

FIRMWARE RELEASE NOTES

Versions V2.0.0 to V2.2.23.0

Model HDL-32E

High Definition LiDAR Sensor



Velodyne

For all new features and changes, refer to the documentation that accompanies the new firmware release for details on usage.

V2.2.23.0 (12-April-2017)

- Fixed: Distance shifts by 1.6 cm across power cycles or resets. If this level of accuracy improvement is desired, then the sensor must be sent back to the factory for recalibration.
- Changed: Phase Lock setting now accepts numbers in degrees rather than counts.
- Improved: Calibration update has been removed from the System tab as this function is primarily used at the factory.
- Added: Ethernet MAC address is now configurable.
- Added the following JSON schema to “/cgi/info.json” in section “info”:
 - factory_mac_addr
- Added the following JSON schema to “/cgi/settings.json” in section “net”:
 - mac_addr
- Added the following JSON schema to “/cgi/settings.json” as a new section:
 - active_net
 - addr
 - mask
 - gateway
 - dhcp
 - mac_addr
- Improved: Greatly reduced the likelihood of a firmware update failing. Note: Even if the sensor firmware update fails, the sensor will either boot up with the old firmware version or enter failsafe mode. It is highly unlikely the sensor will “brick”.
- Improved: Sometimes, laser data was lost because of internal communications errors.
- Added: Additional “Build” column on the Info tab, providing more information on the firmware build.
- Added: The following JSON schema has been added to the “info/image” subsection in both the snapshot file and the JSON string “/cgi/info.json”:
 - “top “ indicates the top board image loaded from last firmware update
- Added: The following JSON schema has been added to the “info” section in both the snapshot file and the JSON string “/cgi/info.json”:
 - “build” indicates the firmware build as pertaining to the new column on the “Info” tab.
- Changed: The internal memory map has changed and requires the sensor to first be reset after flashing the bottom board but before flashing the top board. This is so that the firmware knows the new location from which to push the firmware to the top board. After the sensor is reset, go to the firmware update page and press the “Update” button without first specifying the location of the firmware file. The next screen will start the firmware push to the top board. Press “Process Firmware Update” to complete the firmware update process.

V2.2.21.0 (4-May-2016)

- Fixed: Top-of-hour rollover exceeding 3.6 billion microseconds.
- Added support for NMEA sentence GPGGA
- Fixed: Timestamp jumping issue.
- Added web interface option to determine if use of PPS signal is dependent on the GPS receiver lock.
- Added web interface option to determine if PPS signal should be followed only after NN seconds of stability. Following the rising edge of the PPS signal, all other transitions will be ignored for 0.95 seconds.
- Added web interface option to determine if the sensor will use GPS time from the NMEA sentence only if GPS receiver lock is good; or keep following GPS time from the NMEA sentence regardless of GPS receiver lock status.

V2.2.20.0 (2-Feb-2016) - Beta

- Fixed: In some busy networks the Telemetry UDP message (port 8308) NMEA field may go missing (blank).
- Using the Web Interface to set an invalid IP addresses into the NET IP field will be ignored.
- Fixed: Sensor was using an old IP address from which to send data, even after a DHCP server assigns the sensor an IP address. Sensor will now use the new IP address assigned by a DHCP server.
- ADDED: Data packet tagging
 - Every data packet now identifies the type of sensor and return type the packet is formatted for. Future version of HDL-32E firmware will support this as well.
 - The following chart explains what the bytes mean:

Return Type	Field (37h) Address: 4DEh	Field (21h) address: 4DFh
HDL32 Strongest	37h	21h
HDL32 Last	38h	21h
HDL32 Dual	39h	21h
VLP16 Strongest	37h	22h
VLP16 Last	38h	22h
VLP16 Dual	39h	22h

V2.2.9.2 (21-Apr-2015)

- Recompile design routing to correct jitter
 - Version 2.2.9.1 caused motor noise and upload issues in a small subset of sensors.

V2.2.9.1 (13-Mar-2015)

- Added support for NMEA over Ethernet
 - Sensor can now process NMEA timestamp data over Ethernet port 10110. Data follows NMEA 0183 standards. PPS signal must still be sent over serial connection.
- Introduced Field of View feature

- Customers may now select what rotational range of data to include in data stream. If all data in a packet is outside the configured FOV, the packet will not be created. Note: This does not prevent the sensor from firing lasers outside the FOV.
- Fixed regression in NMEA sentence processing
 - Fixes issue with some GPS units that support non zero fractional seconds fields in the NMEA \$GPRMC sentence. In previous 2.2.X.X builds, this could cause the Top of Hour Counter to be off as much as 1 second. 2.1.X.X Firmware does not have this issue.

V2.2.4.0 (07-Nov-2014)

- Introduced dual return option.
 - Customers may now select what return type the sensor outputs. Choices are 'Strongest,' which is the legacy operation mode, 'Last,' which gives the furthest return recorded, and 'Dual,' which returns both strongest and last. Please see updated documentation for more information including packet formatting for dual return.
- Introduced rotational phase lock feature.
 - Phase lock can be used to synchronize the rotational position of multiple sensors based on GPS time and relative sensor orientation.
- Added check for valid NMEA GPS updates.
 - NMEA sentences are now checked for basic syntax before being accepted. Two consecutive valid sentences are required to synchronize uSec clock.
- Improved PPS handling.
 - Prevented a bouncing PPS signal from causing invalid synchronization.
- Improved data reporting.
 - Fixed issue that caused certain units, under narrow conditions, to return data from previous channels.

V2.1.7.1 (10-Oct-2014)

- Improved PPS handling.
 - In rare startup conditions, issues with GPS PPS signal could cause the system to hang.
- Added support for improved manufacturing calibration process.
 - Further manufacturing controls added to improve performance and reduce variance based on component tolerances.

V2.1.7 (31-Oct-2013)

- Added new rotation speed control algorithm.
 - Rotation speed now has greatly improved accuracy using closed loop feedback system.
- Added configuration options for port settings.
 - Firmware now allows customization of the ports that position and data packets are sent on.
- Improved web server GUI support.
 - All web server GUI features are displayed correctly even using non-Internet Explorer browsers.
- Improved accuracy on diagnostics page read-outs.
 - Some of the values displayed were improperly scaled previously.
- Added PPS detection and reporting to position packets and web server GUI.
 - The sensor will now detect and report the status of the PPS data received from the GPS device.
- Fixed maximum speed limit.
 - A small portion of sensors were unintentionally limited to less than 1200 rpm (20Hz).

V2.0.6 (14-Mar-2013)

- Fixed noisy returns under certain conditions.
 - This has also been referred to as Split Noise returns, where a laser will sometimes return a range that looks correct (in line with the other lasers) and sometimes return a shorter range.

V2.0.4 (8-Feb-2013)

- Improved uplink robustness.
 - Uploading new firmware or calibration files under certain conditions was aborted and needed to be re-tried several times. This version has improved the uplink process significantly.

V2.0.2 (20-Dec-2012)

- Improved tachometer display accuracy.
 - This version has a much higher display accuracy of the rotations per minute (RPM) on the screen of the Web GUI interface.

V2.0.1

- Hot fix for inverted GPS pulse.
 - HDL32 time synchronization via an external PPS pulse was accidentally linked to the falling edge resulting in a delay of time synchronization in the amount of the PPS pulse duration. This version of software now triggers correctly on the rising edge of the external PPS signal.

V2.0.0

- Please see manual for descriptions of new functionality.

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