



THROUGH IP

REMOTE TRANSCEIVER INTERFACE

User Guide

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Congratulations on purchasing a TIP100 **THROUGH IP** Remote Transceiver Interface for your Codan NGT series HF transceiver. Read this section to learn about the features of the interface and what you need to set it up.

TIP100 Components

- TIP100 interface unit.
- Mains power supply (12V DC Plug Pack).
- TIP100 to NGT Transceiver interface cable.
- TIP100 to NGT Handset interface cable.

What you will need to set up a TIP100

- Codan NGT series HF transceiver with NGT Handset and a speaker.
- A computer with web browser (e.g. Chrome, Firefox, Internet Explorer) and an Ethernet or Wireless network connection. The computer needs to be connected to the same network as your TIP100 interface unit).
- An Ethernet or Wireless network.
- Ethernet network interface cable.
- A broadband Internet connection (DSL/Cable/LAN). The broadband connection will need a minimum of 128kbit in both the upload and download direction.

TIP100 Front Panel



RESET	This small recessed button can be pressed with the tip of a pen or pencil. A brief press of the button will reset the device. Holding the button pressed in for approximately 10 seconds will restore factory default settings. This is indicated by the green STATUS LED being on and the red STATUS LED blinking.
TX	On the handset side, the TX indicator shows that the handset PTT button is pressed.
LINK	Indicates if a link is active or not.
STATUS	The status lights blink when the TIP100 interface unit starts up and is establishing a network link. When the TIP100 interface unit is on and has an IP address, the status lights show solid green. For more information on the status lights of the TIP100 interface unit, see page 29.

TIP100 Rear Panel



TRANSCIEVER	Connect the TIP100 interface unit to either the NGT Transceiver or to the NGT Handset using the corresponding interface cable.
LAN	Connect the TIP100 interface unit to a wired LAN network.
PWR	Plug the 12V DC power cord from the mains power supply into the TIP100 interface unit. Note that on the transceiver side the TIP100 interface unit needs to remain powered at all times independently of the transceiver to allow the transceiver to be remotely powered off and on.

Use the information in this chapter to set up and configure the TIP100 **THROUGH IP** Remote Transceiver Interface.

To get started you will need to:

- Have a mains power supply to power the TIP100 interface unit.
- Connect interface cables to your TIP100 interface unit and an Ethernet network.
- Connect either a “TIP100 to NGT Handset” interface cable or a “TIP100 to NGT Transceiver” interface cable to the TIP100 interface unit.
- Connect a speaker to the socket on the interface cable to allow you to hear the IP address announcement from the TIP100 interface unit.
- Ensure that your network has a facility to automatically assign IP numbers like through DHCP,
-or-
- Have a statically allocated IP address available that can be used to configure your TIP100 interface unit.

Automatic Link Mode of the TIP100

Starting from version 1.13 of the TIP100 software, the TIP100 has an 'Auto-Link' capability when both the handset and transceiver TIP100 are used on the same network segment.

This is particularly useful when deploying the TIP100 on a dedicated Ethernet segment like with a cross-over cable or using media converters to deploy the TIP100 using a fibre optical link.

To use this feature, the transceiver TIP100 just needs to be factory default configuration and the handset TIP100 just needs to be in 'Handset' mode with the 'Transceiver Address' left blank.

Follow the directions in Setting Up the TIP100 and Configuring the TIP100 to ensure that the handset TIP100 is in 'Handset' mode and with the 'Transceiver Address' left blank.

For this initial setup a network with DHCP capability is recommended, but after this step, there is no further requirement for DHCP and the TIP100's can be reconnected to their own independent network segment or cross-over cable.

Setting Up the TIP100

Before you begin, make sure you have all the appropriate cables for your set-up. Start the system set-up with the TIP100 interface unit that is going to be connected to the NGT transceiver. Ensure that you have the speaker that comes with your transceiver available for this set-up.

Step 1: Connect a network cable

Plug a standard (straight) network cable into the network port (**LAN**) of the TIP100 interface unit and the other end into your network hub or network switch. You can also use a crossover network cable (not included) for a direct connection to your PC.

Step 2: Connecting the interface cable

Connect either a "TIP100 to NGT Handset" or a "TIP100 to NGT Transceiver" interface cable to your TIP100 interface unit to the socket marked **TRANSCEIVER** on the TIP100 interface unit.

Step 3: Connecting a speaker

Connect the loudspeaker that comes with your transceiver to the speaker socket on the interface cable that you connected to the TIP100 interface unit. If you are setting up the TIP100 for the transceiver, this speaker will only be used temporarily so you can hear the IP address announcements and can be removed after the configuration is complete.

Step 4: Connect the power supply

Plug the round DC power plug of the power supply module into the socket marked **PWR** on the TIP100 interface unit.

Plug the power supply into an appropriate electrical outlet and switch on the outlet if required.

Step 5: Network startup

The TIP100 interface unit will now search for a DHCP server to get an IP address and announce it over the loudspeaker.

For example: 192.168.0.12 (Voice: one nine two dot one six ...)

Make sure you write this IP address down as you will need this address to further configure the TIP100 interface unit. If you missed the announcement, you can press the reset button on the front panel and listen to the announcement again.

If there is no DHCP service available on your network, the TIP100 will try to find an IP address that is suitable for your network, but this can take up to 5 minutes.

Step 6: Browse to the TIP100 Configuration Web page

Using the address from the voice announcement, open a new browser window on your computer and type the address in the address bar of your browser and press Enter.

Your browser will now open the default **Status** page of the TIP100 interface unit.

Configuring the TIP100

After you have opened the Status page of the TIP100 interface unit in your browser, click on the **Setup** menu item at the top left of the page. A number of new menu items will appear.

Under **Setup**, the main configuration items are:

1. Application
2. Network Settings
3. Log Settings
4. Security Settings

See page 17 for an image of the **Setup** configuration screen of the TIP100 interface unit.

Configuring the TIP100 Application

For a full remote interface system for your NGT transceiver, you will need two TIP100 interface units. The first provides the network interface for the NGT Transceiver and the second provides the network interface to the NGT Handset and a loudspeaker.

On the **Setup** page, select either “Codan NGT Handset Interface” or “Codan NGT Transceiver Interface” from the **Application** selection box. Note that the “Codan NGT Transceiver Interface” is the default configuration after a reset to 'factory' defaults.

Configuring the TIP100 Network Settings

The default configuration of the TIP100 interface unit is to connect to the Ethernet network using DHCP and obtain the network setting automatically. These settings can be observed in the top bar of the status screen.

To set the network parameters manually, enter the required values in the network settings fields.

To confirm the settings click on the **Apply** button at the bottom of the screen. The TIP100 interface unit will now restart and configure the new settings.

Note: if you manually configured the network parameters (i.e. Static IP) and changed the IP address, you will need to change the IP address in the browser as well to access the TIP100 interface unit status and configuration pages again.

Note: if you are using the 'Auto-Link' feature of the TIP100 (Software version 1.13 and newer) you can leave the IP configuration to automatic.

Configuring the TIP100 for the NGT Transceiver

When the TIP100 interface unit is connected to a NGT Transceiver, no further configuration is required.

The TIP100 is default configured to listen on port 5500 for incoming connections. This port number is needed for the configuration of the TIP100 interface unit that is connected with the NGT Handset.

Depending on your network set-up, the port number may also be required for the configuration of network gateways and routers.

Use the following steps to check the configured port number.

1. Note the network address voice announcement and open a browser to the TIP100 interface unit that it is connected to the NGT Transceiver.
2. Navigate to **Setup**.
3. Check if the Application is set to “Codan NGT Transceiver”.
4. Navigate to **Transceiver**.
5. Select between **TCP** or **UDP** for the **Network Link Mode**. **UDP** will provide better interactive response and is best used on local networks only. **TCP** is the default and provides for better reliability especially when wireless networks are used.
6. Note the port number value next to **Network Base Port** or enter a new desired port number.
7. Click **Apply** if you made any changes.
8. The speaker that you used for hear the voice announcement can now be removed.

Configuring the TIP100 for the NGT Handset

When the TIP100 interface unit is connected to a NGT Handset, the unit needs to be configured in 'Handset' mode to be able to connect to the network address and port of the TIP100 interface unit that is connected to the NGT Transceiver.

1. Open a browser to the TIP100 interface unit that it is connected to the NGT Handset.
2. Navigate to **Setup**.
3. Check if the **Application** is set to “Codan NGT Handset Interface”.
4. Navigate to **Handset**.

If the transceiver and handset TIP100 are on the same network subnet, it is possible to use the 'Auto-Link' capability. If the transceiver TIP100 is located in another network (e.g. via a gateway elsewhere on the Internet) you need to manually configure the transceiver TIP100 address.

Automatic linking to the transceiver TIP100

To use the 'Auto-Link' mode of the TIP100, all that is required is to leave the **Network Address** field blank. Ensure that **Network Base Port** is the same as is used with the transceiver and click **Apply**.

Manually configuring the transceiver TIP100 address

If your transceiver TIP100 is not on the same network subnet, you need to configure the transceiver IP or domain name as follows:

1. Next to **Network Address** enter the IP address or the domain name of the TIP100 interface unit that is connected to the transceiver.
2. Check if the port number show next to **Network Base Port** is the same as the port number configured on the TIP100 interface unit with the NGT Transceiver.
3. Click **Apply**.

The TIP100 unit will now restart and will attempt to connect to the transceiver. The progress of this can be observed from the TIP100 status page in your browser (See page 14).

Read on to learn about using the TIP100 with your Codan NGT series transceiver.

Once configured and powered, the TIP100 that is configured for the NGT Handset, initiates the link to the TIP100 that it connected to the transceiver.

Handset Operation

Once the link is established, the operation of the NGT Handset is essentially as if it is directly connected to the transceiver. This includes powering the transceiver on and off, adjusting the volume and accessing the same transceiver functionality you would be able to use when the NGT Handset was directly connected to the transceiver¹.

You may however notice some slight delays depending on the network connection used compared with a handset that is directly connected to a transceiver.

For optimum control of your NGT transceiver through your remote control system, you should adjust a small number of configuration settings in your NGT as follows:

- **Key Repeat Rate** 0.5s or more
- **Key Hold Time** 1.0s or more

These settings can be found in the Control Menu of your NGT transceiver and you may need to be logged in as Admin to see and adjust these settings. See your NGT transceiver documentation for more details.

Network Connections

The TIP100 interface unit uses both **TCP** and **UDP** networking to create and maintain the network link between the two stations, so it is necessary that the

1 However configuring or programming the NGT Transceiver through the PC programming software NSP is not supported.

intermediate routers and gateways are configured to allow both incoming and outgoing **TCP** and **UDP** traffic for the TIP100 interface units.

The ports that need to be enabled are the **Network Base Port** number and two subsequent port numbers. For example for the default base port number of **5500**, ports **5500**, **5501** and **5502** will be used by the TIP100.

Internet Links

To operate the TIP100 interface unit via the Internet, it is necessary that the TIP100 interface unit with the NGT Transceiver can be reached via either a **static IP address** or a **domain name**². The network gateway or router providing the Internet connection needs to have all the **UDP** and **TCP** ports enabled for incoming traffic and forward it to the internal IP address of the TIP100 interface unit.

In this case it is necessary that the local IP address of the TIP100 unit remains constant. For this purpose, configure the TIP100 manually with an IP address suitable for the internal network.

Alternatively, it may be possible to configure the DHCP server on the local network to always assign the same IP address to the TIP100 based on the MAC address of the TIP100.

The MAC address can be noted from the status page of the TIP100 interface unit and is also printed on the bottom of the unit.

TIP100 Status Web Page

The picture below is the status information page of the TIP100 interface unit.

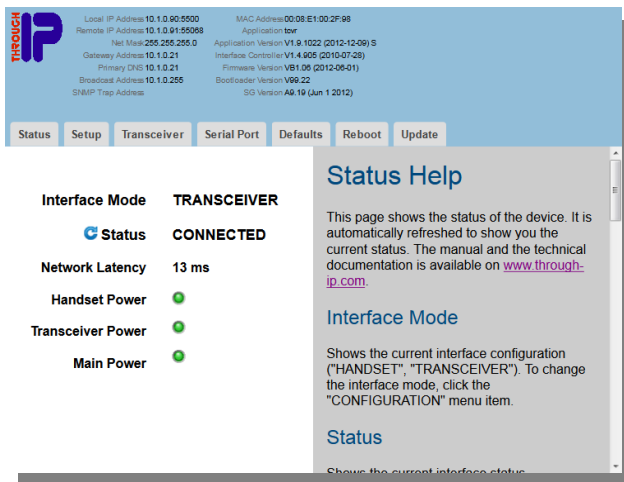
At the top of the page the MAC and IP addresses are shown as well as the software version of the TIP100.

In the example shown the TIP100 interface unit was configured for “Codan NGT Handset” which is shown as **Interface Mode HANDSET** handset operation and is currently attempting to link to the transceiver (shown as **Status LINKING**).

Once a link is established, the TIP100 interface units will measure the nominal network delay time for the current link. Below that the status of the transceiver power supply, the transceiver itself and the handset is shown.

The grey area on the right hand side provides on-line help for the current screen.

2 Domain names can be used with dynamic IP addresses.



To configure the unit, click on the **'Setup'** menu item (second menu item from the left). A new web page will appear with a number of menu items:

Status

This returns the web page to the status screen.

Setup

This is the configuration page after clicking the **'Setup'** menu item. Use this page to configure the T1P100 for either Handset or Transceiver mode as well as the network parameters setup.

Handset

When the T1P100 is configured for Handset mode (using the **Setup** menu page), this menu item will be available to the right of the **Setup** menu to allow configuration of the network address and port of the transceiver T1P100 unit.

Transceiver

When the TIP100 is configured for Transceiver mode (using the **Setup** menu page), this menu item will be available to the right of the **Setup** menu to allow configuration of the network port that the TIP100 will use to listen for incoming connections. This port needs to be same port number as is used on the TIP100 in Handset mode.

Serial Port

This screen allows configuration of the RS232 serial port parameters to be used. Note that the data mode is only available when used with interface cables that have the extra DB9 RS232 connector included or see the chapter TIP100 Rear Panel Connectors on page 33 for more details on the DB25 connector of the TIP100.

Defaults

Allows for resetting the TIP100 to factory default settings. Note that factory default settings can also be restored by pressing and holding the RESET switch for approximately 10 seconds until the right most RED LED starts flashing.

Reboot

Allows for restarting the TIP100 remotely.

Update

When it is necessary to update the TIP100 software, this page allows for the TIP100 to enter a special software update mode.

Use with caution and only when instructed to do so by Through IP support.

TIP100 Setup Web Page

The main configuration screen below is used to configure the TIP100 interface unit between the application mode (“Codan NGT Handset Interface” -or- “Codan NGT Transceiver Interface”), as well as the configuration of the network parameters of the unit.

The **Sonic IP** setting determines the voice announcement of the network address at start up of the TIP100 interface unit.

To have an IP address automatically assigned by the network with DHCP, all network parameters should be 0.

The grey area on the right hand side provides additional information on the configuration parameters shown.

The screenshot displays the TIP100 Setup Web Page. At the top, there is a header with the 'Sonic IP' logo and a list of system information: Local IP Address (10.1.0.00:5500), Remote IP Address (10.1.0.01:55008), Net Mask (255.255.255.0), Gateway Address (10.1.0.21), Primary DNS (10.1.0.21), Broadcast Address (10.1.0.255), SNMP Trap Address, MAC Address (00:08:E1:00:2F:98), Application (Iov), Application Version (V1.9.1022 (2013-12-09) S), Interface Controller (V1.4.905 (2010-07-28)), Firmware Version (V81.06 (2012-06-01)), Bootloader Version (V00.22), and SG Version (A9.19 (Jun 1 2012)).

Below the header is a navigation menu with tabs: Status, Setup, Transceiver, Serial Port, Defaults, Reboot, and Update. The 'Setup' tab is selected.

The main content area is titled 'Setup' and contains the instruction: 'Configure the TIP100 application mode and network settings below:'. Underneath, there is a section for 'APPLICATION' with a dropdown menu set to 'Codan NGT Transceiver Interface'. Below that is a section for 'NETWORK SETTINGS' with a 'Use SonicIP' option set to 'Yes' and a table for IP Address, Netmask, Gateway IP Address, and Primary DNS, all with input fields containing '0'.

On the right side, there is a grey sidebar titled 'Setup Help' containing the text: 'Here you configure the general setup and network parameters for the device as described below. For a detailed help please refer to the manual.' Below this is another 'APPLICATION' section with the text: 'The device mode is selected from the Application selection field. Click Apply to reconfigure and restart. Once the device has restarted to apply the new settings, select the Application menu to configure specific settings for this mode.' At the bottom of the sidebar is a 'NETWORK SETTINGS' section with the text 'Use SonicIP'.

TIP100 Transceiver Configuration Web Page

Once the **Network Settings** on the **Setup** page are configured for the transceiver unit refresh the page and the **Transceiver** menu will appear.

There are a few configuration parameters as shown below for which the default settings are generally Ok for a initial setup.

The screenshot displays the web interface for configuring a TIP100 transceiver. At the top, there is a header with the 'THROUGH IP' logo and various system information including Local IP Address (10.1.0.90/8300), Remote IP Address (10.1.0.91/55008), MAC Address (00:08:E1:00:2F:98), Application (tcr), Net Mask (255.255.255.0), Application Version (V1.9.1022 (2012-12-09)), Gateway Address (10.1.0.21), Interface Controller (V1.4.905 (2010-07-28)), Primary DNS (10.1.0.21), Firmware Version (V81.06 (2012-06-01)), Broadcast Address (10.1.0.255), Bootloader Version (V99.22), and SNMP Trap Address. Below the header is a navigation menu with tabs for Status, Setup, Transceiver, Serial Port, Defaults, Reboot, and Update. The 'Transceiver' tab is active. The main content area is titled 'Transceiver' and contains configuration settings for the TIP100 in Transceiver mode. It includes a note about connecting the Handset and Transceiver TIP100's to the Network Base Port. Below this is the 'NETWORK CONFIGURATION' section with a form containing: Network Link Mode (dropdown menu set to TCP), Network Base Port (text input field set to 5500), and Continuous Audio Stream (radio buttons for No and Yes, with No selected). There are 'Apply' and 'Cancel' buttons. On the right side, there is a 'Transceiver Help' section with the text: 'The TIP100 is currently configured to operate as a network interface for the Codan NGT Transceiver.' Below the help text is another 'NETWORK CONFIGURATION' section titled 'Network Link Mode' with a detailed explanation of selecting UDP for quicker response or TCP for better reliability.

Network Link Mode

Configure the TIP100 to either use TCP or UDP for the network connections. The TCP setting provides the highest reliability and is generally the preferred mode to use.

When network delays are high enough for the TCP mode to have problems remaining connected without audio drop-outs, UDP can be used to overcome some of these problems and will generally have smaller drop-outs.

Network Base Port

Is the main configuration setting that needs to be the same between the Handset and the Transceiver unit in order to successfully connect.

For a setup where there is only one Transceiver, the default value can be used.

For a setup with for more than one TIP100 connected to the same Transceiver and connected through the same gateway, it will be necessary for one of the TIP100 to be configured with a different Network Base Port (e.g. 5600) to allow the gateway port forwarding to the correct TIP100.

TIP100 Handset Configuration Web Page

As the Handset TIP100 is the side that initiates the network connections to the Transceiver TIP100, the Handset interface needs to be configured with the correct network address and port for the Transceiver TIP100. An example is shown below:

The screenshot displays the configuration web page for a TIP100 handset. At the top, there is a status bar with the following information:

- Local IP Address: 10.1.0.91:55008
- Remote IP Address: 10.1.0.90:5500
- Net Mask: 255.255.255.0
- Gateway Address: 10.1.0.21
- Primary DNS: 10.1.0.21
- Broadcast Address: 10.1.0.255
- SNMP Trap Address:
- MAC Address: 00:08:E1:02:35:4C
- Application: hs
- Application Version: V1.9.1022 (2012-12-09) S
- Interface Controller: V1.4.901 (2011-10-28)
- Firmware Version: V81.005 (2012-06-01)
- Bootloader Version: V99.22
- SG Version: A8.19 (Jun 1 2012)

Below the status bar are navigation tabs: Status, Setup, Handset, Serial Port, Defaults, Reboot, and Update. The 'Handset' tab is selected.

The main content area is titled 'Handset' and contains the following text:

Configuration settings for the TIP100 in Handset mode (Change the application mode in the **Setup** menu).

Note that for the Handset and Transceiver TIP100's to successfully connect, the *Network Base Port* configured below must be the same in both TIP100's:

NETWORK CONFIGURATION

Network Address:

Network Base Port:

On the right side, there is a 'Handset Help' section with the following text:

Handset Help

The TIP100 is currently configured to operate as a network interface for a Codan NGT Handset. On this page the network address and base port for the transceiver connection is configured. Once the address and port are configured, this TIP100 automatically attempts to establish a connection with the transceiver interface unit.

NETWORK CONFIGURATION

Network Address

Enter the network address for the TIP100 unit that interfaces to the transceiver unit. The address can either be an IP address (e.g. 10.1.0.42) or a domain name (e.g. transceiver.through-ip.com).

Network Base Port

Enter the network port for the TIP100 unit that interfaces to the transceiver unit. For more details about this, the default port of

Network Address

This configuration contains the network address for the TIP100 unit that interfaces to the Transceiver unit.

The address can either be an IP address (e.g. 10.1.0.42) or a domain name (e.g. transceiver.through-ip.com).

To use the 'Auto-Link' capability, leave this configuration item blank.

Network Base Port

To successfully connect to the Transceiver, this configuration setting needs to be the same as it is configured for the corresponding Transceiver TIP100.

TIP100 Auto-Link on local subnet

The TIP100 'Auto-Link' feature works by using broadcast UDP messages to link from the handset to the transceiver. This feature only works when both TIP100's operate on the same network subnet.

Both sides are also required to use the same configured port number (e.g. the default ports 5500 to 5502).

If more than one TIP100 are to be used on the same network segment, both the second client and the second transceiver TIP100 need to be preconfigured port number different from the default.

The TIP100 in their default factory configuration and without a DHCP service on the network (e.g. on a cross-over cable) will eventually fall-back on the using an IP address from the 'Automatic Private IP Addressing' range (169.254.x.x). This can take a number of minutes.

The 'Auto-Link' feature is mainly implemented on the handset side of the TIP100 and is compatible with transceiver TIP100's from version V1.9.1040 and newer.

Note that a factory reset on a TIP100 device always reverts to 'transceiver' mode and that performing a 'factory reset' on the handset TIP100 will disable the 'Auto-Link' capability.

The TIP100 can be remotely monitored in a number of ways:

- TIP100 Status Web Page
- SYSLOG Messages
- SNMP Monitoring & Traps

Status Web Page

The status web page of the TIP100 allows for monitoring the TIP100 through a standard web browser. In a basic system this may be all that is needed.

SYSLOG Messages & Log Level

The TIP100 contains a **SYSLOG** client. As part of the TIP100 operation the **SYSLOG** client can send regular status updates using the standard **syslog** UDP port 514.

The amount of logging can be configured with the **Log Level** setting, where a lower setting means less log messages and each subsequent higher level means more log messages get enabled.

The default for SYSLOG messages is to be broadcast on the local LAN where they can be captured using SYSLOG server software. The IP of the SYSLOG server can also be configured to direct the SYSLOG messages to a specific server address.

As broadcast messages are generally not forwarded beyond the local LAN segment, setting a specific SYSLOG server address makes it possible to forward and capture the SYSLOG messages remotely.

SYSLOG server software is widely available for a range of operating systems in both desktop and server variants.

Using a SYSLOG server may provide an ability to look at a TIP100 status changes over a period of time.

SNMP Monitoring & SNMP Traps

The TIP100 can also be monitored using the SNMP v1 protocol. In addition to the standard SNMP network parameters, a number of state variables indicating the current TIP100 status and configuration can be read. The TIP100 can also be configured to send TRAPS (alerts) to a configured IP address.

SNMP Variables

The TIP100 makes a number of enterprise specific string variables available through the following Object Identifiers (OID):

`SNMPv2-SMI::enterprises.17491.1.5.1.1.1.2`

The string variables in use are as follows:

Index	Description
1	Status (as per Status web page)
2	Interface Mode (as per Status web page)
3	Application Version
4	Interface Controller Version
5	Local IP address
6	Local Port Number
7	Remote IP address
8	Remote Port Number
9	Net Mask
10	Gateway IP Address
11	Primary DNS IP Address
12	Broadcast IP Address
13	SNMP Trap IP Address or domain name
14	-
15	Continues streaming (0=OFF, 1=ON)
16	Network latency (in milli seconds)
17	Handset Power (0=OFF, 1=ON)
18	Transceiver Power (0=OFF, 1=ON)
19	Mains Power (0=OFF, 1=ON)
20	Link Mode (1=UDP, 2=TCP)
21	Remote Link Mode (1=UDP, 2=TCP)
22	Configured Remote Address

SNMP TRAPS

For the TIP100 to send SNMP TRAPS, a SNMP Trap address must be configured. This configuration is part of the network configuration under **Configuration > Setup**. This SNMP trap address can be entered as either an IP address or a domain name.

When an SNMP Trap address is configured, the TIP100 generates TRAP messages on changes of the following:

- Status
- Handset Power
- Transceiver Power
- Mains Power

In addition the TIP100 generates a regular keep alive type message that includes current network latency.

Remote Reboot/Reset

Other than from the web pages, the TIP100 has the ability to be remotely rebooted or reset through accessing a simple URL like:

```
http://<tip100-ip-address>/BAS.cgi?boot=1
```

Note that this URL does not return any data and that the reset of the TIP100 is immediate.

The use of this URL may be useful to force a reset at a regular time using a script like:

```
wget -t 1 http://<tip100-ip-address>/BAS.cgi?boot=1
```

Note that as the TIP100 does not return any data, the use of the **-t 1** option is necessarily to prevent **wget** from trying more than once. See the example **wget** output below:

```
# wget -t 1 http://10.1.0.91/BAS.cgi?boot=1
--2013-08-12 12:34:53-- http://10.1.0.91/BAS.cgi?boot=1
Connecting to 10.1.0.91:80... connected.
HTTP request sent, awaiting response... No data received.
Giving up.
```


The TIP100 supports remote signalling of I/O signals³:

- GPIO2 as an input
- GPIO3 as an output

GPIO2 Input

On both the handset side and the transceiver side, the spare GPIO2 pin on the TIP100 Rear Panel Connectors is configured as input pin. When there is a network connection, the GPIO3 output on the opposite TIP100 is connected to this input pin.

The input has an internal pull-up resistor and is best operated by using a contact that pulls the pin to ground.

See chapter the Connectors in page 33 for details on the connector pins.

GPIO3 Output

When a GPIO2 input is activated (e.g. connected to ground), the GPIO3 open collector output on the opposite connection end is also activated. Similarly when the GPIO2 input is released, the GPIO3 output is also deactivated.

While the GPIO3 is an open collector output, it also has an internal pull up resistor to 5V so it is only compatible with external equipment that also operates on 5V.

Using higher voltages on this output could damage the TIP100.

³ Supported on TIP100's with Interface Controller version 1.5 and higher. Contact Through IP Support for information to upgraded information on the TIP100 Interface Controller.

GPIO2 to GPIO3 Latency

The delay or latency on the GPIO3 output being activated after the GPIO2 input is activated is approximately 15ms plus the network latency.

In practice, expect a typical delay of between 30 and 50ms.

Most problems with the TIP100 can be solved quickly by following the advice in this chapter.

When you have a problem with your TIP100, there is usually a quick and simple solution.

First make sure:

- The interface cables between your TIP100 interface unit and the NGT Transceiver or NGT Handset are pushed in all the way.
- The TIP100 interface unit DC power cords are connected to a working power source.
- The power supply for the NGT Transceiver is turned on and connected to the NGT Transceiver.
- The TIP100 interface unit is connected to an active network connection and has an active DHCP service. Press the reset button to hear the network address voice announcement (at the transceiver side, you may need to temporarily connect a speaker to the interface cable) or if you know the configured address, use your browser to view the status page of your TIP100.

If you are still having trouble, you can restore the default factory settings of your TIP100 by pressing and holding the reset button. While you press the reset button both the green and red STATUS LED's will be on. After approximately 10 seconds the TIP100 will restore the factory default settings and the red STATUS LED will start flashing.

Note that restoring to default factory settings revert the TIP100 to 'Transceiver mode' and it needs to be manually reconfigured to 'Handset' mode.

If you can't connect to the web pages of the TIP100

- Check that the IP address used by the TIP100 is in the same range as the IP address of the network you are using. For example if the TIP100 address voice announcement is 192.168.0.21 but the IP address of your PC is something like 10.30.0.75 you won't be able to connect to the TIP100 because of the network mask used by your network. With the example above of 10.30.0.75 and a network mask of 255.255.255.0, the network will only accept IP address in the range of 10.30.0.1 though to 10.30.0.254 and hence the address 192.168.0.21 can't be reached.
- If the TIP100 was configured with a manual address, it may be out of the network range as described above. It can be reset to factory setting by pressing and holding the reset button until the red STATUS led starts flashing (after about 10 seconds). After that the TIP100 has been reset and will use DHCP to obtain a new network address compatible with your network. Note that this requires that there is a DHCP server in your network.
- If there is no DHCP service in your network, the attempt to obtain an IP address eventually times out after a few minutes and the TIP100 assigns itself a randomised address that starts with 169.254.157 (e.g. 169.254.157.192).
- If none of the above is possible, you may be able to temporarily reconfigure the IP address of your PC to match the address range of the TIP100 (e.g. 169.254.157.1) and connect to the TIP100 in that way. Make sure to note the existing IP configuration of your PC so it can be restored after you have configured the TIP100.

If your NGT Handset does not power on

- Check that there is a working network connection between the TIP100 interface unit with the NGT Handset and the TIP100 interface unit with the NGT Transceiver. Use a web browser to navigate to the **Status** page of the TIP100 interface unit with the transceiver.
- Make sure that the NGT Transceiver has power available. This is indicated by the TIP100 interface unit **Status** page with a green light next to **Main Power Supply**.
- Make sure that the TIP100 interface unit for the NGT Handset and the TIP100 interface unit for the NGT Transceiver are linked with each

other. This is indicated by the TIP100 interface unit **Status** page which much show **CONNECTED** or **TALKING** next to **Status**.

- Press the power button on the NGT Handset.

If you can't hear sound

- Ensure that the speaker plug of the interface cable between the TIP100 interface unit and the NGT Transceiver is properly connected to the speaker socket on the NGT Transceiver.
- Ensure that on the TIP100 interface unit, the speaker plug is properly connected to the speaker socket on the NGT Handset interface cable.
- Ensure the NGT Transceiver audio is not muted.
- Adjust the volume on the NGT Handset.

If you have trouble controlling the NGT transceiver

- Ensure that the NGT transceiver is (re)configured with the configuration setting **Key Repeat Rate** (Config Menu), set to a value of **0.5s** or more.
- Ensure that the NGT transceiver is (re)configured with the configuration setting **Key Hold Time** (Config Menu), set to a value of **1.0s** or more.

TIP100 Status Lights

The TIP100 has two status lights on the front that indicate what is happening.

If the TIP100 is

On

Off

Announcing a network address

Waiting for a software upgrade

The status light

Is solid green

Is off

Is blinking red

Is solid green and blinking red

Restore TIP100 Factory Settings

The TIP100 can be reset to factory setting by pressing and holding the reset button until the red STATUS led starts flashing (after about 10 seconds). After that the TIP100 has been reset and will use DHCP to obtain a new network address compatible with your network. Note that this requires that there is a DHCP server in your network.

Forced TIP100 Upgrade Mode

If required TIP100 can be forced in upgrade mode as follows:

- Remove power from the TIP100.
- Press and hold the reset button on the front panel of the TIP100.
- Reapply power to the TIP100 while holding the reset button.
- Keep holding until you see the front panel STATUS leds flash simultaneously.

In this mode, the TIP100 will use DPHC to obtain an new network address. It is often useful to have access to a router or other DHCP server to observe which IP address gets allocated to the TIP100.

When you navigate to this compatible with your network, it will show the boot loader Update page (the same page you would see when going through the normal update process).

At this page, the firmware update process can be retried.

Learning More, Service, and Support

7

More information about the TIP100 interface unit is available in the on-screen help and on the Web. The following table describes where to get software and service information.

To learn about

Service and support and software downloads

Safety and regulatory compliance information

Obtaining warranty service

Do this

Go to: www.through-ip.com/support/tip100

See Compliance in Chapter 9 Specifications on page 39.

First follow the advice in this booklet, the on screen help and online resources. If the unit still doesn't function, contact support@through-ip.com.

This chapter describes the connectors located on the TIP100 rear panel and on the interface cables used with the TIP100.

TIP100 Rear Panel Connectors

PWR

The connector marked **PWR** is a 2.1 mm DC barrel socket located on the right hand side of the rear panel and is used to supply power to the TIP100.

Pin No.	Function	Signal levels
Tip	Supply Input	+13.2 V DC
Sleeve	Ground	0V

LAN

The connector market **LAN** is a standard RJ45 Ethernet connection to connect the TIP100 to a 10/100Mbit/s Ethernet network. The connector provides two status LED's indicating network status and activity.

TRANSCEIVER

The connector marked **TRANSCEIVER** is a 25-way DB type socket connector located on the left hand side on the rear panel of the TIP100. It provides all the interface connections for the TIP100 and is typically accessed with one of several adaptor cables available to allow connection to either a handset or a transceiver and with and without RS232 data capability.

Pin No.	Function	Signal levels
1	Ground	0V
2	RS232 - TX	RS232 Output (Optional)
3	RS232 - RX	RS232 Input (Optional)
4	RS232 - CTS	RS232 Input (Optional)
5	RS232 - RTS	RS232 Output (Optional)
6	Relay	Normally Open
7	Ground	0V
8	GPIO0	0 to 12V logic input and open collector output. Used internally by TIP100.
9	GPIO2	0 to 5V logic input. Connected to remote GPIO3 output. Requires Interface Controller V1.5 and above.
10	Audio In +	Nominal 500 mV P-P to ground with normal speech
11	Audio In -	
12	Speaker Out +	Speaker should be 4 ohm with a power rating of 5 watts
13	Speaker Out -	
14	DC Supply Input	+13.6V nominal
15	Handset Power	+9.5V DC – 500mA max.
16	Handset Standby	+4.5V DC – 100mA max.
17	Relay	Normally Closed
18	Relay - Common	Contacts rated 50V 1A
19	Handset Data -	1 to 5V logic
20	Handset Data +	1 to 5V logic
21	GPIO1	0 to 12V logic input and open collector output. Used internally by TIP100.
22	GPIO3	0 to 5V open collector output (with pull up). Connected to remote GPIO2 input. Requires Interface Controller V1.5 and above.
23	Audio Ground	0V
24	Audio Out +	Nominal 500mV P-P to ground with normal speech
25	Audio Out -	

Interface Cable Connectors

The 25-way TRANSCEIVER connector on the TIP100 provides all the interfaces to connect the TIP100 to a range of peripherals with their own specific connectors.

The following sections describe the various connectors used on these interface cables.

Handset Plug

Connects the TIP100 to a NGT Transceiver handset socket.

Pin No.	Function	Signal levels
1	Sensing Input	+5 V standby power or +9 V handset power
2	Data – Input/Output	1 to 5 V logic
3	Data +Input/Output	1 to 5 V logic
4	Ground	0 V
5	Audio Output -	Nominally 500 mV P–P to ground with normal speech
6	Audio Output +	Nominally 500 mV P–P to ground with normal speech
7	Power On Ouput	Momentary 0 V = PWR ON

Handset Socket

Provides a connection for the NGT Handset to be connected to the TIP100

Pin No.	Function	Signal levels
1	Power Output	+4.5 V standby power or +9 V handset power
2	Data -	1 to 5 V logic
3	Data +	1 to 5 V logic
4	Ground	0 V
5	Audio Input -	Nominally 500 mV P-P to ground with normal speech
6	Audio Input +	Nominally 500 mV P-P to ground with normal speech
7	Power On Input	Momentary 0 V = PWR ON

Speaker Plug

Connects the TIP100 to a NGT Transceiver speaker output socket.

Pin No.	Function	Signal levels
Tip	Audio +	Up to 5V P-P depending on volume level
Sleeve	Audio -	Up to 5V P-P depending on volume level

Speaker Socket

Provides a connection for a speaker to be connected to the TIP100.

Pin No.	Function	Signal levels
Tip	Speaker +	Up to 5V P-P depending on volume level
Sleeve	Speaker -	Up to 5V P-P depending on volume level

RS232 Plug (optional)

At the transceiver side, the optional interface cable for data use provides a 9-way DB style plug with a pin out similar a PC RS232 connector. Equipment that normally plug in directly to a PC RS232 connector can be plugged in on this plug.

Pin No.	Function	Signal levels
1	Not connected	
2	Receive Data	RS232 Input
3	Transmit Data	RS232 Output
4	Not connected	
5	Signal Ground	0 V
6	Not connected	
7	Request To Send	RS232 Output
8	Clear To Send	RS232 Input
9	Not connected	

RS232 Socket (optional)

At the handset side, the optional interface cable for data use provides 9-way DB style socket that is compatible for direct connection to RS232 plugs on PC's.

Pin No.	Function	Signal levels
1	Not connected	
2	Transmit Data	RS232 Output
3	Receive Data	RS232 Input
4	Not connected	
5	Signal Ground	0 V
6	Not connected	
7	Clear To Send	RS232 Input
8	Request To Send	RS232 Output
9	Not connected	

This chapter includes specifications for the TIP100.

Network

Network Connection	RJ-45 10/100Mbit/s Ethernet with Link and Activity LED
Network Protocols	TCP/IP, UDP, HTTP, ICMP, SNMP, Supports BootP, DHCP and Auto IP Integrated web server for configuration and update functions Voice announcement of IP address
Network Audio	G.711 (uLaw / 8kHz) Enabled on audio presence
Network Bandwidth	128kbit minimum
Network Latency	Approx. 200ms (excl. network delays)

Power

Power supply	+13.2V DC nominal
Current Consumption	Transceiver interface 120mA Handset interface 300mA (incl. Handset, audio)

Physical

Size	108mm (w), 134mm (d), 34mm (h)
Weight	310 gram
Enclosure	Aluminium

Environmental

Operating temperature	0 - 55°Celsius / 32 - 131° Fahrenheit
Humidity	0 - 70% relative humidity, non-condensing

Compliance

Certifications

C-Tick
RoHS compliant (lead free)

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