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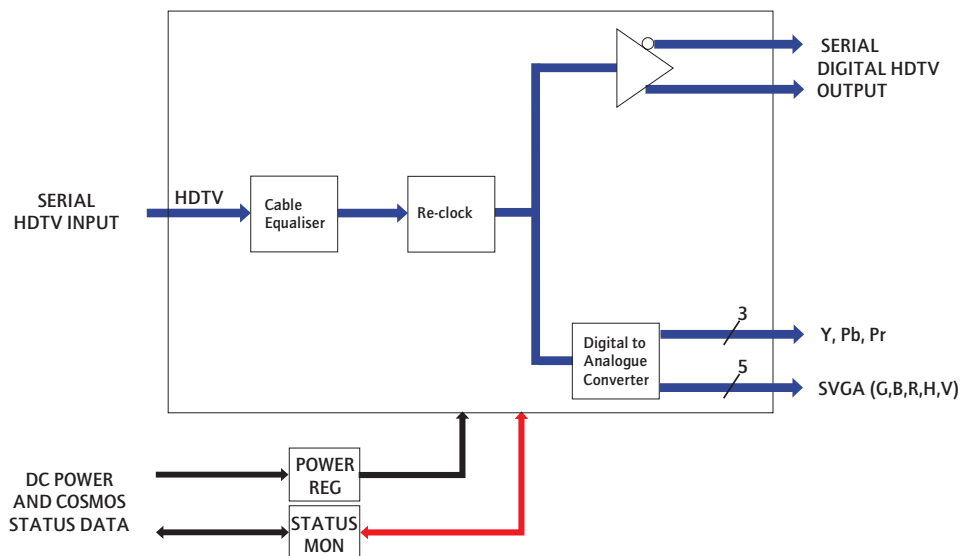
1 Introduction

The 3417 is an HDTV digital to analogue converter designed to be used in the ICON series of 1RU or 3RU frames. It offers Y, Pb, Pr analogue outputs or SVGA output and two reclocked HD-SDI outputs.

It handles interlaced serial digital signals of 1.485Gb/s and 1.485/1.001 Gb/s conforming to SMPTE specification 292M - 1080i 30Hz and 1080i 30/1.001 Hz.

The features available are:

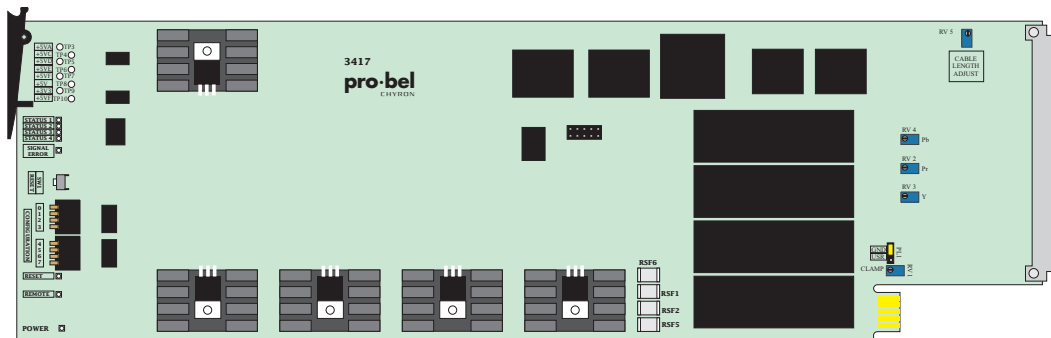
- Y, Pb, Pr or VGA outputs
- adaptive input equalisation up to 100m of Belden 1494 or equivalent cable
- re-clocking at 1.485Gb/s or 1.485/1.001 Gb/s (automatic)
- on-board pattern generator locks to incoming video or local oscillator
- convenient error output warns of CRC, Line number and TRS errors
- COSMOS equipped



The 3417 HDTV digital to analogue converter

2 Installation

The 3417 HDTV digital to analogue converter fits in the 1050 3U and 1051 1U ICON modular product rackframes.



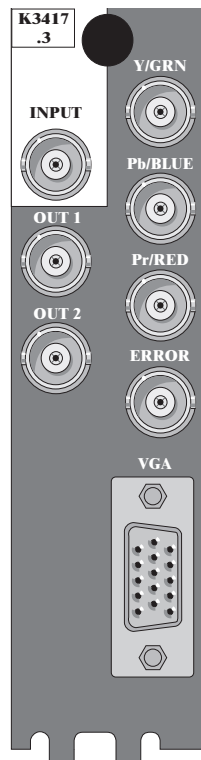
The 3417 HDTV digital to analogue converter

Please refer to the installation chapter for help with installing modules and rear connectors into the ICON frame.

2.1 I/O connections

The 3417 is used with the 30mm K3417-3 rear connector.

The HDTV input uses one BNC whilst re-clocked versions of the input are available on two further BNCs. Component outputs provided comprise Y, Pb and Pr on BNCs and an SVGA monitor feed on a 15 pin high density connector. There is also a BNC connector for the TTL error output signal.



The K3417-3 rear connector

Use a standard VGA cable for the SVGA monitor output.

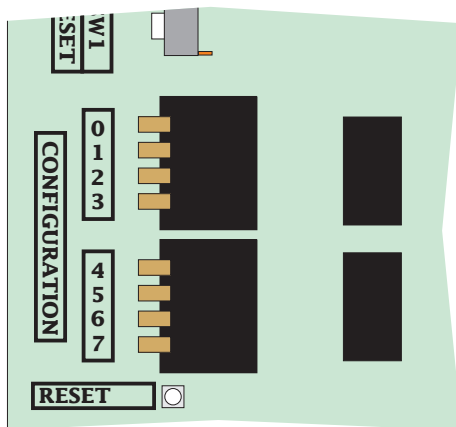
3 Configuration

3.1 Local card edge controls

DIL switch settings control the following output and pattern generator modes:

Setting the output mode

The 3417 may be used in either the Y, Pb, Pr mode or the VGA mode. Make the selection with front edge DIL switch 0 as shown in the following diagram:



Push DIL switch 0 DOWN, towards the card, for VGA mode and UP for Y,Pb,Pr mode

Setting the pattern generator mode

The pattern generator mode generates 100% colour bars to SMPTE 274M. Select the pattern generator mode by pushing DIL switch 1 DOWN. Leave DIL switch 1 UP for normal operation as a digital to analogue converter.

Selecting the pattern lock source

The pattern may be referenced to the incoming HDTV signal or an on-board clock. Set DIL switch 2 DOWN to lock to the HDTV input and UP to lock to an internal clock.

Selecting local/remote operation

The 3417 may be operated using the local DIL switches or via the COSMOS application. Set DIL switch 7 DOWN for remote operation and UP for local operation.

DIL switch control summary

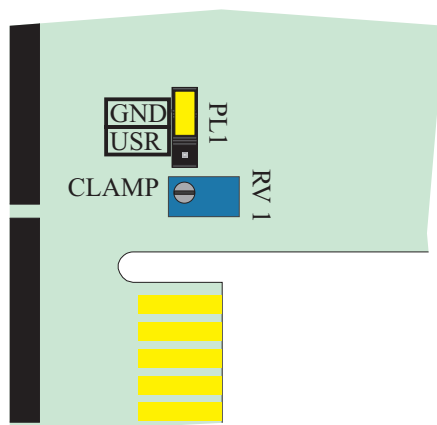
The available switch settings are summarised in the following table:

Switch settings	
DIL lever	Function
0	ON = VGA mode, OFF = Y,Pr,Pb mode
1	ON = pattern generator mode, OFF = DAC mode
2	ON = pattern lock to reference, OFF = pattern lock to clock
3	Not used
4	Not used
5	Not used
6	Not used
7	ON = remote control mode, OFF = local control mode

3.2 Factory pre-set controls

Adjusting the output clamp level

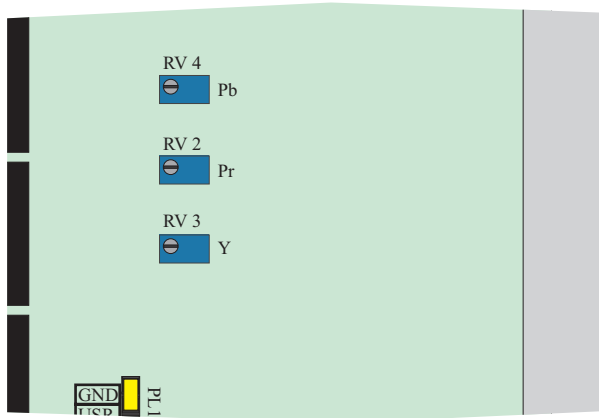
The analogue video output clamping level may be adjusted over the range of $\pm 1V$ by using clamp potentiometer RV1, providing jumper PL1 is in the USR position. Leave PL1 in the GND position to set the output clamp for 0V operation. PL1 and RV1 are near the module edge connector and cannot normally be accessed with the card fitted in a rackframe.



RV1 adjusts output clamp level with PL1 in the USR position

Adjusting the analogue video output

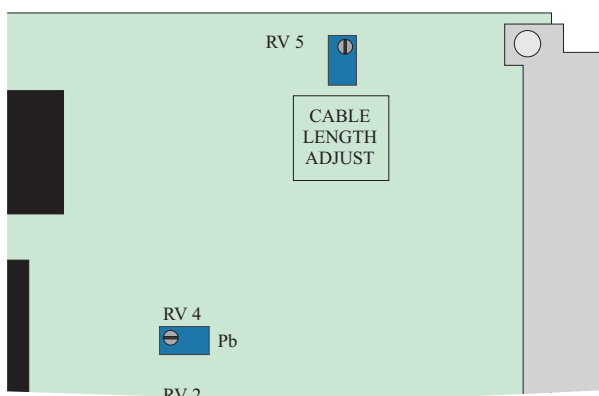
Individual adjustments are provided for Y, Pb and Pr output amplitude. These adjustments are pre-set at the factory and should not require re-adjustment. Access to these controls, which are sited near the module edge connector, is not normally available with the card fitted in a rackframe.



Factory presets RV3, RV4 and RV2 adjust Y, Pb and Pr outputs.

Adjusting the input cable equaliser

The input cable equalisation is factory set for 100 metres of cable. Access to RV5, cable length adjust potentiometer is not normally available with the card fitted in a rackframe.



Factory preset RV1, adjusts input cable equalisation

NOTE: The cable equalisation should adapt automatically for 0-100 metres of cable

4 Status monitoring

The COSMOS frame interface, if fitted, will provide the following information to the COSMOS status monitoring system:

- Input error
- Module power LED status
- Reset
- DIL switch status

In remote mode, the Y, Pb, Pr /VGA output signal format selection and pattern modes may be controlled through COSMOS.

In addition, the module is programmed with the following information, which can be read by the status monitoring controller:

- module present
- module type
- module bar code
- module issue no

For further details of the Pro-Bel status monitoring system please refer to the COSMOS status monitoring manual.

5 Trouble shooting

The green card edge POWER LED is not lit

- check the PSU indicator to confirm that there is power to the frame
- check the resettable fuses protecting the card - do this by removing the power to the card for about 30 seconds then restoring the power
- if necessary, refer to the power supply trouble shooting guide in the appropriate ICON rackframe manual section

There is no output signal

- ensure that the green power LED on the front of the main card is lit
- check that a valid input is connected to the rear panel
- check that the appropriate red Signal Error is not lit
- if only the test pattern is present check the setting of DIL switch 1
- check the setting of DIL switch 0 as the VGA and Y,Pr,Pb outputs cannot be active at the same time

The TTL error output is active

- check the quality of the input signal and the signal path from the source to the 3417 module input

The clamp level is incorrect

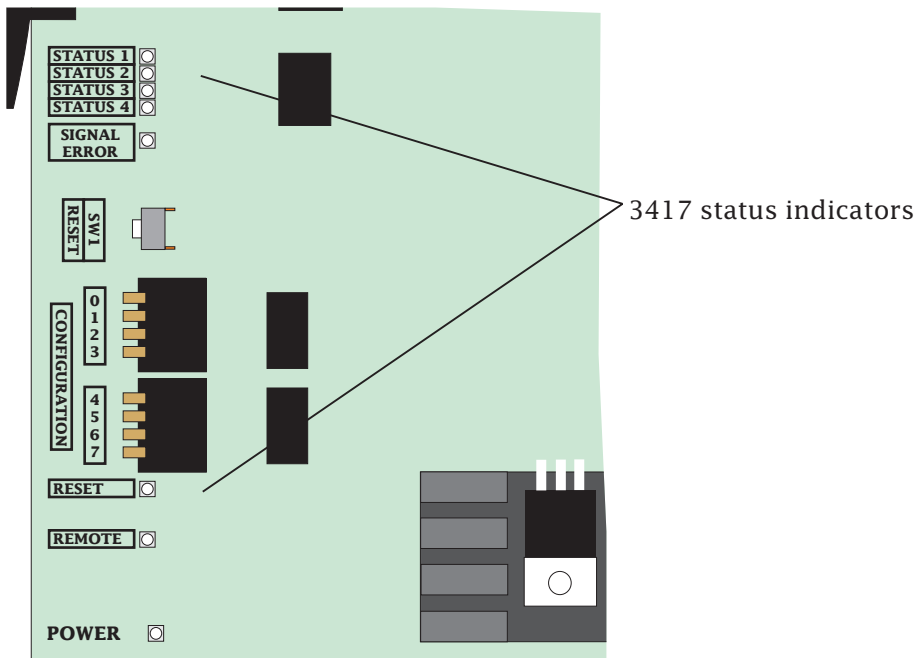
- check that jumper PL1 is set correctly and that RV1 has not been mis-adjusted
- re-adjustment of variable clamp RV1 may require the card to be returned to the factory

NOTE:

Two 3417 modules may be used to analyse signal paths by using one as a source in pattern generator mode and the other as a test receiver with the TTL output monitored on an oscilloscope.

One module cannot be used to generate a test pattern and analyse an input at the same time.

3417 Status indicators	
LED label	Meaning when lit
SIGNAL ERROR	Lights red to indicate that the input signal is missing
RESET	Lights red to Indicate that the module is in reset
REMOTE	Lights yellow to show that the module is in remote mode
POWER OK	Lights green if all voltage rails are present
STATUS 1-4	Indicates detected input mode. The 3417 will only work in the 1080i 30 Hz mode and 1080i 30/1.001 Hz mode (Status LED 4 ON)



NOTE: Although the 3417 will not produce an output for HDTV inputs other than those in the 1080i 30Hz and 1080i 30/1.001 Hz format, the four status lights will still give an indication of other HDTV input formats, even if they cannot be converted. The table on the following page shows all of the formats that can be detected.

Status LEDs and HDTV input detection				
Mode detected	Status 4	Status 3	Status 2	Status 1
720P 60 Hz and 60/1.001 Hz	OFF	OFF	OFF	OFF
Invalid	OFF	OFF	OFF	ON
1080P 30 Hz and 30/1.001 Hz	OFF	OFF	ON	OFF
Invalid	OFF	OFF	ON	ON
1080P 25Hz	OFF	ON	OFF	OFF
Invalid	OFF	ON	OFF	ON
1080P 24Hz and 24/1.001 Hz	OFF	ON	ON	OFF
Progressive (Unknown)	OFF	ON	ON	ON
1080i 30 and 30/1.001 Hz (3417 mode)	ON	OFF	OFF	OFF
Invalid	ON	OFF	OFF	ON
1080i 25Hz F	ON	OFF	ON	OFF
Invalid	ON	OFF	ON	ON
1080i 25Hz C	ON	ON	OFF	OFF
Invalid	ON	ON	OFF	ON
1035i 30 Hz and 30/1.001 Hz	ON	ON	ON	ON
Unknown	ON	ON	ON	ON

6 Specification

Inputs

Number and type: One HDTV serial digital video input to SMPTE 292M, 1080i 30 Hz and 1080i 30/1.001 Hz

Impedance: 75Ω unbalanced

Signal outputs

Number and type: Two as input equalised and re-clocked
HDTV analogue to SMPTE 274M, 1 each of Y, Pb, Pr
SVGA output in RGBHV format at 33.75kHz horizontal/60-59.94Hz vertical

Impedance: 75Ω unbalanced

Analyser output

Number and type: Single TTL output provides a pulse if any of the following errors occur on the input, CRC, Line number and TRS

Pattern output

Number and type: One 100% colour bar signal to SMPTE 274M

Performance

Y, Pb, Pr frequency response: < 0.2dB down @ 30mHz

VGA R, G, B frequency response: < 0.2dB down @ 30mHz

Maximum input cable length: 100M of Belden 1694 or equivalent cable (adjustable)

Output clamp: ± 1V adjustable or fixed at 0V

LED indicators

Input error - red
Reset - red
Remote - yellow
Power OK - green
Status 1-4 - yellow

7 **Ordering information**

Part number	Description
ICO-3417-3000	HDTV Digital to Analogue Converter, 30mm