TereScope™ Monitor

USER'S GUIDE

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INTRODUCTION

TereScope™ Monitor provides a graphical user interface for monitoring and controlling a TereScope 155 Protocol Independent (PI) Series Free Space Optics (FSO) communication system. By connecting the TereScope to a serial port on a PC, the user can monitor link status, align the system (for those TereScope models with motorized alignment capabilities), and perform advanced diagnostic procedures.

As a result of customer requests, we have recently added enhanced logging features to the TereScope Monitor program. TereScope Monitor (v1.25 and greater) will now allow the user to monitor and record vital link statistics automatically. Log files are automatically created every 24 hours (midnight to midnight) and stored as *.txt files.

This guide provides the user with information on how to use the TereScope Monitor with any TereScope 155 PI Series system. Some features may be limited to certain models or models with added options. Refer to the manual for your particular TereScope model for more specific information regarding installation and maintenance. This manual should be read in its entirety before installation. Failure to do so may cause damage to the TereScope system.

SYSTEM REQUIREMENTS

- 486 or better PC-compatible computer

- Microsoft® Windows® 98, Windows® XP Pro, Windows® 2000 or Windows® NT v4.0 or better

- 5 MB hard disk space

- CD ROM Drive

INSTALLATION

The TereScope Monitor with logging uses InstallShield®[1] software for installation. Prior to installing the latest version of TereScope Monitor, please uninstall any earlier versions of this software from your PC. This can be accomplished by using the 'Add/Remove Software' feature in your Control Panel (under Settings on the Windows® Start menu). Find TereScope Monitor on the list of removable software and click the Add/Remove button.

Floppy disk installation directions:
To install the software, insert Disk 1 and open the Start menu. Select 'Run' and browse the disk drive. Be sure to browse file types "all files" and select "TereScope Monitor.msi". Click on 'OK' to run this file. This will begin the installation procedure. Insert Disk 2 when prompted. Answer the questions in the InstallShield Wizard to complete installation.

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[1] InstallShield® is a registered trademark of InstallShield Software Corporation.

Place the disk in the CD ROM drive and open the disk drive directory. Open the Disk1 folder; then double click on the 'Setup' application file. This will begin the installation procedure. Answer the questions in the Install Shield to complete installation.

Important! To use the logging features, select the 'Custom Installation' when prompted (**see Figure 1.)**

Installation of this software requires acceptance of the End User License Agreement. Please accept the conditions of this agreement to install the software. Upon completion of the installation procedure, please review the "readme" file to see the latest news regarding your software version.

To uninstall TereScope Monitor, select Add/Remove Programs from the Control Panel (under Settings on the Windows® Start menu). Find TereScope Monitor on the list of removable software and click the Add/Remove button.
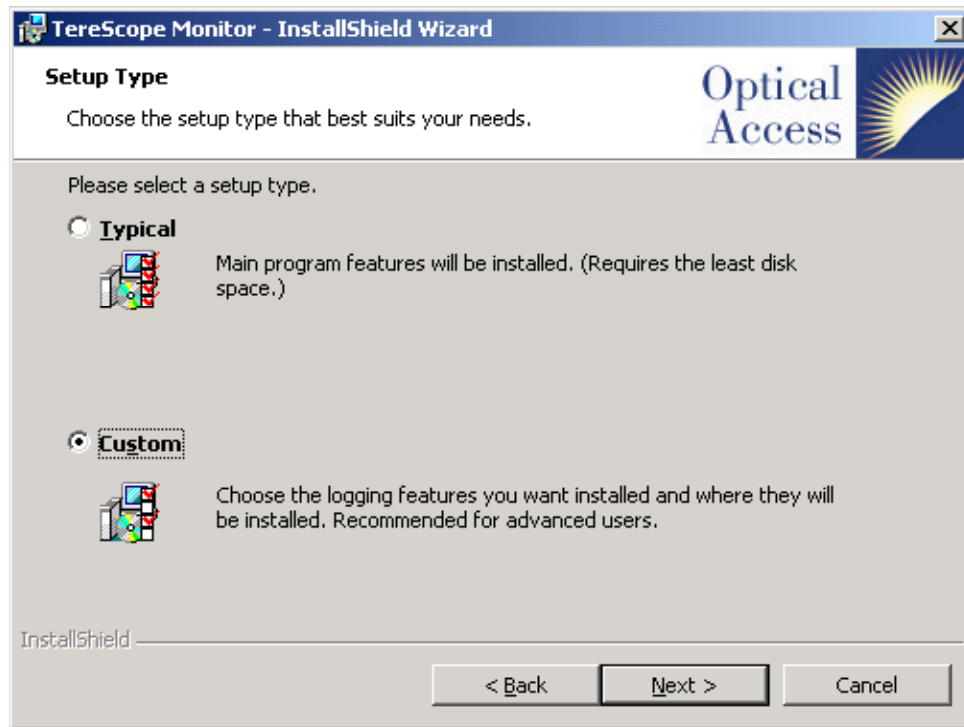
Figure 1 Choose "Custom" to load TereScope Monitor Logging Features.

OPERATION

Before using the TereScope Monitor logging features, you must first open TereScope Monitor. To do this, go the Start Menu and select Programs/TereScope/TereScope Monitor. This will activate the program and provide an active Graphical User Interface (GUI) window on your PC. With this you can accomplish all of the monitoring described elsewhere in the TereScope Monitor user's manual.

Next, open the TereScope Logging software. This is done in the Start Menu by selecting Programs/TereScope/TereScope Logging. This will provide an icon in the icon tray in the lower

right hand corner of your screen. Right click on this icon and select 'Setup'. The default settings are show in Figure 2a. To activate the logging feature, select the 'Text Log Mode' and enter a Logging Interval value between 1 and 300 seconds (see Figure 2b). **Note**: do not enter values for "Memory Buffer size' or 'Log File Size' – these are for use by Optical Access service personnel only.
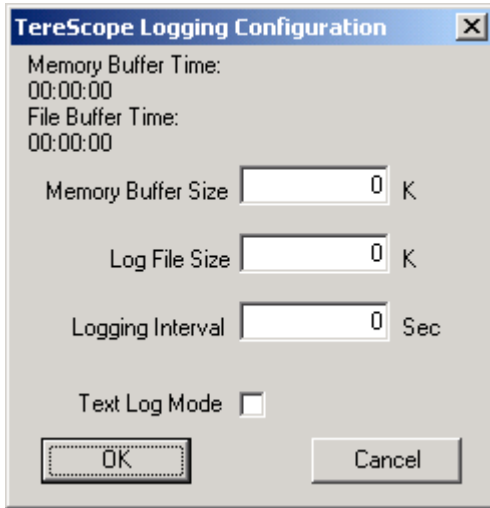

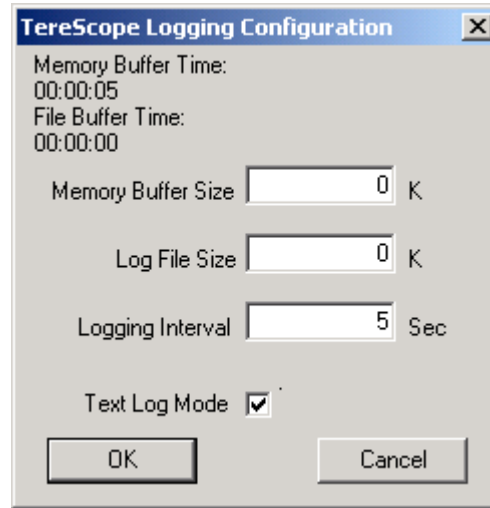**Figure 2a**. Default settings   **Figure 2b**. Suggested settings for logging activation

After checking the 'Text Log Mode' box and giving a value for the 'Logging Interval', click on 'OK'. This will initiate the creation of two types of log files: statistics log files and error log files. The error log files are appended with "err" on the end and are for service personnel use only. The statistics log files will contain a complete record of all variables accessible in your TereScope 155 PI Series system (see Figure 3).

A new log file is created at midnight of every day. The files are stored in C:/Program Files/Optical Access/TereScope/Log Files. The naming convention assigned to each log file is the year, month and day, represented as 'YYYYMMDD'. For example, the name of the log file recorded on March 6, 2002 would be "200236".

Log files can be viewed using Microsoft WordPad® in the Start menu under Programs/Accessories/WordPad. (Please note that double clicking on the file will activate NotePad® as the editor. NotePad cannot format the file correctly and the file will be hard to read. An example of the log file content can be seen in Figure 3.
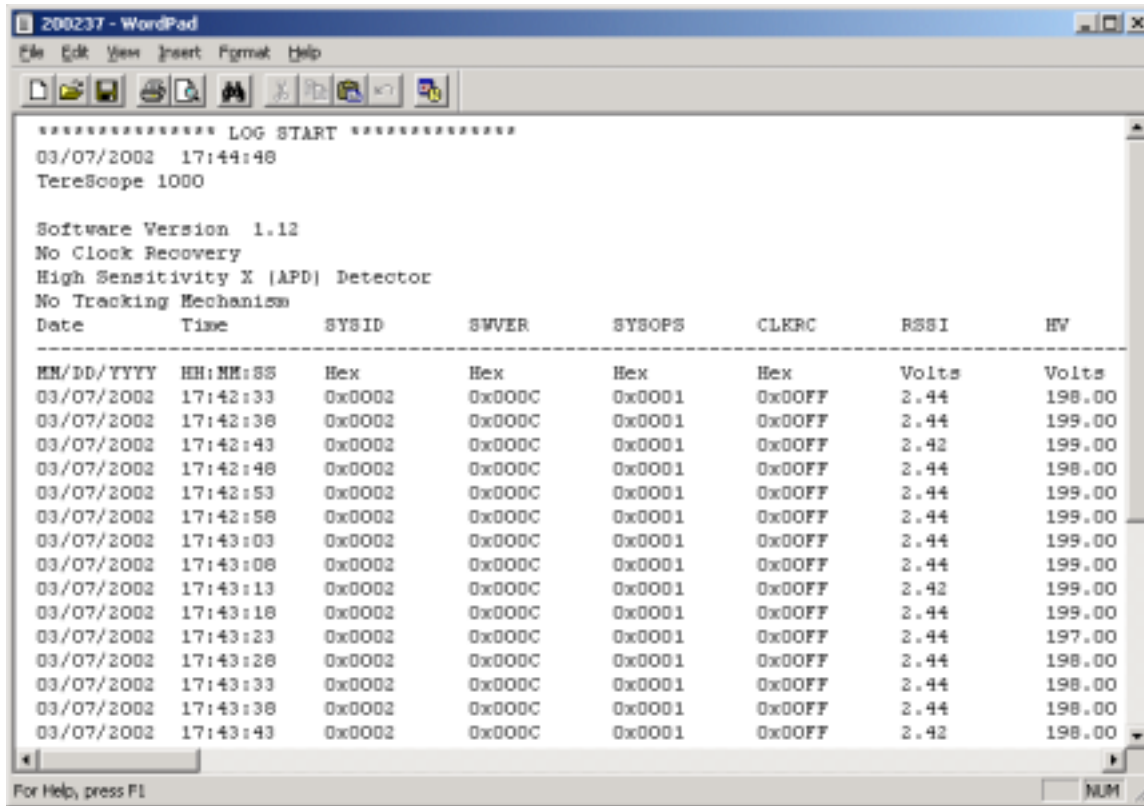
Figure 3. Example of log file as viewed in WordPad.

Log files can also be opened with Microsoft Excel®. This will divide the data into discrete cells, allowing more detailed analysis of the logging information.

For more information on the meaning and suggested values of each link parameter, please refer to your TereScope user's manual. If you have any questions regarding the use of the logging features of the TereScope Monitor program, please contact your Optical Access representative.
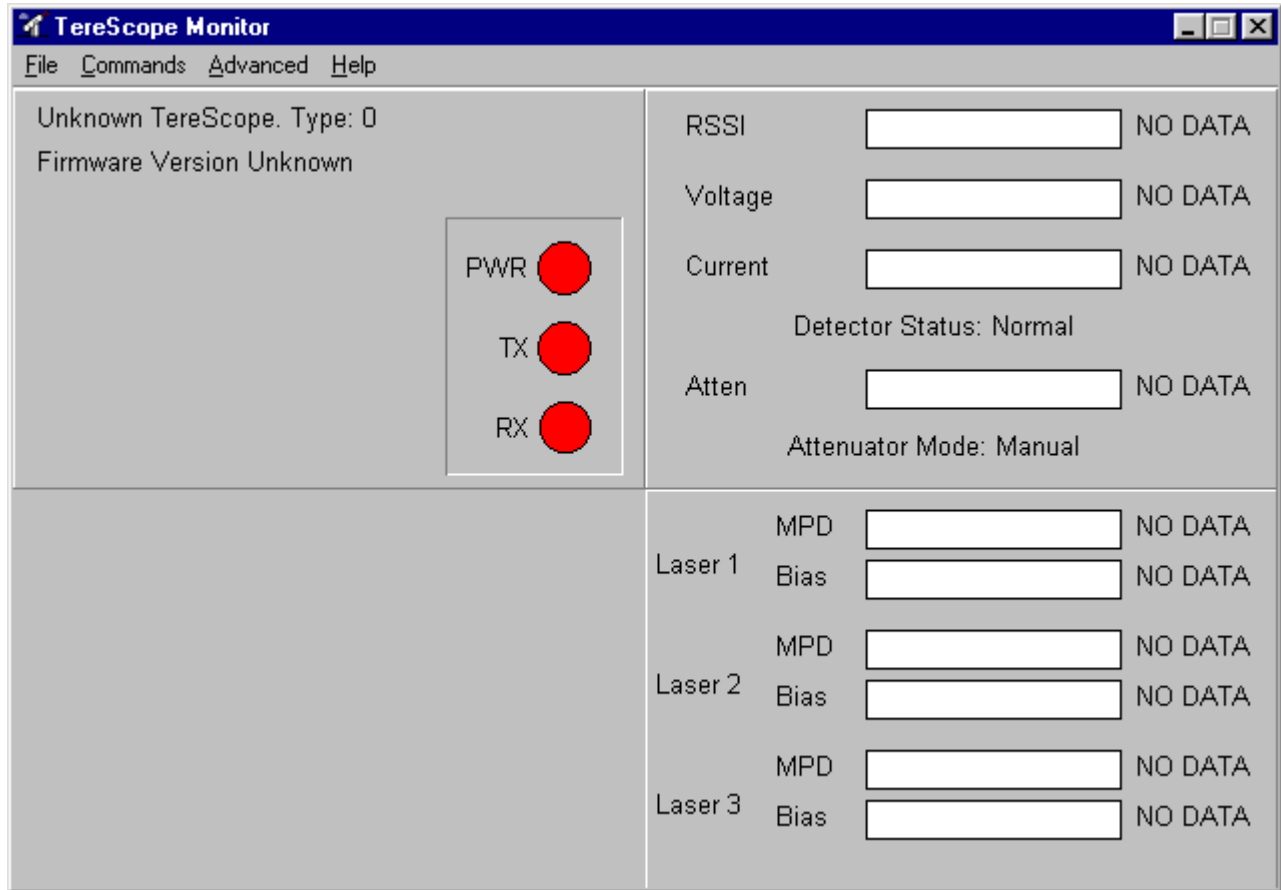
MAIN WINDOW

Figure 4. Main Window (no TereScope connected).

All the basic functionality of TereScope Monitor is available through the main window, which appears when the program is run. This window is divided into four panels. The upper left panel contains information on the TereScope system, which is connected to the serial port. This includes the model (e.g. TereScope 1000, TereScope 3000, etc.), the firmware version, and any options installed. For those TereScope models with multiple video sources, the current source will be shown; and for those models with an internal temperature sensor, the temperature will be shown. The three colored circles mimic the status LEDs on the back of the TereScope. PWR indicates that the unit is on and communicating with the TereScope Monitor program. If this signal is red, check the TereScope power and make sure the serial port connection is set-up properly. This signal may turn red temporarily if Windows is busy and unable to process serial events. This does not indicate a problem with the unit. TX indicates that user data is being transmitted to the remote unit. RX indicates that data is being received from the remote unit. Note that TX and RX here refer to the state of the laser link, not the fiber interface.

The upper right panel contains information on the detector. The RSSI (Received Signal Strength Indicator) bar graph is the primary indication of received power. The RX status LED is based on the RSSI level being above a given threshold. This threshold is different for different TereScope models. Additionally, during times of peak scintillation, the actual threshold for a link without burst errors will be higher. The detector voltage and current bar graphs provide additional information on the detector

status. If the voltage falls too low on the detector resulting in reduced bandwidth and poor link performance, the voltage bar graph will turn red. If the current is too high, which may result in amplifier saturation, the current bar graph will turn red. Either of these cases indicates a link problem, which should be referred to the manufacturer. Because of limited resolution, the current measurement may stay at the low end of the scale even when there is a good link; RSSI is the primary indication of link quality. The detector status indicates whether the detector has been disabled, either by the user or automatically, to prevent permanent damage. If it remains permanently in a shutdown state, please contact the manufacturer.

The lower right panel contains information on the lasers. The number of lasers depends on the TereScope model; information is shown only for the actual number of lasers present. The MPD (Monitor Photodiode) bar graphs show an approximate value of the average power transmitted by the lasers. The bias bar graphs show the bias current provided to the lasers (bias measurements are not available on all TereScope models). If either of these is excessively low, the appropriate bar graph will turn red. This indicates a potential laser problem that could result in link failure and should be referred to the manufacturer. For very short-range links, the MPD may read higher than normal because it is detecting transmitted power from the remote link as well. This is only a problem for monitoring purposes and will not degrade the link performance in any way.

The Commands Menu includes simple commands which could be sent to the TereScope system. The Reset command resets the TereScope firmware, which will reset parameters to their power-on default values. The link may be lost for a short period of time during the initialization sequence, so this command should only be used if the system appears to be unstable. The EEPROM Load and Save commands allow the user to modify certain power-on default parameters for those systems which include internal EEPROM. Save will store the current values to EEPROM, making them the new power-on defaults. Load will restore values from EEPROM, undoing any changes made since power-on. Care should be taken in writing to EEPROM to make sure that the system is stable with the new values. All values stored in EEPROM are changed through Advanced Menu settings and the warning that appears should not be ignored. The Video Source commands allow the user to switch between internal and external cameras for those systems which include both.

The Advanced Menu brings up additional windows for advanced options. In most situations these options should only be modified by Optical Access personnel or following their recommendations, as improper settings could result in a loss of the communications link. Because of this, the Advanced Menu may not be available on all software versions.
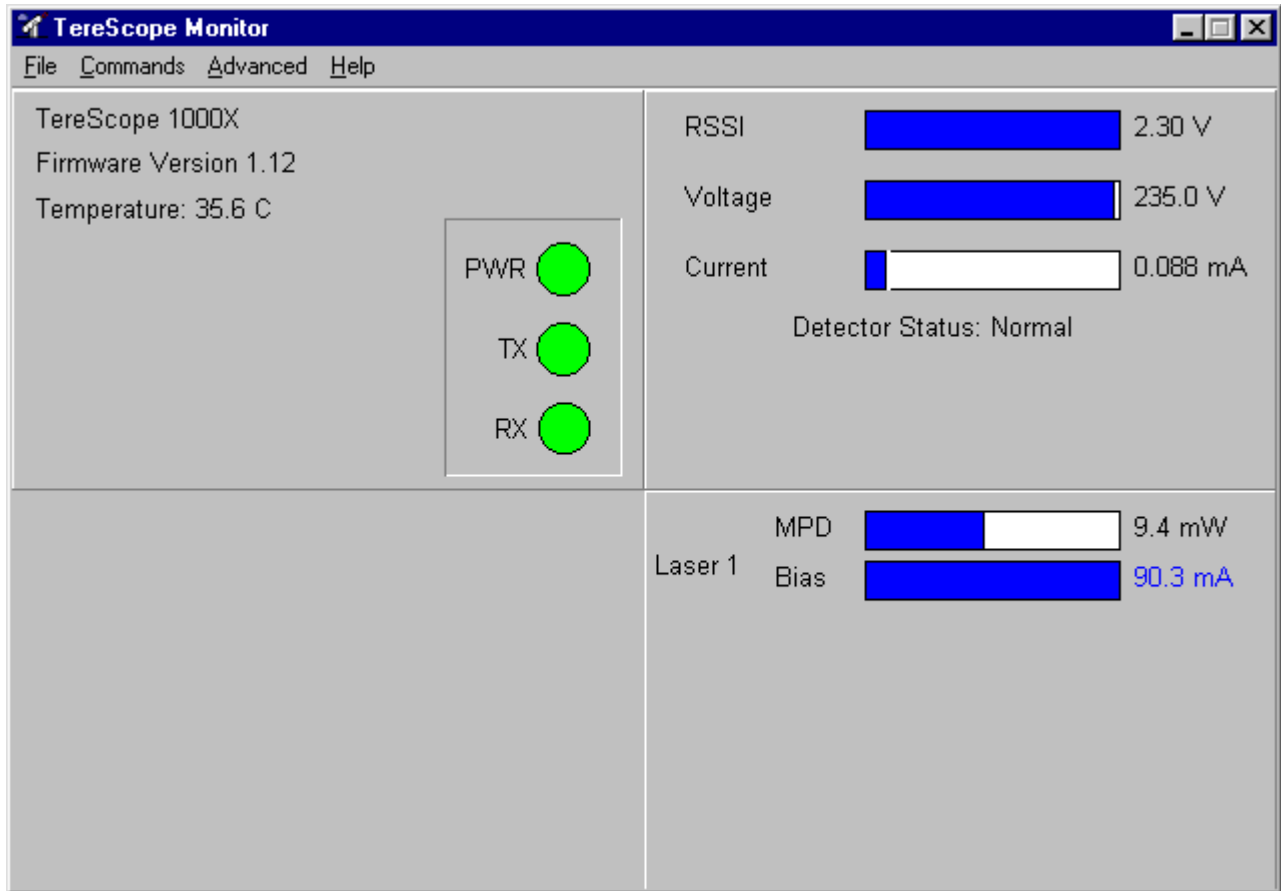
Figure 5. Main Window (connected to TereScope 1000X).
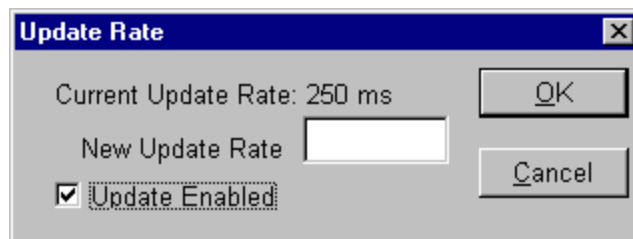
UPDATE RATE (ADVANCED)

Figure 6. Update Rate Dialog Box.

The Update Rate dialog allows the user to change the rate at which data is sent by the TereScope system across the serial port. This is an advanced feature primarily intended for logging and factory testing. The factory default is 250 ms. Setting the rate to a value less than the time it takes to send a complete frame of data (approximately 70-100 ms, depending on the TereScope model) will result in data being set continuously. However, the screen refresh rate will still be limited by the display

functions to 250 ms. A value of zero is invalid and will result in no change to the update rate. The slowest update rate allowed is 60 seconds (60000 ms).

To change the update rate, enter the new update rate (in milliseconds) at the prompt, then press the OK button. To verify that the change has taken place, you must reopen the Update Rate dialog.

Update may also be disabled entirely by unchecking the Update Enabled box, then pressing the OK button. Because this will prevent user monitoring until update is re-enabled, this option is not recommended and may not be available on all software versions.
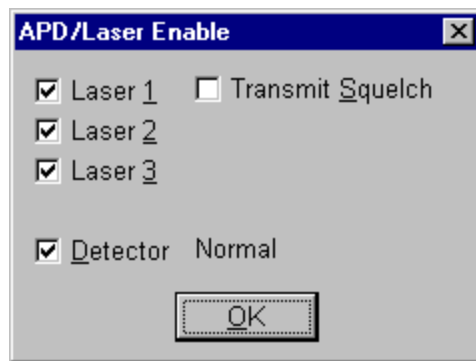
APD LASER ENABLE (ADVANCED)

Figure 7. APD/Laser Enable Dialog Box.

The APD/Laser Enable dialog allows the user to enable or disable individual lasers. If the TereScope model uses an APD as a detector, this can also be shutdown. This is an advanced feature primarily intended for factory testing. The current detector status (Normal or Shutdown) is also shown here.

To enable or disable a laser, check or uncheck the corresponding box. The number of lasers will vary depending on the TereScope model. To enable or disable the detector, check or uncheck its box (if a PIN detector is used, this option will not be available). The transmit squelch option, on systems which support this mode, will cause the laser to be disabled when there is no transmitted data on the fiber. This prevents the TereScope from chattering when there is no data to be sent. Some protocols require this mode to be enabled for proper operation; however, alignment can be easier with this disabled.

Because disabling a laser or the detector will result in link failure until it is re-enabled, this option is not recommended and may not be available on all software versions.

The upper panel controls the mode of the attenuator. In manual mode, the user can set the position by entering an attenuation level and pressing the Set button. The current position should change to reflect the new setting. In automatic mode, the attenuator is automatically controlled by the

TERESCOPE SERIAL PARSER

The TereScope Serial Parser is responsible for parsing the data received from the TereScope system and sending commands to the TereScope over the serial communications link. It provides a set of API functions for other programs (such as TereScope Monitor and TereScope Network Management System) to access the status data and provide commands to be sent.

The TereScope Serial Parser will be launched and closed automatically when needed, displaying a notification icon in the taskbar while it is running. It should not be closed manually, or other programs will not be able to access updated TereScope data.

To change the COM port used, click on the TereScope Serial Parser icon in the system tray. This will bring up a popup menu with several options. Selecting Setup will display a serial port configuration dialog box. Click on the appropriate port, and select OK. The port settings will automatically be changed to match the settings used by the TereScope (19200 baud, 8 bits, no parity, 1 stop bit).
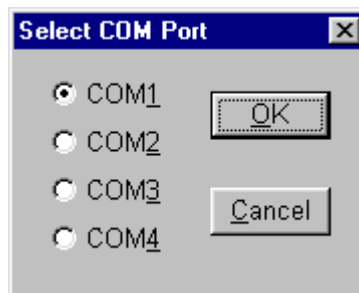

Figure 8. TereScope Serial Parser Setup Dialog Box.

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