



**RFL Electronics Inc.**

**INSTRUCTION MANUAL**  
**VS800**

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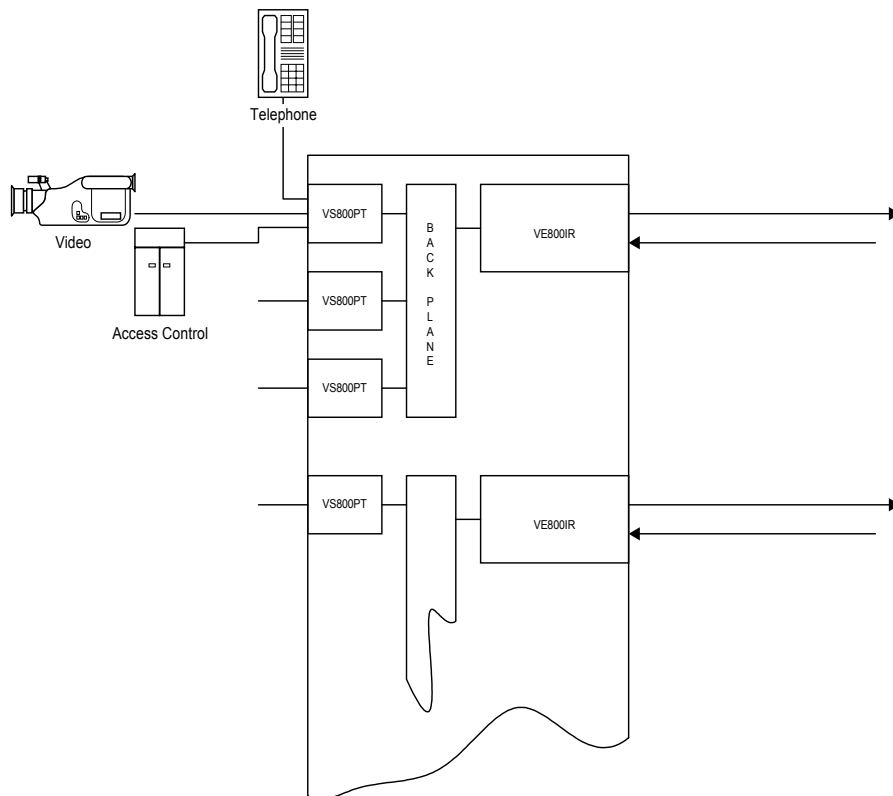
# 1. Introduction

## 1.1 Overview

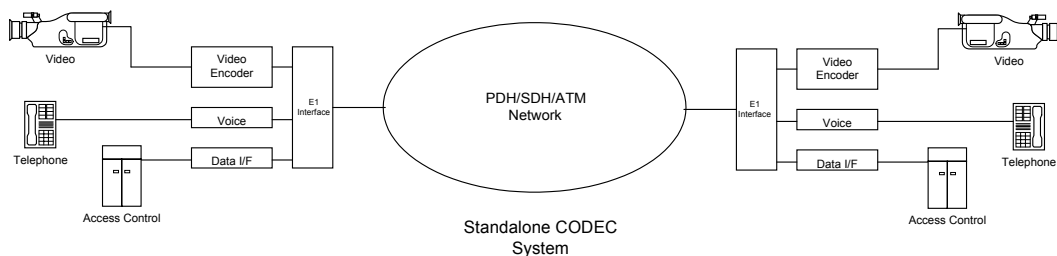
The RFL VS800 CODEC enables high quality video transmission combined with voice and data over E1 (2.048Mbit/s), T1 (1.55Mbit/s) or Ethernet links. This provides an alternative to dedicated fibre schemes as it is possible to use any standards based telecommunications bearer, such as PDH, SDH/SONET or ATM.

The video interface supports connection of either PAL or NTSC cameras. In addition a bi-directional serial data connection, RS232 or RS422/485, is provided for applications such as camera PTZ or access control, and a bi-directional voice channel.

The VS800 is available as 3U high modules fitting in a 19" rack, or as a stand-alone extrusion. Both versions can be integrated into a common system.



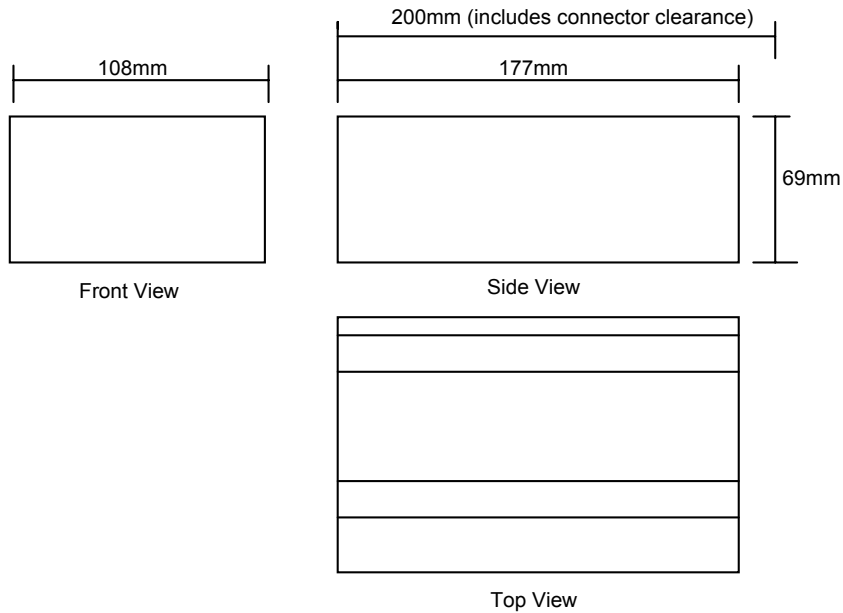
Typical Rack based system  
Shows 3 x video channels connecting to an E1 link



## 1.2 System Configurations:

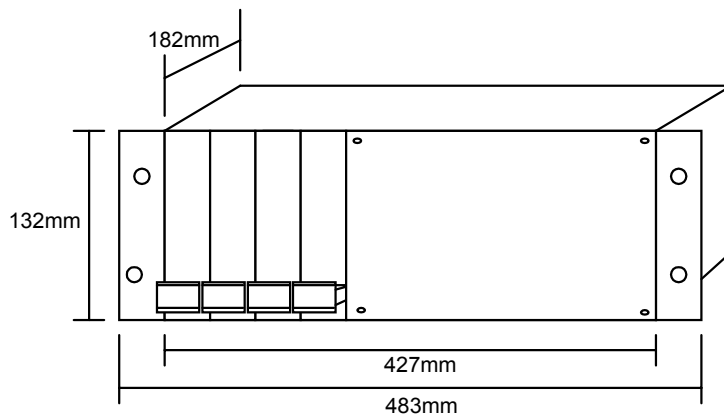
### 1.2.1 Standalone Unit

#### Enclosure Dimensions:



### 1.2.2 Rack Mount Unit

#### Enclosure Dimensions



Each E1/T1 or Video module occupies 6HP of 84HP available in a 19" rack. A mains power supply if included occupies the left 14HP.

### 1.2.3 Power Supply Options:

Input nominal	Input range
12Vdc	10.8V – 18V
24Vdc	18V – 36V
48Vdc	36V – 72V

Power consumption: 5W for T1/E1 module plus 7.5W per video encoder/decoder.

For Mains operation of rack mounted units, a wide input 94V – 264V ac 50/60 Hz power supply is available for mounting in leftmost position of the rack. Other power inputs can be accommodated using standard 3U Eurocard cassettes.

Mains operation of standalone units is by free-standing wide input 94V - 264V ac 50/60Hz power supplies.

### 1.3 Configuration Code

#### 1.3.1 Standalone Extrusion

VE800TS – Single channel E1 video encoder  
VE800RS – Single channel E1 video decoder  
(specify power supply option required)

VT800TS – Single channel T1 video encoder  
VT800RS – Single channel T1 video decoder  
(specify power supply option required)

#### 1.3.2 Rack based System

VS800SR – 19" x 3Ru high, 14 slot sub-rack  
(specify power supply option required)

VT800IR – T1 Communications Interface  
or  
VE800IR – E1 Communications Interface  
or  
VL800IR – Ethernet Communications Interface

VS800PT – Single channel PAL encoder  
VS800NT – Single channel NTSC encoder

VS800PR – Single channel PAL decoder  
VS800NR – Single channel NTSC decoder

The only difference between equipment at a Server end (camera) and Client end (monitor) is the firmware loaded on the VS800 Video module and the way it is configured. Apart from defining whether the function is Server or Client, the firmware also defines audio compression: G711 (64k PCM) or G726 (compressed), giving four different firmware types.

## 2. Installation procedures

### VS800 E1/T1 Version

#### 2.1 Physical

The equipment should be inspected visually before installation and again prior to power up.

The code on the video module identifies if the unit is set up as an encoder or decoder, plus the assigned channel number.

VS800T ch# (encoder, camera end installation)  
VS800R ch# (decoder, video monitor end installation)

where # is the channel number.

Standalone CODECS include a mounting bracket arrangement that provide a number of installation options including cubicle and wall mount. The sub-rack system is designed to fit in a standard 19" cubicle, with all physical connections at the rear.

#### 2.2 Dip switch settings

Check that the DIP switches on the VS800IR module are correctly set:

Switch	Off function	On function	Default
1	Normal	External loopback	Off
2	Command Line Interface disable	Command Line Interface enabled	On
3	Get clock from incoming data	Use internal clock	Off
4	Not used for E1	HDB3 line coding	On
5		Reserved	Off
6		Reserved	Off
7		Reserved	Off
8		Factory test	Off

A network will normally supply timing for VS800 but if they are connected directly, back to back, one end will have to have switch 3 set to ON to select an internal clock.

#### 2.3 Cable Interfaces

Once the equipment has been physically secured and before cables are connected, all cards should be checked to ensure they are correctly seated.

##### 2.3.1 Power

Power connections are made using a two-part connector on the WAN module. Before connecting power to the equipment it is important that the user checks the supply voltage is within specification.

##### 2.3.2 Video

A camera or monitor connects to the BNC connector marked "Video" of a VS800xx module.

### 2.3.3 Audio

Audio connection is via an RJ11 4-Wire connector.

Pin	Function
1	In
2	In
3	Out
4	Out

Input impedance is 600Ohm, transformer coupled.  
Bandwidth is 300Hz to 3,400Hz

### 2.3.4 Asynchronous Data

Video modules are equipped with a 9-Pin D type socket. This provides a transparent RS232 or RS422/485 connection with the remote end data interface.

Pin	RS232 function	Direction	RS422/485 function	Direction
1	Data Carrier Detect	Out	Do not connect	
2	Rx Data	Out	Rx -ve	Out
3	Tx Data	In	Tx -ve	In
4	NC		NC	
5	Signal Ground		Signal Ground	
6	Data Set Ready	Out	Do not connect	
7	Request To Send	In	Tx +ve	In
8	Clear To Send	Out	Rx +ve	Out
9	NC		NC	

### 2.3.5 Wide Area Network connection

#### 2.3.5.1 E1 75 ohm

Two BNC connectors are provided on a WAN module, one marked Tx, the other Rx.

#### 2.3.5.2 E1 120 ohm

To be defined.

#### 2.3.5.3 T1

To be defined.

## 2.4 Power up procedure

The unit is designed for permanent operation and a configuration/test sheet enclosed with the CODEC will give full details of the performance settings installed if they deviate from the default factory settings as defined in Table 2A and 2B.

Table 2A (Standalone)

VS800TS/RS	Setting	Standard
Video	1,092Kbit/s	H261 Enhanced
Voice	G711	4-wire I/F
Data	User definable up to 38.4Kbit/s	RS232/422

Table 2B (Rack Mount)

VS800TR/RR	Setting	Standard
Video	512Kbit/s	H261 Enhanced
Voice	G711	4-wire I/F
Data	User definable up to 38.4Kbit/s	RS232/422

All cards are designed for "hot" insertion and extraction however if possible best practice is to power the system down. Users should also check the power budget before adding video cards to an existing system.

## 2.4 Initial Set up problems

In the unlikely event that the units fail to operate the following settings should be checked:

- 1) Both ends of the link are powered up.
- 2) The communications channel has been fully tested and is available.
- 3) Tx and Rx cables are correctly connected.
- 4) The VS800 is correctly positioned as either an encoder or decoder.
- 5) The Line coding of the link (see section 2.2).
- 6) Synchronisation/Timing (see section 2.2).

If the equipment still fails to operate correctly, refer to the troubleshooting section of this manual or contact the extended hours RFL technical support line.

## 3. Advanced User Settings

The VS800 is designed to provide high quality video images. The video cards in the rack-based system can be configured such that multiple video streams share the same E1/T1 connection. The user should ensure that sufficient bandwidth is available for all video streams, taking into account that for optimum quality each should be allocated 512Kbit/s. Bandwidth settings as low as 64Kbit/s can be made and dependent on the application reasonable quality achieved.

### 3.1 Management Tools

Two tools are available for configuring VS800 performance settings, VideoBridge Administrator and VideoBridge Viewer. These have to be installed on a PC which has an Ethernet connection with the maintenance port of a rack mounted set of VS800 cards. Also it will need to be able to communicate with the IP subnet which has been declared in the VS800 cards. Standard IP addresses for VS800 cards are in the range 192.168.0.221 to 192.168.0.228 with a subnet mask of 255.255.255.0. Standard patch cables can be used if to connect both units via a hub, or a cross over cable can be used for direct connection. On a live system, the VS800 WAN card acts as an Ethernet Bridge to give access from the PC to remote Video modules. It is normal for this Ethernet link to be dedicated to VS800 traffic and not connected to any larger network.

Installing VideoBridge Viewer from the CD also installs VideoBridge Administrator.

#### 3.1.1 VideoBridge Administrator.

Once installed from CD, it is useful to have access from a shortcut on the desktop. Locate VbAdministrator.exe using the PC's Find facility. When found, right-click the mouse over its name and select "Create Shortcut". Accept the offer to place the shortcut on the desktop.

On starting up, VideoBridge Administrator searches the network VS800 Video modules and lists those it recognises. Further scans can be initiated by an Scan button, but it may be worthwhile reviewing settings under the Options button before doing this.

The Options button provides a means of defining the range of addresses to be scanned, declare 192.168.0.255 for all addresses on the default subnet. Also a tick-box when enabled permits scanning via a 1:1 cable connected between a COM port of the PC and a VS800 serial port. Scan duration can be defined.

After a successful scan, a device can be selected from the list generated and its properties selected for review and possible modification (Properties button). Two tabs are available, the first "General" showing version information of installed firmware. The properties Host Name and Location can be changed, but have no effect on operation. The buttons Reprogram and Erase Registry should be used with care and only after consultation with the factory. The "Network" tab provides a means of setting a VS800 IP address. Standard settings are:

	<b>VE800PT/NT Server</b>	<b>VE800PR/NR Client</b>
Channel 1	192.168.0.221	192.168.0.222
Channel 2	192.168.0.223	192.168.0.224
Channel 3	192.168.0.225	192.168.0.226
Channel 4	192.168.0.227	192.168.0.228

with a subnet mask of 255.255.255.0. Standard settings for stand-alone boxes are as channel 1.

### 3.1.2 VideoBridge Viewer

A shortcut created for VideoBridge Viewer needs to be modified to set up and control a link between VS800 Server and Client. Right-click the shortcut and open Properties. Under the Shortcut tab add, for example, the following after "...\\VbViewer.exe":

```
-l -n192.168.0.221 -n192.168.0.222
```

without spaces after the "n"s. The -l (ell for Lima) switch sets point to point mode and the following -n parameters the IP addresses first the Server for the session and second the Client. This example will set up Channel 1, other channels are set up using IP addresses defined in 3.1.1.

On calling up VideoBridge Viewer, a message box may appear indicating difficulty connecting with a decoder. This can usually be ignored. The application appears as a row of buttons with information boxes underneath. In order to change video settings the Viewer must appear to be stopped, indicated by the leftmost button "1" appearing not to be depressed. Under Video options select Settings and Configuration.

Select Video Type PAL, Connection TCP and desired bit rate under the General tab.

Under the H261 tab select Constant Quality and set both Temporal Quality and Spatial Quality sliders to 3. These settings have been seen to provide optimum quality for surveillance applications.

The bit rate set under the General tab is a capping level for the video stream. Under conditions of low activity, actual bit rate may be quite low. Selecting Constant Quality will slow frame refresh in conditions of high activity in preference

Audio can be enabled under the Audio tab. Compression, G711 or G726 is a property of which firmware has been installed using VideoBridge Administrator.

When options have been selected, the stream can be started by pressing the 1 button on the toolbar.

Once a stream has been started, serial data can be configured by selecting Settings and Serial Port under Video options. Select the SerialFpga1 tab for available parameters, ticking the Channel Enable box and not the Software Enable box.

Finish off by closing down VideoBridge Viewer. Answer Yes to the questions "Do you want to leave the standalone connection running after you exit?" and "Do you want to use infinite retries to maintain this connection?".

## 4. Expanding the System

The rack-based system can be expanded to accommodate up to 3 independent CODECS.

Standard backplanes accommodate 5 VS800 modules, four video and one WAN. There is no restriction on which slot the WAN module occupies.

Adding Video cards to an existing backplane arrangement:

- 1) Before inserting a card the user should check the allocation of bandwidth used by existing video cards.
- 2) Check existing and new power budget
- 3) Cards can be hot inserted into the chassis from the front.
- 4) The CODEC CPU recognises new cards
- 5) Physical terminations are made at the rear with connections as defined in previous sections of this manual.

## 5. LED Indicators

### 5.1 WAN module

- Power                      Power is available to the voltage regulators.
- Fault
  - Continuous          One of the voltage regulators has failed, or, one of the two mezzanine modules is missing.
  - Flashing              Software crash.
- Rx Error
  - Continuous          Major fault.
  - Flashing              Ethernet error.
- Comms Live              Ethernet link up
- E1 OK                      E1 frames being received from remote.

Note: Rx Error and Comms Live LEDs are not provided on the standalone version.

### 5.2 Video Module

- Activity
  - Continuous          Processor crash.
  - Flashing              Processor activity.
- Data                      Data packet transmission.
- Link                      Data connection with backplane.

Note: Data and Link LEDs are not provided on the standalone version.



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