

Quad Subscriber Unit (QSU) Installation & Operation Manual

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STATUTORY NOTICES

APPROVALS

The BABT Approval Number for this apparatus is NS/1282/2/P/603727.
Subject to the following condition:

"That the equipment may only be connected via other approved equipment installed in accordance with BS6701 and fitted with a hardwired protective earth."

The 2-wire ports are approved for connection to telephones and PABX trunk lines. The 4-wire E&M ports are approved for connection to private network links and PABXs. The 4-wire E&M and 2-wire Loop Disconnect ports are TNV. Only the 9237-001 and the 9237-012 versions are BABT approved.

Unused E & M ports should be covered using Cover Assembly Product Code 1051-001 to prevent user access.

WARNINGS

The 2-wire ports may have AC ringing voltage up to 125V present.

The equipment contains lethal mains voltages and must be powered from a mains supply with an earth connection.

Interconnection directly, or by way of other apparatus, of ports marked: 'SAFETY WARNING. See instructions for use.' with ports marked or not so marked may produce hazardous conditions on the network. Advice should be obtained from a competent engineer before such a connection is made.



Case Communications Ltd declare that this product conforms with the protection requirements of Council Directive 89/336/EEC on the approximation of the laws of the member states relating to electromagnetic protection.

All PCB assemblies contain Electrostatic Sensitive Devices (ESDs) which may be permanently damaged if incorrectly handled. This equipment must be handled in accordance with BS5783 code of practice for the handling of electrostatic sensitive devices.

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Quad Subscriber Unit

1. Introduction

The Quad Subscriber Unit is a mains powered, stand alone unit consisting of four 4-wire E&M Signalling to Loop Disconnect Signalling conversion circuits. Signalling conversion is bi-directional and essentially transparent. The voice frequency interface at the E&M port is 4-wire. At the loop disconnect interface, signalling and voice are carried on a 2-wire pair intended for connection to a telephone. The unit is designed to operate in conjunction with a KMX-9000 series chassis equipped with a Compressed Voice Card or with a DVC ADPCM Voice Card.

2. Mechanical

The card is housed in a steel box of overall dimensions, excluding connectors, indicator and end-plate angles, of 446mm (W) x 326mm (D) x 44mm (H). It will fit, for example, within a 1RU high space in a 19" equipment rack. Ventilation holes are provided in the box sides and lid. Chassis support runners or a shelf must be used when rack mounting.

3. Connections

Mains connection is via an IEC320 C14, DIN40040 filtered connector at the rear of the unit. On the 9237-001 and 9237-012 the connection is fitted with a 2A 250VAC anti-surge fuse and is for operation on supplies conforming to range 2. On the 9237-011 the connection is fitted with a 2.5A 125V AC anti-surge fuse and is for operation on supplies conforming to range 1, see section 4. In each case the fuse can be replaced by levering open the fuse compartment which is an integral part of the filtered mains inlet.

Connection to telephone apparatus is via a Western Electric standard RJ45 male connector for each circuit at the rear of the unit, wired as follows:

Pin 4:	B wire
Pin 5:	A wire

Connections to telephones in the UK *must* be via an RJ45 to BT standard jack conversion lead, product code 1545 which is available separately. One is required per circuit.

Connections to the 4-wire E&M ports are via a 15-way male 'D'-type connector for each circuit at the rear of the unit. One metre long cables are supplied with the unit for connection to the voice cards.

Connections are as follows:

Pin 1:	4-wire Tx
Pin 2:	4-wire Tx
Pin 4:	Outgoing signalling 'M' lead
Pin 5:	Earth (connected to PCB 0V and Mains Earth)
Pin 7:	4-wire Rx
Pin 8:	4-wire Rx
Pin 15:	Incoming signalling 'E' lead

Note:

- (i) Tx refers to the VF output, Rx to the VF input.
- (ii) The 'D'-type connector shells are connected to Earth.
- (iii) There is no safety isolation between the ports.
- (iv) The connections to the network must be broken before the mains connection is removed from the apparatus.
- (v) The network connections must not be hard wired.

4. Installation

THIS UNIT MUST BE INSTALLED BY SERVICE PERSONNEL.

The approvals and warnings in the preface of this document must be read before installation.

The 4-wire transmission medium, e.g. CVC card, must insert a minimum of 3dB loop loss.

AC input voltage ranges

The unit is factory set for range 2 on the 9237-001 and 9237-012, and for range 1 on the 9237-011:

Range 1	90-135VAC	47-63Hz	2A maximum
Range 2	198-264VAC	47-63Hz	1A maximum

The unit must be returned to the factory if operation on a different range to that on which the unit was originally factory set is required.

A mains lead is supplied with the unit. This apparatus is intended for use on AC supplies of the above ratings only.

WARNING: Do not cover the ventilation holes of the unit. Ensure a good air flow through and around the unit.

5. Specifications

4-wire E&M Signalling ports:

The E&M ports meet the requirements of SSDC5A and Oftel OTR 001 port 6B requisites.

The 4-wire VF ports have a nominal impedance of 600_.

2-Wire Interfaces and VF Characteristics:

The 2-wire interface meets the requirements of BS6305 with regard to nominal impedance and Port 4B requisites of Oftel recommendation OTR 001. Correct VF operation will only be obtained if the apparatus connected to the 2-wire ports complies with BS6305 with regard to the nominal impedance.

VF Gain:

2-4 wire :- +0.3dB +/- 0.3dB (1000Hz test tone level -10dBm0)

4-2 wire :- +0.7dB +/- 0.3dB (See Installation Note)

Return Loss:

2-wire:	200Hz	± 15dB
	600Hz	± 27dB
	1000Hz	± 25dB
	2000Hz	± 24dB
	3400Hz	± 22dB

4-wire: (input and output)	200Hz	± 25dB
	600-3000Hz	± 28dB
	3400Hz	± 25dB

Terminal Balance Return Loss: (4-wire return loss)	200Hz	± 20dB
	1000Hz	± 24dB

Complex balance impedance:	2000Hz	± 20dB
	3400Hz	± 16dB

Idle Noise:

2 and 4 -wire ± 60dBm0p

Frequency Response:

Frequency Response: (relative to 1020Hz -10dBm0 level)	Freq. Hz	4-2 wire dB	2-4 wire dB
	200	-0.3	0.1
	600	0	0.3
	1200	0	-0.1
	1800	-0.2	-0.4
	2400	-0.3	-0.6
	3000	-0.4	-0.7
	3400	-0.4	-0.7

Group delay:

2-4 wire and 4-2 wire group delays are less than 15 μ s.

2-wire loop current feed: 32mA +/- 2mA on the 9237-001.

40mA +/-2mA on the 9237-011, -012

2-wire loop detect threshold: 10mA +/- 1mA

5.1 Ringing Generator

Ringing source is 75VAC RMS nominal (all circuits open-circuit) at 25Hz superimposed on -48VDC. The ringing generator is approved to BS6301.

5.2 Overall

Power consumption from the mains input is 110W absolute maximum. The internal power supply units are approved to BS6301.

5.3 Electromagnetic Compatibility

The unit meets the requirements of the EEC EMC directive and FCC part 15J. Specifically the unit complies with EN50082-1 (IEC801, DS5104) and EN55022: 1987 Class A.

6. Links

WARNING: Before removing the box lid, disconnect all external leads and the mains supply from unit. When powered the unit contains lethal voltages.

Links are on the internal main PCB and are accessed by removing the 12 screws securing the box lid.

Each circuit has 3 links identified on the PCB as follows:

xEPOL 'E'-lead signalling convention (Default condition: Earthed 'E'-wire = busy : not fitted. When fitted Earthed 'E'-wire = idle).

xMPOL 'M'-lead signalling convention (Default condition: Earthed 'M'-wire = busy : not fitted. When fitted Earthed 'M'-wire = idle).

xPDNM Powered-down 'M' lead state (Powered-down default condition: 'M'-wire Open Circuit = position 1-2, 'M'-wire Earthed position 2-3).

Note that this link also reverses the powered-up signalling convention. To correct this adjust the xMPOL link.

x is the circuit number.

Note: When used with CVC cards (TCV/TVF and QCV/QVF), the powered-down 'M' lead state set by links xPDNM should be in the default condition (1-2). The CVC card links should be set for non-active output signalling on aggregate link failure, to avoid continuous telephone ringing in this condition.

When for example 2 QSU circuits are connected back-to-back in hot line mode, active signalling input on any circuit will cause continuous un-cadenced ringing, i.e. the QSU does not provide ringing cadence. If cadence is required and is not provided by the exchange or external apparatus, the Voice Adapter Unit (Product Code 9257-001) should be used.

7. Indicator

Presence of power within the box is indicated by a green LED on the front of the unit. If the LED is extinguished it does not necessarily mean there is no AC mains power connected to the unit.

8. Service

This unit contains no user serviceable parts, and must be serviced by qualified personnel.