adt-audio

Installation Manual

Part III:

Console Frame
Installation of the console
Operating conditions
Maintainance

Version 1.22/04 • English

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Summary

Preface

This manual contains all the information that is necessary to prepare and plan the installation of the mixing console and accessory components.

Please, read this manual carefully. We point out common mistakes and problems that are connected with the installation and provide suggestions to avoid such problems. You will save a lot of time and unnecessary start up problems by investing a couple of hours in the reading of this manual.

The first chapter of the manual contains everything about the power supply units and crossover devices that are necessary for fail safe power supply configurations and the implementation of the mains connections. Chapter 2 is about the audio installation. Besides detailed information about basic principles of audio installation and the methods of grounding, this chapter contains all pinning diagrams, pictures and graphics about the locations of the connectors, and a detailed description of their functions. Chapter 3 contains general information about the assembly of the console, environmental considerations, the recommended maintenance, and a couple of remarks about the operation of the console to ensure a long and problem free lifespan.

This manual concerns the stereo version of the BC4 broadcast console system, rev. 1.2

1. Frames

General informations

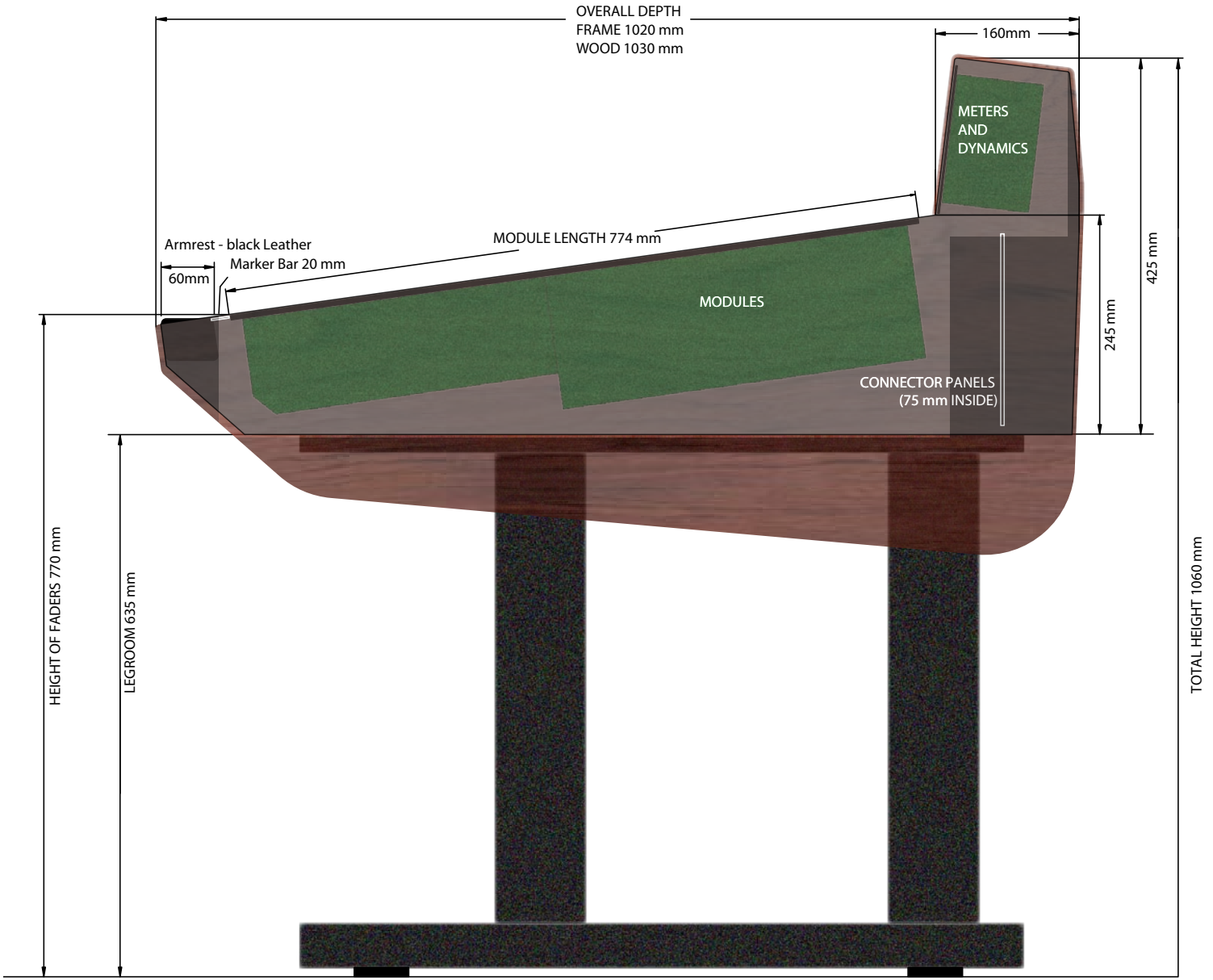
BC4 console frames are available in many different versions. Almost any frame size with an even number of module slots is possible. The maximum, overall width of a single frame is 3100 mm. Such a frame has 76 module slots and can be used for a configuration of 64/8/2 or 60/8/4. Larger consoles can use up to three combines frames that are mounted on a common, special floorstand. All frames are basically desktop versions that can be used with the floorstand as well.

Side view

The side view shows are all dimensions of the frame. The height above floor is determined by the height of the floorstand and can be adapted to special needs.

Frame Width

The width of the frames depends of the number of modules of a particular console. The width of a single slot is 40mm. All input and group modules are arranged in a grid of 4 modules. Any number of input modules and groups that can divided by 4 is possible. The width of the master section is 8 slots. This master block contains up to three program master modules and 2 blind panels for the installation of custom switches and accessories. If the



width of a particular console is limited, the master section can be reduced to 6 slots by leaving out the two blind panels.

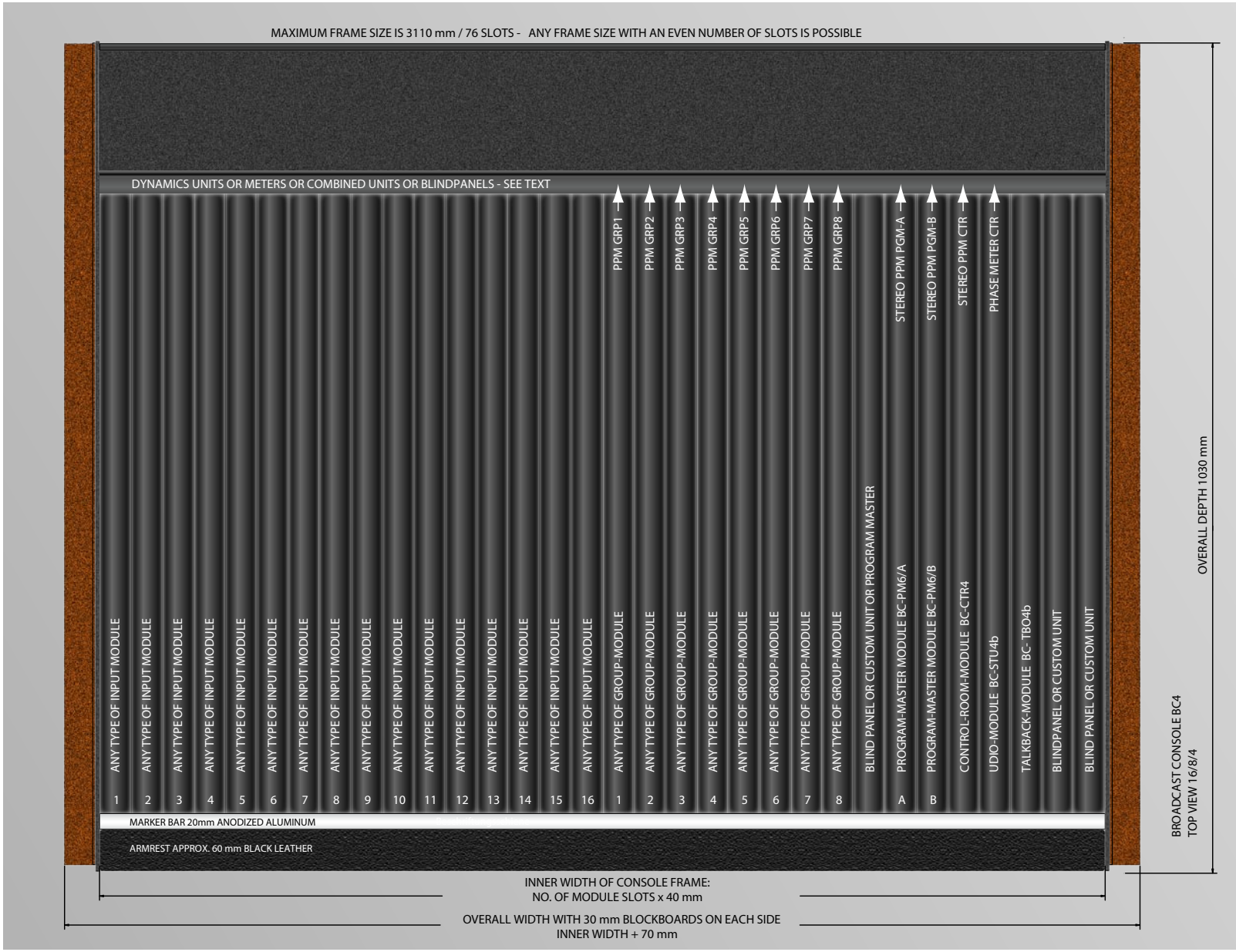
Master section

The master section can be installed anywhere in the console. Two program masters, a control room module a playback and a talkback module are required. The console will work with one program master module as well. The location of the master section in the frame must be determined with the order. It is not possible to change this position later.

Groups

A BC4 broadcast console can be equipped with 0, 4, 8, 12 or 16 groups. Since the standard modules have a routing section for 8 mono groups that can be implemented for 8 stereo groups as well, 8 group modules are standard. With small consoles 4 groups may be appropriate.

The group modules use special wiring PCB‘s and a special connector panel. Group blocks of 4 group modules can be installed anywhere in the console‘s frame. There is no other limit. It is not necessary to install 8 groups in



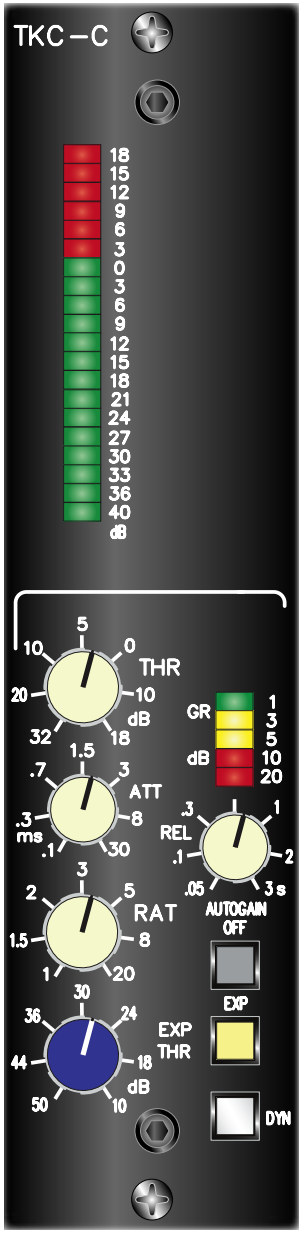
one block. They can also be installed in two blocks in different locations. The assignment of the groups to the frame slots is determined by bridges on the frame PCB's. Only these bridges determine what group number is assigned to a particular module. Each slot can be either used for a mono or a stereo group module. This principle offers maximum flexibility as far as the frame layout is concerned.

Input modules

The frame slots that are used for input modules are basically compatible with all types of input modules. However, the stereo input module BC-IS12 requires additional connectors for the stereo insert inputs and outputs. If this modules are used in a standard module slot, the stereo insert can not be used. Apart from this limitation, the module is fully functional. Special boards with these additional connectors and corresponding connector panels are available. It is possible to use any mono input modules with these slots with no limitations. The slots for BC-IS12 stereo modules must be specified with the order.

Blindpanels, producer tables, remote areas, writing surface

Any even number of blind panels can be installed on the left and right side of the console and between the blocks of 4 input modules and 4 groups. The only limit is the maximum width of a single frame. These options offer the choice to adapt a particular frame exactly to the needs. The blindpanels can be standard, single slot blindpanels or complete plates in any size. It is also possible to install custom supplied equipment, like remotes or keyboard into these plates. Of course, the depth of the frame limits this possibility. Blind panels of any size can be black anodized like the standard top plates or powder coated. It is possible to install a standard channel wiring under the blind panels. This makes it possible to install input modules when the particular blind panel section is no longer needed.



3.2.4 Variantes

All frames are basically tabletop versions. The available floorstand is fixed to flange plates on the left and right side of the frame. These floorstands can used with all console versions. The only difference between the tabletop frame and the floorstand version is the wooden side panel that covers the top of the floorstand. The side panel for the tabletop version is smaller. The wooden side panels are made of varnished, beechwood, multiplex blockboards. Other versions are possible on special order.

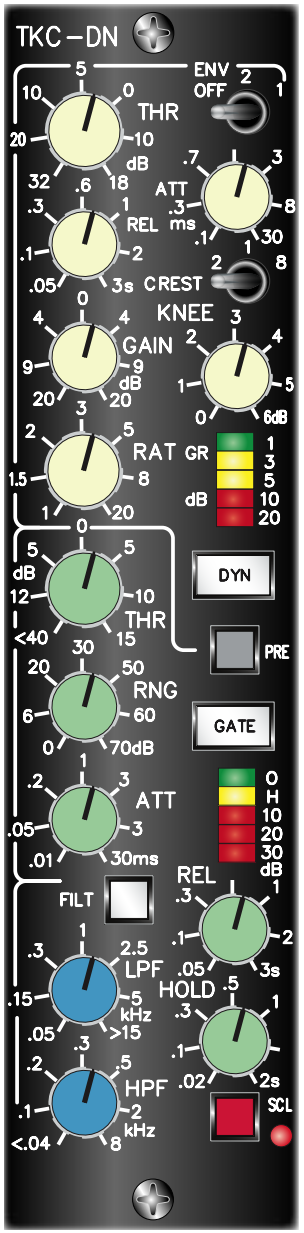
Meterbridge

The meter bridge is standard for all consoles. The BC4 frame uses the same meter bridge that is used for the BC3 on-air consoles, the SRC51 surround console and the ToolCon/ToolCon+ Live Consoles. Therefore, all available equipment for these series can be used with the BC4 as well.

Dynamics

In addition to the selection of different meter systems, Dynamic Modules can be installed in the meter bridge.

Several versions of dynamic modules are available. The picture shows the TKC-DN, Compressor-Noise Gate that can be used with any mono input channel. If this option is installed with your console, the dynamics unit is installed above the particular channel in the consoles meter bridge. The frame wiring inserts the module into the channel insert. The external insert



is still available; the dynamics modules can be configured to be installed pre the module insert output or post the insert input. Once the necessary frame PCB's and the additional wiring are installed on particular module slots, these modules can be upgraded with dynamics modules at any time. Apart from the TKC-DN, a Compressor-Expander, and combined modules; Compressor-Expander with PPM meter are available. An upgrade with the necessary frame PCB's and wiring is possible at the location; however it is more expensive.

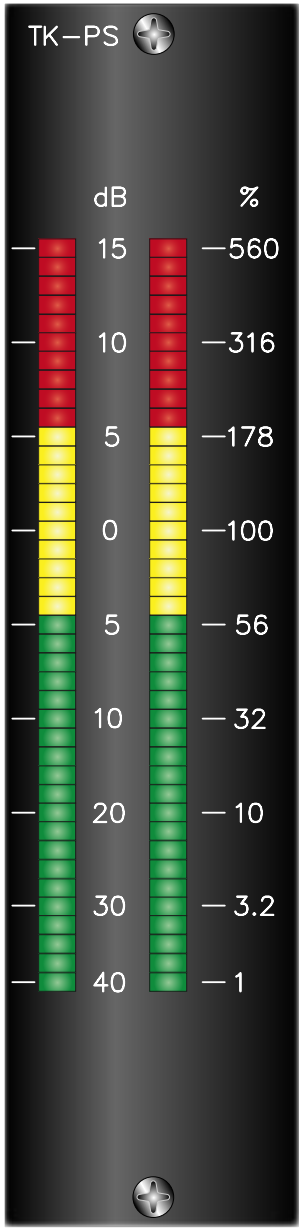
Meters

Several different meter versions can be used with all BC4 Broadcast Consoles. While each standard console has a set of ADT high resolution PPM LED meters included, which read the program master outputs, the control room source select and the group outputs, almost any other signal in the console can be assigned to a meter.

Sources

All modules have configurable meter outputs. With input and group modules, there are usually 4 jumpers that determine the source signal for an external, additional meter. Channel ouput, pre fader and post fader signals and the input signal can be selected. With stereo modules, stereo or mono, external meters are possible. In addition to the source selection by jumper blocks per channel, a separate matrix can be used to add a mono signal for the meter.

The master modules have meter sends for the auxiliary outputs, the program masters, the control room source selectors and the PFL master. If no separate PFL meter is installed, the control room meter can display the PFL master as soon as PFL is active by automatic switching. Standardized flatcable connects the meter sends of the



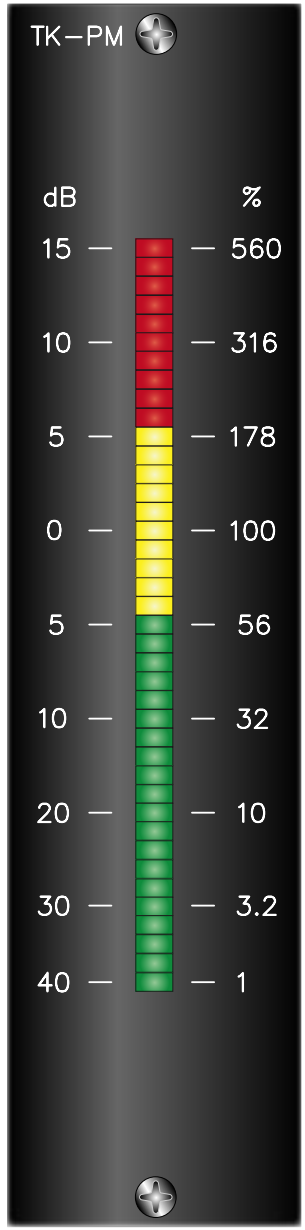
module with the meter frame boards in the bridge. The location of the meters is not fixed and can be selected by the customer. All meters use a single 24 V DC supply voltage. A separate supply for the meters with appropriate capacity is available with each of the power supply units.

Meter Versions

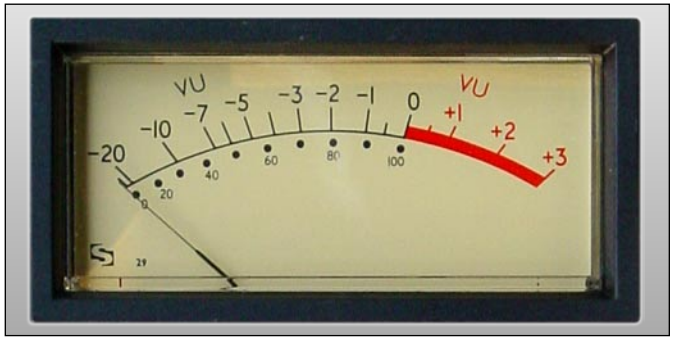
adt-audio hi-res LED PPM
The TK-PS and TK-PM ADT high resolution LED meters are the standard system for the BC4 consoles. The meters use 40 LED's in a range from +15 dB to -40 dB with a resolution of 1 dB in the range from +15 to -10 dB and 2 dB down to -30 dB. The release time is linearized and can be adjusted to the standard value of 1.5 sec per 20 dB. The attack time is below 1 ms for -1 db display with an burst input signal of 10 ms @ 5 kHz. The meter is available in stereo and mono versions and fits into the meter bridge frame boards. It can be used for all channels and masters of the BC4 system. A corresponding phase correlation meter is also available.

A different scale plate with a display range from + 10 dB to - 45 can be installed alternatively. The level adjustment range is more than sufficient to use both scales with all possible nominal levels.

adt-audio 10-LED PPM
An additional, low resolution version with 10 LED's and a total of 30 dB range is available. This is the same meter that is used with the BC4 input channels in a format that fits into the meter bridge. These meters are low cost and can be used for auxiliary send or any other purpose, alternatively. They are available in mono and stereo configurations.



VU Meters



VU Meters can be used alternatively for each meter. In addition, LED and VU meters can be mixed in any way. The VU-meters are brand Sifam. Theyfit into two channel slots. Two meters can be installed, one above each other. The meters have an active rectifier circuit with level adjustment. The attack and release time is 300 ms. The lead can be adjusted to any desired value.

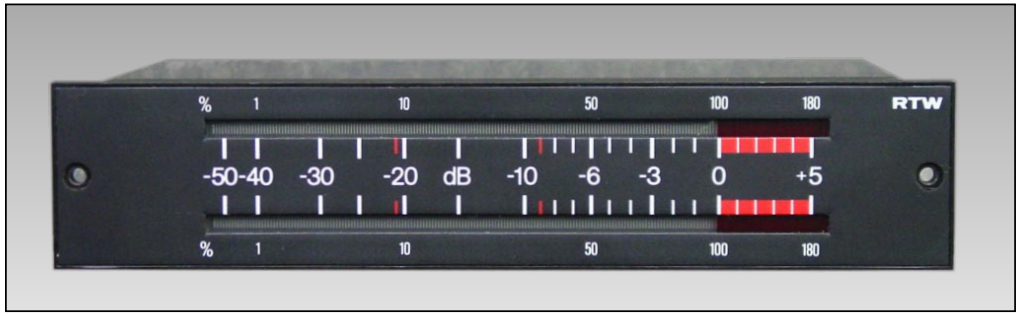
RTW-Peakmeter

Different versions of 200 segment plasma bar-graph meters, brand RTW, Germany can be installed. These meters can be used for each source, alternatively to LED-PPM's and VU Meters. The Series 1000 devices can be mounted vertically and fit into the module grid. This series is best choice for use with the BC4 system.

Devices in standard cassette housings 190 x 40 mm (type 1113, 1115 or 1119) must be installed horizontally. A maximum of 2 devices, one above each other can be installed. Special front panels are available for both, the Series 1000 and Series 1100 units. Phase correlation meters are available as well.

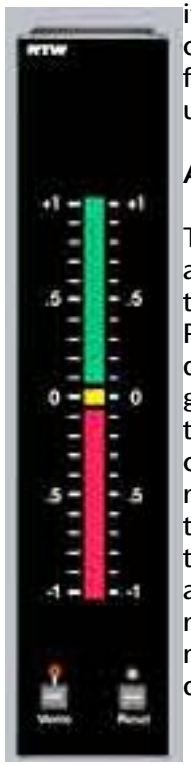
The pictures on this page show some of the available versions. Please check the RTW website (www.rtw.de) for details about the different versions.

All RTW devices need special front panels and special wiring. These meters do not fit into the standard meter frameboards. The series 1000 can be adapted to the frame PCB's while the series 1100 devices require a frame slot where no PBC's are installed.



Loudspeakers

For use as PFL and talkback loudspeaker we offer an active mini speaker that fits into the meter bridge. One or two speakers can be used in a console. They are normally driven by the mini speaker output and can be used in stereo if two system are installed.The loudspeakers are equipped with coax wide-band systems. The 8 watts power amplifier is supplied from a separate voltage that is available with all power supply units. The speaker fits into 4 meter bridge slots.



Additional devices

The picture shows a TFT multifunction display, RTW Portamonitor. Such devices can be integrated into the meterbridge with special made front panels if they fit into the height of the top plate (145 mm) and if the depth is not more than 100 mm. Please ask for details.

2. Installation of the console

This chapter is only of importance if the unit is not delivered and installed by adt-audio or one of its representatives. In this case, the console system is delivered by a forwarding agency. You will receive several wooden boxes that contain the console, the floor stand, the power supply units, and the accessories. To keep the total weight of the main box as low as possible, the main box contains only the main frame of the console, everything else is packed in additional boxes. Since the total weight of the console frame box is considerable, it might be a problem to unload the main case. As soon as we have shipped the console system, we will inform you about the details of shipment. Please get in touch with the local office of the forwarding agency to clear up all details about the unloading of the boxes. The total weight of the entire system depends on the size of the frame and on the versions of modules. In any case, the total weight of a BC4 broadcast console system will be between 100 kg/220 lbs (16 channel) and 300 kg/660 lbs (72 channel). Two persons can easily handle the power supply, accessories and other boxes.

Unpacking

Make sure that you have the following tools at hand:

A set of screwdrivers for Philips head screws and
metric Allen keys 1.5 to 4 mm
A set of metric spanners, from 10 to 19 mm

Please unpack all the other boxes before unpacking the main box. If your console has a floor stand, you will need the floor stand to assemble the frame. In addition, the floor stand box also contains a cardboard box with screws and other small parts that are necessary for the assembly of the frame. This box also contains an exploded view, drawing of the frame, and the wooden side panels.

Open the main box with the console and remove the lid and all end walls. The console frame is fixed to the base plate of the box with 4 screws. You can reach these screws from the bottom of the box. Remove the screws to free the main frame.

Check carefully to verify that the console was not damaged during transit. If there is damage, inform the forwarder before you continue. Do not alter anything and make sure to take some pictures of the damage. In most cases, transport insurance will cover any damage; this however, depends on the details of the purchase. In any case, you are supposed to inform the forwarding agency and us immediately.

Depending on the size and the weight of the frame you might need up to 6 persons for the next step, the installation of the floor stand. There are two separate floor stands, one for each side of the frame. They are fixed with 2 screws thru the upper tube of each stand to the flange plate on the left and right bottom of the main frame. It is the same point that was used to fix the main frame into the transport box.

See the exploded view that contains marks for the lifting points of the frame.

Do not use the meter bridge as a handle or lifting point when lifting and/or moving the console.

Use the flange plates and the side panels.

The easiest way to install the floor stand is to sit the console frame on its connector panel with the fader bank up (in the air). Depending on the weight of the frame, 4 or 6 persons will be required to lift the frame. For safety, two persons, (one on either end of the console) should securely hold the console in place at all times when it is in this position. The bottom of the frame can now be accessed easily. Attach the two floor stands to the flange plates and fix them in place with the special screws that are located in the small cardboard box. After this part is accomplished, you can carefully tilt the entire frame up into the normal operating position. Make sure that there are enough persons to safely handle the weight of the console.

To avoid damage, the wooden side panels are packed separately. After the installation of the floor stand, place the console into the final position and unpack the side panels. The panels contain threaded inserts. They

are fixed to the side panels by a couple of screws. See the exploded view for the location of the fixing points and fix the panels on both sides of the frame. In most cases, the small wooden panels for the meter bridge are already mounted. If this is not the case with your console, remove the rear cover sheets on both sides of the meter bridge and fix the wooden panels.

Remove the protective foil covering the armrest.

You are now ready to install the power supply. Read the first chapter of the manual that contains important information about the installation of the power supply. Mount the power supply, make sure that it is switched off, and connect both power cords to the mains socket. If you have a failsafe power supply, you can use one of the two power supply units for a first check. Of course, you can also install the complete power supply system. Mount both power supply units and the crossover unit into a rack or put it into its permanent location. Make sure that everything is switched off and connect all units to the mains supply.

Important note:
Make sure that you install the two power supply units to two different fuses. If you do not do so, a problem on one of the units that is connected to this fuse will disable the crossover system.

Switch all units on and check if all control LED's come on. Switch everything off again and install the included cables. With a normal cable, you will have only one cable to connect the power supply and the console. With a failsafe unit, there are 2 additional cables to connect the two power supply units to the crossover device. The console must be connected to the crossover device.

After you have installed all connections, double check for any transport damage. Check if all the modules are properly installed in the frame. If you are sure that everything is okay, switch the system on and check if all control LED's of the power supply are on. It is a good idea to install the speaker system in the next step and make a quick test if all channels work.

3. Operating conditions

Environments

The environmental conditions have a great influence on the long-term stability and reliability of the entire console.

Temperature

The recommended operating temperature range is from 10 °C to 45 °C. The console will also operate at temperatures above and below this limit of course. However, operating at temperatures outside this range for long periods will reduce the lifespan of the console.

Under normal conditions, we recommend that you power down the console if it is not in use. The console is ready for use within a minute. It will reach a steady operating temperature within the first hour of operation. There is no reason to leave the system switched on constantly.

For some reasons it can be of advantage as far as the lifespan of the console is concerned to leave the system powered on if, for example, the temperature is not stable, and drops down far below 10 degrees at night. In this case, it will take a longer period to reach its steady operating state.

Within the first weeks of operation, the console should run in continuous operation. Failure of an IC, an electrolytic or other early failure is most likely in the first weeks of operation.

Soiling

The console and all its connectors should be kept as dust and dirt free as possible. If drinks or other liquids are accidentally spilled onto the console, the concerned modules must be immediately removed and a cleaned. We recommend the use of Isopropyl alcohol for cleaning the console. Isopropyl alcohol will not damage the components of the console. The sooner the remains of any spilled liquid is cleaned, is the less risk there is of damage.

4. Maintainance

A BC4 console requires no regular maintenance. Service is only required, if there is a failure that makes repair necessary. Almost all problems can be fixed by exchanging a defective module. Following our recommended procedures for the use and care of the console will result in an extended lifespan of the console.

Console use

All electromechanical components of the console, such as potentiometers, switches, faders, and relays are self-cleaning. However, self-cleaning only occurs when the particular component is in use. The electrical and mechanical lifespan of these components exceeds the useful life of the system in any case. A rotary pot, for instance, that has a lifespan of 50000 rotation, will work properly for a period of more than 30 years if it is used one time in an hour for 8 hours a day and 200 work days per year. Long-term reliability is directly connected to continuous operation. Fine dust and hardened grease, will be a problem for components that remain unused for years. If it is not possible to use all the components of a console constantly, we recommend that you actuate all pots and switches at least one time per 6 months to keep the self cleaning process running.

Testing the console

From time to time, (we recommend at least one time per year) all functions of the mixer should be tested. Check every function, all the inputs and outputs and all controls and switches of the entire console. If you are not able to make any necessary repairs immediately, make a note of all problems that were found for future repairs. With large, complex consoles, it is a good idea to maintain a logbook at hand that is used to note all problems in the studio. Since it is likely that most of the problems will be discovered while working with the console, it is good idea to make a quick note which includes all the details of the problems such as; the particular channel, the source signal and any special setting that caused the problem. This helps a service technician to locate problems. Many problems that come up in a particular setting only, may not be easily reconstructed after the end of a session. The more precise the notation in the logbook, the more likely it is that mistakes that are caused by a bad cable or anything else that is not a problem of a function of the console itself, can be found and repaired.

Cleaning

Only non-corrosive cleaners such Isopropyl alcohol should be used for cleaning the console and its components. Isopropyl alcohol is he best choice for all parts, including the plastic knobs and caps and the pushbutton knobs, all electric components and the top plates. More aggressive cleaners can cause problems because they might corrode mechanical or electrical components. **Do not use any kind of thinner** – you will have to replace all plastic parts that were exposed to the thinner.

Potentiometers and push buttons

Depending on the environmental situation at the location, the grease inside the switches, rotary pots and slider faders begins to harden within a period between approximately 6 years and 15 years. It is not possible to determine an exact time when this occurs, since the environmental influence is different from location to location and the frequency of use of the different components also has an influence on this condition as well.

It is very easy to prevent these effects just by following these simple maintenance steps. We recommend that this be done after 6 six years of operation.

Rotary pots and slider faders:
When the grease between bushing and shaft begins to harden, the pot will run tight. Apply a small drop of penetrating oil between the shaft and the bushing and turn the pot 5 to 10 times. Doing this will keep the pots in good shape for many years.

Pushbutton switches
The grease in the pushbutton switches will also begin to harden. Since it is the same process, this will usually happen at the same time and it depends on the environmental conditions and the frequency of use. The best way to maintain pushbutton switches is the use of a special lubricant,

type CRC3-36, brand CRC, Belgium. If you cannot get this oil, you can order it from the factory.

This cleaner contains a non-aggressive, non-permanent solvent that dissolves hardened fat and grease effectively. The second component is a good, non-hardening, penetrating oil that protects the cleaned surface for a long time. CRC3-36 comes as aerosols that make it easy to apply the agent.

Using CRC3-36 with pushbutton switches is very easy. Remove a module and put it on a table so that you can see the topside of the switches. Press the knob of the aerosol tin carefully while you put the end of the little tube that comes the tin next to the locker block at the top of the switch. By pressing the knob carefully, you can produce oil foam. Apply approximately 1 cubic cm of this foam to each switch that has to be cleaned. Wait some minutes before you operate each switch 5 to 10 time. With this procedure, you can keep all the switches in a good shape for an unlimited period.

DO NOT USE ANY KIND OF CONTACT SPRAYS!
DO NOT USE VASELINE OR SIMILAR GREASE!
DO NOT DIP AN ENTIRE MODULE INTO A CLEANING BATH!

Please follow these rules to avoid trouble. Once you have applied conventional contact spray to a module, you have to use this repeatedly. There is no way to remove the spray out of switches or faders unless these components are replaced. Some technicians use Vaseline as a protection against corrosion. The biggest problem with Vaseline is that it starts to melt when the temperature is higher than 40 °C. If Vaseline is used for the cleaning of switches, you have to deal with the problem that after the temperature exceeds 40 ° C, the entire contact area of the switch will be covered in Vaseline. As soon as the temperature drops down below 40 degrees, the fat hardens again. This causes considerable contact problems. If you put an entire module into a cleaning bath, for instance of an ultrasonic cleaner, the only effect is, that you distribute all the dirt equally to the entire module. This means that the dirt will be inside pots, switches, and everything else. Modules that were treated in this way, will never work properly again.

Screws

After a period of about 4 years, the power supply unit should be opened and all screws of the transformer and the prints should be re-tightened. The thermal situation in a power supply makes it likely that screws in terminator blocks will loose their contact pressure for the high temperature difference between the on and off state.