Pre-Flight - On site: Matrice 100 + X3 + RedEdge3

Brief flight crew about mission plan	Where will drone go to first? Any hazards specific to this mission?
Turn on iPad	iPad may take a moment to boot up.
Turn on field computer	Field computer may take a moment to boot up.
Attach lanyard to DJI controller	Lanyard reduces strain on arms holding controller.
Attach signal enhancers to antennae on DJI controller	Reflective side faces away from person operating controls and towards the drone.
Check DJI controller battery	One press of power button to show power level. Ensure sufficient level-- at least one LED lights up.
Install propellers	Install 4 propellers to Matrice 100 aircraft. Match propellers with dots on top to motor with dots on top. Match propeller with no dots to motors with no dots.
Attach DJI Zenmuse X3 camera to Matrice 100 aircraft	This camera is often stored attached to the aircraft, in which case this step is already completed.
Insert blank microSD card into DJI Zenmuse X3 camera	
Insert blank SD card into Micasense Rededge3 camera	Card must be 32GB or smaller
Dust lens of DJI Zenmuse X3	
Dust lens of Micasense RedEdge3	
Ensure wires on aircraft are secure	Pay careful attention to the wire connecting the battery compartment to the aircraft.
Ensure the failsafe zipties attaching camera to aircraft is intact	Ziptie is a backup tether between DJI Zenmuse X3 camera and aircraft. It will be loose so as not to interfere with the operation of the gimbal, but should be present and undamaged.
Ensure Matrice 100 battery has a full charge	One press on the power button should show 4 solid LEDs.
Insert Matrice 100 battery into	It should make a satisfying *click*.

aircraft	
Double check propellers are tight	
Double check aircraft battery is secure.	
Attach iPad to cradle on DJI controller	
Turn DJI controller on	One quick press on the power button quickly followed by a second press.
Place aircraft in take off area	Ensure a clear opening above aircraft for takeoff. Peferably take off on top of a ground cover of some kind (e.g., plywood) to limit dust getting kicked up onto lens.
Turn on aircraft battery	One quick press on the power button quickly followed by a second press. Watch for the gimbal initialization routine (DJI camera will swivel around as aircraft boots up).
Open DJI Go app on iPad	
Plug in cord connecting iPad (either USB-C or Lightning) to DJI controller (USB-A)	MapPilot recommends using an official Apple cord
Allow DJI Go to run through system checks	Watch for messages that won't be ported over to the MapPilot app (e.g., battery is too cold/warm)
Close DJI Go app	DJI Go must be closed when MapPilot is running.
Open MapPilot iPad app	
In MapPilot, navigate to the mission to be flown	Mission will either be a saved mission (if it were prepared during "at home" preflight procedure or is a repeat of a previously flown mission) or a new mission should be created.
Wait for "Aircraft Detected" message and red triangle indicating aircraft location to appear on iPad screen	Camera view should also be available by touching the camera icon at the bottom center of the screen.
Ensure microSD card in DJI Zenmuse X3 camera has sufficient storage	In MapPilot, tap the aircraft button on the right hand side of the screen to bring up information about the aircraft. The remaining storage on the SD card will be shown here. A ~17 minute flight will require ~2.5GB of storage.
Forward overlap set at desired value for mission?	
Side overlap set at desired value for mission?	
Altitude set at	

desired value for mission?	
"Offset" set at desired value for mission?	Offset will bump the altitude of the mission up or down from the "altitude" setting, but will maintain the transect spacing and flight speed that determine side and front overlap. Thus, a positive offset will mean effectively higher overlap on the ground compared to the front/side overlap settings, and a negative offset will mean lower overlap on the ground compared to the front/side overlap settings. If you want 95% overlap of the tops of the trees, and the trees are 30m tall, plan a mission with 95% overlap and then use an offset of 30m.
Connectionless versus active connect set at desired value for mission?	Active connect is the default and requires a strong connection between the iPad and the drone in order to initiate camera triggering. Connectionless uploads all the commands for when to take images (using a fixed time interval) to the drone before take off. Active Connect mode produces better imagery (more even spacing between images and images are taken at the same flight speed) if that strong connection can be maintained throughout the mission. If the connection ever becomes too weak (the DJI controller may still have full control over the drone, even if the connection is too weak for camera triggering), then no pictures are taken. If there's any chance the signal might drop, connectionless mode ensures there are no gaps in coverage.
Camera settings set at desired value for mission?	Gimbal angle, shutter mode, white balance can all be set once the aircraft is connected (but not before, so this will need doing even if flying a saved mission).
Upload mission to aircraft	Tap appropriate button on top right of iPad screen.
"Yes" to terrain awareness	
Check safety of flight path produced from terrain awareness	What is the total range of elevation to be ascended, descended? Are there any elevation obstacles that will require especially close attention during flight?
"Potentially dangerous return to home altitude" decision	Often "no" in order to get the most useful flight time out of each battery, but make sure drone won't be on other side of large elevation obstacle (taller than return-to-home altitude) when it needs to return home. There should almost never be an obstacle like this in the middle of a mission because it would most likely prevent visual line of site to the aircraft.
Connect to rededgeXXXXXX WiFi network using field computer	XXXXXX represents the serial number of the Micasense Rededge3 camera. Wifi network is weak so put field computer near the aircraft. WiFi password is "micasense". If you have trouble connecting. Shut down aircraft and restart. You'll have to redo all parts of this checklist after .
Use web browser to navigate to Micasense	192.168.10.254

Rededge interface		
Ensure sufficient satellite connection		
Ensure SD card in Micasense Rededge has sufficient storage		Amount of space left on card can be found on the camera's home page in the web browser interface. A ~17 minute flight will use ~6GB of storage.
Ensure date and time are correct		Band surrounding them should be green
Set "timer mode" in settings tab		Set timer interval to desired value. DJI Zenmuse X3 camera (max frequency = 1 image / 2 seconds) can't trigger as fast as Rededge camera (max frequency = 1 image / 1 second), so there is an opportunity to make up for the narrower field of view of the Rededge camera that would result in less forward overlap if images were taken at the same rate for each camera. The vertical field of view for the Rededge is approximatey 18.5 degrees, which is ~56% of the field of view of the X3 (32.8 degrees). so setting the timer interval to the maximum rate (1 image per second) will yield a similar forward overlap between the imagery resulting from the two cameras.
Ensure green LED is flashing on Micasense Rededge3 camera		Lift up the drone to look; don't tilt too much or the DJI camera gimbal will strain against its limits
Before first flight of the mission, take images of calibrated reflectance panel		Position panel directly opposite sun direction, with person between sun and panel (person's shadow should fall directly on the panel). Lift drone over reflectance panel, take one big step to the side. Use silver manual shutter button to take an image of panel with Rededge camera from ~1 meter off the ground.
Start Rededge image capture		On field computer Micasense Rededge interface Settings tab, press "start"
Press start to take off and begin mapping mission		On iPad, tap the appropriate button on the top right of the screen.
Ensure drone climbs safely through any canopy gaps		
Ensure LED flashing on Rededge camera is as expected		If all is well, LED will flash alternately green and blue

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