DETAILED PROJECT REPORT (DPR)

Version 1.0

CITY SURVEILLANCE SYSTEM

1. 4 Megapixels V/F Bullet Camera

Category	Parameter	Description
Camera	Image Sensor	1/3"CMOS
	Max. Resolution	2688(H)×1520(V)
	ROM	128 MB
	RAM	128 MB
	Scanning System	Progressive
	Electronic Shutter Speed	Auto/Manual 1/3 s–1/100,000 s
	Min. Illumination	0.008 Lux @ F1.5
	Illumination Distance	60 m (IR)
	Illuminator On/Off Control	Auto/Manual
	Illuminator Number	4 (IR LED)
	Pan/Tilt/Rotation Range	Horizonal: 0°–360° Vertical: 0°–90° Rotation: 0°–360°
Lens	Lens Type	Motorized Vari-focal
	Lens Mount	φ14
	Focal Length	2.7-13.5mm
	Max. Aperture	F1.5
	Field of View	Horizontal: 104°–27°Vertical: 55°–15°Diagonal: 124°–31°
	Iris Control	Fixed
	Close Focus Distance	0.8 m–0.8 m
	DORI Distance	W: D: 64 m; O: 25.6 m; R: 12.8 m; I: 6.4 m T: D: 220 m; O: 88m; R: 44 m; I: 22 m
Smart Event	IVS	Intrusion; tripwire
Video	Video Compression	H.265; H.264; H.264B; MJPEG
	Smart Codec	H.264: Yes H.265: Yes
	Video Frame Rate	50Hz Main stream (2560 × 1440 @ 25 fps); sub stream (704 × 576 @ 25 fps) Main stream (2688 × 1520 @ 20 fps); sub stream (704 × 576 @ 20 fps); Third stream: CIF@1fps 60Hz Main stream (2560 × 1440 @ 30 fps); sub stream (704 × 480 @ 30 fps) Main stream (2688 × 1520 @ 20 fps); sub stream (704 × 480 @ 20 fps); Third stream: CIF@1fps
	Stream Capability	3 streams
	Resolution	2688 × 1520 (2688 × 1520); 2560 × 1440 (2560 × 1440); 2304 × 1296 (2304 × 1296); 1080p (1920 × 1080); 1.3M (1280 × 960); 720p (1280 × 720); D1 (704 × 576/704 × 480); VGA (640 ×480); CIF (352 × 288/352 × 240)
	Bit Rate Control	CBR/VBR

DETAILED PROJECT REPORT (DPR)

Version 1.0 **CITY SURVEILLANCE SYSTEM**

	Video Bit Rate	H.264: 32 kbps–6144 kbps H.265: 12 kbps–6144 kbps
	Day/Night	Auto(ICR)/Color/B/W
	BLC	Yes
	HLC	Yes
	WDR	120 dB
	White Balance	Auto/Natural/Street Lamp/Outdoor/Manual/Regional Custom
	Gain Control	Auto/Manual
	Noise Reduction	3D NR
	Motion Detection	OFF/ON (4 areas, rectangular)
	Region of Interest (RoI)	Yes (4 areas)
	Smart Illumination	Yes
	Image Rotation	0°/90°/180°/270° (Support 90°/270° with 2688 ×1520 resolution
	Mirror	Yes
	Privacy Masking	4 areas
Audio	Audio Compression	G.711a; G.711Mu; G.726
Network	Network Port	RJ-45 (10/100 Base-T)
	Network Protocol	HTTP; TCP; ARP; RTSP; RTP; UDP; RTCP; SMTP; FTP; DHCP; DNS; DDNS; PPPoE; IPv4/v6; QoS; UPnP; NTP; RTMP; Multicast; HTTPS SFTP; 802.1x; ICMP; IGMP
	Interoperability	ONVIF (Profile S/Profile G); CGI; Milestone; Genetec
	User/Host	20
	Storage	OEM Cloud; FTP; Micro SD card (max. 256 GB); NFS
	Browser	IE Google Firefox
	Management Software	Smart PSS; DSS; DMSS
	Mobile Client	iOS; Android
Port	Audio Input	1 channel (RCA port)
	Audio Output	1 channel (RCA port)
	Alarm Input	1 channel in: 5mA 3V–5V DC
	Alarm Output	1 channel out: 300mA 12V DC
Power	Power Supply	DC12V/PoE(802.3af)
	Power Consumption	Basic power consumption: 2W (12V DC); 2.7W (POE) Max powe consumption: (H.265, Max resolution, Max stream, WDR, IR full intensity, IVS): 8.2W (12V DC), 9.6W (POE)
Environment	Operating Temperature	-30°C to +60°C (-22°F to +140°F)
	Operating Humidity	≤95%
	Storage Temperature	-40°C to +60°C (-40°F to +140°F)
	Protection	IP67; IK10
Structure	Casing	Metal
Make		Dahua/ Honeywell/Bosch / Pleco

DETAILED PROJECT REPORT (DPR)

Version 1.0 CITY SURVEILLANCE SYSTEM

	Replenishment (ANR)	
	Image Tampering Prevention	Yes. Watermark and verification are available for videos and pictures
	Drawing Detection Line	Supports automatically drawing detection lines
	Auto Registration	Supported
Intelligencence	Target Detection	Motor vehicles and non-motor vehicles
	License Plate Recognition	Adopts self-developed algorithm to recognize license plates combining numbers and letters
	Vehicle Type Recognition	Vehicle head: Coach bus, medium bus, SUV, MPV, pickup, heavy truck, medium truck, car, van, and light truck Vehicle tail: SUV, car, van, coach bus, pickup, cargo truck, mini truck, tank truck, and mixer truck
	Motor Vehicle Violation Capture	Overspeed, under speed, wrong-way driving, illegal lane change
	Non-motor Vehicle Violation Capture	Overloading, not wearing a helmet
	Traffic Flow Detection	Statistics of vehicle flow, average speed, vehicle type, lane occupancy, average time headway, average queue length, road status, and more; statistics can be exported in Excel
Ports	Storage	FTP, TF card (maximum 256GB@Class10)
	Network	1 RJ-45 Ethernet port, 10/100/1000M network transmission
	RS-485	1 Port
	RS-232	2 Ports
	Alarm Input & Output	3/2 Channel Input/ Output
	Audio Input& Output	1/1 Channel Input/ Output
Power	Power Supply	12V DC, 36V DC, PoE
	Operating Temperature	−40°C to +60°C (−40°F to +149°F) or better
	Approved Make	Dahua/ Honeywell/Bosch/Pleco

Version 1.0 CITY SURVEILLANCE SYSTEM

4Mp Enforcement/ANPR Camera

Category	Parameter	Description
		4Mp Enforcement/ANPR Camera
Basic	Main processor	High-performance embedded processor
	Image Sensor	1/1.8" CMOS
	Image Resolution	2688 × 1520
	Electronic Shutter Speed	1/25 s–1/100000 s (manual/auto)
	Video Frame Rate	Maximum 25fps; main stream (2688 × 1520 @ 25fps), (1080 @ 50/60fps)
	IRIS Control	Fixed iris/manual iris/auto iris/P iris
	Lens Type	Vari-Focal
	Mount Type	On-Boards
	Focal Length	10 ~ 40 mm or better
	Video Bit rate	32kbps–32767kbps
	Picture Encoding Format	JPEG
	Wavelength	845nm or better
	Video Compression	H.265/H.264M/H.264H/H.264B/MJPEGG
	White Balance	Auto/ outdoor/ manual/ local white balance/ natural street light
	Bad Pixel Correction	Supported
	WDR	90 dB or better
	Edge Enhancement	Supported
	Noise Reduction	2DNR/3DNR
	Composite Image	Supports composing 1, 2, 3, or 4 pictures
	OSD Overlay	Motor vehicles: Time, location (video channel locati (number, direction), plate (number and colour), spe vehicle colour, vehicle logo, vehicle type Non-moto

DETAILED PROJECT REPORT (DPR)

Version 1.0

CITY SURVEILLANCE SYSTEM

4.Field Switch

Category	Parameter	Description
Hardware	PoE	Supported
	Ethernet Port	8 PoE Ports (10/100/1000 Mbps)+ 1 Non-PoE Port (10/100/1000 Mbps)
	Layer	L2
	Switching Capacity	3.6 Gbps
	Packet forwarding Rate	2.678 Mpps
	Packet Buffer Memory	1 Mbit
	MAC Table Size	2K
	PoE Protocol	EEE 802.3af (PoE); IEEE 802.3at (PoE+);Hi-PoE; IEEE 802.3bt
	Long Distance PoE Transmission	Supported
	Poe Assignment	Whole 8Core of Network cable
	Flow control	Enable By-default
	Antitheft Lock Hole	Supported
	Power Supply	Extremal Power Adapter: 53V DC
	Operating Temperature	-10 °C to +55°C (14 °F to 131°F)
	Operating Humidity	5% - 95%
	ESD	Air Discharge: 8KV Contact Discharge: 6KV
	Thunder proof	Common mode: 4 kV Differential mode: 2 kV
	Approved Brand	Dahua / Honeywell / Pleco/ Bosch

DETAILED PROJECT REPORT (DPR)

Version 1.0

CITY SURVEILLANCE SYSTEM

SPECIFICATIONS FOR HDD

Sl. No	SPECIFICATION	Hard Disc For storage
1	Interface	SATA 6 GB/s
2	Advance Format (AF)	Yes
3	RoHS Compliant	Yes
4	Host to/ from drive speed	245 Mb/s
5	Cache	256 MB
6	RPM	7200
7	Non-Recoverable read error per bit read	<1 in 1000
8	MTBF (Hours)	2000000
9	Warranty	5 Years

SPECIFICATIONS FOR BODY CAMERA

Dimensions (Max.)	88.4 mm x 52.2 mm x 19.6 mm (3.48" x 2.06" x 0.77")
Interface USB Type Connection Interface	micro USB to USB Type A USB 2.0
Storage Capacity	32 GB
Viewing angle	130 degree
Aperture	F/2.8
Battery Life (Fully Charged)	5hrs. or better
Power Supply (Max.)	Input: AC 100V-240V, 50-60Hz, 0.4A Output: DC 5V / 2A
Resolution	Full HD 1080P
Frame Rate	30/60fps
Video Format	MP4 (H.264)
Weight	88g (3.10oz)
Operating Temperature	-20°C (-4°F) ~ 65°C (149°F)
Storage Temperature	25°C (-13°F) ~ 70°C (158°F)
IP Rating	IPX4
Approved Make	Dahua/ Transcend

DETAILED PROJECT REPORT (DPR)

Version 1.0

CITY SURVEILLANCE SYSTEM

	White Balance	Auto, ATW, Indoor, Outdoor, Manual
	Noise Reduction	Ultra DNR (2D/3D)
	EIS	Supported
	Defog	Supported
	Privacy Masking	24 areas
Audio	Audio Compression	G.711a/G.711Mu/AAC/G.722 / G.726/ G.729/ MPEG2-L2
	Audio Input& Output	1/1 channel In/Out
Network	Network	RJ-45 (10/100 Base-T)
	Protocol	IPv4/IPv6, HTTP, HTTPS, SSL, TCP/IP, UDP, UPnP, ICMP, IGMP, SNMPv1/v2c/v3(MIB-2), ARP, RTCP, RTSP, RTP, SMTP, NTP, DHCP, DNS, PPPOE, DDNS, FTP, IP Filter, QoS, Bonjour, 802.1x
	Interoperability	ONVIF Profile S&G&T, API
	Multicast	Supported
	Edge Storage	NAS (Network Attached Storage),Local PC for instant recording, **Micro SD card 256 GB (to be included by bidder)**
Interface	Alarm Input & Output	7/2 Alarm Input/ Output
	Event Trigger	Motion detection, Video tampering, Scene changing, Network disconnection, IP address conflict, Illegal Access,Storage anomaly
	Power Supply	AC24V/3A(±25%), PoE+(802.3at)
	Operating Temperature	-40°C ~ 70°C (-40°F ~ +158°F) / Less than 95% RH
	Ingress Protection	IP67:IK10
General Intelligence	General Intelligence	Object Abandoned/Missing
Artificial Intelligence	Perimeter Protection	SMD Plus, Smart Motion Detection Intelligent detection: Intrusion, tripwire (support the classification and accurate detection of vehicle and human)
	Auto Tracking	Supported
Certificate	CE	CE: EN55032/EN55024/EN50130-4
	FCC	FCC: Part15 sub-part-B,ANSI C63.4- 2014
	Approved Make	Dahua/ Honeywell/Bosch/Pleco

DETAILED PROJECT REPORT (DPR)

Version 1.0

CITY SURVEILLANCE SYSTEM

6.Surveillance Camera- PTZ

Category	Parameter	Description
Camera	Image Sensor	1/2.8" STARVIS™ CMOS
	Scanning System	Progressive
	Effective Pixels	4MP, 2560(H) x 1440(V)
	Electronic Shutter Speed	1/1s~1/30,000s
	Video Frame Rate	Max outputs 4MP (2560×1440) @25/30 fps
	Min. Illumination	Color: 0.005Lux@F1.6;B/W 0.0005Lux@F1.6; 0Lux@F1.6 (IR on)
Lens	IR Distance	250m (820ft)
	Aperture	F1.6~ F4.95
	Optical Zoom	45X
	Digital Zoom	16X
	Focal Length	3.95mm~177.75mm
	Field of View	H: 70.3° ~ 1.8°; V: 37° ~ 1°; D: 69.3° ~ 2°
PTZ	Iris Control	Auto/Manual
	Wavelength	850nm
	Pan/Tilt Range	Pan: 0° ~ 360° endless; Tilt: -20° ~ 90°,auto flip 180°
	Preset Speed	Pan: 300° /s; Tilt: 200° /s
	Presets	300
	Power up Action	Auto restore to previous PTZ and lens status after powerfailure
	Video Compression	H.265/ H.264/ MJPEG
	Smart Codec	Smart H.265+, Smart H.264+
	Stream Capability	3 streams
	WDR	120 dB
	Bit Rate	H.265/H.264: 3Kbps ~ 20480Kbps

7.1 IP Network Outdoor Intercom Station

1. Ideal solution for outdoor or indoor two-way communication system in noisy, dusty, high temp and acid oralkaline environment.
2. IP network intercom system very suitable for big scale installation system by CAT5 cable or -breoptical cable.
3. Aluminum -nish with damage proof screw -xing up.
4. Aluminum -nish with damage proof screw -xing up.
5. Both surface or embedded mounting ways with supplied mounting box.
6. Classic range high quality IP intercom panel.
7. Intercom panel built-in speaker and microphone.
8. Full duplex two-way communication system.
9. It can start the communication to the call station by pressing the call button. the call station will bereminded with ring call and indicator as which intercom pane l from where is calling. The call will beautomatically transferred to next call station
10. once busy, no answer or fault occurred.
11. With one contact output and contact input for third party communication.
12. Non-dedicated network is needed, the system could be easily built-up over exiting LAN/WA network.
13. Embedded server Linux technology with two ARM and DSP high speech chip.
14. Max support 64,000 call stations working at the same time.
15. Start time less than 0.1 second, and network data delay of less than 100 milliseconds.
16. Waterproof rate of IP66.
17. It is powered by DC12V, the power adapter is included.

Mounting Standard RJ45 port, Power Supply Support both surface or embedded by supplied mounting box Power Consumption DC 12V Network Protocol 5W Network Speed TCP, UDP, ARP, ICMP, IGMP Audio Sampling 10/100 Mbps Transmission Rate 8KHz-44.1KHz,16 bits S/N Ratio Kbps to 320Kbps Frequency Response ≥ 90dB Data Delay 20Hz-20hz Waterproof Rate 100. Milliseconds Connector One line output & one RJ45 port for LAN, one contact input and one contact output. Dimensions 255 x 115 x 50 (W x D X H)mm

7.2 Audio analytic Software

Server of IP network audio system and IP PA system . Support Windows 2000, Windows 2007, Windows 7.All display in English Built-in system set up, system monitor, media player, program timer, system memory functions .Cloud broadcast Mp3 le online , scheduled and matrix at presented time to designated loudspeaker zones . Each equipment's working status could be monitored and displayed on this software. Flexible multiple level loudspeaker zone dentitions, end-user can dene loudspeakers into as many as possible zones at the same time. Built-in weekly timer could broadcast pre-recorded voice message, bell, song to selected zones by trigger contact or manually operation. The head equipment to encode analog sources into digital source to be transferred over network. Support max 5 di-erent sound cards for simultaneously sources collection .One software packet include administrator and branch server and alarm server. Graphic maps display for visually simple monitoring and operation.

7.3 IP Based Microphone Unit

Full duplex Two-way communication from any point to anaphor intercom system.
3.4-inch LCD user friendly human machine interface.
Numeric keys, functional keys to call any terminal, easy to operate. One button push to answer intercom system.
Several paging capacities: zone paging, group paging, all zone paging, two-way intercom.
Networking conference system solutions of discussion and voting function.
Intercom inquiry with chime warning tone and flashing indicator.
Support infrared remote-control receiver, with a remote controller to complete all operations.
Built – In 2W full Range monitor speakers with a remote controller to complete all operations.
Hand-free call and program broadcast receiving.
With earphone or headphone input for monitor or communication.
One external microphone input and one aux output for sound system
24v DC power supplied,

Network Input :	Standard RJ45
Communication Protocol :	TCP/IP, UDP, IGMP
Audio Format :	MP3/MP2
Sampling Rate:	8K – 48KHz
Transmit Speed:	10/100Mbps
Audio Mode:	16 Digit stereo CD sound quality
Frequency Response:	20Hz-16KHz (+1dB, -dB)
THD:	THD 0.3%
S/N ratio:	less than 70dB
Built-in Monitor Speaker:	4 ohms, 2w
Aux Input:	350mv Industry- standard voltage wire terminals
Aux Output:	1V Industry -standard voltage wire terminals
Aux Output Impedance:	1K Ohms
Microphone Impedance:	10mV
Working temperature:	5 to 40degree cointegrate
Humidity:	10%- 90%
Power Consumption:	10W
Power Supply:	24v DC

7.4 IP Based Network Server For PA

Interface between system and IP network audio system
Automatically broadcast the per-recoded voice alarm message once triggered by the closed contact.
Different zone trigger could be assigned with different voice massage
The multiple pre-recoded voice massage are stored in the server or controller
The pre-set voice massage to be broadcasted to which speaker zone output.
Panel support up to 32 speaker zones.
The panel capable for both IP network PA and intercom system.
Each IP network audio system support more than 200 units working together for more than 6,400 speaker zone.
The panel could be built-up over existing LAN/WAN network, non-dedicated network is needed.

Description: IP Network Panel.
Power Supply: AC 220v or 240v, 50-60Hz
Power consumption: 15w
Network Speed 10/100Mbps
Audio Sampling: 8KHz-48KHz, 16 bits
Transmission Rate: 8Kbps to 320Kbps
S/N Ratio: >90dB
Frequency Response: 20Hz-20KHz
Data Delay: <30 milliseconds
Connector: One RJ45 port for LAN, 16 contact inputs and four contact output.

8. SPD Specification

SL No.	Configuration	Description
1	Description of SPD Type	Type1+2
2	Network Voltage	230/400 V
3	Maximum Continuous Operating Voltage (Uc)	320 VAC
4	Temporary overvoltage with stand (Ut)	440 Vac
4	Nominal Discharge Current, 15 X 8/20 µs (In)	30 kA
5	Maximum Discharge Current, 8/20 µs (Imax)	100 KA
6	Lightning impulse current (10/350µs) (Imp)	8 KA /Pole
8	Protection Level (Up)	0.9 KV
9	Technology	MOV
10	Thermal Disconnector	Internal
11	Operating Temperature	-40/+85 °C
12	Protection Class	IP20
13	Housing Materials	Thermoplastic UL94-V0
14	Remote signaling of disconnection	Optional
15	Standards Compliance	IEC 61643-11 / EN61643-1 UL 1449 ed.4
16	Approved Brand	CITEL/ OBO/DHEN

9. Speciation for Single Mode Unitube Armored Optical Fiber Cable

SR. NO.	SPECIFICATION / QUALITATIVE REQUIREMENT
1	06/08/12/24-Core, Single mode 9/125micron primary coated buffers, 10G Ethernet OS2, Armored Loose Tube, ECCS (Electrolytic Chrome Coated Steel) Tape, Jelly Filled LooseTube.
2	Two Steel Wires/Rods embedded in outer periphery of the jacket as strength members.UV Stabilized jacket and protected from Rodent attacks
3	Complying to ANSI/TIA-568-C.3, ISO/IEC 11801, Telcordia GR-20 Core, ITU-T REC G.652D, IEC 60793-1/60794-1, EN 50173, RoHS Compliant
4	Suitable for use in indoor/outdoor ducts, direct burial and backbone cabling
5	Loose tube material: Polybutylene Terephthalate (PBT) with Natural/White Colour having Inner Diameter/Outer Diameter 1.7/2.5 ± 0.1 mm
6	Peripheral strength member as two steel wires/rods having dimensions as 0.6 ± 0.05 mm
7	Moisture Barrier as Water Swellable Tape, Armoring ≥ 0.150 mm (ECCS Tape),Number of Ripcords as 01 no polyester based yarns.
8	Outer sheath material as HDPE/LSZH with diameter as 7.5/8.5 ± 0.5 mm having thickness of1.5mm nominal
9	Weight of the cable for 04/06/0812 core (HDPE/LSZH): 65.0/75.0 ± 10 kg/km, for 24core (HDPE/LSZH): 75.0/95.0 ± 5 kg/km
10	Fiber colour and Loose tube colour as per ANSI/TIA standards.
11	Tensile Strength : 1000 N, Crush Resistance : 4000 N/100mm
12	Minimum bend radius: 20 x Diameter (during installation), Minimum bend radius: 10 Diameter (during full load)
13	Fiber Type: G. 652D (OS2)
14	Attenuation: ≤ 0.38 dB/km (@1310 nm), ≤ 0.25 dB/km (@1550 nm)
15	Chromatic Dispersion : ≤ 3.5 ps/nm.km (@1285 - 1330 nm),(@1550 nm) ≤ 18 ps/nm.km
16	Zero Dispersion Wavelength: 1300 - 1324 nm
17	Zero Dispersion Slope: ≤ 0.092 ps/nm^2.km
18	Polarization Mode Dispersion: ≤ 0.2 ps/√km
19	Cut-off Wavelength: ≤ 1260 nm
20	Mode Field Diameter: 9.2 ± 0.4 µm (@1310 nm), 10.4 ± 0.4 µm (@1550 nm)
21	Core Cladding Concentricity Error: ≤ 0.8 µm
22	Cladding Diameter: 125 ± 1 µm , Coating Diameter : 245 ± 10 µm
23	Cladding Non-circularity: ≤ 1 %
24	Installation Temperature: -20 °C to +70° C,-20 °C to +60° C Operating Temperature:
25	Cable Size and Standard Length: 4F to 12F: 4.0 kms ± 10%24F : 2.0 kms ± 10%
26	Approved Brand: Digisol / Legrand / CommScope

10. Speciation For Solid Cable Catagary 6 UTP FR-PVC

SR. NO.	SPECIFICATION / QUALITATIVE REQUIREMENT
1	The 4 pair Unshielded Twisted Pair cable shall be UL Listed.
2	This cable well exceeds the requirements of ANSI/TIA-568-C.2 and ISO/IEC 11801 Class E
3	Nominal Outer Diameter of Cable should be 5.6 ± 0.2 mm and Conductor Diameter 23 AWG
4	Construction: 4 twisted pairs separated by internal PE Cross Separator. Full separator. Half shall not be accepted. Rip Cord is must.
5	Conductor: Solid bare Copper, Outer jacket sheath: FRPVC with UL approved CM/CMRrated cable. Jacket color: Grey
6	Insulation Material: High Density Polyethylene (HDPE) with Insulation Diameter: 0.89 ± 0.01 mm
7	Dielectric Strength of cable should be 2.5 KVDC for 2seconds
8	Bending Radius: < 4X Cable Diameter at -20°C ± 1°C Pulling Force: 25.35 lbs
9	Electrical Parameters: Insertion loss (Attenuation), NEXT, PSNEXT, ELFEXT (ACRF), PSELFEXT (PSACRF), Return Loss, ACR and PS ACR.
10	Insertion Loss of 32.8 db/100m at 250 MHz
11	Cable should support operating temperature from -20° to +70°C
12	Cable support Conductor Resistance ≤ 9.38 Ω/100m Max.
13	Mutual Capacitance of cable should be < 5.6 nF/100m Max.
14	Resistance Unbalance of cable should be 5% Max.
15	Capacitance Unbalance of cable should Max. 330 pF/100m
16	Cable support Delay Skew: < 45 ns/100m, Operating Voltage: 72V
17	Nominal Voltage of Propagation (NVP): 69% and Current Rating: 1.5 A Max.
18	Impedance: 100 ± 15 Ω @100 MHz. and Propagation Delay @ 250 MHz: 536 ns/100m
19	Approved Brand: Digisol / Legrand / CommScope

11. Speciation for Fiber Rackmount LIU Loaded Drawer Type 06/12/24 PORT

SR. NO.	SPECIFICATION / QUALITATIVE REQUIREMENT
1	The Fiber Rackmount LIU loaded having Adapter panel fixedon drawer base frame, with Adapters and with Pigtails and assembled with splice trayas per the Loaded fiber port requirement and their applicable accessories.
2	Suitable to mount at different positions (depth wise) on standard 1U 19 inchracks. Drawer ty to pull out for easy maintenance when assembled in racks.
3	Cold Rolled Steel material with black powder coating
4	Three types of cable entry holes for different size cables through cableglands, covered with rubber cable grommets/covers.
5	Splicing of 24 fibers in each plastic fiber splicing trays with integrated cable spool design.
6	Non removable top cover and no rear cover. Drawer type to pull out for better access of inte
7	As per the Loaded fiber port requirement, Loaded 16 (SC Simplex) adapters with SC SIMPL Pigtails on rack mount ports.
8	As per the Loaded fiber port requirement Accessories kit consists of Cable manage rings/Cable saddles, Cable glands (PG13.5, 2 nos), Splice rods, Blanking clips, Velcro ties, ties, Cable inlet/outlet hole covers (2 types, 2 no each)
9	Cable management rings/Cable saddles can be mounted inside the rackmount, no provisior mount outside in front of the adapter panel.
10	Suitable for storing up to 1 meter of 900 µm tight buffered fiber pigtail per adapter.
11	Panel Dimensions: 482 x 220 x 44.3 mm (Length x Width x Height)
12	Splice Tray Dimensions: 220 x 90 x 15 mm (Length x Width x Height)
13	Port identification numbers printed on the Adapter panel
14	Standards: Comply as per ANSI/TIA-568-C.3, ISO/IEC11801, RoHSCompliant.
15	Operating Temperature: -20 °C to +70° C Installation Temperature: -20 °C to +70° C
16	Approved Brand: Digisol / Legrand / CommScope

12. 2KVA Rack Mountable UPS

Sl. No.	Minimum Technical Specifications	
1	Capacity (in kVA / kW)	2kVA/1.6kW 1-Phase Input / 1-Phase Output with IGBT Rectifier
2	Input Voltage Range	110-300VAC
3	Input Frequency Range	40 – 70Hz
4	Nominal Output voltage	200/208/220/230/240 VAC
5	O/P Voltage	200/208/220/230/240Vac
6	Charging Current	6 A
7	Efficiency(Min)	89%
8	Output Socket	Output Socket. Minimum 2 nos – Indian Socket & 1 Terminal Block inbuilt to the UPS back
9	Backup Required	Min.4680 VAH (for 800Watt Load)
10	Battery Bank Voltage	72 VDC
11	USB Port should be available	Require
12	RS232 Port & SNMP enabled	RS232 port require & SNMP for Remote monitoring.
13	Product IP	IP 20
14	Inbuilt Automatic Bypass	Require
15	Intelligent Battery Management	Require
16	Battery Deep Discharge Protection	Require
17	ECO Mode	Require
18	Manufacturer	QMS: As per ISO 9001: 2008 EMS: As per ISO 14001: 2004 OSHAS: As per ISO 18001: 2007 TL9000 Factory calibration lab of manufacturer shall be NABL accredited in India
19	ROHS	Yes
20	2 Years Warranty for UPS & 2year on Battery. OEM should have Turnover more than 400Crores for last 3 years.	
21	Approved Brand: Delta	

13. 6KVA Rack mountable UPS

Minimum Technical Specifications	
Capacity (in kVA / kW)	**6kVA 1-Phase Input / 6 KW 1-Phase Output DSP Controlled IGBT Rectifier**
Input	
Voltage Range:	100 – 280 VAC (Load Dependent)
Frequency range	40Hz – 70Hz
Power factor	Greater than 0.95 at full load.
Output	
Nominal voltage:	220/230/240 VAC
Crest factor	3:1 On Full Load (Minimum)
N+X Upto Systems	Require
AC-AC Efficiency	95% .
Battery VAH	Min.4992VAH
Protection	IP-20
Communication Port	REPO , USB Port, RS-232 Port,
Display Panel (In-build LC Display & LED)	
Measurements (On LCD)	Input: Voltage & Frequency, Bypass: Voltage & Frequency, Output: Voltage, frequency, Kilowatt & kVA, Battery: Remaining time & Battery Level indicator, Percentage & Load Level Indicator, Ambient temperature.
Fault Indication (On LCD)	Inverter O/P voltage abnormal, Overload shutdown, Charge voltage too high, Damaged Batteries, Battery missing, Battery voltage to low & Over temperature Protection.
Battery Backup / Battery Bank & Charger	
Backup Required	240min at 1000Watt Load
Battery Bank Voltage	192 VDC
Certifications	
Manufacturer	QMS: As per ISO 9001: 2008
	EMS: As per ISO 14001: 2004
	OHSAS: As per ISO 18001: 2007
Product Safety Certifications (Mandatory)	SURGE: IEC61000-4-5:level4
	CS: IEC61000-4-6: level3
	IEC61000-4-8
	IEC 61000-2-2
	EN 62040-2:2006
	EN 61000-3-2:2009
	CE & RoHS
2 Years for UPS Warranty and 2 Years for Battery. OEM should have Min.400Cr. Turn over for last 3years	
Approved Brand: Delta/ APC/ Numeric	

14. Optical Line Terminal

Sl No	Feature	Specification
1	Key Features	1U 19 inch standard box EPON OLT with 4 PON ports
2		Support DN, Ipv6 Ping, Ipv6 Telnet
3		Support ACL based on source Ipv6 address, destination Ipv6 address, L4port, protocol type, etc.
4		Support MLD v1/v2 snooping
5		Friendly EMS/Web/Telnet/CLI/SSH management
6		CLI command style similar to mainstream manufacturers
7		Support APP management
8		Support port-based rate limitation and bandwidth control;
9		In compliant with IEEE802.3ah standard
10		Support data encryption, multi-cast, port VLAN, separation, RSTP, etc
11		Support Dynamic Bandwidth Allocation (DBA)
12		Support ONU auto-discovery/link detection/remote upgrade of software
13		Support VLAN division and user separation to avoid broadcast storm
14	EPON Port	QTY 4
15		Physical Interface SFP SLOT
16		Connector Type PX20+
17		Max splitting ratio 1:64
18	Management Ports	1*10/100BASE-T out-band port, 1*CONSOLE port
19	PON Port Specificity on (PX20+module)	Transmission Distance 20KM
20		EPON port speed Upstream 1.25G
21		Downstream 1.25G
22		wavelength TX 1490nm, RX 1310nm
23		Connector SC/UPC
24		Fiber Type 9/125μm SMF
25		TX Power +2~+7dBm(PX20+)
26		Rx Sensitivity -30dB(PX20+)
27		Saturation Optical Power -6dBm
28	AC Power Supply	AC:100~240V, 47/63Hz
29	DC Power Supply	DC:-48V
30	Operating Environment	Working Temperature 0~+50°C
31		Storage Temperature -40~+85°C
32		Relative Humidity 5~90%(non-conditioning)
		Approved Brand: Digisol / Zyxel / Belden

15. L3 Full Manageable Core Switch

Sl. No.	Technical Specifications
1	Layer-2 Fully Managed Stackable Switch having 24x 10/100/1000BaseTports, 2x 10GBASE-T ports & 4x 10G SFP+ slots
2	Switching Capacity should be at least 168Gbps
3	Packet Forwarding Rate should be at least 125Mpps for 64-byte packet size
4	The switch should have non-blocking architecture & wire-speed performance under fullyloaded condition from day one
5	The switch should have smart fans with sensor IC that provides different fan speed based on different temperature
6	The switch should have support for physical stacking with at least 8 units per stack.
7	The switch should have support for virtual stacking with at least 25 units per stack.
8	The Switch should have support for redundant power supply.
9	**The Switch should have following L2 features from day one**
10	1. MAC Address Table size: at least 16000
11	2. Flow Control: IEEE 802.3x in full duplex, back pressure in half duplex & HoL blocking prevention
12	3. Jumbo Frame Support (At least 9K bytes)
13	4. IGMP v1 v2 v3 snooping with at least 1024 IGMP snooping groups, Per VLAN IGMP Snooping, host-based IGMP snooping fast leave
14	5. MLD v1 v2 snooping with at least 1024 MLD snooping groups, Per VLAN MLD Snooping,hos based MLD fast leave
15	6. IEEE802.1D STP, 802.1w RSTP,802.1s MSTP with at least 16 MSTP instances, Root guard equivalent feature. G.8032 ERPS features.
16	7. The switch should be able to avoid the loop occurring in a single port connected to an unmanaged switch/hub by shutting down the corresponding port or corresponding VLAN
17	8. IEEE 802.3ad & IEEE 802.1AX Link Aggregation with at least 8 ports per groups & 32groups per switch.
18	9. Port mirroring & VLAN mirroring for Tx/Rx/Both. One-to-One mode, Many-to-one mode,Flow based mirroring.
19	10. IEEE 802.1Q VLAN, at least 4000 Static VLANs, 4000 Dynamic VLANs Groups, GVRP, Voice-VLAN, asymmetric VLAN, 802.1v protocol VLAN, MAC based VLAN, Private VLAN.
20	The switch should have 802.1p support with 8 queues per port. Support strict. WRR queue handling technique. Tr TCM, sr TCM.
21	The switch should support CoS based on VLAN, IP address, MAC address, DSCP, TCP/UDP number, 802.1p priority queues, user defined packet content. Ipv6 address

22	The switch should have Port-based ingress & egress bandwidth control with minimum granularity of at least 8Kbps. Flow-based ingress & egress bandwidth control with minimum granularity of at least 8Kbps
23	The switch should have support for standard & extended Access control lists based on VLAN ID, 802.1p priority, MAC address, IP Address, DSCP, TCP/UDP port number, user definedpacket content, Ipv6 address. Time based ACL.
24	The switch should have the following security features from day one: SSHv2 for Ipv4 & v6, Broadcast/Multicast & Unicast storm control, port security feature with at least 64 MAC per port, traffic segmentation, ARP spoofing prevention, IEEE 802.1x port based authentication, authentication database fallover, DHCP server screening, DAI (Dynamic ARP Inspection), BPDU attack protection, DoS attack prevention, Binding of IP address & MAC address with physical port. Web based Access Control, MAC based Access Control, Dynamic VLAN assignment, Guest VLAN, RADIUS & TACACS+. At least four level of user account control.
25	The switch should have feature to protect the CPU from protocol control packet attack.
26	The switch should have feature of at least 512 static routes, default root, RIPv1v2, RIPng,OSPF, Policy Based Routing, at least 128nos. Of IP interfaces, Ipv6 Neighbor Discovery, VRRP, policy based route from first day
27	The Switch should have following Management features from day one: Web-based GUI, CLI,Telnet Server, TFTP Client, SFTP server, SNMPv1v2cv3, SNMP trap, BooTP/DHCP Client,SNTP, NTP, debug command, RMONv1, RMONv2, Syslog, ICMPv6, DHCP server, DHCP Relay Option 60,61,61,125, LLDP, LLDP-MED, Multiple Image support, sflow, trusted host, Physical console port for Out of band management.
28	All type of switches & transceivers should be from same make.
29	Approved Make: Digisol/D-Link/Cisco

16.1. Road Traffic Signal Controller

The Traffic Signal Controller equipment is a microcontroller-based controller with solid state traffic signal l switching module and a conflict monitoring facility to ensure that conflicting, dangerous or disallowed traffic si displays are not shown.

Site specific configuration data shall be stored in a non-volatile memory device (FLASH memory) easily programm at the site through keypad or laptop. A minimum of 512KB flash memory and 128KB RAM shall be provided. Vola memory shall not be used for storing the junction specific plans or signal timings.

All timings generated within a traffic signal controller shall be digitally derived from a crystal clock which shal accurate to plus or minus 100 milliseconds.

The controller shall provide a real time clock (RTC) with battery backup that set and update the time, date and da the week from the GPS. The RTC shall have minimum of 10 years battery backup with maximum time tolerance sec per day.

16.2. Police Panel

The controller shall provide the following facilities in a separate panel with provision for lock and key arrangem for use by the Traffic Police.

One Forced Flash Switch: Activation of this switch should force the signal to Flashing Amber / Flashing Red.

One Auto / Manual Switch: Activation of this switch should enable manual operation of the controller. Deactiva of the manual switch shall continue from the current stage without interruption.

One Manual Advance Push Button Switch: In manual operation mode, the stages appear in the sequence specifi the signal plan timetable. Activating the pushbutton switch shall terminate the currently running stage and start next, without violating safety clearances.

One Junction OFF Switch: Activating this switch should put OFF all signal lamps. On deactivation of the switch traffic signal controller shall resume its normal operation without violating any safety clearances.

16.3. Modes of Operation

The traffic signal controller shall have the following modes of operation:

Fixed Time

In fixed time (pre-timed) mode the traffic signal controller shall execute stage timings according to the site-spe timetable maintained in the traffic signal controller FLASH memory. Inputs from vehicle detectors shall be ignore this mode and no preemption shall be made on any stage. Cycle time remains constant in every cycle execution given time period.

16.4. Operating Parameters

Phases - The controller shall have facility to configure 32 Phases either for vehicular movement, filter green, indicati green, pedestrian movement or a combination thereof.
It shall be possible to operate the filter green (turning right signal) along with a vehicular phase. The filter green sign shall flash for a time period equal to the clearance amber period at timeout when operated with a vehicular phase.

The pedestrian phase signal shall be configured for flashing red or flashing green aspect during pedestrian clearanc It shall be possible to configure any phase to the given lamp numbers at the site.

Stages – The controller shall have facility to configure 32 Stages.

Cycle Plans – The controller shall have facility to configure 24 Cycle Plans and the Amber Flashing / Red Flashing pla It shall be possible to define different stage switching sequences in different cycle plans. The controller shall have th capability for a minimum of 32 cycle-switching per day in fixed mode of operation.

Day Plans – The controller shall have facility to configure each day of the week with different day plans. It shall al be possible to set any of the day plans to any day of the week. The controller shall have the capability to configure 7 days plans.

Special Day Plans – The controller shall have facility to configure a minimum of 20 days as special days in a calend year.

Starting Red – During power up the controller shall initially execute the All Red for a time period of 3 Seconds to 1 Seconds. The default value of this Starting Red is 5 Seconds. Facility shall be available to configure the time period Starting Red within the given limits at the site.

Inter-green – Normally the inter-green period formed by the clearance Amber and Red extension period will b common for all stages. However, the controller shall have a facility to program individual inter-green period from Seconds to 10 Seconds.

Minimum Green – The controller shall allow programming the Minimum Green period from 5 Seconds to 10 Secon without violating the safety clearances. It should not be possible to preempt the Minimum Green once the stage sta commencing execution.

All Red – Immediately after the Starting Controller. All the approaches should be given red signal for a few secon before allowing any right of way, as a safety measure. The controller shall have programmability of 3 Seconds to Seconds for All Red signal.

Green – Green Conflict Monitoring – The controller shall have a facility to list all conflicting phases at an intersecti The controller should not allow programming of these conflicting phases in a Stage hardware failure leading to a conf condition (due to faulty devices or short circuit in the output) shall force the signal into Flashing Amber / Flashing R

Cable less Synchronization – It shall be possible to synchronize the traffic signal controllers installed in a corridor the following modes of operation, without physically linking them and without communication network. GPS enabl RTC shall be the reference for the cable less synchronization.

- Fixed Time mode with fixed offsets

1.4 Input / Output
The signal lamps shall be operating on 24VDC / 12VDC ±10%

Keypad
The traffic signal controller shall have a custom-made keypad for programming of Controller.

Operator Display
The traffic signal controller shall have a LED backlit Liquid Crystal Display (LCD) as the operator interface.

Functional Specification of Traffic Signal Controller (Solar powered Hybrid type)

Automatic Traffic Controller (Master)

* Solar Power Compatible 12V/24V DC
* Micro controller Based
* Display 20 X 4LCD
* Master Slave Controllers Automatic Communication
* Programmer Hand Held Keypad
* Memory NVRAM /SREPROM
* Possible to program for one year.
* Communication Port RS232 / RS 485, or 2 wire communication Networking with Any other manufactures co (GivingProtocol)
* Facility for Synchronization through RS 232
* Conditional phase transition
* Communication with up to 4 slave Control unit

Slave Control Unit

* Solar Power Compatible
* Micro controller Based
* Communication with master Controller
* No Data received conditions Amber/Red Aspect Blinking (automatically such to blinking mode)
* Conflict monitoring

Police Control Panel

* Auto / Manual / Next
* Forced Blinker
* ON / OFF

DETAILED PROJECT REPORT (DPR)

Version 1.0

CITY SURVEILLANCE SYSTEM

Technical Specification _ Traffic Signal Controller

Sl. No	SPECIFICATION	Traffic Signal Controller
1	MAKE / MODEL	MICROTRANS / BEL / CMS / KELTRON / MAINTEL
2	MICRO-CONTROLLER	32 Bit
3	OPERATING MODES	• Fixed Time • VA
4	USER INTERFACE	• 4-line x 20 ch LCD • Keypad Matrix 20min
5	NO OF OUTPUTS	• 20 each output card • scalable up to 80
6	POLICE CONTROL PANEL KEYS	• Lamp OFF • Forced Flash • Manual • Auto • Hurry Call
7	INTERFACE	• RS232- to get the debug information about the controller status • Ethernet- communication to the ATCS server • USB- Firmware upgrade
8	Input Detection Interface	• Inductive Loop Detection • Camera Detection • Pedestrian push button
9	CABINET CONSTRUCTION	• 1.5mm thick metal sheet • Size 87cm x 55cm x 27cm
10	Applicable Standards and Compliance	• IS: 7537 – 1974 Standard • BS: 505 -71 British Standard • IRC: 93-1985 guidelines • ISO: 9001: 2015 • CE • IP 65

16.5. ROAD TRAFFIC SIGNAL ASPECTS (Vehicular and Pedestrian)

16.6. LEDs based Road Vehicular Traffic Signal Aspects is consisting of three components – Polycarbonate Signal head including power LED retrofit Kit with sun visor. Traffic Signal Aspects is an optical system which produces alight pattern of specified size, colour and shape for providing control information to vehicle drivers. Road Vehicular Traffic Signal Aspects shall be energy efficient Traffic Signal aspect and compliance with European and Indian Standard.

16.7. LEDs based Pedestrian Signal Aspects is consisting of three components – Polycarbonate Signal head includi power LED retrofit Kit with sun visor. Pedestrian Signal Aspects is an optical system which produces alight pattern specified size, color and shape for providing control information to Pedestrian. Pedestrian Signal Aspects shall be ener efficient Traffic Signal aspect and compliance with European and Indian Standard.

16.8. Technical Specifications of Road Traffic Signal Aspects [Vehicular and Pedestrian]

Technical specs	RED	AMBER	GREEN Arrow	GREEN Ball	P.RED	P. GREEN
OPTICAL CHARACTERISTICS						
Technology	LEDs					
TYPE	Power LED					
Color	Red	Amber	Bluish Green	Bluish Green	Red	Bluish Green
Color Wave length	615 – 635nm	580 – 595nm	490 – 500nm	490 – 500nm	615 – 635nm	490 – 500nm
LED Aspect diameter	300mm diameter					
Minimum luminous Intensity of LED Aspects	400cd					
TECHNICAL CHARACTERISTICS						
Operating Voltage	230V AC +/- 10% / 12V DC / 24V DC					
Operating Frequency	50Hz ± 5%					
Maximum power consumption	< 12Watt					
LED Operating Temperature	0°C to +60° C					
LED module ingress	IP 65					
Constructional integrity	Comply					
GENERAL						
Signal head color	BLACK / Grey or as required by customer					
Signal head Material	Ultra Violet stabilized molded Poly Carbonate or Mild Steel as required by Customer					
Lens	Ultra Violet stabilized molded Poly Carbonate					
Dimming	Auto dimming (Optional) on demand					
TEST, DECLARATIONS & MARKING						
LED manufacturer and Signal head manufacturer	ISO 9001 : 2015 Certificate					
Marking and labelling	CE marking (EN 12368) Certificate					
LED Module	IP65 Test Report					
Make	Microtrans / Keltron / BEL					

16.13. Technical Specifications of Standard Pole

Material	
Material	GI Class 'B' Pipe
Standard	ISI mark
Dimensions	
Height	4000mm
Diameter	114mm
Wall thickness	4.5mm +/- 10%
Base plate	
Size	300mm x 300mm
Wall thickness	12mm
Colour	
Colour	Yellow colour recommended or as per client's requirement.
Paint	Spray paint (Outdoor application) with two coats of primer
Foundation	
Foundation type	Surface mount on RCC foundation
Foundation Accessories	J Bolt 4 x 500 mm

16.13. Technical Specifications of Cantilever Pole

Material	
Material	GI Class 'B' Pipe
Standard	ISI mark
Dimensions	
Height	6000mm
Diameter	141mm
Wall thickness	4.5mm +/- 10%
Overhang Arm Length	3000 - 4500mm
Overhang Arm Diameter	115mm
Base plate	
Size	500mm x 500mm
Wall thickness	20mm
Colour	
Colour	Yellow colour recommended or as per client's requirement.
Paint	Spray paint (Outdoor application) with two coats of primer
Foundation	
Foundation type	Surface mount on RCC foundation
Foundation Accessories	J Bolt 6 x 750mm

Count Down Timer

16.9. Vehicular Count Down Timer shall be digital 199seconds display capacity to show remaining time in reve counting to alert motorist in better way. It shall be configurable with vehicular traffic signal Aspects in such a way th it can automatically sense and self-learn timings.

16.10. Pedestrian Count Down Timer shall be digital 199seconds display capacity to show remaining time in reve counting to alert motorist in better way. It shall be configurable with Pedestrian Signal Aspects in such a way that it c automatically sense and self-learn timings.

16.11. Technical Specifications of Vehicular Count Down Timer [Vehicular and Pedestrian]

Technical specs	Full Color Count Down Timer
	OPTICAL CHARACTERISTICS
Technology	LEDs
TYPE	Power LED
Color	Dual Color
Display	199seconds (Max).
	TECHNICAL CHARACTERISTICS
Operating Voltage	230V AC +/- 10% / 12V DC / 24V DC
Operating Frequency	50Hz ± 5%
Maximum powerconsumption	< 25 Watt
LED OperatingTemperature	0°C to +60° C
LED module ingress	IP 65
Constructional integrity	Comply
	FUNCTIONAL CHARACTERISTICS
Operating Mode	Self-Learning – Count down timer is equipped with micro controller. It automatically sense traffic signals, and learn timing, verify and display reverse counting from 3rd cycle on ward there is no change in timings or switched OFF traffic signals.
	GENERAL
Enclosure color	BLACK / Grey or as required by customer
Enclosure Material	Mild Steel with black colour powder coating for outdoor application
Lens	No Lens,
Dimming	Auto dimming (Optional) on demand
	TEST, DECLARATIONS & MARKING
Count Down Timer Manufacturer	ISO 9001 : 2015 Certificate
Marking and labelling	CE marking (EN 12368) Certificate
Count Down Timer	IP65 Test Report
Make	Microtrans / Keltron / BEL

16.12. Poles for Traffic Signals

There are two types of Poles being considered for Traffic Control systems i.e. Standard Pole and Cantilever Pole.

16.14. Cables for Traffic Control Systems

No's of core : 6 and 12 core 1.5 sq. mm 3 Core 2.5 sq. mm

Operating Voltage	230V AC +/- 10% / 12V DC / 24V DC

suitablesize as specified in BOQ

Certification : ISI Marked

Standards : Indian Electricity Act and Rules

IS: 1554: PVC insulated electric cables (heavy duty)

16.15. Technical Specification of Cables 3 core x 2.5sq. mm Copper armoured

Cables are ISI Marked and as per ISI specifications for Power Supply Cables

Type	3 core 2.5 sq. mm, Copper, Armored,underground cable
Conductor material	Bare Copper
Insulating material	PVC type – A
Insulation thickness	0.80 mm
No. Of cores/pairs/triads	as per requirement
Maximum outer diameter	16.40 mm + /- 1.00 mm
Tolerance	+/- 05 % of the ordered Length
Test & applicable standards	IS:8130,is:5831,is:3975 & IS:1554 part1
Sp. Information/ highlights	C.R. at 20 deg.C:<12.1 ohm/km
Other details	Insulation res:>100 mega ohm/km

16.17. Technical Specifications for 1.5 Sq. mm un armoured Control Cables

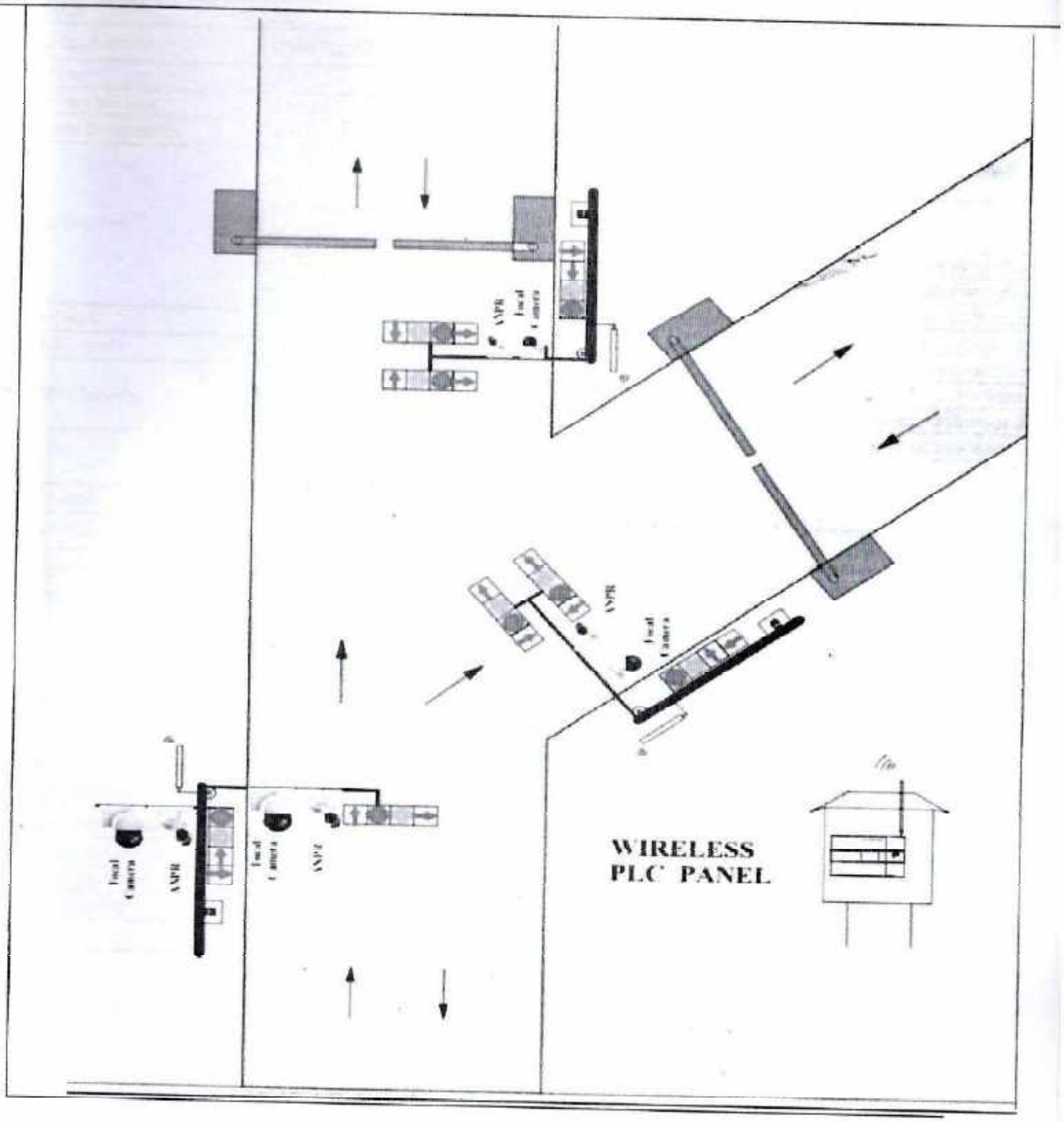
Type	1.5 sq. mm Multicore (4, 6, & 12), Copper, unarmored, underground cable
Conductor material	Bare Copper
Insulating material	PVC type – A
Insulation thickness	0.80 mm
No. Of cores/pairs/triads	as per requirement
Maximum outer diameter	16.40 mm + /- 1.00 mm
Tolerance	+/- 05 % of the ordered Length
Test & applicable standards	IS:8130,is:5831,is:3975 & IS:1554 part-1
Sp. Information/ highlights	C.R. at 20 deg. C:<12.1 ohm/km
Other details	Insulation res:>100 mega ohm/km

16.18. HIGH DENSITY POLYETHYLENE (HDPE) PIPE AND FITTINGS

This specification includes but is not limited to high density polyethylene, primarily intended for use of electrical cable laying eith buried or above grade.

Technical Specifications	
Material Grade	HDPE DWC
Size	63 mm OD
Color	Black
Surface Finishing	Color Coated
Test & applicable standards	ISI Mark, IS4984/2016
Sp. Information/ highlights	PE63, PN4 Polyethylene (PE) pressure Pipe
Other details	Supplied in Coil length

. **Schematic Diagram Of Traffic Signal system**



DETAILED PROJECT REPORT (DPR)

Version 1.0

CITY SURVEILLANCE SYSTEM

Electronic Image Stabilization(EIS)	Yes
Smart Illumination	Yes
Defog	Yes
Image Rotation	0°/90°/180°/270° (Supports 90°/270° with 2688 × 1520 resolution and lower)
Mirror	Yes
Privacy Masking	8 areas
Audio Compression	G.711a; G.711Mu; G726; G.723
Alarm Event	No SD card; SD card full; SD card error; network disconnection; IP conflict; illegal access; motion detection; video tampering; tripwire; intrusion; fast moving; abandoned object; missing object; loitering detection; people gathering; parking detection; scene changing; audio detection; defocus detection; external alarm; face detection; people counting in area; stay alarm; people counting; people counting exception detection; safety exception; queue management; face & body detection; face & body detection (match attributes alarm); face & body detection (mismatch attributes alarm); face recognition
Network	RJ-45 (10/100/1000 Base-T)
SDK and API	Yes
Cyber Security	Video encryption: firmware encryption; configuration encryption; Digest; WSSE; account lockout; security logs; IP/MAC filtering; generation and importing of X.509 certification; syslog; HTTPS; 802.1x; trusted boot; trusted execution; trusted upgrade
	IPv4; IPv6; HTTP; HTTPS; TCP; UDP; ARP; RTP; RTSP; RTCP; RTMP; SMTP; FTP; SFTP; DHCP; DNS; DDNS; QoS; UPnP; NTP; Multicast; ICMP; IGMP; NFS; SAMBA;
Protocol	PPPoE; 802.1x; SNMP; Bonjour
Interoperability	ONVIF (Profile S/Profile G/Profile T); CGI; Milestone; Genetec; P2P;RTMP
User/Host	20 (Total bandwidth: 80M)
Storage	FTP; Micro SD card (256 G); NAS; SFTP
Certifications	CE,FCC,UL,BIS
RS-485	1 (baud rate range: 1200 bps–115200 bps)
Audio Input/output	Audio Interface: 1/1 channel In/Out
Alarm Input	3 channel In: 5mA 5V DC
Alarm Output	2 channel Out: 1000mA 30V DC/500mA 50V AC
Power Supply	12V DC/24V AC/PoE+ (802.3at); ePoE
Power Consumption	Basic power consumption: 3.7W (12V DC); 5.7W(24V AC); 5.5W (PoE)
Operating Conditions	–40°C to +65°C (–40°F to +149°F)/Less than 95% RH
Storage conditions	–40°C to +65°C (–40°F to +149°F)
Protection Grade	IP67, IK10, Anti-Corrosion Protection: NEMA 4X (optional)
Approved Make	Dahua/ Honeywell/Bosch/Pleco
Casing	Metal + Plastic

DETAILED PROJECT REPORT (DPR)

Version 1.0

CITY SURVEILLANCE SYSTEM

Technical Specs of FR Camera	
Image Sensor	1/1.8" 4Megapixel progressive CMOS
Max. Resolution	2688 (H) × 1520 (V)
ROM	4 GB
RAM	2 GB
Scanning System	Progressive
Electronic Shutter Speed	Auto/Manual 1/3 s–1/100000 s
Min. Illumination	0.001 Lux@F1.6 (Color, 30IRE) 0.0002 Lux@F1.6 (B/W, 30IRE) 0 Lux (Illuminator on)
S/N Ratio	> 56 dB
Illumination Distance	120 m (393.70 ft)
Illuminator On/Off Control	Auto/Manual
Illuminator Number	4 (IR LED)
Pan/Tilt/Rotation Range	Pan: 0°–360° Tilt: 0°–90° Rotation: 0°–360°
Lens Type	Motorized vari-focal
Mount Type	Module interface
Focal Length	8 mm–32 mm
Max. Aperture	F1.6 (Constant)
Field of View	Horizontal: 40° (W)–15° (T) Vertical: 23° (W)–9° (T) Diagonal: 46° (W)–18° (T)
Iris Type	Auto; Precise iris control
Video Compression	H.265, H.264, H.264H, H.264B, MJPEG(only supported by sub stream)
Smart Codec	Smart H.265+/ Smart H.264+
Video Frame Rate	Main Stream: 2688 × 1520 (1–50/60 fps) Sub stream: 704 × 576 (1–25 fps);704 × 480 (1–30 fps) Third stream: 1920 × 1080 (1–25/30 fps)Fourth stream: 1920 × 1080 (1–25/30 fps) Fifth stream: 704 × 576 (1–25fps);704 × 480 (1–30 fps)
Stream Capability	5 streams
Resolution	4M (2688 × 1520), 3M (2304 × 1296),1080 (1920 × 1080), 1.3M (1280 × 960),720p (1280 × 72 (704 × 576/704 × 480), VGA (640 × 480), CIF (352 × 288/352 × 240)
Bit Rate Control	CBR/VBR
Video Bit Rate	H.264: 32 kbps–10240 kbps H.265: 12 kbps–10240 kbps
Day/Night	Auto (ICR)/Color/B/W
BLC	Yes
HLC	Yes
WDR	140 dB
Scene Self-adaptation (SSA)	Yes
White Balance	Auto/natural/street lamp/outdoor/manual/regional Custom
Gain Control	Auto/Manual
Noise Reduction	3D NR
Motion Detection	OFF/ON (4 areas, rectangular)
Region of Interest(RoI)	Yes (4 areas)

DETAILED PROJECT REPORT (DPR)

Version 1.0

CITY SURVEILLANCE SYSTEM

Technical Specs of Storage	
Main Processor	64-bit high-performance multi-core processor
Operating System	Embedded LINUX OS
Operating Interface	Web (PCAPP)
Controller	Single controller
Cache	8 GB by default (extendable to 64 GB)
AI by Camera	Face detection, face recognition, IVS (abandoned object, missing object, loitering, crowd gathering, parking, fence-crossing, fast moving, tripwire and intrusion), video metadata (human, vehicle, non-motor vehicle), vehicle recognition, people counting (fisheye or people counting camera required),face & body detection, crowd distribution, smart thermal (call detection, visible channel-smoking detection, thermal channel-smoking detection)
Thermal	Works with camera for fire alarm, temperature alarm, temperature difference alarm, hot spot, cold spot, smoking and calling
People Counting	Works with camera for tripwire people counting, regional people counting and queue people counting
Bullet-PTZ Smart Track	Works with camera for manual tracking, auto tracking, click positioning and select positioning
Fisheye Dewarp	Supports deworming for fisheye cameras
Cluster	N+M
Third-party Camera Access	Onvif, Onvifs RTSP, Sony, Panasonic, Axis, Arecont, Pelco, Canon, Samsung, Hikvision
Video Compression	Smart H.265+;H.265;Smart H.264+;H.264;MJPEG
Audio Compression	G.711a;G.711u;G.729;AAC;G.726;MP2L2;G.7221
Network Protocol	HTTP;HTTPS;TCP/IP;IPv4;RTSP;UDP;SMTP;NTP;DHCP;DNS;DDNS;P2P;iSCSI;FTP;SMB;NFS;GAT1400;
Interoperability	ONVIF (Profile S); CGI; SDK
Browser	Chrome; PCAPP; IE9 or higher; Firefox
Network Mode	Multiple-address mode; Load balance; Fault-tolerance; Link aggregation
Multi-channel Playback	Max. 16-channel playback
Record Mode	Auto record; manual record; search video detection; IO alarm; thermal imaging; intelligent event; all record file
Storage Method	Internal HDD and network disk
Backup Method	HDD, peripheral USB storage device
Playback Function	1. Play, pause, stop, fast forward, fast backward, reverse play, frame by frame 2. Full-screen, backup (clip; file), snapshot, digital zoom, audio on; off
Video Direct Storage (Private Protocol)	Incoming: 320-channel (bandwidth: 800 Mbps) Recording: 320-channel (bandwidth: 800 Mbps) Outgoing: 320-channel (bandwidth: 800 Mbps) Playback: 32-channel (bandwidth: 64 Mbps)
Video Direct Storage (Onvif)	Incoming: 320-channel (bandwidth: 800 Mbps) Recording: 320-channel (bandwidth: 800 Mbps) Outgoing: 320-channel (bandwidth: 800 Mbps) Playback: 32-channel (bandwidth: 64 Mbps)
Video Direct Storage (Auto Register)	Incoming: 320-channel (bandwidth: 800 Mbps) Recording: 320-channel (bandwidth: 800 Mbps) Outgoing: 320-channel (bandwidth: 800 Mbps) Playback: 32-channel (bandwidth: 64 Mbps)
Video Direct Storage (International Protocol)	Incoming: 320-channel (bandwidth: 800 Mbps) Recording: 320-channel (bandwidth: 800 Mbps) Outgoing: 320-channel (bandwidth: 800 Mbps) Playback: 32-channel (bandwidth: 64 Mbps)
Picture Direct Storage	Incoming: 120-channel (550 KB/picture) Recording: 120-channel (550 KB/picture) Outgoing: 120-channel (550 KB/picture) Playback: 32-channel (550 KB/picture)
Disk Group	Yes
iSCSI	Supports client and Server
Network Disk	Supports client
RAID	RAID0;RAID1;RAID5;RAID6;RAID10;RAID50;RAID60;SRAID

DETAILED PROJECT REPORT (DPR)

Version 1.0

CITY SURVEILLANCE SYSTEM

Record Management	Supports record control (continuous, event-based, scheduled, scheduled & event-based).
Storage Pool	Yes
IPSAN Performance	280-channel × 2 Mbps video stream writing and 24-channel × 2 Mbps video playback (I/O size VMS is 64 KB) 400-channel × 2 Mbps video stream writing and 24-channel × 2 Mbps video pla (I/O size of VMS is 512 KB)
General Alarm	Motion detect; tampering; IPC external alarm
Anomaly Alarm	IPC offline alarm; storage error; HDD full; video frame loss; SSD exception; IP conflict; MAC co login lock; fan malfunction; no HDD; network security exception; power exception; disk health exception; RAID exception; storage pool exception; temperature alarm; share service
Intelligent Alarm	Face detection, face recognition, IVS (abandoned object, missing object, loitering, crowd gathe parking, fence-crossing, fast moving, tripwire and intrusion), video metadata (human, vehicle, motor vehicle), vehicle recognition, people counting (fisheye or people counting camera requ face & body detection, crowd distribution, smart thermal (call detection, Visible channel- sm detection, thermal detection-smoking detection)
Alarm Linkage	Record; snapshot (full image); alarm uploading; remote device alarm output; camera audio; buzzer; log; preset; email, smart tracking and warning light. Disarming alarm linkage action by period or one-click sync disarm config with channels
HDD Interface	24 slots, SATA Max.18 T/HDD hot swapping CMR support enterprise-grade HDD
eSATA	1 port
RS-232	1 port, for debug or COM data transmission
USB	4 ports. 2 USB2.0 ports at the front panel and 2 USB3.0 ports at the rear panel
HDMI	1 port, only for debug
Network Port	4 RJ-45 10/100/1000 Mbps self-adaptive Ethernet ports. (gigabit electrica port) 1 RJ-45 10/1 Mbps self-adaptive Ethernet ports. (100 Mbps electrical port)
Power	1+1 redundant power supply
Network Port Extension	4 × 1-GbE LAN ports (optional) 2 × 10-GbE optical fiber ports (optional)
Disk Bay	24
Form Factor	4U
Certifications	CE,FCC,UL,BIS
Power Supply	100-240 VAC 50-60 Hz
Power Consumption	<100 W (without HDD, idling) <300 W (all HDDs connected)
Fan	Intelligent speed regulation fan
Operating Temperature	0 °C to 45 °C (+32 °F to +113 °F)
Approved Make	Dahua/ Honeywell/Bosch/Pleco
Operating Humidity	10%–80% (RH), non-condensing

DETAILED PROJECT REPORT (DPR)

Version 1.0

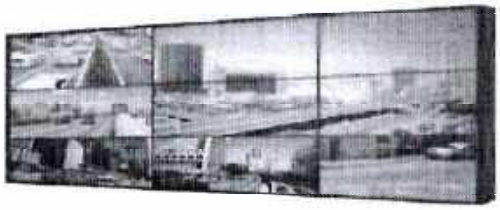
CITY SURVEILLANCE SYSTEM

Technical Specs of Video Controller		
Main Processor	Quad-core embedded microprocessor	
Operating System	Embedded LINUX	
Bus	PCI-E	
Slot	12(2 Main Control Board Slot, 10 Video and Audio Function Board)	
Mainframe	Power module (redundant power optional), main control board, control board, PCI-E bus rear panel, smart temperature controlled fan	
Video Input Card	2 nos. expandable up to 10	
Video Output Card	5 nos. expandable up to 10	
VIC0201(H-M70 (HDMI)	Interface	2ch HDMI1.4 support HDCP
	Access Capability	2ch@4K, downward compatibility
VEC0404H-M70 (HDMI)	Interface	4ch HDMI
	Encoding Format	H.264/MPEG4
	Encoding Capability	4CH@1080P, support resolution: 1080P/720P/UXGA/ SXGA+/SXGA/XGA/SVGA/VGA
VEC0404D-M70 (DVI)	Interface	4ch DVI-I (HDMI & VGA with convertor)
	Encoding Format	H.264/MPEG4
	Encoding Capability	4CH@1080P, support resolution: 1080P/720P/UXGA/SXGA+/ SXGA/XGA/SVGA/VGA
VDC0605H-M70(HDMI)	Decoding Capability	2CH@32MP(25fps)/8CH@12MP (15fps)/8CH@4K(25fps)/32CH@ 1080P/72CH@720P/128CH@D1
	Interface	6ch HDMI (Interfaces 2/3/5/6 support 4K resolution, others support 1080P)
	Output Resolution	4096*2160@24fps, 3840*2160@30fps, 1920*1080@60fps, 1280*1024@60fps, 1280*720@60fps, 1024*768@60fps
	Split	1/4/6/8/9/16/25/36, free split
Decoding Card Video-Wall Splicing	Splicing	Support video-wall splicing (max 60 LCD display units)
	Video-Wall	Support Splicing/Zoom/Merge/ Roam/Overlay
	Video Input	HDMI/DVI
	Video Output	HDMI
	Audio Output	HDMI (embedded)
	Control Mode	WEB/Local GUI/Video Platform/ Network Keyboard/iPad
Interface	6 RJ-45 ports (10/100/1000M), 2 in mainboard and 4 in control board	
Serial Port	4 RS232 ports (4 RJ45), for console and control 1 RS485 port	
USB	3 USB2.0, 1 USB3.0	
Power Supply	100~240V AC, 50/60Hz	
Power Consumption	≤600W	
Working Environment	-10°C ~+50°C / 10~90%RH / 86~106kpa	
Approved Make	Dahua/ Samsung/Sony	

DETAILED PROJECT REPORT (DPR)

Version 1.0

CITY SURVEILLANCE SYSTEM



Technical Specs of Video Panel	
Diagonal Size	55"(16:9)
Panel Type	ADS
Resolution	1920×1080 (FHD)
Bezel Width	2.3mm (T/L), 1.2mm (B/R)
Backlight	Direct LED
Brightness	500 cd/m²
Contrast Ratio	1200:1
Pixel Density	40dpi
Viewing Angle	H178°, V178°
Response Time (G-to-G)	8ms
Color Depth	8bit (16.7M)
Color Temperature	10,000K
Surface Treatment	Haze 25%, 3H
MTBF	50,000h
Input	CVBS(BNC)×1, VGA(D-Sub)×1, DVI-D×1, HDMI×1, RS232×1, USB×1, IR×1
Output	RS232×1
Power Supply	AC100V~AC240V, 50/60 Hz
Power Consumption (Standby)	<0.5W
Power Consumption (Typical)	130W
Power Consumption (Max.)	166W
Energy Efficiency Class (EU)	G
Installation Mode	Floor-standing, wall-mounted
VESA	600×400mm, M6
Control Mode	Infrared, RS232 dual mode, supporting remote control by computer
Approved Make	Dahua/ Samsung/Sony
Operating Environment	Temperature - 0°C~+50°C Humidity - 10%RH~80%RH (non-condensing)

DETAILED PROJECT REPORT (DPR)

Version 1.0

CITY SURVEILLANCE SYSTEM

Server Specs	
Main Processor	One 12-core Intel Xeon 4310 processor
Operating System	Win Server 2019
Controller	Single controller
RAM	16GB*1 DDR4, up to 1TB, ECC memory
Power Redundancy	1+1 redundant power
RAID Controller	PERC H355 Controller
Network	6 Gigabit ports
Serial Port	1
VGA	2
USB	1*USB2.0 2*USB3.0 ports
Quantity of Hard Drive	Standard: One 3.5 inch SATA 2TB enterprise-level HDD
Power Supply	800W high efficiency platinum edition 110V–240V AC
Power Consumption	< 600 W
Operating Temperature	5°C to +40°C (+41°F to +104°F)
Operating Humidity	8%–85% (RH), no condensing
Storage Humidity	5%–95% (RH), no condensing
installation	Standard 19–inch, 1U rack-mounted, with mounting guide rail

Video Management Software Specifications
All software and licenses for end to end IP based video surveillance system
Proposed CCTV system shall be based on Non Proprietary open standard based integrated system with network centric functionality complied to ONVIF profile-S and management architecture, aimed at providing high-speed manual/automatic
Failure of one camera shall not affect other cameras.
The video management system shall be an enterprise class IP enabled fully distributed solution, designed for limitless multi-site and multiple server installations requiring 24/7 surveillance with support for devices from different location.
The video management system shall allow a minimum 20,000 number of cameras, recording servers and clients to be connected to management server across multiple sites.
Single server should connect upto 500 ANPR and 500 Face Recognition
The video management system shall include a distributed architecture, allowing clients on the host system with the user rights to view video sources belonging to multiple independent video management systems simultaneously.
The video management system shall contain a management server that shall be the central manager of the system and control recording servers, cameras, devices and users.
The video management system shall incorporate a fully integrated video-sharing functionality for distributed viewing of video from any camera in the system on any computer with the viewing client.
The video management system shall support encryption of video for export purposes.
Cameras, which shall show a minimum list of the following items. 1) Camera status (connected or disconnected)
An individual camera is recording or not
The name of the camera, the hardware device and the IP address of the hardware device
The recording server, the camera is connected

DETAILED PROJECT REPORT (DPR)

Version 1.0

CITY SURVEILLANCE SYSTEM

What storage the camera is using
Live video format, for example H.264 or M-JPEG
Recording video format, for example H.264 or M-JPEG
The viewing client shall enable operators to connect to the management server for initial authorization. Up on authorization, the vie client shall be able to connect to the recording server(s), for access to live and record
The Client operator shall be able to drag and drop a camera from a tree of available cameras or a camera sequence into any video t live viewing.
The viewing client shall allow the user to be able to:
View live video from cameras;
Playback recordings from cameras with a selection of advanced navigation controls, including an intuitive time line browser.
Switch between a number of views, each able to display videos from 1 up to 34 cameras from multiple servers at a time. The system shall make it possible to create views based on different layouts optimized for 4:3 and 16:9 dispel
Use multiple screens as well as floating windows for displaying different views simultaneously.
Quickly replace one or more views of cameras with other cameras.
View images from several cameras in sequence in a single camera position in a designated carousel position.
View video from selected cameras in greater magnification and/or higher quality in a designated special view position.
Control PTZ cameras.
Use digital zoom on live as well as recorded video.
Get a quick overview of sequences with detected motion.
Quickly search for motion in selected areas of a video recording.
Supports Raster Maps up-to 256 and each raster map size upto 15MB
The viewing client shall include a built-in map function which shall provide an intuitive overview of the system and shall offer integra access to all system components.
The map function shall be able to use standard graphical file formats.
It shall be possible to use any number of layered maps and to easily drag- and-drop and point-and-click icons representing cameras.
The viewing client shall support a map function which shall support instant camera preview when moving the mouse pointer over a specific camera.
The map function shall support real-time status monitoring indication from all system components like camera, recording server, sto etc.
The map function shall support graphical at-the-glance visualization of the system status through color coding. Graphical tool illustra health status of various equipment on a single screen, such as graphical representation
Storage
VMS should Support edge storage and central storage supports upto 4PB
VMS should support Central storage: Extend storage via iSCSI.
Server disk configuration for picture storage involving face detection and recognition, alarms, and object detection
Create record plan by time template: All day template, weekday template, weekend template and custom template
Supports hot-standby Server
Back up the video by schedule from the edge storage, like EVS, NVR, DVR, etc.
Disk quota: Group the disks, and cameras can be allocated to different disk groups
Vehicle Restricted List Management
Set start time and end time for vehicle restricted list
Arm and disarm vehicle restricted list.
Import and export vehicle restricted list.
Parking Management
Overview of entrance and exit information: Number of parking spaces and remaining parking spaces, traffic statistics, parking turn ove parking utilization rates
Support dual-camera capture for higher recognition rate.
Edit parking-lot, includes total and available spaces, parking name etc

DETAILED PROJECT REPORT (DPR)

Version 1.0

CITY SURVEILLANCE SYSTEM

Support configuration of barrier control rules, and support configuration of barrier control rules for zero-space-left cases
VMS should support searching for vehicle records, on-site vehicles, and ANPR details
VMS should support traffic Violation & search function by time, vehicle number, and traffic violation information type.
Support querying for data of passing-by vehicles by section, time period, plate number, plate color, average speed, and type
Supports Violation Penalty
Violators can be penalized.
Supports printing traffic tickets
Violation records can be reviewed.
Violation records can be searched for, including ANPR captured violations, and road section and traffic restriction violations.
Gives Overview of traffic flow
Supports searching for the traffic flow at intersections and road sections from specific periods.
Stand Alone Viewing Client
The standalone viewing client shall make it possible to view exported video.
The standalone viewing client shall run from an. exe file, and no installation of software shall be required in order to view exported sources.
Mobile Viewing Client
It shall be possible to access and view cameras and views on a Smart phone or a tablet (a mobile device). Mobile Client should have live and Playback functionality. It must support android, windows, iOS platform

SL. No.	Product	Technical Specification
1	**2MP IR Mini Dome Network camera For PCR Van**	1/2.8" 2Megapixel progressive scan CMOS; H.265&H.264 dual-stream encoding; 25/30fps@1080P(1920×1080); WDR(120dB), Day/Night(ICR), 3DNR, AWB, AGC, BLC; Digital Zoom 16X; Multiple network monitoring: Web viewer, VMS; 2.8mm fixed lens; Max. IR LEDs Length 23m; Micro SD memory, IP67, IK10, Built-in Mic; Supports Watermark; EN50155(Environment), E-MARK; Power Supply DC12V, PoE (IEEE 802.3af)(Class 0); Certifications: CE, FCC, UL, BIS;
2	**4 Channels POE AI Mobile Video Recorder For PCR Van**	Supports 4-ch 2MP PoE IP cameras input; Supports H.265/smart H.265 video compression; Supports 1/2 HDDs (up to 2 TB for each), and 1 SD card (up to 256 GB); OSD Overlay: Channel, time, GPS position, license plate; Embedded with 3G/4G/Wi-Fi module; 4 channels PoE audio input; Two-way Talk; Supports DSM, face recognition or ANPR; Aviation connectors optional; Multiple network monitoring: Web viewer, VMS; Operation Interface: WEB, AV, VGA, HDMI; Certifications: CE,FCC,EN50155,ISO7637-2,ISO16750,BIS;
3	**Body Camera**	Android 9.0.; 8-core 1.8 GHz High-Performance CPU.; 2.0" touch screen.; Supports 1080p@30 fps recording, the image resolution up to 34MP (7808 × 4400); H.265/H.264 high compression coding.; Support 2G/3G/4G Cellular network, WiFi, Bluetooth, NFC, GPS/GLONALL positioning.; LED illumination, and auto IR mode, OSD overlay.; Power saving mode optional, pre-record and post-record up to 60 s.; 16 GB internal storage and support external TF card storage which can be expanded up to 256 GB.; Electronic Image Stabilization (EIS) technology to provide better image quality.; One press to record video, audio, alarm, PTT.; Supports IP68, drop test 2 meters. Certifications: CE, FCC, BIS