v2.4.0 Changelog

Firmware v2.4.0 for all Ouster sensors

Ouster

Sep 21, 2022

Contents

1 Features / Releases Support Table

Table 1: Features / Releases Support Table

Features	Supported FW Versions	Supported HW Revisions
Signal multiplier	2.1.0 and higher	Rev C (PN: 840-102XXX-C) and higher
Azimuth window masking	2.1.0 and higher	Rev C (PN: 840-102XXX-C) and higher
Calibrated reflectivity	2.1.0 and higher	OS0 & OS1 Rev C (PN: 840-102XXXC) and higher
Dual Returns	2.2.0 and higher	Rev 06 (PN:840-102xxx-06) and higher
Channel Data Profiles (Single Return, Low Data Rate)	2.3.0 and higher	All Hardware revisions

Note: Channel Data Profiles (Single Return, Low Data Rate configurations along with Dual returns) were added as part of the Configurable Data Packet Format in FW 2.3. Please note in order to enable dual returns the user needs to have both a **Rev 06** sensor or later and FW version 2.2 or later.

2 Supported Products

The current firmware is supported on the following Ouster products:

OS0 , OS1, OS2:

- GEN1: P/N 840-101-XXX-XX
- Rev C: P/N 840-102-XXX-C
- Rev D: P/N 840-102-XXX-D
- Rev 05: P/N 840-102xxx-05
- Rev 06: P/N 840-102xxx-06

Note: Dual Return mode is only supported with **Rev 06** and above sensors.

3   Firmware Changelog

Version v2.4.0

Date 2022-08-31

Description

"Fixed"

- Bug Fix in High Input Voltage Alert behavior.
- Range aliasing improvement.
- Bug in keep-alive behavior for HTTP 1.1.
- **Critical bug fix:** Heavy vibration can trigger the sensor to reset without any alerts, causing an interruption to the data stream. The data stream will resume in approximately 60s. Note: Only affects FW version 2.3 and later.

"Changed"

- pixel_shift_by_row value updated.
- *Alerts-and-Errors* table has been updated to provide more information on each individual alert.

"Added"

- Add the following HTTP Commands to help configure and read the sensor config parameters (Refer to section 13.1 Sensor Metadata for more information): 1. GET /api/v1/sensor/config. 2. POST /api/v1/sensor/config.
- New optional argument for both TCP/HTTP commands "summary" for `get_alerts` command. **Note:** Valid uses of get_alerts:

  - get_alerts 1 (1 is the value of the cursor).
  - get_alerts summary.
  - get_alerts 2 summary (2 is the value of the cursor).

  Invalid uses of get_alerts:

  - get_alerts summary 2.

"Removed"

- `auto_start_flag` has been deprecated.
- `udp_ip` has been deprecated.
- `base_pn`, `base_sn` and `proto_rev` have been deprecated.

Version v2.3.1

Date 2022-06-03

Description

"Fixed"

- Bug Fix in RNG19_RFL8_SIG16_NIR16 mode.

"Added"

- Add support for new PN's.

Version v2.3.0

Date 2022-04-15

Description

"Added"

- Additional Channel Data Profiles (*Single Return*, *Low Return*) were added as part of the Configurable Data Packet Format, refer to section **Configurable data packet format**.
- Additional options for config parameter udp_profile_lidar.
- New TCP command get_telemetry.

"Changed"

- Reflectivity and Signal value is now from 1 to 255. 0 correspond to an invalid reflectivity and Signal value (similar as Range).

"Fixed"

- Fixed startup packet drop behavior (5b alert).

Version v2.2.1

Date 2022-02-17

Description

"Fixed"

- Fixed point cloud detection on a subset of sensors

Version v2.2.0

Date 2021-12-18

Description

"Added"

- Add support for Configurable Data Packet Format
- Add support for Dual Returns mode

"Changed"

- Update Sensor Web UI
- Update TCP command get_lidar_data_format
- Update TCP command get_sensor_info

Version v2.1.3

Date 2021-10-22

Description

"Added"

- Added PN support

Version v2.1.2

Date 2021-07-16

Description

"Added"

- Add support for minor hardware revisions

Version v2.1.1

Date 2021-06-21

Description

"Added"

- Add support for Calibrated Reflectivity
- Add Config UI to sensor web page (Beta)
- Add signal multiplier modes to increase signal strength in the enabled azimuth window for gen2 sensors only
- Add alerts for motor speed
- Add alerts for unexpected sensor state transition
- Improve OS2 cold start to -20℃
- Improve OS2 signal strength by 16%

"Removed"

- Delete TCP command set_data_dst_ip

- Delete TCP command get_data_dst_ip
- Delete TCP command set_udp_port_lidarAdded PN support for new turntable boards
- Delete TCP command set_udp_port_imu
- Delete TCP command get_lidar_mode
- Delete TCP command set_lidar_mode
- Delete TCP command get_config_file_path
- Delete TCP command set_auto_start_flag
- Delete TCP command get_auto_start_flag
- Delete TCP command get_watchdog_status

"Changed"

- Change the Reflectivity values in the packets from 16-bit to 8-bit

"Fixed"

- Fixed phase locked motor control to handle out-of-bounds motor velocity
- Slow time sync on initial boot with PTP
- Fixed azimuth_window parameter logic behavior

4   API Changelog

Version v2.4.0

Date 2022-08-31

Description

"Added"

- New HTTP Commands to help configure and read sensor config parameters:
    - GET /api/v1/sensor/config
    - POST /api/v1/sensor/config
- New optional argument for both TCP/HTTP commands <MODE> = "summary".

"Removed"

- `auto_start_flag` has been deprecated.
- `udp_ip` has been deprecated.
- `base_pn`, `base_sn` and `proto_rev` have been deprecated.

"Fixed"

- Pixel shift by row has been updated.
- Bug in keep-alive behavior for HTTP 1.1.

Version v2.3.0

Date 2022-04-15

Description

"Added"

- Add additional options for config parameter udp_profile_lidar, refer to **Sensor Configurations**.
- Add new TCP command get_telemetry, refer to **Sensor Configuration and Calibration**.
- Add the following GET HTTP Commands (Refer to **Sensor Metadata** for more information):
    - /api/v1/sensor/metadata/sensor_info
    - /api/v1/sensor/metadata/lidar_data_format
    - /api/v1/sensor/metadata/beam_intrinsics
    - /api/v1/sensor/metadata/imu_intrinsics
    - /api/v1/sensor/metadata/lidar_intrinsics
    - /api/v1/sensor/metadata/calibration_status

- /api/v1/sensor/metadata
- /api/v1/sensor/telemetry
- /api/v1/time/sensor
- /api/v1/sensor/alerts

Version v2.2.0

Date 2021-12-18

Description

"Added"

- Add config parameter udp_profile_lidar, udp_profile_imu and their documentation
- Add initialization_id to get_sensor_info TCP command
- Add columns_per_packet to get_config_param TCP command

"Changed"

- The fields base_pn, base_sn, and proto_rev in get_sensor_info TCP command have been cleared

Version v2.1.3

Date 2021-10-22

Description

"Added"

- Added PN support

Version v2.1.2

Date 2021-07-16

Description

"Added"

- Add support for minor hardware revisions

Version v2.1.1

Date 2021-06-21

Description

"Added"

- Add configuration parameter `signal_multiplier` and its documentation

"Removed"

- Remove deprecated TCP command `set_data_dst_ip`
- Remove deprecated TCP command `get_data_dst_ip`
- Remove deprecated TCP command `set_udp_port_lidar`
- Remove deprecated TCP command `set_udp_port_imu`
- Remove deprecated TCP command `get_lidar_mode`
- Remove deprecated TCP command `set_lidar_mode`
- Remove deprecated TCP command `get_config_file_path`
- Remove deprecated TCP command `set_auto_start_flag`
- Remove deprecated TCP command `get_auto_start_flag`
- Remove deprecated TCP command `get_watchdog_status`

"Changed"

- Fixed azimuth_window parameter logic behavior. Notable changes:
- [0,0] now outputs only a single column instead of all columns.
- [1,2] results in sensor startup failure and an alert because there are no valid output columns.

Version v2.0.0

Date 2020-11-20

Description

"Added"

- Add TCP command `get_lidar_data_format`.
- Add in `azimuth_window` documentation.
- Add in commands `phase_lock_enable` and `phase_lock_offset` and their documentation.
- Add in verbose responses to parameter validation for TCP commands.
- Add in command `save_config_params` which supersedes the deprecated command `write_config_txt`, which will be deleted in future firmware.
- Add in command `get_config_param  active` in favor of the deprecated command `get_config_txt`, which will be deleted in future firmware.
- Add in new STANDBY and WARMUP statuses.
- Add in parameter `operating_mode` in favor of the deprecated parameter `auto_start_flag`, which will be deleted in future firmware.
- Add in parameter `udp_dest` in favor of the deprecated parameter `udp_ip`, which will be deleted in future firmware. This is to be consistent with the `set_udp_dest_auto` parameter and to reflect that valid values can be hostnames in addition to ip addresses.
- Add in HTTP GET `api/v1/diagnostic/dump` endpoint.

"Removed"

- Remove deprecated TCP command `set_udp_ip`.

"Changed"

- TCP command `get_beam_intrinsics` now returns: 1) `lidar_origin_to_beam_origin_mm`, distance between the lidar origin and the beam origin in millimeters; and 2) beam altitude and azimuth angle arrays with padded zeros removed.

- `azimuth_window` parameter now in terms of millidegrees and implemented CCW.

- Deprecate `api/v1/system/time/` HTTP API and its sub-APIs and replace with `api/v1/time/`

Version v1.13.0

Date

Description

"Added"

- Add TCP command `set_udp_dest_auto`

- TCP command `get_alerts`, includes more descriptive errors for troubleshooting

"Changes"

- Packet Status now called Azimuth Data Block Status and is calculated differently

- Packets with bad CRC are now dropped upstream and replaced with `0` padded packets to ensure all packets are sent for each frame.

- Return format of TCP command `get_time_info` updated

"Removed"

- Removed reference to window_rejection_enable

Version v1.12.0

Date

Description

"Changes"

- Corrected IMU axis directions to match Sensor Coordinate Frame.

- Sensor Coordinate Frame section of sensor user manual for details on sensor coordinate frame. This change inverts IMU X, Y, and Z axis relative to v1.11.0.

Version v1.11.0

Date 2019-03-25

Description

- Add section on HTTP API commands.

- TCP Port now hard-coded to 7501; port is no longer configurable.

- Update to SYNC_PULSE_IN and MULTIPURPOSE_IO interface and configuration parameters (see details below).

Configuration parameters name changes:

- `pps_in_polarity` changed to `sync_pulse_in_polarity`
- `pps_out_mode` changed to `multipurpose_io_mode`
- `pps_out_polarity` changed to `sync_pulse_out_polarity`
- `pps_rate` changed to `sync_pulse_out_frequency`
- `pps_angle` changed to `sync_pulse_out_angle`
- `pps_pulse_width` changed to `sync_pulse_out_pulse_width`

New configuration parameters:

- `nmea_in_polarity`
- `nmea_ignore_valid_char`
- `nmea_baud_rate`
- `nmea_leap_seconds`

Configuration parameters option changes:

- timestamp_mode - `TIME_FROM_PPS` changed to `TIME_FROM_SYNC_PULSE_IN`
- multipurpose_io_mode (formerly pps_out_mode) - `OUTPUT_PPS_OFF` changed to `OFF` - `OUTPUT_FROM_PPS_IN_SYNCED` changed to `OUTPUT_FROM_SYNC_PULSE_IN` - Removed `OUTPUT_FROM_PPS_DEFINED_RATE` - Added `INPUT_NMEA_UART`

TCP command changes:

- **Added commands:**
  - `get_time_info`
- **Changed commands:**
  - `get_config_txt` (returned dictionary keys match parameter changes)
- **Removed commands:**
  - `set_pps_in_polarity`
  - `get_pps_out_mode`
  - `set_pps_out_mode`
  - `get_timestamp_mode`
  - `set_timestamp_mode`

Polarity changes: * `sync_pulse_in_polarity` was corrected to match parameter naming. * `sync_pulse_out_polarity` was corrected to match parameter naming.

Version v1.10.0

Date 2018-12-11

Description

"Added"

- Add `get_alerts`, `pps_rate` and `pps_angle` usage commands and expected output.

"Removed"

- Remove all references of `pulse_mode`.
- Remove TCP commands prior to v1.5.1.

Version v1.9.0

Date 2018-10-24

Description

"Changes"

- No TCP command change.

Version v1.8.0

Date 2018-10-11

Description

- `get_sensor_info` command gives `INITIALIZING`, `UPDATING`, `RUNNING`, `ERROR` and `UNCONFIGURED` status.

Version v1.7.0

Date 2018-09-05

Description

"Changes"

- No TCP command change.

Version v1.6.0

Date 2018-08-16

Description

"Added"

- Add `get_sensor_info` command gives `prod_line` info.