Operation manual

English

DB4/DB8 MKII
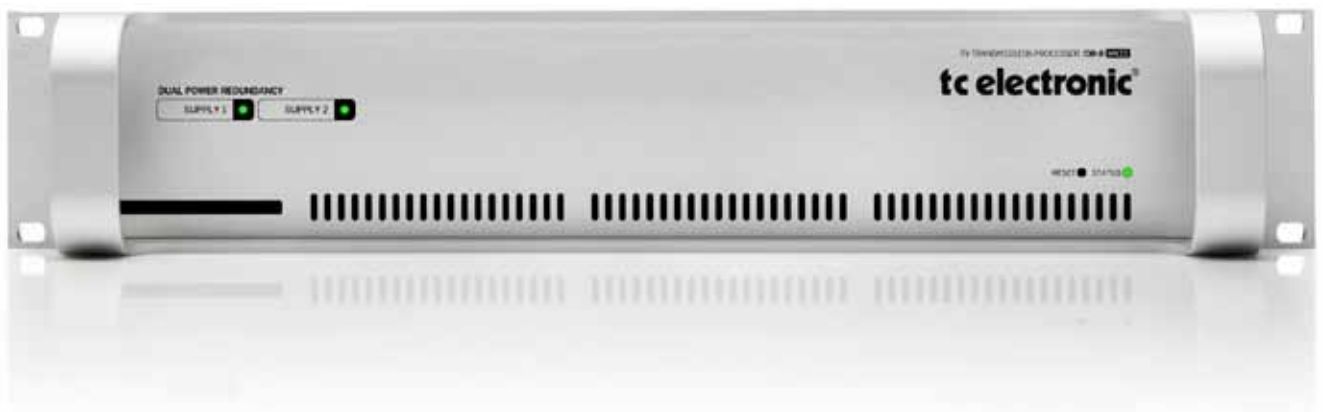
tc electronic

IMPORTANT SAFETY INSTRUCTIONS

The lightning flash with an arrowhead symbol within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the product.

1   Read these instructions.
2   Keep these instructions.
3   Heed all warnings.
4   Follow all instructions.
5   Do not use this apparatus near water.
6   Clean only with dry cloth.
7   Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
8   Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
9   Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10 Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
11 Only use attachments/accessories specified by the manufacturer.

12 Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.

13 Unplug this apparatus during lightning storms or when unused for long periods of time.
14 Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way,   such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.

Warning
- To reduce the risk of fire or electrical shock, do not expose this equipment to dripping or splashing and ensure that no objects filled with liquids, such as vases, are placed on the equipment.
- This apparatus must be earthed.
- Use a three wire grounding type line cord like the one supplied with the product.
- Be advised that different operating voltages require the use of different types of line cord and attachment plugs.
- Check the voltage in your area and use the correct type. See table below:

Voltage	Line plug according to standard.
110-125V	UL817 and CSA C22.2 no 42.
220-230V	CEE 7 page VII, SR section 107-2-D1/IEC 83 page C4.
240V	BS 1363 of 1984. Specification for 13A fused plugs and switched and unswitched socket outlets.

- This equipment should be installed near the socket outlet and disconnection of the device should be easily accessible.
- Do not install in a confined space.
- Do not open the unit - risk of electric shock inside.

Caution:
- You are cautioned that any change or modifications not expressly approved in this manual could void your authority to operate this equipment.
- To completely disconnect from AC mains, disconnect the power supply cord from the AC receptacle.
- The mains plug of the power supply shall remain readily operable.
- Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type.
- Ventilation should not be impeded by covering the ventilation openings with items, such as newspapers, tablecloths, curtains, etc.

Service
- There are no user-serviceable parts inside.
- All service must be performed by qualified personnel.

EMC / EMI
This equipment has been tested and found to comply with the limits for a Class B Digital device, pursuant to part 15 of the FCC rules.
These limits are designed to provide reasonable protection against harmful interference in a residential installations.
This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.
If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

The user may find the following booklet, prepared by the Federal Communications Commission, helpful:
"How to identify and Resolve Radio/TV interference Problems."
This booklet is available from the US. Government Printing Office, Washington, DC 20402, Stock No. 004-000-0034-4.

For the customers in Canada:
This Class B Digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations. Cet appareil numérique de la classe B respecte toutes les exigences du Réglement sur le matériel brouilleur du Canada.

Licenses

NOTE If you have purchased any of the optional software Licenses or the TC Icon Software Editor, then read the License Agreements in the Appendix section prior to use.

Thank you for choosing DB8 or DB4 as your next step in audio. Even if the near future is analog we are convinced you have chosen wisely. Consistency in Loudness is the single most important audio issue to get right in broadcast today. DB8 and DB4 employ cutting edge technology to enable stations get rid of listener complaints about jumping levels, and to transmit in analog and digital with optimum processing for both feeds.

The Difference Between DB8 and DB4
– DB8 has four independent processors in one frame and thus runs 4 independant Engine algorithms simultaneouly.

– DB4 has two engines but can run two processing engines PLUS a LM6 Radar meter.

DB8 is designed for large broadcast centers, while DB4 may be a more appropriate match for a regional station, but they share the same processing, the same presets and the same physical I/O structure - and even the same program to control them. Many machines of both types can be controlled from one Icon program (included with this package), and they will identify themselves over a network, be it local or remotely located machines.

Software and Manual for DB8 and DB4
Software updates for both machines are always released simultaneously, and the two machines share the same manual. The relevant differences are highlighted. Instead of both names being printed throughout the manual, "DB8" is used as a generic term.

Presets
DB8 and DB4 include a number of international standard presets ready for use. More presets are continuously made available in software updates, and from the TC web-site. Presets are based on information from broadcasters around the world. Some are subtle, some aggressive, but they all provide outstanding audio resolution, never before available in a broadcast processor.

Identify Your Opportunities
If your station is an early mover in digital and seeking to identify advantages, DB8 and DB4 will provide you with all the possibilities you need to experiment and find the right competitive angle. The processors can also adapt to your audience's changing needs, or audio strategy could even be changed from program to program.

Technical Integrity
Synchronous 48 kHz sampling and 48 bit processing throughout. Wide range, high order jitter rejection. The DB8/DB4 platform is without compromises. In fact, hundreds of machines could be cascaded without even degrading the transmitted sound.

Foundation
TC's involvement with high quality digital audio dates back to the mid eighties with pre-DSD technology being employed in the still ubiquitous delay, 2290. TC's commitment to digital excellence continued over the years with equipment for the music, film and mastering industries. The multichannel processing in DB8 and DB4, for instance, was originally developed for film. Those tools have been adjusted for broadcast use and are now part of your arsenal. Or dynamics control, where some of the latest end-listener distortion canceling methods originally invented for mastering have been built in. DB processors even include advanced loudness and true-peak meters, founded on ITU and EBU standards TC has been a significant contributor to.
Many years of experience with analog and digital broadcast combined with the know-how of skilled engineers is the strong base of the DB8/DB4 platform. From the purist and quality conscious hardware engineers to software writers of whom some were involved with designing the MPEG codecs, the team forms a competent, non-dogmatic design group ready to take broadcast audio to the next level.
We are confident you will value your new possibilities.

GETTING STARTED

This is an illustration of how to connect a standard DB8/DB4 as it comes with one Mainframe and one TC Icon software Editor. We recommend reading through the entire Hardware & Installation section before operating.

Connections

8 x XLR FOR DIGITAL I/O

25PIN DSUB TO XLR

100-240V AC

DB-8

X-COUPLED ETHERNET CABLE

PC or Mac
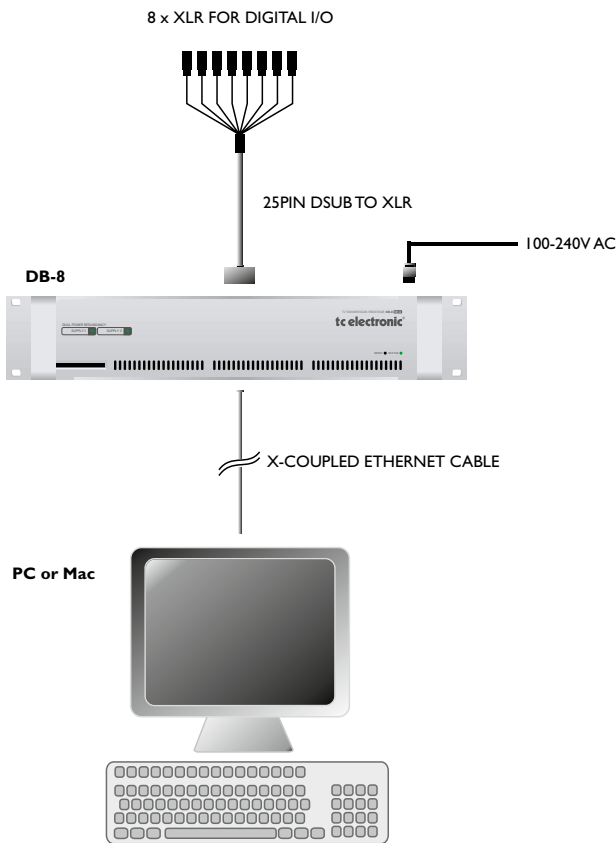
NOTE Please note that a crossed ethernet cable (supplied) must be used in this type of setup. When the system is connected to a HUB as a part of a major network non-crossed ethernet cables must be used (not supplied).

Quick setup guide

This quick setup guide applies for a simple setup as illustrated. The setup procedure requires that your PC or Mac has a network adapter installed as well as a TCP/IP protocol.

- Unpack the Mainframe and mount in a well ventilated space.
- Connect mains power and audio-connections via the supplied 25 pin to XLR cable and use the supplied X-coupled ethernet cable to connect the Mainframe to your network adapter as illustrated.
- Boot computer and Mainframe.

Install the TC Icon Software Editor
Follow the intallation instructions.

- Open the TC Icon Software Editor and the following screen will appear.

TC Icon | Select | Auto | Setup

There are currently no assigned devices.

Either select the devices you wish to control on the Setup/Devices page, or press 'Assign' to let TC Icon automatically assign any detected devices.

Assign

- Press **Assign**. The System is scanned and all connected mainframes will appear on the next screen.
- Press the mainframe you wish to access.
- That's it - you are now up and running.

NOTE Latest version of Mainframe software and latest version of the TC Icon Software Editor is supplied on the CD delivered with the Mainframe and Software Editor package. However, from time to time, software updates are available. To achieve the latest software you should visit our site at www.tcelectronic.com and go to "Downloads - Software Updates - TC Icon Software Editor" and follow the instructions. You may also contact your local dealer to get the latest software.

Mainframe Front

Power Supply 1 & Power Supply 2 LEDs
DB8/DB4 features two fully independant power supplies. Each power supply has its own status LED.

- For each power supply a green LED indicates that external power is connected and the power supply is fully functioning.

- A red LED indicates a problem. Either there is no external power connected or there is a problem at certain checkpoints in the relevant power supply.

Due to the redundant design the frame will still be fully operationable, however, we advise that you address the issue and investgate the cause of the error indication at the first given opportunity.

- No light in any LEDs - no power connected.

NOTE: Notice that only one power supply is necessary for DB8/4 to run. Status is also indicated in the TC Icon Editor.

Reset key
Press and hold during boot up to reset I/P address to default. Default I/P address in 192.168.1.xx - where xx is the last two digits of the frame's serial number.
Press and hold approx. 5 seconds until LED blinks during operation, to reset only ethernet communication without interrupting audio.

Status LED
Green color indicates "OK".
Flashing orange LED indicates sw update in progress.
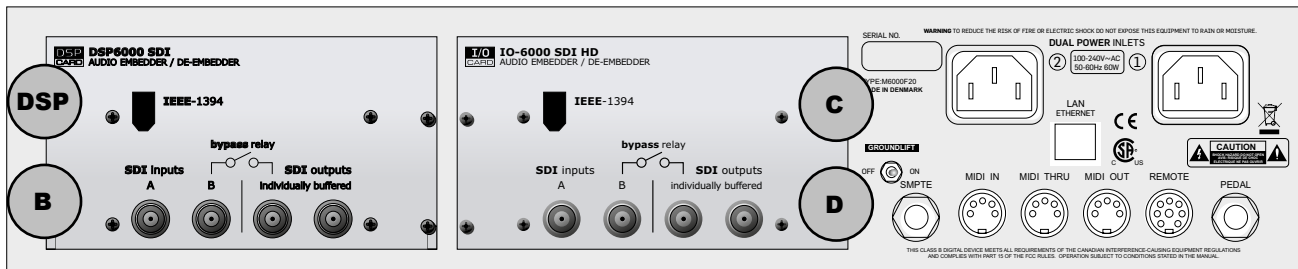Red indicates a network problem. Check cables.

PCMCIA slot
For future software facilities and handling of additional preset banks.

Mainframe Rear

DSP6000 SDI card   **I/O 6000 SDI HD - expansion card**

DSP & I/O expansion slots A B C

DSP, A B, and C slots should be filled consecutively
ALWAYS starting with a DSP card in the DSP slot (upper
left).
Dual-space cards are installed adjacently as illustrated
above.

Following DSP cards are available:

- DSP6000 SDI (dual space)
- AES3 COAX DSP
- DSP AES/EBU Eight channel (single space)

Following I/O cards are available:

- I/O-6000 SDI HD
- AES3 COAX I/O
- AES OCTAL I/O (Balanced)

Dual Power In
The Dual Power input for extended operational security
and stability accepts 100-230V AC. 50/60Hz.
Connect to two independent power sources to be safe in
case of a fuse blow.

SMPTE
1/4" connection for SMPTE sync. Input.

Ethernet/LAN
Connection for external control devices such as a computer
with installed net adaptor or the TC Icon.
The type is 32 bit PCI Ethernet interface fully compliant
with IEE 802.3u 10/100 Mbps CSMA/CD standards.
The connector type is a 100 Base-T RJ-45 (CN13)

Ground Lift
Use this standard chassis ground lift if you encounter
problems with "hum."

MIDI In, Thru and Out
5 pin DIN connectors.

Remote
This connection is for service and test purposes only.

Pedal
General Purpose Input (GPI). GPI input for switching of up
to 8 presets.

Rackmounting Advice
• The DB8/DB4 mainframe should not be placed in an
  environment with a temperature exceeding 50 degrees
  celsius.
• Do not cover the ventilation openings on the sides of the
  frame.

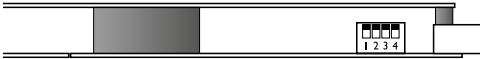The cooling fans are activated according to the
temperature inside.

Warning
**Do NOT mount an ADA 24/96 card in any of the
card slots. DB4/DB8 MKII does NOT support the
ADA 24/96 card and the card will be damaged if
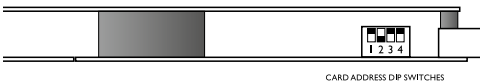mounted in a DB4/DB8 MKII frame!**

I/O Cards

I/O cards MUST be mounted in slots A, B and C consecutively starting in slot A. Dip-switches must be correctly set on the I/O cards.

For DSP cards all jumpers must be set to off (up position)

For I/O cards jumper 2 must be set to on (down-position)

CARD ADDRESS DIP SWITCHES

To install a DSP or I/O expansion card in your Frame.

1 Switch OFF the unit and disconnect the mains power cord.
2. Remove the DUM-1 option plate(s) or module by loosening the 2 screws.
3. Insert the card gently and mount the two screws.

Static Electricity

As all computer hardware can be sensitive to static electricity, certain precautions must be taken to protect it from damage during storage and handling.

Storage

Non-mounted modules should always be stored in anti-static shielded bags.

General Handling

When inserting or removing any modules, avoid touching the circuit board by handling only the rear panel of the module. To minimize the static potentials that can cause damage to the electronic circuits, you should observe precautionary grounding techniques such as touching a grounded DB4/DB8 Mainframe immediately before inserting modules.

Removing Modules

Before removing any card from your Mainframe, unplug the mains power cable. Unplug all other connections from the module before unscrewing the two screws securing the module in the Mainframe. When removing a module from a Mainframe, the card should be mounted directly in another Mainframe or placed in an anti-static shielded bag.

Mounting Modules

Before mounting modules in your DB8/DB4, unplug the mains power cable. Remove the dummy-panel or original module from the slot where you want to install the module. The module should then be removed from the shielded bag and mounted directly in the Mainframe by handling the rear panel of the module only. Avoid touching any components on the PCB-Board.

HW & INSTALLATION

Caution!

The servicing instructions are for use by qualified personnel only. To reduce the risk of electric shock do not perform any servicing other than that in the operation instructions unless you are qualified to do so.
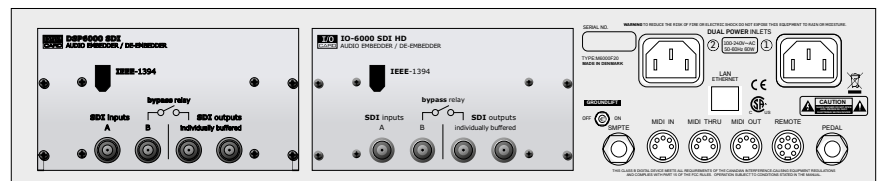
DSP & CARD CONNECTION

SDI cards

The SDI card for DB4/DB8 supports all commonly used SD and HD formats. While de-embedding and embedding 8 channels of audio (48 kHz, 24 bit), selectable from the four SDI Groups in chunks of four audio channels, it passes the video side untouched.

Processing may be inserted on any two of the four SDI Groups, and re-embedding may take place on any two groups. Consequently, the machine enables cross patching of audio and format conversion between SDI Groups. The design features two separate SDI inputs, of which one is active at a time, and two parallel, separately buffered outputs.

The DB's present an attractive SDI solution with massive jitter rejection, 48 bit processing and low latency. They also feature bit transparent, synchronous data handling, enabling routing of data reduced audio, such as AAC, DTS or Dolby E.

DSP6000 SDI
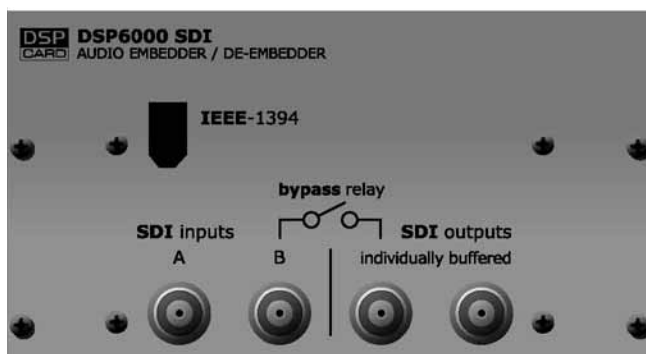
I/O6000 SDI HD
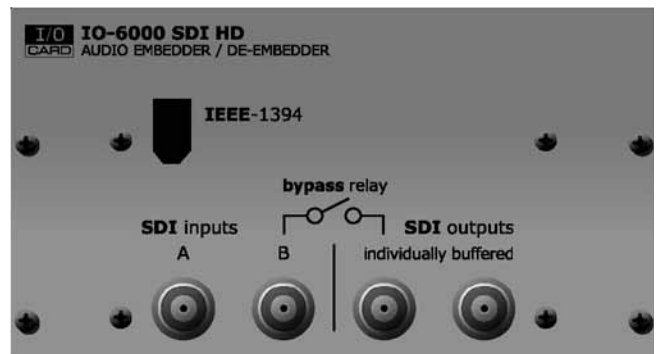
HD Audio

- Embedded audio multiplexer and demultiplexer
- Supports 38 HD video formats
- Supports eight audio channels at one time
- Fully SMPTE 299M compliant & compatible with common non-compliances
- Up to eight bit errors can be corrected in each audio data packet
- Full support for 48 kHz synchronous or asynchronous 16-bit, 20-bit and 24-bit audio
- All four audio groups can be deleted
- Any two audio groups can be replaced when operating in multiplexer mode

SD Audio

- Embedded audio multiplexer and demultiplexer
- Supports 6 SD video formats
- Supports eight audio channels at one time
- Compliant to SMPTE 272M A and C & compatible with common non-compliances
- Full support for 48 kHz synchronous 16-bit, 20-bit and 24-bit audio
- Programmable audio sample distribution
- All four audio groups can be deleted
- Any two audio groups can be replaced when operating in multiplexer mode

Automatic Bypass

The DSP6000 SDI card (bypass version) features automatic bypass at power-down or at loss of power. Even at boot-up audio and video is passed lossless to transmission.

SDI I/O Expansion card

- With the SDI expansion card installed up to 16 I/O channels can be handled either in 1 TV stream with 16 channels or in 2 TV streams with 8 channels each.

Technical notes

Max recommended cable length is 60 meters to and from DB8/DB4. Cable type should comply to SMPTE standards, such as Belden 1694 or better.
Note that in bypassed mode the total cable length pre AND post the unit should not exceed 60 meters.

When an installation is finished, please check bypass functionality by turning off the DB processor in situ to take cable types and cables lengths into account.

AES3 COAX - DSP
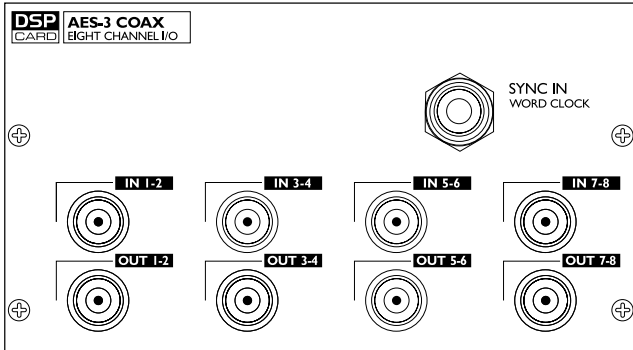
HW & INSTALLATION

Introduction
The optional AES-3 Coax card with 8 BNC connections is especially designed for broadcast installations as they often prefer the 75 Ohm unbalanced BNC connections that support considerably longer cables.

Grounding
A jumper on the card determines grounding to chassis status. Per default the card is grounded to chassis.

If you need to change the grounding status, follow this procedure:

• Disconnect mains power cord.
• Loosen the two screws holding the DSP card and remove the card gently.
• Move the jumper to pins:
  2-3   : Floating (not grounded)
  1-2   : Grounded (default)
• Insert the card gently in the DSP slot and remount the screws.
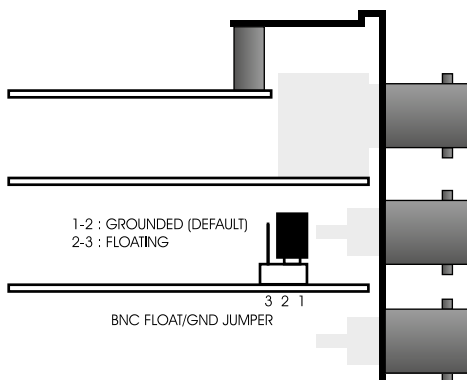
Hardwire Bypass at power off
At power off the frame is hardwire-bypassed via relays ensuring NO signal loss.

SYNC IN, WORD CLOCK
Refer to infomation on next page.

General Handling
When inserting or removing any modules, avoid touching the circuit board by handling only the rear panel of the module. To minimize the static potentials that can cause damage to the electronic circuits, you should observe precautionary grounding techniques such as touching a grounded Mainframe immediately before inserting modules.

AES OCTAL - Expansion
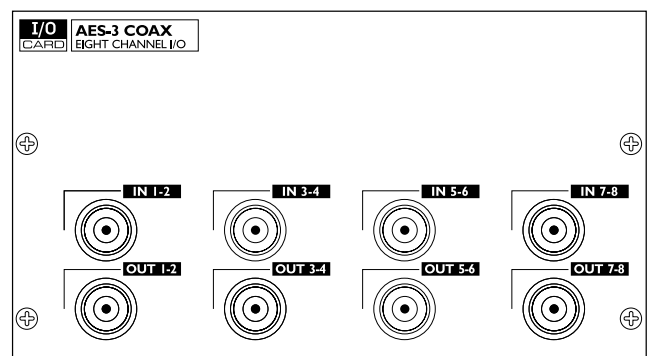
Eight channel I/O expansion card on with BNC connectors.

DSP & CARD CONNECTION

DSP	SIGNAL	DATA IN CH.				DATA OUT CH.				OPEN	GND	SHIELD
		1-2	3-4	5-6	7-8	1-2	3-4	5-6	7-8			
	PIN HOT	1	2	3	4	5	6	7	8	9, 11	10, 12, 13 22, 23, 24	25
	COLD	14	15	16	17	18	19	20	21			

AES/EBU
EIGHT CHANNEL I/O

SYNC IN
WORD CLOCK

SERIAL NUMBER

BNC connector

Use the supplied cable to connect the AES/EBU Inputs/ Outputs.

Cable type is twisted pair (12 pairs) with common screen. Recommended impedance: 110 Ohm.

One end is equipped with an AES/EBU 25 pin D-Sub connector, the other end is equipped with four male XLR's and four female XLR's.
Male XLR's are marked with: Out - 1 to 4.
Female XLR's are marked with: IN- 1 to 4.

Extension cables must be constructed according to AES/ EBU-3 standards.

Following is the pin-out:

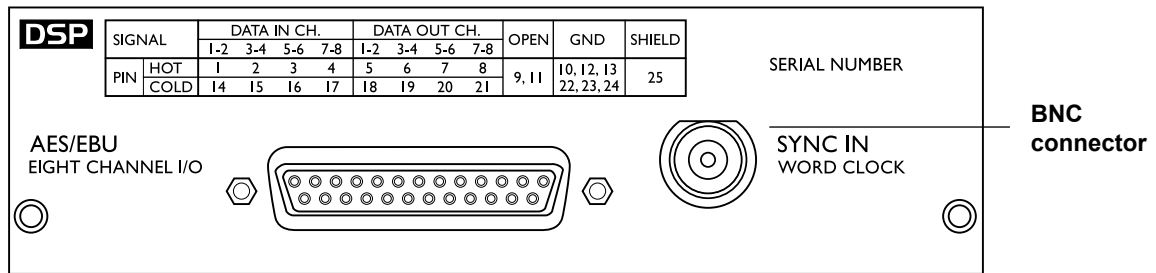| Pin number	Cable pair number	XLR	XLR-pin	Assignment
1	1a	Female 1	2	Input 1/2 +
2	2a	Female 2	2	Input 3/4 +
3	3a	Female 3	2	Input 5/6 +
4	4a	Female 4	2	Input 7/8 +
5	5a	Male 1	2	Output 1/2 +
6	6a	Male 2	2	Output 3/4 +
7	7a	Male 3	2	Output 5/6 +
8	8a	Male 4	2	Output 7/8 +
9	No connection			No connection
10	9a	Female 1	1	Common
11	No connection			No connection
12	9b	Female 2	1	Common
13	10a	Female 3	1	Common
13	10b	Female 4	1	Common
14	1b	Female 1	3	Input 1/2 -
15	2b	Female 2	3	Input 3/4 -
16	3b	Female 3	3	Input 5/6 -
17	4b	Female 4	3	Input 7/8 -
18	5b	Male 1	3	Output 1/2 -
19	6b	Male 2	3	Output 3/4 -
20	7b	Male 3	3	Output 5/6 -
21	8b	Male 4	3	Output 7/8 -
22	11a	Male 1	1	Common
23	11b	Male 2	1	Common
24	12a	Male 3	1	Common
24	12b	Male 4	1	Common
25	Shield	no connection		Common

Twisted cable pairs must be respected

NOTE

Sync In Word Clock

For connections to external clock via the standard BNC connector (see illustration above).
When several devices are connected in a chain and synced via Word Clock, termination on the last device of the chain is necessary.
As the DB8/DB4 is expected to be the last unit in such a chain (or the only), the factory default setting on the DSP card is: TERMINATED (75 Om).

If you need to terminate the Word Clock signal elsewhere in the chain you will need to un-terminate the DSP card. To do this you must remove the DSP card from the mainframe and remove the termination jumper:

• Switch off the power and disconnect main power cord.
• Loosen the two screws holding the DSP card and remove the card gently.
• Remove the terminating jumper near the BNC plug.
• Insert the card gently in the DSP slot and remount the screws.

Termination jumper

SYNC IN TERMINATION JUMPER
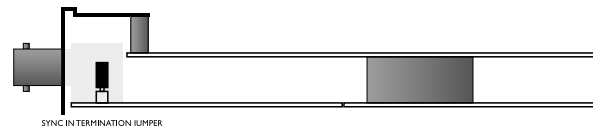
Pins connected via jumper : Terminated (75 Om).
Pins NOT connected via jumper : Not Terminated

The following section describes the TC ICON hardware remote control.

Up to 8 mainframes can be controlled via the TC ICON hardware remote but DB8/DB4 units are most often controlled via PC or Mac using the free TC Icon Software Editor. When using up to four instances of the TC Icon Software Editor; 32 frames can be controlled simultaneously. Please find descriptions of both in the following manual sections.

Remote CPU front panel

Power Key

Switches power On/Off. Green LED indicates power on state.

Remote CPU rear panel
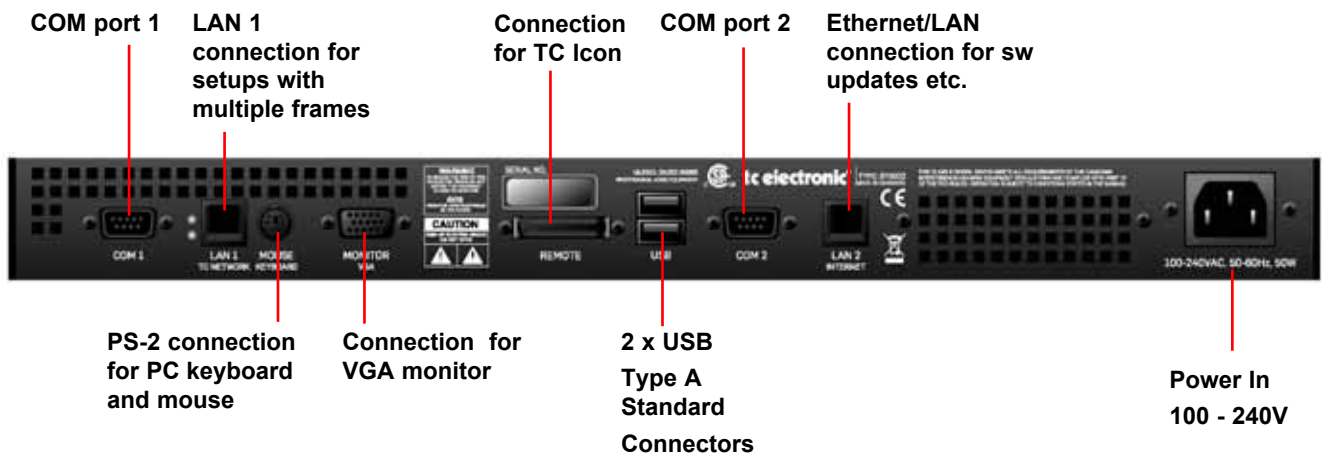
Ethernet Connection

32 bit PCI Ethernet interface fully compliant with IEE 802.3u 10/100 Mbps CSMA/CD standards.
The connector type is a 100 Base-T RJ-45 (CN13)

Connection for PC keyboard or mouse

A standard PS2 Y-splitter must always be used when connecting a PS2-mouse, a keyboard or both.
This cable is not supplied with the unit.

Connection for TC Icon

36 pin multi-cable connection for TC Icon.

NOTE **TC Connection Cable.**
Use the special TC Icon cable supplied with the unit ONLY !

USB Connection

USB connection for some TC products with USB connection. E.g. LM2

Monitor

By connecting a monitor via this standard 15 pin D-Sub you can have the exact same picture as displayed on the TC Icon, running in parallel with the Icon. Color depth is 24 bit with a screen resolution of 640 x 480 pixels at 60Hz.

Power

Connect 100-240V AC, 50/60Hz auto-select.

Rack-mounting Advice

• The CPU unit should not be placed in an environment with a temperature exceeding 50 degrees celsius.
• Do not cover the ventilation openings on the back of the Remote CPU.

NOTE The cooling fan is activated according to the temperature inside.

Com ports / RS232

For connection of TC units with RS232 interface. E.g. P2 and DB2.

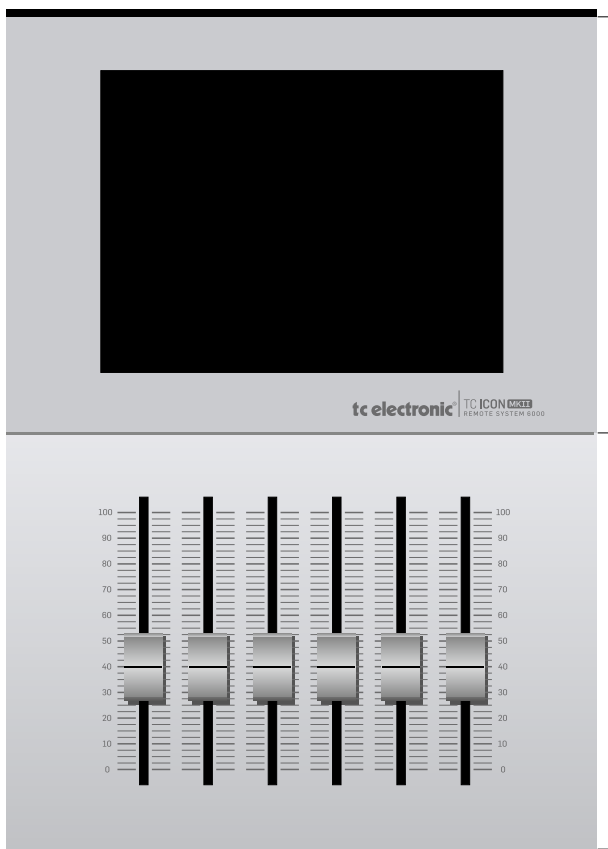## TC Icon Front

TC Icon Rear

── 198 mm ──

Screen

The TC Icon screen is a touch-sensitive capacitive screen. Touch calibration as well as brightness and colors can be adjusted/selected in the TC Icon Setup menu.

Maintenance

The touch screen must be cleaned only with a soft cloth slightly moistened with water or a mild detergent solution.

⚠ **WARNING**   Do not spray liquids directly on the screen.

Faders

The Faders are touch-sensitive. The sensitivity of the Faders can be adjusted so response to movement is achieved only when operated with your finger-tips. This way unintended movement of the Faders with e.g. a sleeve etc. will not result in changes in parameter values. The sensitivity can be adjusted in the TC Icon Setup menu.

TC Connection Cable.
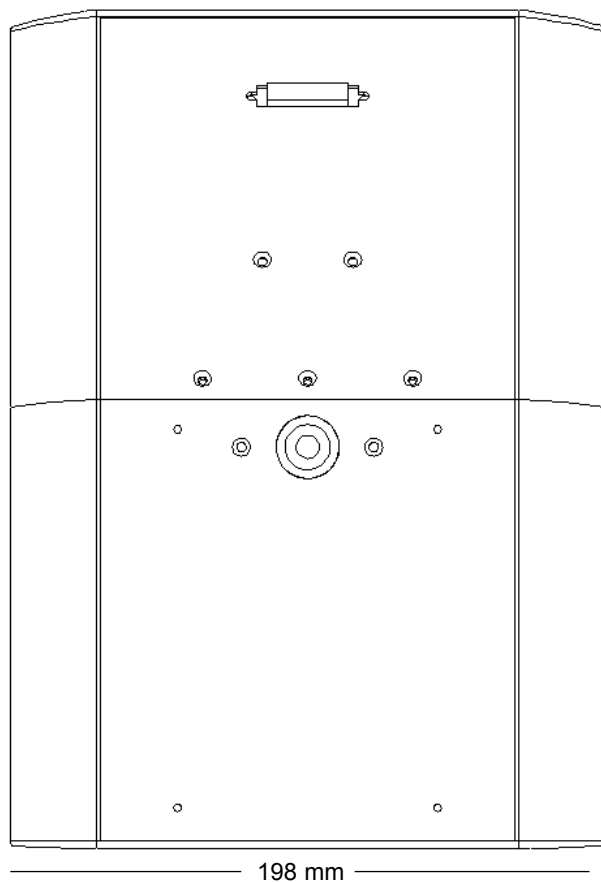
Use the special TC Icon cable supplied with the unit ONLY! No other cables can be used. The 7.5 meters (22 feet) cable cannot be extended as this will reduce the power for the Icon supplied via the cable!

Mic stand mounting

There are two standard threads. 3/8" and 5/8". The TC Icon can be mounted on both types without further accessories.

Mounting of plate.

Mount the supplied plate on the rear of the TC Icon, to assure stable operation when placed on a table or similar. This is easily done using the 4 screws and screwdriver supplied with the unit.

Dimensions

D: 279mm
W: 198mm
H front: 33mm

Keeping your software updated

DB4/DB8 is a constantly evolving platform and updating software is a standard procedure to keep the system up-to-date. Depeding on your setup, software-updates can be done in a couple of different ways described on the following pages.

Software types

There are three types of software in a DB4/DB8 mainframe, one for the TC Icon Remote CPU MKII and then the TC Icon Software Editor for PC and Mac, that can be used instead of a TC Icon (hardware version)

• Frame software
• Net (Ethernet) software
• DSP software

• Software for the TC Icon Remote CPU MKII
• TC Icon Software Editor form Mac or PC

Before diving into the actual update procedures, you should check whether you have the latest software installed already.

UPDATING DB4/DB8 MKII SOFTWARE

Updating Remote CPU MKII software

Update Remote CPU 2

TC ICON MKII

U MKII   **LAN 2**

**Standard
Ethernet cable**
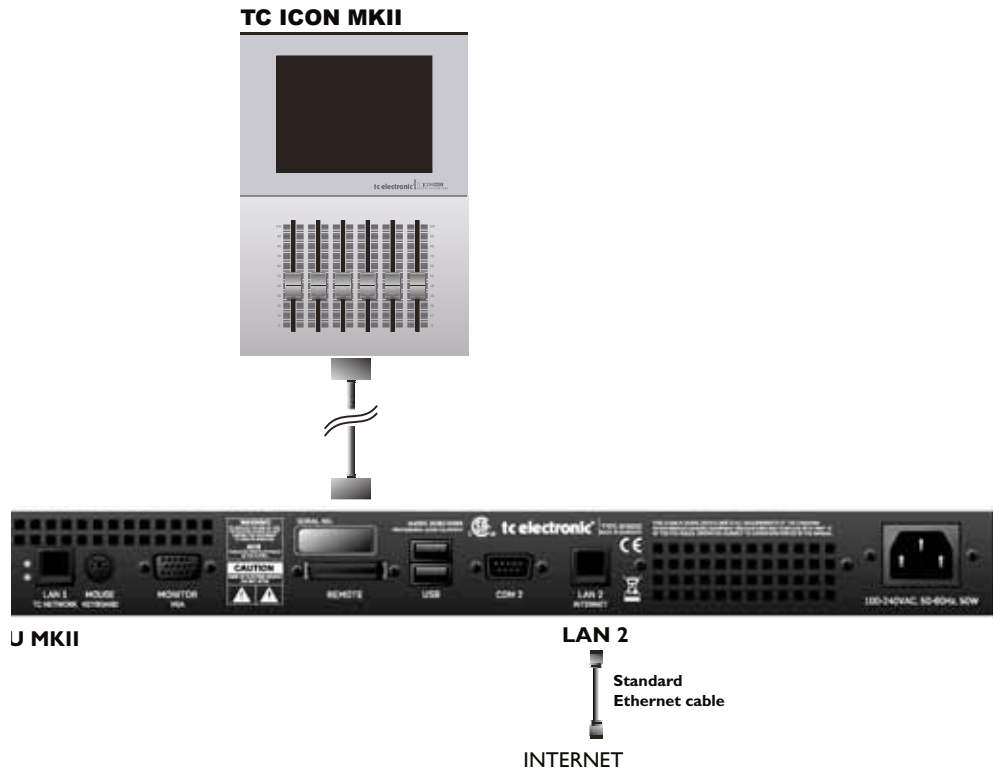
INTERNET

Remote CPU MKII software is updated directly via the internet.

- Connect Remote CPU MKII LAN 2 to your internet router using a standard ethernet cable
- Go to the Setup/Update page and press the UPDATE FROM TC WEBSITE button
- That's it!

If you see a message "Download from web failed", go to the Setup/Net page and ensure that it says:
"Connected. TC Website Available", under Internet DHCP Connection (LAN 2)
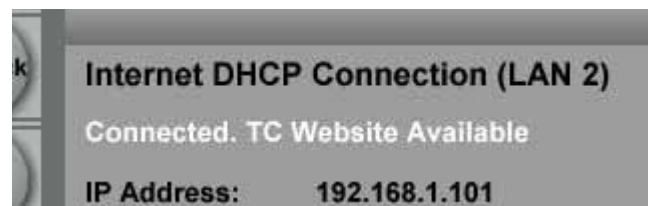
If the message is: "Connected. TC Website Not Available" or "LAN 2 Not Connected", then check cables and try again. If the problem continues you may need to look into firewall issues with your network administrator.

Updating Mainframe 6000 MKII software

**TC ICON EDITOR
on PC OR MAC**

DB4/DB8 MKII

tc electronic

**X-Coupled
Ethernet cable**

- Download and install TC Icon Editor on a Mac or a PC
- Download Frame, DSP & Net software to a folder on your computer.

PC example:
Create a folder in the root directory (C), and call the folder DB8kupdate. The path for this folder is then "**C:\ DB8update".**
Unzip and place the Frame, DSP & Net software in this folder.

Mac example:
Create a folder on your Macintosh HD and call the folder s6kupdate.
The path is then **"//Volumes/Macintosh HD/DB8update".**
Unzip and place the Frame, DSP & Net software in this folder.

- Disconnect your computer from your internet router
- Connect the DB8 MKII LAN port to you computers netcard using a X-coupled ethernet cable
- Open the TC Icon Editor, select the Frame to update and go to the Frame/System/Update page
- Enter the path for the software:
  "C:\DB8update" (for Windows)

Software Update

Update folder
c:\DB8update

or **"//Volumes/Macintosh HD/S6kupdate"** (for Mac) as Update Folder path

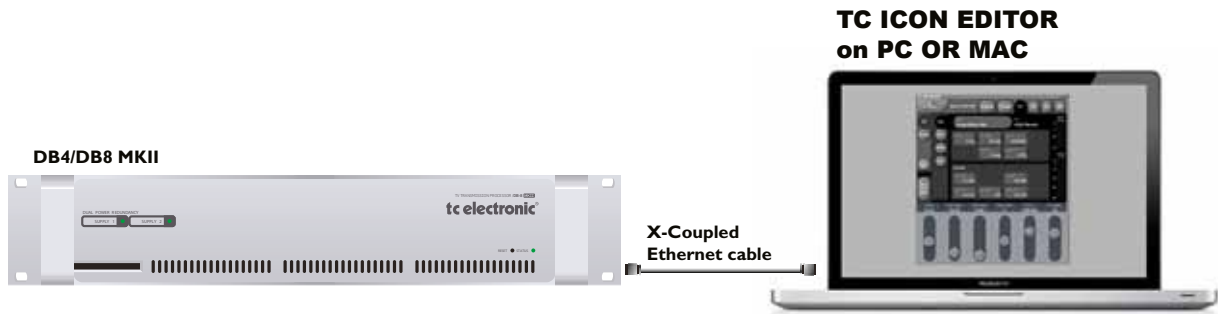**Software Update**

Update folder
//Volumes/Macintosh HD/DB8update

- Select Frame and press Update SW
- Select Net and press Update SW
- Select DSP and press Update SW

The Icon Editor shows the update status via a progress bar.

A log file of the update can be obtained for service purposes. The file is saved at the location where the software is updated from. The file lists the result of the operation and can be opened with most text editors.

TIP To verify correct update-procedure has taken place, check the software version numbers both before and after an update. These version numbers are located on the Frame/System/Version page.

UPDATING DB4/DB8 MKII SOFTWARE

Advanced setup
- Central Server setup for software for update and preset handling

"TC NETWORK" (Static IP) - STUDIO A

8 x XLR FOR DIGITAl I/O

25PIN DSUB TO XLR

8 x XLR FOR DIGITAl I/O

25PIN DSUB TO XLR

DB8/DB4 MKII
tc electronic

DB8/DB4 MKII
tc electronic

Static IP
10.10.10.1

Static IP
10.10.10.2

Standard Ethernet Cables

**TC ICON EDITOR
on PC OR MAC**

Static IP
10.10.10.3

Standard Ethernet Cable

100 MBit HUB

Static IP
10.10.10.4

REMOTE CPU MKII   **LAN 1**

TC ICON ELEVATED
Mounted on 3/4" or 5/8" fittings

TC ICON MKII
tc electronic

"TC NETWORK" (Static IP) - STUDIO B

DB8/DB4 MKII
tc electronic

X-Coupled ethernet cable

LAN 1

Static IP
10.10.10.1

tc electronic

LAN 2   DHCP
e.g. 192.168.1.2

Static IP
10.10.10.2

TC ICON MKII
tc electronic

CENTRAL SERVER

DHCP
e.g. 192.168.1.1

LAN 2

DHCP
e.g.192.168.1.10

CENTRAL SERVER

SWITCH/
ROUTER

INTERNET

Central Server (MotherShip) setup

This is a typical setup in larger studio facilities with several rooms, where you place software updates and e.g. a preset vault on a central server/computer in a shared folder.

The illustration on the previous pages shows two studios and a central server with internet access.

LAN 1 TC Network connects:

- Local DB4/DB8 Mainframes
- Local Remote CPU LAN 1
- E.g. PC/Mac running the TC Icon Editor

LAN 2 Internet

- Connects to central server and internet

To learn about shared folders please refer to the sections:
- *Shared folders PC - basics*
- *Shared folders Mac - basics*

Two networks
- two sets og IP addresses

This setup includes two networks. The static "TC Network" and the DHCP. Each network must use its own unique group of IP addresses.

We assume that the Router in the uses the standard group of IP addresses: 192.168.1.xx, and we must therefore give TC Icon Remote CPU MKII's LAN1 and all DB4/DB8 mainframes its own group.
E.g. 10.10.10.xx, where x is unique for each unit.
(please see illustration on the previous page)

- First change the IP addres of the DB4/DB8 Mainframes to 10.10.10.x via the TC Icon Editor.
  Reboot each frame
- Then change the LAN 1 IP address on the Remote CPU MKII to e.g. 10.10.10.x
  Reboot the Remote CPU MKII

Updating your software:

• Download the software from:
  http://www.tcelectronic.com/system6000support.asp
  and place the software in a **shared** folder on the "central server".
• Select the frame you are about to update
• Go to the Frame-System-Update-Frame page
• Then set the Update Folder path to the shared folder
• Press Update SW
• Repeat for DSP and NET (Ethernet)

Example: PC update folder path

Example: MAC update folder path

Log File,

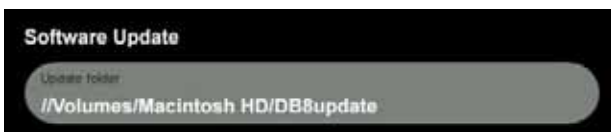As explained on the previous page, a log file of the update can be obtained for service purposes. The file is saved at the location where the software is uploaded from. The file lists the result of the operation and can be opened with most text editors.
The file is saved in the same folder as the software is placed and read/write access for that folder must be set.

PRESET VAULT ON CENTRAL SERVER

In larger studio facilities with several studios, preset banks and automation presets can be stored on a central server in a setup similar to the one described on the previous pages.

We recommend creating two seperate underlined shared folders on the server. One for preset banks and one for automation presets.

In the examples below we use the following folder names:

"S6Kpresets" - for preset banks
"S6Kautomation" - for automation presets

Presets

Presets are handled as entire Banks and you load/save an entire bank between the server and your local DB4/DB8 MKII Mainframe. *

The exact path to the folder on the server must be entered in the File Folder field on the Library bank page.

Example: Path to folder with presets banks - PC

Example: Path to folder with automation presets - Mac

* Detailed description on bank handling is described in the manual section "Library Bank".

Automation Presets

Automation presets are stored and recalled directly to and from a shared folder on the central server.

The exact path to the folder on the server must be entered in the Folder Path field on the Auto File page.

Example: Path to folder with presets banks - PC

Example: Path to folder with automation presets - Mac

To learn about shared folders please refer to the sections:
- **Shared folders PC - basics**
- **Shared folders Mac - basics**

Subnet Mask & TCP/IP addresses

The Subnet Mask is a number that defines a group of computers (or Icons/Mainframes) connected to the network. All units in the group must have the same Subnet Mask. The DB8 Subnet Mask is by default 255.255.255.0

The TCP/IP address is unique to each unit connected in the network. An IP address consists of 4 numbers separated by a "." Example: 192.168.1.1
The first three numbers (e.g. "192.168.1") must be the same for each unit, but no two units in the subnet can have the same the last number.

The TC Icon default address is   : 192.168.1.125
The M6000 default address is   : 192.168.1.xx

- where "xx" is identical to the last two digits in the Mainframes serial number. This way multiple DB8 Mainframes can be setup directly out of the box without changing the IP numbers.
If your computer's IP address (or any in the network) is one of the above you have two options. Either to alter the three last number in your computer's IP address or to alter the last number in the TC Icon and Mainframe IP addresses.

Setting Subnet Mask & TCP/IP

Setting the Subnet and TCP/IP on DB8 Mainframe is done via the TC Icon page: frame/system/main/net

Setting TCP/IP on TC Icon Remote CPU MKII is done on via the Setup/Net page.

Resetting a frames IP address

By pressing and holding the reset button on the frontpanel during boot-up, the frames IP address can at all times be reset to default: 192.168.1.xx*, - where "xx" is the last two digits in the frames serial number.

* If the frames serial number ends on "00", the IP address will be: 192.168.1.100, as "00" is not a valid IP number in all networks.

> **NOTE**
> There is a small risk that two frames have the same last 2 digits in the serial number and thus will conflict after a reset. Solution: - reset one frame and change its IP address before connecting the second.

Setting Subnet Mask & TCP/IP on a PC

To find the TCP/IP address and the Subnet Mask settings on your computer running Windows:

Example - Windows XP
Go to Control Panel, Network Connections, Internet Protocol (TCP/IP)

Subnet Mask & TCP/IP address on a Mac

Example OSX
• Go to "System Preferences - Network
• Under Configure select "manually"
• Set TCP/IP address

For further information please refer to you operating systems manual.

HW & INSTALLATION

NETWORK BASICS

Shared folders PC - basics

When sharing a folder on Windows XP/VISTA/WIN7 you have to make sure that the user of the TC Icon Remote CPU MKII has rights to access read/write in the share folder.

The default user on your hardware ICON is already setup:

User name   : **ICON**
Password   : **Administrator**
(Notice the capital letters, as these are case sensitive)

This user has to be added on the computer holding your shared folder for software updates and preset handling:

- Press start in the lower left corner of your desktop
- Right click "My Computer" and click "Manage"

Computer Management now appears and you click "Local Users and Groups"

Then "Users" and "Groups" appear and you double click on "Users"
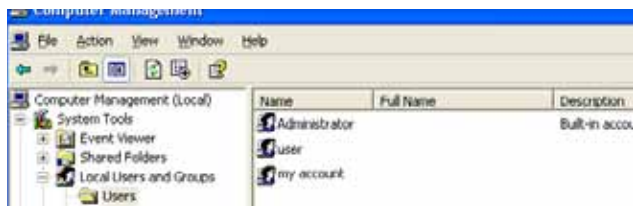
You typically have 3 accounts on your system, Administrator, Guest, and the default account you created while installing windows. You now have to add a new account!

You right click the blank space underneath the 3 accounts and click "New User"

Type in user name : **ICON**
And Password   : **Administrator**

Leave Full name and Description blank unless you need these information. All check boxes should be left as is.

Click "Create" and the "Close" and the user now has rights to access the computer.

Now go to the folder you want to share
- Right-click on the folder and select properties
- Select Sharing
- Mark "Share this folder"
- Type in the name "iconupdate" as share name
- Mark "Maximum allowed" in User Limit

- Then press "Permissions" and allow: Full Control, Change and Read.

- On the "General" page make sure that "Read only" is NOT marked. This allows the update software to write a Result file describing the update success/failure to be written.
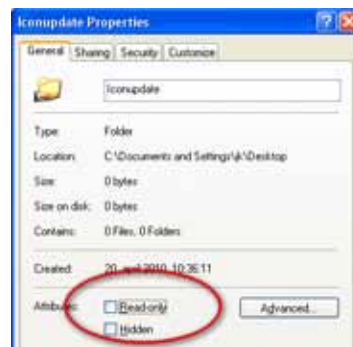
- Press Apply and OK

- The path to the folder is now **\\xxxx\iconupdate** and it is available on the network.
"xxxx" is the name of the computer.

TIP <u>To find the computers name:</u>
Press, START and right-click on My Computer and select properties. Select the tab "Computer Name":

- in this case the name is "mypc"

Windows 7 note

For succesfully sharing a folder on Win7 x86/x64 you have to setup sharing rights for the folder(any share) on the machine.

- Open Network and Sharing Center by clicking the Start button , clicking Control Panel, clicking Network and Internet, and then clicking Network and Sharing Center.

- Click the arrow button next to Password protected sharing, and then click one of the following options:

1 - In the **Public Folder Sharing section** select the following option:
"Turn on sharing so anyone with network accesscan read and write files in the Public folders."

2 - In the **Password protected sharing section** select the following option:
"Turn off password protected sharing."

If option 2 is NOT available it is most likely because you are on a domain controlled network, and we advise talking to your network administrator, before proceeding.

Advise for the network administrator:
The user should be able to sign out of the domain controlled network. Logging into a local account will not solve this issue.

A new account must be added to the domain with read/ write access to the shared folder on the Mothership.

Shared folders Mac - basics

On Mac computers shared folders are setup in System Preferences - Shared.

Press "+" under Shared Folders

• Select the folder holding the software and press "Add".
• The folder is now shared.

There are two ways of updating the software

Updating directly from the Internet
- if the TC Icon Remote CPU MKII's LAN2 (Internet)
connection is connected directly to the internet, the
software can be updated directly.
See explanation on page 14.

Updating from a Central Server
- The software is downloaded, placed in a shared folder on
a central server and updated from there.

Updating directly from the Internet

• First of all you should check whether your Icon software
is up-to-date or not. Press Update Version Info on the
Frame System Version page

• Make sure your DB8 is connected to the Internet via the
TC Icon Remote CPU MKII's LAN2 Internet connection.
Status on the connection can be seen on the Setup/net
page.
It should say "Connected to TC"
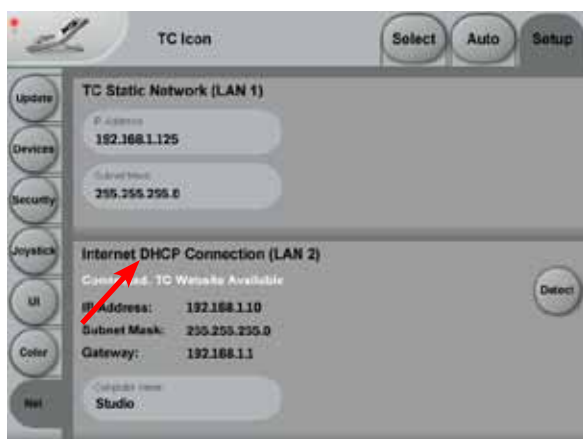
Three indications can be given:
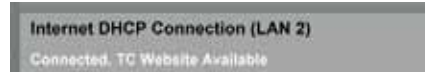
"Connected. TC Website Available". This indicates that
LAN2 is correctly connected to TC Electronics download
server. Go to the Update page and press "Update From TC
Website".

 TC Electronic does NOT have access to any files or
information on devices connected to LAN2.
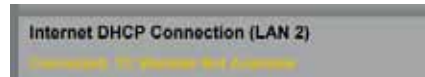
"Connected. TC Website not Available". This indicates that
LAN2 is correctly connected to the internet but you are
either on a closed network with no internet access, or the
download server at TC Electronic cannot be reached.

"LAN 2 Not Connected". You are not connected to the
internet. Please check network setup and all cables, - then
try again.

Updating from a Central Server

Updating TC Icon software from a shared folder on a PC

• Connect the LAN2 connection to your computers network
connection. For a direct connection use a X-Coupled
ethernet cable. If connected via a hub, use standard
(non-X-coupled) cables.
• Download and unzip the TC Icon cab file and place the
file in a folder. This folder needs to be shared.

To learn about shared folders please refer to the sections:

- *Shared folders PC - basics*
- *Shared folders Mac - basics*

- found on the previous pages.

Then enter the correct Network Folder Path to the shared
folder containing the software on the Setup/Net page.

Example PC:

Example Mac:

Introduction

This section of the manual is a general introduction to operate DB8/DB4 via the Software Editor or the TC Icon. The basic DB8/DB4 consists of a Mainframe with a DSP card and up to three I/O cards, plus a PC Editor but the DB8/DB4 can also be controlled via a TC Icon hardware remote.
Several mainframes, Mac/PC's with installed Software Editor and TC Icons can be hooked up at the same time via a standard Local Area Network (LAN).

Accessing a Mainframe

First time you connect the Mainframe to the PC with installed PC editor and network adapter:

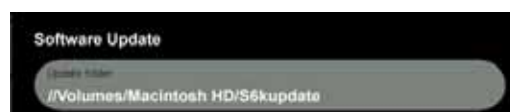• Power up your computer and your DB8/DB4.
• Start the Software editor and the following page appears:

• Press **Assign**
• All connected DB8/DB4 mainframes will be detected and assigned to one of the 8 locations (see fig. 1).
• Press the DB8/DB4 icon to access the DB8/DB4.

Scanning the system
The scenario described above covers the first time you boot up your system or when no connected units are assigned.
To scan the system for all connected units, go to the **Setup** page and press **Detect** (see fig 2). The connected mainframes will the appear in the left side of the display, and you can assign them to any of the 8 locations illustrated in the right side of the display by selecting the frames with the cursors followed by pressing one of the oval keys.

Engine Structure

The core element of DB8/DB4 is the Engine structure. This structure enables you to run up to two/four powerful algorithms/presets simultaneously.
Each Engine is capable of utilizing up to 8 Inputs and 8 Outputs, depending on the selected algorithm/preset.
Up to 16 physical Input and 16 physical Output channels can be routed in the most flexible way.

Engine Resources

The powerful and flexible DSP distribution structure lets you run up to 4 Engine presets at the same time using any available algorithms.

Basic TC Icon operation

Navigation in the Software Editor or TC Icon display is easy as soon as a few basic elements are explained.
The Icon **Link** key in the upper left corner allows you to navigate between the two pages/modes illustrated below.

Generally :
• Press the top-tabs to do primary selections
• Press the side-tabs or elements to do secondary selections.

Fig 1

Via the "overall" **Select & Setup** pages you access overall settings and choices like:
• Selection of which mainframe to operate
• Enable devices to network
• Updates via disk
• TC Icon settings such as display appearance
• SMPTE Automation

Fig 2

The selection of mainframe is done in the Select page illustrated in "Fig 1". The page/pages illustrated in Fig. 2 are pages containing parameters on a specific mainframe. These are the Operating Pages and the page you will be working in once the system is up and running. Only when several mainframes are connected you will need to go to the "overall" Select and Setup pages to switch mainframe.

BASIC OPERATION

UI - Icon Views

On the Icon Setup page two sub-pages are available for controlling the TC Icon appearance.

Fader appearance
Three options are available. Changes will take effect next time you open the TC Icon.

Faders at bottom

Fader at right side

No faders

The Icon LINK key · **Bank Select** · **Library, Frame & Engine select Tabs** · **Function Select Tabs** · **Fader Group Selector** · **Fine Adjust**
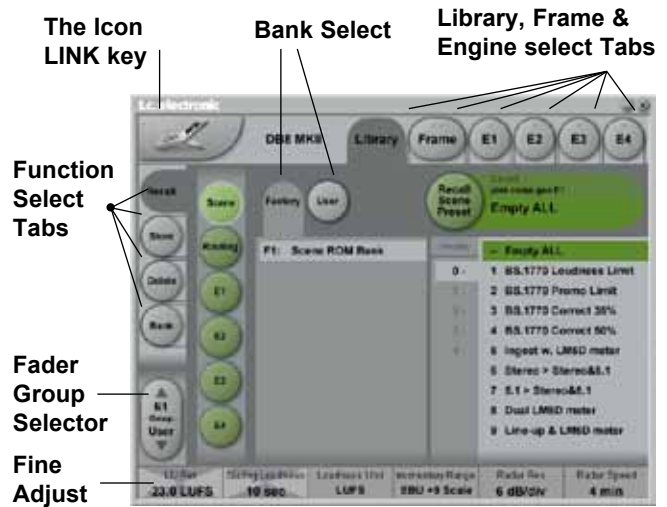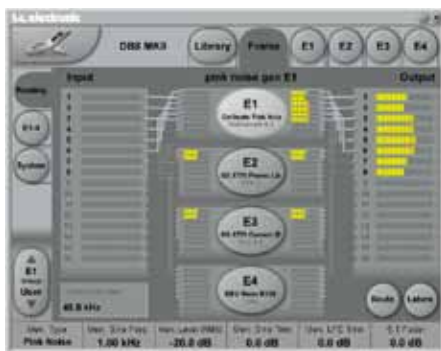
Operating Levels
The Library-Recall page illustrated in Fig.3 leads to explanation of the "operating levels" in the DB8/DB4. We differentiate between 2 levels of presets:
Scene and Engine levels.

- **SCENE**
  This is the most extensive selection you can make. It includes all four Engine algorithms as well as physical and virtual Engine Routings. A Scene recall can be compared to a "total recall."

- **ENGINE**
  Handles the current algorithm in the selected Engine. A single preset can be loaded to each of the four Engines.

Parameter Values and Fader Groups
In the bottom of the display, Fader assignments and values will always reflect the last modified Engine. Most parameters can be controlled via the 6 Faders. As some algorithms hold numerous parameters and we operate with 6 Faders the preset parameters are organized in Fader Groups. To scroll between the Fader Groups use the **Fader Group** selectors.

Parameter value - Fine Adjust
Any parameter value can be adjusted in two accuracies. A Normal and a Fine Adjust - mode. To switch between the two modes press the Value Fields above the faders. As shown in the illustration the Fine Adjust mode will be indicated with two triangles in the value field.

Fader 6
Any parameter can always be assigned to Fader 6 by pressing the parameters value field. Detailed explanation will follow in the next sections.

User Fader Group - Custom Group
A User Fader group where you can assign parameters to all 6 faders can also be created and saved along with the preset. The User Fader group is selected by pressing the **Fader Group** selectors.

Operation Level Tabs

Bank Selectors

Library, Frame and Engine selectors

Function Select Tabs

Fader Group Selector

Press "info" for preset information

Decade selector ("tens")

Parameter Fader values present in the last modified Engine.
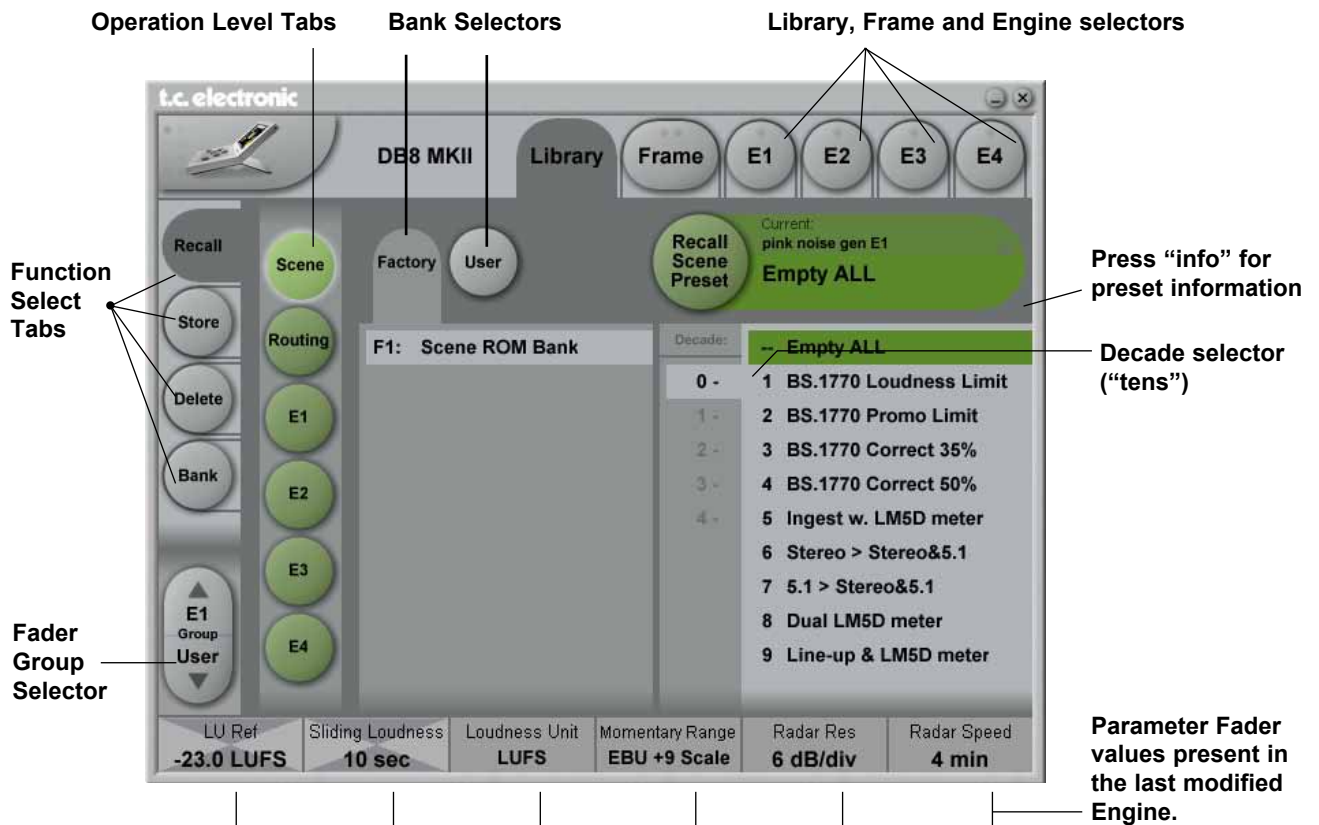
OPERATION

Library Recall

On the Library Recall page the following banks are available for recall operations:

Scene
Gives access to the following preset banks:
• Factory
• User
• Card (optional)

Engine 1-4
Gives access to the following preset banks:
• Factory
• User
• Card (optional)

Routing
Gives access to the following preset banks:
• Factory
• User
• Card (optional)

Recalling a Scene, Routing or Engine preset
• Press the RECALL tab to select the Recall page.
• Now select the level of: Scene, Routing or Engine 1-4.
• Select which bank you wish to recall from: Factory or User. If a DB8/DB4 formatted PCMCIA card is inserted in the Mainframe card-banks will be available and displayed below the User banks.
• Select presets pressing: Bank, Decade(tens) and preset number.
  (grayed out numbers indicates that the Decade is empty)
• Press the **Recall** key to recall/load the preset.

Info
For presets carrying the "info" tag we have added relevant information for the specific preset. Press **Info** and a pop-up display will appear.

Example:

LIBRARY - STORE

Operation Level Tabs   **Bank Selectors**

Function Select Tabs

Fader Group Selector

Library, Frame and Engine selectors

Decade selector ("tens")

Preset location selector ("ones")
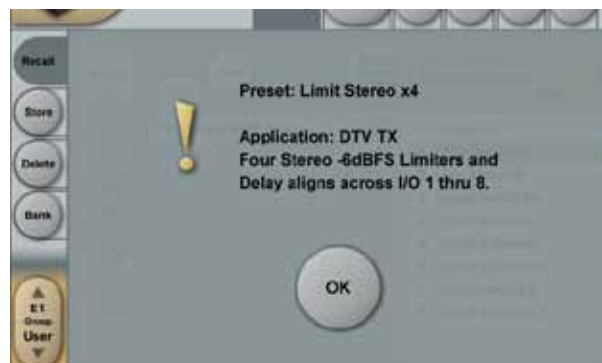
Library Store
For storing operations the following banks are available.

Scene, Engine 1-4 and Routing
Allows you to store in the following banks.
• User
• Card (optional)

Naming Presets
All user preset types can be renamed.

Basic operation
• Press the **Name** field. A keyboard will pop up.
• Type in the new name.
• Press **Enter**.

> **NOTE** The preset is not stored when the keyboards **Enter** key is pressed. Only the name is entered. To store you MUST press the red **Store** key on the Store page.

The previously accessed display will always be present beneath the keyboard. Current Fader values will be displayed and faders can be used to adjust parameter values. The preset is not stored when the keyboard's **Enter** key is pressed. Only the name is entered. To store you MUST press the red **Store** key.

> **NOTE** Fader assignments in the bottom of the display will always reflect the last modified Engine. The Engine Fader Group selector in the lower left corner indicates the Engine in use.

Library - Bank

From the Library Bank page you can copy Scene, Routing and Engine banks to and from PCMCIA card or to and from your hard disk when using a TC Icon Editor.

Basic Operation
Bank copying is handled as a complete User bank transferal.

• Press **Scene**, **Routing** or **Engine** to select preset bank type.
• Select "from" and "to" depending on your choice.
• Press **Copy Bank**.

Scene/Routing/Engine Banks
To/From - Bank/File
Scene, Routing or Engine banks can be backed up and retrieved from a PCMCIA or a file location on a connected computer (when using the TC Icon software editor).

Copy Bank
Press to activate copy function between the selected Banks.

Rename
Press to rename selected bank via the Naming pop-up display.

Delete
Press to clear the selected Bank. You will be asked to confirm your choice to avoid unintended deletion.

Using PCMCIA cards
To use a PCMCIA card with DB8-DB4 the card must be properly formatted. This is done from the Frame/System/Card page.

A 1MB PCMCIA card can hold:
1000 Engine presets in 10 banks of 100 presets
500 Routing presets in 10 banks of 50 presets
500 Scene presets in 10 banks of 50 presets

A 512kB PCMCIA card can hold:
500 Engine presets in 5 banks of 100 presets
250 Routing presets in 5 banks of 50 presets
250 Scene presets in 5 banks of 50 presets

OPERATION

Library, Frame and Engine selectors

Function Select Tabs

Fader Group Selector

Library - Delete

For convenience it is possible to "clean up" the User banks by deleting individual presets.

Deleting a Preset
- Select **Delete** (side tab) and select level by pressing **Scene** or **Engine**.
- Select the preset to delete by pressing the actual Bank, Decade(to select tens) and the actual preset.
- Press the **Delete** key to delete the preset.

Routing
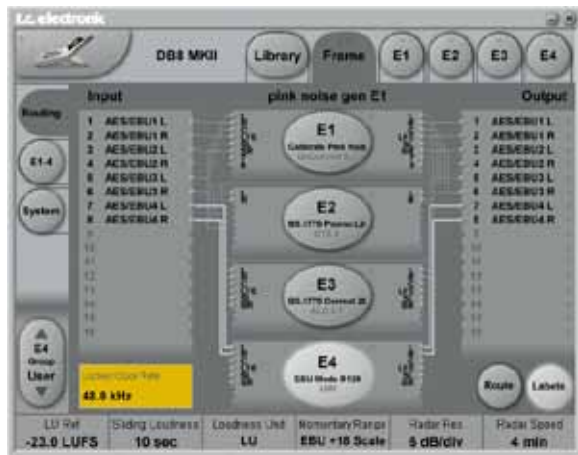
Introduction
The Routing page is the patch bay of the DB8/DB4 Mainframe. All routings of physical Inputs/Outputs as well as internal routing between Engines is setup here.
The understanding of this page is therefore essential to operating the DB8/DB4.

To access the Routing Page:
• Press **Frame** (upper tab)
• Press **Routing** (side tab)
• Press **Route** to enable routing facilities

This is the page where you:
• Have the overall view of all I/O's
• Route physical Inputs to Engine Inputs
• Route Engine Outputs to physical Outputs
• Access Input and Output meters

Routing Inputs
• Press the **Route** key to select route operation.
• Press Engine 1-4 to select the Engine you wish to route
• Select a physical Input or another Engine's Output using **Fader 1**
• Select Engine Input using **Fader 2**

Routing Outputs
• Press the **Route** key to select Route operation
• Press Engine 1-4 to select the Engine you wish to route
• Select an Engine Output using **Fader 5**
• Select Physical Output using **Fader 6**

The I/O possibilities are as follows
• It is possible to route an Input to several Engine Inputs (up to 32), however, it is not possible to connect more than one physical Input to the same Engine Input.
• It is possible to connect all Engine Outputs (up to 32) to one single physical Output.
• It is possible to connect an Engine Output to the Inputs of the three other Engines.

Engine Processing Delay

NOTE Processing delay between the routed Engines behaves as if they were external devices.

Labels
The Input/Output fields can show either meters or the Labels/names on the Input/Output channels. To switch between the two modes, press "Labels".

Renaming Physical Inputs and Outputs
Input and Output channels can be labeled individually. This is a global renaming process and is accessed by pressing **System** (side tab) followed by **I/O** and **Labels**.

Meters
Engine I/O Meters
Engine I/O meters are shown at the left and right of the large E 1-4 buttons in the middle of the display. The number of meters shown will always reflect the number of I/O channels in the loaded algorithm.

Frame - E1 to E4/E2 (DB8/DB4)

This page holds the User group parameters for all four Engines. Selecting User group parameters is done from the Engine pages. Values can be altered from both the Engine Edit pages and the page displayed above. Press the parameter you wish to assign to the Fader located below.

State

Clock Master

Sets the master clock of the processor. A machine with SDI option always expects an SDI input signal. If SDI is not available, the machine reverts to 48 kHz internal rate operation, which should be regarded an error condition.

Clock Fallback

Determines how the processor reacts if it looses external reference. If "Halt" is selected, signal processing stops. If "Internal" is selected, the clock switches to the selected Internal Clockrate in case of lost external reference.

Internal Clock Rate
The internal Clock Rate can be set to 44.1 or 48 kHz.
As it is considered "unconventional" to use the DB8 internal clock in broadcast setups, a yellow indication will appear on the frame select page when internal is selected.

Clock Status

Locked Clock Rate
The Clock Rate to which the Mainframe is currently locked.

Color indications
The yellow color indicates that:
- Auto Revert to Internal is selected and...
- the selected Clock Master has been present at one point but is now lost and...
- the frame has switched to the selected internal clock rate.

The red color indicates "no lock" - check cables and clock source.

Detected Sample Rate
This is a read-only parameter indicating the actual incoming Sample Rate. The tolerance of this detection is +/- 10Hz.

Example: An incoming Sample Rate of 44.056kHz will be detected as approx. 44.06kHz and the system indicates the Locked Clock Rate 44.100kHz.
The system will lock to and reject jitter at any Sample Rate between:

- 42.5 - 45.5kHz
- 46.5 - 48.5kHz

Power State

Display Power State

Off – No indication at power failure

Error – Failure of one power connection indicated by a red indicator on the Frame tab.

Warning – Failure of one power connection indicated by a yellow indicator on the Frame tab.

DB4 and DB8 GPI Specification

DB4 and DB8 offers a GPI input for remote switching between Scenes (all Engine Presets plus Routing). The input can be used for daily operation, or for backup and redundancy purposes. It allows change between 2, 4 or 8 presets using just one connection. GPI functionality includes two flexible modes ("3 presets" and "7 presets") where normal editing of presets is allowed unless the GPI input is moved away from its idle state. These modes are typically be used for putting the machine into a defined state, for instance for backup or emmergency announcements overruling normal operation. GPI switching is "intelligent" and performed without audio interruption as long as the same algorithms are used in Engine 1-4, and only parameters are changed.

Basic operation

GPI functions are accessed from the System/Main/GPI page in TC Icon.

The Enable Recall parameter can be set to Off (GPI recall disabled), 2, 3, 4, 7 and 8 presets.
Presets are selected as a state condition, i.e. presenting the GPI input a permanent voltage signifying a specific preset.
See table below for description of "Enable Recall" settings. NOTE: Moving "Enable Recall" away from the Off position immediately results in a Scene preset recall, and locks the machine from editing of parameters or recall of other presets.

The "Select Between Scenes" parameter sets the preset range from which presets are recalled based on GPI commands. For instance, if set to "10-19", GPI commands recall a User Scene preset in the range 10-19. If "Enable Recall" is set to "4 presets", the GPI input thus selects between User Scene preset 10, 11, 12 and 13.

Enable Recall	Notes
Off	Make sure this state is selected, if GPI recall is not being used.
2 Presets	User Scene 0 or 1 is permanently recalled. Note: Switching to this mode will instantly perform a Scene Recall, even if no connections are made to the GPI input.
3 Presets	As long as the GPI input is idle (+5V), GPI recall is inactive. In idle mode, the machine can be normally controlled from Icon, or using the serial data input.If active GPI windows 1, 2 or 3 are selected, the corresponding Scene is recalled, and the serial data control input is disabled.This GPI mode is suitable for Backup and Alarm messaging operation.
4 Presets	User Scene 0, 1, 2 or 3 is permanently recalled. Note: Switching to this mode will instantly perform a Scene Recall, even if no connections are made to the GPI input.
7 Presets	As long as the GPI input is idle (+5V), GPI recall is inactive. In idle mode, the machine can be normally controlled from Icon, or using the serial data input.If active GPI windows 1-7 are selected, the corresponding Scene is recalled, and the serial data control input is disabled.This GPI mode is suitable for Backup and Alarm messaging operation.
8 Presets	User Scene 0, 1, 2, 3, 4, 5, 6 or 7 is permanently recalled. Note: Switching to this mode will instantly perform a Scene Recall, even if no connections are made to the GPI input.

Installation

Selection between up to 8 presets is achieved by feeding the processor a DC voltage to the 1/4" jack input labeled "Pedal". The input voltage is compared against voltage windows that correspond to certain presets.

Between the valid voltage windows, invalid windows have been inserted to protect against erratic operation. The processor constantly monitors the GPI input, and only if several consecutive measurements point to the same, valid voltage window, a recall is performed.

The voltage windows chosen enable easy "binary relay encoding" as shown in fig. 1. If long cable runs are required, HF decoupling using a ceramic capacitor across the Tip and Sleeve terminals inside the jack plug may be indicated.

Note: The ring terminal of the 1/4" jack is not used.

GPI Implementation

Three modes...

1 of 2: Select between 2 presets
1 of 4: Select between 4 presets
1 of 8: Select between 8 presets
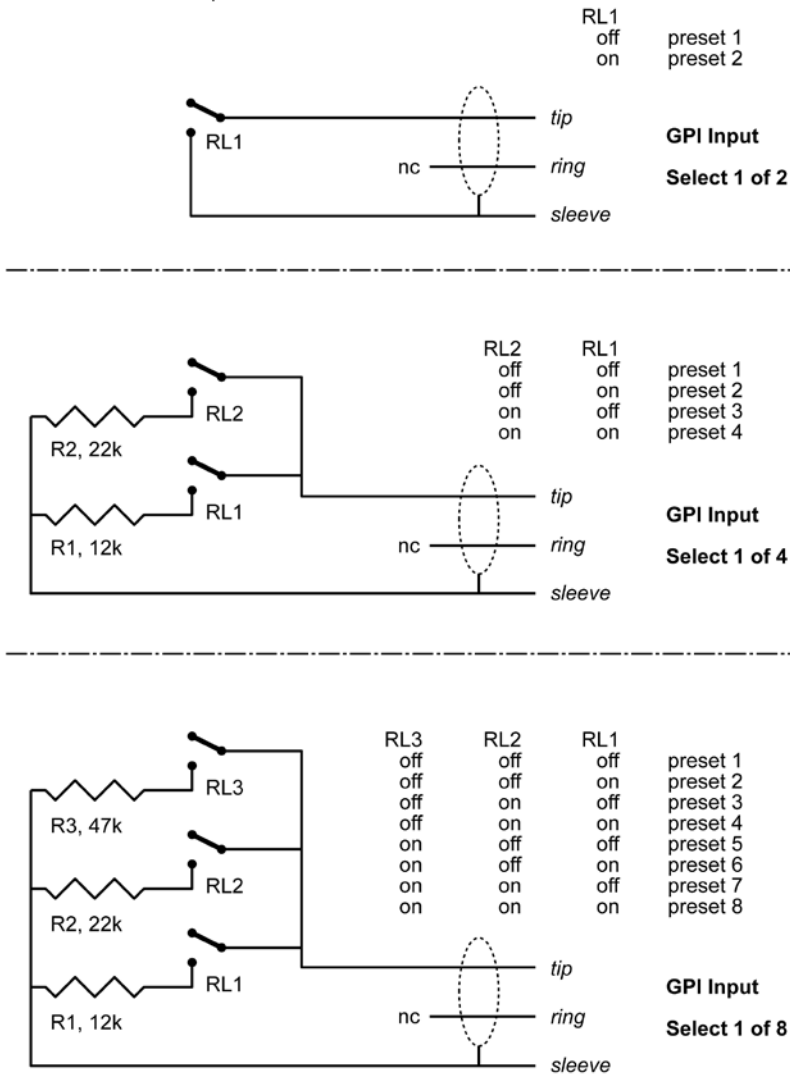
Fig 1, Relay coding of 2, 4 and 8 preset GPI configurations

GPI Technical specifications

Inside the processor, a 10kohm resistor connects the Tip terminal to a +5V power supply. When nothing is connected to the GPI input, the input voltage therefore is +5V. Resistors can be used to pull down the voltage as suggested in Fig 1. In Table 1, voltages outside the limits mentioned are to be considered invalid. No action is taken if invalid measurements are made. GPI recall action resumes when a stable, valid measurement again is detected.

Mode	Preset No	Target / Vs	Min typ / V	Target typ / V	Max typ / V
1 of 2	0	1.000 (idle)	2.67	5.00	5.00
	1	0.000	0.00	0.00	0.51
1 of 4	0	1.000 (idle)	4.16	5.00	5.00
	1	0.687	3.38	3.44	3.50
	2	0.545	2.67	2.73	2.79
	3	0.438	0.00	2.19	2.25
1 of 8	0	1.000 (idle)	4.50	5.00	5.00
	1	0.824	4.06	4.12	4.18
	2	0.687	3.38	3.44	3.50
	3	0.600	2.94	3.00	3.06
	4	0.545	2.67	2.73	2.79
	5	0.489	2.38	2.44	2.50
	6	0.437	2.13	2.19	2.25
		0.400	0.00	2.00	2.06

Tech Notes:
"Idle" refers to the state when no input is connected, or when the input is left floating.

Rather than absolute voltage measurements, the windows are defined as a fraction of the supply voltage, Vs. This voltage can be measured with a high impedance DMM on the Tip terminal when no pull down resistors are applied.

The table shows values as a fraction of Vs, and, as a guideline, typical voltages when Vs=5.000V. (If the Supply voltage is e.g. 5.015V, the table should be corrected by multiplying these values by 5.015/5).

OPERATION

MIDI Setup Page

Introduction

MIDI Channels
To recall presets for Scene, Routing and Engines 1 to 4 you must first setup individual MIDI channels for these categories.
In the example above MIDI channels 1 to 4 ar set up for Engines 1 to 4 respectively and channel 5 to access Scene presets and channel 6 to access Routing presets.

Bank Mode
The Bank mode settings determine the destination bank of the received program change on the specified MIDI channels.

Normal mode:
This mode requires that the external sending MIDI device can send both Controller 0 and 32 in addition to MIDI program changes. This is an essential feature to recall presets from a device holding more than 128 preset locations. (see table in next column for details)

Factory and User mode:
These modes will force any incoming program change to access either Factory or User banks directly and are typically used if your sending MIDI device cannot send Controllers 0 and 32 as described above.

Normal mode
In Normal mode all banks can be accessed for program changes. Bank selection is done via Ctrl 0 (MSB) and Ctrl 32 (LSB):

- Controller 0 must be set to 0 in all cases.
- Controller 32 value must match the bank number you wish to address according to the table below.

Ctrl 32 value 0	- F1:	**Loudness, Stereo**
Ctrl 32 value 1	- F2:	**Loudness, Multichannel**
Ctrl 32 value 2	- F3:	Reserved
Ctrl 32 value 3	- F4:	**Format Conversion**
Ctrl 32 value 4	- F5:	Reserved
Ctrl 32 value 5	- F6:	**Delay and EQ**
Ctrl 32 value 6	- F7:	Reserved
Ctrl 32 value 7	- F8:	**Monitor and Lineup**
Ctrl 32 value 8	- F9:	Reserved
Ctrl 32 value 9	- F10:	Metering
Ctrl 32 value 10	- F11:	Reserved
Ctrl 32 value 11	- F12:	Reserved
Ctrl 32 value 12	- F13:	Reserved
Ctrl 32 value 13	- F14:	Reserved
Ctrl 32 value 32	-	User bank
Ctrl 32 value 64	-	Card Bank 1
Ctrl 32 value 65	-	Card Bank 2
Ctrl 32 value 66	-	Card Bank 3
- - - - -		
Ctrl 32 value 73	-	Card Bank 10

Example:
You wish to recall preset 5 from the Loudness, Stereo bank. According to the table above:
- Set Ctrl 0 to "0" and Ctrl 32 to "0" and send program change no 5.

SysEx Device ID
Range: 0 to 126
Select SysEx ID for the Mainframe.

MIDI Rate
Range: Normal or 19.2
This parameter sets the Baud Rate / MIDI transfer rate. The default setting is "Normal". However, "19.2" may be better suited for external master control programs as found in broadcast stations.

MIDI Control Page

On the MIDI Control Page the following options are available:

Read Program Change
Select whether the Frame should read incoming program changes or not.

Send Program Change
Select whether the Frame should send program changes to MIDI out when presets are recalled via TC Icon or the TC Icon Software editor.

Read Control Change
Select whether the Frame should Read Control Changes messages.

Send Control Change
Options here are Single (7 bit) or Double (14 bit) precision.

Read SysEx - Send SysEx
These two parameters determine whether the Frame should read and send SysEx.

MIDI DUMP Page
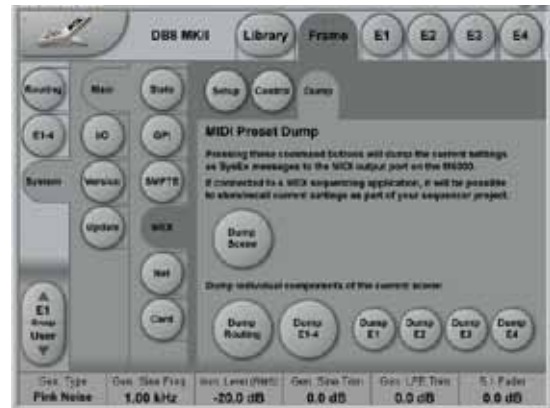
Various options for MIDI information dump is available.

Dump Scene - includes both routing and all presets loaded in the Engines.

Dump Routing - dumps current routing presets.

Dump E1-E4 - Dumps all currently loaded presets in all four Engines.

Dump E1, Dump E2, Dump E3, Dump E4 - Individual dump from each Engine with the currently loaded algorithms.

Net

Network Identifier

Press the field "Network Identifier" to enter a name for the Mainframe. This is the global TC network name for the frame. By giving the frame a specific name it will be easier to identify the frame when hooked up in a network with several frames.

Card

Format card with empty preset banks

This function will format a PCMCIA card with DB8/DB4 preset banks. A formatted 1Mb card will hold:

- 10 Engine user card banks of 100 presets
- 10 Routing user banks of 50 presets
- 10 Scene user banks of 50 presets

You may also choose to format and prepare a 1 Mb card for Automation Lists.

I/O - Setup - AES card installed

This page indicates the frame's current card configuration.

I/O - DSP - AES card installed

This page indicates current status on the DSP card.
- Dither for AES pairs can be set to 24-20-18-8

I/O - Setup - SDI card installed

I/O Setup page
Setup page with SDI installed.
The Frame-System-I/O-Setup appears as illustrated below when a SDI card is installed.

I/O - DSP - SDI card installed

Input Select
Select between SDI inputs A or B

Input/Output channels 1-4/5-8
Use the Input/Output parameters to select which SDI Groups become available on the Routing display of the processor.

Group 1-4 indicators
These "LEDs" indicate which SDI Input Groups have audio available.

Locked Clock Rate
This information field displays the currently locked Clock Rate, which is always 48 kHz when the processor is used with SDI.

Frequency
This information field displays the SDI Input data rate in a range between 140 Mbps and 1.5 Gbps.

OPERATION

Format

This information field displays the SDI Input format.
A partial list of SDI formats handled and recognized by
DB4/8:

Format	Latency
SD 29.97	85/1.77
SD 25	87/1.81
1280x720/60p	38/0.79
1280x720/59.94p	38/0.79
1280x720/50p	39/0.81
1280x720/30p	38/0.79
1280x720/29.97p	38/0.79
1280x720/25p	39/0.81
1280x720/24p	39/0.81
1920x1080/30p	40/0.83
1920x1080/29.97p	40/0.83
1920x1080/25p	42/0.88
1920x1080/24p	42/0.88
1920x1080/60i	40/0.83
1920x1080/59.94i	40/0.83
1920x1080/50i	42/0.88
1920x1080/25i	42/0.88

I/O - A/B/C

Input, Output and Dither settings for e.g. an SDI 8
card placed in slot B/C as well as Locked Clock Rate,
Frequency and Format indication

I/O - Labels

All physical Inputs and Outputs can be named/renamed.
Enter the Titles page by pressing the tabs System and
Titles. Press any of the 16 Inputs/Outputs and the Naming
display will pop up. Enter adequate name for the Input/
Output and press **Enter**.
The names will be displayed on the Frame-Routing page.

 The I/O Labels are global and are not affected by
preset changes.

Version

The Version page indicates the Frame serial number and
current software versions.

Update Version Info

Pressing the UPDATE VERSION INFO will download a file
to your hard drive containing information about the latest
sw. versions. - The TC Icon Editor will check whether you
are running the latest version and write status next (e.g.
new Version available) to each software type as indicated
above.

For information on how to update the software please refer
to page 16.

Name of the currently recalled preset   **Library Frame and Engine Selectors**

Display function indicator

Parameter Pages

Link key

Fader Group Selector

Fine Adjust Mode selected

Gain Meters

Input/Output Meters

Fader Group Parameters/ Value fields
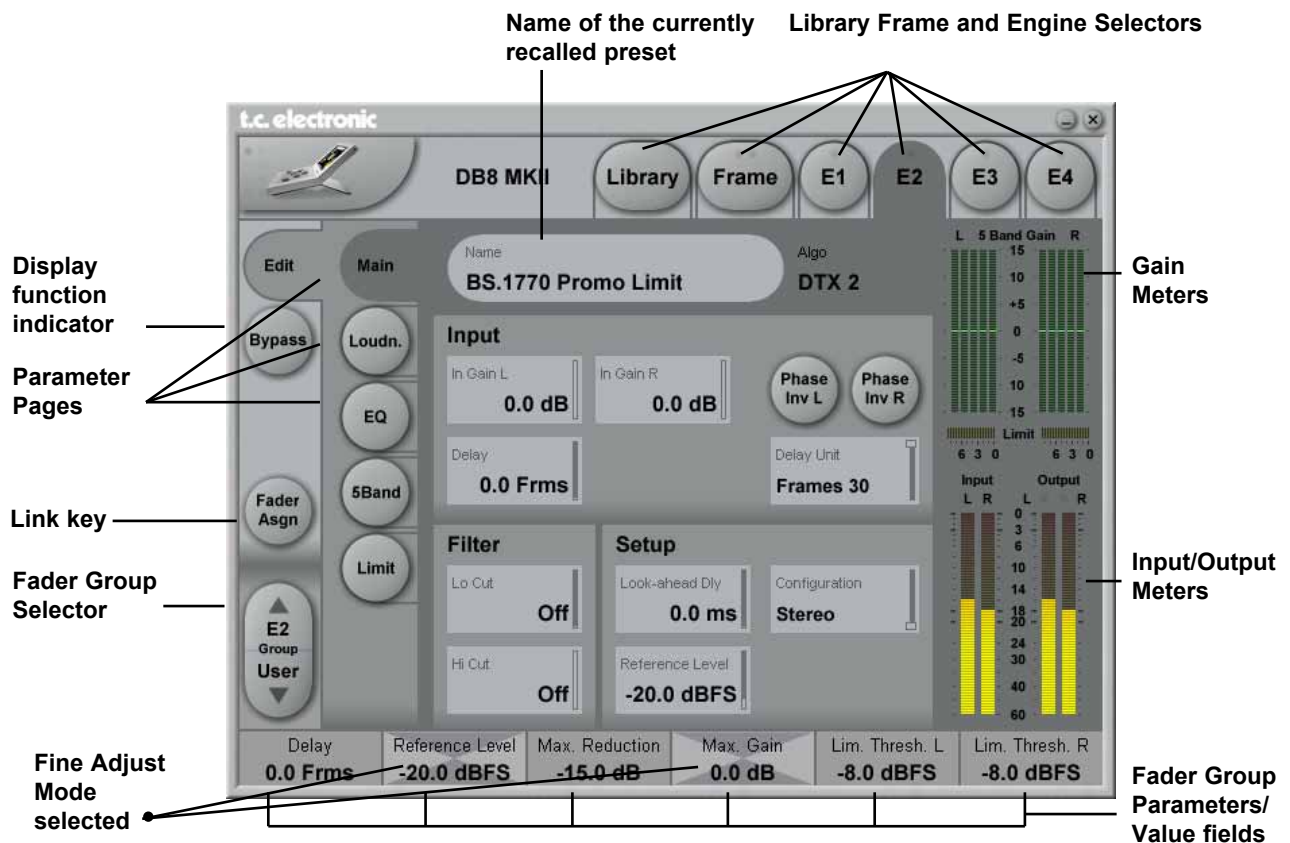
The Engine 1-4 Edit Pages

This is where you edit algorithm parameters.Parameters in several algorithms are distributed on different pages. As illustrated above, the Multiband-2 has 5 pages: Main, Loudness, EQ, 5 band and Limiter. Depending of the quantity of parameters represented in the groups one or more groups will be displayed.

Basic operation
- Press E1 to E4 to select Engine. Parameters for the recalled algorithms are instantly available for editing.
- Select a parameter group. In the example above - a Multiband-2 algorithm - the groups are Main, Setup, Expander, Compressor, Limiter and Output.
- Parameters are assigned to Fader Groups. Select Fader Groups using the **Fader Group** selector.
- Press any parameter and it is assigned to Fader 6.

Fader User Group - Assign key

By pressing the **Fader Group Selector Up** key you enter the User group. In this group you can assign any parameter to any fader. The User Fader group is stored with a preset.

- Press the **Link** key.
- Select the fader you wish to link a parameter to, by pressing the field just above the fader.
- Press the parameter you wish to link to the selected fader.

Bypass
The **Bypass** key will respond in different ways depending on the recalled algorithm. See specific algorithm description.

Naming a Preset
- Press the Name field. A keyboard will pop up. (See the "Naming display" section).
- Type in the new name.
- Press **Enter**.

Parameter value - Fine Adjust

Any parameter value can be adjusted in two accuracies. A Normal and a Fine Adjust - mode. To switch between the two modes press the Value Fields above the faders. As shown in the illustration the Fine Adjust mode will be indicated with two triangles in the value field. (fader 2+4 in the illustration).

Software Editor Setup menu

Info
On this page, the current Software Editor version number is listed.

Devices
On this page you control and assign the devices in the setup.

- Press **Detect** to scan the network for connected devices. All devices will appear in the list.
- Now assign the devices one at a time by selecting the device using the **Cursor up/down** followed by pressing one of the eight oval keys in the right side of the display.

Security
In the security page you can activate/deactivate the "sticky clip" function.
When this function is set to "on" the Overload LEDs on the Routing page will stay lit once activated, until the **Reset Clip** key is pressed.

Color
Select the Color scheme of your choice. Depending on the surrounding light conditions, different schemes may be more appropriate than others.

Icon User Interface
(only available on the hardware version of the TC Icon)

Go to the Select & Setup pages pressing the TC Icon key in the upper left corner.
Press SETUP (upper tab) and UI (side tab) to enter the setup page for the TC Icon display.

TC Icon Display Parameters
In this display, you set up various parameters regarding the appearance of the display as well as the Fader Touch Sensitivity.

Display Brightness
Adjust the brightness of the display using either the **Arrow** cursors or simply drag the "**Adjust** handle".

Show Mouse Cursor
Press to show mouse/pointer position.

Calibrate Display Touch
For optimal performance the touchscreen will at times need to be calibrated. Press and follow instructions to calibrate the touchscreen.

Fader Sensitivity
To avoid accidental movement of the faders, they are sensitive to humidity and will only respond when touched by your skin.

Enable Fader Touch
Enables touch sensitivity of the Faders.

AC/DC Sensitivity
Sets the Faders, sensitivity to AC and DC. Adjust these handles to achieve optimal performance in your environment.

SMPTE

Reader Enabled
On/Off switch for the DB8/DB4 SMPTE Reader.

Frame Rate
Range: 24 FPS, 25 FPS, 29.97 FPS,
30 Drop FPS, 30 FPS.

Running Status
The small field in the top left corner of the numeric display will state "Running" when SMPTE clock is running.

Auto Edit Page

In the Auto Edit page, all automation Events are listed and handled.

Keep
Press to save the Event List locally on the Icon. It is possible to save one Event List on the Icon. Additional cue-lists can be stored and recalled on a PCMCIA card.
The **Keep** key will turn red as soon as any editing of the list has taken place, indicating that you must press to save the list.
This key corresponds/is the same, as the **Keep** key located on the File page. (see following page)

Write
When enabled, any program change is written to the SMPTE Event List. This can be Engine, Routing or Scene recalls.

Read
When enabled, the Event list will be executed according to incoming SMPTE clock. Read and Write functions can be activated simultaneously.

General Read and Write status is given in the **Icon Tab** in the left corner.

Follow
When Follow is selected the list will scroll and the current event/song position will always be in the top line.
When Follow is de-selected the list will NOT scroll but the cursor position will move according to song-position.

Modify
Press this key to access Event parameters for the currently selected Event. (see further description below)

Delete
Press to delete the selected Event.

Event Parameters
For each Event the following parameters are available.

Time   - indicates the SMPTE time at which the Event
           takes place.
Device - indicating on which Device Mainframe the
           Event is taking place. Device numbers 1-8,
           corresponds to the Device position at the
           Select page.
Event   - states the occurring Event at the given time.

Insert New Event
Press to insert an Event (see further description below)

Cursor
The triangular cursor always indicates the current clock position in relation to the Event List.

Modify/Insert Page

SMPTE

Event Settings

Operation
- To access Event settings, press **Modify** in the Edit page.
- Set up all parameters for the Event you are about to Modify or Insert.
- Press OK to confirm.

Time
The time where the Event being Modified or Inserted is taking place.

Step/Adjust
Range: Frame, 1 Second, 10 Seconds, 1 min.,
10 min. or 1 hour.
Use the Step parameter to select Adjust range and the Adjust parameter to increase/decrease the time.

Device
This parameter selects which Mainframe connected to the LAN you are working on. Device numbers 1-8, corresponds to the Device position at the Select page.

Preset Type
Selects whether the preset Event you are working on is a Scene, Routing, Engine or a System preset.

Bank
Select the bank related to the preset you are about to setup/recall via SMPTE.

Preset
Select the preset from the selected bank.

File

Current List

Keep
Press to save the Event List locally on the Icon. It is possible to save one Event List on the Icon. Additional cue-lists can be stored and recalled on a PCMCIA card..
The **Keep** key will turn red as soon as any editing of the list has taken place, indicating that you must press to save the list.
This key corresponds/is the same, as the **Keep** key located on the Edit page. (see previous page)

Revert
This "Undo" function allows you to revert the to the last saved SMPTE Event list. This is the List that is stored locally on the TC Icon.

Clear
Press **Clear** to delete the entire SMPTE Event list present in the TC Icon.

File Storage
Event lists can easily be organized and saved to a PCMCIA card in the Mainframe. Mainframe selection is done in the Auto Edit page.

PC
Press to get a list of all SMPTE Event lists stored on the connected computers hard drive.

Card
Press to get a list of all SMPTE Event lists stored on a PCMCIA card.

New
Press **New** to create and name a new Event list.

Save
Press to save the current Event list.

Load
Press to load Event list.

Delete
Press to delete selected Event preset from the Event Preset list.

Options

Automation Timecode Options

Master Sync Device
Select which of the Mainframes connected on the LAN you wish to act as Master Clock.

Start Of Daytime
Range: 23:00:00:.00 or 00:00:00:00
If the SMPTE time code present on your tape media or film does not start exactly at the beginning of the tape, the 23:00:00:00 setting would be a good choice to keep chronological order in the Event List.

Support of SNMP
Multiple DB8 and/or DB4 units can be monitored using industry standard SNMP trapping. SNMP includes monitoring of sync status, overload, silent outputs and more. - Look on www.tcelectronic.com under "Products -DB8/DB4" for details.

CONTROLLING MORE THAN 8 FRAMES

It is possible to control up to 32 System DB4/DB8 Mainframes using four instances of the TC Icon Editor on a PC*.

<u>To do so, follow these steps:</u>
- Place the TC Icon exe file on your desktop if it is not already there.
- Create three shortcuts to the Icon.exe file and rename each instance.
  E.g. Icon 1, Icon 2 etc.
- Then right-click on each shortcut and enter the following lines in "Target":

"C:\Documents and Settings\MYPC\Desktop\Icon.exe" \instance=1
"C:\Documents and Settings\MYPC\Desktop\Icon.exe" \instance=2
etc.
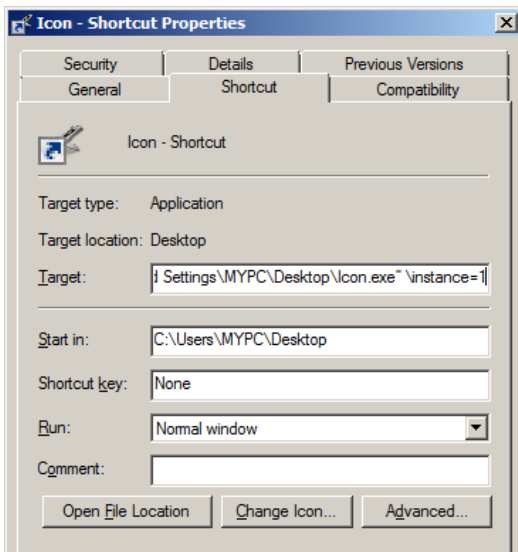
* Not available on Mac

LICENSE AGREEMENT

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The TC ICON operating system is based on Microsoft NT.

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Single TC ICON/Remote CPU
The TC ICON OS is licensed with the TC ICON/Remote CPU as a single integrated product. The TC ICON OS may only be used with the TC ICON/Remote CPU as set forth in these licensing terms.

Rental
You may not rent, lease or lend the TC ICON OS.

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You may permanently transfer all of your rights set forth in these licensing terms only as part of a permanent sale or transfer of the TC ICON/Remote CPU, provided you retain no copies, you transfer all of the TC ICON OS (Including all component parts, the media and printed materials, any upgrades, these licensing terms, and, if applicable, the Certificate(s) of Authenticity), and the recipient agrees to these licensing terms. If the TC ICON OS is an upgrade, any transfer must also include all prior versions of the TC ICON OS.

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Note on Java Support
The TC ICON OS may contain support for programs written in Java. Java technology is not fault tolerant and is not designed, manufactured, or intended for use or resale as online control equipment in hazardous environments requiring fail-safe performance, such as in the operation of nuclear facilities, aircraft navigation or communication systems, air traffic control, direct life support machines, or weapons systems, in which the failure of Java technology could lead directly to death, personal injury, or severe physical or environmental damage. Sun Microsystems, Inc. has contractually obligated Microsoft Corporation to make this disclaimer.

EXPORT RESTRICTIONS
Export of the TC ICON OS from the United States is regulated by the Export Administration Regulations (EAR, 15 CFR 730-744) of the U.S. Commerce Department, Bureau of Export Administration (BXA). You agree to comply with the EAR in the export or re-export of the TC ICON OS: (i) to any country to which the U.S. has embargoed or restricted the export of goods or services, which as of May 1999 include, but not necessarily limited to Cuba, Iran, Iraq, Libya, North Korea, Sudan, Syria, and the Federal Republic of Yugoslavia (including Serbia, but not Montenegro), or to any national of any such country, wherever located, who intends to transmit or transport the TC ICON OS back to such country; (ii) to any person or entity who you know or have reason to know will utilize the TC ICON OS or portion thereof in the design, development or production of nuclear, chemical or biological weapons; or (iii) to any person or entity who has been prohibited from participating in U.S. export transactions by any federal agency of the U.S. government. You warrant and represent that neither the BXA nor any other U.S. federal agency has suspended, revoked or denied your export privileges. For additional information see http://www.microsoft.com/exporting.

TECHNICAL SPECIFICATIONS - FRAME

Platform
Number of audio channels:	Max 16 inputs, 16 outputs
Number of processing engines:	4 in DB8, 2 in DB4
Processing Delay:	0.15 ms + 0.21 ms per engine @ 48 kHz, 0.07 ms
Additional delay:	0-4 sec per audio channel
Output Dither:	HPF/TPDF 8-24 bit and Off
Frequency Response DIO:	DC to 23.9 kHz ± 0.01 dB @ 48 kHz
Internal sample rate:	48.0 kHz, 44.1 kHz
Internal clock precision:	+/- 30 ppm
Jitter rejection at external sample rates:	42.5 to 45.5 kHz, 46.5 to 48.5 kHz
Rejection filter (4th order):	< -3 dB @ 50 Hz, < -65 dB @ 500 Hz, < -100 dB @ 1.4 kHz
Rejection filter peak (jitter gain):	< 1 dB @ 2 Hz

PCMCIA Interface
Connector:	PC Card, 68 pin type 1 cards
Standards:	PCMCIA 2.0, JEIDA 4.0
Card Format:	Supports up to 2 MB SRAM

Control Interface
MIDI:	In/Out/Thru: 5 Pin DIN
"GPI control input"	Change between 2, 4 or 8 presets
Remote:	Custom MIDI In & Out
SMPTE:	Input for timed program changes
Ethernet, SNMP and remote control:	10/100 Mbits/s, Base-T

EMC
Complies with:	EN 55103-1 and EN 55103-2, FCC part 15 class B, CISPR 22 class B

Safety
Certified to:	IEC 60065, EN 60065, UL 6500 and CSA E65

Environment
Operating Temperature:	32° F to 122° F (0° C to 50° C)
Storage Temperature:	-22° F to 167° F (-30° C to 70° C)
Humidity:	Max. 90 % non-condensing

General
Front indicators:	PSU 1 OK, PSU 2 OK, Remote Communication
Finish:	Natural color anodized aluminum face plate. Painted and plated steel chassis
Dimensions:	19 x 3.5 x 12 inches (483 x 89 x 305 mm), 2 RU
Weight:	19 lbs. (8,6 kg)
Mains voltage:	100 to 240 VAC, 50-60 Hz auto-select
Power supply function:	Dual Power Supply Redundancy
Fan:	Dual Fan Redundancy
Power consumption:	25 to 50 W typ., 60 W max, depending on I/O configuration
Backup Battery Life:	>10 years
Warranty, Parts and labor:	1 year

IO configurations
AES balanced
Number of audio channels:	8 channel In, 8 channel Out
Connectors:	SUB-D, 25 pole, 110 Ohm, AES/EBU in/out
Formats:	AES/EBU (24 bit)
Word clock input:	BNC, 75 Ohm or Hi-Z, 0.6 to 10 Vpp
Intrinsic interface jitter :	< 1 ns peak, BW : 700 Hz to 100 kHz
Digital output phase:	Less than 3% of sample period
Input variation before sample slip:	+27 % / -73 % of sample period
Interface function:	Synchronous, bit transparent

AES3-id unbalanced
Number of audio channels:	8 channel In, 8 channel Out
Connectors:	BNC, 75 Ohm, 0.1 to 10 Vpp, AES3-id in/out
Bypass Relay:	Inputs to outputs while powered off and during boot-up
Formats:	AES/EBU (24 bit)
Word clock input:	BNC, 75 Ohm or Hi-Z, 0.6 to 10 Vpp
Intrinsic interface jitter:	< 1 ns peak, BW : 700 Hz to 100 kHz
Digital output phase:	< 3 % of sample period
Input variation before sample slip:	+27 % / -73 % of sample period
Interface function:	Synchronous, bit transparent

SDI
Number of audio channels:	8 channel In, 8 channel Out
Connectors:	2 BNC In, 2 BNC Out. 75 Ohm
Bypass Relay:	Input B to output while powered off and during boot-up
Function:	Audio de-embed/embed, video thru
Formats supported:	SD and HD. 143 - 1485 MHz
Input selection:	Input 1 or 2, SDI group 1-4
Outputs:	2 is a replicate of 1. Outputs are individually buffered.
Audio embed + de-embed delay:	1.77 ms @ SD, 0.83 ms @ HD
Video delay:	22.3 us @ SD, 15.4us @ HD
Interface function:	Synchronous, bit transparent video and audio

These specifications cover the optional TC Icon remote control

TC Icon MK II

Display Type:	6,5" TFT active matrix color LCD display, 640 x 480 pixels resolution. High luminance (300 cd/m2, typ.)
Touch screen:	Resistive, 20 gram activation force
Faders:	Six (6), 90mm motorized with touch sensitivity
Connection:	36-pin MDR connection for Remote CPU 6000 mk II

EMC

Complies with:	EN 55103-1 and EN 55103-2, FCC part 15 class B, CISPR 22 class B

Safety

Certified to:	IEC 60065, EN 60065, UL 6500 and CSA E65

Environment

Operating Temperature:	32° F to 122° F (0° C to 50° C)
Storage Temperature:	-22° F to 167° F (-30° C to 70° C)
Humidity:	Max. 90 % non-condensing

General

Finish:	Natural color anodized aluminum. Stand plate in brushed stainless steel
Dimensions:	D x W x Hfront x Hback: 11 x 7.8 x 1.3 x 3.9 inches (279 x 198 x 33 x 100 mm)
Weight:	5.56 lb (2,51 kg)
Warranty, Parts and labor:	1 year

Remote CPU 6000 MK II

CPU:	Embedded AMD Geode LX-800, 500MHz
System disc:	512MB CompactFlash Card
System Memory:	256MB SO DIMM 200-pin DDR SDRAM
Operating system:	Windows Embedded Standard
Connections:	Two separated 10/100 Mbits/s TC
Ethernet interface:	Network (fixed IP) and firewalled internet network (dynamic IP). Standard IEEE 802.3u protocol compatible on RJ-45 connectors.
USB interface:	Two Universal Serial Bus ports, USB 2.0 compliant (for connection of TCE products, e.g. Reverb4000, DB2)
COM interface:	Two RS-232 serial communication ports. SUB-D 9 pin (for connection of TCE products, e.g. P2, DB2)
Keyboard/Mouse:	Mini-DIN connector supports standard PC/AT keyboard and a PS/2 mouse.
External display:	VGA output, SUB-D 15 pin
Remote:	36-pin connection for TC Icon mk II

EMC

Complies with:	EN 55103-1 and EN 55103-2, FCC part 15 class B, CISPR 22 class B

Safety

Certified to:	IEC 60065, EN 60065, UL 6500 and CSA E65

Environment

Operating Temperature:	32° F to 122° F (0° C to 50° C)
Storage Temperature:	-22° F to 167° F (-30° C to 70° C)
Humidity:	Max. 90 % non-condensing

General

Finish:	Natural color anodized aluminum face plate. Painted and plated steel chassis
Dimensions:	19 x 1.75 x 8.2 inches (483 x 44 x 195 mm)
Weight:	4,8 lb. (2,2 kg)
Mains Voltage:	100 to 240 VAC, 50 to 60 Hz (auto-select)
Power Consumption:	50 watts
Backup Battery Life:	>10 years
Warranty, Parts and labor:	1 year

Technical Specifications are subject to change without notice !

APPENDIX