KK SYSTEMS

Industrial Quality Interface & Protocol Converters

KKSYSTEMS.COM

Welcome to KK Systems

KK Systems Ltd manufactures and markets a range of industrial quality RS232, RS422, RS485, Ethernet, fibre and USB interface converters and other data communications products.

Several C programmable platforms are available for building custom converters for a wide variety of applications including protocol conversion, data acquisition and telemetry. The new KDE485 with Ethernet offers TCP/IP and TLS together with 16-bit and 22-bit analog data acquisition.

All products are manufactured to the highest quality standards and are fully supported by ourselves. The Company has been established since 1991.

We export and support our products worldwide, with distributors in the USA and some European countries; other areas we cover directly by Airmail, DHL/UPS/Fedex, or according to customer preference. Our products are CE marked to indicate compliance with the latest EMC emissions and immunity regulations.

We also offer custom product development and manufacture. Since most such products are based on our existing designs, we can offer a fast problem-free development cycle at a competitive price.

INLINE CONVERTERS

The KK Systems range of inline products comprises of:

- The K2 range - non isolated, DB9 to DB9/terminal block
- The K3 range - isolated, DB9 to DB9/terminal block
- The K422-ISOL and K232-ISOL - isolated, DB25 to DB25

These are professional grade interface converters which have been on the worldwide market since 1992, with tens of thousands sold. Do not confuse with cheap Chinese imitations!

K2 RS232 to RS422/485 Interface Converter

The K2 is a non-isolated RS232 to RS422 or RS485 converter for 0-115200 baud, data transparent. It is primarily for RS232 to RS422 conversion. It can also act as a Master in a 4-wire RS485 system. For 2-wire RS485, RTS Control is required from the RS232 device. It has a DB9 female connector at both ends and plugs directly into a standard PC DB9 RS232 port.

K2-TB RS232 to RS422/485 Interface Converter

The K2-TB is identical to the K2 but has a removable terminal block on the RS422/485 port.

K2-ADE RS232 to 2-wire RS485 Interface Converter

The K2-ADE is a non-isolated RS232 to RS485 converter for 1200-38400 baud, with a 115200 baud option. It is intended for RS232 to 2-wire RS485 conversion. It is microprocessor controlled for precise RS485 driver control and does not need RTS Control; cheaper devices use methods which reduce noise immunity. It uses a DB9 connector at both ends and plugs directly into a standard PC DB9 RS232 port.

K2-ADE-TB RS232 to 2-wire RS485 Interface Converter

The K2-ADE-TB is identical to the K2-ADE but has a removable terminal block on the RS485 port.

K3 RS232 to RS422/485 Isolated Interface Converter

The K3 is an isolated (1500V AC test voltage) RS232 to RS422 or RS485 converter for 0-38400 baud, data transparent comms. It is primarily for RS232 to RS422 conversion. It can also act as a Master in a 4-wire RS485 system. For 2-wire RS485, RTS Control is required from the RS232 device. It has a DB9 female connector at both ends and plugs directly into a standard PC DB9 RS232 port. For applications where insufficient RS232 power is available, an external 2.5mm standard coax power connector is provided for a 9-12V DC power unit.

K3-TB RS232 to RS422/485 Isolated Interface Converter

The K3-TB is identical to the K3 but has a removable terminal block on the RS422/485 port.

K3-ADE RS232 to 2-wire RS485 Isolated Interface Converter

The K3-ADE is an isolated (1500V AC test voltage) RS232 to RS485 converter for 1200-38400 baud. It is intended for RS232 to 2-wire RS485 conversion.
It is microprocessor controlled for precise RS485 driver control and does not need RTS Control; cheaper devices use methods which reduce noise immunity. It uses a DB9 connector at both ends and plugs directly into a standard PC DB9 RS232 port. For applications where insufficient RS232 power is available, an external 2.5mm standard power connector is provided for a 9-12V DC power unit.

K3-ADE-TB RS232 to 2-wire RS485 Isolated Interface Converter

The K3-ADE-TB is identical to the K3-ADE but has a removable terminal block on the RS485 port.

K3-232 RS232 Isolator

The K3-232 is an RS232 to RS232 isolator with a 1500V AC test voltage. It supports full duplex data without hardware handshakes. It is data transparent and is intended for full-duplex point to point communication at 0-38400 baud. It has a DB9 female connector at both ends and plugs directly into a standard PC DB9 RS232 port. For applications where insufficient RS232 power is available, an external 2.5mm standard power connector is provided for a 9-12V DC power unit.

K3-232-TB RS232 Isolator

The K3-232-TB is identical to the K3-232 but has a removable terminal block on the remote RS232 port.

K232-ISOL RS232 Isolator

The K232-ISOL is similar to the K3-232 but comes in a DB25-DB25 package. It is designed to plug into a standard DB25 PC (DTE) RS232 port. This product has a very low power consumption (approx 3mA), a conformally coated PCB and has been in the industrial marketplace since 1993.

K422-ISOL RS232-RS422 Interface Converter

The K422-ISOL is similar to the K3 but comes in a DB25-DB25 package and is intended for RS422 only. It is designed to plug into a standard DB25 PC (DTE) RS232 port. This product has a very low power consumption (approx 3mA), a conformally coated PCB and has been in the industrial marketplace since 1993.

DIN RAIL FIBRE MODEMS

KDF-232-ST-50 and KDF-422-ST-50 Fibre Modems

The KDF-232-ST-50 is a fibre modem/line driver, for transmitting full duplex RS232 data over up to 4km of multimode 50/125 or 62.5/125 glass fibre, from 1200 to 115200 baud, data transparent. It features a unique loopback test which enables the whole link to be tested from one end, simply by pressing a button on the front panel.

The KDF-422-ST-50 is identical to the KDF-232-ST-50 but is intended for RS422 and 2-wire or 4-wire RS485. It features automatic driver enable (ADE) and can run 2-wire RS485 over fibre.

DIN RAIL CONVERTERS

The KK Systems range of inline products comprises of:

- The **KD485-STD** range - interface converters only, no processor or data buffering
- The **KD485-ADE** range - interface converters with a processor, data buffering and predefined functions
- The **KD485-PROG** range - as KD485-ADE but can run application-specific data/protocol converter programs (written in C)
- The **KDE485 range** - as KD485-PROG but with many enhancements: Ethernet, USB, analog inputs

The isolation of the KD485/KDE485 is tested at 1500V AC. This is enables e.g. a single power supply to power any number of units without compromising isolation or creating ground loops. Many thousands of units have been sold since 1994 and are found in a huge range of industrial systems.

KD485-STD Interface Converter

The KD485-STD is an interface converter/isolator only and is baud rate and character format independent. Its main application is in isolated conversion between RS232 and RS422. It can also act as a Master in a 4-wire RS485 system. It can drive a 2-wire RS485 bus if the RS232 host provides RTS Control.
Requires a power supply in the range of 7-35 volts DC.

KD485-STD Port 1: RS232   Port 2: RS422 or RS485.

Other interfaces available:
KD485-STD-232-232: RS232 isolator
KD485-STD-422-422: RS422 isolator
KD485-STD-232-20MA: RS232 to 20mA TTY loop converter
KD485-STD-422-20MA: RS422 to 20mA TTY loop converter

KD485-ADE RS232 to RS422/485 Intelligent Interface Converter

The KD485-ADE is similar to the KD485-STD but inserts a microprocessor (with two serial ports) into the data path which provides data buffering, automatic RS485 driver enable, facilitates baud rate etc conversion and cleans up the data by removing bit width jitter. The KD485-ADE is a highly versatile converter which is intended for RS232 to RS485 (2-wire and 4-wire) conversion but works equally well for RS232 to RS422, half duplex and full duplex.
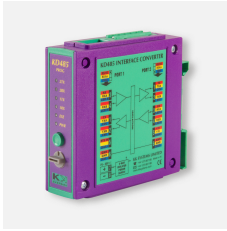
KD485-ADE Port 1: RS232   Port 2: RS422 or RS485.

Other interfaces available:
KD485-ADE-232-232: RS232 isolator with data buffering and baud rate conversion
KD485-ADE-4XX-4XX: RS422/485 isolator - can also act as an RS485 repeater
KD485-ADE-232-20MA: RS232 to 20mA TTY loop converter
KD485-ADE-4XX-20MA: RS422/485 to 20mA TTY loop converter

KD485-PROG Programmable Interface/Protocol Converter

This converter is similar to the KD485-ADE with the addition of a 32kbyte EEPROM for application specific data conversion programs. It is typically used for protocol conversion applications. Source code size up to 10,000 lines of C is enough for almost anything required in serial comms. A Modbus RTU Slave library is available to speed up the development of custom Modbus RTU converters. A 16-position software-readable switch is provided. The KD485-PROG has been on the market since 1995.

KD485-PROG Port 1: RS232   Port 2: RS422 or RS485.

Other interfaces available:
KD485-PROG-232-232: RS232 isolator with protocol conversion capability
KD485-PROG-4XX-4XX: RS422/485 to RS422/485
KD485-PROG-232-20MA: RS232 to 20mA TTY loop converter
KD485-PROG-4XX-20MA: RS422/485 to 20mA TTY loop converter

KDE485 Programmable Interface/Protocol Converter

The KDE485 is a C user programmable protocol converter with many features aimed at modern factory automation and other professional, industrial, data acquisition and telemetry applications.

Custom C software development is supported via a powerful free and license-free STM Cube IDE (Eclipse-based, GCC C compiler - see photo below) development environment which is preconfigured to minimise the learning curve.

KDE485 features include:

- **Four serial ports** (2xRS232, 1x2wRS485, 1x4wRS485/RS422 - optionally 4xRS232) plus 5th port via USB VCP
- **Ethernet** (10/100, auto-MDIX) with TCP/IP (LWIP), DHCP, NTP, TLS, HTTPS client, Dropbox upload client, remote config and firmware update options, etc
- **USB** (2MB FAT12 FLASH drive and a serial VCP)
- Power input 11-35V DC, isolated from all interfaces (12 or 24V recommended; 24V required for -20V output for 4-20mA sensors)
- **Analog current sink 0-20mA** for 4-20mA sensor emulation / relay drive mode
- Automatic Driver Enable on RS485 ports
- Five addressable LEDs, a push button switch, a 16-position hex switch
- 1200-1843200 baud on serial ports
- **Optional isolated 16-bit analog sensor interface:** PT100, PT1000, thermocouple (all 8 types), AD590, 4-20mA, 2 voltage inputs
- **Optional ARINC429** interface for building powerful ARINC429 products; example avionics source code is included
- **Optional 8MB SPI RAM**
- **Optional internal GPS** - uses external GPS antenna for GPS to NTP function, or general positioning data (SMA connector). NEO-M9N multi-constellation.
- **Optional internal 22 bit ADC** (SMA connector)
- High quality removable screw terminals
- Internal expansion options for custom variants: 2x 12-bit ADC, 2x 12-bit DAC, any SPI device, CAN
- UK designed, manufactured and supported
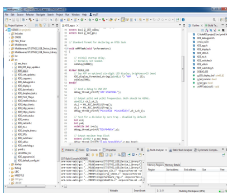
KDE485 GPS-NTP version is preconfigured to act as an NTP server for LANs which need time data but cannot use an internet connection for security reasons.

Note: photo shows the SMA connector used by the GPS or 22 bit ADC option.

KDE485 GPS-NTP

https://kksystems.com/kde485

USB CONVERTERS

USB to serial (RS232, RS422, RS485) interface converters

USB-232

The USB-232 is an isolated (1500V AC test) USB to RS232 converter.

This industrial grade product supports up to 115200 baud and is ideal for computers which do not have a serial port, or where an extra serial port is required. The USB-232 is unique in the market in that it has a world-unique device ID which ensures that it appears under the same COM port number regardless of which USB port on a particular PC it is plugged into. This simplifies application software configuration and eliminates many tech support issues.

Drivers from Windows 98 to Windows 10+, 32 bit and 64 bit, are supplied and normally auto install on Windows 7 or higher.

USB-485

The USB-485 is an isolated (1500V AC test) USB to RS422/485 converter.

This industrial grade product supports up to 115200 baud and is ideal for computers which do not have a serial port, or where an extra serial port is required. The USB-485 is unique in the market in that it has a world-unique device ID which ensures that it appears under the same COM port number regardless of which USB port on a particular PC it is plugged into. This simplifies application software configuration and eliminates many tech support issues. The serial port supports RS422 and 2-wire and 4-wire RS485 with automatic RS485 driver enable.

Drivers from Windows 98 to Windows 10+, 32 bit and 64 bit, are supplied and normally auto install on Windows 7 or higher.

USB-485 AND XLR BUNDLE

This combination of a USB-485 converter and an XLR cable is ideal for use with many professional audio controllers. The converter will plug directly into the USB socket of a laptop or PC while the 3-pin XLR plug connects to the remote interface port of the controller allowing remote control using appropriate software.
XTA recommends this combination for use with their iCore software and DP series audio management controllers.

USB-485 TO EMERSON BUNDLE

This combination of the USB-485 converter and the CAB-030 cable is intended for directly connecting into the RJ45 port of Control Techniques / Emerson / Nidec SK, SP, Quantum, Mentor and EP motor drives. It has been tested at up to 38400 baud with the Commander SK and the CTSoft drive control software.

PROGRAMMABLE CONVERTERS

We offer three types of converters which can manipulate the data stream, using a user-developed program.

The **KDE485** is a C programmable converter with four serial ports, Ethernet and USB connectivity and analog I/O features. The development kit is free and license-free. Example source code is provided for many applications including data acquisition, telemetry, etc.

The **KD485-PROG** has two serial ports which are factory configured with any combination of RS232, RS422/485, or 20mA loop (TTY). It is programmed in C, with a compiler purchased separately. Many thousands have been sold into a huge range of industrial applications since 1995.

The **PPC** Programmable Protocol Converter has four serial ports which are RS232 but can be field-repopulated (by changing chips) to RS422/485. It is programmed in Pascal (built-in) or C (a compiler purchased separately). The PPC has been available since 1992 and thousands have been sold, including fully customised versions for applications such as CNC machine control.

KK Systems also offer a programming service for custom protocol converters, where we develop the software to a customer specification. We have developed many types, with a particular focus on Modbus.


PPC-4-H2-C

Programmable Protocol Converter, 4-port boxed model. Includes KTERM PC terminal emulator and other software on CD, user manual, PPC-PC cable and a mains power unit (UK or 2-pin Euro style according to destination). Four RS232 ports (see below for build options including RS485 and RS422 ports). H2 option is standard.

The PPC is a ready to use protocol converter which has a built-in Pascal compiler with special extensions for comms programming. It can also be programmed in ANSI C and a special comms library is provided
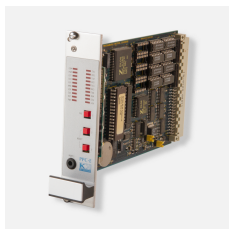
PPC-E

As PPC-4 but on a 3U single Eurocard with 3Ux6HP aluminium front panel, 100x160mm PCB size. A DIN41612 connector carries four RS232 / RS422 / RS485 ports. 9-12V DC input. Includes -4, -R, -H2, -C, -96 options.

This version is ideal for applications with a large number of channels. The backplane can be a PCB or hard wired DIN41612 connectors. Hundreds are in use in telecomms and industrial applications.
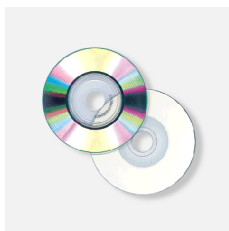
PPC C Compiler

PC-based ANSI C cross-compiler for the PPC with the -C option, Z180 CPU. Single user licence, no runtime royalties.

KD485 C Compiler

PC-based ANSI C cross-compiler for the KD485-PROG, H8/300 CPU. Single user license, no runtime royalties.

KD485 MODBUS Library

MODBUS RTU SLAVE library for KD485-PROG. Greatly speeds up the development of Modbus-to-custom protocol converters. No runtime royalty.

OTHER PRODUCTS

KD420

The KD420 is a high speed Modbus sensor interface which allows any 4-20mA or voltage output (-30V to +30V) sensor to appear as a Modbus RTU Slave on a 2-wire RS485 multidrop bus. An external relay contact can also be sensed. The sensor value is presented in a set of Modbus registers, concurrently in several formats including integer and floating point. High speed data acquisition is supported with up to 220 readings per second.

The KD420 is powered from 11 to 35V DC, or 24V DC if its 20V sensor power output is required. The Modbus comms interface, the analog sensor interface, and the power input are all mutually isolated and 100% isolation-tested at 1500V AC.

The KD420 provides a simple and inexpensive means of interfacing a variety of sensors (for example PT100 temperature, flow or pressure sensors) to an existing SCADA or telemetry system.

The KDE485 (ISOLATED ANALOG option) can also be programmed to perform the KD420 functionality, with many additional features.

CUSTOM DESIGN AND MANUFACTURE

High Volume Customised Products

We offer a custom development service for all types of interface or protocol converters, incorporating RS232, RS422, RS485, USB, Ethernet (TCP/IP) or fibre interfaces. Illustrated are examples of some custom designs of some inline moulded converters which are based on the USB-485 or the K2-ADE. The ticketing machine on every bus in Berlin uses a KK custom interface converter.
The new KDE485 is a great platform for building more powerful custom products, with LAN / Internet access, analog data acquisition, and peripherals such as keypads and LCD displays.

Some of our custom isolated converters use specialised design techniques to achieve high data rates together with high isolation and low power consumption.

This is a custom RS232 to 2-wire RS485 converter which uses 10kV-rated optoisolators and runs up to 38400 baud.

We have also developed several custom versions of our USB-485 converter.

This is one example of a custom USB to 2-wire RS485 which has high voltage isolation suitable for reinforced isolation requirements for 3 phase 415V AC supplies.

Custom Protocol Converters

These are based on the KDE485, the KD485-PROG or the PPC. We have considerable expertise in the development of protocol converters involving various protocols including both MODBUS RTU Master and MODBUS RTU Slave. The software is developed to an agreed specification and can be tested using customer's loan equipment. The customer normally receives the sources and is able to maintain the program in-house.
The new KDE485 offers much more capability, with 4 serial ports, Ethernet, USB, and analog inputs.

KK Product Applications

Our interface and protocol converters are used throughout industry, in diverse applications including oil rig automation, CNC machine control, power station generator monitoring, fire alarm protocol conversion, pager interfacing to alarm systems, interactive displays, ticketing and parking equipment, ship navigation systems, ROVs, rolling mills, AC motor drives, horticulture, UPS interfacing, wind turbines...

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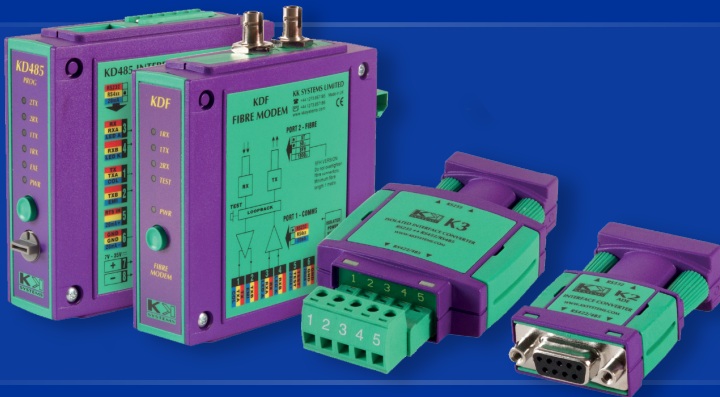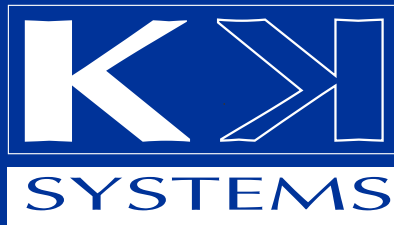
KK SYSTEMS

KKSYSTEMS.COM

sales@kksystems.com

Tel: +44 1273 857185

KK SYSTEMS LTD
Tates
London Road
Pyecombe
Brighton
West Sussex
BN45 7ED
United Kingdom