Phase One iXM Cameras on DJI Matrice 300 RTK with P3 Gimbal

Integration Guide

PHASE**ONE**

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Phase One iXM Cameras on DJI Matrice 300 RTK with P3 Gimbal Integration Guide

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1 Introduction

1.1 Scope

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1.2 Applicable Documents

Note	For complete installation instructions and user care for the DJI Matrice 300 RTK, refer to the DJI Matrice 300 RTK manuals supplied by DJI.

Item	Manual
DJI Matrice 300 RTK	Matrice 300 RTK User Manual
Phase One Cameras	iXM-RS/iXM Series Aerial Camera Systems Installation Guide

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2 What's in the Box

The following tables lists all parts included in the Phase One Integration Kits for P3 Gimbal as follows:

Table 1. Phase One P3 Payload Standalone for DJI Matrice 300 RTK (P/N 76020500)

Part No.	Item	Qty	Image
60900126	Accessories Case	1	
75097000	iXM/P3 Suitcase	1	
76019200	Phase One Laser Rangefinder (LRF) TF3-180 **Note** To replace the LRF, the gimbal must be sent to Phase one for servicing.	1	
76021830	Damping Plate	1	

Part No.	Item	Qty	Image
76021520	Skyport quick release	1	
76019800	HDMI module	1	
76020400	iXM camera plate	1	
	Mounting plate	1	
76021530	Micro USB type C cable	1	
76021540	Allen key set (2.0/2.5)	1	

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Part No.	Item	Qty	Image
76021720	Phase One P3-I Gimbal Kit for DJI M300	1	
	M4x10 screws for camera plate	5	
	M3x6 screws for HDMI module + frame lower bar to camera	3	
		3	
	M4x8 screws for mounting plate	1	

3 Required Items

The following items are required for installing a Phase One iXM Camera on a DJI M300 drone:

- One of the following Integration Kits:
  - Phase One P3 Payload Standalone for DJI Matrice 300 RTK (P/N 76020500)
  - Phase One P3-100MP Payload for DJI Matrice 300 RTK (P/N 76020700)
  - Phase One P3-50MP Payload for DJI Matrice 300 RTK (P/N 76020800)
- DJI M300 drone
- Additional remote control (optional)
- PC for firmware updates.

4 Replacing the Damping Plate

The DJI Matrice 300 RTK is supplied with a damping plate that must be removed and replaced with the Phase One P3 damping plate.

4.1 Removing the DJI Matrice 300 RTK Damping Plate

To remove the existing damping plate from the DJI M300 drone:

1. Place the protective aircraft cradle from the DJI Matrice 300 RTK suitcase on the top of drone.

2. Place the M300 drone on its back.

3. Using a Philips #0 screwdriver, remove both screws securing the USB-C connector to the drone. Save the screws for later.

4. Remove the connector from the drone.

5. Using a 2.5 mm Allen key, remove the two screws securing the damping plate to the bottom of the DJI Matrice 300 RTK.

6. Using a 2.5 mm Allen key, remove the two screws securing the damping plate to the front of the DJI Matrice 300 RTK.

7. Remove the DJI Matrice 300 RTK damping plate.

4.2 Mounting the P3 Damping Plate

To mount the P3 damping plate:

1. Locate the four M3x6 screws supplied in the Integration Kit for P3 Gimbal.

2. Position the P3 damping plate in position as shown at right.

3. While holding the damping plate in position, insert each screw in its location.

4. For each screw: reopen the screw, place a drop of Loctite 222 on the screw thread and insert the screw in position. Tighten the screw to torque 60 cNm.

5. Connect the USB-C connector.

6. Locate the two screws you removed from the USB-C connector above.

7. Insert each screw in position and tighten the screw to torque 5 cNm.

8. Place the DJI Matrice 300 RTK upright on its legs.

5 Mounting the P3 Gimbal on the DJI M300

To mount the P3 gimbal on the DJI Matrice 300 RTK:

1. Remove the protective metal cap from the quick release receptacle.

2. Insert the gimbal into the quick release receptacle on the damping plate, while aligning the unlocked symbol on the bayonet opposite the white mark on the receptacle.

3. Rotate the non-slip ring to the right until the locked symbol is opposite the white mark on the receptacle and the bayonet clicks and locks.

6 Calibrating the DJI Matrice 300 RTK with Payload

> **Note**
>
> - The P3 gimbal and camera are bound by Phase One before leaving the factory.
>   If you are using your own iXM-50 or iXM-100 camera, make sure it is updated with the latest firmware so that it will automatically bind with the P3 gimbal (see section B.1.4 - Updating Camera Firmware).
>
> - The DJI Matrice 300 RTK and the DJI Smart Controller controllers are paired by DJI before leaving the factory.

6.1 Calibrating the Compass

Perform compass calibration on the ground as described in the DJI Matrice 300 RTK User Manual.

6.2 Calibrating the Center of Gravity

> **Warning**
>
> - Perform the initial takeoff under minimal wind conditions.
>
> - Since the DJI Matrice 300 RTK is carrying a considerable payload, initial takeoff should be performed swiftly to approximately 3m/10ft altitude,

When performing the initial takeoff, the DJI Matrice 300 RTK's center of gravity must be calibrated as described in the DJI Matrice 300 RTK User Manual.

7 Operator Modes

7.1 Operator Modes

The number of DJI Smart Controllers you are using determines the available operator modes as follows:

- Single operator mode is used when you are using one DJI Smart Controller with the DJI Matrice 300 RTK.

- Dual Operator Mode is used when you are using two DJI Smart Controllers with the DJI Matrice 300 RTK. In this case, one operator controls the DJI Matrice 300 RTK and the other operator controls the payload.

In dual operator mode, the following software options are available:

- the pilot and the payload operator both use the DJI Pilot application.

8   Operating the P3 Gimbal and iXM Camera through the Smart Controller

This section describes how to operate the iXM camera and gimbal using the Smart Controller.

> **Note**
>
> For information on operating the DJI Matrice 300 RTK, refer to the Matrice 300 RTK User Manual.

> **Note**
>
> If you replaced the camera supplied with the P3 gimbal, make sure the camera firmware is upgraded and the camera is configured as described in Appendix B.1.2 and Appendix C.

8.1   Powering up the System

To power up the smart controller and DJI Matrice 300 RTK:

> **Note**
>
> Always power up the Smart Controller before you power up the DJI Matrice 300 RTK.

1. On the smart controller, tap then press and hold the power button until the LEDs come on and the controller vibrates.

2. On the DJI Matrice 300 RTK, tap then press and hold the power button until the LEDs come on.

To control the DJI Matrice 300 RTK from the smart controller:

1. On the controller screen, tap **Pilot 2**.
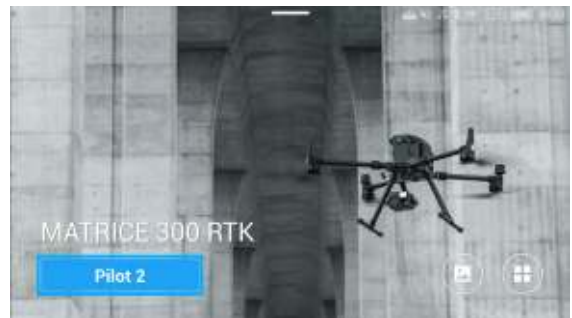
2. Tap **Enter Camera View**.
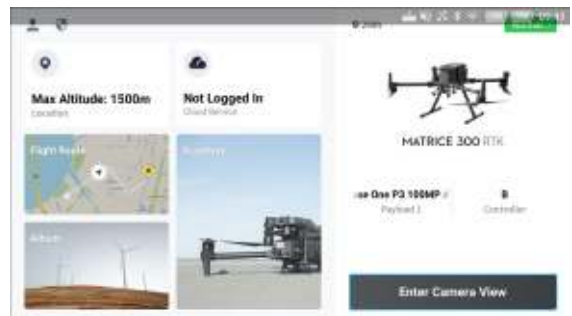
3. Review the **Preflight Check** settings and modify any items if required, then tap X.

4. The following windows appear:

   1. FPV (drone) - appears in the main window

   2. Map

   3. Payload

   > ### Note
   >
   > If the camera testing area is dark, the video signal in the payload window may be too dark to see, or with a red hue.

5. Tap the payload window. The payload window appears in the main window and the Phase One controls appear in addition to DJI controls.

8.2 Smart Controller Phase One Software Controls

The following figure and table describe the main Phase One control and information items on the main payload window.
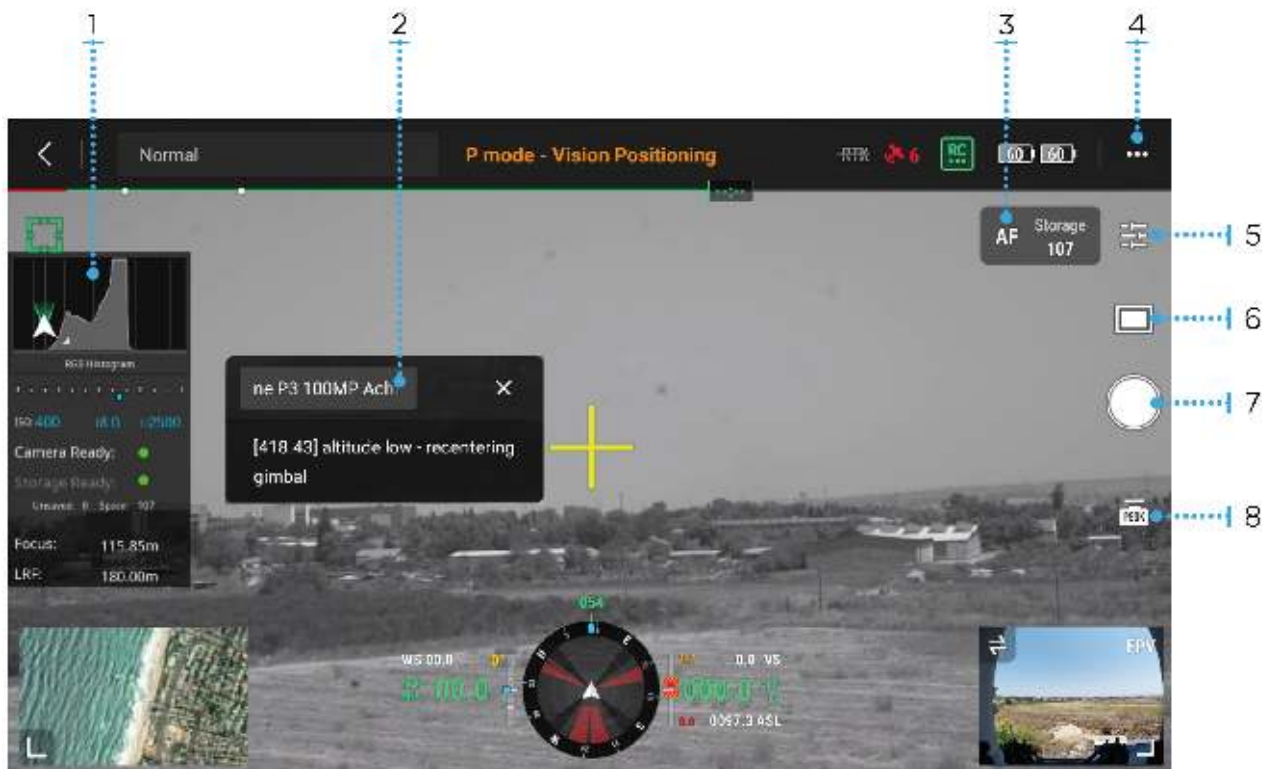
Item	Function	Description
1	Camera information overlay	Displays the following: • Histogram • Camera settings (ISO, f-stop, shutter speed) • Camera status • Storage status • Focus distance • LRF measured distance
2	Floating Window	Displays initialization information, warnings and errors.
3	AF/MF toggle	Toggles between autofocus and manual focus.
4	More Settings	Provides access to additional payload settings.
5	Menu	Provides access to SD card format option.
6	Photo Mode	Opens photo mode settings.
7	Capture	Captures an image.
8	Payload Settings	Opens payload parameter settings (camera, gimbal).

8.3   Smart Controller Hardware Controls

The following figure and tables describe the hardware controls on the Smart Controller.

Item	Function	Description
1	Main window view button (C2)	Configurable button. Recommended setting: Toggle between payload and FPV windows
2	Shutter button	Press to take a photo.
3	Gimbal pitch wheel	Adjusts gimbal pitch up or down
4	Gimbal yaw wheel	Adjusts gimbal yaw left or right.
5	Focus mask toggle	Toggles focus mask on or off.
6	Recenter gimbal button (C1)	Configurable button. Recommended setting: Recenter the gimbal.
7	5D button	Configurable function button

8.3.1   Configuring Smart Controller Hardware Controls

You can configure each of the following Smart Controller buttons or combinations of these buttons to operate a specific drone or camera function:

- C1

- C2

- 5D

To configure individual Smart Controller buttons:

1. Tap [...].

2. Tap Remote Controller Settings.
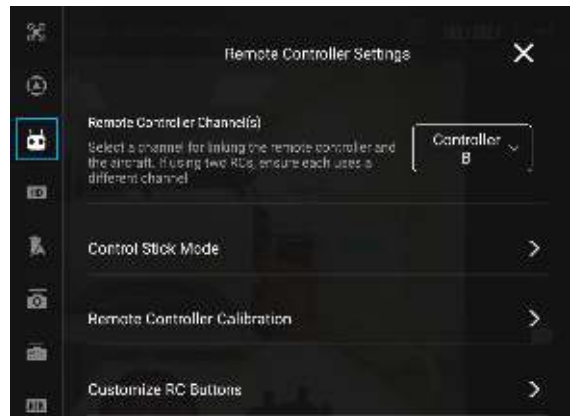
3. Tap **Customize RC Buttons**.
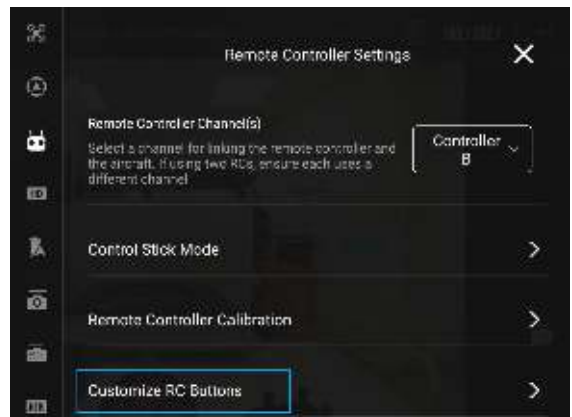
4. Tap the current definition for the button/position that you want to customize:

- C1

- C2

- 5D UP

- 5D DN

- 5D L

- 5D R

5. Tap the required functions group name.
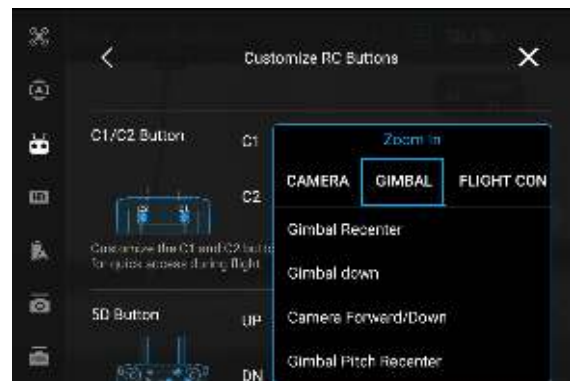
6. Tap the function you want that button to operate.

To configure a combination of Smart Controller buttons:

1. If the **Customize RC Buttons** screen is not displayed, perform Steps 1 to 3 in To configure individual Smart Controller buttons above.

2. In the **Button Combo** section, for each combination you want to configure:

   a. Tap C1 or C2.

   b. Tap UP, DN, L or R.

   c. Tap the function you want that combination to operate (as described in Steps 5 to 6 in To configure individual Smart Controller buttons above.
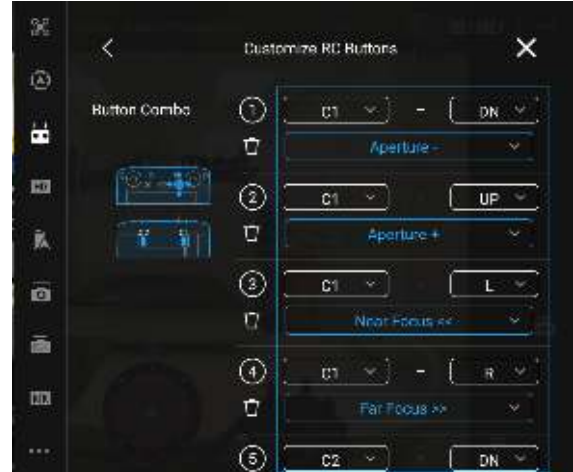
The following table lists the functions that Phase One recommends you assign to the configurable buttons and button combinations:

C1/C2 Button	D5 Left	D5 Right
-	Near Focus – small change	Far Focus – small change
C1	Near Focus – moderate change	Far Focus – moderate change
C2	Near Focus – coarse change	Far Focus – coarse change
C1/C2 Button	**D5 Up**	**D5 Down**
-	When AE is on: EV + When AE is off: ISO +	When AE is on: EV - When AE is off: ISO -
C1	Aperture +	Aperture -
C2	Shutter Speed +	Shutter Speed -

8.4 Camera Actions

To zoom in to a specific area:

1. Tap the required area on the main payload window. The AF box appears where you tapped, and the image zooms in to the selected area.

   > **Note**
   >
   > Tap anywhere to cancel zoom in.

To perform manual focus:

1. Tap [AF]. The focus mode changes to manual.

2. Move the focus slider up or down as required.

To access gimbal controls:

1. Tap **PSDK**.

2. Tap [⊕].

3. Tap PSDK again to close the PSDK window.

To toggle automatic exposure on or off:

4. Tap **PSDK**.

5. Tap [AE].

6. Tap PSDK again to close the PSDK window.

To change ISO or EV:

1. Tap **PSDK**.

2. Tap [+] or [−] as required to perform the following:

   ▪ [+]:

      ◆ when AE is on: EV +

      ◆ when AE is off: ISO +

   ▪ [−]:

      ◆ when AE is on: EV -

      ◆ when AE is off: ISO -

3. Tap PSDK again to close the PSDK window.

To toggle the Camera Information Overlay:

1. Tap **PSDK**.

2. Tap .

3. Tap PSDK again to close the PSDK window.

To toggle the Floating Window:

1. Tap **PSDK**.

2. Tap .

3. Tap PSDK again to close the PSDK window.

To toggle the Live View feed from the iXM camera on or off:

1. Tap **PSDK**.

2. Tap ⬛.

3. Tap PSDK again to close the PSDK window.

To select interval (time-lapse) mode and configure the interval:

> Warning
>
> Do not use interval mode when performing mapping missions.

1. Tap ⬛.

2. Tap **PSDK,** scroll down to **Auto Capture Mode** and verify that it is set to **Time Interval**.

3. Tap **X**.
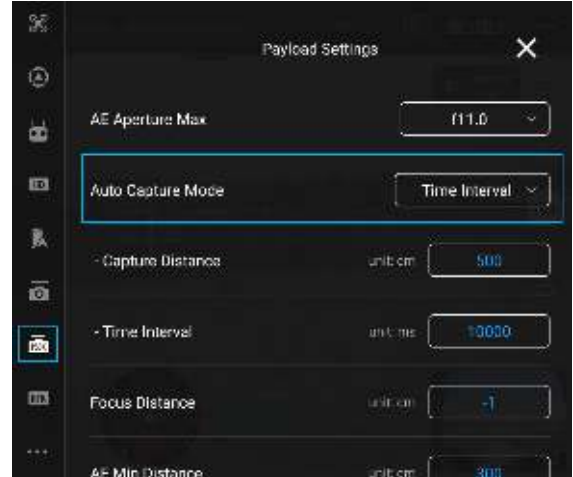
4. Tap **Photo Mode**.

5. Tap **Interval** and select the required interval between consecutive images.

6. Tap anywhere to close the **Photo Mode** window.

To format the XQD memory card:

1. Tap Menu.

2. Tap [■■■].

1. Tap **Format SD Card**.

2. Tap **OK** to confirm.

8.5   More Payload Settings

To configure payload and gimbal settings:

1. Tap [■■■].

1. Tap **PSDK.** The Payload Settings camera parameters appear.
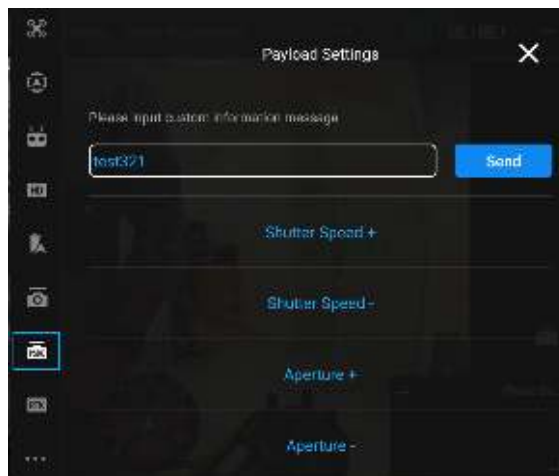
2. For gimbal settings, scroll down.
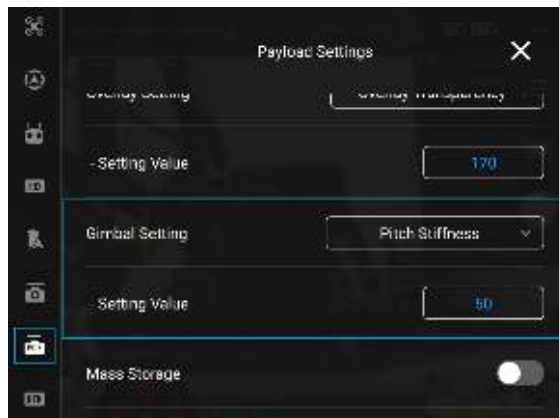
> **Note**
>
> For detailed information on the gimbal settings and operation, refer to DJI Matrice 300 RTK documentation.

> **Caution**
>
> The default DJI Matrice 300 RTK gimbal pitch and gimbal pan (yaw) settings are very low. Increase these settings as described in the DJI Matrice 300 RTK documentation.

The following table describes only the special controller-related camera settings (common camera settings are not included) and gimbal settings:

| Setting	Description
Custom Information	Enter any text up to 128 characters. The text will appear in the image XMP metadata.
Exposure Mode	Manual Auto (auto exposure)
AE Priority	Sets the auto exposure (AE) priority. **AE Priority** uses the light conditions to define the best settings for each parameter (aperture, ISO and shutter), according to the priority you select and within the range you define for each parameter (see below). The following predefined sets of parameters are available for selection: • Aperture/ISO/Shutter • Aperture/Shutter/ISO • ISO/Aperture/Shutter • ISO/Shutter/Aperture • Shutter/Aperture/ISO • Shutter/ISO/Aperture You define the permissible range for each parameter through the following settings: • AE ISO Min • AE ISO Max • AE Shutter Speed Min • AE Shutter Speed Max • AE Aperture Min • AE Aperture Max
Auto Capture Mode	Sets the auto capture interval to one of the following modes: **Note** If you enable one of the following modes (except **Off)**, an additional related parameter appears for you to configure, as detailed following. • **Off** – images are captured manually. • **Distance Interval** – an image is captured whenever the camera has transversed the distance you set in **- Capture Distance [cm]**. Default: 500 • **Time Interval** - an image is captured according to the interval you set in **- Time Interval [ms]**. Default: 3000 • **Burst Mode** (for iXM-GS120 cameras only) –when you perform a manual capture, a series of images (between 1-10) is captured according to the number you set in **- Burst Capture Count.** Default: 10.
Focus Mode	**Manual** – focus is according to the value set in Focus Distance [cm]. **Auto** - focus is according to the strategy set in Focus Limit Control.
Focus Distance [cm]	Sets the focus distance (in centimeters) to use when the **Focus Mode** is set to **Manual**. You should confirm that the camera lens can focus to the distance you define. If you define a focus distance beyond the range of the lens, the camera lens will focus to the closest distance within the range.

Setting	Description
AF Min Distance [cm] AF Max Distance [cm]	Auto focus minimum distance sets the auto focus lower limit value (in centimeters). The camera lens will not try to focus on objects closer than this value. Auto focus maximum distance sets the auto focus upper limit value (in centimeters). The camera lens will not try to focus on objects further than this value (for example, infinity). **Note** Use AF Min Distance and AF Max Distance to focus on a subject at a known distance. For example, if an object is 5 m away, set the AF Min Distance to 4 m and the AF Max Distance to 6 m. The focus will then operate only between 4 - 6 m, and if the LRF reads a value beyond this range, the camera lens will only move to the defined maximum or minimum focus distance, thereby increasing operational speed and focus accuracy.
Focus Limit Control	Sets the focus distance to the value acquired by the laser range finder according to the strategy option you set as follows: • **Clip Distance** (default) - use when the camera is required to automatically focus over a wide range of distances. This strategy works as follows: ▪ When the distance to the subject is less than the **AF Min Distance,** the focus distance is set to **AF Min Distance.** ▪ When the distance to the subject is greater than the **AF Max Distance,** the focus distance is set to the **AF Max Distance.** ▪ When the subject is between the **AF Min Distance** and **AF Max Distance,** the focus distance is set to the distance measured. • **Gate Distance** - use when it is difficult to focus on the subject and you need to avoid abrupt changes of focus distances that occur when using **Clip Distance** (for example, when inspecting a power mast or the blade of a wind turbine). This strategy works as follows: ▪ When the subject is between the **AF Min Distance** and **AF Max Distance,** the focus distance is set to the distance measured. ▪ When the subject is outside the **AF Min Distance** and **AF Max Distance**, the focus distance is set to the last applicable focus distance measured. • **Relative Distance** – use to mitigate possible abrupt changes in the focus distance between the **AF Min Distance** and **AF Max Distance.** This strategy uses the value (default: 500 cm) that you set in the **Relative Change Threshold** parameter that appears when this strategy is selected and works as follows: The focus distance is set to the same value as the **Gate Distance.** ▪ If the measured distance increases more than the **Relative Change Threshold** value, the focus distance remains constant. ▪ If the measured distance decreases more than the **Relative Change Threshold** value, the focus distance is continuously updated. **Note** A change in the focus distance is not made if the absolute value of the measured change (positive or negative) is more than the **Relative Change Threshold**.

Setting	Description
Focus Bracketing	Sets whether to take a series of images with a slight difference in the focus of each image. If you enable this setting, you also need to configure the following settings: • Bracketing Capture Count - number of images to capture in the series. • Bracketing Step - the amount of difference in focus between images in the series. • Bracketing Mode - how to spread the different images around the first focus point: ▪ **Around focus point** - images are spread evenly in front and behind (for example, if the **Bracketing Capture Count** is 5: 2 images will be in front of the focus point, 1 at the focus point, and 2 behind the focus point). ▪ **In front focus point** - one image will be at the focus point, and the remaining images (as defined by the **Bracketing Capture Count**) will be in front of the focus point. ▪ **Behind focus point** - one image will be at the focus point, and the remaining images (as defined by the **Bracketing Capture Count**) will be behind the focus point. **Note** Refer to the Focus Bracketing Calculator to calculate the correct values to enter, see https://phaseone.chorus.thirdlight.com/link/hdecqyw0psqt-ps0m5o. ▪
Overlay Preview	After an image is captured, a preview window appears with the captured image and its associated histogram. This setting defines whether the preview overlay is **OFF, or if its** size is **SMALL** or **LARGE**.
Overlay Setting	• Overlay Transparency - sets the transparency of the overlay. • **Overlay Preview Time -** sets the duration (in seconds) that the preview overlay appears. • **Overlay Focus Point -** toggles the focus point overlay. The LRF is calibrated to this point. • **Focus Peaking Threshold -** sets the focus peaking sensitivity (areas in Payload window that are in focus).
- Setting value	The value for the Overlay Setting mode you selected.

Setting	Description
Gimbal Setting	**Pitch Stiffness** – see **Stiffness** below in this table. Value: 0 – 255. **Pitch Hold Strength** – see Hold Strength below in this table. Value: 0 – 255. **Roll Stiffness** – see **Stiffness** below in this table. Value: 0 – 255. **Roll Hold Strength** – see Hold Strength below in this table. Value: 0 – 255. **Yaw Stiffness** – see **Stiffness** below in this table. Value: 0 – 255. **Yaw Hold Strength** – see Hold Strength below in this table. Value: 0 – 255. **Gyro Filter/Output Filter** - the filters eliminate noise and vibration due to structural resonances in the camera, lens, or gimbal. Setting the filters too high or too low can cause signal disturbances that can reduce the overall stabilization. See **Gyro Filter and Output Filter** below in this table. Value: 0 – 10. **Proportional Gain -** force that is proportional to the difference between the desire angle and the current angle. Value: 0 - 255 (default: 100). **Force Forward Heading** - sets whether the yaw commands received by the payload from the drone are interpreted as 0 degrees when representing absolute angles (typically in auto mission). When enabled, this guarantees that the gimbal is pointing forward during a mapping mission. Values: 0 – not active 1 - active **Recenter Close to Ground** – sets automatic gimbal recentering when the aircraft bottom sensor measures a distance less than 150 cm. Values: 0 – not active 1 – active (default) **Caution** The camera will not automatically recenter when landing.
• Stiffness	Adjusts the degrees to which the gimbal tries to correct for unwanted camera movement and hold the camera stable. The higher you can run the setting without vibration or oscillation, the better. Recommended tuning procedure: 1. Start with a low value of 20 for all axes then turn motors ON. Slowly increase this setting until you feel an oscillation in each axis, then reduce it until the oscillation subsides. You can touch the camera to feel the oscillation during tuning. Increase the stiffness setting 5-10 points at a time until oscillation appears then reduce 5 points until oscillation subsides. 2. Pitch - slowly increase this setting until you feel an oscillation in the pitch axis, then reduce the setting until the oscillation subsides. Make sure there is no vibration when tilting the camera up and down and when moving the gimbal in any orientation. 3. Roll - slowly increase this setting until you feel an oscillation in the roll axis, then reduce the setting until the oscillation subsides. Pick the gimbal up and make sure there is no vibration when you move the gimbal around. 4. Yaw - slowly increase this setting until you feel an oscillation in the yaw axis, then reduce the setting until the oscillation subsides. Tilt the gimbal about 20 degrees from the verticality and make sure that no vibrations are presented.
• Hold Strength	The amount of power allocated to correct the displacement between the current angle and commanded angle. This option is only recommended for advanced users.

Setting	Description
• Gyro Filter	Default setting: 2. Defines the strength of the filter applied to Gyro sensor output. If the gimbal has oscillations that cannot be corrected by adjusting stiffness settings, the Gyro Filter is used to further tune the gimbal and remove the oscillation.
• Output Filter	Default setting: 3. Defines the strength of the filter applied to motor output. If the gimbal has oscillations that cannot be corrected by adjusting stiffness settings, the Output Filter is used to further tune the gimbal and remove the oscillation. 1. If the gimbal is vibrating at a high frequency after tuning, increase the filter values. 2. If the gimbal is oscillating or rocking at a low frequency after tuning, decrease the filter values.
Mass Storage	Set to **ON** to transfer images from the camera memory card to a PC with a USB cable connected to the camera and PC. Warning This setting must be set to **OFF** during flight.
New Folder	Creates a new folder for storing images captured during flight. The folder name is in the format nnnphaseone, where nnn begins with 100 and is incremented by 1 each time you tap **New Folder**.

Appendix A LED Indications

There are three LEDs on the P3 gimbal located on the following:

1. Gimbal controller

2. Gimbal frame upper bar

3. HDMI module

LED indications are described in the following table:

LED	Color	State	Description
Gimbal controller	Red	Blinking	Low battery.
	Red	Solid	Gimbal error (motor or IMU). Connect to the software/apps for details.
	White	Blinking	Calibrating.
	White	Solid	Gimbal boot.
	Yellow	Blinking	Gimbal ready.
	Green	Blinking	Lock mode.
	Green	Solid	Follow mode.
	Blue	Blinking	Remote with lock mode.
	Blue	Solid	Remote with follow mode.
Gimbal frame upper bar	Red	Solid	System error (motor or IMU). Connect to the software/apps for details.
	White	Blinking	Calibrating.
	White	Solid	System boot.
	Yellow	Blinking	System ready.
	Green	Blinking	Lock mode.
	Green	Solid	Follow mode.
	Blue	Blinking	Remote with lock mode.
	Blue	Solid	Remote with follow mode.

LED	Color	State	Description
HDMI module	Blue	Blinking	Video is being streamed
	Green	Blinking	HDMI input detected but cannot connect to gimbal connection box
	Red	Blinking	HDMI input not detected

> ### Note
> If other HDMI module LED colors or states appear, reboot the DJI Matrice 300 RTK.

Appendix B Updating Firmware

Note

All Phase One firmware and associated documentation is available in a zip file that can be downloaded from https://www.phaseone.com/downloads/p3-payload-firmware/.

Make sure the following DJI components are running the firmware specified in the Compatibility Matrix in the Release Notes for P3 DJI M300 (see the above zip file):

- DJI Matrice 300 RTK

- Smart Controller

- Gimbal Connector

B.1   Updating Gimbal Components

Note

You must install Gremsy Uploader (available for Microsoft Windows only) on your PC to upgrade the gimbal and gimbal components firmware.

To download Gremsy Uploader and firmware upgrade files:

1. Download the P3 Payload Firmware from https://www.phaseone.com/download-categories/p3-payload-firmware/.

2. Unpack the zip file.

To install Gremsy Uploader:

1. Locate and unpack the GremsyUploader_vX.X.X.X.rar file.

2. Run GremsyUploader.exe.

3. After installation is complete, Gremsy Loader will open.

4. Click **P3-I System (S/N: GT3P1xxxxxx)** and click **SELECT**.

B.1.1   Updating Gimbal Firmware

To upgrade the gimbal firmware:

> ### Note
>
> In the zip file you download above, the firmware file is in the following folder:
> P3 DJI System Configuration vX.X/Firmware/gremsyP3I_vXXX_Official.hex

1. On the gimbal frame upper bar, remove the screw securing the HDMI module cable to PORT 2. Keep the screw in a safe place for later use.

2. Disconnect the HDMI module cable from PORT 2.

3. Disconnect the Data A and Data B cables LEMO connectors from the camera ports as shown at right.

4. Mount the gimbal on the DJI Matrice 300 RTK.

5. Power on the DJI Matrice 300 RTK.

6. Locate the USB cable provided in the integration kit. Connect the Type-A connector to your PC, and the Type-C connector to PORT 2.

7. In Gremsy Uploader, click **P3 GIMBAL** and follow the instructions displayed.

8. When the firmware is successfully upgraded, the gimbal is automatically restarted.

9. Disconnect the USB cable Type-C connector from PORT 2.

10. Connect the LEMO connectors on the Data A and Data B cables from the gimbal to the camera ports as shown at right.

11. Connect the HDMI module cable to PORT 2.

12. Locate the previously removed screw, place a drop of Loctite 222 on the screw thread and insert the screw in position to secure the connector to PORT 2. Tighten the screw to torque 20 cNm.

B.1.2   Updating Gimbal Connection Box Firmware

To upgrade the gimbal connection box firmware:

> **Note**
>
> In the zip file you download above, the firmware file is in the following folder:
> P3 DJI System Configuration vX.X/Firmware/gBox_P3I_vX.X.X.hex

1. On the gimbal frame upper bar, partially remove the screw securing the LRF cable to PORT 1.
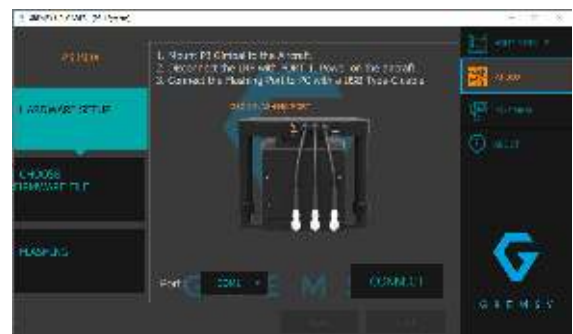
2. Disconnect the HDMI module cable from PORT 2.

3. Disconnect the Data A and Data B cables LEMO connectors from the camera ports as shown at right.

4. Locate the USB cable provided in the integration kit. Connect the Type-A connector to your PC, and the Type-C connector to PORT 1.

5. In Gremsy Uploader, click **P3 BOX** and follow the instructions displayed.

6. When the firmware is successfully upgraded, the connection box is automatically restarted.

7. Disconnect the USB cable Type-C connector from PORT 1.

8. Connect the LRF cable to PORT 1.

9. Connect the LEMO connectors on the Data A and Data B cables from the gimbal to the camera ports as shown at right.

10. Connect the HDMI module cable to PORT 2.

11. On the partially removed screw, place a drop of Loctite 222 on the screw thread and insert the screw in position to secure the connector to PORT 1. Tighten the screw to torque 20 cNm.

B.1.3   Upgrading HDMI Module Firmware

To upgrade the HDMI module firmware:

> **Note**
>
> - In the zip file you download above, the firmware file is in the following folder:
>   P3 DJI System Configuration vX.X/Firmware/VX.X.X.X.7z
>
> - You will need the USB C female to USB A male adapter.

1. On the gimbal frame upper bar, remove the screw securing the HDMI module cable to PORT 2. Keep the screw in a safe place for later use.

2. Disconnect the HDMI module cable from PORT 2.

3. Remove the screw securing the HDMI module to the camera body. Keep the screw in a safe place for later use.

4. Disconnect the HDMI module from the camera HDMI PORT by pulling the module out.

5. Connect the HDMI module cable to a USB C female/USB A male adapter. Do NOT connect the adapter to the PC yet.

6. In Gremsy Uploader, click **HDMI MODULE** and click **DETECT.**

7. While the detection phase is running, on the HDMI module press and hold the Boot button while connecting the HDMI module cable with the USB adapter to a USB 3.0 Type-A port on the PC.

8. Verify that **Device connected** appears in Gremsy Uploader. Click **NEXT**.

9. Click **CHECK** to view the current version (if the base version firmware is currently installed, the version will not appear).

10. Click **OPEN** and navigate to the firmware file you unpacked.

11. Click **NEXT**.

12. Click **FLASH**.

Firmware flashing takes several minutes.

13. When the firmware is upgraded successfully, a message appears.

14. Disconnect the HDMI module cable with the adapter from the PC. Disconnect the adapter from the cable.

15. Insert the HDMI module into the camera HDMI port.

16. Locate the previously removed screw securing the HDMI module to the camera, place a drop of Loctite 222 on the screw thread and insert the screw in position to secure the HDMI module to the camera. Tighten the screw to torque 50 cNm.

17. Connect the HDMI module cable to the gimbal frame upper bar, PORT 2.

18. Locate the previously removed screw securing the connector to PORT 2, place a drop of Loctite 222 on the screw thread and insert the screw in position to secure the connector to PORT 2. Tighten the screw to torque 20 cNm.

B.1.4   Updating Camera Firmware

> **Note**
>
> - Your iXM 50/iXM 100 camera must be running camera firmware 4.23 or higher to enable camera pairing with the P3 gimbal.
>   To update the camera firmware, see https://www.phaseone.com/download-categories/ixm-firmware/.
>
> - In the zip file you download above, the firmware file is in the following folder:
>   P3 DJI System Configuration vX.X/Firmware/iXMX.XX.XX.fwr

Appendix C Configuring the iXM Camera

> ## Note
>
> Your iXM 50/iXM 100 camera must be running camera firmware 4.23 or higher to enable camera pairing with the P3 gimbal.
>
> To update the camera firmware, see https://www.phaseone.com/download-categories/ixm-firmware/.

> ## Note
>
> You must install iX Capture or Capture One on your PC before configuring the camera.
>
> **To install the iX Capture:**
>
> 1. Download ix Capture from https://www.phaseone.com/download-categories/ix-capture-software/.
>
> **2.** Run iXCapture.Win.3.4.x.x.exe.

To configure the iXM camera to operate with the DJI Matrice 300 RTK:

1. Insert a XQD card into the card slot (any size, brand or model is applicable).

2. Connect a USB cable with a Type-C connector as follows:

   a. Type-A connector to your PC

   b. Type-C connector to the USB port on the camera.

3. Switch on the DJI Matrice 300 RTK to power up the camera.

4. On your PC, open iX Capture, click the active camera tab, click **SERVICE**, click **FORMAT CARD** and make sure the memory card is identified by the camera.

5. Click **LINK**, and under the **RIGHT TERMINAL,** set **TYPE** to **DJI M300**.

6. Restart the camera.

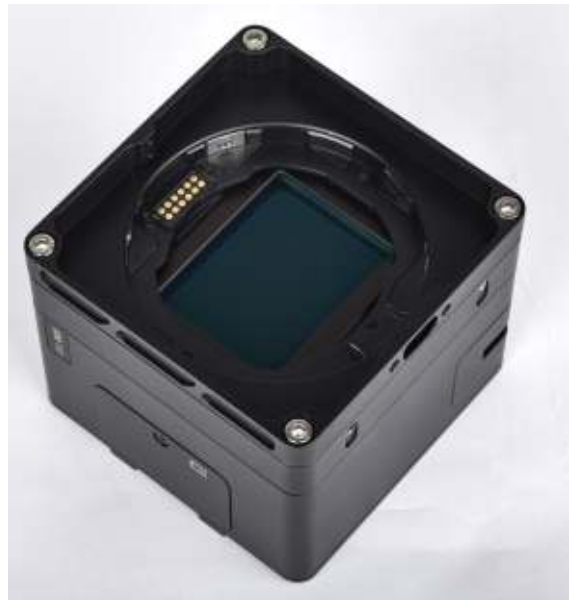> **Note**   If the camera is used for any other purpose, repeat the above procedure but in step 5, configure the **LINK** to **OFF**.

Appendix D Removing and Attaching the Lens to the iXM Camera

1. Loosen the four screws fastening the lens to the camera body.

2. Remove lens from camera body.

3. Insert the replacement lens into the camera body.

4. Tighten the four screws fastening the lens to the camera body to torque 50 cNm.
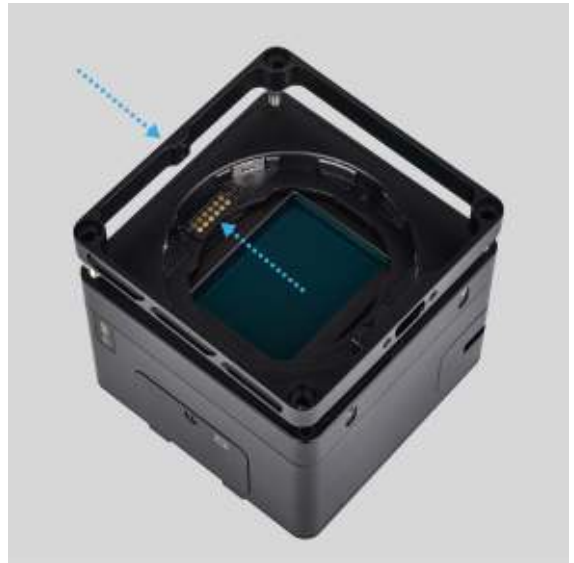
Appendix E Assembling the Plates on an IXM Camera

Note

The camera and mounting plates are preassembled on the camera body. The instructions in this section are provided for maintenance purposes.

E.1   Assembling the Camera Plate

To assemble the camera plate on an IXM camera:

1. Remove the lens from the camera body (see Appendix D - Removing and Attaching the Lens to the iXM Camera).

2. Position the camera plate on the camera body, making sure that the small bulge on the plate is adjacent to the lens contacts.

3. Secure the camera plate to the camera body using four M4x10 screws supplied with the integration kit. Tighten the screws to torque 200 cNm.
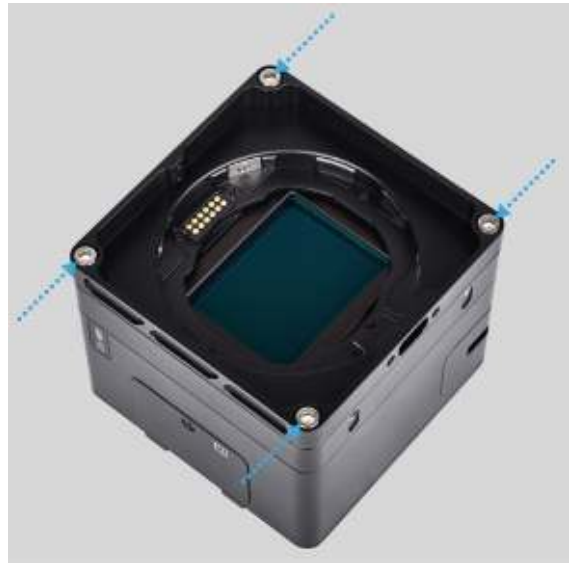
4. Reattach the lens in the camera body (see Appendix D - Removing and Attaching the Lens to the iXM Camera).

5. Locate the mounting plate.

6. Attach the mounting plate to the camera plate.

Appendix F Mounting the Phase One iXM Camera in the P3 Gimbal

> ## Note
> The camera is preassembled and balanced in the gimbal. The instructions in this section are provided for maintenance purposes.

To prepare the gimbal for mounting the camera:

1. Loosen the left and right lower bar locks by rotating them to the left.

2. Slide the lower bar downwards to allow the iXM camera to comfortably slide into the frame.

3. Loosen the center-balance lock.

4. Center-balance the gimbal and lock it.

> ## Note
> Center balancing at this stage is for camera installation only.

To insert the camera in the gimbal:

1. While pressing the spring lock on the gimbal upper bar, slide the mounting plate at the top of the camera into the gimbal upper bar camera slot.

2. Raise the lower bar to secure the camera and tighten the left and right lower bar locks by rotating them to the right.

3. Locate the M3x6 screw and place a drop of Loctite 222 on the screw thread. Insert the screw through the slot in the frame lower bar and into the camera as shown at right. Do not tighten yet.

4. Connect the LEMO connectors on the Power, Data A
   and Data B cables from the gimbal to the camera ports
   as shown at right.

5. Slightly tighten the screw in the gimbal frame upper bar
   locking plate (securing the camera to the upper gimbal
   frame).

6. Slightly tighten the screw in the gimbal frame lower bar
   (securing the camera to the lower gimbal frame).

Note

After you installed the camera in the gimbal, balance the gimbal as described in Appendix G - Balancing the Gimbal.
Tightening the screws in the frame upper and lower bar should be performed only after balancing the gimbal.

Appendix G Balancing the Gimbal

G.1   Balancing the P3 Gimbal

> ### Note
> Balancing and LRF calibration are performed before the gimbal and camera leave the factory. The instructions in this section are provided for maintenance purposes.

> ### Caution
> 1. Remove the lens cap.
> 2. Make sure the memory card is inserted in the camera.
> 3. Make sure all external camera covers are assembled and LEMO connectors are connected before balancing the gimbal.

To achieve the best performance from the P3 gimbal, proper balancing is necessary. Accurate balance is critical in images where the gimbal will be subjected to extreme movements or accelerations.

The following axes should be precisely balanced prior to powering up the gimbal:

- Pitch axis front-back balance
- Pitch axis vertical balance
- Roll axis balance
- Yaw axis balance

G.1.1   Pitch Axis Front-Back Balance

When the proper front-back balance is achieved, the camera will stay level when you remove your hands.

To balance the pitch axis front-back balance:

1. Loosen the screw in the gimbal frame upper bar locking plate (securing the camera to the upper gimbal frame).

2. Loosen the screw in the gimbal frame lower bar (securing the camera to the lower gimbal frame).

3. Gently slide the camera forward or backward until the pitch axis remains level.

4. Tighten the screws you loosened above in Steps 1 and 2.

G.1.2   Pitch Axis Vertical Balance

When the proper vertical balance is achieved, you can rotate the camera in any angle, and it will stay at that position.

To balance the pitch axis vertical balance:

1. Rotate the pitch axis so that the lens is pointing upward.

2. Loosen both vertical adjustment thumb screws, gently slide the camera mount crossbar and the top bar forward and backward until the camera remains pointing upward when released.

3. Tighten the thumb screws while making sure the number markings on both vertical bars are the same.

> ### Note
>
> If vertical balance cannot be achieved, the front-back balance should be rechecked (see section G.1.1 above).

G.1.3   Roll Axis Balance

Left-right roll balance is achieved if the camera stays level when you remove your hands.

To balance the roll axis:

1. Loosen the center-balance lock.

2. Gently slide the camera left or right until the roll axis remains level. Close the center-balance lock.

G.2   Securing the Screws in the Frame Upper and Lower Bar

After the gimbal is balanced, secure the screws in the frame upper and lower bar as follows:

1. Place a drop of Loctite 222 on the screw thread in the frame upper bar and tighten the screw to torque 50 cNm.

2. Place a drop of Loctite 222 on the screw thread in the frame lower bar and tighten the screw to torque 50 cNm.

G.3 Yaw Axis Balance

Yaw axis balance is required to make sure the gimbal with camera is not front-heavy or back-heavy.

To balance the yaw axis:

1. Tilt the gimbal about 20 degrees from the verticality.

2. Loosen the thumb screw, then gently slide the yaw axis slider backward/forward until the gimbal doesn't swing and remains at any given position when released.

3. Tighten the thumb screw to lock the yaw axis slider in position.

Appendix H Replacing the HDMI Module

To replace the HDMI module:

1. On the gimbal frame upper bar, remove the screw securing the HDMI module cable to PORT 2. Keep the screw in a safe place for later use.

2. Disconnect the cable from PORT 2.

3. Remove the screw securing the HDMI module to the camera body. Keep the screw in a safe place for later use.

4. Disconnect the HDMI module from the camera HDMI PORT by pulling the module out.

5. Insert the new HDMI module into the camera HDMI port.

6. Locate the previously removed screw securing the HDMI module to the camera, place a drop of Loctite 222 on the screw thread and insert the screw in position to secure the HDMI module to the camera. Tighten the screw to torque 50 cNm.

7. Connect the HDMI module cable to the gimbal frame upper bar, PORT 2.

8. Locate the previously removed screw securing the connector to PORT 2, place a drop of Loctite 222 on the screw thread and insert the screw in position to secure the connector to PORT 2. Tighten the screw to torque 20 cNm.