Table of Contents

Functional Description 2
Installation 2
Operation 3
Diagnostics 4
Configuration 5
RS-485 (half duplex) – Multidrop 9

Mr. Lucian
Sales manager

Joyoung International Trading Co., Ltd
Whatsapp/Wechat: +86 18106906650
Email: Lily@htechplc.com
Mobile: +86 18106906650
Website: www.xm-dcs.com
Address: Room 1503, Building B, Diamond Coast,
No. 96 Lujiang Road, Siming District, Xiamen Fujian

Wechat

Simplex Serial Communication Input/Output (SSCA)

Functional Description

The Simplex Serial Communication Input/Output (SSCA) terminal board is a compact serial communication terminal board that provides up to six communication channels. Each channel may be configured for RS-232C, RS-485, or RS-422 signaling. The I/O pack plugs into the DC-62 pin connector to communicate with the Mark VIe controller over Ethernet.

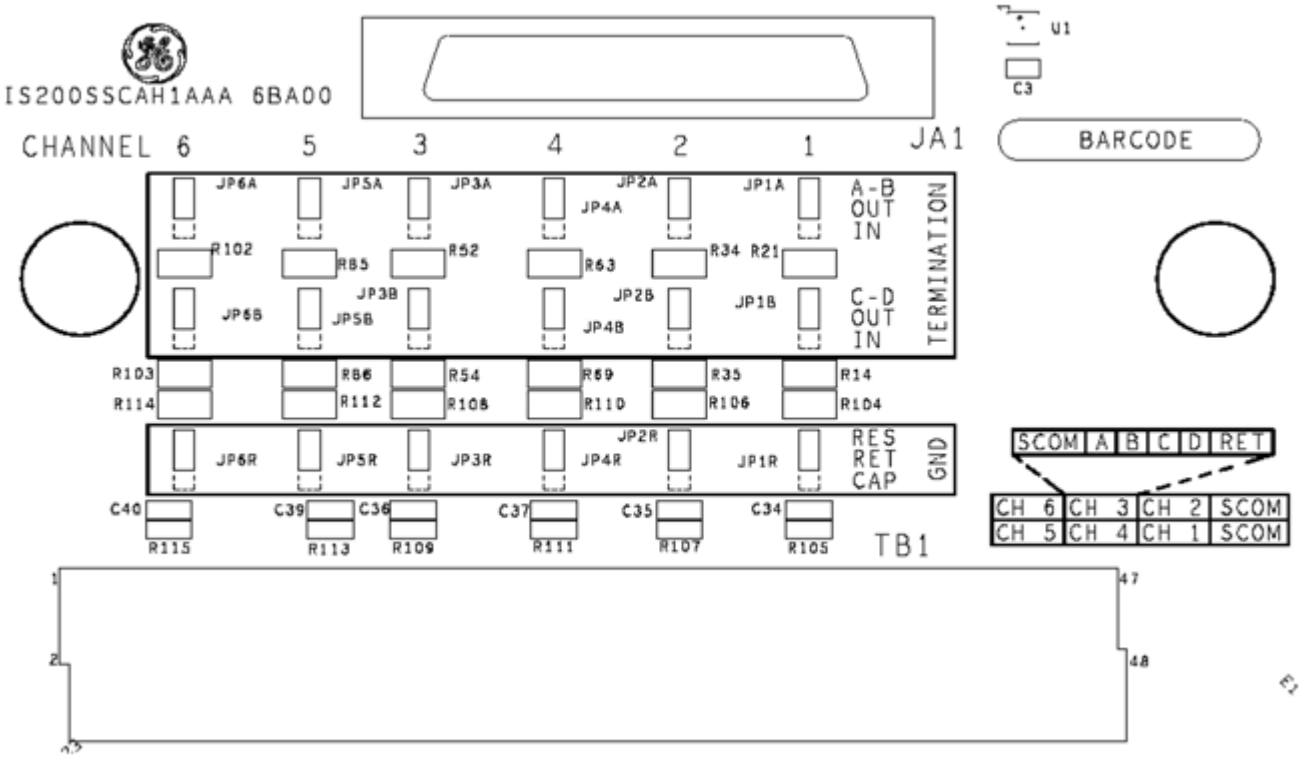
Installation

There is no shield termination strip with this design.

The SSCA is mounted on a DIN-rail using a sheet metal carrier and plastic insulator mount. This assembly will also bolt directly into a cabinet. There are two types of Euro-Block terminal blocks available:

- SSCAH1 has a permanently mounted terminal block with 48 terminals.
- SSCAH2 has a right-angle header accepting a range of commercially available pluggable terminal blocks, with 48 terminals.

Typically, the SSCA uses #18 AWG (shielded twisted pair) wiring. The I/O cable shield termination is on an external mounting bracket supplied by the customer or by GE. The chassis ground connection uses E1 and E2 as mounting holes. One of the SCOM terminals (37-48) must be connected to a suitable shield ground.



SSCA Jumper Positions

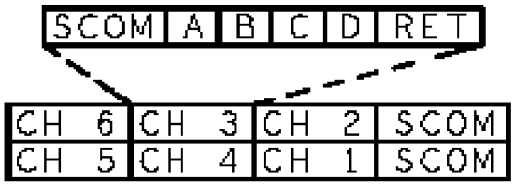
Operation

The SSCA includes six connection points for each of the six serial communication channels. The points include four signal lines A-D, a signal return, and a shield common (SCOM). Signal assignments include:

Protocol	A	B	C	D	Notes
RS-422	TX+	TX-	RX+	RX-	Cable length up to 1000 ft
RS-485	TX/RX+	TX/RX-	Jumper from A	Jumper from B	Cable length up to 1000 ft
RS-232	DTR/RTS	TX	CTS	RX	Cable length up to 50 ft or 2500 pF

The return for RS-232C is through the terminal called RET. The signals for all six serial communication channels are arranged in the same order, which is SCOM, A, B, C, D, Ret when viewed from left to right.

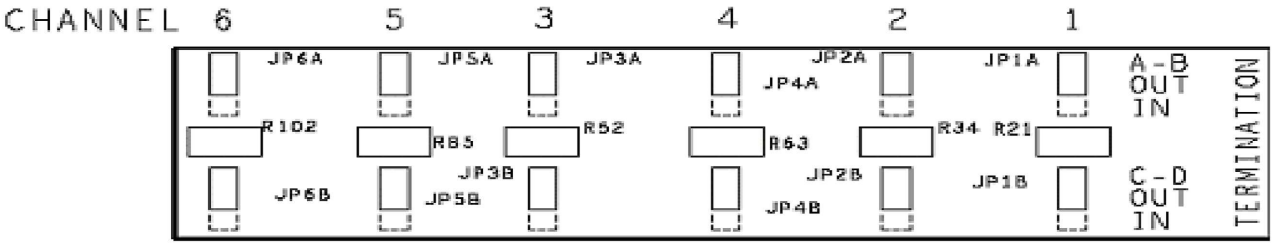
The groups of six signals for a serial channel are assigned to terminals adjacent to each other. When viewed from left to right, the channels on the bottom set of terminals are five, four, and one. The top set of terminals contain channels six, three, and two when viewed from left to right. The board SCOM connections are grouped on the right side of the terminals. A signal location diagram is included on the SSCA.



The explicit terminal board screw connections include:

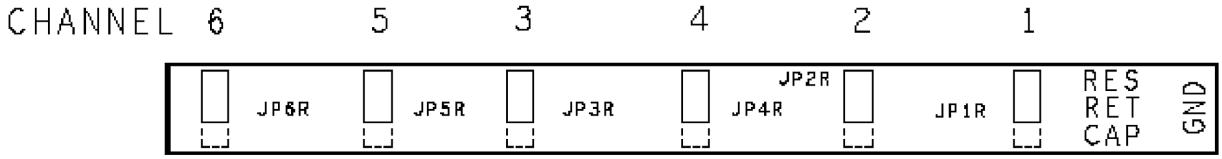
	Port 1	Port 2	Port 3	Port 4	Port 5	Port 6
SCOM	26	25	13	14	2	1
PT_A	28	27	15	16	4	3
PT_B	30	29	17	18	6	5
PT_C	32	31	19	20	8	7
PT_D	34	33	21	22	10	9
Ret	36	35	23	24	12	11

When using RS-422 or RS-485, a termination resistor must be provided at either end of a transmission line. The SSCA provides selectable termination resistors for each pair of signal lines. Jumpers JP1A and JP1B apply or remove the termination resistors between signals A-B and C-D. The same function is repeated for each serial communication channel. The default jumper position includes a disconnected termination resistor. The SSCA is clearly marked to display the relationship of the termination jumpers and the serial communication channel signals.



In RS-232C systems, it is often not desirable to have a hard ground of the RET signal path on both ends of a cable. The SSCA includes jumper selectable grounding options for each of the six RET lines. The line may be grounded through a 100 Ω resistor or through a 0.01 uF capacitor / 1M Ω resistor parallel combination. If the device attached to the SSCA has a hard ground of the RET line, the capacitive ground should be selected on the SSCA. If there is not a hard ground on the connected equipment, the resistive ground (default position) should be selected on the SSCA.

RET ground jumpers are identified on the SSCA as JP1R through JP6R. Positions are displayed as RES and CAP for resistive and capacitive return connection. All jumpers are clearly labeled.



Specifications

Item	Specification
Number of channels	Six
Termination resistors	Jumper selectable between open and resistor of 121 Ω, ½ W, 1%
RS-232C return path ground	Selectable between resistive ground of 100 Ω, ½ W, 1% or 1M Ω, ½ W, 1% in parallel with 0.01 uF, 500 V, 10% capacitor
Maximum drops in RS-422 or RS-485 systems	Eight drops maximum
Size	15.9 cm high x 10.2 cm wide (6.25 in x 4.0 in)
Technology	Surface-mount
Temperature	Operating: -30 to 65ºC (-22 to 149 ºF)

Diagnostics

The JA connector on the terminal board has its own ID device that is interrogated by the I/O pack. The ID device is a read-only chip coded with the terminal board serial number, board type, revision number, and J connector location. When this chip is read by the I/O processor and a mismatch is encountered, a hardware incompatibility fault is generated.

Configuration

For the six serial communication channels:

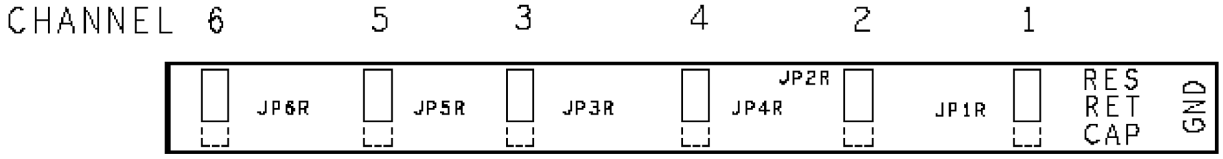
- Jumpers JP1A through JP6A apply or remove termination resistors between signal lines A and B
- Jumpers JP1B through JP6B apply or remove termination resistors between signal lines C and D
- Jumpers JP1R through JP6R select whether the return has a resistive or capacitive connection to SCOM.

All other configuration is performed from the ToolboxST application. Electronic selection of the serial communications method, either RS-232, RS-422, or RS-485, is internal to the I/O pack.

RS-232C (Point-to-point)

- It is often not desirable to have a hard ground of the RET signal path on both ends of a cable. SSCA includes jumper selectable grounding options for each of the six RET lines.
- The line may be grounded through a 100 Ω resistor or, through a 0.01 uF capacitor / 1 M Ω resistor parallel combination.
- If the device attached to SSCA features a hard ground of the RET line then the capacitive ground should be selected on SSCA. If there is not a hard ground on the connected equipment then the resistive ground (default position) should be selected on SSCA.
- RET ground jumpers are identified on SSCA as JP1R through JP6R. Positions are displayed as RES and CAP for resistive and capacitive return connection. The jumpers are clearly labeled on the SSCA.

In general, if the information on third-party side hardware configuration (hard ground or not) is available during pre-FAT, keep RET with resistance ground. The JP#R stays connected to RES (Default), and configure with the ToolboxST application as follows:



Note If a computer is connected as a test simulation device (with MODSIM running), the wire from Pin-5 of D-Type connector must be connected to SCOM1.

Protocol	A	B	C	D	Notes
RS-422	TX+	TX-	RX+	RX-	Cable length up to 1000 ft
RS-485	TX/RX+	TX/RX-	Jumper from A	Jumper from B	Cable length up to 1000 ft
RS-232	DTR/RTS	TX	CTS	RX	Cable length up to 50 ft or 2500 pF

Explicit terminal board screw connections include:

	SCOM	A	B	C	D	RET
Channel 1	26	28	30	32	34	36
Channel 2	25	27	29	31	33	35
Channel 3	13	15	17	19	21	23
Channel 4	14	16	18	20	22	24
Channel 5	02	04	06	08	10	12
Channel 6	01	03	05	07	09	11

Connection Between SSCA and Third-party Device (Slave) – RS-232

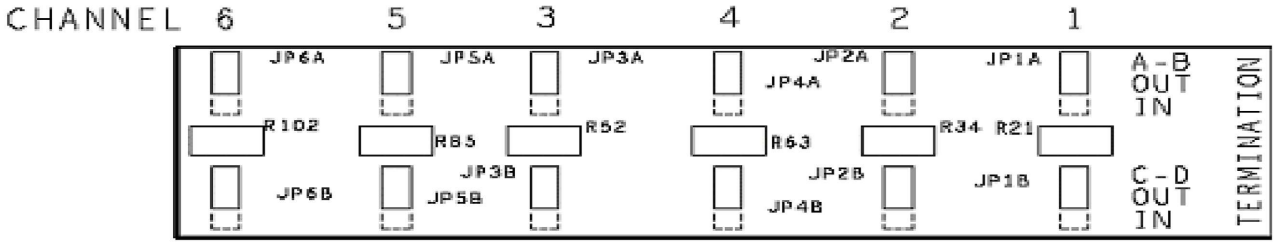
- B (TX) to third-party device (Slave) RX
- D (RX) to third-party device (Slave) TX
- A (DTR/RTS) to third-party device (Slave) CTS
- C (CTS) to third-party device (Slave) RTS
- I/O pack SSCA out (TX) —+————————+– (RX)
- I/O pack SSCA out (RX) —+————————-+– (TX)
- I/O pack SSCA out (DTR/RTS)—+————————+– (CTS)
- I/O pack SSCA out (CTS) —+————————+– (RTS)

Protocol-RS-232	Slave Device Side	DTR/TRS	TX	CTS	RX	SCOM	RET
SSCA SIDE							
CHANNEL 1	RS-232	28	30	32	34	26	36
CHANNEL 2	RS-232	27	29	31	33	25	35
CHANNEL 3	RS-232	15	17	19	21	13	23
CHANNEL 4	RS-232	16	18	20	22	14	24
CHANNEL 5	RS-232	4	6	8	10	2	12
CHANNEL 6	RS-232	3	5	7	9	1	11

RS-485

- There is the need to provide a termination resistor at either end of a transmission line.
- SSCA provides selectable termination resistors for each pair of signal lines.
- Jumpers JP#A and JP#B apply or remove the termination resistors between signals A-B and C-D.
- Above Point 3 function is repeated for each serial communication channel. The default jumper position is to disconnect the termination resistor.
- The SSCA is clearly marked to display the relationship of the termination jumpers and the serial communication channel signals.

The configuration at SSCA jumper *(JP#A, JP#B set to IN)* must match the ToolboxST configuration as follows. The 120 Ohm resistance selection is used as an example.



Terminal board screw connections include:

	SCOM	A	B	C	D	RET
Channel 1	26	28	30	32	34	36
Channel 2	25	27	29	31	33	35
Channel 3	13	15	17	19	21	23
Channel 4	14	16	18	20	22	24
Channel 5	02	04	06	08	10	12
Channel 6	01	03	05	07	09	11

Protocol	A	B	C	D	Notes
RS-422	TX+	TX-	RX+	RX-	Cable length up to 1000 ft
RS-485	TX/RX+	TX/RX-	Jumper from A	Jumper from B	Cable length up to 1000 ft
RS-232	DTR/RTS	TX	CTS	RX	Cable length up to 50 ft or 2500 pF

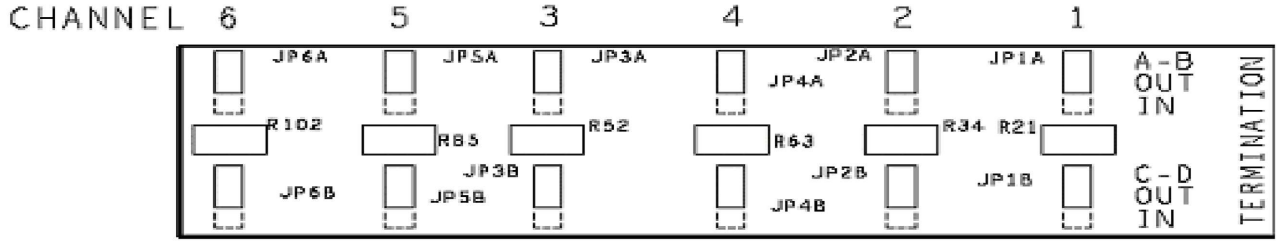
Connection Between SSCA and Third-party Device (Slave) – RS-485 Half Duplex

- A (TX/RX+) to third-party device (Slave) TX/RX+
- B (TX/RX-) to third-party device (Slave) TX/RX-
- C – Jumper from A
- D – Jumper from B

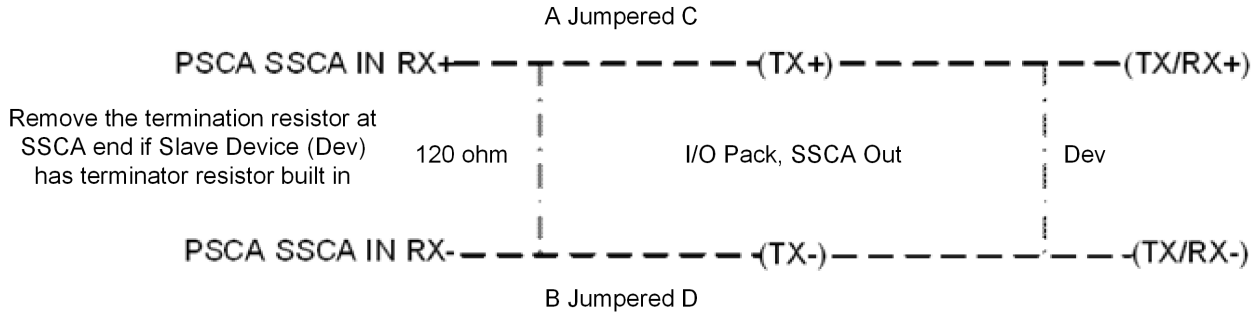
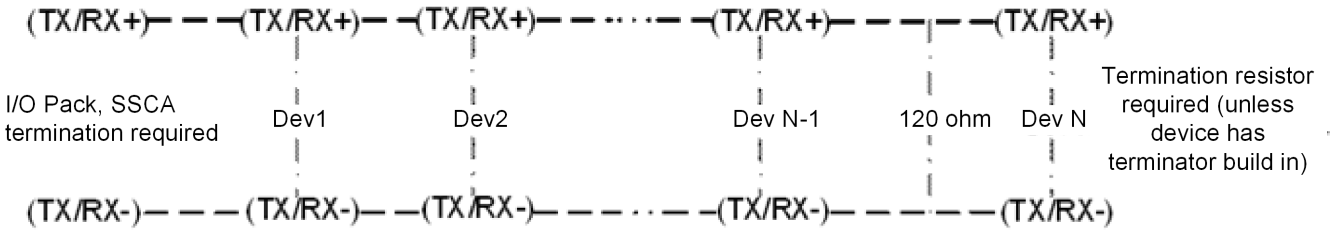
Note Put A/B termination **In**, but leave C/D termination **Out** on the terminal board.

Protocol-RS-485	**Slave Device Side**	**TX/RX+**	**TX/RX-**	**N/A**	**N/A**	**SCOM**	**RET**
SSCA SIDE	Media converter pins	DATA +	DATA -	JUMPER	JUMPER	SGND	
CHANNEL 1	RS-485	28	30	28-32	30-34	26	36
CHANNEL 2	RS-485	27	29	27-31	29-33	25	35
CHANNEL 3	RS-485	15	17	15-19	17-21	13	23
CHANNEL 4	RS-485	16	18	16-20	18-22	14	24
CHANNEL 5	RS-485	4	6	4-8	6-10	2	12
CHANNEL 6	RS-485	3	5	3-7	5-9	1	11

CHANNEL #	**A (TX/RX+)**	**B (TX/RX-)**	**C (JUMPERED WITH A)**	**D (JUMPERED WITH B)**	**JUMPER (JP#A)**	**JUMPER (JP#B)**
CHANNEL 1	28	30	32	34	JP1A - IN	JP1B – OUT
CHANNEL 2	27	29	31	33	JP2A - IN	JP2B – OUT
CHANNEL 3	15	17	19	21	JP3A - IN	JP3B – OUT
CHANNEL 4	16	18	20	22	JP4A - IN	JP4B – OUT
CHANNEL 5	4	6	8	10	JP5A - IN	JP5B – OUT
CHANNEL 6	3	5	7	9	JP6A - IN	JP6B – OUT



RS-485 (half duplex) – Point-to-point



RS-485 (half duplex) – Multidrop