



VIBRATION MONITOR

The VMS4SE accepts input directly from ICP type accelerometer, processes the signal and gives analog output in the form of standard current or voltage to suit different applications in power, cement and metal industries; optionally VMS4SE also accepts universal analog input to serve various application. VMS4SE comes with field interface board with buffered output on BNC connector for analysis purpose of raw signal of vibration input. The VMS4SE module operates independently and can also be connected to a data Highway for remote systems communication functions through a personal computer or a distributed control system (DCS) using RS 485 or Ethernet communication.

FEATURES:

- 4 / 8 Channel vibration input module
- Optional 8 channel universal analog input module
- 3 I/P & 2 O/P slots capacity
- Compact and rugged panel mount
- Extruded aluminum chassis with IP55 front fascia
- Field configurable for acceleration, velocity or displacement range
- Fast sampling and generation of alarm/trip
- User free mapping of relay to channels
- Comprehensive alarm/trip logic
- Alpha-numeric display for programmable tag no. / Engg unit
- RS-485 serial port (One standard and 2nd optional)
- 1x ethernet port (Optional)
- Analog output (4-20 mA) (Optional)
- Field interface buffer output module
- Modbus RTU over serial and modnet over ethernet protocols
- Windows based free *mVSCAN* configuration software
- Data logging option

INSTALLATION

Safety Precautions in Installation: -

1. Before any other connection is made, the protective earth terminal shall be connected to a protective conductor. The mains (supply voltage) wiring must be terminated within the connector in such a way that, should it slip in the cable clamp, the Earth wire would be the last wire to become disconnected. The protective conductor terminal is marked with a label on the product bearing the following Symbol:



To connect the protective conductor terminal to earth, complete these steps:

- 1) Use a spade lug to make contact with the metal surface of the VMS4SE.
- 2) Use a green and yellow wire to reliably earth the protective conductor terminal. Wire gauge must be no thinner than the current-carrying wire in the product's mains supply.

3) Resistance between the protective conductor terminal and earth must be no greater than 0.1 ohms. Use thicker gauge wire if the resistance is too high.

2. Do not use this instrument in areas under hazardous conditions such as excessive shock, vibration, dirt, moisture, corrosive gases or oil. The ambient temperature of the areas should not exceed the maximum rating specified.

3. To minimize the possibility of fire or shock hazards, do not expose this instrument to rain or excessive moisture.

NOTE:

- ✓ Be sure all personnel involved in installation, servicing, and programming are qualified and familiar with electrical equipment and their ratings.
- ✓ Do not install, store, or use it in the place with a lot of dust, corrosive and flammable gases, vibrations and shocks exceeding the allowed values, place low or high temperature outside of the installation condition, direct sunlight and near equipment generating strong radio waves or magnetic fields, It may cause accidents.

SPECIFICATION: -

1.INPUT

Accelerometer Input: -

No Of Modules	4Ch,8Ch
Type	Remote ICP piezoelectric Accelerometer
Sensitivity	100mV/g standard
Dynamic Range	80 g Peak

Measurement Parameters: -

Parameter	Range (Field Selectable)	Resolution
Acceleration	0 to 50.0g (RMS, Pk)	0.1g
Velocity	0 to 100.0mm/sec (RMS, Pk)	0.1mm/sec
Displacement	0 to 2000microns (Pk-Pk) #	1 micron #Derived peak
Sensor Excitation Current	4 mA approx.	
Scan Time	50 mSec/channel	
Frequency Range (Factory Set)	High pass: 2.5Hz,5Hz,10Hz Low pass: 1KHz,2.5KHz,10KHz- 3dB filter accuracy: ± 10%	
Accuracy	± 2% of full span (Input to display)	

2.ANALOG INPUT (OPTIONAL)

No. of AI Modules	8 Ch
Input Type	Thermocouple, RTD, voltage, current
Input Range	Refer Below Table.
Accuracy	0.1% FS
ADC Resolution	17 bit
Display Resolution	0.1 / 1.0 °C
Sampling Rate	T/C & Voltage/current: 50mSec/channel RTD: 100mSec/channel
Display Scan Rate	1 to 99 Sec (Programmable)
CJC	Auto/ manual/ external for T/C type
Sensor Open	All inputs except 0-5V, 0-10VDC
Sensor Burnout Current	0.4uA
RTD Excitation Current	250uA (Approx.)
NMRR	> 40dB

CMRR	> 120dB
Temp-Co	< 100ppm/°C
Input Impedance	> 1MΩ
Max. Voltage	20VDC
Connector Type	24 Pin rectangular connector

Table: - Display Range for Analog Input

	Input Type	Ranges
Thermocouple	E	-200 to 1000°C
	J	-200 to 1200°C
	K	-200 to 1372°C
	T	-200 to 400°C
	B	400 to 1820°C
	R	0 to 1768°C
	S	0 to 1768°C
RTD	N	-200 to 1300°C
	PT100	-199.9 to 850.0°C
	CU53	-210.0 to 210.0°C
	NI120	-70.0 to 210.0°C
Voltage/Current	0/4 to 20mA (Ext.250Ω)	-1999 to 9999
	0/1 to 5V	
	-10 to 20 mV DC	
	0 - 100 mV DC	
	0 - 10 V DC	

3. DISPLAY AND KEYS

Channel Number	2-Digit, 0.56", green seven segment LED
Measuring Parameter Value	4-Digit, 0.56", red seven segment LED
Engineering Unit	6-Digit, 0.3", orange alphanumeric LED
Status LEDs	Manual, run, fit, Tx/Rx, relay status Alarm/control status per channel
Keys	2 X 4 For configuration, operation and calibration

4.OUTPUT

Alarm/Trip Output (Optional) Relay Output (Optional)	
Relays	8 Nos. per card
Type	C- NO or C-NC (Jumper selectable)
Rating	2A @ 250VAC / 30VDC
Connector Type	25 D-Sub
Open Collector (OC) Output (Optional)	
OC Outputs	16
Type	Sinking
Rating	100mA@30VDC
Connector Type	25 D-Sub
Analog Output (Optional)	
No of Outputs	Max. upto 8 nos. per card
Output Types	0/4 to 20 mA (Isolated)
Load	500Ω Max. (For current o/p) 3000Ω Min. (For voltage o/p)
Accuracy	±0.1% Of full scale (Display to output)

5.COMMUNICATION OUTPUT

RS-485-1 (Standard) & RS-485-2 (Optional)	
Protocol	Modbus-RTU slave
Baud Rate	9600 or 19200
Connector	2 Pin, plug-in terminals
Ethernet (Optional)	
Protocol	Modbus - TCP/IP (Modnet) slave
Baud Rate	10 Mbps
Connector	RJ45

6. DATA LOGGING (OPTIONAL)

Memory	25MB (Periodic), 7MB (Event)
Logged Data Retrieval	VIA <i>mVSCAN</i> Software
Min. Periodic Log Time	1 min
No. of Records	101888 * [256 / ((2*No of Ch) + 12)]

7. POWER SUPPLY

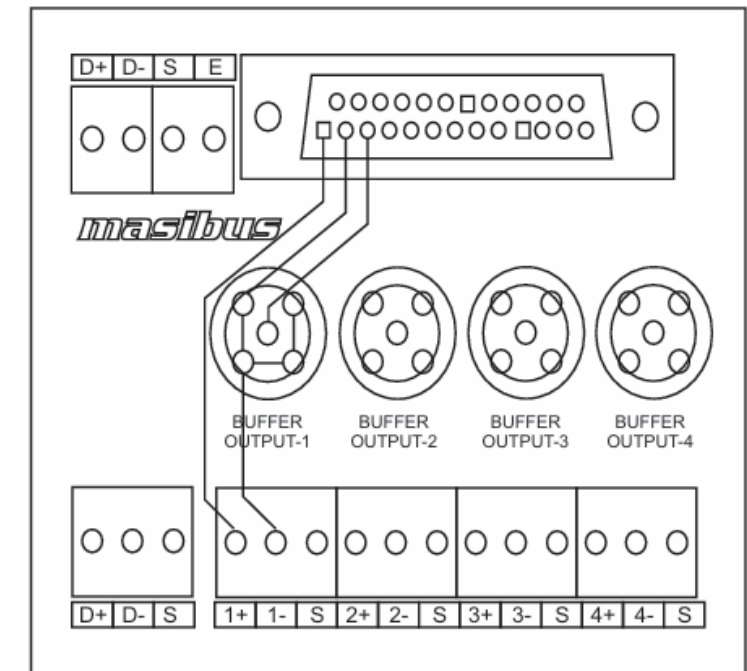
Voltage	85-265VAC, 50/60 Hz / 100-295 VDC 18 - 36VDC (Optional)
Power Consumption	16VA (Max.) [85-265V AC] 8VA (Max.) [18-36VDC]

8. ENVIRONMENTAL

Operating Temperature	-10 to 55 °C
Storage Temperature	0 to 80 °C
Humidity	20 to 95 % RH Non-condensing

9. Buffered Output (Din-Rail Mount Field Interface Module)

No. of Output Per Card	4 nos.
Output Impedance	<100 Ohms
Frequency Range	0.5Hz to 10KHz
Accuracy	0.25% of Full range



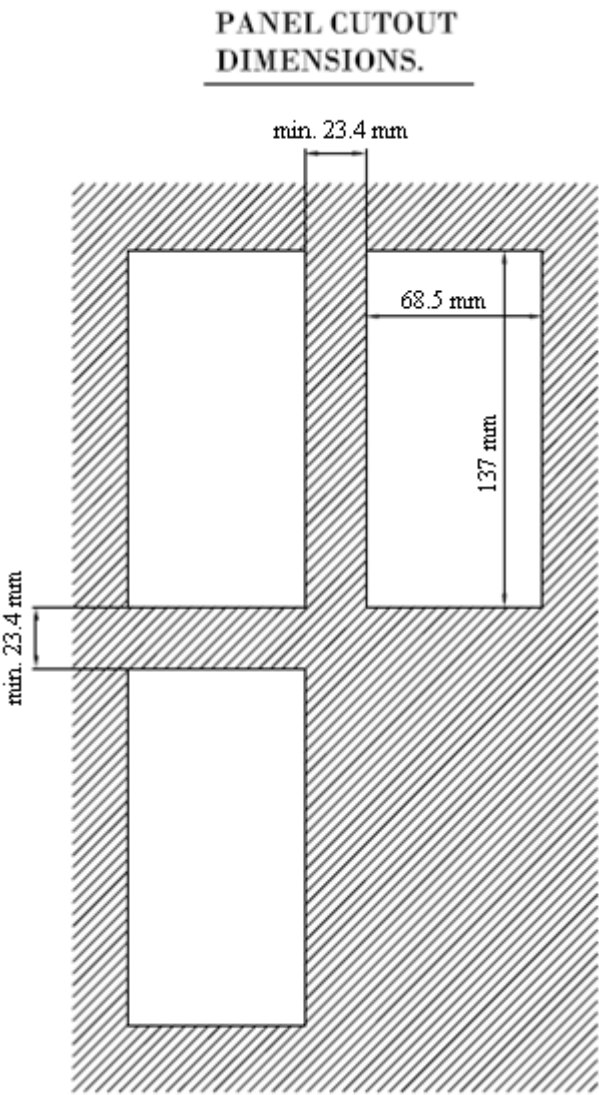
Field Interface Module (BNC Port)

10.PHYSICAL

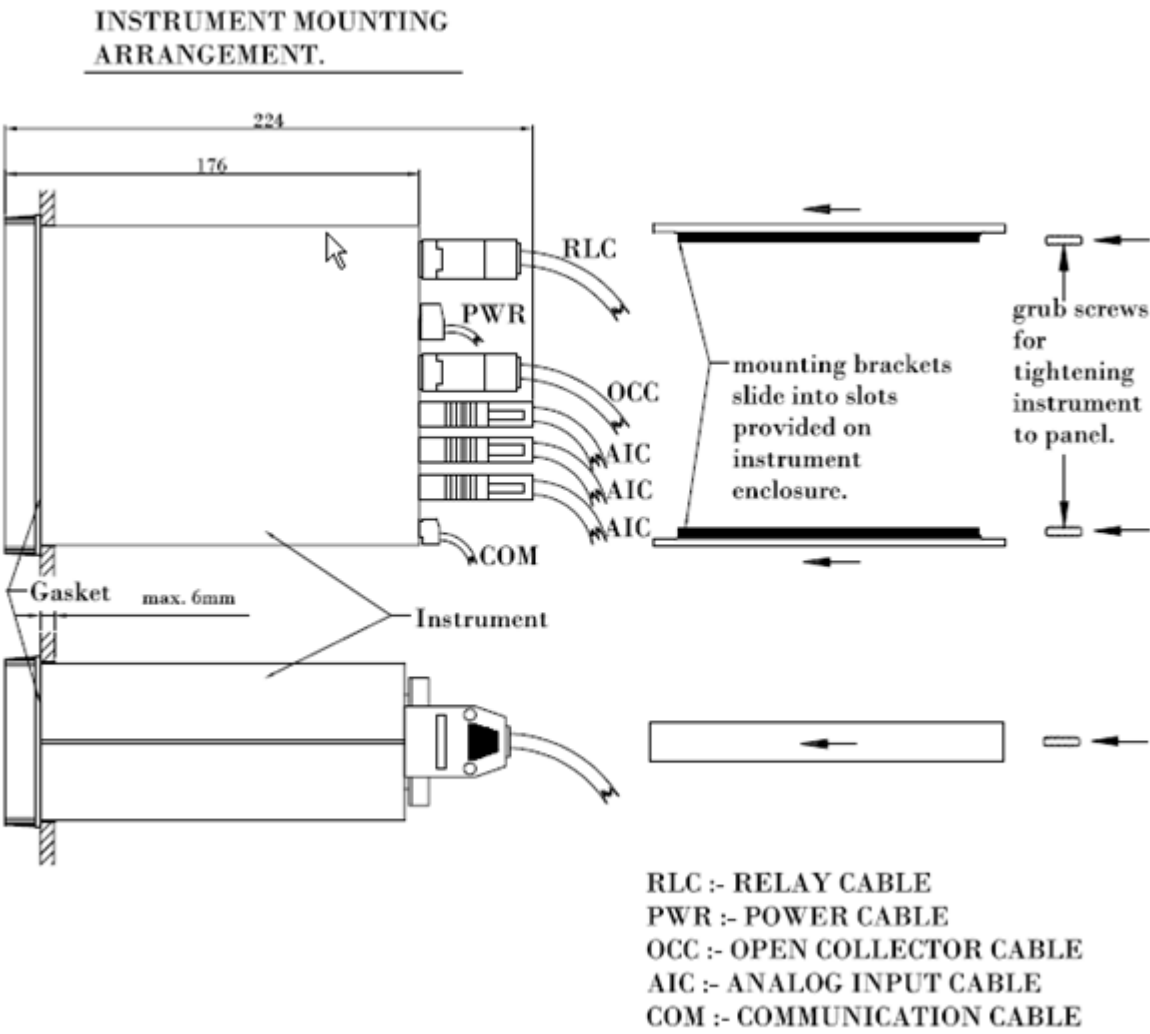
Size (in mm)	144 (H) X 72 (W) X 165 (D)
Panel Cutout (in mm)	137 (H) X 68.5 (W)
Depth Behind Panel (in mm)	155 / 203 (With cable connector)
Mounting	Panel mount (Standard)
Weight	1.25 Kg
Enclosure Material	Extruded aluminum
Protection	IP20 (Overall), IP55 (Front fascia)

MOUNTING OF VMS4SE

- Mounting Method: Panel Mounting
- External Dimensions and Panel Cut Out Dimensions:

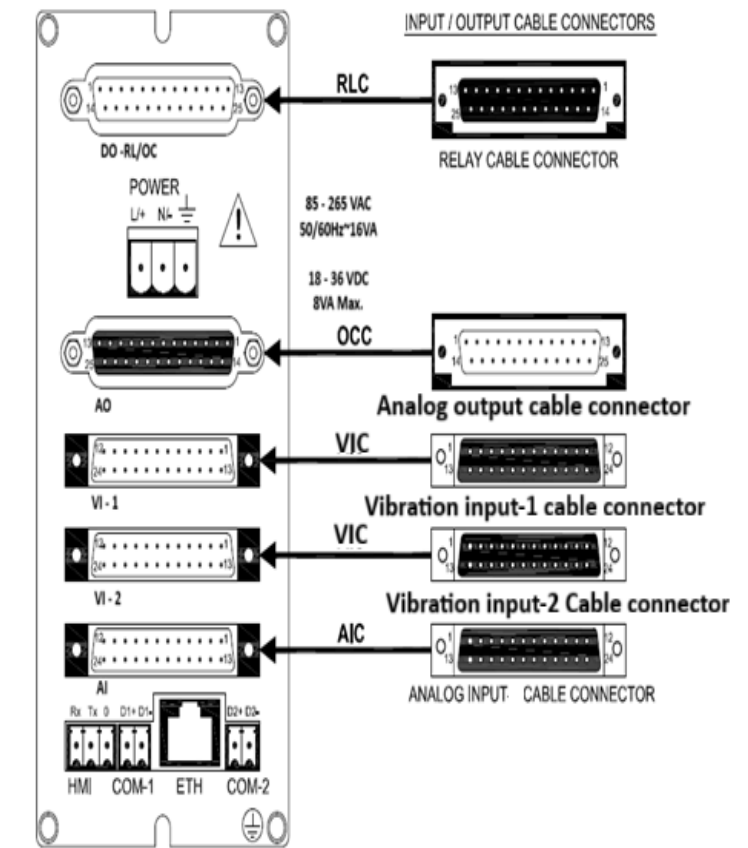


Side View and Top View



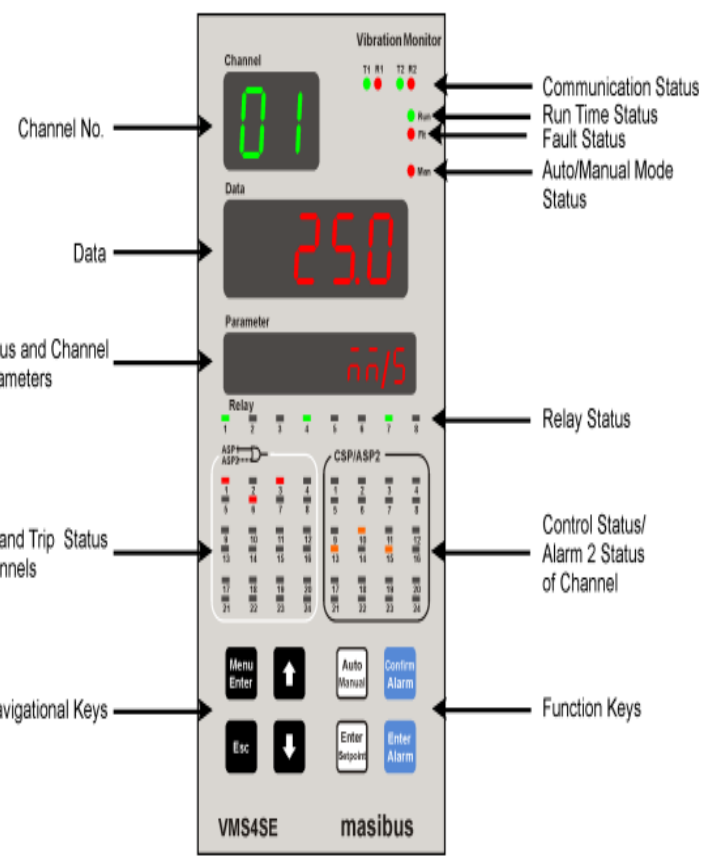
Note: -
1) AOC (Analog Output Cable) can be used in place of OCC (Open Collector Cable)
2) VIC (Vibration Input Cable) can be used in place of AIC (Analog Input Cable)

TERMINAL CONNECTION



TERMINAL	
DO – RL/OC Relay Terminals	Pre-Feb. Cable
Power Supply	Pre-Feb. Cable
VI – 1, VI - 2	Pre-Feb. Cable
AI, AO	Pre-Feb. Cable
RS-485 Communication	Wire Size: 26- 16AWG Screw Size: M2.0 Steel Ni Plated
Ethernet Communication	RJ-45 Connector

FRONT AND REAR PANEL DIAGRAM:



Name of Part	Indication on Front Panel
Channel Display	Channel
Data Display	Data
Parameter Display	Parameter
COM-1 RS485 slave indicator LED	T1 and R1
COM-2 RS485 master indicator LED	T2 and R2
Run indicator LED	Run
Auto/Manual Mode LED	MAN
Relay indicator LED	Relay
Control / Alarm-2 indicator LED	CSP/ASP2
Alarm-1+Alarm-2 indicator LED	ASP1+ASP2

KEY FUNCTION DESCRIPTION

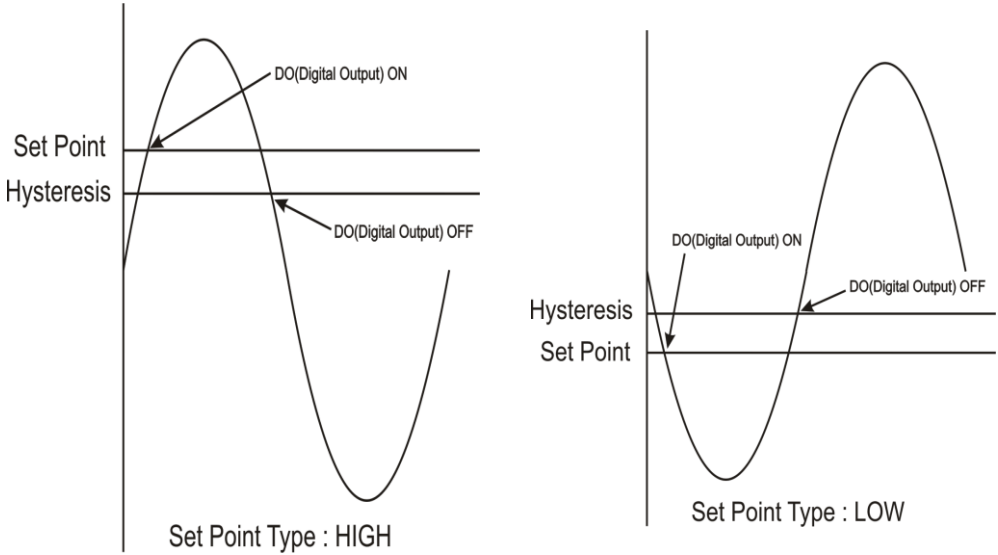
Keys	Operation
MENU/ENTER KEY 	It allows Mode Selection when pressed during Run mode, while it allows saving value of a parameter inside a mode. When inside any mode, it allows to enter in sub-mode.
ESCAPE KEY 	It is used to come out from mode/Sub-mode. It is also used to escape from edit mode without saving the respective parameter.
INCREMENT KEY 	It is used in increment of value in run mode and other modes

DECREMENT KEY 	It is used in decrementing value when run mode and other modes. It is also used for shifting a digit while editing numeric value.(When user wants to edit numeric value, Decrement key will work as shift key)
AUTO/MANUAL KEY 	It allows user to toggle between Auto Channel Display mode – Manual Channel Display Mode.
ACKNOWLEDGE MENT KEY 	Acknowledge the Alarm During RUN Mode.
ALARM SETPOINT KEY 	Enter into Set Alarm1 and Alarm2 mode during RUN Mode
CONTROL OUTPUT SETPOINT KEY 	When pressed in run mode it will allow the user to enter into Control Set point Mode

Control Output Operation

Control O/P is the simplest form of temperature control. The output from the device is either on or off, with no middle state. For heating control, the o/p is on when the temperature is below the set point, and off above set point. Since the temp. crosses the set point to change the o/p stage, the process temp. will be cycling continually, going from above set point to below, and back above. In cases where this cycling occurs rapidly, and to prevent contactors and valves from getting damaged, on-off differential, or Hysteresis is added to the control operations. This Hysteresis assures, if temp. goes below set point by a certain amount before then only o/p will turn off or on again. On-Off Hysteresis prevents the o/p from chattering or making fast, continual switches if the cycling above and below the set point occurs very rapidly. Once Process value reaches down to set point-Hysteresis value relay will be energized and it will be on until process value goes up towards Set point.

Basic Do (Digital Output) Function



Watchdog Timer (WDT) / Watchdog Output Operation

The WDT, when enabled, operates from the internal Low-Power RC (LPRC) Oscillator clk source. The WDT can be used to detect system software malfunctions by resetting the device if the WDT is not cleared periodically in software. If malfunctioning of device persist even after watchdog reset device will go into shutdown mode followed by error messages on display as per Error! Reference source not found.. Device Fault can be monitored by a failsafe relay o/p which is mapped for watchdog o/p. When WDT is disable device will continue to work with fault. The Fault LED will be on in this condition.

Error Messages	Fault
Error 1	CPU card EEPROM failure
Error 2	SC 1 card ADC failure
Error 3	SC 1 card EEPROM failure
Error 4	SC 2 card ADC failure
Error 5	SC 2 card EEPROM failure
Error 6	SC 3 card ADC failure
Error 7	SC 3 card EEPROM failure
Error 8	CPU card Controller Hang – failure
Error 9	Communication between CPU and Display card Failure

AIRAM OUTPUT

Every single channel can have maximum 3 set points. 2 for Alarm outputs(1 for Alarm 1 Set Point and 1 for Alarm 2 Set Point) and 1 for Control Set Point, totaling 48 alarm outputs and 24 control outputs for 24 number of channels. Control Outputs are Optional.

- 8 Relays and/or 24 Open Collectors can be used as DO. All Digital Outputs are Optional.

For operation manual please visit www.masibus.com
Specifications are subject to change without notice due to Continuous improvements.
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