# GENTEC ®
## GENSTAR TECHNOLOGIES

**MEDICAL MONITORING, ALARM AND CONTROL SYSTEMS**
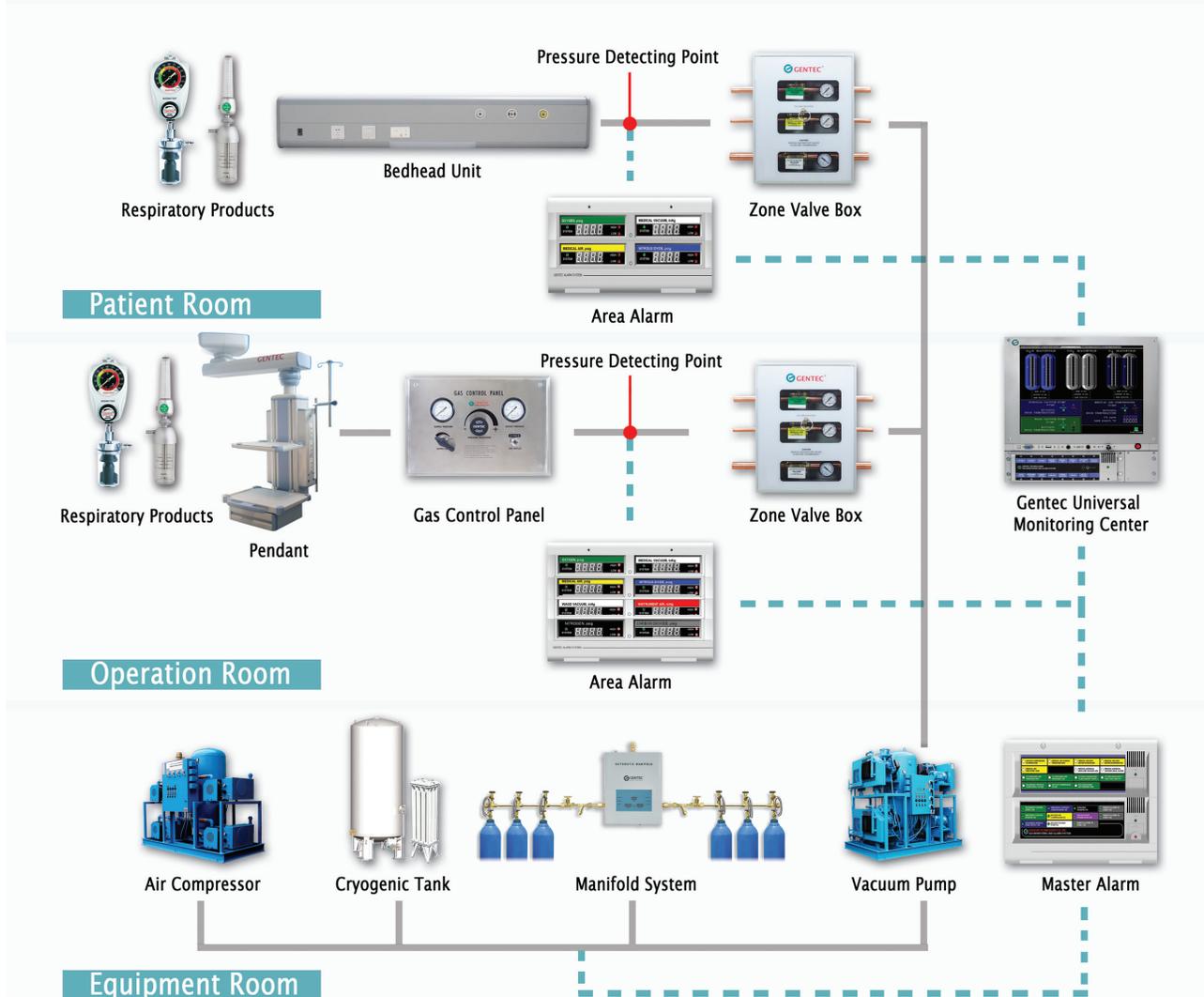
International Edition

*Technology for a Better Future*

CE

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## GUMACS™ Overview

Gentec Universal Monitoring, Alarm and Control System™ is a highly modular system utilizing the most advanced technologies in electronics and software. The modular design can implement limitless configurations to meet different monitoring/control requirements. Future expansion can be achieved through upgradable firmware, software, and additional panels.

GUMACS™ alarm series complies with the latest edition of NFPA 99 and optionally for HTM 02-01. GUMACS™ alarm series have built-in networking capability and can be implemented to standard RS-485 and Ethernet network systems.

Furthermore, GUMACS™ alarm series accept all 4-20 mA and voltage signals, and can monitor customized readings or alarm conditions such as humidity, temperature, concentration levels, and flow rates in addition to typical pressure readings. With these versatilities, GUMACS™ alarm series are often applied to industrial, laboratories, and other applications.

## Customized Software

Implementation of an intelligent monitoring system with networking capability like the GUMACS™ is made easy with Object Visual Lab®, the interactive software generating package. Having a strong working relationship with Object Visual Lab®, Gentec is able to provide customized software to complement GUMACS™ alarm systems when advanced monitoring/control requirements are involved. In addition, trend data can be collected and saved for later analysis to help facilitating future projects.

## GUMACS™ Series Gas Area Alarm
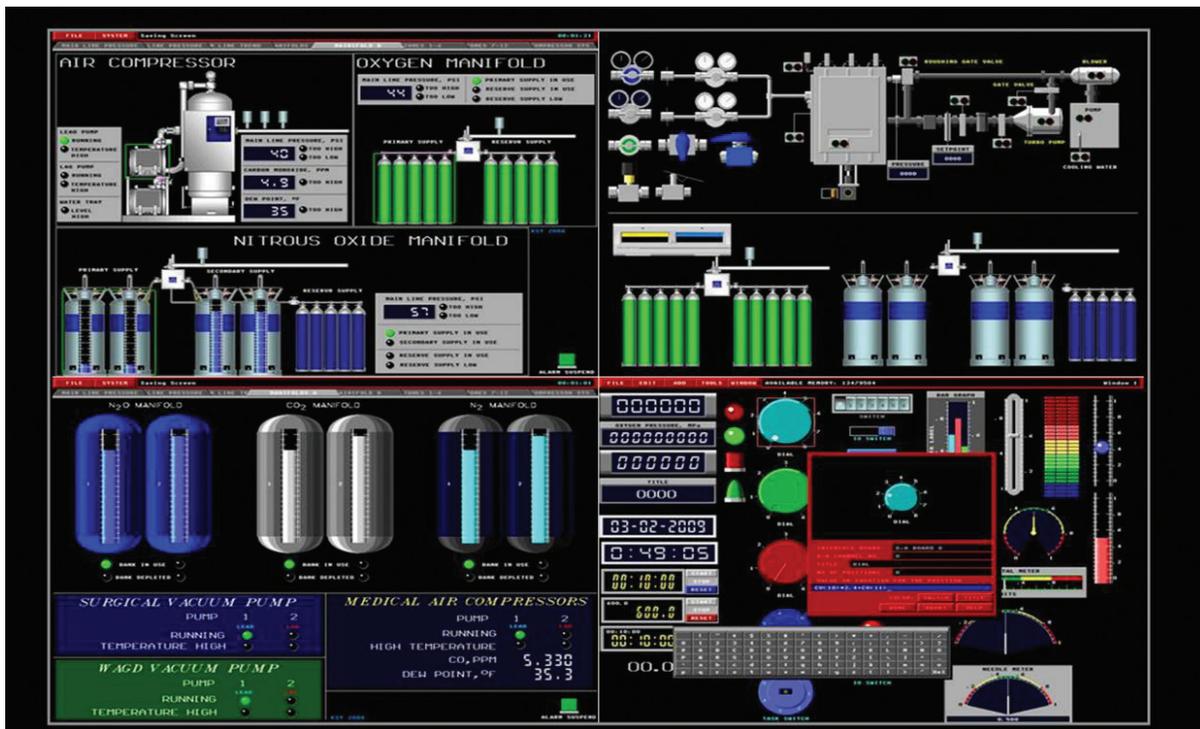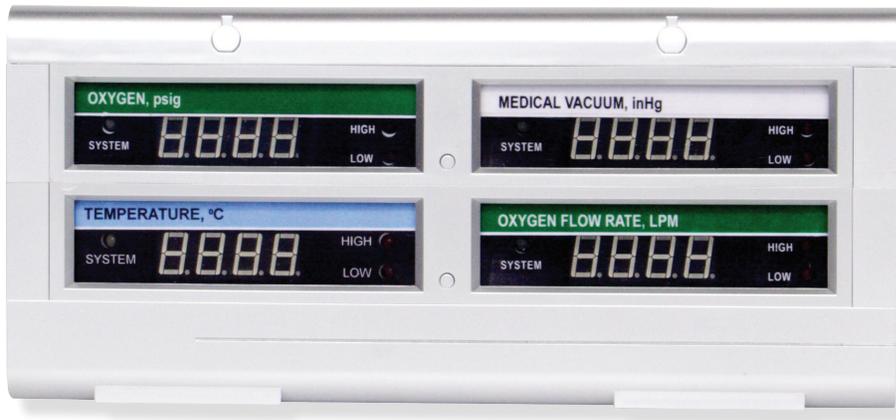


Area Alarm with Local Sensors



GUMACS™ Series Area Alarm is CE marked and NFPA 99 compliant. Designed to accept a variety of input signals, GUMACS™ Series Area Alarm is often used to monitor pressure, flow rate, temperature, humidity, concentration, and other safety indexes. If needed, GUMACS™ Series Area Alarm can also offer relay switch output control capability.

Built-in RS485 communication port allows each GUMACS™ Series alarm to be networked for remote monitoring. The physical data will be processed and displayed on site by the area alarms. In addition, GUMACS™ System Console can request data from the slave modules, the area alarms and master alarms.

**Key Features**
• Modular system configuration
• 1 to 16 input channels available
• Pressure units are customizable (Psig, kPa, Bar, MPa, inHg, and mmHg )
• Can be used to monitor pressure, flow rate, temperature, humidity, concentration, and other safety indexes
• High/low alarm limits and silence time are customizable
• Built-in RS-485 communication port for networking
• Accept 4-20 mA current inputs and single-ended voltage signals
• One contact switch output per input channel
• Displays error message when pressure transducer is not connected
• Compact size with large four-digit LED numerical displays
• Dual color LEDs for system statuses
• All parameters can be field adjustable
• Labels can be customized upon request
• Alarm volume is adjustable

## GUMACS™ Series Gas Area Alarm

## Electrical and Physical Specifications

| Mechanical | |
|---|---|
| Front Panel | Injection Molded Plastic (PCABS, V0 Flame Rated) |
| Case Body | Metal Alloy |
| Physical Dimension (Width x Height x Depth ) | Overall: 1~4 Channel: 300mm x 135mm x 107mm    5~6 Channel: 300mm x 175mm x 107mm 7~8 Channel: 300mm x 215mm x 107mm |
| Wall Opening (Width x Height) | (Depth beneath the wall is 95mm)    5~6 Channel: 272mm x 165mm 1~4 Channel: 272mm x 125mm    7~8 Channel: 272mm x 205mm |
| **Electrical** | |
| Power Requirements | Input: 100~240 VAC, 0.5 A Maximum |
| Analog Input | Input Type: (1) Single-ended, voltage    (2) Differential, voltage        (3) 4~20 mA current supplying 15 VDC    (4) 4~20 mA current not supplying 15 VDC Working Range: ±10 VDC/4~20 mA Safe Range: ±14 VDC/0~28 mA Maximum Resolution: 14 bit or 1% of sensor full range |
| Relay Output | Channels: 1 output per 1 input channel Range: 0.15 A at 48 VDC/1 A at 30 VDC/0.5 A at 120 VAC |
| Buzzer | Adjustable Intensity |
| **Communication** | |
| RS-485 Port | 9600/19200 baud, standard (8-bit data, no parity, 1 stop bit) |

## Dimensions
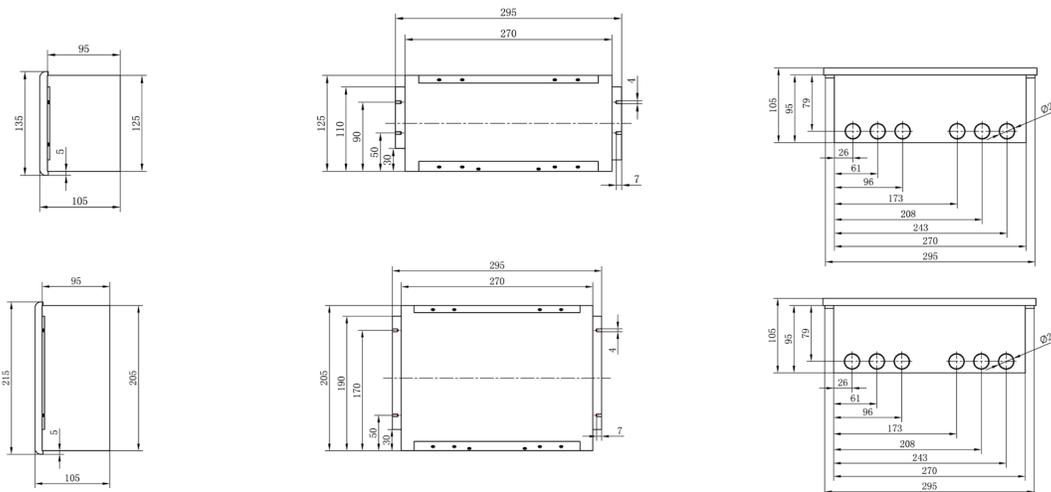


## Ordering Information

**BAA  -  R  -  03  -  OVA**

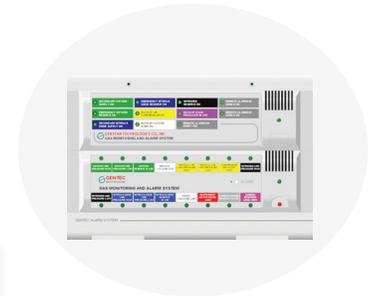| **Area Alarm** | **Sensor Type** L: Local Sensor R: Remote Sensor | **Number of Numerical Channels** (01 to 16 Normally) | **Gas Type** O: Oxygen V: Vacuum A: Medical Air I: Instrument Air N: Nitrogen 2: Nitrous Oxide C: Carbon Dioxide W: WAGD Vacuum |
|---|---|---|---|

**Example:**
BAA - R - 03 - OVA indicates an area alarm (remote sensor) for oxygen, vacuum, and medical air .

GUMACS™ Series Gas Master Alarm



Master Alarm (up to 32 inputs)

GUMACS™ Series Master Alarm is CE marked and NFPA 99 compliant. It is used to monitor the operation conditions of source equipments such as air compressors, vacuum pumps, and/or manifold systems, etc. GUMACS™ Series Master Alarm can also offer relay switch output control capability when required.

Built-in RS485 communication port allows each GUMACS™ Series alarm to be networked for remote monitoring. The physical data will be processed and displayed on site by the master alarm. In addition, GUMACS™ System Console can request data from the slave modules, the area alarms and master alarms.

Although not done conventionally, GUMACS™ Series Master Alarm can be used as an Area Alarms Monitoring Center. When connected, the working conditions of the area alarms will be displayed on the Area Alarms Monitoring Center. This would be a good solution for a medium-sized central monitoring project.
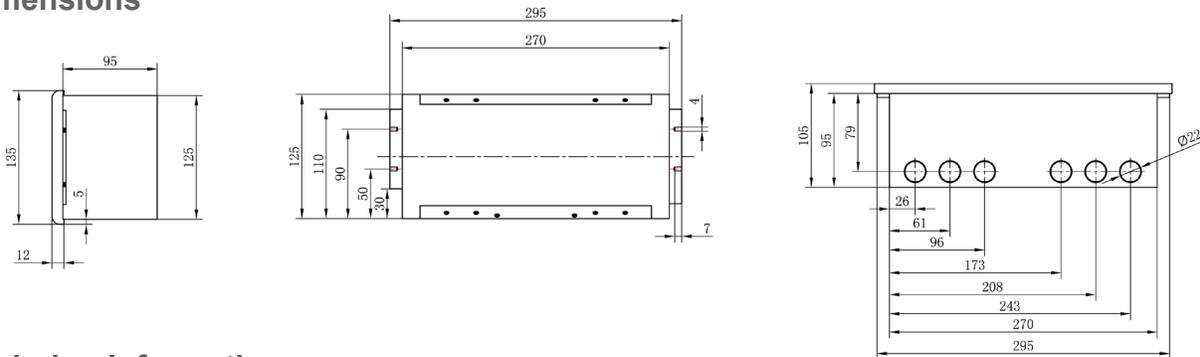
**Key Features**
• Can expand up to 64 TTL or contact switch inputs
• Can offer up to 48 switch output capability
• Built-in RS-485 communication port for networking
• Can be upgraded to a combination alarm if numerical displays are required
• Accept both normally open (N/O) and normally closed (N/C) switches
• High/low alarm limits and silence time are customizable
• Can be used to monitor the conditions of area alarms
• Labels can be customized upon request
• Alarm volume is adjustable

## GUMACS™ Series Gas Master Alarm

## Electrical and Physical Specifications

| Mechanical | | |
|---|---|---|
| Front Panel | Injection Molded Plastic (PCABS, V0 Flame Rated) | |
| Case Body | Metal Alloy | |
| Physical Dimension (Width x Height x Depth ) | Overall: 1~16 Channel: 300mm x 135mm x 107mm 33~48 Channel: 300mm x 295mm x 107mm | 17~32 Channel: 300mm x 215mm x 107mm 49~64 Channel: 300mm x 375mm x 107mm |
| Wall Opening (Width x Height) | (Depth beneath the wall is 95mm) 1~16 Channel: 272mm x 125mm 33~48 Channel: 300mm x 285mm | 17~32 Channel: 272mm x 205mm 49~64 Channel: 300mm x 365mm |
| **Electrical** | | |
| Power Requirements | Input: 100~240 VAC, 0.5 A Maximum | |
| Analog Input (for first module) | Input Type: (1) Single-ended, voltage (3) 4~20 mA current supplying 15 VDC Working Range: ±10 VDC/4~20 mA Channels: 16 Maximum Safe Range: ±14 VDC/0~28 mA Maximum Resolution: 14 bit or 1% of sensor full range | (2) Differential, voltage (4) 4~20 mA current not supplying 15 VDC |
| Digital Output (for one expansion module) | 5 VDC, -2.6 mA per Channel Maximum Number of Channels: 16 Maximum Omron G2R-1, G2R-14, G2R-1A, G2R1A4 or Grayhill 70-OAC5, 70-ODC5, and Compatibles | |
| Digital Input (for one expansion module) | 5 VDC, 24 mA per Channel Maximum Number of Channels: 16 Maximum Grayhill: 70-IAC5, 70IDC5 , and Compatibles | |
| Numerical Display | Resolution: Large 7-segment, four-digits LED | |
| **Communication** | | |
| RS-485 and RS-232 Port | 9600/19200 baud, standard (8-bit data, no parity, 1 stop bit) | |

## Dimensions



## Ordering Information

**BMA** - **01** - **00**

**Master Alarm**

**Number of Digital Input**
01: 1~16 Digital Inputs
02: 17~32 Digital Inputs
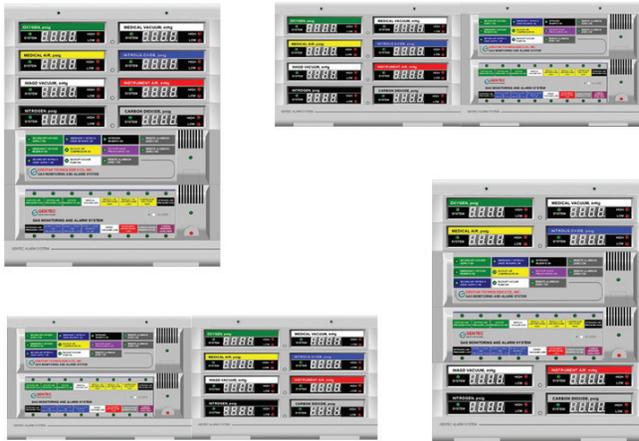03: 33~48 Digital Inputs
04: 49~64 Digital Inputs

**Number of Digital Output**
00: 0 Digital Outputs
01: 1~16 Digital Outputs
02: 17~32 Digital Outputs
03: 33~48 Digital Outputs

**Example:**
BMA - 01 - 00 indicates a master alarm for 1~16 input channels .

GUMACS™ Series Gas Combination Alarm



Flexibility of Module Placement



GUMACS™ Series Combination Alarm

GUMACS™ Series Combination Alarm is CE marked and NFPA 99 compliant. Integrating the numerical display functions and master alarm functions, the combination alarm is sometimes more preferable. It can be used to monitor the operational conditions of source equipment and other numerical safety indexes. GUMACS™ Series Combination Alarm can also offer relay switch output control capability when required.

Built-in RS485 communication port allows each GUMACS™ Series alarm to be networked for remote monitoring. The physical data will be processed and displayed on site by the combination alarm. In addition, GUMACS™ System Console can request data from the slave modules, area alarms and master alarms.

**Key Features**
• Can be expanded to handle up to 64 TTL or contact switch inputs and 48 TTL or relay (contact switch) outputs
• Built-in RS-485 communication port for networking
• High/low alarm limits and silence time are customizable
• Relative positions of modules can be adjusted to meet the space requirements or limitations
• Displays error message when pressure transducer is not connected
• Labels can be customized upon request
• Alarm volume is adjustable

## GUMACS™ Series Gas Combination Alarm

## Electrical and Physical Specifications

| Mechanical | |  |
|---|---|---|
| Front Panel | Injection Molded Plastic (PCABS, V0 Flame Rated) | |
| Case Body | Metal Alloy | |
| Physical Dimension | Customized | |
| Wall Mounting Hole | Customized | |
| **Electrical** | | |
| Power Requirements | Input: 100~240 VAC, 0.5 A Maximum | |
| Analog Input (for first module) | Input Type: (1) Single-ended, voltage<br>(2) Differential, voltage<br>(3) 4~20 mA current supplying 15 VDC<br>(4) 4~20 mA current not supplying 15 VDC<br>Working Range: ±10 VDC/4~20 mA<br>Channels: 16 Maximum<br>Safe Range: ±14 VDC/0~28 mA Maximum<br>Resolution: 14 bit or 1% of sensor full range | |
| Digital Output (for one expansion module) | 5 VDC, -2.6 mA per Channel Maximum<br>Number of Channels: 16 Maximum | Omron G2R-1, G2R-14, G2R-1A, G2R1A4 or Grayhill 70-OAC5, 70-ODC5, and Compatibles |
| Digital Input (for one expansion module) | 5 VDC, 24 mA per Channel Maximum<br>Number of Channels: 16 Maximum | Grayhill: 70-IAC5, 70IDC5 , and Compatibles |
| Numerical Display | Resolution: Large 7-segment, four-digits LED | |
| **Wiring** | | |
| Termination | Analog Input, I/O, and RS-485: PCB mounted screw terminal connections<br>AC Power: 3 pin AC power connections | |
| **Communication** | | |
| RS-485 and RS-232 Port | 9600/19200 baud, standard (8-bit data, no parity, 1 stop bit) | |

## Ordering Information

**EMA - R - 02 - OV - 01 - 00**

- **Combination Alarm**
- **Sensor Type**
  - L: Local Sensor
  - R: Remote Sensor
- **Number of Numerical Channels**
- **Gas Type**
  - O: Oxygen
  - V: Vacuum
  - A: Medical Air
  - I: Instrument Air
  - N: Nitrogen
  - 2: Nitrous Oxide
  - C: Carbon Dioxide
  - W: WAGD Vacuum
- **Number of Digital Input**
  - 01: 1~16 Digital Inputs
  - 02: 17~32 Digital Inputs
  - 03: 33~48 Digital Inputs
  - 04: 49~64 Digital Inputs
- **Number of Digital Output**
  - 00: 0 Digital Outputs
  - 01: 1~16 Digital Outputs
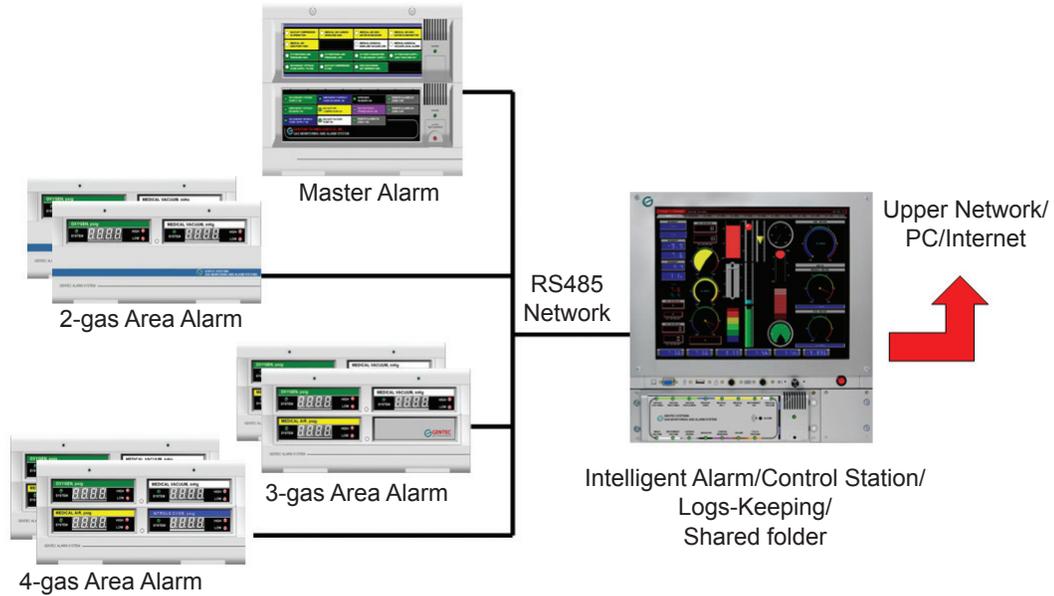  - 02: 17~32 Digital Outputs
  - 03: 33~48 Digital Outputs

**Example:**

EMA - R - 02 - OV - 01 - 00 indicates a combination alarm (remote sensor) with 2 numerical channels (oxygen, vacuum), 1~16 digital input channels, and 0 digital output.

Master Alarm

2-gas Area Alarm

3-gas Area Alarm

4-gas Area Alarm

RS485 Network

Upper Network/ PC/Internet

Intelligent Alarm/Control Station/ Logs-Keeping/ Shared folder

## GUMACS™ System Console

GUMACS™ System Console is a powerful industrial PC-based system. As a station host, Intelligent Alarm/Control Station (IACS) can be expanded to monitor a great number of analog/digital inputs and provide output control capabilities. With Gentec customized software, IACS can easily meet or exceed customer's monitoring requirements. In addition, trend data can be collected and saved for later analysis to help facilitate future projects.

As a network master of Intelligent Alarm/Control Network (IACN), GUMACS™ System Console can manage a variety of GUMACS™ Series alarms and other devices. All digital and analog inputs are first processed locally and then sent to the System Console via the RS-485 network in order. More complicated computing, data logging, trend analyzing, and intelligent decision making tasks are carried out by the System Console. It is also possible to deliver the information to upper network.

**SYSTEM SPECIFICATIONS:**
• High performance industrial PC with flat panel display
• Analog and digital inputs
• Analog and digital output capabilities
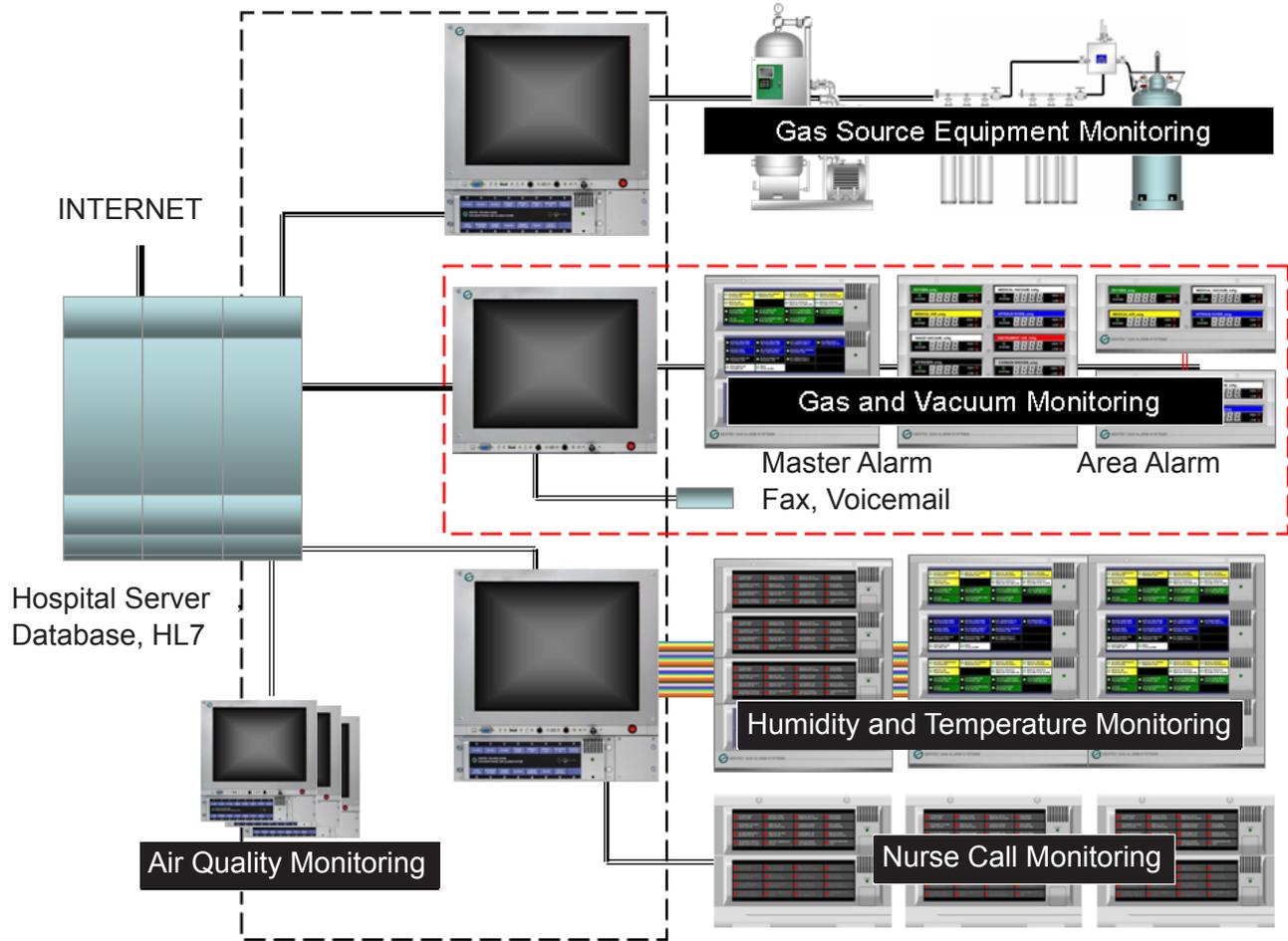• Built-in RS-485, RS-232, and Ethernet ports

**EXPANSION OPTIONS:**
• Touch panel, voice mail, fax transmission
• Additional digital and analog IO expansion modules
• Customized system software
• Connect to upper level hospital network and Internet
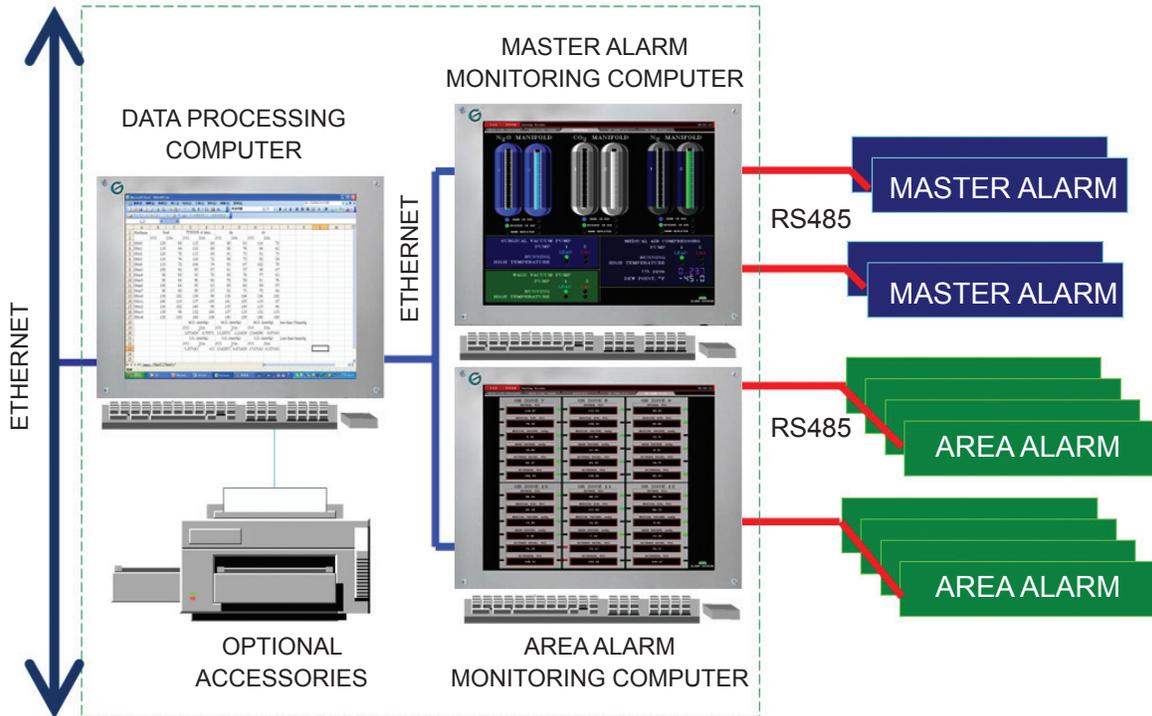
## Gentec Central Monitoring System

• Quality control and quality assurance

• Trend data analyzing helps decision making, thus improving efficiency of operations management

• Can be integrated into existing hospital management system

## e-Hospital Solution

INTERNET

Gas Source Equipment Monitoring

Gas and Vacuum Monitoring

Master Alarm
Fax, Voicemail

Area Alarm

Hospital Server
Database, HL7

Humidity and Temperature Monitoring

Air Quality Monitoring

Nurse Call Monitoring

## Gas Alarm Systems Provides:

**"Visual Indications"** to indicate normal functions of the pipeline system.

**"Visual Indications and Audible Indications"** to WARN that the routine replacement of cylinders or other engineering action is required.

**"Visual and Audible Emergency Alarms"** to inform that abnormal conditions have occurred which may require urgent action by the user. This alarm condition will require a rapid response by the various departments' staff.

**(HTM 02-01)**

**Master Alarms** shall monitor the operations and conditions of the supply source, the reserve source (if any), and the pressure in the main lines of each gas pipeline systems.

**Area Alarms** shall monitor all gas, vacuum, and piped WAGD systems in Level 1 and Level 2 facilities.

**Level 1 Piped Gas and Vacuum Systems**

"Systems serving occupancies where interruption of the piped gas and vacuum system would place patients in imminent danger of morbidity or mortality."

**Level 2 Piped Gas and Vacuum Systems**

"Systems serving occupancies where interruption of the piped gas and vacuum system would place patients at manageable risk of morbidity or mortality."

**GENTEC**®

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