

# *dCS Scarlatti Upsampler*

## **Service Manual**

**October 2009**

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## SAFETY AND CONFIDENTIALITY

### Safety Warnings



**Servicing must be carried out by qualified service personnel only.**



These products contain circuitry that operate at high voltages and/or currents. Removing safety covers can expose personnel to risk of electric shock or other injury.

Take special care when working on the Power Board, as much of the board is at high voltage.



These products contain static-sensitive devices which can be seriously damaged by incorrect handling. Observe standard anti-static precautions at all times.



This product is lead-free to comply with the RoHS directive. If soldering or de-soldering is required, SAC solder (tin / silver / copper) must be used to ensure reliable repairs.

### Disclaimer

Data Conversion Systems Ltd. accept no liability for any kind for loss, accident or injury resulting from service activities.

### Confidentiality



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## UNIT DESCRIPTION



The *dCS Scarlatti Upsampler* is a 2-channel audio DDC intended for use with a *Scarlatti Transport*, *DAC* and *Clock*. The USB interface accepts PCM data from PCs or Macs. The unit is extensively configured by software stored in flash memory. The key features are as follows.

- Industry standard PCM inputs: AES3 on an XLR3 connector, 3x SPDIF on 2x RCA and 1x BNC connectors, 1x Toslink optical SPDIF, USB interface on type B connector.
- Industry standard PCM outputs: 2x AES3 or Dual AES on XLR3 connectors, 2x SPDIF on 2x RCA connectors, 1x SDIF-2 interface on 2x BNC connectors.
- USB interface operates in a novel version of asynchronous mode – patent pending.
- All PCM inputs will accept up to 24-bit data at 32, 44.1, 48, 88.2 or 96kS/s.
- All PCM outputs generate 24-bit data at 32, 44.1, 48, 88.2 or 96kS/s.
- The Dual AES interface generates 24-bit data at 88.2, 96, 176.4 or 192kS/s.
- IEEE1394 interface currently outputs encrypted DSD data to other *dCS* units or loops data through. Connected by one of two 6-pin 1394 connectors. This interface must be assumed to be incompatible with iLink or IEEE1394 interfaces produced by other manufacturers due to proprietary encryption.
- Industry standard Word Clock Input and Output. The unit can either Slave to the audio data (AES or SPDIF only), Sync to an external master clock on the Word Clock Input or in USB mode act as a 44.1kHz grade 2 Master Clock, allowing a suitable DAC to be locked to the Word Clock Output.
- A flexible clocking system allows locking to Word Clock at 32, 44.1, 48, 88.2 or 96kHz while accepting data at 32, 44.1, 48, 88.2 or 96kS/s.
- Twin crystal oscillators – one for 44.1kHz-related data, the other for 48kHz-related data. Discrete Phase-Locked-Loop circuitry.
- IR or RS232 remote control.
- Software may be updated by the user from a suitable CD, played on a standard CD Player or Transport. If the software has become corrupted, the unit may be re-booted from a ROM, fitted to a Programmer Board.
- All-aluminium case with laminated damping plates.

## HARDWARE AND SOFTWARE HISTORY

### Hardware History & Configuration Code

For products manufactured since early 2000, the long version of the *dCS* unit serial number may be read from the menu. This contains a great deal of information about the build standard of the unit, allowing *dCS* to advise on the suitability of software updates, whether a hardware update is advisable and (sometimes) the cause of a particular problem.

The example below is a *Scarlatti Upsampler* with serial number SUP-0S2-7G4--1C5-012-5832.

A typical serial number	This code group means:
SUP	<b>PRODUCT CODE.</b> SCK = Scarlatti Clock, SDC = Scarlatti DAC, STT = Scarlatti Transport, SUP = Scarlatti Upsampler, PPR = Puccini Player, PUU = Puccini U-Clock, PCK = Paganini Clock, PDC = Paganini DAC, PTT = Paganini Transport, PUP = Paganini Upsampler.
0S2	<b>OPTIONS CODE.</b> First character = product options (e.g. 1394 interface fitted). Second character: B = Black, S = Silver. Third character = voltage setting: 1 = 100V, 2 = 115/120V, 3 = 200V, 4 = 215/220V, 5 = 230/240V.
7G4	<b>CONTROL BOARD CODE.</b> The build standard of the Control board.
-	<b>TOP BOARD CODE.</b> The Upsampler has no top board, so this slot is not used.
1C5	<b>DISPLAY BOARD CODE.</b> The build standard of the Display Board.
012	<b>CASE &amp; BASE CODE.</b> This covers the build standard of the case parts, mains transformer, Power Board, 1394 Boards, back panel wiring and anything else.
5832	<b>CONTROL BOARD SERIAL NUMBER.</b> Each Control Board has a unique serial number.

### Software History

September 2008	v1.00	This is the first issue, it includes 1394/USB software v4.00.
February 2009	v1.01	This update corrects a tendency for some units to remain muted when the USB interface is run at 96kS/s. The 1394/USB software is updated to v4.01.

**The latest software should be loaded in all units.**

## COMMON SET-UP ERRORS

### Symptom: The unit fails to power up

- Check that the rated supply voltage stated on the back panel matches the local supply voltage.
- Ensure there is power available on the power cable, connect it to the unit. Set the back panel power switch to the **I** position (ON), wait 10 seconds and press the **POWER** button.
- Check that the mains fuse under the mains inlet has not blown. If it has, correct any obvious cause then replace the fuse as described in the manual.

### Symptom: The Display turns on when a control is operated, then turns off

- This happens when the Display Settings > Display On/Off menu page is set to OFF. Change the setting to ON to stop the Display blanking out.

### Symptom: The unit fails to respond to the controls

- If the indicator above the **POWER** button is illuminated, press the **POWER** button once to return to normal operation.

### Symptom: The Upsampler fails to lock to a digital source, displays No Input

- Ensure the source is connected with a proper cable to one of the Upsampler's PCM inputs and that input is selected.
- The Upsampler's 1394 interface acts as an OUTPUT only.

### Symptom: The audio output is monophonic

- If the output is set to Dual AES, make sure the Upsampler and DAC are set to Dual AES mode.

### Symptom: Crackles, pops or noise occur while playing music

- The high level of out-of-band noise inherent in the DSD format can be demodulated by some power amplifiers. Try setting the DAC Filter to a higher number.
- One or more of the digital audio cables connecting the system may be damaged, intermittent or of the wrong type. Some expensive cables are not correctly designed for digital audio use. Try another cable.
- The CD may be dirty – clean it carefully with a radial motion.
- The disc may be “copy protected”. Check that the Compact Disc Digital Audio logo is printed on the disc. If it is not, the disc is not a CD – please complain to the disc manufacturer.
- The source medium may be damaged or contain corrupted data.
- Occasional clicks may be heard if the Upsampler, DAC and source are not locked to the same clock. Please correct the set-up.
- The source equipment may have a very high level of jitter – servicing is required.

### Symptom: The DAC reports the wrong sample rate in Dual AES mode

- The Upsampler offers a choice of single AES or Dual AES operation at 88.2 and 96kS/s. Make sure the Upsampler and DAC's DUAL AES menu pages are set correctly.

### Symptom: Erratic operation from the TosLink input at 88.2 or 96kS/s

- Check that the optical connections are clean, the connectors are properly installed and the cable is undamaged.
- The TosLink receiver is an industry standard part that is not guaranteed to operate correctly at 88.2 or 96kS/s. Use a different digital input instead.

### Symptom: Using a non-dCS CD Transport, the Upsampler does not report 16/44.1

- Some Transports (e.g. Mark Levinson ML31.7, Linn CD21) add dither, so the DAC correctly reports 17/44.1 or something similar.
- Some CD Transports upsample to 48 or 88.2kS/s, the Upsampler will report the format of the data it receives.

## DISMANTLING PROCEDURE

Bear in mind that you should not have to completely dismantle the unit to carry out the repair!

Tools required:

- Ratchet screwdriver handle.
- Screwdriver bits: Allen key 2, 2.5 & 3mm A/F, 6mm flat blade, No1 PoziDriv.
- Nut spinners / socket spanners: 5.5mm, 7mm, 12.5mm (1/2"), 14mm (5/16") & 16mm (5/8") A/F.



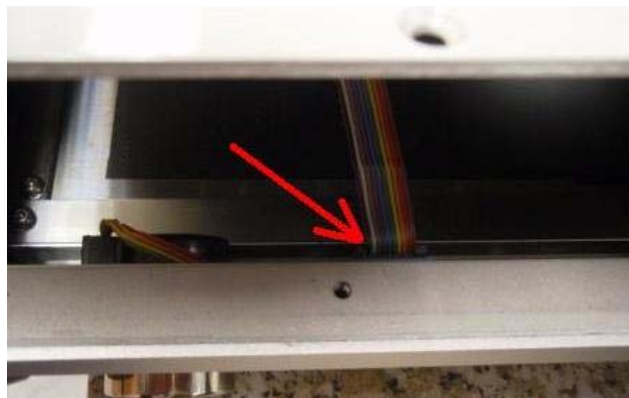
Remember to observe anti-static precautions when dismantling.

### Opening the case

Disconnect all cables from the unit. Rest the unit on a soft anti-static surface to prevent damage to the finish. Turn the unit upside-down and remove the 14 screws shown in red below.



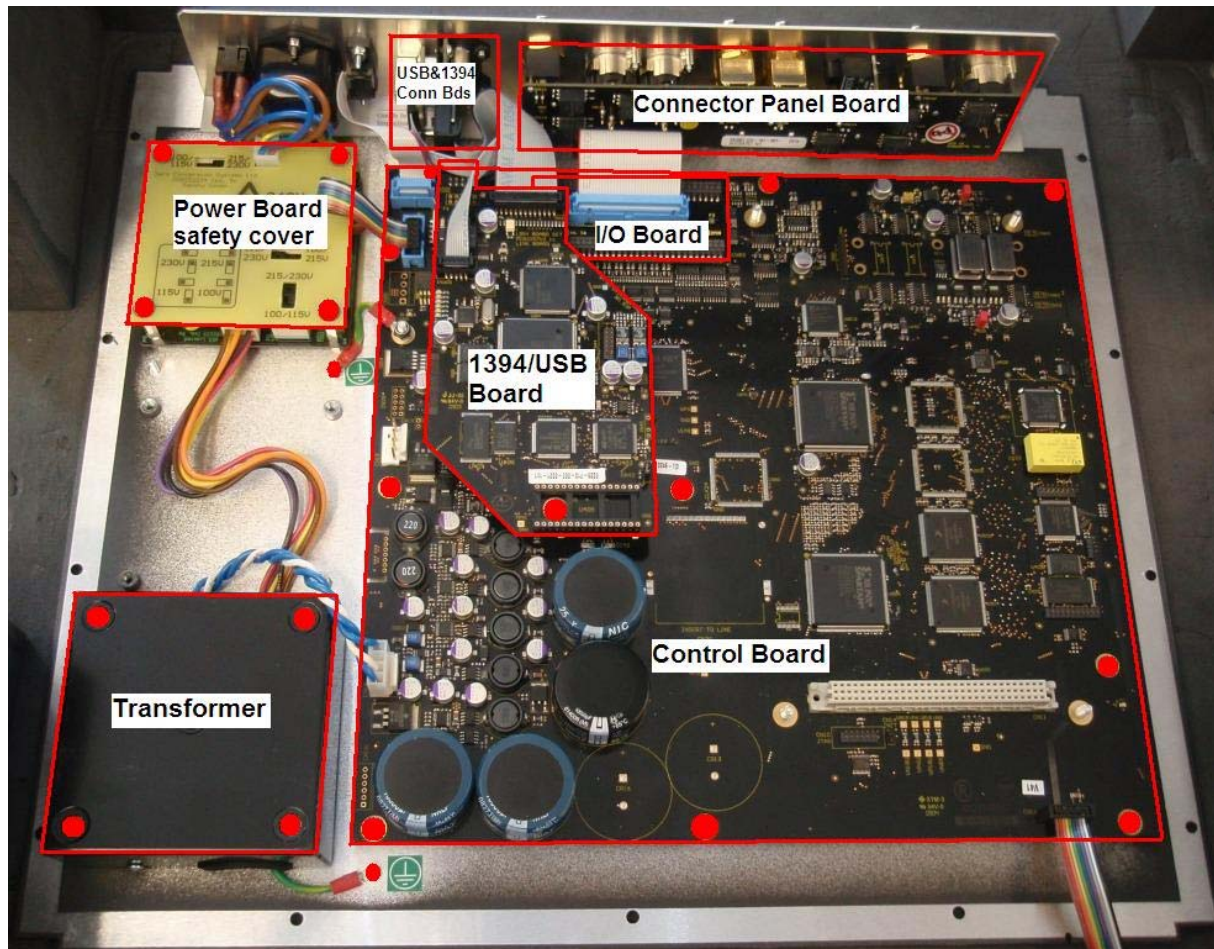
Lift the front edge of the base plate, reach inside and disconnect the ribbon cable from the Display Board, indicated in the picture below by the red arrow.



(Don't forget to reconnect the cable when you reassemble!) Lift the base plate out of the case, taking care that the rear panel connectors clear the back of the case.



## Identification of the sub-assemblies



The fixings are indicated by red dots.

## Removing sub-assemblies

The main section of the **1394/USB Board** is secured by one screw and washer inside the outline of the ROM socket (U405). Remove the screw and pull the board off the Control board. The 1394 Connector Board and USB Connector Board are attached to a bracket which is fixed to the back panel by 3 screws.

The **Power Board** is protected by a yellow safety cover, fixed by a screw at each corner. The Power Board underneath is fixed by a hex pillar at each corner. Disconnect the cables and lift the board off the 4 studs.

The mains **Transformer** is fixed by a screw in each corner. Disconnect the cables from the Power Board and Control Board, then detach the green/yellow screen wire from the base plate.

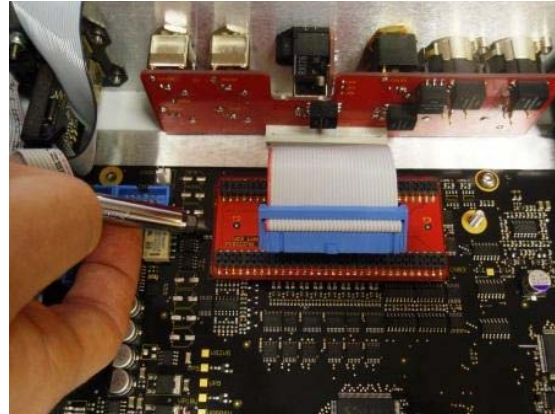
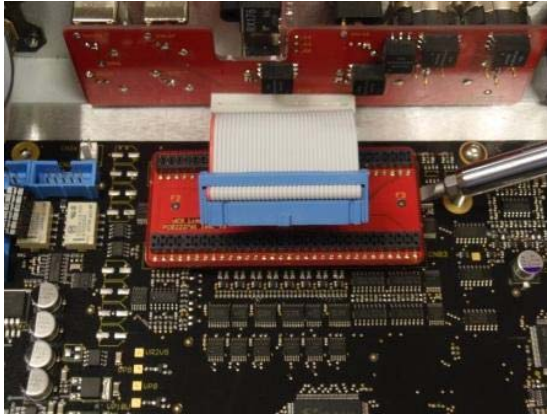


The **I/O Board** (made as part of the Connector Panel Board) is a **very tight press-fit** onto Control Board header CN82/83.



**This board is difficult to remove!** Careless use of tools can cause serious (and expensive) damage to the Control Board, **for which dCS shall not be liable**. If you really need to remove it and you are not confident you can do so safely, refer servicing to dCS.

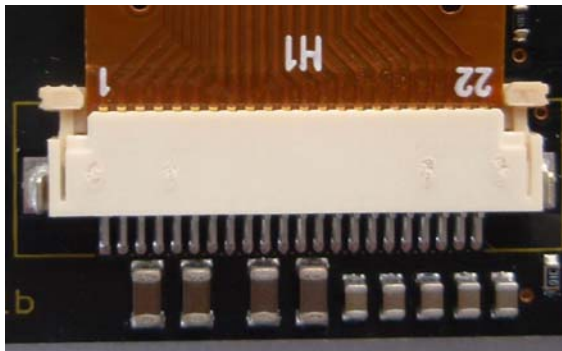
First disconnect the cable to the Connector Panel Board. Use a 6mm flat-blade screwdriver to lever the right side of the board up a few mm, pivoting on the top of the stud. Carefully lever up the left side of the I/O Board in the same way, protecting the Control board with your fingers. When the I/O board has been loosened, lift it off.



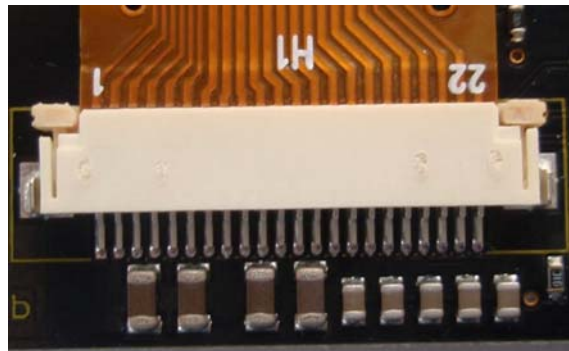
The **Control Board** fixings are shown as red dots in the picture on the previous page.

The **Connector Panel Board** is fixed to the back panel by the nuts and screws on the connectors themselves.

The **Display Board** is secured to the case front by 12 nuts and washers. Release the clamps on CN4 by pulling them out of the connector by a few mm. (When reassembling, take care to ensure the flat flex cable is fully engaged inside CN4 and the clamps are pushed back in.) Disconnect the cables from CN4 & 5, remove the nuts and washers and ease the board off the studs.

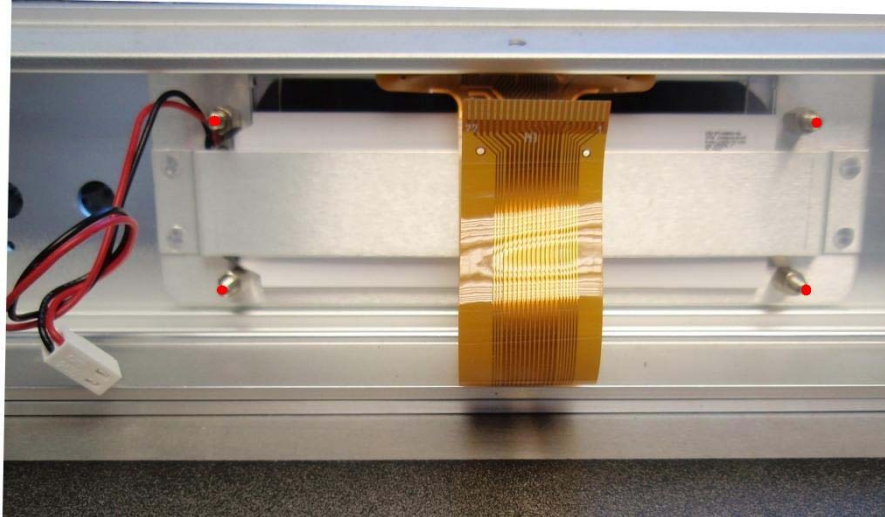


ZIF clamp open



ZIF clamp closed

The **LCD module** is clamped to the front panel by a metal yoke secured by four M3 x 8 pillars. When re-fitting the LCD module, tighten the nuts just enough to secure the module. Take care not to overtighten the nuts, as this can cause pale patches on the display or even damage the device. The pillars used to space the Display Board from the front panel are longer (M3 x 10), take care not to mix them up.



## SUBASSEMBLY DETAILS

Subassemblies which are common to other products are detailed in separate Service Manuals.

### Common Subassemblies

#### Control Board DCS156541 v7



The Control Board carries out all the digital processing and provides regulated DC to the unit. This board is common to most other current *dCS* products, it is configured by software. To date, the 7G or 7J versions of this board has been used on all *Scarlatti Upsamplers*.

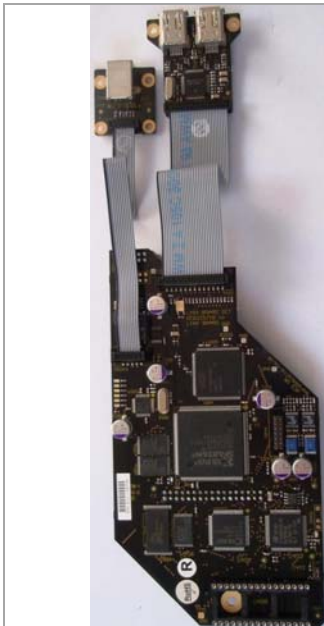
The circuit diagram file is 156540cd7g4.pdf.

The component layout file is 156540cl7g.pdf.

Earlier versions of this board were used on the Classic range.

This board is detailed in the separate **Control Board v7 Service Manual**.

#### 1394/USB Interface Board set DCS225710



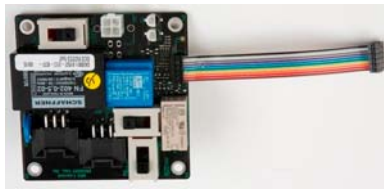
This assembly comprises a main 1394 interface board (LINK), a small 1394 connector board (PHY) and a small USB connector board, joined by ribbon cables. It handles the 1394 and USB interfaces, running its own software, which is downloaded from the Control Board as necessary. The same board set is used in the *Paganini Upsampler*, it is NOT compatible with the Classic range.

The circuit diagram file is 225710cd1c1.pdf.

The component layout file is 225710cl1c.pdf.

This board is detailed in the separate **1394-USB Interface Board Service Manual**.

### Power Board DCS152223



This board filters the mains supply and allows the power to be switched on/off safely from the front panel POWER button. The connection of the mains supply to the Mains Transformer primaries is set by 3 slide switches. It is common to most current products. The Power Board is covered by a yellow insulator board for safety. Several earlier versions of this board were used on the Classic range.

The circuit diagram file is 152223cd5a1.pdf (current version).

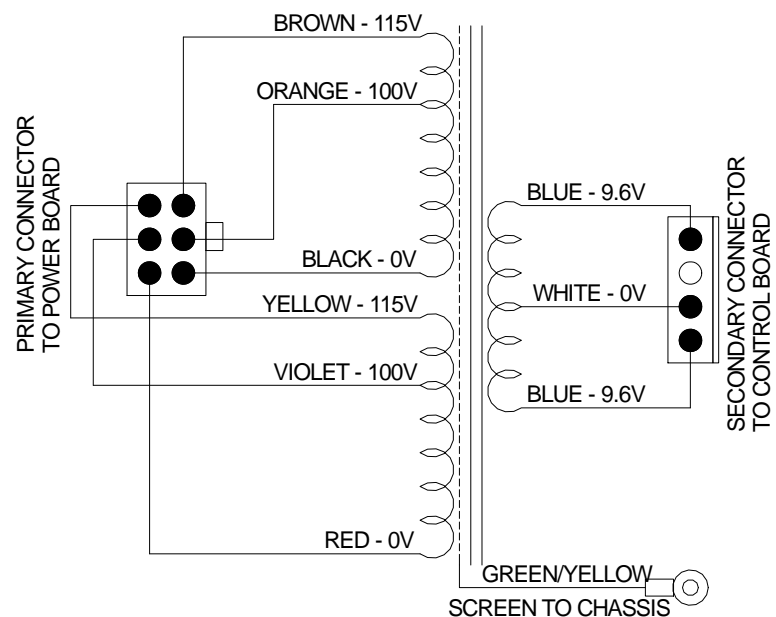
The component layout file is 152223cl5a.pdf (current version).

This board is detailed in the separate **Power Board Service Manual**.

### Mains Transformer DCS002896



This transformer is common to all current products except the *Puccini U-Clock*. The twin primaries allow the transformer to be configured for 100, 115/120, 200, 215/220 or 230/240V.



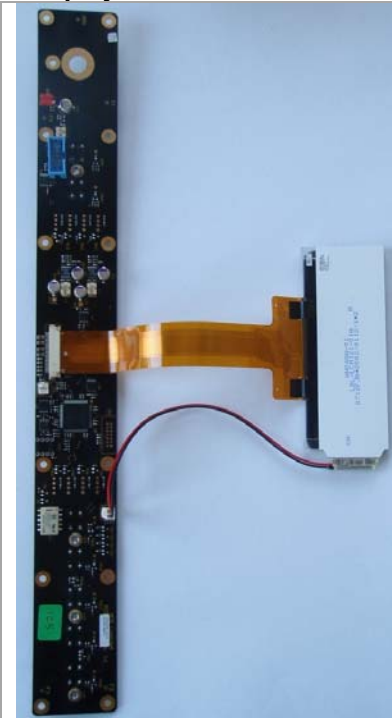
TYPICAL winding resistances are:

- Black to Orange or Red to Violet: 22 ohms
- Black to Brown or Red to Yellow: 25 ohms
- Blue to White: 0.15 ohms

Note that there is a considerable resistance variation from one transformer to another.



### Display Board DCS222750



The Display Board carries the front panel controls and remote receiver, it drives the LCD display module MOD0160008 (shown at the right side of the picture). The same board is used on the *Scarlatti Clock* and *Scarlatti DAC*.

To date, the 1C and 1D versions of this board have been used on most *Scarlatti Upsamplers*. The differences between these versions are minor.

CN2 connects to Control Board CN16. This carries power (+5V / 0V), data, clock, IR remote control and power on/off signals.  
C4 & CN5 connect to the LCD display module.

The circuit diagram file is 222750cd1d1.pdf.

The component layout file is 222750cl1d.pdf.

This board is detailed in the separate **Display Board Service Manual**.

## Unique Subassemblies

### Connector Panel Board DCS225761



This board is in two sections. The main part (the upper section in the picture) carries the digital I/O connectors and some digital interface components. The AES / SPDIF inputs (CN101-104) and outputs (CN109-112) are isolated with pulse transformers T1 - 8. TosLink receiver U101 (mounted on a small break-off board) connects to the main part by 3 wires. All connections are brought out on ribbon cable CN2.

The second part (the lower section in the picture) fits onto the two I/O headers CN82/83 on the Control Board. CN1 connects to the ribbon cable CN2 on the main part of the Connector Panel board.

The retention force of CN82/83 is VERY high. Take great care to avoid damage if it is necessary to detach this board from the Control Board.

The circuit diagram file is 225761cd1a1.pdf.

The component layout file is 225761cl1a.pdf.

## FAULT-FINDING

### Known Faults and Solutions

**Make sure the latest software is loaded.**

At this time, there are no known systematic faults with the *Scarlatti Upsampler*.

### Fault Finding Guide

#### Symptom: The mains fuse blows

This can be caused by a brief mains voltage surge. Check that the voltage setting is correct, then fit a new fuse of the correct type (20x5mm T0.5A L). If the new fuse does not blow, soak for 24 hours to verify the fix.

If the new fuse blows, the most likely causes are:

- Incorrect voltage setting. See the **Power Board Service Manual** for details.
- A damaged surge arrestor on the Power Board. See the **Power Board Service Manual**.
- The mains transformer short-circuits. This is VERY RARE, so please do not make assumptions! Test the transformer against the circuit diagram on page **12**, checking for short-circuits. Note that the secondary windings (Blue and White wires) have a very low resistance.

To date, we have never seen a fault in the rest of the unit that causes the mains fuse to blow.

#### Symptom: The unit fails to power up

- Is AC reaching the Power Board? If not, check the mains wiring and mains fuse.
- Is the full mains voltage AC passing through the Power Board to the mains transformers? If not, make sure the Power Board is turned on and find the point at which the circuit is broken.
- Is low voltage AC reaching Control Board at connector CN17/18? With nominal mains voltage, the AC voltage (referred to the base plate) at pins 1 & 4 (blue wires) should be 10V and at pin 2 (white wire) should be 0V. If the voltage is substantially different, check the transformers for signs of overheating.
- To check the Control Board power supply circuitry, measure the DC voltages between GND (or the base plate) and the various square test point pads around the board. You will have to lift the 1394 main board clear to do this (switch off the power first!). Typical measurements are:

Name	DC Voltage
VR2V5	+2.500V
VP5	+5.0V
VP9	+8.5V
VP18U	+17.9V

Name	DC Voltage
VP5PSU	+5.0V
VP3PSU	+3.4V
VP3	+3.2V
V1P8	+1.8V

Name	DC Voltage
VN18U	0V *
VP6U	-6.8V
VN8X	-5.9V

\* Note that VN18U is disabled on this model.

If any of these measurements are different by more than 5%, this indicates a fault in the power supply or that the power supply is being overloaded by the circuitry it is supplying. Power down, disconnect the 1394 Board and DAC Analogue Board, then check to see if this has corrected the voltages.

- If power is reaching the Control Board, check the behaviour of the red diagnostic LED, located near the front right corner of the Control Board. When power is applied, the LED should flash once and then flash twice a few seconds later. It should remain off for about 20 seconds while the board boots up, then turn on. If this does not happen but there is some LED activity, the microcontroller is not running. Try reloading the software from ROM, as described on page **22**.



- At the rear right corner of the Control Board, you will see 2 metal-cased crystal oscillators X01 & X02. There is provision for 4 crystals on the board, a red LED behind each turns on when the crystal is powered. At power up, the LED behind X02 should turn on and stay on. During boot-up, the LEDs behind the other 3 crystals should flash together on 2 occasions. Check that a 22.6MHz clock appears at U626 pins 3 & 4. If not, X02 or U613 may be faulty.
- If the Control Board microcontroller is running, CN12 may be connected to PC running Hyperterminal to extract diagnostic information from the Control Board. Please see the **Control Board v7 Service Manual** for more information.

**Symptom: The unit fails to lock at some sample rates**

- Select the required input (not USB) and set the SYNC source to Audio. If the unit locks correctly when the input rate is 44.1, 88.2, 176.4kS/s or DSD but not when the input rate is 32, 48, 96 or 192kS/s, this suggests a fault near crystal X01.
- Select the required input and set the SYNC source to Audio. If the unit locks correctly when the input rate is 32, 48, 96 or 192kS/s, but not when the input rate is 44.1, 88.2, 176.4kS/s or DSD, this suggests a fault near crystal X02.

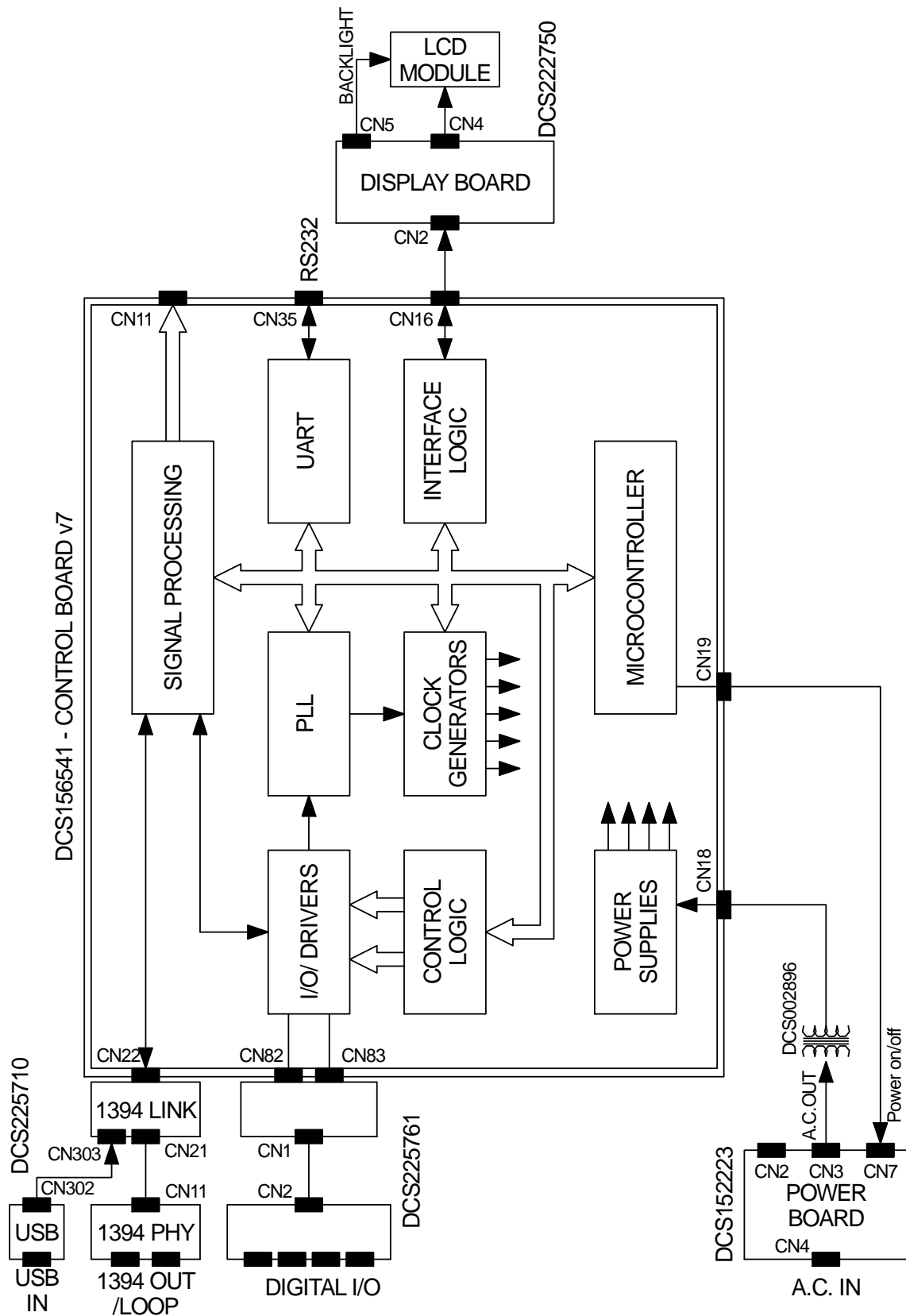
**Further tests**

In most cases, the above information will be sufficient to get an unresponsive unit up and running, or indicate a serious fault on the Control Board – which is normally dealt with at dCS.

For faults which are restricted to the 1394 or USB interfaces, please refer to the **1394-USB Interface Board Service Manual**.

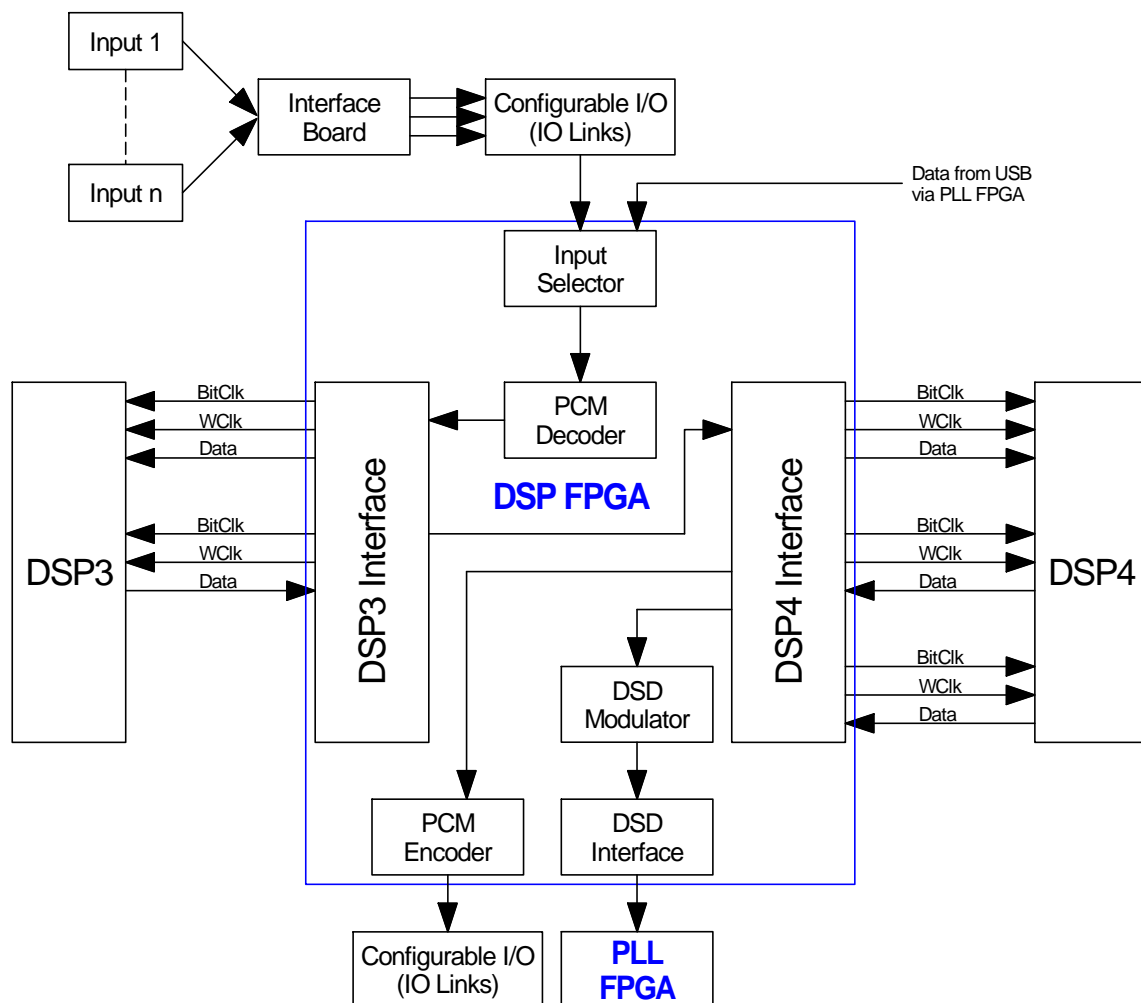
If the Display Board is not working correctly but the unit is still working correctly as an Upsampler, please refer to the **Display Board Service Manual**. Note that an intermittent ribbon cable connection to the Control Board is a fairly common cause of Display Board problems.

## BLOCK DIAGRAM

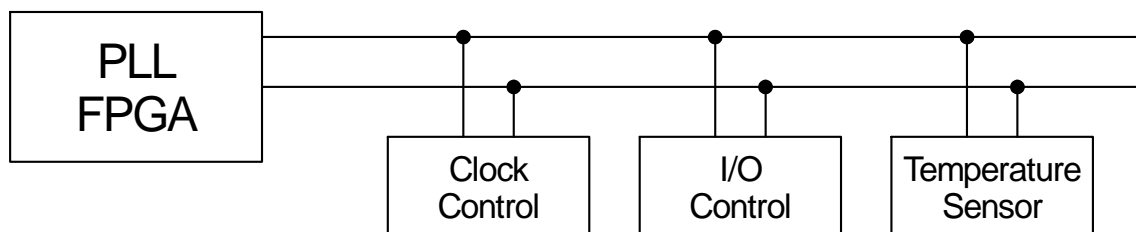


## SIGNAL PROCESSING PATH

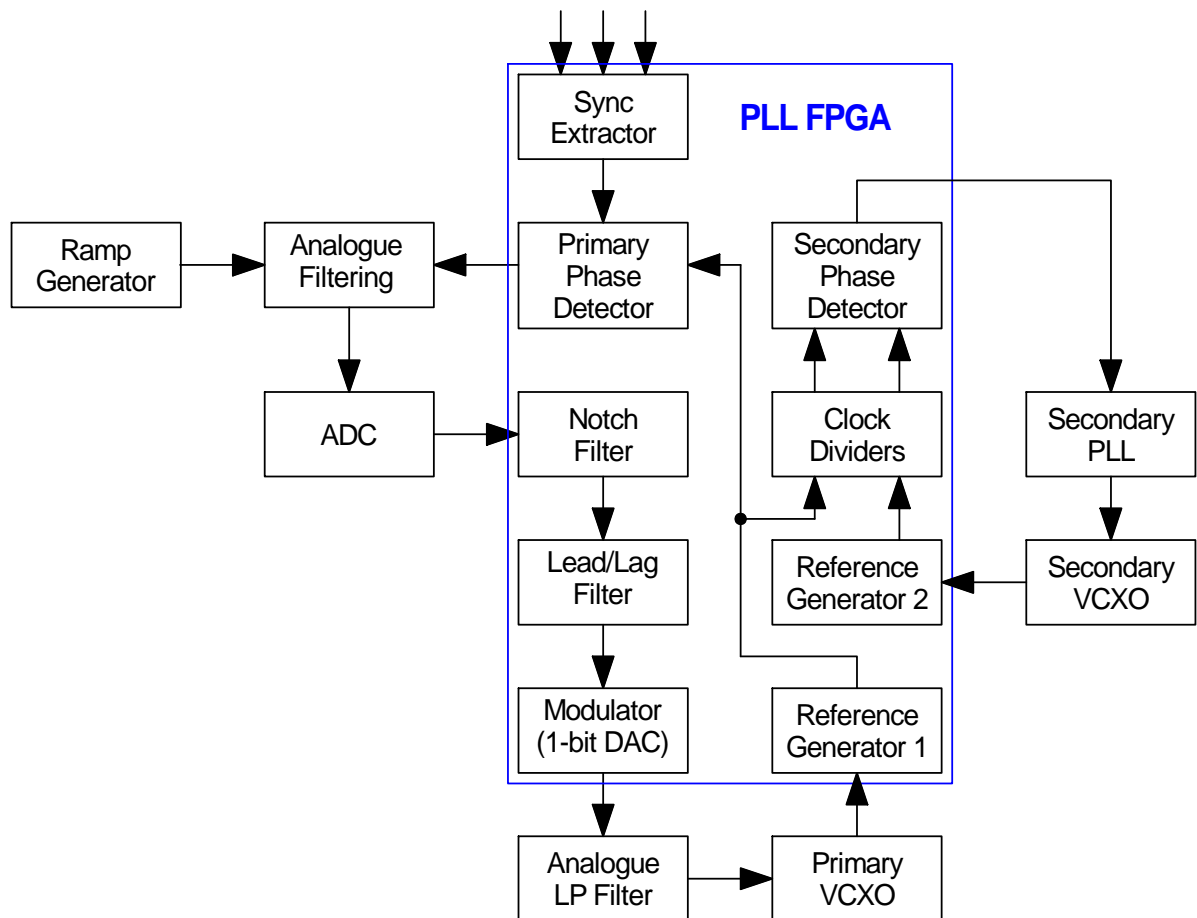
### Audio Path



### I<sup>2</sup>C Bus



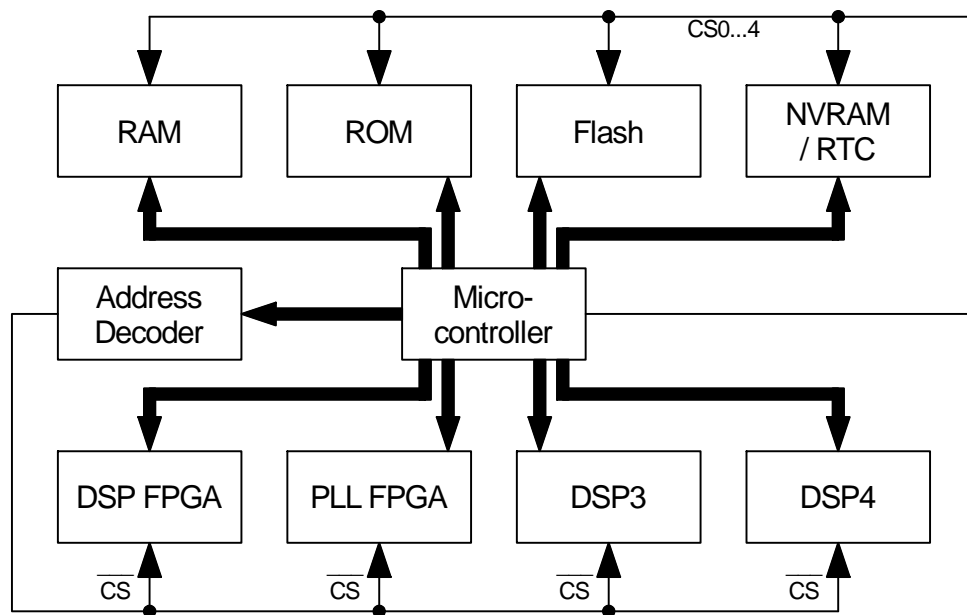
## PLL



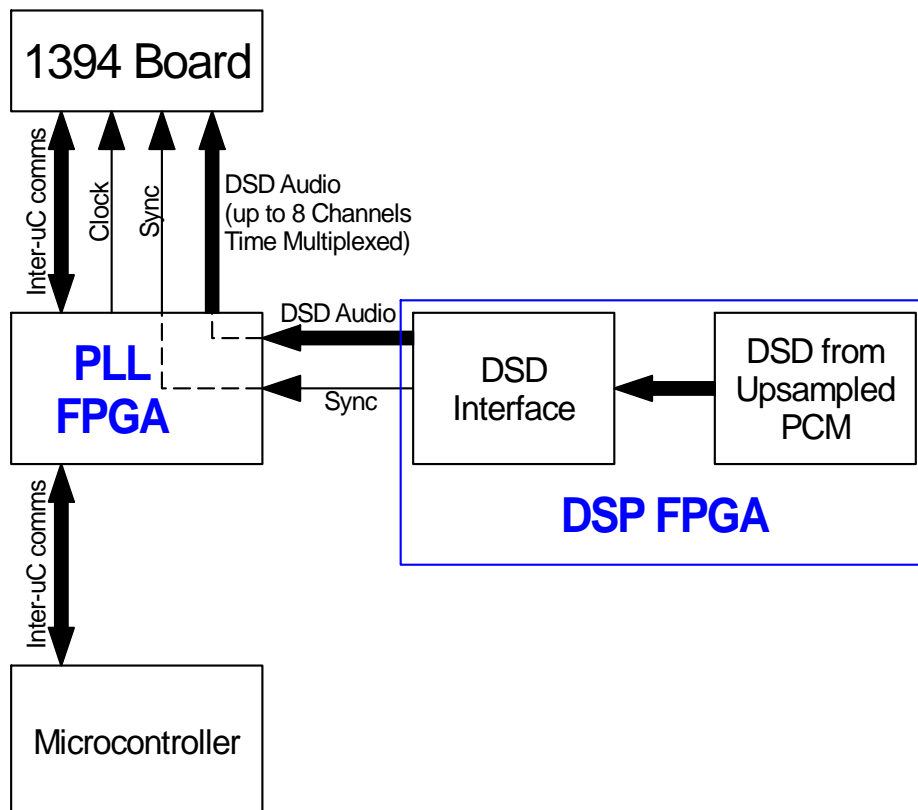
### Clocking setup

- The INPUT clocks the primary PLL.
- The secondary PLL is locked to the primary PLL.
- For cross-VCXO conversions (e.g. 44.1 -> 96), the OUTPUT is clocked by the secondary PLL.
- The 1394/USB Board needs the two VCXOs to be locked together for all rates.

## UA & UD



## 1394 Interface



## CD UPDATE PROCEDURE

### dCS Scarlatti Upsampler v1.01 Software Update



If you are loading a software version later than 1.01, follow the instructions provided with the disc.

Please read these instructions through fully at least once before attempting the update.

The CD supplied with these instructions enables the software in any *dCS Scarlatti Upsampler* with version 1.00 software to be updated to version 1.01. *dCS* contact information is given at the end of this document.

To play the CD, you will need a standard CD transport, a CD player with a digital output or a *dCS* Transport. For simplicity, the term CD transport is used in the rest of these instructions to cover all CD playback equipment. A few CD transports are not suitable because they upsample to 48kS/s, or change the data in other ways (for example, the ML37 produces 17 bit data) – don't worry - the CD Update routine detects these and stops, preventing any changes to the internal software.

The actual displays shown on your *Scarlatti Upsampler* during the upgrade may vary slightly depending on what version software is currently installed. If this occurs, it is not a cause for concern.

#### Initial Set-Up

- Make sure that the Transport's PCM outputs are turned ON (in the **Settings** menu on the *Scarlatti Transport*).
- Connect the *Scarlatti Upsampler* directly to the CD transport using either the AES interface (this uses a cable with XLR connectors), or an SPDIF interface (this uses a cable with RCA, BNC or Toslink optical connectors). Select the input on the *Scarlatti Upsampler* that corresponds to the interface you have just connected.

The *Scarlatti Upsampler* should lock and display **0/44.1->....** (for example, **0/44.1->DSD.**)

- Disconnect any 1394 cables.
- Open the menu and set the **Upsampler Settings/Sync Source** menu page to **Audio**.

#### Update Procedure

- Mute your power amplifier
- Insert the *dCS* Update CD into the transport, making sure it is in **STOP** mode. The disc must **not** be playing.
- Open the *Scarlatti Upsampler* 's menu by pressing the **Menu** button on the front panel. Press the **Menu** button again to select the **Information** menu. Press the **→** button to highlight the **CD Update** page and press the **Menu** button to start the update.
- **X Sure? ✓** will appear on the display – press the **Menu** button to continue.

The unit will display **Please wait** briefly, then **Please Start CD**.

- Press the CD transport **PLAY** button.



Do not press **PLAY** before the *Scarlatti Upsampler* is ready. This can cause the update to fail.



The unit will now display **Scanning...**, while it checks the *dCS* update CD. If there is anything wrong with the *dCS* CD that has been loaded, or it does not match the product, or the new software will not run without a hardware update, the unit will display **Wrong Disc!** and revert to normal operation. Don't worry – the internal software is unchanged. If either of the above cases occur contact your *dCS* distributor or *dCS*.

If the data is correct, after about 30 seconds the unit will briefly display **OK** then **V1.01**.

About 45 seconds later, the unit will display **1/32** as it receives the first block of data, then move on to **2/32** and so on until it reaches **32/32**. Each block takes about 50 seconds to load, please be patient.

About 28 minutes into the update, the unit will reboot itself and display **Scarlatti Upsampler**. After about 2 more minutes, the update is complete.

- Switch the *Scarlatti Upsampler* off (NOT just to sleep mode), wait 10 seconds, then switch on again. This is necessary to re-start the 1394 interface.

Your *Scarlatti Upsampler* is now ready for use.

### Problems?

- If the display does not change for more than 5 minutes or there is a power failure, switch off the unit at the rear panel switch, wait 10 seconds, then switch on and start the update again.
- If the disc skips or you accidentally advance the transport, the unit will display **Skipped!** Switch off the unit at the rear panel switch, wait 10 seconds, then switch on and start the update again.

If the **Non Seq** message appears on the display, the most likely cause is that the update CD is faulty. There is no cause to worry as the original software is backed up inside the unit.

- Check the disc for dirt or damage. If the disc appears to be dirty, wipe it gently from the centre outwards with a dry soft cloth. If the disc is damaged, contact your local *dCS* distributor or *dCS* for a replacement. If it appears to be OK, run the **CD Update** routine again to load the new software.



If the *Scarlatti Upsampler* starts up correctly but has a problem of some kind, do not repeatedly CD Update as this cannot solve the problem.

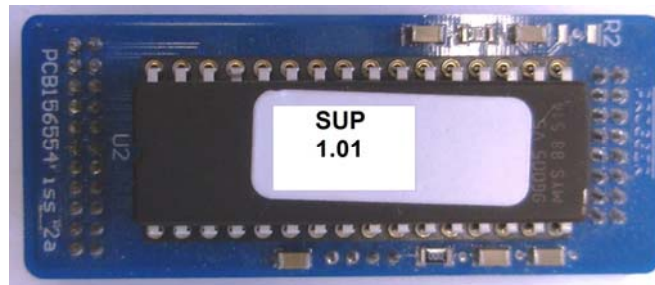
## RE-LOADING SOFTWARE FROM ROM

### Re-loading the Control software

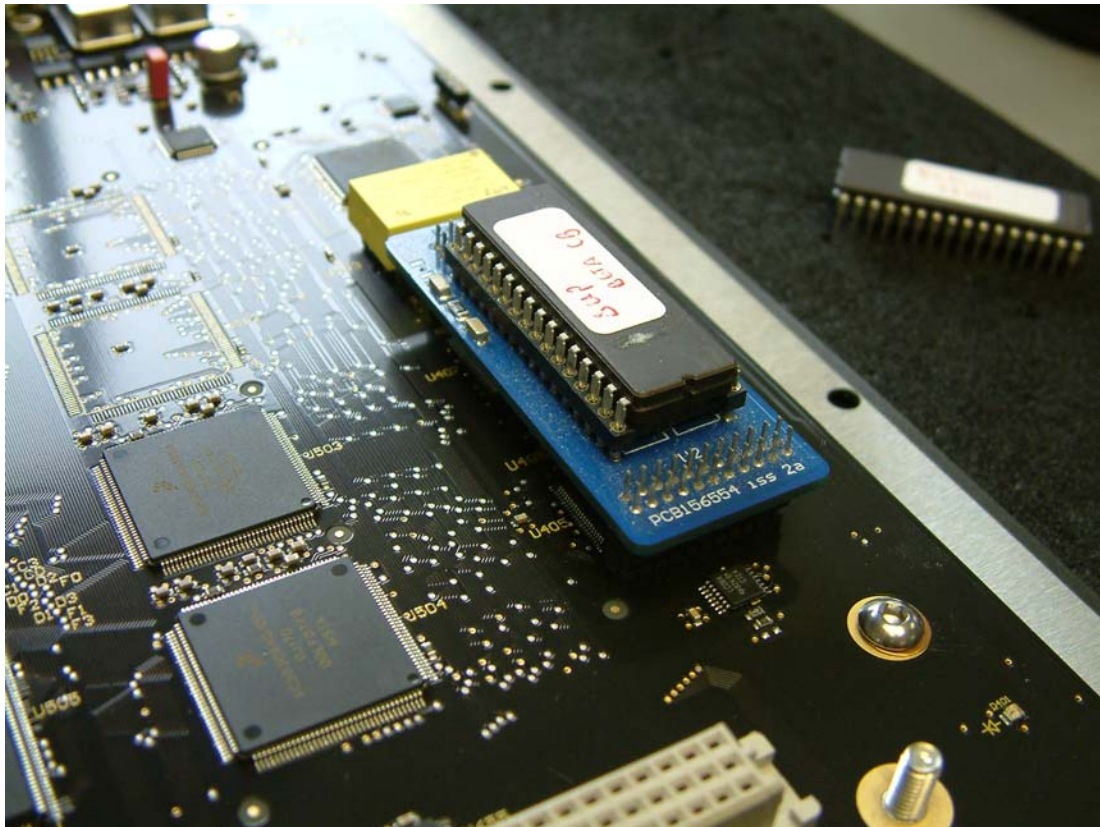
Normally, software can be updated from CD without opening the case, provided the unit boots up and runs correctly.

Occasionally, the software stored in the flash memory becomes corrupt, usually as a result of a power failure or user error while CD Updating. There is also some evidence that nearby electrical storms can do this. If the software has become corrupt, it is necessary to reload the unit from a ROM. To do this, you will need a DCS156554 programmer board and a ROM labelled "**SUP**" which is loaded with the *Scarlatti Upsampler* software. You can load an older version from ROM and then CD Update to the current version if necessary.

- Power the unit up and then pull out the power cable.
- Open the case, disconnect the Display Board ribbon cable and remove the top cover.
- Fit the **SUP** ROM to the socket in the programmer board, ensuring that the notched end is beside the "U2" label.



- Fit the programmer board onto the 3 headers near the edge of the Control Board, as shown below, making sure all pins fit into the sockets on the underside of the programmer board.



- Connect the power cable.

The Control Board will power up, red LED D401 will flash once and LEDs elsewhere on the board will turn on. The loading process takes several minutes, please be patient. When it is complete, the red LED D401 will start flashing steadily.



If D401 is still off after more than 10 minutes, the software has failed to load for some reason. Pull out the power cable, make quite sure the programmer board and ROM are correctly seated and repeat the process.

- Disconnect the power cable.
- Remove the programmer board and ROM, put them somewhere safe in anti-static packaging.
- Reassemble the unit, remembering to connect the Display Board cable.
- Open the menu and check that on the **Information / Version Information** page, the **Control version** matches the ROM issue.
- Check that the unit is operating correctly.

## Re-loading the 1394 code

If the 1394 Board stops responding, either due to an environmental influence or a mistake while CD Updating, the 1394 main board must be reloaded with a ROM. You will need a ROM labelled “1394/USB v4 BOOT” (or later) which is loaded with basic 1394/USB code and a 2-way jumper.



Note that 1394 code v1 and v2 are NOT compatible with Scarlatti and must not be loaded into Scarlatti products.

- First, make sure the Control software is up to date. If it is not, CD Update before proceeding.
- Power the unit up and then pull out the power cable.
- Open the case, disconnect the Display Board ribbon cable and remove the top cover.
- Fit the **1394/USB v4** ROM to the socket U405 on the 1394 main board, ensuring that the notched end is towards the RIGHT-hand side. Fit the jumper to the nearby programming header, CN42.



- Connect the power cable and observe the red LED near CN42.

The LED will flash once per second for about 45 seconds, then turn off. After another 35 seconds, the LED will flash rapidly to indicate the re-load is complete.

- Disconnect the power cable.
- Remove the 1394/USB ROM and jumper, put them somewhere safe in anti-static packaging.
- Reassemble the unit, remembering to re-connect the cable to the Display Board.
- Power up the unit and select the **1394** input.

The 1394 Board is now loaded with a basic version of the 1394 code. Once the unit has booted up, the Control Board will download the current 1394 code automatically. The unit will display **1394 Update**, a progress bar and **Updating...**

DO NOT SWITCH OFF. The progress bar will fill in over the next 6 minutes, then **Updating...** will disappear. After another 30 seconds, the update is complete and the display will return to normal.

- Open the menu and check that on the **Information / Version Information** page, the **1394 version** is 4.01 (or later).
- Check that the unit is operating correctly.