MFR 4K

User Guide for the
MFR 4K PTZ Camera

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Change History

Version	Date	Change Summary	Author
v1.0	17/9/2019	New Edition Release	RE
v1.1	13/3/2020	Sub-Zero Start Up Update	RE

Warranty and Support

All Visual Engineering products are supplied as standard with a 12 month 'Return to Base' warranty.

Please note: Any unauthorised product disassembly, modification or the removal of tamper proof labels will void the warranty.

In the event of a suspected product failure, users should contact the Visual Engineering support team on the telephone number +44 (0) 1206 211842 or please email us at:

support@visualengineering.co.uk

Should the fault persist or if the support team are unable to resolve the fault, it may be necessary to return the equipment.

Equipment should only be returned using the RMA (Returns Management Authorisation) process. Users should contact the support team on the above number and request an RMA number.

Introduction

The MFR 4K is a very rugged PTZ camera environmentally sealed for use in harsh environments.

It incorporates a camera with a 4x Full HD resolution and a 20x optical zoom lens supporting a 70° wide angle of view.

It is capable of outputting Quad Full HD, Full HD or lower video resolutions via a water proof HDMI connector.

To ensure it retains performance and clear optics across a wide range of changing environmental conditions it is a hermetically sealed and can be purged with either dry air or nitrogen.

It incorporates an internal heater system to ensure reliable operation if the camera is powered up in sub-zero temperatures.

It has absolute position feedback and therefore has the ability to self correct its actual position if external forces act upon it.

It also offers eight user preset settings that can be saved allowing PTZ framing and camera racking profiles to be easily recalled.

The pan and tilt drive trains are actuated by gearless stepper motors, reducing the operational noise to a minimum.

Pan and tilt speeds are zoom factor corrected, giving fine control over the entire range of the lens with pan speeds up to 100º per second.

Remote control of the camera and motor drives is via Sony Visca or PelcoD protocols over RS232 or RS485 serial connections.

Power and data to the camera is via its Fischer minimax connector.

The outer casing is manufactured from aluminium. All external mating surfaces are gasket sealed to maintain its IP68 rating.
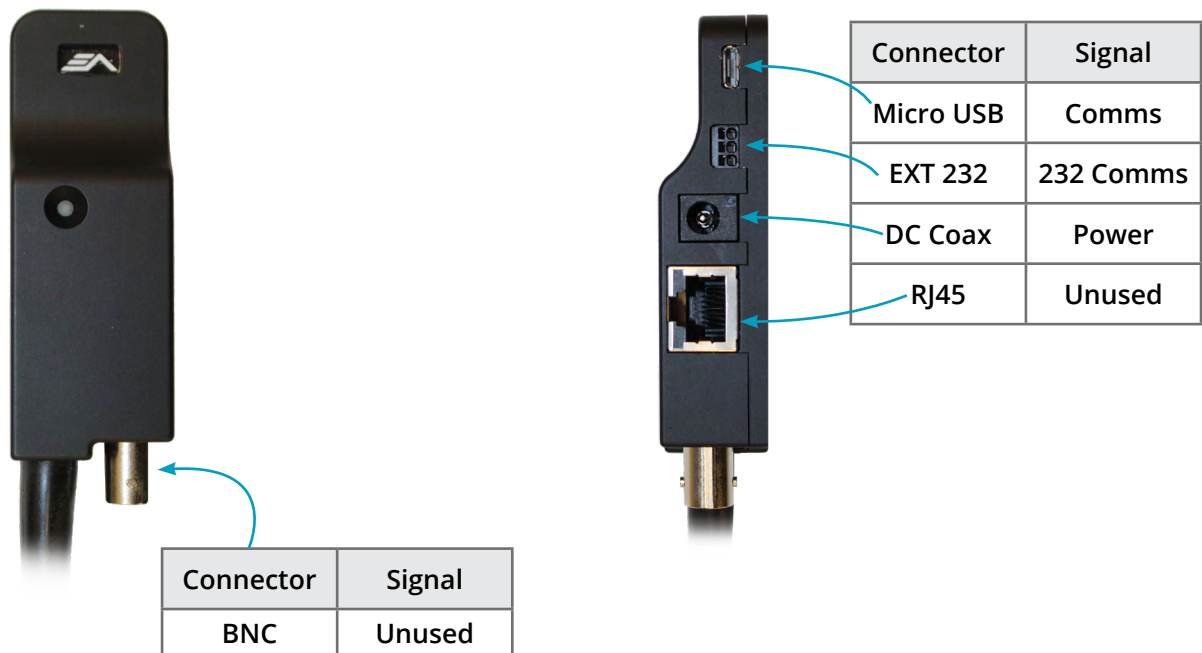
Connections

The MFR 4K kit includes a power comms break out cable, part number 110-3562.

The cable assembly connects to the Fischer MiniMax connector on the base of the camera. All signals are then split out to their relevant connectors.

The connections are described below.

Connector	Signal
Micro USB	Comms
EXT 232	232 Comms
DC Coax	Power
RJ45	Unused

Connector	Signal
BNC	Unused

MFR 4K communications are supported via the micro USB and the EXT 232 connectors.

The EXT 232 connector supports RS232 comms, the pinout of the connector is described on the right.

RS232 Comms

RX (to cam)
TX (from cam)
GND

HDMI weatherproof connector.

Power Comms Cable connector.
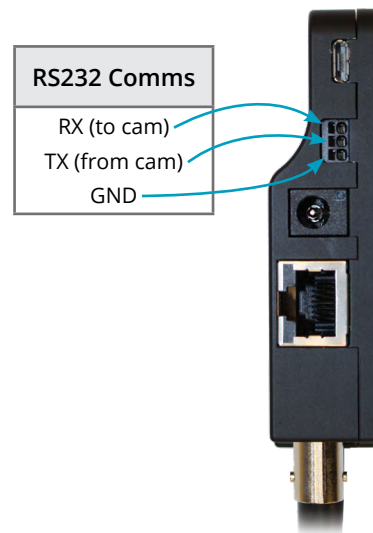
On Screen Display

On start up the OSD video overlay reports the camera's current:

Temperature
Humidity
Dew Point

This information can be used to monitor the performance of the camera and its hermetic seal.

Purge Port

The camera features a purge port which is used to purge the camera with either dry air or nitrogen.

If a camera is suspected of having a compromised air tight seal it may be necessary to repeat the purge process.

In this instance contact Visual Engineering on how to proceed:

support@visualengineering.co.uk

Sub-Zero Start Up

The MFR 4K camera has an internal heating system so if it is switched on in sub-zero temperatures it will start up in a controlled method so as to ensure reliable operation.

❄ Powering on in sub-zero temperatures ❄

If the MFR 4K camera is powered on at temperatures below -15°C the primary and secondary heaters will both be enabled.

The camera will remain powered down until the internal temperature rises above -15°C

Once the internal temperature rises above -15°C the camera will start up, the primary heater will turn off, keeping only the secondary heater turned on.

The secondary heater will remain on until the internal temperature rises above -5°C.

During use the secondary heater will toggle on/off between -5°C and -15°C to continually regulate the internal temperature.
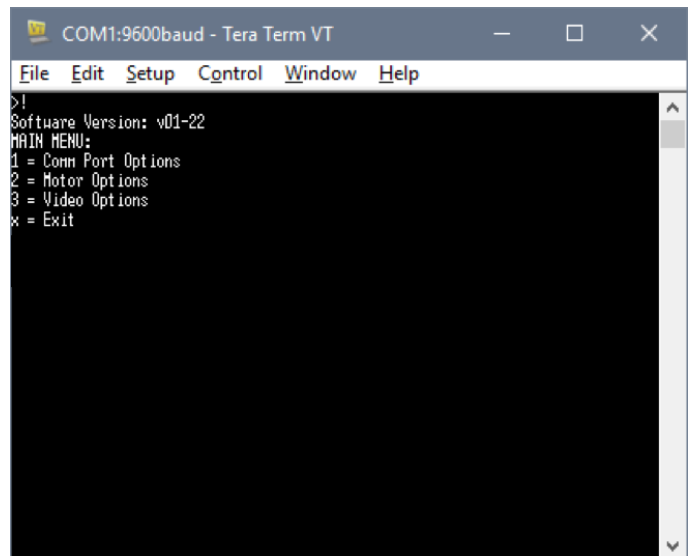
Configuring the Camera

The MFR 4K can be configured for a specific user profile, to include; communications settings, motor control and video format. Once configured the camera will retain the settings.

The camera is configured using a menu structure on its control interface which is only accessible at power on. To access the control menu it is necessary to connect the camera to a serial comms software application, such as TeraTerm set to 9600 baud 8n1.

Boot Menu

- Connect the power comms cable to a USB port on a PC.
- Open the serial comms application
- Re-power the camera, a > will appear and shortly after !
- As soon as the ! appears type 'v' 'e' in quick succession.
- The Main Menu shown on the right will then be displayed.
- Select the required option.
- The function of each option are described in the tables that follow.

Comm Port Options

Comm Port Options		
Sub Menu	**Description**	**Options**
Mode	The serial comms standard	RS485, No Parity , RS232, No Parity, RS485, Odd Parity, RS232, Odd Parity RS485, Even Parity, RS232, Even Parity
Baud Rate	The serial comms baud rate	1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200
Protocol	The PTZ control protocol	Auto Detect, Visca, Pelco P, Pelco D, Forward Vision
Unit Address	The camera's unit address, this allows several cameras to be connected on the same comms bus.	1, 2, 3, 4, 5, 6, 7

Motor Options

Motor Options		
Sub Menu	**Description**	**Options**
Auto Position Correction	Whether the camera automatically corrects its actual position if external forces act upon it	Disabled, Enabled
Stall Detection	Detects a stall in the motor drive	Disabled, Enabled
Motor Speed	The speed at which the motors are driven	High, Medium, Low
Hold Torque	The torque force which the camera uses to hold position	High, Medium, Low

Video Options

| Video Options		
Sub Menu	**Description**	**Options**
Output Mode	The output video format	4K/29.97, 4K/25, 1080p/59.94, 1080p/50, 1080i/59.94, 1080i/50, 1080p/29.97, 1080p/25, 720p/59.94, 720p/50, 480p/59.94, 480p/50
Digital Zoom	If disabled only optical zoom is allowed	Disabled, Enabled
On Screen Display	The OSD in the camera's video	Disabled, Enabled
Flip on Tilt	The video picture will automatically invert when the camera head is tilted over the top of its travel.	Disabled, Enabled

Software Control

The MFR 4K camera's serial communication supports PelcoD, PelcoP & Sony Visca protocols.

The user may choose to use a software controller of their choice or use the VE Camera Controller. This software application can be downloaded from the Visual Engineering website:

www.visualengineering.co.uk/supportdownload/9

The user should install the Software application on a PC. The image below shows what the software application looks like.
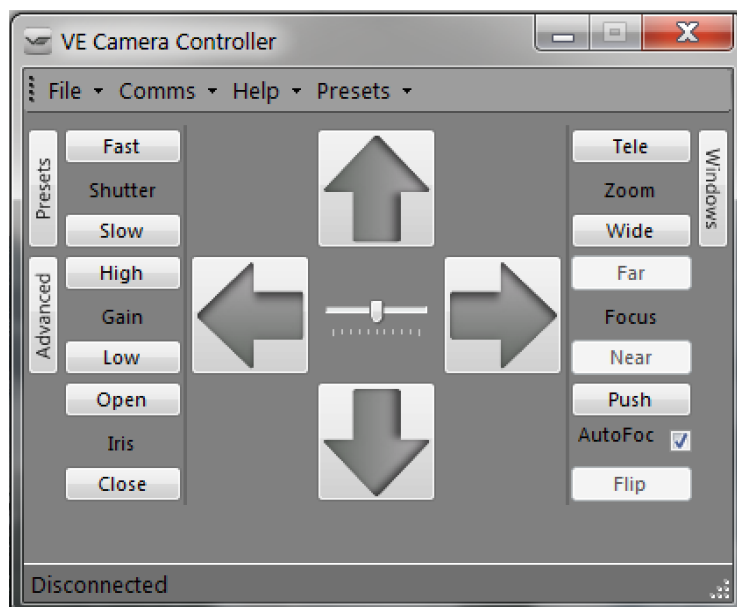
It is necessary to connect the camera to a USB port on the PC. The operating system of the computer will allocate this a COM port number. Once this connection has been made the user can go ahead and connect the application to the COM port. In the example below the port COM3 has been selected. Now select Connect.
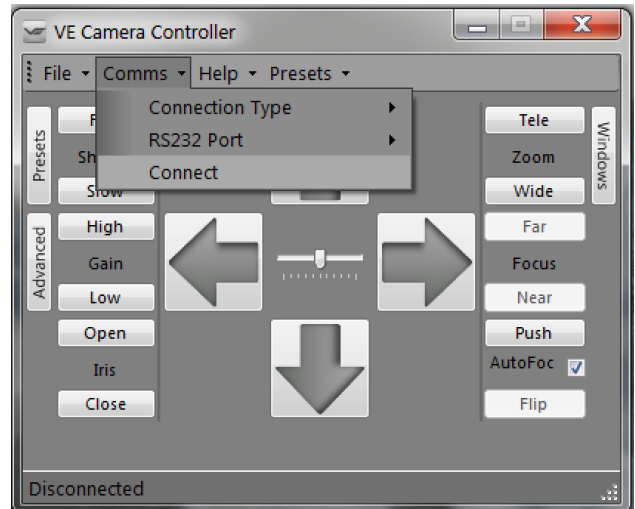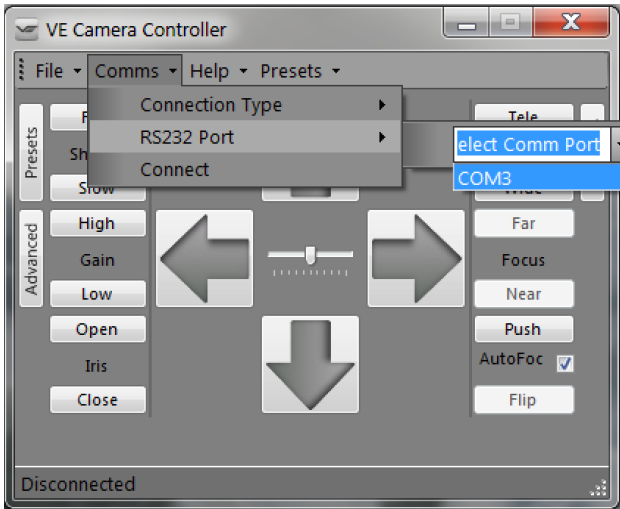
Now that the software application is connected to the comms lead the functions of the software can be used. In the example below the pan right command has been selected. This will cause the MFR 4K camera to pan right. Similar commands for pan left, tilt up & down and zoom functions can also be tried out using the intuitive software user interface.
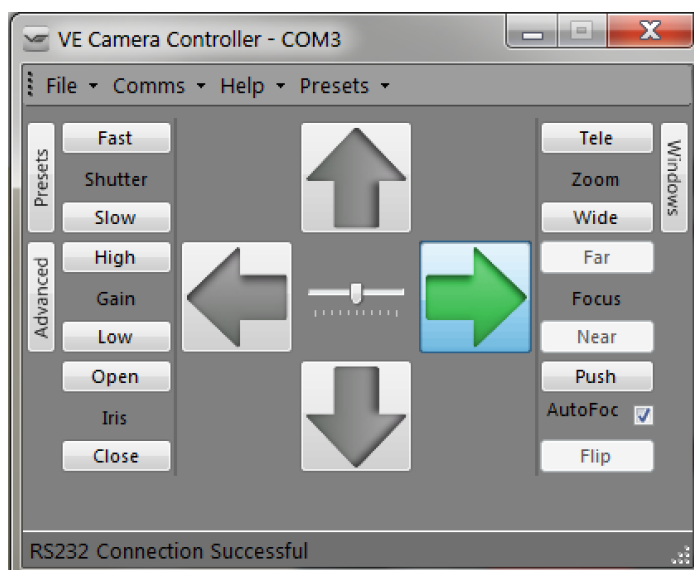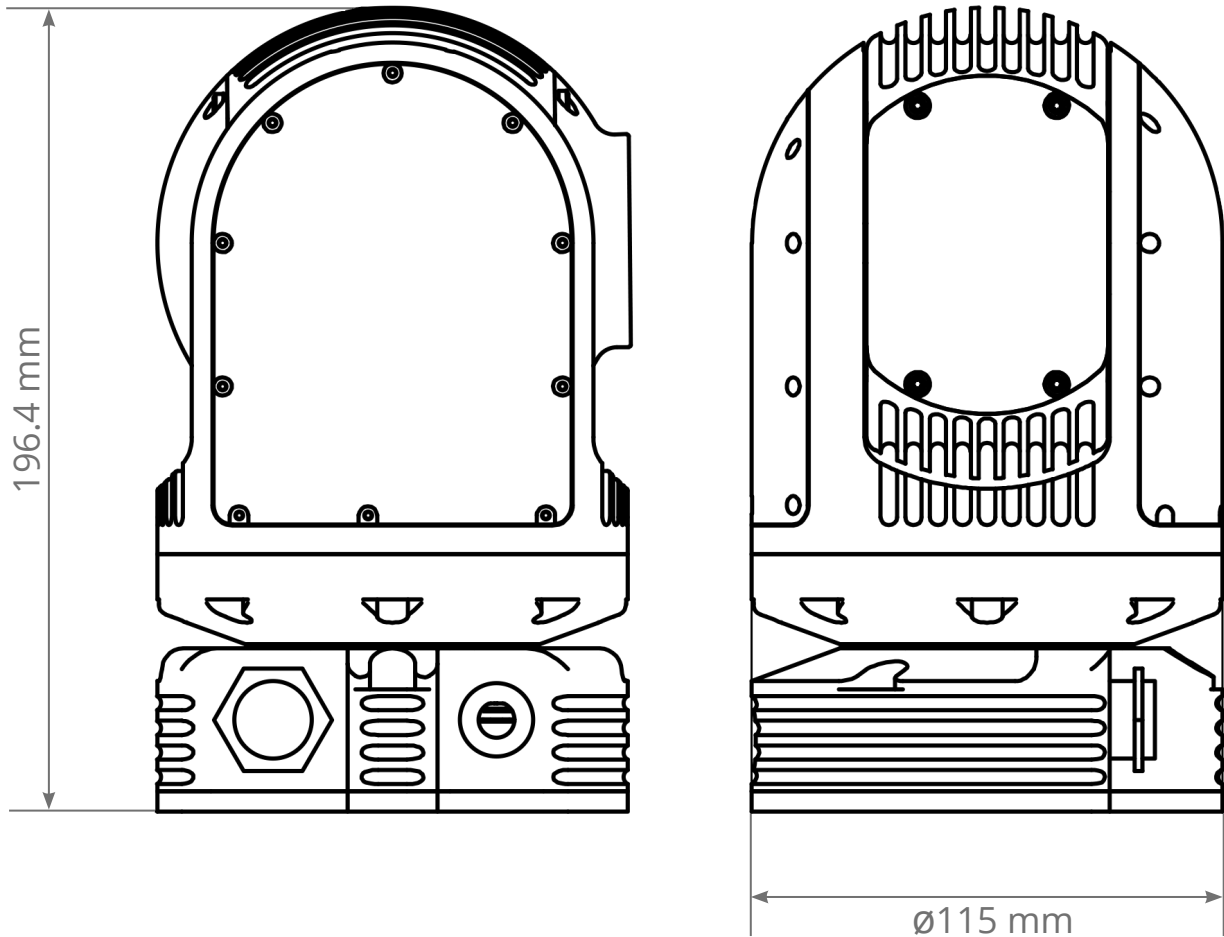
Specifications

Specifications			
QFHD Resolution	2160p/29.97, 2160p/25	**Purge Type**	Dry Air or Nitrogen
FHD Resolution	1080p/59.94, 1080p/50	**Video Interface**	HDMI
Sensor	1/2.5 Type CMOS	**Control Protocol**	Visca, PelcoD
Pixels	8.51M	**Pan & Tilt Range**	270° Tilt, Continuous Pan
Optical Zoom	20x	**Pan & Tilt Drive**	Low Noise Stepper
Digital Zoom	1.5x QFHD, 2.0x FHD	**Power Requirement**	9-18V DC, 11.5W
Lens	f=4.4mm (Wide), 88.4mm (Tele)	**Environmental**	IP68
Field of View	70° to 4°	**Weight**	1.5kg
Sensitivity	0.06 lux, ICR Off	**Dimensions**	ø 115 x 196.4 mm
Image Stabilisation	Enabled	**Casing**	Aluminium

Dimensions

196.4 mm

ø115 mm