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Setting up LAN control with JED controllers (rev 1)

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Introduction

As manufacturers are switching from RS32to alternative communications methods with LCD panels and projectors, JED has implemented a way of communications via the LAN port which is present in some of these units. (Initial testing is with recent Sharp LED LCD panels, e.g. PN60/70TA3 or ...TB3, and this document will have further revisions adding new AV device setups.)

(Some manufacturers also use the HDMI port with an external interface and control the panel/projector via an interface. Sony uses a box known as the HDMI Consumer Electronics Control system. The interface boxes from Sony are called CBX-H10/1 and CBX-H11/1.)

The LAN interface is implemented using a Lantronix xDirect module which converts an RS232 signal to a LAN protocol called TCP. The JED controller "talks" bi-directionally with the AV device from its "projector" RS232 connection and the xDirect connects to the AV device via a crossover LAN cable. No hub is used, and there is no DHCP server needed. Rather, absolute, fixed IP addresses are setup in the xDirect device and in the AV device. See: <http://www.lantronix.com/device-networking/external-device-servers/xdirect.html>

JED controller interface to LAN port of LCD screens etc

Crossover network cable from xDirect interface goes into LAN socket of LCD screen, etc



RS232 from proj. socket of any JED controller goes to Lantronix xDirect RS232 to Ethernet adaptor. Coms is bi-directional.



Side note: Setting your PC's IP address ready to talk directly to display and xDirect devices:

This procedure is used several times, but is covered just once in this paragraph (assumed Windows 7).

- a) Log onto the PC with an administrator account;
- b) Plug into the powered-up target device via a CAT5 cable (Panel or xDirect: This is a **must** for the following boxes to appear);
- c) Click **Start**, then click **Control Panel**;
- d) Click **View network status and tasks** (in Network and Internet);
- e) Click **Local Area Connection** and then **Properties**;
- f) Click **Internet Protocol Version 4 (TCP/IPv4)** and then **Properties**;
- g) On the (second) **Properties** page, note the current settings for restoration later:
 - i) Whether **Obtain and IP address automatically** is set;
 - ii) If it was not (i.e. **Use the following IP address**: was set), note down the IP address, Subnet mask and Default gateway);
- h) Now set a new PC IP address as follows:
 - i) Set: **Use the following IP address**:
 - ii) Set the first three dot-decimal numbers in the 4-number IPv4 address to match the first three of the device to be connected to;
 - iii) Set the last dot-decimal number to something different than the device we are connecting so, so there is not an IP address clash;
 - iv) Set Subnet mask to: **255.255.255.0** ;
 - v) Leave Default gateway blank (it's not used here); Click **OK**; Click **Close**; Click **Close**;
 - vi) Close the networking Control Panel page;

Summary of steps to set up communications between network-connected panels and JED controllers

- 1) Set up display device to default LAN settings, with settings for point-to-point communications without a router (i.e. DHCP Client OFF, fixed IP addresses) using a crossover Ethernet cable;
- 2) Set up display security settings (E.g. passwords) and set/verify port addresses;
- 3) Set up xDirect for DHCP Client OFF, fixed IP address to same subnet as display device;
- 4) Set up xDirect settings for Serial tunnel, **Connection** and **Network** Settings (Baud rates, Parity, etc, TCP Protocol, IP address, Local and Remote ports); and
- 5) **Set up JED controller** to work via specialised drivers which support LAN translation, providing user Name and Password stubs as needed.

These steps are identified as such in the following paragraphs.

(Browser usage ... don't use IE!

At JED we have found from sad experience that Internet Explorer (V11.0.9600.17633) under Windows 7 will not work with xDirect setup software. While appearing to run OK through setup, when the time comes to actually save the settings, it has lost contact with the device, and the settings are never actioned.

Chrome or Firefox seem to work correctly, but make sure they are the latest versions. Below we cover using the DeviceInstaller internal browser.)

Step 1: Determine/set up target display device LAN settings

Before setting up the xDirect communications device, it is necessary to determine the target display device LAN default settings, and if necessary, adjust them to be compatible with LAN control in a point-to-point control situation.

This would involve either using the display device's IR remote to access the LAN setup, or going "on line" to it if it supports a browser access mode, and using it to examine default settings and setting up the required point-to-point configuration. This actual process is going to vary from device to device, and at JED we will try to test LAN connectivity as required (and if we can get access) and update this document as examples are tested, adding device specific notes. In each case we will attempt to cover all settings, allowing that a particular display device may have been altered from the default setting before the installer is attempting a setup.

Sharp specific settings (Tested with a PN70TA3, but valid for PN60/70TB3 as well)

(The unit tested had a built-in panel PC, but the communications we are to set up are with the LCD panel itself, NOT the panel PC. The panel PC is located behind a screw-on panel above the centre-line on the left-hand edge, looking from the front. It ALSO has a LAN socket, as well as a number of USB connectors, but this is NOT the one we need to connect to, to talk to the panel itself.)

The LAN connection to the panel is quite low down on the left hand bottom edge, and the LAN connection there is identified in the panel manual as connection 17 on page 10 diagram. (There are also additional panel connections on the left hand side vertical edge, for D-sub 2, HDMI 2 & 3 and a USB 2 port (type B).

Initial access to the LAN settings needs to be via the IR remote (because we need to determine/set its IP address BEFORE a browser can talk to it.): Go to: **SETUP | LAN**. Then because we are not using a DHCP server, set **DHCP Client to OFF**.

Then check that the monitor IP address is set to: **192.168.150.2**. This is the default setting, so make sure this is still set up. Also, set/verify **Subnet Mask** is set to **255.255.255.0**, and **Default Gateway** is set to **0.0.0.0**.

To determine/verify the panel's port address and setup security, the next step is to connect to the panel from a browser running on a PC (preferably not IE!).

Step 2: Set the PC's Ethernet settings using the procedure at the top of page 2 to:
Sharp specific: 192.168.150.10 (deliberately different to the panel address at **192.168.150.2**.)

Start up a browser, type <http://192.168.150.2/> and press Enter.

On the page which appears, there will be three headings under **NETWORK**: i.e. **LAN SETUP**, **SECURITY** and **GENERAL**

- 1) Click on **LAN SETUP**. This should show the same settings as seen above via the IR menu: **DHCP CLIENT** is **OFF**, IP address: **192.168.150.2**, **SUBNET MASK** set to **255.255.255.0** and **DEFAULT GATEWAY** set to **0.0.0.0**. Click on **APPLY** if any changes are made.
- 2) Click on **SECURITY**. Here, we can set up a User Name and Password. Because we are communicating via just a simple cross-over cable, security from outside interference is not an issue, and so we need to set **USER NAME**, **PASSWORD** and **PASSWORD CONFIRMATION** to zero characters, then click on **APPLY**.
The JED controllers configured to work via a network connection have been set up to work with null User Names and Passwords, sending just the needed CR (0Dh) in reply to the panel requests for these. Set/verify **ACCEPT IP ADDRESS** is set to **All IP Addresses**, and click on **APPLY** if changed.
- 3) Click on **GENERAL**. This sets up other factors needed. Set the **AUTO LOGOUT TIME** to **65000 Minutes**. Set/Verify that **DATA PORT** is set to **10008**. Click on **APPLY** if changed.

This completes the panel LAN setup. Cycle the main power for the panel after this setting.

Step 3: Setting up the Lantronix xDirect Module

- 2) Ensure latest version of Lantronix Device Installer is installed on your PC.
http://ltxfaq.custhelp.com/app/answers/detail/a_id/644
- 3) Connect xPort module to LAN port on your PC via a CAT5 crossover cable, and use the supplied power supply into the USB style connector on the side of the module.
- 4) Start Lantronix Device Installer;
- 5) Click on **Search**. This will show the xDirect device's IP (as shipped, or current) address and Hardware address (which should match the MAC address on the module. Probably this will be in red, with Status shown as: **Unreachable**, (because it is probably on a different sub-net from the PC). **Note the xDirect current IP address for the next step**, which is to set the PC into the same sub-net, without a DHCP Client;
- 6) Now **set the PC to the current subnet of the xDirect device**, using the procedure on the top of page 2. Set the last field to a different address so as not to clash. E.g. If it was 172.16.4.70, set the PC to 172.16.4.10;
- 7) Now go on-line to the xDirect device by clicking on **DeviceInstaller** on your desktop. It should find the connected device, showing its IP address, Hardware address and a status of **Online** (in black).
- 8) Double-click the device line (right panel) to show device details.
- 9) Click on the **Web Configuration** tab. This should show the xDevice's IP address with **:80** at the end. Then click once on the green arrow at the end of the address line to go on-line;

10) This will bring up the access box asking for username and a password. The default settings for these are as follows (note cases):

User Name: **admin**

Password: **PASS**

11) Once in the webserver, the user can configure options. The critical settings pages to be aware of if using the device as a serial-to-Ethernet link, as we are, are the 'Serial Settings' page, the 'Connection Settings' page and the 'Network' page.

Step 4: xDirect settings for Serial Tunnel, Channel 1

1) The **Serial Settings** web page should be configured as required by the device on the RS232 end:

- Sharp LCD** example, the JED controllers normally communicate with RS232-interfaced Sharp panels at 9600, so the versions specific designed to work via a network interface use the same baud rate, parity and byte length settings of 9600 8N1.
- Pack Control and Flush Modes are disabled.
- When finished setting Serial parameters, click on **"OK"** and **"Done!"** will flash alongside the OK (for 5 seconds) if all settings are acceptable.

The screenshot shows the xDirect web interface for LANTRONIX. The main title is 'Serial Settings' for 'Channel 1'. A red box highlights the 'Port Settings' section, which includes: Protocol: RS232, Flow Control: None, Baud Rate: 9600, Data Bits: 8, Parity: None, and Stop Bits: 1. Below this is the 'Pack Control' section with 'Enable Packing' disabled, Idle Gap Time: 12 msec, Match 2 Byte Sequence: No, Send Frame Immediate: No, Match Bytes: 0x00, and Send Trailing Bytes: None. The 'Flush Mode' section has 'Flush Input Buffer' and 'Flush Output Buffer' both set to 'No' for all three options: 'With Active Connect', 'With Passive Connect', and 'At Time of Disconnect'. An 'OK' button is at the bottom.

2) The **Connection Settings** web page should be configured to communicate with the network device on the other end. The main settings to be aware of on this page are:

- Set **Connect Protocol** to **TCP**;
- Set **Connect Mode: Passive Connection: Accept incoming:** to **Yes**, with no Password.
- The Local Port and Remote Port. The local port refers to the connection port on the current device. This can usually be left at **10001**. The Remote port refers to the port on the other device you want to connect to. **Sharp specific:** Notice under **"Step 2, 3) General"** above, the **DATA PORT** (the **"Remote Port"** here) is set to **10008**.
- The Remote Host. This is the IP address of the **other** network device you wish to connect to. **Sharp specific:** Set this to: **192.168.150.2** (The screen shot below is NOT for Sharp specific)

- e) When finished setting Connection parameters, click on “OK” and “Done!” will flash alongside the OK (for 5 seconds) if all settings are acceptable.

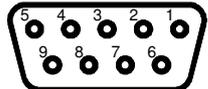
- 3) The **Network** web page: To change the unit’s IP address open the Network page, and set up the following:
- a) **Network Mode: “Wired only”;**
 - b) Click on “**Use the following IP Configuration**” button: then
 - i) Assign an **xDirect IP address** in the same group as the display device default intending to be interfaced to i.e. the first three dot-decimal numbers in the 4-number IPv4 address should match, but the last dot-decimal number should be different from the device’s default IP address.
Sharp example, the LCD screens default IP address is 192.168.150.2, so one would set the address of the xDirect device to **192.168.150.1**;
 - ii) Set the Subnet Mask to **255.255.255.0**;
 - iii) Set the **Ethernet Configuration** to “**Auto Negotiate**”;
 - c) When finished setting Network parameters, click on “OK” and “Done!” will flash alongside the OK (for 5 seconds) if all settings are acceptable.
- 4) (The Server and Hostlist pages are not used. Leave as default.)
- 5) Make sure you click on ‘**Apply Settings**’ to save the settings before you exit the xDevice web server. This will bring up a “Please wait while the configuration is saved ...” and a progress bar taking 15 seconds to set;
- 6) Check settings: **Set the PC’s Ethernet settings** using the procedure at the top of page 2 to:
Sharp specific: 192.168.150.10 (deliberately different to the panel address at **192.168.150.2** and the xDirect (newly set address) of **192.168.150.1**.) Reload DeviceInstaller. Then, allow search, and it should show the “PC

Local area connection” (left panel) as **192.168.150.10**, and the “XDT232” address (right panel) as now **192.168.150.1** (in black).

- 7) You can also “ping” the xDirect: From the PC Start menu, run cmd.exe, and type ping 192.168.150.1, (or whatever the set IP address is) and the xDirect should reply with four successful pings.
- 8) The device should now be configured and ready to act as a bi-directional transparent data link between your RS232 device and your network device.

Step 5: Connect and configure JED controller of choice to communicate via the xDirect.

- 1) RS232 connections to xDirect. These use a D-sub 9-pin connector, female on xDirect, male on cable. Communications runs at 9600 8N1.

| Function/Direction | T470/T460/T440/T430 serial connection | xDirect Connector (Male on cable) |  <p>D-sub 9 male solder side</p> |
|--|---------------------------------------|-----------------------------------|---|
| Ground | Ground | 9-pin D-sub pin 5 | |
| Data from controller to projector | Tx | 9-pin D-sub pin 2 (RXD) | |
| Reply data from projector to projector | Rx | 9-pin D-sub pin 3 (TXD) | |

- 2) After installation wiring of any projector to a T470, use a multimeter to check voltages of –9 on BOTH TX and RX pins in any installation, as described in the troubleshooting part of JED Part A manuals. Then connect the xDirect to the panel with an installation CAT5 Crossover cable;
- 3) Select the appropriate LAN-based driver in the JED controller. These drivers differ from standard (via RS232) drivers in that “CR” dummy UserName / Password transmissions occur before most command transmissions.

Sharp specific: T460: “Sharp LCD Generic 6”. T440/T430: Code 3A on the switches. T470: code 8E00h
 In each case, the controller will do a connect status check, showing Coms OK (T460) and blinking the OFF red LED ONCE when the OFF button is pressed. A “Panel not replying” or three Red flashes shows a problem.

Each JED controller driver can poll the xDirect and panel every 5 seconds. This is set up on the T460 by setting “Reply” mode, setting OPT7 on the T430/T440, and setting “Reply mode: On” with the T470 configuration software. This can be checked for correct operation by starting the system via the JED controller, and then turning it OFF with the IR remote. The JED controllers will, after several polls, also go to the standby state.