# Design Document
# For
# Environment Management System

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## 2.0 Pre-approval Sheet:

| ACTIVITY | NAME | AREA/ DESIGNATION | SIGNATURE | DATE |
|---|---|---|---|---|
| **Prepared by** | | Executive– Engineering & Commissioning | | |
| **Reviewed by** | | Manager – Engineering & Commissioning | | |
| **Approved by** | | Manager – Engineering & Commissioning | | |

## 3.0 Version Records:

| Version | Date | Changes | Remarks |
|---|---|---|---|
| | | | |

## 4.0 Introduction:

The objective of preparing a Design Document is to prepare design data and detailed specifications for all major components of the equipment and system for the detailed engineering regarding agreed scope of supply, installation and performance, to ensure Customer Requirements are achieved for the project as per agreed specifications.

Environment Management System (EMS) will monitor and respond according to parameters of display units with connected devices.

The objective of this document is to illustrate the complete design of an Integrated Scheme for EMS as per the Relevant Standards, Agreed Technical Specifications, User Requirement Specifications (URS) and other finalized terms and conditions.

## 5.0 SCOPE:

This Design Documentation applies only to PC based Environment Management System & its integrated equipments & field level devices as per order.

The EMS system covers following HVAC systems:

1. **SYS-G-OCP-01**
2. **SYS-G-OCP-02**
3. **SYS-G-OCP-03**
4. **SYS-G-OCP-04**
5. **SYS-G-OCP-05**

## 6.0 Responsibility:

In order to achieve the above objective for the complete Environment Management System, following shall be the responsibility of, Avant Garde Cleanrooms & Engg Solution Pvt Ltd .

**……Pvt Ltd:**

1. The complete system is designed as per the Relevant Standards, Agreed Technical Specifications.
2. Technical specifications of all the equipment are as per the Tender Document, subsequent MOM's and the Purchase Order Specifications.

**…… Pvt. Ltd:**

Responsibility on their part shall be as per following:

1. To check and verify all the documents submitted as per above are in line with agreed specifications and scope and shall approve all the documents to signify that the vendor has complied with his commitment.
2. To provide the necessary site clearance and complete the site activities covered in …….. Pvt. Ltd.
3. To provide the necessary Provision as per IO summary Provision list.

## 7.0 Brief Description:

The design of the System has integration of all the field devices to the workstation through necessary devices.

Integration shall mean all the parts of system are connected together through software and shall share all the information. The integration of all input/output points shall be achieved through software programs, electronic components, hardware packaging and communication network through Local Area Network.

The Environment Management System shall carry out the monitoring & control for various devices of following:

- ❖ Acknowledgment button
- ❖ Room Display Units
- ❖ Room Field Device

During normal operation, control stations shall carry out their respective functions. This shall be governed by user level password access to prevent interference during normal operation.

The system will allow for time delay setting, Monitoring of all systems, reliability analysis and troubleshooting.

**Environment Management System comprise of following:**

The EMS is capable of integrating multiple functions including equipment supervision, Control and monitor.

The EMS consists of the following:

a) Networkable/Standalone Interface Unit
b) PC Workstation
c) Field Sensors (analog/Digital)
d) Room Display Units
e) Acknowledgement Button

The system is modular in nature and permits expansion of both capacity and functionality through the addition of above mentioned devices.

Each DDC Controller operates independently by performing its own specified input and output control. The failure of network connection will not interrupt the execution of control strategies at other operation devices.

Standalone DCC Controllers are able to access any data or send control commands directly to any other DDC Controllers or combination of controllers on the network without dependence upon a central processing device.

## 8.0 Acronyms and Terms

| S.No. | Acronym | Description |
|---|---|---|
| 1. | AHU | Air Handling Unit |
| 2. | EMS | Environment management system |
| 3. | CD | Compact Disc |
| 4. | CD-RW | Compact disk read write |
| 5. | COM | Communication |
| 6. | CQA | Central Quality Assurance |
| 7. | DDC | Direct Digital Controller |
| 8. | DDS | Detailed design specification |
| 9. | FSR | Full scale range |
| 10. | G.A. | General Assembly |
| 11. | GB | Gigabyte |
| 12. | GHz | Gigahertz |
| 13. | GMP | Current Good Manufacturing Practice |
| 14. | GMT | Greenwich Mean Time |
| 15. | IO | Input Output |
| 16. | I/P | Input |
| 17. | IQ | Installation Qualification |
| 18. | Kbps | Kilo bytes per second |
| 19. | LED | Light Emitting Diode |
| 20. | MB | Megabyte |
| 21. | MHz | Megahertz |

| S.No. | Acronym | Description |
|---|---|---|
| 22. | MS | Microsoft |
| 23. | NIST | National Institute of Standards and Technology |
| 24. | No. | Number |
| 25. | O/P | Output |
| 26. | PC | Personal Computer |
| 27. | P&I | Process & Instrumentation |
| 28. | PVC | Polyvinyl chloride |
| 29. | POT | Portable Terminal Unit |
| 30. | TCP/IP | Transmission Control Protocol/ Internet Protocol |
| 31. | UPS | Uninterruptible power supply |
| 32. | VAC | Volts alternating current |
| 33. | RAM | Random access memory |
| 34. | UPS | Uninterruptible power supply |
| 35. | VDC | Volts Direct current |
| 36. | DESIGO CC Station | Desigo CC software that serves as a graphical user interface |

## 9.0 PC Specification:

| S.No. | Description | Make/Model No. | Remarks |
|---|---|---|---|
| **Master PC Specifications** | | | |
| **1.** | Processor | 3.3 Ghz, 3.3GHz/ 4 core / 8MB/80W | |
| **2.** | Hard Drive | 3x1 TB SATA | |
| **3.** | DVD Writer | 1X inbuilt (290W) | |
| **4.** | Monitor | 21" TFT | |
| **5.** | Mouse | Optical | |
| **6.** | Keyboard | 104 Keys | |

## 10.0 System Architecture Diagram

**Enclosed: Total No. of Pages - 01**

## 11.0 Control Logic

| | | |
|---|---|---|
| **Project:……** | **CONTROL PHILOSOPHY** | |
| | **Building Management System** | |

# CONTROL PHILOSOPHY

# FOR

# ENVIRONMENT MANAGEMENT SYSTEM

| |
|---|
| **PROJECT:** |
| **Client:** |
| **Consultant:** |

# EMS Control Logic:

## IO Summary

There are following items in IO summary:

- PC Workstation (One master PC in Engineering office)
- Acknowledgement Button
- Interface Unit
- 3 Channel Room Display Units (Temp/RH/Pressure)

## Functionality:

- Acknowledgement button is to silent the Display unit.
- Background colour shall change from green to red if parameter deviates from set point. This colour change shall occur after set time delay.
- Time delay for temperature is 5 min, for pressure 03 min and for RH 10 min. but it should settable as per user requirement.
- Set points shall be set from the central, master system with 3 level password protection system. No one shall be allowed to change the set points from display menu.
- In case of power failure to all in HVAC MCC panel, all the associated hooters and flashers shall be disabled till the power is resumed.

### *Notes:*

- Temperature Humidity & Pressure limits will be settable ( End-user will be accessible for this option)

**12.0 DDC Distribution List/ IO Summary/ Basis of Design**

## 13.0 DDC Panel GA & Wiring Diagram

**Enclosed: Total No. of Pages – 1 Lot**

## 14.0 Post Approval Sheet

### Functional Document Completion and Post Approval:

It is certifying that above-mentioned system is designed to fulfill the requirement of user for desired & reliable operation as specified and recommended by the manufacturer.

### Post Approval Sheet

| ACTIVITY | NAME | AREA/ DESIGNATION | SIGNATURE | DATE |
|---|---|---|---|---|
| **Prepared by** | | Executive – Engineering & Commissioning. | | |
| **Reviewed by** | | Manager – Engineering & Commissioning. | | |
| **Approved by** | | Manager – Engineering & Commissioning. | | |