TitanSMA/EA - Release Notes

Firmware Versions	Release Date
4.3.20 (TitanSMA/EA)	2018-09-19
4.3.19 (TitanSMA/EA)	2018-06-29
4.3.18 (TitanSMA/EA)	2018-04-30
4.0.10 (TitanSMA/EA)	2018-01-23
4.0.8 (TitanSMA/EA)	2017-11-02
3.3.4 (TitanEA)	2016-11-15
3.3.3 (TitanSMA)	2016-11-11

Summary for Version 4.3.20

Firmware version 4.3.20 is a general availability release that introduces improvements and resolves some outstanding issues. This firmware release includes a workaround to address the GPS Week Number Roll Over limitation, a major GPS limitation that causes the week number to go back in time by approximately 20 years every 20 years. For TitanSMA, firmware version 4.3.20 also resolves an archiving issue that occurred in earlier firmware versions.

Summary for Version 4.3.19

Firmware version 4.3.19 is a general availability release to support a minor hardware update that is required for newly-manufactured TitanSMA/EA instruments. Otherwise, this firmware version provides the same features and performance capabilities as Firmware version 4.3.18. If your instrument is currently running Firmware version 4.3.18, there is no reason to update to version 4.3.19.

Summary for Version 4.3.18

Firmware version 4.3.18 offers a number of new capabilities and improvements for the TitanSMA/EA, including accelerometer azimuth and tilt orientation correction as well as enhanced calibration capabilities thanks to a new user configurable Sine and PRB (Pseudo Random Binary) calibration waveform synthesizer. Additional improvements and fixes are also included that improve the usability and reliability of the instrument. See details below.

New features and improvements in release 4.3.20 include:
- [Workaround for GPS Week Number Rollover](#)

New features and improvements in release 4.3.18 include:
- [Synthetic Sine and PRB waveform generation for calibration](#)
- [Calibration playback files with adjustable gain, duration, lead-in and lead-out](#)
- [Calibration command API](#)
- [Sensor 3D real-time orientation correction using orthogonal data rotation](#)

Fixes and changes addressed in release 4.3.20 include:
- [Fixed the Web interface to display correct default duration for Calibration Playback files](#)
- [Resolved continuous archiving issue on start up that prevented archiving of channels (TitanSMA only)](#)

Fixes and changes addressed in release 4.3.18 include:
- [Fixed problem with time-based SeedLink data retrievals](#)
- [Sample rate added to Dataless SEED instrument response](#)

New Features and Improvements released in 4.3.20 firmware

Workaround for GPS Week Number Rollover
The Global Positioning System (GPS) has a design limitation where the timing information from the satellites uses a 10 bit (0-1023) week number that cycles every 20 years. This is called Week Number Roll Over. Firmware version 4.3.20 introduces a workaround for this issue where the TitanSMA/EA compares the week number received from the GPS satellite with a fixed minimum week number and adjusts the received week number if necessary. If the satellite week number is less than 2016 then firmware adds 1024 to the GPS receiver week number permitting operation until week 3040 (2038-04-10) when it will roll back to week 2016 (2018-08-25).

New Features and Improvements released in 4.3.18 firmware

Synthetic Sine and PRB waveform generation for calibration
A new synthetic waveform signal generator for calibration introduces the ability to generate on-demand sine wave and PRB signals. This feature allows the user to configure the frequency or pulse-width, duration, amplitude, as well as lead-in and lead-out silence intervals for the selected waveform.

This feature complements the existing waveform file playback feature; it does not replace it. The file playback feature allows you to generate any specific signals you wish to define and upload to the TitanSMA/EA.

Calibration playback files with adjustable gain, duration, lead-in and lead-out

Calibration waveform files uploaded to the TitanSMA/EA can now be played back with adjustable gain, duration, lead-in and lead-out silence, and in voltage source mode. Gain is adjustable from 1.0 to 0.001. File playback can be limited to a specific duration instead of playing back the entire file. Lead-in and/or lead-out silence can be set from 0 to 3600 seconds.

Calibration command API

The new HTTP-based Calibration API provides the ability to create custom scripts or applications to initiate a calibration for a specified sensor. The Calibration API requests allows the user to specify the desired parameters for the required calibration output signal type: file playback or synthesized sine or PRB, voltage waveform, and other waveform parameters.

Sensor 3D real-time orientation correction using orthogonal data rotation

A new feature has been added to firmware version 4.3.18 to perform real-time 3D seismic data rotation to correct sensor orientation for use cases in which the physical orientation of a Titan accelerograph, is different than what is desired, and where the output X, Y and Z signals do not represent the desired directions of sensitivity (often intended to be East, North and Vertical). Examples of where the sensor orientation correction feature may be used include sensor azimuth correction and sensor tilt correction. Please refer to the *TitanSMA User Guide* or *TitanEA User Guide* for detailed use case information.

Fixes and Changes released in 4.3.20 firmware

Fixed the Web interface to display correct default duration for Calibration Playback files

In the **Waveform** tab on Web interface, configuring a Playback type of calibration allows the user to select different sample calibration files from the **Filename** dropdown menu. Each sample calibration file has a default value for Duration that should change when you select a different Filename. For example, "Titan prb 20g 10ms 5min" has a default Duration value of 300 and "Titan sine 2g 30s" has a default Duration value of 30. In previous firmware versions this Duration default value did not refresh when a different Filename was selected. Firmware 4.3.20 fixes this issue.

Resolved continuous archiving issue on start up that prevented archiving of channels (TitanSMA only)

For TitanSMA, in previous firmware versions, upon start up, some channels would not be included in continuous archiving. This was dependent on the condition of the Store when continuous archiving started and was most likely to occur if a Store had been recreated shortly before continuous archiving started. Firmware 4.3.20 fixes this issue. Channels that

may have been missed on start up are now discovered and added to the continuous archive process.

Fixes and Changes released in 4.3.18 firmware

Fixed problem with time-based SeedLink data retrievals

In previous releases, in rare occurrences, time-based SeedLink data retrieval requests returned no data. Firmware version 4.3.18 fixes this issue.

Sample rate added to Dataless SEED instrument response

The currently configured sample rate is now correctly reflected in dataless SEED files generated by the instrument. The sample rate can be found in SEED blockette #52, field #18.

Upgrade Considerations and Dependencies

Ensure all default instrument passwords are changed to reduce the risk of unauthorized access

Nanometrics highly recommends that all instrument passwords are changed from the default values to improve network security and reduce the risk of unauthorized access. This includes the root password, calibration password, and admin password. Nanometrics technical note *How to Increase the Security of your Internet-connected Instruments (18109)* provides recommendations on how to ensure your instruments are secure, including how to change these passwords to improve instrument security. This technical note can be obtained through our online knowledge base, or by contacting Nanometrics customer support.

User-uploaded calibration playback files are deleted when upgrading firmware

User-uploaded calibration playback files must be reloaded onto the instrument after a firmware upgrade, as these are deleted as part of the firmware upgrade process.

Firmware upgrade from 3.1.3 or earlier will cause the Linux root password to revert to the factory default password

If upgrading the firmware from version 3.1.3 or earlier to version 3.2.8 or later, the passwords for logging in to the Linux root or the calibration file upload accounts will revert to factory default passwords. The passwords to log on to the Web Interface are preserved.

> **Workaround**: If you have previously changed the Linux passwords, you must use the factory default password to login and manually update them to the desired passwords. Search for "Calibration Password" in the online help or in the PDF User Guide.

Apollo Server and Apollo Project Version Dependency

If you are using Apollo Server and Apollo Project with the TitanSMA/EA, be sure to use Apollo Server version 2.5.9 or higher and Apollo Project version 2.4.1 or higher. This is to support the default NP streaming format used in TitanSMA/EA firmware version 3.1.x or later. Alternatively, the 'Libra Compatibility Streaming' option available in the Configuration menu can allow the TitanSMA/EA to work with older versions of Apollo Server and Apollo Project.

Configurable Archive Filenames (TitanSMA only)

For the TitanSMA, upgrading to firmware version 4.3.18 from a version prior to 4.0 will apply changes to configurable archive filename settings:

- File format extensions will be appended to all existing archive filename patterns. '.miniseed' will be added to seismic data archive filenames, and either '.miniseed' or '.csv' will be added to existing SOH archive filenames, depending on the configured SOH archive format.
- Seismic event archives will be reconfigured to use MiniSEED format, regardless of the current configuration. This format setting will have to be changed after firmware upgrade if another format is desired.
- Support for SOH archive files in NP format was removed in firmware version 1.5.28. If the TitanSMA is initially using an older firmware version and SOH archive files are configured to use NP format, this setting will be reconfigured to use MiniSEED format.

Other Considerations or Limitations

Some pages of alternate languages unavailable in Firefox

Newer versions of Firefox cannot display all of the Web Interface pages for all languages, and navigating to these unavailable pages returns the user to the **Summary** page.

> **Workaround:** This issue is exclusive to newer versions of Firefox. Using an alternate browser (Chrome, Safari) will avoid this issue.

Context menu "paste" does not work properly in configuration menu

When configuring the instrument using the configuration menu in the Web Interface, the use of context menu paste (i.e. right-clicking the item and selecting "paste" from the subsequent menu) will insert text that visibly looks correct but will not be recognized by the configuration system.

> **Workaround:** Use the keyboard shortcut 'CTRL-V' to paste the configuration instead of using the context menu paste.

HTTP based web service

The Web Interface and the APIs use the HTTP protocol for instrument access. Some browsers may show a security warning when attempting to access the instrument.

Column names for Sensor State of Health in Exported CSV Files are no longer configurable

When defining a custom sensor in the instrument configuration it is possible to specify custom names for each of the Sensor SOH channels. Starting with firmware version 4.3, these custom channel names will appear on the **Sensors** page only, and will no longer be downloaded with the CSV-based state of health files.

Continuous Archive may not include all expected channels when recreating the Store

If continuous archiving is enabled, and it later becomes necessary to recreate an instrument Store from the Web Interface **Maintenance** page, some channels may not be included in the archive.

> **Workaround:** Assuming the default internal and external state of health reporting intervals are configured, disable and re-enable continuous archive approximately 70 to 90 minutes after recreating the instrument Store. This issue will be resolved in a future release.

Ext4 format no longer supported on external SD media, as of version 3.4 (TitanSMA only)

As of firmware version 3.4.x, TitanSMA no longer supports Ext4 formatting for the removable SD card. SD cards for archiving must be formatted as FAT32 SDHC. You can format an SD card when it is installed on the TitanSMA, or use a Windows, Linux or Macintosh PC to format an SD card as FAT32 SDHC. Note that Windows cannot format a 64GB SD card as FAT32 SDHC. SD cards preformatted as FAT32 SDXC will need to be reformatted as FAT32 SDHC on the TitanSMA instrument.

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