MRMC
MARK ROBERTS MOTION CONTROL

ORBITAL XL
AUTOMATED PRODUCT PHOTOGRAPHY

QUICK START GUIDE

QSG Product code: MRMC-2228-00
Product Covered: MRMC-2004-03

CRANES AND RIGS | BROADCAST | HEADS & DSLR | PRODUCT PHOTOGRAPHY | RENTALS

Orbital XL 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 the 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.

General care

- Do not force switches or external connections.

- When moving the unit, disconnect the mains 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 Orbital XL from Mark Roberts Motion Control (MRMC). The Orbital is a robust e-commerce solution for taking high-volume product shots in conjunction with the MRMC turntables providing full-control whether you are shooting stills, 360 spins, multi-row photography or video. Camera controls and presets for the rig can be configured and saved in Flair Motion Control Software by MRMC for a fully automated and accurate product photography.

With a large operating envelope, the XL is ideal for shoots requiring more reach and height. With a 2.4m height, you can get right over the top of larger products, such as larger household appliances, furniture or even cars.

Tools required

- Gantry, at least 4m high (Fork lift can be used instead)
- Heavy duty lifting straps
- Hex key set
- G-clamp

Setting up the hardware

1. Carefully extract the rig from the packing crate.

2. Before lifting the lift column, using 2 x screws add the supplied 2 x buffers on the end of the lift column. (The buffers on the track are already mounted.)

> **Note**
>
> Bumpers are steel plates that physically prevent the rig from going off the end of the lift and track should the soft and hard limits fail. Rubber bumpers on the rig help to prevent damage to the rig or lift or track, but you should never intentionally use the buffers to stop the rig.

3. Remove cable ties from the lift motor. Also remove the 2x screws added for protection of the motor during shipment.

Remove the 2xscrews

Remove the cable tie
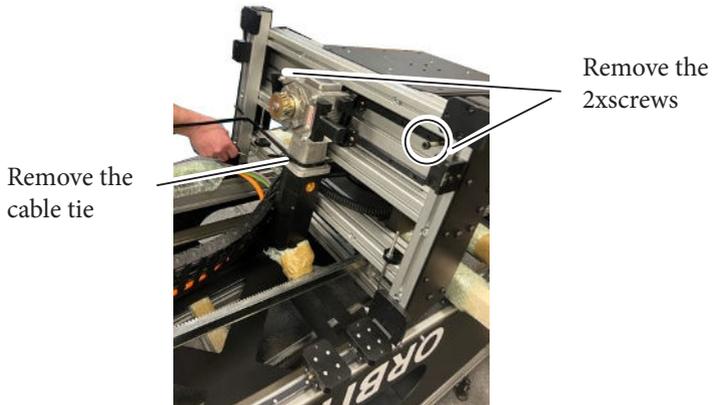
4. Lift the carriage pivoting it on the bearing blocks that hinge on one side. When fully upright, seat it on the second pair of bearing blocks on the other side.

5. To attach the drag chain, locate the spacer on the lift motor and loosen the 2 x countersunk screws on the plate on the end of the

drag chain and put back in when the plate is lined up with the spacer.

Spacer
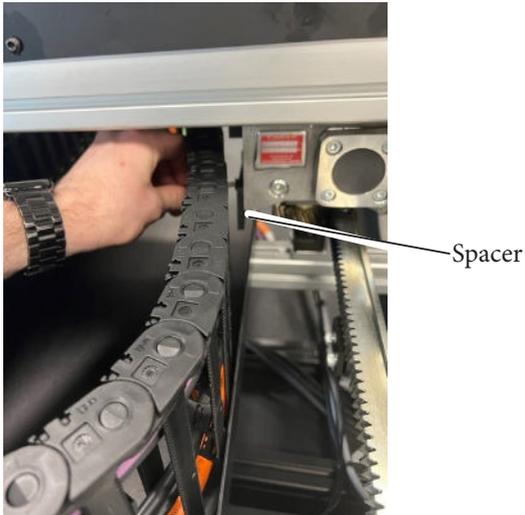
6.   Tighten the 8 x screws on both sides on the lift carriage to secure it to the bearing blocks on the lift rail.

Note

Screws are supplied in a bag inside the lift carriage.

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7.   Move the carriage to the bottom of the lift column.

8. Align the lift motor zero markers on the side, as shown.

Align the zero marker on the lift

9. Use the procedure in *Attaching the lift motor pinch wheel* on page 15 to put the motor in mesh with the racking and attach the pinchwheel assembly.

> Note
>
> The motors in Orbital XL have absolute encoders. Before the motor is put in mesh, line the markers, so the motor can be set to zero in this position. This step is essential when taking the motor out of mesh and putting it back in mesh again, for example when replacing the pinchwheel.

10. Remove cable ties from the track motor. Also remove the 2x screws added for protection of the motor during shipment.
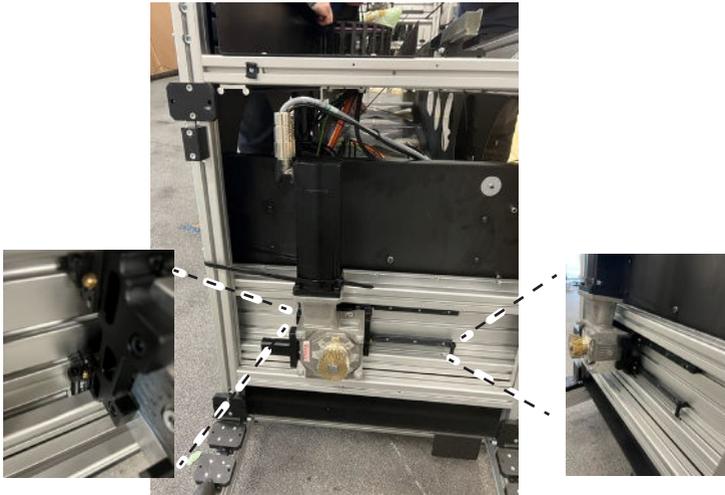
11. Unstrap the weights on the carriage when it is safe to do so.

12. Tie the lifting straps around the first or second sleeper (depending on the lifting apparatus height with respect to the gantry) on the lift column and hook it to the gantry. Gently, lift the column pivoting it on the bearing blocks that hinge on one end on the track. When fully upright, seat it on the second bearing block on the track. Be aware that as the column is lifted up, the hinged bearing should slide on the track to make space for the other end to land on the second

pair of track bearing blocks.Tighten the 2 x screws on both sides on the lift carriage to secure it to the bearing blocks on the lift rail.
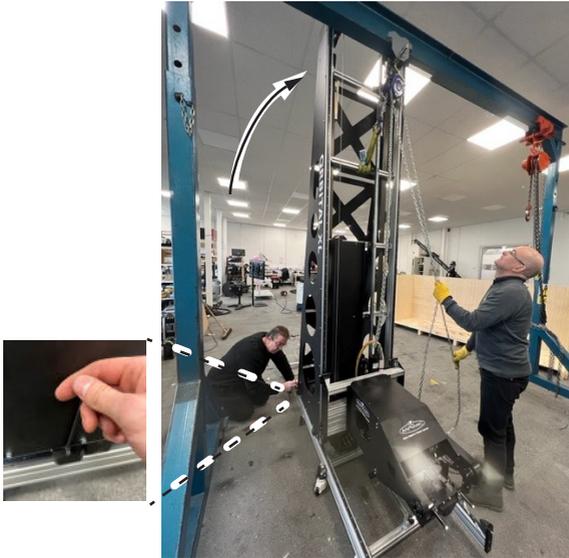
Note

Screws are supplied in a bag inside the base.

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13. Move the carriage to the end of the track to align the track motor zero markers, as shown.
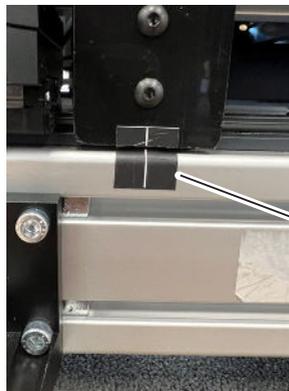
Align the zero marker on the track and lift column

14. Use the procedure in *Attaching the track motor pinch wheel* on page 14 to put the motor in mesh with the racking and attach the pinchwheel assembly.

> Note
>
> The motors in Orbital XL have absolute encoders. Before the motor is put in mesh, line the markers, so the motor can be set to zero in this position. This step is essential when taking the motor out of mesh and putting it back in mesh again, for example when replacing the pinchwheel.

15. Add the cable arm and the umbilical as shown in *Connecting the cables* on page 13.

Joining the Track Extension

1. Ensuring that the feet in the track under the Orbital XL are raised and the rig is resting on the castors, wheel it to the location.

2. Level the track in both length and width directions using a spirit level, by adjusting the four corner feet of the track. Make sure all four corner feet are touching the ground (no wobble).

> Hint
>
> The four corner feet also determine the track height. If you are laying track on a level floor, try to use the middle of the height adjustment range so that subsequent sections have some leeway (in their feet) to cater for any unevenness in the floor.

3. Lower the middle feet. Using the spirit level again level the track on the ground. Tighten all the lock nuts on the feet.

4. Lay the next track section in line with the previously laid track section with a gap of approx. 10mm, making sure it is the right way around (the teeth of the racking should be on the same side.)

5. Adjust the height of the new track section to match that of the previous section by adjusting the two corner feet nearest to the joint (one on each rail).

6.   Level the new track section with a spirit level by adjusting the two corner feet furthest from the joint (one on each rail).

7.   Align the racking teeth of both lengths of rail. Make sure the rack joint has the correct spacing by clamping a rack matching block to it, teeth meshed, using a G-clamp.

8.   At one of the track joints, slide a track bearing over the ends of the bearing rails.

9.   Put one of the long bearing rail joints onto the track.

10. Align the bearing rail joint with the existing rail by sliding the spare 2 x track bearings partially over the joint at each end.

Track bearing

> **Note**
>
> The spare track bearings are packed in the kit with part number OEM-LBRS-0041.

11. Insert the 6 x screws and loosely tighten them.

12. While aligning the bearing rail joint to the rail, slide the track bearings along the rail over the joint back and forth until a smooth movement is achieved. Fully tighten all the screws.

13. Repeat steps 10 to 12 for all remaining joints.

14. Slide the rail joiner towards the rail extension to attach it. Tighten the screw. Repeat on the opposite side.

Bearing rail joint

Rail joiner
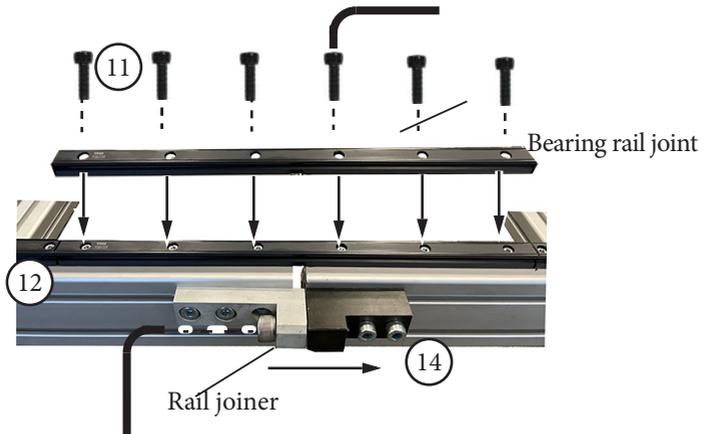
Mounting the lens control motor

1. Mount the lens control motor onto the camera bracket by clamping it on the matte bar and ensuring that the gears on the motor are in mesh with the lens ring gears.

Align gears

Clamp motor to matte bar

2. Plug the required cables to the camera, such as the Ten Pin cable for the camera power, HDMI cable and USB cable.

Connecting the cables
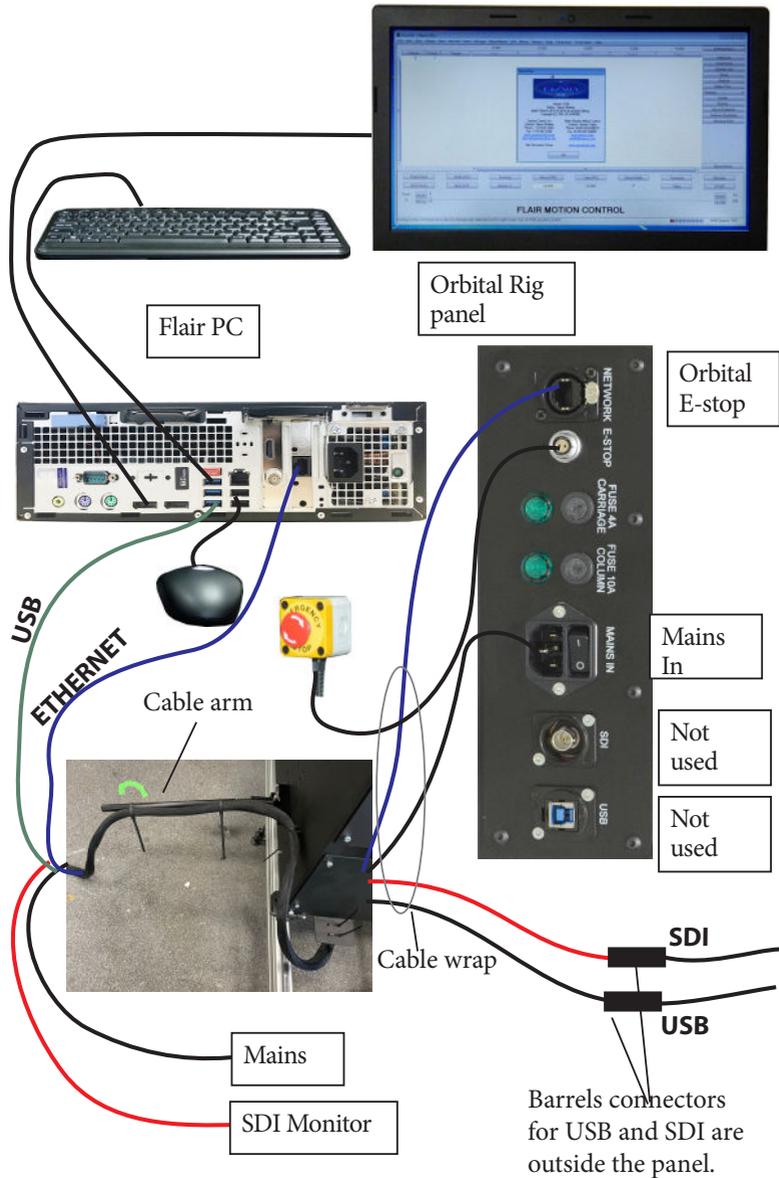
The diagram shows a typical application. Attach the power cables last.

Attaching the track motor pinch wheel

1. On the separately supplied track pinch wheel assembly, remove the brass retaining pin by pulling on the ring.

2. Push the track motor slightly towards the rail racking so that the track motor gear is in mesh with the rack.

3. Mount the pinch wheel assembly onto the track motor on the rig underside, by sliding the track motor gear against the rack and putting the pinch wheel Socket onto the track motor Mounting bar.

Star knob

Socket

Anti-skip block

4. Replace the retaining pin in the pinch wheel assembly by pushing on the ring (not the sleeve), to hold the assembly in place on the track motor.

5. Hand-tighten the star knob so that the rubber wheel presses against the smooth side of the rack until you start feeling pressure on the red wheel. You must still be able to turn it easily by hand. This holds the track motor gear firmly against toothed side of the rack.

6. Connect the pinch wheel cable.

> Hint
>
> The Limits magnets on the track and lift are physically swappable.

Attaching the lift motor pinch wheel

1. On the separately supplied lift pinch wheel assembly, remove the brass retaining pin by pulling on the ring.

2. Push the track motor slightly towards the rail racking so that the track motor gear is in mesh with the rack.

Lift pinion

Lift motor mounting bar

3. Mount the pinch wheel assembly onto the lift motor on the rig, by sliding the lift pinion against the rack and inserting the lift motor Mounting bar the into the pinch wheel socket.
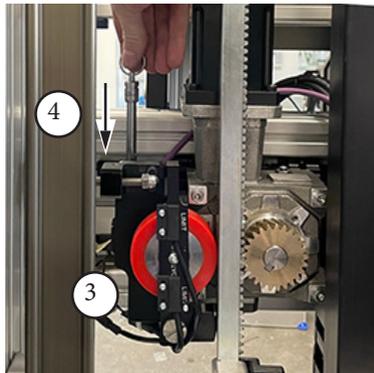
4. Replace the retaining pin in the pinch wheel assembly by pushing on the ring (not the sleeve), to hold the assembly in place on the track motor.

5. Hand-tighten the star knob so that the rubber wheel presses against the smooth side of the rack until you start feeling pressure on the red wheel. You must still be able to turn it easily by hand. This holds the lift motor gear firmly against toothed side of the rack.

Star knob
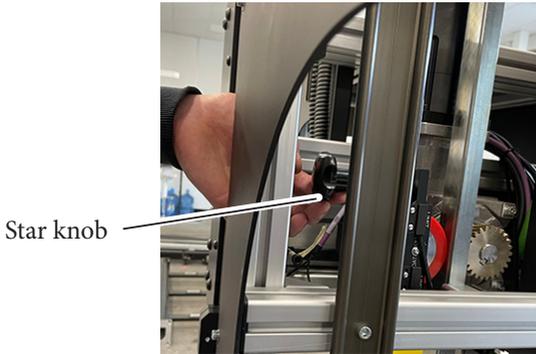
6. Connect the lift limit cable.

> Hint
>
> The Limits magnets on the track and lift are physically swappable.

Notes

Appendix 1 **Specifications**

Weight: 260 kg (198 lbs) without camera and turntable

Weight of rail: 55kg (each)

Payload (camera and head): 15kg

Maximun speed: Track: 50 cm/s

                       Lift: 50 cm/s

Power requirements: Main 240 Volts AC (earthed/grounded) AC 50-60Hz or transformer.

Temperature range: 0-45 °C (32-113 °F)

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

Overall dimension: 3.3m H x 3.1m L x 0.75m W

Horizontal travel: 2.1m

Vertical travel: 2.4m

Rotate travel range; +/-90°

Extension track: 2.9m each
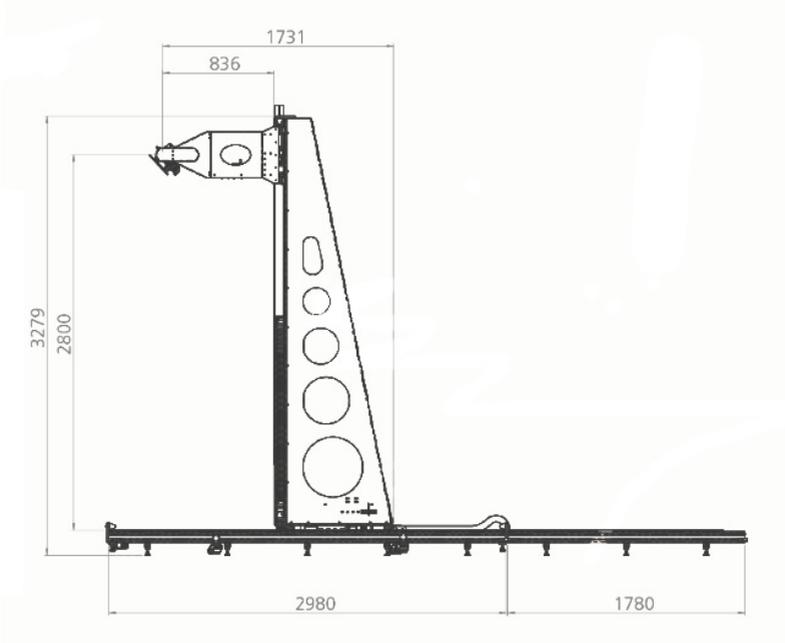
Appendix 2 **Rear Panel**

Panel and connector summary
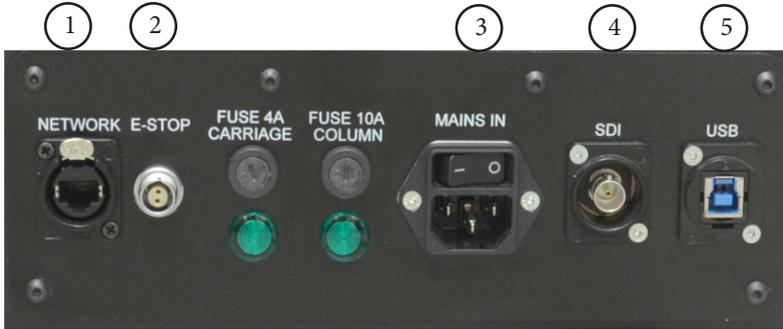
1. **NETWORK** RJ45 connector, for connection to the PC running the Flair Motion Control software. The Ethernet port is rated at 100Mbits/sec but can operate at lower speeds of 10 Mbits/sec or less.

2. **E-STOP** connector for connecting to the Emergency Stop. The Emergency stop or E-Stop is a necessary safety feature fitted to almost all motion control equipment. The E-Stop button is placed close to the operator and pressed when the rig is required to be stopped immediately. For pin-out information see *E-Stop Connector* on page 24.

3. **MAINS IN** connector to supply power. Orbital requires a 15A 240V DC power supply. For pin-out information see *Mains In connector* on page 24.

4. **SDI** port for viewing the HDMI output from the camera to a display.

5. **USB** port for downloading pictures and videos from the camera to the PC.

Connector pin-out information

E-Stop Connector

The **ESTOP** connector is a two-pin female connector, to which you attach the dedicated external E-stop buttons. The polarity does not matter, so there are no specific pin-out allocations. The rig will not operate without the E-stop buttons attached, as they complete the E-stop circuit loop and allow the rig to run. Breaking the circuit loop at any point (for example by depressing an E-stop button) invokes the E-stop for the entire rig.

Mains In connector

Power input connector for the Orbital. It is a 3-Way (Male) C14 IEC connector. 240 Volts AC.

1. Earth
2. Live
3. Neutral
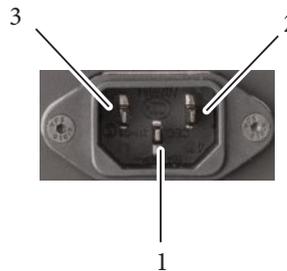
SDI connector

The **VIDEO** connectors on the Orbital is rated at 3 GHz BNC connector allowing the camera signal come out through the base.

1. VIDEO (inner)
2. GND (outer)
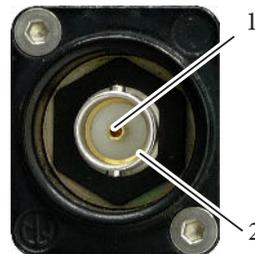
Appendix 3 **Spin Rig Setup**

Overview

Spin Rig is a tool built into Flair Motion Control software that, once configured, allows you to communicate with digiCamControl software to trigger capture, download pictures, and to control camera settings via USB.

digiCamControl is used to control the camera remotely from your Windows PC via USB. You can use digiCamControl to trigger image capture, review images right after photo is captured, control camera settings, view the image in LiveView as you see it in the camera's viewfinder and autofocus and zoom in and out remotely.

This guide tells you how to install digiCamControl on a Windows PC running Flair Motion Control Software and setting up Spin Rig display to use the digiCamControl functions.

PC Requirements

- Personal computer using the Intel x86 architecture
- Windows 10 Professional
- USB capability
- 4 Gbytes of memory
- DSLR camera
- USB cable compatible with the camera
- Setup files

System preparation

Make changes to the following settings, which you can access in **Windows Control Panel**:

1. Set file extensions to be visible:

    Appearance and Personalization > Folder Options, and in the pop-up go to the **View** tab and turn off "**Hide extensions for known file types**", and then click on **OK**.

2. Obtain the installer for digiCamControl for Flair.

Installing and setting up the digiCamControl software

digiCamControl is open source software and MRMC has written plug ins for digiCamControl to work with Flair. These plug ins have been written for digiCamControl v2.1.1 and will not work on other versions.

1. If not already installed on the Flair PC for Orbital XL, navigate to the digiCamControl installer and plug ins from MRMC on the supplied USB stick.

2. Run the installer for digiCamControl v2.1.1 and follow the on-screen instructions to install digiCamControl.

3. Copy the plugins into `C:\Program Files (x86)\digiCamControl\Plugins\CameraControl.Plugins\` and overwrite any existing files.

4. If not already connected, connect the camera with the PC via USB. Ensure that the camera is turned on.

5. Use the controls in digiCamControl to make sure that the software is talking to the camera.

    5.1   Turn on the LiveView in digiCamControl.

6. Choose **Plug ins** >**Tools** >**TCP Server settings**.

7. Check **Enable TCP server**.

8. Click on **Save**.

Setting up Flair

1. Navigate to the FLAIR6 folder **C:\Flair\Flair6** and open the `Flair.ini` file.

2. Change the values of the following fields to these values:

    *   `*KineModel:spinrig`

Add the following lines in the **`Flair.ini`** file.

- **`*Spinrig:Default`**
- **`*DigiCamControl:True`**
- **`*DigiCamAddress:127.0.0.1`**
- **`*DigiCamPort:9100`**

3.   Save and close **`Flair.ini`**.

4.   Ensure that digiCamControl is running and the DSLR camera is connected via USB to the PC.

5.   Launch Flair and check that Flair opens in the Spin Rig Display. Use this page to set up Steps, Goto Speed, Angle and Time settings for the Spin Rig.

SpinRig controls
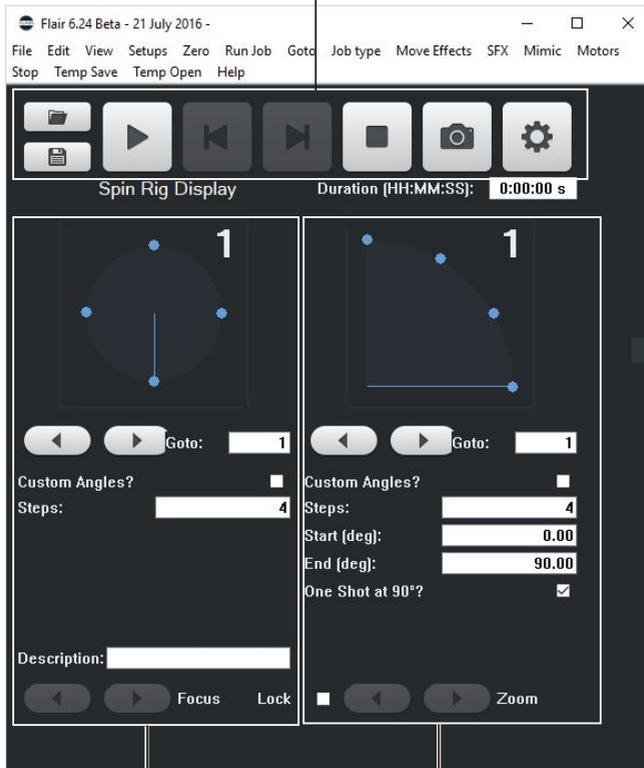
Rotation Controls

Elevation controls

6. Choose the Settings button or choose **Setups >Digicam settings** in Flair. You can use this interface to specify the camera control settings that will be effective in digiCamControl.

7. Use the **Focus** tab to trigger camera captures via Flair.

Notes

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