INTRODUCTION

Eela Audio S120 series mixing consoles

The EELA AUDIO S120 is an innovative approach to the design of a flexible, high quality and multipurpose, audiomixer. The S120 modular mixer comes standard with full length P&G conductive plastic faders and balanced inputs and outputs.

The basic system has 2 main stereo busses for output A and B, two aux-busses and two N-1 or cleanfeed busses for a maximum of two S123 Telco modules per mixer, stereo pfl. and several DC control busses.

A variety of modules makes it possible to meet the customer requirements. As there are:

S121 : Microphone / line input
S122 : Stereo Line input
S123 : Mono Line input with return output (Telco module)
S124 : Master output with compressor / limiter
S125 : Master with separate faders for L and R
S126 : Auxiliary / Oscillator / Talkback
S127 : 12- way selector module
S128 : Monitor module with LED PPM

Main connections are made with XLR's for in- and outputs, with 1/4" jacks for the inserts and secondary signals. The capacity of the separate power supply used depends on the number of channels in the chassis.

Available frame sizes:

S120CH11 Main frame 19" / 10HE for 11 modules
S120CH8 Main frame for 8 modules, 320 mm
S120CH12 Main frame for 12 modules, 480 mm
S120CH18 Main frame for 18 modules, 720 mm
S120CH24 Main frame for 24 modules, 960 mm
S120CH30 Main frame for 30 modules, 1200 mm

BROADCAST MAIN FRAMES (with card rack for EA700 facilities modules)

S120BC18 Main frame for 18 modules, 720 mm
S120BC24 Main frame for 24 modules, 960 mm
S120BC30 Main frame for 30 modules, 1200 mm

Eela Audio S121 Microphone / Line input module

In standard version the input is electronically balanced; as an option a transformer can be fitted as well as an RF filter.
An optional switch can be mounted as a phase reverse, external VCA control or for other purposes.

The following controls are present:

MIC/LINE INPUT SELECT:

Both inputs are on separate connectors, the microphone input has 48 Volt phantom power for use with condenser microphones.

GAINCONTROL:

One knob is used for both the MIC and LINE input, but with adapted ranges. The gain control range is 50 dB for the MIC input and 26 dB for LINE.

HIGH PASS FILTER:

For inhibiting unwanted LF disturbance in the signal. Operates on both inputs. The frequency is 80 Hz, the slope 12 dB/octave.

EQUALISER:

3 bands of tone control are available:
- HF shelving +/-12 dB@ 10 kHz
- MF bell curve +/- 10 dB @ 3 kHz
- LF shelving +/- 12 dB@ 60 Hz

an EQ ON SWITCH allows complete bypassing of this section.

AUX SENDS 1 AND 2:

Two send level controls, suitable for foldback and effect send purposes. Aux 1 can be set pre- or postfader with a jumper on the PCB, AUX 2 is postfader only.

PAN

For placement of the signal between left and right busses. In the centre position both sides are -3 dB for a constant overall level in all positions of the panpot.

PEAK

A LED, indicating the signal level in the channel approaching 3 dB below clipping, both pre- or postfader.

ROUTING SWITCHES

The two switches are available tor addressing maximum 4 mixing busses in stereo pairs.
In a 2 output configuration the switches can also be used for individual left and right selection.

PFL SWITCH

Sends the prefader signal (derived after the insert point) to the monitoring, thereby generating a DC control signal for automatic change over of the monitoring and depressing one or more channel PFL switches.

FADER

The actual gain setting device in the channel is a Voltage Controlled Amplifier (VCA) driven by a DC voltage derived from a linear mechanical fader.
This set up offers extra features like an additional internal MUTE circuit for extreme cut off values with the fader closed, combined with the generation of a FADER DOWN DC signal for use in the faderstart circuit and for driving DC-signalling/ mute busses, via jumper selection.
The control behaviour on the fader is customised to have a wide high accuracy working area and a fade out range below -30 dB.

INSERT

Located pre fader, post equaliser, suited for connection of external signal processing units.
SEND and RETURN are combined on one 1/4" jack connector and are at a level 6 dB below the nominal output.

FADERSTART OUTPUT

Available in LINE mode for starting external equipment, in MIC mode for muting and red light signalling.

Eela Audio S122 Stereo Line input module

The inputs are on two XLR connectors and are electronically balanced; as an option transformers can be fitted.

The following controls are present:

GAINCONTROL:

A potentiometer with a centre detent for a calibrated unity gain setting. The control range is +/- 10 dB w.r.t. nominal unity gain.

EQUALISER:

3 bands of tone control are available:
- HF shelving +/-12 dB@ 10 kHz
- MF bell curve +/- 10 dB @ 3 kHz
- LF shelving +/- 12 dB@ 60 Hz

an EQ ON SWITCH allows complete bypassing of this section.

AUX SENDS 1 AND 2:

Two send level controls, suitable for foldback and effect send purposes. Aux 1 can be set pre- or postfader with a jumper on the PCB, AUX 2 is postfader only. The signal is a mix from the left and right channel.

BALANCE

For correction of the left to the right balance of the signal between left and right busses. In the centre position both sides are unity gain with a control range of +/- 3 dB.

PEAK

A LED, indicating the signal level in the channel approaching 3 dB below clipping, both pre- or postfader.

ROUTING SWITCHES

The two switches are available tor addressing maximum 4 mixing busses in stereo pairs. In a 2 output configuration the switches can also be used for individual left and right selection.

PFL SWITCH

Sends the prefader signal (derived after the insert point) in stereo to the monitoring, thereby generating a DC control signal for automatic change over of the monitoring on depressing one or more channel PFL switches.

FADER

The actual gain setting device in the channel is a Voltage Controlled Amplifier (VCA) driven by a DC voltage derived from a linear mechanical fader.
This set up offers extra features like an additional internal MUTE circuit for extreme cut off values with the fader closed, combined with the generation of a FADER DOWN DC signal for use in the faderstart circuit and for driving DC-signalling/ mute busses, via jumper selection.
The control behaviour on the fader is customised to have a wide high accuracy working area and a fade out range below -30 dB.

FADERSTART OUTPUT

From the VCA control circuit a logic signal for fader down (or up) is derived. The signal drives an optocoupler output for remote control of external equipment. The character can be set by a jumper for a continuous signal or a pulse.

Eela Audio S123 Mono Line input / output module (Telco)

This module is meant for the connection of mono sources like telephone hybrids. As extra an output is available with a N-1 return signal (Cleanfeed). All audio facilities are equal to the S121 mono mic / line input module.

The following extra controls are present:

ON / CALL INDICATION:

This LED indicates (when interfaced to a external hybrid) if an incoming call is present by blinking and if the hybrid and module is switched on (LED steady).

HYBRID ON SELECT:

With this pushbutton a remote hybrid can be switched on when a call comes in or when an outgoing call has been made.

RETURN OFF SWITCH:

In situations when sending a return signal is unwanted this signal can be muted. Talkback remains possible.

TB SWITCH:

Sends the Talk Back signal from the microphone and preamp in the S126 module (aux/osc.) to the N-1 output instead of the original signal. It also generates a DIM on the monitor loudspeakers.

Note: it is possible to disable command signals when the fader is opened e.g. for use with analogue hybrids On the PC board is a jumper to set this mode marked “2-wire” to disable TalkBack when fader opened and “4-wire” for TalkBack any time the channel is switched on with the hybrid on switch.

HYBRID ON OUTPUT

From the VCA control circuit a logic signal for fader down (or up) is derived. The signal drives an optocoupler outputs for remote control of connected hybrids. The character can be set by a jumper for a continuous signal or a pulse ON and a pulse OFF contact on a single ¼” jack.

RING INPUT

From the hybrid a logic “Ring detect” signal can be delivered to this module to indicate an incoming call on this particular hybrid. This input can also be found on a ¼” jack

Eela Audio S124 Stereo output module

This module contains the mix and line amplifiers for one stereo pair of outputs, controlled by a single fader. A compressor / limiter is included.

The following controls are present:

COMPRESSOR / LIMITER:

Integrated in the VCA circuit is a compressor / limiter control circuit with two operational settings. The function can be switched between a fixed threshold limiter for overload protection or a compressor for enhancing the loudness of the signal. The latter setting is a gain reduction device with a proportional action, dependant on the amount of gain reduction. Starting with a gentle 1.5 to 1 slope, the ratio tightens to a limit slope at 10 dB, so combining extra loudness with overload protection. The level on which the limiting takes place is the same as for the limiter setting.

LED INDICATION (+2, +10)

Two LED's are used for indicating the working of the control circuit and the amount of gain reduction. In the compressor mode the 10 dB LED indicates the override by the limiter.

RELEASE TIME:

This rotary control is for varying the timing of the circuit for the desired effect with a range from fast (300 msec.) to slow (3 sec.) The most CCW position activates a switch, bringing an automatic program controlled release network in circuit with a fast release for short peaks and a slow gain riding action for overloads of longer duration.

COMPRESSOR:

The off position selects the limiter, the switch on sets the circuit of compression.

ON:

A switch to activate or bypass the whole circuit.

FADER:

A single fader is controlling both outputs via VCA's for accurate tracking of the gain.

INSERTS:

A prefader insertion point at a level of 6 dB below the output level is available for each channel on a ¼" jack connector.

OUTPUTS:

The outputs for left and right channel are on male 3 pin XLR's and transformer balanced. The maximum level is + 20 dBu into a 600 Ohm load, the minimum load being 200 Ohm. A special circuit is employed to reduce the LF distortion at high levels caused by the transformer, giving a specification of THD better than – 60 dB @ +18 dBu within a frequency range of 40 Hz to 15 kHz. The output impedance is very low with a value of 30 Ohm.

Eela Audio S125 Dual mono output module

This module contains the mix and line amplifiers for one stereo pair of outputs, controlled by an individual fader per output.

The following controls are present:

FADER:

An individual fader is controlling the level of the outputs via VCA's.

INSERTS:

A prefader insertion point at a level of 6 dB below the output level is available for each channel on a ¼" jack connector.

OUTPUTS:

The outputs for left and right channel are on male 3 pin XLR's and transformer balanced. The maximum level is + 20 dBu into a 600 Ohm load, the minimum load being 200 Ohm. A special circuit is employed to reduce the LF distortion at high levels caused by the transformer, giving a specification of THD better than – 60 dB @ +18 dBu within a frequency range of 40 Hz to 15 kHz. The output impedance is very low with a value of 30 Ohm.

Eela Audio S126 Aux / oscillator / talkback module

This module contains the mix and line amplifiers for the two aux send outputs. Outputs are transformer balanced on male 3 pin XLR's. Also an oscillator and talkback circuit is included in this module.

The following controls are present:

POWER SUPPLY INDICATION:

The LED's on the S126 module indicate the presence of the power supply voltages +18 V, -18 V, and the + 48 V phantom power.

OSCILLATOR:

An line up oscillator is built in. The level is fixed, set by an internal trimpot, the frequency can be selected from the front panel. Depressing the ON / 1 kHz button switches the oscillator on at 1000 Hz, the 10 kHz button changes the frequency to 10 kHz. The LED indicates the ON status. The oscillator signal is routed to the 4 main busses via the ¼" jack marked OSC. Inserting a connector cuts this signal path and gives access to the oscillator signal for external purposes. The output is unbalanced at a level 6 dB below the nominal output level.

AUX 1 and AUX 2 MASTER CONTROLS:

For setting the output level from the aux mixing busses. The signal can be overridden by a talkback signal by pressing the appropriate talkback button.

TALKBACK MICROPHONE:

A built-in electret microphone, followed by a limiter circuit for a constant output level.

TALBACK LEVEL:

Located after the limiting circuit for adapting the talkback level to the application.

TALKBACK PUSHBUTTONS:

Three destinations can be selected via spring loaded pushbuttons being both aux outputs and an external one connected to a ¼" jack. The switch contact of the jack is fed trough mix resistors to the main busses for slate talkback. Activation of these pushbuttons gives a DIM on the loudspeaker outputs of the S128 control room monitor module.

AUX 1 AND AUX 2 OUTPUTS:

Transformer balanced line level outputs with similar specifications as the main outputs.

Eela Audio S127 12-way stereo source selector

This module is a passive mechanical switch selector to be used as a source selector for a stereo input channel or as a monitor extension.

The following controls are present:

12 WAY SOURCE SELECTIONS:

On the front panel are 12 pushbuttons with mechanical change over to select any one of the 12 sources. These sources preferably have to be balanced to guarantee professional crosstalk specs trough the selector.

INPUTS:

The inputs for source 1 to 6 (Left and right) are on one 25 pin D-connector. Source 7 to 12 (Left and right) are on the other.

OUTPUT:

The stereo output can be wired to the EXT input of the S128 monitor module or to a S122(E) stereo input.

Eela Audio S128 Control room monitor

This module contains all the circuits needed to monitor the signal.

The following controls are present:

DUAL LED PPM:

This 19 segment stereo LED PPM follows the monitor selector or indicates PFL when any of the pfl. switches on a channel is pressed.

MONITOR SOURCE SELECTOR:

Five interlocked pushbuttons serve as a soured selector for the monitor. The internal sourdes are both the stereo main outputs and the mono aux outputs.
The external input is transformer balanced on XLR's to avoid any problems in grounding systems.

PFL LED:

The source selected can be overridden by the output of the pfl mixing bus on depressing one or more channel pfl switches. Both meters and the audio outputs follow this action indicated by the LED. This automatic change over does not occur when pfl to phones is selected.

MONO:

This switch mixes the signal to the loudspeaker output to mono for an audible phase or mono compatibility check.

MONITOR LEVEL:

This potentiometer determines the signal level on the CR Loudspeaker outputs. Further influence on this signal level have the DIM and MUTE functions.
DIM, lowering the level by approx. 20 dB, is active on depressing one of the talkback buttons.
Mute is a full cut off the signal and is applied via the mute control bus on opening a microphone channel set for this action. The mute function can be disabled with a jumper.

PFL:

Changes the signal to the headphones from monitor selector to pfl. When pfl is selected to headphones the pfl signal will not appear on the monitor speakers.

HEADPHONE LEVEL:

This potmeter sets the level to the operators headphone output. The source for this output normally follows the loudspeaker selection, inclusive the automatic changeover to pfl. This selction will be replaced by the pfl signal on depressing the pfl to phones switch which also inhibits the automatic changeover of the loudspeakers and meter outputs.

HEADPHONE OUTPUT:

Connected to the front panel mounted ¼" jack are the outputs from the headphone amplifier. This amplifier is suited for driving most stereo headphones with medium to high impedance.

MONITOR OUTPUT:

The left and right outputs for the loudspeakers are unbalanced at nominal level on a ¼” jack.

SIGNALISATION OUTPUT:

On the back of this unit is a ¼” jack with the output for the signalisation lamp drivers.

METERBRIDGE:

A 25 pin D-type connector near the power supply input for wiring up an external meterbridge. Signals available are all unbalanced main- and aux outputs, the pfl signal and DC control lines.

Eela Audio S120 series Specifications

TECHNICAL SPECIFICATIONS

General

Voltages in dBu are referred to 0 dBu = 0.775 Volt RMS.
Faderpositions are at 0 mark.
Nominal outputlevel is + 6 dBu.
Outputs are loaded with 600 Ohm.
External sources have an impedance ot 200 Ohm.
Data given are valid trom 40 Hz to 15 kHz.
Noise measurements are unweighted, RMS, 22 Hz to 22kHz.
Signal to noise ratio's are referred to + 6 dBu.

Specifications

Inputs	**Min.gain**	**Max.gain**	**Impedance**	**Balance**
Microphone	+ 26 dB	+76 dB	2kOhm	55dB
Line	-16 dB	+ 12 dB	13 kOhm	30dB
External monitor	OdB	OdB	13 kOhm	30dB

Outputs	**Nom.level**	**Max. level**	**Impedance**	**Balance**
Main	+ 6 dBu	+20 dBu	40 Ohm	30 dB
Auxiliary	+ 6 dBu	+20 dBu	40 Ohm	30 dB
C.R. Speakers *	+ 6 dBu		100 Ohm	Unbalanced
Headphones *	+20 dBu		100 Ohm	Unbalanced
Oscillator	0 dBu		50 Ohm	Unbalanced

* Potentiometers full open.

Equaliser and filters : see curves
Frequency response : 0/-1 dB (20Hz – 20 kHz)
Headroom : 20 dB

Crosstalk

Jnterchannel crosstalk : 100 dB (fader damping)
Stereocrosstalk : 60 dB (stereo channels)
Mono crosstalk : 60 dB (panpot damping)

Signal to noise ratio

Output noise : - 88 dB (master fader @ 0 dB)
: - 85 dB (one channel @ 0 dB)
equ. Input noise : - 125 dBu (mic. maximum gain)

Eela Audio S120 settings and adjustments

SETTING OF JUMPERS, DIL-SWITCHES AND PROGRAMMING RESISTORS.

S120 Couple board.

On this board is a 4 way DIL switch to ground the unused main busses.
The busses are grounded by putting the switches in the ON position.

When the console is equipped with at least 2 stereo output modules type S124 or S125 all switches are set in the OFF position.

When the console is equipped with only one stereo output module being either type S124 or S125 two of the DIL-switches have to be set in ON position to ground the unused busses. This is dependent of the way the routing switches are configured:
-If the stereo output is under routing switch A only then a.m. goes for DIL-switch 3 and 4.
-If the left stereo output is under routing switch A and the right stereo output is under B then a.m. goes for DIL-switch 1 and 4.

S121 Microphone\line input module.

Jumper 1 determines the AUX 1 output to be pre or post fader (factory set for PRE)
Jumper 2 determines activating the mute system on opening the fader to mute controlroom speakers or studio speakers
(when appropriate interface connected). Factory set for controlroom muting.
Jumper 3 determines the faderstart output to be either continuous or pulse.
Jumpers 4,5 and 6 can convert the insert point connector into a cough input by placing them in the marked position
(jumper 4 up and jumpers 5 and 6 down). Factory setting is for insert point.

Trimpot PT 1 is to set distortion to a minimum at nominal level and 1 kHz frequency.
Trimpot PT 2 is to set the channel unity gain at nominal fader position.

S122 Stereo line input module.

Jumper 1 determines the right AUX 1 output to be pre or post fader (factory set for PRE)
Jumper 2 determines the left AUX 1 output to be pre or post fader (factory set for PRE)
Jumper 3 determines the faderstart output to be either continuous or pulse.

Trimpot PT 1 is to set distortion of the LH chain to a minimum at nominal level and 1 kHz frequency.
Trimpot PT 2 is to set distortion of the RH chain to a minimum at nominal level and 1 kHz frequency.
Trimpot PT 3 is to set the channel unity gain at nominal fader position for LH and RH chain simultaneously.

S124 Stereo output module with compressor limiter.

At the ribbon cable connector X3 you find 0 ohms resistors to program the mix amps to the correct mix bus dependant of the use of the output module (under A or B routing switch).
This also determines the programming of the 0 ohms resistors at the ribbon cable connector X2 which determines what signal goes to which high level bus for monitoring/metering and to the optional meterbar connector.

Trimpot PT 1 is to set the threshold of the limiter. The threshold is factory set for + 6 dBm unless otherwise specified.
Trimpot PT 2 unity gain at nominal fader position for LH and RH chain simultaneously.
Trimpot PT 3 distortion of the LH chain to a minimum at nominal level and 1 kHz
Trimpot PT 4 distortion of the RH chain to a minimum at nominal level and 1 kHz.

S125 Dual mono output module (2 faders).

At the ribbon cable connector X3 you find 0 ohms resistors to program the mix amps to the correct mix bus dependant of the use of the output module (under A or B routing switch).
This also determines the programming of the 100 ohms resistors at the ribbon cable connector X2 which determines what signal goes to which high level bus for monitoring/metering and to the optional meterbar connector.

Trimpot PT 1 unity gain at nominal fader position for the LH chain.
Trimpot PT 2 distortion of the LH chain to a min. at nominal level and 1 kHz.
Trimpot PT 3 unity gain at nominal fader position for the RH chain.
Trimpot PT 4 distortion of the RH chain to a minimum at nominal level and 1 kHz

S126 Aux/oscillator/talkback module.

Trimpot PT 1 is to set the level of the oscillator. It is factory set to give + 6 dBm on the main outputs unless otherwise specified.

S128 Monitor module with LED PPM.

Jumper JP 1 on the main board determines the signalisation output to be controlled on either control room monitor mute or studio monitor mute (see also jumper 2 setting at S121 modules).

With the 4 trim pots on the meterboard the LED meters have to be aligned.
The meters are factory set for reading 0 at + 6 dBm unless otherwise specified.
Trimpot PT 1 is to set the 0 reading of the RH LED array.
Trimpot PT 2 is to set the -40 reading of the RH LED array.
Trimpot PT 3 is to set the 0 reading of the LH LED array.
Trimpot PT 4 is to set the -40 reading of the LH LED array.