Version History for Lodestar Firmware 3.02.01

Version 3.02.01.1019 21st November 2018

This firmware release is based on 3.02.00 with the main changes listed below. This version of firmware should be used for all Lodestar V3 and V2 (Latest Standard) applications – excluding the Surface Lodestar and Gyro Compatt 5. For further information regarding firmware compatibility, contact your local Sonardyne office.

New Features:
- [26870] Implement ASCII Pressure message (PSONDIGI)

Version 3.02.00.1012 7th June 2018

This firmware release is based on 3.02.00 with the main changes listed below. This version of firmware should be used for all Lodestar V3 and V2 (Latest Standard) applications – excluding the Surface Lodestar and Gyro Compatt 5. For further information regarding firmware compatibility, contact your local Sonardyne office.

Fixes / changes:
- [29746] The Lodestar firmware crashes when particular configuration is loaded.

Version 3.02.00.1006 12th March 2018

This firmware release is based on 3.01.00 with the main changes listed below. This version of firmware should be used for all Lodestar V3 and V2 (Latest Standard) applications – excluding the Surface Lodestar and Gyro Compatt 5. For further information regarding firmware compatibility, contact your local Sonardyne office.

New Features:
- [23190] Added support for Beam Level DVL Aiding
- [26587] Added support for new OBSTDVL message.
- [23190] Further improvements to support beam level DVL, including added Error Velocity checks when beam processing. Ensured that there are enough buffers for combinations of sensors
- [28519] Added SYS SLIST command

Fixes / changes:
- [23190] Updated OBSTDVL message (MID 235) and DVL MODE AUTO | BEAM | BODY logic
- [28192] Modified TTF usage for SMS augmentation
- [28260] Modified DVL Beam Level Default Pre-filter values
- [28631] Added extra beam level pre-filter conditions
- [28196] Corrected bug in PD4 frame transformation

- [28522] Modified PRDKELLBIN to provide TOA rather than TOV
- [27708] Improvements to DVL trigger BIST logic
- [28567] Fixed decode of SMS reply to allow augmentation to take place.
- [28600] Fixed issues with UDP inputs
- [28605] Fixed issue with derived sound speed when in DVL MODE BEAM
- [28605] Fixed issue with Valeport and PSONSS being selected as SV sources
- [28760] Changed configuration of Ethernet stack for better TCP connections
- [28731] Modified DVL framer to ensure packets aren't missed.
- [28812] Fixed issue with Ethernet settings being corrupted when link is lost.
- [28258] Fixed issue in code which would have stopped Settings from being logged.

Version 3.01.00.973 21st March 2017

This firmware release is based on 3.00.00 with the main changes listed below. This version of firmware should only be used for all Lodestar-Nav/SPRINT-Nav (3rd generation) V3 applications.

- [24827] - Added output to ENG List to display Power PIC F/W version
- [25153] - Fixed PSONNAV (and LNAV) sensor status.
- [25229] - Added PIC Application for Degraded AHRS
- [24716] - Fixed issue with SVS logging any NMEA telegram if PSONSS was sent over the same multiplex link.
- [25309]   - Fixed issues with PORT PASS when between two TCP ports.
- [24337] - Limit values acceptable for the TSYS TIME command
- [24776] - CIMU to be retained when updating PIC APP settings and allowing CIMU to be added to any port in CUSTOMER user mode.
- [24828] - Fixed such that only '1' and '0' are valid with USEVERTICAL C+C
- PPR 25229 - Added AHRS Degradation for Lodestar 200
- PPR 23475 - Limit values allowed for TSYS TIME command
- PPR 25261 - Reduced the number remote points that delayed heave is calculated
- PPR 24803 - Corrected issue with SYS SHUTDOWN when commanded early after boot
- PPR 24510 - Removed support for non multiplex SD card logging
- PPR 25229 - Modified such that only heading is degraded for a LS 200
- PPR 25685 - Corrected PIC list output when LS 200
- PPR 25686 - Output ISA SN with an IMU LIST
- PPR 25930 - Added LNAVUTC
- PPR 24190 - Fixed issue with TCP and UDP PORT SNOOP
- PPR 25931 - Added ability for L/S to generate PPS and ZDA
- PPR 25218 - Added checks on sequence number to ensure correct BR times are used for augmenting replies.
- PPR 25977 - Added checking for LBL XC in pre-filter.
- PPR 26267 - Ensured that only triggers that should be enabled by the firmware (according to the current settings) are enabled at start-up
- PPR 26312 - Added checking on DVL trigger output (including BIST bits for error conditions)
- PPR 25931 - Added BIST bits for PPS output trigger
- PPR 25984 - If sensor level is unknown for a V2 unit - assume 500 when required

- PPR 25613 - Added SMS Augmentation
- PPR 26753 - Allow SON2 to be sourced from INS
- PPR 26581 - Added command to allow filter to be configured for IMU angular rates in OP MSGs
- PPR 21634 - Fixed bug for V2 hardware where UARTs would lock up.
- PPR 26423 - Added PWRSTAT to default logging to SD card
- PPR 26461 - Added integration of Keller pressure sensor
- PPR 26489 - Finalised changes required for V3.1 hardware
- PPR 26581 - Added Filtering on Angular rate data in OP MSGs
- PPR 26656 - Added support for new Async 6G ranging protocol
- PPR 26794 - Removed 5G support from LBL augmentation
- PPR 26817 - Removed support for MPRESS, MDVL and MLBL message generation
- PPR 26840 - Fixed issue with timer buffers running out.
- PPR 26881 Fixed HELP output
- PPR 26880 Fixed HELP output
- PPR 26895 Fixed Power PIC read update
- PPR 25930 Fixed issue with where g was being removed from INS acceleration outputs
- PPR 25613 - Corrected TTF and TXWait times to be in us for calculations
- PPR 27234 & 27225 - Rename SPRINTSYRINX to SPRINTNAV and ensure that it is persisted over firmware upgrades and reset of factory defaults.

Version 3.00.00.946 21st March 2016

This firmware release is based on 2.08.00 with the main changes listed below. This version of firmware should be used for all Lodestar V3 and V2 (Latest Standard) applications – excluding the Surface Lodestar and Gyro Compatt 5. For further information regarding firmware compatibility, contact your local Sonardyne office.

New Features:
- [22296] Modify Firmware to accept and log a second DVL input
- [22534] Log (and allow configuration) of diagnostic data to SD card
- [22535] Implement Relative Navigation Output
- [22881] Implement parsing and logging of ASONDV message (from Syrinx)
- [22904] Add PIC setting to allow output of real time IMU data
- [22982] Allow SUSBL aiding without time synch
- [23095] Support comms routing between multiplexed and non-multiplexed port
- [23096] Allow output of serial break on UART
- [23189] Parse and Log Syrinx DVL Time Synch Message
- [24126] Lodestar Command and Control: Add PORT PWRPASS command to V3 firmware to list all power port (enable/disable)
- [24509] Add setting to denote sensor combination fitted to IMU
- [24601] Add diagnostics logging and output to SD card in firmware default settings

Fixes / changes:
- [11333] Re-add automatically closed SD files when battery charge > 10%
- [11866] Put 4800 baud back in as an option for V3 Hardware Only
- [22930] SON2 does not indicate if VTG is being used in AHRS aiding
- [23204] Increase TTL value for Lodestar ping packet
- [23543] Prevent output of negative unit variance in SON2 telegram
- [24540] Velocity aiding flag not set correct on (SON2 and TSS2) output AHRS messages

Version 2.08.00.908 11th June 2015

This firmware release is based on 2.07.01 with the main changes listed below. This version of firmware should be used for all Lodestar applications.

New Features:
- [20336] Provide 3-beam DVL aiding support
- [20514] Implement new output PSONNAV message
- [21922] Lodestar firmware: Implement XPOS aiding and Observation message for SPRINT V1.3
- [21962] Implement LNAV Binary Message

Fixes / changes:

- [22344] Unable to send IN X MSG + COMMAND to the GyroCompatt
- [20700] Checksum calculated for LOG type message on non-multiplex telegrams is incorrect

Version 2.07.01.880 14th Jan 2014

This firmware release is based on 2.07.00 with the main changes listed below. This version of firmware should be used for all Lodestar applications.

New Features:
- [17885] Added logging of PSONBCNTIDE message for LBL
- [18061] Added Valeport SVX2 Depth message. Only supports DBAR
- [18205] $INGGA telegram now populates INS 1DRMs value
- [18207] DVL logging is separated into PD0 and PD4/5
- [18717] Velocity compensation now working correctly. This firmware version complies with IMO certification.

Version 2.07.00.868 29th May 2013

This firmware release is based on v2.05.02 with the main changes listed below. This version of firmware should be used for all Lodestar applications.

New Features:
- **[17491]** Supports multiple transponder LUSBL DPINS algorithm.
- **[15532, 15964]** Added 3D GPS aiding.
- **[15949]** Added 3D SUSBL aiding.
- **[15532, 15964]** Added use of GST and GSA logging.
- **[15964]** Added enhanced GNSS
- **[17187]** VTG logged but not used in the algorithms.
- **[15950]** Boosts horizontal position covariance states when changing from one positioning sensor to another.
- **[12715]** Added DVL PD0 use.
- **[16921]** Added support for Winson Processed data for depth aiding.
- **[15953]** Changed logged filenames:
  - Sequence number always increases and goes from 0 to 999,999 then rolls over.
  - It is stored in the EEPROM (IO) as 10 bytes from addr 40 as "SEQdddddd\0".
  - D<IMU SN>_<SeqNum>_yyyymmdd_hhmmss#.BIN
  - D<IMU SN>_<SeqNum>_yyyymmdd_hhmmss.BIN
  - Addng a '#' at the end of a filename and before the '.BIN' to indicate when the first file created after the Lodestar starts up.
- **[15967]** Made changes to make Ethernet code more robust.
  - Added Ethernet reset.
  - **[16255]** Added ability to ping.
  - Added ethernet reset without requiring memory allocations.
  - Removing an Ethernet cable causes the Ethernet to reset.

- Logging of NMEA msgs now done, whether good enough to use in subsequent algorithm or not.
- **[16561]** LOG LS now lists creation date/time not modified date/time.
- **[14360]** PIC MATCH UNLK\r is now set when a SYS LOAD FACTORY is done eg by command or if no FLASH settings found.
  - o **[16249]** Since the PIC hardware can occasionally break, code has been added to protect the firmware from repeatedly trying to access it and getting stuck.
- **[16478]** Added BIST entry to indicate if problem with mux checksum.
- **[17001]** Added permanent bit for not trusting the AHRS result and thus the INS.
- **[17609]** CMDS added / changed. See docs for CMDS VERSION 70 (v2.05.00) and CMDS VERSION 97 (v2.07.00).

Fixes / changes:
- **[12645]** Fixed USBL MA cmd so it expects Vessel2USBL not Body2USBL angles.
- Fixed saving to Flash issue on some boards. Added DBG info if there's a problem saving to FLASH.
- **[17472]** All USBL/LBL comms now logged whether mux/non-mux port.
- **[17548]** Corrected initial position calculation for USBL initialising the INS when non-zero USBL MAs.
- **[17666]** Doesn't set the Bcn or Lvr age rejection bits if the PSONUOBS status flag is invalid.
- **[16250]** Fixed Auto INS RST issue causing IMU data loss.
- **[16420]** Prevents INS re-initialisation too frequently which could result in PMAT and DXMAT msgs overloading the port.
- **[17126]** If automatic SD card file deletion needs to happen multiple times it now doesn't prevent cmds being accepted while it goes through the deletions.
- **[17454]** Fixed trigger behaviour for case when it's running as an output, then it's set to be an input and go=1 and it didn't set up the setting internally correctly.
- **[15527, 16420]** Warning output rate for specific DBG msgs reduced to avoid too many causing buffer overflows.

Version 2.05.02.820 14th Jan 2013

This firmware is identical to V2.05.01 except for the following changes. This version of firmware should be used for all Lodestar applications.

New Features:
- **[13590]** MUSBL always output for each observation

Fixes / changes:
- **[16393]** INS initialised using AHRS from IMU time, not initial position time
- **[16465]** Ring buffer search protection for IMU data.

Version 2.05.01.809 29th October 2012

This firmware is identical to v2.05.00 but includes changes for the Gyrocompatt powering the Lodestar.

This version of firmware should be used for all Lodestar applications.

New Features:
- **[15811]** Gyrocompatt power differences (compared to a non-Gyrocompatt) supported.
- CMDS changed. See docs for CMDS VERSION 70 (v2.05.00) and CMDS VERSION 75 (v2.05.01).

Version 2.05.00.799 26th September 2012

This version of firmware should be used for all Lodestar applications *except* GyroCompatt6. A new version V2.05.01 which is currently in testing should be used in LGC6 applications. Shortly V2.05.01 will be released and will then be used in all Lodestar applications including LGC6.

Note that V2.04.00 firmware was never released so the changes below are between V2.03.00 to V2.05.00

New Features:

- **[13602]** 5G & 6G USBL and LBL now supported.
- **[13392]** 5G & 6G USBL use the same commands. 5G & 6G LBL uses the same commands. After being told which 2 ports are to expect 5G & 6G comms it automatically works out which end of the 5G & 6G comms is on which port. i.e. not restricted to using T1/T2 for the bottom-side comms and C0/1/2 for topside.
- **[14998]** For PSONUOBS and PSONLOBS containing an invalid Status flag, the data is still logged.
- **[13616]** Latitude from SUSBL updates the AHRS latitude.
- If no UTC field present (NULL) in the GPS GGA or Subsea GGA or PSIMSSB then TOA is used
- **[12077]** Added ZUPT aiding.
- **[14803]** Added OP MSG PRDDPT.
- **[10735]** Added code for persisting port settings for OP/IN/LOG MSG after an IP address change.
- **[14496]** Added changes for new 8084-171 power board.
- **[14520]** No external power to be generated hence removed SYS EXTPWR commands and ALARM commands
- **[15091]** Changed SYS GYROCOMPATT command.
- **[14785]** Prevents SD card copying while logging to the SD card.
- **[14673]** C1 to accept commands as default.
- **[14953]** PIC defaults for MATCH/BREAK/SLEEP are now set to defaults by a SYS LOAD FACTORY.
- **[13689]** Added ability to turn termination resistors on and off.
- CMDS changed. See docs for CMDS VERSION 45 (v2.03) and CMDS VERSION 70 (v2.05.00).

Fixes / changes:

- **[15869]** Fixed scenario where "Default Settings" were suddenly being used.
- **[13608]** Fixed Ethernet logging when LBL msgs sent topside on same port as logging.
- **[14012]** Fixed autoshutdown cmd.
- **[14334]** Initial SETTINGS msg output to SD card now ok - only outputs it once the log file has been opened.
- **[15108]** A repeated serial break being sent when plugging 232 into a Lodestar's 485H port configured for LBL/USBL should now not occur.
- Changed LBL calculation very slightly.
- **[15865]** Clears down old Ethernet errors in BIST.