



Table 1. P12 Connector Pinout

P12 Connector Pin	PCB Pad Identifier	Signal Details	Cable	Label Color	Label Text	HDSUB 15 Pin	DSUB 9 Pin
2	E2	J12 User Defined IO 1 (+)	TSP (+)	-	-	1	-
3	E3	J12 User Defined IO 1 (-)	TSP (-)	-	-	11	-
4	E4	J12 User Defined IO 2 (+)	TSP (+)	-	-	2	-
5	E5	J12 User Defined IO 2 (-)	TSP (-)	-	-	12	-
6	E6	J12 User Defined IO 3 (+)	TSP (+)	-	-	4	-
18	E18	J12 User Defined IO 3 (-)	TSP (-)	-	-	14	-
8	E8	J12 User Defined IO 4 (+)	TSP (+)	-	-	5	-
20	E20	J12 User Defined IO 4 (-)	TSP (-)	-	-	15	-
10	E10	J12 User Defined IO 10	TSP (+)	-	-	3	-
11	E11	J12 User Defined IO 11	TSP (-)	-	-	13	-
21	E21	J12 User Defined IO 21	RG174	WHT	J12 UIO (21)	-	-
22	E22	J12 User Defined IO 22	RG174	WHT	J12 UIO (22)	-	-
13	E13	USB Diff + (White Wire)	USB-B Cable	-	-	-	-
25	E25	USB Diff - (Green Wire)		-	-	-	-
(GND)	--	USB Ground (Black Wire)		-	-	-	-
1	E1	RS232 Serial Comm TXD	9180-060 TSP Cable	-	-	-	2
14	E14	RS232 Serial Comm RXD		-	-	-	3
(GND)	--	RS232 Serial Ground		-	-	-	5
24	E24	Time Synchronization 1PPS I/O	RG174	GRN	TIME DIO (24)	-	-
7,9,12,15,16,17,19,23	--	Ground	-	-	-	-	-

Assembly Notes:

- 1.) Place connector identification label containing "P12" on the key side at this location. On the bottom cover place cable assembly number. You may omit the CBL- portion of the assembly number due to size constraints.
- 2.) Place pigtail identification labels with shown text and colors from table 1 at the locations shown and cover with clear heat shrink.
- 3.) Bundle twisted-shielded pair cables at approximate 4" intervals to keep cables together.
- 4.) Remove plastic thumbscrew covers prior to assembly.
- 5.) Table 2 provides assembly component Bill of Materials.
- 6.) Label HD15 Backshell as shown.
- 7.) Modify MAND-6845548 assembly to provide connection as shown.
- 8.) For the RS232 cable, utilize the 9180-060 Belden TSP.

Table 2. Assembly BOM

Description	Qty	Manufacturers PN	Manufacturer
Micro-DSub Aluminum Backshell	2	MEC-28M-01-301-02	Lumistar
MDM 25-pin Female Connector	1	CONN-380-025-213L001	NorComp
MDM 25-pin Female Backshell PCB	1	HARM-3428M0141201	Lumistar
UNC2-56 Thumbscrews	2	NTEC-B71014305	Northern Technologies
BNC Female RG174 Pigtail, 12"	5	LCOM-SP7363	LCOM
Heat-shrink Tubing	AR	(Common Stock)	(Various)
0-80 82-Degree Stainless Steel Screw, Flathead, 0.3125 Length	4	(Common Stock)	(Various)
HD15 Female Connector, Solder Cup	1	CONN-180-015-203L001	NorComp
D9 Female Connector, Solder Cup	1	CONN-171-009-203L001	NorComp
Backshell Kit w/Thumbscrews	2	CONN-973-009-10R011	NorComp
1 Ft. Twisted-Shielded Pair, 26AWG, 110 Ohm	6	CABL-55A1121-26-6/9-9	TE/Raychem
USB-B Receptacle Pigtail, 254mm.	1	MAND-6845548	Mandyann
1 Ft. 26AWG TSP, Audio Cable	1	CABL-9180-060	Belden

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Title:
LS-28-M P12 Cable Assembly

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Signal Mnemonic	Connector Pin	Signal Description - Input	Signal Description - Output	Signal Direction	Signal Characteristics
J12UIO1	J12-2	Ch1 External Clock In +	Ch1 Clock Out +	Input/Out	RS422
		PCM Encoder1 Clock In +	Simulator1_TXD1 Clock Out +	Input/Out	RS422
		Trigger1 In +	Slave1 Clock Out +	Input/Out	RS422
		AUX1 Clock In +	Combiner Clock Out +	Input/Out	RS422
J12UIO2 (*)	J12-3	Ch1 External Clock In -	Ch1 External Clock Out -	Input/Out	RS422
		PCM Encoder1 Clock In -	Simulator1_TXD1 Clock Out -	Input/Out	RS422
		Trigger1 In -	Slave1 Clock Out -	Input/Out	RS422
		AUX1 Clock In -	Combiner Clock Out -	Input/Out	RS422
J12UIO3	J12-4	Ch1 External Data In +	Ch1 Data Out +	Input/Out	RS422
		PCM Encoder1 Data In +	Simulator1_TXD1 Data Out +	Input/Out	RS422
		Trigger2 In +	Slave1 Data Out +	Input/Out	RS422
		AUX1 Data In +	Combiner Data Out +	Input/Out	RS422
J12UIO4 (*)	J12-5	Ch1 External Data In -	Ch1 Data Out -	Input/Out	RS422
		PCM Encoder1 Data In -	Simulator1_TXD1 Data Out -	Input/Out	RS422
		Trigger2 In -	Slave1 Data Out -	Input/Out	RS422
		AUX1 Data In -	Combiner Data Out -	Input/Out	RS422
J12UIO5	J12-6	Ch2 External Clock In +	Ch2 Clock Out +	Input/Out	RS422
		PCM Encoder2 Clock In +	Simulator2_TXD2 Clock Out +	Input/Out	RS422
		Trigger3 In +	Slave2 Clock Out +	Input/Out	RS422
		AUX2 Clock In +	Combiner Clock Out +	Input/Out	RS422
			Simulator1_TXD1 Clock Out +	Input/Out	RS422
J12UIO6 (*)	J12-18		Simulator1_TXD1 Strobe Out +	Input/Out	RS422
		Ch2 External Clock In -	Ch2 External Clock Out -	Input/Out	RS422
		PCM Encoder2 Clock In -	Simulator2_TXD1 Clock Out -	Input/Out	RS422
		Trigger3 In -	Slave2 Clock Out -	Input/Out	RS422
		AUX2 Clock In -	Combiner Clock Out -	Input/Out	RS422
J12UIO7	J12-8		Simulator1_TXD1 Clock Out -	Input/Out	RS422
			Simulator1_TXD1 Strobe Out -	Input/Out	RS422
		Ch2 External Data In +	Ch2 Data Out +	Input/Out	RS422
		PCM Encoder2 Data In +	Simulator1_TXD1 Data Out +	Input/Out	RS422
		Trigger4 In +	Slave2 Data Out +	Input/Out	RS422
J12UIO8 (*)	J12-20	AUX2 Data In +	Combiner Data Out +	Input/Out	RS422
			Simulator1_TXD1 Data Out +	Input/Out	RS422
			Decom1 Strobe Out +	Input/Out	RS422
		Ch2 External Data In -	Ch2 Data Out -	Input/Out	RS422
		PCM Encoder2 Data In -	Simulator2_TXD2 Data Out -	Input/Out	RS422
J12UIO9	J12-21	Trigger4 In -	Slave2 Data Out -	Input/Out	RS422
		AUX2 Data In -	Combiner Data Out -	Input/Out	RS422
			Simulator1_TXD1 Data Out -	Input/Out	RS422
			Decom1 Strobe Out -	Input/Out	RS422
J12UIO10	J12-22	Preset Select B0	Ch1 Carrier Lock	Input/Out	5V TTL
		External Status Trigger 1	Ch1 Bit Sync Lock	Input/Out	5V TTL
			Ch1 Signal Quality Lock	Input/Out	5V TTL
			Stream 1 Lock	Input/Out	5V TTL
J12UIO11	J12-10	Preset Select B1	Ch2 Carrier Lock	Input/Out	5V TTL
		External Status Trigger 2	Ch2 Bit Sync Lock	Input/Out	5V TTL
			Ch2 Signal Quality Lock	Input/Out	5V TTL
			Stream 2 Lock	Input/Out	5V TTL
J12UIO12	J12-11	Preset Select B2	Combiner Carrier Lock	Input/Out	5V TTL
		External Status Trigger 3	Combiner Bit Sync Lock	Input/Out	5V TTL
			Combiner Signal Quality Lock	Input/Out	5V TTL
			Stream 3 Lock	Input/Out	5V TTL
J12UIO12	J12-11	Preset Select B3	Time Lock	Input/Out	5V TTL
		External Status Trigger 4	Reference Lock	Input/Out	5V TTL
			Stream 1 Lock	Input/Out	5V TTL
			Stream 2 Lock	Input/Out	5V TTL

User IO Selection Table for J12

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