

HCS-PLIX

Two-Way X10 Interface for the HCS-II Home Automation System

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v1.03

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HCS-PLIX Overview



The HCS-PLIX interface board allows the HCS-II Home Automation System to send and receive X10 signals over your home's electrical system. This allows your HCS-II to control any X10 modules you have installed in your home. All sorts of X10 devices are available for controlling everything from lights and outlets to heating and air conditioning, sirens, relays, etc. Since no additional wiring is necessary with X10, it allows you to add automation control with very little effort.

Since the HCS-PLIX can also receive X10 commands, you can use any X10 transmitter to send commands to your HCS-II as well as have your HCS-II monitor for lights you turn on manually using an X10 controller. Numerous wireless remote products are available that transmit X10 codes so you can easily add wireless remotes to your HCS-II system and trigger HCS-II events via RF.

The HCS-PLIX mounts on top of the HCS-II controller board using the expansion headers on the system controller. The HCS-PLIX board is connected to your home's electrical system using an optoisolated TW-523 X-10 Interface (purchased separately).

Once the HCS-PLIX is installed, you can take advantage of all the X10 commands in XPRESS. The HCS-PLIX uses an onboard microprocessor to take care of all the complex X10 signaling which allows the HCS-II to concentrate on other tasks.

Constructing your HCS-PLIX

If you purchased a kit from CCC, check the contents to ensure you have all the necessary parts. If you purchased your HCS-PLIX already assembled, skip to Chapter 3.

HCS-PLIX

Qty	Description	Part Reference
1	HCS-PLIX Circuit Board	NA
1	74HCT04 IC	U1
1	74HCT138 IC	U2
1	6821 Bus Interface IC	U9
1	18-Pin PLIX Processor	U10
1	14-Pin IC Socket	U1
1	16-Pin IC Socket	U2
1	40-Pin IC Socket	U9
1	18-Pin IC Socket	U10
2	10k Ω ¼ watt Resistors (Brown-Black-Orange)	R1, R2
1	0 Ω ¼ watt Resistor/Jumper (Black)	R8
2	15pF Monolithic Capacitors	C8, C9
4	0.1uF Monolithic Capacitors	C10, C11, C12, C13
1	3.6864 MHz Crystal	XTL2
1	Crystal Insulator	XTL2
1	RJ-11 Modular Jack	J5
2	2x13 Long Pin Sockets	J19, J20
1	2x4 Pin Header	JP1
1	1x3 Pin Header	JP2
1	2x8 Pin Header	JP3
3	Shorting Blocks	NA
2	Header Socket Key Pegs	J19, J20

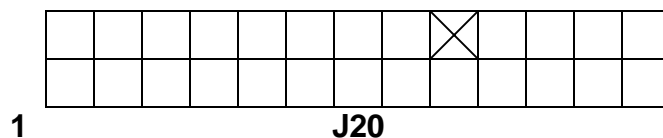
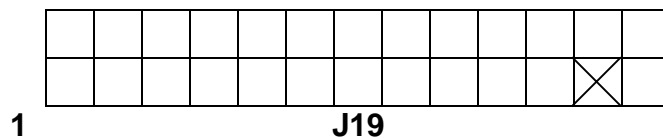
Use ESD protection when handling the ICs! If you do not have a strap, touch something grounded before handling the chips.

- Use masking tape to hold parts in place while soldering
- Use water based rosin solder for easy cleanup after board construction

Building your HCS-PLIX is quite simple. The circuit board has outlines for each part. These outlines correspond to the part numbers listed in the parts list. If you still are unsure about the placement or orientation of a part, check out the picture of an assembled HCS-PLIX on our website at:

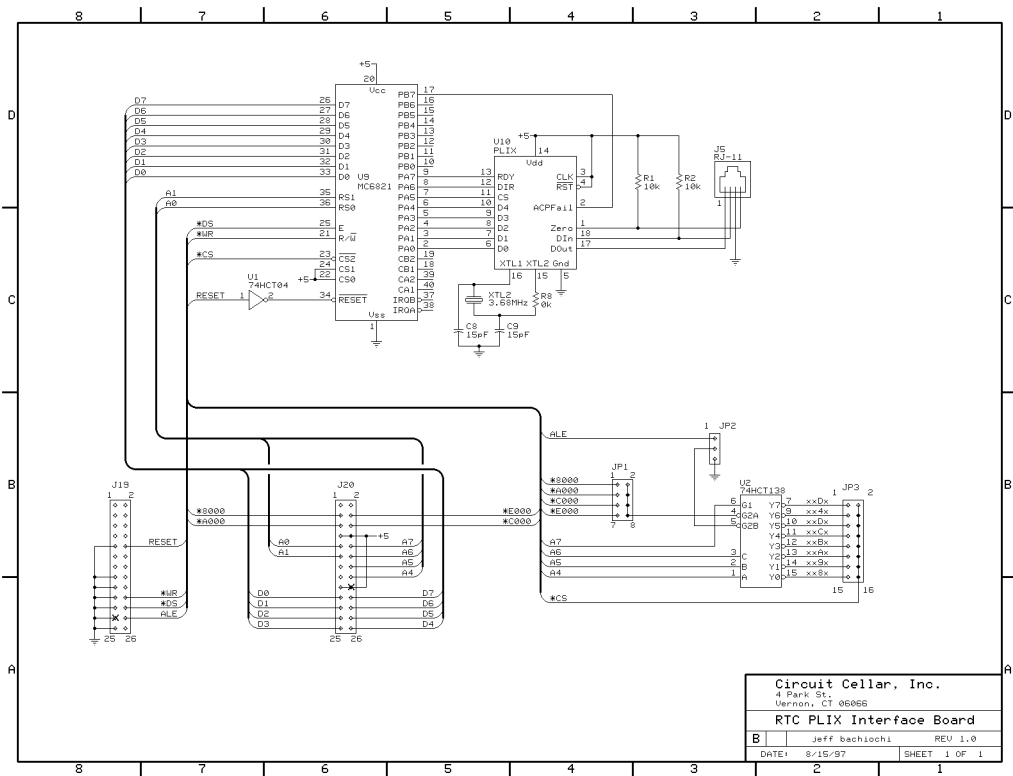
<http://www.cc-concepts.com/products/hcs/plix.html>

- 1) Orient your circuit board so the side with the white diagram faces up. All parts must be installed on this side.
- 2) Start with the resistors. Install all the resistors on the board. Resistors can be oriented either way. Note the color bands on each resistor. They correspond to the colors listed in the parts list.
- 3) Install the capacitors. Small capacitors use a single number to indicate their value. 0.1 μ F capacitors will say "104". The 15pF capacitors will say "150".
- 4) Install the IC Sockets. Make sure you install the socket so the notch is on the same side as the small box on the circuit silkscreen. Pin 1 of each socket should be installed in the square solder pad.
- 5) Install the crystal, which is located next to U10. Insert the crystal through the holes in the crystal insulator and then insert the crystal & insulator into the circuit board for soldering.
- 6) Install the IDC headers (1x3, 2x4, 2x8). When installing JP2, make sure it stays straight while you solder it.
- 7) Install the RJ-11 Jack (J5) by snapping it into place and then soldering the pins.
- 8) Now install the 2x13 Pin Sockets. **THE PINS MUST BE INSERTED FROM THE SOLDER SIDE OF THE BOARD.** The pins should be sticking out on the component side of the board. Be careful not to overheat the pins as it can melt the socket plastic and cause the pin to tilt. **Solder the long pins on the component side!**
- 9) In order for other boards to connect on top of the HCS-PLIX, two pins must be cut off which allows for proper alignment of the boards. Each HCS board has protective keys in certain pin locations to ensure boards are inserted properly. **MAKE SURE YOU KNOW THE RIGHT PIN TO CUT!** Look for the white "1" next to each long pin socket and identify the pin to be cut from the diagrams below:



- 10) Now install the pin keys (small white plastic pegs). Insert a peg in each socket position where you cut a pin off on the other side of the board (according to the above diagram)

- 11) Clean off all solder flux using a solvent (if you used Rosin Core solder) or warm water if you used water based rosin solder. Allow the board to dry overnight before proceeding.
- 12) Insert the ICs into their respective sockets. Ensure the 'half moon' cutout in each chip aligns with the cutout of the IC socket and the cutout in the silkscreen diagram.
- 13) Your HCS-PLIX is now complete and ready to be installed!



Circuit Celler, Inc.
 4 Park St.
 Urmson, CT 06866

RTC PLIX Interface Board

B	Jeff Bachiochi	REV 1.0
DATE:	8/15/97	SHEET 1 OF 1

Installing your HCS-PLIX

The HCS-PLIX requires XPRESS firmware v3.60. If you have an older version, contact Creative Control Concepts to get the latest upgrade.

You must set the jumpers on your HCS-PLIX board before you use it. Take a shorting block and install it on the Axxx setting on JP1. Take another and install it on the xxCx setting on JP3. Finally, install the last shorting block on the GND setting of JP2.

In order to use your HCS-PLIX, you need a TW-523 X10 Power Line Interface which is purchased separately. Foreign users will need the 220V version of the TW-523. Creative Control Concepts has TW-523's available. Foreign users should contact a local supplier for the 220V version of the TW-523. This interface must plug into a power outlet so ensure you have a power outlet near your HCS-II system. If not, get one installed. While some users have reported using TW-523's located up to 25 feet away from their HCS with no problem, the closer together they are, the better.

Once you have located a suitable outlet for your TW-523, plug it in. The red LED should light up. Power down your HCS system. The HCS-PLIX simply plugs onto the HCS-II expansion headers or the headers on any expansion boards you already have installed. **NOTE** – if you have a DTMF board, that board should be on top of the stack so the RJ-11 jack is accessible.

Once the HCS-PLIX is installed, take the TW-523 modular cable and connect the HCS-PLIX to the TW-523. Most telephone cables WILL NOT WORK. You should use the cable supplied with the TW-523. If you bought a TW-523 from another vendor and don't have a cable, contact Creative Control Concepts to get one. If you have extra phone cables in your home, you can check to see if they'll work. First, there must be four wires in the connector, not 2. Second, hold the connectors next to each other, side by side, facing the same direction (i.e. the tabs should both be on top). Look down at the wires inside the modular connectors. If they are not colored, find another cable. If they are colored, look at the color sequence from left to right. If the colors are in the SAME ORDER on both connectors, the cable WILL work. However, if the colors are in opposite orders, it is a normal telephone cable and will NOT work with a TW-523.

If you are replacing a PL-Link board, you must recompile your XPRESS code. Remove the *Define PL-Link = 1* line and recompile. The HCS will automatically sense the HCS-PLIX board. If you leave the PL-Link definition in your code, the HCS-PLIX is disabled.

If this is a new X10 installation for you, add any X10 commands you wish and recompile. Complete command information can be found in your XPRESS Command Reference Manual.

Power up your HCS system. As X10 commands are sent you should notice the red LED on the TW-523 flashing.

Need Help?



If you get stuck trying to get your system to work, drop us a line at support@cc-concepts.com and we will do our best to help you get your PIC-TV working.

Check out our web site at <http://www.cc-concepts.com/> for updates, bug reports, etc.

