Ncam Reality real-time camera tracking enables live virtual broadcast graphics in studio or outside broadcast, including installation on a handheld, Steadicam, Jib and cable-based systems.

The Ncam Reality camera tracking system features a multi-sensor camera bar that is easily mounted on the camera and provides real-time data to the Ncam tracking server.

Ncam Reality provides full position, orientation information, plus focal length and focus, via industry-standard protocols compatible with any VR/AR graphics system. It is suitable for a wide range of applications both indoors and outdoors, across all camera rigs and even handheld or Steadicam or others.

Instant real-time tracking
No need for time-consuming system calibration, surveys, training and learning of environment.

Multi-sensor hybrid technology
For a robust solution in mission-critical situations, Ncam combines patented multi-sensor Technology. Ncam does not rely on simple optical-only solutions.

Live Markerless Tracking
No need for adding markers on the floor, ceiling or studio/pitch. Ncam’s unique tracking technology identifies for patterns and areas of contrast generating 3D tracking points and historical point clouds - all in real-time.

Rapid setup and workflow
Ncam Reality’s user-friendly interface enables the fast configuration of an automated origin, axis alignment. Operators can also use the intuitive image-based modelling module for manual placement. Ncam supports all production-proven and industry-standard broadcast graphics engines, either via the Free-D protocol or Ncam’s SDK.

Integrated lens profiling
High accuracy lens profiling that produces proprietary lens distortion models for all lens types via in-built lens profiling module. Ncam Reality can import pre-existing Open CV lens profiles and export to your preferred graphics engine.

Lens encoding
Focal length and focus values are combined within the camera bar by using external encoders or direct data from Canon/Fujinon digital virtual ports via smart encoder cable.

Advanced SDK for custom integration
The revolutionary and advanced SDK enables a rich real-time tracking data stream including timecode, optical parameters, distortion maps (distorted/undistorted) and active camera telemetry and lens profile/models (optical parameters).

Copper or fiber connectivity
Ncam’s camera bar data is sent down a single Cat-6 Gigabit Ethernet cable or converted using an Ethernet to Fiber Converter or Extender.

April 2019
**SPECIFICATION**

### Main camera information

**Supported cameras**
- Digital broadcast cameras with HD SDI monitoring.
- Film cameras with HD video tap plus timecode.

**Supported lenses**
- ENG Lenses.
- Broadcast Zoom.

**Lens metadata**
- From LDS lens via SDI stream.
- Canon/Fujinon lens data via Ncam smart cable.
- Direct encoding via ethernet.

**Lens profiling**
- Precision lens profiling & measurement of lens distortion & optical parameters.
- Stored and selectable from database and exported to graphics engine.

**Camera configurations**
- Handheld, Steadicam, tripod, crane, Jib, pedestal.

**Camera monitor feed equipment**
- HD 1920x1080 3G SDI with timecode.
- 23.98, 24, 25, 29.97, 30 fps frame rate.
- Progressive or PsF or Interlaced.

**Composited image preview to camera**
- HD 1920/1080 3G SDI (wired/wireless)
- Frame rate (based on camera monitor output).
- Progressive or PsF (monitor output).
- To electronic viewfinder or field monitor.

### Ncam server

**Configuration**
- One Server per broadcast camera.

**Device interface**
- Monitor, keyboard, mouse.

**Operating system**
- Ncam OS based on Ubuntu 18.04.

**Application software**
- Ncam Reality.

**Location**
- Studio – rack-mounted – controlled over KVM Mobile – OB Truck.

**Power**
- 4A @ 220V (8A @ 110V) AC.
- AC mains 50/60Hz – Heat output: 1kW (max).

**Outputs**
- Ncam server real-time user display
- HD SDI output
- Real-time composited image of monitor video with tracked and keyed CGI
- Routed to camera EVF or field monitor
- Routed to video village and director/producer monitors
- Automatic take system records a labelled .fbx file
  - Camera position, rotation, focus, iris and zoom
  - Timecode plus captured point cloud for each take
  - Lens profile data for post-production

### Ncam Tracking Latency

2.5 video frames (Interlaced/PsF mode).
5 video frames (Progressive mode).

### Integrations

**All Render Engines**
- One system per Ncam Server

<table>
<thead>
<tr>
<th>Render Engine</th>
<th>Free D</th>
<th>Reality SDK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Viz Engine</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Brainstorm</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Zero Density</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Pixotope (Future Group)</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Ventuz</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>RT Graphics</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Wasp3D</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Ross Xpression</td>
<td>Yes*</td>
<td>Yes**</td>
</tr>
<tr>
<td>ORAD/Avid</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

*Yes* - Cinelens Degree 2 (2D experimental)
*Yes** - Distortion maps are not supported

### Locations

**Interior**
- In studio/on-set

**Exterior**
- Back-lot/on location

**N.B.** not weather/water/blast-proof (camera bar and lenses require shielding / server requires Easy-Up or similar)

### Rigging

- Ncam is mounted on 15mm or 19mm rods. This should be considered when mounting system with Box Cameras, follow focuses etc.
- Weight of the Ncam camera bar is 2.65 lbs or 1.2kgs but may vary in total weight based on which encoders are used.

### Operation

- One Ncam technician.
- One Graphics operator to manage and create on-air graphics output.