# CDU

## Clean Room Display Unit

Masibus model CDU Clean Room Display Unit is designed to measure and display Temperature, Humidity and Differential Pressure in one compact enclosure.

CDU Clean Room Display Unit accepts analog input from Temperature, Humidity and Differential pressure sensors, optionally the sensors for all 3 parameters are integrated inside for ease of use & installation. CDU is also available in Remote sensor with 10 meter cable option for RH + T measurement

CDU is available in two display options either 4 digit 0.56" Red seven segment displays to Indicate Temperature, %RH and DP individually or 3.5" TFT LCD, CDU with LED display option has individual LEDs for Status indication for all three channels. High and low alarm LED indications are settable using programming modes. One no potential free Digital Input for door status available in CDU with LCD option.

CDU has inbuilt buzzer for audible process value violation. Data acquisition can be done on SCADA/ PLC application through RS485 using MODBUS protocol.

CDU-LED version optionally also accepts Humidity and Temperature input through wireless zigbee network from Masibus make HT16Ew Humidity & Temperature Transmitter.

Designed using proven micro-controller technology, this Clean Room Display Unit has been validated to perform accurate and reliable performance in harsh field environment.

## Features

- RH, Temperature and DP measurement
- Advanced digital RH+T sensor technology
- Calibration not required for digital RH+T sensor
- Internal sensor option (Ease of installation)
- Remote sensor option for RH+T measurement
- Available in LED and touchscreen TFT LCD display options
- 3 programmable alarms with visual annunciation
- Software programmable channel ranges, units & input types
- Real time clock with battery back-up
- Synchronized with server clock over RS485
- Data backfilling via DNP 3.0 avoiding data loss (optional)
- RS485/MODBUS RTU multidrop communication for PLC, SCADA etc.
- FDA 21 CFR part11 compliant SCADA version also Datalogging
- Optional Wireless connectivity available in LED version (with HT16Ew model)

## Applications

- Pharmaceutical industry
- HVAC (Heating, ventilation, air conditioning, cooling)
- Blood stations, pharmacies
- Horticultural and cultivation of plants
- Pharma Environments monitoring applications
- Data acquisition, analysis and processing

# TECHNICAL SPECIFICATIONS

## Input

### Input Sensor Type

| Input type | Differential Pressure (DP) | Humidity (RH) | Temperature (T) |
|---|---|---|---|
| Integral | ✓ | ✓ | ✓ |
| Analog (4-20mA/ 0-10VDC | ✓ | ✓ | ✓ |
| Remote sensor with cable | ✗ | ✓ | ✓ |
| Wireless | ✗ | ✓ | ✓ |

### Measurement Range

| | Differential Pressure (DP) | Humidity (RH) | Temperature (T) |
|---|---|---|---|
| Integral▲ | ±125 Pa, ±500Pa, ±1000Pa 0-125 Pa, 0-500Pa, 0-1000 Pa | 0-100%RH | 0 to 60℃ |
| Analog | -999 to 999 | | |
| Wireless | NA | 0-100%RH | 0 to 60℃ |

### Accuracy△

| | Differential Pressure (DP) | Humidity (RH) | Temperature (T) |
|---|---|---|---|
| Integral | ± 2% of FS (unidirectional) | ±2.5% (0 to 90% RH) ±3.5% (90 to 100% RH) | ±0.4℃ |
| Analog | 0.1% of full span + 1 count | | |
| Repeatability | ✗ | 0.25% | 0.24℃ |
| Hysteresis | ✗ | 0.8% | ✗ |

### Resolution

| | DP | RH | T |
|---|---|---|---|
| Integral | 0.1/1 (user selectable) | 1% | 0.1 ℃ |
| Analog | 1 count | 1 count | ± 0.1 ℃ |

### Response Time

| | | |
|---|---|---|
| Integral | 2 Sec | 12 Sec typically |
| Analog | <1 sec | |

### Analog Input type Features

| | |
|---|---|
| ADC Resolution | 16 Bit |
| NMRR | >40dB |
| CMRR | >120dB |
| Temp Co | <100 ppm/℃ |
| Input Impedance | >1 MΩ for Voltage i/p; 250Ω for mA i/p |
| Max Voltage | 20V DC |

## Display & Keys

| | LED Display | LCD Display |
|---|---|---|
| Process Value | 3-line (RH+T+DP), 0.56" 4-digit 7 segment Red LED | 3.5" TFT LCD, 262k color graphical with white backlight, 320 x 480 pixels, Visual area: 49.96 x 74.44 mm |
| RTC | 0.56" 4-digit 7 segment Red LED (Optional) | 3.5" TFT LCD |
| Status Indication | 9 Red LED's for Alarm, Batch and Communication | Unit symbol display through soft input |
| Keys | Menu, Increment, Decrement, Acknowledgement | Capacitive touch panel |

## Output

| | |
|---|---|
| RTC | Real time clock with battery backup |
| Buzzer | In built buzzer provided to beep during set values violated condition |
| Loop Power Supply | 24VDC (±10%) @75mA with In built Short Circuit Protection (For Analog i/p) |

## Communication

| | |
|---|---|
| Interface | RS485 (2 wire) |
| Protocol | Modbus-RTU, DNP 3.0 (Optional) |
| Baud rate | 9600, 19200, 38400 bps |
| Data Backfilling | Yes (with DNP 3.0 Protocol only) |

## Wireless (optional)*

| | |
|---|---|
| Frequency Band | ISM 2.4 GHz |
| Protocol | ZigBee (IEEE 802.15.4 standard) |
| Transmit Power | 63mW (+18 dBm) |
| Receiver Sensitivity | -101 dBm |
| Connectivity | With HT16Ew (data received from RH + T) |
| Antenna | Internal |

## Data Logging

| | |
|---|---|
| Memory | 64 Mbits |
| Record Type | Date/ Time/ Temperature/ Humidity/ Pressure/ Alarm Status |
| Total Records | Up to 400000 |
| Record Transmit Interval | User Selectable from every 1 Min to 9999 Min |

## Power Supply

| | |
|---|---|
| Voltage | 18-36V DC |
| Power Consumption | <5VA |
| Data Backup | Non-volatile memory (can be written up to 100000 times) |

**Isolation (Withstanding voltage)**
- Between primary terminals* and secondary terminals**: At least 1500V AC for 1 minute
- Between secondary terminals**: At least 500V AC for 1 minute
- Insulation resistance: 20MΩ or more at 500V DC between power terminals and grounding terminal
- * Primary terminals indicate power terminals.
- **Secondary terminals indicate I/O signal & Communication O/P.

## Physical

| | |
|---|---|
| Enclosure Dimension (in mm) | 150 x 150 x 50 (H x W x D) for LED 163 x 174 x 50 (H x W x D) for LCD Tolerance: ±2mm |
| Stainless Steel Front Plate | 165 x 165 (H x W) mm (LED) 195 x 195 (H x W) mm (LCD) |
| Weight Approx | <1 kg |
| Enclosure material | Enclosure M.S. powder Coated Body with Stainless Steel Front Flush |
| Enclosure Protection | IP20 |
| Terminal Cable Size | 1.5mm² |

## Environmental

| | |
|---|---|
| Ambient Temperature | 0 to 55℃ |
| Storage Temperature | 0 to 80℃ |
| Humidity | 20% to 95% RH (Non-Condensing) |
| Instrument Warm-up Time | Approx. 15 minutes |

## Ordering Code

| Model | No of Parameter | No of Integral Sensor | | Input Type | | | RTC display | | Power supply | | Communication Protocol | | Display Type | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | DP▲ | RH | T | | | | | | | | |
| CDU | X | X | | XXX | | | X | | X | | X | | X | |
| | 1 1 parameter | 0 None | | I00 | Integral sensor | None | None | Y | Yes | U2 | 18-36V DC | M | Modbus | LED | 7 seg LED |
| | 2 2 parameter | 1 One | | 0II | None | Integral sensor | Integral sensor | N | No | | | D | DNP 3.0 | LCD | TFT LCD |
| | 3 3 parameter | 2 Two | | III | Integral sensor | Integral sensor | Integral sensor | | | | | | | | |
| | | 3 Three | | AAA | Analog i/p | Analog i/p | Analog i/p | | | | | | | | |
| | | | | ICC | Integral sensor | Remote Sensor with Cable | Remote Sensor with Cable | | | | | | | | |
| | | | | 0CC | None | Remote Sensor with Cable# | Remote Sensor with Cable# | | | | | | | | |
| | | | | IWW | Integral sensor | Wireless i/p* | Wireless i/p* | | | | | | | | |
| | | | | 0WW | None | Wireless i/p* | Wireless i/p* | | | | | | | | |

*Available in LED version only. Works only with Masibus wireless transmitter HT16Ew
#Remote Sensor shall be supplied with 10 meters cable
▲Please provide the measurement range for Integral DP type while ordering
△Clean Air Environment

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All specifications are subject to change without notice due to continuous improvements.
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