Galileo Callisto 616
Galileo Callisto 616 AES

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Meyer Sound Laboratories
Galileo Callisto 616 User Guide, PN 05.231.034.01 A

SAFETY INSTRUCTIONS FOR LOUDSPEAKERS/ELECTRONICS

SYMBOLS USED

These symbols indicate important safety or operating features in this booklet and on the chassis:

			
Dangerous voltages: risk of electric shock	Important operating instructions	Frame or chassis	Protective earth ground
Pour indiquer les risques résultant de tensions dangereuses	Pour indequer important instructions	Masse, châssis	Terre de protection
Zu die gefahren von gefährliche spanning zeigen	Zu wichtige betriebsan-weisung und unterhalt-sanweisung zeigen	Rahmen oder chassis	Die schutzerde
Para indicar voltajes peligrosos	Instrucciones impor-tantes de funcionamiento y/o manteniento	Armadura o chassis	Tierra proteccionista

SAFETY INSTRUCTIONS FOR LOUDSPEAKERS/ELECTRONICS

IMPORTANT SAFETY INSTRUCTIONS

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use this apparatus near water.
6. Clean only with dry cloth.
7. Do not block any ventilation openings. Install in accordance with Meyer Sound's installation instructions.
8. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus that produce heat.
9. Do not defeat the safety purpose of the grounding-type plug. A grounding-type plug has two blades and a third grounding prong. The third prong is provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10. Protect the power cord from being walked on or pinched, particularly at plugs, convenience receptacles, and the point where they exit from the apparatus. The AC mains plug or appliance coupler shall remain readily accessible for operation.
11. Only use attachments/accessories specified by Meyer Sound.
12. Use only with the caster rails or rigging specified by Meyer Sound, or sold with the apparatus. Handles are for carrying only.
13. Unplug this apparatus during lightning storms or when unused for long periods of time.
14. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as when the power-supply cord or plug has been damaged; liquid has been spilled or objects have fallen into the apparatus; rain or moisture has entered the apparatus; the apparatus has been dropped; or when for undetermined reasons the apparatus does not operate normally.

WARNING: To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture. Do not install the apparatus in wet or humid locations without using weather protection equipment from Meyer Sound.

POWERCON USE CAUTION

Disconnect the mains plug before disconnecting the power cord from the speaker.

SAFETY INSTRUCTIONS FOR LOUDSPEAKERS/ELECTRONICS

English

- To reduce the risk of electric shock, disconnect the apparatus from the AC mains before installing audio cable. Reconnect the power cord only after making all signal connections.
- Connect the apparatus to a two-pole, three-wire grounding mains receptacle. The receptacle must be connected to a fuse or circuit breaker. Connection to any other type of receptacle poses a shock hazard and may violate local electrical codes.
- Do not install the apparatus in wet or humid locations without using weather protection equipment from Meyer Sound.
- Do not allow water or any foreign object to get inside the apparatus. Do not put objects containing liquid on or near the unit.
- To reduce the risk of overheating the apparatus, avoid exposing it to direct sunlight. Do not install the unit near heat-emitting appliances, such as a room heater or stove.
- This apparatus contains potentially hazardous voltages. Do not attempt to disassemble the unit. The unit contains no user-serviceable parts. Repairs should be performed only by factory-trained service personnel.

Français

- Pour réduire le risque d'électrocution, débrancher la prise principale de l'haut-parleur, avant d'installer le câble d'interface
- allant à l'audio. Ne rebrancher le bloc d'alimentation qu'après avoir effectué toutes les connections.
- Branchez l'haut-parleur dans une prise de courant à 3 dérivations (deux pôles et la terre). Cette prise doit être munie d'une protection adéquate (fusible ou coupe-circuit). Le branchement dans tout autre genre de prise pourrait entraîner un risque d'électrocution et peut constituer une infraction à la réglementation locale concernant les installations électriques.
- Ne pas installer l'haut-parleur dans un endroit où il y a de l'eau ou une humidité excessive.
- Ne pas laisser de l'eau ou tout objet pénétrer dans l'haut-parleur. Ne pas placer de r´cipients contenant un liquide sur cet appareil, ni à proximité de celui-ci.
- Pour éviter une surchauffe de l'hautparleur, conserver-la à l'abri du soleil. Ne pas installer à proximité d'appareils dégageant de la chaleur tels que radiateurs ou appareils de chauffage.
- Ce haut-parleur contient des circuits haute tension présentant un danger. Ne jamais essayer de le démonter. Il n'y a aucun composant qui puisse être réparé par l'utilisateur. Toutes les réparations doivent être effectuées par du personnel qualifié et agréé par le constructeur.

Deutsch

- Um die Gefahr eines elektrischen Schlages auf ein Minimum zu reduzieren, den Lautsprecher vom Stromnetz trennen, bevor ggf. ein Audio-Schnittstellensign alkabel angeschlossen wird. Das Netzkabel erst nach Herstellung aller Signalverbindungen wieder einstecken.
- Der Lautsprecher an eine geerdete zweipolige Dreiphasen-Netzsteckdose anschließen. Die Steckdose muß mit einem geeigneten Abzweigschutz (Sicherung oder Leistungsschalter) verbunden sein. Der Anschluß der unterbrechungsfreien Stromversorgung an einen anderen Steckdosentyp kann zu Stromschlägen führen und gegen die örtlichen Vorschriften verstoßen.
- Der Lautsprecher nicht an einem Ort aufstellen, an dem sie mit Wasser oder übermäßig hoher Luftfeuchtigkeit in Berührung kommen könnte.
- Darauf achten, daß weder Wasser noch Fremdkörper in das Innere den Lautsprecher eindringen. Keine Objekte, die Flüssigkeit enthalten, auf oder neben die unterbrechungsfreie Stromversorgung stellen.
- Um ein Überhitzen dem Lautsprecher zu verhindern, das Gerät vor direkter Sonneneinstrahlung fernhalten und nicht in der Nähe von wärmeabstrahlenden Haushaltsgeräten (z.B. Heizgerät oder Herd) aufstellen.
- Im Inneren diesem Lautsprecher herr-schen potentiell gefährliche Spannungen. Nicht versuchen, das Gerät zu öffnen. Es enthält keine vom Benutzer reparierbaren Teile. Reparaturen dürfen nur von ausgebildetem Kundenienstpersonal durchgeführt werden.

Español

- Para reducir el riesgo de descarga eléctrica, desconecte de la red de voltaje el altoparlante antes de instalar el cable de señal de audio. Vuelva a conectar la alimentacion de voltaje una vez efectuadas todas las interconexiones de señalizacion de audio.
- Conecte el altoparlante a un tomacorriente bipolar y trifilar con neutro de puesta a tierra. El tomacorriente debe estar conectado a la protección de derivación apropiada (ya sea un fusible o un disyuntor). La conexión a cualquier otro tipo de tomacorriente puede constituir peligro de descarga eléctrica y violar los códigos eléctricos locales.
- No instale el altoparlante en lugares donde haya agua o humedad excesiva.
- No deje que en el altoparlante entre agua ni ningún objeto extraño. No ponga objetos con líquidos encima de la unidad ni cerca de ella.
- Para reducir el riesgo de sobrecalentamiento, no exponga la unidad a los rayos directos del sol ni la instale cerca de artefactos que emiten calor, como estufas o cocinas.
- Este altoparlante contiene niveles de voltaje peligrosos en potencia. No intente desarmar la unidad, pues no contiene piezas que puedan ser repardas por el usuario. Las reparaciones deben efectuarse únicamente por parte del personal de mantenimiento capacitado en la fábrica.

CONTENTS

CHAPTER 1: INTRODUCTION

HOW TO USE THIS MANUAL

Make sure to read these operating instructions in their entirety before using the Galileo® Callisto 616 loudspeaker management system. In particular, pay close attention to material related to safety issues.

As you read these operating instructions, you will encounter the following icons for notes, tips, and cautions:

NOTE: A note identifies an important or useful piece of information relating to the topic under discussion.

TIP: A tip offers a helpful tip relevant to the topic at hand.

CAUTION: A caution gives notice that an action may have serious consequences and could cause harm to equipment or personnel, or could cause delays or other problems.

Information and specifications are subject to change. Updates and supplementary information are available at www.meyersound.com.

Meyer Sound Technical Support is available at:

- **Tel:** +1 510 486.1166
- **Tel:** +1 510 486.0657 (after hours support)
- **Web:** www.meyersound.com/support
- **Email:** techsupport@meyersound.com

GALILEO CALLISTO 616

The Callisto 616 array processor is an elegant hardware and software solution for driving and aligning Meyer Sound loudspeaker array systems. The 2-space, rack-mount Callisto 616 includes six analog/AES inputs, 16 analog outputs, and a fully digital matrix processor. For maximum flexibility, the Callisto 616 can be controlled from its front panel, using its navigation buttons and LCD screen, or from the accompanying Compass control software.

Callisto 616 Front and Rear Panels

Designed as the perfect complement to Meyer Sound's M Series™ and LEO-M arrays, the Callisto 616 features delay integration for aligning loudspeaker arrays, atmospheric correction filters, and simultaneous low- and high-pass filters for subwoofer control. The Callisto 616 offers an extensive equalization architecture that includes U-Shaping equalization, comprised of five bands with adjustable slopes, widths, and gain, and 10-band complementary phase parametric filtering, both available on outputs. TruShaping® equalization, comprised of four of bands equalization with adjustable widths and gain, is available on inputs.

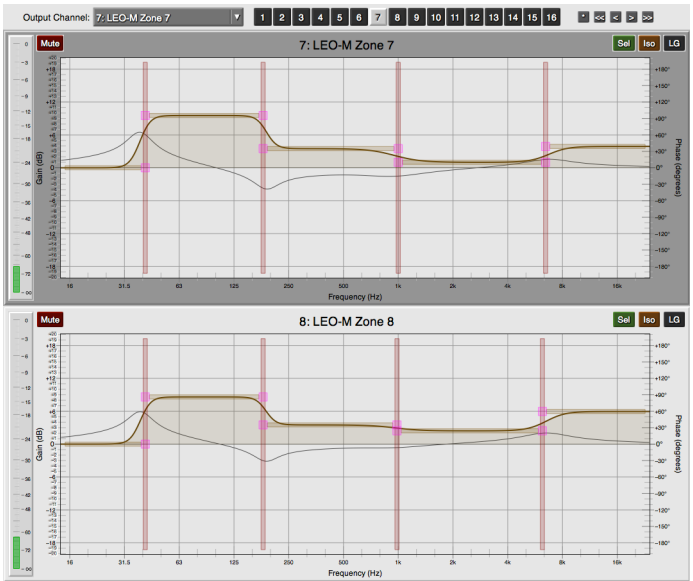
The Callisto 616 features full digital operation with fixed latency across all output channels regardless of any applied processing. All internal processing is performed at 96 kHz with a 32-bit vector floating point processor.

GALILEO CALLISTO 616 AES

The Callisto 616 AES model provides 16 matrix outputs on eight AES/EBU (AES3) digital outputs. It can be used to drive the standard Callisto 616's digital inputs or any other device that accepts 96 kHz, AES3 digital audio signals. For more information, including detailed differences between the Callisto 616 AES and the standard Callisto 616, see Appendix A, "Galileo Callisto 616 AES."

COMPASS CONTROL SOFTWARE

The Compass control software provides comprehensive control of the Callisto 616 from an intuitive graphical user interface. The software enables easy access to all features and even provides control of multiple units. Compass runs on a Mac® or Windows®-based computer.



Compass Control Software, EQ Plots

The Callisto Map tab displays a summary overview of all Callisto channels complete with signal flow. Inputs and outputs can be labeled and conveniently grouped for gang edits. The Input Processing and Output Processing tabs provide access to all DSP settings. Equalization parameters can be easily edited with numeric entry or by graphically dragging frequency bands. Multiple layers of equalization can be viewed for a composite graphic plot of equalization curves.

SIM 3 SUPPORT

The Callisto 616 and Callisto 616 AES can be connected directly to the SIM® 3 audio analyzer, providing complete audio measurement capabilities for complex audio systems.

CHAPTER 2: FEATURES AND FUNCTIONS

CALLISTO 616 PROJECTS

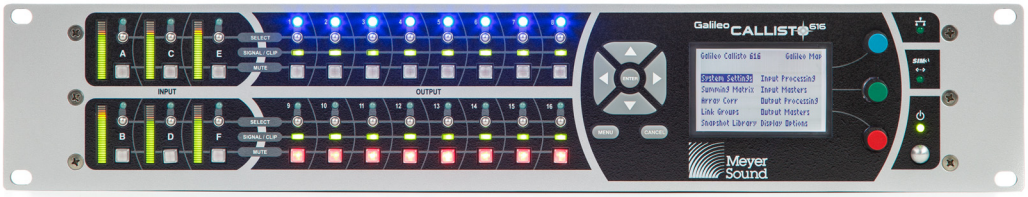
Callisto 616 project files are saved by the Compass control software to the host computer. Project files retain the full configuration of parameters, system settings, and snapshots stored in the Callisto 616. When a Callisto 616 is connected to the host computer, the Compass control software reads and displays the configuration currently residing in the Callisto 616.

The Compass control software, running on a computer, does not have its own memory for system settings and parameters, and just reads what it is connected to. So when Compass is connected to a Callisto 616, it reads and displays the project file and the current active snapshot that is contained in the unit's memory. However, loading another project file (stored on the computer) into the Compass control software when it is connected to a Callisto 616 replaces whatever project file is currently in the Callisto 616.

CAUTION: Opening a project file in the Compass control software when the computer is connected to a Callisto 616 overwrites the project, and its snapshots, residing in the Callisto 616 (if the Overwrite option is selected when opening the project). To merge snapshots from another project file into the current project in a Callisto 616, use the Merge Project option on the Open Project dialog box (click More for this option to appear).

TIP: You can use the Compass control software to back up Callisto 616 configurations. The configurations are saved as project files on the host computer and can be later used to restore the configuration, via Compass, back into the Callisto 616.

CALLISTO 616 FRONT PANEL



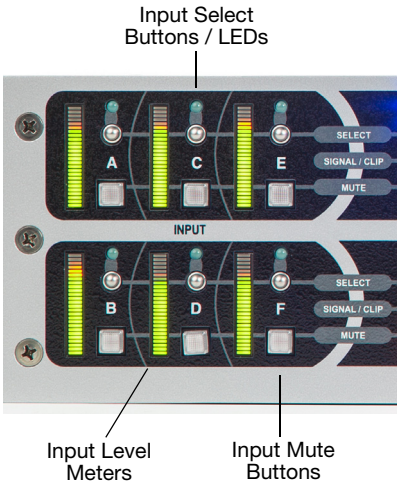
Callisto 616 Front Panel

The Callisto 616 front panel provides access to all of the powerful features of the loudspeaker management system. Input level metering is shown for all inputs, as well as status and control of all outputs. The large LCD screen provides access to all of the EQ, gain, delay, and other settings available for both inputs and outputs. A set of cursor buttons provides navigation throughout the screen, and Enter, Cancel, and Menu buttons give selection control. In addition, three rotary encoders (knobs) allow the user to adjust the center frequency, bandwidth, and boost or cut of the equalization points, as well as control other system parameters.

The Callisto 616 front panel is divided into the following three sections:

- Inputs
- Outputs
- Navigation

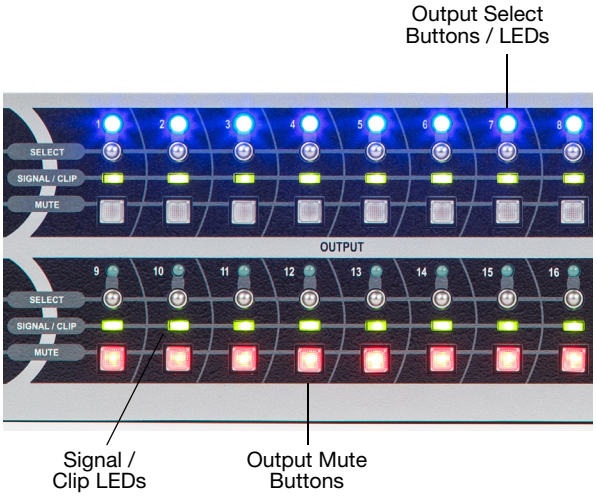
Front Panel Input Section



Callisto 616 Front Panel Input Section

- **Input Level Meters:** Multi-segment LED ladders for each input channel. The green LED range begins at approximately –80 dB below clipping. The yellow LED range lights a few dB below clipping. The top red LED indicates clipping. In the Compass control software on the Settings > Input and Output page, you can set the Input Voltage Range for each input channel to either +26 dBu (15.5 V rms) or +20 dBu (7.75 V rms), which determines the clipping levels.
- **Input Select Buttons / LEDs:** One for each input channel, allowing the inputs to be selected for various operations; multiple input channels can be selected. The accompanying blue LED lights when an input channel is selected. Selecting an input in the Compass control software also activates the button and the associated LED.
- **Input Mute Buttons:** One for each input channel, allowing the inputs to be muted and unmuted. Muting an input in the Compass control software also activates the button.

Front Panel Output Section



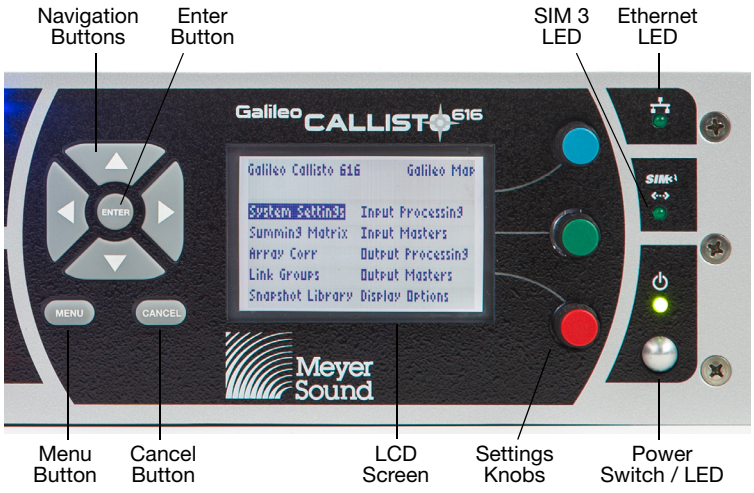
Callisto 616 Front Panel Output Section

- **Signal / Clip LEDs:** Multi-color LEDs, one for each output channel. The LED turns green to indicate output levels from –85 dB below clipping to approximately –5 dB below clipping, with the LED glowing brighter as the signal increases. The LED turns amber to indicate levels from approximately –5 dB to just below the clipping level. The LED turns red when the output signal reaches the clipping level. In the Compass control software on the Settings > Input and Output page, you can set the Output Voltage Range for each output to either +26 dBu (15.5 V rms) or +20 dBu (7.75 V rms), which determines the clipping levels.

  NOTE: The default and recommended Output Voltage Range is +26 dBu.

- **Output Select Buttons / LEDs:** One for each output channel, allowing the outputs to be selected for various operations; multiple output channels can be selected. The accompanying blue LED lights when an output channel is selected. Selecting an output in the Compass control software also activates the button and the associated LED.
- **Output Mute Buttons:** One for each output channel, allowing the outputs to be muted and unmuted. Muting an output in the Compass control software also activates the button.

Front Panel Navigation Section



Callisto 616 Front Panel Navigation Section

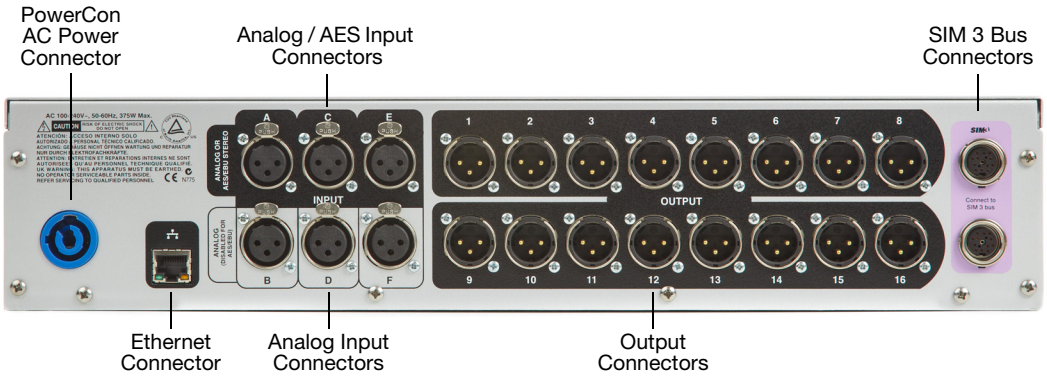
- **Navigation Buttons:** Navigates the menu pages on the LCD screen.
- **Enter Button:** Enters the selected menu page, or in some cases toggles values or settings after they have been highlighted on the LCD screen with the Navigation buttons.
- **Menu Button:** Returns to the main Callisto Map page on the LCD screen, no matter which menu page is currently displayed. The Menu button is also used to accept names after they have been entered on the Label page.
- **Cancel Button:** Steps back to the previous menu page on the LCD screen. Most actions within the Callisto 616 are immediately implemented and are not reversed with the Cancel button.
- **LCD Screen:** In conjunction with the other front panel buttons, the 128 x 64 pixel backlit screen provides access to all of the pages available on the Callisto 616 — including the summing matrix, all EQ points, levels, delays, and other special settings. Use the Display Settings page to adjust the brightness, contrast, and viewing angle of the LCD screen.

- **Settings Knobs:** Three rotary encoders (with push switches) that adjust values for the currently selected parameter on the LCD screen. For example, when setting the Parametric EQ points, the Blue knob adjusts the center frequency, the Green knob adjusts the bandwidth (Q), and the Red knob adjusts the cut/boost level.
- **Ethernet LED:** Indicates Ethernet activity when the Callisto 616 is connected to a computer running the Compass control software.
- **SIM 3 LED:** Indicates when the Callisto 616 is successfully connected to a SIM 3 audio analyzer.

  NOTE: The SIM 3 Address for the Callisto 616 must be set to a number between 0 and 14 (the default is 10), either in the System Settings menu onboard the Callisto 616 or in the Compass control software. It will then be available in the Switcher section of SIM 3 under tabs 0 through 14, and can be configured to perform audio measurements.

- **Power Switch / LED:** Press to turn on the Callisto 616. To turn off the unit, press and hold the switch for approximately 2 seconds.

CALLISTO 616 REAR PANEL



Callisto 616 Rear Panel

The Callisto 616 rear panel provides connections for six inputs and 16 outputs, plus connections to the SIM 3 analyzer or additional Callisto 616 units. An Ethernet connector allows connection to a remote computer running the Compass control software.

- **PowerCon AC Power Connector:** This locking connector mates with the provided AC power cable.

  CAUTION: Make sure the AC power cable has the appropriate power plug (on the other end) for the area in which you will operate the Callisto 616.

  NOTE: The Callisto 616 incorporates Meyer Sound's Intelligent AC power supply, which automatically adjusts for any line voltage worldwide, and provides both soft turn-on and transient protection.

- **Ethernet Connector:** RJ-45 connector for connecting the Callisto 616 to an Ethernet network, so it can be controlled from a computer running the Compass control software. Use a shielded CAT-5e cable (recommended) or better Ethernet data cable.
- **Analog / AES Input Connectors (A, C, E):** XLR-3F input connectors that accept either a standard line-level analog signal or AES 2-channel digital signal. In the Compass control software on the Settings > Input and Output page, you can set these inputs to either Analog or AES.

- **Analog Input Connectors (B, D, F):** XLR-3F input connectors that accept standard line-level audio only. These inputs are typically paired with their corresponding input pairs (A, C, and E) for receiving 2-channel, left/right audio signals. The analog-only inputs are disabled when their input pair is set to AES mode. For example, when input A is set to AES mode, input B is disabled.
- **Analog Output Connectors (1–16):** 16 XLR-3M connectors for routing audio to Meyer Sound self-powered loudspeakers, or to power amplifier channels driving passive loudspeaker systems. Any signal routing and processing stored in the Callisto 616's project file is applied to these outputs.

  NOTE: The Callisto 616 AES provides 16 matrix outputs on eight AES/EBU (AES3) digital outputs. For more information, see Appendix A, "Galileo Callisto 616 AES."

- **SIM 3 Bus Connectors:** Connects to the SIM 3 audio analyzer so the Callisto 616's inputs and outputs can be used as measurement points. The second SIM 3 bus port is provided for looping to an additional Callisto 616 unit or to a SIM-3088 line-level switcher.

FIXED DIGITAL LATENCY

The Callisto 616 features full digital operation with fixed latency across all output channels regardless of the processing applied (see Table). All internal processing is performed at 96 kHz with a 32-bit floating point vector processor.

Internal Digital Audio Input Latency

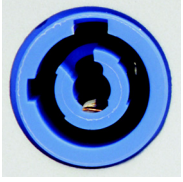
Sample Rate Input (kHz)	Measured Latency (ms)
32.0	4.15
44.1	3.52
48.0	3.37
96.0	2.60
192.0	2.43
Analog audio input latency: 1.53 ms	

**Test conditions were factory default settings: All input and output EQ filters enabled but set to flat response, no other filtering enabled.*

CHAPTER 3: CONNECTING THE CALLISTO 616

POWER CONNECTOR

The Callisto 616 uses a locking PowerCon® connector to provide AC voltage to the unit. Its internal switching power supply accepts voltages from 90 to 264 V AC, 50/60 Hz.

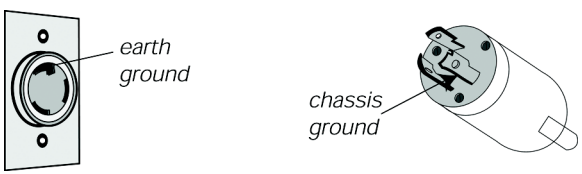


Locking PowerCon connector for AC power

Electrical Safety Issues!

Pay close attention to these important electrical and safety issues:

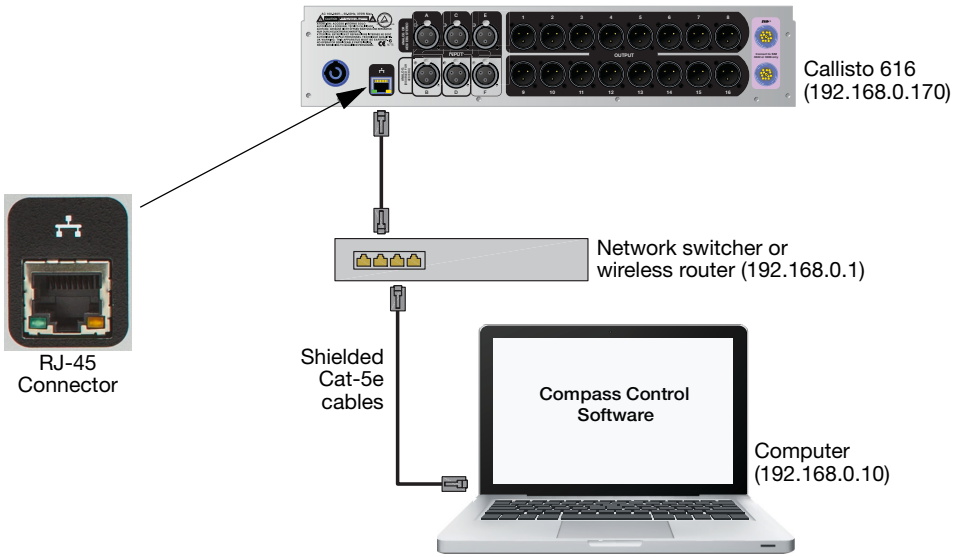
- Make sure you to use the correct power plug for the AC power in the area in which you will operate the Callisto 616.
- Always use a grounded outlet and plug.



⚠ **CAUTION:** To comply with EMC standards, only operate this device with the supplied shielded power cord.

REMOTE COMPUTER CONNECTION

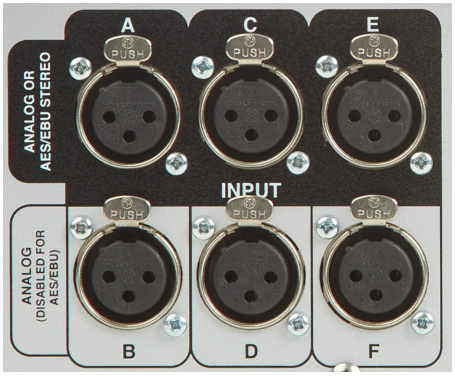
The Callisto 616's RJ-45 port connects to a standard computer Ethernet port with shielded Cat-5e cables. The Ethernet connection allows the unit to be controlled remotely from a Mac or Windows-based computer running the Compass control software. Bi-directional communication ensures that the current settings, whether changed from the Callisto 616 front panel or from the Compass software, are always in sync.



Callisto 616 Connected to Computer

NOTE: When connecting the Callisto 616 to a computer through a router, make sure the router's IP address is appropriately configured (192.168.0.1).

INPUT CONNECTORS (FROM CONSOLE)



Callisto 616 Input Connectors

Analog Inputs

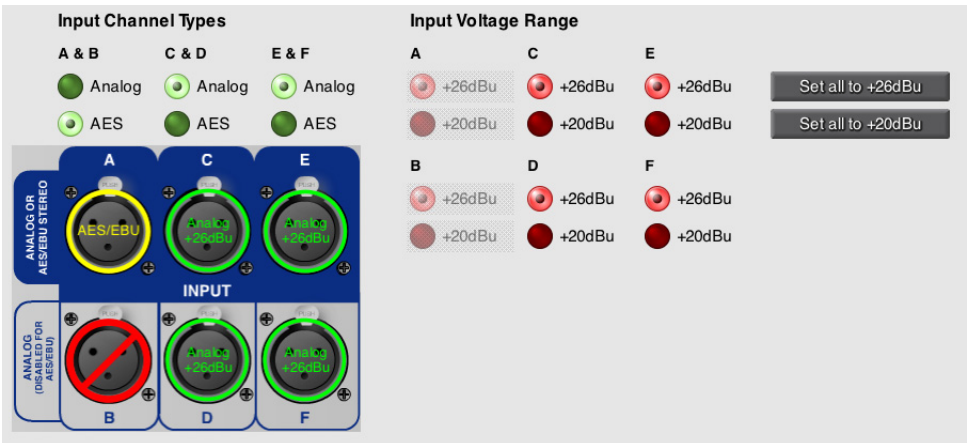
Analog source signals, including those from analog mixing consoles, are connected to the XLR-3F connectors labeled A through F on the left side of the Callisto 616 rear panel. The six analog inputs are electronically balanced and feed state-of-the-art A/D converters operating at 24-bit resolution at a 96 kHz sample rate. In the Compass control software on the Settings > Input and Output page, the Input Voltage Range can be set to either +26 dBu (the default) or +20 dBu. In addition, inputs A, C, and E can be configured as Analog or AES. The input meters on the Callisto 616 front panel indicate levels for both analog and digital signals.

NOTE: The adjustable output range provides two level output settings to drive Meyer Sound self-powered products. The +20 dBu output range setting lowers the overall noise floor by nearly 6 dB. However, this setting makes the Callisto 616 output signal more vulnerable to defects in the overall grounding system. Thus the actual improvement attained depends on the quality of the grounding between components. For this reason the default setting has been changed to +26 dBu. In either setting, the digital gain will compensate for either analog output gain so that the overall system output level set in the Callisto 616 will remain the same.

AES/EBU Inputs

AES/EBU digital source signals are connected to the XLR-3F connectors labeled A, C, and E on the Callisto 616 rear panel. Standard stereo AES/EBU digital audio signals at sample rates up to 96 kHz are supported. The input meters on the Callisto 616 front panel indicate levels for both analog and digital signals

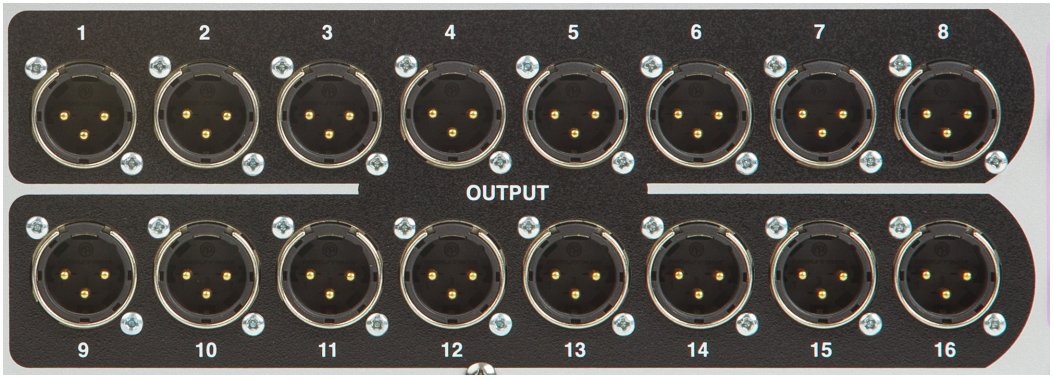
NOTE: In the Compass control software on the Settings > Input and Output page, the Input Channel Types can be set to Analog or AES. Because AES/EBU signals carry two channels of digital audio, when AES is selected, the second connector in the pair is disabled.



Compass System Settings, Input Channel Types

Both analog and digital input sources can be used simultaneously with Callisto 616. For example, AES/EBU signals can feed inputs A and C (inputs B and D are disabled), and analog signals can feed inputs E and F.

OUTPUT CONNECTORS (TO LOUDSPEAKERS/ARRAYS)



Callisto 616 Output Connectors

The Callisto 616 includes 16 XLR-3M output connectors featuring high-resolution 96 kHz, 24-bit D/A converters. These outputs have the same line-driving capabilities found on Meyer Sound's analog line drivers, delivering signal levels up to +26 dBu. The Callisto 616 can easily drive Meyer Sound self-powered loudspeakers to full output at all frequencies, even over lengthy cable runs.

NOTE: In the Compass control software on the Settings > Input and Output page, the Output Voltage Range can be set to either +26 dBu (the default) or +20 dBu. The +20 dBu setting lowers the overall noise floor by 6 dB but makes the output signal more susceptible to defects in the system's grounding; thus the actual performance at +20 dBu depends on the quality of grounding between components. At either setting, the unit's digital gain compensates for the output gain so that the overall system output level of the Callisto 616 will remain constant.

NOTE: The Callisto 616 AES provides 16 matrix outputs on eight AES/EBU (AES3) digital outputs. For more information, see Appendix A, "Galileo Callisto 616 AES."

CONNECTING THE SIM 3 AUDIO ANALYZER

Callisto 616 SIM 3 Connectors

The Callisto 616 rear panel includes a bus for direct connection to the SIM 3 audio analyzer. Once connected, the Callisto 616 can act as a line switcher for the analyzer and be used to measure across any selection of inputs and outputs without any additional patching beyond the single cable connection to the analyzer.

The default bus address for the Callisto 616 is 10 and the available range is 0–14. When the SIM 3 is connected to the Callisto 616 it is auto-detected and its presence is indicated with the SIM 3 LED on the Callisto 616 front panel. The SIM 3 also appears in the Compass control software on the Settings > SIM 3 page.

Looping SIM Connector

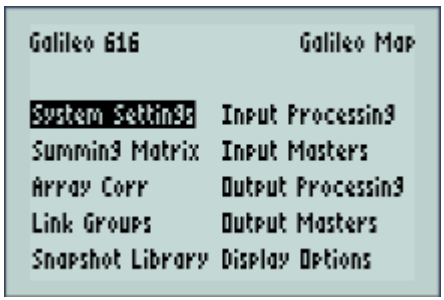
A second SIM 3 (looping) connector is included on the Callisto 616 rear panel that can be used to connect to an additional Callisto 616 or to a SIM-3088 line-level switcher.

NOTE: If a SIM-3088 switcher is connected to the SIM 3 looping connector, a SIM-3004 remote power supply is required; make sure the power supply connector marked “Connect to 3022 Analyzer Only” is used for this connection.

CHAPTER 4: USING THE CALLISTO 616 FRONT PANEL

All of the functions and system settings in the Callisto 616 are available via the front panel interface, navigating with the front panel buttons and knobs and viewed on the display. The same functions are paralleled in the Compass control software. The user can choose to control Callisto 616 from the front panel or remotely via the Compass control software, as they are interactive and communicate bi-directionally.

THE CALLISTO MAP PAGE



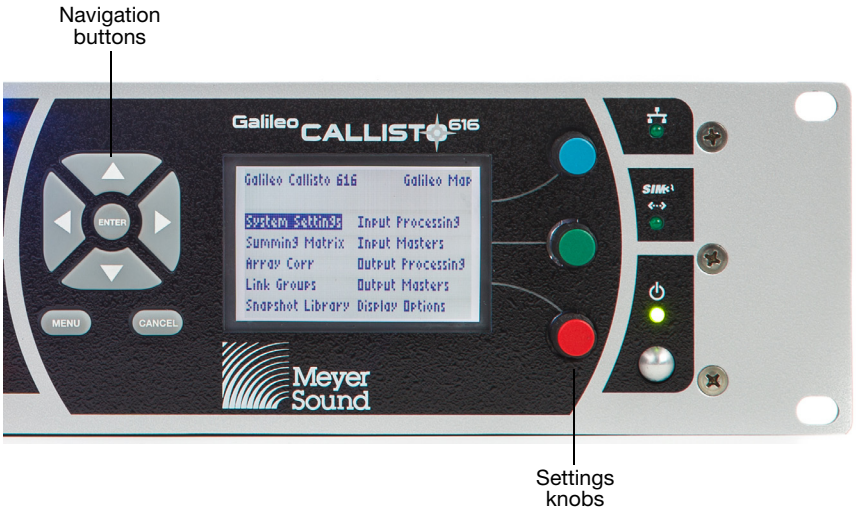
Callisto Map Page

The main screen on the Callisto 616, called the Callisto Map page, allows access to all of the functions of the system. It is the default screen after boot-up, and can be accessed at any time using the Menu button. Access the following pages via the Callisto Map page:

- System Settings
- Summing Matrix
- Link Groups
- Snapshot Library
- Input Processing
- Input Masters
- Output Processing

- Output Masters
- Display Options

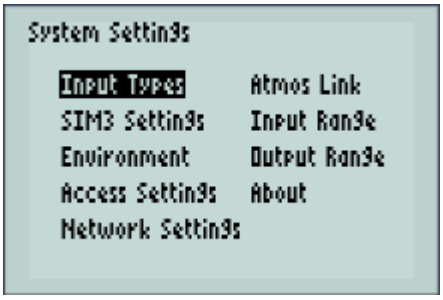
Navigate the Callisto Map page using the Arrow buttons to highlight a menu selection, and press the Enter button to select a page. The Blue knob also scrolls through the selections, functioning like the Up and Down arrows, and the Green knob moves between the left and right columns like the Left and Right arrows. Pressing either of these two knobs selects the highlighted page, just like the Enter button.



Callisto 616 Navigation Buttons and Knobs

NOTE: The Cancel button typically functions as a “Back” button, stepping back page by page toward the Callisto Map page. It does not typically undo parameter changes that were done within a page. As an exception, on the Label page the Cancel button steps back to the previous page without saving changes, while the Menu button saves the changes.

SYSTEM SETTINGS

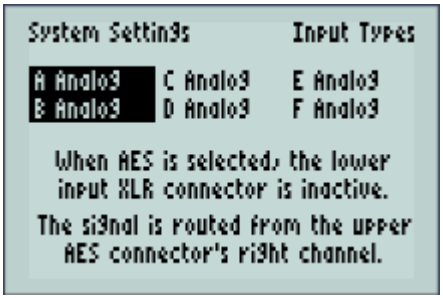


System Settings Page

The System Settings page gives access to a variety of global and setup parameters. Navigate the selections identically to the Callisto Map page using the Arrow buttons or knobs, and press the Enter button or the Blue or Green knobs to select. Access the following pages:

- Input Types
- SIM 3 Settings
- Environment
- Access Settings
- Network Settings
- Atmospheric Link
- Input Range
- Output Range
- About

Input Types

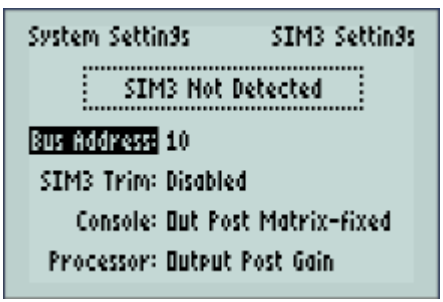


Input Types Page

Press the Enter button or the Blue or Green knob from System Settings to select this function. Input types scroll in pairs, using the Left and Right arrows to highlight the desired input pair. Push or turn the Blue knob to toggle between the choices of Analog/Analog or AES/Inactive.

Once the inputs are configured as desired, return to the System Settings page by pressing the Cancel button, or press the Menu button to return to the Callisto Map page.

SIM 3 Settings



SIM 3 Settings Page

Press the Enter button or the Blue or Green knob from System Settings to select this function. SIM 3 Settings will show whether a SIM 3 analyzer is connected and detected, and set other parameters when the Callisto 616 is connected to the analyzer. Settings include:

- **SIM 3 Bus Address:** Select from 0 through 14 by rotating the Blue knob clockwise to go up in value, and counterclockwise to go down in value.
- **SIM 3 Trim:** Select from Disabled or Enabled by clicking or rotating the Blue knob.

SIM 3 Trim allows the SIM operator to directly see the extent of their gain changes. In the SIM3 interface, Room response shows acoustic relative gain, Processor shows electronic relative gain, and Result shows a combination of both.

A post processor trim or gain stage is helpful for crossover gain setting. Crossover gain setting is achieved by viewing a memory trace of one loudspeaker and setting a second to match it at the crossover frequency. The gain of the second loudspeaker is adjusted until the traces match. If the gain is set in the Processor then the Room response will show a different crossover frequency than the Result. If the gain stage is post processor, both Room and Result agree on the frequency. For frequency based crossover, the post processor SIM 3 Trim is preferred. For relative levels between subsystems, the in processor gain stage is preferred.

NOTE: The acoustical crossover is defined as the point of equal level of two systems. If a mid-hi loudspeaker and a subwoofer are measured individually, the crossover might appear at 200 Hz. This would be the same reading in both Room and Result, because the processor is at unity in both. This indicates that the subwoofer must be turned down for the crossover to be 100 Hz. If you attenuate the subwoofer in the processor loop, the crossover will move down in the Result but will not change in the Room response. The subwoofer will still appear to need to be turned down since the change happened outside of the Room response. If the change is made in the output post processor SIM 3 Trim, the crossover will drop to 100 Hz in both Room and Result.

Once the SIM 3 settings are configured, return to System Settings by pressing Cancel, or press Menu to return to the Callisto Map page.

Environment

Press the Enter button or the Blue or Green knob from System Settings to select this function. Use the Up and Down arrows to navigate the selections, and the Blue knob to change values. Settings include:

- **Temperature:** Highlight and use Blue knob to scroll through the values, clockwise for higher temperature and counterclockwise for lower.

- **Humidity:** Highlight and use Blue knob to scroll through the values, clockwise for higher humidity and counterclockwise for lower.
- **Altitude:** Highlight and use Blue knob to select among the three ranges.

Once the Natural Environment settings are configured, return to the System Settings page by pressing the Cancel button, or press the Menu button to return to the Callisto Map page.

Access Settings

Press the Enter button or the Blue or Green knob from System Settings to select this function. Access Settings allows the Callisto 616's front panel to be locked from further changes with an access code, and allows the system engineer to specify which parameters may be changed and which ones will remain inaccessible to another user (or to accidental button pushing).

The access list is identical to that in the Compass control software, and includes the ability to modify Projects and recall Snapshots, change gains, polarity, delays, and equalization, mute channels, link groups, and update the Callisto 616's firmware. Use the Up and Down arrows to scroll through the parameters. Use the Enter button or press or turn the Blue knob to allow or deny access to particular parameters, by selecting Yes or No for each.

The default Access Code is "0 0 0", which allows unrestricted access to all parameters; it is shown at the top of the Access Settings page. To change the code, highlight Lock Access Settings and press the Enter button or the Blue knob.

A screen called Enter New appears, with instructions. Use the three knobs to scroll through numerals 0 through 99 to create three sets of one- or two-digit numbers, which the person setting the code must remember; press the Enter button to accept the code. The Access Settings page reappears, with the Access Code blank and Unlock Access Settings appearing in the list of options.

To unlock the device, highlight this option and press the Enter button or the Blue knob, use the three knobs to set the correct code, and press the Enter button. The Access Code will appear at the top of the page and parameters may now be changed.

When a parameter such as input gain or parametric equalization is locked, and an attempt is made to change it, a screen saying "This setting is locked" appears. Press the Cancel button to remove this screen and go back to the previous page.

⚠ **CAUTION:** Be certain to remember the access code that has been used to lock the Callisto 616's front panel parameters from any changes. It must be entered correctly or changes will not be able to be made — and it will be necessary to contact Meyer Sound Technical Services to obtain help with unlocking the unit.

Network Settings

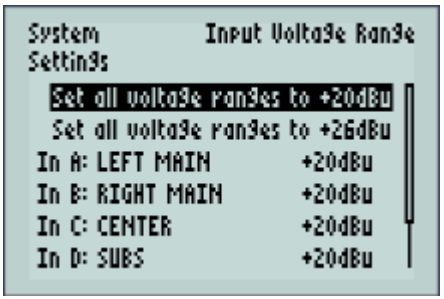
Network Settings Page

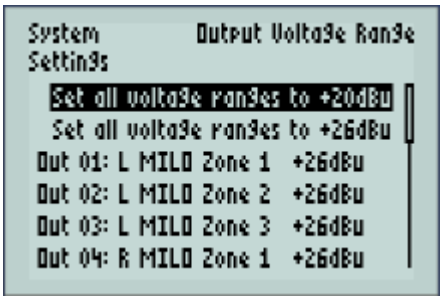
Press the Enter button or the Blue or Green knob from System Settings to select this function. Network Settings provides fields for device Nickname and for IP Type. Additional relevant fields are offered for DHCP (dynamic) and Static IP addresses. Toggle between them with a push of the Blue knob or the Enter button. The DHCP mode supports direct cable connection between the computer's Ethernet card and the Callisto 616. The DHCP will also reveal the MAC address. This will display below the assigned IP address.

With either DHCP or Static IP, highlighting "Write Network Settings" and pressing Enter or the Blue knob will load the settings and open a note saying "Writing Configuration". "Reload Network Settings" will load the IP address of the current server, and opens a note saying "Reading Configuration" before writing those values into the provided fields. Static IP has fields for IP Address, Net Mask, and Gateway, as well as Write Network Settings and Reload Network Settings.

A utility is offered that allows an IP Address, Net Mask, and Gateway number to be created by highlighting each of the four value positions, scrolling the Blue knob to the desired value, then using the Right arrow to go to the next value position. For each of these fields, press Menu to accept the changes, or Cancel to ignore the changes.

Input Range and Output Range





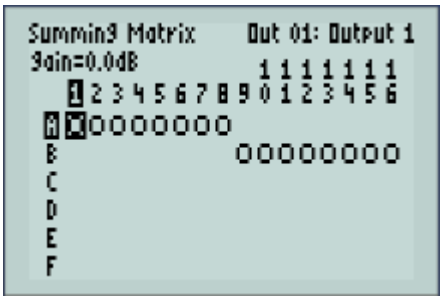
Input Voltage Range Page

Select Input Range or Output Range from the System Settings page to set the voltage range at either +20 dBu or +26 dBu. Apply the settings globally by highlighting “Set All Voltage Ranges to +20 dBu” (or +26 dBu) and pressing the Enter button.

Adjust the individual input or output voltage range for each channel by scrolling to the desired channel using the Up and Down arrows, and then pressing or turning the Blue knob to toggle between the two values.

NOTE: The adjustable output range provides two level output settings to drive Meyer Sound self-powered products. The +20 dBu output range setting lowers the overall noise floor by nearly 6 dB. However, this setting makes the Callisto 616’s output signal more vulnerable to defects in the overall grounding system. Thus the actual improvement attained depends on the quality of the grounding between components. For this reason, the default setting is +26 dBu. In either setting, the digital gain will compensate for either analog output gain so that the overall system output level set in the Callisto 616 will remain the same.

SUMMING MATRIX



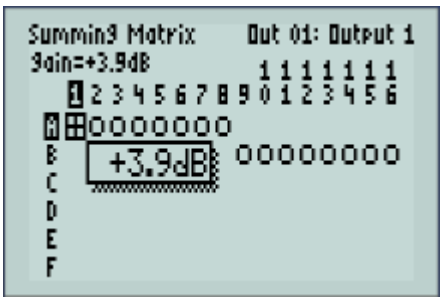
Summing Matrix, 8 + 8 Configuration

Press the Enter button or the Blue knob from the Callisto Map page to enter the Summing Matrix. A selected (active) audio route is designated by a circle at any crosspoint within the matrix; a blank signifies no audio routing between an input and an output. The box-shaped cursor will outline any crosspoint on which it is placed. The input letter and output number corresponding to the current cursor position are highlighted, and the Select LEDs on the inputs and outputs will also light.

Navigate the Summing Matrix by using the Left and Right arrows (or the Blue knob) to scroll through outputs, and the Up and Down arrows (or the Green knob) to scroll through inputs.

To select (or deselect) an audio route between an input and an output, press the Enter button. This will toggle the crosspoint between unity gain (0.0 dB, shown with an O) and fully attenuated (–90 dB or –Inf, shown with a blank).

Change the gain at the crosspoint where the cursor is presently located by turning the Red knob — clockwise for gain and counterclockwise for attenuation. The range is from +20 dB to –90 dB, and is designated in the matrix as a [–] for levels below unity gain, and a [+] for levels above unity. The actual level is shown for the cursor position in “gain = xx dB” in the upper left corner of the Summing Matrix window, and is also shown in a highlighted box on the screen while the value is being changed via the Red knob.



Summing Matrix, Attenuation

CAUTION: Placing the cursor on a crosspoint containing a value other than unity gain or off (one with a [–] or [+] in it) and then pressing the Enter button will first turn it off and then a second press will change the value to unity gain.

NOTE: When in the Summing Matrix, pressing the Enter button is similar to the Router Mode in the Compass control software. The crosspoint where the cursor is located will toggle between on (unity gain) and off (minus infinity).

CREATING LABELS

Label Page

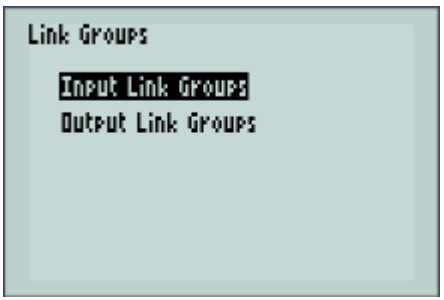
Labels can be created for the individual channels in Input Processing and Output Processing, for groups in Link Groups, for arrays in Array Correction, and for snapshots in the Snapshot Library. In all of these pages, highlight the Label field and press the Enter button or the Blue knob. A page of characters will appear on the screen; use the following controls to scroll among and select characters for the label:

- **Blue Knob:** Scrolls through the available set of characters presented on the screen; press the knob to enter the character into the name field at the top of the screen.
- **Green Knob:** Scrolls through the characters that have already been selected and placed in the label field, placing a flashing cursor under the letter; pressing the knob will delete the character to the left of the one underlined with the flashing cursor. Moving the cursor to a location in an already created word, then going back to the blue knob and selecting other letter(s) and pressing it to enter the character(s) will insert them in the space to the left of the cursor.
- **Red Knob:** Pressing the knob will place a space to the right of the cursor when the cursor is at the end of what is being written, and to the left of the cursor when it is in the middle of what is written.
- **Arrow Buttons and Enter:** The Left and Right arrows will go along a row of characters and the Up and Down arrows will go vertically through the rows. The Enter button will put that letter or symbol in the label area.
- **Menu Button:** Pressing the Menu button when the name is complete will save it.

- **Cancel Button:** Pressing the Cancel button will discard the naming changes and return to the previous screen.

TIP: The fastest way to enter names is to use a combination of the rotary knobs and the Up and Down arrows. Use the Arrow buttons to go to the desired row, and then use the Blue knob to highlight and select the desired letters. Create spaces with the Red knob, and correct errors or add words in the middle with the Green knob.

LINK GROUPS

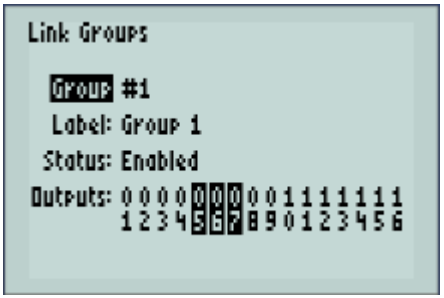


Link Groups Page

The Link Groups page allows a set of input or output channels to be selected so that actions done to one channel will be done to all members of the same group. The group can be enabled or disabled; when disabled, changes made to one channel will not be duplicated in the others. An input or output channel can belong only to one Link Group.

CAUTION: Since an input or output channel can only belong to one Link Group, selecting a channel that is currently assigned to another Link Group will remove it from the original group and add it to the new one.

The Link Group fields are:



Link Groups Page (with Linked Output Channels Highlighted)

- **Group:** Use the Up and Down arrows to highlight, and the Left and Right arrows or the Blue knob to scroll through and select group #1 through #8; both methods do a continuous scroll.

  NOTE: In the Link Groups screen, the Left and Right arrows always affect the group number, regardless of which field is highlighted, unless the Inputs or Outputs field is highlighted.

- **Label:** Enter a name with the same method as other label fields.
- **Status:** Use the Up and Down arrows to highlight, and the Enter button or Blue knob (either push or rotate) to toggle between Disabled or Enabled.
- **Inputs or Outputs:** Use the Up and Down arrows to highlight, and then use Left and Right arrows or Blue knob to scroll among input or output channels to link. Press the Enter button or the Blue knob to select each one, which will remain highlighted; click again to deselect.

  NOTE: When channels are linked and one of them is selected using the Select buttons on the Callisto 616 front panel, all of the blue LEDs within the group light, and the screen typically goes to the main Processing window for the channel that was selected. The name of the channel in the upper right corner is highlighted and flashing, indicating that it is linked. Any change made for this one channel in the processing win-

dow will also happen in the other linked channels. To view the other channels in the group, press the Select button corresponding to that channel and it will appear in the display, and will show that channel number in the upper right corner.

Callisto 616 Front Panel with Select LEDs Showing Linked Channels

NOTE: Atmospheric Correction cannot be part of a link group.

NOTE: To unlink the group of channels, go to Link Groups from the main menu, scroll to highlight the Status field, and click the Enter button (or turn or press the Blue knob) to select Disabled. Clicking on any of the Select buttons will then turn on only that LED, and turn off the lighted group.

TIP: To remove an input or output channel from a Link Group, select the appropriate group, scroll down to Inputs or Outputs and across to the highlighted channel, and press the Enter button or the Blue knob to remove the highlight.

NAVIGATING WITH THE SELECT BUTTONS

The input and output Select buttons interact with the display screen to quickly access any of the channels. When they are selected and active, the blue LED corresponding with that channel will light.

Depending on which type of parameter is active on the display, pressing a channel Select button will function in the following way:

- **Input / Output Masters:** Cursor goes to the fader for that channel, allowing gain changes with the Red knob or Arrow buttons.
- **Summing Matrix:** Cursor goes to the particular input/output combination that is selected, allowing routing selection with the Enter button or level control with the Red knob.
- **EQ Mode Graphs** (including Numeric tables): Goes to the graph and the particular mode that was last selected.
- **Other Pages:** Cursor goes to the main Processing page for the selected input or output channel.

TIP: When adjusting EQ parameters, holding the Menu button and pressing the Up and Down arrows will toggle through the channels, while pressing the Left and Right arrows will toggle through the EQ modes (types) within the currently selected channel. The Enter button bypasses individual parametric EQ bands, and the TruShaping or Low/High Pass equalization when in the graph or numeric EQ pages.

TIP: Press and hold a Select button, and then press additional ones to select multiple channels for temporary “linking.” Actions done with one of these channels will simultaneously occur on all the selected channels (other than atmospheric correction). To unlink the channels, press any Select button.

SNAPSHOT LIBRARY

Snapshot Page)

The Snapshot Library lists all existing Snapshots (full system configurations for the Callisto 616) within a Project and available in the memory of the Callisto 616 or in the library of a connected computer running the Compass control software. The Callisto 616 ships with over 50 Factory Standard Presets which are viewed in the front panel as a second page of the Snapshot Library. The default page is User Snapshots; scroll to the Factory Presets using the Right arrow.

Use the Up and Down arrows or the Blue knob to scroll through existing Snapshots, and press the Enter button to enter an Edit field for the selected Snapshot. Navigate the Edit screen with the Arrow buttons. At the top of the Edit screen, information is provided for the selected Snapshot, including its ID number and whether it is currently the active Snapshot or has been modified; these fields may not be changed.

The available fields in the Edit menu are:

- **Name:** Displays the current name, and allows changes to the name. Pressing the Enter button brings up the naming utility, and after any changes press the Menu button to keep them or the Cancel button to return without making any name changes.
- **Comment:** Add a comment, if desired. Use the same procedure as in the Name field above.
- **Is Boot:** Use to choose which Snapshot will be the boot configuration for the Callisto 616; pressing the Enter button or pressing/turning the Blue knob will select between No or Yes.

NOTE: Only one Snapshot at a time may be selected as the boot configuration for the Callisto 616, and it may be selected either in the Compass control software or via the “Is Boot” field above. That Snapshot will have “(boot)” in front of its name in the Snapshot Library list.

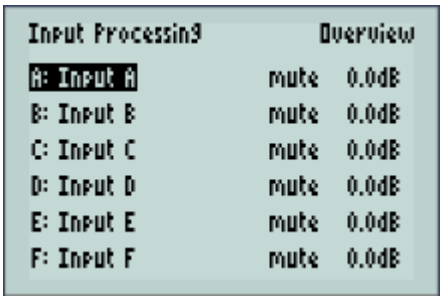
- **Recall:** Highlight the Recall command using the Up and Down arrows (the Left and Right arrows will go across the two columns of commands when the highlight cursor is in the lower section of the Edit page), and press the Enter button to load the selected Snapshot as the current Callisto 616 configuration. The currently active Snapshot is designated with an asterisk before its ID number in the Snapshot Library.
- **Update:** Highlight as in Recall above, and press the Enter button to add changes to an existing Snapshot. This command allows changes to the currently active Snapshot, rather than creating a new Snapshot.
- **Duplicate:** Highlight, and press the Enter button to create a duplicate of the selected Snapshot. It will be placed at the end of the Snapshot Library list, and will have “#2” added at the end of its name (the actual number will increase depending on how many duplications are made). Select it for further editing and renaming, if desired.
- **Delete:** Highlight, and press the Enter button to delete the selected Snapshot. It will be deleted from the memory of the Callisto 616 and from the Snapshot Library in a connected computer running the Compass control software.

Create New Snapshot

At the top of the Snapshot Library list is “Create New Snapshot”. After creating the desired configuration within the Summing Matrix, Input and Output Processing, Link Groups, and so on, highlight and press the Enter button to open the naming window and create a name for the new Snapshot. Press the Menu button when complete, and the newly named Snapshot will be added to the bottom of the Snapshot Library list and become current.

NOTE: Within the Snapshot page in Callisto 616, a particular Snapshot can be designated as the “boot snapshot”, so that whenever the unit is turned on it will open with those system settings and parameters active. Highlight the desired Snapshot from the list of those that have been created, highlight the “Is Boot” field, and press the Enter button or the Blue knob to set it to “Yes.”

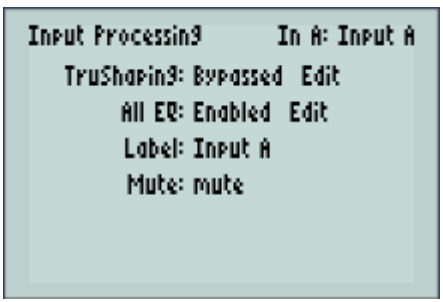
INPUT PROCESSING



Input Processing Overview page

Select Input Processing from the Callisto Map page, which leads to an Overview page listing all of the inputs and their labels, and the mute status and input level setting of each. Scroll through and highlight the inputs using the Up and Down arrows, and press the Enter button to select and go to the parameters page for that input. An alternate route to the Input Processing parameters for a channel is via the Input Masters page, using the same procedure.

On the Overview page, pressing the Green knob will mute and unmute the highlighted channel; the word “mute” is highlighted when that input channel is muted. Turning the Red knob will affect the gain of the highlighted channel, clockwise for gain and counterclockwise for attenuation; pressing and holding the Red knob will make coarser gain adjustments.

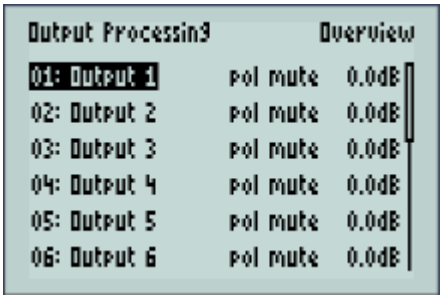


Available parameters in Input Processing

Within the channel's Input Processing page, the available parameters are:

- **TruShaping:** Press or turn the Blue knob to select Enabled or Bypassed for that channel's TruShaping EQ section; press the Enter button to enter the Edit page for the TruShaping equalizer and make changes.
- **All EQ:** Press or turn the Blue knob to select Enable or Bypassed for that channel's total equalization. Press the Enter button to enter the existing equalization curve with a cursor nominally placed at 1 kHz; turning the Blue knob will scroll through the EQ curve and the values at the cursor point will be shown at the top of the screen and pressing the knob while turning will scroll more quickly through the frequencies. Turning the Green knob will zoom the location of the cursor both horizontally and vertically; press the knob while turning to zoom more quickly.
- **Label:** Pressing the Enter button will open the naming utility; create the desired label and press the Menu button to accept.
- **Mute:** Highlight this field and press the Enter button or press/turn the Blue knob to toggle between mute and unmute for the channel; when muted, the word "mute" is highlighted.
- **Gain:** Highlight the field, and use the Red knob to adjust gain in the range of –60 dB to +10 dB (nominally at 0 dB); press and turn the knob to scroll quickly through the gain values.
- **Delay:** Highlight the field, and turn the Red knob clockwise to adjust the delay from the nominal zero point, and counterclockwise to reduce the value if it is above zero. Press the knob and turn for a coarser adjustment, and to reach higher values more quickly.
- **Delay Units:** To change the delay units, highlight and toggle through the choices with the Enter button or press or turn the Blue knob. The Blue knob scrolls from milliseconds counterclockwise to samples clockwise.

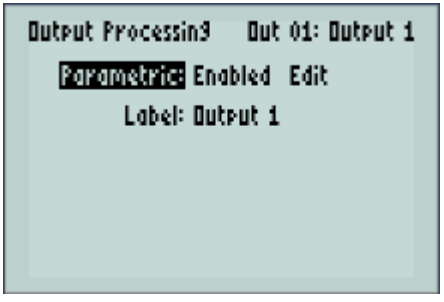
OUTPUT PROCESSING



Output Processing Overview page

Select Output Processing from the Callisto Map page, which leads to an Overview page listing all of the outputs and their labels, and the mute status and output level setting of each. Scroll through and highlight the outputs using the Up and Down arrows, and press the Enter button to select and go to the parameters page for that output. An alternate route to the Output Processing parameters for a channel is via the Output Masters page, using the same procedure.

In the Overview page, pressing the Blue knob will reverse the polarity of the highlighted channel; the word “pol” will be highlighted when the polarity is reversed for that output channel. Pressing the Green knob will mute and unmute the highlighted channel; the word “mute” will be highlighted when that output channel is muted. Turning the Red knob will affect the gain of the highlighted channel, clockwise for gain and counterclockwise for attenuation; pressing and holding the Red knob will make coarser gain adjustments.



Output Processing Parameters

Within the channel's Output Processing page, the available parameters are:

- **Parametric:** Press or turn the Blue knob to select Enabled or Bypassed for that channel's parametric EQ section; press the Enter button to enter the Edit page for the parametric equalizer and make changes.
- **All EQ:** Press or turn the Blue knob to select Enabled or Bypassed for that channel's total equalization. Press the Enter button to enter the existing equalization curve with a cursor nominally placed at 1 kHz; turning the Blue knob will scroll through the EQ curve and the values at the cursor point will be shown at the top of the screen and pressing the knob while turning will scroll more quickly through the frequencies. Turning the Green knob will zoom the location of the cursor both horizontally and vertically; press the knob while turning to zoom more quickly.

  NOTE: When All EQ is bypassed, the individual fields for Parametric, TruShaping, and High/Low Pass will also be shown as bypassed. These settings will remain locked in the bypassed condition until All EQ is again enabled.

- **Label:** Pressing the Enter button will open the naming utility; create the desired label and press the Menu button to accept.
- **Mute:** Highlight this field and press the Enter button or press/turn the Blue knob to toggle between mute and unmute for the channel; when muted, the word "mute" is highlighted.
- **Gain:** Highlight the field, and use the Red knob to adjust gain in the range of –60 dB to +10 dB (nominally at 0 dB); pressing the knob and turning will scroll through the gain values more quickly.
- **Delay:** Highlight the field, and turn the Red knob clockwise to adjust the delay from the nominal zero point, and counterclockwise to reduce the value if it is above zero. Press the knob and turn for a coarser adjustment, and to reach higher values more quickly.
- **Delay Units:** To change the delay units, highlight and toggle through the choices with the Enter button or press/turn the Blue knob. The Blue knob scrolls from milliseconds counterclockwise to samples clockwise.
- **Polarity:** Press the Enter button or press/turn the Blue knob to go between Normal and Reversed polarity.

- **SIM 3 Trim:** The SIM 3 Trim field is enabled or disabled in the SIM 3 settings page, accessed via System Settings. When an analyzer is connected, use the Red knob to adjust the gain to the analyzer.
- **Link Group:** Shows if the output channel is part of a Link Group; the default label is “none”, and if part of a group its label is displayed.

  NOTE: A channel can only be made part of a group using the Link Group page, and if the Enter button is pressed a message saying this comes on the screen; press the Cancel button to return to the Output Processing page.

- **Array Group:** Can be used to assign an output channel to an Array Group. The default is “none”; turning the Blue knob clockwise will scroll through “Array 1” through “Array 8”, and assign the output to the array. The user will still need to go to the Array Correction page to select the type and size of the array and to enable it.
- **Atmospheric Bypass:** Press the Enter button or press/turn the Blue knob to toggle between Bypassed and Enabled.
- **Atmospheric Distance:** Turn the Blue knob clockwise to increase the distance, and counterclockwise to decrease. Press and hold the knob for a more coarse adjustment, and to increase faster.

  NOTE: Atmospheric controls must be set for each desired output channel. Even when channels are linked, atmospheric changes are not applied across the group.

  TIP: When viewing both EQ and phase on the graph, choose shading for the EQ so that it is easier to distinguish between the two presented lines. The EQ curve is shaded, and phase is not.

THE EQUALIZATION MENU

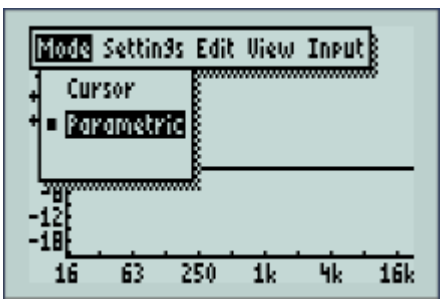
Within the Parametric or All EQ pages, a menu bar can be opened that gives access to more equalization and view options and controls. When any of these pages are displayed, press the Up arrow to open the menu at the top of the page. Pressing the Down arrow once this menu appears will open the submenus.

At this point, using the Left and Right arrows will scroll across the main menu headings, and the Up and Down arrows will scroll among the submenu items, highlighting them. Press the Enter button to select the desired item.

NOTE: The Up arrow that opens the menu bar acts as a toggle; clicking it again will close the menu bar; when the drop-down submenu is open, press the Cancel button to escape from it.

The available items in the Equalization menu (accessed from the EQ pages) are Mode, Settings, Edit, View, and Input/Output.

Equalization Mode Menu

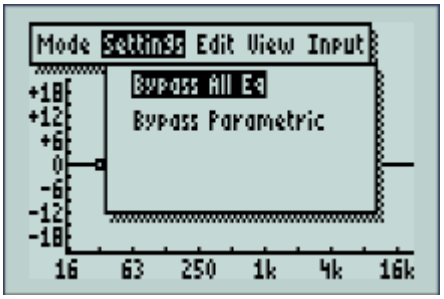


Equalization Mode Menu

Use the Up and Down arrows, and press the Enter button to select from the following submenu items:

- **Cursor:** Provides a vertical cursor on the EQ point, and has fields that show frequency, gain setting, and phase.
- **Parametric:** Opens the Parametric EQ page.

Equalization Settings Menu

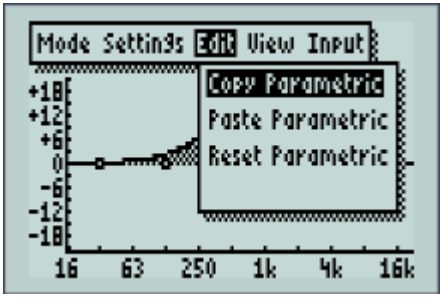


Equalization Settings Menu

Use the Up and Down arrows, and press the Enter button to select from the following submenu items:

- **Bypass All EQ:** Temporarily removes all equalization from the input or output channel signal; select the item again to enable.
- **Bypass Parametric:** Temporarily removes all parametric equalization from the input or output channel signal while any other EQ remains; select the item again to enable.

Equalization Edit Menu



Equalization Edit Menu

Use the Up and Down arrows, and press the Enter button to select from the following submenu items:

- **Copy Parametric:** Highlight this item and press the Enter button to copy the present equalization settings on the page; use the following command to paste them into another channel.

  NOTE: When in Cursor mode, a Copy All function appears in the Edit submenu, allowing all of the values in the selected channel to be copied. After copying, a Paste All function is also provided. If multiple channels are selected when using the above functions, the pasted values will be placed in all of the selected channels.

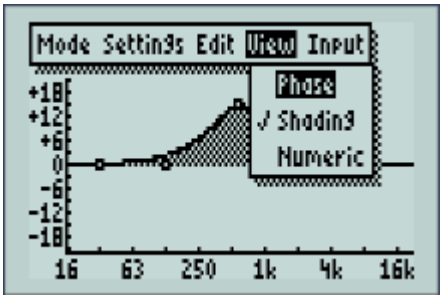
- **Paste Parametric:** After going to the page of another channel, highlight this item and press the Enter button to paste the copied equalization settings.

  NOTE: Once a set of equalization values are copied, they may be pasted into as many channels as desired, one channel at a time. Press the Channel Select button for the desired channel on the Callisto 616 front panel to go to that channel's page, and paste in the EQ values, or navigate to the other channels by pressing the Cancel button twice, until the Input Processing or Output Processing Overview page is reached, and then scroll down to the desired channel and press the Enter button to select. Alternately, use the Input/Output menu described below to select the next channel.

- **Reset Parametric:** Resets the values of all of the parametric EQ points to zero on the present channel's page, and can be used in any of the EQ pages.

  CAUTION: The Reset Parametric command is not a toggle, so the settings will be lost for that channel. For temporarily removing the effect of either of these equalization values from the input or output channel, use the Bypass controls in the Settings menu of the EQ graph page, or the Enabled/Bypassed fields in the Input Processing or Output Processing pages.

Equalization View Menu



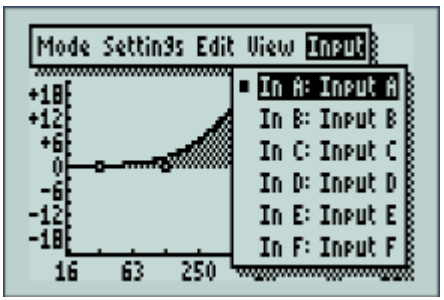
Equalization Edit Menu

Use the Up and Down arrows, and press the Enter button to select from the following sub-menu items:

- **Phase:** Shows the phase response of the EQ curve along with the frequency response.
- **Shading:** Shows the EQ curve with shading from center line to curve (default setting).
- **Numeric:** Shows the values table for each equalization point within the current channel's Parametric, TruShaping, or High/Low Pass EQ page, in the place of the EQ graph.

NOTE: When View > Numeric is selected, all views of the EQ settings for any selected channel are shown in the form of numeric tables until Numeric is deselected. Scroll through the available EQ points with the Left and Right arrows, and use the Blue, Green, and Red knobs to change values at the selected points.

Equalization Input/Output Menu

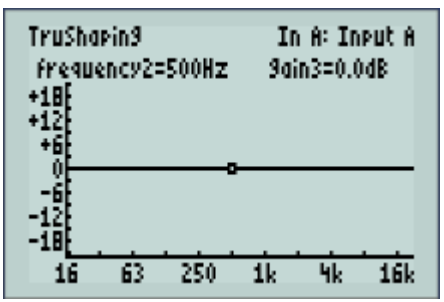


Equalization Input Menu

Use to select any input or output from within the current EQ page; scroll with the Up and Down arrows and press the Enter button to select.

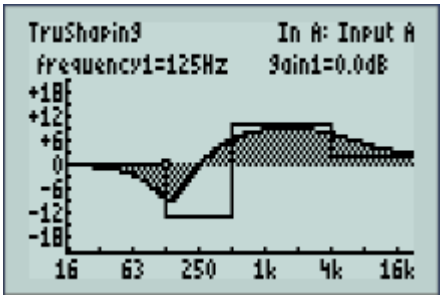
NOTE: EQ changes that have been done in one EQ page for a particular channel will be retained and shown in the next page view.

USING TRUSHAPING EQ



TruShaping EQ with EQ Point

When TruShaping EQ is selected in the Input Processing page, one EQ point is presented at a time on the page. These points are nominally centered at 125 Hz, 500 Hz, and 4 kHz, though once their frequency has been changed for one channel using the Blue knob, the new value replaces these values for that Callisto 616 project.



TruShaping EQ with Equalization Changes

Press the Left and Right arrows or press or turn the Green knob to select among the TruShaping EQ points. The selected band and upper or lower EQ point will flash, and any frequency and gain changes made will affect that point and band. The bands are:

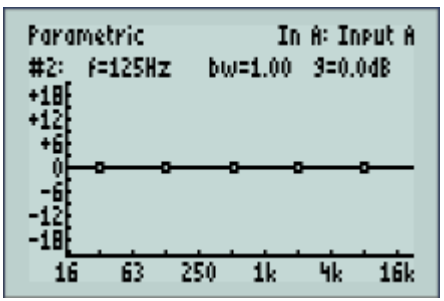
- **Low Shelving:** Left-most part of frequency line and dot are flashing; the Blue knob moves frequency and Red knob changes gain.
- **Low Bandpass, lower frequency:** Left-most dot and section of frequency line just above it are flashing; allows the lower frequency of this filter to be changed with the Blue knob, and the Red knob changes gain.
- **Low Bandpass, upper frequency:** Central dot and section of the frequency line to its left are flashing; allows the upper frequency of this filter to be changed with the Blue knob, and the Red knob changes gain.
- **High Bandpass, lower frequency:** Central dot and section of the frequency line to its right are flashing; allows the lower frequency of this filter to be changed with the Blue knob, and the Red knob changes gain.
- **High Bandpass, upper frequency:** Right-most dot and section of the frequency line to its left are flashing; allows the upper frequency of this filter to be changed with the Blue knob, and the Red knob changes gain.
- **High Shelving:** Right-most dot and section of the frequency line are flashing; the Blue knob moves frequency and Red knob changes gain.

NOTE: For the TruShaping EQ settings, turn the Blue knob to adjust the exact "knee" frequency for the upper and lower points for each EQ band, and then turn the Red knob to adjust the amount of boost or cut. In the upper right corner of the page, a fixed field says "gain [1 — 4] = X.X dB". The field named "gain1" is Low Shelving, "gain2" is Low Bandpass, "gain3" is High Bandpass, and "gain4" is High Shelving.

TIP: When a channel is on its TruShaping EQ page in either the graph or numeric view, pushing the Enter button will toggle between Enabled and Bypassed.

NOTE: Three "knee" points are available with the TruShaping filter; the upper frequency boundary of one filter is also the lower boundary of the one above it.

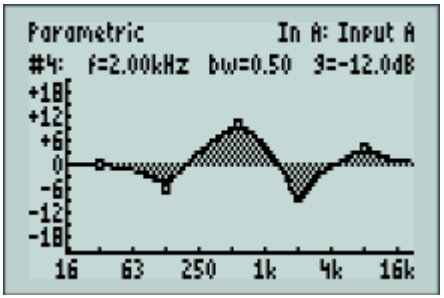
USING PARAMETRIC EQ



Parametric EQ with EQ Points

When Parametric EQ is selected in the Input or Output Processing pages, all available EQ points are presented on the page — five for inputs and 10 for outputs. Choose the particular parametric EQ point to change using the Left and Right arrows; the selected one will blink.

Once a Parametric EQ point is selected, use the knobs to adjust the parameters, as follows; the knobs behave the same as a single band of the Meyer Sound analog CP-10 parametric equalizer:



Parametric EQ with Equalization Changes

- **Blue Knob:** Moves the frequency center for each point; the value is shown in the “f=X.X” field on the top left.
- **Green Knob:** Adjusts the bandwidth of the parametric EQ point; turn clockwise to narrow and counterclockwise to widen between 0.10 and 2.00; the value is shown in the “bw=X.XX” field on the top center.
- **Red Knob:** Adjusts the boost and cut of the parametric EQ point; clockwise for gain and counterclockwise for attenuation; the value is shown in the “g=X.XdB” field on the top right.

NOTE: Press and hold the knobs to make coarser adjustments (wider frequency intervals, bandwidth by 0.1, gain by 1 dB), and just turn the knob for finer adjustments.

TIP: By pushing any channel select button, input or output, the display goes to the Processing page for that channel. When in one of the Edit windows (Parametric or TruShaping, High/Low Pass for Outputs), the screen goes directly to the Edit window and EQ display for that channel.

NOTE: To bypass the parametric EQ section in a channel when in the graph or numeric page, press Menu+Enter.

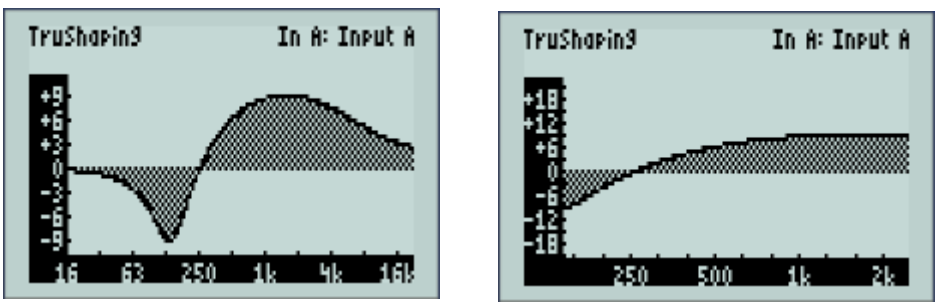
EQ GRAPH ZOOM MODES

Cursor Zoom

Cursor zoom places a cursor on the EQ page and allows the expansion of the curve in both the horizontal and vertical scales, from +/–18 dB to +/–1 dB, and from 20 Hz to 20 kHz to increments of only a few Hz in the LF to a few hundred Hz in the HF. Select Mode > Cursor when in an EQ graph (Input or Output Processing, in Parametric or TruShaping or Low/High Pass) by pressing the Up arrow, highlighting Mode, pressing the Down arrow to open the sub-menu, using the Up and Down arrows to highlight Cursor, and pressing the Enter button.

Turning the Blue knob will scroll through the EQ curve and the values at the cursor point will be shown at the top of the screen. Pushing the Blue knob and turning clockwise will zoom the curve horizontally. Turning the Red knob will scroll the EQ curve vertically in either direction from the default centered position, and pushing it while turning will zoom the vertical scale. Turning the Green knob will simultaneously zoom the horizontal and vertical scales, while pressing it will reset the graph to the default view.

Standard Zoom

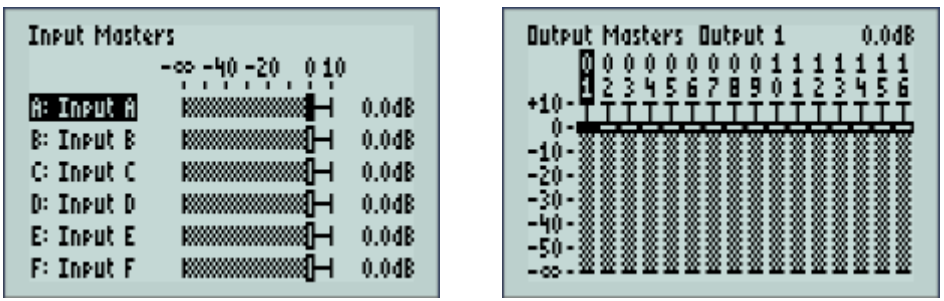


Equalization Curve with Vertical Zoom (Left) and Horizontal Zoom (Right)

In any of the EQ graph views, clicking the Down arrow will highlight the horizontal and vertical scales. Pressing and turning the Red knob clockwise will expand the vertical scale, up to 1 dB per division from the beginning 6 dB per division. Pressing and turning the Blue knob will expand the horizontal scale to increments of only a few Hz in the lower frequencies to a few hundred Hz in the higher frequencies.

Turning the Blue knob without pressing will scroll across the expanded horizontal scale. Turning the Green knob will zoom both horizontal and vertical scale simultaneously; pressing and turning will do a quicker zoom and turning without pressing will do a slower zoom. Clicking the Up arrow will release the Zoom mode.

INPUT AND OUTPUT MASTERS



Input Masters Page (Left) and Output Masters Page (Right)

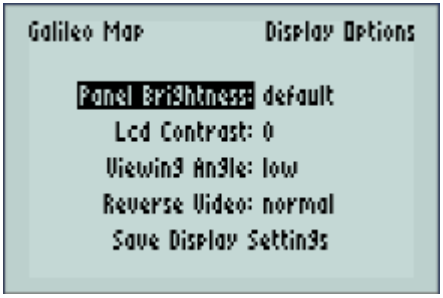
The Input Masters and Output Masters pages provide a convenient location to adjust the gains of all the inputs and outputs, in a virtual fader view. From the Callisto Map page, highlight the desired masters section and press the Enter button or the Blue knob. Once in the Masters page, use the Up and Down arrows or turn the Blue knob to scroll through the inputs and outputs.

Turning the Red knob will adjust the gain of that input or output in 0.1 dB steps, clockwise for gain and counterclockwise for attenuation. Pressing and turning the Red knob will change the gain in 1 dB steps.

NOTE: Alternately, for the Input Master page, pressing the Left and Right arrows will also change the gain in 1 dB steps, and pressing the Up and Down arrows will scroll among the inputs. For the Output Masters page, pressing the Up and Down arrows will change the gain in 1 dB steps, and pressing the Left and Right arrows will scroll among the outputs.

NOTE: In Input & Output Masters, pressing the Enter button while on a channel will go to the Processing page for that channel.

DISPLAY OPTIONS



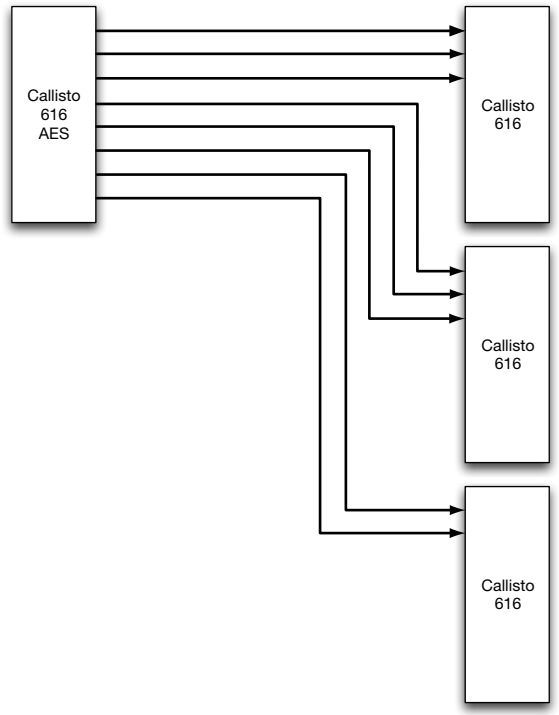
Display Options Page

The display options available in the Callisto 616 are:

- **Panel Brightness:** Highlight and use the Blue knob to scroll through the options of Dark Show, Dim, Default, and Outdoor.
- **LCD Contrast:** Highlight and use the Blue knob to change values from 0 to 63.
- **Viewing Angle:** Highlight and use the Blue knob to scroll through options of Low, Medium, and High.
- **Reverse Video:** Highlight and use the Blue knob to select Normal or Reverse; knob can be pressed in or turned for this selection.
- **Save Display Settings:** Highlight and press the Enter button or the Blue knob to save. If settings are not saved, the screen will revert to the default when the Callisto 616 is next turned on.

APPENDIX A: GALILEO CALLISTO 616 AES

The Callisto 616 AES provides 16 matrix outputs on eight AES/EBU (AES3) digital outputs. It can be used to drive the standard Callisto 616's digital inputs or any other device that accepts 96 kHz, AES3 digital audio signals. This appendix documents the differences between the Callisto 616 AES and the standard Callisto 616.



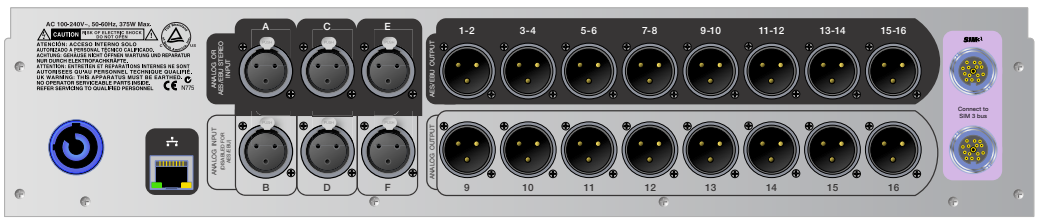
Callisto 616 AES Driving Three Callisto 616s

Inputs

The Callisto 616 AES has the same six analog/digital audio inputs (A–F) as the standard Callisto 616. The inputs can be switched between analog and digital in the same manner as the standard Callisto 616.

Outputs

The top row of eight XLR audio outputs for the Callisto 616 AES provides 16 channels of AES/EBU digital outputs (two channels per output; 1–2, 3–4, 5–6, 7–8, and so forth). When connecting these outputs to the inputs of AES/EBU devices, use only cables rated for AES/EBU signals. The bottom row of eight XLR audio outputs (9–16) provides eight channels of analog outputs. Any output processing applied to outputs 9–16 are mirrored in digital format on the appropriate AES/EBU output and on the corresponding analog output.



Callisto 616 AES Rear Panel

NOTE: The Callisto 616 AES exhibits a loss of 8 dB when the output voltage ranges are set to +26 dB, and a loss of 2 dB when set to +20 dB. The gain offset can be corrected by using the output gain controls.

Processing

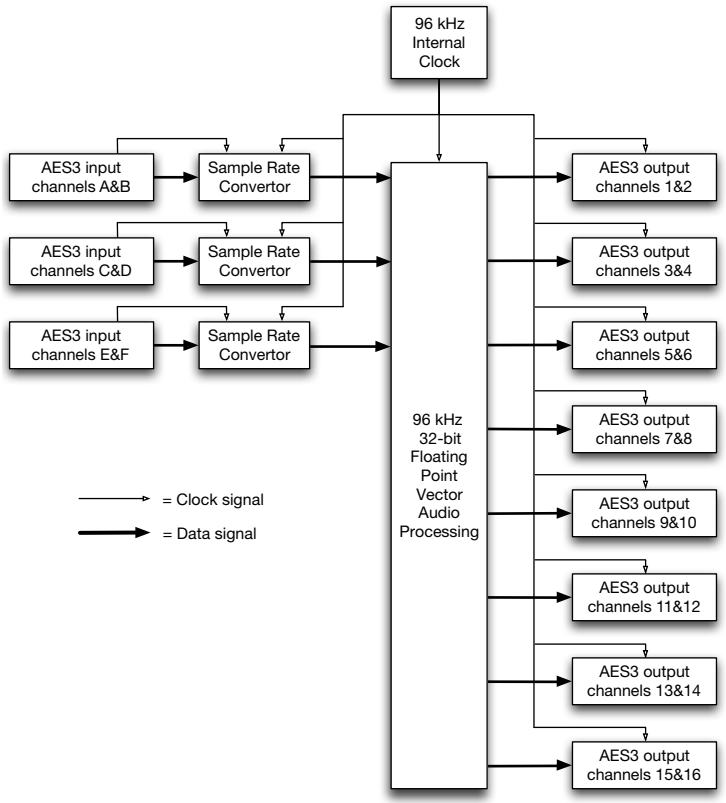
The Callisto 616 AES offers mostly the same processing on inputs and outputs as the standard Callisto 616 except for parametric filtering. The Callisto 616 AES includes parametric filtering on both inputs and outputs (5-band), while the standard Callisto 616 includes parametric filtering only on outputs (10-band).

Callisto 616 Available Processing

Processing		Callisto 616 AES	Callisto 616 (Standard)
Inputs	Gain	✓	✓
	2-sec Delay	✓	✓
	TruShaping EQ	✓	✓
	Parametric Filter	5-band	(none)
Outputs	U-Shaping EQ	✓	✓
	Parametric Filter	5-band	10-band
	Polarity Reversal	✓	✓
	2-sec Delay	✓	✓
	Atmosphere Correction	✓	✓
	Delay Integration	✓	✓
	High- / Low-Pass Filters	✓	✓
	Gain	✓	✓

Callisto 616 AES Clock

The Callisto 616 AES uses an internal sample clock for its digital audio output. It cannot be synchronized to an external source.



Callisto 616 AES Clocking Scheme

APPENDIX B: SPECIFICATIONS

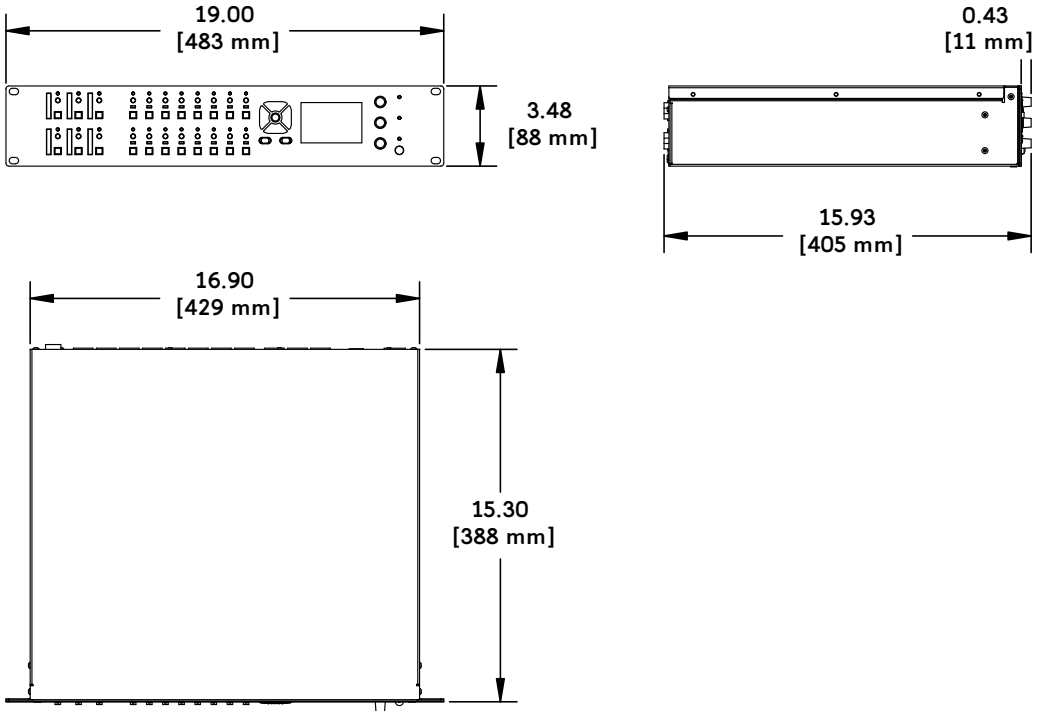
CALLISTO 616 SPECIFICATIONS

INPUTS	
Inputs Section	Six inputs, analog or digital (AES/EBU, selectable in pairs)
Connectors	Gold-plated XLR female
Maximum Peak SPL	+26 dBU (maximum range selected, 0 dB input gain)
Metering	26-segment LED ladder meters on each input
OUTPUTS	
Outputs Section	16 analog outputs
Connectors	Gold-plated XLR male
Maximum Output Level	+26 dBU into 600 Ω or greater (maximum range selected)
Metering	Variable intensity, bi-color signal presence/clip LED on each output
SUMMING	
Summing Matrix	Full 6 x 16 summing matrix; any input summed with any input and routed to any output
PROCESSING	
Digital Conversion	24-bit resolution, 96 kHz sampling rate
Internal Processing	32-bit vector floating point, 96 kHz
Processor	Monolithic, 1 GHz vector DSP
Input Processing	Gain, delay, TruShaping equalization
Output Processing	Gain, delay, polarity reversal, U-Shaping equalization, 10-band parametric filtering, delay integration, atmospheric correction, simultaneous low- and high-pass filters
NETWORK/CONTROL	
Front Panel	128 x 64 LCD, navigation buttons, high-resolution encoder knobs, and illuminated mute switches
Network	RJ-45 port for network connection and control from a Mac or Windows-based computer

Software	Full bidirectional communication with Meyer Sound's Compass control software within a client-server architecture
SIM	Two SIM bus ports for linking to the SIM 3 audio analyzer for measuring Callisto 616 outputs (either post delay or post gain)
AC POWER	
Connector	powerCON 20
Operating Voltage Range	100–240 V AC, 50/60 Hz
Power Consumption	0.55 A rms (115 V AC); 0.27 A rms (230 V AC); 0.56 A rms (100 V AC)
PHYSICAL	
Dimensions	2-space rack 19.00" w x 3.48" h x 15.30" d (483 mm x 88 mm x 388 mm)
Weight	19.2 lbs (8.71 kg)
ENVIRONMENTAL	
Operating Temperature	0° C to +45° C
Non Operating Temperature	<–40° C or >+75° C
Humidity	to 95% at 35° C
Operating Altitude	to 4600 m (15,000 ft)
Non operating Altitude	to 6300 m (25,000 ft)
Shock	30 g 11 msec half-sine on each of 6 sides
Vibration	10 Hz – 55 Hz (0.010 m peak-to-peak excursion)

NOTE: For specifications unique to the Callisto 616 AES, see Appendix A, "Galileo Callisto 616 AES."

CALLISTO 616 DIMENSIONS



Callisto 616 Dimensions

CALLISTO 616 COMPLIANCE

DECLARATION OF CONFORMITY

according to ISO/IEC Guide 22 and EN 45014

2832 San Pablo Avenue
Berkeley, California 94702
USA

T: +1 510 486.1166
F: +1 510 486.8356

info@meyersound.com
www.meyersound.com

Manufacturer's Name: **Meyer Sound Laboratories Inc.**

Manufacturer's Address: **2832 San Pablo Avenue**
Berkeley, California 94702-2204
USA

Declares that the product

Product Names: **CALLISTO 616 and CALLISTO 616 AES**

Product Options: **All**

Conforms to the following Product Specifications:

Safety: EN 60065:2002/A1:2006 + A11:2008 + A2:2010 + A12:2011, + /AC 2007

EMC: EN 55103-1: 2009 emission
EN 55103-2: 2009 immunity

This device complies with EN 55103-1 & -2 as noted below. Operation is subject to the following 2 conditions: This device may not cause harmful interference, and this device must accept any interference received, including interference that may cause undesired operation.

Environmental: EN 50581:2012

Supplementary Information:

The product herewith complies with the requirements of the Low Voltage Directive (LVD) 2006/95/EC, EMC Directive 2004/108/EC and the RoHS Directive 2011/65/EU.

Signature:

Date of issue: October 22, 2013

Ms. Margie Garza
Director of Quality
Meyer Sound Laboratories Inc.
Berkeley, California 94702 USA

European Contact:
Your local Meyer Sound dealer, or
Meyer Sound Germany, GmbH.
Horresser Berg 4A, 56410 Montabaur, Germany

Meyer Sound Laboratories Inc.
2832 San Pablo Ave.
Berkeley, CA 94702

www.meyersound.com
T: +1 510 486.1166
F: +1 510 486.8356

Galileo Callisto 616 User Guide, PN 05.231.034.01 A