

MARK ROBERTS MOTION CONTROL

QRS - QUIET RAIL SYSTEM



QUICK START GUIDE

QSG Product code: MRMC-2138-00

Product Covered: MRMC-8074-00, MRMC-8046-00

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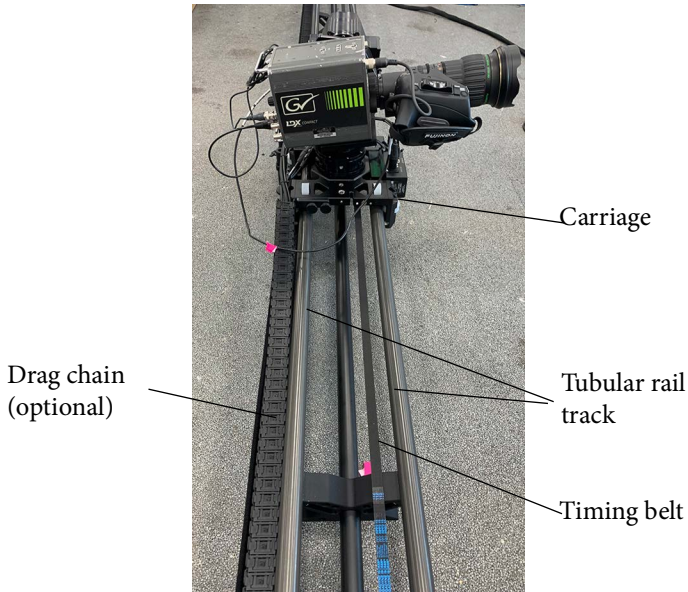
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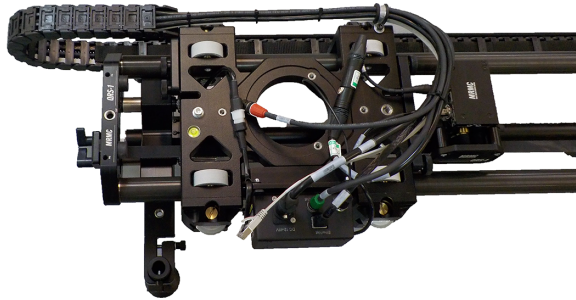
Chapter 1 Quick Start

Overview

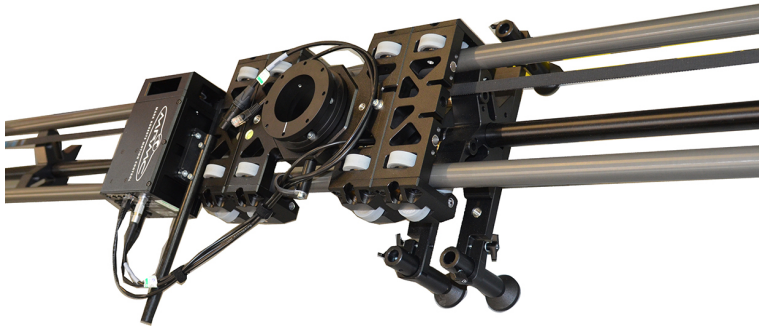
Thank you for using the Quiet Rail System from Mark Roberts Motion Control (MRMC). The Quiet Rail System (QRS) is designed for reliable day-in, day out use in professional studio environments. The extremely quiet Quiet Rail System is used in conjunction with MRMC heads such as AFC-100s and the modular system is designed to help you achieve smooth, repeatable camera motions. It is suitable for live action, stills, and time-lapse applications, and can handle a total camera and head payload of up to 20kg.



QRS comes in two variants:



QRS less than 6m long with a standard carriage capable of carrying a payload of up to 20kg.



QRS greater than 6m long with a larger carriage for greater stability with larger drag chain.

Quiet Rail System has the following components:

- The tubular rail track on which the carriage carrying the head and the camera slides.
- The carriage on which the robotic head is mounted. The carriage also has the stepper motor drive box and FreeD capable unibox which drives the stepper motor attached to it.

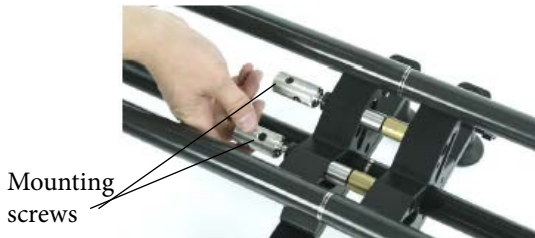
- The timing belt
- The optional cable management system, or drag chain, which houses the cables for the motor drive, unibox, head and the camera and moves along with the carriage.
- The robotic head and the camera

Safety

- Do not use around flammable gas. All electrical equipment can generate sparks that can ignite flammable gas.
- Keep Away From Pets And Children. The track and camera heads have powerful motors that can pinch, so take care not to get your hands trapped in the gears or cabling.
- Keep the equipment dry. The system has **not** been made weatherproof. Do not use with wet hands.
- Keep cables tidy. Use cable ties to keep them out of harm's way, and use the cable arm supplied with the Monorail to keep any trailing cables (such as Ethernet and power cables) away from the belt drive. If you have a head with slip rings then make use of them; avoid running any cables between the base of the head and the rotating part of the head or camera.

Assembling the Quiet Rail System

1. The Quiet Rail System is delivered in 2m sections which can be easily joined together. Before you start joining the sections, place them on an even stable surface.
2. Place the two lengths with the end-clocks mounted at the end of either side.
3. Feed the carriage into either of the end sections.
4. Place any other lengths in the centre of the two end rails.
5. Match the sections; each section has a “left” and “right” side – one side has centering pins and mounting screws, the other one – pin holes and screw holes. Tighten the mounting screws.

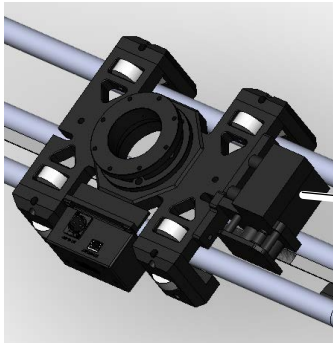


Tip

Insert a key or a screw driver in the mounting screws to tighten them with more force.

Adding the Timing Belt

1. Ensure that motor drive is already attached to the carriage.

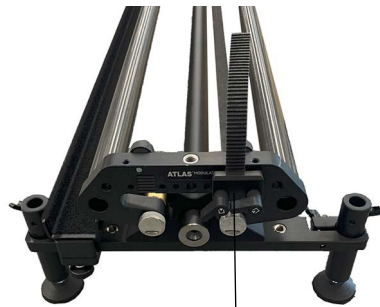


Motor drive attached to the carriage

2. Place one end of the timing belt in the clamp on the motion end block and tighten the clamps

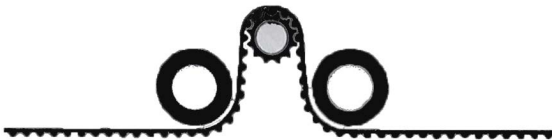
Hint

When mounting the timing belt ensure that the clamp is on the same side of the slider as the drive's gear wheel. If necessary, place the clamp symmetrically on the other side of the stop.



Clamp

3. Conduct the belt through the motor drive's wheels. Skip this step if your version of motor drive already has the belt mounted..



4. Place the second end of the belt analogically on the second motion end block and stretch the timing belt,

5. Holding the stretched belt, tighten the clamp on the other motion end block.

Note

Ensure that the timing belt is hand-tight and not over-stretched. It is recommended that the tightness of the belt is checked every two weeks and if loose, it should be tightened accordingly.

Adding the tray and the drag chain (optional)

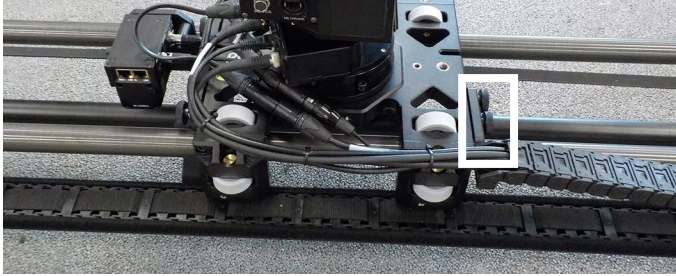
1. If not already mounted, add the clamps for the drag chain. Note that these should be on the side opposite to the unibox mounted on the carriage so the drag chain does not obstruct the carriage movement.
2. Place the tray over the clamps; the slots in the tray will attach to the clamps magnetically. Similarly add all the tray segments to the track sections.
3. Attach the end of the drag chain with the cable wrap to the end of the tray.



Note

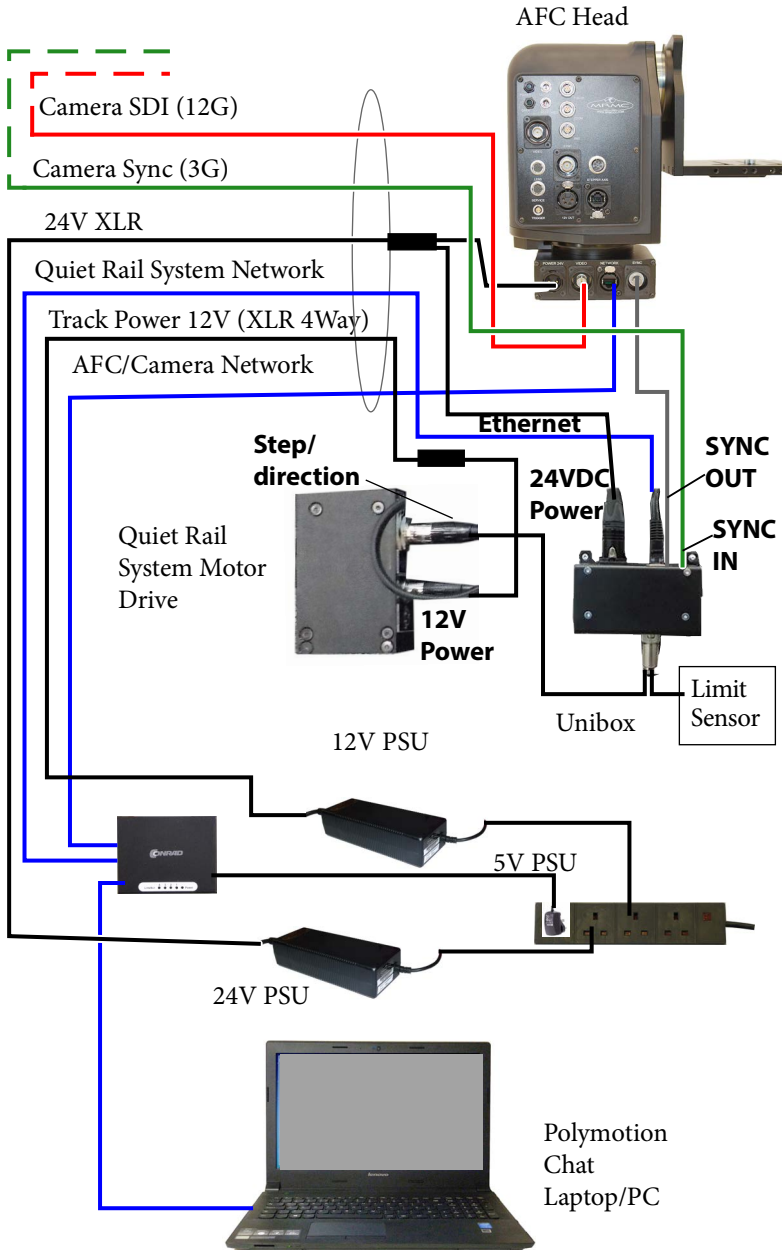
Raise the track as far as possible on the feet so the top of the feet do not obstruct the travel of the carriage.

4. Attach the other end of the drag chain to the side of the carriage by tightening 2 x thumb screws.



5. Mount the head on the carriage.
6. Mount the camera on the head using the instructions in the *AFC Quick Start Guide*.

Connecting the Cables - QRS (< 6m Track)

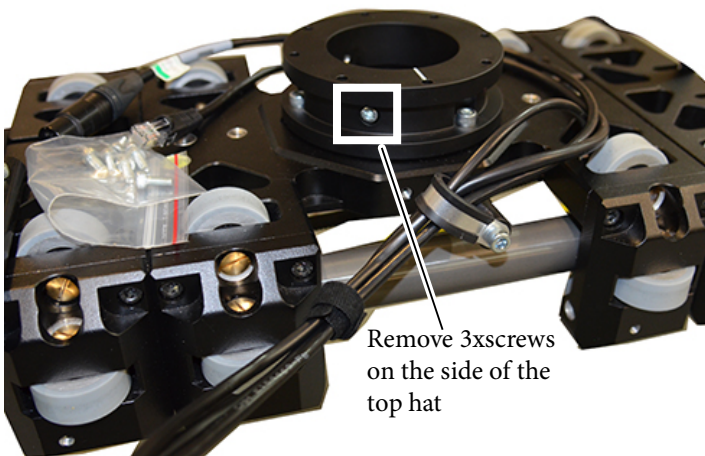


Picture of cable connections

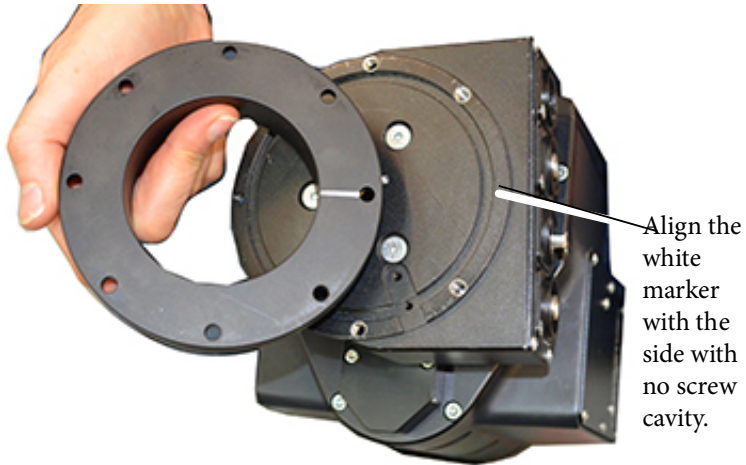


Attaching the Head

1. Remove the top-hat from the carriage by unscrew 3xscrews on the side.

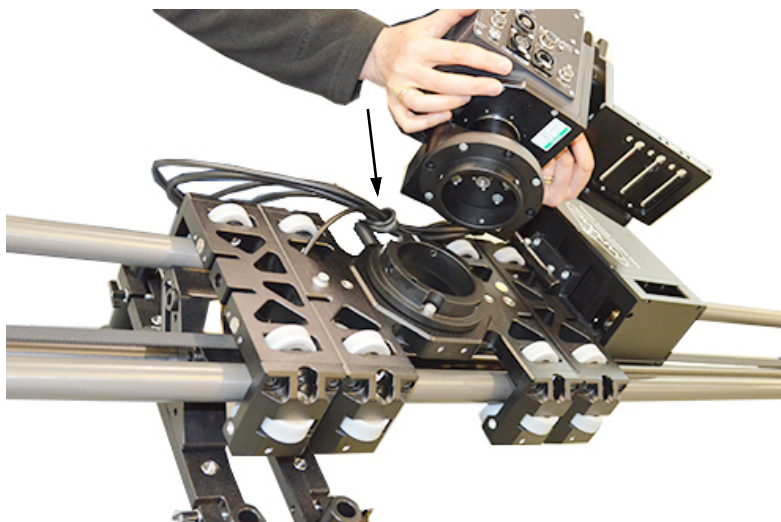


2. Align the top hat with the bottom of AFC-100 such that the white marker is just below the point without screw cavity.



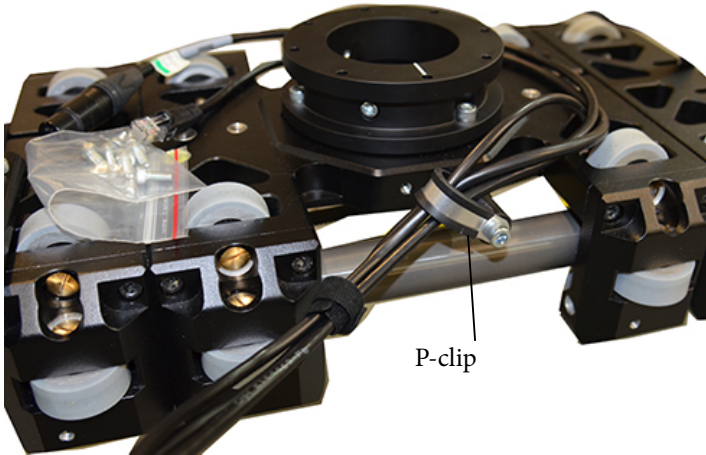
3. Now reverse the top-hat and add 7xscrews to secure it with the underside of the AFC-100 head.
4. Attach the AFC-100 head with the carriage by aligning the three markers on the carriage interface with the marker on the AFC-100

interface and tightening the 3xscrews. Note that the marker on the AFC-head top-hat interface is not no longer visible.



Adding the Cables (>6m track)

1. Unscrew the p-clip attached to the carriage.

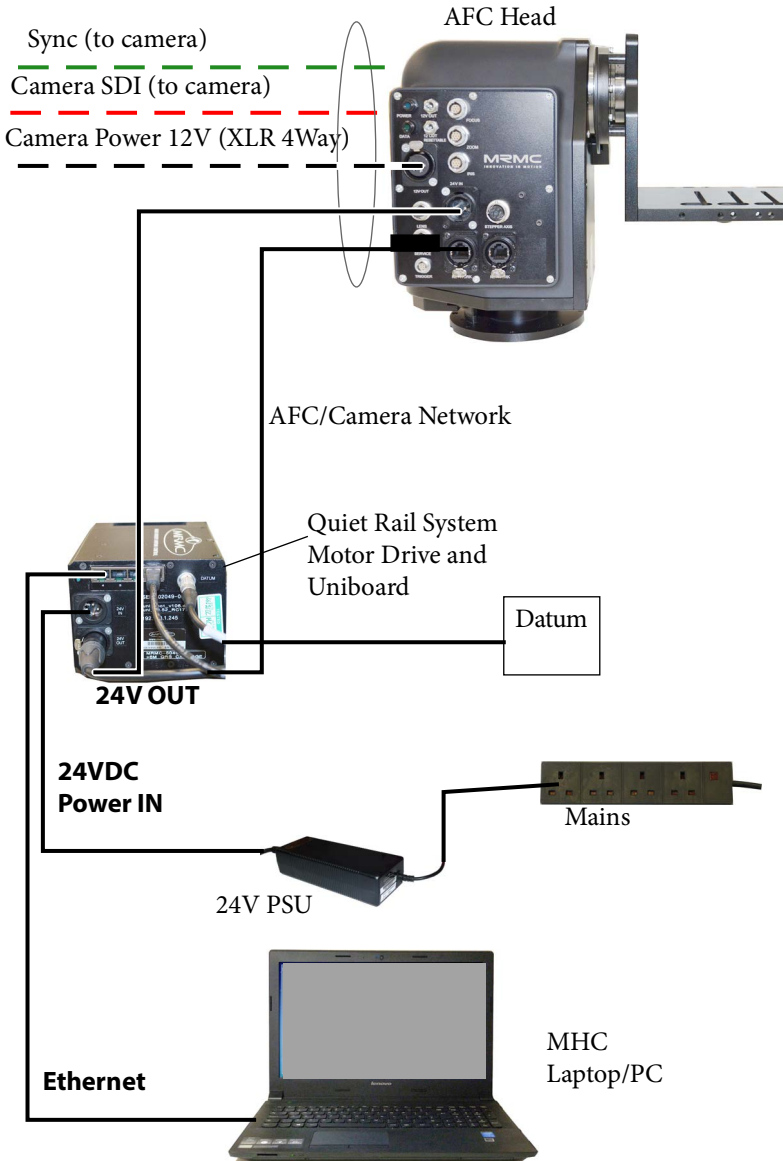


2. Feed additional cables through the p-clip ensuring that they are in the same direction as above to prevent them from catching on the head or the carriage during movement.

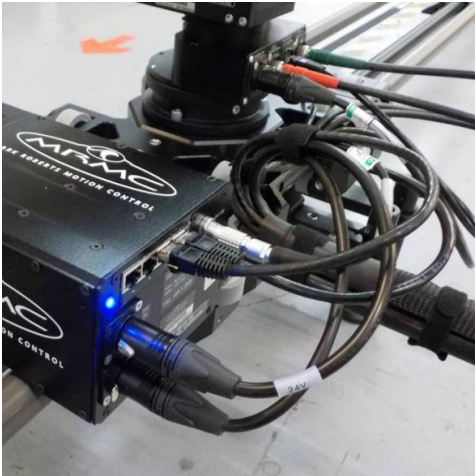


3. Screw the p-clip back to its location.

Connecting the Cables - QRS (> 6m Track)



Picture of Cable Connections



Datum magnet

Quiet Rail System has a Single Datum magnet which can be detected by the Datum Switch on the carriage. The Datum magnet defines a fixed reference point on the track for the electronics. The Chat PC can then use this position as the **home** position or **zero point**, from which all positions, movements, and soft limits along the track are measured.

Datum magnet



Hint

If you move the Datum magnet to a different position along the track, remember to change the soft limits in your controller or Flair/MHC computer to cater for the new Home position.

Notes

Appendix 1 Specifications

Weight: 14.5 kg for the Rail track and legs
3 kg for the carriage

Operating Voltage: (Motor Unit) 12V DC
(Unibox) 24V DC

Temperature range: 0-40 °C (32-113 °F)

Humidity tolerance: 0% to 85% relative humidity, non-condensing

Maximum payload (head + camera): 20kg

Rail Range of Motion: Subject to rail length, in sections (1.2m, 2m, 3m and multiples thereof)

Maximum speed: 40cm/s

Maximum Acceleration/Deceleration: 40cm/s²

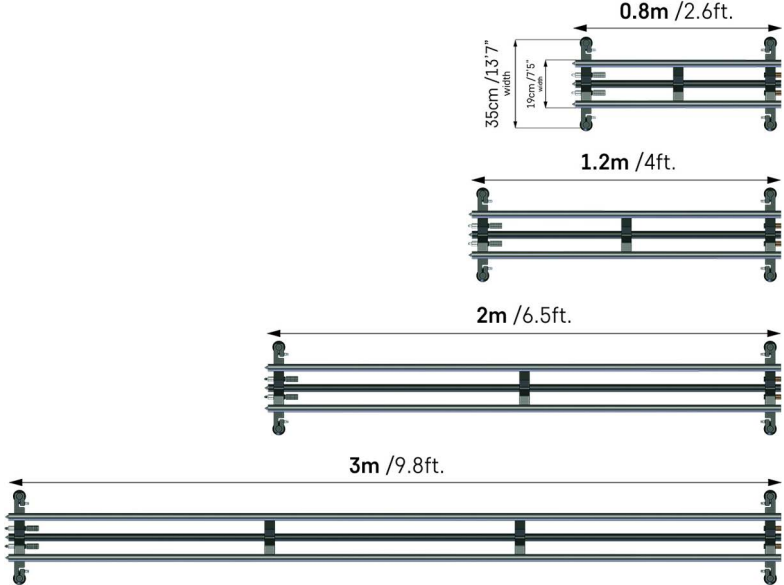
Bi-Directional Repeatability: <4mm

Noise level: <42db

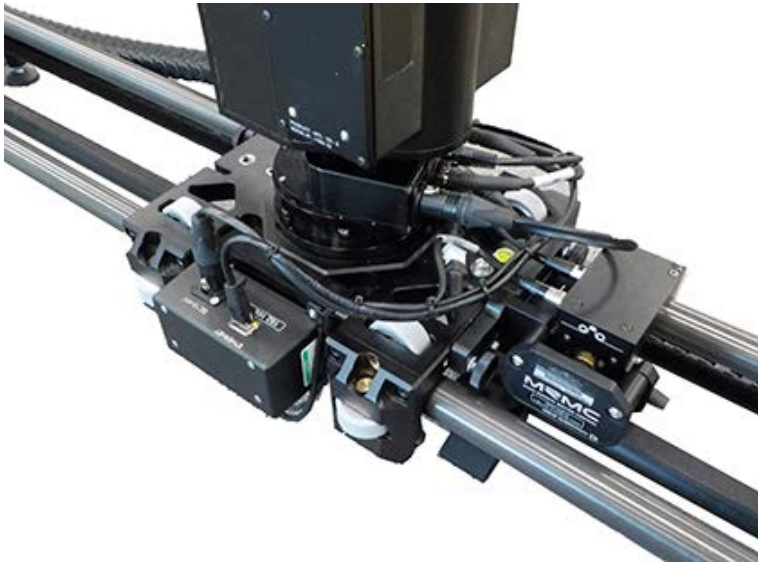
Communications Interface: Ethernet MRC Protocol

Maximum width of feet: 400mm

Range of feet adjustment: 20mm



Notes



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