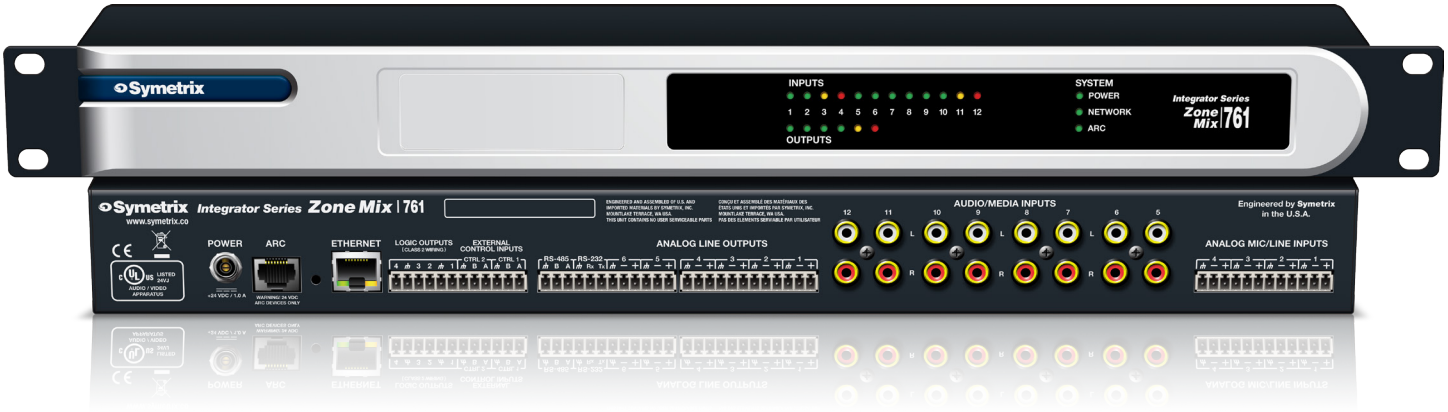
Integrator Series
Control Protocol



Symetrix

Contents

Introduction

About this document

The purpose of this document is to provide a technical understanding of the Symetrix Control Protocol for Integrator Series devices. It will define and illustrate the protocol used to communicate with the Integrator Series products via a 3rd-party interface. Note that this document is titled “Control Protocol” since it discusses 3rd-party control via both RS-232 (where available) and UDP/IP (Ethernet).

Integrator Series devices can be controlled by 3rd-party controllers such as certain AMX or Crestron models, or any RS-232 or Ethernet equipped device that can be adapted to this protocol. The protocol consists of humanly readable text commands and responses. It is based on the SymNet Control Protocol (described in a separate document) and inherits many of the features from that system.

Control is achieved by using a scheme of pre-assigned controller numbers. Nearly anything that can be adjusted from the Integrator Series control application can be controlled externally by referencing the appropriate controller number. The controller numbers for each device type are listed in the Appendices to this document.

Conventions used in this document

A dollar sign ($) preceding a set of alphanumeric characters denotes a hex value. All other number values should be considered decimal values. **Example:** “$A0” represents the decimal value of “160”.

Values enclosed in [square brackets] are optional parameters and do not need to be included. If omitted, default values will be used as described for each command.

The term “control application” is used to refer to the Windows-based graphical user interface application provided by Symetrix to control Integrator Series devices.

General Notes

Connections

All Integrator Series products are equipped with Ethernet ports, but only some have RS-232 ports. Zone Mix 760s manufactured after December 1, 2007 are shipped with RS-232 ports ports (the date of manufacture may be found on the serial number sticker). For the sake of clarity the RS-232 port will be referred to as the “Accessory Remote Control Port”. Either port may be used to control the device. If both options are available, Ethernet is generally preferred because of the simplified set-up and faster data rates.

RS-232 Port Configuration

Connect your RS-232 based accessory remote to the Accessory Remote Control Port RS-232 connector. For experimentation purposes, a terminal emulation program such as HyperTerminal included with Windows can be run on a PC instead. Typically this connection requires a “straight through” cable, but a null-modem cable may be required depending on the manufacturer. In general, if the sexes of the two connectors you are trying to connect are the same, a “null modem” cable is required. Set up the controller for baud: 57600, data bits: 8, stop bits: 1, parity: NONE. No handshaking or flow control is used.

The commands **Set Baud**, **Set Quiet Mode** and **Set Echo** affect the accessory RS-232 port. The device’s default settings (Baud 57600, Quiet Mode ON, Echo OFF) are typical for most applications, so most users will not need to know about these commands. However, they are also documented for reference on pages 14-15.

Ethernet Port Configuration

Generally, no special configuration is required for the Ethernet port. The single Ethernet port on the device may be used for both the control application and for external control. Take note of the device’s IP address (listed in the Connection Wizard), as you will need to send all commands to this address.

The commands **Set Quiet Mode** and **Set Echo** affect the Ethernet port. The device’s default settings (Quiet Mode ON, Echo OFF) are typical for most applications, so most users will not need to know about these commands. However, they are also documented for reference on pages 14-15.

Ethernet Control

The Ethernet protocol allows the use of the existing human-readable RS-232 command language over an Ethernet network. The protocol is similar to Telnet in use. However, instead of using TCP as Telnet does, it uses UDP. And, it does not use any of the options or escape sequence found in Telnet.

To use this feature, command strings following the RS-232 command language can be sent as the payload of a UDP packet. The following rules should be observed in sending commands:

- Commands should be sent to UDP port number 48630 of the proper Symetrix device's IP address. The IP address may be found using the Connection Wizard.
- Commands should be formatted exactly as defined in this document.
- Command strings may or may not include a zero termination character.
- Commands should not be broken up across multiple packets
- If high reliability communications are required, responses to commands should be analyzed for success.

Responses to commands will exhibit the following behavior:

- Responses to each command issued are returned in a single packet unless the response is larger than a single packet can hold. Responses will not have any single carriage return-terminated line broken up across packets unless there is no carriage return in the response.
- Responses are returned to the IP address and source port number that sent the packet.
- Responses follow the configuration of the port, just as if it were an RS-232 port. For example, echo mode, quite mode and deaf mode are kept independently for the RS-232 port and the Ethernet port.
- Responses do not include a zero-termination character.
- All transmissions originating from Symetrix devices will either be responses to commands or pushed data.

Each command sent to a Symetrix device contains information in the Ethernet packet header as to who sent the command, and hence, where a response will be sent. This source information is saved when a packet is received by a Symetrix device. All responses go to the last received IP address and port and this IP address and port number are saved in non-volatile memory across power cycles.

Until the first command is received, responses will not to know where they are supposed to be sent. This normally is not an issue as communication from the Symetrix device is generally a response to a command. However, if the Symetrix device is set up to push control data, it will also be pushed out this UDP port. If no valid packets have ever been received by a Symetrix device, pushed data will not be sent out the Ethernet port.

Pushing of data is not controlled independently for RS-232 and Ethernet ports. It is either enabled or disabled for both.

Note: The RS-232 serial port and the Ethernet port are essentially independent. They maintain separate settings for quiet, echo, and deaf modes. Commands sent to one port are not echoed out the other, and responses are sent only to the port from which the command was received. Hence, the two ports will not necessarily send out the same data. One exception to this is push data, which is sent out both ports in parallel.

RS-485 Control

RS-485 control is generally done using one or more of the Symetrix ARC (Adaptive Remote Controller) devices. Further discussion of RS-485 and the ARCs can be found on the Symetrix web site.

Parameter Notes

Faders

Faders can be controlled to the limits of their minimum and maximum values shown in the control application screens. A controller position of zero (0) will cause the minimum fader position to be realized. A controller position of 65535 will cause the maximum fader position to be realized. Increasing positions will move the fader linearly in dB.

Most volume faders have a range of -72dB to +12dB. In these cases, the following formula can be used to convert from controller position to dB:

Volume dB = -72 + 84*(CONTROLLER POSITION/65535)

If CONTROLLER POSITION = 0, Volume dB = OFF

Note that some faders have a different range than –72 to +12dB. In this case, the formula will depend upon the actual fader range. The more general formula is shown below:

Volume dB = MINIMUM VALUE + (MAXIMUM VALUE – MINIMUM VALUE)*(CONTROLLER POSITION/65535)

Where MINIMUM VALUE is the fader's lower limit in dB and MAXIMUM VALUE is the fader's upper limit in dB.

Buttons

Buttons such as a mute or bypass can be controlled similarly with controller positions by sending the minimum value (0) to turn the switch off (button not pushed) and sending the maximum value (65535) to turn the switch on (button pushed). In some cases, the buttons use negative logic, i.e. 0 turns it on. These exceptions are noted in the Appendix for each product.

Input Selectors

A value of zero (0) will select the first input or output and a value of (65535) will select the last input or output. Other values are selected by sending evenly spaced (linear) values as shown by the formula below:

Controller Value = (INPUT NUMBER - 1)*65535/(NUMBER OF INPUTS - 1)

Meters

Meters can be read via RS-232 or Ethernet. The read back value will be linear in dB with 65535 representing +24 dBu (0 dBFS) and 0 representing -48 dBu (-72 dBFS) (or less). The formula below can be used to calculate a dB reading from a controller value:

Level dBu = 72*(CONTROLLER VALUE/65535) - 48

If CONTROLLER VALUE = 0, Level dBu <= -48 dBU

Input and output meters in some other modules such as Compressors, and AGCs can also be read via RS-232 or Ethernet. In this case, the read back value will be linear in dB with 65535 representing the maximum value shown on the meter and 0 representing the minimum value shown on the meter (or less). The formula below can be used to calculate a dB reading from a controller value:

Level dB = (MAXIMUM VALUE - MINIMUM VALUE)*(CONTROLLER VALUE/65535) + MINIMUM VALUE

If CONTROLLER VALUE = 0, Level dB <= MINIMUM VALUE

Note: Meters are a "read-only" parameter. Attempting to change the meter value will have no effect.

Other Parameters

Many other parameters such as compression ratios, delay times, EQ settings and pans can also be controlled externally. For other parameter types, as in the above examples, sending a value of zero (0) will set the parameter to its minimum value and sending a value of (65535) will set it to its maximum value. Ratios, frequencies, width/Q, and attack/release/hold times all use a logarithmic scale. Pans and delay times use a linear scale. Quantities expressed in dB such as gains, volumes, thresholds and depths are linear in dB. When in doubt, experiment by changing a value from the control application and reading it back via RS-232 or Ethernet.

Getting Started

Protocol

The Control Protocol is a text-based (ASCII string) protocol. Commands are sent with simple character strings with terms separated by spaces and completed with a carriage return character <CR> (ASCII code decimal 13 or hex $0D). The general form for commands is:

<COMMAND> <PARAMETER> <PARAMETER> ... <CR>

A white space character (space, tab, etc.) must be included between the command and each parameter. Extra white space characters can be sent for readability if desired. In this document a single space will be used. If a command is accepted, the device will respond to each command with an acknowledgement string whose syntax varies with each command.

Control Commands

(CS) Controller Set

Use this command to move a controller position to a new absolute value. The command must specify the controller number and the new controller position. The syntax of the command is:

CS <CONTROLLER NUMBER> <CONTROLLER POSITION><CR>

Where **<CONTROLLER NUMBER>** is the decimal controller number (1-10000) listed in the Appendix for each product, and **<CONTROLLER POSITION>** is a 16-bit number in decimal (0-65535).

If the command is accepted, the device will respond with the string:

ACK<CR>

If the command is interpreted but fails for any reason the device will respond with the string:

NAK<CR>

A typical reason for failure is that the specified controller number does not exist.

(CC) Change Controller

Use this command to move a controller to a new relative value. This command will increment or decrement a controller by a specified amount. The command must specify the controller number, whether it should be incremented or decremented, and the amount to change by. The syntax of the command is:

CC <CONTROLLER NUMBER> <DEC/INC> <AMOUNT><CR>

Where **<CONTROLLER NUMBER>** is the decimal controller number (1-10000) listed in the Appendix for each product, **<DEC/INC>** is 0 to decrement and 1 to increment, and **<AMOUNT>** is the amount to increment or decrement (a decimal number, 0-65535). If the amount to be decremented or incremented causes the parameter to exceed its minimum or maximum value, the value will be limited to its minimum or maximum value. For example, if you increment a parameter by 10 and its current value is 65530, the new value will be limited to 65535.

If the command is accepted, the device will respond with the string:

ACK<CR>

If the command is interpreted but fails for any reason the device will respond with the string:

NAK<CR>

A typical reason for failure is that the specified controller number does not exist.

(GS) Get Controller

This command will return the controller position (value) associated with a specific controller number. The command must specify the controller number. The syntax of the command is:

GS <CONTROLLER NUMBER><CR>

Where **<CONTROLLER NUMBER>** is the decimal controller number (1-10000) listed in the Appendix for each product.

If the command is accepted, the device will respond with the string:

<CONTROLLER POSITION><CR>

Where controller position is a 16-bit number in decimal (0-65535)

If the command is interpreted but fails for any reason the device will respond with the string:

NAK<CR>

A typical reason for failure is that the specified controller number does not exist.

If the value being requested is a button that only has two states, the returned values will be either 0 or 65535, regardless of the actual value sent to the controller. For example, assume controller number 1 controls a mute button. If you send **CS <1> <754>**, and then **GS <1>**, it will return 0, not 754. More generally, if the parameter you are controlling has granularity coarser than the 16-bit values used, the returned values will be quantized to the granularity of the parameter. Controls where you might observe this effect are buttons as mentioned above and input selectors.

(GS2) Get Controller with Controller Number

This command will return the controller number with controller position (value) associated with it together in the same string. This command is provided at the request of AMX/Crestron programmers to make it easier to interpret and parse returned controller positions. The command must specify the controller number. The syntax of the command is:

GS2 <CONTROLLER NUMBER><CR>

Where **<CONTROLLER NUMBER>** is the decimal controller number (1-10000) listed in the Appendix for each product.

If the command is accepted, the device will respond with the string:

<CONTROLLER NUMBER> <CONTROLLER POSITION><CR>

Where controller position is a 16-bit number in decimal (0-65535)

If the command is interpreted but fails for any reason the device will respond with the string:

NAK<CR>

A typical reason for failure is that the specified controller number does not exist.

(GSB) Get Controller Block

This command will return the controller position (value) of a specific range of consecutive controller numbers. The command must specify the starting controller number and the number of consecutive controllers to return. The syntax of the command is:

"GSB <CONTROLLER NUMBER> <BLOCK SIZE><CR>"

Where **<CONTROLLER NUMBER>** is the decimal controller number (1-10000) listed in the Appendix for each product and **<BLOCK SIZE>** is the number of consecutive controllers. Note that **<BLOCK SIZE>** can be at most 256.

If the command is accepted, the device will respond with the string:

<CONTROLLER POSITION1><CR>

<CONTROLLER POSITION2><CR>

<CONTROLLER POSITION3><CR>

...

<CONTROLLER POSITIONn><CR>

Where **<CONTROLLER POSITIONn>** is a 16-bit number in decimal (0-65535), or -1 if a controller does not exist. The values will always be five digits, with leading zeros added as necessary (e.g. 7 would be returned as 00007<CR> and -1 would be returned as -0001<CR>.)

If the command is interpreted but fails for any reason the device will respond with the string:

NAK<CR>

A typical reason for failure is that the requested block size is larger than 256. For more information and tips on reading back controller numbers, see the GS command.

Example command sent:

GSB 9 3<CR>

Example Response:

32321<CR>

00256<CR>

00003<CR>

(GSB2) Get Controller Block with Controller Number

This command will return the controller number with controller position (value) associated with it for a specific range of consecutive controller numbers. The command is very similar to GSB described above, but the return string may be easier to process in some systems. The command must specify the starting controller number and the number of consecutive controllers to return. The syntax of the command is:

GSB2 <CONTROLLER NUMBER> <BLOCK SIZE><CR>

Where **<CONTROLLER NUMBER>** is the decimal controller number (1-10000) listed in the Appendix for each product and **<BLOCK SIZE>** is the number of consecutive controllers. Note that **<BLOCK SIZE>** can be at most 256.

If the command is accepted, the device will respond with the string:

#<CONTROLLER NUMBER1>=<CONTROLLER POSITION1><CR>

#<CONTROLLER NUMBER2>=<CONTROLLER POSITION2><CR>

#<CONTROLLER NUMBER3>=<CONTROLLER POSITION3><CR>

...

#<CONTROLLER NUMBERn>=<CONTROLLER POSITIONn><CR>

Where **<CONTROLLER NUMBERn>** is the decimal controller number (1-10000) listed in the Appendix for each product and **<CONTROLLER POSITIONn>** is a 16-bit number in decimal (0-65535), or -1 if a controller does not exist. The values for the controller number and position will always be five digits, with leading zeros added as necessary (e.g. 7 would be returned as 00007 and -1 would be returned as -0001).

If the command is interpreted but fails for any reason the device will respond with the string:

NAK<CR>

A typical reason for failure is that the requested block size is larger than 256. For more information and tips on reading back controller numbers, see the GS command.

Example command sent:

GSB2 9 3<CR>

Example Response:

#00009=32321<CR>

#00010=00256<CR>

#00011=00003<CR>

(GPR) Get Preset

This command will return the last preset that was loaded. The syntax of the command is:

GPR D<CR>

If the command is accepted, the device will respond with the string:

PrstD=<PRESET NUMBER><CR>

The **<PRESET NUMBER>** return value will be 0-50. A return value of 0 indicates that no preset has been recalled. The value for the preset number will always be 4 digits, with leading zeros added as necessary (e.g. 7 would be returned as 0007).

If the command is interpreted but fails for any reason, the device will respond with the string:

NAK<CR>

(LP) Load Preset

This command will load the specified preset (1-50). The syntax of the command is:

LP <PRESET NUMBER><CR>

Where **<PRESET NUMBER>** = 1-50 as defined in the control application.

If the command is accepted, the device will respond with the string:

ACK<CR>

If the command is interpreted but fails for any reason the device will respond with the string:

NAK<CR>

A typical reason for failure is that the specified preset has not been defined.

(FU) Flash Unit

This command momentarily flashes the front panel LEDs of the device. This command can be used as a quick test to verify communications. The syntax of the command is:

FU<CR>

If the command is accepted, the LEDs will flash and the device will respond with the string:

ACK<CR>

If the command is interpreted but fails for any reason the device will respond with the string:

NAK<CR>

LEDs on devices other than the one to which you are physically connected can be flashed by using the Set Device command.

Push Commands

Integrator Series devices can send out unsolicited RS-232 and Ethernet data. All parameters that can be externally controlled can be set up to automatically send out their values whenever they change. This method, referred to as pushing data, can be used instead of or in addition to polling (asking for data). When using this feature, take care that your system can handle the volume of data you set up and that it can differentiate between responses to commands and unsolicited data. Commands used to control the push feature are described below. Also, the following questions and answers provide a detailed discussion of this feature, including real-world problems and solutions.

When is data pushed?

For data to be pushed 1) the push feature must be globally enabled and 2) individual parameters must be enabled to push using the Push Enable command. Then, the controller value will be sent out 1) whenever the control's underlying parameter changes or 2) when a refresh command is issued. Regardless of if the parameter change is made via the control application, RS-232, RS-485, preset recall, analog control or any other method, the data will be pushed. This means for example that if your control system changes a controller value set up for push, you will immediately receive notification of that change.

Where (out what port) is the data pushed?

The data is sent out the accessory RS-232 port and the Ethernet port of the Symetrix device. If the device does not contain an RS-232 port, it is only sent out the Ethernet port.

What does the pushed data look like?

The format for unsolicited or "push" data is the same as the GSB2 command. Strings consist of the controller number and its value in the following format:

#<CONTROLLER NUMBER>=<CONTROLLER POSITION><CR>

Where **<CONTROLLER NUMBER>** is the decimal controller number (1-10000) listed in the Appendix for each product and **<CONTROLLER POSITION>** is a 16-bit number in decimal (0-65535). The values for the controller number and position will always be five digits, with leading zeros added as necessary (e.g. 7 would be returned as 00007).

Up to 64 strings, separated with a <CR> as shown, may be sent out together.

Example:

#00007=12321<CR>

#00324=00128<CR>

#10000=65535<CR>

Should I use the push feature or poll for parameter changes?

The decision is up to you. Use whichever method makes more sense for your application and control system. In fact, some "control-only" applications may not need to use either. For example if the only thing controlling the device is your control system, then you know when anything changes. Manual polling is often simpler to implement initially because all data from the device is a direct response to command you send it, simplifying parsing. However, in situations where a large number of parameters that change infrequently need to be monitored, pushing may make more sense. You may also prefer the convenience of not needing to set up a timer to continually poll parameters for changes. Use whatever method is appropriate for your situation.

How often is data pushed?

If there is data to be pushed, it is normally sent out every 100 milliseconds. This is called the push interval. While 100 ms is the default, the push interval can be changed via a Set Push Interval command.

Can I push meter data?

Yes, meters can be enabled for push. Keep in mind that with normal audio signals connected to a meter, the meter value will most likely be changing constantly, so you will typically see the meter data being pushed at every 100 ms interval. However, a Set Push Threshold command can be used to prevent pushes until the data differs by a specified amount (by default, this amount is 1).

How can I control the amount of data pushed?

There are several methods for controlling pushed data. First, since pushed data is enabled on a per-control basis, your first line of defense is to limit it to only certain controls. Second, pushing can be globally turned on and off using an RS-232 command. Third, pushing can be enabled for just a range of controller numbers. Fourth, the Set Push Threshold command can be used to prevent pushes until the data changes by a specified amount. Fifth, the Set Push Interval command controls how often the data is pushed, useful for meters and other data that changes frequently. Finally, the Push Refresh and Push Clear commands provide additional methods of control.

I want to refresh everything to make sure my control system is synchronized to the hardware. How can I receive all data even if it hasn't changed?

Use the Push Refresh command. Alternatively, you could use the Get Controller commands to manually ask for the controls you are concerned with.

Sometimes my control system turns off push for an extended period of time. When I turn it on, will I be notified of all changes that occurred while push was turned off?

Yes, by default, all changes made while push was off will be immediately reported as soon as it is turned on. This applies to both turning push off globally or for individual controllers via the Push Disable command. Take care that your system can handle the potentially large amount of data that can be generated. It may be helpful to "gradually" turn on the push feature, enabling a small range of controller numbers at once. You can also use the Push Clear command to deal with this scenario. It allows you to effectively ignore all previous unreported changes.

What is the difference between the Global Push Enable/Disable (PU) command and the Push Enable (PUE) and Push Disable (PUD) commands? Why are there 2 different ways to specify a range of controllers?

The Global Push Enable/Disable command can be used to completely turn off push, or turn on push for all or a single contiguous range of controller numbers. In contrast, the Push Enable/Disable command allows much finer control. Individual (non-contiguous) controllers can be turned on and off, hence multiple ranges are supported.

The reason both methods are provided is for backwards compatibility. The less flexible "single range" global PU command was added first. Later, the more flexible PUE and PUD commands were added as an enhancement. The older global method was left in so existing programs wouldn't need to be modified. We recommend that you use either one system or the other exclusively. Do not combine them. New designs should use the PUE and PUD commands and never use the PU command with a range specified.

How does push work at power-up?

When a device is first powered up, push is globally turned on but all controllers are individually disabled. All controller numbers are assumed to have changed. This means that after power-up, the first time you enable a controller to push, you will immediately receive its current value. This can be prevented by issuing a Push Clear command before issuing the Push Enable command.

I'm not receiving unsolicited data. Any suggestions for troubleshooting?

First of all, make sure that general communication is working between your control system and the Symetrix accessory serial port or Ethernet port. Make sure you can send commands and receive ACK messages. Try the Flash Unit command.

For Ethernet, make sure the Ethernet port is connected to the same network as the control system. Verify the connection LED on the Ethernet jack and/or switch is lit. Verify you can "ping" the device using its IP address.

Make sure the push feature has been globally enabled using the Global Push Enable/Disable command. Push is globally enabled on power-up, but may be turned off via RS-232 or Ethernet. Power cycling the device is a quick way to verify this.

Make sure the individual controllers have been enabled using the Push Enable command. Push is disabled for all controllers on power-up, and must be turned on via RS-232 or Ethernet. Sending a PUE command is a quick way to enable all controllers.

Make sure the parameter to be pushed is changing. Change the parameter via the control application, a Controller Set command, or other method. You can also use the Push Refresh command to force the data to be sent. If you have changed the push threshold, make sure the parameter is changing by an amount larger than the threshold.

For Ethernet, the device needs to know the proper IP address to send the data. Make sure at least one command has been sent from the control system to the device. If the control system ever changes IP addresses, another command must be sent to establish the new address.

What are the limitations of this feature?

If multiple parameters change at the same time, up to 64 controller numbers will be sent out during each push interval (default 100 ms) until all have been sent out. This maximum rate may be further limited by your RS-232 baud rate. If a large amount of data is being pushed, we recommend using the highest baud rate your system can support. A baud rate of 115200 is sufficient to prevent further limiting of the throughput.

Commands related to push:

(PU) Global Push Enable/Disable

This command enables or disables the push feature. When enabling, a range of controllers can be specified to allow pushing only certain values. Disabling is always global and prevents any unsolicited data from being pushed. The syntax of the command is:

PU <ON/OFF> [<LOW> [<HIGH>]]<CR>

Where **<ON/OFF>** is 0=OFF and 1=ON, **<LOW>** is the optional lowest controller number to push (only valid when enabling) and **<HIGH>** is the optional highest controller number to push (only valid when enabling). **<LOW>** and **<HIGH>** are both decimal controller numbers (1-10000) listed in the Appendix for each product. If no controller numbers are specified, the entire range of 1-10000 will be enabled for push. If only one controller number is specified, it is assumed to be the **<LOW>** value and the range from that number up to 10000 will be pushed. If two controller numbers are specified, the range formed by those values (including the values themselves) will be enabled for push. **<LOW>** must be less than or equal to **<HIGH>**. When enabling, the range specified overrides any previous ranges, i.e. it replaces the range, rather than adding to it.

If the command is accepted, the device will respond with the string:

ACK<CR>

If the command is interpreted but fails for any reason the device will respond with the string:

NAK<CR>

At power-on, push is always enabled. Remember that individual controller numbers must be enabled using the **Push Enable** command as well. Data is pushed whenever a change in that controller occurs or if forced to refresh using the Push Refresh command.

Note: **Global Push Enable** with a range specified, e.g. **PU 1 100 200<CR>** is not recommended. Instead, we recommend always globally enabling the entire range using **PU 1<CR>** and using the **Push Enable** command for individual control.

(PUE) Push Enable

This command enables the push feature for an individual controller or range of controllers. The syntax of the command is:

PUE [<LOW> [<HIGH>]]<CR>

Where **<LOW>** is the optional lowest controller number to push and **<HIGH>** is the optional highest controller number to push. **<LOW>** and **<HIGH>** are both decimal controller numbers (1-10000) listed in the Appendix for each product. If no controller numbers are specified, the entire range of 1-10000 will be enabled for push. If only one controller number is specified, only that controller number is enabled. If two controller numbers are specified, the range formed by those values (including the values themselves) will be enabled for push. **<LOW>** must be less than or equal to **<HIGH>**. Multiple PUE commands can be used to enable non-contiguous controller numbers since changes are additive.

If the command is accepted, the device will respond with the string:

ACK<CR>

If the command is interpreted but fails for any reason the device will respond with the string:

NAK<CR>

At power-on, push is disabled for all controllers in Integrator Series devices. Data is pushed whenever a change in an enabled controller occurs or if forced to refresh using the Push Refresh command. Changes that happen while a control is disabled will be pushed immediately upon enabling that control. The Push Disable command is the inverse of this command and provides a way to turn off controllers for push.

(PUD) Push Disable

This command enables the push feature for an individual controller or range of controllers. The syntax of the command is:

PUD [<LOW> [<HIGH>]]<CR>

Where **<LOW>** is the optional lowest controller number to stop pushing and **<HIGH>** is the optional highest controller number to stop pushing. **<LOW>** and **<HIGH>** are both decimal controller numbers (1-10000) listed in the Appendix for each product. If no controller numbers are specified, the entire range of 1-10000 will be disabled for push. If only one controller number is specified, only that controller number is disabled. If two controller numbers are specified, the range formed by those values (including the values themselves) will be disabled for push. **<LOW>** must be less than or equal to **<HIGH>**. Multiple PUD commands can be used to disable non-contiguous controller numbers since changes are subtractive.

If the command is accepted, the device will respond with the string:

ACK<CR>

If the command is interpreted but fails for any reason the device will respond with the string:

NAK<CR>

At power-on, push is disabled for all controllers in Integrator Series devices. The Push Enable command is the inverse of this command and provides a way to turn on controllers for push.

(GPU) Get Push-enabled Controllers

This command returns a list of all controllers currently enabled for push. A range may optionally be specified to limit the display to controllers enabled for push within that range. The syntax of the command is:

GPU [<LOW> [<HIGH>]]<CR>

Where **<LOW>** is the optional lowest controller number to inquire about and **<HIGH>** is the optional highest controller number to inquire about. **<LOW>** and **<HIGH>** are both decimal controller numbers (1-10000) listed in the Appendix for each product. If no controller numbers are specified, the entire range of 1-10000 will be inquired about. If only one controller number is specified, it is assumed to be the **<LOW>** value and the range from that number up to 10000 will be inquired about. If two controller numbers are specified, the range formed by those values (including the values themselves) will be inquired about. **<LOW>** must be less than or equal to **<HIGH>**.

If the command is accepted, the device will respond with a list of enabled controller numbers separated by **<CR>**. If no controllers are enabled, it returns the string:

ACK<CR>

If the command is interpreted but fails for any reason the device will respond with the string:

NAK<CR>

Special case: Entering **GPU 0<CR>** will return a list settings related to push. It begins with **Global=<0/1>** to show if push is globally enabled (1) or disabled (0). This is followed by five 5-digit values showing the settings of 1) the global lower limit, 2) the global upper limit, 3) the threshold for parameters, 4) the threshold for meters, and 5) the push interval in milliseconds. The default printout would look like this:

Global=1<CR>

00001 10000 00001 00001 00100<CR>

(PUR) Push Refresh

This command causes data to be pushed immediately even if it hasn't changed (assuming push is enabled). This may be useful when trying to synchronize a control system to the device. A range of controllers can be specified to refresh only certain values. The syntax of the command is:

PUR [<LOW> [<HIGH>]]<CR>

Where **<LOW>** is the optional lowest controller number to refresh and **<HIGH>** is the optional highest controller number to refresh. **<LOW>** and **<HIGH>** are both decimal controller numbers (1-10000) listed in the Appendix for each product. If no controller numbers are specified, the entire range of 1-10000 will be refreshed. If only one controller number is specified, it is assumed to be the **<LOW>** value and the range from that number up to 10000 will be refreshed. If two controller numbers are specified, the range formed by those values (including the values themselves) will be refreshed. **<LOW>** must be less than or equal to **<HIGH>**.

If the command is accepted, the device will respond with the string:

"ACK<CR>"

If the command is interpreted but fails for any reason the device will respond with the string:

NAK<CR>

At power-on, all controller values are assumed to have changed, so it acts as if a full refresh was performed. In addition, push must be enabled for the range of controllers you are refreshing (see **Push Enable**). Controller numbers that don't meet this criterion will not be affected by the **Push Refresh** command. In other words, if a controller is not enabled for push, refreshing it won't cause the value to be pushed even if that controller is later enabled. The controller must be enabled for push at the time the Push Refresh command is issued.

(PUC) Push Clear

This command causes previous changes in data to be ignored and not pushed. It may be desirable to issue this command when first enabling push to prevent being swamped by the flood of incoming data. A range of controllers can be specified to clear only certain values. The syntax of the command is:

PUC [<LOW> [<HIGH>]]<CR>

Where **<LOW>** is the optional lowest controller number to clear and **<HIGH>** is the optional highest controller number to clear. **<LOW>** and **<HIGH>** are both decimal controller numbers (1-10000) listed in the Appendix for each product. If no controller numbers are specified, the entire range of 1-10000 will be cleared. If only one controller number is specified, it is assumed to be the **<LOW>** value and the range from that number up to 10000 will be cleared. If two controller numbers are specified, the range formed by those values (including the values themselves) will be cleared. **<LOW>** must be less than or equal to **<HIGH>**.

If the command is accepted, the device will respond with the string:

ACK<CR>

If the command is interpreted but fails for any reason the device will respond with the string:

NAK<CR>

It may be useful to issue this command if push has been disabled for a long time and then is about to be re-enabled. Otherwise, you will immediately receive notification for all changes that occurred during the disabled time.

(PUI) Set Push Interval

This command changes the minimum length of time between consecutive pushes of data. (See "How often is data pushed?" above for more information.) At power-up, this value defaults to 100 milliseconds. The syntax of the command is:

PUI <MILLISECONDS><CR>

where **<MILLISECONDS>** is the push interval in milliseconds, between 20 ms and 30,000 ms (30 seconds).

If the command is accepted, the device will respond with the string:

ACK<CR>

If the command is interpreted but fails for any reason the device will respond with the string:

NAK<CR>

While setting a short interval can speed up the push response, it may have a negative impact on overall system performance. The shorter the interval, the more time will be spent looking for push data. This can slow down responses to other RS-232 commands and the control application. Therefore, we recommend using the longest interval that is practical, especially if data is being pushed while the control application is on-line. The default value of 100 milliseconds usually provides a good compromise between prompt reports of changing data and overall system performance.

Note that in cases where many controllers are changing rapidly, the serial baud rate may ultimately limit the update rate. Using the highest possible baud rate is recommended.

(PUT) Set Push Threshold

This command changes the push threshold value. Recall that data is only pushed when it changes. The threshold is the amount a value must change from the previous push before it is pushed again. For example, if a controller value was 10,000 and the threshold was 1,000, the data would not be pushed again until the value rose to at least 11,000 or fell to 9,000 or below.

The device actually maintains two different thresholds: one for parameter data such as faders and buttons, and another for meters (including LEDs). These two thresholds can be set to the same value or be different. It may be desirable to use a fairly large threshold for meters to avoid constant pushing of values. The power-on default for both of these values is 1.

The syntax of the command is:

PUT [<PARAMETER THRESH>] [<METER THRESH>]]<CR>

Where **<PARAMETER THRESH>** is the optional threshold for parameters other than meters (e.g. faders and buttons) and **<METER THRESH>** is the optional threshold for meters. Both values must be between 0 and 65535. If neither threshold is specified, both thresholds are set to the default of 1. If only one threshold is specified, that value is used for both the parameter and meter thresholds.

If the command is accepted, the device will respond with the string:

ACK<CR>

If the command is interpreted but fails for any reason the device will respond with the string:

NAK<CR>

Technical Note: The threshold is a "greater than or equal to" type parameter, meaning it must be met (or exceeded) to trigger a push. For example: if the threshold is 1 and the last value pushed was 10,000, then a new value of 10,001 or 9,999 would cause a push to occur. Note that it is possible to set the threshold to zero. In this case, the value will be pushed if there is any change at all to the underlying DSP variable - even if the change is so small that the pushed controller value is identical (which may happen due to the limited resolution of the 16-bit controller value scheme).

Setup Commands

Note: If you ever find yourself in a situation where you are not sure of the accessory controller port settings, you can use the control application to change the settings with the Accessory Port Settings dialog under the Tools menu. Alternatively, the rear panel reset button can be used to return the settings to factory defaults. However, that should be only used as a last resort since it also resets many other things.

(SB) Set Baud

The Set Baud command controls the accessory controller port's RS-232 baud rate.

The syntax of the command is:

SB <BAUD><CR>

Where **<BAUD>** is 1200, 2400, 4800, 9600, 19200, 38400, 57600 or 115200.

If the command is accepted, the device will respond with the string:

ACK<CR>

If the command is interpreted but fails for any reason the device will respond with the string:

NAK<CR>

The baud rate is saved in non-volatile memory. It does not need to be continually set. It will not hurt the device to be repeatedly set with the same value as it is only written if a different value is set. This command can be sent to either the Ethernet or RS-232 port, but only affects the accessory control RS-232 port. **Note:** New devices default to a baud rate of 57600.

(SQ) Set Quiet Mode

The Set Quiet Mode command controls the text output of the control port during responses. When quiet mode is turned on, it restricts the output to just ACK, NAK or simple values. All command descriptions above assume that quiet mode is turned ON. Quiet mode ON should generally be used for normal operation.

When quiet mode is set to OFF, lengthy strings intended to be read by humans are sent in response to commands. This mode is useful when using a terminal program for testing or debugging.

The syntax of the command is:

SQ <ON/OFF><CR>

Where **<ON/OFF>** is 0 = OFF, 1 = ON.

If the "SQ 0" command is accepted, the device will respond with the string:

Setting Quiet Mode to false.<CR>

If the command is interpreted but fails for any reason the device will respond with the string:

NAK<CR>

The quiet mode state is kept separately for the Ethernet port and the RS-232 port. A Set Quiet Mode command received on the Ethernet port does not affect the RS-232 port and vice versa. The quiet mode state is saved in non-volatile memory. It does not need to be continually set. It will not hurt the device to be repeatedly set with the same value as it is only written if a different value is set. Note: New devices default to quiet mode ON.

(EH) Set Echo Mode

The Set Echo Mode command controls the text output of the control port during commands. When echo mode is turned on, all characters that are received on the RS-232 or Ethernet port are sent or "echoed" back. This mode is useful when using a terminal program for testing or debugging.

When echo mode is turned off, the characters received are not echoed back. All command descriptions above assume that echo mode is turned off. Echo mode OFF should generally be used for normal operation.

The syntax of the command is:

EH <ON/OFF><CR>

Where **<ON/OFF>** is 0 = OFF, 1 = ON.

If the command is accepted, the device will respond with the string:

ACK<CR>

If the command is interpreted but fails for any reason the device will respond with the string:

NAK<CR>

The echo mode state is kept separately for the Ethernet port and the RS-232 port. A Set Echo Mode command received on the Ethernet port does not affect the RS-232 port and vice versa. The echo mode state is saved in non-volatile memory. It does not need to be continually set. It will not hurt the device to be repeatedly set with the same value as it is only written if a different value is set. Note: New devices default with echo mode OFF.

Appendix A – List of Controller Numbers for Deuce 722

The tables below show the controller numbers for parameters in the Deuce 722. They are grouped by category. The notes refer to controller values that are "unusual" in some way. In other cases, values can be calculated using the guidelines detailed previously.

722 UNIT INPUTS, TEST TONES

CONTROL	CONTROLLER NUMBER				NOTES
	DUAL MONO MODE		STEREO MODE		
	Ch 1	Ch 2	Ch 1	Ch 2	
Unit Inputs					
Analog Gain (+4, -10, etc.)	101	**1101**	101	**1101**	+4=65535, -10=49151, -20=32768, -40=16384, -50=0
ARC Audio select	N/A	**1102**	N/A	**N/A**	
Phantom	107	**1107**	107	**1107**	
Invert	108	**1108**	108	**1108**	
Digital Trim	109	**1109**	109	**1109**	
Mute	192	**1192**	192	**1192**	
Test Tones					
Bypass	195	**1195**	195		
Test Tones Active	195	**1195**	195		Negative Logic (0=on)
White/Pink/Sine Selector	196	**1196**	196		
Sine Frequency	197	**1197**	197		
Input Meters					
Main Input Meter	113	**1113**	113	**1113**	Read-only

722 BRITISH EQ

CONTROL	CONTROLLER NUMBER				NOTES
	DUAL MONO MODE		STEREO MODE		
	Ch 1	Ch 2	Ch 1	Ch 2	
British EQ					
Rumble Active	132	**1132**	132		Negative Logic (0=on)
Rumble Frequency	133	**1133**	133		
Lo Shelf Active	114	**1114**	114		Negative Logic (0=on)
Lo Shelf Frequency	115	**1115**	115		
Lo Shelf Gain	116	**1116**	116		
Lo Band Active	117	**1117**	117		Negative Logic (0=on)
Lo Band Frequency	118	**1118**	118		
Lo Band Gain	119	**1119**	119		
Lo Band Q/Width	120	**1120**	120		
Mid Band Active	121	**1121**	121		Negative Logic (0=on)
Mid Band Frequency	122	**1122**	122		
Mid Band Gain	123	**1123**	123		
Mid Band Q/Width	124	**1124**	124		
Hi Band Active	125	**1125**	125		Negative Logic (0=on)
Hi Band Frequency	126	**1126**	126		
Hi Band Gain	127	**1127**	127		
Hi Band Q/Width	128	**1128**	128		
Hi Shelf Active	129	**1129**	129		Negative Logic (0=on)
Hi Shelf Frequency	130	**1130**	130		
Hi Shelf Gain	131	**1131**	131		
Module Master					
Module Active	134	**1134**	134		Negative Logic (0=on)

722 DYNAMICS 1

CONTROL	CONTROLLER NUMBER				NOTES
	DUAL MONO MODE		STEREO MODE		
	Ch 1	Ch 2	Ch 1	Ch 2	
Gate					
Reduction Meter	200	**1200**	200		Read-only
Threshold	201	**1201**	201		
Depth	202	**1202**	202		
Attack Time	203	**1203**	203		
Hold Time	204	**1204**	204		
Release Time	205	**1205**	205		
Expander					
Reduction Meter	210	**1210**	210		Read-only
Threshold	211	**1211**	211		
Ratio	212	**1212**	212		
Attack Time	213	**1213**	213		
Release Time	214	**1214**	214		
De-Esser					
Reduction Meter	220	**1220**	220		Read-only
Response (Gentle, etc.)	221	**1221**	221		
De-Esser plus Expander					
De-Esser Reduction Meter	230	**1230**	230		Read-only
De-Esser Response (Gentle, etc.)	231	**1231**	231		
Expander Reduction Meter	240	**1240**	240		Read-only
Expander Threshold	241	**1241**	241		
Expander Ratio	242	**1242**	242		
Expander Attack Time	243	**1243**	243		
Expander Release Time	244	**1244**	244		
Compressor					
Gain	135	**1135**	135		
Knee	137	**1137**	137		

722 DYNAMICS 1... continued

CONTROL	CONTROLLER NUMBER				NOTES
	DUAL MONO MODE		STEREO MODE		
	Ch 1	Ch 2	Ch 1	Ch 2	
Compressor... continued					
Threshold	138	**1138**	138		
Ratio	139	**1139**	139		
Attack Time	140	**1140**	140		
Release Time	141	**1141**	141		
Reduction Meter	144	**1144**	144		Read-only
Split Band Compressor					
Low Band Reduction Meter	250	**1250**	250		Read-only
Low Band Knee	252	**1252**	252		
Low Band Threshold	253	**1253**	253		
Low Band Ratio	254	**1254**	254		
Low Band Attack Time	255	**1255**	255		
Low Band Release Time	256	**1256**	256		
High Band Reduction Meter	260	**1260**	260		Read-only
High Band Gain	261	**1261**	261		
High Band Knee	263	**1263**	263		
High Band Threshold	264	**1264**	264		
High Band Ratio	265	**1265**	265		
High Band Attack Time	266	**1266**	266		
High Band Release Time	267	**1267**	267		
Split Frequency	268	**1268**	268		
Module Master					
Dynamics 1 Type Selector	40	**41**	40		0=Gate, 9362=Exp, 18724=DS, 28086=DS/EXP, 37449=Comp, 46811=Split Comp
Output Meter	299	**1299**	299	**298**	Read-only
Module Active	206	**1206**	206		

722 DYNAMICS 2

CONTROL	CONTROLLER NUMBER				NOTES
	DUAL MONO MODE		STEREO MODE		
	Ch 1	Ch 2	Ch 1	Ch 2	
Compressor					
Reduction Meter	300	**1300**	300		Read-only
Output Gain	301	**1301**	301		
Knee	303	**1303**	303		
Threshold	304	**1304**	304		
Ratio	305	**1305**	305		
Attack Time	306	**1306**	306		
Release Time	307	**1307**	307		
AGC					
Detector Threshold	312	**1312**	312		
Ratio	313	**1313**	313		
Target Output Level	314	**1314**	314		
Response (Slow/Fast)	315	**1315**	315		
The Clamp					
Trigger Level	320	**1320**	320		
Recovery Time	321	**1321**	321		
"Limit" LED	322	**1322**	322		Read-only
"Clamp" LED	323	**1323**	323		Read-only
Gain Reduction Meter	324	**1324**	324		Read-only
Module Master					
Dynamics 2 Type Selector	42	**43**	42		0=Comp, 21845=AGC, 43690=Clamp
Output Meter	399	**1399**	399		Read-only
Module Active	308	**1308**	308		

722 ROUTING (SPL Computer/Mixer/Ducker) - Dual Mono Mode Only			
CONTROL	CONTROLLER NUMBER		NOTES
	DUAL MONO MODE		
	Ch 1	Ch 2	
SPL Computer			
Maximum Gain	400	1400	
Minimum Gain	401	1401	
Gain-Sense Ratio	402	1402	
Speed	403	1403	
Gap Threshold	404	1404	
Gap Time	405	1405	
Max Gap Interval	406	1406	
Force Gap Now	407	1407	
Threshold	408	1408	
Sense Level Meter	409	1409	Read-only
Reset	410	1410	
Calibrate	412	1412	
Gain Meter	413	1413	Read-only
Sense Statistics High	414	1414	Read-only
Sense Statistics Low	415	1415	Read-only
Gap Detect	416	1416	
Mixer			
Pan	424	1424	
Gain	425	1425	
Ducker			
Threshold	440	N/A	
Depth	441	N/A	
Hold Time	443	N/A	
Gain Reduction Meter	445	N/A	Read-only
Sidechain Level Meter	446	N/A	Read-only
Ducker Mix Chan. 1	454	N/A	
Ducker Mix Chan. 2	458	N/A	
Module Master			
Routing Type Selector	44	N/A	0=Mixer, 21845=Ducker, 43690=SPL
Module Active	411	N/A	

722 Balance (Stereo Mode Only)

CONTROL	CONTROLLER NUMBER	NOTES
	STEREO MODE	
Balance		
Position	426	
Width	427	
Module Master		
Module Active	411	

722 EQUALIZER/DELAY

CONTROL	CONTROLLER NUMBER			NOTES
	DUAL MONO MODE		STEREO MODE	
	Ch 1	Ch 2	Ch 1 | Ch 2	
Highpass Filter				
Frequency	533	**1533**	533	
Filter Type	534	**1534**	534	
Resonance	535	**1535**	535	
Active	536	**1536**	536	
Lo Freq Slope	537	**1537**	537	
Lowpass Filter				
Frequency	539	**1539**	539	
Filter Type	540	**1540**	540	
Resonance	541	**1541**	541	
Bypass	542	**1542**	542	
Lo Freq Slope	543	**1543**	543	
Delay				
Delay Time	546	**1546**	546	
Delay Bypass	547	**1547**	547	
8 Band Parametric EQ				
Band 1 Frequency	500	**1500**	500	
Band 1 Gain	501	**1501**	501	
Band 1 Bandwidth (Octaves)	502	**1502**	502	
Band 1 Active	503	**1503**	503	Negative Logic (0=on)
Band 2 Frequency	504	**1504**	504	

722 EQUALIZER/DELAY... continued

CONTROL	CONTROLLER NUMBER				NOTES
	DUAL MONO MODE		STEREO MODE		
	Ch 1	Ch 2	Ch 1	Ch 2	
8 Band Parametric EQ ...continued					
Band 2 Gain	505	**1505**	505		
Band 2 Bandwidth (Octaves)	506	**1506**	506		
Band 2 Active	507	**1507**	507		Negative Logic (0=on)
Band 3 Frequency	508	**1508**	508		
Band 3 Gain	509	**1509**	509		
Band 3 Bandwidth (Octaves)	510	**1510**	510		
Band 3 Active	511	**1511**	511		Negative Logic (0=on)
Band 4 Frequency	512	**1512**	512		
Band 4 Gain	513	**1513**	513		
Band 4 Bandwidth (Octaves)	514	**1514**	514		
Band 4 Active	515	**1515**	515		Negative Logic (0=on)
Band 5 Frequency	516	**1516**	516		
Band 5 Gain	517	**1517**	517		
Band 5 Bandwidth (Octaves)	518	**1518**	518		
Band 5 Active	519	**1519**	519		Negative Logic (0=on)
Band 6 Frequency	520	**1520**	520		
Band 6 Gain	521	**1521**	521		
Band 6 Bandwidth (Octaves)	522	**1522**	522		
Band 6 Active	523	**1523**	523		Negative Logic (0=on)
Band 7 Frequency	524	**1524**	524		
Band 7 Gain	525	**1525**	525		
Band 7 Bandwidth (Octaves)	526	**1526**	526		
Band 7 Active	527	**1527**	527		Negative Logic (0=on)
Band 8 Frequency	528	**1528**	528		
Band 8 Gain	529	**1529**	529		
Band 8 Bandwidth (Octaves)	530	**1530**	530		
Band 8 Active	531	**1531**	531		Negative Logic (0=on)
Parametric Equalizer Active	532	**1532**	532		Negative Logic (0=on)

722 EQUALIZER/DELAY... continued

CONTROL	CONTROLLER NUMBER				NOTES
	DUAL MONO MODE		STEREO MODE		
	Ch 1	Ch 2	Ch 1	Ch 2	
31 Band Graphic EQ					
20Hz Band Gain	550	1550	550		
25Hz Band Gain	551	1551	551		
31.5Hz Band Gain	552	1552	552		
40Hz Band Gain	553	1553	553		
50Hz Band Gain	554	1554	554		
63Hz Band Gain	555	1555	555		
80Hz Band Gain	556	1556	556		
100Hz Band Gain	557	1557	557		
125Hz Band Gain	558	1558	558		
160Hz Band Gain	559	1559	559		
200Hz Band Gain	560	1560	560		
250Hz Band Gain	561	1561	561		
315Hz Band Gain	562	1562	562		
400Hz Band Gain	563	1563	563		
500Hz Band Gain	564	1564	564		
630Hz Band Gain	565	1565	565		
800Hz Band Gain	566	1566	566		
1KHz Band Gain	567	1567	567		
1.25KHz Band Gain	568	1568	568		
1.6KHz Band Gain	569	1569	569		
2KHz Band Gain	570	1570	570		
2.5KHz Band Gain	571	1571	571		
3.15KHz Band Gain	572	1572	572		
4KHz Band Gain	573	1573	573		
5KHz Band Gain	574	1574	574		
6.3KHz Band Gain	575	1575	575		
8KHz Band Gain	576	1576	576		
10KHz Band Gain	577	1577	577		
12.5KHz Band Gain	578	1578	578		

722 EQUALIZER/DELAY... continued

CONTROL	CONTROLLER NUMBER				NOTES
	DUAL MONO MODE		STEREO MODE		
	Ch 1	Ch 2	Ch 1	Ch 2	
31 Band Graphic EQ ...continued					
16KHz Band Gain	579	**1579**	579		
20KHz Band Gain	580	**1580**	580		
Graphic Equalizer Active	581	**1581**	581		Negative Logic (0=on)
Module Master					
Invert	549	**1549**	549		
Filter Type Selector	46	**47**	46		0=Parametric EQ, 65536=Graphic EQ
Module Active	548	**1548**	548		

722 Feedback Fighter

CONTROL	CONTROLLER NUMBER				NOTES
	DUAL MONO MODE		STEREO MODE		
	Ch 1	Ch2	Ch 1	Ch2	
Feedback Fighter					
Clear	601	**1601**	601		
Lock	602	**1602**	602		
Panic Limiter Threshold	603	**1603**	603		
Panic LED	604	**1604**	604		Read-only
Maximum Notch Depth	606	**1606**	606		
Notch Step Size	607	**1607**	607		
Feedback Threshold	608	**1608**	608		
Sensitivity Radio Button	609	**1609**	609		
Filter Bandwidth Radio Button	610	**1610**	610		
Number of Fixed Filters	611	**1611**	611		
Filter Recycle Enable	605	**1605**	605		
Recycle Delay	612	**1612**	612		
Band 1 Frequency	660	**1660**	660		
Band 2 Frequency	661	**1661**	661		
Band 3 Frequency	662	**1662**	662		
Band 4 Frequency	663	**1663**	663		

722 FEEDBACK FIGHTER... continued

CONTROL	CONTROLLER NUMBER				NOTES
	DUAL MONO MODE		STEREO MODE		
	Ch 1	Ch 2	Ch 1	Ch 2	
Feedback Fighter ...continued					
Band 5 Frequency	664	**1664**	664		
Band 6 Frequency	665	**1665**	665		
Band 7 Frequency	666	**1666**	666		
Band 8 Frequency	667	**1667**	667		
Band 9 Frequency	668	**1668**	668		
Band 10 Frequency	669	**1669**	669		
Band 11 Frequency	670	**1670**	670		
Band 12 Frequency	671	**1671**	671		
Band 13 Frequency	672	**1672**	672		
Band 14 Frequency	673	**1673**	673		
Band 15 Frequency	674	**1674**	674		
Band 16 Frequency	675	**1675**	675		
Band 1 Gain	676	**1676**	676		
Band 2 Gain	677	**1677**	677		
Band 3 Gain	678	**1678**	678		
Band 4 Gain	679	**1679**	679		
Band 5 Gain	680	**1680**	680		
Band 6 Gain	681	**1681**	681		
Band 7 Gain	682	**1682**	682		
Band 8 Gain	683	**1683**	683		
Band 9 Gain	684	**1684**	684		
Band 10 Gain	685	**1685**	685		
Band 11 Gain	686	**1686**	686		
Band 12 Gain	687	**1687**	687		
Band 13 Gain	688	**1688**	688		
Band 14 Gain	689	**1689**	689		
Band 15 Gain	690	**1690**	690		
Band 16 Gain	691	**1691**	691		
Module Master					
Module Active	600	**1600**	600		Negative Logic (0=on)

722 OUTPUT LIMITER

CONTROL	CONTROLLER NUMBER				NOTES
	DUAL MONO MODE		STEREO MODE		
	Ch 1	Ch 2	Ch 1	Ch 2	
Limiter					
Threshold	621	**1621**	621		
Release Time	622	**1622**	622		
Reduction Meter	623	**1623**	623		Read-only
Module Master					
Output Meter	631	**1631**	631	**632**	Read-only
Module Active	630	**1630**	630		

722 UNIT OUTPUTS

CONTROL	CONTROLLER NUMBER				NOTES
	DUAL MONO MODE		STEREO MODE		
	Ch 1	Ch 2	Ch 1	Ch 2	
Unit Outputs					
Output Mute	653	**1653**	653	**657**	
Output Gain	654	**1654**	654	**658**	
Master Mute	N/A	**N/A**	652		
Master Fader	N/A	**N/A**	651		
+4/-10 Radio Button	655	**1655**	655		+4=0, -10=65535
Output Meters					
Main Output Meter	2108	**2208**	2108	**2208**	Read-only

722 LINKED CONTROLS - these controls affect two parameters with a single controller number

CONTROL	CONTROLLER NUMBER			NOTES
	DUAL MONO MODE		STEREO MODE	
	Ch 1	Ch 2	Ch 1 | Ch 2	
Unit Outputs				
Output Gain	9200		**N/A**	
Output Mute	9201		**N/A**	
Output Gain				
Master Mute (all channels)	9999		**9999**	

Integrator SeriesController Numbers

Appendix B – List of Controller Numbers for Zone Mix 760 / 761

The tables below show the controller numbers for parameters in the Zone Mix 760 and 761. They are grouped by category. The notes refer to controller values that are “unusual” in some way. In other cases, values can be calculated using the guidelines detailed previously.

ZONE MIX 760 / 761 INPUT PROCESSING

CONTROL	CONTROLLER NUMBER (by Input)												NOTES
	1	2	3	4	5	6	7	8	9	10	11	12	
Inputs and Trim													
Analog Gain (+4, -10, etc. For 760, Mic/Line for 761)	101	**201**	301	**401**	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	Mic = 65535, Line = 0 on the 761
ARC Audio select	N/A	**N/A**	N/A	**406**	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	
Phantom Power	107	**207**	307	**407**	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	
Invert	108	**208**	308	**408**	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	
Digital Trim	109	**209**	309	**409**	509	**609**	709	**809**	909	**1009**	1109	**1209**	
Noise Active	195	**295**	395	**N/A**	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	
Pink/White Selector	196	**296**	396	**N/A**	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	
Main Input Meter	113	**213**	313	**413**	513	**613**	713	**813**	913	**1013**	1113	**1213**	Read-only
Input Equalizer													
Lo Shelf Active	114	**214**	314	**414**	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	Negative Logic (0=on)
Lo Shelf Frequency	115	**215**	315	**415**	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	
Lo Shelf Gain	116	**216**	316	**416**	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	
Lo Band Active	117	**217**	317	**417**	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	Negative Logic (0=on)
Lo Band Frequency	118	**218**	318	**418**	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	
Lo Band Gain	119	**219**	319	**419**	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	
Lo Band Q/Width	120	**220**	320	**420**	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	
Mid Band Active	121	**221**	321	**421**	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	Negative Logic (0=on)
Mid Band Frequency	122	**222**	322	**422**	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	
Mid Band Gain	123	**223**	323	**423**	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	
Mid Band Q/Width	124	**224**	324	**424**	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	
Hi Band Active	125	**225**	325	**425**	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	Negative Logic (0=on)
Hi Band Frequency	126	**226**	326	**426**	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	

ZONE MIX 760 / 761 INPUT PROCESSING... continued

CONTROL	CONTROLLER NUMBER (by Input)												NOTES
	1	2	3	4	5	6	7	8	9	10	11	12	
Inputs and Equalizer... continued													
Hi Band Gain	127	227	327	427	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Hi Band Q/Width	128	228	328	428	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Hi Shelf Active	129	229	329	429	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Negative Logic (0=on)
Hi Shelf Frequency	130	230	330	430	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Hi Shelf Gain	131	231	331	431	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Rumble Active	132	232	332	432	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Negative Logic (0=on)
Rumble Frequency	133	233	333	433	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Main Active	134	234	334	434	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Negative Logic (0=on)
Compressor													
Output Gain	135	235	335	435	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Output Meter	136	236	336	436	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Read-only
Knee	137	237	337	437	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Threshold	138	238	338	438	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Ratio	139	239	339	439	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Attack Time	140	240	340	440	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Release Time	141	241	341	441	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Active Button	142	242	342	442	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Negative Logic (0=on)
Gain Reduction Meter	144	244	344	444	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Read-only
AGC													
Input Meter	N/A	N/A	N/A	N/A	544	644	744	844	944	1044	1144	1244	Read-only
Output Meter	N/A	N/A	N/A	N/A	545	645	745	845	945	1045	1145	1245	Read-only
Target Output Level Fader	N/A	N/A	N/A	N/A	548	648	748	848	948	1048	1148	1248	
Active Button	N/A	N/A	N/A	N/A	550	650	750	850	950	1050	1150	1250	Negative Logic (0=on)
Feedback Fighter													
Active Button	152	252	352	452	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Negative Logic (0=on)
Clear Button	153	253	353	453	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Lock Button	154	254	354	454	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Panic Limiter Threshold	155	255	355	455	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	

ZONE MIX 760 / 761 INPUT PROCESSING... continued

CONTROL	CONTROLLER NUMBER (by Input)												NOTES
	1	2	3	4	5	6	7	8	9	10	11	12	
Feedback Fighter... continued													
Panic LED	156	**256**	356	**456**	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	Read-only
Enable Button	157	**257**	357	**457**	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	
Notch Depth	158	**258**	358	**458**	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	
Notch Step	159	**259**	359	**459**	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	
Feedback Threshold	160	**260**	360	**460**	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	
Sensitivity Radio Button	161	**261**	361	**461**	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	
Bandwidth Radio Button	162	**262**	362	**462**	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	
Fixed Filters	163	**263**	363	**463**	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	
Recycle Delay	164	**264**	364	**464**	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	
Band 1 Frequency	165	**265**	365	**465**	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	
Band 1 Gain	166	**266**	366	**466**	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	
Band 2 Frequency	167	**267**	367	**467**	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	
Band 2 Gain	168	**268**	368	**468**	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	
Band 3 Frequency	169	**269**	369	**469**	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	
Band 3 Gain	170	**270**	370	**470**	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	
Band 4 Frequency	171	**271**	371	**471**	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	
Band 4 Gain	172	**272**	372	**472**	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	
Band 5 Frequency	173	**273**	373	**473**	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	
Band 5 Gain	174	**274**	374	**474**	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	
Band 6 Frequency	175	**275**	375	**475**	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	
Band 6 Gain	176	**276**	376	**476**	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	
Band 7 Frequency	177	**277**	377	**477**	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	
Band 7 Gain	178	**278**	378	**478**	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	
Band 8 Frequency	179	**279**	379	**479**	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	
Band 8 Gain	180	**280**	380	**480**	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	
Main Mix Gain													
Channel Fader	190	**290**	390	**490**	590	**690**	790	**890**	990	**1090**	1190	**1290**	
Channel Mute	192	**292**	392	**492**	592	**692**	792	**892**	992	**1092**	1192	**1292**	

ZONE MIX 760 / 761 OUTPUT PROCESSING

CONTROL	CONTROLLER NUMBER (by Output)						NOTES
	1	2	3	4	5	6	
Unit Outputs							
+4/-10 Radio Button	2101	**2201**	2301	**2401**	2501	**2601**	+4=32768, -10=16677
Output Gain	2104	**2204**	2304	**2404**	2504	**2604**	
Output Mute	2106	**2206**	2306	**2406**	2506	**2606**	
Main Output Meter	2108	**2208**	2308	**2408**	2508	**2608**	Read-only
Output Route							
Output Route	2181	**2281**	2381	**2481**	2581	**2681**	Zone 1 Connect
Output Route	2182	**2282**	2382	**2482**	2582	**2682**	Zone 2 Connect
Output Route	2183	**2283**	2383	**2483**	2583	**2683**	Zone 3 Connect
Output Route	2184	**2284**	2384	**2484**	2584	**2684**	Zone 4 Connect
Output Route	2185	**2285**	2385	**2485**	2585	**2685**	Zone 5 Connect
Output Route	2186	**2286**	2386	**2486**	2586	**2686**	Zone 6 Connect
Loudspeaker Manager							
Band 1 Frequency	2111	**2211**	2311	**2411**	2511	**2611**	
Band 1 Gain	2112	**2212**	2312	**2412**	2512	**2612**	
Band 1 Q	2113	**2213**	2313	**2413**	2513	**2613**	
Band 1 Active	2114	**2214**	2314	**2414**	2514	**2614**	Negative Logic (0=on)
Band 2 Frequency	2115	**2215**	2315	**2415**	2515	**2615**	
Band 2 Gain	2116	**2216**	2316	**2416**	2516	**2616**	
Band 2 Q	2117	**2217**	2317	**2417**	2517	**2617**	
Band 2 Active	2118	**2218**	2318	**2418**	2518	**2618**	Negative Logic (0=on)
Band 3 Frequency	2119	**2219**	2319	**2419**	2519	**2619**	
Band 3 Gain	2120	**2220**	2320	**2420**	2520	**2620**	
Band 3 Q	2121	**2221**	2321	**2421**	2521	**2621**	
Band 3 Active	2122	**2222**	2322	**2422**	2522	**2622**	Negative Logic (0=on)
Band 4 Frequency	2123	**2223**	2323	**2423**	2523	**2623**	
Band 4 Gain	2124	**2224**	2324	**2424**	2524	**2624**	
Band 4 Q	2125	**2225**	2325	**2425**	2525	**2625**	
Band 4 Active	2126	**2226**	2326	**2426**	2526	**2626**	Negative Logic (0=on)
Band 5 Frequency	2127	**2227**	2327	**2427**	2527	**2627**	
Band 5 Gain	2128	**2228**	2328	**2428**	2528	**2628**	
Band 5 Q	2129	**2229**	2329	**2429**	2529	**2629**	
Band 5 Active	2130	**2230**	2330	**2430**	2530	**2630**	Negative Logic (0=on)

ZONE MIX 760 / 761 OUTPUT PROCESSING... continued

CONTROL	CONTROLLER NUMBER (by Output)						NOTES
	1	2	3	4	5	6	
Loudspeaker Manager... continued							
Band 6 Frequency	2131	**2231**	2331	**2431**	2531	**2631**	
Band 6 Gain	2132	**2232**	2332	**2432**	2532	**2632**	
Band 6 Q	2133	**2233**	2333	**2433**	2533	**2633**	
Band 6 Active	2134	**2234**	2334	**2434**	2534	**2634**	Negative Logic (0=on)
Band 7 Frequency	2135	**2235**	2335	**2435**	2535	**2635**	
Band 7 Gain	2136	**2236**	2336	**2436**	2536	**2636**	
Band 7 Q	2137	**2237**	2337	**2437**	2537	**2637**	
Band 7 Active	2138	**2238**	2338	**2438**	2538	**2638**	Negative Logic (0=on)
Band 8 Frequency	2139	**2239**	2339	**2439**	2539	**2639**	
Band 8 Gain	2140	**2240**	2340	**2440**	2540	**2640**	
Band 8 Q	2141	**2241**	2341	**2441**	2541	**2641**	
Band 8 Active	2142	**2242**	2342	**2442**	2542	**2642**	Negative Logic (0=on)
Highpass Frequency	2143	**2243**	2343	**2443**	2543	**2643**	
Highpass Slope Button	2144	**2244**	2344	**2444**	2544	**2644**	
Highpass Filter Type	2145	**2245**	2345	**2445**	2545	**2645**	
Highpass Resonance	2146	**2246**	2346	**2446**	2546	**2646**	
Highpass Active	2147	**2247**	2347	**2447**	2547	**2647**	Negative Logic (0=on)
Lowpass Frequency	2148	**2248**	2348	**2448**	2548	**2648**	
Lowpass Slope Button	2149	**2249**	2349	**2449**	2549	**2649**	
Lowpass Filter Type	2150	**2250**	2350	**2450**	2550	**2650**	
Lowpass Resonance	2151	**2251**	2351	**2451**	2551	**2651**	
Lowpass Active	2152	**2252**	2352	**2452**	2552	**2652**	Negative Logic (0=on)
Delay Time	2153	**2253**	2353	**2453**	2553	**2653**	
Delay Active	2154	**2254**	2354	**2454**	2554	**2654**	Negative Logic (0=on)
Invert	2156	**2256**	2356	**2456**	2556	**2656**	
Main Active	2158	**2258**	2358	**2458**	2558	**2658**	Negative Logic (0=on)
Limiter							
Threshold	2171	**2271**	2371	**2471**	2571	**2671**	
Release Time	2172	**2272**	2372	**2472**	2572	**2672**	
Reduction Meter	2173	**2273**	2373	**2473**	2573	**2673**	Read-only
Active	2174	**2274**	2374	**2474**	2574	**2674**	Read-only

ZONE MIX 760 / 761 ZONE PROCESSING

CONTROL	CONTROLLER NUMBER (by Zone)						Notes
	1	2	3	4	5	6	
Zone Mix							
Input 1 Gain	6101	**6117**	6133	**6149**	6165	**6181**	
Input 2 Gain	6102	**6118**	6134	**6150**	6166	**6182**	
Input 3 Gain	6103	**6119**	6135	**6151**	6167	**6183**	
Input 4 Gain	6104	**6120**	6136	**6152**	6168	**6184**	
Input 5 Gain	6105	**6121**	6137	**6153**	6169	**6185**	
Input 6 Gain	6106	**6122**	6138	**6154**	6170	**6186**	
Input 7 Gain	6107	**6123**	6139	**6155**	6171	**6187**	
Input 8 Gain	6108	**6124**	6140	**6156**	6172	**6188**	
Input 9 Gain	6109	**6125**	6141	**6157**	6173	**6189**	
Input 10 Gain	6110	**6126**	6142	**6158**	6174	**6190**	
Input 11 Gain	6111	**6127**	6143	**6159**	6175	**6191**	
Input 12 Gain	6112	**6128**	6144	**6160**	6176	**6192**	
Input 1 Mute	6301	**6317**	6333	**6349**	6365	**6381**	Negative Logic (0=muted)
Input 2 Mute	6302	**6318**	6334	**6350**	6366	**6382**	Negative Logic (0=muted)
Input 3 Mute	6303	**6319**	6335	**6351**	6367	**6383**	Negative Logic (0=muted)
Input 4 Mute	6304	**6320**	6336	**6352**	6368	**6384**	Negative Logic (0=muted)
Input 5 Mute	6305	**6321**	6337	**6353**	6369	**6385**	Negative Logic (0=muted)
Input 6 Mute	6306	**6322**	6338	**6354**	6370	**6386**	Negative Logic (0=muted)
Input 7 Mute	6307	**6323**	6339	**6355**	6371	**6387**	Negative Logic (0=muted)
Input 8 Mute	6308	**6324**	6340	**6356**	6372	**6388**	Negative Logic (0=muted)
Input 9 Mute	6309	**6325**	6341	**6357**	6373	**6389**	Negative Logic (0=muted)
Input 10 Mute	6310	**6326**	6342	**6358**	6374	**6390**	Negative Logic (0=muted)
Input 11 Mute	6311	**6327**	6343	**6359**	6375	**6391**	Negative Logic (0=muted)
Input 12 Mute	6312	**6328**	6344	**6360**	6376	**6392**	Negative Logic (0=muted)
Station Priority							
Threshold	7101	**7201**	7301	**7401**	7501	**7601**	
Hold Time	7102	**7202**	7302	**7402**	7502	**7602**	
Input 1 Priority	7104	**7204**	7304	**7404**	7504	**7604**	
Input 2 Priority	7105	**7205**	7305	**7405**	7505	**7605**	

ZONE MIX 760 / 761 ZONE PROCESSING... continued

CONTROL	CONTROLLER NUMBER (by Zone)						Notes
	1	2	3	4	5	6	
Station Priority... continued							
Input 3 Priority	7106	**7206**	7306	**7406**	7506	**7606**	
Active Station Indicator	7108	**7208**	7308	**7408**	7508	**7608**	Read-only
Program Ducker #1							
Threshold	7116	**7216**	7316	**7416**	7516	**7616**	
Depth	7117	**7217**	7317	**7417**	7517	**7617**	
Hold Time	7119	**7219**	7319	**7419**	7519	**7619**	
Gain Reduction Meter	7121	**7221**	7321	**7421**	7521	**7621**	Read-only
Program Ducker #2							
Threshold	7124	**7224**	7324	**7424**	7524	**7624**	
Depth	7125	**7225**	7325	**7425**	7525	**7625**	
Hold Time	7127	**7227**	7327	**7427**	7527	**7627**	
Gain Reduction Meter	7129	**7229**	7329	**7429**	7529	**7629**	Read-only
Sources/Levels							
Program 1 Level	7131	**7231**	7331	**7431**	7531	**7631**	
Program 2 Level	7132	**7232**	7332	**7432**	7532	**7632**	
Page Level	7133	**7233**	7333	**7433**	7533	**7633**	
Program 1 Selector	21 / 61	**23 / 63**	25 / 65	**27 / 67**	29 / 69	**31 / 71**	760 / 761
Program 2 Selector	22 / 62	**24 / 64**	26 / 66	**28 / 68**	30 / 70	**32 / 72**	760 / 761
SPL Computer							
Sense Input Source	37 / 77	**38 / 78**	39 / 79	**N/A**	N/A	**N/A**	760 / 761
Maximum Gain	7135	**7235**	7335	**N/A**	N/A	**N/A**	
Minimum Gain	7136	**7236**	7336	**N/A**	N/A	**N/A**	
Gain-Sense Ratio	7137	**7237**	7337	**N/A**	N/A	**N/A**	
Speed	7138	**7238**	7338	**N/A**	N/A	**N/A**	
Gap Threshold	7139	**7239**	7339	**N/A**	N/A	**N/A**	
Gap Time	7140	**7240**	7340	**N/A**	N/A	**N/A**	
Max Gap Interval	7141	**7241**	7341	**N/A**	N/A	**N/A**	
Force Gap Now Button	7142	**7242**	7342	**N/A**	N/A	**N/A**	

ZONE MIX 760 / 761 ZONE PROCESSING... continued

CONTROL	CONTROLLER NUMBER (by Zone)						Notes
	1	2	3	4	5	6	
SPL Computer... continued							
Threshold	7143	**7243**	7343	**N/A**	N/A	**N/A**	
Sense Level Meter	7144	**7244**	7344	**N/A**	N/A	**N/A**	Read-only
Reset Statistics	7145	**7245**	7345	**N/A**	N/A	**N/A**	
Active	7146	**7246**	7346	**N/A**	N/A	**N/A**	Negative Logic (0=muted)
Gain Meter	7171	**7271**	7371	**N/A**	N/A	**N/A**	Read-only
Gap Detect LED	7172	**7272**	7372	**N/A**	N/A	**N/A**	Read-only
Sense Statistics Low	7173	**7273**	7373	**N/A**	N/A	**N/A**	Read-only
Sense Statistics High	7174	**7274**	7374	**N/A**	N/A	**N/A**	Read-only
Auto-Set Button	7175	**7275**	7375	**N/A**	N/A	**N/A**	
Zone Source Meters							
Program 1 Meter	7178	**7278**	7378	**7478**	7578	**7678**	Read-only
Program 2 Meter	7179	**7279**	7379	**7479**	7579	**7679**	Read-only
Page Meter	7180	**7280**	7380	**7480**	7580	**7680**	Read-only
Zone Output Meter (pre-SPL)	7181	**7281**	7381	**7481**	7581	**7681**	Read-only
Zone Master							
Main Zone Gain	7147	**7247**	7347	**7447**	7547	**7647**	
Main Zone Mute	7148	**7248**	7348	**7448**	7548	**7648**	
Main Zone Meter	7151	**7251**	7351	**7451**	7551	**7651**	Read-only

ZONE MIX 760 / 761 LINKED CONTROLS

CONTROL	CONTROLLER # FOR LINKED CHANNELS								
	Ch 1,2	Ch 3,4	Ch 5,6	Ch 1,2,3	Ch 4,5,6	Ch 3-6	Ch 1-4	Ch 1-5	Ch 1-6
Main Zone Volumes									
Main Zone Volumes	9340	**9342**	9344	**9350**	9352	**9360**	9362	**9370**	9374
Main Zone Mutes	9341	**9343**	9345	**9351**	9353	**9361**	9363	**9371**	9375
Output Volumes									
Output Volumes	9300	**9302**	9304	**9310**	9312	**9320**	9322	**9330**	9334
Output Mutes	9301	**9303**	9305	**9311**	9313	**9321**	9323	**9331**	9335
Master Mute (all channels)									
Master Mute (all channels)	9999								

ZONE MIX 760 / 761 PAGING STATIONS				
CONTROL	CONTROLLER NUMBER by station #			Notes
	1	2	3	
Station Routing				
Push to Talk Button	8101	**8201**	8301	
Output 1 Enable	8151	**8251**	8351	
Output 2 Enable	8152	**8252**	8352	
Output 3 Enable	8153	**8253**	8353	
Output 4 Enable	8154	**8254**	8354	
Output 5 Enable	8155	**8255**	8355	
Output 6 Enable	8156	**8256**	8356	
Station Source Selector	33 / 73	**34 / 74**	35 / 75	760 / 761
Station Active LEDs (761 Only)				
Zone 1	7191	**7192**	7193	Read-only
Zone 2	7291	**7292**	7293	Read-only
Zone 3	7391	**7392**	7393	Read-only
Zone 4	7491	**7492**	7493	Read-only
Zone 5	7591	**7592**	7593	Read-only
Zone 6	7691	**7692**	7693	Read-only

ZONE MIX 761 LOGIC OUTPUTS					
Control	Controller Number (by Output)				Notes
	1	2	3	4	
Current Value	31	**32**	33	**34**	Ignores polarity

Integrator Series Controller Numbers

Appendix C – List of Controller Numbers for Automix Matrix 780

The tables below show the controller numbers for parameters in the Automix Matrix. They are grouped by category. The notes refer to controller values that are "unusual" in some way. In other cases, values can be calculated using the guidelines detailed previously.

INPUT PROCESSING

Control	CONTROLLER NUMBER (by Input)												Notes
	1	2	3	4	5	6	7	8	9	10	11	12	
Inputs and Trim													
Analog Gain (Mic/ Line)	101	**201**	301	**401**	501	**601**	701	**801**	N/A	**N/A**	N/A	**N/A**	0=Line
ARC Audio select	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	N/A	**806**	N/A	**N/A**	N/A	**N/A**	
Phantom Power	107	**207**	307	**407**	507	**607**	707	**807**	N/A	**N/A**	N/A	**N/A**	
Invert	108	**208**	308	**408**	508	**608**	708	**808**	908	**1008**	1108	**1208**	
Digital Trim	109	**209**	309	**409**	509	**609**	709	**809**	909	**1009**	1109	**1209**	
Noise Active	195	**295**	395	**495**	595	**695**	795	**895**	995	**1095**	1195	**1295**	
Main Input Meter	113	**213**	313	**413**	513	**613**	713	**813**	913	**1013**	1113	**1213**	Read-only
Input Equalizer													
Lo Shelf Active	114	**214**	314	**414**	514	**614**	714	**814**	914	**1014**	1114	**1214**	Negative Logic (0=on)
Lo Shelf Frequency	115	**215**	315	**415**	515	**615**	715	**815**	915	**1015**	1115	**1215**	
Lo Shelf Gain	116	**216**	316	**416**	516	**616**	716	**816**	916	**1016**	1116	**1216**	
Lo Band Active	117	**217**	317	**417**	517	**617**	717	**817**	917	**1017**	1117	**1217**	Negative Logic (0=on)
Lo Band Frequency	118	**218**	318	**418**	518	**618**	718	**818**	918	**1018**	1118	**1218**	
Lo Band Gain	119	**219**	319	**419**	519	**619**	719	**819**	919	**1019**	1119	**1219**	
Lo Band Q/Width	120	**220**	320	**420**	520	**620**	720	**820**	920	**1020**	1120	**1220**	
Mid Band Active	121	**221**	321	**421**	521	**621**	721	**821**	921	**1021**	1121	**1221**	Negative Logic (0=on)
Mid Band Frequency	122	**222**	322	**422**	522	**622**	722	**822**	922	**1022**	1122	**1222**	
Mid Band Gain	123	**223**	323	**423**	523	**623**	723	**823**	923	**1023**	1123	**1223**	
Mid Band Q/Width	124	**224**	324	**424**	524	**624**	724	**824**	924	**1024**	1124	**1224**	
Hi Band Active	125	**225**	325	**425**	525	**625**	725	**825**	925	**1025**	1125	**1225**	Negative Logic (0=on)
Hi Band Frequency	126	**226**	326	**426**	526	**626**	726	**826**	926	**1026**	1126	**1226**	
Hi Band Gain	127	**227**	327	**427**	527	**627**	727	**827**	927	**1027**	1127	**1227**	

INPUT PROCESSING... continued

Control	CONTROLLER NUMBER (by Input)												Notes
	1	2	3	4	5	6	7	8	9	10	11	12	
Input Equalizer... continued													
Hi Band Q/Width	128	**228**	328	**428**	528	**628**	728	**828**	928	**1028**	1128	**1228**	
Hi Shelf Active	129	**229**	329	**429**	529	**629**	729	**829**	929	**1029**	1129	**1229**	Negative Logic (0=on)
Hi Shelf Frequency	130	**230**	330	**430**	530	**630**	730	**830**	930	**1030**	1130	**1230**	
Hi Shelf Gain	131	**231**	331	**431**	531	**631**	731	**831**	931	**1031**	1131	**1231**	
Rumble Active	132	**232**	332	**432**	532	**632**	732	**832**	932	**1032**	1132	**1232**	Negative Logic (0=on)
Rumble Frequency	133	**233**	333	**433**	533	**633**	733	**833**	933	**1033**	1133	**1233**	
Main Active	134	**234**	334	**434**	534	**634**	734	**834**	934	**1034**	1134	**1234**	Negative Logic (0=on)
Compressor													
Outpug Gain	135	**235**	335	**435**	535	**635**	735	**835**	N/A	**N/A**	N/A	**N/A**	
Output Meter	136	**236**	336	**436**	536	**636**	736	**836**	N/A	**N/A**	N/A	**N/A**	Read-only
Knee	137	**237**	337	**437**	537	**637**	737	**837**	N/A	**N/A**	N/A	**N/A**	
Threshold	138	**238**	338	**438**	538	**638**	738	**838**	N/A	**N/A**	N/A	**N/A**	
Ratio	139	**239**	339	**439**	539	**639**	739	**839**	N/A	**N/A**	N/A	**N/A**	
Attack Time	140	**240**	340	**440**	540	**640**	740	**840**	N/A	**N/A**	N/A	**N/A**	
Release Time	141	**241**	341	**441**	541	**641**	741	**841**	N/A	**N/A**	N/A	**N/A**	
Active Button	142	**242**	342	**442**	542	**642**	742	**842**	N/A	**N/A**	N/A	**N/A**	Negative Logic (0=on)
Gain Reduction Meter	144	**244**	344	**444**	544	**644**	744	**844**	N/A	**N/A**	N/A	**N/A**	Read-only
AGC													
Input Meter	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	944	**1044**	1144	**1244**	Read-only
Output Meter	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	945	**1045**	1145	**1245**	Read-only
Target Output Level Fader	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	948	**1048**	1148	**1248**	
Active Button	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	950	**1050**	1150	**1250**	Negative Logic (0=on)
Feedback Fighter													
Active Button	152	**252**	352	**452**	552	**652**	752	**852**	852	**852**	852	**852**	Negative Logic (0=on)
Clear Button	153	**253**	353	**453**	553	**653**	753	**853**	852	**852**	852	**852**	
Lock Button	154	**254**	354	**454**	554	**654**	754	**854**	852	**852**	852	**852**	
Panic Limiter Threshold	155	**255**	355	**455**	555	**655**	755	**855**	852	**852**	852	**852**	

INPUT PROCESSING... continued

Control	CONTROLLER NUMBER (by Input)												Notes
	1	2	3	4	5	6	7	8	9	10	11	12	
Feedback Fighter... continued													
Panic LED	156	256	356	456	556	656	756	856	852	852	852	852	
Enable Button	157	257	357	457	557	657	757	857	852	852	852	852	
Notch Depth	158	258	358	458	558	658	758	858	852	852	852	852	
Notch Step	159	259	359	459	559	659	759	859	852	852	852	852	
Feedback Threshold	160	260	360	460	560	660	760	860	852	852	852	852	
Sensitivity Radio Button	161	261	361	461	561	661	761	861	852	852	852	852	
Bandwidth Radio Button	162	262	362	462	562	662	762	862	852	852	852	852	
Fixed Filters	163	263	363	463	563	663	763	863	852	852	852	852	
Recycle Delay	164	264	364	464	564	664	764	864	852	852	852	852	
Band 1 Frequency	165	265	365	465	565	665	765	865	852	852	852	852	
Band 1 Gain	166	266	366	466	566	666	766	866	852	852	852	852	
Band 2 Frequency	167	267	367	467	567	667	767	867	852	852	852	852	
Band 2 Gain	168	268	368	468	568	668	768	868	852	852	852	852	
Band 3 Frequency	169	269	369	469	569	669	769	869	852	852	852	852	
Band 3 Gain	170	270	370	470	570	670	770	870	852	852	852	852	
Band 4 Frequency	171	271	371	471	571	671	771	871	852	852	852	852	
Band 4 Gain	172	272	372	472	572	672	772	872	852	852	852	852	
Band 5 Frequency	173	273	373	473	573	673	773	873	852	852	852	852	
Band 5 Gain	174	274	374	474	574	674	774	874	852	852	852	852	
Band 6 Frequency	175	275	375	475	575	675	775	875	852	852	852	852	
Band 6 Gain	176	276	376	476	576	676	776	876	852	852	852	852	
Band 7 Frequency	177	277	377	477	577	677	777	877	852	852	852	852	
Band 7 Gain	178	278	378	478	578	678	778	878	852	852	852	852	
Band 8 Frequency	179	279	379	479	579	679	779	879	852	852	852	852	
Band 8 Gain	180	280	380	480	580	680	780	880	852	852	852	852	

INPUT PROCESSING... continued

Control	CONTROLLER NUMBER (by Input)												Notes
	1	2	3	4	5	6	7	8	9	10	11	12	
Automixer Channels													
Channel Fader	190	**290**	390	**490**	590	**690**	790	**890**	990	**1090**	1190	**1290**	
Channel Auto Button	191	**291**	391	**491**	591	**691**	791	**891**	991	**1091**	1191	**1291**	
Channel Mute Button	192	**292**	392	**492**	592	**692**	792	**892**	992	**1092**	1192	**1292**	
Channel Automix Priority	193	**293**	393	**493**	593	**693**	793	**893**	993	**1093**	1193	**1293**	
Channel On LED	194	**294**	394	**494**	594	**694**	794	**894**	994	**1094**	1194	**1294**	Gating only
Channel Gain Meter	196	**296**	396	**496**	596	**696**	796	**896**	996	**1096**	1196	**1296**	Gain-sharing only (continuous value, requires processing)
Post-Automix Meter	199	**299**	399	**499**	599	**699**	799	**899**	999	**1099**	1199	**1299**	

AUTOMIXER MASTER PARAMETERS

Control	Controller Number	Notes
Gating Automixer		
Hold time	**1301**	
Off Gain	**1302**	
Sensitivity	**1303**	
NOM Attenuation	**1304**	
NOM Limit	**1305**	
Current NOM Count	**1306**	Read-only
Last On/Default	**1307**	Requires custom values
Gain-sharing Automixer		
Response	**1321**	
Slope	**1322**	
Both		
Master Fader	**1390**	
Master Mute Button	**1392**	

SUBMIX MATRIX PROCESSING (12x8 Mixing Matrix)

Control	Controller Number (by Subix)								Notes
	1	2	3	4	5	6	7	8	
Input 1 Gain	6101	6117	6133	6149	6165	6181	6197	6213	
Input 2 Gain	6102	6118	6134	6150	6166	6182	6198	6214	
Input 3 Gain	6103	6119	6135	6151	6167	6183	6199	6215	
Input 4 Gain	6104	6120	6136	6152	6168	6184	6200	6216	
Input 5 Gain	6105	6121	6137	6153	6169	6185	6201	6217	
Input 6 Gain	6106	6122	6138	6154	6170	6186	6202	6218	
Input 7 Gain	6107	6123	6139	6155	6171	6187	6203	6219	
Input 8 Gain	6108	6124	6140	6156	6172	6188	6204	6220	
Input 9 Gain	6109	6125	6141	6157	6173	6189	6205	6221	
Input 10 Gain	6110	6126	6142	6158	6174	6190	6206	6222	
Input 11 Gain	6111	6127	6143	6159	6175	6191	6207	6223	
Input 12 Gain	6112	6128	6144	6160	6176	6192	6208	6224	
Input 1 Connect	6301	6317	6333	6349	6365	6381	6397	6413	
Input 2 Connect	6302	6318	6334	6350	6366	6382	6398	6414	
Input 3 Connect	6303	6319	6335	6351	6367	6383	6399	6415	
Input 4 Connect	6304	6320	6336	6352	6368	6384	6400	6416	
Input 5 Connect	6305	6321	6337	6353	6369	6385	6401	6417	
Input 6 Connect	6306	6322	6338	6354	6370	6386	6402	6418	
Input 7 Connect	6307	6323	6339	6355	6371	6387	6403	6419	
Input 8 Connect	6308	6324	6340	6356	6372	6388	6404	6420	
Input 9 Connect	6309	6325	6341	6357	6373	6389	6405	6421	
Input 10 Connect	6310	6326	6342	6358	6374	6390	6406	6422	
Input 11 Connect	6311	6327	6343	6359	6375	6391	6407	6423	
Input 12 Connect	6312	6328	6344	6360	6376	6392	6408	6424	
Submix Gain	6313	6329	6345	6361	6377	6393	6409	6425	
Submix Mute	6314	6330	6346	6362	6378	6394	6410	6426	
Submix Meter	6315	6331	6347	6363	6379	6395	6411	6427	Read-only

SUBMIX ASSIGNS (Submix to Output 8x8 Routing Matrix)

Control	Controller Number (By Output)							
	1	2	3	4	5	6	7	8
Input 1 Connect	2001	**2009**	2017	**2025**	2033	**2041**	2049	**2057**
Input 2 Connect	2002	**2010**	2018	**2026**	2034	**2042**	2050	**2058**
Input 3 Connect	2003	**2011**	2019	**2027**	2035	**2043**	2051	**2059**
Input 4 Connect	2004	**2012**	2020	**2028**	2036	**2044**	2052	**2060**
Input 5 Connect	2005	**2013**	2021	**2029**	2037	**2045**	2053	**2061**
Input 6 Connect	2006	**2014**	2022	**2030**	2038	**2046**	2054	**2062**
Input 7 Connect	2007	**2015**	2023	**2031**	2039	**2047**	2055	**2063**
Input 8 Connect	2008	**2016**	2024	**2032**	2040	**2048**	2056	**2064**

OUTPUT PROCESSING

Control	Controller Number (By Output)								Notes
	1	2	3	4	5	6	7	8	
Unit Outputs									
+4/-10 Switch	2101	**2201**	2301	**2401**	2501	**2601**	2701	**2801**	+4=32768, -10=16677
Output Level	2104	**2204**	2304	**2404**	2504	**2604**	2704	**2804**	
Output Mute	2106	**2206**	2306	**2406**	2506	**2606**	2706	**2806**	
Main Output Meter	2108	**2208**	2308	**2408**	2508	**2608**	2708	**2808**	Read-only
Loudspeaker Manager									
Band 1 Frequency	2111	**2211**	2311	**2411**	2511	**2611**	2711	**2811**	
Band 1 Gain	2112	**2212**	2312	**2412**	2512	**2612**	2712	**2812**	
Band 1 Q	2113	**2213**	2313	**2413**	2513	**2613**	2713	**2813**	
Band 1 Active	2114	**2214**	2314	**2414**	2514	**2614**	2714	**2814**	Negative Logic (0=on)
Band 2 Frequency	2115	**2215**	2315	**2415**	2515	**2615**	2715	**2815**	
Band 2 Gain	2116	**2216**	2316	**2416**	2516	**2616**	2716	**2816**	
Band 2 Q	2117	**2217**	2317	**2417**	2517	**2617**	2717	**2817**	
Band 2 Active	2118	**2218**	2318	**2418**	2518	**2618**	2718	**2818**	Negative Logic (0=on)
Band 3 Frequency	2119	**2219**	2319	**2419**	2519	**2619**	2719	**2819**	
Band 3 Gain	2120	**2220**	2320	**2420**	2520	**2620**	2720	**2820**	
Band 3 Q	2121	**2221**	2321	**2421**	2521	**2621**	2721	**2821**	
Band 3 Active	2122	**2222**	2322	**2422**	2522	**2622**	2722	**2822**	Negative Logic (0=on)
Band 4 Frequency	2123	**2223**	2323	**2423**	2523	**2623**	2723	**2823**	
Band 4 Gain	2124	**2224**	2324	**2424**	2524	**2624**	2724	**2824**	
Band 4 Q	2125	**2225**	2325	**2425**	2525	**2625**	2725	**2825**	

OUTPUT PROCESSING... continued

Control	Controller Number (By Output)								Notes
	1	2	3	4	5	6	7	8	
Loudspeaker Management... continued									
Band 4 Active	2126	**2226**	2326	**2426**	2526	**2626**	2726	**2826**	Negative Logic (0=on)
Band 5 Frequency	2127	**2227**	2327	**2427**	2527	**2627**	2727	**2827**	
Band 5 Gain	2128	**2228**	2328	**2428**	2528	**2628**	2728	**2828**	
Band 5 Q	2129	**2229**	2329	**2429**	2529	**2629**	2729	**2829**	
Band 5 Active	2130	**2230**	2330	**2430**	2530	**2630**	2730	**2830**	Negative Logic (0=on)
Band 6 Frequency	2131	**2231**	2331	**2431**	2531	**2631**	2731	**2831**	
Band 6 Gain	2132	**2232**	2332	**2432**	2532	**2632**	2732	**2832**	
Band 6 Q	2133	**2233**	2333	**2433**	2533	**2633**	2733	**2833**	
Band 6 Active	2134	**2234**	2334	**2434**	2534	**2634**	2734	**2834**	Negative Logic (0=on)
Band 7 Frequency	2135	**2235**	2335	**2435**	2535	**2635**	2735	**2835**	
Band 7 Gain	2136	**2236**	2336	**2436**	2536	**2636**	2736	**2836**	
Band 7 Q	2137	**2237**	2337	**2437**	2537	**2637**	2737	**2837**	
Band 7 Active	2138	**2238**	2338	**2438**	2538	**2638**	2738	**2838**	Negative Logic (0=on)
Band 8 Frequency	2139	**2239**	2339	**2439**	2539	**2639**	2739	**2839**	
Band 8 Gain	2140	**2240**	2340	**2440**	2540	**2640**	2740	**2840**	
Band 8 Q	2141	**2241**	2341	**2441**	2541	**2641**	2741	**2841**	
Band 8 Active	2142	**2242**	2342	**2442**	2542	**2642**	2742	**2842**	Negative Logic (0=on)
Highpass Frequency	2143	**2243**	2343	**2443**	2543	**2643**	2743	**2843**	
Highpass Slope Button	2144	**2244**	2344	**2444**	2544	**2644**	2744	**2844**	
Highpass Filter Type	2145	**2245**	2345	**2445**	2545	**2645**	2745	**2845**	
Highpass Resonance	2146	**2246**	2346	**2446**	2546	**2646**	2746	**2846**	
Highpass Active	2147	**2247**	2347	**2447**	2547	**2647**	2747	**2847**	Negative Logic (0=on)
Lowpass Frequency	2148	**2248**	2348	**2448**	2548	**2648**	2748	**2848**	
Lowpass Slope Button	2149	**2249**	2349	**2449**	2549	**2649**	2749	**2849**	
Lowpass Filter Type	2150	**2250**	2350	**2450**	2550	**2650**	2750	**2850**	
Lowpass Resonance	2151	**2251**	2351	**2451**	2551	**2651**	2751	**2851**	
Lowpass Active	2152	**2252**	2352	**2452**	2552	**2652**	2752	**2852**	Negative Logic (0=on)
Delay Time	2153	**2253**	2353	**2453**	2553	**2653**	2753	**2853**	
Delay Active	2154	**2254**	2354	**2454**	2554	**2654**	2754	**2854**	Negative Logic (0=on)
Invert	2156	**2256**	2356	**2456**	2556	**2656**	2756	**2856**	
Main Active	2158	**2258**	2358	**2458**	2558	**2658**	2758	**2858**	Negative Logic (0=on)
Limiter									
Threshold	2171	**2271**	2371	**2471**	2571	**2671**	2771	**2871**	
Release Time	2172	**2272**	2372	**2472**	2572	**2672**	2772	**2872**	
Reduction Meter	2173	**2273**	2373	**2473**	2573	**2673**	2773	**2873**	Read-only
Active	2174	**2274**	2374	**2474**	2574	**2674**	2774	**2874**	Negative Logic (0=on)
Output Meter	2175	**2275**	2375	**2475**	2575	**2675**	2775	**2875**	Read-only

OPEN COLLECTOR OUTPUTS

Control	Controller Number (BY OUTPUT)				Notes
	1	2	3	4	
Current Value	31	32	33	34	Ignores polarity

LINKED CONTROLS (INPUTS)
- these controls affect two or more parameters with a single controller number

Control	Controller Number for linked channel numbers						Notes
	In 1,2	In 3,4	In 5,6	In 7,8	In 9-10	In 11-12	
Automixer Channels							
Channel Fader	9401	9403	9405	9407	9409	9411	

LINKED CONTROLS (OUTPUTS)
- these controls affect two or more parameters with a single controller number

Control	Controller Number for linked channel numbers										Notes
	Ch 1,2	Ch 3,4	Ch 5,6	Ch 7,8	Ch 9,10	Ch 11,12	Ch 1-5	Ch 1-6	Ch 1-7	Ch 1-8	
Submix Master											
Submix Volumes	9340	9342	9344	9346	9348	9350	9352	9354	9356	9358	
Submix Mutes	9341	9343	9345	9347	9349	9351	9353	9355	9357	9359	
Master Mute all channels)	9999										Used by GUI toolbar Icon

MISCELLANEOUS

Control	Controller Number	Notes
Emergency Active	9211	Read only

Integrator Series Controller Numbers

Appendix D – List of Controller Numbers for Room Combine 788

The tables below show the controller numbers for parameters in the Room Combine. They are grouped by category. The notes refer to controller values that are “unusual” in some way. In other cases, values can be calculated using the guidelines detailed previously.

ROOM COMBINE 788 INPUT PROCESSING

CONTROL	CONTROLLER NUMBER (by Input)												NOTES
	1	2	3	4	5	6	7	8	9	10	11	12	
Inputs and Trim													
Analog Gain (Mic/Line)	101	**201**	301	**401**	501	**601**	701	**801**	N/A	**N/A**	N/A	**N/A**	0=Line
ARC Audio select	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	N/A	**806**	N/A	**N/A**	N/A	**N/A**	
Phantom Power	107	**207**	307	**407**	507	**607**	707	**807**	N/A	**N/A**	N/A	**N/A**	
Invert	108	**208**	308	**408**	508	**608**	708	**808**	908	**1008**	1108	**1208**	
Digital Trim	109	**209**	309	**409**	509	**609**	709	**809**	909	**1009**	1109	**1209**	
Noise Active	195	**295**	395	**495**	595	**695**	795	**895**	995	**1095**	1195	**1295**	
Main Input Meter	113	**213**	313	**413**	513	**613**	713	**813**	913	**1013**	1113	**1213**	Read-only
Input Equalizer													
Lo Shelf Active	114	**214**	314	**414**	514	**614**	714	**814**	914	**1014**	1114	**1214**	Negative Logic (0=on)
Lo Shelf Frequency	115	**215**	315	**415**	515	**615**	715	**815**	915	**1015**	1115	**1215**	
Lo Shelf Gain	116	**216**	316	**416**	516	**616**	716	**816**	916	**1016**	1116	**1216**	
Lo Band Active	117	**217**	317	**417**	517	**617**	717	**817**	917	**1017**	1117	**1217**	Negative Logic (0=on)
Lo Band Frequency	118	**218**	318	**418**	518	**618**	718	**818**	918	**1018**	1118	**1218**	
Lo Band Gain	119	**219**	319	**419**	519	**619**	719	**819**	919	**1019**	1119	**1219**	
Lo Band Bandwidth	120	**220**	320	**420**	520	**620**	720	**820**	920	**1020**	1120	**1220**	Lower values = wider filters
Mid Band Active	121	**221**	321	**421**	521	**621**	721	**821**	921	**1021**	1121	**1221**	Negative Logic (0=on)
Mid Band Frequency	122	**222**	322	**422**	522	**622**	722	**822**	922	**1022**	1122	**1222**	
Mid Band Gain	123	**223**	323	**423**	523	**623**	723	**823**	923	**1023**	1123	**1223**	
Mid Band Bandwidth	124	**224**	324	**424**	524	**624**	724	**824**	924	**1024**	1124	**1224**	Lower values = wider filters
Hi Band Active	125	**225**	325	**425**	525	**625**	725	**825**	925	**1025**	1125	**1225**	Negative Logic (0=on)
Hi Band Frequency	126	**226**	326	**426**	526	**626**	726	**826**	926	**1026**	1126	**1226**	
Hi Band Gain	127	**227**	327	**427**	527	**627**	727	**827**	927	**1027**	1127	**1227**	

ROOM COMBINE 788 INPUT PROCESSING... continued

CONTROL	CONTROLLER NUMBER (by Input)												NOTES
	1	2	3	4	5	6	7	8	9	10	11	12	
Input Processing... continued													
Hi Band Bandwidth	128	**228**	328	**428**	528	**628**	728	**828**	928	**1028**	1128	**1228**	Lower values = wider filters
Hi Shelf Active	129	**229**	329	**429**	529	**629**	729	**829**	929	**1029**	1129	**1229**	Negative Logic (0=on)
Hi Shelf Frequency	130	**230**	330	**430**	530	**630**	730	**830**	930	**1030**	1130	**1230**	
Hi Shelf Gain	131	**231**	331	**431**	531	**631**	731	**831**	931	**1031**	1131	**1231**	
Rumble Active	132	**232**	332	**432**	532	**632**	732	**832**	932	**1032**	1132	**1232**	Negative Logic (0=on)
Rumble Frequency	133	**233**	333	**433**	533	**633**	733	**833**	933	**1033**	1133	**1233**	
Main Active	134	**234**	334	**434**	534	**634**	734	**834**	934	**1034**	1134	**1234**	Negative Logic (0=on)
Compressor													
Lo Shelf Active	135	**235**	335	**435**	535	**635**	735	**835**	N/A	**N/A**	N/A	**N/A**	
Lo Shelf Frequency	136	**236**	336	**436**	536	**636**	736	**836**	N/A	**N/A**	N/A	**N/A**	Read-only
Lo Shelf Gain	137	**237**	337	**437**	537	**637**	737	**837**	N/A	**N/A**	N/A	**N/A**	
Lo Band Active	138	**238**	338	**438**	538	**638**	738	**838**	N/A	**N/A**	N/A	**N/A**	
Lo Band Frequency	139	**239**	339	**439**	539	**639**	739	**839**	N/A	**N/A**	N/A	**N/A**	
Lo Band Gain	140	**240**	340	**440**	540	**640**	740	**840**	N/A	**N/A**	N/A	**N/A**	
Lo Band Bandwidth	141	**241**	341	**441**	541	**641**	741	**841**	N/A	**N/A**	N/A	**N/A**	
Mid Band Active	142	**242**	342	**442**	542	**642**	742	**842**	N/A	**N/A**	N/A	**N/A**	Negative Logic (0=on)
Mid Band Frequency	144	**244**	344	**444**	544	**644**	744	**844**	N/A	**N/A**	N/A	**N/A**	Read-only
ACG													
Input Meter	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	944	**1044**	1144	**1244**	Read-only
Output Meter	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	945	**1045**	1145	**1245**	Read-only
Target Output Level Fader	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	948	**1048**	1148	**1248**	
Active Button	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	N/A	**N/A**	950	**1050**	1150	**1250**	Negative Logic (0=on)
Feedback Fighter													
Active Button	152	**252**	352	**452**	552	**652**	752	**852**	N/A	**N/A**	N/A	**N/A**	Negative Logic (0=on)
Clear Button	153	**253**	353	**453**	553	**653**	753	**853**	N/A	**N/A**	N/A	**N/A**	
Lock Button	154	**254**	354	**454**	554	**654**	754	**854**	N/A	**N/A**	N/A	**N/A**	
Panic Limiter Threshold	155	**255**	355	**455**	555	**655**	755	**855**	N/A	**N/A**	N/A	**N/A**	
Panic LED	156	**256**	356	**456**	556	**656**	756	**856**	N/A	**N/A**	N/A	**N/A**	

ROOM COMBINE 788 INPUT PROCESSING... continued

CONTROL	CONTROLLER NUMBER (by Input)												NOTES
	1	2	3	4	5	6	7	8	9	10	11	12	
Feedback Fighter... continued													
Enable Button	157	**257**	357	**457**	557	**657**	757	**857**	N/A	**N/A**	N/A	**N/A**	
Notch Depth	158	**258**	358	**458**	558	**658**	758	**858**	N/A	**N/A**	N/A	**N/A**	
Notch Step	159	**259**	359	**459**	559	**659**	759	**859**	N/A	**N/A**	N/A	**N/A**	
Feedback Threshold	160	**260**	360	**460**	560	**660**	760	**860**	N/A	**N/A**	N/A	**N/A**	
Sensitivity Radio Button	161	**261**	361	**461**	561	**661**	761	**861**	N/A	**N/A**	N/A	**N/A**	
Bandwidth Radio Button	162	**262**	362	**462**	562	**662**	762	**862**	N/A	**N/A**	N/A	**N/A**	
Fixed Filters	163	**263**	363	**463**	563	**663**	763	**863**	N/A	**N/A**	N/A	**N/A**	
Recycle Delay	164	**264**	364	**464**	564	**664**	764	**864**	N/A	**N/A**	N/A	**N/A**	
Band 1 Frequency	165	**265**	365	**465**	565	**665**	765	**865**	N/A	**N/A**	N/A	**N/A**	
Band 1 Gain	166	**266**	366	**466**	566	**666**	766	**866**	N/A	**N/A**	N/A	**N/A**	
Band 2 Frequency	167	**267**	367	**467**	567	**667**	767	**867**	N/A	**N/A**	N/A	**N/A**	
Band 2 Gain	168	**268**	368	**468**	568	**668**	768	**868**	N/A	**N/A**	N/A	**N/A**	
Band 3 Frequency	169	**269**	369	**469**	569	**669**	769	**869**	N/A	**N/A**	N/A	**N/A**	
Band 3 Gain	170	**270**	370	**470**	570	**670**	770	**870**	N/A	**N/A**	N/A	**N/A**	
Band 4 Frequency	171	**271**	371	**471**	571	**671**	771	**871**	N/A	**N/A**	N/A	**N/A**	
Band 4 Gain	172	**272**	372	**472**	572	**672**	772	**872**	N/A	**N/A**	N/A	**N/A**	
Band 5 Frequency	173	**273**	373	**473**	573	**673**	773	**873**	N/A	**N/A**	N/A	**N/A**	
Band 5 Gain	174	**274**	374	**474**	574	**674**	774	**874**	N/A	**N/A**	N/A	**N/A**	
Band 6 Frequency	175	**275**	375	**475**	575	**675**	775	**875**	N/A	**N/A**	N/A	**N/A**	
Band 6 Gain	176	**276**	376	**476**	576	**676**	776	**876**	N/A	**N/A**	N/A	**N/A**	
Band 7 Frequency	177	**277**	377	**477**	577	**677**	777	**877**	N/A	**N/A**	N/A	**N/A**	
Band 7 Gain	178	**278**	378	**478**	578	**678**	778	**878**	N/A	**N/A**	N/A	**N/A**	
Band 8 Frequency	179	**279**	379	**479**	579	**679**	779	**879**	N/A	**N/A**	N/A	**N/A**	
Band 8 Gain	180	**280**	380	**480**	580	**680**	780	**880**	N/A	**N/A**	N/A	**N/A**	
Automixer Channels													
Channel Fader	190	**290**	390	**490**	590	**690**	790	**890**	990	**1090**	1190	**1290**	
Channel Auto Button	191	**291**	391	**491**	591	**691**	791	**891**	N/A	**N/A**	N/A	**N/A**	
Channel Mute Button	192	**292**	392	**492**	592	**692**	792	**892**	992	**1092**	1192	**1292**	
Channel Automix Priority	193	**293**	393	**493**	593	**693**	793	**893**	N/A	**N/A**	N/A	**N/A**	

ROOM COMBINE 788 OUTPUT PROCESSING

CONTROL	CONTROLLER NUMBER (by Output)								NOTES
	1	2	3	4	5	6	7	8	
Unit Outputs									
+4/-10 Switch	2101	**2201**	2301	**2401**	2501	**2601**	2701	**2801**	+4=32768, -10=16677
Output Level	2104	**2204**	2304	**2404**	2504	**2604**	2704	**2804**	
Output Mute	2106	**2206**	2306	**2406**	2506	**2606**	2706	**2806**	
Main Output Meter	2108	**2208**	2308	**2408**	2508	**2608**	2708	**2808**	Read-only
Loudspeaker Manager									
Band 1 Frequency	**2111**	2211	**2311**	2411	**2511**	2611	**2711**	2811	
Band 1 Gain	**2112**	2212	**2312**	2412	**2512**	2612	**2712**	2812	
Band 1 Q	**2113**	2213	**2313**	2413	**2513**	2613	**2713**	2813	Lower values = wider filters
Band 1 Active	**2114**	2214	**2314**	2414	**2514**	2614	**2714**	2814	Negative Logic (0=on)
Band 2 Frequency	**2115**	2215	**2315**	2415	**2515**	2615	**2715**	2815	
Band 2 Gain	**2116**	2216	**2316**	2416	**2516**	2616	**2716**	2816	
Band 2 Q	**2117**	2217	**2317**	2417	**2517**	2617	**2717**	2817	Lower values = wider filters
Band 2 Active	**2118**	2218	**2318**	2418	**2518**	2618	**2718**	2818	Negative Logic (0=on)
Band 3 Frequency	**2119**	2219	**2319**	2419	**2519**	2619	**2719**	2819	
Band 3 Gain	**2120**	2220	**2320**	2420	**2520**	2620	**2720**	2820	
Band 3 Q	**2121**	2221	**2321**	2421	**2521**	2621	**2721**	2821	Lower values = wider filters
Band 3 Active	**2122**	2222	**2322**	2422	**2522**	2622	**2722**	2822	Negative Logic (0=on)
Band 4 Frequency	**2123**	2223	**2323**	2423	**2523**	2623	**2723**	2823	
Band 4 Gain	**2124**	2224	**2324**	2424	**2524**	2624	**2724**	2824	
Band 4 Q	**2125**	2225	**2325**	2425	**2525**	2625	**2725**	2825	Lower values = wider filters
Band 4 Active	**2126**	2226	**2326**	2426	**2526**	2626	**2726**	2826	Negative Logic (0=on)
Band 5 Frequency	**2127**	2227	**2327**	2427	**2527**	2627	**2727**	2827	
Band 5 Gain	**2128**	2228	**2328**	2428	**2528**	2628	**2728**	2828	
Band 5 Q	**2129**	2229	**2329**	2429	**2529**	2629	**2729**	2829	Lower values = wider filters
Band 5 Active	**2130**	2230	**2330**	2430	**2530**	2630	**2730**	2830	Negative Logic (0=on)
Band 6 Frequency	**2131**	2231	**2331**	2431	**2531**	2631	**2731**	2831	
Band 6 Gain	**2132**	2232	**2332**	2432	**2532**	2632	**2732**	2832	

ROOM COMBINE 788 OUTPUT PROCESSING... continued

CONTROL	CONTROLLER NUMBER (by Output)								NOTES
	1	2	3	4	5	6	7	8	
Loudspeaker Management... continued									
Band 6 Q	**2133**	2233	**2333**	2433	**2533**	2633	**2733**	2833	Lower values = wider filters
Band 6 Active	**2134**	2234	**2334**	2434	**2534**	2634	**2734**	2834	Negative Logic (0=on)
Band 7 Frequency	**2135**	2235	**2335**	2435	**2535**	2635	**2735**	2835	
Band 7 Gain	**2136**	2236	**2336**	2436	**2536**	2636	**2736**	2836	
Band 7 Q	**2137**	2237	**2337**	2437	**2537**	2637	**2737**	2837	Lower values = wider filters
Band 7 Active	**2138**	2238	**2338**	2438	**2538**	2638	**2738**	2838	Negative Logic (0=on)
Band 8 Frequency	**2139**	2239	**2339**	2439	**2539**	2639	**2739**	2839	
Band 8 Gain	**2140**	2240	**2340**	2440	**2540**	2640	**2740**	2840	
Band 8 Q	**2141**	2241	**2341**	2441	**2541**	2641	**2741**	2841	Lower values = wider filters
Band 8 Active	**2142**	2242	**2342**	2442	**2542**	2642	**2742**	2842	Negative Logic (0=on)
Highpass Frequency	**2143**	2243	**2343**	2443	**2543**	2643	**2743**	2843	
Highpass Slope Button	**2144**	2244	**2344**	2444	**2544**	2644	**2744**	2844	
Highpass Filter Type	**2145**	2245	**2345**	2445	**2545**	2645	**2745**	2845	
Highpass Resonance	**2146**	2246	**2346**	2446	**2546**	2646	**2746**	2846	
Highpass Active	**2147**	2247	**2347**	2447	**2547**	2647	**2747**	2847	Negative Logic (0=on)
Lowpass Frequency	**2148**	2248	**2348**	2448	**2548**	2648	**2748**	2848	
Lowpass Slope Button	**2149**	2249	**2349**	2449	**2549**	2649	**2749**	2849	
Lowpass Filter Type	**2150**	2250	**2350**	2450	**2550**	2650	**2750**	2850	
Lowpass Resonance	**2151**	2251	**2351**	2451	**2551**	2651	**2751**	2851	
Lowpass Active	**2152**	2252	**2352**	2452	**2552**	2652	**2752**	2852	Negative Logic (0=on)
Delay Time	**2153**	2253	**2353**	2453	**2553**	2653	**2753**	2853	
Delay Active	**2154**	2254	**2354**	2454	**2554**	2654	**2754**	2854	Negative Logic (0=on)
Invert	**2156**	2256	**2356**	2456	**2556**	2656	**2756**	2856	
Main Active	**2158**	2258	**2358**	2458	**2558**	2658	**2758**	2858	Negative Logic (0=on)
Limiter									
Threshold	**2171**	2271	**2371**	2471	**2571**	2671	**2771**	2871	
Release Time	**2172**	2272	**2372**	2472	**2572**	2672	**2772**	2872	
Reduction Meter	**2173**	2273	**2373**	2473	**2573**	2673	**2773**	2873	Read-only
Active	**2174**	2274	**2374**	2474	**2574**	2674	**2774**	2874	Negative Logic (0=on)
Output Meter	**2175**	2275	**2375**	2475	**2575**	2675	**2775**	2875	Read-only

Room Combining

Control	Controller Number			Notes
	Room A	Room B	Combine	
Room Numbers/Switch				
Combine Group 1	8701	**8702**	1601	Room A and Room B are the room numbers (1-8) that are combined by the corresponding Combine switch. Room A and B use the following values: Room 1 = 0 Room 2 = 9362 Room 3 = 18724 Room 4 = 28086 Room 5 = 37449 Room 6 = 46811 Room 7 = 56173 Room 8 = 65535
Combine Group 2	8703	**8704**	1602	
Combine Group 3	8705	**8706**	1603	
Combine Group 4	8707	**8708**	1604	
Combine Group 5	8709	**8710**	1605	
Combine Group 6	8711	**8712**	1606	
Combine Group 7	8713	**8714**	1607	
Combine Group 8	8715	**8716**	1608	
Combine Group 9	8717	**8718**	1609	
Combine Group 10	8719	**8720**	1610	
Combine Group 11	8721	**8722**	1611	
Combine Group 12	8723	**8724**	1612	
Combine Group 13	8725	**8726**	1613	
Combine Group 14	8727	**8728**	1614	
Combine Group 15	8729	**8730**	1615	
Combine Group 16	8731	**8732**	1616	
Combine Group 17	8733	**8734**	1617	
Combine Group 18	8735	**8736**	1618	
Combine Group 19	8737	**8738**	1619	
Combine Group 20	8739	**8740**	1620	
Combine Group 21	8741	**8742**	1621	
Combine Group 22	8743	**8744**	1622	
Combine Group 23	8745	**8746**	1623	
Combine Group 24	8747	**8748**	1624	
Combine Group 25	8749	**8750**	1625	
Combine Group 26	8751	**8752**	1626	
Combine Group 27	8753	**8754**	1627	
Combine Group 28	8755	**8756**	1628	

ROOM AND BGM VOLUMES, BGM SOURCE SELECT

CONTROL	CONTROLLER NUMBER (by Output)								NOTES
	1	2	3	4	5	6	7	8	
Microphone Volume									
Volume	**1411**	1421	**1431**	1441	**1451**	1461	**1471**	1481	
Mute	**1412**	1422	**1432**	1442	**1452**	1462	**1472**	1482	
Microphone Mix Meter	**1413**	1423	**1433**	1443	**1453**	1463	**1473**	1483	
BGM Volume/Source									
Volume	**1511**	1521	**1531**	1541	**1551**	1561	**1571**	1581	
Mute	**1512**	1522	**1532**	1542	**1552**	1562	**1572**	1582	
BGM Mix Meter	**1513**	1523	**1533**	1543	**1553**	1563	**1573**	1583	
Source Select	**1514**	1524	**1534**	1544	**1554**	1564	**1574**	1584	
Room Master									
Meter	**1515**	1525	**1535**	1545	**1555**	1565	**1575**	1585	
Input Assignments									
Input to Room Assignment	**1414**	1424	**1434**	1444	**1454**	1464	**1474**	1484	Set by wizard, do not change

PAGING

Control	Controller Number	Notes
Paging		
Mic Select	8160	9-position, #9 is none
Push to Talk	8101	
Room Assign		
Room 1	8151	
Room 2	8152	
Room 3	8153	
Room 4	8154	
Room 5	8155	
Room 6	8156	
Room 7	8157	
Room 8	8158	

AUTOMIXER MASTER PARAMETERS

Control	Controller Number	Notes
Gain-Sharing Automixer		
Response	1321	
Slope	1322	

MISCELLANEOUS

Control	Controller Number	Notes
Emergency		
Emergency Active	9211	Read-only
Output Gain		
Master Mute (all channels)	9999	Used by GUI toolbar icon

Symetrix

Integrator Series Control Protocol

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