

Mitel TA7102

INSTALLATION GUIDE



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CONTENTS

1	ABOUT THIS MANUAL	4
1.1	DOCUMENT OBJECTIVES	4
1.2	INTENDED AUDIENCE	4
1.3	RELATED DOCUMENTATION	4
1.4	DOCUMENT STRUCTURE	5
1.5	DOCUMENT CONVENTIONS	6
2	OVERVIEW	8
2.1	CONNECTORS AND INDICATORS	9
3	INSTALLATION	13
3.1	PLANNING THE INSTALLATION	13
3.2	SAFETY RECOMMENDATIONS	15
3.3	REQUIRED MOUNTING TOOLS AND EQUIPMENT	16
3.4	UNPACKING AND INSPECTION	16
3.5	LOCATION AND MOUNTING REQUIREMENTS	16
3.6	HARDWARE INSTALLATION	20
4	POWERING ON THE TA7102	21
4.1	IP ADDRESS DISCOVERY OR CONFIGURATION	21
4.2	INDICATORS (LEDs)	25
4.3	RESET/DEFAULT BUTTON	27
4.4	MANAGEMENT CHOICES	31
5	APPENDIX A – STANDARD COMPLIANCE AND SAFETY INFORMATION	32
5.1	DISCLAIMERS	32
5.2	TRANSLATED WARNING DEFINITION	34
5.3	SAFETY WARNINGS	35
5.4	SAFETY RECOMMENDATIONS	36
6	APPENDIX B - CABLING CONSIDERATIONS	37
6.1	RJ-45 CABLE	37
6.2	RJ-11 (TELEPHONE) CABLE	40
7	APPENDIX - C STANDARD HARDWARE INFORMATION	42
7.1	INDUSTRY STANDARD PROTOCOLS	42
7.2	HARDWARE FEATURES	44
7.3	PRODUCT ARCHITECTURE DETAILS	44
7.4	REAL TIME FAX ROUTER TECHNICAL SPECIFICATIONS	44
7.5	ANALOG LINE INTERFACE (FXS)	45
7.6	AUDIO SPECIFICATIONS	46
7.7	DTMF TONE DETECTION	46
7.8	DTMF TONE GENERATION	46
7.9	POWER CONSUMPTION	47
7.10	MTBF VALUE	47
7.11	OPERATING ENVIRONMENT	47
7.12	DIMENSIONS AND WEIGHT	48
8	APPENDIX D - GLOSSARY	49
9	APPENDIX E – LIST OF ACRONYMS	52

1 ABOUT THIS MANUAL

The TA7102 offers two Ethernet connectors switches enabling to establish two connections between conventional analog telephones or Group 3 fax machines and either a WAN, a LAN or a personal computer. It can be used to provide connectivity to broadband access equipment for a Service Provider's IP Telephony offering to residential or SME markets.

1.1 DOCUMENT OBJECTIVES

The *TA7102 Hardware Installation Guide* provides technical information on how to physically install the TA7102. It also describes the cabling required for the TA7102 device.

The information included in this guide consists of:

- Hardware descriptions of the TA7102 device
- Hardware installation instructions
- Installation scenarios examples
- LED indications
- Cabling and pin-out data

Please refer to the *Dgw v2.0 Software Configuration Guide* for software configuration information.

Use the *TA7102 Hardware Installation Guide* in conjunction with the appropriate publications listed in "Related Documentation".

1.2 INTENDED AUDIENCE

This guide is intended for the following audiences:

- Technical staff who are familiar with electronic circuitry, networking theory and have experience as an electronic technician.
- System administrators with a basic networking background and experience, but who might not be familiar with the TA7102 device.
- System administrators who are responsible for installing and configuring networking equipment and who are familiar with the TA7102 device.

1.3 RELATED DOCUMENTATION

In addition to this manual, the TA7102 document set includes the following:

- *Dgw v2.0 Software Configuration Guide*.

1.4 DOCUMENT STRUCTURE

The TA7102 *Hardware Installation Guide* contains the following information.

Table 1: TA7102 Hardware Installation Guide Chapter/Appendices

Title	Summary
<u>"Chapter 1 - Overview"</u>	Provides a brief description of the TA7102.
<u>"Chapter 2 - Installation"</u>	Contains instructions for installing the TA7102 and connecting the cables.
<u>"Chapter 3 - Powering on the TA7102"</u>	Leads you through the basic steps to start the TA7102.
<u>"Appendix A - Standards Compliance and Safety Information"</u>	Lists the various standards compliance of the TA7102.
<u>"Appendix B - Cabling Considerations"</u>	Describes the pin-to-pin connections for cables used with the TA7102.
<u>"Appendix C - Standard Hardware Information"</u>	Lists the technical hardware information of the TA7102.

1.5 DOCUMENT CONVENTIONS

The following information provides an explanation of the symbols that appear on the TA7102 and in the documentation for the product.

Warning Definition

Warning: Means danger. You are in a situation that could cause bodily injury. Before you work on any equipment, you must be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents.

Where to find Translated Warning Definition

For safety and warning information, see [“Appendix A - Standards Compliance and Safety Information” on page 19.](#)

This Appendix describes the international agency compliance and safety information for the TA7102. It also includes a translation of the safety warning listed in the previous section.

Other Conventions

The following are other conventions you will encounter in this manual.

Caution: Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury and/or damage to the equipment or property.

Note: Indicates important information about the current topic.

Standards Supported Indicates which RFC, Draft or other standard document is supported for a specific feature.

SCN vs PSTN

In Mitel' and other vendor's documentation, the terms SCN and PSTN are used. A SCN (Switched Circuit Network) is a general term to designate a communication network in which any user may be connected to any other user through the use of message, circuit, or packet switching and control devices. The Public Switched Telephone Network (PSTN) or a Private Branch eXchange (PBX) are examples of SCNs.

Standards Supported

When available, this document lists the standards onto which features are based. These standards may be

RFCs (Request for Comments), Internet-Drafts, or other standards.

The TA7102's implementations are **based** on the standards, so it's possible that some behavior differs from the official standards.

For more information on and a list of RFCs and Internet-Drafts, refer to the IETF web site at <http://www.ietf.org>.

2 OVERVIEW

This chapter describes the TA7102 connectors and indicators.

Provider-specific profiles ensure that the TA7102 is a genuine plug and play solution. It offers a low total cost of ownership as it reduces installation and maintenance costs. Moreover, the TA7102 integrates features such as TLS, SRTP, and HTTPS designed to bring enhanced security for network management, SIP signaling and media transmission aspects.

The TA7102 offers two Ethernet connectors switches enabling to establish two connections between conventional analog telephones or Group 3 fax machines and either a WAN, a LAN or a personal computer. It can be used to provide connectivity to broadband access equipment for a Service Provider's IP Telephony offering to residential or SME markets.

Key Features

- IP connectivity for analog phones and faxes
- Up to 2 simultaneous calls
- FXS interface ports
- Two Ethernet ports
- HTTP, SNMP, FTP and TFTP for configuration and management
- True Plug-and-Play
- Automatic configuration script download
- Call Routing service
- Secure SIP signaling
- Secure Media transmission
- SNMPv3 and web management
- DHCP Client
- PPPoE Client
- T.38 support
- Command Line Interface (CLI)
- SSL/TLS Encryption

2.1 CONNECTORS AND INDICATORS

This section provides an overview of the front and rear panels of the TA7102.

Product Serial Number Location

The serial number label for the TA7102 device is located on the bottom of the unit.

Front Indicators and Connectors

See “[Indicators \(LEDs\)](#)” for a description of the LED patterns the TA7102 may have and the states they represent.

[Figure 1](#) shows the four visual indicators located on the front of the TA7102.

Figure 1: TA7102 Front Panel Indicators



[Table 2](#) describes the connectors on the front panel of the TA7102.

Table 2: TA7102 Front LEDs

	LED	Description
1.	Ready	When lit, the TA7102 is ready to initiate or receive a call. The unit does not have to be registered to a server.

2.	In Use	When lit, at least one of the FXS lines is in use.
3.	ETH	Provides the state of the network connected to the <i>WAN</i> and <i>LAN</i> connectors.
4.	Power	When lit, power is applied to the TA7102.

Rear Connectors

The TA7102 has several connections that must be properly set. [Figure 2](#) shows the rear panel of the TA7102.

Standards Supported - ITU-T I.430 Basic user-network interface - Layer 1 specification (section 9).

Figure 2: TA7102 Rear Panel Connectors

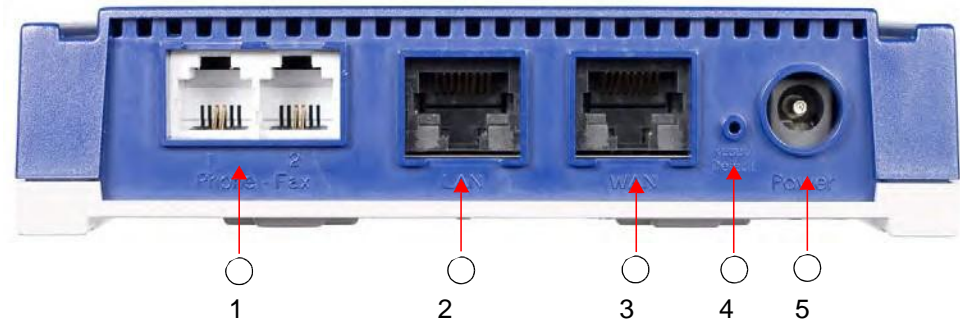


Table 3 describes the rear panel connections (from left to right).

Table 3: Rear Connections of the TA7102

	Connection	Description
1.	Phone-Fax 1 / Phone-Fax 2	Two RJ-11 connectors to attach a conventional telephone or G3 fax machine.
2.	LAN	A 10/100 BaseT Ethernet RJ-45 connector that can be connected into the network card of a computer.
3.	WAN	A 10/100 BaseT Ethernet RJ-45 connector for access to a LAN, WAN or computer.
4.	Reset / Default switch	Resets configuration parameters of the TA7102 to default (known) values. It can be used to reconfigure the unit. Warning: Read Section “ RESET/DEFAULT Button ” before attempting to reset the unit.

5.	Power connector	External 12 Vdc power supply.
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3 INSTALLATION

This chapter describes the installation of the TA7102.

3.1 PLANNING THE INSTALLATION

Before installing the TA7102, you should complete the following tasks:

- Create a network diagram (see section “[Network Diagram](#)”).
- Gather IP-related information (see section “[IP-Related Information](#)” for more information).
- Install the hardware and software needed to configure the TA7102 (see section “[Network Information](#)”).

Installation Checklist

The installation checklist lists the tasks for installing the TA7102. Print a copy of this checklist and mark the entries as you complete each task. Include the completed checklist in your site log.

Figure 3: Installation Checklist

TA7102 name/serial number

Task	Verified By	Date
Network information available & recorded in site log		
Environmental specifications verified		
Site power voltages verified		
Installation site pre-power check completed		
Required tools available		
Additional equipment available		
TA7102 received		
Quick start guide received		

Regulatory compliance and safety information received		
Warranty card received		
Software version verified		
Rack, desktop, or wall mounting of chassis completed		
Initial electrical connections established		
ASCII terminal attached to console port		
Cable length limits verified		
Initial configuration performed		
Initial operation verified		

Site Log

Mitel recommends that you maintain a site log to record all actions relevant to the TA7102, such as:

- Installation: Print a copy of the installation checklist and insert it into the site log.
- Upgrades and maintenance: Use the site log to record ongoing maintenance and expansion history. Update the site log to reflect the following:
 - Configuration changes
 - Maintenance schedules, requirements, and procedures performed
 - Comments, notes, and problems
 - Software changes and updates to firmware

Network Information

When planning the installation of the TA7102, you should consider the following network information.

Network Diagram

It is always good practice to draw a network overview diagram that displays all neighboring IP nodes, serial connected elements, and other components. It is recommended that you keep a copy in the site log (see [“Site Log”](#) for more information on keeping a site log).

IP-Related Information

Before you can install the i, you need to have the following information:

- IP addresses and subnet mask used for the Ethernet WAN connector
- IP addresses of the central SIP server
- IP addresses of the central server used for configuration upload and download

Power Source

If you suspect that your AC power is not reliable, for example if room lights flicker often or there is machinery with large motors nearby, have a qualified professional test the power. Install a power conditioner if necessary.

3.2 SAFETY RECOMMENDATIONS

The following are safety recommendations and best practices to follow when working with the TA7102.

Maintaining Safety with Electricity

Warning: Do not work on the TA7102, connect or disconnect cables during periods of lightning activity.

Warning: Disconnect all power before servicing the TA7102.

Warning: Hazardous network voltages might be present in WAN, LAN, and telephone networks connectors regardless of whether power to the device is OFF or ON. Use caution when working near these connectors to avoid electric shock. When detaching cables, detach the end away from the TA7102 first.

General Safety Practices

Follow these guidelines to ensure personal safety and protect the equipment:

- Keep the TA7102 clear and dust-free during and after installation.
- Locate the emergency power-off switch for the room in which you are working. Then, if an electrical accident occurs, you can act quickly to turn off the power.
- Disconnect all power before installing the TA7102.
- Do not work alone if potentially hazardous conditions exist.
- Never assume that power is disconnected from a circuit. Always check.
- Do not perform any action that creates a potential hazard to people or makes equipment unsafe.

Warning: This equipment must be installed and maintained by service personnel. Incorrectly connecting this equipment to a general-purpose outlet could be hazardous. The telecommunications lines must be disconnected before unplugging the main power connector.

Preventing Electrostatic Discharge Damage

Wear an ESD-preventive wrist strap, ensuring that it makes good skin contact. Connect the clip to earth ground to channel unwanted ESD voltages to ground safely.

3.3 REQUIRED MOUNTING TOOLS AND EQUIPMENT

You will need the following tools and parts to properly install the TA7102:

- Screwdriver as required for attaching brackets to rack or wall.
- Screws and anchors for wall-mounting, if required.
- Four wood screws or other fasteners, for installing the chassis on a wall.
- ESD-preventive wrist strap.

In addition, you might need the following external equipment:

- Modem for remote access.
- RJ-45 cables for the WAN and LAN connections.

3.4 UNPACKING AND INSPECTION

If you haven't already done so, unpack the TA7102 device. Carefully remove it from the package and packing material. The TA7102 package contains the following items:

- 1 x TA7102 unit
- 1 x power cord for the country in which you are using the TA7102
- 1 x universal power supply
- 1 x 10/100 BaseT Ethernet RJ-45 cable
- 1 x Printed Flyer

You may also need additional 10/100 BaseT Ethernet RJ-45 cables.

3.5 LOCATION AND MOUNTING REQUIREMENTS

Warning: The analog lines of the TA7102 are not intended for connection to a telecommunication network that uses outside cable.

Warning: To prevent fire or shock hazard do not expose the unit to rain or moisture.

The TA7102 is suited for use in an office or residential environment where it can be wall-mounted or free standing.

Location

Install the TA7102 in a well-ventilated location where it will not be exposed to high temperature or humidity. Do not install the TA7102 in a location exposed to direct sunlight or near stoves or radiators. Excessive heat could damage the internal components.

When deciding where to position the TA7102, ensure that:

- The TA7102 is accessible for future upgrade, maintenance and troubleshooting, and cables can be easily connected.

- The cabling is away from the following:
 - Sources of electrical noise such as radios, transmitters, and broadband amplifiers.
 - Power lines and fluorescent lighting fixtures.
 - Water or moisture that could enter the casing of the TA7102.
- The airflow is not restricted around the TA7102 or through the vents of the unit. The unit requires a minimum of 25 mm (1 in.) clearance.
- The operating temperature is between 0°C and 40°C.
- The humidity is not over 85% and is non-condensing.

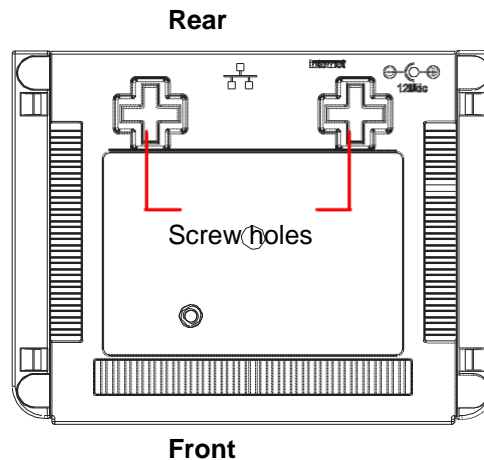
Wiring Requirements

Make sure that the telephone wiring, LAN and WAN cables reach the device and can be dressed in a manner that is safe for the wiring, does not pull or create lateral stress on the connectors on the device, and does not present a trip hazard to personnel working in the vicinity of the equipment. Do not connect any cable or wiring at this time.

Wall-Mounting

- To wall-mount the TA7102:
 1. Disconnect all of the cables from the TA7102 before mounting.
 2. Ensure that the wall you are using is smooth, flat, dry and sturdy. Attach a piece of plywood, approximately 250 mm x 200 mm x 12 mm (10 inches x 8 inches x 0.5 inches) securely to the wall, if necessary.
 3. Position the TA7102 against the wall (or plywood) as illustrated in Figure 4.

Figure 4: Bottom View - Wall Mounting Screw Holes



You can position the TA7102 any way you want.

4. Mark the position of the screw holes on the wall. Drill the two holes and install two screws.
5. Place the screw holes of the TA7102 over the screws installed in the previous step.
6. Proceed to **Hardware Installation**.

Free Standing Unit

When installing the TA7102 on a desk or table, it should be located at least 20 cm from your monitor, computer casing or other peripherals, including speakers. Never put books or paper on the TA7102.

Condensation

When bringing the unit into a warm environment from the cold, condensation may result that might be harmful to the unit. If this occurs, allow the unit to acclimatize for an hour before powering it on.

Cleaning

To clean the TA7102, wipe with a soft dry cloth. Do not use volatile liquids such as gas and thinner that are harmful to the unit casing.

For resistant markings, wet a cloth with a mild detergent, wring well and then wipe off. Use a dry cloth to dry the surface.

3.6 HARDWARE INSTALLATION

This section describes how to set the connectors of the TA7102.

Warning: Do not connect the TA7102 directly to Telecommunication Systems.

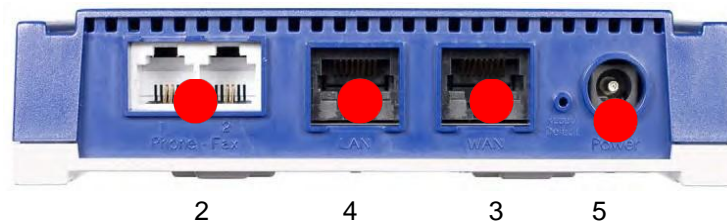
Caution: The TA7102 must be installed on a circuit equipped with a breaker so that you can easily power the unit off if required.

See **Appendix B - Cabling Considerations** for more details on the cables the TA7102 uses.

Connecting Cables

The following describes how to connect the various cables to the TA7102.

Figure 5: TA7102 Hardware Installation



1. Before you begin, be sure that the TA7102 is powered off.
2. Connect analog telephones or fax machines into the Phone-Fax 1 and Phone-Fax 2 connectors. Use a standard telecommunication cord with a minimum of 26 AWG wire size.

Note: The TA7102 telephone line interface has been designed to interface with a conventional telephone or fax machine. Connections to FXS ports of third party devices such as a PBX / Key System could damage the TA7102.

3. Connect a 10/100 BaseT Ethernet RJ-45 cable into the WAN connector of the TA7102; connect the other end to a compatible Ethernet interface that supplies TCP/IP network access (e.g., router, switch, hub or computer). Use a standard telecommunication cord with a minimum of 26 AWG wire size. You can either use a crossover or straight Ethernet cable because it performs automatic MDI / MDIX detection. See ["RJ-45 Cable"](#) for more details.
4. Connect a 10/100 BaseT Ethernet RJ-45 cable into the LAN connector of the TA7102 and connect the other end to the network card of a computer. Use a standard telecommunication cord with a minimum of 26 AWG wire size. You can either use a crossover or straight Ethernet cable because it performs automatic MDI / MDIX detection. See **RJ-45 Cable** for more details.
5. Connect the power cord to the TA7102. Do not yet connect the other end of the power cord to an electrical outlet. You are now ready to start the TA7102.

4 POWERING ON THE TA7102

This chapter describes the initial provisioning of the TA7102.

4.1 IP ADDRESS DISCOVERY OR CONFIGURATION

This section describes how to contact the TA7102's management interface to start with unit configuration.

Note that the TA7102 IPv6 interface is disabled by default.

Once the physical connection is complete and the TA7102 is powered up, you must first find out the IP address the TA7102 is using. The TA7102's IP address can be set either dynamically or statically. The default behavior of the TA7102 is to try to obtain a dynamic IP address through a DHCP server.

Dynamic IPv4 Address Discovery

The default configuration is set so that the unit can be directly plugged into a network and provisioned with a DHCP server. Mitel strongly recommends to set your DHCP server before installing the unit on the network. This way, you know the IP address associated with a particular unit.

Caution: If you set a TA7102 with a static *eth1-4* IPv4 address in a subnet (for instance, 192.168.200.1) and the *eth5* interface receives a dynamic IP address in the same subnet (via a DHCP server or PPP peer), you will not be able to contact the unit via the WAN. You must be careful that a dynamic IP address does not overlap a static IP subnet that is already configured. Note that the current default value of the TA7102 is 192.168.0.10.

See the *Software Configuration Guide* for more details on how to set an external DHCP server.

Caution: If you are experiencing problems, or if you do not want to use a DHCP server and use a static IP address instead, perform a Partial Reset procedure, as explained in **Partial Reset**.

DHCP servers generally allocate a range of IP addresses for use on a network and reserve IP addresses for specific devices using a unique identifier for each device. The TA7102 unique identifier is its media access control (MAC) address. You can locate the MAC address as follows:

- It is printed on the label located on the bottom side of the unit.
- It is stored in the *System Information* page of the web interface.

If you have not reserved an IP address, you can discover which IP address has been assigned to the TA7102 by either:

- Taking one of the telephones connected to the TA7102 and dialing ***#*0** on the keypad.

The current IP address of the TA7102 (static or DHCP) will be stated.

- Consulting your DHCP server's logs to find out details on the DHCP lease that was given to the TA7102.

- Using a network packet sniffer (e.g., Wireshark) to examine the DHCP messages exchanged between the TA7102 and your DHCP server while the TA7102 boots up.
- **To start the TA7102 with a dynamic IP address:**
 1. If you need to discover the IP address of the TA7102, install and start your network packet sniffer.
 2. Power on the TA7102 by connecting the other end of the power cord to an electrical outlet. The electrical outlet must be installed near the TA7102 so that it is easily accessible.

Note: If the *Power* LED is always blinking and never turns on, this means that the TA7102 cannot find either an IPv4 DHCP server or an IPv6 address automatically. Check that you have a DHCP server properly configured on your network.

You can now access the TA7102 web interface. Refer to the *Software Configuration Guide* for more details.

Initial Provisioning Sequence

When starting the TA7102 for the first time, it needs to be configured before it can support calls. This process is known as *provisioning*. This sequence assumes that you have installed the TA7102 hardware as per **Hardware Installation**.

The TA7102 requests its configuration only on the first restart. You can change the configuration at will after the initial provisioning and the provisioning system can refresh the TA7102 configuration.

- **Initial provisioning sequence:**
 1. When the TA7102 starts, it broadcasts a message requesting DHCP services (if the unit is configured to start in DHCP mode).
 2. The DHCP server responds with a set of IP addresses and network parameters, one of which is the TA7102 IP address.

The following are some of the network parameters assigned via DHCP:

 - TA7102 IP address
 - Subnet Mask
 - Default Router IP address
 - DNS IP addresses
 - Configuration script server IP address and port number (optional)
 - SIP Servers IP address and port number

The TA7102 request its configuration by using a configuration file.

Default Static IPv4 Address Configuration

If there is no DHCP server in your network, then the IP address has to be configured statically.

- **To start the TA7102 with a static IP address:**

1. With a 10/100 Hub and two 10/100 BaseT Ethernet RJ-45 straight cables, connect both cables to the Hub; one of them is connected into the **WAN** connector. The other cable links the computer to the Hub.
2. Reconfigure the IP address of your computer to **192.168.0.11** and the Subnet Mask to **255.255.255.0**.
3. Restart the computer.
4. Power on the TA7102, by connecting the other end of the power cord to an electrical outlet. The electrical outlet must be installed near the TA7102 so that it is easily accessible.
5. Insert a small, unbent paper clip into the **Reset / Default** hole located at the rear of the TA7102. The *Power* LED will start blinking, and after a few seconds, all the LEDs will start blinking. Release the paper clip after all the LEDs start blinking and before they all stop blinking (between 7-11 seconds). This procedure is called a partial reset. After a partial reset is performed, the TA7102 uses the default IP address 192.168.0.1/24. Refer to [“Partial Reset”](#) for details on the partial reset procedure. The corresponding link-local IPv6 address is also available and printed on the sticker under the TA7102.
You can now access the TA7102 web interface. Refer to the *Software Configuration Guide* for more details.

IPv6 Link Local Address Configuration

If there is no DHCPv6 server or IPv6 router in your network, you can use the link local address to contact the unit. Note that the TA7102 IPv6 interface is disabled by default.

1. With a 10/100 Hub and two 10/100 BaseT Ethernet RJ-45 straight cables, connect both cables to the Hub; one of them is connected into the **WAN** connector. The other cable links the computer to the Hub.
2. Power on the TA7102 by connecting the other end of the power cord to an electrical outlet. The electrical outlet must be installed near the TA7102 so that it is easily accessible.
3. Insert a small, unbent paper clip into the **Reset / Default** hole located at the rear of the TA7102. The *Power* LED will start blinking, and after a few seconds, all the LEDs will start blinking. Release the paper clip after all the LEDs start blinking and before they all stop blinking (between 7-11 seconds). This procedure is called a partial reset. After a partial reset is performed, the TA7102 enables its link local IPv6 address. Refer to **Partial Reset** for details on the partial reset procedure. The corresponding link-local IPv6 address is also available and printed on the sticker under the TA7102.

Proceed with accessing the TA7102's web interface by using the unit's link local address. The unit's link local address is printed on a sticker under the unit. The link local address can be determined by using the following pattern: [fe80::290:f8ff:feXX:XXXX] where XXXXXX are the last 6 digits of the unit's MAC address. Example: The link local address for the TA7102 with MAC address 00:90:F8:12:34:56 would be [fe80::290:f8ff:fe12:3456].

Note: On Windows, a scope ID needs to be added to the link local address ([fe80::290:f8ff:fe12:3456%**11**]). You can find this number by executing the 'ipconfig' command in a command prompt. Note the number at

the end of the IPv6 default Gateway for the interface used to contact the unit.

On Linux, the scope identifier may be the link name or the interface number. The interface number can be determined through the Linux command line.

Vocal Unit Information

When entering special characters on your telephone pad, the TA7102 talks back to you with relevant information.

- To access vocal unit **information**:
- 1. Take one of the telephones connected to the TA7102.
- 2. Dial one of the digits sequence on the keypad.

Table 4: Vocal Unit Information

Digits to Dial	Information Vocally Sent by the TA7102
**0	Current IP address of the TA7102 (static or DHCP).
**1	MAC address of the TA7102.

Verifying the Installation

There are a few ways to verify that the TA7102 is properly connected to the IP network and is working:

- By contacting it with a SNMP browser
- By contacting it via the CLI
- By contacting it via a web browser

By pinging it

These procedures assume that you know the IP address of the TA7102 you want to verify. If the TA7102 does not respond, do the following:

- Verify that the LAN and WAN cables are securely connected to the TA7102 and to the network connectors.
- Be sure that you did not connect crossover network cables.
- Verify the state of the IP network to ensure it is not down (the ETH LED should be ON or blinking).

4.2 INDICATORS (LEDS)

The indicators (LEDs) of the TA7102 are described in **TA7102 Connectors and Indicators**.

LED Patterns – Specific Conditions

Table 5 describes the different states a Mitel unit can have and their associated LED patterns.

Table 5: LED Patterns

Condition	Description	LED Pattern
RestartPending	Triggered when the <i>RESET/DEFAULT</i> button is pressed in the <i>ResetPending</i> state. The unit prepares for a physical shutdown and restart.	<i>Power</i> LED: <ul style="list-style-type: none"> blinking, 1Hz, 50% duty All other LEDs: <ul style="list-style-type: none"> OFF
RecoveryPending	Triggered when the <i>RESET/DEFAULT</i> button is pressed at start-time or for at least 7 seconds.	All LEDs: <ul style="list-style-type: none"> blinking, 1Hz, 50% duty
DefaultSettingsPending	Triggered when the <i>RESET/DEFAULT</i> button is not released while in <i>ResetPending</i> state. At run time, if the <i>RESET/DEFAULT</i> button is released within 5 seconds, the unit applies default settings, otherwise the action is cancelled and the unit goes back to the operation mode state or it resets. At start time, the unit stays in this state until the <i>RESET/DEFAULT</i> button is released. The unit then applies the default settings and restarts.	All LEDs: <ul style="list-style-type: none"> steady ON
UpdateInProgress	A firmware pack is downloaded into the unit and written to persistent storage.	All LEDs: <ul style="list-style-type: none"> cycling from left to right, individually blinking 1Hz, 33% duty

UpdateFailed	Triggered after a failure of a firmware pack download operation. After 4 seconds, the unit restarts.	<p>All LEDs:</p> <ul style="list-style-type: none"> • blinking at 3Hz, • 50% duty. One LED out of two has a 180 degree phase. This pattern lasts for 8 seconds.
Rescue Network Enabled	Triggered after the user has performed a partial reset procedure.	<p>Power and <i>In Use</i> LEDs:</p> <ul style="list-style-type: none"> • blinking (synchronized) 1Hz, 75% duty
BootOnRecoveryBank	Triggered when the unit is booting on the recovery bank and no update is pending.	<p>Power LED:</p> <ul style="list-style-type: none"> • blinking, 0.25Hz, 75% duty
Automatic network configuration in progress	Waiting for DHCP (IPv4 or IPv6) answer or IPv6 router advertisement or PPPoE connection.	<p>All LEDs:</p> <ul style="list-style-type: none"> • Blinking green, 3Hz, 50% duty
No network address set	Triggered when the unit cannot be contacted because DHCP failed, PPP failed, and no static interface is configured.	<p>Power LED:</p> <ul style="list-style-type: none"> • blinking, 3 Hz, 50% duty.
NetworkRescue	The unit tries to download and install a firmware given by the Network Rescue server.	<p>Ready LED:</p> <ul style="list-style-type: none"> • Off <p>All other LEDs:</p> <ul style="list-style-type: none"> • blinking to show a LED displacing light from left to right and right to left.

LED Patterns – Default Behaviour

When no specific condition matches those described in [Table 5](#), the LEDs behave individually according to the following rules:

Table 6: Default LED Behaviour

LED Type	Condition	Behaviour
Power	RestartInProgress	Blinking, 1 Hz, 50% duty
	RestartCompleted	Steady ON
ETH	Network traffic	Blinking, variable rate
	No network traffic	Steady ON
In Use	Lines Idle and Unlocked	Steady OFF
	Lines InUse and Unlocked	Steady ON
	Shutting Down	Steady yellow
	Locked	Blinking yellow, 1 Hz, 50% duty
Ready	All lines are enabled (operational state).	Steady ON
	All lines are disabled (operational state).	Steady OFF
	At least one line is enabled and at least one line is disabled (operational state).	Blink 0.25 Hz 75%

4.3 RESET/DEFAULT BUTTON

The *RESET/DEFAULT* button allows you to:

- Cancel an action that was started.
- Revert to known factory settings if the TA7102 refuses to work properly for any reason or the connection to the network is lost.
- Reconfigure a unit.

At Run-Time

The *RESET/DEFAULT* button can be used at run-time – you can press the button while the TA7102 is running without powering the unit off. [Table 7](#) describes the actions you can perform in this case.

Table 7: RESET/DEFAULT Button Interaction

RESET/ DEFAULT Button Pressed for:	Action	Comments	LEDs Pattern
2 to 6 seconds	Restarts the TA7102	No changes are made to the TA7102 settings.	<i>Power LED:</i> <ul style="list-style-type: none"> • blinking, 1Hz, 50% duty <i>All other LEDs:</i> <ul style="list-style-type: none"> • OFF
7 to 11 seconds	Sets the TA7102 in Partial Reset Mode	Sets some of the TA7012 configuration to pre-determined values.	<i>All LEDs</i> <ul style="list-style-type: none"> • blinking, 1Hz, 50% duty
12 to 16 seconds	Restarts the TA7102 in Factory Reset	Deletes the persistent configuration, creates a new configuration file with the default factory values, and then restarts the unit.	<i>All LEDs</i> <ul style="list-style-type: none"> • steady ON
17 seconds and more	No action is taken	The RESET/DEFAULT Button Pressed event is ignored	N/A

At Start-Time

You can use the *RESET/DEFAULT* button at start-time – you power the unit off, and then depress the button until the LEDs stop blinking and remain ON. This applies the “Factory Reset” procedure (see **Factory Reset**). This feature reverts the TA7102 back to its default factory settings.

Partial Reset

The Partial reset provides a way to contact the TA7102 in a known and static state while keeping most of the configuration unchanged.

Following a partial reset, the TA7102 management interface is set to the *Rescue* interface. The default address for this interface is 192.168.0.1/24 and has its corresponding link-local IPv6 available and printed on the sticker under the TA7102. Any existing network interface that conflicts with the Rescue interface address is disabled.

You can contact the TA7102 at this address to access its configuration parameters. It is not advised to access the unit on a regular basis through the *Rescue* network interface. You should reconfigure the unit's network interfaces as soon as possible in order to access it through another interface. See **After a Partial Reset** for more details.

In a partial reset, the following services and parameters are also affected:

- 4AAA service: User(s) from profile are restored with their factory password.
SNMP service: Resets the *enableSnmpV1*, *enableSnmpV2*, *enableSnmpV3* and *snmpPort* values to their default values.
- WEB service: Resets the *serverPort* to its default value.

To trigger the Partial Reset:

1. Insert a small, unbent paper clip into the *RESET/DEFAULT* hole located at the rear of the TA7102. While pressing the *RESET/DEFAULT* button, restart the unit. Do not depress before all the LEDs start blinking (between 7-11 seconds).
2. Release the paper clip.

After a Partial Reset

Following a partial reset, you should:

1. Create or activate network interfaces as described in the *Software Configuration Guide*, Chapter *Interface Parameters*, Section *Interfaces Configuration*. Do not disable the *Rescue* interface!
2. Change the TA7102 system management network interface to something other than *Rescue* as described in the *Software Configuration Guide*, Chapter *Miscellaneous – Management Interface*, Section *Management Interface Configuration*. Note that you must be able to contact the interface you select in order to continue with the following steps.
3. Contact the TA7102 through the new system management network interface.
4. Disable the *Rescue* network interface as described in the *Software Configuration Guide*, Chapter *Interface Parameters*, Section *Interfaces Configuration*.

Factory Reset

The Factory reset reverts the TA7102 back to its default factory settings. It deletes the persistent MIB values of the unit, including:

- The firmware pack download configuration files.
- The SNMP configuration, including the SNMPv3 passwords and users.
- The PPPoE configuration, including the PPP user names and passwords.

The Factory reset creates a new configuration file with the default factory values. It should be performed with the TA7102 connected to a network with access to a DHCP server. If the unit cannot find a DHCP server, it sends requests indefinitely.

- **To trigger the Factory Reset:**

1. Power the TA7102 off.
2. Insert a small, unbent paper clip into the **Reset / Default** hole located at the rear of the TA7102. While pressing the *Reset / Default* button, restart the unit. Do not depress before the LEDs stop blinking and are steadily ON.
3. Release the paper clip. The TA7102 restarts. This procedure resets all variables in the MIB modules to their default value. When the TA7102 has finished its provisioning sequence, it is ready to be used with a DHCP-provided IP address and MIB parameters. This procedure can also be performed at run-time.

Note: The Factory reset alters any persistent configuration data of the TA7102.

4.4 MANAGEMENT CHOICES

Congratulations for properly installing the TA7102. You can now configure the software parameters of the unit.

The TA7102 offers various management options. All these options are described in the *Dgw v2.0 Software Configuration Guide*.

Table 8: Management Options

Management Choice	Features
Web GUI	The TA7102 web interface allows you to configure the following information: <ul style="list-style-type: none"> • Network attributes • SIP parameters • VoIP settings • Management settings such as configuration scripts, restore / backup, etc.
SNMPv1/2/3	The TA7102 SNMP feature allows you to configure all the MIB services.
Command Line Interface (CLI)	The TA7102 CLI feature allows you to configure all the MIB services.
Unit Manager Network	The UMN offers the following: <ul style="list-style-type: none"> • Auto-discovery • Group provisioning • SNMP access and remote management.

5 APPENDIX A – STANDARD COMPLIANCE AND SAFETY INFORMATION

This Appendix lists the various standards compliance of the TA7102.

5.1 DISCLAIMERS

The following are the disclaimers related to the TA7102.

Federal Communications Commission (FCC) Part 15

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

Reorient or relocate the receiving antenna.

Increase the separation between the equipment and receiver.

Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

Consult the dealer or an experienced radio/TV technician for help

Note: Any changes or modifications not expressly approved Mitel could void the user's authority to operate the equipment.

Notice to European customers:

The CE marking affixed to Mitel products indicates conformance to the R&TTE directive 99/05/EC (Radio and Telecommunications Terminal Equipment Directive). For a copy of the original signed Declaration (in full conformance with EN45014), please contact your Mitel office or Sales partner.



DECLARATION OF CONFORMITY

Please contact your Mitel office or Sales partner.

5.2 TRANSLATED WARNING DEFINITION

The following information provides an explanation of the symbols which appear on the TA7102 and in the documentation for the product.

Warning: Means danger. You are in a situation that could cause bodily injury. Before you work on any equipment, you must be aware of the hazards involved with electrical circuitry and familiar with standard practices for preventing accidents.

Waarschuwing: Dit waarschuwingssymbool betekent gevaar. U overtreedt in een situatie die lichamelijk letsel kan veroorzaken. Voordat u aan enige apparatuur gaat werken, dient u zich bewust te zijn van de bij elektrische schakelingen betrokken risico's en dient u op de hoogte te zijn van standaard maatregelen om ongelukken te voorkomen.

Varoitus: Tämä varoitusmerkki merkitsee vaaraa. Olet tilanteessa, joka voi johtaa ruumiinvammaan. Ennen kuin työskentelet minkään laitteiston parissa, ota selvää sähkökytkentöihin liittyvistä vaaroista ja tavanomaisista onnettomuuksien ehkäisykeinoista.

Attention: Ce symbole d'avertissement indique un danger. Vous vous trouvez dans une situation pouvant causer des blessures ou des dommages corporels. Avant de travailler sur un équipement, soyez conscient des dangers posés par les circuits électriques et familiarisez-vous avec les procédures couramment utilisées pour éviter les accidents.

Warnung: Dieses Warnsymbol bedeutet Gefahr. Sie befinden sich in einer Situation, die zu einer Körperverletzung führen könnte. Bevor Sie mit der Arbeit an irgendeinem Gerät beginnen, seien Sie sich der mit elektrischen Stromkreisen verbundenen Gefahren und der Standardpraktiken zur Vermeidung von Unfällen bewußt.

Avvertenza: Questo simbolo di avvertenza indica un pericolo. La situazione potrebbe causare infortuni alle persone. Prima di lavorare su qualsiasi apparecchiatura, occorre conoscere i pericoli relativi ai circuiti elettrici ed essere al corrente delle pratiche standard per la prevenzione di incidenti.

Advarsel: Dette varselsymbolet betyr fare. Du befinner deg i en situasjon som kan føre til personskade. Før du utfører arbeid på utstyr, må du være oppmerksom på de faremomentene som elektriske kretser innebærer, samt gjøre deg kjent med vanlig praksis når det gjelder å unngå ulykker.

Aviso: Este símbolo de aviso indica perigo. Encontra-se numa situação que lhe poderá causar danos físicos. Antes de começar a trabalhar com qualquer equipamento, familiarize-se com os perigos relacionados com circuitos eléctricos, e com quaisquer práticas comuns que possam prevenir possíveis acidentes.

¡Advertencia! Este símbolo de aviso significa peligro. Existe riesgo para su integridad física. Antes de manipular cualquier equipo, considerar los riesgos que entraña la corriente eléctrica y familiarizarse con los procedimientos estándar de prevención de accidentes.

Varning! Denna varningssymbol signalerar fara. Du befinner dig i en situation som kan leda till personskada. Innan du utför arbete på någon utrustning måste du vara medveten om farorna med elkretsar och känna till vanligt förfarande för att förebygga skador.

5.3 SAFETY WARNINGS

- This section lists the following safety warnings:
- Circuit Breaker (20A) Warning
- TN Power Warning
- Product Disposal Warning
- No. 26 AWG Warning
- WAN, LAN, Phone-Fax 1 and Phone-Fax 2 Connectors Warning
- Socket Outlet Warning

Circuit Breaker (20A) Warning

Warning: This product relies on the building's installation for short-circuit (overcurrent) protection. Ensure that a fuse or circuit breaker no larger than 120 VAC, 20A U.S. (240 VAC, 10A international) is used on the phase conductors (all current-carrying conductors).

TN Power Warning

Warning: The device is designed to work with TN power systems.

Product Disposal Warning

Warning: Ultimate disposal of this product should be handled according to all national laws and regulations.

No. 26 AWG Warning

Warning: To reduce the risk of fire, use only No. 26 AWG or larger telecommunication line cord.

WAN, LAN, Phone-Fax 1 and Phone-Fax 2 Connectors Warning

Warning: Do not connect the *WAN*, *LAN*, *Phone-Fax 1* and *Phone-Fax 2* connectors directly to the Public Switched Telephone Network (PSTN), to an off premise application, an out of plant application, any exposed plant application, or to any equipment other than the intended application, connection may result in a safety hazard, and/or defective operation and/or equipment damage. Exposed plant means where any portion of the circuit is subject to accidental contact with electric lighting or power conductors operating at a voltage exceeding 300V between conductors or is subject to lightning strikes.

Socket Outlet Warning

Warning: The socket outlet, if used, shall be located near the equipment and shall be easily accessible by the user. The AC adaptor inlet is considered as disconnection device. The device must be readily operational.

5.4 SAFETY RECOMMENDATIONS

To insure general safety follow these guidelines:

- Do not open or disassemble this product.
- Do not get this product wet or pour liquids into it.
- Do not perform any action that creates a potential hazard to people or makes the equipment unsafe.

Caution: When using this equipment, basic safety precautions should always be followed to reduce the risk of fire, electric shock and injury to persons, including the following:

- Do not use this product near water, for example, near a bath tub, wash bowl, kitchen sink or laundry tub, in a wet basement or near a swimming pool.
- Avoid using a telephone (other than a cordless type) during an electrical storm. There may be a remote risk of electric shock from lightning.
- Do not use the telephone to report a gas leak in the vicinity of the leak.

6 APPENDIX B - CABLING CONSIDERATIONS

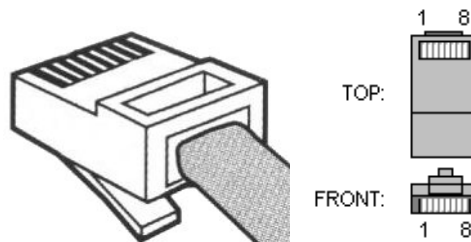
This Appendix describes the pin-to-pin connections for cables used with the TA7102.

Warning: To reduce the risk of fire, use only No. 26 AWG or larger telecommunication line cord.

6.1 RJ-45 CABLE

The RJ-45 connector is commonly used for network cabling and for telephony applications. It is used to wire both ends identically so the signals pass straight through. RJ-45 cabling is also known as Twisted-pair Ethernet (TPE), Unshielded twisted pair (UTP) and 10/100 Base-T.

Figure 6: RJ-45 Cable



When connecting an Ethernet cable to the TA7102, use a standard telecommunication cord with a minimum of 26 AWG wire size. It is possible to use either a crossover or straight Ethernet cable to connect in the Ethernet connectors. These connectors perform automatic MDI / MDIX detection, meaning that they adapt to the type of cable connected to them.

The auto MDI / MDIX feature works only when the connectors are configured in auto detect mode, which is the default mode.

Whenever you force the TA7102 to use a specific Ethernet mode (for example 100 Mb Full Duplex), the type of cable to use depends on the other peer. For example, a straight cable is required to connect the TA7102 to a hub or a switch, while a crossover cable is required to connect the TA7102 to a PC.

Straight Through Cable


A RJ-45 straight through cable is used to connect a computer to a network device. For instance, you must use straight through cables to connect a computer to a network hub, switch, and router.

Table 10: RJ-45 Pinout Information


	Function	Colour Coding	
		EIA/TIA 568A	EIA/TIA 568B AT&T 258A
1	Transmit +	White with green stripe	White with orange stripe
2	Transmit -	Green with white stripe or solid green	Orange with white stripe or solid orange
3	Receive +	White with orange stripe	White with green stripe
4	N/A	Blue with white stripe or solid blue	Blue with white stripe or solid blue
5	N/A	White with blue stripe	White with blue stripe
6	Receive -	Orange with white stripe or solid orange	Green with white stripe or solid green
7	N/A	White with brown stripe or solid brown	White with brown stripe or solid brown
8	N/A	Brown with white stripe or solid brown	Brown with white stripe or solid brown


The RJ-45 cable uses two pairs of wires: one pair for transmission and the second pair for reception. It is wired so that pins 1 & 2 are on one twisted pair and pins 3 & 6 are on a second pair according to common wiring standards which meet the EIA/TIA T568A and T568B requirements.

Figure 7: Straight Through Connectivity

Pin 1  Pin 1

Pin 2  Pin 2

Pin 3  Pin 3

Pin 6  Pin 6

Pin Name and Function

The following is the function of each pin in a RJ-45 cable.

Table 11: Pin Name and Function

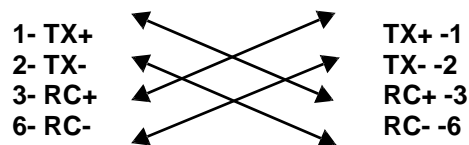
Pin #	Name	Function
1	Transmit Data Plus	Positive signal for the TD differential pair. This signal contains the serial output data stream transmitted onto the network.
2	Transmit Data Minus	Negative signal for the TD differential pair. This contains the same output as pin 1.
3	Receive Data Plus	Positive signal for the RD differential pair. This signal contains the serial input data stream received from the network.
4	not connected	
5	not connected	
6	Receive data minus	Negative signal for the RD differential pair. This signal contains the same input as pin 3.
7	not connected	
8	not connected	

Crossover Cable

A RJ-45 crossover cable is used when only two systems are to be connected to each other, peer to peer, at the Ethernet Cards by “crossing over” (reversing) their respective pin contacts. An example would be connecting two computers together to create a network. The crossover eliminates the need for a hub when connecting two computers. A crossover cable may also be required when connecting a hub to a hub, or a transceiver to transceiver or repeater to repeater. When connecting a hub to a transceiver, a straight through cable is always used.

Note: This is not an IEEE supported configuration and should be used for test purposes only.

A crossover cable is sometimes called a null modem. The coloured wires at either end are put into different pin numbers, or crossed over.

Figure 8: Crossover Connectivity

6.2 RJ-11 (TELEPHONE) CABLE

The RJ-11 cable is commonly used for telephone connection.

Caution: Do not plug a phone jack connector into an RJ-45 port.

Wiring Conventions

For telephone connections, a cable requires one pair of wires. Each wire is identified by different colours. For instance, one wire might be red and the other, red with white stripes. Also, an RJ-11 connector must be attached to both ends of the cable.

Each wire pair must be attached to the RJ-11 connectors in a specific orientation. The following figure illustrates how the pins on the RJ-11 connector are numbered. Be sure to hold the connectors in the same orientation when attaching the wires to the pins.

Figure 9: RJ-11 Connector Pin Numbers

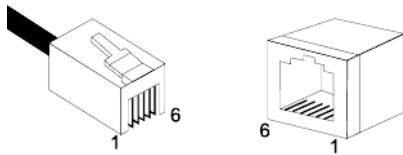


Table 12: RJ-11 Pinout Information

Pin #	Function
1	Not used
2	Not used
3	Ring
4	Tip

Table 12: RJ-11 Pinout Information (Continued)

Pin #	Function
5	Not used
6	Not used

The RJ-11 pair of wires is wired so that pins 3 and 4 are connected to the Ring and Tip, which meets the following requirements:

- EIA/TIA-IS 968
- CS-03 Issue 8, Part III requirements.

Warning: The RJ-11 cable should comply with UL 1863 and CSA C22.2 No 233 standards.

7 APPENDIX - C STANDARD HARDWARE INFORMATION

The specifications and information regarding this product are subject to change without notice. Every effort is made to ensure the accuracy of this document. Because of ongoing product improvements and revisions, Mitel cannot guarantee its accuracy, nor can be responsible for errors or omissions. Please contact your Mitel sales representative to obtain the latest version of the technical specifications.

7.1 INDUSTRY STANDARD PROTOCOLS

The TA7102 has been designed to support all major industry standards used today, as well as those that will eventually be implemented at a later date. Because of this specific design characteristic, the TA7102 can be integrated with existing telephone, fax and data equipment such as PCs and routers.

Table 13: Industry Standard Protocols

Parameter	Description
Vocoders	<ul style="list-style-type: none"> G.711 (a-law, u-law) with optional VAD support G.723.1a G.726 G.729a G.729ab
IP Telephony Protocols	<ul style="list-style-type: none"> SIP - RFC 3261, RFC 3262, RFC 3263
Real-Time Transport Protocols	<ul style="list-style-type: none"> RTP/RTCP - RFC 1889, RFC 1890, RFC 2833, RFC 3389
Network Management Protocols	<ul style="list-style-type: none"> SNMPv3 DHCP - RFC 2131, RFC 2132 TFTP - RFC 1350 Syslog - RFC 3164 HTTP 1.0 - RFC 1945 HTTP 1.1 - RFC 2616 HTTPS Basic and digest HTTP authentication - RFC 2617
Data Features	<ul style="list-style-type: none"> PPPoE client - RFC 1332, RFC 1661, RFC 1334, RFC 1994, RFC 2516, RFC 1471, RFC 1472, RFC 1473, RFC 1877. Note: some PPPoE RFCs are implemented partially. TFTP or HTTP auto-provisioning DHCP server NAPT

QoS	<ul style="list-style-type: none">• ToS• DiffServ• 802.1p• 802.1Q
-----	--

7.2 HARDWARE FEATURES

Interfaces

- 2 x RJ-11 connectors, analog phone/fax (FXS) interface
- 2 x RJ-45 connectors, 10/100 BaseT Ethernet access (autosense: up to 100 Mbits)

Power

- External 12 Vdc power supply (wall plug or desktop, based on country/area model).

7.3 PRODUCT ARCHITECTURE DETAILS

- Supports multiple concurrent communications using any vocoders.
- DSP-based DTMF detection and generation.
- DSP-based fax/data relay.
- Embedded operating system with 32-bit real-time multitasking Kernel.
- Embedded IPv4 TCP/IP stack with configurable QoS implemented by:
 - ToS byte at Network layer 3
 - 802.1p at Data Link layer 2
- Network parameters assigned via DHCP

7.4 REAL TIME FAX ROUTER TECHNICAL SPECIFICATIONS

Automatic selection between voice and fax.

Table 14: Fax Technical Specifications

Parameter	Description
Ethernet	10/100 BaseT Ethernet
Data Link	Ethernet
Network	IP (Internet Protocol)
Transport	TCP / UDP

Protocols	Group 3 Fax Clear channel (G.711), G.726 or T.38 Real Time Fax Over IP protocol Stack
Fax Data Compression	MH
Fax Transmission	Up to 14.4 kbps

7.5 ANALOG LINE INTERFACE (FXS)

- RJ-11 connectors
- Direct connection to a fax machine or telephone (Internal installation and internal cabling)
- DC feeding of the access line protected for over voltage
- Loop current detection and hook flash detection capable
- Generation of Selective Ring

Table 15: Analog Line Interface

Parameter	Description
Trunk Type	Loop Start: capable of Wink and Immediate signalization
Ring Source	50 VRMS max @ 20 up to 50 Hz (selectable) sine signal
Nominal Impedance	BellCore compliant 600/900 ohms default setting.
Ring Drive Capacity	Up to 4 ringer equivalents (4 RENs) per port.
Loop Current Range	15 to 32 ma factory set. Default 20 ma regulated.
Ring Trip Detection Time	2 ring cycles max
On Hook Voltage	-48 VDC
Frequency Response	200 Hz to 3400 Hz ± 3 dB (Tx/Rx)
Return Loss	500-3200 Hz: 30 dB

7.6 AUDIO SPECIFICATIONS

- Software-adjustable dynamic and static jitter buffer protection.
- Programmable by country: Call progress tone generation including dial tone, busy tone, ringback and error tones.
- DSP-based echo control device.
- Silence detection/suppression level software adjustable.

7.7 DTMF TONE DETECTION

Table 16: DTMF Tone Detection

Parameter	Description
16-Digit DTMF Decoding	0 to 9, *, #, A, B, C, D
Permitted Amplitude Tilt	High frequency can be +4 dB to -8 dB relative to low frequency
Dynamic Range	-35 dBm to +3 dBm per tone
Frequency Accept	$\pm 1.5\%$ of nominal frequencies
Minimum Tone Duration	40 ms
Interdigit Timing	Detects like digits with a 40 ms interdigit delay

7.8 DTMF TONE GENERATION

Table 17: DTMF Tone Generation

Parameter	Description
Per Frequency Nominal	-6 dBm to -4 dBm
Frequency Deviation	Within 1.5% of nominal values

7.9 POWER CONSUMPTION

Table 18: Power Consumption

Mitel Model	Voltage/ Frequency	Operating Condition	Current (mA)	Power (W)	VA	Thermal Dissipation (W)
TA7102	120Vac / 60Hz	All ports off hook	TBD	TBD	TBD	TBD
	240Vac / 50Hz	All ports off hook	TBD	TBD	TBD	TBD
	12Vdc	All ports off hook	475	5.7	TBD	TBD
	12Vdc	All ports ringing into 4REN	450	5.4	TBD	TBD

7.10 MTBF VALUE

The Mean Time Before Failure (MTBF) value of the TA7102 models is 750,000 hours.

These values are at 25 degrees Celsius ambient temperature. It has been defined using RelCalc v5.0, Bellcore method (LimitedStress - Method I, Case 3), Desktop unit excluding the power adaptor.

7.11 OPERATING ENVIRONMENT

Table 19: Operating Environment

Parameter	Description
Operating Temperature	-40°C to 85°C
Humidity	Up to 85%, non-condensing
Storage	-40°C to +85°C

7.12 DIMENSIONS AND WEIGHT

Table 20: Dimensions and Weight

Parameter	Description
Dimensions	3.1 cm x 12.7 cm x 9.9 cm - 1.2 in. x 5 in. x 3.9 in. (approx.)
Weight	170 g (0.37 lb)

8 APPENDIX D - GLOSSARY

10 BaseT

An Ethernet local area network that works on twisted pair wiring.

100 BaseT

A newer version of Ethernet that operates at 10 times the speed of a 10 BaseT Ethernet.

Domain Name Server (DNS)

Internet service that translates domain names into IP addresses. To use a domain name, a DNS service must translate the name into the corresponding IP address. For instance, the domain name www.example.com might translate to 198.105.232.4.

Dual-Tone Multi-Frequency (DTMF)

In telephone systems, multi-frequency signalling in which a standard set combinations of two specific voice band frequencies, one from a group of four low frequencies and the other from a group of four higher frequencies, are used. Although some military telephones have 16 keys, telephones using DTMF usually have

12 keys. Each key corresponds to a different pair of frequencies. Each pair of frequencies corresponds to one

of the ten decimal digits, or to the symbol “#” or “*”, the “*” being reserved for special purposes.

Dynamic Host Configuration Protocol (DHCP)

TCP/IP protocol that enables PCs and workstations to get temporary or permanent IP addresses (out of a pool)

from centrally-administered servers.

Federal Communications Commission (FCC)

U.S. government regulatory body for radio, television, interstate telecommunications services, and international services originating in the United States.

Foreign Exchange Service/Station (FXS)

A network-provided service in which a telephone in a given local exchange area is connected, via a private line, to a central office in another, i.e., “foreign”, exchange, rather than the local exchange area’s central office. This is the station (telephone) end of an FX circuit. An FXS port will provide dial tone and ring voltage.

International Telecommunication Union (ITU)

Organization based in Geneva, Switzerland, that is the most important telecom standards-setting body in the world.

Internet Protocol (IP)

A standard describing software that keeps track of the Internet's addresses for different nodes, routes outgoing messages, and recognizes incoming messages.

Light Emitting Diode (LED)

A semiconductor diode that emits light when a current is passed through it.

Local Area Network (LAN)

Data-only communications network confined to a limited geographic area, with moderate to high data rates. See also WAN.

Media Access Control (MAC) Address

A layer 2 address, 6 bytes long, associated with a particular network device; used to identify devices in a network; also called hardware or physical address.

Network

A group of computers, terminals, and other devices and the hardware and software that enable them to exchange data and share resources over short or long distances. A network can consist of any combination of local area networks (LAN) or wide area networks (WAN).

Private Branch Exchange (PBX)

A small to medium sized telephone system and switch that provides communications between onsite telephones and exterior communications networks.

Protocol

A formal set of rules developed by international standards bodies, LAN equipment vendors, or groups governing the format, control, and timing of network communications. A set of conventions dealing with transmissions between two systems. Typically defines how to implement a group of services in one or two layers of the OSI reference model. Protocols can describe low-level details of machine-to-machine interfaces or high-level exchanges between allocation programs.

Public Switched Telephone Network (PSTN)

The local telephone company network that carries voice data over analog telephone lines.

Router

A specialized switching device which allows customers to link different geographically dispersed local area networks and computer systems. This is achieved even though it encompasses different types of traffic under different protocols, creating a single, more efficient, enterprise-wide network.

Switched Circuit Network (SCN)

A communication network, such as the public switched telephone network (PSTN), in which any user may be connected to any other user through the use of message, circuit, or packet switching and control devices.

Server

A computer or device on a network that works in conjunction with a client to perform some operation.

Session Initiation Protocol (SIP)

A protocol for transporting call setup, routing, authentication, and other feature messages to endpoints within the IP domain, whether those messages originate from outside the IP cloud over SCN resources or within the cloud.

Subnet

An efficient means of splitting packets into two fields to separate packets for local destinations from packets for remote destinations in TCP/IP networks.

Transmission Control Protocol/Internet Protocol (TCP/IP)

The basic communication language or protocol of the Internet. It can also be used as a communications protocol in a private network (either an intranet or an extranet).

Voice Over IP (VoIP)

The technology used to transmit voice conversations over a data network using the Internet Protocol. Such data network may be the Internet or a corporate Intranet.

Wide Area Network (WAN)

A large (geographically dispersed) network, usually constructed with serial lines, that covers a large geographic area. A WAN connects LANs using transmission lines provided by a common carrier.

9 APPENDIX E – LIST OF ACRONYMS

AWG	American Wire Gauge
CE	Cummunauté européenne (French)
DHCP	Dynamic Host Configuration Protocol
DNS	Domain Name Server
IETF	Internet Engineering Task Force
IP	Internet Protocol
LAN	Local Area Network ma milliampere
MAC	Media Access Control
MDI	Media Dependent Interface
MDIX	Media Dependent Interface Crossover
PBX	Private Branch eXchange
PSTN	Public Switched Telephone Network
RFC	Request for Comment
SCN	Switched Circuit Network
SIP	Session Initiation Protocol
SME	Small and Medium-sized Enterprise
TPE	Twisted-Pair Ethernet
UTP	Unshielded Twisted pair
VoIP	Voice over Internet Protocol
WAN	Wide Area Network

