

# **Specification – Control System Equipment & TTS Video Recording System**

**Date: 02 August 2021**

# Specification – TTS Video Recording System

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## A. Control System Equipment

### 1. NI 9147 – 4 Slot Ethernet Expansion Chassis for C Series Modules (Part No.: 783496-01)

#### Memory:

- a. Nonvolatile memory 2 512 MB
- b. Volatile memory (DRAM) 256 MB

#### Network

- a. Network interface 10Base-T, 100Base-T, 1000Base-T Ethernet
- b. Compatibility IEEE 802.3
- c. Communication rates 10 Mbps, 100 Mbps, 1,000 Mbps autonegotiated,
- d. half/full-duplex
- e. Maximum cabling distance 100 m/segment

#### Internal Real-Time Clock

- a. Accuracy 5 ppm

#### USB Port

- a. USB device port
- b. Type USB 2.0 Hi-Speed, with standard B connector
- c. Maximum data rate 480 Mbps

#### Battery

- a. Typical battery life with power applied to power connector: 10 years
- b. Typical battery life in storage at 55 °C: 5.7 years
- c. Minimum battery life in storage at 85 °C: 5.3 years

#### Power Requirements

- a. Voltage input range: 9 VDC to 30 VDC
- b. Reverse-voltage protection: 30 VDC maximum
- c. Maximum power input, with four C Series modules: 11 W
- d. Maximum power input, without C Series modules: 7 W

### 2. NI 9476 with D-sub, 32-Ch, 24 V, Sourcing Output, 500 $\mu$ s C Series Digital Module (Part No.: 779140-01)

#### Output Characteristics

|   |                            |
|---|----------------------------|
| Number of channels                              | 32 digital output channels |
| Output type                                     | Sourcing                   |
| Output voltage ( $V_O$ )                        | $V_{sup} - (I_O R_O)$      |
| Power-on output state                           | Channels off               |
| External power supply voltage range             | ( $V_{sup}$ ) 6–36 VDC     |
| Continuous output current ( $I_O$ ) per channel |                            |
| With 6–30 VDC supply voltage                    | 250 mA max                 |
| With 30–36 VDC supply voltage                   | 200 mA max                 |
| Output impedance ( $R_O$ )                      | 0.3 $\Omega$ max           |
| Continuous overvoltage protection ( $V_{sup}$ ) | up to 40 V max             |
| Reversed-voltage protection                     | None                       |

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|  |   |
|--|---|
| Current limiting                         | None  |
| Short-circuit protection                 | Indefinitely protected when a channel is shorted to COM or to a voltage up to $V_{sup}$ |
| Trip current for one channel             |   |
| With all other channels at rated current | 3 A typ   |
| With all other channels off              | 5 A typ   |
| $V_{sup}$ current consumption            | 28 mA max   |
| Maximum update rate                      | 40 $\mu$ s max  |
| Propagation delay                        | 500 $\mu$ s max   |

### 3. NI 9264 with D-sub, 16-Ch $\pm 10$ V, 25 kS/s, 16-Bit, Analog Output, C Series Module (Part No.: 780927-01)

#### Output Characteristics

|                       |   |
|-----------------------|---|
| Number of channels    | 16 analog output channels   |
| DAC resolution        | 16 bits   |
| Type of DAC           | String  |
| Power-on output state | Channels off  |
| Startup voltage       | 0 V   |
| Power-down voltage    | 0 V   |
| Output range          |   |
| Nominal               | $\pm 10$ V  |
| Minimum               | $\pm 10.35$ V   |
| Typical               | $\pm 10.5$ V  |
| Maximum               | $\pm 10.65$ V   |
| Current drive         | $\pm 16$ mA all channels maximum;<br>$\pm 4$ mA per channel typical |
| Output impedance      | 2.0 $\Omega$  |

### 4. NI 9237 with D-sub, 4 Ch $\pm 25$ mV/V Bridge Analog Input, 24-bit, C Series Module (Part No.: 780264-01)

#### Input Characteristics

|                                    |  |
|------------------------------------|--|
| Number of channels                 | 4 analog input channels                |
| Bridge completion                  |  |
| Half and Full                      | Internal                               |
| Quarter                            | External                               |
| ADC resolution                     | 24 bits                                |
| Type of ADC                        | Delta-Sigma (with analog prefiltering) |
| Sampling mode                      | Simultaneous                           |
| Internal master timebase ( $f_M$ ) |  |

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|   |              |
|---|--------------|
| Frequency   | 12.8 MHz     |
| Accuracy  | ±100 ppm max |
| Data rate range ( $fs$ ) using internal master timebase |              |
| Minimum   | 1.613 kS/s   |
| Maximum   | 50 kS/s      |
| Data rate range ( $fs$ ) using external master timebase |              |
| Minimum   | 390.625 S/s  |
| Maximum   | 51.3 kS/s    |

### 5. NI DB37F-Pigtail, 37-Pin Shielded D-SUB to Pigtail Cable 4m (Part No.: 778620-04)

|           |  |
|-----------|--|
| Pin:      | 37-Pin   |
| VGA Port: | D-SUB Female to 37-Pin D-SUB Male,                                     |
| Cable:    | Shielded Multifunction Cable   |
| Features: | four analog inputs, four analog outputs, and ten digital I/O channels. |

# Specification – TTS Video Recording System

## B. TTS Video Recording System

### 1. 4MP PTZ Camera Specification

#### Camera Module

Auto Focus, ICR (Infrared Cut Removable Filter), BLC (Backlight Compensation), HLC (Highlight Compensation), 3D DNR (digital noise reduction), EIS (electronic image stabilization), 16 × Digital Zoom, 25 × Optical Zoom.

General Function: Mirror, password protection, watermark, IP address filter

#### Lens

Focal Length: 5.9 mm to 147.5 mm, 25 × Optical

FOV: Horizontal field of view: 59.8° to 3.3° (wide-tele),  
Vertical field of view: 33.7° to 1.9° (wide-tele),  
Diagonal field of view: 65° to 3.8° (wide-tele)

#### PTZ

Movement Range: (Pan) 360°, (Tilt) -20° to 90° (auto flip)

Patrol Scan: 8 patrols, up to 32 presets for each patrol

Pattern Scan: 4 pattern scans, record time over 10 minutes for each scan

PTZ Status Display: yes

#### Video

Max. Resolution: 1920 × 1080

Main Stream: 50Hz: 25fps (1920 × 1080, 1280 × 960, 1280 × 720), 50fps (1920 × 1080, 1280 × 960, 1280 × 720)  
60Hz: 30 fps (1920 × 1080, 1280 × 960, 1280 × 720), 60 fps (1920 × 1080, 1280 × 960, 1280 × 720)

Video Compression H.265, H.264, MJPEG

Smart Tracking manual tracking, event tracking, auto-tracking

Alarm Linkage Alarm actions, such as Preset, Patrol Scan, Pattern Scan, Memory Card Video Record, Trigger Recording, Notify Surveillance Center, Upload to FTP/Memory Card/NAS, Send Email, etc.

Vandal-proof Alarm Yes

#### Network

Protocols IPv4/IPv6, HTTP, HTTPS, 802.1x, Qos, FTP, SMTP, UPnP, SNMP, DNS, DDNS, NTP, RTSP, RTCP, RTP, TCP/IP, DHCP, PPPoE, UDP, IGMP, ICMP, Bonjour A

Simultaneous Live View Up to 20 channels

User/Host Up to 32 users. 3 levels: Administrator, Operator and User

Web Browser IE 8 to 11, Chrome 31.0+, Firefox 30.0+, Safari 11+

#### Interface

Communication Interface 1 RJ45 10 M/100 M Ethernet Interface; Hi-PoE

On-board Storage Built-in memory card slot, support Micro SD/Micro SDHC/Micro SDXC, up to 256 GB; NAS (NFS, SMB/ CIFS), ANR

Alarm Input 7 alarm inputs

Alarm Output 2 alarm outputs

Video Output 1.0V[p-p]/75Ω, PAL, NTSC, BNC connector

RS-485 HIKVISION, Pelco-P, Pelco-D, self-adaptive

#### General

24 VAC (Max. 60 W, including max. 18 W for IR and max. 6 W for heater),

Hi-PoE (Max. 50 W, including max. 18 W for IR and max. 6 W for heater)

Operating Conditions Temperature: -40°C to 70°C (-40°F to 158°F), Humidity: ≤ 95%

Dimensions Φ 266.6 mm × 410 mm (Φ 10.50" × 16.14")

Weight Approx. ±8 kg (17.64 lb)

#### Approval

Protection Lightning Protection, Surge Protection and Voltage Transient Protection, ±6kV Line to Gnd, ±3kV Line to Line, IEC61000-4-5, IP67 Standard, IK10

# Specification – TTS Video Recording System

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## 2. 2MP PTZ Camera Spec

### Camera Module

Auto Focus, IR (Infrared Cut Filter), BLC (Backlight Compensation), HLC (Highlight Compensation), 3D DNR (digital noise reduction), EIS (electronic image stabilization), 16 × Digital Zoom, 25 × Optical Zoom.

General Function: Mirror, password protection, watermark, IP address filter

### Lens

Focal Length: 5.7 mm to 142.5 mm, 25 × Optical

FOV: Horizontal field of view: 59.8° to 2.8° (wide-tele),  
Vertical field of view: 33.6° to 1.6° (wide-tele),  
Diagonal field of view: 68.6° to 3.2° (wide-tele)

### PTZ

Movement Range: (Pan) 360° endless, (Tilt) -20° to 90°

Patrol Scan: 8 patrols, up to 32 presets for each patrol

Pattern Scan: 4 pattern scans, record time over 10 minutes for each scan

PTZ Status Display: yes

### Video

Max. Resolution: 1920 × 1080

Main Stream: 50Hz: 25fps (1920 × 1080, 1280 × 960, 1280 × 720), 50fps (1920 × 1080, 1280 × 960, 1280 × 720)  
60Hz: 30 fps (1920 × 1080, 1280 × 960, 1280 × 720), 60 fps (1920 × 1080, 1280 × 960, 1280 × 720)

Video Compression H.265+/H.265/H.264+/H.264

Smart Tracking manual tracking, event tracking, auto-tracking

Alarm Linkage Alarm actions, such as Preset, Patrol Scan, Pattern Scan, Memory Card Video Record, Trigger Recording, Notify Surveillance Center, Upload to FTP/Memory Card/NAS, Send Email, etc.

Vandal-proof Alarm Yes

### Network

Protocols IPv4/IPv6, HTTP, HTTPS, 802.1x, Qos, FTP, SMTP, UPnP, SNMP, DNS, DDNS, NTP, RTSP, RTCP, RTP, TCP/IP, DHCP, PPPoE, UDP, IGMP, ICMP, Bonjour

Simultaneous Live View Up to 20 channels

User/Host Up to 32 users. 3 levels: Administrator, Operator and User

Web Browser IE 8 to 11, Chrome 31.0+, Firefox 30.0+, Edge 16.16299+, Safari 11+

### Interface

Communication Interface 1 RJ45 10 M/100 M Ethernet Interface; Hi-PoE

On-board Storage Built-in memory card slot, support Micro SD/Micro SDHC/Micro SDXC, up to 256 GB; NAS (NFS, SMB/ CIFS), ANR

Alarm Input 7 alarm inputs

Alarm Output 2 alarm outputs

RS-485 HIKVISION, Pelco-P, Pelco-D, self-adaptive

### General

24 V, 3.0A, 50/60Hz, AC (Max. 60 W, including max. 18 W for IR and max. 6 W for heater)

Hi-PoE, 42.5 to 57V, 1.41A (Max. 50 W, including max. 18 W for IR and max. 6 W for heater)

Operating Conditions Temperature: -40°C to 70°C (-40°F to 158°F), Humidity: ≤ 95%

Dimensions Φ 266.6 mm × 410 mm (Φ 10.50" × 16.14")

Weight Approx. ±8 kg (17.64 lb)

### Approval

Protection IP67 Standard, IK10, 6,000V Lightning Protection, Surge Protection and Voltage Transient Protection

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### 3. Antenna Powerbeam / Wireless Bridge

#### a) Primary Powerbeam:

|                           |   |                    |
|---------------------------|---|--------------------|
| Dimensions                | 420 x 420 x 230 mm (16.54 x 16.54 x 9.06")                |                    |
| Weight                    | 2.22 kg (4.89 lbs)  |                    |
| Power Supply              | 24V, 0.5A Gigabit PoE Adapter (Included)                  |                    |
| Max. Power Consumption    | 8.5W  |                    |
| Power Method              | Passive PoE (Pairs 4, 5+; 7, 8 Return)                    |                    |
| Supported Voltage Range   | 20 to 26VDC   |                    |
| Gain                      | 25 dBi  |                    |
| Networking Interface      | (1) 10/100/1000 Ethernet Port                             |                    |
| Processor Specs           | MIPS 74Kc   |                    |
| Memory                    | 64 MB   |                    |
| LEDs                      | Power, Ethernet, (4) Signal Strength                      |                    |
| Channel Sizes             | PtP Mode  | PtMP Mode          |
|                           | 10/20/30/40/50/60/80 MHz                                  | 10/20/30/40 MHz    |
| Enclosure Characteristics | Antenna Feed  | Dish Reflector     |
|                           | Outdoor UV Stabilized Plastic                             | Powder-Coated SPCC |
| Mounting                  | Pole-Mounting Kit (Included)                              |                    |
| Wind Loading              | 380 N @ 200 km/h (85.4 lbf @ 125 mph)                     |                    |
| Wind Survivability        | 200 km/h (125 mph)  |                    |
| ESD/EMP Protection        | Air: $\pm 24$ kV, Contact: $\pm 24$ kV                    |                    |
| Operating Temperature     | -40 to 70° C (-40 to 158° F)                              |                    |
| Operating Humidity        | 5 to 95% Noncondensing                                    |                    |
| Vibration Test            | IEC 68-2-6  |                    |
| Temperature Shock Test    | IEC 68-2-14   |                    |
| UV Test                   | IEC 68-2-5 at 40° C (104° F), Equivalent: ETS 300 019-1-4 |                    |
| Wind-Driven Rain Test     | ETS 300 019-1-4, Equivalent: MIL-STD-810 G Method 506.5   |                    |

#### b) Secondary Powerbeam:

|                           |   |                    |
|---------------------------|---|--------------------|
| Dimensions                | 459 x 459 x 261 mm (18.07 x 18.07 x 10.28") |                    |
| Weight                    | 3.22 kg (7.10 lbs)                          |                    |
| Power Supply              | 24V, 0.5A Gigabit PoE Adapter (Included)    |                    |
| Max. Power Consumption    | 8.5W  |                    |
| Power Method              | Passive PoE (Pairs 4, 5+; 7, 8 Return)      |                    |
| Supported Voltage Range   | 20 to 26VDC                                 |                    |
| Gain                      | 25 dBi                                      |                    |
| Networking Interface      | (1) 10/100/1000 Ethernet Port               |                    |
| Processor Specs           | MIPS 74Kc                                   |                    |
| Memory                    | 64 MB                                       |                    |
| LEDs                      | Power, Ethernet, (4) Signal Strength        |                    |
| Channel Sizes             | PtP Mode                                    | PtMP Mode          |
|                           | 10/20/30/40/50/60/80 MHz                    | 10/20/30/40 MHz    |
| Enclosure Characteristics | Antenna Feed                                | Dish Reflector     |
|                           | Outdoor UV Stabilized Plastic               | Powder-Coated SPCC |
| Mounting                  | Pole-Mounting Kit (Included)                |                    |
| Wind Loading              | 559 N @ 200 km/h (125.7 lbf @ 125 mph)      |                    |
| Wind Survivability        | 200 km/h (125 mph)                          |                    |
| ESD/EMP Protection        | Air: $\pm 24$ kV, Contact: $\pm 24$ kV      |                    |
| Operating Temperature     | -40 to 70° C (-40 to 158° F)                |                    |
| Operating Humidity        | 5 to 95% Noncondensing                      |                    |

## Specification – TTS Video Recording System

|                        |   |
|------------------------|---|
| Vibration Test         | IEC 68-2-6  |
| Temperature Shock Test | IEC 68-2-14   |
| UV Test                | IEC 68-2-5 at 40° C (104° F), Equivalent: ETS 300 019-1-4 |
| Wind-Driven Rain Test  | ETS 300 019-1-4, Equivalent: MIL-STD-810 G Method 506.5   |

### 4. 16 Port Gigabit PoE Switch

|                          |   |
|--------------------------|---|
| Downstream Ports         | 16*10/100/1000Base-T(16 Ports PoE)  |
| Uplink Ports             | 2*10/100/1000Base-T and 2*1000Base-X(SFP)   |
| Network Standard         | IEEE802.3 , IEEE802.3u, IEEE802.3ab, IEEE802.3z, IEEE802.3X   |
| Switch Capacity          | 40Gbps  |
| Throughput               | 28Mpps  |
| Switch Processing Scheme | Store and Forward   |
| Memory Buffer            | 4M  |
| MAC Table                | 8K  |
| PoE Standard             | 802.3af/at(PSE)   |
| PSE Type                 | End-span  |
| Power Pin Assignment     | 1/2(+), 3/6(-)  |
| PoE Power Output         | 54V DC , 30 watts max   |
| PoE Budget               | 170 watts max   |
| Operating mode           | Default: All ports can communicate with each other  |
|                          | VLAN: 1. Downlink ports only communicate with uplink ports,<br>2. Restrain network storm under 2Mbps                |
|                          | Flow control: Switch flow control function is turned off, this mode is suitable for video surveillance transmission |
| Lightning protection     | 6KV Execute:IEC61000-4-5  |
| Power Supply             | 100~240V AC, 50/60Hz  |
| Power Dissipation        | <200W(Including PoE)  |
| Work temperature         | -10°C~50°C  |
| Storage temperature      | -40°C~85°C  |
| Humidity(Non-condensing) | 5%-95%  |
| Dimension (L×W×H)        | 442mm × 285mm × 44.5mm  |
| Weight                   | 3kg   |

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### 5. 8 Ports Gigabit PoE Switch

|                          |   |
|--------------------------|---|
| Downstream Ports         | 8* 10/100/1000Base-T (PoE)                                    |
| Uplink Ports             | 2x 1000Base-X SFP Port  |
| Switch Capacity          | 20Gbps  |
| Throughput               | 14Mpps  |
| Switch Processing Scheme | Store and Forward   |
| Memory Buffer            | 1M  |
| MAC Table                | 4K  |
| PoE Standard             | 802.3af/at(PSE)   |
| PoE Type                 | End-span  |
| Power Pin Assignment     | 1/2(+), 3/6(-)  |
| PoE Power Output         | 54V DC , 30 watts max   |
| PoE Budge                | 135 watts max   |
| PoE power display        | Support 8 LED digital tube to display machine PoE power usage |
| One-key Smart            | Default: All ports are free to communicate                    |
|                          | VLAN: The down ports are isolated from each other             |
|                          | CCTV: Optimize flow control for port isolation                |
| Lightning protection     | 6KV Execute : IEC61000-4-5                                    |
| Power Supply             | AC 110V~240V  |
| Power Dissipation        | <5W   |
| Work temperature         | -10°C~45°C  |
| Storage temperature      | -40°C~85°C  |
| Humidity(Non-condensin)  | 5%-95%  |
| Dimension (L×W×H)        | 245mm×245mm×44mm  |
| Weight                   | ±1Kg  |

### 6. 16 Channel AcuSense NVR 256Mbps with No PoE - 4 False Alarm Filtering

| Video/Audio Input      |  |
|------------------------|--|
| IP Video Input         | 16-ch  |
| Two-Way Audio          | 1-ch, RCA (2.0 Vp-p, 1k Ω)   |
| Network                |  |
| Incoming Bandwidth     | 256 Mbps   |
| Outgoing Bandwidth     | 200 Mbps   |
| Video/Audio Output     |  |
| Recording Resolution   | 12 MP/8 MP/6 MP/5 MP/4 MP/3 MP/1080p/UXGA/720p/VGA/4CIF/DCIF/2CIF/CIF/QCIF |
| CVBS Output (Optional) | 1-ch, BNC (1.0 Vp-p, 75 Ω), resolution: 704 x 480                          |

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|  |  |
|--|--|
| HDMI/VGA Resolution (as Main Port)       | 4K (3840 x 2160), 2K (2560x1440), 1920 x 1080, 1600 x 1200, 1280 x 1024, 1280 x 720, 1024 x 768. 4K resolution is available only for HDMI. |
| HDMI/VGA Resolution (as Auxilliary Port) | 1920 x 1080, 1280 x 1024, 1280 x 720, 1024 x 768   |
| Audio Output                             | 1-ch, RCA (linear, 1k $\Omega$ )   |
| Decoding                                 |  |
| Decoding Format                          | H.265+/H.265/H.264+/H.264/MPEG4  |
| Synchronous Playback                     | 16-ch  |
| Capability                               | 12-ch @ 1080p  |
| Smart Analysis                           |  |
| Capability                               | False alarm filtering (line crossing and intrusion) for 4-ch for 2 MP, 3 MP, and 4 MP network camera                                       |
| Hard Disk                                |  |
| SATA                                     | 4 SATA interfaces for four 3.5" hard drives  |
| Capacity                                 | Up to 8 TB capacity for each hard drive  |
| eSATA                                    | 1 eSATA interface  |
| External Interface                       |  |
| Network Interface                        | 1-port RJ-45 10/100/1000 Mbps self-adaptive Ethernet interface   |
| USB Interface                            | Front panel: 2 x USB 2.0; rear panel: 1 x USB 3.0  |
| Alarm In                                 | 16   |
| Alarm Out                                | 4  |
| PoE Interface                            |  |
| Interface                                | 16-port RJ-45 10/100 Mbps self-adaptive Ethernet interfaces  |
| Power                                    | $\leq 200$ W   |
| Supported Standard                       | IEEE 802.3 af/at   |
| General                                  |  |
| Power Supply                             | 100 to 240 VAC   |
| Maximum Power                            | $\leq 300$ W   |
| Consumption (without HDD)                | $\leq 30$ W  |
| Working Temperature                      | 14° to 131° F (-10° to 55° C)  |
| Working Humidity                         | 10% to 90% non-condensing  |
| Chassis                                  | 1.5U chassis   |
| Dimensions (W x D x H)                   | 17.5" x 15.7" x 2.8" (445 mm x 400 mm x 71 mm)   |
| Weight (without HDD)                     | $\leq 11$ lbs (5 kg)   |

### 7. 9U Swingframe Wallbox - Incl Fan and 5-Way 3m Power Lead

- 570(W) x 600(D) x 400mm(H)
- 200mm Swing frame collar
- Glass front door
- Cable entry top and bottom
- Fan
- Plastic 5 way power ( 3pin)

### 8. Network Keyboard - DS-1100KI

|                      |                                     |
|----------------------|-------------------------------------|
| <b>Control Mode</b>  | IP-based                            |
| <b>TFT LCD Panel</b> | 7" TFT LCD monitor with touch panel |
|                      | Resolution: 800 x 480               |
| <b>Joystick</b>      | 4-axis joystick                     |

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|                           |                        |   |
|---------------------------|------------------------|---|
| <b>Audio</b>              | Line In                | 1-ch, 3.5 mm connector (2.0 Vp-p, 1 kΩ)         |
|                           | Audio Out              | 1-ch, 3.5 mm connector (Linear, 560 Ω)          |
| <b>External Interface</b> | Network Interface      | 1 10M/100M/1000M Ethernet interface             |
|                           | RS-232 Interface       | 1 RS-232 interface                              |
|                           | RS-485 Interface       | 1 RS-485 interface                              |
|                           | USB Interface          | 1, USB2.0 (for data storage and device upgrade) |
| <b>General</b>            | Power Supply           | 12 VDC  |
|                           | Power Consumption      | ≤ 15W   |
|                           | Working Temperature    | -10°C to +55°C (14 °F to 131° F)                |
|                           | Working Humidity       | 10% to 90%                                      |
|                           | Dimensions (W × D × H) | 435 × 193 × 110 mm (17.1" × 7.6" × 4.3")        |
|                           | Weight                 | ±2 Kg (4.4 lb)                                  |

### 9. Cable - CAT6E UTP BC 100m

- Unshielded twisted pairs
- Solid Copper Conductor
- Category 6
- 10BASET 100BASETX 1000BASET/TX 10GBASET

### 10.Connectors

- RJ45 connector for CAT 5 Cable (Quantity 50)
- RJ45 connector boots (Quantity 50)

### 11.Surveillance Cameras – 4MP Fixed Bullet Network Cameras

#### Camera Module

Fixed Focus, ICR (Infrared Cut Filter), BLC (Backlight Compensation), HLC (Highlight Compensation), 3D DNR (digital noise reduction), 3-Axis adjustment – Pan: 0° to 360°, Tilt: 0° to 100°, Rotate: 0° to 360°.

General function: One-key reset, anti-flicker, three streams, heartbeat, mirror, password protection, privacy mask, watermark, IP address filter.

#### Lens

Focal Length: 2.8, 4, 6, 8, 12 mm  
 FOV: 2.8 mm, horizontal FOV: 109°, vertical FOV: 60°, diagonal FOV: 131°  
 4 mm, horizontal FOV: 88°, vertical FOV: 46°, diagonal FOV: 105°  
 6 mm, horizontal FOV: 53°, vertical FOV: 30°, diagonal FOV: 61°  
 8 mm, horizontal FOV: 41°, vertical FOV: 23°, diagonal FOV: 48°  
 12 mm, horizontal FOV: 25°, vertical FOV: 14°, diagonal FOV: 29°

Video Compression: Main stream: H.265/H.264  
 Sub-stream: H.265/H.264/MJPEG  
 Third stream: H.265/H.264H.265, H.264, MJPEG

Video Bit rate: 32 Kbps to 16 Mbps  
 Maximum Resolution: 2688 x 1520

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|                |   |
|----------------|---|
| Main Stream:   | 50Hz: 25 fps (2688 × 1520, 2304 × 1296, 1920 × 1080)<br>60Hz: 30 fps (2688 × 1520, 2304 × 1296, 1920 × 1080)      |
| Alarm Trigger: | Motion detection, video tampering, network disconnected, IP address conflict, illegal login, HDD full, HDD error. |

### Network

|                         |   |
|-------------------------|---|
| Protocols:              | TCP/IP, ICMP, HTTP, HTTPS, FTP, DHCP, DNS, DDNS, RTP, RTSP, RTCP, PPPoE, NTP, UPnP, SMTP, SNMP, IGMP, 802.1X, QoS, IPv6, Bonjour        |
| Network Storage:        | Support microSD/SDHC/SDXC card (128G), local storage and NAS (NFS,SMB/CIFS), ANR  |
| Simultaneous Live View: | Up to 6 channels  |
| User/Host:              | Up to 32 users. 3 levels: Administrator, Operator and User  |
| Web Browser:            | Plug-in required live view: IE8+, Chrome 41.0-44, Firefox 30.0-51, Safari 8.0-11<br>Plug-in free live view: Chrome 45.0+, Firefox 52.0+ |

### Interface

|                          |   |
|--------------------------|---|
| Communication Interface: | 1 RJ45 10 M/100 M self-adaptive Ethernet port |
| On-board Storage:        | Built-in microSD/SDHC/SDXC slot, up to 128 GB |

### General

|                                   |   |
|-----------------------------------|---|
| Power Supply:                     | 12 VDC ± 25%, Φ 5.5 mm coaxial plug power<br>PoE(802.3af, class 3)                                      |
| Operating Conditions Temperature: | -30°C to 60°C (-22°F to 140°F), Humidity: ≤ 95%   |
| Dimensions                        | Camera: Φ104.8 mm × 299.7 mm (Φ4.1" × 11.8")<br>Package: 386 mm × 156 mm × 155 mm (15.2" × 6.1" × 6.1") |
| Weight Approx.                    | ±1.2kg (2.7 lb)   |

### Approval

|            |               |
|------------|---------------|
| Protection | IP67 Standard |
|------------|---------------|

## Specification – TTS Video Recording System

### C. Pricing Schedule

| Item | Description  | Quantity | Unit Price | Total Price |
|------|--|----------|------------|-------------|
| 1    | <b>Control System Equipment Set 1</b>  |          |            |             |
|      | NI 9147 – 4 Slot Ethernet Chassis (Part Number 783496-01)  | 1        |            |             |
|      | NI 9476 with D-sub, 32-Ch, 36 V, Sourcing Output, 500 $\mu$ s C Series Digital Module (Part Number 779140-01)      | 1        |            |             |
|      | NI 9264 with D-sub, 16-Ch $\pm$ 10V, 25 kS/s, 16-Bit, Analog Output, C Series Module (Part Number 780927-01)       | 1        |            |             |
|      | NI 9237 with D-sub, 4 Ch $\pm$ 25mV/V Bridge Analog Input, 24-bit, 50kS/s, C Series Module (Part Number 780264-01) | 1        |            |             |
|      | NI DB37F-Pigtail, 37-Pin Shielded D-SUB to Pigtail Cable 4m (Part Number 778620-04)                                | 3        |            |             |
| 2    | <b>Control System Equipment Set 2</b>  |          |            |             |
|      | NI 9147 – 4 Slot Ethernet Chassis (Part Number 783496-01)  | 1        |            |             |
|      | NI 9476 with D-sub, 32-Ch, 36 V, Sourcing Output, 500 $\mu$ s C Series Digital Module (Part Number 779140-01)      | 1        |            |             |
|      | NI 9264 with D-sub, 16-Ch $\pm$ 10V, 25 kS/s, 16-Bit, Analog Output, C Series Module (Part Number 780927-01)       | 1        |            |             |
|      | NI 9237 with D-sub, 4 Ch $\pm$ 25mV/V Bridge Analog Input, 24-bit, 50kS/s, C Series Module (Part Number 780264-01) | 1        |            |             |
|      | NI DB37F-Pigtail, 37-Pin Shielded D-SUB to Pigtail Cable 4m (Part Number 778620-04)                                | 3        |            |             |
| 3    | <b>Control System Equipment Set 3</b>  |          |            |             |
|      | NI 9147 – 4 Slot Ethernet Chassis (Part Number 783496-01)  | 1        |            |             |
|      | NI 9476 with D-sub, 32-Ch, 36 V, Sourcing Output, 500 $\mu$ s C Series Digital Module (Part Number 779140-01)      | 1        |            |             |
|      | NI 9264 with D-sub, 16-Ch $\pm$ 10V, 25 kS/s, 16-Bit, Analog Output, C Series Module (Part Number 780927-01)       | 2        |            |             |
|      | NI 9237 with D-sub, 4 Ch $\pm$ 25mV/V Bridge Analog Input, 24-bit, 50kS/s, C Series Module (Part Number 780264-01) | 1        |            |             |
|      | NI DB37F-Pigtail, 37-Pin Shielded D-SUB to Pigtail Cable 4m (Part Number 778620-04)                                | 2        |            |             |

## Specification – TTS Video Recording System

| Item  | Description  | Quantity | Unit Price | Total Price |
|-------|--|----------|------------|-------------|
| 4     | <b>Video Recording System</b>  |          |            |             |
|       | 4MP PTZ Camera Specification   | 2        |            |             |
|       | 2MP PTZ Camera Specification   | 4        |            |             |
|       | Antenna Powerbeam / Wireless Bridge (Including mounting brackets)        | 1        |            |             |
|       | 16 Port Gigabit PoE Switch   | 1        |            |             |
|       | 8 Ports Gigabit PoE Switch   | 1        |            |             |
|       | 16 Channel AcuSense NVR 256Mbps with No PoE<br>- 4 False Alarm Filtering | 1        |            |             |
|       | 9U Swingframe Wallbox - Incl Fan and 5-Way 3m Power Lead                 | 1        |            |             |
|       | Network Keyboard - DS-1100KI   | 1        |            |             |
|       | Cable - CAT6E UTP BC 100m  | 3        |            |             |
|       | RJ45 Connectors for CAT5 cable   | 50       |            |             |
|       | RJ45 Connector boots   | 50       |            |             |
|       | Surveillance Cameras – 4MP Fixed Bullet Network Cameras                  | 10       |            |             |
|       | Sundries   | 1        |            |             |
|       | Labour – Installation, Commissioning & Testing                           | 1        |            |             |
| Total |  |          |            |             |