

MDD 1100

Multi-Standard  
Digital Decoder


Operator's  
Manual

© May 1997

Snell & Wilcox Ltd, Durford Mill, Petersfield, Hampshire, GU31 5AZ, United Kingdom.

# Safety Warnings

Always ensure that the unit is properly earthed and power connections correctly made.

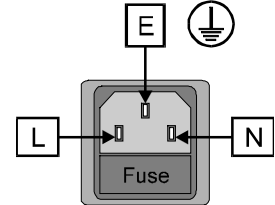
This equipment shall be supplied from a power system providing a **PROTECTIVE EARTH**  connection and having a neutral connection which can be reliably identified.

The power terminals of the IEC mains input connector on the rear panel are identified as shown below:

E = Protective Earth Conductor

N = Neutral Conductor

L = Live Conductor



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## Power cable supplied for countries other than the USA

The equipment is normally shipped with a power cable with a standard IEC moulded free socket on one end and a standard IEC moulded plug on the other. If you are required to remove the moulded mains supply plug, dispose of the plug immediately in a safe manner. The colour code for the lead is as follows:

GREEN/YELLOW lead connected to E (Protective Earth Conductor)

BLUE lead connected to N (Neutral Conductor)

BROWN lead connected to L (Live Conductor)

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## Power cable supplied for the USA

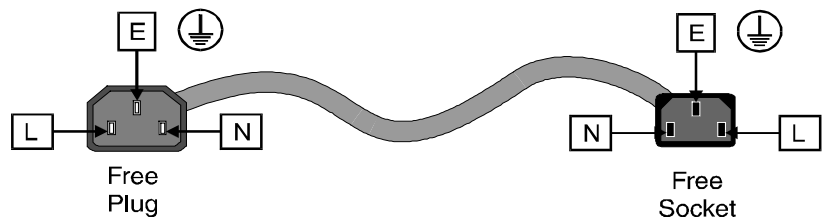
The equipment is shipped with a power cord with a standard IEC moulded free socket on one end and a standard 3-pin plug on the other. If you are required to remove the moulded mains supply plug, dispose of the plug immediately in a safe manner. The colour code for the lead is as follows:

GREEN lead connected to E (Protective Earth Conductor)

WHITE lead connected to N (Neutral Conductor)

BLACK lead connected to L (Live Conductor)

The terminals of the IEC mains supply lead are identified as shown opposite:



*Note that for equipment that is not fitted with a mains power switch, to comply with BS60950 Clauses 1.7.2 and 2.6.9, the power outlet supplying power to the unit should be close to the unit and easily accessible.*



### **Warnings**

Voltages within this unit can be lethal under certain circumstances. Where power is required to be connected to the unit during servicing great care must be taken to avoid contact with these voltages.

Maintenance should only be carried out by suitably qualified personnel.

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## EMC Standards

This unit conforms to the following standards:

Electromagnetic Compatibility-Generic Immunity Standard BS EN 50082-1:1992

*The European Standard EN 50082-1:1992 has the status of a British Standard and is related to European Council Directive 89/336/EEC dated 3rd May 1989.*

Electromagnetic Compatibility-Generic Emission Standard BS EN 50081-1:1992

*The European Standard EN 50081-1:1992 has the status of a British Standard and is related to European Council Directive 89/336/EEC dated 3rd May 1989.*

## Safety Standards

This unit conforms to EN60065:1992 as ammended by ammendment A1(May 1993) and ammendment A2(March 1994). Specification for safety of technology equipment, including electrical business equipment.

## EMC Performance of Cables and Connectors

Snell & Wilcox products are designed to meet or exceed the requirements of the appropriate European EMC standards. In order to achieve this performance in real installations it is essential to use cables and connectors with good EMC characteristics.

All signal connections (including remote control connections) shall be made with screened cables terminated in connectors having a metal shell. The cable screen shall have a large-area contact with the metal shell.

### COAXIAL CABLES

Coaxial cables connections (particularly serial digital video connections) shall be made with high-quality double-screened coaxial cables such as Belden 8281 or BBC type PSF1/2M.

### D-TYPE CONNECTORS

D-type connectors shall have metal shells making good RF contact with the cable screen. Connectors having "dimples" which improve the contact between the plug and socket shells, are recommended.

## Packing List

The unit is supplied in a dedicated packing carton provided by the manufacturer and should not be accepted if delivered in inferior or unauthorised materials. Carefully unpack the carton and check for any shipping damage or shortages.

Any shortages or damage should be reported to the supplier immediately.

Enclosures:

- MDD 1100
- Power cable
- Operator's Handbook

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## Installation

The MDD1100 is supplied in a dedicated carton provided by the manufacturer and should not be accepted if delivered in inferior or unauthorised material. Carefully unpack the unit and check for any shipping damage or shortages. If you encounter any problems please report them to the supplier immediately.

**IMPORTANT NOTE :** In cases of complaint the packing material should be retained for inspection by the carrier.

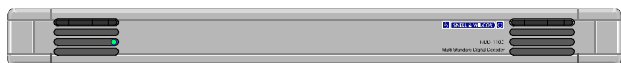


The unit is designed for mounting in a 1U high slot in a 19" racking system.

The chassis is equipped with a pair of mounting ears attached to the side plates and suitable screws should be inserted through the holes in these flanges to secure the chassis to the racking system. Ensure that the rack is correctly configured to accept the 1U unit with chassis runners positioned to support the unit.

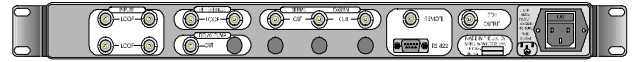
*Under no circumstances should the unit be hung from its rack ears alone as this will result in irreparable damage to the case.*

Whilst mounting the unit please try to ensure that there is adequate air flow to the sides of the unit. If an MDD is to be mounted in a rack together with convection cooled equipment, e.g. Analogue distribution amplifiers ensure that it is not located above or interspersed with these units. The equipment should be operated in an environment having a temperature between 0°C and +40°C and a relative humidity of less than non-condensing.

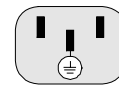


The front panel is opened by pulling the two catches forwards. We have found that the easiest way of doing this is with your thumbs ! The internal hinge mechanism has been designed so that the panel can slide forwards and drop down to leave unrestricted access to the boards.

## Electrical Connection



The power supply accepts AC mains in the range 88 to 256 Volts AC @ 45Hz to 60Hz and will auto switch to these standards. The main power connection, located at the rear of the unit, is made via a fused IEC320 inlet socket (fuse 2.5 AT) with the middle pin as earth conductor. This electrical connection should be located as close to the unit as possible to facilitate easy isolation.



Earth  
Connection

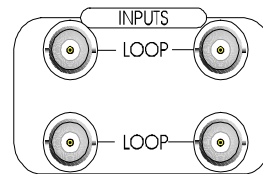
## Power Indicator

The ON / OFF switch is located behind the front panel. The power LED is visible with the front panel open or closed. The power indicator will glow GREEN under normal conditions but switch to RED if the cooling fan has failed or an internal error has occurred.

## Signal Connections

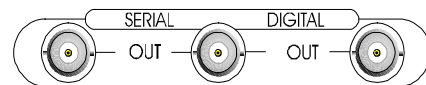
### Composite Inputs

The Composite inputs are labelled A LOOP and B LOOP. The relevant input is selected from the menu system (See section "The Menu System") Nominal input level is 1V peak to peak and a termination must be fitted if the loop through facility is not used.



### Serial Outputs

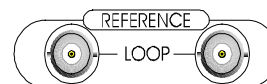
All digital outputs can be used simultaneously. To aid compliance with EMC/RFI regulations, we recommend the use of high quality co-axial cable type BBCPSF1/2 or equivalent.



### Reference

When a suitable signal is connected to the Reference connector, the unit, and the output signals, will be synchronised to this signal. The signal may be black burst or standard composite video.

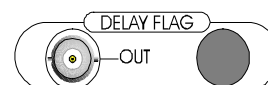
A passive loop-through connection is provided via BNC connectors and a termination must be fitted if the loop through is not used. When no reference is connected the unit will lock to the incoming video data.



### Delay Flag

The DELAY Flag (Synchroniser Delay) is for use with auto-tracking audio delay units. This connector provides a TTL compatible signal representing the signal delay through the unit (synchroniser delay). The signal will go high for the duration of the delay time.

The maximum delay time is 1 frame+ a few lines and the delay time will increment in steps of 74ns.



### EHD Output

This connector provides an output from an opto-isolated open collector switch for reporting of EDH errors. Details of the EDH system are available on request.



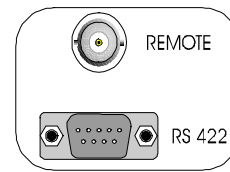


## Remote Control

Interface to the "Roll Call" communications network is via the single REMOTE BNC connector. Connections should be made by means of a 'T' piece ( $Z_0=75$  Ohms) to a 75 Ohm cable system with both extremities terminated in 75 Ohms.

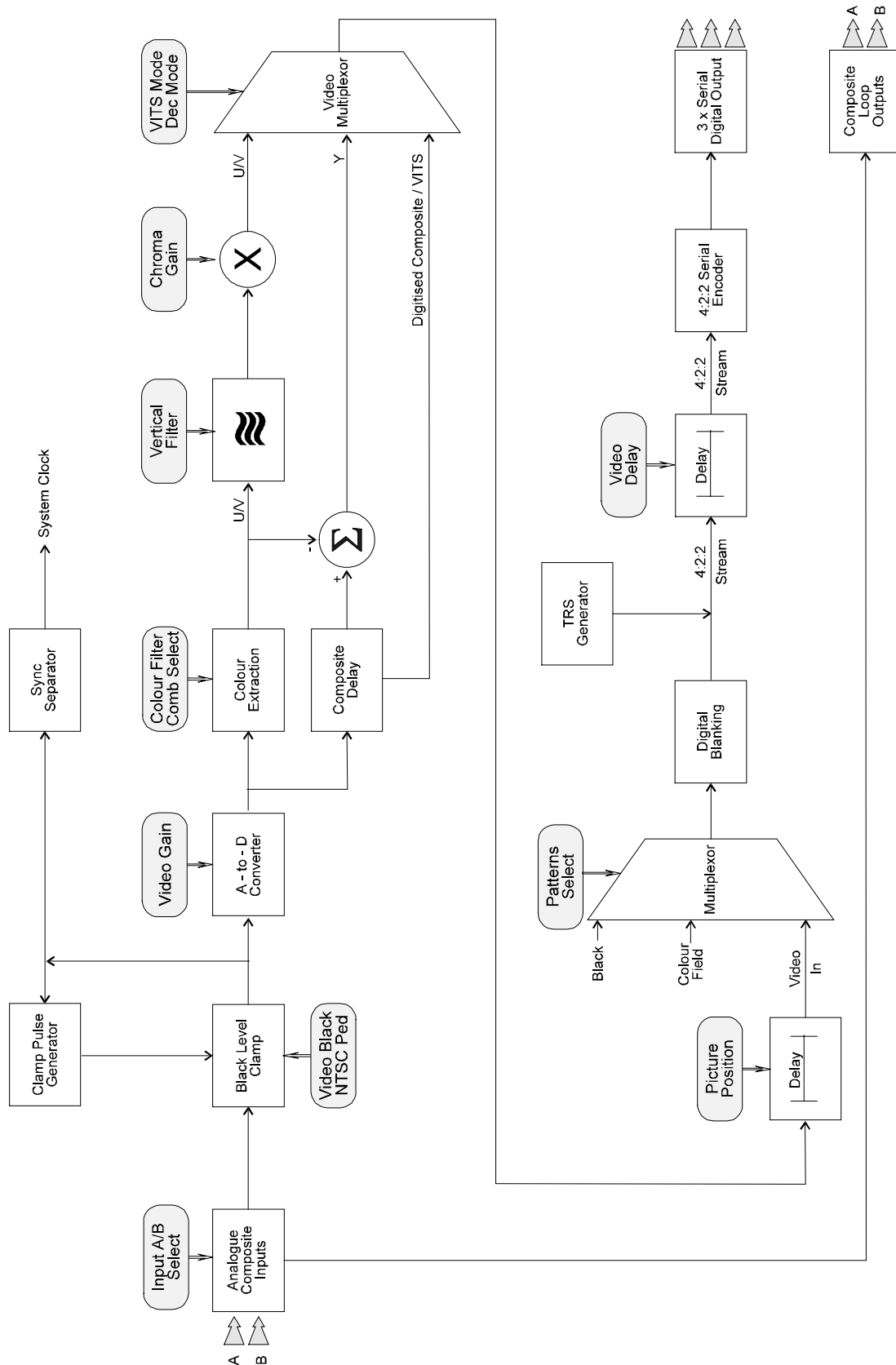
Under no circumstances should the "Roll Call" network be directly connected to any other communications network such as a computer "Ethernet" system.

Provision is made for RS 422 remote control interfacing via the 9-pin female 'D' connector



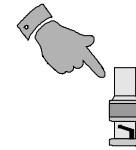
# Block Diagram

Simple Block Diagram, including Adjustable Parameter.

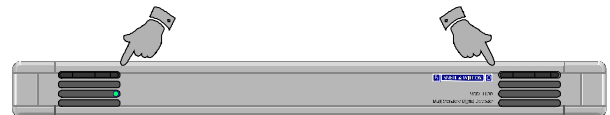


## Getting Started

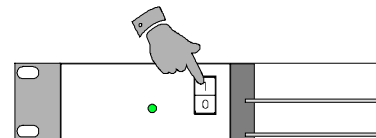
Connect up the unit so that there is a Analogue Composite video signal applied to input A. REMEMBER to fit a termination if the video loop through is not used. Any one of the 3 serial outputs can be used from the same channel.



The front panel is opened by using the two black catches at either end of the panel. We have found the best way of opening the panel is to use your thumbs to release the catches and then ease the panel sufficiently forward to take hold of it. Carefully slide the assembly forward and allow the panel to hinge down.

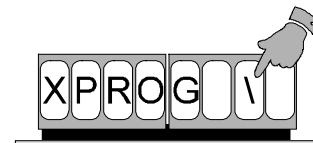


Turn the unit on. A beep will be heard from the lower card and the power LED will glow GREEN.



If an internal error occurs, such as EDH, or the cooling fan was to fail then this LED would turn RED.

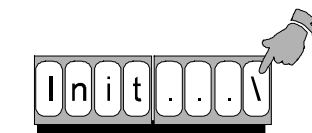
The display on the top card will indicate that the Xilinx devices are being configured. The bar at the end of the message will rotate during this process. When the lower card has configured itself another 'beep' will be heard.



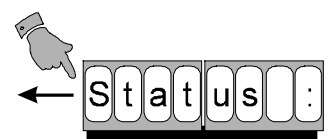
The name of the unit will then be displayed for a short while before the card enters it's initialisation phase where configuration information is downloaded to the lower card.



The INIT message will be displayed with a rotating bar during this process.



A scrolling message will then display the units name and the configuration status.

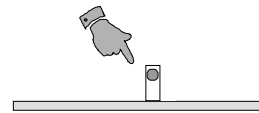


The initialisation sequence is now complete and the output should be the decoded input.

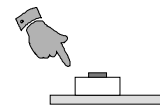
## Card Edge Features

### Upper Card

The LED indicates that the input to the sync separator has no sync's present. In this situation check that the cabling to the rear of the box is correct and that each feed is carrying a valid signal. Next check so see that the required input is correctly selected from the menu. In most cases changing to the correct input will cure this fault.



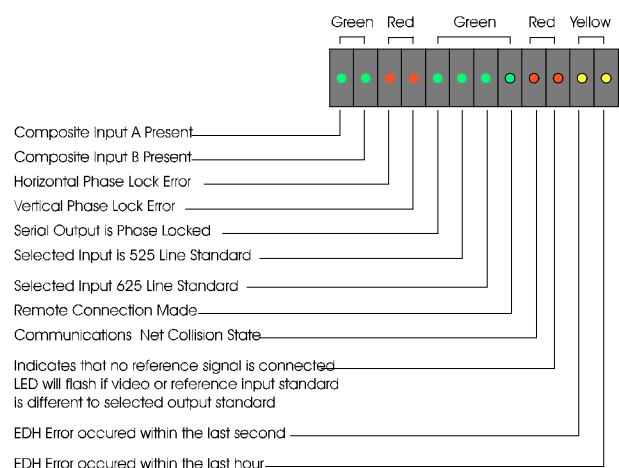
As with the lower card, a CPU reset switch is provided and is located next to the display. This switch should be used to RESET the microcontroller on the upper card in the unlikely event that the controlling software has become unstable.



### Lower Card

A CPU reset switch is provided for the lower card and is located on the left hand side of the card, just behind the card ejector. This switch should be used to RESET the microcontroller on the lower card in the unlikely event that the controlling software has become unstable. The top card should also be reset at the same time.

An EDH reset switch is provided for the lower card and is located on the right hand side of the card, just behind the card ejector. If an EDH error has occurred during operation then one of the yellow LED's will be illuminated indicating the time period during which the error occurred. Also the main power LED will turn from GREEN to RED to signify this error. Pressing the EDH reset switch will clear the internal error checking and turn the yellow LED's off and the power LED back to green



### Factory Configuration

- Auto standards mode
- Normal Comb mode
- Vertical Adaptive Filter
- Composite Input A
- Colour mode
- Black Tracking Enabled
- Medium Colour Filter
- Freeze on Input Fail
- Pedestal On
- Genlock to Input or Ref.
- All VITS lines enabled

# AOperatio n

There are four modes of YC separation using different combing architectures. Each mode has been optimised for different applications.

## Adaptive mode

This mode uses a field comb to separate the Y & C. Traditional comb failure artefacts are suppressed by a tailored algorithm. The delay through the unit is 1 frame  $\pm 1$  user adjustable line. This mode should be used if failure artefacts become obtrusive or if minimum chroma smear on shot changes is required.

## Normal mode

This mode uses a non-adaptive field comb to separate the Y & C. The delay through the unit is 1 frame  $\pm 1$  user adjustable line. This mode gives the best possible YC separation giving a high Luminance bandwidth and significantly reduced cross colour. However, some comb failure artefacts will be noticed on saturated vertical transitions.

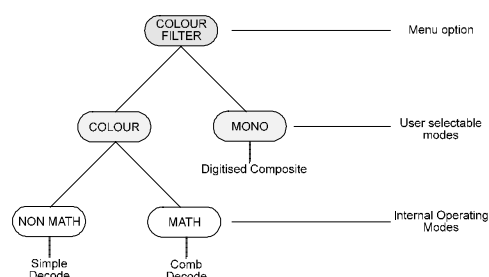
## Min Delay mode

The Minimum Delay mode utilises a non-adaptive field comb, however the delay through the unit has been reduced to 2 lines  $\pm 1$  user adjustable line. This mode is ideal for editing environments where the least possible video delay is required but with the sharpest possible pictures.

## Adaptive Min Dly

The Adaptive Minimum Delay mode utilises the same field combing structure as the non-adaptive mode, however comb failure artefacts are suppressed by a tailored adaptive algorithm. The delay through the unit is still 2 lines  $\pm 1$  user adjustable line. Adaptive Minimum Delay produces excellent multi-generation performance even though the resolution is slightly lower on scenes with little or no movement.

There are 2 further modes of operation, COLOUR and MONO. These modes are selected from the menu system option COLOUR MONO (See next section).



## Colour Mode

In COLOUR mode the decoder will automatically switch between simple and comb decoding depending upon the mathematical relationship between horizontal line frequency and subcarrier.

### Comb decode

This mode will be automatically selected if the incoming PAL or NTSC signal has the required mathematical relationship. The Field Comb algorithm preserves the luminance bandwidth.

### Simple decode

This mode will be automatically selected if the mathematical relationships are invalid. In this mode the chrominance is effectively removed from the luminance by a notch filter.

## Mono Mode

Any input that contains no burst will be automatically detected as monochrome and the decoder will switch to MONO mode, clearing the U and V channels and passing the digitised input directly to the output, thus preserving quality. MONO mode can also be manually selected from the menu and should be used if for some reason a burst is present on a mono signal.

*Important Note : Both Minimum Delay modes are disabled in PAL M.*

## Colour Filter

Another important option in the menu system is the COLOUR FILTER. By altering the response of the chrominance filter, prior to remodulation and subtraction from the composite, the effective area of the spectrum that is combed can be controlled.

On static scenes the luminance and the chrominance will be separated by the comb structure. However, with movement the comb will fail and the luminance resolution will be degraded. Therefore a wider chroma bandwidth will produce slightly lower luminance resolution with moving scenes. In general the filter choice will depend upon the type of material that is being decoded.

This is shown in the table below.

<i>Filter</i>	<i>Movement</i>
<b>WIDE</b>	Little
<b>MEDIUM</b>	Medium (default)
<b>NARROW</b>	Fast moving

## Adaptive Vertical Filter

An adaptive vertical filter has been included which cancels out small chroma phase errors thus suppressing Hannover bars.

The filter also offers a further reduction in cross colour and reduced chroma smearing on vertical transitions. The adaption algorithm can be switched on or off from the "VERT ADP" option in the menu.

The operation will generally depend upon the type of material being decoded. Some guidelines as to which settings should be used are given below,

On

Filter will adapt to vertical transitions. This is optimised for the sharpest pictures.  
This has the maximum vertical resolution & Hannover bar suppression

Off

Picture content has a lot of high frequency diagonal luminance  
eg. Small graphics, captions, scrolling titles, chequered patterning etc.....

## Synchroniser Operation

The GENLOCK option in the menu system determines how the unit operates when a suitable signal is connected to the Reference connector.

When Genlock is ON the output will be synchronised to the reference signal, with timing adjustments available through the Genlock H & V phasing controls. However, if no reference is present the unit will automatically lock to the selected input and switch the synchroniser into it's fixed delay mode. The delay depends upon which comb mode has been selected, see the following table.

<i>Mode</i>	<i>Delay</i>
<b>ADAPTIVE</b>	316.5 lines
<b>NORMAL</b>	316.5 lines
<b>MIN DELAY</b>	4.5 lines
<b>ADAPTIVE MIN</b>	4.5 lines

If the above delays are not acceptable then it is recommended that the input be looped through to the reference. In this way the Genlock H and V phasing will allow precise timing of the output signal.

When genlock is OFF there is no defined relationship between the input and output and the delay through the unit can best be described as "elastic". The only case for using this genlock OFF facility is when the stability of the source is not sufficient for reference locking.

## Menu System

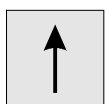
The MDD has an interactive user interface, consisting of a high contrast 8 character display and a bank of four push button switches, both of which are accessed by opening the front panel.



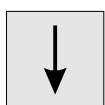
Long messages are scrolled across the display so that more information can be displayed.



Cancels the current action and reverts to the previous level.



Steps to the next menu level or causes a relevant value to increase.



Steps to the previous menu level or causes a relevant value to decrease.



Branches to a sub-menu or causes a parameter to be accepted with a transition to the previous menu level.

### Operation

The decoder configuration can be programmed via the control buttons adjacent to the display. These buttons give access to a number of menus which have been arranged so that progressively selecting the relevant item on any given menu will eventually lead to the parameter requiring modification.

Some of the parameter modifications take effect immediately allowing the change to be previewed before accepting it by pressing the [ENT] button. Pressing the [ESC] Button will cancel the change and move the menu up one level.

Once the decoder has been configured the menu should be returned to the top level by pressing [ESC] [ESC] [ESC]. In this way any status or error messages can be scrolled across the display.

SW Vn	=	X.yy (software version).
TV Mode	=	PAL I / NTSC / PAL M / PAL N / Auto
Input	=	Composite A / B
c/m (colour mode)	=	Decoded / Dig Comp
C. Filter	=	Wide / Medium / Narrow
On Fail	=	Black / Colour Field / Input

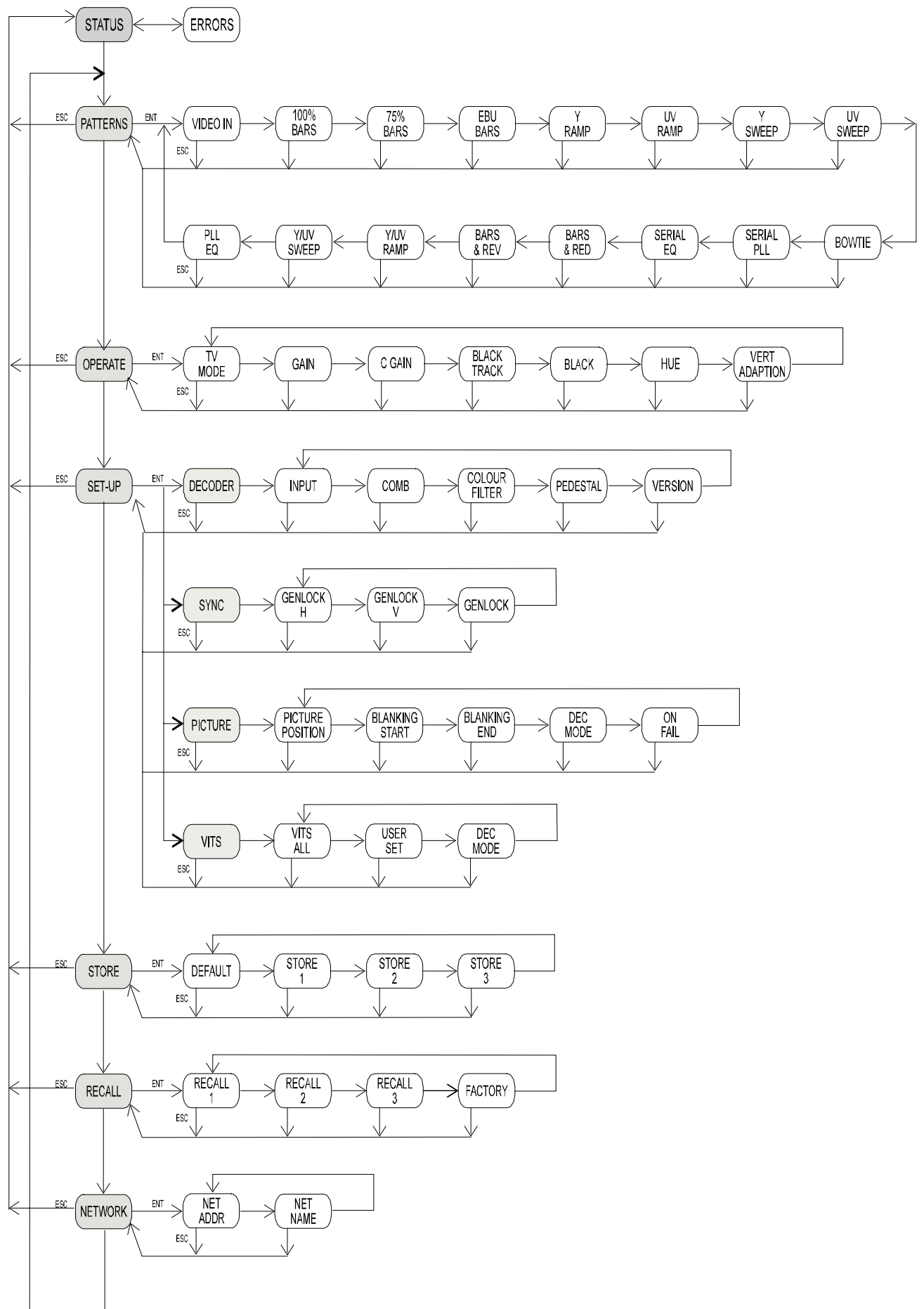
### Error Messages

No composite signal.	Missing input or wrong input selected
Wrong Input standard.	Unrecognised input standard or incorrect standard for selected output
Signal Level Invalid.	Signal level outside the Automatic Black trackin window - Unable to track.

### Default Settings

The menu system is factory configured so that each option has a default setting, which are listed with the description of each menu item. The Factory defaults can be recalled at any time from the FACTORY option in the STORE menu.

Any change made to the menu set up will be automatically stored in DEFAULTS options after the unit has been left idle for more than 2 minutes. These defaults will then be loaded the next time the unit is powered up. The FACTORY settings can be recalled from the STORE menu at any time.





At the top level of the menu system are 6 options;

PATTERNS	selects video source to output.
OPERATE	regularly changed parameters. Changing these options will not effect the picture output.
SET-UP	decoder set-up parameters. There may be some picture disturbance on the output whilst changing these parameters.
STORE	stores decoder configurations in internal memory
RECALL	recalls decoder configurations in internal memory
NETWORK	sets the remote control network address for the card

## Patterns

Video In	sets the output to display the input video
100% Bars	Colour Bars to 100% levels
75% Bar	Colour Bars to 75% levels
EBU Bars	Colour bars to EBU levels
Y Ramp	Luminance ramp - linearly increasing luma level
UV Ramp	Chrominance ramp - linearly increasing chroma levels
Y Sweep	Luminance Sweep - increasing horizontal frequency
UV Sweep	Chrominance Sweep - increasing horizontal frequency
Bowtie	Designed to test the U to V timing relationship
Serial PLL	Designed to test the PLL in the serial receiver of the next unit downstream
Serial Eq	Designed to test serial cable equalisation in the downstream receiver
Bars & Red	Split field of Colour bars and Red
Bars & Rev	Split field of Colour bars and reversed Colour bars
Y/UV Ramp	Split field of Luminance & Chrominance ramps
Y/UV Sweep	Split field of Luminance & Chrominance sweeps
PLL EQ	Split field of Serial PLL & Eq test patterns
Default setting	Video In

## Operate

TV Mode	selects the mode for the input.
Auto	input standard is automatically detected
PAL I	configures the unit for a PAL I input
NTSC	configures the unit for a NTSC input
PAL M	configures the unit for a PAL M input
PAL N	configures the unit for a PAL N input
Default	Auto
Vid Gain	sets the sensitivity of the ADC. ie. Gain
Range	-3.00 dB to +3.00 dB in 0.2 dB steps
Default	0 dB
C Gain	sets the chroma gain
Range	-6.00 dB to +6.00 dB in 0.05 dB steps
Default	0 dB.
Black Track	disables or enables the Automatic Black stabilisation
Off	No stabilisation
Align	Used for card alignment
On	Auto black stabilised
Default	On
Black	sets the offset of the ADC ie. Black level
Range	-20 mV to +20 mV in 0.2 mV steps
Default	0 mV
Hue	allows adjustment of the NTSC hue control
Range	-180° to +180° in 0.5 degree steps
Default	0°
Vert Adap	disables or enables the Adaptive algorithm for the vertical filter.
On	Adaptive filtering
Off	Vertical filtering ie. No Adaption
Default	On

## Set-up

The SET-UP menu is split up into 4 sub-sections,  
 Decoder  
 Sync  
 Picture  
 Vits

### Decoder Sub Menu

Input selects the composite input  
 Comp A input A  
 Comp B input B  
 Default Comp A

Comb selects the style of Combing and adaptive algorithms  
 Adaptive Adaptive Field comb  
 Normal Non-Adaptive Field comb  
 Min Norm Minimum delay Non-Adaptive Field comb  
 Min Adap Adaptive Minimum delay Field comb  
 Default Normal

*Note :* Both Minimum Delay modes are disabled in PAL M

Colour Filter selects the type of filter used to filter the chrominance prior to it being re-modulated for subtraction from the composite.  
 Wde filtering with a wide bandwidth  
 Medium filtering with a medium bandwidth  
 Narrow filtering with a narrow bandwidth  
 Default Medium

Pedestal determines whether the input pedestal is removed or passed  
 Ped On the input has a pedestal  
 Ped Off the input has no pedestal  
 Default Ped On

Version returns the software and xilinx version numbers

### Synchroniser Sub Menu

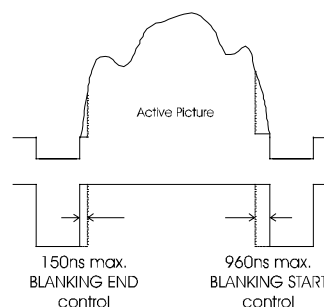
Genlock H Sets the H phasing of the output relative to the reference  
 Range 0 - 863 pixels adjustable in 1 pixel steps  
 Default 0 nsec - In phase

Genlock V Sets the V phasing of the output relative to the reference  
 Range PAL : 0 - 624 lines in  $\pm 1$  line steps  
 NTSC : 0 - 524 lines in  $\pm 1$  line steps  
 Default 0 lines - In phase.

Genlock Sets the mode of operation for the synchroniser  
 ON If a reference signal is present then the output will be locked to it, otherwise the output will lock to the selected input.  
 OFF The output is free-running - the delay is "elastic"  
 Default On

### Picture Sub Menu

Picture Position Sets the active picture position relative to the syncs.  
 Range  $\pm 259$  nsec adjustable in 37 nsec steps  
 Default PAL spec



Blanking End Allows adjustment of the point at the start of the active line where blanking ends.  
 Range +518 to -592 nsec adjustable in 74 nsec steps  
 Default PAL spec

Blanking Start	Allows adjustment of the point at the end of the active line where blanking starts.
Range	+518 to -592 nsec adjustable in 74 nsec steps
Default	PAL spec
Dec Mode	specifies whether the input is colour or mono
Decode	colour input will be decoded
Dig Comp	output is non-decoded digitised composite to preserve quality
Default	Decoded
On Fail	selects the output that will be displayed should the input fail
Freeze	the output will freeze when the input is lost
Black	sets the output to a single black field
Default	Freeze

*VITS ALL, then configure individual lines using the VITS Lxxx option*

### VITS Sub Menu

Vits All	initiate global VITS lines mode set-up, applies to all the VITS lines
Blank All	All VBIS lines will be blanked
Pass All	All VBIS lines will be passed as set by the decode mode.
Default	Pass All
User Set	select which VITS line is operational
Range	PAL I / PAL N : lines 6 to 22 paired with 319 to 335 NTSC / PAL M : lines 10 to 20 paired with 272 to 282
On / Off	enable the VITS line
Dec Mode	select the operational VITS mode
Dig Comp	All VBIS lines will be passed unchanged through the Luminance channel. The U & V channels will be blanked
Decoded	Decodes the VBIS line as normal video, ie Y & C separated
Default	Decoded

*Note :* When setting up a number of VBIS lines it may be easier to first configure all the VITS lines using

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## Store

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Default	Stores current set-up that is recalled automatically on power up.
Store 1,2,3	Store current set-up in Store 1, 2 or 3

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## Recall

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Factory	Recall the factory configuration and default settings.
Recall 1,2,3	Recall configuration stored in Store 1, 2 or 3

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## Network

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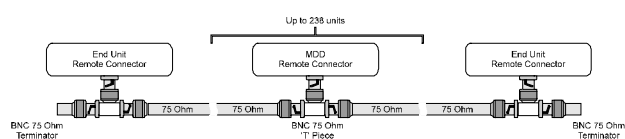
Address	Sets the remote control network address for the card
Range	16 to 255 in steps of 1
Default	Address 16 for the Lower slot, 17 for the Upper slot
Network Name	Sets the network name for the card.
Range	ASCII character sequence. The "UP" and "DOWN" arrow keys sequence through the character set. The "ENTER" key accepts the current letter and moves on to the next character space At the end of the line the "ENTER" key will accept the whole line and return to the previous menu level.
Default	Card serial number eg 25-09-06

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## Remote Control

The MDD has provision to be remotely controlled via two different interfaces, either S&W RollCall, or RS422.

Interface to the "RollCall" communications network is via the single BNC connector. Connections should be made by means of a 'T' piece ( $Z_0=75$  Ohms) to a 75 Ohm cable system as shown below. It should be noted that both extremities of the cable system must be terminated in 75 Ohms and the maximum number of units limited to 240 on one single cable run.



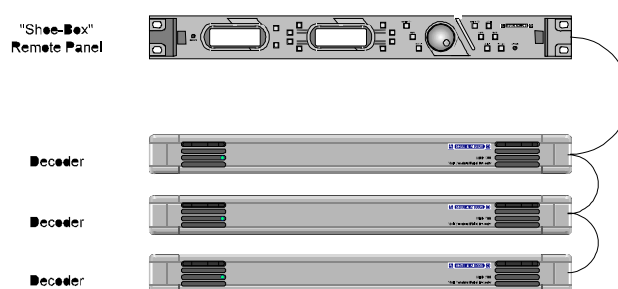
The communications network is a specially designed remote control network system and many more units can be accommodated by using a "Network Bridge". Remote control can come from either a dedicated front panel or "shoe-box" or a standard IBM compatible PC. Full protocol documentation and more detailed information is available on request from the supplier.

The RS 422 remote control interface is via the 9-pin female 'D' connector. Protocol information is also available on request from the supplier.

### Basic RollCall Operation

All the features from the menu system are available remotely with the same options structure. This maintains compatibility and facilitates easy operation for users familiar with the unit.

The most common MDD 1100 remote configuration is shown below where many decoders are connected to the network for remote control by one remote panel or "shoe-box".



### Typical Set-up

The network address for each card is set via the menu system option "NETWORK". The lower card defaults to address 16 whilst the upper card, if fitted, will default to address 17. When installing a network it is recommended that a table similar to the one at the end of the manual be kept up-to-date to allow fast and accurate allocation of new unit addresses.

The card edge menu system is disabled when the unit is being remotely controlled. Any attempt to change parameters will be blocked and an error message "REMOTE ACCESS - Hold down all keys to disconnect" will be displayed. By holding all 4 menu keys together the remote user will be disconnected from the MDD unit and control will be returned to the local card edge keys.

Parameter changes are reflected both locally and remotely. For example, if the output is changed to the colour field test pattern by a remote unit then any further access from the card edge to the PATTERNS option will indicate this change. Similarly, if the card edge changes a parameter then this will be reflected on the display panel of the remote unit.

For more detailed information about the operation of the remote panel or PC software please consult their relevant manuals.



**Communications**

RollCall™ BNC	Proprietary Snell & Wilcox interface multi-drop via BNC network.
RollCall™ RS485	Proprietary Snell & Wilcox protocol mutli-drop via single 9-way ribbon cable

**Power**

Input Voltage Range	88 V to 256 V 45/60 Hz
PSU	Auto Switching
Consumption	40VA maximum - Single channel unit 80VA maximum - Dual channel unit
Mains Fuse Rating	IEC320 fused inlet - fuse rating 2.5 AT
Power ON/OFF	Switch located behind front panel
Mains Plug	Fit 7A Fast to any Fused plug

**Mechanical**

Temperature Range	0 to 40° C operating
Cooling	Filtered cooling system processor monitored fan fail
Case Type	1U Rack Mounting
Dimensions	483 mm x 495 mm x 45 mm (w,d,h)
Weight	10kg

Company policy is one of continuous product improvement. Specification is subject to change without notice

## Maintenance

In the unlikely event of this unit failing to operate correctly no attempt should be made to repair the unit unless all the necessary test equipment, service manuals and technical expertise is available and permission has been granted in writing by SNELL and WILCOX Ltd. or their official agents, for such repairs to be attempted. Failure to comply with these conditions will void the warranty.

First line maintenance should be confined to the replacement of the plug-in cards, the power supply module, the cooling fan, the air filter and the mains inlet fuse.

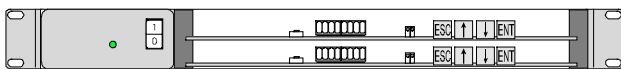
### Cleaning

It is important that the ventilation slots in the front and bottom of the front panel and the slots in the side of the unit do not become obstructed or blocked in any way including the build-up of dust etc. as this will interfere with the ventilation and cooling of the unit. A reduction of air flow through the unit may result in overheating and the power supply over-temperature cut-out may operate and shut down the unit.

The front panel slots, side panel slots and the cooling fan should be regularly inspected and cleaned if necessary.

### Removing the PCB Card

The front panel should be pulled forward and down using the two plastic levers A & B to reveal the two circuit cards which may then be safely removed by means of the card ejectors.



#### IMPORTANT NOTE

*The circuit cards must be replaced in their correct locations. Failure to observe this procedure will render the unit non-operational and may result in damage to the electronics.*

### Removing the Power Supply

Disconnect power to the unit by removing the IEC power connector

Allow two minutes for capacitors to discharge

Remove the top cover of the unit (14 screws)

Pull off the white plug-in connectors (2 items)

Remove the two M3 countersunk screws on the underside of the case securing the module

Withdraw the module The replacement module is Snell & Wilcox part No. RMY5 UPP100

### Removing the Mains inlet fuse

The unit has a 2.5AT fuse located in the small pull-out tray of the IEC mains inlet assembly fitted to the rear panel. A spare fuse will also be found in this tray.

The replacement fuse is Snell & Wilcox part No. RMF5 2.5AT

### Removing the Cooling fan

Remove the top cover of the unit (14 screws)

Remove the two circuit cards using the card ejectors

Remove the cable retaining screws from the top of the fan (2 M3 screws)

Remove the card-guide-to-frame retaining screws (6 screws) and remove card guide

Remove the nut and washer from the stud in front of the fan (M3 nut)

Remove countersunk fan retaining screw from underside of case (M3 screw)

The fan and its mounting may now be moved into the card space area

Remove the fan electrical connections from the front PCB

Cut the wires at the connector end to allow removal from the protective sleeving

The fan assembly may now be removed from the unit. The replacement fan is Snell & Wilcox part No. RM F907 (specify either PAPST or Comair type) and has a new connector fitted to the wires which should be retained along the case wall.

### Replacing / Cleaning the air filter

The front panel should be pulled forward and down using the two plastic levers

Remove the two M3 nuts and washers securing the metal mesh

Remove the filter material

The filter may be washed in soap and water and replaced when completely dry

The filter may be replaced with Snell & Wilcox part No. RMF 806



