CCU/IO-485 (and CCU/I-485) Install Instructions

Part #: CCU/IO-485 (or CCU/I-485)

This equipment is designed for installation and service by fully qualified field engineers. No user serviceable or installation parts inside.

Description:

CCU/IO-485 :

      The CCU/IO-485 has 8 relay outputs and 8 supervised inputs.

CCU/I-485 :

      The CCU/I-485 is exactly the same as the CCU/IO-485 except that the 8 outputs on the CCU/IO-485 are replaced with 16 unsupervised inputs. Any CCU/IO-485 mentioned in this document may be replaced with a CCU/I-485. This document will use CCU/IO-485s in all of it's examples.

Supplied:

1	x	CCU/IO-485 board with firmware for RS485/RS232 interface
1	x	Mounting Bracket
1	x	Power connector for CCU/IO
1	x	Supervision relay connector for CCU/IO
1	x	RS485 interface connector

You will need:

1	x	cable from 24V DC power source to CCU/IO. Connector supplied.

If connecting to CCU/485-IO

1	x	RS485 interface cable (see later for wiring information)

If connecting to CCU/422-IO, CCU/232-IO or CCU/FIBRE-IO

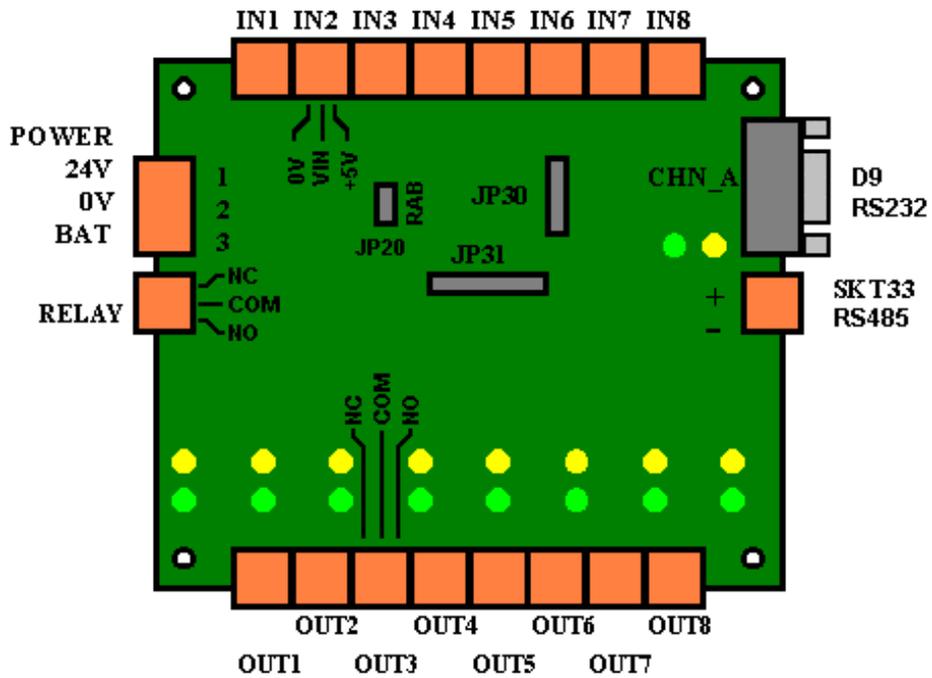|		
1	x	RS232 interface cable (see later for wiring information)

Power Requirements:

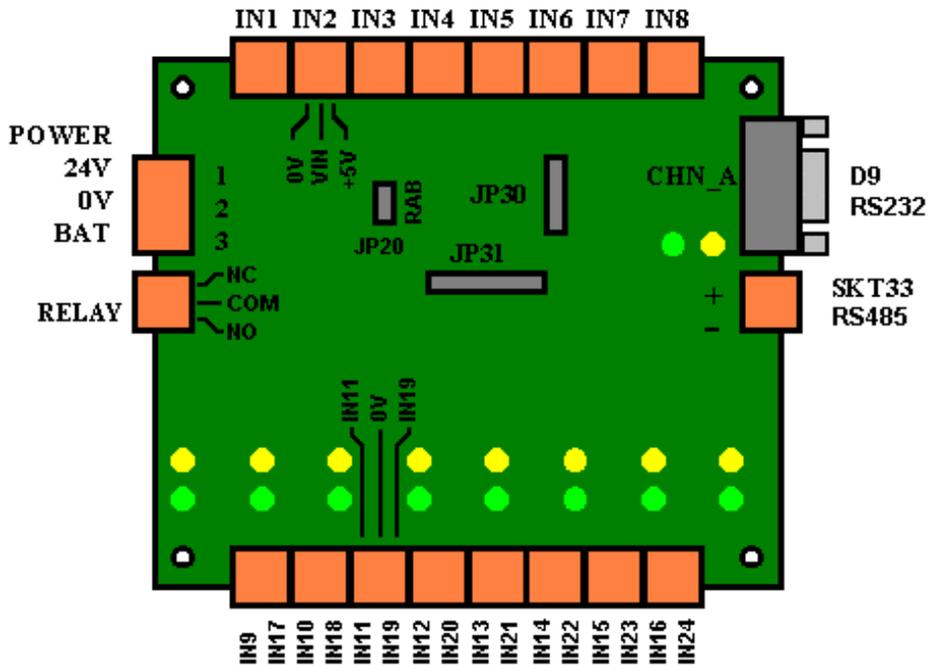|	
Typical:	200mA at 24VDC
Voltage Input:	20-30 VDC

Board Layout:

CCU/IO-485:

CCU/I-485: (Note the outputs are replaced with 2 inputs each. The middle pin on each is 0V.)
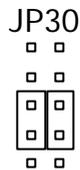
Installation of CCU/IO-485:

If connecting to CCU/422-IO, CCU/232-IO or CCU/FIBRE-IO -

- If connecting the CCU/IO-485 to a CCU/232-IO, CCU/422-IO or CCU/FIBRE-IO then place jumpers on JP30 as shown below and connect the RS232 port (CHN_A) of the CCU/IO-485 to port C of the CCU/232-IO, CCU/422-IO or CCU/FIBRE-IO using the following connection diagram.

| CCU/IO-485 RS232 9PIN (DTE)	CCU/232-IO, CCU/422-IO or CCU/FIBRE-IO Channel C 9PIN (DCE)
2	3
3	2
5	5

JP30

- This configuration only allows one CCU/IO-485 to be connected to the network for each CCU/232-IO, CCU/422-IO or CCU/FIBRE-IO.
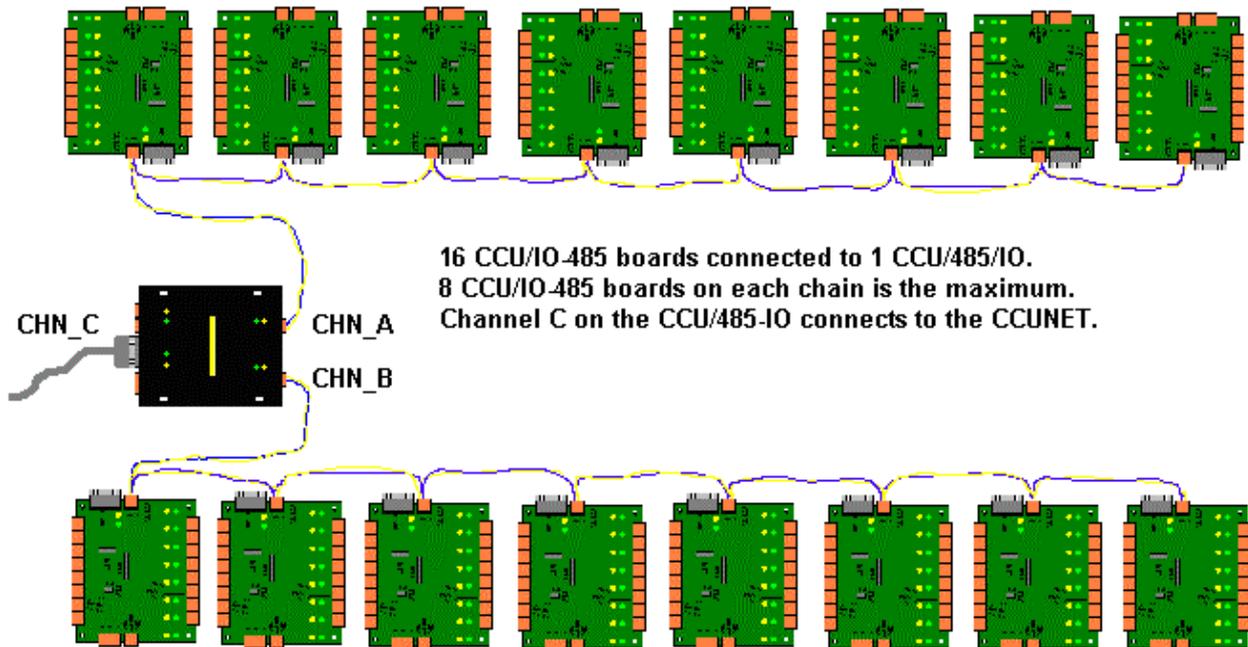

CCU/422-IO
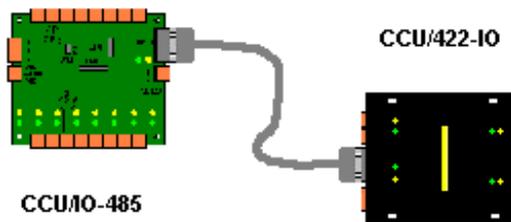
CCU/IO-485

If connecting to a CCU/485-IO -

- If connecting the CCU/IO-485 to a CCU/485-IO then place jumpers on JP30 as shown below and connect the RS485 (SKT33) port of the CCU/IO-485 to port A or B of the CCU/485-IO using the following connection diagram. Up to eight CCU/IO-485 boards can be chained off one channel of the CCU/485-IO, giving up to 16 CCU/IO-485 boards connected to one CCU/485-IO. Appendix A contains informatin on wiring for this configuration.

CCU/IO-485 RS485 (SKT33)	CCU/485-IO Channel A or B
+	R+
-	R-
middle pin	middle pin

JP30
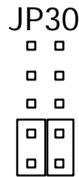
- This configuration only allows sixteen CCU/IO-485 boards to be connected to the network for each CCU/485-IO.

16 CCU/IO-485 boards connected to 1 CCU/485/IO.
8 CCU/IO-485 boards on each chain is the maximum.
Channel C on the CCU/485-IO connects to the CCUNET.

CHN_C   CHN_A   CHN_B

For all installations -

- For normal operation a jumper should be in place across A on JP20.
- If hardware supervision is required connect the relay output from the CCU/IO-485 to a suitable input on the FIP (software supervision does not require this). The relay socket is located next to the power connector. The relays will energise when Supervision failure is detected.
- Connect the 24V DC power source to the supplied connector. The power connector is next to the CHN_C port. Pin connections are:

PWR (+24VDC)   RETURN/COM(0V)   BATTERY(24V)

These connections are written on the board. If the 24V power source is Uninterruptible, then there is no need to connect the BATtery connection.

Pin number	Function
1	24V
2	COM
3	BAT

Connecting the inputs and outputs to the CCU/IO-485:

- The outputs on the CCU/IO-485 are relays that have a common (COM), normally open (NO) and normally closed (NC) output, as shown in the Board Layout (page 1). When the relay is not energised the common line in shorted to the normally closed line. When the relay is energised the common line is shorted to the normally open output.

- The inputs on the CCU/IO-485 run off a 20mA loop. To obtain supervision on these inputs a 220 ohm terminating resistor must be added across the remote end. For inputs that are a distance from the CCU/IO the line should be powered by a higher voltage to allow for line loss (note that the value of the supervision resistor also changes). Refer to Appendix A for details.

Operation of LEDs:

- CHN_A has a Green and a Yellow LED. The green LED glows when the port is operating correctly. The yellow LED glows when the port is not operating correctly, or there has been supervision failure on this port.

For the CCU/IO-485:
- Each output relay has two leds associated with it. When the relay is energised and switches the green LED glows. If the relay fails to switch when it is energised the yellow LED glows.
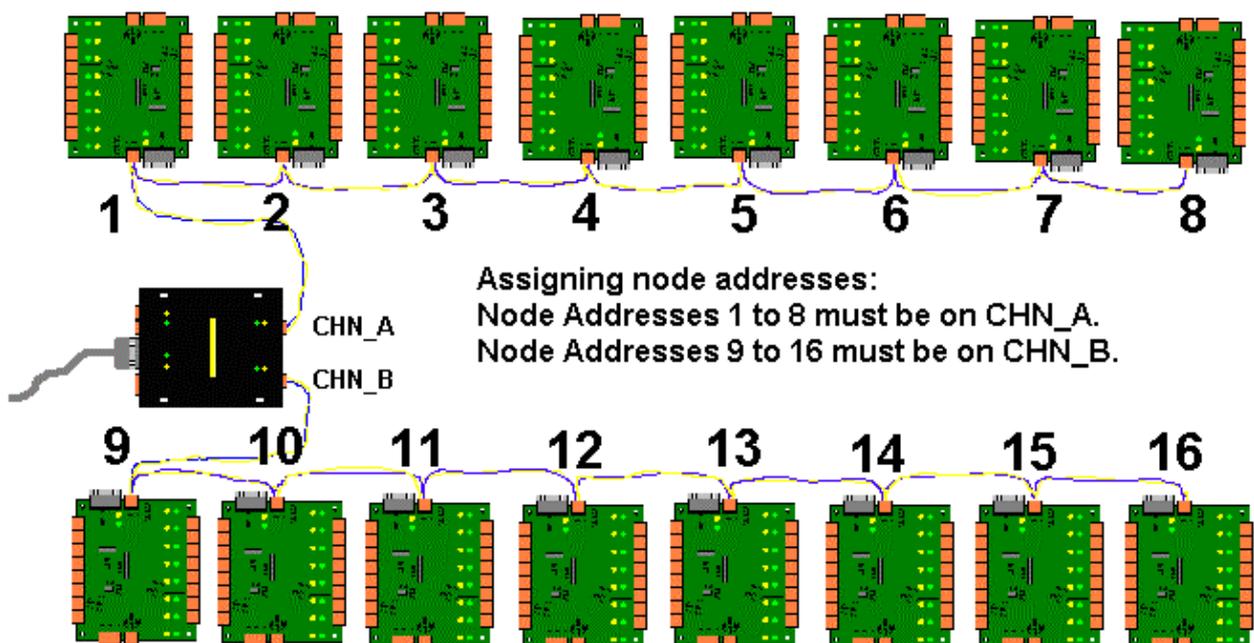
For the CCU/I-485:
- The LEDs used for the output relay on the CCU/IO-485 are unused on the CCU/I-485.

Configuration of CCU/IO:

- You must use the jumpers JP31 (1 to 8) on the CCU/IO to configure the local CCU Node address. Each CCU Node is numbered sequentially from Address 1. Boards connected to Channel A on the CCU/485-IO must have addresses from 1 to 8 inclusive. Boards connected to Channel B on the CCU/485-IO must have addresses from 9 to 16 inclusive. For example if 12 CCU/IO-485s are connected to a CCU485/IO (8 connected on Channel A and 4 on Channel B), then the 8 CCU/IO-485s on Channel A will be given the Addresses 1 to 8. The 4 CCU/IO-485s on Channel B will be given the Addresses 9 to 12. Address 0 CANNOT BE USED. If a CCU/IO-485 is connected to a CCU/232-IO, CCU/422-IO or CCU/FIBRE-IO, then the CCU/IO-485 must be given an address of 1. The jumpers are arranged so that they represent the address in the BINARY number system. Example:

Addr	8	7	6	5	4	3	2	1
1								SHORT
2							SHORT	
3							SHORT	SHORT
4						SHORT		
5						SHORT		SHORT
6						SHORT	SHORT	
7						SHORT	SHORT	SHORT
8					SHORT			
9					SHORT			SHORT
10					SHORT		SHORT	
11					SHORT		SHORT	SHORT
12					SHORT	SHORT		
13					SHORT	SHORT		SHORT
14					SHORT	SHORT	SHORT	
15					SHORT	SHORT	SHORT	SHORT
16				SHORT				

You will notice that 6,7 and 8 should never be shorted.

Assigning node addresses:
Node Addresses 1 to 8 must be on CHN_A.
Node Addresses 9 to 16 must be on CHN_B.

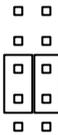REF: CCU/IO-485.DOC REV: C   June 20, 2000

For Programming only:

- A PC can be temporarily connected to CHN_A of CCU/IO-485 for programming. Note that this is a straight through standard RS232 cable for laptops. Jumper JP30 must be set as shown

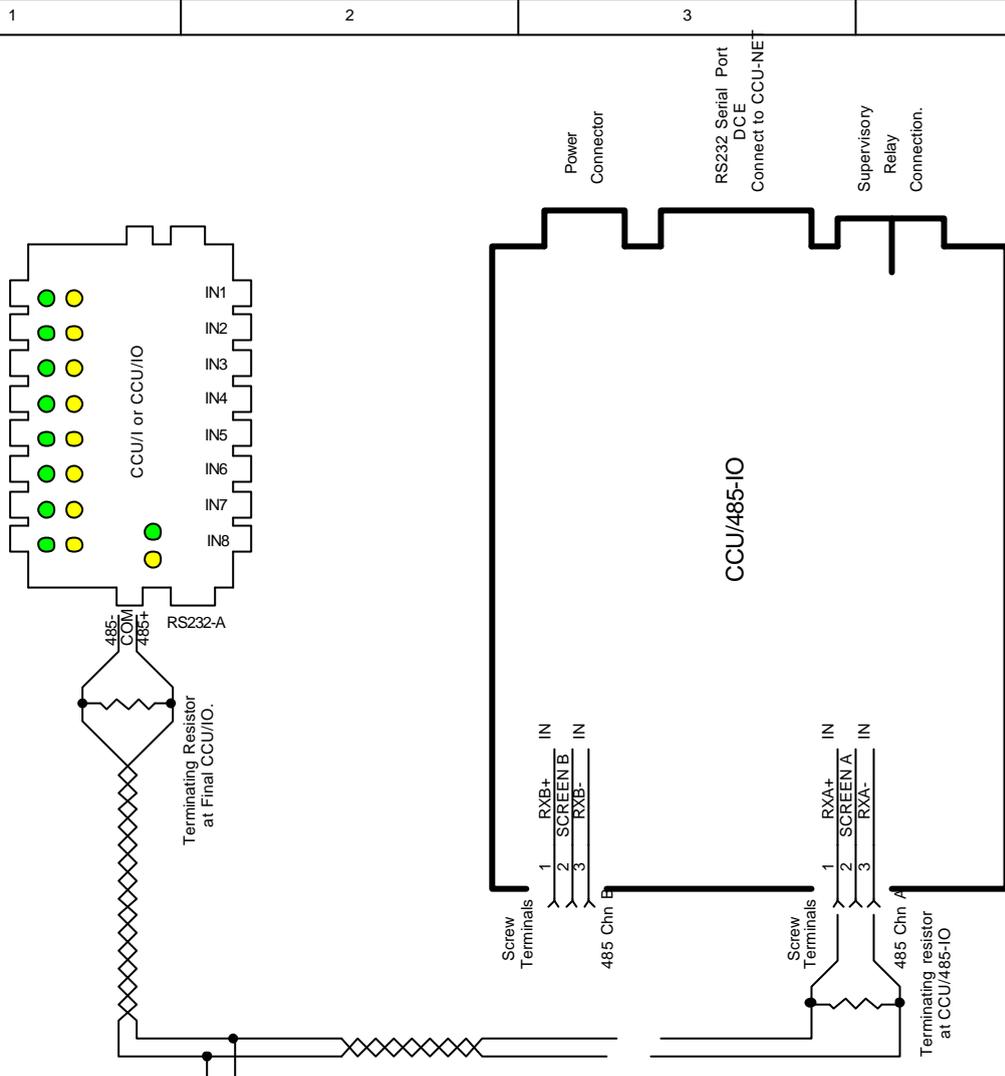| CCU/IO-485 CHN_A 9PIN (DCE)	PC/LAPTOP 25PIN	PC/LAPTOP 9PIN
2	3	2
3	2	3
5	7	5

JP30

- When programming jumpers should be placed across A and across B on JP20.

Appendix A - Wiring for RS485 chain:

CCU-Net (A data collection , transportation and control network)
Connecting CCU/IO cards to a CCU/485-IO

CCU/I or CCU/IO — IN1, IN2, IN3, IN4, IN5, IN6, IN7, IN8

RS232-A — 485-, COM, 485+

Terminating Resistor at Final CCU/IO.

RS232-A — 485+, COM, 485-

CCU/I or CCU/IO — IN1, IN2, IN3, IN4, IN5, IN6, IN7, IN8

CCU/485-IO

Power Connector

RS232 Serial Port DCE Connect to CCU-NET

Supervisory Relay Connection.

Screw Terminals — 1 RXB+ IN, 2 SCREEN B IN, 3 RXB- IN — 485 Chn B

Screw Terminals — 1 RXA+ IN, 2 SCREEN A IN, 3 RXA- IN — 485 Chn A

Terminating resistor at CCU/485-IO

Cabling recommendations.

1. Do not run the RS485 within telephone cabling as this will violate safety of the telephony network. RS485 power levels and harmonics are far greater than the minimal level required to prevent cross induction between audio channels.

RS485 will produce an annoying data stream buzz on audio channels and subsequent complaints.

2. The greatest transmission length can be achieved with twisted pair , low capacitance , screened data grade 50 Ohm cable.

By using good quality cable and avoiding sources of noise such as transmitters and mains cables a distance of around 50 metres is possible. Each node added to the network reduces the overall cable length.

3. Before working on the cable check the DC and AC voltage levels with a suitable multimeter. This may save your life in the event that the data cable has inadvertently become connected to a source of power.

Calculating the Value of the Terminating Resistor.

Terminating Resistor = 2 * transmission line impedance.

Example 1: for 50 Ohm individually screened pair data cable use 100 Ohm resistors.

Example 2: for 600 Ohm telephone communications cable use 1200 Ohm resistors.

Note 1: RS485 is designed to use 50 Ohm twisted pair.

Appendix B - Supervised inputs on a CCU/IO-485:

Connecting inputs to a CCU/IO board.

REF: CCU/IO-485.DOC REV: C June 20, 2000