

ETC® Quick Guide

Unison® Heritage AV/Serial Interface

Overview

This quick guide is intended for use by installing contractors for installation purposes and by ETC trained technicians and technicians programming devices that will communicate with Unison through a serial interface. The configuration portion of this guide is written with assumption of an intermediate level of familiarity and experience with the equipment and protocol involved.

With Unison

The Unison AV/Serial Interface station provides a method for PCs or any RS232 serial communication capable device to control and interact with the Unison Paradigm LinkConnect control network. The AV/Serial Interface acts as a virtual station with similar functionality to existing Unison Heritage station types, allowing for virtual buttons, faders and rates to be manipulated with serial commands.

Presets, macros or other Unison station actions may be activated or deactivated using this station. Feedback information is given in the form of responses and by polling the status of the virtual buttons and faders (similar to the visual feedback LEDs on a standard wall station).

The station also features a short configuration independent communications protocol for ease of implementation. Due to the simplicity of the station, more than one station may be used in a system. Contact ETC Project Management for assistance.



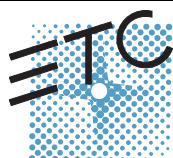
LightDesigner Software

The functionality of the AV/Serial Interface station in a Unison system is easily configured by adding the new AV/Serial Interface station into an existing LightDesigner project configuration.



The Unison AV/Serial Interface station protocol (the serial communication as defined in this document) defines the serial interaction with the station itself. It supports manipulation of four objects to control the functions configured in LightDesigner including buttons, faders, rates and levels.

- **Buttons** represent the station's virtual buttons. A button's state can be maintained on (as though someone were holding it down) or simply be off. There is also a command to execute a "press", which simulates a press and release of a button (the most common use). Each virtual button on the station has a corresponding virtual LED to indicate function state. These LEDs are controlled by the Unison Paradigm Architectural Control Processor (ACP) and are read only.
- **Faders** represent the station's virtual faders. Faders can be set to any level from zero to full on (100%). Each virtual fader also has a virtual LED, which is also a read only property.



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7181M2120 ■ Rev B ■ Released 2009-05 ■ ETC intends this document to be provided in its entirety.

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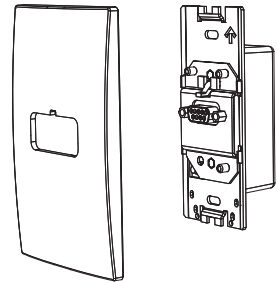
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- **Levels** are a configurable feedback mechanism for up to 16 objects that report their levels to the serially connected device. Levels are typically used to monitor channel intensities controlled by faders.
- **Rates** - the station utilizes fade rates to facilitate smooth and level transitions given the limited bandwidth of RS232. There is a configurable rate that corresponds with each fader of the station. When a new fader level is given, the fader is moved at the set rate to the new level. Rate is set in a unit of seconds.

Installation

The AV/Serial Interface Station may be installed into an industry standard single gang backbox (provided by others) or a single gang surface mounted backbox (sold separately and available from ETC).

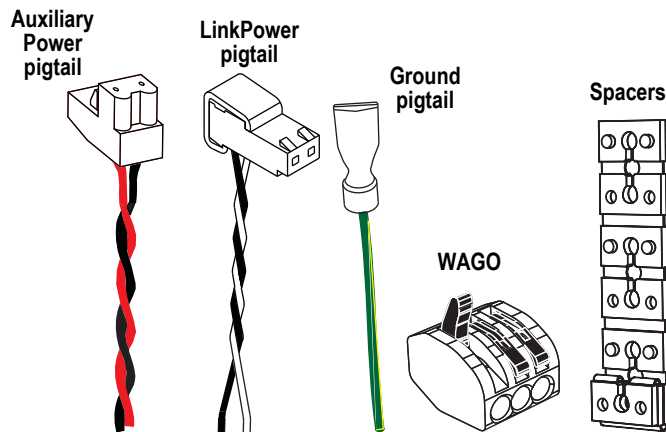
Installation should follow local codes and standard practices. All control wiring should be installed and terminated by a qualified installer and should follow standard wiring installation practices. Leave approximately 10 inches (254mm) of wiring in the backbox for connection and future service needs.



AV/Serial Interface wiring requirements include:

- Connection to the Echelon® LinkPower® (LinkConnect) control network utilizing low voltage Class II wiring. Wiring is topology free and polarity independent over Belden 8471 (or approved equal).
- Connection of two 16 AWG (1.5mm²) wires for 24V dc Auxiliary Power.
- Connection of one 14 AWG (2.5mm²) ESD drain (ground) wire. Required only when the control cable is not installed in grounded metal conduit.

The AV/Serial Interface station ships with a termination kit containing a LinkPower pigtail, Auxiliary Power pigtail, ground wire pigtail, spacers, and all required connectors for installation.



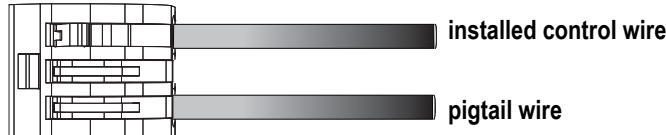
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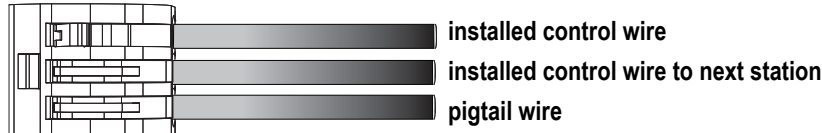
Connect the Wiring

- Step 1: Pull all required wiring to the backbox.
- Step 2: Terminate and connect LinkPower. LinkPower is topology free and polarity independent. You may install LinkPower in any combination of bus, loop, star or home-run.

topology of a single station installation



topology of multiple stations installed in series

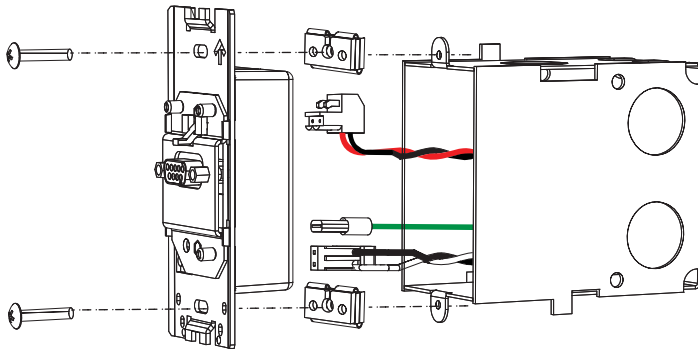


- a: Locate the LinkPower pigtail and two WAGO cage clamp connectors from the termination kit.
- b: Strip 3/8" (9-10mm) from the ends of each LinkPower wire (both pigtail and installed LinkPower wire).
- c: Use the WAGO cage clamp connector to connect the installed control wire to the connectorized pigtail wires provided. Open the terminal levers on the WAGO connector and insert the installed (typically black) Belden 8471 LinkPower wire and the black lead from the LinkPower pigtail into the terminals.
- d: Close the levers onto the wires.
- e: Repeat for the installed (typically white) Belden 8471 LinkPower wire and remaining pigtail wire using a new WAGO connector.
- f: Install the LinkPower connector to J4 (NET) on the AV/Serial Interface control board.
- Step 3: Terminate and connect Auxiliary Power (24Vdc) wiring.
- a: Locate the Auxiliary Power pigtail and two WAGO cage clamp connectors from the termination kit.
- b: Strip 3/8" (9-10mm) from the ends of each Auxiliary wire (both the provided pigtail and installed wire).
- c: Use the WAGO cage clamp connector to connect the installed power wire to the connectorized pigtail wires provided. Open the terminal levers on the WAGO connector and insert the installed (typically black) 16 AWG (1.5mm²) Auxiliary Power wire and the black lead from the pigtail into the terminals.
- d: Close the levers onto the wires.
- e: Repeat for the installed (typically red) 16 AWG (1.5mm²) Auxiliary Power wire and remaining pigtail wire using a new WAGO connector.
- f: Install the Auxiliary connector to J3 (Power) on the AV/Serial Interface control board.
- Step 4: Terminate the ESD drain (ground) wire. This connection is required only when the control cable is not installed in grounded metal conduit.
- a: Locate the ground wire pigtail and one WAGO cage clamp connector from the termination kit.
- a: Strip 3/8" (9-10mm) from the end of each ground wire (both the provided pigtail and the installed wire).
- b: Use the WAGO cage clamp connector to connect the installed ground wire to the pigtail wire provided. Open the terminal levers on the WAGO connector and insert the installed (typically green/yellow) ESD drain (ground) wire and the green/yellow lead from the pigtail into the terminals.
- c: Close the levers onto the wires.
- d: Install the ground spade to the receptacle on the AV/Serial Interface Station control board.

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Install the Station into the Backbox



Spacers are provided in the termination kit to help align the station and cover flush against the wall in flush mount applications. The spacers are not needed on surface mount backboxes.

Step 1: Insert the station electronics and wiring into the backbox. The arrow on the mounting plate must point up.

Note: *For some flush mount applications with certain trim rings it may be necessary to remove the station's back cover before installation into the backbox.*

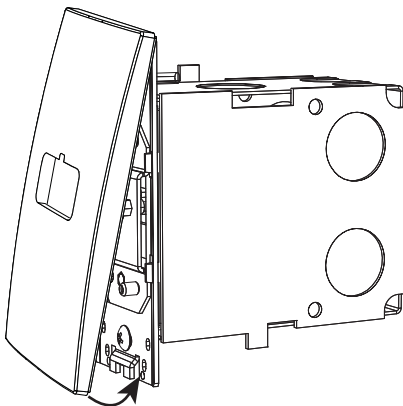
Step 2: If needed, fold the spacer in a zigzag fashion and press together to achieve the required thickness to fill the gap between the station and backbox. Cut off and discard the excess material and place the spacer between the station and backbox.

Step 3: Secure the station to the backbox with the two screws provided. If using spacers, the screws install through them.

Note: *To improve successful station and wall plate installation, do not overtighten the screws.*

Install the Faceplate

The faceplate is secured to the station with two magnets that are located on the bottom side of the faceplate.



Step 1: Align the top of the faceplate approximately 20 degrees from the station.

Step 2: Hook the top of the faceplate to the tabs located on the station electronics assembly. To ensure the faceplate is hooked properly on the top hook, wiggle it slightly side to side while the bottom is angled 20 degrees from the wall.

Step 3: Swing the bottom of the faceplate down until the magnets engage.

Step 4: If the faceplate does not fully attach automatically, wiggle the bottom of the faceplate until the magnets are seated properly to the station and the faceplate is secure.

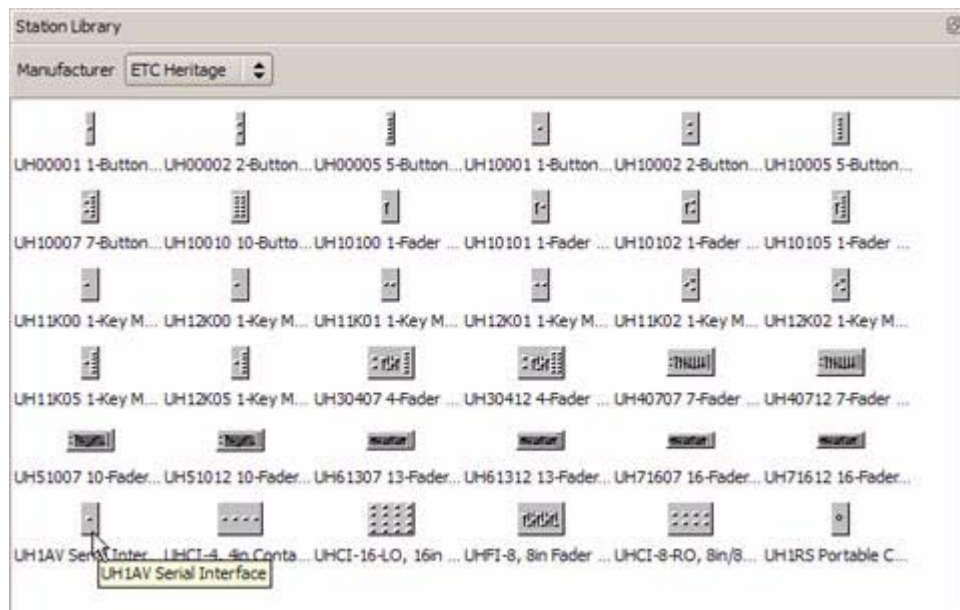
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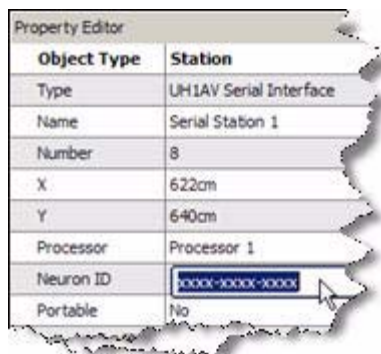
Configuration

Below is a general instruction for reference of how to add a station into a LightDesigner configuration. You should reference the Unison LightDesigner Online Help or printed Quick Guide for detailed instructions to add the Unison Heritage AV/Serial Interface station to your LightDesigner configuration and how to set the properties for the new station.

- Step 1: In the Design view, add an AV/Serial Interface station into the LightDesigner configuration by simply dragging and dropping the station from the Station Library into the Plan Workspace.



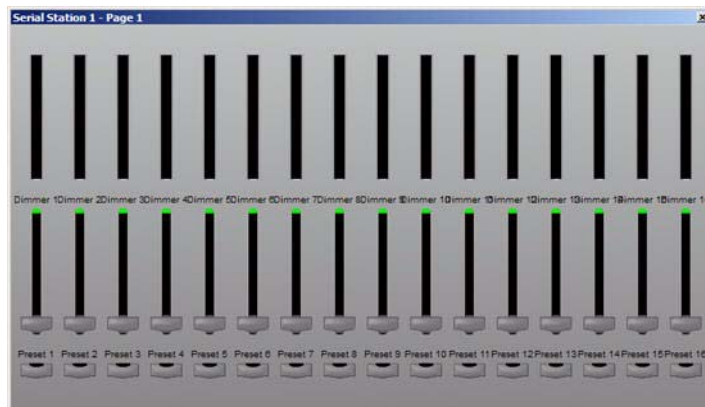
- Step 2: Specify the Neuron ID for the station in the Property Editor. This is the preferred method of binding stations as it simplifies the process of connecting a station to the processor.



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- Step 3: Switch to the Program/Simulate view and double-click on the station in the Plan Workspace to display the virtual station in simulation mode.



- Step 4: Configure the buttons, faders and level assignments in LightDesigner as desired to be used as inputs (causing events in Unison), or as monitors (watching an LED state to see status of some other event, such as channel intensity level).
- Right-click on a button or fader and select “Set Control Function” from the context menu.
 - Use the “Set Control Function” dialog to assign each controls function.



Note: Buttons, faders and levels are numbered 1 through 16 from left to right on the virtual station.

Communication

Between the AV/Serial Interface Station and the Serial Host

Communication between the AV/Serial Interface station and the serial host utilizes a standard RS232 straight-through cable. The station connector is 9 pin “D style” connector with a standard pinout:

- pin 2- Transmit data (TX)
- pin 3 - receive data (RX)
- pin 5 - Common

Set Baud Rate

Default communication port settings are 9600 baud, 8 bits, no parity 1 stop bit, and Xon/Xoff flow control. Using the dip switches on the rear of the unit, the baud rate may be adjusted according to the following table:

DIPs

Baud Rate	1	2	3	4	5	6	7	8
9600 bps	Off	Off	X	X	X	X	X	X
19200 bps	Off	On	X	X	X	X	X	X
38400 bps	On	Off	X	X	X	X	X	X
115200 bps	On	On	X	X	X	X	X	X



Note: The first column of the above baud rate dips is “index 1” and the far right column is “index 16”.

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Verifying Station Operation with a Computer

Connect your computer to the station with a standard RS232 straight-through cable. The station connector is 9 pin "D style" connector with a standard pinout:

- pin 2- Transmit data (TX)
- pin 3 - receive data (RX)
- pin 5 - Common

Use a communications terminal application, such as HyperTerminal, to interface with the station. Default communication port settings are 9600 baud, 8 bits, no parity 1 stop bit, and Xon/Xoff flow control. The port setting can be changed if required. [See "Set Baud Rate" on page 6.](#)



Note: *Be sure that the baud rate matches the baud rate set on the station.*

Sample Commands

Commands are terminated with carriage return:

- SC 1.1 (Turn on echo mode)
 - You won't see anything when you type until echo mode is turned on. Default is off.
- GV (Get version number) [See "Version \(mv.nv.pv\)" on page 9.](#)
- GS2 (Get neuron ID) [See "Station Status \(ss\)" on page 10.](#)
- SC3.1 (Set level and fader scale to 0-100, or percentages)
- GC3 (Get configuration index 3's value)
- GC (Get all of the configuration values) [See "Configuration Settings \(nn.cf\)" on page 10.](#)
- SB1.2 (Set button 1 - execute a toggle) [See "Button States \(bs\)" on page 9.](#)
- SF1.50 (Set fader 1 to a level of 50) See [Level \(ll\)](#) and [Fade Rate \(rr.dd\)](#) on page 9.

```
->GV
->RV1.1.0
->GS2
->RS2.025C-E2E6-0100
->SC3.1
->GC
->RC1.1
->RC2.0
->RC3.1
->RC4.0
->RC5.0
->SB1.2
->UB1.0.1
->SF1.100
->UF1.100.1
```


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Unison AV/Serial Interface Station Protocol Command Structure

Commands

Multi-byte commands use the following format where [bracketed] parameters including a separating delimiter are optional as necessary: <verb><noun>[<index>][.value>]

All multi-byte commands are terminated by a carriage return: 0x0D)

Verbs	Verb Definition	Nouns
S = Set	"Do this"	B = Button
G = Get	"Tell me about..."	C = Configuration
R = Reply	A response to a Get command	F = Fader
U = Update	An automatic system response initiated by a status change of an item on the station (such as a button's LED turning on)	L = Level
		M = Memory
		R = Fade Rate
		S = Status
		T = Type
		V = Version

Object	Get Command	Reply Message	Set Command	Update Message
Button	GB nn	RB nn.bs.ld	SB nn.bs	UB nn.bs.ld
Fader	GF nn	RF nn.ll.ld	SF nn.ll	UF nn.ll.ld
Fade Rate	GR nn	RR nn.fr	SR nn.rr.dd	
Level	GL nn	RL nn.ll		UL nn.ll
Configuration	GC nn	RC nn.cf	SC nn.cf	
Version	GV	RV mv.nv.pv		
Station Status	GS nn	RS nn.ss		
Memory	GM nn	RM nn.mm	SM nn.mm	
Notes:				
Reply messages are read only status messages that are sent from the Paradigm ACP and output by the station. They cannot be issued by the serial host.				

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Index and Value Details

Default values and settings are in **bold**.

Index (nn)

0	= All
nn	= Index of the Object

Button States (bs)

0	= Off (Maintained)
1	= On (Maintained)
2	= Executes a button press
Notes: At reset, button states are set to 0 unless saved to memory.	

LED States (ld) [Read Only]

0	= Off
1	= On
2	= Unsupported/unused
3	= Blink (includes Blink Slow and Blink Medium)

Level (ll)

ll	= 0-255 (default) [or 0-100]
Notes: The level scale (0-255 or 0-100) is set in Configuration Settings, index 3. Level defaults to a scale of 0-255 At reset, fader levels are set to 0 unless saved to memory.	

Fade Rate (rr.dd)

rr	= 0-300 seconds [0 or 0.0 = disable rate (default)]
dd	= 0-9 tenths of a second
Notes: Defaults to disable rate (0)	

Version (mv.nv.pv)

mv	= Major Version
nv	= Minor Version
pv	= Patch Version

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Station Status (ss)

(ss)	Index
1	Hex encoded value, 2 characters (i.e. 0x10 = installed but unbound / 0x20 = installed & bound)
	Bit Description
0	Station reset occurred
1	Station wink occurred
2	A command error occurred
3	UART error occurred
4,5	Connection status (00 = uninstalled, 01 = installed, 10 = bound)
6-15	Unused
2	Neuron ID string
3	Unused
4	Unused
5	Unused
6	Unused
7	Unused
8	Unused
Notes:	
Index 1 is a hex encoded value, but is returned in decimal format. A reply of RC1.32 indicates bound connection status and normal operation (0x20 = 32d).	

Configuration Settings (nn.cf)

(nn)	Index	Settings (cf)
1	Echo	0 = off, 1 = on
2	No update	0 = off, 1 = station will be polled by the computer
3	Level & fader scale	0 = 0-255, 1 = 0-100
4	Reply terminator	0 = CRLF, 1 = CR (LF is always ignored on receiving)
5	unused (internal use)	0 = disabled,
99	Reset station	1 = set configuration to defaults, clear memories, set fade rates to 0, set key and fader LEDs to off, set levels to 0, and clear bindings.
Notes:		
Configuration switches are stored in persistent memory and are retained during a power loss.		

Memory (nn)

(nn)	Index	Settings
1	Fader levels	0 = clear, 1 = save
2	Fader rates	0 = clear, 1 = save
3	Button states	0 = clear, 1 = save
Notes:		
Get Memory returns 1 if any item saved is in a non-default state.		