MegaVision

TereScope Management

User Guide

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About this Guide

Scope

This guide shows how to manage any of the series of TereScopes (e.g., TereScope 2, TereScope 155, TereScope 2000, TereScope 4000, TereScope 5000) using *MRV's* MegaVision® network management application.

Audience

This guide is intended for the use of network administrators who have working knowledge of SNMP management.

Related Documents

- ***MegaVision NMS Application User Manual***
  This manual describes how to install and use the MRV's MegaVision NMS Application.

- ***MegaVision TereScope Release Notes***
  This document contains information not found in the User Guide and/or overriding information, and is produced if warranted.

- ***TereScope Manual***
  This document contains information on the relevant TereScope to be managed.

Organization

For customer convenience, the management description is organized according to the service architecture of the MegaVision Application GUI which is hierarchical.

Typographical Conventions

The typographical conventions used in this document are as follows:

Convention	Explanation
`CourierBold`	This typeface represents information provided by/to the system.
Italics	This typeface is used for emphasis.
Enter	This format represents the key name on the keyboard or keypad.
ⓘ	This icon represents important information.
⚠	This icon represents risk of personal injury, data loss, or system damage.

Acronyms

ARP	Address Resolution Protocol
BER	Bit-Error Rate
CLI	Command Line Interpreter
CTS	Clear To Send
dB	deciBel
DCD	Data Carrier Detect
DCE	Data Communication Equipment
DNS	Domain Name System/Service
DSR	Data Set Ready
DTE	Data Terminal Equipment
DTR	Data Terminal Ready
Gnd	Ground
GUI	Graphical User Interface
IP	Internet Protocol
ITU	International Telecommunications Union
LLB	Local LoopBack
LAN	Local Area Network
MDI	Media Dependent Interface
MDI-X	Media Dependent Interface with cross-wiring
NIC	Network Interface Card
NMS	Network Management Station
OID	Object IDentifier
RARP	Reverse ARP
RI	Ring Ignore
RLB	Remote LoopBack
RMON	Remote MONitoring
RTS	Request To Send
RxD	Receive Data
SNMP	Simple Network-Management Protocol
TDM	Time-Division Multiplexer/Multiplexing
TELNET	(dial-up) TELephone NETwork (connection protocol)
TFTP	Trivial-File Transfer Protocol
TxD	Transmit Data
UPS	Uninterruptible Power Supply
URL	Universal Resource Location
WAN	Wide Area Network

TereScope Overview

General

The TereScope is a communication link that can carry voice, data, and video transparently over a photonic beam. The link consists, basically, of two heads, each containing a transceiver, and facing each other so that the beam interconnects them. A wide range of models is available to support various frequencies, operating ranges, and eye-safety compliance. There are models that support data rates of up to 1 Gbps and operating ranges of up to 5 km.

Requirements

− SNMP NMS[1] with a 10Base-T NIC/port and MS-DOS program.

− Category 5 *cross* cable (shown in *Figure 1*, page *7*) not longer than 100 m or 328 ft if the TereScope is to be connected to the SNMP NMS directly. (The SNMP NMS, e.g., PC is a DTE.)

       or

Category 5 *straight* cable (shown in *Figure 1*, page *7*) not longer than 100 m or 328 ft if the TereScope is to be connected to the SNMP NMS via a DCE (e.g., switch).
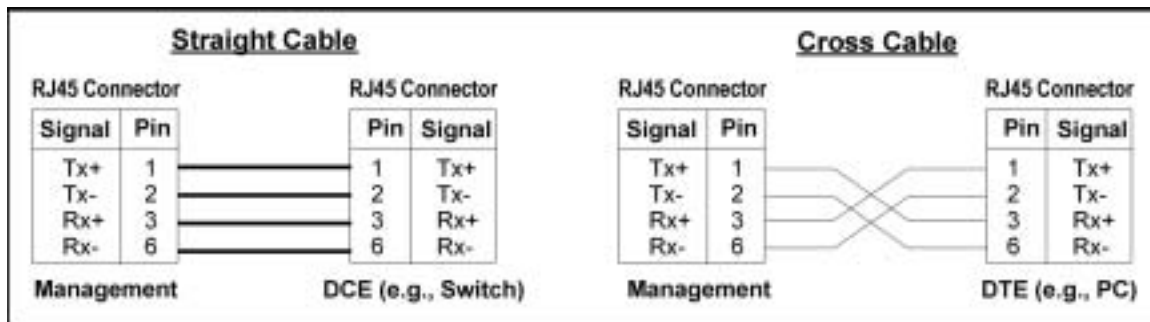

Figure 1: Straight and Cross Cable Wiring

SNMP Agent

General

A TereScope is SNMP manageable if it has an SNMP agent installed in each of its two heads. In models 2000, 4000, and 5000 the SNMP agent is pre-installed. TereScopes in the field can have the SNMP agent installed in them by an MRV-approved service person.

Models

Table 1 describes the available models of the SNMP agent for TereScope management.

Table 1: Models of SNMP Agent

Model	Description
RSM-SNMP	Installable in all TereScopes, except TereScopes 4000 and 5000.
SNMP-MGT	Installable in TereScopes 4000 and 5000. This SNMP agent model provides, in addition, operation configurability, such as, Fusion and Loopback testing.

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[1] e.g., PC running MRV's *MegaVision*® Web-based network management application.

Layout

Port

Protocol: Ethernet 10Base-T.

Connector: RJ45

Pinout: MDI (1 → Tx+; 2 → Tx-; 3 → Rx+; 6 → Rx-)

LEDs

Setup

Set the DIP switch toggles as shown in *Table 2*, page *8*.

Table 2: DIP Switch Setting of TereScope

Toggle	Position	Function
IP configurability. (To determine the right toggle, refer to the description of the toggle on the TereScope.)	ON	Enable TereScope configuration (e.g., changing default IP address of the SNMP agent) from the SNMP NMS. (The default IP address of the SNMP agent is marked on a sticker on the rear panel of the TereScope.)
	OFF	Disable TereScope configuration from the SNMP NMS, enable configuration at the TereScope head, and set the IP address of the SNMP agent as **10.0.0.101**.

Cabling

Connect the TereScope management port (RJ45 connector) to an SNMP NMS either:

  − Directly with a Category 5 *cross* cable, or

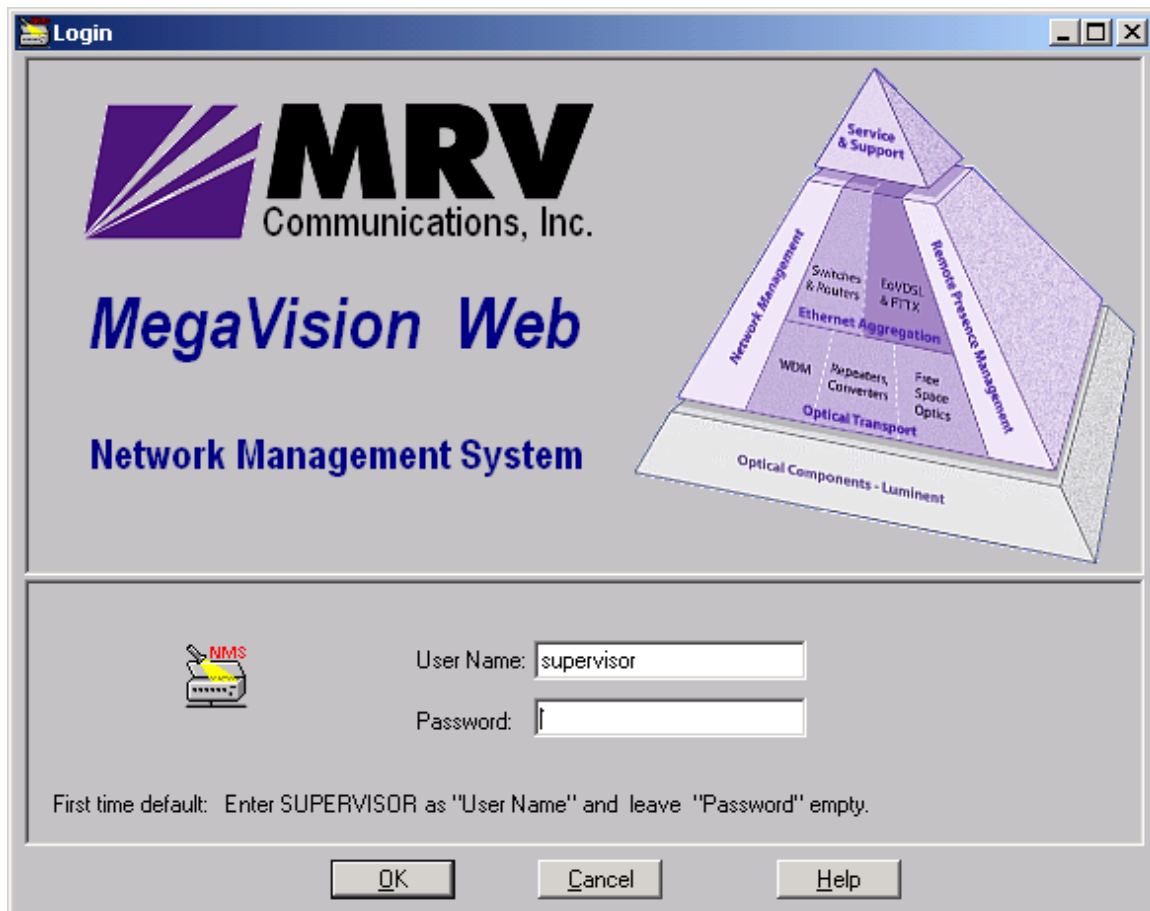 − Via a DCE (e.g., switch) with a Category 5 *straight* cable.

Management Access

The procedure for accessing the MegaVision application is as follows:

1. Double-click the icon .

2. Follow the prompts until the login window (*Figure 2*) opens.

Figure 2: Login Window

3. Select the access level by typing the associated name (possibly **user** or **supervisor**) in the User Name: field.

4. In the Password: field, either type the password or, if the default password was not changed, leave it empty. Click OK or press **Enter** key to open the Map Level window (*Figure 3*).
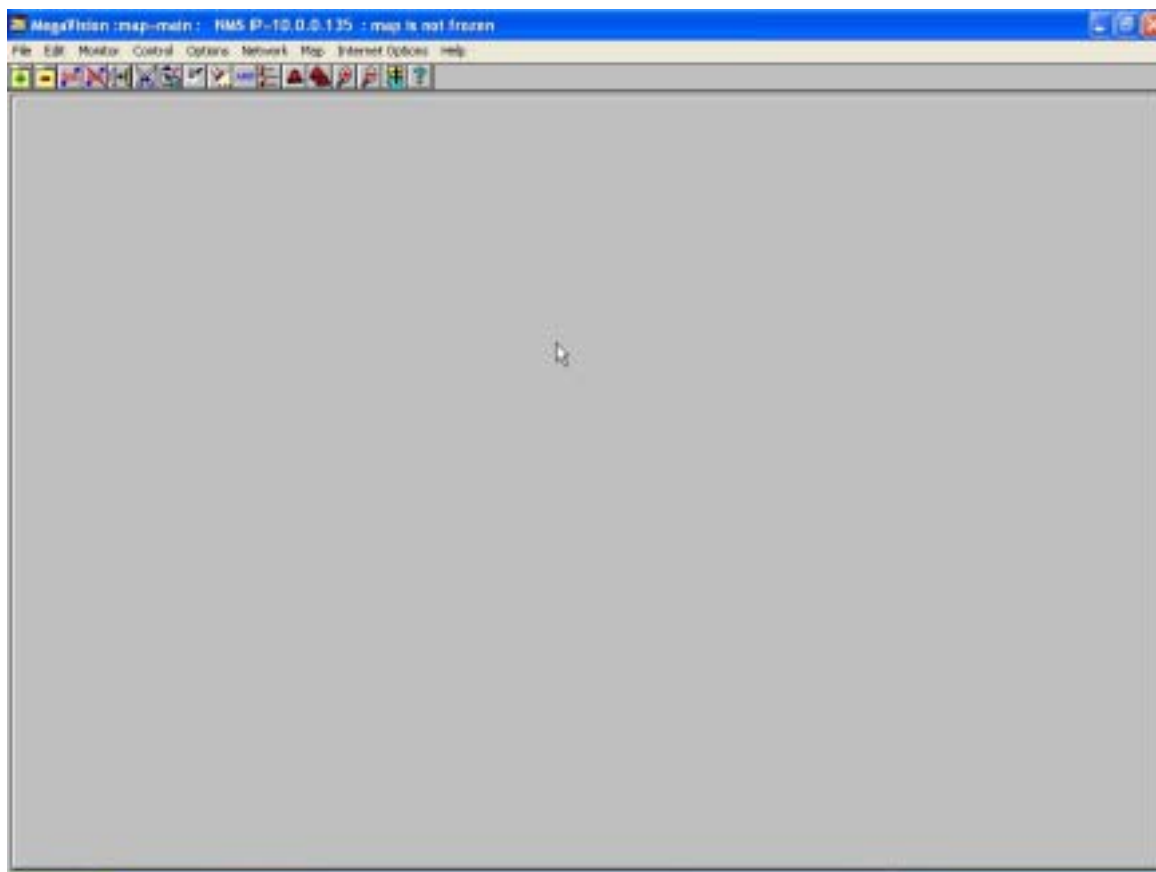
Figure 3: Map Level Window

The hot spots and active areas that apply generically to devices are described in detail in the *MegaVision NMS Application User Manual*.

The hot spot and active area that applies specifically to the TereScope is described below.

    – Opens the TereScope Device Level management window.

**Green** – Communication with SNMP host OK.

Red – Communication with SNMP host lost.

Management Setup

In order to manage a TereScope, certain setup actions must be performed with the TereScope and MegaVision application. In particular, these actions include setting IP addresses so that the TereScope can be managed from the same or a different subnet.

The setup procedure is as follows:

1. Set the IP configurability DIP switch toggle to the **ON** position.

2. In the Map Level window (*Figure 3*, page *10*), either click the button **+** (top left corner) or click with the right mouse button and select **Add Device**. The **Device Types** window (*Figure 4*, page *11*) opens.
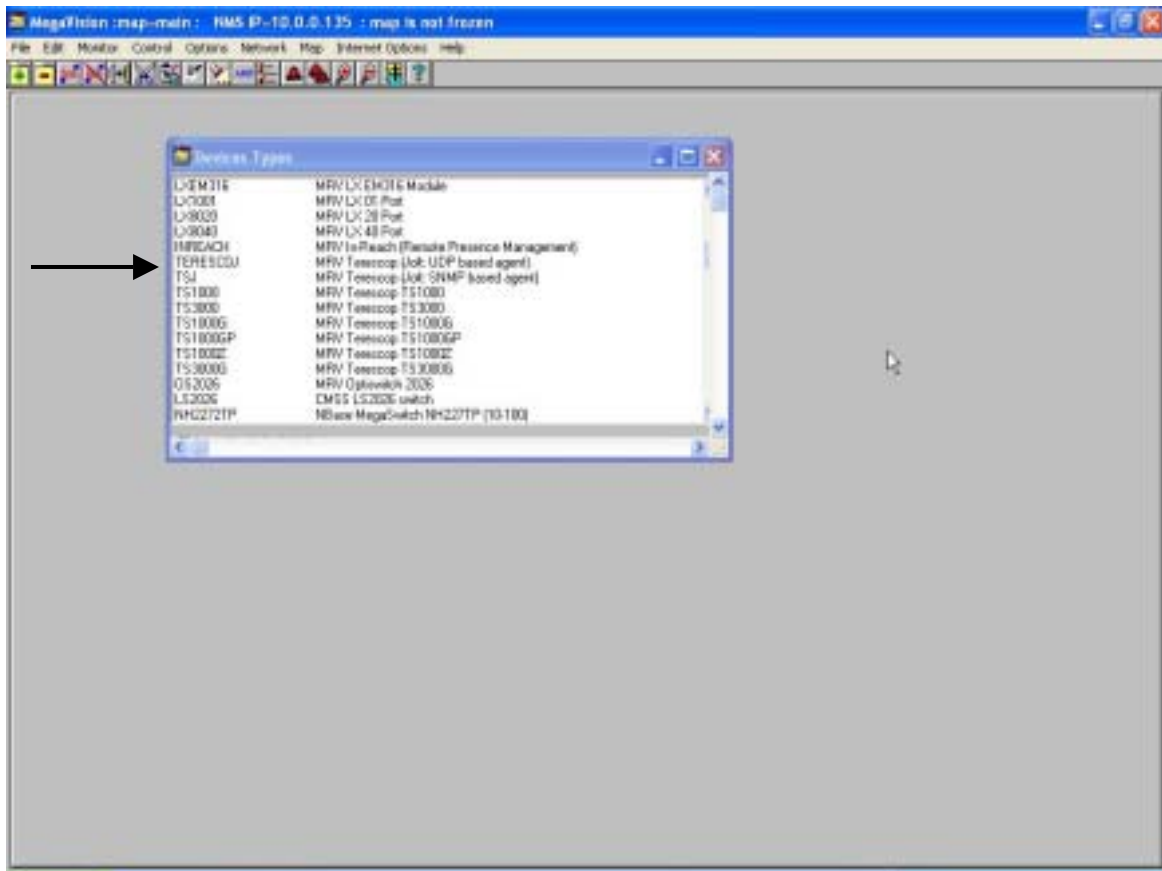
Figure 4: Device Types Window

3. In the **Device Types** window, select **TSJ** from the list.

4. The **Describe Device Communication Parameters** window (*Figure 5,* page *12*) opens.
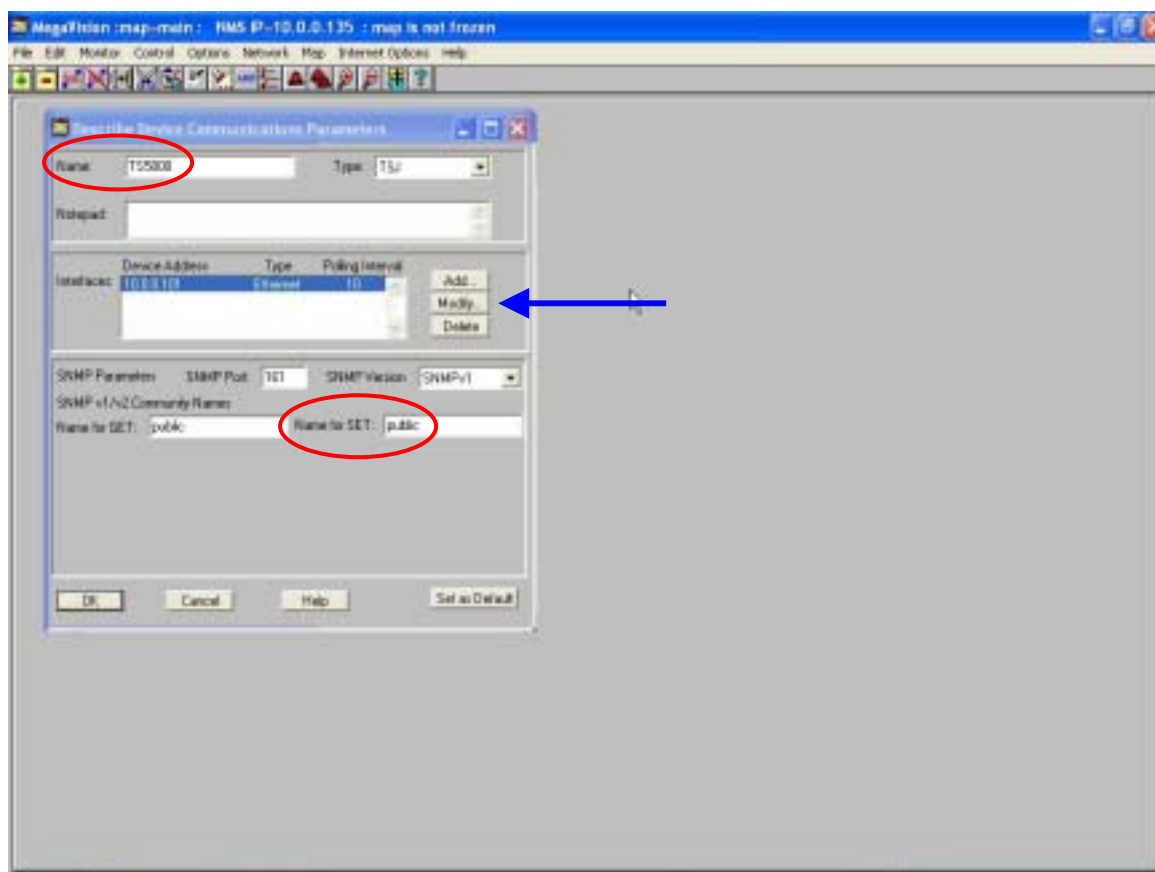
Figure 5: Describe Device Communication Parameters Window

5.   In the **Describe Device Communication Parameters** window:

a. Enter a name for the TereScope in the field **Name** and make sure that the entry in the two fields **Name for SET** and **Name for SET** is **public**.

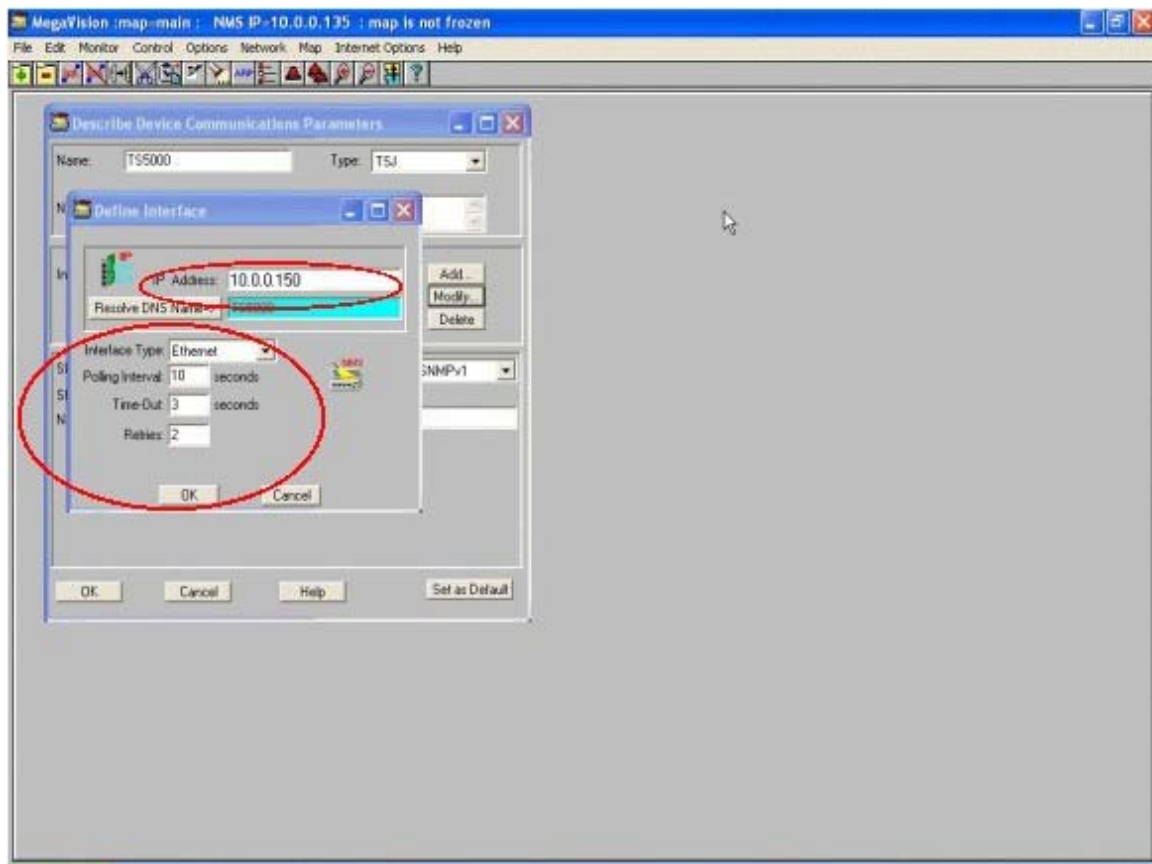b. Click on the button **Modify**. The **Define Interface** window (*Figure 6,* page *13*) opens.

Figure 6: Define Interface Window

6.   In the **Define Interface** window, do the following:

   a.   Enter the default **IP Address**. (The default IP address – e.g., 10.0.0.150 – is marked on a sticker on the rear panel of the TereScope).

   b.   Select **Interface Type** as **Ethernet**.

   c.   Set **Polling Interval**

   d.   Set **Time-Out**

   e.   Set **Retries**

   f.   Click ⬚ **OK** to close the window.

7.   In the **Describe Device Communication Parameters** window, click ⬚ **OK** to close the window. The TereScope icon ▥ appears in the **Map Level** window (*Figure 3*, page *10*).

8.   If the SNMP NMS and TereScope are on *__different__* subnets, set a new static route in the routing table of the router as follows:

   a.   Open **MS-DOS Prompt** window. (To open the window at the SNMP NMS which runs a Microsoft Operating System, click ⬚ **Start** and select ⬚ **Run...**. When the **Run** window opens, type **command** and click ⬚ **OK**.)

   b.   At the DOS command prompt ▥, type
   route add [TS_IP_ADDR] mask [MASK] [MGR_IP_ADDR]
   Where,

   route, **add**, **mask** are keywords to be typed as is.

[TS_IP_ADDR] is TereScope default IP address (marked on a sticker on the rear panel of the TereScope).

[MASK] is Subnet Mask.

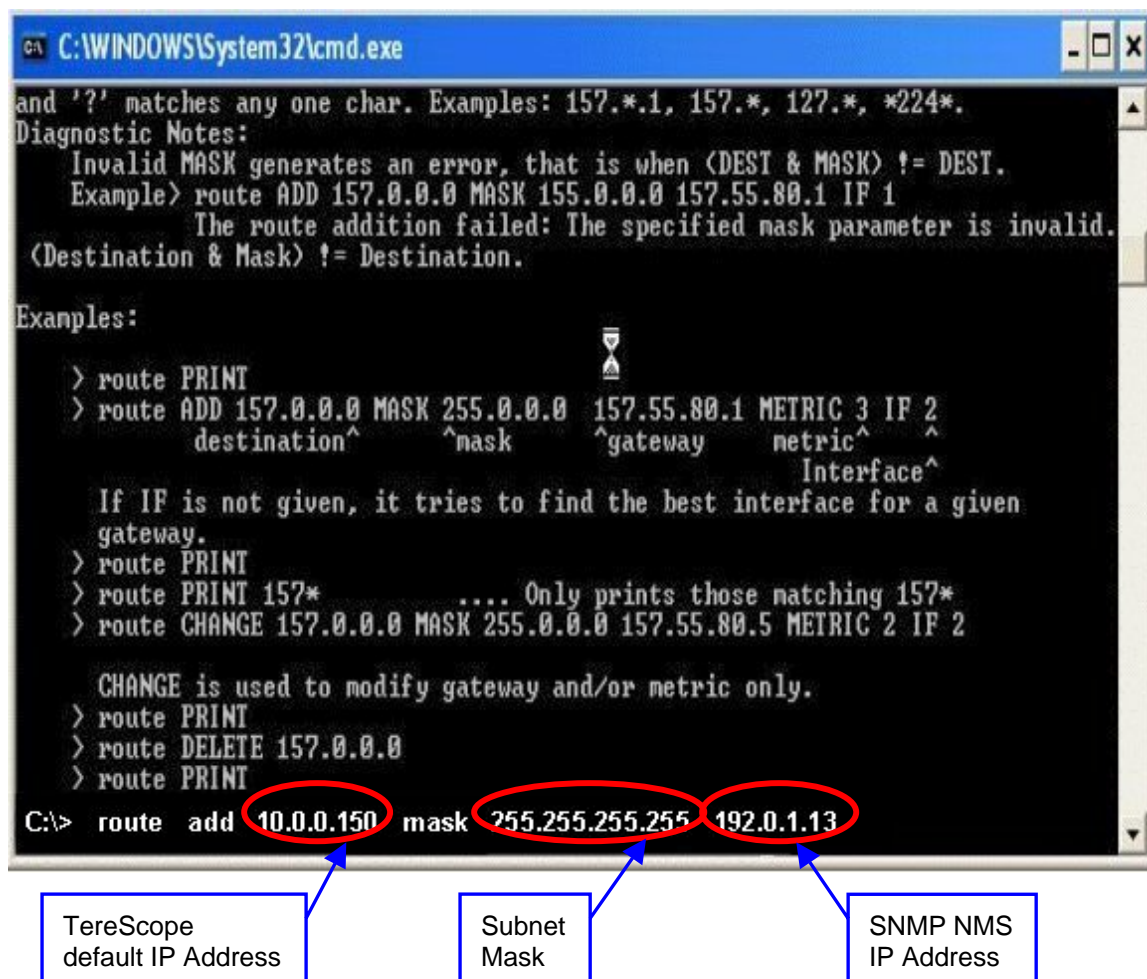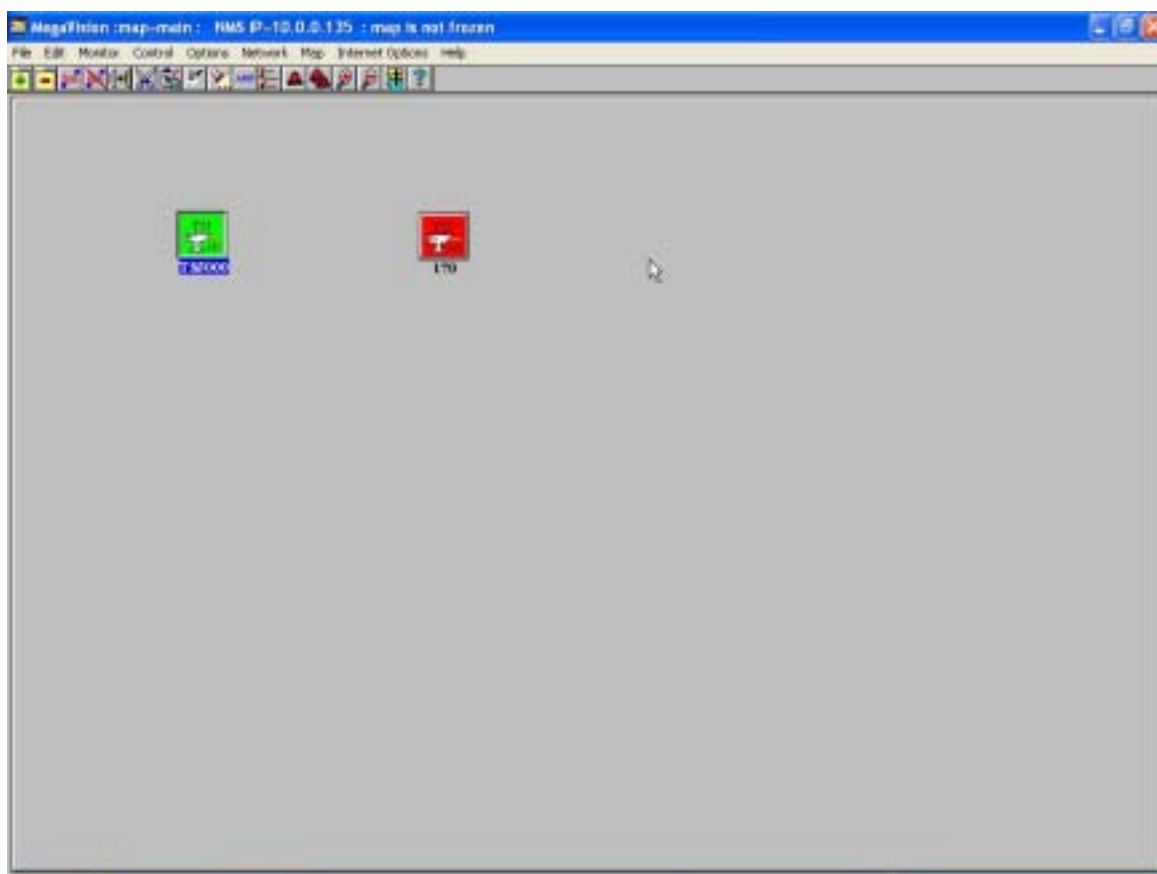[MGR_IP_ADDR] is SNMP NMS IP address (e.g., PC's IP address).

Figure 7: DOS Command Window

9. Close the DOS Command window. The Map Level window (*Figure 8*) will show a green icon of the TereScope to indicate that its communication with the SNMP NMS is OK.

Figure 8: TereScope Icon (Green) Added in Map Level Window

10. Double-click on the icon [icon]. The **Device Parameters Configuration** window (*Figure 9,* page *16*) opens. The field IP Address: shows the TereScope default IP address.
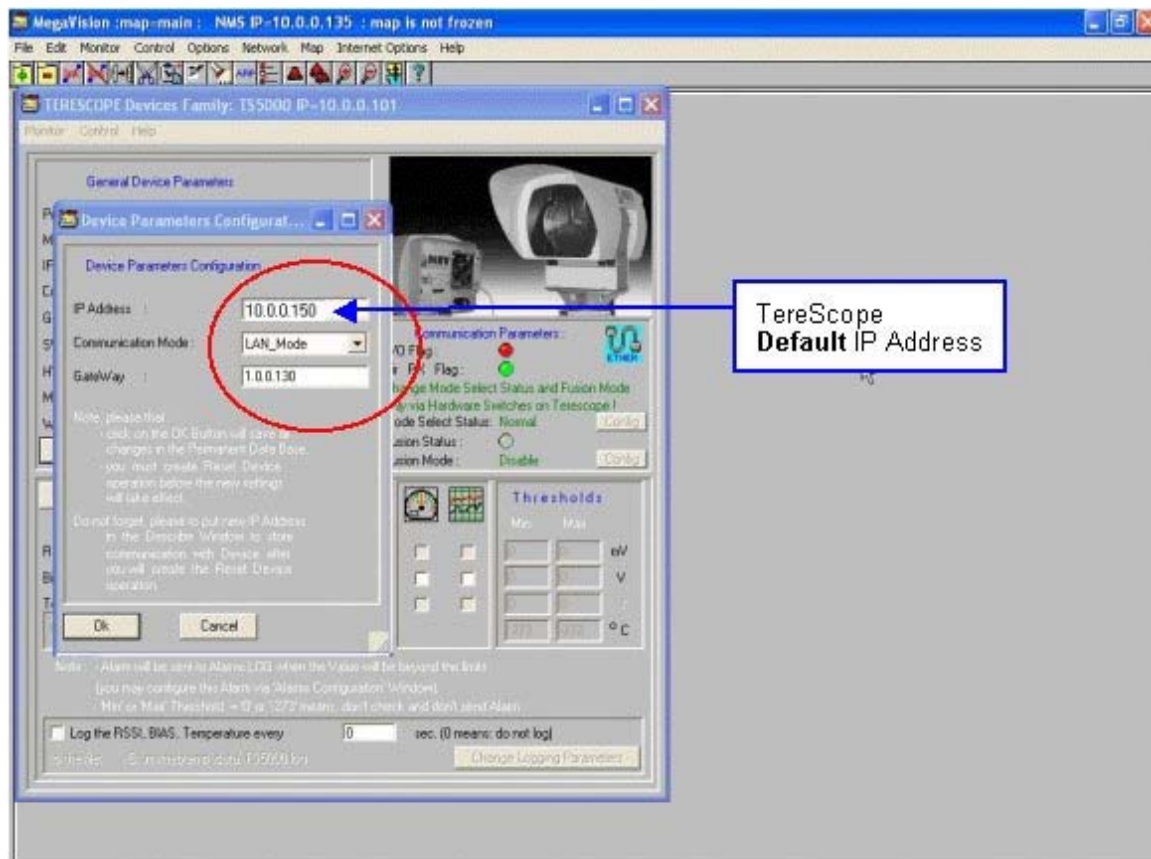
Figure 9: Device Parameters Configuration Window (showing TereScope default IP address)

11. In the **Device Parameters Configuration** window:

    a. In the field IP Address : , enter the new TereScope IP address. (The IP address is usually one from the IP address space of your network.)

    b. In the field Communication Mode , select one of the following:

        − **LAN_Mode** if the TereScope and SNMP NMS are connected to the same IP network.

        − **Router_Mode** if the TereScope and SNMP NMS are interconnected via a router.

    c. If **Router_Mode** was selected, in the field GateWay , enter the Gateway address.

    d. Press OK . (The window closes.)

12. Click on the button **Parameters Config** to reopen the **Device Parameters Configuration** window (*Figure 10*, page *17*), and verify that the IP settings are OK.
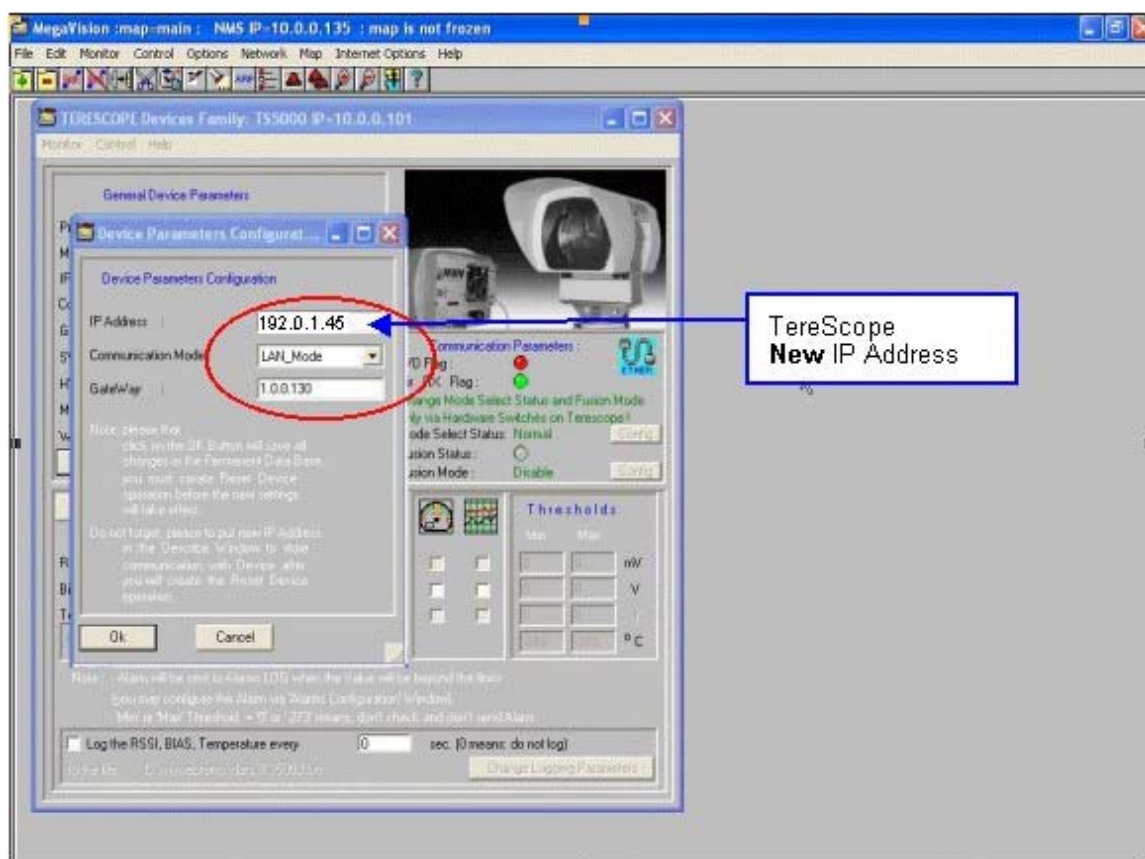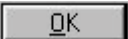
Figure 10: Device Parameters Configuration Window (showing TereScope new IP address)

13. Click the button **Reset Device** to reset the TereScope. When the **Confirm** window (*Figure 11*, page *18*) opens, press the button [OK].
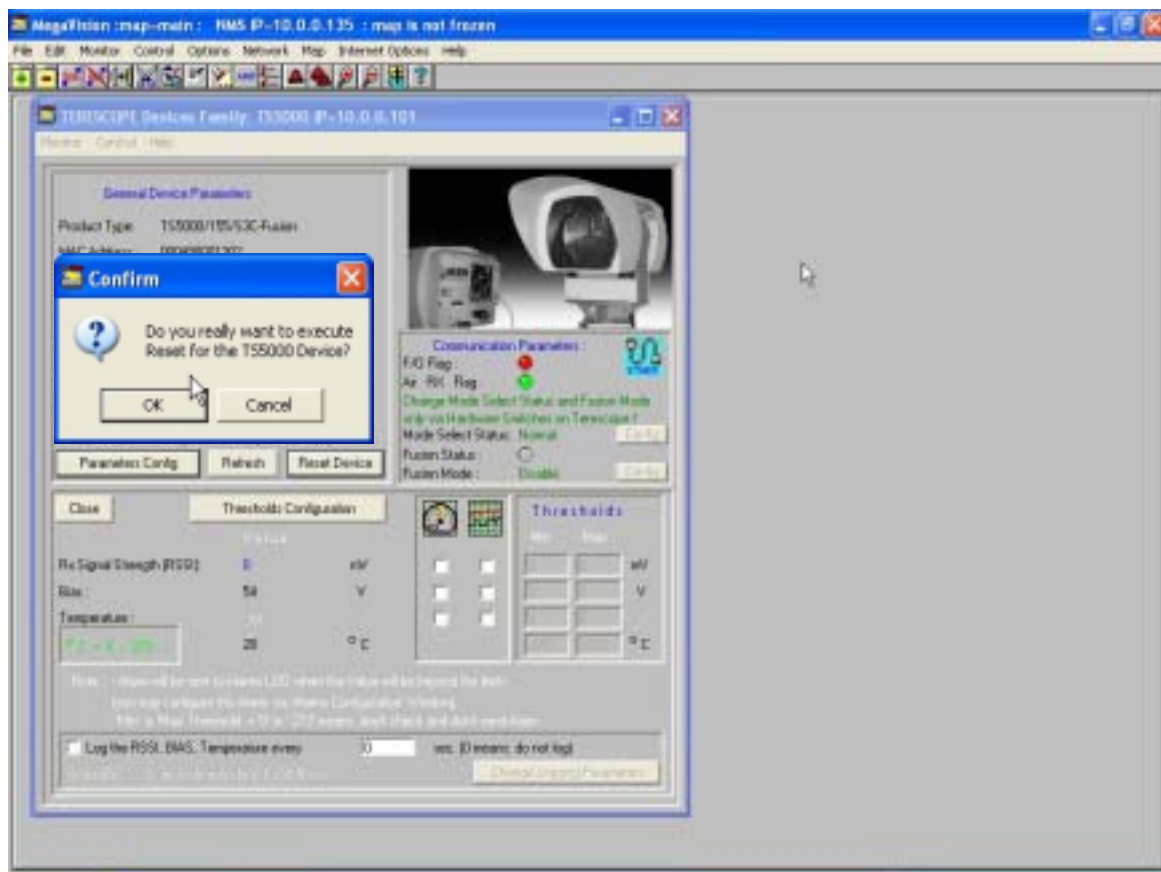
Figure 11: Confirm Window

The communication icon turns into to indicate that communication is currently broken since the TereScope is undergoing reset. At the end of the reset process, the

communication icon reverts to indicating that communication has been reestablished and that the TereScope is operating with its new IP address.

Device Management

Accessing the Management Window

This section shows how to monitor, configure, and control the TereScope remotely.

Open the **Device Parameters Configuration** window (*Figure 12*, page *19*).
(This window can be opened in one of the following ways:

<u>Way 1</u>

In the Map Level window (*Figure 8*, page *15*), double-click on the icon .

<u>Way 2</u>

In the MegaVision Main Menu window, click on the menu button **Monitor** or **Network** and select
the item **Devices List/Network Inventory...** and click. A window with the list of all
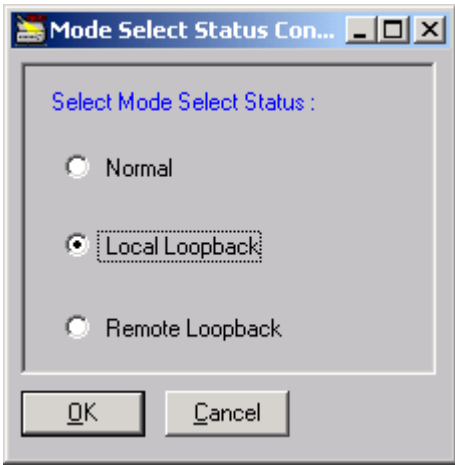devices is opened. Double-click on the row **TSJ**.)
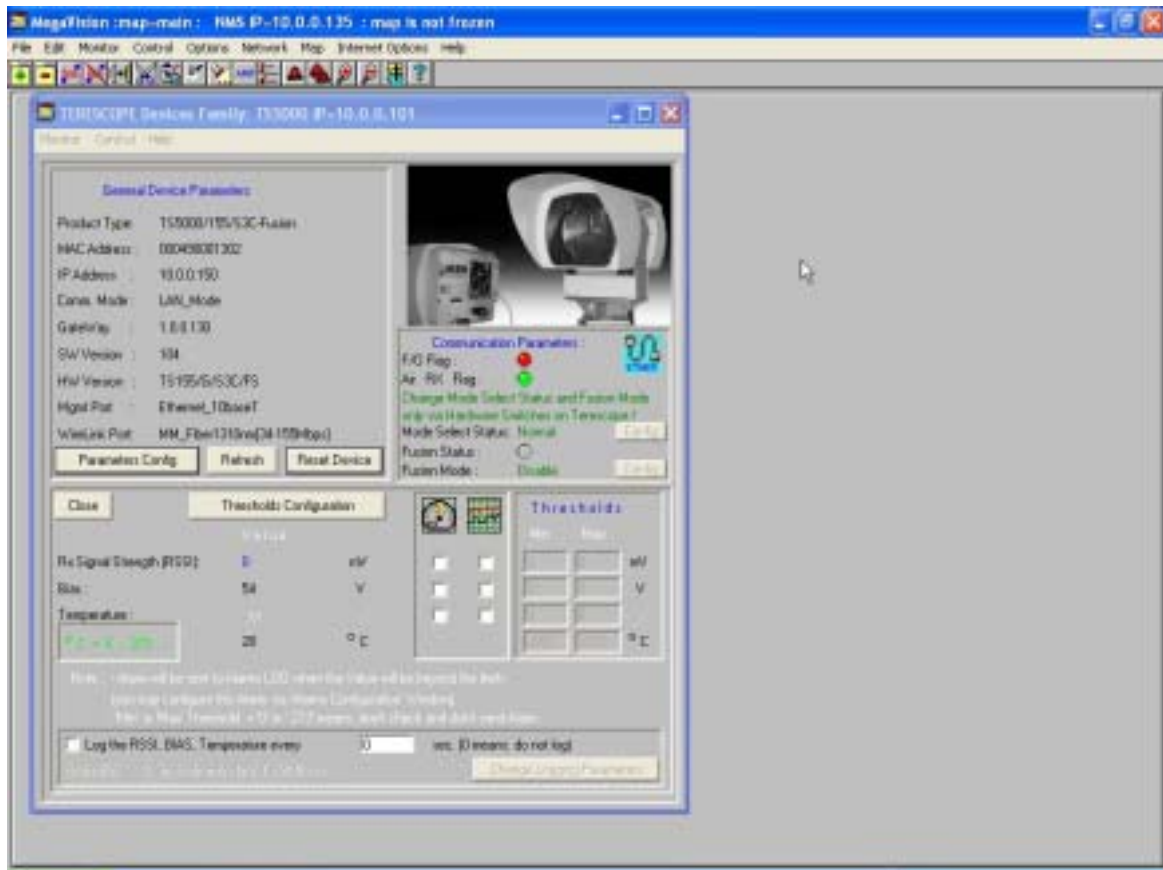
Figure 12: Device Parameters Configuration Window

General Device Parameters

Table 3: General Device Parameters Fields and Tools

No.	Field/Tool	Function
1	Product Type	Type of TereScope.
2	MAC Address	MAC address of the TereScope SNMP agent.
3	IP Address	IP address of the TereScope SNMP agent.
4	Comm. Mode	Communication mode. The options are: LAN_Mode TereScope is set to assume that it is on the *same* network as that of the SNMP NMS. Router_Mode TereScope is set to assume that it is connected to the SNMP NMS via a router.
5	GateWay	Gateway IP address.
6	SW Version	The version of the *firmware* of the SNMP Agent of the TereScope.
7	HW Version	The version of the *hardware* of the SNMP Agent of the TereScope.
8	Mgmt Port	Type of SNMP NMS port (e.g., 10Base-T Ethernet).
9	WireLink Port	Type of data port connected to the device at the end of the TereScope link, e.g., MultiMode fiber, 1310 nm operating wavelength, and 155 Mbps operating speed.
10	Parameters Config LAN_Mode Router_Mode	Set the IP Address, Communication Mode, and Gateway. The choices for Communication Mode are: TereScope and SNMP NMS are connected to the same IP network. TereScope and SNMP NMS are interconnected via a router.
11	Refresh	Update display from the database of the TereScope.
12	Reset Device	Ignore the changes in the window and close it. (Opens the confirm window shown in *Figure 11*, page *18*.)

Table 4: Communication Parameters Fields and Tools

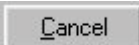| No.	Field/Tool	Function
1	ETHER	SNMP Communication OK.
2		No SNMP Communication.
3	F/O Flag (or Electrical Flag) ● (Green-ON LED) ● (Red-ON LED)	SNMP Agent link to switch side. Link OK Link Faulty
4	Air RX Flag ● ●	SNMP Agent link to air link (photonic beam). Link OK Link Faulty
5	Mode Select Status and Fusion Mode can be changed via NMS!	The TereScope can be configured from the SNMP NMS, i.e., DIP switch toggle for IP configuration is set to *ON* position.
6	Change Mode Select Status and Fusion Mode only via hardware switch on the TereScope!	The TereScope can be configured only by locally and physically changing its settings, i.e., DIP switch toggle for IP configuration is set to *OFF* position.
7	Mode Select Status:	Normal TereScope set to operate normally. Local Loopback TereScope set to operate *Local* LoopBack mode. Remote Loopback TereScope set to operate *Remote* LoopBack mode.
8	Config (This tool is activated when Fusion Mode is disabled.)	Open the **Mode Select Status Con...** window: The window fields/tools are: ⊙ Normal TereScope to operate normally. ⊙ Local Loopback TereScope to operate in *Local* LoopBack mode. ⊙ Remote Loopback TereScope to operate in
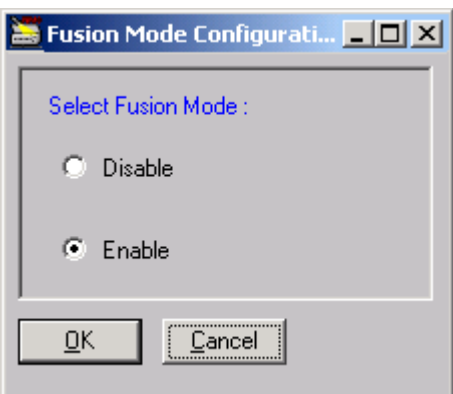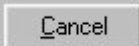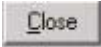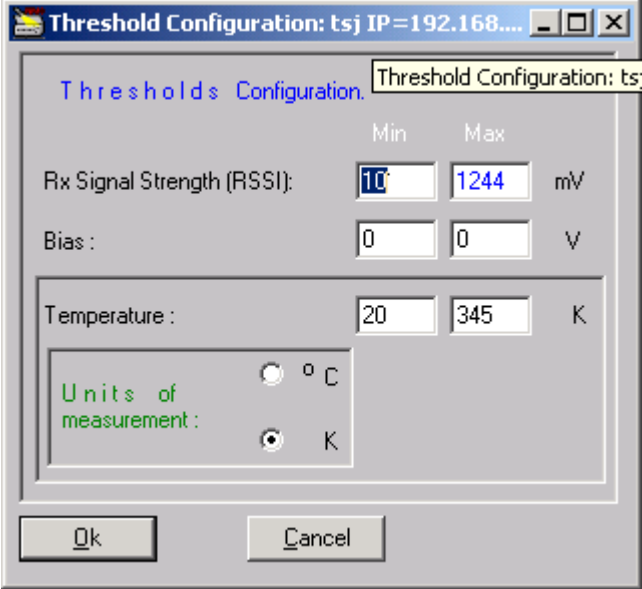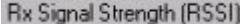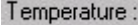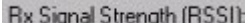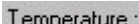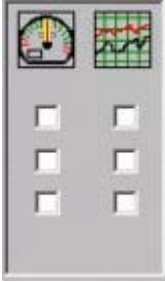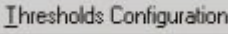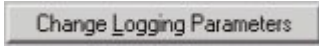
		Remote LoopBack mode. [OK] Accept the changes in the window and close it. [Cancel] Ignore the changes in the window and close it.
9	Fusion Status (Grey LED) (Green LED) (Black LED)	Fusion (redundant link) disabled. Fusion active; low RSSI at one end of link. Fusion in standby; RSSI OK.
10	Fusion Mode	Enable Fusion mode enabled. Disable Fusion mode disabled.
11	Config	Open **Fusion Mode Configuration** window: The window fields/tools are: ⊙ Disable Deselect Fusion Mode ⊙ Enable Select Fusion Mode [OK] Accept the changes in the window and close it. [Cancel] Ignore the changes in the window and close it

Table 5: Thresholds Fields and Tools

No.	Field/Tool	Function
1	Close	Close the window.
2	Thresholds Configuration	Open the **Threshold Configuration** window. The window fields/tools are: Set the lower and upper thresholds which if crossed can generate an alarm or trap. Min Lower threshold Max Upper threshold Rx Signal Strength (RSSI): Strength of the signal at the receiver (RSSI) (in millivolts). Bias : Bias on the receiver (in volts). (For factory use.) Temperature : *Threshold* temperature (in ^{o}C or ^{o}K). for TereScope Temperature threshold values can be set only if ^{o}K is selected as the unit of measurement.
3	Rx Signal Strength (RSSI):	The actual strength of the RSSI signal at the receiver (in millivolts).
4	Bias :	The actual bias on the receiver (in volts). (For factory use.)
5	Temperature :	The actual TereScope temperature (in ^{o}C or ^{o}K).
6		Clicking the check box ☐ under (speedometer icon) to get ☑ will display a speedometer chart for the row (Rx Signal Strength (RSSI), Bias, or Temperature). This chart displays the *instantaneous* value at the end of the polling interval. Clicking the check box ☐ under (line chart icon) to get ☑ will

		display a line chart for the row (Rx Signal Strength (RSSI), Bias, or Temperature). This chart displays the values at times that are integral multiples of the polling interval.
7	Thresholds Min Max 0 0 mV 0 0 V 0 0 K -273 -273 ° C	Threshold values using Thresholds Configuration . Min Lower threshold Max Upper threshold
8	☑ Log the RSSI, BIAS, Temperature	Start logging the RSSI, bias on the signal, temperature, etc. in the log file.
9	0 sec. (0 means: do not log)	TereScope Status Information Collection Interval. The value 0 means that data will not be logged. Any value in the range 1 to 300 (seconds) may be set. If a value larger than the polling interval is to be selected, it should be an integral multiple of the polling interval for the purpose of synchronization. If a value smaller than the MegaVision's polling interval is selected, data will be logged at times that are multiples of the polling interval.
10	D:\Disk_Win2000\mgv227h1\data\tsj.log	TereScope Status Information Collection File **tsj.log**. Clicking a check mark in the check box Log the RSSI, BIAS, Temperature will visually emphasize this field. The file can store up to 15,000 entries. When the file becomes full, its contents replace the contents of the **tsj.bak** file, which can also store up to 15,000 entries. This means that up to 30,000 newest entries can be stored in the two files. In order not to lose entries, the **tsj.bak** file must be copied to another file before the **tsj.log** file becomes full.
11	Change Logging Parameters	Accept value in TereScope Status Information Collection Interval field 0 sec. (0 means: do not log).

Appendix A: IP Address Unknown

This appendix describes the procedure for setting the IP address for a TereScope in the event that the IP address is no longer known (for whatever reason).

1. Set the IP configurability DIP switch toggle to the **OFF** position. (In this position, the IP address of the TereScope is **10.0.0.101**.)

2. In the procedure described in the section *Management Setup* (page *11*), perform steps *2* to *5.*

3. In step *6* set the IP address to 10.0.0.101.

4. Perform steps *7* and *9.*

5. Set the IP configurability DIP switch toggle to the **ON** position.

6. Perform steps *10* to *13.*

7. Verify that the new IP has been accepted.

Appendix B: LLB and RLB Tests

General

This appendix applies only for SNMP Agent model SNMP-MGT, described in *Table 1,* page *7*.

LLB Test

Purpose

The LLB test is used to determine whether the local TereScope head's electro-optical circuitry is OK.

Data Path

The data path (round-trip) in an LLB test is shown schematically in below. (The remote TereScope head is not used in the LLB test.)
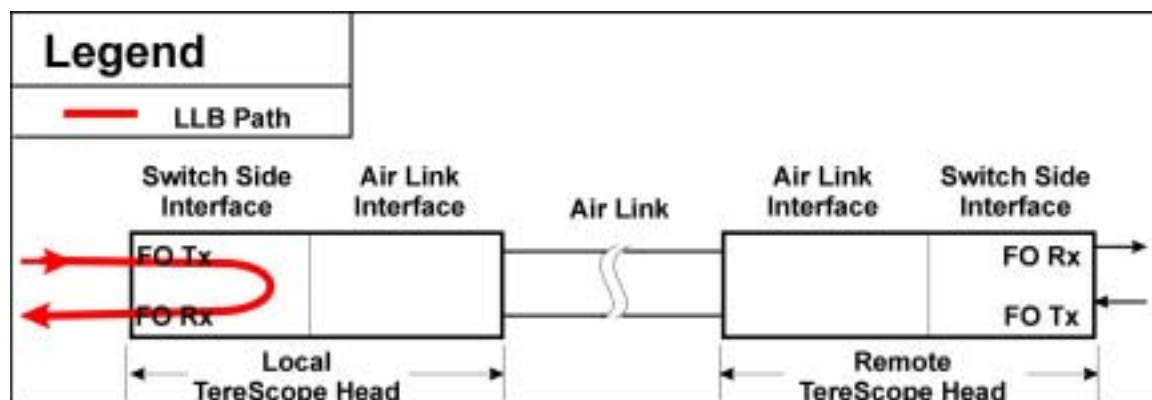

Figure 13: Data Path in LLB Test

Procedure

LLB can be performed by hardware or software control. The procedure for performing LLB by hardware control is described in the relevant TereScope manual.

The procedure for performing LLB by software control is as follows.

1. Ensure that the Control Mode DIP switch toggle is set to the ON (SW MODE) position.

2. If Config is dimmed, i.e., it is disabled, click on Config in the same row as Fusion Mode. The window **Fusion Mode Configuration** (*Figure 14*, page *27*) opens. Set ⦿ Disable and click OK .

3. Click on Config in the same row as Mode Select Status. The window **Mode Select Status Con...** (*Figure 14*, page *27*) opens.
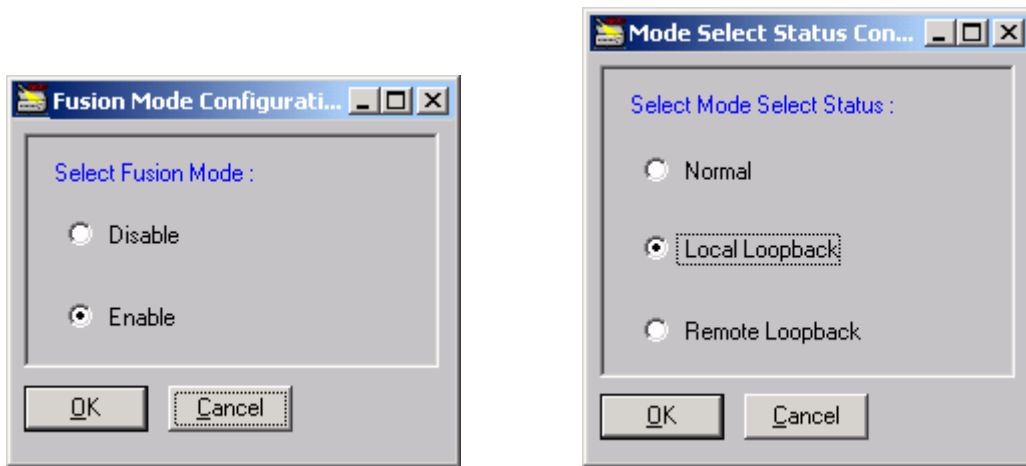
4. Set ⦿ Local Loopback and click OK .

Figure 14: Fusion Mode Configuration and Mode Select Status Con … Windows

RLB Test

Purpose

The RLB test is used to determine whether the local TereScope head, WDM cabling connected to it, and remote TereScope head's air link interface are OK.

Data Path

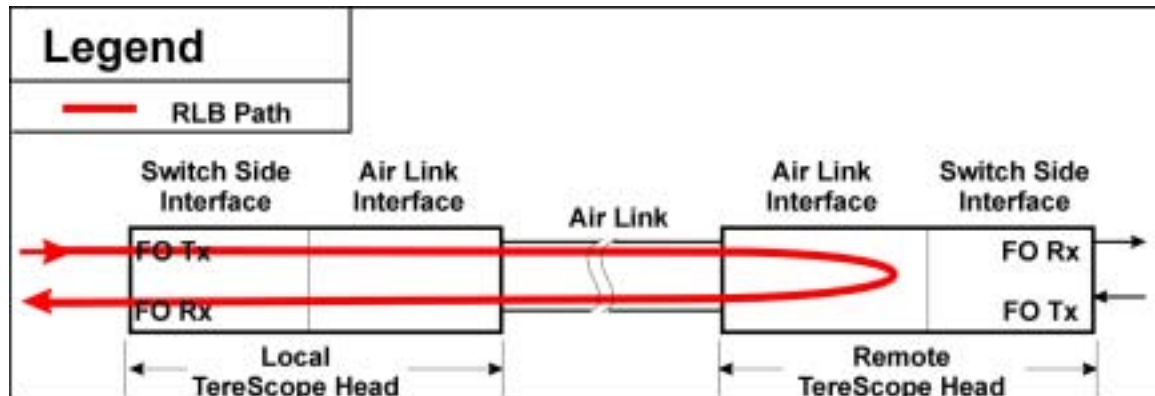The data path (roundtrip) in an RLB test is shown schematically in below.

Figure 15: Data Path in RLB Test

Procedure

RLB can be performed by hardware or software control. The procedure for performing RLB by hardware control is described in the relevant TereScope manual.

The procedure for performing RLB by software control is as follows.

1. Ensure that the Control Mode DIP switch toggle is set to the ON (SW MODE) position.

2. If `Config` is dimmed, i.e., it is disabled, click on `Config` in the same row as `Fusion Status`. The window **Fusion Mode Configuration** (*Figure 14*, page *27*) opens. Set `Disable` and click `OK`.

3. Click on `Config` in the same row as `Mode Select Status`. The window **Mode Select Status Con...** (*Figure 14*, page *27*) opens.

4. Set `Remote Loopback` and click `OK`.

	Note
	When RLB mode is set, the SNMP NMS is included in the RLB loop. An NMS outside the RLB loop cannot be used to exit the RLB mode.

Appendix C: Fusion Control

General

This appendix applies only for SNMP Agent model SNMP-MGT, described in *Table 1,* page *7.*

Purpose

MRV's Fusion system, in full redundancy mode, activates a radiowave link when the IR laser link of the TereScope fails so that the TereScope continues to operate as if the failure did not occur. The Fusion system is constructed to maximize availability to 99.999% between network nodes and operates in most weather conditions including rain, snow, and fog.

Procedure

Fusion can be performed by hardware or software control. The procedure for performing Fusion by hardware control is described in the relevant TereScope manual.

The procedure for performing Fusion by software control is as follows.

1. Ensure that the Control Mode DIP switch toggle is set to the ON (SW MODE) position.

2. If `Config` is dimmed, i.e., it is disabled, click on `Config` in the same row as `Fusion Mode`. The window **Fusion Mode Configuration** (*Figure 14*, page *27*) opens. Set `⊙ Enable` and click `OK`.