

HERAB Fast Control System

SHARC Link Long Distance Receiver

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1 General Remarks

- Module size: 8.0 by 3.6 cm.
- Power consumption: ~ 0.5 A @ 5 V.

To transfer data from external modules to the SHARC modules (via twisted pair cables) the 'SHARC Link Ports' are used at the receiving side. Considering the timing specification of the SHARC chip and the proposed nibble transfer rate of 30 MHz the maximum cable length is limited to ~ 30 m if the standard SHARC link flow control has to be used. To be able to use longer cables this special receiver board has to be used in front of the SHARC module. It contains a FIFO memory to create a larger input buffer and therefore to give more time for the flow control protocol. Each module is able to handle up to six SHARC links simultaneously.

The values listed below specify the timing limitations of the module (for a nibble transfer rate of 30 MHz).

- Minimum time between 'data stable' and low going clock edge: 12 ns
- Maximum time between 'data stable' and low going clock edge: 26 ns
- Maximum cable length: **150 m** for the link ports 1 and 2, **60 m** for the link ports 3, 4, 5 and 6. (link ports 1 and 2 are connected to the upper two connector positions). There may be restrictions for other than timing reasons.

The module does not recognize 'SHARC words', it only handles pixels. However, the pixels must be transferred at least in groups of four since the internal FIFO has a word length of 16 bits.

If the module receives the flow control 'stop' signal (/LACK) the data transfer will be stopped after the transmission of the current 4-pixel group.

1.1 Data Files for Programmable Logic

The latest versions of the data for the programmable logic chips can be found in the following files:

	Chip	Position
fpga logic	ACTEL 17E256	U8

2 SHARC Link Input Connector (J1, J2, J3)

The SHARC link input connector is a 18 x 4 [BERG Metral Connector](#) field, realized as 3 stacked BERG Metral 6 x 4 connectors (type BERG 70284-101). The following table shows the pin assignment (front view):

	d	c	b	a
J3-6	L6-LD3	L6-LD3*	L6-LD0	L6-LD0*
J3-5	L6-LCLK	L6-LCLK*	L6-LD1	L6-LD1*
J3-4	L6-LACK	L6-LACK*	L6-LD2	L6-LD2*
J3-3	L5-LD3	L5-LD3*	L5-LD0	L5-LD0*
J3-2	L5-LCLK	L5-LCLK*	L5-LD1	L5-LD1*
J3-1	L5-LACK	L5-LACK*	L5-LD2	L5-LD2*
J2-6	L4-LD3	L4-LD3*	L4-LD0	L4-LD0*
J2-5	L4-LCLK	L4-LCLK*	L4-LD1	L4-LD1*
J2-4	L4-LACK	L4-LACK*	L4-LD2	L4-LD2*
J2-3	L3-LD3	L3-LD3*	L3-LD0	L3-LD0*
J2-2	L3-LCLK	L3-LCLK*	L3-LD1	L3-LD1*
J2-1	L3-LACK	L3-LACK*	L3-LD2	L3-LD2*
J1-6	L2-LD3	L2-LD3*	L2-LD0	L2-LD0*
J1-5	L2-LCLK	L2-LCLK*	L2-LD1	L2-LD1*
J1-4	L2-LACK	L2-LACK*	L2-LD2	L2-LD2*
J1-3	L1-LD3	L1-LD3*	L1-LD0	L1-LD0*
J1-2	L1-LCLK	L1-LCLK*	L1-LD1	L1-LD1*
J1-1	L1-LACK	L1-LACK*	L1-LD2	L1-LD2*

3 SHARC Board Connector (JS)

The SHARC board connector is a 2 x 28 SMD connector (MSC-Vertriebs-GmbH, order number: 854-10-56-30-051):

Pin	Signal		Pin	Signal
1	GND (code)		2	GND
3	GND (code)		4	VCC
5	open (code)		6	L6RES
7	L6ACK		8	L5RES
9	L6CLK		10	L4RES
11	L6D0		12	n.u.
13	L6D1		14	VCC
15	L6D2		16	GND
17	L6D3		18	L4ACK
19	L5ACK		20	L4CLK
21	L5CLK		22	L4D0
23	L5D0		24	L4D1
25	L5D1		26	L4D2
27	L5D2		28	L4D3
29	L5D3		30	GND
31	VCC		32	L3ACK
33	L2ACK		34	L3CLK
35	L2CLK		36	L3D0
37	L2D0		38	L3D1
39	L2D1		40	L3D2
41	L2D2		42	L3D3
43	L2D3		44	GND
45	L1ACK		46	n.u.
47	L1CLK		48	L3RES
49	L1D0		50	L2RES
51	L1D1		52	L1RES
53	L1D2		54	VCC
55	L1D3		56	GND