User's Guide

TINTORETTO
LAN

Installation and
Configuration Guide

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INDEX

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PREFACE

ENVIROMENTAL CONDITIONS

ENVIRONMENTAL TEMPERATURE	RELATIVE HUMIDITY
from 0 to + 45°C	from 5 to 92% n.c.

Rapid changes of temperature or humidity should be avoided (0,03°C/min).
This equipment, including cables, should be installed in an area free from:
- Dust, humidity, heat from direct sun light.
- Objects which irradiate heat. These could cause damage to the container or other problems.
- Objects which produce a strong electtromagnetic field (loudspeakers, etc.)
- Liquids or chemical corrosive substances.

GENERAL WARNINGS for all equipment powered directly from mains power

POWER SUPPLY	207-253 Volt single phase 50 Hz
FUSES	only those indicated on the equipment label
ISOLATION CLASSIFICATION	only those indicated on the equipment label
NOMINAL CURRENTS	only those indicated on the equipment label

To avoid electric shock, the equipment should never be opened. Ask qualified personnel help.
Disconnect the power cable from the wall outlet when the equipment is not to be used for a long period. To disconnect the cable pull it by the plug, never pull it by the cable itself.
If there should be liquid or object penetration in the equipment, disconnect the power cable and call a qualified personl for testing.

CLEANING THE TERMINAL

Use a clean and soft cloth. Wet the cloth with water or natural detergent if it is necessary to remove any stains.
Never use chemical products such as petrol or solvents.

VIBRATIONS OR DROPPING

Caution against vibrations and dropping.

<div align="center">

WARNING
This is a class A product.
In a domestic environment this product may cause radio interference
in which case the user may be required to take adequate measures.

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1.   CONFIGURATION GUIDE

LAN to Internet over Single Account

1.1.   WHAT YOU NEED

Before we start the configuration please check if all the needed items are available:

Tintoretto LAN
- One RJ45-RJ45 8 pin cable for connection to the ISDN line
- One RJ45-RJ45 8 pin cabvle for connection to the LAN
- One RJ45-DB9 adaptor (to be used with one of the two RJ45-RJ45 cables) for connection to the Config port
- Power supply
- This Configuration Guide

PC
- Ethernet Network card, with 10BaseT UTP connector
- CD-ROM or Floppy Disk of your operating system

LAN
- One or more HUBs with sufficient UTP ports to connect to Tintoretto LAN and workstations
- Ethernet UTP cables

ISDN
- ISDN (BRI) line

Internet
- your Internet account data like ISDN numbers, IP addresses, user id and passwords (to be provided by ISP)

1.2.   FRONT PANEL

POWER	● ○ ○ ○
Green	Running. Power-on selftest succesfully completed
Flashing Green	In BOOT mode, programming Flash memory
Red	Failed to complete the power-on selftest
Yellow	Copying firmware to RAM memory
Flashing Yellow	In BOOT mode.

LAN	○ ● ○ ○
Green	LAN connected and in forwarding mode
Red	Not connected to the LAN
Yellow	LAN connected but not in forwarding mode: e.g. Listening, Learning or Blocking

B1	○ ○ ● ○
OFF	ISDN B1 channel not used
Green	ISDN B1 channel connected, in data mode
Yellow	ISDN B1 channel connected, waiting to be authenticated
Red	ISDN B1 channel disconnecting. Connection closed.

B2	○ ○ ○ ●
OFF	ISDN B2 channel not used
Green	ISDN B2 channel connected, in data mode
Yellow	ISDN B2 channel connected, waiting to be authenticated
Red	ISDN B2 channel disconnecting. Connection closed

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Fig. 1.1. Front panel
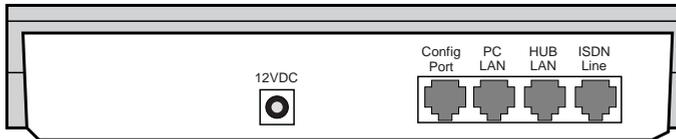
Fig. 1.2. Rear panel

1.3.   CONNECTIONS TO BE MADE

- Use one of the two RJ45-RJ45 cables. Connect one end to the DB9-RJ45 adaptor. Connect the DB9 interface to a serial port of your computer (COM1 or COM2). Connect the other end to the "Config Port" on the rear panel. Once the configuration is completed you can use the RJ45-RJ45 cable for ISDN connection.
- ATTENTION. TINTORETTO LAN COMES WITH A PRECONFIGURED IP ADDRESS SET TO **192.168.1.1/ 255.255.255.0**. SHOULD THIS CONFLICT WITH A NETWORK STATION HAVING THE SAME IP ADDRESS <u>DO NOT CONNECT IT TO THE HUB OR NETWORK. REFER TO SECTION "HOW TO CHANGE TINTORETTO LAN'S IP ADDRESS"</u>, OTHERWISE
  Use the second RJ45-RJ45 cable. Connect one end to the "LAN Hub" port on the rear panel. (fig. 1.4). The "LAN PC" port is a "crossed" LAN port to be used when connecting TINTORETTO LAN directly to a computer NIC card, without using a HUB (fig. 1.3).
- Connect the jack from the power supply to the "12VDC" plug on the rear panel.

Note: The two LAN ports cannot be used simultaneously.

Power on TINTORETTO LAN, connecting the power supply to the mains plug and wait some seconds; TINTORETTO LAN will perform a power-on selftest. During this operation the leds on the front panel will light in sequence.

Once the power-on selftest is completed on the front panel you must find the following led status, Power and LAN ON Green, B1 and B2 OFF.
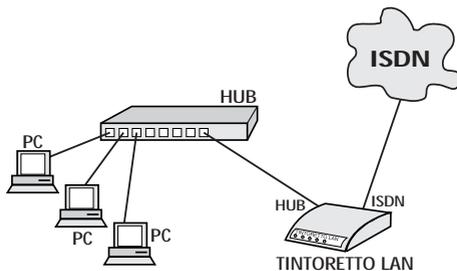

*Fig. 1.3. Connection using a Hub and multiple computers*   *Fig. 1.4. Connection using a single computer*
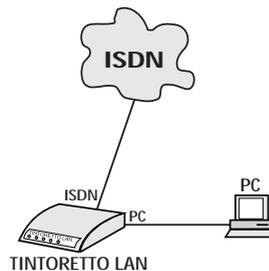
1.4. PREPARE YOUR LAN

If your computers are not connected to a LAN (Local Area Network) ask qualified personell to do this job for you, or if you are skilled enough do it your self.
If you are going to use a single computer, please be sure it has a Ethernet NIC card with 10BaseT (UTP or RJ45) connector.

1.5. NETWORK PROTOCOLS

Computers use specific communication protocols in order to share resources and "talk" to other computers on the local or remote networks.

There are several different types of protocols existing. The most popular are:
- NetBeui, proprietary protocol developed and used on Microsoft Windows® networks.
- TCP/IP, standard protocol used on the Internet and by most operating systems
- IPX/SPX, proprietary protocol developed by Novell® and mainly used on Netware based networks.

Generally a single protocol is used on a LAN, but often more protocols share the same network.
In order to allow Tintoretto LAN to communicate to your computers and connect them to the Internet you must have TCP/IP installed on your computers.

If you are installing Tintoretto LAN in a existing Microsoft Windows® network you will probably find one or more protocols already installed (NetBeui, IPX/SPX or both). You must add TCP/IP.

Attention:
If your network is entirely based on TCP/IP protocol, or if applications or network devices using TCP/IP are present you must specially pay attention to some aspects of the configuration. Please refer to "Additional Configuration" and "Further important checks" sections.

1.5.1. INSTALLING TCP/IP PROTOCOL

If you are using Windows95/98, follow this procedure to install the TCP/IP protocol. If the TCP/IP is already installed, go directly to the section Default Gateway.

1.5.2. TCP/IP CONFIGURATION

During the protocol installation you could need, when requested, to provide some additional drivers from the Windows95/98 installation CD-ROM or diskettes.

From the **START menu**, select **Settings, Control Panel** and then **Network**.

Click on **Add** button.
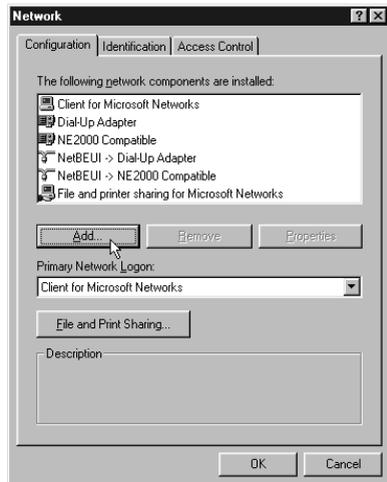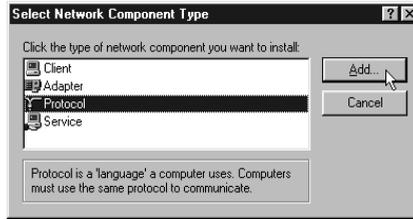
Select **Protocol** and click the **Add** button.
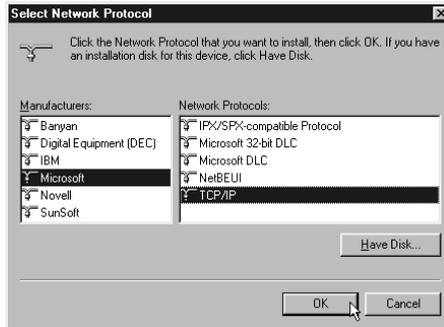
Select **Microsoft** and **TCP/IP**, then click **OK**.
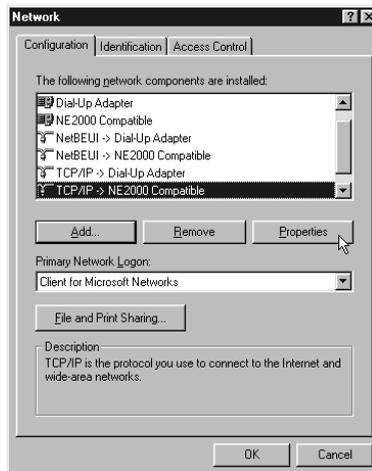
Wait until the files installation is carried out.

Select the option:
TCP/IP -> "*yourEthernet board*" and click **Properties**.
If the TCP/IP is already installed, go directly to the section **Gateway**, otherwise follow these indications to assign the specific IP address to each workstation.

1.5.3. IP ADDRESSES

In a TCP/IP network, each device (PC. printer etc) has a specific IP address. The IP address is an unique identifier composed by 4 numbers (up to 255 each) separated by dots (i.e. 192.168.1.1) and by a Subnet Mas composed by 4 numbers (up to 255 each) separated by dots (i.e. 255.255.255.0). The value of the subnet mask is the same for the Pcs of the same network. A different and unique IP address is required for each station (PC) for the Internet access.
Look at the following examples.
If you don't have an IP address assigned, we suggest to use an IP address from 192.168.1.**1** to 192.168.1.**254**
Remember: the range 192.168.x.x is normally used and reserved in Lan to Internet applications with single user account.

Example: your LAN has 4 stations: 3 PCs (A,B,C) and your Tintoretto Lan.

Station	IP address	Subnet Mask
Tintoretto Lan	192.168.1.1	255.255.255.0 (PRECONFIGURED)
PC A	192.168.1.2	255.255.255.0
PC B	192.168.1.3	255.255.255.0
PCe C	192.168.1.4	255.255.255.0

If you have more than 3 PCs then use the same numbering scheme (192.168.1.5, 192.168.1.6 etc.)
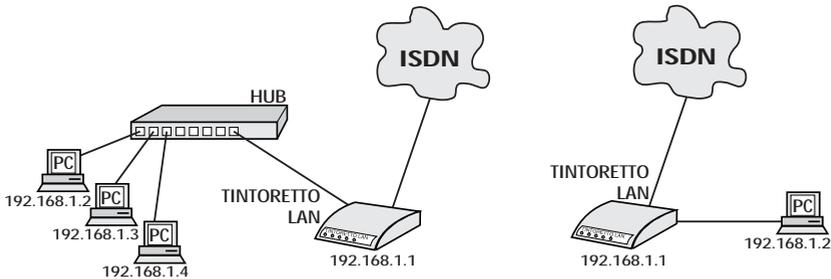
Fig. 1.5. IP address assignment example

Another IP address range to set-up is about the **DNS** (**Domain Name Server**). The DNS range is normally defined by your ISP (Internet Service Provider). Typically the ISP give two values: the Primary DNS, and the Secondary DNS (not mandatory). These addresses are different from the ones of your local network.
Select the label **IP Address**. Choice Specify an **IP Address** and insert the **IP Address** and **Subnet Mask** values.
Do not click **OK** and go the next step.
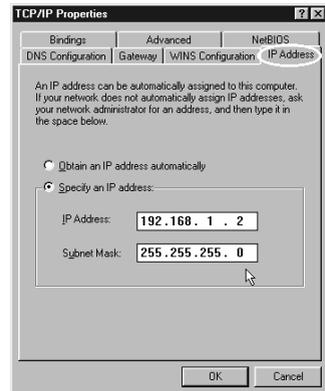
1.5.4. GATEWAY

Select the Gateway label and insert Tintoretto IP address in the **New Gateway field**.
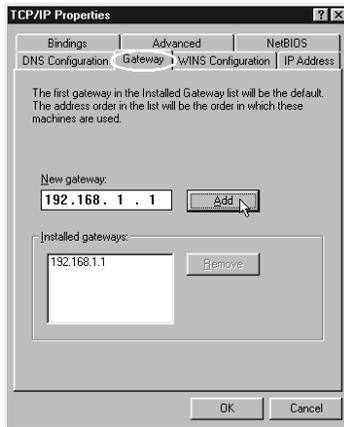
Click **Add**. The new address will appear in the Installed **Gateways window**.
Do not click OK and go to the next step.

Note: If an IP address is already present in the Installed Gateway window, probably another router is installed on the LAN.

Contact your Network Administrator for more details.
If you are sure that there are no routers on the LAN, you can remove it using the **Remove** button.

1.5.5. DNS CONFIGURATION

Select the **DNS Configuration** label.
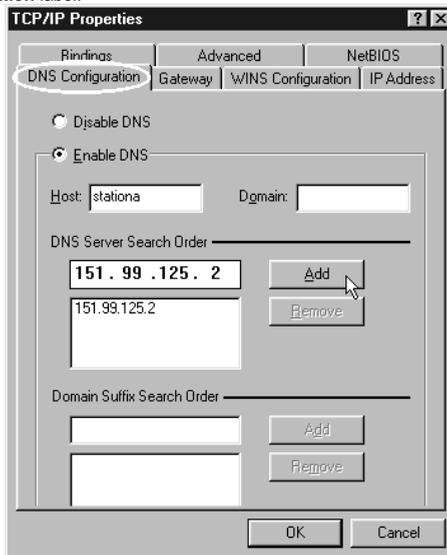
Click on **Enable DNS**.

Insert in the field **Host** an alias to identify your PC in the network.
Insert in the field **DNS Server Search Order**, the IP address of the DNS server supplied by your ISP. ClicK **Add**.

The IP address inserted will appear in the window below. If you have two DNS addresses, insert the Primary, then **click**. Add and insert the Secondary and click Add.

➔   Click O**K** to confirm and save the protocol set-up. Click **OK** once again to close the Network window.
➔   You will be requested to reboot your computer. Click **OK** for a new boot.

Repeat the same procedure for the other PCs of the LAN.

Once the configuration of all the Pcs is carried out, go on with TCP/IP Protocol verification.

1.5.6.   TCP/IP PROTOCOL VERIFICATION

You can test the protocol set-up and the LAN operation with a simple utility called **PING**.

Ping is a service available in the TCP/IP protocol to poll a local or remote devive in a network.

The syntax is: **PING <destination IP address>**, i.e. PING 192.168.1.2 sends an inquiry message from the local station to the station having address 192.168.1.2. When the destination station receives a ping, it sends back a confirmation reply.

➔   From the **Start menu** select **Programs** and click **MS-DOS Prompt**.

➔   In the DOS window type **PING 192.168.1.2** and **RETURN**.

If everything is working properly you will see:

Pinging 192.168.1.2 with 32 bytes of data:

Reply from 192.168.1.2: bytes=32 time<10ms TTL=32
Reply from 192.168.1.2: bytes=32 time<10ms TTL=32
Reply from 192.168.1.2: bytes=32 time<10ms TTL=32
Reply from 192.168.1.2: bytes=32 time<10ms TTL=32

Note: The value of the time and TTL could be different from the ones in the example. Anyway the indication Reply from 192.168.1.2 means that the remote station replied correctly to your inquiry.

Repeat the PING with the IP addresses of the other stations. If somethingh is not working properly (LAN or IP setting)you will seer:

Pinging 192.168.1.3 with 32 bytes of data:

Request timed out.
Request timed out.
Request timed out.
Request timed out.

In this case, please check:

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- TCP/IP set-up (Start, Setup, Control Panel, Network)
- IP address of the stations
- Hub (if used) and stations are powered on.
- Ethernet cables (UTP) correctly connected to the stations and to the hub. Usually the HUB has a LED for each Ethernet port, which turns on or flashes when a station is connected.

➔   Type **exit** and **RETURN** to close the DOS window.

1.5.7. CONFIGURE TINTORETTO LAN

The setup of your TINTORETTO LAN take just few minutes of your time.

In order to simplify the configuration, Tintoretto LAN comes with a preconfigured profile (starting from firmware release 05P4.1.1.2). The only data to be input are the ISPs ISDN number to be dialed, Internet account used id and password.

Note: the preconfigured profile is erased by a Full reset operation or by a firmware upgrade. For more details about the preconfigured profile and how to restore it please refer to section "Preconfigured parameters".

The configuration can be carried out through the serial Config port or via a Telnet session from the LAN.
Before starting check you have the following informations available:

- The Internet access details supplied by your ISP
- Your Lan's IP addresses and Subnet Mask
- A terminal emulation program like Hyperterminal, set up to 9600 bit/s, 8 data bit , 1 stop bit , no parity (9600,8,N,1) or a Telnet program.

1.6.   STARTING THE CONFIGURATION

If you are going to use telnet:
From the **Start menu** select Run Type telnet **192.168.1.1** and click on **OK**.
Go to section **LOGIN**.

If you are going to use the serial Config Port:
Run your terminal emulation with the correct serial port connected to your Tintoretto LAN. Using Windows 95/978 you can run Hyperterminal with following procedure:
➔   From the **Start menu** select Program, Accessories, Hyperterm.
➔   Select Hyperterm (o Hyperterm.exe).

In the **Name field** type **Tintoretto LAN**, select an icon and then click **OK**.
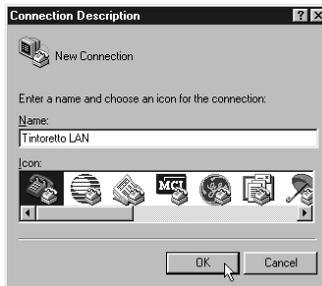
➔   In the "**Connect using**" field select the port to which you have connected the cable of TINTORETTO LAN, i.e. Direct to COM1. Then click **OK**.
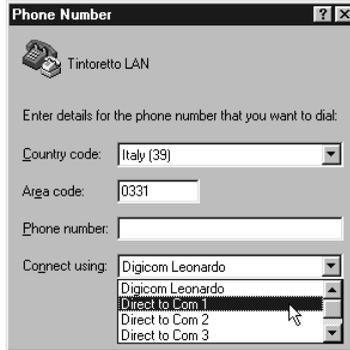
➔   In the next window select Bit per second: **9600**, Data Bit: **8**, Parity: **None**, Stop bit: **1**, Flow Control: **None**, then click **OK**.
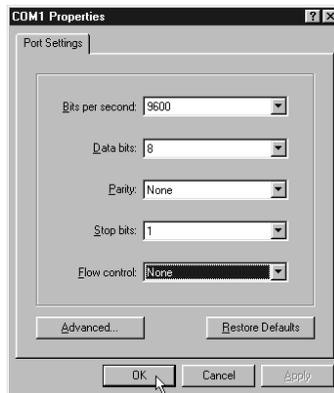
➔   Press **RETURN** until you see on the monitor the first configuration screen:

```
Terminals supported:
    teletype, ansi, avt, ibm3101, qvt109, qvt102, qvt119, tvi925, tvi950,
    vt52, vt100, wyse-50, wyse-vp

Enter terminal type:
```

➔   If you known which emulation you setup on the Hyperterm, select it, otherwise type **ansi** and **RETURN**.

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1.6.1. LOGIN

The Login Menu will appear.

```
                          LOGIN MENU

    Option         Description
  1. Login       - Initiate operator session
  2. Help        - Read menu introduction

 Enter option number

  >
```

From this step on, follow the options available on the screen. Remember:

- Type the corresponding number to select an option
- Press TAB key to go back to the previous menu.
- Press = for the Main Menu.

➔   **Type 1** to initiate the operator session, the default password is **BRIDGE** (uppercase).

```
                          LOGIN MENU

    Option         Description
  1. Login       - Initiate operator session
  2. Help        - Read menu introduction

 Enter option number

 >1

 Enter :
    password (1 to 8 characters)

 >******
```

➔   For security reason the password does not appear on the screen. When the password is accepted the
     Main Menu appears.
➔   From here on all data must be typed with Lower Case.

```
                          MAIN MENU

    Option              Value       Description
  1. Quick start        menu      - Quick start configuration menu
  2. Configuration      menu      - Define operating parameters
  3. Statistics         menu      - Device LAN and WAN statistics
  4. Diagnostics        menu      - Access troubleshooting tools
  5. Network events     menu      - View network event history
  6. Save configuration           - Save configuration immediately
  7. Logout                       - End operator session
  8. Help                         - Read menu introduction
```

1.7.   NECESSARY DATA

The values shown in the following example are for sample purpose only, just to give you an indication of which information you need to insert.

Parameter	Example	Supplied by:
ISDN number to be called	123456	Internet Provider
primary DNS	151.99.125.2	Internet Provider
* User ID	digicom	Internet Provider
* User PASSWORD	spa	Internet Provider
Tintoretto LAN IP address	192.168.1.1	Network administrator
Tintoretto LAN Subnet mask	255.255.255.0	Network administrator

* only if the account needs id and password authentication

1.8.   MINIMUM CONFIGURATION, ISDN NUMBER, USER ID AND PASSWORD

➜   Select **Configuration**.

```
                              MAIN MENU

   Option            Value        Description
 1. Quick start       menu       - Quick start configuration menu
 2. Configuration     menu       - Define operating parameters
 3. Statistics        menu       - Device LAN and WAN statistics
 4. Diagnostics       menu       - Access troubleshooting tools
 5. Network events    menu       - View network event history
 6. Save configuration           - Save configuration immediately
 7. Logout                       - End operator session
 8. Help                         - Read menu introduction
```

➜   Select **WAN set-up.**

```
                           CONFIGURATION MENU

   Option            Value        Description
 1. Access set-up      menu       - Establish access parameters
 2. Internet set-up    menu       - Define IP environment
 3. Applications set-up menu      - Configure Internet applications
 4. WAN set-up         menu       - Configure WAN operation
 5. Bridging set-up    menu       - Define bridging environment
 6. IP routing set-up  menu       - Define IP routing environment
 7. Filter set-up      menu       - Filter operations
```

➜   Select **Remote site set-up**.

```
                           WAN SET-UP MENU

 1. Switch type       [NET3]      - Set switch type
 2. Link set-up        menu       - Configure Link operation
 3. Remote site set-up menu       - Configure remote site access
 4. Security set-up    menu       - Configure security
 5. PPP set-up         menu       - Configure PPP parameters
 6. IP address connect menu       - Configure IP address connect
 7. Force disconnect              - Disconnect a link
 8. Link summary                  - Summary statistics of all links
```

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➔   Select **Edit remote site**.

```
                         REMOTE SITE SET-UP MENU

   Option                Value          Description
1. Edit remote site      menu         - Modify/add a remote site entry
2. Display summary                    - Display summary of remote sites
3. Display call summary               - Display call summary of remote sites
4. Remove remote site                 - Delete remote site entry
5. Manual call                        - Make a manual call to a remote site
6. Force disconnect                   - Disconnect a call to a remote site
```

➔   Type **internet** and press **ENTER**.

```
                         EDIT REMOTE SITE 1 MENU

1. Connection set-up        menu            - Configure connections
2. Activation set-up        menu            - Configure activation parameters
3. Protocol set-up          menu            - Configure protocols
4. Security parameters      menu            - Configure security parameters
5. Remote site alias        "internet"      - Alias of remote site entry
6. Connection               [single_link]   - Select connection configuration
7. Primary connection       [ISDN_call]     - Select connection type
8. Secondary connection    *[none]          - Select connection type
9. Remote site type         [interoperable] - Interoperable or spoofing
```

➔   Select Connection **set-up**.

```
                         EDIT REMOTE SITE 1 MENU

1. Connection set-up        menu            - Configure connections
2. Activation set-up        menu            - Configure activation parameters
3. Protocol set-up          menu            - Configure protocols
4. Security parameters      menu            - Configure security parameters
5. Remote site alias        "internet"      - Alias of remote site entry
6. Connection               [single_link]   - Select connection configuration
7. Primary connection       [ISDN_call]     - Select connection type
8. Secondary connection    *[none]          - Select connection type
9. Remote site type         [interoperable] - Interoperable or spoofing
```

➔   Select **ISDN call set-up**.

```
                    EDIT REMOTE SITE 1 CIRCUIT SET-UP MENU

1. ISDN call set-up    menu       - Configure ISDN calls
2. Auto-call           [disabled] - Activate auto-call
```

➔   Select **ISDN number**.

- Here you can insert the complete ISDN number of your Internet (POP.
- If TINTORETTO LAN is attached to an ISDN switchboard and a leading digit is requested in order to access the public network, i.e. a 0 (zero) put it in front of the ISDN number.

```
             EDIT REMOTE SITE 1 CIRCUIT SET-UP ISDN CALL SET-UP MENU

1. Advanced settings       menu        - Advanced ISDN call settings
2. ISDN number            [123456]     - Set ISDN number
3. Alternate ISDN number  [none]       - Set alternate ISDN number
4. Wildcard               [none]       - Set wildcard ISDN number
5. Call you               [none]       - Set call you prefix
6. Call me                [none]       - Set call me prefix
7. Callback               [disabled]   - Enable/disable callback
```

Type in the **ISDN** number and press **ENTER**.
Press **TAB twice** for previous menu.(EDIT REMOTE SITE 1 MENU).

Note: The following section may be ignored if the internet account does not use user id and password authentication method.

Select **Security parameters**. Here you must type in the user id and password items you got from the ISP.

```
                      EDIT REMOTE SITE 1 MENU

  1. Connection set-up       menu              - Configure connections
  2. Activation set-up       menu              - Configure activation parameters
  3. Protocol set-up         menu              - Configure protocols
  4. Security parameters     menu              - Configure security parameters
  5. Remote site alias       "internet"        - Alias of remote site entry
  6. Connection              [single_link]     - Select connection configuration
  7. Primary connection      [ISDN_call]       - Select connection type
  8. Secondary connection   *[none]            - Select connection type
  9. Remote site type        [interoperable]   - Interoperable or spoofing
```

Select **Outgoing user name**. Type in the "**user id**". Press **ENTER**.
Select **Outgoing PAP password**. Type in the "**user password**". Press **ENTER**. (Typing not echoed)
Select **Outgoing CHAP secret**. Type in the "**user password**". Press **ENTER**. (Typing not echoed)

```
                EDIT REMOTE SITE 1 SECURITY PARAMETERS MENU

   Option                  Value         Description
  1. Incoming PAP password  [none]       - Set incoming PAP password
  2. Incoming CHAP secret   [none]       - Set incoming CHAP secret
  3. Outgoing user name     "digicom"    - Set outgoing user name
  4. Outgoing PAP password  "*"          - Set outgoing PAP password
  5. Outgoing CHAP secret   "*"          - Set outgoing CHAP secret
```

Note: The Outgoing PAP password and Outgoing CHAP password are not showed. If you are not sure about what you typed, just do it again.

➔   Type **=** for Main Menu.

1.9.   CONFIGURATION SAVE AND LOGOUT

That's it. TINTORETTO LAN is set up and ready to work. Finally save the configuration.

```
                         MAIN MENU

   Option              Value        Description
  1. Quick start        menu        - Quick start configuration menu
  2. Configuration      menu        - Define operating parameters
  3. Statistics         menu        - Device LAN and WAN statistics
  4. Diagnostics        menu        - Access troubleshooting tools
  5. Network events     menu        - View network event history
  6. Save configuration             - Save configuration immediately
  7. Logout                         - End operator session
  8. Help                           - Read menu introduction
```

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Select **Save Configuration** in order to store the configuration in non volatile memory. The alarm state line will show: ALARM: configuration saved. Select **Logout** in order to exit the configuration menu.

Power off and on the Tintoretto LAN and wait for the selftest to be performed.

Once the Power and LAN leds will light with green color go ahead with the Tintoretto LAN Operational check. Quit the Hyperterminal or your terminal emulation program.

Disconnect the RJ45-RJ45 cable from the "Config Port" and from the RJ45-DB9 adaptor. Use the cable to connect the ISDN line port of Tintoretto LAN to the ISDN line plug (see figure 1.3 and 1.4, section "Connections to be made").

The configuration just carried out includes the parameters typed by your self and a complete set of preconfigured parameters which will allow the optimal operations. In few words, the Internet connection will be made at 64Kbit/s using a single ISDN channel, NAT enabled, Multilink enabled, Inactivity timer set to 200 seconds, ISDN usage limitations set to 5 hours or 90 calls, second link disabled, IP protocol enabled, IPX and Bridge protocols disabled, active IP Microsoft Browsing filter, active Bridge Apple and Netware filters.

We reccommend to use this configuration in order to verify that everything works fine. You may then change this state if necessary. Please refer to sections "Complete configuration", "Further configuration", to the additional Tech Notes documentation available on floppy disk or CD-ROM rather than on digicom's Internet web. Strictly follow the given instructions. In case of doubts contact digicom's tech support at **support@digicom.it**. **Do not change any parameter if you are not aware of the effects of these changes.**

1.10. TINTORETTO LAN OPERATIONAL CHECK

In order to quickly test the right behaviour you can use a simple way, similar to the one used before to check the TCP/IP protocol installation on the LAN workstations.

Use one of the previously verified LAN workstations.

If you used different values for IP addresses use your own instead of the ones used for our example.

Note: In our example we will refer to B1as the first used ISDN channel.Tintoretto LAN could use physical channel B2 as first channel in case the other is currently not available or used by other equipment.
Anyway, when single link operation is used the second channel led must never light simultaneously to the first channel's led. Should this happen verify that the second link is disabled (**link 2 disabled**) and **single_link** mode is configured. (From **Main Menu**, select **Configuration, WAN setup**, select **Link setup**, type **2** and **ENTER** for link number. If needed select **Link operation** and type yes setting it to **disable**).

➜   From **START menu**, select **Program** and then **Prompt MS-DOS**.
          In the DOS window type **PING 192.168.1.1** and press **ENTER**.

If everything is working properly the result will be:

Pinging 192.168.1.1 with 32 bytes of data:

Reply from 192.168.1.1: bytes=32 time<10ms TTL=32
Reply from 192.168.1.1: bytes=32 time<10ms TTL=32
Reply from 192.168.1.1: bytes=32 time<10ms TTL=32
Reply from 192.168.1.1: bytes=32 time<10ms TTL=32

During this test B1 and B2 LEDS must be off.

If no answer is received after the ping, check the LAN connection and Tintoretto LAN set-up, then try again.

➜   Carry out a ping to the DNS IP address, in this example **151.99.125.2** Press **RETURN**.

Pinging 151.99.125.2 with 32 bytes of data:

Some lines '**Request timed out**' could appear on the screen and in the meantime **B1** LED on the front panel will be ON to indicate the Outgoing call over ISDN. The correct sequence of this LED is: red, yellow and then green.

➜   When B1 LED is green you can type again PING **151.99.125.2** and the answer will be:

Reply from 151.99.125.2: bytes=32 time<10ms TTL=32

Note: The time value in this example can be different from yours.

If the Outgoing call is not carried out, verify the connection to the ISDN line and the Tintoretto LAN setup, then try again.

Wait until the **Inactivity timer** expires causing an automatic line disconnection (B1 LED off).

➜   Type **exit** to quit the DOS.

At this point you can try the first connection to the Internet. Run your favourite browser (Explorer or Netscape), type an URL address, i.e. **www.digicom.it** and go to the Net. Tintoretto LAN will call your ISP and after a few second you will see the requested web.

If Tintoretto LAN does not carry out the call (see the front panel LED), check if your browser is setup to use the LAN for the remote access.

With Microsoft Internet Explorer verify the settings in the Display, Internet Options, Connection menu. It must be set to 'Connect to Internet via LAN or Local Network'.

If no other operation is carried out, after the time set for the activity timer, the ISDN connection is automatically closed. Otherwise the link is mainteined active until you browse the Internet.

If Tintoretto LAN carried out the call, B1 LED is green but no page appears, verify the IP and DNS value setup on the station (PC) you are using.

If Tintoretto LAN carried out the call and B1 LED remains yellow, verify the user ID and password value.

Should Tintoretto LAN not close the ISDN connection after the idle timer expiration, verify that no program is set to automatically generate traffic. The easiest way to determine if the traffic is coming from the LAN is to disconnect Tintoretto LAN from the HUB or single PC it is connected to.

Should the connection be closed refer to section "How to determine the origin of an ISDN call". Should the connection be mantained open it means that the traffic is coming through the connection to your ISP. Sometimes a wrong configuration in the ISP's access router could erroneously forward routing protocols (RIP, IGMP, IGRP etc.) to the users. Contact your ISP and ask to verify this situation.

1.11. FURTHER IMPORTANT CHECKS

Once the normal automatic connection and disconnection behaviour is verified for Internet e-mail or browsing purposes, please perform a further check to determine if any other application or device used on our network could generate TCP/IP traffic which would cause a call to the ISP.

A simple way to determine this is to:

Power on all computers and run browsers and e-mail programs on them.

Tintoretto LAN will probably issue a call because of the default home pages set in the browsers or e-mail check operation set in e-mail programs.

After the idle timer expiration the ISDN connection must be closed.

Should the link not be closed, verify if the e-miail programs are set up to automatically check the incoming mail every x seconds where x is less than the time set for the Inactivity timer. It is reccommended to not have the e-mail checked automatially in order to avoid undesired ISDN calls.

Should the link be correctly closed, wait for few minutes, then activate all other commonly used applications and verify that those applications will not cause any call to the Internet (exept if specifically needed).
In case of link activation it means that the application is accessing IP addresses not belonging to the local LAN or is trying a DNS name resolution. DNS access is the most common cause.
Verify the application settings and correct the problem. Refer to section "How can I identify the originator of an ISDN call".

Another know cause is related to the **Windows Update** utility. This function can automatically try a connection to Microsoft's web sites every 15 or 45 minutes in order to download updates of the operationg system components. This situation will continue unil the Update is succesfully completed. Please note that this operation often fails because of server or Internet congestion.

Refer to section "Further configuration" for more details and suggestions.

If our ISP provides Multilink/128Kbps service and your account is allows this funtionality you could enable it. Refer to section "Further Configuration", "How to enable Multilink PPP/128Kbps connections".

If you install new applications after Tintoretto LAN's installation please verify that those application do not cause undesired calls to the ISP.

<div align="center">

ATTENTION
</div>

This device automatically establishes calls over ISDN based upon requests coming from the computer connected to the LAN and applications running on those computers. Carefully read and verify what described in sections "Further configuration", "Tintoretto LAN Operational check", "Further important checks" once you have finished the configuration.
The preconfigured profile implements call and usage limitations in order to put a cap to the daily cost of the Internet service. Furthermore,   you can ask your telecom provider to monitor and trace the calls made from your ISDN line.

FURTHER CONFIGURATION

This section describes some extended configuration examples and tips. For the whole description of Tintoretto LAN's options and advanced features refer to the complete "Reference Manual".

Q. How can I enable the Multilink PPP functionality and use the second B channel dinamically in order to achieve 128Kbit/s when needed?

A. In order to enable the Multilink PPP functionality you must be sure that your ISP is supporting this service and in really able to accept dual link calls coming from you.

If this service id fully supported by your ISP, it is possible to configure your Tintoretto LAN in order to make the call at 64Kbit/s first and raise the second channel only when the data traffic exeeds the preset thresholds.

If you are using Tintoretto LAN to connect to a remote Tintoretto LAN (LAN to LAN application) do this settings only on one of the two.

NOTA: Please remember that a 128Kbps connection means double billing. Use it only if really needed.

In order to enable dinamic Multilink operation do the following:
1. From the Main Menu, select **Configuration, WAN setup**.
2. Select **Link setup**, type **2** and **ENTER**.
3. Select **Link operation** and type yes setting it to **enable**. You have enabled the use of the second ISDN channel.
4. Press **TAB**.
5. Select **Remote Site setup**.
6. Select **Display summary** and take note of the Id corresponding to your provider profile. Press **TAB**.
7. Select **Edit remote** site, type the Id number and press **ENTER**.
8. Select **Connection**, type threshold and press **ENTER**.
9. Select **Protocol set-up**, select **Multilink** setting it to enable in case it is **disable**. Press **TAB**.
10. Select **Activation set-up**.
11. Select **Threshold set-up**.
12. You will see 4 parameters.
13. Up threshold (80%). Determines the percentage of primary link's capacity that will cause the secondary link to be activated.
14. Up stability timer (5 min). It defines how long the primary linkís throughput must be at or above the Up Threshold before the secondary call is activated
15. Down threshold (60%) Determines when the secondary link is shut down again. It must be set lower than the Up Threshold.
16. Down stability timer (10 min). When the total link throughput drops below the value set by the Down Threshold for a period of time defined by the Down Stability Timer, the secondary link will be disconnected and placed back in the stand-by mode

Using the above given values the second channel would be raised when the data traffic (either transmit or recieve) exeeds the '80% of 64 Kbps (51.2 Kbps) for 5 minutes, and would be dropped if the traffic should go under the 60% of 64 Kbps (38.4Kbps) for 10 minutes.

1. Change the threshold values according to your needs.
2. Press **TAB**, select **Schedule**.
3. Select Activation intervals, type activate and press **ENTER**, type sunday and press **ENTER**, type 00:00 and press **ENTER**.

Using this values the possibility to use Multilink is enabled for 24 hours/day for the whole week.

You can exclude day times or week days by repeating step 3 and typyng deactivate when desired. Remember to set correctly the system date and time in the Configuration, Access setup, Device setup, Set time menu.

You can see the activation schedule status by selecting **Display Schedule**.

➔   Type **=**, save the configuration, reboot your Tintoretto LAN.

VERIFY THAT THE SECOND CHANNEL WORKS PROPERLY

Now you must verify that the second channel is correctly activated and specially that the provider is correctly accepting your dual link connection. Do a call, generate traffic and wait until the second channel is raised.
If the provider is correctly handling the second channel the B1 and B2 leds will both light for the time set in the Down stability timer or idle timer values. Should the second channel's led light just for few seconds this means that your provider is rejecting the dual channel connection.

Tintoretto LAN will try to establish the second channel connection every 6 seconds, until the first channel is connected and the threshold conditions will be valid.

**ATTENTION: Each retry is an ISDN call wich will be billed.**

In order **to avoid useless calls and billing, disable** immediately the t**hreshold** value in **Connection** resetting it to **single_link** and **disable** link **2** in **Link setup**. Contatct your ISP and ask the reason of the second channel reject. **DO NOT** enable the use of the second channel (Connection setto dual_link or threshold and link 2 enabled in Link setup) if your provider is not accepting multilink connections.

Q. How to configure a couple of Tintoretto LAN in order to interconnect two remote LANs?
A. This document describes the configuration for LAN interconnection over ISDN (LAN to LAN) using TCP/IP

Refer to the user guide for hardware connections. The given example is showing a minimal configuration, for working interconnection. Once running you may extend the configuration in order to better fit your needs (DHCP, NAT, NAT export, Callback, Multilink etc.).

This example refers to:
● A central site, named headq
● A remote site, named branch
● TCP/IP protocol used on both networks
● Different IP addresses (192.168.0.0/ 255.255.255.0 for headq, 10.0.0.0/255.0.0.0 for branch)
● CHAP authentication
● ISDN connection over single channel at 64Kbps.
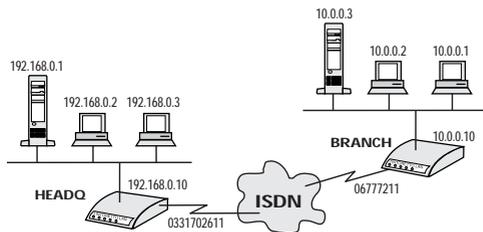
In the following examples, we will refer to "select" meaning "type the corresponding item number" (type 2 in order to select item Configuration). TAB corresponds to the Tabulator key.

During configuration you can substitute your own values for IP addresses, user id and password, etc. For easier working first do a quick drawing of your networks and write down the values.

Configuring headq

Access Tintoretto LAN's configuration through the Config Port and type in the default password. You are now in the Main menu screen.

➜ **Tintoretto LAN's IP address**

Tintoretto LAN will use IP address 192.168.0.10 and Subnet mask 255.255.255.0 (corrieponding to 24 bit).

Starting menu: Main menu
1. Select **Configuration**, select **Internet Setup**.
2. Select **IP Address**, type **192.168.0.10**, press **ENTER**, type **24 for size of subnet mask**, press **ENTER**.
3. Press **TAB**.

➜ **Configuring authentication level**

In order to correctly identify the remote partner and for security reason we will activate CHAP authentication protocol.

Starting menu: Main menu
1. Select **WAN setup**, select **Security setup**, select **Security level**, type **CHAP** and press **ENTER**.
2. Press **TAB**.
   Check that Request security is set to incoming_only.

➜ **Configuring remote site (branch)**

Now we will create a "profile" which refers to the remote site branch, associating all the needed parameters.

Starting menu: WAN setup menu
1. Select **Remote site setup**, select **Edit remote site**, type **branch** for **alias**, press **ENTER**, type **none** for **Template** and press **ENTER**.
2. Select **Connection**, type **single_link** and press **ENTER**.
3. Select **Activation Setup**, select **Inactivity timer** ed type a value in seconds, after which the connection must be closed in case of traffic inactivity, i.e. **200** and press **ENTER**.
4. Press **TAB**, select **Connection Setup**, select **ISDN call setup**, select ISDN number, type 02777211 (the ISDN number of the remote Tintoretto LAN remoto), press **ENTER**.
5. Press **TAB twice**.

➜ **Configuring IP over ISDN link**

Once connected Tintoretto LAN will automatically define a default path to the remote partner.

Starting menu: Edit Remote site 1 menu
1. Select **Protocol setup**, select **IP parameters**, select **IP routing**, select **Auto default route** which will be set to **enable**.
2. Press **TAB three** times.

➜ **Configuring user id and password for authentication**

These parameters will be exchanged for each connection between the two Tintoretto LANs.

Please pay attention when typing these values because for security reasons they are not echoed. If you think you typed in wrongly, just retype it again.

Starting menu: Edit Remote site 1 menu
1. Select **Security parameters**
2. Select **Incoming PAP password**, type **pwbranch**, press **ENTER**.
3. Select **Incoming CHAP secret**, type **pwbranch**, press **ENTER**.

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4.   Select **Outgoing User Name**, type **headq**, press **ENTER**.
5.   Select **Outgoing PAP password**, type **pwheadq**, press **ENTER**.
6.   Select **Outgoing CHAP secret**, type **pwheadq**, press **ENTER**.
7.   Press **TAB three** times.

Attention: the value chosed for Outgoing User Name MUST match the alias used in the remote router; in other words, the remote router sitting on "branch" LAN, will have a remote site named (alias) "headq".

➔   Configuring automatic call to remote site

Tintoretto LAN will automatically call the remote site "x" whenever it will se a packet which has a destination IP address associated to the remote site.
You can configure up to 40 different destinations (remote sites).

Starting menu: Wan setup menu
1.   Select **IP Address connect**, type 1 and press **ENTER**.
2.   Type **10.0.0.0** and press **ENTER**, type **8** and press **ENTER**, type **branch** and press **ENTER**.
3.   Press **TAB**.
4.   Select **IP Address connect**, setting it to **enabled**.
5.   Select **Show IP addess connect entries**. You will see the following screen

```
ID IP Address Subnet MaskSize   Subnet  Mask Remote Site
_  _____ _____  _____  _____
1   10.0.0.0      8          255.0.0.0  branch
```

6.   Press **TAB**.

➔   Configuration save and reboot

Starting menu: Wan setup menu
1.   Press = (the "equal" sign).

Starting menu: Main menu
2.   Select **Save Configuration**
3.   Reboot Tintoretto LAN

Tintoretto LAN will perform the reboot and then it's ready to work.

Configuring LAN stations in "headq"

Each station on the network "headq" must have:
● A unique IP address of network 192.168.1.x, i.e. 192.168.1.1, 192.168.1.2, etc.
● The asme Subnet Mask 255.255.255.0
● The same Default Gateway IP address, the one assigned to Tintoretto LAN (192.168.1.10).

If there is a DHCP server in the network you must:
● Define the IP address used for Tintoretto LAN as RESERVED
● Add and define the IP address of Tintoretto LAN as "Router" in the DHCP service

Configuring branch

Access Tintoretto LAN's configuration through the Config Port and type in the default password. You are now in the Main menu screen.

➔ **Tintoretto LAN's IP address**

Tintoretto LAN will use IP address 10.0.0.10 and Subnet mask 255.0.0.0 (corresponding to 8 bit).

Starting menu: Main menu
1. Select **Configuration**, select **Internet Setup**.
2. Select **IP Address**, type **10.0.0.10**, press **ENTER**, type 8 for s**ize of subnet mask**, press **ENTER**.
3. Press **TAB**.

➔ **Configuring authentication level**

In order to correctly identify the remote partner and for security reason we will activate CHAP authentication protocol.

Starting menu: Main menu
1. Select **WAN setup**, select **Security setup**, select **Security level**, type **CHAP** and press **ENTER**.
2. Press **TAB**.
   Check that Request security is set to incoming_only.

➔ **Configuring remote site (headq)**

Now we will create a "profile" which refers to the remote site headq, associating all the needed parameters.

Starting menu: WAN setup menu
1. Select **Remote site setup**, select **Edit remote site**, type **headq** for **alias**, press **ENTER**, type none for **Template** and press **ENTER**.
2. Select **Connection**, type **single_link** and press **ENTER**.
3. Select **Activation Setup**, select **Inactivity timer** ed type a value in seconds, after which the connection must be closed in case of traffic inactivity, i.e. **200** and press **ENTER**.
4. Press **TAB**, select **Connection Setup**, select **ISDN call setup**, select **ISDN number**, type **0331702611** (the ISDN number of the remote Tintoretto LAN remoto), press **ENTER**.
5. Press **TAB twice**.

➔ **Configuring IP over ISDN link**

Once connected Tintoretto LAN will automatically define a default path to the remote partner.

Starting menu: Edit Remote site 1 menu
1. Select **Protocol setup**, select **IP parameters**, select **IP routing**, select Auto default route which will be set to **enable**.
2. Press **TAB three** times.

➔ **Configuring user id and password for authentication**

These parameters will be exchanged for each connection between the two Tintoretto LANs.

Please pay attention when typing these values because for security reasons they are not echoed. If you think you typed in wrongly, just retype it again.

Starting menu: Edit Remote site 1 menu
1. Select **Security parameters**
2. Select **Incoming PAP password**, type **pwbranch**, press **ENTER**.

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3. Select **Incoming CHAP secret**, type **pwbranch**, press **ENTER**.
4. Select **Outgoing User Name**, type **headq**, press **ENTER**.
5. Select **Outgoing PAP password**, type **pwheadq**, press **ENTER**.
6. Select **Outgoing CHAP secret**, type **pwheadq**, press **ENTER**.
7. Press **TAB three** times.

Attention: the value chosed for Outgoing User Name MUST match the alias used in the remote router; in other words, the remote router sitting on "branch" LAN, will have a remote site named (alias) "headq".

➔ **Configuring automatic call to remote site**

Tintoretto LAN will automatically call the remote site "x" whenever it will se a packet which has a destination IP address associated to the remote site.
You can configure up to 40 different destinations (remote sites).

Starting menu: Wan setup menu
1. Select **IP Address** connect, type **1** and press **ENTER**.
2. Type **192.168.1.0** and press **ENTER**, type 24 and press **ENTER**, type **headq** and press **ENTER**.
3. Press **TAB**.
4. Select **IP Address** connect, setting it to **enabled**.
5. Select **Show IP addess** connect entries. You will see the following screen

```
ID  IP Address  Subnet Mask Size  Subnet Mask   Remote Site
─  ──────────  ───────────────   ────────────  ──────────
1  192.168.0.0      24           255.255.255.0    headq
```

6. Press **TAB**.

➔ **Configuration Save and Reboot**

Starting menu: Wan setup menu
1. Press **=** (the "equal" sign).

Starting menu: Main menu
2. Select **Save Configuration**
3. Reboot Tintoretto LAN

Tintoretto LAN will perform the reboot and then it's ready to work.

Configuring LAN stations in "branch"

Each station on the network "branch" must have:
● A unique IP address of network 10.0.0.x, i.e. 10.0.0.1, 10.0.0.2, etc.
● The asme Subnet Mask 255.0.0.0
● The same Default Gateway IP address, the one assigned to Tintoretto LAN (10.0.0.10).

If there is a DHCP server in the network you must:
● Define the IP address used for Tintoretto LAN as RESERVED
● Add and define the IP address of Tintoretto LAN as "Router" in the DHCP service

Check if it works

In order to see if everything works fine it is enough to try a PING to a IP address of a remote station.

You must see led B1 light yellow during connection, and green once the authentication phase is sucessfully passed.

Retrying the PING you should see the replies. You are in communication with the remote LAN.

Now stop any operation and wait until the inactivity timer expires. The connection must be closed.

Finally, be sure to have a name resolution mechanism based upon DNS, WINS or HOSTS/LMHOSTS files in order to be able to correctly reach remote shared resources.

Q. How can I identify the originator of an ISDN call?
A. Tintoretto LAN logs all line activations in a special area called Activation log. There you will find the source IP address of the station which generated the packet which is opening the link, the destination IP address and the data field of this packet.

In order to access the activation log Select Main menu, Network Events, Show Activation log.

Activation log example:

```
#1 1999-04-02 13:05:24 IP Address Connect event to internet (IP)
#2 1999-04-02 13:05:24 (NAT) Dst 151.99.125.2 Src 192.168.1.12
#3 1999-04-02 13:05:24 Length = 60 - 45 00 00 3c 0c 11 00 00 1f 01 7b 4b
                          + 00 00 00 00 97 63 7d 02 08 00 b8 5b 80 00 15 00 61
                          + 62 63 64 65 66 67 68 69 6a 6b 6c 6d 6e 6f 70 71 72
                          + 73 74 75 76 77 61 62 63 64 65 66 67 68 69
Time is 1999/04/02 13:06:16, 3 items since last clear.
Type: [s]-to redraw, [=] main menu, any other key to end.
```

Here you can see a example where a station which has IP address 192.168.1.12 generated a call to remote site internet because of the destination address 151.99.125.2. The hexadecimal values are containing some useful informations.
Sending these informations to digicom's tech support (**support@digicom.it**) it is possible to analize them and find out the reason of the call (HTTP, POP, SMTP, FTP etc.).

Q. How to restore the preconfigured profile using TFTP
A. After a Full reset operation, all configuration parameters are deleted and brought to factory defaults. The preconfigured profiles is no longer available.

You can easily reload the preconfigured profile using a TFTP session.
The TFTP.EXE utility and the file containing the preconfigured profile can be found on the supplied diskette or CD-ROM, or on digicom's Internet web site (**www.digicom.it**) download area.

Do the following:
1. Access Tintoretto LAN's configuration through the Config Port.
2. Select **Main menu**, **Configuration**, **Internet Setup**.
3. Select **IP Address**, type **192.168.1.1** and <**ENTER**>
4. Type **24 for subnet mask** and <**ENTER**>
5. Type **=** for Main menu.
6. Select **Configuration**, **Access Setup** menu.

7. Select **TFTP** access setting it to **enabled.**
8. Run **TFTP.exe.**
9. Type **192.168.1.1** in the **Remote Host** tab.
10. Select **config.txt** in the **Local Directory** tab.
11. Select **Ascii** for **Mode**.
12. Clic on the **-->** (Send file) button and confirm transmission.
13. Wait until Tintoretto LAN shows the **Preempted by TFTP operation message** on the terminal emulation prompt.

The preconfigured profile is now newly loaded. Complete the configuration by inserting the ISDN number, the user id and the password.

Q. How to change Tintoretto LAN's IP address
A. If the current IP address is not suitable, you can change it.

Do the following:
1. Access Tintoretto LAN's configuration through the Config Port.
2. Select **IP Address**, type the new **IP address**, i.e. **192.134.21.12** and <**ENTER**>
3. Type **24** for the **subnet mask** and <**ENTER**>.
    A Subnet mask 24 corresponds to 255.255.255.0 (Standard Class C, IP from 192.x.x.x to 223.x.x.x).
    A Subnet mask 16 corresponds to 255.255.0.0 (Standard Class B, IP from 128.x.x.x to 191.x.x.x).
    A Subnet mask 8 corresponds to 255.0.0.0 (Standard Classe A, IP from 1.x.x.x to 126.x.x.x).
    Ask support to your network administrator in order to find out the new IP address and Subnet mask.
4. Type **=** for Main menu
5. Select **Save configuration**. Reboot Tintoretto LAN

On the supplied diskette or CD-ROM you can find the NOTE_TEC_EN.PDF file containing more tech notes,
configuration tips and common problem solutions. See also the FAQ area on http://www.digicom.it

PRECONFIGURED PARAMETERS

Your device is supplied witha preconfigured profile. An indicator of the preconfiguration is the device name set to PRECONF.

PRECONFIGURED PROFILE	PROFILE AFTER A FULL RESET

Device name: PRECONF
IP Address 192.168.1.1
Subnet Mask 255.255.255.0 (24)
IP Routing enabled
IPX Routing disabled
Bridging disabled
LAN RIP disabled
IP address Connect default to remote site 1
IP address Connect enabled

Remote site 1 internet
NAT enabled
IP enabled
CCP enabled
WAN RIP disabled
IPX disabled
BCP disabled
Auto default route enabled
Connection using single link (64K)
Link 2 disabled
Multilink enabled
Inactivity timer 200 seconds

Call limitation set to 90
Usage limitation set to 300 minutes (5 hours)

Ip filter MSBROWSE active
Bridge filter NETWARE active
Bridge filter APPLE active

ATTENTION: the above preconfigured profile is COMPLETELY removed by a FULL RESET operation.

Device name: DEV80xxxx
IP Address none
Subnet Mask none
IP Routing enabled
IPX Routing enabled
Bridging enabled
LAN RIP rip1 compatibile
IP address Connect disabled

Remote site generic
NAT disabled
IP enabled
CCP enabled
WAN RIP rip1_compatibile
IPX enabled
BCP enabled
Auto default route none
Connection using thresholded dual link (128K)
Link 2 enabled
Multilink enabled
Inactivity timer 60 seconds

Call limitation set to unlimited
Usage limitation set to unlimited

No active filters

It is possible to restore the preconfigured profile via TFTP. Refer to section " How to restore the preconfigured profile using TFTP "

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DECLARATION C€ OF CONFORMITY

Digicom S.p.A. via Alessandro Volta 39 21010 Cardano al Campo -Varese-
declares that this product satisfies the basic requirements of
Electromagnetic Compatibility and Safety of the below indicated Directive:

- **89/336/CEE** of 3 may 1989 with subsequent modifications (Directive 92/31/CEE of april 28, 1992, Directive 93/68/CEE of july 22,1993 and Directive 93/97/CEE of 29 october 1993).
- **73/23/CEE** of february 19, 1973 with subsequent modifications (Directive 93/68 ECC of july 22, 1993).

CHECK REPORT

The equipment has been successfully tested according to the check procedure indicated on the inside back cover of the user's manual. It is in conformity with the technical characteristics described in the users' manual supplied with the equipment.

WARRANTY

WARRANTY CLAUSES

- The equipment has a warranty which covers manufacturing and operating faults for the period indicated on the inside back cover of the user's manual.
- The warranty is to be considered freight forward and the goods must reach the address indicated below at customer's expences.
- Warranty means the substitution or repairing of fault products. Working hours used for repairing included in the warranty.
- The estetic and the separable parts are not included in the warranty.
- The warranty is not extended to equipments which have been subject to misuse, improper installation, electric discharge or repaired by unauthorized staff.

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