

LINK-56K



Emulator for Motorola's DSPs

A Product of Domain Technologies, Inc.

LINK-56K

User's Guide, Version 1.05

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DSPs supported by this product:

Motorola DSP56001

Motorola DSP56002 and derivatives

Motorola DSP56156 and derivatives

Motorola DSP56301 and derivatives

Motorola MC68356 and derivatives

Motorola DSP56800 and derivatives

Motorola DSP56600 and derivatives

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CHAPTER 1 - GENERAL INFORMATION

1.1 - System Introduction

LINK-56K is a software development system for the Motorola™ 16 and 24 bit Digital Signal Processors.

1.2 - Introduction to this Manual

This manual covers the hardware aspect of LINK-56K. A separate manual covers the operation of the software debugger.

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1.3 - System Features

- Microsoft Windows user interface
- Non-intrusive system
- Compatible with Motorola's tools
- High speed RS-232 interface with the emulation unit
- Interfaces with the DSP through the OnCE or JTAG emulation ports
- Multiple power supply modes

1.4 - Package Contents

- LINK-56K emulation unit
- Debug-56K software
- Power supply
- 10 pin cable
- 14 pin cable
- RS-232 cable
- User's manuals
- Registration form
- PROBE-56001 (Supplied with the DSP56001 emulator only)

1.5 - Hardware Requirements

The minimum LINK-56K hardware requirements are the following:

- PC with Microsoft Windows
- 4 MB of hard disk space
- 8 MB RAM
- 3.5" diskette drive
- RS-232 Port
- Mouse

1.6 - JTAG/OnCE

LINK-56K supports emulation through the JTAG port or the OnCE ports. The mode is selected automatically by the debugger software. One JTAG mode and two OnCE modes are available:

JTAG mode: The JTAG mode is used with DSPs with a JTAG emulation port. The 14-pin cable should be used in the JTAG mode.

10-pin OnCE mode: The JTAG mode is used with DSPs with a JTAG emulation port. The 14-pin cable should be used in the JTAG mode.

14-pin OnCE mode: This mode is used with target cards using a 14-pin OnCE connector. The 14-pin cable should be used in this mode.

1.7 - Powering Options

LINK-56K supports multiple powering options. LINK-56K is normally powered by the adapter provided with the system. LINK-56K may optionally be powered by the target card and the target card may also supply LINK-56K.

The following is a list of the powering modes available and the jumper settings.

Mode 1: LINK-56K is powered by a DC adapter:
JP3, JP4, JP6, JP7 in.
JP1, JP2, JP5 out.
JP8 out: LINK-56K not supplying target.
JP8 in, JP9 +5: LINK-56K supplies target with +5V DC.
JP8 in, JP9 +3: LINK-56K supplies target with +3V DC.

- Mode 2:** LINK-56K is powered by an AC adapter:
JP1, JP2, JP4, JP7 in.
JP3, JP5, JP6 out.
JP8 out: LINK-56K not supplying target
JP8 in, JP9 +5: LINK-56K supplies target with +5V DC.
JP8 in, JP9 +3: LINK-56K supplies target with +3V DC.
- Mode 3:** LINK-56K is powered by the target card:
JP5 in
JP1, JP2, JP3, JP4, JP6, JP7 out.

The default mode is mode 1, with LINK-56K not supplying the target. The default mode for LINK-56001 is mode 1 with LINK-56K supplying target.

When LINK-56K is powering the target card, make sure not to overload the emulation unit. Up to 200 mA may be sourced from the emulation unit.

Power sharing is done via the pin 8 of the the 10-pin cable or via pin-11 of the 14-pin cable.

When LINK-56K is powered by the target card, 70 mA @ 5VDC are needed.

To change the powering mode remove the two screws at the back of the unit, remove the back panel, slide the card out of the box, and change jumpers.

Connect the emulation unit to your target system through the supplied OnCE cable or the JTAG cable. If the connector on your target system is not protected for misplacement, make sure that the conductor with a strip connects to pin 1 of the connector.

1.8 - The OnCE/JTAG Connector

The OnCE and the JTAG signals share the same connector on the back of the emulator. Three modes are supported:

- 10-pin OnCE mode
- 14-pin OnCE mode
- JTAG mode

The 10 pin cable should be used in the 10-pin OnCE mode. The 14-pin cable should be used in either the 14-pin OnCE mode or the JTAG mode.

The following is the outline of the 10-pin cable connector in the 10-pin OnCE mode.

					Pin	Description
					1	DSI
					2	Ground
9	7	5	3	1	3	DSO
					4	Ground
•	•	•	•	•	5	DSCLK
					6	Ground
					7	-DR
•	•	•	•	•	8	VCC
					9	-RST (DSP reset)
10	8	6	4	2	10	Ground

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The following is the outline of the 14-pin cable connector in the 14-pin OnCE mode.

							Pin	Description
							1	DSI
							2	GND
13	11	9	7	5	3	1	3	DSO
							4	GND
•	•	•	•	•	•	•	5	DSCLK
							6	GND
							7	-DR
•	•	•	•	•	•	•	8	Misplacement key
							9	-RST
14	12	10	8	6	4	2	10	Unused
							11	VCC
							12	Unused
							13	Unused
							14	Unused

The following is the outline of the 14-pin cable connector in the JTAG mode.

							Pin	Description
							1	TDI
							2	GND
13	11	9	7	5	3	1	3	TDO
							4	GND
•	•	•	•	•	•	•	5	TCK
							6	GND
							7	Unused
•	•	•	•	•	•	•	8	Misplacement key
							9	-RST
14	12	10	8	6	4	2	10	TMS0
							11	VCC
							12	TMS1
							13	-DE
							14	-TRST

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1.9 - PROBE-56001 Jumper Settings

This section of the manual applies to DSP56001 emulators only. For all other products please skip this section.

Jumpers A, B, C in jumper block 1 are used to set the DSP's initial operating mode. Mode 0 is the default mode. The initial operating mode is often set by the target card, in such cases the jumpers A and B should be open. When a jumper is closed, the mode bit will be set to zero. The following table lists the valid modes with their respective jumper settings.

Mode	MMM/CBA	DSP's Operating Mode
0	0 0 0	PRAM enabled, reset @\$0000
1	0 0 1	Bootstrap from EPROM
2	0 1 0	PRAM enabled, reset @\$E000
3	0 1 1	PRAM disabled, reset @\$E000
4	1 0 0	Reserved for bootstrap
5	1 0 1	Bootstrap from HOST
6	1 1 0	Bootstrap from SCI (ext clk)
7	1 1 1	Reserved for bootstrap

The clock to the DSP on the probe can be supplied either from the probe itself or from the target system. Jumpers J3, J4, J5 select the source of the clock. The following table lists the valid modes with their respective jumper settings.

Jumper J3	Jumper J4	Jumper J5	DSP Clock Source
Closed	Closed	Open	From probe (local)
Open	Open	Closed	From target (external)

Jumper J2 connects pin 8 of the OnCE connector to the power lines of the probe, this allows power sharing between the emulation unit and PROBE-56001.

Jumper J2	Powering mode
Closed	Power shared through pin
Open	Independent powering

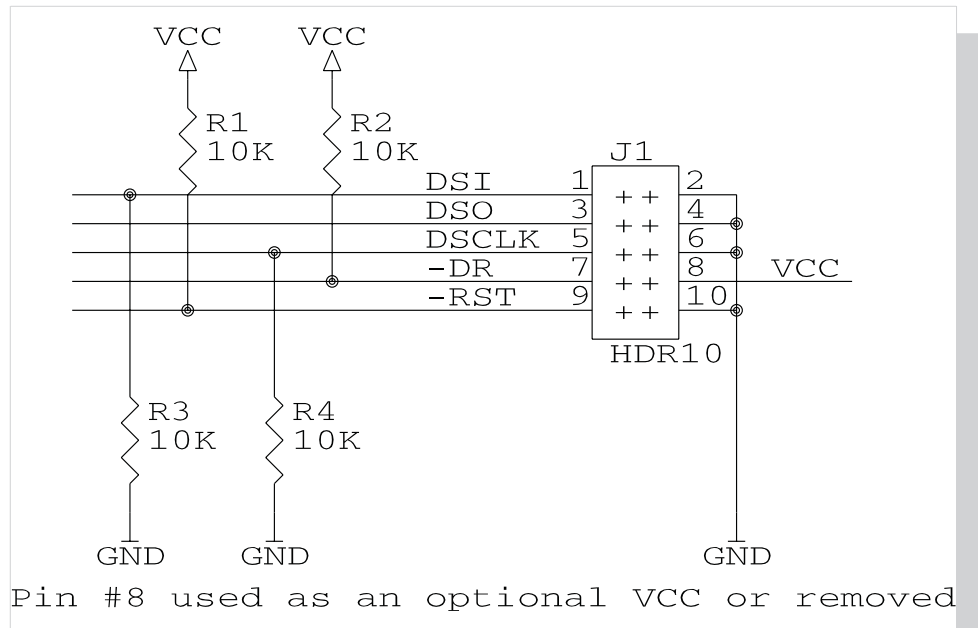
Jumper J1 is used for the reset line. A blocking diode is used on PROBE-56001 in order to isolate the reset signal generated on the target from the reset line generated on the probe. If J1 is set, the diode is bypassed. If J1 is removed the diode is used. J1 should be removed for proper operation when the target system is generating a non-tristated reset signal.

Jumper J1	Reset mode
Closed	Reset lines connected directly
Open	Reset lines connected through diode

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CHAPTER 2 - REFERENCES

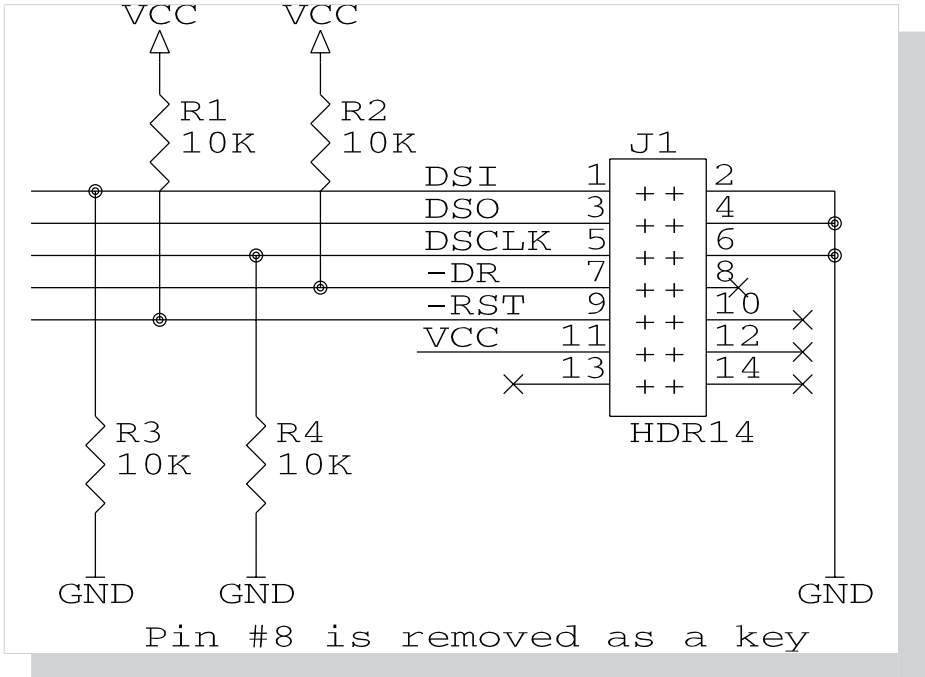
Figure 1 - 10 pin OnCE header



Example of target card circuitry when using a 10 pin OnCE header

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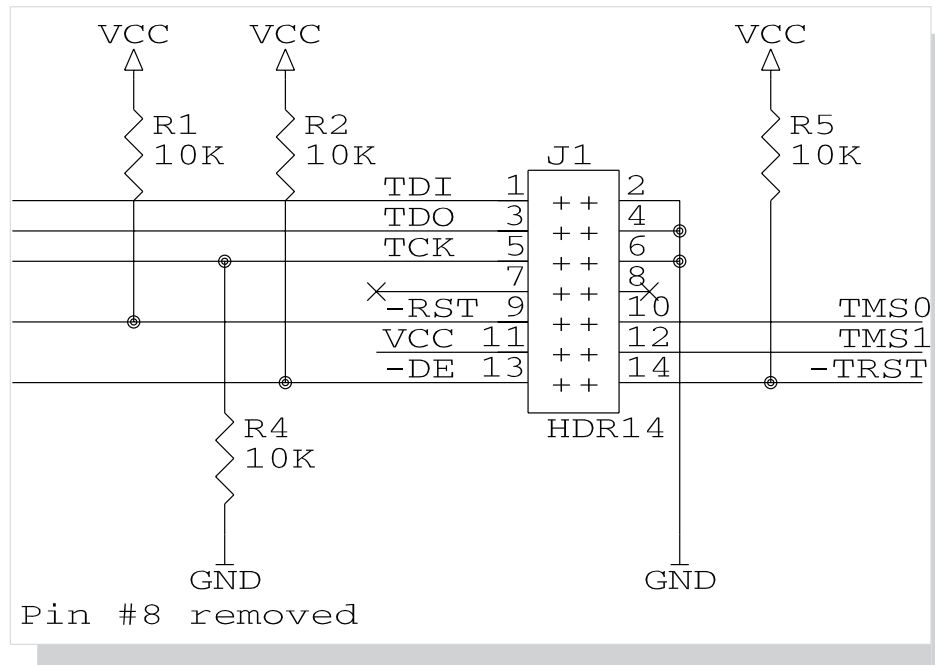
Figure 2 - 14 pin OnCE header



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Example of target card circuitry when using a 14 pin OnCE header

Figure 3 - 14 pin JTAG header



Example of target card circuitry when using 1 14 pin JTAG header.

