MAHATMA GANDHI MISSION TRUST
MGM INSTITUTE OF HEALTH SCIENCES, CENTRAL PURCHASE DEPARTMENT (CPD)
Plot 1 &2, Sector -1 Kamothe, Navi Mumbai 410209

4. E-Tender for Pneumatic Tube System

Tenders invited from reputed Manufactures or their authorised distributors / dealers of Pneumatic Tube System at MGM Hospital, Sanpada, Navi Mumbai in the format given bellow:

Name & Address of Vendor: _____

_____

Sr. No.	Item Particular	Make	Qty	UNIT	Rate Per Unit		Total Amount		GST %
					Supply	Installation	Supply	Installation	
1	Pneumatic Tube System		1	No					

Kindly email your lowest quotation as above with your terms & conditions as well as applicable brochure / catalog, user list to only etenders@mgmuhs.com

Date:	Name:
	Designation:
	Email ID:
Seal	Mobile No.:
	Full Address:

System Specifications

General behavior of system is defined with following features.

➢ The System is flexible with modular technology for spontaneous transport with speeds up 4-6 m/s.

➢ System has capability for transports over long distances transport frequently and efficiently. It will optimize the path inside the tubing network.

➢ While shipment is running, system has feature to keep other shipments in queue. User or system must be able to cancel the queued transport, if sender changes his/her mind before it leave the sending station and takes back the carrier from station.

➢ The System controlled by PC (Computer) of Operating System driven should also be working with Linux LTS 64-bit version. It should have remote accessibility using remote desktop control software.

➢ The system has Live and Real Time Supervision with the Entire network view with remote accessibility.

➢ The system has Live andReal Time communications channels between all the modules and is visible on PC monitor in topology view.

➢ All modules are connected with TCP/IP protocol via LAN cable or wi-fi. It provides the communication to all stations and devices in the network and hence are digital in nature and maintaining a real time with speed. Moreover, TCP/IP protocol is faster, secure than serial communication. (traditional RS485, RS 232 etc protocols)

➢ Minimum communication speed of main server to each component is 20 Mbps irrespective of the location or distance of component. Hence reduction in cost of long cable installation and nullify the chance of error in communication.

➢ Every component gets power from near by plug of single phase, 230V, 6 A. (except blowers which should be 3 phase)

➢ The power cable of all station high grade composite with grounding, power and earth all three in one along with 3 Pin.

➢ Movement inside component units works on timing belt/pulley or teeth-gear/pulley mechanism. All DC motors has to be servo for accurate positioning movement.

➢ Logging of each and every state change of all the devices used in components.

➢ Replacement or damage of device or mechanical part has to be also logged with proper reason and timestamp.

➢ System can update component software over Ethernet connection in parallel way. This will provide components with latest software yet minimum downtime.

➢ Parallel movement of component has to take place. This will help to start the shipment as soon as possible. This will reduce the setup time before blower start and initiate the shipment.

➢ All shipment and logging related data has to be considered as confidential data for hospital client. Hence it has to be handled carefully. Any 3rd party usage without prior written confirmation of authorized person from Hospital client will lead to punishable offense.

➢ A user can be assigned to multiple station, in that case shipment has to be delivered to closest station.

➢ Mail notification has to be possible on receiving of shipment to user.

➢ Login into the visualization software can be performed from other network computer as well.

➢ There must be web interface to download the system backup from remote computer in the network.

➢ Control software and visualization software should have support of cross platform. Hence they should be used in windows or Linux machine.

1.1Control Computer with peripherals (Basic)

•Latest processor CPU with SMPS Cabinet
•8GB RAM
•480GB NVMe
•minimum 2 USB 3.0 Ports
•PCI Slot for ISDN/Modem Card

- Data Port
- Ethernet 100/1000 Lan Card
- Standard Keyboard
- Standard Optical mouse;
- 22" Monitor

2.1.1 Control and Visualization Software (Pre-loaded on Control PC)
- Supervision with Real time monitoring for viewing and maintenance of system
- Network viewing
- Software in local language
- System access and controls for each component on the network
- Shipment history
- Statistics with bar or pie chart with shipment records of daily, weekly, monthly analysis
- Logging of each transaction and error; with transaction ID, send station ID, Receive Station ID, start time and End / Receive time with dates.
- Remote service accessibility
- Component connection status visualization
- Dynamic clearing station configuration for flush of stuck/delayed carrier.
- Various Priority Settings for urgent and emergency transports
- Optimization of pathways with intelligent alternate routing of carriers
- Print module for reports and statistics, analysis reports
- User profiles and rights
- System graphic visualizations
- System and device parameter Settings for Management and Maintenance
- Station pin setting for access control
- Priority settings configure the priority of the transport of goods from and/or to designated stations.
- User Profiles and Rights: User profiles determine the access level to data and devices in the system. User rights are permissions granted to users according to their user profile. They define what data and devices a user profile can read or modify.
- System Visualization for remote Monitoring, Controlling, and Maintenance Remote assistance from anywhere on-site and/or off-site.
- Topographic view of the system offers a detailed, accurate diagram in real time.

Track & Trace tools for information and Analysis: Generates a basic view of every realized transport whereas Log generates a detailed view. Log Book records chronologically many kinds of information that user might want to record manually.
- System should have possibility to update the software version.
- Back and restore of system data

•Beeper/signal notification features

•RFID configuration features

•Star topology connection of server with all components

•Event driven approach : Allows to take action simultaneously

•Control system is subscription based.

•Software for remote access must be installed to take remote control of system and diagnosethesystem.Remote accesshostingmustbeprovidedbythe manufacturing company. Moreover, this data has to be stored in India. Any data storage outside India prior to written approval will lead to punishable offense.

2 Component Specifications

To make pneumatic transportation, It basically need few mechanical components. Following is the list and features of mechanical components. Irrespective of component type, All component should have their own power plug and LAN port availability. LV and Electrical department must provide LAN port and power socket of minimum 230V, 5A rating near by all station and diverter location. All components must be equipped with servo motor, rather than reed switch based position approach. Servos are fast, accurate and reliable than traditional reed switch based approach.

2.1 Side Channel Blowers with Safety and Control Unit

•The low maintenance unidirectional side channel blower with automatic device to convert air/suction mode (air switch diverter) complete with silencer, carrier damper and accessories.

•Insulation coordination for equipment within low voltage systems.

•3 phase power supply

•Voltage (V): 400

•Frequency (Hz): 50.

•The side channel blower has high degree of safety and produce powerful suction effect.

•It has variable frequency drive to adjust blower speed.

•The blower is safe guarded with motor circuit-breaker.

•Solid particles or contaminants withheld using the filters before entering the side channel blower.

•Should be supplied with Complete with silencer, filters, dampers & installation accessories and air switch device.

•The blower is unidirectional rotation and equipped with unique electronic

•The blower should be is automatically activated through centralized control system.

2.2 Station

Following are the generic features of software installed inside all the stations.

•User interface has to be designed in a way that if larger screen is attached, it should be able to adjust the graphics and resolutions.

•7" capacitive touch screen

- Keypad to dial number and Directory/Address book to search name.
- The address book name should be shownduring input of address key using number keys
- Quick dial destination list as easy access

- Local Service and visualization of all devices
- Software in local language like Hindi, Gujarati, Marathi, Telugu, Tamil, Bengoli etc
- Screen saver on inactive for few seconds. (This has to be configurable)
- Possibility to customize screensaver text.
- Last shipment history
- Screen lock with pin to restrict the access in common area
- Characters each line with Clear text in station display
- Speed-dial button for direct dialing of the receiver
- Keep the last dialed destination in display to keep sending the same destination
- Beeper and LEDs based signal notification
- Feature in graphics to cancel the queued or last create shipment until carrier leaves the station.
- Connection with server has to be based on event driven. Node must initiate connection.
- Server has to serve the request of client. This communication must not be polling driven. It has to be event driven. Change in any device state will directly transmitted to server and it will take necessary action.
- Current Date and time visualization using standard date time clock sync protocols.
- Operating system of processor has to be optimized with minimum sized with latest libraries and kernel version > 4.4.
- Communication with server has to be encrypted with ssl.

3.2.1End Station

- The device is wall mountable; each device is equipped with state-of-art maintenance free gear drive and servo motor mechanism & self-adjusting.
- This has to be bottom loaded type station. This means carrier must be inserted at the bottom of station while sending.
- Stations are equipped with RFID readers for various functions such as Carrier ID and inventory, Carrier ID with properties, permitted addresses or groups, prohibited addresses or groups, automatic destination, reject items not identifiable etc.. (Optional)
- Eachstation has capability / option for arrival signal by visual LEDs and audio beeper.
- Automatic energy-saving mode of screen as screensaver.
- Screen saver text can be customized
- with modular replaceable control cards
- It is equipped with carrier holding rack (capacity 4 carriers) made from stainless steel
- It also has to be equipped with carrier receiving basket (made from stainless steel)and cushion.

•It is equipped with minimum 2 carriers of spring loaded side flip mechanism.

•It is connected to the network via TCP/IP protocol with LAN or wi-fi connection.

•It powered from near by plug of 230V, 6A pin with 3 pin.

•This will keep sending carrier in queue, while receiving the carrier hence behaves like a full duplex operation mode.

•Mounting height of the bottom plate of station has to be at height 1.1 m from fully

finished floor.

3.2.2 Pass-Through Type Stations – Top loaded

•This type stations has to be Top loaded. That means carrier must be put upper part of the station.

•Mounting height of the top plate of station has to be at height 1.5 m from fully finished floor.

•The device is wall mountable; each device is equipped with state-of-art maintenance free gear drive mechanism and servo motor.

•Stations are equipped with RFID readers for various functions such as Carrier ID and inventory, Carrier ID with properties, permitted addresses or groups, prohibited addresses or groups, automatic destination, reject items not identifiable etc.. (Optional)

•Each station has capability / option for unlimited remote arrival messaging via (Optional) Net Client on to user's PC.

•Integrated carrier damping arrangement; no air waste while sending or receiving a carrier;

•LED and Beeper for notice;

•Automatic energy-saving mode by screen saver.

•Customization screen saver text.

•With modular replaceable control cards

•7" capacitive touch screen

•It must be equipped with carrier holding rack (capacity 4 carriers) made from stainless steel

•It also has to be equipped with carrier receiving basket (made from stainless steel)and cushion.

•It must be equipped with minimum 2 carriers of spring loaded side flip mechanism.

•It mustbe connected to the networkvia TCP/IP protocol with LAN or wi-fi connection.

•It must be powered on from near by plug of 230V, 6A pin with 3 pin.

•This will keep sending carrier in queue, while receiving the carrier hence behaves like a full duplex operation mode.

3.2.3 Multi Load Station

•The device is wall mountable; each device is equipped with state-of-art maintenance free gear drive and servo motor mechanism.

•This has to be bottom loaded type station. This means carrier must be inserted at the bottom of station while sending.

•Stations are equipped with RFID readers for various functions such as Carrier ID and inventory, Carrier ID with properties, permitted addresses or groups, prohibited addresses or groups, automatic destination, reject items not identifiable etc.. (Optional)

•This station can not receive carrier

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•Automatic energy-saving mode of screen as screensaver.

•Screen saver text can be customized

•with modular replaceable control cards

•7" capacitive touch screen

•It is equipped with carrier holding rack (capacity 4 carriers) made from stainless steel

•It is equipped with minimum 2 carriers of spring loaded side flip mechanism.

•It is connected to the network via TCP/IP protocol with LAN or wi-fi connection.

•It powered from near by plug of 230V, 6A pin with 3 pin.

•Mounting height of the bottom plate of station has to be at height 1.1 m from fully finished floor.

3.2.4Lab Receiving Station

•Sliding Receiving area with 1.5mtr length; the deviceshould compact size and connected to dedicated and independent power lines

•The device should be wall/table top mountable

•Pipe open end with only digital input to notify the receiving of shipment and turn the blower off.

•This type station can not be used for sending a carrier.

2.3Diverter Units

•The diverter units are switching device used at branching points in the system to direct the path of the carrier from a single tube at one end to 4 select-able tubes at the other end.

•The ends of the diverters should be attached with forwarding tube network using steel clamps that are easily removable during servicing.

•It must have optical sensor to detect passage of the carrier.

•It must have movable tube that gently guides the carrier through the diverter in pre and auto-selected direction. The tube is positioned precisely at the selected port using servo motor.

•The diverter should have enclosed rigid frame with removable side covers for services with minimized electrostatic interference and alignment to W-X-Y-Z ports based on servo motor.

•The component should be wall/ceiling mountable; Each device should be equipped with state-of-art maintenance free gear drive and timing belt-pulley mechanism & servo motor.

•It must be connected to the network via TCP/IP protocol with LAN or wi-fi connection.

•It must be powered on from near by plug of 230V, 6A pin with 3 pin.

2.4Zone Transfer

•Zone transfer is basically a handover and take over device from one zone to other zone.

•Every zone will have 2 pipes for hand over and take over operations. This will allow to work zone as independently.

•In case of 2 zones, this 2 pipes connected and system can manage the inter zone transportation.

•In case of 2 zones, this 2 pipes connected and system can manage the inter-zone transportation.
•In case of more than 3 zone there can be a dedicated blower and diverter set. This set will work as zone transfer. This set will handle handover and takeover operations from all rest zones.
•As our components works parallel and takes position simultaneously. This type of zone transfer will be cost effective and easy to implement.
•This type of special zone transfer is called diverter zone transfer.

2.5 System Tube Network
•The network should be of special PVC forwarding tubes and bends conforming to ISI marked for characteristics; Tubes and bends should be smoothly connected with metal clamps. UPVC pipe should have IS 4985.
•4kgf ISI standard pipes
•The Tubes and bends should be mounted at site using thread rods & tube clips at every 2 to 3 meter distance.
•All drop points connecting to stations and exiting from stations should be in transparent tube (transparent PVC, Acrylic or PC).
•ISI standard local pipes(Preferably Finolex or Supreme) can be used to reduce the transportation and tube cost. During installation, our installation engineer test the pipe before mounting and remove not qualified pipes. Moreover,our carrier is designed to take care of 0.5mm thickness variation in pipe. Hence, we don't get any significant difference in the system performance and efficiency.

3.5.1 System Forwarding Bends
•It must be smoothly crafted with radius minimum 650mm to max 1000mm.
•Based on available installation space this will be used.
•For 110mm : Minimum radius is 650mm
•For 160mm : Minimum radius is 800mm

3 Device Specifications
3.1 Optical/Magnetic sensor
•Switch should be modular and provided built-in various devices. Should be portable in nature, easily replaceable.
•Should be com-connectable to various devices through the system should have single control cable of high grade composite with grounding,
•Sensors has to be connected with 2 or 3 wire NO or NC type configuration.
•low voltage supply of 10-30V for human protection.
•There must be 2-3 brands available for sensors, for redundancy purpose.
3.2 Display
•Capacitive touch screen
•minimum cross corner size of 7"
3.3 Motor

•DC servo motors has to be used with high encoder resolutions.

•It must be connected with timing belt and pulley mechanism or rack and pinion mechanism.

•Servos are accurate, fast and

•Motor must have home position defined with magnetic or proximity sensor. Other positions can be achieved simply based on encoder values, it does not need the sensor for all positions or reed switch.

4Carriers or Capsules

•These special carriers are with caps for secure use;

•Payload up to 3 kg;

•Impact resistant and crystal-clear poly carbonate/acrylic middle body;

•Carrier must have flip-side type spring loaded opening and closing mechanism.

•Velcro rings must have width of 1.5 inch.

•Carrier minimum volume dimension:

•110mm: 240mm*85mm

•160mm: 330mm*115mm

•When required only spring or necessary part of the flip side mechanism has to be replaced and other part has to be reused to reduce the carbon footprint.