KK SYSTEMS LTD

NEW

CE

KDF Fibre Modem

✔ RS232/422/485/20mA serial -> Fibre

✔ Glass and polymer fibre versions

✔ Remote loopback test

✔ 7V to 35V DC powered

✔ Three-way isolated – avoids ground loops

✔ Automatic Driver Enable on RS485

✔ Data flow indicator LEDs

✔ 30-115200 baud

The KDF™ is an RS232/422/485/20mA to fibre modem / fibre line driver.

Both polymer and multimode glass fibres are supported to cover both factory floor and long range communications.

A unique local/remote loopback test function enables the complete link to be tested.

High quality optical components are used and the power budget is 100% tested.

The KDF is an interface converter with one serial communications port and one fibre optic port. This type of product is also called a fibre modem or a fibre line driver.

Serial Interface Types

The serial port is available factory-fitted with RS232, RS422/485, or 20mA Loop interfaces.

The RS422/485 interface can be user configured for RS422 or for 2-wire or 4-wire RS485 operation, full-duplex or half-duplex. On RS485 it offers automatic driver enable (ADE) operation, enabling the KDF to directly drive multidrop 2-wire and 4-wire RS485 buses and to act as an RS485 bus extender or repeater.

Fibre Interface Types

The fibre port is available with either ST (glass fibre) or SFH (polymer fibre) connectors. This covers both long and short distance communication requirements, with a choice of fibre termination methods.
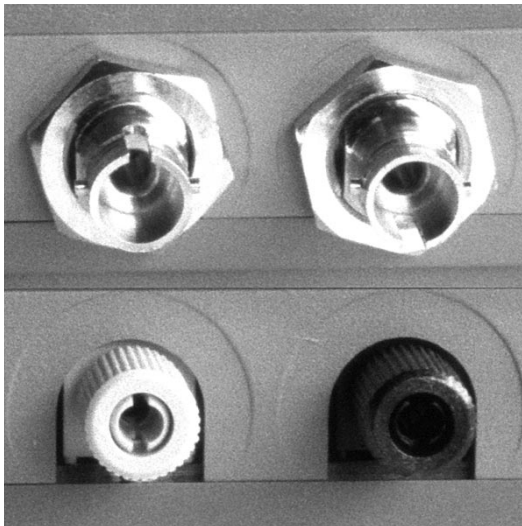
ST

SFH

ST is a high grade low loss connector commonly used in office and industrial networks. Various termination methods are available. The ST connector is normally used with glass fibre; with 50 micron (50/125) multimode glass fibre the KDF can operate to 4000m. ST can also be used with polymer fibre because it is well suited to frequent disconnection. The KDF uses high grade machined and pre-aligned ST components.

SFH is a low cost connector system for 1mm (2.2mm outside diameter) polymer fibre. This type of fibre can be cut with a knife and inserts directly into the SFH connector which is a part of the KDF housing, so no special termination tools are required. The maximum distance is 100m.

Longer distances are possible to special order for both ST and SFH versions.
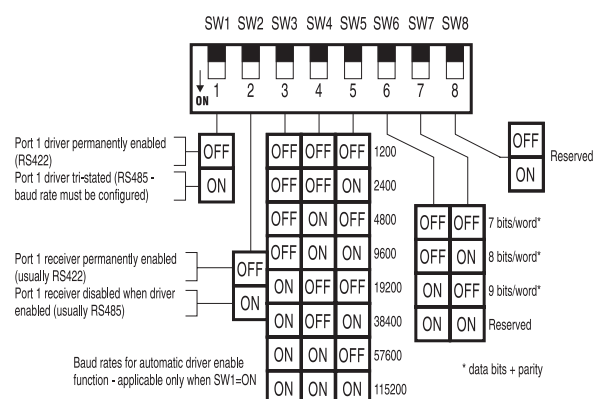
Loopback Test

The KDF offers a unique system test feature. Pressing the TEST button emits a special "test" signal which illuminates the TEST LED on every KDF which is successfully receiving it. The entire fibre link can be tested with access to one end only.

Other Features

● Power budget is 100% factory tested

● Emitter average power level is much lower than in competing products, for longest product life

● DIN-rail enclosure with removable screw terminals; fits 35mm symmetric rails

● DC power input in the range +7V to +35V; uses a high efficiency switching power supply

● Full 3-way isolation; The serial port is isolated from the power supply input, enabling a single power supply to power multiple KDFs without ground loop problems

● Internal pull-up/pull-down resistors on RS422/485 ports ensure that RS485 bus floats to a valid state when not driven

Configuration

The KDF requires no configuration, other than in RS422/485 applications where various half-duplex or full-duplex options and ADE baud rates can be selected using a DIP switch:

SW1:
	SW1
Port 1 driver permanently enabled (RS422)	OFF
Port 1 driver tri-stated (RS485 - baud rate must be configured)	ON

SW2:
	SW2
Port 1 receiver permanently enabled (usually RS422)	OFF
Port 1 receiver disabled when driver enabled (usually RS485)	ON

Baud rates for automatic driver enable function - applicable only when SW1=ON:
SW3	SW4	SW5	
OFF	OFF	OFF	1200
OFF	OFF	ON	2400
OFF	ON	OFF	4800
OFF	ON	ON	9600
ON	OFF	OFF	19200
ON	OFF	ON	38400
ON	ON	OFF	57600
ON	ON	ON	115200

SW6	SW7	
OFF	OFF	7 bits/word*
OFF	ON	8 bits/word*
ON	OFF	9 bits/word*
ON	ON	Reserved

* data bits + parity

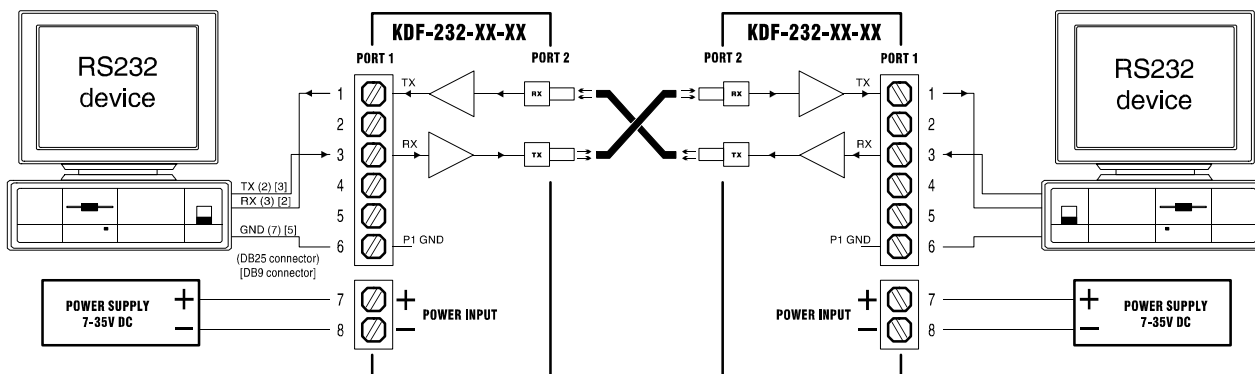| SW8	
OFF	Reserved
ON	

Synchronous operation

The KDF is data transparent and works equally well with synchronous data, with the provisos that the transitions must not be closer than 10 microseconds, the RS485 ADE function assumes async data, and that most sync applications require a separate clock to be transmitted which would require a second KDF to be used.
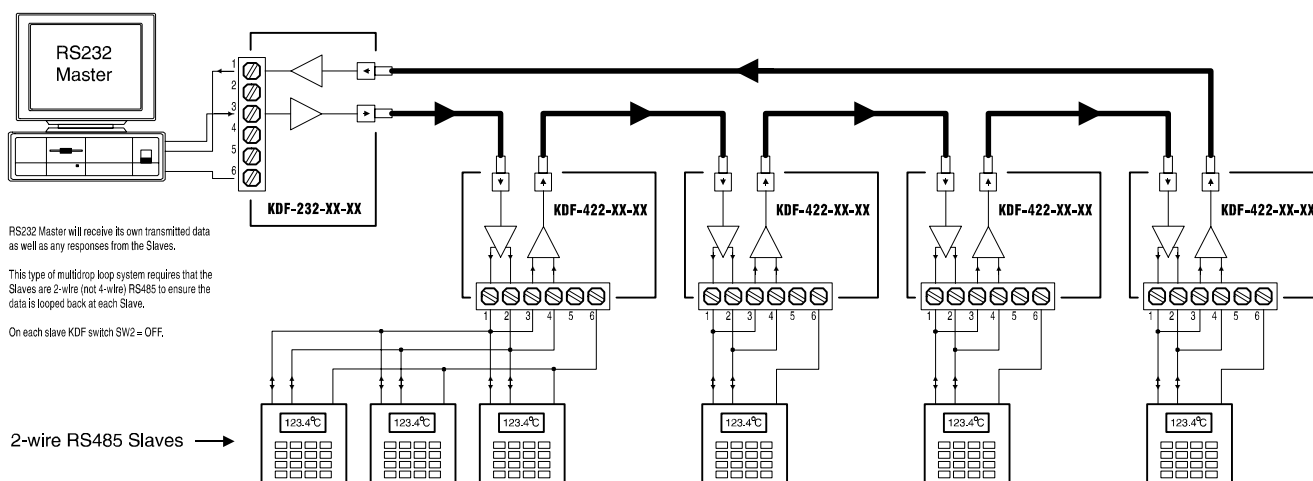
Application Examples

RS232-RS232 full-duplex point to point link
This diagram also covers RS232 RS422 RS485 and 20mA KDF interfaces

Multidrop Fibre Loop with 2-wire RS485 Slaves

RS232 Master will receive its own transmitted data as well as any responses from the Slaves.

This type of multidrop loop system requires that the Slaves are 2-wire (not 4-wire) RS485 to ensure the data is looped back at each Slave.

On each slave KDF switch SW2 = OFF.

2-wire RS485 Slaves →

Ordering Information

The Port 1 (serial) and Port 2 (fibre) interfaces are specified as follows:

KDF-XX-YY-ZZ

where

XX   Port 1 type: **232** or **422** or **20MA**

YY   Port 2 fibre connector: **ST** or **SFH**

ZZ   Fibre type: **50** or **1000**

Examples:

KDF-232-ST-50   RS232 to ST connector and 50 micron glass fibre.

KDF-232-SFH-1000 RS232 to SFH connector and 1000 micron (1mm) polymer fibre.

The above two are the most popular versions of the KDF.

KDF-422-SFH-1000   RS422/485 to SFH connector and 1000 micron (1mm) polymer fibre.

KDF-20MA-SFH-1000   20mA Loop to SFH connector and 1000 micron (1mm) polymer fibre.

The SFH connector accepts standard polymer fibre with a 2.2mm outside diameter.

No fibre, ST connectors, termination tools or user training are included with the KDF.

Fibre is available separately, in both bulk reels and (with ST) terminated to a specified length.

The customer must verify suitability before ordering.

Interfaces:	One serial port RS232/422/485/20mA, one fibre port. TX & RX signals only.
Data formats:	Data transparent, all character formats and protocols supported. RS485 automatic driver enable (ADE) function: Asynchronous data only, 1200-115200 baud, 7/8 bits/word, with and without parity. 20mA Loop ports: 1200-19200 baud.
RS232 interface:	Receiver threshold +1.5V typ. Hysteresis 500mV typ. Receiver input impedance 5kΩ typ. Transmitter output swing ±8V typ. into 3kΩ load.
RS422/485i/face:	Receiver threshold 200mV typ (differential). Hysteresis 50mV typ. Receiver input impedance 12kΩ min. Transmitter output swing 5V (no DC load); 1.5V (60Ω load).
20mA loop i/face:	Input: LED, nominal drop 2V Output: open coll. transistor, Vce(sat)<2V 20mA current source: accuracy ±20%; no-load output voltage is approximately equal to KDF supply voltage.
Fibre length:	ST interface (50/125 glass fibre): >16db power budget (approx 4000m). SFH interface (1000 micron polymer fibre): >100m. Longer distances optionally available.
Bit error rate:	Not measurable at < 120kbaud.
Bit timing jitter:	±2 microseconds.
Peak emitter power:	ST interface: 35 microwatts typ. infra-red 850nm. SFH interface: 200 microwatts typ. visible 660nm.
Power supply:	+7V to +35V DC. +7V to +26V DC if Port 1 is 20mA Loop. Input power is approximately constant at 1-2 watts (startup current 300-600mA) depending on model. At startup, the supply voltage must reach 7V within 1 sec otherwise the power supply will not function.
Isolation voltages:	Between Port 1 and power input: 64V PK, 100% tested at >1000V AC RMS, 1 second. Between input, output and current source of 20mA Loop port: 100V AC, functionally (low voltage) tested.
Environmental:	Operating temperature 0 to +50C. Storage temperature -25C to +70C. Relative humidity (operating and storage) 0 to 90%, non-condensing.
Ventilation:	Rail-mounted KDF must have a 50mm gap above and below.
EMC compliance:	Emissions EN50081-2 (94), immunity EN50082-2 (95). Shielded cables must be used for Port 1 connections.
Dimensions:	29mm (W) x 114mm (H) x 97mm (L) approx. in rail-mounted position, including screw terminals.

Other KK Products
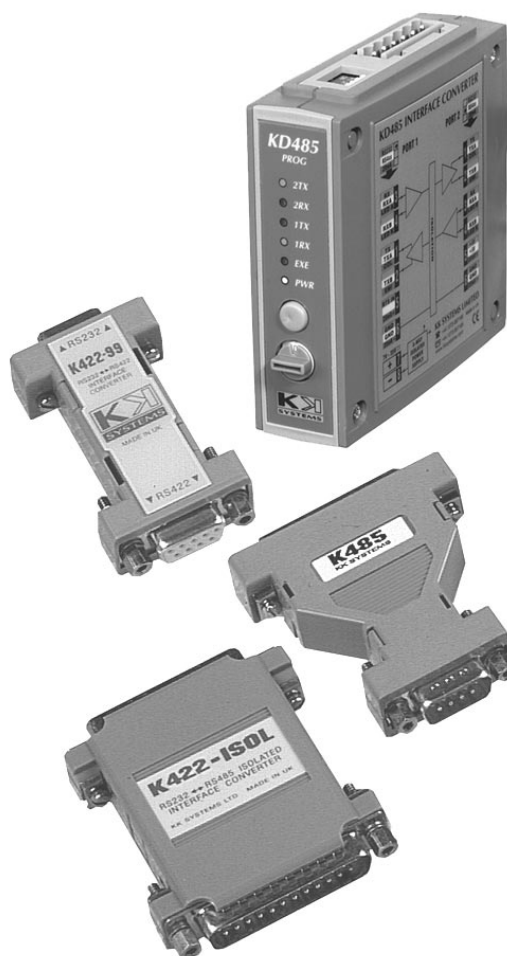
A range of high quality low cost RS232-RS422/485-20mA interface and protocol converters is also available in both inline and DIN rail packages. Please contact us or see our website for full details.

ST is a registered trademark of AT & T.

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