



# MSC

## MASIBUS SMART CONVERTER

**MSC-PS-MS** : Profibus DP Slave to Modbus RTU Master

**MSC-ME-MS** : Modbus Serial to Modbus Ethernet Data Concentrator/gateway

**MSC-ME-ZB** : Modbus ZigBee to Modbus Ethernet

**MSC-ZB-RS** : ZigBee Wireless to RS-485 Serial (ZigBee Adapter)

**MSC-RE-RS** : Modbus Serial to Modbus TCP/IP Protocol Converter

**MSC-RS-RS** : Isolated RS-485 to RS-485 Repeater



The Masibus Smart Converter series addresses a market segment that sets the focus on cost savings & space saving compact design. The economic design combined with its master-slave conversions makes MSC an attractive gateway/converters in terms of price, universality and flexibility.

This MSC family converts two industrial protocols simply and efficiently into each other. Be it a simple serial RS-485 bus, Ethernet, classic Profibus or Wireless-ZigBee, MSC provides a common platform for a transparent conversion of automation protocols. It smoothly integrates into the existing field networks in plant with both wired and wireless network standards.

MSC is configured and diagnosed by a dedicated configuration tool (MSC Studio).

MSC Converter design combines the two network interfaces on a DIN-Rail & Wall mount housing. LED indicators reveal the status information for power & bus communication. The protocol conversions are pre-programmed and loaded as dedicated firmware into the device.

Masibus ZigBee Adapter delivers wireless connectivity to electronic devices through advanced mesh network. It provides wireless connectivity to replacing existing wired RS-485 network of the sensors, controllers and other serial devices. It works both as a router and a co-ordinator/aggregator/master.

### Features

#### MSC-RE-RS

- Supports max. upto 247 Modbus RTU slave IDs.
- No. of RS-485 ports (Modbus RTU master): 1 No.
- Modbus TCP/IP (ModNet) - 10/100Mbps- Auto detecting
- No. of client supports on Modbus TCP/IP (ModNet) - Up to 15 No.
- Not required any Modbus query Mapping/Configuration

#### MSC-RS-RS

- RS-485 half duplex communication
- Auto baud rate detection
- Signal boost up to 1200m (Depends upon baud rate)
- Maximum 31 RS-485 nodes per repeater
- 120  $\Omega$  termination resistor selection
- Isolation 1500VAC RMS

### Features

#### MSC-PS-MS

- Integrates multiple Modbus RTU slaves into Single Profibus Network
- Fast cyclic data communication between master and slave
- Supports up to 100 commands or 512 read & write registers on Modbus
- Diagnostic and configuration via RS232
- Maximum of 244 bytes cyclic input and output data on Profibus DP Slave

#### MSC-ME-MS

- Supports max. upto 64 Modbus RTU Slave devices on RS-485
- No. of RS-485 Ports (Modbus RTU Master): 2 (Only one active at a time)
- Modbus TCP/IP (ModNet) - 10/100Mbps- auto-detecting
- No. of client supports on Modbus TCP/IP (ModNet) - up to 15
- Supports upto 192 commands or 2048 read/1024 write registers on Modbus

#### MSC-ME-ZB

- Supports upto 64 Modbus RTU slave devices on RS-485 & ZigBee
- Number of master ports (Modbus RTU): 1 RS-485 (Wired) & 1 ZigBee (Wireless) - Only one active at a time
- ZigBee topology: Point-point/point-multipoint/mesh
- Modbus TCP/IP (ModNet) - 10/100Mbps- auto-detecting
- No. of client supports on Modbus TCP/IP (ModNet) - up to 15
- Supports up to 192 commands or 2048 Read/1024 write registers on Modbus

#### MSC-ZB-RS

- Number of ports: 1 RS-485 (Wired) & 1 ZigBee (Wireless)
- ZigBee popology: Point-point/point-multipoint/mesh
- Router/Co-ordinator/aggregator/master/slave configuration through MSC studio
- MSC-ZB-RS (Router/Slave) can connect to MSC-ME-ZB or MSC-ZB-RS (Co-ordinator/Master)
- Wireless range extension possible through router

### Applications

- Data sharing between PLC, DCS, controllers, inverters and other network devices
- Operator interfaces
- Industrial / factory / process/building automation
- Intelligent field sensors and actuators communication
- Solar string / environmental monitoring

# TECHNICAL SPECIFICATIONS FOR MSC-PS-MS

General		Indication	
Communication controller Type	ARM 926EJ-S / 200 MHz / MMU	Status LEDs	2 LEDs, (System status + communication status) & power status
Configuration Port	RS-232 for diagnostic and configuration	Power Supply and Isolation	
Master Communication	RS-485 (Optically isolated) Modbus RTU	Power Supply	24V DC $\pm 10\%$ @ 130 mA current (200mA Max.)
Configuration Software	mPC Tool (Supports windows OS)	Power Consumption	3 Watt (Max.)
PROFIBUS DP Slave Value		Isolation (Between Supply and Communication Ports)	1000VAC RMS
I/O	Maximum of 244 bytes cyclic input and 244 bytes output data	Physical	
Transmission Rate	9.6 to 12 Mbps	Mounting	DIN-Rail (35mm) EN 60715
Connector	D-Sub female connector, 9 PIN	Enclosure Material	ABS
Functions	DP V0 (Cyclic communication)	Dimension (in mm)	75 (H) X 22.5 (W) X 110 (D)
Data Transport Layer	DP V0 (Cyclic communication)	Color	Light grey
		Weight	150 g
Modbus RTU Master Value		Environmental	
I/O	Max. No. of I/O data 512 read/512 write registers or 100 commands	Operating Temperature	0 to 55 °C
		Storage Temperature	-10 to 70 °C
		Humidity	30 to 95 % Non-condensing
Function Codes	01 - Read coil status 02 - Read input status 03 - Read holding register 04 - Read input register 05 - Force single coil 06 - Preset single register 15 - Force multiple coils 16 - Preset multiple register	Accessories	
Serial Communication Parameters	Data bits - 8 bits Stop bits - 1, 2 Parity bits - None, even, odd	Configuration and diagnosis RS-232 Cable (1 meter)	
Maximum Units	31 unit per host (Node number: 1 to 126)	(Note: Latest Software can be downloaded from our website)	
Ordering Code			
	<b>Model</b>		
	MSC	XX	XX
		PS	Profibus DP MS Modbus RTU

## TECHNICAL SPECIFICATIONS FOR MSC-RE-RS

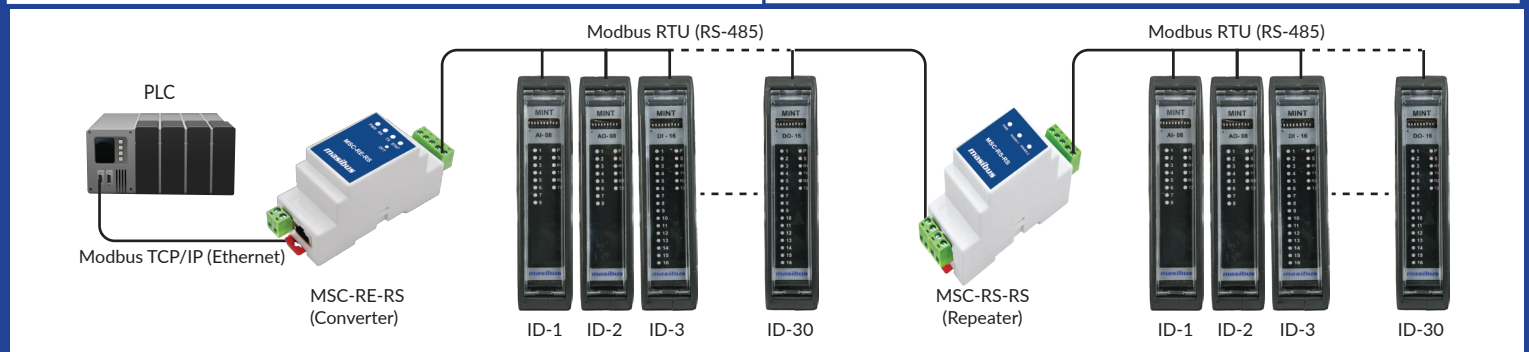
General	
Communication Controller Type	ARM cortex M4 32-bit MCU
Communication Protocol Support	Modbus TCP server/slave, Modbus RTU master
Indication LEDs	Power, status, RS-485 communication rx/tx
Ethernet Indication LED	link, activity LED
Ethernet Port Specification	
Network Interface	Ethernet 10/100Base-TX
Connector	RJ45
Protocols	Modbus TCP server/slave
Max. Modbus TCP Masters/Clients Support	15 (With TCP Socket Rollover Features)
Serial Port Specification	
No. of Ports	RS-485 x 1 (D+, D-, GND)
Protocols	Modbus RTU master
Serial Communication Parameters	Baud rate: 9600,19200,38400,57600,115200 Data bits - 8 bits, Stop bits - 1, 2 Parity bits - None, even, odd

## TECHNICAL SPECIFICATIONS FOR MSC-RS-RS

Interface	
Communication Speed	RS-485 half duplex
Connector	Terminal block
Status LEDs	1 LED Power, 2 LED's communication status
Communication	
Communication Speed (Baud Rate)	Auto baudrate detection
Signal Boost	up to 1200m (depends upon baud rate)
Maximum Nodes	31
Connector	Plug-in screw terminals, 1.5mm <sup>2</sup> cable size
Recommended Cable	Shielded twisted pair, size: 0.14mm <sup>2</sup> (Shield require to GND)

## Common Specifications for Msc-RE-RS/MSC-RS-RS

Power Supply and Isolation		Physical	
Power Supply	9 to 36V DC $\pm 10\%$	Mounting	DIN Rail (35mm) EN 60715
Power Consumption	<5W Watt	Case	ABS
Isolation (Between Supply and Communication Ports)	1500VAC RMS	Module Dimension (in mm)	88 (L) X 37 (W) X 59 (H)
Environment		Color	White
Operating Temperature	0°C to 55°C	Weight	100 g Approx.
Storage Temperature	-10°C to 70°C		
Humidity	30-95 %RH non-condensing		
Ordering Code		<b>Model</b>	
		MSC-RE-RS	Modbus Serial to Modbus TCP/IP Protocol Converter
		MSC-RS-RS	Isolated RS-485 to RS-485 Repeater



# TECHNICAL SPECIFICATIONS FOR MSC-ME-MS and MSC-ME-ZB

Performance		ZigBee Wireless (applicable for MSC-ME-ZB model only)	
Processor	32-bit CPU ARM core	Frequency Band	ISM 2.4 GHz
Maximum No. of Read Registers	2048	Communication Port Protocol	ZigBee (IEEE 802.15.4 standard) Modbus RTU master or Modbus RTU slave
Maximum No. of Write Registers	1024	Transmit Power	63 mW (+18 dBm)
Maximum No. of Modbus Commands Supported	192	Receiver Sensitivity	-101 dBm
No. Of Modbus Devices Supports on Serial Port	64	Distance (Max.)	Upto 1000 meter typically (Line of sight) without any obstacles
No. of Clients Supported on TCP/IP	15	Indoor Range	20 to 100 meter typically
<b>Configuration Software</b>		Connectivity	Connect to Masibus ZigBee Adapter MSC-ZB-RS (For data collection over wireless communication)
MSC Studio	Configuration and diagnostics	Antenna	Dipole pluggable 2.1 dBi (3 Meter extension cable can be provided optionally)
<b>Communication Output</b>		Operating Channels	11 to 26
<b>RS485 Serial port</b>		<b>Power Supply</b>	
Protocol	Modbus-RTU master	Voltage	18-32 V DC ±10%
No. of Ports	2 (MSC-ME-MS) 1 (MSC-ME-ZB)	Power Consumption	<5W
Communication Speed (Baud Rate)	9600, 19200, 38400, 57600, 115200 bps	<b>Isolation</b>	
Parity	ODD, EVEN, NONE	Supply to RS-485:	1500VAC RMS
Data Bits	8	Supply to Ethernet:	1000VAC RMS
Stop Bit	1, 2	<b>Physical</b>	
Default Settings	9600, 8 data bits, 1 stop bit, no. parity	Dimension (in mm)	101(H) x 22.5(W) x 120(D)
Connector	Plug-in screw terminals, 1.5mm <sup>2</sup> cable size	Mounting	DIN-Rail (35 mm)
Recommended Cable	Shielded, twisted pair, size: 0.14mm <sup>2</sup>	Weight Approx.	<160 grams
<b>Ethernet Port</b>		Enclosure Material	Molded ABS
Protocol	Modbus over Ethernet (TCPIP-ModNet)	Enclosure Protection	IP20
No. of Port	1	Color	Black
Speed	10/100 Mbps (Auto-detecting)	<b>Environmental</b>	
Connector	RJ45 (Auto-crossover)	Ambient Temperature	0 to 55°C
		Storage Temperature	-10 to 70°C
		Humidity	30% to 95% RH (Non-Condensing)

# TECHNICAL SPECIFICATIONS FOR MSC-ZB-RS

Performance		ZigBee Wireless	
RF Data Rate	250 kbps	Network Topologies	Point-to-point, point-to-multipoint, mesh
Indoor Range	20 to 100 meter typically	Protocol Supported	Digi mesh
Outdoor Range	Upto 1000 meter typically (Line of sight) without obstacles	Operating Channels	11 to 26
Transmit Power	63 mW (+18 dBm)	Spread Spectrum	TYPE direct sequence
Receiver Sensitivity	-101 dBm	Filtration Options	PAN ID, 64-bit MAC
<b>Features</b>		<b>Power Supply</b>	
Antenna	Dipole pluggable 2.1 dBi (3 Meter extension cable can be provided optionally)	Voltage	24 V DC (Externally) Or optionally using 12VDC adaptor
Frequency Band	ISM 2.4 GHz	Power Consumption	3W
Working Mode	Can work as router and coordinator	<b>Physical</b>	
Serial Data Interface	RS-485 (Can connect to Masibus or any third party RS-485 network)	Dimension (in mm)	75(H) x 75(W) x 35(D)
		Enclosure Material	ABS
		Enclosure Protection	IP20
		Mounting	Wall mount (alongwith mounting clamps/screws)
		Weight	110 grams approx.
		<b>Environmental</b>	
		Ambient Temperature	0 to 55°C
		Storage Temperature	-10 to 70°C
		Humidity	30% to 95% RH (Non-Condensing)

## Ordering Code

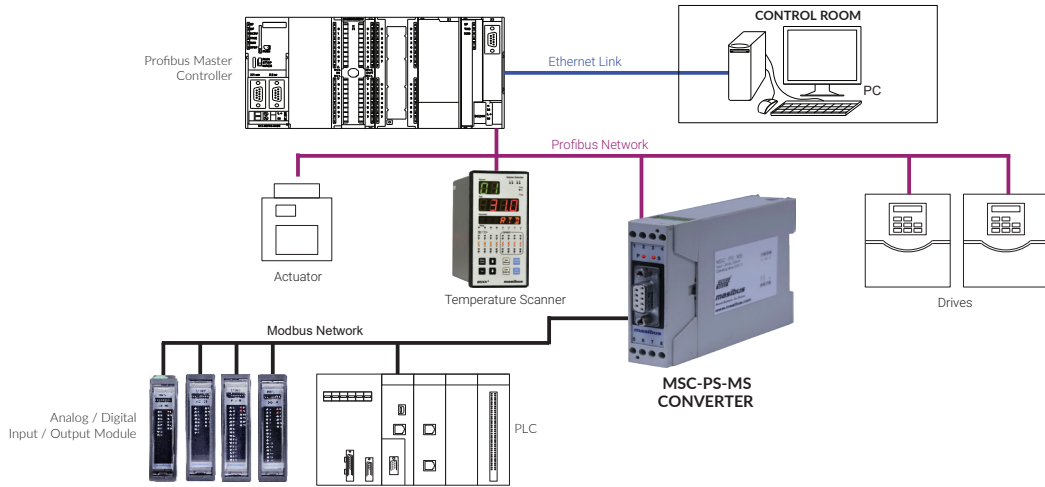
<b>Model</b>	MSC-ME-MS	Modbus Serial to Modbus Ethernet
<b>Model</b>	MSC-ME-ZB	Modbus ZigBee to Modbus Ethernet
<b>Model</b>	MSC-ZB-RS	ZigBee Wireless to RS-485 Serial (ZigBee Adapter)

### Optional Accessory (Extra cost) for Zigbee Model

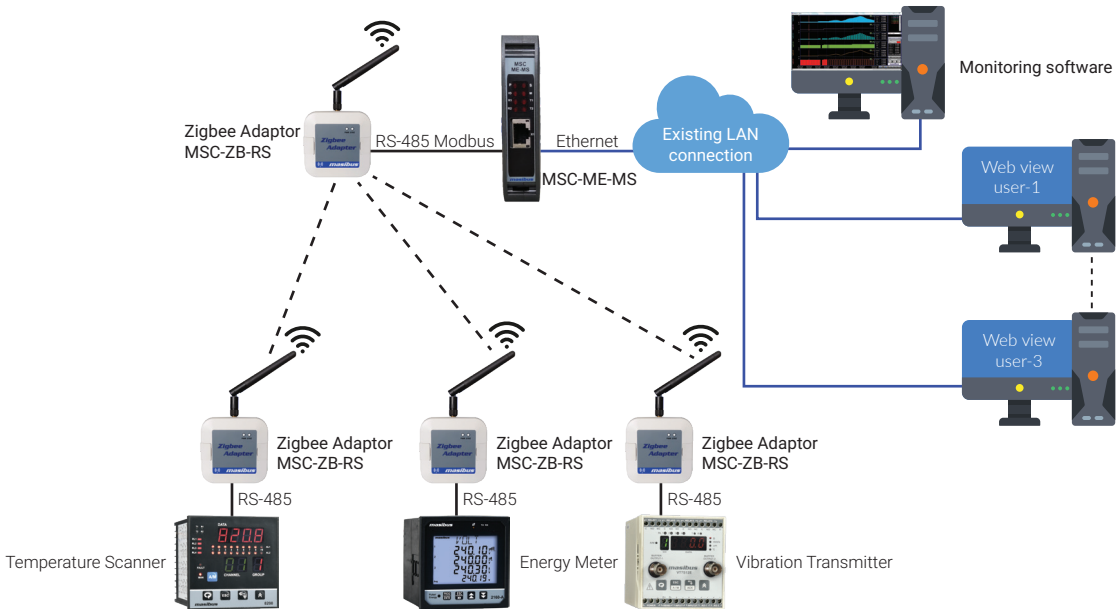
CBL-ZB-ANT-03: 3 Meter extension cable for antenna

# APPLICATION DIAGRAM

## Data Acquisition System Over Profibus Network



## Protection Monitoring System using Zigbee Mesh Network



## Wireless Data Acquisition System Using Zigbee Mesh Network

