



CLASPTM

CLOSED LOOP ANALOG SIGNAL PROCESSOR



USER'S GUIDE

Version 3.0.1



Bridging the gap between Analog and Digital Recording

3212 West End Avenue, Suite 500, Nashville Tennessee 37203



CAUTION

RISK OF ELECTRIC SHOCK
DO NOT OPEN



ATTENTION: RISQUE DE CHOC ELECTRIQUE - NE PAS OUVRIR

WARNING: TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK DO NOT EXPOSE THIS EQUIPMENT TO RAIN OR MOISTURE

The symbols shown above are internationally accepted symbols that warn of potential hazards with electrical products. The lightning flash with arrowpoint in an equilateral triangle means that there are dangerous voltages present within the unit. The exclamation point in an equilateral triangle indicates that it is necessary for the user to refer to the owner's manual.

These symbols warn that there are no user serviceable parts inside the unit. Do not open the unit. Do not attempt to service the unit yourself. Refer all servicing to qualified personnel. Opening the chassis for any reason will void the manufacturer's warranty. Do not get the unit wet. If liquid is spilled on the unit, shut it off immediately and take it to a dealer for service. Disconnect the unit during storms to prevent damage.

SAFETY INSTRUCTIONS

NOTICE FOR CUSTOMERS IF YOUR UNIT IS EQUIPPED WITH A POWER CORD.

WARNING: THIS APPLIANCE MUST BE EARTHED.

The cores in the mains lead are coloured in accordance with the following code:

GREEN and YELLOW - Earth BLUE - Neutral BROWN - Live

As colours of the cores in the mains lead of this appliance may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows:

- The core which is coloured green and yellow must be connected to the terminal in the plug marked with the letter E, or with the earth symbol, or coloured green, or green and yellow.
- The core which is coloured blue must be connected to the terminal marked N or coloured black.
- The core which is coloured brown must be connected to the terminal marked L or coloured red.

This equipment may require the use of a different line cord, attachment plug, or both, depending on the available power source at installation. If the attachment plug needs to be changed, refer servicing to qualified service personnel who should refer to the table below. The green/yellow wire shall be connected directly to the units chassis.

CONDUCTOR		WIRE COLOR	
		Normal	Alt
L	LIVE	BROWN	BLACK
N	NEUTRAL	BLUE	WHITE
E	EARTH GND	GREEN/YEL	GREEN

WARNING: If the ground is defeated, certain fault conditions in the unit or in the system to which it is connected can result in full line voltage between chassis and earth ground. Severe injury or death can then result if the chassis and earth ground are touched simultaneously.

WARNING FOR YOUR PROTECTION PLEASE READ THE FOLLOWING:

KEEP THESE INSTRUCTIONS

HEED ALL WARNINGS

FOLLOW ALL INSTRUCTIONS

CLEAN ONLY WITH A DAMP CLOTH.

DO NOT BLOCK ANY OF THE VENTILATION OPENINGS. INSTALL IN ACCORDANCE WITH THE MANUFACTURERS INSTRUCTIONS.

DO NOT INSTALL NEAR ANY HEAT SOURCES SUCH AS RADIATORS, HEAT REGISTERS, STOVES; OR OTHER APPARATUS (INCLUDING AMPLIFIERS) THAT PRODUCE HEAT.

ONLY USE ATTACHMENTS/ACCESSORIES SPECIFIED BY THE MANUFACTURER.

UNPLUG THIS APPARATUS DURING LIGHTNING STORMS OR WHEN UNUSED FOR LONG PERIODS OF TIME.

WATER AND MOISTURE: Appliance should not be used near water (e.g. near a bathtub, washbowl, kitchen sink, laundry tub, in a wet basement, or near a swimming pool, etc). Care should be taken so that objects do not fall and liquids are not spilled into the enclosure through openings.

POWER SOURCES: The appliance should be connected to a power supply only of the type described in the operating instructions or as marked on the appliance.

GROUNDING OR POLARIZATION: Precautions should be taken so that the grounding or polarization means of an appliance is not defeated.

POWER CORD PROTECTION: Power supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to cords at plugs, convenience receptacles, and the point where they exit from the appliance.

SERVICING: To reduce the risk of fire or electric shock, the user should not attempt to service the appliance beyond that described in the operating instructions. All other servicing should be referred to qualified service personnel.

FOR UNITS EQUIPPED WITH EXTERNALLY ACCESSIBLE FUSE RECEPTACLE: Replace fuse with same type and rating only.

MULTIPLE-INPUT VOLTAGE: This equipment may require the use of a different line cord, attachment plug, or both, depending on the available power source at installation. Connect this equipment only to the power source indicated on the equipment rear panel. To reduce the risk of fire or electric shock, refer servicing to qualified service personnel or equivalent.

Endless Analog Inc. Limited Warranty

Endless Analog Inc. warrants this product to be free of defects in material and workmanship for a period of one year from the date of original retail purchase. This warranty is enforceable only by the original retail purchaser. To be protected by this warranty, the purchaser must complete the product registration form online at: www.endlessanalog.com/product-registration. The purchaser must have a valid serial number and product registration code in order to complete the online form. During the warranty period Endless Analog shall, at its sole and absolute option, repair or replace, free of charge, any product that proves to be defective on inspection by Endless Analog or its authorized service representative. To obtain warranty service, the purchaser must first call or email Endless Analog at the telephone number and email address printed below to obtain a Return Authorization Number and instructions of where to return the unit for service. All inquiries must be accompanied by a description of the problem. All authorized returns must be sent to the Endless Analog repair facility postage prepaid, insured and properly packaged. Endless Analog reserves the right to update any unit returned for repair. Endless Analog reserves the right to change or improve design of the product at any time without prior notice. This warranty does not cover claims for damage due to abuse, neglect, alteration or attempted repair by unauthorized personnel, and is limited to failures arising during normal use that are due to defects in material or workmanship in the product. Any implied warranties, including implied warranties of merchantability and fitness for a particular purpose, are limited in duration to the length of this limited warranty. Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you. In no event will Endless Analog be liable for incidental, consequential or other damages resulting from the breach of any express or implied warranty, including, among other things, damage to property, damage based on inconvenience or on loss of use of the product, and, to the extent permitted by law, damages for personal injury. Some states do not allow the exclusion of limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state. This warranty applies to products sold and used in the United States of America and all International countries and territories.

Endless Analog, Inc.

+1 866-929-4446

support@endlessanalog.com

www.endlessanalog.com

TABLE OF CONTENTS

Overview

Introduction	1
Unpacking & Inspection	1
System Requirements	1
Registration	1
CLASP Signal Flow Diagram	2

CLASP Hardware Setup

Back Panel	3
Input	
Tape Send	
Monitor	
DAW Return	
Tape Control	
MIDI In	
MIDI Out	
SYNC In	
SYNC Out	
Connecting Audio	4
Input Connection	
Tape Send Connection	
Tape Machine to DAW Connection	
DAW Return Connection	
Monitor Connection	
Connecting MIDI	5
Transport Control	5
Optical Sensor	5
Configuring the Optical Sensor	6

CLASP Software Setup

Mac Installation	7
Windows Installation	7
Machine Sync Plug-In	7
Bridge Plug-In	7
Delay Compensation Modes	
Banking in Bridge Plug-In	8

DAW Configuration

Setting Up CLASP in ProTools HD	9
Cubase 4 (See Setting Up Clasp in Nuendo 4)	
Setting Up CLASP in Nuendo 4	13

Operations

Navigating the Front Panel	16
Power Switch	
Remaining Tape Time Counter	
IPS	
POST	
MON	17
SYNC	
RTZ	
Synchronizing & Tape Machine	18
Errors	

Daisy Chaining Multiple CLASP Units

19

Trouble-Shooting

20

Technical Specifications

21

INTRODUCTION

Thank you for purchasing the (Closed Loop Analog Signal Processor) System. This system was designed using state of the art components to deliver crystal clear audio for an indefinite period of time.

Please contact us at 1-866-929-4446 with your questions or comments regarding this product. Endless Analog Inc is committed to constant product improvement and believes the best way to accomplish this task is by listening to the experts on our gear, our valued customers. We appreciate the support you have shown us through the purchase of this product.

Please pay close attention to how you connect your hardware. Proper audio and midi signal flow is required in order for **CLASP** to function properly.

We urge you to read this manual before hooking up your hardware to familiarize yourself with its features and connectivity.

Have Fun and enjoy your new system!

UNPACKING & INSPECTION

Please retain the original packaging and shipping carton for the **CLASP** system that is designed to protect the unit during shipping.

The shipping carton contains:

- **CLASP** Hardware unit with serial number
- Power Cable
- Custom Tape Machine Control Cable(s)
- Registration Card with product registration code
- Optical Sensor (optional)
- Reflective sensing tape (optional)
- Mounting tape (optional)

SYSTEM REQUIREMENTS

Supported DAWs

Avid Pro Tools HD 2 or higher ver. 7.3 & up
(recordings at 96K require HD3)
Steinberg Nuendo 4 & up
Steinberg Cubase 4 & up

Mac & Windows Compatible

Supported MIDI Interfaces

M Audio MIDI Sport 4x4 (original not anniversary)
M Audio MIDI Sport 2x2 (original not anniversary)
M Audio MIDI Sport 2x4 (original not anniversary)

Supported Tape Machines

3M M79	Studer A807
Ampex ATR 124	Studer A827
Ampex ATR 102	Studer J37
MCI JH Series	Studer C37
Otari MTR	Studer 820
Otari MX 5050	Tascam
Studer A800	Sony APR-24
Studer A80	

REGISTRATION

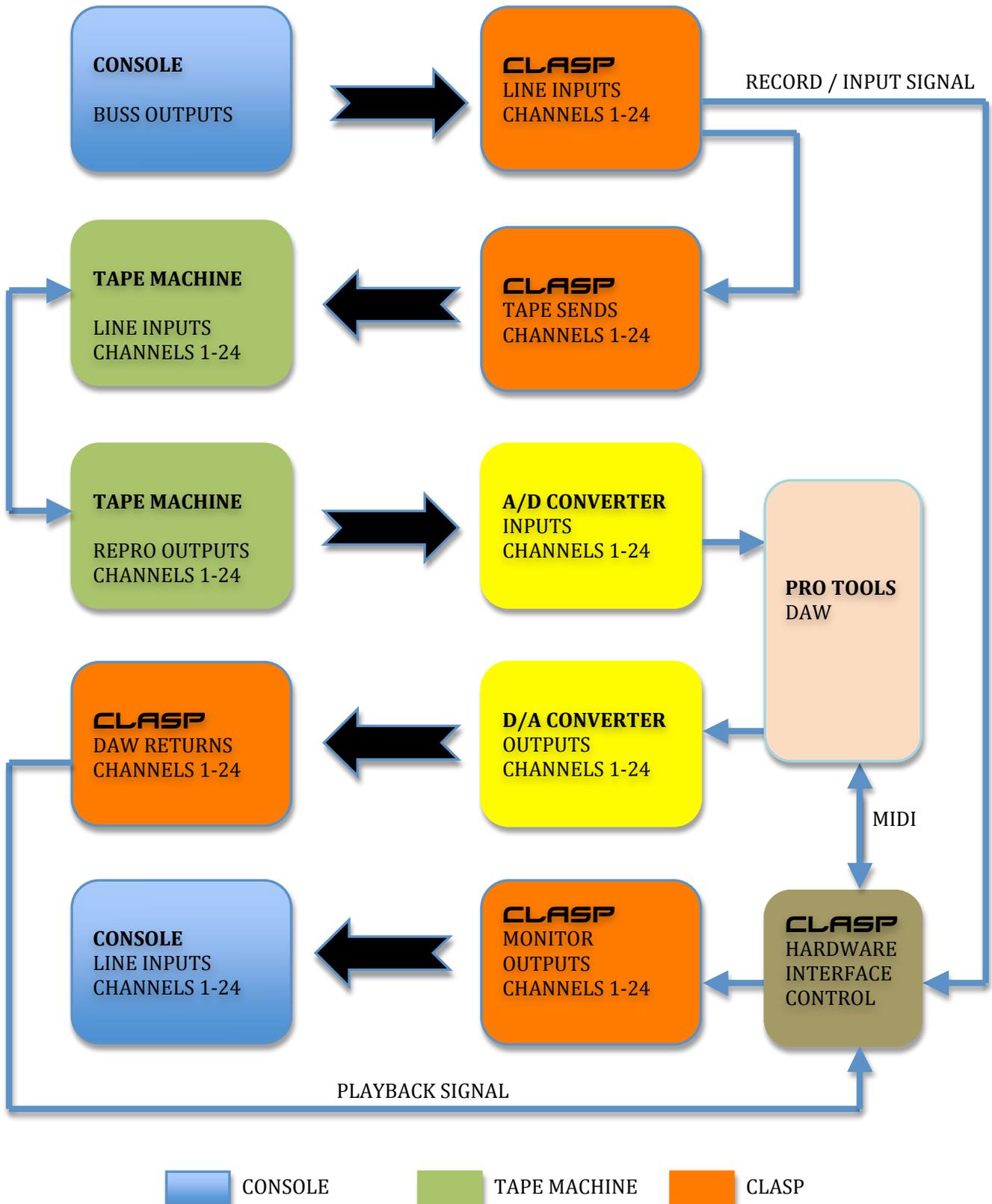
If you haven't done so, please register your **CLASP**. This will insure that you have access to the most up-to-date information and resources. Go online and register at:

<http://www.endlessanalog.com/product-registration>

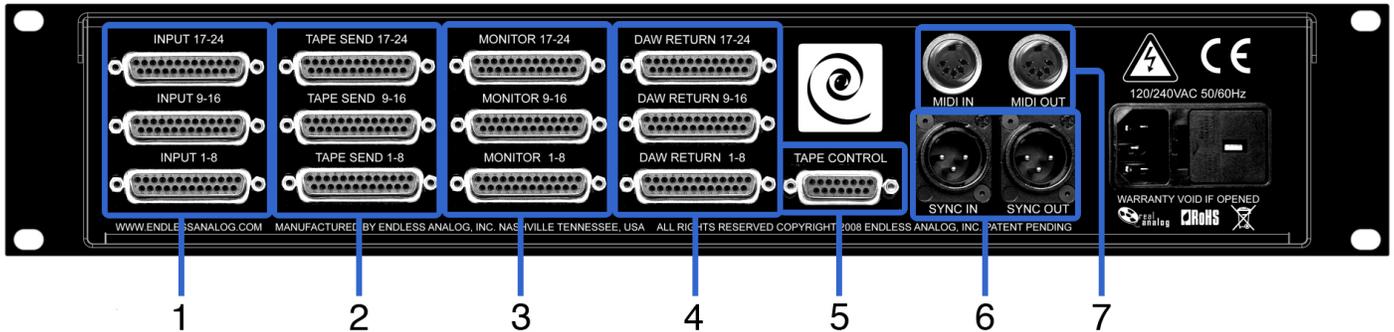
Software Updates for **CLASP** when available can be downloaded directly from the Endless Analog Website. Registered end users will receive email notification of any updates.

You must be a registered user with a valid serial number to access software and other downloads.

CLASP SIGNAL FLOW CONNECTION DIAGRAM



CLASP HARDWARE SETUP



BACK PANEL

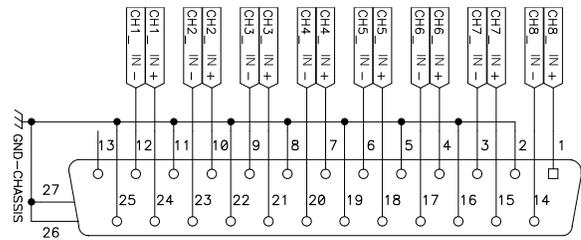
- 1 - Input** – Line level inputs connect to MIC pre outputs or console bus outputs
- 2 - Tape Send** – Line level tape send outputs connect to analog tape machine inputs
- 3 - Monitor** – Line level monitor outputs connect to console input monitoring channels
- 4 - DAW Return** – Connect to Line Level DAW D/A outputs
- 5 - Tape Control** – Connect using provided control cable to analog tape machine parallel remote connection
- 6 - Midi In** – Connect to available MIDI output port on hardware MIDI interface

Midi Out – Connect to available MIDI input port on hardware MIDI interface
- 7 - SYNC In** – Choose available channel on analog tape machine and connect to this channel.

SYNC Out – Connect to balanced audio output of same analog recorder channel used with SYNC IN

To ensure longevity and proper operation, mount the **CLASP** in a well-ventilated location.

D-Sub pin-out wired in accordance with TASCAM specification. Pin 2 is wired HOT.



To properly connect **CLASP** to unbalanced inputs it is necessary to lift the cold side of the differential output and not tie to ground. Failure to do this will cause damage to the active electronics inside the **CLASP** hardware and will void your warranty. For more information please contact Endless Analog technical support.

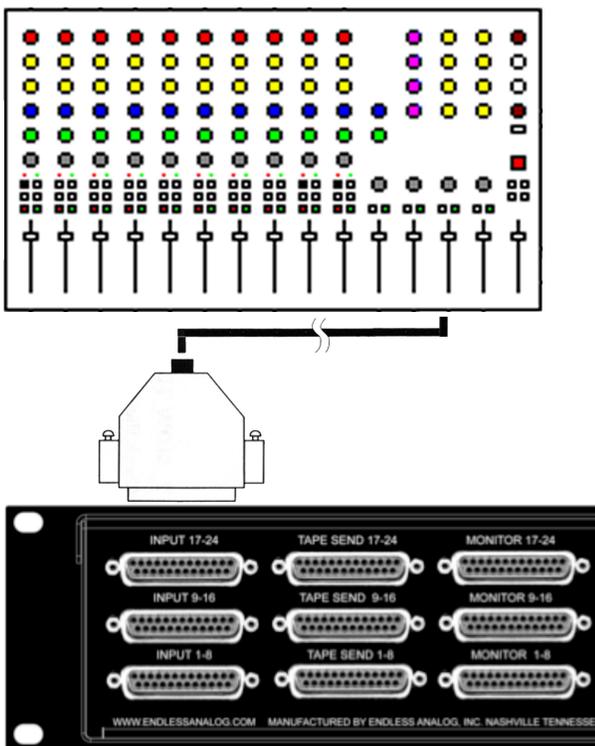
SYNC In/Out only need to be connected to the tape machine during the Synchronization Process and are disconnected from audio In/Out during normal operation.

CONNECTING AUDIO

The **CLASP** handles audio in discrete paths. Audio passing through the **CLASP** must travel along the same channel from INPUT to MONITOR output. The audio that is fed into INPUT 1 is passed out of the **CLASP** via TAPE SEND 1. Ensure that audio is fed along channel 1 of your TAPE MACHINE and subsequently out off your TAPE MACHINE into the first input of the DAW interface. The audio exiting the DAW interface will route into DAW RETURN 1 of the **CLASP**. Depending on the mode and current operation, the MONITOR output of the CLASP will pass either the audio signal from the DAW RETURN or the audio signal from the INPUT.

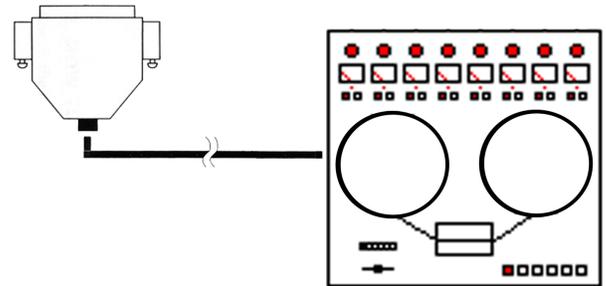
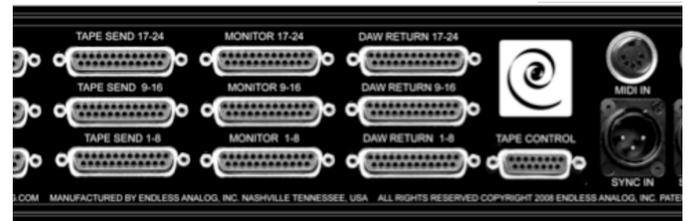
INPUT Connection

Connect the INPUT 25-pin D-sub to the Bus output, channel Direct Out, or any other line signal in your studio prepped for recording.



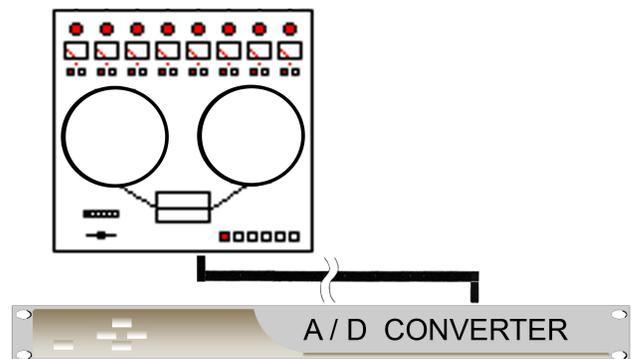
TAPE SEND Connection

Connect the TAPE SEND 25-pin D-sub to your TAPE MACHINE via the shortest cable assembly possible.



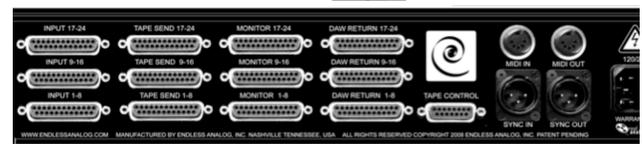
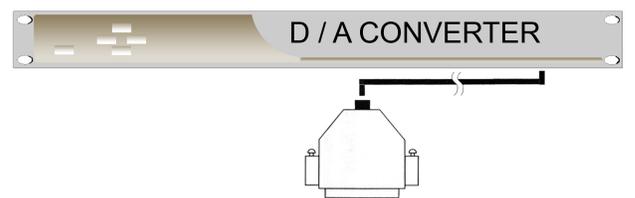
TAPE MACHINE > DAW Connection

Connect the (REPRO) outputs of your TAPE MACHINE to the A/D (Input) converters of your DAW via the shortest cable assembly possible.



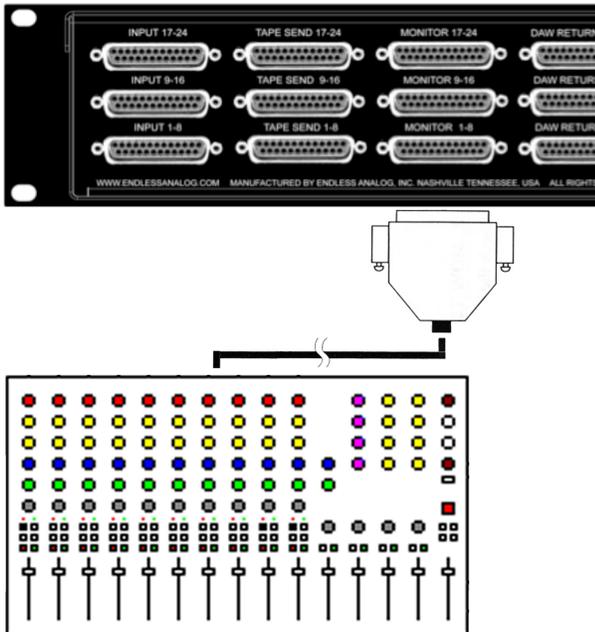
DAW RETURN Connection

Connect the D/A (Output) converters of you DAW to the DAW RETURN 25 pin D-sub



MONITOR Connection

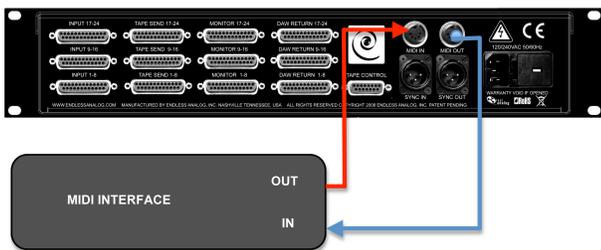
Connect the MONITOR output to the Tape Return, Monitor Input, or Line Input of your audio console.



CONNECTING MIDI

Wire the MIDI interface output to the MIDI input of the **CLASP** and the MIDI interface input to the MIDI output of the **CLASP**.

The **CLASP** must be connected to a supported MIDI interface. Ensure that no software, other than the supported DAW, has access to that port.



TRANSPORT CONTROL

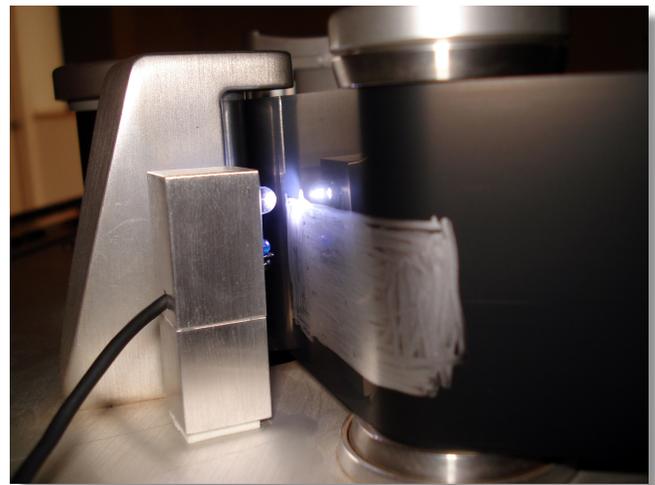
The **CLASP** commands your tape machine through a custom transport cable. The cable supplied is dependant on the tape machine used with **CLASP**. The cable enables **CLASP** to control basic transport function of your tape machine such as PLAY, STOP, RECORD, and REWIND. This powerful connection, combined with the Optical Sensor, manages all the controls of your tape machine for you.

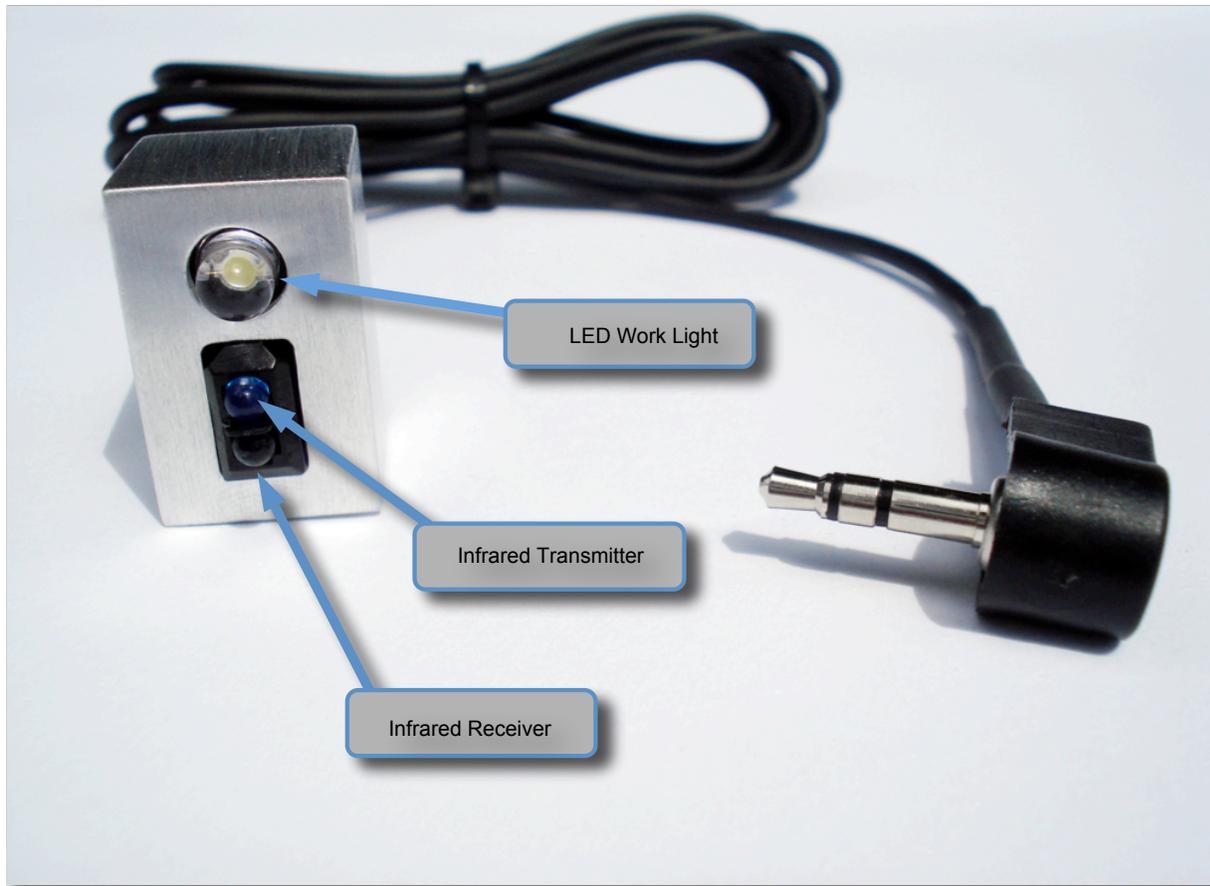
Connect one end of the transport cable to the back of the hardware unit and the other end to your tape machine. Most likely, you will need to disconnect your current remote transport and utilize this port with the **CLASP** Transport Control cable.

OPTICAL SENSOR

Using the Optical Sensor, **CLASP** detects if the end of tape has been reached before the Remaining Tape Time Counter reads zero. This is helpful just in case you forget to properly reset your machine with **CLASP** during setup.

All analog tape machines except late model Studers require the Optical Sensor.





Configuring the Optical Sensor

This photograph illustrates the working parts of the **CLASP** Optical Sensor. To ensure proper functionality, be sure to make a mental note of each part of the sensor when mounting it to your analog recorder.

The LED Work Light provides illumination in low-light situations and is active when connected to the **CLASP** hardware and the power is on.

The Infrared Transmitter emits an invisible beam that is reflected off the tape.

The Infrared Receiver detects the reflected infrared beam sent by the infrared transmitter and communicates with the **CLASP** Hardware.

The 1/8th inch male plug connects to the **CLASP** control cable at the back of the Analog Tape Machine.

STEP 1 – Using the supplied double stick adhesive, mount the optical sensor at least ¼ inch from the surface of the back of the recording tape. **IT IS IMPORTANT THAT THE SENSOR IS MOUNTED IN A LOCATION WHERE THE TAPE DOES NOT MOVE TOWARD OR AWAY FROM THE SENSOR OVER TIME FROM REEL TAKEUP. THIS COULD DAMAGE BOTH THE TAPE AND SENSOR.**

STEP 2 – With the tape rewound to the beginning, play or fast-forward into the tape at least 30 seconds.

STEP 3 – Using the supplied reflective sensing tape, carefully place a piece 3 inches wide as shown in this photograph. The top of the rectangle should be aligned with the LED work light.

STEP 4 – Make sure the reflective sensing tape is applied firmly without any loose edges or bumps.

CLASP SOFTWARE SETUP

MAC INSTALLATION V3.0

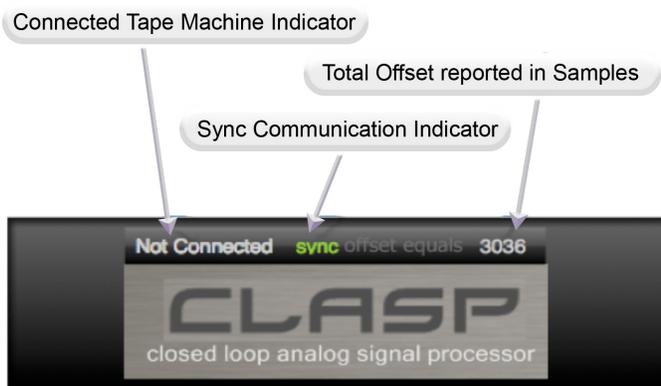
To install the **CLASP** software on a Macintosh (OS version 10.4 – 10.6) first download the plug-in suite you desire for Mac (RTAS, VST). Double click on the installer package icon and the plug-in suite will automatically install on your system. The installer will prompt you throughout the installation process.

WINDOWS INSTALLATION V3.0

To install the **CLASP** software on a Windows (OS version XP - Vista) first download the plug-in suite you desire for Windows (RTAS, VST). Double click on the installer package icon and the plug-in suite will automatically install on your system. The installer will prompt you throughout the installation process.

MACHINE SYNC PLUG-IN

This is the Machine Sync Plug-in. There are 3 Machine Sync Plug-ins to use each for a different tape machine. The plug-in will indicate what tape machine is currently stored in memory. No machine will read **'Not Connected'**.



CLASP BRIDGE PLUG-IN

This is the master control plug-in for the **CLASP** recording system. Only one instance per DAW session is used. The plug-in requires virtually no resources from the host. It commands a large number of features and displays the status of **CLASP**. The Bridge Plug-in communicates with the Machine Sync Plug-in and the hardware unit.

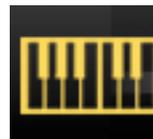
Delay Compensation Modes



Tape Mode is used when extracting audio from the Repro Head of your tape machine. Tape Mode is the primary feature of CLASP. Insure that your tape machine is in Repro mode and you have synchronized at the selected tape machine's speed.



Direct Mode is used when you wish to record through the tape machine electronics but not hit tape. The tape machine must be in input monitor mode for timing to remain sample accurate.



Programmer Mode is used when recording or sequencing midi with Pro Tools. To enter this mode you must also disable Pro Tools delay compensation. Programmer mode is not needed when using Cubase or Nuendo.

Banking in Bridge Plug-In

Banking is a powerful and key feature to the correct operation of **CLASP**. The Bank Left and Bank Right buttons allow you to move through the Track Arming Status. You can bank through the channels to see which tracks **CLASP** has armed for recording.

To Arm and Unarm all tracks from the Bridge Plug-In, press 'Bank' in the bottom left-hand corner of the plug-in.

To avoid hearing delay issue, bank through the channels before and after arming tracks in Pro Tools.

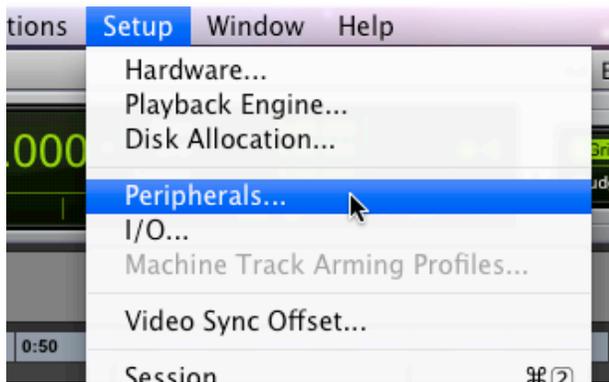


DAW CONFIGURATION

Setting up **CLASP** in Pro Tools HD

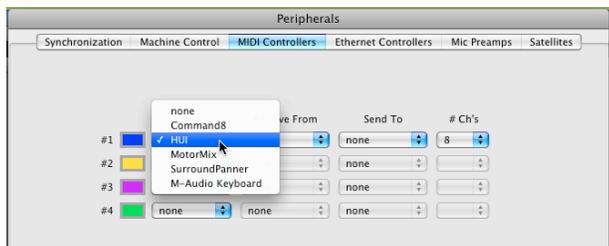
STEP 1

After installing the **CLASP** RTAS software, make sure your MIDI interface is connected and working and the **CLASP** hardware is powered on and connected to midi port -A- (input and output) of your M-Audio Midi Sport interface. Next, open Pro Tools HD and select **Setup > Peripherals**



STEP 2

Select the '**MIDI Controllers**' tab at the top of the '**Peripherals**' window. Next, select '**HUI**' under '**Type**' and Controller '**#1**'



Under '**Send To**' select the first MIDI OUTPUT port. Under '**Receive From**' select the first MIDI INPUT port.

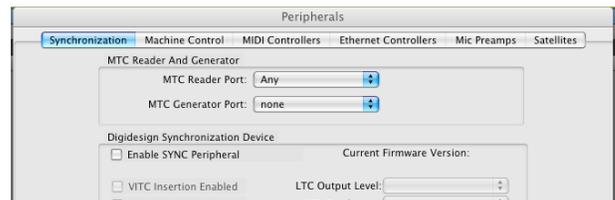


IMPORTANT - Make sure that no other devices are using this Port.

STEP 3

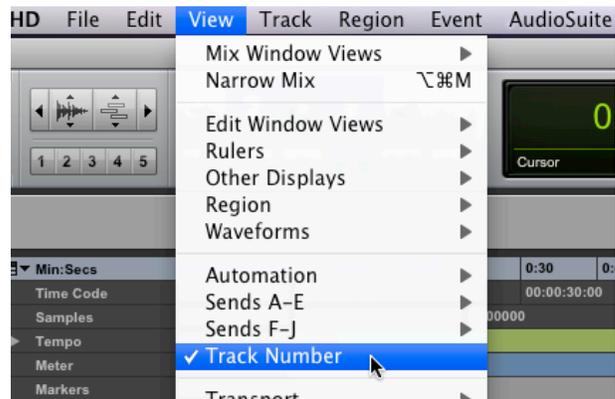
Under '**Synchronization**' tab set MTC generator port to '**none**'. Hit '**OK**'

IMPORTANT - Make sure that no other devices are using the MIDI ports connected to **CLASP**.



STEP 4

Select **View > Track Number** (check). This is important for proper track arming.



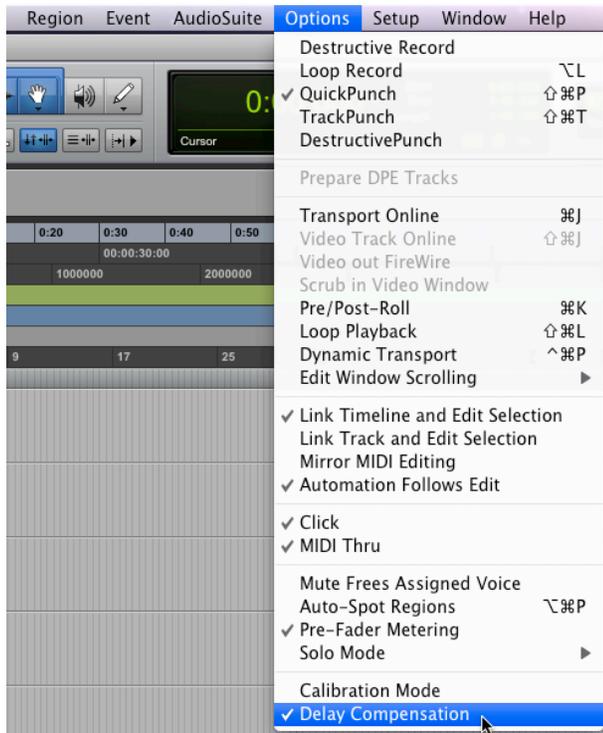
STEP 5

Open up '**Preferences**' pane. Under '**Mixing**' select '**Scroll to Track Banks Controllers**' box. Hit '**OK**'



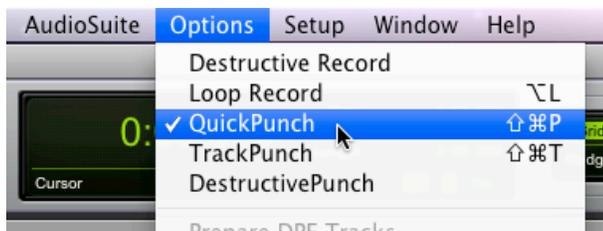
STEP 6

Select **Options > Delay Compensation** (check).
IMPORTANT - Delay Compensation is required for **CLASP** to function properly.



STEP 7

Select **Options > QuickPunch** (check).



STEP 8

Create 24 new Mono Audio tracks in your Pro Tools Session.

STEP 9

Assign each mono track each to its own discrete mono input and output in sequential order matching each input and output with the corresponding track number.

STEP 10

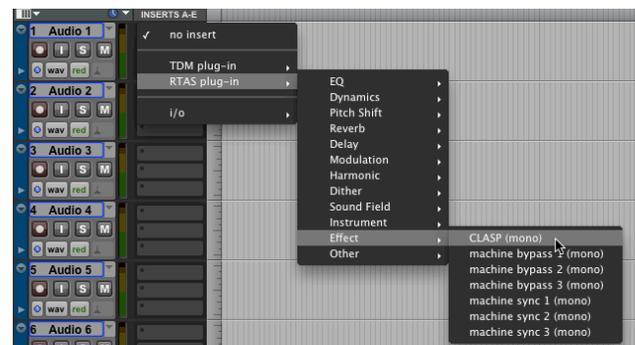
Create 24 New Master Fader Tracks.

STEP 11

Assign each mono master-track each to its own discrete mono output in sequential order matching each output with the corresponding track number. i.e. master 1 assigned to output 1 etc.

STEP 12

Insert 1 instance of the **CLASP** Bridge plug-in into the session. It is necessary to control the **CLASP** hardware and **CLASP** Machine Sync plug-ins.
***Use only 1 instance of this plug-in per session.**

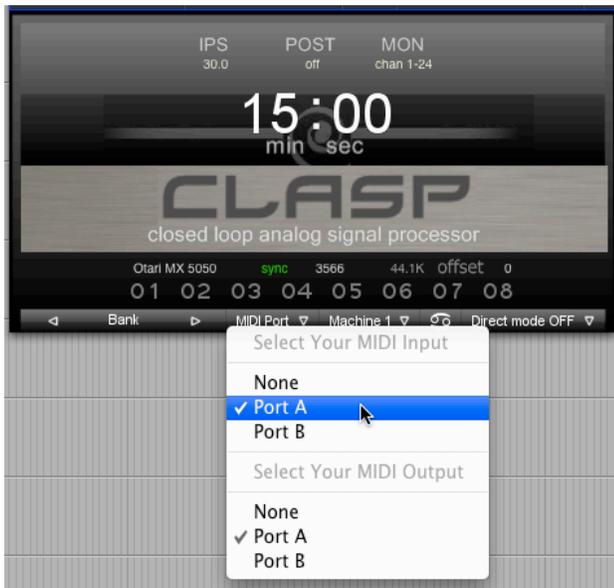


STEP 13

On the **CLASP** Bridge plug-in GUI, select 'MIDI' port then select the same MIDI INPUT Port that was selected in STEP 2.
***If this MIDI INPUT port is not set correctly CLASP will not function properly.**

STEP 14

On the **CLASP** Bridge plug-in GUI, select 'MIDI' port then select the same MIDI OUTPUT Port that was selected in STEP 2.
***If this MIDI OUTPUT port is not set correctly CLASP will not function properly.**



STEP 15

Insert one instance of the **CLASP** MACHINE SYNC 1 plug-in on each of the 24 MASTER channels. Use only one instance of this plug-in per channel (*using more than one per channel will cause audio to be out of sync*).

STEP 16

Make sure the Machine Sync 1 Plug-ins are inserted on each of the 24 Master Tracks.



STEP 17

After the **CLASP** MACHINE SYNC 1 Plug-ins are inserted on all 24 Master fader channels, re-check your assignment of each Master fader and each Audio channel to its own MONO hardware output. For example, Master fader 1 is assigned to MONO output 1, Master fader 2 is assigned to MONO output 2, Master fader 3 is assigned to MONO output 3, and so on. Do this for all 24 Master fader channels and all 24 Audio tracks.

Every Track in your Pro Tools Session MUST be routed through a mono master fader with the

CLASP Machine Sync Plug-in inserted and enabled in order for the delay compensation engine to work properly.

So for example, if you have a pre-existing session that contains audio tracks that you are adding **CLASP** overdubbed tracks to, and you wish to assign these tracks to a sub-mix, make sure the sub mix is routed out of the Pro Tools I/O hardware by first passing through two mono master channels that have the **CLASP** Machine Sync Plug-Ins inserted.

*Proper channel assignment and routing is necessary for **CLASP** to function properly!*

STEP 18

Pro Tools Track Arming

To properly arm tracks first select the bank of 8 tracks you wish to arm or disarm. When disarming tracks wait until the track-arming indicator shows the disarmed track as 'grey' in the **CLASP** window before proceeding.

STEP 19

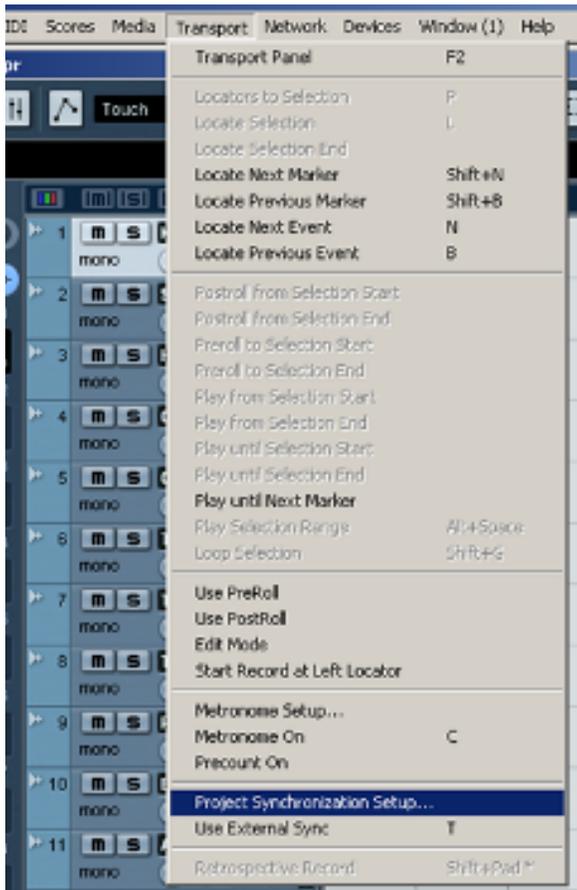
In this screen shot channels 9 – 16 are selected using the CLASP Bridge Plug-in.



Setting up **CLASP** in NUENDO 4

STEP 1

After installing the **CLASP** VST software, make sure your MIDI interface is connected and working. Next, open Nuendo 4 and select **Transport > Project Synchronization Setup**



STEP 2

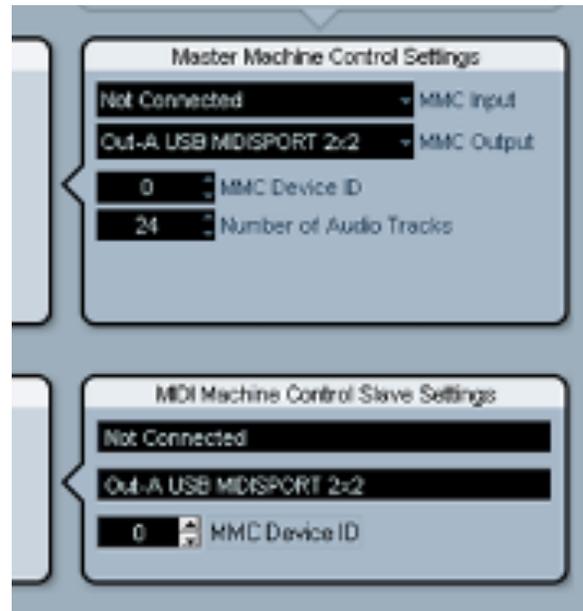
Select the MIDI interface output connected to the **CLASP** hardware's MIDI input and output in the **Master Machine Control Settings**.

Select **MMC Device ID: 0**

Deselect MIDI Timecode to **CLASP** MIDI Interface

Deselect MIDI Clock to **CLASP** MIDI Interface

MIDI Time code and MIDI Clock should NOT be sending out to CLASP Hardware!



Disable your midi metronome or assign to a midi port that is not used by **CLASP**.

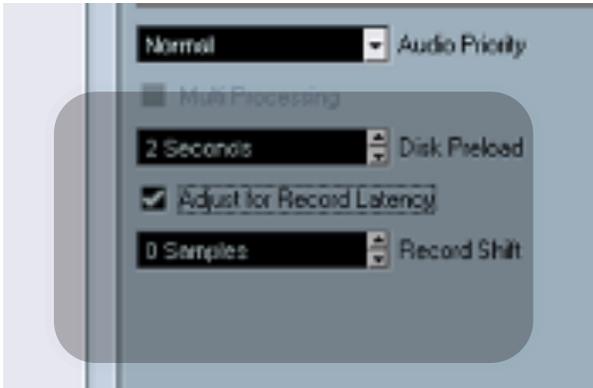
STEP 3

Select **Devices > Device Setup**



STEP 4

Place a checkmark in the 'Adjust Record Latency' checkbox and set 'Record Shift' to: 0 samples



STEP 5

Setup up at least 24 mono inputs, each routed discretely to each analog A/D input. Setup up at least 24 mono outputs, each routed discretely to each analog D/A output.

The audio path must be discrete for to function properly.

STEP 6

CHANNEL ASSIGNMENTS & ROUTING

Route Channels 1-24 to Outputs 1-24. Each channel should be assigned to it's own discrete MONO output.

For example, Channel 1 is assigned to MONO output 1, Channel 2 is assigned to MONO output 2, Channel 3 is assigned to MONO output 3, and so on. Do this for all 24 channels.

Proper channel assignment and routing is necessary for to function properly!

STEP 7

CHANNEL ASSIGNMENTS & ROUTING

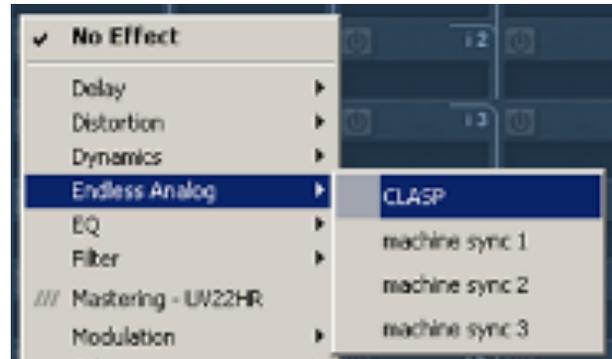
Route Inputs 1-24 to Channels 1-24. Each channel should be assigned to it's own discrete MONO input.

For example, Channel 1 is assigned to MONO input 1, Channel 2 is assigned to MONO input 2, Channel 3 is assigned to MONO input 3, and so on. Repeat this for all 24 channels.

*Proper channel assignment and routing is necessary for **CLASP** to function properly!*

STEP 8

Assign one instance of the **CLASP** Bridge Plug-in to any mono track insert. The **CLASP** Bridge plug-in has no audible effect on the audio passing through it. It is necessary to control the **CLASP** hardware and **CLASP** Machine Sync plug-ins.



**Use only 1 instance of this plug-in per session.*

STEP 9

Select Machine 1 on the **CLASP** Plug-in



STEP 10

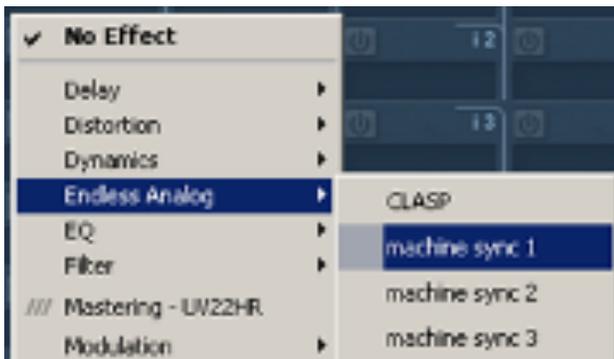
On the **CLASP** Bridge plug-in, select 'MIDI' port then select the same **MIDI INPUT** and **OUTPUT** Ports that were selected in **STEP 2**.



If this MIDI INPUT port is not set correctly CLASP will not function properly.

STEP 11

Insert one instance of the **CLASP** MACHINE SYNC 1 plug-in on each of the 24 mono audio INPUT channels. Use only one instance of this plug-in per INPUT channel (using more than one per channel will cause audio to be out of sync).



The MACHINE SYNC plug-ins communicate with the Bridge Plug-in to synchronize the recorded audio from your analog tape machine.

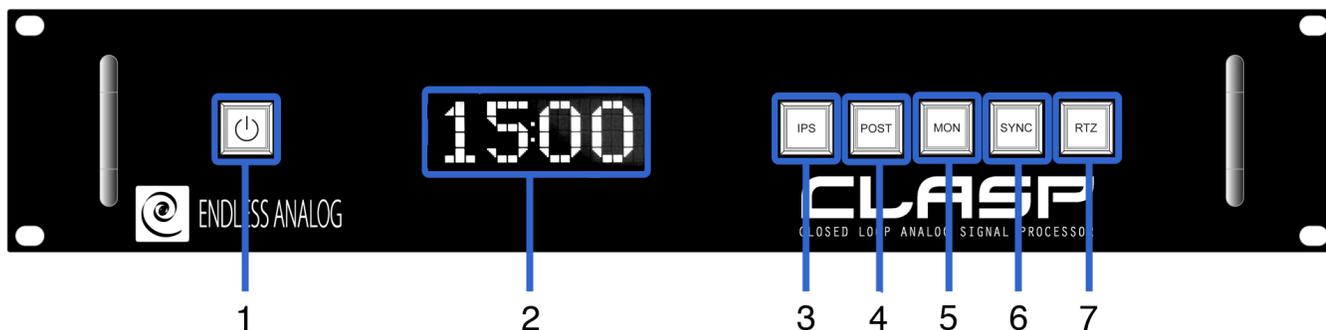
STEP 12

Continue inserting MACHINE SYNC 1 plug-ins on audio INPUT Channels.



STEP 13

Arm the tracks that you want to record using **CLASP**.



NAVIGATING THE FRONT PANEL

1 - Power Switch

Illuminates when device is on.

2 - Remaining Tape Time Counter

The **CLASP** system indicates the remaining tape time on both the Hardware and **CLASP** Bridge Plug-in. The time will begin flashing on the hardware and will turn red on the plug-in during the last minute remaining.

3 - (IPS) Inches Per Second

This control is used to set the tape speed of the **CLASP** hardware to match the tape speed selected on your analog tape machine. There are three IPS settings: 30 IPS (15 minutes of recording time), 15 IPS (30 minutes of recording time), 7 IPS (1 hour of recording time). The IPS setting is reflected on both the **CLASP** hardware display and the **CLASP** Bridge Plug-in.

4 - (POST) Post Roll

Use the Post Roll control in order to prevent excess wear and tear on your tape machine transport. This will allow your tape machine to continue recording after the DAW transport has been stopped. There are five settings: Off, 3 seconds, 6 seconds, 9 seconds, and 12 seconds. For example, you might select a higher Post Roll setting if you are starting and stopping your DAW very quickly. The Post Roll setting is reflected on both the **CLASP** hardware display and the **CLASP** Bridge Plug-in.

*When you change the IPS on your tape machine you must update the IPS setting on the **CLASP** hardware to match.*

Pressing both the IPS and POST buttons simultaneously place CLASP in large tape reel mode. 30 IPS will have 30 minutes as opposed to 15 and 15 IPS will have 60 minutes as opposed to 30. 7.5 IPS will always have a maximum of 60 minutes. To exit large reel mode simply cycle through the tape speeds until you return to 30 IPS.

5 - (MON) Monitoring

Use this control to select which bank of channels you are recording to in your DAW. There are three monitor settings:

Channels 1 - 24

The **CLASP** will only recognize DAW track arming for channels 1 - 24

Channels 1 - 16

The **CLASP** will only recognize DAW track arming for channels 1 - 16

Channels Repro

With Repro only selected, the delayed audio from the analog tape machine repro head is always monitored when recording. (This is useful for getting tape sounds before a tracking session begins)

Monitor settings are reflected on both the **CLASP** hardware display and the **CLASP** Bridge Plug-in. The Monitor button will flash when monitoring DAW REPRO and will light solid when monitoring INPUT.

6 - (SYNC) Synchronization

This control is used to synchronize the analog tape machine to the DAW. The **CLASP** software provides memory to store synchronization settings for three separate analog recorders and their individual tape speeds (up to three tape speeds per machine, see IPS settings). When performing synchronization the **CLASP** hardware will display the Machine SYNC plug-in that is about to be overwritten. To select a different Machine SYNC plug-in, use the Machine drop down menu on the **CLASP** Bridge Plug-in.

7 - (RTZ) Return To Zero

Select this control to rewind the tape machine to the beginning of the tape.

***It's important to have the monitor settings on the **CLASP** hardware correspond with the DAW track arming for proper audio monitoring control.*

When daisy chaining more than one CLASP unit together use monitor settings as follows:

With 2 or 3 24-track machines select monitor setting channels 1 - 24

With 2 or 3 16-track machines select monitor setting channels 1 - 16

*Synchronization must be performed for each available tape speed on each analog recorder that is connected to the **CLASP** system.*

***It is only necessary to perform synchronization when a new tape machine is first connected. Stored machine synchronization profiles are stored on the host computer and not in the **CLASP** hardware.*

*Machines that are using the optical sensor accessory will not RTZ unless the **CLASP** hardware countdown timer has elapsed one full minute into the countdown. This is a safety measure to prevent the tape from flying off the reel because of rewinding past the reflective sensor mark on the beginning of the reel.*

Synchronizing **CLASP** & Tape Machine

You have wired up the hardware unit, installed the plug-ins, and configured your DAW. Now, you will synchronize the CLASP with your tape machine(s) and record away. Synchronizing is the process of CLASP profiling delay compensation for different speeds of the tape machines in your studio. It can store up to 3 different tape speeds for 3 different tape machines. This process must be completed before you can properly record any audio with the CLASP.

STEP 1

Open a CLASP enabled session in your DAW. Ensure that your MIDI interface is properly connected to the CLASP hardware and properly configured in your DAW.

STEP 2

Connect the SYNC Output of the CLASP to the Input of a track of your tape machine. Connect the SYNC Input of the CLASP to the Output of the previously selected track of your tape machine. Record arm the track and put the tape machine into REPRO mode.

STEP 3

Select the profile slot of your tape machine. (Machine 1, Machine 2, Machine 3) on the CLASP bridge plug-in.

STEP 4

Set your tape machine for 30 IPS. Locate the IPS button on the CLASP and push it until the display reads 30 IPS.

STEP 5

Push the SYNC button on the CLASP. Wait for the confirmation. If the display reads IMPROPER CONNECTION, see below.

STEP 6

Repeat STEP 4 & STEP 5 to synchronize your tape machine at 15 IPS and 7.5 IPS. Some machines may not SYNC at 7.5 IPS.

Errors

“Improper Connection”

Tape machine is in input mode

Track is not record enabled

Audio connection not being made check patch cables

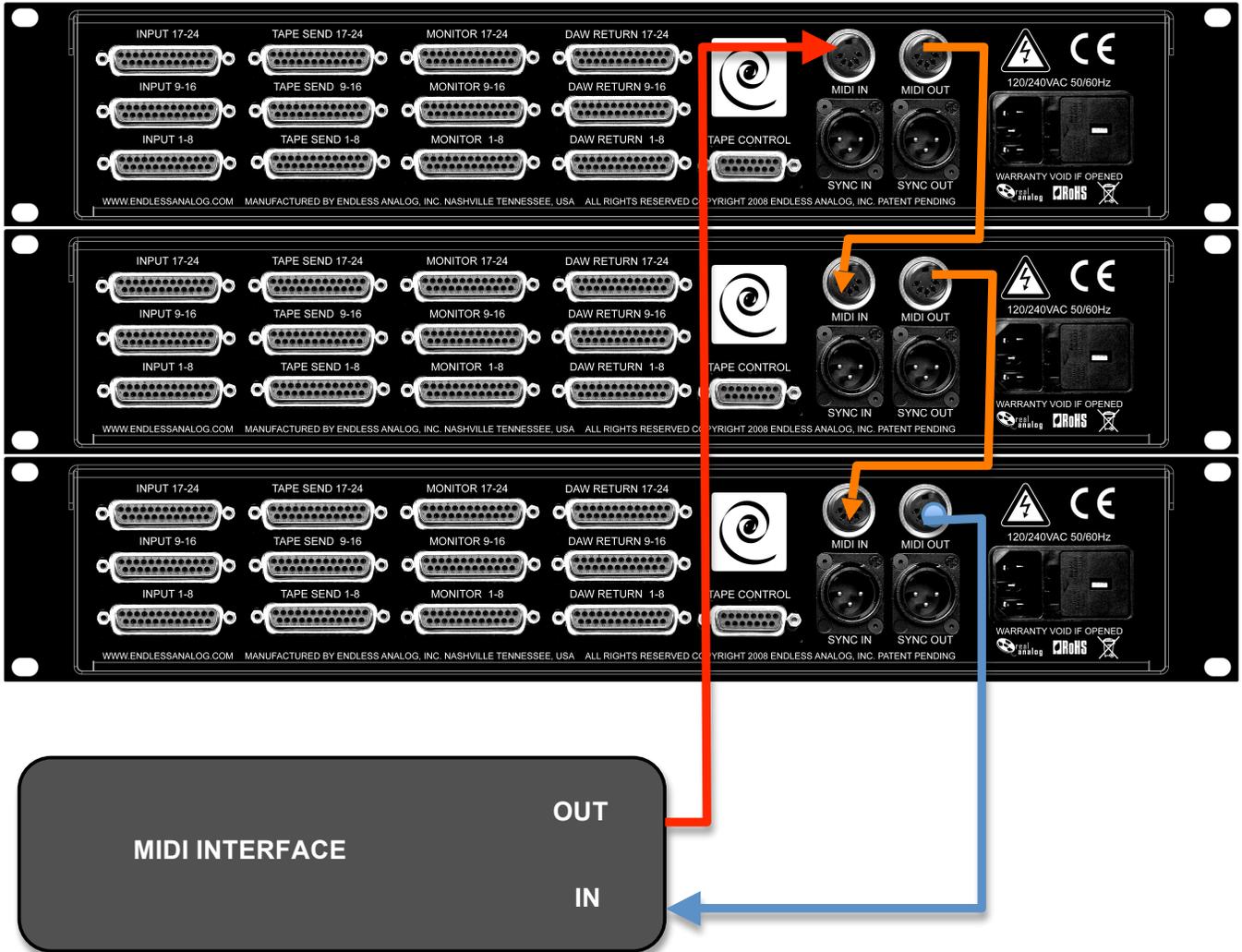
DAISY CHAINING MULTIPLE CLASP UNITS

This illustration shows the proper way to daisy chain up to three CLASP systems together. The first unit in the chain becomes the master and will control the settings of the two slaves. IPS, POST, & MON buttons become inactive on slave units. All controls are handled from the master. When daisy chaining three systems, the MON displays on the CLASP Bridge plug-in will read MULTI 1 – 72. If only two systems are daisy chained it will read MULTI 1 – 48. This is because the default monitor mode is in 24 channel banks. If a 16-track configuration is desired, pressing the MON button on the master unit until the display reads MONITOR

CHANNELS 1 – 16 will set each unit to 16 channel banks. For example the master will be assigned 1 – 16, slave 1 will be assigned 17 – 32, and slave 3 will be assigned channels 33 – 48. The CLASP Bridge plug-in will then display MULTI 1 – 48.

With Pro Tools Daisy Chain, the tape machines must be the same make and model running at the same tape speeds.

With Nuendo Daisy Chain, unique or different analog recorders can be used at different tape speeds.



There is delay in the headphones before I try to PLAY or RECORD audio.

If you're getting delay in headphones when you are not recording this is generally caused by improper connection and means that you are monitoring through Pro Tools instead of monitoring through the **CLASP** hardware. Monitoring has to be done through the **CLASP** hardware otherwise the monitor audio signal will be delayed.

There is delay in the headphones while RECORDING audio.

The most common cause of getting delay in headphones while recording is failing to properly bank over using the bank buttons on the **CLASP** Bridge plug-in to select the bank of the corresponding armed tracks inside of Pro Tools.

Delay compensation display is red instead of green. I don't hear any problems. Should I be concerned?

The most common cause of delay compensation going into red instead of green is having master faders assigned to outputs that are not in sequential order. So let's say for example that you have 24 master faders set up inside of pro tools the first 16 master faders are assigned to outputs one through 16 in sequential order the last eight master faders instead of being assigned through channels 17 through 24 are assigned to channels 19th through 26th this would call us the pro tools the way compensation engine to fail. Therefore giving you a red delay compensation indicator it's important to keep all master faders and their outputs assigned in sequential order and not to skip any outputs.

How to use clasp to reprocess prerecorded tracks.

In your pro tools session assign the outputs of the pre-recorded tracks to individual mono outputs that are patched back into the clasp inputs. Next inside pro tools set up new mono audio tracks that have their inputs assigned to receive analog processed audio coming from the tape machine feed to your analog to digital converters. Note that if you solo the newly recorded audio tracks and solo the outputted pre-recorded session tracks simultaneously this will allow you to take advantage of the repro monitoring feature in clasp and audition the sound of the tape while it's being recorded to make adjustments for level to tape as well as picking the desire to tape speed

TECHNICAL SPECIFICATIONS

Circuit topology:	Minimal signal path design passive buffered hybrid monitor output
Maximum Input Level:	Line level +36db balanced, Pin 2 hot
Maximum Output Level:	+30db balanced 600 ohms, Pin 2 hot
Output Types:	D Sub 25 female, XLR male, XLR female
Noise @ 20khz unweighted:	-92db
Distortion THD, IMD:	0.005%
Frequency response:	-/+0.5db 1 Hz to 20kHz line in/out
AC power:	Dual independent iron core 115v to 240v, 50-60Hz selectable, 25 watts maximum
Dimensions:	19 x 7.5 x 3.5 inches (482 x 190.5 x 89mm)
Weight:	16 lbs (7.25kg)
Dimensions-shipping carton:	21 x 18 x 8 in (533 x 457 x 203mm)
Weight-packed	19lbs (8.61kg)