

UMD ProtoLink Network

This application note outlines how a UMD ProtoLink Network provides a cost effective job costing system for a manufacturing company. This is a typical application for a UMD ProtoLink Network.

UMD ProtoLink Networks (UPN) are used for multi point data entry applications. They are designed to be simple to understand, install and operate.

A UMD ProtoLink Network system comprises:

- * a personal computer with a standard serial port running the *UMD S161 Host Data Collector Software* or a custom application that uses the *UMD S160 ProtoLink Network API* library routines to run the network
- * upto 127 *UMD ProtoLink Products* networked together, which currently includes the following:
 - UMD Model 264 Custom Keyboard, UMD Model 490 Custom VGA Terminal, UMD Model 330 Wall Mount Custom Terminal* and the *UMD Model 363 Multi Keyboard Wedge*
 - * *UMD Model 153 RS232 to RS485 Interface Converters* for each node on the network
 - * twisted pair (4 core) communications cable.

Sample Application - Job Costing

In this example we wish to determine the amount of labour required to completely manufacture certain products. These items have many processes associated with them, for example, picking and preparing parts, assembling and testing. Many different items are manufactured in the plant. Different processes are carried out at the same location and there are many processing points in the factory. Multi-skilled people perform different processes.

Costing such jobs manually can be an extremely time consuming and difficult occupation. One of the major problems with job costing is data collection and collation.

Job costing solution...bar coding!

As there are many different products to be manufactured, numerous personnel and considerable documentation, there is a large volume of data to be entered into a job costing system. To ensure that the data entry process is accurate and efficient, bar coding will be used throughout the enterprise to identify factory orders, personnel and processes.

The objective of this job costing system is to determine how much labour is used to complete a particular job. The best way to handle this in our specific situation is to print a "job ticket" which follows the items through the manufacturing line. This ticket contains job and process numbers that identify what processes are to be performed. These data elements are printed as bar codes to enable ready data input. Each worker is provided with a bar coded id badge.

Hardware

As there are many fixed points where data is to be collected, a number of data collection stations are required to be organised into a network. These stations must be able to read bar codes. Some stations will use simple wands, others hand held CCD or laser scanners. Manual keypad input is also required at the stations to enter quantities and other information.

An ideal data collection station is the *UMD Model 330 Wall Mount Custom Terminal*. It has a two line by sixteen character liquid crystal display for displaying prompts and user input plus a small keypad, bar code wand and scanner input ports. Being a wall mount unit means that it can be placed out of the way so as to not take up valuable bench space.

A dedicated inexpensive personal computer with a standard serial port is required to operate the network. As the computing power needed is modest, a superseded '286 computer will be used.

Software

The *UMD S161 Host Data Collector Software* will be used on the personal computer to operate the network and collect data because :

- a) the data entry requirements are modest, ie there is no need for large data entry screens with multiple choice answers or decision trees.
- b) the collection of data does not need to be manipulated in "real-time".

A custom application could have been written using the *UMD S160 ProtoLink Network API* library routines to run the network if desired.

The UMD S161 software is readily configured to prompt the station operators for the desired information, eg "Enter Job #", "Enter Employee #", "Enter Process ID" and "Start/stop". The UMD S161 software also allows the station keypads to be configured at the master computer. In this example, the 20 key keypad would be assigned numerics, back space, enter, "start"/"stop" function and cancel transaction keys.

The data collected by the UMD S161 software is time stamped and saved to a tab delimited ASCII data file, ready for import into a database or spread sheet application. The following example shows a data file that contains two transactions. The first transaction was entered at 10:12 am on 14 September from station 1 with the response JOB1267 entered to the first prompt ("Enter Job #"), ID1234 entered for the second prompt ("Enter Employee #"), P01 for the third prompt ("Enter Process ID") and START entered for the last prompt ("Start/Stop") :

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10:12:30 14/09/95 001 "JOB1267" "ID1234" "P01" "START"
10:27:54 14/09/95 001 "JOB1267" " " " " "STOP"
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Installation

Installing the UMD ProtoLink Network is simple as A, B, C:

A. Install and connect together UMD Model 153 interface converters using double twisted pair communications cable. The UMD Model 153's use RS485 signals that can be used in a multidrop fashion over hundreds of metres.

B. Connect a personal computer via its standard serial port to the first UMD Model 153 in the network. Note that this Model 153 requires a plug pack for power.

C. Connect a UMD Model 330 Wall Mount Custom Terminal (or any other UMD ProtoLink Product) to the next Model 153 in line. Here, the Model 153 obtains its power from the Model 330. Next run the UPN Configuration Software on the personal computer to configure the UMD ProtoLink Product with its own unique network address.

D. Repeat operation C for each station to be added until completion of the hardware installation.

E. Configure the UMD S161 software by editing simple text files to set up the user prompts and keypads.

F. Run the UMD S161 data collection application software on the personal computer to begin collecting job costing data.

Operation

At the start of the day, the stations are all powered up and the personal computer started with the UMD S161 Host Data Collector Software.

Job tickets are printed onto cards which are attached to the first item in every job lot. Before a worker starts a new process on the job, they read in the job ticket at the closest station by reading in the bar coded job and process id fields using the wand. They then identify themselves by reading in the bar code on their employee id badge. Next they press the "start" function key on the station to signify that the job has just started. When the job is finished, they simply wand in the job id and press the "stop" function key.

At designated times during the day, the UMD S161 software runs a user provided procedure which transfers the collected data to a floppy disk. The data on the floppy disk is imported into a user supplied database package which is used to collate the information. A report is produced to give total time for each job, number of jobs completed by employee, average time for each process etc.

Further information

For further information, contact the Sales Department at Unique Micro Design.