CARTONI

PROFESSIONAL CAMERA SUPPORT

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Remote System

Usage and maintenance

User Manual

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1 Features

The *Cartoni Remote System* comprehends a fair amount of useful features:

- Easy setup;
- One cable to control them all;
- Modular configurations;
- Distance of communication up to 200m;
- Digital lens integration;
- Mountable on desktop;

2 Safety rules

The Cartoni Remote System comprehends mechanical parts in movement that can cause injury if not properly operated.
The setup of the Cartoni Remote System should be carried out by qualified personnel.
Do not power the system during the setup phases.
Limit the access to the area of operation to qualified personnel only.
Do not operate the remote head manually if the power is turned on.

3 System configurations

The Cartoni Remote system works in a chain configuration where one cable transmits both power and digital data. Both ends of the communication line should be properly terminated with a bus terminator; all power supplies solutions provided by Cartoni have integrated terminators. The input devices are directly connected to the control device. For more details on system assembly and configurations see §5.

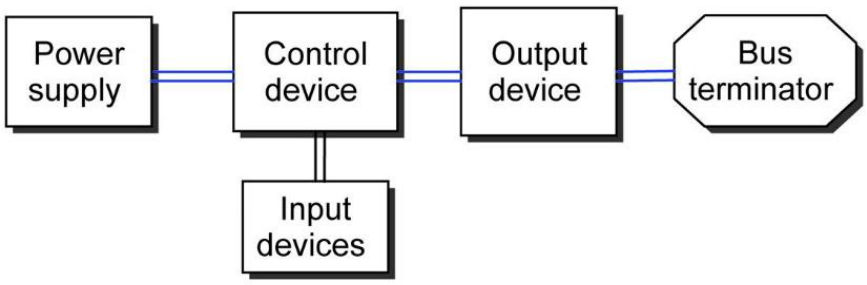


Figure 1: Schematic configuration of the Cartoni remote system.

4 Cartoni Remote System Devices Overview

e-Rem25	Console	e-Cube	Hand wheels
Power supply	Data/Power cables	Encoder cables	Joystick
Digital lens cables	Zoom handle	Focus handle	Desktop lens controller
Zoom/Focus motors	Auxiliary enable	Tally kit	Other accessories

4.1 Common characteristics

4.1.1 Power connectors

All Cartoni devices have the two power connectors in common:

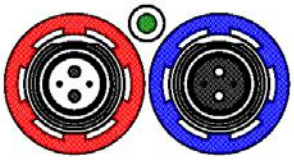


Figure 2: Power/Data connectors.

The male connector with a red washer is the power input, the female connector with a blue washer is the power output. The green led between the two power connectors indicates the connection status (Table 1).

4.1.2 Connection led

Led color	Description
Off	Not powered device
On	Connection with other devices is correctly established
Blinking	Trying to connect to other devices

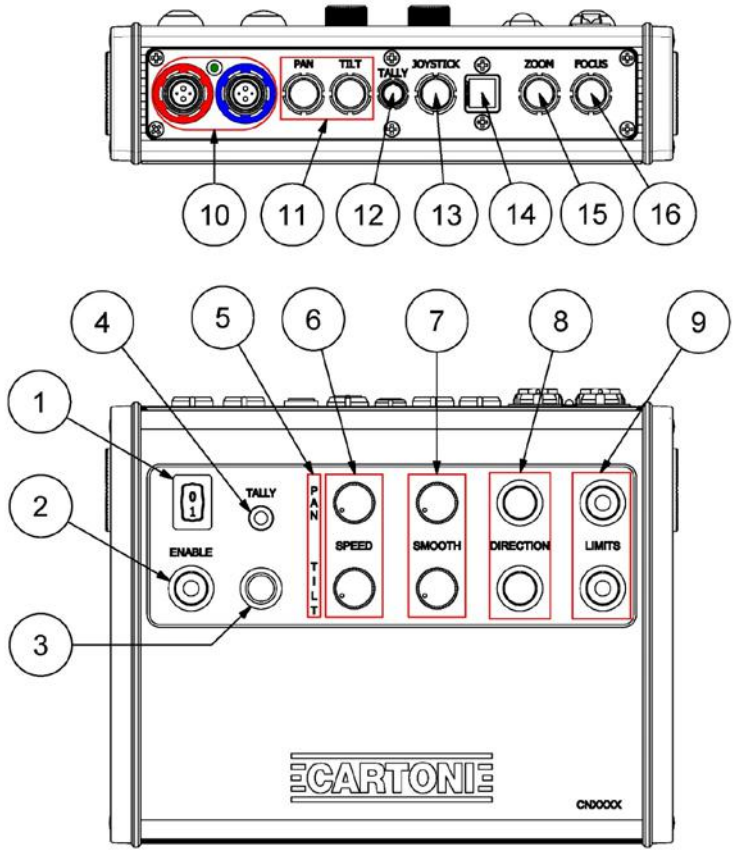
Table 1: Connection led colors.

4.1.3 Programming port

Each Cartoni device that include an electronic board, has a programming port allowing to update the firmware (see §6.2).

4.2 Control Console

Each control console can manage a maximum of two encoded axes and two analog axes. The control console allows the user to adjust the speed multiplier and the smoothing level of the input signals reducing the hand vibrations. It is possible to reverse the travel direction independently on the two main axes. The control console is able to limit the range of the axes according to the user's settings (§4.2.8.1). A large RGB led shows the system status. Several input devices can be connected via the connectors on the back panel (i.e. encoded devices as e-Cube or Hand wheels for a greater accuracy or a 3-Axis joystick for a simple desktop setup). In addition to the encoded inputs, two additional analog inputs are available for the Zoom and Focus controllers (§4.5.4 and §4.5.5). It is possible to connect an external button (§4.8.7) to momentary freeze the system, in order to recover the e-Cube Pan/Tilt position without taking your hands off the controls. The Tally led shows the remote camera recording status, and an output Tally connector repeats the signal to connect any monitor supporting this feature.



1. Main power switch (§4.2.1)	9. Limit buttons with led (§4.2.7.1)
2. Enable button (§4.2.2)	10. Power connectors (§4.1.1)
3. Status led (§4.2.6.1)	11. Axis 1 & 2 encoder input (§4.5.1, §4.5.2)
4. Tally led (§4.2.6.3)	12. Tally output (§4.6.9)
5. Axes 1 & 2 labels	13. Joystick expansion (§4.5.3)
6. Speed knobs (§4.2.4)	14. Programming port for firmware update
7. Smooth knobs (§4.2.5)	15. Zoom potentiometer handle (§4.5.4)
8. Direction switches (§4.2.3)	16. Focus potentiometer handle (§4.5.5)

Table 2: Console feature list.

Technical specifications

Weight	1 kg
Dimensions	217 × 175 × 61 mm
Input voltage	12 ÷ 24 V
Current consumption	1 A
Fixing method	Console bracket (§4.6.10) or leaning on desktop

Table 3: Console technical specifications.

4.2.1 Power switch

The *Power Switch* turn on/off all the devices connected to the console.
Please turn on the power only when all the cables are properly plugged.

4.2.2 Enable button

The *Enable* button toggles the system between enabled and disabled state. A red led on this button is on when the system is disabled. An external button is available to perform the same function (See §4.5.6). While disabled, the head maintains its position and every input is ignored.

4.2.3 Direction buttons

The *Direction* buttons change the relative direction of each axis.

4.2.4 Speed knobs

The *Speed Knobs* set axis velocity. Rotating this knob completely to the left will disable the movement of the corresponding axis.
Using the e-Cube, the knob on vertical position sets the ratio between the e-Cube and e-Rem25 to 1:1 (i.e. 90° on e-Cube lever corresponds to 90° on the e-Rem25).

4.2.5 Smooth knobs

The *Smooth Knobs* reduce vibrations from input devices.
High settings on this parameter could cause delay in response.

4.2.6 Led indications

4.2.6.1 Status led

Led color	Description
Green	Normal operation
Blue	System disabled: any input is ignored and Settings Mode activated
Red	More input controls are connected than output axes to control
White	More output axes to control are connected than input controls
Light Blue	Problem on the main communication line
Yellow	Waiting for 1st limit to be set (§4.2.7.1)
Purple	Waiting for 2nd limit to be set (§4.2.7.1)

Table 4: Status led colors.

4.2.6.2 Limit led

Led status	Description
On	Limits activated for this axis
Blinking	Limits setting phase
Off	No limits activated for this axis

Table 5: Limit led colors.

4.2.6.3 Tally led

The *Tally* led is an indication of the tally status on the remote controlled camera.

4.2.7 Settings Mode

The *Settings Mode* allows to set additional parameters.

Settings Mode is automatically entered while the system is in the disabled status (blue status led).

In *Settings Mode* you can:

1. Set the movement Soft Limits for each axis.

4.2.7.1 Setting the Soft Limits

To set the axis limits, press the limit button on the console when in the disabled status.

Steps to configure the limits:

Action/Status	Status led	Button led
System disabled and Settings Mode is active	Blue	Off
Press the limit *button* (for less than 2 seconds)	Yellow	Off
The axis selected is enabled and it can be moved. Move the axis to the desired limit position then press the limit *button* again to set the first limit	Purple	Blinking
Move the axis to the second limit position and press the limit *button* again to set the second limit. The system will go back in disabled status and the limits are enabled	Blue	On

Table 6: Limit setting procedure.

Once the limits are set, to toggle the limits on/off press the limit *button* for more than 2 seconds, the status led turns yellow to indicate that you can release the button.

You can set the limits only for one axis at a time.

4.2.8 Connectors panel

Connectors (11) connect encoded input devices like e-Cube (§4.5.1) and Wheels (§4.5.2).

Connector (12) connects the tally output to a monitor.

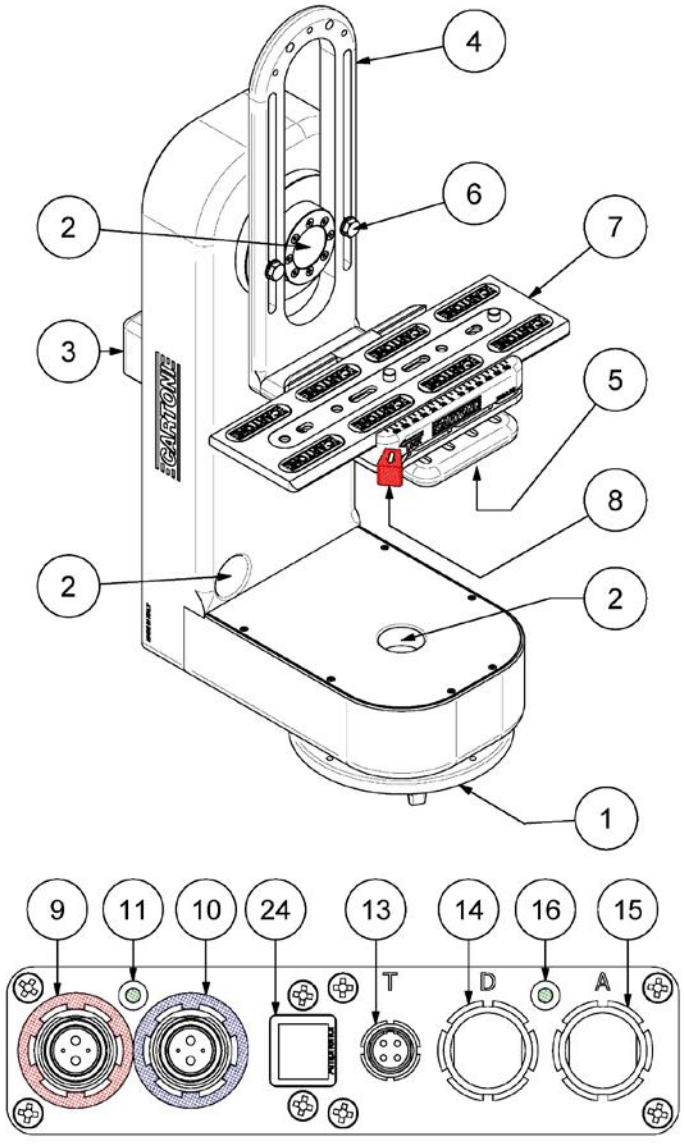
Connector (13) let you to connect a joystick (§4.5.3) or the auxiliary momentary disabling button (§4.5.6).

Connector (14) with a USB cable let you to update the firmware (§6.2).

Connectors (15) and (16) are analog inputs for Zoom (§4.5.4), Focus (§4.5.5).

4.3 Remote Head e-Rem25

The e-Rem25 is a remote controlled head suitable for cameras up to 25 kg. Extremely smooth, reliable, silent, the e-Rem25 is the ideal complement in television studios, on pedestals or tripods and ideal for filming upside down from cranes. The e-Rem25 remote head is equipped with simple modular electronics, along with state-of-the-art gear mechanics, making it the best option for Studio remote controlled cameras. A variety of remote command options are available for e-Rem25 including joystick, Hand wheels and fluid pan bar with optional Zoom and Focus handles on the console. The e-Rem25 is capable of controlling directly any Canon or Fujinon digital lenses.



1. Mitchel base	9. Power In
2. Cable management holes	10. Power Out
3. Connector hub	11. Status led
4. L shaped support	12. Programming port for firmware update
5. Left / Right regulation	13. Tally sensor input
6. Up / Down regulation	14. Digital lens connection
7. Back / Forward regulation	15. Analog lens connection
8. Plate lock	16. Lens status

Table 7: e-Rem25 feature list.

4.3.1 Technical specifications

Weight	12 kg
Maximum Dimensions	526 × 320 × 170 mm
Input voltage	24 V
Maximum current consumption	12 A
Fixing method	Mitchel flat base
Maximum payload	25 kg
Pan/Tilt maximum speed	240 °/s
Pan/Tilt minimum speed	0.24 °/s
Pan range	± 540 ° (unlockable)
Tilt range	± 45 ° (unlockable)
Pan resolution	800.000 count / turn
Tilt resolution	800.000 count / turn

Table 8: e-Rem25 technical specifications.

4.3.2 Overview

Use the holes (2) to reduce the twisting of the cables.
To ensure a secure work environment, each time the head is powered up, Pan and Tilt limits are activated by default, to unlock them follow the procedure described in §4.2.7.1.

4.3.3 Balancing camera on the remote head

To achieve a better performance of the head, please balance the camera so that the center of gravity (COG) matches with the center of the Pan/Tilt axes. It is better to do this regulation once all the cables and accessories are in place.
Adjust the left and right position (5) so that the COG is aligned with the Pan axis, compatibly with the camera dimensions. This regulation is very important in case of high dynamic movement on the Pan axis. Position the camera on 90 degree of Tilt (up or down) and regulate the up / down position loosening the bolts (6); when the camera maintains its balance at 90 degree the right position has been achieved. Tighten the bolts (6) and bring back the camera on its horizontal position. Loosen the plate lock (8) and move the camera plate back and forward (7) until the camera is balanced. Tighten the plate lock (8).
A good balance is required to ensure good shots as well as the durability of the product over time.

4.3.4 Lens status led

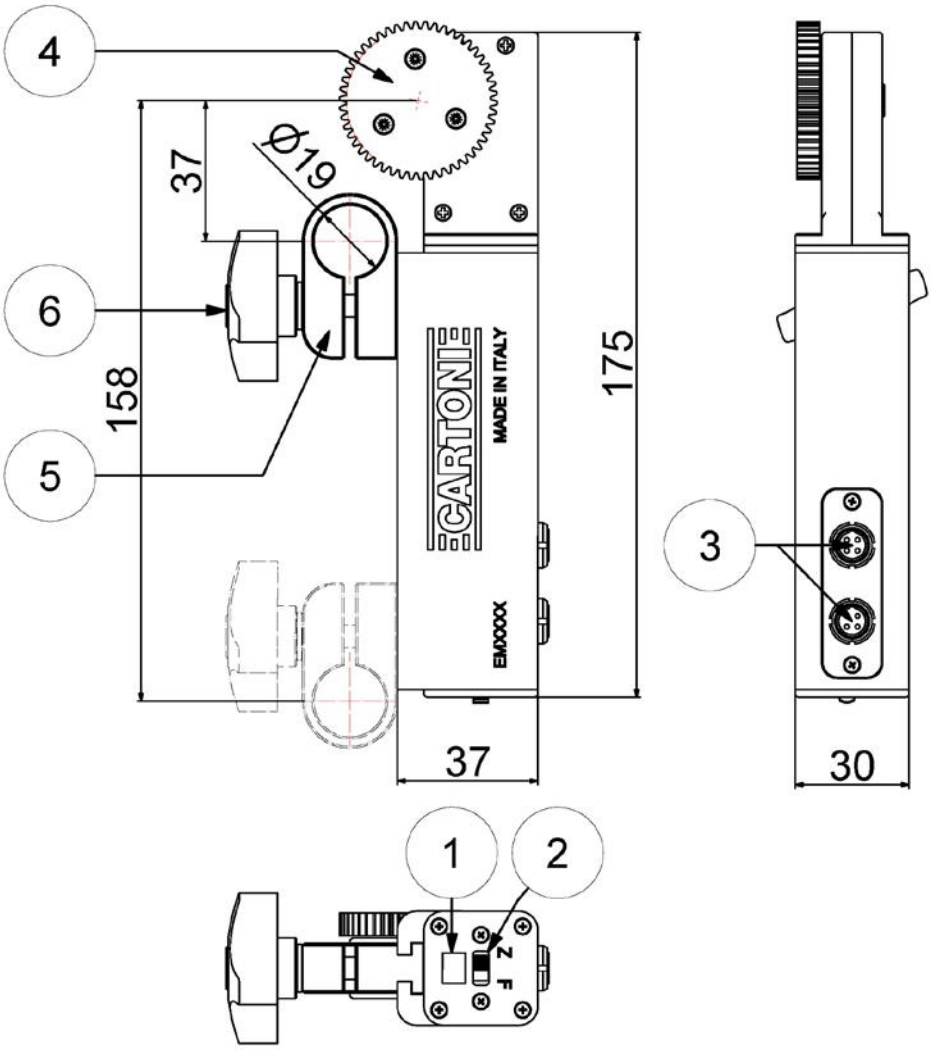
The lens status led (16) indicates the status of digital lenses (connector 14) and analog lenses (connector 15).

Led color	**Description**
On	One of the compatible lens has been detected
Blinking	Auto calibration phase
Off	No lens detected

Table 9: Lens status led colors.

4.4 Lens remote motors

The lens motors are the integrated solution to actuate any kind of lens. The motors connect to the main communication line, avoiding additional cables and are the best option for precise Zoom and Focus control. Different gear modules (4) are available as accessories to fit to different lens (Table 13). The relative distance from the support hole and lens gear can be adjusted from 37 mm up to 158 mm to accommodate the motor on a large range of supports.



1. Motor ID (§4.4.1) 2. Zoom Focus selector (§4.4.2) 3. Bus connectors (§4.6.6)	4. Interchangeable gear (Table 13) 5. Slide with support hole 6. Locking knob

Table 10: Remote motors feature list.

4.4.1 Technical specifications

Weight	450 g
Overall dimensions	175 × 37 × 30 mm
Input voltage	24 V
Maximum current consumption	1 A

Table 11: Remote motors technical specifications.

4.4.2 Connection of the motors

It is possible to connect up to 2 motors per remote head, one for Zoom and one for Focus. Motors with the same ID can't work together. When using the external motors be sure to set the lens switch on manual (See Figure 4). Due to their miniaturized design, these devices do not have the standard power supply configuration, so dedicated cables and terminator must be used for their connection. Always connect a terminator at the end of the line (see Figure 3). It is possible to connect only one motor indeed. Once connected, each motor performs an auto calibration. It is advisable to mount it mechanically first and then connect the cable, so the auto calibration can properly start.

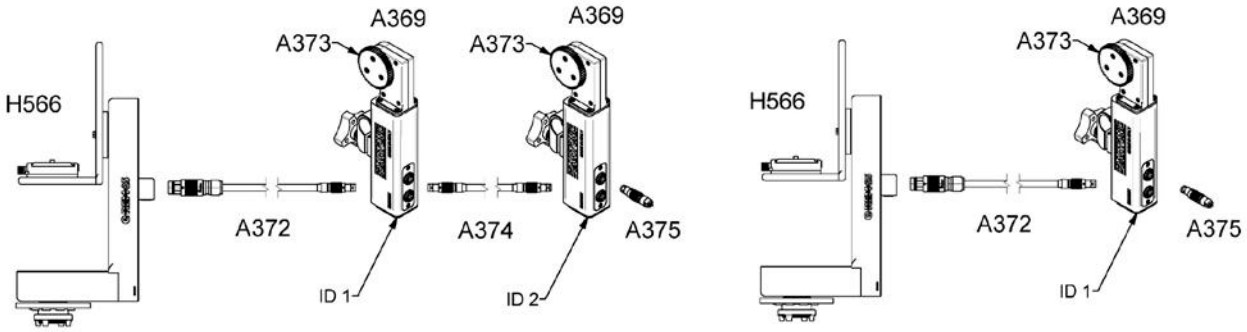
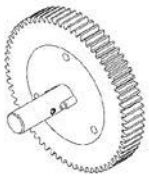


Figure 3: How to connect the A369 motors to the remote head.

Lens gear module guide	
A373/M4	M=0.4 Z=100
A373/M5	M=0.5 Z=80
A373/M6	M=0.6 Z=66
A373/M8	M=0.8 Z=50

Table 12: Gear modules available for A369.



4.4.3 Selecting Zoom or Focus

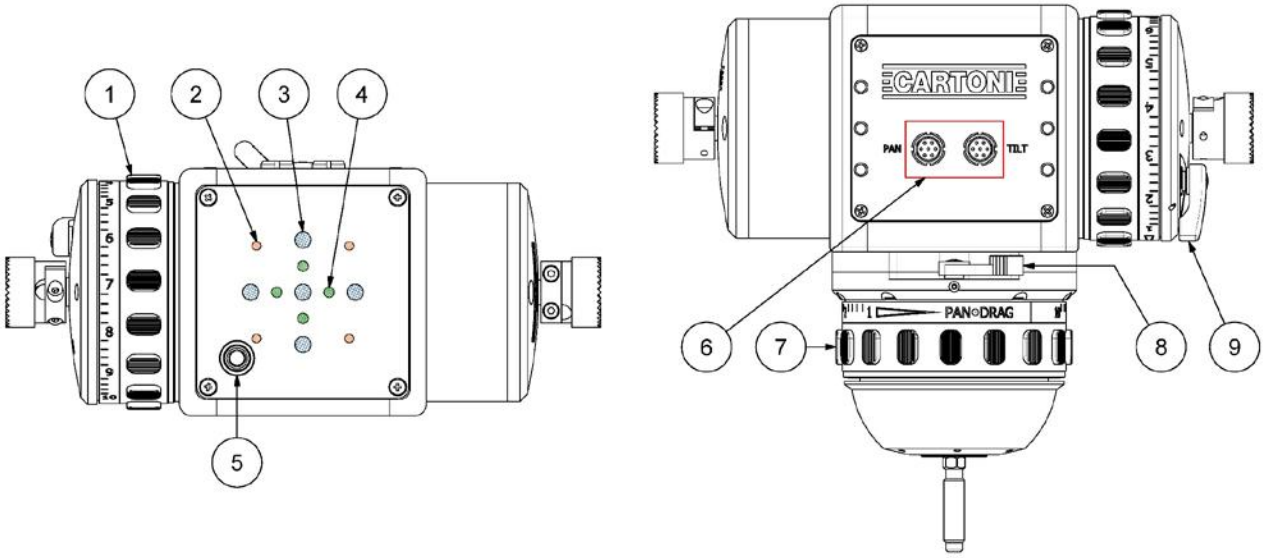
The switch on the bottom cover (2 on Table 11), let you select motor operating mode: Zoom or Focus. Setting the same function on both motors will exclude both of them from the control chain.

Figure 4: Lens servo/manual switch.

4.5 Input devices

4.5.1 e-Cube Pan-Bar

The e-Cube is an encoded fluid head pan-bar. This fluid head is designed to operate remote controlled head or other devices in an intuitive way, achieved by the operator just as if he was operating a traditional Pan and Tilt head. The movements performed on the e-Cube are mirrored by the remote controlled head.
The e-Cube is a smart alternative to Hand wheels (§4.5.2) or joysticks (§4.5.3).
The e-Cube head has a flat cover platform with multiple threaded holes to install a monitor and/or a Console. A level bubble helps in mounting the device horizontally.
Two telescopic pan bars are coupled to the vertical shaft and carry 2 sliding counterweights to balance the weight of lens controllers (§4.5.4 and §4.5.5) attached to the bar.
Pan/Tilt outputs connect (6) to the encoders connectors (11 on Table 2).



1. Tilt drag adjustment 2. M5 threaded holes 3. 3/8' threaded holes 4. 1/4' threaded holes 5. Level bubble	6. Encoder connectors 7. Pan drag adjustment 8. Pan brake 9. Tilt brake

Table 13: e-Cube/100 feature list (e-Cube 7 has equivalent features).

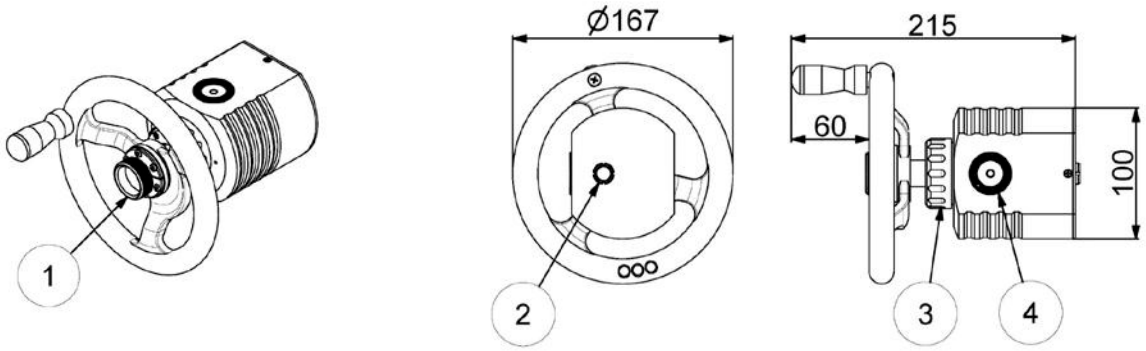
Technical specifications

	H601	H602
Weight (without pan bars)	4.1 kg	6.5 kg
Dimensions	290 × 120 × 220 mm	300 × 174 × 230 mm
Fixing method	100 mm bowl	Mitchel flat base
Drag mechanism	Continuous	7 steps + 0
Pan bars diameter	20 mm on the fixed part - 25 mm on the extensible part	
Encoder resolution	40'000 count / turn	

Table 14: e-Cube technical specifications.

4.5.2 Hand wheels

Each hand wheel can control 1 axis. The hand wheels must be connected to the encoders connectors (11 in Table 2) on the control console. The Hand wheels let you achieve a more precise movement with respect to the e-Cube. They are mounted on the Hand wheels bracket (§4.6.11).



1. Hand wheel locking screw 2. Encoder connector	3. Drag adjustment ring 4. Threaded rosette Z.60 d.32 mm

Table 15: Hand wheels feature list

Technical specifications

Weight	2.3 kg
Dimensions	215 × 167 × 167 mm
Hand wheel radius	167 mm
Fixing method	Threaded rosette Z.60 d.32 mm
Drag mechanism	Adjustable friction ring
Encoder resolution	24'000 count / turn

Table 16: Hand wheels technical specifications.

4.5.3 3-axes joystick

The 3-axes joystick is the simplest input device that can be connected to the system. It has 3 axes analog output to control Pan, Tilt and a third axis configured as Zoom. The joystick zoom has a low priority (See Annex D: Devices priority)

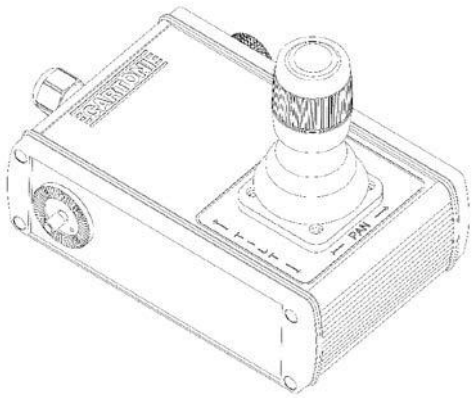


Figure 5: 3-axes joystick.

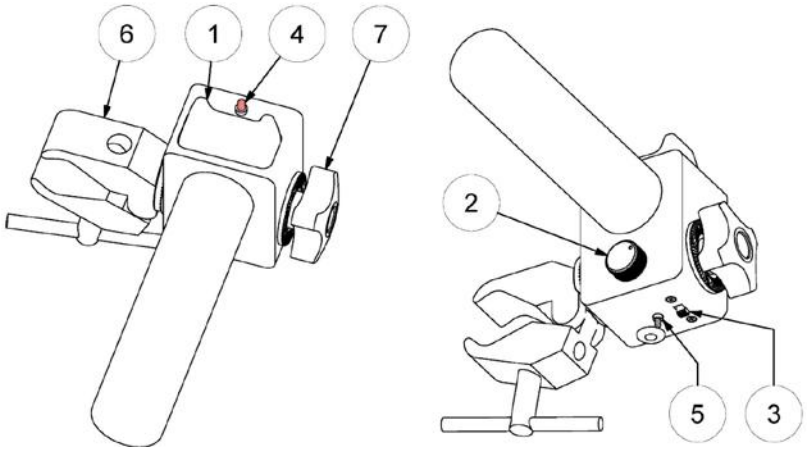
Technical specifications

Weight	700 g
Dimensions	117 × 195 × 140 mm
Fixing method	Threaded rosette Z.60 d.32 mm

4.5.4 Cartoni Zoom handle

The zoom handle allows to operate the zoom speed through the rocker (1). The knob (2) set the maximum zoom speed limit. This device also includes a VTR button (4) and a RET button (5). The switch on the bottom (3) inverts the rocker control direction.

The Cartoni Zoom handle has to be connected to the connector 15 in Table 2.



1. Zoom rocker 2. Zoom speed adjustment 3. Direction switch 4. Red VTR button	5. Black RET button 6. Universal clamp 7. Fixing knob

Table 17: Zoom handle feature list.

Technical specifications

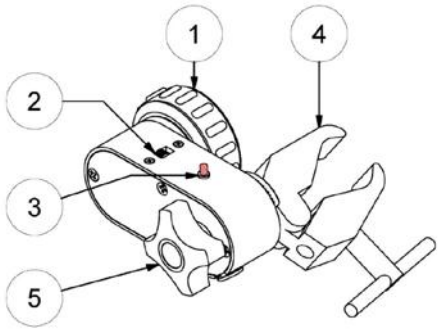
Weight	500 g
Dimensions	167 × 75 × 80 mm
Fixing method	Universal clamp

Table 18: Zoom handle technical specifications.

4.5.5 Cartoni Focus handle

The focus knob (1) allows you to control the focus position. A rubber ring guarantees a constant grip on the fingers. The switch (2) selects the direction of motion.

This device also includes a temporary button (3) to remotely enable/disable the movements. The Focus handle has to be connected to the connector 16 in Table 2.



1. Focus knob 2. Direction switch 3. Momentary disable button	4. Universal clamp 5. Fixing knob

Table 19: Focus handle feature list.

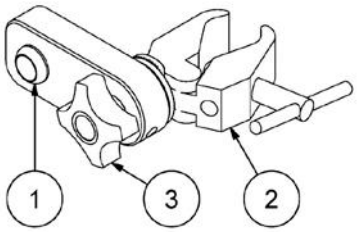
Technical specifications

Weight	400 g
Dimensions	100 × 73 × 55 mm
Fixing method	Universal clamp
Number of knob turns	3

Table 20: Focus handle technical specifications.

4.5.6 Enable/disable external button

The external button lets you to temporary enable or disable the movements on the remote head just for the time you need without taking your hands off the pan-bar. The external button has to be connected to the joystick connector (13 in Table 2) on the console.



1. Blue enable/disable button 2. Universal clamp	3. Locking knob

Table 21: Enable/disable external button feature list.

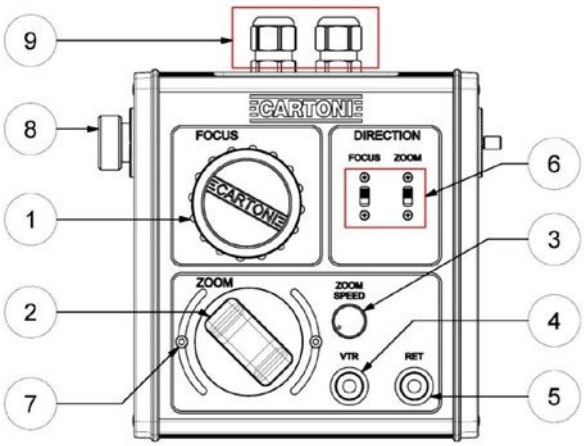
Technical specifications

Weight	250 g
Dimensions	85 × 40 × 35 mm
Fixing method	Universal clamp

Table 22: Enable/disable external button technical specifications.

4.5.7 Lens Controller for desktop

The Zoom and Focus controller includes all the controls already presents on the Zoom handle (§4.5.4) and Focus handle (§4.5.5). The controller can be mounted on the console side, allowing one hand control over the Zoom and Focus knobs.



1. Focus knob 2. Zoom rocker 3. Maximum Zoom speed potentiometer 4. Red VTR button 5. Black RET button	6. Direction switches 7. Zoom rocker angle adjustment allen screw 8. Console assembly screw 9. Zoom and Focus connectors (see 15 and 16 in Table 2)

Table 23: Lens controller feature list.

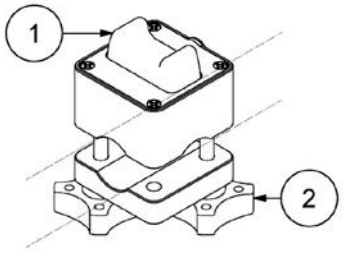
Technical specifications

Weight	1 kg
Dimensions	165 × 195 × 75 mm
Fixing method	Threaded rosette Z.60 d.32 mm

Table 24: Lens controller technical specifications.

4.5.8 Generic 1-axis handle

This generic controller is suitable to control every type of axis. This controller has only one rocker to set the speed. It has to be connected to connectors 15 or 16 in Table 2. It is possible to choose which direction to set the potentiometer with respect to the clamped tube.



1. Control rocker	2. Locking knobs

Table 25: Generic 1-axis handle feature list.

Technical specifications

Weight	300 g
Dimensions	67 × 67 × 91 mm
Fixing method	Custom clamp adjustable every 90 degree
Diameter of tube	16 ÷ 25 mm

4.6 Accessories

4.6.1 Power supplies

Different power supplies are available depending on the application. All the power supplies come with a standard Neutrik connector 4 poles. See "Annex A: Connectors pinout" for details.

A345	320 W
A378	600 W High power efficiency

Table 26: Power supply list

4.6.2 Bus Cables

The cables carry both power and data. The available lengths are:

A342	1 m
A333	5 m
A340	15 m
A343	25 m
A339	50 m
A361	75 m
Custom length	

4.6.3 Bus terminators

This special connector is required to close properly the communication bus. Different dimensions of the connector are available for different devices.

A344	Fischer terminator	
A375	Lemo terminator	

4.6.4 Bus extender

The Bus extender allows to join multiple bus cables (§4.6.2) to extend the communication length.

4.6.5 Encoder cables

The Encoder cable is used to connect the encoded device (e-Cube or Hand wheel) to the control console. The code A351 contains 1 connection cable.

4.6.6 Lens motors connection cables

These cables connect the lens motors (§4.4).

Code A372 is used to connect the motors to the remote head and code A374 is used to connect two motors (See Figure 3).

4.6.7 Emergency push button

The emergency push button is connected to the AC line before the power supply. If this button is pressed, all the system is immediately shutdown. After the button is pressed the head e-Rem25 may remain in motion for a small amount of time due to its inertial forces. To restore the power rotate the red mushroom button in the clockwise direction.

4.6.8 Digital lens data cables

Both Canon and Fujinon broadcast and box lenses are supported. On digital lenses Zoom and Focus control and remote actuation of the VTR and RET are supported. On analog lenses the actuation of VTR and RET is supported only on Fujinon lenses with 12 poles Hirose connectors.

See "Annex C: Lens compatibility" for a more exaustive list.

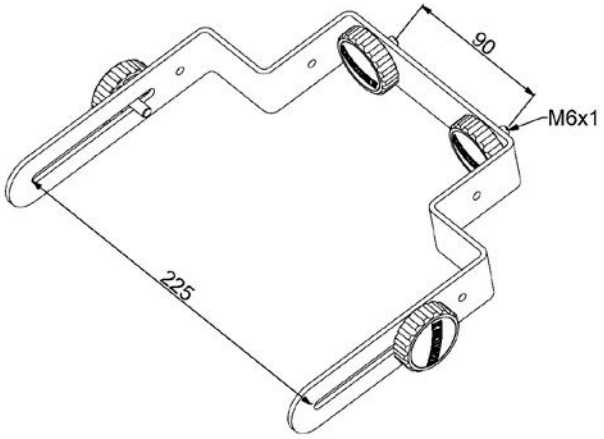
4.6.9 Tally feature

It is available a light sensor, connected to the remote head (13 in Table 8), to sense the tally light of the camera. The camera tally light is mirrored on the console (4 in Table 2).

An additional open ended cable is available to drive an external tally light (connector 12 in Table 2).

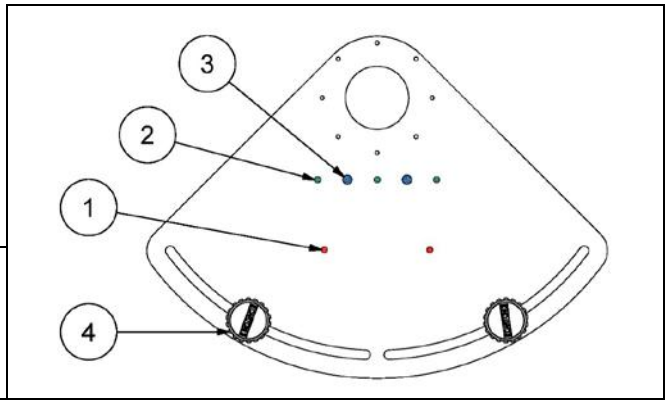
4.6.10 Console bracket

The Console bracket allows mounting the control console on the e-Cube or Hand wheels bracket.



4.6.11 Hand wheels bracket

The Hand wheels bracket allow the fixing of hand wheels and console bracket on a Mitchel base. The two Fixing knobs can be adjusted on a 45 degree slot. A large hole in the center allow the passage of cables.



1. M6 threaded holes
2. 1/4' threaded holes
3. 3/8' threaded holes
4. Fixing knobs with threaded rosette Z.60 d.32 mm

4.6.12 Converters for Fujinon and Canon control handles

Based on what type of connector your handle needs, Cartoni has a wide variety of converters to accept inputs also from the original Fujinon and Canon control handles (See Table 27).

Fujinon			Canon		
Zoom					
	Tajimi 8 poles	**A362**		**Tajimi 8 poles**	**A363**
	Conversion cable from Tajimi R04-JF8 Fujinon to Cartoni Zoom			Conversion cable from Tajimi R04-JF8 Canon to Cartoni Zoom	
	Hirose 12 poles	**A366**		**Hirose 20 poles**	**A367**
	Conversion cable from Hirose HR10-10J-12S Fujinon to Cartoni Zoom			Conversion cable from Hirose HR25A-9J-20S Canon to Cartoni Zoom	
Focus					
	Hirose 12 poles	**A365**		**Hirose 20 poles**	**A364**
	Conversion cable from Hirose HR10-10J-12S Fujinon to Cartoni Focus			Conversion cable from Hirose HR25A-9J-20S Canon to Cartoni Focus	

Table 27: Conversion cables overview.

5 Typical configurations

5.1 Pan-Bar assemblies

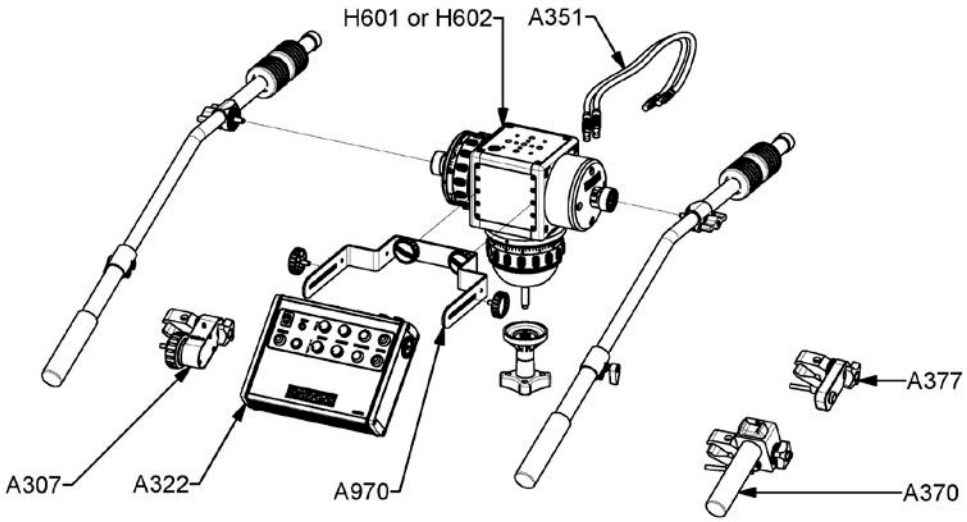


Figure 6: Pan-Bar accessories.

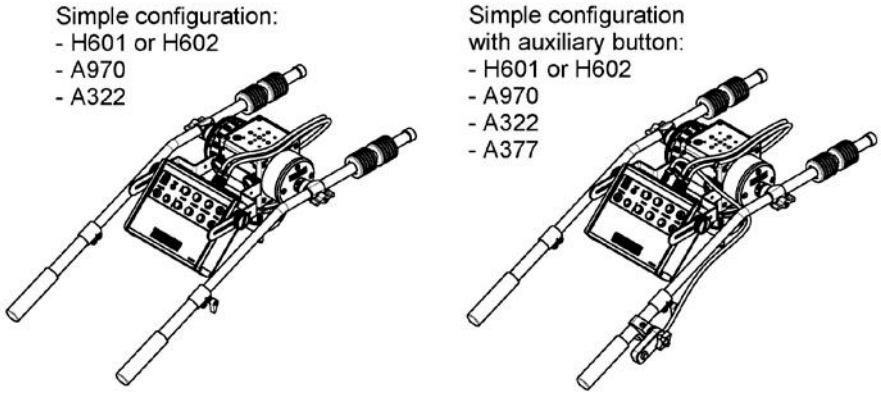


Figure 7: e-Cube simple configurations with or without the auxiliary button.

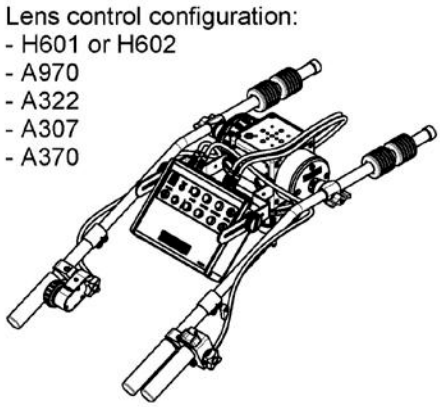


Figure 8: e-Cube lens control configuration.

5.2 Hand wheels assembly

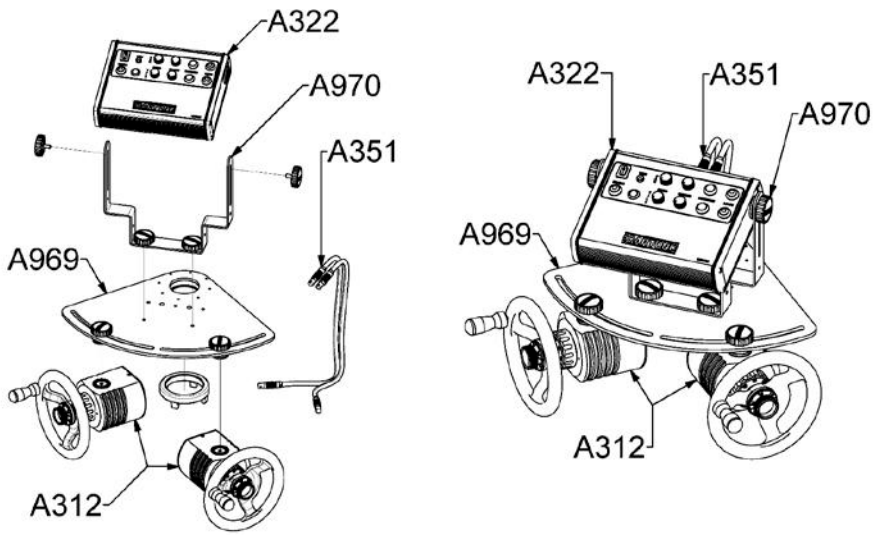


Figure 9: Hand wheels assembly components.

5.3 Remote head + Pan-Bar

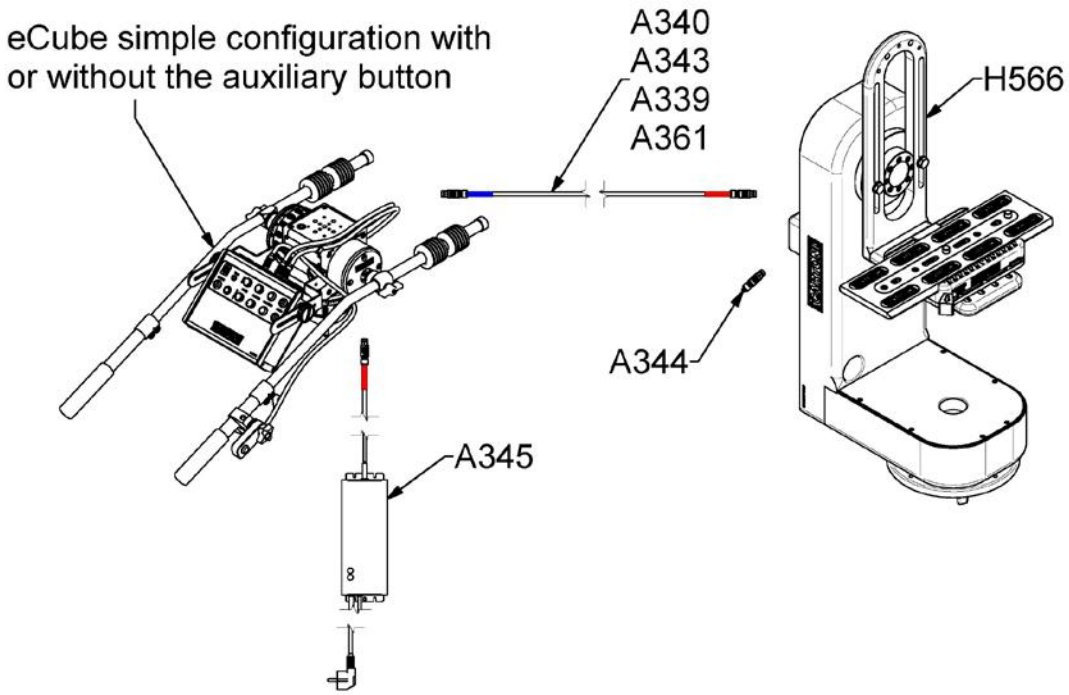


Figure 10: Remote head basic Pan-Bar control configuration.

5.4 Remote head + Pan-Bar with Zoom and Focus controls with digital lenses

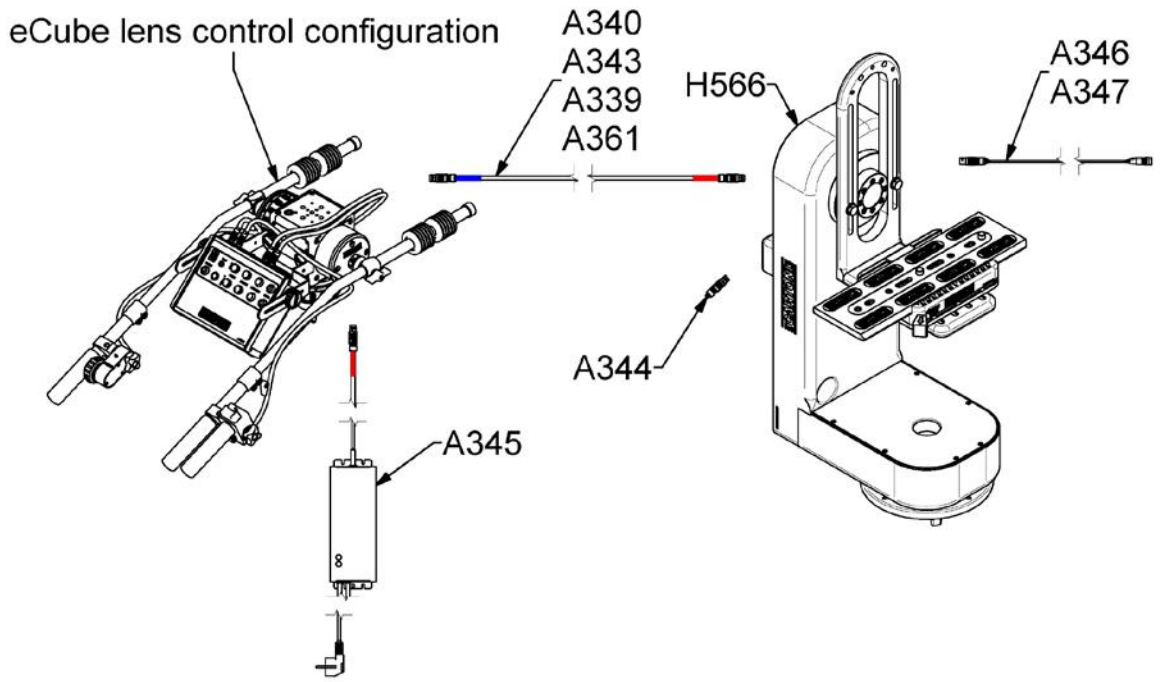


Figure 11: Remote head with Zoom and Focus digital controls.

5.5 Remote head + Pan-Bar with Zoom and Focus controls with external motors

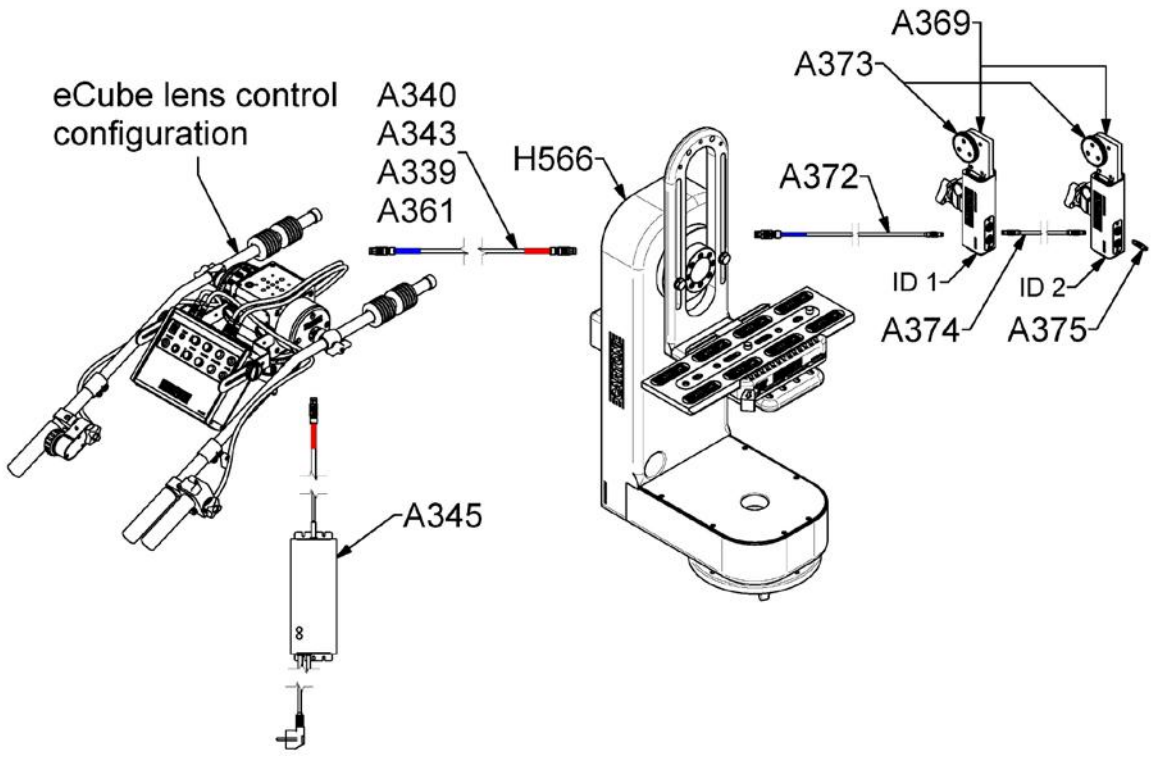


Figure 12: Remote head with Zoom and Focus external motor controls.

5.6 Remote head + hand wheels

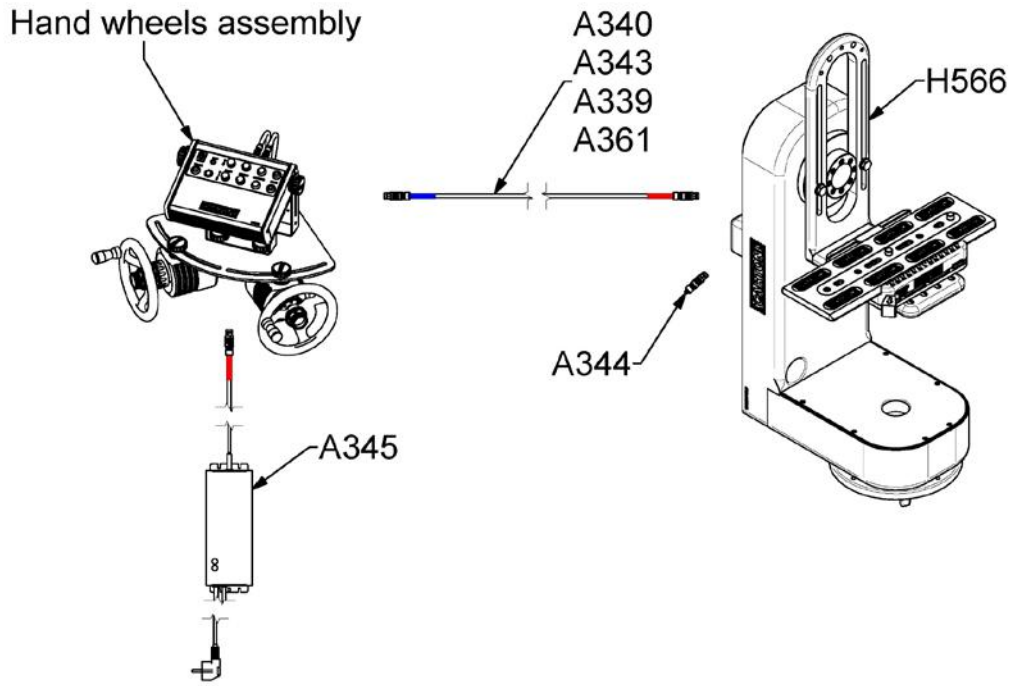


Figure 13: Remote head basic Hand wheels control configuration.

5.7 Remote head + Joystick + Zoom and Focus controls for desk setup

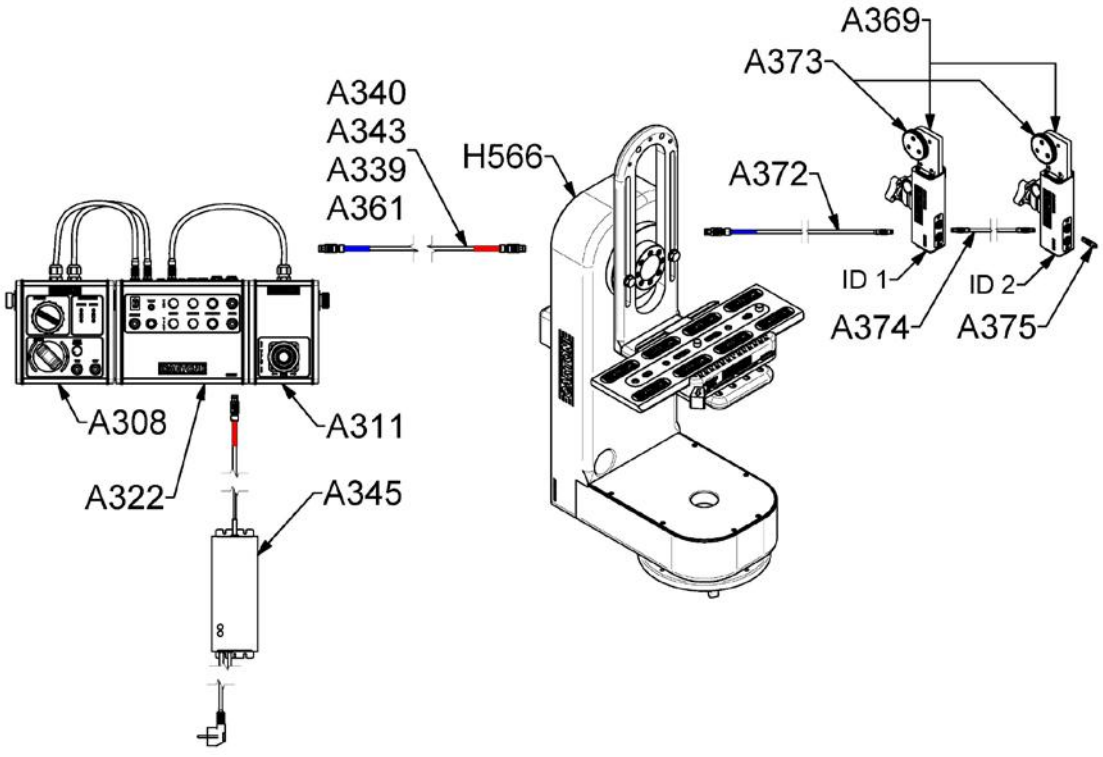
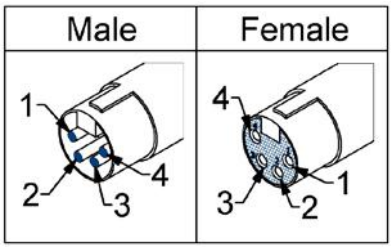


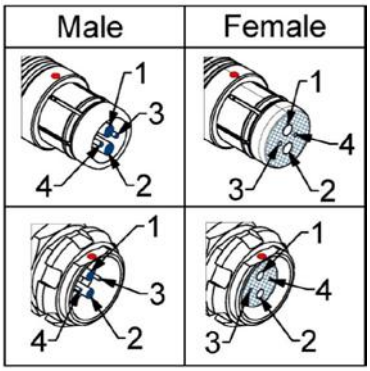
Figure 14: Remote head with Zoom and Focus external motor controls in desktop configuration.

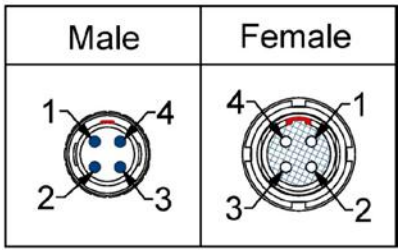
6 Troubleshooting

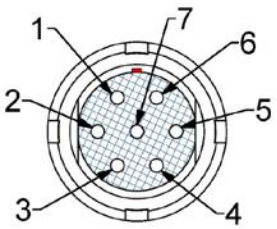
Problem	Solution
The system shutdown after a sudden movement.	Due to a high current consumption, the power supply has cut off the line to protect the circuits. Disconnect completely the power supply on both ends for 5 minutes, then reconnect the cables and the system will start again.
There is an excessive play on the e-Rem25 axes (Pan or Tilt).	Due to specific working condition or use, it is possible to observe a raise in the mechanical play on the transmission chain. In this case it is necessary to register the tightness of the transmission gear. Contact Cartoni technical support to receive instructions (Contacts on page 30).
Other problems not listed here.	Contact Cartoni technical support (Contacts on page 30).

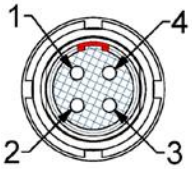
Annex A: Connectors pinout

Neutrik power connector (included in the power supply §4.6.1)	
	1. GND 2. NC 3. NC 4. +24V DC

Data / Power connectors (Standard)	
	1. GND 2. +24V DC 3. Data- 4. Data+

Data / power connectors (Mini) (Used on lens motors §4.4)	
	1. GND 2. +24V DC 3. Data- 4. Data+

Encoder connectors (Female on panels)	
	1. GND 2. Reserved 3. +5V 4. Channel A 5. Channel B 6. Channel I 7. Reserved

Tally output for monitor (Female on panels)	
	1. Common 2. NC 3. Output signal (connected with common when tally is on) 4. NC

Annex B: Driver installation

Cartoni electronic boards uses an FTDI chip to communicate through a Virtual COM Port on a computer.
For this to work it is necessary to install the FTDI drivers. FTDI drivers are available to download for free from FTDI website (www.ftdichip.com).
For driver installation, please refer to http://www.ftdichip.com/Documents/InstallGuides.htm.

Annex C: Lens compatibility

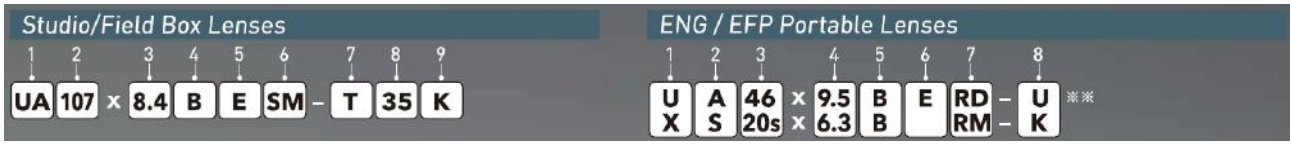
The Remote System can control a wide variety of Fujinon and Canon lenses. As a general rule in order to verify if a lens is compatible refer to the following tables:

Canon

All Studio / Field Box lens are supported	**6 = A**: *Zoom* and *Focus* servo **6 = R**: Only *Zoom* servo, one external lens motor can be used to control the *Focus* movement (§4.4). *VTR* and *RET* functions are supported only with a digital connection

Table 28: Canon lenses compatibility.

Fujinon



All Studio / Field Box lens are supported	**7 = RD or ZD**: *Zoom* and *Focus* servo **7 = RM**: Only *Zoom* servo, one external lens motor can be used to control the *Focus* movement (§4.4) VTR and RET functions are always supported

Table 29: Fujinon lenses compatibility.

Anyway, in order to be sure that your lens is controllable by the Remote System, please contact our technical support. The following lens models has been tested in our laboratories:

Lens model	Zoom Servo	Focus Servo	VTR function	RET function
Canon DIGISUPER XJ27X6.5B	✓	✓	-	-
Canon HJ14ex4.3B IASE	✓	✓	✓[1]	✓[1]
Canon HJ17ex6.2B IASE	✓	✓	✓[1]	✓[1]
Canon HJ18ex7.6B IASE S	✓	✓	✓[1]	✓[1]
Canon HJ21EX7.5B IRSE	✓	✗	✓[1]	✓[1]
Canon HJ24ex7.5B IASE S	✓	✓	✓[1]	✓[1]
Canon KJ22ex7.6B IASE	✓	✓	✓[1]	✓[1]
Fujinon DIGIPOWER XA72x9.3 BESM	✓	✓	-	-
Fujinon DIGIPOWER XA76X9.3 BESM	✓	✓	-	-
Fujinon DIGIPOWER XA99x8.4 BESM	✓	✓	-	-
Fujinon UA22X8.0BERD-S 8	✓	✓	-	-
Fujinon ZA12X4.5BERD-S58	✓	✓	✓	✓
Fujinon ZA17X7.6BERD-S6	✓	✓	✓	✓

Table 30: Tested lens models.

[1] Only with a digital connection.

Annex D: Devices priority

In case more devices with same functionality are connected together, only the device with the highest priority is taken into consideration. Refer to this table to know exactly what device has the precedence.

Axis	1st choice	2nd choice	3rd choice
Pan, Tilt	e-Cube	Hand wheels	Joystick
Zoom	Zoom handle	Joystick	
Focus	Focus handle		

Table 31: Input devices priority, highest priority in on the left side. If the device is not found the system will scan for the next device on the right.

The Lens controller for desktop is recognized as both Zoom and Focus handle.
Equivalent of the input priorities there is also a priority respected when digital lens and motors are connected together: the external motors take the precedence over the internal lens servo motors. **Always put the lens on manual when using external motors** (See Figure 4).

Annex E: Product codes

The product codes reported in Table 30 are to be considered valid at the revision date of this document (reported at the bottom right of each page). Values reported in this table are subject to change without advise.

Product Code	Description
A307	Focus remote control handle
A308	Zoom/Focus control module
A311	3-axis Joystick
A312	Handwheel
A313	Tally cable for external monitor
A322	Control console Pan, Tilt, Zoom, Focus
A333	Cable data/power 05 meters
A338	Bus Extender
A339	Cable data/power 50 meters
A340	Cable data/power 15 meters
A342	Cable data/power 01 meters
A343	Cable data/power 25 meters
A344	Fisher terminator
A345	Power supply 320W with cables
A346	Digital cable Canon HiRose
A347	Digital cable Fujinon HiRose
A351	Encoder cable Lemo 7 pin
A357	Emergency push button
A358	Digital cable Fujinon DB9
A361	Cable data/power 75 meters
A362	Conversion cable Zoom Fujinon Tajimi 8 pins
A363	Conversion cable Zoom Canon Tajimi 8 pins

A364	Conversion cable Focus Canon HiRose 20 pins
A365	Conversion cable Focus Fujinon HiRose 12 pins
A366	Conversion cable Zoom Fujinon HiRose 12 pins
A367	Conversion cable Zoom Canon HiRose 20 pins
A368	Tally sensor
A369	Lens drive motor
A370	Zoom remote control handle
A372	Zoom-Focus motor to head cable
A373/M4	0.4 MOD Gear for motor
A373/M5	0.5 MOD Gear for motor
A373/M6	0.6 MOD Gear for motor
A373/M8	0.8 MOD Gear for motor
A374	Zoom-Focus motor to motor cable
A375	Lemo terminator
A377	Enable/Disable auxiliary button handle
A378	Power supply 600W High power efficiency with cables
A969	Handwheels bracket
A970	Console bracket
H566	e-Rem25 remote head
H601	Pan-bar e-Cube
H602	Pan-bar e-Cube 7

Table 32: Product codes at 01/11/2021.

Contacts

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00159 – Rome
Italy

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Fax: ***+39 (0)6 43588293***
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e-mail: **cartoni@cartoni.com**

https://www.instagram.com/cartoni.camerasupports/

https://www.facebook.com/cartoni.camerasupports

https://twitter.com/CartoniSocial

https://www.linkedin.com/company/cartoni-spa

https://www.youtube.com/c/CartoniCameraSupports/videos

https://vimeo.com/cartonicamerasupports