AVENUE

Avenue™ signal integration system

Model 5420 Digital Logo Inserter Data Pack

ENSEMBLE DESIGNS

Revision 3.1 SW v2.0.0

This data pack provides detailed installation, configuration and operation information for the **5420 Digital Logo Inserter** module as part of the Avenue Signal Integration System.

The module information in this data pack is organized into the following sections:

- Module Overview
- Applications
- Installation
- Cabling
- Module Configuration and Control
  - Front Panel Controls and Indicators
  - Avenue PC Remote Control
  - Avenue Touch Screen Remote Control
- Troubleshooting
- Software Updating
- Warranty and Factory Service
- Specifications

MODULE OVERVIEW

The 5420 Digital Logo Inserter module allows the keying (insertion) of a graphic image or animation sequence over a serial digital program background. The keying operation is an additive linear key with a density (transparency) control.

Three modes of operation are available: DSK, DSK Preview, or Fill/Key. In DSK mode, the module keys the graphic over the serial digital background and outputs the entire signal on the PGM output BNCs. In the DSK preview mode, selecting a new event causes an on-air event to transition off. The new event is sent to the PVW output but not transitioned on-air. Activating the Cut or Mix control puts the event on-air and also feeds it to the PVW output. In Fill/Key mode, two serial digital outputs are provided so the module can source a key and fill to a switcher's DSK input if desired.

Graphic stills, logos and animation sequences can be authored in targa format with any computer software desired. These stills, logos and animation sequences are collected and named with a PC application called Avenue Logo that comes on a CD with the module. They are then downloaded to non-volatile flash memory on the module using the application. Each image is stored in flash memory which can store up to 5 full frame images or many smaller images, depending on their size. Total available storage is about 2 M pixels or 8 MB. An average corner logo is approximately 100 x 100 pixels in size for a total area of about 10,000 pixels, allowing the 5420 to store up to 200 average size logos. Each frame in an animation sequences is considered one logo. Animation sequences can be up to 200 frames long (approximately 6.5 seconds in 525 mode).

Each logo can be defined by number, name, type and can be positioned horizontally and vertically on an image by image basis using Avenue Logo or the Avenue remote control system. In and out transition times can also be programmed for each image. A density control allows changing the transparency of the key. These values are then stored for each logo.

Images can be defined as events that can be cut or mixed on manually or triggered to come on by GPI control from an external control device. Up to eight events can be defined to correspond to the eight GPI inputs available on the Control connector on the rear of the module. The 5815 Remote GPI panel can also be used to control the GPIs. GPI trigger 8 can be programmed to act as a regular GPI trigger or as a cut or mix control to transition one of the other selected GPIs (1 – 7) as a cut or mix.

As shown in the 5420 functional block diagram on the following page, a serial digital background signal is fed to the module and enters a receiver/decoder circuit where it is monitored for cable equalization and EDH processing. The reclocked background signal is available from a loopback output BNC if needed. EDH status is reported for the input signal.

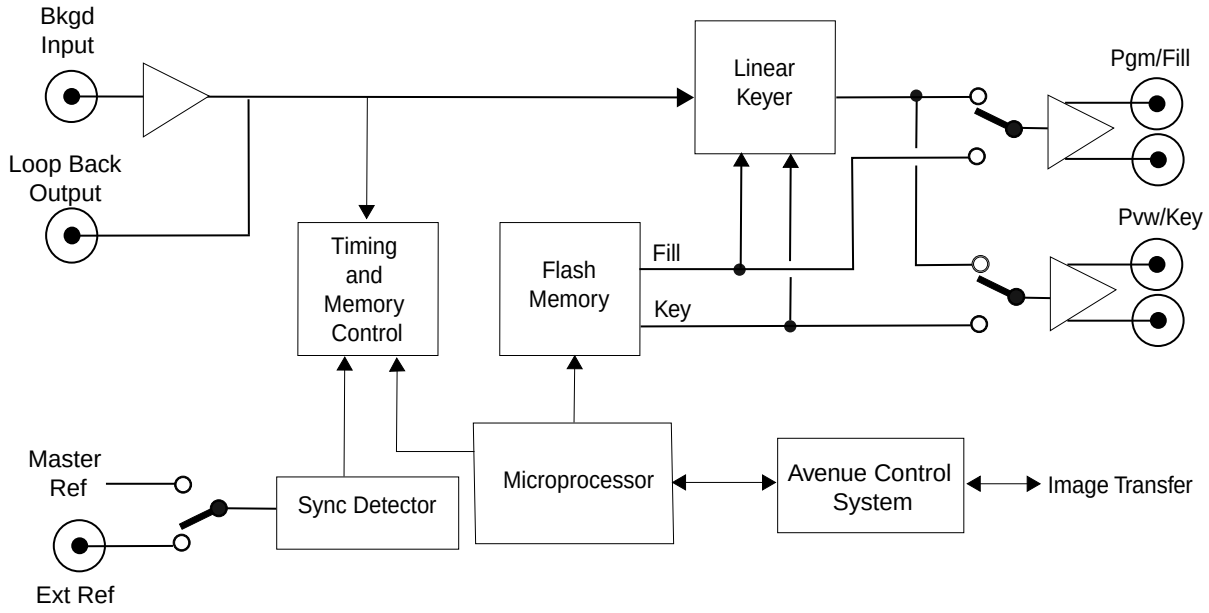
The processed background signal then enters a linear keying circuit where the selected key image cuts a hole in the background and the fill signal is added. When configured for DSK mode, the background is added to the fill and a composited image of background with key is available from the PGM output BNCs. Timing for the output signal is derived from the serial input.

DSK w/Preview mode places the background and fill on the PVW output to be viewed before being cut or mixed on-air as the next event.

When the module is configured for Fill/Key mode, black is added to the fill instead of the background signal and the timing reference is selectable from the external video reference BNC, the master frame reference or the serial input. The separate Fill and Key signals go to their respective output BNCs for feeding a device such as a switcher. When an image is selected as a key, it is directly transferred to the linear keying circuit.

The on-board CPU can monitor and report module ID information (slot location, software version and board revision), and power status to the optional frame System Control module. This information can be accessed by the user or set to register an alarm if desired using the remote control options available.

Because the 5420 is an Avenue module, every function and parameter can be controlled from an Avenue Touch Screen Control Panel, Avenue Express Panel, or the Avenue PC Control Application. Memory registers can be used to save the complete configuration of the module, making it easy to change instantly between different configurations.



5420 Digital Logo Inserter Block Diagram

APPLICATIONS

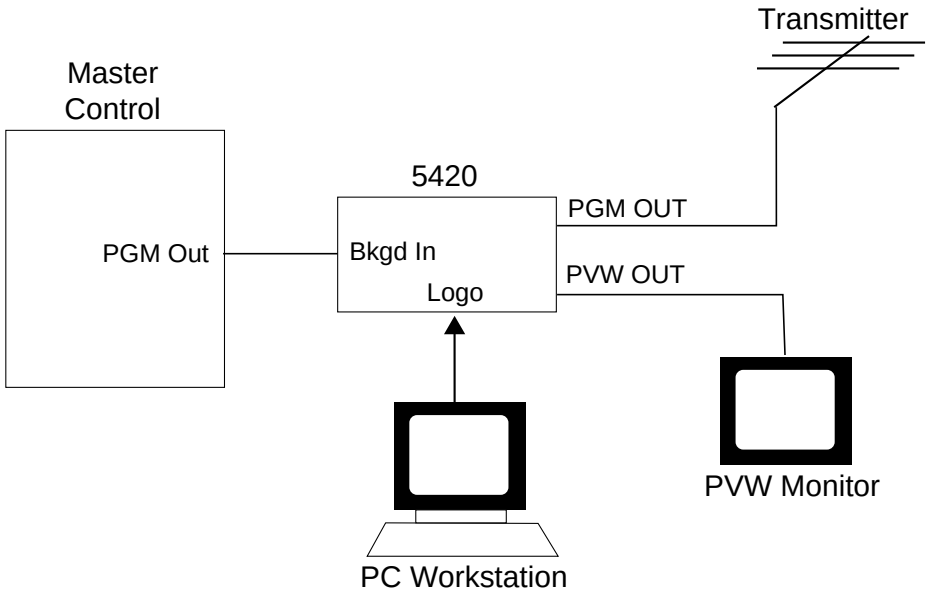
The 5420 module can be utilized in many ways to take advantage of its versatility. Some keying tasks that can be performed by the 5420 include the following:

- Fixed or animated station and channel ID
- Copyright protection
- Emergency standby notification
- Gateway for downstream keys and masks from a graphic workstation
- Custom full-field test patterns/zone plates

The module can operate in DSK mode, DSK w/Preview, or Fill/Key mode. Examples of common applications are given here.

DSK Mode

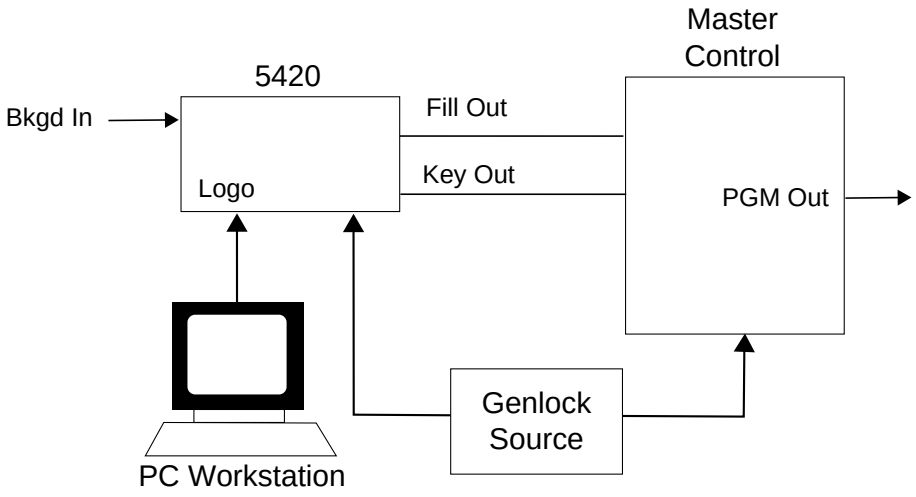
When the module is configured for DSK mode, a serial digital signal from a device such as a Master Control switcher can be connected to the input and a graphic or logo from a PC workstation can be inserted over the background to provide the final video as shown in the example below. The PGM outputs can be fed to the transmitter and other destinations and PVW outputs are available for monitoring.



Using the 5420 in DSK Mode

Fill/Key Mode

When the module is configured for Fill/Key mode, the background and key signal can be used to supply separate Fill and Key signals to feed a Master Control switcher as an input source, in a similar manner as a character generator. The 5420 can be genlocked to an external reference to match the timing of the Master Control device as shown below.



Using the 5420 in Fill/Key Mode

INSTALLATION

Plug the 5420 module into any one of the slots in the 1 RU or 3 RU frame and install the plastic overlay provided onto the corresponding group of rear BNC connectors associated with the module location. Note that the plastic overlay has an optional adhesive backing for securing it to the frame. Use of the adhesive backing is only necessary if you would like the location to be permanent and is not recommended if you need to change module locations. This module may be hot-swapped (inserted or removed) without powering down or disturbing performance of the other modules in the system.

CABLING

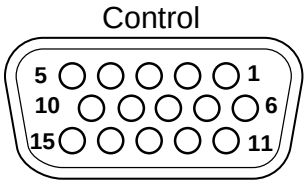
Refer to the 3 RU and 1 RU backplane diagrams of the module on the following page for cabling instructions. Note that unless stated otherwise, the 1 RU cabling explanations are identical to those given in the 3 RU diagram.

Control Devices

In addition to GPI access through the control system, the module provides eight GPI input contact closures and control from a dedicated serial port both accessible through the 15-pin D **Control** connector on the corresponding rear slot of the frame.

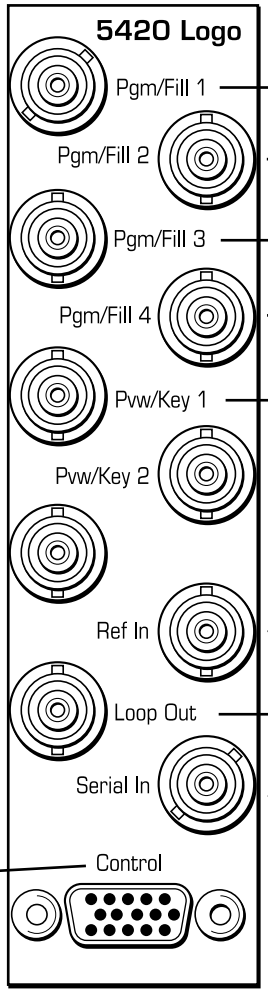
Three types of devices can control the eight GPI inputs to the **5420** module; the Avenue 5815 GPI Control Panel, a customer-supplied GPI device and an external device (such as a PC) using a Serial port connection. Connection of the 5815 GPI Control Panel and the GPI device to the 5420 module and the cable pinouts for each application are given in the next sections. Refer to Appendix A for the details for connecting an external device such as a PC, including the serial protocol.

3 RU Backplane



Pin	Function
1	RX +
2	RX –
3	Gnd
4	TX –
5	TX +
6	Gnd
7	GPI 8
8	GPI 7
9	GPI 6
10	GPI 5
11	GPI 4
12	GPI 3
13	Gnd
14	GPI 2
15	GPI 1

Pinouts for the 15-pin **Control** connector for serial control and GPI inputs are given above.



Connect the **Pgm/Fill 1** – **Pgm/Fill 4** output BNCs to serial destinations.

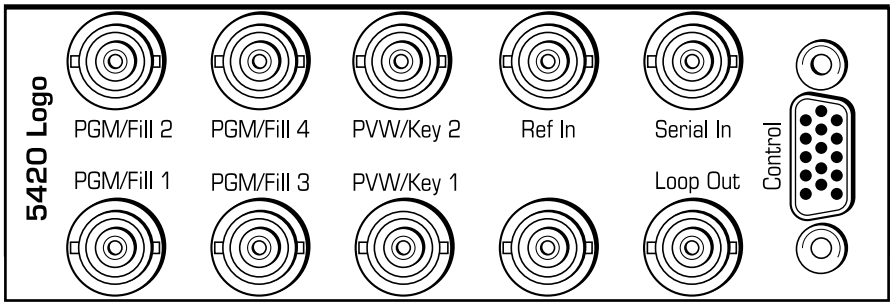
Connect the **Pvw/Key 1** – **Pvw/Key 2** output BNCs to serial destinations.

Connect an external genlock reference signal to the **Ref In** BNC if required.

Loop the reclocked background serial signal to other destinations from the **Loop Out** BNC if required.

Connect the Background serial signal to the **Serial In** BNC.

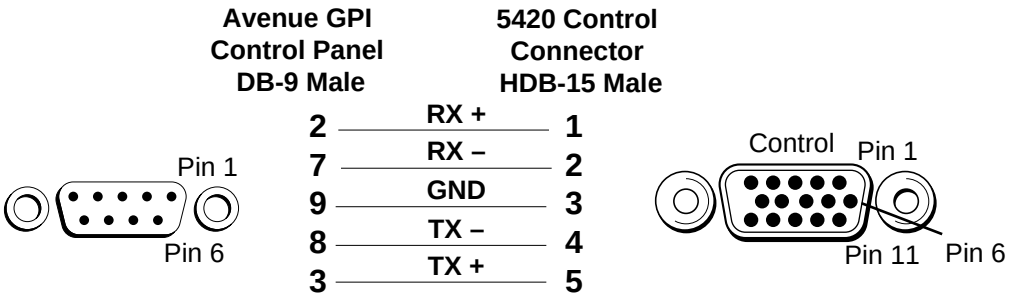
1 RU Backplane



Avenue GPI Remote Control Panel

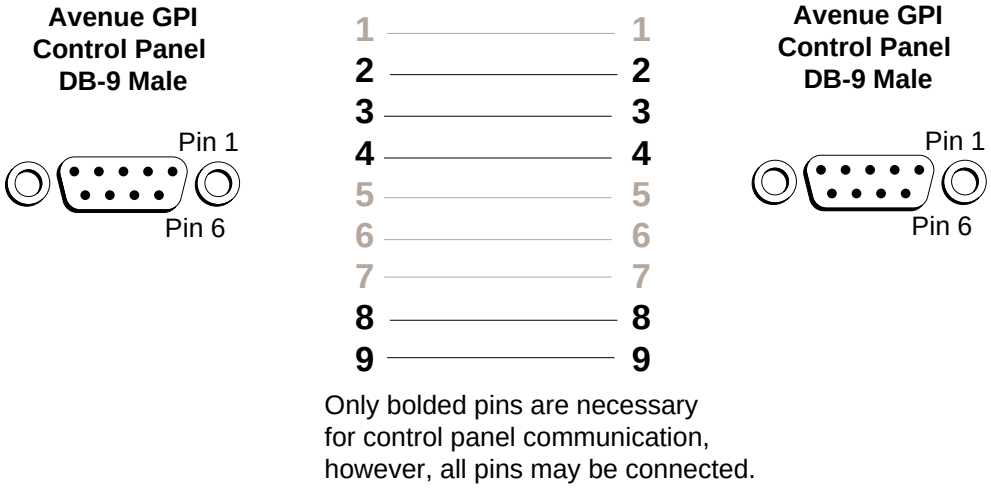
Connect an Avenue 5815 GPI Control Panel from the rear of the control panel (either DB 9-pin male) to the **Control** connector on the rear of the 5420 module (HDB 15-pin male). The pinout for this connecting cable is given below.

The 5815 GPI Control Panel can be rack-mounted in a standard 19 inch equipment rack. Connect the universal in-line power supply provided to the connector at the left rear of the GPI panel. The power supply is auto-sensing and requires no adjustments.



Avenue GPI Remote Control Panel to Avenue Frame Pinout

Up to eight Avenue 5815 GPI Control Panels can be connected in parallel for GPI control. Panels are connected together via the DB 9-pin loop-through connectors on each panel. The cable to connect each panel is a DB 9-pin male to DB 9-pin male with straight pin-to-pin connections as shown in the illustration below. This cable may be purchased at any electronics supply store or constructed from the diagram. Note not all pins are necessary for control panel connection but all pins can be connected.

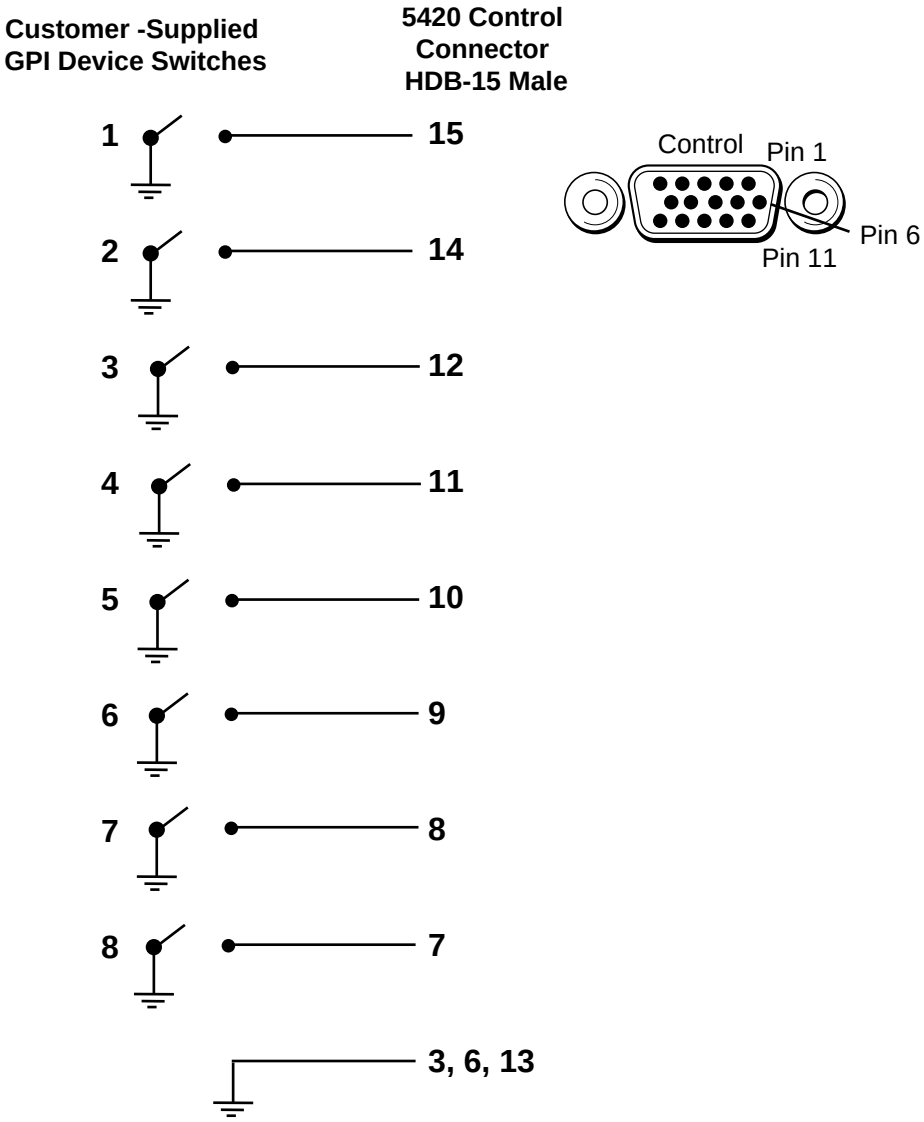


Avenue GPI Remote Control Loop-through Pinout

GPI Control

An external customer-supplied GPI device can be connected to the rear of the 5420 module to control any of the eight GPI inputs.

Connect the GPI control device to the 5420 **Control** connector pins as shown below. Each GPI pushbutton should be wired with closure to ground to trigger a crosspoint.



Customer-supplied GPI Device to Avenue Frame Pinout

5815 GPI Control Panel Operation

The GPI inputs to the 5420 module can control up to eight logos or animation sequences defined as events using the remote control menus. The configured inputs can then be triggered with the Avenue 5815 GPI Control Panel shown below. Up to eight control panels can be installed in parallel as explained earlier in this data pack.

Assign logos or animation sequences to each of the eight GPI inputs using Avenue PC or the Touch Screen control menus as explained in the next sections. When one of the eight pushbuttons is selected, the event assigned to that input will be placed on air according to the parameters (in and out transition time, density, horizontal and vertical position) configured with the remote control menus or with the Avenue Logo application.

5815 GPI Control Panel

MODULE CONFIGURATION AND CONTROL

The configuration parameters for each Avenue module must be selected after installation. This can be done remotely using one of the Avenue remote control options. This module has no local front panel configuration controls. The **REMOTE/LOCAL** switch on the front edge of the circuit board which should be set to the **REMOTE** mode.

The **5420 Parameter Table** on the following page summarizes the various configuration parameters that can be set remotely and the default/factory settings.

Avenue module parameters can be configured and controlled remotely from one or both of the remote control options, the Avenue Touch Screen or the Avenue PC Application. Once the module parameters have been set remotely, the information is stored on the module CPU. This allows the module be moved to a different cell in the frame at your discretion without losing the stored information. Remote configuration will override whatever the switch settings are on the front edge of the module.

For setting the parameters using the Avenue PC option, refer to the **Avenue PC Remote Configuration** section of this document.

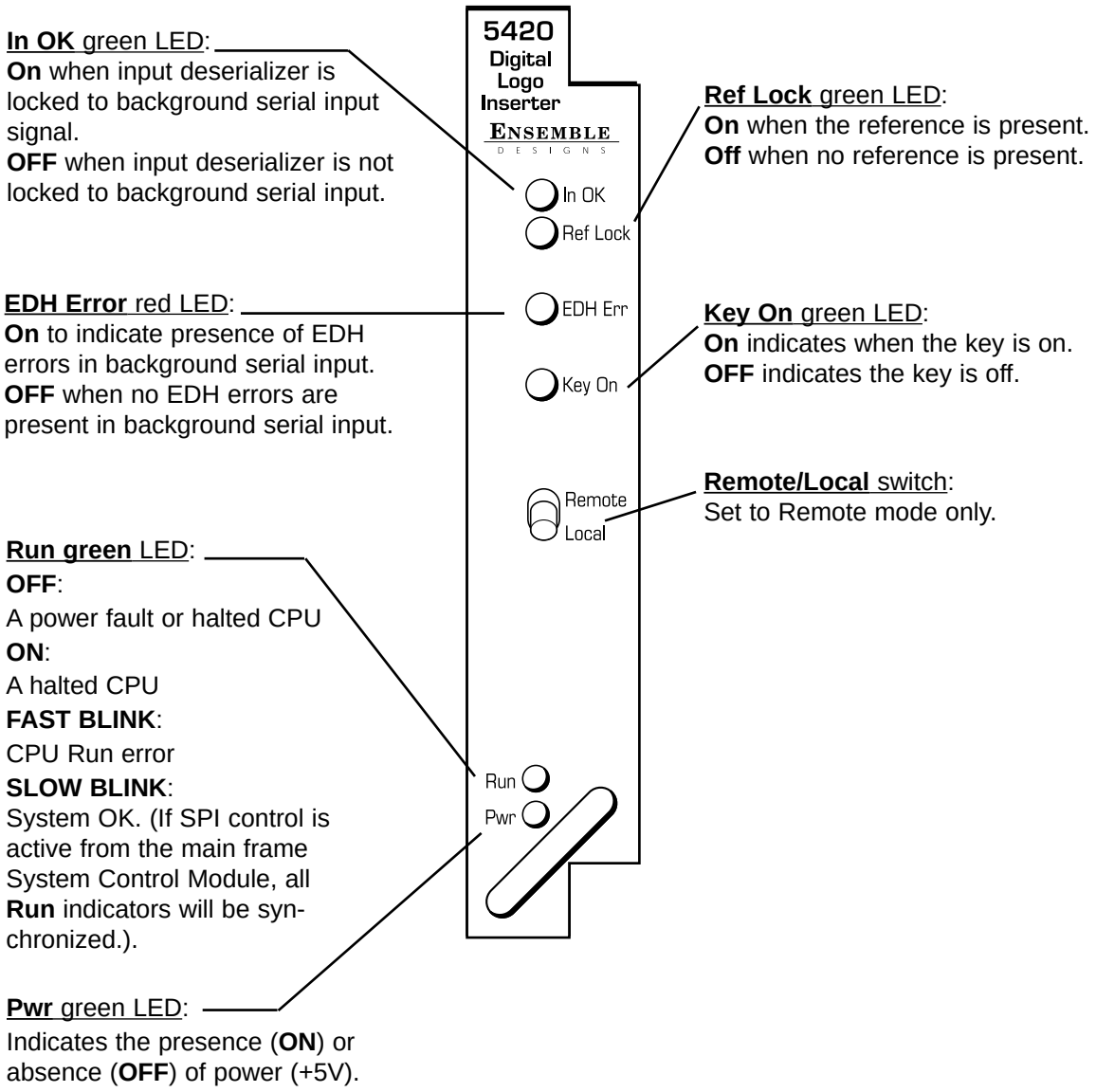
For setting the parameters using the Avenue Touch Screen option, refer to the **Avenue Touch Screen** operating section in the Avenue System Overview section.

5420 Parameter Table

CONTROL	LOCAL	REMOTE	DEFAULT	DEFAULT USER LEVEL
Cut	Off	On Off	Off	Level 2
Mix	Off	On Off	Off	Level 2
Event Select	1	1 – 8	Event 1	Level 2
Number	1	1 – 50	Logo 1	Level 2
Density	100%	0 – 100%	100%	Level 2
V Pos	0 lines	0 – 625 lines	0 lines	Level 2
H Pos	0 pixels	0 – 720 pixels	0 pixels	Level 2
Cycle	Off	Off Loop Ping Pong	Off	Level 2
Event No	1	Event 1 – 8	Event 1	Level 2
Enable	1	On Off	On	Level 2
Logo No	1	Logo 1 – 50	Logo 1	Level 2
In Trans	1	1 – 240 frames	1	Level 2
Out Trans	1	1 – 240 frames	1	Level 2
Mode	DSK	DSK DSK w/ Preview Fill/ Key	DSK	Level 2
GPI 8/Event 8	Event 8	Event 8 Mix Cut	Event 8	Level 2
Ref Select	Digital In	Digital In External Master	Digital In	Level 2

Front Panel Controls and Indicators

Each front edge indicator and switch setting is shown in the diagram below:



Avenue PC Remote Configuration

The Avenue PC remote control status menus for this module are illustrated and explained below. Refer to the **5420 Parameter Table** for a summary of available parameters that can be set remotely through the menus illustrated. For more information on using Avenue PC, refer to the Avenue PC Control Application Software data pack that came with the option.

Parameter fields that are grayed out can indicate one of the following conditions:

- An option is not installed.
- The function is not active.
- The module is locked.
- The User Level set with Avenue PC is not accessible from the current User Level.

For information on installing and using the Avenue Logo application for downloading logos and animations to the module, refer to the Avenue Logo data pack and CD that accompanies the 5420 module.

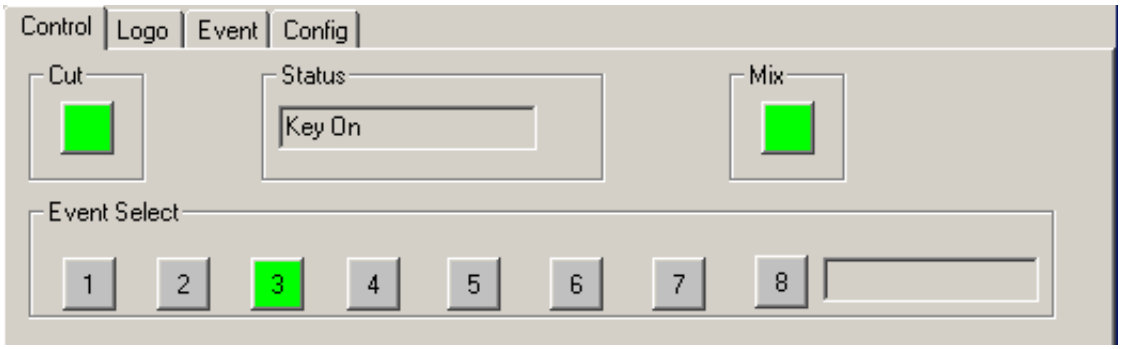
5420 Avenue PC Menus

The **Control** menu screen shown below allows you to select an event defined in the **Event** menu as the next transition.

- **Cut** – select to cut the selected event on or off.
- **Mix** – select to mix the selected event on or off.
- **Event Select** – select a defined event to be triggered by the corresponding GPI input.

The following status display is provided:

- **Status** – shows the selected event status (**Key Off** and **Key On**).



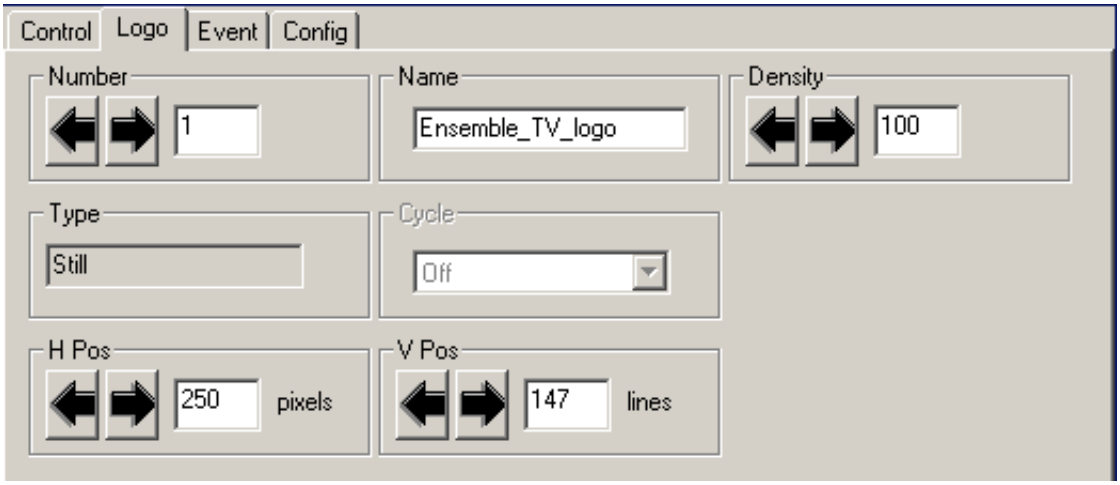
The **Logo** menu shown below allows you to select a logo, set up the density (transparency), select the type of cycling, and horizontal and vertical position of individual logos:

- **Number** – allows you to select the desired logo number stored in memory.
- **Name** – displays the name of the selected logo.
- **Density** – set the amount of transparency of the displayed logo.
- **V Pos** – set the vertical position of the logo in lines.
- **H Pos** – set the horizontal position of the logo in pixels.
- **Cycle** – select the type of cycle desired when an animation is enabled (**Off**, **Loop** or **Ping Pong**).

The following status display is provided:

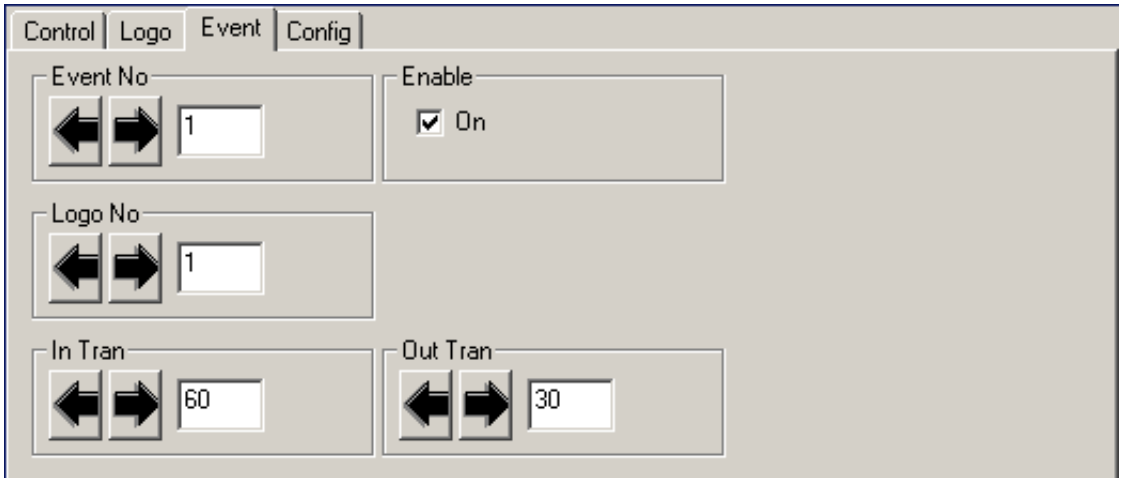
- **Name** – displays the name of the currently selected logo.
- **Type** – displays the type of logo (**Still** or **Animation**).

Note: When you change parameters for a logo with these local controls, you may wish to note the changes for each logo. As these changes are not reflected back to the original file stored on the PC, you can then make these changes to the file stored in the project folder with Avenue Logo. The next time you download the logo it will not need any adjustment.



The **Event** menu shown below allows you to define an event:

- **Event No** – select an event number to define (**1 – 8**).
- **Logo No** – select the logo number you wish to include in the event.
- **In Tran** – set the transition time in frames for the logo to key on.
- **Out Tran** –set the transition time in frames for the logo to key off.
- **Enable** – check the **On** box to enable the defined event.

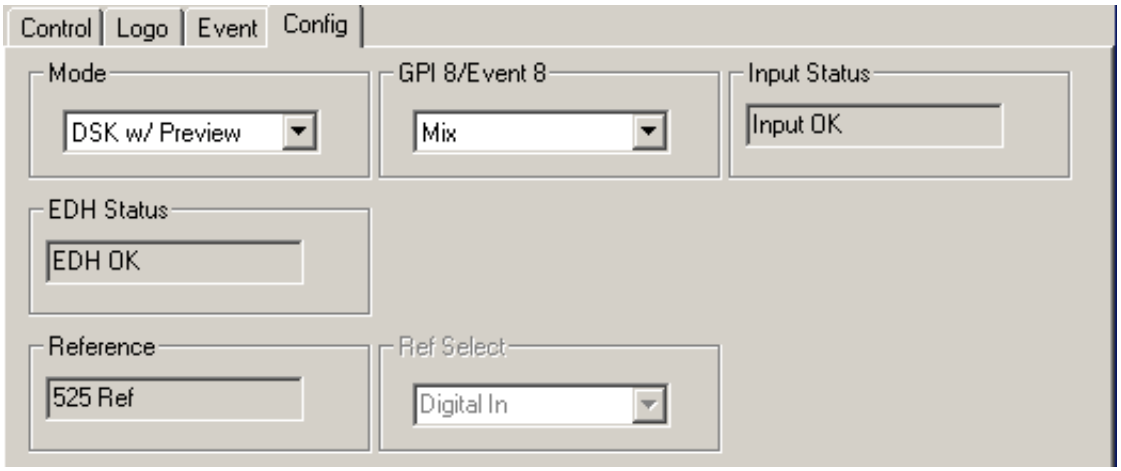


The **Config** menu shown below allows you to configure the mode, the GPI 8 control action, and the reference input for the module:

- **Mode** – select either **DSK**, **DSK w/Preview**, or **Fill/Key** mode for the module.
- **GPI 8/Event 8** – select the action for the GPI 8 control as fire **Event 8**, or **Mix** or **Cut** the selected Event 1 – 7, On, or Off.
- **Ref Select** – choose a reference source from **Digital In**, **External**, or **Master** when **Fill/Key** mode is selected.

The following status displays are also provided:

- **Input Status** – displays the status of the serial digital input signal as **No Input** and **Input OK**.
- **EDH Status** – displays the EDH status of the digital input signal (**No Input**, **No EDH**, **EDH OK**, or **EDH Error**).
- **Reference** – displays the selected reference when in **Fill/Key** mode (**525**, **625** or **No Ref**).



Avenue Touch Screen Remote Configuration

The Avenue Touch Screen remote control status menus for this module are illustrated and explained below. Refer to the **5420 Parameter Table** for a summary of available parameters that can be set remotely through the menus illustrated. For more information on using Avenue Touch Screen, refer to the Avenue System Overview operating section.

Parameter fields that are grayed out can indicate one of the following conditions:

- An option is not installed.
- The function is not active.
- The module is locked.
- The User Level set with Avenue PC is not accessible from the current User Level.

For information on installing and using the Avenue Logo application for downloading logos and animations to the module, refer to the Avenue Logo data pack and CD that accompanies the 5420 module.

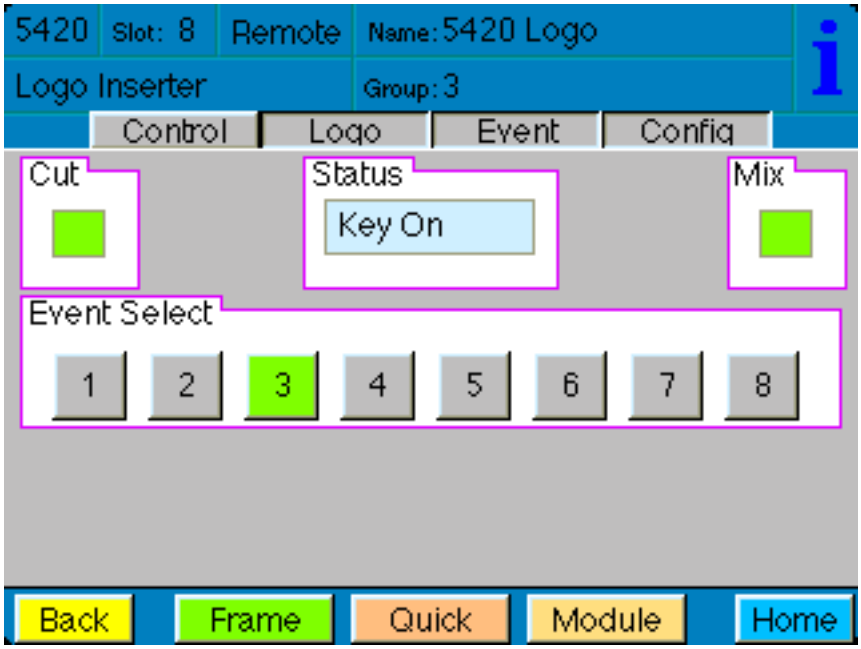
5420 Avenue Touch Screen Menus

The **Control** menu screen shown below allows you to select an event defined in the **Event** menu as the next transition.

- **Cut** – select to cut the selected event on or off.
- **Mix** – select to mix the selected event on or off.
- **Event Select** – select a defined event to be triggered by the corresponding GPI input.

The following status display is provided:

- **Status** – shows the selected event status (**Key Off** and **Key On**).



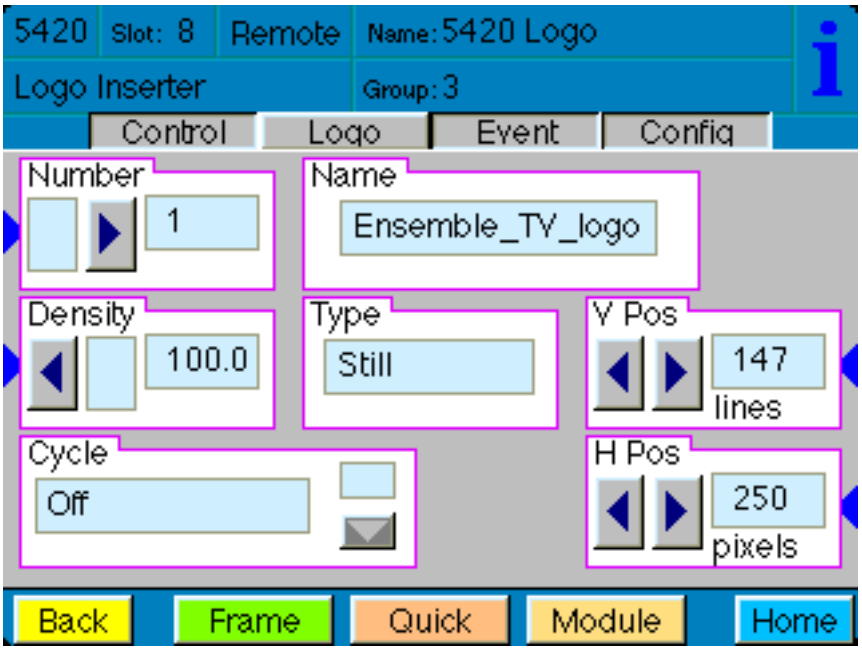
The **Logo** menu shown below allows you to select a logo, set up the density (transparency), select the type of cycling, and horizontal and vertical position of individual logos:

- **Number** – allows you to select the desired logo number stored in memory.
- **Name** – displays the name of the selected logo.
- **Density** – set the amount of transparency of the displayed logo.
- **V Pos** – set the vertical position of the logo in lines.
- **H Pos** – set the horizontal position of the logo in pixels.
- **Cycle** – select the type of cycle desired when an animation is enabled (**Off**, **Loop** or **Ping Pong**).

The following status display is provided:

- **Name** – displays the name of the currently selected logo.
- **Type** – displays the type of logo (**Still** or **Animation**).

Note: When you change parameters for a logo with these local controls, you may wish to note the changes for each logo. As these changes are not reflected back to the original file stored on the PC, you can then make these changes to the file stored in the project folder with Avenue Logo. The next time you download the logo it will not need any adjustment.



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- **Event No** – select an event number to define (**1 – 8**).
- **Logo No** – select the logo number you wish to include in the event.
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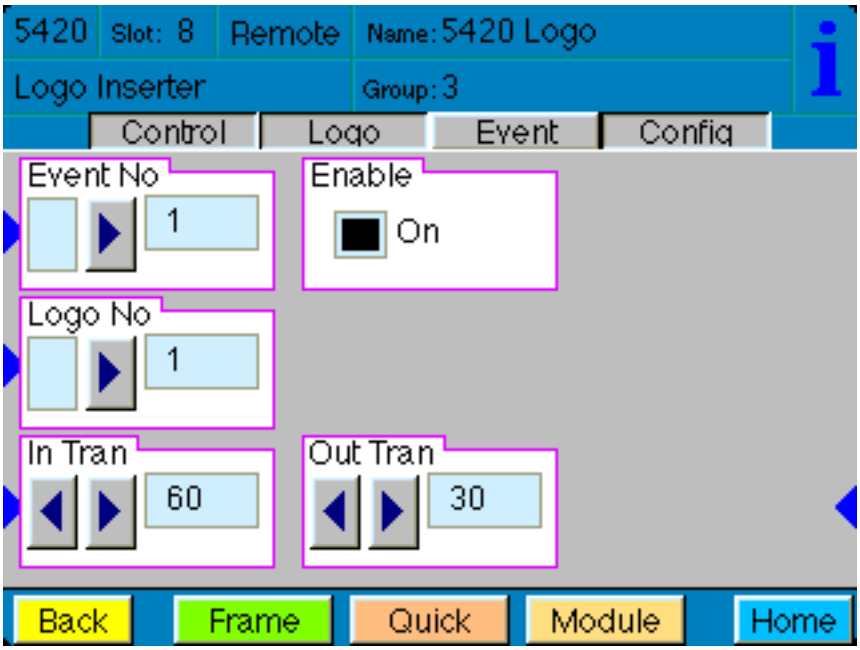
- **Out Tran** –set the transition time in frames for the logo to key off.
- **Enable** – check the **On** box to enable the defined event.

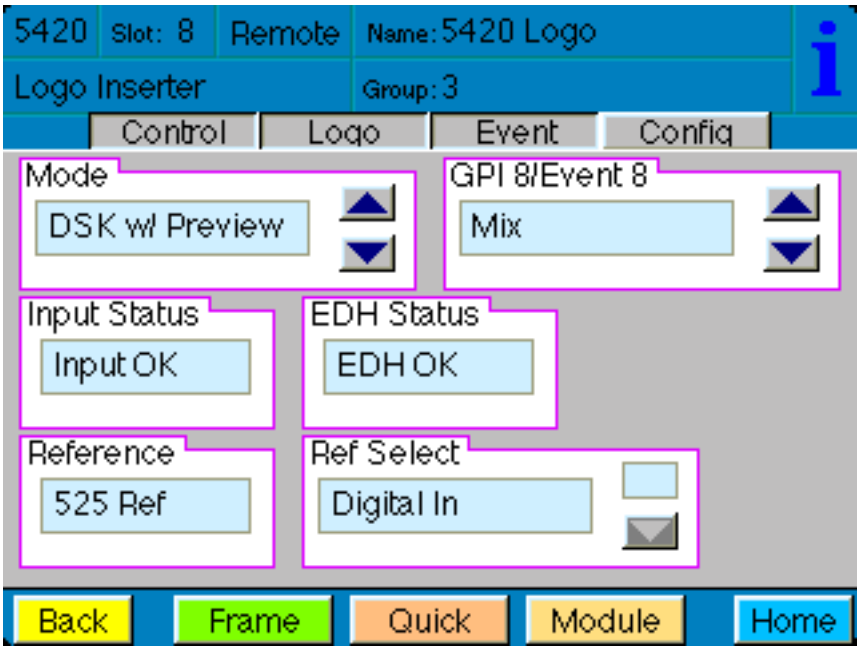


The **Config** menu shown below allows you to configure the mode, the GPI 8 control action, and the reference input for the module:

- **Mode** – select either **DSK**, **DSK w/Preview**, or **Fill/Key** mode for the module.
- **GPI 8/Event 8** – select the action for the GPI 8 control as fire **Event 8**, or **Mix** or **Cut** the selected Event 1 – 7, On, or Off.
- **Ref Select** – choose a reference source from **Digital In**, **External**, or **Master** when **Fill/Key** mode is selected.

The following status displays are also provided:

- **Input Status** – displays the status of the serial digital input signal as **No Input** and **Input OK**.
- **EDH Status** – displays the EDH status of the digital input signal (**No Input**, **No EDH**, **EDH OK**, or **EDH Error**).
- **Reference** – displays the selected reference when in **Fill/Key** mode (**525**, **625** or **No Ref**).



TROUBLESHOOTING

As a troubleshooting aid, the reference signal status and presence, power and CPU status can be easily monitored from the front panel of this module using the front panel indicators.

Refer to the overall troubleshooting tips given below for the module:

Can't control module:

- Check status of CPU **Run** green LED. Should be blinking slowly and in unison with other modules if System module is present. If not, try removing it and plugging it in again to be sure it is seated properly.
- System module may not be working properly if installed.
- Front panel Local/Remote switch not in Remote when using Avenue PC.

No signal out of module:

- Check status of **In OK** LED.
- Check cabling to input of module.

You may also refer to the technical support section of the Ensemble Designs web site for the latest information on your equipment at the URL below:

http://www.ensembledesigns.com/support

SOFTWARE UPDATING

Software upgrades for each module can be downloaded remotely if the optional System Control module is installed. These can be downloaded onto your PC and then Avenue PC will distribute the update to the individual module. (Refer to the Avenue PC documentation for more information) Periodically updates will be posted on our web site. If you do not have the required System Control Module and Avenue PC, modules can be sent back to the factory for software upgrades.

WARRANTY AND FACTORY SERVICE

Warranty

This module is covered by a five year limited warranty, as stated in the main Preface of this manual. If you require service (under warranty or not), please contact Ensemble Designs and ask for customer service before you return the unit. This will allow the service technician to provide any other suggestions for identifying the problem and recommend possible solutions.

Factory Service

If you return equipment for repair, please get a Return Material Authorization Number (RMA) from the factory first.

Ship the product and a written description of the problem to:

Ensemble Designs, Inc.

Attention: Customer Service RMA #####

870 Gold Flat Rd.

Nevada City, CA. 95959 USA

(530) 478-1830

Fax: (530) 478-1832

service@endes.com

http://www.ensembledesigns.com

Be sure to put your RMA number on the outside of the box.

SPECIFICATIONS

5420 Digital Logo Inserter

Input Signal:

Number:	One
Signal Type:	Serial Digital (SMPTE 259M)
Impedance:	75 Ω
Return Loss:	> 15 dB DC to 270 Mbs
Maximum Cable Loss:	300 meters of Belden 8281

Reference Input Signal:

Number:	One external (Master) One internal (External)
Signal Type:	1 V p-p nominal composite video, PAL or NTSC
Return Loss:	> 40 dB (applies to external reference input)

Serial Outputs 1 – 4:

Signal Type:	Serial Digital (SMPTE 259M)
Impedance:	75 Ω
Return Loss:	> 15 dB DC to 270 Mbs
Output DC:	None (AC coupled)
Delay:	< 30 clocks from Background input

Reclocked Loop Through Signal:

Number:	One
Signal Type:	Serial Digital (SMPTE 259M)
Impedance:	75 Ω
Return Loss:	> 15 dB DC to 270 Mbs
Output DC:	None (AC coupled)
Delay:	~ 2 clocks

General Specifications:

Connectors:	BNC
Power Consumption:	< 9.6 Watts
Temperature Range:	0 to 50 degrees C ambient (all specs met)
Relative Humidity:	0 to 95% noncondensing
Altitude:	0 to 10,000 ft
Fusing:	1.5 Amp PTC resettable fuse

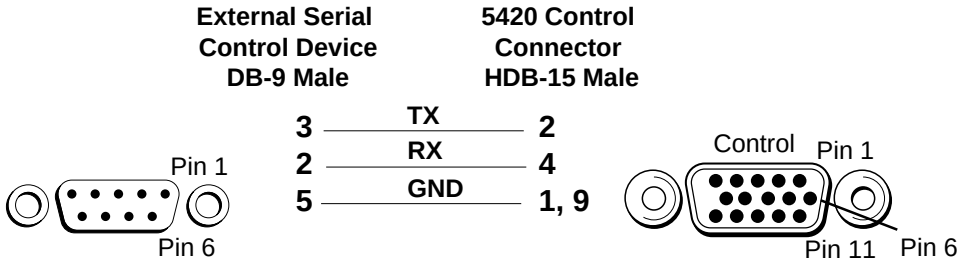
Due to ongoing product development, all specifications subject to change.

APPENDIX A

Serial Control

The 5420 Digital Logo Inserter module has a serial interface port which supports a command protocol for remote control of the eight GPI selections. This serial port is used by the optional Avenue 5815 GPI Control Panel or an external GPI control device. The port can also be used by external devices such as a PC to control the GPI inputs.

Refer to the pinout information in the illustration below for the cable needed to connect a PC or other device to the serial port of the module. The port can be cabled to support either RS-422 or RS-232 signaling levels.



External Serial Control to Avenue Frame Control Cable Pinout

The details for the serial protocol are outlined in the section below.

The communication standard for this port is as follows:

Data Rate: 38.4 Kbaud

Start Bits: 1

Stop Bits: 1

Parity: None

The command and status messages for this port are in plain ASCII form, with each command or message terminated with a carriage return (shown as <cr> below).

Commands to the module are as follows:

Fire GPI Command

Syntax: G1 <cr>

This will fire GPI 1.

The module will respond with a single status message:

Syntax: S1 <cr>