



Firmware Release Notes

**Giga-tronics
2400 and 2500 Series
Microwave Signal Generators**

Firmware revision history for firmware versions V4.09 to V4.86

Use Automation Xpress to Update the Firmware

Table of Contents

1 General information

2 Firmware download procedure using Automation Xpress

3 Firmware and Automation Xpress revision history

1 General Information

Easily upgrade your Giga-tronics 2400 and Giga-tronics 2500 Series Microwave Signal Generator to the newest version of firmware using Automation Xpress software. Automation Xpress and your instrument's firmware may be obtained from the Giga-tronics support web site at: <http://www.gigatronics.com/support/>

The 2400 and 2500 Series firmware is compatible with all models listed in the tables below:

2400 Series

2408B	2408S	2408B-X	2408L	2408M	2408AL	2408AM	2408C
2420B	2420S	2420B-X	2420L	2420M	2420AL	2420AM	2420C
2426B	2426S	2426B-X	2426L	2426M	2426AL	2426AM	2426C
2440B	2440S	2440B-X	2440L	2440M	2440AL	2440AM	2440C

2500 Series

		2502B
2508A	2508AS	2508B
2520A	2520AS	2520B
2526A	2526AS	2526B
2540A	2540AS	2540B
		2550B

CAUTION



Do not downgrade firmware!

It is strongly recommended not to downgrade the firmware below the version the signal generator was originally delivered with. Hardware improvements/changes may not be supported by older firmware versions. All firmware is backwards compatible.

Update the firmware in 3 steps:

1. Download the Automation Xpress Software from the Giga-tronics web site and install it on your PC. If you already have Automation Xpress software loaded on your PC, make sure that version is compatible with the firmware version you will be loading on your signal generator. To check compatibility, look at the firmware revision history table at the end of this document. It is always recommended to use the latest revision of Automation Xpress.
2. Download the signal generator's firmware file to your PC.
3. Follow the download procedure in Section 2 of this document.

2 Firmware Download Procedure

The following procedure should be used to download firmware to your signal generator.

1. Download the newest version of Automation Xpress from the Giga-tronics website.
2. After connecting the computer to the signal generator, open up the Automation Xpress software.
3. Click OK for the Demo mode.
4. Click on the Service tab.
5. Click on Firmware Download.
6. Choose appropriate connection.
7. Click on Download File.
8. Follow prompts displayed on the screen.

3 Firmware Revision History

Below lists the compatible versions of Automation Xpress software. To view more details about AX changes, see the AX Release Notes.

Release Date	FW Version	AX Version	AX DLL Version	Change Description
08/25/11	4.86	6.5.7	3.5.6	- GT2500B enhancements - Moved large and non-time-critical arrays to NVRAM to save code space, including the web server, logo, and all the fonts. Requires the latest AX 6.5.7 to initialize the NVRAM content for the instrument to work properly after upgrading to firmware V4.86. - Added Initialize Instrument window in AX. - Added Initialize Instrument function in gt2400dll.
03/15/11	4.77	6.5.6	3.5.5	- Updated USB driver. - Updated DLLDeclare.bas – VBModule.
01/21/11	4.77	6.5.5	3.5.5	Added SCPI command to set RF time off for list mode.
01/11/11	4.77	6.5.4	3.5.4	- Modify Corr:Flatenss for faster operation. - Add ALCOffType, allows "PM Leveling always off" in addition to "PM Leveling Off for pulses <1us". - Fixed up variable and label names. - Added "AON" parameter to SYST:OPENloop command. - Added new ALC host commands to change pulse polarity and output enable/disable. - Fixed RF Off time issue in IVI driver application and output bufer for list mode's unleveling - Fixed problem where PM is stuck in Burst mode via remote. - Fixed problem where SyncOutDelay does not work if set to -10ns to -40ns. - Changed min PRI from 30ns to 20ns, also allows SyncOutDelay to be -PRI to +PRI). - Fixed AM, FM, and PM submenu update via remote. - Added missing resolution to PM Burst Period and Delay. - Changed Pulse detection from synchronous to asynchronous. - Fixed issue where no RF is present with 10nS wide pulses. - Added SCPI command LIST:RFOffTime d (S MS US) to set RF time off for list mode. - Fixed the bug that when PM is ON then RF on, List mode does not output list correctly, only PM is output.
05/20/10	4.69	6.5.4	3.5.4	- Fix V/GHz for 50GHz. - Change "Preset" so if 8003 is connected, Ramp Resolution is not modified.

				• Change CORRection to allow 1000 points max.
05/06/10	4.67	6.5.4	3.5.4	• Fixed SWCR 381 – 2550B 31 to 44 MHz issue in dll. • Fixed Scan Mod step time list download bug in AX GUI.
05/06/10	4.68	6.5.4	3.5.4	• Fix 50 GHz Dist Bd Issue. • Fix CW problem when switching from Analog Ramp. • Display Boot code version in info menu. • Prepare for config 2520-637.
04/22/10	4.66	6.5.3	3.5.3	• Change Giga copyright to 2010. • Update boot version to 12.0. (Should be last change to boot code.)
04/16/10	4.65	6.5.3	3.5.3	• Implement request regarding switching ramp resolution.
04/09/10	4.64	6.5.3	3.5.3	• Add SCPI ramp delay command. • Round to 2 significant digits for Power values. • For 50 GHz models, change Attenuator switch points to -5, -15, -25, ect.
03/18/10	4.63	6.5.3	3.5.3	• Fix issue with non-2502 units caused by firmware V4.62.
02/22/10	4.62	6.5.3	3.5.3	• Fix 2502 power issues between 2.0 and 2.5 GHz.
01/22/10	4.60	6.5.3	3.5.3	• Fix issue with PM operation in 12000 emulation mode. • Fix HP8340 emulation command problems introduced in V4.57
01/12/10	4.59	6.5.3	3.5.3	• Preserve Flatness data when unit is preset.
12/23/09	4.58	6.5.3	3.5.3	• Implement CORRection:FLATness feature in HP8360 emulation.
12/18/09	4.57	6.5.3	3.5.3	• Fixed issues. 1) Add support for “ns” units for PM Delay command. (“PY” had defaulted to max value when “ns” entered.) 2) OPPL resolution is limited to the same as 12000
10/09/09	4.56	6.5.3	3.5.3	• 2500B/2400C AM performance enhancements.
09/18/09	4.55	6.5.3	3.5.3	• 2500B/2400C ModGen chnages: 1. Max AM rate changed from 100kHz to 1MHz. 2. Max FM rate changed from 1MHz to 10MHz. 3. Max Pulse Width changed from 10ms to 1 second. 4. Max value of PM SyncOut changed from 10ms to 1 second.
08/13/09	4.54	6.5.2	3.5.2	• Fixed AX 2500B 40GHz to 50GHz frequency setting bug.
08/13/09	4.54	6.5.3	3.5.3	• Fixed AX modulation bug. Modulation windows cannot be opened if the internal modulation disabled.
08/04/09	4.54	6.5.1	3.5.1	• Add SCPI cmd TRIG:SOURce:SPECIAL ON/OFF for new list mode that accepts a BUS trigger to start each sweep, but a BNC trigger to move from point to point. (Normal Repeat and Trigger type is ignored in "special" mode.)
08/03/09	4.53	6.5.1	3.5.1	• Fixed issues with GT2500B and GT2400C support.

				• Fixed interface window serial port crash bug. • Fixed phase modulation and low frequency issues. • GenInfo window now shows same firmware version format as the unit front panel. • Fixed the connection issue if the unit is not a GT2500B or GT2400C.
07/23/09	4.53	6.5.0	3.5.0	• Fix reply issue with SCPI command "POW:ATT:AUTO?" • Fix PM sync out 20ns timing issue for 2500B and 2400C. • Fix :SYSTem:OPENloopppm? command. • Fixed SCPI commands POW:CENt, POW:CENt?, POW:STEP?, POW:SPAN d • Fixed PM SyncOut delay output format • Add code to support new ModGen feature for 8360 emulation. • Make HP8360 Pulse Delay work for triggered mode.
06/27/09	4.52	6.5.0	3.5.0	• Fix 8340 Store/Recall issues including RF State, CW and Sweep mode startup. • Lockout Save/Recall functions from front panel in 8340 mode. (Only allowed from 8757.) • Fix 8340 mode with 2500B and 2400C (PM menu should be restricted). • Fix RF turn on when sweep started with RF off in 8340 mode. • Fix Recall Ramp Freq vs Ramp Power. • Remove Step Sweep and Ramp Sweep2 menu in 8340 emulation mode. • Fix issue where Recall state while connected to the 8757 hangs the system. (Due to no response to OM command after RC command.)
06/26/09	4.51	6.5.0	3.5.0	• Implement "Pulse Delay" feature for PM Internal Continuous mode for HP8360 emulation. • Add support for HP8360 PM commands. • Add command to change to 8360 emulation via remote.
06/24/09	4.50	6.5.0	3.5.0	• Implemented support for GT2500B and GT2400C, including: Unified FM, Phase modulation, Pulse modulation Burst mode, PM Leveling, and Power Boost.
06/23/09	4.50	6.4.3	3.4.1	• Add optional START leaf to the SCPI command TRIG:SOURCE command • Add restriction: X 6.5.0 or higher is required to load firmware • Add hidden X command XBDB to access the boot utility. • Add new high level firmware load for Ethernet, GPIB, RS232 and USB. • Add SCPI command SYST:FUQ? so DLL can query firmware load status. • Show message after firmware download and fix up other boot messages. • Add Cal factor for FM Internal Wide mode.

				• Add ParamBlock flag for rear output unit: IsRearOutput. • Fix FM Cal for 2500A. • Fix FM wide mode issues when at high mod index. • Fix FM synchronization issue at boot up. • Make Power Sweep Step remote command work for 8003. • Change Power Sweep step default for 8003. • Make HP8370 emulation automatically show the menus. • Make Cable Cal operation On/Off and add indicator "CC". • Fix Cable Cal and Amp Cal indicator issue for Save/Recall.
04/18/09	4.49	6.4.3	3.4.1	• Added firmware download using USB. • Added fast CW using USB. • Fix Remote Activation problem when user changes language.
03/25/09	4.49	6.4.2	3.4.0	• Fix FM unlock issue for 2500Bs when switching above and below 10 MHz • Fix Remote Menu Display mode for serial DLL usage. • Finalize 2400C changes. • CableCal now standard. • GT9000, GT7000, and GT900 now standard by default in FW, no configuration required. • Fix Char data download issue. Problem observed when opening a connection via DLL with either Ethernet or USB, then when opening a connection via GPIB, the first try will fail due to the query returning the Cal data. • Preserve Remote variables across a NVRam reset due to firmware load.
02/19/09	4.48	6.4.2	3.4.0	• Add support for USB FastCW including char data upload.
02/18/09	4.47	6.4.2	3.4.0	• Fix occasional failure problem for Internal FM cal in 2400s.
02/13/09	4.46	6.4.2	3.4.0	• Add support for USB firmware download • Resolve attenuator issue for 2550B. (Use alternate var for more space.) • Make Analog Sweep a separate option. • Fix AM and FM boot up issues. • Display 2500A or 2400B until the 2500B and 2400C are released. • Fix internal Phase Mod menu showing without ModGen. • Fix FM boundary checking issue. • Update NVRam version to force initialization.
02/03/09	4.45	6.4.2	3.4.0	• Add msvbvm50.dll file to AX installation files to fix Windows Vista the file missing problem.
01/07/09	4.45	6.4.1	3.4.0	• Fix AX crash bug if firmware version with a character.
12/22/08	4.45	6.4.0	3.4.0	• Implemented SCPI commands to set/query ramp resolution (number of points in the ramp).

				- Resolved issue with AM source SCPI command. - Updated PRI, width, external syncout delay, PM delay and PM mode related SCPI commands with PM burst mode. - Added SCPI commands to set/query burst period, number of pulses in burst, RF delay and burst trigger type. - Added SCPI commands to set/query phase modulation. - Added SCPI commands to set/query power boost and open loop PM features. - Update FM, PhM max deviation for 50 GHz units - Fix .001 Hz resolution for front panel entry.
12/08/08	4.44	6.4.0	3.4.0	- Enabled No Delayed ACK for TCP mode to enable full functionality of FastCW for Ethernet. - Add/Fix delete list functions for Native and SCPI. - Fix SCPI SYS:ERROR? command.
12/05/08	4.40	6.4.0	3.4.0	- Fix numerous Ethernet issues. - Add Support for Point-by-Point Dwell time in List Mode - Fix when DU 9 already active, OpenConnection fails due to extra time to paint display - Add function to get boot-up errors. - Fix up header file for LabWindows. - Fixed Ethernet AutoProg to add a call to GT2400_SetIPAddress function.
11/26/08	4.43	6.4.0	3.4.0	(General Changes) - Improve FastCW. Switching time dropped to around 500 us from over 900 us. - Added protection when fast CW checksum fails to avoid PC end timeout - Fix a bug in CW blanking - Added flow control for fast CW in Ethernet. - Reset TCP socket everytime when IP address is changed so that TCP connection could be recovered from a broken connection without restarting the box. - Added native commands to control CableCal process and access data - Add HP8370 series terminators CR and LF. - ALC code change to avoid errors in detector zero cal. (2500B features added) - Added PM burst mode - Added support for new C1 ModGen Board - Added Power Boost control - Added 50 GHz support
11/05/08	4.41	6.4.0	3.4.0	- Fix ALC Data packet issue for FastCW mode (affects all transfer methods). - Fix ethernet FastCW issues.
11/05/08	4.42	6.4.0	3.4.0	- Add CFG-750 support (Master/Slave) - Fix FM issues. - Add Amp Mode/Cal (2600)

08/20/08	4.40	6.3.6	3.3.3	• Set the CW frequency to the ramp start freq when mode is changed to ramp freq. This is to eliminate the unlock condition caused by not enough time to settle when RF is turned on during ramp. If RF is turned on during ramp, the ramp will restart and require longer time to change from the current ramp freq to the start freq. • Fix when FM is turned off on a 2400, there is a brief unlock. • Added a 30 us delay after the Local button is pressed and before the lock detection is turned on. This is to avoid the brief unlock when switching from list mode to local CW. • GTA changes • Modulation no longer restricted for GTA except, NB FM only. • Fix for DU 9 display mode in HP8370 emulation. • Modified ListLoad function to allow it to work with old DLL (without Pt-By-Pt dwell time.) • Fix for large size list serial download problem caused an early termination problem in GPIB list download. Now set the OPC status to pending only for GPIB. • Undo previous changes, the problem was in the DLL. • Deleted leading zeroes for IP address and subnet mask to avoid confusion.
07/18/08	4.39	6.3.6	3.3.3	• Added a native command to set RF Off Time in lists. RFOT d (S MS US) • Added Improved Analog Ramp. • Update for Option 31 • Correct the FM error message for GTA and Analog Ramp • Changed step sweep so it can sweep backwards now. • Add "DU 9" mode to SCPI language: "DISPlay:MENU:STATe n". • Fix "ramp sweeping" text display. • Fix uninitialized data problem. (Observed when changing from 9.9 MHz to 10 MHz) • Fix Atten display issue.
05/03/08	4.36	6.3.6	3.3.3	• Fix unlock issues. • When GT900 emulation mode was first entered, the operation mode is now default to CW, so that the frequency changes can be made without setting the modes. • Fixed SEND STATUS command. It now returns correct lock/level status. • GT900 Emulation mode: SEND STATUS command
04/22/08	4.33	6.3.6	3.3.9	• Change List mode GUI to support "point-to-point" dwell times. • Add GT2400_GetSystemBootUpData

04/17/08	4.35	6.3.6	3.3.3	• Add Fast CW “DU 9” mode • Analog ramp improvements, merged into 8340 mode. • Fix digital sweep issues. • Improve system menu arraignment and add baud rate setting. • Add support for Agilent EPM in CableCal menu and improve CableCal menu. • Finalize modulator table changes. (Improves AM performance for NRL/2500B) • Fix ALC issues causing inconsistent dwell times. • FW supports “point-to-point” dwell times. • Fix Step and Knob input incorrectly allowed in Language Menus. • Fix Ethernet config issues.
03/25/08	4.33	6.3.3	3.3.3	• Fix false unlock problem for GT2400A units. (Problem visible after V4.26.) • Undo previous change, ALCMinPower restored to -20 dBm.
01/25/08	4.32	6.3.3	3.3.3	• Limit ALC power minimum to -17 dBm to address “Unleveled” issues close to -20.
12/03/07	4.28	6.3.3	3.3.3	• Add 2500 support for HP8340/8757
11/09/07	4.26	6.3.3	3.3.3	• Add GTA support.
11/06/07	4.25	6.3.2	3.3.2	• Added Ethernet and USB capability • " " (Space) separated commands in GT900 emulation mode, as well as other GT 900 emulation mode issues. • Added step sweep. • Added default baud rate option.
07/20/07	4.24	6.2.10	3.2.9	• Fixed AX Pulse Modulation Panel mode radio button to default back to Continuous when switching from External to Internal Source. • Fixed DLL function GT2400_SetPMSource to assign a programmed value to the correct member of the structure. Previously assigning to .PMState instead of .PMSource. • Fixed DLL function GT2400_SetPMIntRFPulseDelay to send “PULSE:DElay” command instead of “PULSE:PER”. • Fixed DLL function GT2400_RFBlanking to send “RFB” instead of “RFD” • Fixed AX 6.1/6.0—SCPI/NATIVE Auto-Programmer Does Not Record CW, LIST, or PULSE (Internal) in DEMO. • Fixed AX AutoProgrammer Automation Xpress Demo Mode. • In AX disabled Unleveled interrupt during the list operation. Also includes the following AX V6.2.9 changes: • Implemented disabling of ScanMode for 2500 synthesizer. • Fixed displaying 2400 model number when

				connecting to 2500. - Increased the frequency resolution to .001 Hz. Also includes the following DLL V3.2.8 change: - Fixed RFOfftime data corruption during downloading of List to the synthesizer.
05/03/07	4.24	6.2.8	3.2.7	- Enhanced Serial Port initialization at start up by forcing the synthesizer to the target baudrate. - Enhanced Serial Port switching via Interface panel in a similar manner as above. - Fixed Serial Port reinitialization from Interface panel when a previous connection was unsuccessful.
04/04/07	4.24	6.2.5	3.2.4	Fix POW:STOP command and remove 20 dB limitation in remote power sweeps.
03/26/07	4.23	6.2.5	3.2.4	Fix FM Internal Narrow mode calibration bug for GT2400.
03/13/07	4.22	6.2.5	3.2.4	- GT900 Emulation Changes: - Implement Disp On/Off command. - Add support for special terminators without the need for an EOI: [CR] [LF] , : ; /
03/12/07	4.21	6.2.5	3.2.4	- Added APIs for GetRepeatType and GetTriggerType. - Disable fast RF on in list mode.
03/01/07	4.21	6.2.4	3.2.3	Fix List mode bug when last and first freqs are the same.
02/22/07	4.20	6.2.4	3.2.3	- Fix compatibility with 8003: - Make Separate Ramp function for 8340 emulation, and clean up standard ramp function. - Fix Ramp Freq unlock with fast sweep time problem. - Fix List based mode transitions: When switching from an unknown previous condition. - Force blanking when transition from freq is not known in Ramp Freq. - Fix Ramp Freq problem - Fix backwards list problem for band crossings and for when consecutive freqs are the same. - Remove unwanted screen painting during remote operation. - Moved the call to StartExecutionTask to proper place which inadvertently fixes the unlock problem in 2400B when turning FM off. - Fix CW blanking logic error. - Fix problem when Start and Stop Freq or Power are the same.
02/14/07	4.19	6.2.4	3.2.3	Fix freq comp data application problem.
02/13/07	4.18	6.2.4	3.2.3	Fix integrator gain and ramp out issues.
02/06/07	4.17	6.2.4	3.2.3	- Fixed display messages for boundary check in PM and FM - Add SCPI commands to test AM impedance control. - Auto set AM impedance to 5k for HP8370 Emu (CFG 627).

01/23/07	4.16	6.2.4	3.2.3	• Fixed Fast CW LF operation. • Fixes List and Ramp mode power spikes. • Fix Low Freq Ramp and List problems. • Fix Phase adjust issues for GT2500. • Fix 8340 Emu problem. • Fix compatibility with 8757D in 8340 mode complete • Disable "Ramp Sweep Blanking Timing" in 8340 mode. • Fix Ramp Freq 0-10V Ramp out problem.
01/16/07	4.15	6.2.4	3.2.3	• Support modulation features at low frequency.
01/05/07	4.15	6.2.3	3.2.2	• Fix Ramp Frequency and Ramp Power functionality problems. • Fix problem with skipped atten cells related to power menuline limits. • Fix Low Frequency calculation bug. • Add Ramp During CW for 2500 with Scaler Analyzer • Minor Low Freq Modulation fixes.
12/29/06	4.14	6.2.3	3.2.2	• Add Low Frequency Modulation Support • Add support for Agilent EPM power meter Cable Cal
12/27/06	4.13	6.2.3	3.2.2	• Fixed a typo in frequency comparison.
12/20/06	4.13	6.2.2	3.2.2	• Improved and restored firmware download in demo mode. • Special handling in low frequency range to synchronize with firmware V4.13. • Fix New 'Advanced Menu' ALC Menu Does Not Update After Local ALC Change and [Activate] • Fix New CW Menu 'Power Offset' and 'Power Slope' Do Not Update After Local Front Panel Change
12/08/06	4.12	6.2.0	3.2.0	• Fix intermittant UNLOCK conditions and other Lock Detect issues • Fix – Oven Cold indicator fully functional.
11/23/06	4.10	6.2.0		•
11/09/06	4.09	AX V6.1	3.1.2.2	GT2400/GT2500 issue: • Fix SCPI PULSE:WIDTH, PULSE:SYNC Commands Do Not Work

For other versions of firmware that are not listed above, please contact the factory.