

AP+ LV Release Notes

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1. Introduction

This document describes the major changes between each official release of AP+ LV firmware.

2. AP+ V1.5 Firmware 8.30.213

Release date 2024-01-12

Release of LV firmware for the new AP+ V1.5 hardware platform.

- New IMU Support
 - Added legacy IMU 80 supports for AP+ 50 LV configuration.
 - Added IMU 93 and IMU 95 supports for AP+ 30 and AP+ 50 LV configurations respectively.

• I/O Configuration

- Added GSOF Strobe Info stream (#72) and GSOF DMI status stream (#73). Refer to the AP+ Interface Control Document for details on messages.
- Added Legacy uPOS ICD Group 1, 2, 3, 7, 10, 11, 20, 38, 99, and 20000 messages, including:
 - Group 1: Vehicle Position, Velocity, Attitude & Dynamics
 - Group 2: Vehicle Navigation Performance Metrics
 - Group 3: Primary GNSS Status
 - Group 7: PPS Time Recovery and Status
 - Group 10: General Status and FDIR
 - Group 11: Secondary GNSS Status
 - Group 20: IIN Solution Status
 - Group 38: GNSS Receiver RTX Status
 - Group 99: Versions and Statistics
 - Group 20000: User Diagnostic Information (Base station correction message status)
- o Added Legacy NMEA PPS output

GAMS Calibration

• Added Calibration Start Heading Accuracy (see screen grab below regarding the updates on GUI). For the GAMS Calibration procedure, please refer to Applanix support for further details.

	LE frame)			
X:	0.000 [m]	X:	0.683	[m]
Y:	0.000 [m]	Y:	-2.024	[m]
Z:	0.000 [m]	Z:	-0.051	[m]
1-σ:	5.000	1-σ:	0.001	
	Heading Accuracy [Deg]:	11.000		
alib Star				
	Heading Accuracy [Deg]:	0.100		
Targe	t Heading Accuracy [Deg]: Heading Accuracy [Deg]:	0.100 54.926		

- Added messages for GAMS Calibration Control, including setting up GAMS calibration parameters, starting GAMS Calibration, and getting GAMS calibration parameters/status. Refer to the AP+ Interface Control Document for details on messages.
- Enhanced GAMS Calibration performance and reduced calibration time.

• Receiver Configuration

• Added distance-based strobe and time-based strobe features for AP+ LV and displayed the strobe configuration on the web GUI (as shown below).

1 2	U			(/
Strobe Pulse Width	10 [msec]	Active Edge	Rising Edge 🗸	Manual Trigger	Trigger Once
	(Range 10msec - 990msec))	(Positive Pulse)		
Strobe Trigger Mode	Distance Based 🗸	Distance Interval	1.00 [m] [0.9~2	00m]	
Restart trigger on reboot		Start Now	Stop		
Distance trigger using DMI					

• Added User Accuracy Specification page to allow users to define attitude, heading, position, and velocity RMS accuracy thresholds.

User Accuracy Specification

RMS Accuracy		
Attitude:	0.05	[Deg]
Heading:	0.08	[Deg]
Position:	2.00	[m]
Velocity:	0.50	[m/s]

- INS Control
 - o Added INS Diagnostics page to display system diagnostics indicators.
 - Fixed position and velocity value inconsistent issues between the reference frame and vehicle/sensor frames on GUI output.

• Navigation

- Enhanced navigation engine to maintain data integrity and reliability during long GNSS outages.
- Fine-tuned navigation engine for IMU57 and GAMS, for a more stable and robust navigation solution.

• Data Logging

- Enhanced stability for ethernet logging.
- Improved to output firmware version in T04 record.
- Web GUI
 - Updated Trimble GUI.

3. AP+ V1.5 Firmware 8.20.216

Release date 2022-08-22

Release of LV firmware for the new AP+ V1.5 hardware platform.

- Receiver Configuration
 - Added time-based strobe feature for AP+ LV and displayed the strobe configuration on the web GUI.
- Navigation
 - Enhanced system stability during high CPU loading condition.
- I/O Configuration
 - Ethernet logging output stream available independent with internal logging.
 - Note: The system must deselect the Ethernet logging on the previous firmware (8.20.008) before upgrading to the new release firmware that supports independent ethernet logging.

4. AP+ V1.5 Firmware 8.20.008

Release date 2022-04-12

Initial release of LV firmware for the new AP+ V1.5 hardware platform.

• Configurations

• This firmware supports the following products/models/IMUs. Any given model supports all the IMU types belonging to lower level models as well, accessible via a drop down menu on the GUI or by sending a command message.

AP+18 LV	no remote IMU, onboard IMU 79
AP+20 LV	remote IMU 90, onboard IMU 79
AP+30 LV	remote IMU 82, onboard IMU 79
AP+50 LV	remote IMU 91, onboard IMU 79
AP+60 LV	remote IMU 57, onboard IMU 79

• IMU

- Raw IMU data is logged for both the onboard and remote IMUs whenever logging is enabled.
- Real time navigation may be selected to use either the onboard or remote IMU. A flag is embedded in the logged data that indicates to POSPac which IMU was used in real time so the data may be displayed appropriately.
- In AP+ V1.5 the remote IMU uses the Rx portion of COM 2 as described in the Integration Manual, however, low rate user output may be configured on COM 2.

• Control and Configuration Interface

• All installation parameters can be set, and control actions initiated, via the web based GUI. For OEM integration there are a set of messages that may be sent to AP+ that replicate all the features available on the GUI. Refer to PUBS-ICD-006559 - AP+ Interface Control Document for details.