



# mo-sys StarTracker

## In-studio Optical Camera Tracking System

Mo-Sys Engineering is a leading innovator and manufacturer of virtual production solutions. With over 25 years' experience, Mo-Sys pioneered marker-based camera tracking technology with the introduction of StarTracker.

With the largest installed base of any professional camera tracking vendor, StarTracker offers users unrivalled tracking accuracy across 6 axis, simple one-time set-up and autonomous operation, combined with mission-critical reliability. The world's leading broadcasters, major motion film producers, OEM and events companies depend on StarTracker daily throughout their facilities.

- **6-axis tracking with lens zoom and focus** – delivers precision blending of photo-realistic 3D virtual graphics with the real world
- **Unrivalled tracking accuracy** – precision 3D tracking and lens mapping, with zero drift, keeps virtual graphics locked to the real world. No need for time-consuming and costly daily recalibration
- **Digital markers (NEW)** – StarTracker is fully compatible with Brompton digital markers. This is useful when working in LED volumes with deep LED ceilings
- **Robust tracking** – 120-degree field of view optical tracking offers maximum freedom of movement. The camera can be pointed almost straight down and StarTracker will maintain accurate tracking
- **Resilience and reliability** – StarTracker is unaffected by powerful studio lighting or reflections. Creative lighting changes are possible because StarTracker uses a different spectrum of light to track
- **Excellent synchronisation** – StarTracker enables fast camera movement to keep talent perfectly framed while maintaining accurate AR and VR asset positioning
- **Autonomous operation** – once calibrated StarTracker works without requiring an operator, minimising the cost of operation
- **Integrated by OEM partners** - Vinten, Cartoni, Shotoku, Grass Valley, Panasonic – no other camera tracking vendor is utilised and trusted by so many OEM vendors
- **Auto Aligner** – rapid studio calibration technology, minimises setup time prior to shooting
- **Custom lens profiling** – StarTracker includes custom lens profile support, provided by Mo-Sys directly, enabling even greater realism to your mixed reality content
- **Expandable and upgradable** – whether you have a green screen virtual studio, or LED wall virtual studio, StarTracker is the only tracking system you'll need

# System information



## StarTracker

Axes tracked	6DOF: position & rotation 2 lens: (zoom, focus)
Camera mounting	Any (ped, jib, steadicam, handheld)
Lenses encoded	External - Canon, Fujinon, film lenses Internal (Serial) - Canon & Fujinon
Power consumption	20 W
Voltage range	12-24 V DC
LED ring wavelength	850 nm (IR) 455 nm (blue) on request
Tracking server / PC	Not required
Display	Not required for daily operation after initial setup

## Studio space

Min studio size	No lower limit
Max studio size	100 x 100 m (no explicit limit)
Min ceiling height	>0.3 m from sensor*
Max ceiling height	16+ m*
Lighting restrictions	No restrictions *with appropriately sized and spaced stars
Number of studios/tracker	No limit
Number of trackers/studio	No limit

## Tracking method

Lens	External encoders or VR lens readout
Position/rotation	Tracks randomly positioned retro-reflective stickers Patent confirmed: EP2962284A2
Protocol	Mo-Sys F4
Connection	UDP (IP) via RJ45 socket
Genlock	Analogue SDI, BnB, Tri-Level
Min Delay	1 field (NTSC: 16.6 ms)

## Star dots

h = average floor-star height	
Diameter	Between 1-15 cm depending on height
Spacing	Approx 1/10 floor-star height
Minimum visible to track	11 (20+ well-spaced recommended)
Configuration	Ceiling or floor mounted

## Accuracy

Positional	Approx 0.03% of h (nominal*)
Angular	Approx 0.01 deg (nominal*)
Encoding	16 bit

\*As an optical system the accuracy depends on the distribution of stars visible to the sensor and their position in 3D space

Time to find pose after tracking loss	< 1 s (nominal)
Drift accumulation	No drift accumulation
Daily optical calibration	None required

## Dimensions

Sensor Unit	7.5 x 7.5 x 7.5cm
Processor Unit	19 x 14 x 5cm

## Weight

Sensor Unit	390g
Processor Unit	1450g

For more information

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