



V1629

DUAL MONITORING ENCODER

INSTALLATION and OPERATION

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V1629 DUAL MONITORING ENCODER

INSTALLATION AND OPERATION

1. DESCRIPTION

The V1629 is a two channel monitoring encoder which converts SDI signals to analogue colour composite ones. It is based heavily on the existing V1627, but has two completely independent channels. It is a 3U high Eurocard which can be fitted into either a V1601 or V1603 chassis from which it receives its power. A passive rear module is required for all external interconnections; different ones are used for the V1601 and V1603 chassis.

For each channels there is an active, reclocked, digital output and two analogue composite colour output signals. Since there is a re-clocked output the unit can effectively be put in series with the signal path, avoiding the need for a DA. The analogue outputs conform to the published specifications of the various colour systems, but the post DAC filtering is optimised for the viewing rather than the transmission environment. Since the coder portion is intended for monitoring purposes it uses only 8 bits from the SDI data stream. The data reduction is done using the Dynamic Rounding technique, which avoids the visibility of rounding or truncation errors.

The two analogue CVBS outputs from each channel can be switched over to Y/C. In this case the full CVBS is not available (i.e. it is not possible to have CVBS and Y for example).

Each channel operates automatically on both possible input formats, 625/50 and 525/60. Within each format two colour standards are available as follows:

625/50 : PAL I or PAL N

525/60 : NTSC or PAL M

Which standard is used can be set locally on a DIL switch on the PCB or remotely over the DART remote control system.

The two channels are quite independent and can be operating in either the same or different colour standards and/or different formats. Also any channel can be producing CVBS while the other does YC.

If NTSC is the chosen colour standard then it can be switched between the normal standard, as used in the US and most other NTSC countries, or to the Japanese variant which does not have Setup, and therefore slightly different levels as well. This can also be set on the DIL switches or over DART.

As well as the encoder functions each channel of the unit can also produce a PLUGE test signal (**P**rogramme **L**ine-**U**p **G**enerating **E**quipment). This is useful for setting up a bank of picture monitors for the same brightness and contrast. PLUGE can be selected on the front panel or since this unit may be used in quantity associated with a bank of picture monitors it is possible to remotely select PLUGE on a GPI input. This is the only control that is common to both channels. But conversely since this could disturb the output picture, a DIL switch on each channel can disable PLUGE generation from any source (switch, DART or GPI). The unit is not an SPG so cannot generate PLUGE without a valid input signal.

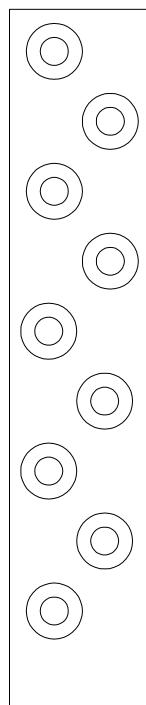
The front panel has several LEDs and switches. Two LEDs are common with all V1600 modules and show the presence of on board regulated power and remote access from the DART system. Other LEDs indicate the operating standard of each channel, if present, whether YC is selected and whether PLUGE is on the outputs. There are two switches, one for PLUGE and the other for the control source – Local or Remote. (The GPI control is always ‘live’ so does not need to be selected.)

2. INSTALLATION

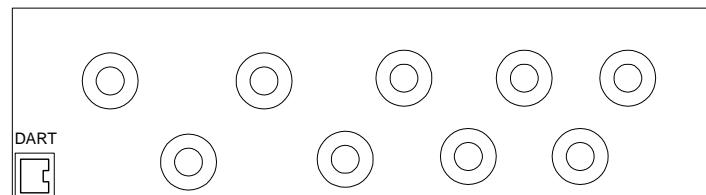
2.1 REAR PANEL CONNECTIONS

The two available rear panels are shown below:

3U (V1603)



1U (V1601)



SIGNAL	SOURCE	COMMENTS
POWER	The Rack	~7.5W
SDI A I/P	SD (IN)	Sourcing cable length up to 200m
SDI A O/P	Reclocked version of SDI A	Driving cable length up to 200m
CVBS A1	Colour Composite or Y	Channel A: CVBS or Y
CVBS A2	Colour Composite or C	Channel A: CVBS or C
GPI	External Grounding	GPI control of PLUGE
CVBS B2	Colour Composite or C	Channel A: CVBS or C
CVBS B1	Colour Composite or Y	Channel A: CVBS or Y
SDI B O/P	Reclocked version of SDI A	Driving cable length up to 200m
SDI B I/P	SD (IN)	Sourcing cable length up to 200m

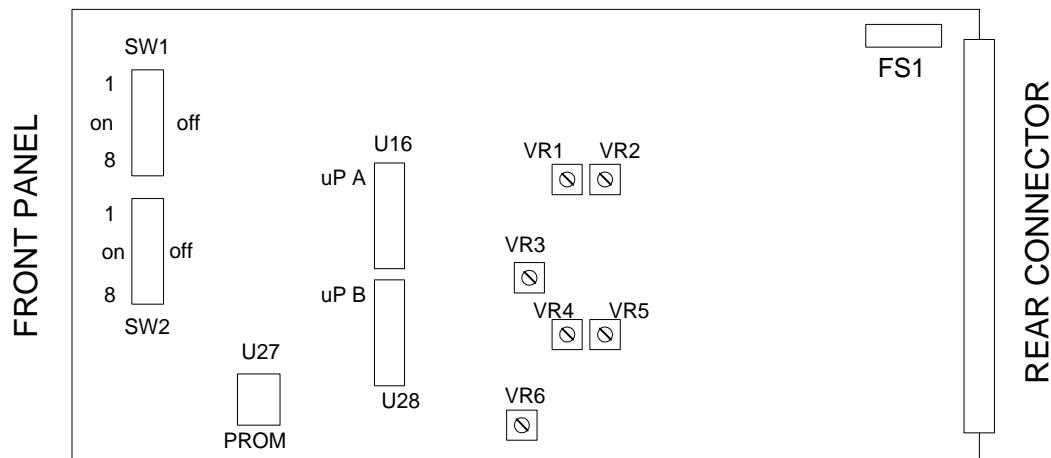
2.2 INSERTION DELAY

The SDI insertion delay is **10ns**.

The insertion delay from the SDI de-serialiser to the analogue outputs is **1.44μs**. This is the same for the both the YC and CVBS outputs.

2.3 HARDWARE

The figure below shows diagrammatically the main board along with certain components of interest. In particular it shows the positions of the 8 way DIL switches and the programmable micro-controller devices for each channel. The small PROM, U27, holds the data for the programmable FLEX device, U20.



2.4 ADJUSTMENTS

The drawing in section 2.3 shows 6 variable resistors pots. These are defined here.

POT	PURPOSE
VR 1	CH A CVBS O/P Black Level = 0V ±10mV (PAL I)
VR 2	CH A Y O/P Black Level = 0V ±10mV (PAL I)
VR 3	CH A Overall O/P Level = 700mV ±10mV (PAL I)
VR 4	CH B CVBS O/P Black Level = 0V ±10mV (PAL I)
VR 5	CH B Y O/P Black Level = 0V ±10mV (PAL I)
VR 6	CH B Overall O/P Level = 700mV ±10mV (PAL I)

All levels are set up in the factory, and while the information is given here it is not expected that users and operators will need to make any adjustments in the field over the expected lifetime of the equipment.

2.5 SWITCH SETTINGS

This table shows the use of the DIL switches, SW1 and SW2. SW1 is exclusively for channel A and SW2 for channel B. Note that to turn a parameter ON the switch should be pushed toward the front of the boards. Ignore the ON indication on some of the actual switches which might imply the opposite.

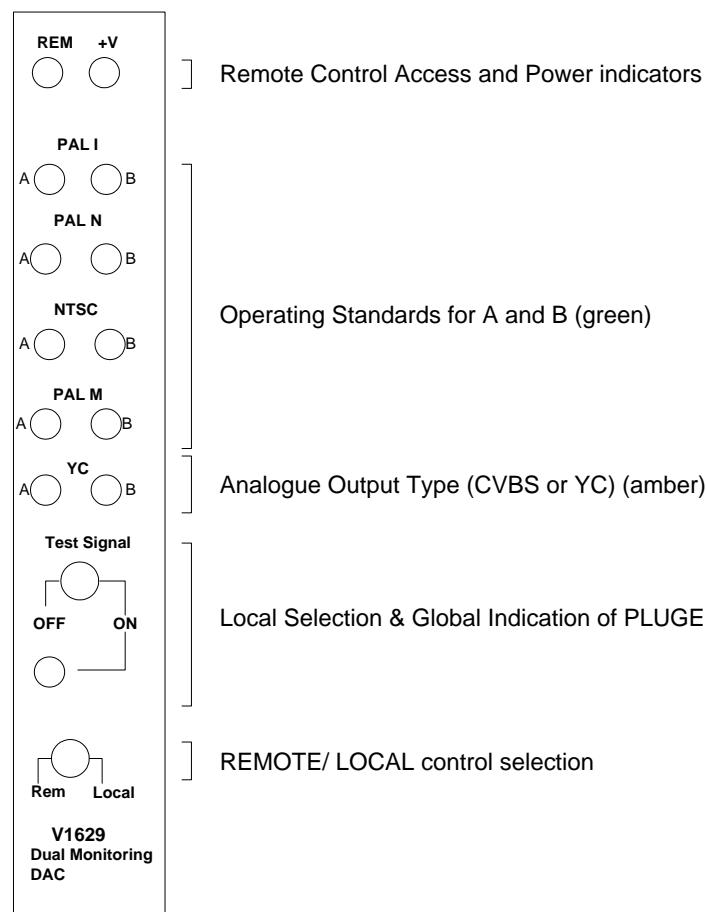
SWITCH	TITLE	ON (Front)	OFF (Rear) - Default
1	Std. Select	625/50 \Rightarrow PAL N 525/60 \Rightarrow PAL M	625/50 \Rightarrow PAL I 525/60 \Rightarrow NTSC
2	VI Blank	Blank Vert. Interval on CVBS	Pass Vertical Interval to CVBS
3	DR Off	Dynamic Rounding disabled	Dynamic Rounding ON
4	NTSC - Japan	NTSC JAPAN for 525/60 i/ps	Standard NTSC for 525/60 i/ps
5	unused		
6	unused		
7	PLUGE Disable	PLUGE not selectable	PLUGE available
8	YC on Output	Analogue O/Ps \Rightarrow Y and C	Analogue O/Ps \Rightarrow CVBS

For normal operation all switches should be OFF, i.e. set towards the rear.

3. OPERATION

3.1 FRONT PANEL LAYOUT

The V1629 front panel layout is as shown here.



3.2 FRONT PANEL INDICATIONS

3.2.1 REM

The REM LED indicates that the PCB is being accessed by the Rack Controller. It is NOT an indication that the unit is in REMOTE control mode. As the Rack Controller accesses the module the LED will emit short blips.

3.2.2 +V

This LED indicates that the on board 5V regulator is operating. It does not show that the unit is receiving the distributed rack power. For example if the on board fuse is 'blown' the LED will not be ON.

3.2.3 OPERATING STANDARDS

This group of green LEDs indicate the presence and operating standard of both channels. If one of the channels has no input then none of the four LEDs for that channel will be ON. If a signal is present then one and only one of the four LEDs for that channel will be ON.

If NTSC is being used then there is no front panel indication whether it is standard NTSC or the Japanese variant, which has no setup.

3.2.4 TEST SIGNAL

The normal Test Signal available is PLUGE, and this is used in all other parts of this manual. It is possible that future variants may use different test signals, so the front panel has been designed with this in mind.

This switch is used to select PLUGE when the unit is in LOCAL control. There are some restrictions on the use of PLUGE as described in section 3.7.

When selected PLUGE only appears on the CVBS (or YC) outputs. Its selection does not affect the SDI output which will continue to reflect the SDI input.

The LED indicates that PLUGE is on at least one of the outputs. This is not necessarily enabled from the front panel switch, since it can have been set over DART or from the GPI.

3.2.5 REM/LOC

This switch is used to select control from LOCAL to REMOTE over the DART control network. Local control is made using the internal DIL switches and the front panel PLUGE switch. All equivalent functions are available over DART.

3.3 LOCAL CODER CONTROL

Local control of the coder functions is all done on the DIL switches on the PCB except for PLUGE on and off.

Most of the coder functions are inherent to the design, but some characteristics can be changed using the DIL switches on the PCB. The two switches SWs 1 and 2 operated identically on the two channels and are completely independent. Within each DIL switch there are 8 switches which are used as in the following table.

Note the nomenclature of the switch position with regard to On and OFF. This may not be the same as the label ON on some of the physical devices. (This is because the unit uses positive logic whereby a high voltage is a logic 1, but the action of turning a switch ON usually puts a logic 0 on the control.)

SWITCH	TITLE	ON (Front)	OFF (Rear) - Default
1	Std. Select	625/50 \Rightarrow PAL N 525/60 \Rightarrow PAL M	625/50 \Rightarrow PAL I 525/60 \Rightarrow NTSC
2	VI Blank	625: 623.5 \rightarrow 22, 311 \rightarrow 335	625: 623.5 \rightarrow 6, 311 \rightarrow 320
		525: 1 \rightarrow 20, 263.5 \rightarrow 19	525: 1 \rightarrow 9, 263.5 \rightarrow 9
3	DR Off	Dynamic Rounding disabled	Dynamic Rounding ON
4	NTSC - Japan	625: no effect	625: no effect
		525: NTSC JAPAN	525: Standard NTSC
5	unused		
6	unused		
7	PLUGE Disable	PLUGE not selectable	PLUGE available
8	YC on Output	Analogue O/Ps \Rightarrow Y and C	Analogue O/Ps \Rightarrow CVBS

For normal operation all switches should be OFF, i.e. set towards the rear.

3.4 STANDARD SETTING

The unit can generate 4 different colour standards, with a variant on one of them. Which are available depends on the SDI input format. 625/50 signals can be in PAL I or PAL N, while 525/60 can be in NTSC (or NTSC Japan) or PAL M.

In LOCAL control they are set as follows:

Channel A: SW 1, switch 1 Rear = PAL I or NTSC
 Front = PAL N or PAL M

Channel B: SW 2, switch 1 Rear = PAL I or NTSC
 Front = PAL N or PAL M

Additionally switch 4 is used to set the NTSC variant:

Channel A: SW 1, switch 4 Rear = Standard NTSC
 Front = Japanese NTSC

Channel B: SW 2, switch 4 Rear = Standard NTSC
 Front = Japanese NTSC

In REMOTE control mode all these options are settable over DART.

3.5 VI BLANKING

Normally the V1629 passes any signal in the active video parts of the vertical interval lines through to the coding process. This is useful if they carry Component test signals, or monochrome TELETEXT signals for example.

For some application the user may want to blank these vertical interval lines. This can be done locally using switch 2 on the DIL switch banks or remotely over DART. The active lines being coded are as follows (using the conventional line numbering system for each primary standard):

Format	VI Pass	VI Blank
625/50 Field 1	7 to 310	23 to 310
625/50 Field 2	321 to 623.5	336 to 623.5
525/60 Field 1	10 to 263.5	21 to 263.5
525/60 Field 2	10 to 263.5	20 to 263.5

3.6 DART CONTROL

The V1629 can be controlled over the DART remote control system. All the same functions as defined above can be controlled locally.

To enable DART control put the Local/Remote switch to REMOTE. There is no direct indication that the unit is in remote control other than the position of this switch. The REM LED will blink to indicate that the unit is being accessed, but this applies even if the unit is in Local control since the DART system can always read the unit's status.

For DART control the rack containing the unit must be fitted with a suitable Rack Controller such as the V1608.

The DART map of all available controls is shown in section 3.12.

3.7 PLUGE

PLUGE is a monochrome test signal to assist in the setting up of picture monitors. It contains two parts; low level near black signals for setting the brightness and progressive white areas for setting the contrast using either ones eyes or brightness measuring equipment.

The V1629 does not have a free running oscillator, and so cannot produce an output on either channel without a valid SDI input. Thus PLUGE is only available on the output of each channel when it has a valid input.

PLUGE can be selected in three ways; locally on the front panel switch, remotely over DART or from a GPI input to the rear panel. If the unit is in LOCAL mode then the front panel switch will put PLUGE out on both channels unless either one or both of them has had PLUGE disabled on the internal switches. The front panel amber LED will be ON to show that PLUGE has been selected. Remote control over DART is similar, in that if the unit is in REMOTE mode PLUGE can be selected to both channels only, provided it has not been disabled on the internal switches.

The GPI control is always available. It operates if the unit is in either LOCAL or REMOTE control and will always select PLUGE to both channels, unless they have been individually disabled on the internal switches.

The amber front panel LED indicates that PLUGE has been requested, from whichever source, but not that it is on the output, which may have been disabled from the internal switches.

3.8 ADJUSTMENTS

Both the V1627 and V1628 have internal adjustable potentiometers for setting up gains and black levels. They are shown in this table:

POT.	BUILD	OUTPUT	PARAMETER
VR 1	Both	A on CVBS	CVBS Gain
VR 2	Both	A on CVBS	CVBS Black
VR 3	Both	A on Y/C	Y Black
VR 4	V1628 Only	C on YUV	Sync Amplitude
VR 5	V1628 Only	C on YUV	Y Amplitude
VR 6	V1628 Only	C on YUV	Y Black Level offset
VR 7	V1628 Only	D on YUV	Pr Zero Offset
VR 8	V1628 Only	E on YUV	Pb Zero Offset

3.9 SIGNAL FAIL

If the input signal to either channel fails, then the SDI input stages recognise the absence of the 270MHz, and mutes the output. Since the coder stage thus loses its clock there will be no output.

All analogue outputs are switched off to a dc level. For the Coder outputs, this is in the region of the sync tips, approximately -300mV. For the YC outputs, if selected, the dc voltage is near blanking level. There is no facility to generate a colour black signal.

If the input signal to a channel has failed, then PLUGE is not available on that channel.

3.10 GPI

The GPI input is for selecting PLUGE onto the outputs. It is active when the unit is in either LOCAL or REMOTE mode and will always put the outputs of both channels to PLUGE unless one or other of the relevant internal DIL switches is set to inhibit it.

The GPI is connected through a BNC connector. The 'active' contact has an internal pull-up resistor (6K8) to +5V. The external control device should connect this to Ground, i.e. the screen of the BNC. Note that this means that a 75R termination is enough to enable PLUGE.

3.11 TROUBLE SHOOTING

The V1629 is a reliable and easy to use unit but there could be some circumstances where the output is not what is expected. This short guide may help to solve problems quickly.

SYMPTOM	POSSIBLE CAUSE(S)
No O/P from either channel	Is the module powered? Check the +V LED Is the correct rear module being used? Are the input(s) true SDI D1 signals.
No O/P from one channel	Is there a SDI D1 input? Are you looking at chroma with the channel set to YC? Is the input connected to the right BNC? Note that channel B input is at the opposite end to channel A.
Mono Output (burst present)	The unit may be set to produce the wrong colour standard – PAL N when you expect PAL I or PAL M when you expect NTSC. See section 3.4. Is the input monochrome?
Mono Output (no burst)	You are probably looking at the Y output with the channel set to YC.
No syncs on output	Assuming the input is OK (correctly identified on the front panel or over DART) then you are probably looking at the C output with the unit set to YC.
Wrong colour standard	Set incorrectly on the DIL switch or over DART.
Wrong level in NTSC	Probably caused by the unit being set to Japanese NTSC on the internal DIL switches or over DART.
Permanent PLUGE	Is the GPI input grounded? (Note that a 75R termination is sufficient to enable PLUGE.) Either remove the GPI or set the internal switch to inhibit it.
Can't get PLUGE	Is it inhibited on the internal DIL switch?

3.12 DART CONTROLS

The following parameters can be controlled over DART, and a corresponding status read back:

PARAMETER	DEFAULT STATE
Ch A YC Select	CVBS
Ch A Standard Select	PAL I or NTSC
Ch A Blank Vertical Interval	VI Passed
Ch A Disable Dynamic Rounding	DR ON
Ch A NTSC Japan	EIA NTSC
Ch B YC Select	CVBS
Ch B Standard Select	PAL I or NTSC
Ch B Blank Vertical Interval	VI Passed
Ch B Disable Dynamic Rounding	DR ON
Ch B NTSC Japan	EIA NTSC
Both Channels: PLUGE Select	Not Selected

The following parameters reflect the status of the module and can be read over the DART remote control, but there is no corresponding control parameter:

PARAMETER
Local or Remote Control
Ch A I/P Fail
Ch A I/P Format (625 or 525)
Ch B I/P Fail
Ch B I/P Format (625 or 525)