



V25 MULTIPLEXER SUPPLEMENTARY MANUAL V1.0

## Technical Supplement

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**BEFORE INSTALLING THE UNIT**

**PLEASE REFER TO THE SAFETY INSTRUCTIONS IN APPENDIX A**

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## **Contacts**

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## 1 Introducing the V25



### 1.1 General Overview

The V25 Multiplexer is the most compact and fully featured member of the Vocality multiplexer range. It provides an impressive range of core Vocality features such as analogue voice, data and bridge/routing in an extremely light and portable package and is completely compatible with all V50, V100 and V200 equipment. By using the same control software as the other units in the range, the same management interface can be used to control the unit.

The V25 is designed to support two voice/fax channels, two 10/100base-T Ethernet connections and has two data ports. In order to minimise size and weight, the voice channels are presented with only FXS POTS and 4-wire Tie-line interfaces. Any of these services will interoperate with a full-size unit at the network hub, where gateway connections are made to the rest of the network. Optional STU-III relay functionality is provided by the addition of the

Vocality Secure Voice Relay Card (VI68718) in two-channel form – Compatibility with legacy STU relays is not supported in the initial release.

Both data ports conform to the standard Vocality DB15 pinout specification and are presented on high-density connectors for smallest size. Either may be configured to be an aggregate link or tributary port but Port 1 is presented as DTE only and Port 2 as DCE only, although typically, users will tend to use the black (lid) end for aggregate traffic and the metal (chassis) end for tributary applications. They may be synchronous or asynchronous and configured to use V.24, V.11, RS530, V.35 or RS449 electrical interfaces all selectable from the supervisor port without the need to remove the lid. Each data port provides considerable flexibility in clocking options. This allows a unit to accept, source or onward link clocks.

New technology incorporated within the V25 allows the maximum data throughput limit to be raised from the V100 standard of 2.048Mbps to 5.12Mbps in the aggregate. A new, highly stable internal oscillator and PLL design guarantees clock accuracy and stability under all conditions and state-of-the-art SLIC technology provides a highly programmable and robust POTS interface with exceptional clarity.

A V25 network may be managed from the dedicated supervisor port of any chassis in the network. The user logs on to the required unit and configures the network from the most convenient management port using a clear and simple display, which may be accessed using a PC running a terminal emulation package such as HyperTerminal under Windows™. Alternatively, the supervisor may be operated in a terse teletype mode for integration into a central network management system. In either case, the port uses an asynchronous RS232 interface presented on a 6-way locking mini-DIN socket.

This user manual describes the use, configuration and installation of the V25 Multiplexer and contains information relating mainly to its unique features. It is not intended to replace the V100 Multiplexer Technical Manual and should be read in conjunction with that document.

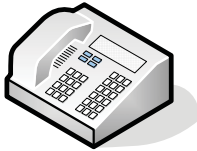
## Capabilities

### 1.1.1 Analogue Voice/FAX



Two analogue voice/fax channels are available in software-selectable 2-wire FXS or 4-wire Tie-line form. Optional STU-III relay functionality may be added to this by the inclusion of a VI68718 SVR Card, which supports both channels. This card is fitted in the factory prior to shipment.

### 1.1.2 Secure Voice Relay

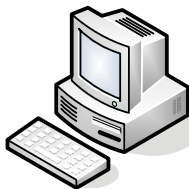


Optional STU-III relay functionality may be added to the voice/fax capability by the inclusion of a VI68718 SVR Card, which supports both voice channels. This card is normally fitted in the factory prior to shipment. The Secure Voice Relay feature works in parallel with the standard facilities, using an automatic discriminator to monitor the analogue channels and activate the STU relay when required. Operation of the discriminator may be suppressed or enabled by software control on the configuration menu. In this way, all of the standard features of the voice motherboard are still available with the addition of the ability to relay the encrypted data from STU-III military secure telephones. At no time is the secure data decrypted.

UNTIL THIS MANUAL IS UPDATED, THE V25 SVR WILL ONLY INTEROPERATE WITH OTHER SVR CARDS (i.e. V25 or DIGITAL VOICE CARD)

Support for other encrypting telephones may be added by software update in the future.

### 1.1.3 Data



Data ports are implemented on High-Density 15-way 'D'-type connectors and support the full range of software-selectable interface standards. Port 1 is DTE-only with one Phase-locked Loop (PLL) for deriving an output clock, whereas Port 2 is DCE-only with two PLLs. This permits the TX clock to be phase locked to any other port in the system, thus permitting onward-linking if required.

### 1.1.4 10/100base-T Integrated Router



In common with other members of the product range, the V25 incorporates an IP Router – this time presented as two separate 10/100base-T ports on RJ45 connectors on the front and rear of the unit, each with its own MAC address. Performance-enhancing Proxy (PEP) functionality is available through the use of a Feature Key at extra cost. Two IP ports offers users the ability to connect a V25 to an IP aggregate whilst supporting IP routing functionality as a

tributary service without the need for additional hardware.

### 1.1.5 USB

The USB port is included in the hardware for future applications.

### 1.1.6 Control and Monitoring

The V25 has a dedicated 6-way locking mini-DIN connector for management and control, labelled "M&C". This port has an RS232 interface and presents either a formatted display for network control or a terse teletype mode for integration into the overall network management system. The facility for uploading and downloading configuration data using script files is also provided. Refer to the "V100 Teletype Manual" for a detailed explanation.

## 1.2 Restrictions

The management and control of the V25 is performed using the same Man Machine Interface (MMI) as the full-size chassis products. There are a few functionality restrictions which are explained below. For full details, please refer to the latest V100 Technical Manual.

### 1.2.1 Slot and Port Numbers

Throughout the configuration of the V200, V100, V50 or V25, references are made to slot locations and port numbers in the network. By convention, the syntax used is "NODE:SLOT:CHANNEL", where NODE is the Node ID, SLOT is a number which means the chassis (0), Option slot 1 (1), or Option Slot 2 (2) and CHANNEL is a number which means the particular channel number within that slot.

On the V25 the port numbering obeys the same convention but of course there are no option slots as such and so the port numbering is fixed. The data ports are numbered as normal and the voice channels occupy logical slot 1. The embedded IP bridge/router ports can be assigned a logical port number from 0:10 to 0:31:

Port	Port Number
Port 1	0:1
Port 2	0:2
Tel-Line	1:1
	1:2
Embedded IP bridge/router	0:10 to 0:31

### 1.2.2 The DATA menu

A typical Data Channels menu screen is shown below. All of the normal options are available with the exception of the ability to change the DTE/DCE presentation of the ports. This allows (i) a TT clock to be generated for the DTE port (0:1) which may be used by the connected modem as a terrestrial clock input and (ii) separate phase-locked RX and TX clocks to be generated for the DCE port (0:2) which may be used in synchronous modes by the connected DTE device, perhaps an external router or a military-grade data encryptor. The only other restriction is the provision of only the GRX global clock reference bus. This still allows clocks to be onward-linked but all PLL-derived clocks must be locked to the same source.

A typical Data Configuration screen is shown below:

```

Node0                               V25 Multiplexer Supervisor
Agg Status: 0:1 Lost
-----[ DATA #1]-----

Channel Iface Mode Type Format Rate  ---RX clock---  ---TX clock---
0:1     RS449 Agg DTE NRZ  2048000 Ext  -  0           Src  Ref
0:2     V.11 Trib DCE Sync  64000  PLL  -  -           Rxc  -           1:0:2

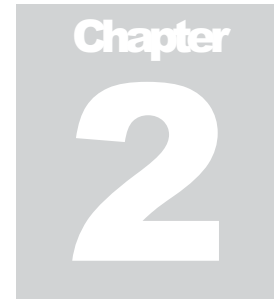
-----Configuration #1 is active-----
Use <SPACE>/+ or - to select

```

Connected 0:04:57 VT100 9600 8-N-1 SCROLL CAPS NUM Capture Print echo

### 1.2.3 The VOICE menu

The Voice configuration menu appears as normal for a 2-channel card in slot 1. The interface functionality is however, restricted to "FXS" and "Tie-line" for both channels. For PABX or PSTN connectivity, it is recommended that a V100 or V200 is used as they offer voice port termination cards for breaking out telephony circuits into the public network.



## 2 Installation

### 2.1 Supply and Voltage Connection

DC power must be supplied to the V25 at the correct voltage via the DC inlet on the rear panel, which is rated at 9-18V DC @ 2A. Power should be provided using the using the appropriate external adaptor supplied with the unit. The unit may alternatively be supplied from a 12V car battery.

Supply rail connections have inline filter inductors to reduce EMC coupling to the host. EMC performance may be affected if the unit is operated outside the limits above. Permanent damage may also result.

### 2.2 Environmental

The V25 must be operated under the following conditions:

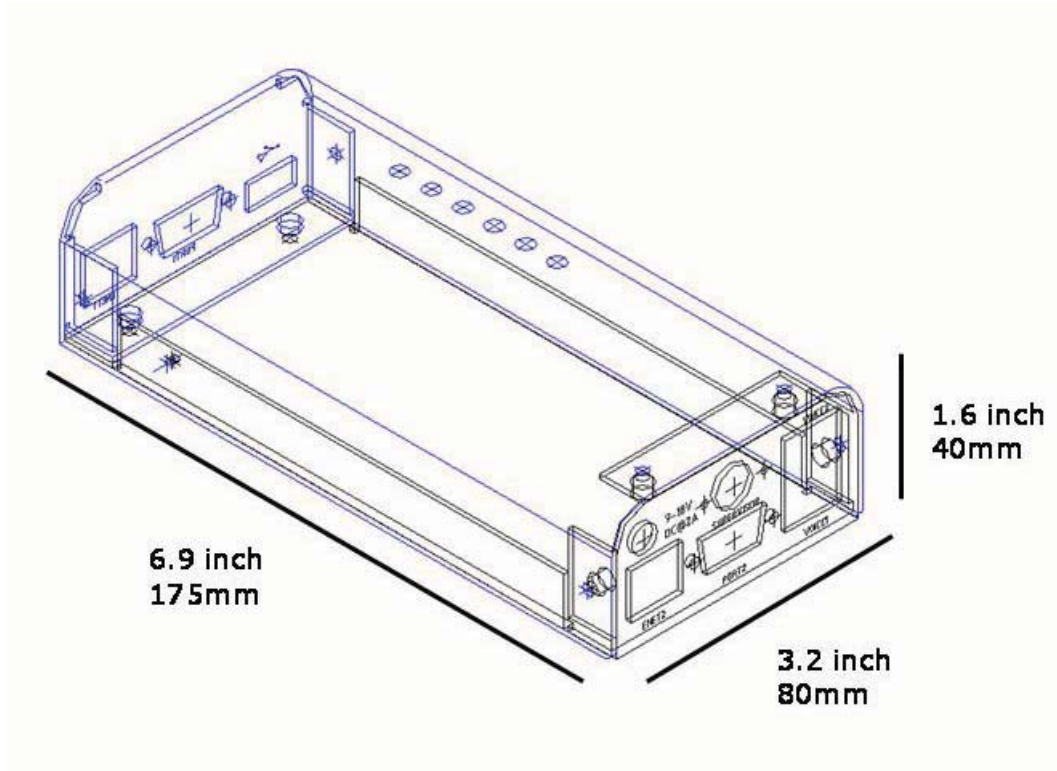
External Temperature 0-50 degC convection cooled

Humidity 0-90% RH non-condensing

Pressure 86-106 Kpa

Since the unit has no forced-air cooling, it should be operated in an area with adequate free air circulation.

### 2.3 Mechanical Construction



The V25 consists of a two-part metal enclosure with a 10/100base-T Ethernet, Serial DTE and USB port on the lid/front panel and the power inlet, M&C and all other connections at the rear. A flexible PCB carrying the six indicator LEDs is mounted on the inside of the lid and attaches to the main PCB via a ZIF socket. A small reset button is accessed via a tiny hole on the side near the "ENET1" connector. Depressing this with a paper clip or similar tool for 5 seconds while the unit is powered up will restore factory default settings.

To remove the lid, unscrew the two UNC4/40 jackscrews associated with the HD 'D'-type connector for Port 2. Then unscrew the two Torx™ screws in the underside of the box and the four Torx™ screws in the lid at the other end. Slide the lid away from the chassis a short distance and then pivot it upwards, observing that the flexible PCB is still attached. To detach the flexible PCB, unlock the ZIF socket by releasing the clamp with a thumbnail and gently withdraw the PCB. The lid may now be safely removed.

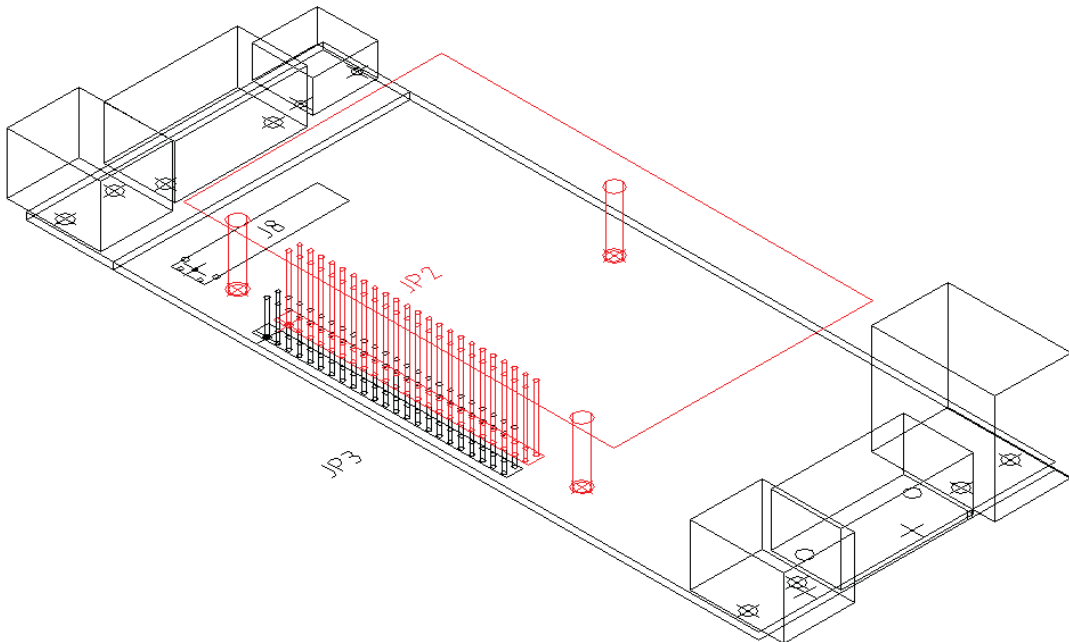


**WARNING: STATIC SENSITIVE COMPONENTS!  
ESD PRECAUTIONS MUST BE OBSERVED WHEN FITTING  
OPTION CARDS REFER TO APPENDIX A**

Internally, the V25 comprises a small PCB which contains all of the circuitry. The DC power connector and the M&C connector are hardwired to the PCB with flying leads. There are no internal adjustments or jumper links and no maintenance can be performed by the operator.

### 2.3.1 Fitting an SVR Card

The V25 is designed to be able to fit inside a host system, which provides power and electrical. The PCB is attached to the chassis via three mounting holes using 16mm threaded pillars. It is also to these pillars that the optional SVR Card should be attached after first mating the card with the appropriate connector, JP2. JP2 is the tallest of the two 48-way double-row pin headers, shown in red in the following diagram:

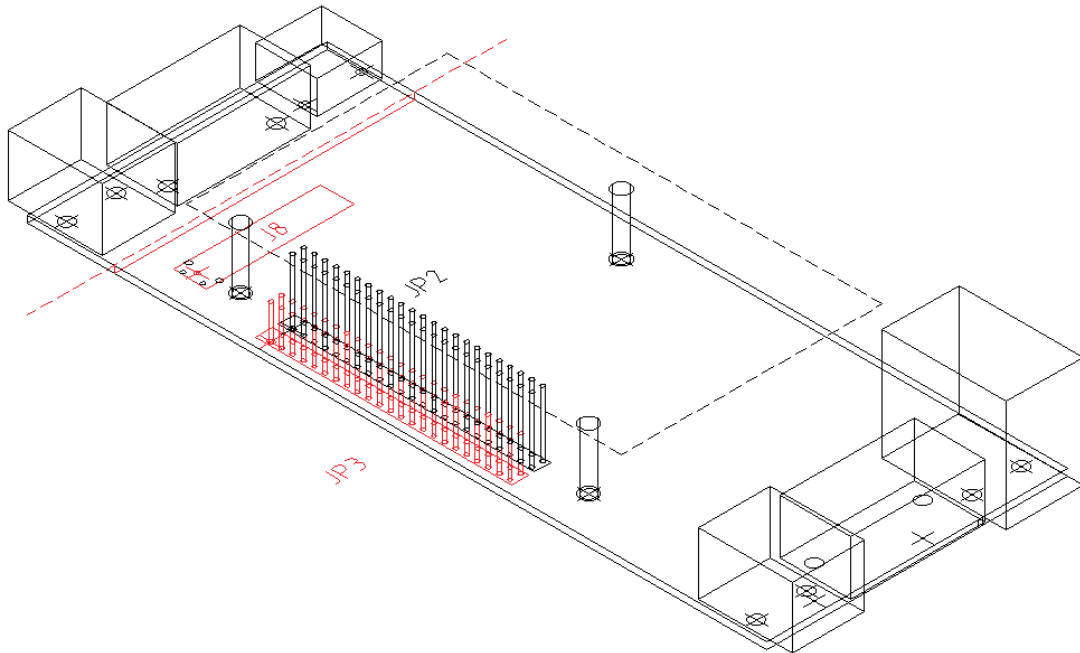


## 2.3.2 OEM Integration

The V25 is designed to be able to fit inside a host system, which provides power and electrical connectivity. Two internal connectors are provided for this purpose, one of which presents a parallel interface, the other of which presents a serial interface.

### 2.3.2.1 Parallel Interface

A second 48-way double-row pin header labeled "JP3" is located between JP2 and the edge of the PCB. This is the Host Expansion Connector, the purpose of which is to provide direct parallel access to the V25 internal buses when the unit is integrated into another piece of equipment. The pinout of JP3 is given in appendix B, 6.5. **Consult Vocality International Ltd before using this connector:**



### 2.3.2.2 Serial Interface

In addition to the Parallel Interface connector, there is a 3x16-pin header labeled "J8" located towards the end of the PCB the purpose of which is to provide direct serial access to the aggregate port of the V25 when integrated into other equipment. In this mode, the V25 is built as a bare board (no enclosure), and the end of the PCB housing one of the serial and Ethernet ports plus the USB port is broken off. In their place, a 16x3 connector may be factory-fitted which allows the integrator direct access to the Port1 serial interface. The pinout of J8 is given in Appendix B, 6.6. **Consult Vocality International Ltd before using this connector.**

### 2.3.2.3 Remote LEDs

In embedded mode it is possible to sacrifice the DTE port and fit a 6x2 header on part of the footprint of J8 (pins A/B7 through A/B12), which gives access to the signals that drive the six bi-colour LEDs that normally reside on the top cover.

Series resistors must be provided. Depending on how the gate array is programmed, either:

(a) Red and green LEDs are mounted in inverse parallel using a single, common series resistor. In this case, the red LEDs are pulse density modulated in order to match their brightness to green LEDs. This is how the top cover LEDs are driven. Or:

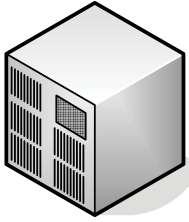
(b) Separate red and green LEDs with a common cathode may be used, with a common ground taken from any convenient point. Pins A15 and B15 are recommended.

There is no +3v3 available on J8, and the gate array is not 5V tolerant. Therefore, the use of common anode LEDs is not recommended. Normally the gate array drives these pins in their DTE port mode. LED remoting is therefore NOT SUPPORTED by default - an FPGA and software upgrade is necessary to enable them. **Consult Vocality International Ltd before using this connector.**

Pin connections (subject to FPGA program)

Pin	Function
A7	'Status' red anode
B7	'Status' green anode
A8	'Data 1' red anode
B8	'Data 1' green anode
A9	'Data 2' red anode
B9	'Data 2' green anode
A10	'Voice 1' red anode
B10	'Voice 1' green anode
A11	'Voice 2' red anode
B11	'Voice 2' green anode
A12	'USB' red anode
B12	'USB' green anode

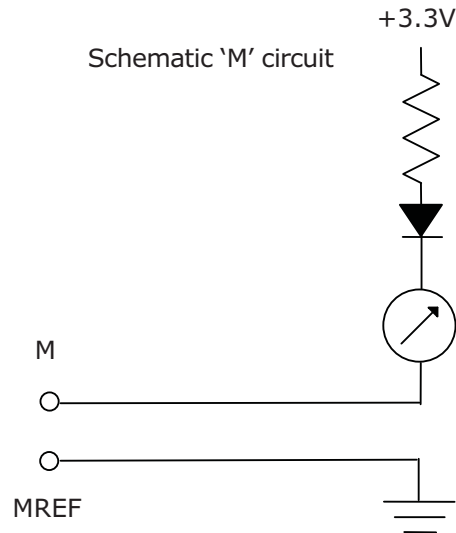
## 2.4 TIE-LINE mode



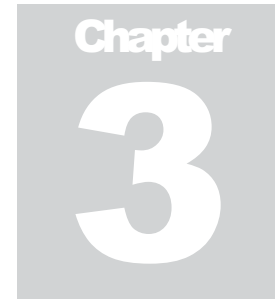
When either of the Voice Ports is configured to Tie-line mode, their respective RJ45 port may be connected to an audio switch matrix or clean feed monitor circuit. The port presents a 4-wire voice interface and a pair of signals used to activate the channel. No ringing voltages are generated by, or should be connected to the ports in Tie-line mode.

E&M is not supported by the V25 but each port has the equivalent of an 'M' circuit which may be used to activate the connection to the remote unit under control of the "M-Lead Activation" field on the System Menu.

The following diagram shows how the 'M' circuit is presented:



The current detector in the 'M' circuit has an internal impedance of 10K and is referenced internally to +3.3V. It can be stimulated by keying the 'M' lead to ground and the 'MREF' signal is provided for this purpose.



## 3 Comparison with V100

The V25 shares many of the features and functionality provided by its older brother the V100. However, some functionality has been changed. See Section 1.2 for a description of the restrictions on the V25.

The table below compares some of the V100 and V25 features.

Feature	V25	V100
Supervisor port	6-pin locking mini-DIN	9-way D-type connector
Alarm port	No	Voltage-free changeover contacts
HSC port	No	Yes
LAN port	Yes - 2	Yes - 1
Link port	DTE only	DTE or DCE
Data port	DCE only	DTE or DCE
USB port	Host mode	None
Voice/FAX channels	2 Voice ports FXS or Tie-line	Maximum 8 or 16 depending on model All voice ports can be configured as either FXS or FXO (depending on model) or Tie-line
Options cards available	SVR only	TDM, ISDN and E1
Software	V25 build of Generic software Rev 4.0.5 or later	Standard V100 software dependant on hardware revision.
Feature keys	Used to enable extra software features. Only PEP is available in the V25. See section 4.4	Used to enable extra software features. See the V100 Technical Manual for more information.



## 4 Features

### 4.1 Indicators

The V25 has six LED indicators on the lid for displaying the status of the unit as follows:

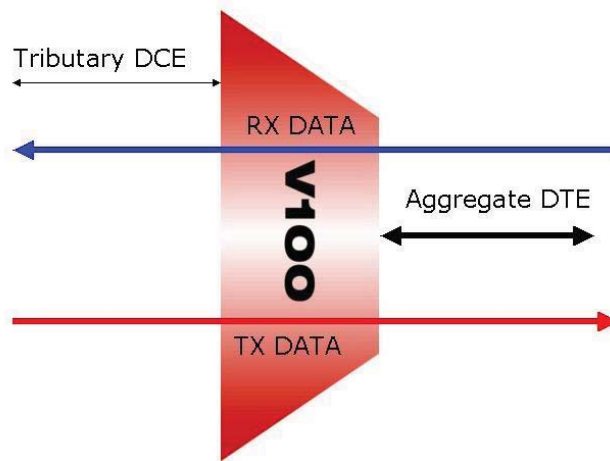
LED	Red	Green
Status	Booting or fault	Unit OK
Data 1, Data 2	Aggregate flashing: Carrier lost Tributary: Errored packet sent/received	Aggregate solid: Carrier detected Aggregate flashing: Loop present Tributary: Good packet sent/received
Voice 1, Voice 2	N/A	Channel active
USB	Fault condition	Port active

### 4.2 Alarms

There is no summary alarm connector. Fault conditions are reported either visually by the LEDs or via the management system, using the RS232 supervisor port or Telnet access.

### 4.3 Clocks

V25 data ports support the same pinouts as those on the V100 but only support a subset of the functionality. Either may be used as an aggregate or as a tributary but Port 1(0:1) may only be configured in DTE mode and Port 2(0:2) may only be configured in DCE mode. The bigger products in the Vocality range all provide two reference buses known as GRX and GTX; the V25 only supports GRX. These buses carry global clock reference signals and allow the unit to derive phase-locked output clocks from a common input frequency. Since the V25 is intended primarily for SOHO-style end-user applications, the implementation of just a single reference bus is not considered a limitation.



NOTE: By convention, the Receive Clock "RXC" is defined as "the clock associated with the direction of data flow from aggregate to tributary" and the Transmit Clock "TXC" as "the clock associated with the direction of data flow from tributary to aggregate". This assumes that aggregate ports are normally DTE presentation and tributaries are normally DCE, so for an aggregate, RX data is input and TX data is output whereas for a tributary, RX data is output and TX data is input.

The following table summarises the functionality available at each port:

Port	Presentation	RX Clock Sources	TX Clock Sources
0:1	DTE	EXT	EXT
		TXC	RXC
		PLL	PLL
		DBA	DBA
0:2	DCE	EXT	EXT
		TXC	RXC
		PLL	PLL
		DBA	DBA
			TTP (TT input, ST output from PLL)
			TTD (AS TTP but variable ST output)

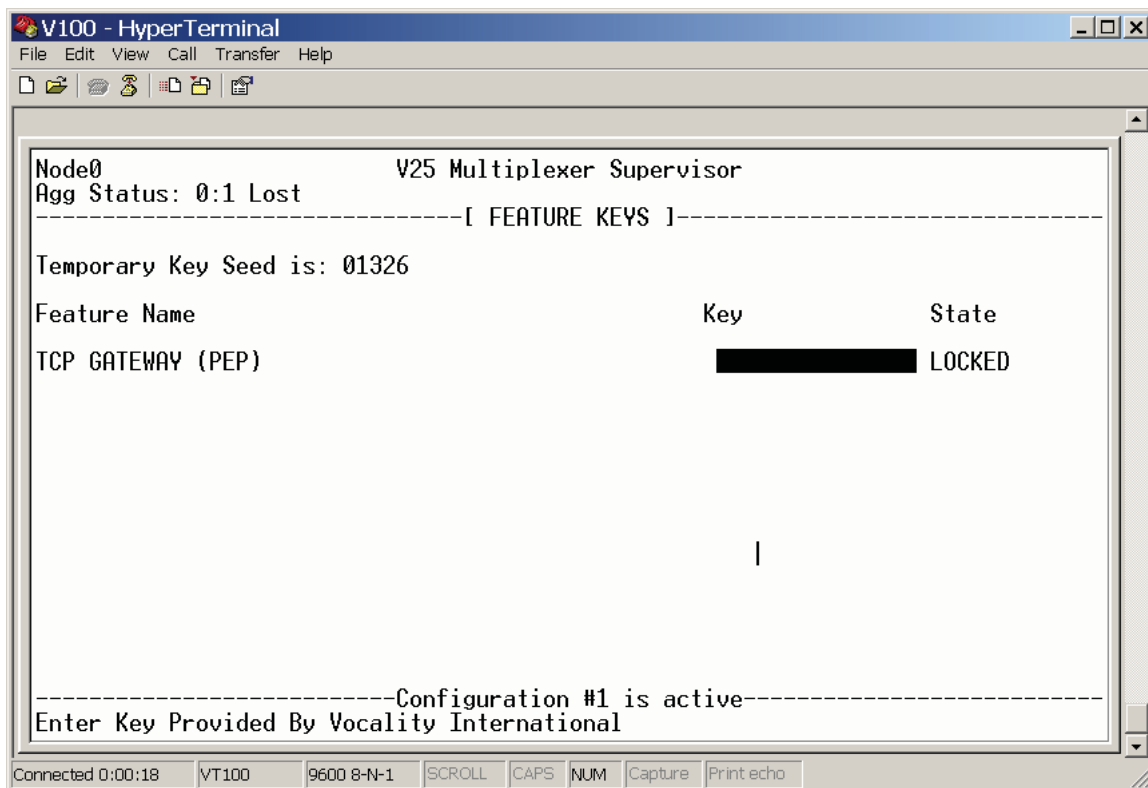
Note that there is no longer a selection for "INT" or Internal. The V25 uses a VCXO for derivation of clocks, which runs at a nominal 6.144MHz +/-25ppm with an adjustment range of +/-100ppm and consequently any clocks that must be generated by the unit may now be produced in PLL mode with considerable accuracy even without a reference input.

The following definitions apply:

- (i) "EXT": The external interface
- (ii) "TXC": The channel TX clock
- (iii) "PLL": From the port's RX Phase-locked Loop
- (iv) "DBA": From the port's RX PLL as (iii), but the rate can be dynamically varied
- (v) "RXC": The channel RX clock
- (vi) "TTP": TXC PLL output mode where RXC input clock is sourced from TT
- (vii) "TTD": TXC DBA output mode where RXC input clock is sourced from TT

#### 4.4 Software Feature Keys

The feature keys menu allows the entry of encrypted keys which enable enhanced features in the V25. Two types of keys are supported – permanent keys are purchased to permanently enable the features. Temporary keys are available to trial test a feature. They are active for up to 24 hours or until the V25 is restarted. Please contact Vocality International to obtain the appropriate keys for your units.



To enable a feature, move to the Key field, enter the key and press enter. The State changes from LOCKED to UNLOCKED.

## 5 Appendix A : Safety and Approvals



### WARNING:

This unit generates hazardous voltages.

There are no user-serviceable parts.

In the event of failure, the unit should only be repaired by qualified personnel or returned to the factory.

### **WARNING:** INSTALLATION OF EQUIPMENT

Any SELV 10/100base-T network plugs used - which could accidentally be plugged into the telephone ports - must have their key tabs removed such that they can only be removed using a special tool. This equipment must therefore only be professionally installed by suitably trained service personnel.

### **WARNING:** CONNECTION OF OTHER EQUIPMENT

This equipment allows connection only of suitably approved equipment to its ports, the safety status of which is defined below.

#### SELV Ports:

- i) Supervisor Port
- ii) Data Ports
- iii) LAN Port
- iv) USB Port

The above named ports are classified as SELV (Safety Extra Low Voltage) in accordance with

EN60950-1:2002, and must only be connected to equipment which similarly complies with the SELV safety classification.

TNV2 Ports:

- i) Voice ports (telephones or Tie-line connections) (when fitted)

The above named ports, classified as TNV2 (Telecom Network Voltage Type 2) in accordance with EN60950-1:2002, generate TNV2 voltages. They must not be connected to any external equipment also capable of generating TNV voltages.

Compliance with EMC emissions standards EN55022 and immunity standards EN50082-1 and 50082-2 is conferred by the host chassis. In order to meet the requirements of these standards, the card must be operated with screened link, channel and supervisor cables. Failure to do so may result in non-compliance.

**WARNING:** ESD PRECAUTIONS AND STATIC SENSITIVE CARD HANDLING



Vocality International Ltd. observe the general requirements of BS EN 100015-1 (1992) in all matters relating to the handling and storage of electrostatic sensitive devices (ESDs) and assemblies. We recommend strict observance of this standard during the installation of all Option Cards.

All cards are assumed to contain at least one ESD and therefore all subassemblies containing PCBs should be handled in the same way. Products are designed with protection components on external and internal connectors where appropriate. User manuals, applications notes and modification instructions contain warnings where an ESDs may become exposed to ESD. The packaging of Vocality International Ltd. products is classified as secondary, for physical protection only.

Cards should be handled in an ESD Protected Area (EPA) using approved materials (wrist straps, bonding cords etc) from recognized suppliers.

ESDs should always be protected by primary packaging when moving between EPAs or EPA and field sites. Equipment containing ESDs devices in primary packaging (e.g. the metal enclosure) are moved off-site using additional secondary packaging for mechanical protection. Within the EPA, cards should be stored in their primary packaging in electrostatic dissipative bags.

5.1 DECLARATIONS OF CONFORMITY



Vocality International Ltd, Lydling Barn, Lydling Farm, Puttenham Lane, Shackleford, Surrey GU8 6AP, UK



**EC DECLARATION OF CONFORMITY**

THIS IS TO CERTIFY:

**V25 Multiplexer, manufactured by  
*Vocality International Ltd***

CONFORMS WITH THE PROTECTION AND  
ELECTROMAGNETIC COMPATIBILITY  
REQUIREMENTS OF THE FOLLOWING STANDARDS:

- BS EN 60950-1: 2001 Safety Standard*
- BS EN 61000-6-3: 2001 Emission Standard*
  - BS EN 55022 (conducted emissions)*
  - BS EN 55022 (radiated emissions)*
- BS EN 61000-6-1: 2001 Immunity Standard*
  - BS EN 61000-4-2*
  - BS EN 61000-4-3*
  - BS EN 61000-4-4*
  - BS EN 61000-4-5*
  - BS EN 61000-4-6*
  - BS EN 61000-4-8*
  - BS EN 61000-4-11*

Signed ..... M.P.SAUNDERS  
(Group Technical Director)

Date .....

## FCC DECLARATION OF CONFORMITY

THIS IS TO CERTIFY:

**V25 Multiplexer, manufactured by  
Vocality International Ltd**

COMPLIES WITH PART 15 OF THE FCC RULES.  
OPERATION IS SUBJECT TO THE FOLLOWING TWO  
CONDITIONS:

- (1) *This device may not cause harmful interference and*
- (2) *This device must accept any interference received, including interference that may cause undesired operation.*

*NOTE This equipment has been tested and found to comply with the limits for a class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:*

- (a) *Reorient or relocate the receiving antenna.*
- (b) *Increase the separation between the equipment and the receiver*
- (c) *Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.*
- (d) *Consult the dealer or an experienced radio technician for help.*

Signed ..... M.P.SAUNDERS  
(Group Technical Director)

Date .....

## 6 Appendix B: Pin Assignments

### 6.1 Supervisor Cable

RS232/V.24 STRAIGHT 5-way Multiplexer Supervisor DCE to Terminal DTE Cable (Part Number VI68224A)			
MUX 5-way Male Mini-DIN Connector	Terminal 9-way Female Connector UNC 4/40 Screws	Signal Name	Signal Type (at mux end)
Shield	Shield	SHIELD	SHIELD
1	2	RXD	Output
6	3	TXD	Input
3	5	GND	Ground

Notes:

- Cable type: Belden 3 separate conductors, overall screen (or equivalent). Maximum length 5 metres.

**6.2 Data Ports**

Both data ports are presented with a DB15F HD interface:

Pin #	Signal Name					DTE	DCE
	V.11	RS449	V.35	RS530	V.24		
Shield	Shield	Shield	Shield	Shield	Shield	C	C
1	GND	GND	GND	GND	GND	C	C
2	T(A)	SDA	SDA	SDA	TXD	O	I
9	T(B)	SDB	SDB	SDB	-	O	I
3	C(A)	RTSA	DTR	RTSA	DTR	O	I
10	C(B)	RTSB	-	RTSB	-	O	I
4	R(A)	RDA	RDA	RDA	RXD	I	O
11	R(B)	RDB	RDB	RDB	-	I	O
5	I(A)	RRA	DCD	RRA	DCD	I	O
12	I(B)	RRB	-	RRB	-	I	O
6	S(A)	RTA	SCRA	SCRA	RXC	I	O
13	S(B)	RTB	SCRB	SCRB	-	I	O
7	-	STA	SCTA	SCTA	TXC	I	O
14	-	STB	SCTB	SCTB	-	I	O
8	-	TTA	SCTEA	SCTEA	EXTXC	O	I
15	-	TTB	SCTEB	SCTEB	-	O	I

**6.3 Analogue Voice Ports**

8-way RJ45-Type Analogue voice port Pin Connections				
Pin No.	4-wire Tie-line mode		2-wire FXS/FXO mode	
	Signal Name	Signal Type	Name	Type
1	MREF	Reference GND	-	-
2	RX+	Input	-	-
3	RX-	Input	-	-
4	-	-	TIP	Input/Output
5	-	-	RING	Input/Output
6	TX+	Output	-	-
7	TX-	Output	-	-
8	M	Current Sense	-	-

**WARNING:**

**LINE VOLTAGES ARE PRESENT ACROSS TIP AND RING ON FXS CONNECTIONS. CONNECT ONLY TELEPHONE APPLIANCES TO THESE PINS. DAMAGE COULD RESULT TO CUSTOMER EQUIPMENT.**

## 6.4 10/100base-T Ports

8-way RJ45 10/100base-T Port Connections		
Pin No.	Signal Name	Signal Type
1	TX+	Input
2	TX-	Input
3	RX+	Output
4	Shield	-
5	Shield	-
6	RX-	Output
7	Shield	-
8	Shield	-

## 6.5 JP3 Parallel Host Expansion Connector

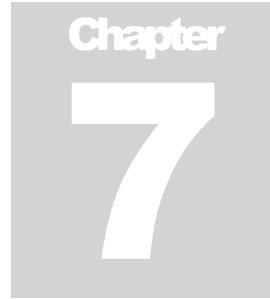
Host Port Connector JP3					
Pin No.	Signal Name	Signal Type	Pin No.	Signal Name	Signal Type
1	+5V	Power from host	2	+5V	Power from host
3	GND		4	GND	
5	BS_B0#	Output	6	NC	
7	GEN12	General I/O	8	GEN0	General I/O
9	GEN13	General I/O	10	GEN1	General I/O
11	GEN14	General I/O	12	GEN2	General I/O
13	GEN15	General I/O	14	GEN3	General I/O
15	GEN16	General I/O	16	GEN4	General I/O
17	GEN17	General I/O	18	GEN5	General I/O
19	GEN18	General I/O	20	GEN6	General I/O
21	GEN19	General I/O	22	GEN7	General I/O
23	GEN20	General I/O	24	GEN8	General I/O
25	GEN21	General I/O	26	GEN9	General I/O
27	GEN22	General I/O	28	GEN10	General I/O
29	GEN23	General I/O	30	GEN11	General I/O
31	BS_B1#	Output	32	SER_CLKIN	I/O
33	R/W#	Output	34	SER_DATOUT	I/O
35	GPL_A1_H	Output	36	SER_SVO	I/O
37	CS_H#	I/O	38	SER_ETCIN	I/O
39	+5V	Power from host	40	+5V	Power from host
41	GND		42	GND	
43	PCMCLK_H	I/O	44	N/C	-
45	PCMFS_H	I/O	46	SER_DATIN	I/O
47	SER_CLKOUT	I/O	48	SER_SYNOUT	I/O

This connector presents generic signal lines to permit customization to specific interface requirements. Refer to Vocality for details of DC and AC characteristics of these signals.

## 6.6 J8 Serial Host Expansion Connector

Note that, in order to achieve correct connectivity, the pin numbers on the mating connector must swap end-for-end, ie. 1<>16 within each row. The pin numbers given below are the numbers used by the V25.

Number	Name	Direction	Description
A1	SecDatI	From V25	Secondary data in (connected to B4, unused)
A2	SecClkO	To V25	Secondary clock out (connected to A3, unused)
A3	SecClkI	From V25	Secondary clock in (connected to A2, unused)
A4	n/c	-	NC
A5	n/c	-	NC
A6	SynIn	From V25	Sync In
A7	ETCOut	To V25	Ext TX clock out
A8	Rsrv E	-	Reserved
A9	DRI	From V25	Device ready in
A10	SAO	To V25	Sig accepted out
A11	SVI	From V25	Sig valid in
A12	DatIn	From V25	Data in
A13	ClkIn	From V25	Clock in
A14	n/c	-	NC
A15	GND	-	GND
A16	n/c	-	NC
B1	ID_D3	Passive	Board id 3
B2	ID_D4	Passive	Board id 4
B3	n/c	-	NC
B4	SecDatO	To V25	Secondary data out (connected to A1, unused)
B5	IDCom	To V25	ID Common
B6	ID_D2	Passive	Board id 2
B7	Rsrv D	-	Reserved
B8	Rsrv C	-	Reserved
B9	Rsrv B	-	Reserved
B10	Rsrv A	-	Reserved
B11	NPOR	To V25	Power on reset (active low)
B12	OutCtrl	To V25	Output control
B13	InpMon	From V25	Not used, pulled to GND
B14	n/c	-	NC
B15	GND	-	GND
B16	ID_D5	Passive	Board id 5
C1	ID_D0	Passive	Board id 0
C2	ID_D1	Passive	Board id 1
C3	n/c	-	NC
C4	DatMarg	From V25	Not used, pulled to GND
C5	NcardFlt	From V25	Card fault (active low)
C6	SynOut	To V25	Sync out
C7	ETCin	From V25	Ext Tx clock in
C8	n/c	-	NC
C9	DRO	To V25	Device ready out
C10	n/c	-	NC
C11	SVO	To V25	Sig valid out
C12	DatOut	To V25	Data out
C13	ClkOut	To V25	Clock out
C14	+5V	-	+5V power
C15	GND	-	GND
C16	GND	-	GND



## 7 Appendix C: Specifications

<b>Data Ports</b>	Number	2
	Presentation	Port 1 DTE(Aggregate), Port 2 DCE(Tributary)
	Interface	Selectable V.24/RS232, V.11, V.35, RS422, V.36, RS449 on DB15HD Female
	Format	Synchronous Transparent/HDLC or Asynchronous
	Data Rates	Sync: 50bps to 5.12Mbps  Async: 50, 75, 300, 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200bps  Selected word structure combinations with optional error-correction and compression
	Clock sources	See text
<b>Analogue voice/FAX</b>	Number	2
	Presentation	8-way RJ45
	Interface	2-wire FXS for connection to telephone/trunk port with ring voltage/cadence generation and dial pulse/ring trip detection  4-wire Tie-line with activation input
	Compression	G.723.1 (5.3/6.3Kbps MP-MLQ), G.729 Annex A (8Kbps CS-ACELP), G.726 (16-40Kbps ADPCM), G.727 (16-40Kbps E-ADPCM), G.711 (64Kbps PCM) $\mu$ -law or A-law Proprietary NetCoder® (6.4,7.2,8.0,8.8,9.6Kbps)
	Relays	Group 3 FAX relay at 2400-14400bps V.32bis Modem relay up to 14400bps STU-III Secure Voice Relay by Option Card
	Signalling	MFR1, R1, R2, SS4, SS5, AC15, Call Progress

	Echo canceller	G.168 adaptive (16/32mS tail)
	Coding delay	Per algorithm
	Gain	±31dB programmable in 1dB steps
<b>IP Router Ports</b>	Number	2
	Presentation	10/100base-T on RJ45 Ethernet, Auto-MDIX
	Facilities	IPV4 Static Router with DHCP Server/Relay
<b>USB Port</b>	Number	1
	Presentation	USB-II @ 12Mbps on 'A' type connector
	Mode	Host
<b>Supervisor</b>	Presentation	6-way locking mini-DIN
	Interface	V.24/RS232 serial
	Format	Asynchronous
	Data Rate	9600bps, 8 bits, no parity, one stop bit
	Flow Control	None
	Mode	Formatted terminal display or Teletype M&C
	Emulations	Automatic support of most common terminals
<b>Physical</b>	Indicators	6 Red/Green LED indicators, remote connection available
	Dimensions	175mm x 80mm x 40mm
	Weight	450g
	Environment	Operating: 0-50degC, 0-90%RH non-condensing Storage: -40degC to +85degC
	Power Supply	9-18VDC @2.0A
	Max Power	<10W



## 8 Appendix D: Part Codes

V25 Multiplexer

V25 External PSU Module

V25 Supervisor Cable

Software Feature – PEP

VI68400

VI68403

VI68224B

VI68400/SWF/PEP



## 9 Appendix E: Abbreviations

Agg	Aggregate Port
ARP	Address Resolution Protocol
Bps(Kbps)	Bits per Second (Kilobits per second)
CIR	Committed Information Rate
DBA	Dynamic Bandwidth Allocation
DHCP	Dynamic Host Configuration Protocol
DNS	Domain Name Service
GRX	Global Receive Clock
GTX	Global Transmit Clock
ICMP	Internet Control Message Protocol
IETF	Internet Engineering Task Force
IP	Internet Protocol
LAN	Local Area Network
LDN	Local Directory Number
MAC	Media Access Control
MTU	Maximum Transmission Unit (bytes)
PEP	Performance Enhancing Proxy
PLL	Phase-Locked Loop
QoS	Quality of Service
RFC	Request For Comments
RXC	Receive Clock
RXD	Receive Data
STP	Spanning Tree Protocol
TCP	Transmission Control Protocol
TCPGw	TCP Gateway
TFTP	Tiny File Transfer Protocol
TOS	Type of Service
Trib	Tributary port
TXC	Transmit Clock
TXD	Transmit Data
UDP	User Datagram Protocol
UDPGw	UDP Gateway
WAN	Wide Area Network