Double 4K/Skyport
Configuration File User Guide

Engineered in Minneapolis, MN
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Content

1 Introduction

Note: Double 4K - Skyport is formerly known as AGX710.

This document details the use and modification of the configuration file for the Double 4K/ Skyport camera. A variety of settings allows the camera to be configured to meet installation and data capture requirements. For example, selection of the installed platform interfaces, control of the condition for capturing an image, and format of the generated imagery.

Note: This guide applies to version 1.3.0 of the software. It is recommended to upgrade your Double 4K/ Skyport to at least this version before following this guide.

2 Configuration File Management

The following sections identify the process for viewing and modifying the camera configuration.

2.1 Current Settings

The current configuration file is saved by the camera to the SD card. To view the file, insert the SD card into a computer and open the info folder. Within this folder you will find file config.yml as shown in Figure 1:

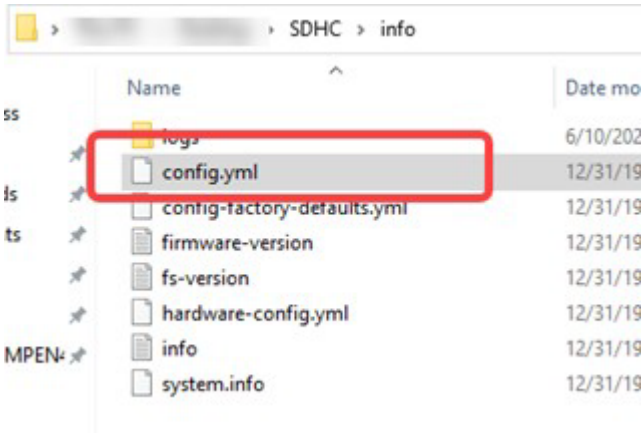

Figure 1: config.yml file

This folder also contains the file config-factory-defaults.yml. This file can be referenced to identify the settings when the camera was purchased.

2.2 Modifying Settings

The config.yml configuration file is a text document which can be opened with any text editor (for example, Notepad). Settings within the file are organized as key/value pairs, which are separated by a colon. For example, the following pair identifies the key as OverlapPercent with a value of 70.0.

```
OverlapPercent: 70.0
```

Keys (and spacing) with the file should never by modified; only the value is changed. Improper modification of the file is likely to result in the camera not operating as expected. If this occurs, it is recommended to save the config-factory-defaults.yml file as the configuration file (see Section 2.3) and take additional care in modifying configuration file contents when attempted again. Sentera Support can be contact to assisting with this process at support@sentera.com or 844-736-8372.

2.3 Saving Settings

In order for the new configuration file to be used by the camera, it needs to be saved to the base directory of the SD card with filename config.yml, as shown in Figure 2.

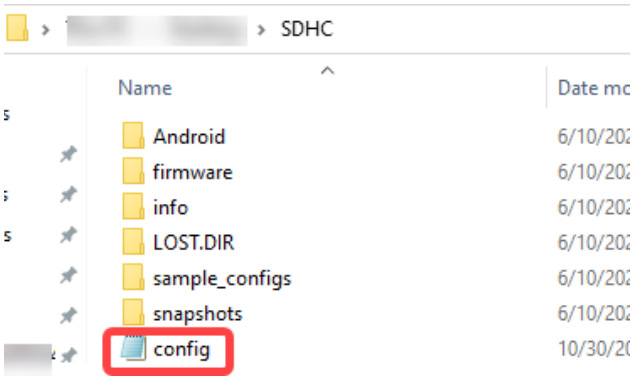

Figure 2: config folder

The next time the camera is booted, the new settings will be used.

3 Configuration File Content

The following sections detail the content of the configuration file. Section 3.1 is an exact copy of the configuration file, where modifiable values have been replaced with hyperlinks to addition specification. Hyperlinks are shown with green coloring, while values which should not be modified are show with red coloring.

3.1 Configuration Fields

This section shows the configuration file.

```
AssumedAircraftHeading: 3.2.1
CameraConfig:
  Imager:
```

```
- CamID: Do-not-modify
  CamName: 3.2.2
  Exposure:
    AutoExposure: 3.2.3
    EV: 3.2.4
    ISO: 3.2.5
  Image:
    JpegQuality: 3.2.6
    PostProcessing: Do-not-modify
    Size:
      Height: 3.2.7
      Width: 3.2.7
  PositionOffsetMM:
    X: 3.2.8
    Y: 3.2.8
    Z: 3.2.8
  StartingZoomGain: Do-not-modify
  TriggerID: Do-not-modify
  WorldFiles:
    Enabled: Do-not-modify
- CamID: Do-not-modify
  CamName: 3.2.2
  Exposure:
    AutoExposure: 3.2.3
    EV: 3.2.4
    ISO: 3.2.5
  Image:
    JpegQuality: 3.2.6
    PostProcessing: Do-not-modify
    Size:
      Height: 3.2.7
      Width: 3.2.7
  PositionOffsetMM:
    X: 3.2.8
    Y: 3.2.8
    Z: 3.2.8
  StartingZoomGain: Do-not-modify
  TriggerID: Do-not-modify
  WorldFiles:
    Enabled: Do-not-modify
ImagerID: Do-not-modify
VideoSettings:
  BitrateMode: 3.2.9
  Bitrate_kbsp: 3.2.10
  FrameRate: Do-not-modify
  KeyframeInterval: Do-not-modify
  Recording:
    Enabled: 3.2.11
    Format: Do-not-modify
  Streaming:
    Enabled: 3.2.12
    Format: 3.2.12
    MTU: Do-not-modify
    UdpDelayMs: Do-not-modify
    UseRTPHeaders: 3.2.12
```

```
      VideoPacketDest:
        IP: 3.2.13
        Port: 3.2.13
    VideoSize:
      Height: 3.2.14
      Width: 3.2.14
    ViewConfig:
      OSDConfig:
        AngleIndicator: 3.2.15
        Background: 3.2.15
        CameraSettings: 3.2.15
        Crosshairs: 3.2.15
        Enabled: 3.2.15
        GPSStatus: 3.2.15
        PictureTaken: 3.2.15
      Position:
      - 3.2.16
      - 3.2.16
      Shaders:
      - Do-not-modify
      - Do-not-modify
DebugConfig:
  SimulateCamera: Do-not-modify
  SimulatedSessionFolder: Do-not-modify
File:
  ConfigName: 3.2.17
  ConfigRevision: 3.2.17
  FileVersion: Do-not-modify
  ModifiedDate: 3.2.17
  SWVersion: Do-not-modify
IlsConfig:
  Source: Do-not-modify
  UDP:
    MulticastIP: Do-not-modify
    RxPort: Do-not-modify
  UDPBlockID: Do-not-modify
KnownHeightAGLMeters: 3.2.18
LiveAnalyticsConfig:
  AnnotatedImagesEnabled: Do-not-modify
  DebugImagesEnabled: Do-not-modify
  DebugLogsEnabled: Do-not-modify
NetworkConfig:
  Camera:
    IP: 3.2.19
  WifiAP:
    Channel: 3.2.20
    Enabled: 3.2.20
    IP: 3.2.20
SessionConfig:
  ForceAppendSessions: Do-not-modify
  GPSFixConfig:
    AccurateFixMeters: Do-not-modify
    DegradedFixMeters: Do-not-modify
    PreciseFixMeters: Do-not-modify
  SessionType: 3.2.21
```

```
SourceConfig:
  DjiConfig:
    Interface:
      Protocol: Do-not-modify
      Serial:
        Baud: Do-not-modify
        Port: Do-not-modify
      UDP:
        MulticastIP: Do-not-modify
        RxPort: Do-not-modify
    PlatformType: Do-not-modify
  DjiPsdkConfig:
    Interface:
      Protocol: Do-not-modify
      Serial:
        Baud: Do-not-modify
        Port: Do-not-modify
      UDP:
        MulticastIP: Do-not-modify
        RxPort: Do-not-modify
        TxIP: Do-not-modify
        TxPort: Do-not-modify
    IsMaster: Do-not-modify
  Hg4940Config:
    AuxAntennaPos:
      STD: Do-not-modify
      X: Do-not-modify
      Y: Do-not-modify
      Z: Do-not-modify
    Interface:
      Protocol: Do-not-modify
      Serial:
        Baud: Do-not-modify
        Port: Do-not-modify
      UDP:
        MulticastIP: Do-not-modify
        RxPort: Do-not-modify
        TxIP: Do-not-modify
        TxPort: Do-not-modify
    MainAntennaPos:
      STD: Do-not-modify
      X: Do-not-modify
      Y: Do-not-modify
      Z: Do-not-modify
  MavlinkConfig:
    Interface:
      Protocol: Do-not-modify
      Serial:
        Baud: Do-not-modify
        Port: Do-not-modify
      UDP:
        MulticastIP: Do-not-modify
        RxPort: Do-not-modify
        TxIP: Do-not-modify
        TxPort: Do-not-modify
```

```
  OnyxConfig:
    Interface:
      Protocol: Do-not-modify
      Serial:
        Baud: Do-not-modify
        Port: Do-not-modify
      UDP:
        MulticastIP: Do-not-modify
        RxPort: Do-not-modify
        TxIP: Do-not-modify
        TxPort: Do-not-modify
  ProcerusConfig:
    FirmwareType: Do-not-modify
    Interface:
      Protocol: Do-not-modify
      Serial:
        Baud: Do-not-modify
        Port: Do-not-modify
      UDP:
        MulticastIP: Do-not-modify
        RxPort: Do-not-modify
        TxIP: Do-not-modify
        TxPort: Do-not-modify
    UseRevRProtocol: Do-not-modify
  RTCMConfig:
    EnableForwarding: Do-not-modify
    ProtocolIn: Do-not-modify
    ProtocolOut: Do-not-modify
    Serial:
      Baud: Do-not-modify
      Port: Do-not-modify
    UDP:
      MulticastIP: Do-not-modify
      RxPort: Do-not-modify
      TxIP: Do-not-modify
      TxPort: Do-not-modify
  SbgcConfig:
    Interface:
      Protocol: Do-not-modify
      Serial:
        Baud: Do-not-modify
        Port: Do-not-modify
      UDP:
        MulticastIP: Do-not-modify
        RxPort: Do-not-modify
  SbpConfig:
    Interface:
      Protocol: Do-not-modify
      Serial:
        Baud: Do-not-modify
        Port: Do-not-modify
      UDP:
        MulticastIP: Do-not-modify
        RxPort: Do-not-modify
  ScpConfig:
```

```
    Interface:
      Protocol: Do-not-modify
      Serial:
        Baud: Do-not-modify
        Port: Do-not-modify
      UDP:
        MulticastIP: Do-not-modify
        RxPort: Do-not-modify
        TxIP: Do-not-modify
        TxPort: Do-not-modify
  SourceType: 3.2.22
  UbloxConfig:
    Interface:
      Protocol: Do-not-modify
      Serial:
        Baud: Do-not-modify
        Port: Do-not-modify
      UDP:
        MulticastIP: Do-not-modify
        RxPort: Do-not-modify
TriggerConfig:
  IntervalConfig:
    IntervalSeconds: 3.2.23
  LocationTriggerConfig:
    AutoHeightOverlapConfig:
      MinimumTriggerHeightAGLMeters: 3.2.24
      OverlapPercent: 3.2.24
    DistanceConfig:
      TriggerDistanceMeters: 3.2.25
    KnownHeightOverlapConfig:
      OverlapPercent: 3.2.26
    UsedCamID: 3.2.27
  TriggerType: 3.2.28
```

3.2 Configuration Detail

The following sections describe the configuration details.

3.2.1 AssumedAircraftHeading

This setting identifies the heading (in degrees) that the camera assumes on installations where aircraft heading isn't available.

Valid settings:

- 0.0 – 360.0

3.2.2 CameraConfig:Imager:CamName

This setting defines the folder name for the imager within the SD card session folder.

Valid settings:

- Alphanumeric strings (no spaces) which are unique between the two imagers.

3.2.3 CameraConfig:Imager:Exposure:AutoExposure

This setting controls how camera imagery is used for autoexposure control.

Valid settings:

- frame-average: Uses the entire image for exposure. This is the recommended setting for ground surveys.
- center-weighted: Uses the enter frame but weights the center 1/3 more. This setting is good for infrastructure inspections (for example, towers) where the center 1/3 of the image has the region of interest.
- spot-metering: Uses only the very center of the image. This setting can be good for infrastructure inspection, but the object must be centered, or the exposure will be wrong.

3.2.4 CameraConfig:Imager:Exposure:EV

This setting controls the overall brightness of the image, as long as ISO is set reasonably. This value is generally set negative for agriculture applications where most of the scene is dirt or plants and set positive for flights where imagery containing the sky is captured (for example, infrastructure inspection).

Valid settings:

- -10 to +10.

3.2.5 CameraConfig:Imager:Exposure:ISO

This setting defines the gain for the image. A setting of AUTO is recommended as it gives the best performance, that is, lowest gain possible without image blur occurring.

For manual settings, ISO400/800 is generally good for agriculture applications while ISO200/400 can work well for infrastructure inspection. The main component affecting this setting is the amount of light in the scene. Higher ISOs lead to less motion blur (due to faster shutter speeds) but will increase imager noise. If the ISO is set too high, autoexposure may have problems getting the correct brightness and will oscillate between bright and dark.

Valid settings:

- AUTO
- ISO100
- ISO200
- ISO400
- ISO800

- ISO1600

3.2.6 CameraConfig:Imager:Image:JpegQuality

This setting controls the strength of the jpeg compression. The higher the number, the larger the file size and the finer detail the image will retain. 100% will contain the highest quality images but will also be the largest file size.

Valid settings:

- 50-100

3.2.7 CameraConfig:Imager:Image:Size

This setting controls the size of the still image to save. This should typically not be modified as it will change the field of view of the camera, resulting in overlap settings (for example, parameter OverlapPercent, Section 3.2.24) that may not be accurate.

Valid settings (Width x Height):

- 4000x3000
- 3200x2400
- 2592x1944
- 2048x1536
- 1920x1080
- 1600x1200
- 1280x960
- 1280x768
- 1280x720
- 1024x768
- 800x600
- 800x480
- 720x480
- 640x480
- 352x288
- 320x240
- 176x144

3.2.8 CameraConfig:Imager:PositionOffsetMM

These settings define the positional offset (in millimeters) between the Global Navigation Satellite System (GNSS) antenna reference point and the imager principal point. These settings are meaningful on RTK enabled platforms where high positional accuracy is achievable. Figure 3 gives the coordinate axis for the camera (looking at the back of the camera). The positional offset is defined by starting at the GNSS antenna and translating to the camera.

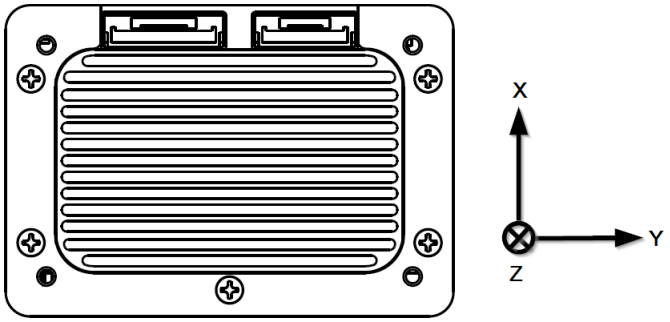

Figure 3: Back of Camera

Valid settings:

- Any positive or negative decimal value.

3.2.9 CameraConfig:VideoSettings:BitrateMode

This setting defines the video encoding mode.

Valid settings:

- **VBR:** Variable Bitrate mode is the recommended selection. The bitrate is dynamically increased or decreased based on the scene complexity.
- **CBR:** Constant Bitrate mode causes the video stream transmission to be at a constant rate.
- **CQ:** Constant Quality mode is a special variant of VBR, which attempt to maintain a constant video quality.

3.2.10 CameraConfig:VideoSettings:Bitrate_kbps

This setting defines the bit rate of the raw video feed, in kilobits per second. Extreme care should be taken when adjusting this as too high of a value can flood the data link and result in video breakups, while too low of a setting will result in an unusable video.

Valid settings:

- 500 - 10000

3.2.11 CameraConfig:VideoSettings:Recording:Enabled

This setting allows enabling/disabling of recorded video to the SD card. The recorded video will be the same resolution and have the same overlays as the streaming video.

> **Note:** This feature currently only works when the platform supports opening and closing sessions, otherwise the video will be corrupt. Contact Sentera for details.

Valid settings:

- true
- false

3.2.12 CameraConfig:VideoSettings:Streaming

These settings control operation of the video stream. Settings should match the requirements of the unit ingesting the video stream.

Enabled

Selection to enable/disable the video feed.

Valid Settings:

- true
- false

Format

This sets the transport stream format of the streaming video feed.

Valid Settings:

- **H264:** Raw H264 over UDP. This is typically used with RTP headers (see parameter UseRTPHeaders) for H264 over RTP [RFC 6184].
- **MPEG2_TS:** Encapsulates the H264 in an MPEG2 Transport Stream (video feed only).

UseRTPHeaders

Enables/Disables the use of Real-time Transport Protocol (RTP) headers to encapsulate the protocol.

Valid settings:

- true
- false

3.2.13 CameraConfig:VideoSettings:Streaming:VideoPacketDest

These settings specify the destination for the video feed.

IP

The IP address of the video feed destination.

Valid settings:

- Any valid IP in the form ###.###.###.### - for example, 192.168.143.242.

Port

The IP port of the video feed destination.

Valid settings:

- 49152 - 65535

3.2.14 CameraConfig:VideoSettings:VideoSize

These settings define the size of the video feed. Best results are obtained when using a 16x9 aspect ratio – example setting for this include: 1920x1080, 1280x720, 852x480, 568x320.

Valid settings:

- **Width:** 320 - 1920
- **Height:** 240 - 1080

3.2.15 CameraConfig:VideoSettings:ViewConfig:OSDConfig

These settings enable/disable various On-Screen Display (OSD) components in the video feed. These displays are purely cosmetic and will not change the functionality of the system.

Valid settings:

- true
- false

Enabled

Enables/Disables all OSD components. Setting this to false produces a “pure” video feed.

Angle Indicator

Displays an artificial horizon line at 0 degrees and 90 degrees, to help check the pitch angle of the gimbal.

Background

Displays a translucent white background behind the GPS status and “picture taken” status to help with readability.

CameraSettings

Displays the ISO and EV compensation values, for the camera that is currently display at full screen.

Crosshairs

Displays a static crosshair in the center of the image.

GPSStatus

On systems with a GPS separate from the vehicle GPS, this will display the signal strength of the camera GPS as well as the RTK fix type.

PictureTaken

Display a small camera icon and a number indicating which imager is active whenever a picture is taken.

3.2.16 CameraConfig:VideoSettings:ViewConfig:Position

This setting controls the configuration of the video feed. The first element of the list defines imager-0 configuration (typically the RGB/Wide imager) while the bottom element defines imager-1 configuration (typically the NIR/Narrow imager).

Both fields can be set independently, but one of the two should always be set to FULL or TOP.

Valid settings:

- **FULL:** This imager will take up the full size of the video feed.
- **PIP_LR:** This imager will display as a small picture-in-picture window in the lower right.
- **TOP:** This imager will take up the top half of the display, stretching to fit.
- **BOTTOM:** This imager will take up the bottom half of the display, stretching to fit.
- **DISABLE:** Do not show this imager.

3.2.17 File

These settings are used to track and version configuration files. Use of the fields assists in organizing multiple configuration files which could be used for various data capture use cases.

ConfigName

A name for the configuration file. This name does not have to match the file name and can be anything that will help differentiate the file to the end user.

Valid settings:

- Any alphanumeric string, including spaces.

ConfigRevision

A revision number or letter, used to version control the file.

Valid settings:

- Any alphanumeric string, including spaces.

ModifiedDate

The data that the file was last modified. This field is used similarly to the revision, for providing version control of the file.

Valid settings:

- Any date in the format: YYYY-MM-DD HH:MM:SS.

3.2.18 KnownHeightAGLMeters

This setting defines the altitude (in meters) above-ground-level (AGL) to assume when operating in KNOWN_HEIGHT_OVERLAP mode (see parameter TriggerType, Section 3.2.28).

Valid settings:

- 0.0 – 400.0

3.2.19 NetworkConfig:Camera:IP

This setting specifies the IP Address for the camera.

Valid settings:

- Any valid IP in the form ###.###.###.### - for example, 192.168.143.141.

3.2.20 NetworkConfig:WifiAP

These setting control the camera's Wifi Access Point (AP). Use of the Wifi requires an antenna be installed internal to the camera. If your camera was purchased prior to December 2017, contact Sentera to add the antenna to your camera.

Channel

The channel used for Wifi communication. If in a high Wifi activity area, a Wifi network analyzer tool can be used to select a channel which does not include other devices.

Valid settings:

- 1 - 11

Enabled

Selection to enable or disable the Wifi Access Point.

Valid settings:

- true
- false

IP

The IP address for the Wifi Access point.

Valid settings:

- Any valid IP in the form ###.###.###.### - for example, 192.168.43.1.

3.2.21 SessionConfig:SessionType

This setting defines when the camera will start a session, that is, create a folder on the SD card and allow for image capturing.

Valid settings:

- **GPS_FIX:** The camera session in started once GPS achieves an accuracy better than a threshold (see parameter AccurateFixMeters). Operation in this mode is recommended as it ensures good location and time data for captured imagery.
- **TIME_FIX:** The camera session is started once a valid time is achieved – usually received from a GPS module.
- **IMMEDIATE:** The camera session is started immediately upon camera boot. Since captured imagery position and time data will be invalid, this option should only be used for testing –for example, if indoors and a GPS fix is not possible.

3.2.22 SourceConfig:SourceType

This setting defines the primary source(s) for camera telemetry data – which corresponds to the platform the camera is being operated on.

Valid Settings:

- **U_BLOX:** GPS data is received from a u-blox module. Camera roll and pitch are computed from an internal Inertial Measurement Unit (IMU). Camera yaw is assumed as a fixed value (see parameter AssumedAircraftHeading, Section 3.2.1).
- **U_BLOX_HFUSE_YAW:** This mode is identical to mode U_BLOX, with the exception that camera yaw is computed from an internal heading-fusion algorithm. Aircraft heading is assumed to always be forward-facing during flight, rather than being locked to a fixed direction.
- **MAVLINK:** GPS and attitude data is received from connection to a MAVLink based system.
- **MAVLINK_SBP:** GPS data is received from a Swift navigation RTK module. Attitude data is received from connection to a MAVLink based system.

- **DJI_PSDK:** GPS is received from connection to a DJI Payload SDK (PSDK) based system. Attitude data is received from the DJI PSDK connection and the gimbal controller.

3.2.23 TriggerConfig:IntervalConfig:IntervalSeconds

When operating in INTERVAL mode (see parameter TriggerType, Section 3.2.28), this setting controls the time (in seconds) between successive image captures.

Valid settings:

- 1.0 - 30.0

3.2.24 TriggerConfig:LocationTriggerConfig:AutoHeightOverlapConfig

These settings control image capture operation when in mode AUTO_HEIGHT_OVERLAP (see parameter TriggerType, Section 3.2.28).

MinimumTriggerHeightAGLMeters

This setting controls the minimum height (in meters) above-ground-level (AGL) that the vehicle must achieve before image capture will be performed. This inhibition of image capture prevents unintended pictures from being taken while on the ground, which could occur because of the low accuracy in the GPS position solution immediate after powering the unit.

Valid settings:

- 0.0 - 200.0

OverlapPercent

This setting is the percent overlap of imagery to trigger image capture. The camera uses this percentage and the measured height above ground to achieve image capture with desired overlap.

Valid settings:

- -600 to +90

3.2.25 TriggerConfig:LocationTriggerConfig:DistanceConfig:TriggerDistanceMeters

When operating in DISTANCE mode (see parameter TriggerType, Section 3.2.28), this setting controls the distance (in latitude/longitude movement) to trigger an image capture.

Valid settings:

- 0.5 – 1000

3.2.26 TriggerConfig:LocationTriggerConfig:KnownHeightOverlapConfig:OverlapPercent

When operating in KNOWN_HEIGHT_OVERLAP mode (see parameter TriggerType, Section 3.2.28), this setting controls the percent overlap of imagery to trigger image capture. The camera uses this

percentage and the assumed height above ground (see parameter KnownHeightAGLMeters, Section 3.2.18) to achieve image capture with desired overlap.

Valid settings:

- -600 to +90

3.2.27 TriggerConfig:LocationTriggerConfig:UsedCamID

When operating in AUTO_HEIGHT_OVERLAP or KNOWN_HEIGHT_OVERLAP mode (see parameter TriggerType, Section 3.2.28), this setting controls which imager is used for determining achieved overlap. This setting is meaningful on cameras which have imagers with different fields-of-view, to specify the wider or narrow camera.

Valid settings:

- This setting must match parameter CameraConfig:Imager:CamID, to select which imager to use.

3.2.28 TriggerConfig:TriggerType

This setting controls the condition for capturing imagery.

Valid settings:

- **COMMAND:** Image capture is "commanded" by the connected interface (dictated by parameter SourceType). For example, on MAVLink based systems image capture is commanded via the MAVLink protocol by the host controller.
- **AUTO_HEIGHT_OVERLAP:** GPS data is used to capture imagery to achieve a specified overlap (see parameter set AutoHeightOverlapConfig, Section 3.2.24). Height above-ground-level (AGL) is automatically determined as the difference in GPS altitude between the take-off location and the current flight height.
- **KNOWN_HEIGHT_OVERLAP:** GPS data is used to capture imagery to achieve a specified overlap (see parameter set KnownHeightOverlapConfig Section 3.2.26). Height above-ground-level (AGL) is fixed (see parameter KnownHeightAGLMeters Section 3.2.18).
- **DISTANCE:** GPS data is used to capture an image every time a fixed distance is moved (see parameter TriggerDistanceMeters, Section 3.2.25).
- **INTERVAL:** Imagery is captured at a periodic interval (see parameter IntervalSeconds, Section 3.2.23).

4 Common Operating Modes

The following sections define sets of configuration data which are common to achieve data capture requirement on different aircraft. For brevity, each section includes a subset of all configuration fields, identifying the most pertinent settings.

These sections help to consolidate configuration parameters and give additional detail and clarity on their interdependencies.

4.1 Double 4K on DJI Mavic, Phantom, and Inspire

The following sections apply to Double 4K installation on the DJI Mavic, Phantom, and Inspire platforms.

4.1.1 Default

The following settings are those shipped with Double 4K cameras at the time of production.

- SourceType: U_BLOX
- SessionType: GPS_FIX
- TriggerType: AUTO_HEIGHT_OVERLAP
- MinimumTriggerHeightAGLMeters: 5.0
- OverlapPercent: 70.0
- AssumedAircraftHeading: 90.0

The camera receives GPS data from a u-blox GPS module – either from the aircraft (in the DJI Mavic and Phantom case) or from the lock-and-go (in the DJI Inspire case). The camera starts a session when a GPS location fix is achieved by the GPS module, causing a folder (named with the GPS time) to be saved to the SD card. This folder is where subsequent imagery and supporting files are saved for this camera session.

After the aircraft reaches an altitude of 5.0 meters above the take-off location, the camera uses the GPS location and altitude to achieve the selected camera capture overlap percentage. Since the camera doesn't know the aircraft heading, the aircraft is assumed to be East facing (heading = 90.0 degrees) throughout the flight.

4.1.2 Forward-Facing Flight

The following settings are used to achieving a forward-facing flight direction.

- SourceType: U_BLOX_HFUSE_YAW
- SessionType: GPS_FIX
- TriggerType: AUTO_HEIGHT_OVERLAP
- MinimumTriggerHeightAGLMeters: 5.0
- OverlapPercent: 70.0

These settings are identical to the default settings (see Section 4.1.1) with the exception that aircraft heading is assumed to be forward-facing rather than at a fixed direction throughout flight. Forward-facing flight can be better if planning to generate stitched mosaics with photogrammetry software, as it allows imagery rolling-shutter correction to more easily be performed.

4.1.3 Terrain Following Flight

The following settings can be used during terrain following flights.

- SourceType: U_BLOX
- SessionType: GPS_FIX
- TriggerType: KNOWN_HEIGHT_OVERLAP
- KnownHeightAGLMeters: 5.21208
- OverlapPercent: 70.0
- AssumedAircraftHeading: 90.0

These settings are identical to the default settings (see Section 4.1.1) with the exception of operating in "known height overlap" mode. In this mode the camera assumes the selected AGL value rather than calculating AGL based off the GPS altitude and the take-off location. This setting (that is, KnownHeightAGLMeters) must match the flight altitude to generate a coherent data product. This mode also doesn't inhibit camera captures below a flight altitude threshold (for example, 5.0 meters), so very low altitude missions can be accomplished.

When executing lower altitude flights over variable height terrain this mode can be used to generate a more accurate data product (for example, Sentera QuickTile). For higher altitude flight or when operating over relatively flat landscape, using the default settings is usually the easier method as you don't need to explicitly identify your flight altitude within the camera's configuration parameters.

4.1.4 Distance Triggering Flight

The following settings can be used to trigger the camera based on a distance criterion rather than an overlap setpoint.

- SourceType: U_BLOX
- SessionType: GPS_FIX
- TriggerType: DISTANCE
- TriggerDistanceMeters: 10.0
- AssumedAircraftHeading: 90.0

These settings are identical to the default settings (see Section 4.1.1) with the exception of now triggering based on a selected moved distance. Setting TriggerDistanceMeters dictates how much horizonal distance is traversed to cause a camera capture. This mode also doesn't inhibit camera captures below a flight altitude threshold (for example, 5.0 meters), so very low altitude missions can be accomplished.

4.2 Double 4K / Skyport on DJI M200/300 Series

The following sections apply to Double 4K / Skyport installation on the DJI M200 and M300 series platforms.

4.2.1 Default

The following settings are those shipped with Double 4K / Skyport at the time of production.

- SourceType: DJI_PSDK
- SessionType: TIME_FIX
- TriggerType: COMMAND

The camera starts a session once a GPS time solution is achieved. Communication with the airframe is accomplished using the DJI Payload SDK (PSDK) interface. The PSDK provides tight integration with the aircraft's autopilot; camera captures are "commanded" by the autopilot based on the user's flight mission setup in the ground control station (for example, Sentera FieldAgent).

4.3 Double 4K on Sentera PHX

The following sections apply to Double 4K installation on the Sentera PHX platform.

4.3.1 Default

The following settings are those shipped with Double 4K cameras at the time of production.

- SourceType: MAVLINK
- SessionType: GPS_FIX
- TriggerType: COMMAND

The camera starts a session once a GPS location fix solution is achieved. The camera communicates with the airframe using the MAVLink interface. The MAVLink interface provides tight integration with the aircraft's autopilot; camera captures are "commanded" by the autopilot based on the user's flight mission setup in the ground control station (for example, Sentera FlyPHX).

4.4 Double 4K RTK on Sentera PHX

The following sections apply to RTK capable Double 4K installation on the Sentera PHX platform.

4.4.1 Default

The following settings are those shipped with Double 4K cameras at the time of production.

- SourceType: MAVLINK_SBP
- SessionType: GPS_FIX
- TriggerType: COMMAND

The camera starts a session once a GPS location fix solution is achieved. The camera communicates with the airframe using the MAVLink interface and communicates with a Swift navigation module for RTK GPS data. The MAVLink interface provides tight integration with the aircraft's autopilot; camera captures are "commanded" by the autopilot based on the user's flight mission setup in the ground control station (for example, Sentera FlyPHX).

5 Support

Need Support? Email us at support@sentera.com or call us 844-736-8372.

6 Revision History

This table list the revision history.

Release No.	Date	Revision Description
Rev -	June 18, 2021	Original document.
Rev A	Aug 4, 2021	Update specification for 1.3.0 software release. Add section on common operating modes.
Rev B	October 5, 2021	Updated AGX710 name to Double 4K / Skyport
Rev C	December 9, 2021	• Updated title from Double 4K / Double 4 K Skyport to Double 4K / Skyport. • Fixed Heading style for 3.2.3 and link from page 3.
Rev D	September 1, 2022	Updated Branding

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