KOALA®

INSTANT CAMERA TRACKING

SETUP AND OPERATION MANUAL

v.1.3

CONTENT

1. WHAT IS KOALA?

KOALA enables rapid acquisition of PAN, TILT, ZOOM, and FOCUS tracking data with any tripod-mounted camera.

Additionally, with CRANE option it provides XYZ position information of camera mounted on a crane or a telescopic crane and slider with AUX encoder option.

In a broadcast setting, the system seamlessly operates in SYNC thanks to its dedicated input. Alternatively, in various scenarios, users have the flexibility to generate data at the desired framerate.

Tracking data is accessible through UDP Ethernet, UDP Wi-Fi, and RS485 Serial interfaces. Users can also select between the "FreeD" and "OSC" protocols.

Locally you can reset the LENS and PAN, utilize the AUTOLEVEL function, monitor real-time TRACKING DATA, and check SYNC status.

For remote management, a dedicated web page allows convenient access to all essential settings.

KOALA has been developed based on the feedback from experts in the virtual production industry and it’s designed for simple and intuitive use, aiming to provide a ready-to-use tracking system for a broad range of users in a few minutes.

Easy to understand and compatible with commonly used shooting techniques in virtual production.

KOALA allows more time for productivity and creativity!

This manual is based on software version 1435, some variations may exist in alternative versions.

2. MODES AND LICENSES

KOALA has various operating modes: LENS, HEAD, CRANE, TELESCOPIC and SLIDER. These modes require specific hardware and activation licenses.

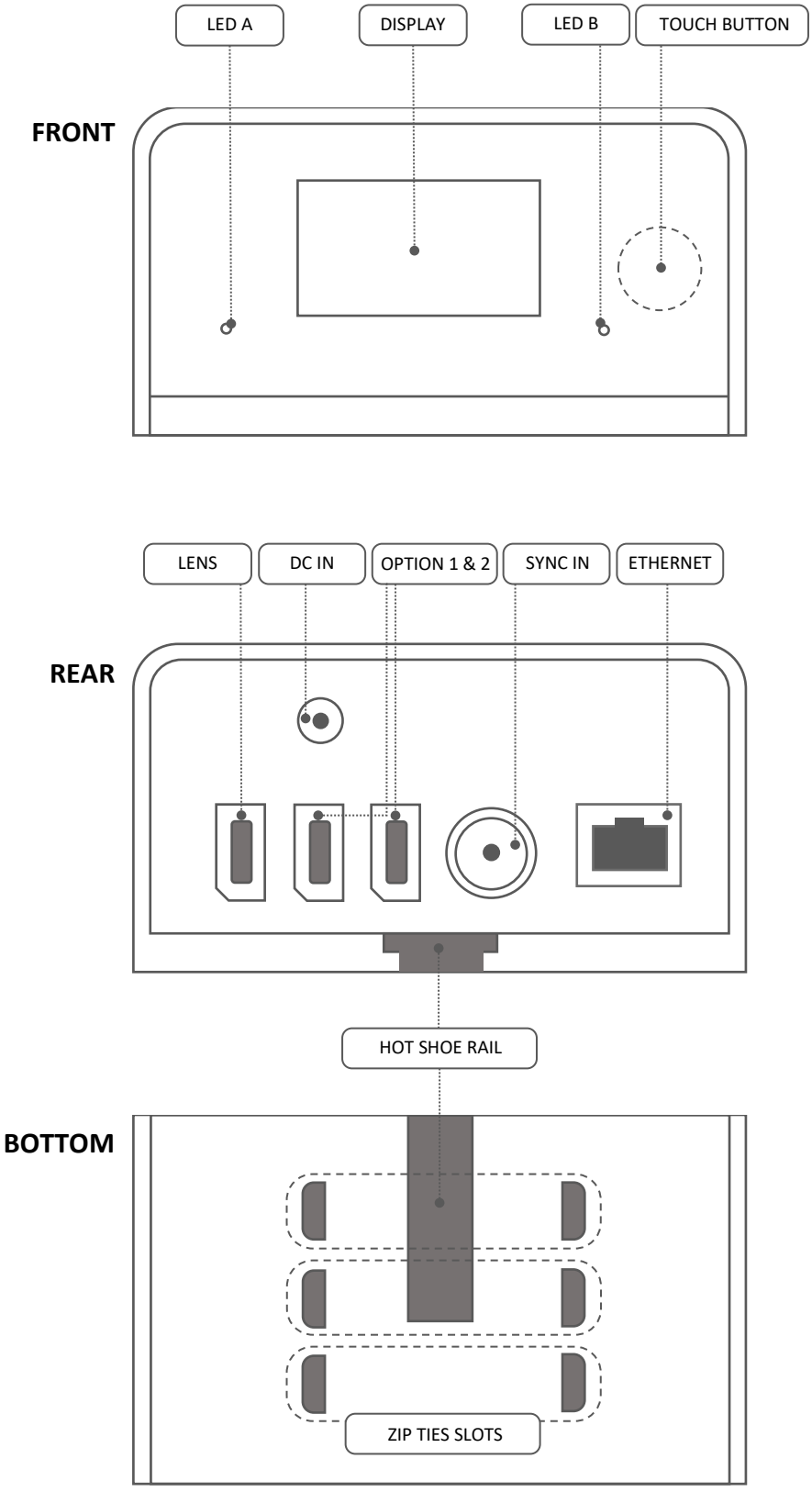
	LENS	HEAD	CRANE	TELESCOPIC & SLIDER
ZOOM AND FOCUS DATA	✓	✓	✓	✓
HEAD PAN, TILT AND ROLL DATA		✓	✓	✓
X, Y, Z POSITION OF CAMERA			✓	✓
ALL OTHER FUNCTIONS	✓	✓	✓	✓

The license is provided by the manufacturer based on the purchased KIT.

License codes are entered through the SERVICE WEB PAGE, and it's possible to check which licenses are active by accessing the SERVICE MENU > LICENSES.

It is possible to upgrade the license by purchasing the additional option and providing the SERIAL CODE visible on the SERVICE WEB PAGE or accessing the SERVICE MENU > LICENSES on the display.

3. LAYOUT AND CONNECTIONS



4. OPERATING AREA

KOALA has two operating areas: Production and Service.

a. PRODUCTION

When KOALA is powered ON by default, it enters in **Production**.

In Production, KOALA generates tracking data.

Through the web interface you can set measurements, offsets, ID, sync, etc and directly from the display, you can check tracking data, network parameters, and various convenient functions such as Pan and Lens resets or autolevel.

b. SERVICE

In Service, you can find all the settings related to basic configurations, such as licenses, Wi-Fi parameters, mounting type, mode selection, as well as factory data reset and software OTA update.

To enter in **Service**, press and hold the button for at least 5 seconds starting one second after power-up or reboot. You will notice a small white pixel in the top left corner of the display while holding down the button. Continue holding the button until the service mode is initiated.

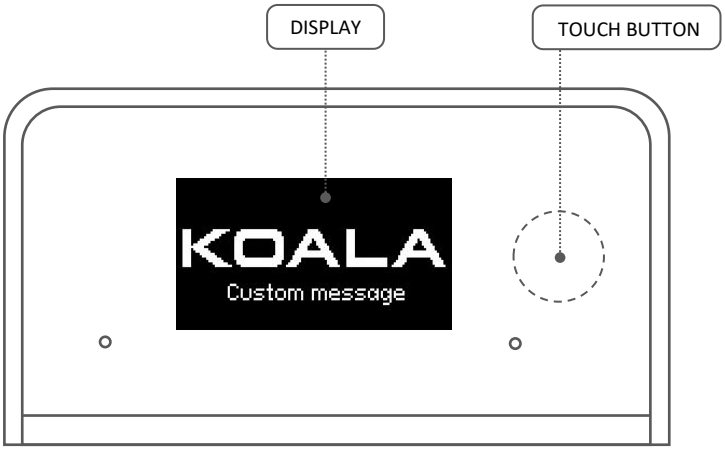
Below are listed the functions

Function	**PRODUCTION**		**SERVICE**	
	SETUP MENU (display)	**SETUP WEB PAGE**	**SERVICE MENU (display)**	**SERVICE WEB PAGE**
SEND DATA TRACKING	Always in PRODUCTION			
INFO DATA	✓	✓		
RESET PAN, LENS, AUX	✓	✓		
SET PARAMETERS		✓		
AUTOLEVEL	✓	✓		
STABILIZATION	✓	✓		
SCREEN SAVER ON/OFF	✓			
WI-FI ON/OFF	✓		Always ON in SERVICE	
ACCESS POINT ON/OFF			✓	
RESET NETWORK TO DEFAULT			✓	
SET WI-FI SSID AND PASSWORD				✓
CUSTOM DISPLAY MESSAGE				✓
SET LICENSES				✓
LICENSES CHECK			✓	
SENSOR SETUP & RECALIBRATION			✓	
FACTORY RESET			✓	
OTA UPDATE			✓	✓
INTERFERENCE TEST	✓		✓	

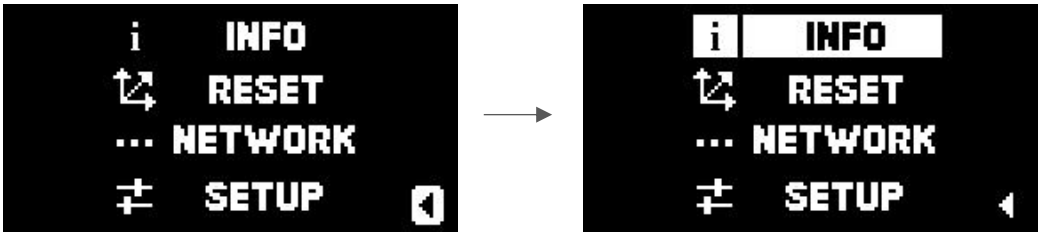
5. SETUP AND SERVICE MENU

Through the touch button located on the right side of the display, you can interact with the menu and its corresponding functions.

SHORT TOUCH – **SELECT**
LONG TOUCH – **CONFIRM**



A short touch on the button reveals the menu, scroll through functions with quick presses, and access them with a long touch of the button



a. SETUP MENU

INFO	DATA	Show real time tracking data and sync status
	PARAMETERS	Show parameters and offset
	GFX VIEW	Show some real time tracking data in graphics mode
	INTERFERENCE	Real-time verification of interference
	VERSION	Show version of software and hardware

RESET	PAN	Reset PAN procedure
	LENS	Reset ZOOM and FOCUS procedure
	AUX	Reset AUX procedure

NETWORK	ETHERNET INFO	Show Ethernet info (IP, destination IP, port and type)
	Wi-Fi INFO	Show Wi-Fi info (IP, destination IP, port and type)
	Wi-Fi ON/OFF	Enable or disable Wi-Fi

SETUP	STABILIZATION	Run Stabilization procedure / Auto stabilization on-off
	AUTOLEVEL	Run Autolevel function
	SC. SAVER ON/OFF	Enable or disable display Screen saver
	REBOOT	Reboot KOALA

b. SERVICE MENU

NETWORK	AP MODE ON/OFF	Enable or disable Access Point Mode (Wi-Fi)
	RESET TO DEFAULT	Reset Ethernet and Wi-Fi parameters to default
	IP	Show Ethernet IP
	IP - SSID	Show Wi-Fi IP and SSID

SENSOR	MOUNT	Change MOUNT position (display LEFT or RIGHT)
	MODE	Change MODE (LENS, HEAD, CRANE, TELESCOPIC, SLIDER)
	INTERFERENCE TEST	Real-time verification of interference
	RECALIBRATION	Recalibration sensor (see section 16.e)

LICENSES	SERIAL CODE	Show CODE for licenses
	LENS, HEAD, CRANE, TELESCOPIC & SLIDER	Show licenses STATUS

RESET / UPDATE	FACTORY RESET	Reset to default all parameters (Excluding licenses)
	OTA UPDATE	Run OTA Update

6. INSTALLATION AND MEASURES

a. MOUNT KOALA AND RECALIBRATE

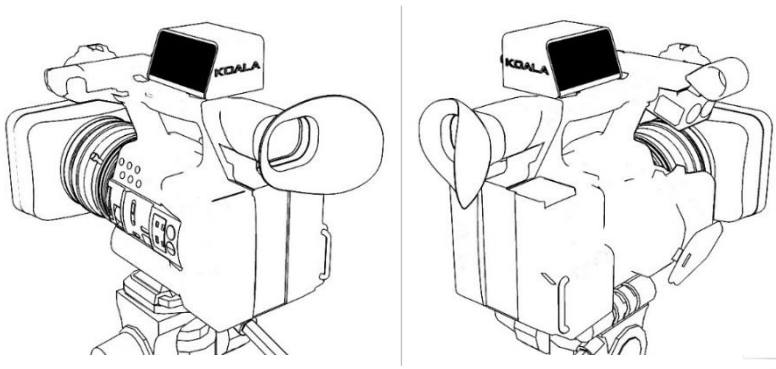
Use the hot-shoe adapter in the designated guide or the straps in the respective slots and securely mount KOALA on the top of the camera or in an easily accessible position.
Under SERVICE MENU > SENSOR > MOUNT set the KOALA position based on the display orientation: LEFT or RIGHT relative to the camera.

The OPTION should be mounted on the outermost part of the arm with the connectors facing forward.

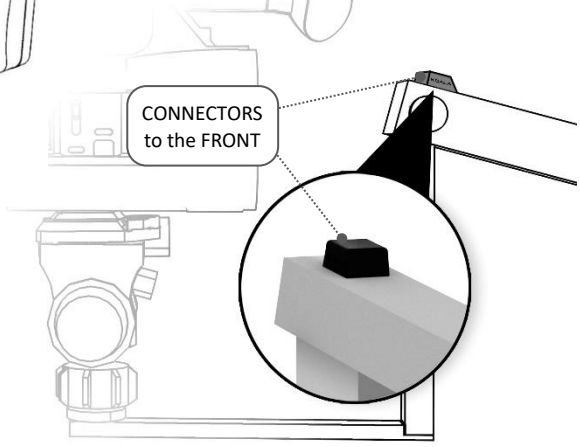
Check for magnetic interference, which could reduce tracking stability and accuracy, using the function found in SERVICE MENU > SENSOR > INTERFERENCE TEST (see section 16.d)

At the end of the installation, we recommend RECALIBRATING KOALA and, if applicable, the OPTION, following the procedure outlined in Section 16.e.

LEFT **RIGHT**



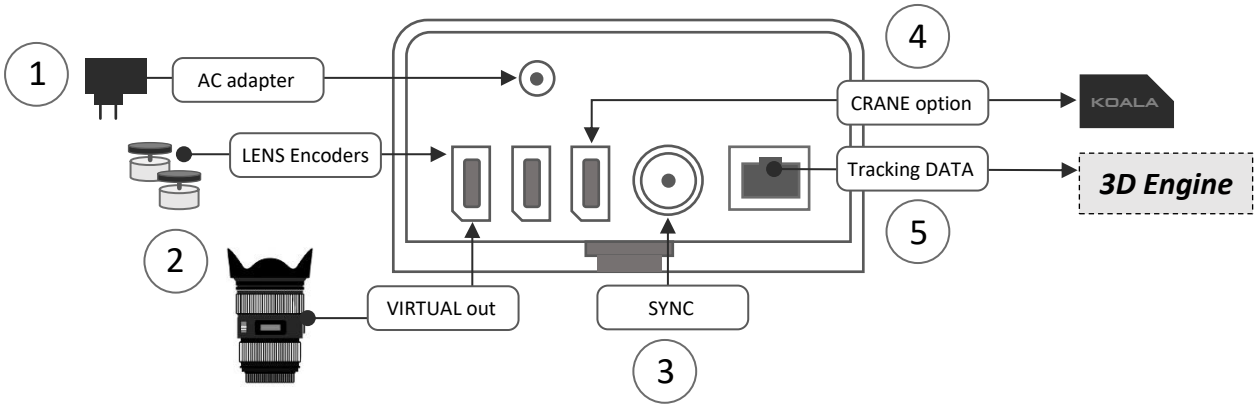
OPTION



b. WIRE KOALA

Connect KOALA only using official cables and accessories, which are tested and meet the required specifications. The use of cables or accessories not certified by the manufacturer will void the warranty and may cause irreparable damage to KOALA.

example of connecting KOALA

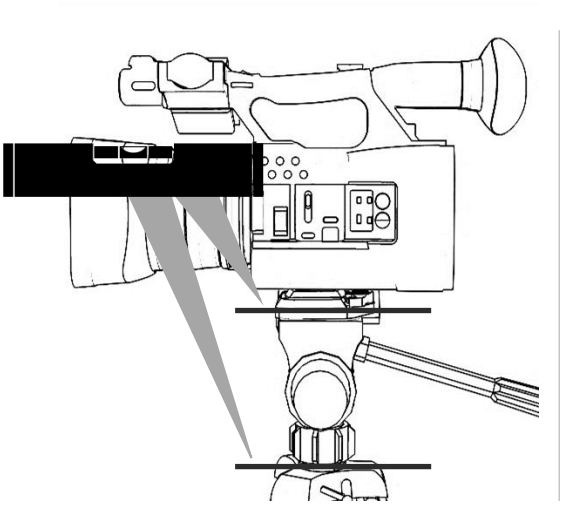


1. Use the supplied AC adapter.
2. Based on your configuration, connect the external encoders provided in the kit or the VIRTUAL cable for your lens in LENS port.
3. Connect the SYNC if necessary, otherwise, set the data rate according to your requirements in SETUP WEB PAGE.
4. If using KOALA in CRANE mode, connect the corresponding accessory with the provided cable in OPTION port.
5. Connect an Ethernet cable from KOALA to your 3D engine and configure the network.

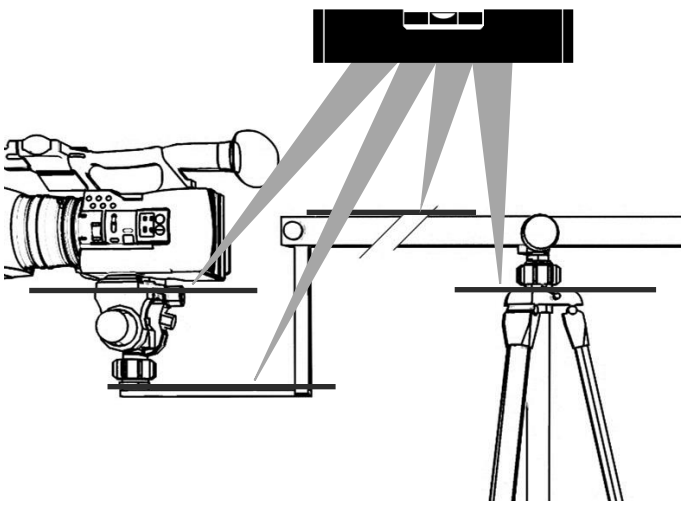
c. AUTOLEVEL

Level TRIPOD, HEAD and CRANE (Crane mode) and proceed to the "AUTOLEVEL" function from the SETUP MENU, in this way KOALA will be perfectly leveled with the camera.

HEAD



CRANE / TELESCOPIC / SLIDER



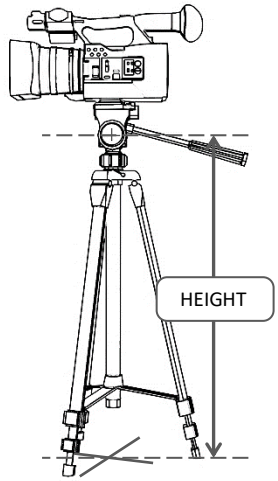
NOTE: repeat this operation only if KOALA and/or OPTION is reassembled or moved.

d. MEASUREMENTS

The position of KOALA does not affect the method of taking measurements and the following images depict various types of equipment that may differ in appearance, but the measurement method remains consistent.

HEAD

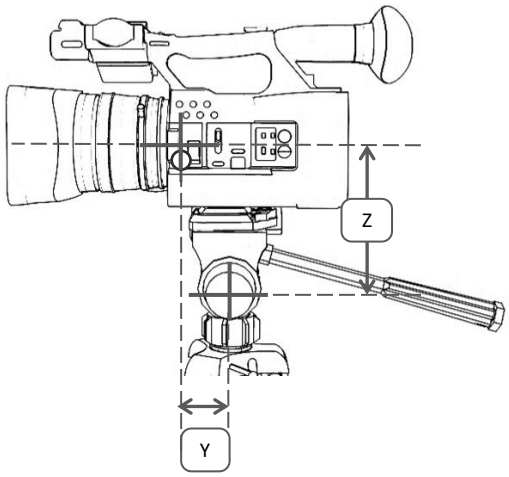
TRIPOD height (mm)



From the floor
to the Head pivot

HEAD, CRANE, TELESCOPIC, SLIDER

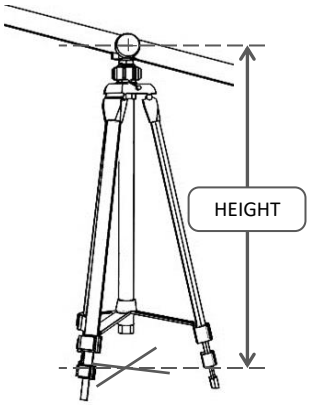
CMOS offset (mm)



From the Head pivot to the CMOS position* for the Y and to the center of lens for Z
In the example above Y and Z are positive.

CRANE, TELESC., SLIDER

TRIPOD height (mm)

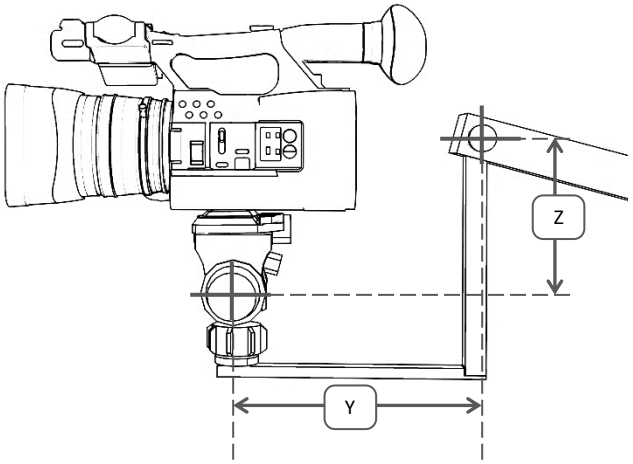


From the floor to the rear pivot of the Crane / Slider

***NOTE:** the position of the CMOS depends on the camera model used. You can see ⌖ in some case.

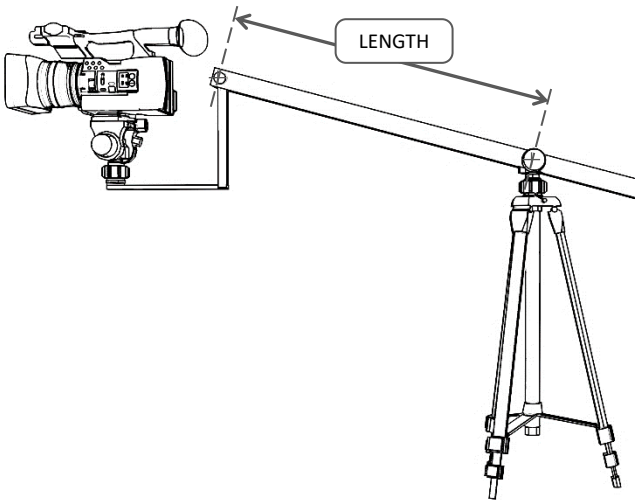
CRANE, TELESCOPIC, SLIDER

HEAD offset (mm)



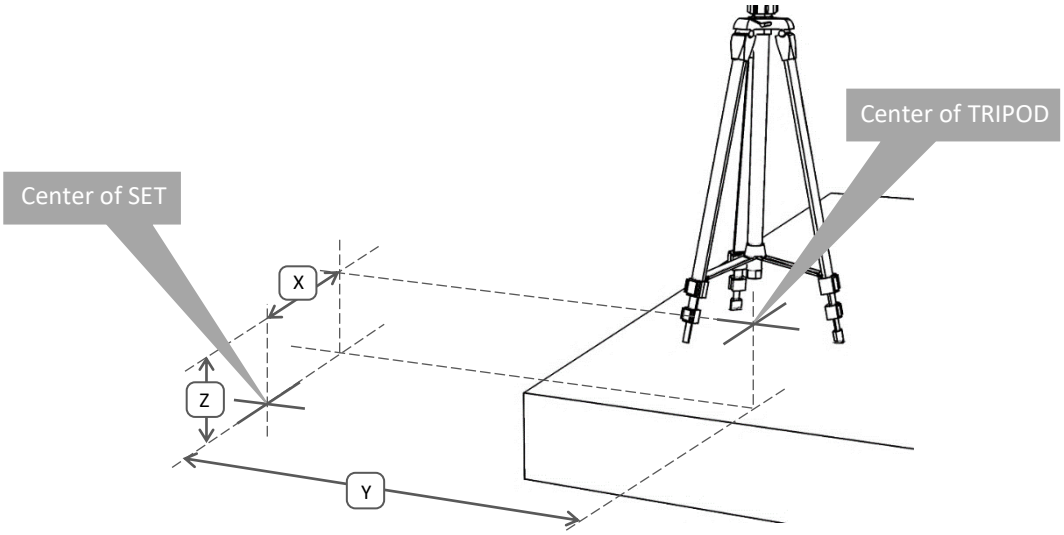
From the Crane front pivot to the Head pivot.
In the example above Y is positive and Z is negative

CRANE length (mm)



From the rear rotation pivot to the front rotation pivot of the Crane

Absolute POSITION (mm) - optional



From SET's center to TRIPOD's center at the floor
In the example above X and Z are positive, Y is negative

7. LENS ENCODERS

a. MOUNT EXTERNAL ENCODERS

For a proper pairing of external encoders with lens gears, begin by confirming the correct pitch of the gear, depending on the lens brand. Attach the magic arm to the camera, allowing it to reach the optics with the encoders. Then, couple them securely, ensuring there is no gap between the teeth, and tighten accordingly. Finally, connect the cable to the LENS port on KOALA and proceed to step c.

b. LENS WITH VIRTUAL OUTPUT

If your lens is equipped with the 'VIRTUAL' output, you can directly extract data from the internal encoders. Use the cable specific to the lens brand, connect it to the LENS port on KOALA, and you're good to go. Proceed to step c.

c. OFFSET AND DIRECTION

1. Decide if the ZOOM reset point (initial value) will be wide or tele and bring it to that position
2. Decide if the FOCUS reset point (initial value) will be at infinity or at minimum and set it to that position
3. Reset the lens from SETUP MENU > RESET > LENS or from SETUP WEB PAGE with "reset LENS" mode
4. On the display, show the data under SETUP MENU > INFO > DATA
5. Move the ZOOM and FOCUS and verify that their values are positive. If they are positive, the procedure is complete; otherwise, proceed to step 6
6. Invert the mount of encoders or from the SETUP WEB PAGE set "neg" to ZOOM or FOCUS, depending on the encoder to invert
7. Save your settings from SETUP WEB PAGE with "SAVE DATA" mode
8. Return ZOOM and FOCUS to the reset position and restart procedure from step 3.

NOTE: Unlike OSC, the FreeD protocol does not allow negative values for ZOOM and FOCUS. Therefore, KOALA will send a value equal to zero in the FreeD data if the ZOOM or FOCUS encoders were to count negative values.

8. SET PARAMETERS

After taking all measurements and following the procedure for the lens encoders, access the SETUP WEB PAGE where you can configure the following parameters.

NOTE: The available parameters vary depending on the mode (LENS, HEAD, CRANE, TELESCOPIC, SLIDER).

a. ENCODERS

… ENCODER DIRECTION	POS/NEG	Set the counting direction to positive or negative
… OFFSET	number	Add a starting offset value when the encoder is reset at 0
AUX ENCODER	steps/mt	Set the number of steps/mt in TELESCOPIC or SLIDER mode
SMOOTH FILTER	Intensity	Set the intensity of the smooth filter

b. MEASURES

TRIPOD HEIGHT	mm	Set the height of the TRIPOD
CRANE LENGTH	mm	Set the length of CRANE or minimum l. in TELESCOPIC mode
HEAD OFFSET	mm	Set the offset of the HEAD relative to the CRANE
CMOS OFFSET	mm	Set the offset of CMOS relative to the HEAD
ABSOLUTE POSITION	mm	Set the TRIPOD's position relative to the center of the SET

c. ETHERNET & Wi-Fi

DHCP	ON/OFF	Enable or disable DHCP
IP	4 bytes	Set the Static IP of KOALA (if DHCP is OFF)
DESTINATION IP	4 bytes	Set the destination IP of Tracking Data
UDP PORT	number	Set the port number of UDP Tracking Data
PROTOCOL TYPE	FreeD/OSC	Set the protocol of UDP Tracking Data

d. SYNC & ID

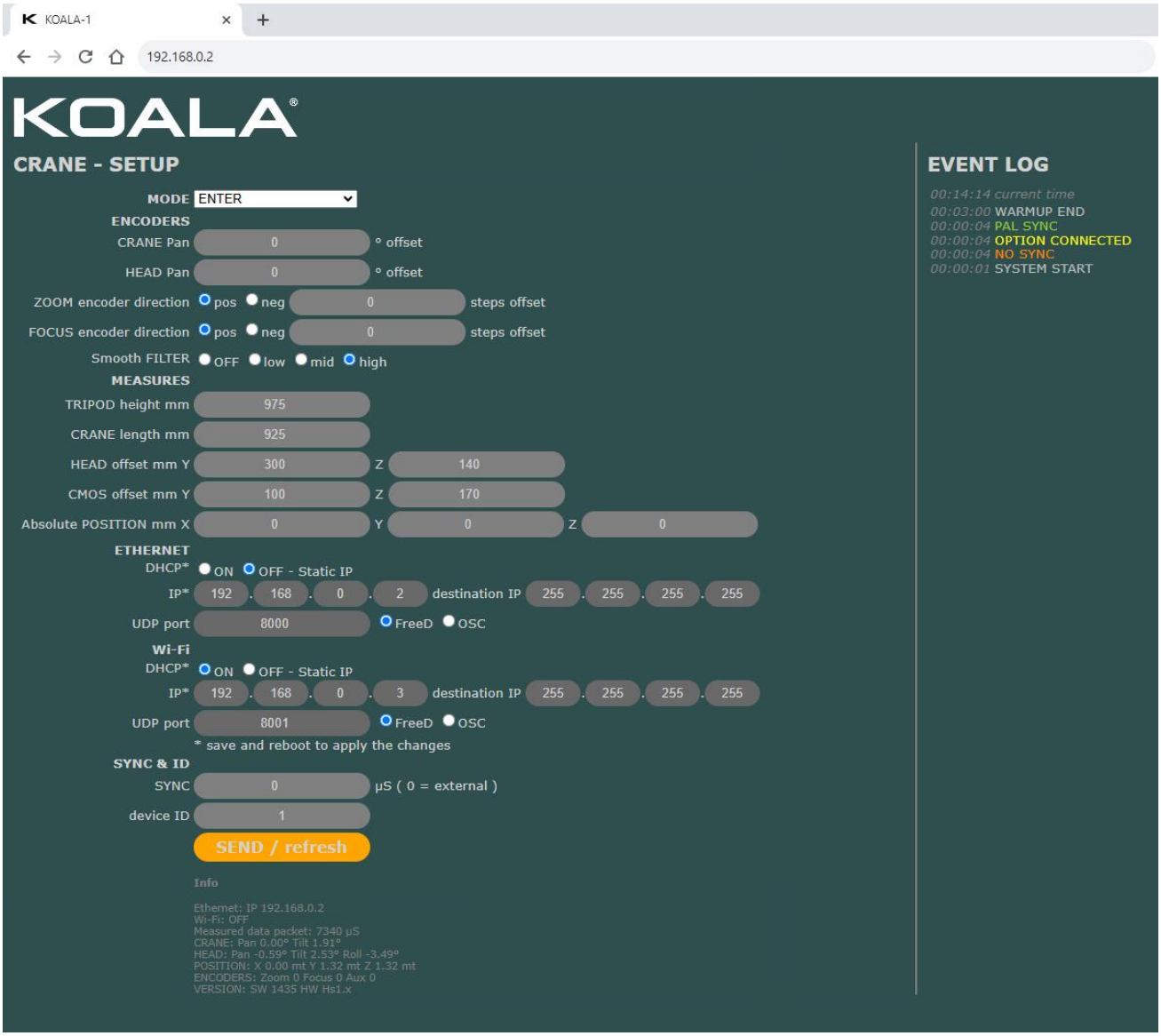
SYNC	µSec	Data tx framerate, set to 0 to use external SYNC*
ID	1 byte	KOALA identification number

Set the parameters and SAVE from dropdown menu on web page (see section 9.)

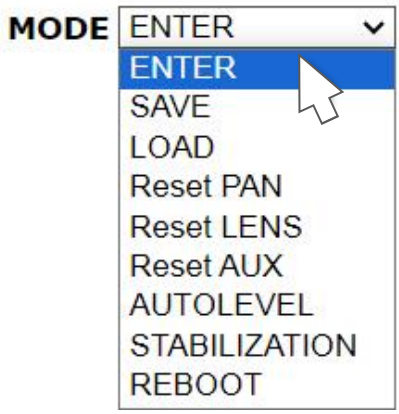
*** NOTE: Keep in mind that if set to 0 and the SYNC signal is absent, KOALA will not transmit tracking data, and LED B (right) will turn red.**

9. SETUP & LOG WEB PAGE

Connect KOALA to your Ethernet or Wi-Fi, and then open the KOALA's IP in a browser to access the SETUP WEB PAGE. (KOALA's IP is displayed in SERVICE MENU > NETWORK)



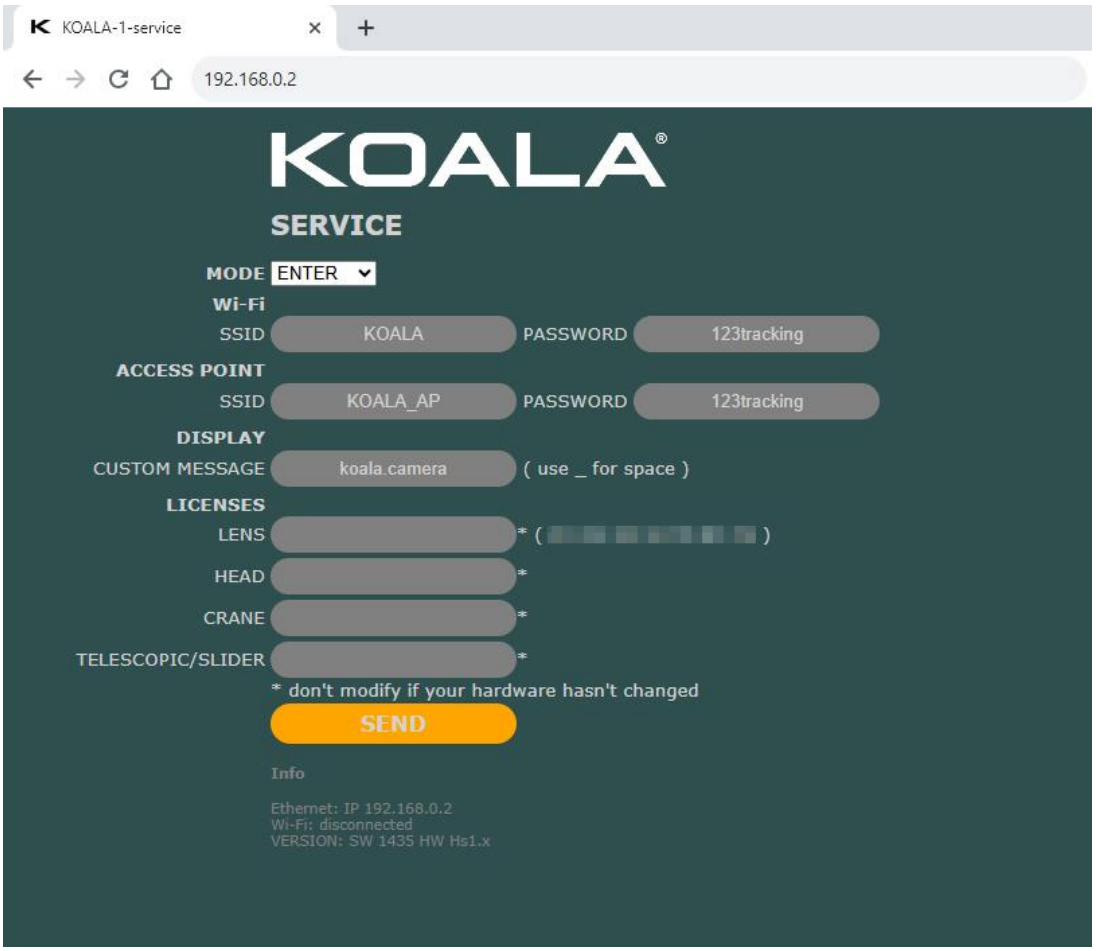
Set the MODE from dropdown menu then click “SEND” button to execute.



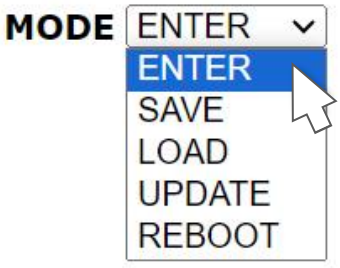
ENTER	Use this mode for TEST new data (e.g. measures) or refresh INFO data
SAVE	SAVE permanently data in KOALA
LOAD	Retrieve saved data
Reset PAN	Set Pan orientation to initial value
Reset LENS	Set Zoom and Focus encoders count to initial value
Reset AUX	Set Aux encoder to 0
AUTOLEVEL	function to level the values of tilt and roll
STABILIZATION	Start procedure to stabilize the drift
REBOOT	Reboot KOALA

10. SERVICE WEB PAGE

Power ON KOALA in SERVICE (press and hold the touch button for 5 seconds during startup), connect it to your Ethernet or Wi-Fi, and then open the KOALA's IP in a browser to access the SERVICE WEB PAGE.
(KOALA's IP is displayed in SERVICE MENU > NETWORK)



Set the MODE from dropdown menu then click “SEND” button to execute.



ENTER	Use this mode for enter new data or refresh INFO data
SAVE	SAVE permanently data in KOALA
LOAD	Retrieve saved data
UPDATE	Run OTA update and continue on display menu
REBOOT	Reboot KOALA

11. LED STATUS AND ICONS

The LEDs provide at-a-glance indications of specific KOALA activities

LED A (left)	RED	POWER ON

LED B (right)	RED	SYNC FAIL (no OUTPUT data)
	BLUE flash every 2”	OUTPUT data OK
	2 fast RED flashes	SAVE parameters (from WEB PAGE)
	2 fast GREEN flashes	LOAD parameters (from WEB PAGE)
	RED-GREEN-BLUE	REBOOT process
	PURPLE - 2 flashes	Wi-Fi connection process
	WHITE	AUTOLEVEL and RESET functions
	WHITE flashes	STABILIZATION or RECALIBRATION process
	GREEN slow blink	WARMUP in progress
	YELLOW flashes	OTA UPDATE in progress

The display shows notification icons, explained below

	ETHERNET cable connected
	Wi-Fi is ON and connected
	Wi-Fi is ON and disconnected
	Wi-Fi is ON in Access Point mode
	WARMUP in progress
	OPTION unit not connected (in CRANE, TELESCOPIC or SLIDER mode)
	LICENSE FAIL (or MODE selected not licensed)
	ETHERNET is waiting DHCP

12. NETWORK

Configure KOALA based on your network settings, including static IP, destination IP, UDP data transmission port, and protocol type.

The default data is as follows:

	DHCP	Static IP	Destination IP	UDP Port	Data Type
ETHERNET	OFF	192.168.0.2	255.255.255.255	8000	FreeD
Wi-Fi	ON	192.168.0.3	255.255.255.255	8001	FreeD

	SSID	Password
Wi-Fi	KOALA	123tracking
Access Point	KOALA_AP	123tracking

NOTE: Using KOALA in Wi-Fi mode during production is strongly discouraged due to potential reliability and stability issues. AP mode, weak or disrupted Wi-Fi networks can cause significant stability decreases because the Wi-Fi module may boost transmission power to compensate.

The Wi-Fi mode proves highly useful during initial installation phases or for parameter adjustments using mobile devices. However, it's advisable to turn OFF Wi-Fi once these tasks are complete.

13. DATA TRACKING

KOALA sends tracking data in three ways: Ethernet, Wi-Fi, and serial communication.

There are two available protocols: FreeD and OSC

a. FREED

It is the most widely used and supported tracking protocol (in specific, the FreeD D1).

KOALA sends FreeD data in UDP mode (Ethernet and Wi-Fi) and Serial RS485.

For serial connection a specific cable is required to be connected to the 'Option 2' port, and the receiver should be configured as follows:

BAUD RATE: 38400
DATA BIT: 8
PARITY: ODD
STOP BIT: 1
FLOW CONTROL NONE

b. OSC

The data in OSC format is sent via UDP over Ethernet and Wi-Fi in the following manner:

Address pattern (path)	Type and numbers of variables	Description
/KOALA*x*/POS	fff (3 Float)	X, Y, Z position of camera
/KOALA*x*/ROT	fff (3 Float)	Pan, Tilt, Roll of camera
/KOALA*x*/ZFA	iii (3 Integer)	Zoom, Focus, Aux values

"*x*" is the ID of KOALA. For example, if the ID is 3, the pattern will be **/KOALA3/…**

14. RESET PROCEDURES

The reset procedure is used to set PAN, LENS, and AUX separately to their initial values.

The reset can be performed either through SETUP MENU > RESET or from SETUP WEB PAGE by selecting the corresponding function from the dropdown menu.

a. PAN

Align the camera with the front of the set when the PAN offset is set to 0. If, for various reasons like obstacles or convenience, this alignment is not possible, reset the position by applying a PAN offset in the SETUP WEB PAGE. Follow the reset procedure as outlined on the display.

Please note that when using KOALA in HEAD or CRANE mode, the camera positioning for the reset will vary depending on the configured offsets.

b. LENS

Based on the settings determined in the LENS ENCODER section, bring ZOOM and FOCUS to their starting positions and initiate the reset.

c. AUX

The AUX encoder should be brought to its initial position before performing the reset.
In TELESCOPIC mode, set the length to minimum and reset.
In SLIDER mode, place the camera in the center of the slider and reset.

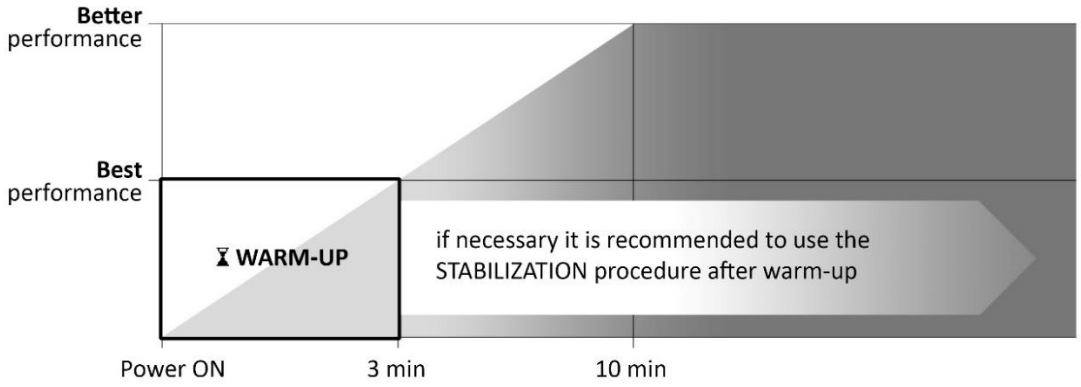
NOTE: It is recommended to execute the PAN reset following the WARM-UP phase to ensure the stabilization of KOALA sensors.

15. WARM-UP AND STABILIZATION

a. WARM-UP

KOALA needs a warm-up time of about 3 minutes for best performance, and after 10 minutes even better.

During the first warm-up phase (3 minutes) the LED B will flash green from slow to fast until the end of the procedure and a filling hourglass icon will appear on the display.
Use KOALA during this early stage is not recommended for best performance.



NOTE: Power ON KOALA while it is stationary. This ensures accurate and stable data from KOALA right from the initial stages of use. Otherwise, it is advisable to remove the power, wait for a moment, and then power ON KOALA when it is not in motion.

b. STABILIZATION PROCEDURE

The stabilization procedure is useful when evident pan drifts are noticed such as to compromise the quality of the tracking and it takes only 20 seconds. To stabilize KOALA, simply keep it still and start the procedure under SETUP MENU > STABILIZATION > RUN PROCEDURE or from the SETUP WEB PAGE.
Please remember that after this procedure it is preferable to keep KOALA still for at least 5 minutes to correctly complete the stabilization procedure.
If, even after completing the STABILIZATION procedure, no improvement is evident, it is advisable to power OFF KOALA, wait for a few seconds, and then restart the device.

c. AUTOMATIC STABILIZATION

Automatic mode (in SETUP MENU > STABILIZATION > AUTO ON/OFF) will stabilize KOALA during inactive periods and after warm-up phase. Do not use automatic stabilization when the environment is disturbed, as it may cause issues.

It is recommended to avoid environments that negatively interfere with KOALA (see section 18)

16. OTHER FUNCTIONS

KOALA provides additional functions:

a. SMOOTH FILTER

This function applies a data interpolation filter to make the motion smoother.
It is recommended to keep the filter turned OFF to minimize data transmission delay if necessary.
You can adjust the intensity from the SETUP WB PAGE.

b. SCREEN SAVER

This function proves useful for two reasons: firstly, like all OLED displays, reducing usage when not necessary is advisable to prolong its lifespan. Secondly, in situations where minimizing light emissions from devices is essential, such as when using KOALA in a theater audience.

The screen saver is enabled from SETUP MENU > SETUP > SC. SAVER ON/OFF, and after about 15 seconds of inactivity, the display turns OFF. To turn the display back on, simply touch the button.

c. CUSTOM MESSAGE

It is possible to customize a message to be displayed on the home page of the display.
This can be useful for visually identifying multiple KOALAs in the same setup, such as specifying the name or number of the camera. It also allows for branding or including reference contacts.
It can be done through the SERVICE WEB PAGE.

d. INTERFERENCE TEST

Through this function, you can verify in real-time if there is magnetic interference and jitter at the mounting point of KOALA and the OPTION (crane, telescopic or slider mode).

Executable in INFO MENU > INTERFERENCE or in Service mode under SENSOR > INTERFERENCE TEST

The indicator must be in the GOOD zone and never in the BAD zone; the jitter level must remain below the threshold of 1.0. If the indicator is in the BAD zone or jitter exceeds 1.0, it is necessary to find a position free of interference.

e. RECALIBRATION

Recalibrating KOALA (Head) or the OPTION (Crane) is a fundamental operation and must be done correctly to avoid abnormal behavior. Follow these simple steps, which only need to be repeated if KOALA or the OPTION is reassembled in a new position.

If done correctly, this process makes KOALA extremely precise and reliable.

Start the function from SERVICE MENU > SENSOR > RECALIBRATION > HEAD (or OPTION), then select RECALIBRATE HEAD (or OPTION). It's possible to restore to Factory the recalibration with relative function.

Unplug OPTION or other cables when recalibrating HEAD to have full freedom of movement.

1. Position the TILT as low as possible and perform a PAN of +180° and -180° (+90° and -90° for OPTION)
2. Raise the TILT by approximately 20° and perform a PAN of +180° and -180° (+90° and -90° for OPTION)
3. Repeat step 2 until reaching the maximum possible TILT level (it is not necessary to reach 90°)

Fill all area points (showed on display) or long press button to stop procedure.

17. FACTORY AND NETWORK RESET

To restore KOALA to factory settings, access the SERVICE MENU > RESET / UPDATE > FACTORY RESET function.

It's possible to reset only network parameters using the SERVICE MENU > NETWORK > RESET TO DEFAULT function. (see section 12)

18. PRECAUTIONS AND INTERFERENCES

KOALA is a robust and precise device, but it should be handled with caution and kept away from environmental interferences that could compromise its proper functioning or potentially cause serious damage.

- Electrostatic Currents or Power Surges
- Magnetic Fields (section 16.d)
- Vibrations or impacts
- Extreme Temperatures or frequently fluctuations
- Proximity to Heat Sources
- Water or Humid Environments

19. BEST PRACTICE & DAILY USE

- Mount KOALA (and the option) absolutely securely, with no possibility of any gaps or even minimal movement between it and the camera (also the option)
- After mounting KOALA and the Crane Option, perform sensor recalibration correctly.
- Level the head and the crane and execute Autolevel function.
- Utilize an Ethernet connection, both for management and tracking data
- Keep the Wi-Fi turned OFF (Wi-Fi is useful for OTA update or in LENS mode)
- Use a SYNC signal free of HUM, of high quality, and securely locked
- Turn KOALA ON only when necessary. Do not keep it powered ON for extended periods of inactivity
- The PAN reset will be more accurate after the warm-up phase
- Ensure that all interferences are minimized (perform an Interference test if necessary)

The daily operative procedure involves these simple steps:

1. **Power ON KOALA while it is stationary**
2. **Wait for the end of the warm-up phase (>10 minutes for better performance)**
3. **Proceed with the resets**
4. **KOALA is ready!**

20. CONNECTORS PINOUT

CONNECTOR	DESCRIPTION	TYPE OF PLUG	PINOUT
DC IN	Power	Male JACK 2.1mm x 5.5mm	Internal pin: +5V External pin: GND
LAN	Ethernet	RJ-45	
SYNC	Genlock Analog IN (Black Burst)	Male BNC	Internal: Video Signal External: GND
LENS	External ZOOM and FOCUS encoders - VIRTUAL cable Lens	IX40G-A	1: GND 2: Encoder ZOOM A 3: NC 4: Encoder ZOOM B 5: + 5V 6: GND 7: Encoder FOCUS A 8: NC 9: Encoder FOCUS B 10: + 5V
OPTION 1	CRANE option + AUX encoder	IX40G-A	1: GND 2: Encoder AUX A 3: Reserved 4: Encoder AUX B 5: + 5V 6: GND 7: Reserved 8: + 3,3 V 9: Reserved 10: + 5V
OPTION 2	CRANE option + RS485 OUT	IX40G-A	1: GND 2: RS485 - A 3: Reserved 4: RS485 - B 5: + 5V 6: GND 7: Reserved 8: + 3,3 V 9: Reserved 10: + 5V