ENGINEERING PUBLICATION
MOTION CONTROL DIVISION

SUBJECT: SERIAL COMMUNICATION HARDWARE FOR SIGMA FSP

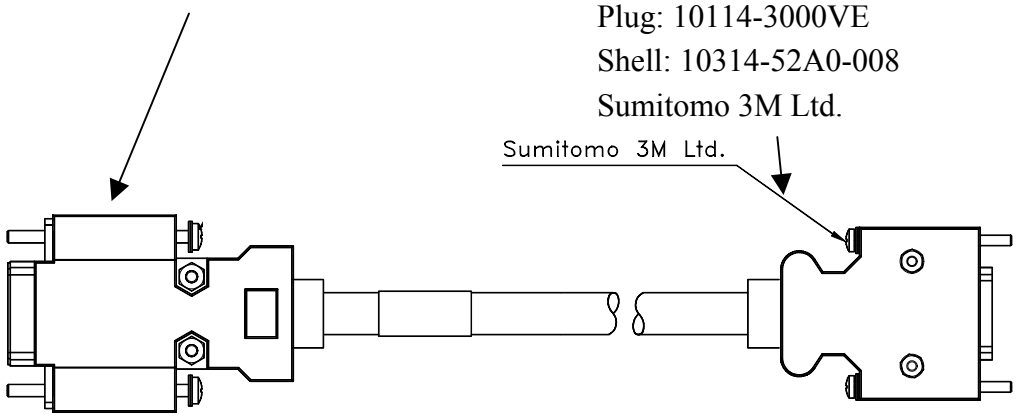
CATEGORY: TECHNICAL NOTE

ENGINEER: Derek Lee, Chris Knudsen **DISTRIBUTION: PUBLIC**

Cable Configuration

D-Sub 9-pin connector (female)

Half-pitch 14-pin connector
Plug: 10114-3000VE
Shell: 10314-52A0-008
Sumitomo 3M Ltd.



Equivalent YEA cable: YS-12
Note: YEA cable is RS-232C only

Communication Specifications

The communication specifications are as follows:

- Baud Rate: Up to 19200 bps
- Number of Bits: Start: 1 bit
  Data: 7 bits
  Stop: 1 bit
  Parity: 1 bit (even)
- Synchronization Method: Start-Stop
- XON/XOFF Control: None
- Shift Control: None
- Communication Method: Semi-duplex

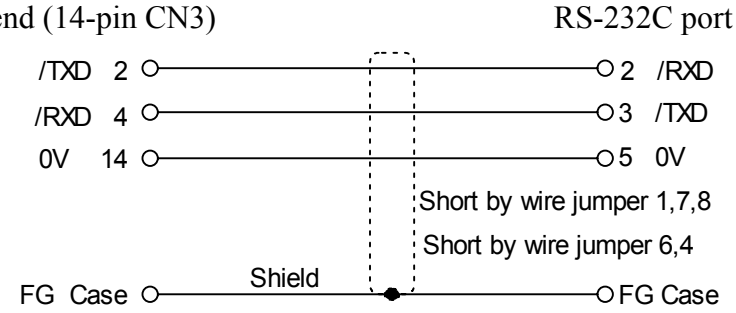
2121 Norman Drive South
Waukegan, IL 60085
(847) 887-7000

Publication # *eng/07.045/MTN*
Date: 3/8/07
Revision 0

Connection Circuits

- Standard RS-232C Port (CN3)

  Maximum cable length is 2 m (6.56 ft). In this case, the connection circuits are follows:



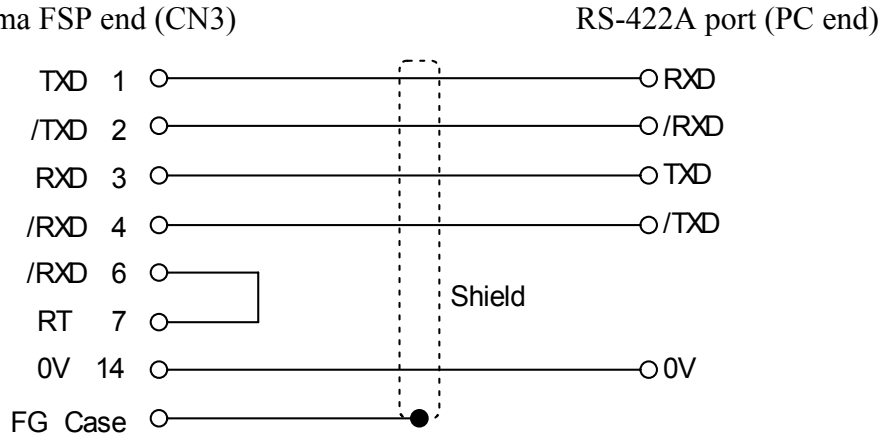
- With RS-422A Port: Single-Axis (CN3)

  Sigma FSP can also be connected to an RS-422A port.

  In this case, the connection circuit is as follows:

  - Transmission Distance: 30 m (98.4 ft)
  - Transmission System: RS-422A

  RS-422 Single-Axis Communication Cable Interconnection Diagram



  Pins 6-7: Short to use an internal terminating resistor (see table below).

- With RS-422A Port: Multi-Axis (CN3)

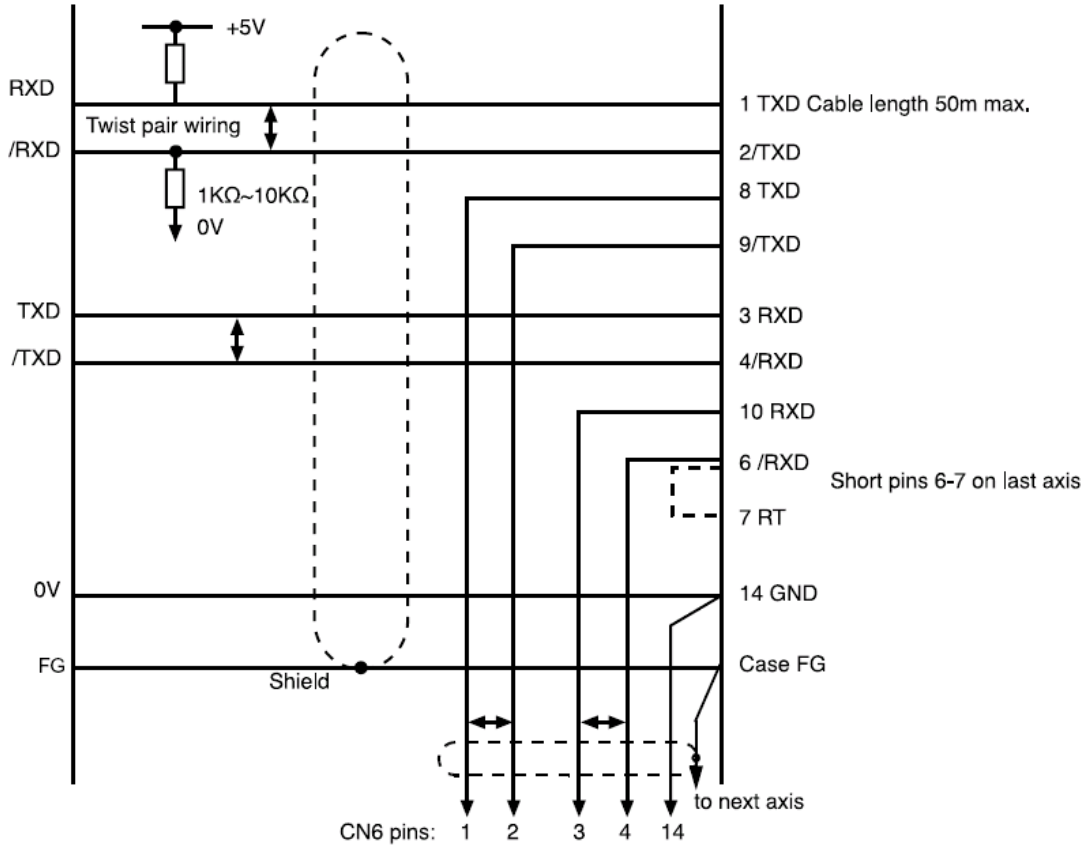
  Sigma FSP can utilize multi-axis communications when connected to an RS-422A port.

  In this case, the connection circuit is as follows:

  - Transmission Distance: 30 m (98.4 ft)
  - Transmission System: RS-422A

  RS-422 Multi-Axis Communication Cable Interconnection Diagram

  RS-422A port (PC end) Sigma FSP end (CN3)



  Pins 6-7: Short to use an internal terminating resistor (see table below).

Connector Pin Numbers and Signal Names

Pin No.	Signal Name	Signal Circuit Name	Signal Direction
1	TXD	Transmit data (not inverted)	P[*1]← S[*2]
2	/TXD	Transmit data (inverted)	P←S
3	RXD	Receive data (not inverted)	P→S
4	/RXD	Receive data (inverted)	P→S
5	Reserved	Reserved pin	#[*3]
6	/RXD	Short pins 6 and 7 to insert a 220Ω terminating resistance between RXD and /RXD	
7	RT		
8	TXD	Transmit data (not inverted)	P←S
9	/TXD	Transmit data (inverted)	P←S
10	RXD	Receive data (not inverted)	P→S
11	Reserved	Reserved pin	#
12	Reserved	Reserved pin	#
13	Reserved	Reserved pin	#
14	GND		#

[*1]. P: Personal computer
[*2]. S: Sigma FSP
[*3]. #: Reserved terminal (leave open)

RS422 Interface Cable

1. Make sure that the drive system, control system, power system, and other transmission systems are separate from each other (i.e., do not run the power wire with the control wire).

2. The RS422 cable length is 30 m maximum. Use the minimum length necessary.

3. Errors may occur from noise in the connected terminal. If noise occurs, use a shield-type cable and/or ferrite core to reduce the noise.

4. Insert a terminating resistor (100Ω) as needed. Make the termination on the PC side receiving line. Short pins 6 and 7 only on the last axis.

5. If noise persists, it may be necessary to add pull-up/pull-down resistors as shown in the RS422 drawings above.