KEITHLEY
A Tektronix Company

DAQ6510 Data Acquisition System
Version 1.7.16 Firmware Release Notes

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CONTENTS

GENERAL INFORMATION

SUPPORTED MODELS

This firmware is used on the following Keithley Instruments product models:

> Model DAQ6510 Data Acquisition and Multimeter System

INSTALLATION INSTRUCTIONS

Firmware upgrade and downgrade instructions

NOTE

If you are upgrading from a firmware version earlier than 1.7.10, use the **Downgrade to older** option from the front panel or use the downgrade remote commands. See "Upgrading the firmware" in your instrument's Reference Manual for more information. When upgrading from a firmware version earlier than 1.7.10, system messages will display the firmware version as 1.7.1. This is a cosmetic issue and does not affect instrument performance.

If you are upgrading your instrument from version 1.7.10, follow the "Installation Instructions" in the **General Information** section of this document.

CAUTION

Do not turn off power or remove the USB flash drive until the upgrade process is complete.

From the front panel:

1. Copy the firmware upgrade file (`.upg` file) to a USB flash drive.
2. Verify that the upgrade file is in the root subdirectory of the flash drive and that it is the only firmware file in that location.
3. Disconnect any terminals that are attached to the instrument.
4. Turn the instrument power off. Wait a few seconds.
5. Turn the instrument power on.
6. Insert the flash drive into the USB port on the front panel of the instrument.
7. From the instrument front panel, press the **MENU** key.
8. Under System, select **Info/Manage**.
9. Choose an upgrade option:
    - To upgrade to a newer version of firmware: Select **Upgrade to New**.
    - To return to a previous version of firmware: Select **Downgrade to Older**.
10. When the upgrade is complete, reboot the instrument.

A message is displayed while the upgrade is in progress.

For additional firmware installation instructions, refer to the "Upgrading the firmware" topic in the "Maintenance" section of the *Model DAQ6510 Data Acquisition and Multimeter System Reference Manual* (document number DAQ6510-901-01). This manual is available online at tek.com/keithley.

VERSION 1.7.16 RELEASE

OVERVIEW

Version 1.7.16 provides a fix and an enhancement.

CRITICAL FIX

Reference number:	SK-2995
Symptom:	A blue screen may occur during the handling of many display elements in memory, such as repeatedly generating error pop-ups during test execution.
Resolution:	This issue has been resolved.
Reference number:	SK-2994 When using 2700 or 2701 emulation mode, relays were still operating under concurrent channel operation instead of `always break before make` operation.
Resolution:	This issue has been resolved.
Reference number:	SK-2333
Symptom:	Overflow measurements can occur when using 50 Hz line frequency and switching between AC and DC measurement functions
Resolution:	This issue has been resolved.

ENHANCEMENT

Category:	**General changes**
Reference number:	SK-2829 Support was added for a new serial number format. A serial number can now be assigned using a standard format of four alphanumeric and six numeric characters.
Category:	**General changes**
Reference number:	SK-2764 Updated the End User License Agreement (EULA) to the current revision.

VERSION 1.7.14J RELEASE

OVERVIEW

Version 1.7.14j provides a fix and an enhancement.

CRITICAL FIX

Reference number:	SK-2330
Symptom:	The instrument will become unresponsive if a LAN cable is disconnected and reconnected nine times or more. A power cycle is required to make the instrument responsive.
Resolution:	This issue has been resolved.

ENHANCEMENT

Category:	**System commands**
Reference number:	SK-2137
	New commands have been added to control the connection rule for closing and opening channels in the instrument:
	TSP: `channel.connectrule` (default `channel.CONCURRENT`)
	SCPI: `:ROUTe[:CHANnel]:CONNect:RULE` (default `CONCurrent`)
	The connection rule describes the order in which switch channels are opened and closed during channel operations. This applies to scanning operation and when using these commands when a channel is set to a function.
	The default value does not guarantee a connection rule. The instrument closes relays as efficiently as possible to improve speed performance without applying a rule.
	When the connection rule is set to break before make, the instrument ensures that all switch channels open before any switch channels close.
	When the connection rule is set to make before break, the instrument ensures that all switch channels close before any switch channels open.
	For additional information on these commands, refer to the *Model DAQ6510 Data Acquisition and Multimeter System Reference Manual* (document number DAQ6510-901-01). This manual is available online at tek.com/keithley.

VERSION 1.7.12 RELEASE

OVERVIEW

Version 1.7.12 provides a fix.

CRITICAL FIX

Reference number:	NS-2105
Symptom:	Running a scan with the automatic scan restart feature enabled and restarting the trigger model periodically may lead to an out of memory error message, depending on how often the trigger is reinitialized.
	The error may also occur when saving numerous configuration scripts or system setups, depending on the time since the instrument has been restarted.
Resolution:	This issue has been resolved.

VERSION 1.7.11B RELEASE

NOTE

If you are upgrading from a firmware version earlier than 1.7.10, use the **Downgrade to older** option from the front panel or use the downgrade remote commands. See "Upgrading the firmware" in your instrument's Reference Manual for more information. When upgrading from a firmware version earlier than 1.7.10, system messages will display the firmware version as 1.7.1. This is a cosmetic issue and does not affect instrument performance.

If you are upgrading your instrument from version 1.7.10, follow the "Installation Instructions" in the **General Information** section of this document.

OVERVIEW

Version 1.7.11b provides fixes and enhancements.

CRITICAL FIXES

Reference number:	NS-1962
Symptom:	When scanning with four-wire measurements on a channel followed by two-wire measurements on a subsequent channel with a 7706 or 7707 card installed, the first scan results in correct measurements for the four-wire channel, but incorrect four-wire channel readings for subsequent scans.
	This error is caused by an upper-bank channel closing improperly when stepping from one channel to another, interfering with the readings for the second scan loop and any subsequent loops.
Resolution:	This issue has been resolved.
Reference number:	NS-2077
Symptom:	When writing a large amount of reading buffer data to a USB drive, a newline character ($\backslash$n) may be missed and result in two data rows being written as one row.
Resolution:	This issue has been resolved.

VERSION 1.7.10 RELEASE

NOTE

When you load the 1.7.10 firmware into your instrument, system messages will display the firmware version as 1.7.1. This is only a cosmetic issue and does not impact the performance of the unit. Subsequent firmware upgrades will display a two-digit firmware version number.

To install firmware version 1.7.10 on your instrument, use the **Downgrade to older** option from the front panel or use the downgrade remote commands. See "Upgrading the firmware" in your instrument's Reference Manual for more information.

OVERVIEW

Version 1.7.10 provides fixes and enhancements.

CRITICAL FIXES

Reference number:	NS-2020
Symptom:	After a first attempt to save a screen capture, subsequent attempts without a USB flash drive inserted into the front port of the instrument may cause the instrument to become unresponsive.
Resolution:	This issue has been resolved.
Reference number:	NS-2070
Symptom:	Heavy script processing can interfere with the timely generation of an SRQ as the result of setting the MAV bit in the Status Byte Register. This interference affects both the bus and the front panel display.
Resolution:	This issue has been resolved.
Reference number:	NS-2072
Symptom:	After changing the group number of a node to be the group number previously used for another node, the instrument may generate errors when trying to start a test on that node using the `execute()` command, even after using `waitcomplete()` to make sure the previous tests have finished. Subsequently, performing a `waitcomplete()` on the previous group number may cause the instrument to wait for tests to complete on that node even though the node is in a new group.
Resolution:	This issue has been resolved.

Reference number:	NS-2074
Symptom:	The MAV bit may be set in the status byte indicating that there is data to be read from the instrument, but the subsequent read operation to pull that data from the instrument fails and times-out. This may occur when rapidly generating data and enabling the MAV bit to be set in the status model to indicate when data is available to read from the instrument.
Resolution:	This issue has been resolved.

ENHANCEMENTS

Category:	**System commands**
Reference number:	NS-1946
	New commands have been added:
	TSP: `lan.dstprotection = lan.ON` or `lan.OFF`
	SCPI: `SYSTem:COMMunication:LAN:DST:PROTection <ON (1)` or `OFF(0)>`
	`OFF` is the default command state.
	When DST protection is turned `OFF`, a simple open-and-close on the DST port (5030) will close any and all open LAN connections.
	When DST protection is turned ON, the DST port will need to be opened and the system login and password entered followed by closing the DST port to close any open LAN connections, including the DST port.
	Turning DST protection `ON` prevents LAN connections from being inadvertently closed by your IT department performing a port scan across the corporate network.

VERSION 1.7.8 RELEASE

OVERVIEW

Version 1.7.8 provides fixes.

CRITICAL FIXES

Reference number:	NS-1964
Symptom:	After configuring a scan in SCPI 2700 or SCPI 2701 emulation mode, the `READ?` command closes the first channel and takes a reading, then advances to the second channel in the scan list. Subsequent `READ?` commands do not advance the scan to the next channel in the list. The subsequent `READ?` commands respond with a reading being measured on the second channel in the scan sequence and not on the expected channel.
Resolution:	This issue has been resolved.

Reference number:	NS-1972
Symptom:	After configuring a scan in SCPI 2000 emulation mode, the `TRACe:DATA?` command is used to trigger and scan through the channels in the scan list. The front panel indicates that the first channel closes, but the instrument does not audibly indicate closure and opening of the remaining channels in the scan list. No data is returned in response to the `TRACe:DATA?` command.
Resolution:	This issue has been resolved.
Reference number:	NS-2004
Symptom:	In SCPI 27xx emulation mode, non-measurement channels (such as those on a 7705 card) closed with the `ROUTe:MULTi:CLOSe` command prior to starting a scan do not remain closed during the scan as expected, as they are errantly opened when the scan is initiated.
Resolution:	This issue has been resolved.

VERSION 1.7.7 RELEASE

OVERVIEW

Version 1.7.7 provides fixes.

CRITICAL FIXES

Reference number:	NS-1933
Symptom:	In SCPI 2701 emulation mode, a user cannot send a channel list parameter that worked for a Model 2701. The `-154, string too long` error is generated.
Resolution:	This issue has been resolved.
Reference number:	NS-2025
Symptom:	While running a test loop in an application that sends the `reset()` command as part of the code, a blue screen appears after running the test for several days.
Resolution:	The issue has been resolved.
Reference number:	NS-2043
Symptom:	While remotely communicating with the instrument, if a new error is displayed on the front panel shortly after a previous error is being cleared from the front panel, the instrument may become unresponsive or inoperative.
Resolution:	The issue has been resolved.

VERSION 1.7.5 RELEASE

OVERVIEW

Version 1.7.5 provides fixes and enhancements.

CRITICAL FIXES

Reference number:	NS-1943
Symptom:	When recalling a saved system configuration containing four-wire measurement scan channels, the setup returns Error 1115: "Parameter error: no paired channels accepted."
Resolution:	This issue has been resolved.
Reference number:	NS-1974
Symptom:	After running a scan and then disabling a channel group from the scan on the front panel, running the scan again returns Error -285 TSP: "Syntax error at a line due to an unfinished string."
Resolution:	The issue has been resolved.
Reference number:	NS-2017
Symptom:	When appending buffer data to a .csv file using the buffer.saveappend command, the line with channel numbers is shifted over to start with the time column instead of starting with channel data columns, as the line for channel labels does.
Resolution:	This issue has been resolved.

ENHANCEMENTS

Category:	**General settings**
Reference number:	The "Branch to Block" setting on various branch blocks on the Trigger Flow screen on the front panel now allows a minimum value of 0.

VERSION 1.7.3 RELEASE

OVERVIEW

Version 1.7.3 provides fixes and enhancements.

CRITICAL FIXES

Reference number:	NS-1908
Symptom:	Changing an annunciator setting (such as auto zero or filter enable) on the Settings or Calculations screen is not reflected in the Home screen annunciators.
Resolution:	This issue has been corrected.
Reference number:	NS-1918
Symptom:	The internal system clock battery is drained when the instrument is not plugged in for several months or longer, causing the instrument to lose the current time and date when powered on. The instrument battery must then be replaced.
Resolution:	This issue has been corrected.
Reference number:	NS-1927
Symptom:	The LXI identification web page shows the incorrect LXI version and web page links.
Resolution:	This issue has been corrected.

ENHANCEMENTS

Category	Remote commands
Reference number:	NS-1931: Added a TLS (transport layer security) option when using the `tspnet.connect()` command. *connectionID = tspnet.connect(ipAddress, portNumber, initString, useTLS)* *ipAddress*: A string that indicates the IP address or host name to connect to. *portNumber*: Default 5025. *initString*: Sends a string to *ipAddress*. *useTLS*: 0 or 1; 0: Do not use TLS with the connection (default) 1: Use TLS with the connection. When *useTLS* is set to 1, the instrument negotiates the security protocol when connecting to the host or IP address that is used. This security protocol is used when using `tspnet.write()` to send data or `tspnet.read()` to receive data. The following is an example of how to use a host name with the TLS option: *connectionID* = tspnet.connect("hostname.domain.com", 443, "", 1)
Category	**Remote commands**
Reference number:	NS-1960: The `localnode.gettimewithfractional()` TSP command is available to retrieve the number of seconds elapsed since January 1, 1970, with fractional seconds appended to the returned response.

VERSION 1.7.2 RELEASE

OVERVIEW

Version 1.7.2 provides fixes and required support.

NONCRITICAL FIXES

Reference number:	NS-1915
Symptom:	When running a Test Script Processor® (TSP) script application with a custom user interface that has an End App button, the custom user interface may not close properly when "End App" is selected.
Resolution:	This issue has been corrected. This fix also introduces a behavior change from previous firmware versions. If you are running a nested script (scripts running within a script), the user interface only displays the first running script. Previously, the user interface displayed name changes between nested scripts.

VERSION 1.7.0 RELEASE

OVERVIEW

Version 1.7.0 is a significant maintenance firmware release for the DAQ6510 that brings numerous updates along with stability and reliability improvements. See the *Model DAQ6510 Data Acquisition and Multimeter System Reference Manual* (document number DAQ6510-901-01) for more information.

CRITICAL FIXES

Reference number:	AR55036, AR62150, NS-339
Symptom:	Repeated creation and deletion of user-defined buffers may cause out-of-memory errors. Error messages indicating the maximum size for buffers being created are wrong and provide misleading guidance.
Resolution:	Reading buffer memory management now allows users to easily allocate the largest size available when creating a reading buffer. Documentation has been clarified to explain the creation process. Improved buffer memory management also greatly reduces the possibility of getting out-of-memory errors.
Reference number:	AR56349, AR60259, NS-929
Symptom:	USB communication issues.
Resolution:	To better accommodate the variety of VISA installation options available to users, the STALLing USBTMC is not active as it had been before.

Reference number:	AR61116, AR62660, NS-529, NS-1558
Symptom:	Repeatedly saving a buffer to a file on a USB flash drive using the `buffer.saveappend` command eventually causes Error 2203, "Cannot open file."
Resolution:	This issue has been corrected.
Reference number:	AR62310
Symptom:	Exercising various combinations of front panel settings for the Event Log may cause the front panel to lock up.
Resolution:	This issue has been corrected.
Reference number:	AR61734, NS-1097
Symptom:	Pressing a shortcut while the swipe screen is moving causes the instrument to become inoperable.
Resolution:	This issue has been resolved.
Reference number:	AR61766, NS-1049
Symptom:	Graph is unresponsive to touch after some screen input sequences.
Workaround:	This issue has been resolved.
Reference number:	AR61773, NS-983
Symptom:	Instrument unable to trigger over digital I/O in 2700 emulation mode.
Resolution:	The instrument now properly triggers from either the accessory card digital I/O pin 6 (Trigger In) or the BNC Trigger In.
Reference number:	AR61925, NS-1108
Symptom:	Manual scaling of histogram display does not work correctly.
Resolution:	This issue has been resolved.
Reference number:	AR62144, NS-879
Symptom:	Touching the swipe screen while maximizing or minimizing the swipe screen may cause the instrument to become inoperable.
Resolution:	This issue has been resolved.
Reference number:	AR62462, NS-1432
Symptom:	Using the instrument with a 7708 card can result in a short circuit condition.
Resolution:	This issue has been resolved.

Reference number:	AR62632, NS-647, NS-682, KS-2983
Symptom:	Fast continuous streaming of data (at rates > 50 kS/s) results in report of buffer overrun condition.
Resolution:	Enhancements have been made in firmware to better support streaming to the computer while using digitizing, however, hardware limitations are still present. The KickStart software provides the framework and code to help the user achieve 50 kS/s runs for up to 5 hours.
Reference number:	AR62869, NS-1771
Symptom:	Instrument may slow down or become inoperable storing data to a USB flash drive in scan mode.
Resolution:	This issue has been resolved.

KNOWN ISSUES

Reference number:	NS-1386
Symptom:	Errors and mis-aligned information may be displayed if you are using applications designed for earlier versions of firmware
Workaround:	Download updated applications from the tek.com/keithley website and install them on the instrument.
Reference number:	AR62218, NS-1241
Symptom:	Rapidly changing the Quickset performance slider between medium and fast settings can result in the slider becoming unresponsive.
Workaround:	Switch to another screen and back to Quickset.

ENHANCEMENTS

Category	**Reading buffers**
	• Reading buffer memory management now allows users to easily allocate the largest size available when creating a reading buffer.
	• Added a method to clear the active buffer by pressing the MENU + EXIT keys.
	• When selecting the active buffer, an option now exists to create a new user buffer.
	• Added the `display.activebuffer` TSP remote command and `DISPlay:BUFFer:ACTive` SCPI command to specify the active buffer for the instrument using remote commands.
Category	**Configuration lists**
	• Added the ability to use remote commands to store inactive measure function settings in a configuration list index.
	• Added the ability to use remote commands to query or configure inactive measure function attributes.

Category	**New commands and options**
	• Added a method to automatically install any scripts to internal storage memory that reside in an autoinstall directory on the USB drive when inserted into the instrument.
	• Added `fs.*` TSP commands for accessing and managing file system settings.
	• Added remote commands to set continuous measurement.
	• Added an outside high and low limit option for scan monitor mode.
Category	**Ease of use**
	• Graph and Histogram settings are now shared for ease of viewing data between the two screens. Also added other graphing enhancements.
Category	**General changes**
	• The maximum TSP node ID is now 63. The previous maximum was 64.

VERSION 1.0.04

OVERVIEW

Version 1.0.04 is a maintenance release of the DAQ6510 firmware. This release includes one critical fix.

CRITICAL FIXES

Reference number:	NS-1094
Symptom:	Input overload protection triggered on one channel caused overflow readings on subsequent channels during high-speed scans.
Resolution:	This issue has been corrected.

NONCRITICAL FIXES

There were no noncritical fixes included in this release. See the "Critical fixes" sections for more information about release content.

ENHANCEMENTS

There were no enhancements included in this release. See the "Critical fixes" sections for more information about release content.

VERSION 1.0.03

OVERVIEW

Version 1.0.03 is a maintenance release of the DAQ6510 firmware. This release includes one critical fix and several noncritical fixes.

CRITICAL FIXES

Reference number:	NS-1122
Symptom:	The instrument potentially performs make-before-break relay connections instead of break-before-make for 7701, 7708, and 7709 cards when scanning certain channels.
Resolution:	This issue has been corrected.

NONCRITICAL FIXES

Reference number:	NS-867
Symptom:	When the SCPI2700 or SCPI 2700 command set is selected, setting an aperture larger than allowed by SCPI or TSP command set commands causes error -222, "Parameter data out of range," to be generated.
Resolution:	The instrument records and reports the selected aperture, but internally uses the largest supported aperture.
Reference number:	NS-929 NS-1016
Symptom:	The instrument does not respond properly when using Keysight VISA in some applications.
Resolution:	This issue has been corrected.
Reference number:	NS-983
Symptom:	When the SCPI2700 command set is selected, the instrument does not respond to external triggers on pin 6 of the digital I/O connector on the KTTI-GPIB, KTTI-RS232, or KTTI-TSP communication accessory. It does respond to the BNC Trigger input.
Resolution:	The instrument now properly triggers from either the communication accessory digital I/O pin 6 Trigger In or the BNC Trigger In.

Reference number:	NS-1153
Symptom:	The instrument generates an error when specifying a channel list range that spans more than one card. For example, "(@101:240)".
Resolution:	This issue has been corrected.
Reference number:	NS-1162
Symptom:	When writing to the communication accessory digital I/O as an output port the 6 outputs transition at different times rather than simultaneously.
Resolution:	The issue has been corrected.

ENHANCEMENTS

There were no enhancements included in this release. See the "Critical fixes" and "Noncritical fixes" sections for more information about release content.

VERSION 1.0.02

OVERVIEW

This Firmware Release is a result of changes to the internal production process. There were no issues or concerns that needed to be addressed in this release.

VERSION 1.0.01

OVERVIEW

Version 1.0.01 is a maintenance release of the DAQ6510 firmware. This release includes two critical fixes and several noncritical fixes.

CRITICAL FIXES

Reference number:	NIHK-6215
Symptom:	In any emulation mode, a 4-wire reading may incorrectly return an overflow.
Resolution:	In all emulation modes, 4-wire readings return the correct reading.

Reference number:	NIHK-6331
Symptom:	Using the Keithley Model 7701, 7706, or 7708 to make measurements may result in overflows and inaccuracies when, without opening all of the channels in between, you make a 2-wire measurement followed by a 4-wire measurement or a 4-wire measurement followed by a 2-wire measurement. A scan with both 2-wire and 4-wire measurements may be inaccurate after the change-in-function has occurred. A scan with a single function, either 2-wire or 4-wire measurements, would contain accurate measurements. The USB interface may exhibit lockups when used for extended periods.
Resolution:	The 7701, 7706, or 7708 now make accurate measurements for all combinations of 2-wire and 4-wire measurements, whether in a scan, script, or from the display.

NONCRITICAL FIXES

Reference number:	NIHK-4779
Symptom:	The USB interface may exhibit lockups when used for extended periods.
Resolution:	The USB interface has been changed to improve performance, status byte responsiveness, and long-term reliability. There is no impact to VISA compatibility.

Reference number:	NIHK-6176
Symptom:	Using the infinite count in a trigger model can yield unexpected results.
Resolution:	The use of an infinite count in a trigger model has been improved and functions as expected.

Reference number:	NIHK-6183, NIHK-6204, NIHK-6211
Symptom:	When the KTTI-GPIB card is installed and GPIB communications are used, the SRQ line on the GPIB interface is not functional
Resolution:	The SRQ line is now properly driven on the GPIB interface.

Reference number:	NIHK-6184
Symptom:	Frequent switching using the FRONT/REAR TERMINALS switch may make the instrument inoperable.
Resolution:	The switching between front and rear terminals has been improved.

Reference number:	NIHK-6242
Symptom:	When the instrument is emulating the Keithley Model 2700 the instrument uses a different version of the moving average filter than the actual Keithley Model 2700 or 2701.
Resolution:	Emulation of the Keithley Model 2700 and 2701 now uses the same version of the moving average filter as the original products. This type of filter is also available in non-emulation modes under the name Hybrid Average filter. Channels do not support the hybrid filter type.
	A hybrid filter combines characteristics of the repeating and moving filter types. A hybrid filter always averages an entire window of readings before returning the requested filtered reading. If the window is empty when the first reading is triggered, multiple readings are made to fill the window, after which the single requested filtered reading is returned. This process may take longer than a single reading. Once the window is filled, subsequent triggers make a single reading, add it to the window, and return the single requested filtered reading. This process will take the duration of a single reading.
	The TSP and SCPI commands for these filter-type options are `dmm.measure.filter.type = dmm.FILTER_HYBRID_AVG` and `[SENSe[1]]:<function>:AVERage:TCONtrol:HYBRid`.
Reference number:	NIHK-3957
Enhancement:	When the EXIT key is pressed, the previous screen becomes active. Previously, the instrument returned to the menu screen.
Reference number:	NIHK-5778
Resolution:	The scan time for scans with a count greater than one and autoranged functions has been improved. The instrument now retains the range learned from the first scan iteration and uses it as a basis for delays and ranging on subsequent scans. Previously, only worse case values were considered.
Reference number:	NIHK-6156
Resolution:	SCPI commands were added to programmatically control the display's active reading buffer and watch list. Additional documentation can be found in the latest reference manual under the `:DISPlay:WATch:CHANnels` and `:DISPlay:BUFFer:ACTive` commands.
Reference Number	NIHK-6158
Enhancement	The Reset Popups button on the Event Log screen and Log Settings tab now clears the error log of any suppressed warning popups. When a warning event occurs, the user interface displays a popup. You can suppress the popup so that subsequent warnings do not generate a popup. Previously, the suppression list could not be cleared.

Reference number:	NIHK-6168
Enhancement:	SCPI now allows the use of the dBm unit in a writable buffer. Additional documentation can be found in the latest reference manual under the `:TRACE:WRITE:FORMAT` command.

Reference number:	NIHK-6171, NIHK-6172
Enhancement:	A moving average filter is no longer allowed as a filter type on a channel. The moving average filter makes a reading, averages it with a previous set of readings, and returns the result. This can yield unexpected results during a scan because the averaged readings will not be sequential in time. To prevent inadvertent errors, this option has been removed for channels. It is still available for normal DMM usage.

Reference number:	NIHK-6195
Enhancement:	The time taken to switch functions using the front panel has been reduced substantially across all function.

Reference number:	NIHK-6213
Enhancement:	All emulation modes now support a beeper for continuity and limits.

Reference number:	NIHK-6221, NIHK–6236
Enhancement:	The scan screen menu has been changed as follows. The command Create New has been renamed to Create New List. Save has been renamed to Save System. The functionality is the same. There are two additional menu entries. The first is Reset Scan Settings, which clears the scan list and resets all settings associated with a scan, but not DMM settings. The other is Reset System, which redirects you to System Info and Management where the Reset button, which resets the entire instrument to power-on defaults, is located.

Reference number:	NIHK-6258
Enhancement:	TCP/IP communication speeds have been improved for short packets.

Reference number:	NIHK-6277
Enhancement:	All emulation modes now support a beeper for continuity and limits.

Reference number:	NIHK-6303
Enhancement:	In 2701 emulation mode, the following command is now supported as described in the Model 2701 User's Manual `:TRACe:POINts:ACTual`...

Reference number:	NIHK-6329
Enhancement:	When opening and appending a file on a USB flash drive, if the file does not exist it will be created. If the file exists, it will be appended to as before. This affects the `file.open()` and `io.open()` TSP commands.

ENHANCEMENTS

There were no enhancements included in this release. See the "Critical fixes" and "Noncritical fixes" sections for more information about release content.