CC Server
Application
Note

SQUARE D
GROUPE SCHNEIDER

CC Server Application Note
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Document History

Revision	Date	Pages affected/Description of change
1	4/94	Initial Release.

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General Description

Functions

The Classic I/O - CRISP/32 Server (CC Server) provides an intelligent interface between the Classic I/O subsystem and the host CPU. The CC Server is a microprocessor-based data controller that scans the Classic I/O Address and Data Busses for input and output data. This frees the host CPU from this task and critical timing issues. The CC Server in conjunction with the CC Backplane can function in a single or redundant configuration.

On-board intelligence and nonvolatile memory allows the CC Server to perform error checking and fault diagnosis. The CC Server contains Light Emitting Diodes (LEDs) that provide status information.

Configurations

The CC Server is available in the following configurations.

Module Type	Description
505 505 - 150	CC Server - IEEE Transceiver
505 505 - 151	CC Server - Thin Wire

Connections

A D-shell connector provides power from the CC Server Backplane. The Backplane connector engages as the CC Server is installed. The CC Server is connected to the ABUSO, DBUSO, and DBUSI Classic I/O Subsystem via the Backplane and cables to the Server.

⚠ CAUTION

The CC Server uses CMOS logic extensively for low power consumption and high reliability. To prevent damage due to static electricity, the CC Server should be stored in a conductive bag and handled only by its enclosure.

Notes:

Overview

The CC Server is composed of the following basic sections (see Figure 1).

- CC Server Controller
- CC Server Link (for redundant operation)
- Console Port
- I/O Network Interface
- CC Server Parallel I/O Interface
- CC Server Backplane

The subassemblies function together to create an interface that transfers information between the Host CPU and the Classic I/O Subsystem.

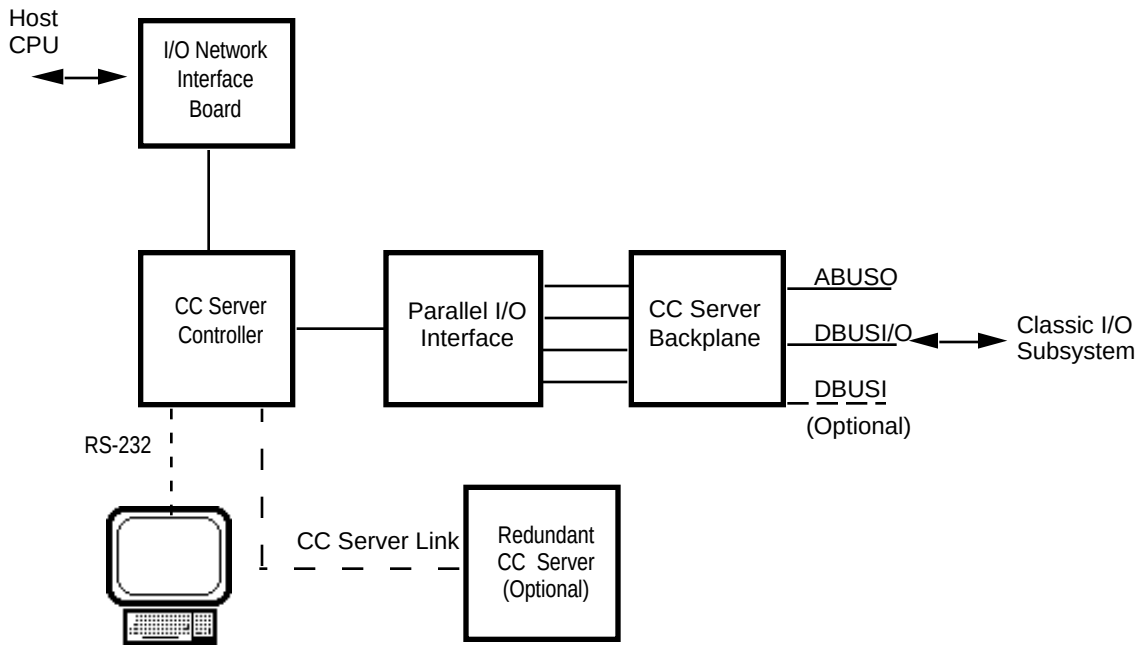


Figure 1. CC Server Block Diagram

Classic I/O CC Server Controller

In order to handle its many data storage and communication duties, the CC Server is equipped with a 68000 microprocessor, memory, and several communication interfaces. Communication between the Host CPU and the CC Server is accomplished using a high-speed, IEEE 802.3-compatible, local area network. This communication method is called I/O Network.

CC Server Link

The optional CC Server Link (CCSL) is used to communicate between redundant CC Server pairs. This link is used to synchronize and arbitrate CC Server access to the attached Classic I/O Subsystem.

Console Port

The console port displays diagnostic information when the CC Server starts. Refer to the CC Server Connections section of this manual for the proper connection method. This port is used for diagnostic troubleshooting, and is not connected during normal operation.

I/O Network Interface

The I/O Network Interface board enables the CC Server to communicate with host systems using a high-speed, IEEE 802.3 -compatible, local area network.

Classic I/O Parallel Interface

This Parallel Interface board provides the CC Server access to the Classic I/O Subsystem via four 20-circuit ribbon cables to the backpanel.

CC Server Backplane

The CC Server Backplane converts the 20-circuit ribbon cables from the Parallel Interface board to the 40-circuit ribbon cables that connect to the Classic I/O Subsystem. The backplane also delivers power to the CC Server via a 37-pin D-shell connector.

Startup

When the CC Server is first powered up or after the reset pushbutton is pressed, the CC Server goes through a startup sequence and performs local diagnostics. The red FAULT indicator is on during this time and the green SCAN indicator is off. If a diagnostic test fails, the CC Server will be restarted periodically by the internal watchdog timer.

Initialization

Once all diagnostics pass, the FAULT indicator flashes while the CC Server attempts to go active.

Runtime

After the CC Server has gone active at least once, the FAULT indicator is turned off. Thereafter, the green 'SCAN' indicator flashes each time the CC Server communicates with the Host CPU.

Console Port

An optional CRT can be connected to the Console Port and during Startup, Initialization, and Runtime. Diagnostic messages display the CC Server's status.

Notes:

Diagnostic Indicators

General

The CC Server contains a red and a green LED to indicate its status. These LEDs can be used to help locate a faulty CC Server.

In a non-redundant configuration, a 'good' CC Server is normally in a state with the red LED off and the green LED blinking periodically, indicating that it is communicating with the host. If CRISP is not running on the Host CPU, the green LED will not blink. If there are redundant CC Servers, the green LED blinks more frequently on the 'active' CC Server. The red LED will blink on an 'idle' CC Server until it has been active at least once. (Note that the active/idle status of a CC Server is not related to active/idle status of the host CPU's.)

If the red LED on a CC Server is continuously on, this is an indication that there is a problem. Before removing a faulty CC Server, attempt to reset the CC Server using the RESET button on the left side of the module. If the red LED remains on, either there is a problem with the network connection, or the CC Server is defective.

Reset Indicators

As an additional diagnostic aid, a local terminal can be connected to the Console port (RS-232-C) to receive status information from the CC Server while the module is performing its internal diagnostics. Set the port as follows: 9600 bps, 8 bits, no parity, one stop bit, and connect to the port as described in the Console Port Pin Assignments section of this document.

The exact information displayed on the local terminal is dependent on the CC Server options and the revision of the firmware. For example, a CC Server using I/O Network may display the following.

```
CC Server V03.00

Diagnostic test ..1..2..3..4..5..6..7..8..9..10
```

⚠ CAUTION

This test may cause a process upset on an Active system.

Reset Indicators (cont)

The information returned can be used to identify any problems internal to the CC Server. The following table defines the status data received from the CC Server.

Test	Definition
1	RAM Diagnostics
2	CC Server Link Diagnostic
3	DUART-0 channel A Diagnostic
4	DUART-0 channel B Diagnostic
5	DUART-1 channel A Diagnostic
6	DUART-1 channel B Diagnostic
7	EEPROM Diagnostic
8	NET RAM Diagnostic
9	NET Interface Diagnostic
10	CI/O Interface Diagnostic

Note that the diagnostics test the internal circuitry only. These diagnostics do not test the CCSL.

CC Server Link

In systems with redundant CC Servers, a CC Server Link (CCSL) allows communication between CC Servers.

Cabling

Figure 2 shows the connector layout of the CC Server.

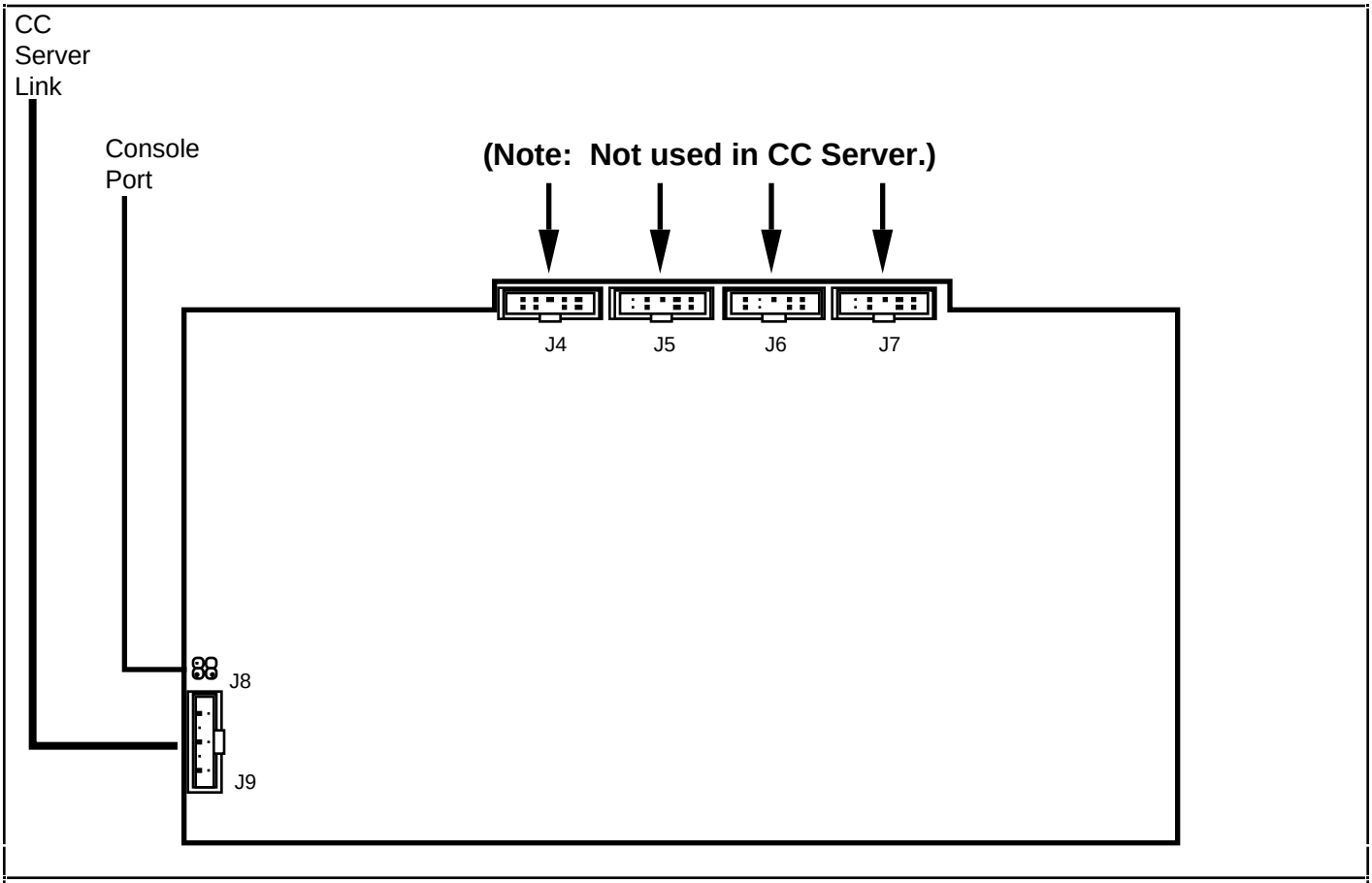


Figure 2. CC Server Connector Layout

Console Port Pin Assignments

The 4-pin connector (J8) on the left edge of the CC Server provides the interface to the Console Port. The pin assignment for the connector is as follows.

Pin	Signal
1	Transmit Data
2	Signal Ground
3	Not Used (keying plug)
4	Receive Data

⚠ CAUTION

Many AC-powered terminals internally connect the signal ground (pin 7) of the 25-pin, RS-232-C connector to the ground lead of the AC line cord. Connecting such a terminal to the CC Server Console Port sets up a ground loop and connects the power supply ground of the I/O cabinet to the AC ground of the terminal. Consequently, the Console Port should be connected to a terminal only for troubleshooting and should not be left connected unless the terminal is isolated from AC ground or an isolation device is put in series with the Console Port cable.

Strapping Options

General

The CC Server has the following different strapping options. These jumpers are factory set and should not be changed in the field. Figure 3 shows the locations and settings for the Transceiver I/O Network CC Server and the Thin Wire I/O Network CC Server.

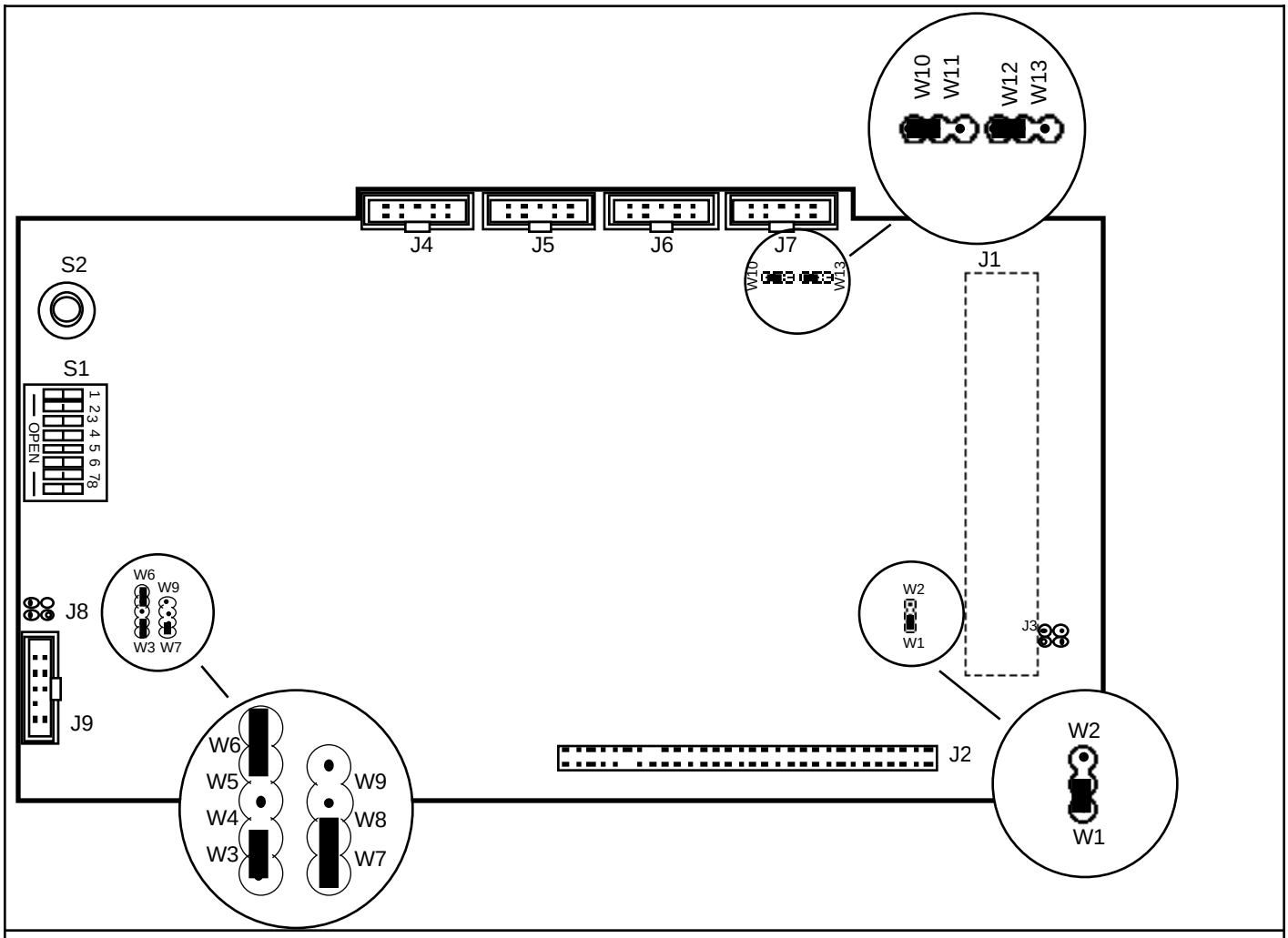


Figure 3. CC Server Strapping

I/O Network Strapping

The I/O Network interface board has the following different strapping options. These jumpers are factory set and should not be changed in the field. Figure 4 shows the locations and settings for the Transceiver I/O Network CC Server. Figure 5 shows the locations and settings for the Thin Wire I/O Network CC Server.

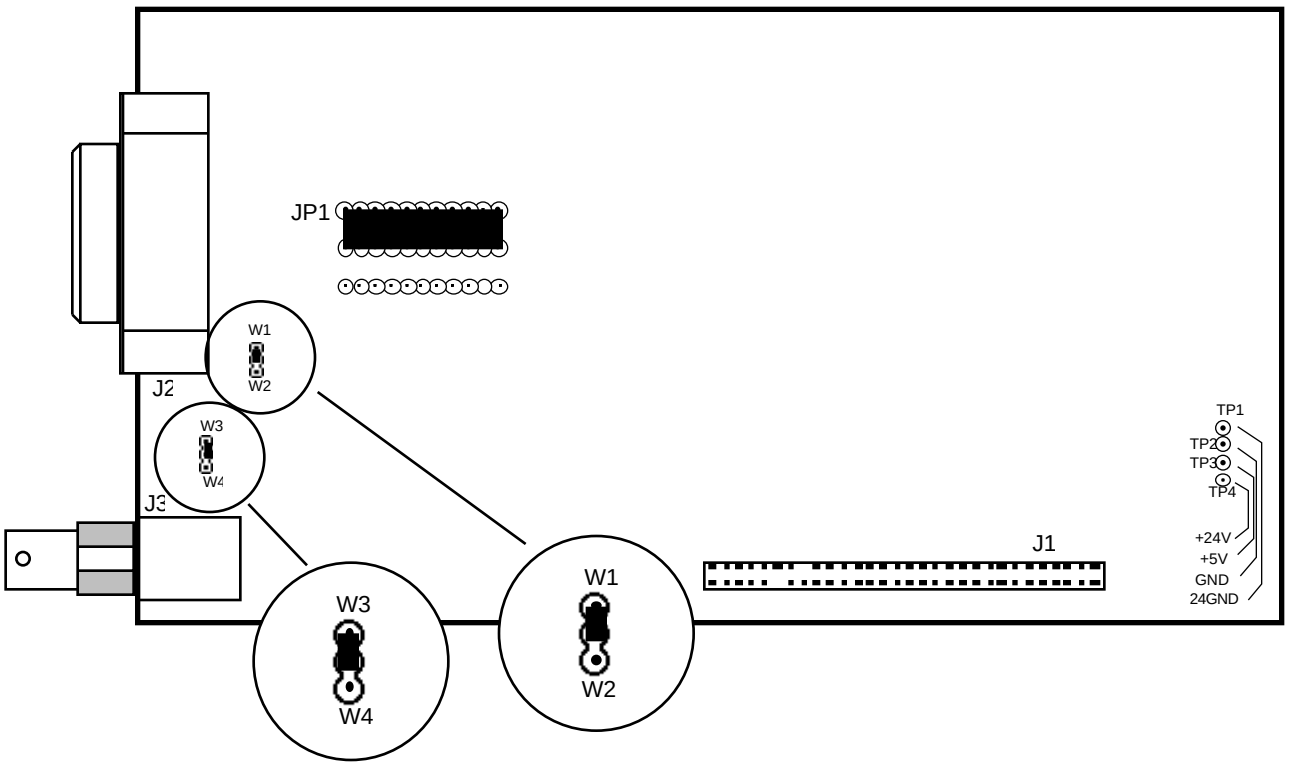


Figure 4. Transceiver I/O Network Strapping

I/O Network Strapping (cont)

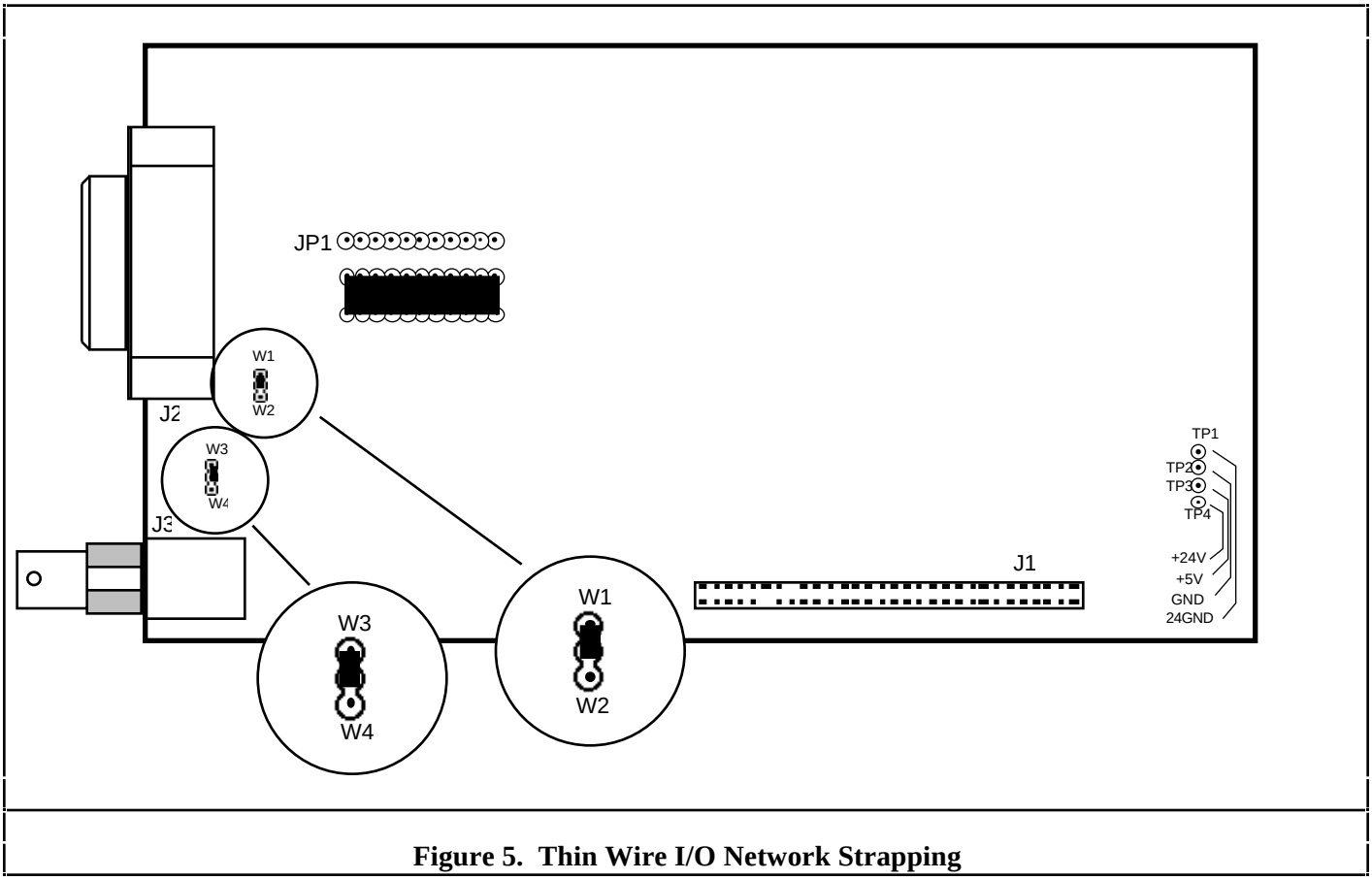


Figure 5. Thin Wire I/O Network Strapping

Notes:

CC Server Addressing

General

An 8-position, switch pack on the left side of the CC Server is used to set the address of the CC Server. The address switches form a binary address, with the most significant bit set at top switch position and the least-significant bit set at the bottom switch position (note that the open position on the switch pack is the set (1) position). The switch layout is shown in Figure 6.

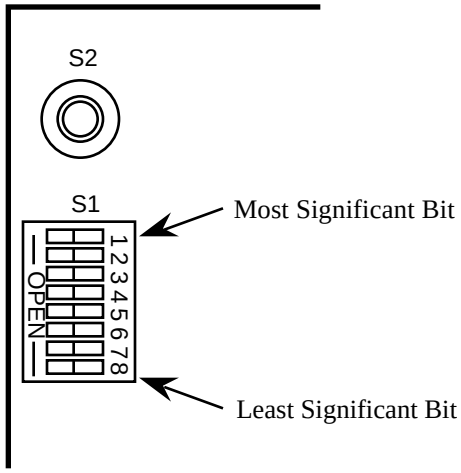


Figure 6. CC Server Address Switch

The following table shows the address set when one of the switch pack positions is opened. The switch pack part of the CC Server address is the sum of the address numbers for whichever switches are open.

S1 Position	Decimal Address	Hexadecimal Address
1	128	80
2	64	40
3	32	20
4	16	10
5	8	8
6	4	4
7	2	2
8	1	1

General (cont)

In an I/O Network system, the address of the CC Server is a 6-byte address conforming to the IEEE 802.3 Locally Administered Address specification. The least-significant byte of this address is the setting of the switch pack (S1). The most-significant three bytes are made up of a fixed bit pattern. The remaining two bytes are from a pattern that is stored in the CC Server EEPROM at the time of manufacture.

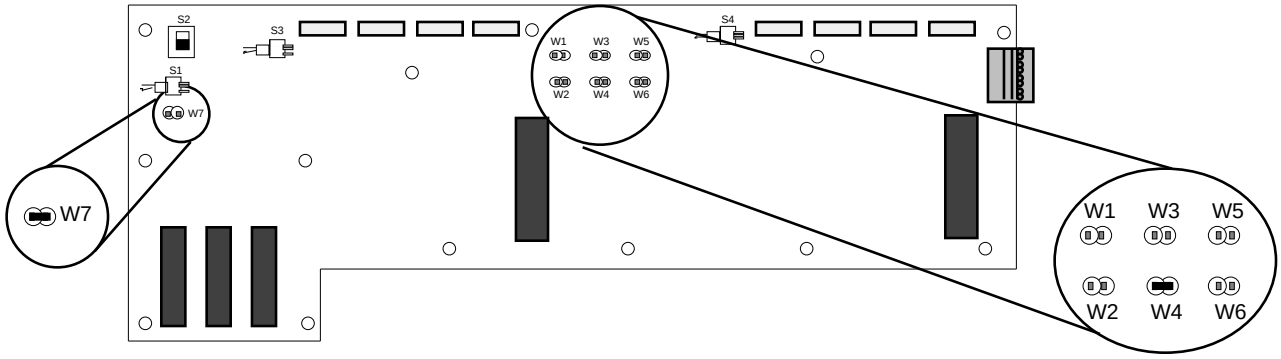
CC Server Backplane Strapping and Switch Settings

General

Installing a jumper in W7 enables the CLEAR signal to the Classic I/O Subsystem.

W4 selects the conditions under which the CC Servers assert the CLEAR signal. If W4 is not installed, the CLEAR signal is asserted only when both CC Servers are malfunctioning. If W4 is installed, the CLEAR signal is also asserted if the host CPU loses I/O communications to the CC Servers.

W1, W2, W3, W5, and W6 are currently not used.



S3 and S4 are power switches for the CC Servers. S2 selects a diagnostic ripple test mode on the Classic I/O busses. To select test mode, slide the switch to either the up or down position, then reset the CC Servers. A rippling 1-Bit pattern will appear on the Classic I/O address and data busses.

⚠ CAUTION

Selecting bus test mode will cause a process upset. This mode should only be selected on a system that has been shut down.

To return to normal, running mode, slide S2 to the center position and reset both CC Servers.

S1 configures the Backplane to support single or dual CC Servers. In single mode, the Backplane can accept either CC server A or CC Server B. In dual mode, both CC Servers must be installed.

Notes:

Specifications

General

- Microprocessor controlled
- Control system status indicator
- Local monitoring
- Console port for local terminal
- IEEE 802.3 compatible network interface

Firmware support

On-line diagnostics

Environmental

- 0 to 70°C ambient temperature (module only)
- 20 to 80% relative humidity, non-condensing

Physical

- Power consumption:
  - +5 volts, 1.7A typical
  - +24 volts, 500 mA typical.
- Dimensions: 4.5"H x 8"W x 5"D.
- Weight: 1 lb, 12 oz.

Notes: