

SensorConnect Changelog

Updated: 2021-05-28

v14.1.7 (2021-05-28)

Inertial Features and Changes

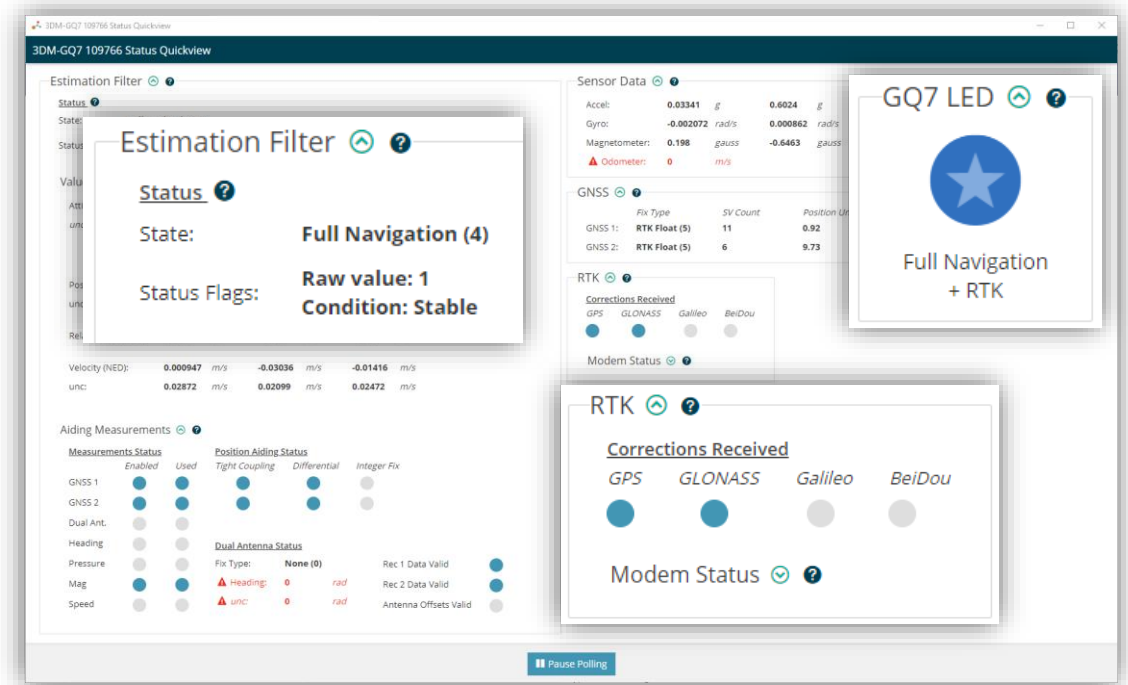
Status Quickview Window

The new Status Quickview option launches a separate window that continuously polls and displays some most commonly used data fields to more quickly and easily see an overview of the device state without configuring the message format and setting up a data dashboard.

This window can be viewed for each connected device alongside the main SensorConnect window as the device is configured or data is viewed on a custom dashboard.

The status quickview is supported for all inertial sensors but has some additional elements to help provide a more complete status overview for the 3DM-GQ7 including LED displays that mirror the device LED and 3DM-RTK LED (if connected).

Data in the quickview window is not stored unless the device is configured to stream each field.



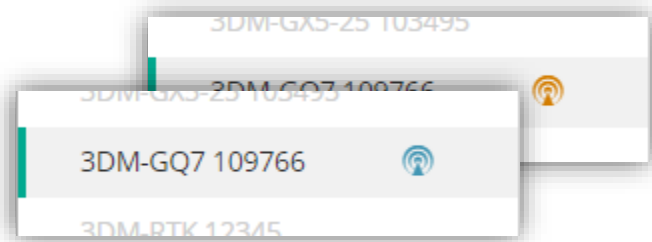
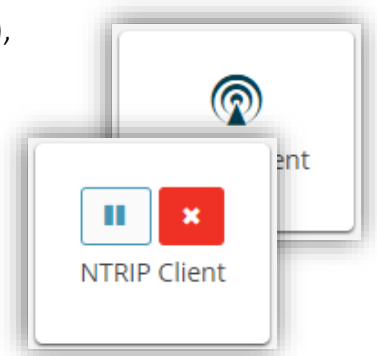
NTRIP Client for RTK Corrections without 3DM-RTK

The NTRIP Client allows correction data to be streamed directly to a device from a 3rd party network. This feature is currently only available for the 3DM-GQ7 from the device options screen under the Advanced section. An internet connection is required to use this feature.

When clicked a dialog is presented to enter the 3rd party NTRIP caster details (host, port, mountpoint), your user credentials for that network, and the GQ7 auxiliary port connection details.

Once connected Pause/Resume and Stop streaming buttons are available on the NTRIP Client option tile.

- **Pause** to temporarily stop streaming corrections which can be restarted by clicking **Resume**
- **Stop** to cancel streaming correction and close the connection



While streaming an indicator displays on the device tree to indicate corrections are being received. The indicator is **blue while receiving corrections** and turns **orange when streaming is paused**. The state and last received time can be seen in the tooltip when hovering the mouse pointer over the device tree indicator.

Other changes and bug fixes

- Timestamp data fields are now saved to the device at the beginning of the message format instead of the end.
- Fix the available Estimation Control configuration options for the CV5-25 (hard and soft iron auto-calibration now available)
- GNSS Position and Attitude Aiding Status, Aiding Measurement Summary data channels: fix status bitfield parsing, change time of week channel name from “TOW (Last Valid)” to “Time of Week” for accuracy (previously collected data will not be pulled forward into new channel but will remain available under old channel name).

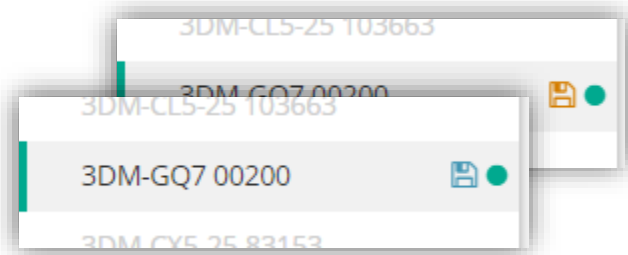
v13.9.2 (2021-04-06)

Record to Binary File

Recording raw byte communication to and from the device was previously available in the Monitor Bytes window for connected devices (base stations, inertial devices, 3DM-RTK) but has been moved to the main device options screen for better accessibility. For inertial and RTK devices it is found under the Control section, for base stations it is found under Advanced.

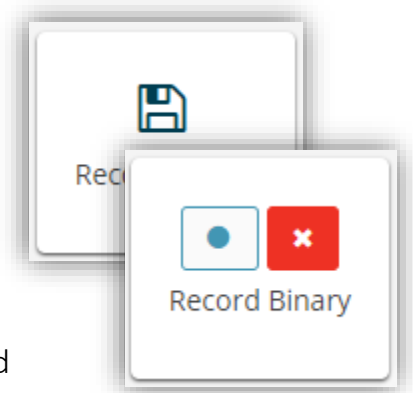
When clicked the user is prompted to select a file location for the new binary file. Once selected the file is created and all traffic over the port will be recorded unless recording is paused or stopped. Pause/Resume and Stop button controls are accessed on the Record Binary option tile once a file is selected and is open.

- **Pause** to temporarily stop recording – additional traffic will be recorded to the same file when **Resumed**
- **Stop** to close the file – to continue recording another file will need to be opened



When a file is open a save indicator displays on the device tree to indicate communication with that device is being recorded. The indicator is **blue when actively recording** and turns **orange when recording is paused**.

While actively recording the file name, size, and write rate can be seen in the tooltip by hovering the mouse pointer over the device tree indicator.



Wireless Features and Changes

Torque-Link-200-3ch Support

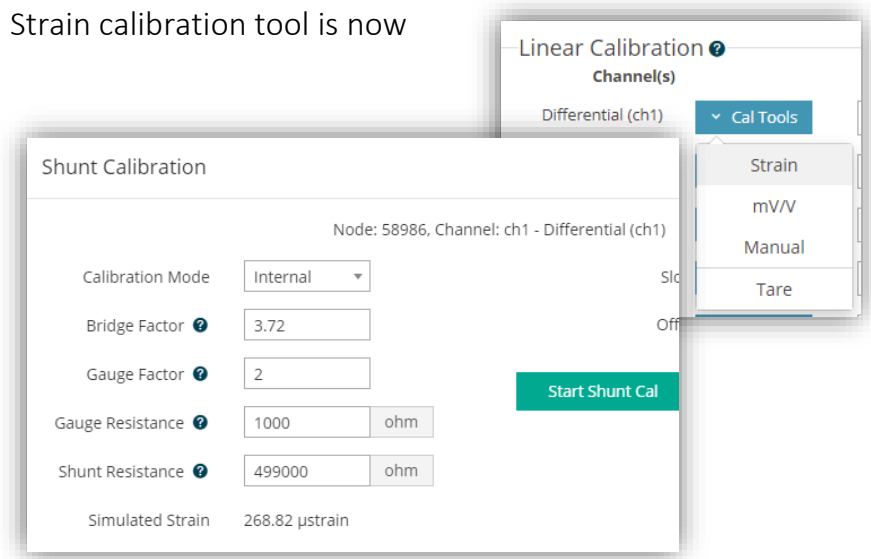
Full configuration and data visualization support has been added for the Torque-Link-200-3ch.

Strain Calibration tool improvements

The “Number of Active Gauges” input field on the wireless channel Strain calibration tool is now “Bridge Factor” and input is no longer required to be a whole number.

Bridge Factor is the number of active arms in a strain gauge Wheatstone bridge but may also be a fractional value depending on the physical configuration of the gauges.

For example: steel has a Poisson ratio of 0.3 so gauges used in a transverse configuration on steel may contribute 0.3 to the bridge factor instead of 1.



Other changes and bug fixes

- Fix for base station transmit power changing on failure to communicate with a previously discovered node in the Sampling Network screen.

Inertial Changes and Bug Fixes

- Get SensorCloud RTK Activation Code improvements: previously clicking Get Activation Code automatically copied the code to the clipboard but now launches a dialog that displays the code with a copy button and a link directly to SensorCloud RTK.
- Fix bug causing 3DM-RTK firmware upgrades to hang indefinitely at the end of the upgrade process after applying the new image and power-cycling.
- Add support for new GQ7 data output fields:
 - GNSS Dual Antenna Status (0x82,0x49)

v13.8.5 (2021-02-01)

Wireless Changes and Bug Fixes

- Fix bug preventing display of data sampled once every 30 seconds or slower on the Timeseries Graph widget – this will retroactively fix the display of previously collected data.

Inertial Features and Changes

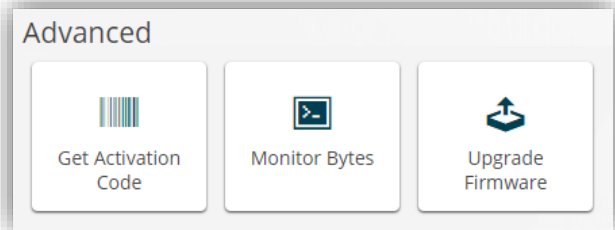


3DM-RTK Support

Support has been added for the 3DM-GQ7.
Available functionality includes:

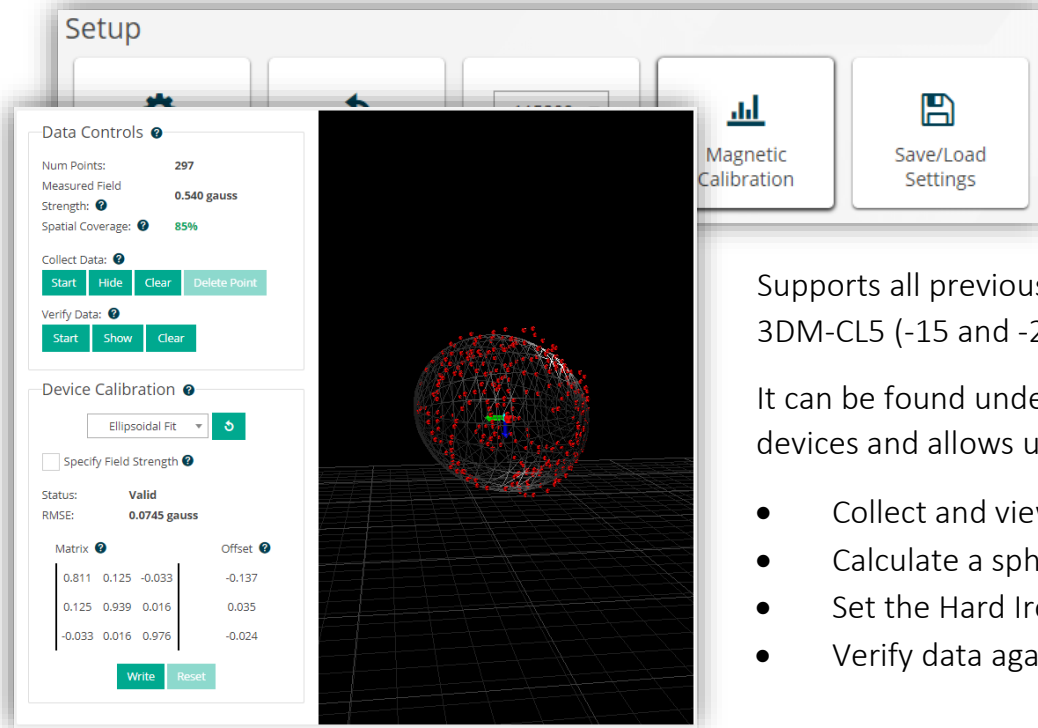
- Firmware upgrades
- Read SensorCloud RTK activation code
- Basic device, modem, and signal status indicators

When plugged into a connected 3DM-GQ7 the RTK device status information can be viewed by sampling the GNSS RTK Corrections Status channel field in the RTK data set.



3DM-CL5-15, -25 Support

Full configuration and data visualization support has been added for the 3DM-CL5-15 and 3DM-CL5-25.



Magnetic Calibration Tool

Previously available in the standalone Iron Calibration tool, this functionality has been integrated into SensorConnect for convenience and stability.

Supports all previously supported devices as well as the 3DM-GQ7 and 3DM-CL5 (-15 and -25).

It can be found under Setup on the main options screen for supported devices and allows users to:

- Collect and view plotted magnetometer data
- Calculate a spherical or ellipsoidal fit
- Set the Hard Iron Offset and Soft Iron Matrix device configuration
- Verify data against the calculated fit

MIP Packet Builder

Interface added for building custom MIP commands to send to inertial devices and parse responses available under Advanced on the main options screen for supported inertial devices. Most users will not need this functionality and should use this only with guidance from support.

Other changes and bug fixes

- Fix performance issues around data collection with Byte Monitoring window open – now, by default, data packets will be excluded and only commands and responses displayed. All traffic (data, commands, responses) will still be saved to recorded binaries.
- Add support for new GQ7 data output fields:
 - Odometer Scale Factor Error (0x82,0x47)
 - Odometer Scale Factor Error Uncertainty (0x82,0x48)
- Add warning messages in Configuration to help with GPIO config (i.e. warn on odometer input enabled but not configured to a pin).

v13.4.13 (2020-11-03)

Wireless Changes and Bug Fixes

- Added support for mass units: grams, tons, tonnes (metric ton)
- Fix beacon timing issue on start synchronized sampling network

Inertial Features and Changes

3DM-GQ7 Support

Full configuration and data visualization support has been added for the 3DM-GQ7 (limited support previously available).

Firmware Upgrades

Inertial firmware can now be upgraded via SensorConnect for all GX5, CX5, and CV5 devices, and the new GQ7. All-in-one firmware files (.zhex) will be made available through the Microstrain site for easy, one-click upgrades.

Serial	Type	Status	Current Version	New Version
6284.00200	3DMGQ7	Uploading... 62.65%	Comms: 0.4.97 IMU: 0.8.75 GNSS: 0.2.75 NAV: 0.2.9	Comms: 1.0.1 IMU: 1.0.1 GNSS: 1.0.1 NAV: 1.0.1

Filename: GQ7_firmware_r48902_b28.zhex

The legacy upgrade tool will not work with the new ZHex file format and does not support the GQ7.

Other changes and bug fixes

- Improve Reset button functionality – display confirmation dialog with option to save current settings to startup
- -10 devices message format no longer reset to all channels at max rate on connect

v12.7.7 (2020-07-28)

Wireless Features and Changes

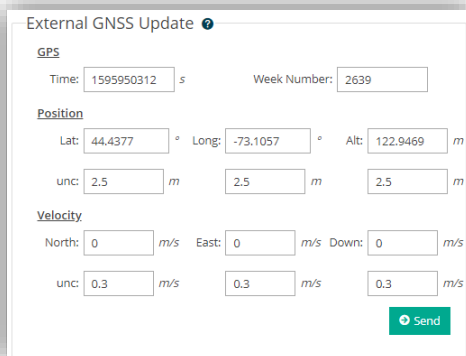
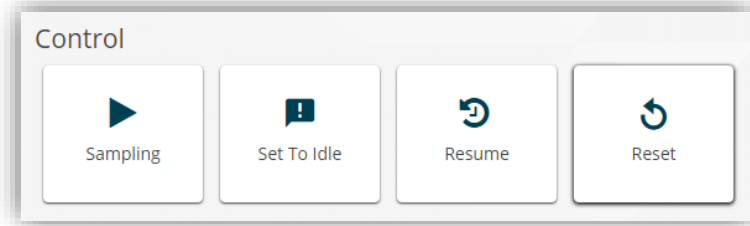
Bug fixes

- Fix for failure to load Configure screen after changes made to Temperature Sensor settings.

Inertial Features and Changes

Reset Device button

Reset button is now available for all inertial devices under the Control section of the main options screen. This button sends the Reset Device command (0x01, 0x7E) to the sensor.

A screenshot of the "External GNSS Update" form. It has sections for "GPS" (Time: 1595950312 s, Week Number: 2639), "Position" (Lat: 44.4377 °, Long: -73.1057 °, Alt: 122.9469 m, with uncertainty values of 2.5 m for each), and "Velocity" (North: 0 m/s, East: 0 m/s, Down: 0 m/s, with uncertainty values of 0.3 m/s for each). A "Send" button is at the bottom right.

External GNSS message builder

Users are now able to send a GNSS update message to the filter through the Initialize/Reset Estimation Filter screen. This sends only a single External GNSS Update command (0x0D, 0x16) at a time, it does not transmit continuously. In its current state this feature is most useful for providing just an initial position for a filter configured to accept external GNSS messages.

Other changes and bug fixes

- Sensor to Vehicle Frame Transformation setting changed to Sensor to Vehicle Frame Rotation for accuracy
- Fixed Antenna Offset validation to ensure the offset magnitude ≤ 10 m
- Fixed Accel Bias, Gyro Bias, Capture Gyro Bias, Mag Hard Iron Offset configured values switching on save/load
- Sampling configurations: changed default sample rate to 100 Hz for supported data sets

v12.5.16

(2020-03-19)

Wireless Features and Changes

Channels 25 and 26: Wireless frequency channels 25 and 26 are now available for the WSDA-200-USB and WSDA-2000.

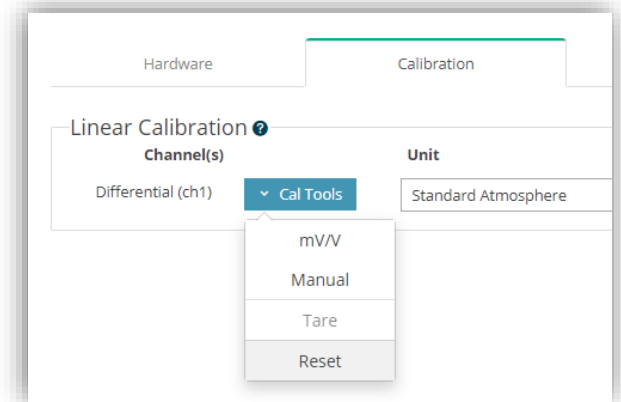
V12.5.10 (2020-02-07)

Wireless Features and Changes

PT-Link-200-GY Support: Full data streaming and configuration support for the new PT-Link-200-GY has been added.

Reset to Factory Calibration

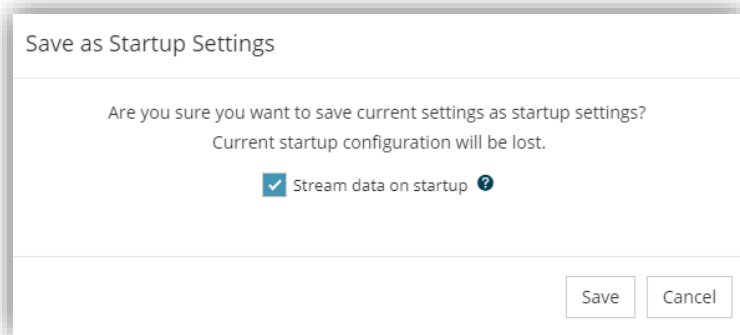
The ability to reset a Wireless node channel's calibration back to the original factory calibration values has been added for supported devices. The Reset button is available under the Cal Tools menu on the Calibration tab of the Configure screen. This is currently only supported on the PT-Link-200-GY.



Inertial Features and Changes

Enable/Disable Streaming on Startup

An option has been added to Save as Startup Settings on the Save/Load Settings screen to enable or disable streaming on startup. Changing this option will not change current settings, it will only be applied on startup.



Bug Fixes

- Clicking Apply on the Inertial Sampling Config screen will now only apply the new message format without resuming streaming – the Start button still both applies the new message format and initializes/resumes streaming.
- Limited functionality issue on inertial devices connected via serial at a baud rate of 9600 has been resolved.

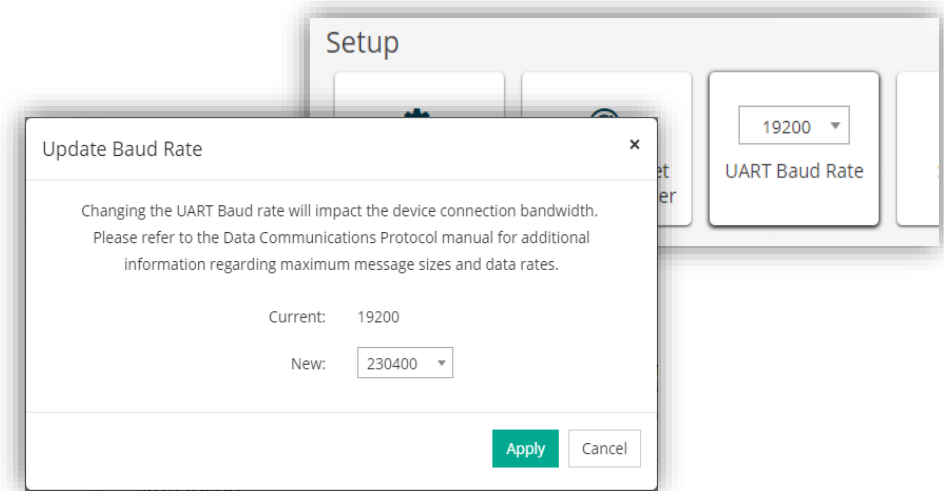
V12.3.0 (2019-12-18)

G-Link-200-R Support: Full data streaming and configuration support for the new G-Link-200-R has been added.

Inertial baud rate configuration:

The ability to configure the baud rate on inertial devices has been added. It is accessible from the UART Baud Rate button on the main device options menu. When changes are applied the connection will automatically be re-established at the new baud rate to maintain communication.

Previously, connection via USB always displayed the baud rate as 115200 in the device info panel – this will now accurately reflect the baud rate configured on the device.



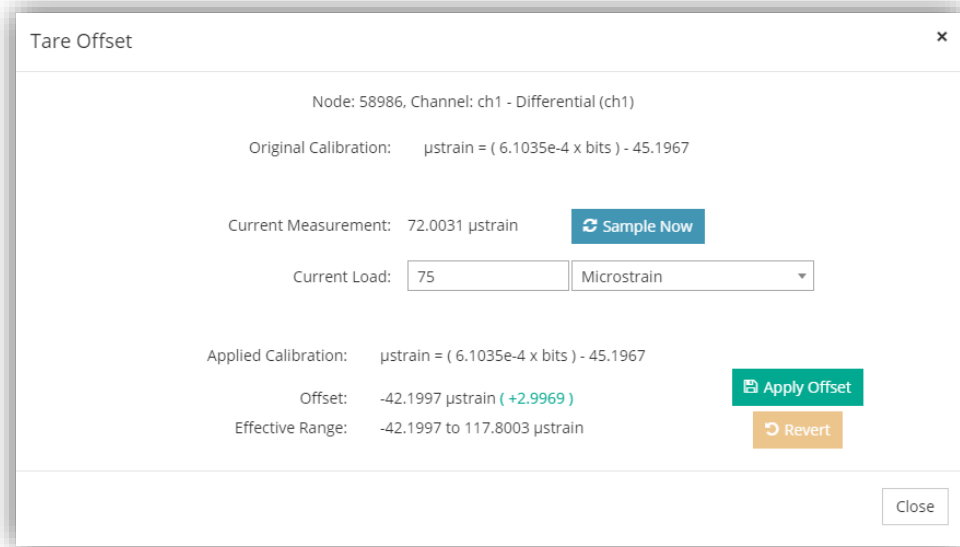
Other notable updates and bug fixes:

- Fixed data stuttering in Time Series Graph widget when sampling at high data rates.

V12.1.4 (2019-10-30)

Wireless Tare:

A tare tool has been added for differential and single-ended channels on supported nodes (see below). This is available for each channel on the Calibration tab in Configure under the Cal Tools dropdown.



This tool automatically adjusts the offset by sampling a real value with the currently configured calibration settings and calculating the offset that would return the user-specified measurement value. That offset can then be applied to the channel and tested by re-sampling to confirm that the measurement now matches the target.

Supported Node	Minimum Firmware Version*
V-Link-200	12.45139
SG-Link-200, -OEM	12.44849
Torque-Link-200	12.44849

* At time of release, firmware for this feature is not yet available

Notable Bug Fixes:

Byte Monitor behavior on sensor disconnect

Previously on sensor disconnect/reconnect or repository change, the Byte Monitor window would lose connection to the sensor and prevent the launch of another window for the same sensor to resume monitoring bytes sent and received over the connection. With this update, we've made changes to make this window behave more intuitively:

- On sensor disconnect the Byte Monitor window will now display an overlay indicating the sensor is disconnected and will automatically resume displaying raw byte data on sensor reconnect.
- On repository change all Byte Monitor windows will be automatically closed.

Export CSV formatting issue with Valid Flag data

An issue was introduced in the previous release (12.0.9) with the addition of data with valid flags associated with each point. When exporting data, if a value/flag channel did not have data for every included timestamp (sampling at a lower frequency, not sampling for the entire time range, timestamps offset with other data, etc.) data for other channels were sometimes offset incorrectly and written to the wrong column in the CSV. This issue has now been resolved and CSVs will be formatted as expected.

V12.0.9 (2019-09-10)

3DM-GX4-25 00051 - Orientation Quaternion			
0.91918	-0.08116	-0.25538	0.28862

3DM-GX4-25 00051 - Orientation Matrix (Est)		
0.70060	0.57426	0.42354
● -0.49043	0.81867	-0.29876
-0.51830	0.00160	0.85520

Matrix and Quaternion data:

Matrix and Quaternion Data will now be properly stored and displayed (previously this data was discarded).

- View a channel's latest data point with the Matrix Display widget
- Export data to CSV for selected time range

Currently, only inertial devices output matrix or quaternion channels.

Valid Flags:

Many inertial data fields output a valid flag associated with each point – previously this data was discarded, but SensorConnect will now properly store and display this information

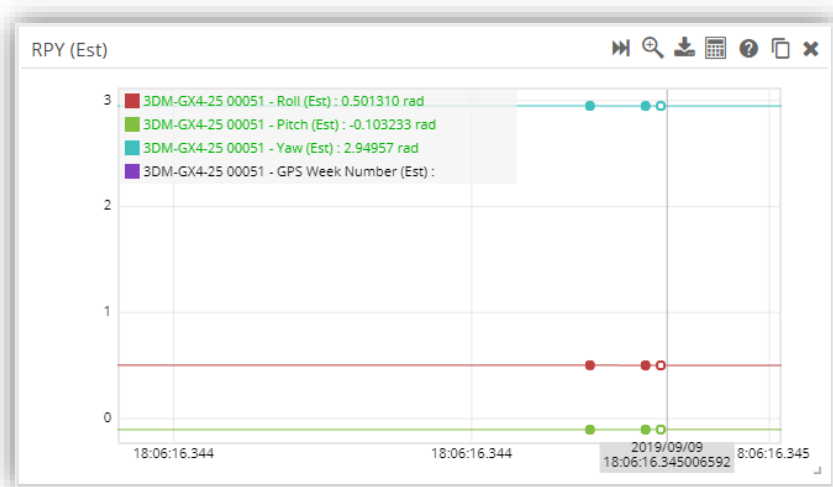
- Indicated as a green (valid) or red (invalid) dot in the Numeric Display, Matrix Display, and Text Chart widgets
 - o The Text Chart can be configured not to display the Valid column in the widget settings
- Indicated as green (valid) or red (invalid) legend text in the Time Series widget
- Black text or a missing dot means there is no associated valid flag
- Valid flags are exported to CSV with the base channel values



Improve timestamps on inertial data:

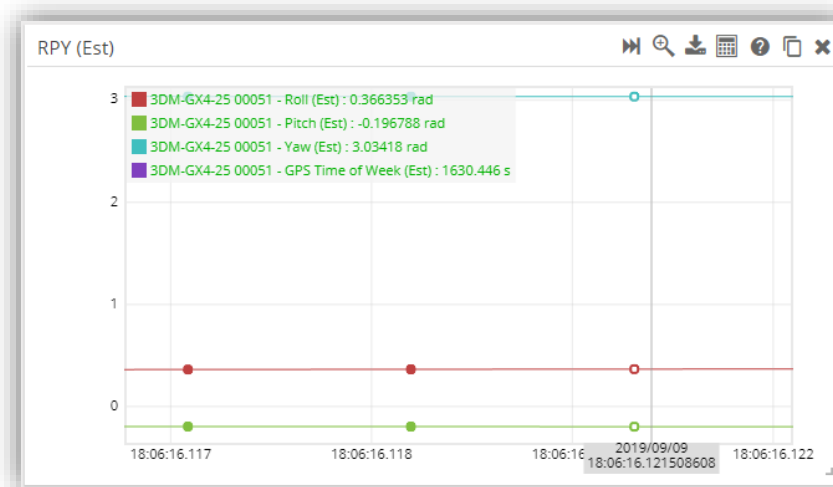
Inertial data points will no longer ‘bunch’ on the Time Series graph and in CSV exports when streaming at high sample rates over a USB connection if the timestamp data field is included in the data packet.

Changes have been made to the Inertial Sampling configuration screen to assist in selecting a message format that will allow your data to benefit from the timestamping improvements.



Point bunching – No Timestamp included

(Three points @ 500 Hz over USB)



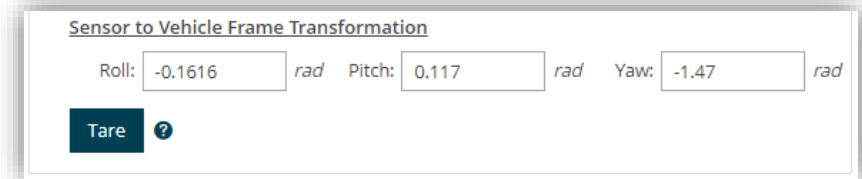
Improved timestamping – Timestamp included in packet

(Three points @ 500 Hz over USB)

Add Inertial calibration functions:

Added Tare Orientation, Capture Gyro Bias, and Capture Auto Mag Calibration for inertial devices which support these commands. They can be found in Configuration directly below the affected settings for each:

- Tare Orientation – Sensor to Vehicle Frame Transformation
- Capture Gyro Bias – Gyro Bias
- Capture Auto Mag Calibration – Hard Iron Offset, Soft Iron Matrix



Sensor to Vehicle Frame Transformation

Roll: rad Pitch: rad Yaw: rad

Tare ?

Settings values are updated to display the results after the corresponding command is run.

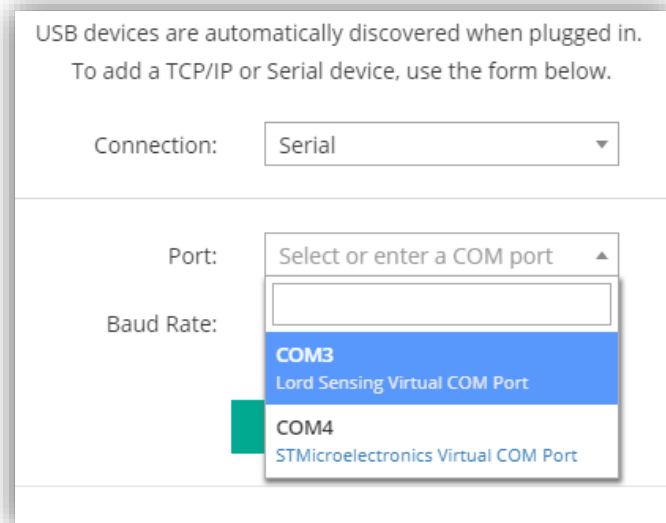
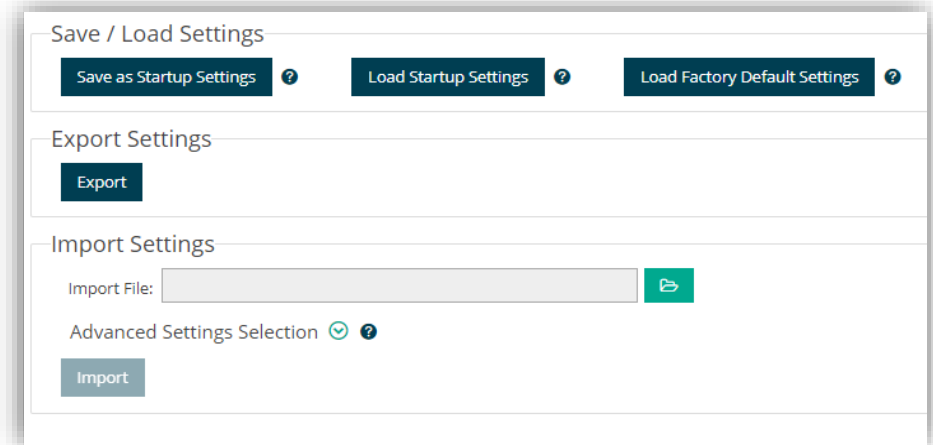
Other notable updates and bug fixes:

- Trailing spaces in new repository names automatically removed
- Additional status flag and bitfield channels will now display as human-readable text instead of numbers in the Time Series, Numeric Display, and Text Chart widgets
- Fix default calibration coefficient for SG-Link-200 and Torque-Link-200 pulse frequency channels
- Fix Byte Monitoring window display sizing when monitor's scale settings adjusted from default
- Fix duplicate inertial channel names on the Data tab

V10.4.9 (2019-06-05)

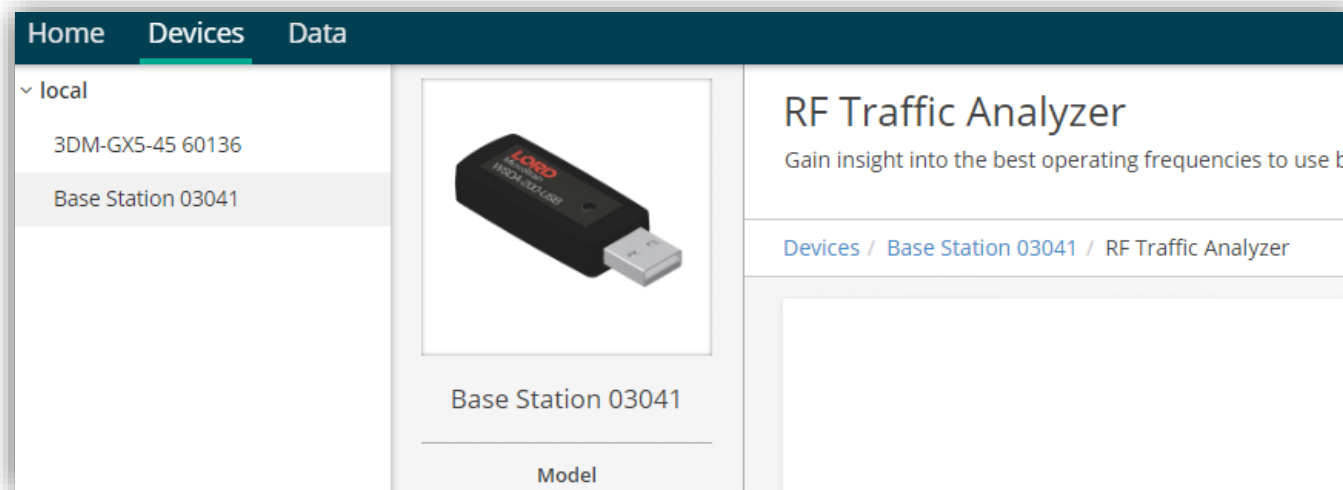
Inertial Save/Load Settings: The Save/Load Settings option for an Inertial device allows you to:

- Save the device's current settings as startup settings
- Load the device's startup settings onto the device
- Load the factory default settings onto the device
- Export the current settings to a file
- Import a settings file back onto the device



COM Port list: The Manual Add Device window has been updated to include a list of the COM ports on the PC, allowing for easier selection.

Title Bar / breadcrumbs: A title bar has been added to the top of the right section and includes information about the content you are looking at, as well as navigation breadcrumbs to easily jump back to the previous page.



Byte Monitoring – Save to File: The Byte Monitoring window now has an option to save the live raw binary data to a file.




Other notable updates and bug fixes:

- Fix for RPM to Hertz unit conversion
- Fix for channels data not loading correctly in some scenarios where transmitted and log data were collected
- Allowing manual calibration of SG-Link-200 and Torque-Link-200 pulse frequency and total pulses channels
- Changed the Shunt Cal's default number of gauges and gauge resistance values based on node model
- Display higher resolution on FFT frequencies when needed
- Updated to CEF 74.1.16 / Chromium 74.0.3729.131




V10.0.8 (2019-04-09)

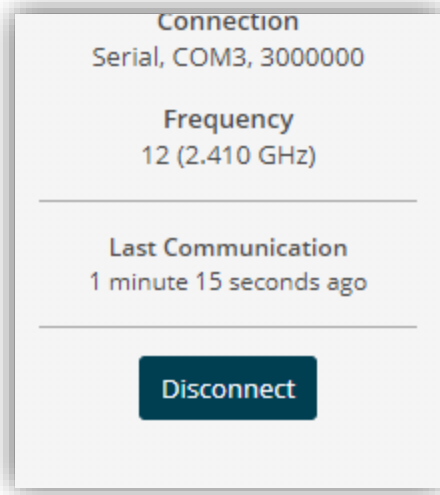
Support for Double-Precision: Some Inertial fields are output with double precision. Previous versions of SensorConnect truncated these values to floats. SensorConnect now fully supports double precision for these values.

Improved Wireless Start Sampling: In some cases, SensorConnect was unsure if a Wireless Node actually started sampling and would erroneously list a Node as started when it was still idle. If the response to the start sampling command is not heard, SensorConnect will now notify you, and give you the option to resend the command to the device.

Network Settings: Synchronized  Lossless  Protocol: 

One or more Nodes in the network may have failed to start sampling. [Resend Start Command](#)

<input checked="" type="checkbox"/>	Node	Channels	Sampling	Data Type 	Log/Transmit 	% Total	Status
<input checked="" type="checkbox"/>	65364	3 active ▾	256 Hz continuously ▾	float ▾	Transmit ▾	50.00%	 Unknown sampling status



Disconnect: It can be useful, especially when developing your own applications using LORD Sensing's hardware, to keep SensorConnect open, and quickly disconnect/reconnect to a device. We've added this functionality to all devices now, not just devices that were manually added.

Auto-Y keyboard shortcut: Auto-Zoom on the Y-axis is a commonly used feature. You can now perform this action by pressing the 'Y' key when focused on the Timeseries Widget.

Other notable updates and bug fixes:

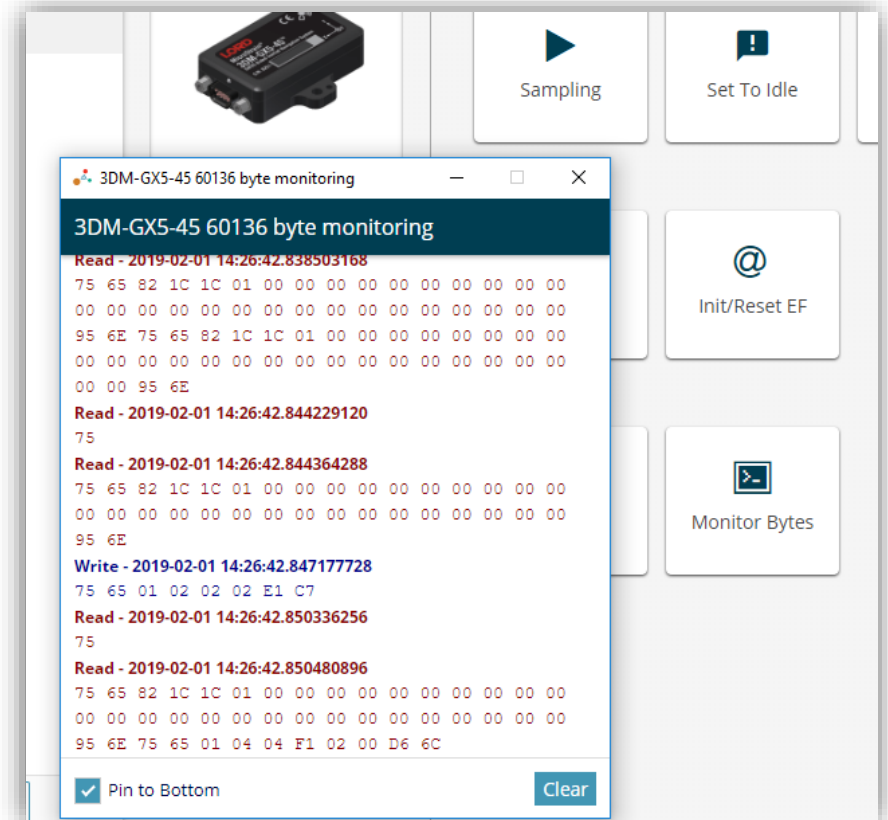
- Fix for being unable to configure an IEPE-Link
- Fix for unplugging a BaseStation sometimes causing Nodes to be hidden from it in the Device List
- Fix for incorrect input ranges for G-Link-200-OEM 40G Nodes
- Fix for Byte Monitoring windows showing duplicate data in some cases
- Fix for CSV export failing in some cases
- Fix for MathEngine stats failing if at least one selected channel has no data for the select time range
- Showing error message on startup of SensorConnect if missing critical files due to an installer error, instead of just crashing
- Sorting Inertial channels alphabetically in the Inertial Sampling screen
- Added timestamps of the min and max values in the MathEngine stats output

v9.17.4 (2019-02-01)

Monitor Bytes option: Each connected device (BaseStation, Inertial Node, Displacement Node) now has a *Monitor Bytes* option which allows viewing the raw bytes from reads and writes to/from the device.

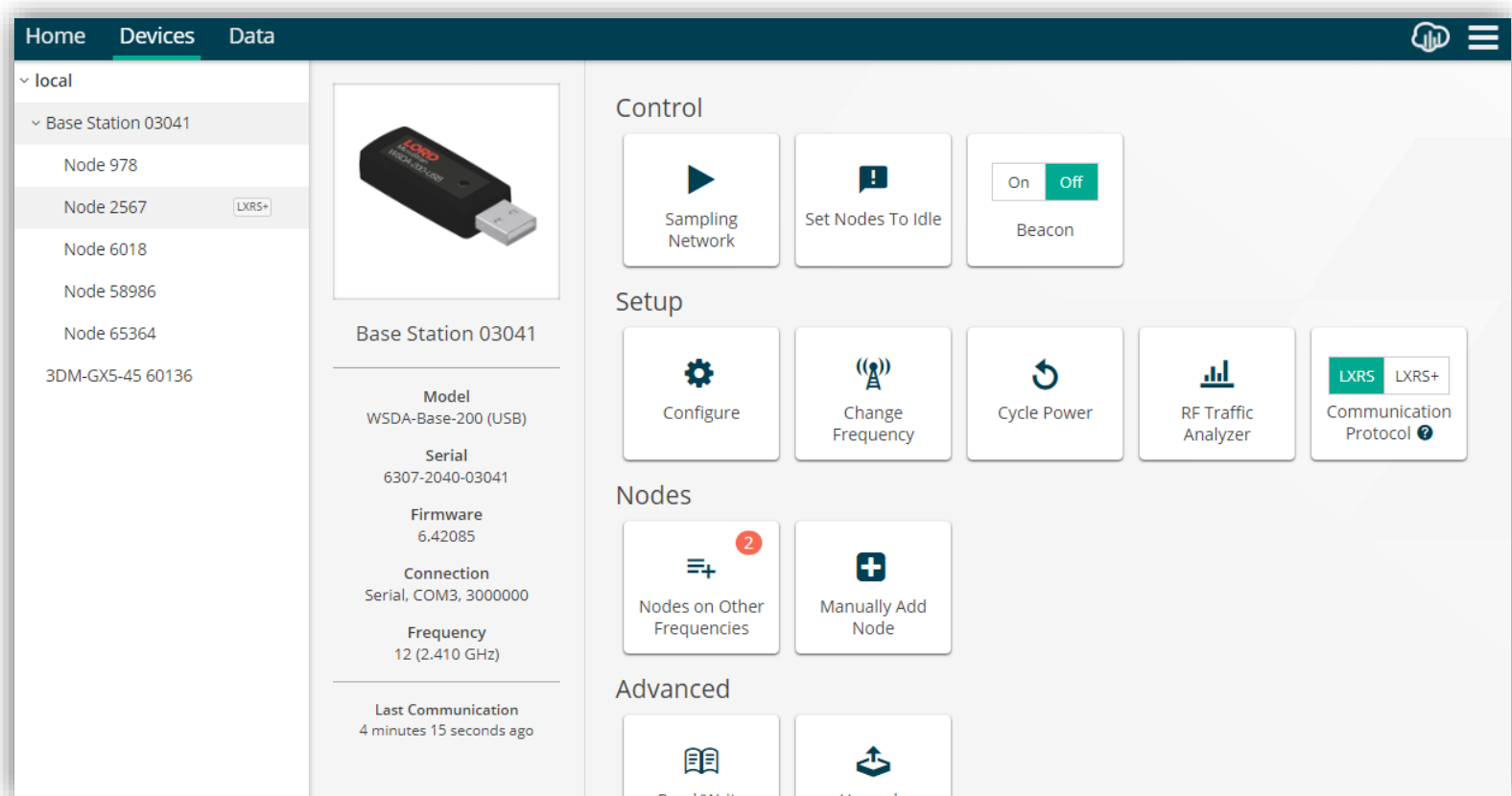
Other notable updates and bug fixes:

- Revised list of input ranges for RTD channels
- Support for SG-Link-200 and SG-Link-200-OEM new firmware only allowing 1 low pass filter setting for all channels
- Fix for incorrectly detecting calibration changes when first entering the TC-Link-200 configuration screen
- Fix for error messages positioned incorrectly on the Inertial configuration screen
- Fix for IPv6 addresses not fitting in the device info sidebar
- Fix for CSV export crash in some scenarios




v9.16.13 (2018-12-21)

Device Info sidebar: The section that shows the device image and information, has been restyled and moved from the top bar to a sidebar. More information has been added to this section as well, depending on the device.



Inertial basic configuration: Inertial basic configuration is fully implemented. This includes configuration of Estimation Filter, GNSS, and IMU-AHRS settings.



3DM-GX5-45 60136

Model
3DM-GX5-45
6251-4220

Serial
6251.60136

Firmware
1.1.28

Options
8g,300dps

Connection
Serial, COM4, 115200

Last Communication
3 minutes 24 seconds ago

Last Known State
Unknown

Inertial Node Configuration

X: gauss Y: gauss Z: gauss

Soft Iron Matrix Noise

<input type="text" value="0.001"/>	<input type="text" value="0.001"/>	<input type="text" value="0.001"/>
<input type="text" value="0.001"/>	<input type="text" value="0.001"/>	<input type="text" value="0.001"/>
<input type="text" value="0.001"/>	<input type="text" value="0.001"/>	<input type="text" value="0.001"/>

GNSS

GNSS Assisted Fix

Enable Assisted Fix

GNSS Constellation Settings

	Reserved	Maximum
<input checked="" type="checkbox"/> GPS	<input type="text" value="8"/>	<input type="text" value="16"/>
<input checked="" type="checkbox"/> SBAS	<input type="text" value="1"/>	<input type="text" value="3"/>
<input checked="" type="checkbox"/> QZSS <input type="checkbox"/> L1SAIF	<input type="text" value="0"/>	<input type="text" value="3"/>
<input type="checkbox"/> Galileo	<input type="text" value="4"/>	<input type="text" value="8"/>
<input checked="" type="checkbox"/> GLONASS	<input type="text" value="8"/>	<input type="text" value="14"/>

Available Channels: 32
Reserved Channels: 17
Maximum Channels:


Estimation Filter

- Aiding Control
- Vehicle Dynamics Mode
- Mounting
- Estimation Control
- Auto-Initialization Control
- Zero Update (ZUPT) Controls
- Geographic Sources
- Adaptive Measurements
- Measurement Noise
- Accelerometer Process Noise
- Gyroscope Process Noise
- Mag Process Noise

GNSS

IMU-AHRS

Revamped Inertial sampling screen: The Inertial sampling screen has been redesigned to better differentiate between channels that fall under IMU-AHRS, GNSS, and Estimation Filter.



3DM-GX5-45 60136

Model
3DM-GX5-45
6251-4220

Serial
6251.60136

Firmware
1.1.28

Options
8g,300dps

Connection
Serial, COM4, 115200

Last Communication
34 seconds ago

Last Known State
Unknown

Inertial Sampling

AHRS IMU

GPS Correlation Timestamp 1 hertz

✕	Channel Group	Sampling
✕	Accelerometer Vector	250 hertz
✕	Gyroscope Vector	250 hertz
	Add Channel	

GNSS

GPS Time 4 hertz

✕	Channel Group	Sampling
✕	Position (LLH)	4 hertz
✕	Clock Information	4 hertz
	Add Channel	

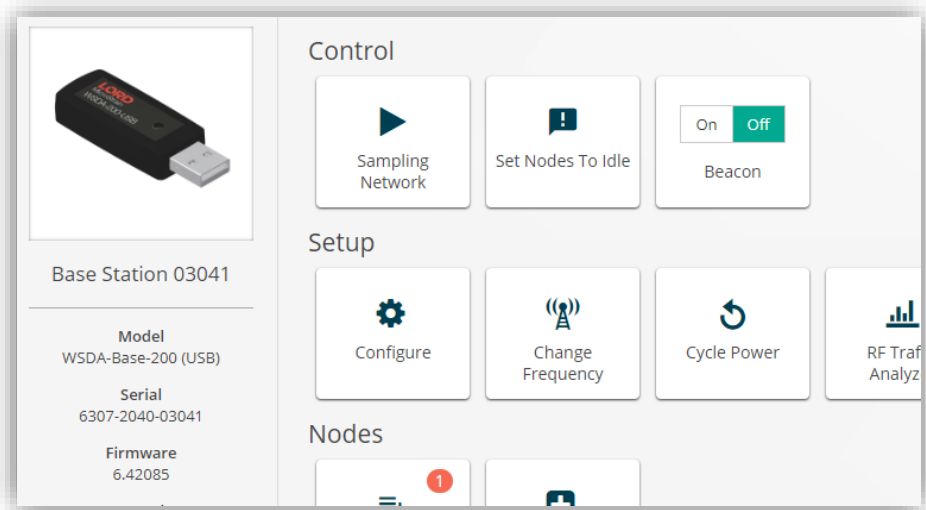
Estimation Filter

GPS Time 1 hertz

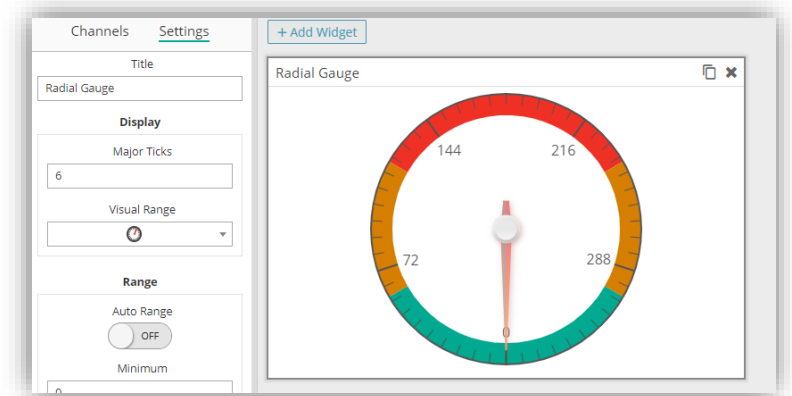
✕	Channel Group	Sampling
✕	Heading Update	1 hertz

Save as Startup Settings Apply Start

Beacon Status: The current Beacon status is now indicated with a toggle switch on the Beacon button (when supported by the device firmware).

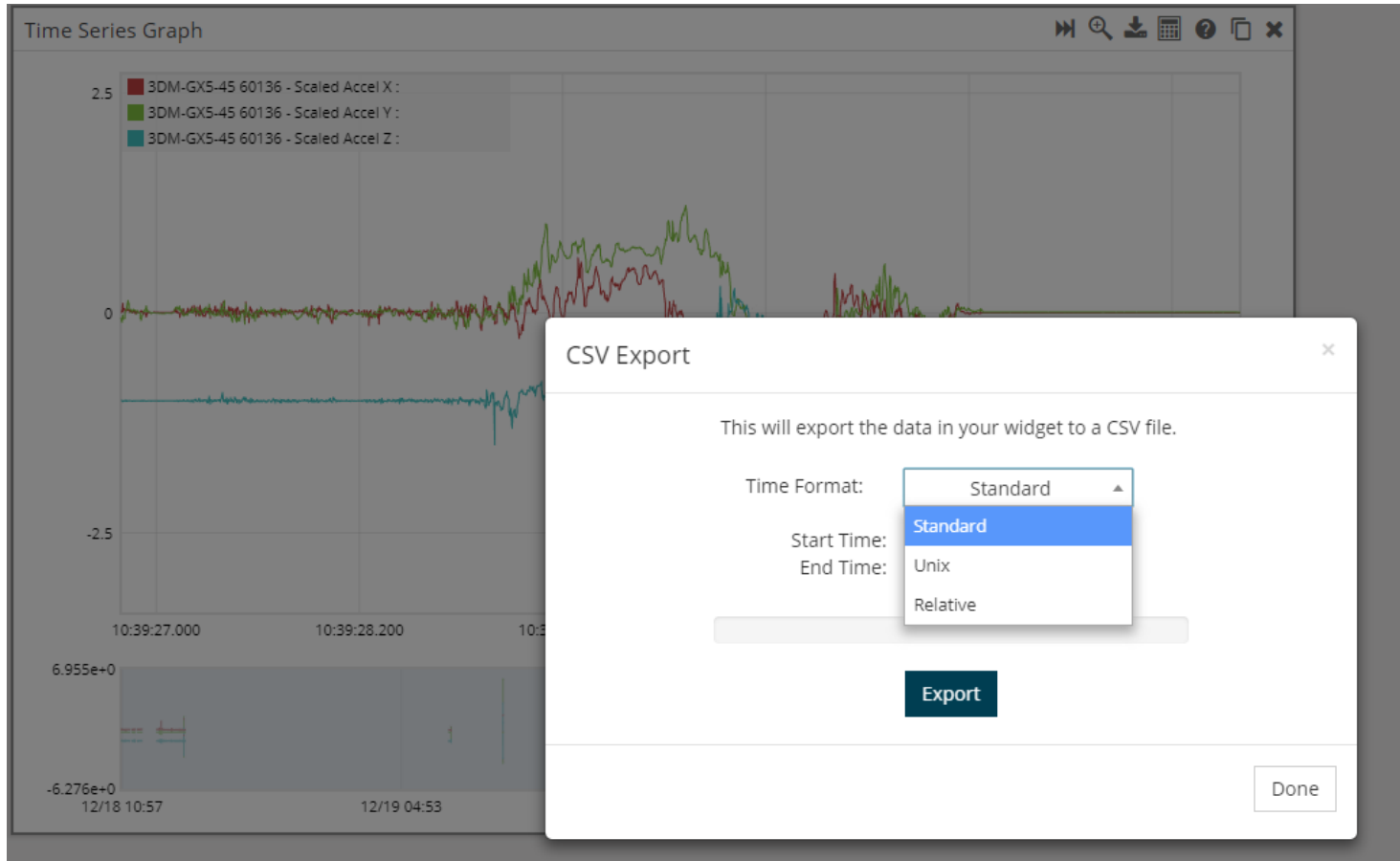


360 degree radial gauge: The Radial Gauge widget has a new setting that allows changing to a complete 360° circle. This can be useful in displaying data that wraps around, such as orientation.



Export CSV timestamp format: The CSV export functionality now has an option to choose the format of the timestamps that will be in the CSV. For example:

- **Standard:** 12/21/18 15:39:26.803017212 (each line has the full, human-readable timestamp)
- **Unix:** 1545406766803017212 (each line has the number of nanoseconds since unix epoch)
- **Relative:** 0.004995580 (each line has the number of seconds from the start time)



[Diagnostic and Status flags text display](#): The Diagnostic and Status flags are fully supported now show text values instead of their numeric values, when possible.



[TC-Link-200 and RTD-Link-200 Support](#): The TC-Link-200 and RTD-Link-200 are fully supported.

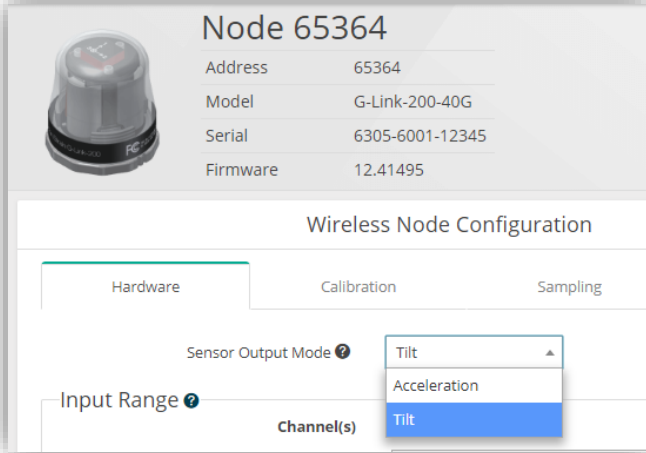
[Faster FFTs](#): Static FFT generation (accessed from the MathEngine button on the Timeseries graph widget) is now up to 20x faster.

Other notable updates and bug fixes:

- Improvements to Unit/Volt wireless calibration tool
- Added mV/g calibration tool for IEPE-Link
- Improved styling of radial gauge widget
- Fix for RF Sweep mode sometimes staying enabled when leaving the screen
- Fix for freezing when clicking on a Wireless Node immediately after it was added to the device menu
- Fix for switching repos sometimes throwing errors
- Fix for timeseries graphing issues when lots of NaNs are in the data
- Fix for zoom not working correctly on FFT widget when plotting FFTs with different frequency ranges
- Fix FFTs not working for sample rates slower than 1Hz
- Confirm closing of Notes widget so users don't accidentally throw away their notes
- Dark mode styling of helper tooltips

v9.12.11 (2018-09-24)

Sensor Output Mode: The latest firmware for the G-Link-200 allows configuring the device to output Tilt channels.




Node 65364


Address	65364
Model	G-Link-200-40G
Serial	6305-6001-12345
Firmware	12.41495

Wireless Node Configuration

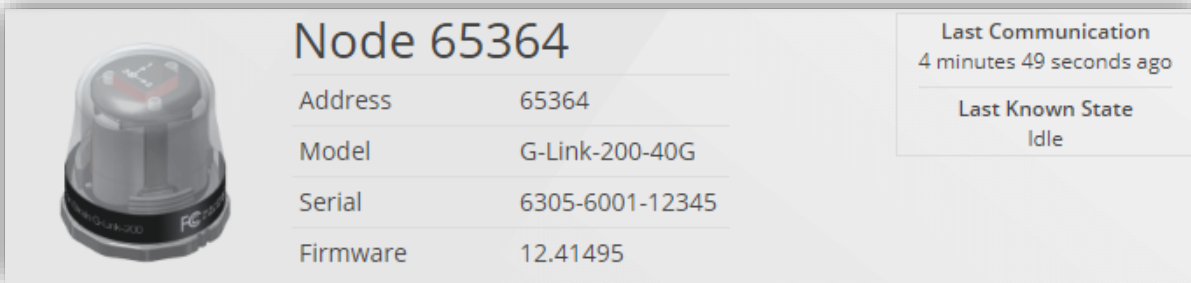
Hardware | Calibration | Sampling

Sensor Output Mode  Tilt

Acceleration

Input Range  Channel(s) Tilt

Last Known State: The last known state for devices is shown in the top right of the screen when the device is selected. This information, including the last communication time, will also automatically be refreshed every few seconds.



Node 65364

Address	65364
Model	G-Link-200-40G
Serial	6305-6001-12345
Firmware	12.41495

Last Communication
4 minutes 49 seconds ago

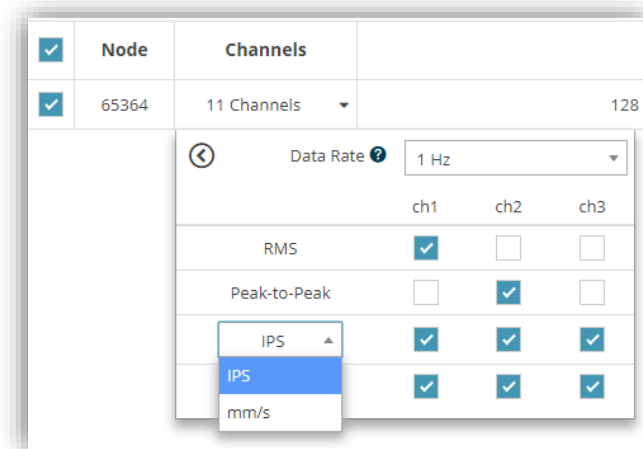
Last Known State
Idle

Other notable updates and bug fixes:

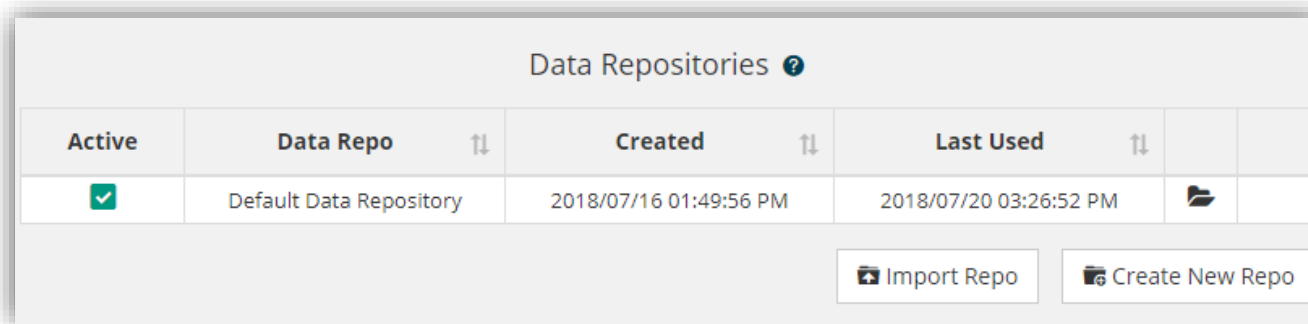
- Support for more Inertial configuration options
- Support for the SG-Link-200
- Support for % memory full diagnostic channel data
- Auto-seeding the timestamp for Demod-Digital when connected and when Resume button is pressed
- Fix for FFT widget shift-zoom issues when Windows display zoom scaling is applied
- Fix for Node Save State always saving calibration coefficients even when user specified not to
- Fix for Shunt Cal tool sometimes causing SensorConnect to crash
- Fix for error when attempting to reconnect to a WSDA-Pro in some scenarios

v9.9.2 (2018-07-24)

Velocity Derived channel unit: The Derived channel list now allows configuring the Velocity channel to support both IPS and mm/s (on supported Node firmware).



Data Repository Import: An Import Repo button has been added which allows importing of a Data Repository that was collected from another computer. A browse folder button was also added for opening the Data Repo in Windows File Explorer.



Initialize/Reset Estimation Filter: The Initialize/Reset Estimation filter functionality has been added for Inertial Nodes.

Estimation Filter Initialize/Reset

Configuration

Auto-Initialization Control

Auto-Initialize Estimation Filter

Aiding Control

GNSS Source

Internal GNSS

Heading

Use Magnetometer

Use GNSS Velocity Vector

Use External Heading Message

Current State Info

Filter Status

Status: **Initialization**

Status Flags: Position and Velocity not initialized

[Reset](#)

Estimated Values

	Latitude	Longitude	Height
Position:	0.000000°	0.000000°	0.000000 m
	Heading/Yaw	Pitch	Roll
Attitude:	0.000000 rad	-0.000000 rad	0.000000 rad

Set Initial Attitude/Heading

Heading/Yaw (rad)	Pitch (rad)	Roll (rad)
<input type="text" value="0"/>	<input type="text" value="0"/>	<input type="text" value="0"/>

Use accelerometers to determine initial pitch and roll

[Apply Initial Values](#)

[Apply Configuration](#)

Other notable updates and bug fixes:

- Revised list of supported Input Ranges for the SG-Link-200-OEM
- Support for the Torque-Link-200 Wireless Node
- Support for configuration of WSDA-Base-101 buttons
- Added default calibrations in the configuration screen for known channels
- Added buttons to browse to, or open directly, an exported CSV file
- Added the ability to hide all nodes when right-clicking a BaseStation in the Device menu
- Added the ability to hide disconnected BaseStations and Inertial sensors when right-clicking in the Device menu
- CEF Update which fixed a flickering line graph issue
- Fix for LiveConnect connections failing to communicate with Nodes due to timeout issues
- Fix for failing to reconnect to a WSDA-Pro through LiveConnect in the same session
- Fix for small ranges causing issues in the Linear Gauge auto-ranging

v9.6.4 (2018-06-14)

Notable updates and bug fixes:

- Support for the TC-Link-200-OEM Wireless Nodes
- Support for the SG-Link-200-OEM Wireless Nodes
- Fix for calibration coefficients sometimes not being loaded and applied to data correctly
- Fix for BaseStation timeouts sometimes being set incorrectly when switching between connection methods
- Fix for auto-y on the Timeseries graph sometimes not zooming correctly

v9.4.3 (2018-05-08)

Notable updates and bug fixes:

- Fix for channel units getting corrupted
- Fix for crash when closing SensorConnect when running RF Sweep
- Fix for errors when switching between RF Sweep Modes
- Fix for Node Save State not exporting all eeprom locations

v9.3.8 (2018-05-01)

Changes to wireless node Calibration settings: Various changes were made to the Calibration settings (slope, offset, and unit) page to improve usability:

Linear Calibration ⓘ

Channel(s)
1 - Differential 1

Cal Tools

Unit
Microstrain

Calibration
= (0.4252 x bits) - 44576.5313

- Automatic unit conversion between units of the same category
- Raw voltage unit calibrations available for applicable nodes
- New tools to automatically calculate slope and offset from information on the sensor calibration sheet
Shunt calibration and manual slope and offset entry will still be available for relevant channels.

Unit/V Calculator for Single-ended Channels: Slope and offset are calculated based on the voltage output at the specified sensor input.

mV/V Calculator for Differential Channels: Slope and offset are calculated based on the sensor's mV/V sensitivity, maximum capacity, and the hardware offset balance target of the channel.

Node: 58986, Channel: ch5 - Single-ended 1

.75 Meter

.3 Volts

Volts at 0 m: .25

Node: 58986, Channel: ch1 - Differential 1

3.2 mV/V at max capacity

Max Capacity: 1.36079107321055 Kilogram

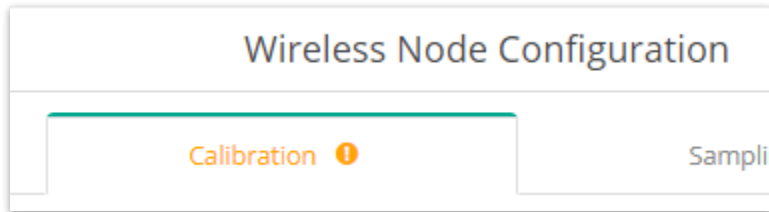
Balance Target: Mid (50%)

Slope: 1.2673e-4 kg/bit

Offset: -16.2219 kg

Effective Range: -16.2219 to 17.0005 kg

Calibration invalid warnings: When an Input Range is changed or a channel's Hardware Offset is updated via Auto Balance on the Hardware tab, the calibrations for the associated channel(s) may no longer be valid, warnings are displayed on impacted channels to indicate a change may be needed.



Orange text and a warning icon indicate there are warnings on the tab – these do not need to be resolved before configuration changes are applied.

The calibration tools button will turn orange, and a warning icon will be displayed when the channel's calibration has been impacted.

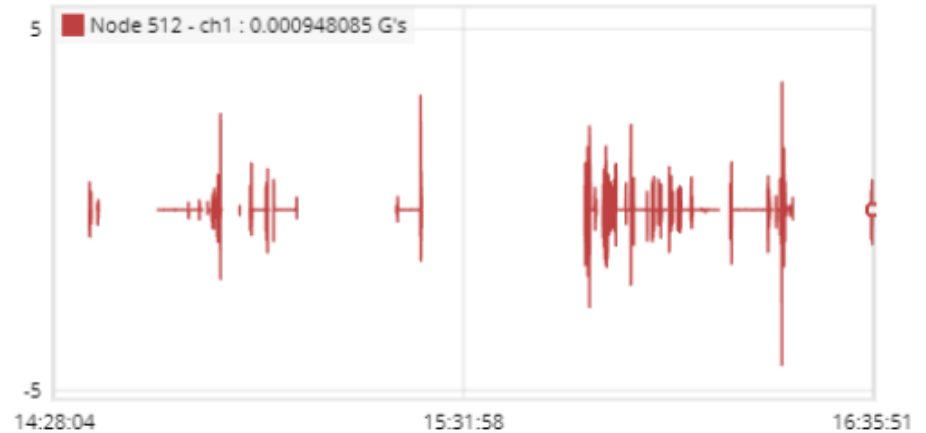
Auto Recalibrate: Whenever possible, an auto recalibrate button will be available for an impacted channel. Clicking this will update the calibration to compensate for all hardware configuration changes automatically.

Channel(s)		Unit
1 - Differential 1	Cal Tools	Microst
2 - Differential 2	Cal Tools	Meter
3 - Differential 3	Cal Tools	None

MathEngine Stats Updates:

- Added a screenshot of the TimeSeries graph that the stats were run on
- Added Standard Deviation
- Added Peak to Peak
- Added Time Range

Stats Output



Time Range: 2.130 hours

Apr 30 2018 14:28:04 - Apr 30 2018 16:35:51

Node 512 - ch1

Number of Points: 746339

Average: 0.0000651653698329564

Max: 3.5361063480377197

Min: -4.298521518707275

Peak To Peak: 7.834627866744995

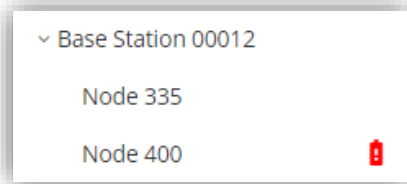
RMS: 0.09958166703684156

Standard Deviation: 0.0995816457149887

Other notable updates and bug fixes:

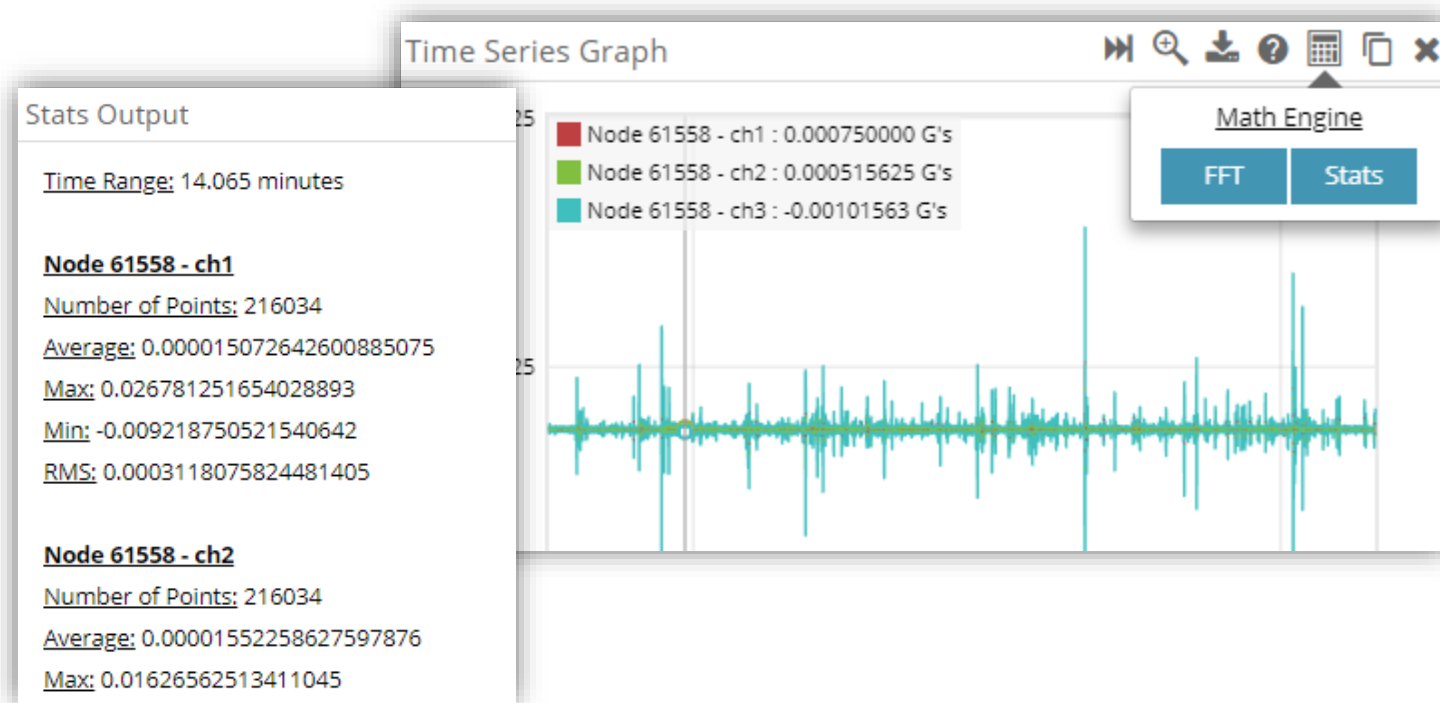
- Added Export option for the Notes widget
- Only showing widget icons when active or on hover, for a cleaner UI when not interacting with the widgets
- Allow staying logged in to SensorCloud when switching data repos
- Upgrading the database on loading of a data repository if needed (fixes issue with multiple users on one machine)
- Fix for the TimeSeries graph not plotting the first point in some scenarios
- Fix for Hide Node right-click option sometimes not showing up
- Fix for WSDA-Pro devices using incorrect timeouts when switching between different methods of connection to the same device (TCP vs USB vs LiveConnect)
- Fix for MathEngine FFTs causing the UI to freeze during a long calculation
- Fix for MathEngine FFTs being incorrect when using a large amount of data

v9.0.2 (2018-04-04)



Low Battery Indicator: A low battery indicator icon next to Nodes when a low battery notification is heard in a diagnostic packet (only available on some Nodes).

Stats (MathEngine): A Stats function has been added to the MathEngine dropdown which calculates the Min, Max, Average, and RMS per channel in the user selected time range.




Notes Widget: Take notes about your data directly in your dashboard. Include pictures, videos, and external links with an easy-to-use interface.

Notes

B *I* U Open Sans **A** [List Icons] [Grid Icon] [Link Icon] [Image Icon] [Video Icon]

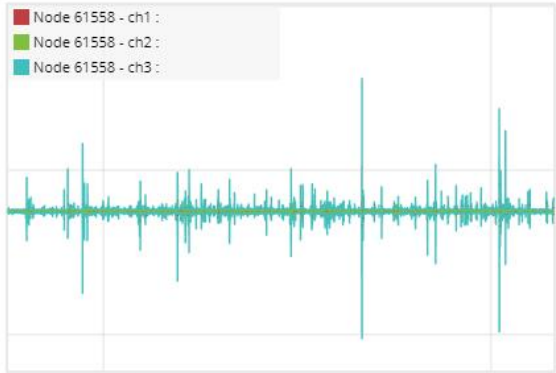
Bridge Test

Node 40 is installed on the left underside of the bridge.
Node 41 is installed on the top right side of the bridge.



0.125
0.025
-0.075

■ Node 61558 - ch1 :
■ Node 61558 - ch2 :
■ Node 61558 - ch3 :



09:10:00 09:20:00

[View SensorCloud Data](#)

Other notable updates and bug fixes:

- Improved device enumeration to better find devices connected via USB
- Improved operation of broadcast Set to Idle
- Added more descriptive channel labels in the Sampling screen
- Fix for logging out of SensorCloud causing an error which prevented new activity from showing up
- Fix for datalog download wrapping around when downloading a Node that was 100% full
- Fix for crash when downloading logged derived channel data
- Fix for the mean derived data channel showing incorrect channel name
- Fix for BaseStation firmware upgrade sometimes requiring a restart of SensorConnect
- Fix for Chromium memory leak, which required SensorConnect to restart its UI every few hours

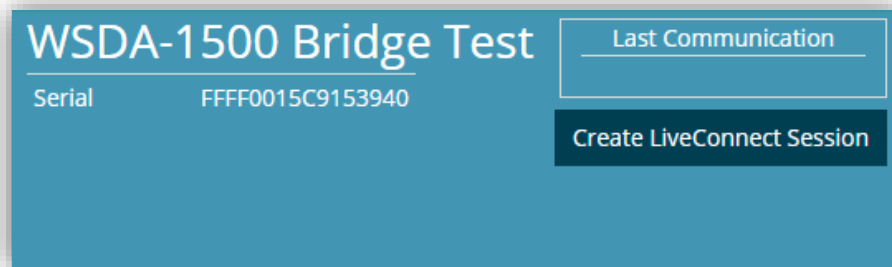
v8.8.15

(2018-01-31)

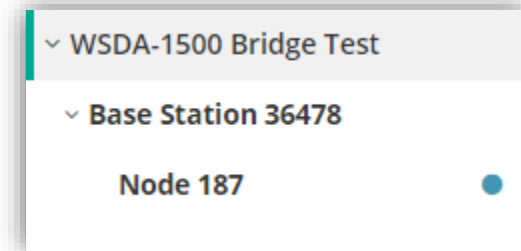
- Improved communication for WSDA-Pro devices (WSDA-1000, WSDA-1500, and WSDA-2000)
- Automatic latency test / timeout discovery when first connecting to WSDA-Pro devices
- User adjustable timeout with latency test for WSDA-Pro devices
- Lazy loading of devices, allowing for faster SensorConnect startup times
- Support for some basic Inertial configuration options
- Added Inertial Set to Idle and Resume buttons
- Support for the Digital Demod device
- Updating Node information when a Node Discovery packet is heard, to minimize communication attempts
- Fix for failing to communicate with Nodes over TCP connections with lots of latency
- Fix for failing to switch communication protocols from the sampling screen
- Fix for crash on startup if data repo failed to be deleted
- Fix for Device Menu communication protocol indicator something showing incorrect value
- Fix for percent bandwidth being shown in Non-Sync Sampling mode in some cases
- Fix for Shunt-Cal writing erroneous value to the Hardware Offset eeprom
- Fix for Timeseries graph resetting zoom after 30 seconds in some cases
- Fix for IEPE-Link incorrectly limiting burst duration

v8.4.8 (2017-11-30)

- LiveConnect functionality now available when logged in to your SensorCloud account within SensorConnect



Log in to SensorCloud and click on a WSDA-Pro device. A new "Create LiveConnect Session" button is available.



Creating a LiveConnect session allows you to communicate with your WSDA-Pro device as if it were connected directly to your computer. Change settings, configure networks, and collect data to your local PC while the ethernet-connected WSDA is anywhere in the world!

- Support for WSDA-Pro devices connected via USB. Plug in your WSDA-1500 or WSDA-2000 via the USB port on the back of the device, and it will show up in SensorConnect just like a standard USB BaseStation
- Better organization of device options
- Improved Histogram widget's axes display
- Updated device images
- Improved performance with large number of Nodes in the device list
- Support for the 910hz Sample Rate
- More dark theme improvements
- Fix for CSV export always truncating decimal places to 6 digits of precision
- Fix for inaccurate frequency axis calculations for FFT widget
- Fix for Sync Sampling being unchecked by default if a Node in the sampling table fails to communicate
- Fix for bug in FFT widget with multiple FFTS where differing frequencies are incorrectly scaled to the max frequency

v7.7.6

(2017-09-26)

- Loading calibration coefficients in more places to prevent the case of SensorConnect not knowing the calibration to apply to data
- Refreshing device header information after firmware upgrades, eeprom changes, etc.
- Removed Retry loading device info button when device is known to be disconnected
- Fix for timestamps being calculated incorrectly (rounding error) with sample rates 1kHz and above
- Fix for timestamps being slightly off between log and transmit data points with sample rates 1kHz and above
- Fix for WebGL1 FFT error on creation
- Fix for error when exporting derived channels to CSV
- Fix for failing to change Node's protocol through the Node options screen if it differs from the BaseStation's
- Fix for Sensor Delay configuration usability issues
- Fix for crash when reloading Node information in some cases
- Fix for dark theme incorrectly styles in some cases
- Fix for widget icons highlighting white on white background for light theme
- Fix for F11 full screen not working

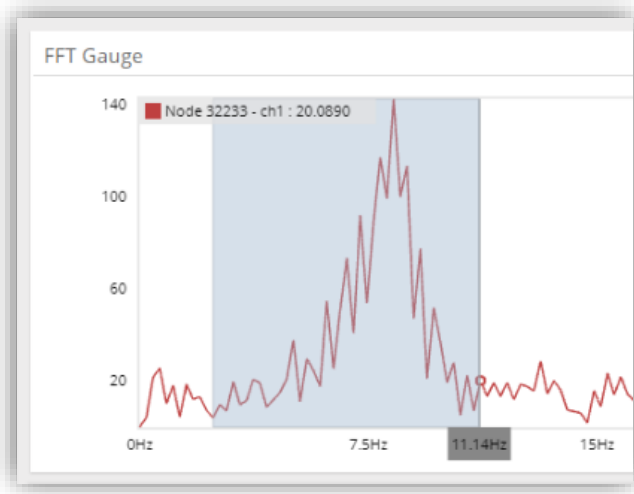
v7.4.11

(2017-08-30)

- Major Fix for firmware upgrade of BaseStations sometimes causing the device to become inoperable
- Fix for last communication time sometimes being incorrect for devices
- Fix for very slow download speeds when downloading logged data from Wireless Nodes
- Fix for many duplicate units being added to the database
- Fix for exporting logged data, in combination with other transmitted data, causing some values to be uncalibrated in the resulting CSV file
- Fix for random spikes in Timeseries graph that aren't actually in the data
- Fix for many widgets being blurry when using Windows zoom levels above 100%

v7.4.5 (2017-08-24)

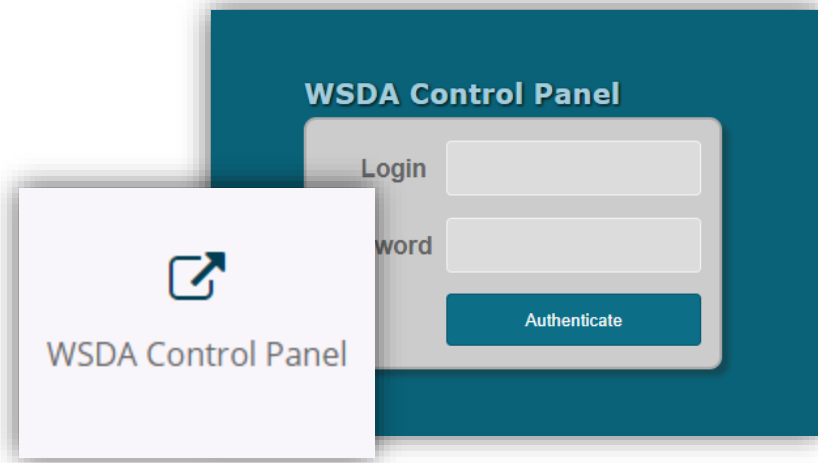
FFT horizontal zooming: The FFT widget now allows for zooming in the X-axis.



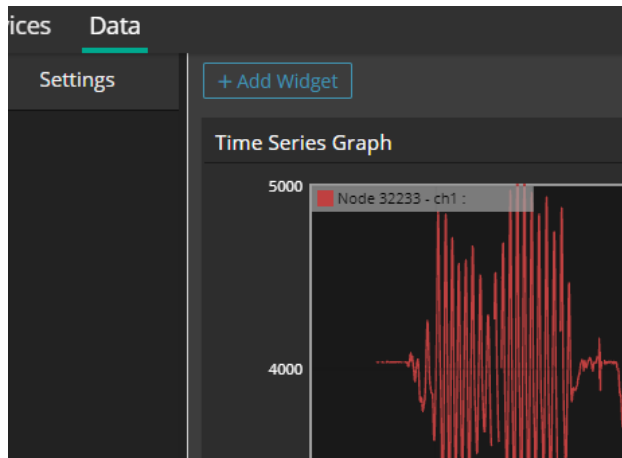
Y-axis clamping: The Timeseries and FFT widgets have a new setting that allows clamping the Y-axis to specific min and max values.

The screenshot shows a configuration panel titled 'Range'. It contains a 'Y-Axis Range' toggle switch, which is currently turned 'ON'. Below the toggle are two input fields: 'Minimum' with the value '3000' and 'Maximum' with the value '5000'.

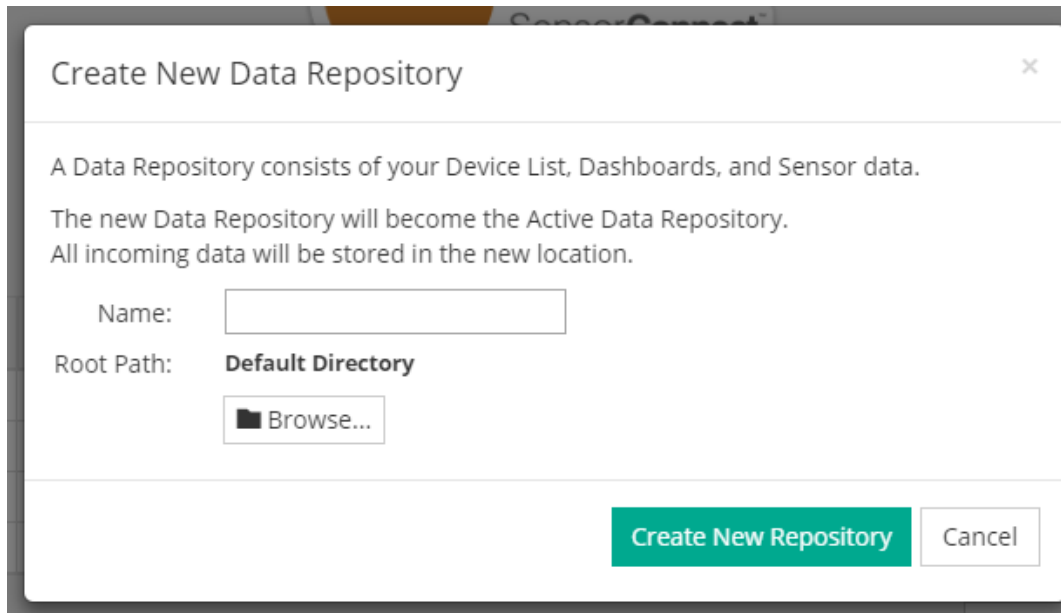
WSDA Control Panel: When connected to a WSDA-1500 via TCP/IP, a new WSDA Control Panel button is provided in the options which is an easy shortcut to opening the control panel in a new browser tab for WSDA-1500 specific settings.



Dark theme improvements: The Dark theme has been expanded to work across all of SensorConnect's UI.



[Easier Data Repository creation](#): We've received feedback that creating Data Repositories was tedious. With the latest SensorConnect, you only need to provide a name for your new repository and it will be created in a default location. If you still want to choose the location (for storing on a different hard drive for instance), this can still be done by pressing the Browse button.



Create New Data Repository [X]

A Data Repository consists of your Device List, Dashboards, and Sensor data.
The new Data Repository will become the Active Data Repository.
All incoming data will be stored in the new location.

Name:

Root Path: **Default Directory**

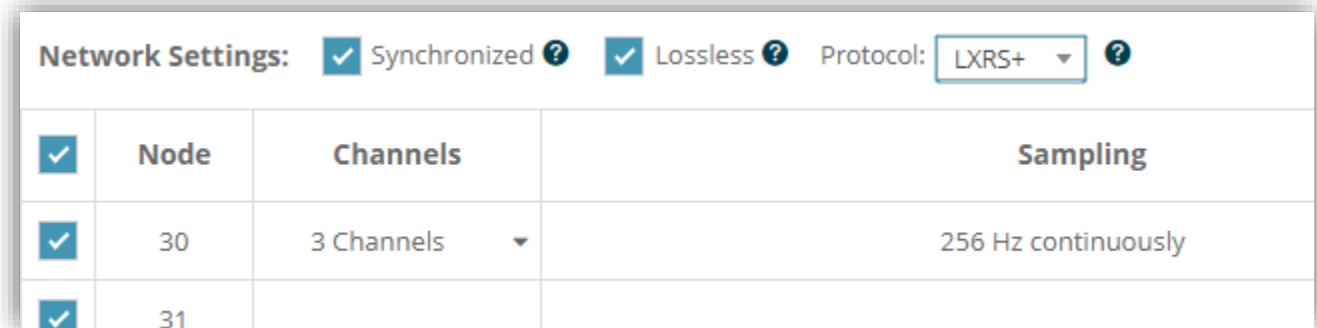
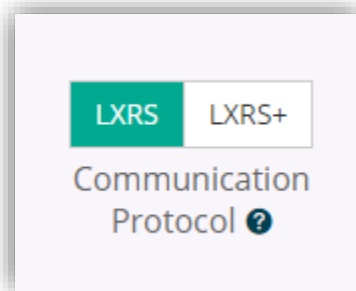
[Other notable updates and bug fixes:](#)

- Support for DPI Scaling to prevent a blur when using a display with a zoom applied in Windows
- Fixed color issue with status indicator widget
- Fixed TCP/IP connection not allowing reconnecting
- Fixed disconnecting from a device sometimes causing a crash
- Fixed bug in Sensor Warmup

v7.0.0 (2017-08-03)

64-bit: We now offer 64-bit builds of SensorConnect. We recommend everyone use this installer when possible. We will still provide 32-bit builds of SensorConnect for those with 32-bit machines.

LXRS+ support: Nodes and BaseStations that support LXRS+ can now be changed between the two modes. LXRS+ prioritizes network throughput over range, and is designed to work at ranges up to 400m with network throughput of up to 16kps. A LXRS+ option is available on the options screen for devices that support it, and in the Sampling screen when it is available for a network.



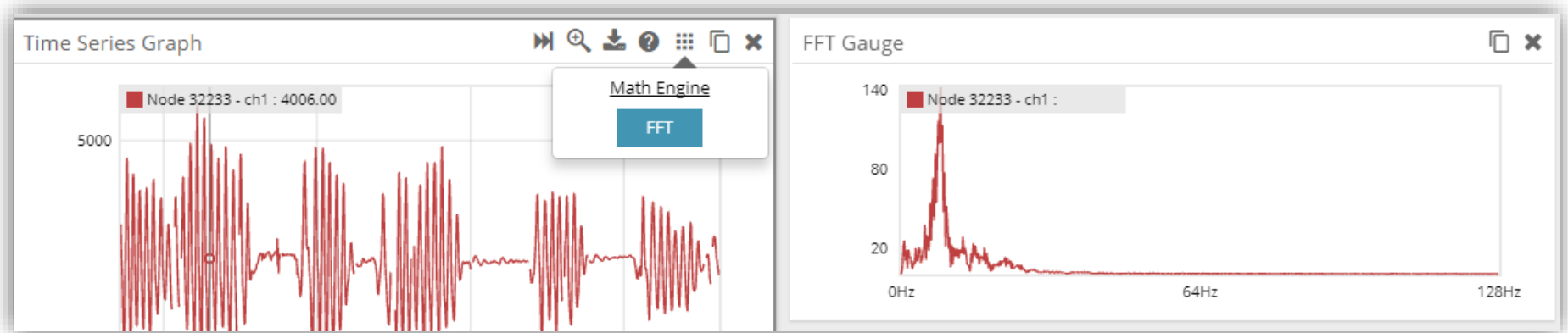
Network Settings: <input checked="" type="checkbox"/> Synchronized ? <input checked="" type="checkbox"/> Lossless ? Protocol: LXRS+ ?			
<input checked="" type="checkbox"/>	Node	Channels	Sampling
<input checked="" type="checkbox"/>	30	3 Channels ▼	256 Hz continuously
<input checked="" type="checkbox"/>	31		

WSDA-200 support: The WSDA-200 USB BaseStation is now supported, with the option to enable LXRS+ mode for Nodes/networks that support it.

3DM-GX5 and 3DM-CV5 support: The 3DM-GX5 and 3DM-CV5 Inertial product lines have basic support with more features coming soon.

Automatic check for updates: On startup, SensorConnect will now check for updates in the background. If an update is available, the menu icon in the top right of the screen will change to orange, and the dropdown will indicate that an update can be downloaded from our website.

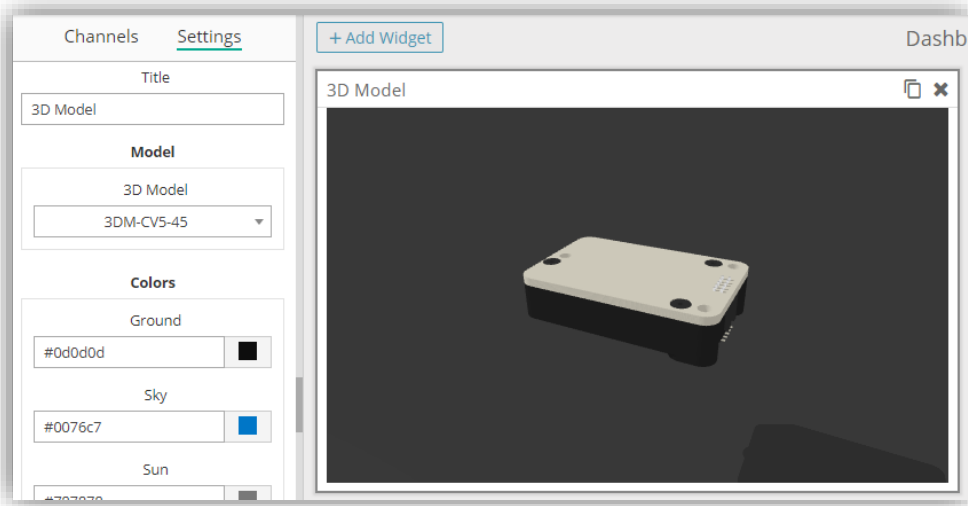
MathEngine and static FFTs: We are happy to announce the introduction of [MathEngine](#) into the SensorConnect interface. On a Timeseries graph, zoom in to the data you want to analyze, click the MathEngine button, and select the FFT option. A new static FFT widget will be created of the data that you had selected in the graph.



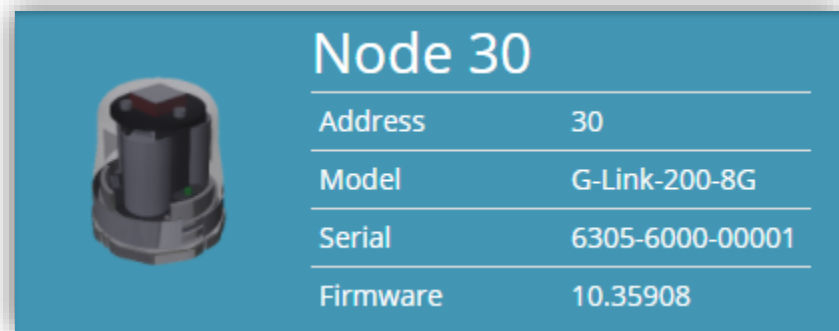
Duplicate widgets and dashboards: Widgets and dashboards can now easily be duplicated with the push of a button.

Maximizing widgets: Double-clicking the header bar of a widget maximizes it to take up the full width and height of the dashboard area.

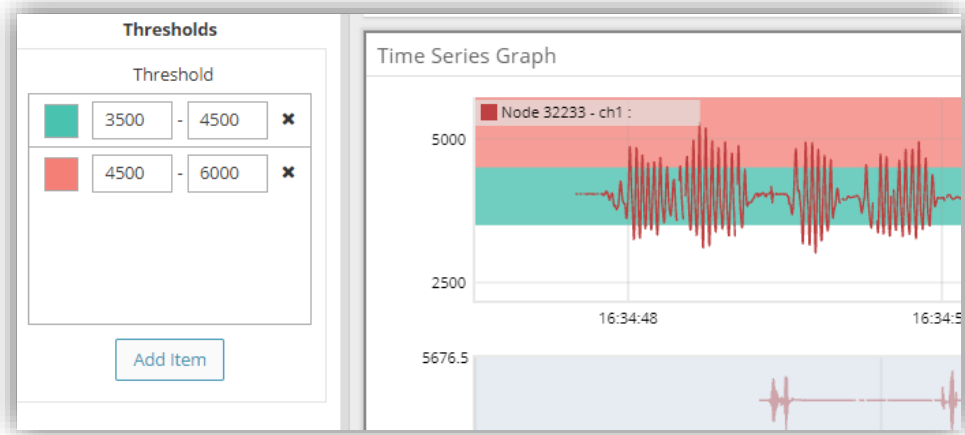
New 3D models: The 3D Model widget now has support for displaying LORD Sensing devices.



Device images: Clicking on a device will now show an image of that device in the header, which helps better identify what you are interacting with.



Thresholds: The Timeseries widget now allows for setting thresholds, which will add colored sections to the graph.



Support for FFT with WebGL1: Many customers were reporting they could not use the FFT widget because their computer did not support WebGL2, or it was blacklisted for some reason. We have ported this widget over to WebGL1 to remove that requirement.

Other notable updates and bug fixes:

- Fix for logged data causing issues with calibration coefficients
- Fix for transmit and logged data causing duplicate entries in the CSV export
- Fix for devices being connected and disconnected causing a crash in some scenarios
- Added retries to installer upgrade utility
- Added more rows and columns to the dashboard for greater flexibility of widgets
- Using WebGL2 features when possible to optimize the performance of the Timeseries graph
- Fix for analog pairing screen not working correctly
- Fix for Timeseries graph erroneously zooming back out on initial load or some user interactions
- Fix for sometimes causing a spike at the end of downloaded datalogged data

v6.0.0 (2017-03-07)

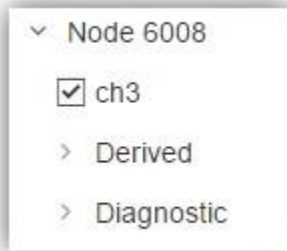
G-Link-200: The G-Link-200 is fully supported. This includes configuration and parsing of new data packets.

Derived channels: The G-Link-200 is the first Node to support Derived Channels. These can be configured by clicking the Channels dropdown in the Wireless Sampling screen.

<input checked="" type="checkbox"/>	Node	Channels
<input checked="" type="checkbox"/>	17	7 Channels ▾
<input checked="" type="checkbox"/> Raw Channels ? <input checked="" type="checkbox"/> ch1 <input type="checkbox"/> ch2 <input type="checkbox"/> ch3		
<input checked="" type="checkbox"/> Derived Channels ? <input checked="" type="checkbox"/> 6 enabled		

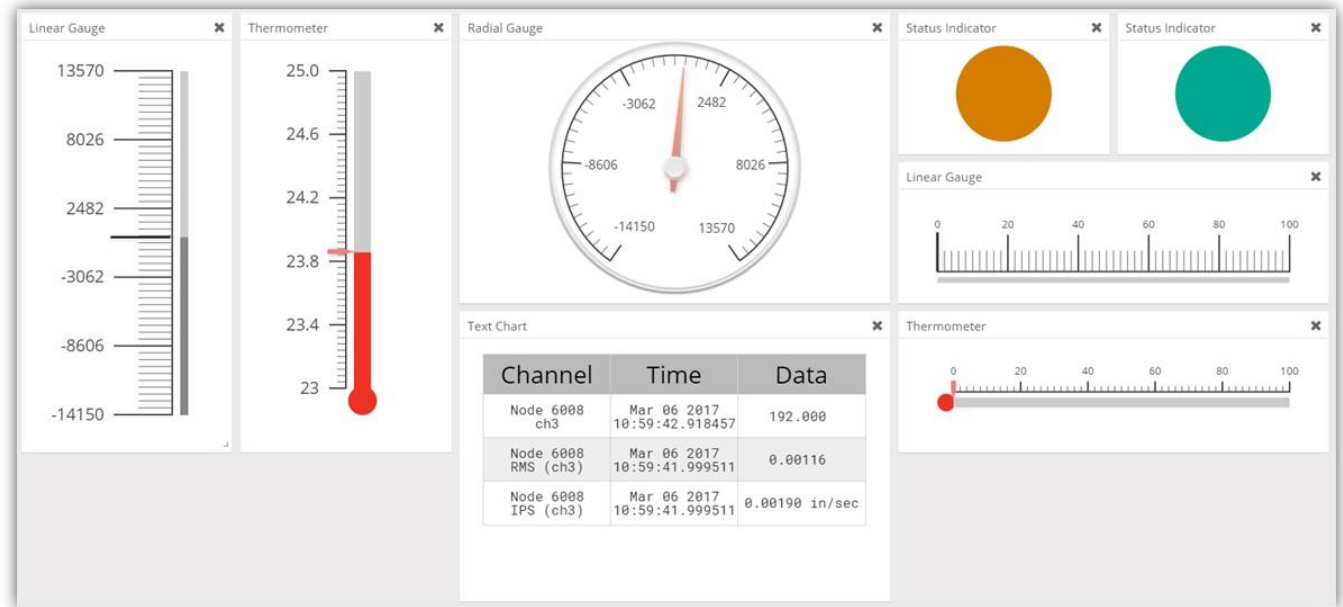
<input checked="" type="checkbox"/>	Node	Channels	Sampling Rate	
<input checked="" type="checkbox"/>	17	7 Channels ▾	512 Hz continuous	
⏪ Data Rate ? every 2 seconds ▾				
		ch1	ch2	ch3
RMS	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Peak-to-Peak	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
IPS	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Crest Factor	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	

Improved channel tree organization: The channel tree now has separate hierarchies for Derived and Diagnostic data channels, making it easier to get to the data you need without cluttering the interface.



New data widgets: New data widgets are now available for displaying data. The new widgets include

- Linear Gauge
- Thermometer
- Radial Gauge
- Status Indicator



Color ranges: Many widgets now support configuration of the Color Ranges setting.

The screenshot shows the settings for a Linear Gauge widget. The settings panel on the left includes:

- Title:** Linear Gauge
- Display:** Major Ticks set to 6.
- Range:** Auto Range is ON. Minimum is 0, Maximum is 100.
- Color:** Three color ranges are defined:
 - 0 - 20 (Green)
 - 20 - 60 (Orange)
 - 60 - 100 (Red)

The preview on the right shows a vertical gauge with a scale from 0 to 100. The needle is positioned at approximately 20, and the gauge is filled with the corresponding colors from the ranges: green at the bottom, orange in the middle, and red at the top.

The screenshot shows the settings for a Numeric Display widget. The settings panel on the left includes:

- Title:** Numeric Display
- Display:** Precision set to 6.
- Color:** Two color ranges are defined:
 - 0 - 100 (Green)
 - 100 - 200 (Blue)

The preview on the right shows a numeric display showing the value 192.000 in blue text.

Helper tooltips: You will notice many helper tooltips on the Wireless configuration and Sampling screens. Clicking these will provide details for the specific setting.

The image shows a screenshot of the 'Wireless Node Configuration' interface. The main title is 'Wireless Node Configuration'. There are two helper tooltips overlaid on the screen. The first tooltip, titled 'Storage Limit Mode', explains that this mode applies when the node logs to its internal memory and lists two options: 'Stop' (returns to idle mode) and 'Overwrite' (first-in, first-out). The second tooltip, titled 'Lossless Enabled', lists benefits like retransmission and operation in range, while 'Lossless Disabled' lists no retransmissions and consistent latency. At the bottom, there are three checkboxes: 'Synchronized' (checked), 'Lossless' (checked), and 'High Capacity' (unchecked).

Wireless Node Configuration

Storage Limit Mode

The **Storage Limit Mode** applies when the Node is datalogging to its own internal memory.

- **Stop:** When the Node fills up its memory, it will stop logging data and return to Idle mode.
- **Overwrite:** When the Node fills up its memory, new data will overwrite old data in a first-in, first-out method.

Storage Limit Mode ? Stop

Lossless Enabled

- Nodes will retransmit data until acknowledged by the WSDA gateway
- Lossless performance in environments where the Node achieves as low as 50% packet error rate
- Allows for operation in situations where the Node and gateway move in and out of range of each other
- Potential for higher latency

Lossless Disabled

- No retransmissions will occur
- Useful when your application requires consistent latency or can tolerate lost data

Synchronized ? Lossless ? High Capacity ?

Live updating of SensorCloud channels: If you are logged in to SensorCloud from within SensorConnect and are viewing your cloud data, it will now periodically update with new data. This means you can leave a dashboard up with just SensorCloud data and see the most recent data continuously update.

Other notable updates and bug fixes:

- F11 full screen support
- Set Nodes to Idle button on BaseStation options screen for setting multiple Nodes to idle mode
- Channel Data Tree displays icon for sensor/channel activity
- Snap to Latest button on Timeseries graph controls
- Support for SensorCloud Two-Factor Authentication (2FA) login
- Fix for long loading of Stage 1 (requires upgrade of data repositories older than 5.27.0)
- No longer cycling power on Nodes unless an EEPROM change has actually been made