



# Lancaster Firmware Upgrade

## Version 3.15 Release Notes

### Hardware/Software Requirements

- Lancaster 5
- Lancaster Mark III Rev 4 (with FW version 3.4 or later)
- PrecisionFlight 1.1 or Mission Planner 1.3.35 or later
- PrecisionMapper 26.0 or later

### Revision History

#### FW Version 3.15

##### Bug Fixes

###### Safety Issue

- A safety issue was identified that would leave the propeller spinning under some conditions when it should have been disarmed. This has been corrected. This issue only affected software disarming; the physical interlock key continues to work normally. This issue only affected the Lancaster 5, not the Lancaster Mark III Rev 4.

#### FW Version 3.14

##### Improvements

###### Improved Dual-Frequency GPS Support on Lancaster V

- A compatibility issue was identified that would cause a false positive report of loss of GPS when flying with the dual-frequency GPS. This has been corrected. See also “Known Issues”, below.

###### USB Key Simplification

- On the plane’s USB key, the “payload” folder inside “HEFW” is no longer needed and may be deleted.

##### User Interface Changes

###### Rededge Payload Support

- When flying with the Rededge multispectral payload, the LCD screen will prompt you to press OK to take calibration images of the radiometric calibration target. This will happen both before launch and after landing. Doing so improves data processing quality.

##### Bug Fixes

###### LIDAR Payload Support

- LIDAR v2 payload error messages were previously all reported as PLD\_001. Now, the correct error code will be reported.
- Fixed a deadlock issue causing LIDAR v1 payloads to freeze during preflight with 3.13 firmware.

### Flight Behaviour

- Pressing “land now” in InFlight while the plane is in its initial loiter no longer causes the plane to get stuck in the loiter.
- Uploading a mission via Mission Planner with a smaller number of waypoints than the current mission could previously cause the mission to be corrupted or the plane to get stuck in the landing loiter. This has been fixed.

### Known Issues

#### Possible Loss of GPS After Downgrade

- On a Lancaster V, the following sequence of events could result in loss of GPS functionality, preventing the ability to launch:
  1. Perform pre-flight checks with 3.14 firmware.
  2. Replace a dual frequency GPS plate with a single-frequency plate or vice versa.
  3. Perform pre-flight with a firmware version prior to 3.14.
- If the above steps are performed, the autopilot may report no GPS lock, even though the GPS is functioning correctly. To resolve this issue, always perform preflight checks with firmware 3.14 or later after swapping to a different GPS plate. This will restore GPS functionality. This problem only affects the Lancaster V. The dual-frequency GPS is not officially supported on the Lancaster IV.

## FW Version 3.13

### Improvements

#### New LIDAR Payload support

- Support for the new LIDAR v2 payload.

#### Dual Frequency GPS Support

- The FW now supports use of a more accurate dual frequency GPS receiver.

## FW Version 3.12

### Bug Fixes

#### Fixed auto-pilot parameter

- Incorrect auto-pilot parameter value was fixed.

## FW Version 3.11

### Improvements

#### Improvement to AOI Coverage

- The boundary overshoot of downwind transects has been increased to ensure better data capture along the AOI border.

#### Upwind Only Data Collection

- The aircraft can be set to survey an area while capturing data only during upwind transects. Enabling this feature will double the required flight time.
- To enable this feature, add the line "TransectTurns oneway" to the mission .dat file.

#### Battery Level Estimator

- Minor improvement to the battery level estimator to ensure that a short down spike in voltage does not cause the aircraft to abort the mission prematurely.
- The low battery threshold has been increased by 0.15V.

#### Bug Fixes

##### Data Capture for Linear Flight Plans

- When using a linear flight plan, the firmware will now enable/disable the payload data capture at the correct waypoints.

### **FW Version 3.10**

#### Improvements

##### Optimized settings for PixHawk auto-pilot

- New PixHawk parameters
- Change to landing approach waypoint (now 15m from landing location @ 4m altitude).

### **FW Version 3.9**

#### Bug Fixes

##### Resuming a Mission (Battery Swap) When Using a Thermal or LIDAR payload

- When resuming a mission when using a Thermal or LIDAR payload, the data from the previously completed part of the survey was being over-written and lost. This is now fixed. A large thermal or LIDAR survey can now be performed with multiple flights and the resulting data will be placed into the same survey directory without any data loss.

### **FW Version 3.8**

#### Improvements

##### Resuming Survey After Communication Loss

- A loss of communication with the ground station will cause the aircraft to enter RTL mode. Once communication is re-established the aircraft can be instructed to resume the survey. When resuming the survey the aircraft will restart the last transect it flew before the RTL event in order to avoid gaps in data collection.

##### RTL Failsafe Disabled During Takeoff & Landing

- A loss of communication with the ground station during the takeoff or landing phases of flight will not cause the aircraft to RTL.

##### Improved Low Battery Failsafe

- The aircraft now adjusts the low battery threshold in real-time based on its distance from the landing loiter location.

#### Reduced Survey Data Size

- The aircraft disables payload data capture during user actions such as 'Emergency Dive' or 'Go To Loiter'. If the user resumes the mission, the aircraft will start capturing data when starting to fly a transect.

#### Incident-Light Sensor

- The Lancaster 5 aircraft now records the incident-light sensor (ILS) readings in the survey's telemetry data. This will be used to improve data quality.

### Bug Fixes

#### 'Land Now' followed by 'Resume Mission' command

- This command sequence previously caused some survey data files to be placed in the wrong directory in the aircraft USB key. This bug is now fixed.

#### Writing Waypoints from InFlight

- Fixed issue that caused InFlight to show old waypoint positions when uploading waypoints to the aircraft.

#### Writing Waypoints from Mission Planner

- Writing waypoints from Mission Planner will no longer clear the 'visited' area of the survey.

### Known Issues

#### Home Position

- The 'Home' position is where the aircraft will return to loiter over when detecting a loss of communication with the ground station. This is currently set to be at the position of the aircraft during pre-flight checks.
- In future firmware updates the Home position will automatically be placed at the landing loiter position.

## FW Version 3.7

### Improvements

#### Lancaster 5 Support

- This firmware supports the Lancaster 5 aircraft.

#### InFlight 1.0 Support

- Support for InFlight 1.0 enabling new features such as automatic waypoint updates and high level user commands (emergency dive, land now, etc).

#### Optimized Flight Path

- The aircraft now performs turns closer to the survey boundary in order to reduce the total flight time.

#### Reduced Survey Data Size

- The aircraft disables survey data capture during turns.

#### Mission Resume

- Improvements to the resume mission selection menu.

#### RTL Disabled When Landing

- When the aircraft is landing, a loss of communication with the ground station will not cause the aircraft to enter RTL (Return To Launch) mode. The aircraft will continue the landing sequence.

#### User Interface Changes

##### RC Controller (Futaba) Stabilize Mode

- The auto-pilot Stabilize mode now has priority over RTL mode and InFlight user actions. For example, if the user enables Stabilize mode and enables RTL (using the Futaba RC controller), the aircraft will remain in Stabilize mode.

##### Landing Loiter Change

- During landing, the descending loiter is now shifted slightly sideways from the landing loiter point, in order to better line up the final descent.

##### Improvements to Radio Controller Calibration

- During pre-flight the user will be prompted to not touch the Futaba RC controller for a few seconds in order to calibrate the trim values.