

GeoCue
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Version 1.0

True View 515 vC

Hardware User Guide



Updated for firmware v2.4.0

Compatible with LP360 version 2024.1.30. and newer.



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ABOUT GEOCUE

GeoCue was founded in 2003 by a group of engineers with extensive experience in developing hardware and software solutions for primary remote-sensed data acquisition. Our initial products were aimed at reducing schedule and cost risk in geospatial production workflows by providing organizational, productivity and data management tools for base geospatial data production. These tools have been realized as the GeoCue product family. Today GeoCue workflow management tools are used by a majority of North American geospatial production shops. In 2005, GeoCue began selling and supporting Terrasolid tools for kinematic LiDAR data production. This was followed in 2009 by our acquisition of QCoherent Software LLC, the creator of the point cloud exploitation toolset, LP360. Today GeoCue is the largest supplier of kinematic LiDAR processing tools in North America and LP360 is the world's most widely used tool for exploiting point cloud data. In 2014, GeoCue started a division focused on using small Unmanned Aerial Systems for high accuracy mapping. Leveraging our expertise in production, risk reduction, and point cloud processing tools, we are continuing to bring new services and products to market to provide surveyors and other geomatics professionals exciting tools for geospatial data extraction using low-cost drones including Loki, our plug-and-play PPK direct positioning system, and now our TrueView LiDAR/Imagery fusion (3DIS) sensors. To learn more, visit www.geocue.com.



ABOUT LP360 DRONE

LP360 is a 64-bit Windows® desktop application used for many years by the LP360 Geospatial community for processing traditional aerial, mobile, and terrestrial tripod laser scanner data. The LP360 Drone community is the focus of this Users Guide containing the LP360 workflows for processing and exploiting TrueView, microdrones® and guest sensor drone data. Formerly called TrueView EVO, LP360 Drone, is GeoCue's LP360 point cloud exploitation product with the addition of a collection of tools and workflows for processing drone data. LP360 Drone is the software used to post-process your raw flight data to generate a 3D LiDAR point cloud in LAS format, colorize the point cloud, and geotag the images collected. LP360 also has many tools for assessing and processing point cloud data, such as accuracy assessment, automatic and manual ground classification, and contour/ surface generation. LP360 Drone is available in the following licensing levels:

- **LPViewer** – A free viewer level of LP360 for viewing a point cloud.
- **TrueView EVO/LP360 Drone Explorer** – A low-cost inspector license equivalent to [LP360 Viewer](#), with Image Explorer enabled for viewing True Pose® photos, and Import TrueView Cycle for field QC checks. This is also the license that should be purchased for delivery with [LP360 Explorer Packages](#) provided to end users so they can make full use of the TrueView 3DIS point cloud and photos, plus any derivative products you generate for them.
- **LP360 Drone** – Enables PPK processing for guest systems, such as the DJI P4RTK plus TrueView 2DIS and 3DIS. This is the next generation [ASPSuite Advanced](#) and is equivalent to [LP360 Standard](#) with the addition of the TrueView workflow tools and tools for ground classification and volumetric computations. It is limited to product areas of no more than 10 km² of LAS data. Available as an annual subscription or a perpetual license.
- **LP360 Drone+3D Accuracy** – Enables the automatic detection of [Accuracy Stars and related target types](#). Available as an annual subscription or a perpetual license.
- **LP360 Drone+Photo** – Enables local [Ortho Mapping](#). Available as an annual subscription or a perpetual license.
- **LP360 Drone+Photogrammetry with Agisoft** – Enables local [Agisoft Ortho Mapping](#), if you have a Metashape license, and Cloud based [Agisoft Ortho Mapping](#) (using LP360 or TrueView points). Available as an annual subscription or a perpetual license.
- **LP360 Drone+Cloud Photo 3000** – Enables both the local [Ortho Mapping](#), local [Agisoft Ortho Mapping](#) processing if you have your own Metashape license, and Cloud based [Agisoft Ortho Mapping](#) (includes 3000 photos per month, additional photos may be processed using LP360 or TrueView points). Available as an annual subscription license.
- **LP360 Drone+Full Photo (formerly Fast Photo)** – Legacy license that enables both the local [Ortho Mapping](#) and local [Agisoft Ortho Mapping](#), if you have a Metashape license, and Cloud based [Agisoft Ortho Mapping](#) (using LP360 or TrueView points).
- **LP360 Drone+Strip Align** – Enables Strip Align tools for adjusting for dynamic trajectory errors in the dataset. Available as an annual subscription or a perpetual license.
- **LP360 Drone+Business Intelligence Tools** – Enables specific point cloud tasks designed for extraction of non-ground features, such as rail, power lines, buildings, trees. Available as an annual subscription or a perpetual license.



- **LP360 Drone+Unlimited** – this is the same functionally as LP360 Drone with the size limit removed. Available as an annual subscription or a perpetual license.

The legacy TrueView EVO license levels are:

- **TrueView EVO, formerly named TrueView EVO Lite** – Enables PPK processing for guest systems, such as the DJI P4RTK. This is the next generation [ASPSuite Advanced](#) and is equivalent to [LP360 Advanced](#) with the addition of the TrueView workflow tools. It is limited to product areas of no more than 10 km² of LAS data.
- **TrueView EVO 3DIS, formerly named TrueView EVO** – This is equivalent to [LP360 Advanced](#) with the addition of the TrueView workflow tools. It is limited to product areas of no more than 10 km² of LAS data.
- **TrueView EVO Unlimited** – this is the same functionally as TrueView EVO with the size limit removed. Available as an annual subscription.

ABOUT LP360 ONLINE/TRUEVIEW RECKON

[LP360 Online](#) and [TrueView Reckon](#) are Amazon Web Services (AWS) hosted platforms that are used for a variety of purposes in TrueView (and other) workflows. It provides services such as (items marked with a \$T are extra cost, paid in Points):

- Project data hosting and visualization (\$T)
- Data archival (\$T)
- Management and automatic delivery of sensor calibration files
- Automatic sensor health check
- Transfer of sensor Cycle data to GeoCue for technical support
- Management of Points for services that are paid via a metering scheme (marked in this list with \$T)
- Transaction history of sensor usage
- other related services

LP360 Online or TrueView Reckon is [accessed from within LP360 Drone](#) in various workflows. These workflows might require an LP360 Drone user to provide their login credentials. LP360 Online and TrueView Reckon each have a web interface for data visualization and account monitoring.

Every customer with a TrueView, microdrones traditional, or guest sensor (whether purchased or a rental) is provided a Reckon or LP360 Online account.

ABOUT TRUEVIEW RECKON

[TrueView Reckon](#) is an Amazon Web Services (AWS) hosted platform that is used for a variety of purposes in TrueView (and other) workflows. It provides services such as (items marked with a \$T are extra cost, paid in TrueView Points):

- Project data hosting and visualization (\$T)



- Data archival (\$T)
- Management and automatic delivery of sensor calibration files
- Automatic sensor health check
- Transfer of sensor Cycle data to GeoCue for technical support
- Management of TrueView Points for services that are paid via a metering scheme (marked in this list with \$T)
- Transaction history of sensor usage
- other related services

TrueView Reckon is accessed from within LP360 Drone in various workflows. These workflows might require an LP360 Drone user to provide their Reckon login credentials. TrueView Reckon also has a web interface for data visualization and account monitoring.

Every customer with a TrueView or guest sensor (whether purchased or a rental) is provided a Reckon account.

A TRUEVIEW CYCLE

All TrueView sensors running the latest firmware write their various data streams to a standard file folder structure called a "Cycle" on the UMS (USB Mass Storage). The original meaning of "Cycle" was the on/off sequence of the sensor. It is possible to have multiple collections (flights, in the case of a drone) in a single "Cycle", so it is not necessarily correct to think of a "Cycle" as being synonymous with flight, though it typically is.



FCC AND IC COMPLIANCE



This device complies with Part 15 of the FCC Rules and Industry Canada License-exempt RSS standard(s). Operation is subject to the following two conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Parts used in the construction of this device may contain radio components or functionality. The parts are selected based upon availability and are compliant with FCC and Industry Canada rules and standard(s). Compliance statements and / or certification can be obtained within the manufactures' resources.

This device contains the following parts:

Component	Hardware Version ID no.	Product Marketing Name	Firmware Version ID no.	IC no.	FCC no.
Raspberry Pi-4 model B	Raspberry Pi,4 model B	Raspberry Pi,4 model B	n/a	20953-RPI4B	2ABCB-RPI4B
APPLANIX APX- 15/20	n/a	n/a	n/a	Please see Manufacturer Compliance Certificate	Please see Manufacturer Compliance Certificate
Hesai PandarXT-32	n/a	n/a	n/a	Please see Manufacturer Compliance Certificate	2ASO2PANDARX

Table 1. Radio components in the TrueView 515vC payload.



NOTICE TO USERS

Warnings

Before you use your TrueView 515vC payload please read these warnings carefully. Failure to do so can result in serious injury.



WARNING

Do not attempt to take apart, reassemble, or alter the TrueView 515vC payload as it will void the warranty. Only qualified personnel can service the payload.



CAUTION

Do not interrupt power to the drone/payload until the payload is fully powered **OFF**.



CAUTION

Do not expose the payload to rain, water, snow, or high moisture environments.



CAUTION

The TrueView 515vC payload has an operation range of -15°C up to 50°C. Operation outside this temperature range can lead to damage to the payload.



WARNING

This is a Class 1 Laser Product. This product complies with IEC/EN 60825-1: 2014 and complies with FDA performance standards for laser products except for conformance with IEC 60825-1 Ed. 3., as described in Laser Notice No. 56, dated May 8, 2019.



WARNING

This device requires adequate airflow to prevent overheating during operation. Do not use this device for prolonged periods without proper ventilation or airflow. Inadequate ventilation can cause the device to overheat, leading to malfunctions, damage, or even fire.

Disposal



Do not put batteries or other electrical equipment into general waste containers. Substances in batteries are harmful to human health and the environment. Dispose of electrical equipment at a collection point or recycling center. Contact your local authority for detailed information.



OVERVIEW

TrueView 515vC Payload System Items

No.	Item	Part Number	Quantity
1	TrueView 515vC payload	PLD1001623A00T	1
2	TrueView 515vC payload travel case	CCS1000200A00T	1
3	32GB UMS flash drive (Use only the UMS drive provided) ⁽¹⁾	A004105	1
4	AV18 GPS antenna	ANT1000705A00T	1
5	LiDAR calibration report	n/a	1
6	Lens cleaning kit	n/a	1
7	Debug cable	A005095	1
8	Battery	BAT1000154A00T	1
9	Battery charger and cables	MIS1000155A00T	1
10	Cable clips	MIS1000261A00N	1 pkg of 3

⁽¹⁾ To purchase additional UMS flash drives please contact [GeoCue Customer Support](#) or your Sales Representative. Quote article number A004105.

Table 2. List of TrueView 515vC payload system items.



Figure 1. TrueView515vC what's in the box.



TrueView 515vC Product Specifications

Model	TrueView 515vC payload
Article number – TrueView 515vC	PLD1001623A00T
Year of release	2024
Mass (Payload only no accessories)	1.99 kg
Dimensions	294x185x195 (mm)

Table 3. TrueView 515vC payload product specifications.

Camera Product Specifications

Type	Color camera
Imaging Device	2 x GeoCueMapping Camera (GMC) 26 MP
Type of Shutter	Mechanical
Camera Sensor Format	APS 3:2
Resolution (MegaPixels)	26
Pixels: H x V	6252 x 4168
Pixel Size: H x V (µm)	3.76
Sensing Area: H x V (mm)	23.5x 15.7
Focal Length	16 mm
FOV (individual camera)	83°
FOV (Combined lateral view cameras)	120°

Table 4. TrueView 515vC payload camera product specifications.





TrueView 515vC Payload Technical Specifications

Specification	Value
Data Collection	LiDAR + imagery
Laser Scanner	Hesai M1X
LiDAR Beams/Returns	32/2
LiDAR Range	Max 120m, Typical 80m @ 20% reflectivity
Pulse Repetition Rate	640 kHz
Cross-track Field of View	120°
Position and Orientation System (POS)	Applanix APX-15
Accuracy	Typical 3cm*
Precision	Typical 3cm* σ
Camera Sensor	Triple 1" sensor with mechanical shutter, hardware mid-exposure pulse, 78MP combined, RGB.

*1 σ @ 50m, nadir and with Strip Align

Table 5. TrueView 515vC payload technical specifications.

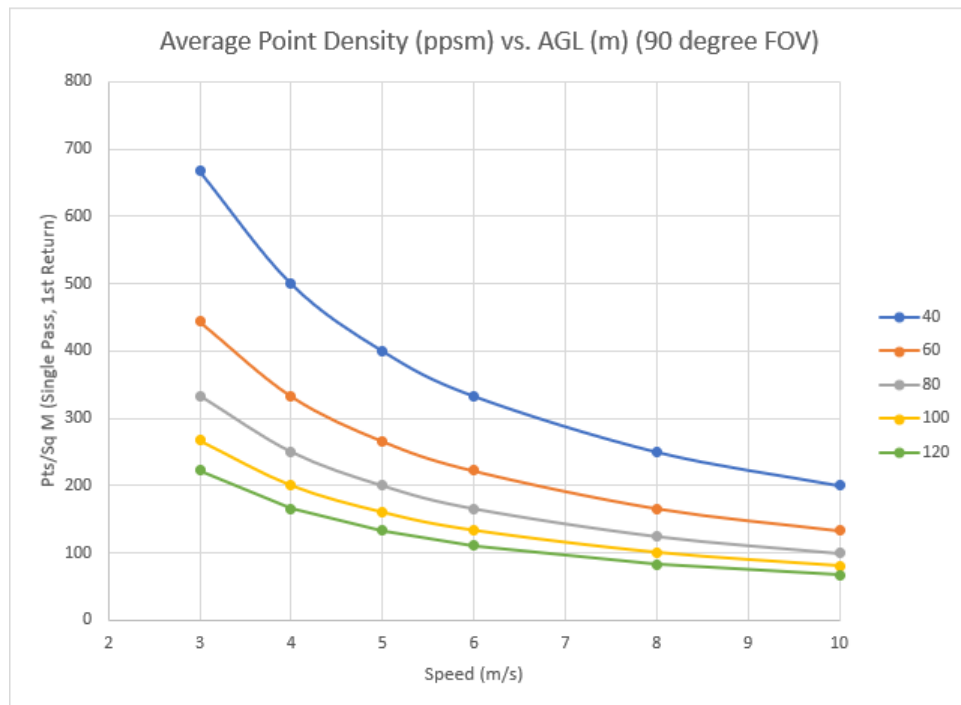


Figure 2. Average point density vs speed for given AGL (altitude) (single pass, 1st return only).

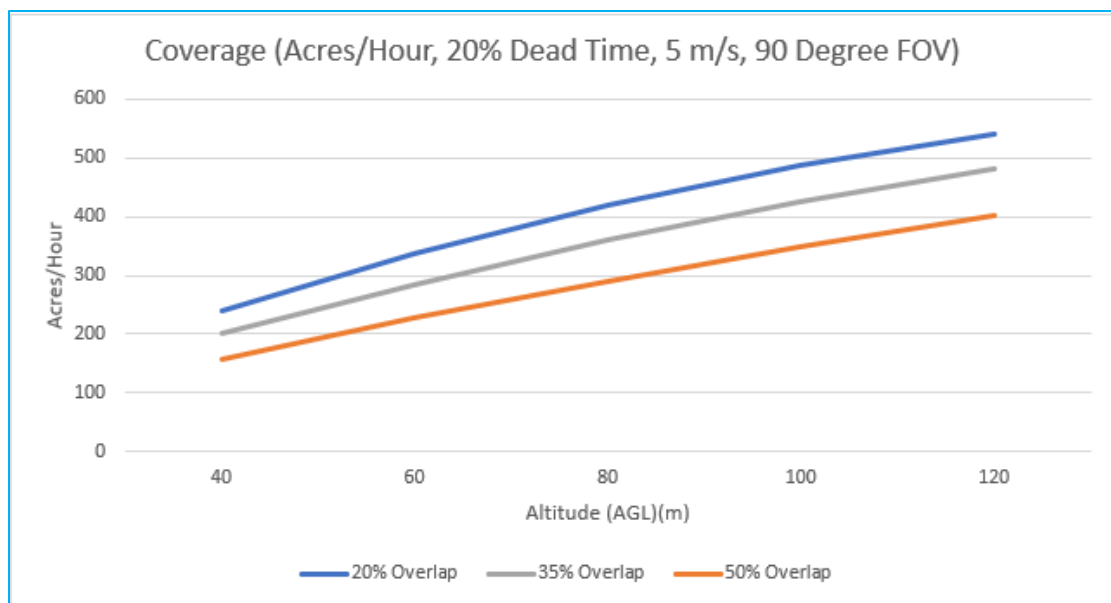


Figure 3. Coverage (acres/hour) vs AGL (altitude) for given overlap.



SYSTEM DESCRIPTION

This section describes the TrueView 515vC payload. It addresses how it works, how to set it up, and how to configure the system.



Figure 4. TrueView 515vC payload.



TrueView 515vC Payload Parts

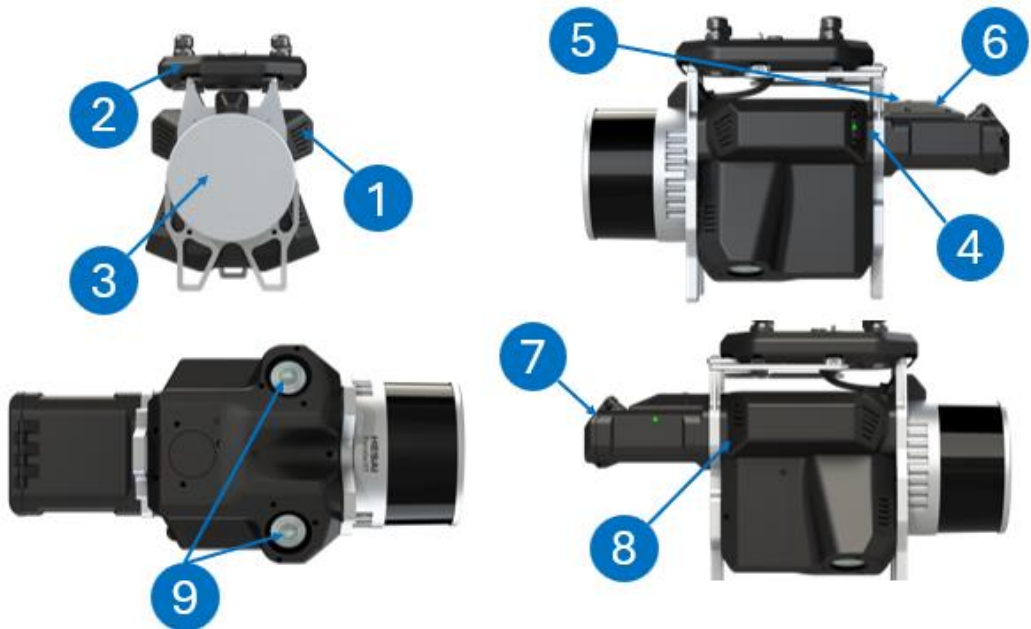


Figure 5. TrueView 515vC payload parts.

1. Cooling vents (right and left side)	2. Payload interface
3. Scanner	4. USB port
5. Multifunction button	6. LED status indicators
7. Battery compartment	8. Debug port
9. Three (3) GeoCueMapping cameras	

Table 6. Explanation of TrueView 515vC payload parts.



USB Port

The USB port is located on the side of the payload. The storage device allows the user to retrieve data after the completed flight.

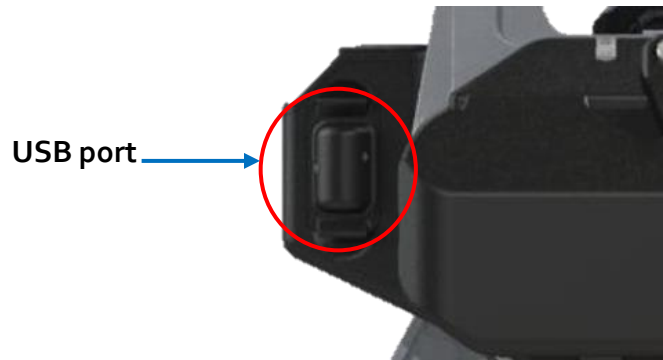


Figure 6. USB port located on the side of the payload.

UMS Drive

The TrueView 515vC payload includes one approved UMS (USB Mass Storage) drive with the capacity of 32GB flash storage that guarantees a maximum transfer speed over USB3 technology while minimizing electromagnetic radiation. It is important to only use approved UMS drives to make sure the transfer speed is correct, and the data is collected.

FAT32 is the official supported format for the UMS. The system is designed to bypass FAT32 file-size limitations. If formatting is needed, please use the native formatting tool of your operating system, and select **FAT32** as the partition format type.



Figure 7. UMS drive.

**NOTE**

Please note that external storage devices with a capacity equal or larger than 128GB can be used after landing to recover the data from the internal drive of the payload. This limitation is put in place to avoid any EMI interference with the drone carrying the payload. Take note of this restriction and plan accordingly for a successful flight.

**WARNING**

To avoid corruption, make sure you eject the drive according to your operating system's instructions. If your operating system detects possible corruption when inserting the UMS into the computer's port, proceed to fix the drive according to the operating system instructions. Do not ignore corruption warnings as they may cause the UMS to stop functioning properly with the payload.

EXTENDED FLIGHTS WITH LONG ENDURANCE DRONES

The external storage device for the payload is limited to 32GB and can be filled in just one hour for most TrueView payloads when conducting extended flights with an drone of long endurance. It is highly recommended that you fly **without** the external drive connected and instead rely on the internal storage of 128GB that is available.

For a smooth flight and to avoid any data loss, please monitor the internal storage capacity from the payload TrueView Web UI access that is accessible prior to the flight. It is important to note that external storage devices of a capacity equal or larger than 128GB can only be used after landing to recover the data from the internal drive of the payload.

This limitation is put in place to avoid any Electro Magnetic Interference with the drone carrying the payload. Please take note of this restriction and plan accordingly for a successful flight.

For more information about TrueView Web UI go to [TrueView Web UI User Guide](#).

FORMATTING LARGE CAPACITY UMS

Windows does not provide a built-in option to format UMS drives larger than 32GB in the FAT₃₂ file format. We suggest using a third-party tool that can be used to format larger UMS drives in FAT₃₂ format.

A commonly recommended tool is the **FAT₃₂ Format** tool, which can be downloaded from the following link: [Fat32-Format Tool](#).



This tool allows users to format UMS drives up to 2TB in size in the FAT32 file system, which is a file system that is compatible with a wide range of devices, including game consoles, media players, and older operating systems.

It is important to note that formatting a UMS drive will erase all data on the drive. It is important to back up any important files before formatting. Additionally, it is recommended to use a reliable and trustworthy tool when formatting drives to avoid potential data loss or damage to the drive.

Multifunction Button

The multifunction button can be used to start/stop data collection or to abort an operation following the combinations below:

Button Press Type	Payload Reaction	LED Readout
Short press	Start data collection if payload is initialized (SYS LED is solid green).	SYS LED will switch to a slow blink green to indicate data collection started.
Long press (5 seconds)	Terminate and delete current data including log files. Note: This can be triggered at any state of the payload initialization.	SYS LED will fast blink yellow followed by solid white. Note: Once SYS is solid white payload can be turned OFF.
Short press (after collecting data started)	Switch to stop collecting phase and start downloading data to UMS.	SYS LED will switch to slow blink white followed by solid white or red error state. Note: Payload can be turned OFF once either solid white or error state SYS LED is on.

Table 7. Multifunction button instruction chart.

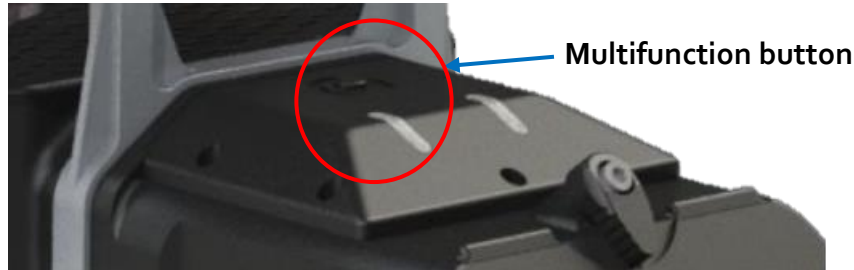


Figure 8. Multifunction button located at the top of the battery compartment of the payload.

Debug Port

The debug port is located on the bottom right side of the payload. To access it remove the plastic cover. The debug port is used for service and advanced configuration of the TrueView 515vC payload.



WARNING

This port can be used to display the TrueView Web UI in case Wi-Fi is turned off or inaccessible. Only use the debug port for this purpose unless instructed to do so by [GeoCue Customer Support](#).

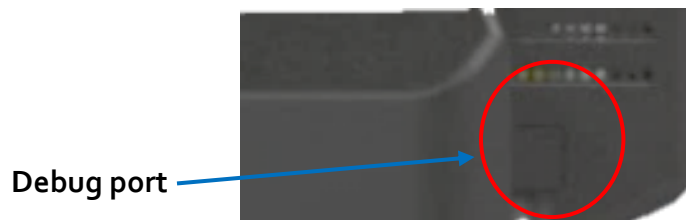


Figure 9. Debug port is located at the bottom right side of the payload.



Debug Cable

The debug cable is a GeoCue approved accessory to use for service or advanced configuration of the TrueView 515vC payload through the debug port.



Figure 10. TrueView535 payload debug cable.

Battery and Power

The TrueView 515vC payload comes with and can be powered by its own 3200 mAH removeable lithium ion battery with a built-in charge status indicator and a charging station. Each battery will provide approximately 90 minutes of power under normal conditions. Cold temperatures can significantly reduce battery life. When operating the payload with the battery, the switch should be turned ON. Post wind-down, the switch should be turned OFF if not operating the payload.

The TrueView 515vC payload can be powered by the drone through the PLI (Payload Interface). When the power is being drawn from the drone the requirement of the power supply as follows;

Minimum Voltage	Maximum Voltage	Power Typical (W)	Power Peak (W)	Humidity
10	34	38.7	48.375	30 ~ 85%RH Non-Condensing

Table 8. TrueView 515vC power draw.

The power sequence is as follows;

- Battery power is used whenever the voltage of the battery exceeds the voltage of the drone by 1V.
- If PLI (drone) power is present (and $\geq 1V$ above battery voltage), PLI power is selected by default regardless of the presence of a battery.



LED Status Indicators

The LED status indicators provide signals to alert the user of the payload state or errors. Further information can be retrieved through the [TrueView Web UI](#).

Once the power is turned on, there are a total of two LED status indicators on the front of TrueView 515vC payload to display the payload status.

Please refer to [LED status indicators chart](#), section LED Status Indicators Operation for all status information.

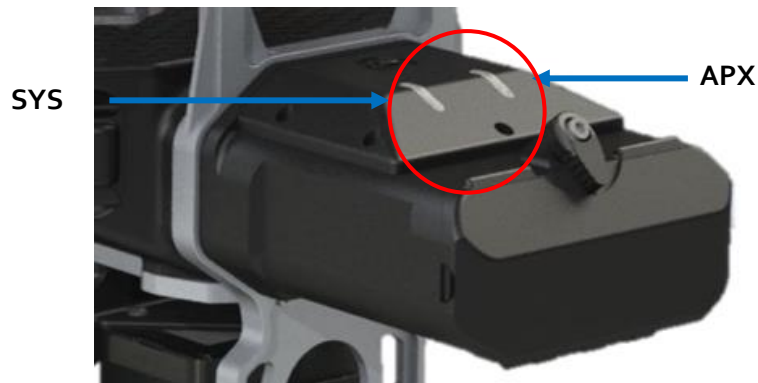


Figure 11. LED status indicators, SYS (left), APX (right).



Table 9 [Table 9](#) shows all the lighting sequences, LED messages, and their meanings. Table 10 [Table 10](#) shows how to interpret the symbols in the table.

SYS	APX	LED Readout	Meaning
		No light	No power
		Slow blink	Payload is starting
		Fast blink	Initializing
		On - solid	APX start up (power on)
		Fast blink	Starting APX data recording
		Slow blink	APX setup is ready
		On – solid	Initialization completed and ready to fly
		Slow blink	Downloading data to USB drive in progress.
		Any state	Error
		Fast blink	Stop collecting and start downloading data to UMS
		On – solid	System is ready to be turned off
		Simultaneous fast blink	Firmware installation completed

Table 9. LED status indicators chart.

Step	Action
	Black circle with a white outline indicates the LED status indicator is OFF.
	Starburst of any color indicates the LED status indicator is blinking. Speed will be indicated by “fast blink” or “slow blink”.
	Circle of any color other than black indicates the LED status indicator is solid.

Table 10. LED status indicators legend.



PROCEDURES



NOTE

The images shown in following section are to demonstrate the procedure only.

Attach the Payload to the Drone

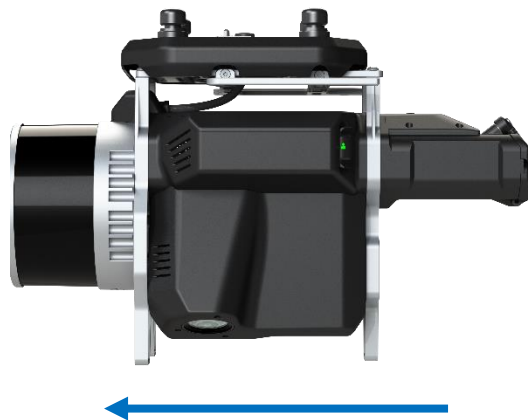


Figure 12. Direction of flight.

The following steps summarize how to attach the payload to the drone:

1. Make sure the payload adapter tab is locked in the extended position.
2. Verify that the payload is oriented in the proper position (scanner lens facing the front of the drone). Perform a visual inspection of the mating connectors and pegs on the payload and drone. Make sure the connectors and pegs on the payload interface and the drone are dry and free from any dirt or debris. Clean the connectors and pegs with dry compressed air if dirt or debris is present.



CAUTION

Do not connect the payload if the connectors or pegs are damaged, or if dirt or debris cannot be removed. Damage to the payload or drone can occur. Contact GeoCue Customer Service for more assistance.

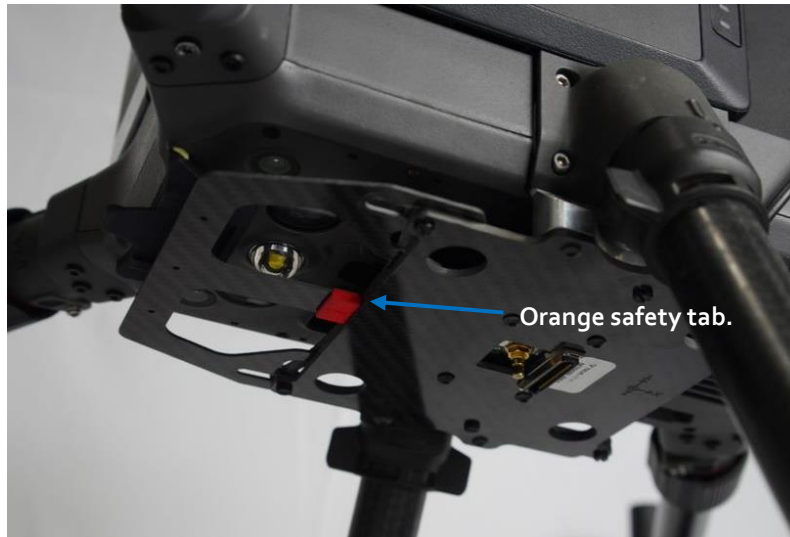


Figure 13. Orange safety tab on the payload adapter clip (open position).

3. Align the front of the payload with the front of the drone. See Figure 12 for front orientation.
4. Push the payload up into the adapter slot. Make sure all four pegs are flush with the mount.
5. Push the locking mechanism clip up to release the lock plate. Make sure to hold the payload while the plate moves into position.



Figure 14. Release the adapter clip.



6. Make sure the locking mechanism is fully engaged. The locking mechanism is engaged if you cannot see the orange safety arrows on the lock plate.
7. Place your hand underneath the payload for support and pull the lock out gently to make sure it is locked and does not disengage.



Figure 15. Make sure the payload clip is in the fully retracted position. Confirm that the orange tab is no longer visible on the payload adapter.



CAUTION

If the locking mechanism does not fully engage, remove, and reattach the payload. Light pressure can be applied to the payload and the lock plate to help engage the locking mechanism.



CAUTION

Always hold the payload until the locking mechanism is fully engaged. Do not release the payload until a visual inspection is complete. Severe damage to the payload may occur.



Release the Payload from the Drone

1. To release the payload from the drone:
2. Hold the payload with one hand.
3. Push up on the payload locking mechanism clip and pull the lock plate out into the extended position.
4. Lower the payload from the mount.



Figure 16. Release the payload adapter clip.



CAUTION

Before releasing a payload to attach another payload make sure that the drone and the payload are fully powered **OFF**.



ADDITIONAL PAYLOAD OPERATION

Cleaning

As with most optical surfaces, minimal cleaning is the best practice. Any contamination, dust, or debris on the scanner optical surfaces can cause the laser light to diffuse or weaken. This will result in poor data collection. Fingerprints or debris on the camera lens can cause image quality loss.

When cleaning the scanner, camera lens, and the payload body only use clean microfiber cloths. If you need to use cleaning liquids, mix mild liquid dish washing soap with clean warm water in a clean spray bottle. Do not use isopropyl alcohol or acetone.



CAUTION

The scanner window can be cleaned with a microfiber cloth. Do not use isopropyl alcohol or acetone.

Payload Interface

The payload interface is located on the top of the payload and on the payload adapter that is on the drone, houses the connectors and pegs. The connectors may need cleaning. To clean the connectors and pegs it is recommended to only use compressed air. Do not use liquids to clean the connectors or pegs and do not put anything in or on the connectors or pegs to clean such as a brush or cotton swab.

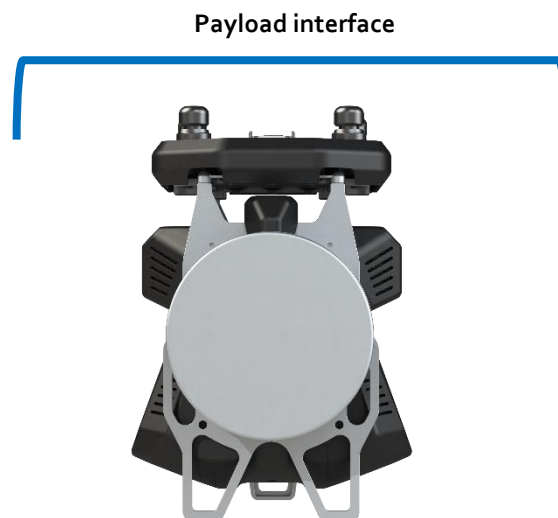


Figure 17. Payload interface.



Scanner and Camera Lens/Sensor Care

When the payload is not being used, it is recommended to install the scanner and camera lens covers. Do not leave the scanner or camera pointing directly towards the sun. This can cause damage to the sensors. This is more important if the lens covers are not installed. For this situation put the payload back into the transportation case.

System Configuration File (SCF)

The System Configuration file (SCF), `SystemConfiguration.json`, is saved in the internal memory and is copied into the `Cycle\System` folder upon creation of each Cycle. The SCF contains information on the calibration parameters of all components for each TrueView system and is used by LP360 to process TrueView data. The latest calibration file for each sensor is stored on the TrueView Reckon portal.



FIRMWARE UPDATE

If updates are required, the TrueView 515vC payload user can install the firmware update.

Please meet the following conditions before updating the payload firmware.

- ✓ If you have a payload battery, make sure it is fully charged and installed in the payload.
- ✓ If you do not have a payload battery that is fully charged and installed, make sure the payload is mounted and properly connected to the drone.
- ✓ The drone or payload battery is fully charged.
- ✓ The drone with the payload is outside with visibility to the sky where the GPS fix can be found.
- ✓ Make sure the UMS storage device is available.

Firmware installation:

1. Make sure the above prerequisites are met.
2. If not already done, download the latest version of the firmware.
3. Make sure the drone and payload are powered OFF and that the battery is disconnected.
4. Install the TrueView 515vC payload UMS device into the computer.
5. Copy all the files with the **.mdpkg** and **.json** extension onto the UMS device.
6. Power ON the TrueView 515vC payload as you would do for a normal flight.
7. Firmware will install automatically. Allow up to 2 minutes for the process to complete. The two indicators on the back of the payload will blink cyan for 10 seconds when installation is successful. The payload will reinitialize automatically upon completion.
8. If no flight is required, follow the instructions in the Multifunction Button section to shut down the payload. Once completed power off the drone battery.

Verification of the update:

1. Remove the UMS storage device from the TrueView 515vC payload and insert it into the computer.
2. Navigate to the UMS storage device drive and verify the file extension was changed to **.installed** on every **.mdpkg** and **.json** file. This means the installation of the firmware was successful. **Remove the installation files once the installation process has been successful.**

We recommend completing a flight after the firmware update to quality check the data before the next operation. Please contact GeoCue at support@geocue.com if you require assistance.



TRUEVIEW 515VC PAYLOAD FIELD OPERATIONS

Base Station

The TrueView 3DIS records GNSS signals during flight which will be corrected later in LP360. This type of system is known as a PPK system. Base station processing methods should be considered during the planning process because the user will need to determine how they plan to correct their flight data before collecting. TrueView GNSS signals can be corrected by one of three methods:

1. **Single base** – Single base, as the name implies, is a static recording from one single base station which is close in proximity to the flight area. Corrections are computed at the base station, then applied to the data collected by TrueView. CORS stations can also be used for single base processing if they are within 12 miles of the flight area and record static data at 1Hz. The base station must also record both L1 and L2 signals and must be during the same time as the flight. Single base is the only processing method if you plan to process with the [local](#) option selected.
2. **SmartBase** – SmartBase is a cloud processing option that uses multiple CORS stations to compute base corrections for your flight. Smart base processing allows for longer baselines from the flight area and the user does not have to set up a base station or download CORS data from a nearby station. This option still requires an existing CORS network in the area of flight. Users can go online to the [Applanix SmartBase website](#) and determine if their flight location is covered by the SmartBase network and estimate the quality of the results.
3. **PP-RTX** – PP-RTX is a cloud processing option that does not require a base station or CORS network. PP-RTX corrections can be computed anywhere. Accuracy is reduced using this method but can be used as a last resort option in the event of base station failure or lack of CORS network.

More information can be found in our knowledge base articles:

<https://support.geocue.com/positioning-options-in-true-view-workflows/>

<https://support.geocue.com/single-base-vs-smartbase-vs-pp-rtx>



Pre-Flight

DISABLE OBSTACLE AVOIDANCE

IMPORTANT M300 Only

The integration of the TrueView 3DIS system will cause disruption to the M300's built-in obstacle avoidance detection systems. If these systems are not disabled, they can cause erratic and potentially dangerous behavior including loss of control of the drone. To disable obstacle avoidance, perform the following steps:

1. Launch the DJI Pilot application, open a mission, or go into manual view.
2. Tap the Ellipsis menu (...) on the top right corner of the screen.
3. Tap the second icon from the top Obstacle Sensing Settings
4. Tap each tab for Upward, and Downward tap the toggle button off for each category. (Figure 18)
5. The Horizontal sensors can remain on if the GNSS and power cables coming from the top of the aircraft are secured to the aircraft and not within the field of view of the detection sensors.

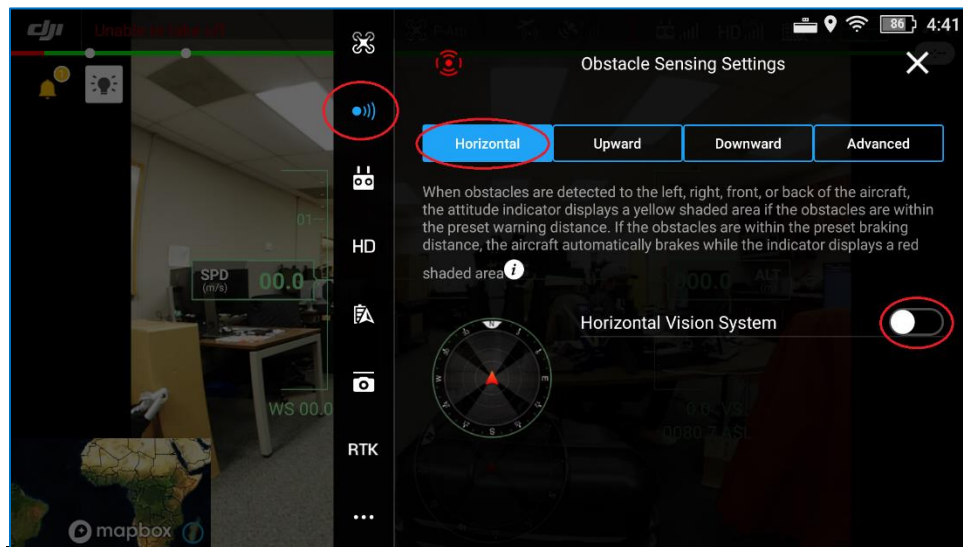


Figure 18. DJI Pilot - Obstacle sensing settings menu.



CENTER OF GRAVITY (GC) CALIBRATION

IMPORTANT M300 Only

When heavy payloads are carried on the M300 platform a center of gravity (GC) calibration must be performed if there is any change to the payload. This would include if you switched from a TrueView 410 to a TrueView 515 or DJI P1 or even switched to flying without a payload. The drone must be in flight and hovering to start the calibration. It is ideal to perform this calibration in a wind free environment. To perform the GC calibration, perform the following steps:

1. Launch the DJI Pilot application, open a mission, or go into the manual view.
2. Tap the Ellipsis menu (...) on the top right corner of the screen.
3. Stay within the Flight Controller Settings tab and scroll to the bottom of this screen.
4. Tap the Center of Gravity Auto Calibration Button and follow the instructions. (Figure 19)

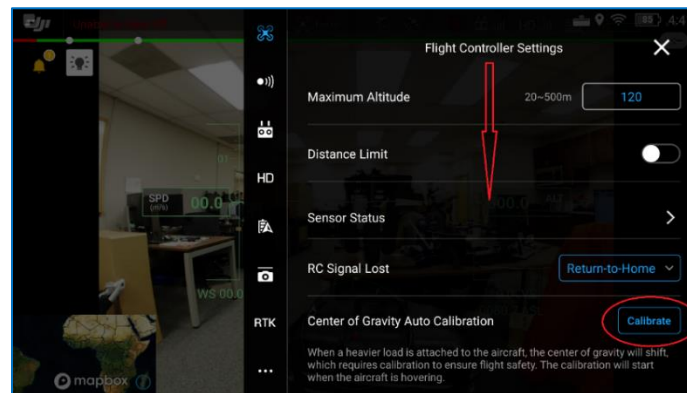


Figure 19. DJI Pilot - Flight controller settings menu.

LED STATUS INDICATORS OPERATION

When the power switch is turned on (if the drone is equipped with one) or power is applied to the system, the system will go through the startup procedure as normal, and all LED indicators will flash yellow. After a few seconds, each LED status indicator will begin to show a sequence. Please see section LED Status for more information.



HEADING ALIGNMENT MANEUVER

The heading alignment maneuver needs to be done after takeoff, before flying the mission, and after the mission prior to landing for each flight. This maneuver is critical for getting accurate heading corrections for the IMU and will impact the results of the data if not performed.

1. Before takeoff, identify a safe direction to perform the heading alignment maneuver. Avoid areas with people, bodies of water, and obstacles.
2. After takeoff, once at mission altitude, let the drone hover in place for two seconds.
3. Push the right stick all the way forward quickly and hold until the drone accelerates to 10m/s. This should take about four seconds. Do not provide any other input. The drone should be accelerating in a straight line.
4. After reaching 10m/s, about four seconds of forward flight, release the stick and leave it centered. The drone will quickly stop. **Note: Speeds beyond 12-14 m/s may yield poorer results.**
5. Wait two seconds, then use the left stick to turn (yaw) the drone about 15-20 degrees, then wait a second. (This is for safety; it is intended to prevent the drone from returning directly overhead when you do step 5. Yaw the drone in a direction so that its return path will be clear of people below, and when it returns, it will be at least 15-20m away, and in front of you.)
6. Pull the right stick all the way back quickly and hold until the drone accelerates to 10m/s. This should take about four seconds. Do not provide any other input. The drone should be accelerating in a straight line backwards.
7. After reaching 10m/s, about four seconds of backward flight release the stick and leave it centered. The drone will quickly stop. Wait at least two seconds after it stops before starting the mission. **Note: Speeds beyond 12-14 m/s may yield poorer results.**
8. Fly the mission you have planned.
9. At the end of the mission allow the drone to return to home, but do not let it descend, a final heading alignment maneuver needs to be done.
10. To take back manual control over the drone.
11. Repeat steps 1-6 again. Make sure that when repeating step 4) that you turn the drone sufficiently that it will be several meters (>5) away from the takeoff location at the end of its backwards travel. This is needed so that when returning automatically, the drone will properly navigate to above the takeoff location before beginning its automatic descent. If you are closer than 5m, it will likely begin descending without aligning with the original takeoff location.
12. After the drone has been stationary for two seconds, hold the (Home) button to begin the automatic return and landing. Watch the drone carefully to be certain it is landing in the intended spot. Otherwise, make the necessary adjustments or take manual control to complete a safe landing.

**NOTE**

On windy days, avoid starting the maneuver into a headwind, as the drone may not be able to achieve accelerations that are high enough. Try doing the maneuver crosswind if possible.



Figure 20. Heading alignment maneuver.

After Landing

1. After landing the SYS LED should be flashing white, indicating the system is transferring data. Do not power off the system during this time or it will interrupt the data transfer.
 - a. If proximity mode is disabled or the drone does not land within 25 meters of the home point, the SYS LED will be blinking green after landing. Short press the multi-function button on the TrueView, the SYS LED changes from blinking green to flashing white.
2. The flashing white light indicates the TrueView is writing data to the drive. Be sure not to power off the TrueView or remove the drive during this period.
3. When the system LED changes to solid white, the flight data has been transferred to the UMS drive.
4. Power off the TrueView system.
5. For missions requiring multiple flights, repeat these steps from the "pre-flight" section of this document. The system should be completely powered off between flights (battery swaps) after the data has been successfully written.
6. Check the data for errors before leaving the field.
7. Field check the data to verify all data has been collected. The Field check instructions can be found in the LP360 Users Guide.

**CAUTION**

The flashing white light indicates the TrueView is writing data to the drive. Do not power off the TrueView or remove the drive while it is writing the data to the UMS drive.



TRUEVIEW MISSION CHECKLIST

Step	Action	Notes
1.	Setup base station and turn ON.	
2.	Check mission plan and modify if necessary.	
3.	Complete a safety briefing and flight plan review with field crew.	
4.	Install the payload on drone mount.	
5.	Verify payload adapter latch is in the locked position and secured.	
6.	Verify safety cable attached between TrueView and drone rails.	
7.	Check all drone GPS antennas upright and secured.	
8.	Verify the TrueView UMS is inserted, and sufficient storage is available.	
9.	Move drone to takeoff location.	
10.	Unfold and secure drone arms, lock in place.	
11.	Unfold drone propellers, visually inspecting for any problems.	
12.	Install fully charged drone batteries. Do not turn the unit ON.	
13.	Double-check all cabling is secure and will not interfere with the props.	
14.	Remove TrueView lens caps; clean lenses/sensor if necessary.	
15.	Turn on drone controller then power on the drone as per normal operations.	
16.	Monitor the TrueView status indicators waiting for: 1. SYS – Solid Green - TrueView has been initialized, ready for takeoff. 2. GNSS – Flashing Cyan - Valid date/time stamp received.	
17.	Wait for drone to initialize and verify there are no errors showing.	
18.	Verify the TrueView is Powered On (Flashing LED lights) if drawing power externally from the drone platform. If the TrueView is powered through the payload battery, switch ON the payload through the power ON switch within the Battery Compartment.	
19.	Safety Check: Area clear of individuals and flight space is clear to fly.	
20.	Manually take-off and ascend to mission altitude. Verify good LOS to drone and planned flight area.	
21.	Manually perform IMU in-air heading alignment maneuver.	
22.	Initiate mission using the flight planning tool.	
23.	Monitor drone/ TrueView during flight as per normal operations.	
24.	When the last flight line of the mission plan is complete, let the drone start the Return to Home sequence. Do not let it descend at the Home point. Toggle the drone to manual control (P->A->P) instead. Applicable for M300 DJI drone models only.	•
25.	Manually perform IMU in-air heading alignment maneuver again.	
26.	Make sure the landing area is still clear; complete the landing using Return to Home or manually as preferred.	
27.	Verify SYS light is flashing white (transferring data).	
28.	Monitor the TrueView SYS LED; flashing white means data is being copied to UMS; solid white data copy is complete. Wait for solid white to go to next step.	
29.	Power TrueView OFF using main power switch in battery compartment (door must be open to toggle). Never power OFF while SYS LED is still blinking white indicating a copy operation is in progress; data loss will occur. If SYS LED turns to blinking or solid red, it is safe to turn off and move to troubleshoot section or contact GeoCue for further instructions.	
30.	Remove UMS drive and pass to post-processing.	



SUPPORT

Our searchable support knowledge base contains information on workflows, tips, hints, and probable resolutions to error messages or commonly encountered situations.

<https://support.geocue.com/>

Normal support business hours are **Monday - Friday, 8 AM — 5 PM** USA Central Time.

Our GeoCue Support website contains general workflow information, in addition to specific issue and error messages that you may encounter. Click on the link and search for information contained in the knowledge base.

If a support request is sent during business hours a representative will typically get back to you within 4 hours. If received after hours, a response will be sent the following day. To speed response time please include the following information in your request:

- Contact information - please include e-mail address and phone number
- Company name
- Product name and version number
- True View Model and Serial Number

If your request includes problems pertaining to a specific error message, please include a screenshot of the error message.

For hardware and software support contact: support@geocue.com



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