

493.71 RS485 Transition Board

This functional specification covers model 493 RS-485 Transition board.

February, 1999 Rev C

Revision History

11-2-98 Initial Creation

11-18-98 Rev B

- move station select function to a separate register
- provide a unique interlock clear bit per interlock input
- Changed Electrical specifications for fuse trip current to be worst case at 50 deg. C rather than specified at 20 deg. C.

02-23-99 Rev C

- Add model number to spec. Add drawing numbers to spec.

1.1 introduction

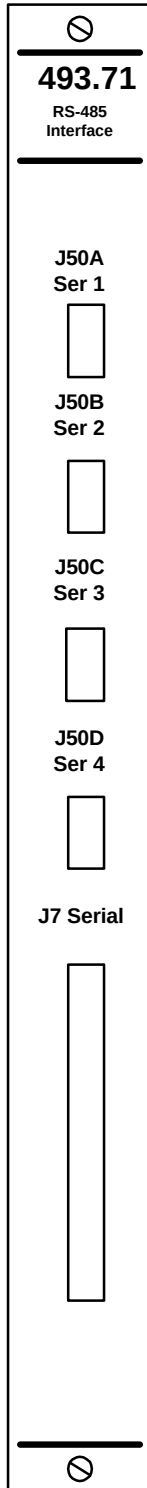
The RS485 Transition Board plugs into the transition bus in the back of a multi-channel 493 chassis. The following functions are supported on the board.

- Four channels of RS-485 interfaces (2/4 wire)to convert the four serial ports on the 498.71 GRES from TTL. The RS-485 communication channels normally are connected to a 493.05 Remote Station Controller.
- Four station stop interlock inputs (one per station).
- Four inputs to a single E-Stop chain
- MTS Transition Bus interface

1.2 specifications

Parameter	Specification
Operating environment:	
temperature	5°C to 40°C ambient
humidity	0 to 85%, non-condensing
Altitude	10,000 ft max
air flow	300 LFM
Board size:	
height	234 mm
depth	80 mm
Weight	5 oz.(.14 kg)
Transition bus compliance	A10: D16 Carrier Transition space
Power	
+5 VDC	250 mA maximum
Fused +12VDC at each Serial Port Connector	Self resetting upon fault clearing, 1 A max
Serial Ports (4)	Max Cable Length = 125 feet
	(specified using MTS cable 514739-01)
Interlock In	Dry contact
	Open = interlock
E-Stop	Four inputs to a 24V E-Stop chain, 1 Amp Max.

1.3 functional description



- J7 provides connections to the four TTL serial ports on the 498.71 GRES module
- J50A – J50D provide connections to the four RS-485 interfaces (2/4 wire), the four station stop interlock inputs and the 4 connections to the E-Stop chain.

1.4 registers / address map

Local Registers

Board ID

Address 0 Contains the board id. 16 bit. Type ID = 0053 hex

Interlock Control/Status

Address 2 The Interlock CSR provides status / control of the interlocks

Local CSR Register

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
----	----	----	----	----	----	---	---	---	---	---	---	---	---	---	---

Interlock CSR Register Bit Definitions

Bit	Name	Definition
0	Interlock 1/5	R/W. Reading a 1 indicates active interlock on J50A. Writing 0 clears the interlock as long as the interlock is no longer present at the input.
1	Interlock 2/6	R/W. Reading a 1 indicates active interlock on J50B. Writing 0 clears the interlock as long as the interlock is no longer present at the input.
2	Interlock 3/7	R/W. Reading a 1 indicates active interlock on J50C. Writing 0 clears the interlock as long as the interlock is no longer present at the input.
3	Interlock 4/8	R/W. Reading a 1 indicates active interlock on J50D. Writing 0 clears the interlock as long as the interlock is no longer present at the input.
4-15	unused	Read as 1

Station Interlock Map Register

Address 4

The station interlock map register is used to map the front panel interlock inputs to station interlocks.

Station Interlock Map Register

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
----	----	----	----	----	----	---	---	---	---	---	---	---	---	---	---

Station Interlock Map Register Bit Definitions

Bit	Name	Definition
0	Station 1-4/5-8	R/W. Writing a 1 maps interlock inputs on J50A - D to Stations 1 - 4 respectively. Writing a 0 maps interlock inputs on J50A - D to Stations 5 - 8 respectively. Power up state = Station 1 – 4 Note: Software supports stations 1-4 only. Stations 5-8 are for future use.
1- 15	unused	Read as 1

1.5 connections

Serial Connectors

Serial connector **J7**

J7 on the RS485 Transition Module connects to **J7 SERIAL** on the 498.71 through cable 498765-01. Pin assignments for the connectors are shown below.

J7 Front Panel Connector Pin Assignments

Pin	Signal	Pin	Signal
1	TX1	14	Gnd
2	RX1	15	Shutdown 1
3	RTS1	16	Reset 1
4	TX2	17	Gnd
5	RX2	18	Shutdown 2
6	RTS2	19	Reset 2
7	TX3	20	Gnd
8	RX3	21	Shutdown 3
9	RTS3	22	Reset 3
10	TX4	23	Gnd
11	RX4	24	Shutdown 4
12	RTS4	25	Reset 4
13	not used		

Transceiver connectors
J50X

Each port is brought out to one of four front panel high density DD-9S connectors (**J50A** through **J50D**) from the transceivers on the transition circuit card. Pin assignments for the connectors are shown below.

J50X Serial Port Pin Assignments

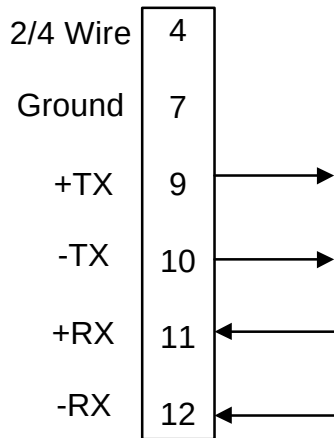
4-Wire RS-485		2-Wire RS-485	
Pin	Signal	Pin	Signal
1	+12V	1	+12V
2	Ground (12V)	2	Ground (12V)
3	Reset	3	Reset
4	4-Wire/2-Wire	4	4-Wire/2-Wire
5	Station Stop	5	Station Stop
6	Not used	6	Not used
7	Digital Ground	7	Digital Ground
8	E-Stop	8	E-Stop
9	+TX (RS-485)	9	+TX/+RX (RS-485)
10	- TX (RS-485)	10	-TX/-RX (RS-485)
11	+RX (RS-485)	11	Not used
12	-RX (RS-485)	12	Not used
13	E-Stop	13	E-Stop
14	Not used	14	Not used
15	Not used	15	Not used

Typical Connections

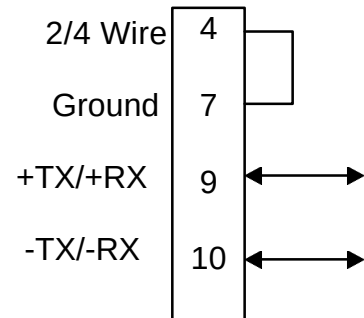
2/4 wire RS-485 Communications Connections

2/4 wire RS-485 communications selection is handled via cable configurations.

J50X 4 Wire RS-485



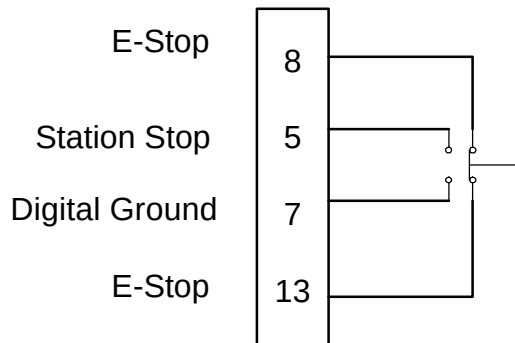
J50X 2 Wire RS-485



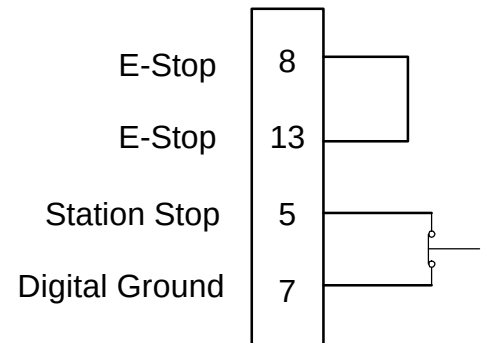
Station Stop/E-Stop Connections

J50A – J50D provide connections to Station Stop inputs, as well as to the common E-Stop chain. If the Station Stop or E-Stop functions are not used on a J50X connector, these functions must be jumpered out.

J50X E-Stop



J50X Station Stop



1.6 Transition Bus Definition

J1 Pin Assignments

Pin #	Row A	Row B	Row C
1	/INTERLOCK 1	+3.3V	/INTERLOCK 2
2	/INTERLOCK 3	+3.3V	/INTERLOCK 4
3	/INTERLOCK 5	3.3V GND	/INTERLOCK 6
4	/INTERLOCK 7	3.3V GND	/INTERLOCK 8
5	A1	RESERVED	A2
6	A3	RESERVED	A4
7	A5	RESERVED	A6
8	A7	RESERVED	A8
9	A9	RESERVED	A10
10	D0	RESERVED	D1
11	D2	RESERVED	D3
12	D4	RESERVED	D5
13	D6	DIG GND	D7
14	D8	DIG GND	D9
15	D10	DIG GND	D11
16	D12	DIG GND	D13
17	D14	+5V	D15
18	R/W	+5V	/RESET
19	/DS	+5V	/DTACK
20	/SLOTSEL	+5V	/FAIL
21	/E-STOPIN	SUPER CLOCK	HI CLOCK
22	/E-STOPOUT	/PWRFAIL	LOW CLOCK
23	+15 V	ANLG GND	+15 V
24	RESERVED	RESERVED	RESERVED
25	-15 V	ANLG GND	-15 V
26	+12V	12V GND	+12V
27	RESERVED	RESERVED	RESERVED
28	-12V	12V GND	-12V
29	24 VGND	24 VGND	24 VGND
30	24 VGND	24 VGND	24 VGND
31	+24	+24	+24
32	+24	+24	+24

1.7 list of related drawings

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|---------------------------------------|-------------|
| 1. Module Assembly: | 100-003-832 |
| 2. PWA: | 558393-01 |
| 3. PWB: | 558392-01 |
| 4. Schematic: | 558391-01 |
| 5. Station Stop/E-Stop Jumper: | 556341-01 |
| 6. Cable Assy, 493.05 W/Station Stop: | 556343-01 |
| 7. Cable Assy, 493.05 W/Estop: | 556342-01 |