SYSTEMS ELECTRONICS GROUP

SYSTEMS M4500 INDUSTRIAL CONTROLLER

S4516 SERIAL COMMUNICATIONS BOARD

S3000 NETWORK PORT
AND RS-232/RS-422 USER PORT

- **One S3000 Serial Network Port and One RS-232/RS-422 User Port**
- **S3000 Network Port Configurable For 106kbps, 228kbps, Or 344kbs**
- **RS-232/RS-422 Port Configurable For 9600 Or 19.2k Baud**
- **RS-232/RS-422 Data Receive and Transmit LED's**
- **Serial Network Comm Led**
- **Removable Field Wiring Connectors**
- **Standard M4500 I/O Form Factor**

General Description

The S4516, for use with the M4500 series of modules, contains one S3000 Serial Network Interface port and one RS-232/RS-422 User Port. The S4516 provides a means for an M4500 module to communicate to other S3000, M4000, or M4500 modules/processors via the S3000 serial network. The RS-232/RS-422 port allows communications to other PLC or host computers. Multiple S4516 boards can be installed in one M4500 (up to the number of slots for that particular model) to allow the use of multiple S3000 network ports or RS-232/RS-422 User ports.

The serial network port conforms to the S3000-N1 network protocol. This network is a high speed (up to 344KBPS), twisted pair, serial network configured in a master/slave topology. Up to 32 M4500, S3000, or M4000 modules/processors (nodes) can be connected on one network. Communications between the nodes on the network is controlled via commands (sfunc13) in the user application program resident in the node acting as the master. The serial network baud rate is software configurable (via the user's program in the M4500) for either 106KBPS, 229KBPS, or 344KBPS.

The USER port is available as a general purpose RS-232/RS-422 port accessed under software control of the user program. Typical uses of this port are connection to other control equipment, data acquisition to a host PLC, etc.. Drivers are available for this port that implement the MODBUS protocol and the Allen-Bradley DF1 protocol. The USER port is dip switch selectable for either RS-232 mode or RS-422 mode. The USER port supports a frame format consisting of 1 start bit, 8 data bits, 1 stop bit, and no parity. An addition, the baud rate is software configurable (via the user's program in the M4500) for either 9600 Baud or 19.2K Baud.

Access to the serial network port is implemented via sfunc13 in the M4500 user's program while access to the USER port is implemented with sfunc10 (USER port read) and sfunc11 (USER port write). Configuration of the S4516 (network address, network baud, and USER port baud) is performed using sfunc19 in the M4500 user's program. Refer to the M4500 Program Development Manual for complete details on these system functions.

Installation

Prior to installing the S4516, the I/O slot addressing dip switch on the board must be set for the slot the board will be addressed as.

Note: Geographical addressing is not used in the M4500. The slot the S4516 is addressed as is solely defined by the dip switch settings on the S4516 itself not by the slot in the M4500 chassis that the board is placed in. Two poles on the dip switch of the board set the binary slot address of the board as follows:

S4516 SW1 Dip Switch Slot Addressing

2	1	Slot Address
off	off	0
off	on	1
on	off	2
on	on	3

The SW2 Slot address dip switch is located in the lower right hand corner of the component side of the S4516. The respective switch pole is "on" when in either the "on" or "close" position and "off" when either in the "off" or "open" position depending on the type of dip switch used.

RS-232/RS-422 Dip Switch (SW1): This must also be set depending on whether the RS-232 mode or RS-422 is used. Two poles on SW1 define the mode. Pole 1 is for the RS-232 mode, pole 2 is for the RS-422. To select a specific mode, set the corresponding pole "on" or "closed". Note that only one mode can be selected, therefore the pole for the mode not used must be set "off" or "open".

To install the S4516 in the M4500 chassis, turn power to the M4500 "off" and remove the cover plate of the M4500 by loosening the captive screws that retain it. Install the S4516 in the respective slot of the M4500, making sure the DIN connector on the S4516 fully mates with the DIN connector in the M4500 motherboard and that the top of the S4516 is seated correctly in the card guides at the top of the M4500. Install the M4500 cover back onto the M4500 making sure the LED's and Field connector protrude through the respective openings in the cover. The M4500 cover will retain the S4516 both from the top and the front, holding the S4516 in place during normal operation. Tighten the captive screws that retain the cover on the M4500. Install the S4516 overlay on the M4500 cover at the slot the S4516 is installed in. Install the female field wiring connectors to the corresponding male connectors on the S4516. The S4516 is now installed and ready to run. To remove the S4516, simply perform the previous steps in reverse.

S4516: SERIAL COMMUNICATIONS BOARD

Specifications

Board Size:	
Length:	6.50"
Height:	4.25"
Width:	0.80"
Serial Network Port:	
Type:	RS-485
Comm Rate:	344KBPS, 229KBPS, or 106KBPS
# of nodes (max):	32
Isolation:	2000 VRMS
Distance:	1,000 ft., 2,000 ft., 4,000 ft.
Protocol:	Proprietary
USER Port:	
Type:	RS-232/RS-422 selectable
Comm Rate:	9600 Baud 19.2K Baud
Start Bits:	1
Data Bits:	8
Stop Bits:	1
Parity:	None
Power Requirements:	
Icc (typ - M4500 BUS):	150 milliamps
Temperature Ranges:	
Storage:	0 to 85 degrees C
Operating:	0 to 60 degrees C
Relative Humidity:	5 to 95% non-condensing

S4516: SERIAL COMMUNICATIONS BOARD

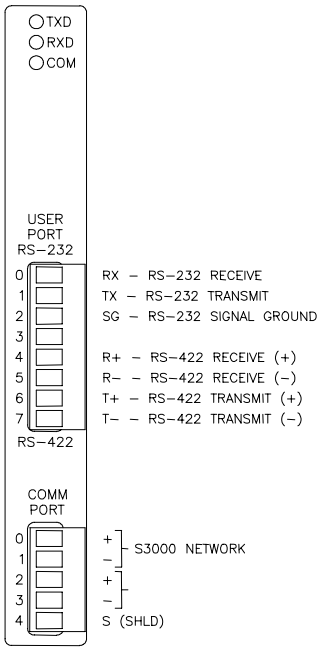

Figure 1
S4516 Faceplate

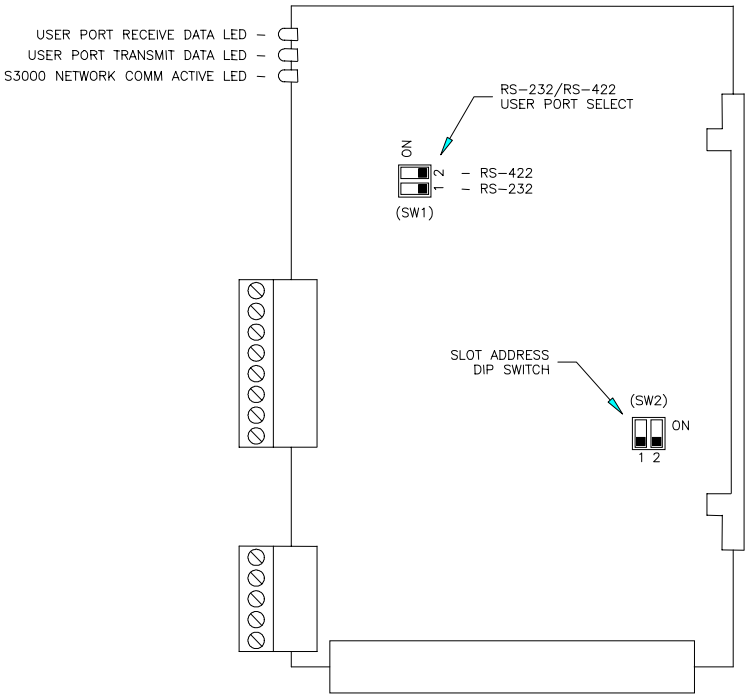

Figure 2
S4516 Board Outline