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Prototype Design for a Pharmaceutical Intermediate Warehouse

PROTOTYPE DESIGN FOR A PHARMACEUTICAL INTERMEDIATE WAREHOUSE
FIRE ALARM SYSTEM, CCTV AND ACCESS CONTROL SYSTEM
TECHNICAL DESCRIPTION OF THE WORKS

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TECHNICAL DESCRIPTION OF THE WORKS

1 INTRODUCTION

1.1 General

This description of works intends to establish the general and specific recommendations, scope of works and technical specifications for the supply and installation of an Fire Alarms System, CCTV and Access Control System within the prototype design project that will be used to build approximately twenty-five (25) Pharmaceutical Intermediate Warehouse are planned to be built throughout the country, located inter-districts or provinces as suitable), in the most sustainable network to support nationwide health services.

The present documentation should be considered as part and complementary to the drawings of others engineering disciplines involved as well as others contract documents. It includes a detailed description and technical specifications of the equipment and material to be installed in the Fire detection and security system.

Contractor will train and instruct client's personnel in the correct use, operation and supervision of the system, prior to the handing over of the project.

2 FIRE DETECTION AND ALARM SYSTEM - TECHNICAL SPACIFICATION

2.1 General Requirements

The fire detection and warning system shall be of category "P", protecting properties, installed throughout the building / building area. The aim is to provide an automatic fire warning in advance so as to minimize the time between ignition and extinction.

The fire detection and alarm system may comprise of a main panel processor unit connected to fire detection devices, monitoring and control devices and warning devices located in any protected area, namely optical smoke sensors, heat sensors, and optical smoke/heat sensor with integral sounder units, manual call points, electronic sounders, and interface units, each with its own short circuit built-in isolators. All loop cabling and any other components and accessories deemed necessary for a safe, reliable and satisfactory system will conform to the relevant and applicable requirements and recommendations of Public Technical Memorandum, with BS EN 54-2 & 4 BS EN 50130-4 LPCB to the requirements of EN54 Parts 2 & 4.

2.2   System Description

The fire detection and alarm system will be linked to centralized system and designed to facilitate accurate identification of the source of heat / smoke / fire in their early stages to minimize occurrences of false alarms due to faulty equipment, electrical transients, system faults etc.

The fire alarm control panels will make final decision on whether a fire or fault exists by comparing the plotted patterns from a fire sensor against known fire and fault patterns held in its memory. System will be true Analogue with the ability to print the output from a fire sensor over a period of time.

All system components and devices will be connected to two-wire loop circuits (as shown in the typical schematics) with each component having its own individual built-in isolator. Removal or disconnection of any component from the loop will not affect the functioning and performance of other components and the system.

System will be of safe addressable type i.e. all the devices on the loops will be Allocated addresses automatically from the panel at the time of system power up on a numerically lowest unused value basis (algorithms)

And also given an address during commissioning, the value of which will be stored in non-volatile memory, within the electronics module of the outstation. This value will be read during loop allocation and provided it is valid will be used to setup the outstations primary address.

SAFE Addressing will cover the benefits of Soft Addressing and also overcome the limitations of Hard Addressing. This means that If the devices are inserted or removed all the existing devices will keep the same address.

The panel will allocate the address in strict sequential order when the loop is powered up to speed up commissioning and ensure that it is impossible for two devices to have the same address.

Facilities will be provided to constantly monitor and check the following circuits and fault conditions:

- The power supply to the loops;
- For open-circuit, short-circuit, earth fault and any other fault condition in the loop wiring;
- For communication failure and errors in all cards and loops;
- For faults in keyboard and printer circuits
- Monitoring of all devices status every 1.3 minutes to create a table of each 1 analogue channel for event analysis

All devices Optical/Heat Sensor, Heat Sensor, Optical Smoke /Heat Sensor Sounder, Fire Alarm Interface Units, Electronic Sounders, Manual Call Points, etc. will be installed on the same loop. And shall have build in isolators in all outstations.

2.3   System Operation

In the event of a fire being reported from the smoke/heat Detectors, activation of manual call points or sprinkler operation the sequence of alarm operation will be as follows:

If a fire condition is reported from a smoke or heat detector, Manual Break Glass, or sprinkler flow switch, then the evacuation alarm tone will be done by the electronic sounders in the same zone. Then after a certain delay (to be agreed at the time of commissioning) or after 3 minutes the alarm has not been acknowledged, the evacuation tone from the sounders will activated in the adjacent fire zones. Or on the floor directly above and below. All other floors or zones will be given the Alert tone . The evacuation of the building will be staged in phases to allow orderly movement of people.

Activation of the fire alarm system will directly initiate some or all of the following to be agreed as a part of the overall engineering policy.

- " Release doors normally locked by magnetic devices;
- " Release doors normally held open by magnetic devices;
- " Shutdown mechanical equipment ventilation plant;
- " Shutdown general exhaust fans;
- " Start up smoke extract fans;
- " Start up exhaust make up fans;
- " Automatically operate fire dampers.

Sprinkler valves, flow switches and other monitored valves will be directly supervised by the fire alarm systems to other systems.

These will not include but not limited to the following:

- " Building automation system
- " Emergency lighting system
- " Security system
- " Standby generator installation

2.4   System, Components and Devices

2.4.1   Main Fire Alarm Control Panel:

The fire detection system shall consist of a central processor unit connected to fire detection devices, monitoring and control devices and warning devices located in any protected area. The control unit shall continuously monitor the analog status of all devices and trigger detection when there is a fire or smoke.

The control panel should be able to make decisions regarding the state of the system from the information received from each detection device.

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The system operation will be configurable on the control panel through a keyboard or specific Windows-based software to allow for changes in the future. This configuration should be maintained even under the circumstances of the power failure.

The control unit will have a front panel consisting of LED indicators, control keypad and LCD illuminated display, as described below. The LCD display will provide details of all occurrences in the system.

Data ports must be provided for communication with remote repeaters on LCD and others. The control panel must be a modular design, capable of functioning as a stand-alone unit, or as part of a network.

In case of fire the system must send messages by "SMS" to at least 2 mobile phone numbers with indication of fire and covered area.

The fire arresting system shall follow the European Standard EN54, Parts 2 and 4. The panel shall also be manufactured to ISO9001 standards.

2.4.2   Sensors:

All analogue sensors and bases shall be provided by the manufacturer of the control equipment. The sensor bases for interfacing between the loop wiring and the sensor head shall not contain any electronics. The base fixings should be suitable for UK industry standard BESA or conduit boxes. All bases shall have the necessary connections for sending repeat fire signals to a remote LED unit.

The sensors provided shall be lockable into position if required and removal of locked sensors shall be achievable only through the use of the appropriate removal tool. Sensor removal tools should be provided on completion of the contract as part of the spare parts profile. The removal of a sensor from its base shall not affect the continuity of the detection loop.

The following types of analogue sensors will be available as standard:

- ˝ Optical Smoke sensor
- ˝ Optical Smoke sensor with integral sounder and/or strobe
- ˝ Optical Heat sensor
- ˝ Optical Heat sensor with integral sounder

All of the above shall be compatible with the aforementioned base providing inter-changeability between sensor heads without the requirement for switch settings. All sensors will also have an integral short circuit isolator, which in the event of a single cable fault will isolate the faulty section of cable and retain all devices on the loop operationally in less than 1 second.

The sensitivity off all sensors will be adjustable from the control panel. This may be carried out manually to manage false activation issues or automatically using the system clock i.e. day/night settings for specific risks. It shall be possible to programme sensors within a range of sensitivity levels from State 0 (high level) through to State 15 (disabled).

Each sensor will possess an integral Red LED giving a flashing indication of a fire signal or a continuous indication for certain fault conditions. The integral LED can also be enabled/disabled to provide operational status i.e. short flashes that indicate the unit is powered and communicating with the control panel. The optical heat sensor with integral CO sensing shall include a further Blue LED providing flashing indication for presence of carbon monoxide making it easier to identify the location of activation.

The CO element shall be incorporated into the optical chamber to sense the presence of carbon monoxide gas emissions from smoldering fires. In normal environments the CO element shall have a life expectancy of a minimum of 5 years. This CO element shall be fault and life monitored and shall be replaceable via a service exchange programme.

2.4.2.1   Sensor Sourander Combined Units:

Install as or if shown in the drawings. These combined units will in addition to the features listed above by the optical/heat sensor, incorporate a high output sounder. The output will be 85dBA or 75dBA at the bedhead.

These sensor sounder combined units will be installed on the same 2 core loops as the other devices. Additional 2 core power cable from the Power Supply Units in the FACPs / from remote external power supply units for the operation of these units will not be permitted, for better system integrity.

The integral sounders will be capable of being individually programmed from the main fire alarm control panels. Integral sounders operating on the initiation of its corresponding detector only, will not be acceptable.

Sensor-sounder combined units mounted in the false ceilings will be provided with semi-flush mounted kits. Heat sensor sounder combined units will be used in the kitchen areas only & it shall has inbuilt short circuit isolator.

2.4.3   Manual Call Points:

The manual call points shall be electrically compatible with all of the aforementioned sensor types. Each device shall contain its own microprocessor giving a 1 second response time from initiation as required within BS5839. The MCP shall be available as a semi-flush mounting unit fixing to a standard single gang recessed box or as surface mounting unit on a matching red plastic back box.

The MCP will have the ability to be tested functionally without the need to remove the front cover or breaking the glass with a special test key (supplied as standard). The key shall insert in the front facia of the MCP ensuring easy access of the key at all times. The key will also be used to reset the MCP when fitted with a resettable plastic element. The option to retrofit a clip-on transparent plastic cover to prevent accidental or malicious activation should be available as standard and give the unit an IP55 ingress rating when fitted to the plastic back box.

2.4.4   Alarm Sounders:

Install as shown in the drawings. These will comply with the requirements of BS EN 54-3 BS EN 50130-4. Alarm Sounders are all Electronic sounders Addressable and loop powered and Standard Evacuate & Alert tone with voice messaging Programmable tones selectable by control panel. Programmable tones are selectable by control panel Sounder frequency as defined in BS5839.

Synchronisation of all sounders to be fully synchronised with all other analogue addressable loop powered sounder speech devices on the system.

The safe addressable Alarm Sounders will be loop wired and loop signaled and provided with built-in short circuit isolation and will be sited in the emergency stairwell staff/utility areas and plant rooms. The sounders will be configured via software to operate individually or in sectored groups, totally independent of the way they have been connected to the loops. The sounders will have the synchronization feature to ensure that all the sounders give alert and evacuate tones that are totally in phase. Conventional Sounders that "free-run" and therefore be out of phase with each other will not be accepted.

The Sounders will have Minimum sound pressure level 103 dBA at 1 metre with frequencies of 970 Hz and 910 Hz. Variety of sounds will be available.

2.4.5   Interface Modules:

Fire detection interface units will be directly connected to the loop to provide both inputs and outputs for the control or annunciation of other life safety, security and building management systems. These units shall be either self-contained wall mountable units or DIN rail mounting units for fitting within 3rd party control equipment/panels. Each device will incorporate a short circuit isolator as standard to maintain system integrity in the event of an equipment failure or wiring fault. As standard six variants will be available:

(i)   4 channel input and/or output interface

(ii)   1 channel Low Voltage input/output interface

(iii)   1 channel Low Voltage input only interface

(iv)   Mains Voltage 240V 13A switched output interface

(v)   Mains powered 4 channel interface with monitored integral power supply unit, battery standby and 250mA output circuits

(vi)   Key switch operated single channel interface.

2.5   Wiring and Wiring facilities

Supply and install the necessary conduit, enclosed trucking to the Fire Cable and accessories and wiring for the fire alarm system.

All cables associated with Fire Alarm installation will be of fire resistant 2 core 1.5 sq. mm.

The cable for use on the Fire Alarm loop will be of the following type and specification.

The cable is to BS 6207: Part 1 having

Typically no more than 2 cores:

A maximum of 190 pF/m intercore capacitance

A maximum of 220 pF/m core to screen capacitance

A maximum of 13 ohms per core

Each core having 1.5 sq. mm crosses sectional area

A red cover sheath (preferred for alarm applications)

Having continuous metal sheath encapsulation

Fire resistant tested to BS6387 categories CWZ.

Multi core cables having more than 2 cores will not be allowed for loop wiring due to inadequate separation and possible interference problems.

 Cable will be; Firecell SR114, Pirelli FP400 cable or approved equivalent.

All wiring will be installed to provide complete and satisfactory function system in all respects. All cable terminations at components and junction boxes will have identification tags, indicating through out the system.

The Fire Alarm/Detection system wiring will be completely independent from the other system wiring in all respects in accordance with the IEE Regulations.

2.6   Testing and Commissioning

After the installation is complete, the contractor will conduct operating and commissioning tests. The equipment will be demonstrated to operate in accordance with the requirements of the specification. The system installation, testing and commissioning will be as per Local approvals and requirements.

The fire alarm system will be completely programmed in accordance with Fire Department requirement and a specialist from the manufacturer will attend and demonstrate the complete system. A company trained representative will personally supervise the complete installation and final testing of the system.

All tests will be carried out in the presence of the Client or persons authorized by the consultant / client. Upon the completion of the acceptance tests, the representatives will instruct operatives in the proper operation, maintenance programming, configuration, and testing of the system. The vendor will provide equipment and /or software which is necessary to allow field modification of the programming and configuration.

3 IP CCTV SURVEILLANCE SYSTEM – TECHNICAL SPECIFICATIONS

3.1 Design Concept & Scope of Works

3.1.1 Design Concept

The entire IP CCTV surveillance system is designed to control and monitor the entrance, Server Room, corridors, all storage areas and the whole outdoor area of the Pharmaceutical Intermediate Warehouse.

3.1.2 Scope of work

˝ Supply, installation, testing and commissioning high quality fast-acting IP CCTV surveillance system along with power supply, power distribution and required accessories in the locations of different blocks of the Pharmaceutical Intermediate Warehouse.

The entire system shall be as per the design and technical specifications enclosed with tender documents.

- ˝ The price quoted by the bidders should include all the expenses incurred in commissioning of all cameras with power supply, accessories and other devices complete with software.
- ˝ The CCTV surveillance system will consist of IP Fixed dome cameras (indoor and outdoor type), software, server, power supply and cables.
- ˝ Video management software shall offer both video stream management and video stream storage management. Recording frame rate and resolution in respect of individual channel shall be programmable.
- ˝ Provide an independent network that can be integrated to the purchasers network without degrading the perform supervisory specialists and technicians at the job to assist in all phases of system installation, start up and commissioning.
- ˝ Cat 6cable/fiber cable connectivity with all required hardware up to purchasers networking switches of LAN, locations of networking switches.
- ˝ 230 volts AC Power supply distribution from UPS to each location of cameras along with DBs, JBs, cabling work etc. with required accessories.
- ˝ Power supply unit as required for cameras.
- ˝ Training & handing over of all materials, equipment and appliances.
- ˝ Any other items/accessories required for installation, testing and commissioning of CCTV system.
- ˝ No extra cost shall be paid for miscellaneous items if required to complete the work as per the design concept.
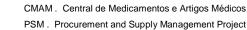
3.2 Technical Specifications

3.2.1 IP Video System Overview:

″ Transmit and Receive H.264 and MPEG-4 Video and bi-directional Audio.

″ Video and alarm management software under one single front end and should be on open platform with support to to renowned IP camera brands.

″ Support for multi user and multi user group environment in addition to user hierarchy

″ System should allow to be used as a distributed or central architecture with support to any number of cameras and any number of clients that may be added in future.

″ System Guarantees Bandwidth & Frame rate control.

″ Provides Activity Controlled Frame rate, which in turn reduces the Bandwidth and the Storage requirements.

″ Provides Broadcast quality Video across IP network including Internet.

″ Provides multiple failover and network resilience.

″ Provides real time recording at 25fps with no frame loss.

″ Supports Multiple IP Video Streams.

″ Secured recording for evidence purposes and user authentication to protect data integrity.

″ Video Stream bit rate selectable from 32 to 4096kbps.or better

″ All the IP cameras shall have SD card slot for recording in SD card when network is down/fail

3.2.2 IP Fixed Dome Camera (Indoor Type):

″ Latest Sony Ex View 1/3 ‰or 1/4" interlaced imager or better

″ Camera must provide atleast 752x582 (PAL) active pixels

″ Color Resolution 540 TV Lines or better for sharp pick up of live video.

″ Minimum Sensitivity of Day: 0.5 Lux; Day/Night: 0.5 lux color / 0.05 lux

″ White Balance Mode: Auto; Fluorescent; Indoor; Outdoor

″ Verifocal /Auto Iris DC drive lens options of 3.8 . 9.5mm or 9 . 22mm

″ Shutter Speeds 1/60 to 1/10,000 (NTSC), 1/50 to 1/10,000 (PAL) or Auto*

″ Operating voltage: Power over Ethernet (802.3AF); 12V/24V AC/DC.

″ The hardware architecture must incorporate multiple processors to ensure best video quality and other functions even at maximum processor load

″ The IP Camera must offer a choice of either MPEG-4 Advanced Simple Profile or H.264 video compression standards, by just upgrading the firmware over the network without dismantling the camera.

″ The IP Camera must run Linux Operating system for reliability.

″ The camera must have a built in firewall - SSL and other non-IP address specific security measures are deemed insufficient

″ Should support and allow configuration of the following video resolutions

″ 352 X 288 (SIF)

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˝ 704 X 576 (4 SIF)

˝ 704 X 288 (2 SIF)

˝ When running on MPEG-4 / H.264 compression, the video codec should support at least 2 simultaneous streams at resolutions between 4SIF and SIF.

˝ Each Video stream should in turn allow for TCP connections, UDP connections and an unlimited number of Multicast connections

˝ Each stream must allow independent configuration of bit rate, frame rate, I frame interval, rate control mode and motion data.

˝ All streams must guarantee full frame (25fps) rate under high motion and all conditions. A certification from the manufacturer is required

˝ The IP Camera must support Capped Bit Rate (CBR) control, to enable users to keep bandwidth utilization under a certain value without compromise on image quality irrespective of the level of motion in the scene.

˝ The IP Camera must support Activity Controlled Frame Rate control to automatically adjust framerate depending on motion in the scene. During periods of negligible motion, the frame rate must drop to 1fps and when motion occurs the frame rate will return to full frame rate (30fps/25fps) within 100ms. It must be configurable using a Region of Interest editor (ROI) that can select regions of the scene where motion will be ignored.

˝ Support network protocol 802.3 and IETF Standards 10/100 Base-T Ethernet, RTP/RTCP,TCP, UDP, ICMP, SNMP, HTTP, FTP, TELNET, MULTICAST, ARP and IGMP

˝ Each stream Bit-rate should be user configurable from 32 to 4096 Kbps or better

˝ The IP Camera will have a built in web server, making it accessible for configuration using a standard Internet browser

˝ The IP Camera must be compatible to support advanced analytics software which should be able to perform the following:

- Intelligent Motion Detection - Virtual trip wire
- Left item detection - Theft detection
- Object tracking
- Counter flow detection

˝ Must have minimum 1 alarm inputs and 1 relay outputs

˝ The IP Camera must support redundant recording by streaming to multiple recorders at the same time.

˝ Camera should be able to detect motion based on localized area, object size & direction

˝ It must be possible to reset a unit back to Factory Default configuration without losing IP address information

˝ Video Output PAL

- Composite Video

˝ Serial Data Port supporting RS232/ RS422/ RS485

˝ Password protected Web interface for administration

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" Should have onboard diagnostics facility for serial, Video & Network interface. System logging shall be possible to a remote IP address, the console port or the unit itself.

" The system MUST be able to use one particular frame rate and resolution at Day time and automatically switch to another frame rate/resolution profile when low light conditions occur

" The system MUST allow for Telnet/FTP access into the units and also this access MUST be configurable, wherein when active access is allowed and when deactivated access MUST not be allowed.

3.2.3 Video Operation Codec Management, Recording and Processing Software (VOCMRPS)

" VOCMRPS will be a highly scalable, enterprise level software solution. It must offer a complete Video Surveillance solution that will be scalable from one to hundreds of cameras that can be added as and when required. It should allow for seamless integration of third party security infrastructure where possible. The system MUST be capable of working on latest Windows OS and Windows Server platforms. Should support client- server architecture.

" The software must come as one unit and not multiple loadable units and should support free distribution of multiple clients to multiple machines.

" The software must not have operator seat based licensing. It must allow for any number of user seats/installations on the IP video network to be added for future scalability at no management software cost or licensing cost.

" The manufacturer supplied management software pack should be on open platform/ standard media player.

" The VOCMRPS should allow for video to be streamed on a video mosaic wall.

" All upgrades and releases should be made available free of cost during warranty period.

" The system shall allow operation with/without a PC keyboard or mouse with touch screen PC monitors. Once system configured, virtual matrix functions can be carried out using CCTV keyboards and should have capability to configure with HDTV.

" The VOCMRPS shall provide the following:

- Automatic search of components of proposed system on the network. They can be Cameras, Monitors, Alarm panels, NVRs. It should also capture video from various source like webcam, USB cam etc.

- The system should allow for live view, playback and system configuration of the IP video system.

- The system should allow for creation of multiple users and user groups and assign tasks to each.

- Drag & Drop functions for most functions on the system and also for set up of connection between cameras and monitors and also support to create custom layout by grouping of cameras from different server/ locations into groups for more efficient monitoring.

- Several simultaneous live picture connections of camera in network. It should be capable of showing video pane layouts including 2x2, 3x3, 4x4, 5x5,8X8 various Hot Spots (1+5, 1+7, 1+9, 1+12, 1+16) and custom layouts

- It shall be possible to display video and audio bit rates; frame rate and resolutions on each video pane as overlays.

- The live view must be capable of highlighting motion as green rectangle overlays and displaying real-time alarm information overlayed on the live video feed.

- It shall be possible to listen to audio from individual codec (cameras) or Receivers.

- Audio must be simultaneously transmitted from the Operator to allow a two-way conversation.

- It must be possible to establish bi-directional audio connection on alarm. The user should also be able to disable listen when speaking to prevent feedback through the microphone.

- System setup for pre-defined surveillance tasks to be invoked at pre-defined times in the day.

- Programming of automatic recording events on NVR, maybe based on events such as alarms and video analysis

- Remote maintenance of IP Video components

- Off line construction of site ±reeqand addition of devices

    -It shall be possible to show text on screen display (OSD) when video is displayed on a Receiver/Decoder.

- The location of the OSD must be configurable on the screen

- The system should provide Video Lockout facility where a super-user can prevent all other users from viewing live video and divert recorded video to another Networked Video Recorder. The super-user shall also be able to release the video lockout and restore the system to its original state. It should also support software watchdog for advance detection of problem & recovery at server.

˝ The VOCMRPS shall allow the following:

- Live display of cameras

- Live display of camera sequences, salvos and guard tours - Playback of archived Video at speeds of x1/4 . x16

- Retrieval of archived Video using normal playback, thumbnails (motion, event or time based)

- Instant Replay of Live Video

- Use of site maps and Google map - Configuration of system settings.

˝ For each camera set up bit rate, frame rate, and resolution shall be set independent of other cameras in the system. Altering the setting of one shall not affect the settings of other cameras.

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- Should allow up to 32 cameras to be replayed simultaneously from one NVR

- Auto-protecting of video recording on post and pre ±alarmqimages.

- Exported recordings will be protected by an invisible watermark using hashing function with a 1024 bit key.

   - Should have facilities for play, forward, rewind, pause along with fast forward and rewind for reviewing the recorded videos.

˝ The application should allow for time-synchronized playback of different cameras together in the same video pane. This will enable the operator to watch playback of an event in an area covered by multiple cameras from different angles as the event happens.

˝ The system must support absolute redundancy with 1 to N, N to 1 and N to N redundancy configurations. All this should be provided without a licensing model.

˝ The system must support video bookmarks, where the system allows the user to create textual bookmarks at various places in a recorded footage and allow access to these bookmarks through an intelligent bookmark management system.

˝ The system must allow application of sorting and searching filters on bookmarks for faster retrieval and access to incidents in recorded footage.

3.2.4   Network Video Recorder (NVR)

˝ Should be installable on a Linux/Windows PC.
˝ The NVR/NAS should have no limitations on the kind of storage to be used (RAID, NAS, etc).
˝ The NVR/NAS must be capable of recording 50 cameras simultaneously.
˝ The NVR/NAS must be providing for a disk management system which will automatically reap old recordings to overwrite with new ones when max disk usage is reached.
˝ The storage on a minimum Disk of 8TB

3.2.5   CAT – 7 Cable:
˝ 23 AWG Annealed bare solid copper, CAT-7 UTP Cable, Channel optimized to 350 Mhz
˝ Meets EIA/TIA 568-B.2-1 Category 6 specifications, Passed UL 444 test and meets CM and CMR ratings
˝ Worst Case Cable Skew : 45 nsec/100 meters
˝ Characteristic Impendence : 100(+/- 3) Ohms 500MHz , Tested till 700 Mhz
˝ Conductor Annealed copper wire Diameter 0.52 mm (nominal)
˝ Insulation High Density polyethylene, Diameter 0.94 mm (nominal)
˝ Support for Fast Ethernet and Gigabit Ethernet IEEE 802.3/5/12,Voice,ISDN, ATM 155 & 622 Mbps and Broadband.

4   ACCESS CONTROL SYSTEM – TECHNICAL SPECIFICATIONS

Access control system planned for the Pharmaceutical Intermediate Warehouse is an integrated solution that consists of hardware and software designed to control entry into selected areas and manage movement of people/vehicles within. The system is designed to increase security by defining access permissions based on area and time for each user and maintaining a log of all events.

4.1   Software

- ″   There shall be no limitations on the number of PC workstations, readers and alarm inputs.
- ″   The number of cards/users shall be limited only by memory available in hardware.
- ″   At least 3 active cards per user shall be supported.
- ″   At least 8 access levels per user shall be supported.
- ″   Access levels should be assigned to a user, not to a card, in order to help issue a new card in a fast and easy manner, without reassigning access levels.
- ″   The software shall support at least 4000 holiday dates and have automatic holiday rescheduling feature.
- ″   The software shall have the ability to perform scheduled automatic database maintenance and backup tasks at user selected intervals and ability to configure the amount of history stored in the active database.
- ″   The software shall have the ability to produce the following report types: system and alarm event reports, user reports, hardware configuration settings, access level reports, employee time & attendance reports.
- ″   The reports shall be available in Adobe PDF and MS Excel formats.
- ″   Report filters must be convenient and user friendly: allow operator preview user photos, content of access levels, hardware settings and time zone configuration.
- ″   The software shall support an unlimited number of building floor plans.
- ″   Floor plan viewing interface shall have convenient zoom in/out controls by mouse wheel.
- ″   The software shall allow operator to conveniently edit floor plans by %dragging and dropping+ hardware devices to selected plan areas.
- ″   The software shall allow assigning custom icons to each floor plan in order to help operators identify floor plans quickly. The software shall have a wide selection of default icons as well.
- ″   The software shall support %full-screen+ mode that would take up 100% of the monitor area and prevent operators from starting or accessing any other programs.
- ″   All configuration and user changes shall be sent to controller immediately. The software shall display the progress in percent as the changes are being downloaded. The downloading shall be done in background and not affect the normal use of the software in any way.
- ″   The floor plans shall display real-time status of system hardware and allow operators to immediately see the effects caused by configuration changes.
- ″   Dynamic search function shall be present in all windows of the program: search results shall be narrowed automatically as a key phrase is being entered. I.e. after entering characters %ky+ the

program shall locate and display all records containing these characters, and after typing in more characters shall refresh the results automatically.

″ The software shall use an industry standard database engine released not earlier than 2005 and currently supported by the manufacturer.

″ The software shall have the ability to automatically display photos and additional information about users as they enter/exit through doors.

″ The software shall be available in the official language(s) of the country where it is being installed. If such language is not included in the standard installation, the software shall support user friendly translation method: simply replacing program text directly in the software (‰n the fly), without the need of sending any files to the manufacturer for compiling.

″ The software shall have a modern interface, attractively designed and convenient to use.

″ The software shall be adapted for operators who have not received any special training related to management of integrated security systems. Graphical user interface shall be intuitive. Introducing the system to a new operator shall not take more than 1 hour.

″ In order to reduce the amount of work done by an operator, the software shall incorporate an option to copy objects: users, doors, floor plans, time schedules, access levels and holidays.

″ The software shall facilitate integration with other systems of the building.

″ The software shall have the ability to transfer entry and exit events to HR systems with the purpose of work time calculation.

″ The software shall store information and provide reports about visitors and appointments.

4.2 Hardware

″ The hardware shall support open architecture. Communication protocols shall be available to system integrators and software development companies in order to protect end-users from being constrained to a single brand of hardware or software.

″ The hardware shall support all industry standard readers that output information in Wiegand or Clock/Data formats (up to 128 bits).

″ There shall be at least 2 types of controllers: (a) for one door with an entry reader and an exit button and (b) for one door with two readers (entry and exit) or for two separate doors with entry readers and exit button.

″ There shall be an IP-reader available. The IP-reader shall integrate a contactless card reader and controller in a single body, designed for surface mounting on a wall or a door frame eliminating the need for enclosures.

″ Each controller and IP-reader shall have a standard RJ-45 network port for communication with software and other controllers.

″ Controller and IP-reader shall support standard Ethernet 10/100BaseT network and TCP/IP communication protocol.

″ Systems using Ethernet converters, adapters, or terminal servers that enable network connectivity for legacy controllers by tunneling RS-232/485 serial data over Ethernet shall not be acceptable.

˝ Single-door controller and IP-reader shall have at least 32Mb SDRAM operating memory and 8 MB Flash memory for database and events. Two-door controller shall have an option for expanding Flash memory to 32MB.

˝ All controllers and IP-readers shall use a 32Bit 100Mhz RISC processor (or better) in order to enable fast execution of advanced functions.

˝ Controllers and IP-readers shall use Linux operating system and accept firmware upgrades via network.

˝ All system parameters including card numbers, PINs, access levels, time schedules, holidays and operations modes shall be stored in controller and IP-reader memory and not affected in case of a power loss.

˝ Single-door controller and IP-reader shall have enough memory to store at least 40,000 users. Two-door controller shall have enough memory to store at least 250,000 users.

˝ In case communication with the host PC is interrupted, the controller and IP-reader must have enough memory to store at least 5000 latest events (FIFO buffer).

˝ Operation of controller and IP-reader shall be completely independent of the PC or %Master controller+. Should the PC or the communication link fail, the users should not be affected in any way and all functions should continue working.

˝ IP-reader shall have the following inputs and outputs:

i. Exit button input

ii. Door contact input

iii. Auxiliary alarm input

iv. Tamper sensor and tamper input

v. Inputs for monitoring AC power and backup battery state. There should be an option to reconfigure these inputs to function as general purpose inputs.

vi. Relay for controlling an electric lock.

vii. General purpose auxiliary output relay.

˝ One-door controller shall have the following inputs and outputs:

i. Power output for the reader

ii. Outputs for controlling LEDs and beeper of the reader

iii. Wiegand or Clock/Data input

iv. Exit button input

v. Door contact input

vi. Auxiliary alarm input

vii. Tamper input

viii. Inputs for monitoring AC power and backup battery state. There should be an option to reconfigure these inputs to function as general purpose inputs.

ix. Relay for controlling an electric lock.

x. General purpose auxiliary output relay.

˝ Two-door controller shall have the following inputs and outputs:

   i.   Power output for two readers

   ii.   Outputs for controlling LEDs and beepers of the readers

   iii. Two Wiegand or Clock/Data inputs

   iv.   Two exit button inputs

   v.   Two door contact inputs

   vi.   Two auxiliary alarm inputs

   vii. Tamper input

   viii. Inputs for monitoring AC power and backup battery state. There should be an option to reconfigure these inputs to function as general purpose inputs.

   ix.   Two relays for controlling an electric lock.

   x.   Two general purpose auxiliary output relays.

˝ Relays of controllers and IP-readers should support two modes of operation: (a) dry contact and (b) powered mode, whereas power to the lock is provided via relay contacts this way simplifying wiring and eliminating the need for an additional power supply.

˝ Controllers and IP-readers shall have an RS-232/485 communication port that would act as a backup communication channel in case the network connection was interrupted.

˝ Controllers and IP-readers shall have a built-in PoE capability, in order to reduce wiring and provide backup power effectively. PoE feature must comply with the 802.3af standard.

˝ Controllers and IP-readers shall be capable of supplying up to 600mA @ 12VDC to peripheral devices: readers, electric locks, sirens, detectors, etc.

˝ Controllers and IP-readers shall accept the standard 12VDC power input in case an existing network infrastructure does not support PoE.

˝ In case the main PC of the system fails, controllers and IP-readers shall accept a connection from a laptop in order to diagnose the problem, change settings or control peripheral devices.

- " In case of an alarm controllers and IP-readers shall initiate communication and provide timely notifications to operators. Hardware that does not initiate communication and needs to be polled frequently will not be acceptable due producing needless traffic on the network and processing load on the PC.

- " The system shall support biometric IP-readers with the following or better specifications:

i. 25,000 fingerprint template storage capacity

ii. 1-to-many verification in less than 1 second (with the database of 3000 users)

iii. 1-to-many verification with the database of 9000 users.

iv. 500,000 event storage

v. Built-in USB, RS-232/485, LAN and WLAN communication ports

vi. Selectable operation modes: fingerprint, fingerprint + card, fingerprint + PIN.

vii. Door-phone function

viii. Microphone, speaker and 2.5‰QVGA color LCD

ix. 72MB flash memory

x. Door contact and exit button inputs

xi. Lock control relay

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(Alexandre Mutemba, Eng.º)