

TDS Performance Verification Softwares

These softwares do a Performance Verification of various types of TDS scopes, all according to the Service Manuals.

Most steps are done exactly as stated in the manual although some have been enhanced to do a more thorough testing. In a few cases the procedure has been altered to match the specs rather than the procedure in the manual due to obvious errors in the manual. For a semi automated sequence the programs supports SG5030 or R&S SME03 for SG's and FLUKE 510x for DC Calibrator. With semi automated I mean that all settings are done via GPIB but the user is prompted to do or move connections to the CH inputs. There is also a full auto mode which does all signal switching and uses predetermined compensation values for frequency (B/W) and cable lengths (Channel Skew). This however works only on [my own setup of instruments](#) and it is highly unlikely that a setup exactly like it exists anywhere in the world. With no GPIB instruments it could also be run manually, i.e. the user is prompted for settings of the test instruments. The TDS, however, must be connected to GPIB or the program won't start. The program selects mode depending on what instruments it finds on the bus. The GPIB address of the scopes is not important as long as it is not 0. Should there be more than one TDS of the right type on the bus the one with lowest address is selected. Additional features are creating, saving and printing result data files, built in GPIB Communicator and TDS Error Log Viewer. The TDS 200, TDS 1000/2000 and TDS 3000 versions contain routines to do a full adjustment of the scope and also to change the type of scope e.g. you could change a TD S210 to TDS 220 or a TDS 3014 to TDS 3054 to increase the bandwidth. On the TDS 200 and TDS 1000/2000 a change of type requires a full adjustment to be done for the new type to be saved. This change-of-type routine is initially locked in the software but can be unlocked for a small fee, just follow the instructions given in the program.

Below is a typical screen shot. They all look pretty much the same.

TDS400 Performance Verification, v2.1.0 - HH, March 2013

File P/V Utilities View About

Performance Verification of TDS 460, S/N B010845

Date & Time: 2013-02-25, 22:52

Operator: HH

Comments: _____

Offset - Test ACQ / 1 of 4

| CHANNEL | VERT SCALE | OFFSET/DC VOLT | LIMITS | MEASURED | PASS/FAIL |
|---------|------------|----------------|-------------------|----------|-----------|
| CH 1 | 1 mV/div | 1.0000 V | 0.9950 - 1.0050 V | 1.0003 V | PASS |
| CH 1 | 100 mV/div | 10.000 V | 9.9350 - 10.065 V | 10.045 V | PASS |
| CH 1 | 1 V /div | 99.900 V | 99.250 - 100.55 V | 100.36 V | >PASS |
| CH 2 | 1 mV/div | 1.0000 V | 0.9950 - 1.0050 V | 1.0005 V | PASS |
| CH 2 | 100 mV/div | 10.000 V | 9.9350 - 10.065 V | 10.051 V | >PASS |
| CH 2 | 1 V /div | 99.900 V | 99.250 - 100.55 V | 100.36 V | >PASS |
| CH 3 | 1 mV/div | 1.0000 V | 0.9950 - 1.0050 V | 1.0009 V | PASS |
| CH 3 | 100 mV/div | 10.000 V | 9.9350 - 10.065 V | 10.055 V | >PASS |
| CH 3 | 1 V /div | 99.900 V | 99.250 - 100.55 V | 100.40 V | >PASS |
| CH 4 | 1 mV/div | 1.0000 V | 0.9950 - 1.0050 V | 1.0008 V | PASS |
| CH 4 | 100 mV/div | 10.000 V | 9.9350 - 10.065 V | 10.050 V | >PASS |
| CH 4 | 1 V /div | 99.900 V | 99.250 - 100.55 V | 100.34 V | PASS |

DC Voltage Measurement - Test ACQ / 2 of 4

| CHANNEL | DC VOLTAGE | LIMITS | MEASURED | PASS/FAIL |
|---------|------------|------------------|----------|-----------|
| CH 1 | ±350.0 mV | 679.2 - 720.8 mV | 699.4 mV | PASS |
| CH 2 | ±350.0 mV | 679.2 - 720.8 mV | 698.4 mV | PASS |
| CH 3 | ±350.0 mV | 679.2 - 720.8 mV | 701.8 mV | PASS |
| CH 4 | ±350.0 mV | 679.2 - 720.8 mV | 702.2 mV | PASS |

Analog Bandwidth - Test ACQ / 3 of 4

| CHANNEL | VERT SCALE | REF @ 50 kHz | -3 dB | MEASURED | FREQ | PASS/FAIL |
|---------|------------|--------------|-------|----------|------|-----------|
| | | | | | | |

TDS 460, FW: v2.5.5

Exit Test

The > before PASS occurs when the result is more than 70% of the given limit and off course should the result be outside the limit FAIL will show.

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[TDS3000](#)

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[TDS1000/2000 v1.1.2](#) New Sep 10, 2017

Changes from 1.1.1 to 1.1.2

Bugfixes:

Selecting Full Sequence didn't clear Test Status display.

Create New Log File didn't clear Test Status display.

SPC couldn't be bypassed in Full Seq.
Import/Append Log File didn't work properly and didn't provide relevant Error message in case of missing or corrupt file or folder.

Changes:

New version of embedded GPIB Communicator.
New version of embedded Error Log Viewer.
Main, GPIB Com and Error Log Viewer added to View Modules.
Remove Signals message in Offset Zero test skipped if Full Sequence and SPC was done.
Messages in Adjust changed so SPC could be skipped when Adjust was done.

Changes from 1.1.0 to 1.1.1

Changes:

Main form caption slightly changed.
New version of the embedded GPIB Communicator program.
Show Module versions moved to View Menu (from Utilities Menu).
Show Module versions appearance slightly changed.
Menu Utilities/GPIB Communication renamed to GPIB Communicator.

Changes from 1.0.0 to 1.1.0

Bugfixes:

Runtime Error when using illegal characters in Logfile name.
Incorrect settings for External Trig test.

Changes:

Contrast adjustment for color scopes (2k) enabled after function has been verified to work.
Message saying that a full adjustment is needed to save Contrast adjustments removed since this is not the case for TDS1k/2k.

1.0.0

This is the first published version and it supports also B and C models.
The Change Scope Type function is only enabled for non letter scopes in this version since I don't have any letter scope to verify it with.
For the same reason the Adjust Contrast is only enabled for monochrome scopes.
If someone with a letter scope is willing to test the function let me know and can send a version with all functions enabled.

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[TDS200 v2.2.5](#) **New April 12, 2019**

Changes from 2.2.4 to 2.2.5

Bugfixes:

Incorrect CG setting in adjustment for TDS210 & TDS220 with F/W 2.0 or higher caused step 46 to fail.
Only in full auto.
Number of tests shown in message during adjustment wrong for TDS210 & TDS220 with F/W 2.0 or higher. Only in full auto.

Changes:

Message at the end of "Change Type" changed so Adjust Contrast could be selected before a full adjustment.

Changes from 2.2.3 to 2.2.4

Changes:

Previous versions were based on the procedures for checking Gain using the early Service Manuals.

The Gain check procedure now uses the same way to calculate limits as the latest / last version of the Service Manual.

Minor text change on the About form and the link to check for updates changed.

Changes from 2.2.2 to 2.2.3

Bugfixes:

Selecting Full Sequence didn't clear Test Status display.

Create New Log File didn't clear Test Status display.

SPC couldn't be bypassed in Full Seq.

Import/Append Log File didn't work properly and didn't provide relevant Error message in case of missing or corrupt file or folder.

If a TDS 2k scope with a lower GPIB address was on the bus the TDS 200 would not be found.

Changes:

New version of embedded GPIB Communicator.

New version of embedded Error Log Viewer.

Main, GPIB Com and Error Log Viewer added to View Modules.

Remove Signals message in Offset Zero test skipped if Full Sequence and SPC was done.

Messages in Adjust changed so SPC could be skipped.

Changes from 2.2.1 to 2.2.2

Bugfixes:

No warning message about 50 ohm terminators when starting Full Sequence in full Auto.

Wrong folder for Logfile was selected after type was changed.

Changes:

Price for locked function (Change Type) changed from \$30 to \$25.

Changes from 2.2.0 to 2.2.1

Changes:

Main form caption slightly changed.

New version of the embedded GPIB Communicator program.

Show Module versions moved to View Menu (from Utilities Menu).

Show Module versions appearance slightly changed.

Menu Utilities/GPIB Communication renamed to GPIB Communicator.

Changes from 2.1.0 to 2.2.0

Bugfixes:

Runtime Error when using illegal characters in Logfile name.

Incorrect settings for External Trig test due to Manual error fixed to match specs rather than the procedure in the manual.

2.1.0

This is the first published version.

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[TDS300 v2.3.3](#) **New Sep 10, 2017**

Changes from 2.3.2 to 2.3.3

Bugfixes:

Didn't support TDS 340 non A.

Selecting Full Sequence didn't clear Test Status display.

Create New Log File didn't clear Test Status display.

SPC couldn't be bypassed in Full Seq.

Import/Append Log File didn't work properly and didn't provide relevant Error message in case of missing or corrupt file or folder.

If a TDS 3k scope with a lower GPIB address was on the bus the TDS 300 would not be found.

Changes:

New version GPIB Communicator.

New version of Error Log Viewer.

Main, GPIB Com and Error Log Viewer added to View Modules.

Remove Signals message in Offset Zero test skipped if Full Sequence and SPC was done.

Changes from 2.3.1 to 2.3.2

Changes:

Main form caption slightly changed.

New version of the embedded GPIB Communicator program.

Show Module versions moved to View Menu (from Utilities Menu).

Show Module versions appearance slightly changed.

Menu Utilities/GPIB Communication renamed to GPIB Communicator.

Changes from 2.3.0 to 2.3.1

Bugfix:

Runtime Error when using illegal characters in Logfile name.

Changes from 2.2.0 to 2.3.0

Bugfix:

Runtime error if trying to load a Logfile and no files were saved.

Changes from 2.1.0 to 2.2.0

Changes:

Create LogFile and Import/Append LogFile routines changed.

New version of embedded TDS Error Log program.

2.1.0

This is the first published version.

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[TDS3000 v2.1.2](#) **New Sep 10, 2017**

Changes from 2.1.1 to 2.1.2

Bugfixes:

Selecting Full Sequence didn't clear Test Status display.
Create New Log File didn't clear Test Status display.
AppTitle missing last letter.
Import/Append Log File didn't work properly and didn't provide relevant Error message in case of missing or corrupt file or folder.

Changes:

New version of embedded GPIB Communicator.
New version of embedded Error Log Viewer.
Main, GPIB Com and Error Log Viewer added to View Modules.
Remove Signals message in Offset Zero test skipped if Full Sequence and SPC was done.
Menu Utilities/GPIB Communication renamed to GPIB Communicator.

Known Issues:

Change Type does not support TDS 3064B and none of the C-models.
Reading the Error Log or Change Type does not work on scopes with F/W 3.41. That Error Log doesn't work has been confirmed by Tek in a slightly cryptic reply.
A work around if you want to change type and already have 3.41 is to temporarily load v3.39 which works. Download 3.39 here. Latest version could be found on Tek's website.

Changes from 2.1.0 to 2.1.1

Bugfix:

All 300 MHz scopes failed BW test. Thanks Bob H for letting me know.

Changes from 2.0.0 to 2.1.0

Bugfixes:

Incorrect GPIB command in Adjustment procedure (Auto mode only).
Incorrect amplitude settings for Trigger test on B and C models.
Incorrect Limit for Sample Rate check on C models.
Test Aborted message was not shown in Trig Test when Exit Test was selected.

Changes:

Adjustment procedure changed to work with and verified for 4 ch B-models.
Change Type procedure and messages slightly changed.
Support for TDS 3064B added on PV and adjust but not Change Type.
Ext Trig Connection message at start of Auto mode deleted.
50 ohm terminators reminder message when starting Gain test in Auto mode deleted.
Handling of various SG/TDS combinations changed so two generators could be used for BW and Trig tests on some TDS's.

2.0.0

This is the first published version.

Please, note that this could be considered a beta version since I have only been able to test it fully on a TDS 3014 changed to TDS 3054.

So there may still be some bugs or issues I haven't detected yet. Use the email link at the bottom of this page to report whatever you find.

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[TDS400 v2.2.5](#) **New Sep 10, 2017**

Changes from 2.2.4 to 2.2.5

Bugfixes:

Selecting Full Sequence didn't clear Test Status display.
Create New Log File didn't clear Test Status display.
SPC couldn't be bypassed in Full Seq.
Import/Append Log File didn't work properly and didn't provide relevant Error message in case of missing or corrupt file or folder.

Changes:

New version of embedded GPIB Communicator.
New version of embedded Error Log Viewer.
Main, GPIB Com and Error Log Viewer added to View Modules.

Changes from 2.2.3 to 2.2.4

Bugfixes:

Bandwidth check didn't work on A-models due to the same problem seen in the 500-version some time ago, i.e. the on screen measurements were incorrect on CH2-CH4 when those and Immediate Measurements (not shown on screen) didn't have the same source channel. This must be a F/W bug in the scope. Tested scope was a 420A with F/W 1.0.2.
Long-term sample rate and delay time check didn't work properly on A-models (could not blame the scope there).

Changes from 2.2.2 to 2.2.3

Changes:

Main form caption slightly changed.
New version of the embedded GPIB Communicator program.
Show Module versions moved to View Menu (from Utilities Menu).
Show Module versions appearance slightly changed.
Menu Utilities/GPIB Communication renamed to GPIB Communicator.

Changes from 2.2.1 to 2.2.2

Bugfix:

Amplitude setting of AUX Trig Sens test failed when the system mode was full Auto (only applicable to my own Cal System).

Change:

Acq mode of the first test of Offset changed from Hi Res to Average.

Changes from 2.2.0 to 2.2.1

Bugfix:

Runtime Error when using illegal characters in Logfile name.

Changes from 2.1.1 to 2.2.0

Changes:

New version of embedded TDS Error Log program.

Create LogFile and Import/Append LogFile routines changed.
Print routine updated.

2.1.1

This is the first published version.

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[TDS500/600/700 v1.1.3](#) **New Sep 10, 2017**

Bugfixes:

Selecting Full Sequence didn't clear Test Status display.
Create New Log File didn't clear Test Status display.
SPC couldn't be bypassed in Full Seq.
Import/Append Log File didn't work properly and didn't provide relevant Error message in case of missing or corrupt file or folder.

Changes:

New version GPIB Communicator.
New version of Error Log Viewer.
Main, GPIB Com and Error Log Viewer added to View Modules.
Remove Signals message in Offset Zero test skipped if Full Sequence and SPC was done.

Changes from 1.1.1 to 1.1.2

Changes:

Main form caption slightly changed.
Show Module versions moved to View Menu (from Utilities Menu).
Show Module versions appearance slightly changed.
Show Test Parameters moved to View Menu (from Utilities Menu).
Menu Utilities/GPIB Communication renamed to GPIB Communicator.

Changes from 1.1.0 to 1.1.1

Bugfixes:

Still problems with Analog Bandwidth check on some scopes. The scope will randomly send incorrect P-P values causing the test to fail. The problem always occurred on CH2 to CH4.

It appears that if, although not used, the Immediate measurement (not shown on screen) had a different source channel than the P-P measurement shown on the screen this could happen but only on some scopes. A TDS784A would fail while a TDS544A wouldn't. Firmware bug in the scope ??

Timeout for SPC could sometimes be too short (300s) causing a Time Out message. It was changed to 1000s (16.67 minutes) which is the only available as next higher..

Change:

New version of the embedded GPIB Communicator program.

Changes from 1.0.1 to 1.1.0

Bugfixes:

A timing issue would cause Analog Bandwidth check to fail. Thanks to Bob H for letting me know.

No warning and no change of SG if an SG5030 was used on a 1GHz scope resulting in the system trying to set the SG5030 to frequencies higher than 550 MHz.

When in Full Auto mode (only applicable to my own Cal System) the SetSG command didn't use the system comp values in BW check if a R&S SME03 was used for SG.

Change:

The link in About to check for updates changed from the index page to the this page.

Changes from 1.0.0 to 1.0.1

Bugfix:

Runtime Error when using illegal characters in Logfile name.

1.0.0 This is the first published version.

Since it supports a large range of instruments I have not been able to test and verify every configuration.

Hopefully there won't be many errors but I would like to know of any bugs or preferred changes.

Use the link below or the one from the About window of the program

Uninstall any previous version before installing this one or extract the *.exe file from the *.CAB file and replace your current file.

You must have a NI GPIB card with the correct drivers installed. [Find and download National Instruments GPIB card drivers here.](#)

It is expected to work on any PC/win OS (not 3.1) with a correctly installed and working NI card/adapter.

[Email me with comments.](#) /Håkan

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