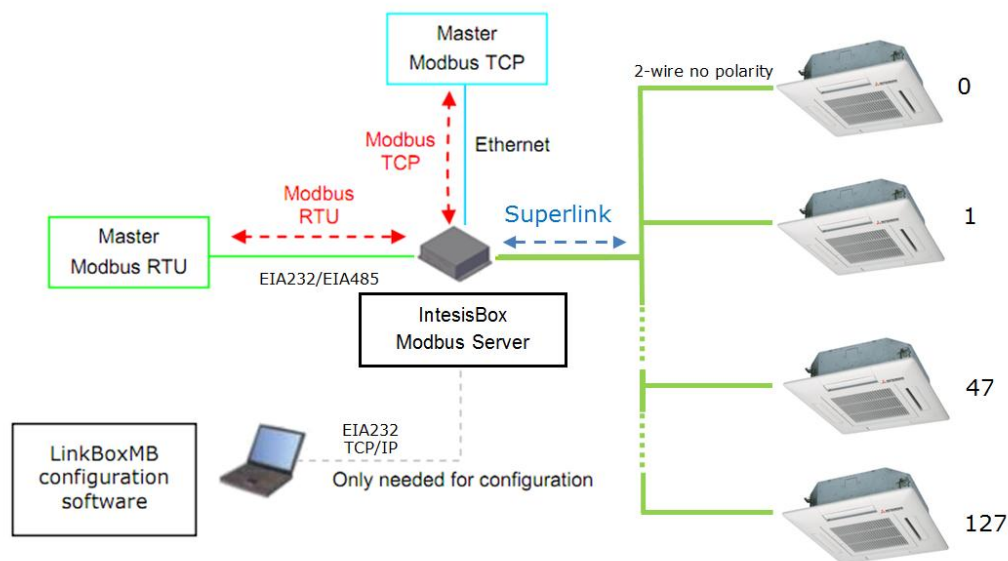




# IntesisBox®

## Modbus Server – Mitsubishi Heavy Industries AC

**Gateway for integration of Mitsubishi Heavy Industries air conditioning systems into Modbus (RTU and TCP) systems.**



This gateway allows integrating a Mitsubishi Heavy Industries AC system inside a supervision/control/automation system through PLC, SCADA and, in general, through any device or system with Modbus mastering (TCP or RTU) interface.

The aim of this integration is to make accessible several Mitsubishi Heavy Industries air conditioning indoor units communicating with the Superlink protocol as if they were part of a Modbus system. Therefore, the IntesisBox® Modbus Server acts as a Modbus slave in the Modbus interface, allowing the Modbus master read and write in the Modbus registers.

Two Modbus mode connection types can be active in IntesisBox®: Modbus RTU or Modbus TCP, or both simultaneously.

IntesisBox® includes all hardware needed to connect directly with the Mitsubishi Heavy Industries indoor units connecting with Superlink network.

*IntesisBox Modbus Server series are configured using LinkBoxMB, a software tool for Windows™ supplied along with the purchase of IntesisBox® with no additional cost. With the standard installation of LinkBoxMB, a Demo project for integration of several MHI indoor units is also installed. Using this demo project makes the engineering needed for this integration easy and quick, almost plug&play.*

## 1. IntesisBox® capacity

Element	Max.	Notes
Number of indoor units	128 *	Maximum number of AC indoor units that can be controlled
Number of points per indoor unit	14	Modbus addresses per indoor unit
Maximum number of points	1797*	Valid Modbus addresses
Maximum TCP master connections	2	Maximum number of TCP simultaneous Modbus Master connections
Maximum RTU master connections	1	Maximum number of RTU simultaneous Modbus Master connections

\* There are two different models of IntesisBox® Modbus Server – Mitsubishi Heavy Industries AC each one with different capacity. The table above shows the capacity for the top model (with maximum capacity).

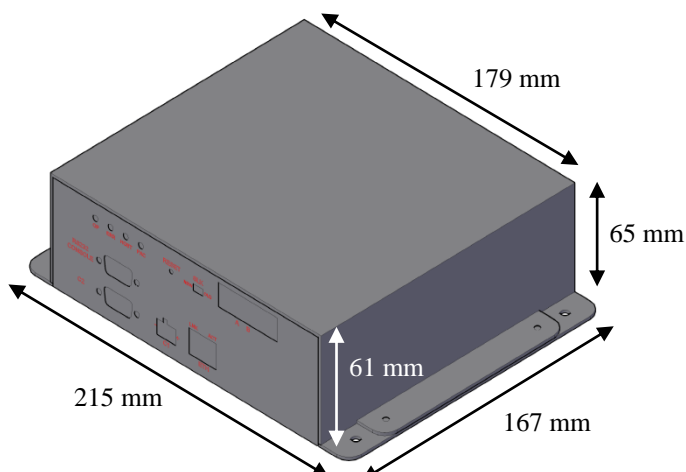
Their order codes are:

- **MH-AC-MBS-48:**
  - Model supporting up to 48 indoor units
  - For Superlink-I (Previous Superlink) or Superlink-II (New Superlink).
  - Indoor Unit actual address range is 00 to 47
- **MH-AC-MBS-128:**
  - Model supporting up to 128 indoor units
  - For Superlink-II (New Superlink)
  - Indoor Unit actual address range is 000 to 127

## 2. Modbus interface of IntesisBox®

<b>General</b>	
Max. Number of MHI indoor units	Two different versions of IntesisBox® available, supporting a maximum of 128 and 48 indoor units respectively.
Virtual signals	One communication error virtual signal per every indoor unit. All these virtual signals are available from Modbus.
<b>Modbus interface</b>	
Device type	Slave.
Modbus modes supported	TCP, RTU EIA232 or EIA485.
Modbus TCP configuration parameters	<ul style="list-style-type: none"> <li>• IP address.</li> <li>• Subnet mask.</li> <li>• Default gateway address.</li> <li>• TCP port.</li> </ul>
Modbus RTU configuration parameters	<ul style="list-style-type: none"> <li>• EIA232/EIA485.</li> <li>• Baud rate.</li> <li>• Parity.</li> <li>• Slave number.</li> </ul>
<b>Points</b>	
Configuration	AC system related fields. <ul style="list-style-type: none"> <li>• Indoor unit main address: Main Address of the AC indoor unit each modbus memory block relates to.</li> </ul>
Supported Modbus function codes	<ul style="list-style-type: none"> <li>• 3- Read holding registers.</li> <li>• 4- Read input registers.</li> <li>• 6- Write single register.</li> </ul> <p><i>If poll records are used to read/write multiple records, the range of addresses requested must contain valid addresses, otherwise the corresponding Modbus error code will be responded.</i></p>
Modbus data coding	All the point's values are coded in 2 byte registers (even if their possible values are 0 and 1). They are expressed in MSB..LSB format (big endian)

### 3. Mechanical & Electrical characteristics



Enclosure	Industrial sheet metal. Size: 215mm x 167mm x 61mm. Weight: 2.025 Kg
Color	Gray metalized.
Power	100 to 240VAC~ 50 to 60Hz 5W max. Power connector: C14 (male) <sup>1</sup>
Fuse	250V, 1.5A Dimensions: 20x5mm
Terminal wiring (for low-voltage signals)	Per terminal: solid wires or stranded wires (twisted or with ferrule) 1 core: 0.75 ... 1.25mm <sup>2</sup> 2 cores: 0.75 ... 1.25mm <sup>2</sup> 3 cores: not permitted
Mounting	Wall
Modbus TCP port	1 x Ethernet 10Base-T (RJ45).
Modbus RTU ports	1 x Serial EIA232 (DB9 male DTE). SELV 1 x Serial EIA485 (Plug-in screw terminal block 2 poles). SELV
A-B port	1 x Superlink terminals (Plug-in screw terminal block 2 poles "A" "B"). SELV
LED indicators	2 x Ethernet port link and activity (LNK, ACT). 4 x MHI Interface (OP, ERR, HOST, PAC)
Push buttons	1 x Reset Device
Selectors	1 x SLK selector
Console port	EIA232. (DB9 female DCE). SELV
Configuration	Via console port. <sup>2</sup>
Firmware	Allows upgrades via console port.
Operational temperature range	0°C to +40°C
Operational humidity range	5% to 95%, non condensing
Protection	IP20 (IEC60529).
RoHS conformity	Compliant with RoHS directive (2002/95/CE).
Norms and standards	CE conformity to EMC directive (2004/108/EC) and Low-voltage directive (2006/95/EC) EN 61000-6-2, EN 61000-6-3, EN 60950-1, EN 50491-3

<sup>1</sup> A power cable with connector C14 male 1.6 meters long is supplied with the device.

<sup>2</sup> Standard cable DB9male-DB9female 1.8 meters long is supplied with the device for connection to a PC COM port for configuring and monitoring the device. The configuration software, compatible with Windows® operating systems, is also supplied.

## 4. AC Unit Types compatibility

Indoor units compatible with the IntesisBox® Modbus – Server are those included in the Mitsubishi Heavy Industries KX family and so on.

Check available combination of Mitsubishi Heavy Industries Central Control and BMS interface units in the next tables.

In the case of SL2NA or SL3NA, it is necessary to erase registration of non-connected indoor unit. For SL2NA and SL3NA, change is required for the setup deprived of the rights of instruction of Remocon control Lock/Unlock.

### New Superlink connections:

MH-AC-MBS-128 MH-AC-KNX-128	SC-LGWNA-A SC-BGWNA-A/B etc.	SC-SL3NA-AE/BE etc.	SC-SL2NA-E etc.	SC-SL1N-E etc.	Max Indoor Units	Address No.
1	Non connect	2	0	0-8	128	000-127
		1	0-2			
		0	0-4			

MH-AC-MBS-48 MH-AC-KNX-48	SC-LGWNA-A SC-BGWNA-A/B etc.	SC-SL3NA-AE/BE etc.	SC-SL2NA-E etc.	SC-SL1N-E etc.	Max Indoor Units	Address No.
1	Non connect	2	0	0-8	48	00-47
		1	0-2			
		0	0-4			

### Previous Superlink connections:

MH-AC-MBS-48/128 MH-AC-KNX-48/128	SC-LGWNA-A SC-BGWNA-A/B etc.	SC-SL3NA-AE/BE etc.	SC-SL2NA-E etc.	SC-SL1N-E etc.	Max Indoor Units	Address No.
1	Non connect	Non connect	1	0	32	00-47
			0	1,2		
			0	0	48	