CDSD DISC TRANSPORT

USER MANUAL

CAUTION

This product is a Class 1 laser product, but this product contains a laser diode higher than Class 1. To ensure continued safety do not remove any covers or attempt to gain access to the inside of the product. Refer all servicing to qualified personel. The following caution label appears on your unit on the rear panel:

CAUTION

Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure. The use of optical instruments with this product will increase eye hazard.

INFORMATION TO THE USER

Alteration or modification carried out without appropriate approval may invalidate the user's right to operate the equipment.

WARRANTY

EMM Labs warrants the CDSD product against defects in material and workmanship under normal use and service for a period of time specified by the product's serial number from the date of first delivery to the owner. The warranty time period is 1 year for the drive unit and 5 years for all other parts and is limited to the original owner.
EMM Labs will pay for return shipping charges back to the owner when the product is sent to EMM Labs within the first 90 days after purchase. Otherwise, owner will be responsible for all shipping charges to and from EMM Labs.
For all warranty claims, a copy of the original invoice must accompany the product.
Opening the product or modifying it in any way by the owner, including but not limited to cryogenic treatment, will void any warranty.
Please contact EMM Labs (support@emmlabs.com) for RMA number and shipping instructions before shipping any product to EMM Labs.

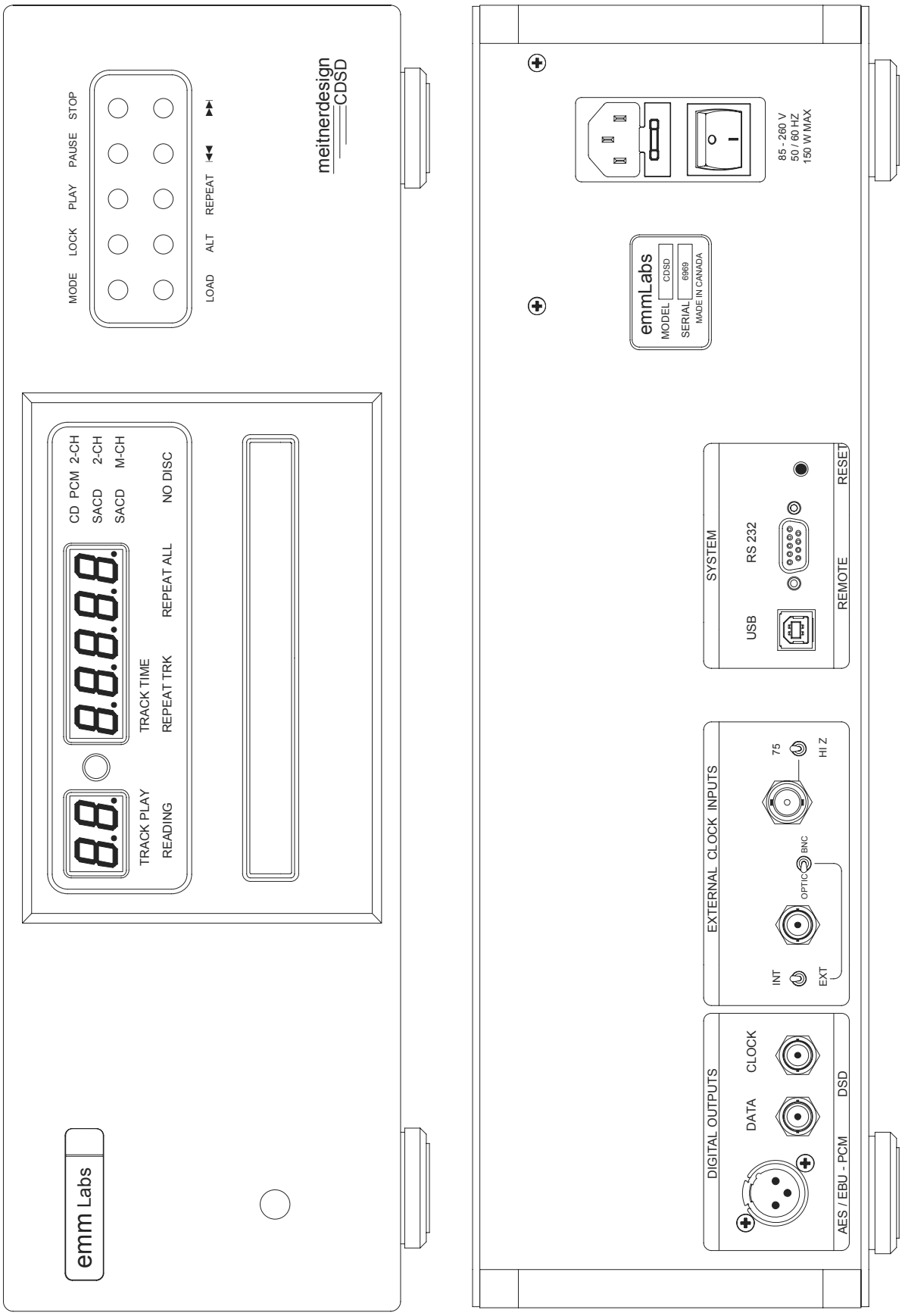
EMM Labs products are sold worldwide through authorized dealers with restricted territories. If any EMM Labs product is purchased from non-authorized dealers or from a dealer selling outside his / her authorized territory all warranties will be void.

CDSD Disc Transport

The CDSD is a disc player for CD and stereo / multichannel SA-CD. It is the companion product for EMM Labs high quality digital-to-analog converters, either in stereo or 6-channel configurations, and provides a proprietary digital audio link via fiber optical cable (EMM OptiLink). As a unique feature, the CDSD up-samples any PCM signal to twice the sample rate as it is used on SA-CD's before sending it to its EMM OptiLink output. There is no internal D/A conversion.

Features

- Supported disc formats:
  - Redbook CD
  - Stereo and Multichannel SA-CD
  - MP3
- Outputs:
  - AES/EBU for CD and MP3 only
  - EMM Labs OptiLink (all discs) for up to 6 discrete channels of digital audio
- Optical and BNC clock inputs allow external D/A converter to be clock master for best sonic performance
- System control via Infrared remote and serial RS-232
- USB port for future software upgrades (see Appendix B)
- Power supply
  - Power factor corrected
  - Factory set to 100V or 115V or 230V, 50/60Hz
  - Power consumption: 30W
- Dimensions W x D x H: 435 x 400 x 140mm
- Weight: 11kg


meitnerdesign
CDSD
MODE LOCK PLAY PAUSE STOP
LOAD ALT REPEAT
CD PCM 2-CH
SACD 2-CH
SACD M-CH
NO DISC
TRACK TIME
REPEAT TRK
REPEAT ALL
TRACK PLAY
READING
emm Labs
emmLabs
MODEL CDSD
SERIAL 6969
MADE IN CANADA
85 - 260 V
50 / 60 HZ
150 W MAX
SYSTEM
USB
RS 232
REMOTE
RESET
EXTERNAL CLOCK INPUTS
75
HI Z
OPTIC
BNC
INT
EXT
DIGITAL OUTPUTS
DATA
CLOCK
AES / EBU - PCM
DSD

Function Switches and Indicators

Power

The main power switch is on the back of the unit. The chrome power button on the front is a momentary switch that toggles the operation between power on and power save mode every time the user pushes it. During the power save mode the remote control and all front panel functions become inactive.

Default program setting for SA-CD

The CDSD can be programmed to always choose either the stereo or multichannel program from the SA-CD layer every time it reads a SA-CD for the first time. After the CDSD has chosen the default program the user can still manually change the program with the MODE button as described below. The default program is set with the ALT key (see below).

Switches on rear panel of CDSD

INT / EXT:	This toggle switch selects between 2 possible external clock inputs from either the optical or BNC connector. Please refer to the explanation of the Clock Master and Clock Slave operation later in this manual for more information. If the BNC clock input is connected via a T-connector it should not be terminated (HI Z), and for all other connections it should be terminated with 75 Ohms.
OPTIC / BNC:	Selects source for clock input between optical (OptiLink) or BNC.
75Ω / HI Z:	This toggle switch turns cable termination for the BNC clock input on /off. In HI Z position it is turned off.
RESET:	Used in connection with software upgrades via the USB port. Should not be used during normal operation.

Front Panel Keys and Indicators

MODE:	During playback of a SA-CD disc with stereo and multichannel program this button can be pressed to switch between the 2 programs. If a hybrid SA-CD is played the button can be pressed to also switch between Redbook CD and SA-CD playback (the player has to be in Stop in order to switch disc formats).
LOCK:	This indicator is lit whenever the selected clock operation (master or slave) is locked and operational. If the blue light is off, there will be no audio. When changing clock setups this can take several seconds to settle and light up – be patient!
PLAY:	Starts playback or continues it from Pause mode.
PAUSE:	Pauses playback (press PLAY to continue).
STOP:	Stops playback
LOAD:	Opens and closes disc tray

ALT: This key is used to change default settings of the CDSD. The basic operation for this is to press and hold the ALT, and then to press a second key for the appropriate function. Then both keys should be released at the same time. This process takes about 15 seconds. During that time the CDSD should be in STOP and not turned off as the setting is written into internal memory.
Second key functions:

PREVIOUS: sets stereo program selection to stereo
NEXT: sets program selection to multichannel

REPEAT: This buttons toggles through 3 states: repeat off – repeat track (repeats current track) – repeat all (repeats entire disc).

PREVIOUS: Jumps back a track. Hold down for 3 seconds to enter fast rewind mode (exit mode by pressing PLAY).

NEXT: Jumps to next track. Hold down for 3 seconds to enter fast forward mode (exit mode by pressing PLAY).

Basic Operations and Typical Connections

Wired remote control

On the rear panel you can find a DIN 9-pin (RS-232) connector for serial remote control. See appendix for more details. The USB port is currently only used for servicing.

Two Interface Choices

The CDSD can be connected to the DAC via 2 different digital audio interfaces: EMM OptiLink and AES/EBU. The latter is muted during SA-CD playback as it cannot transmit DSD signals which are the SA-CD native signal encoding method. EMM OptiLink, however, is designed for DSD and PCM signals and works for playback of all discs. For best performance with EMM Labs converters you should always use the EMM OptiLink connections with the 3 provided optical ST glass cables.

Clock Master and Clock Slave Modes

The CDSD provides 2 basic ways for how to connect it to an external D/A converter, such as the EMM Labs DCC2 or DAC6e: clock master or clock slave modes. Master / slave is in reference to who provides the clock signal to the D/A conversion process and who receives an external clock as a guide signal to lock to.

In clock **master** mode the CDSD generates and provides the clock to the D/A conversion process. Of course, for this the D/A converter has to be configured such that it selects the external clock input for its timing signal. This mode does not provide the best possible sonic performance and should only be used with D/A converters that do not provide a clock output.

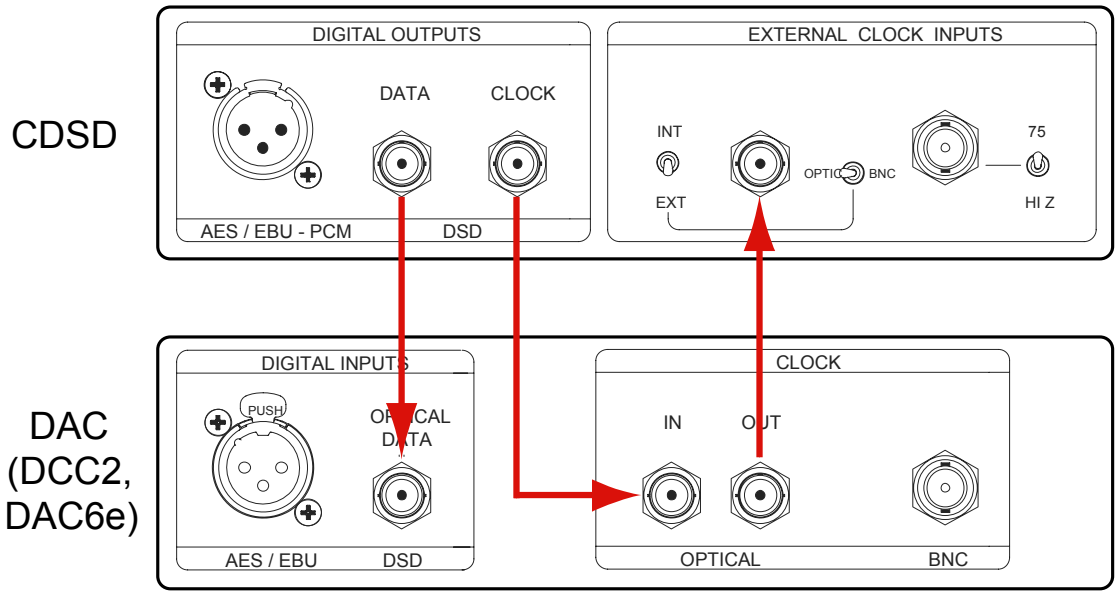
In clock **slave** mode the CDSD receives its clock reference from the D/A converter. An additional connection between CDSD and D/A converter needs to be provided for this. For best results the CDSD should always be operated in clock slave mode.

EMM OptiLink Connection

As explained above this mode should be used for best performance. Please use the ST glass optical cables provided with the CDSD.

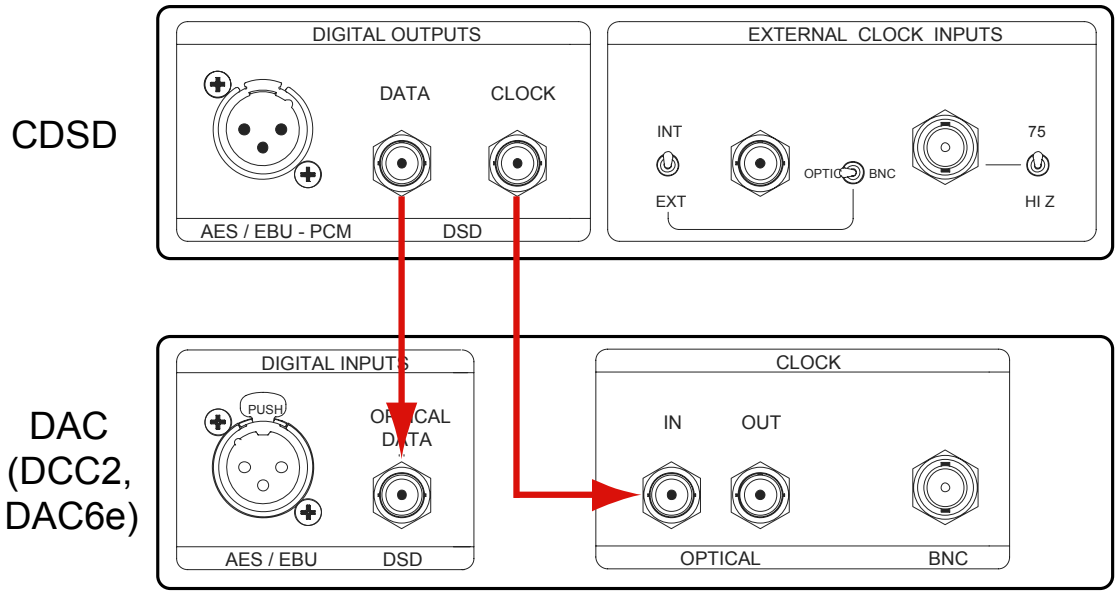
Cable connections for CDSD clock slave operation:

Note: *Please note the toggle switch position on rear of CDSD. Refer to manual of DAC for correct configuration. Use this mode and setup with EMM Labs converters.*



Cable connections for CDSD clock master operation:

Note: *Please note the toggle switch position on rear of CDS. Refer to manual of DAC for correct configuration.*



Channel assignment when using EMM OptiLink

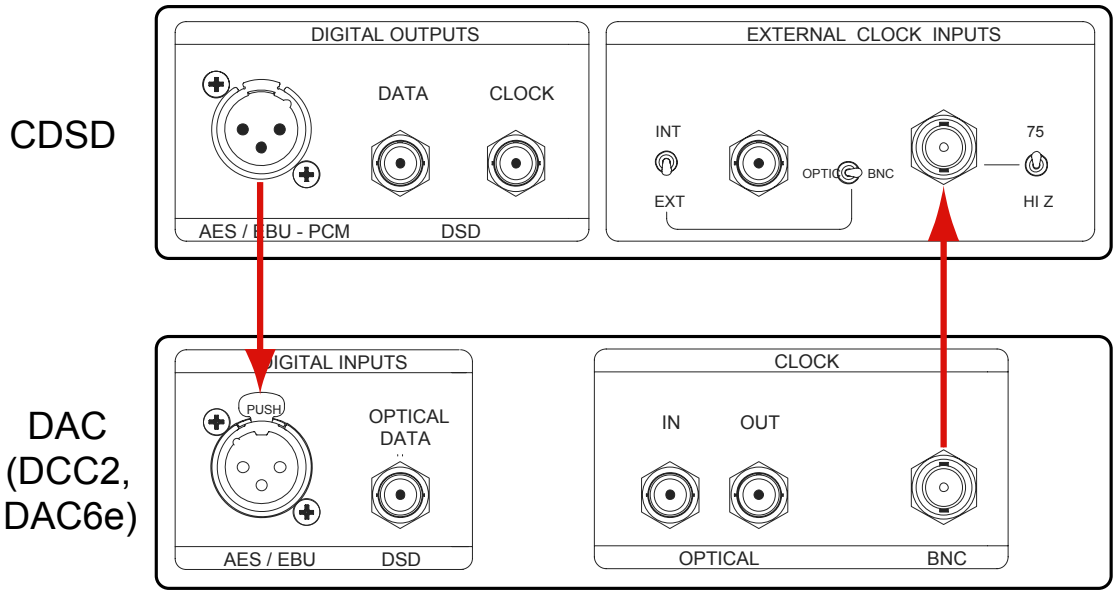
The CDSD can play back up to 6 channels from SA-CD when combined with the EMM Labs DAC6 series converter. In this case the analog output channels of the DAC6 have the following channel assignment:

Channel 1: Left front
Channel 2: Right front
Channel 3: Center front
Channel 4: Low Frequency Subwoofer
Channel 5: Left rear surround
Channel 6: Right rear surround

AES/EBU Connection

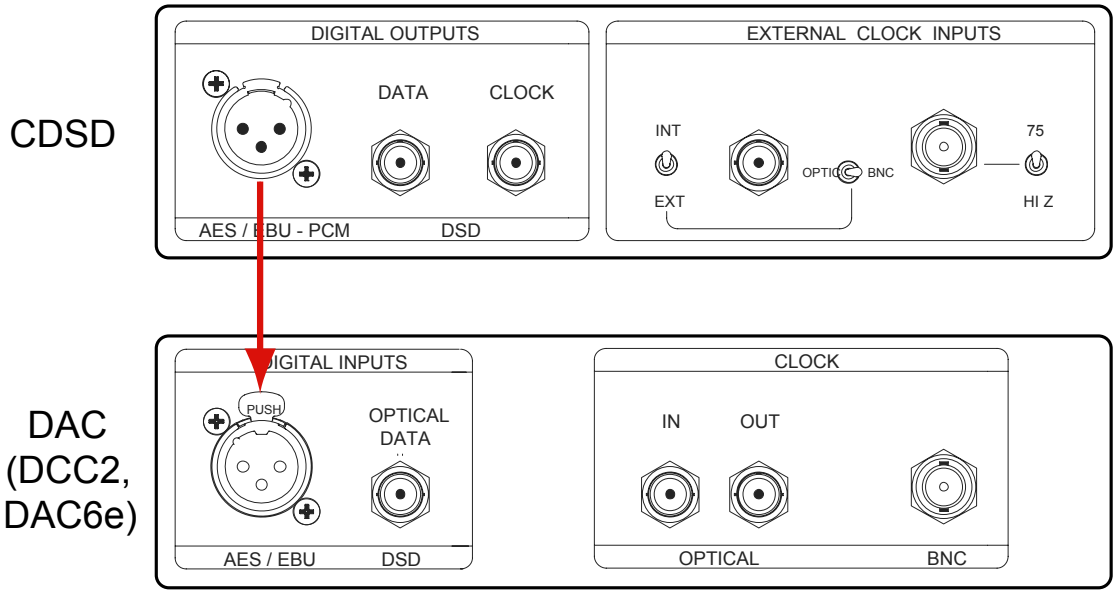
Cable connections for CDSD clock slave operation:

Note: *Please note the toggle switch position on rear of CDSD. Refer to manual of DAC for correct configuration.*



Cable connections for CDSD clock master operation:

Note: *Please note the toggle switch position on rear of CDSD. Refer to manual of DAC for correct configuration.*



Infrared Remote Control

The optional remote control provides combined functions for the EMM Labs CDSD and DCC2 products. The functions that are relevant to the CDSD specifically are highlighted in blue rectangles in the drawing on the right.

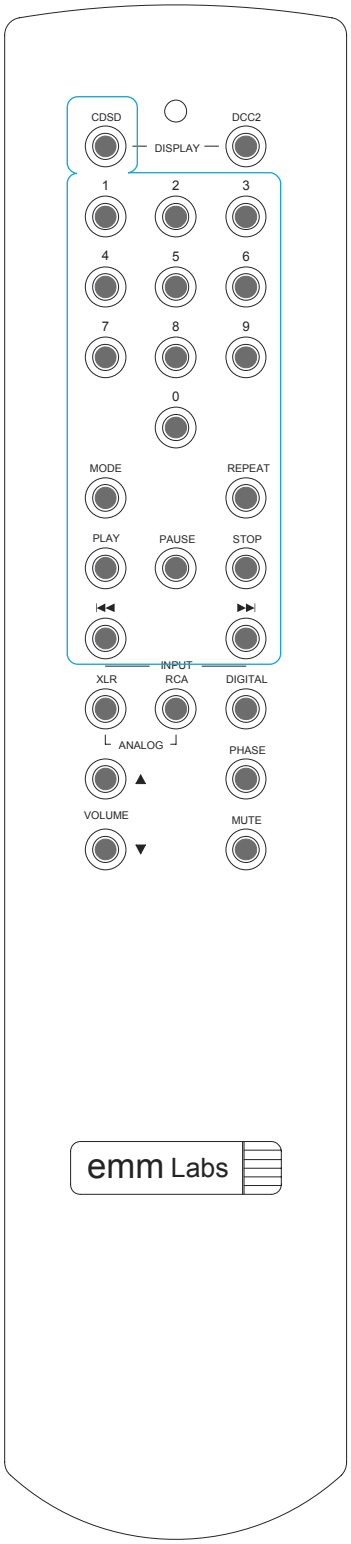
DISPLAY – CDSD: This function toggles the front panel display on the CDSD on and off while the players continues to operate normally otherwise.

Numeric Buttons: These buttons can be used to directly access any track on the disc.

MODE: This provides the same functionality as the button on the front panel (i.e. toggling through CD – SA-CD stereo – SA-CD multi channel playback).

REPEAT: Toggles through No Repeat – Repeat track – Repeat all.

Transport keys: These buttons provide the same functionality as the corresponding ones on the front panel. The STOP key can be pressed twice within 1 second to open the drawer.



Appendix

The following technical notes are provided for informational purposes, and are for use by authorized personnel only.

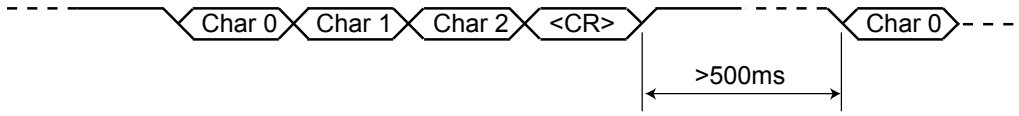
A: Serial Remote Control (RS-232)

The CDSD is equipped with a 9-pin RS232 connector for system remote control via a serial cable (not provided by EMM Labs). The cable should be non-crossed for connections between a PC and the CDSD. The parameters and settings for this link are:

- 19,200 baud
- 8 bits
- 1 stop bit
- no flow control
- no parity bit

Commands to CDSD

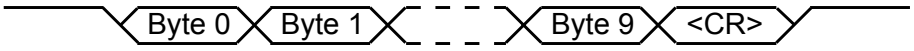
All commands sent to the CDSD consist of 3 ASCII characters followed by a <CR>. Repeating a <CR> will repeat the last command sent. Received commands are not stored in a stack and, therefore, need to be sent in intervals of at least 500ms to allow enough time for the CDSD to execute a command before receiving the next one.



ply	Start playback
pse	Pause playback
stp	Stop playback
mod	Toggles between CD – SA-CD stereo, SA-CD multichannel. The first time this command is sent after a playback period it needs to be repeated after about 1 second to get activated.
rpt	Toggles between no repeat – repeat track – repeat all
prv	Jumps back one track
nxt	Jumps to next track
try	Opens / closes tray
don	Turns front panel display on
dof	Turns front panel display off (unit keeps operating)
pon	Turns CDSD on from Standby mode
pof	Stops playback and sets CDSD to standby
tr0, tr1, ..	Direct access to tracks on disc. Track number above 10 can be accessed by first sending a command with the tens, and then a command with the ones.

Status info from CDSD

The CDSD sends back 10 Bytes terminated with a <CR> whenever any status changes.



Byte 0		Seconds ones in ASCII
Byte 1		Seconds tens in ASCII
Byte 2		Minutes ones in ASCII
Byte 3		Minutes tens in ASCII
Byte 4		Hours ones in ASCII
Byte 5		Track number ones in ASCII
Byte 6		Track number tens in ASCII
Byte 7	bit 0	1 when “Reading” indicator is on (front panel)
	bit 1	1 when “Repeat Track” indicator is on(front panel)
	bit 2	1 when “Repeat All” indicator is on (front panel)
	bit 3	1 when “CD PCM 2HC” indicator is on (front panel)
	bit 4	1 when “SACD 2CH” indicator is on (front panel)
	bit 5	1 when “SACD MCH” indicator is on (front panel)
	bit 6	1 when MP3 disc is selected
	bit 7	1 when DVD disc is selected (DVD-V or DVD-A)
Byte 8	bit 0	reserved
	bit 1	1 when front panel display is off
	bit 2	1 when CDSD in Standby mode
	bit 3	1 when “No Disc” indicator is on (front panel)
	bit 4	1 when internal clock selected
	bit 5	1 when optical clock selected
	bit 6	1 when in pause
	bit 7	1 when clock is locked
Byte 9		<CR> (x0D)

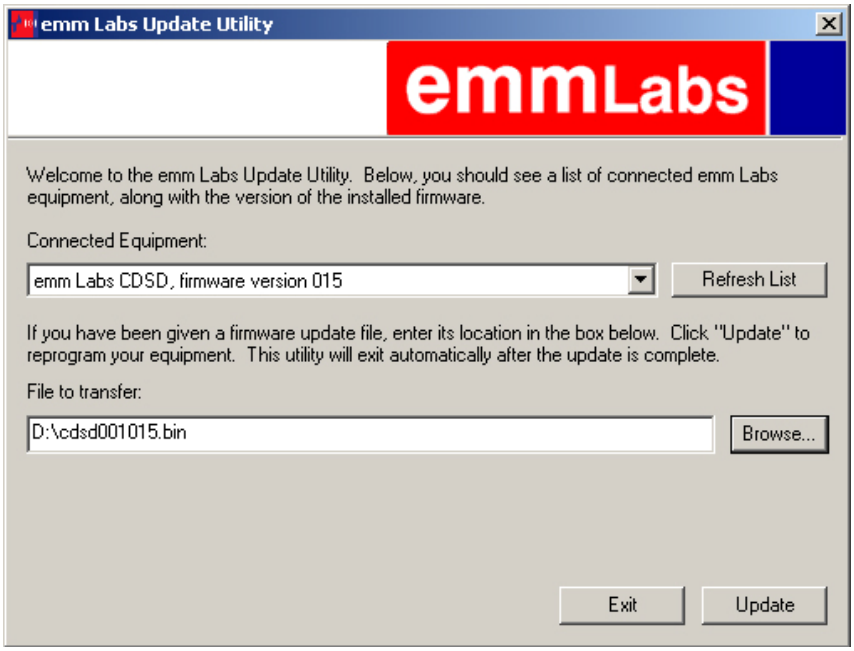
B: Upgrading the Software of your CDSD

Your CDSD is controlled by an internal processor that can be programmed with software to enhance or add new features. EMM Labs is constantly working to refine this software so your CDSD always offers the state-of-the-art sonic performance.

If a new update becomes available EMM Labs will distribute it along with a software application that will connect your CDSD via its USB connector to a PC.

First Time Installation and Upgrade Procedure:

1. Do not connect the CDSD yet to the PC
2. Launch the supplied application “emmsetup.exe” on your PC and closely follow instructions on the screen. Connect your CDSD to the PC only when told so.
3. When you reach the following screen, make sure to point the field “File to Transfer” to the file supplied by EMM Labs.
4. When completed, turn off power to the CDSD (switch on back panel), wait 15 seconds and power it back on again. DO NOT POWER OFF BEFORE PROGRAMMING IS COMPLETE (which can take up to 1 minute).



Subsequent Upgrade Procedure:

After you have used the EMMSETUP utility for the first time a shortcut “EMM Labs Update Utility” is installed on the desktop of your PC as well as in the START>PROGRAMS>EMM Labs folder. There is no need to launch the “emmsetup.exe” application anymore.

1. Connect your CDSD to the PC via a USB cable
2. Launch “EMM Labs Update Utility” from the desktop of your PC and you should see the above screen directly.
3. Proceed from here as for first time installation.

IMPORTANT NOTE:

THE ENTIRE UPDATE PROCEDURE CAN TAKE UP TO 1 MINUTE. IT IS IMPORTANT THAT YOU DO NOT INTERRUPT POWER TO THE CDSD, NOR DISCONNECT THE USB CABLE, NOR TURN OFF THE PC DURING PROGRAMMING, OR ELSE YOUR CDSD WILL NOT BE ABLE TO BOOT NORMALLY.

In case the programming has been interrupted accidentally, please follow the steps below:

1. Turn off power to the CDSD via its back panel switch
2. Press and hold the Reset button on the back panel
3. Turn power back on. Release the Reset button only after the lights on the front panel turn on.
4. Proceed as described under “Subsequent Upgrade Procedure”.