ToolMod Faderbox

ToolMod®

adt-audio®

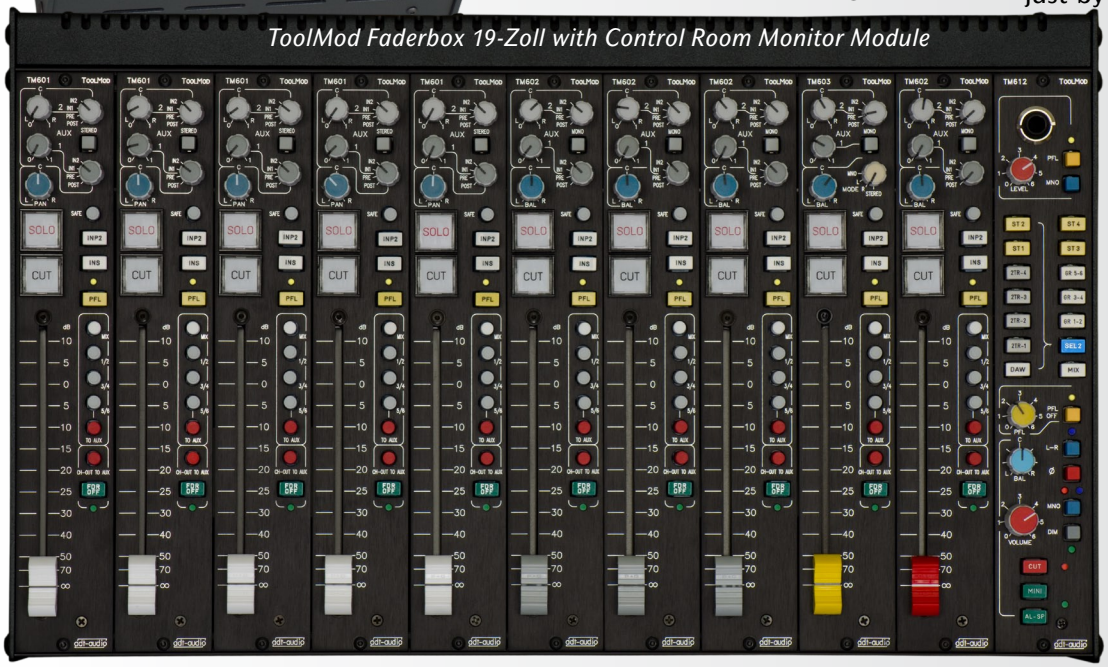
5 Channel ToolMod Faderbox

The ToolMod Faderbox fills the gap between large format analog mixing consoles and summing boxes with the tonal and technical quality of a professional audio console.

All inputs and outputs are balanced. Mono and stereo input modules come with two inputs, insert send and return, and channel output. In addition to the main stereo master, there are six subgroups. Two auxiliaries and inline operation are possible with all input modules.

With the compact 6U-high format and the three available versions for 5, 11, and 20 channels, problem-free integration of the Faderbox in a DAW system is easy. Front-end-mixers for recording, summing mixers with real fades, subgroups, and other advanced features as well as stem mixers for mastering and multipurpose mixers can be configured just by combining the necessary number of different input modules in one of the available frames.

ToolMod Faderbox 19-Zoll with Control Room Monitor Module



Link System

Any number of Faderboxes can be linked. The link interface is fully balanced and works trouble-free even if Faderboxes are powered from different power supply units and are linked with long cables. Adding more input modules even if the available free space in a frame is not sufficient is possible just by linking another frame. It is also possible to distribute input modules to several frames, if the available space for a large console is not sufficient.

Stereo Master and Subgroups

In addition to the main stereo master MIX, there are six subgroups. The master amplifiers are installed in the Faderbox frames. Therefore, master- and subgroup-modules are not mandatory. If master- or group-modules are required, it is easy to configure mono and stereo input modules for this purpose.

The groups 5 and 6 can be used as aux masters or record masters alternatively. Each input module comes with two aux faders with input select switches, and a switch for mono or stereo operation. The sends can be used as two independent mono sends or as stereo send with level and pan-pot.

- Mono- and stereo input modules with identical features
- 2 inputs, insert send and return and channel output in mono- and stereo-modules
- integrated inline feature for recording and monitoring at a time
- Main stereo master and 6 groups
- Stereo input modules with integrated M/S matrix
- 3 frame versions, for 5, 11 and 20 modules
- large format, illuminated push button switches for Solo in Place and Cut
- PFL in addition to Solo in Place
- professional, high precision, conductive plastic faders with extremely long lifespan
- superior headroom + 30 dBu
- Unity gain dynamic range > 124 dBA & > 120 dBu/RMS
- all inputs and outputs balanced
- Master amplifiers are installed in the frame for flexible configuration with or without stereo-master- and group-master modules
- Link option using balanced busses for trouble free linking of any number of Faderboxes
- Fader-Off function for calibrated mixing
- fully modular system with motherboard
- easy combination with adt-audio ToolMod pro-audio modules and with any kind of outboard gear and preamps

Inline Mode

Using the inline feature that is implemented in mono and stereo input modules makes possible to use a particular module for recording while monitoring or mixing a DAW track. Recording is possible using the main fader and the stereo master, the subgroups, and the channel outputs, while the auxiliaries are used for monitoring. Alternatively, the auxiliaries and the groups 5 & 6 can be used for recording, while the main fader and the stereo master is used for mixing or monitoring.

Preamps, Equalizers, Dynamics

ToolMod pro-audio modules are best suited to add preamps, equalizers, and dynamics in mono and stereo version to the Faderbox to build up a complete, modular mixing system of any size with all conceivable features. The module grid of the vertical versions of the ToolMod pro-audio modules system and the frames for these versions match the grid of the Faderbox. Since the Faderbox uses the same power supply system, a single ToolMod power supply unit can be used for a combined Faderbox setup with ToolMod modules.

Due to the superior headroom of + 30 dBu throughout the entire console and the balanced inputs and outputs it is possible to combine preamps, equalizers, and dynamics of any brand with the Faderbox.

20 Channel ToolMod Faderbox with Control Room Monitor Module

TM601
Mono Input Module

The TM601 mono input module has two line inputs, one channel output, and a switched insert send and return. All inputs and outputs are electronically balanced.

The fader is a professional, high accuracy conductive plastic version with a very long life-span. Large format illuminated push button switches are used for CUT and SOLO, which operates as solo in place.

The switches for the selection of the main stereo master MIX and the six groups a fed via the pan-pot. Two aux sends offer additional flexibility.

Inputs
There are two electronically balanced inputs with calibrated CMRR. The selection of the second input takes place by the **INP2** switch.

Insert
The balanced insert point is located between the input select switch and the fader input. The insert output signal is always present. The **INS** switch activates the insert input.

Fader
The main fader is the same professional, high accuracy conductive plastic fader with 100 mm / 4" stroke that is used in the adt-audio large format consoles. The maximum gain is 10 dB, the 0 dB position is internally calibrated. The scale accuracy is better than 1 dB between + 10 dB and - 30 dB, the cut-off attenuation is better than 100 dB at 1 kHz and better than 95 dB at 15 kHz. With a life-span of at least 200000 cycles, this fader provides trouble-free, continuous operation for many years.

Fader-Off Switch
To maintain the original d/a converter output levels when using the ToolMod Faderbox as summing box or as stem mixing system, the **FDR-OFF** switch bypasses the main fader. The level is calibrated to 0 dB with pinpoint accuracy.

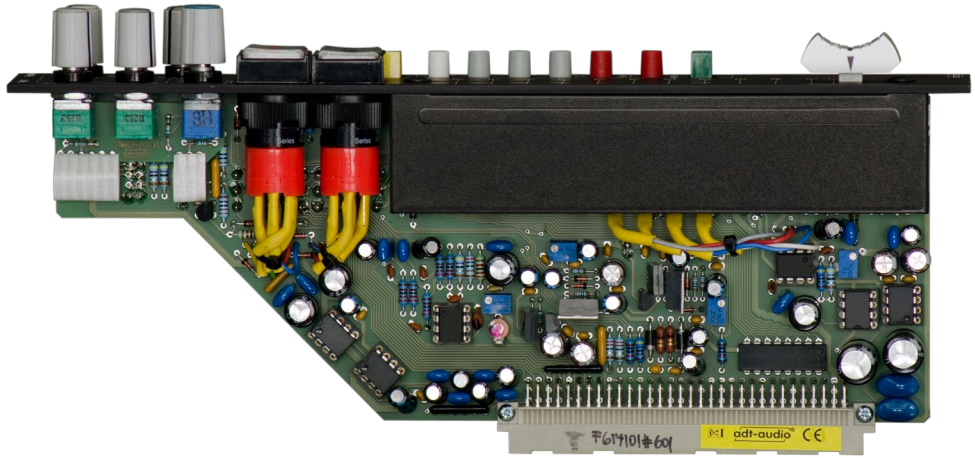
Cut, Solo, PFL
Large format, LED-illuminated push-button switches with engraved lettering are used for CUT and SOLO.

Solo operates as 'Solo in Place'. All input modules of a ToolMod Faderbox are muted by **SOLO**, unless **SOLO** or **SAFE** is pressed. **SAFE** disables the Solo function for the particular module(s); these modules are not muted from other channels and the **SOLO** switch itself won't mute other modules. **CUT** and mute from solo takes place post fader or post **FDR-OFF**, respectively.

PFL as a real 'pre fader listen' operates independent of the solo system. **PFL** works in adding mode, any number of input modules can be mixed to the PFL bus at a time. If a TM612 control room monitor module is installed in the ToolMod Faderbox, the speakers can be switched to PFL automatically. The TM612 comes with an additional control output for PFL for external use.

Pan-Pot
The Pan-Pot is a rotary pot with center click. Two versions are possible. Factory standard is the version with 3 dB center attenuation. 0 dB center attenuation is alternatively available. If the Faderbox is primarily used as summing mixer, this version offers the advantage that the original d/a output levels - and therefore the original DAW mix - are not altered by the setting of the pan-pot.

Channel Output
The channel output is electronically balanced and driven post fader / post cut, in parallel



to the input of the pan-pot. Using the channel output in 'Direct' mode for recording is possible by the **CH-OUT-TO-AUX** switch. This feature can also be used to drive delay or reverb unit via an aux send. More details on this on page 16 / 'Inline Mode'.

Routing
Four switches are used to select the main stereo bus **MIX** and the 6 groups as stereo pairs (**1/2**, **3/4**, **5/6**, **7/8**). Parallel selection of any number of busses is possible. The routing switches are driven from the output of the pan-pot.

TO-AUX overrides the standard operation of the routing switch for the groups 5 and 6 and assigns the **5/6** switch to the outputs of the two aux sends. This function offers a couple of additional features.

Aux
The aux section of the TM601 mono input module comes with two aux pots **AUX1** and **AUX2** and two stepper switches. The 4-position stepper switches are used for the input selection of the particular aux-send. Each send can be switched to input 1 or input 2 directly, or pre and post fader. Unless the **STEREO** switch is pressed, both sends work as independent mono sends. With **STEREO**, **AUX1** works as level control and **AUX2** as pan-pot, so the aux section can be used as one stereo send alternatively. **STEREO** disables the input select switch for **AUX2**, selection for stereo mode takes place with the **AUX1** switch.

The aux-sends can be used if either (5/6) **TO AUX** or **CH-OUT-TO-AUX** is pressed.

CH-OUT TO AUX switches the output of the **AUX1** send to the channel output. It is possible to select **AUX2** by a jumper on the pcb. In combination with the aux input select switch, there are some additional features.

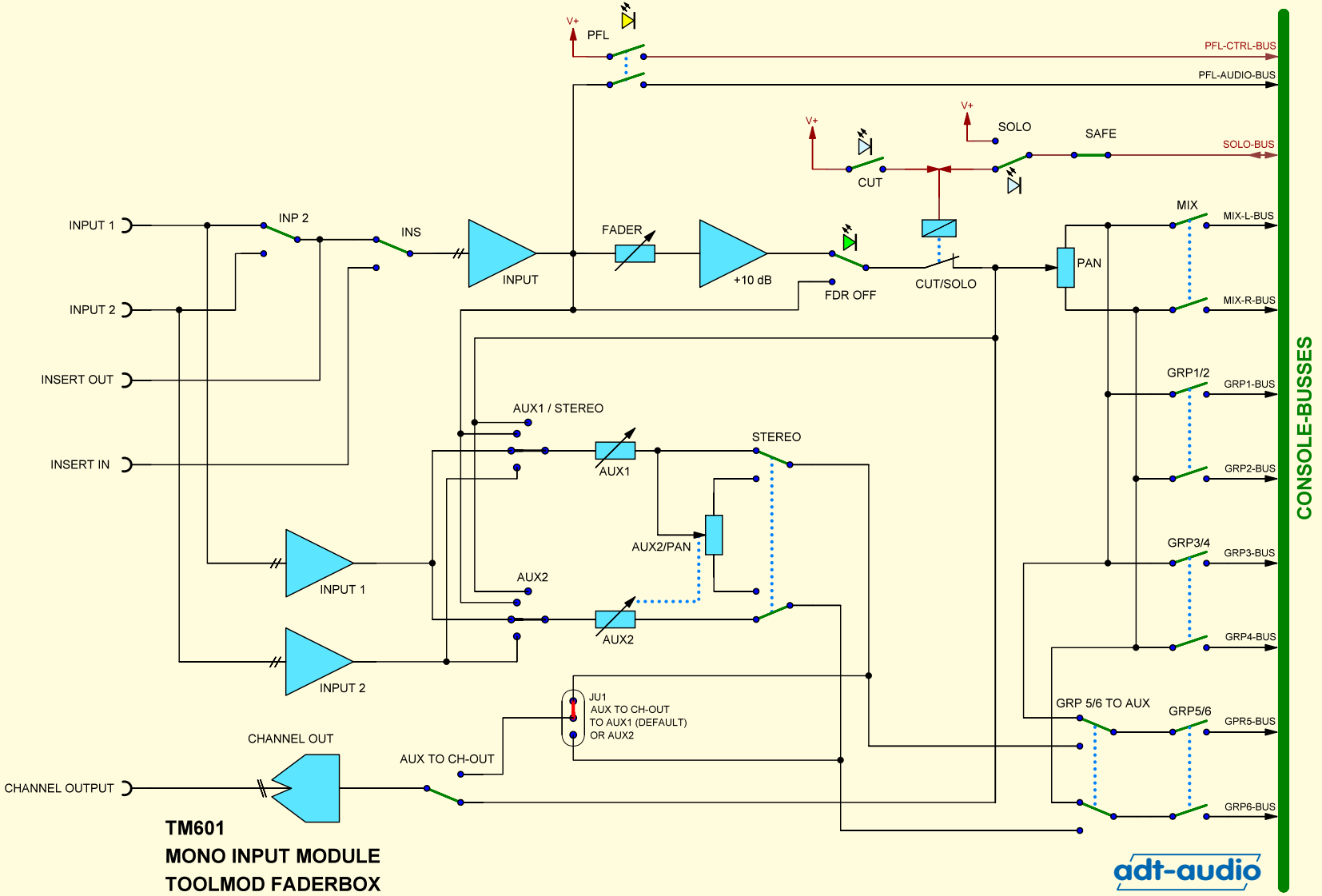
Clean-Feed
If IN1 or IN2 are selected as source, the aux send operates as clean feed for the signal that is connected to the selected input. This feature makes possible to send an external preamp or any other source directly to the channel output and control the level with the **AUX1** pot. Since the main fader is not affected **CH-OUT-TO-AUX** can be used for the recording of a signal that is connected to one of the inputs, while the other input is used to monitor a DAW track using the main fader and the stereo master. See 'Inline Mode' on page 16 for details.

Auxiliary Send for a single Reverb or Delay Unit
The same basic principle of operation can be used to feed a reverb or delay unit or any other effect processor either directly from the input or pre or post fader.

Direct Recording
Direct Recording via the channel output using **CH-OUT-TO-AUX** or group 5 & 6 using **TO-AUX** makes possible to set monitor and record levels independently.

5/6 TO AUX
The **TO AUX** switch below the group select switch **5/6** makes possible to use these groups as 2 conventional auxiliaries. Depending on the **STEREO** switch, groups 5 and 6 are either two independent mono sends or one stereo send that can be used for any purpose. The aux input select switches allow clean feeds directly from one of the two module inputs as well as operation pre or post fader.

Inline Mode
Since it is possible for each aux send to select one of the two module inputs directly, (5/6) **TO AUX** and **CH-OUT-TO-AUX** can be used for switch the TM601 mono input module to inline mode. The main channel can be used as monitor chain for a DAW track connected to input 1 while a signal connected to input 2 can be used for recording via the channel output, using **CH-OUT-TO-AUX** or via the groups 5 and 6.See 'Inline Mode' on page 16 for details.


V+
PFL
PFL-CTRL-BUS
PFL-AUDIO-BUS
V+
SOLO
SAFE
SOLO-BUS
V+
CUT
INPUT 1
INP 2
INS
INPUT
FADER
+10 dB
FDR OFF
CUT/SOLO
PAN
MIX
MIX-L-BUS
MIX-R-BUS
INPUT 2
INSERT OUT
INSERT IN
AUX1 / STEREO
AUX1
STEREO
GRP1/2
GRP1-BUS
GRP2-BUS
AUX2/PAN
INPUT 1
AUX2
AUX2
GRP3/4
GRP3-BUS
GRP4-BUS
INPUT 2
JU1
AUX TO CH-OUT
TO AUX1 (DEFAULT)
OR AUX2
GRP 5/6 TO AUX
GRP5/6
GPR5-BUS
CHANNEL OUT
AUX TO CH-OUT
CHANNEL OUTPUT
GRP6-BUS
CONSOLE-BUSSES
TM601
MONO INPUT MODULE
TOOLMOD FADERBOX
adt-audio

TM602
Stereo Input Module

The feature set of the TM602 stereo input module is almost identical to the TM601 mono input module. Like the TM601, the TM602 has two line inputs, a switched insert section, and a channel output. The layout of the aux-sends and the pan-pot are adapted to the stereo format. All inputs and outputs are electronically balanced.

The stereo fader is a professional, high accuracy conductive plastic version with a very long life span. Large format illuminated push button switches are used for CUT and SOLO, which operates as solo in place.

The switches for the selection of the main stereo master MIX and the six groups a fed via the pan-pot, which is implemented as stereo balance control. Two aux sends offer additional flexibility.

Inputs
There are two electronically balanced stereo inputs with calibrated CMRR. The selection of the second input takes place by the **INP2** switch.

Insert
The balanced stereo insert point is located between the input select switch and the fader input. The insert output signal is always present. The **INS** switch activates the insert input.

Stereo Fader
The main fader is the same professional, high accuracy conductive plastic stereo fader with 100 mm / 4" stroke that is used in the adt-audio large format consoles. The maximum gain is 10 dB, the 0 dB position is internally calibrated. The scale accuracy is better than 1 dB between + 10 dB and - 30 dB, the tracking error between the stereo channels in the same range is better than 0.5 dB. The cut-off attenuation is better than 100 dB at 1 kHz and better than 95 dB at 15 kHz. With a life span of at least 200000 cycles, this fader provides trouble-free, continuous operation for many years.

Fader-Off Switch
To maintain the original d/a converter output levels when using the ToolMod Faderbox as summing box or as stem mixing system, the **FDR-OFF** switch bypasses the main fader. The level is calibrated to 0 dB with pinpoint accuracy.

Cut, Solo, PFL
Large format, LED-illuminated push-button switches with engraved lettering are used for **CUT** and **SOLO**.

Solo operates as 'Solo in Place'. All input modules of a ToolMod Faderbox are muted by **SOLO**, unless **SOLO** or **SAFE** is pressed. **SAFE** disables the Solo function for the particular module(s); these modules are not muted from other channels and the **SOLO** switch itself won't mute other modules.

CUT and mute from solo takes place post fader or post **FDR-OFF**, respectively.

PFL works as real 'pre fader listen' independent of the solo system. **PFL** operates always in adding mode; any number of input modules can be mixed to the PFL-bus. If a TM612 control room monitor module is installed in the ToolMod Faderbox, the speakers can be switched to PFL automatically. The TM612 comes with an additional control output for PFL for external use.

Pan-Pot
Actually, the **Pan-Pot** in the stereo module is a balance pot with 0 dB center attenuation and center click.

Channel Output
The channel output is electronically balanced and driven post fader / post cut, in parallel to the input of the balance pot. Jumpers on the pcb make possible to place the output post balance pot instead. The output can also be used to drive delay or reverb units using the aux send. More details on this on page 16 / 'Inline Mode'.

Routing
Four switches are used to select the main stereo bus **MIX** and the 6 groups as stereo pairs (**1/2**, **3/4**, **5/6**, **7/8**). Parallel selection of any number of busses is possible. The routing switches are driven from the output of the balance-pot.

TO-AUX overrides the standard operation of the routing switch for the groups 5 and 6 and assigns the **5/6** switch to the outputs of the two aux sends. This functions offers some of additional features.

Aux
The aux section of the TM602 stereo input module comes with two aux pots **AUX1** and **AUX2** and two stepper switches. The 4-position stepper switches are used for the input selection of the particular aux-send. Each send can be switched to input 1 or input 2 directly, or pre and post fader.

Unless the **MONO** switch is pressed, both sends operate as stereo send with **AUX1** level pot and **AUX2** as pan-pot. The stepper switch of **AUX1** is used as source selector and the stepper switch of **AUX2** is not used. With **MONO**, both sends operate as independent mono sends with independent source selection and a mono matrix in each send.

The aux-sends can be used if either (5/6) **TO AUX** or **CH-OUT-TO-AUX** is pressed,

CH-OUT-TO-AUX switches the output of the aux sends to the channel output. In combination with the aux input select switch, there are some additional features.

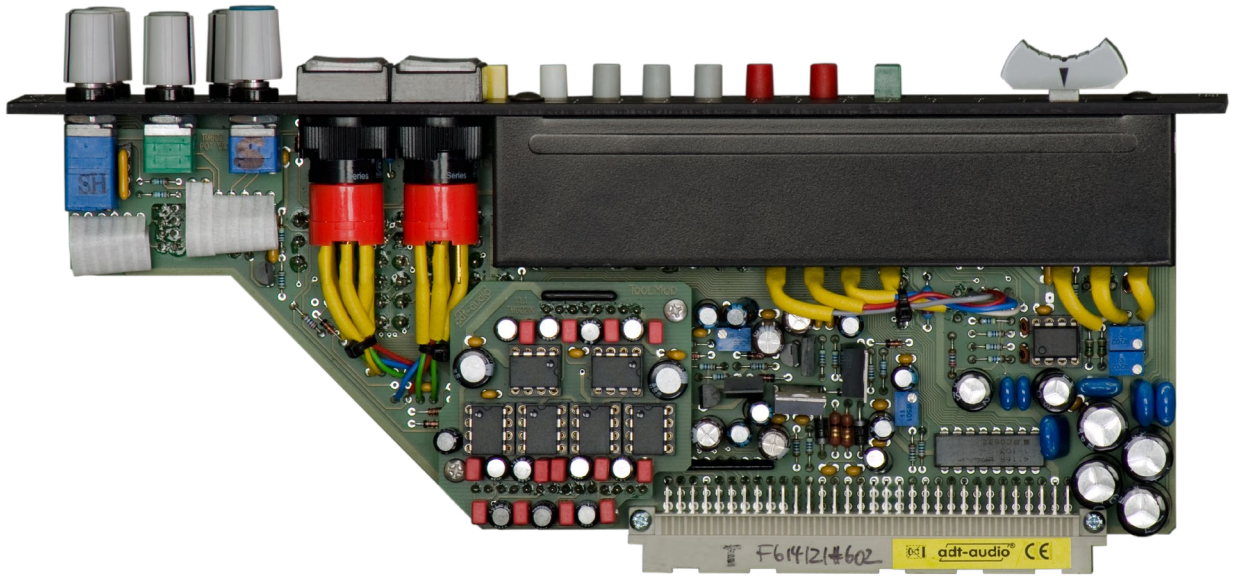
Clean-Feed
If IN1 or IN2 are selected as source, the aux send operates as clean feed for the signal that is connected to the selected input. This feature makes possible to send an external preamp or any other source directly to the channel output and control the level with the **AUX1** pot. Since the main fader is not affected **CH-OUT-TO-AUX** can be used for the recording of a signal that is connected to one of the inputs, while the other input is used to monitor a DAW track using the main fader and the stereo master. See 'Inline Mode' on page 16 for more details.

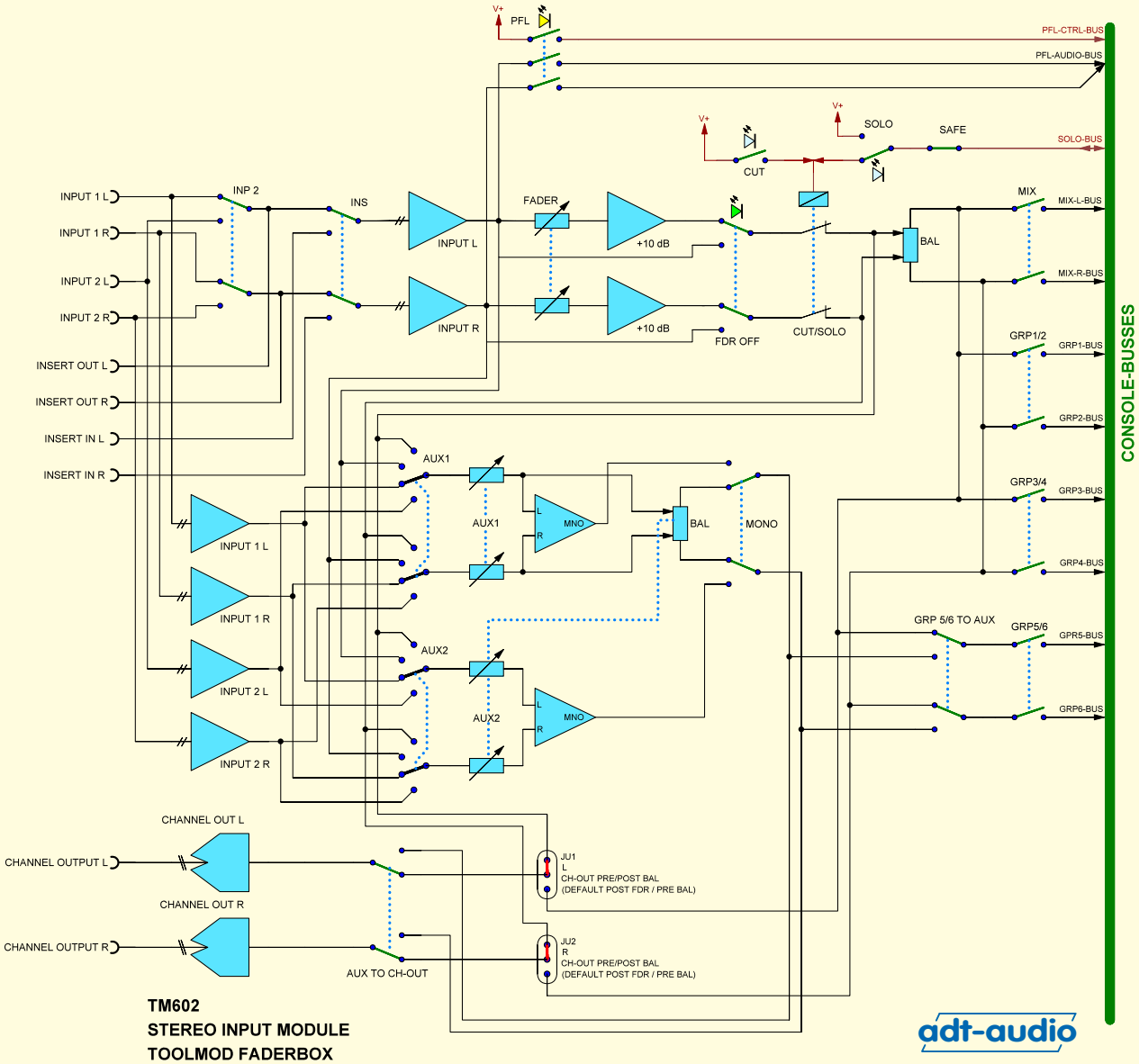
Auxiliary Send for a single Reverb or Delay Unit
The same basic principle of operation can be used to feed a reverb or delay unit or any other effect processor either directly from the input or pre or post fader.

Direct Recording
Direct Recording via channel output using **CH-OUT-TO-AUX** or group 5 & 6 using **TO-AUX** makes possible to set monitor and record levels independently.

5/6 TO AUX
The **TO AUX** switch below the group select switch **5/6** makes possible to use these groups as two conventional auxiliaries. Depending on the **MONO** switch groups 5 and 6 are either two independent mono sends or one stereo send that can be used for any purpose. The aux input select switches allow clean feeds directly from one of the two module inputs as well as pre or post fader.

Inline Mode
Since it is possible for each aux send to select one of the two module inputs directly, **5/6 TO AUX** and **CH-OUT-TO-AUX** can be used for switching the TM602 stereo input module to inline mode. The main channel can be used as monitor chain for a stereo DAW track connected to input 1 while a stereo signal connected to input 2 can be used for recording via the channel output, using **CH-OUT-TO-AUX** or via the groups 5 and 6. See 'Inline Mode' on page 16 for more details.




V+
PFL
PFL-CTRL-BUS
PFL-AUDIO-BUS
V+
SOLO
SAFE
SOLO-BUS
V+
CUT
INPUT 1 L
INPUT 1 R
INPUT 2 L
INPUT 2 R
INSERT OUT L
INSERT OUT R
INSERT IN L
INSERT IN R
INP 2
INS
INPUT L
INPUT R
FADER
+10 dB
+10 dB
FDR OFF
CUT/SOLO
BAL
MIX
MIX-L-BUS
MIX-R-BUS
GRP1/2
GRP1-BUS
GRP2-BUS
GRP3/4
GRP3-BUS
GRP4-BUS
GRP 5/6 TO AUX
GRP5/6
GRP5-BUS
GRP6-BUS
CONSOLE-BUSSES
AUX1
AUX1
L
R
MNO
BAL
MONO
INPUT 1 L
INPUT 1 R
INPUT 2 L
INPUT 2 R
AUX2
AUX2
L
R
MNO
CHANNEL OUT L
CHANNEL OUTPUT L
CHANNEL OUT R
CHANNEL OUTPUT R
AUX TO CH-OUT
JU1
L
CH-OUT PRE/POST BAL
(DEFAULT POST FDR / PRE BAL)
JU2
R
CH-OUT PRE/POST BAL
(DEFAULT POST FDR / PRE BAL)
TM602
STEREO INPUT MODULE
TOOLMOD FADERBOX
adt-audio

TM603

Stem-Mixing Stereo Input Module with M/S Matrix

The TM603 stereo input module comes with some additional features that are important if the ToolMod Faderbox is used for stem mixing. The additional input mode select switch in the TM603 makes possible to use the module with m/s format input signals, and as mono input.

Like the TM602, the TM603 has two stereo line inputs, a switched stereo insert section and a stereo channel output. The layout of the aux-sends and the pan-pot are adapted to the stereo format. All inputs and outputs are electronically balanced.

The stereo fader is a professional, high accuracy conductive plastic version with a very long life span. Large format illuminated push button switches are used for CUT and SOLO, which operates as solo in place. The switches for the selection of the main stereo master MIX and the six groups a fed via the pan-pot, which is implemented as stereo balance control. Two aux sends offer additional flexibility.

Inputs

There are two electronically balanced stereo inputs with calibrated CMRR. The selection of the second input takes place by the **INP2** switch.

Input Mode

The selection of the input mode takes place with a 4 position stepper switch. In addition to standard stereo operation (left input to left channel and right input to right channel), mono operation is possible in two different ways. With the **MNO** setting a mono matrix adds the left and the right channels and feeds the matrix output signal to both module channels. The **L** setting feeds both module channels from the left input. The additional M/S to L/R matrix makes possible to use a stereo input signal in m/s format that is converted to standard left/right stereo. The input mode selections is located post insert, pre fader.

Insert

The balanced stereo insert point is located between the input select switch and the fader input. The insert output signal is always present. The **INS** switch activates the insert input.

Fader

The main fader is the same professional, high accuracy conductive plastic stereo fader with 100 mm / 4" stroke that is used in the adt-audio large format consoles. The maximum gain is 10 dB, the 0 dB position is internally calibrated. The scale accuracy is better than 1 dB between + 10 dB and - 30 dB, the tracking error between the stereo channels in the same range is better than 0.5 dB. The cut-off attenuation is better than 100 dB at 1 kHz and better than 95 dB at 15 kHz. With a life span of at least 200000 cycles, this fader provides trouble-free, continuous operation for many years.

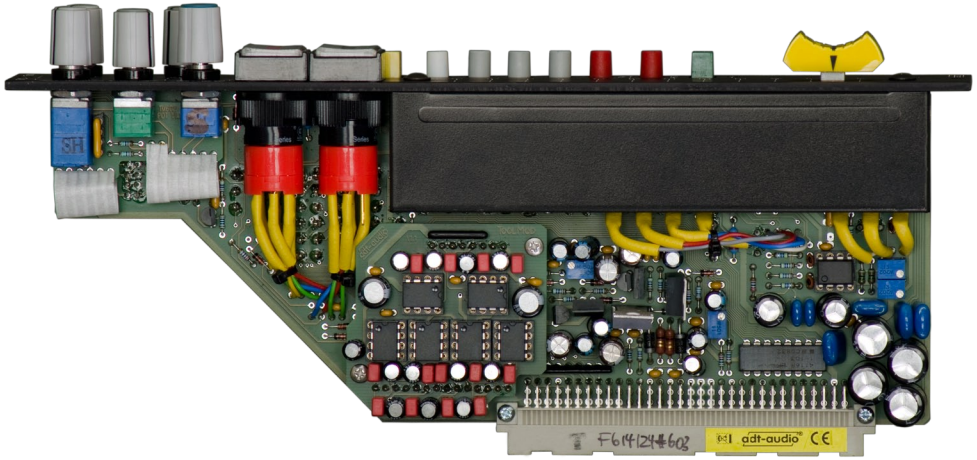
Fader-Off Switch

To maintain the original d/a converter output levels when using the ToolMod Faderbox as summing box or as stem mixing system, the **FDR-OFF** switch bypasses the main fader. The level is calibrated to 0 dB with pinpoint accuracy.

Cut, Solo, PFL

Large format, LED-illuminated push-button switches with engraved lettering are used for **CUT** and **SOLO**.

SOLO operates as 'Solo in Place'. All input modules of a ToolMod Faderbox are muted by **SOLO**, unless **SOLO** or **SAFE** is pressed.



SAFE disables the Solo function for the particular module(s); these modules are not muted from other channels and the **SOLO** switch itself won't mute other modules. **CUT** and mute from solo takes place post fader or post **FDR-OFF**, respectively.

PFL works as real 'pre fader listen' independent of the solo system. **PFL** operates always in adding mode, any number of input modules can be mixed to the PFL-bus.

If a TM612 control room monitor module is installed in the ToolMod Faderbox, the speakers can be switched to PFL automatically. The TM612 comes with an additional control output for PFL for external use.

Pan-Pot

Actually, the **Pan-Pot** in the stereo module is a balance pot with 0 dB center attenuation and center click.

Channel Output

The channel output is electronically balanced and driven post fader / post cut, in parallel to the input of the balance pot. Jumpers on the pcb make possible to place the output post balance pot instead. The output can also be used to drive delay or reverb units via aux sends. More details on this on page 16.

Routing

Four switches are used to select the main stereo bus **MIX** and the 6 groups as stereo pairs (**1/2**, **3/4**, **5/6**, **7/8**). Parallel selection of any number of busses is possible. The routing switches are driven from the output of the balance-pot.

TO-AUX overrides the standard operation of the routing switch for the groups 5 and 6 and assigns the **5/6** switch to the outputs of the 2 aux sends. This offers some additional features.

Aux

The aux section of the TM603 stereo input module comes with two aux pots **AUX1** and **AUX2** and a stepper switch. The 4-position stepper switch is used for the input selection of the aux-sends. The sends can be switched to input 1 or input 2 directly, or pre and post fader. Unless the **MONO** switch is pressed, both sends operate as stereo send with **AUX1** as level pot and **AUX2** as pan-pot. With **MONO**, both sends operate as independent mono sends with common source selection and a mono matrix.

The aux-sends can be used if either (5/6) **TO AUX** or **CH-OUT-TO-AUX** is pressed,

CH-OUT-TO-AUX switches the output of the aux sends to the channel output. In combination with the aux input select switch, there are some additional features.

Clean-Feed

If IN1 or IN2 are selected as source, the aux send operates as clean feed for the signal that is connected to the selected input. This feature makes possible to send an external preamp or any other source directly to the channel output and control the level with the **AUX1** pot. Since the main fader is not affected **CH-OUT-TO-AUX** can be used for the recording of a signal that is connected to one of the inputs, while the other input is used to monitor a DAW track using the main fader and the stereo master. See ‘Inline Mode’ on page 16 for details.

Auxiliary Send for a single Reverb or Delay Unit

The same basic principle of operation can be used to feed a reverb or delay unit or any other effect processor either directly from the input or pre or post fader.

Direct Recording

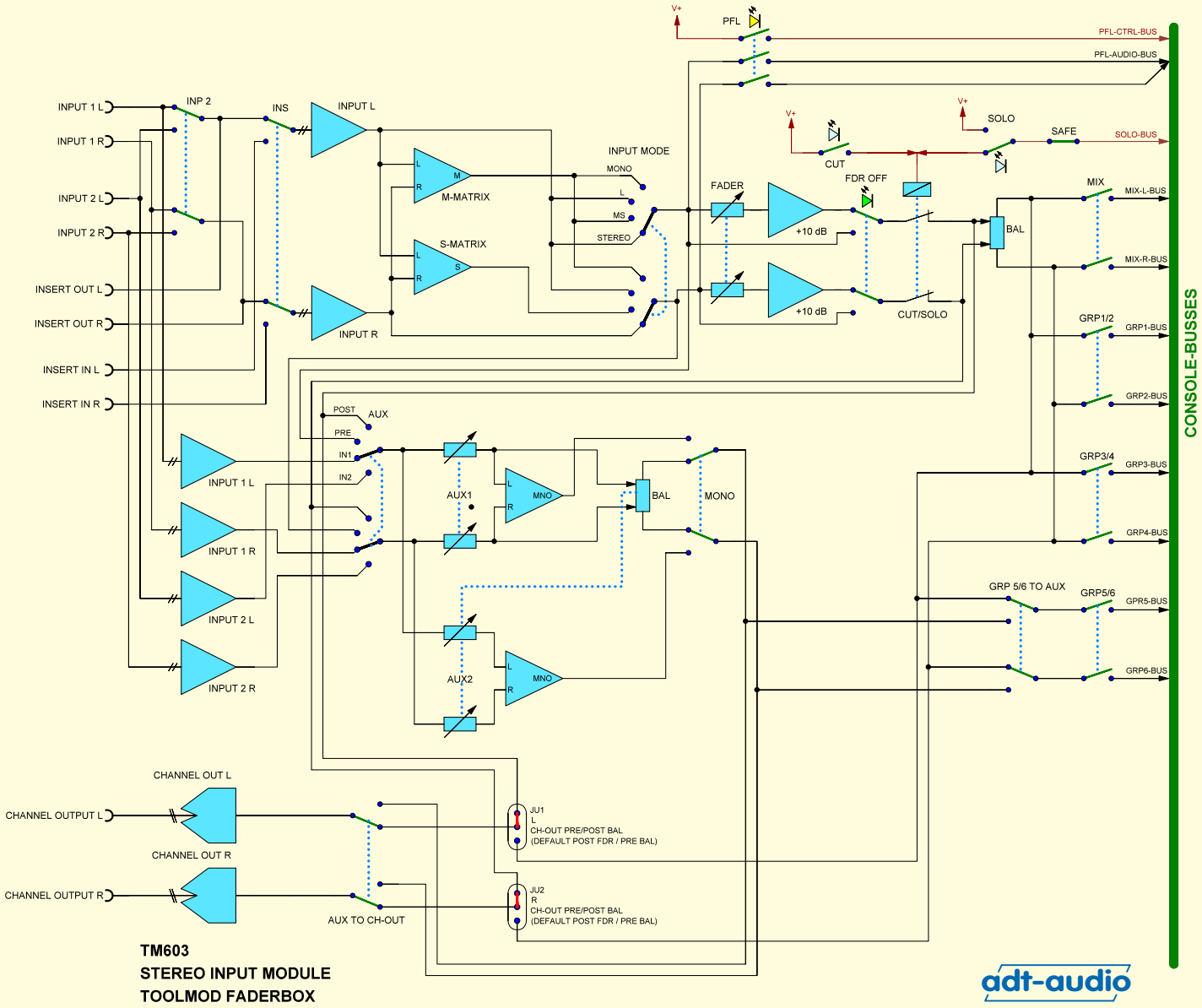
Direct Recording via channel output using **CH-OUT-TO-AUX** or group 5 & 6 using **TO-AUX** makes possible to set monitor and record levels independently.

5/6 TO AUX

The **TO AUX** switch below the group select switch **5/6** makes possible to use these groups as two conventional auxiliaries. Depending on the **MONO** switch, groups 5 and 6 are either two independent mono sends or one stereo send that can be used for any purpose. The aux input select switch allows clean feed directly from one of the two module inputs as well as pre or post fader.

Inline Mode

Since it is possible for the aux send to select one of the two module inputs directly, **5/6 TO AUX** and **CH-OUT-TO-AUX** can be used for using the TM603 stereo input module in inline mode. The main channel can be used as monitor chain for a stereo DAW track connected to input 1 while a stereo signal connected to input 2 can be used for recording via the channel output, using **CH-OUT-TO-AUX** or with the groups 5 and 6. See ‘Inline Mode’ on page 16 for details.


INPUT 1 L
INPUT 1 R
INPUT 2 L
INPUT 2 R
INSERT OUT L
INSERT OUT R
INSERT IN L
INSERT IN R
INP 2
INS
INPUT L
INPUT R
M-MATRIX
S-MATRIX
INPUT MODE
MONO
L
MS
STEREO
PFL
V+
PFL-CTRL-BUS
PFL-AUDIO-BUS
SOLO
SAFE
SOLO-BUS
CUT
FADER
FDR OFF
+10 dB
+10 dB
CUT/SOLO
BAL
MIX
MIX-L-BUS
MIX-R-BUS
GRP1/2
GRP1-BUS
GRP2-BUS
GRP3/4
GRP3-BUS
GRP4-BUS
GRP 5/6 TO AUX
GRP5/6
GPR5-BUS
GRP6-BUS
CONSOLE-BUSSES
POST
PRE
IN1
IN2
AUX
AUX1
AUX2
MNO
BAL
MONO
CHANNEL OUT L
CHANNEL OUTPUT L
CHANNEL OUT R
CHANNEL OUTPUT R
AUX TO CH-OUT
JU1
L
CH-OUT PRE/POST BAL
(DEFAULT POST FDR / PRE BAL)
JU2
R
CH-OUT PRE/POST BAL
(DEFAULT POST FDR / PRE BAL)
TM603
STEREO INPUT MODULE
TOOLMOD FADERBOX
adt-audio

TM612

Stereo Control Room Monitor Module

The TM612 stereo control room module adds a fully-fledged monitor section for the control room speakers to the ToolMod Faderbox.

The volume control is a high precision conductive plastic rotary pot with 0.2 dB tracking accuracy and extremely long lifespan. Phase reversal and left-right swap are implemented, as well as a control room speaker balance control. Mono matrix, DIM with adjustable attenuation and remote port, outputs for three speaker systems, Main, ALT, and MINI and automatic PFL switchover with separate level control complete the feature set of the TM612. Nine external stereo sources and the outputs of the stereo master and the six groups can be selected as input signal. All inputs and outputs are electronically balanced. The headroom of the entire module is + 30 dBu.

Input Select

Two switch blocks with seven switches each are used to select the input signal of the TM612 control room monitor module. The **SEL2** switch in the switch block on the right side selects the output of the left block. The input selector feeds the speaker section and the headphone amplifier in parallel. All switches are electrically interlocked.

Four switches are used to select the outputs of the stereo master **MIX** and the six groups as stereo pairs (**GR 1-2** to **GR 5-6**). These are the outputs of the master amplifiers that are in installed in the frame of the Faderbox. No external cable connections are necessary for these sources if the module is installed in slot 11 of a 19" Faderbox or in slot 20 of a 20-channel Faderbox.

The remaining nine switches are used for external stereo signals. These inputs are electronically balanced. Two 25-pin d-sub connectors, which are installed in the 19”- and the 20-channel version of the Faderbox, are used for eight of the nine inputs. One of the d-sub connectors holds the four stereo inputs **ST1** to **ST4**, the other one the stereo inputs **2TR-1** to **2TR-4**. **DAW**, the ninth input, uses the standard connectors IN1-L and IN1-R of the input modules and is also available, if the TM612 is installed in a 5-channel Faderbox. (See 'Compatibility' below for details). Different colors of the knobs and custom lettering is possible.

Meters

The output of the input source selector is available on the TRS-jacks IN2-L and IN2-R and can be used to drive external meters. The outputs are balanced. Jumper setting can use these jacks as inputs for the **2TR-1** source select switch alternatively. (see 'Compatibility' below for details).

Phase Reversal, Left-Right Swap, and Balance Control

The **Φ** switch reverses the phase in the right stereo channel and the **L-R** switch swaps the left and right stereo channels. The **BAL** pot makes possible to adjust the center position of the stereo speakers with a range from ‘left channel only’ to ‘right channel only’. The balance control with a calibrated center detent operates with 0 dB center attenuation. Phase reversal, L-R swap, and balance control affect the speaker chain and not the headphone amplifier, unless the alternate jumper setting for the headphones is used. (See 'Headphone Amplifier Configuration' for details)

Mono-Matrix

Unless otherwise specified by the customer, the mono matrix operates with 6 dB attenuation. Any other value from 0 dB to – 6 dB can be adjusted by internal trimpots. With the standard factory setting, the mono signal is switched to both stereo channels in parallel; however, it is possible to assign mono to the left or the right channel only- by jumpers. The mono matrix is located pre balance pot.

PFL

If one or more **PFL** switches in the input modules of a Faderbox system are pressed, the TM612 monitor module switches over to the output of the PFL master automatically, unless the **PFL-OFF** switch is used to block this function. This functions is integrated in the link system. Since the PFL level is usually higher than the master level, the **PFL** pot allows adjusting the PFL level separately.

The PFL section is located post balance control, pre DIM. Usually, PFL is switched to both stereo channels in parallel; however, it is possible to assign PFL only to one of the stereo channels by jumpers.

Dim

The standard factory setting of the **DIM** function is 12 dB. Any attenuation from 6 dB to infinity can be adjusted by internal trimpots. Remote control is possible by a floating contact using the specific remote input on the 9-pin d-sub connectors 'Link Control'. If the attenuation is set to infinity, the remote control input can be used to mu-

te the speakers.

Volume Pot
Volume control takes place by a high precision, conductive plastic rotary pot with extreme lifespan. The tracking accuracy of the stereo channels is better than 0.2 dB over a range of 40 dB. The factory standard setting of the overall gain is 0 dB. The gain of the balanced output drivers can be adjusted by trimpots to a maximum gain of 9 dB. The **CUT** switch is located post output drivers and mutes the entire speaker section.

Speaker Outputs
The TM612 control room monitor module comes with three balanced stereo outputs for speaker systems. The **AL-SP** switch selects the alternate speaker outputs instea d of the main speaker outputs. **MINI** overrides **AL-SP** and selects the third speaker set. The outputs for the main speaker system are available on the CH-OUT-L and CH-OUT-R XLR connectors in parallel to TRS-jacks. TRS-jacks are used for all other outputs.

Headphone Amplifier
The headphone amplifiers operates independent of the control room speaker section but is also fed from the input source selector. The volume control takes place by a separate pot. In addition, there is a separate mono-matrix. The PFL switching also operates independent of the speaker PFL. The **PFL** switch next to the headphone volume pot activates automatic switchover to PFL post PFL pot when at least one **PFL** switch in an input module is pressed.

With the standard setting of the module, mono and PFL are switched to both stereo channels in parallel. Jumper configuration makes possible to assign mono and PFL independently to only the left or right channel.

The output driver of the headphone amplifier offers more than enough power for headphones of any impedance. Using an external distribution box, at least three headphones can be used in parallel; however, to avoid different volume headphones with identical sensitivity should be used. The internal gain can be adapted by trimpots to achieve a meaningful control range of the headphone volume control, if headphones with non-standard sensitivity are used.

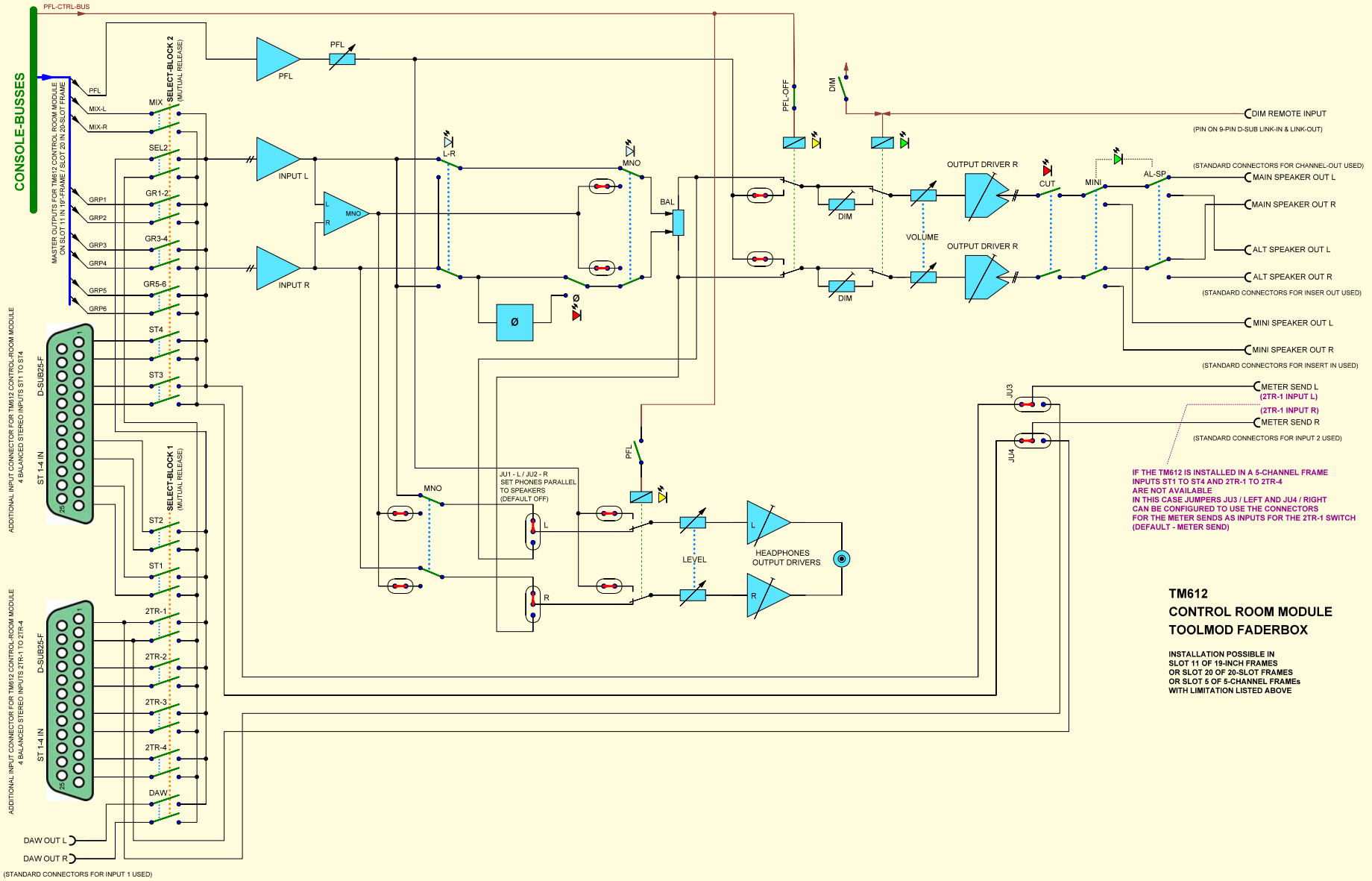
Headphone Amplifier Configuration
With the default configuration, the phase reversal, the L-R swap, the balance control, and the mono matrix of the speaker chain do not affect the headphone output. The alternate configuration sets the input of the headphone amplifier post balance control of the speaker chain. With this setting, mono, phase reversal, L-R swap, and the setting of the BAL pot affect both speaker outputs and headphones; however, the mono switch in the headphone section is out of operation. The PFL section of the headphone amplifier is not affected. This configuration takes place by jumpers.

Compatibility with Faderbox Frames
The last module compartment in the 19”-frame and in the 20-channel frame are fitted with additional connectors on the motherboard and on the connector panel. If the TM612 control room module is installed in this compartment, all features are available.

If the module is installed in the last compartment of a 5-channel Faderbox, the inputs for the external stereo sources **ST1** to ST4 and **2TR-1** to **2TR4** are not available. The available space on the connector panel of the 5-channel frame is not sufficient for the necessary, additional connectors. However, the external input **DAW** that uses standard connectors, is available. If the output for external meters is not required, these connectors can be used for the **2TR-1** input alternatively. The configuration takes places by jumpers.

If the module is installed in any other compartment, only the **DAW** input and – corresponding jumper setting assumed – the **2TR-1** inputs are available. All other external and internal inputs of the input select section and the PFL system inactive.

Block Diagram
The block diagram can be found on the next page.


PFL-CTRL-BUS
CONSOLE-BUSSES
MASTER OUTPUTS FOR TM612 CONTROL ROOM MODULE ON SLOT 11 IN 19"-FRAME / SLOT 20 IN 20-SLOT FRAME
PFL
MIX-L
MIX-R
SEL2
GRP1
GRP2
GRP3
GRP4
GRP5
GRP6
SELECT-BLOCK 2 (MUTUAL RELEASE)
MIX
GR1-2
GR3-4
GR5-6
ST4
ST3
ST2
ST1
2TR-1
2TR-2
2TR-3
2TR-4
DAW
SELECT-BLOCK 1 (MUTUAL RELEASE)
ADDITIONAL INPUT CONNECTOR FOR TM612 CONTROL-ROOM MODULE
4 BALANCED STEREO INPUTS ST1 TO ST4
D-SUB25-F
ST 1-4 IN
ADDITIONAL INPUT CONNECTOR FOR TM612 CONTROL-ROOM MODULE
4 BALANCED STEREO INPUTS 2TR-1 TO 2TR-4
D-SUB25-F
ST 1-4 IN
DAW OUT L
DAW OUT R
(STANDARD CONNECTORS FOR INPUT 1 USED)
INPUT L
INPUT R
L-R
MNO
BAL
Ø
PFL-OFF
DIM
DIM REMOTE INPUT
(PIN ON 9-PIN D-SUB LINK-IN & LINK-OUT)
OUTPUT DRIVER R
VOLUME
CUT
MINI
AL-SP
(STANDARD CONNECTORS FOR CHANNEL-OUT USED)
MAIN SPEAKER OUT L
MAIN SPEAKER OUT R
ALT SPEAKER OUT L
ALT SPEAKER OUT R
(STANDARD CONNECTORS FOR INSER OUT USED)
MINI SPEAKER OUT L
MINI SPEAKER OUT R
(STANDARD CONNECTORS FOR INSERT IN USED)
JU1 - L / JU2 - R
SET PHONES PARALLEL
TO SPEAKERS
(DEFAULT OFF)
LEVEL
HEADPHONES
OUTPUT DRIVERS
JU3
JU4
METER SEND L
(2TR-1 INPUT L)
(2TR-1 INPUT R)
METER SEND R
(STANDARD CONNECTORS FOR INPUT 2 USED)
IF THE TM612 IS INSTALLED IN A 5-CHANNEL FRAME
INPUTS ST1 TO ST4 AND 2TR-1 TO 2TR-4
ARE NOT AVAILABLE
IN THIS CASE JUMPERS JU3 / LEFT AND JU4 / RIGHT
CAN BE CONFIGURED TO USE THE CONNECTORS
FOR THE METER SENDS AS INPUTS FOR THE 2TR-1 SWITCH
(DEFAULT - METER SEND)
TM612
CONTROL ROOM MODULE
TOOLMOD FADERBOX
INSTALLATION POSSIBLE IN
SLOT 11 OF 19-INCH FRAMES
OR SLOT 20 OF 20-SLOT FRAMES
OR SLOT 5 OF 5-CHANNEL FRAMEs
WITH LIMITATION LISTED ABOVE

Inline Mode

Inline operation for recording and monitoring with a single channel is possible with mono and stereo input modules. There are a couple of variations that work as follows.

The block diagrams show the signal flow of the record and the monitor chain. For the sake of clarity, all block diagrams refer to the TM601 mono input module. Since mono and stereo input modules have identical features, the same principles of operation are possible with the TM602 stereo input module, and, with a single difference, with the TM603 m/s-stereo input module. The record signal flow is shown in red and the monitor chain is shown in green.

Inline Basics

One of the two inputs of an input module is connected to the d/a converter output of a DAW track, or a pair of tracks with stereo modules. This input is used for monitoring or mixing. The other input is connected to an external preamp or any other signal that has to be recorded. In the following examples input 1 is used for the DAW track while input 2 is used for recording. Reversed operation with input 2 for monitoring and input 1 for recording is possible as well.

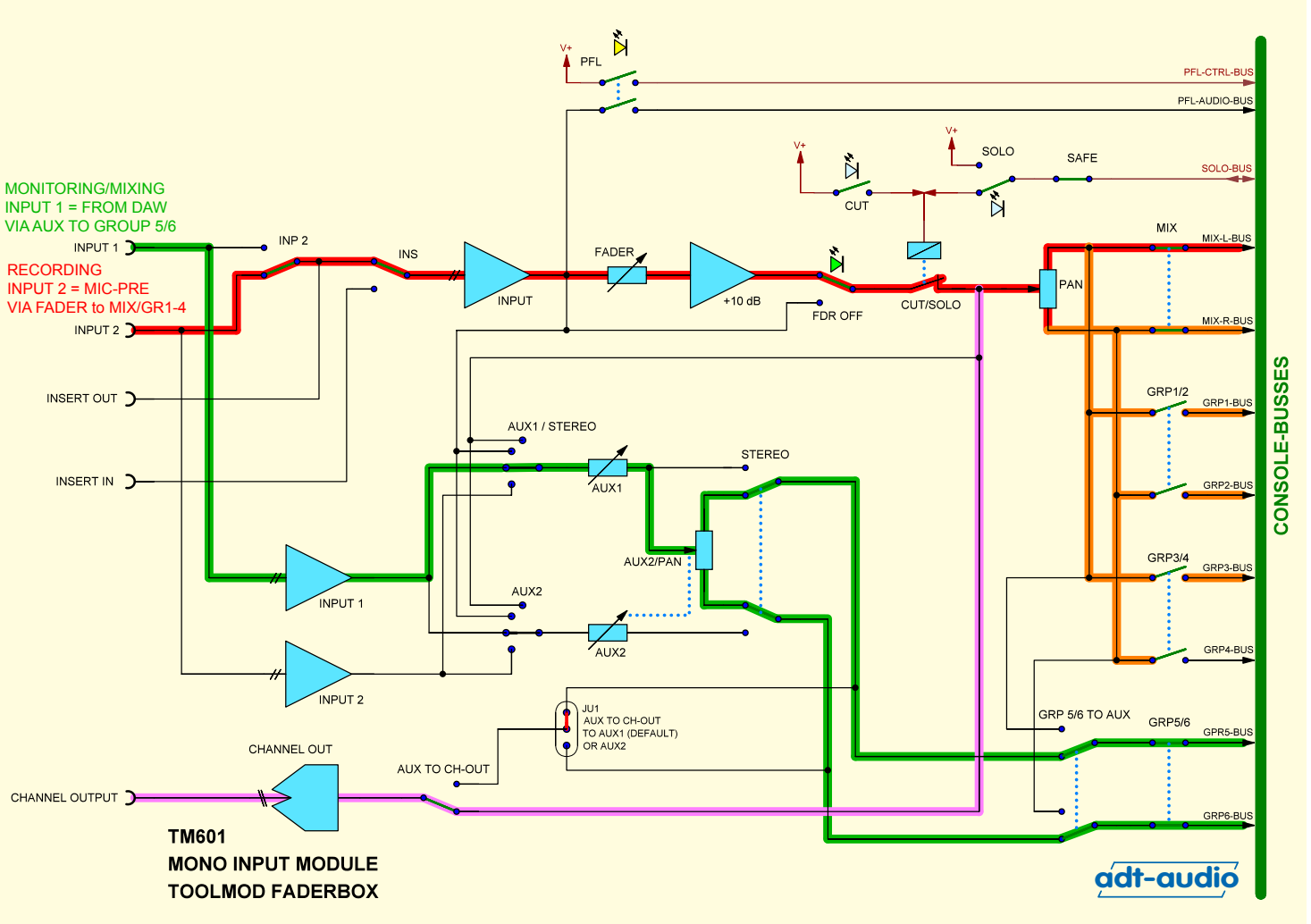
Example 1:

Monitoring / mixing via the groups 5 & 6
Recording via stereo master MIX or groups 1 to 4

This example uses the groups 5 & 6 for monitoring. Recording takes place using the stereo master or the groups 1 & 2 or 3 & 4. The main fader controls the record level; CUT and SOLO are part of the record chain.

The aux sends are used in stereo mode for monitoring via groups 5 & 6. AUX1 works as level pot, AUX2 as pan-pot for the monitor mix.

This version is best suited for complex recordings with many microphones that have to be mixed to stereo groups.



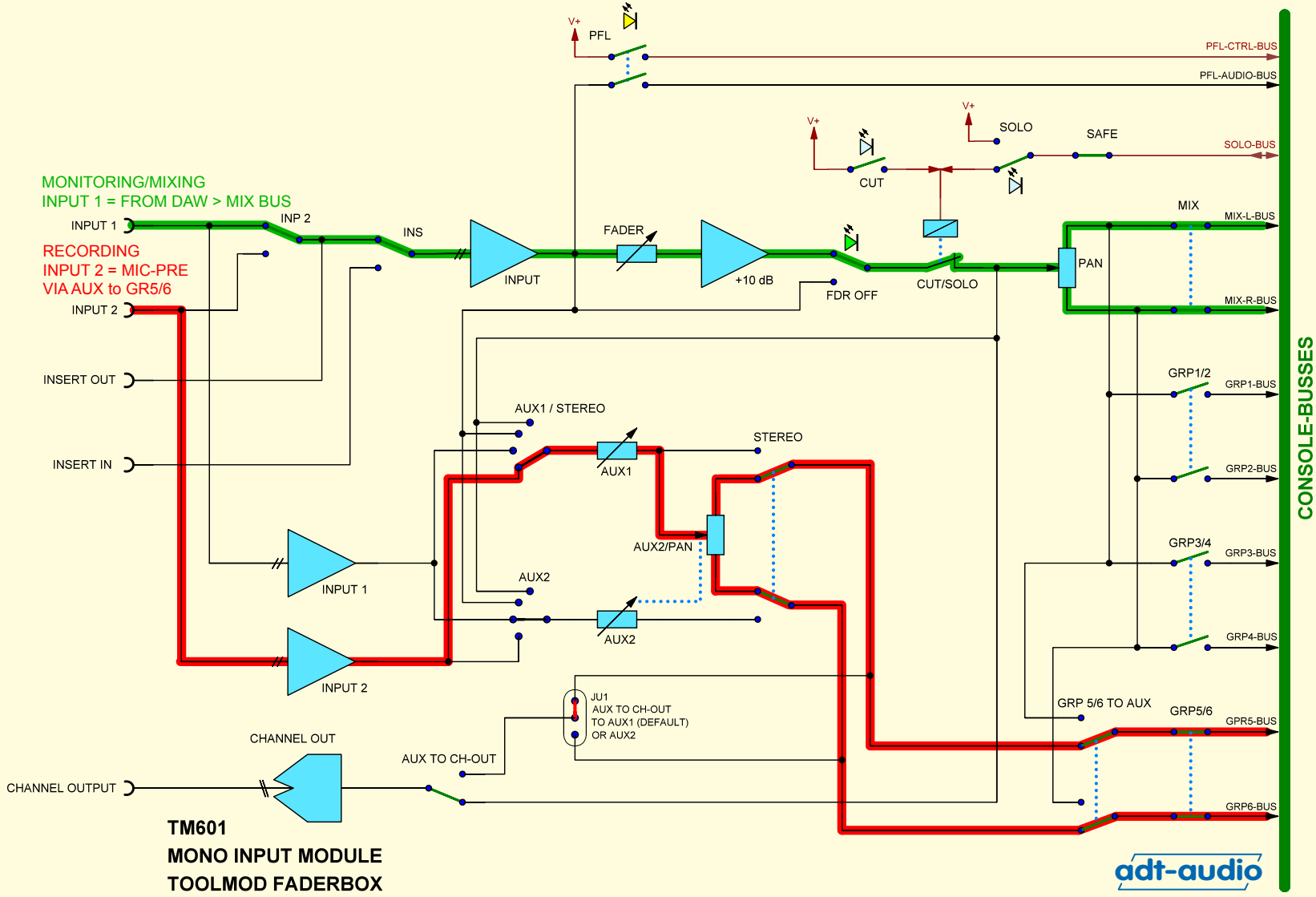
Example 2:

Monitoring/ mixing via stereo master or groups 1 to 4 Recording via AUX and groups 5 and 6

This example uses the groups 5 & 6 for recording. Monitoring takes place using the stereo master or the groups 1 & 2 or 3 & 4. The main fader controls the monitor level; CUT and SOLO are part of the monitor chain.

The aux sends are used in stereo mode for recording via groups 5 & 6. AUX1 works as level pot, AUX2 as pan-pot for the recording mix.

This version is best suited for complex recordings with many microphones that have to be mixed to astereo group.



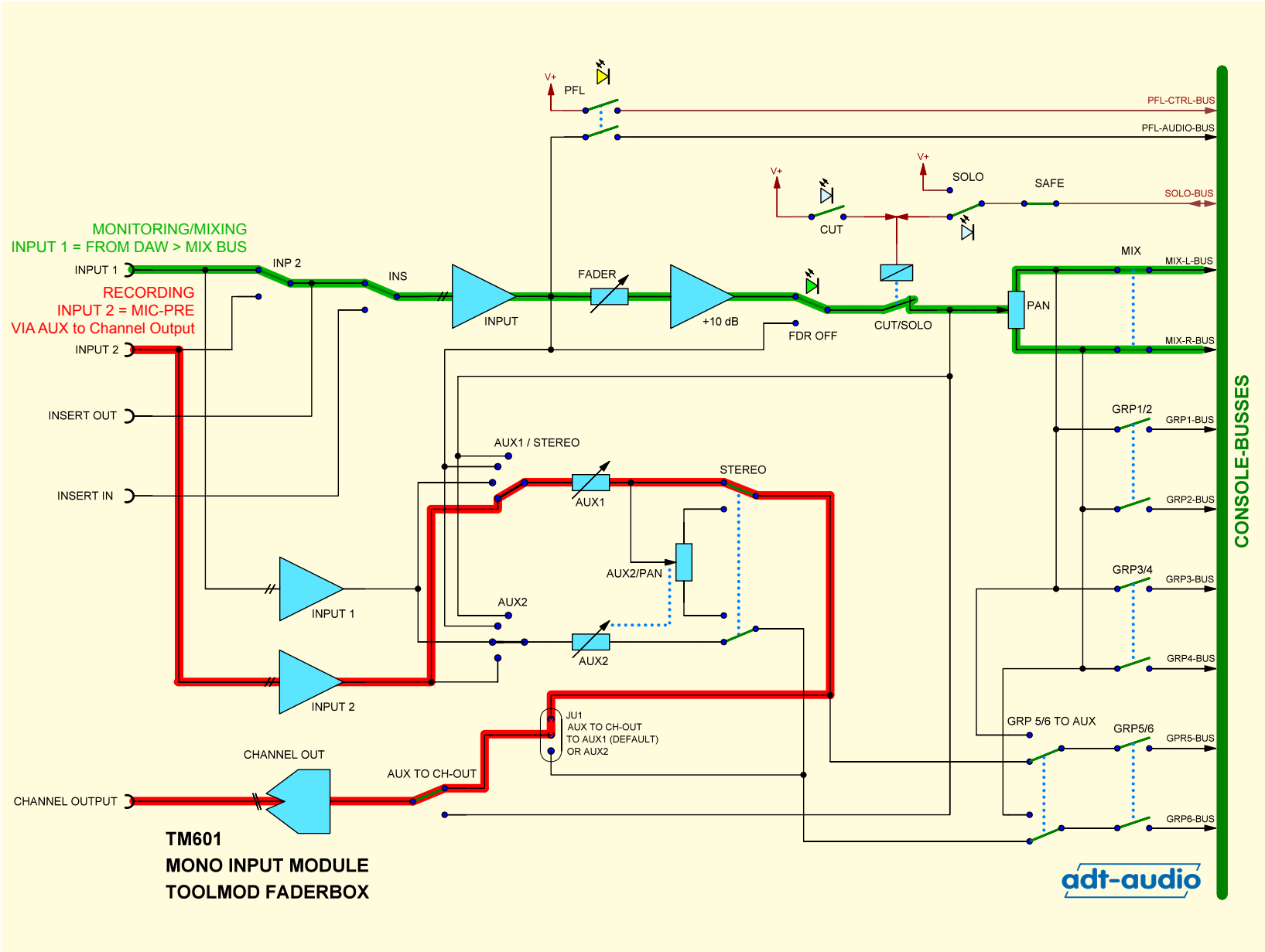
Example 3:

Monitoring / mixing via stereo master MIX
Recording via channel output

Example 3 is basically identical to example 2. Input 1, the main fader, and the stereo master is used for monitoring, while input 2 and the aux send are used for recording; however, instead of using the groups 5 & 6, example 3 uses the channel output. AUX1 controls the recording level. This version works similar to 'Direct' in a conventional console and is best suited for recording of many single tracks without mixing at a time. Of course, it is possible to use stereo input modules as well.

With mono input modules, it is possible to use the AUX1 pot that is needed neither for monitoring nor for recording as aux-send via group 6. Depending on the setting of the input select switch for AUX2, the send can be used as auxiliary pre or post fader or for a playback mix.

Since examples 2 and 3 use the stereo master for monitoring, these methods can be used at a time. While using some channels for mixing several sources to the groups 5 & 6, other channels can be used in 'Direct' mode according to example 3. In this way it is possible to record many tracks at time, while all input modules can be used for monitoring the DAW output.



ToolMod Faderbox Frames

Three versions of the Faderbox frame are available. The smallest frame can hold five modules. It is best suited for small front-end mixers and stem mixing. The 19” frame for 11 modules and the larger, 800 mm / 31.5” frame for 20 modules can be used universally. All module compartments are compatible with mono and stereo input modules. In addition, the TM612 stereo control room module can be installed in the 19” and the 800 mm frames.

Desktop-, Rack-mounted-, and Build-in-Versions
The frames are identical and can be used as desktop frame, rack-mounted frame, or build-in version by adding rack brackets and other accessories.

Rack-mounted and Build-in Frames
Rack-brackets for installation in standard racks or in a cutout of a desk or console can be installed in four different ways as shown in the pictures on page 21. All frames are 6U high.

The 5-channel frame with an overall width of 210 mm / 8.25” fits into 10” and 9.5” (1/2 * 19”) racks. With the standard brackets, the frame fits into 10”-racks; a different version of the brackets for uncommon 9.5” racks is available. The 19”-frame is compatible with all standard racks. Even though no standard racks for the 800 mm/31.5” frame are available, rack mounting in a custom-build rack is possible.

Module Installation and Removal
The entire wiring of the ToolMod Faderbox takes place on the motherboard and the master-pcb in the frame. There are no cable connections between the modules and the frame. Removing and installing modules is possible without removing the Faderbox from a rack and/or removing any cover sheets.

Link-Feature
Any number of ToolMod Faderboxes can be linked. The version of the master-pcb in the frame determines if a particular Faderbox operates as master-, slave-, or daisy-chain-unit. The master-pcb is a plug-in board that can be replaced with another version at any time.

Dimensions

The ToolMod Faderbox with a total height of 266 mm / 10.5” fits into 6U when mounted in a rack. The maximum depth of the frame is 150 mm / 6”. The graphics below shows the side view and cross section. The table below shows the different dimensions and the necessary size of a cutout if the Faderbox is installed in a console or table.

Frame Version	inner Width	Width Desktop Version	Width Rack Version	Width build-in Version	Cut-Out Size	Cut-Out Size
-	-	incl. Screw Heads	incl. Brackets	incl. Brackets	flush fitting	ascending 8°
5 Channel Frame	**200 mm / 7.875"**	**210 mm / 8.25"**	**254 mm/10"- 241.5 mm/9.5" *)**	**260 mm / 10.24"**	**212 x 268 mm/8.35 x 10.55"**	**212 x 274 mm/8.35 x 10.78"**
19" Frame	**440 mm / 17.332"**	**448 mm / 17.635"**	**483 mm / 19"**	**489 mm / 19.25"**	**450 x 268 mm/17.72 x 10.55"**	**450 x 274 mm/17.72 x 10.78"**
20 Channel Frame	**800 mm / 31.375"**	**810 mm / 31.9"**	**835 mm / 32.87"**	**851 mm / 33.5"**	**812 x 268 mm/32 x 10.55"**	**812 x 274 mm/32 x 10.78"**
* 254 mm for 10" Rack (Standard), 241.5 mm for 9.5-Zoll / 0.5 * 19" Racks by different Brackets					(W * H)	

Some Remarks

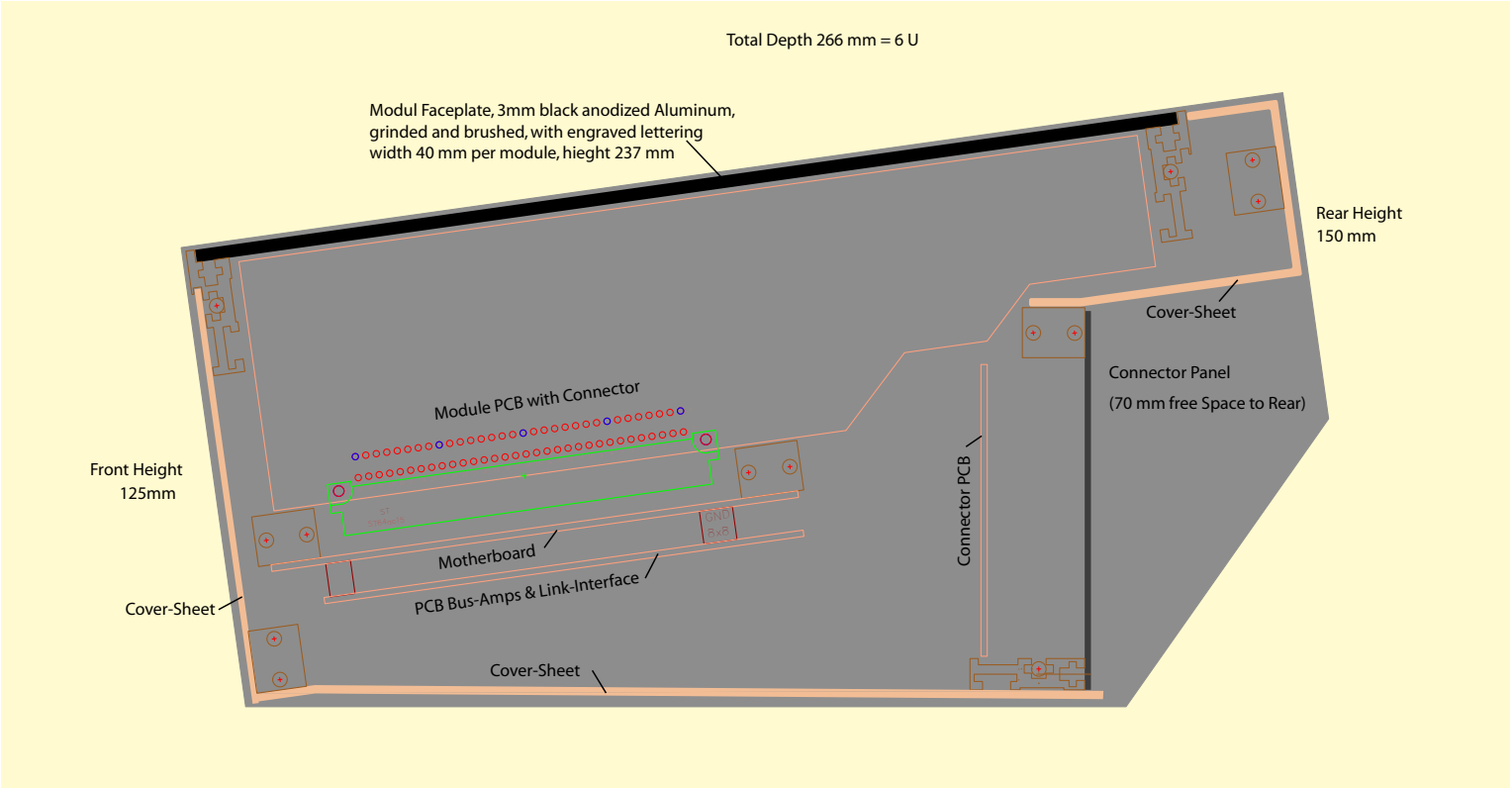
The column ‘Width Desktop Version ’ refers to the overall width including screw heads.

A none-standard version of the rack brackets is needed if a 5-channel Faderbox is installed in a 9.5” (1/2 * 19”) rack. With the standard brackets, the 5-channel-box fits into a 10” / 254 mm rack. Since some computer equipment uses this size, 10” racks are available at reasonable prices.

Installing the Faderbox in a Desk or a Console

To install a Faderbox in a cutout of a desk or console, just check the necessary size of the cutout in the table. It is possible to fix the console from top or the bottom, flush with the table surface or at an angle of 8 degrees.

Different cutout sizes are necessary for these versions; all are listed in the table. Threads in the side panel allow installing the rack brackets in four ways. Adjusting to different thicknesses of the table plate is possible by slotted holes in the rack brackets. See 'Frame Options' on page 21 for details.



Frame Options

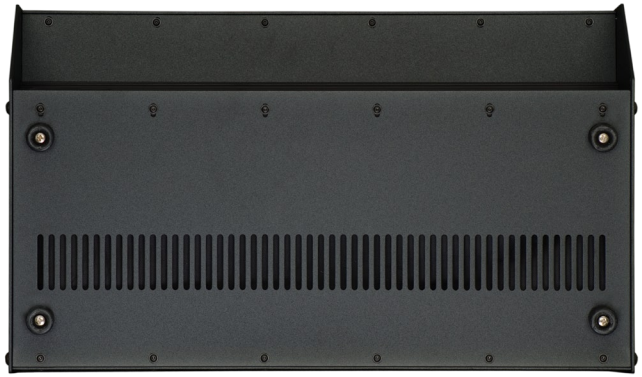
All versions of the ToolMod Faderbox can be used as desktop, 'lunchbox', or rack-mounted version. Installation in a desk or console is possible as well. The frame is identical for all versions. By adding rubber feet, handles, or brackets the frame can be adapted in the desired way. The pictures show these options. The standard side panels contain the necessary fixing holes and threads for all versions.

Desktop and Lunchbox Version

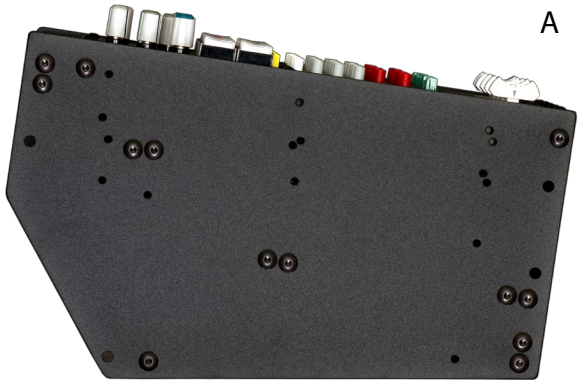
The picture A shows the side view of a desktop Faderbox. Wooden side panels to cover the screw heads in the side panels are available. Rubber feet are installed in the bottom sheet (see picture below). For easy transportation, handles can be installed on one or both sides of the frame (see picture B / 'Lunchbox' style).

Rack mounting and Installation in a Desk or Console

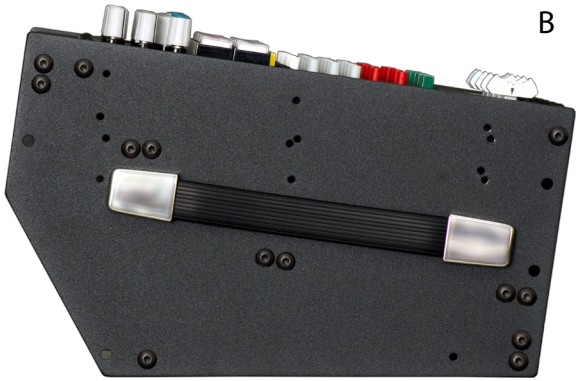
The standard rack brackets for the ToolMod Faderbox can be used for rack mounting or the installation in a cutout in a desk. It is possible to install the brackets in four different ways. The pictures D and C show the brackets installed for rack mounting with flush fitting in parallel to the rack or ascending at an angle of 8 degrees. Installation in a desk with fixing from top is also possible with the brackets mounted like this. The pictures E and F show the installation of the brackets for installation in a cutout of a desk with fixing from the bottom. Slotted holes make possible to adjust the brackets to different table plates. Standard brackets can be used for all these versions; however, if the 5-channel frame is installed in a 9.5”-rack instead of a 10” rack, a special version of the brackets is necessary.



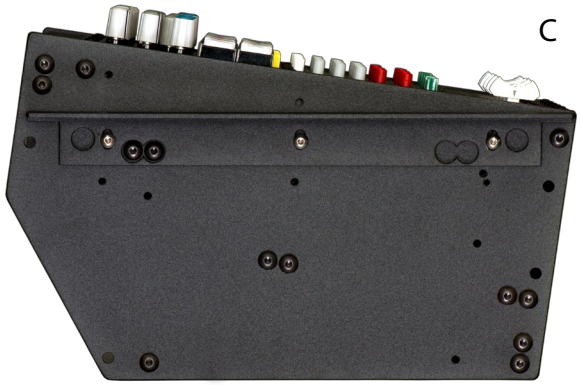
A



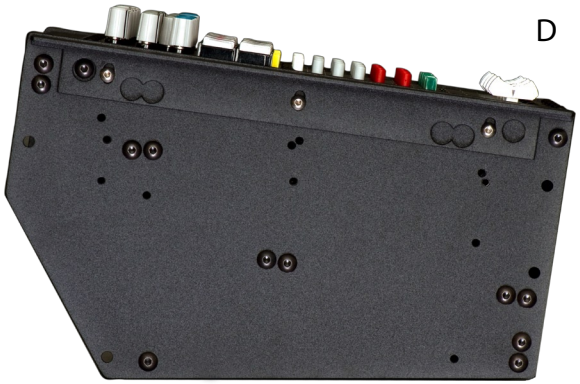
B



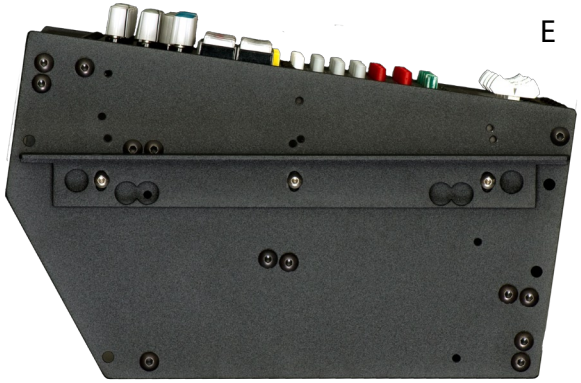
C



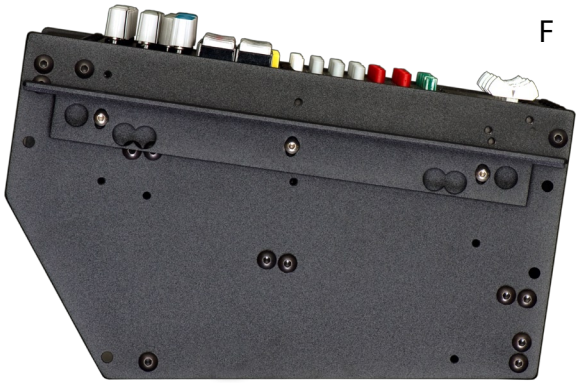
D



E



F



Motherboard

The motherboard in the frame of the ToolMod Faderbox holds the complete input/output distribution, the supply rails, and the mix- and control-busses for the stereo master, the subgroups, solo, and PFL. There are no cables between the modules and the frame. The modules are fitted with a 96-pin connector according to the DIN41612 industrial standard that fits into mating female connectors on the motherboard. Therefore, installation and removal of modules is a simple task that offers the choice to upgrade and reconfigure a Faderbox in next to no time. It is not necessary to remove the frame from a rack or a cutout or to take off cover sheets. The only necessary tools are a screwdriver and a pair of removers or standard 4 mm metric screws.

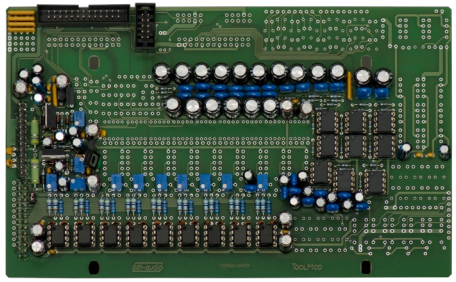
The picture on the right side shows the motherboard of an empty 5-channel Faderbox. The picture on top shows a frame with no blind panels and a single module installed. Another picture shows a module.

Installation and Removal of Modules.

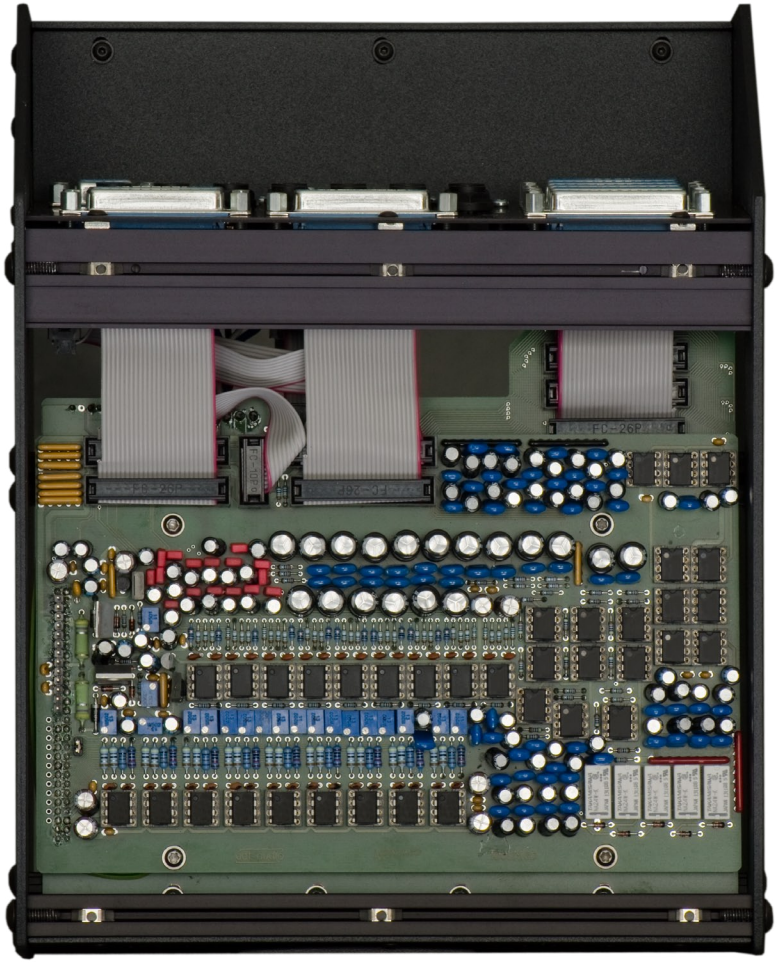
After removing the screws, removers can be screwed into the metric 4 mm threads (M4) in the fixing holes of the module faceplates. By using the removers as handle, removing and installing modules without using knobs as handle is easy. If no removers are at hand, standard M4 screws can be used instead.

Master Amplifiers and Link Interface

The master amplifiers of the ToolMod Faderbox are installed on a plug-in board in the frame. There are several versions of this pcb that is loacted below the mother-board.



The picture on the right side shows the master-pcb in a 5-slot frame with master and group outputs and link inputs and outputs. The picture on the left side shows the 'Master only' version of the pcb without link inputs and outputs. The master-pcb can be replaced with another version. After removing the bottom cover sheet, the screws that fix the master-pcb, and all cables, the entire pcb can be unplugged and replaced. All necessary cables and connectors for all versions of the master-pcb belong to the standard scope of supply.



Master-PCB Version

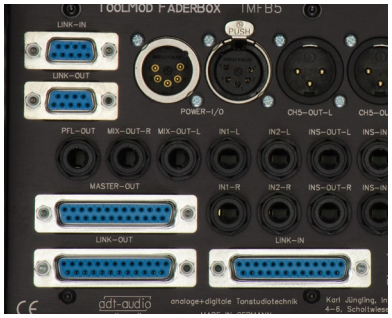
The following versions of the master-pcb are available:

- **Master only** – for stand-alone versions
  Master amplifiers installed, link inputs and outputs not installed
- **Master + Link-In** – for master consoles with the option to link a slave console
  Master amplifiers and link inputs installed, link outputs not installed
- **Slave** – for slave consoles
  Master amplifiers and link inputs not installed, link outputs installed,
- **Daisy Chain** – for slave consoles with the option to link another slave console
  Master amplifiers not installed, link inputs and outputs installed
- **Master full** – for master consoles with slave console(s), with the option to link the entire system to another master console
  Master amplifiers, link inputs, and link outputs installed

With the proper selection of the master-pcb, all meaningful combinations for linking any number of Faderboxes are possible.

Link Inputs and Outputs and Link Cables

All link inputs and outputs are electronically balanced to ensure trouble-free operation, even with Faderboxes that are far away from each other and/or use different power supply units. The pinning of the 25-pin d-sub connectors used for the link inputs and outputs match the ‘Tascam’ standard; common d-sub multicores cables can be used.



The link control inputs and outputs connect the control busses for solo and PFL. In addition, connecting this cable unlocks the link inputs of a master or daisy-chain frame. Common computer cables with male 9-pin d-sub connectors can be used.

The picture on the left side show a detail of the connector panel of a 5-channel Faderbox with the link control inputs and outputs.

Master and Group Modules

Since the master amplifiers of the ToolMod Faderbox are installed in the frame, neither a master module nor subgroup modules are mandatory. If a main master or group master is not necessary for the particular application, all module compartments of the Faderbox can be used for input modules. Since all module compartments are compatible with mono and stereo modules, any combination of modules in a particular frame is possible.

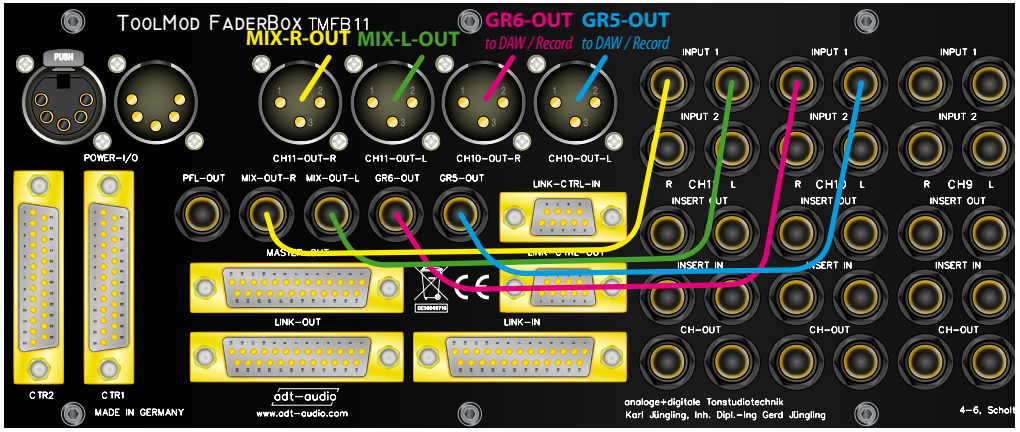
Master Fader

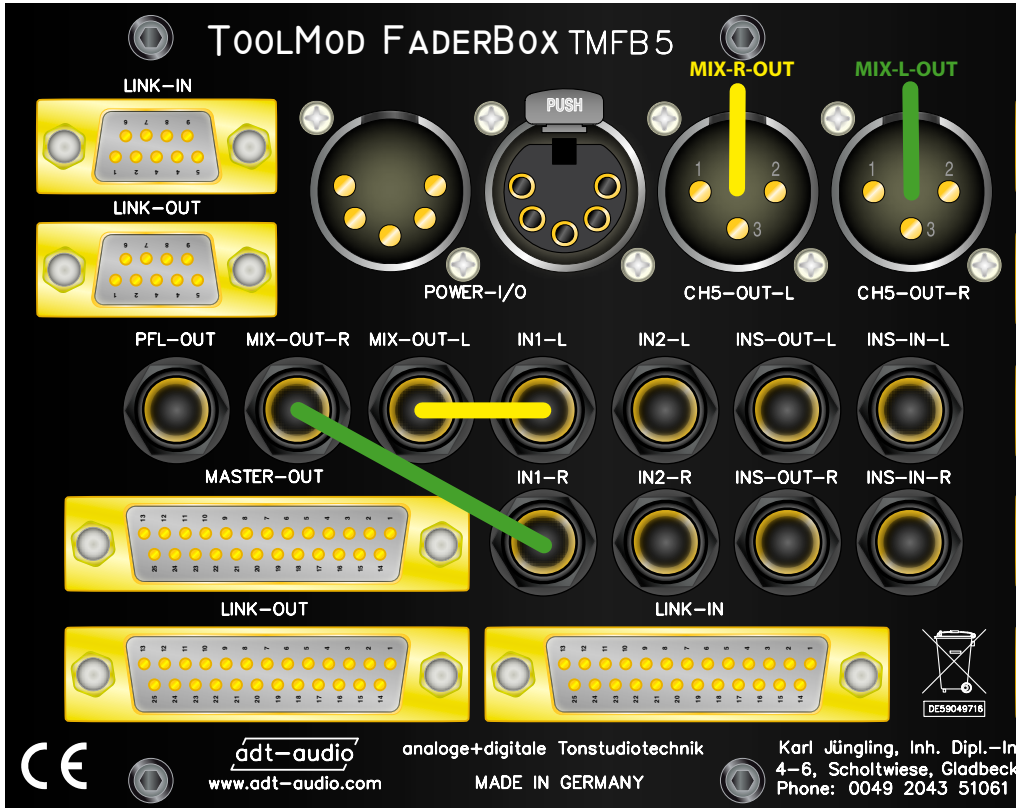
If a master fader is necessary for the main stereo master MIX, a stereo input module can be used for this purpose by connecting the outputs of the master amplifiers in the frame with one of the inputs of the stereo input module. In this case, the output of the stereo input module becomes the master output of the Faderbox..

The graphics on the right side shows a detail of the connector of a 5-channel Faderbox. To use a stereo module that is installed in the fifth module compartment as stereo master, it is only necessary to install two short patch cords. These patch cords are marked in the picture with the green and the yellow line. The master output is available on the XLR connectors CH5-OUT-L and CH5-OUT-R.

Subgroup Master

Using mono oder stereo input modules as subgroup masters works in the same way. If the input of a particular module is connected to a group output, the module becomes the master for the particular group and the group master output is available on the channel output of the module.





Since each input module has two inputs, the modules can used as group master or input channel alternatively, without the need of patching. All features of the input module, like insert, aux functions, and routing are available. Since routing to another subgroup is possible if a particular module is used as subgroup master, groups can be arranged not only in one level. You can mix several subgroups to another subgroup and add input modules to this group directly. The aux-features make possible to feed effect processors from group masters.

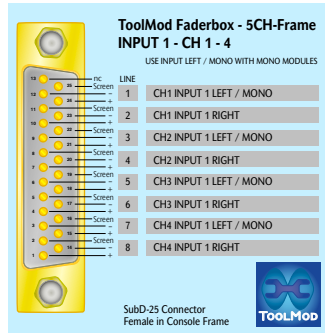
The graphics on the left side shows the necessary cabling with a 19” Faderbox, using short patch cords, when slot 10 is used as stereo subgroup master for the groups 5 & 6 and slot 11 is used as main stereo master. Since the groups 5 & 6 are used for recording if the Faderbox is used in inline mode, this module works as ‘record-master’ during recording and as stereo subgroup master in the mix.

Connector Panels

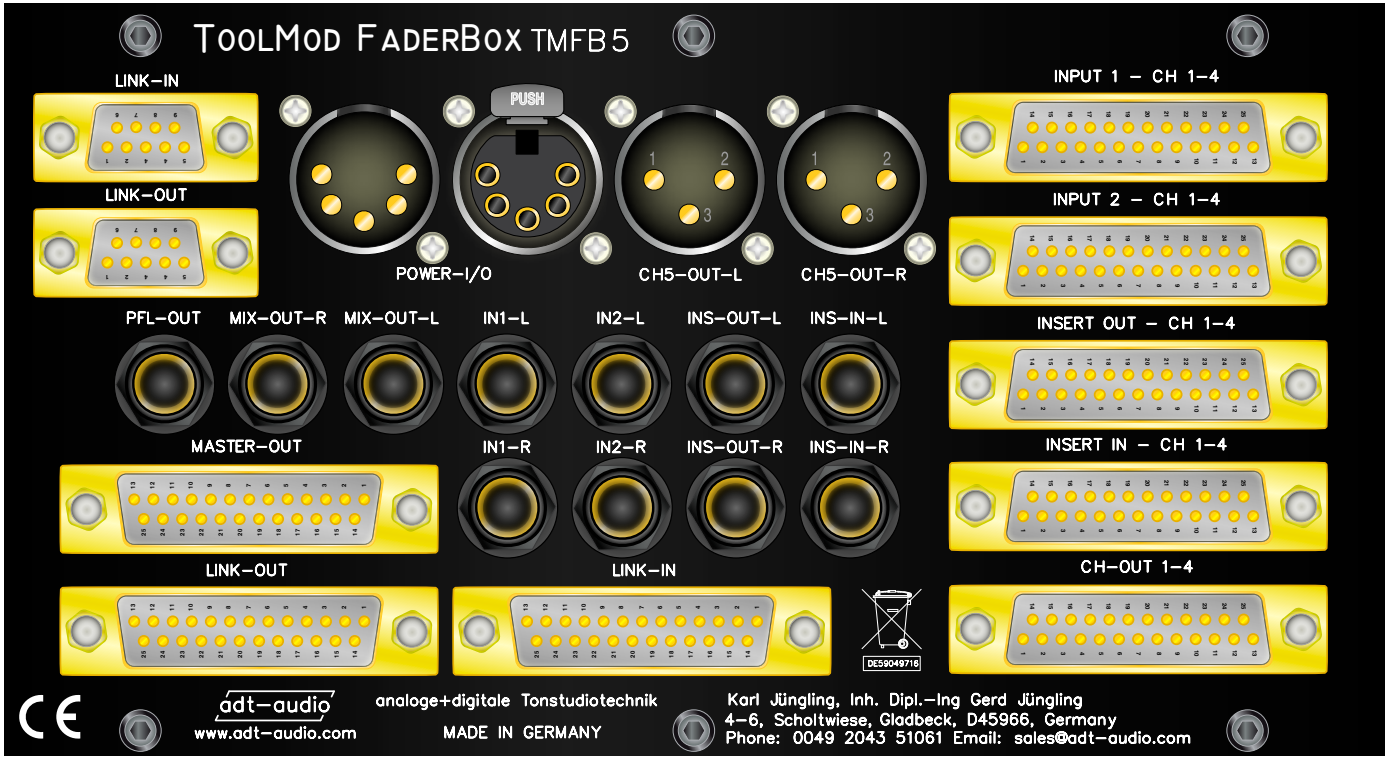
The connector panels of the three versions of the ToolMod Faderbox use the same connectors for the power supply, the master outputs, and the connectors of the link system. However, the connectors for the input modules are different. The inputs and outputs of the first four module compartments of the 5 channel Faderbox, the first eight channels of the 19" Faderbox, and the first 16 channels of the 20-channel box use 25-pin d-sub connectors, according to the analog 'Tascam' standard. TRS and XLR connectors are used for all other module compartments.

5-Channel-Frame Connector Panel

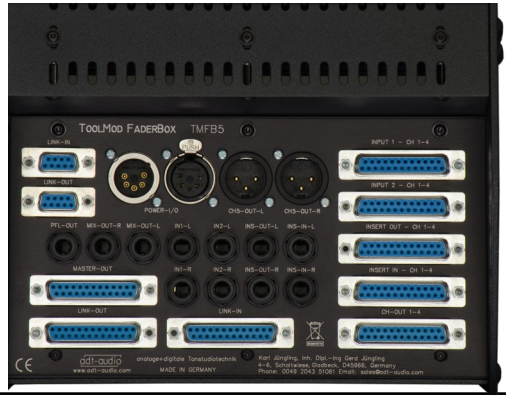
The graphics below shows the connector panel of the 5-slot Faderbox. Five 25-pin d-sub connectors are used for the inputs 1 and 2, the insert inputs and outputs, and the channel outputs of the first four module slots. The connectors offer the choice of installing stereo modules on these compartments. If mono modules are used, only the left channel connections are used. Special multicores according to your needs are available at short notice. The pinning diagram on the right side shows the principle that is used for all connectors for the first four slots. For the pin assignments of all connectors, please check the Faderbox Installation Manual.



TRS jacks are used for the inputs and the insert in- und outputs of the fifth module slot. The outputs of this slot are available on XLR connectors. This combination allows configuring the fifth module compartment for use as master fader for the stereo master without the need for special cables. Please check page 24 for details on the configuration of master and group modules.



Three 25-pin d-sub connectors are used for the master outputs, link outputs, and link inputs. In addition, there are two 9-pin d-sub connectors for the link control inputs and outputs and two 5-pin XLR-connectors for the power supply. The PFL output and the output of the stereo master are also available on TRS jacks.



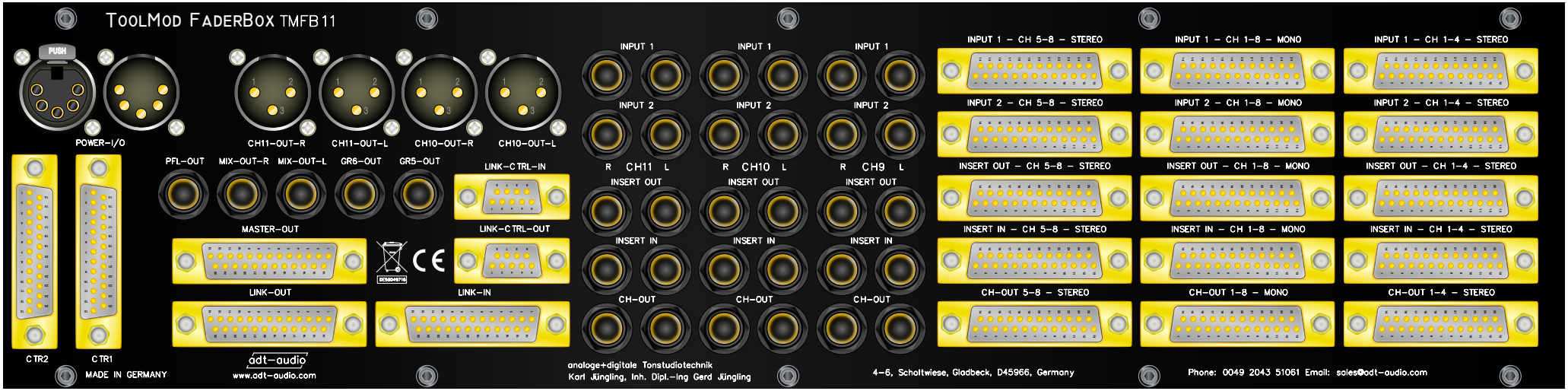
19”-Frame Connector Panel

The graphics below shows the connector panel of the 19”-version of the Faderbox. There are 15 25-pin d-sub connectors in total for the inputs and outputs of the module compartments 1 to 8. Three connectors for each of the two inputs, the insert inputs and outputs, and the channel outputs offer the choice to use standard d-sub multicores cables if the slots 1 to 8 hold mono or stereo channels only. Two of the three connectors are used for stereo channels in the slots 1 to 4 and 5 to 8, while the third connector is used for mono channels in the slots 1 to 8. The pin-assignments meet the ‘Tascam’ standard. If the outputs of a d/a converter are connected with a standard d-sub multicore, tracks 1 to 8 feed 8 mono channels or 4 stereo channels. If mono and stereo modules are installed in random order, special multicores might be required that are available according to your specifications at short notice. The graphics on the next page show the principle of the pin assignments for these connectors. For the pin assignments of all connectors, please check the Faderbox Installation Manual.

TRS jacks are used for the inputs, the insert in- und outputs, and the channel outputs of the module slots 9, 10, and 11. The channel outputs of the slots 10 and 11 are available on XLR connectors in parallel. This combination allows configuring these module compartments for use as master fader for the stereo master or group-masters without the need for special cables. Please check page 24 for details on the configuration of master and group modules.

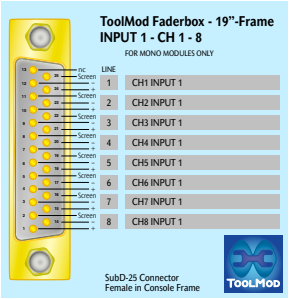
Three 25-pin d-sub connectors are used for the master outputs, link outputs, and link inputs. In addition, there are two 9-pin d-sub connectors for the link control inputs and outputs and two 5-pin XLR-connectors for the power supply, similar to the other frame versions of the Faderbox. The PFL output, the output of the stereo master, and the group outputs 5 and 6 are also available on TRS jacks.

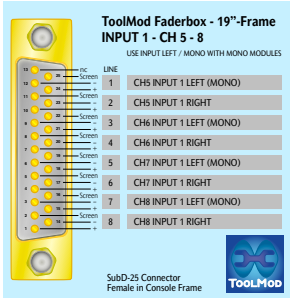
The TM612 control room monitor module can be installed in the 11th module compartment. Two additional 25-pin d-subs, CTR1 and CTR2 hold the inputs for external stereo signals ST1 to ST4 and 2TR-1 to 2TR-4. The standard connectors for the 11th slot are used for all other inputs and outputs of the TM612 module.

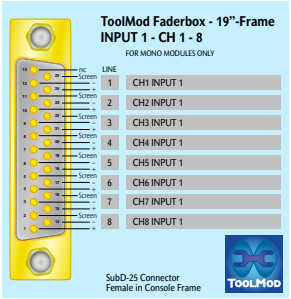


20 Channel Frame Connector Panel

The graphics below shows the connector panel of the 20-channel version of the Faderbox, which is almost identical to the 19" version apart from the connectors for the additional nine module compartments. There are 30 25-pin d-sub connectors in total for the inputs and output of the module compartments 1 to 16. The layout of the connectors for the slots 1 to 8 and 9 to 16 are identical to the layout of the connectors for the slots 1 to 8 of the 19" Faderbox. Three connectors per 8 module compartments for each of the two inputs, the insert inputs and outputs, and the channel outputs offer the choice to use standard d-sub multicore cables if the slots 1 to 8 and/or 9- 16 hold mono or stereo channels only. Two of the three connectors are used for stereo channels in the slots 1 to 4 and 5 to 8 or 9 to 12 and 13 to 16, while the third connector is used for mono channels in the slots 1 to 8 or 9 to 16. The pin-assignments meet the 'Tascam' standard. If the outputs of a d/a converter are connected with a standard d-sub multicore, tracks 1 to 8 feed 8 mono channels or 4 stereo channels. If mono and stereo modules are installed in random order, special multicores might be required that are available according to your specifications at short notice. The graphics on the right side show the principle of the pin assignments for these connectors. For the pin assignments of all connectors, please check the Faderbox Installation Manual.



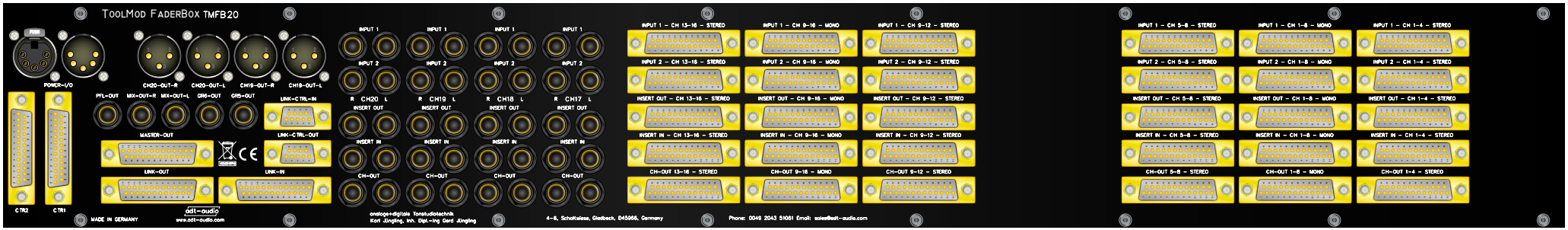




TRS jacks are used for the inputs, the insert in- und outputs, and the channel outputs of the module slots 17 to 20. The channel outputs of the slots 19 and 20 are available on XLR connectors in parallel. This combination allows configuring these module compartments for use as master fader for the stereo master or group-masters without the need for special cables. Please check page 24 for details on the configuration of master and group modules.

Three 25-pin d-sub connectors are used for the master outputs, link outputs, and link inputs. In addition, there are two 9-pin d-sub connectors for the link control inputs and outputs and two 5-pin XLR-connectors for the power supply, similar to the other frame versions of the Faderbox. The PFL output, the output of the stereo master, and the group outputs 5 and 6 are also available on TRS jacks.

The TM612 control room monitor module can be installed in the 20th module compartment. Two additional 25-pin d-subs, CTR1 and CTR2 hold the inputs for external stereo signals ST1 to ST4 and 2TR-1 to 2TR-4. The standard connectors for the 20th slot are used for all other inputs and outputs of the TM612 module.



Power Supply Units for the ToolMod Faderbox

The ToolMod Faderbox uses the same power supply units that are used for ToolMod Pro-Audio Modules, ToolMix Summing Boxes, and the ToolKit Channel Strip. The three standard power supply units ToolPwr-M, ToolPwr-S, and ToolPwr-E can be used for the Faderbox as a stand-alone unit as well as for a combined system.

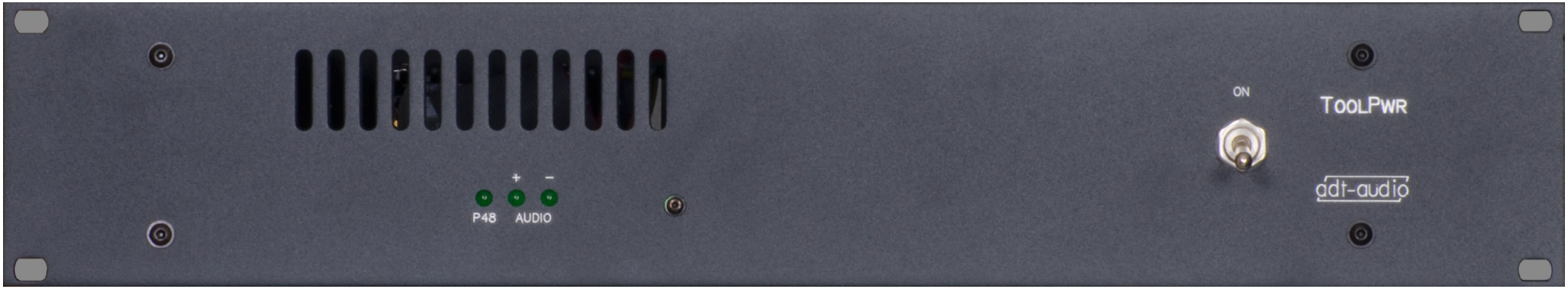
ToolPwr-M
The desktop power supply unit ToolPwr-M with 100 watts nominal power is best suited for the 5-channel Faderbox. The capacity is sufficient for some additional ToolMod modules as well.

ToolPwr-S
The rack mounted power supply unit ToolPwr-S with 230 watts nominal power fits into 2 rack spaces of a standard 19" rack. This unit is the best choice for the 19" Faderbox, with or without some additional ToolMod modules.

ToolPwr-E
The ToolPwr-E with twice the nominal power uses the same rack mount chassis as the ToolPwr-S. The capacity is sufficient for a 19" Faderbox with an extensive set of additional ToolMod modules and for the 20-channel Faderbox.

System with a 20-channel Faderbox and many additional ToolMod modules that exceed the capacity of the ToolPwr-E, use two or more power supply units for the entire ToolMod system.

Power Supply Unit ToolPwr-M



Faceplate of the ToolPwr-S and ToolPwr-E Power Suppy Units

Accessories

A range of accessories for the completion of Faderbox is available.

Blind Panels
Blind panels to cover unused module compartment are made from brushed, black anodized aluminum.

Removers
Removers are used for easy handling of the modules without using the knobs as handles. The fixing holes in the faceplates are fitted with metric 4 mm threads (M4) that are used for the removers.

Rack Brackets
Rack brackets are needed for the rack-mounted version and the build-in version of the Faderbox.

The brackets come as pair with all necessary screws and spacers. The standard version fits for all versions of the Faderbox but the 5-channel box when used in a ½ * 19” rack. With the standard version, the 5-channel box fits into a 10” rack.

Handles
Handles can be attached to the left and/or right side panel of all versions the Faderbox. The handles come with screws and caps.

Power Cables
5-pin XLR power cables for adt-audio ToolMod systems are available from stock in 1 ft., 2 ft., 3 ft., 5 ft., and 10 ft. versions. Special cables are available at short notice.

Patch Cords
XLR and TRS patch cords are used for connecting the inputs and outputs of a Faderbox with ToolMod module frames and other outboard gear. 1 ft. and 2ft. cables XLR male to XLR female, XLR male to TRS, XLR female to TRS and TRS to TRS are available from stock. All other versions are available at short notice.

D-Sub-Multicore-Cables
In addition to our stock of analog standard multicores with 25-pin d-sub connectors according to 'Tascam' standard, any special version up to a length of 60 ft. with any combination of plugs is available at short notice. We keep stock of d-sub to d-sub, d-sub to 8 * XLR male, d-sub to 8 * XLR female, and dsub to 8 * TRS up a length of 2 meters / 6 ft..

Technical Specifications ToolMod Faderbox

Inputs:

Mono and Stereo Input Modules,
Control Room Module Inputs
electronically balanced (balanced to Ground)
nominal Level+ 6 dBu
maximum Input Level for THD ≤ 1 %,
f = 20 Hz - 50 kHz, ≥ + 30 dBu
Input-Impedance *f* = 20 Hz - 20 kHz, ≥ 8000 kΩ,
CMRR according to IRT
20 Hz ≥ 90 dB, 1 kHz ≥ 80 dB, 15 kHz ≥ 70 dB

Link-Inputs
electronically balanced (balanced to Ground)
nominal level + 6 dBu
maximum Input Level for THD < 1 %,
f = 20 Hz - 50 kHz ≥ + 30 dBu
Input-Impedance *f* = 20 Hz - 20 kHz ≥ 8000 kΩ,
CMRR according to IRT
20 Hz ≥ 90 dB, 1 kHz ≥ 80 dB, 15 kHz ≥ 70 dB

Outputs:

Mono and Stereo Input Modules,
Control Room Monitor Outputs, Master outputs
electronically balanced (balanced to Ground)
nominal Level + 6 dBu
maximum Output Level for THD < 1 %,
f = 20 Hz - 50kHz, Load ≥ 1200 Ω, ≥ + 30 dBu
maximum Output Level vs Load
➔ see Diagram on next Page
Source Impedance, *f* = 20 Hz bis 5 0kHz, ≥ 50 Ohm
➔ see Diagram on next Page
Output CMRR according to IEC
f = 20 Hz - 20 kHz, ≥ 40 dB

Link-Outputs:
electronically balanced (balanced to Ground)
nominal Level + 6 dBu
maximum Output Level for THD < 1 %,
f = 20 Hz - 50kHz, Load ≥ 3200 Ω, ≥ + 30 dBu,
Source Impedance, *f* = 20 Hz bis 50kHz ≤ 50 Ohm
Output CMRR according to IEC, *f* = 20 Hz - 20 kHz, ≥ 40 dB

Gain:

Channel Input to Channel Output or Master- or Group Output
Fader @ 0 dB or FDR-OFF, 1 kHz
Pan-Pot @ L or R with Mono Input Modules
and @ Center with Stereo Input Modules
= ± 0.2 dB
Level Adjustment Range of the Internal Master Amplifiers
≥ ± 2 dB
Level Adjustment Range of the 0 dB Fader Position
and FDR-OFF Operation ≥ ± 6 dB
Level Tolerance of the Link Inputs and Outputs
≤ ± 0.2 dB

Frequency Response:

any Signal Path, Level ≤ + 24 dBu, *f* = 20 Hz to 50 kHz
≤ ± 0.1 dB,
- 3 dB @ >150 kHz (by internal RF-Filter)

Phase Response:

any Signal Path, Level ≤ + 24 dBu
@ *f* = 20 Hz ≤ +5°, @ *f* = 20 kHz ≥ -10°

Slewrate:

any Signal Path ≥ 7 V/µs

THD:

any Signal Path, *f* = 10 Hz to 20 kHz,
Load ≥ 1200 Ω,
Level + 26 dBu: kges ≤ 0.01 %
Level + 28 dBu: kges ≤ 0.1 %
Level + 30 dBu: kges ≤ 1 %

S/N, Dynamic range:

Input Source Resistance = 40 Ω
RMS values, *f* = 22 Hz – 22 kHz
(according to DIN 45405)
referred to 0 dBu = 775 mV
A weighted values, with DIN-A type filter,
AVG Aeasurement,
referred to 0 dBA = 775 mV @ 1 kHz

Dynamic Range, referred to ´the Maximum
Level of + 30 dBu,
RMS Value in dB and A-weighted Value in dBA

Modul Input to Modul Output
Fader closed or CUT:
≤ -100 dBA, ≤ -95 dBu
Dynamic Range ≥ 130 dBA / 125 dB

Fader 0 dB or FDR-OFF:
≤ -97 dBA, ≤ -92 dBu
Dynamic Range ≥ 127 dBA / 122 dB

Fader +10 dB
≤ -93 dBA, ≤ -88 dBu
Dynamic Range ≥ 123 dBA / 118 dB

Modul Input to master or group output
1 channel installed and routed to master or group, fader down or CUT:
≤ -100 dBA, ≤ -95 dBu
Dynamic Range ≥ 130 dBA / 125 dB

Fader 0 dB or FDR-OFF:
≤ -97 dBA, ≤ -92 dBu
Dynamic Range ≥ 127 dBA / 122 dB

4 channels installed and routed
to master or group,
fader down or CUT:
≤ -97 dBA, ≤ -92 dBu
Dynamic Range ≥ 127 dBA / 122 dB
fader 0 dB or FDR-OFF:
≤ -95 dBA, ≤ -90 dBu
Dynamic Range ≥ 125 dBA / 120 dB

Noise values increase by 3 dB if the number of installed and routed channel are doubled.

Infinity Cut Off:

Faders
f = ≤ 1 kHz: >= 100 dB, f = 15 kHz: ≤ 95 dB
CUT
f = ≤ 1 kHz: >= 105 dB, f = 15 kHz: ≤ 100 dB
Pan-Pot with 3 dB Center Attenuation
≥ 50 dB
rotary Fader (Aux):
≥ 70 dB

Scale Accuracy:

Mono and Stereo Faders:
0 dB ≤ ± 0.2 dB
+ 10 dB to - 30 dB ≤ 1 dB

Tracking accuracy:

Stereo Faders
0 dB ≤ ± 0.2 dB
+ 10 dB to - 30 dB ≤ 0.5 dB

Stereo-Crosstalk:

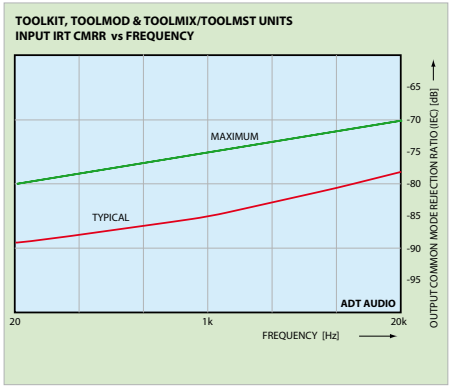
f = 20 Hz to 20 kHz, any Path = 70 dB
(Pan-Pot Cut-Off attenuation with
mono input modules with 3 dB center attenuation
≥ 50 dB)

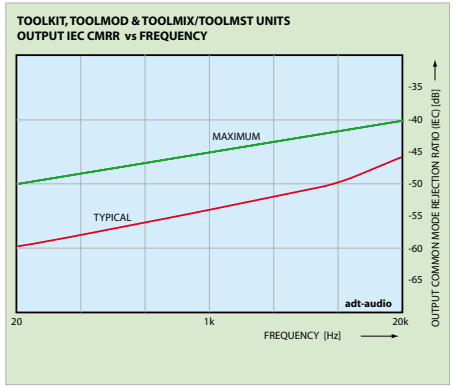
Power Supply:

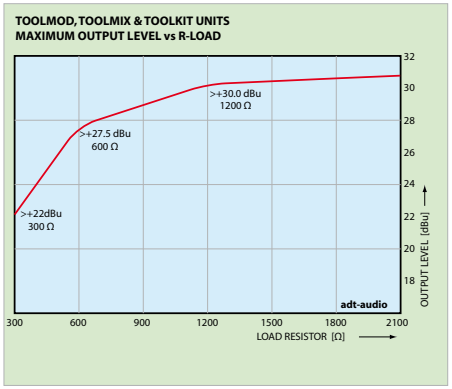
Standard ToolMod/ToolMix
Power Supply, +/- 25 Volt DC
Current Consumption
Mono Input Module ≤ 100 mA
Current Consumption
Stereo Input Module ≤ 180 mA
Current Consumption Frame,
Depending on the version of
the master-pcb 150 bis 400 mA

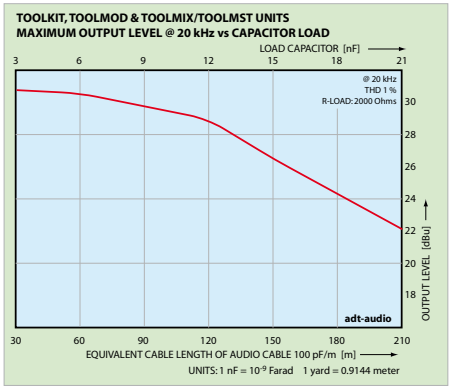
Current consumption increases by 30 mA for each output loaded with 1200 Ω @ + 30 dBu.

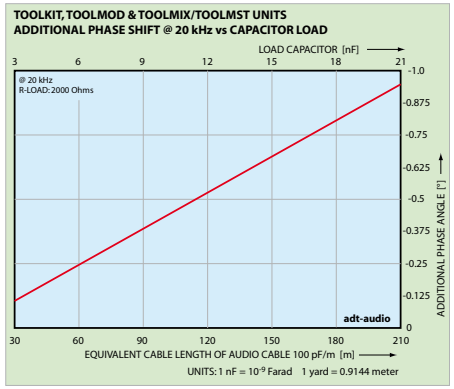
Diagrams:

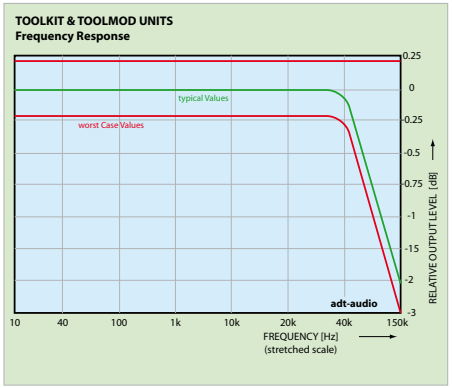


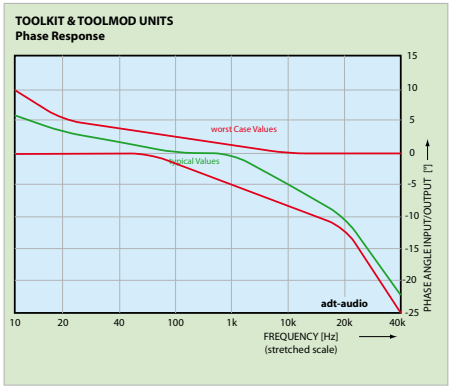


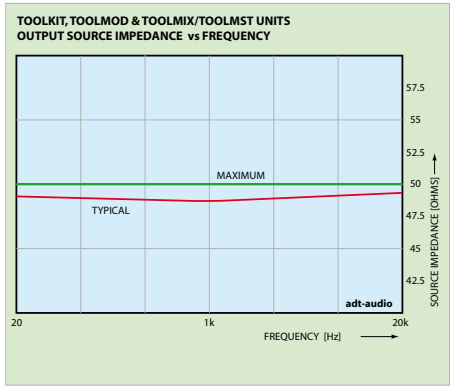












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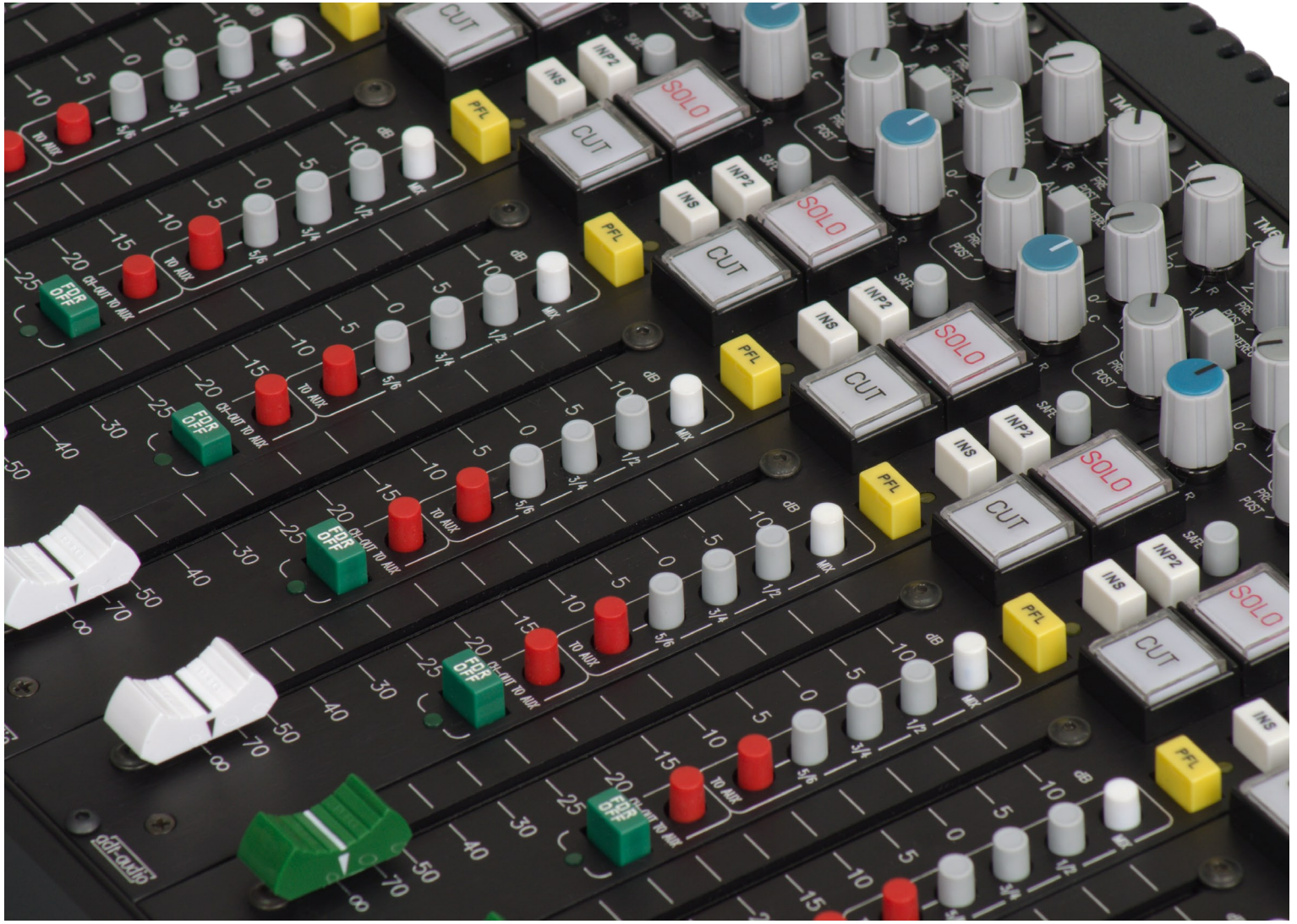

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