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Triangle MicroWorks, Inc.  
Communication Protocol Test Harness

What's New?

*a description of the changes included in all versions of the Test Harness*

Version 3.09.00  
March 15, 2010

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This document describes features or corrections that have been added to the Communication Protocol Test Harness.

This section describes new features and/or bug fixes included with each new release of the Communication Protocol Test Harness. The symbols to the left of each revision are used to help define the following kinds of revisions:



Additional Test Harness Features



Corrections to problems, with indications for when the problems were introduced.

Note: as of v2.00.32, this document only lists changes to the Test Harness itself. Please refer to the following documents for protocol-specific changes that also affect the Test Harness:

- [DNP3 Master Source Code Library What's New](#)
- [IEC 60870-5-101 Master Source Code Library What's New](#)
- [IEC 60870-5-103 Master Source Code Library What's New](#)
- [IEC 60870-5-104 Master Source Code Library What's New](#)
- [Modbus Master Source Code Library What's New](#)
- [DNP3 Slave Source Code Library What's New](#)
- [IEC 60870-5-101 Slave Source Code Library What's New](#)
- [IEC 60870-5-103 Slave Source Code Library What's New](#)
- [IEC 60870-5-104 Slave Source Code Library What's new](#)
- [Modbus Slave Source Code Library What's New](#)

## Version 3.09.00 (March 15, 2010)



Added SDNP File Transfer timeout parameter.



Added use of Windows file permissions in SNP File Transfer.



Added properties to save sdnppauthentication and sendPreChallenge settings in the workspace.













Added support for WinPcap 4.1.1 (latest version, for use in Monitor Mode with TCP connections).











Set default address for TCP Servers (Outstations) to \*.\*.\* (to allow connections from any Client address).







Improved IEC 60870-5-103 sample plug-ins.


-  *Description:* Selecting data types with the arrow key in the Data Window Tree did not change the display in the point list.  
*Introduced:* v3.00  
*Resolution:* Fixed in v3.09
-  *Description:* The protocol analyzer did not always display the last line of data.  
*Introduced:* v3.0  
*Resolution:* Fixed in v3.09
-  *Description:* The Async database queue could overflow if there were more than 10,000 points in response to an Integrity poll or General Interrogation.  
*Introduced:* v3.0  
*Resolution:* Fixed in v3.09
-  *Description:* Not entering a value (i.e., leaving the value field blank) when changing an SDNP Analog Value would cause the Test Harness to crash.  
*Introduced:* v3.0  
*Resolution:* Fixed in v3.09
-  *Description:* If a command in the M103 Command Window did not succeed, it would block execution of the next command.  
*Introduced:* v3.0  
*Resolution:* Fixed in v3.09
-  *Description:* General Commands executed in the M103 Command Window sent the wrong values (0 and 1 vs. 1 and 2).  
*Introduced:* v3.0  
*Resolution:* Fixed in v3.09
-  *Description:* Changing the value of stale points in the Data Window could cause the Test Harness to crash.  
*Introduced:* v3.0  
*Resolution:* Fixed in v3.09
-  *Description:* When writing Modbus coils, if fewer than 8 coils were written, the values were not properly initialized to 0.  
*Introduced:* v3.01.01 (Initial release)  
*Resolution:* Fixed in v3.09
-  *Description:* A DNP3 Dataset with a BSTR that is too large can cause an exception.  
*Introduced:* v3.01.01 (Initial release)  
*Resolution:* Fixed in v3.09
-  *Description:* The m103Cancel command was not implemented.  
*Introduced:* v3.00  
*Resolution:* Fixed in v3.09


-  *Description:* The m104csetc command issues a Short Float without time stamp.  
*Introduced:* v3.00  
*Resolution:* Fixed in v3.09
-  *Description:* An exception occurred when saving/restoring workspaces if a hidden point had been deleted.  
*Introduced:* v3.00  
*Resolution:* Fixed in v3.09
-  *Description:* Hidden points in the IEC 60870-5-101, -102, -103, or -104 Data Window were not restored properly.  
*Introduced:* v3.00  
*Resolution:* Fixed in v3.09
-  *Description:* The protocol analyzer search function did not consistently work properly.  
*Introduced:* v3.00  
*Resolution:* Fixed in v3.09
-  *Description:* Executing mmbwritemulticoils with no value caused an exception.  
*Introduced:* v3.00  
*Resolution:* Fixed in v3.09
-  *Description:* The datavariabale was not completely filled in for Object Groups 11, 13, 42, and 43.  
*Introduced:* v3.00  
*Resolution:* Fixed in v3.09
-  *Description:* IEC 60870-5-104 redundancy channels failed to open from the GUI. Also, opening redundancy channels from the GUI did not set up all of the variables properly, so some Tcl commands did not work properly.  
*Introduced:* v3.08  
*Resolution:* Fixed in v3.09
-  *Description:* The Invalid checksum example plug-ins did not work properly.  
*Introduced:* v3.00  
*Resolution:* Fixed in v3.09


### **Version 3.08.00 (September 25, 2009)**

-  Added plain text decoding of output commands
-  Improved handling of DNP3 Octet String objects (Object 110); do not allow setting of flags, and do not display flags in MDNP Data window, since there are no flags for Octet Strings.
-  Modified installer in order to properly detect .NET 2.0 SP1.

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*Description:* Parsing of an Object 41Variation 3 response into a TCL variable did not work properly.  
*Introduced:* v3.00  
*Resolution:* Fixed in v3.08
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*Description:* The sdnpanlgout and sdnpbinout Tcl command events did not send the specified status.  
*Introduced:* v3.00  
*Resolution:* Fixed in v3.08
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*Description:* The Data Window did not properly handle IEC 60870-5-103 T3 Measurand andT9 Measurand II data.  
*Introduced:* v3.00  
*Resolution:* Fixed in v3.08
- 


*Description:* The DNP3 Simulators did not check Load Current after an initial Trip.  
*Introduced:* v3.00  
*Resolution:* Fixed in v3.08


### **Version 3.07.00 (July 17, 2009)**


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Added ability to configure IEC 60870-5-104 from the GUI.
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Removed linkAddress from the IEC 60870-5-104 Session configuration. (This field was misleading, but did not have any effect.
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*Description:* When exiting, the Test Harness did not properly save the settings file or workspace, and no longer closed the windows, plug-ins, etc.  
*Introduced:* v3.06.00  
*Resolution:* Fixed in v3.07
- 


*Description:* The Test Harness did not allow setting of the quality flags for IEC 60870-5-101 or -101 slave Integrated Totals (MIT) data types.  
*Introduced:* v3.00  
*Resolution:* Fixed in v3.07
- 


*Description:* The sample workspace for reading raw input bytes from a file did not load properly.  
*Introduced:* v3.00  
*Resolution:* Fixed in v3.07
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*Description:* The Test Harness Data Window did not show signed IEC 60870-5 measurands (e.g., M\_ME\_NA) data types properly.  
*Introduced:* v3.00  
*Resolution:* Fixed in v3.07


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*Description:* The GI Group parameter in the Configuration settings could not be enabled because it was set as read only.  
*Introduced:* v3.00  
*Resolution:* Fixed in v3.07
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*Description:* DNP3 broadcast requests were not sent to the broadcast (IP) address.  
*Introduced:* v3.00  
*Resolution:* Fixed in v3.07
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*Description:* When simulating a DNP3 Outstation, the Test Harness did not validate UDP addresses correctly.  
*Introduced:* v3.00  
*Resolution:* Fixed in v3.07
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*Description:* When saving a workspace, the Test Harness would attempt to write signed values that are unsigned (e.g., binary counter values).  
*Introduced:* v3.00  
*Resolution:* Fixed in v3.07
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*Description:* The mdnpbincmd help incorrectly showed support for 8bitstartstop and 16bitstartstop qualifiers.  
*Introduced:* v3.00  
*Resolution:* Fixed in v3.07
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*Description:* TCL commands using arrays of 32 bit values incorrectly limited the values to 32 bits.  
*Introduced:* v3.00  
*Resolution:* Fixed in v3.07


## **Version 3.06.00 (April 14, 2009)**

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Added documentation for DNP3 Secure Authentication features and configuration.
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Provided better default values when adding points via the Data Window.
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Added an interface to open a local file (for DNP3 file transfer).
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*Description:* File transfer reads could result in leaking buffers.  
*Introduced:* v3.00  
*Resolution:* Fixed in v3.06
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*Description:* The .Test Harness could leak handles on RS-232 connections.  
*Introduced:* v3.00  
*Resolution:* Fixed in v3.06

-  **Description:** The database limited the number of elements in a data set to 30, which could result in writing past the end of an array if a larger number of elements was defined in a prototype.  
**Introduced:** v3.01.01 (Initial release)  
**Resolution:** Fixed in v3.06
-  **Description:** Opening a DNP3 Master serial connection using default values for all other parameters left the Network Type as TCP\_UDP, which resulted in using UDP transmit code for broadcast messages.  
**Introduced:** v3.00  
**Resolution:** Fixed in v3.06
-  **Description:** Secure Authentication criticalFCs configuration settings were not saved in the workspace.  
**Introduced:** v3.01.00  
**Resolution:** Fixed in v3.06
-  **Description:** MDNP File transfer Tcl scripts did not function properly if the file handles had the most significant bit set.  
**Introduced:** v3.00  
**Resolution:** Fixed in v3.06
-  **Description:** The s103msrnd and s103msrnd3 Tcl commands incorrectly allowed Types 3 and 9 to be specified. Similarly the change reason on msrnd and msrnd2 commands allowed these types.  
**Introduced:** v3.0  
**Resolution:** Fixed in v3.06
-  **Description:** A Test Harness outstation could connect to the Master before it built its database.  
**Introduced:** v3.00  
**Resolution:** Fixed in v3.06
-  **Description:** A DNP3 Outstation did not properly handle the Master rereading only the current block during file transfer.  
**Introduced:** v3.00  
**Resolution:** Fixed in v3.06
-  **Description:** The IEC 60870-5 outstation Group parameter in the configurations settings was incorrectly set to Read Only.  
**Introduced:** v3.00  
**Resolution:** Fixed in v3.06
-  **Description:** The Group parameter in the configuration settings could not be changed.  
**Introduced:** v3.0  
**Resolution:** Fixed in v3.06







## Version 3.05.00 (December 4, 2008)


-  *Description:* USB keys did not always work properly after upgrading to v3.04.  
*Introduced:* v3.04  
*Resolution:* Fixed in v3.05
-  *Description:* Some modifications (e.g., link addresses) were not being saved properly.  
*Introduced:* v3.00  
*Resolution:* Fixed in v3.05


## Version 3.04.02 (October 20, 2008)


-  *Description:* When upgrading to v3.04.01, the license server did not start properly, causing USB licenses to fail to be recognized and preventing installing new licenses.  
*Introduced:* v3.04.01  
*Resolution:* Fixed in v3.04.02


## Version 3.04.01 (September 30, 2008)


-  Added ability to specify parameter values that are not defined in the specification (to facilitate testing of the remote station's ability to process invalid requests/responses).
-  Added ability to automatically load a workspace on startup. Added "Load the following Workspace at startup without asking" to the Test Harness Options dialog box.
-  Improved IEC 60870-5-102 and -103 Master Command Windows.
-  *Description:* Some IEC 60870-5-101 and -104 data types (e.g., M\_EP\_TA, M\_EP\_TB) did not display in the data window.  
*Introduced:* v3.00  
*Resolution:* Fixed in v3.04.01
-  *Description:* IEC 60870-5-101 and -104 Sector properties were incomplete (e.g., the description area was too small; defaultResponseTimeout, maxEvents, EventMode, etc. were not configurable).  
*Introduced:* v3.00  
*Resolution:* Fixed in v3.04.01
-  *Description:* IEC 60870-5-104 Slave channels incorrectly set isControlling to TRUE by default.  
*Introduced:* v3.00  
*Resolution:* Fixed in v3.04.01

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*Description:* For some IEC 60870-5-101 and -104 data types (e.g., M\_EP\_TA), modifying the flags would sometimes inadvertently also change the data value.  
*Introduced:* v3.00  
*Resolution:* Fixed in v3.04.01
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*Description:* DNP3 data sets were not properly saved and restored from workspaces.  
*Introduced:* v3.0  
*Resolution:* Fixed in v3.04.01
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*Description:* In the Channel/Session/Sector Advanced menu, clicking on the Cancel button did not properly cancel the window.  
*Introduced:* v3.00  
*Resolution:* Fixed in v3.04.01
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*Description:* Values for some IEC 60870-5-101 and -104 data types could not be changed and/or displayed in the data window.  
*Introduced:* v3.00  
*Resolution:* Fixed in v3.04.01
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*Description:* Some commands (e.g., s103dpi set) were logged multiple times in the protocol analyzer.  
*Introduced:* v3.00  
*Resolution:* Fixed in v3.04.01


## **Version 3.04.00 (September 12, 2008)**


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Added support for v2.0 DNP3 Secure Authentication
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Added Data Sets to Command and Data Windows
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Modified License Server to better support Windows Vista. With this version, license operations (request/install/remove) can be performed without requiring “Run as Administrator.”
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Modified License Server to better support Windows Vista. With this version, license operations (request/install/remove) can be performed without requiring “Run as Administrator.”
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Improved license error dialog when running on a Virtual Machine to explain that running on a Virtual Machine is only supported with a USB key.
- 

Enhanced error handling and error messages when a user attempts to load an invalid workspace.
- 

Added support for saving/restoring DNP3 Device Attributes
- 

Modified License Request dialog to reduce information requested from user; enhanced Quote Request dialog.
- 

Added command to open Statistics window.



Enhanced IEC 60870-5-103 Data Window display.



Added target layer diagnostics to protocol analyzer output.



*Description:* The Edit->Protocol Format option could cause the Test Harness to crash.

*Introduced:* v3.00

*Resolution:* Fixed in v3.04



*Description:* Some IEC 60870-5-101 and -104 data types (e.g., measurands) could not be added from the data window.

*Introduced:* v3.00

*Resolution:* Fixed in v3.04



*Description:* Some protocol analyzer settings did not get saved and restored properly.

*Introduced:* v3.0

*Resolution:* Fixed in v3.04



*Description:* The m104fscna command did not allow SCQ to be set to zero.

*Introduced:* v3.00

*Resolution:* Fixed in v3.04



*Description:* If data sets were created on the Outstation, the Test Harness had to read the dataset before writing to it.

*Introduced:* v2.0.43

*Resolution:* Fixed in v3.04



*Description:* Validate points was not being shown on Add Command->DNP3 menu.

*Introduced:* v3.0

*Resolution:* Fixed in v3.04



*Description:* The Test Harness did not associate the channel/session/sector between the GUI and the command line.

*Introduced:* v3.0

*Resolution:* Fixed in v3.04

## Version 3.03.00 (April 1, 2008)



Added ability for DNP users to set the Internal Indication (IIN) bits.



Added additional information in protocol analyzer log for DNP3 file transfer and DNP3 Master requests.



Add StaticGroup to DNP3 Outstation configuration GUI so that customers can add any Object Group (including Octet Strings) to Static Poll Class 0 response.



Added ability to specify the time in Time Sync Commands.



Modified time keeping to facilitate using UTC; added ability to have different times and added MinutesOffset and UseUTC for each session. DNP3 sessions will default to UseUTC == true. The protocol analyzer and data window will continue to use system (computer) time.



*Description:* IEC 60870-5-104 Tcl commands did not work unless IEC 60870-5-101 was licensed.

*Introduced:* v3.00

*Resolution:* Fixed in v3.03



*Description:* Restored ability to specify alias name for channel/session/sector parameter on commands.

*Introduced:* v3.00

*Resolution:* Fixed in v3.03.00



*Description:* Some workspaces created with Test Harness v2.x could not be read with Test Harness v3.00 through v3.02.

*Introduced:* v3.00

*Resolution:* Fixed in v3.03.



*Description:* The Test Harness did not save the TimeMode setting.

*Introduced:* v3.00

*Resolution:* Fixed in v3.03 (added to Settings file).



*Description:* The command line history did not work properly for complex commands.

*Introduced:* v3.00

*Resolution:* Fixed in v3.03.

## Version 3.02.00 (January 11, 2008)



This version contains a number of enhancements including:

- Ability to refilter after capturing data.
- Ability to develop add-ins using any .NET language.
- Support for scripting in Python.
- Ability to customize colors in the protocol analyzer display.
- Ability to save a protocol analyzer log, and reload and refilter it later
- Enhancements to workspaces: a new prompt reminds the user to save the workspace; this can be turned off and later turned on via the Options menu.
- Ability to run on a Virtual Machine as long as a valid USB key license is present
- Ability to send invalid messages via a .NET plug-in (example provided)

- DNP security support. (Note: v3.02 includes changes agreed to by the Technical Committee during its annual face-to-face meeting).



*Description:* The installer would sometimes crash after warning that another tcl84.dll was found.

*Introduced:* v2.00.42

*Resolution:* Fixed in v3.02.00



*Description:* Counters did not roll over when incremented from data window.

*Introduced:* v2.00

*Resolution:* Fixed in version 3.02.00



*Description:* The Test Harness could crash when an invalid response was sent during File Transfer operations.

*Introduced:* v2.00

*Resolution:* Fixed in v3.02.00



*Description:* Some values (e.g., \00) could not be set in a bitstring in a data set.

*Introduced:*

*Resolution:* Fixed in v3.02.00

## Version 3.01



Intermediate Beta Releases of Test Harness v3. All users of these versions should upgrade to v3.02.

## Version 3.00



Initial Beta Release of Test Harness v3. All users of these versions should upgrade to v3.02.

## Version 2.00.51 (February 28, 2007)



Added licensing improvements to improve stability of USB Key licenses.



Improved USB Key license dialog to indicate when a USB Key cannot be licensed.



Modified the mdnpanlgout command and Analog Output GUI command to use Variation 2 (instead of Variation 1) when writing DNP3 Object Group 41 (Analog Outputs). Level 2 Slaves should support Variation 2.



*Description:* The Communication Protocol Test Harness could crash if a channel closed while the connector thread was processing a channel status update.

*Introduced:* v2.00

*Resolution:* Fixed in v2.00.51



*Description:* Having a large number of USB devices plugged in could cause the Test Harness to crash.

*Introduced:* v2.00.28

*Resolution:* Fixed in v2.00.51



*Description:* The licensing software would sometimes show an incorrect expiration date for the Maintenance Plan.

*Introduced:* v2.00.28

*Resolution:* Fixed in v2.00.51



*Description:* The USB Key licensing software introduced a memory leak.

*Introduced:* v2.00.28

*Resolution:* Fixed in v2.00.51



*Description:* The Communication Protocol Test Harness would sometimes issue a "Site Key not Valid" error message when a new (valid) activation key was entered.

*Introduced:* v2.00.28

*Resolution:* Fixed in v2.00.51



*Description:* The licensing software would not always find a USB key if other keys were installed.

*Introduced:* v2.00.28

*Resolution:* Fixed in v2.00.51



*Description:* If separate Test Harness and SCADA Data Gateway USB keys were plugged into the same computer, the Test Harness and/or the SCADA Data Gateway could not find its license.

*Introduced:* v2.00.28

*Resolution:* Fixed in v2.00.51

## **Version 2.00.50 (January 10, 2007)**



Added licensing improvements and additional license-related logging.

## **Version 2.00.49 (November 1, 2006)**





Added additional diagnostics assist in troubleshooting installations in which the Tcl code cannot properly load packages.

## **Version 2.00.48 (June 22, 2006)**






Added ability to turn off evaluation licenses. This option works around a bug in the third-party evaluation licensing software that can cause a PC crash on some systems.







## Version 2.00.47 (June 9, 2006)

-  *Description:* The DNP3 Master Command GUI would always send Analog Output Block commands with the Long variation, even if Short was specified.  
*Introduced:* v2.00.26  
*Resolution:* Fixed in v2.00.47
-  *Description:* The Test Harness used an incorrect range for IEC 60870-5 Step Position information (MST) data types.  
*Introduced:* v2.00  
*Resolution:* Fixed in v2.00.47

## Version 2.00.46 (April 27, 2006)

-  Modified default command line values to make it easier to add measurands to TH database (e.g., assume values for pacnaioa, etc. if not specified).
-  Enhanced command line value checking to prevent adding IOA 0 (0 is not a valid value for the IOA in IEC 60870-5).
-  Added support for Modbus FC 8 Diagnostics Subcodes 1 (Restart) and 4 (Force Listen Only)

## Version 2.00.45 (March 17, 2006)

-  Added IEC 60870-5-103 Command Window to provide access to commonly used commands through the GUI.
-  Added support for Areva custom ASDUs for IEC 60870-5-103.
-  Added support for Siemens SIPROTEC private ASDU 205 for IEC 60870-5-103.
-  Added support for Gasunie PIDs (mitnc, mittc, csenz, mctna, cctna, msptb, mdptb, mbotb, mmetf, and (for IEC 60870-5-104) ctsna) for IEC 60870-5-101/104.
-  *Description:* Workspaces were not saved properly if a new command window was added.  
*Introduced:* v2.00.26  
*Resolution:* Fixed in v2.00.45
-  *Description:* IEC 60870-5-101/104 workspaces did not save/restore interrogation groups properly.  
*Introduced:* v2.00.26  
*Resolution:* Fixed in v2.00.45

## Version 2.00.44 (February 2, 2006)

**dnp3** Added support for Output Event objects.



Added sample workspaces to demonstrate populating the DNP3 Master or Slave database from a spreadsheet (.csv) file.



The Test Harness no longer sets its clock when it receives a Clock Sync command while in Monitor Mode. This change ensures the time stamps in the protocol analyzer log remain consistent.



Modified the display order of inumber/ftype (for IEC 60870-5-103) to be consistent with other devices.



*Description:* Specifying an invalid host name when in TCP/IP Monitor mode using winpcap v3.1 would cause the Test Harness to crash.

*Introduced:* v2.00.40

*Resolution:* Fixed in v2.00.44



*Description:* The licensing software did not correctly read the serial number from some USB mass storage devices, preventing USB key licensing with these devices.

*Introduced:* v2.00.42

*Resolution:* Fixed in v2.00.44

## Version 2.00.43 (December 2, 2005)

**dnp3** Added support for Data Sets (defined in TB2004-004).

**dnp3** Added support for Object 0 (Device Description), as defined in TB2003-001.



Improved browser for file transfer; the directory separator (e.g., "/" or "\") is now configurable.



Improved default values for parameters that are not saved in the workspace to provide better compatibility with workspaces that add parameters in the future.



Improved the uninstall prompts to lessen the likelihood of unknowingly aborting the uninstall process.



*Description:* The Test Harness would issue a divide by zero error when an empty directory was entered manually (not browsed) in the DNP3 File Transfer GUI.

*Introduced:* v2.00.26

*Resolution:* Fixed in v2.00.43



*Description:* Refreshing or changing window focus during DNP3 file transfer could result in unexpected behavior, including possible crash.

*Introduced:* v2.00.26

*Resolution:* Fixed in v2.00.43



*Description:* The Test Harness did not properly save/restore workspaces for non-English versions of Windows.

*Introduced:* v2.00

*Resolution:* Fixed in v2.00.43

## Version 2.00.42 (September 9, 2005)



Added check for tcl84.dll during installation, in order to detect potential conflicts with the Tcl/Tk installation.



Added description of Add description of request ID and command status to manual.



*Description:* The Test Harness would not run on Windows NT

*Introduced:* v2.00.40

*Resolution:* Fixed in v2.00.42. (NOTE: Due to compatibility issues with the Windows NT DLLs, the Test Harness cannot control test equipment such as the OMICRON CMD-256 when running on NT; however, it will otherwise function completely. The Test Harness will issue an error message if features requiring the incompatible DLL are accessed.)

## Version 2.00.41 (July 20, 2005)



Updated DNP3 device profile documents to accurately show supported objects/variations.



Improved documentation to clarify how to set the default variation on a per-point basis.



Improved display of Conformance Test Icons. Only one conformance Test Icon is shown and it is shown only if at least one Conformance Test is present.



Added description of automating conformance tests and duplicating RTU configurations, and made minor updates to Test Harness manual.



*Description:* The channel open Dialog did not work properly for IEC 60870-5-101 channels if DNP3 and Modbus were not licensed.

*Introduced:* v2.00.26

*Resolution:* Fixed in v2.00.41













*Description:* The MDNP Read Command Configuration (in the Protocol Command window) used the wrong object Group for binary input reads.




*Introduced:* v2.00.26

*Resolution:* Fixed in v2.00.41

## Version 2.00.40 (June 3, 2005)

-  Added support for Modbus and IEC 60870-5-104 to the Test Harness Monitor Mode. The Test Harness now supports Monitor Mode for DNP3, Modbus, IEC 60870-5-101, -103, and -104.
-  Added support for TCP/IP in the Test Harness Monitor Mode. The Test Harness now supports TCP/IP and serial monitoring, as well as entering previously recorded data (strings) for the above mentioned protocols.
-  Improved the Open Channel dialog box for Monitor Mode. Both channels (Master and Slave/) can now be configured within a single window.
-  Add ability to control SQ bit for IEC 60870-5-101 and -104 protocol components.
-  Added support for string data types in mdnpassignclass command.
-  Modified installation script to insert “./bin” at the front of the path. As long as the Test Harness starts in its working directory, it will find proper Tcl/Tk version in ./bin. Other apps probably won't find ./bin, so they aren't adversely affected. This modification simplifies use of the Test Harness when other Tcl versions are installed on the same computer.
-  Added detailed description of UDP configuration to Test Harness manual.
-  *Description:* The DNP3 Slave component returned the incorrect file size for a file open on a directory.  
*Introduced:* v2.00  
*Resolution:* Fixed in v2.00.40
-  *Description:* If the Master station repeated connected and disconnected quickly, communications could hang.  
*Introduced:* v2.00  
*Resolution:* Fixed in v2.00.40
-  *Description:* The 60870-5-101 Slave open dialogs would not work properly if DNP3 and Modbus were not licensed.  
*Introduced:* v2.00.26  
*Resolution:* Fixed in v2.00.40

## Version 2.00.39 (March 29, 2005)

-  Added support for UDP support for DNP, as described in the DNP Networking Specification.
-  Added support for Dual End Point for DNP, as described in the DNP Networking Specification.
-  Added ability to display structured IOAs in the Data Window.



Added M\_ME\_ND (Measured value, normalized value without quality descriptor) data types to IEC 60870-5-101 and -104 Data Window displays.



Added configuration of channels and sessions used by Conformance Test Scripts when saving/restoring workspaces.



*Description:* The Test Harness GUI interface would sometimes disable all logging.  
*Introduced:* v2.00.26  
*Resolution:* Fixed in v2.00.39



*Description:* The DNP Master Test Harness did not show time stamps for Analog events with time stamps.  
*Introduced:* v2.00  
*Resolution:* Fixed in v2.00.39



*Description:* The Data Window did not show double bit inputs when a DNP Master or Slave session was selected.  
*Introduced:* v2.00.38  
*Resolution:* Fixed in v2.00.39



*Description:* If timeFormat was set to “none” for IEC 60870-5-101 Slave sessions, M\_EP\_TA/M\_EP\_TB/M\_EP\_TB ASDUs were built incorrectly.  
*Introduced:* v2.00  
*Resolution:* Fixed in v2.00.39



*Description:* The autoClassPolling setting was not correctly saved to a workspace.  
*Introduced:* v2.00.38  
*Resolution:* Fixed in v2.00.39



*Description:* Disabled DNP3 data points did not get saved to the workspace.  
*Introduced:* v2.00.26  
*Resolution:* Fixed in v2.00.39




*Description:* Loading a workspace with IEC 60870-5-103 Slave Time Tagged Measurands greater than 65535 failed.  
*Introduced:* v2.00.26  
*Resolution:* Fixed in v2.00.39




*Description:* The workspace did not store the setting to specify if Select Before Operate (SBO) was required for IEC 60870-5 control points.  
*Introduced:* v2.00.26  
*Resolution:* Fixed in v2.00.39




*Description:* IEC 60870-5-101 and -104 workspaces did not save and restore M\_ME\_ND data points properly.  
*Introduced:* v2.00.26  
*Resolution:* Fixed in v2.00.39

 *Description:* Submitting a license request during the initial startup resulted in a "package not found" error.  
*Introduced:* v2.00  
*Resolution:* Fixed in v2.00.39


 *Description:* The License Dialog box could show an invalid kill code (even if no license had been removed).  
*Introduced:* v2.00  
*Resolution:* Fixed in v2.00.39


## **Version 2.00.38 (January 18, 2005)**


 Improved the modify channel/session/sector dialog boxes to allow more values to be modified.

 Added support for Windows 98.


## **Version 2.00.37 (December 15, 2004)**


 Improved efficiency of Test Harness database. The redesigned database efficiently handles point gaps, which are common in Modbus and IEC 60870-5 protocols.


 Added ability to specify a point number when adding Modbus points to the database.


 *Description:* Issuing an MDNP time sync with delay measurement command to a broadcast address would cause the Test Harness to crash.  
*Introduced:* v2.00  
*Resolution:* Fixed in v2.37

## **Version 2.00.36 (November 2, 2004)**

 Added Monitor Mode for IEC 60870-5-101 and IEC 60870-5-103 protocol serial connections. This mode allows the Test Harness to monitor communications between two devices.

 Upgraded software licensing software, fixing several minor bugs in license validation.

 *Description:* IEC 60870-5-103 workspaces did not restore all values properly.  
*Introduced:* v2.00  
*Resolution:* Fixed in v2.36

 *Description:* The license issue date recorded in the license dialog box could be displayed incorrectly.  
*Introduced:* v2.00  
*Resolution:* Fixed in v2.36



*Description:* The workspace would not save properly if an IEC protocol channel was opened after a DNP3 Slave channel.

*Introduced:* v2.00.26

*Resolution:* Fixed in v2.36

## Version 2.00.35 (September 23, 2004)



Added Monitor Mode for DNP protocol serial connections. This mode allows the Test Harness to monitor communications between two devices.



Added check to install procedure to verify user has Administrator privileges. Administrator privileges are required by the license management software.



Modified protocol analyzer display to use Session and Sector names for session or sector specific data.



Added event messages for DNP3 Slave component when flags are changed via the data window GUI.



The data window and command window are now automatically updated when a channel, session, or sector is added or changed.



Added ability to provision timeformat and sendclocksync events in s101opensector to support additional data types with time stamp.



Added “blocking mode” for IEC commands; this allows the “Run all commands” command to work for these protocols.



Improved help text for DNP3 Master time sync (mdnptimesync) command.



*Description:* Opening a workspace with duplicate session names could cause the Test Harness to crash.

*Introduced:* v2.00.26

*Resolution:* Fixed in v2.00.35



*Description:* Modifying an IEC 60870-5-104 channel and saving the workspace resulted in a corrupted workspace.

*Introduced:* v2.00.26

*Resolution:* Fixed in v2.00.35



*Description:* The IEC 60870-5-101 and IEC 60870-5-104 spontaneous messages did not display in the protocol analyzer window when data values were changed from the Data window.

*Introduced:* v2.00.26

*Resolution:* Fixed in v2.00.35









*Description:* The installation utility did not allow setting a license key during installation. It would repeatedly display the evaluation warning dialog instead.


*Introduced:* v2.00.32

*Resolution:* Fixed in v2.00.35






## Version 2.00.34 (August 2, 2004)

-  Added Command Window to GUI for IEC 60870-5-101 and IEC 60870-5-104 protocols.
-  Modified Modbus open channel default parameters to use industry standard defaults.
-  *Description:* Email address checking was too stringent in the license removal dialog. Some valid email addresses were not accepted.  
*Introduced:* 2.00.32  
*Resolution:* Fixed in v2.00.34
-  *Description:* The *s101mmena remove* and *s104mmena remove* commands did not work properly.  
*Introduced:* v2.00  
*Resolution:* Fixed in v2.00.34
-  *Description:* The DNP3 Master data window did not show points after a gap in the point numbers.  
*Introduced:* v2.00.26  
*Resolution:* Fixed in v2.00.34
-  *Description:* Some IEC 60870-5-101 and 60870-5-104 commands incorrectly allowed an IOA value of 0.  
*Introduced:* v2.00  
*Resolution:* Fixed in v2.00.34

## Version 2.00.33 (June 17, 2004)

-  Modified default channel names for xxxopenchannel commands. The default channel name specifies the COM port for serial connections or the protocol for TCP/IP connections.

## Version 2.00.32 (June 9, 2004)

-  Added option on license window to send the Computer ID to Triangle MicroWorks via email.
-  Improved installation utility to provide clearer description of installation options and automatically uninstall previous versions when upgrading.
-  Added ability to control external test equipment such as OMICRON CMC-156 from the Command GUI.
-  Added ability to alter sequence of commands based on a conditional test when running all commands in the command window.
-  Added support for Modbus Read/Write Holding Registers command to GUI.



Modified mmbreadwritehregs to support an array of values.



Modified IEC 60870-5-101/104 simulated database so that all points work as “1PASS”. (Previously, event numbered points worked as 2PASS). Added interface to allow changing individual points to 2PASS.



Added ability to read XML point description file through DNP3 file transfer. The filename is DeviceDescription.xml; the mdnpfilecopyfromremote command can copy this file from a DNP3 Slave Test Harness.



Enhanced database interface for Modbus.



Enhanced licensing and installation processes. Added button to license screen to request Activation Key via email. If no email is available, a ZIP file with all required information is created; this file can then be emailed to [sales@TriangleMicroWorks.com](mailto:sales@TriangleMicroWorks.com) to request a license.



*Description:* The “class” and “get description” options did not work for some sdnpc commands.

*Introduced:* v2.00

*Resolution:* Fixed in v2.00.33



*Description:* DNP3 workspaces did not save and restore classes properly.

*Introduced:* v2.00.26

*Resolution:* Fixed in v2.00.33



*Description:* The Test Harness incorrectly generated integrated total events for IEC 60870-5-104 when the integrated total values was changed, rather than when the integrated total was frozen.

*Introduced:* v2.00

*Resolution:* Fixed in v2.00.33



*Description:* When a TCP/IP port closed, the message “closed due to remote close” was displayed, even if the port closed for another reason.

*Introduced:* v2.0

*Resolution:* Fixed in v2.00.33



*Description:* The Test Harness would now allow version upgrades if using an evaluation license.

*Introduced:* v2.00.30

*Resolution:* Fixed in v2.00.33



## Version 2.00.30 (April 13, 2004)












Added Validate Points command to Command GUI to display an error dialog box if selected points in the database do not match preset values.








Added ability to run all commands in the Command window.

-  Provided more informative names in licensing software. Renamed “Site Code” to “Computer ID” and “Site key” to “Activation Key.”
-  The Communication Protocol Test Harness now prevents installation of upgrades if the Maintenance and Enhancement Plan has expired.

## Version 2.00.29 (March 31, 2004)


-  Improved performance of data window updates. These updates are now event driven, rather than via polling.
-  Provided database access commands for File Transfer operations.
-  Added support for callback function to be called when a fragment is given to the transport layer for transmission. This allows Test Harness scripts to overwrite values (e.g., IIN bits) in a message.
-  Added additional configuration options to the GUI (on Session Advanced Settings Menu).
-  Modified Modbus Channel default values to use TCP/IP.
-  Added support for receiving Object 52, Variation 1.
-  Updated Configuration/Interoperability Guide to more clearly show Function Code and qualifier support for each object and variation.
-  Modified default variations for Slave DNP3 sessions. The protocol requires changing variations when flags are not nominal, allowing the default variation to be without flags.
-  Add *sessionId* to *dataVariable* set by Tcl command callback function. For example:  

```
set dnpdata(SESSION_ID) 4.
```
-  Reviewed qualifier field of DNP3 commands for consistency (e.g., 8bitindex vs. 8bitindexed).
-  Enhanced File Transfer Operations.
-  Upgraded software licensing software. The new version provides better protection against lost licenses and provides better debugging capabilities in the event a license is lost. Renamed “Site Code” to “Computer ID” and “Site Key” to “Activation Key.” Also removed ability to transfer a license. To transfer a license, kill the existing license and send the resulting Kill Code and new Computer ID to [sales@TriangleMicroWorks.com](mailto:sales@TriangleMicroWorks.com).
-  *Description:* The Test Harness could crash when IEC 60870-5-101 and IEC 60870-5-103 channels were configured with a link address size of 0.  
*Introduced:* v2.00  
*Resolution:* Fixed in v2.18

 *Description:* A DNP3 Slave session would respond to a Reset Link command using the configured destination address, rather than the address of the Master that issued the command.


*Introduced:* v2.00

*Resolution:* Fixed in v2.19

 *Description:* The Test Harness checked the wrong byte for the status of a pattern block response message.

*Introduced:* v2.00


*Resolution:* Fixed in v2.00.29

 *Description:* The Test Harness would sometimes respond incorrectly (rather than reporting an error) when a DNP3 Slave session received requests for unsupported qualifiers.


*Introduced:* v2.00

*Resolution:* Fixed in v2.00.29

## Version 2.00.27 (February 3, 2004)


 Added enhancements to GUI interface, including a new “show all windows” toolbar button and improvements to handling of workspaces; using multiple command windows; and the protocol analyzer filter and display.

 Added diagnostic information for IEC 60870-5-103 protocol to indicate when blocking mode is enabled.

 *Description:* The *sdnpshowdata* command would stop showing data at the first disabled point.


*Introduced:* v2.00

*Resolution:* Fixed in v2.00.27

 *Description:* The Test Harness displayed the return status byte incorrectly for an *mdnpanlgln short* command.

*Introduced:* v2.00


*Resolution:* Fixed in v2.00.27


 *Description:* The Test Harness did not always set the DNP link layer DIR bit correctly.












*Introduced:* v2.00

*Resolution:* Fixed in v2.00.27



## Version 2.00.26 (January 15, 2004)

 Added Graphical User Interface (GUI) to configure channels and display data. A Command Window was added for DNP3. (The Command window will be added for other protocols in the future).

 Added ability to open a channel by host name (e.g., *mdnpopenchannel host myhost*) instead of requiring an IP address

-  Made \*.\*.\* the default Host IP address for Slave connections. With this address, the Slave will accept a connection from any Client.
-  Added Modbus examples and simulator to Windows Start menu.
-  Modified command interpreter so that all Test Harness commands are now case insensitive.
-  Added default Master response timeout to open session command for all protocols (e.g., mdnpopsession). This default will be used by all commands unless a timeout value is specified on the command line.
-  Modified the default DNP3 application layer confirm timeout to 10 seconds to prevent timeouts on slow baud rates.
-  Improved error message when a parameter value does not match the expected type.
-  Provided access to IIN value through dataVariable. Removed reference to iinVariable from command help.
-  Changed Modbus Plus *RouteAddress* parameter to *RoutePath*.
-  *Description:* Opening and closing channels and sessions very quickly (by a script) caused a problem in the connector thread, which could result in high processor utilization or possibly a crash.  
*Introduced:* v2.00  
*Resolution:* Fixed in v2.00.26
-  *Description:* Closing and reopening IEC 60870-5-101 or -103 sessions could cause the system to stop polling.  
*Introduced:* v2.00  
*Resolution:* Fixed in v2.00.26
-  *Description:* Some commands (e.g., mdnpbincmd, mdnpanlgcmd, mdnppatternmask) could leak memory if no response was received from the Slave.  
*Introduced:* v2.00  
*Resolution:* Fixed in v2.00.26

## Version 2.00.25 (December 12, 2003)

-  Added Modbus support to the Test Harness. Modbus is a separately licensed protocol.
-  Added Modbus Conformance Test Scripts. These scripts are based on the University of Michigan conformance test procedure, and are licensed with the Modbus component of the Test Harness.



Added SDNP session configuration option to specify which object groups are to be included in a response to a request to read static data.



Modified Source Code Library's interpretation of the session auto mask to allow sending both "enable unsolicited" and "disable unsolicited" commands, as described in the draft MDNP Conformance Test document.



*Description:* The Test Harness would report an "Invalid message length error" if no points for the specified type were defined in the database.

*Introduced:* v2.00

*Resolution:* Fixed in v2.00.25



*Description:* The Test Harness would answer with an incorrect COT (5 instead of 37 – 41) for ASDU types 15, 16, and 37.

*Introduced:* v2.00

*Resolution:* Fixed in v2.00.25



*Description:* Closing a Slave channel did not always get rid of the TCP listener

*Introduced:* v2.00

*Resolution:* Fixed in v2.00.25

## Version 2.00.24 (November 10, 2003)



*Description:* The Test Harness did not set the set "Unknown IOA" in the COT field for failed commands.

*Introduced:* v2.00

*Resolution:* Fixed in v2.00.24



*Description:* The Test Harness did not send a proper response when it received a command for a nonexistent sector.

*Introduced:* v2.00

*Resolution:* Fixed in v2.00.24



*Description:* The Test Harness did not echo the command properly if the command failed due to an unknown IOA.

*Introduced:* v2.00

*Resolution:* Fixed in v2.00.24


## Version 2.00.23 (October 31, 2003)




Improved display of Virtual Terminal data.





Added support for automatic installation of DNP sessions. This feature is controlled via the *autoopensession* parameter of the *mdnpopenchannel* and *sdnpopenchannel* commands.

 *Description:* DNP Analog floating point values would sometimes not display correctly.  
*Introduced:* v2.00  
*Resolution:* Fixed in v2.00.23


 *Description:* The Test Harness component had a “memory leak” when using IEC 60870-5 protocols over a serial link and no confirm was received from the remote device.  
*Introduced:* v2.00  
*Resolution:* v2.00.23


## **Version 2.00.22 (October 8, 2003)**


 Added support for ASDU 123 for Procome Specification for IEC 60870-5-103 protocol.


 Improved detection of IEC 60870-5 sessions going offline. Any application layer error will now take a session offline. (DNP sessions already detected offline sessions in this manner.)

 Improved handling of Tcl callback function for Virtual Terminal objects.


 *Description:* Attempting to send or receive large (more than 250 character) DNP Virtual Terminal messages could cause the Test Harness to crash due to a buffer overflow condition in the DNP diagnostics routine.  
*Introduced:* v2.00  
*Resolution:* Fixed in v2.00.22


 *Description:* Executing a “sdnpvterm get point 0 value” command could cause the Test Harness to Crash.  
*Introduced:* v2.00  
*Resolution:* Fixed in v2.00.22

 *Description:* The Test Harness sent one less link retry than was configured for DNP Sessions.  
*Introduced:* v2.00  
*Resolution:* Fixed in v2.00.22









 *Description:* The Test Harness could crash when executing s103closechannel command.  
*Introduced:* v2.00  
*Resolution:* Fixed in v2.00.22

## **Version 2.00.20 (September 2, 2003)**


 Added automatic crash reporting. The Communication Protocol Test Harness will now allow the operator to send debugging information to Triangle MicroWorks, Inc. if it crashes. The operator can also send an Incident Report by using the Help Menu.

-  *Description:* Communication Protocol Test Harness DNP Slave sessions did not handle Object 50 Variation 1 properly if Qualifier was other than 7.  
*Introduced:* v2.00  
*Resolution:* Fixed in v2.00.20













## **Version 2.00.19 (August 8, 2003)**


-  *Description:* Frozen Counters were not included in the response to a DNP Class 0 poll  
*Introduced:* v2.00  
*Resolution:* Fixed in v2.00.19
-  *Description:* A DNP Slave session would not cancel the selectTimer, which could cause a crash.  
*Introduced:* v2.00  
*Resolution:* Fixed in v2.00.19
-  *Description:* A DNP read specifying a limited quantity would return the specified number of each object type. This fix is required to pass the DNP3 2002 Conformance Test Procedures.  
*Introduced:* v2.00  
*Resolution:* Fixed in v2.00.19
-  *Description:* The DNP Master component did not validate application sequence numbers.  
*Introduced:* v2.00  
*Resolution:* Fixed in v2.00.19. The message is discarded if the application sequence number is invalid.
-  *Description:* MDNP Test Harness commands that add to generic request message did not initialize the request descriptor. This could cause a crash if an error message was required.  
*Introduced:* v2.00  
*Resolution:* Fixed in v2.00.19
-  *Description:* DNP Master broadcast messages did not set the DIR bit in link control field.  
*Introduced:* v2.00  
*Resolution:* Fixed in v2.00.19
-  *Description:* If the DNP Slave component received a Select Request message larger than 256 bytes, the Test Harness could crash.  
*Introduced:* v2.00  
*Resolution:* Fixed in v2.00.19
-  *Description:* The DNP Link layer checked the FCB before checking the data block CRCs.  
*Introduced:* v3.00  
*Resolution:* Fixed in v3.00.19


## Version 2.00.18 (July 22, 2003)


-  *Description:* Clearing the DNP Slave database could cause the Test Harness to crash.  
*Introduced:* v2.00  
*Resolution:* Fixed in v2.00.18

## Version 2.00.17 (July 10, 2003)


-  Added ability to generate events when flags values are changed in the simulated data base.
-  Added link layer configuration parameters (LinkClass1PendingDly, LinkClass1PollCnt, LinkClass1PollDly, LinkClass2PendingDly, LinkClass2PollDly, and LinkClassPendingCnt) for consistency with v2.x Source Code Library. These parameters allow tuning the unbalanced link polling behavior in restricted throughput data links such as the satellite (low throughput and long delays) and multi-point radio (channel sharing and high Tx/Rx changeover times).
-  Improved message displayed when a frame is received for an address that is not configured. This message now also includes the link address.
-  Added ability to configure offset between Monitor and Control Points for IEC 60870-5 protocols
-  Implemented reset user link layer function code in FT1.2.
-  Added ability to cause a write to fail in the simulated DNP Slave database.
-  The default propagation delay is now configurable (via the m101opensector delay and clocksncmode parameters).
-  The Test Harness now validates the protocol for all protocol specific commands
-  Add deadband to help menu for sdnpanlgin command
-  Added link in Test Harness Help menu to get latest What's New document
-  *Description:* The MDNP assign class function did not work for 8/16bit index data. This functionality is beyond Subset Level 3.  
*Introduced:* v2.00  
*Resolution:* Fixed in v2.00.17
-  *Description:* The Test Harness could crash if a channel were opened and closed multiple times.  
*Introduced:* v2.00.16  
*Resolution:* Fixed in v2.00.17

 *Description:* The Test Harness requestList accessed by the tmwrequests command could get out of sync when using IEC 60870-5 protocols.  
*Introduced:* v2.00  
*Resolution:* Fixed in v2.00.17


 *Description:* The Test Harness interface did not allow re-enabling points that had been disabled.  
*Introduced:* v2.00  
*Resolution:* Fixed in v2.00.17


 *Description:* The mdnpshowdata command did not display negative analog inputs and outputs correctly.  
*Introduced:* v2.00.12  
*Resolution:* Fixed in v2.00.17


## **Version 2.00.16 (June 19, 2003)**


 Added limit checks for sprintf statements. This prevents buffer corruption caused by writing past the end of the current buffer.


 Added support for Broadcast per IEC 60870-5-101 edition 2.


 Restructured Source Code Library to allow Master and Slave sessions on a channel simultaneously to support Peer or Dual mode.










 Added a sector configuration parameter for all command types (CSENA, CSENB, CSENC, CSETA, CSETB, CSETC) to specify whether the optional ACT TERM is sent back to the master upon completion of the Set command.


 Improved Protocol Analyzer display to use terminology from standards documents; now display "SQ" instead of "SEQ" for Single/Sequence bit for IEC 60870-5 protocols.

 *Description:* When multiple sessions were configured for balanced mode, some sessions didn't startup properly. The End of Initialization was not being sent by all devices.  
*Introduced:* v2.00  
*Resolution:* Fixed in v2.00.16

 *Description:* Broadcast times did not work properly  
*Introduced:* v2.00  
*Resolution:* Fixed in v2.00.16

 *Description:* Broadcast messages for Clock Sync & General Interrogation commands did not work properly  
*Introduced:* v2.00  
*Resolution:* Fixed in v2.00.16


-  *Description:* When multiple IEC 60870-5-101 sessions were configured for balanced mode, some sessions did not start up properly. The End of Initialization was not being sent by all devices.  
*Introduced:* v2.00  
*Resolution:* Fixed in v2.00.16
-  *Description:* A read of DNP Object 60 Variation 2 that required multiple fragments would result in an “Error Unsupported” Qualifier on the Master  
*Introduced:* v2.00  
*Resolution:* Fixed in v2.00.16
-  *Description:* DNP Object 60 Variation x Qualifier 7 or 8 did not read up to the specified number if multiple object types existed  
*Introduced:* v2.00  
*Resolution:* Fixed in v2.00.16
-  *Description:* A Counter Freeze operation would cause a crash in the Source Code Library if `dnpdata_binCtrGetPoint()` returned Null to indicate that the point is currently disabled.  
*Introduced:* v2.00  
*Resolution:* Fixed in v2.00.16
-  *Description:* When multiple Master DNP sessions were configured on a single channel, the Test Harness could freeze.  
*Introduced:* v2.00  
*Resolution:* Fixed in v2.00.16
-  *Description:* When processing IEC 60870-5-103 Type 2 Data with the Invalid flag set, the Test Harness would crash.  
*Introduced:* v2.00  
*Resolution:* Fixed in v2.00.16
-  *Description:* DNP Master Test Harness would not process a multifragment response if it did not request an Application Layer Confirm  
*Introduced:* v2.00.12  
*Resolution:* Fixed in v2.00.16. Note that the DNP Conformance Test Procedures require an Application Layer Confirm on multifragment response messages.
-  *Description:* The Master Test Harness would crash when attempting to connect to a Slave that was opened with a different host IP address than was specified by the Master.  
*Introduced:* v2.00  
*Resolution:* Fixed in v2.00.16
-  *Description:* The Test Harness would incorrectly reset the Forced flag for Binary Inputs on an Integrity Poll.  
*Introduced:* v2.00  
*Resolution:* Fixed in v2.00.16


 *Description:* If the DNP Link Layer discarded a frame (for example, due to an invalid start character or an invalid CRC), it might also discard the start character of the next frame.


Introduced: v2.00


Resolution: Fixed in v2.00.16


## Version 2.00.15 (May 27, 2003)

 The Test Harness now starts a separate thread to connect to a server so that other channels are not affected by connection delays.

 The Test Harness now disconnects old TCP Connection when it receives a request for new connection from same Master. The user is notified when this scenario occurs.


 The Test Harness now displays dialog box to remind users of evaluation versions when their license will expire.

 Added MMI filter to allow filtering of user commands in the Protocol Analyzer window

 *Description:* When the Source Code Library was resending a message because it was waiting for a data link from the Master, and another data request message was received (instead of a data link confirm message that was expected) the Source Code Library would stop sending Application Layer Messages.

*Introduced:* v2.00

*Resolution:* Fixed in v2.00.15


 *Description:* The DNP Transport Function Sequence Number would rollover from 62 to 0, instead of from 63 to 0.


*Introduced:* v2.00


*Resolution:* Fixed in v2.00.15

## Version 2.00.14 (May 13, 2003):

 Added *LinkOfflinePollDly* configuration parameter.


 Improved detection of sessions going offline. Any application layer error will now take a session offline. Receiving any valid fragment from that session will take it back online.

 Improved memory management. Implemented a new memory management scheme that supports static memory as well as providing limits on the number of each type of structure that can be allocated. It also provides details on how many structures of each type have been allocated and keeps track of the maximum number that was allocated. This provides feedback that can be used in sizing applications and monitoring allocated memory. Cleaned several areas in which memory was not being freed properly.

 *Description:* If a DNP3 slave device received any request, other than an unsolicited confirmation while it was waiting for an unsolicited confirmation, it would inadvertently cancel the unsolicited retry timer and hence stop retrying unsolicited responses.


Introduced: Version 2.00

Resolution: Fixed in Version 2.00.14

 *Description:* Messages could become stuck in the Transmit Queue, resulting in repeated "Duplicate request not inserted in transmit queue" messages with no messages ever getting sent.

Introduced: Version 2.00


Resolution: Fixed in Version 2.00.14


 *Description:* DIR bit was not set on application confirmations to events.

Introduced: Version 2.00


Resolution: Fixed in Version 2.00.14

### **Version 2.00.13 (April 28, 2003):**

 Added Incremental Application Layer Response Timeout configuration parameter.


 Unsolicited Responses now retry using the offline retry period, even if new events are detected.

 The Incremental Timeout timer is now disabled if the timeout value is set to zero

 *Description:* The Source Code Library could reference unallocated memory and cause a crash if Link Layer Confirms were enabled and the Application Layer timeout was configured to be less than ((Link Layer timeout) \* (number of Link Layer retries+1)).

*Introduced:* Version 2.00

*Resolution:* Fixed in version 2.00.12. When the Application Layer times out, it now tells the Transport Layer, which in turn tells the Link Layer.

 *Description:* If the analog deadband value exceeded the range of its storage container (e.g., if it is defined as TMWDEFS\_SHORT and exceeded 0xFFFF), the Source Code Library truncated the value instead of using a full-scale value.

*Introduced:* Version 2.00

*Resolution:* Fixed in version 2.00.12

 *Description:* Analog values were stored as unsigned (instead of signed) values

Introduced: Version 2.00

Resolution: *Fixed* in version 2.00.12. Modified DNPUTIL\_ANALOG\_VALUE structure and related code to use signed values.

### **Version 2.00.11 (April 24, 2003):**



If a connection is broken or the remote device restarts, the Source Code Library will attempt to reopen the connection.



Source Code Library now passes Triangle MicroWorks, Inc. DNP Conformance Test Scripts.



*Description:* The Source Code Library could send unsolicited responses even when *unsolAllowed* was configured as *TMWDEFS\_FALSE*.

*Introduced:* *Version 2.00*

*Resolution:* *Fixed in version 2.00.11*

### **Version 2.00 (January 29, 2003):**



Implemented new user interface. The Test Harness is now fully scriptable (using Tcl/Tk), and the configuration (.ini) file is no longer required.



Integrated v3.00 Source Code Libraries.