
BLACK BOX MICROMUX

NETWORK D.S.U. - MODEL SP-1 RA

V.35 Version FOR G.703 / E1

CO-AXIAL CABLE CONNECTION.

INFORMATION MANUAL

MX9034-R2

Connection to the G.703 / E1 network

There are two B.N.C. connectors on the rear panel of the SP-1 RA. They are labelled as "RX" and "TX". Your G.703 carrier service

Introduction

The *MicroMuxtm* Model SP-1 RA Network D.S.U., from Black Box, is designed to enable the connection of data communication systems to carrier services, or private services, such as microwave links, that are presented as G.703 at 2Mbit/s. This model has a single V.35 port with rate adaption. It supports 75 ohm and 120 ohm networks.

The standard interface, on the MX9034-R2, between the SP-1 RA and the Data Communications Equipment, is V.35. It requires a special cable to convert the connector format. The X.21 standard, and RS449 with common clocks, can be supported by the MX9021-R3 version.

Rate Adaption

The SP-1 RA rate adaption is set up using two switches (switches two and three) on the switch bank accessible at the rear of the unit.

Rate	SW2	SW3
2.048M	off/up	off/up
1.024M	on/down	off/up
512k	off/up	on/down
256k	on/down	on/down

Installation

On unpacking the SP-1 RA you should find the unit and this manual. You will also find an additional DTE cable, CBLV35, if you have ordered it with the unit. All units have an integral power supply. Mains powered units are delivered with an integrated male IEC connector and a 13A fused lead. The 48V supply option is delivered with a screw block terminal. If there are any questions refer to your supplier.

equipment may be labelled with transmit and receive. The SP-1 RA "RX" port should be connected to the receive side of the carrier equipment. The SP-1 RA "TX" port transmits carrier and this should be connected to the out-bound port of the carrier service.

G.703 75 ohm Cable Schedule

Connections should be made using 75 ohm co-axial cables with B.N.C. connectors. The co-ax cables required are two off, 75 ohm co-ax cables, of 5mm diameter, which must be terminated in male BNC connectors. The maximum cable attenuation must be 6db at 1024kHz. The attenuation characteristics should follow the "root f" law. Cable type RG59, or 2002, or equivalent, should meet this specification.

G.703 and 120 ohm Twisted Pair

The use of 120 ohm twisted pair cable is part of the CCITT specification G.703. It is common in Europe and may appear in the U.K. as the interface to services provided under the terms of the Open Network Provision. U.K. carriers have chosen, in the main, to adopt the 75 ohm co-axial cable option. The SP-1 RA supports 120 ohm twisted pair. However, should you have a need for 120 ohm please contact your Black Box representative, as re-configuration of the interface module is necessary.

Status Indicators

There are four LED status indicators on the front panel of the SP-1 RA labelled "Loop-Bk", "Clock-Mstr", "Network" and "Power". The "Loop-Bk" LED will illuminate when the loop-back condition is selected using switch four on the switch bank. The "Clock-Mstr" LED will illuminate when the SP-1 RA is set to clock master mode. The "Network" indicator is illuminated when the SP-1 RA is receiving correctly encoded data from the line interface equipment.

problem with the equipment attached to the MicroMux. Please contact your Black Box representative for more details.

V.35 Flow control signals

The MicroMux SP-1 RA has X.21 C & I control signals looped back internally on the DTE port, as there is no meaningful method of emulating C & I signalling over a G.703 carrier network.

Clock slave and clock master options

The MicroMux SP-1 RA is shipped with the G.703 set up to use clock recovered from the carrier network signal. There is an option to set up an internal clock source. This is enabled by putting switch one to the "on/down" position. In most instances one end of a link should be set up as a clock master. For some types of private network equipment at both ends is required to be clock masters. The use of different clocks for send and receive data may cause a

Polarity of data

Data encoded by the MicroMux SP-1 RA is inverted when it is within the G.703 data stream. This may be an issue when the MicroMux is used asymmetrically with an embedded G.703 device. It is usually possible to invert the data within the embedded system. However, if data inversion is an issue please note that there is a data inversion option implemented on the MicroMux, using switch five. Non-inversion is enabled by moving switch five to the "on/down" position.

SP-1 RA front and rear panel.

Switch functions:	"Up/off" position.	"On/down" position
Switch one:	Clock Slave	Clock Master

Switch four:	Normal Operation	Local and Remote Loop Back
Switch five:	G.703 Data Inverted	G.703 Data Not Inverted
Switch eight:	DTE Clock Not Inverted	DTE Clock Inverted

Extract from the G.703 Applique manual

This extract is reproduced herein as a requirement under the terms of the host independent approval regulations. Users of the SP-1 RA are advised that the approval is only valid when the SP-1 RA is used in the form in which it is delivered. The port defined as the "Input Port" is the internal interface between the G.703 Applique and the SP-1 RA host environment, and is within the SP-1 RA enclosure. The SP-1 RA host is an approved host within the terms of the General Approval.

Safety Warnings and Requirements

These warning notices apply to the **Input Port**, the port marked "SAFETY WARNING: see instructions for use".

Warning, the port marked "SAFETY WARNING: see instructions for use" does not provide isolation sufficient to satisfy the requirements of BS6301; apparatus connected directly to this port should either have been approved to BS6301 or have previously been evaluated against British Telecommunications plc (Post Office) Technical Guides 2 or 26 and given permission to attach. Any other usage will invalidate the approval of the Applique.

Interconnection of the Applique **Input Port** (the port marked "SAFETY WARNING: see instructions for use), directly, or by way of any other apparatus, with ports on other apparatus (marked or not so marked) may produce hazardous conditions on the network. Users should seek advice from a competent engineer before such a connection is made.

The Applique is approved as Independent of Host. As such the Applique is only approved for use with a

host, and with host attachments, that are either type approved in their own right, or, if supplied after 1st March 1989, are covered by the terms of the General Approval number NS/G/1234/J/100003. A Host supplied under the terms of the General Approval number NS/G/1234/J/100003 satisfies the conditions of the paragraphs above. The SP-1 RA host is an approved host within the terms of the General Approval.

The Applique must not be modified in any way. Any form of modification invalidates the approval for connection, and the warranty of the unit. The Applique approval label must be visible externally. The approval label must not be detached from the Applique, nor attached to the host.

The terms of the approval require that there must be a minimum distance (5mm) between the Applique and any other part of the host, including other Appliques. This condition is met by default when the Applique is installed in a MicroMux SP-1 RA enclosure.

If voltages greater than 250V are present in the host users should refer to a competent safety engineer for advice.

It is a condition of the approval that a copy of these user instructions and safety warnings must be supplied with the host. Failure to provide the Applique user instructions with the host will invalidate the Applique approval, hence their reproduction herein.

Failure to install the Applique in accordance with these instructions will invalidate the approval. If you experience difficulties, or are in any doubt, please contact your Black Box representative.

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