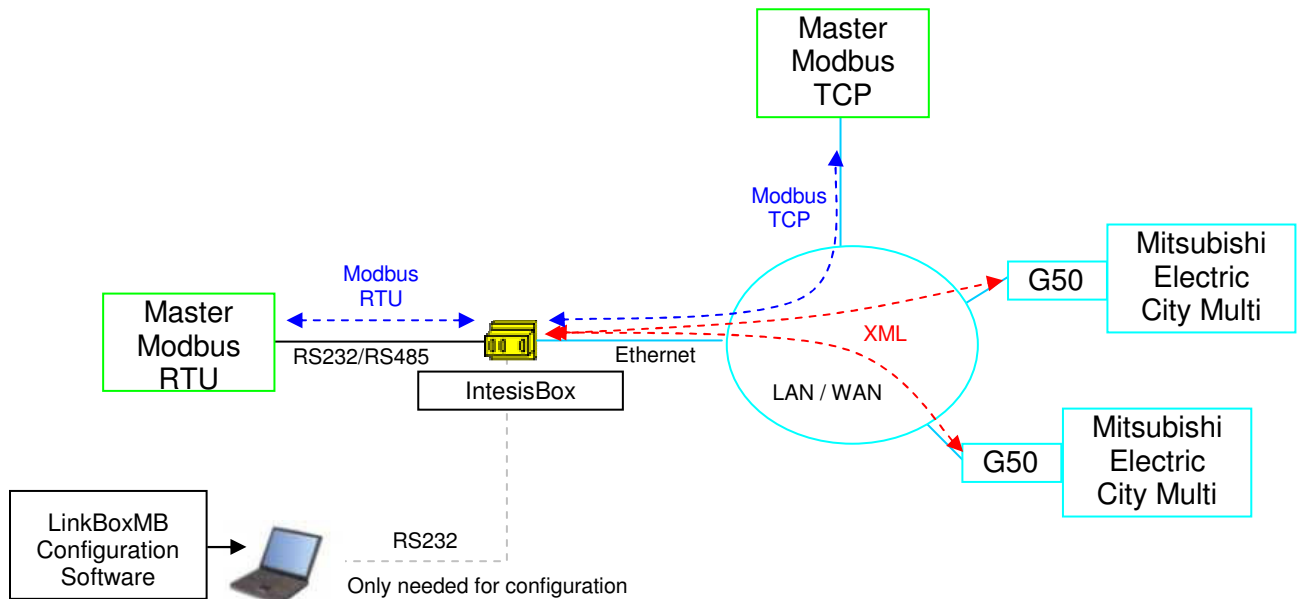




IntesisBox®

Modbus Server - Mitsubishi Electric G50

Gateway for monitor and control Mitsubishi Electric City Multi Air Conditioning systems from any Modbus master device TCP or RTU (BMS, PLC, SCADA, HMI, TouchPanel...)



This integration requires the Mitsubishi Electric City Multi AC system be equipped with the Mitsubishi Electric G-50A or GB-50A gateway. This gateway from Mitsubishi Electric offers the signals of the City Multi AC system through XML protocol. Every G50 (G-50A or GB-50A) allows access to the signals of up to 50 City Multi internal units and 50 groups, no matter the number of external units installed. In the G50, the group is the control unit, every group can have from 1 to 16 associated internal units. This integration supervises and control groups, not internal units, although if only one internal unit is associated to every group then you can supervise and control internal units individually. This G50 gateway is supplied by Mitsubishi Electric. Contact your nearest Mitsubishi Electric distributor for details.

IntesisBox® can “talk” to up to 4 Mitsubishi Electric G50s using XML protocol and offers the signals of all these City Multi groups through its Modbus slave interface, each signal in a predefined fixed Modbus address.

The Modbus interface of IntesisBox can be freely configured as RTU RS232, RTU RS485 or TCP.

The commissioning of IntesisBox® is almost plug & play, only IP parameters of the box and of G50s have to be configured using *LinkBoxMB*, a friendly software configuration tool for Windows™ supplied along with IntesisBox with no additional cost.

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IntesisBox capacity

Element	Max.	Notes
Number of G50s	4	Number of independent G50 that can be defined into IntesisBox
Number of City Multi groups: (Number of G50s X 50)	200	Maximum number of groups
Number of variables per group	18	Modbus addresses
Number of variables per G50	901	Modbus addresses
Maximum number of variables	3.604	Modbus addresses

There are 4 different models of *IntesisBox[®] Modbus server - Mitsubishi Electric G50* with different capacity every one of them. The table above shows the capacity for the top model (with maximum capacity).

The 4 different models allow integrating respectively: 1, 2, 3 or 4 G50s.

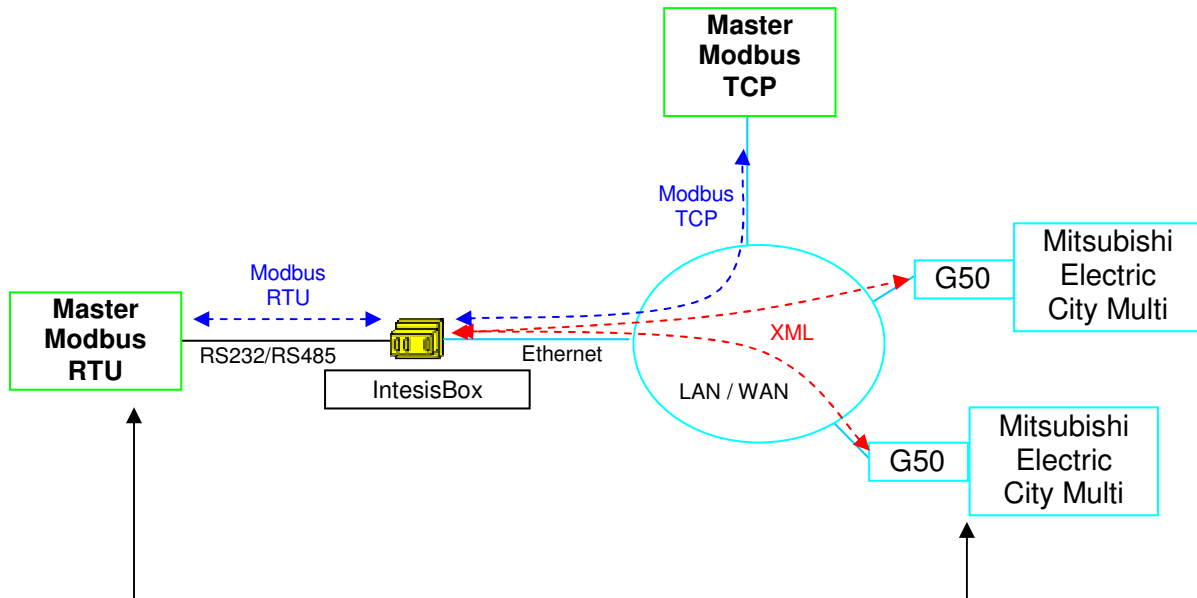
And their order codes are:

- **ME-AC-MBS-50.** Model supporting up to 50 City Multi groups.
- **ME-AC-MBS-100.** Model supporting up to 100 City Multi groups.
- **ME-AC-MBS-150.** Model supporting up to 150 City Multi groups.
- **ME-AC-MBS-200.** Model supporting up to 200 City Multi groups.



Sample applications

Integration of Mitsubishi Electric City Multi Air Conditioning systems into Modbus control systems.

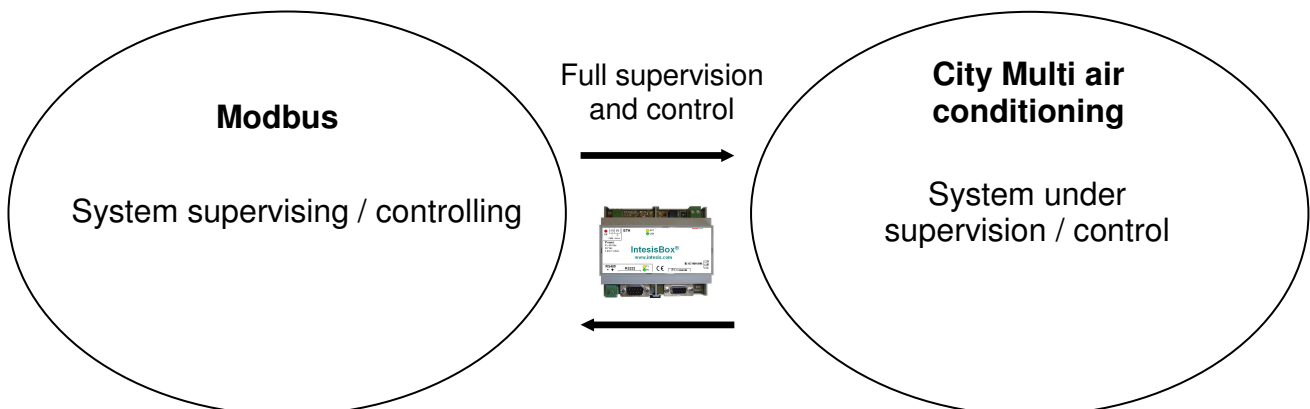


Control system with Modbus master interface:

- BMS.
- SCADA.
- PLC.
- DDC.
- Home Automation.
- AMX, Crestron...
- ...

Typical Mitsubishi Electric Air Conditioning systems equipped with G50 interface:

- City Multi model
- G-50A or GB-50A
- 50 City Multi indoor units or 50 groups per G50
- Every group can have from 1 to 16 associated indoor units
- ...



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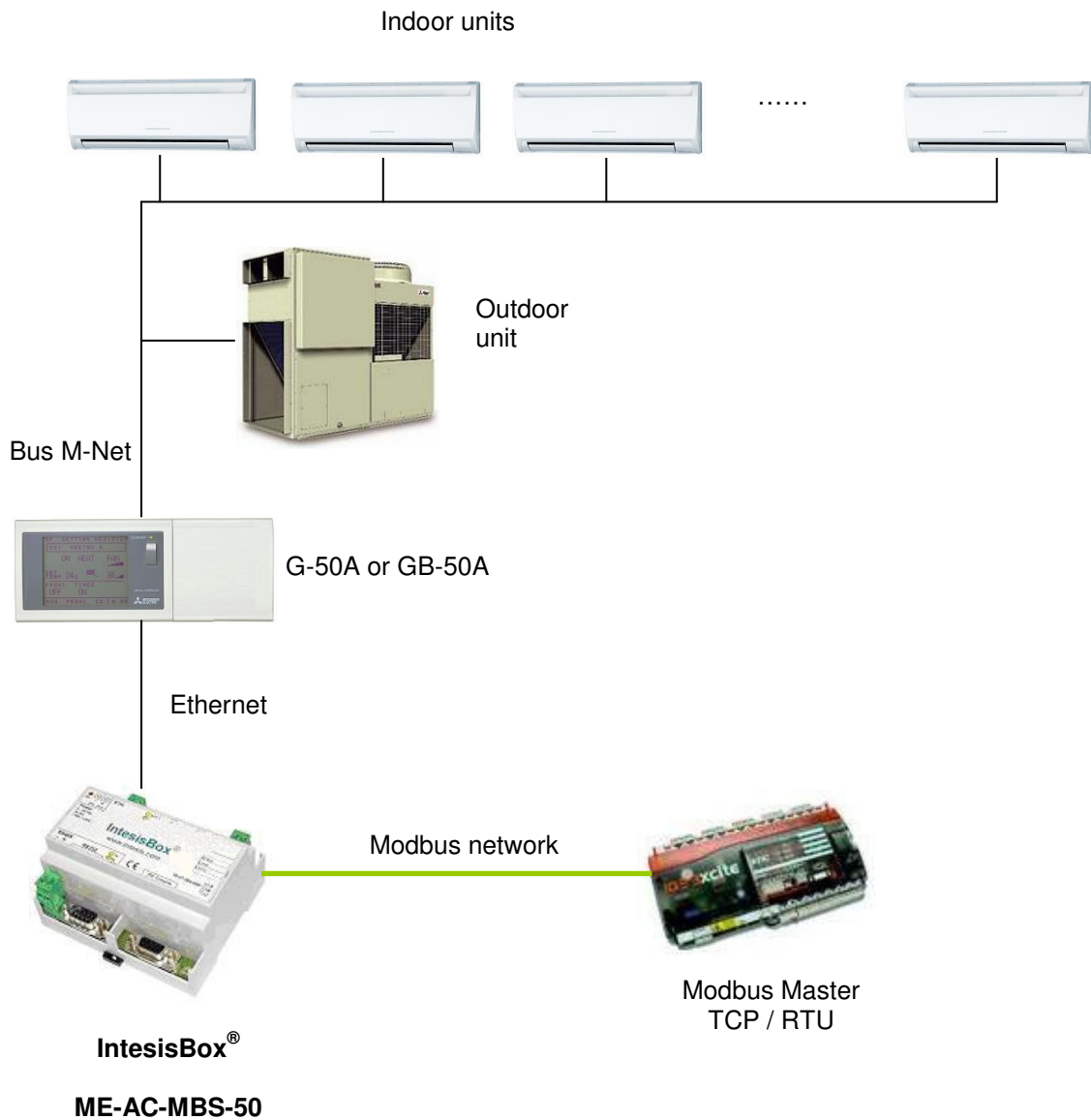
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Typical applications

Integration of Mitsubishi Electric Air Conditioning into Modbus systems.

For this application, Mitsubishi Air Conditioning system must be equipped with G-50A or GB-50A Gateway. For more information about these devices contact Mitsubishi Electric.



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Modbus interface

General	
Max. Number of Mitsubishi Elec.G50s	Up to 4 G50s can be supported. There are four different models for this gateway, supporting: 1, 2, 3 or 4 G50s respectively.
Virtual signals	<ul style="list-style-type: none"> • One communication error virtual signal per every G50 device defined. • One communication error virtual signal per every group into the G50 device. • One virtual signal per every group into the G50 device to enable/disable this group in the polling process. <p>All these virtual signals can be read/written from Modbus.</p>
Modbus interface	
Device type	Slave.
Modbus modes supported	TCP, RTU RS232 or RS485.
Modbus TCP configuration parameters	<ul style="list-style-type: none"> • IP address. • Subnet mask. • Default gateway address. • TCP port.
Modbus RTU configuration parameters	<ul style="list-style-type: none"> • RS232/RS485. • Baud rate. • Slave number.
Points	
Configuration	No point configuration needs to be done, all the Mitsubishi Electric G50 signals are automatically associated to predefined fixed Modbus Addresses.
Modbus function codes supported	<p>Read functions:</p> <ul style="list-style-type: none"> • 3- Read holding registers. • 4- Read input registers. <p>Write functions:</p> <ul style="list-style-type: none"> • 6- Write single register. • 16- Write multiple registers. <p><i>If poll records are used to read/write multiple records, the range of addresses requested must contain valid addresses, if not the corresponding Modbus error code will be responded.</i></p>
Modbus data coding	All the point's values are coded in 2 bytes registers (even if their possible values are 0 and 1) and expressed in MSB..LSB.



Extract of the predefined Modbus address table

Modbus Address	G50	Group	Property
1	1		0 Error Com. G50
101	1	1	1 Drive
102	1	1	2 Mode
103	1	1	3 SetTemp
104	1	1	4 AirDirection
105	1	1	5 FanSpeed
106	1	1	6 RemoCon
107	1	1	7 DriveItem
108	1	1	8 ModelItem
109	1	1	9 SetTempItem
110	1	1	10 FilterItem
111	1	1	11 Ventilation
112	1	1	12 FilterSign
113	1	1	13 ErrorSign
114	1	1	14 InletTemp
115	1	1	15 FilterSignReset
116	1	1	16 ErrorSignReset
117	1	1	17 Error Com. Group
118	1	1	18 Polling Active

Modbus Address	G50	Group	Property
2	2		0 Error Com. G50
5101	2	1	1 Drive
5102	2	1	2 Mode
5103	2	1	3 SetTemp
5104	2	1	4 AirDirection
5105	2	1	5 FanSpeed
5106	2	1	6 RemoCon
5107	2	1	7 DriveItem
5108	2	1	8 ModelItem
5109	2	1	9 SetTempItem
5110	2	1	10 FilterItem
5111	2	1	11 Ventilation
5112	2	1	12 FilterSign
5113	2	1	13 ErrorSign
5114	2	1	14 InletTemp
5115	2	1	15 FilterSignReset
5116	2	1	16 ErrorSignReset
5117	2	1	17 Error Com. Group
5118	2	1	18 Polling Active

Modbus Address	G50	Group	Property
5001	1	50	1 Drive
5002	1	50	2 Mode
5003	1	50	3 SetTemp
5004	1	50	4 AirDirection
5005	1	50	5 FanSpeed
5006	1	50	6 RemoCon
5007	1	50	7 DriveItem
5008	1	50	8 ModelItem
5009	1	50	9 SetTempItem
5010	1	50	10 FilterItem
5011	1	50	11 Ventilation
5012	1	50	12 FilterSign
5013	1	50	13 ErrorSign
5014	1	50	14 InletTemp
5015	1	50	15 FilterSignReset
5016	1	50	16 ErrorSignReset
5017	1	50	17 Error Com. Group
5018	1	50	18 Polling Active

Modbus Address	G50	Group	Property
10001	2	50	1 Drive
10002	2	50	2 Mode
10003	2	50	3 SetTemp
10004	2	50	4 AirDirection
10005	2	50	5 FanSpeed
10006	2	50	6 RemoCon
10007	2	50	7 DriveItem
10008	2	50	8 ModelItem
10009	2	50	9 SetTempItem
10010	2	50	10 FilterItem
10011	2	50	11 Ventilation
10012	2	50	12 FilterSign
10013	2	50	13 ErrorSign
10014	2	50	14 InletTemp
10015	2	50	15 FilterSignReset
10016	2	50	16 ErrorSignReset
10017	2	50	17 Error Com. Group
10018	2	50	18 Polling Active

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Mitsubishi Electric G50 interface

Mitsubishi Electric G50 interface	
Device type	Client.
Configuration Parameters	Polling interval (1..600 seconds). Per every G50 defined: <ul style="list-style-type: none">• Descriptive name.• IP address.• TCP port.

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Signals available per every Mitsubishi Electric City Multi AC indoor unit or group of indoor units

Property	Description / Status
Drive	Start/Stop Read/Write: ON, OFF
Mode	AC Mode Read/Write: COOL, DRY, FUN, HEAT, AUTO, HEAT RECOVERY, LC_AUTO, BYPASS Read: AUTO HEAT, AUTO COOL
SetTemp	Temperature Set Point (only integer numbers allowed) Read/Write: For COOL or DRY mode:19..30 °C, for HEAT mode: 17..28 °C, for AUTO mode:19..28 °C)
AirDirection	Air output direction Read/Write: HORIZONTAL, MID1, MID2, VERTICAL, SWING
FanSpeed	AC fan speed or LOSSNAY Read/Write: HIGH, MIDH, MIDL, LOW
RemoCon	Prohibition for General control from the local panel Read/Write: PROHIBIT, PERMIT
DriveItem	Prohibition for ON/OFF control from the local panel Read/Write: CHK_ON, CHK_OFF
ModeItem	Prohibition for Mode control from the local panel Read/Write: CHK_ON, CHK_OFF
SetTempItem	Prohibition for Set Point control from the local panel Read/Write: CHK_ON, CHK_OFF
FilterItem	Prohibition for Filter Reset control from the local panel Read/Write: CHK_ON, CHK_OFF
Ventilation	Operational status for LOSSNAY or OA Read/Write: HIGH, LOW, OFF
FilterSign	Status for Filter Dirty Read: ON, OFF Write: RESET
ErrorSign	Error status Read: ON, OFF Write: RESET
InletTemp	Ambient Temperature Read: 0.0 to 99.9
G50 Communication Error	Communication error with G50 Virtual signal generated by IntesisBox to indicate the status of the communication with the G50.
Group Communication Error	Group communication error Virtual signal generated by IntesisBox to indicate that the group is not configured into the G50.
Polling Active	Polling active Virtual signal to indicate or set if the Group is active or not active during the polling process.

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Configuration tool

LinkBoxMB	<ul style="list-style-type: none">• Visual engineering tool, easy of use, for gateway's configuration and supervision compatible with Microsoft Windows operating systems, supplied with the gateway free of charge.• Multi-window tool allowing to supervise simultaneously the communication activity with both protocols (systems), real time values for all the signals allowing to modify any value (very useful for test purposes), console window showing debug and working status messages, and configuration windows to configure all the gateway's parameters and signals.• Signals configuration in plain text files (tab separated) for easy and quick configuration using Microsoft Excel (very useful in projects with a lot of points).• Allows configuring the gateway's parameters and signals while in off-line (not connected to the gateway).• Connection to the gateway for download the configuration and supervision by using serial COM port of the PC (serial cable supplied with the gateway).• Allows configuring all the external protocols available for IntesisBox[®] Modbus Server series.• Upgrades for this software tool available free of charge whenever a new protocol is added to the IntesisBox[®] Modbus Server series.• Multi-project tool allowing having in the engineer's PC the configuration for all the sites with different IntesisBox[®] Modbus Server series gateways.• Multi-language tool, all the language-dependent strings are in a plain text file (tab separated) for easy modification or addition of new languages.• A list of system commands is available to send to the gateway for debugging and adjust purposes (Reset, Date/time consultation/adjust, Firmware version request...).
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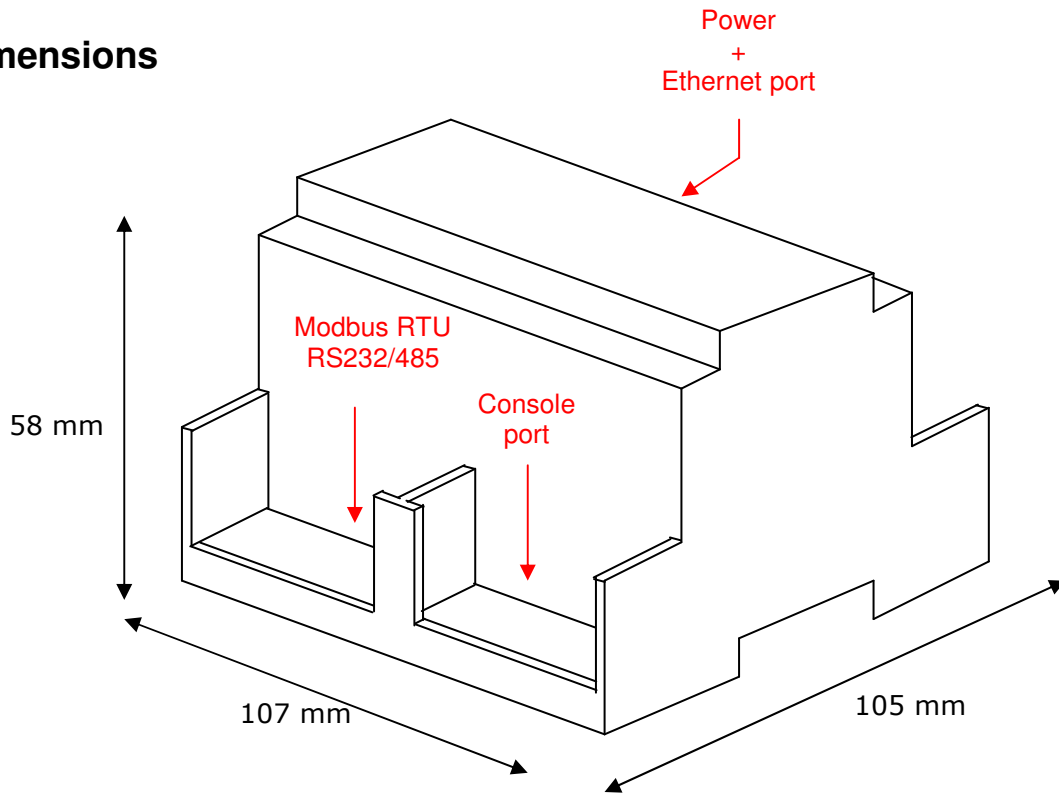
Mechanical & Electrical characteristics



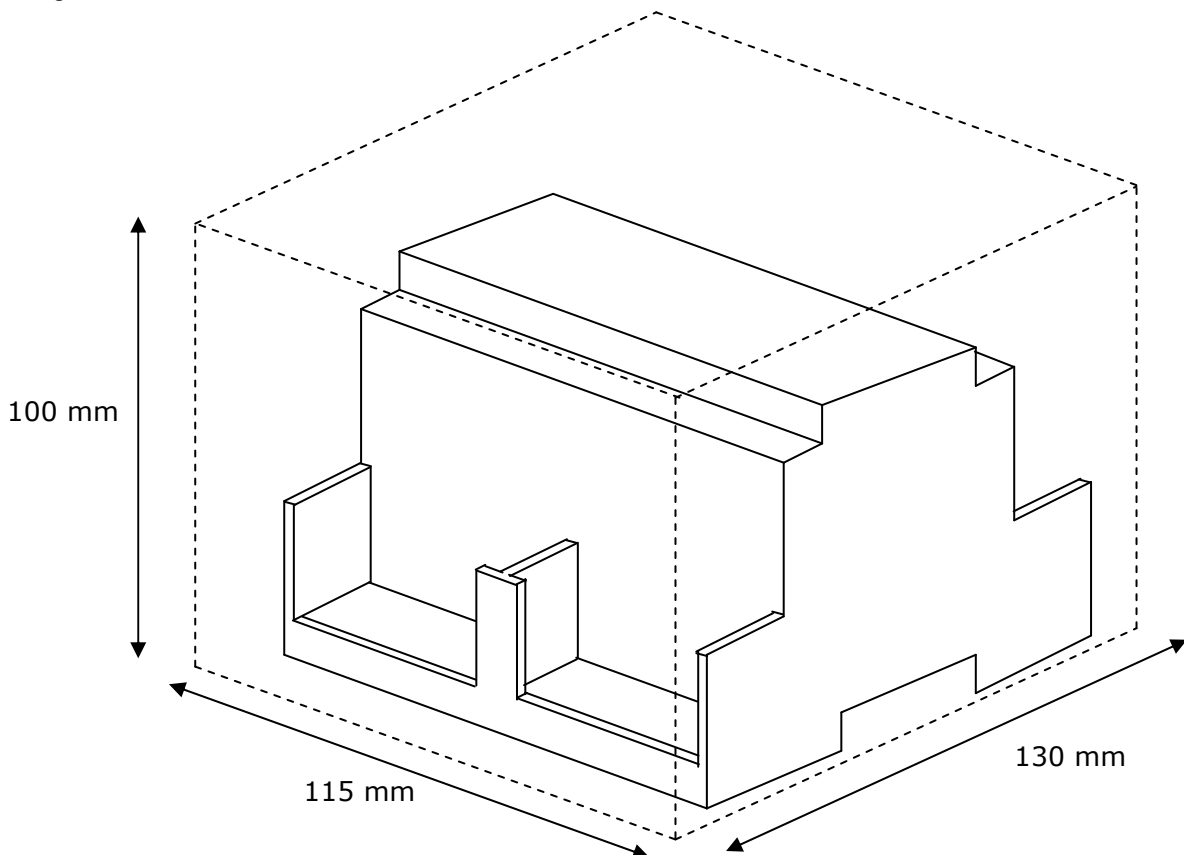
Envelope	Plastic type PC (UL 94 V-0). Size: 107mm x 105mm x 58mm.
Color	Grey. RAL 7035.
Power	9 to 30VDC +/-10% 1.4W. 24VAC +/-10% 1.4VA. Power connector is a 2 pole plug-in screw terminal bloc.
Mounting options	Desktop Wall DIN rail EN60715 TH35.
Modbus RTU ports	1 x Serial RS232 (DB9 male DTE). 1 x Serial RS485 (Plug-in screw terminal block 2 poles).
Modbus TCP & Mitsubishi Elec.G50 port	1 x Ethernet 10BT RJ45 connector.
LED indicators	1 x Power. 2 x Ethernet port activity (LNK, ACT). 2 x Modbus RTU port activity (Tx, Rx).
Console port	RS232. DB9 female connector (DCE).
Configuration	Via console port. ¹
Firmware	Allows upgrades via console port.
Operational temperature range	-40°C to +70°C
Operational humidity range	5% to 95%, non condensing
Protection	IP20 (IEC60529).
RoHS conformity	Compliant with RoHS directive (2002/95/CE).
Certifications	CE

¹ Along with the device it is also supplied a standard DB9 male - DB9 female 1.8 m. cable for configuring and monitoring the device using a PC via serial COM port. The configuration software LinkBoxMB (free of charge), compatible with MS Windows® operating systems, is also supplied with the device.

Dimensions



Recommended available space for its installation into a cabinet (wall or DIN rail mounting), with space enough for external connections:



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