

Contents

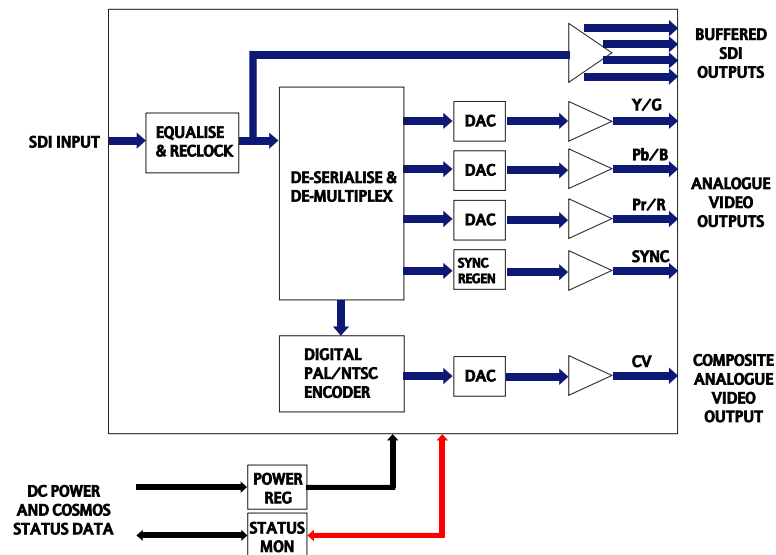
1	Introduction	2
2	Configuration and operation	4
2.1	Selecting the rear connector	4
2.2	Setting component output options	5
2.3	Component level adjustment	6
2.4	Status LEDs	8
3	Trouble shooting	10
4	COSMOS status monitoring	12
5	Specification	14
6	Ordering information	16

1 Introduction

The 3415 is a precision 10 bit 270Mb/s component digital to analogue video converter with full ITU-R 601 filtering. The output is switchable for GBR or Y, Pb, Pr with sync on Y/GBR and on a separate output. An output of composite analogue video is provided to facilitate composite monitoring and four re-clocked and buffered copies of the SDI input are provided with the 30mm rear panel. Vertical interval information may be passed or blanked and most configuration settings can be remotely controlled or monitored via the COSMOS interface.

The features available are:

- three analogue component outputs plus sync and analogue composite monitoring
- additional four re-clocked buffered SDI outputs with the 30mm K3415-3 rear connector
- 10 bit 270Mbit/s processing
- automatic 525/625 operation
- adaptive input equalisation
- variable/calibrated (N10) gain
- setup (pedestal) on/off in 525
- VANC (Vertical Ancillary Data) deletion on/off
- COSMOS equipped

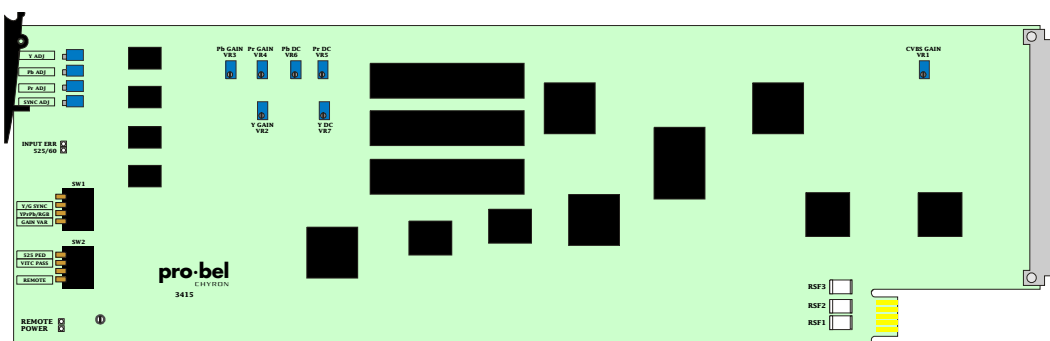
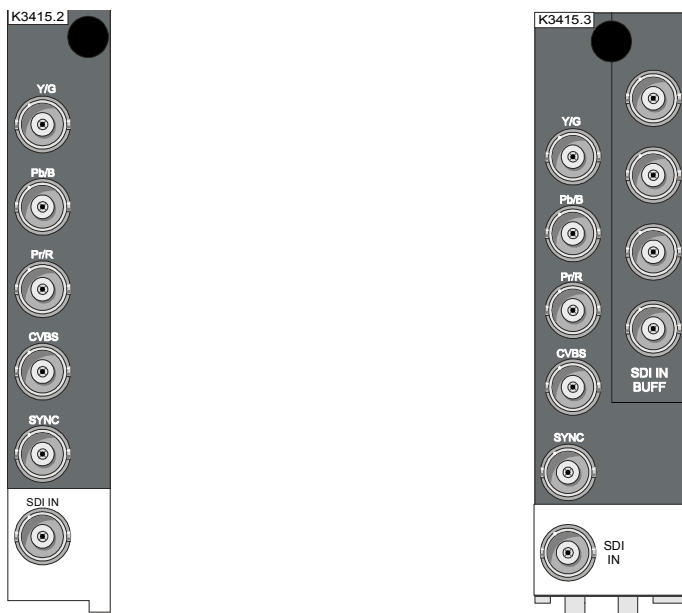


The 3415 Component video digital to analogue converter

2 Configuration and operation

2.1 Selecting the rear connector

The 3415 may be used with either the 20mm K3415-2 rear connector or the 30mm K3415-3 rear connector which provides four outputs of the re-clocked buffered SDI input.



The 3415 Component video digital to analogue converter

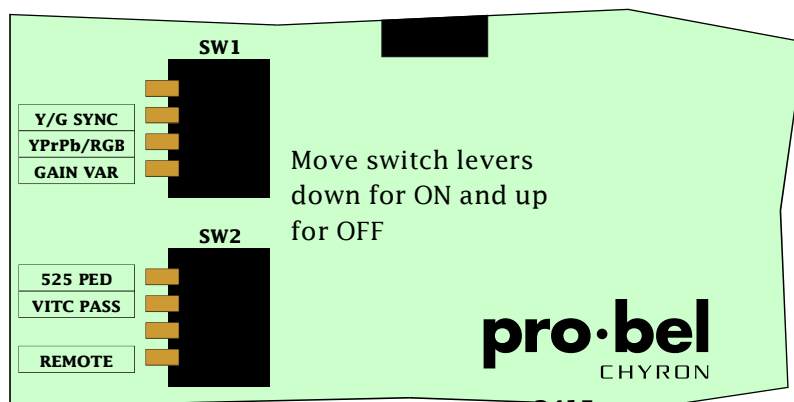
Please refer to the installation chapter for help with installing modules and rear connectors into the ICON frame.

2.2 Setting component output options

The analogue component output may be set in either Y, Pb, Pr or GBR formats. Syncs may be added to the luminance (Y) or GBR signals and a 7.5 IRE pedestal may be added in 525 operation to R, G, B and Y outputs.

The analogue outputs may be manually adjusted from front controls or left calibrated according to SMPTE/EBU N10. In addition the converter may be set to pass or blank VANC (Vertical Ancillary Data). COSMOS allows many of these functions to be controlled remotely.

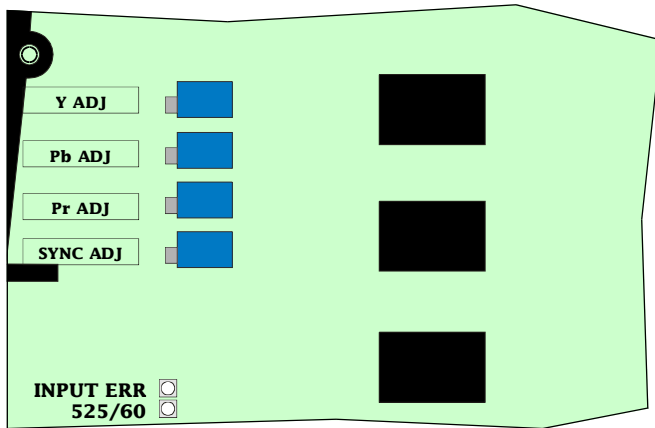
The front control dip switch settings are shown in the following diagram and summarised in the table below.



Front switch controls		
SW1 & SW2 lever name	OFF function	ON function
Y/G SYNC	Sync not added to Y/GBR	Sync added to Y/GBR
YPrPb/RGB	Y Pr Pb mode	RGB mode
Gain Var	Pre-set gain	Variable gain (see 2-3)
525 PED	No set-up (pedestal) added	7.5 IRE set-up added to Y/GBR outputs in 525 line mode
VITC PASS	VANC (Vertical Ancillary Data) from input deleted from analogue outputs	VANC (Vertical Ancillary Data) from input passed to analogue outputs
REMOTE	COSMOS remote configuration disabled	COSMOS remote configuration enabled

2.3 Component level adjustment

Gain adjustment is provided for the module analogue outputs for compatibility with both Betacam and M-II formats. Adjustment ranges are shown relative to SMPTE/EBU N10 levels.



Front gain controls

Name	Description
Y ADJ	Luminance gain ± 1 dB
Pb ADJ	Pb gain +3dB to -1dB
Pr ADJ	Pr gain +3dB to -1dB
SYNC ADJ	Sync gain ± 1 dB

NOTES:

Signal gain adjustable in Gain Var mode only.

Other module adjustments are factory preset only and should not require re-adjustment.

Standard component levels

The following tables summarise standard analogue component levels for SMPTE/EBU with and without set-up in 525.

GBR					
	Max	Min	Video	Sync	P-P
SMPTE/EBU N10	700mV	0mV	700mV	-300mV	1V
525 no set-up	714mV	0mV	714mV	-286V	1V
525 with set-up	714mV	54mV	660mV	-286V	1V

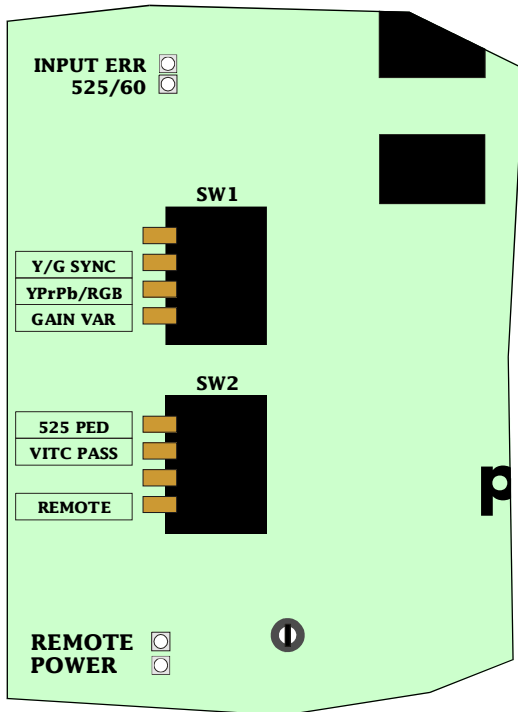
Y Pb Pr SMPTE/EBU N10 - no set-up					
	Max	Min	Video	Sync	P-P
Y (100% bars)	700mV	0mV	700mV	-300mV	1V
Pb, Pr (100% bars)	350mV	-350mV	700mV		700mV
Y (75% bars)	525mV	0mV	525mV	-300mV	825mV
Pb, Pr (75% bars)	262.5mV	-262.5mV	525mV		525mV

Y Pb Pr 525 with set-up (Betacam®)					
	Max	Min	Video	Sync	P-P
Y (100% bars)	714mV	54mV	660mV	-286mV	1V
Pb, Pr (100% bars)	467mV	-467mV	934mV		934mV
Y (75% bars)	549mV	54mV	495mV	-286mV	835mV
Pb, Pr (75% bars)	350mV	-350mV	700mV		700mV

Y Pb Pr 525 with set-up (MII®)					
	Max	Min	Video	Sync	P-P
Y (100% bars)	700mV	53mV	647mV	-300mV	1V
Pb, Pr (100% bars)	324mV	-324mV	648mV		648mV
Y (75% bars)	548mV	53mV	495mV	-300mV	848mV
Pb, Pr (75% bars)	243mV	-243mV	486mV		486mV

2.4 Status LEDs

The module is equipped with the following indicators to provide a means of monitoring operation:



Indicators		
LED	Colour	Function
Input error	Red	Internal PLL not locked
525/60	Yellow	Automatic line standard selection - illuminated in 525 mode
Remote	Yellow	Remote COSMOS operation selected
Power	Green	Power OK

In local operation and 625/50 mode only the green POWER LED should be lit.

3 **Trouble shooting**

The Input Error LED is lit

- check that a valid serial digital video signal is connected to the rear connector input BNC

Video black level is raised in 525 mode

- check that the 525 PED switch is not on if 7.5 IRE set-up is not required

Output levels are incorrect

- for calibrated N10 levels check that the GAIN VAR switch is off

The output is not synchronised in downstream equipment

- check the syncs requirement of the downstream equipment and supply separate syncs, syncs on green or syncs on luminance as appropriate

The Power LED is not lit

- check mains power to the frame is turned on
- if necessary check the PSU as explained in the power supply section
- check the card is plugged in securely
- check to see if one of the re-settable fuses has operated. To do this turn the power off, wait for thirty seconds and then restore the power.

4 COSMOS status monitoring

The 3415 module will provide the following information to the COSMOS status monitoring controller (if fitted):

- standard selection (automatic)
- input error or PLL lock status
- pass VANC on/off
- 525 set-up on/off
- Var/Fixed gain
- YPbPr/GBR selection
- Y/GBR sync on/off
- Power OK
- local/remote configuration select switch status

In remote mode, the following may also be controlled through COSMOS

- pass VANC on/off
- 525 set-up on/off
- Var/Fixed gain
- YPbPr/GBR selection

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 Specification

Inputs

Number and type: One 270Mb/s serial digital video input to EBU Tech 3267E, SMPTE 259M-C

Impedance: 75 Ω unbalanced

Outputs

Number and type: Three analogue component video, 1Vpp nominal, Y/G, Pb/B, Pr/R

One analogue mixed sync 2.0Vpp

One analogue composite video CVBS

Four re-clocked 270Mb/s SDI (only available with 30mm rear panel)

Impedance: 75 Ω unbalanced

Performance

Input return loss: > 15dB 10MHz to 270MHz

Input equalisation: Automatic up to 300m Belden 8281 or similar cable

Output return loss:
(analogue) > 35dB to 4.3MHz

Output return loss:
(re-clocked SDI) > 15dB 10MHz to 270MHz

Gain: Error (cal mode) <1% any component
Stability 1 hour <1% any component

Pulse and bar response: Luminance 2T <0.3%K
Chrominance 4T <0.3%K

Sweep response: Luminance 0.1dB to 5.5MHz
Chrominance 0.1dB to 2.75MHz

Delay: Delay inequality <10ns between any components

Group delay ripple: Luminance \pm 3ns to 5.75MHz
Chrominance \pm 6ns to 2.75MHz

Noise: <-70dB rms 100Hz to 5MHz

On-card controls

Y/GBR sync on/off
YPbPr/GBR
Set-up on/off 525
SMPTE/EBU N10 levels/variable
Vertical blanking on/off
Luminance/Green gain
Pb/Blue gain
Pr/Red gain
Sync gain

LED indicators

525/60 - yellow
Input error - red
Remote configuration mode - yellow
Power OK - green

6 **Ordering information**

Part number**Description**

ICO-3415-2000

Component video DAC, component and composite outputs, 20mm

ICO-3415-3000

Component video DAC, component, composite and four SDI outputs, 30mm