IQD1DAC D to A Converter

Module Description

The IQD1DAC module converts serial D1 format 270Mbits/sec data to analogue component video, in either YPbPr or GBR format.

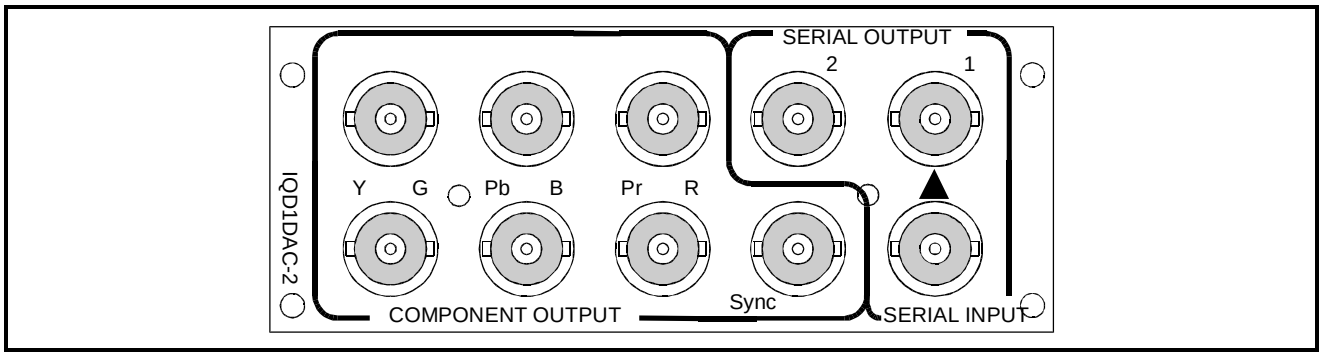
Functional Description

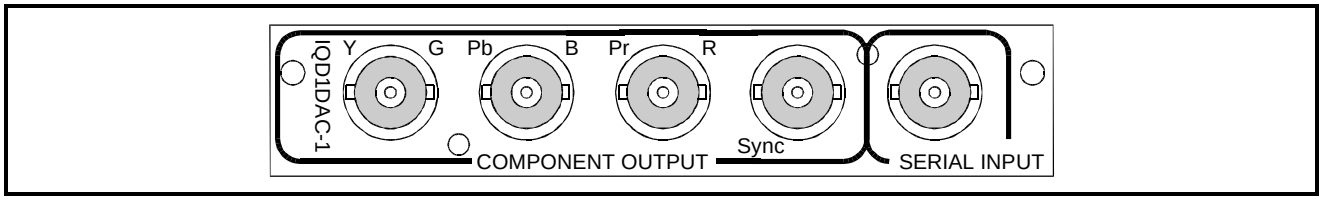
The incoming data is de-serialised after cable equalisation. The signal is analysed for 525 or 625 data, and optionally for EDH error data.

Blanking is applied, and Y/C timing set. The signal is de-multiplexed to YPbPr.

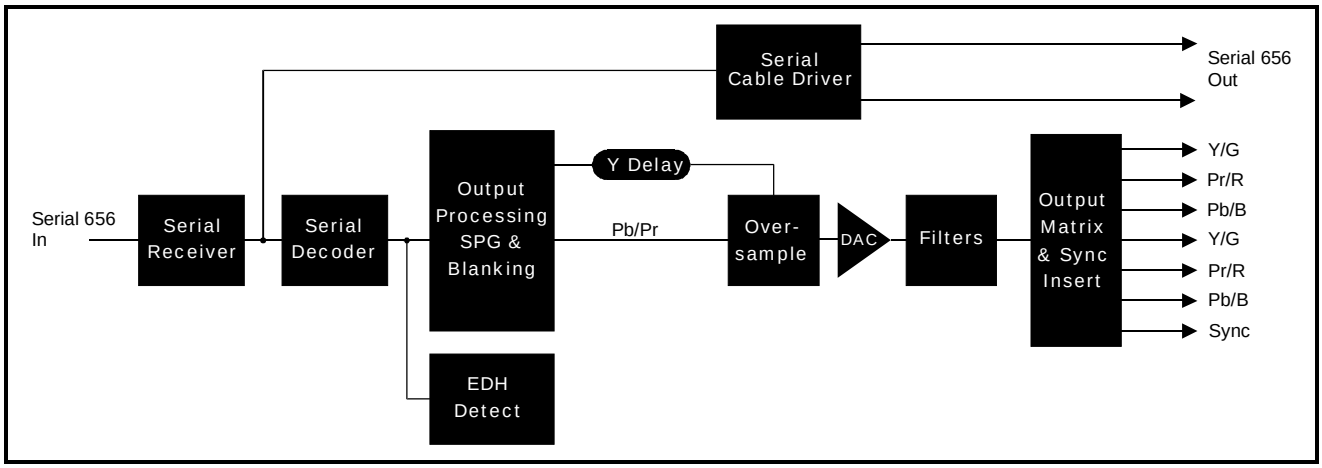
Each channel is oversampled and applied to three 10 bit DAC's. These analogue signals are corrected for gain and offset, syncs added to the Y signal, and then low-pass filtered. These signals are then optionally matrixed to GBR and buffered for the final outputs.

REAR PANEL VIEWS





BLOCK DIAGRAM



Features

- 525 or 625 D1 inputs
- YPbPr or GBRS output
- 10-bit resolution
- 601 specification filters
- Monitors SDI for EDH errors
- Active loop-through inputs (double width module only)
- Selectable blanking

Versions of the module cards available are:

IQD1DAC-1-0	Digital serial to YPbPr or RGB with 601 spec 10-Bit
IQD1DAC-2-0	Digital serial to YPbPr or RGB with 601 spec 10-Bit + 2 serial ouputs
IQD1DAC-1-0-E	Digital serial to YPbPr or RGB with 601 spec 10-Bit + 2 serial ouputs + EDH detect
IQD1DAC-2-0-E	Digital serial to YPbPr or RGB with 601 spec 10-Bit + 2 serial ouputs + EDH detect
IQD1DAC-1-F-0	Digital serial to YPbPr or RGB with near 601 spec 10-Bit + 2 serial ouputs
IQD1DAC-2-F-0	Digital serial to YPbPr or RGB with near 601 spec 10-Bit + 2 serial ouputs
IQD1DAC-1-F-E	Digital serial to YPbPr or RGB with 601 spec 10-Bit + 2 serial ouputs + EDH detect
IQD1DAC-2-F-E	Digital serial to YPbPr or RGB with 601 spec 10-Bit + 2 serial ouputs + EDH detect

Features

Signal Inputs

Serial Input	D1 525 or 625 serial digital

Signal Outputs

Component	1 set (IQD1DAC-1) or 2 sets (IQD1DAC-2) of YPbPr or GBR to EBU/SMPTE specification (Betacam optional) Sync on G/Y, selectable on B/R
Serial (IQD1DAC-2 only)	2 sets of 10-bit Serial D1 (reclocked)
Sync	Mixed syncs at -2 V pk to pk

Controls

Picture Position
Y to PbPr Timing
YPbPr/GBR Selection
EDH Clear
Vertical Blanking (VITS)
Syncs
Horizontal Blanking
Restore Original Settings
Digital Bypass
Pedestal (Available to order)
Logging

Specifications

Frequency Response	Within 601 Specification
Output D.C.	< 15 mV
Analog Output Return Loss	Better than 35dB DC to 5.0 MHz
Maximum Input Cable Length	200 m
Processing	10-bit
Serial Input/Output Return Loss	better than 15dB to 270 MHz

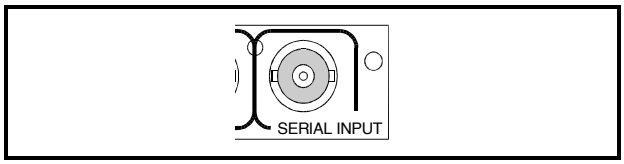
Preset Control Ranges

Picture Position	+518 to -592 ns in increments of 74 ns
Y to PbPr Timing	+518 to -592 ns in increments of 74 ns
EDH Clear	On/Off
Vertical Blanking (VITS)	On/Off
Syncs	On/Off
Digital Bypass	On/Off
Horizontal Blanking	D1 active (no shaping) D1 active (shaped) Composite (shaped) Minimum legal composite (shaped)
Output Select	YPbPr or GBR
Pedestal (Available at to order)	On/Off

Additional RollCall™ Functions

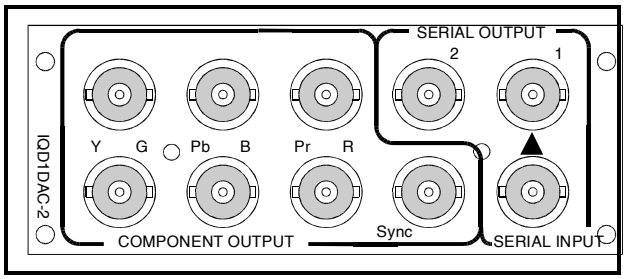
EDH	Statistics
Picture Position	+3400 ns to -1628 ns in increments of 74 ns
Y to PbPr Timing	+1036 to -592 ns in increments of 74 ns

INPUT SIGNALS



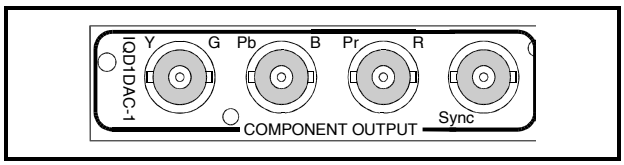
Serial D1 525 or 625 via a BNC socket terminated with a resistive 75 Ohm load.
The serial input should be of scrambled format following the polynomial $(x^9 + x^4 + 1)(x + 1))$
This input contains an automatic equaliser allowing input lengths up to 200m when high quality coax is used.

OUTPUT SIGNALS



One set (0.8" module) or two sets (1.6" Module) of component signals YPbPr or GBR, and 2 serial active loop-through outputs (double width module only) are available via BNC connectors for connection to 75 Ohms systems.

Note that the serial outputs are active loop-through versions of the serial input and that both serial outputs must be correctly terminated in 75 Ohms at all times



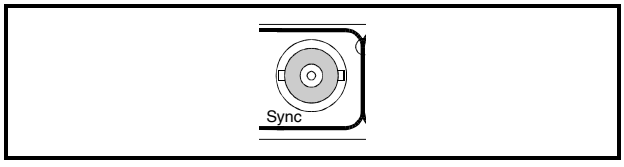
The output format may be either YPbPr or GBR at standard EBU/SMPTE levels.

To change the output format use SW1 position 1.

The component output signals are to EBU/SMPTE specification, to 10-Bit resolution with optional CCIR 601 filtering.

Note that to ensure reliable transmission of serial digital signals without causing unacceptable levels of radiated emissions, only high quality 75 Ohm co-axial cable should be used. The cable must also be terminated with a precision 75 Ohm load. Serial output via 75 Ohm BNC socket provides active loop through (re-clocked and regenerated) of serial input. Output sourced from 75 Ohm.

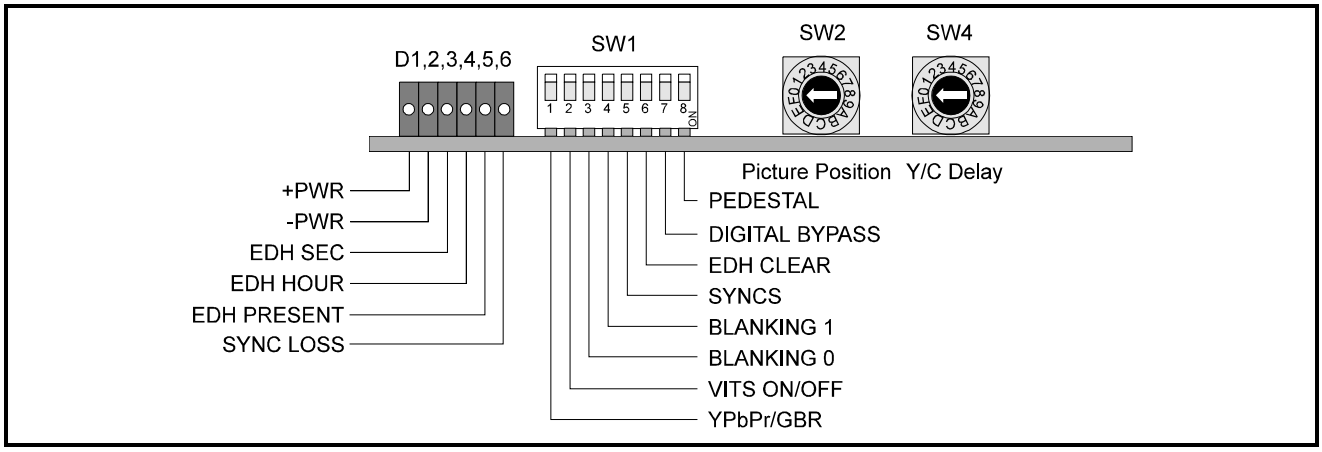
SYNC OUTPUT



This provides a composite sync output via a BNC connector for connection to 75 Ohm systems.

The output level is 2 V p-p into 75 Ohms.

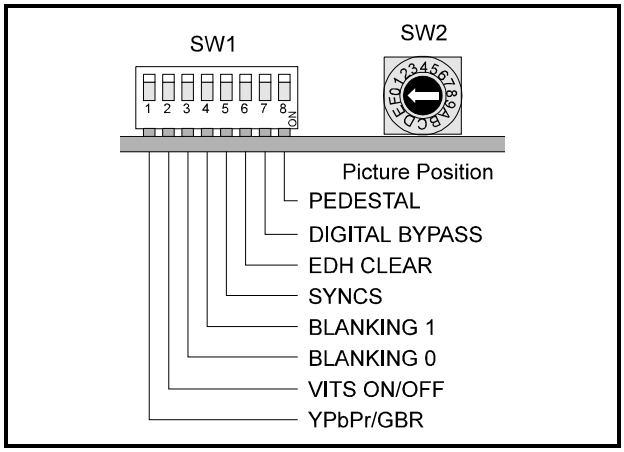
CARD EDGE CONTROLS



Adjustment of the settings for the IQD1DAC is available either via card edge controls and/or via a more comprehensive remote control system using RollCall™.

Note that in Main-frames where RollCall™ is not available the remote link, LK1, located at the front of the card, should be removed. This ensures that when the unit is powered-up the factory default settings are loaded. With LK1 fitted the card will power-up with the last settings sent by the remote control panel.

SWITCH SW1



This switch allows various functions to be enabled.Note that for cards using the RollCall™ remote control system, activating these switches will override the remote control settings. The RollCall™ control panel will then follow these settings.

Note that the unit will respond to both local and remote control, one system overriding the settings of the other For cards using the RollCall™ remote control system, activating these switches will override the remote control settings. The RollCall™ control panel will then follow these settings.

SW1/1(YPbPr)

This switch allows the component output format to be set to either YPbPr or GBR.When the switch is in the OFF position the output is YPbPr.When the switch is in the ON position the output is GBR.

SW1/2 (VITS)

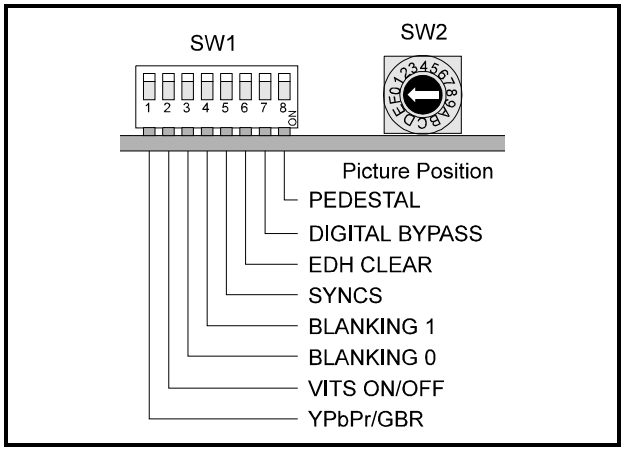
When this switch is ON the unit will pass data (unblanked) present on VITS lines. When the switch is OFF all data in the vertical interval will be blanked. Note that in the 525 standard VITS lines are from line 10 and 273 and in the 625 standard from line 6 and 319 inclusive.

SW1/3 & 4 (BLANKING)

These switches allow various widths of horizontal blanking to be applied to the signal.

A 2-bit code is used to enable the different widths as shown below:

HB1 (Pos 4)	HB0 (Pos 3)	Blanking Width
OFF	OFF	Analogue minimum
OFF	ON	Analogue normal
ON	OFF	Digital filtered
ON	ON	Digital normal



SW1/5 (SYNCS)

When this switch is in the OFF position syncs are added to all of the GBR signals.

When the switch is in the ON position syncs are removed from the GBR output signals.

Note that by using the RollCall™ system syncs may also be added to either the green signal only or to the blue and red signals.

SW1/6 (EDH CLEAR)

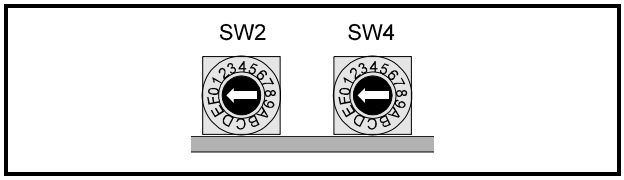
Setting this switch to the ON position resets the EDH statistics LED indicators D3, D4 and D5.

SW1/7 (DIGITAL BYPASS)

When this switch is set to the ON position the content of the D1 input (including D1 information, TRS codes and maximum picture width available) is passed through the unit.

SW1/8 (PEDESTAL) not yet available

Setting this switch to the ON position adds a pedestal to the output (525 mode only)



SW2 (Picture Position)

This switch allows the picture position to be moved by +518ns to -592ns in increments of 74ns.

Position 8 is the default calibrated position.

Note that under RollCall™ control this range is increased to +3700ns to -1628ns

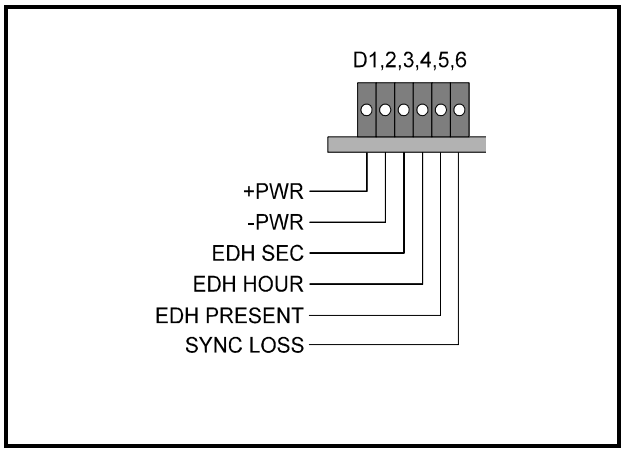
SW4 (Y/C Delay)

This switch allows the timing between the Y signal and the PbPr signal to be adjusted by +518ns to -592ns in increments of 74ns.

Position 8 is the default calibrated position.

Note that under RollCall™ control this range is increased to +1036ns to -592ns

LED INDICATORS



D1 +PWR

This green LED is illuminated when the positive power supply is present.

D2 -PWR

This green LED is illuminated when the negative power supply is present.

D3 EDH SEC

This yellow LED becomes illuminated when an EDH error has occurred within the last second.

D4 EDH HOUR

This yellow LED becomes illuminated when an EDH error has occurred within the last hour.

D5 EDH PRESENT

This yellow LED will become illuminated when EDH information is present in the incoming data stream. It will flash momentarily whenever an incoming data error is detected.

D6 SYNC LOSS

This red LED will become illuminated when no valid D1 signal is present at the serial input.

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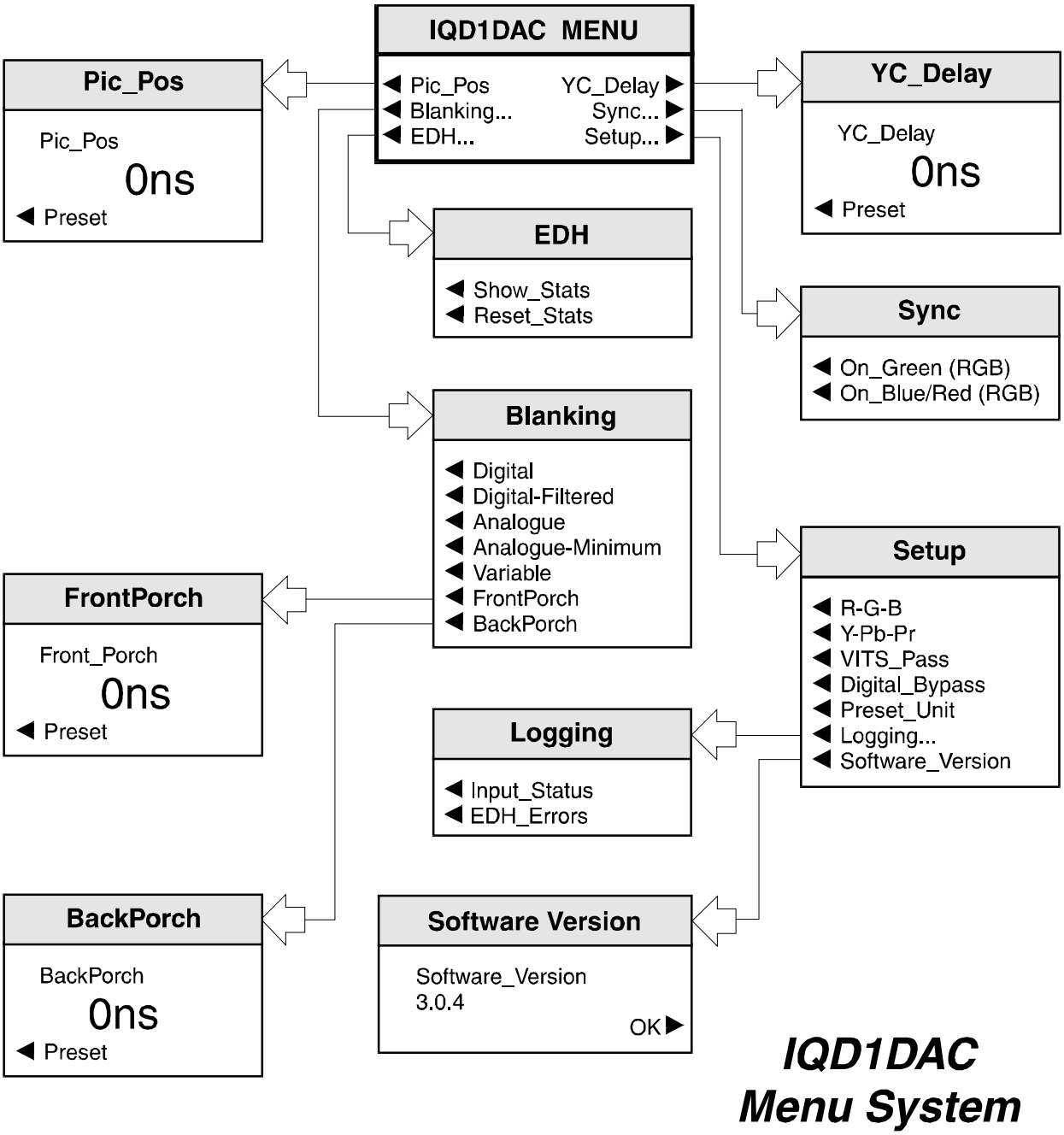
IQD1DAC MENU
Pic_Pos
YC_Delay
Blanking...
Sync...
EDH...
Setup...
Pic_Pos
Pic_Pos
0ns
Preset
YC_Delay
YC_Delay
0ns
Preset
EDH
Show_Stats
Reset_Stats
Sync
On_Green (RGB)
On_Blue/Red (RGB)
Blanking
Digital
Digital-Filtered
Analogue
Analogue-Minimum
Variable
FrontPorch
BackPorch
Setup
R-G-B
Y-Pb-Pr
VITS_Pass
Digital_Bypass
Preset_Unit
Logging...
Software_Version
FrontPorch
Front_Porch
0ns
Preset
Logging
Input_Status
EDH_Errors
BackPorch
BackPorch
0ns
Preset
Software Version
Software_Version
3.0.4
OK
IQD1DAC
Menu System

Manual Revision Record

Date	Version No.	Issue No.	Change	Comments
101296	1	1		First Issue
060597	2	1	Word version created	
031197	2	2	CE mark added	New manual issued
111297	2	3	™ added/corrected to RollCall	New manual issued