

The Tech Works **5400** Digital Interface Module is designed to provide industry standard interface to our RS485 Network System. A standard RJ connector allows RS232 serial interface to products such as pocket pager, serial printer, CCTV, Personal Computer, access control, etc. Each point in a system is output any time a change of status occurs. The point is identified by its unique Master, Column, and Lamp address. Up to 20 characters of ASCII text can be added to each point for user friendly output or commands to control other equipment. This data is entered using a standard PC RS232 interface and common communication software. Software settings allow the installer to set Time, Date, and Status (*steady, flashing, or off*) output with each event. The output can be tailored to allow direct printer logging output of each event with Text, Time, Date, and Status or Text only output for command control interface.

#### Associated Equipment

*Clinic-Call™, Court-Call™, Light-Call™  
Voice-Call, Duress-Call*

## OPERATING AND INSTALLATION INSTRUCTIONS for **5400 DIGITAL INTERFACE MODULE**

#### BENEFITS

- Low Cost
- Field Programmable
- Easy to Install
- Industry Standard  
Connectors

#### Design Information

12 VDC - <200 mA  
Dimensions - 5.07" W, 1.5" H, 5.07" D.  
RS485 - Screw Terminals  
RS232 - RJ45 Connector

#### Architects' and Engineers' Specifications

The Light Signaling System shall include a Digital Interface Module (DIM) for integration of a printer or Serial command control device. The DIM shall provide bi-directional interface to the Light Signaling Network. Any change of status in any device on the network shall be output as an ASCII text message capable of including the point identification, point status, time, date, and up to 20 characters of user programmable text. Programming shall be possible with any standard EIA RS232 PC communication interface. DIM's requiring special hardware or software for user interface shall not be considered under this specification.

The Light Signaling System Digital Interface Module shall be Tech Works Model 5400.

# Tech Works™

"Making Specialized Communication Easy"

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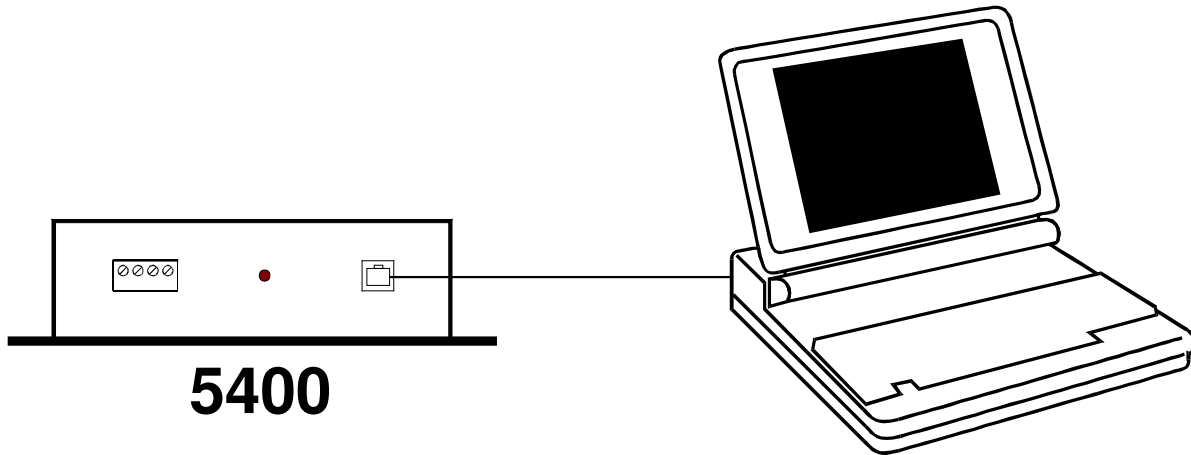
Web site **www.tech4people.com**

10/08

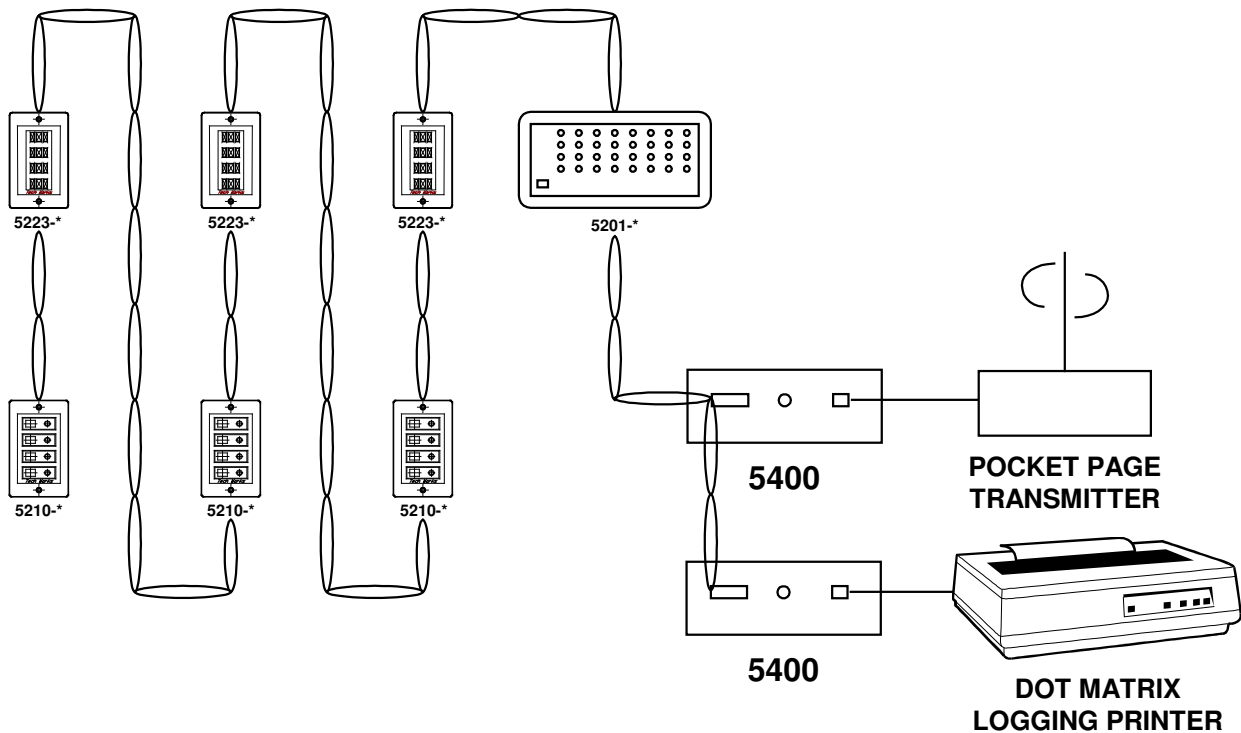


# Digital Interface Module

Plug it into your computer to program the setup and text output....



Then,  
Plug it into your *Tech Works* network  
and a printer or a pocket pager and go to work!



## It's that simple!

Tech Works 5400 Digital Interface Module

## Configuring and Programming

Up to 20 characters of user programmable text can be added to each point using any standard personal computer in terminal mode or with the DIM Utility provided. The RS232 communication parameters are 2400 baud, no parity, eight data bits, one stop bit. Set your computer com port to these parameters and disable all "handshaking" between hardware. With your computer in dos mode, type "dimutil" for com port 1 or "dimutil 2" for com port 2. The utility start up menu will allow you to work in terminal mode for small programming changes. For initial programming of numerous points, the utility allows you to read the data from the DIM and save it to disk under a file name you choose. The DIM can then be easily programmed using a text editor such as notepad. When finished, save the file as text and write back to the DIM using the utility. The DIM can also be manually programmed using Hyper Terminal. This method is best used for small changes to the programming and is accessed by holding the carriage return for a period of ten seconds to access the program mode.

```
COM1 TERMINAL MODE: ESC to return to Main Menu -----
TechWorks Digital Interface Module V2.2

----- MENU -----
<Enter> Re-displays Menu
Q<Enter> Quit Configuration Mode
I<Enter> Displays Interface Type
I=t<Enter> sets interface type where t: 0 for Printer, 1 for Pager
D<Enter> Displays Date and Time
D=mm/dd/yy w<Enter> sets Date and day of week w. w=0-6 0-Sun 1-Mon..6-Sat
T=hh:mm:ss<Enter> sets Time hours in 24 hours format 00-23
Y<Enter> Displays state of Daylight Savings Time
Y=n<Enter> Sets state of Daylight Savings Time. n=0 to disable, 1 to enable
Sn<Enter> Displays address for segment n. n=1-2
Sn=aa<Enter> Sets address for segment n. n=1-2, aa=01-64
    Set aa=00 to disable expanded message processing
Mn:mgl<Enter> Displays message for Seg n, Master m, Group g, Light l
Mn:mgl=abc<Enter> sets message 'abc' for Seg n, Master m, Group g, Light l
    Where: n=1-2, m=1-8, g=1-8, and l=1-4, message length is 20 chars max
    Use ~ character for CR and ^ character for Line Feed
    Example:
    M1:321<Enter> Displays message for Seg 1, Master 3, Group 2, Light 1

?
```

Figure 1

Figure 1 above shows the menu for the DIM. The Dim will store date and time for approximately two weeks without power and is preset at the factory. To check the date and time, enter "D" followed by a carriage return and the current date and time will be displayed. To enable daylight savings enter "Y=1" followed by a carriage return. The DIM is capable of monitoring two network segments. If S1 and S2 are both set to 00, the DIM will not process expanded network messages. This is the factory default. For more information about expanded networks and their addressing refer to the network expander documentation.

## Connecting to a Printer

Plug the printer in and turn it on.

Check the configuration to be sure your printer is set to **"Serial"** port with parameters

- X 2400 baud
- X No parity
- X 8 data bits
- X 1 stop bit.

Disable hardware handshaking.

Feed paper into printer and push **"Sel"**.

Connect Tech Works **5400** to the printer using the DB25M adapter and the CAT 5 Patch Cord.

Connect Network Power and Data to the **5400**.

The printer should print: "date\_time\_Tech Works Digital Interface Module"

It's that simple! From now on any event on the network will go straight to the printer.

## Connecting to a serial command control interface (Pocket Paging)

Plug the serial device in and turn it on.

Check the configuration to be sure your command control device is set to **"Serial"** port with parameters

- X 2400 baud
- X No parity
- X 8 data bits
- X 1 stop bit
- X Comp 2 Protocol

Two special control characters are available for the **5400**. When a text string in the **5400** contains a "~" (tilde) a carriage return ("CR") is sent to the serial output. Whenever a text string contains a "^" (karet) the **5400** will send a line feed to the serial output.

Tech Works recommends the Comp2 protocol for Pocket Paging. This means that the **"beeper # <CR> Message <CR>"** is to be input with each Tech Works point for separate paging by beeper or group. For example you would type **"M1: 841=501~Mr Jones RM 222~"** into the **5400** followed by enter to save. This would page beeper or beeper group 501 with the message Mr. Jones Rm. 222.

You must program each point in the **5400** with the proper "beeper #" and "message" to be sent upon a network event for that point identification. Unprogrammed points simply send a carriage return and a line feed when an event occurs. This is ignored by most equipment.

Any command control interface using ASCII text can be programmed into the **5400**. Simply follow the manufacturers protocol for proper command control of their product and put that text into each point of the **5400**.

When programming is complete type "Q" to quit, connect the **5400** to the command control equipment via the RS232 connector (DB9 or 25), and the Tech Works network via the screw terminals. For further information or help with your application just give us a call.

# ENHANCED DIM DOCUMENTATION

## DIM Version 2.2 Enhancements

Version 2.2 DIM has the following features:

1. Requires transitions (carriage return) on RS232 receive line for 10 seconds before it will go into configuration mode.
2. Will automatically time-out of configuration mode in 5 minutes if no keys are pressed.
3. Supports expanded segments as well as local messages. Up to two segment addresses can be entered using the S1 & S2 commands. The segment addresses can be between 01 and 64. Setting the addresses to 00 will cause DIM to ignore expanded messages.
4. Segment addresses can be changed without having to re-enter configuration data.
5. Supports custom messages up to 20 characters each.
6. 800 MS delay on RS232 output.
7. Daylight Savings Time
8. Y2K Compliance

## DIM Utility Program

The DIMUTIL.EXE program allows communication with the 5400 module. This program must be run in DOS MODE ONLY. It has the following features:

1. Allows configuration data to be read and saved to disk in separate files using the [R]ead option.
2. Allows configuration data files to be written back into the 5400 using the [W]rite option.
3. Stores all 5400 configuration including segment addresses and interface type. The file format is simple ASCII and can be edited using a simple text editor.
4. Support communication with DIM via serial port 1 or 2. The serial port is specified on the command line: "DIMUTIL 2".
5. Displays help message if started with wrong option or "?": "DIMUTIL?".
6. Monitors and displays communications with 5400.
7. Allows interactive terminal configuration of the 5400 using [T]erminal Mode.
8. Automatically connects to 5400 and puts into configuration mode.
9. Supports upload only from V1.1 DIM at 2400 baud by using the "O" option: "DIMUTIL O". The message data is automatically saved to disk as if it was read from segment 1. The read data can then be downloaded to a Version 2.X DIM without modification.
10. Supports upload only from V1.0 printer only DIM at 4800 baud by using the "P" option: "DIMUTIL P". The message data is automatically saved to disk as if it was read from segment 1. The read data can then be downloaded to a Version 2.X DIM without modification.
11. Automatically detects communications errors with 5400 and flags operator.

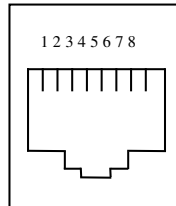
## Editing Files

Once a file is created using the [R]ead option, it is saved with the name you give it and an extension of .DIM. This is an ASCII text file which can be edited using the "NOTEPAD" in Windows or the DOS "EDIT".

The file must not be edited using a Windows Word Processing Program because control codes will be added which will effect program operation when reloaded to the 5400. Once editing is complete, simply "save" the changes and use the [W]rite option to send your changes to the 5400. Don't forget to type "Q" when upload is complete.

# TECH WORKS 5400 MODULAR ADAPTOR PINOUTS FOR ASSOCIATED EQUIPMENT 5400 RS232 CONNECTORS

FRONT VIEW OF RJ45  
CONNECTOR



SHIPPED WITH 5400			INTERFACE CONNECTIONS						
5400			GREY	WAVEWARE DB9M TO 5400			COMMTECH DB9F TO 5400		
TW RJ-45 CONNECTOR (DCE)			DB9F	DB9M BLACK (DTE)		RJ45	DB9F BLACK (DTE)		RJ45
PIN	SIGNAL	COLOR	PIN	SIGNAL	PIN	PIN	SIGNAL	PIN	PIN
1	TX OUT	BLUE	2	RX IN	3	1	RX IN	3	1
2	RX IN	ORANGE	3	TX OUT	2	2	TX OUT	2	2
3	RSD OUT	BLACK	1	N/C	1	N/C	N/C	1	N/C
4	CTS IN	RED	4	N/C	4	N/C	N/C	4	N/C
5	RTS IN	GREEN	7	N/C	7	N/C	N/C	7	N/C
6	DTR OUT	YELLOW	8	N/C	8	N/C	N/C	8	N/C
7	DSR OUT	BROWN	6	N/C	6	N/C	N/C	6	N/C
8	GND	SLATE	5	GND	5	8	GND	5	8
N/A			9		9	N/A		9	N/A

Be sure to set S1=01 in the 5400 programming and on the transmitter set the unit to COMP2 protocol and 2400 baud which on Waveware is set by having dip switches 1,2,4,5 & 8 ON. Be sure to press “Q” for quitting the 5400 programming before disconnecting the cable and connecting it to the transmitter otherwise the 5400 is still in programming and will not send message to the transmitter.