

LCD-LINK OPTION

Terminal Interface for COMM-LINK2 & HCS II

Rev. 1.0

******* NOTICE *******

It is very important to understand the
function of this **BEFORE** you install it.
Please read the entire manual
before using the board.

******* CAUTION *******

PLEASE READ THE ENTIRE MANUAL ** BEFORE ** ATTEMPTING ASSEMBLY !!
Understand the significance of each component and jumper setting
BEFORE assembly and applying power. **CHECK AND RECHECK !**
FAILURE TO DO SO WILL PUT YOUR WARRANTY AT RISK !!

CIRCUIT CELLAR INC.

4 Park Street • Vernon, CT 06066

TECHNICAL MANUAL

LCD-LINK OPTION

Terminal Interface
for COMM-LINK2 & HCSII

Technical Manual

Release 1.0
4/6/92

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4 Park St.
Vernon, CT 06066

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REV. 3/92

Table of Contents

Section	Description	Page
	Notices	i
	Warranty Information	ii
1	MICROCONTROLLER REVOLUTION	1
2	8031 FAMILY PIN DESCRIPTION	2
3	EXTERNAL ADDRESS SPACE	2
4	DEVICE TYPE SELECTION (JP1 & JP2)	3
5	EXTERNAL CODE SELECTION (JP3)	4
6	RESETTING THE COMM-LINK2 (JP4)	4
7	RS-232 COMMUNICATIONS (J2)	5
8	RS-485 COMMUNICATIONS (JP5)	6
9	RS-485/POWER CONNECTIONS (T1 & T2)	7
10	POWER FOR THE COMM-LINK2	8
11	COMM-LINK2, THE BASIC NETWORK NODE FOR THE HCS II	8
12	LCD-LINK CONNECTIONS	10
12.1	LCD CONNECTIONS (J3)	10
12.2	HEARTBEAT (JP8)	10
12.3	MODE (JP7)	11
12.4	SCREW TERMINAL ENABLES (JP1)	11
12.5	SCREW TERMINAL CONNECTIONS (I0-I3)	11
13	LCD-LINK SOFTWARE	12
13.1	GETTING STARTED - LCD-LINK MONITOR	13
13.2	CHECKSUMS	13
13.3	LCD-LINK COMMAND SET	14
13.4	NOTES	14
14	DEFAULT JUMPER CONFIGURATION	17
15	INTERACTIVE STANDALONE MODE	18
16	LCD-LINK KIT INSTRUCTIONS	20
17	LCD-LINK SCHEMATICS (OPTION)	22
17.1	COMM-LINK2 SCHEMATICS (BASE BOARD)	23
18	COMM-LINK2 SILKSCREEN	25
19	LCD-LINK PARTS LIST (OPTION)	26
19.1	COMM-LINK2 PARTS LIST (BASE BOARD)	27

MICROCONTROLLER REVOLUTION

'Expandable', the catch phrase of the 80's, is taking on new meaning in the 90's. The ability to add functions to a small microcontroller through an expansion bus has been a hot selling 'feature' for many companies. Today's cost-conscious product developer may not be willing to pay for that flexibility. Their product is well defined and must be minimal in cost. Expansion capabilities require additional parts, real estate, and power that is wasted in many cases where expansion will not be used.

What many need is an 8031/8052 controller in a plain brown wrapper, that is, optimized for these minimal-configuration applications.

The COMM-LINK2 board meets this criteria. Optimized both for single-use drop-in solutions as well as volume OEM applications, this new microcontroller is designed to be small and cost effective.

Measuring only 3.5 by 5.2 inches, the COMM-LINK2 board contains an 8031 (or 80C52) processor, EPROM and RAM memory, 12-bits of parallel I/O, and an RS/232-RS/485 serial port. A single 5 VDC regulated supply is necessary for operation or this can be obtained from a 9-12 VDC unregulated input by the on-board linear regulator.

8031 FAMILY PIN DESCRIPTION

Port 0	pins 39-32	8-bit open drain bidirectional I/O (multiplexed low-order data/address for external memory)
Port 1	pins 1-8	8-bit quasi-bidirectional I/O
Port 2	pins 21-28	8-bit quasi-bidirectional I/O (high-order address for ext. memory)
Port 3	pins 10-17	8-bit quasi-bidirectional I/O (secondary functions as follows: RXD/data Serial Channel's receiver TXD/data Serial Channel's transmitter *INT0 Interrupt 0/counter gate 0 input *INT1 Interrupt 1/counter gate 1 input T0 Counter 0 input T1 Counter 1 input *WR write for external data memory *RD read for external data memory)
ALE	pin 30	Address latch enable
*PSEN	pin 29	read for external program memory
*EA	pin 31	tied to logic high for executing code masked within the 8x5x series processors with internal ROM or tied to logic low to disable internal ROM and fetches all instructions from external program memory

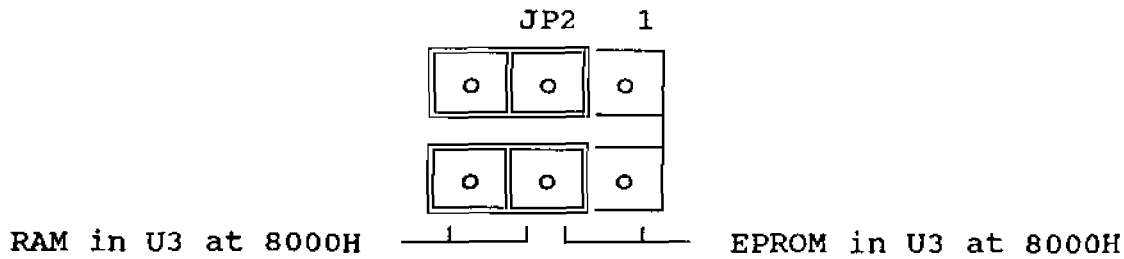
EXTERNAL ADDRESSING SPACE

The COMM-LINK2 microcontroller can directly address 64K of external memory. That is, overlapped DATA/CODE memory, for an "anything goes here" space.

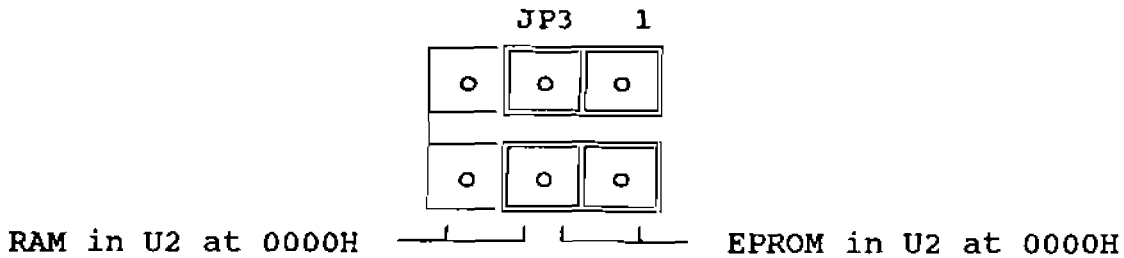
Combinations 32K RAMs and EPROMs are allowed on the COMM-LINK2 board. When using the 8031, your EPROM code starts execution at 0000H. When using the 80C52 (masked with BASIC in the internal ROM), RAM must be at 0000H.

DEVICE TYPE SELECTION

Two memory sockets are provided on the COMM-LINK2 board (U2 & U3). Each memory socket has a jumper used in selecting the type of address space assigned to the socket. JP1 selects the device type for U2 and JP2 selects the device type for U3. The selection made determines where the control lines are connected on the memory socket. RAM and EPROM devices require slightly different configurations. The following is an example of memory configuration when using an 8031.



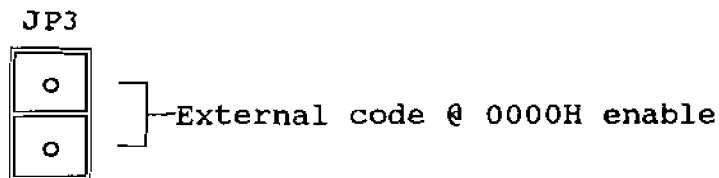
JP2 shows RAM in U3 starting at address 8000H



JP1 shows EPROM in U2 starting at address 0000H

EXTERNAL CODE SELECTION

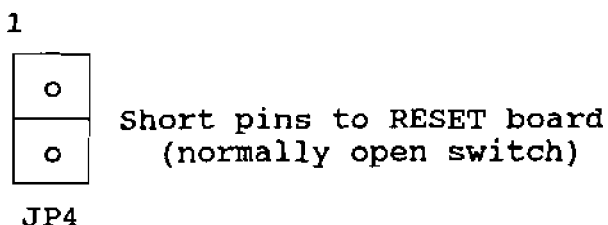
The 8031 microcontroller requires *EA (pin 31 on the microcontroller) to be pulled down to a logic low level. This instructs the processor to start executing machine language code starting at address 0000H. The 8052 is masked with BASIC and will run internal code (BASIC interpreter) if *EA is pulled up to a logic high. Pulling *EA low on an 8052 will disable BASIC and execute code starting at 0000H (similar to an 8032).



JP3 shows the microcontroller enabled for external code execution

RESETTING THE COMM-LINK2

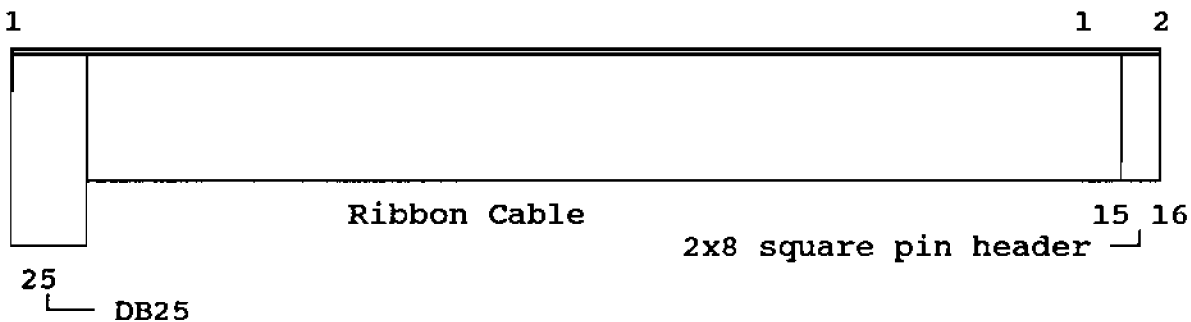
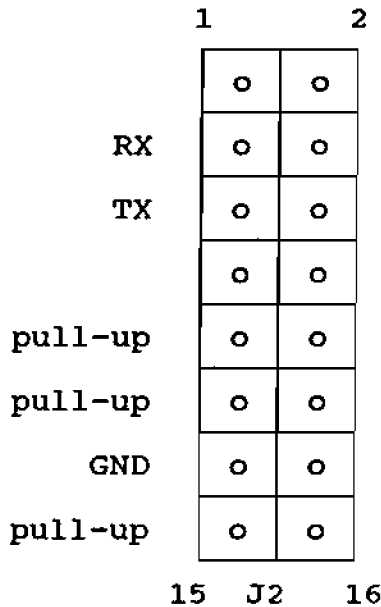
Reset of the COMM-LINK2 board occurs when a normally open push-button switch is attached to JP4 and momentarily pressed. A logic high is applied to the system RESET line and held momentarily high by an R/C circuit.



Use JP4 for connecting a normally open push-button switch as an external system RESET

RS-232 COMMUNICATIONS

The COMM-LINK2 contains a full-duplex serial channel. TTL-level serial signals are converted to ±10-volt RS-232-compatible signals by U7, the MAX232 device. A 16-lead flat ribbon cable made with a DB-25 at one end (for connection to DTE terminal device) and a 16-pin plug for connection to JP2) will permit serial communication with a dumb terminal or computer.

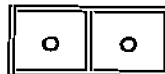


Cable required for RS-232 communications

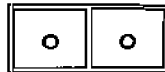
To eliminate unwanted noise on the RX input to the processor, remove the unused line driver chip. (U7-MAX232 or U8-75176)

RS-485 COMMUNICATIONS

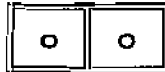
RS-485 communications over a single twisted pair can include multiple (up to 32) devices. Since each device can transmit and receive, certain protocols must be adhered to to prevent message collision. The simplest being "listen to the line and transmit only if free". (The protocol you use will depend on the application and is beyond the scope of this manual.) JP5 enables termination resistors on the twisted pair and should be installed only on the microcontrollers located at the extreme ends of the twisted pair (one at each end). U8, the 75176 RS-485 device, draws as much current as the rest of the COMM-LINK2 board. If you don't require RS485 communications removing U8 will reduce overall power requirements.



pull-down enable



pull-up enable



100-ohm load termination

1 JP5

JP5 shows termination of the RS-485 lines enabled

The 100 ohm termination which is across the RS485 twisted pair may be needed on the node at the end of the twisted pair daisy chain. The pull-up and pull-down resistors may be required to assure that the twisted pair is coaxed to the idle state when no RS485 driver is active. It is suggested that any termination be done on the last node for less confusion.

