



Liberty IPLinx 5000

RTI Driver User Guide

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1 Introduction

This driver has been designed to provide two-way control of Liberty IPLinx HDMI-over-IP video systems, via TCP/IP. Three separate driver files are included with the package, providing support for the original IPLinx 2000 series products, as well as the newer IPLinx 5000 and ranges.

2 Liberty Configuration

It is recommended that the Liberty IPLinx system be installed, configured and tested by a suitably qualified engineer, according to Liberty documentation, prior to integration with this driver. Some additional, specific configuration is required to ensure correct operation of the driver:

The Liberty IPLinx Control Interface Telnet Client must be configured with a static IP address in the same range as the RTI processor in order for the two to communicate:

1. Enter the IP address of the IPLinx IP Control box into the web browser of a computer connected to the same network, to display the Web Interface (the default IP address is “192.168.11.243” and default password is “admin”).
2. Choose the **CTL Settings** tab.
3. Enter the static IP address information into the **IP Setup [Telnet client and browser communication]** section, and click **Apply**.

The screenshot displays the Liberty CTL Settings web interface. At the top, there are three tabs: 'Matrix', 'TX/RX Settings', and 'CTL Settings', with 'CTL Settings' being the active tab. Below the tabs, there are two main configuration sections. The first section, 'IP Setup [TX and RX communication]', contains three input fields: 'IP Address' with the value '169.254.1.1', 'Subnet Mask' with '255.255.0.0', and 'Default Gateway' with '169.254.1.254'. Below these fields is a red attention note: '(Attention) After pressing Apply, this IP control box will automatically reboot for the settings to take effect.' and an 'Apply' button. The second section, 'IP Setup [Telnet client and browser communication]', is circled in red. It also contains three input fields: 'IP Address' with '172.16.103.243', 'Subnet Mask' with '255.255.0.0', and 'Default Gateway' with '172.16.0.1'. Below these fields is another red attention note: '(Attention) After pressing Apply, this IP control box will automatically reboot for the settings to take effect.' and an 'Apply' button.

Figure 1: Liberty CTL Settings

It is additionally necessary to configure an **Alias** (name) for each transmitter (input) device and each receiver (output) device. Access the web interface as described above, this time choosing the **TX/RX Settings** tab. Note that the current device names are displayed in **Device Settings** at the top of the page. Select a device to display its current configuration:

Matrix **TX/RX Settings** CTL Settings

Device Settings

Devices: ☐ OUT4-Cinema ☐ IN2-AppleTV ☐ IN3-SkyHD ☒ OUT1-Lounge ☐ OUT2-Kitchen ☐ IN1-BluRayPlayer ☐ OUT3-MasterBedroom ☐ IN4-Xbox

Select a device you want to configure. (If the device list is empty, it means no devices are available on line.) Reload

IP Setup

IP Mode: ☒ Auto IP ☐ DHCP ☐ Static

IP Address:

Subnet Mask:

Default Gateway:

Apply

Alias

Apply

Figure 2: Liberty TX/RX Settings

You can edit the device name in the **Alias** field, clicking Apply when done. Note that the name must comply with the following conventions:

For Transmitter (input) devices: *IN[number]-[name]*

For Receiver (output) devices: *OUT[number]-[name]*

It is important that each name begins with “IN” or “OUT”, which is then followed by the input or output number. You can then optionally add a hyphen (-) followed by an appropriate description for the device (note that no spaces are allowed). For example, in the screenshot above, the first input is named *IN1-BluRayPlayer*, equally valid is just *IN1*.

3 Driver Installation & Configuration

Open your RTI Integration Designer system file (or use the demo programming file entitled “Liberty_IPLinx.rti”). Select your XP series processor from the **System Workplace** window and choose the **Drivers** tab.

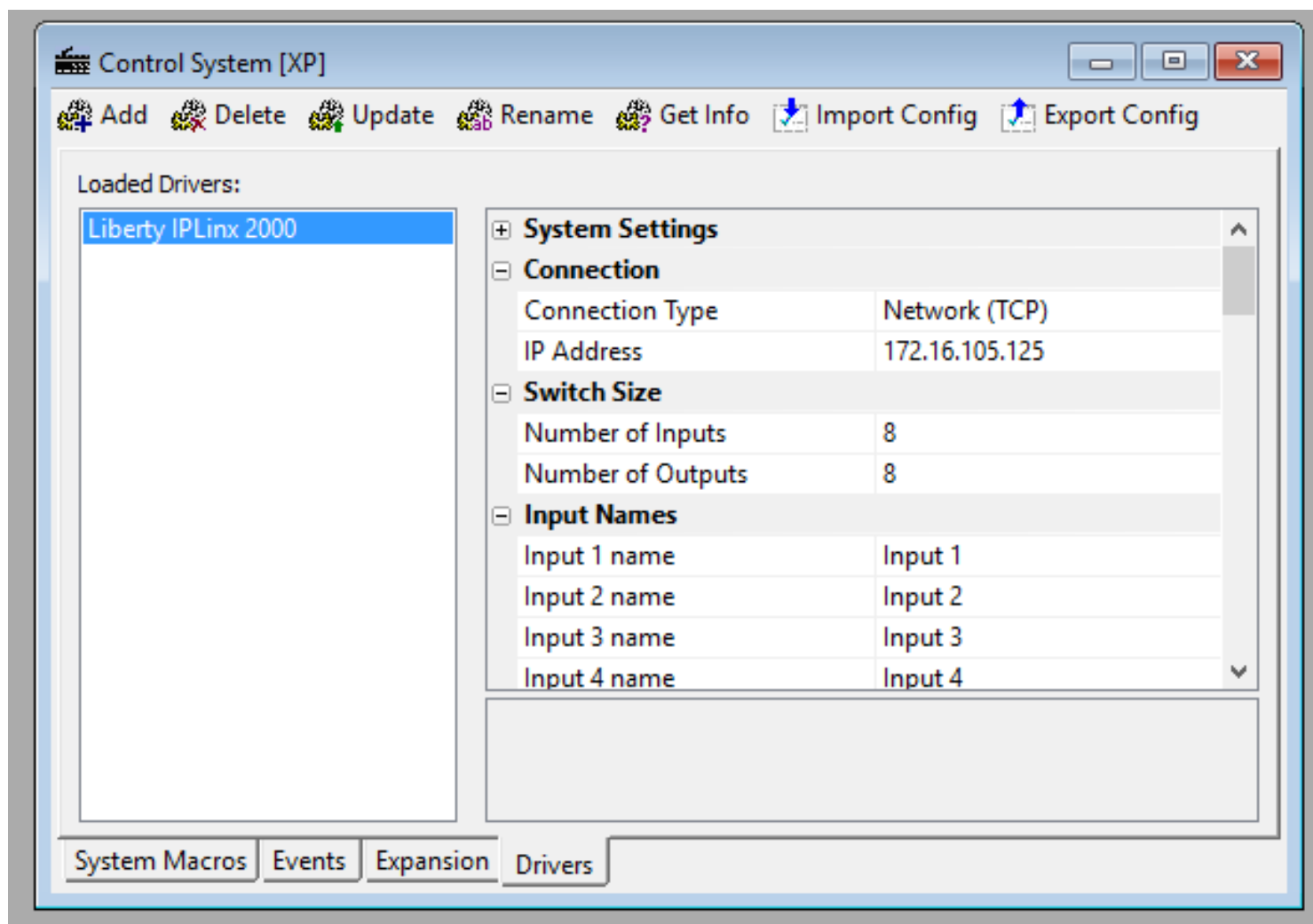


Figure 3: Driver Properties

If the Liberty IPLinx driver does not appear in the **Loaded Drivers** list, select **Add** and choose to open the appropriate driver for your system:

Liberty_IPLinx 2000.rtidriver Liberty IPLinx 2000 series

Liberty_IPLinx 5000.rtidriver Liberty IPLinx 5000 series

Table 1: Driver Types

The driver features a number of configuration properties that must first be completed. Note that the Serial Port Settings Types provide a way of defining the settings for a serial port, which can then be applied to the serial ports of multiple inputs and outputs.

Setting	Description
Connection	Connection Type - this option defaults to "Network (TCP)". IP Address - The IP address on the LAN for the Liberty Control Interface.
Switch Size	Number of Inputs - the number of transmitters in the system. Number of Outputs - the number of receivers in the system.

Setting	Description
Serial Port Settings type x	Baud Rate - the baud rate in bits per second. Bits - the number of data bits. Parity - the parity bit setting. Stop Bits - the number of stop bits. Inputs - the inputs to which this setting type is to be applied. Outputs - the inputs to which this setting type is to be applied.

4 Driver Commands

The driver features a number of commands used for control. To add a command:

- Choose your remote control device from the **System Workplace** window, right click on the button to which a command is to be added and select **Edit Properties**.
- Select the **Driver Command** tab and click the arrow button to display the available commands for the Liberty IPLinx driver.
- Choose a command and click **Ok**.

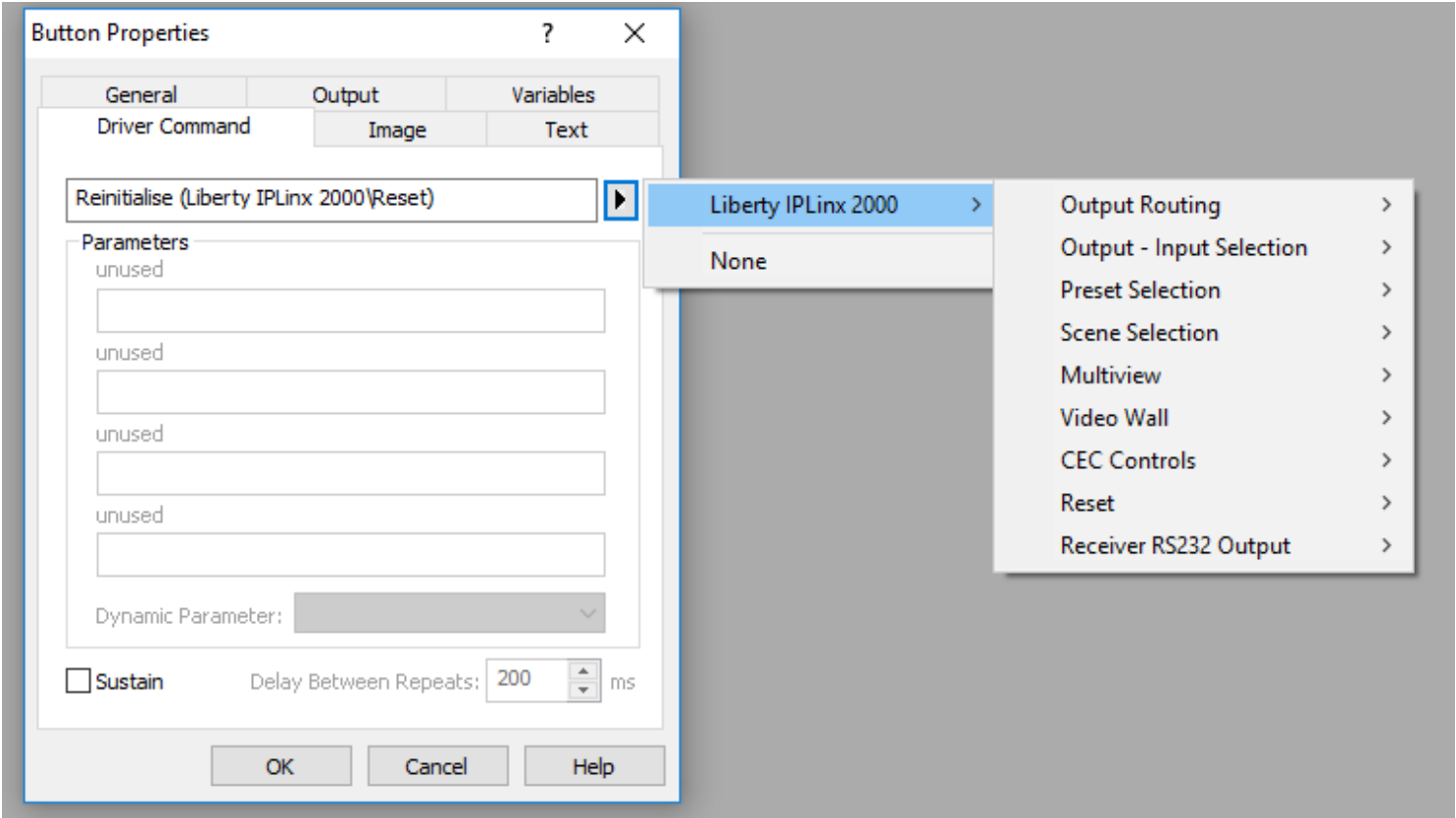


Figure 4: Driver Commands

Table 2: Driver Commands

Command	Description
Switch Output (AV)	Switch a specific input to a specific output (combined AV switching).
Switch Output (Breakaway)	Switch a specific input to a specific output (separate video, audio or usb switching).
Clear Output Selection	When multi switching outputs, or creating presets, this command clears all currently selected outputs.
Select All Outputs	When multi switching outputs, or creating presets, this command is used to select all outputs.
Select Output	This command is used to select individual outputs for subsequent multi switching, or creating presets.
Toggle Output	This command is used to select or de-select individual outputs for subsequent multi switching, or creating presets.
Select Input (AV)	This command is used to select an input to which previously selected outputs should be switched (combined AV switching).
Select Input (Breakaway)	This command is used to select an input to which previously selected outputs should be switched (separate video, audio or usb switching).
Store Preset (All Outputs)	Store the current configuration of all outputs as a preset (with an ID of 1-16).
Store Preset (Selected Outputs)	Store the current configuration of all currently selected outputs as a preset (with an ID of 1-16).
Recall Preset Selection	Recall a preset by ID.
Scene Activate**	This command is used to activate a scene, by name.
Multiview	This command is used to select multiple inputs to be displayed (Tiled) onto the selected output.
Single Host Video Wall Create*	<p>Define a video wall using a single host (input).</p> <p>Wall Name - choose a wall name (this is important as other commands refer to this name).</p> <p>Input - specify an input number to use as the host.</p> <p>Size - the video wall screen configuration expressed as "x,y". For example "2,2"* creates a 2 x 2 (4 screen) video wall.</p> <p>Output - the output numbers used to create the video wall. These can be comma separated (e.g."1,2,3,4") or defined as a range (e.g."1-4"*), or a combination of the two (e.g. "*1,2-4"*). This field must contain a number of outputs equal to the amount defined in the Size field.</p>
Single Host Video Wall Switching*	<p>Switch a pre-configured single host video wall to a specific input.</p> <p>Wall Name - the name of the wall to be switched.</p> <p>Input - specify an input number to switch to.</p>

Command	Description
Bezel Gap*	<p>Define the size of the TV frame (video edge) to correct for large bezel screens in video wall mode.</p> <p>Wall Name - specify the wall name defined in the Video Wall command.</p> <p>Overall Width, Height - the overall size of the television in mm (e.g. "*600,550*").</p> <p>Screen Width, Height - the size of the actual screen in mm (e.g. "*550,500*").</p>
Picture Parameters*	<p>Make adjustments to screen appearance of specified outputs within a video wall.</p> <p>Wall Name - specify the wall name defined in the Video Wall command.</p> <p>Shift,Scale (Horizontal,Vertical) - shift and/or scale a video screen, horizontally and/or vertically, where 1 unit = 8 pixels (for shift) and 1 row/column (for scale), separated by a colon. For example, "1,-2:3,4" will shift the screen horizontally by 8 pixels, vertically by minus 16 pixels, and over-scale the image by 3 rows and 4 columns.</p> <p>Tearing Delay - define the tearing delay in microseconds. This provides a way of adjusting an input image, distorted as a result of dividing it up for display in a video wall.</p> <p>Outputs - the output numbers to which the parameters should be applied. These can be comma separated (e.g. "*1,2,3,4*") or defined as a range (e.g. "*1-4*"), or a combination of the two (e.g. "*1,2-4*"). This field must contain some or all of the outputs specified in the video wall command.</p>
Multi Host Video Wall Create*	<p>Define a video wall using multiple hosts (inputs).</p> <p>Wall Name - choose a Wall Name (this is important as other commands refer to this name).</p> <p>Size - the video wall screen configuration expressed as "x,y". For example "2,2"* creates a 2 x 2 (4 screen) video wall.</p> <p>Inputs - specify the inputs to be used in the video wall. The quantity of inputs must be equal to the amount of columns in the video wall (i.e. the number defined as "y" in the Size field).</p> <p>Output - the output numbers used to create the video wall. These can be comma separated (e.g. "1,2,3,4"*) or defined as a range (e.g. "*1-4*"), or a combination of the two (e.g. "*1,2-4*"). This field must contain a number of outputs equal to the amount defined in the Size field.</p> <p>NOTE: After using the Multi Host Video Wall command, it may be necessary to send the "Reset Input" command to any inputs remaining distorted.</p>
Multi Host Video Wall Switching*	<p>Switch a pre-configured multi host video wall to specific inputs.</p> <p>Wall Name - the name of the wall to be switched.</p> <p>Input - the inputs to be used in the video wall. The quantity of inputs must be equal to the amount of columns in the video wall (i.e. the number defined as "*y"* in the Size field).</p>

Command	Description
CEC**	<p>Send a CEC command to specified outputs.</p> <p>Output - the output number(s) to which the command should be sent. These can be comma separated (e.g. <code>"*1,2,3,4"</code>) or defined as a range (e.g. <code>"*1-4"</code>), or a combination of the two (e.g. <code>"*1,2-4"</code>).</p> <p>Control - choose a CEC command to send.</p>
Reinitialize	<p>A command to update text variables in RTI for device names defined in the Liberty system.</p>
RS232 Output	<p>Inputs - the inputs to which the string is to be sent. These can be comma separated (e.g. <code>"*1,2,3,4"</code>) or defined as a range (e.g. <code>"*1-4"</code>), or a combination of the two (e.g. <code>"*1,2-4"</code>).</p> <p>Outputs - the outputs to which the string is to be sent. These can be comma separated (e.g. <code>"*1,2,3,4"</code>) or defined as a range (e.g. <code>"*1-4"</code>), or a combination of the two (e.g. <code>"*1,2-4"</code>).</p> <p>String - the serial string to be sent. The String field takes printable ASCII characters.</p> <p>If you wish to send Binary data, then these characters must be sent as the following supported escape sequences:</p> <ul style="list-style-type: none"> <code>\r</code> carriage return (13) <code>\n</code> line feed (10) <code>\t</code> tab (9) <code>\b</code> bell (7) <code>\f</code> form feed (12) <code>\\</code> send the <code>'\'</code> character <code>\x..</code> send the character specified by the following 2 hex characters <p>There is no space after any escape characters, and it's permitted to freely mix printable ASCII and escaped characters. For example, the following strings send the exact same sequence out of the RS232 port:</p> <pre>Hello\r\n \x48\x65\x6c\x6c\x6f\x0d\x0a He\x6c\x6co\r\x0a</pre>

* These commands are not supported by the IPLinx 2000 and drivers.

** These commands are not supported by the IPLinx 5000 and drivers.

IMPORTANT NOTE

There is a bug in exiting Integration Designer that means that empty command parameters are not passed - they are simply ignored and all non-empty parameters are shuffled up. This leads to incorrect parameter being assigned in the driver.

The workaround is to ensure that *all* paramters contain non-empty values.

This is particularly important for RS232 Output command, where you may wish to send commands to inputs, or outputs, but not both. In this case set the input / output fields you don't wish to use to 0 (rather than leaving blank). This is an invalid port and is silently ignored by the driver.

5 Driver Variables

The driver features a number of variables, providing feedback from the Liberty system.

Table 3: Driver Variables

Variable	Description
Operational Mode	Reports the current connection status.
Model Number	Reports the model number of the Liberty IP controller.
OUT _{xxx} Current Input (integer)	Reports the number of the input currently routed to the given output.
OUT _{xxx} Current Input (name)	Reports the name of the input currently routed to the given output.
IN _{xxx} Name	The name defined for a particular input in the Liberty system.
OUT _{xxx} Name	The name defined for a particular output in the Liberty system.
Output <i>xx</i> Selected	A Boolean variable reporting the selection status of the given output.

The above names can be manually configured via the web interface of the Liberty Control Interface (see the above section entitled “Liberty Configuration” for more information).

6 Troubleshooting

The driver cannot control the Liberty system

- Confirm the Ethernet switch used by the Liberty system is correctly uplinked to the same network as the RTI processor.
- Confirm that the correct IP address is defined in the RTI driver properties for the Liberty control interface.

Switching commands are failing

- Ensure you have named the devices correctly in the Liberty system. Read the section of this guide entitled “Liberty Configuration” for more information.

An input is distorted, or is displaying only part of the complete image

- Try sending the **Reset Input** command to the affected input.

The input/output names displayed on the RTI panel are incorrect

- Try sending the **Reinitialize** command to update the names after changes have been made to the Liberty system.