



**NATIONAL CENTER FOR COMBUSTION RESEARCH  
AND DEVELOPMENT (NCCRD)  
INDIAN INSTITUTE OF TECHNOLOGY MADRAS  
CHENNAI – 600036, INDIA**

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**Ref. No. ICS/11-12/013/DSTX/TSUN**

**Date: 7 Mar. 2016**

**Due date: 28 Mar. 2016**

**Item name: IP CAMERAS AND ACCESSORIES FOR DROP TOWER**

1. Quotations are invited in duplicate for the items shown overleaf (in Annexure I). The quotations duly sealed and superscribed on the envelope with reference no. and due date, should be addressed to the undersigned so as to reach on or before the due date mentioned above.
2. The quotations should be valid for sixty days from the due date and the period of delivery required should also be clearly indicated.
3. The total cost of the equipment in terms of CIP Chennai should be clearly mentioned.
4. Terms of warranty and guarantee should be explicitly mentioned.
5. Packing and delivery charges, customs and clearance duty should be clearly stated.
6. Goods shall not be supplied without an official supply order.
7. Local firms : Quotations should be for free delivery to this institute. If quotations for ex-godown delivery charges should be indicated separately.
8. Firms outside Chennai: Quotations should be for F.O.R. Chennai. If F.O.R. consignor station, freight charges by passenger train / lorry transport must be indicated. If ex-godown, packing, forwarding and freight charges must be indicated.
9. The rate of sales / general taxes and the percentage of such other taxes legally leviable and intended to be claimed should be distinctly shown along with the price quoted. Where this is not done, no claim for sales / general taxes will be admitted at any stage and on any ground whatsoever. The taxes leviable should take into consideration that we are entitled to have Concessional Sales Tax (CST) applicable to non-government educational institutions run with no profit motive for which a concession sales tax certificate will be issued at the time of final settlement of the bill.
10. Payment : Specify the mode of payment and if advanced payment has to be made. Every attempt will be made to make payment within 30 days from the date of receipt of bill / acceptance of goods, whichever is later.
11. IIT Madras is exempt from payment of excise duty and is eligible for concessional rate of customs duty. Necessary certificate will be issued on demand.
12. IIT Madras has the right to accept the whole or any part of the tender or portion of the quantity offered or reject it in full without assigning any reason.
13. In case of any technical queries/clarifications, please contact Prof. Amit Kumar, Dept. of Aerospace Engineering, IIT Madras, Chennai, E-mail: [amitk@ae.iitm.ac.in](mailto:amitk@ae.iitm.ac.in).
14. The sealed quotation may be sent to  
**Prof. S. R. Chakravarthy**  
**NCCRD Office**  
**No. 201, Rarefied Gas Dynamics Lab (Behind Aerospace Engineering Dept.)**  
**Chennai – 600036**  
**(P) +91-44-22575025**



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**Annexure I**

Ref. No. ICS/11-12/013/DSTX/TSUN

Date: 7 Mar. 2016

Due date: 28 Mar. 2016

**IP CAMERAS AND ACCESSORIES FOR DROP TOWER**

- IP surveillance for the microgravity drop tower facility, 2.4 x 2.4 x 32 m
- 4 cameras required:
  - 2 PTZ camera to be fixed at the top
  - 5varifocal lens cameras
  - 1 wireless camera
- Wireless access point
- Compatible 16 Channel NVR

A schematic diagram provided showing the tentative positions of the cameras inside the tower is attached. 1 varifocal lens camera to be placed inside the laboratory room and 1 varifocal lens camera to be placed on the outside of the tower viewing the stairs.

**Camera Specifications**

Features	Description
<b>Functional Specifications</b>	1/2.8” progressive CMOS sensor or better
	Built-in Infrared-Cut Removable (ICR) Filter module
	Motorized varifocal autofocus lens, 3 ~ 9 mm, or better
	20 meter illumination distance or better
	Minimum illumination: 0.5 lux (color mode), 0 lux (B/W, IR-LED on) or better
<b>Video Specifications</b>	H.264, MPEG4, MJPEG
	Max resolution: 2048x1536 or better
<b>Audio Specifications</b>	2-way audio
<b>Network Specifications</b>	<b>Network Interface:</b> Wired LAN : 10/100BASE-TX (RJ-45), 802.3af PoE
	<b>Network Protocols:</b> IPv6, IPv4, TCP/IP, UDP, ICMP, DHCP client, NTP client, DNS client, DDNS client, SMTP client, FTP client, HTTP / HTTPS, Samba client, PPPoE, UPnP port forwarding, SNMP, RTP / RTSP/ RTCP, IP filtering, QoS, CoS, Multicast, IGMP.



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<b>Software Specifications</b>	<b>Event Management:</b> Motion detection Digital input trigger Also periodic alerts should be sent on email or ftp Event notification and upload snapshots/video clips via HTTP, SMTP or FTP
	<b>Image Features:</b> Adjustable image size, quality and bit rate Time stamp and text overlays Configurable privacy masks & motion windows Flip & mirror, ePTZ Configurable shutter speed
<b>External device interface</b>	Micro SD/SDHC
	Audio input/output
	1 DI / 1 DO or better
<b>Operating Temperature</b>	-40 to 50 °C (-40 to 122 °F)
<b>Weather proof</b>	IP-66 weather-proof standard IK-10 vandal-proof standard
<b>Certifications</b>	UL/ERTL/ETDC,FCC, CE
<b>ONVIF</b>	ONVIF supported
<b>OEM</b>	OEM should have Toll Free Number
	OEM should have a service center in chennai
<b>Warranty</b>	Minimum of 2 years

**PTZ Camera specifications:**

<b>Features</b>	<b>Description</b>
<b>Functional Specifications</b>	1/2.8” progressive CMOS sensor or better
	Built-in Infrared-Cut Removable (ICR) Filter
	Varifocal Lens : Auto Iris, 4.7 to 94 mm or better
	Wide Dynamic Range (WDR)
	Minimum Illumination (Lux) : 0.05 Lux (Color), 0.01 Lux (B/W) or better
<b>Video Specifications</b>	H.264, MPEG4, MJPEG
	Max Resolution: 1920 x 1080p or better



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<b>Pan/Tilt</b>	Motorized Pan /Tilt
	Pan travel: 360° endless Tilt Travel: -10° ~ 190° or better
	Preset Speed: 5°~400°/s or better
<b>Zoom</b>	Optical Zoom : 18X , Digital zoom: 10x or better
<b>Audio Specifications</b>	2-way audio
<b>Network Specifications</b>	<b>Network Interface:</b> Wired LAN : 10/100BASE-TX (RJ-45) , 802.3at midspanPoE
	<b>Network Protocols:</b> IPv4,TCP/IP,UDP,ICMP,DHCP Client,NTP Client,DNS Client,DDNS Client SMTP Client,FTP Client,HTTP,PPPoE, UPnP Port Forwarding, RTP/RTSP/RTCP,IP,IGMP,IEEE802.1x,QoS SNMP
<b>Software Specifications</b>	<b>Event Management:</b> Motion detection Digital input trigger Also periodic alerts should be sent on email or ftp Event notification and upload snapshots/video clips via HTTP, SMTP or FTP
	<b>Image Features:</b> Adjustable image size, quality and bit rate Time stamp and text overlays Configurable privacy masks & motion windows Flip & mirror Configurable shutter speed.
<b>External Device Interface</b>	Micro SD/SDHC
	Audio input/output
	1 DI / 1 DO or better
<b>Operating Temperature</b>	-40 to 50 °C (-40 to 122 °F)
<b>WeatherProof</b>	IP-66 weather-proof standard IK-10 vandal-proof standard
<b>Certifications</b>	UL/ERTL/ETDC,FCC, CE
<b>ONVIF</b>	ONVIF supported
<b>OEM</b>	OEM should have Toll Free Number
	OEM should have a service center in chennai
<b>Warranty</b>	Minimum 2 years



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**Wireless camera specifications:**

<b>Features</b>	<b>Description</b>
<b>Functional Specifications</b>	1/4" CMOS sensor or better
	Focal length: 3.45 mm or better
	Minimum illumination: 0 lux with IR LED on
	Built-in Infrared-Cut Removable (ICR) Filter
<b>Video Specifications</b>	Max resolution: 1280 x 720p or better
	Video Format : Motion JPEG (MJPEG), MPEG-4, H.264
<b>Audio Spec</b>	2-Way Audio Support
<b>Network Specifications</b>	LAN : 10/100BASE-TX (RJ-45),802.3af PoE , 802.11 n
<b>Software Specifications</b>	<b>Image Feature:</b> Configurable image size, quality, frame rate, and bit rate Time stamp and text overlays Configurable motion detection windows Configurable privacy mask zones
	<b>Event Management:</b> Motion detection Digital input trigger Also periodic alerts should be sent on email or ftp Event notification and upload snapshots/video clips via HTTP, SMTP or FTP
<b>Network Specifications</b>	IPv4, TCP/IP, UDP, ICMP, DHCP Client, NTP Client, DNS Client, DDNS Client, SMTP Client, FTP Client, HTTP / HTTPS, Samba Client, PPPoE, UPnP Port Forwarding, RTP / RTSP/ RTCP, IP filtering, 3GPP, IGMP.
<b>External Device Interface:</b>	1 DI / 1 DO or better
	Micro SD/SDHC
<b>Operating Temperature</b>	0 to 40 °C (32 to 104 °F)
<b>Certifications</b>	UL/ERTL/ETDC,FCC, CE
<b>ONVIF</b>	ONVIF supported
<b>OEM</b>	OEM should have Toll Free Number
	OEM should have a service center in chennai
<b>Warranty</b>	Minimum 2 years



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**Wireless Access point specifications:**

<b>Features</b>	<b>Description</b>
<b>Standards</b>	Support for IEEE 802.11b, IEEE 802.11g, IEEE 802.11n
	Should support 802.3ab ,802.3u and IEEE 802.3
	Should support IEEE 802.11i
	Compliance with IEEE 802.3af for providing PoE based power, and power adapter for alternate source of power supply to AP.
<b>Interface</b>	One RJ-45 10/100/1000 Mbps Gigabit Ethernet port.
	Should have a hardware reset button.
	Should have below LED Indicators: Power, LAN, WLAN.
<b>Features</b>	Access point should have external Dipole antennas.
	Minimum antenna gain of 5dbi
	Support for MIMO: 2x2 or better
	The min transmit power of AP should be atleast 26 dBm.
	It should support Wi-Fi Multimedia (WMM) for QoS
	Should support atleast 8 configurable SSIDs or better
<b>Security</b>	WPA personal and Enterprise
	WPA2 personal and Enterprise
	64/128-bit data encryption using WEP for security
	The AP must support a Internal RADIUS server
	ARP spoofing prevention functionality must be supported
	MAC address access control (Filtering)
	Isolation between two wireless clients associated with an access point Radio.
<b>Management</b>	Telnet, Secure Telnet (SSH), HTTP ,and Secure HTTP (HTTPS) based management
	SNMP v1,v2 and v3 must be supported
	Support for Network Time Protocol(NTP) for clock synchronization
<b>Certifications</b>	FCC,UL and WiFi
	The Access point must be WPC certified.
<b>OEM</b>	OEM should have Toll Free Number
	OEM should have a service center in chennai
<b>Warranty</b>	Minimum 2 years



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**Network Video Recorder specifications:**

<b>Hardware</b>	NVR – 16 Channel NVR with 8 hard disk tray Max 4 TB hard disk per tray support HDD- Enterprise/Surveillance HDD
<b>Platform</b>	The system shall be open platform with support for integration of multiple IP camera leading brands & ONVIF compatible models.
<b>Functions</b>	Should support 16 concurrent recordable cameras without external server/storage boxes. The system shall at least support 80mbps throughput. The system should support VMS Client, Browser and Mobile based monitoring/live viewing. The system shall be able to backup recorded video to a remote FTP server according to pre-defined schedule.
	The system should support remote playback system with intelligent search tool. The remote playback system shall support video enhancement function to filter the visibility, sharpen, brightness, contrast and grey scale on recorded video to give user a better display
<b>Display</b>	The system shall have ability to display videos and manage the system locally with monitor connected via either HDMI or VGA.
<b>Event alert</b>	Event & Action: Instant alarm response supporting email, E-map popup on web/remote, push notification on mobile
<b>Interface</b>	The NVR should have 2 x 1 GbE RJ45 network ports , USB Ports: Min. 4 USB 2.0 ports
<b>OEM</b>	OEM should have Toll Free Number
	OEM should have a service center in chennai
<b>Warranty</b>	Minimum 2 years



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