Specifications

Operating Voltage
12VDC

Current Draw
CIM only – 150 mA; CIM 150 mA + NETCOM2P/6P 140 mA = 290 mA

Dimensions
4 5/8" x 3" (11.7 cm x 7.6 cm)

Operating Environment
Suitable for industrial and commercial applications.

Operating temperatures: 5^0 C to 60^0 C (41^0 F to 140^0 F)

Cables
CIM to CIM: CAT5, 2 twisted pairs, maximum cable distance first CIM to last CIM 3280 ft (1000 m) @9600 bps

CIM to ACU: ribbon cable to communication terminal H2

CIM 0 to PC direct serial: 22 AWG, 5 conductors shielded, maximum 49.2 feet (14.9m) @ 9600 bps

CIM 0 to NETCOM2P/6P: plugs directly into CIM

CIM 0 to NETCOM2: 22 AWG, 5 conductors shielded, maximum 49.2 ft (14.9 m) @ 9600 baud

CAN Bus
CAN Bus 1: PC to ACU communication

CAN Bus 2: ACU to ACU communication for global functions and CIM to CIM

Topology
Linear – does not support star or ring topologies

Inter-building Connectivity
Yes

ACU Firmware
Requires control board with EPROM version 9.20 or higher for door control

Requires control board with EPROM version 9.20 or higher for elevator control

Note
The control board's H2 header is an open header and does not require setting jumper J16-pins F & G or DIP switches S2 – 7 & 8 for activation.

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CIM Setup Guide - PC109x – Document # KD10027-E-0920

CIM Setup Guide

This guide outlines how to install and connect Communication Interlink Modules (CIM). CIM modules may be configured with a network connection (TCP/IP) using a NETCOMP or a NETCOM or with a direct serial connection to a PC/server.

Before You Start

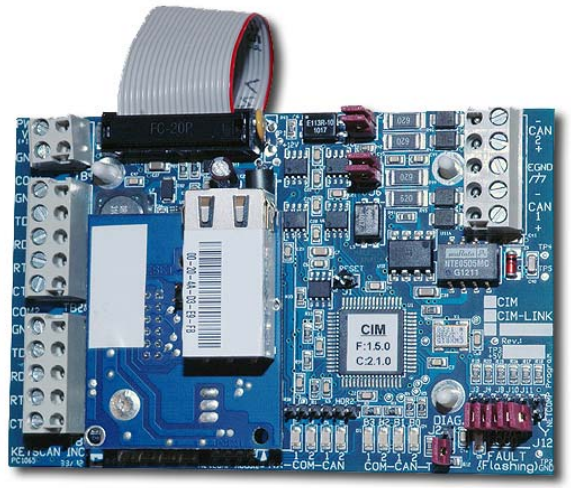
- Verify that you have all the parts as outlined below.
- We recommend reviewing this document so you are familiar with the CIM's conventions and jumper settings before you start connecting the units.
- If you are installing the CIM modules for network communication using a NETCOMP or a NETCOM, refer to the respective NETCOM Installation Guide that accompanied the NETCOM device for specific programming instructions.

Contents

Parts List

CIM Module	1
Ribbon Cable with Ferrite	1

Figure 1 - CIM Circuit Board shown with optional NETCOM2P



Pre-Installation

We suggest that you review the following material to ensure that you have the required firmware and software versions that support the CIM modules.

CIM Module Requirements

Depending on the Keyscan software application, the following outlines CIM module software and firmware requirements:

System VII / Vantage

- System VII – version 7.0.6 or higher for global inputs/outputs
- Vantage – version 8.1.5 or higher for global inputs/outputs
- EPROM version 7.40/8.20 or higher – door control units
- EPROM version 7.97/8.77 or higher – elevator control units
- If using a NETCOM2P or NETCOM6P, ensure the NETCOMP version is a PC1051 or later (blue) printed circuit board

Aurora

- Aurora – version 1.0.1 or higher for global inputs/outputs
- EPROM version 9.20 or higher – door control units
- EPROM version 9.20 or higher – elevator control units
- If using a NETCOM2P or NETCOM6P, ensure the NETCOMP version is a PC1051 or later (blue) printed circuit board

Note
We recommend CAN Bus 1 and CAN Bus 2 are connected on all CIM modules.

For global outputs, we recommend using the global OCB-8 option. This requires the purchase of an optional OCB-8 which connects to the control board's Control 5 header. Global outputs are not supported on CA200 or CA250 door control units and EC1000, EC2000, EC1500, or EC2500 elevator control units.

Multiple Building Communication on a WAN

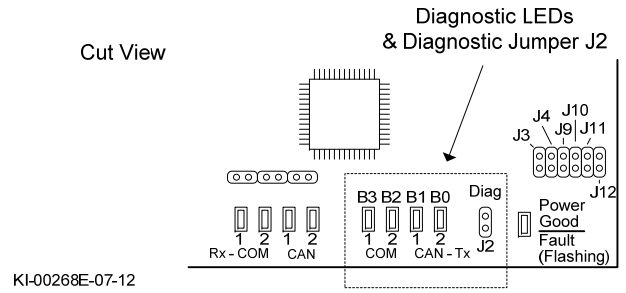
dormakaba Canada Inc. requires a point-to-point private network where NETCOMs are used on a LAN/WAN (TCP/IP) that integrates building to building communication.

Supplementary Documentation

You may also require the following Keyscan documentation which can be located on the Product Documentation Library CD or the Aurora Installation DVD:

- CIM - LINK Setup Guide for integrating multiple communication loops
- Technical Guide
- Global Inputs & Outputs/Schedules

Figure 9 – Diagnostic LEDs – B3 – B0



CIM Boot-up

When power is applied to the CIM or the reset jumper J1 is momentarily shorted, the CIM module will begin its boot-up sequence. The module uses the 4 diagnostic LEDs to indicate where it is in the boot-up sequence.

B3 – B0 Code

- 1 to 4 – basic initialization notices
- 5 (0101) – the CIM has entered NETCOMP program mode (LEDs will extinguish after approximately 1 second.)
- 6 (0110) – the CIM has entered ACU connection mode (The LEDs may extinguish after 1 second if the CIM can establish communication with the ACU quickly. The CIM may stay in this mode longer if it is auto-matching the bit rate of the ACU or is unable to communicate to the ACU via the global communication port.)
- 7 (0111) – the CIM has entered CIM 0 mode (It has been set to provide PC to CAN Bus communication. (If the bit rate has been set via jumpers J9 – J11, the CIM will extinguish the LEDs after approximately 1 second. If the CIM has been set for auto-match bit rate, the LEDs may extinguish after 1 second if the CIM can establish communication with the ACU quickly. The CIM may stay in this mode longer if it is auto-matching the bit rate of the ACU or is unable to communicate to the ACU via the global communication port.)

Diagnostic Guidelines

LEDs B3 – B0 indicate Tx data transmission states. Diagnostic Jumper J2 sets the CIM board to run in diagnostic mode.

CIM Diagnostics – LED Codes

The following table lists diagnostic LED codes on the CIM. LED indicators are as follows:

- 0 = OFF
- 1 = ON

Place a jumper on J2 to run the CIM in diagnostic mode.

LED				Trouble Indication Code	Fault
B3	**B2**	**B1**	**B0**		
0	0	0	0	0	None
0	0	0	1	1	+ 5V Logic Voltage Low
0	0	1	0	2	+ 12V Input Voltage Low
0	0	1	1	3	+ 5V Isolated Logic Supply Low
0	1	0	0	4	CAN Bus 1 Fault
0	1	0	1	5	Global Broadcast Fail
0	1	1	0	6	ACU Panel Initialize Fail
0	1	1	1	7	CAN Bus 2 Fault
1	0	0	0	8	CIM to ACU Auto-Match Bit Rate Fail or Incomplete
1	0	0	1	9	Data carrier detect (DCD) connection lost. Applies to reverse network mode only.

Note

Diagnostic mode is indicated by all 4 LEDs flashing 3 times. Diagnostic codes are displayed every 20 seconds. Multiple codes are displayed lowest to highest.

End of diagnostic routine is indicated when all 4 LEDs flash 3 times.

Unless Power Good/Fault LED is flashing, the unit will not enter unit diagnostic mode even if a jumper is on J2.

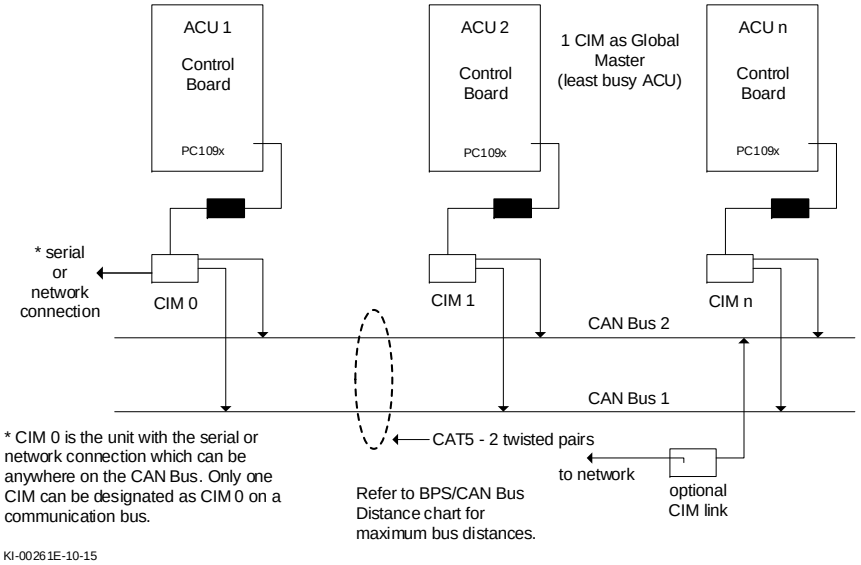
Diagnostics are continued on the next page ...

CIM Module Configuration

The Communication Interlink Module (CIM) is used to establish PC to ACU and ACU to ACU communication when two or more access control units are installed on a communication bus. The CIM uses highly reliable CAN Bus architecture on CAT 5 cable with 2 twisted pairs. The CIM communication modes on the CAN Bus are as follows:

- CAN Bus 1 (required) - PC to ACU main communication
- CAN Bus 2 (optional) - ACU to ACU communication for global functions (i.e. global anti-pass back, global time zones, and global I/Os)
- CAN Bus 2 - CIM to CIM communication for CIM hardware control and monitoring and reverse network communication

Figure 2 – CIM Module Overview



CIM Conventions

Before connecting, be aware of the following CIM module conventions.

- CIM modules inter-connect two or more ACUs with a CIM connected to each ACU on the communication bus
  - CIM modules are not required for a single ACU communication bus
- One CIM must be jumpered as a global master when using ACU to ACU communication for global anti-pass back on CAN Bus 2; global anti-pass back does not apply to elevator control units
- Any CIM module on the communication bus can be configured as the global master or configured as CIM 0
  - where a higher number of control boards are on the communication bus, assign the global master to a CIM other than CIM 0
- The CIM unit with the serial or network connection must be jumpered as CIM 0
- Only one global master and only one CIM 0 are allowed per communication bus
  - If connecting CIM-LINK modules, designate only one global master for the entire network of bridged communication buses
- First and last modules must be jumpered to terminate CAN Bus 1 and CAN Bus 2
- Reverse network communication or global functions require CAN Bus 1 and CAN Bus 2
- For reverse network communication CIM 0 requires a NETCOM6P

BPS/CAN Bus Distance Chart

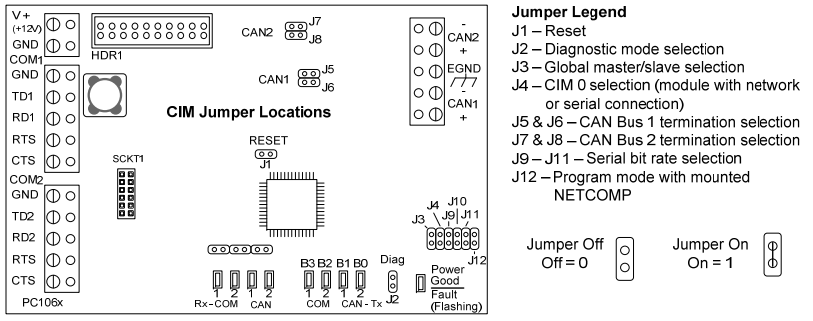
Select serial bit rates based on the cable distance of CAN Bus 1. Determine CAN Bus 1 distances before setting serial bit rate jumpers outlined on page 6.

PC/ACU Bit Rate	CAN Bus 1 CAT 5 Distance	RS-232 Distance
9600	3280 ft (1000 m)	100 ft (30 m)
19,200	3280 ft (1000 m)	49.2 ft (14.9 m)
57,600	984.25 ft (300 m)	26.2 ft (8 m)
115,200	262.46 ft (80 m)	9.84 ft (3 m)

CIM Jumper Settings

The CIM has jumpers that determine the board's attributes. Ensure the necessary jumpers are set depending on the position and function of the board. Jumper settings are reviewed in the following tables. Please note the jumper locations in Figure 3.

Figure 3 – CIM Module Jumper Locations



Jumper Legend
- J1 – Reset
- J2 – Diagnostic mode selection
- J3 – Global master/slave selection
- J4 – CIM 0 selection (module with network or serial connection)
- J5 & J6 – CAN Bus 1 termination selection
- J7 & J8 – CAN Bus 2 termination selection
- J9 – J11 – Serial bit rate selection
- J12 – Program mode with mounted NETCOMP

Jumper Off Off = 0 Jumper On On = 1

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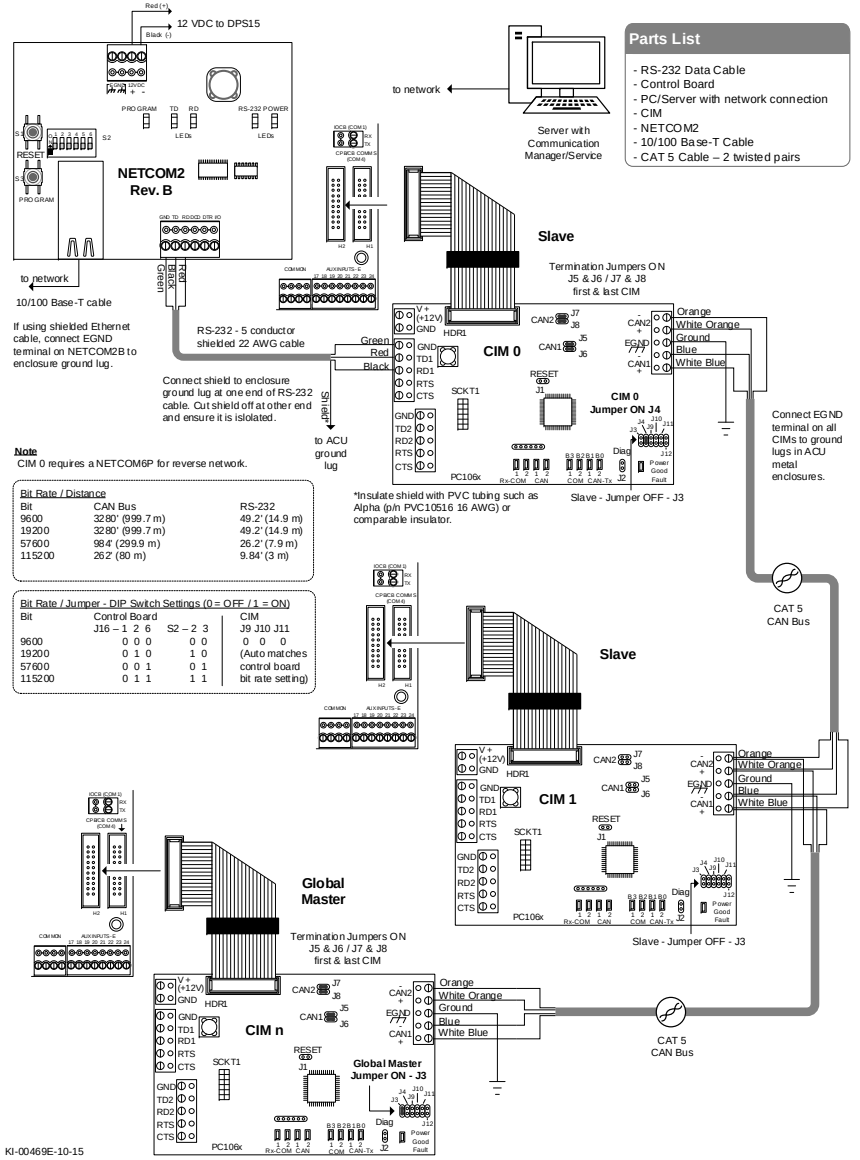
CIM Global Master Jumper – J3 (Master/Slave ACUs)

Jumper J3 sets the CIM as global master. Only one CIM can be designated as a global master. All other CIMs are designated as slaves.

Module	Jumper #	Jumper Setting	Notes
CIM – Global Master	J3	1	Global master CIM at least busiest ACU. Set global master CIM connected to door control unit only when using ACU to ACU communication on CAN Bus 2. Do not set a CIM as global master that is connected to an elevator control unit. See note below.
CIM - Slave	J3	0	

Note
On a communication bus with multiple CIM/elevator control units only, a global master CIM is not required.

Figure 8 – Network Connection with NETCOM2 Rev. B & Multiple CIMs/ACUs

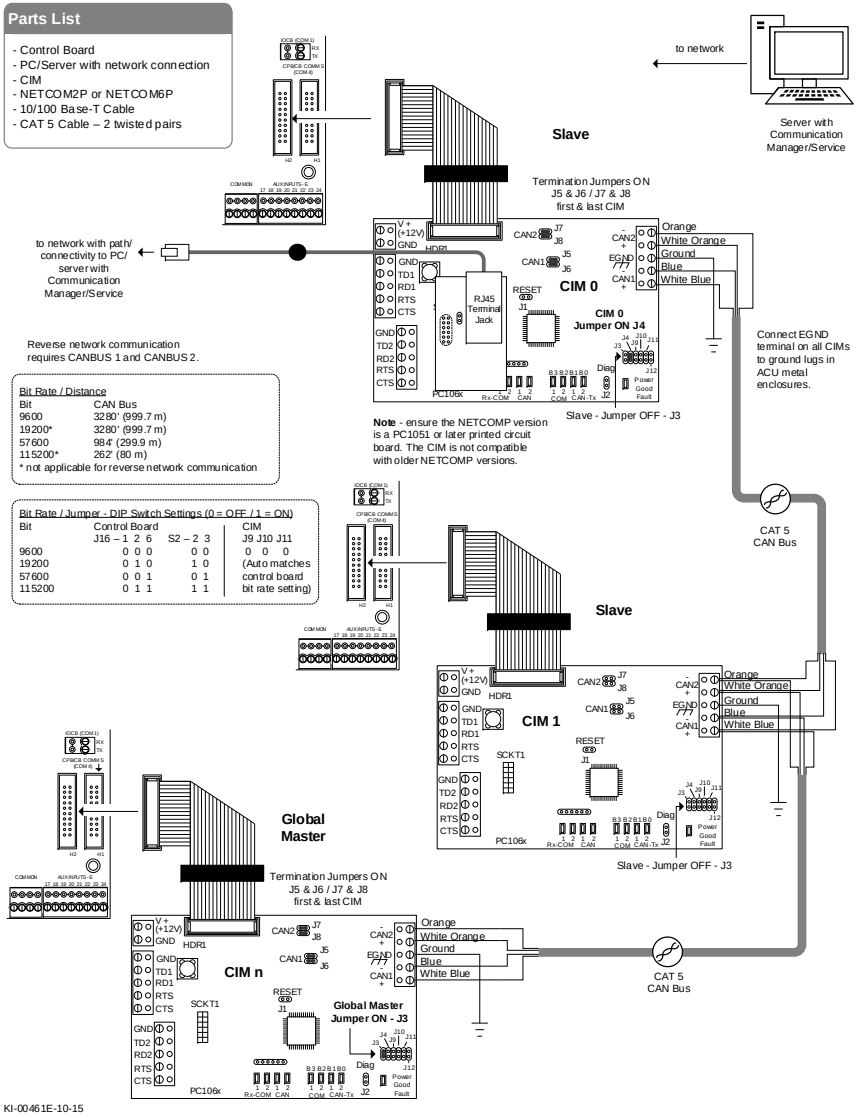


CIM Diagnostic LEDs – B3 – B0

The CIM unit has on-board diagnostic LEDS - B3 to B0 - which are designed to assist in troubleshooting communication difficulties.

- diagnostic LEDs during boot-up - initial power or Reset J1
- data LEDs during operation are Tx – transmit

Figure 7 – Network Connection with NETCOM2P/6P & Multiple CIMs/ACUs



Network Communication—via Optional NETCOM2

The NETCOM2 is a modular serial to TCP/IP converter that can be connected via a RS-232 data cable to the CIM board for network communication. The CIM circuit board with the network connection is referred to as CIM 0. This CIM unit must have a jumper on J4.

The NETCOM2 must be programmed with the Keyscan NETCOM Program Tool Utility in order to function. Refer to the NETCOM2 Installation Guide for programming instructions.

CIM 0 Jumper – J4

Jumper J4 must be set on the module that is designated as CIM 0. This is the module with either a direct serial connection or a network connection via a NETCOMP or NETCOM to the PC/server with the communication manager/service application.

Module	Jumper #	Jumper Setting	Notes
CIM 0	J4	1	
CIM 1 to CIM n	J4	0	
		Off = 0 / On = 1	

CAN Bus Termination Jumpers - J5 to J8

The first and last modules on CAN Bus 1 and CAN Bus 2 must have the appropriate jumpers set to terminate the bus. Terminating modules can be a CIM, CIM 0 or, if applicable, a CIM-LINK.

If at a later date additional CIMs are placed at either end of CAN Bus 1 or CAN Bus 2, be sure to reset the termination jumpers accordingly.

CAN Bus 1

Module	Jumper #	Jumper Setting	Notes
First & last module (CIM or CIM 0)	J5 J6	1 1	Termination – on
All other modules	J5 J6	0 0	Termination - off
		Off = 0 / On = 1	

CAN Bus 2

Module	Jumper #	Jumper Setting	Notes
First & last module (CIM or CIM 0 or CIM-Link)	J7 J8	1 1	Termination – on
All other modules	J7 J8	0 0	Termination - off
		Off = 0 / On = 1	

Jumper settings are continued on the next page ...

Serial Bit Rate Jumpers – J9 to J11

The CIM has selectable serial bit rates outlined in the following table. Bit rates are governed by CAN Bus 1 distances and RS-232 distances. Refer to the BPS Distance Chart. Set CIM jumpers to match the ACU baud rate.

The Auto-match bit rate functions in the same manner irrespective of which ACU panel it is connected to or if it is configured as CIM 0 or CIM (n). The CIM will detect and match the communication bit rate with the ACU panel.

We recommends using the auto-match ACU jumper setting outlined in the table below.

Example
As an example, if configuring a 5 panel system, set J16 bit rates the same on all ACU control boards, and then allow the CIM unit to auto-match the ACU bit rate. The CIM unit automatically sets the CAN Bus bit rate to match.

Bit Rate / Second	Jumper #	Jumper Settings
Auto match ACU	J9 J10 J11	0 0 0
9600	J9 J10 J11	0 0 1
19,200	J9 J10 J11	0 1 0
57,600	J9 J10 J11	1 0 0
115,200	J9 J10 J11	1 0 1
230,400	J9 J10 J11	For future use
460,800	J9 J10 J11	For future use
		Off = 0 / On = 1

Reset Jumper – J1

The CIM has a reset jumper J1. If the board has been re-configured while powered, momentarily short J1 on the CIM board to institute the changes. Momentarily shorting the System Reset J6 jumper on the control board also effects changes to the CIM board while powered.

Network Communication—via Optional NETCOM2P or NETCOM6P

The NETCOM2P and NETCOM6P (encrypted) are modular serial to TCP/IP converters that plug directly into the CIM board for network communication. The CIM circuit board with the network connection is referred to as CIM 0. This CIM unit must have a jumper on J4.

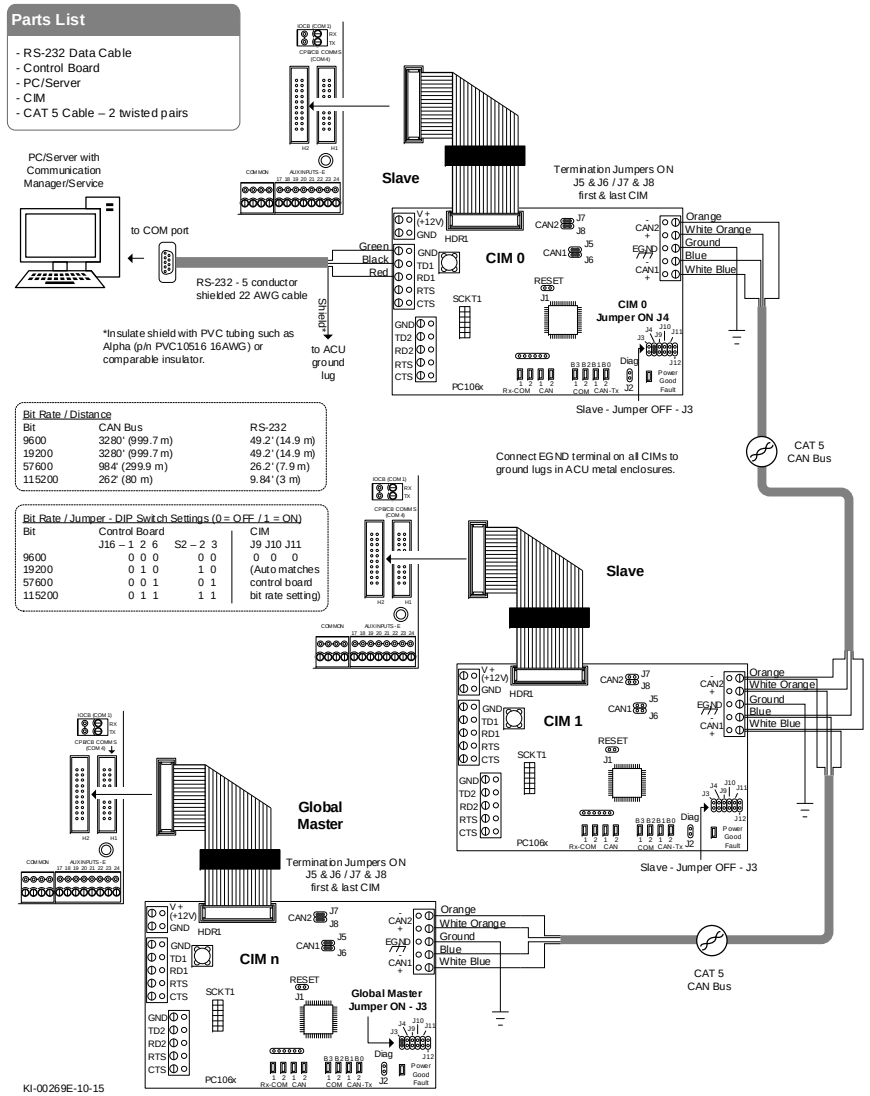
The NETCOM2P and the NETCOM6P must be programmed with the Keyscan NETCOM Program Tool Utility in order to function. Refer to the NETCOM2P/CIM or NETCOM6P/CIM Programming Guides for programming instructions.

When configuring CIM 0 with a NETCOM2P or NETCOM6P, ensure the NETCOMP version is a PC1051 or later printed circuit board. The CIM is not compatible with older NETCOM2P/6P versions.

Serial Communication

Serial communication is a direct serial connection from the PC/server to the CIM unit using a 9-pin RS-232 data cable with 5 conductors - Part # 40-2322. The CIM circuit board with the serial connection is referred to as CIM 0. This CIM unit must have a jumper on J4. A Communication Manager must be installed on the PC/server that has the direct serial connection to CIM 0. The PC/server must be set on the same bit rate as the ACU with a direct serial connection.

Figure 6 – Serial Communication CIM 0 to PC/Server



Installation Guidelines

The following guidelines offer a general outline for configuring and connecting the CIM units. You may have to refer to other Keyscan documentation that was included with other components such as a NETCOM2P or NETCOM6P – Reverse Network to complete the installation depending on how you are configuring the CIM units.

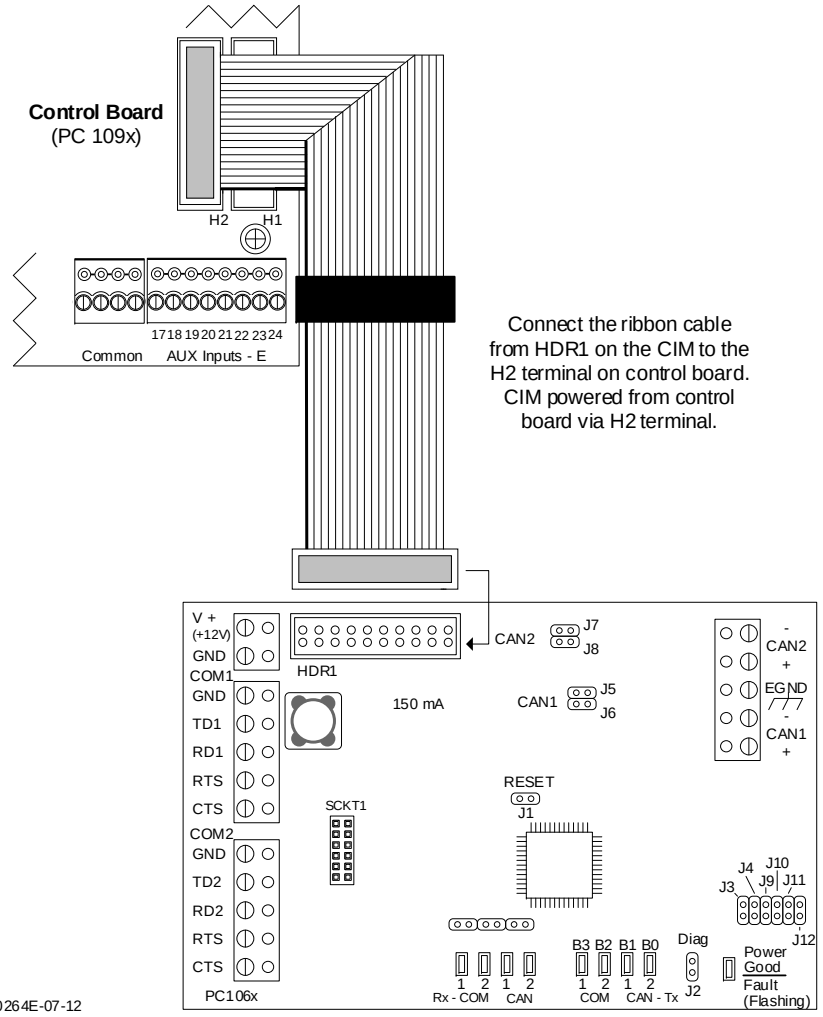
1. If using a network connection, ensure that you program the NETCOM device as outlined in the documentation included with your particular NETCOM unit.
2. Connect the CIM circuit board according to the diagrams on the succeeding pages.
3. Ensure that the EGND terminal on TB1 of each CIM is connected to an earth ground to protect the circuit board and the system from high—voltage transients.
4. Set the jumpers accordingly on the CIM depending on whether it is a global master or slave, it is a terminating CIM on the CAN Bus, or it is CIM 0. Also ensure the correct communication serial bit rates are correct. Refer to the CIM Jumper Settings table.
5. Repeat connections and jumper settings for each control board and CIM.
6. Apply power to all CIM and ACU circuit boards.
7. Do one of the following procedures at the control board while powered depending on whether the board has jumpers or DIP switches:
   - J6 - If this is an existing system, short System Reset J6 on the control board for board initialization. Allow sixty seconds.
   - S1 – If this is an existing system, press the S1 Reset button
   - J16 - If this is a new installation, place a jumper on J16 – pin H; momentarily short jumper J1 to clear memory on each control board that is connected to a CIM. This process may take over two minutes while the control board loads the factory default settings. During the clear memory procedure, the System Status LED flashes red and the control board's piezo emits a cycle of two short beeps followed by a pause. Do not make any changes to the control board during the clear memory procedure. Remove the jumper from J16 – pin H.
   - S1/S3 – Press S1 and wait 5 seconds, then within 10 seconds press S3. This process may take over two minutes while the control board loads the factory default settings. During the clear memory procedure, the System Status LED flashes red and the control board's piezo emits a cycle of two short beeps followed by a pause. Do not make any changes to the control board during the clear memory procedure.
8. Return to a PC with the Client module, log on to the appropriate site, and perform a full upload.

CIM Connection Diagrams

Observe the diagrams on the following pages for connecting the CIM units to the access control boards and connecting the CIMs with CAN Bus 1 and CAN Bus 2.

The CIM that is designated as CIM 0 supports serial or network (TCP/IP) to CAN Bus 1 communication. The CIM unit does not support modem communication.

Figure 4 – CIM to ACU Connections



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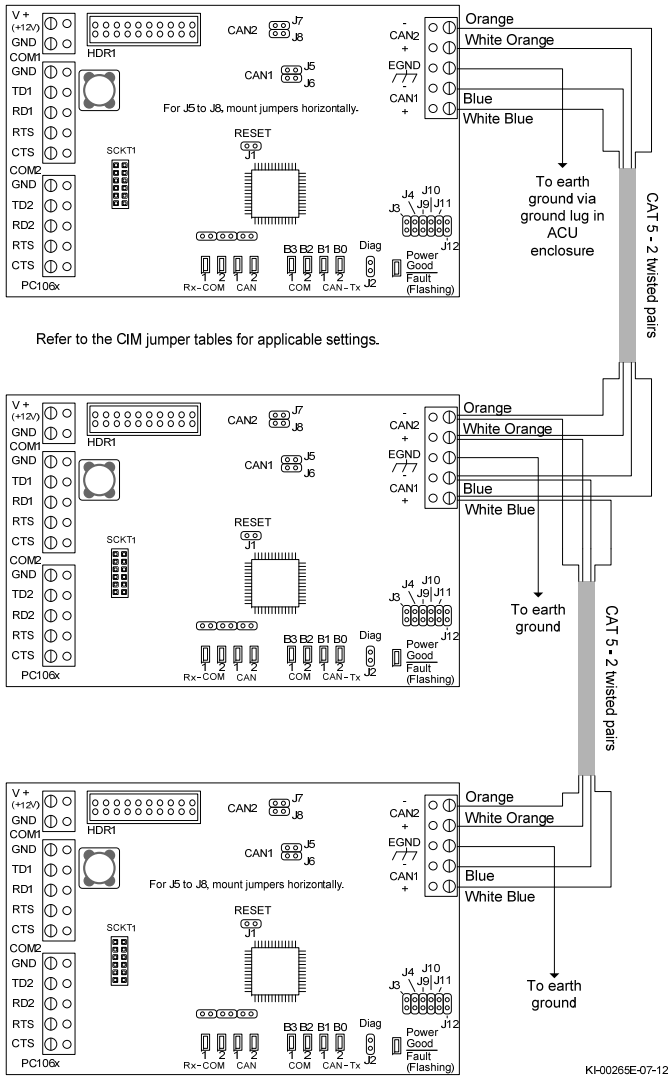
Note

The control board's H2 header is an open header and does not require setting J16 – pins F & G for activation.

Figure 5 – CIM to CIM Connections



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