MARK ROBERTS MOTION CONTROL

PTA-1

QUICK START GUIDE

QSG Product code: MRMC-2266-00
Product Covered: MRMC-1555-00, MRMC-2251-00

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PTA-1 Quick Start Guide

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Chapter 1 **Quick Start**

Important safety instructions

To ensure the best from the product, please read this manual carefully. Keep it in a safe place for future reference.

To reduce the risk of electric shock, do not remove the cover from the unit. No user serviceable parts inside. Refer servicing to qualified personnel.

Power and connections

- This unit must be connected to a mains socket outlet with a protective earth connection.
- This unit is not disconnected from the AC power source as long as it is connected to the wall outlet.
- When not using the unit for a long period of time, ensure that the AC power cord is disconnected from the wall outlet.
- The AC wall outlet should be installed near to the unit and be easily accessible.
- Do not plug in or attempt to operate an obviously damaged unit.

General care

- Do not force switches or external connections.
- When moving the unit, disconnect the mains cable and then disconnect the long umbilical cable.
- Do not attempt to clean the unit with chemical solvents or aerosol cleaners, as this may damage the unit. Use a clean dry cloth.
- Do not use around flammable gas. All electrical equipment can generate sparks that can ignite flammable gas.
- Keep away from pets and children. The head has powerful motors that can pinch, so take care not to get your hands trapped in the head or cabling.

- Keep cables tidy. Use cable ties to keep them out of harm's way. If you have a head with slip rings then make use of them; avoid running any cables between the base and the rotating head or camera.

Location

Installation of this unit should be away from sources of excessive heat, vibration, and dust.

Intellectual property

This product includes confidential and/or trade secret property. Therefore, you may not copy, modify, adapt, translate, distribute, reverse engineer, or decompile contents thereof.

Overview

Thank you for using the PTA-1 robotic camera head from Mark Roberts Motion Control (MRMC). The versatility of the PTA-1 to work with any camera and lens combination and fully remote remotely operable makes it suitable for Outside Broadcast environments. It has a high payload capacity of 25kg without a reduction in operational speed and can be deployed in height-restricted areas. With the IP65 rating, the system can be permanently installed in outdoor locations (stadiums, racecourses etc.) and due to its removable sled, any camera can be easily mounted and removed as required.

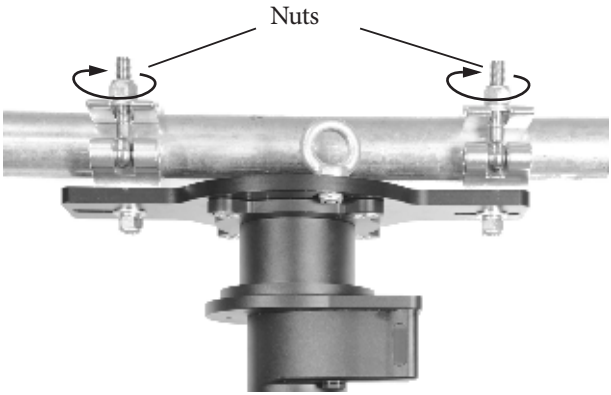
You can use the Ethernet connection on the PTA-1 to connect directly to a PC running Multi-Head Controller (MHC) software.

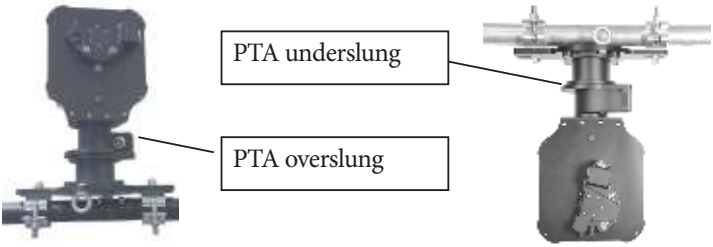
Setting up the hardware

1. Mount the Pan Tilt Arm (PTA) onto a heavy-duty scaffolding pole by securing the PTA to the pole using the two scaffolding clamps. Ensure the nuts on the clamps are tight and the arm cannot twist on the scaffolding plate.

> Note
>
> Ensure the mounting bar can take the weight without stress and that the space on the bar is free to allow full movement of the pod when panning without hitting any obstacles. The maximum weight of the PTA system is 30kg but due to motion and, if mounted outdoors possible high winds, the bar should be able to support at least 100kg.

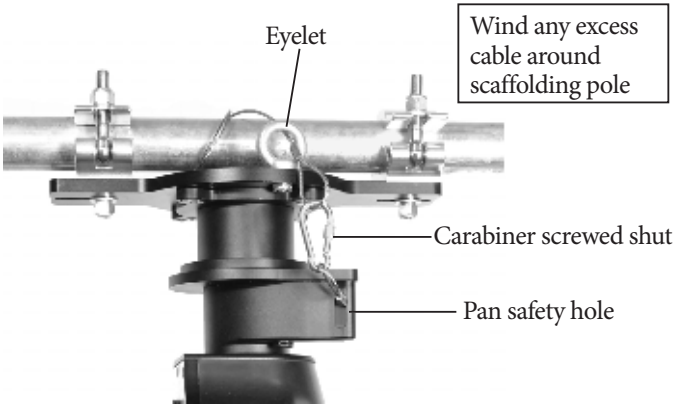
The torque setting of the screws in the scaffolding clamps is 159.1Nm. Always ensure there is enough thread going through the nyloc nut.





If the head is going to be used for target tracking, then ensure that the PTA is perfectly levelled to the ground using a spirit level.

2. Attach the safety cable around the bar, through at least one eyelet, and through the pan safety hole (near the connector socket). Remove any excess slack by making extra loops around the bar. Then join with a carabiner and screw the carabiner shut.



Note

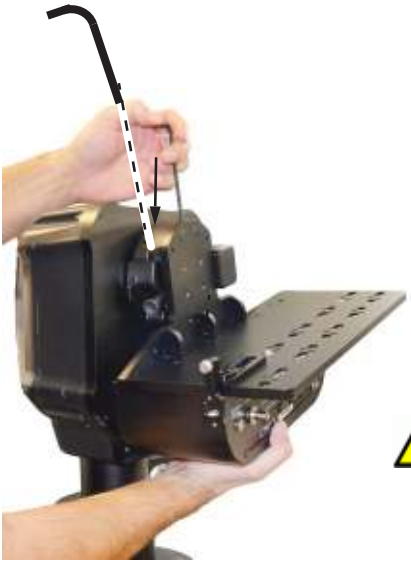
Safety cables should be wound up to keep them short:

- In the event of a fall, the falling item has less opportunity to get speed before the cable catches it.
- This prevents them catching on any moving parts.

3. Attach the roll ring to the arm by sliding the roll wedge into the side plate and ensure the safety catch locks into place —preventing the roll ring to be detached again. Then tighten the two captive screws to firmly secure the roll.

Safety catch

Once the roll ring is attached to the arm, safety catch locks into place



Tighten the screws using 4mm allen key. The torque setting of the screws is 11.2Nm.

Do not touch the contacts on the PTA.

4. Once the PTA-1 is fully constructed, test the movement of the unit by hand before connecting to power. Ensure that full movement of pan and tilt axes is possible and there are no obstructions.

Connecting the cables

Attach the power cables ensuring each connector is fully secured into the socket and that the cable or connector is not caught in any moving part.

1. Connect the short umbilical cable to the power connectors in the PTA and the Pod. Ensure the red markers on the socket and the plug align.

2. Connect one end of the long umbilical cable to the PTA-1 and the other to the power supply socket in the break-out box. Ensure the red markers on the socket and the plug align.

3. Connect one end of the network cable to the Ethernet connector in the junction box and the other to the PC. If your setup contains multiple heads connected via Ethernet, then the network cable would connect to a network switch, which in turn would be connected to the PC.

4. If you are using the D5 in video mode, connect the **SDI Out** connector to a video output device using a standard coaxial cable. The maximum recommended length of the cable is 5m.

5. Optionally, connect the USB port on the PC to a joystick, such as an Xbox joystick or a MRMC Joystick Controller. This device gives you a precise and real-time control of the camera direction and functions. You can use the MHC screen to control the camera instead if you omit a joystick.

6. Finally, connect the mains cable to the power supply.

Notes

Appendix 1 **Troubleshooting**

Typical symptoms, causes, and actions

Symptoms	Cause and/or action
PTA-1 head did not appear connected in MHC	Check that all cables are connected, and all devices have power. Check you have added the correct IP address of the PTA-1 head in MHC. If you have connected more than one PTA-1 heads, connected the MRMC system to another local network, or moved the PTA-1 head between networks, check that correct addresses have been entered in MHC.
The LEDs on the PTA-1 head did not light up.	
A '!' appears with the PTA-1 head icon in the MHC Main screen.	Click the spanner( ) icon appearing below the PTA-1 head icon to allow MHC to correct the error.
PTA-1 tracking is not accurate	Ensure that the PTA is installed perfectly levelled to the ground. Ensure that you have checked this with spirit level.
While tracking the camera is pointing in the wrong direction.	The Pan axis must move to the left when position is moved positively. If it is incorrect, then scaling for the axis will need its sign changing. The Tilt axis must move up when position is moved positively. If this is incorrect, then scaling for the axis will need its sign changing.

Notes

Appendix 2 **PTA-1 connectors**

Connector plate summary

1. **SWITCHABLE 24VDC 1A** connector is the 24V DC outlet for powering a camera or HDMI/SDI signal converter. Centre positive.
2. **VIDEO IN** input connector for the video 1 signal from the camera. This circuit is rated at 3 GHz and internally connects with the **VIDEO** out connector in the junction box via the Power/ Communications cable.
3. **SERIAL LENS** connector is for the serial (digital) lens that has internal servo motors for focus, zoom, and iris.

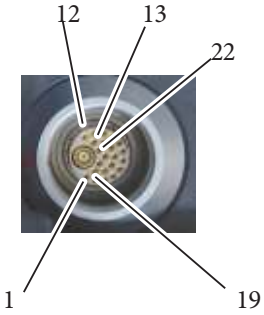
4, 5. **FOCUS**, **ZOOM** connectors for external servo Lens Control Motors (LCMs).

6. **CAMERA POWER 12VDC OUT 10A** connector for powering a camera. The maximum allowable load for the outlet is 10Amps.
7. **CAMERA ETHERNET** connector is the RJ45 Gigabit Connector rated at 1000 mbits/sec for communications between the camera and the head.

Connector pin-outs

Panel mount connector

Panel mount connector is the 22-way (female) connector of type EGG.3K.822.CLL1 on the camera platform and the arm.

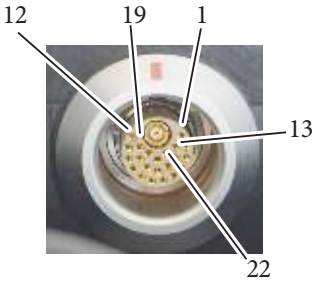


1. 24V
2. GND
3. 24V
4. GND
5. 24V
6. GND
7. Ethernet 1
8. Ethernet 2
9. Ethernet 3
10. Ethernet 4
11. Ethernet 5
12. Ethernet 6
13. Ethernet 7
14. Ethernet 8
15. CANL
16. CANH
17. Motor+ (ROLL)
18. Motor-
19. Encoder A
20. Encoder +5V
21. Encoder B
22. Motor Limit (detect if motor is connected)

Panel mount connector

Panel mount connector is the 22-way (female) connector of type EGG.3K.822.CLL1 on the arm base and in the power supply box.

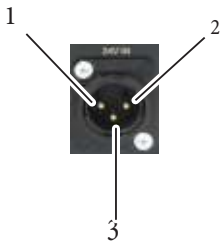
1. 24V
2. GND
3. 24V
4. GND
5. 24V
6. GND
7. Ethernet 1
8. Ethernet 2
9. Ethernet 3
10. Ethernet 4
11. Ethernet 5
12. Ethernet 6
13. Ethernet 7
14. Ethernet 8
15. Not assigned
16. N/C
17. N/C
18. N/C
19. N/C
20. N/C
21. N/C
22. N/C



Power In connector

Power to supply the head and the power output connector on the junction box. It is a XLR 3-Way (Male) connector. The PTA-1 can run from 12-35 Volts DC.

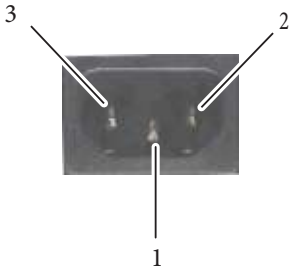
1. GND
2. N/C
3. +24V



Mains In connector

Power input connector n the junction box for the PTA-1 head. It is a 3-Way (Male) C14 IEC connector. 240 Volts AC.

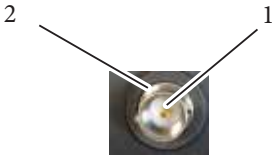
1. Earth
2. Live
3. Neutral



SDI Out Connector

Connector for SDI Video signal from the camera in the junction box.

1. Video Out (HD or SD) Centre
2. GND



Switchable 24VDC 1A Connector

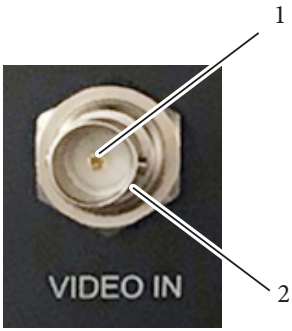
24V DC outlet for powering a camera or HDMI/SDI signal converter. Centre positive.

1. GND (collar)
2. 24VDC

Video In Connector

The **VIDEO** connector is rated at 3 GHz allowing the video signal from the camera to go into the head, through the long communications cable, and out through the junction box.

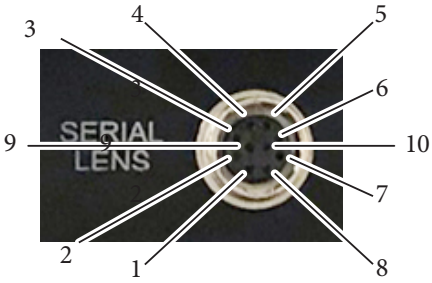
1. VIDEO (inner)
2. GND (outer)



Serial Lens connector for internal servo LCMs

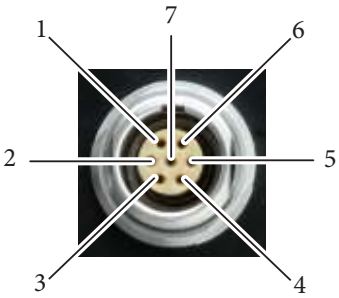
Connector for a serial (digital) lens that has internal Lens Control Motors (LCMs) for focus, zoom, and iris.

1. Boot Select
2. RS232 Out
3. RS232 In
4. VCC
5. GND
6. RS232 Select
7. RS422 Out –
8. RS422 Out +
9. RS422 In +
10. 1RS422 In –



Focus, Zoom connectors for external servo LCMs

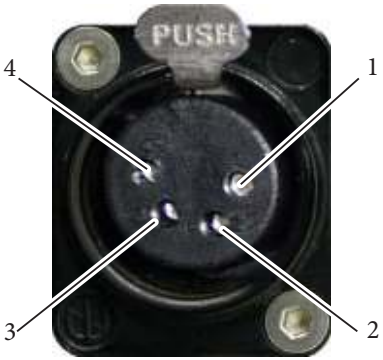
The **FOCUS** and **ZOOM** connectors are for external servo Lens Control Motors (LCMs).



1. Motor +
2. Motor –
3. Encoder A
4. +5V
5. GND
6. Encoder B
7. Motor ID

CAMERA POWER 12VDC OUT 10A connector (large 4-way XLR)

General purpose 12V DC outlet.



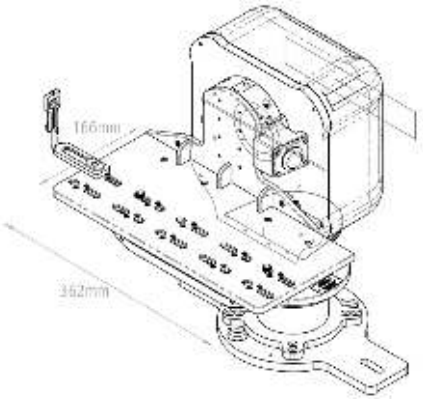
1. GND
2. N/C
3. N/C
4. +12VOUT

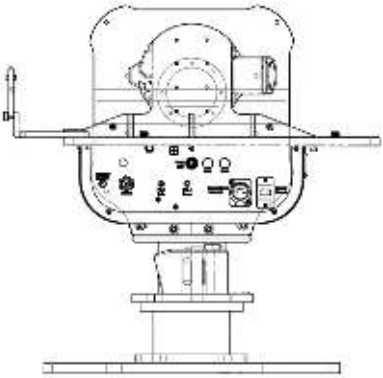
Notes

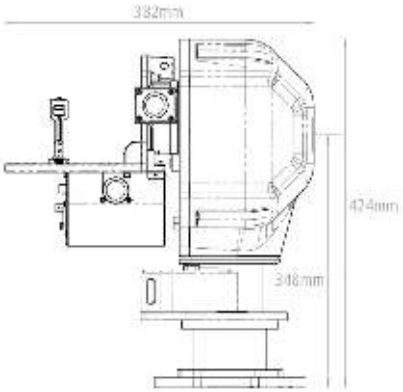
Appendix 3 **Specifications**

Size	Operational space	~ 1.2m^3
Weight	PTA-1	15.3kg
	Connection cable (long)	5m: 1.10kg 10m: 2.10kg 15m: 3.10kg 20m: 4.10kg 30m: 6.10kg
	Connection cable (short)	0.30kg
	Breakout Box	4.00kg
Camera payload	25kg	
Power requirements	24 Volts DC 10A Optional 110V 16A and UK/EU/US	
Temperature range	0-45 °C (32-113 °F)	
Humidity tolerance	0% to 85% relative humidity, non-condensing	
IP Rating	IP65 (with connector plate seal modification)	

Connections	Via camera platform: • RJ45 Gigabit Ethernet (1000 BASE-T) (IEEE 802.3ab) for Camera • 3G HD SDI Max output 1080p 50/60 FPS • Camera power 12V • Switchable 24VDC 1A • Serial lens connection (10 pin hirose) • Lens motor lemo connections for Zoom and Focus Via power supply unit: • RJ45 Gigabit Ethernet (1000 BASE-T) (IEEE 802.3ab) for Camera • 3G HD SDI Max output 1080p 50/60 FPS • 24VDC 9.2 A
Axes speed	Pan: 0.001° – 180° per second Tilt: 0.001° – 180° per second Zoom: 0.001° – 60° per second Focus: 0.001° – 60° per second
Accuracy of playback (angular resolution)	0.3 arc-min


166mm
362mm




332mm
424mm
348mm

Product Number	Product description	Comments
MRMC-2136 -00	PTA-1 Robotic Broadcast Arm Adjustable Platform	POD arm, Adjustable platform with shower-proof Electronics box, POD breakout box, 600mm umbilical, 5m umbilical, Scaffold plate
MRMC-2137 -00	PTA-1 Platform, Adjustable, Showerproof	Adjustable platform with shower-proof Electronics box
MRMC-2152 -00	PTA-1 Adjustable Platform Only (No Electronics Box)	Adjustable platform
MRMC-1555 -00	POD ARM ASSEMBLY (NK-PP-600-01)	Standard POD arm
MRMC-1556 -00	Pod PSU & Connector Block Assembly (M-ASM-000015)	Standard plastic POD breakout box
MRMC-1531 -00	Cable Assembly 22+1HD Way 5m LEMO FGG.3K.822.CLCK23 Z w/75R Cable	Standard POD 5m umbilical cable

Product Number	Product description	Comments
MRMC-2902 -00	Cable Assembly 22+1HD Way 600mm LEMO FGG.3K.822.CLCK23 Z w/75R Cable	PTA-1 electronics box to POD arm cable
MRMC-1504 -01	ROBOTIC POD SCAFFOLD MOUNTING PLATE ASSY	Standard POD mounting plate
MRMC-8007 -00	PTA-1 Kit	Unfinished product

Notes

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