



INDIAN INSTITUTE OF TECHNOLOGY BOMBAY

MATERIALS MANAGEMENT DIVISION

Powai, Mumbai - 400076

## **Specifications for Cameras and Accessories for Existing Motion Capture System**

**RFx No. 6100000704 (Reference No. 1000016847)**

### **Line Item 1: Camera for Motion Capture System (Qty. 2)**

Two additional cameras are required to augment a four-camera Motion Capture System already installed at our facility. This motion capture system is used for providing measurements of 3D Positions and Orientations of at least two rigid bodies (each having a typical dimension of 1.5 feet) where these two rigid bodies are connected to each other by means of a joint (e.g. a revolute/pin joint) and hence constrained to stay close to each other. The system should be able to track this combination of rigid bodies in a volume of 15 feet X 15 feet X 10 feet. In order to increase the number of rigid bodies that this system can capture we wish to add two more cameras to this system along with all associated accessories such as cables (at least 30 m for each camera) and mounting clamps and heads. Detailed specifications are given below.

#### **1. Camera Output:**

- a. Optical Motion Capture Camera must provide Full 256 grayscale output for marker centroid identification.

#### **2. Imaging Sensor:**

- a. The camera must provide a custom-designed imaging sensor with a full frame resolution of atleast 5 million pixels at atleast 420Hz.
- b. The custom designed imaging sensor must provide 256 subpixel resolution for the highest centroid identification accuracy.
- c. The custom designed imaging sensor must possess an electronic freeze frame shutter / global shutter that records the entire sensor image at the same exact point in time. Allows for sharp and accurate data when captured at high speed.

#### **3. On-Board Processing:**

- a. The Camera must contain dedicated on-board processors for maximizing data accuracy and throughput.
- b. On-board processors must be able to resolve partially overlapped markers with separate centroids.

#### **4. 2D On-Board Processing:**

- a. Camera must transmit additional 2D tracking information to host PC for superior labeling and reconstruction.

#### **5. Camera Lens Field of View:**

- a. Camera must be available in 56 and 70 degree Lens and Strobe FoV combinations using high power IR wave length (850nm), resulting in superior volume coverage and illumination of lens FoV.
- b. IR waves emitted from strobe must directed and focused with secondary optics.

**6. Camera Sensing and Feedback:**

- a. Camera must be equipped with an accelerometer to enable camera selection for simple system set-up (Tap to Select). Accelerometers also monitor camera position in real time and provide notice if camera is bumped or moved after system calibration.
- b. Camera must be equipped with Thermal Sensors to detect changes in camera temperature which could affect system status.
- c. Camera must be equipped with front facing OLED display to provide camera identification, information and system status.

**7. Data Transmission:**

- a. Data communication and motion capture system power must be transmitted to the camera in a single cable - for easier and faster system set up.
- b. Data must be communicated throughout motion capture system with Gigabit Ethernet speed (1Gigabit/second).

**8. Interference Free:**

- a. The Camera must be able to operate without interference from normally existing magnetic and electronic fields within the capture environment.
- b. The Camera must be able to operate out-of-doors in direct sunlight and with dynamic lighting conditions.

**9. Software Integration and Control:**

- a. Camera and software must allow a native (not 3<sup>rd</sup> party) control application to provide real-time control functionality for system set-up, calibration and operation on a mobile device; facilitating single user operation.

**10. Software & Hardware Compatibility:**

- a. These cameras should be compatible with the existing motion capture system currently installed at our facility which comprises of Vicon Vantage V5 Cameras (Qty. 4) & Vicon Tracker Software.

**11. Cables & Mounting Accessories:**

- a. Please also include mounting clamps, heads and cables (at least 30m) for each camera i.e. Qty. 2.

**Line Item 2: Reflective Markers (Qty. 30)**

14 mm IR reflective markers on hard plastic base compatible with the cameras.

**General Mandatory Requirements for all Line Items**

1. Warranty : One year from the date of successful installation/ commissioning.
2. This cameras and associated accessories described above working in a compatibility mode with Vicon Vantage V5 Cameras and Vicon Tracker Software must be installed in India at least at one site, please give detailed contact details. Proof i.e. purchase order and satisfactory certificate from the user must be provided.
3. Installation on site by a factory trained engineer must be provided and this engineer must demonstrate proper operation of the camera in compatibility mode with our motion capture system (Vicon Vantage V5 Cameras & Vicon Tracker Software) already installed at our facility.
4. The datasheet and user's manual of the specific quoted cameras and accessories should be submitted with the bid from which determination of compliance with the specifications mentioned above is possible. These documents should also be available on the website of the OEM.
5. Detailed point wise compliance document must be submitted and must be certified by the OEM. Any vague remarks will disqualify the bid.