



S130
USERS MANUAL



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1. INTRODUCTION

The EELA AUDIO S130 is an innovative approach to the design of a flexible, high quality and multipurpose, audiomixer, based on the experience with our S120 and S340.

We have found that the operator interface is very much a matter of personal preference, previous experience, the type of program and the application of the system for postproduction or broadcast purposes.

Also interfacing to a large range of source equipment, like different types of machines has to be very flexible, mainly because there is little or no standardization in this area.

The answer we found for this great variety of configurations is the use of a MICROPROCESSOR in each channel for controlling the logic and. By means of programming switches the way of working can be altered by the user to adapt this to his needs or wishes.

The use of an individual processor per channel is mainly a matter of safety and ease of servicing. All communication between modules is in the "old fashioned" way by means of static DC & LOGIC busses.

The processor control allows for future updates of the logic functions and is easy for customizing without changes in the hardware.

The architecture of the audio- and DC control busses provides for quite a large range of custom setups, which can be implemented at low cost by simply replacing the EPROM's. Several versions of the software will be available at a later date.

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

S131	:	Microphone / line input
S132	:	Stereo Line input
S133	:	Stereo Line input with return output
S134	:	Group output with high level input
S135	:	Master output with compressor / limiter
S136	:	Auxiliary / Oscillator / Talkback
S138	:	Monitor module

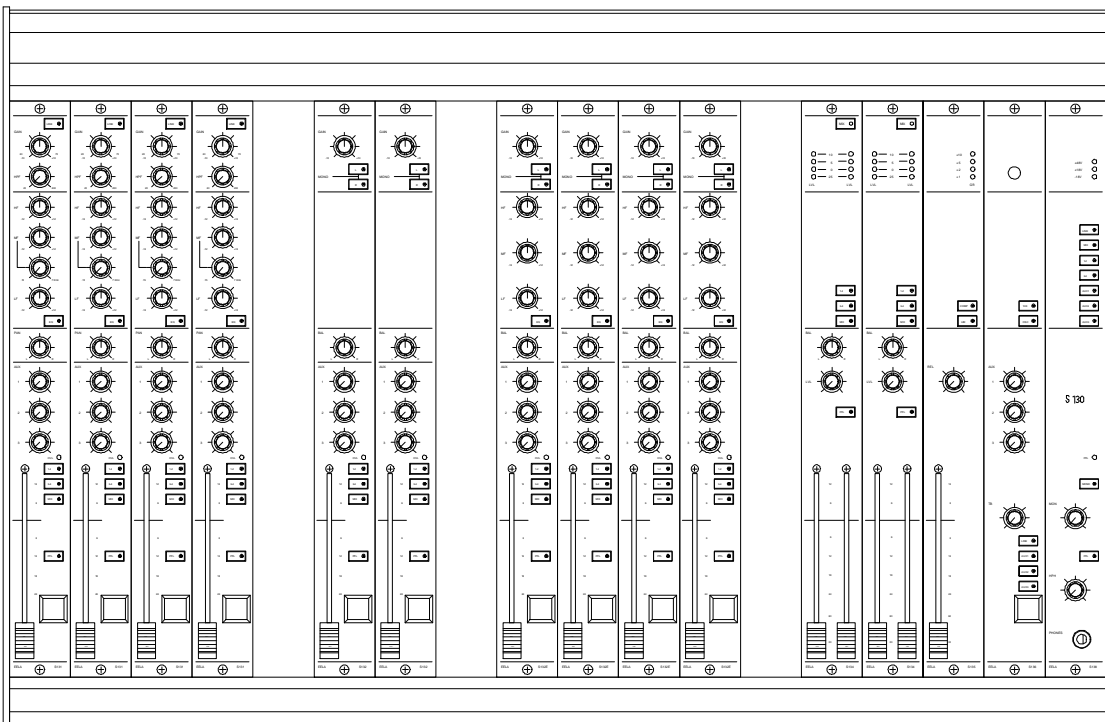
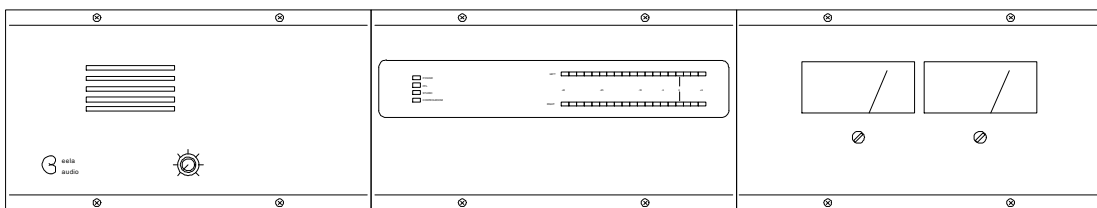
The motherboard, at the bottom of the chassis, is used for distribution of all audio-, control- and power signals to the modules, the facilities modules in the meterbridge and the "outside world".

Connections are made with XLR's for in- and outputs, with 1/4" jacks for the inserts and with D9 multipole connectors for channel remotes. For the power connection, with the EA902 or EA903 power-supply, a Speakon connector is used.

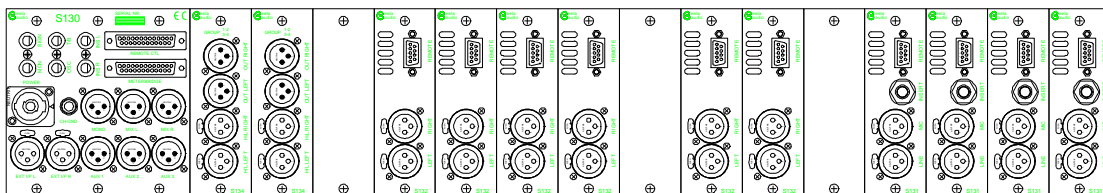
2. OVERVIEW

2.1 MIXING CONSOLE

The function of the individual modules will be described using the layout drawings of the channels. The controls are divided in DIRECT AUDIO CONTROLS in the upper part of the module and the ones in the fader area, coupled to the LOGIC SYSTEM and from there to the audio and logic busses.



Front panel with meterbridge



Backpanel

3. SYSTEM ARCHITECTURE

All modules are connected through a 50 way ribbon cable.

3.1 AUDIO MIXING BUSESSES

The audio mixes are made with a differential balanced virtual ground summing system with high rejection of both RF and LF noise. The crosspoints are made with CMOS switches for low noise operation. For maximum signal to noise ratio the crosspoints are opened when the contributing channel is OFF. Control of the switches is via the channel-processor.

Available (stereo) mixes:

1. MAIN MIX, selectable postfader output from all channels. A sum of all modules creates the output signal, used for the S135 output module.
2. GROUP 1-2, selectable postfader output from all channels. A sum of all modules creates the output signal, used for the S134 output module.
3. GROUP 3-4, same as group 1-2
4. AUX 1, pre-fader (mono) output with level control.
5. AUX 2, pre- or post-fader (mono) output with level control.
6. AUX 3, post-fader (mono) output with level control.
7. PFL (Pre Fader Listening), switchable pre fader stereo output to be used for checking the signal for level and quality and cueing the source equipment. Several logic facilities are coupled to this function.

3.2 DC & LOGIC BUSESSES

These busses are used for communication between modules on logic- and DC control level. The following signals are present:

1. PFL/DC (Pre Fader Listen DC), for controlling the monitor and metering when a channel activates the PFL system
2. PFLRST (PFL RESET) a reset bus for switching off former selections to the PFL bus when an other channel is activated. This function can be disabled to give a mixed PFL behavior.
3. MUTE/ST, a signal active on opening the fader of a microphone channel assigned to STUDIO for controlling monitoring and signalisation in the STUDIO location.
4. MUTE/CR, the same signal, but than activated by CONTROLROOM microphone channels.
5. MASTER/RST, after 'power-on' the MASTER/RESET gives a "save" signal to all microprocessors.
6. DIM, activated by talkback functions (AUX module) for opening the talkback audiopath and lowering the level in the controlroom.

3.3 HIGH LEVEL BUS

The high level signals from the output modules are distributed to the monitor and meterbridge by a 10 way ribboncable. Also the 48 Volts Phantom powering runs over this cable. The high level bus is located at the back of the chassis, far from the audio mix busses.

3.4 GROUNDING SYSTEM

In order to keep the signal as clean as possible, in spite of all the logic, LED's, lamps etc., we have used a diversified ground system in all modules.

The xxx/GND (reference ground for all mixamps) is a separate bus for each audiomix to be returned to the corresponding mixamp.

The GND (analogue ground), is as power return ground for both audio and powering. All ground currents from opamps, are returned to this ground, while LED's, microprocessor controls and switches are related to the DIG/GND (digital ground).

The CH GND (chassis ground) is the frame of the console which has to be connected to the protective mains ground. Audio ground is connected to the chassisground on one place, being the back of the mixertray.

3.5 POWER SYSTEM

The main audio powerrails are + and -18 Volts, decoupled in each module for isolation of faulty modules from the system and for improving LF crosstalk.

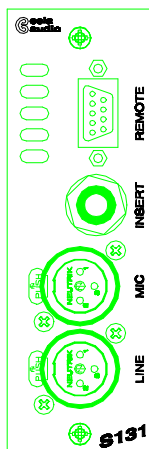
The + 5 Volts for the processor, the logic circuits and the VCA fader reference are made with an individual stabilizer per module from the main audio powerrails.

4. S131 MIC / LINE INPUT CHANNEL

The MIC / LINE module is meant for control and processing of mono microphone- or line level signals as OB lines or video recorders.

The logic system and the audio routing are laid out for use of up to two locations for the microphones, being the CONTROLROOM or STUDIO both with signalisation.

4.1 INPUT CONNECTIONS



The connections are located at the back of the mixertray on the connectorpanel.

Sources are connected to the channel via XLR connectors. In case of microphone sources with phantom powering. This phantom power can be cut off by a jumper on the connectorboard.

The standard version has a differential inputamplifier, a transformer can be added as an option.

INSERTION POINT

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

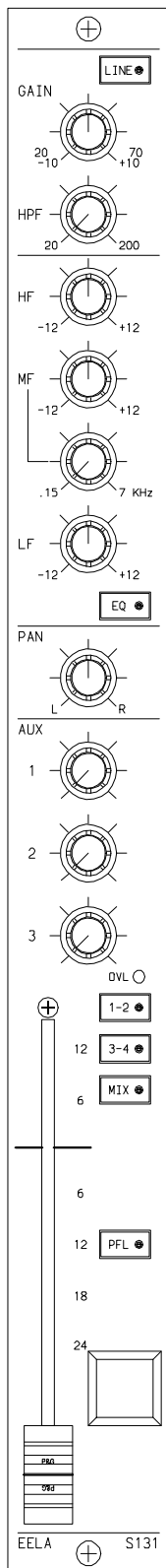
CHANNEL REMOTE CONTROL CONNECTOR

Each module has a channel remote control connector, that can be used for extension of the operator interface or for coupling to an automation system. The following signals can be found on the D9 socket:

CONTROL LINE	PIN	INPUT	OUTPUT
A	2	EXT. MUTE	
B	5-9		MIC. ON indication
C	3	EXT. PFL	
D	4-8		FDR Start (in Line only)
GND	1		

The remote control outputs are made via opto-couplers, eliminating the need for external interface boxes. It is possible to mount opto-couplers in the remote control inputs as well, but standard a 'switch'-input (logic TTL - active low) is used to avoid the need of an external voltage.

4.2 OPERATOR CONTROLS



INPUT SELECT SWITCH

To be used for selection of the MIC or LINE input to the channel. This selection includes not only audio, but also all other logic and VCA control interfaces and remote connections, dependent on the location of the microphones or the line level source connected.

INPUT GAIN CONTROL

This is a pot with a wide range from 20 to 70 dB for the microphone inputs and a limited control over a +/- 10 dB range for the line inputs.

The inputstage is a sophisticated low noise dedicated differential balanced input circuit, which can be modified by adding a transformer if galvanic isolation is a must.

HIGH PASS FILTER

A continuous variable control for setting the frequency of the high pass filter with a range from < 20 Hz to 200 Hz. The slope is 12 dB/octave.

EQUALISER

A three band equaliser with shelving HF and LF sections and a bell- curve MF with the frequency sweepable from 150 Hz to 7 kHz. The range of all equaliser sections is +/- 12 dB.

The EQ ON Switch brings the equaliser section into the audiopath.

PANPOT

Centre detented pot for location of the mono mic/line signal between left and right in the stereo signal. This control is placed before the (stereo) fader, allowing to use the PFL system also for checking the panpot setting.

AUX 1 / 2 / 3

Multi purpose outputs e.g. for effects equipment, special foldback or PA purposes, mono, with levelcontrol. AUX1 is pre fader, AUX2 is pre / post fader selectable by an internal jumper and AUX3 is a post fader output.

OVERLOAD LED

The LED indicates a pre fader audio level of + 12 dB.

GROUP ROUTING SWITCHES

By pressing the 1-2 or 3-4 switch, the audio will be routed to the S134 GROUP modules. With one of these groups an isolated or extra subgroup can be made for recording of incoming signals while the console is ON AIR via the main MIX (S135 Master output).

PFL

This has always a dual mode of operation:

Depressed short gives a LATCHING action, which means that the PFL status is ON until a second press of the switch, or the opening of the channel, or activating PFL from another channel. This can be disabled at wish in the CR-MONITOR module, giving the choice between a MIXED or a SINGLE PFL selection.

Depressed longer makes the PFL function momentary, switching OFF the PFL status on releasing the button.

FADER and ON/OFF BUTTON see next page

Below the AUDIO SECTION the FADER AREA starts, using the ON/OFF switch and the fader, coupled to the processor control of the module and being flexible in configuration by 4 DIL-SWITCHES.

FADER

This is a DC analog control for setting the gain of the channel VCA's with a special control law for creating a high resolution working- and a coarse fade out area. The VCA gain can also be influenced by Logic control from the processor, like COUGH MUTE or external MUTE.

All "VCA SWITCHING" is done via a rampvoltage for a convenient, fast and silent fade-in or out.

ON/OFF BUTTON and -INDICATOR

This is a dual function unit for both control and indication of the channel status. The LED is OFF when the channel is NOT READY, and BRIGHT when the channel is ON.

The combination FADER- ON/OFF logic can be configured in several ways, depending on the dilswitch settings.

4.3 DIL-SWITCHES

DILSWITCH	OFF	ON
1	BUTTON = Mute	BUTTON = Channel On/Off
2	COUGH = Mute	COUGH = Mute + PFL
3	START = Continuous (fader contact)	START = Pulse
4	MIC = Controlroom	MIC = Studio

Dilswitch 3 effects only the LINE-mode

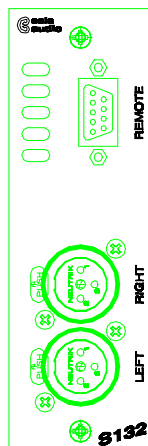
Dilswitch 4 effects only the MIC.-mode

If the prelistened source is a controlroom mic the loudspeakers in the controlroom will be dimmed on PFL action to prevent howl-round.

5. S132(E) STEREO LINE INPUT CHANNEL

The STEREO LINE INPUT S132(E) has one stereo input, that can be used for the connection of stereo machines or line sources, with remote control. Also possible is the use of the channel for picking up STEREO MUSIC LINES.

5.1 INPUT CONNECTIONS



The connection of the audio from the source equipment to the stereochannels is by means of two XLR's for LEFT and RIGHT channel input. Both electronically balanced. A transformer can be fitted as option.

CHANNEL REMOTE CONTROL CONNECTOR

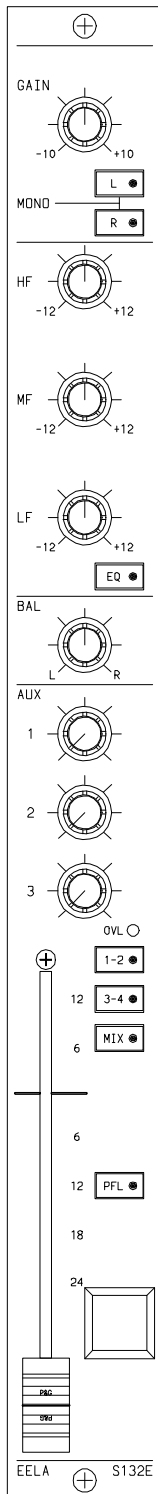
Each module has a channel remote control connector, that can be used for remote control of the source or for coupling to an automation system. The following signals can be found on the D9 socket:

CONTROL LINE	PIN	INPUT	OUTPUT
A	2	EXT. INPUT	
B	5-9		START
C	3	EXT. PFL	
D	4-8		STOP
GND	1		

The EXTERNAL INPUT can have several functions. For more detailed information see the paragraph DILSWITCHES.

The START and STOP are opto-coupler outputs. It is possible to mount opto-couplers in the remote control inputs as well, but standard a 'switch'-input (logic TTL - active low) is used to avoid the need of an external voltage.

5.2 OPERATOR CONTROLS



INPUT GAIN CONTROL

This is a centre detented pot with a range of ± 10 dB for fine gain control of the channel.

The input circuit consists of a differential balanced input. Where the placement of a transformer as option is possible.

MONO/STEREO MATRIX

Two switches allow for 4 input assignments:

- BOTH OUT: the left input to the left channel and the right input to the right channel, the normal STEREO setting.
- LEFT switch in: the left input is connected to both channels (LEFT MONO)
- RIGHT switch in: the right input is connected to both channels (RIGHT MONO)
- BOTH switches IN : a mix of the left and right input is sent to both channels (MIX MONO)

EQUALISER

Available as an option for the stereo channels.

Consists of shelving HF and LF sections and a peak/dip MF section with a bell-curve at 3 kHz. The range of all equaliser sections is ± 12 dB.

The EQ ON Switch brings the equaliser section into the audiopath.

BALANCE CONTROL

Centre detented pot for correction of the L/R balance of the channel over a range of ± 3 dB. This control is located before the fader, allowing the PFL system to be used for checking the balance.

AUX 1 / 2 / 3

Multi purpose outputs e.g. for effects equipment, special foldback or PA purposes, mono, with level control. AUX1 is pre fader, AUX2 is pre / post fader selectable by an internal jumper and AUX3 is a post fader output.

OVERLOAD LED

The LED indicates a pre fader audio level of $+ 12$ dB.

GROUP ROUTING SWITCHES

By pressing the 1-2 or 3-4 switch, the audio will be routed to the S134 GROUP modules. With one of these groups an isolated or extra subgroup can be made for recording of incoming signals while the console is ON AIR via the main MIX (S135 Master output).

PFL

This has always a dual mode of operation:

Depressed short gives a LATCHING action, which means that the PFL status is ON until a second press of the switch, or the opening of the channel, or activating PFL from another channel. This can be disabled at wish in the CR-MONITOR module, giving the choice between a MIXED or a SINGLE PFL selection.

Depressed longer makes the PFL function momentary, switching OFF the PFL status on releasing the button.

FADER and ON/OFF BUTTON see next page.

Below this AUDIO SECTION the FADER AREA starts, using switches and the fader, coupled to the processorcontrol of the module and being flexible in configuration by 4 programming switches. Not all possibilities will be mentioned but only the ones now available in the "standard" software. A number of customer specific options can be implemented if the available settings are not adequate for the desired way of operation, also after initial installation.

ON/OFF BUTTON and -INDICATOR

This is a dual function unit for both control and indication of the channel status. The LED is fully OFF when the channel is NOT READY and BRIGHT when the channel is ON. The LED blinks on receiving a INHhibit fader command from a connected source.

The combination FADER- ON/OFF logic can be configured in several ways, determined by the desired mode of operation. See paragraph Dilsitches.

5.3 DIL-SWITCHES

DILSWITCH	OFF	ON
1	START/STOP by SWITCH	START/STOP by FADER (Knob = Audio Mute)
2	PFL start = off	PFL start = on
3	START = Continuous	START = Pulse
4	External input = INHhibit	External input = Playlamp (EOM)

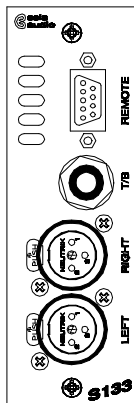
DILswitch 4 configures the external input on the channel remote control (pin 2) as a fader-inhibit or as playlamp tally.

- In terms of a inhibit signal : when a connected machine comes in the RECORD mode it gives out a active-low signal which will be acknowledged by the microprocessor with a blinked ON/OFF LED and the channel will be closed.
- When a machine with PLAYLAMP output is connected to the channel remote and the machine is in PLAY mode the ON/ OFF LED of the channel runs parallel with the incoming signal.

6. S133(E) STEREO LINE INPUT WITH RETURN OUTPUT

The STEREO LINE INPUT S133(E) has one stereo input, that can be used for the connection of stereo outside sources or hybrids, with limited remote control, but with the need of a Cleanfeed (N-1) output.

6.1 INPUT CONNECTIONS



The connection of the audio from the line or line interface to the stereo channels is by means of two XLR's for LEFT and RIGHT channel input. Both electronically balanced. A transformer can be fitted as option.

The connection of the talkback signal is by means of a jack socket to which either the talkbackfeed from the built-in mic and found on the masterpanel or the signal from the presentermic tapped from the insert point can be connected.

CHANNEL REMOTE CONTROL CONNECTOR

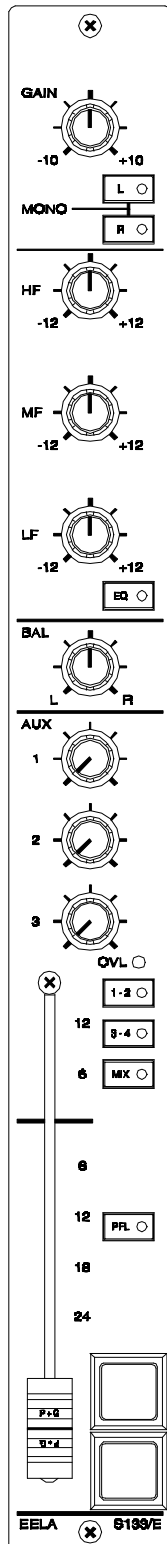
Each module has a channel remote control connector, that can be used for remote control of the line interface. The following signals can be found on the D9 socket:

(CONTROL) LINE	PIN	INPUT	OUTPUT
A	2-6	CALL DETECT INPUT	
B	5-9		START/ON OUTPUT
SND	3-7		RTN TO CALLER AUDIO
D	4-8		STOP OUTPUT
DIG/GND	1		

The CALL DETECT input can have several functions. For more detailed information see the paragraph DILSWITCHES.

The START/ON and STOP controls are opto-coupler outputs. It is possible to mount an opto-coupler in the CALL DETECT signalling input as well, but standard a 'switch'-input (logic TTL - active low) is used to avoid the need of an external voltage.

6.2 OPERATOR CONTROLS



INPUT GAIN CONTROL

This is a centre detented pot with a range of ± 10 dB for fine gain control of the channel.

The input circuit consists of a differential balanced input. Where the placement of a transformer as option is possible.

MONO/STEREO MATRIX

Two switches allow for 4 input assignments:

- BOTH OUT: the left input to the left channel and the right input to the right channel, the normal STEREO setting.
- LEFT switch in: the left input is connected to both channels (LEFT MONO)
- RIGHT switch in: the right input is connected to both channels (RIGHT MONO)
- BOTH switches IN : a mix of the left and right input is sent to both channels (MIX MONO)

EQUALISER

Available as an option for the stereo channels.

Consists of shelving HF and LF sections and a peak/dip MF section with a bell-curve at 3 kHz. The range of all equaliser sections is ± 12 dB.

The EQ ON Switch brings the equaliser section into the audiopath.

BALANCE CONTROL

Centre detented pot for correction of the L/R balance of the channel over a range of ± 3 dB. This control is located before the fader, allowing the PFL system to be used for checking the balance.

AUX 1 / 2 / 3

Multi purpose outputs e.g. for effects equipment, special foldback or PA purposes, mono, with level control. AUX1 is pre fader, AUX2 is pre / post fader selectable by an internal jumper and AUX3 is a post fader output.

OVERLOAD LED

The LED indicates a pre fader audio level of $+ 12$ dB.

GROUP ROUTING SWITCHES

By pressing the 1-2 or 3-4 switch, the audio will be routed to the S134 GROUP modules. With one of these groups an isolated or extra subgroup can be made for recording of incoming signals while the console is ON AIR via the main MIX (S135 Master output).

PFL

This has always a dual mode of operation:

Depressed short gives a LATCHING action, which means that the PFL status is ON until a second press of the switch, or the opening of the channel, or activating PFL from another channel. This can be disabled at wish in the CR-MONITOR module, giving the choice between a MIXED or a SINGLE PFL selection.

Depressed longer makes the PFL function momentary, switching OFF the PFL status on releasing the button.

FADER and ON/OFF BUTTON see next page.

TALKBACK BUTTON see next page.

Below this AUDIO SECTION the FADER AREA starts, using switches and the fader, coupled to the processor control of the module and being flexible in configuration by 4 programming switches. Not all possibilities will be mentioned but only the ones now available in the "standard" software. A number of customer specific options can be implemented if the available settings are not adequate for the desired way of operation, also after initial installation.

ON/OFF BUTTON and -INDICATOR

This is a dual function unit for both control and indication of the channel status. The LED is fully OFF when the channel is NOT READY and BRIGHT when the hybrid is ON (diverted) or the channel is ON. The LED blinks on receiving a CALL DETECT command from a connected hybrid.

The combination FADER- ON/OFF logic can be configured in several ways, determined by the desired mode of operation. See paragraph DILswitches.

TALKBACK BUTTON and -INDICATOR

This is a dual function unit for both latching and momentary control of talkback to the "return to caller" output. A short press will turn on the talkback whilst a second press turns it off again. By keeping the button pressed during the command, the talkback will be switched off at releasing the button again. In 2 wire mode, talkback is disabled when the hybrid is on air to prevent the command entering the transmission due to poor damping of analog hybrids.

6.3 DIL-SWITCHES

DILSWITCH	OFF	ON
1	START/STOP by SWITCH (In 4 wire mode only)	START/STOP by FADER (In 4 wire mode only)
2	4 wire (outside source) mode	2 wire (hybrid) mode
3	START / STOP = Continuous	START / STOP = Pulse
4	Not used	Not used

DILswitch 2 configures the source connected to the channel to be either a 2 wire interface like a hybrid or a 4 wire interface like a outside source or music line accompanied with a cue/communication line in the other direction.

- In 2 wire mode: The audio coming from the hybrid has to be connected to the input XLR's; the "return to caller" audio has to be taken from the output marked as such on the D9 connector. Control for the hybrid can be taken from the ON or START/STOP control outputs on the D9 connector; The control outputs are activated by means of the ON/OFF switch on the front of the S133 module. If the hybrid has a "call detect" control output this can be connected to the D9 connector also; indication is in the ON/OFF switch. Talkback to the hybrid is only possible with fader closed.
- In 4 wire mode: The audio coming from the outside source or music line has to be connected to the input XLR's; the cue/communication line in the opposite direction has to be connected to the output on the D9 connector. The control outputs can be used for ancillary data information and can be activated by means of the fader or the ON/OFF button of the channel. The control input can be used for some sort of indication in the ON/OFF switch.

7. S134 GROUP OUTPUT

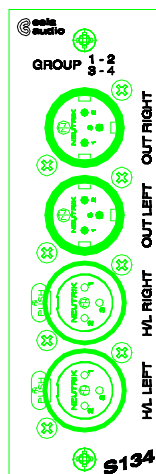
With one of these dual mono group outputs an isolated or extra subgroup can be made for recording of incoming signals while the console is ON AIR via the main MIX (S135 Master output). The module can also be used as master output itself in a smaller desk.

It is possible to use two group modules in one desk. To configure the module as group 1-2 or 3-4, internal jumpers on the module and on the connectorboard are factory set.

The return input is a line level input, electronically balanced to be used as effect return or as a return for other sources which can be inserted into the groups or master.

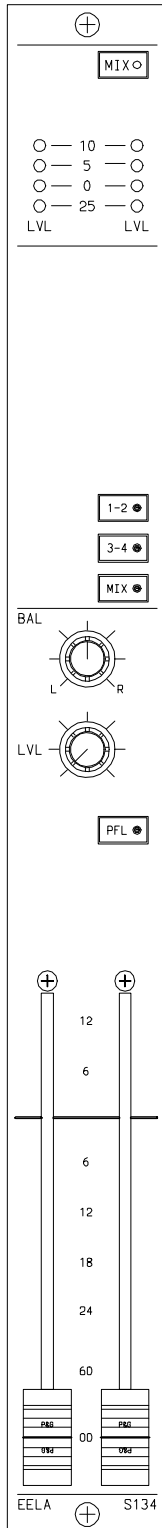
All control functions as switches, LED's, PFL handling and even the audio routing by CMOS switches are ruled by a microprocessor.

7.1 CONNECTIONS



Two male XLR's for LEFT and RIGHT channel output, also electronically balanced, are located at the backpanel on the S134 connectorpanel. On the same spot two female XLR's can be found to connect a source to the return input.

7.2 OPERATOR CONTROLS



MIX SWITCH

Use this button to route (re-inject) the post-fader audio signal from the group module to the main MIX.

LED METER

This peak meter indicates the level of the group output before sending it to the 'outside world' or the main MIX

HIGH LEVEL RETURN SECTION

GROUP ROUTING SWITCHES

By pressing the 1-2, 3-4 or MIX-switch, the audio from the return inputs will be routed to the selected output modules.

BALANCE CONTROL

Centre detented pot for correction of the L/R balance of the return over a range of +/- 3 dB. This control is located before the level pot, allowing the PFL system to be used for checking the balance.

LEVEL CONTROL

This rotary pot determines the signallevel of the return input before sending it to the selected destinations.

PFL

This pre level-pot listening function has the same dual mode of operation as the input channels. Depressed short gives a LATCHING action, which means that the PFL status is ON until a second press of the switch, or the opening of the channel, or activating PFL from another channel. The last mentioned OFF-action can be disabled at wish in the CR-MONITOR module, giving the choice between a MIXED or a SINGLE PFL selection. Depressed longer makes the PFL function momentary, switching OFF the PFL status on releasing the button.

FADER

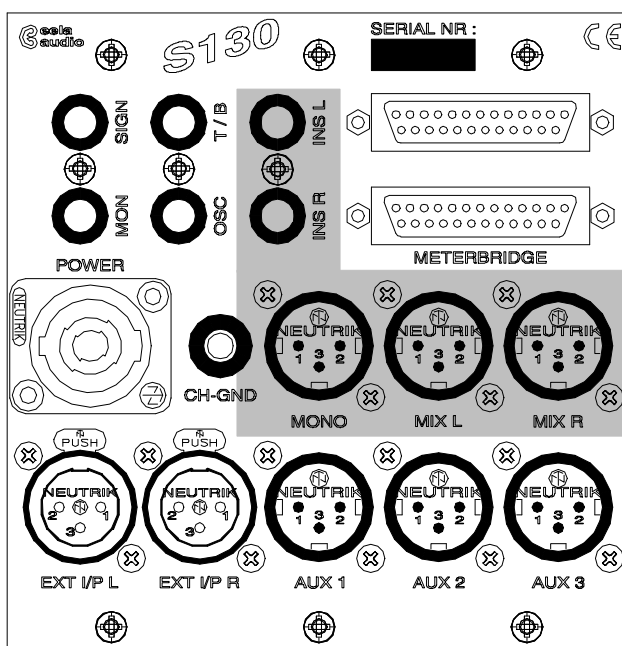
An individual fader per output is controlling the level via the VCA's. The 'budget friendly' Penny & Giles 8100 series fader is mounted as standard, however the P & G 3200 series can be delivered as an option for demanding applications.

8. S135 MAIN OUTPUT

This main output contains the mix and line amps for one stereopair of outputs and a mono output. All transformer balanced. Control over the gain is again with VCA's.

The module contains a compressor / limiter for overload protection or enhancing the loudness of the signal.

8.1 CONNECTIONS



This is the connectorpanel of the S130 master section located at the left side of the mixer backpanel.

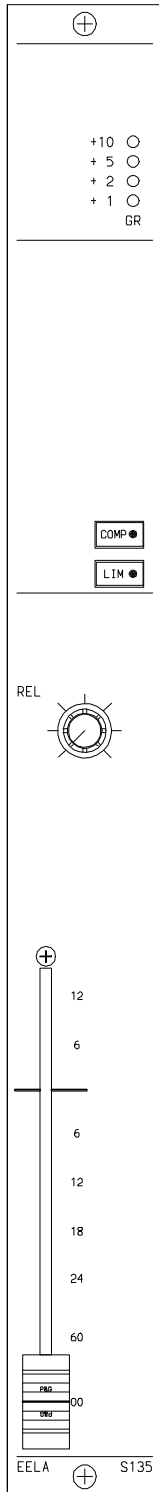
The marking in the drawing shows the connectors belonging to the S135 module. Three male XLR's for LEFT, RIGHT and MONO output.

INSERTION POINTS

LEFT and RIGHT inserts can be used for connection of external signal processing units. The SEND signals are pre fader and pre compressor / limiter at a level of 6 dB below nominal output level.

The 1/4" jack connector per output combines SEND (tip), RETURN (ring) and GROUND (sleeve).

8.2 OPERATOR CONTROLS



LED INDICATION

Four LED's are used for indication the working of the of the control circuit and the amount of GAIN REDUCTION. The LED's indicates 1, 2, 5 or 10 dB above threshold level.

COMPRESSOR / LIMITER

Integrated in the VCA circuit is a compressor / limiter control circuit with two operational settings. The action can be limiter (with fixed threshold) for overload protection or combined with a compressor for enhancing the loudness of the signal. The latter setting is a device with a proportional action, dependent on the amount of gainreduction. Starting with a gentle 1.5 to 1 slope, the ratio tightens to a limit slope at 10 dB, so combining both extra loudness with overload protection. The level on which the limiting takes place is set 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 (300msec) to slow (3sec). The most CCW position of the pot activates a circuit with a fast release for short peaks and a slow, gain riding action for overloads of longer duration.

FADER

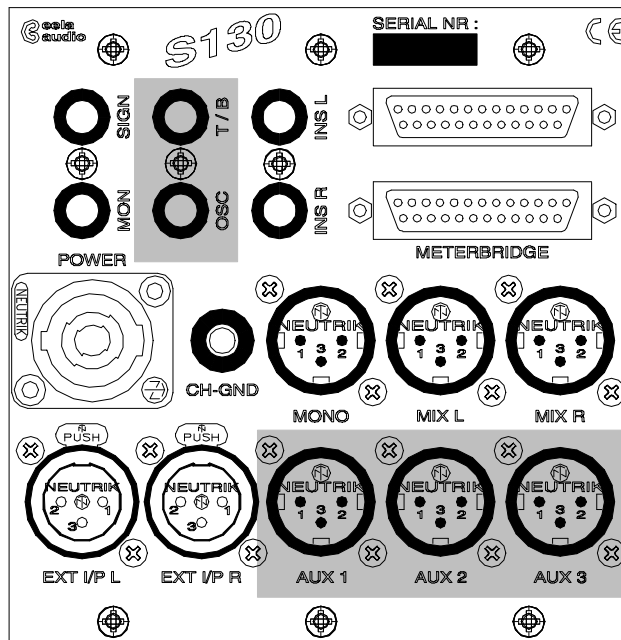
A single fader is controlling both outputs via the VCA's for accurate tracking of the gain.

9. S136 AUX / TALKBACK / OSCILLATOR

The S136 module contains the master section of the auxiliary busses. With the mix- and lineamps for three mono send outputs. These multi purpose outputs can be used for effects equipment, special foldback or PA purposes. The outputs are electronically balanced and can be overridden by talkback.

The oscillator on the module gives the operator the opportunity to 'calibrate' the (group) outputlevels or a the recording level of a recorder.

9.1 CONNECTIONS

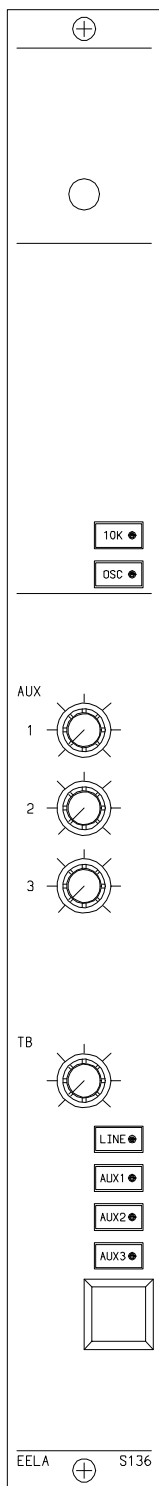


The marking in the drawing shows the connectors belonging to the S136 module. The AUX signals will find it's way out through three male XLR's.

INSERTION POINTS

TALKBACK and OSCILLATOR signals can be picked up or inserted by 1/4" jack connectors (SEND = ring, RETURN = tip and GROUND = sleeve). The oscillator signal has a fixed level of 0 dB.

9.2 OPERATOR CONTROLS



TALKBACK MICROPHONE

An electret microphone is build in, followed by a limiter circuit for a constant outputlevel, independent on the speech distance.

As option a gooseneck mic can be fitted or at request the presenter mic signal can be tapped and used as talkback source.

OSCILLATOR

The oscillatorlevel for line up purposes is fixed, set by a internal trimpot. The frequency can be selected on the frontpanel. Depressing the OSC button switches the oscillator at 1 kHz, the 10 kHz button changes the frequency to 10 kHz.

AUX 1 / 2 / 3

For setting the outputlevel from the mix of all AUX pots of the inputchannels. The signal can be overridden by a TALKBACK signal on pressing the appropriate talkback pushbutton.

TALKBACK LEVEL

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

TALKBACK SELECT BUTTONS

Four destinations can be selected via pre select pushbuttons, being the three AUX outputs and an optional one called LINE. The destination of this LINE can be internally wired on customer demand.

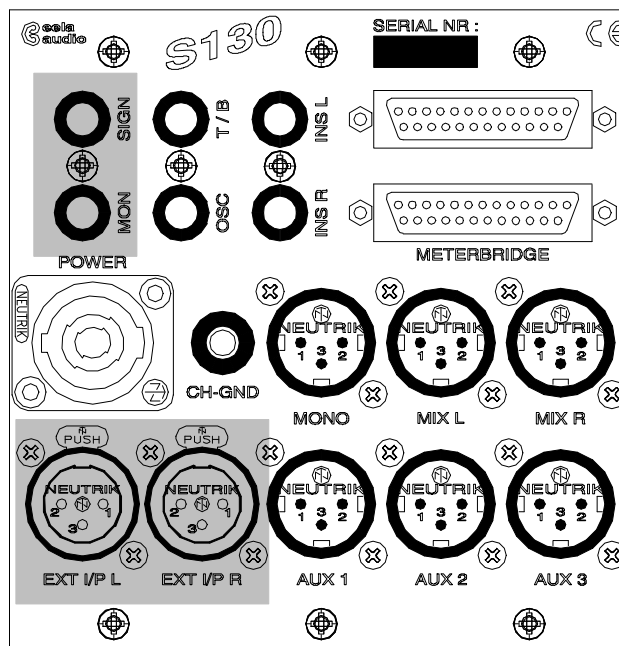
TALKBACK PUSHBUTTON

By pressing this button the talkback audio will be routed to the selected destination(s). Activation of the pushbutton gives a DIM on the loudspeaker output of the S138 monitor module.

10. S138 MONITOR

All functions as Pre Fader Listening, signalisation or source monitoring on loudspeaker and headphone are combined in the S138. The levelcontrol of these speaker and headphone is done on the frontpanel. By use of a microprocessor some smart features according to PFL and source selection are integrated.

10.1 CONNECTIONS

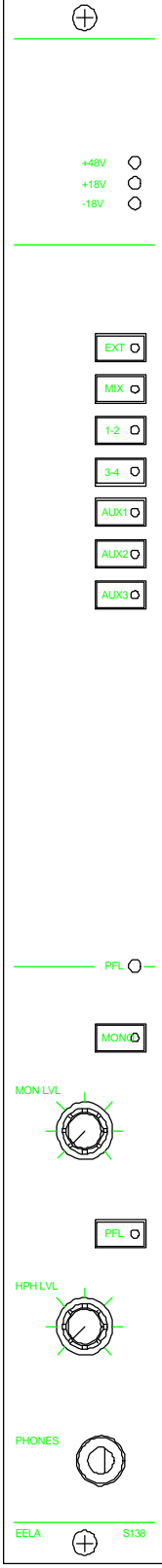


An example of using the **EXTERNAL input** could be a tuner which follows your ON-AIR signal. The connection is made via two female XLR's on the connectorpanel of the master section. The input is electronically balanced.

The left and right output for the **monitor loudspeakers** are unbalanced at nominal level on a 1/4" jack with stereo configuration (LEFT = tip and RIGHT = ring).

The other jack used by the S138 is for **signalisation**. This is a by opto coupler isolated output for power lamp drivers. Pinning is as followed SIGN+ = tip and SIGN- = ring.

10.2 OPERATOR CONTROL



The diagram shows the control panel of the S138 module. At the top is a power supply indication LED. Below it are three LEDs for +48V, +18V, and -18V. A horizontal line separates these from a row of seven pushbuttons: EXT, MIX, 1-2, 3-4, AUX1, AUX2, and AUX3. Below the buttons is a PFL LED. Further down is a MONO button, a rotary knob for MON LVL, a PFL button, another rotary knob for HPH LVL, and a PHONES jack. At the bottom is a 1/4" jack labeled EELA S138.

POWER SUPPLY INDICATION
The LED's on the S138 module indicates the presence of the 3 powersupply voltages + 18 Volt, -18 Volt and the + 48 Volt.

MONITOR SOURCE SELECTION
Seven pushbuttons serve as source selector for the monitoring. The sources are:

- EXTERNAL INPUT
- MAIN OUTPUT (MIX)
- GROUP OUTPUTS (1-2 AND 3-4)
- AUX 1 / 2 / 3

Accept for the Auxiliary's all monitor sources are in stereo.
The MAIN, GROUP, AUX and external source EXT can be monitored one at a time.

PFL LED
The source selection can be overridden by the output of the PFL-mixing bus on pressing one or more channel PFL-switches. This automatic change over does not occur when PFL to PHONES is selected.
By simultaneous pressing the EXT and AUX3 button of the source selector the character of the PFL will be changed form SINGLE-PFL to MIXED-PFL.

MONO
This switch mixes the signal to the LOUDSPEAKER OUTPUT to mono for an audible phase- or mono compatibility check.

MONITOR LEVEL
This rotary pot determines the signallevel on the loudspeaker outputs. Further influence on this level is created by de DIM- and MUTE functions.

- DIM, lowering the level by 20 dB, is activated on depressing one of the TALKBACK buttons.
- MUTE, a full cut off the signal is applied via the MUTE CONTROLROOM or the MUTE STUDIO bus on opening a microphone channel.

Whether the audio will be cut of by the CR-MUTE or the ST-MUTE is set by an internal jumper. The jumper is factory set as CR-mute.

PFL BUTTON
This button changes the signal at the headphone from monitor selector to PFL. When PFL is selected to headphones the PFL will not appear on the monitor speakers.
Pressing this PFL button will reset any activated PFL at the console. This enables the operator to clear the PFL overruling from his source monitoring without looking which selected PFL(s) has to be reset.

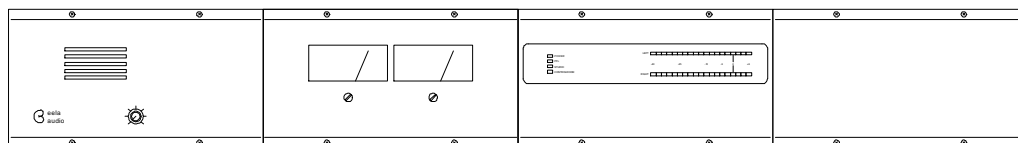
HEADPHONE LEVEL
This pot sets the level to the operators headphone output. The SOURCE for this output normally follows the loudspeaker selection, inclusive the automatic change over to PFL. This selection will be replaced by the PFL signal on pressing the PFL to PHONES switch, which also inhibits the automatic change over of the loudspeaker outputs.

HEADPHONE OUTPUT
Connected to a frontpanel mounted 1/4" jack are the outputs from the headphone amplifier. This amplifier is suited for driving most stereo headphones with medium to high impedance.

11. METERBRIGDE

A meterbrigde for the S130 can be build up with the EA600 series modules. As there are:

-EA600	4 UE blind panel
-EA604	PFL Speaker
-EA609	DUAL LED PPM meter
-EA660	2 * VU meter



The EA609 follows the monitorlevels but can also indicate the main MIX signal by changing two program-resistors on the meterbridge-distributionboard.

On customer demand the EA660 is able to indicate the following signals:

- PFL L/R
- MON L/R
- MIX L/R
- GROUP 1-2
- GROUP 3-4
- AUX 1 / 2
- AUX 3 / SPARE

12. TECHNICAL SPECIFICATIONS

12.1 General:

- Ref. lvl 0 dBu = 0.775 V
- Nom.level is + 6 dBu
- Ch.faders set to 0 dB
- Outputs loaded 600 Ohm
- Ext.sources impedance < 200 Ohm
- Valid from from 40 Hz to 15 kHz
- S/N ratio's are referred to + 6 dBu,
measured as Vrms from 22 Hz - 22 kHz

12.2 Level:

Input sens.mic.....	- 70 dBu
Input sens.line.....	- 4 to + 16 dBu
Insert point level.....	+ 0 dBu
Bal.output level.....	+ 6 dBu

12.3 Impedance:

Mic inputs.....	> 1500 Ohm
Line inputs.....	> 10 kOhm
Xformer balanced outputs.....	< 40 Ohm
Differential outputs (min. load).....	> 600 Ohm

12.4 Balance:

Mic inputs.....	< - 70 dB
Line inputs.....	< - 50 dB
Electronic balanced outputs.....	< - 40 dB
Xformer balanced outputs.....	< - 40 dB

12.5 Frequency response:

-1dB points (no filters/EQ's)	
Mic inputs.....	30 Hz - 25 kHz
Line inputs.....	22 Hz - 30 kHz
HP sweep filter 12 dB/oct.....	20 Hz - 200 Hz
HF eq (shelving 10 kHz).....	+/- 12 dB
MF eq (Bell 3 kHz).....	+/- 10 dB
LF eq (shelving 60 Hz).....	+/- 12 dB

12.6 Overload margins:

Mic inputs (THD < - 40 dB @40 Hz).....	> + 2 dBu
Line inputs (THD < - 40 dB @40 Hz).....	> + 28 dBu
Prefader headroom.....	+ 25 dB
Outputlevel (600 Ohm load).....	> + 20 dBu

12.7 Signal to noise ratio:

EIN mic input (200 Ohm termin.).....	< - 128 dBu
MAIN OUTPUTS with:	
All faders closed.....	- 90 dB
One mono line channel unity gain.....	- 85 dB
One stereo line channel unity gain.....	- 86 dB
AUX outputs, all controls closed.....	- 88 dB

12.8 Distortion:

Nominal input/output levels.....	< - 70 dB
+ 18 dBu on line inputs/outputs.....	< - 60 dB

12.9 Crosstalk:

L-R channel Xtalk stereo modules.....	< - 60 dB
L-R channel Xtalk mono i/p.....	< - 60 dB
Line / Mic Xtalk (at unity gain).....	< - 60 dB
Inter channel Xtalk.....	< - 95 dB
Fader cut off.....	< - 105 dB
Mute cut off.....	< - 110 dB
Cut off routing switches.....	< - 110 dB
Cut off aux level controls.....	< - 86 dB

