



## 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 Master/ Slave Pair
- MINT CP - Communication Processor

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, Profibus-DP & 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.

The MINT I/O Family has unique RS485 (Modbus) based Analog-I/O & Digital-I/O Master/Slave pair modules to reduce field wiring cost.

MINT CP is a Communication Processor which connects MINT I/Os and any make of Serial Modbus-RTU Devices to a Modnet Ethernet Network.

**mINTPLUS** 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 RS485
- 1 RS485 + 1 Profibus DPV0 Slave Port (optional)
- 1 RS485 + 1 Modbus over TCP/IP Port - Modnet (optional)
- 2 Masters can be connected at a time in MINT with 2 RS485 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

- Number of MINT-I/Os per Serial port: 15 maximum
- Modbus TCP/IP(Modnet) - 10/100Mbps- auto-detecting
- Serial RS485 Communication
- Number of Serial Master ports: 2 - Only one active at a time (Selection through Modnet Register)
- Protocol supported: Modbus RTU master

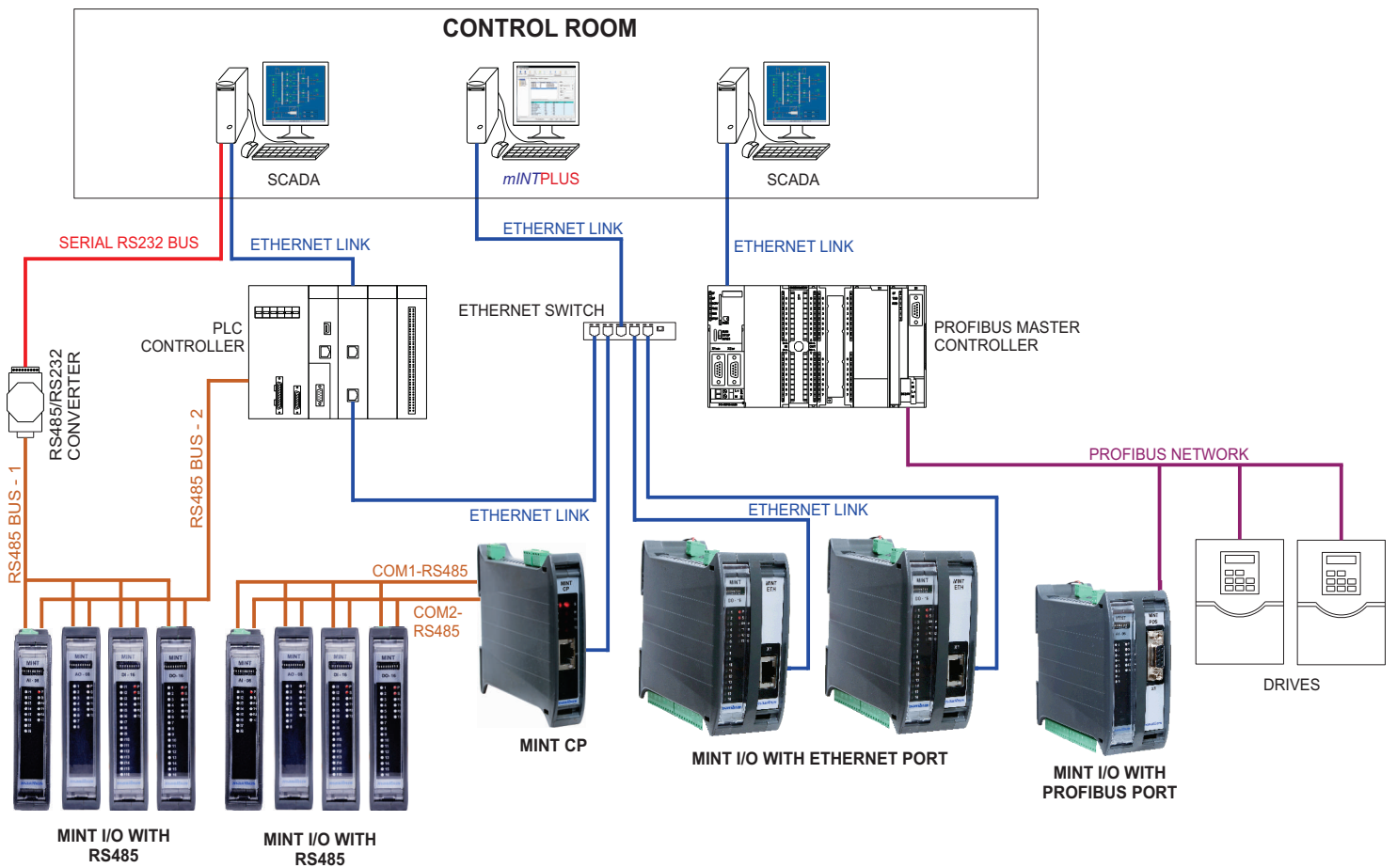
#### Free **mINTPLUS** Configuration Software

- 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
- Master-Slave pair for Signal Simulation and Field Cable Reductions

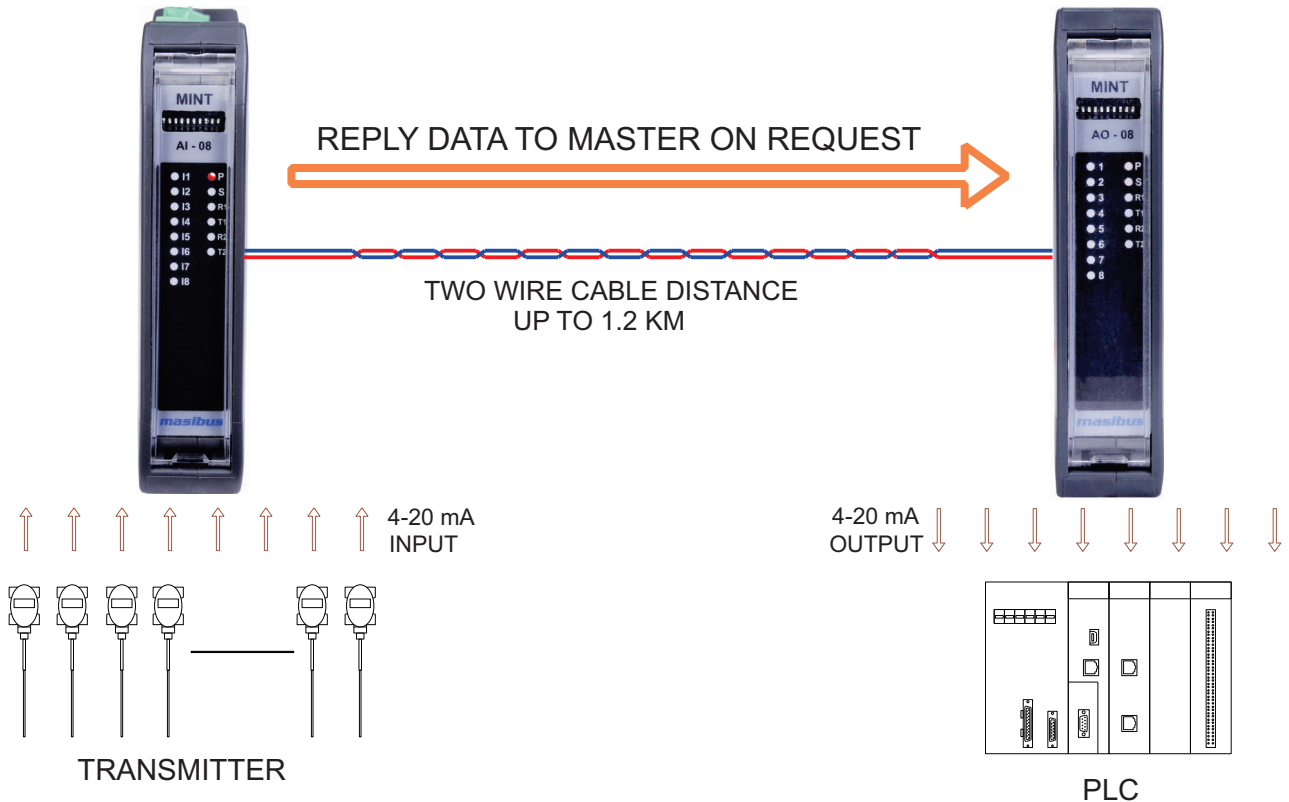
# APPLICATION



## MINT RS485 MASTER-SLAVE PAIR CONFIGURATION

### MINT AI SLAVE

### MINT AO MASTER



# TECHNICAL SPECIFICATIONS: MINT I/O RS485 - ETHERNET - PROFIBUS

AI-08 Module			Status Indication	
<b>Input Specifications</b>			LEDs	
No of Channels	8		Power, Module Status, Communication, Channel Status	
Input Types	Thermocouple	E	-200 °C to 1000 °C	
		J	-200 °C to 1200 °C	
		K	-200 °C to 1350 °C	
		T	-200 °C to 400 °C	
		B	450 °C to 1800 °C	
		R	0 °C to 1750 °C	
		S	0 °C to 1750 °C	
	RTD	N	-200 °C to 1300 °C	
		Pt100 (3 wire)	-200 °C to 850 °C	
		Cu-53	-210 °C to 210 °C	
	Resistor Input	NI-120	-80 °C to 210 °C	
	Current	Upto 2kΩ		0-2000
		0/4 -20mA (Ext. 50Ω resistor)	-2000 to +20000	
	Voltage	0 to +10V		-2000 to +20000
0 to +100mV		-2000 to +20000		
-10mV to +50mV		-2000 to +20000		
0 to +250mV		-2000 to +20000		
Accuracy	0 to +1V		-2000 to +20000	
Scan Rate	T/C & Voltage/Current: 50mSec/Channel RTD: 100mSec/Channel			
ADC Resolution	16 bit			
NMRR	>60dB			
CMRR	>120dB			
Temp-Co	100 ppm/°C			
CJC Error	±2°C (0 to 55°C)			
Input Impedance	V, mV, TC >1 MΩ			
Sensor Burnout Current	0.5µA			
RTD Excitation Current	250µA			
Max Voltage	20V DC			
<b>DI-16 Module</b>				
<b>Input Specifications</b>				
No of Channels	16			
Counter Frequency	1 KHz max			
Counter Resolution	32 bit			
Counter Mode	Up/Down			
Pulse width	500µSec			
Filter time (ms)	0 to 65535 mSec			
De-bounce Time (ms)	0 to 65535 mSec			
Chatter Filter Time	0 to 65535 mSec			
Chatter Filter Counts	1 to 250 events			
Input Impedance	2200 Ω			
<b>AO-08 Module</b>				
<b>Output Specifications</b>				
No of Channels	8			
Output Types	Current	0-20mA/ 4-20mA @ 750Ω max. (external 24V DC required)		
	Voltage	0-10/ 2-10 VDC @ 2KΩ min. (external 24V DC required)		
DAC Resolution	16 bit			
Accuracy	0.05% of FS			
Temp-Co	100 ppm/°C			
<b>DO-16 Module</b>				
<b>Output Specifications</b>				
Output type	Open collector (external 24V DC required) (Source or Sink - factory set)			
Default/Pre-defined Value	ON/ OFF			
Pulse Width	10mSec			
Maximum Current	100mA per Output (total current for output No.1 to 8 <500mA ) (total current for output No.9 to 16 <500mA )			
Vce ON	1.1V max			
			<b>Configuration Software</b>	
			mINT PLUS software	
			Configuration and Diagnostics Online Excel Sheet logging Logging Time selectable : 1 to 65535 mSec	
			<b>Communication</b>	
			<b>RS485 Serial Port</b>	
			Protocol	
			Modbus-RTU Slave	
			No of port	
			2 (1 optional)	
			Communication Speed (Baud Rate)	
			9600, 19200, 38400, 57600,115200 bps	
			Parity	
			ODD, EVEN ,NONE	
			Data bits	
			8	
			Stop bit	
			1, 2	
			Default Settings	
			9600, 8 Data bits, 1 Stop bit, No Parity	
			Connector	
			Plug-in screw terminals, 1.5mm <sup>2</sup> Cable Size	
			Recommended Cable	
			Shielded, Twisted Pair, Size: 0.14mm <sup>2</sup>	
			<b>Ethernet Port (Optional)</b>	
			Protocol	
			Modbus TCP/IP(Modnet)	
			No of port	
			1	
			Speed	
			10/100 Mbps (auto-detecting)	
			Maximum No. of Read Bytes	
			1024	
			Maximum No. of Write Bytes	
			1024	
			Connector	
			RJ45 (auto-crossover)	
			No. of Clients supported	
			Up to 15	
			<b>Profibus Port (Optional)</b>	
			Protocol	
			Profibus DP V0 Slave	
			No of port	
			1	
			Maximum No. of Read Bytes	
			244 (Cyclic Data - as per the GSD)	
			Maximum No. of Write Bytes	
			244 (Cyclic Data - as per the GSD)	
			Baud Rate	
			1200 to 12 Mbps Auto Detecting	
			Connector	
			9 pin D-type Female	
			<b>Power Supply</b>	
			Power Supply	
			18 - 36VDC ±10%	
			Power Consumption	
			For I/O with only RS485 < 3W For I/O with Ethernet/Profibus < 5W	
			<b>Isolation</b>	
			Supply to Field: 1500VAC RMS	
			Supply to RS485: 1500VAC RMS	
			Supply to Profibus: 1500VAC RMS	
			Supply to Ethernet: 1000VAC RMS	
			<b>Physical</b>	
			Dimensions (in mm)	
			101(H) x 22.5(W) x 120(D) for I/O with only RS485	
			Mounting	
			101(H) x 48.5(W) x 120(D) for I/O with Ethernet/Profibus	
			DIN Rail (35 mm)	
			Weight	
			160 gms approx. - For I/O with only RS485 250 gms approx. - For I/O with Ethernet or Profibus	
			Enclosure Material	
			Molded ABS	
			Color	
			Black	
			<b>Environmental</b>	
			Operating Temperature	
			0 to 55 °C	
			Storage Temperature	
			-10 to 70 °C	
			Humidity	
			30 to 95 %RH non-condensing	

## MINT RS485 MASTER-SLAVE PAIR CONFIGURATION

**MINT AO as Modbus Master – MINT AI as Modbus Slave**

**MINT DO as Modbus Master – MINT AI as Modbus Slave**

Default Switch (No.8 at the Front) For MINT Configuration through mINTPLUS Software

2 Serial RS485 Modbus Master ports on Master Module, Only one active at a time

2 Serial RS485 Modbus Slave ports on Slave Module, Only one active at a time

Auto Switch over to Second Port at the time of first Port Fail in Communication

# 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 MINT-I/O supported per serial port	Up to 15	Power Supply	
No. of Clients supported on TCP/IP	Up to 15	Logic Supply Voltage	18 - 32V DC
<b>Configuration Software</b>		Logic Supply Current	100mA max @ 24VDC
mINT PLUS software	Configuration and Diagnostics	Power Consumption	< 2.5W
Communication		Isolation	Supply to RS485: 1500V AC RMS Supply to Ethernet: 1000V AC RMS
<b>RS485 Serial Port</b>		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	I/O Type		AI Channel Type		MINT I/O			AO Type		Communication	
	XX		X		X		X			Port 1	Port 2
MINT	AI - 8	8 channel Analog Input	N	None	N	None	N	None	SS	RS485	RS485
	DI - 16	16 channel Digital Input	0	Non Isolated	0	Sink Type	I	Current o/p	SE	RS485	Ethernet
	AO - 8	8 channel Analog Output			1	Source Type	V	Voltage o/p	SP	RS485	Profibus
	DO-16	16 channel Digital Output									

### MINT - Analog Input / Output - Master/Slave (RS485)

Model	AO Type
MINT AI/AO-MS	X
	I Current o/p
	V Voltage o/p

### MINT - Digital Input / Output - Master/Slave (RS485)

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

Model
MINT CP