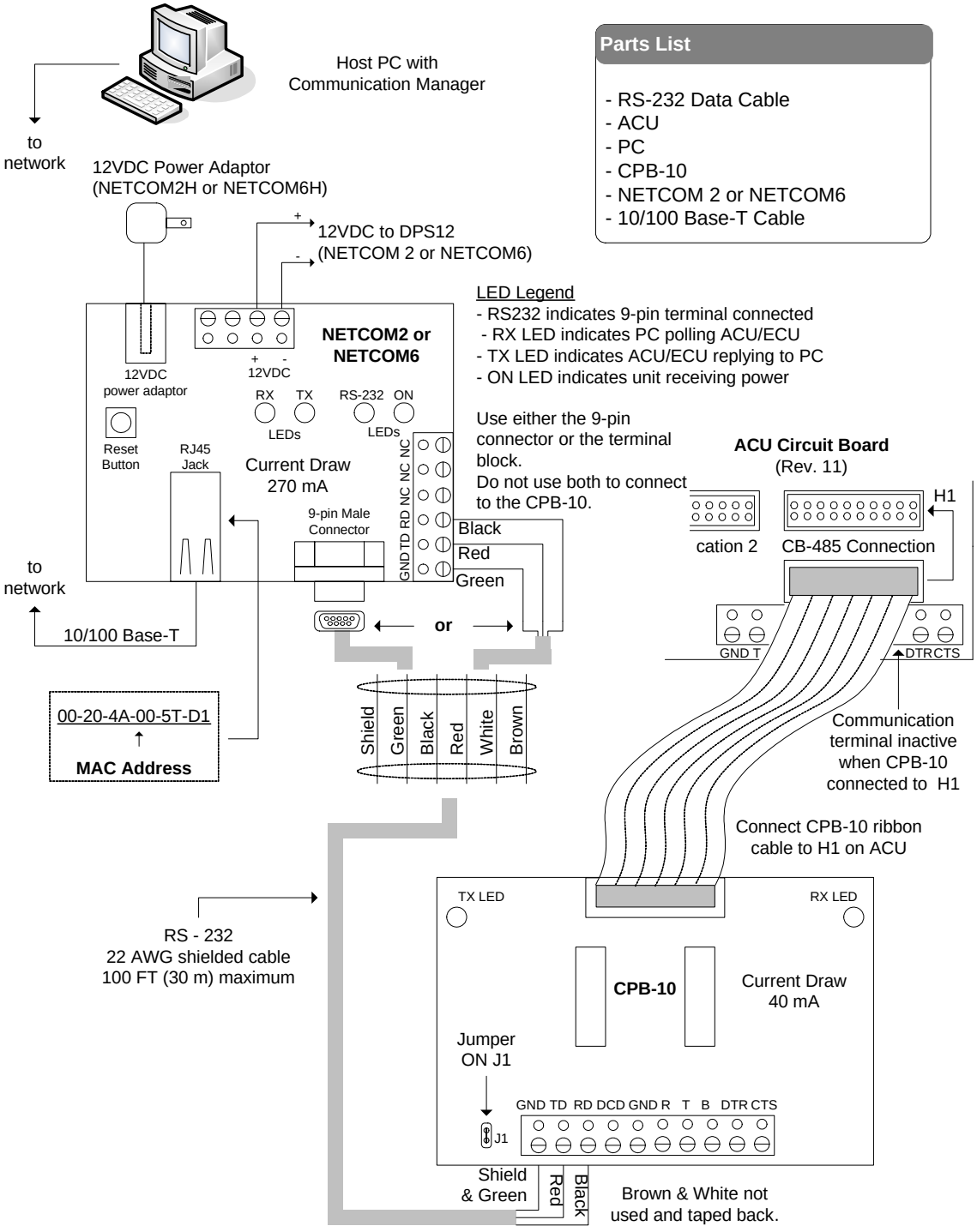


Figure 55 - Single ACU Communication NETCOM2WH or NETCOM 6WH / CB-485

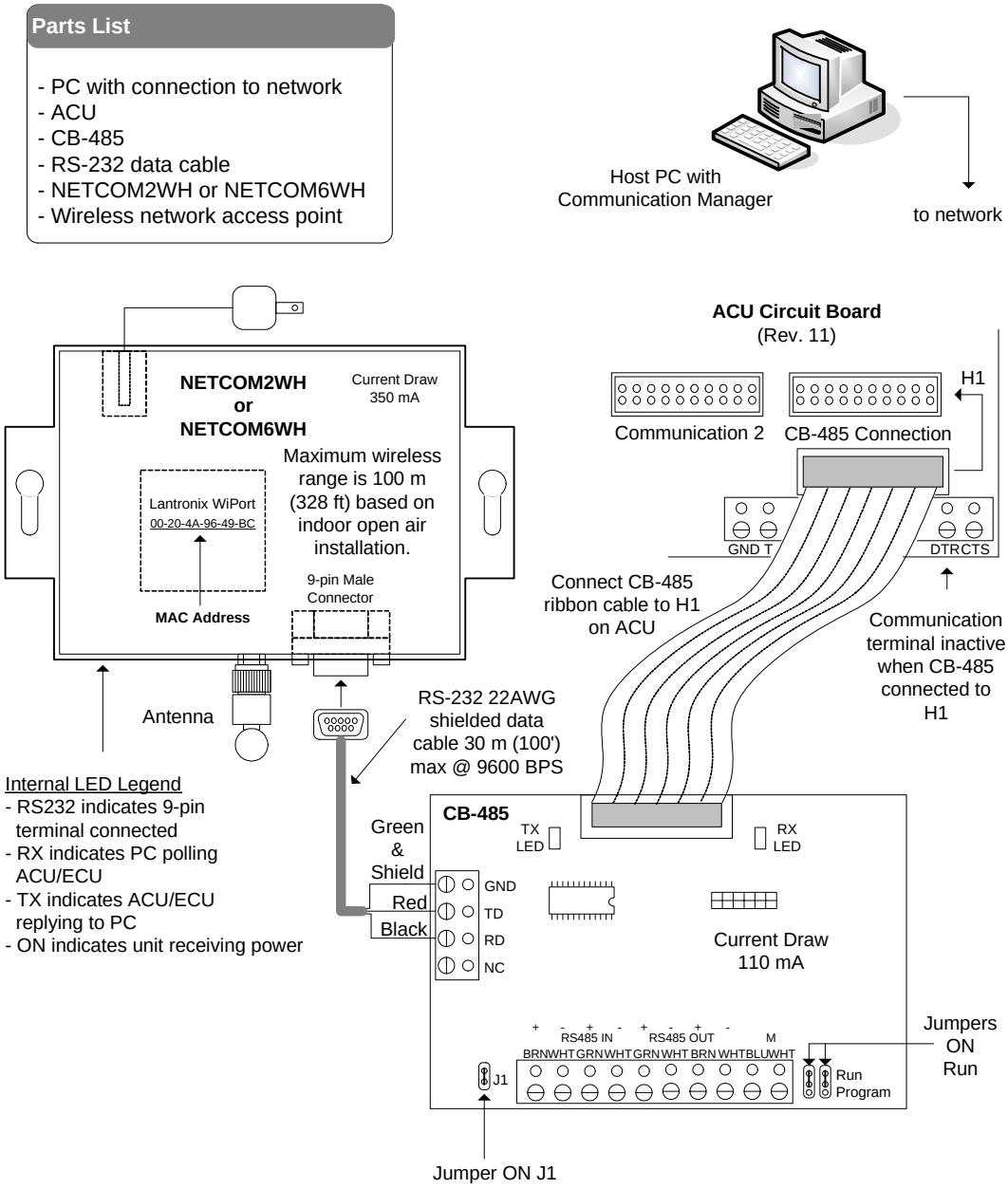


Figure 56 - Single ACU Communication - NETCOM2WH or NETCOM6WH / CPB-10

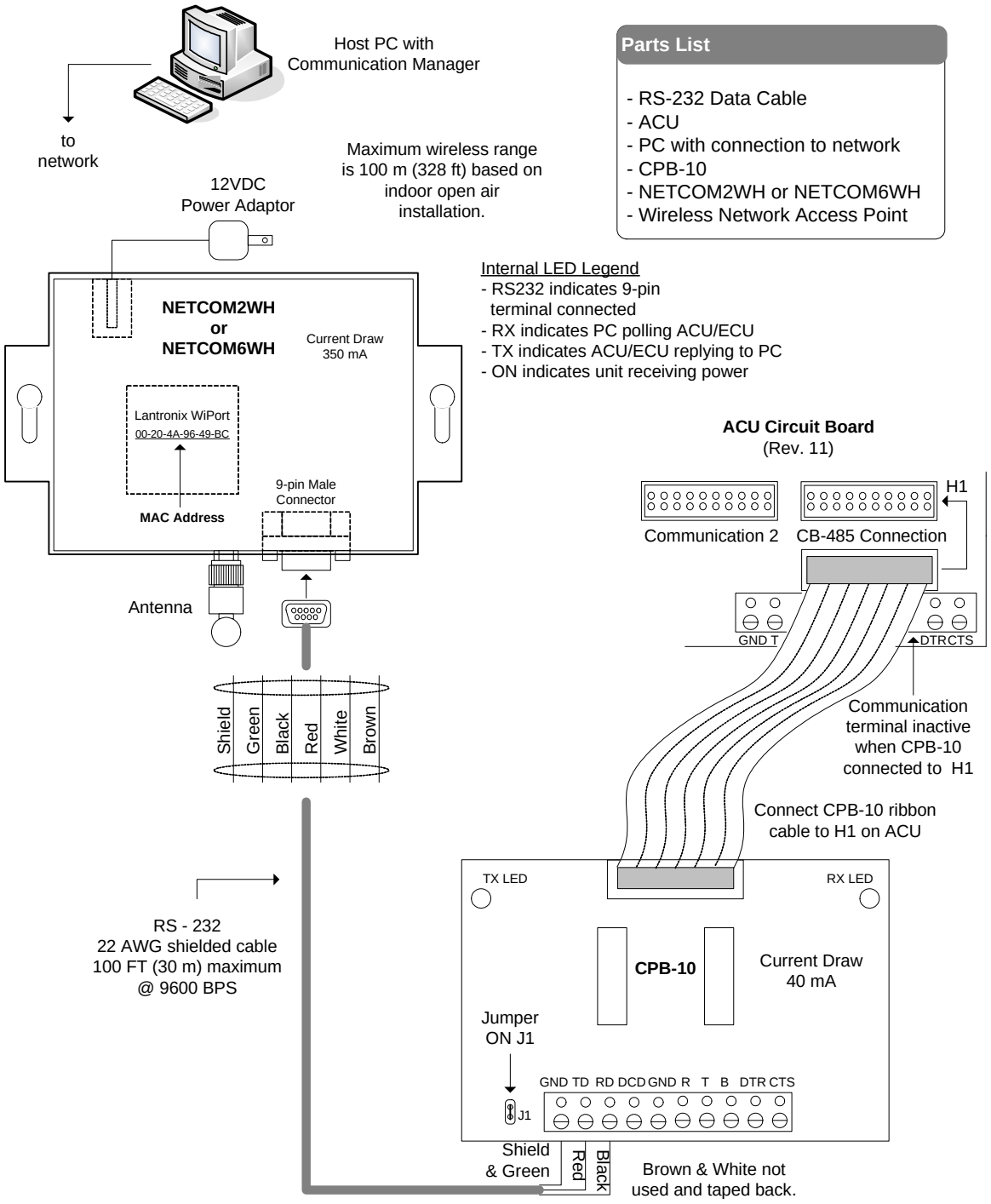


Figure 57 - Single ACU Communication - NETCOM2WH or NETCOM6WH / ACU

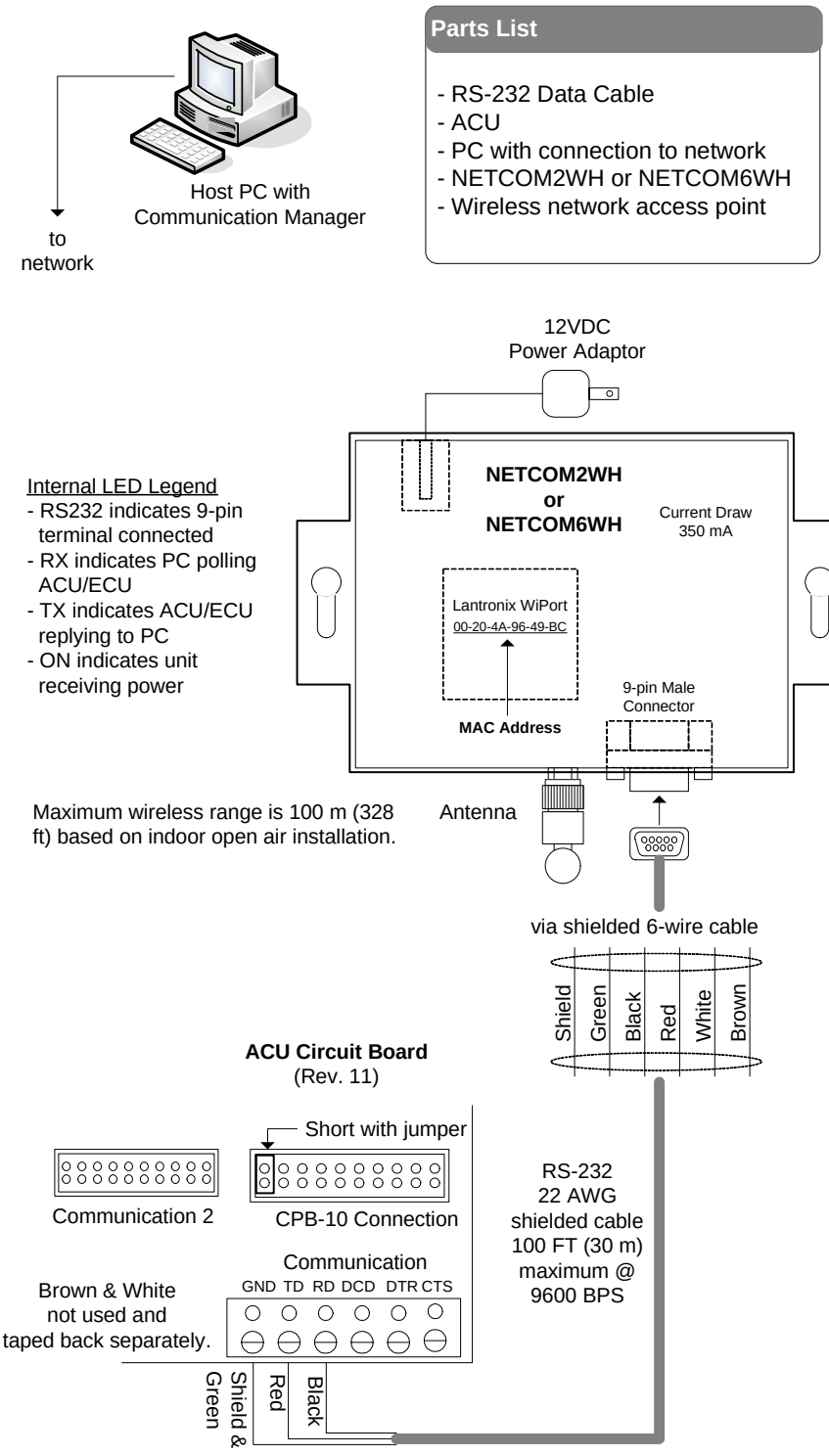


Figure 58 - Single ACU Communication - CB-485M/MC33H

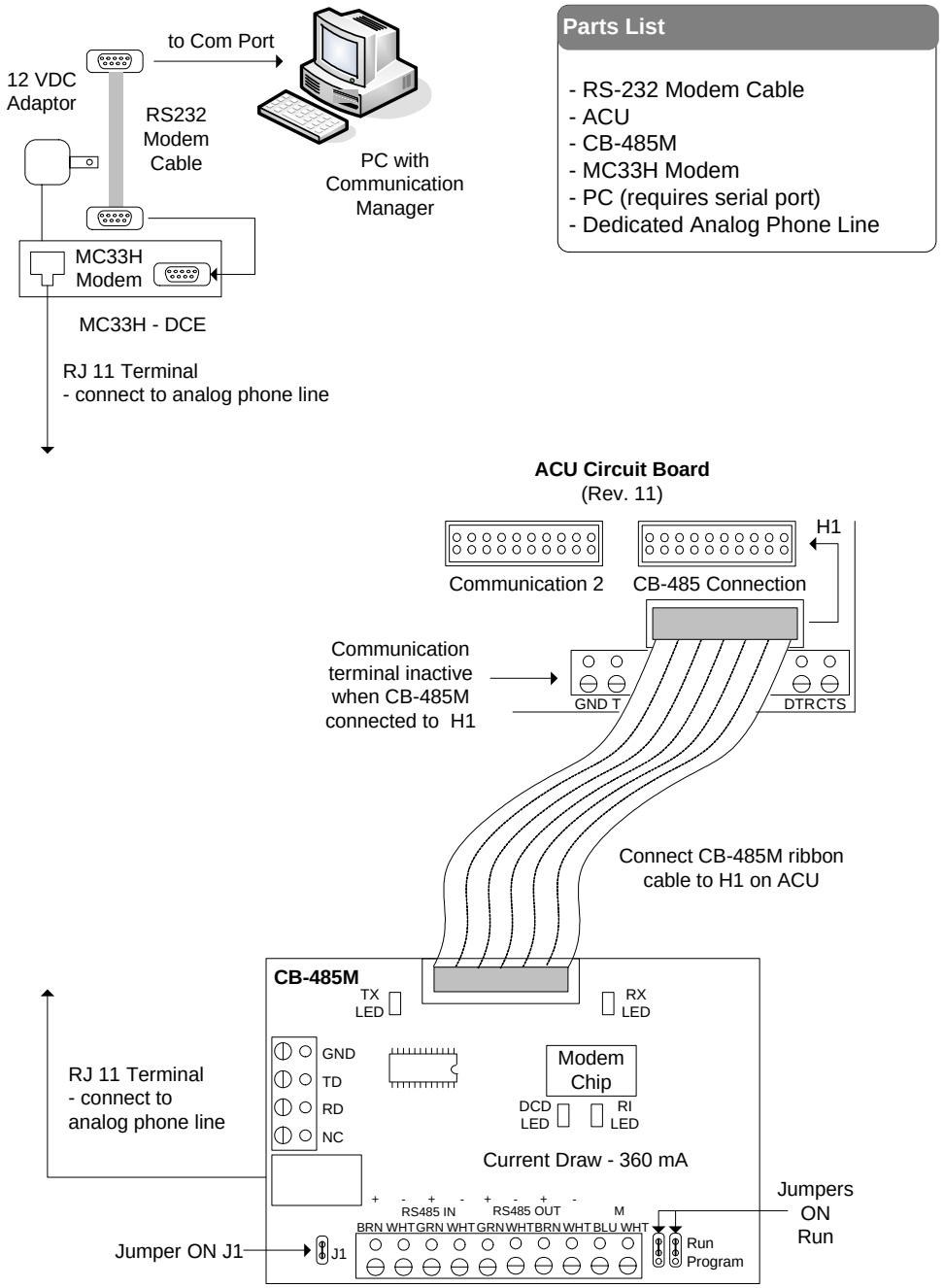
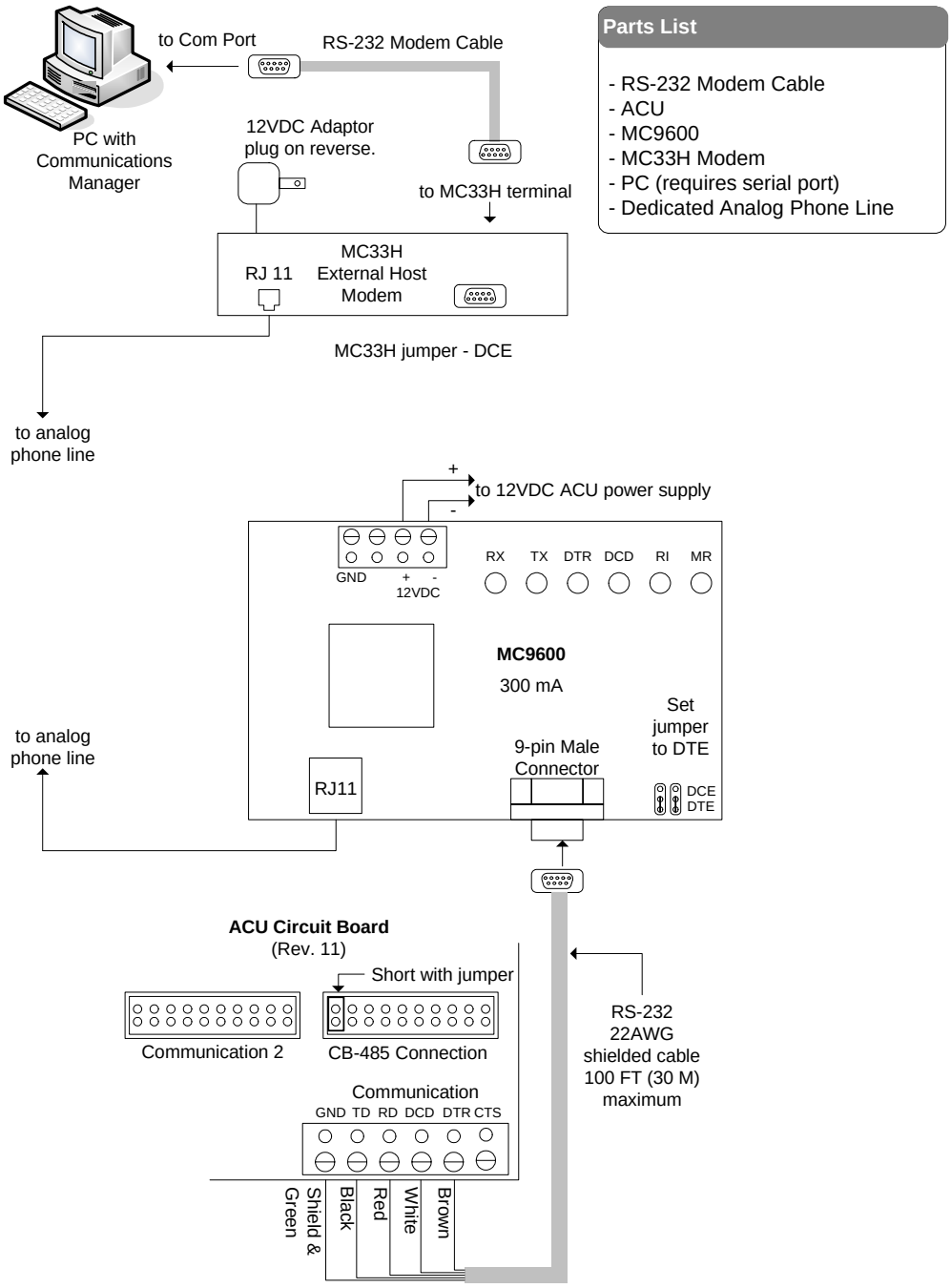


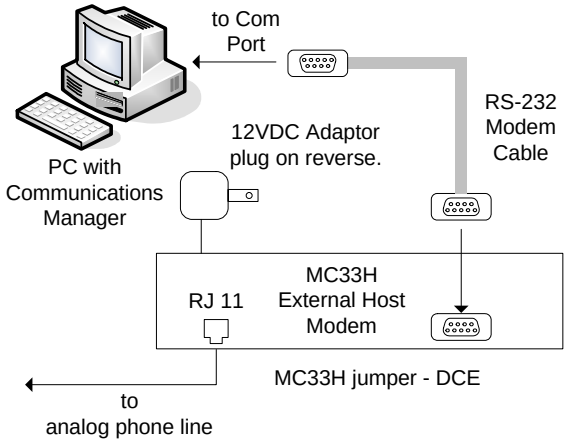
Figure 59 - Single ACU Communication - MC9600/MC33H



Parts List

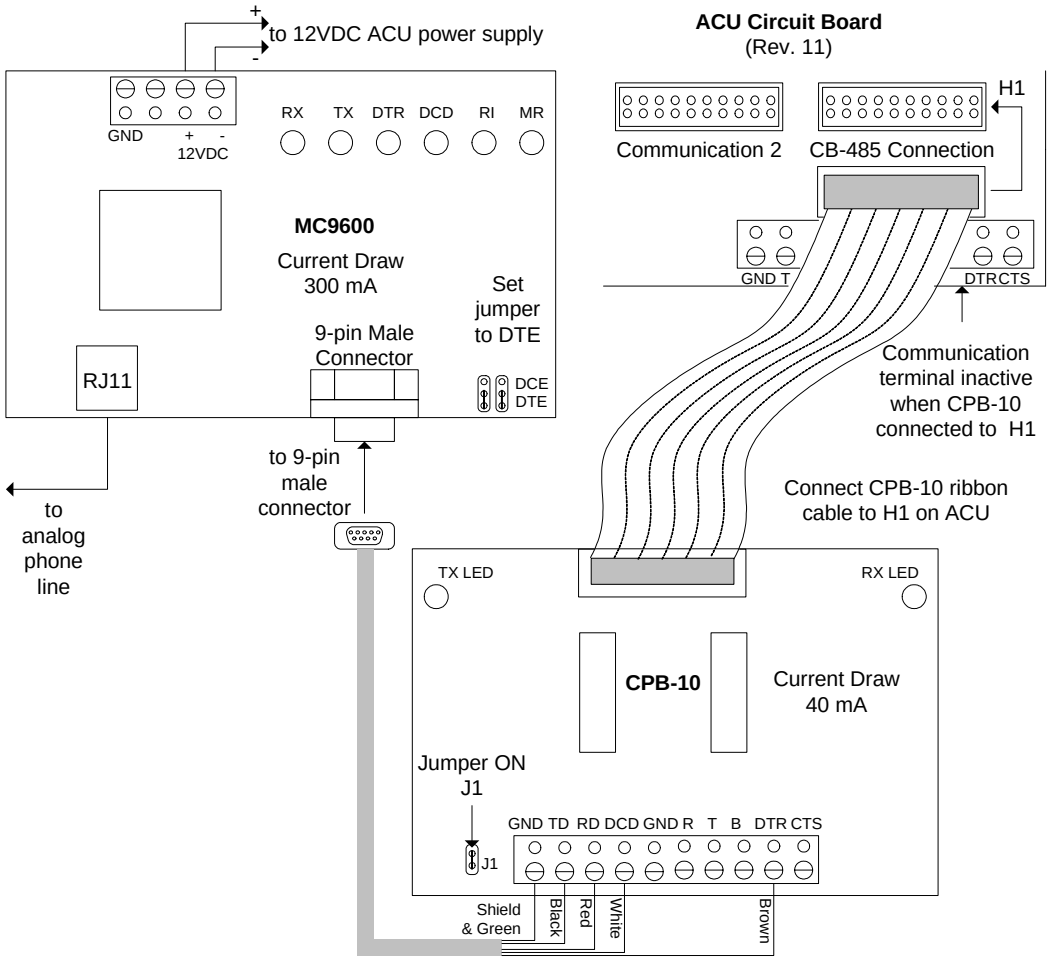
- RS-232 Modem Cable
- ACU
- MC9600
- MC33H Modem
- PC (requires serial port)
- Dedicated Analog Phone Line

Figure 60 - Single ACU Communication - MC9600/MC33H/CPB-10



Parts List

- RS-232 Modem Cable
- RS-232 Data Cable
- ACU
- MC9600
- MC33H Modem
- CPB-10
- PC (requires serial port)
- Dedicated Analog Phone Line



Multiple ACU Communication

The following table reviews supported communication modes, devices, and applicable wiring diagrams/parts list for multiple ACU communication loops.

Table 10 - Multiple ACU Communication

Mode	Devices	Figure
Serial	CB-485	Figure 61
Serial	CPB-10	Figure 62
USB	USB Adaptor/CB-485 (RS-232)	Figure 63
USB	USB Adaptor/CB-485 (RS-485)	Figure 64
USB	USB Adaptor/CPB-10	Figure 65
Network (TCP/IP)	NETCOM2P or NETCOM6P/CB-485	Figure 66
Network (TCP/IP)	NETCOM2 or NETCOM6/CPB-10	Figure 67
Network (TCP/IP)	NETCOM2P or NETCOM6P/CB-485 (1 to 1)	Figure 68
Network (TCP/IP)	NETCOM2 or NETCOM6 (1 per ACU)	Figure 69
Wireless Network (TCP/IP)	NETCOM2WH or NETCOM6WH/CB-485	Figure 70
Wireless Network (TCP/IP)	NETCOM2WH or NETCOM6WH/CPB-10	Figure 71
Wireless Network (TCP/IP)	NETCOM2WH or NETCOM6WH (1 per ACU)	Figure 72
Modem	CB-485M/CB485/MC33H	Figure 73
Modem	MC9600/MC33H/CPB-10	Figure 74

CPB-10

The CPB-10 does not have optical isolation protection and should not be used between two or more buildings. Other options such as a fiber modem, or short haul modem with optical isolation should be used between buildings.

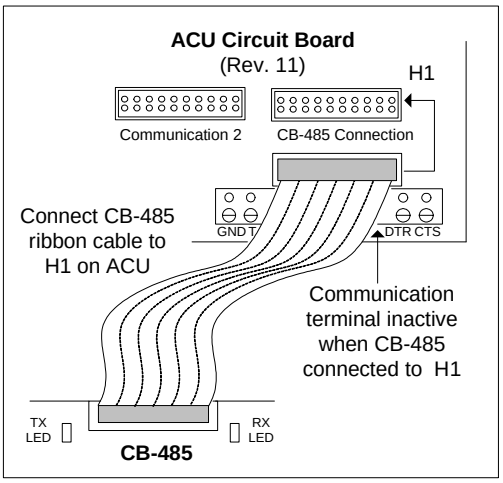
MAC Address

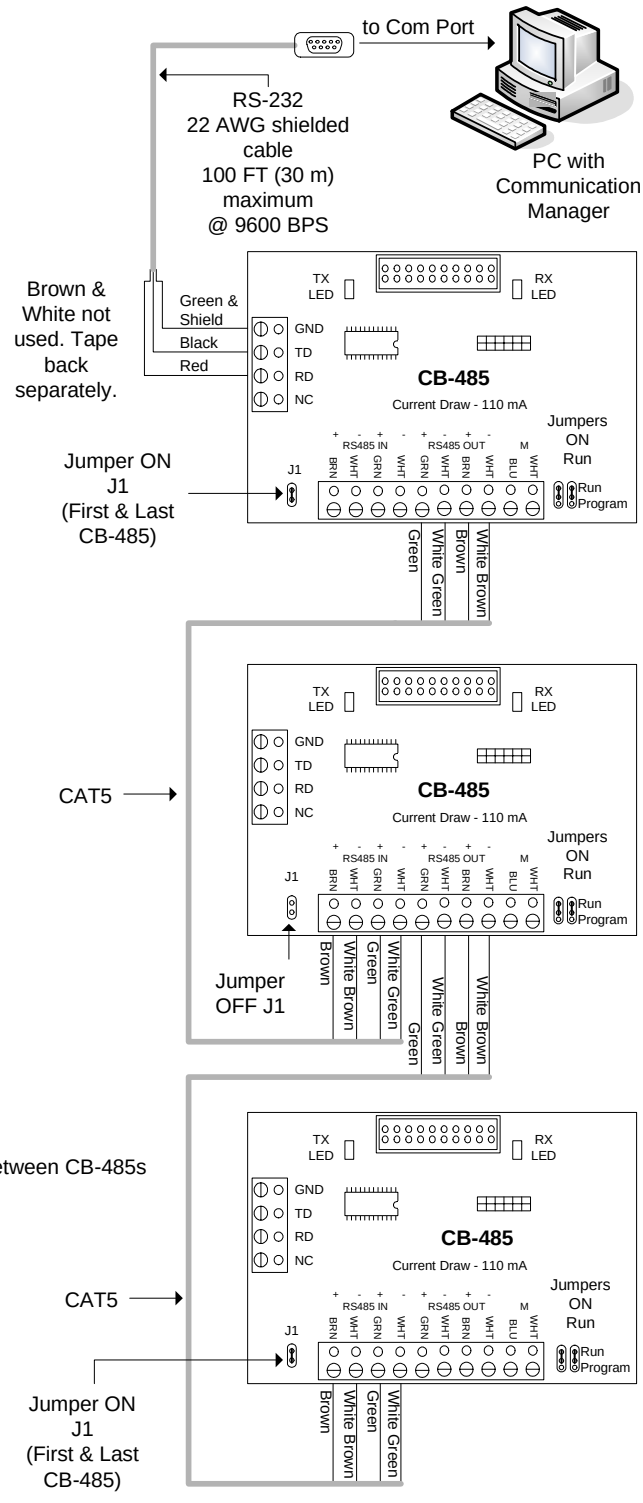
Record the MAC address listed on the NETCOM or NETCOMP serial to TCP/IP convertor. This number is required when programming the device with the Keyscan utility software.

Figure 61 – Multiple ACU Communication – CB-485

Parts List

- PC (with serial port)
- CAT5 Cable - 2 twisted pairs
- ACU
- CB-485
- RS232 Data Cable





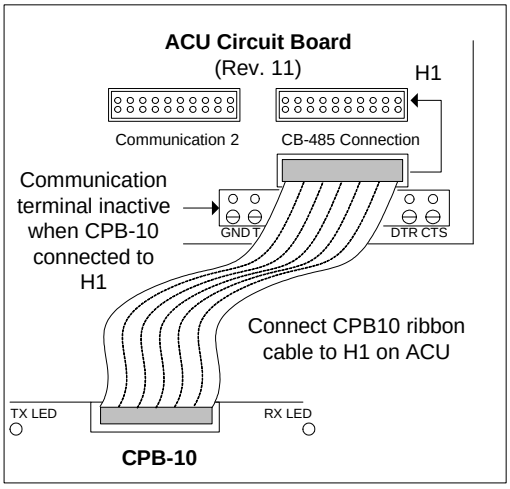
CAT5

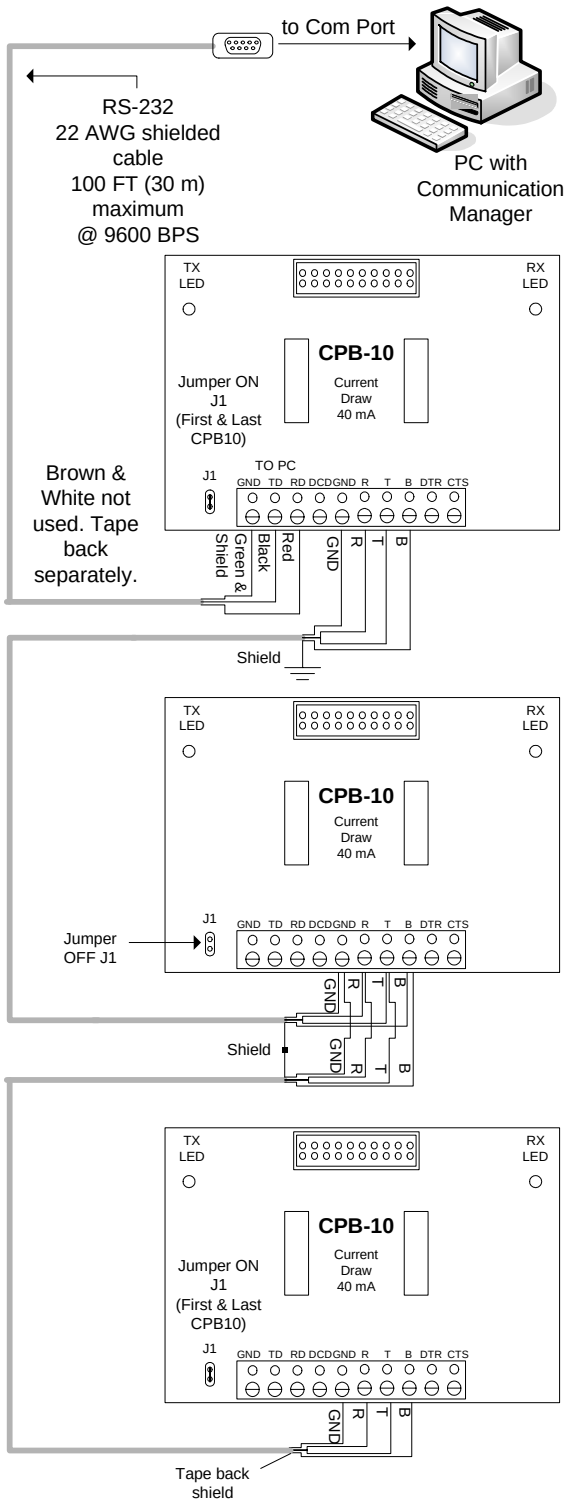
- RS485 cable maximum 2000 ft (609 m) @ 9600 BPS between CB-485s
- may substitute equivalent to CAT 5 - 2 twisted pairs
- maximum baud rate is 56,000 BPS

Figure 62 – Multiple ACU Communication – CPB-10

Parts List

- PC (with serial port)
- 22 AWG 4 conductors shielded cable
- ACU
- CPB-10
- RS232 Data Cable





CPB-10

- supports parallel and star communication (diagram shows CPB-10 in parallel communication)
- maximum distance 1st to last CPB-10 - 4000 ft (1219 m)
- maximum distance between CPB-10s - 2000 ft (609 m)
- see MISCOMM2 for inter-building communication on a CPB-10 communication loop

Figure 63 – Multiple ACU Communication – USB Adaptor/CB-485 (RS-232)

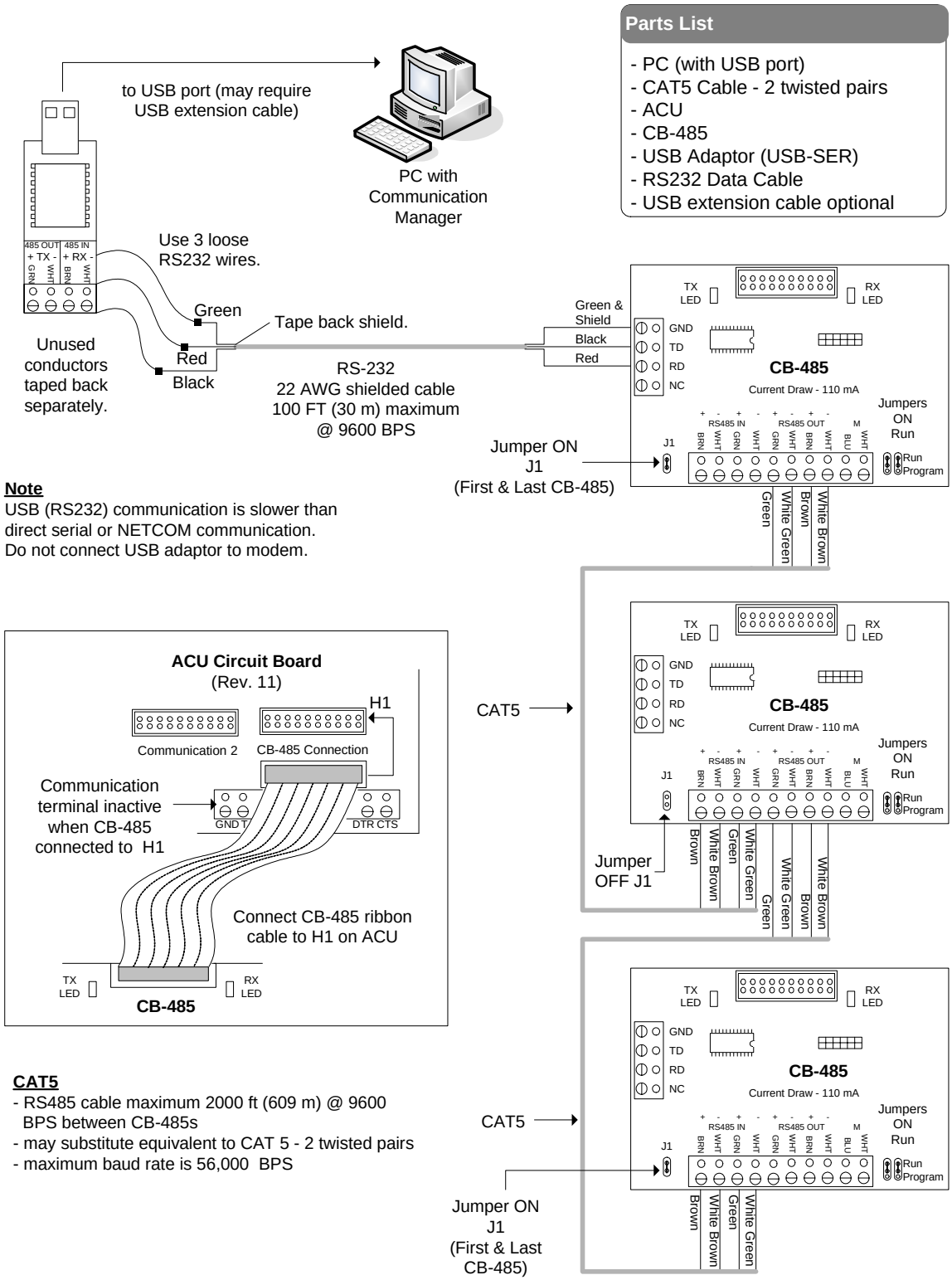


Figure 64 - Multiple ACU Communication - USB Adaptor/CB-485 (RS-485)

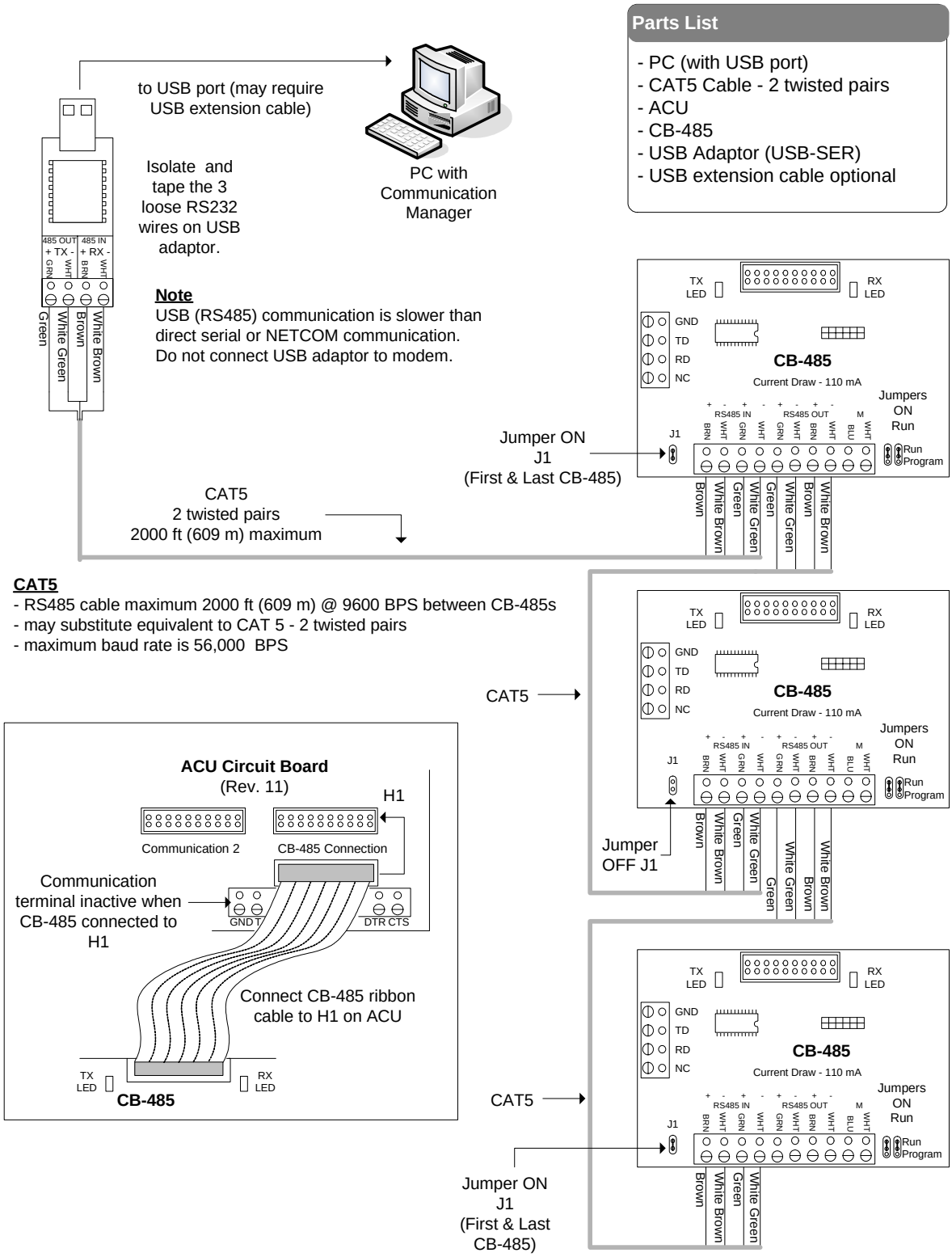


Figure 65 - Multiple ACU Communication - USB Adaptor/CPB-10

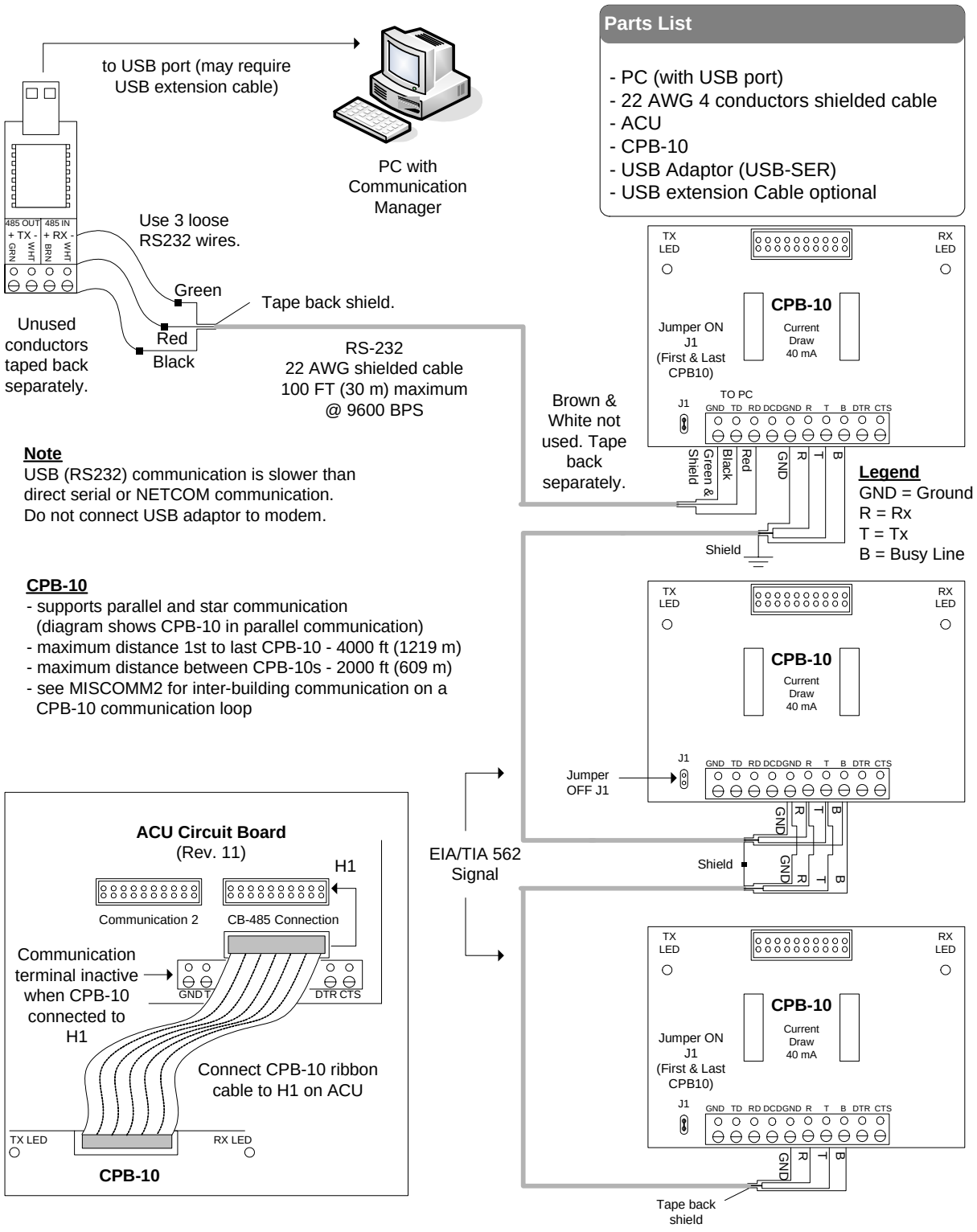


Figure 66 - Multiple ACU Communication - NETCOM2P or NETCOM6P/CB-485

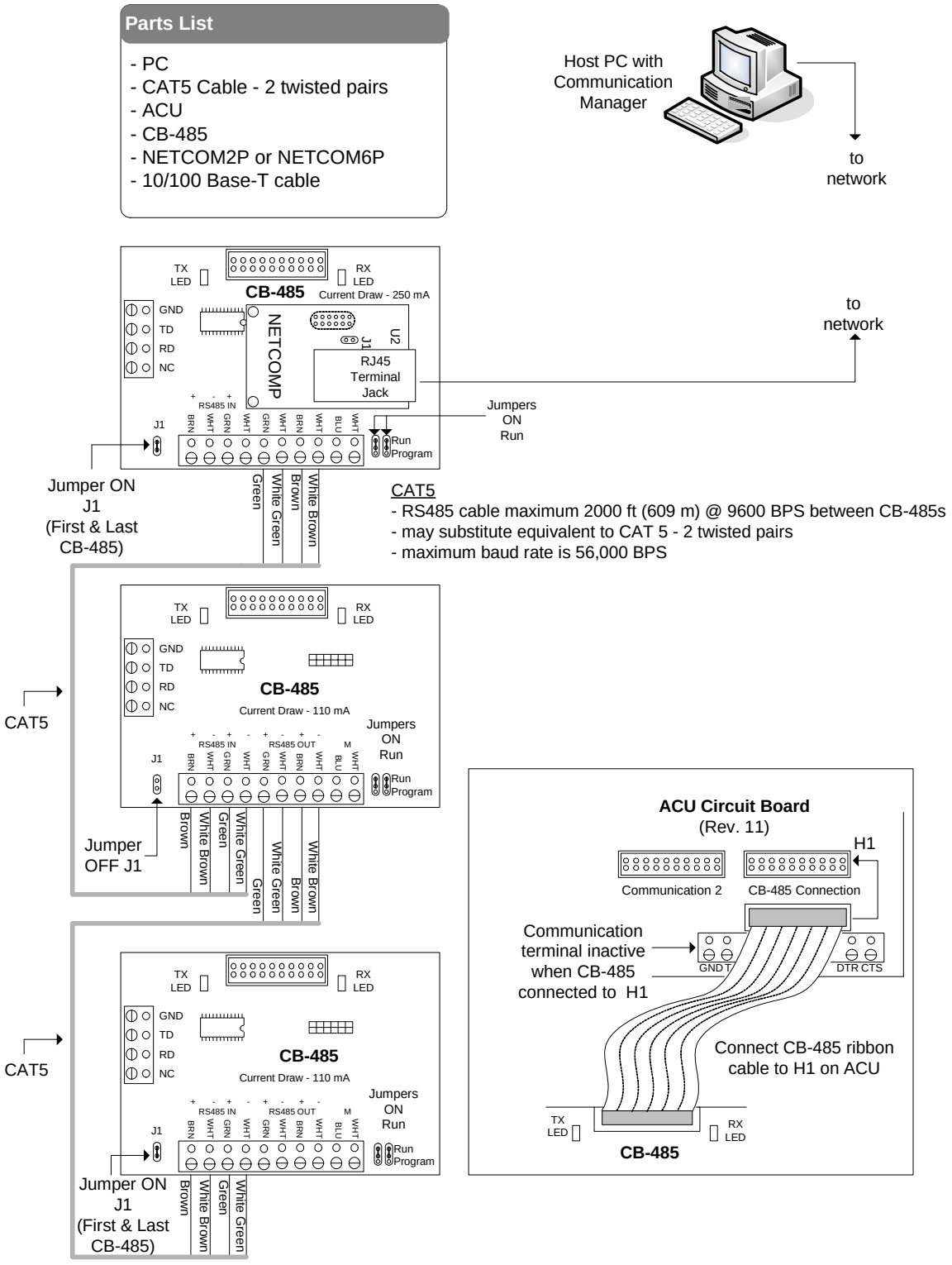


Figure 67 - Multiple ACU Communication - NETCOM2 or NETCOM6/CPB-10

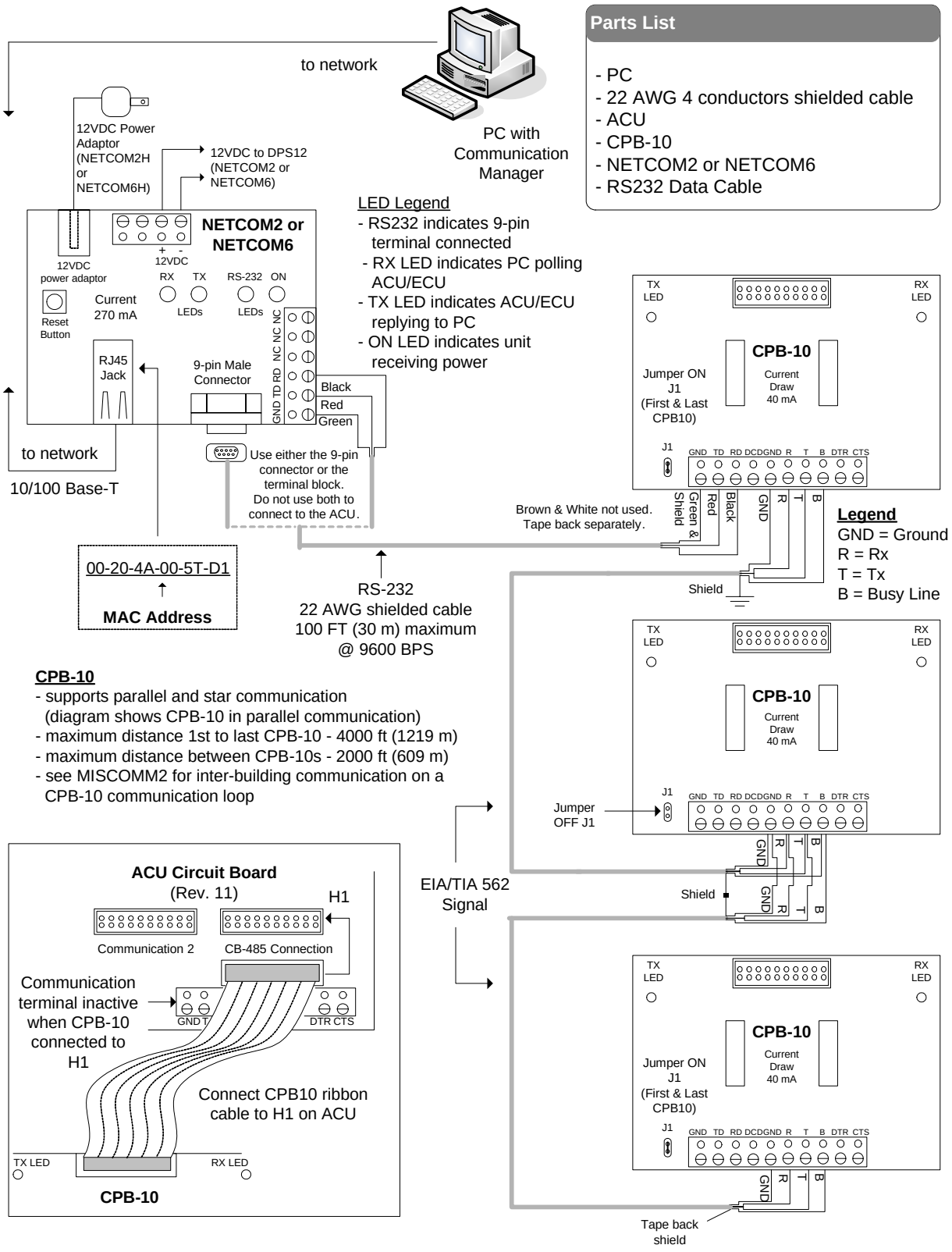


Figure 68 - Multiple ACU Communication - NETCOM2P or NETCOM6P/CB-485 (1 to 1)

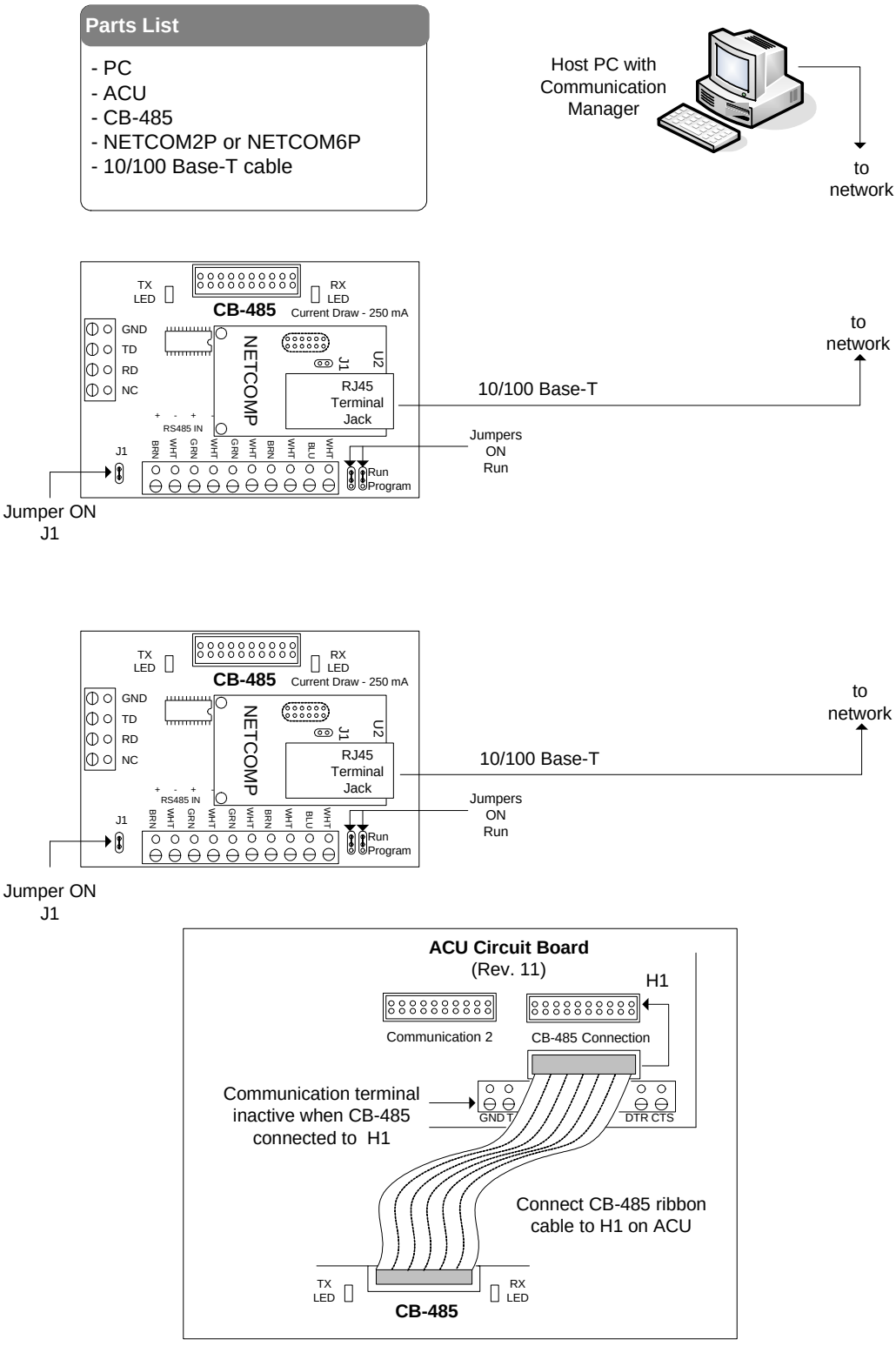


Figure 69 - Multiple ACU Communication - NETCOM2 or NETCOM6 (1 per ACU)

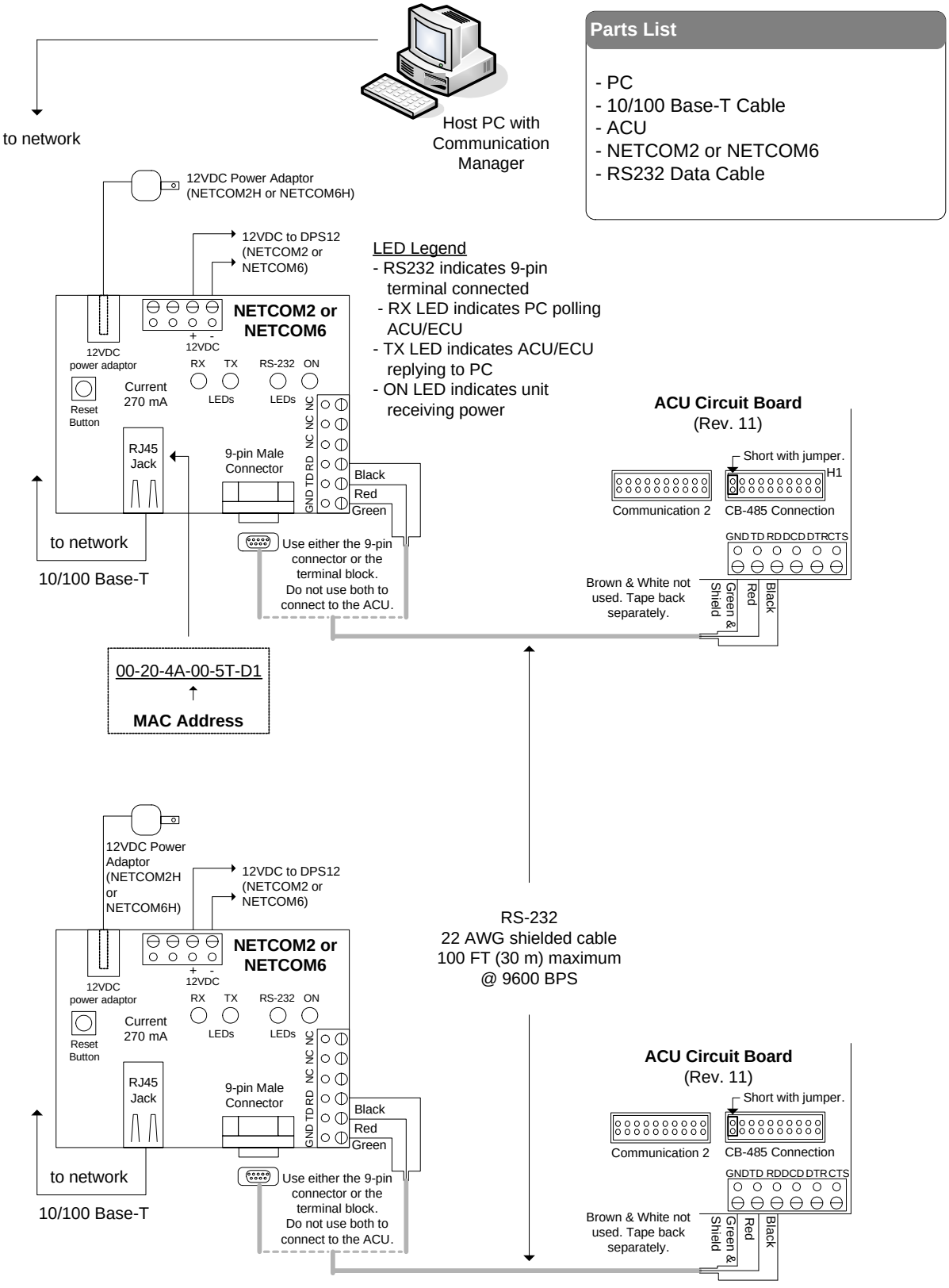


Figure 70 - Multiple ACU Communication - NETCOM2WH or NETCOM6WH/CB-485s

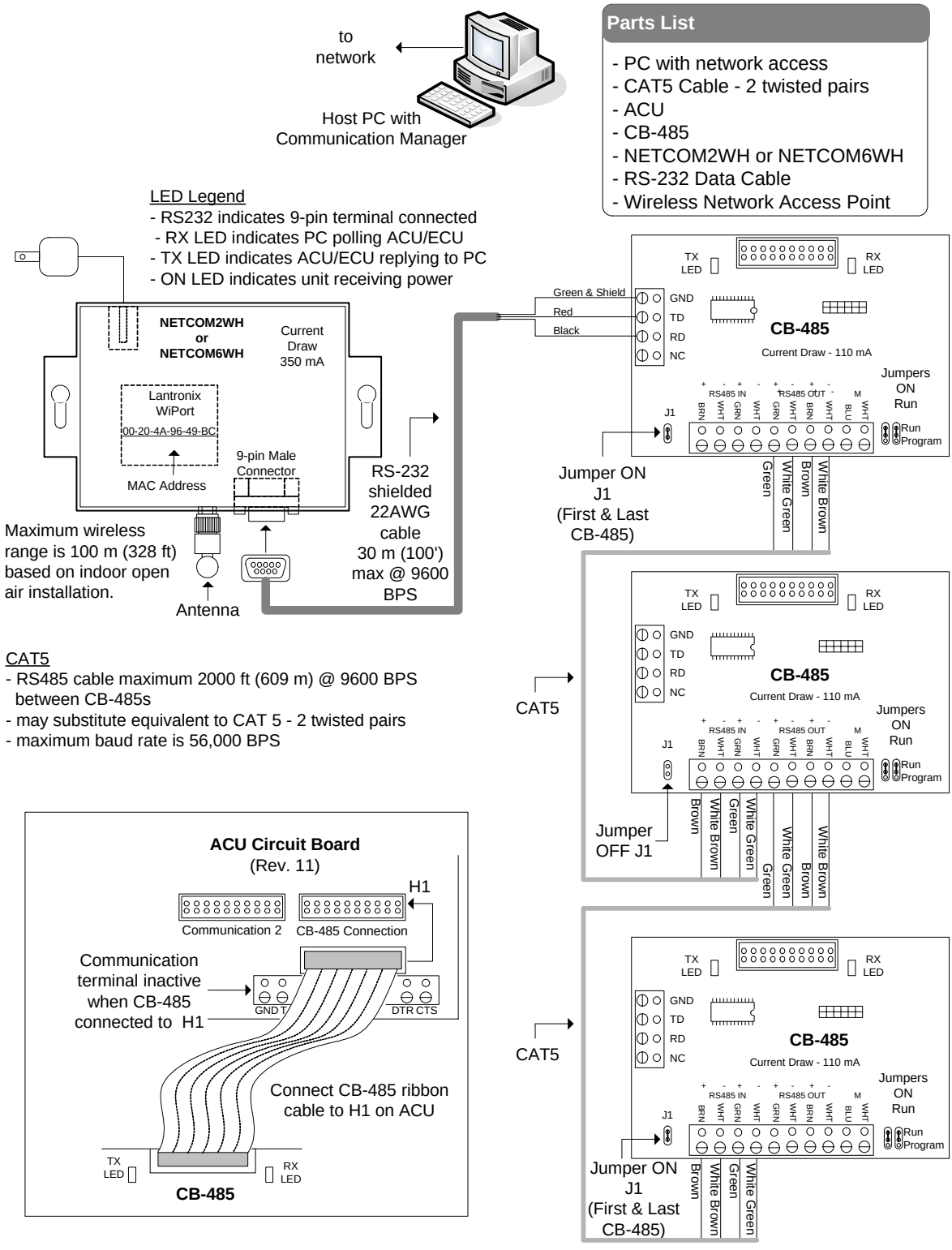


Figure 71 - Multiple ACU Communication - NETCOM2WH or NETCOM6WH/CPB-10s

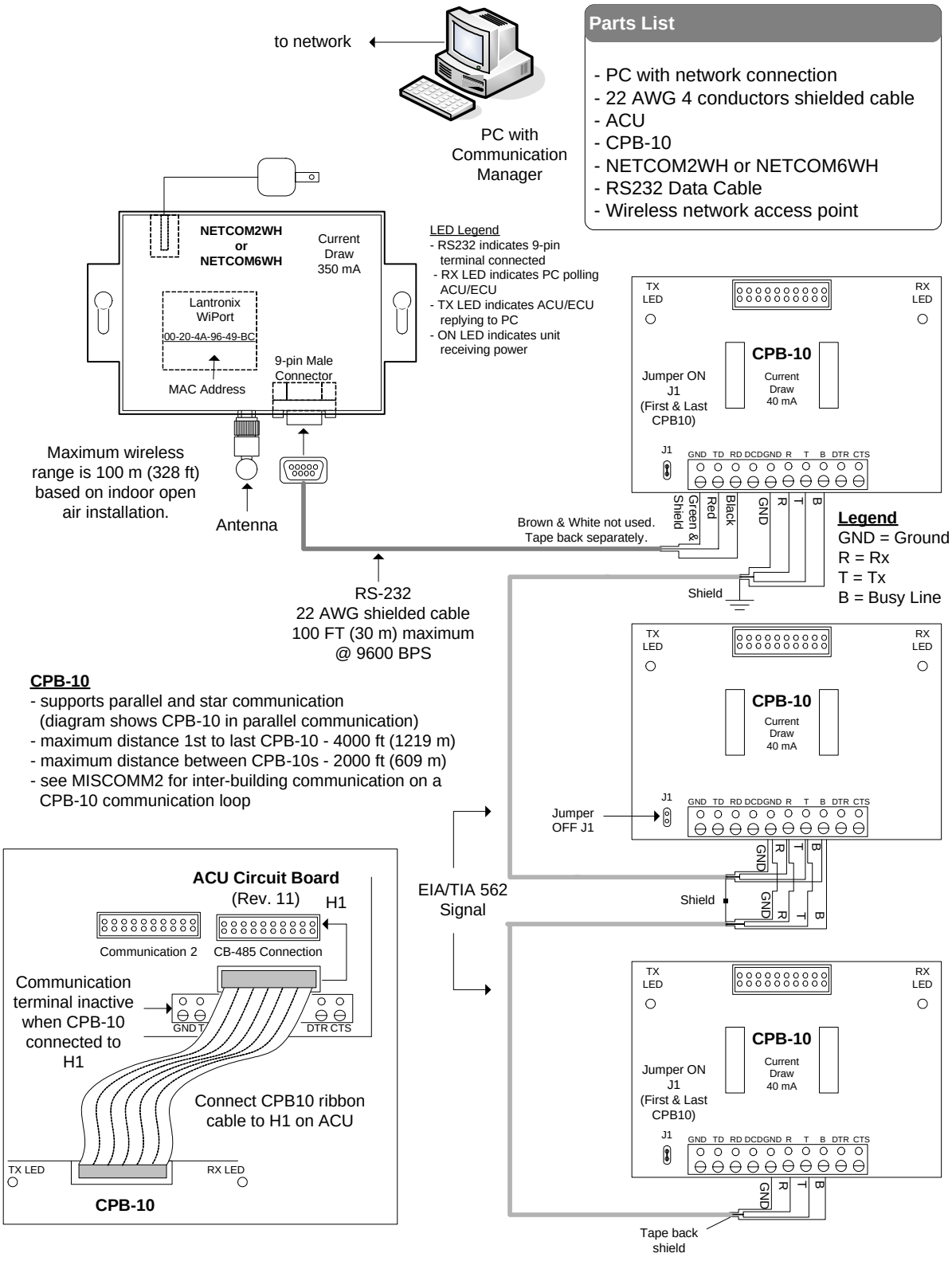


Figure 72 - Multiple ACU Communication - NETCOM2WH or NETCOM6WH / 1 per ACU

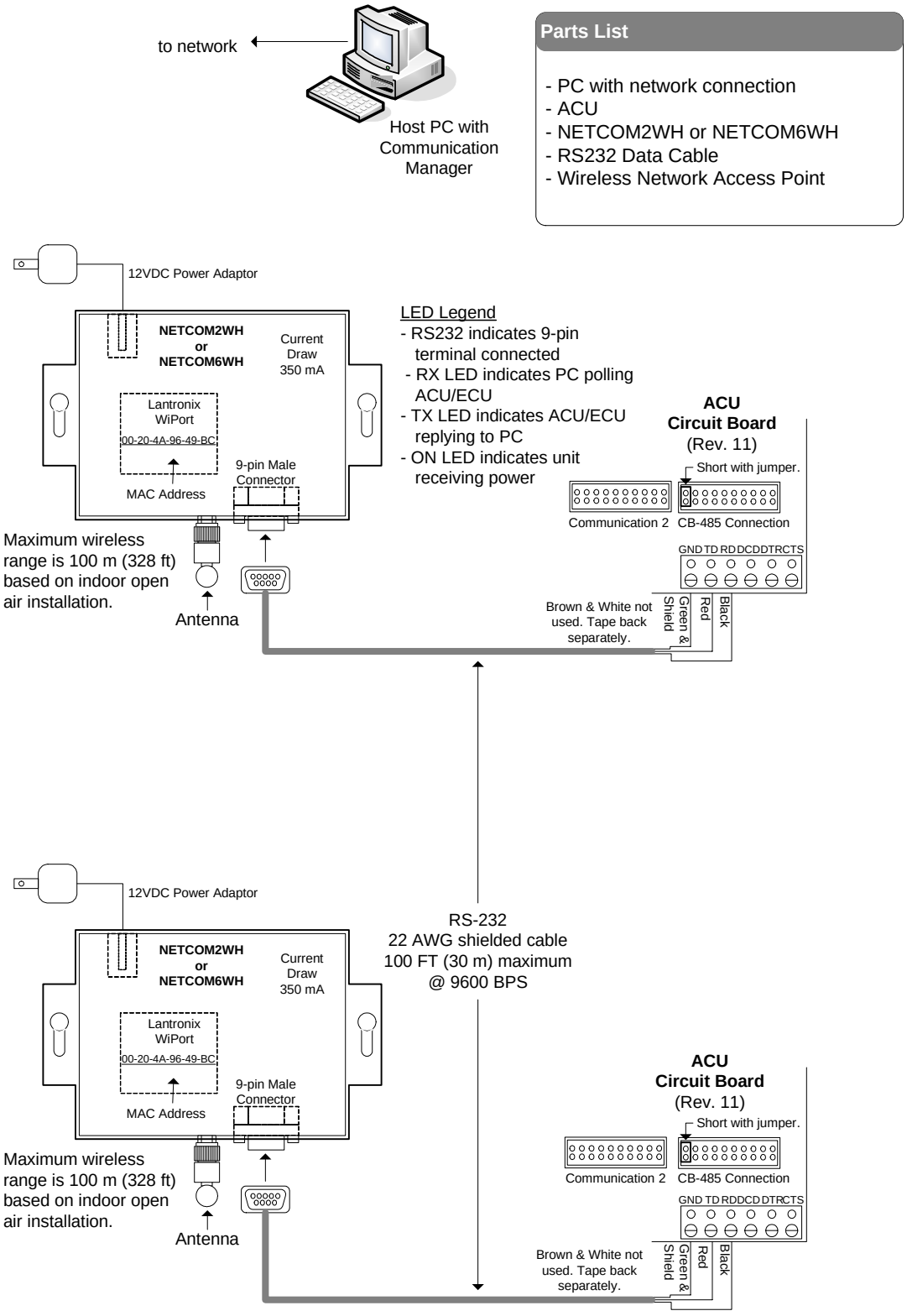
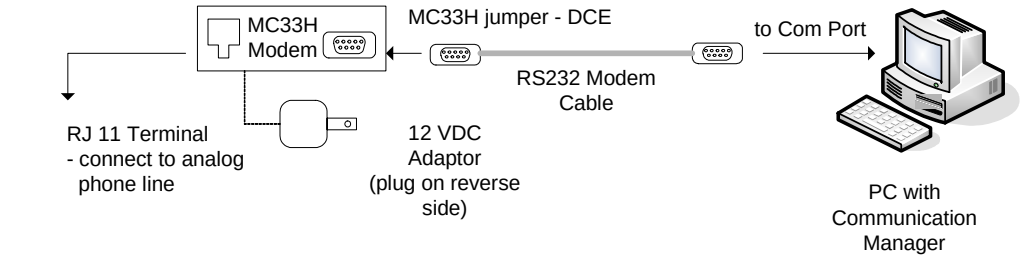
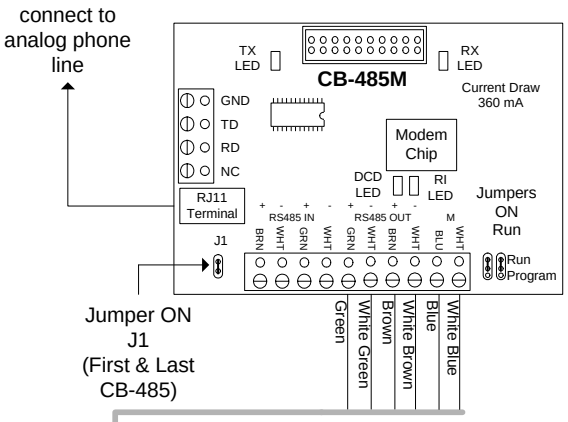
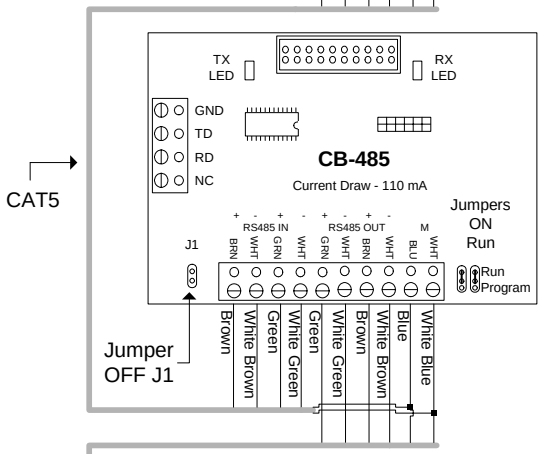
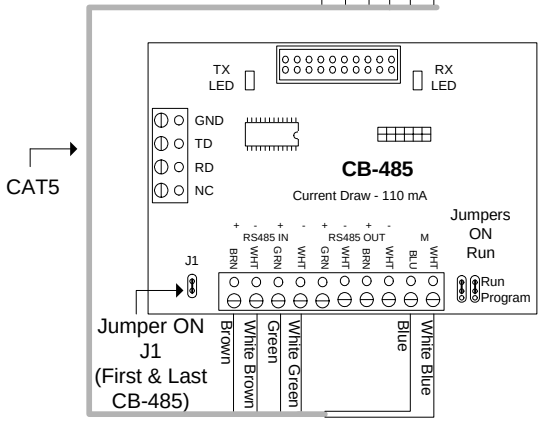


Figure 73 - Multiple ACU Communication - CB-485M/CB-485/MC33H









Parts List

- PC
- CAT5 Cable - 3 twisted pairs
- ACU
- CB-485
- CB485M
- MC33H Modem
- RS232 Modem Cable
- Dedicated Analog Phone Line

CAT5

- RS485 cable maximum 2000 ft (609 m) @ 9600 BPS between CB-485s
- may substitute equivalent to CAT 5 - 3 twisted pairs
- maximum baud rate is 19,200 with CB-485M

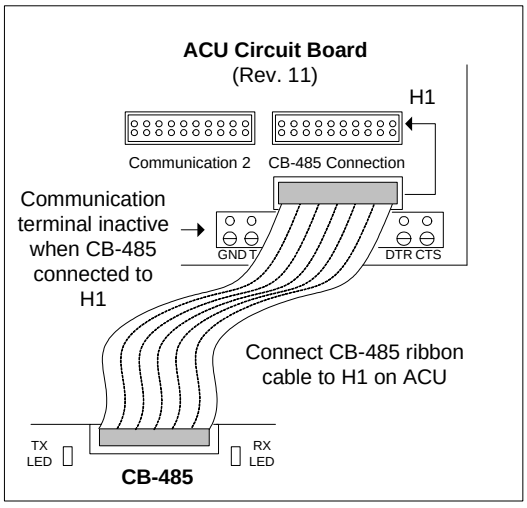
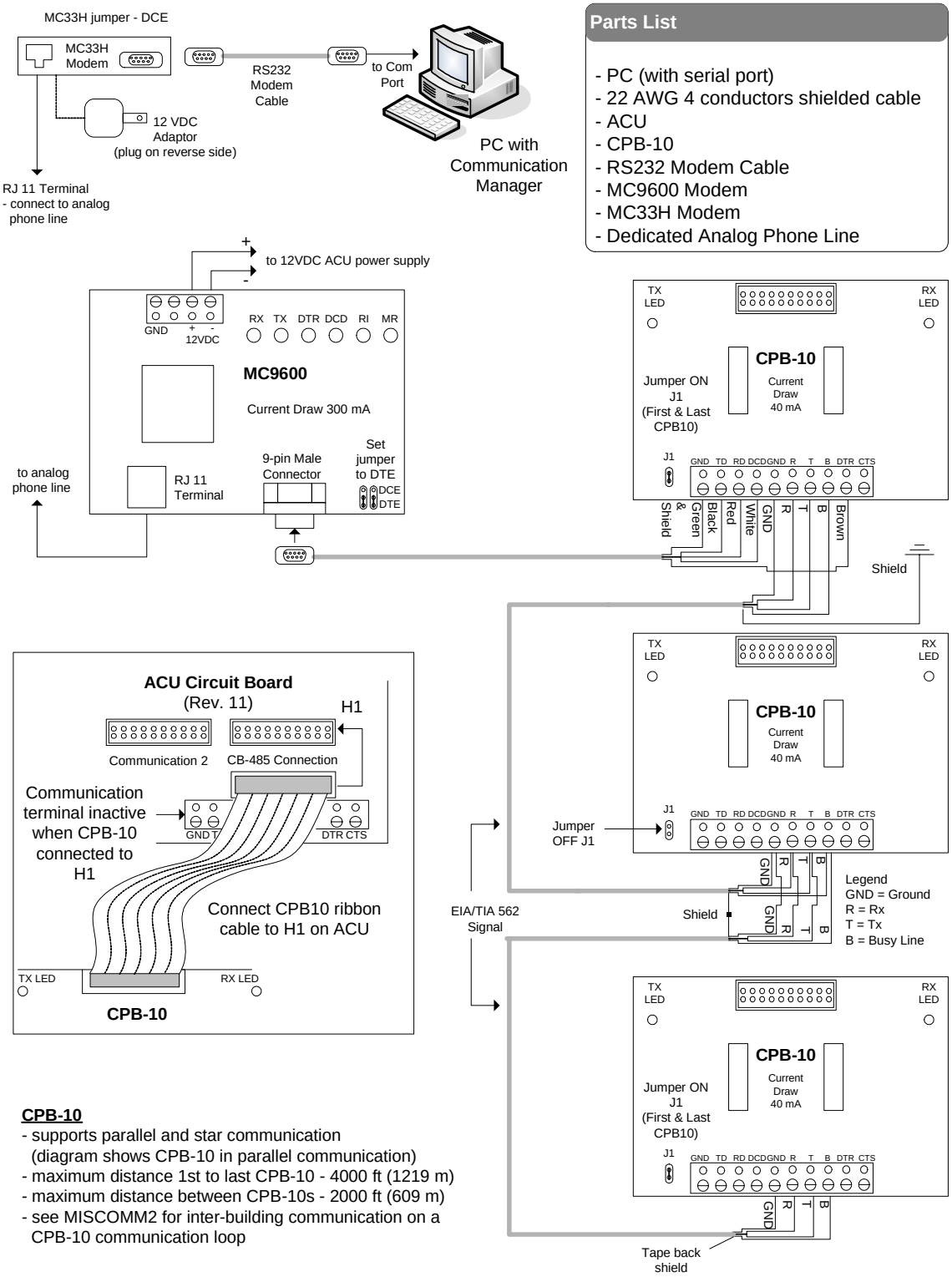


Figure 74 - Multiple ACU Communication - MC9600/CPB-10/MC33H

Important - see Communication Jumper J16 for Multiple ACUs with Modem/CPB-10 Configuration on next page.

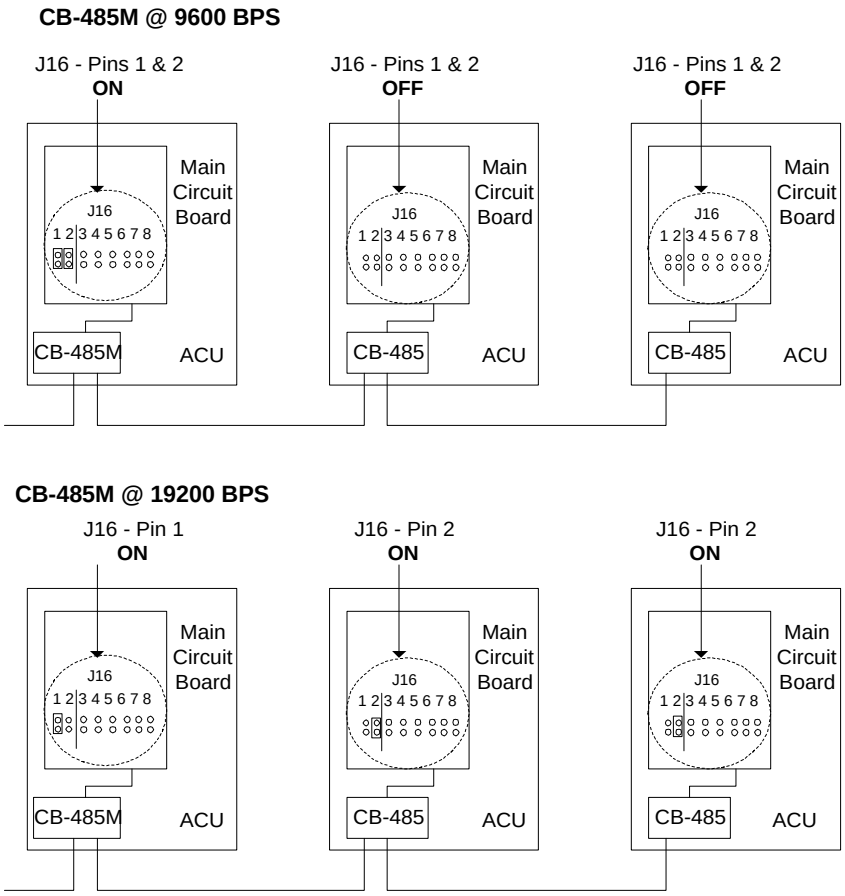


CPB-10

- supports parallel and star communication (diagram shows CPB-10 in parallel communication)
- maximum distance 1st to last CPB-10 - 4000 ft (1219 m)
- maximum distance between CPB-10s - 2000 ft (609 m)
- see MISCOMM2 for inter-building communication on a CPB-10 communication loop

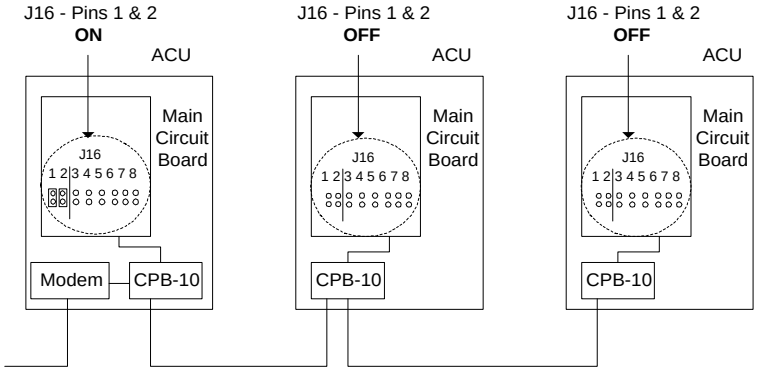
Communication Jumper J16 for Multiple ACUs with CB-485M/CB-485 Configuration

On the ACU that is connected to the CB-485M (modem), set the main circuit board's communication to 9600 (pins 1 & 2) or 19,200 (pin 1) Keyscan Modem. On the remaining ACUs connected by CB-485s, set communication to the equivalent Keyscan serial baud rate.



Communication Jumper J16 for Multiple ACUs with Modem/CPB-10 Configuration

On the ACU that is connected to the modem, set the main circuit board's communication to 9600 Keyscan Modem. On the remaining ACUs connected by CPB-10s, set communication to 9600 Keyscan Serial.



Communication LEDs

The CA 230, CA 4300, CA 8300, EC 1300, EC 2300, CB-485, and CPB-10 have on-board communication LEDs for diagnostic and troubleshooting. The table below outlines the LED and its diagnostic function. When calling Keyscan for technical support, indicating the state of the LED will assist our technicians in isolating potential difficulties.

Table 11 - Communication LEDs

All CA & EC boards	
LED	**State of LED**
Green LED – TD	Flashing: Normal – Replying to PC Not Illuminated – No response Illuminated – Power or wiring fault
Red LED – RD	Flashing: Normal – Polling PC Not Illuminated – No response Illuminated – Power or wiring fault
CB-485/CPB-10	
LED	**State of LED**
Green LED – TX	Flashing: Normal – Replying to PC Not Illuminated – No response Illuminated – Power or wiring fault
Red LED – RX	Flashing: Normal – Polling PC Not Illuminated – No response Illuminated – Power or wiring fault
Red LED – B	Not Illuminated – Normal Illuminated – One of the following conditions exists: a) Alarm in queue b) Communication Manager's Unit Diagnostics communicating with PC c) Modem is dialing out

Figure 75 - Communication LEDs CA & EC boards

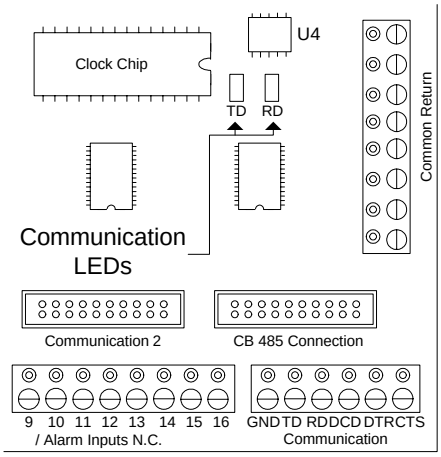


Figure 76 - Communication LEDs on CB-485

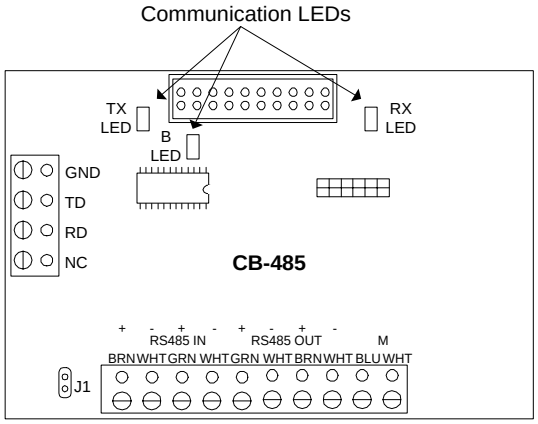
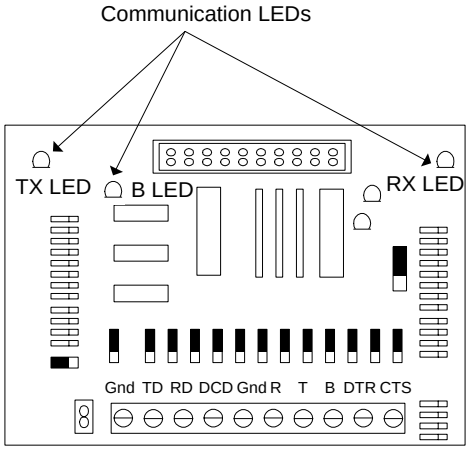


Figure 77 - Communication LEDs on CPB-10



Power-up and Test Voltages

Power Supply Specifications

The power supply for the ACUs and ECUs is a dual power supply with 2 linear DC outputs. Each output is rated at 12VDC – 1.2 Amp.

Wiring Connections

Before connecting power to the ACU, be sure to observe the following points:

- check the cable and wire connections
- ensure no short circuits exist when measuring voltages
- verify the DC polarity is correct for all equipment

Following the above guidelines ensures each device will function properly and not be damaged.

System Power-up Steps

1. Connect 12VDC power, Power Fail Detect, and Earth Ground to the ACU circuit board.
2. Connect backup battery.
3. Connect 2 x 16V 40VA or 16.5V 37VA Class 2 transformers. Must be CSA/UL approved transformers.
4. Repeat battery and transformer connections for additional power supplies.
5. After power is applied to the ACU, check ACU voltage test points. Refer to Table 12 and Table 13.
6. Load factory default settings by momentarily shorting the 2 pins on Clear Memory Jumper J1 on the ACU main circuit board while the ACU is powered. Do not short Jumpers J6 or J8 otherwise the factory default settings will not load properly and result in communication difficulties.
7. When all voltage and current measurements are verified as correct, you are ready to upload the database to the ACUs. Refer to the Client on-line help.

Notes

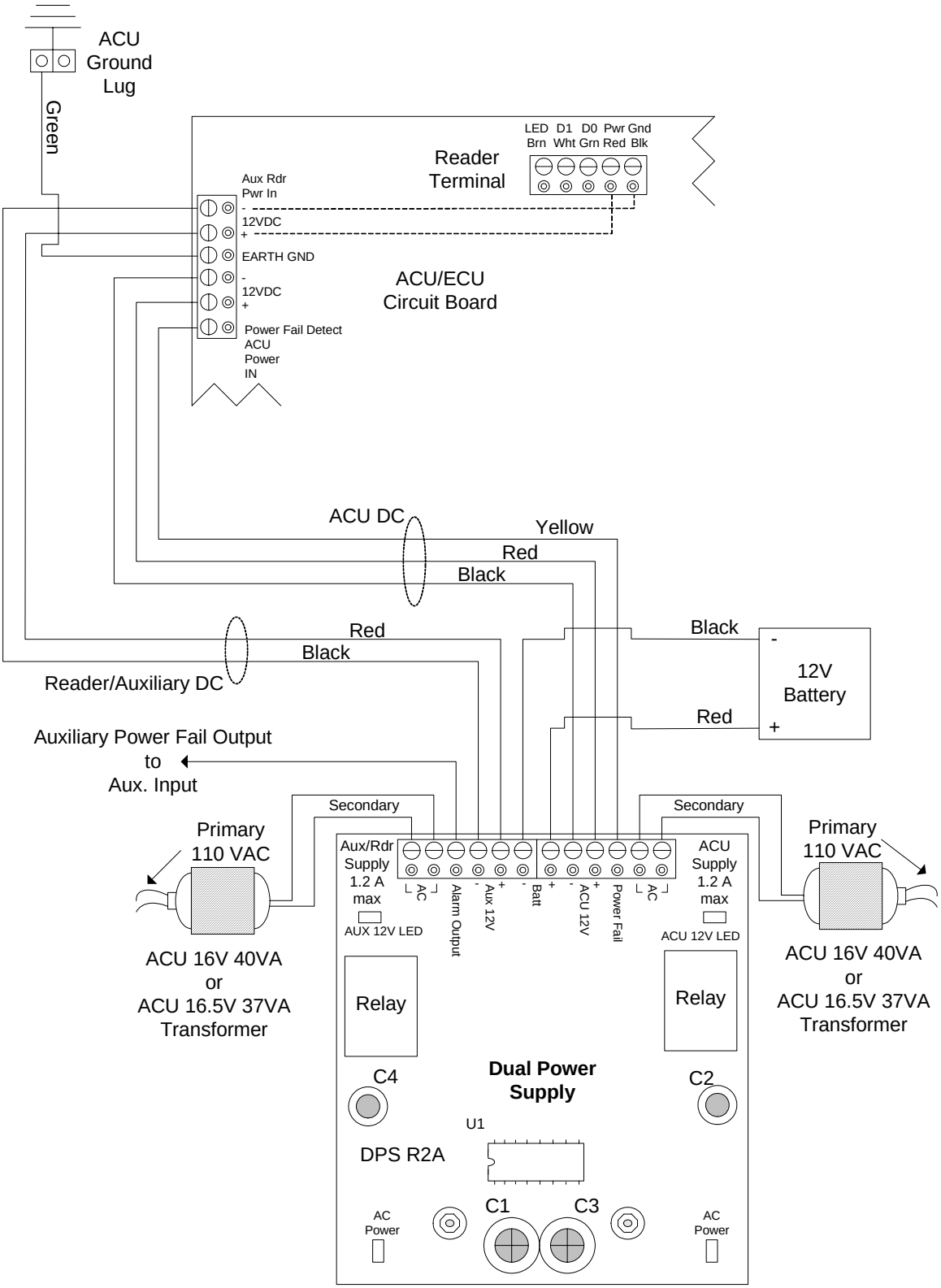
ACU's DC power input x 2.

For battery circuit and auxiliary power output to function, 2 transformers must be connected.

If any reader exceeds 150mA, connect reader red wire directly to separate DC supply's positive (+) terminal.

For monitoring an auxiliary power failure, the Auxiliary Power Fail Output terminal can be connected to an Auxiliary Input on the ACU's main circuit board.

Figure 78 - Power Supply Wiring



Controller Voltage Test Points

The following table outlines the correct voltages for the test points on the ACU main circuit boards. Be sure to review the notes opposite the appropriate voltage test points to comply with proper measuring techniques or special circumstances.

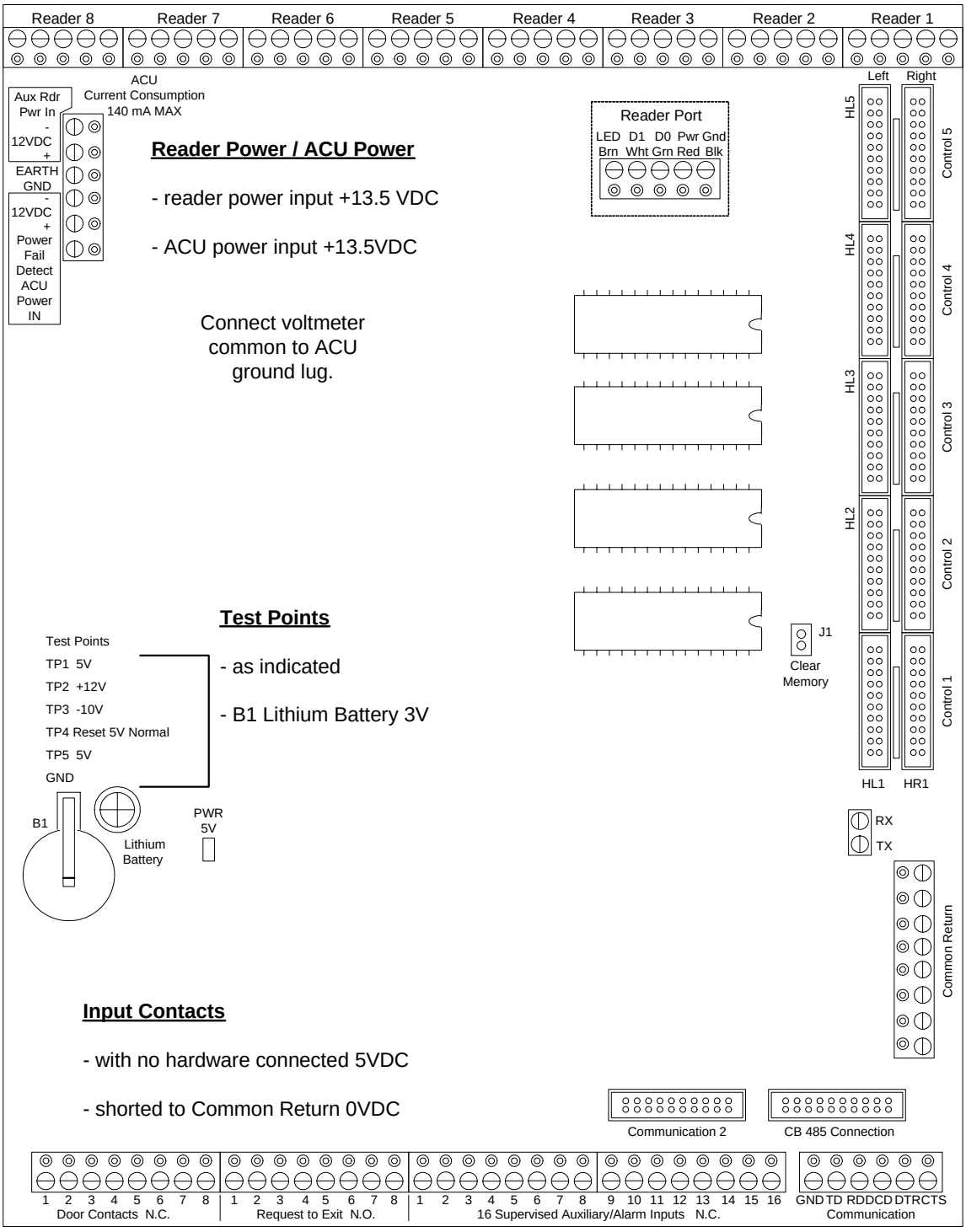
Voltmeter Connections

- Voltmeter set to VDC
- V-Ω to test points
- Com to ground lug in ACU enclosure

Table 12 - Controller Test Points - Voltages

Board Test Point	Voltage	Instructions/Notes
Reader Terminal		
D1 WHT	(+) 5VDC	White data 1
D0 GRN	(+) 5VDC	Green data 0
PWR RED	(+) 12VDC	Red DC Out
Reader Power Input	(+) 13.5VDC	Measure the + contact
ACU Power Input	(+) 13.5VDC	Measure the + contact
TP1	(+) 5VDC	
TP2	(+) 12VDC	
TP3	(-) 11VDC	TP3 voltage (-) 11VDC
TP4	(+) 5VDC	Measure TP4 for 1 minute. If voltage constant at 5VDC, board processor OK If voltage fluctuates or drops to 0VDC, board processor faulty.
TP5	(+) 5VDC	
B1 – Lithium Battery	(+) 3VDC	Voltmeter V-Ω contact to metallic circle of lithium battery
Input Points		
Input points with open circuit	(+) 5VDC	
Input points shorted to common return	0VDC	

Figure 79 - Controller Test Points – Voltages



Controller Test Points – Communication Terminal

The following table outlines the correct voltages for the test points on the communication terminal on the ACU, the CB-485 or the CPB-10.

Table 13 – Communication Voltage Test Points

Communication Test Point	Voltage	Instructions/Notes
ACU Communication Terminal RS-232 connected to ACU		Connect Voltmeter COM to GND on ACU Communication terminal block or green on data cable.
GND		
TD	(-) 9VDC	TD is an ACU generated voltage
RD	(-) 10VDC	RD is a PC generated voltage
DCD		Used for modems only
DTR	n/a	
CTS	n/a	
CB-485 At all ACUs		Connect Voltmeter COM to GND on ACU Communication terminal block or green on data cable. Remove jumper to plug in ribbon.
GND		.
GRN+	3.5VDC	
WHT-	1.5VDC	
BRN+	3.5VDC	
WHT-	1.5VDC	
TD	(-) 7VDC	TD is an ACU generated voltage
RD	(-) 7VDC	RD is a PC generated voltage
Important	When a CB-485 is used, the Communication terminal block on the ACU main circuit board is in-active. Measure only the CB-485 Communication terminal.	
CPB 10 At all ACUs		Connect Voltmeter COM to GND on ACU Communication terminal block or green on data cable. Remove jumper to plug in ribbon.
GND		.
R	12.8VDC	
T	12.8VDC	
TD	(-) 11VDC	TD is an ACU generated voltage
RD	(-) 10VDC	RD is a PC generated voltage
Important	When a CPB-10 is used, the Communication terminal block on the ACU main circuit board is in-active. Measure only the CPB-10 Communication terminal.	

Figure 80 – ACU Communication Test Points

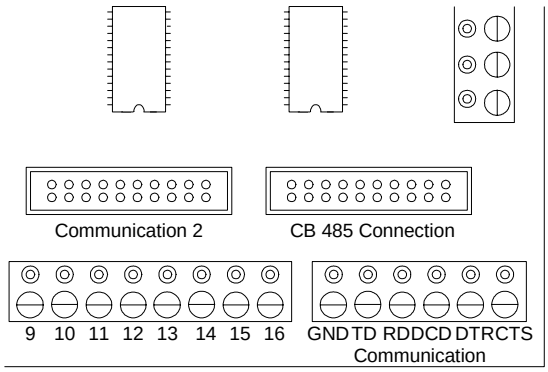


Figure 81 - CB-485 Communication Test Points

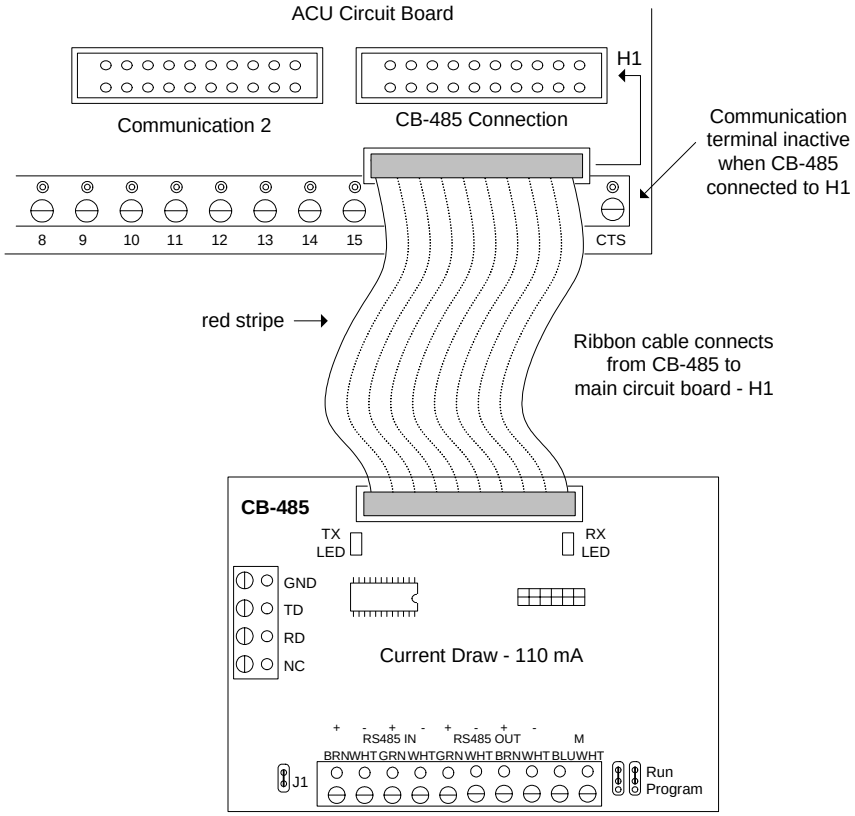
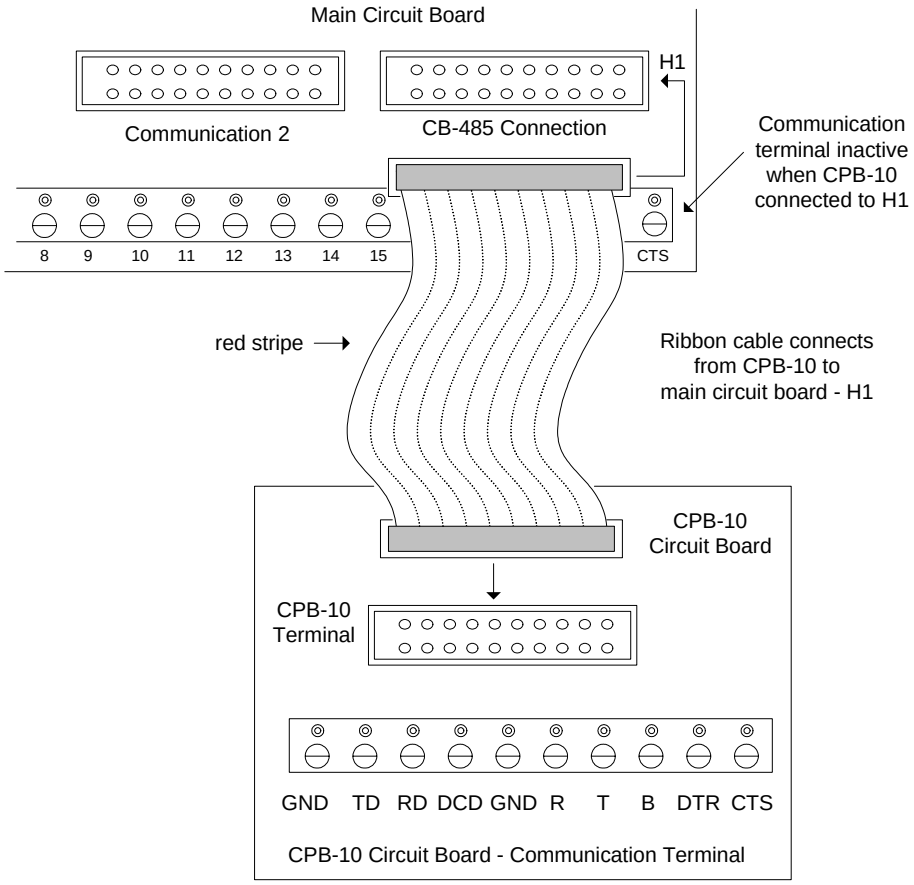


Figure 82 - CPB-10 Communication Test Points



Appendix A – HID Reader Connections

Appendix A reviews typical HID reader connections for the following models:

Power Specifications

The following table outlines HID reader power specifications:

Table 14 - HID Reader Power Specifications

Reader	Power	Notes
K-PROX & K-PROX SG(125 KHz HID compatible)	12VDC, 80mA	
K-VAN	12VDC, 90mA	
K-KPR	12VDC, 115mA + 20mA Interface = 135mA	
HID-5365	12VDC, 50mA	
HID-5395	12VDC, 50mA	
HID-6005	12VDC, 50mA	
HID-5355	12VDC, 155mA	
HID-5355KP	12VDC, 155mA + 20mA Interface = 175mA	
HID 5375	24VDC, 1.2A	Requires 18 AWG cable. Connect to separate 24VDC 2 Amp linear power supply. (Not supplied with ACU)
HID iClass – Rev A		
HID iClass KEYR10	12VDC, 225mA	Connect to separate 12VDC 4 Amp linear power supply (not supplied with

Reader	Power	Notes
(HID label – 6100AKN0010 – Rev A)		ACU kit) for CA8000 when connecting 8 readers. For all other ACU models connect power (red) of iClass reader directly to DPS-12 power.
HID iClass KEYR40 (HID label – 6120AKN0010 – Rev A)	12VDC, 260mA	See note HID iClass KEYR10 – Rev A
HID iClass KEYRK40 (HID label – 6130AKN001000 – Rev A)	12VDC, 260mA + 20mA Interface = 280mA	See note HID iClass KEYR10 – Rev A
HID iClass KEYRW400 (HID label 6121AKN0010 – Rev A)	12VDC, 260mA	See note HID iClass KEYR10 – Rev A
HID iClass – Rev B		
HID iClass KEYR10 (HID label – 6100BKN0010 – Rev B)	12VDC, 75mA	
HID iClass KEYR40 (HID label – 6120BKN0010 – Rev B)	12VDC, 75mA	
HID iClass KEYRK40 (HID label – 6130BKN001000 – Rev B)	12VDC, 244mA + 20mA Interface = 264mA	Connect to separate 12VDC 4 Amp linear power supply (not supplied with ACU kit) for CA8000 when connecting 8 readers. For all other ACU models connect power (red) of iClass reader directly to DPS-12 power.
HID iClass KEYRW400 (HID label – 6121BKN0010 – Rev B)	12VDC, 75mA	

Installation Notes on Proximity Readers

Do not run reader cables in same conduit with AC power or signal cables.

Keep reader cables at a minimum distance of 12 inches or 30 centimetres from AC, computer data, telephone data, or electric lock device cables.

Do not install readers within 3.5 feet or 1.1 metres of computer CRTs.

Do not install readers in areas where broad spectrum EMI noise may be present. Devices such as motors, pumps, generators, and AC switching relays can create EMI noise.

Readers mounted on a metal surface can reduce the read range.

See HID manual for full operational details and recommendations.

Important

The following diagrams illustrate HID readers with dual LEDs. On models 5365, 5395, and 6005 do not use the brown wire with "00" LED. If readers are single LED type "06", substitute the brown wire in place of the orange wire.

- S16 – 5 ON dual LED = 00
- S16 – 5 OFF single LED = 06

Figure 83 - Keyscan K-PROX2 (125 KHz HID compatible)

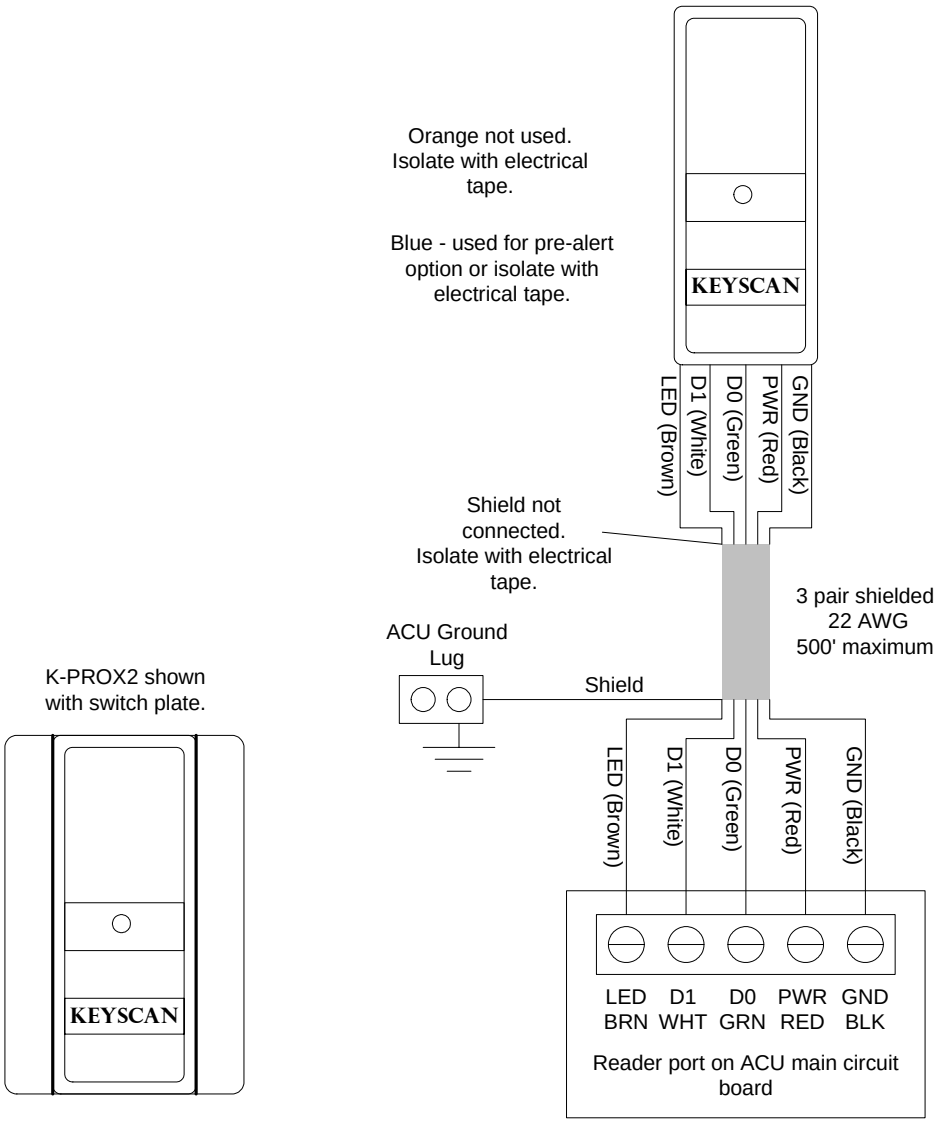


Figure 84 - Keyscan K-VAN Proximity Reader (125 KHz HID compatible)

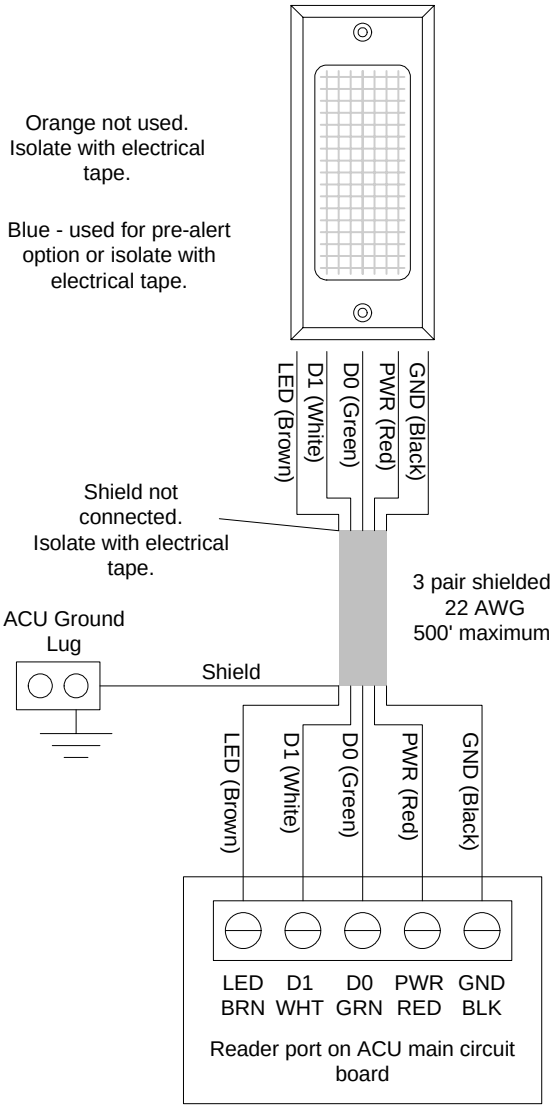


Figure 85 - Keyscan K-KPR Keypad / Proximity Reader (125 KHz HID compatible)

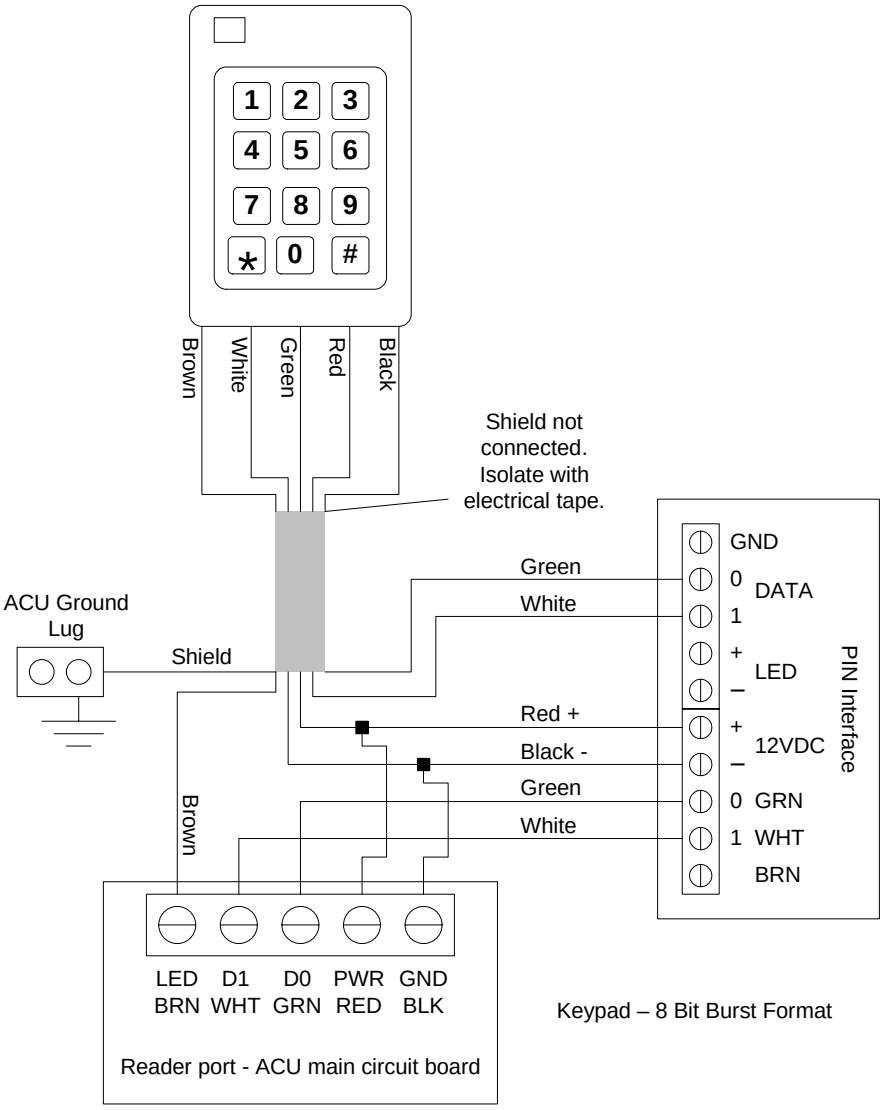


Figure 86 - HID-5395 Wiring

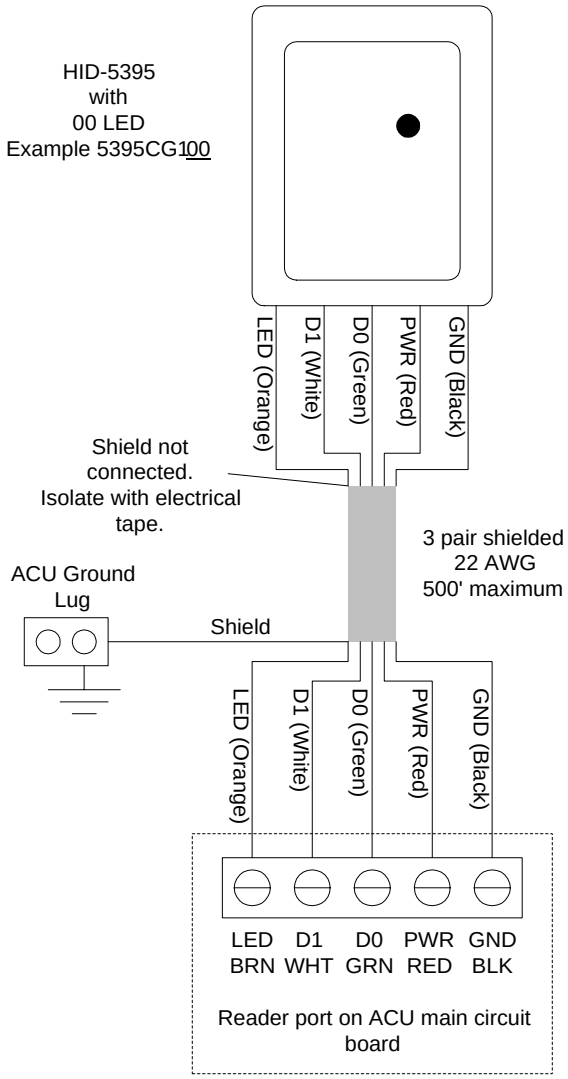


Figure 87 - HID 5365 / 6005 Wiring

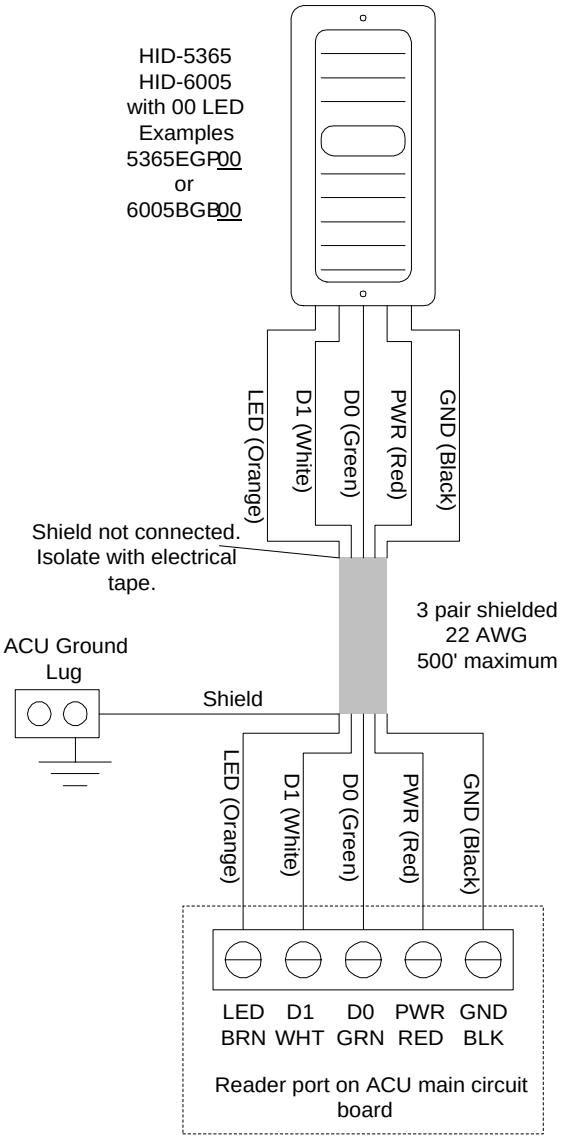
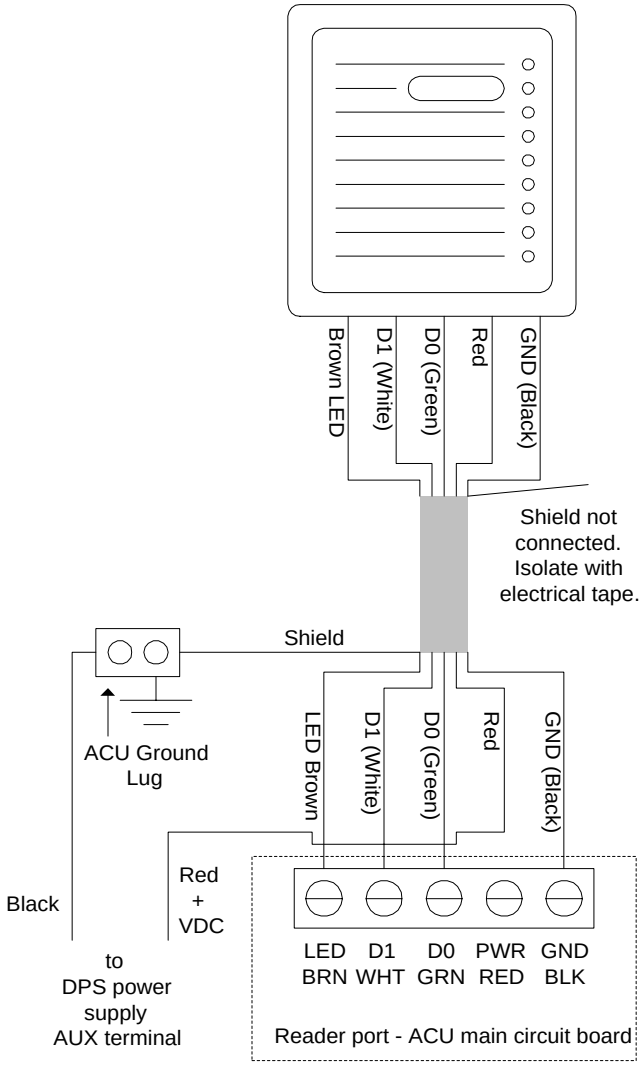


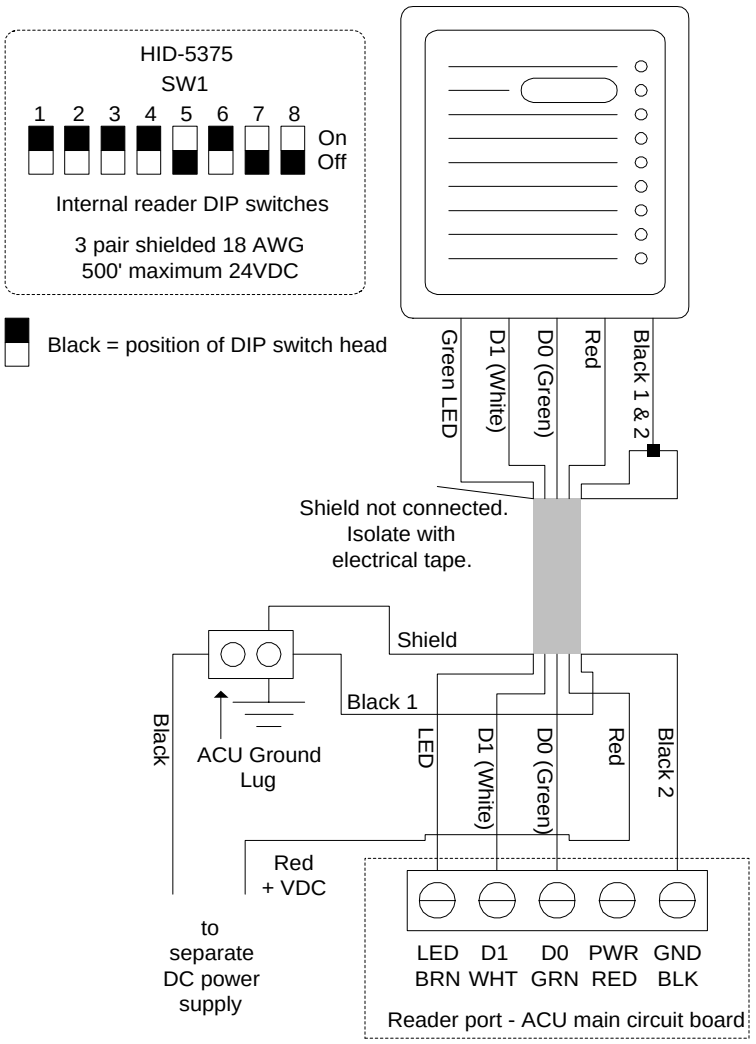
Figure 88 - HID 5355 Wiring



Notes on HID 5355

Suitable for indoor and outdoor use. Maximum read range at 12VDC – ProxCard II card is 9" (22 cm) – ISOProxII card is 8" (20 cm).

Figure 89 - HID 5375 Wiring



Notes on HID 5375

Use separate DC power supply 24VDC.

Do not use HID-5375 readers in elevators.

For dual LEDs, set SW1 – switch 6 to OFF or for a single LED, set SW1 – switch 6 to ON.

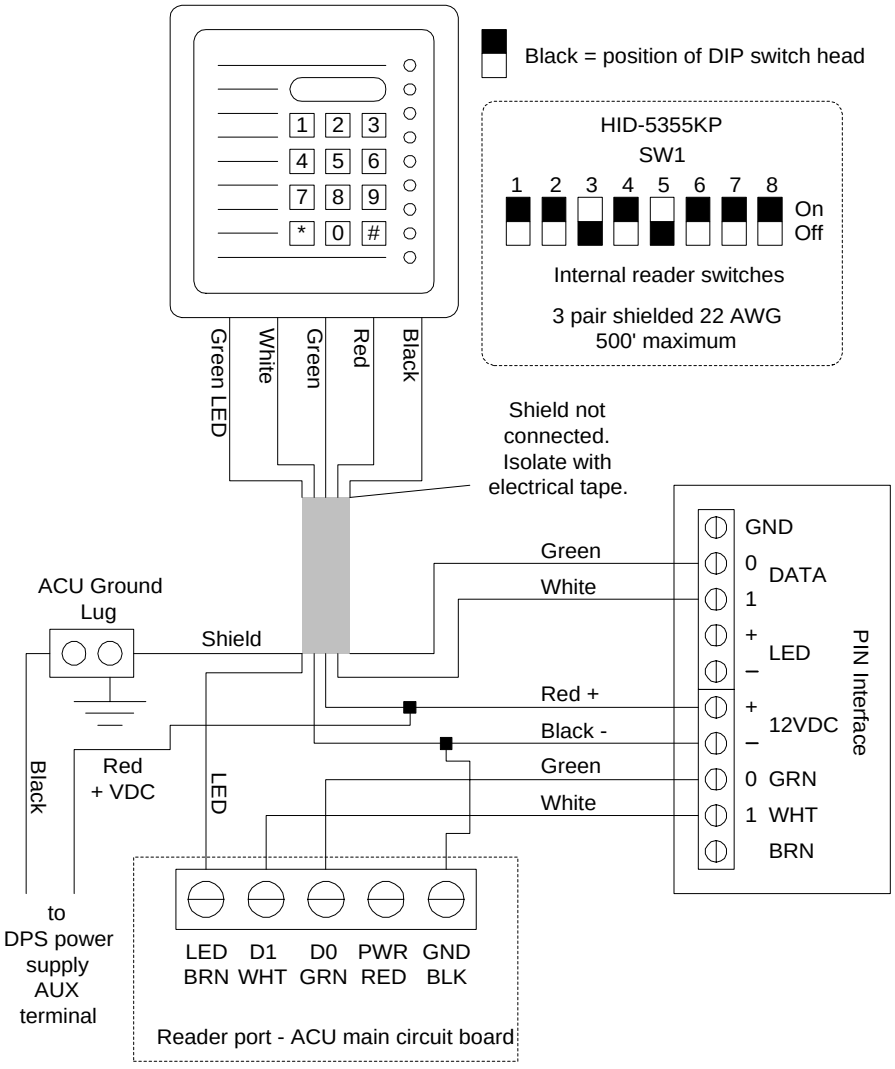
For reader to beep on card presentation, set SW1 – switch 4 to ON.

For Wiegand output set switches and jumpers as follows:

- SW1 – switches 1, 2, 3 to ON
- SW5 – switches 3, 4, 5 to OFF
- P3 – jumpers to 1-2
- P4 – jumpers to 1-2

Connect LED to TB2-4

Figure 90 - HID 5355KP Wiring



Note on HID 5355 KP

Reader/Keypad/LED ordered as 00 (4 bit burst) example 5355AGK00 (Red/Green colour)

Figure 91 - HID iClass KEYR10

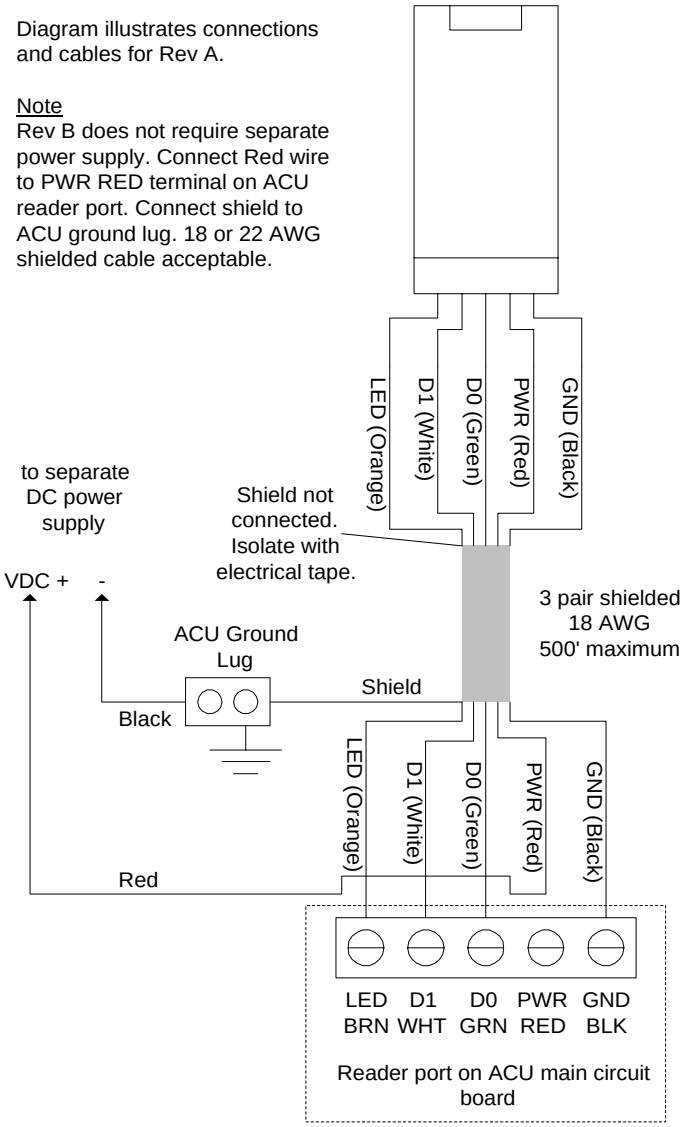


Figure 92 - HID iClass KEYR40

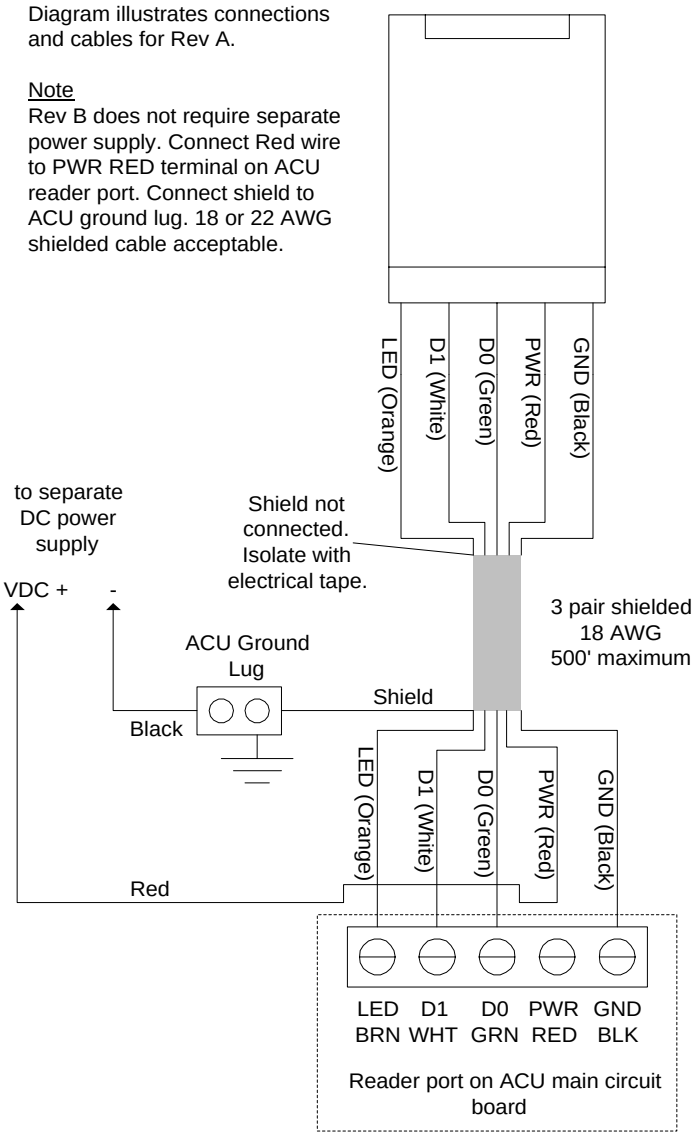


Figure 93 - HID iClass KEYRW400

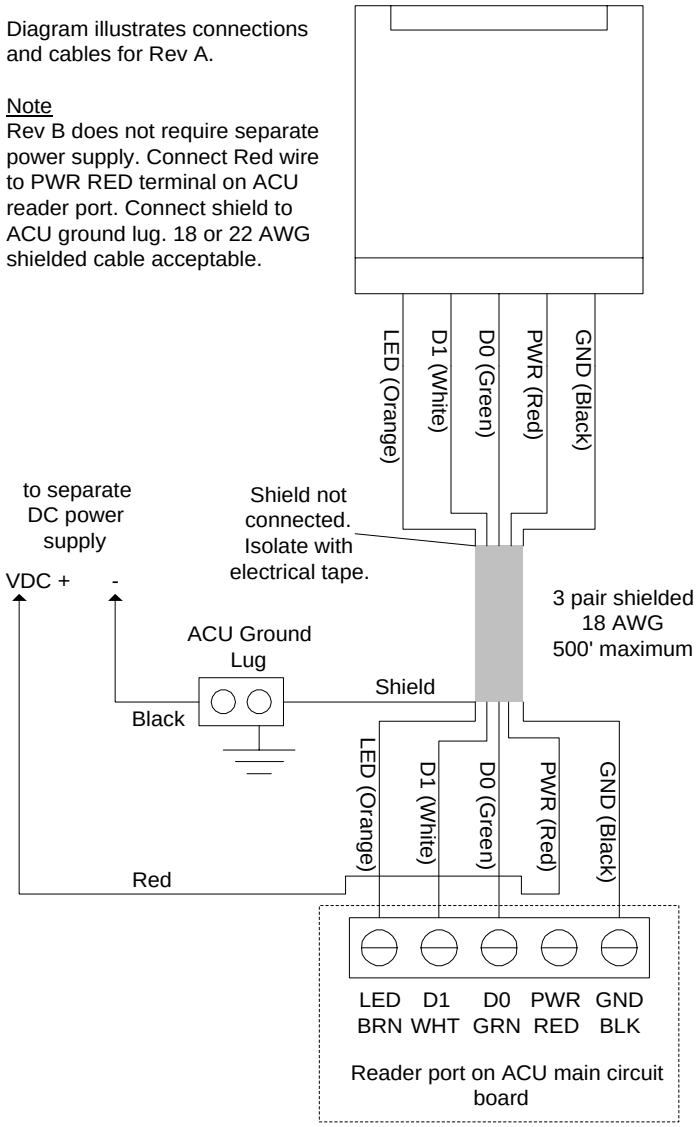
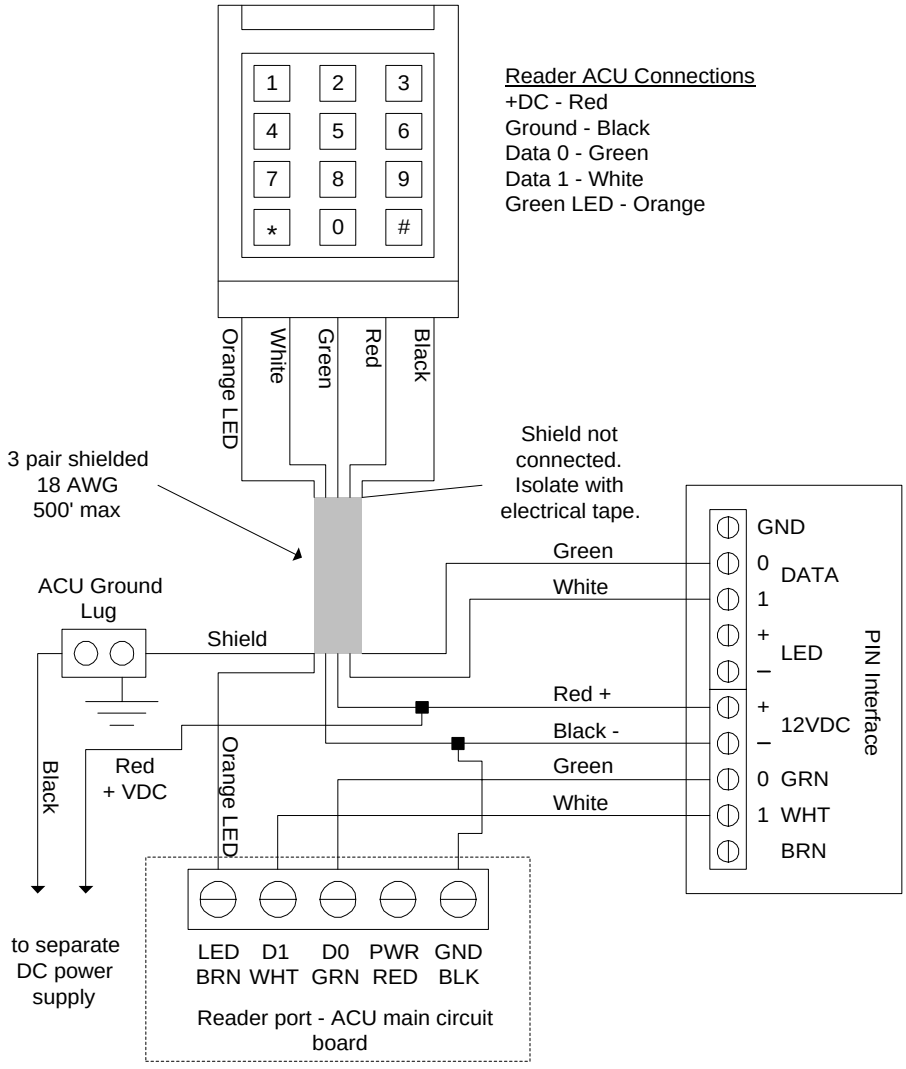


Figure 94 - HID iClass KEYRK40



Note on HID iClass KEYRK40

Reader/Keypad/LED ordered as 00 (4 bit burst) – example 6131AKN00100 (Red/Green colour)

Appendix B – Indala Reader Connections

Appendix B reviews typical Indala proximity reader connections for the following models:

Power Specifications

The following table outlines Indala reader power specifications:

Table 15 - Indala Reader Power Specifications

Reader	Power	Notes
PX 603	12VDC, 100mA	
PX 605	12VDC, 100mA	
PX 610	12VDC, 150mA	Requires additional power supply when connected to CA 8100 circuit board.
PX 620	24VDC, 1.2A	Requires 18 AWG cable. Connect to separate 24VDC 2 Amp linear power supply. (Not supplied with ACU kit.)
PXK 501	12VDC, 100mA + 20mA Interface = 120mA	Current consumption includes interface circuit board

Installation Notes on Proximity Readers

Do not run reader cables in same conduit with AC power or signal cables.

Keep reader cables at a minimum distance of 12 inches or 30 centimetres from AC, computer data, telephone data, or electric lock device cables.

Do not install readers within 3.5 feet or 1.1 metres of computer CRTs.

Do not install readers in areas where broad spectrum EMI noise may be present. Devices such as motors, pumps, generators, and AC switching relays can create EMI noise.

Readers mounted on a metal surface can reduce the read range. See the Indala manual for recommendations.

Figure 95 - Indala PX 603 and PX 605 Wiring

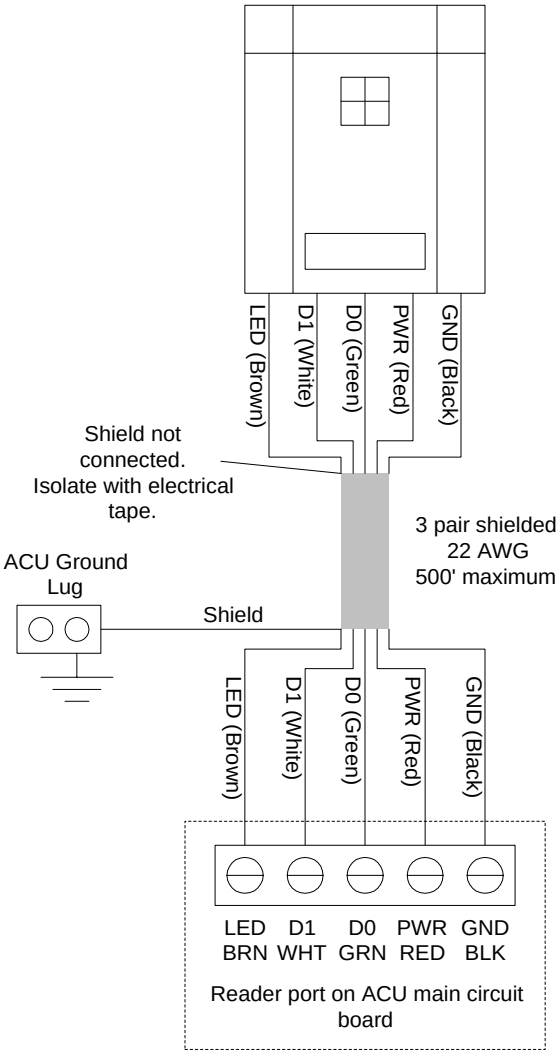


Figure 96 - Indala PX610 Wiring

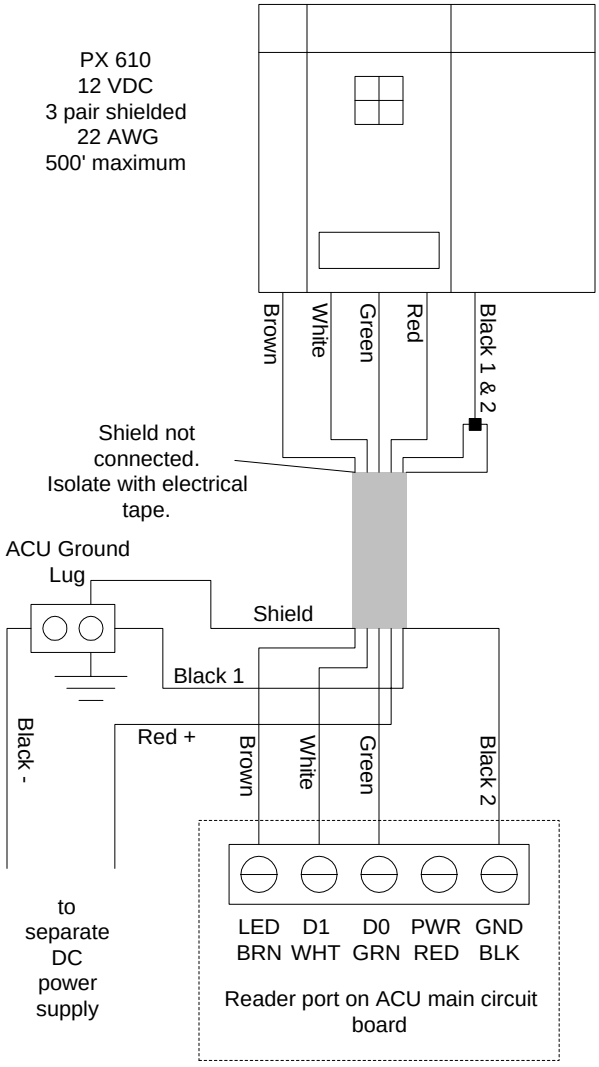
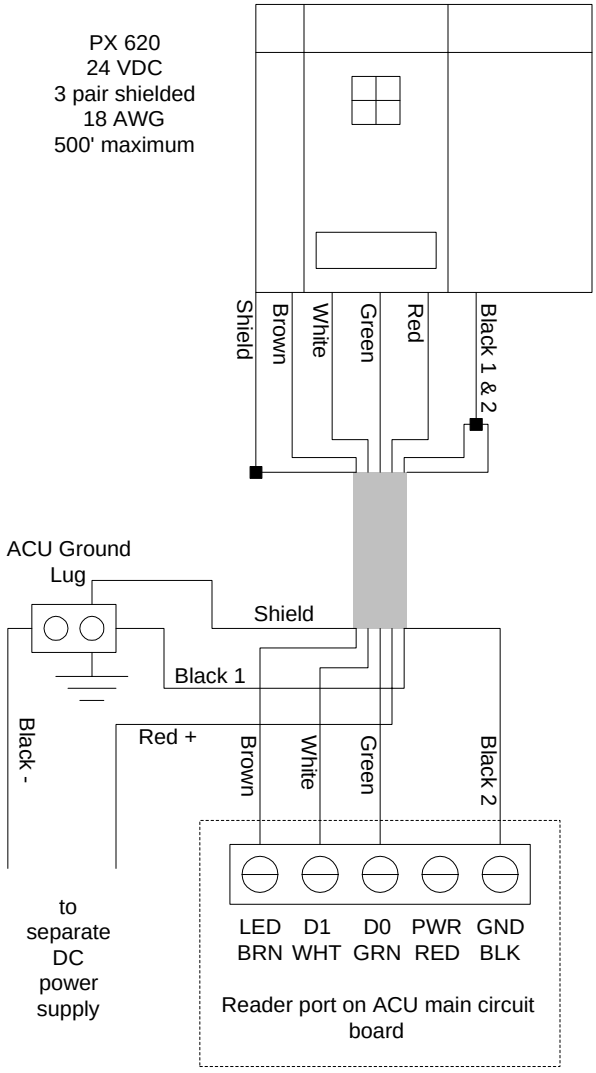


Figure 97 – Indala PX 620 Wiring

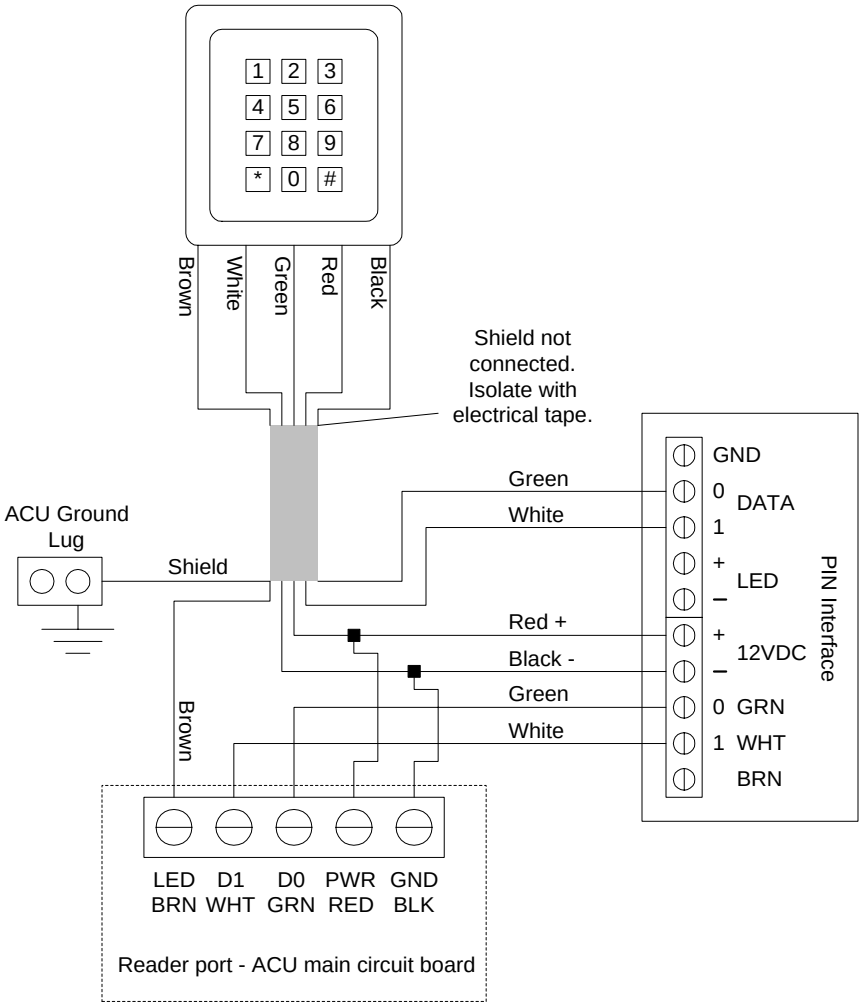


Important

Do not mount an Indala PX 620 reader in an elevator car. The environment is unsuitable and causes the reader to malfunction.

The PX 620 is factory tuned. If a PX 620 requires tuning, tune only once. Excessive tuning may cause the reader to permanently malfunction. Refer to the Indala documentation for instructions on tuning.

Figure 98 - Indala PXK 501 Wiring



Note on Indala PXK 501 Wiring

Reader/Keypad/LED ordered as 8 bit burst – example FP5061B-8 Bit Burst (Red only)

Appendix C – Keyscan WSSKP1 Connections

Appendix C reviews typical Keyscan WSSKP-1 keypad connections and keypad/reader combination connections:

Table 16 - Keypad Power Specifications

Reader	Power	Notes
WSSKP-1 No digital output.	12VDC, 20mA	Orange wire not connected.
WSSKP-1 Digital output	12VDC 530mA	Orange wire connected.

Installation Notes on Keypads

Do not run keypad cables in same conduit with AC power or signal cables.

Keep keypad cables at a minimum distance of 12 inches or 30 centimetres from AC, computer data, telephone data, or electric lock device cables.

Do not install keypads within 3.5 feet or 1.1 metres of computer CRTs.

Do not install readers in areas where broad spectrum EMI noise may be present. Devices such as motors, pumps, generators, and AC switching relays can create EMI noise.

Important

Keypads made by other manufacturers may not have the necessary Wiegand interface. Hence these keypads will not operate in dual card and PIN modes; they will only operate in card/reader simulation.

Figure 99 - WSSKP-1 Keypad Connection

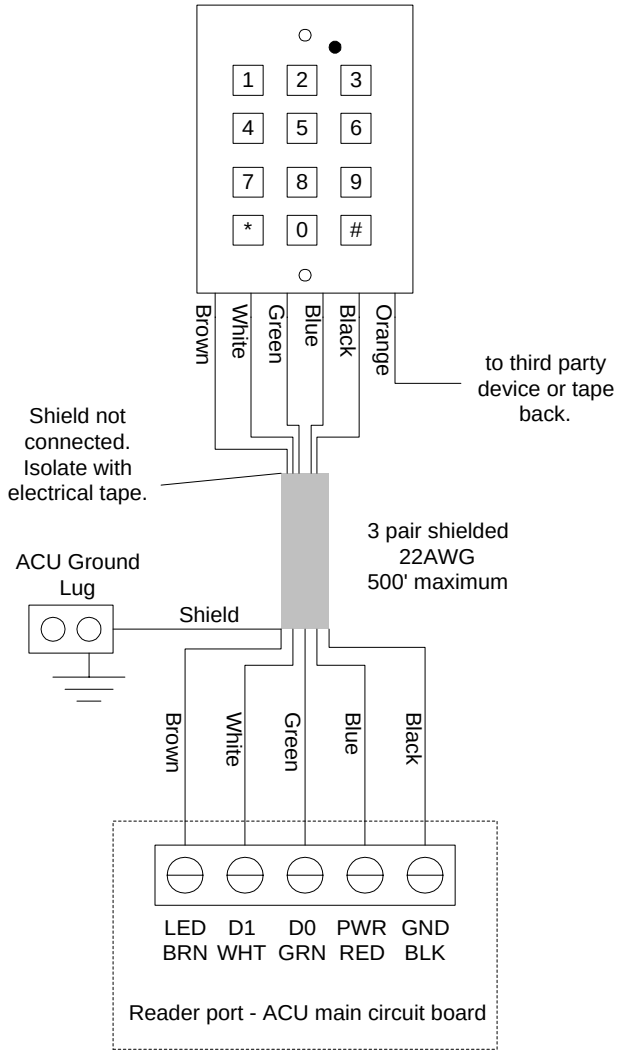


Diagram Notes on WSSKP-1

Orange wire in keypad is used for negative digital trigger for a third party device such as a relay or a lock. If using the orange wire, it is triggered from local PIN stored in keypad memory. The keypad memory stores 28 Personal Identification Numbers. If orange wire is not used, tape back. See instructions with WSSKP-1 keypad for connections with third party devices.

Figure 100 - WSSKP-1 Keypad/Reader Combination Connections

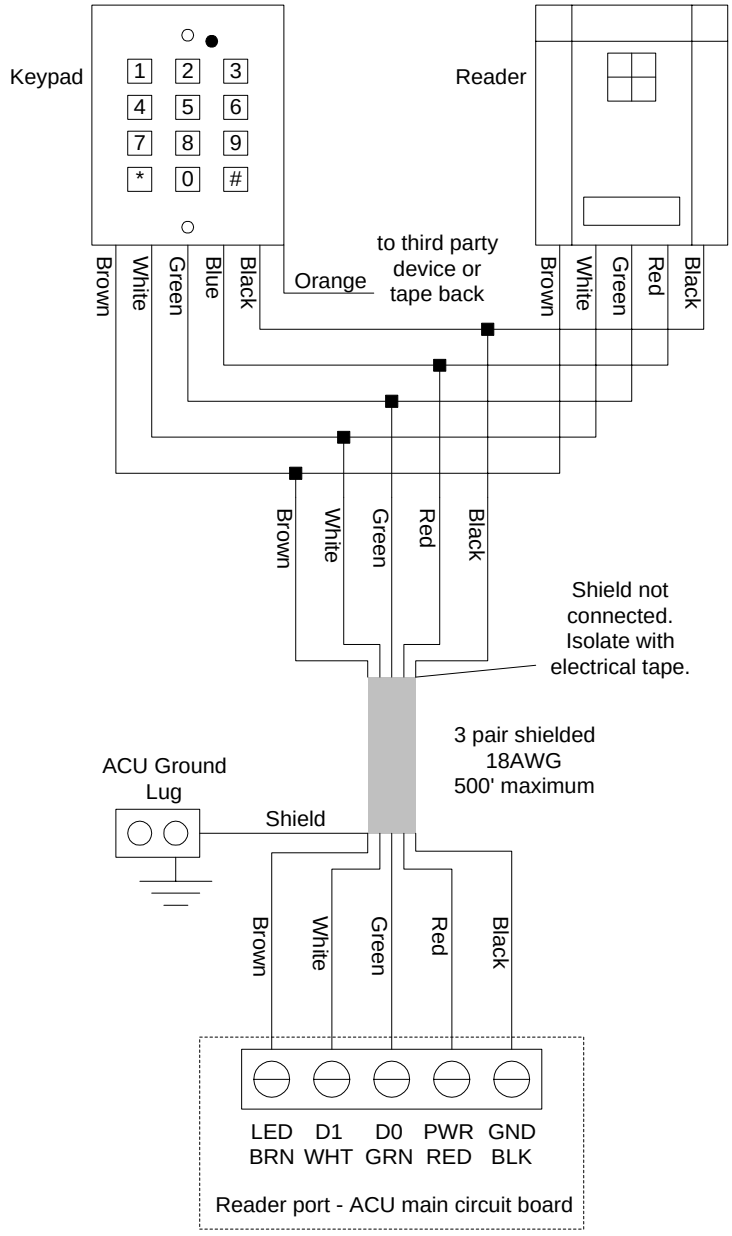


Diagram Notes on WSSKP-1/Reader Combination

The above diagram generally applies to a retro-fit where either a reader or keypad is already installed. If a reader/keypad combination is required on a new installation consider such readers as a HID 5355KP or an Indala PXK501.

Appendix D – RXPROX Receiver / Transmitter Activation

Appendix D reviews typical RXPROX transmitter connections and TX2PRX and TX4PRX transmitter button activation.

Table 17 - RXPROX (RF) Receiver Specifications

Input Power	12VDC, 35mA
Output Signal	433 MHz (Operating 315 MHz)
Relays	2 Class "C" 30V @ 3A max
Range	30 m (100 ft)
Internal Circuit RF side	9V
RF Output – idle	10mA, 90mW
RF Output – during read	25mA, 225mW
RF Output – peak	185mA, 1.6W

Installation Notes on RXPROX Receiver

Do not mount 2 RF receivers within range of each other when using the same transmitter buttons. Assign different transmitter buttons for each RF receiver.

Do not run receiver cable in conduit with AC power or signal wiring. Keep receiver wiring at a minimum of 12" (30cm) from AC wiring.

If receivers exceed the number buttons on the transmitter, do not mount receivers within RF ranges. Minimum distance should be 200 feet.

Reset RXPROX Receiver

The following outlines steps to initiate the receiver for transmitter button activation. This resets the RXPROX receiver.

1. Ensure all receiver DIP switches are OFF.
2. Turn DIP switches 5 and 8 ON.
3. Press and hold the RESET button and apply power.
4. Release the RESET button and wait 5 seconds.
5. Turn DIP switch 5 and 8 to OFF.
6. Configure the receiver DIP switches as noted in TX2PRX and TX4PRX Transmitter Button Activation.

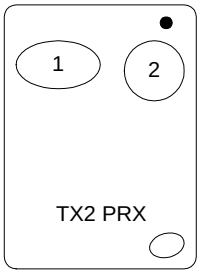
TX2PRX and TX4PRX Transmitter Button Activation

The RXPROX receiver has a set of 8 DIP switches. Switches 1 to 4 assign specific buttons on the TX2PRX and TX4PRX transmitters to activate the RXPROX receiver. All transmitter buttons may be active. Switches 5 to 8 must remain OFF.

The number on the back of the transmitter is the card number that is entered in the cardholder record form in the System V Client software.

TX2PRX Transmitter DIP Switch Assignment

- Receiver DIP switch 1 ON – activates transmitter button 1
- Receiver DIP switch 2 ON – activates transmitter button 2



TX4PRX Transmitter DIP Switch Assignment

- Receiver DIP switch 1 ON – activates transmitter button 1
- Receiver DIP switch 2 ON – activates transmitter button 2
- Receiver DIP switch 3 ON – activates transmitter button 3
- Receiver DIP switch 4 ON – activates transmitter button 4

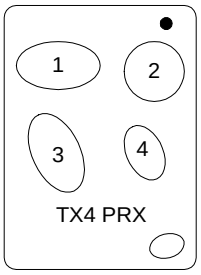
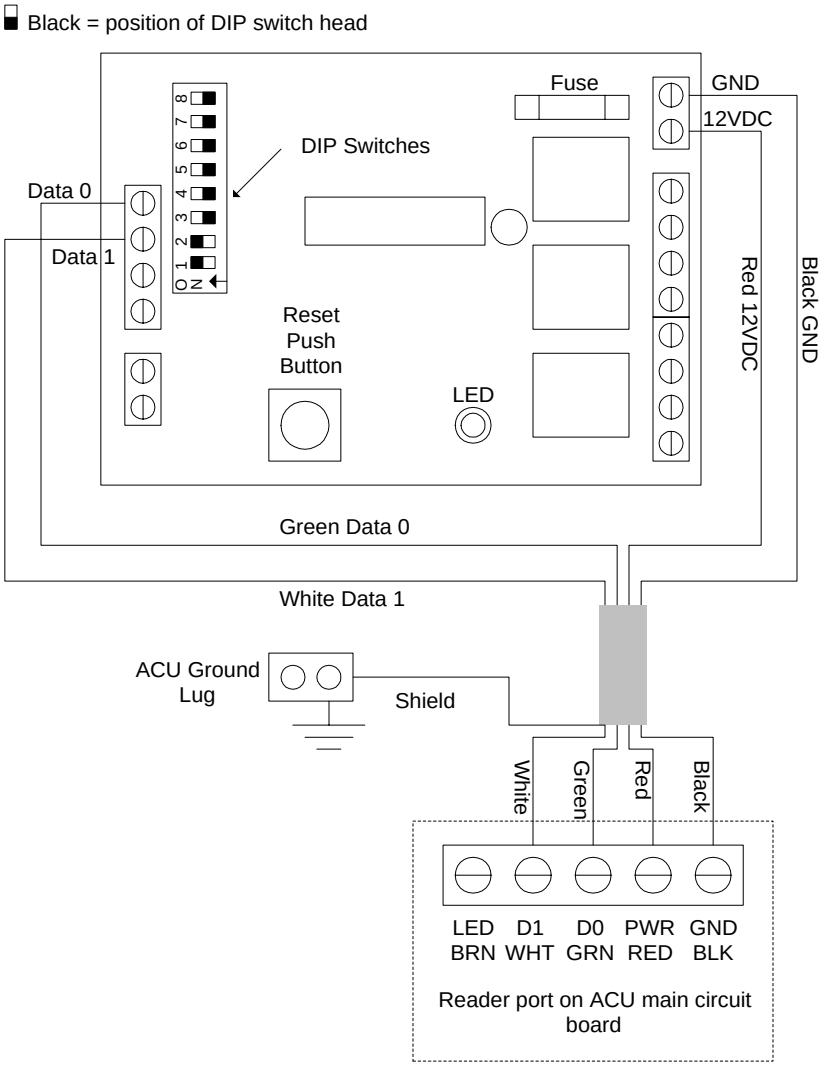


Figure 101 - RXPROX Receiver Connections



Appendix E – Keyscan COMMex

Appendix E reviews typical COMMex connections to extend communication distances from PCs to access control units.

The Keyscan COMMex kit includes two circuit boards. Use one COMMex circuit board as the transmitter and the other as the receiver. Both circuit boards are identical with the exception that one of the circuit boards is mounted in a black case. The circuit board in the black case can be mounted in proximity to the PC or removed from the case if it is to be mounted in a remote enclosure. The maximum distance from the PC is 100 feet.

Table 18 - COMMex Power Specifications

Unit	Power	Notes
COMMex kit	12VDC, 300mA	

Table 19 - COMMex Communication and Cables

Communication Type	Maximum Distance	Cable
RS232	100 feet	Minimum 18 AWG or 22AWG 3 conductor shielded
RS485	4000 feet	CAT 5 – 2 twisted pairs

Installation Notes on COMMex

From the COMMex circuit board that connects to the PC, insert the female socket end of data cable 40-2322 into a COM port. Be sure to connect the shield to an earth ground.

Figure 102 - COMMex Overview

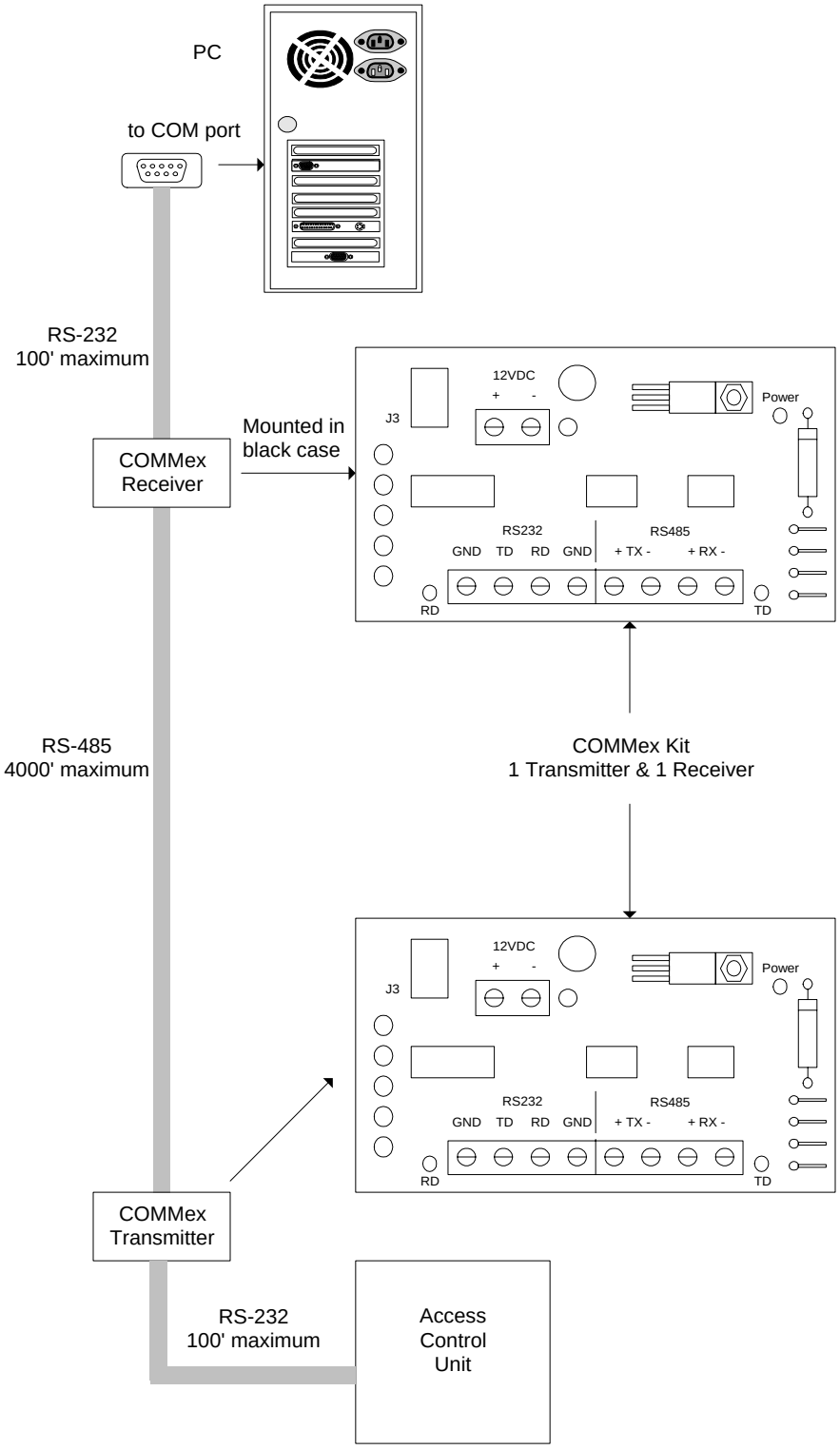
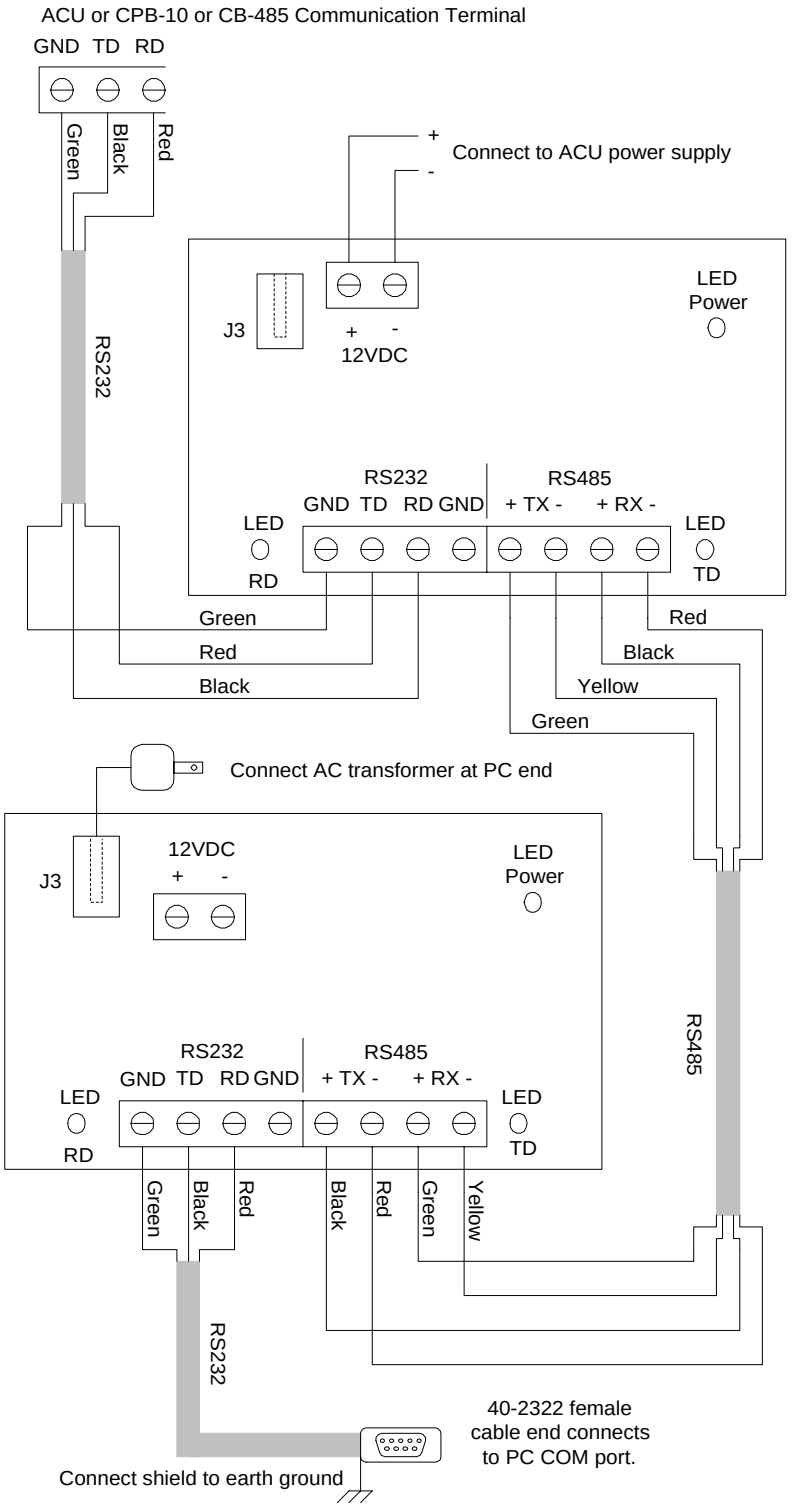


Figure 103 - COMMex Connections



Appendix F – Wiegand Extenders WIEEX and CWIEEX

Appendix F reviews general information, installation guidelines, and connection diagrams for Keyscan RS485 Wiegand Extenders (WIEEX) and COAX Wiegand Extenders (CWIEEX). Wiegand extenders are used for doors and readers that exceed the 500 feet maximum distance from the ACU.

Diagrams can be found on the following pages:

Each type of Wiegand extender includes 1 transmitter and 1 receiver. The following additional components may be required to complete the installation of Wiegand extenders:

- 12VDC 1Amp power supply with battery backup
- mounting interface enclosure

Table 20 - WIEEX/CWIEEX Power Requirements

Unit	Power	Notes
WIEEX Transmitter (Tx)	12VDC, 50mA	
WIEEX Receiver (Rx)	12VDC, 50mA	
CWIEEX Transmitter (Tx)	12VDC, 50mA	
CWIEEX Receiver (Rx)	12VDC, 50mA	
OCB-8	12VDC, 230mA	Optional – An OCB8 is required when not switching a 12VDC door lock or gate operator. See Figure 107 - WIEEX to OCB-8 Cable Connection on page 138.

Table 21 - WIEEX/CWIEEX Cables and Distances

Unit Connections	Maximum Distance	Cable
WIEEX Transmitter (Tx) to Reader	500 feet	Refer to Table 1 - Cable Requirements - Readers
WIEEX Transmitter (Tx) to Receiver (Rx)	4000 feet	CAT 5 - 1 twisted pair (communication) 1 pair 18AWG power if no local independent power supply
WIEEX Receiver (Rx) to ACU	500 feet	
CWIEEX Transmitter (Tx) to Reader	500 feet	Refer to Table 1 - Cable Requirements – Readers
CWIEEX Transmitter (Tx) to Receiver (Rx)	500 feet	RG59U
CWIEEX Receiver (Rx) to ACU	500 feet	

Installation Notes WIEEX (RS485)

Existing 22AWG UTP can be used between a WIEEX transmitter and receiver provided it is in good condition without breaks or high impedance splices. Nominal resistance for 22AWG UTP is approximately 18 ohms/1000 feet.

Short J1 on the WIEEX transmitter and receiver.

Connect the WIEEX transmitter (Tx) to the reader, door contact, request to exit device, auxiliary input, and door lock, whichever are applicable.

Connect the WIEEX receiver (Rx) to the appropriate ACU terminals.

Power the transmitter with a 12VDC 1Amp power supply, if a local power supply is required and not sourced from the ACU.

The Door Unlock Output (RA2/OC) is defaulted for 'fail safe'. If 'fail secure' is required, connect a jumper wire from the RB4 terminal to the GND terminal on the transmitter.

The WIEEX transmitter (Tx) can control a lock device or relay to a maximum of 12VDC 500mA.

Installation Notes CWIEEX (COAX)

Existing coaxial cable can be used between a CWIEEX transmitter and receiver provided it is in good condition without breaks or high impedance splices.

Connect the WIEEX transmitter (Tx) to the reader, door contact, request to exit device, auxiliary input, and door lock, whichever are applicable.

Connect the WIEEX receiver (Rx) to the appropriate ACU terminals.

The Door Unlock Output (RA2/OC) is defaulted for 'fail safe'. If 'fail secure' is required, connect a jumper wire from the RB4 terminal to the GND terminal on the transmitter.

The CWIEEX transmitter (Tx) can control a lock device or relay to a maximum of 12VDC 500mA.

Figure 104 - Wiegand Extender Overview

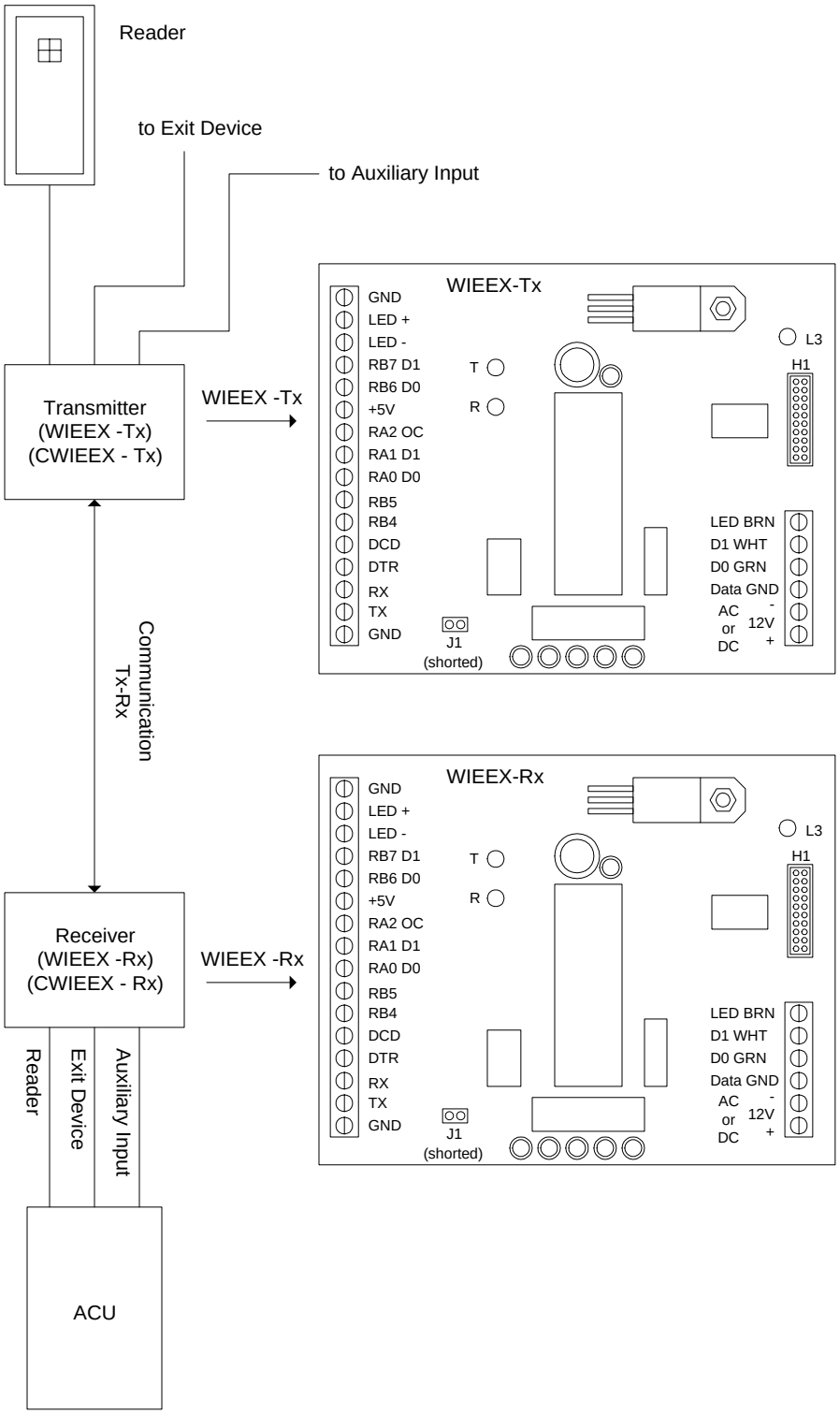


Figure 105 - WIEEX RS485 Transmitter/Receiver Connections

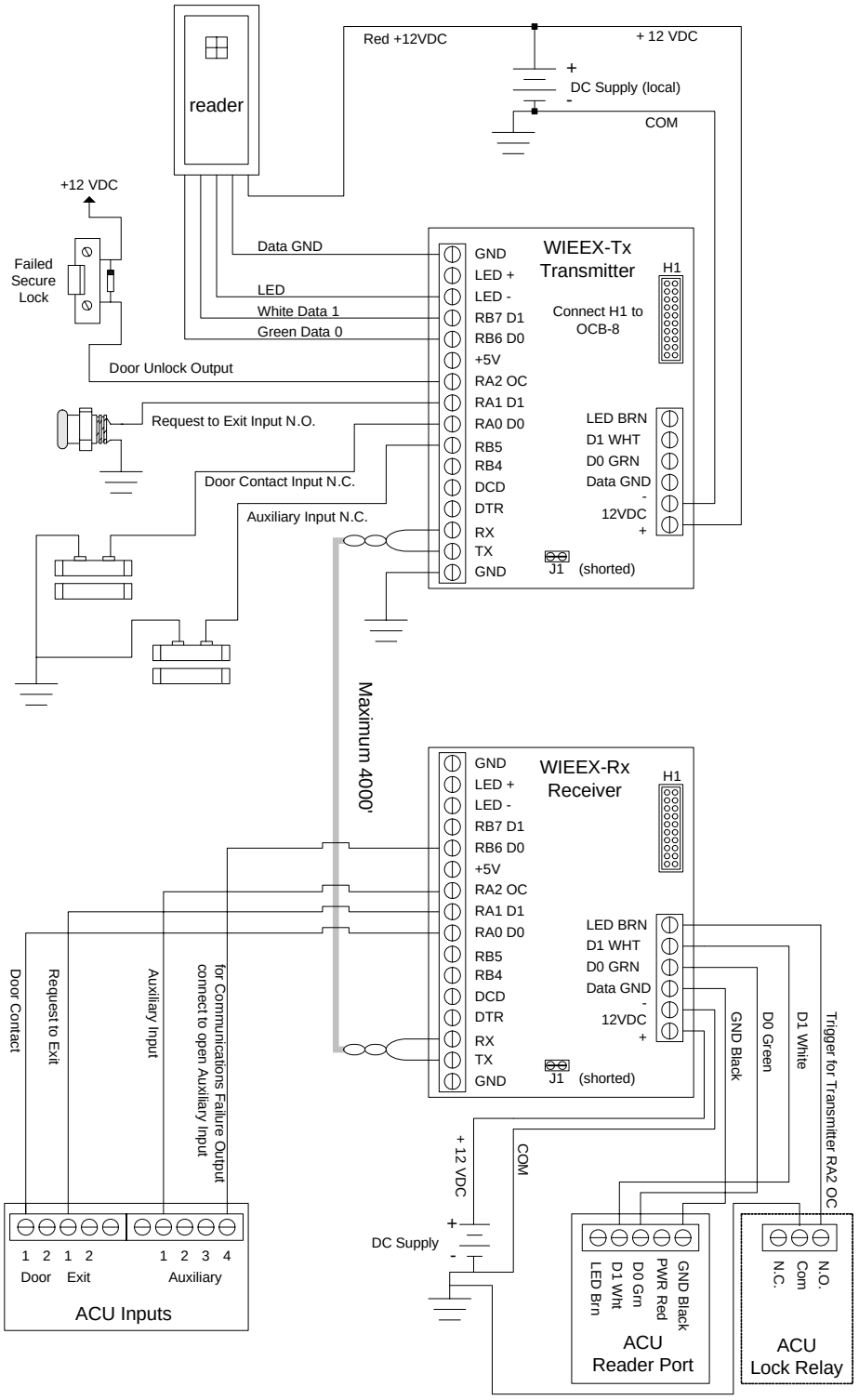


Figure 106 - CWIEEX - Coaxial Transmitter/Receiver Connections

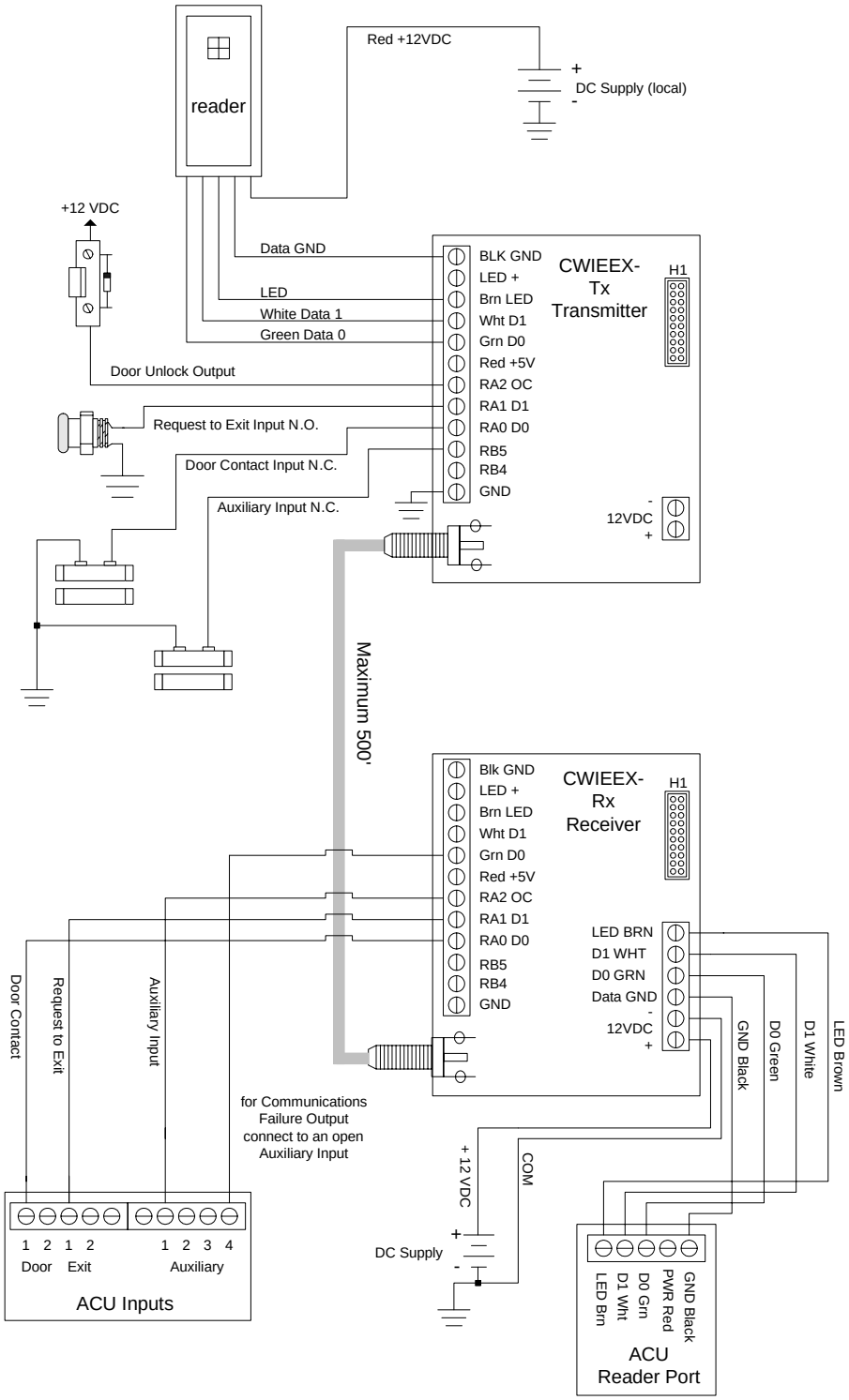
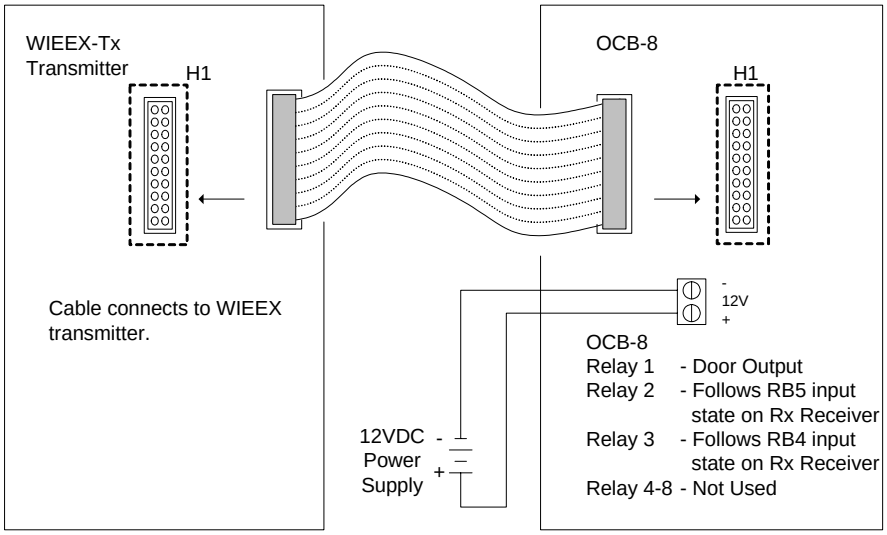
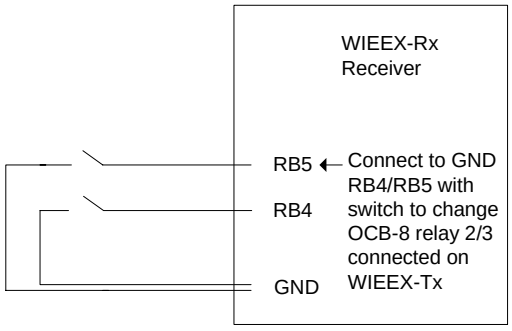


Figure 107 - WIEEX to OCB-8 Cable Connection



Note: Relays 4 to 8, set jumper J4-J8 to reversed state



Appendix G – Handicap Accessibility Relay Option

The handicap accessibility relay is designed to connect with an accessibility operator that mechanically opens and closes a door. Presenting a card with the Handicap Accessibility designation at a valid door pulses a handicap (HC) output relay. The HC output relay pulses the accessibility operator and the system monitors the door contact based on the Handicap Door Held Open Time set in the System V software. To use the Handicap Relay option on CA 4300 and CA 8300 circuit boards, an additional OCB-8 is required.

Table 22 - OCB8 Power Specifications

Unit	Power	Notes
OCB-8	12VDC, 230mA	

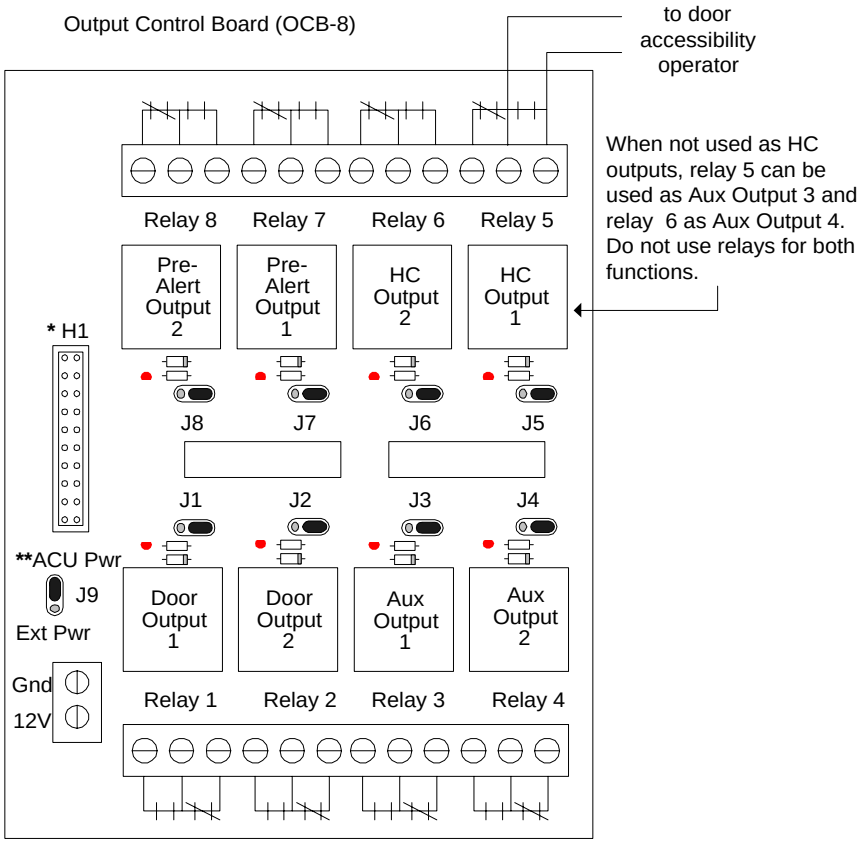
Handicap Relays

Ensure that the HC Output Relay matches the Door Output as indicated below.

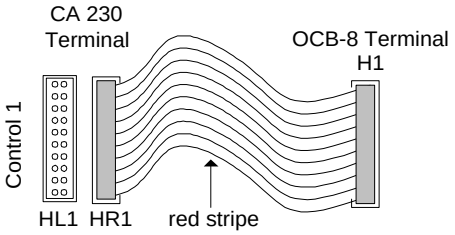
Table 23 - Handicap Relay/ Door Assignment

Main Circuit Board/Output Control Board	Door # /HC Relay #	Ribbon Cable Connection to Main Circuit Board
CA 230/OCB-8	Door 1/HC Relay 5 Door 2/HC Relay 6 Relay 7 and 8 reserved for Pre-alert.	Connect ribbon from OCB-8 to Control 1 (right terminal) on CA 230
CA 4300/OCB-8 (optional)	Door 1/HC Relay 1 Door 2/HC Relay 2 Door 3/HC Relay 3 Door 4/HC Relay 4 Relays 5 to 8 not used.	Connect ribbon on OCB-8 to Control 4 (right terminal) on CA 4300.
CA 8300/OCB-8 (optional)	Door 1/HC Relay 1 Door 2/HC Relay 2 Door 3/HC Relay 3 Door 4/HC Relay 4 Door 5/HC Relay 5 Door 6/HC Relay 6 Door 7/HC Relay 7 Door 8/HC Relay 8	Connect ribbon on OCB-8 to Control 4 (right terminal) on CA 8300.

Figure 108 - Handicap Relay CA 230/OCB-8 Connections



CA 230 to OCB-8 Cable Connection

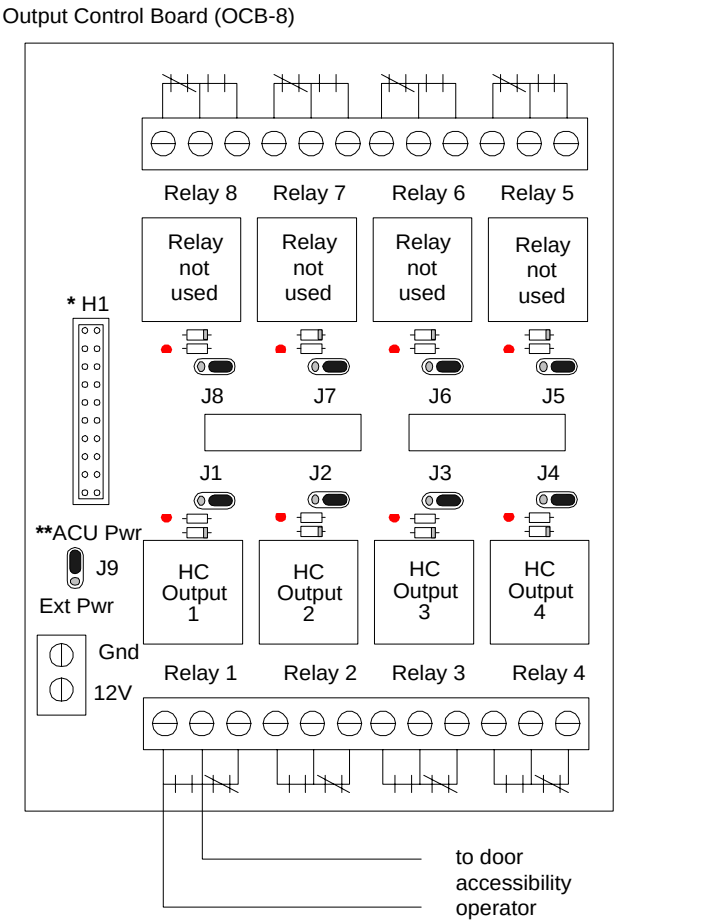


* Connect ribbon cable from H1 terminal on OCB-8 to Control 1 (right) terminal on CA 230 circuit board.

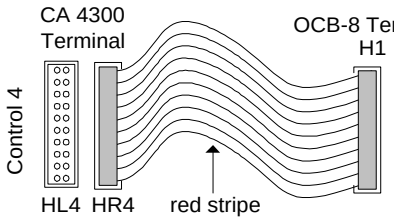
** OCB-8 relay board is powered through ribbon cable when J9 is on ACU PWR.

OCB-8 ribbon cable may be connected to HL1 (left side) on CA 230 circuit board. Set J9 to Ext Pwr. Connect OCB-8 12V/Gnd to Auxiliary side of power supply. OCB-8s may be connected to HL1 and HR1 simultaneously.

Figure 109 - Handicap Relay CA 4300/OCB-8 Connections



CA 4300 to OCB-8 Cable Connection

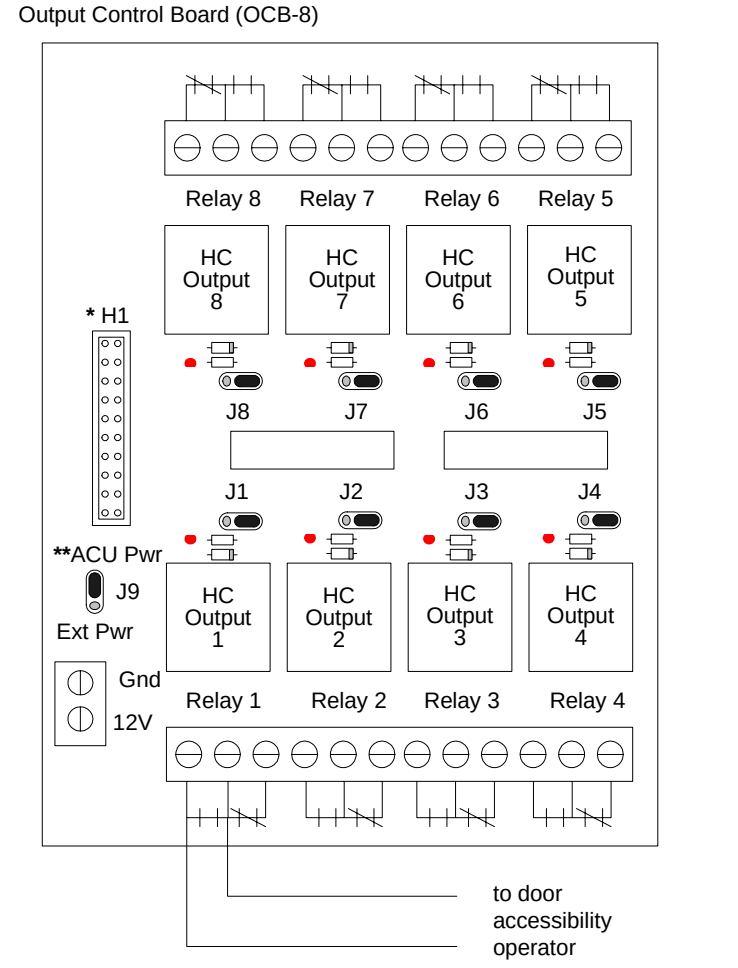


* Connect ribbon cable from H1 terminal on OCB-8 to Control 4 - HR4 terminal (right side) on CA 4300 circuit board.

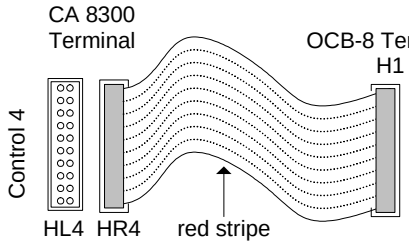
** OCB-8 relay board is powered through ribbon cable when J9 is on ACU PWR.

OCB-8 ribbon cable may be connected to HL4 (left side) on CA 4300 circuit board. Set J9 to Ext Pwr. Connect OCB-8 12V/ Gnd to Auxiliary side of power supply. OCB-8s may be connected to HL4 and HR4 simultaneously.

Figure 110 - Handicap Relay CA 8300/OCB-8 Connections



CA 8300 to OCB-8 Cable Connection



* Connect ribbon cable from H1 terminal on OCB-8 to Control 4 - HR4 terminal (right side) on CA 8300 circuit board.

** OCB-8 relay board is powered through ribbon cable when J9 is on ACU PWR.

OCB-8 ribbon cable may be connected to HL4 (left side) on CA 8300 circuit board. Set J9 to Ext Pwr. Connect OCB-8 12V/Gnd to Auxiliary side of power supply. OCB-8s may be connected to HL4 and HR4 simultaneously.

Appendix H – Pre-alert Relay Option

The pre-alert relay advises when a door remains open at the half interval of the Door Held Open Time. This function is a feature within the panel and must be wired to an external device to function. To use the Pre-alert Relay option on CA 4300 or CA 8300 circuit boards, an additional OCB-8 is required.

Table 24 – OCB-8 Power Specifications

Unit	Power	Notes
OCB-8	12VDC, 230mA	

Pre-alerts

Depending on the number of doors and type of controller, ensure that the Pre-alert Relay on the output control board matches the correct Door Contact as indicated in the following table.

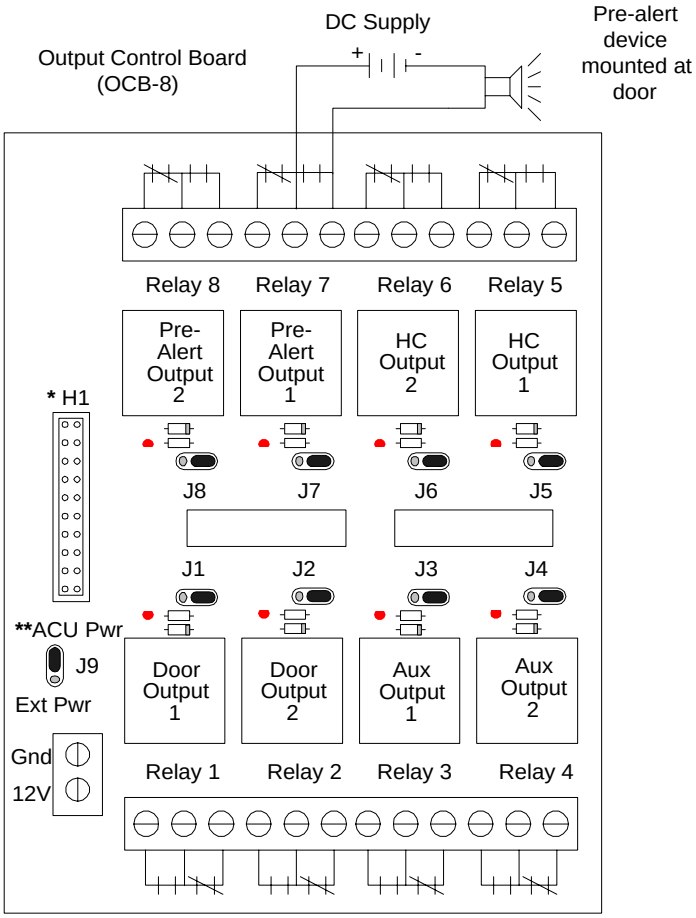
Table 25 - Pre-alert Relay to Door Assignments

Main Circuit Board/Output Control Board	Number of Pre-alert Outputs	Pre-alert Relay # on OCB	Door Contact#	Ribbon Cable Connection to Main Circuit Board
CA 230/OCB-8	2	Relay 7 Relay 8	Door 1 Door 2	Connect ribbon from OCB-8 to H1 on CA 230
CA 4300/OCB-8 (optional)	4	Relay 5 Relay 6 Relay 7 Relay 8	Door 1 Door 2 Door 3 Door 4	Connect ribbon on OCB-8 to Control 2 (right terminal) on CA 4300. (Relays 1 to 4 for Auxiliary Outputs 5 to 8.)
CA 8300/OCB-8 (optional)	8	Relay 1 Relay 2 Relay 3 Relay 4 Relay 5 Relay 6 Relay 7 Relay 8	Door 1 Door 2 Door 3 Door 4 Door 5 Door 6 Door 7 Door 8	Connect ribbon on OCB-8 to Control 3 (right terminal) on CA 8300.

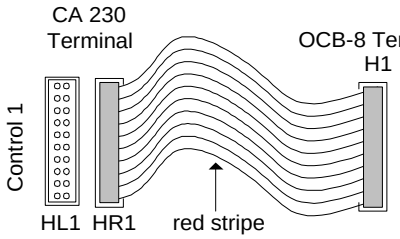
Important

All relays on the OCB-8 board are dedicated as Pre-alert output relays when used on the CA 8300 circuit board.

Figure 111 - Pre-alert Relay CA 230/OCB-8 Connections



CA 230 to OCB-8 Cable Connection

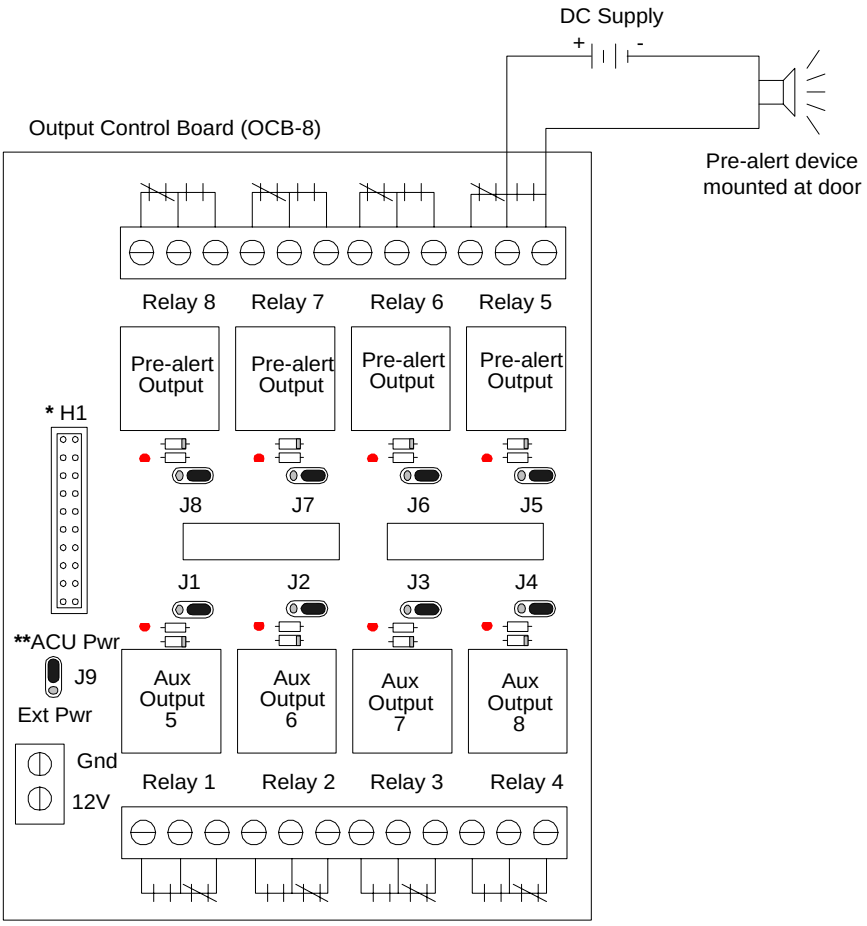


* Connect ribbon cable from H1 terminal on OCB-8 to Control 1 (right) terminal on CA 230 circuit board.

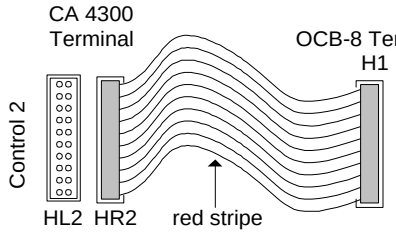
** OCB-8 relay board is powered through ribbon cable when J9 is on ACU PWR.

OCB-8 ribbon cable may be connected to HL1 (left side) on CA 230 circuit board. Set J9 to Ext Pwr. Connect OCB-8 12V/ Gnd to Auxiliary side of power supply. OCB-8s may be connected to HL1 and HR1 simultaneously.

Figure 112 - Pre-alert Relay CA 4300/OCB-8 Connections



CA 4300 to OCB-8 Cable Connection

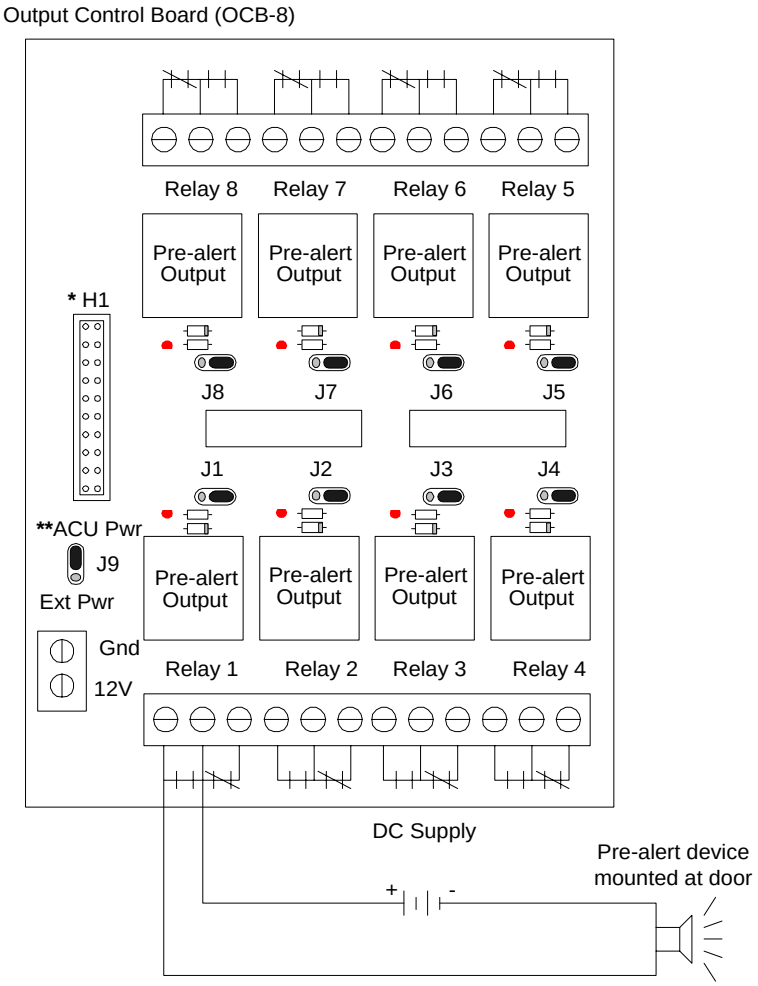


* Connect ribbon cable from H1 terminal on OCB-8 to Control 2 - HR2 (right) terminal on CA 4300 circuit board.

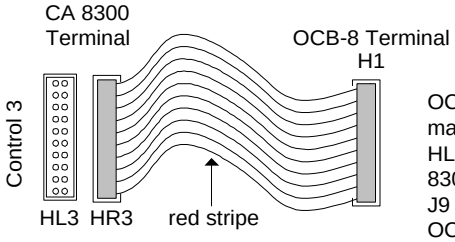
** OCB-8 relay board is powered through ribbon cable when J9 is on ACU PWR.

OCB-8 ribbon cable may be connected to HL2 (left side) on CA 4300 circuit board. Set J9 to Ext Pwr. Connect OCB-8 12V/Gnd to Auxiliary side of power supply. OCB-8s may be connected to HL2 and HR2 simultaneously.

Figure 113 - Pre-alert Relay CA 8300/OCB-8 Connections



CA 8300 to OCB-8 Cable Connection



OCB-8 ribbon cable may be connected to HL3 (left side) on CA 8300 circuit board. Set J9 to Ext Pwr. Connect OCB-8 12V/Gnd to Auxiliary side of power supply. OCB-8s may be connected to HL3 and HR3 simultaneously.

* Connect ribbon cable from H1 terminal on OCB-8 to Control 3 - HR3 terminal (right side) on CA 8300.

** OCB-8 relay board is powered through ribbon cable when J9 is on ACU PWR.

Appendix I – MISCOMM2 Communication between Buildings on a CPB-10 Loop

For ACU communication between two buildings on a CPB-10 loop, we recommend using one of the following devices:dial-up modem, fiber optic modem, short haul modem or an asynchronous line driver with optical isolation.

When using a fiber optic modem, short haul modem, or an asynchronous line driver with optical isolation, a Miscellaneous Communication Board (MISCOMM2) is required.

The MISCOMM2 consists of two boards that are modified CPB-10s. One board connects to the ACU via a ribbon cable and the second connects via a terminal block to the fiber optic modem, short haul modem, or asynchronous line driver with optical isolation. The following table and diagrams illustrate voltages and installation connections for a single ACU and multiple ACUs.

Important

We do not recommend using two CPB-10s for inter-building communication as the potential for a ground loop surge exists which may damage equipment.

Ground Loops

A ground loop is a current across a cable created by a difference in potential between two grounded points, as may exist with two buildings connected by a long run of EIA/TIA-562, RS485 or other data cables. When two devices are connected with potential ground differences, voltage flows from high to low through the data cable, even the ground wire. If the voltage potential is large enough, the equipment is unable to handle the excess voltage and as a result the communication ports are damaged. Even small ground loop voltages cause transmission errors with data signals riding on top of the ground loop current.

Table 26 - MISCOMM2 Voltages

Board	Contact	Voltage	Notes
MISCOMM2	7 (GND) to 1	(+) 12VDC	
	7 (GND) to 2	(-) 8 to (-) 12VDC	line driver generated
	7 (GND) to 3	(-) 8 to (-) 12VDC	pin 3 generated
	7 (GND) to 5	(-) 10VDC	

Figure 114 - MISCOMM2 – Inter Building Communication to a single ACU

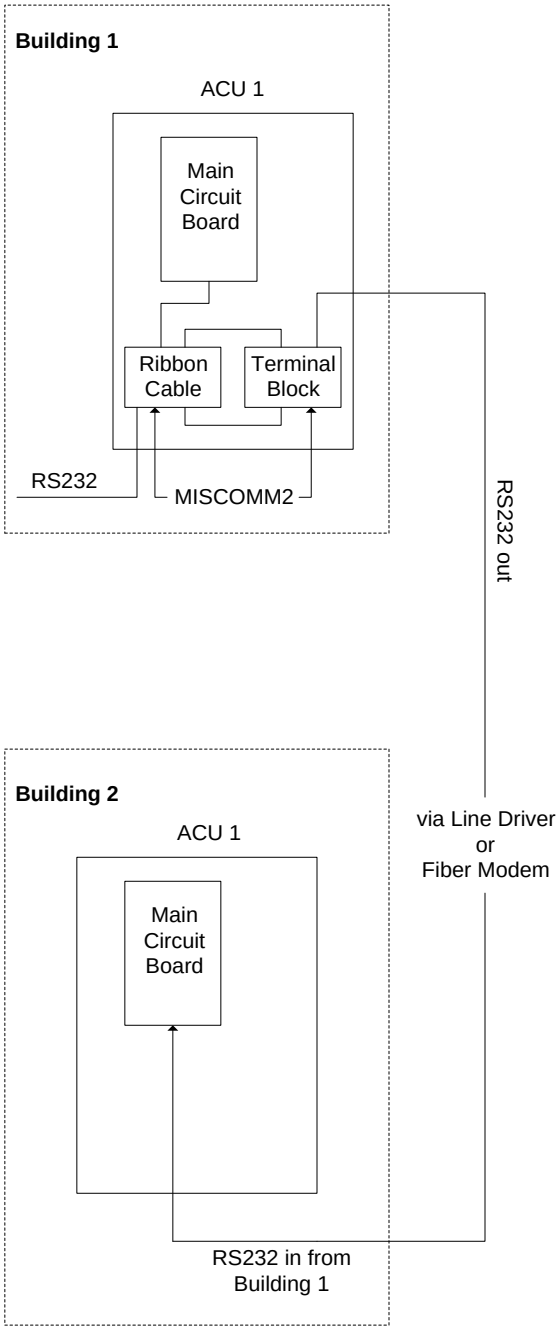
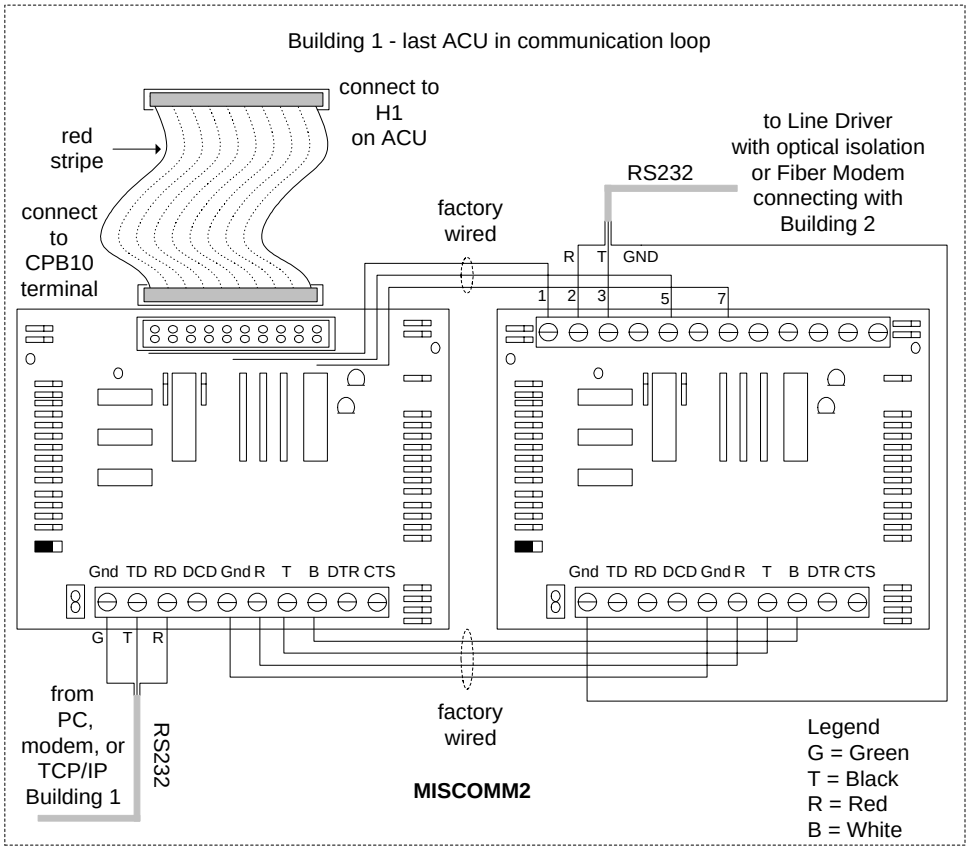


Figure 115 - MISCOMM2 Connections – to a single ACU



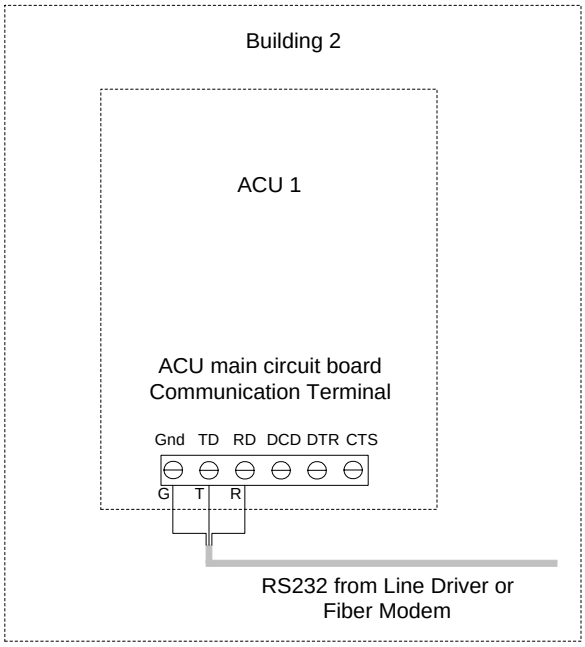


Figure 116 - MISCOMM2 Inter Building Communication to Multiple ACUs

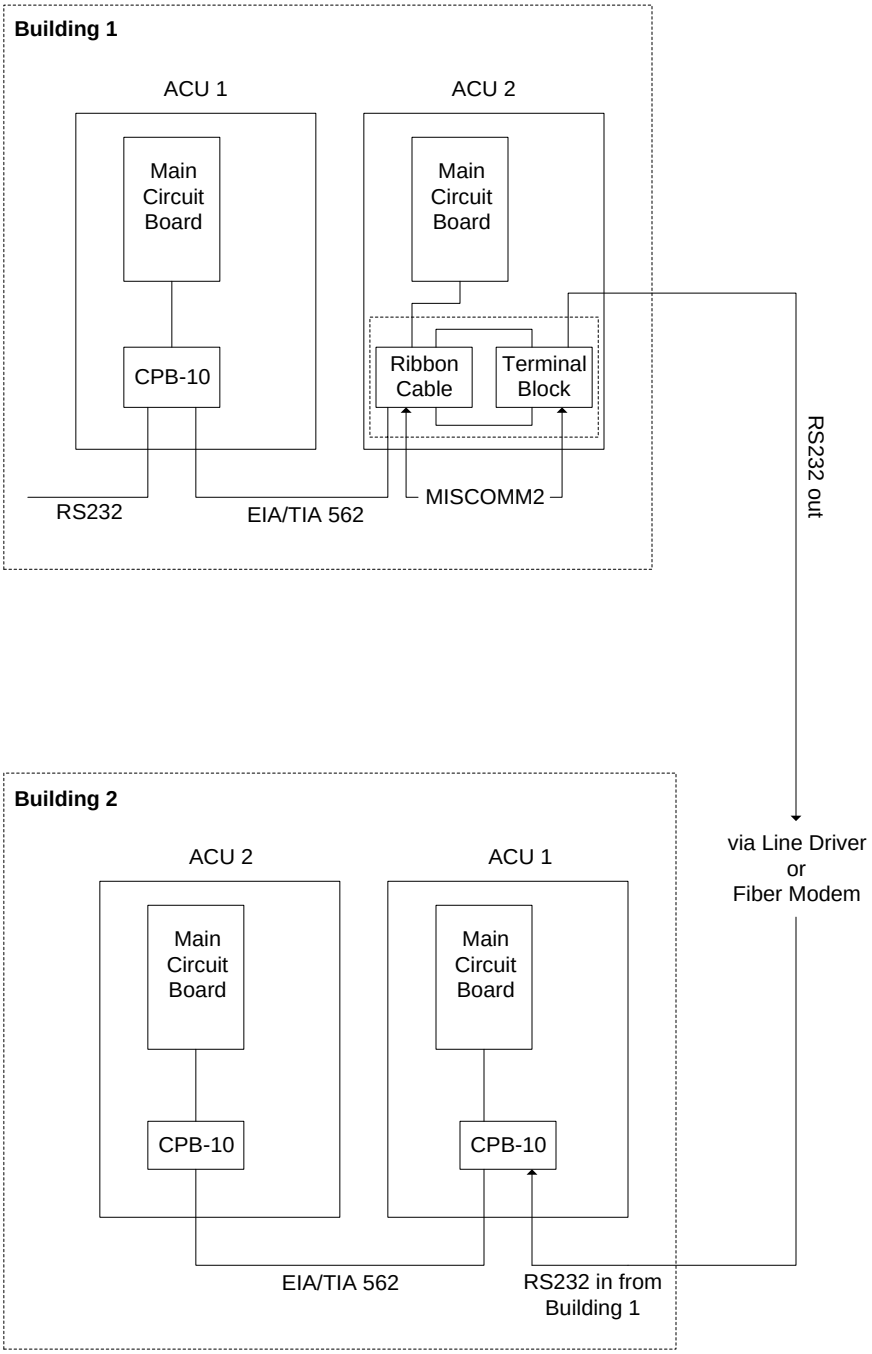
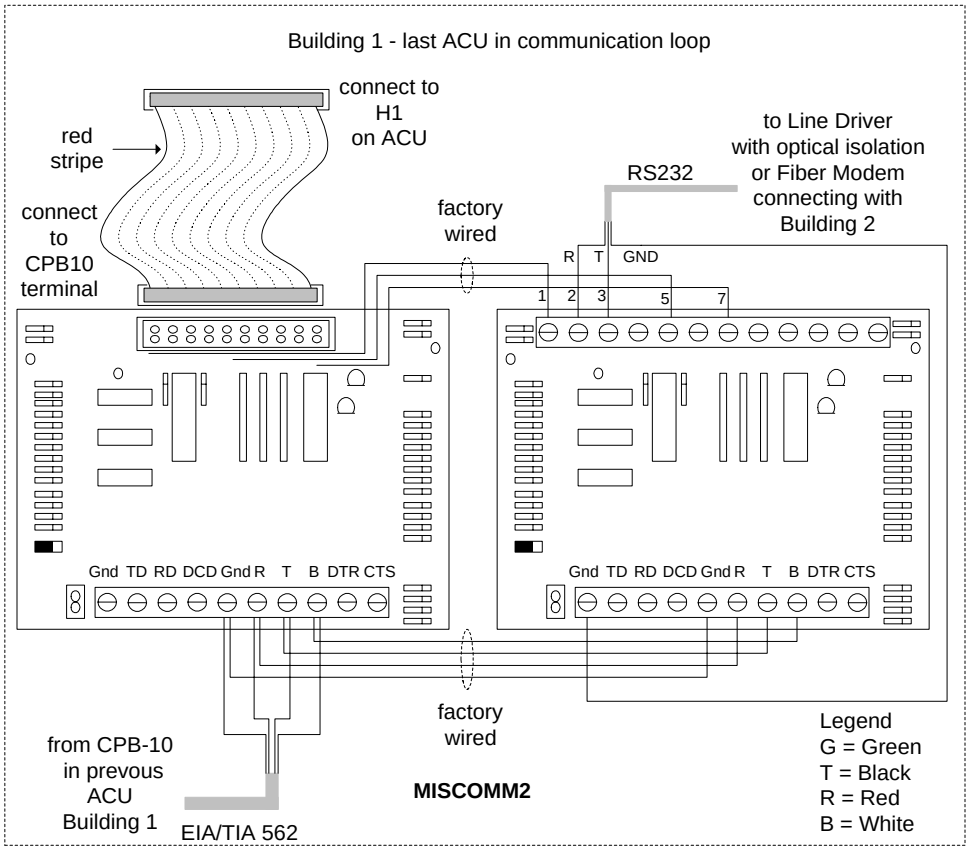
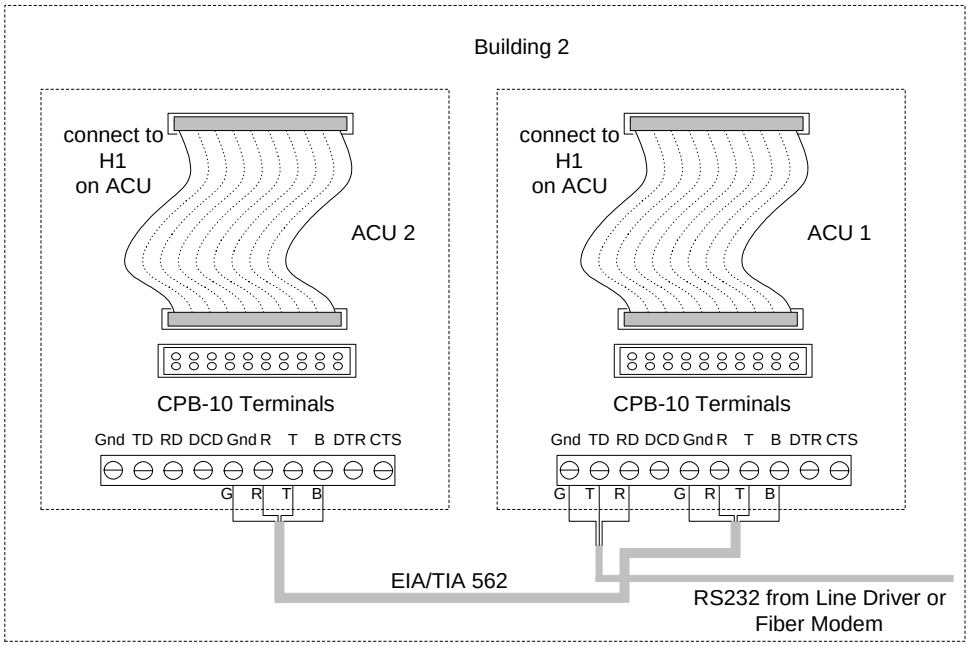


Figure 117 - MISCOMM2 Connections to Multiple ACUs





Appendix J – Telephone Entry Systems

Keyscan access control systems interface with two types of telephone entry systems:

- Phone Bill – requires a dedicated telephone line
- No Phone Bill – requires relay control equipment

Supported Telephone Entry Systems

Keyscan systems interface with the following major brands of telephone entry systems, which have a communication port and transmit visitor activity information:

- Enterphone 2000, Electra, Axess, and Crusader
- Select Engineered Systems (SES), TEC, and CAT
- Sentex Infinity

Keyscan Telephone Interface Kits

Keyscan offers the following 3 interface kits:

- VIS100 ENT interface kit used with Enterphone 2000, Axess, and Crusader (Axess and Crusader require RS-485 to RS-232 converter from Viscount). See page 153 for connections.
- VIS100 SES interface kit used with Enterphone Electra or SES, TEC and CAT series entrance panels. These panels require an OPTKSERIAL communications interface board from the manufacturer. See page 154 for connections.
- VIS100 STX interface kit used with Sentex Infinity series entrance panel. See page 155 for connections.

Test Mode

Terminal RB7/D1 on the interface is used for testing Wiegand output wiring and board operation. To test, connect a wire from RB7/D1 to ground and apply power to the interface board. The interface board outputs card number 12345, batch 000 in test mode. To exit test mode, remove the wire from RB7/D1.

Entering Access Codes in Client Software

Each suite or tenant must be given a record that is created in the Cardholder form from the Keyscan Client software as follows:

- First Name field – suite number or suite name
- Last Name field – last name of tenant
- Card Number – entry code or relay number
- Batch field – 255

Refer to the Client on-line help for setting access levels, time zones etc.

Figure 118 - VIS100 - ENT Connections

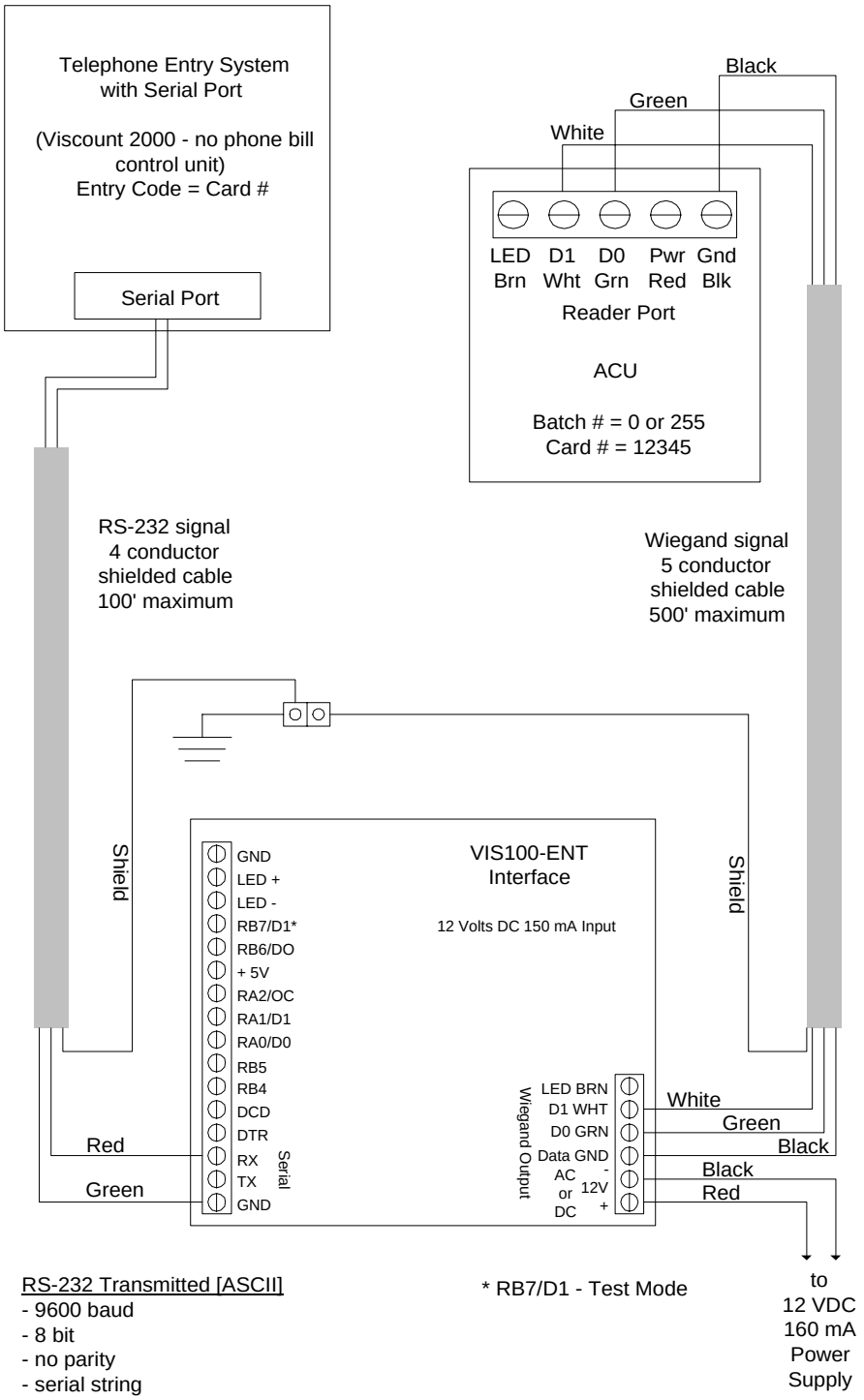
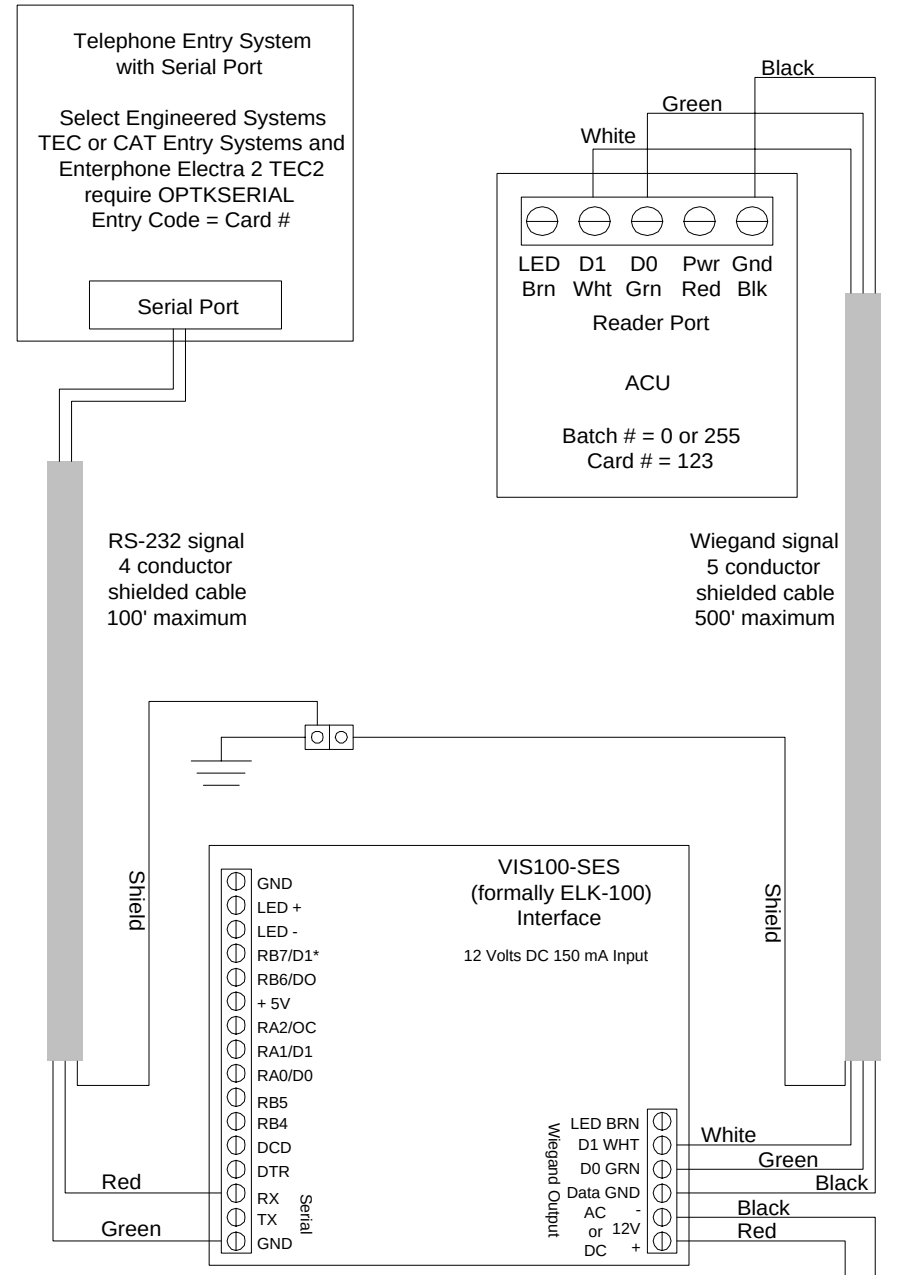


Figure 119 - VIS100 SES Connections



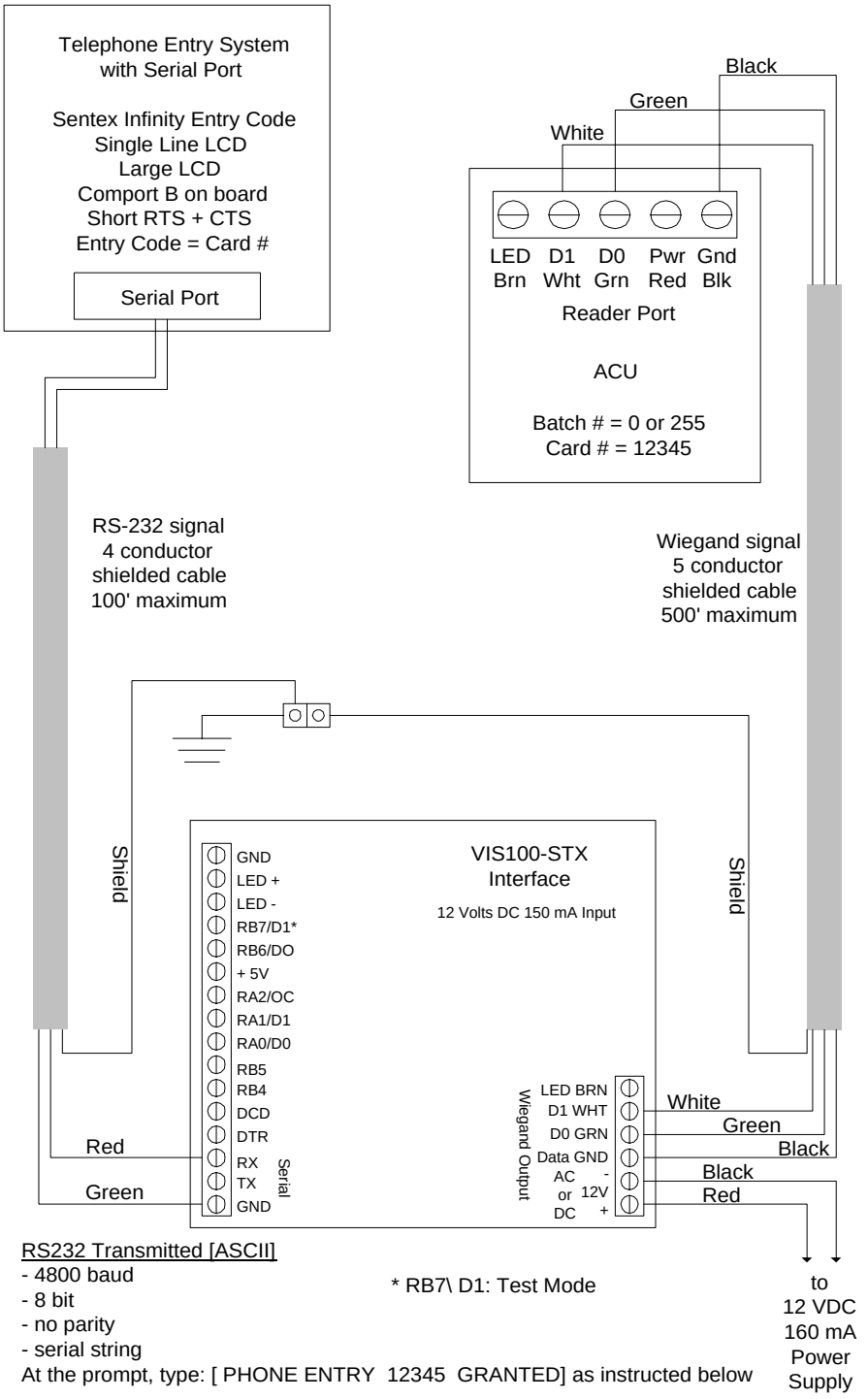
RS232 Transmitted [ASCII]
- 9600 baud
- 8 bit
- no parity
- serial string

At the prompt, type: CODE 123 OPEN as instructed below

* RB7\ D1: Test Mode

CODE *(insert a space)*123 *(insert 2 spaces)*OPEN *(insert a space and then press the Enter key)*

Figure 120 - VIS100 STX Connections



RS232 Transmitted [ASCII]
- 4800 baud
- 8 bit
- no parity
- serial string

At the prompt, type: [PHONE ENTRY 12345 GRANTED] as instructed below

[(insert a space) PHONE (insert a space) ENTRY (insert 2 spaces) 12345 (insert 2 spaces) GRANTED] (press the Enter key)

* RB7\ D1: Test Mode

Appendix K – 'MISC-BRC' Barcode Reader Interface

The MISC-BRC barcode reader interface is a customized interface for EZBarcode or BR-7 barcode readers manufactured by TimeKeeping Systems. Most barcode symbologies are supported including the following bar code types:

- Code 39
- Interleaved 2 of 5
- Codebar
- UPC-A
- UPC-E
- EAN
- Code 11
- Code 93
- Code 128
- MSI

The MISC-BRC barcode reader interface, based on client requests, is customized for truncating large numbers to a Wiegand protocol. The interface board has a custom project number printed on a white label on the central processing chip. Please do not remove this label; it may be required as a reference by our technical support department for potential troubleshooting.

Test Mode

Terminal RB7/D1 on the interface is used for testing Wiegand output wiring and board operation. To test, connect a wire from RB7/D1 to ground and apply power to the interface board. The interface board outputs card number 12345, batch 000 in test mode. To exit test mode, remove the wire from RB7/D1.

Figure 121 - Bar Code Card Placement Specifications

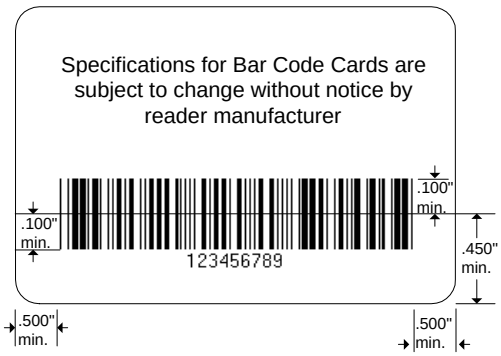
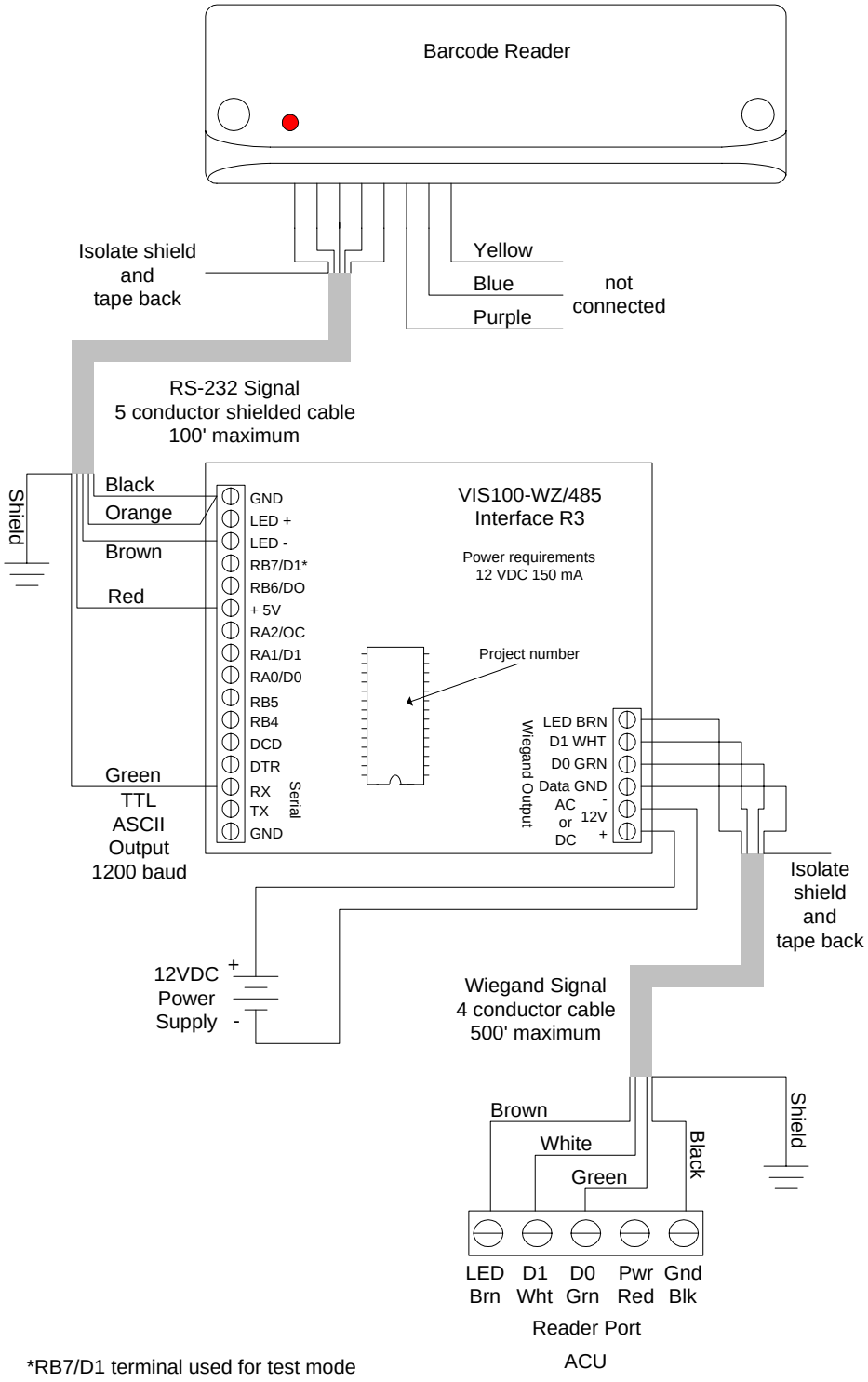


Figure 122 - MISC-BRC Barcode Reader Interface Connections



*RB7/D1 terminal used for test mode

CA 230 Quick Reference

Figure 123 - CA 230 Circuit Board

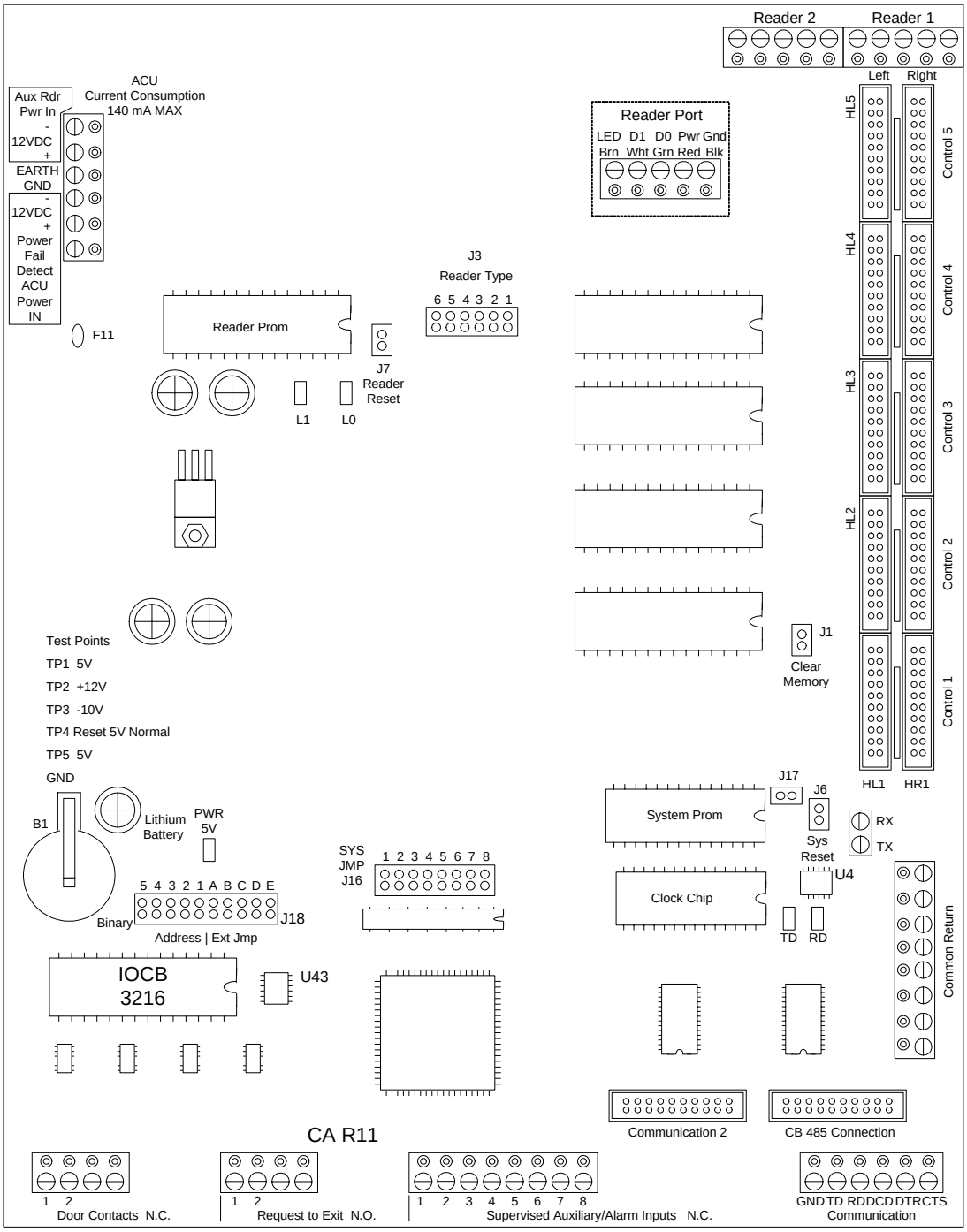


Table 27 - CA 230 Quick Reference

Function	Location	Instructions/Notes	Additional Reference
Power		The DPS12 power supply included has sufficient output for 1 ACU and 5 OCB-8 circuit boards.	
Grounding	GND terminal	Connect ground lug in ACU to cold water pipe ground.	See Figure 78.
Input Reader Power	(+) and (-) 12VDC right side terminals - AUX RDR PWR IN	(-) Black to (-) AUX Alarm on power supply (+) Red to (+) AUX Alarm on power supply	See Figure 78.
Input Board Power	(+) and (-) 12VDC left side terminals - AUX RDR PWR IN	(-) Black to (-) Power ACU on power supply (+) Red to (+) Power ACU on power supply	See Figure 78.
Reader 1 and 2	Data 0, Data 1	Wiegand Signal	See Figure 31.
Reader Port Fuses	F1 – Reader 1 F2 – Reader 2	To reset fuse, disconnect reader from terminal. Fuse automatically resets. Reconnect reader to terminal.	
Setting Jumpers	J16 – System Settings	Sets Communications and System Settings	See page 50.
	J1 – Clear ACU Memory	Momentarily short jumper	See page 60.
	J17 – Software Selection	Sets system software/PROM versions	See Software Selection – Jumper J17 page 53.
	J3 – Reader Types	Sets system to specific reader types.	See page 54.
	J18 – Address/External Settings	Sets the input supervision type	See page 57.
Wiegand LED bit counters	L1, L0	L1 counts first binary digit L0 counts the second binary digit	See page 56.
Relay Status Jumpers (OCB-8 Circuit Board)	JR1 – JR8	Right side – Normal Left side – Reversed	See page 29.
Communication	CB-485 Connection	When CB-485 Connection terminal is in use – CPB-10 or CB-485, the main circuit board Communication block is de-activated.	Main circuit board is RS232.
	Communication 2	Reserved	
Controller Test Voltages			See Table 12 on page 100.
Communication Test Voltages			See Table 13 on page 102.

Function	Location	Instructions/Notes	Additional Reference
Ribbon Cable Connection to OCB-8	Control 1 (right terminal block)	Connect ribbon cable to H1 on OCB-8 Terminal. Relay 1 and 2 are Door Outputs Relay 3 and 4 are Auxiliary relays (Relays 5 & 6 may be used as Auxiliary relays if not assigned as Handicap relays.) Relay 5 and 6 are Handicap relays. Relay 7 and 8 are Pre-alert relays.	See Figure 20 on page 32. See Figure 20 on page 32. See Figure 32 on page 47. See Figure 108 on page 140. See Figure 111 on page 144.

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CA 4300 Quick Reference

Figure 124 - CA 4300 Circuit Board

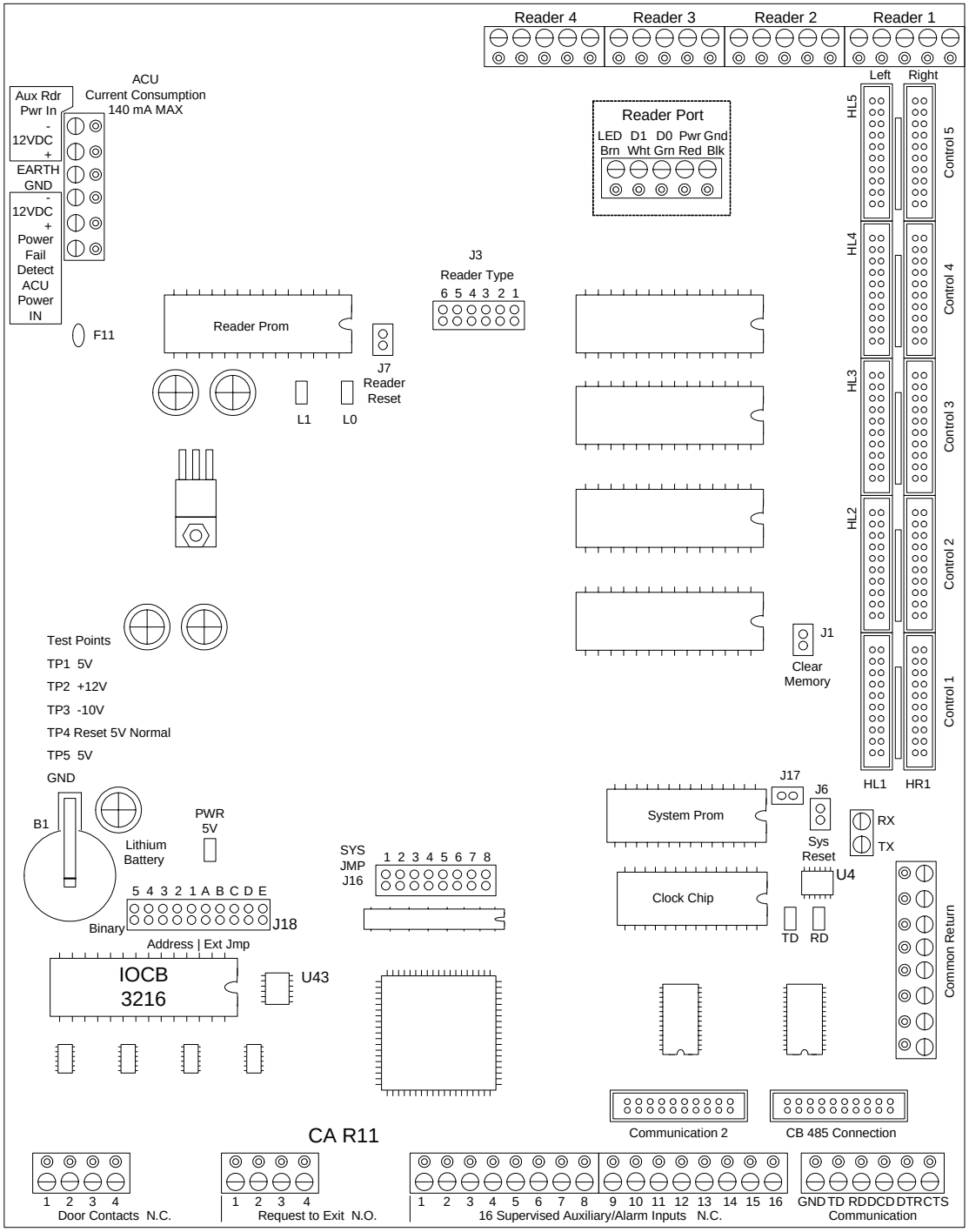

Table 28 - CA 4300 Quick Reference

Function	Location	Instructions/Notes	Additional Reference
Power		The DPS12 power supply included has sufficient output for 1 ACU and 5 OCB-8 circuit boards.	
Grounding	GND terminal – AUX RDR PWR IN	Connect ground lug in ACU to cold water pipe ground	See Figure 78.
Input Reader Power	(+) and (-) 12VDC upper terminals - AUX RDR PWR IN	(-) Black to (-) AUX Alarm on power supply (+) Red to (+) AUX Alarm on power supply	See Figure 78.
Input Board Power	(+) and (-) 12VDC lower terminals - AUX RDR PWR IN	(-) Black to (-) Power ACU on power supply (+) Red to (+) Power ACU on power supply	See Figure 78.
Readers 1 to 4	Data 0, Data 1	Wiegand Signal	See Figure 31.
Reader Port Fuses	F1 – Reader 1 F2 – Reader 2 F3 – Reader 3 F4 – Reader 4	To reset fuse, disconnect reader from terminal. Fuse automatically resets. Reconnect reader to terminal.	
Setting Jumpers	J16 – System Settings	Sets Communications and System Settings	See page 50.
	J1 – Clear ACU Memory	Momentarily short jumper	See page 60.
	J17 – Software Selection	Sets system software/PROM versions	See page 53.
	J3 – Reader Types	Sets system to specific reader types.	See page 54.
	J18 – Address/External Settings	Sets the input supervision type	See page 57.
Wiegand LED bit counters	L1, L0	L1 counts first binary digit L0 counts the second binary digit	See page 56.
Relay Status Jumpers (OCB -8 Circuit Board)	JR1 – JR8	Right side – Normal Left side – Reversed	See page 29.
Communication	CB-485 Connection	When CB-485 Connection terminal is in use – CPB-10 or CB-485, the main circuit board Communication block is de-activated.	Main circuit is RS232.
	Communication 2	Reserved	
Controller Test Voltages			See Table 12 on page 100.
Communication Test Voltages			See Table 13 on page 102.

Function	Location	Instructions/Notes	Additional Reference
Ribbon Cable Connection to OCB-8	1st OCB 8	H1 on OCB-8 to Control 1 (right terminal) CA 4300 (red stripe on bottom)	See Figure 21 on page 33.
	2nd OCB 8 (optional)	H1 on OCB 8 to Control 2 (right terminal) CA 4300 Use Control 2 for Pre-Alert relays (red stripe on bottom)	See Figure 112 on page 145.
		Control 3 not used	
	3rd OCB 8 (optional)	H1 on OCB 8 to Control 4 (right terminal) CA 4300 Use Control 4 for Handicap Accessibility relays. (red stripe on bottom)	See Figure 109 on page 141.
		Control 5 not used	

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CA 8300 Quick Reference

Figure 125 - CA 8300 Circuit Board

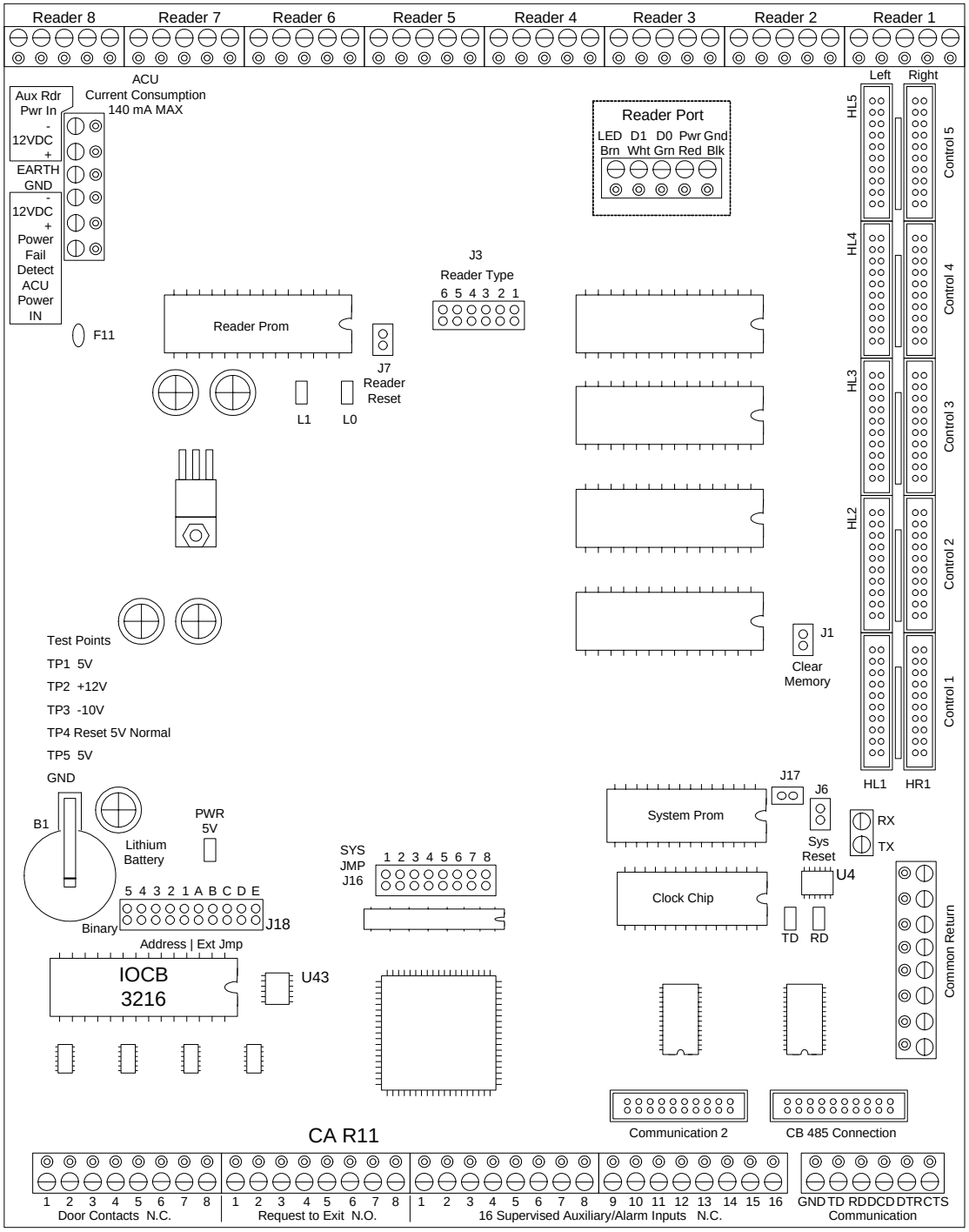

Table 29 - CA 8300 Quick Reference

Function	Location	Instructions/Notes	Additional Reference
Power		The DPS12 power supply included has sufficient output for 1 ACU and 5 OCB-8 circuit boards.	
Grounding	GND terminal – AUX RDR PWR IN	Connect ground lug in ACU to cold water pipe ground	See Figure 78.
Input Reader Power	(+) and (-) 12VDC upper terminals - AUX RDR PWR IN	(-) Black to (-) AUX Alarm on power supply (+) Red to (+) AUX Alarm on power supply	See Figure 78.
Input Board Power	(+) and (-) 12VDC lower terminals - AUX RDR PWR IN	(-) Black to (-) Power ACU on power supply (+) Red to (+) Power ACU on power supply	See Figure 78.
Readers 1 to 8	Data 0, Data 1	Wiegand Signal	Main circuit board is RS232.
Reader Port Fuses	F1 – Reader 1 F2 – Reader 2 F3 – Reader 3 F4 – Reader 4 F5 – Reader 5 F6 – Reader 6 F7 – Reader 7 F8 – Reader 8	To reset fuse, disconnect reader from terminal. Fuse automatically resets. Reconnect reader to terminal.	
Setting Jumpers	J16 – System Settings	Sets Communications and System Settings	See page 50.
	J1 – Clear ACU Memory	Momentarily short jumper	See page 60.
	J17 – Software Selection	Sets system software/PROM versions	See page 53.
	J3 – Reader Types	Sets system to specific reader types.	See page 54.
	J18 – Address/External Settings	Sets the input supervision type	See page 57.
Wiegand LED bit counters	L1, L0	L1 counts first binary digit L0 counts the second binary digit	See page 56.
Relay Status Jumpers (OCB -8 Circuit Board)	JR1 – JR8	Right side – Normal Left side – Reversed	See page 29.
Communication	CB-485 Connection	When CB-485 Connection terminal is in use – CPB-10 or CB-485, the main circuit board Communication block is de-activated.	
	Communication 2	Reserved	

Function	Location	Instructions/Notes	Additional Reference
Controller Test Voltages			See Table 12 on page 100.
Communication Test Voltages			See Table 13 on page 102.
Ribbon Cable Connection to OCB 8	1st OCB 8	H1 on OCB 8 to Control 1 (right terminal) CA 8300 Use Control 1 for Door Outputs (red stripe on bottom)	See Figure 22 on page 34.
	2nd OCB 8	H1 on OCB 8 to Control 2 (right terminal) CA 8300 Use Control 2 for Aux. Alarm Outputs. (red stripe on bottom)	See Figure 34 on page 49.
	3rd OCB 8 (optional)	H1 on OCB 8 to Control 3 (right terminal) CA 8300 Use Control 3 for Pre-Alerts (red stripe on bottom)	See Figure 113 on page 146.
	4th OCB 8 (optional)	H1 on OCB 8 to Control 4 (right terminal) CA 8300 Use Control 4 for Handicap Relays (red stripe on bottom)	See Figure 110 on page 142.
		Control 5 not used	

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EC 1300 Quick Reference

Figure 126 - EC 1300 Circuit Board

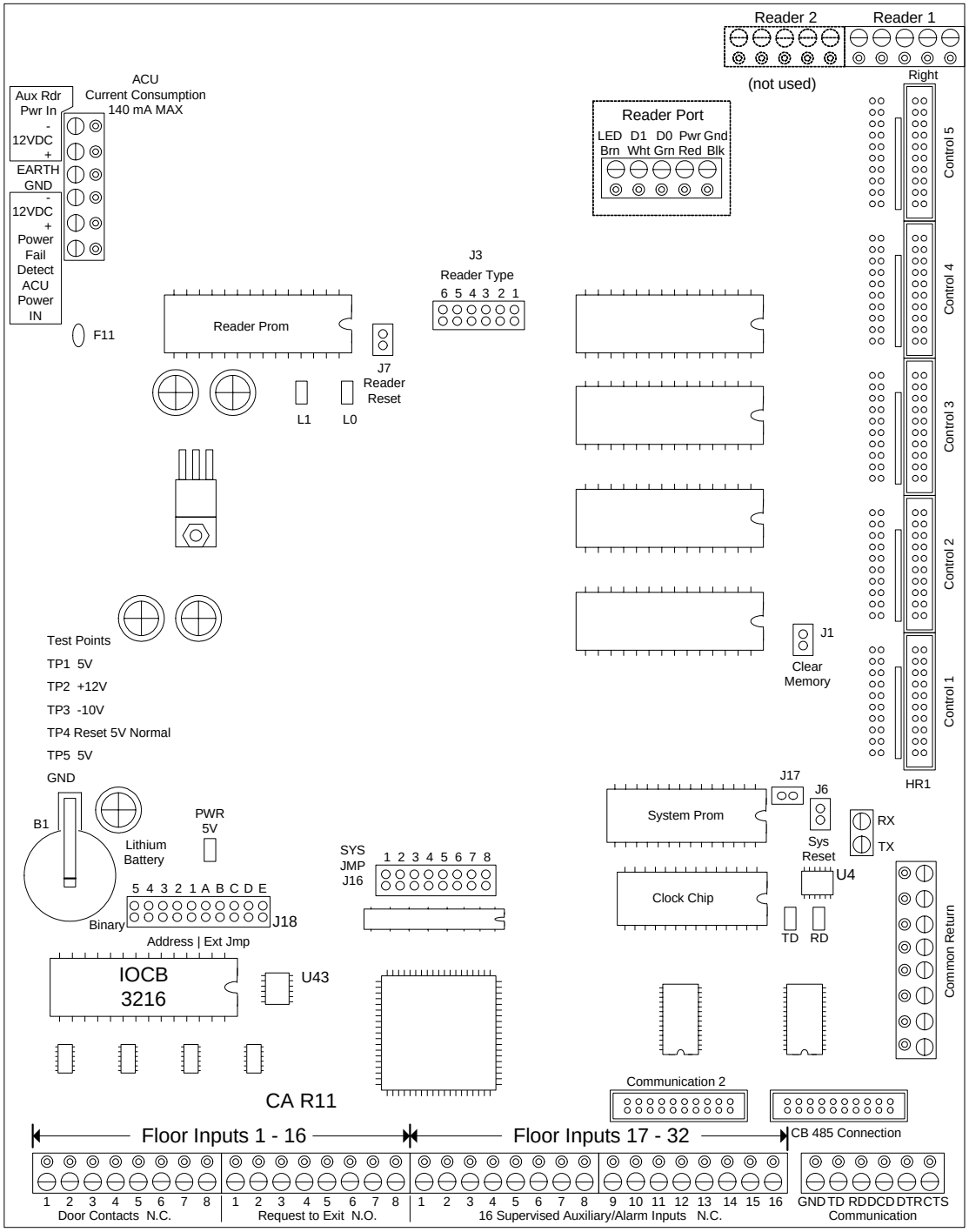

Table 30 - EC 1300 Quick Reference

Function	Location	Instructions/Notes	Additional Reference
Power		The DPS12 power supply included has sufficient output for 1 ACU and 5 OCB-8 circuit boards.	
Grounding	GND terminal – AUX RDR PWR IN	Connect ground lug in ACU to cold water pipe ground	See Figure 78.
Input Reader Power	(+) and (-) 12VDC upper terminals - AUX RDR PWR IN	(-) Black to (-) AUX Alarm on power supply (+) Red to (+) AUX Alarm on power supply	See Figure 78.
Input Board Power	(+) and (-) 12VDC lower terminals - AUX RDR PWR IN	(-) Black to (-) Power ACU on power supply (+) Red to (+) Power ACU on power supply	See Figure 78.
Reader 1	Data 0, Data 1	Wiegand Signal	See Figure 31.
Reader Port Fuses	F1 – Reader 1	To reset fuse, disconnect reader from terminal. Fuse automatically resets. Reconnect reader to terminal.	
Setting Jumpers	J16 – System Settings	Sets Communications and System Settings	See page 50.
	J1 – Clear ACU Memory	Momentarily short jumper	See page 60.
	J17 – Software Selection	Sets system software/PROM versions	See page 53.
	J3 – Reader Types	Sets system to specific reader types.	See page 54.
Wiegand LED bit counters	L1, L0	L1 counts first binary digit L0 counts the second binary digit	See page 56.
Relay Status Jumpers (OCB -8 Circuit Board)	JR1 – JR8	Right side – Normal Left side – Reversed	See page 29.
Communication	CB-485 Connection	When CB-485 Connection terminal is in use – CPB-10 or CB-485, the main circuit board Communication block is de-activated.	
	Communication 2	Reserved	
Controller Test Voltages			See Table 12 on page 100.
Communication Test Voltages			See Table 13 page 102
Ribbon Cable Connection to OCB 8	1st OCB 8 Floors 1 to 8	H1 on OCB 8 to Control 1 (right terminal) EC 1300 (red stripe on bottom)	

Function	Location	Instructions/Notes	Additional Reference
	2nd OCB 8 (optional) Floors 9 to 16	H1 on OCB 8 to Control 2 (right terminal) EC 1300 (red stripe on bottom)	
	3rd OCB 8 (optional) Floors 17 to 24	H1 on OCB 8 to Control 3 (right terminal) EC 1300 (red stripe on bottom)	
	4th OCB 8 (optional) Floors 25 to 32	H1 on OCB 8 to Control 4 (right terminal) EC 1300 (red stripe on bottom)	
	5th OCB 8 (optional) Floors 33 to 40	H1 on OCB 8 to Control 5 (right terminal) EC 1300 (red stripe on bottom)	

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EC 2300 Quick Reference

Figure 127 - EC 2300 Circuit Board

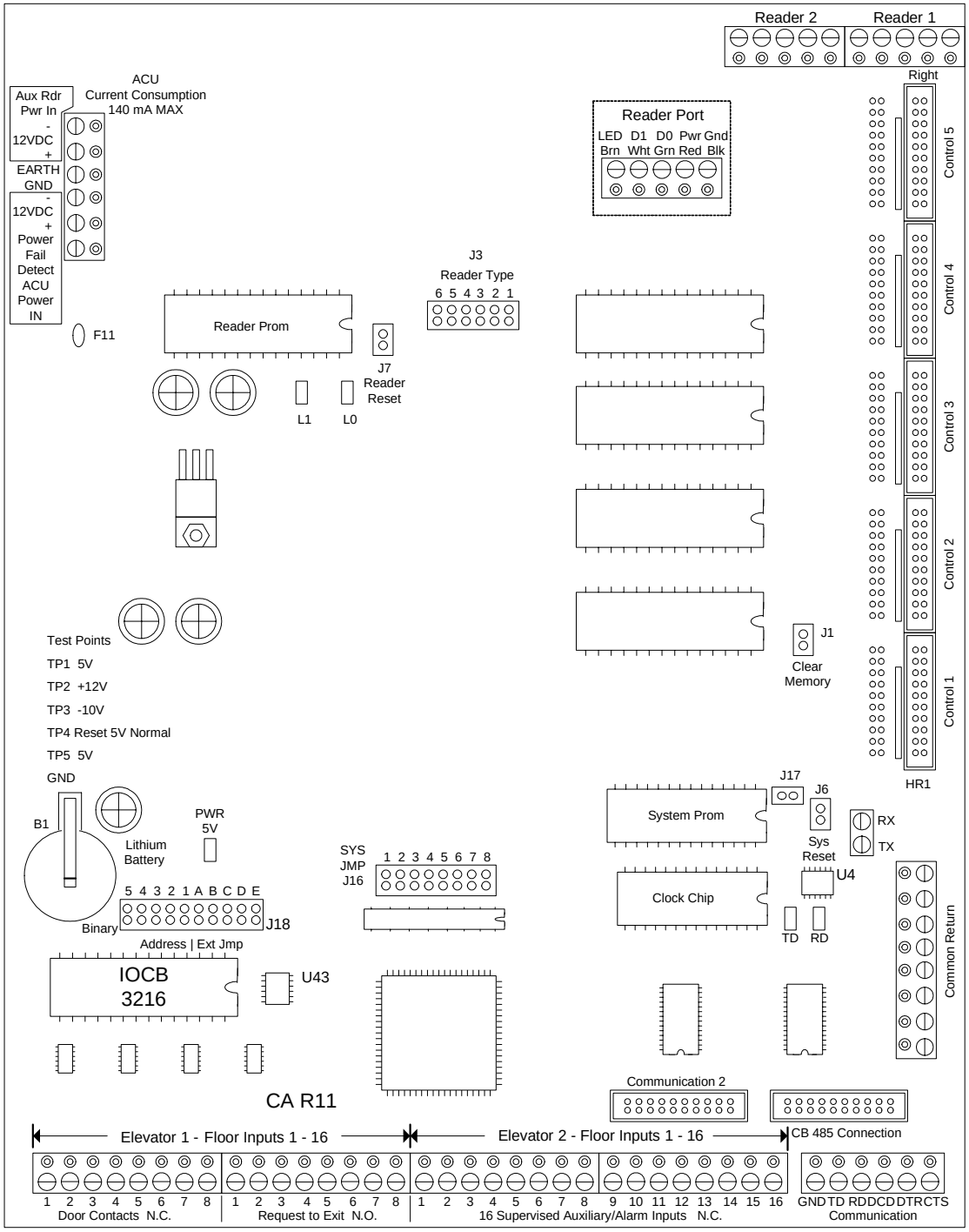

Table 31 - EC 2300 Quick Reference

Function	Location	Instructions/Notes	Additional Reference
Power		The DPS12 power supply included has sufficient output for 1 ACU and 5 OCB-8 circuit boards.	
Grounding	GND terminal – AUX RDR PWR IN	Connect ground lug in ACU to cold water pipe ground	See Figure 78.
Input Reader Power	(+) and (-) 12VDC upper terminals - AUX RDR PWR IN	(-) Black to (-) AUX Alarm on power supply (+) Red to (+) AUX Alarm on power supply	See Figure 78.
Input Board Power	(+) and (-) 12VDC lower terminals - AUX RDR PWR IN	(-) Black to (-) Power ACU on power supply (+) Red to (+) Power ACU on power supply	See Figure 78.
Readers 1 and 2	Data 0, Data 1	Wiegand Signal	See Figure 31.
Reader Port Fuses	F1 – Reader 1 F2 – Reader 2	To reset fuse, disconnect reader from terminal. Fuse automatically resets. Reconnect reader to terminal.	
Setting Jumpers	J16 – System Settings	Sets Communications and System Settings	See page 50.
	J1 – Clear ACU Memory	Momentarily short jumper	See page 60.
	J17 – Software Selection	Sets system software/PROM versions	See page 53.
	J3 – Reader Types	Sets system to specific reader types.	See page 54.
Wiegand LED bit counters	L1, L0	L1 counts first binary digit L0 counts the second binary digit	See page 56
Relay Status Jumpers (OCB -8 Circuit Board)	JR1 – JR8	Right side – Normal Left side – Reversed	See page 29.
Communication	CB-485 Connection	When CB-485 Connection terminal is in use – CPB-10 or CB-485, the main circuit board Communication block is de-activated.	
	Communication 2	Reserved	
Controller Test Voltages			See Table 12 page 100
Communication Test Voltages			See Table 13 page 102
Ribbon Cable Connection to OCB 8	1st OCB 8 Elevator 1 Floors 1 to 8	H1 on OCB 8 to Control 1 (right terminal) EC 2300 (red stripe on bottom)	
	2nd OCB 8 Elevator 2 Floors 1 to 8	H1 on OCB 8 to Control 3 (right terminal) EC 2300 (red stripe on bottom)	

Function	Location	Instructions/Notes	Additional Reference
	3rd OCB 8 (optional) Elevator 1 Floors 9 to 16	H1 on OCB 8 to Control 2 (right terminal) EC 2300 (red stripe on bottom)	
	4th OCB 8 (optional) Elevator 2 Floors 9 to 16	H1 on OCB 8 to Control 4 (right terminal) EC 2300 (red stripe on bottom)	

Relay States

Table 32 – List of Relay States

Device	Relay Jumper		Status	Possible TZ Status	LED State	N.C. Relay State	N.O. Relay State
Door Relay		Normal	Unlocked	ON	☼		
Door Relay		Normal	Locked	OFF	●		
Door Relay		Reversed	Unlocked	ON	●		
Door Relay		Reversed	Locked	OFF	☼		
Aux Output Relay		Normal	Door Held Open Alarm	-	☼		
Aux Output Relay		Normal	Alarm Tripped	-	☼		
Aux Output Relay		Reversed	Door Held Open Alarm	-	●		
Aux Output Relay		Reversed	Alarm Tripped	-	●		
Aux Output Relay		Normal	☐	OFF	☼		
Aux Output Relay		Normal	☑	ON	●		
Aux Output Relay		Reversed	☐	OFF	●		
Aux Output Relay		Reversed	☑	ON	☼		
Pre-alert Relay		Normal	Activated	-	☼		
Pre-alert Relay		Normal	Normal	-	●		
Pre-alert Relay		Reversed	Activated	-	●		
Pre-alert Relay		Reversed	Normal	-	☼		
Accessibility Relay		Normal	Activated	-	☼		
Accessibility Relay		Normal	Normal	-	●		

Device	Relay Jumper		Status	Possible TZ Status	LED State	N.C. Relay State	N.O. Relay State
Accessibility Relay		Reversed	Activated	-	●		
Accessibility Relay		Reversed	Normal	-	☼		
Elevator Relay		Normal	Unsecured	ON	☼		
Elevator Relay		Normal	Secured	OFF	●		
Elevator Relay		Reversed	Unsecured	ON	●		
Elevator Relay		Reversed	Secured	OFF	☼		

Legend

☼	LED – On
●	LED – Off
☐	Manual Output Control – Aux Status Off (Red)
☑	Manual Output Control – Aux Status On (Green)
	Relay State Open
	Relay State Closed
	OCB8 – Relay Jumper in Normal Position
	OCB8 – Relay Jumper in Reversed Position

Warranty

Limited Warranty

Keyscan warrants that all Keyscan manufactured products shall be free of defects in materials and workmanship under normal use for a period of two years from the date of purchase. In fulfillment of any breach of such warranty, Keyscan shall, at its option, repair or replace defective equipment upon return to its facilities. This warranty applies only to defective parts or workmanship. This warranty does not apply to damage that occurred during shipping or handling, or damage due to causes beyond the control of Keyscan such as lightning, excessive voltage, mechanical shock, water damage, or damage arising out of abuse, alteration or improper application of the equipment.

This warranty does not extend to products distributed by Keyscan that are manufactured by 3rd parties. The original equipment manufacturer's warranty shall apply.

The foregoing warranty shall apply only to the original buyer and is and shall be in lieu of any and all other warranties, whether expressed or implied and of all other obligations or liabilities on the part of Keyscan. This warranty contains the entire warranty. Keyscan neither assumes, nor authorizes any other person purporting to act on its behalf to modify or to change this warranty, nor to assume for it any other warranty or liability concerning this product.

In no event shall Keyscan be liable for any direct, indirect, or consequential damages, loss of anticipated profits, loss of time or any other losses incurred by the buyer in connection with the purchase, installation, or operation or failure of this product.

WARNING – Keyscan recommends that the entire system be completely tested on a regular basis. However, despite frequent testing and due to, but not limited to, criminal tampering or electrical disruption, it is possible for this product to fail to perform as expected.

Seller's Right of Possession

In addition to all remedies Keyscan may possess, Keyscan shall have the right at any time for credit reasons or because of buyer's defaults, to withhold shipments in whole or in part, to recall goods in transit, retake same and repossess all goods which may be stored, without the necessity of taking any other action.

Buyer consents that all merchandise so recalled, retaken, or repossessed shall become the absolute property of Keyscan provided that buyer is promptly notified of such action and is given full credit therefore.

Product Installation and Operation

Buyer assumes all responsibility for the proper selection, installation, operation, maintenance and adherence to any and all federal, state/provincial and municipal building and fire codes of the merchandise purchased from Keyscan. Keyscan SHALL NOT BE RESPONSIBLE FOR ANY CONSEQUENTIAL, CONTINGENT, SPECIAL OR INCIDENTAL DAMAGES whatsoever, except as specifically set forth in the LIMITED WARRANTY.

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