



## MINT Intelligent I/Os & Communication Processor

DI-16 16-Channel Digital Input Module

DO-16 16-Channel Digital Output Module

AI-08 8-Channel Analog Input Module

AO-08 8-Channel Analog Output Module

MINT CP - Communication Processor

MINT IO Pair



Masibus' MINT I/O series is the most cost effective field interface module for smart systems whether it is DAS, SCADA, PLC or DCS. The MINT I/Os are available in universal 8 channel analog Input, 8 channel analog output, 16 channel digital input and 16 channel digital output.

Using MINT I/Os supervisory system one can read remote process values and events as well as communicate for process control. These I/Os consist of powerful processors suited for high-speed communication and enhanced hardware features.

The MINT I/O family has Modbus RTU & Ethernet-Modnet port that integrates with same type of existing network in plant.

MINT DI module has unique filter time selection feature for input noise cancellation and debounce time feature to prevent extra events from a single contact closure. MINT DI can also store counter input of frequency up to 1KHz.

MINT CP is a communication processor which connects MINT I/Os and any make of serial Modbus-RTU devices to a Modnet Ethernet network.

**mINT PLUS** configuration software configures all communicating parameters in MINT series.

The MINT series is best suited for processes that require reliable and efficient control with high speed connectivity for system monitoring and information exchange up to the corporate network.

### Features

#### MINT I/O

- 2 Modbus serial ports RS-485
- 1 RS-485 + 1 Modbus over TCP/IP port - Modnet (Optional)
- 2 masters can be connected at a time in MINT with 2 RS-485 port option
- Compact DIN-Rail enclosure
- High-speed communication
- Supports up to 15 clients on TCP/IP
- LEDs for fault, communication and power

#### MINT CP

- No. of Modbus serial slave devices supports on RS-485 - 15 max.
- Modbus over Ethernet (Modnet) - 10/100Mbps- auto-detecting
- Serial RS-485 (Protocol supported: Modbus RTU master)

#### Free **mINT PLUS** Configuration Software

- Configuration and diagnostics
- Online excel sheet logging

### Applications

- Pulse totalizing - Utility accounting
- Cost effective field interface to PLC/DCS
- Remote I/Os for monitoring and control
- SCADA
- Security systems
- Solar string monitoring
- Building automation
- Gas detection systems
- Pipeline monitoring
- Environmental monitoring
- Infrastructure monitoring
- Asset management

# TECHNICAL SPECIFICATIONS: MINT I/O RS485 - ETHERNET

AI-08 Module				DO-16 Module	
<b>Input Specifications</b>				<b>Output Specifications</b>	
No. of Channels		8		Output Type	Open collector (External 24V DC required) (Source or sink - factory set)
Input Types	Thermocouple	E	-200 °C to 1000 °C	Default/Pre-defined Value	ON/ OFF
		J	-200 °C to 1200 °C	Pulse Width	10msec.
		K	-200 °C to 1350 °C	Maximum Current	100mA per output (Total current for output No.1 to 8 <500mA ) (Total current for output No.9 to 16 <500mA )
		T	-200 °C to 400 °C	Vce ON	1.1V max.
		B	450 °C to 1800 °C	<b>Status Indication</b>	
		R	0 °C to 1750 °C	LEDs	Power, module status, communication, channel status
		S	0 °C to 1750 °C	<b>Configuration Software</b>	
	RTD	Pt100 (3 wire)	-200 °C to 850 °C	mINT PLUS Software	Configuration and diagnostics Online excel sheet logging Logging time selectable : 1 to 65535 msec.
		Cu-53	-210 °C to 210 °C	<b>Communication</b>	
		NI-120	-80 °C to 210 °C	<b>RS-485 Serial Port</b>	
	Resistor Input	Upto 2kΩ	0-2000	Protocol	Modbus-RTU slave
	Current	0/4 -20mA (Ext. 50Ω resistor)	-2000 to +20000	No. of Port	2 (1 optional)
			0 to +10V	-2000 to +20000	Communication Speed (Baud Rate)
		Voltage	0 to +100mV	-2000 to +20000	Parity
-10mV to +50mV			-2000 to +20000	Data Bits	8
0 to +250mV			-2000 to +20000	Stop Bit	1, 2
0 to +5V	-2000 to +20000	Default Settings	9600, 8 data bits, 1 stop bit, no parity		
Accuracy	0.1% of FS		Connector	Plug-in screw terminals, 1.5mm <sup>2</sup> cable size	
Scan Rate	T/C & voltage/current: 50mSec./channel RTD: 100mSec./channel		Recommended Cable	Shielded, twisted pair, size: 0.14mm <sup>2</sup>	
ADC Resolution	16 bit		<b>Ethernet Port (Optional)</b>		
NMRR	>60dB		Protocol	Modbus TCP/IP (Modnet)	
CMRR	>120dB		No. of Port	1	
Temp-Co	100 ppm/°C		Speed	10/100 Mbps (auto-detecting)	
CJC Error	±2°C (0 to 55°C)		Maximum No. of Read Registers	1024	
Input Impedance	V, mV, TC >1 MΩ		Maximum No. of Write Registers	1024	
Sensor Burnout Current	0.5µA		Connector	RJ45 (auto-crossover)	
RTD Excitation Current	250µA		No. of Clients Supported	Up to 15	
Max Voltage	20V DC		<b>Power Supply</b>		
Range Scaling	Current/voltage inputs only		Power Supply	18 - 32VDC ±10%	
<b>DI-16 Module</b>				Power Consumption	For I/O with only RS-485 < 3W For I/O with ethernet < 5W
<b>Input Specifications</b>				<b>Isolation</b>	
No of Channels	16			Supply to field: 1500VAC RMS	
Counter Frequency	1 KHz max.			Supply to RS-485: 1500VAC RMS	
Counter Resolution	32 bit			Supply to ethernet: 1000VAC RMS	
Counter Mode	Up/Down			<b>Physical</b>	
Pulse Width	500µSec.			Dimensions (in mm)	
Filter Time (ms)	0 to 65535 msec.			101(H) x 22.5(W) x 120(D) for I/O with only RS-485	
De-bounce Time (ms)	0 to 65535 msec.			101(H) x 48.5(W) x 120(D) for I/O with Ethernet	
Chatter Filter Time	0 to 65535 msec.			Mounting	DIN-Rail (35 mm)
Chatter Filter Counts	1 to 250 events			Weight	160 gms approx. – For I/O with only RS-485 250 gms approx. – For I/O with Ethernet
Input Impedance	2200 Ω			Enclosure Material	Molded ABS
<b>AO-08 Module</b>				Color	Black
<b>Output Specifications</b>				<b>Environmental</b>	
No. of Channels	8			Operating Temperature	0 to 55 °C
Output Types	Current	0-20mA/ 4-20mA @ 750 Ω max. (external 24V DC required)		Storage Temperature	-10 to 70 °C
	Voltage	0.05 -10/ 2-10 VDC @ 2KΩ min. (external 24V DC required)		Humidity	30 to 95 %RH non-condensing
DAC Resolution	16 bit				
Accuracy	0.05% of FS				
Temp-Co	100 ppm/°C				

# MINT CP MODULE

Performance		Ethernet Port	
Processor	32-bit CPU ARM core	Protocol	Modbus TCP/IP (Modnet)
Maximum No. of Read Registers	1024	No. of Port	1
Maximum No. of Write Registers	1024	Speed	10/100 Mbps (auto-detecting)
Maximum No. of Modbus Commands Supported	100	Connector	RJ45 (auto-crossover)
No. of Slave Devices Supported per Serial Port	No. of Modbus devices supports on serial port - 15	Power Supply	
No. of Clients Supported on TCP/IP	Up to 15	Logic Supply Voltage	18 - 32V DC
Configuration Software		Logic Supply Current	100mA max. @ 24VDC
mINT PLUS Software	Configuration and diagnostics	Power Consumption	< 2.5W
Communication		Isolation	Supply to RS-485: 1500V AC RMS Supply to Ethernet: 1000V AC RMS
RS-485 Serial Port		Physical	
Protocol	Modbus-RTU slave	Enclosure Material	ABS plastic
No. of Port	2	Mounting	DIN-Rail (35 mm)
Communication Speed (Baud Rate)	9600, 19200, 38400, 57600, 115200 bps	Dimension (H x W x D)	101 mm x 22.5 mm x 120 mm
Parity	ODD, EVEN, NONE	Color	Black
Data Bits	8	Weight	160 g
Stop Bit	1, 2	Environmental	
Default Settings	9600, 8 data bits, 1 stop bit, no. parity	Operating Temperature	0 °C to 55 °C
Connector	Plug-in screw terminals, 1.5mm <sup>2</sup> cable size	Storage Temperature	-10 °C to 70 °C
Recommended Cable	Shielded, twisted pair, size: 0.14mm <sup>2</sup>	Humidity	30 to 95% RH non-condensing

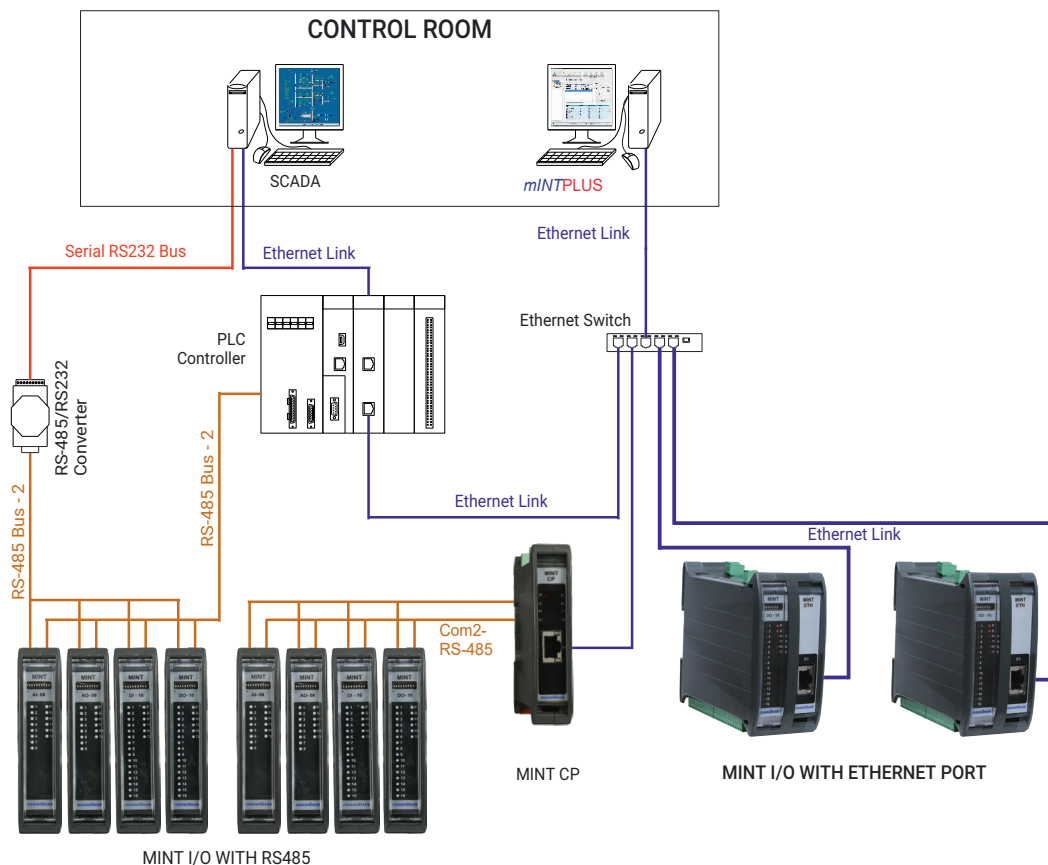
## Ordering Code

Model	MINT	I/O Type		AI Channel Type		MINT I/O DO Type		AO Type		Communication		
		XX		X		X		X		Port 1	Port 2	
		AI	8 channel analog input	N	None	N	None	N	None	SS	RS-485	RS-485
		DI	16 channel digital input	0	8 Channel universal	0	Sink type	I	Current O/P	SE	RS-485	Ethernet
		AO	8 channel analog output	1	4 Channel Fix*	1	Source type	V	Voltage O/P	S0	RS-485	NA
		DO	16 channel digital output	2	8 Channel Fix*							

Note: \*Fix - Current & Voltage

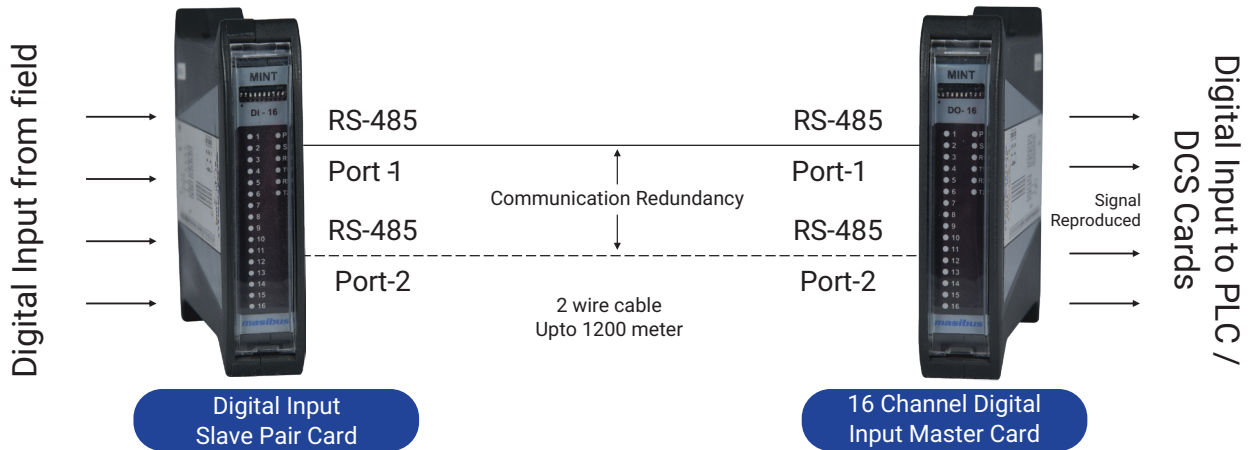
Model
MINT CP

## Application

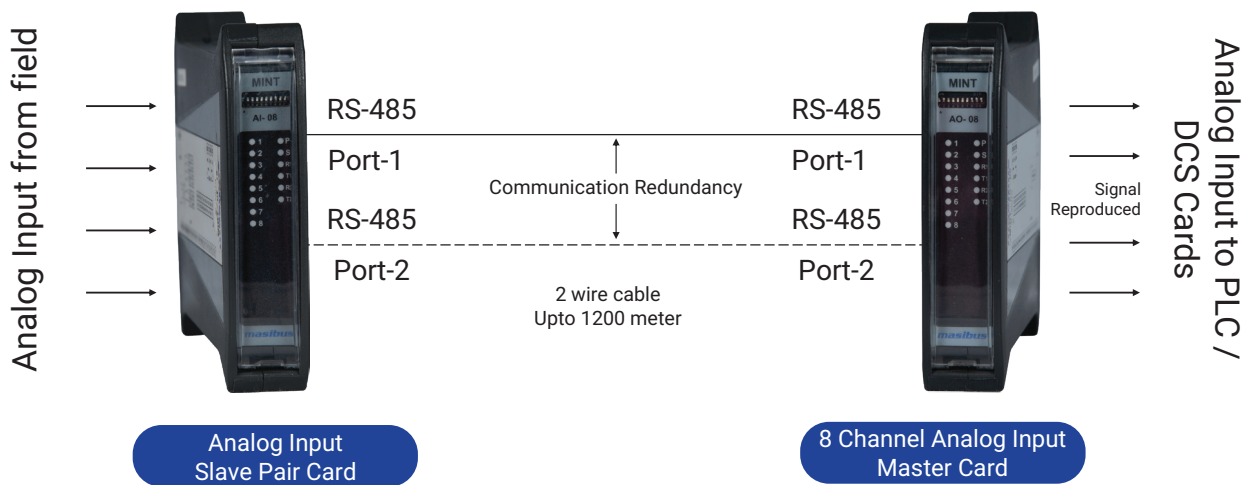


- Reproduces your Analog/Digital inputs from remote end to central PLC/DCS end upto 1200 meters apart
- MINT pair solution cost will be 1/4 of the without pair solution
- RS-485 MINT IO has two separate serial ports provides redundancy
- Plug n play solution works with existing infrastructure on RS-485 link to save the field wiring cost

### I/O Pair for Digital Input



### I/O Pair for Analog Input



### Ordering Code

#### MINT - Analog Input / Output - Master/Slave (RS-485)

Model	AO Type	
MINT AI/AO-MS	X	
	I	Current O/P
	V	Voltage O/P

#### MINT - Digital Input / Output - Master/Slave (RS-485)

Model	DO Type	
MINT DI/DO-MS	X	
	0	Sink Type
	1	Source Type