Mitsubishi E1000 Series HMI

Remote access with Westermo modems
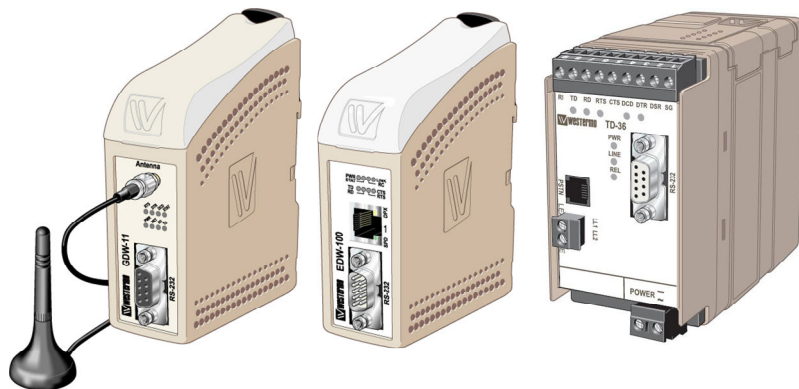
Contents and Contact Details

Section 1 - Introduction

The E1000 series HMI has Dial Up Networking and rudimentary routing capability built into the unit. This makes it possible to program the E1000 across the Dial Up connection using TCP/IP Ethernet, to route through the E1000 to an Ethernet enabled PLC and to program/ monitor a serial PLC connected to the HMI using Transparent mode through the HMI. This last mode requires virtual port emulation software such as Serial-IP, which is available from Westermo, to be installed on the host PC. It is also possible to remotely view the HMI screen using VNC and access trend data via the built in FTP server.

The E1000 series HMI must have a MINIMUM FIRMWARE REVISION of V1.31 used with E Designer of at least V7.2 build 245 for simple configuration using this application note as well as reliable communications for programming and email functions.

In addition to the methods detailed in this application note, Westermo have a range of routers that would allow access directly to the Ethernet network via Dial Up Networking, ADSL, GPRS, GSM, 3G or PSTN modems. A dedicated router would provide a high speed secure link with many built in features such as firewall. For more details contact Westermo UK.

NOTE:
The serial ports on the E1000 series is now a DTE port, unlike the smaller Exxx range which are DCE ports. This means that the connection between a modem and the HMI must now use a straight through RS-232 cable. The same type of cable can now be used from the HMI to the Remote modem and from the PC to Local modem. The cable is a straight through 9 pin Male D type to 9 pin Female D type. Westermo can supply pre-made cables for this, article no 9450-003


Section 2 - E Designer Configuration

1) In E Designer V7, select **New Project** - Select **Terminal** and PLC Model type

2) On Project Browser, select **Peripherals**. Then drag TCP/IP Connection 2 from Unused functions to Com2. Right-click on **Com2** to change the port properties to 57600, RS232C, None, 8, 1 then click OK.

3) Right-click on **TCP/IP Connection 2** and select **Properties**.
       - Enter a connection name,
       - Select act as a Server.
       - In PPP section, select None to begin with.
       - Click on M**odem** button then Enable Modem, disconnect if idle = 0 then OK
       - Click OK
       - Close the Peripherals window

4) Save Project

5) Select **Transfer** from the **Main Menu** then **Project**. Use settings button to edit the TCP/IP or serial download parameters. Connect appropriate programming cable between PC and E1000 HMI. Then click Send and Exit when finished.

6) Create a Dial Up Networking connection in Windows with no user ID or password. Test connection and prove by uploading from HMI - Default DUN IP address 192.168.98.1 or use the configured TCP/IP Connection 1 IP address.

7) Once the connection has been proven then a username and password can be added to the HMI and Windows Dial Up Networking Connection and a re test carried out to prove the new security settings.

> **Important:**
> The modem MUST be powered and connected to the HMI before the HMI is powered up. This is because the HMI will detect the modem as part of its serial driver boot up process.

Section 3 - TD36, TD36/485 and TD-35 Settings

TD-36 and TD36/485

SW 1

SW 2

SW 5

TD-35

SW1

SW2

SW 4

SW 3

SW3

SW4
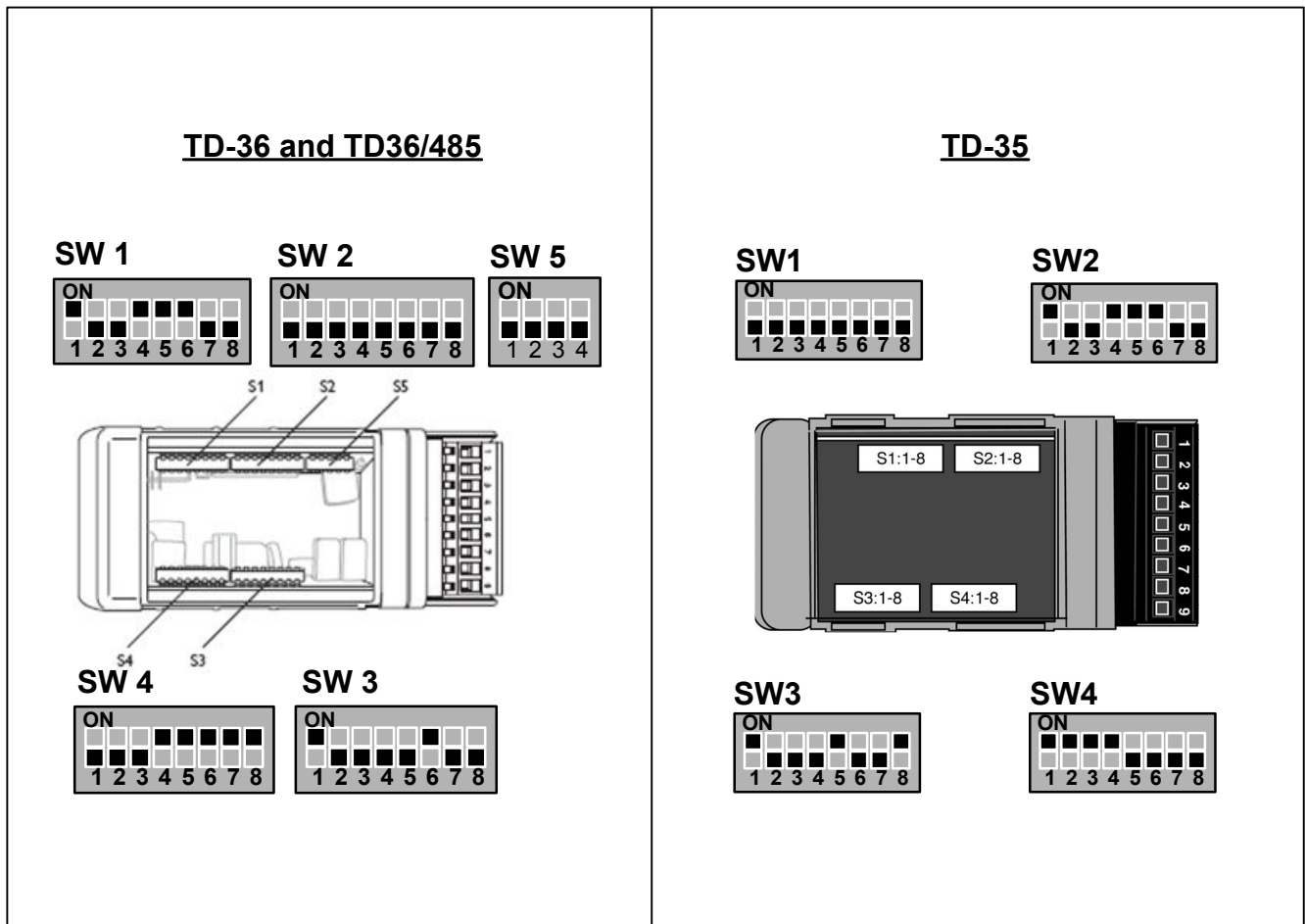
Additional AT Commands for all modems connected to the HMI:

ATS0=0&W

For a TD-36 or TD-36/485 (using RS232) this commands can be entered with TDTool2 using the same procedure shown for the TDW33 modem on the following page. It is also possible to use Hyperterminal or a similar terminal package if required.

For a TD-35 the commands can be entered using Hyperterminal or a similar terminal package.

This AT command is not required for a modem connected to a PC. The switch settings shown above are all that is required for the modem setup at the PC end.

NOTE :
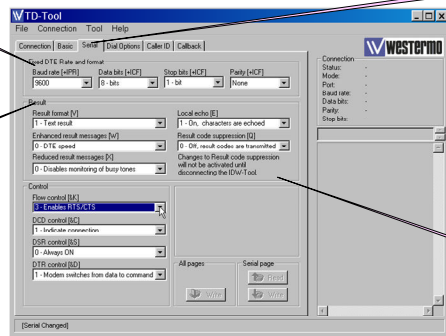All other settings are default

Section 3 - TDW33 and TDTool 2

The TDW-33 is configured using TDTool 2, a Windows based configuration tool, to configure the AT command strings. Once the settings have been entered on each page, click **WRITE to store each page** within the modems profile or select File then Write Profile to write all the pages to the modem in a single download.

This procedure can also be used to configure the TD-36 and TD-36/485 (in RS232 mode) modems to work with an E1000 Series HMI Dial Up Networking Connection.

1) Connect Using Auto baud and a MC9/9 cable from PC

3) On Serial Tab, Set to 57600, 8, N, 1 and also set the command Flow Control Enabled &K3

2) On Basic Tab, Set the auto answer to 0 ring and set %E0

4) On the Dial Options Tab, Set the command &A1
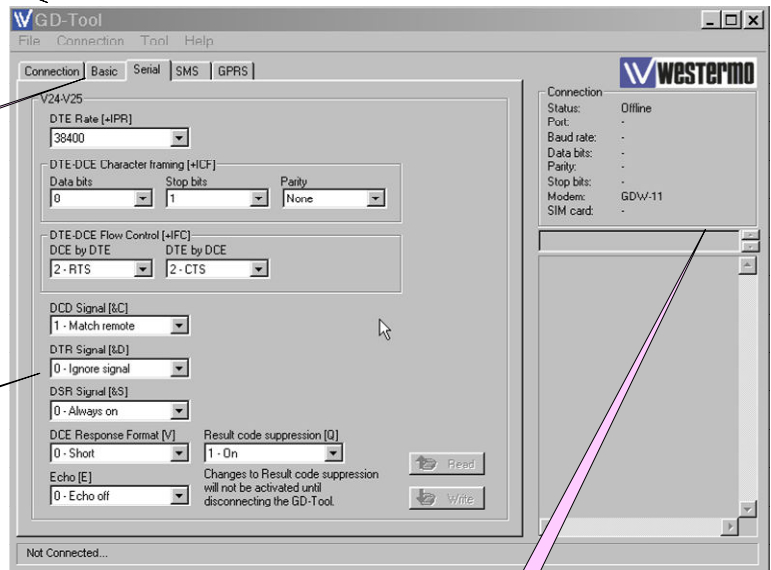
NOTE :
All other settings are default

Section 3 - GDW11 Setup using GDTool

1) Connect PC to Modem using a straight through MC9/9 Modem cable then Select Autoconnect and GDTool will search for the correct Serial rate and parity

2) On Basic Tab select no of rings to auto answer (S0) to be 0 then click the Write Button on that page to save to the modem

3) On Serial Tab set up as shown here to give the AT commands +IPR=57600; +ICF=3,4; +IFC=2,2; then click the Write Button on that page to save to the modem. **Note: These settings can also be used on the GD-01 GSM modem**

GD-Tool

File   Connection   Tool   Help

Westermo

Connection | Basic | Serial | SMS | GPRS

V24-V25

DTE Rate [+IPR]
38400

DTE-DCE Character framing [+ICF]
Data bits   Stop bits   Parity
0   1   None

DTE-DCE Flow Control [+IFC]
DCE by DTE   DTE by DCE
2 - RTS   2 - CTS

DCD Signal [&C]
1 - Match remote

DTR Signal [&D]
0 - Ignore signal

DSR Signal [&S]
0 - Always on

DCE Response Format [V]   Result code suppression [Q]
0 - Short   1 - On

Echo [E]
0 - Echo off

Changes to Result code suppression will not be activated until disconnecting the GD-Tool.

Read   Write

Connection
Status: Offline
Port: -
Baud rate: -
Data bits: -
Parity: -
Stop bits: -
Modem: GDW-11
SIM card: -

Not Connected...

Using the Terminal command box enter the following commands followed by ENTER:
**AT+WOPEN=0
AT+CREG=0
AT+CGREG=0
AT+WIND=0
AT+CGEREP=0
AT+CRC=0
AT+CMEE=0
AT+CLIP=0
AT+WRIM=1
AT&W**
These commands stop all of the unsolicited GSM and GPRS status messages

NOTE:
All other settings are default.

Ensure that the SIM card has a Circuit Switched Data (CSD) number enabled.

Turn off any PIN codes until link has been proven.

Check signal strength using GDTool.

Section 4 - Configuring Windows for Dial Up Networking

These screenshots are from Windows 2000 and show the basic procedure for creating a Dial Up Networking connection. Other versions of Windows use the same procedure with subtle changes to naming and order of screens.
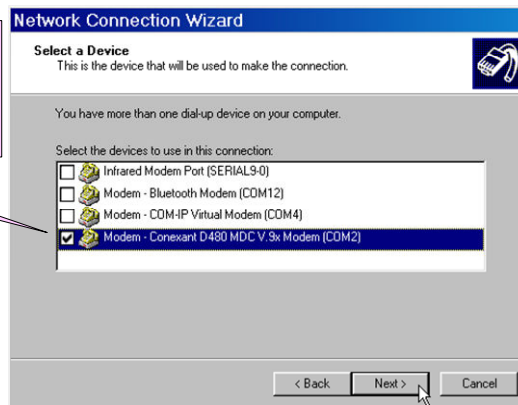
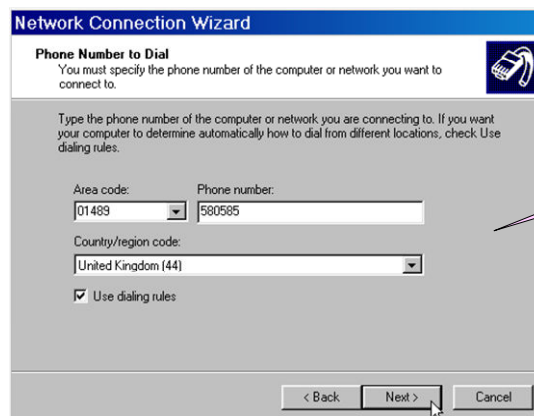Open Network and Dialup Connections and select Make New Connection
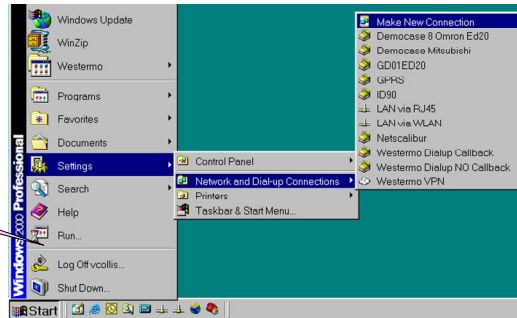
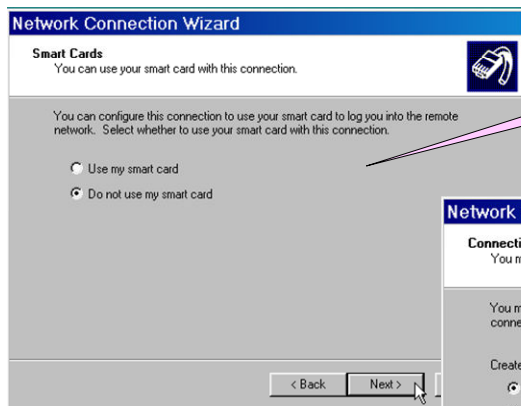Select Next and then Dial up to private network. Then Next again.
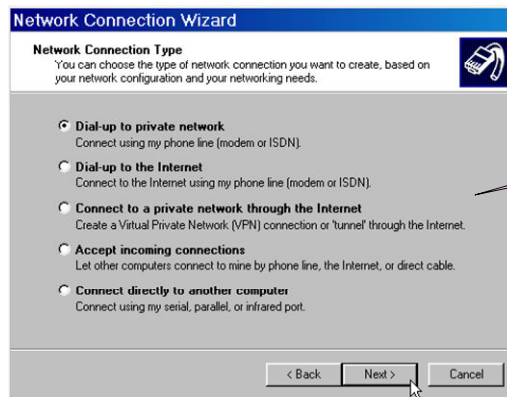
Select the Modem that will be used to dial from the PC to the remote HMI

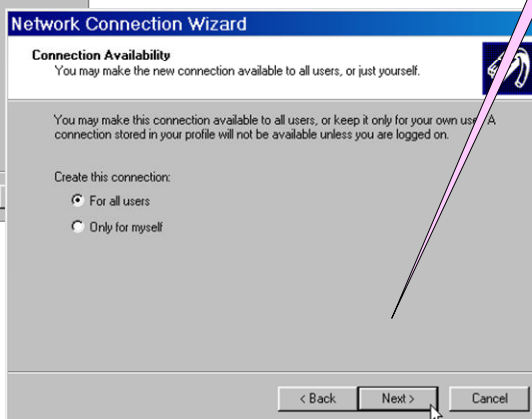Enter the Phone Number and dialling rules

Section 4 - Configuring Windows for Dial Up Networking

Select Next

Then Next again.

Enter a Name for the Dial Up Networking Connection

For first time configuration, leave the User name and Password blank. Select Dial to test the connection

Section 5 - Using SerialIP and Transparent Mode

It is possible to use Transparent mode on the Com2 port in the HMI and then use a Virtual Comm Port Emulation software such as Tactical Software's SerialIP to program a PLC connected to the Com1 port on the HMI.

First of all ensure that the Transparent mode is listed under Com2 in the **Peripherals Properties**. If it is listed under unused functions the drag transparent mode across to Com2. The Default settings of TCP mode and PortNumber 6004 can be used. Save settings and Transfer to HMI and when the HMI has rebooted test using a Dial Up Networking connection.

Once the DUN connection has been established prove that the HMI can be PINGed on either the HMI's Dial Up Networking IP address (Default is 192.168.98.1) or the HMIs configured Physical Ethernet Ports IP address.

Setup the SerialIP or equivalent software to map a Virtual Communications Port to the HMIs Dial Up Networking or Physical Ethernet Port, IP Address and HMI Port Number 6004.

Test the connection by using the appropriate Programming software and port settings to connect to the remote PLC via the Virtual Communications Port.

Shutdown the Dial Up Networking connection when finished.

Section 6 - Using the HMI as a Router

Once the Dial Up Networking Connection has been made it is possible to route through to the Physical Ethernet Connection on the HMI or LAN connection. If there are PLC's connected to the LAN then it is possible to connect through the HMI to these PLC's as long as the PLC's have been configured to use the HMI as the gateway or relay router. In the PLC's IP address setup there will be a gateway or relay router setting and this is the IP address of the HMI on the physical LAN not the Dial Up Networking Address.

Section 7 - Using the HMI as an FTP Server

If you need to access trend data or alarm lists remotely, you can set the HMI to act as an FTP server to allow you to transfer these files to your local machine.

To enable the FTP function within the HMI, go to the "Network Services" in the program. This will bring up a dialog box which allows you to select the services required. Check the "FTP Server" option and click on OK. Make sure the program is downloaded to the HMI to allow this new setting to work.
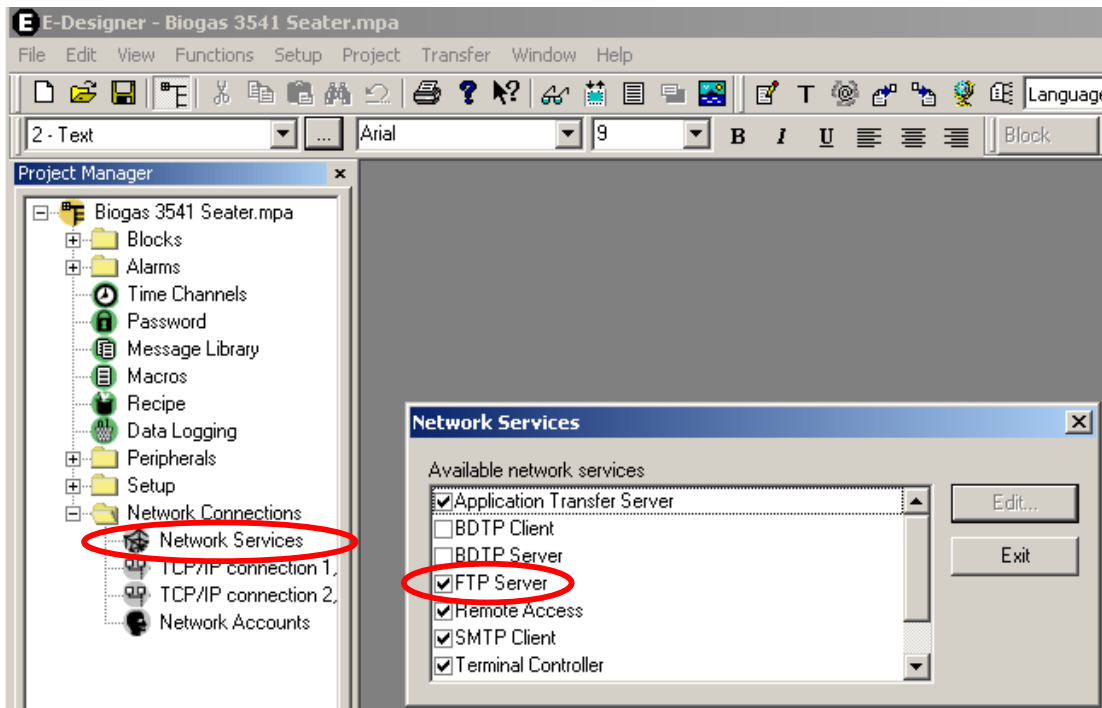
To access the FTP server remotely you will need to have created a DUN connection, as shown in section 4. Once you have established a connection to the HMI, open a web browser and type the IP address of the HMI with the prefix of: **ftp://**

When the connection is made you will see the internal folders of the HMI displayed and will now be able to drag and drop files from the browser window.

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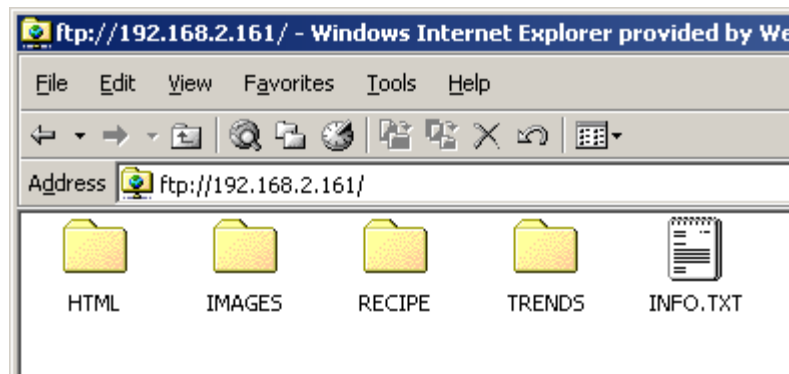
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