PART 2 - KPLC'S SPECIFICATIONS

FOR

Design, Supply, Installation, Testing, Commissioning & Maintenance of Electronic Security Systems at Institute of Energy Studies and Research

1. **MEGAPIXEL H.264 WDR 180° PANORAMIC DAY/NIGHT INDOOR/OUTDOOR DOME IP CAMERAS**

Feature	Technical Specification	Bidder's Response
12-MEGAPIXEL H.264 WDR 180° PANORAMIC DAY/NIGHT INDOOR/OUTDOOR DOME IP CAMERAS		
Image Sensor	4 x 3MP CMOS WDR	
Optical Format	1/3.2" Progressive Scan	
Pixel Pitch	2.2μm	
Minimum Illumination	Day/Night 0.025 Lux, IR sensitive	
Full Field of View (FOV) Resolution	Per Sensor 2048 H x 1536 V; Total = 4096 H x 768 V	
Dynamic Range	Up to 100dB at Full Resolution	
Lens	M12 small size lens, true 3MP lens	
Video Frame Rates	Max 5.2fps (8192 x 1536); 16.7fps (4096 x 768)	
Compression Type	H.264 (MPEG-4, Part 10)	
Multi-Streaming	8 non-identical streams (2 per sensor)	
Electrical	Power Over Ethernet; PoE 802.3af, Class 3 Auxiliary Power; 12–48V DC and 24V AC	
Programmability	Auto adjustment between WDR and LDR modes	
	Binning Mode; Privacy mask	
	Flexible Cropping (resolution windowing down to 1x1 pixel for JPEG and 2x2 pixels for H.264)	
	+/-5° Digital Vertical Alignment to adjust images; Electronic pan, tilt, zoom (PTZ)	
	On-camera real-time motion detection with up to 1024 detection zones (per sensor)	
	Bandwidth and storage savings by running at 1/4 resolution; Bit rate and bandwidth limit control	
Compliance	Industry Standard; ONVIF Conformant	
	Listings; UL (CB)	
	FCC Compliance; 47 CFR 15 Class A	
	Environmental; RoHS, REACH, WEEE	
	Markings; (CE) EN55022 Class A, EN55024, EN61000-3-2, EN61000-3-3, EN60950-1	
Technical	Protection Ratings; IK-10 vandal-resistant polycarbonate dome; IP66 water/dust protection rating	

2. PTZ CAMERA SPECIFICATIONS

Feature	Technical Specification	Bidder's Response
AUTO DOME IP 5MP PTZ CAMERA		
Image Sensor	The HD PTZ camera shall offer a 1/2.8-inch type progressive CMOS imager	
Resolution	High-resolution, PTZ camera with PAL: 25fps@(2592x1944), 45fps@(2048x1536), 50fps@(1920x1080, 1280x960, 1280x720, 704x576) NTSC: 30fps@(2592x1944), 45fps@(2048x1536), 60fps@(1920x1080,1280x960,1280x720,70 4x576) The PTZ camera shall offer an effective number of pixels of 2592 x 1944.	
Lens	The PTZ camera shall have an autofocus lens with endless 360° continuous (42x optical zoom). The PTZ camera shall have 2.4° to 60.9° field of view (7 to 300 mm) The PTZ camera shall offer automatic focus and iris control with manual override.	
IR Range	upto 300 meter	
Zoom	The PTZ camera shall offer a 42x optical zoom lens (7 to 300 mm) & 16x Digital Zoom Zoom Speed Approx 7s (Wide-Tele) Pan Manual Speed: 0.1°~400°/s, Pan Preset Speed: 400°/s Tilt Manual Speed: 0.1°~320°/s, Tilt Preset Speed: 320°/s	
Video Analytics	Intelligent Tracking and alarm rules engine with on-board Essential Video Analytics. 1. Shall be capable of processing and analyzing video within the camera itself, with no extra hardware required. 2. Shall be capable of detecting and sending alarms for abnormal events.	

	3. Region Entrance, Region Exiting, Advanced Motion Detection, Tamper Detection, Line Crossing, Loitering, Object Left, Object Removed
Recording	Recording management can be controlled by the Video Recording Manager application, or . A memory card with a maximum of 256 GB (microSD) can be used for recording "at the edge"
Defog feature.	To improve visibility on fogy and other low contrast moments, shall offer an anti-fog image feature that assists the camera in registering a usable image through the heaviest fog
Input/output alarms	**Input(2):** 2 supervised,
	Output (1): 1 relay output 5 VDC, 150 mA max.
Minimum Illumination	Color: 0.005Lux@F1.2, Color: 0.008Lux@F1.8, B/W: 0Lux with IR on
Software control	Camera set up to be done via Web, Video management client or video management system
Power Option	Dual power source options (Ethernet PoE (802.3at) / AC 24V
	RJ-45 10/100 Base-TX Ethernet (PoE+ (IEEE 802.3at, class 4 standard), 21-30 VAC, 50/60 Hz
Streaming	Fully configurable 3 streaming with individually configurable streams
Integration	The PTZ camera shall conform to the ONVIF standard to provide interoperability with other conformant systems
WDR	Wide Dynamic Range (WDR) 120 dB
Network Interface	10-Base T/100 Base-TX, auto-sensing, half/full duplex, RJ45
Network protocols	IPv4, IPv6, UDP, TCP, HTTP, HTTPS, RTP/RTCP, IGMP V2/V3, ICMP, ICMPv6, RTSP, FTP, ARP, DHCP, APIPA (Auto-IP, link local address), NTP (SNTP), SNMP (V1, V3, MIB-II), 802.1x, DNS, DNSv6, DDNS (DynDNS.org, selfHOST.de, noip.com), SMTP, iSCSI, UPnP (SSDP), DiffServ (QoS), LLDP, SOAP, Dropbox™, CHAP, digest authentication , Stratocast Genetec
Day/Night	True Day/Night Functionality IR Cut Filter with Auto Switch
Casing	Housing: Aluminum Sunshield: Outdoor Grade Plastic
Data **Transmission**	The HD PTZ camera shall provide direct network connection using H.265+/H.265(HEVC)/H.264+/H.264/MJPEG compression and bandwidth throttling to efficiently manage bandwidth and storage requirements while delivering outstanding image quality.
Warranty	3-Year Warranty on replacement, repair and Support

Backlight Compensation	On / Off / Intelligent Auto Exposure (IAE)	
Preset Positions	300 user defined presets	
Privacy Masking	The camera allows for a total Up to 28 areas (24 mask areas and 4 mosaic areas)	
Other miscellaneous items	Supply with the following:	
	Fiber Optic Ethernet Media Converter kit with a small form-factor pluggable (SFP) module -camera shall allow an optional fiber optic media converter module designed to accept a wide-range of 10/100 Mbps SFP modules for use with Multimode or Singlemode optical fiber with LC or SC connectors.	
	Corner Mounting Plate	
	Pole Mounting Plate	
	Pipe Mount Kit	
	Pendant Roof Mounts	
	Optional Mounting Plates for Roof Mounts	
PTZ Features		
Accuracy	Shall provide pan and tilt preset repeatability accurate to within ±0.1 degrees.	
Speeds and modes	Shall offer the two variable modes of speed:	
	Turbo Mode (manual control):	
	Pan: 0.1°/s to 400°/s	
	Tilt: 0.1°/s to 300°/s	
	Normal Mode:	
	Pan: 0.1°/s to 120°/s	
	Tilt: 0.1°/s to 120°/s	
	Preposition speed	
	Pan: 0.1°/s to 400°/s	
	Tilt: 0.1°/s to 300°/s	
	Electronic Shutter Speed (AES): 1sec to 1/100000 sec	
Pre programmable modes	1. The PTZ camera shall offer five (5) pre-programmed but configurable user modes.	
	2. The pre-programmed modes shall be optimized with the best settings for the following environments:	
	a. Outdoor	
	b. Indoor	

		c. Low Light
		d. Motion
		e. Vibrant
	3. The PTZ camera shall allow users to customize these modes for the specific requirements of the camera site.	
Tilt Angle	0°~90°(Auto Flip)	
Environmental	Protection Ratings: IP66	
Heating and temperatures	**Operating Temperature (Input Voltage 24 VAC) -**40 to +60 °C(-40 to +140 °F)(continuous operation)	
	Operating Temperature (Input Voltage PoE+) -40 to +55 °C(-40 to +122 °F)(continuous operation)	
	Storage Temperature: -40 to +60 °C(-40 to +140 °F)	
	Operating Humidity: 0% to 90% RH, non-condensing	

3. IP MEGAPIXEL OUTDOOR/INDOOR BULLET OR DOME CAMERAS

Feature	Technical Specification	Bidder's Response
5 MEGAPIXEL ENVIRONMENTAL IP OUTDOOR/INDOOR BULLET OR DOME IR CAMERAS WITH WDR		
Max Resolution	5 MP (2592 x 1944)	
Image Sensor	1/2.8" Sensor 5MP Active Pixel Progressive Scan, Back Illuminated Image sensor	
Lens	2.8mm – 12mm , varifocal	
IR Illumination	Integrated Adaptive IR Illumination, Auto/ Manual	
IR Range	Up to 50m	
Focus /Zoom	Auto focus, remote zoom	
Field of View (FOV)	HFOV – 106° - 32° VFOV – 73° - 23° DFOV – 142° - 39°	
Day/Night	Day/Night Capability	

Wide Dynamic Range	True WDR (120dB)	
Illumination	Color - 0.01 Lux @ F1.4 (AGC ON) Monochrome - 0 Lux	
Max FPS at Max Resolution	30 FPS	
Video Streams	4 configurable streams	
Video Streams Profiles	Profile 1: 2592 x 1944p @30fps (H.265/ H.264) Profile 2: D1 @30fps (H.265/H.264) Profile 3: 1080p(2MP)/720p/D1/2CIF/CIF up to 15 fps (H.264/H.265/MJPEG) Profile 4: 720p/D1/2CIF/CIF up to 15 fps (H.265/H.264/MJPEG)	
Audio	Bidirectional	
Analytics	Essential Video Analytics	
	Rule based alarms and tracking, Line crossing,	
	Enter / leave field, Follow route, Loitering,	
	Idle / removed object, People counting, Crowd	
	density estimation, 3D tracking	
Local Storage	microSDHC / microSDXC SD card slot	
Power Input	POE IEEE 802.3af / 802.3 at Type 1, Class 0	
	12 VDC ±30%	
Warranty	3-Year Warranty and Support	
ONVIF	ONVIF Profile S and G	
CYBER SECURITY	Secure boot : Yes	
	Signed firmware : Yes	
	Data Encryption: All data, including sensitive data, is encrypted with AES 256 and RSA 2048	
	IP Address Filtering : Yes	
	HTTPs Streaming : Yes, using TLS 1.2	
	Edge Data Encryption : Yes	
	Network Authentication: Yes,802.1x Network authentication	
	Secure Firmware Upgrade : Yes	
	Anti-roll back firmware : Yes	
	Web login Password protection : Yes	
	Unused debug interface protection : Yes	

Power Supply	12V (DC); 802.3af (PoE)	
Power	Approximately 7.5W	
Operating	Less than 95% RH (non-condensing)	
Operating	-30°C to 60°C	
Storage	-30°C to 60°C	
Communication interface	10Base-T/100BaseTX Ethernet (RJ-45)	
Supported protocols	TCP/IP, HTTP, ARP, DSCP, QoS, DHCP, DNS, DDNS, RTP, RTCP, RTSP, PPPOE, SMTP, NTP, HTTPS, TLS/SSL, SFTP, ICMP, IGMP, 802.1x, SNMP, UPnP, Bonjour, UDP	
Web Viewer	Supported in IE 8.0-11.0, Firefox 15.0-47.0, Chrome 20.0-54.0	
Browser	IE, Chrome, Mozilla	

4. **50 CHANNEL ALL IN ONE SECURITY APPLIANCE COMPLETE WITH VIDEO MANAGEMENT SOFTWARE SPECIFICATIONS**

Feature	Technical Specification	Bidder's Response Yes/No
50 CHANNEL EMBEDDED NVR SPECIFICATIONS COMPLETE WITH VIDEO MANAGEMENT SOFTWARE		
Key Features	• Turnkey appliance with Genetec™ Security Center pre-installed • Local recording and monitoring of video, access control, and other security events. • Machine learning endpoint protect	
Model	• SV-350E	
IP Video Input	• Up to 50 cameras and 100 readers (local viewing) • Up to 100 cameras and 100 readers (recording-only)	
Video Compression	• H.264 video compression	
OS	• Installed on Windows 10 Enterprise LTSC	
Channel Capacity	• 100 Mbps / 50 cameras (local viewing) • 200 Mbps / 100 cameras (recording only)	
Storage	• up to 48TB • RAID controller • Data RAID level RAID 5 • Maximum data storage	
OS Drive	• At least 1x 256 GB SSD	
NIC	• 1x 1 GbE + 1x 10GbE	
Processor	• Intel® Xeon® E-2356G	
Peripherals	• Front: 1x USB 3.0 Rear: 1x USB 3.0 5x USB 2.0	

Display	• 1x VGA	
Cybersecurity	• Endpoint protection • BlackBerry Protect machine learning antivirus	
Mechanical and environmental	• Operating temperature • 50°F to 95°F (10°C to 35°C) • Operating humidity • 5 - 90% (non-condensing)	
Integration/Compatibility /operability with other systems	• ONVIV enabled to allow integration and especially with KPLC existing system(GENETIC) • Shall allow third party systems operations.	
Warranty:	• 3-Years warranty with 1-year advance replacement	
Memory	• 16 GB DDR4	
Cameras supported	• Third-party network cameras supported	

Software	• Web, Video management client or video management system
	 • Once booted up the system shall offer immediate access to the VMS management application via a customized GUI with ability to use one central GUI for configuration and operation.
	 • Advanced monitoring and management options using the Intelligent Platform Management Interface (IPMI).
	 • Shall have the following installed:
	     o Microsoft Operating System and Video application pre-installed:
	     o Windows Storage Server
	     o Video Management System
	     o Video Recording Manager including Video Streaming Gateway	

CLIENT WORKSTATIONS SPECIFICATIONS

Feature	Technical Specification	Bidder's Response
Client Workstation Computer		
Storage Devices	SF1/T3: 1 TB SATA drive	
Mechanical and Environmental	• Power supply • SF1: 260W (100-240 VAC) • Operating temperature • SF1: 41°F to 95°F (5°C to 35°C) • Operating humidity • SF1: 20 - 80% (non-condensing)	

Feature	Technical Specification	Bidder's Response
	• Dimensions (W x D x H) • SF1: 3.7" x 11.5" x 11.4" • (97mm x 292mm x 290mm) • Max Weight • SF1: 11.42 lbs (5.14 kg) • Certifications • IEC 60950-1, European Norm EN 60950-1, • CISPR 22/CISPR 24, EN55022/55024	
Security Options	• Endpoint protection • BlackBerry Protect machine learning • antivirus • Hardened image • 200+ security settings changed by default • Maintenance • Verified Windows updates • Connected services for Genetec software • and device firmware updates	
Monitor Compatibility	• Connect up to 4 monitors, Connect up to 4 monitors	
Keyboard; Mouse; Speakers	• Smartcard Keyboard; Multimedia Keyboard; USB Optical Mouse; Laser USB 6-Button Mouse; 2.0 and 2.1 stereo speaker systems available; sound bar for select flat-panel displays	
Warranty and Support Services	• At least 3-years	

LCD MONITORS 32/43 INCHES

Feature	Technical Specification	Bidder's Response
High Definition LCD Monitors		
Resolution	Minimum 3840 x 2160p (4K resolution) LED Monitor.	
LCD Panel	LED	
Inputs	DisplayPort, HDMI, DVI and VGA inputs	
Energy Star certified	Vibration and Shock Level 7.1 Energy Star Certificate	
Design	SECC steel metal housing for better robustness, heat dissipation and shielding	

NETWORK MEDIA CONVERTORS

Feature	Technical Specification	Bidder's Response
MEDIA CONVERTERS SPECIFICATIONS		
General	- Industrial Gigabit and Supports 1000Base-SX/LX with SC connector, or SFP slot - Link Fault Pass-through (LFP) 10K jumbo frame ›Redundant power input -40 to 75°C operating temperature range (T models) - Supports Energy Efficient Ethernet (IEEE 802.3az)	
Interface	RJ45 Ports: 10/100/1000BaseT(X) Fiber Ports: 100/1000Base-SX/LX or 100/1000BaseSFP slot	
Physical Characteristics Housing:	Metal, IP30 protection Dimensions: 30 x 125 x 79 mm (1.19 x 4.92 x 3.11 in) Weight: 170 g (0.37 lb)	
Power Requirement	**Input Voltage**: 12 to 48 VDC, redundant inputs Input Current: 285 mA @ 48 VDC max. **Connection**: Removable terminal block **Overload Current Protection**: 1.5 A **Reverse Polarity Protection**: Present	
Warranty:	At least 3-Years	
LED Indicators	PWR1, PWR2, G1 (copper port 10M/100M/1000M), G2 (fiber port 100M/1000M)	
DIP Switches	Fiber speed 100M/1000M, Link Fault Pass-through, Energy Efficient Ethernet	
Optical Fiber	**Multi-mode Transmission Distance**: 1000BaseSX: 0 to 500 m, 850 nm (50/125 μm, 400 MHz*km) **Single-mode Transmission Distance**: 1000BaseLX: 0 to 10 km, 1310 nm (9/125 μm, 3.5 PS/(nm*km))	

No	Feature	Technical Specification Must share brochure with Technical Bid & MAF	Bidders Response	Quoted Brand
	ACCESS CONTROL MANAGEMENT/APPLICATION SOFTWARE			
	Integrated Command and control	System must be able to monitor a condition for one integrated subsystem while triggering an action for another.eg camera pop up upon perimeter break in or access violation.		
	WEB-Based	Must be WEB based platform that offers easy to use browser based applications that can be Accessed from any networked location via a		

		PC, tablet or smart phone. Allow Users to respond to alarms online, configure the access control system remotely, as well as import personnel data and view WEB security dashboard reports,without the requirement of installing any software		
	Real time central Event/alarm monitoring	Allow a real time view of all cardholder(s) movements in a selected zone/area providing information on who is present on site, as well as a counter of the total people in a zone/area and other real time events management. Provide a complete graphical and textual representation of the status of the entire access control system and integrated sub systems. The system must respond to alarm situations in real time providing a dynamic on-screen interface to systems with advanced graphical maps, live video pop-up and remote door broadcasting.		
	Transactions Display	Allow split screen view of real-time transaction outcomes and alarms. When a card is swiped at a reader, the cardholder's stored image and associated personnel details are displayed to allow cross check that the right person is using the card.		
	Visitor Management	The system Must allow Visitor management both locally and remotely via WEB to enable users request and manage temporary cardholders (visitors) from any location via a standard web browser, using an easy to use Front-end web application. Such management shall include; add visitor details, photos, sponsor details, reason for visit, visit duration and access level required		
	Reports	Must be able to avail Local and WEB-Based reports such as presence/absence reports, access control reports, Event reports, System function ability reports, time and attendance, among others.		
	Perimeter Monitoring	The software must integrate with other perimeter monitoring systems like CCTV, Intrusion systems,perimeter fencing systems and provide pop ups and other alerts on breach of perimeter conditions.		

ACCESS CONTROL SPECIFICATIONS

Supply and Configuration of Biometric Access Systems Control and Card

NO	ITEMS NAME	BIOMETRIC ACCESS CARDS	Bidder's Response	Quoted Brand
		SPECIFICATIONS		
1	Biometric Access control Cards	The Access control cards must be able to seamless work with Facial Recognition Technology / Card Reader and should be compatible with the following technologies:;		
		i. HID i-class, HID Prox, EM Prox & Mifare/Desfire/NFC Tag		
		ii. MIFARE/DESFire/BLE: 50 mm, EM/Felica: 30 mm		

Door closer
Maintenance Laptops
Core Network Switches (backbone Switch)

CORE SWITCH

The Cisco 3650 24 Port Gigabit PoE Switch OR Equivalent
Key Features
- Integrated wireless controller capability
- 24 Port 10/100/1000Mbps data PoE+ and Cisco UPOE models with Energy-Efficient Ethernet (EEE)
- 24 Port 100Mbps/1/2.5/5/10 Gbps Cisco UPOE models with Energy-Efficient Ethernet (EEE) 12- and 24-port 1 Gigabit Ethernet SFP-based models 12- and 24-port 1/10 Gigabit Ethernet SFP+-based models
- Cisco StackWise-480 technology provides scalability and resiliency with 480 Gbps of stack throughput
- Cisco Stack Power® technology provides power stacking among stack members for power redundancy
- Dual redundant, modular power supplies and three modular fans providing redundancy
- Full IEEE 802.3at (PoE+) with 30W power on all copper ports in 1 Rack Unit (RU) form factor
- Cisco UPOE with 60W power per port in 1 Rack Unit (RU) form factor
- IEEE 802.3bz (2.5/5 G/s BASE-T) to go beyond 1 Gb/s with existing Cat5e and Cat6
- IEEE 802.1ba AV Bridging (AVB) built-in to provide better AV experience for including improved time synchronization and QoS
- Software support for IPv4 and IPv6 routing, multicast routing, modular Quality of Service (QoS), Flexible NetFlow (FNF), and enhanced security features
- Single universal Cisco IOS® Software image across all license levels, providing an easy upgrade path for software features
- Enhanced Limited Lifetime Warranty (E-LLW)

CORE SWITCH

The Cisco 3650 24 Port Gigabit PoE Switch OR Equivalent

Feature	Technical Specification	Bidder's Response
Device Type	Switch - 24 ports - L3 - managed - stackable	
Enclosure Type	Desktop, rack-mountable 1U	
Subtype	Gigabit Ethernet	
Ports	16 x 10/100/1000 (UPOE) + 8 x 100/1000/2.5G/5G/10G (UPOE) + 4 x 10 Gigabit SFP+ (uplink)	
Power Over Ethernet (PoE)	UPOE	
PoE Budget	820 W	
Performance	Switching capacity: 272 Gbps ¦ Forwarding performance: 202.38 Mpps ¦ Stacking bandwidth: 160 Gbps	
Capacity	IPv4 routes: 24000 ¦ NetFlow entries: 24000 ¦ Virtual interfaces (VLANs): 4094 ¦ Switched virtual interfaces (SVIs): 1000 ¦ IPv4 routes: 24000	
MAC Address Table Size	32000 entries	
Jumbo Frame Support	9198 bytes	
Routing Protocol	BGP-4, IS-IS, RIP-1, RIP-2, PIM-SM, static IP routing, PIM-DM, EIGRP for IPv6, OSPFv3, PIM-SSM, policy-based routing (PBR), RIPng	
Remote Management Protocol	SNMP 1, RMON 1, RMON 2, RMON 3, RMON 9, Telnet, SNMP 3, SNMP 2c, SSH, CLI	
Authentication Method	Kerberos, Secure Shell (SSH), RADIUS, TACACS+	
Features	Full duplex capability, layer 2 switching, DHCP support, auto-negotiation, ARP support, trunking, VLAN support, auto-uplink (auto MDI/MDI-X), IGMP snooping, Syslog support, IPv6 support, Spanning Tree Protocol (STP) support, Rapid Spanning Tree Protocol (RSTP) support, Multiple Spanning Tree Protocol (MSTP) support, DHCP snooping, Dynamic Trunking Protocol (DTP) support, Port Aggregation Protocol (PAgP) support, Trivial File Transfer Protocol (TFTP) support, Access Control List (ACL) support, Quality of Service (QoS), RADIUS support, Virtual Route Forwarding-Lite (VRF-Lite), MLD snooping, Dynamic ARP Inspection (DAI), Cisco StackWise Technology, Unicast Reverse Path Forwarding (URPF), Uni-Directional Link Detection (UDLD), Rapid Per-VLAN Spanning Tree Plus (PVRST+), Shaped Round Robin (SRR),	

	LLDP support, Link Aggregation Control Protocol (LACP), MAC Address Notification, Remote Switch Port Analyzer (RSPAN), Hot Standby Router Protocol (HSRP) support, Energy Efficient Ethernet, Strict Priority Queuing (SPQ), Class of Service (CoS), Flexible NetFlow (FNF), DiffServ Code Point (DSCP) support
Compliant Standards	IEEE 802.3, IEEE 802.3u, IEEE 802.3z, IEEE 802.1D, IEEE 802.1Q, IEEE 802.3ab, IEEE 802.1p, IEEE 802.3af, IEEE 802.3x, IEEE 802.3ad (LACP), IEEE 802.1w, IEEE 802.1x, IEEE 802.1s, IEEE 802.1ab (LLDP), IEEE 802.3at
RAM	4 GB
Flash Memory	4 GB
Status Indicators	Port transmission speed, port duplex mode, system, active, status, PoE
Expansion / Connectivity	
Interfaces	16 x 1000Base-T RJ-45 UPOE - 60 W ┊ 1 x USB Type A ┊ 1 x serial (console) RJ-45 management ┊ 1 x management (Gigabit LAN) RJ-45 management ┊ 1 x management (mini-USB) Type B management ┊ 8 x 100/1000/2.5G/5G/10GBase-T RJ-45 UPOE - 60 W ┊ 4 x 10GBase-X SFP+ uplink
Expansion Slots	1 (total) / 1 (free) x Stacking Module slot
Power	
Power Device	Internal power supply - hot-plug
Installed Qty	1 (installed) / 2 (max)
Power Redundancy	Optional
Power Redundancy Scheme	1+1 (with optional power supply)
Power Provided	1100 Watt
Voltage Required	AC 120/230 V (50/60 Hz)
Compliant Standards	CISPR 22 Class A, GOST, BSMI CNS 13438 Class A, CISPR 24, EN 61000-3-2, NOM, EN 61000-3-3, EN55024, EN55022 Class A, ICES-003 Class A, RoHS, UL 60950-1 Second Edition, KCC, FCC Part 15 A, ISO 7779, CSA C22.2 No. 60950-1 Second Edition, EN 60950-1 Second Edition, IEC 60950-1 Second Edition, VCCI Class A, KN24, KN22 Class A
Software / System Requirements	

Software Included	Cisco IOS LAN Base	
Dimensions & Weight		
Min Operating Temperature	23 °F	
Max Operating Temperature	113 °F	
Humidity Range Operating	5 - 96% (non-condensing)	
Min Storage Temperature	-40 °F	
Max Storage Temperature	158 °F	

Edge Network Local Switches

Edge Switches

The Cisco SG300-28P 26-Port Gigabit PoE Switch OR Equivalent to achieve the following:

Key Features

- Twenty-six 10/100/1000 switched RJ-45 ports with auto medium dependent interface (MDI) and MDI crossover (MDI-X) cable detection
- Twenty-four Power over Ethernet (PoE) ports offering up to 180W output
- 2 mini Gigabit Interface Converter (mini-GBIC) slots for fiber and copper Gigabit Ethernet expansion (shared)
- No blocking, store-and-forward switching mechanism
- Simplified QoS management enabled by advanced queuing techniques using 802.1p, differentiated services (DiffServ), or type of service (ToS) prioritisation schemes enhances the performance of real-time applications such as voice and video
- Configuration and monitoring from a standard web browser with WebView management
- Secure remote management of the switch via Secure Shell (SSH) and SSL secure channel network protocols
- 802.1Q-based VLANs enable segmentation of networks for improved performance and security
- Private VLAN Edge (PVE) for simplified network isolation of guest connections or autonomous networks
- Automatic configuration of VLANs across multiple switches through Generic VLAN Registration Protocol (GVRP) and Generic Attribute Registration Protocol (GARP)
- Automatic port configuration through auto MDI/MDIX and 802.1ab with Link Layer Discovery Protocol (LLDP) and Universal Plug and Play (UPnP) support
- User/network port-level security via 802.1X authentication and MAC-based filtering
- Increased bandwidth (up to 8x) and added link redundancy with Link Aggregation

Control Protocol (LACP)
- Enhanced rate-limiting capabilities provide control, including back pressure to control the rate at which data can flow into and out of a port
- Multicasting, broadcasting, and flooding control
- Port mirroring for noninvasive monitoring of switch traffic
- Simple Network Management Protocol (SNMP) versions 1, 2c, and 3 and Remote Monitoring (RMON) support
- Fully rack mountable using the included rack-mounting hardware

Feature	Technical Specification	Bidder's Response
Edge Switches		
Description	Cisco SG 300-28 Gigabit Switch or Cisco equivalent.	
General	• Jumbo frames Frame sizes up to 10 KB supported on 10/100 and Gigabit interfaces • MAC table Up to 8000 MAC addresses	
Ports	• 26 Gigabit Ethernet RJ45 • 2x RJ45/SFP Combo Ports	
Power over Ethernet (PoE)	• Maximum power of 15.4W to any Gigabit Ethernet base port. Total power 180W	
Security	• Secure Shell (SSH) Protocol • Secure Sockets Layer • IEEE 802.1X (Authenticator role) • Layer 3 isolation • Port security: Locks MAC addresses to ports, and limits the number of learned MAC addresses	
Flash; CPU memory; Packet Buffer	16 MB; 128 MB; 4MB	
Cabling Type	• Unshielded twisted pair (UTP) Category 5 or better for 10BASE-T/100BASE-TX; UTP Category 5 Ethernet or better for 1000BASE-T	
Power	• Power saving mode: Energy Detect, Short Reach Maximum Consumption 110V = 30.1W / 220V = 30.3W • Heat Dissapation (BTU/hr) 103.4 • Power Supply: 100–240V 47–63 Hz, internal, universal	
Certification	• UL (UL 60950), CSA (CSA 22.2), CE mark, FCC Part 15 (CFR 47) Class A	

1.5KVA,3KVA, 6KVA, 10KVA, DOUBLE CONVERSATION UPS SPECIFICATIONS

No.	Parameter	Requirement	Bidders Compliance
1.	**Nominal capacity (kVA) / Power (kW) per module**	10kVA 6 kVA 3 kVA	
1.1	UPS type	On-line double conversion UPS	
1.2	Parallel operations	Parallel redundant configuration maximizing the availability	
1.3	Design	Rack/Tower convertible design	
2.	**Input**		
2.1	Nominal voltage	230VAC 1-phase	
2.2	Voltage range	160 to 280 Vac	
2.3	Frequency and range	50 Hz, 45 to 65 Hz	
2.4	Input Power Factor	>0.99	
2.5	Current THD	< 5% (at 100% non-linear load)	
3.	**Output**		
3.1	Nominal voltage	230VAC ±2% with pure sine wave	
3.2	Frequency	50Hz	
3.3	Harmonic distortion	< 2% (linear load) / < 5% (non-linear load)	
3.4	Crest factor	3:1	
3.5	Efficiency	ECO-mode ≥98% / Normal mode ≥90%	
3.6	Mode of operation	On-line double conversion	
4.	**Battery**		
4.1	Autonomy time internal battery (min.)	50% load (> 15mins) 100% load (> 5mins)	
4.2	Additional backup time	Allow for external battery cabinet	
4.3	Charging Parameters	Built in super smart charger, shorten 50% of charging time	
5.	**Protection**		
5.1	Input / Output	Overload, Overheating, Short Circuit, Battery Low, Noise and Spike Suppression	
5.2	Overload AC-Mode	104% continuous, 150% for 160 seconds, >150% transfer to bypass	
5.3	Overload Battery Mode	≤110% - 30sec / ≤125% - 1sec / ≤150% - 200msec	
5.4	Overload Bypass Mode	Input Breaker 60A	
6.	**Alarms - Indication**		
6.1	Audible alarm	Beeping sound for Line Failure, Battery Low, Bypass - Overload Status, Fault Status	
6.2	LED-Alarm	Line - Backup - Eco Mode,	

		Bypass, Battery Low/Bad/Disconnect, Overload, Fault	
6.3	LCD-Display	Big touchscreen display 5"	
7.	**Bypass**		
7.1	Type	Internal static (automatic) and manual bypass / External bypass optional	
7.2	Bypass voltage range	Max. Voltage: +15 % (optional +5/10/25%) / Min. voltage: -45% (optional -20/30%) Frequency protection range: $\pm 10\%$	
8.	**Standards**		
8.1	Quality assurance, environment, health and safety	Quality assurance, environment, health and safety	
8.2	Safety	IEC/EN 62040-1	
8.3	EMC	IEC/EN 62040-2	
8.4	Marking	CE	
8.5	Protection class	IP20	
9.	**Environment**		
9.1	Temperature	Working temperature: 0 - 40°C / Storage temperature: -25 - 55°C	
9.2	Humidity / Altitude	0-95% non-condensing / < 2000m	
9.3	Audible noise at 1m	<50dB /1m according to EN62040-2	
10.	**Interface**		
10.1	In the cabinet	RS232 / RS485 / 2 free slots / dry contacts / EPO - software included	
10.2	In the module	RS232, USB, Ethernet	
10.3	Networking	SNMP-Adapter	