

TM-1000 Installation Guide

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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

This document should be used as a reference material.

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1. System Requirements

1.1. Equipment Required

- TM-1000
- Control system (Host)
- 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 SCSI-3 cables for connection between the TM-1000 and the patch panels

1.2. Control System Requirements

1.2.1. Recommended Windows System Requirements:

- Pentium 4: 3Ghz or higher processor with 1GB RAM
- 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.
- WinZip 8.0 or equivalent
- HyperTerminal or equivalent
- Two 100Mbps/1Gbps Ethernet adapters. We recommend 1Gbps if this host is running the TB-StreamServer
- Microsoft Visual Studio 6.0 with Service Pack 5
- We recommend installing the latest version of cygwin (<http://www.cygwin.com/>) to be able to compile projects using the ‘make’ utility. During the installation ,we recommend setting the following modules to ‘install’:

Archive	Install
Devel	Install
Doc	Install
Interpreters	Install
Net	Install
Perl	Install
Shell	Install
Utils	Install

- In the case where cygwin is installed, GNU MAKE utility version 3.80 or equivalent (not 3.81) is required. The TM-1000 software package has not been tested with other versions.

1.2.2. Recommended Solaris System Requirements:

- Sparc-based system ,1Ghz or more, with 512MB of memory or Intel or AMD-based system, 3Ghz or more, with 1GB of memory
- Solaris 8, 9 or 10, Sparc 32/64 bits or Intel/AMD, 32 bits/64 bits
- GNU compiler gcc-3.2.1-1.2.0 or equivalent. The TM-1000 software package has not been tested with other versions

- GNU MAKE utility make-3.80-1.2.0 or equivalent (not 3.81). The TM-1000 software package has not been tested with other versions
- GZIP utility version 1.2.4 or equivalent
- Two 100Mbps/1Gbps Ethernet adapters. We recommend 1Gbps if this host is running the TB-StreamServer
 - Use the OPENPKG script openpkg-1.2.0-1.2.0.sparc64-solaris2.8-cw.sh to install the GNU compiler and GNU MAKE utility on a clean machine
 - The above utilities and applications (except Solaris 8 64 bits and GZIP) are available, for free, over the Internet at <http://www.openpkg.org/>

1.2.3. Recommended Linux System Requirements

- Intel or AMD-based system, 3Ghz or more with 1GB of memory
- Any Linux version with kernel 2.6 or more recent. We have tested the following version:
 - Red Hat Enterprise Linux Workstation (and update 2)
 - Linux Fedora Core 4
 - Linux Gentoo 2006.2
 - Ubuntu 6
 - Other versions can be tested upon request
- GNU compiler gcc-3.2.3 or equivalent. The TM-1000 software package has not been tested with other versions
- GNU MAKE utility make-3.80 or equivalent (not 3.81). The TM-1000 software package has not been tested with other versions
- GZIP utility version 1.2.4 or equivalent
- 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.

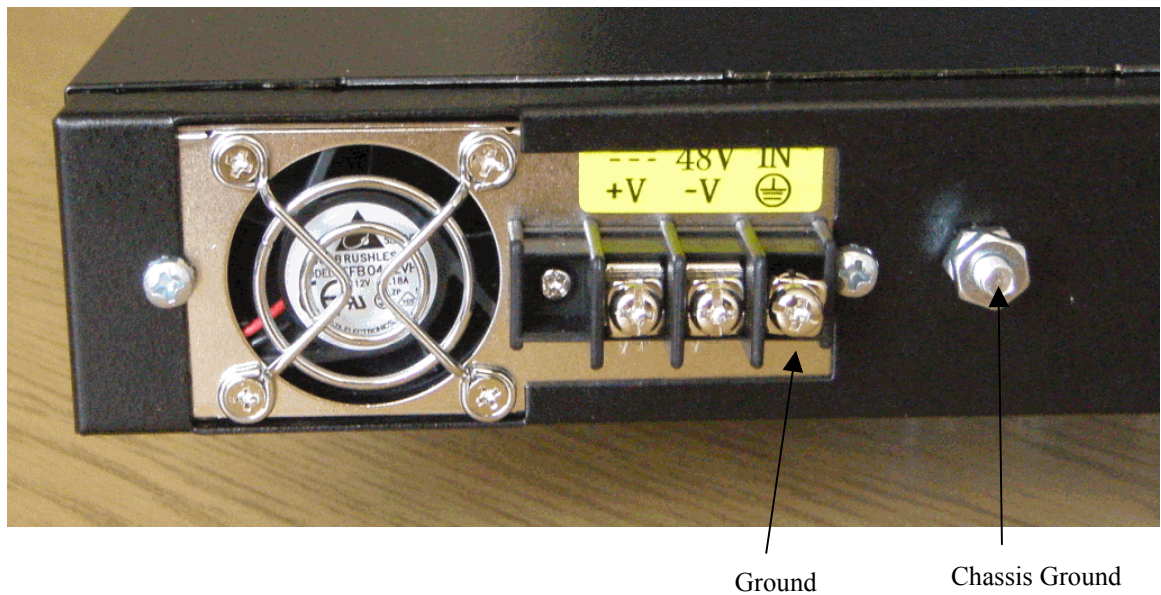


Figure 1 TM-1000 rear view DC Power supply option and ground post

2.1. TM-1000 Front View and Physical Dimensions

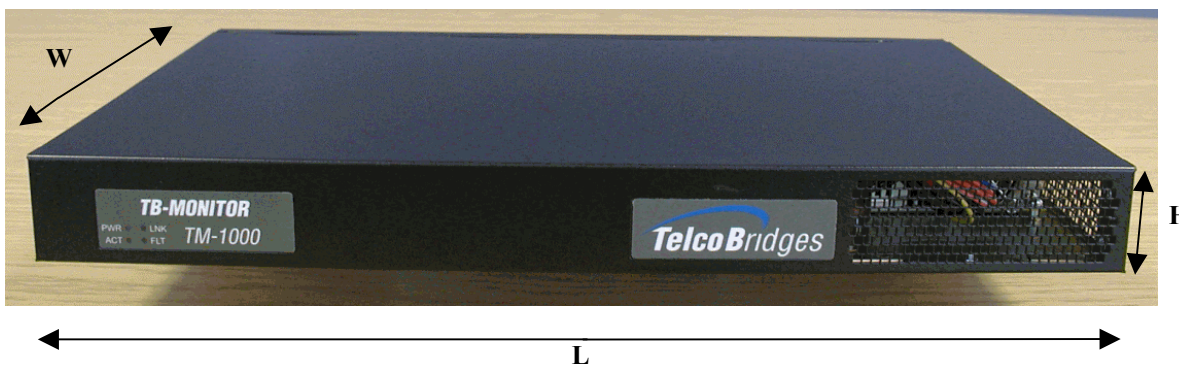


Figure 2 TM-1000 Front View

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 3 TM-1000 right side view

2.4. TM-1000 left side view

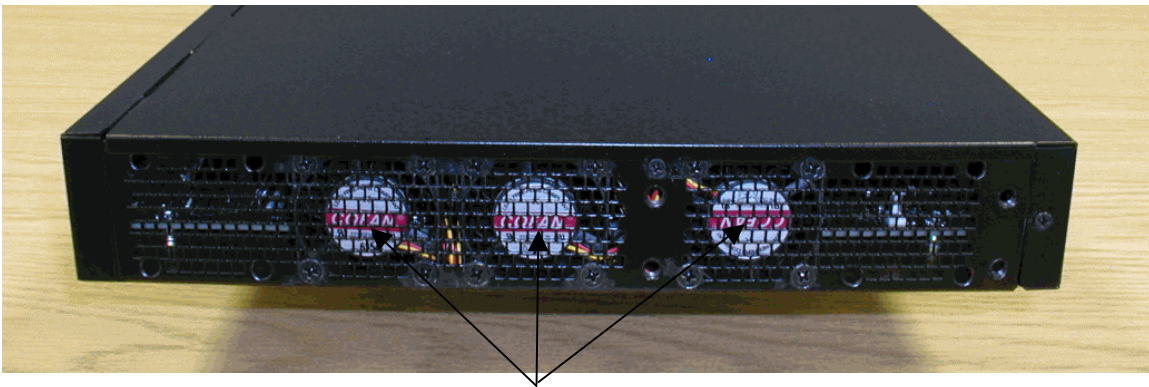


Figure 4 TM-1000 left side view with three cooling fans

2.5. TM-1000 rack-mounting brackets and screws



Figure 5 TM-1000 left and right side bracket kit

2.5.1. TM-1000 with left side bracket installed



Figure 6 TM-1000 left side right angle

2.5.2. TM-1000 with right side bracket installed

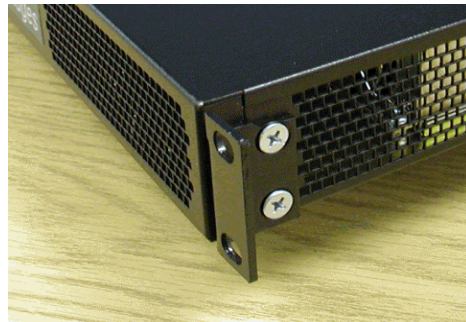


Figure 7 TM-1000 right side right angle

2.6. TM-1000 LED Description



Figure 8 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 9 TM-1000 rear view

2.8. TM-1000 DC Power Supply Option

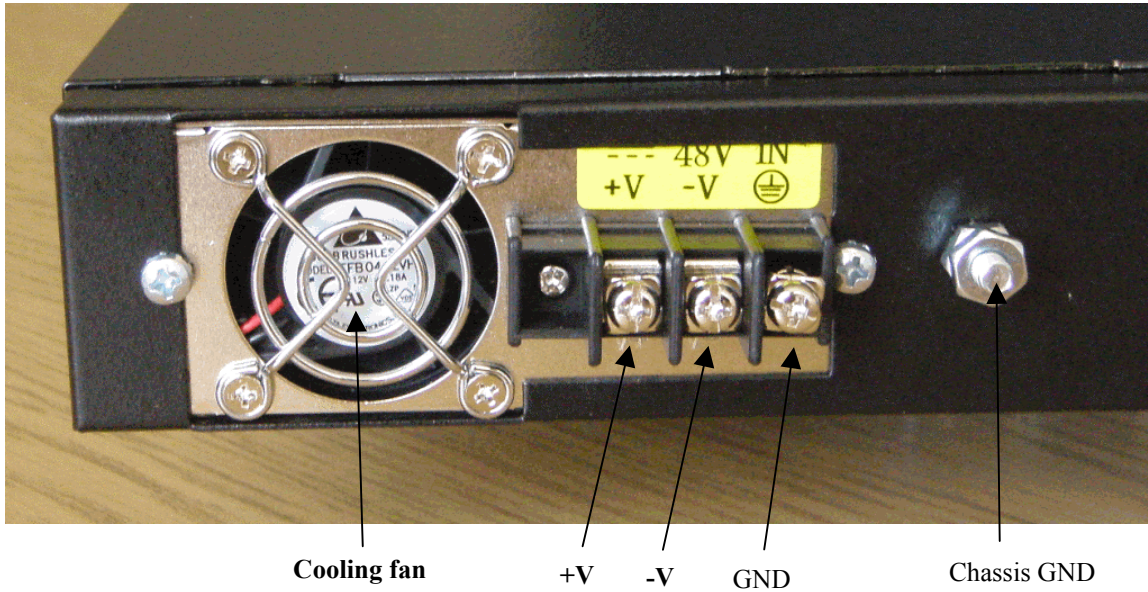


Figure 10 TM-1000 rear view DC Power supply option and ground post

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

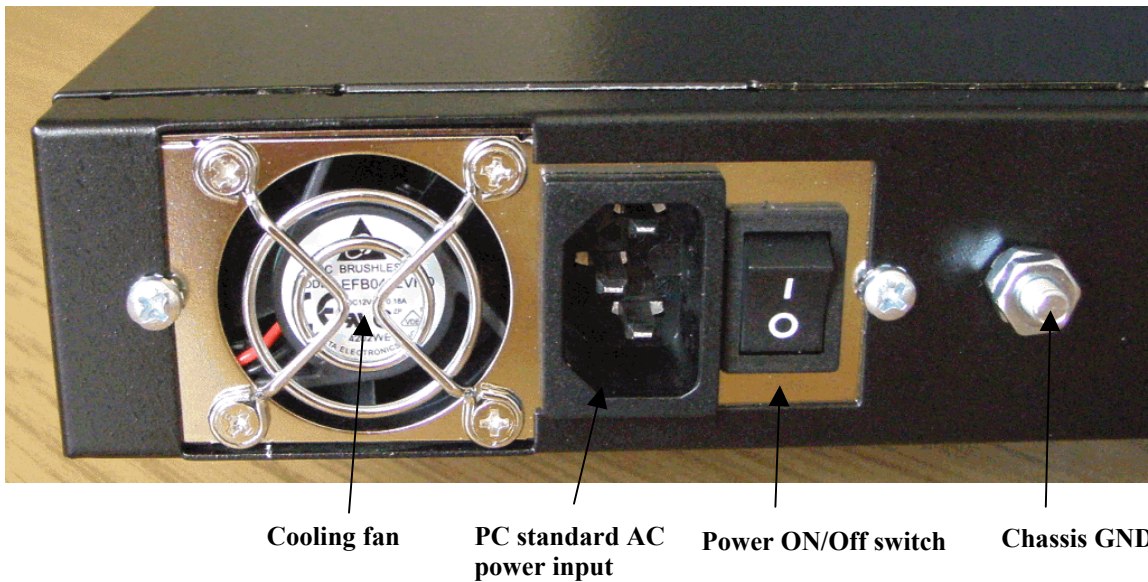


Figure 11 TM-1000 rear view AC Power supply option, On/Off switch and ground post

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

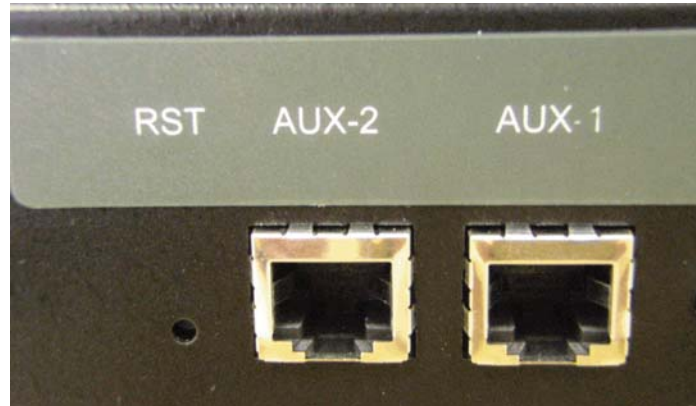


Figure 12 TM-1000 rear view Reset and auxiliary feature

- You will need to insert a pin in the hole to reach the reset button (see Section 7.4.3)
- 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 13 TM-1000 rear view RS-232 Link

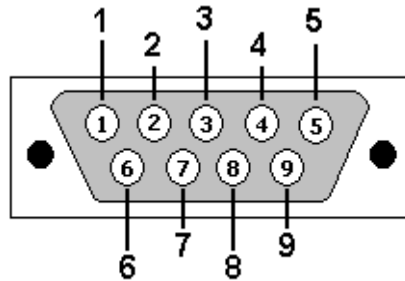


Figure 14 TM-1000 RS-232 Pin Out

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

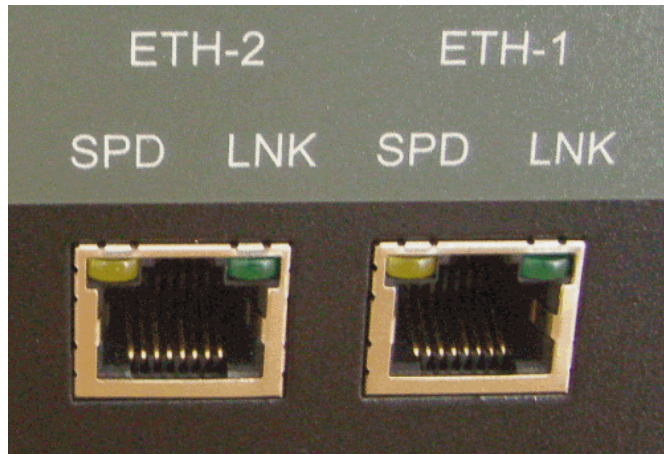
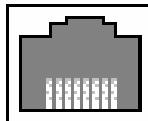


Figure 15 TM-1000 rear view Ethernet 10/100/1G ports

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

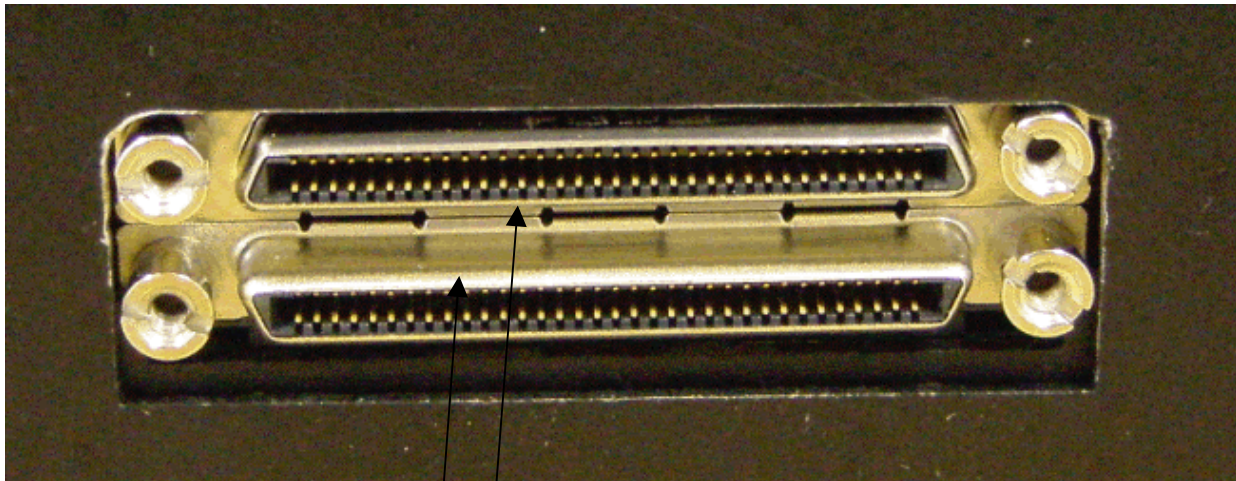
- IEEE 802.3z/ab 1000Base-T

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



Figure 16 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 17 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 18 Patch panel front view

3.2. Patch panel rear view



2 x Philips screws

Pull up the cover to remove

Figure 19 Patch panel rear view

- Patch panel trunk impedance all selector switch

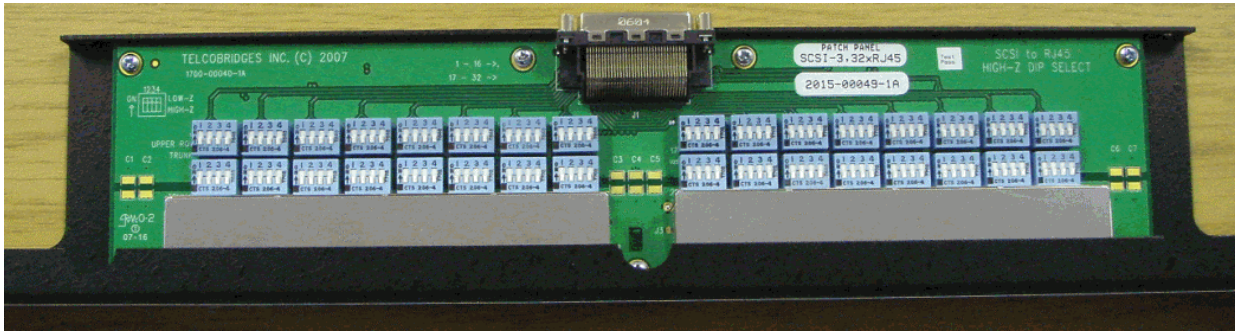


Figure 20 Patch panel impedance selector switch

3.3. Patch panel trunk impedance selector switch

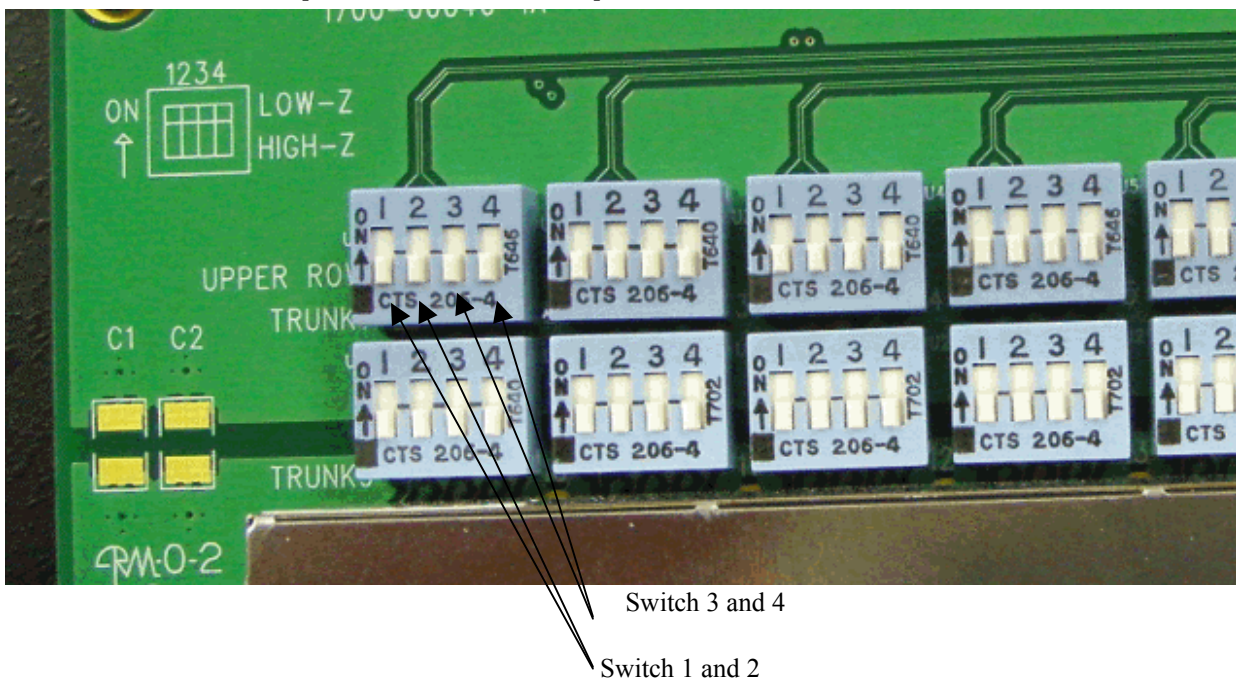


Figure 21 Patch panel impedance selector switch

- 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 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	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 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	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 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	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 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	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 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	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

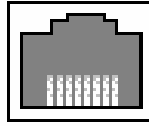
3.7. Patch panel selector switch fit with TM-1000 cable-4

		Switch 9		Switch 10		Switch 11		Switch 12		Switch 13		Switch 14		Switch 15		Switch 16	
Upper Row	Switch 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	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 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	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 2.10 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 6 of this document).
9. Contact **TelcoBridges** at www.telcobridges.com to get a license and the latest software package for each TM-1000 (Reference section 5 of this document).
10. Install the package and license (Reference Section 5 of this document).
11. Verify the installation (Reference Section 7.4.1 of this document).

5. Software Installation

You will need to go to the **TelcoBridges** web site to download the latest version of the software for the TM-1000.

1. Go to www.telcobridges.com
2. On the upper right hand corner you will see the customer Login. Enter your username and password and click on the login button (your username and password should have been provided to you by the **TelcoBridges** support group).
3. Select the package required for your operating system and begin the download process. There are actually four archives to download if you require a full package installation:
 1. The common package contains OS-agnostic code such as header files, samples, source files, and generic makefiles). This file is named `tb640_<MM>.<mm>.<dd>.<rc>_common.tgz` where:
 - i. <MM>, is usually “_0”
 - ii. <mm>, is the major version (in the case below it is 95)
 - iii. <dd> is the minor version (in the case below it is 6)
 - iv. <rc> is the decimal value (in the case below it is 1
 - v. the release candidate tag.

For example: `tb640_0.95.6.1_common.tgz`
 2. The OS-specific binary package contains already compiled binaries such as libraries and tools). This file is named `tb640_<MM>.<mm>.<dd>.<rc>_<processor>-<os/arch>_<buildtype>.tgz`.
For example:
 - `tb640_0.95.6.1_i586-linux_release.tgz`
 - `tb640_0.95.6.1_x86_64-linux64_release.tgz`
 - `tb640_0.95.6.1_i586-solaris32_release.tgz`
 - `tb640_0.95.6.1_i586-win32_release.tgz`
 - `tb640_0.95.6.1_i586-win32_release_dll.tgz`
 - `tb640_0.95.6.1_sparc-solaris32_release.tgz`
 - `tb640_0.95.6.1_sparc-solaris64_release.tgz`
 - `tb640_0.95.6.1_ppc-vxworks_release.tgz`
 3. The TM-1000 firmware file package: This package contains the compressed image that is uploaded to the TM-1000 and runs the embedded code. The file is named `tb640-adapter.release.zip`. This image is common to all **TelcoBridges**’ hardware.
 4. The documentation package (`tb640-doc.zip`) contains user’s guides, API documents (in HTML and CHM formats), application notes, design guides and release notes.

5.1. Windows package installation steps

To install the TM-1000 package onto Windows machine using GUI:

1. Log on to the machine using an account with Administrator privileges
2. Create a new directory using the file explorer

C:\tbrel
3. Using the file explorer, click on the common package, the OS-specific package and the firmware package (specified in Section 5) and uncompress them into the newly created directory.
4. If this is a new TM-1000, go to section Configure TM-1000 (Section 6). If the TM-1000 is already configured, go to Section Upgrading TM-1000 (Section 7).

5.2. Solaris, Linux and Windows (Cygwin) packages installation steps

To install the TM-1000 packages onto a Solaris, Linux or Windows (using Cygwin) machine:

1. Log on to the machine using an account with supervisor privileges (or Administrator privileges in the case of Windows).
2. Start a bash shell by typing the command ‘bash’ at the shell prompt.
3. The paths must be set up correctly to be able to call ‘**make**’, ‘**gcc**’ and ‘**gunzip**’ applications. If the paths are set up correctly, then
 - **make** should output “**make: *** No target specified...**”
 - **gcc** should output “**gcc: no input files**”
 - **gunzip** should output “**gunzip: compressed data...**”

If this doesn’t work, then you need to set up the paths correctly.

4. Create a new directory using the command

```
mkdir tbrel
cd tbrel
```
5. Uncompress the common package, the OS-specific package and the firmware package (specified in Section 5) into the directory:

```
gunzip *tgz
tar -xvf tb640_0.95.6.1_common.tar [filename used as an example]
tar -xvf tb640_0.95.6.1_i586-win32_release.tar [filename used as an example]
unzip tb640-adapter.release.zip [filename used as an example]
```
6. If this is a new TM-1000, go to section 6 Configure TM-1000. If the TM-1000 is already configured, go to Section 7 Upgrade TM-1000.

5.3. Package components

5.3.1. Common package content:

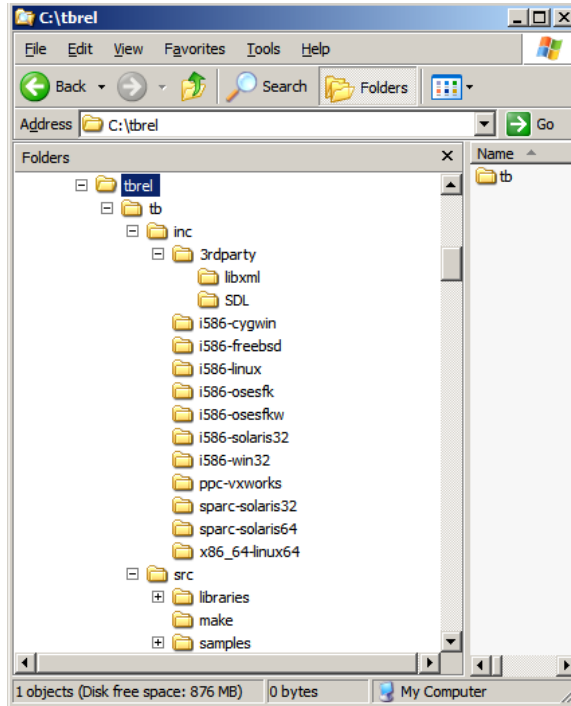


Figure 22 Common package content

Filename	Description and use
/tb/inc	Includes files required to compile sample applications.
/tb/inc/<processor>-<os/arch>	Includes files that are specific to a processor/OS/architecture combination and are required to compile sample applications.
/tb/inc/3rdparty/SDL	Not applicable
/tb/inc/3rdparty/libxml	Not applicable
/tb/src/make	Contains the makefile and sub-makefiles required to compile sample applications.
/tb/src/libraries	Contains different utility libraries with their sources that are required to build some of the sample applications.
/tb/src/samples	Contains the numerous sample application sources.
/tb/src/samples/call_bridging/*.c and *.h	Not applicable
/tb/src/samples/cas/*.c and *.h	Not applicable
/tb/src/samples/cas/casstates.pdf	Not applicable
/tb/src/samples/common	Common source used by other samples
/tb/src/samples/conf/*.c and *.h	Not applicable
/tb/src/samples/connection/*.c and *.h	Not applicable
/tb/src/samples/fsk/*.c and *.h	Not applicable
/tb/src/samples/install/*.c and *.h /tb/bin/<buildtype><processor>-<os/arch>/install	These files are the source, header and makefile required to compile and run the “install” sample application. This sample is the source code of the tool to update the TM-1000.
/tb/src/samples/isdnext/*.c and *.h	Not applicable

Filename	Description and use
/tb/src/samples/mb1/*.c and *.h	Not applicable
/tb/src/samples/np1/*.c and *.h	Not applicable
/tb/src/samples/showmb1port/*.c and *.h	Not applicable
/tb/bin/<buildtype><processor>-<os/arch>/showmb1port	
/tb/src/samples/showtrunk/*.c and *.h	Replaced by tbshowls
/tb/src/samples/sip_callctrl/*.c and *.h	Not applicable
/tb/src/samples/ss7/*.c and *.h	Not applicable
/tb/src/samples/ss7/ss7states.doc	Not applicable
/tb/src/samples/ss7_ha/*	Not applicable
/tb/src/samples/standalone/*.c and *.h /tb/bin/<buildtype><processor>-<os/arch>/standalone	These files are the source, header and makefile required to compile and run the “standalone” sample application. This sample configures the TM-1000 and is receives monitoring packets.
/tb/src/samples/stream/callshandler.pdf	Not applicable
/tb640/samples/stream/callsgenerator/*.c and *.h	Not applicable
/tb/src/samples/stream/callshandler/*.c and *.h	Not applicable
/tb/src/samples/stream/loopback/*.c and *.h	Not applicable
/tb/src/samples/stream/tbstreamplayer/*.c and *.h	Not applicable
/tb/src/samples/stream/tbstreamserver_test/*.c and *.h	Not applicable
/tb/src/samples/tb640clock/*.c and *.h /tb/bin/<buildtype><processor>-<os/arch>/tb640clock	Source code for the tool to setup the system clocking
/tb/src/samples/tb640debug/*.c and *.h /tb/bin/<buildtype><processor>-<os/arch>/tb640debug	Dumps information about the TM-1000 in a file (probe information, trunk configuration, connections)
/tb/src/samples/tb640display/*.c and *.h	Not applicable
/tb/src/samples/tbclear/*.c and *.h /tb/bin/<buildtype><processor>-<os/arch>/tbclear	These files are the source, header and makefile required to compile and run the “tbclear” sample application. It demonstrates how to clear all open resources on the TM-1000. This sample code can be used when a TM-1000 needs to be re-initialized properly by an application. The code base can be adapted to clear only parts of the resources (for example only one trunk).
/tb/src/samples/tbcomm/*.c and *.h	Source code for a sample program to show how to communicate inter-process with the TBX host library.
/tb/src/samples/tbshowls/*.c and *.h /tb/bin/<buildtype><processor>-<os/arch>/tbshowls	Sample program that checks the status of the physical interfaces status (E1/T1/J1, DS3 or OC3/STM-1). This tool replaces the showtrunk sample program.
/tb/src/samples/tcap/*.c and *.h	Not applicable
/tb/src/samples/tones/*.c and *.h	Not applicable
/tb640/samples/voiceprocessing/*.c and *.h	Not applicable
/tb/src/samples/voip/*.c and *.h	Not applicable

Filename	Description and use
/tb/libraries/tbxappsutil	Source of a library containing various utility functions (MD5, string manipulation functions). This library is used by some of the samples.
/tb/src/libraries/tbxdigitmap	CMC
/tb/libraries/tbxclitools	Source of a library used to manage a Windows environment under any shell in text mode. This library is used by some of the samples.
/tb/libraries/tbxlsutil	Source of a library that offers simplification functions to access trunk resources, line interfaces and line services. This library is used by some of the samples.
/tb/libraries/tbxmedia	Not applicable
/tb/libraries/tbxsiputil	Not applicable
/tb/src/libraries/tbxsmartall_cpp	CMC

Table 14 File descriptions for the 'common' package

5.3.2. OS-Specific Package Contents:

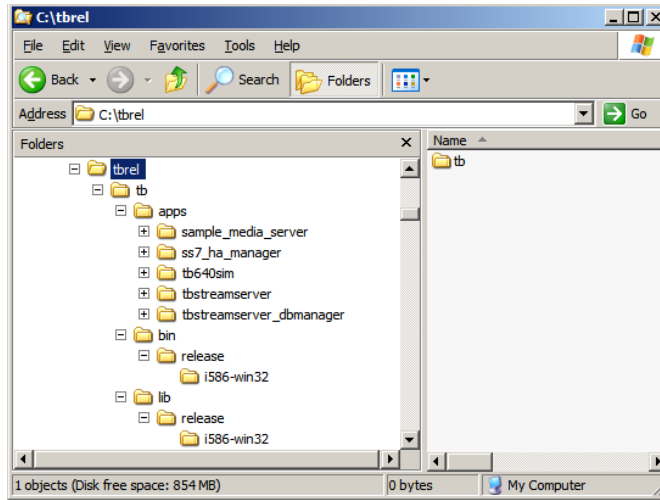


Figure 23 OS-Specific package content

Filename	Description and use
/tb/bin/<buildtype><processor>-<os/arch>	Contains binaries of tools or compiled samples. Also any binary output of any compiled projects (such as samples) are copied here.
/tb/lib/<buildtype><processor>-<os/arch>	Contains required libraries to compile the samples.
/tb/apps	Directory containing tools and applications in their binary form with their associated configuration files.
/tb/apps/sample media server	Not applicable
/tb/apps/ss7 ha manager	Not applicable
/tb/apps/tb640clock	Can be used to configure the TM-1000 clock
/tb/apps/tb640sim	Not applicable
/tb/apps/tb_service_installer	Program for installing an application as a service in Windows.
/tb/apps/tbstreamlisten	Tool used to capture data streams from the TDM network. No DSPs are required on the blades.
/tb/apps/tbstreamserver	Not applicable
/tb/apps/tbstreamserver_dbmanager	Not applicable
/tb/apps/tbstreamserver_tts	Not applicable
/tb/apps/tbx_videomux	Not applicable
/tb/apps/udplistener	This program is used to get trace information from the blade. The blades must be configured to transmit UDP logs to a specific IP address and port (set_debug and load_debug in a console window)

Table 15 File description for the 'OS-Specific' package

5.3.3. TM-1000 package content:

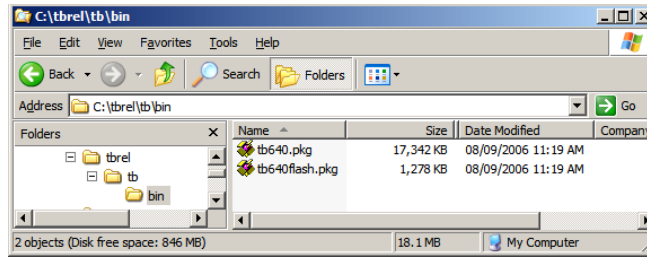


Figure 24 TM-1000 package content tree

Filename	Description and use
/tb/bin/tb640.pkg	This is the installation package for the TM-1000. Use the installation tool to install this package to the TM-1000.
/tb/bin/tb640flash.pkg	This is the firmware flash package for the TM-1000. This package is used to update the version of some programmable hardware components on the TM-1000. Use the installation tool to flash this package onto the TM-1000. Please use with caution. It should only be used if requested by a TelcoBridges support engineer.

Table 16 TM-1000 package content

5.3.4. Document package content:

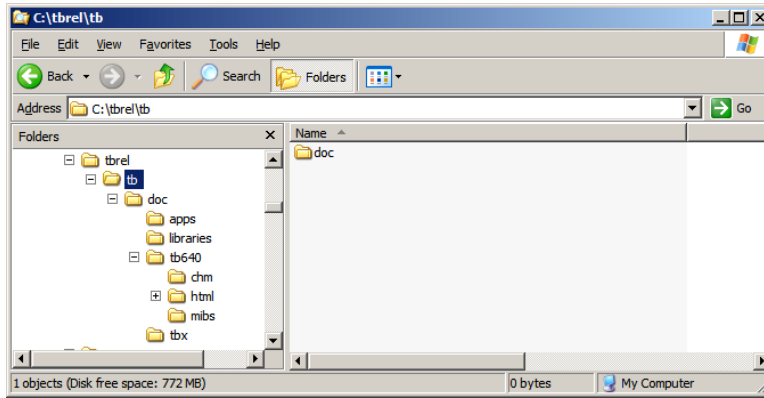


Figure 25 Document package content tree

Filename	Description and use
/tb/doc/apps	This directory contains the documentation about compiled applications.
/tb/doc/cmc	Not applicable
/tb/doc/libraries	This directory contains the documentation about the TM-1000 application libraries.
/tb/doc/tb640	This directory contains the documentation about TM-1000 APIs and supported MIBs
/tb/doc/tbx	This directory contains the documentation about TM-1000 product
/tb/doc/apps/tb640 ss7 ha system overview.pdf	Not Applicable
/tb/doc/apps/tb640 ss7 ha manager guide.pdf	Not Applicable
/tb/doc/apps/tbstreamserver API Reference Guide.pdf	Not Applicable
/tb/doc/apps/tbstreamserver hardware guide.pdf	Not Applicable
/tb/doc/libraries/tb640 ss7 ha callctrl guide.pdf	Not Applicable
/tb/doc/libraries/tb640 ss7 ha tcapctrl guide.pdf	Not Applicable
/tb/doc/tb640/chm/index.chm	This file is the compressed-html version of the index for all API reference manuals. This file is Windows specific.
/tb/doc/tb640/html/index/index.html	This file is the html version of the index for all API reference manuals.
/tb/doc/tb640/mibs	This directory contains support SNMP MIBs files.
/tb/doc/tb640/migration guide vX to vX.txt	API changes from release to release. TelcoBridges try to keep those changes to a minimum.
/tb/doc/tb640/Quick Install Guide for TM-1000.pdf	Summary of the TM-1000 installation guide
/tb/doc/tb640/readme_flash.txt	How to flash the TM1000. Do not use unless instructed by TelcoBridges support
/tb/doc/tb640/release notes.txt	New features in this release and issues fixed. This shows which bug report tracking are fixed (identified by #)

/tb/doc/tb640/tb640 h223 user's guide.pdf	Not Applicable
/tb/doc/tb640/TB640 Installation guide.pdf	Not Applicable
/tb/doc/tb640/tb640 sip user's guide.pdf	Not Applicable
/tb/doc/tb640/tb640 ss7 user's guide.pdf	Not Applicable
/tb/doc/tb640/tb640 user's guide.pdf	Not Applicable
/tb/doc/tb640/TBDspWizard.html	Not Applicable
/tb/doc/tb640/TBVoipWizard.html	Not Applicable
/tb/doc/tb640/TM1000 Installation guide.pdf	This document. Explains how to install the TM-1000
/tb/doc/tbx/TBX API Design Guide.pdf	Explains how to design applications using the TBx architecture of messaging.
/tb/doc/tbx/TBX API Reference Guide.pdf	API reference for the TBx 'hostlib' library used to communicate with any TBx family product.
/tb/doc/tbx/TBX Streamlib API Reference Guide.pdf	Not Applicable

Table 17 Document package content

6. 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.)

6.1. 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.

6.1.1. Create a connection name

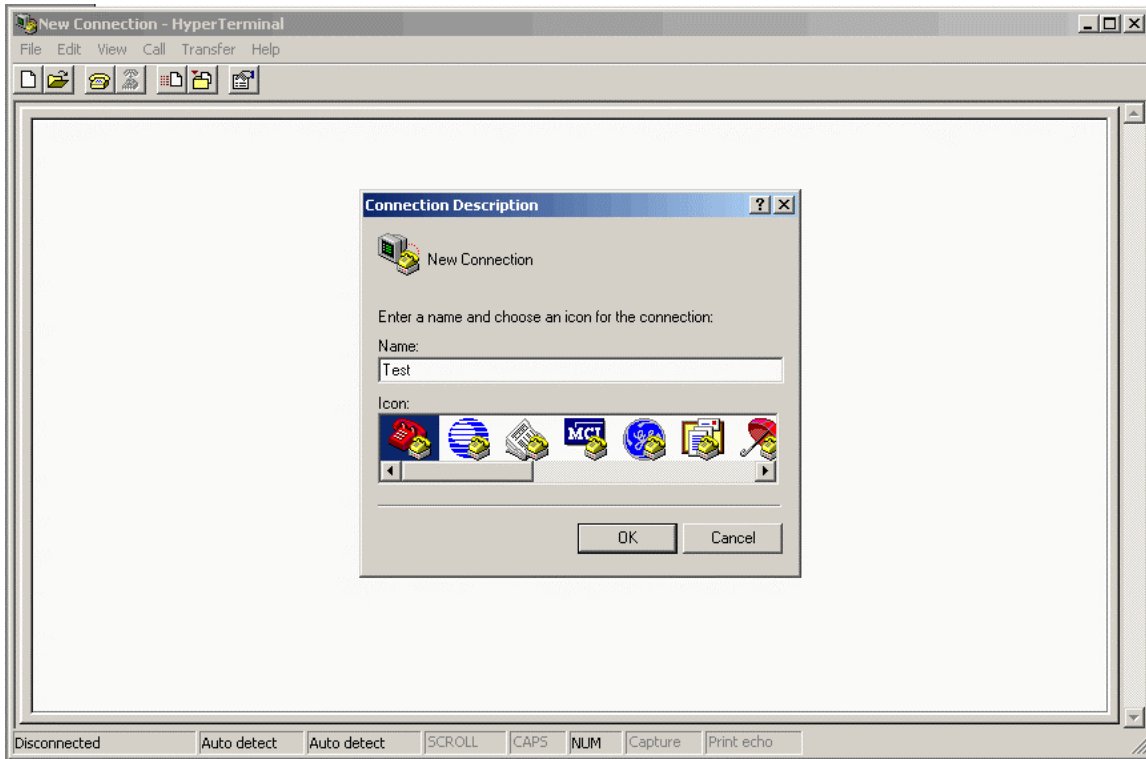


Figure 26 Hyper Terminal configuration step #1

6.1.2. Set the com port

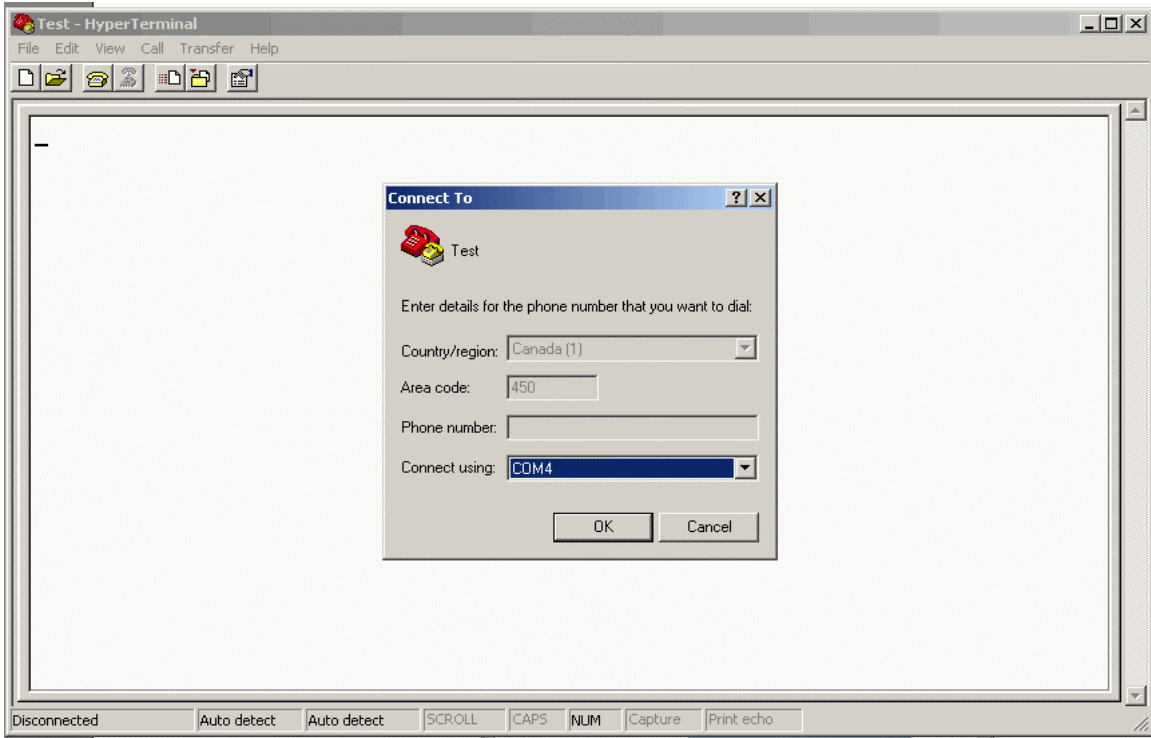


Figure 27 Hyper Terminal configuration step #2

6.1.3. Set Bits rate Flow control

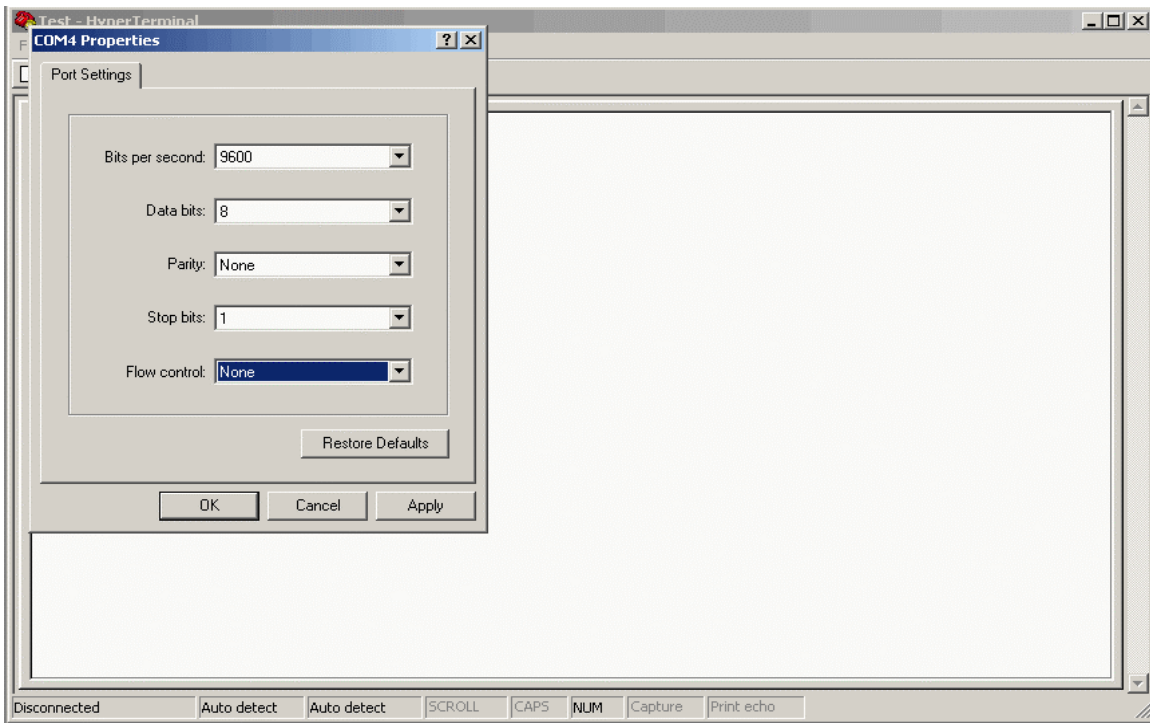
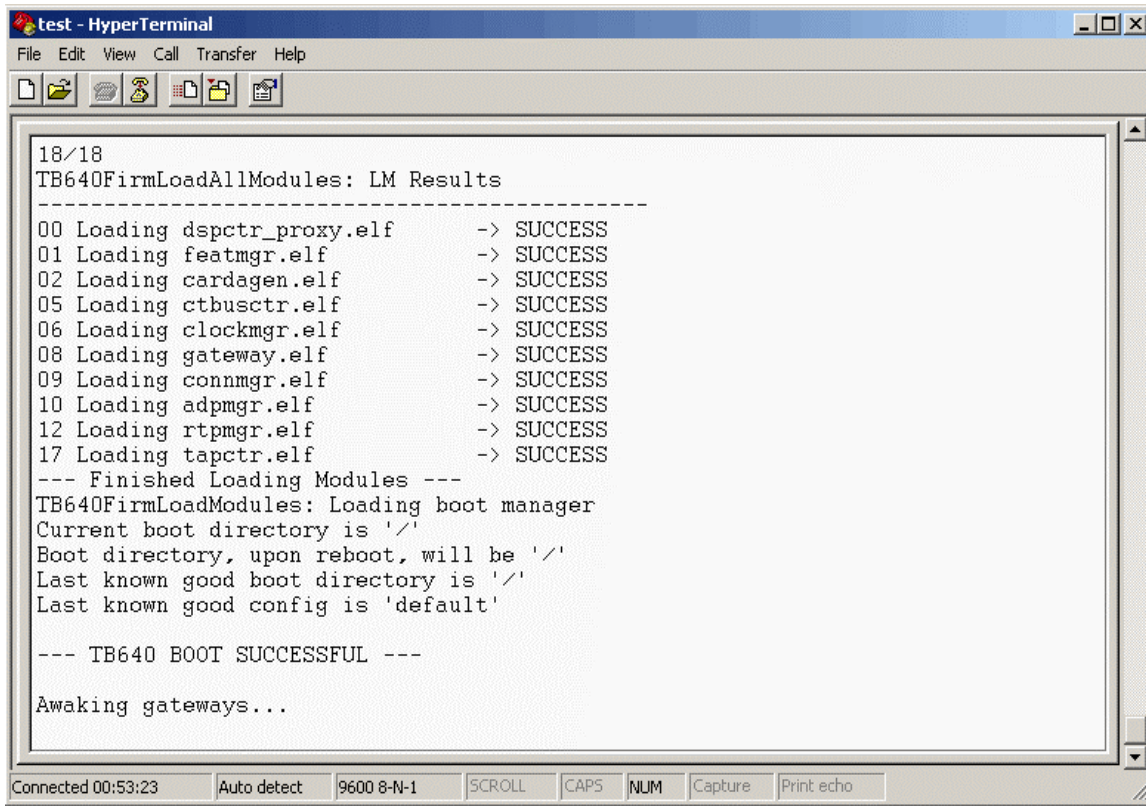


Figure 28 Hyper Terminal configuration step #3

6.1.4. 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 29 Serial connection should be enabled

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

6.2. Software IP address setting

6.2.1. 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.

```

test - HyperTerminal
File Edit View Call Transfer Help

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 'TB002076'

--- TB640 BOOT SUCCESSFUL ---

Awaking gateways...

tb640>set_net

Press <ENTER> to use the existing value,
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>
  
```

Figure 30 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.

6.2.2. 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:

```

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>

```

Figure 31 print_net command

6.3. Software debug setting

6.3.1. set_debug command

Type “set_debug” to set the debug information to the target system.

The debug output (also called udplisten log) from any TM-1000 can be sent to a target system for analysis. This is useful for debugging applications and systems. Each TM-1000 can send UDP packets on a particular UDP port. Eth0 and Eth1 debug output will send different information, but they can be sent to the same target system.

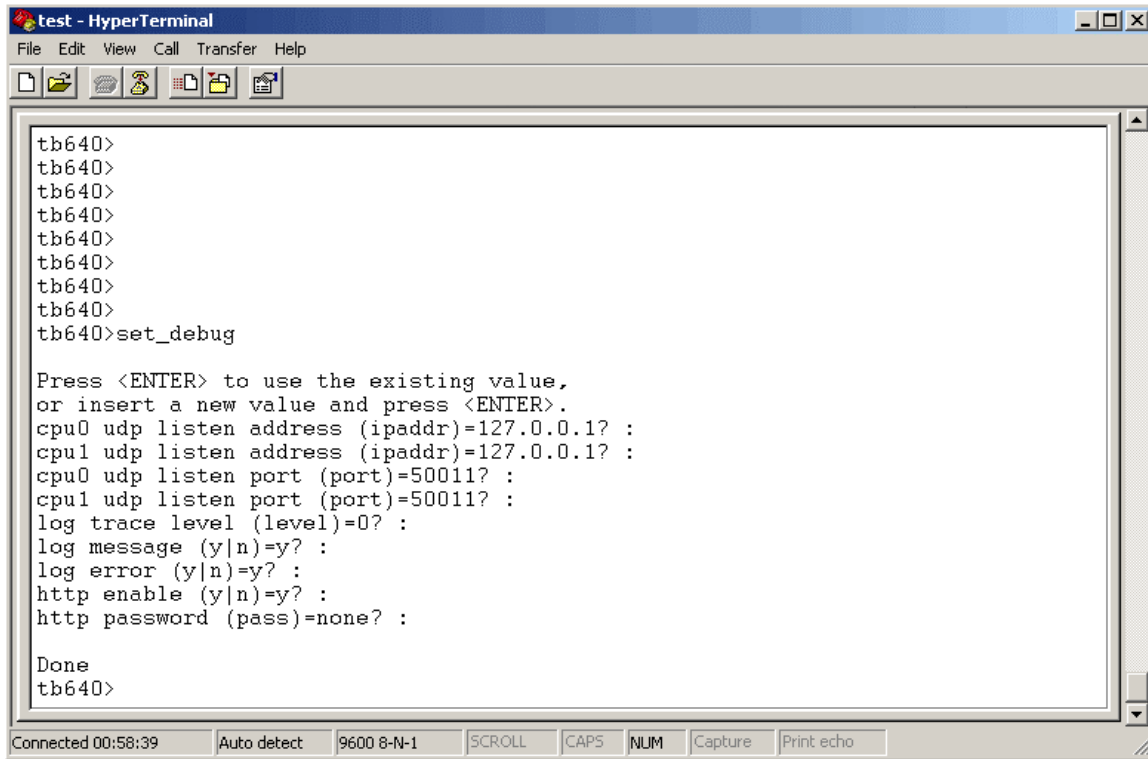
The default trace configuration is used to log errors only. In some cases, the support group may ask you to change these values. Once the test is complete these parameters should be put back their default state (trace level:0, message:n, error:y)

The HTTP Server is used to access internal states of the TM-1000 with HTTP. The support group may ask you to do this. Otherwise this function should not be used. It should be password-protected.

To view the configuration, use print_debug command.

To set a new configuration, use the set_debug command.

Once this is completed, you need to run the tb/apps/udplisten <UDP port #> program on the target system to receive the logs.



```

test - HyperTerminal
File Edit View Call Transfer Help
tb640>
tb640>
tb640>
tb640>
tb640>
tb640>
tb640>
tb640>
tb640>set_debug

Press <ENTER> to use the existing value,
or insert a new value and press <ENTER>.
cpu0 udp listen address (ipaddr)=127.0.0.1? :
cpu1 udp listen address (ipaddr)=127.0.0.1? :
cpu0 udp listen port (port)=50011? :
cpu1 udp listen port (port)=50011? :
log trace level (level)=0? :
log message (y|n)=y? :
log error (y|n)=y? :
http enable (y|n)=y? :
http password (pass)=none? :

Done
tb640>
Connected 00:58:39 Auto detect 9600 8-N-1 SCROLL CAPS NUM Capture Print echo

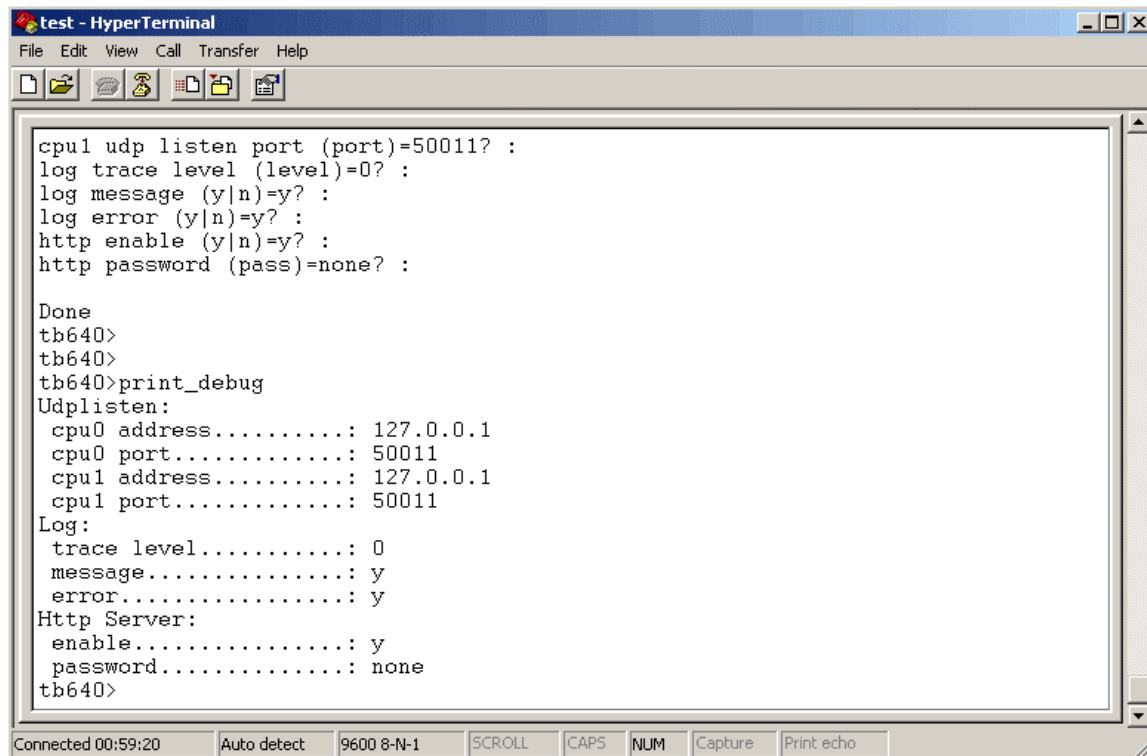
```

Figure 32 set_debug command

Cpu0 address:	IP address where cpu0 will send its debug information. If 127.0.0.1 is used, the information will not be sent outside of the TM-1000.
Cpu0 port:	UDP port used by cpu0 to send its debug information. The convention is to use the serial number digits and add it to 50000. For example, serial number TB000358 will use UDP port 50358.
Cpu1 address:	IP address where cpu1 will send its debug information.
Cpu1 port:	UDP port used by cpu1 to send its debug information.
Log Trace level:	Adjusts the trace level. Trace level 1 is the highest level trace, all the way to level 10 which is almost no traces. Use trace level 0 to disable. <default : 0>
Message	Switches the messages to yes or no. Setting the messages to yes will send to the debug output all messages sent to the TelcoBridges TM-1000. <default: n>
Error:	Switches the error messages to yes or no. Setting the errors to yes will all errors and other important to the debug output. <default: y>
HTTP Server:	
Enable:	Enables or disables the access to the TelcoBridges TM-1000 using HTTP. <default: y>
Password:	Can set a password if HTTP access is enabled. <default: none>

6.3.2. print_debug command

To validate the “set_debug” command type “print_debug”. Figure 33 displays a sample of the information that will be displayed.



```
test - HyperTerminal
File Edit View Call Transfer Help
[Icons]
cpu1 udp listen port (port)=50011? :
log trace level (level)=0? :
log message (y|n)=y? :
log error (y|n)=y? :
http enable (y|n)=y? :
http password (pass)=none? :

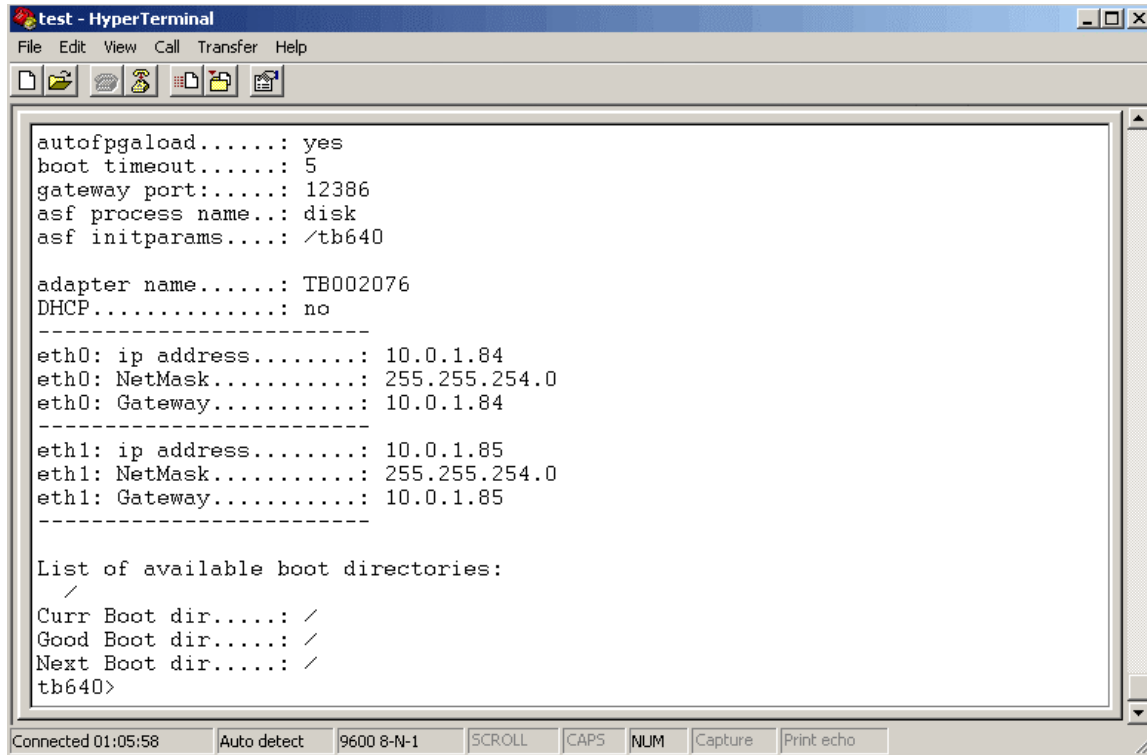
Done
tb640>
tb640>
tb640>print_debug
Udplisten:
cpu0 address.....: 127.0.0.1
cpu0 port.....: 50011
cpu1 address.....: 127.0.0.1
cpu1 port.....: 50011
Log:
trace level.....: 0
message.....: y
error.....: y
Http Server:
enable.....: y
password.....: none
tb640>

Connected 00:59:20 Auto detect 9600 8-N-1 SCROLL CAPS NUM Capture Print echo
```

Figure 33 print_debug command

6.3.3. print_boot command

To validate the TM-1000 start configuration type “**print_boot**”. Figure 34 displays a sample of the information that will be displayed:



```
test - HyperTerminal
File Edit View Call Transfer Help
autofpgaload.....: yes
boot timeout.....: 5
gateway port.....: 12386
asf process name...: disk
asf initparams.....: /tb640

adapter name.....: TB002076
DHCP.....: no
-----
eth0: ip address.....: 10.0.1.84
eth0: NetMask.....: 255.255.254.0
eth0: Gateway.....: 10.0.1.84
-----
eth1: ip address.....: 10.0.1.85
eth1: NetMask.....: 255.255.254.0
eth1: Gateway.....: 10.0.1.85
-----

List of available boot directories:
/
Curr Boot dir.....: /
Good Boot dir.....: /
Next Boot dir.....: /
tb640>
Connected 01:05:58 Auto detect 9600 8-N-1 SCROLL CAPS NUM Capture Print echo
```

Figure 34 print_boot command

6.3.4.set_boot command

This command should only be used to change the UDP gateway port.

Type “set_boot” to set the software boot information to the target system.

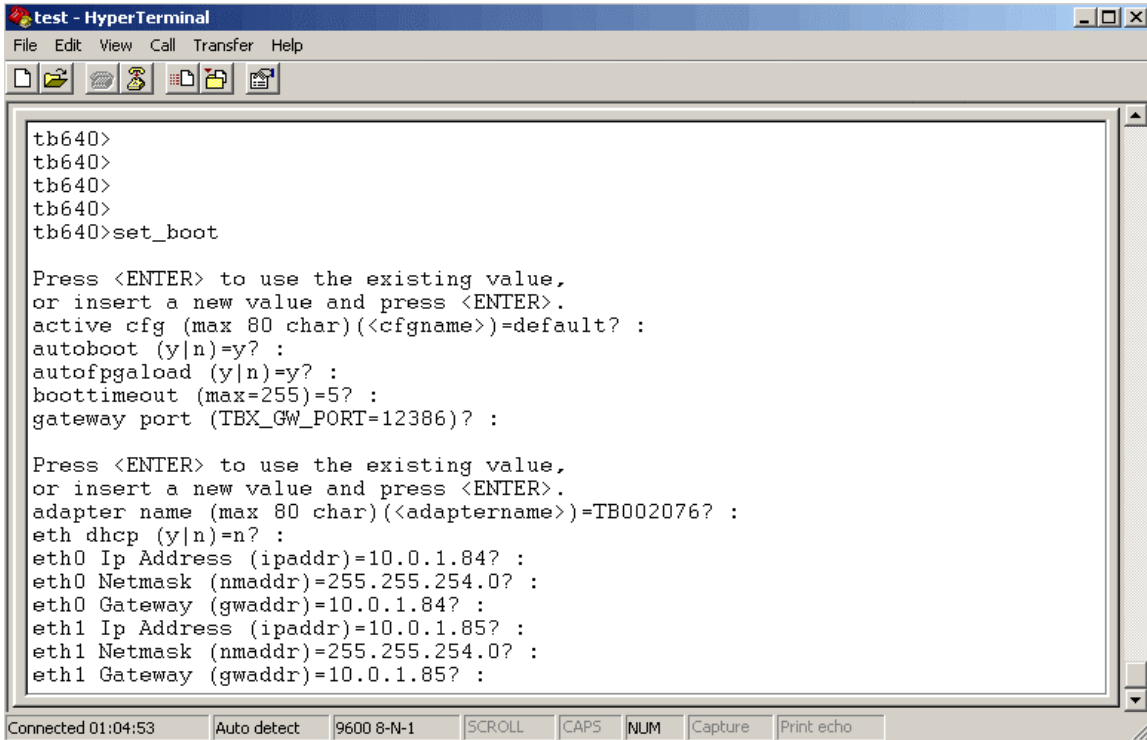


Figure 35 set_boot command picture #1

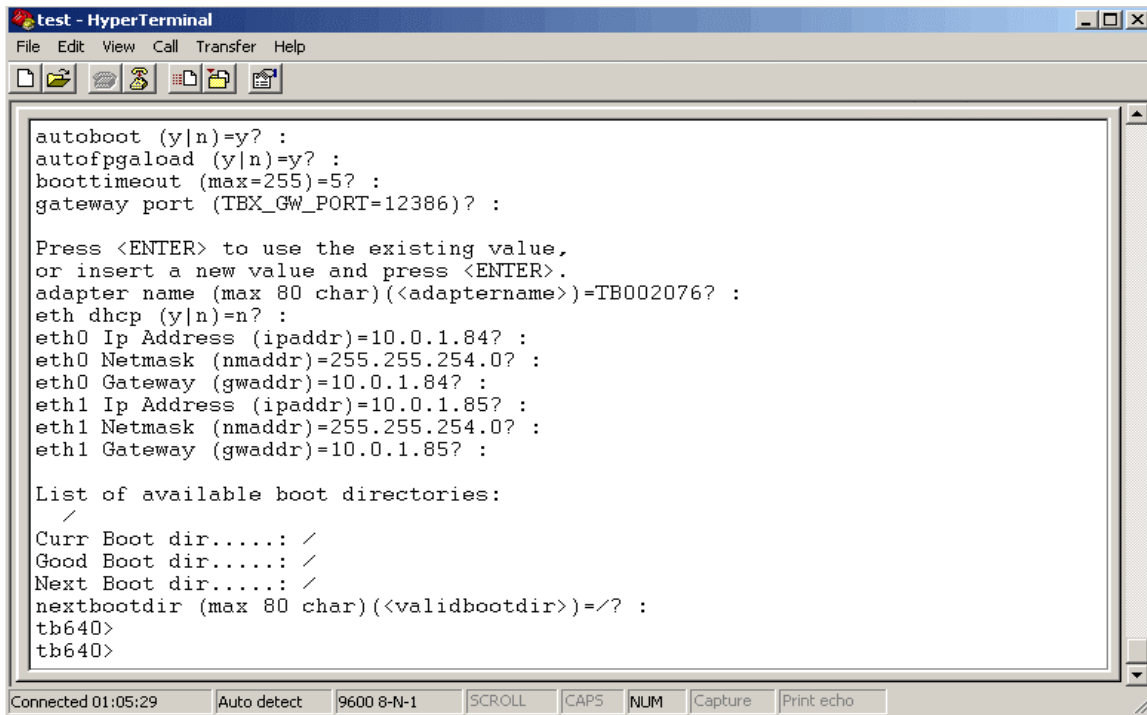


Figure 36 Set_boot command picture #2

Active configuration	You can set, save and start on different configuration name. <default: default>
Autoboot	Automatic software start module. We recommend not changing this parameter. <default: y>
Autofpgaload	Automatic hardware start module. We recommend not changing this parameter. <default: y>
Bovertimeout	Number of seconds to abort the software start system. We recommend not changing this parameter. <default: 5>
Gateway Port:	UDP port used to control the TelcoBridges TM-1000. We recommend not changing this parameter. <default: 12358>
adapter name:	Name of the TM-1000. This character string must uniquely identify the TM-1000. The default is the serial number of that TM-1000.
DHCP:	Dynamic IP address is used when the TM-1000 is restarted. 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.
Curr boot dir	Package name directory that the software is running.
Good Boot dir	Last known package name directory that the software ran properly.
Next boot dir	Package name directory that the software will run at the next restart of the TM-1000. </ > means default root directory, no package was loaded.

6.3.5. Optional shell password:

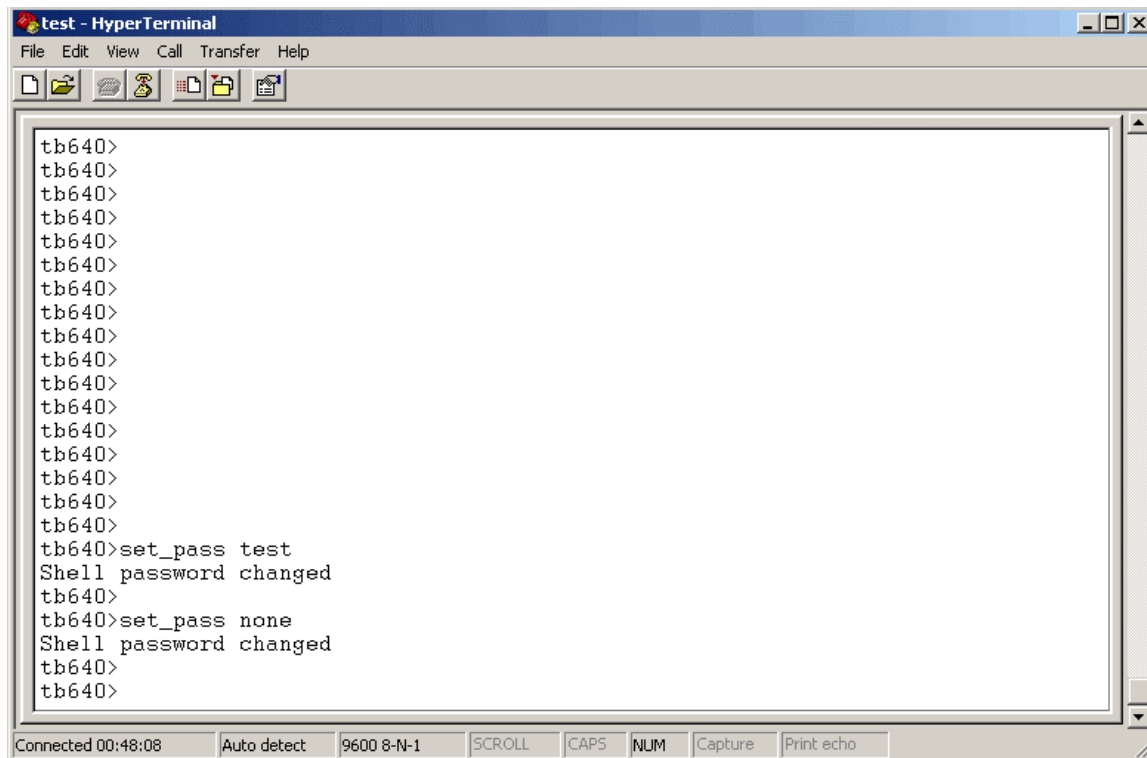
All sensitive shell commands, like "reboot", can be password-protected. By default, there's no password.

To set the password:

1. Type "set_pass" <your password> at the command prompt
2. Restart the TM-1000. This will reset the console and add the "enable" and "disable" commands in the console commands list

Once the password is set, It cannot be changed unless in the enable mode. Enable mode gives you access to sensitive commands.

1. To enter enable mode, type "enable" <your password> at the command prompt
2. To clear the password, type "set_pass" with no argument. (This disables shell protection)
3. To exit enable mode, type "disable" at the command prompt.
4. Type "reboot" to restart and activate the new configuration.
5. Go to Section 7.



```
test - HyperTerminal
File Edit View Call Transfer Help
tb640>
tb640>
tb640>
tb640>
tb640>
tb640>
tb640>
tb640>
tb640>
tb640>
tb640>
tb640>
tb640>
tb640>
tb640>
tb640>
tb640>
tb640>
tb640>
tb640>
tb640>
tb640>
tb640>set_pass test
Shell password changed
tb640>
tb640>set_pass none
Shell password changed
tb640>
tb640>
Connected 00:48:08 Auto detect 9600 8-N-1 SCROLL CAPS NUM Capture Print echo
```

Figure 37 set_pass command

Note: set_net and set_pass commands require you to restart the TM-1000 for the commands to take effect. set_debug takes effect after a restart or after performing “load_debug” command.

7. Upgrading the TM-1000 Firmware

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. You must install the firmware package that you will use.

If unsure of which release to install, please contact **TelcoBridges** customer support.

7.1. Installing a new firmware package

To install a new firmware package on the local file system:

1. Start the installation tool located in the OS-specific package under /tb/bin/release/<proc-OS-arch>/ directory¹.
2. The installation tool should detect all available TM-1000 on the network. If more than one TM-1000 is discovered, select which one you wish to install.
3. Select option 20: Install a package.
 - a. When asked for the path of the package file, enter the path of the file "tb640.pkg" found in the package tb640-adapter.debug.zip under /tb/bin.
 - b. When asked to enter the directory where to install the package, enter the name of the directory used on the **TelcoBridges** TM-1000 (The convention is to use the release number as the directory name, for example: "95-6_1").
 - c. When asked for the path of the license file, enter the path where you saved the license file (XX_TB000XXX_RELEASE_VX_XX_RCX_license.dat) received from the **TelcoBridges** support group. It is important you use the one that comes with the package. You must know the serial number of the TM-1000 to be able to choose the correct license. For example, you could have license WD_TB002034_RELEASE_V0_95_6_RC1_license.dat for a TM-1000 with the serial number TB002034 and for release 0.95.
 - d. You will then be asked to restart your PC
 - e. Type yes if you wish to restart the TM-1000 right now on the new package

If this or any future firmware package is not functional and fails to properly start on the TM-1000, the TM-1000 will restart with the last known boot directory.

Go to Samples compilation section (see section 8).

7.2. Removing a firmware package

The flash memory is 128 MG. A firmware package is over 18 Megs. Once you have reached this limit, you should remove unused packages from the flash memory.

To remove a firmware package from the local file system:

1. Start the installation tool located in the /tb/bin/release/<proc-OS-arch>/ directory.
2. Select option 21: remove a package.
 - a. Enter the number associated with the package to remove.

¹ To make sure of the compatibility, it is recommended to use the install tool from the package actually running on the TM-1000

7.3. Installing a new license

To install a new license:

1. Start the installation tool located in the /tb/bin/release/<proc-OS-arch>/ directory
2. Select option 22: Install a license
 - a. When asked for the path of the license file, enter the path where you saved the license file (XX_TB000XXX_RELEASE_VX_XX_RCX_license.dat) received from the **TelcoBridges** support group. It is important you use the one that has the same version as the package installed on the TM-1000. You must know the serial number of the **TelcoBridges** TM-1000 to be able to choose the right license. For example, you could have license WD_TB000103_RELEASE_V0_79_RC5_license.dat for a TB640 with the serial number TB000103 and for release 0.79.
3. Restart the TM-1000 if needed.

Notes:

- The license installed can be verified by using option 34 and option 2 of the installation program.
- The license installed can be verified only if the firmware loaded is the same as the running firmware (same versions). This can be checked using option 10.
- To check a license on another firmware, set the next boot directory (option 12) and restart the TM-1000.
- When a license expires, the TM-1000 restarts by itself and no features are available until a new license is installed.

Some licenses can be upgraded live without restarting the TM-1000, others cannot.

Do not restart the TM-1000 if:

- The license's expiry time is extended or becomes permanent. For example the expiry date is September and there is an extension until November.
- The license adds features of an already existing feature. For example there is 120 voice processing features activated and the new license has 240 voice processing resources.

Restart the TM-1000 if:

- The old license was already expired and an extended or permanent license is installed.
- There is a new feature added. For example adding more physical interfaces is in the new license, but not the old one.

7.4. Starting the TM-1000

There are many ways to restart the TM-1000.

- Use the restart command from the installation tool
- Use the restart message in the API (TB640_MSG_ID_ADAPTER_OP_RESTART)
- Type <reboot> at the serial or the console
- Turn the power supply ON/OFF

When the TM-1000 is starting, the serial console and udplisten log will show some output data. If something goes wrong (for example wrong licenses file or package problem), you will see it appear there.

7.4.1. Verifying the TM-1000 status

To verify the TM-1000 status:

1. Once the TM-1000 has started, the tb640debug program (/tb/bin/<buildtype><processor>-<os/arch>/tb640debug) can be used. Start the program and select the TM-1000. This will create a file with information about the system. You can verify if everything is all right.
2. To verify if the physical interfaces are connected properly, they must be allocated in monitoring mode if the high impedance selection is used and in normal mode if low impedance is used. This can be verified by using the standalone sample program (see Section 8.3), which configures the physical interfaces, together with the tb640debug program. The tbshowls sample program (/tb/bin/<buildtype><processor>-<os/arch>/tbshowls) can also be used if the physical interfaces are using the low impedance selection on the patch panels.

7.4.2. Verifying airflow

To verify if the airflow in the rack is proper, use temperature sensors on the TM-1000. Three sensors are available to identify any hot points in a rack.

Use the tb640debug tool as described in section 9.1.3. Look for this information: “Zone1 temperature”, “Zone2 temperature” and “Zone3 temperature”. The recommended operation is below 55 degrees C.

7.4.3. TM-1000 Rear Reset Button

The Reset button is located in the back of the TM-1000:

- 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.

7.4.4. Shipping Default IP address

The TM-1000 is shipped with the following IP addresses:

- Eth0: ip address: 192.168.0.2
- Eth0: Netmask: 255.255.255.0
- Eth0: Gateway: 192.168.0.1
- Eth1: ip address: 192.168.0.3
- Eth1: Netmask: 255.255.255.0
- Eth1: Gateway: 192.168.0.1

8. Samples compilation

8.1. Solaris, Linux and Windows (with Cygwin)

1. Start a bash shell
2. Go into the directory where the common package and the OS-specific package were uncompressed.
3. Make sure that the user's PATH variable is able to reach application such as **make**, **cp**, **sed**, **etc**.
4. Make sure that the following environment variables are set:
`export MAKE_MODE = unix`
5. If running on Windows (using cygwin), make sure that the following environment variables are also set:
`export MSVCDIR= C:\\PROGRA~1\\MICROS~4\\VC982`
6. If running on Windows (using cygwin) and trying to compile for Vxworks PPC output, make sure that the following environment variables are also set:
`export WIND_BASE= V:/Tornado2.23`
`export WIND_HOST_TYPE= x86-win32`
7. To compile all libraries and samples, go to the /tb directory and type
`make clean all`
8. To compile all libraries and samples in debug (with symbols), type
`make clean all DBG=1`
9. To compile all libraries and samples for a sparc-64 machine, type
`make clean all SPARC64=1`
10. To compile all libraries and samples for a linux-64 machine, type
`make clean all X86_64=1`
11. Under Windows, to generate Microsoft Visual Studio .DSP project files, type
`make dsp`
12. To compile all libraries and samples for a ppc-vxworks machine, type
`make clean all VXWORKS=1`

8.2. Windows

We recommend using the 'Cygwin' environment to compile under Windows. It is also possible to compile the packages using Microsoft Visual Studio .DSP project files.

Using the GUI, go into the desired source directory, double-click on the .dsp file. The Msdev framework will automatically create an associated .dsw file. Using Visual Studio IDE, select 'rebuild all' to compile the sample.

From the command line, go into the desired source directory and type the following command:

```
msdev <dsp filename> /all /make /rebuild /norecuse
```

² Be sure to use the proper installation path of Microsoft Visual Studio

³ Be sure to use the proper installation path of Tornado 2.2

8.3. Standalone sample program

The standalone sample program (tb\src\samples\standalone) is the best sample program to be used with the TM-1000. It shows how to allocate physical interfaces, configure the clock, allocate layer 1 interfaces (HDLC, SS7) and allocate filters.

It is simple to use since it comes with a configuration file (tb\src\samples\standalone\config.txt).

The source code is available and can be used as a basis for customer applications.

9. Problem report

9.1. How to report a problem

TelcoBridges has developed several tools to gather information about the system to solve the problem quickly.

- Tools must be setup at the beginning (udplisten log)
- Tools can be used before and after the problem is reproduced (tb640debug)

Some information cannot be received from the logs and need to be provided by the customer (Set Up Information).

Once information is gathered and sent to the support group (support@telcobridges.com), the support group will assign a tracking number to this problem. Every following e-mail/MSN/call should start by indicating which tracking number we are referring to.

The first objective is to find an immediate workaround for the problem and then, if necessary, fix the problem in a subsequent package release.

When a new package is released, the release notes (/tb/doc/tb640) will present all fixed tracking number. This way, you can verify if this release fixes the issue that concerns you.

The following items need to be contained in every problem reported:

9.1.1. Set up Information (Mandatory)

Information must include:

- Physical connections (send a diagram if necessary)
- Remote switch connection
- Host controlling the TM-1000 (manufacturer, CPU type, memory, OS version and patch level)
- The TM-1000 serial number
- Application description

For a particular development cycle, some of this information will not change and can be provided only once. Please advise if any of this information change.

9.1.2. Udplisten log (Mandatory)

The udplisten log should be gathering information at all times when developing the application and also in a live system. This way we can identify a problem even if it occurred in the past.

To set it up, use "set_debug" (see section 6.3.1). When any problem is found, please attach the udplisten log output to the problem report.

9.1.3. tb640debug dump (Mandatory)

The tb640debug copies information about the library and one blade in a file. This includes software release running on the host, the firmware release running on the blade, blade information, features available, configuration, status, etc.

When a problem is reported, you must start the tb640debug program, select the TM-1000 you are using and this will create a file. You must attach this file in the problem report.

If the problem is reproducible, we will need a tb640debug dump before and after the problem is reproduced. This can help identify the problem.

tb640debug comes as a sample (tb/src/samples/tb640debug) and a compiled executable (/tb/bin/<buildtype><processor>-<os/arch>/tb640debug).

9.1.4. Console commands

Console commands are additional commands that can be made to the TM-1000 directly. The commands can be used in particular cases. The support group will tell you which commands are necessary depending on the problem encountered.

When asked for these commands, paste the output to a file and send to the support group. Commands are case sensitive. Here are a few useful commands:

- `bspversion`: Version of firmware
- `proclist`: Process version information
- `ps`: Process list
- `hwStats ALL`: Hardware status
- `ethlink`: Information about the Ethernet link
- `ethstats`: Ethernet Statistics

9.2. Access to the system

Sometimes, to gather supplemental information or to speed-up the debugging process, the support group will ask for access to the host controlling the **TelcoBridges** TM-1000 or access to the TM-1000 directly. Once access is achieved, debugging process can continue until the problem is identified.