

Communications Solutions Tutorial

In recent years there has been a virtual explosion of new technologies and methods which greatly simplify the exchange of information between systems. This virtual explosion in new technologies complement many of the traditional direct wiring approaches of interconnecting instruments around a plant, complex, city, or region.

KEP seeks to assist our customers in "getting connected" by using the serial communication ports provided on many of our models such that they may be used for communications with computers, for modems, for printing, for data-logging, and in wire-line and wireless communications.

KEP offers a variety of compatible hardware and software system building blocks which many users find helpful in interconnecting their instruments to their computer over their preferred communication channel.

How can I get a printed report? Many instruments may be supplied with a standard or optional RS-232 serial port which may be connected to a printer with a RS-232 serial interface. Printers are purchased separately as an accessory.

What information can I get on my printed report? The printing capabilities of instruments vary widely. Instruments with more advanced printing capabilities permit the user to decide on the form length, include a custom print header, time and date, sequential print number, and all the desired information. Some models include a more limited print list. Basic models support only the printing of a single number.

How can I initiate the report to print? Depending on the model being used there may be one or more ways to initiate a print. These include: Remote Print Switch, Local Print Key, End of Batch, Interval, and Time of Day.

How can I get information into my PC? There are several issues involved with getting information into a PC from an instrument. The first is the decision for the communication channel to be used. The second is the data gathering software (server). The final is the selection of the software that will display or store the information for the operator (client software).

What is a Server or DDE Server? A server is a communication utility program that you purchase which enables you to easily communicate with an instrument or PLC. Most programs offer a wizard which guides you through naming and selecting the communication channel with its com port and setting, the instruments which will be on that cable and the various measurements, or tags, being made by each instrument. Other programs will reference instrument name and tag.

How can I get information into my spread sheet? One of the simplest ways involves using a "DDE or OPC Server" which has been configured to constantly gather information from your instrument to make it available for other programs to access. (See using a dde server.) The information is accessed in the desired cell of your spread sheet by entering the following: "=KEPDDE|UNIT_NAME!DATA_ITEM_NAME". One of the nice aspects of this approach is there is no need to write a program in many applications. A DDE server and the above command is all you need.

I want to write my own program. How do I go about it? You will need to consider using an off the shelf server or writing your own custom program in the language of your choice. Each instrument with serial communications has a special user manual which describes the format of a request for information and a list of the information. These will act as an aid while you are writing and debugging your program.

What is an HMI Software? HMI software is a software toolbox that enables a user to create custom screens for displaying information and controlling his plant. Capabilities include: controls and displays on touch screen, graphics symbols or object libraries, real time trending, data logging, and alarming. The software toolbox also includes a powerful programming or scripting language.

What do I need to get information into my Human Machine Interface Software? DDE and OPC Servers are routinely used. Alternately, custom scripting may be used in some cases.

What are the some of the common communications possibilities on the market? The choice of communications solutions available on the market is quite large. These include direct connect, wireless, fiber optic, and those which utilize the phone system. There are many others. Each technique offers advantages based on the needs of the system.

What is a hardware interface? The sender and receiver of information must match. This includes at the electrical signal level and at the low level communication settings. Industry standards exist for defining the hardware interface for signaling of information. These include RS-232, RS-422 and RS-485. There are a range of related communication settings which include baud rate, parity, start and stop bits which further clarify the interface.

What is RS-232 and how far can I send it? RS-232 is an industry standard for electrical signal levels. It is commonly used with many serial devices where the information will be send over distances not to exceed 50-200'. RS-232 ports are provided on all personal computers with a connector style known as mini-D or D-Sub.

What is RS-485 and how far can I send these signals? RS-485 is an industry standard for electrical signal levels. It is commonly used with many serial devices where the information will be send over distances not to exceed 4000'. Information is carried of 3 wires including a ground reference. RS-485 to RS-232 adapters are required to provide connections to the RS-232 ports on all personal computers.

What is a protocol? A protocol is an agreed upon method for exchanging information. It is used to decide on the method of formatting information that will be carried along a communication cable. An example would be the MODBUS-RTU protocol used on many instruments. However, there are a vast number on the market place.

What is remote metering? This may be described as any approach that is used to access information from a remote instrument to a centralized PC by connecting to and then polling an instrument for information. Telephone (modem) and wireless systems are commonly used.

What is Wireless Communications? Wireless if a term that includes a variety of technologies which do not require the sender and receiver of the system be directly connected by a wire cable. Instead a wireless transceiver is used. In common usage it may be divided into subclassifications. Common ones include wireless telephone, wireless one and two way personal messaging or paging, and radio telemetry.

What is the cost of a wireless solution? The costs of initial equipment, and installation cost vary. There is usually a monthly service charge associated with each transceiver that is based on the amount of air time, or amount of information to be transferred. There are often reduced charges for off peak hour usage.