ANRITSU CORPORATION
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MX183000A

High-Speed Serial Data Test Software

Release Notes

63rd Edition

Thank you for choosing Anritsu products for your business.
This document provides the latest information about version 12.03.02 of the software for the Anritsu MX183000A and current known bugs.
We look forward to continuing business with you in the future.

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1. Released Version

Ver. 12.03.02

2. Peripheral Devices

The peripheral devices for the MX183000A are shown in the table below.

Model	Name
MP1900A	Signal Quality Analyzer-R
MP1800A	Signal Quality Analyzer
MT1810A	4 Slot Chassis
MU181000A	12.5GHz Synthesizer
MU181000B	12.5GHz 4port Synthesizer
MU181500B	Jitter Modulation Source
MU195020A	21G/32G bit/s SI PPG
MU183020A	28G/32G bit/s PPG
MU183021A	28G/32G bit/s 4ch PPG
MU195040A	21G/32G bit/s SI ED
MU183040A	28G/32G bit/s ED
MU183041A	28G/32G bit/s 4ch ED
MU183040B	28G/32G bit/s High Sensitivity ED
MU183041B	28G/32G bit/s 4ch High Sensitivity ED
MU195050A	Noise Generator
MP1825B	4Tap Emphasis
MU191000A	Synthesizer
MU196020A	PAM4 PPG
MU196020C	PAM4 PPG
MU196040A	PAM4 ED
MU196040B	PAM4 ED
MU196050B	Noise Generator
MU196060A	32G baud NRZ/PAM4 Re-Driver

For the installation position of the mainframe, refer to the Anritsu website (https://www.anritsu.com).

3. Added Functions

Version	Item	Function
Ver. 12.02.01	Added G0447A control function	In MX183000A-PL021/25/26 PCIe Link Training, support has been added for controlling the G0447A PCIe 6 External Re-Driver.
	Added Retimer DUT support for PCIe 6 Link Training	In MX183000A-PL026 PCIe 6 Link Training, support has been added for Link Training and evaluation using Retimer DUTs. Retimers can now be selected as Loopback targets, Retimer detection information can be displayed on the GUI, and Retimer Equalization Extend information can be output to the LTSSM Log for Link Training analysis in systems including Retimers.
	Added status acquisition function for Return Path Optimization	In MX183000A-PL026 PCIe 6 Link Training, a function has been added to obtain the measurement status during Return Path Optimization. Progress information, including the currently measured Preset number, can be acquired using remote commands.
Ver. 12.01.01	Added modules that can be controlled by the MX183000A.	Added the following modules that can be controlled by the PCIe Link Training function, Jitter Tolerance Test function, USB Link Training function and DUT Error Counts Import function. MU191000A Added the following modules that can be controlled by the PCIe Link Training function, Jitter Tolerance Test function and DUT Error Counts Import function. MU196020C MU196050B

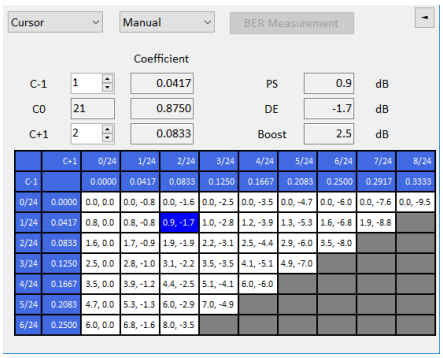
Version	Item	Function
	Added Confidence Level function	In MX183000A-PL021/25/26 PCIe Link Training and MX183000A-PL001 Jitter Tolerance Test, a Confidence Level function has been added to Matrix Scan and JTOL measurements.
	Added retry function for failed conditions in Matrix Scan and JTOL measurements in PCIe Link Training	In MX183000A-PL021/25/26 PCIe Link Training, a function has been added to retry measurements under the next measurement conditions when Matrix Scan or JTOL measurement fails.
Ver. 10.07.03	Added Preset Amplitude Cal function for PCIe 6 Rx LEQ	In MX183000A-PL026 PCIe 6 Link Training, a function has been added that allows BER measurements to be performed using the Amplitude Cal values of each Preset during Rx LEQ operation.
Ver. 10.07.01	Added retry function for Matrix Scan and JTOL in PCIe Link Training	In MX183000A-PL021/25/26 PCIe Link Training, a retry function has been added that re-executes Link Training when the DUT enters an Unlock state during Matrix Scan or JTOL measurement.
	Added features to Return Path Optimization	In MX183000A-PL026 PCIe 6 Link Training, the following functions were added to Return Path Optimization: • Remote control capability • Ability to select CP pattern lanes (Lane 0–15) • Added a mode optimized for TX LEQ Test
	Improved BER measurement after PCIe Link Training	In MX183000A-PL026 PCIe 6 Link Training, BER measurements can be observed after completing Link Training.
	Added FS=32 to Matrix Scan settings	Matrix Scan now supports FS = 32 for PCIe Link Training.

Version	Item	Function
Ver. 10.05.00	Improved Return Path Optimization function for PCIe 6 Link Training	With MX183000A-PL026 PCIe 6 Link Training, improved the Return Path Optimization function to adjust the optimal CTLE for each Preset Q0 to Q9.
	Added PCIe Link Training report function	Added the function to output Link Training and BER measurement result reports in HTML or CSV format to the MX183000A-PL021/25/26 PCIe Link Training.
Ver. 10.04.02	Added PCIe Link Training Lane 0 to 15 measurement function	With MX183000A-PL021/25/26 PCIe Link Training, Lane 0 to 15 can be measured by setting TS Parameter Lane Number in the Option settings.
Ver. 10.03.01	Added error count to the criteria for Jitter Tolerance Test for PAM4 PPG/ED.	Added error count to the judgment criteria when using PAM4 PPG/ED with the MX183000A-PL001 Jitter Tolerance Test.
	Improved Auto Search function on the BER Meas. screen of PCIe 6 Link Training.	Improved the Auto Search function on the BER Measurement screen of MX183000A-PL026 PCIe 6 Link Training so that Vth and Delay can be adjusted.
Ver. 10.00.01	Added MX183000A-PL026 PCIe 6 Link Training function.	The PCIe 6 Link Training function enables link training with devices compliant with the PCI Express 6.0 standard and analysis of LTSSM transition log. MX183000A-PL021 and PL025 are required to use this function. Please refer to the selection guide for the equipment and options required to use this function.
	Added FEC analysis function compliant with PCI Express 6.0 standard	Jitter Tolerance Test enables FEC analysis that complies with the PCI Express 6.0 standard. To use this function, the following equipment and options are required. ● MU196040B ➢ MU196040B-z41 ➢ MU196040B-w43

Version	Item	Function
	Added a module that can be controlled by the MX183000A.	Added the MU196060A Re-Driver as a module that can be controlled by the PCIe Link Training function and Jitter Tolerance Test function.
	PCIe SJ calibration values can be used for Jitter Tolerance Test.	Added the function to perform the Jitter Tolerance Test using the SJ calibration values of PCIe measurement.
Ver. 9.02.03	Added mask files for PCIe 6 Jitter Tolerance Test.	Added the MX183000A Jitter Tolerance Test with mask files for Pass/Fail evaluation of the PCIe 6 Jitter Tolerance Test. Added files: PCIe_CC_64G.mask, PCIe_SRIS_64G.mask
	Added commands to query (Detail) results measured by Jitter Tolerance Test.	Added remote commands that query detailed results measured by the MX183000A-PL001 Jitter Tolerance Test.
	Added setting conditions to be displayed in the Jitter Tolerance Test Report.	Added **PPG Condition** and **ED Condition** as PPG/ED setting conditions to be included in the report saved by the MX183000A Jitter Tolerance Test. Also, added SSC settings to **System Condition**, and "PCIe AIC Test SSC (Down 33kHz)" and "Deviation".
Ver. 9.00.00	Added support for the MX190000A Ver. 9.00.00.	Added support for updates brought by upgrading the MX190000A to Ver. 9.00.00.
Ver. 8.01.31	Added the User Cursor function to the PCIe Link Training option.	Added the User Cursor function to the MX183000A-PL021 PCIe Link Training option. On the **Link EQ** tab of the Option screen, if **User Cursor** is selected for Use Preset, the user can set any Cursor values for changing the waveform output from the DUT Tx.

Version	Item	Function
Ver. 8.00.30	Added a new feature to the Matrix Scan function of PCIe Link Training.	Added the Bypass Link Training feature to the Matrix Scan function of the MX183000A PCIe Link Training. When selected, the Matrix Scan measurement can be performed skipping the Link Training process automatically performed when **Matrix Scan** is clicked. To use this feature, close the Matrix Scan window, and then on the **Link Training** tab of the main screen, click **Link Start** to make the DUT to enter the Loopback.Active state before starting the Matrix Scan measurement.
	Added new features to the option items "Saved Cursor" for PCIe Link Training.	Added new features to save or recall the parameters obtained during Link Training to the option items "Saved Cursor" for the MX183000A PCIe Link Training.
	Added a new feature to the BER Measurement function of PCIe Link Training.	Added **CDR Tune**, which optimally adjusts the internal CDR settings with respect to the waveform input to the SI ED connector, to the BER Measurement function of the MX183000A PCIe Link Training. It can be used when an error is observed due to a large insertion loss between SI ED and DUT even after the CTLE Gain [dB] of SI ED is adjusted.
Ver. 7.02.30	Added the MX183000A-PL023 USB 3.2 x 2 Link Training.	With the USB 3.2 x 2 Link Training function, the LTSSM transition log during Link Training and Training can be displayed. The MX183000A-PL023 is required to use this function.
	Added new functions to the MX183000A-PL022/023.	Added the LFPS Rx Test function.
		Added the function to change the conditions for MP1900A's transition to the next LTSSM state during Link Training with DUT.

Version	Item	Function
	Added a menu item to open the MX183000A Operation Manual.	Added a Help menu item that opens the operation manual.
Ver. 5.00.30	Added the JTOL function that uses the FEC Analysis.	When the MU196040B-42 is installed on the controlled MP1900A, the MX183000A-PL001 Jitter Tolerance Test application can perform the JTOL measurement that uses the FEC Analysis.
	Added the PCIe Link Training function.	Added the MX183000A-PL021/025 PCIe Link Training application a function that sends EIOS to the DUT when **Unlink** is clicked. With this function, the DUT can be returned to the Detect State (initial state) just by clicking **Unlink**, therefore Link Training can be performed without resetting the DUT.
Ver. 4.09.15	Added a module that can be controlled by the MX183000A.	Added the MU196020A PAM4 PPG as a module that can be controlled by the MX183000A-PL021 PCIe Link Training function and MX183000A-PL025 PCIe 5 Link Training function.
Ver. 4.06.03	Added support for MP1900 Windows 10 IoT.	Added support for the MP1900A with Windows 10 IoT OS. To use the MP1900A with Windows 10 IoT OS, use the installer of this version or later.
Ver. 4.03.15	Added MX183000A-PL025 PCIe 5 Link Training function.	The PCIe 5 Link Training function enables link training with devices compliant with the PCI Express 5.0 standard and analysis of LTSSM transition log. MX183000A-PL021 is required to use this function.
Ver. 4.00.08	Added the Matrix Scan function to the PCIe Link Training option.	The Matrix Scan function is added to the PCIe Link Training option. Matrix Scan automatically performs the BER measurement of the cursor value in Loopback.Active state after it completes link training.

Version	Item	Function
	Added a module that can be controlled by the MX183000A.	The following module can now be controlled in the Jitter Tolerance Test application: MU196040B
Ver. 3.08.05	MX183000A-PL021 PCIe Link Training Added “Cursor” as an equalization mode of the SI PPG.	Added “Cursor” as an equalization mode for the signal output from the SI PPG. If, during link training, the DUT prompts for Equalization settings in Cursor mode, the signal output from the SI PPG is equalized by the coefficient specified by the cursor.  Due to this addition, the FS (Full Swing) and LF (Low Frequency) values that can be set for the SI PPG are fixed to 24 and 8, and the following remote commands become invalid. :LTRaining:SEQuence:FSWing :LTRaining:SEQuence:LFRequency
	MX183000A-PL021 PCIe Link Training Added the setting for PPG Electrical Idle Time.	The Electrical Idle time before the SI PPG changes the bit rate can be set to <1ms (less than 1 ms) or to ≥1ms (1 ms or more). Normally, it is recommended to use with set to <1ms as specified in the PCIe Base Specification. ≥1ms can be used for checking the DUT's receiver tolerance.

Version	Item	Function
	MX183000A-PL021 PCIe Link Training Extended the upper limit for the waiting time after resetting the DUT via the CBB Controller.	The upper limit for the waiting time after resetting the DUT via the CBB Controller (Option screen - State Machine tab - Waiting Time) was extended to 300 s.
Ver. 3.07.12	Added MX183000A-PL031 DUT Error Counts Import Function.	The DUT Error Counts Import Function enables MX183000A to acquire measurement results from the DUT's internal counter. Also, this function enables jitter tolerance measurement using the DUT counter results when used in combination with the MX183000A-PL001 Jitter Tolerance Test.
	Added support for optimization of SJ setting sequence at JTOL measurement.	Optimized the set sequence to make it harder to unlock the CDR of the DUT during JTOL (Jitter Tolerance Test). Also, added a function that sets the number of steps to take in resetting the SJ value to zero.
	Added JTOL-related remote commands.	Added commands to query JTOL measurement results.
	Added a function to insert a waiting time during specific state transitions in USB Link Training.	Added a function that inserts a waiting time between Rx Detect and Polling State in USB Link Training.
	Added a function to automatically reset the power supply of CBB 4.0 in PCIe Link Training.	Added a function that automatically resets the power supply of CBB 4.0 in PCIe Link Training, and a jig for the function (ordering number: Z2025A). In order to use this function, you need to install the NI DAQmx software included with Z2025A.

Version	Item	Function
Ver. 3.06.16	Added module for MX183000A control	The following equipment can be controlled by the Jitter Tolerance Test applications: MU196020A, MU196040A
Ver. 3.04.09	Added support to PAM4 Control for controlling four G0375A units	The maximum number of G0375A 32Gbaud Power PAM4 Converter units that can be controlled by PAM4 Control has been expanded to four. As a result, the GUI can be used to control 1 to 4 PAM4 signal channels.
Ver. 3.02.04	Added support for using numeric input using mouse operation	Switches to numeric input mode when right-clicking or clicking wheel on parameter to be changed. In this mode, any numeric value can be set using mouse.
	PAM4 Control Increased PAM4 Auto Search speed	Shortened PAM4 Auto Search time. The regular measurement time is shortened by up to 140 s.
Ver. 3.01.01	Added functions to MX183000A-PL021 PCIe Link Training	Added the ability to specify the cursor as the method for changing DUT Tx EQ at the PCIe LEQ Response test.
		Changing the time required for the MP1900A to change the bit rate during PCIe Link Training supports measurement of the DUT timeout tolerance. Although it is possible to measure a special DUT that does not meet the timeout specifications by setting the bit rate change to Fast, there are restrictions on the above function. Under normal conditions, set to Middle.

Version	Item	Function
		The Full Swing, Low Frequency, Lane Number, and Link Number values received by the MP1900A from the DUT during PCIe Link Training can be displayed in the Result field. In addition, the Full Swing and Low Frequency values can be displayed in the LTSSM transition log. This function can be used to confirm Link Training results.

Version	Item	Function
Ver. 3.00.00	Added MX183000A-PL022 USB Link Training Function	This function supports Link Training and analysis of LTSSM transition logs for USB3.1 devices using the USB Link Training function. Use of this function requires the following models. MP1900A, MU195020A, MU195040A
	Added PCIe Link Training LEQ Measurement Function	This function supports the Link Equalization Test (Preset only) in the PCI Express® Architecture PHY Test Specification. Depending on the test item, this function requires a real-time oscilloscope.
	Added support for PCIe Link Training Common Ref. Clock Architecture (System Board)	Adding this function for synchronizing with the 100 MHz Ref. Clock output from the DUT supports the Common Refclk architecture (System Board) test. MU181000B Opt-02 is required to use this function.
	Added PCIe Link Training LTSSM Trigger Function	This function outputs a trigger signal from the MU195020A when transitioning to the LTSSM State specified by the measuring instrument. Using this function supports confirmation of Data waveforms at any LTSSM state by using an oscilloscope.
	Added support for control using PAM4 Control application remote command	The function performs PAM4 Control using remote commands. For details of the remote command specifications, refer to Chapter 5 of the operation manual for the High-Speed Serial Data Test Software MX183000A.

Version	Item	Function
Ver. 2.01.00	Added PAM4 Control function	This function controls the PAM4 output level when using the combined PPG and G0375A system. It also controls the G0376A CTLE Gain and input threshold voltage. In addition, it also has a function for automatically searching for the optimum value for CTLE Gain, input threshold voltage, PPG Delay, and ED Delay. PAM4 Control is a free application.
	Added foreground display function	This function adds foreground display of the MX183000A to support operation of the MX183000A while checking the MX180000A and MX190000A screens. The foreground display function can be switched ON/OFF from the Menu bar.
Ver. 2.00.00	Added MX183000A-PL021 PCIe Link Training function	Using the PCIe Link Training function supports Link Training for PCIe-compliant devices and display of LTSSM transition logs. The following equipment are required to use this function: MP1900A, MU195020A, MU195040A
	Added module for MX183000A control	The following equipment can be controlled by the PCIe Link Sequence and Jitter Tolerance Test applications: MP1900A, MU195020A, MU195040A
	Added 2ch Combination test mode to MX183000A-PL001 Jitter Tolerance Test	2ch Combination tests are supported at the MX183000A-PL001 Jitter Tolerance Test.

Version	Item	Function
Ver. 1.02.00	Added support for USB BER measurement using USB3.1 Receiver Test Adapter	The USB3.1 Receiver Test Adapter has been added to USB Link Sequence control devices. From this version, the USB Link Sequence operates with the connected USB3.1 Receiver Test Adapter as the basic configuration. For details of the USB3.1 Receiver Test Adapter G0373A, contact our business section.
	Added function for inserting errors into USB Compliance Pattern	A function has been added for inserting 1-bit errors into the Compliance Pattern used by the USB Link Sequence at BER measurement. The target Compliance Patterns are: Gen1 (5.0 GT/s), CP0 Gen2 (10.0 GT/s), CP9
	Added function for sending Compliance Pattern when connected DUT not detected	A function has been added for sending the Compliance Pattern to the USB Link Sequence. This function can send Compliance Pattern even when the connected DUT is not detected.
	Added support for Jitter Tolerance measurements of PAM4 signals	Support has been added for PAM4 signal measurements at the Jitter Tolerance test. This can perform total 3Eye (Upper/Middle/Lower) Jitter Tolerance tests for PAM4 signals.
Ver. 1.01.00	Added support for USB Test Adapter	Support for the USB Test Adapter has been added to the USB Test USB Link Sequence control function. Either the USB Test Adapter or the USB Measurement Kit can be selected as the connection setup. The USB Test Adapter is manufactured by ARTEK INC. and the model number is BSG4G.
	Added command to query Link status	The following command has been to query the Link status. :CALCulate:RESult:EMONitor?

4. Bug Fixes

Version	Item	Fault
Ver. 12.03.02	Auto Search may fail in PCIe 6 Link Training	In MX183000A-PL026 PCIe 6 Link Training, fixed an issue where SKP could be incorrectly detected when using the MCP pattern, causing Auto Search to fail.
	A message may not be displayed when Sync Loss occurs during Jitter Tolerance Test	In Jitter Tolerance Test, fixed an issue where remeasurement might not be performed correctly when Sync Loss occurred with Behavior After Fail set to Retry or Pause.
	Fixed output control during Return Path Optimization	In MX183000A-PL026 PCIe 6 Link Training, fixed the output control so that Global Output and Data Output are turned ON during Return Path Optimization.
Ver. 12.02.01	Tx LEQ Test may fail	In MX183000A-PL026 PCIe 6 Link Training application, fixed an issue where the Tx LEQ Test could fail because the DUT did not transition to the Loopback Active state.
	GUI display and remote command settings may become inconsistent during Return Path Optimization	In MX183000A-PL026 PCIe 6 Link Training application, fixed an issue where the GUI display and internal settings could become inconsistent when a settings file was loaded or cleared by remote command while the Return Path Optimization dialog was open.
	Some parameters may not be restored when loading a settings file	In MX183000A-PL026 PCIe 6 Link Training application, fixed an issue where some settings were not restored correctly when a settings file was loaded. The affected parameters were BER Measurement Detection Unit, MU196040B LFE/DFE, and Initialize to Preset Value.
Ver. 12.01.01	ED pattern may not be set correctly when MCP SRIS is selected with Filtering OFF	In the MX183000A-PL021/25/26 PCIe Link Training application, fixed an issue where, when MCP SRIS was selected and Filtering was set to OFF, an incorrect pattern without SKP (_NOSKP) was selected instead of the MCP pattern for SRIS, resulting in failure to achieve error-free operation.
	DUT may not operate correctly due to improper PPG toggle signal settings during Return Path Optimization	In the MX183000A-PL026 PCIe 6 Link Training application, fixed an issue where, during Return Path Optimization, the amplitude, emphasis, and jitter/noise settings of the PPG were not optimized correctly, causing the DUT to fail to operate properly.

Version	Item	Fault
Ver. 10.07.03	PAM4 Control application may fail to execute Connect	Fixed an issue in the PAM4 Control application where, after launching the application, executing Connect could sometimes fail to establish a normal connection.
Ver. 10.07.01	Return Path Optimization malfunctions when manually adjusted	In MX183000A-PL026 PCIe 6 Link Training application, fixed an issue where MX183000A could freeze and become unresponsive when Return Path Optimization was executed manually and adjustments were made.
	ED polarity may remain inverted after Link Training	In MX183000A-PL026 PCIe 6 Link Training application, fixed an issue where, after executing Link Training, the polarity of the ED could become inverted and fail to return to the correct state.
	Cursor values may not be saved in PCIe Link Training	In MX183000A-PL026 PCIe 6 Link Training application, fixed an issue where, after completing Link Training, the cursor values for “DUT Initial Preset” or “DUT Target Preset” were sometimes not saved.
	Application error occurs when performing JTOL measurement in the DUT Error Counts Import application	In the DUT Error Counts Import application, fixed an issue where performing a JTOL measurement would cause an error message to appear, preventing the measurement from continuing.
	JTOL fails in SI configuration	Fixed an issue where, when performing a Jitter Tolerance Test in SI configuration, the test could stop midway and an error would occur, preventing further progress. This issue occurs in MX183000A Ver. 10.05.00.
	Retimer DUT cannot be placed into loopback during PCIe Link Training	In MX183000A-PL021/25/26 PCIe Link Training applications, fixed an issue where, when performing Link Training in a PAM4 configuration, the process did not include the required check for Retimer Equalization Extend = 0, resulting in failure to place the Retimer DUT into loopback. This fix is applied when used in combination with MX190000A V10.07.09.
	DUT may fail to receive the CMTS signal during Return Path Optimization	During Return Path Optimization, the DUT sometimes failed to receive the CMTS signal output from the MP1900A and therefore did not output the expected signal. This issue was fixed by increasing the CMTS signal transmission interval.

Version	Item	Fault
Ver. 10.05.00	The initial value of SKP Interval for PCIe Link Training is incorrect	In the MX183000A-PL021/25/26 PCIe Link Training application, the initial values of Interval and Interval for SRIS Mode in the Link Training Setting >Option >SKP settings were modified to confirm to the PCIe standard.
Ver. 10.04.02	Auto Search may not be available in Jitter Tolerance Test.	Fixed a problem in which the Auto Search function could not be used for measurement when using the MU196040A PAM4 ED in the Jitter Tolerance Test application. This issue occurs in versions from ver.10.00.01 to ver.10.03.02.
Ver. 10.03.02	When C-2 is set on the PCIe6 BER measurement screen, the polarity is incorrect	Fixed the problem that the polarity was set incorrectly when Coefficient C-2 was set as the Cursor for Emphasis setting on the PCIe6 BER measurement screen in the PCIe Link Training application.
Ver. 10.03.01	Fixed bug in PCIe Link Training remote command	Fixed a problem in which the following remote commands did not work properly in the MX183000A-PL021/25/26 PCIe Link Training application. :LTRaining:SEQuence:RESult? TXPReset :LTRaining:SEQuence:LEQTest:REV3 :LTRaining:SEQuence:LEQTest:REV4 :LTRaining:SEQuence:LEQTest:REV5 :LTRaining:SEQuence:LEQTest:REV6
Ver. 10.02.02	When USB Link Training and Jitter Tolerance Test are started, the amplitude of PPG changes	Fixed a problem in the USB Link Training application that caused the output amplitude of PPG to change when Link Training and Jitter Tolerance Test were started.
	The Total Bit Count on the PCIe6 BER measurement screen is incorrect.	Fixed a problem in the PCIe Link Training application where the Total Bit Count display was incorrect on the PCIe6 BER measurement screen.
	Sync Loss may occur after USB3.2 Gen1/2 Link Training.	Fixed the phenomenon that Sync Loss may occur after Loopback Active when performing USB3.2 Gen1/2 Link Training with SSC added. Additional corrections were made to the problems in Ver. 10.00.01.
Ver. 10.01.00	Fixed the description of the Re-Auto Search command in the Operation Manual.	The description of the Re-Auto Search command in the PCIe Link Training function is incorrect in the Operation Manual, so this is fixed. Please check the following command in chapter 5 of the Operation Manual (M-W3813AW). :SENSe:MEASure:BER:AASearch:DELay

Version	Item	Fault
	Fixed a bug in the Loopback Method query command.	In the PCIe Link Training application, the response to the command to query the Loopback Method setting returned an incorrect string, so this is fixed. The target command is as follow. :LTRaining:SEQuence:LTHRough?
	Jitter Tolerance Test cannot be started when MU196040A is used.	Fixed a bug where Jitter Tolerance Test application cannot be started, when PAM4 ED MU196040A is used.
	When setting LEQ Test parameters with remote commands, LEQ Test may not be executed.	Fixed a bug where the LEQ Test cannot not be executed in the PCIe Link Training application, as the BER Measurement setting does not switch to Auto even if the RX LEQ, Initial TX LEQ, and Tx LEQ Response parameters are set with remote commands.
	Fixed a bug where Use Noise Generator cannot be activated via remote command.	Fixed a bug where the command to activate Use Noise Generator on the Equipment Setup tab in the Jitter Tolerance Test application does not work. The target command is as follow. :SYSTem:EQUipment:USENoise

Version	Item	Fault
Ver. 10.00.01	Sync Loss may occur after USB3.2 Gen1/2 Link Training.	Fixed the phenomenon that Sync Loss may occur after Loopback Active when performing USB3.2 Gen1/2 Link Training with SSC added.
	Bug fix for the JTOL result acquisition command.	Fixed the issue that the response of the command to obtain JTOL results returned a value different from the specifications. :CALCulate:RESult:DATA?
Ver. 9.02.04	PCIe Link Training measurement is not possible without certain options.	Fixed the phenomenon that the PCIe Link Training (MX183000A-PL021/PL025) and JTOL (MX183000A-PL001) applications freeze and cannot be measured when the following options are not available. MU195020A-11/21 1ch/2ch 10Tap Emphasis MU195020A-40/41 1ch/2ch Variable ISI MU195040A-11/21 1ch/2ch CTEL MU196020A-11 4Tap Emphasis MU196020A-40 Adjustable ISI This phenomenon occurs in V9.02.03 of the MX183000A.
Ver. 9.02.03	Failed to start PCIe Link Training without SI ED option 01 installed.	Fixed the issue that prevented the MX183000A-PL021 PCIe Link Training from being connected by **Connect** to the MP1900A when 21G SI ED (without Option 01) is used.
Ver. 9.00.00	Failed to start JTOL when **Sequence** was selected.	Fixed the issue that the MX183000A could not connect to the MP1900A if **Connect** was clicked in Jitter Tolerance Test when in MX190000A, **Sequence** was selected for Test Pattern on the **Pattern** tab of PAM4 PPG.
	JTOL report issue	Fixed the issue that a correct pattern length could not be displayed at Test Pattern in the report of the Jitter Tolerance Test result when, in MX190000A, **PRBS** or **Zero Substitution** was selected on the **Test Pattern** tab of SI PPG or PAM4 PPG.
	Matrix Scan measurement results could not be obtained by the query.	Fixed the issue that the following SCPI command could not return results of Matrix Scan measurement performed when checking **Bypass Link Training**. :LTRaining:SEQuence:BMATrix:RESult?
Ver. 8.03.13	During PCIe Link Training, Test Pattern of Data2 for SI PPG could not be changed.	Fixed the issue that Test Pattern of Data2 for SI PPG could not be changed during PCIe Link Training.
	Errors were found in JTOL and Matrix Scan reports.	Fixed the issue that caused JTOL and Matrix Scan reports to contain errors.

Version	Item	Fault
Ver. 8.03.02	EC (error count) of Matrix Scan in PCIe Link Training may become 0.	Fixed the issue that may cause 0 to be displayed at EC when a certain number of errors are counted by Matrix Scan in PCIe Link Training.
Ver. 8.01.31	Init Tx LEQ test in PCIe Link Training may fail depending on the DUT.	Fixed the phenomenon that may prevent the DUT Tx from switching to Preset according to the MP1900A and may cause the test to fail when on the **Link Training** tab of PCIe Link Training (PCIe4 or later), **Initial TX LEQ** was selected in the **LEQ Test** box, **Apply** was clicked, and then **Link Start** was clicked.
	When the LTSSM Log memory for PCIe Link Training is full, the latest log may not be recorded.	Fixed the phenomenon that prevented the latest log from being recorded when the memory was full under the condition that, in the PCIe Link Training screen, **Link Start** was clicked and left for a few minutes. After the bug fix, logs will be deleted oldest first.
	Mismatches may occur between software internal settings and GUI-displayed values by clicking **Operate MP1900A** in the PCIe Link Training Setup screen.	Fixed the issue that may cause mismatches between software internal settings and GUI-displayed values when **Operate MP1900A** was clicked in the PCIe Link Training Setup screen.
Ver. 7.02.31	When performing Link Start in PCIe Link Training, the display for LTSSM State may remain hyphens.	Fixed the issue that may cause training to be prevented from progressing with the display for LTSSM State remained with hyphens when Link Start is performed in PCIe Link Training.
Ver. 7.02.30	Occasionally failed to connect to the MP1900A.	Fixed the issue that may cause connection failure when **Connect** was clicked in the Equipment Setup screen after the PCIe Link Training or USB Link Training was already started.
	During PCIe Link Training and USB Link Training, 1-bit error may result in Sync Loss.	Fixed the issue that may cause Sync Loss if an error occurred in Sync Header or SKP OS in the test pattern during BER measurement with PCIe Link Training or USB Link Training.

Version	Item	Fault
Ver.6.00.05	SSC configuration command could not be used.	Fixed an issue that the following SSC configuration remote command could not be used. :LTRaining:SEQuence:SSC
	The DUT may exit the Loopback Active state by starting the Jitter Tolerance Test in MX183000A and connecting the equipment, when the Sequence Editor is being used.	Fixed the issue that may cause the DUT, placed in the Loopback Active state by the Sequence Editor Function (MU195020A-50), to exit the Loopback Active state by starting the Jitter Tolerance Test (MX183000A-PL001) and connecting the equipment.
	Calibration of SI ED may fail when PAM4 PPG is used.	Fixed an issue that may cause MX183000A to fail the calibration of SI ED when PAM4 PPG is used.
Ver.5.00.30	An application error may occur by controlling PCIe Link Training from the Compliance Test application.	Fixed an issue that may cause an application error to occur by controlling PCIe Link Training from the Compliance Test application.
Ver.4.02.10	MX183000A-PL021 MP1900A occasionally did not return an appropriate cursor coefficient that corresponded to Preset when performing PCIe Link Training.	Fixed a bug where MP1900A occasionally did not return an appropriate cursor coefficient that corresponded to Preset notified by DUT in Recovery.Equalization.Phase 2 or Phase 3 state when performing PCIe Link Training. This bug fix applies only to V4.02.10 or later of MX190000A.

Version	Item	Fault
Ver.3.08.05	An error message was displayed when, in the Equipment Setup screen for PAM4 Control, selecting two G0375As and clicking Connect.	PAM4 Control failed to connect the equipment when selecting two G0375As. This bug fix applies only to V3.08.05 or later of MX190000A.
	MX183000A-PL021 When performing Link Start in PCIe Link Training, a DUT occasionally could not be in Loopback Active state.	A specific DUT occasionally failed to enter in Loopback Active state when performing PCIe Link Training.
	MX183000A-PL021 In GRL or LeCroy application, PCIe Tx LEQ Response Time Test of a DUT occasionally resulted in Fail.	In GRL or LeCroy application, PCIe Tx LEQ Response Time Test of a DUT occasionally resulted in Fail.
	MX183000A-PL021 Bug fix for remote commands	Incorrect results were occasionally returned when sending the following commands: :LTRaining:SEQuence:RESult? :LTRaining:SEQuence:RESult:CSKP?
Ver.3.07.12	JTOL measurement result did not become Sync Loss.	When JTOL measurement result was Sync Loss, Error Count was occasionally displayed as **1000000**. In this version or later, it is displayed as **Sync Loss**.
	In PCIe Link Training, the Electrical Idle time occasionally exceeded 1 ms.	In PCIe Link Training, the Electrical Idle time occasionally exceeded 1 ms.
	The Output Clock setting was changed unintentionally when connected from the Jitter Tolerance Test or PAM 4 Control application.	The PPG's Output Clock setting was occasionally changed to a value not intended by the user when connected from the Jitter Tolerance Test or PAM 4 Control application. In this version or later, the Jitter Tolerance Test and PAM4 Control option do not control the PPG's Output Clock Rate setting from MX183000A.

Version	Item	Fault
Ver.3.05.00	MX183000A Screen does not display normally	When installing the MX183000A to the MP1800A, part of the screen is cut off and it does not display normally. This bug occurs in MX183000A Version 3.04.09.
Ver.3.04.09	Bugs in USB Link Training PAM4 Control remote commands	Fixed bug in following remote commands: USB Link Training Command :CALCulate:DATA:EALarm? Added following ”CLOS” and ”PSL” arguments PAM4 Control Command OUTPut:DATA:EAMPlitude? Fixed bug causing return of incorrect query when PERCent specified at second argument
	Delayed response at remote control	The remote operation response is delayed when repeatedly starting and stopping each application from Selector. When this occurs, the Query response is not returned within the normal Timeout time.
	Attempts to display unsupported patterns with MX183000A in non-linear mode	Unsupported patterns are wrongly displayed when MX183000A PAM4 Control is in the non-linear PAM4 mode. A non-linear PAM4 signal is not output when a selecting pattern the following Not supported patterns. JP03A, JP03B, SSPRQ, SSPRQ[D3_4], Transmitter_Linearity, PRBS13Q, PRBS31Q
Ver.3.03.01	Occasional application crash at remote	At remote, sometimes the application crashes when switching alternately between Connect/Disconnect.
Ver.3.01.01	Sometimes, not Error Free at PCIe Link Training System measurement	Sometimes, after the Link Training is established, the Loop.back Active state is not error free at the MX183000A PL-021 PCIe Link Training software. This bug has been fixed for V3.01.00 and later.

Version	Item	Fault
Ver.3.00.00	Sometimes, not Error Free at PCIe/USB Link Training	Sometimes, Link Training fails either at PCIe Link Training or USB Link Training, or the status does become error-free after Link Training. This bug has been fixed by the Calibration function added at V3.00.00 and later. Refer to Chapter 6 Usage Precautions for more details.
	Improved PAM4 Control application Auto-search function	Sometimes the function for searching for the optimum value for CTLE Gain, Input Threshold Voltage, PPG Delay, and ED Delay fails. This bug has been fixed for V3.00.00 and later.
	Link fails at USB Link Sequence	The Link Sequence fails to start when starting the USB Link Sequence when using a combination of the MX183000A V2.01.04 and MX180000A V8.05.00 software. The workaround for this bug is to install MX183000A V3.00.00 and MX180000A V8.06.00.
Ver.2.01.04	MX183000A fails to start	When installing the MX183000A V2.01.02 software, an error message is displayed and the application fails to start. This problem is fixed by installing V2.01.04.
Ver.2.01.02	Sometimes, MX190000A not error-free at completion of PCIe Link Training	Sometimes, when quitting the MX183000A after using the MX183000A PCIe Link Training, BER measurement using the MX190000A is not error-free. This bug occurs in MX183000A Version 2.01.00.
Ver.1.01.00	Application may terminate abnormally if Close (x) icon clicked during measurement	The application may terminate abnormally if the Close (x) icon is clicked either when the PCIe application is sending the Link Sequence or at JTOL measurement.

5. Known Issues

Version	Item	Fault
Ver. 10.01.00	PCI Express 4.0 Link Training may not become Loopback Active.	When using the MU196040B and performing Link Training with PCI Express 4.0, it may not become Loopback Active in rare cases. If this phenomenon occurs, perform Link Training again. If the loopback does not become Active after re-running the Link Training, restart the power supply of the main unit and run the Link Training again.
	PCI Express 6.0 Link Training may not become Loopback Active.	When using the MU196040B and performing Link Training with PCI Express 6.0, it may not become Loopback Active in rare cases. If this phenomenon occurs, perform Link Training again. If the loopback does not become Active after re-running the Link Training, restart the power supply of the main unit and run the Link Training again.
Ver. 10.00.01	BER may vary by about E-2.	When performing BER measurement after Link Training with PCI Express 6.0, the BER may vary by about E-2.
	Delay Calibration may fail.	Sometimes, the Delay Calibration may fail. If the Delay Calibration fails, check the connection and perform the Delay Calibration again.
	BER measurement may become unstable after link training is completed.	BER measurement may become unstable approximately 2 seconds after link training is completed (after Outputting Test Pattern). If this phenomenon occurs, perform Link training again.

6. Specification Changes

Item (Management Number)	Version	Description
PCIe Link Training Report Link EQ display specification change	New specifications (V12.02.01~)	Display only applicable items according to the DUT type and configuration settings. Items that are not applicable are displayed as "N/A" or "---".
	Old specifications (～V12.01.01)	Recovery.EQ.Phase2/Phase3 and Preset/Cursor related items were displayed regardless of the DUT type or configuration settings.

Item (Management Number)	Version	Description
PCIe Link Training Specification changes to Initial Tx EQ Test	New specifications (V12.01.01~)	In accordance with the latest PCIe PHY Test Specification, the operation of the Initial Tx EQ Test has been changed so that Recovery EQ Phase 2 and Phase 3 are bypassed.
	Old specifications (~V10.07.03)	During execution of the Initial Tx EQ Test, Recovery EQ Phase 2 and Phase 3 were performed, and Link Training was executed without issuing requests for Preset changes.
PCIe Link Training Change the Lane Number setting range in the Option settings	New specifications (V10.04.02~)	TS Parameter Lane Number Range Lane Number: 0 to 15
	Old specifications (~V10.03.02)	TS Parameter Lane Number Range Lane Number: 0 to 255
PCIe Link Training Change BER Measurement initial values	New specifications (V10.01.00~)	Initial values when PCIe5 is selected Gating Time : 125s
	Old specifications (~V10.00.02)	Initial values when PCIe5 is selected Gating Time : 32s
PCIe Link Training SKP Interval specification change	New specifications (V10.00.01~)	Since SKP Interval is included in the analysis target during Link Training with the latest standard, SKP Interval of 8b/10b, 128b/130b and 1b/1b is seprated into [SKP Interval] and [SKP Interval for SRIS Mode]. When Common or SRNS is selected for Clock Architecture, it will be [SKP Interval], and when SRIS is selected, it will be [SKP Interval for SRIS Mode]. Therefore, the SKP Interval for SRIS Mode cannot be set using the conventional SCPI command for setting the SKP Interval shown below. ● :LTR:SEQ:SKP:INT:8B10B ● :LTR:SEQ:SKP:INT:128B130B If you want to set SKP Interval for SRIS Mode, please use the following command: ● :LTR:SEQ:SKP:INT:SRIS:8B10B :LTR:SEQ:SKP:INT:SRIS:128B130B
	Old specifications (~V9.02.04)	The SKP Interval for 8b/10b and 128b/130b was specified with one parameter regardless of the Clock Architecture selection. Note that 1b/1b is an encoding added to support PCIe Gen6 in V10.00.01, so it does not exist in the old specifications.

Item (Management Number)	Version	Description
PCIe Link Training Specification changes to Initial Tx EQ Test	New specification (V8.03.02 or later)	Causes Recovery.EQ to transit to Phase 2 state when link training with DUT is performed in the PCIe Link Training - Initial Tx EQ test. Therefore, the DUT can request the MP1900A to change either Preset value or Cursor values.
	Old specification (V8.03.00 or earlier)	Causes Recovery.EQ to bypass Phase 2 state when link training with DUT is performed in the PCIe Link Training - Initial Tx EQ test. Therefore, the DUT cannot request the MP1900A to change either Preset value or Cursor values.
PCIe Link Training Changes to the initial values	New specification (V8.03.00 or later)	Initial values when PCIe5 is selected CTLE: -3.0 dB PPG Starting Preset for Rx/Tx LEQ: P5
	Old specification (V8.01.31 or earlier)	Initial values when PCIe5 is selected CTLE: 0 dB PPG Starting Preset for Rx/Tx LEQ: P7
Changes to the Emphasis settings made when **Cursor** is selected for BER Measurement	New specification (V8.00.30 or later)	Changed the Emphasis settings for the MX190000A PPG as follows when **Cursor** is selected for BER Measurement of the MX183000A PCIe Link Training. - [USER], [Coefficient], [Preset0]
	Old specification (V7.02.31 or earlier)	Changed the Emphasis settings for the MX190000A PPG as follows when **Cursor** is selected for BER Measurement of the MX183000A PCIe Link Training. - [USER], [De-Emphasis], [Preset0]
Name change of LTSSM	New specification (V6.00.05 or later)	Changed Master / Slave included in the name of LTSSM name to Lead / Follower according to the PCIe Gen6 standard Rev 0.7.

7. Precautions for Use

The precautions for using each version are described below.

7.1 About SI ED Calibration at PCIe/USB Link Training

The SI ED MU195040A requires calibration when using the PCIe Link Training or USB Link Training MX183000A application. Always perform calibration if the equipment configuration is changed or the software version is upgraded. Perform calibration by clicking the [Calibration] button at the Equipment setup tab after starting the above-described application (MX183000A V3.00.00 or later). For details of the procedure, refer to section 4.3.2 Connecting Measurement Equipment in the High-Speed Serial Data Test Software MX183000A operation manual.
If calibration is not performed correctly, linking with the DUT may not be performed normally or the status may not be error-free.

7.2 Ver. 1.00.01 and Later

7.2.1 Operating Environment Precautions
NI-VISA must be installed to use the MX183000A. Refer to section 2.2 Operating Environment, and section 2.3 Installing/Uninstalling in the MX183000A Operation Manual for details about the operation environment for this software.

7.2.2 License Precautions
The paid MX183000A option uses a license key to enable functionality. Refer to the License_Install_E.pdf file stored on the USB memory stick standard accessory provided with this software.

7.3 Ver. 1.01.00 and Later

7.3.1 Version Precautions when Download Installer

The Ver. 1.00.01 installer cannot be installed over MX183000A Ver. 1.01.00. To install Ver. 1.00.01, first uninstall the MX183000A software.

7.4 Precautions When Recovering MP1900A

This software license key becomes invalid if a system recovery is performed on the MP1900A where the software is installed. For details on the system recovery, refer to 8.2 “System Recovery Function” in the MP1900A Signal Quality Analyzer-R Operation Manual.

Be sure to transfer the license on the MP1900A to a PC or another MP1900A refer to 2.4 “License Key Activation” in the MX183000A High-Speed Serial Data Test Software Operation Manual before performing the system recovery. If you perform the system recovery without transferring the license, contact an Anritsu Service and Sales office.

7.5 Ver. 3.08.05 and Later

According to the addition of “Cursor” as an Equalization signal output mode, the FS (Full Swing) and LF (Low Frequency) values that can be set for SI PPG are fixed to 24 and 8, and the following remote commands become invalid.

:LTRaining:SEQuence:FSWing

:LTRaining:SEQuence:LFRequency

7.6 Downgrading the Installer

If you want to downgrade the MX183000A installer version, take the following steps.

If your version is 4.03.00 or later:

1. Uninstall MX183000A.exe from Add/Remove Programs (Apps & features) in Windows.
2. Install the desired version of MX183000A.

If your version was V.4.03.00 or later, but overwritten by a version older than V4.03.00:

1. Uninstall MX183000A.exe from Add/Remove Programs (Apps & features) in Windows.
2. Delete the MX183000A folder from the Anritsu folder in C drive.
3. Install the desired version of MX183000A.

7.7 Installing MX183000A on External PC

When you install MX183000A on an external PC and control the MX190000A installed on the MP1900A, the firewall or virus security software of the external PC may block the communication of MX183000A.exe and obstruct normal use of the MX183000A. In that case, allow the communication of MX1830000A.exe on the setting screen of the security software.

7.8 Precautions for Using the MU195020A-50/51

The MU195020A-50 Sequence Editor Function and MU195020A-51 Sequence Editor Function PCIe5 Extension options can work with the following software versions. Please note that older versions of the installers will not meet its functional and performance requirements.

MX190000A: Ver. 7.02.30 or later
MX183000A: Ver. 7.02.30 or later

7.9 Precautions for Using the MU196040B-42

The MU196040B-42 FEC Analysis Function Option can work with the following software versions. Please note that older versions of the installers will not meet its functional and performance requirements.

MX190000A: Ver. 5.00.90 or later
MX183000A: Ver. 5.00.30 or later

7.10 Precautions for Using the Z2025A PCIe CBB Controller

The Z2025A PCIe CBB Controller requires NI-DAQmx 20.1 or later when used with MX183000A Ver. 10.07.01 or later. If a version earlier than NI-DAQmx 20.1 is used, the CBB Controller may not operate correctly. Customers using the CBB Controller should update NI-DAQmx to version 20.1 or later.

NI-DAQmx download:

https://www.ni.com/en/support/downloads/drivers/download.ni-daq-mx.html

7.11 Software Version Compatibility List

When using MX183000A in combination with MX180000A and MX190000A, there are some restrictions on their software versions. Refer to the table below to check the compatible versions.

MX180000A	MX190000A	MX183000A	Windows Update Support No.	
			WES7	Windows10 IoT
V8.02.01	-	V1.00.00	-	-
V8.02.03		V1.01.00	-	-
V8.04.00	-	V1.02.00	-	-
V8.05.00	V1.00.02	V2.00.00	-	-
	V1.01.03	V2.01.00	-	-
V8.06.00 or later	V2.00.00	V3.00.00	-	-
	V2.02.00	V3.01.00	-	-
	V2.03.00	V3.02.00	KB4093118	-
	V2.05.00	V3.04.00	KB4093118	-
	-	V3.05.00	KB4093118	-

MX180000A	MX190000A	MX183000A	Windows Update Support No.	
			WES7	Windows10 IoT
	V3.00.05	V3.06.16	KB4467107	-
	V3.01.07	V3.07.12	KB4467107	-
	V3.08.16	V3.08.05	KB4499178	-
	V4.01.32	V4.00.08	KB4499178	-
	V4.02.10	V4.02.10	KB4499178	-
	V4.03.12	V4.03.15	KB4536952	-
	V4.06.02	V4.06.03	KB4541731	-
	V4.09.41	V4.09.15	KB4541731	-
	V4.09.50	V4.09.15	KB4541731	-
	V4.10.20	V4.10.05	KB4541731	KB4580390
	V4.10.23	V4.10.05	KB4541731	KB4580390
	V5.00.90	V5.00.30	KB4541731	KB4598230
	V6.01.05	V6.00.05	KB4541731	KB5003703
	V7.02.30	V7.02.30	KB4541731	KB5003703
	V7.02.31	V7.02.31	KB4541731	KB5006744
	V8.00.30	V8.00.30	KB4541731	KB5007266
	V8.00.31	V8.00.30	KB4541731	KB5007266
	V8.01.31	V8.01.31	KB4541731	KB5009718
	V8.02.00	V8.01.31	KB4541731	KB5009718
	V8.03.00	V8.03.00	-	KB5010791
	V8.03.00	V8.03.02	-	KB5010791
	V8.03.14	V8.03.13	-	KB5014022
	V9.00.00	V9.00.00	-	KB5017855
	V9.00.01	V9.00.00	-	KB5017855
	V9.00.02	V9.00.00	-	KB5022840
	V9.02.02	V9.02.03	-	KB5023702
	V9.02.03	V9.02.04	-	KB5027536
	V10.00.01	V10.00.01	-	KB5030214
	V10.00.02	V10.00.01	-	KB5030214
	V10.01.02	V10.01.00	-	KB5034273
	V10.02.00	V10.02.02	-	KB5038283
	V10.03.02	V10.03.01	-	KB5042350
	V10.03.04	V10.03.02	-	KB5044277
	V10.04.02	V10.04.02	-	KB5050008
	V10.05.02	V10.05.00	-	KB5062557
	V10.07.06	V10.07.01	-	KB5071544
	V10.07.09	V10.07.01	-	KB5071544
	V10.07.12	V10.07.03	-	KB5078752
	V12.01.02	V12.01.01	-	KB5082123
	V12.01.03	V12.01.01	-	KB5087538
	V12.02.01	V12.02.01	-	KB5099538
	V12.03.01	V12.03.02	-	KB5126043