

External lens encoders

This document is a short guide on how to install and use external lens encoders with VioTrack. These encoders will read the position of zoom and focus rings and forward the information to the tracking system, so it can calculate the corresponding optical parameters based on the respective **TrackMen** zoom lens calibration.

The encoders work contact-free with magnetic tape and are not dependent on gear specification of the lens manufacturer. By detecting the Zoom/Focus ring range when rotating them fully at system start, the sensors will adapt to any given lens.

They will forward one balanced serial signal to the tracking workstation for zoom and focus each.

1. Part list

1.1 Package contents

The encoder package generally consist of the following hardware parts for each zoom and focus (see Illustration 2):

1. A contact-free sensor with build-in short serial cable output to 9-Pin D-Sub
2. An aluminum mount to attach the sensor on a 15mm accessory rod with various angle and height
3. A band of magnetic tape for fixation on the zoom/focus ring
4. A plastic stripe with 0.8mm thickness to find the correct distance between sensor and tape
5. A USB-converter to connect the serial line with a workstation, with attached 9-Pin D-Sub connector



Illustration 1: External encoders installed

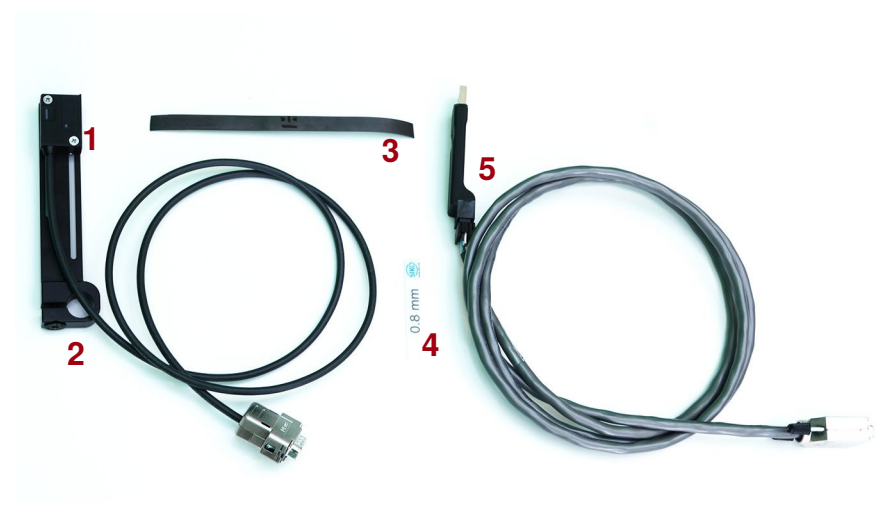


Illustration 2: Package contents

External Lens Encoders

1.2 Additional parts

The contact-free encoders will be integrated into an otherwise complete VioTrack system. For completion of the lens connection, the following parts will be needed:

1. A shielded 1:1 serial extension cable between sensor output and USB-converter; common pinout, see Illustration 10
2. A TrackMen lens calibration file for the respective lens that will be employed

2. Installation

For the hardware installation, please take the following steps:

1. Fix the Sensor on its mount using both screws and the respective long holes. One side of the mount is countersunk for the nut to fit in. If zoom and focus ring are too close together, it may be necessary or desirable to mount both sensors on one mount, using a longer screw.

Attention: Please make sure to use a high-quality shielded cable as extension between the two devices!



Illustration 3: Countersunk long holes for the sensor mount

- Slide the Mount onto the 15mm accessory rod up to the position of the respective ring.



Illustration 4: Find the position of the zoom/focus rings along the accessory rod

- Adjust the height of the sensor using the long holes, so the middle of the sensor is as close to the lens as possible. Fasten the screws firmly.

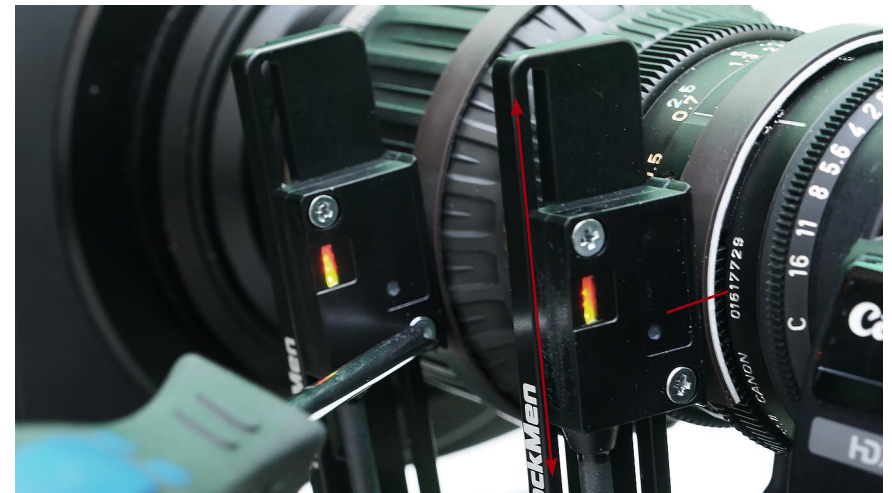


Illustration 5: Adjust the height of the sensors to the middle of the rings

4. Evaluate the range of the zoom/focus ring that will need to be covered with the magnetic tape: mark the point on the ring that is just covered by the sensor when the zoom/focus position is at wide angle / infinite, then turn it to maximum tele / MOD position and mark the furthest point covered.
5. Make sure the tape can cover the whole range. It may be shortened if too long.

Note: If the tape can not cover the whole range for some reason, think of another way to attach the mount. Maybe using the accessory rod on the other side and having the sensor mounted below the lens, for example.



Illustration 6: Evaluate the respective ring range that needs to be covered by the tape

6. Fix the tape on the lens ring. The direction is important: The tape has two areas: one for the counter marked with a - and one for the Index, marked with a ><. Make sure the tape is oriented so the marks fit the corresponding ones on the sensor.

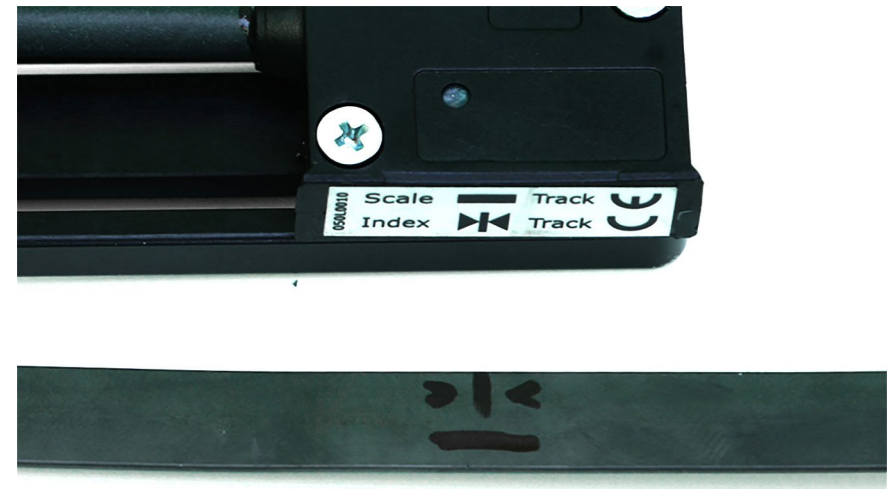


Illustration 7: Make sure the encoder can read the correct side of the tape

7. Adjust the distance between sensor and magnetic tape, holding the 0.8mm plastic strip between them.



Illustration 8: Fix the encoder in the correct distance to the tape

8. When correct, fasten the hexagon socket screw on the bottom side of the mount firmly. Make sure it can not be accidentally moved easily.



Illustration 9: Fasten the mount screw firmly

3. Connection

The encoders will each be connected to the workstation via a serial-to-usb converter that is included in the package.

3.1 Extension and Pinout

Both D-Sub connectors have a pinout that can be plugged into each other with no further adapters or pin crossing. Thus, **a straight shielded cable** may be used to extend the cables. For further information on the pinout, see Illustration 10.

3.2 Zoom/Focus assignment

The system will recognize the assignment of the encoders to zoom and focus data by analyzing the respective serial number of the serial-to-USB converter. It is thus important to connect each sensor to the **correctly labeled USB converter**.

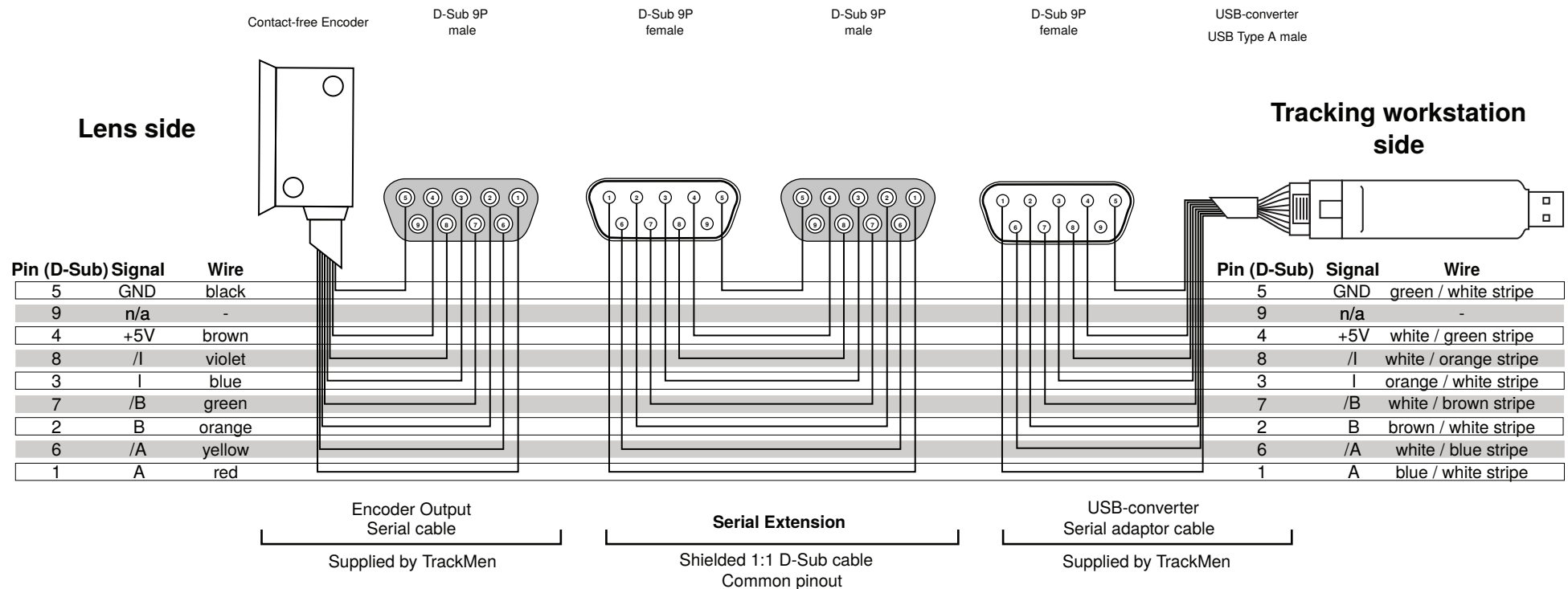


Illustration 10: Connection and pinout scheme

4. Handling

In general, external encoders can be used with no special behaviour needed. The changes are:

4.1 Interface

Usage of external zoom and focus sensors will take a slightly different configuration file than lenses with build-in data output. This configuration will bring up two new tabs to the VioTrack Master window; *Zoom* and *Focus*. Both show the same four options:

Sample delay will set an additional delay for the encoders in milliseconds, in case their timing differs from the rest of the tracking and is not precisely adjustable by using the Lens Delay in the SlaveCam tab.

Invert counting direction will swap whether zooming in / focusing a distance will use rising values or dropping ones. Use this option when you notice that turning the respective ring gets interpreted the wrong way.

Reset counter to zero will set the current value of the data to zero.

Dump counter will show the current encoder values in the System Log as long as it is checked.

4.2 Initialization

The external encoders must be **initialized** each time the system gets started. In order to do so, wait for both system and camera to fully boot and then zoom all the way in and out and focus both MOD and infinite.

The system will automatically recognize the detected minimum and maximum value as full range and be ready to work.

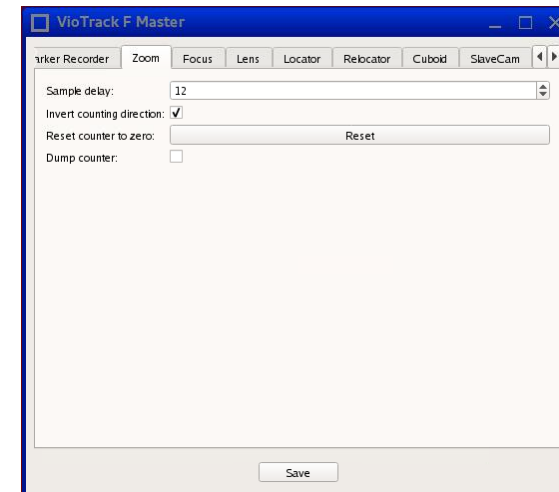


Illustration 11: Zoom and Focus tab in VioTrack Master window



Illustration 12: Initialization; turn both rings the whole way after system start