

FOX Fibre Optic Transceiver

Model B06-060

Installation Guide



Introduction

The Abbey Systems “Fox” Fibre-optic Transceiver is a rail-mount module that converts serial data from copper (RS-232) to fibre optic. With four duplex fibre optic ports, it is commonly used to interface an RTU module to IEDs (intelligent electrical devices) such as protection relays.

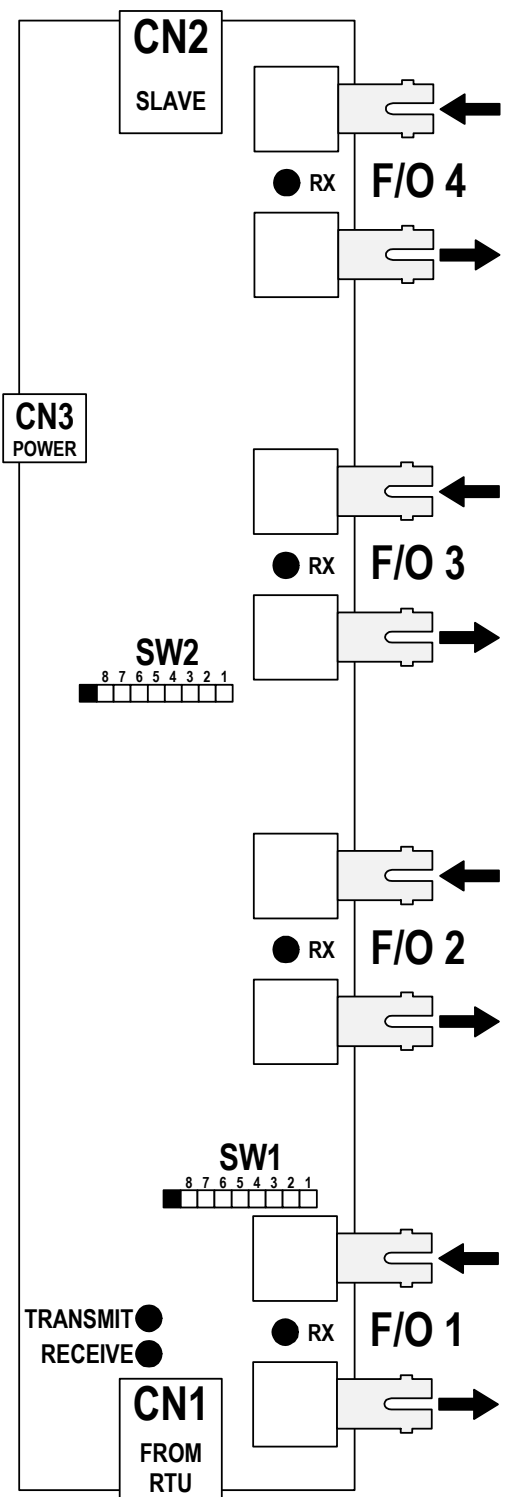


Fig.1 FOX with cover removed



Although the fibre optic transmitters used in the FOX are LED based and ‘eye safe’, users are cautioned not to look directly into any fibre optic port or cable. Infrared light is not visible

Mounting

This can be on either ‘top hat’ style DIN rail, or using the mounting holes on the ends of the unit.

There are M3 tapped inserts spaced at 40x240mm and 5mm holes spaced at 20x240mm available for mounting. The DIN mounts can be removed if using the mounting holes.

The FOX is 250mm long and cable clearances must be taken into account. Check your fibre manufacturer’s minimum bend radius specification.

Connections

Connection to the RTU is via a straight through RJ45 cable to CN1 no longer than 5m.

Fibre optic ports use ST termination (spring loaded bayonet) and support glass multi mode fibre with core/cladding diameters of 50/125µm, 62.5/125µm and 100/140 µm, using unmodulated infrared light (λ 820nm). If the fibre is only a few meters long, it’s per kilometer loss is unimportant. FOX’s transmitters typically launch – 12dBm (63uW) of optical power into 100/140µm fibre at 0dBm transmit power.

External power can be supplied via CN3. See the Powering section for details.

RTU		FOX
1	—Power—	1
6	→	6
7	←	7
8	—GND—	8

Fig.2 RS-232 Cable

Powering

FOX can be powered from either CN1 or CN3. Abbey products capable of self-powering the FOX are the Topcat & Topcat II families, with their serial ports able to supply 100mA & 200mA respectively.

For the Powercat and Serial I/O modules, the serial ports are unable to supply power to the FOX, so 10-36V DC must be supplied via CN3.

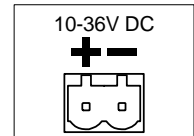


Fig.3 Ext Power

IMPORTANT: On older Powercat serial ports, there may be power present on pin 1. If this is the case, pin 1 on the cable must be disconnected to prevent damage to the Powercat serial port.

The maximum current drain with a 12V supply is a base 25mA plus the 'load per port' current shown in the table. For the default setting of -4dB, the maximum power requirement will be $25 + (4 \times 16) = 90\text{mA}$.

TX Power	Load Per Port
Off	0mA
-4dB	16mA
-2dB	26mA
0dB	40mA
+2dB	65mA

Fibre Transmit Power

Transmit power is selectable for each port via SW1 (port 1 & 2) and SW2 (port 3 & 4). There is a reference table printed on the PCB next to SW2, and with all four switches off, the port is disabled.

The default transmit power of -4dB normally yields an optical power budget of at least 4dB, typically 11dB and is appropriate unless the FOX will be driving long, lossy, poorly terminated fibre or a low sensitivity receiver. Note that using higher power settings will increase the current demand for the FOX as outlined in the powering section.

Indicators

The FOX has six LED indicators. The TRANSMIT and RECEIVE indicators near CN1 represent data to and from the RTU, while each RX indicator on the fibre ports represent data being received on that port.

Slave Units

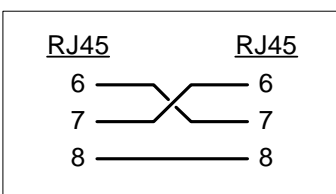


Fig.4 Crossover Cable

FOXes can be daisy chained through the slave port CN2 to the next FOX's RTU port. A special crossover cable must be built as shown and the FOXes must be powered externally.

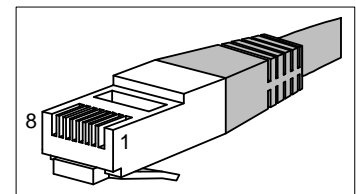


Fig.5 RJ45 Pins

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