V50 MULTIPLEXER AND V50 ROUTER SUPPLEMENTARY MANUAL 1.0

Technical Supplement

vocality
international

www.vocality.com

BEFORE INSTALLING THE UNIT

PLEASE REFER TO THE SAFETY INSTRUCTIONS IN APPENDIX A

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1

1 Introducing the V50

1.1   General Overview

Both the V50 Multiplexer and the V50 Router provide a compact and yet fully featured implementation of the larger V100 unit. They provide access to some core V100 features such as analogue voice or bridge/routing. The V50 provides an impressive range of features and options and is completely compatible with all V100 equipment. By using the same software as its larger brothers, the same management interface can be used to control the card.

The V50 is designed to support up to eight fax channels, 10/100base-T Ethernet and has two data ports. In order to minimise size and weight, the V50 is offered in two variants, one of which offers FXS POTS interfaces and the other of which offer FXO POTS. 4-wire Tie-line and optional STU-IIB/STU-III relay functionality are provided on the first four channels. Either of these variants may interwork with a full-size unit or another V50 at the remote location.

By cascading one of the data ports in aggregate mode to the aggregate port of an additional V50 or V100 unit, the connectivity of the card may be expanded to make a much larger multiplexer or to upgrade the service at a later date.

Both data ports conform to the standard V100 specification. They may be configured to be

either aggregate link or tributary port. They may be synchronous or asynchronous, presented on a standard 15-way connector with V.24, V.11, RS530, V.35 or RS449 electrical interfaces all selectable from the supervisor port without the need to remove the card. Each data port provides considerable flexibility in clocking options. This allows a unit to accept, source or onward link clocks.

A V50 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^{TM}. 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 RS232 interface presented on a standard 3.5mm jack.

This user manual describes the use, configuration and installation of the V50 Multiplexer and the V50 Router and contains information relating mainly to their unique features. It is not intended to replace the V100 Multiplexer Technical Manual and should be read in conjunction with that document.

1.2   Capabilities

1.2.1   Analogue Voice/FAX

Eight analogue voice channels are available in either FXS or FXO form as discrete variants. The FXS variant is Part Number VI68950/FXS and the FXO variant is VI68950/FXO. In both cases the first four channels also support 4-wire Tie-lines. The cards may be ordered in 4-channel or 8-channel form and with optional STU-IIB/STU-III relay functionality, also on the first four channels, if required. Cards are shipped from the factory fully-loaded with 8-channel + STU hardware but the optional functionality can only be activated if the soft feature keys are enabled. These are supplied by Vocality International.

1.2.2   Data
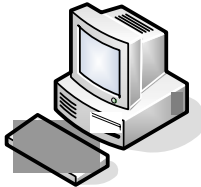
Data ports are implemented on 15-way 'D'-type connectors and support the standard range of software–selectable interface standards. Each port has one Phase-locked Loop (PLL), which permits the TX clock to be phase locked to any other port in the system, thus permitting onward-linking if required.

1.2.3   Expansion - ISDN Basic Rate Interface Link Card
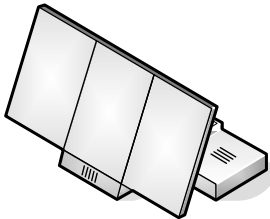
The PCB supports an optional ISDN Terminal Adaptor (TA) via a ribbon cable, which provides access to the ISDN2 service for backup or bandwidth-on-demand. This card is available with either an 'S0/T0'-bus interface or a 'U0'-bus interface. International ISDN protocol variants are supported from the factory upon request. The ISDN TA is configured from its own menu page, which allows the user to enter a primary and secondary ISDN number, set up call control parameters and select clock sources for locking the rest of the system.

The ISDN TA offers connectivity with both land and sea based Inmarsat GAN services.

1.2.4   10/100base-T Integrated Router
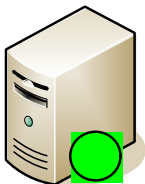
The V50 is designed to the same level as Revision D of the V100 chassis and so incorporates the IP Router, presented on an RJ45 connector on the front of the unit.

1.2.5   Control and Monitoring

The V50 has a dedicated 3.5mm stereo jack for management and control, labelled
"Supervisor". 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.

1.3   Restrictions

The management and control of the V50 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.

1.3.1   Slot and Port Numbers

Throughout the configuration of the V100 or V50, 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 V50 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
Link	0:1
Data	0:2
Tel-Line	1:1
	1:2
	1:3
	1:4
	1:5
	1:6
	1:7
	1:8
Embedded IP bridge/router	0:10 to 0:31

1.3.2   The DATA menu

A typical Data Channels menu screen is shown below. All of the normal options are available with the exception of the RX Phase-locked loop (PLL) on port 0:1 when in DTE mode and the TX PLL on port 0:2 when in DCE mode. (RX and TX swap over if the interface is toggled DTE-DCE). This allows (i) a TX clock to be generated for the LINK port (0:1) which may be used by the connected modem as a terrestrial clock input and (ii) an RX clock to be generated for the DATA port (0:2) which may be used in synchronous modes by the connected DTE device, perhaps an external router or an expansion multiplexer.

A typical Data Configuration screen is shown below:

1.3.3   The VOICE menu – VI68900/FXS

The Voice configuration menu appears as normal for an 8-channel card in slot 1. The interface functionality is however, restricted to "FXS" for all channels with the exception of channels 1-4, which may be set into "Tie-line" mode.
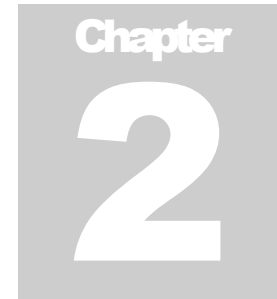
1.3.4   The VOICE menu – VI68900/FXO

The Voice configuration menu appears as normal for an 8-channel card in slot 1. The interface functionality is however, restricted to "FXO" for all channels with the exception of channels 1-4, which may be set into "Tie-line" mode.

Chapter

2

2 Installation

2.1 Supply and Voltage Connection

DC power must be supplied to the V50 at the correct voltage via the DC inlet on the rear panel. There are two variants available; the 12V variant (p/n 68950/FXS-12 or 68950/FXO-12) is rated at 11-18VDC @1A, the 24V variant (p/n 68950/FXS-24 or 68950/FXO-24) is rated at 18-35VDC @0.5A. Power should be provided using the using the appropriate external adaptor supplied with the unit. The 12V variant 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 V50 must be operated under the following conditions:

External Temperature 0-40 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 V50 consists of a two-part metal enclosure with a power switch and ISDN port (if fitted) on the front panel and a power inlet and all other connections at the rear.

Internally, the V50 comprises a small PSU card and two PCBs, the lower of which houses the Data port connections, IP port and Supervisor and the upper of which houses the 8-port RJ45 voice connector. The cards are interconnected by a 48-way mating plug and socket and retained by four 10mm M3 hex mounting pillars. The bottom card also provides a 32-way box header which takes the place of the Special Options Connector on the full-size chassis. The optional ISDN basic-rate terminal adaptor may be plugged into this connector using a 32-way

ribbon cable.

The two data ports are presented on short 15-way ribbon cables from the lower card, which are terminated in 15-way IDC 'D'-type sockets. These and all other port connectors are presented on the rear panel:
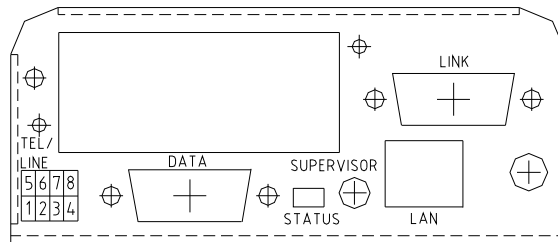
The rear edge of the main PCB also has an LED indicator for PORT1 status (flashing red or green). The meaning of this indicator is discussed in Section 4.1.

2.4   V50 Installation

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

Installation work must be carried out using the strictest electrostatic handling precautions.

2.4.1   Analogue Card Jumpers

The upper card, or Analogue Voice/FAX card presents an 8-way RJ45 connector for a maximum of eight channels. The top four connectors for channels 5 to 8 are only activated when the correct feature code is enabled. The orientation of channel numbers is as shown by the representation on the blanking plate. The first four channels are permanently enabled and in addition to their basic function (FXS or FXO depending upon the card), support 4-wire Tie-line interfaces. The card is fitted with four jumper links which configure the E&M signalling output of the Tie-line interface hardware according to the application. They are set when the card is commissioned and should not need to be changed thereafter. All other configuration changes are made by software selection. The diagram below

shows the FXS variant with the jumpers as fitted in their factory default positions:
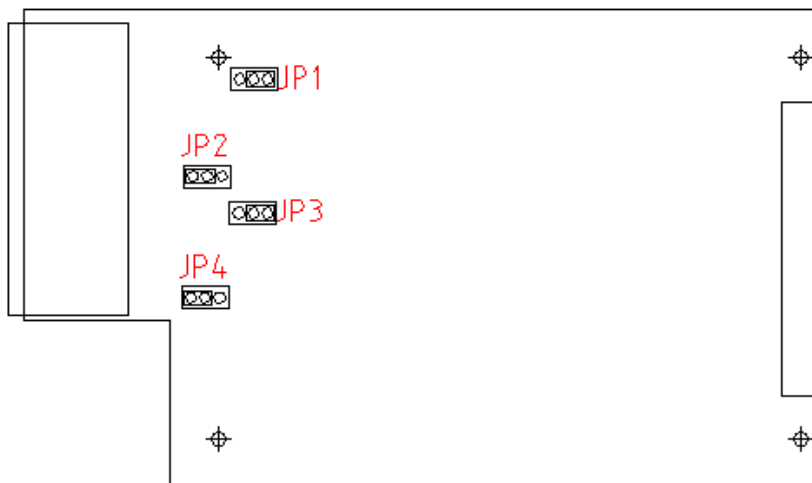
The next diagram shows the FXO variant with the jumpers fitted in their default positions:
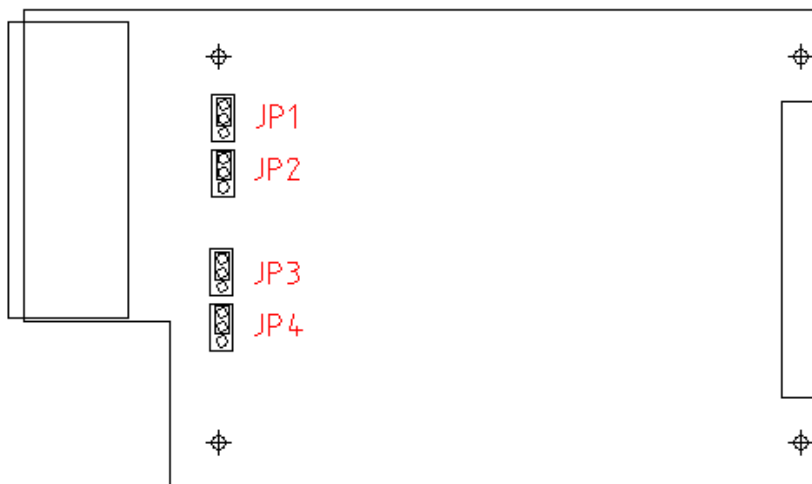
The Factory Default Jumper Settings are shown in bold italics:

Jumper	Description	1-2	2-3
JP1,2,3,4	'E' lead keying	***Normally open***	Normally closed

Jumpers 1, 2, 3 and 4 select normally-open or normally-closed 'E'lead contacts for channels 1-4 when in Tie-line mode.

2.4.2   Data Card Jumpers

The lower card of the two, which comprise the V50, is fitted with several connectors, headers

and jumpers as follows:
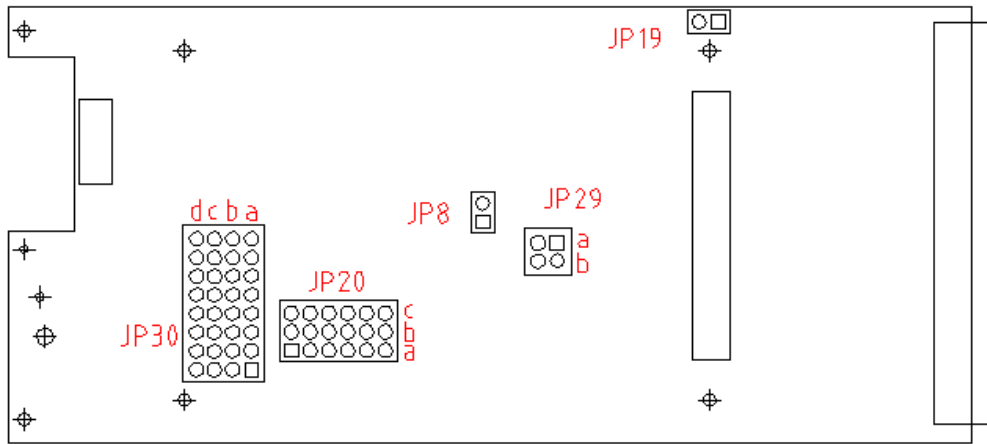
□ Square pin is a1

These connectors are provided to allow flexibility in the hardware capabilities of the V50.
Details of these connectors are given in the table below:

Connector/Jumper	Description	Pin#	Pin Function
JP8	Reset link	1	Link to Pin2 to restart the card
		2	
JP19	Not used	1	+5V
		2	GND
JP20	Ethernet - do not change	a1, b1, c1	Link in position B-C
		a2, b2, c2	Link in position B-C
		a3, b3, c3	Link in position B-C
		a4, b4, c4	Link in position B-C
		a5, b5, c5	Link in position B-C
		a6, b6, c6	Link in position B-C
JP29	I2C Connector. Do not change without advice from qualified Vocality personnel.	a1, b1	Link to connect I2CCLK to Edge Connector b29
		a2, b2	Link to connect I2CDAT to Edge Connector b28
JP30	Port 1 Connector. Use rows BC to connect to DB15 via ribbon cable. Do not change without advice from qualified Vocality personnel. To connect internally to the DIN41612 Edge Connector, link pins as shown.	a2, b2	Link to connect TXDA to Edge Connector a19
		a4, b4	Link to connect RXDA to Edge Connector a19
		a6, b6	Link to connect RXCA to Edge Connector a19
		a8, b8	Link to connect EXTXCA to Edge Connector a19
		c1, d1	Link to connect TXDB to Edge Connector a19
		c3, d3	Link to connect RXDB to Edge Connector a19
		c5, d5	Link to connect RXCB to Edge Connector a19
		c7, d7	Link to connect EXTXCB to Edge Connector a19

2.5   TIE-LINE mode and E&M support

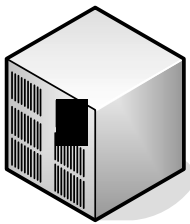When any of ports 1-4 are configured to Tie-line mode, their respective RJ45 port may be connected to the Tie-line card of a PABX. The port presents a 4-wire voice interface and E&M signals. No ringing voltages are generated by, or should be connected to the ports in Tie-line mode.

In Tie-line mode the voice channels operate a 4-wire speech interface and also present four wires for the E&M interface: E, EREF, M and MREF. The Integrated Card is be configured to support type V E&M signalling, with the sense of the 'E'lead closure defined by the jumpers above.

The V50 defines the 'M' circuit as the input and the 'E' circuit as the output. (The reverse of most PABXs) Therefore when connecting to the PABX, 'M' should be connected to 'M' and 'E' to 'E'. The 'E' circuit on the V100 provides a contact closure and the 'M' circuit has a current detector. The 'M'lead is sampled and passed to the remote port to be output as a contact

closure on the 'E'lead.

The following diagram shows how the circuits are presented by default:

Schematic 'E' circuit   Schematic 'M' circuit
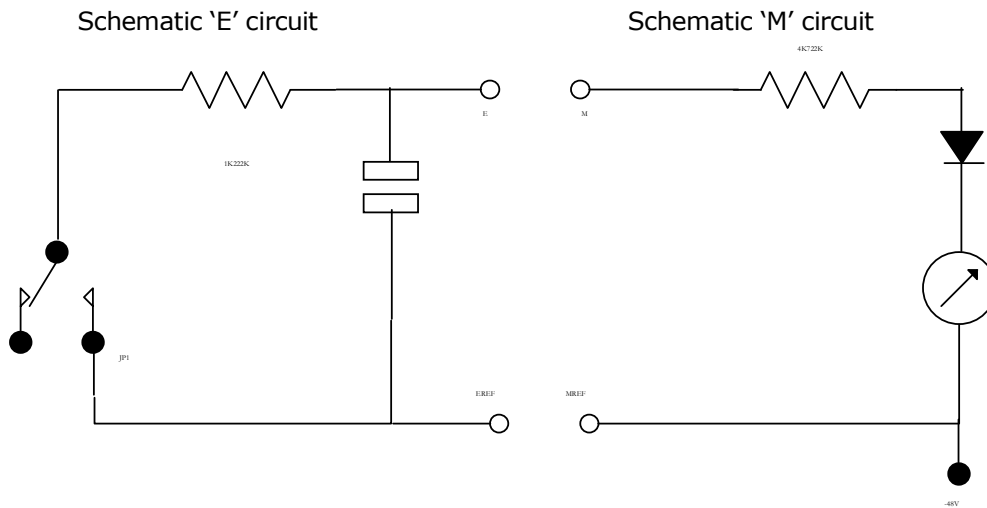
The E&M signalling return paths must be connected externally. This can be accomplished by connecting the EREF lead to the PABX frame ground with a good cable.

The current detector in the 'M' circuit has an internal impedance of 4K7 and is referenced internally to –48V. It can therefore be stimulated by keying the 'M'lead to ground.

The output signal is provided as a contact closure between the 'E'lead and the 'EREF'lead, which is internally connected to GROUND via a 1200ohm resistor. The active state may be a break or a make, selected by JP1.

2.6 Secure Voice Relay Support

This feature must be enabled on the features menu and can only be activated with the appropriate key from Vocality International.

The Secure Voice Relay feature is supported by the channels 1 to 4 only and works in parallel with the standard facilities. An automatic discriminator monitors the analogue channels and activates 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 military secure telephones, both STU-IIB and STU-III. At no time is the secure data decrypted.

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

NOTE: Unlike the STU Relay Daughter card for use with the V100 Analogue Voice Card, the top four voice ports are still usable as FXS or FXO depending on the V50 variant.

Chapter

3
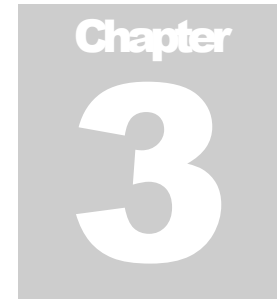
3 Comparison with V100

The V50 shares many of the features and functionality provided by its older brother the V100. However, some functionality has been changed. See Section 1.3 for a description of the restrictions on the V50.

The table below compares some of the V100 and V50 features.

Feature	V50	V100
Supervisor port	3.5mm stereo jack	9-way D-type connector
Alarm port	No	Voltage-free changeover contacts
HSC port	No	Yes
LAN port	Yes	Yes
Link port	DTE only	DTE or DCE
Data port	DTE or DCE	DTE or DCE
Voice/FAX channels	4 or 8 Voice ports 1-4 FXS or FXO (depending on model) or Tie-line Voice ports 5-8 FXO or FXS only (depending on model)	Maximum 8 or 16 depending on model All voice ports can be configured as either FXS or FXO (depending on model) or Tie-line
Special options cards available	ISDN only	TDM, ISDN and E1
Software	Standard V100 software Rev 2.2 or later	Standard V100 software dependant on hardware revision.
Feature keys	Used to enable extra software features. See section 4.5	Used to enable extra software features. See the V100 Technical Manual for more information.

Chapter

4
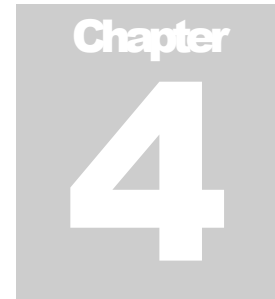
4 Features

4.1 Indicators

The V50 has one LED indicator on the rear panel for displaying the status of the LINK port as follows:

The LED has three states in aggregate mode:

Fast flashing RED when carrier is lost

Solid GREEN when carrier is present

Flashing GREEN when a loop is detected on the port

In tributary mode the LED indicates data activity:

GREEN for good data packet sent or received

RED for an errored packet sent or received

OFF STATE when port 0:1 is configured as a tributary and unused

4.2 Alarms

There is no summary alarm connector.

4.3 Clocks

V50 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 and the Data port (0:2) may be configured in DTE or DCE mode, but the Link port (0:1) may only be configured in DTE mode. In addition, the location of the single PLL for each channel restricts the signals which may be used to generate an output clock. On the link port the PLL is may only be used to produce a TX clock in DTE mode; on the Data port the PLL is also attached to the TX clock in DTE mode but switches to the RX clock in DCE mode.

Tributary DCE

RX DATA

V100

Aggregate DTE

TX DATA
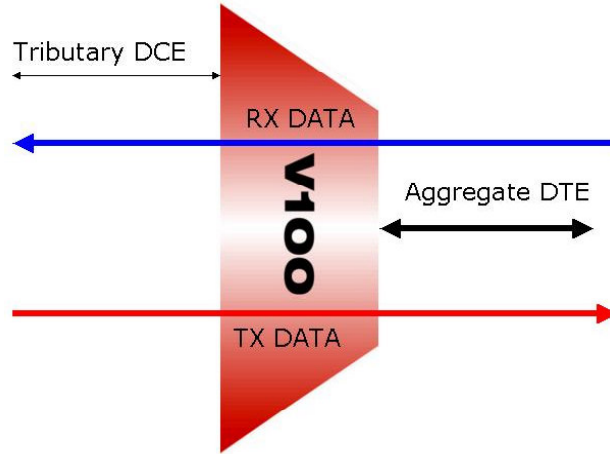
NOTE: By convention, the Receive Clock "RXC" is defined as "the clock associated with the direction of data flow from aggregate to tributary" and the Transmit Clock "TXC" as "the clock associated with the direction of data flow from tributary to aggregate". This assumes that aggregate ports are normally 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
		**	INT
		**	DBA
	DCE	**	**
		**	**
		**	**
		**	**
		**	**
0:2	DTE	EXT	EXT
		TXC	RXC
		**	PLL
		**	INT
		**	DBA
	DCE	EXT	EXT
		TXC	RXC
		PLL	**
		INT	**
		DBA	**

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) "INT":	The internal system clock
(v) "DBA":	From the port's RX PLL as (iii), but the rate can be dynamically varied
(vi) "RXC":	The channel RX clock
(vii) "**"	No function

4.4   Expansion – The High-Speed Channel (HSC)

The High-Speed Channel feature of the full-size V100 chassis is not supported. To expand the connectivity of the system, configure the DATA port as an aggregate DCE and connect it to port 0:1 of a full-size V100 chassis (or alternatively a V100 Compact) in aggregate DTE mode using a VI68720 cable. Ports on either the Integrated Card or the expansion chassis may be routed to any similar port elsewhere in the V100 network, in the normal way. Alternatively, by using IP aggregates two or more units can be hubbed together. Refer to the V100 Multiplexer Technical Manual for more information on using IP aggregates.

4.5   Software Feature Keys
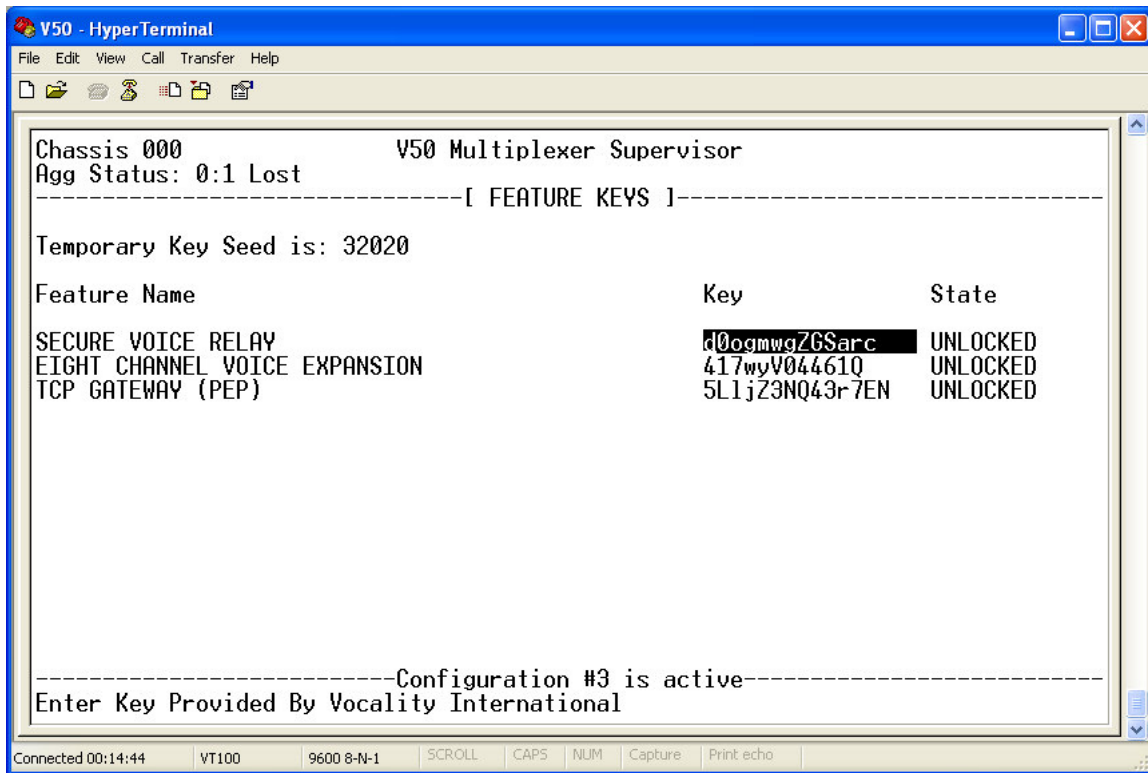
The feature keys menu allows the entry of encrypted keys which enable enhanced features in the V50. Two types of keys are supported – permanent keys are purchased to permanently enable the features. Temporary keys are available to trial test a feature. They are active for up to 24 hours or until the V50 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.

```
V50 - HyperTerminal
File   Edit   View   Call   Transfer   Help

Chassis 000                V50 Multiplexer Supervisor
Agg Status: 0:1 Lost
------------------------------[ FEATURE KEYS ]------------------------------

Temporary Key Seed is: 32020

Feature Name                                    Key              State

SECURE VOICE RELAY                              d0ogmwgZGSarc    UNLOCKED
EIGHT CHANNEL VOICE EXPANSION                   417wyV04461Q     UNLOCKED
TCP GATEWAY (PEP)                               5L1jZ3NQ43r7EN   UNLOCKED




                        -------Configuration #3 is active-------------------------
Enter Key Provided By Vocality International

Connected 00:14:44    VT100    9600 8-N-1    SCROLL   CAPS   NUM   Capture   Print echo
```

Chapter

5

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: THIS EQUIPMENT MUST BE EARTHED BY THE HOST

This equipment relies on the GROUND connection via the DIN41612 edge connector to ensure safe operation such that the user and TELECOM Network are adequately protected.   Operation without this connection could nullify its safety approval for connection to a network.

WARNING: INSTALLATION OF EQUIPMENT

This equipment must only be 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

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 (PBX extension, trunk 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, must only be connected to circuits complying with the requirements therein.

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:

V50 Multiplexer and V50 Router, manufactured by *Vocality International Ltd*

CONFORM 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:

V50 Multiplexer and V50 Router, 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 ....

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6 Appendix B: Pin Assignments

6.1 Supervisor Cable

RS232/V.24 3-way Multiplexer Supervisor DCE to Terminal DTE Cable (Part Number VI68924B)			
MUX 3-way Male 3.5mm phono jack	Terminal 9-way Female Connector UNC 4/40 Screws	Signal Name	Signal Type (at mux end)
Shield	Shield, 5	SHIELD, GND	SHIELD,Ground
1	2	RXD	Output
2	3	TXD	Input

The jack plug numbering is shown below:
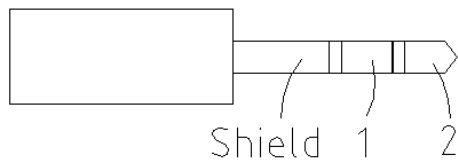
6.2 Data Ports

Both data ports are presented with a DB15F 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				
	4-wire Tie-line mode		**2-wire FXS/FXO mode**	
Pin No.	Signal Name	Signal Type	Name	Type
1	MREF	Reference	-	-
2	M	Current Detector	-	-
3	RXA	Input	-	-
4	TXRXA	Input/Output	TIP	Input/Output
5	TXRXB	Input/Output	RING	Input/Output
6	RXB	Input	-	-
7	E	Contact Closure	-	-
8	EREF	Reference	-	-

WARNING:

LINE VOLTAGES ARE PRESENT ACROSS TIP AND RING ON FXS CARDS. CONNECT ONLY TELEPHONE APPLIANCES TO THESE CARDS. DAMAGE COULD RESULT FROM CONNECTION TO A PABX PORT.

6.4 10/100base-T Port

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	-

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7 Appendix C: Specifications

Data Ports	Presentation	DTE(Aggregate) or DTE/DCE(Tributary)
	Interface	Selectable V.24, V.11, V.35, RS449 on DB15F
	Format	Synchronous Transparent/HDLC or Asynchronous
	Data Rates	Sync: 50bps to 2Mbps
		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

Analogue voice/FAX	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 (68900/FXS)
		2-wire FXO for connection to extension port with ring detection, loop hold and programmable impedance and termination for international compliance (68900/FXO)
		4-wire Tie-line with E&M type V signalling
	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) µ-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-IIB/STU-III Secure Voice Relay
	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
IP Router Port	Presentation	10/100base-T on RJ45 Ethernet connector
	Facilities	Ipv4 Static Router with DHCP Server/Relay
Supervisor	Presentation	DCE
	Interface	RS232 on 3.5mm stereo jack
	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
Physical	Indicators	1 Red/Green LED indicator
	Dimensions	257mm x 121mm x 51mm
	Weight	1Kg
	Environment	0-40degC operating, 0-90%RH non-condensing
	Power Supply	12VDC @1.0A or 24VDC @0.5A

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8 Appendix D: Part Codes

V50 Multiplexer – FXS 12VDC	VI68950/FXS-12
V50 Multiplexer – FXS 24VDC	VI68950/FXS-24
V50 Multiplexer – FXO 12VDC	VI68950/FXO-12
V50 Multiplexer - FXO 24VDC	VI68950/FXO-24
V50 Router 12 VDC	VI68950/VIP-12
V50 Router 24 VDC	VI68950/VIP-24
Integrated Card Supervisor Cable	VI68924B
Software Feature - FXO	VI68950/SWF/FXO
Software Feature - FXS	VI68950/SWF/FXS
Software Feature – PEP	VI68950/SWF/PEP
Software Feature – Secure Telephone (STU) Relay	VI68950/SWF/STU

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9 Appendix E: Abbreviations

Agg	Aggregate Port
ARP	Address Resolution Protocol
Bps(Kbps)	Bits per Second (Kilobits per second)
DBA	Dynamic Bandwidth Allocation
DHCP	Dynamic Host Configuration Protocol
GRX	Global Receive Clock
GTX	Global Transmit Clock
HSC	High-Speed Channel
ISDN	Integrated Services Digital Network
LAN	Local Area Network
LDN	Local Directory Number
MTU	Maximum Transmission Unit (bytes)
PLL	Phase-Locked Loop
QoS	Quality of Service
RXC	Receive Clock
RXD	Receive Data
SPID	Service Profile Identifier
Trib	Tributary port
TXC	Transmit Clock
TXD	Transmit Data
UDP	User Datagram Protocol
WAN	Wide Area Network