

AVENUE

Avenue™ signal integration system

Model 5110 Digital Video Reclocking DA Data Pack

ENSEMBLE

D E S I G N S

Revision 4.1 SW v1.1.7

This data pack provides detailed installation, configuration and operation information for the **5110 Digital Video Reclocking Distribution Amplifier (DA)** 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 5110 module is a digital reclocking distribution amplifier (DA) providing eight outputs with EDH (Error Detection Handling) Monitoring and Insertion. The module can distribute 143 Mbs, 177 Mbs, 270 Mbs, or 360 Mbs serial digital video. Up to 300 meters of cable can be equalized for the lower three data rates and 200 meters for the 360 Mbs data rate. Reclocking signal processing performed on the input data stream provides improved jitter performance. Input EDH errors can be detected and reported and new EDH can be created and incorporated into the output data streams.

A composite monitor output has an On Screen Display (OSD) that provides status information about the module. EDH status, EQ, cable length and data rate are superimposed over the composite video output. The OSD can be controlled manually, by GPI, or can appear automatically when an error is detected.

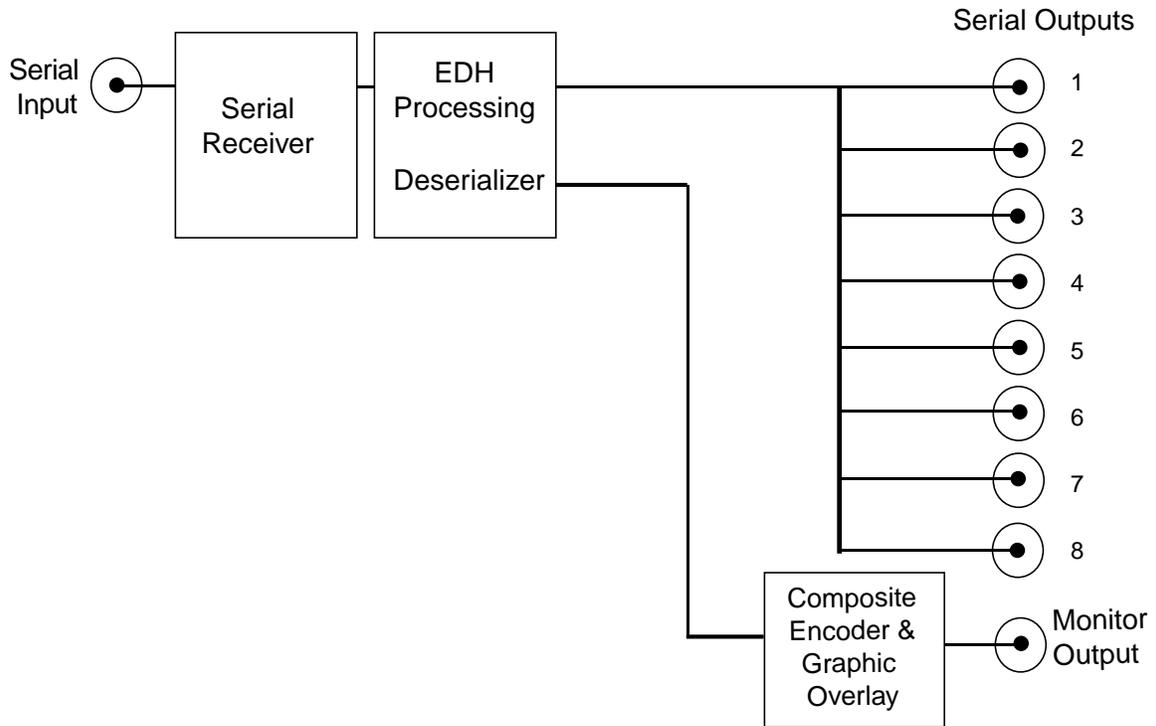
As shown in the block diagram on the next page, the serial input signal passes through a serial receiver circuit where cable equalization and input monitoring is done. This output passes to the EDH processing and deserializer circuit where the serial input signal is decoded and passed through EDH monitor processing.

A composite output is generated from this circuit which feeds the Monitor Output BNC where status information can be superimposed on the composite output video (NTSC or PAL). The status display can be disabled, turned on manually, automatically when an error is detected, or remotely via the 15-pin DB-15 connector on the backplane.

The serial outputs are AC coupled to the BNCs on the rear of the frame providing the eight serial outputs for distribution.

Power is derived from the ± 12 volt frame power. It is regulated to the required +5 volts for the module by on-board regulator. The module is fused with a resettable fuse device. If the fuse opens due to an overcurrent condition, the module will lose power. After pulling the module, the fuse will reset automatically requiring no replacement fuse.

The on-board CPU can monitor and report module ID information (slot location, software version and board revision), equalization (cable length), power status, ancillary data 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.

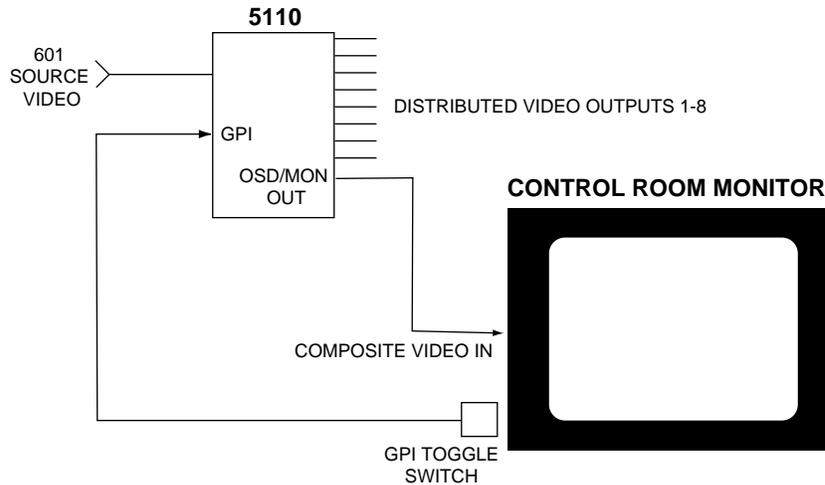


5110 Digital Video Reclocking DA Functional Block Diagram

APPLICATIONS

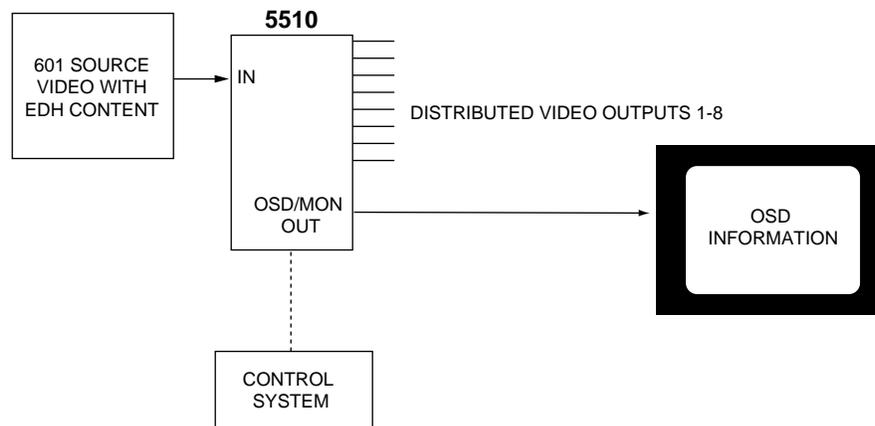
Serial DA with Control Room Monitor

The 5110 Digital Video DA's composite monitor output has an On Screen Display (OSD) that provides status information about the module. This status information is superimposed over the composite video output. This output can be sent to a Control Monitor and the OSD can be toggled on when desired by a GPI trigger to the rear connector of the module. This application is shown in the block diagram below.



Control Room Monitor Application

Another useful application for the 5110 Reclocking DA is for EDH Error Detection and Reporting. As shown in the diagram below, the 5110 has EDH error and ancillary data reporting capabilities which can be displayed on the OSD output or the information can be read by the System Control module and reported through one of the remote applications by setting an alarm.



EDH/Data Error Detection Application

INSTALLATION

Plug the 5110 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 below for cabling instructions. Note that unless stated otherwise, the 1 RU cabling explanations are identical to those given in the 3 RU diagram.

3 RU Backplane

Connect a cable from the Monitor Out BNC to a composite monitor. The On Screen Display (OSD) status will also be displayed if it is enabled.

The following information will be displayed when OSD is enabled:

Group Name:

Board Name:

EQ: No Input or Muted or Cable length.

Data Rate and 50 or 60 Hz Lock status

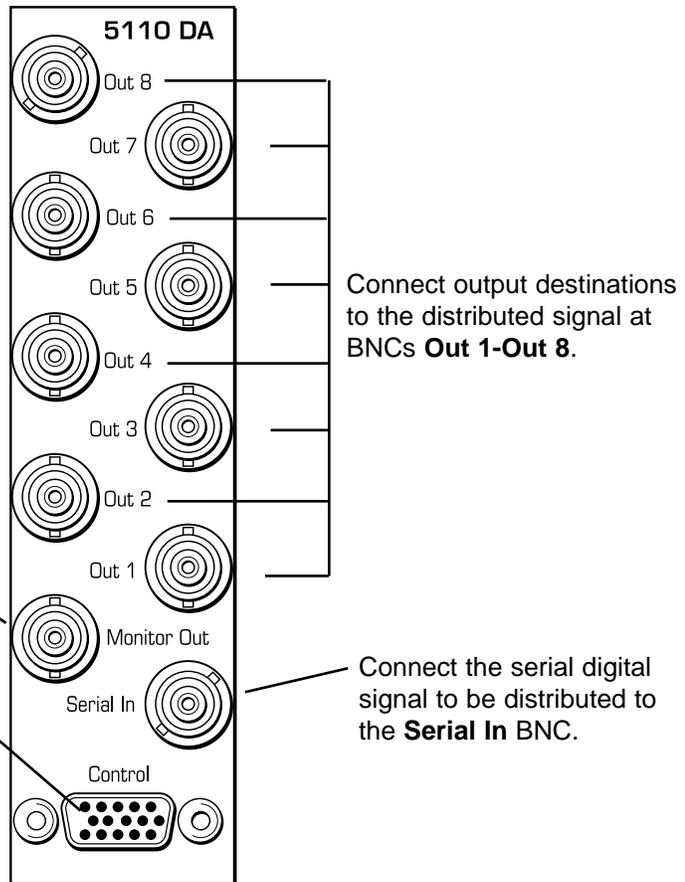
EDH: FFOK APOK ANCOK

(Full Frame, Active Picture, Ancillary)

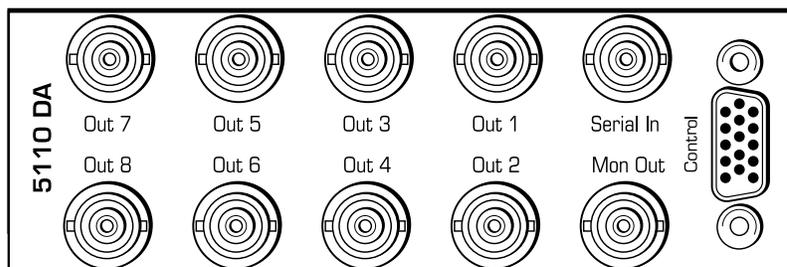
Audio: 1 _ _ _

The **CONTROL** 15-pin D connector can be used to enable the On/Off state of the OSD Output by a remote contact closure switch or relay device .

GPI closure occurs when pin 1 (top right and ground pin 15 (bottom left) are shorted together.



1 RU Backplane



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 or locally using the module front panel controls. Each module has a **REMOTE/LOCAL** switch on the front edge of the circuit board which must first be set to the control mode you will be using.

The configuration parameter choices for the module will differ between **Remote** and **Local** modes. In **Remote** mode, the choices are made through software and allow more selections. The **5110 Parameter Table** on the following page summarizes and compares the various configuration parameters that can be set remotely or locally and the default/factory settings.

If you are not using an remote control option, the module parameters must be configured from the front panel switches. Parameters that have no front panel control will be set to a default value. The **Local** switches are illustrated in the **Front Panel Controls and Indicators** section following the **5110 Parameter Table**.

Avenue module parameters can be configured and controlled remotely from one or both of the remote control options, the Avenue Touch Screens 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 remotely using the Avenue PC option, refer to the **Avenue PC Remote Configuration** section of this document.

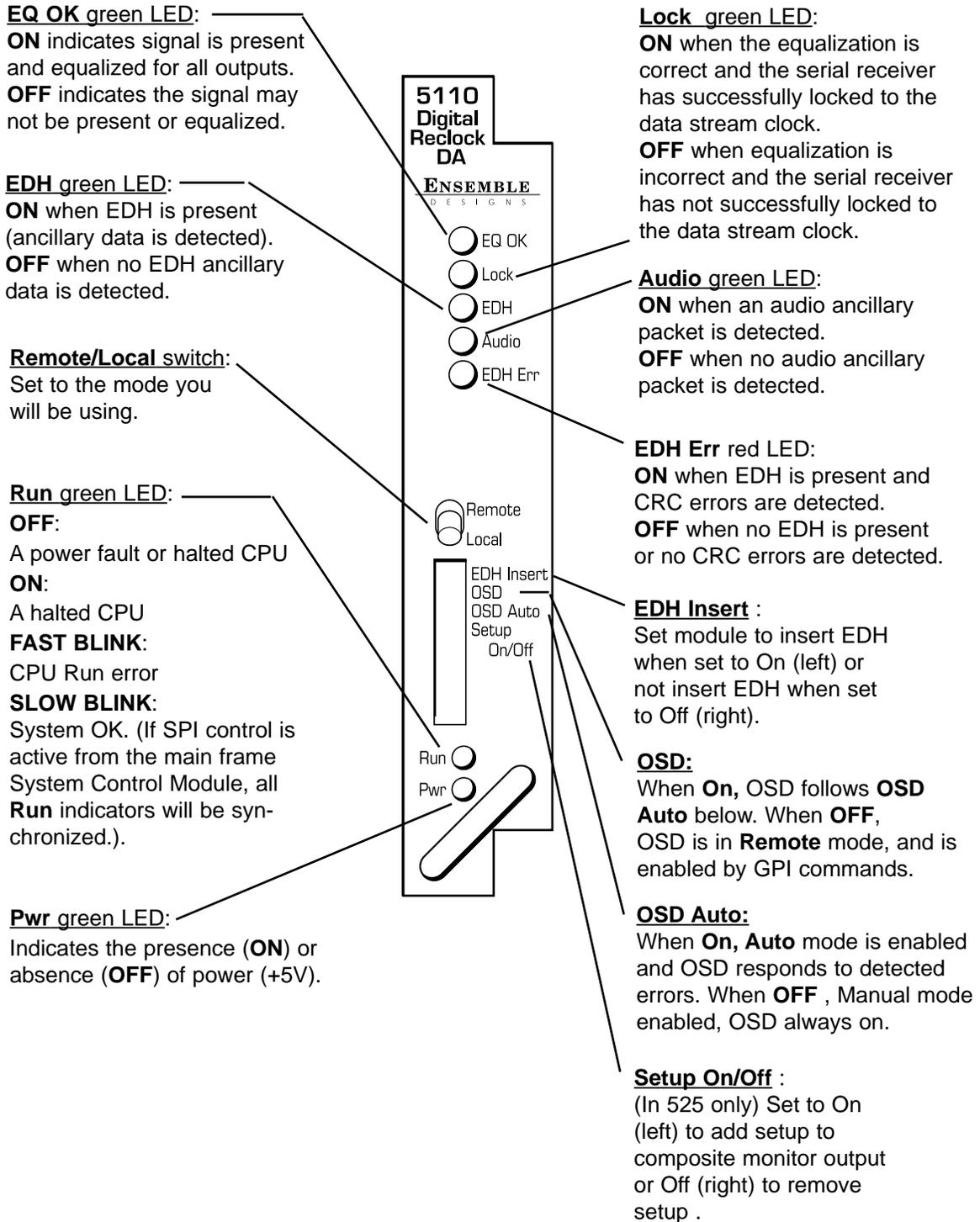
For setting the parameters remotely using the Avenue Touch Screen option, refer to the **Avenue Touch Screen Remote Configuration** section of this data pack following Avenue PC.

5110 Parameter Table

CONTROL	LOCAL	REMOTE	DEFAULT/FACTORY
Max Cable	300 Meters	200-350 Meters	300 Meters
EDH Insert	Switch 1: On Off	On Off	On
Setup	Switch 4: On Off	On Off	On
OSD Control	GPI Control	Off Always On GPI Control	GPI Control
OSD Auto	Off	On Off	Off

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 menus for this module are illustrated and explained below. Refer to the 5110 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.

5110 Avenue PC Menus

The **Serial** menu screen shown below gives the following status information about the module:

- **Equalizer** - shows if signal is present and equalized for all outputs.
- **PLL Lock** - indicates what standard module is locking to.
- **Cable Length** - indicates current cable length being equalized.
- **EDH** - indicates if EDH is present (ancillary data is detected).
- **EDH Error** - indicates presence of CRC errors.
- **Audio** - indicates presence of audio ancillary packet.

Set the following parameters from this menu:

- **Max Cable** - set maximum cable length equalization between 200 and 350 meters.
- **EDH Insert** - set to On or Off.

The screenshot displays the 'Serial' OSD menu with the following parameters and values:

- Equalizer:** Input OK
- PLL Lock:** Lock 525
- Cable Length:** 0 meters
- EDH:** No EDH
- EDH Error:** None
- Audio:** No Audio
- Max Cable:** A slider control set to 300 meters, with a 'Default' button and left/right arrow buttons.
- EDH Insert:** On

Model 5110 Digital Video Reclocking DA

The **OSD** menu shown below allows you to set up the **On Screen Display** parameters as follows:

- **OSD Control** - determines how the OSD is enabled.
- **OSD AutoDisp** - determines if display will be enabled when error is detected.
- **Setup** - enables or disables setup level for the OSD output in NTSC only.



The image shows a screenshot of the OSD menu. At the top, there are two tabs: 'Serial' and 'OSD', with 'OSD' being the active tab. Below the tabs, there are three settings, each in a separate box with a label and a dropdown menu:

- OSD Control**: The dropdown menu is set to 'Always On'.
- OSD AutoDisp**: The dropdown menu is set to 'Off'.
- Setup**: The dropdown menu is set to 'On'.

Avenue Touch Screen Remote Configuration

Avenue Touch Screen remote control menus for this module are illustrated and explained below. Also refer to the 5110 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 Touch Screen data pack that came with the option.

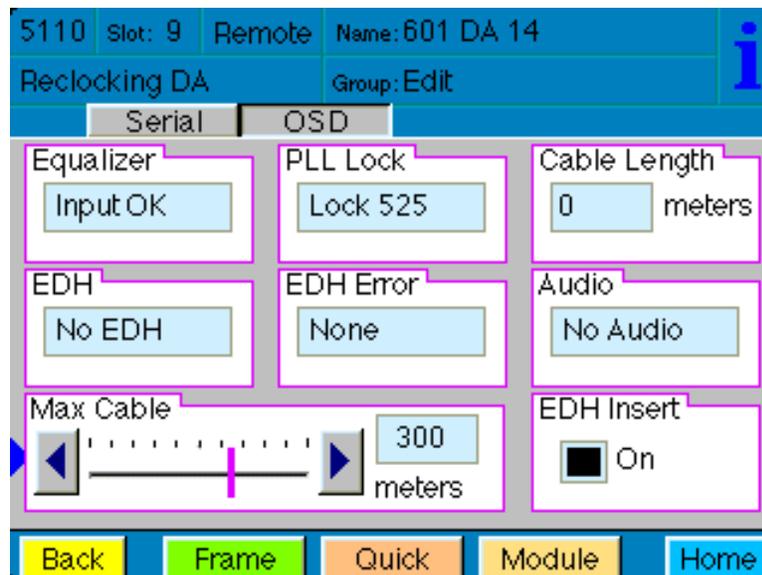
5110 Avenue Touch Screen Menus

The **Serial** menu screen shown below gives the following status information about the module:

- **Equalizer** - shows if signal is present and equalized for all outputs.
- **PLL Lock** - indicates what standard module is locking to.
- **Cable Length** - indicates current cable length being equalized.
- **EDH** - indicates if EDH is present (ancillary data is detected).
- **EDH Error** - indicates presence of CRC errors.
- **Audio** - indicates presence of audio ancillary packet.

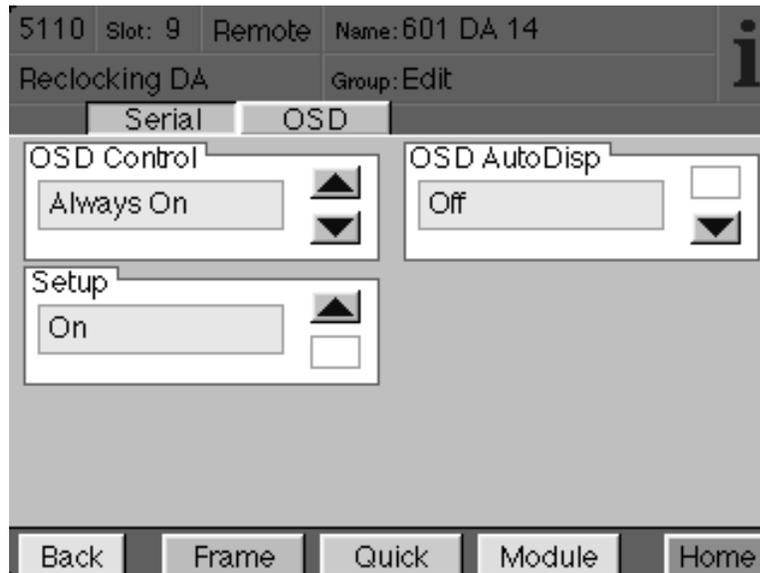
Set the following parameters from this menu:

- **Max Cable** - set maximum cable length equalization between 200 and 350 meters.
- **EDH Insert** - set to On or Off.



The **OSD** menu shown below allows you to set up the **On Screen Display** parameters as follows:

- **OSD Control** - determines how the OSD is enabled.
- **OSD AutoDisp** - determines if display will be enabled when error is detected.
- **Setup** - enables or disables setup level for the composite monitor output in NTSC only.



TROUBLESHOOTING

As a troubleshooting aid, the signal equalization and presence, EDH errors, power and CPU status can be easily monitored from the front panel of this module using the indicators explained in the previous section.

If using the **Remote** mode, the following status items can be monitored using the Avenue Touch Screen Control Panel or PC Application:

- Equalization (cable length)
- EDH Errors
- Power status
- Slot ID, Software Version and Board Revision

Refer to the overall troubleshooting tips given below for the **5110** module:

No status lights are lit on front panel:

- Check that frame power is present (green LED{s} on frame power supplies).
- Check that module is firmly seated in frame. Try removing it and plugging it in again.

Can't control module:

- Check status of CPU **Run** red 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.
- System module may not be working properly if installed.

No signal out of module:

- Check status of EQ OK green LED. Should be lit. If not, check the input signal for presence and quality.
- Check cabling to input of module.
- Check remote cable equalization by switching the module to **Local** using the front panel switch and see if the EQ OK LED comes on.

EDH Error detected:

- Check cable connection at source and input to 5110 module
- Check integrity of signal at source

You may also refer to the technical support section of the Ensemble or Graham-Patten web sites for the latest information on your equipment at the URLs below:

<http://www.ensembledesigns.com/support>

<http://www.grahampatten.com>

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 or Graham-Patten Systems 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.

OR

Graham-Patten Systems, Inc.

13366 Grass Valley Avenue

Grass Valley, CA 95945

(800) 422-6662 or (530) 273-8412

Fax: (530) 273-7458

service@gpsys.com

<http://www.grahampatten.com>

SPECIFICATIONS

5110 Video Reclocking DA

Input Signal Description:

Number:	One	
Signal Type:	Serial Digital (SMPTE 259M)	
Impedance:	75 ohm	
Return Loss:	143, 177, 270 Mbs	>15 dB
	360 Mbs	>15 dB
	540 Mbs	Not specified*
Maximum Cable Loss:	143, 177, 270 Mbs	300 meters of Belden 8281
	360 Mbs	200 meters of Belden 8281
	540 Mbs	Not specified*

Output Signal Description

Number:	Eight	
Signal Type:	Serial Digital (SMPTE 259M)	
Impedance:	75 ohm	
Return Loss:	143, 177, 270 Mbs	>15 dB
	360 Mbs	>15 dB
	540 Mbs	Not specified*
Output DC:	None (AC coupled)	

Composite Monitor Output

Number:	One
Signal Type:	NTSC/PAL
Impedance:	75 ohm
Return Loss:	> 40dB
Output DC:	< +/- 200mV
Response:	+/- 0.25 dB
	10 KHz to 5.0 MHz
KFactors:	<1.5%

General Specifications

Power Consumption:	< 4.0 Watts
Temperature Range:	0 to 40 degrees C ambient
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.

*Module will operate in many 540 Mbs applications but performance is not specified.