



**Cove
Communications**

User Guide

FOX - 232

Fibre Optic RS-232 Transceiver

Serial Number

Date Commissioned

Commissioned By

Cove Communications

Contacts.....

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1. INTRODUCTION

The Cove Communications **FOX 232** is part of the **FOX** range of Fibre Optic Extenders for use with communication systems that conform to the EIA/RS 232 specification. It comprises of a digital data interface and an optical fibre line driver/receiver for the communication of data from computer equipment, control systems and other digital equipment, over long distances.

A pair of **FOX** units together will provide full duplex channel enabling simultaneous communication in both directions.

The **FOX** has been designed to use optical fibres, which enable longer lengths of cable between the ends than ordinary electrical signalling normally allows. This therefore extends the maximum “operating distance” from one unit to another to 4km.

Optical fibre cables are safe and secure. The light signals in a fibre cannot be detected by electronic surveillance equipment and conversely they do not pick up noise in electrically noisy environments – they have immunity to RF/EMI. All units have been designed to meet the European EMC requirements.

2. APPLICATIONS

The **FOX 232** is used to provide data communications between items of digital equipment using RS232/V24 interface standard.

The small size and the light weight of the **FOX** enable it to be mounted physically onto the host equipment. The 'D Type' connector on the **FOX** can be mated directly with the 'D Type' connector on the host and the screw fixings should be used to hold the **FOX** in place.

Precious space can be saved in a rack cabinet by mounting the **FOX** directly onto an interface port, instead of having more cabling to other equipment which occupies more shelf space unnecessarily.

The panel area needed to accommodate the **FOX** is no larger than the 'D Type' connector itself, so a number of **FOX** units can be installed side-by-side close together.

The inherent immunity to electro-magnetic interference of optical fibres make the **FOX** particularly suitable for links through electrically noisy environments, such as machine rooms, the shop floor and so on.

The information transmitted from one **FOX** unit to another arrives clean and still secure, and the inability of detecting equipment to eavesdrop on optical signals makes **FOX** a safe medium for sending sensitive data.

Ground loop problems are entirely eliminated with optical fibre systems because there is no electrical connection between the two ends. With the **FOX**, links between buildings cease to be a problem.

The **FOX** is ideal for large and small computer systems alike. In pairs, they form a highly reliable and economical line driving/receiving unit, which is simple to install and requires no maintenance. They can also be *mains or host powered*.

3. FEATURES

- Standard 25-way 'D Type' connector for widest compatibility :
 - Plug or socket version as required
 - Any pin configuration as required, if different from our detail standard
- *N.B. These are selected at the time of sale, or afterwards by return to supplier.*
- Standard UNC 4-40 locking screws hold the **FOX** firmly into place.
- The optical interface is standard throughout the **FOX** range, so **FOX** units with different host interfaces can be used together to perform protocol conversion. eg. RS232 to RS422.
- The mains power connector accepts a miniature D.C. power plug. Conversion to host-powering is implemented by fitting an internal strap. The **FOX** does not take any power from the data outputs of the host, so there is no danger of violating interface specifications.

- Optical connection via ST or 9mm SMA receptacles.
- DCE or DTE operation internally selected.
- Small compact size.
- Strong all-metal housing provides protection from electro-magnetic interference (EMI.)
- Signal phase inversion (selected internally) allows the data output to the host or to the fibre optic cable to be inverted. This increases the range of other equipment with which the **FOX** is compatible, making it easier to use in existing computer networks.

4. STANDARD CONFIGURATION

The **FOX** has been designed to be as versatile as possible and therefore has a number of features which are selectable options. The standard configuration is shown below.

Where a different arrangement is required, the **FOX** will be configured for a customer's precise requirement, where possible, before despatch. Alternatively, Cove Communications can re-configure units quickly on return to us at our factory.

25-way 'D Connector'

DB-25 Pin	PCB Link	Signal Name	Function
1	P7	Frame Gnd.	Host power common via LK15
2	P2	Tx Data Input	Data input to FOX from host
3	P3	Rx Data Input	Data output from FOX to host
4	P4	RTS	Control input to FOX from host
5	P5	CTS	Control output from FOX to host
7	P6	Signal Gnd.	Connection to 0v of FOX
9	P30	HP+	Optimal host power in (9-12v DC, 150mA)

To change between DCE and DTE configuration, swap over the Jumper on LK 16A and LK16B to DTE pins.

Power Supply

Many RS232 systems have a positive voltage on pin 9 of the 'D Type', but this is by no means standard. The **FOX** is therefore configured to enable host powering except for the final internal strap to the 'D Type' connector pin. To fit strap, join PCB connection P30 to the pin of the 'D Type' as required.

Phase Inversion

The standard polarity of data is that a logical HIGH on the RS-232 input will result in LOW optical power in the fibre. A LOW optical power in the fibre will result in a logical HIGH on the RS-232 output. The overall effect is therefore that a standard link is transparent in polarity.

5. SPECIFICATION RS-232

Host Data Interface

Standard:	EIA/RS232/CCITT V24, V28
Format:	Serial binary asynchronous, simplex, half duplex or full duplex data.
Signals supported:	TD, RD
Data Rate:	DC to 120 kbps
Jitter:	Less than 4 us
Connector:	25-way 'D Type' plug or socket with locking screws.

Optical Fibre Interface

Optical Fibre:	50/125µm, 62.5/125µm, 100/140µm, 200/380µm
Light Source :	GaAlAs LED
Operating Wavelength :	850nm
Output Power :	>150µW (-8.2dBm) into 200/380µm PCS fibre >30µW (-15dBm) into 50/125µm fibre >60µW (-12dBm) into 62.5/125µm fibre
Light Detector :	Si PIN diode
Input Power :	100µW (-10dBm) maximum 1.0µW (-30dBm) minimum
Operating Distance :	Up to 1.5km (200/308µm PCS fibre) Up to 4.0km (50/125µm fibre)
Connectors :	ST or SMA receptacles
Identification :	'TX' (Transmitter – LED) 'RX' (Receiver – detector)
Construction :	Metal case.
Overall Size :	70mm x 44mm x 13mm
Overall Weight :	0.1kg (0.22lb) Typical
DC Power Requirements :	8.5v to 12v at 150mA
Operating Temperature :	-5°C to + 50°C
Storage Temperature :	-20°C to + 70°C
Humidity :	90% non-condensing

7.2 External Use

If the FOX 232 is to be used outside, it should be fitted into a climatic enclosure.

7.3 Fibre Optic Connection

The Fibre Optic Extenders are supplied with either ST or SMA fibre optic connectors according to the order. If no preference is stated the default connector will be the ST version.

7.4 Fibre Optic Cable

The **FOX** will work in multimode fibre optic cable. 50/125 and 62.5/125 fibre optic cable is recommended.

8. MAINTENANCE

The unit has been designed for continuous and fault free operation. Should the unit require servicing it must be returned to Cove Communications as there is no internal customer serviceable parts.

9. FAULT DIAGNOSIS

No Data Connection :	Power supply at fault. If host powered there may be insufficient power from host. Fault in fibre optic connection. DCE and DTE configuration incorrect. Data polarities incorrect (see Phase Inversion). Data rate outside of the operating specification. Optical fibres are not connected to the correct ports.
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