CAPTURE
precise tracking at its best

Firmware revision history

Revision	Date	Changes
2.24.0	15/01/2026	**Improvement**- Added a new 'system heading' variable, the value is sourced from the GPS or calculated, depending on 'OVD GPS' flag. Additionally, a variable was added to indicate whether the system platform is static or dynamic, used for heading calculation. Description can be found in the *'Command and Control API'* document. **Improvement**- New GPS integration. **Optimization-** Video tracking control loop. **Optimization-** new calculation method for the system payload Euler angles when the IMU is not installed on the load. **Optimization-** Save and load settings to EEPROM only for enabled cameras.
2.23.1	05/01/2026	**Fix**- Resolved an issue with axis validation logic in certain internal commands.
2.23.0	30/11/2025	**Improvement-** A new motor command was added to immediately stop all axes. A protection flag is set to prevent any new motion commands until the flag is reset. **Improvement-** A new GPS command was added to reset a single target. Description can be found in the *'Command and Control API'* document.
2.22.0	27/08/2025	**Improvement-** A new Aim configuration has been implemented, allowing users to select one of three operational modes based on mission requirements: • Manual Aim – After performing system calibration, users can apply horizontal and vertical offsets in degrees. • Ballistic Table – A ballistic table can be defined in the system, allowing Aim calculations to be automatically adjusted based on the weapon's ballistic profile and user-provided parameters such as target distance and wind conditions. • Multi Calibration – This option enables Aim calibration at multiple distances. The system then learns the ballistic behavior of the weapon and applies the appropriate compensation automatically across varying ranges. **Improvement-** The Video Tracking functionality now supports movement within the target area while tracking is active.

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		Improvement- Automatic video tracking capability was added. As long as a target is detected, the system will automatically start tracking. **Improvement-** Dual Gimbal systems now support Video Tracking and MoveByPixels. **Improvement-** In Dual Gimbals systems, if the camera Pan axis reaches its SWLS, the main Pan axis will continue moving. This new option ensures smoother and more continuous system operation. **Improvement-** Stabilization and Video Tracking are no longer interdependent. They may now operate separately or simultaneously. **Improvement-** New OP commands were added to enable control of Digital Output (IO) lines, allowing activation and deactivation directly from the protocol. **Optimization:** When stabilization is active and an axis reaches its SWLS, the accumulated error will be reset and will not increase further, improving stability and preventing unnecessary correction buildup. **Fix-** Resolved an issue in Dual Gimbals where Boresight correction required two distance inputs from the user. The system now operates correctly with only one input as intended.
2.21.1	04/06/25	**Fix-** Command handling for Servo Control has been corrected.
2.21.0	26/05/25	**Improvement-** A new function has been implemented to maintain a consistent image center across all zoom levels. Typically, the image center shifts with zoom changes due to the mechanical positioning of the lenses. This feature compensates for such shifts, ensuring a stable and reliable focal point regardless of the zoom level. **Improvement-** A new protocol has been developed for communication with the image-processing system. This protocol supports receiving multiple targets within a single message and enables tracking of a selected target efficiently. **Improvement-** A new capability has been added, allowing image tracking to be activated while stabilization is enabled. When tracking begins, stabilization will be temporarily disabled, and once tracking is turned off, stabilization will resume automatically. **Improvement-** A new servo control capability has been added, enabling movement to predefined positions. Additional details are available in the '*Command and Control API*' document.

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2.20.2	13/05/25	**Improvement-** Ability to enable or disable GPS readings via hardware.
2.20.1	12/03/25	**Improvement-** Dual Gimbals- Changing the motors control method to improve performance within 'Sync Mode'.
2.20.0	05/02/25	**Improvement-** Communication with the weapon control unit to execute operation and read statuses. Description can be found in the *'Command and Control API'* document. **Improvement** - LRF: Added communication with the distance measurement sensor (LRF), including the ability to configure measurement distances and rates, start and stop measurements, and choose whether to use distances provided by the LRF or user-defined values for calculations. Description can be found in the *'Command and Control API'* document. **Improvement** – Dual Gimbals- improving the speed commands of Tilt axes while 'Sync' mode is active.
2.19.2	16/01/25	**Optimization** - Stabilization: Removed all irrelevant commands. **Fix-** Fixed the Ethernet communication issue when the GPS-based TCP connection is active. **Fix**- Fixed the status of 'Is Ready Heading' for the AN GPS.
2.19.1	24/12/24	**Improvement-** Dual Gimbals- When the stabilization loop is active, the values of the variables max diff pos change based on the stabilization accuracy. When the stabilization loop is inactive, the variables revert to their predefined values. **Improvement-**Dual Gimbals- Reading the 'CAPSNAP' firmware version. **Fix-** Dual Gimbals- In Sync mode, Stop the Pan axis from executing movement due to the 'Boresight' calculation when a motion command is received for the Tilt axes, but the Tilt axes reject the command because they have reached the software limit switch.
2.19.0	09/12/24	**Optimization**- Absolute position commands without 'short path'. **Optimization**- Enable negative position commands in absolute mode. **Improvement**- Limit the sending of 'MOT_SetTum' command based on the system configuration. **Improvement-** Dual Gimbals- when 'Sync mode' is active and one of the axes is 'Axis off', the mode will switch to 'Outer mode'. **Improvement-** Dual Gimbals- indication if the axes are synchronized. Description can be found in the *'Command and Control API'* document. **Improvement-**Dual Gimbals- Reading and setting the weapon loading range. **Improvement**- New GPS integration with TCP communication, including a new command for changing the device IP address. Description can be found in the *'Command and Control API'* document.

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		Improvement- Setting the minimum allowed acceleration value. **Improvement**- Stabilization- enable/disable stabilization for each axis individually. **Improvement**- Stabilization- Possibility to correct angle due to system radius for Tilt/Roll separately. **Fix-** fix the SWLS algorithm in speed mode.
2.18.0	09/09/24	**Improvement**- IMU- Angles and speeds for the pedestal's axis system are calculated using only gyroscope readings. Description can be found in the *'Command and Control API'* document. **Improvement**- Stabilization- is based on these calculated speeds and positions. Feedforward control has also been added to improve stabilization. Description can be found in the *'Command and Control API'* document. **Improvement**- New GPS integration. **Fix**- fix the updating of SWLS error flags in speed mode.
2.17.3	02/09/24	**Fix-** Dual Gimbals- fix the movement of Pan axis when sending a ballistic offset in 'Sync mode'.
2.17.2	16/07/24	**Fix-** addresses of configuration variables in the controller memory have been changed.
2.17.1	16/07/24	**Improvement-** Dual Gimbals**-** The option to set a ballistic offset in Sync mode has been added. **Improvement-** Dual Gimbals**-** Reading the number of bullets and several statuses from 'CapSnap' unit. **Improvement-** The stabilization algorithm was updated: an option to stabilize using two IMUs for higher accuracy, the control loop is based on both position and speed loops, and a rebalance mechanism has been added. Description can be found in the *'Command and Control API'* document. **Fix-** Set the 'system inserted heading' (when 'OVD GPS' flag is set) as PAN load position motor at controller startup.
2.17.0	27/06/24	**Improvement-** Dual Gimbals**-** 'Boresight' mechanism and its relevant commands were added. In addition, 'Sync mode' settings commands were added. Description can be found in the *'Command and Control API'* document. **Improvement-** LRF – set range and get range commands were added. Description can be found in the *'Command and Control API'* document. **Improvement-** An option to get the incremental position in addition to the absolute position was added. Description can be found in the *'Command and Control API'* document.
2.16.3	03/04/24	**Fix-** Absolute mode in short path while software limit switch is active. For non-absolute systems only.

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2.16.2	12/03/24	**Fix-** Added a delay in the SWLS settings, to prevent interruptions to the driver when it saves to its memory. ***Remark- Do not turn off the system until the SWLS commands are complete.***
2.16.1	18/02/24	**Improvement-** Dual Gimbals- '*Inner mode'*, Description can be found in the *'Command and Control API'* document. **Fix-** Enable general operations (such scanning, preset etc.) with each Dual Gimbals mode. **Fix-** Scanning- snake movement.
2.16.0	20/12/23	**Improvement-** Software limit switch- setting the software limit switch handler (controller/driver/both). Activate *'slowdown'* mechanism. Description can be found in the *'Command and Control API'* document. **Improvement-** New error register to indicate if one of the motion operations wasn't completed successfully. Description can be found in the *'Command and Control API'* document. **Improvement**- New Error position indication for absolute mode. Description can be found in the *'Command and Control API'* document. **Improvement-** Set faults in motor error register when communication with driver is lost. **Improvement-** Reading the number of satellites from AN GPS. **Fix-** motor error message.
2.15.1	12/11/23	**Improvement-** Dual Gimbals- '*Sighting In'* mechanism, Description can be found in the *'Command and Control API'* document.
2.15.0	9/11/23	**Improvement-** main operations timing. **Improvement-** optimization the readings from the drivers. **Fix**- Homing on startup (using startup register). **Fix**- Dual Gimbals – absolute movement with software limit switch.
2.14.3	11/10/23	**Improvement**- New MPU IMU integration. **Fix** - Dual Gimbals- software limit switch in Sync mode. **Improvement-** Reading absolute encoder position from the drivers.
2.14.0	6/8/23	**Feature**- Dual gimbals Implementation. Description can be found in the *'Command and Control API'* document. **Improvement**- New Cube drivers' integration. **Improvement**- New AN GPS integration. **Fix-** 'preset' angles in a range of 0 to 360°. **Optimization-** Software limit switch- negative position must be less than the positive limit.

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		Optimization- Blocking negative position commands in absolute mode.
2.13.8	23/7/23	**Fix**- Absolute movement with short path. **Fix**- Leveling operation considering the software limit switch.
~~**2.13.7**~~	14/5/23	**Fix**- 'Go To Target' operation for Roll & Tilt systems **Improvement**- Adding filter for IMU readings in stabilization loop. Description can be found in the *'Command and Control API'* document. **Issue**- Absolute movement with short path Unavailable Firmware
2.13.6	27/4/23	**Fix**- The return opcode of 'get OvdGPS' command. **Fix**- Absolute encoder readings timing. **Feature-** Offset for IMU readings. Description can be found in the *'Command and Control API'* document.
2.13.5	19/3/23	**Fix**- The calculation of Euler angles from IMU readings. **Fix-** Changing the minimum value of stabilization acceleration.
2.13.4	7/12/22	**Fix**- Opcodes of stabilization settings commands.
2.13.3	29/9/22	**Improvement**- Stabilization loop- settings of control type, max error and speed command for position control loop were added. Description can be found in the *'Command and Control API'* document.
2.13.2	30/8/22	**Improvement**- Homing function according to the absolute encoder **Fix**- Using 'General Spd' variable in Leveling operation (instead of fix speed value).
2.13.0	28/8/22	**Feature**- Bootloader implementation **Improvement**- Stabilization loop of Roll & Tilt systems **Fix**- Stop motors in Keepalive mechanism
2.12.6	20/7/22	**Fix**- Software limit switch with reverse axis.
2.12.5	22/6/22	**Improvement**- Software limit switch with absolute encoder. **Fix**- Limiting the number of leveling attempts.
2.12.4	13/6/22	**Improvement**- Targets, Presets, scanning and stabilization operations for one axis systems. **Improvement**- Targets, Presets and scanning operation while stabilization is active.

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2.12.3	24/5/22	**Improvement**- Stabilization loop- Roll compensation was added. Description can be found in the *'Command and Control API'* document. **Fix**- Reset VN IMU
2.12.2	31/3/22	**Improvement**- Motion commands while stabilization is active. **Fix-** Initialization position of Scanning.
2.12.1	21/3/22	**Fix**- Drivers communication for one axis systems.
2.12.0	15/3/22	**Feature**- Keep Alive mechanism. Description can be found in the *'Command and Control API'* document. **Feature**- Startup register. Description can be found in the *'Command and Control API'* document. **Feature**- Set the position range. Description can be found in the *'Command and Control API'* document. **Feature**- Leveling operation. Description can be found in the *'Command and Control API'* document. **Improvement**- Drivers communication- reading motors data. **Fix**- blocking movement commands while one of motion operation is active**.**

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