

TM-1000 Installation Guide for Toolpack Monitoring

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Preface

Introduction

Purpose and Scope of this document

This document describes how to install TM-1000.

How to use this document

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1. System Requirements

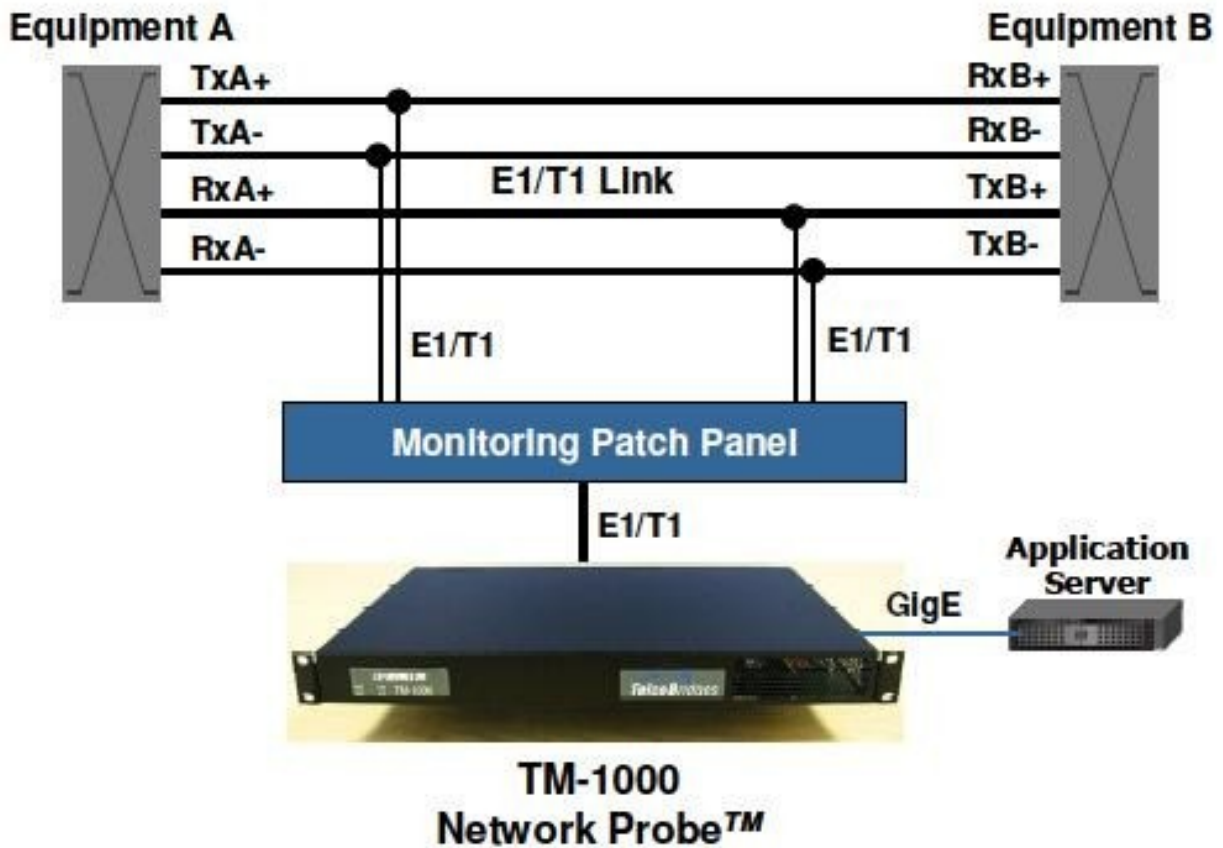


Figure 1 TM-1000 Network Diagram

1.1. Equipment Required

- TM-1000
- Control system (Application Server)
- One null modem DB-9 serial cable to connect the TM-1000 serial port to the Windows system serial port (lines 2 and 3 need to be crossed). This is required only for IP address configuration.
- Two 1 Gbps Ethernet adapters
- Two Gigabit switches (8 ports minimum) for control redundancy
- Four Ethernet cables
- One power source, either 110-220V AC, 4 AMP for TM-1000 option AC or 48V DC, 9 AMP for TM-1000 option DC
- Up to 64 E1/T1/J1 source for monitoring full-duplex
- Up to two monitoring patch panels with RJ-45 input connectors
- Up to four SCI-3 cables for connection between the TM-1000 and the patch panels

1.2. Application Server Requirements

1.2.1. Recommended Windows System Requirements:

- Pentium 4: 3Ghz or higher processor with 1GB RAM
- Two 100Mbps/1Gbps Ethernet adapters. We recommend 1Gbps if this host is running the TB-StreamServer
- Windows 2000 Professional/Server with Service Pack 3 or later, or Windows XP with Service Pack 2 or later. The TM-1000 software package has not been tested on any other version of Windows.

1.2.2. Recommended Linux System Requirements

- Intel or AMD-based system, 3Ghz or more with 1GB of memory
- Two 100Mbps/1Gbps Ethernet adapters. We recommend 1Gbps if this host is running the TB-StreamServer

2. Hardware Equipment

Preventing Electrostatic Discharge Damage

Electrostatic discharge (ESD) can damage equipment and impair electrical circuitry. It can occur if electronic printed circuit cards are improperly handled and can cause complete or intermittent failures.

Always follow ESD prevention procedures when removing and replacing modules:



- Ensure that the TM-1000 is electrically connected to earth ground.
- Wear an ESD-preventive wrist strap, ensuring that it makes good skin contact. Connect the clip to an unpainted surface of the TM-1000 to channel unwanted ESD voltages safely to ground. To guard against ESD damage and shocks, the wrist strap and cord must operate effectively.
- If no wrist strap is available, ground yourself by touching a metal part of the chassis.

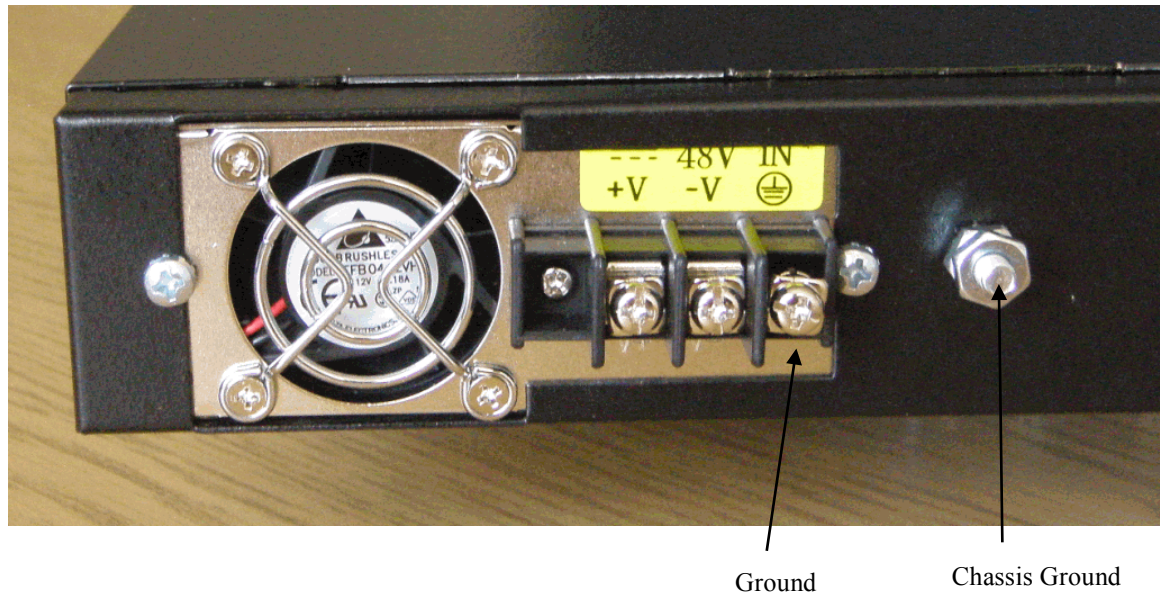


Figure 2 TM-1000 rear view DC Power supply option and ground post

2.1. TM-1000 Front View and Physical Dimensions

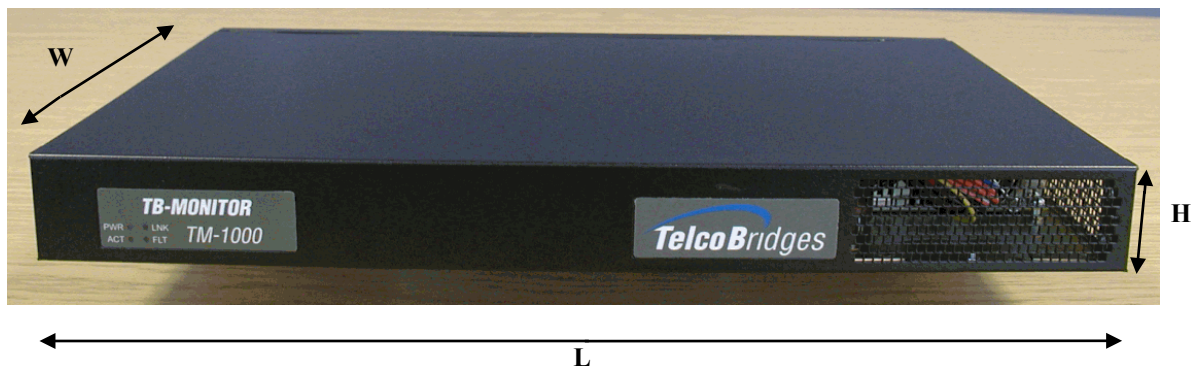


Figure 3 TM-1000 Front View

Dimension	Inches	Centimeters
Length	17 ¼	43.8
Width	11	27.9
Height	1 ¾	3.8

Table 1 TM-1000 dimension

Unit Weight: 9 LB or 4.1 Kg

2.2. TM-1000 Environmental Specifications

Operating temperature	0° to 40°C (32° to 104°F)
Storage temperature	-20° to 70°C (-4° to 158°F)
Operating relative humidity	10% to 85% non-condensing
Storage relative humidity	10% to 85% non-condensing

Table 2 TM-1000 environmental specifications

When selecting an installation site, observe these guidelines:

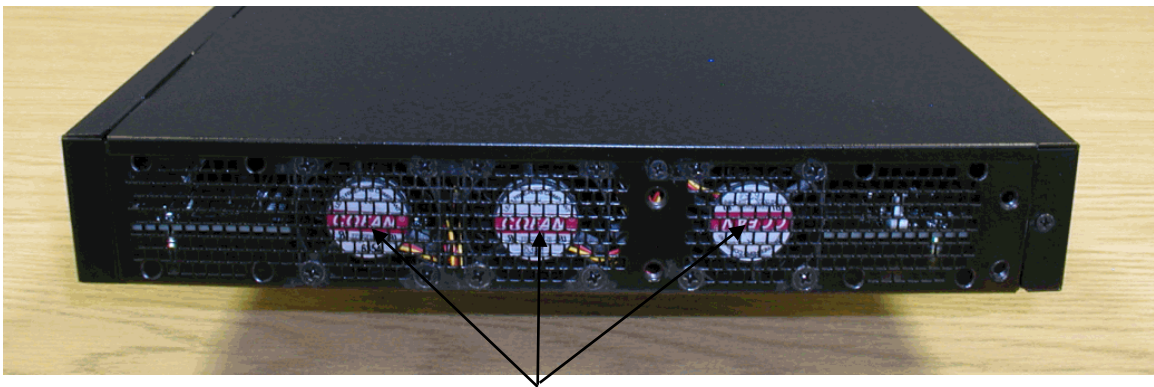
- Cabling is away from sources of electrical noise, such as radios, power lines, and fluorescent lighting fixtures
- Clearance to the TM-1000 is such that:
 - Airflow around the TM-1000 and through the vents is unrestricted
 - Front-panel LEDs can be easily read
 - Access to ports is sufficient for unrestricted cabling
 - AC power cord can reach from the AC power outlet to the connector on the TM-1000. The power outlet must be accessible at all times because it serves as the main method to disconnect power from the TM-1000

2.3. TM-1000 right side view



Figure 4 TM-1000 right side view

2.4. TM-1000 left side view



Cooling fans

Figure 5 TM-1000 left side view with three cooling fans

2.5. TM-1000 rack-mounting brackets and screws



Figure 6 TM-1000 left and right side bracket kit

2.5.1. TM-1000 with left side bracket installed



Figure 7 TM-1000 left side right angle

2.5.2. TM-1000 with right side bracket installed

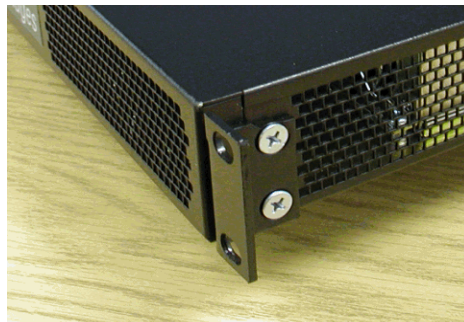


Figure 8 TM-1000 right side right angle

2.6. TM-1000 LED Description



Figure 9 TM-1000 Front View LED description

Item	Color	Description	Item	Color	Description
PWR	None	No power	LNK	None	Not finished restarting the TM-1000
	Red	Power fault		Red	Ethernet port disconnected
	Green	Power good		Green	Ethernet port connected
ACT	None	Trunk not allocated	FLT	None	Internal debug status report
	Red	Tapping resource not available		Red	Internal debug status report
	Solid Green	Trunk allocated		Green	Internal debug status report
	Blink Green	Trunk activity			

Table 3 TM-1000 Front LED status

2.7. TM-1000 Rear View



Figure 10 TM-1000 rear view

2.8. TM-1000 DC Power Supply Option

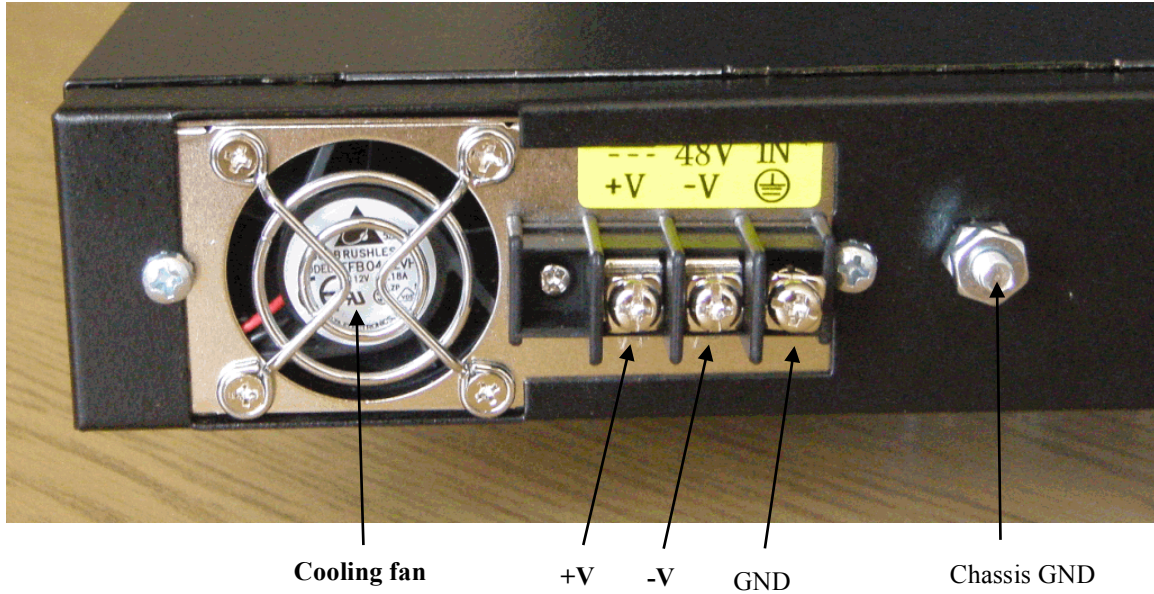


Figure 11 TM-1000 rear view DC Power supply option and ground post

Contact ID	Description
+V	DC Power return
-V	-40 to -65V DC input with 9A max load
GND	Earth ground

Table 4 TM-1000 DC Power supply

You need a Philips screwdriver to tighten the cable tab connections

2.8.1. TM-1000 AC Power Supply Option Description

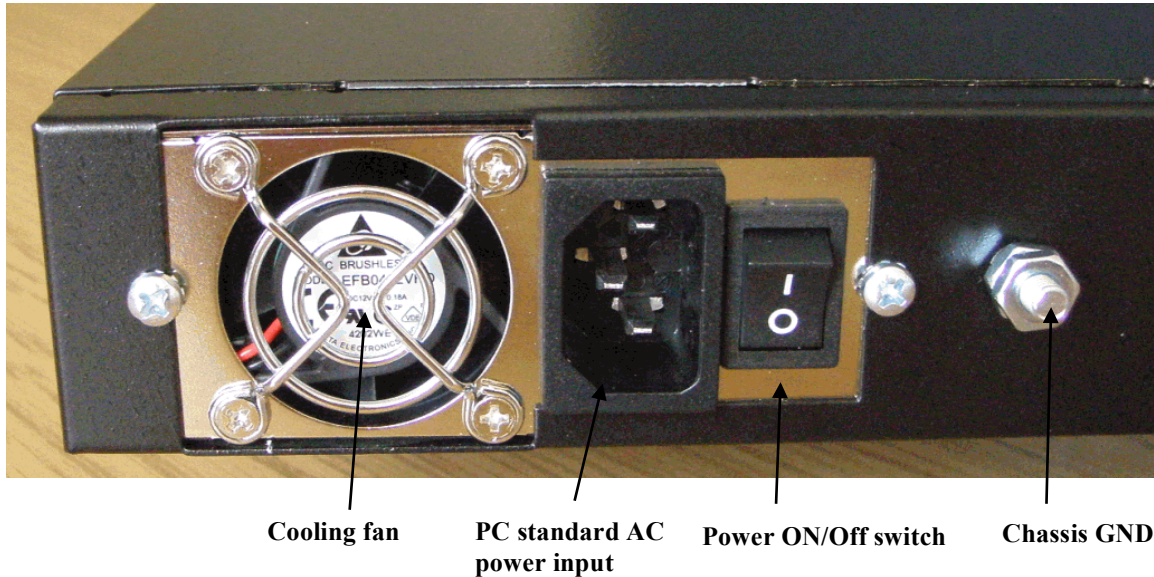


Figure 12 TM-1000 rear view AC Power supply option, On/Off switch and ground post

Power input from 100 to 240V AC, 47 to 63 Hz with 4 Amp maximum load. This is an auto detect AC power input.

2.9. TM-1000 Reset, Auxiliary 1 and 2 Description

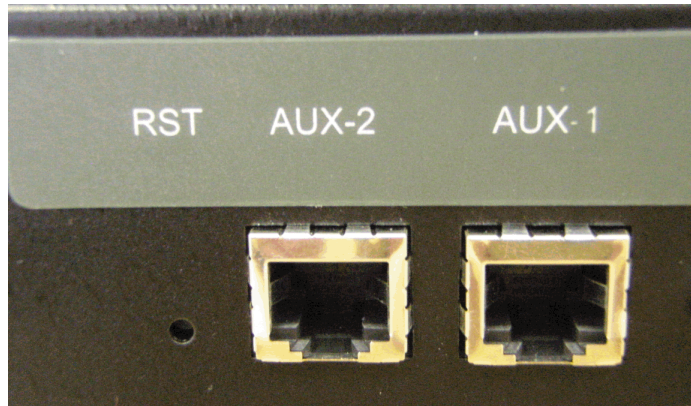


Figure 13 TM-1000 rear view Reset and auxiliary feature

- You will need to insert a pin in the hole to reach the reset button
 - If you quick press and release the reset button the TM-1000 will restart.
 - If you hold on the reset button for at least five seconds, the TM-1000 will shut down.
 - If you hold on the reset button for at least five seconds after a shut down, the TM-1000 will restart.
- Aux-1 and Aux-2 RJ-45 connectors are used for optional features. These features are not implemented yet. **Do not use Aux-1 and Aux-2 connectors.**

2.10.TM-1000 Serial Port RS-232



Figure 14 TM-1000 rear view RS-232 Link

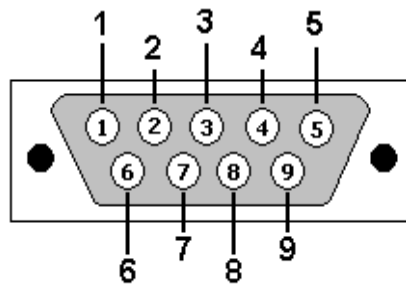


Figure 15 TM-1000 RS-232 Pin Out

Pin number	Description
1	Not connected
2	Receive signal (Rx)
3	Transmit signal (Tx)
4	Not connected
5	Ground
6	Not connected
7	Not connected
8	Not connected
9	Not connected

Table 5 TM-1000 RS-232 DB-9 pin out

2.11.TM-1000 Ethernet 1 and 2

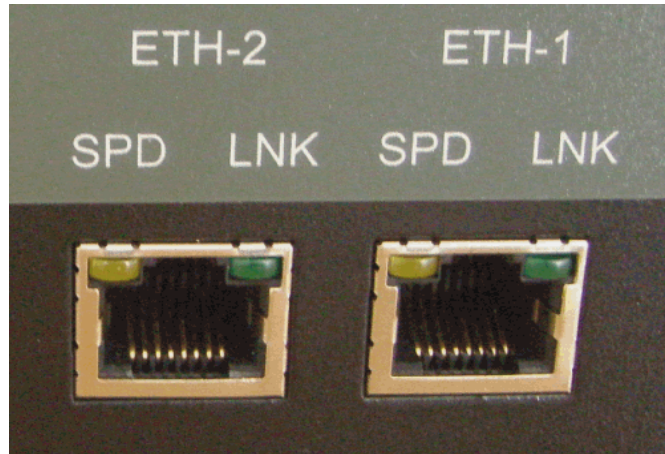
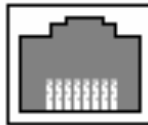


Figure 16 TM-1000 rear view Ethernet 10/100/1G ports

Item	Led color	Description
SPD	Off	Ethernet port connected 100M
	Yellow	Ethernet port connected 1G
LNK	Off	Ethernet port disconnected
	Solid Green	Ethernet port connected
	Blink Green	Ethernet activity on the connected port

Table 6 TM-1000 Ethernet LED description

Connector front view



8 1

Pin number	Description
1	Bi-directional pair A+
2	Bi-directional pair A-
3	Bi-directional pair B+
4	Bi-directional pair C+
5	Bi-directional pair C-
6	Bi-directional pair B-
7	Bi-directional pair D+
8	Bi-directional pair D-

Table 7 TM-1000 Ethernet RJ-45 pin out

Each Ethernet port has a speed auto detect option of 1 Gbps.

2.12.Network Protocol and Standards Compatibility

- IEEE 802.3z/ab 1000Base-T

2.13. TM-1000 E1/T1/J1 Input Cable Connectors

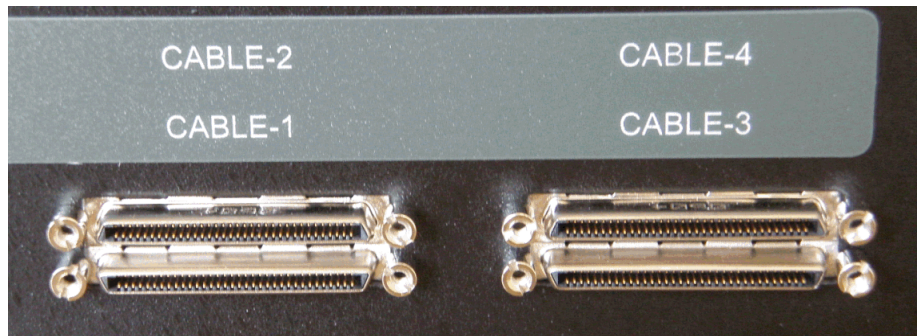
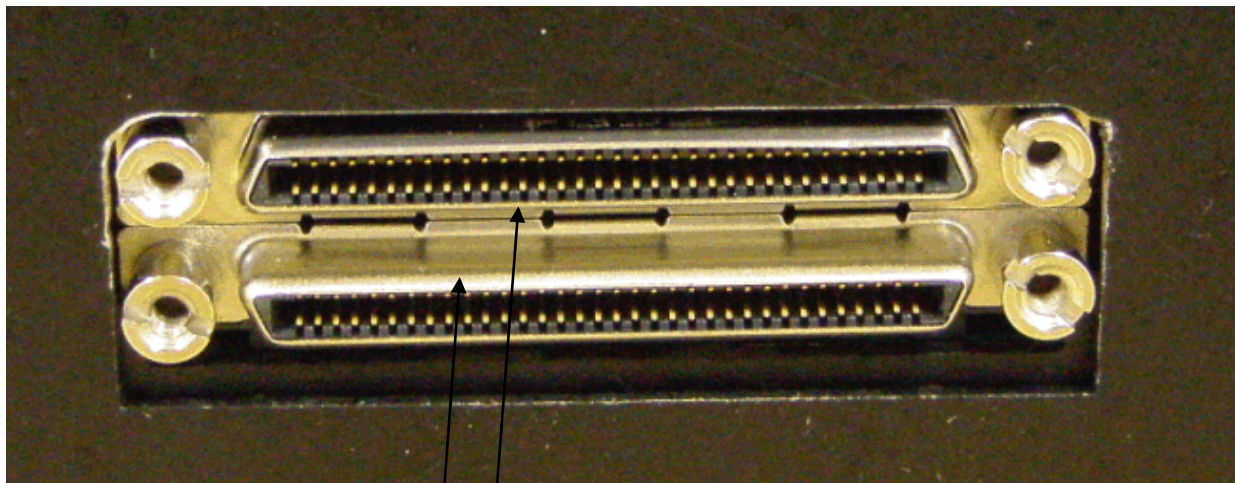


Figure 17 TM-1000 rear view SCSI-3 input connection

2.14. Patch panel SCSI-3 connector



Plug only with Cable-2 or Cable-4 of the TM-1000

Plug only with Cable-1 or Cable-3 of the TM-1000

Figure 18 Patch panel SCSI-3 connector

- The **lower** SCSI-3 connector is always connected with patch panel number **1 to 16**.
- The **lower** SCSI-3 connector must always be connected with **Cable-1 or Cable-3** of the TM1000.
- The **upper** SCSI-3 connector is always connected with patch panel number **17 to 32**.

The **upper** SCSI-3 connector must always be connected with **Cable-2 or Cable-4** of the TM1000.



TM-1000 cable trunk input:

	RJ-45 Pin 1-2 input	RJ45 Pin 4-5 input
Cable-1	Trunk 1-16	Trunk 65-80
Cable-2	Trunk 17-32	Trunk 81-96
Cable-3	Trunk 33-48	Trunk 97-112
Cable-4	Trunk 49-64	Trunk 113-128

Table 8 TM-1000 SCSI-3 trunk cable input

3. Patch panel with 32 x RJ-45

This patch panel supports 64 trunk inputs (32 full-duplex trunks).

3.1. Patch panel front view



Figure 19 Patch panel front view

3.2. Patch panel rear view



2 x Philips screws

Pull up the cover to remove

Figure 20 Patch panel rear view

- Patch panel trunk impedance all selector switch

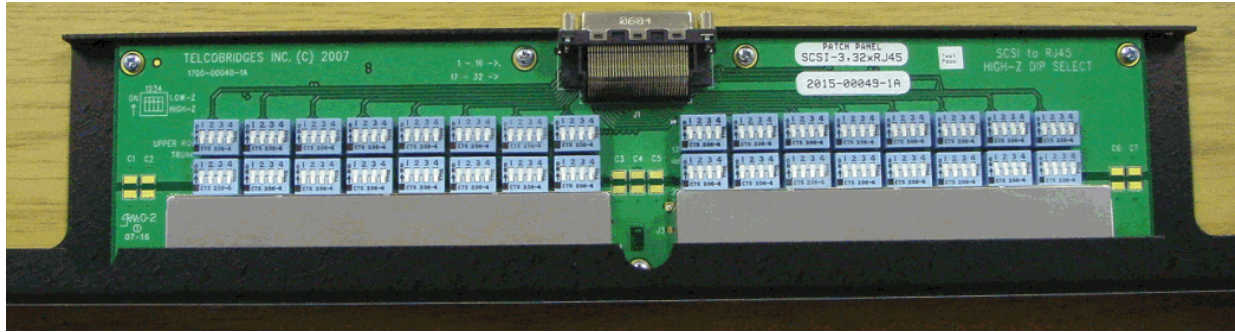


Figure 21 Patch panel impedance selector switch

3.3. Patch panel trunk impedance selector switch

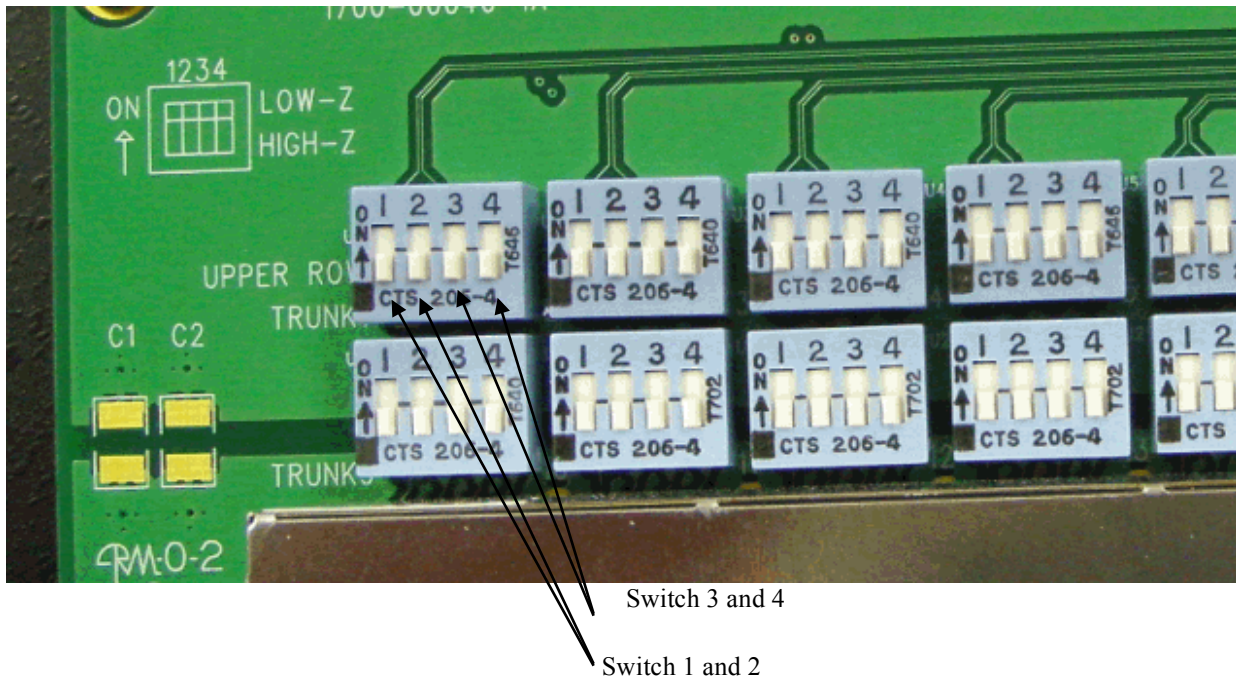


Figure 22 Patch panel impedance selector switch

- Always set the impedance switch as a pair 1-2 and 3-4.
- The default settings of the patch panels impedance is **Off position (470 Ω)**.
- If you set the switch in the **Off** position, the input trunk impedance will be high (**470 Ω**).
- If you set the switch in the **On** position, the input trunk impedance will be low (**0 Ω**).

3.4. Patch Panel Selector Switch Fit with TM-1000 Cable-1

		Switch 1		Switch 2		Switch 3		Switch 4		Switch 5		Switch 6		Switch 7		Switch 8	
Upper Row	Switch Position	1-2	3-4	1-2	3-4	1-2	3-4	1-2	3-4	1-2	3-4	1-2	3-4	1-2	3-4	1-2	3-4
	TM-1000 Trunk Input Rx1 Rx2	1	65	2	66	3	67	4	68	5	69	6	70	7	71	8	72
	Trunk Label On patch Panel	1		2		3		4		5		6		7		8	
Lower Row	Switch Postion	1-2	3-4	1-2	3-4	1-2	3-4	1-2	3-4	1-2	3-4	1-2	3-4	1-2	3-4	1-2	3-4
	TM-1000 Trunk Input Rx1 Rx2	9	73	10	74	11	75	12	76	13	77	14	78	15	79	16	80
	Trunk Label On patch Panel	9		10		11		12		113		14		15		16	

Table 9. Patch panel selector switch fit with TM-1000 Cable-1, trunks 1-16 and 65-80

3.5. Patch panel selector switch fit with TM-1000 cable-2

		Switch 9		Switch 10		Switch 11		Switch 12		Switch 13		Switch 14		Switch 15		Switch 16	
Upper Row	Switch Postion	1-2	3-4	1-2	3-4	1-2	3-4	1-2	3-4	1-2	3-4	1-2	3-4	1-2	3-4	1-2	3-4
	TM-1000 Trunk Input Rx1 Rx2	17	81	18	82	19	83	20	84	21	85	22	86	23	87	24	88
	Trunk Label On patch Panel	17		18		19		20		21		22		23		24	
Lower Row	Switch Postion	1-2	3-4	1-2	3-4	1-2	3-4	1-2	3-4	1-2	3-4	1-2	3-4	1-2	3-4	1-2	3-4
	TM-1000 Trunk Input Rx1 Rx2	25	89	26	90	27	91	28	92	29	93	30	94	31	95	32	96
	Trunk Label On patch Panel	25		26		27		28		29		30		31		32	

Table 10. Patch panel selector switch fit with TM-1000 Cable-2, trunks 17-32 and 81-96

3.6. Patch panel selector switch fit with TM-1000 cable-3

		Switch 1		Switch 2		Switch 3		Switch 4		Switch 5		Switch 6		Switch 7		Switch 8	
Upper Row	Switch Postion	1-2	3-4	1-2	3-4	1-2	3-4	1-2	3-4	1-2	3-4	1-2	3-4	1-2	3-4	1-2	3-4
	TM-1000 Trunk Input Rx1 Rx2	33	97	34	98	35	99	36	100	37	101	38	102	39	103	40	104
	Trunk Label On patch Panel	1		2		3		4		5		6		7		8	
Lower Row	Switch Postion	1-2	3-4	1-2	3-4	1-2	3-4	1-2	3-4	1-2	3-4	1-2	3-4	1-2	3-4	1-2	3-4
	TM-1000 Trunk Input Rx1 Rx2	41	105	42	106	43	107	44	108	45	109	46	110	47	111	48	112
	Trunk Label On patch Panel	9		10		11		12		113		14		15		16	

Table 11. Patch panel selector switch fit with TM-1000 Cable-3, trunks 33-48 and 97-112

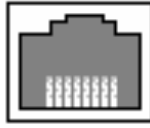
3.7. Patch panel selector switch fit with TM-1000 cable-4

		Switch 9		Switch 10		Switch 11		Switch 12		Switch 13		Switch 14		Switch 15		Switch 16	
Upper Row	Switch Postion	1-2	3-4	1-2	3-4	1-2	3-4	1-2	3-4	1-2	3-4	1-2	3-4	1-2	3-4	1-2	3-4
	TM-1000 Trunk Input Rx1 Rx2	49	113	50	114	51	115	52	116	53	117	54	118	55	119	56	120
	Trunk Label On patch Panel	17		18		19		20		21		22		23		24	
Lower Row	Switch Postion	1-2	3-4	1-2	3-4	1-2	3-4	1-2	3-4	1-2	3-4	1-2	3-4	1-2	3-4	1-2	3-4
	TM-1000 Trunk Input Rx1 Rx2	57	121	58	122	59	123	60	124	61	125	62	126	63	127	64	128
	Trunk Label On patch Panel	25		26		27		28		29		30		31		32	

Table 12. Patch panel selector switch fit with TM-1000 Cable-4, trunks 49-64 and 113-128

3.8. RJ45 (RJ48C) Connector

Connector front view



8 1

Pin number	Description
1	Rx Ring 1
2	Rx Tip 1
3	Not connected
4	Rx Ring 2
5	Rx Tip 2
6	Not connected
7	Not connected
8	Not connected

Table 13 RJ-45 (RJ-48C) E1/T1/J1

4. TM-1000 Hardware Installation

1. By default, the patch panels are set at high (470Ω) impedance. If you need to change the impedance, open the patch panel cover and set the impedance switch to fit with the trunk line interface that you want to connect with (Reference Section 3 of this document).
2. To rack mount the TM-1000, screw in the brackets (Reference Section 2.5 of this document).
3. Connect the SCSI-3 cables between the patch panel and the TM-1000 (Reference Section 2.14 of this document).
4. Connect your trunk input with the RJ-45 connectors in the patch panel (Reference Section 3 of this document).
5. Connect the null serial cable between the TM-1000 and your server (Reference Section 0 of this document for DB-9 connector pin out).
6. Connect the Ethernet cable from the switch to the TM-1000 ETH-1 and ETH-2 (Reference Section 2.11 of this document for pin out).
7. Connect the TM-1000 AC or DC power supply, and turn the power on.
8. Configure the IP address and gateway port of the TM-1000 (Reference Section 5.2)
9. Contact **TelcoBridges** at www.telcobridges.com to get a license and the latest software package for each TM-1000 (Reference section 6 of this document).
10. Install the package and license (Reference Section 6 of this document).

5. Configure the TM-1000

You will need two free IP addresses on two subnets from your network to configure the TM-1000. (One IP address per subnet.)

5.1. Configure the TM-1000 with the serial port

For serial connection, configure the terminal console application, like Hyper terminal at 9600 BPS, 8 bits, no parity, 1 stop bit, no flow control.

For Ethernet connection, use any console application.

5.1.1. Create a connection name

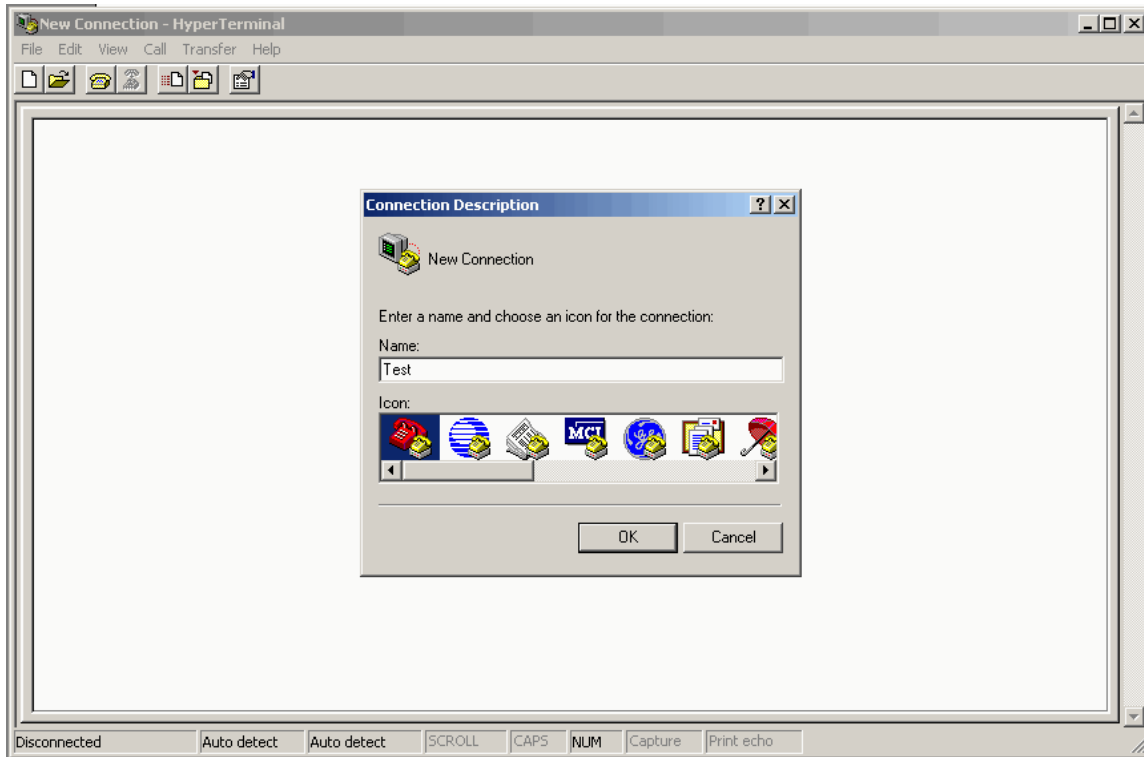


Figure 23 Hyper Terminal configuration step #1

5.1.2. Set the com port

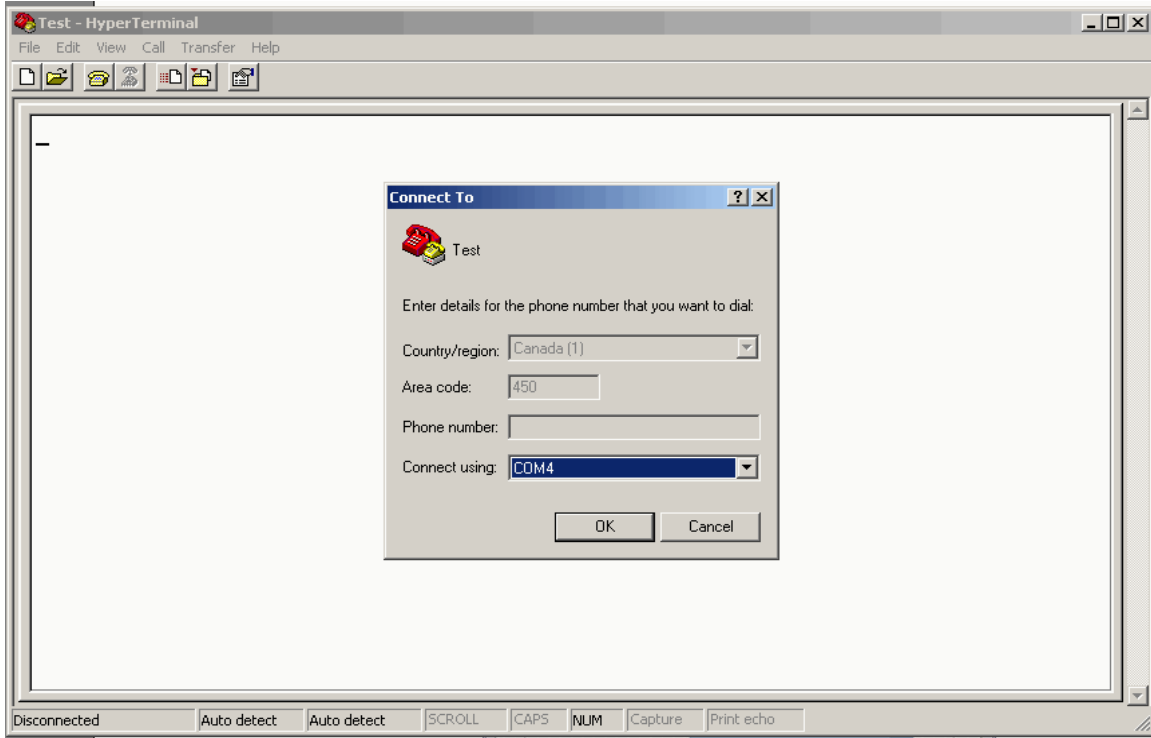


Figure 24 Hyper Terminal configuration step #2

5.1.3. Set Bits rate Flow control

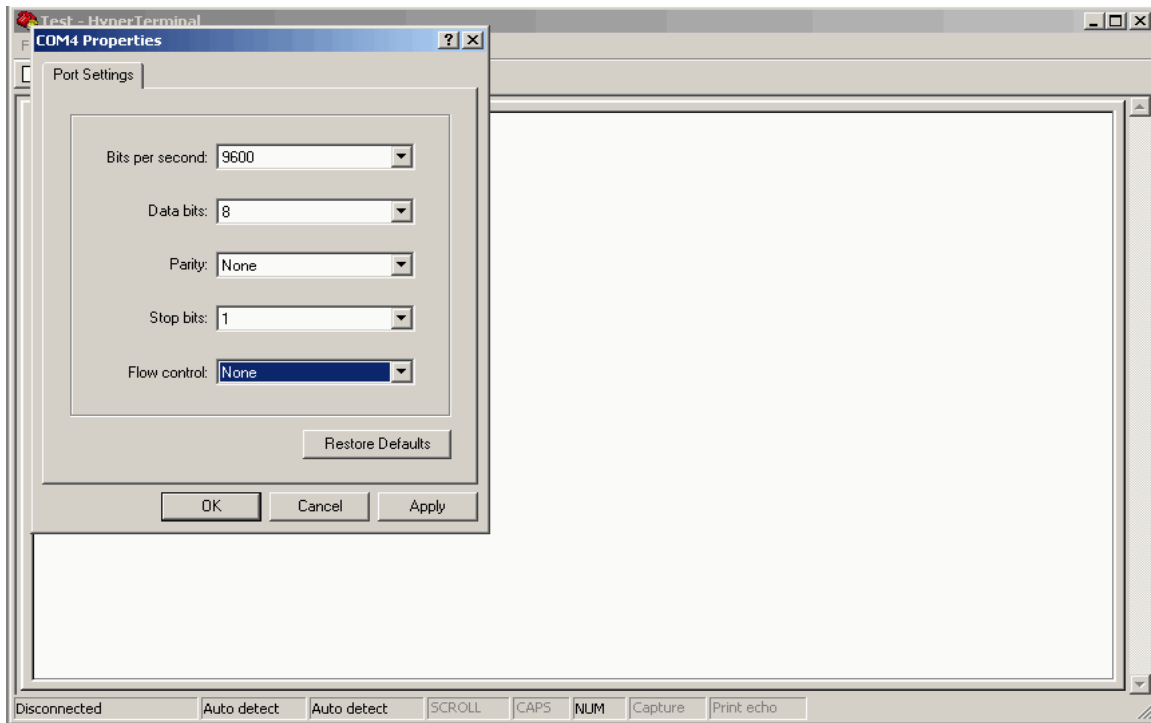
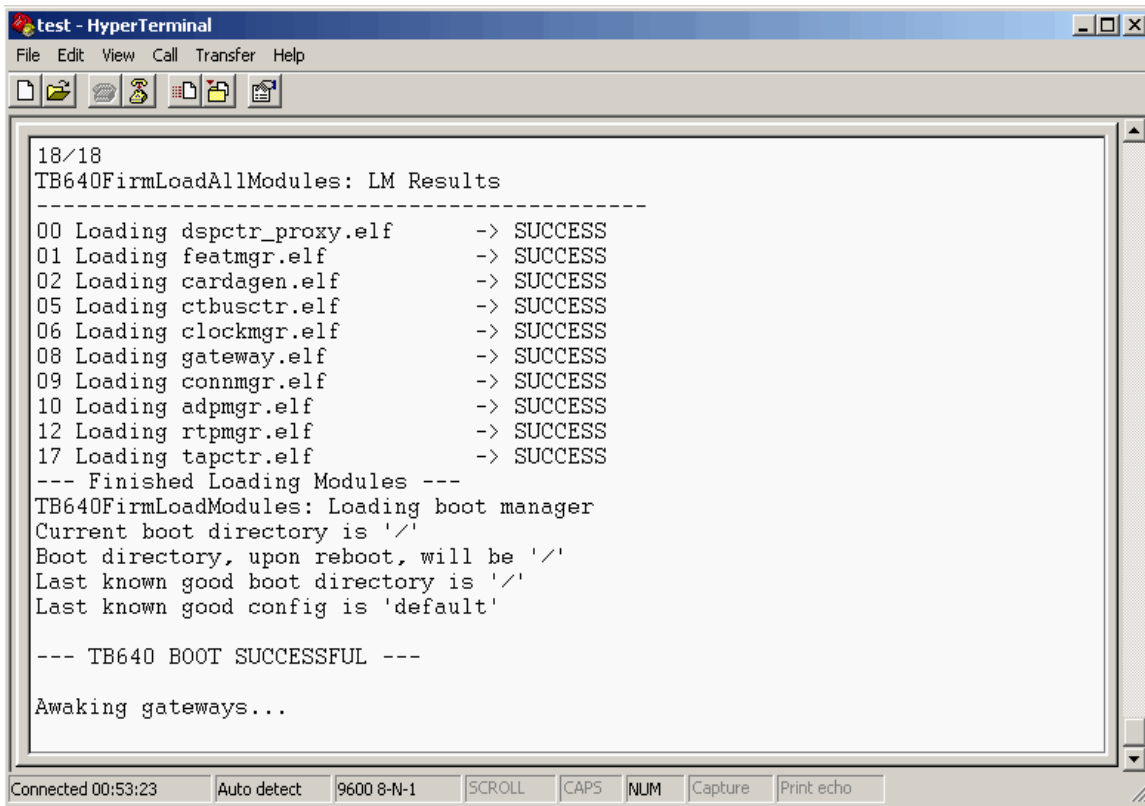


Figure 25 Hyper Terminal configuration step #3

5.1.4. The TM-1000 should be connected



```
test - HyperTerminal
File Edit View Call Transfer Help

18/18
TB640FirmLoadAllModules: LM Results
-----
00 Loading dspctr_proxy.elf      -> SUCCESS
01 Loading featmgr.elf          -> SUCCESS
02 Loading cardagen.elf         -> SUCCESS
05 Loading ctbusctr.elf         -> SUCCESS
06 Loading clockmgr.elf         -> SUCCESS
08 Loading gateway.elf          -> SUCCESS
09 Loading connmgr.elf          -> SUCCESS
10 Loading adpmgr.elf           -> SUCCESS
12 Loading rtpmgr.elf           -> SUCCESS
17 Loading tapctr.elf           -> SUCCESS
--- Finished Loading Modules ---
TB640FirmLoadModules: Loading boot manager
Current boot directory is '/'
Boot directory, upon reboot, will be '/'
Last known good boot directory is '/'
Last known good config is 'default'

--- TB640 BOOT SUCCESSFUL ---

Awaking gateways...

Connected 00:53:23  Auto detect  9600 8-N-1  SCROLL  CAPS  NUM  Capture  Print echo
```

Figure 26 Serial connection should be enabled

Then press the Enter key to see the following command prompt: **TB640>**

5.2. Configure IP addresses

5.2.1. set_net command

At the TB640> command prompt type

“set_net”

to modify the network configuration of the TM-1000. It includes the name of the TM-1000, if the DHCP is enabled or disabled, the IP address, the netmask and the gateway address of both Ethernet ports.

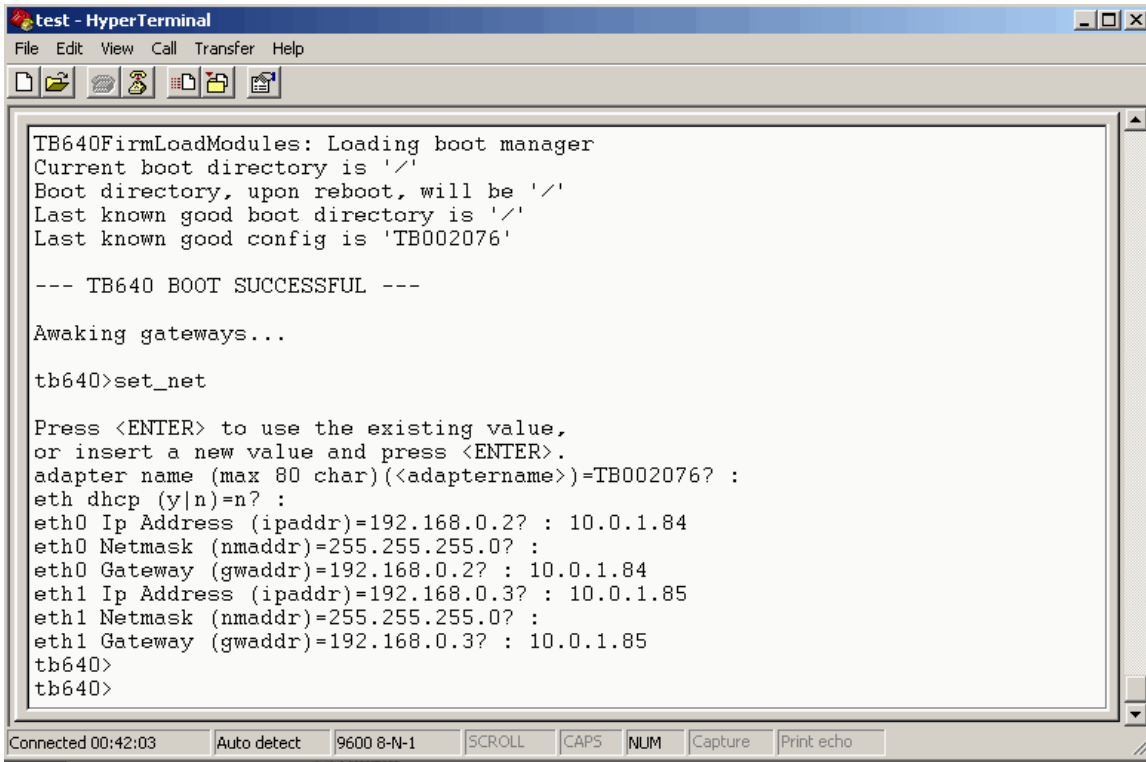


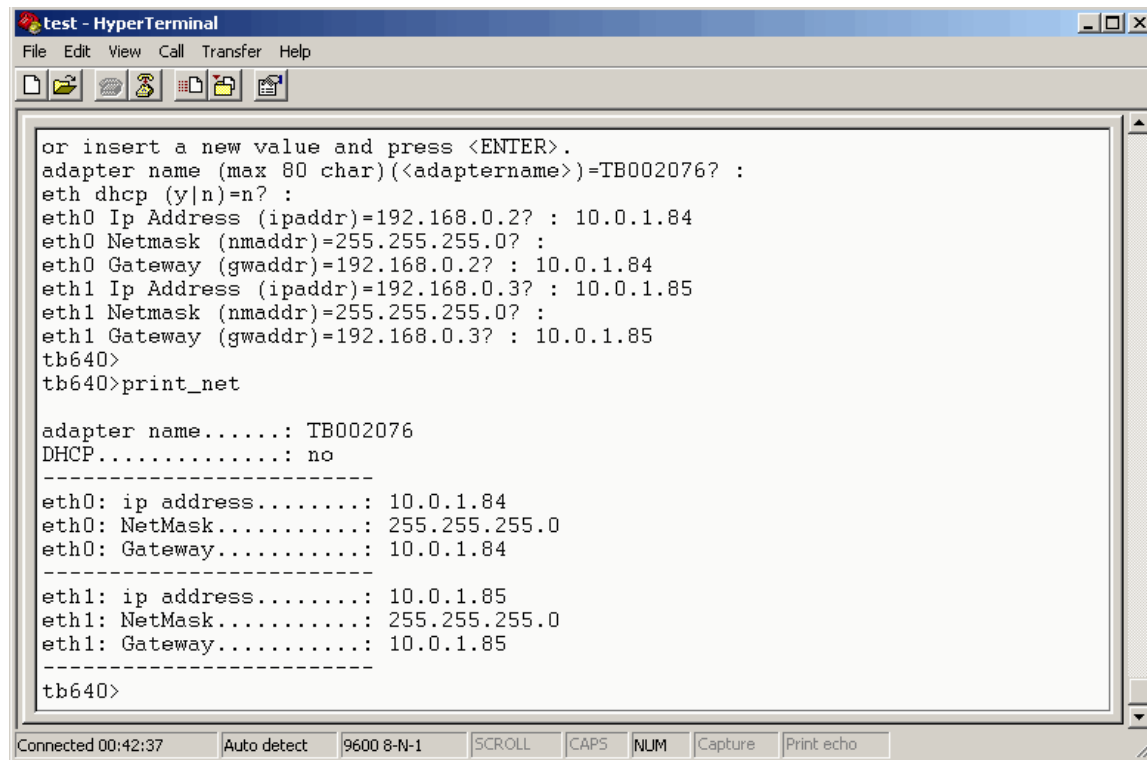
Figure 27 set_net command

adapter name:	Name of the TM-1000. This character string must uniquely identify the TM-1000. The default is the serial number.
DHCP:	Dynamic IP address is used when the TM-1000 is started. Not yet supported
eth0/eth1: ip address:	If not using DHCP, static IP address for port Ethernet 0 and Ethernet 1 of the TM-1000
eth0/eth1: NetMask:	If not using DHCP, network mask for port Ethernet 0 and Ethernet 1 of the TM-1000
eth0/eth1: Gateway:	If not using DHCP, gateway address for port Ethernet 0 and Ethernet 1 of the TM-1000. If you are planning the use the TM-1000 in the same subnet as the host (that is you don't require accessing an IP address outside the subnet), the gateway can be set to '127.0.0.1'. Do NOT use address '0.0.0.0' as the gateway as it is an invalid address.

Restart the TM-1000 to make the changes effective.

5.2.2. print_net command

To validate the “set_net” command, type “print_net” at the shell prompt of the TM-1000. The following information should be displayed:



```
test - HyperTerminal
File Edit View Call Transfer Help
or insert a new value and press <ENTER>.
adapter name (max 80 char)(<adaptername>)=TB002076? :
eth dhcp (y|n)=n? :
eth0 Ip Address (ipaddr)=192.168.0.2? : 10.0.1.84
eth0 Netmask (nmaddr)=255.255.255.0? :
eth0 Gateway (gwaddr)=192.168.0.2? : 10.0.1.84
eth1 Ip Address (ipaddr)=192.168.0.3? : 10.0.1.85
eth1 Netmask (nmaddr)=255.255.255.0? :
eth1 Gateway (gwaddr)=192.168.0.3? : 10.0.1.85
tb640>
tb640>print_net

adapter name.....: TB002076
DHCP.....: no
-----
eth0: ip address.....: 10.0.1.84
eth0: NetMask.....: 255.255.255.0
eth0: Gateway.....: 10.0.1.84
-----
eth1: ip address.....: 10.0.1.85
eth1: NetMask.....: 255.255.255.0
eth1: Gateway.....: 10.0.1.85
-----
tb640>
```

Connected 00:42:37 Auto detect 9600 8-N-1 SCROLL CAPS NUM Capture Print echo

Figure 28 print_net command

6. Software Installation

The **Toolpack Monitoring framework is available starting from the release 2.9.40**. Toolpack framework must be installed on the Application Server (host) that control the TM-1000.

For more information, please refer to https://docs.telcobridges.com/tbwiki/TM1000#Using_TM1000_with_Toolpack

6.1. Installing Toolpack

Refer to the following link for installation.:

https://docs.telcobridges.com/tbwiki/Installing_Toolpack

The installation guide for 2.9 is the same as for 2.8:

https://docs.telcobridges.com/tbwiki/Toolpack_installation_2-8

6.2. Toolpack Configuration Web Portal

The Web Portal is the principal means of interacting with a TM-1000.

https://docs.telcobridges.com/tbwiki/Web_Portal

Configuration:

1. Add the TM-1000 hardware (type TDM and TDM Line Type E1_T1_J1):
 - https://docs.telcobridges.com/tbwiki/Toolpack:Adding_an_Adapter_E
2. Configure the 128 tapped E1s (Rx1: index 0 to 63; Rx2: index 64 to 127)
 - https://docs.telcobridges.com/tbwiki/Toolpack:Create_E1_Configuration_A
3. Configure the system synchronization clock
 - https://docs.telcobridges.com/tbwiki/Toolpack:Defining_a_Clocking_Source_D

7. Upgrading the TM-1000 Firmware and license

The TM-1000 starts from the local file system located on the flash memory. The flash memory comes with a version of the firmware available at production time. The Toolpack framework will update the firmware of the TM-1000 automatically to the installed Toolpack version.

7.1. Installing a license

A valide license must be installed on the TM-1000. See the following link for more information:

https://docs.telcobridges.com/tbwiki/Toolpack:System_Settings_B-Upload_license

8. Toolpack API

This section apply to developers building an application with Toolpack Monitoring API.

8.1. Getting Started

Here is a few documentation pointer to get started with Toolpack API.

- https://docs.telcobridges.com/tbwiki/Toolpack_monitoring
- https://docs.telcobridges.com/tbwiki/Toolpack_API
- https://docs.telcobridges.com/tbwiki/CAF:_Working_With_Cmc_Call_Legs#Capturing_.28monitoring.29_HDLC
- https://docs.telcobridges.com/tbwiki/CMC_library

The Toolpack HTML API reference can be found in the **tb-doc-dev.zip** from the packages download. For example, to download the API for 2.9.40, the path would be (user:telcobridges; pass: tbsupport):

- http://download.telcobridges.com/release2.9.40_dev/tb-doc-dev.zip
- Unzip the file, and open **tb/doc/toolpack/html/index.html**

8.2. Compiling Libraries

Download and compile Toolpack source packages:

- https://docs.telcobridges.com/tbwiki/Compiling_Toolpack

8.3. Sample Application

The sample application “simple_monitoring” shows to use the Toolpack Monitoring API. The source of the application can be found in **/tb/src/toolpack/samples/simple_monitoring/**

The compile binaries can be found in:

`/tb/src/toolpack/samples/simple_monitoring/release/[os_architecture]/`

8.4. Stop and disable Gateway application

Before starting “simple_monitoring”, the Toolpack Framework Gateway application must be stopped and disabled:

1. From the Web Portal, from the left menu, click on “Hosts->Applications”
2. Click on “gateway”
3. Click on remove from the hosts section
4. Click on “Save”