FUJITSU Modbus RTU RAC and VRF System User Manual

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Contents

Important User Information

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Gateway for the integration of a Fujitsu air conditioning unit in ModBus RTU enabled monitoring and control systems.

Compatible with Domestic and VRF line air conditioners commercialized by Fujitsu.

Presentation

The INMBSFGL001I000 interfaces allow a complete and natural integration of Fujitsu air conditioners into Modbus RTU (EIA-485) networks. Reduced dimensions. 93 x 53 x 58 mm 3.7" x 2.1" x 2.3"

Quick and easy installation. Mountable on DIN rail, wall, or even inside the indoor unit of AC.

- External power not required.
- Direct connection to Modbus RTU (EIA-485) networks. Up to 63 INMBSFGL001I000 devices can be connected in the same network. INMBSFGL001I000 is a Modbus slave device.
- Direct connection to the AC indoor unit.
- Configuration from both on-board DIP-switches and Modbus RTU.
- Total Control and Supervision.
- Real states of the AC unit's internal variables.
- Allows simultaneous use of the AC's remote controls and Modbus RTU.
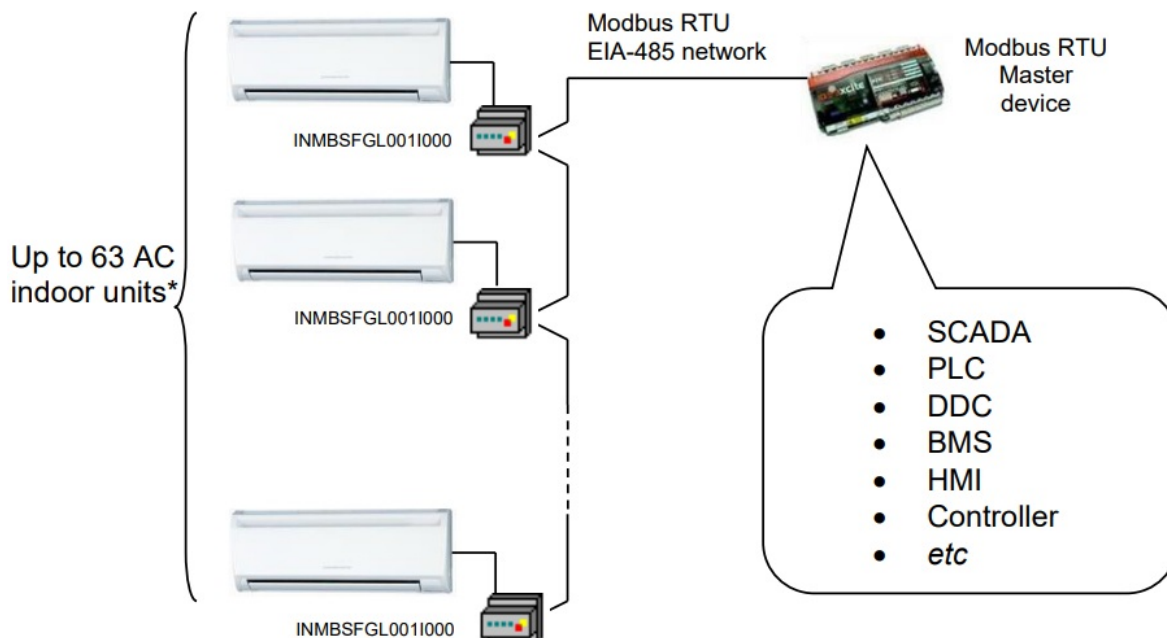
- Up to 63 Intesis devices can be installed in the same Modbus RTU bus. However, depending on the configured speed, the installation of Modbus Repeaters may be required.

Connection

The interface comes with cable + connectors for direct connection to the AC indoor unit, and with a plug-in terminal block of 3 poles for connection to a Modbus RTU EIA-485 network.

Connect to the AC indoor unit

The INMBSFGL001I000 connects directly to the indoor unit internal control board. In the control board locate the socket connector marked as CN65.
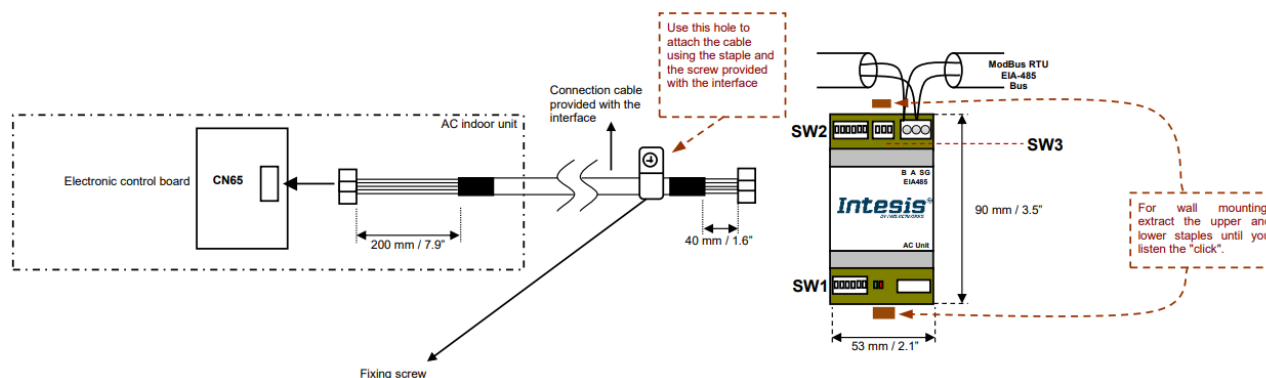
Figure 2.1 INMBSFGL001I000 connection diagram

Connection to the EIA-485 bus

Connect the EIA-485 bus wires to the plug-in terminal block of INMBSFGL001I000 and keep the polarity on this connection (A+ and B-). Make sure that the maximum distance to the bus is 1,200 meters (3,937 ft). Loop or star typologies are not allowed in the case of the EIA-485 bus. A terminator resistor of 120Ω must be present at each end of the bus to avoid signal reflections. The bus needs a fail-safe biasing mechanism.

Quick Start Guide

1. Disconnect the air conditioning from Mains Power.

2. Attach the interface next to the AC indoor unit (wall mounting) following the instructions of the diagram below or install it inside the AC indoor unit (respect the safety instructions given).

3. Connect to CN65 between the interface and the AC indoor unit following the instructions of the diagram.

4. Connect the EIA-485 bus to the connector EIA485 of the interface.

5. Close the AC indoor unit.

6. Check the DIP-Switch configuration of the Intesis interface and make sure it matches the current installation's parameters: By default, the interface is set to:

   - Modbus Slave Address ➔ 1
   - Modbus baud rate ➔ 9600 bps

   These parameters can be modified from DIP-Switches (see for further information).

7. **NOTE:** All changes on the DIP-Switch configuration require a system power cycle to be applied.

8. Connect the AC system to Mains Power.

   IMPORTANT: The Intesis interface requires to be connected to the AC unit (powered) to start communicating.

Modbus Interface Specification

Modbus physical layer
INMBSFGL001I000 implements a Modbus RTU (Slave) interface, to be connected to an EIA-485 line. It performs 8N2 communication (8 data bits, no parity and 2 stop bit) with several available baud rates (2400 bps, 4800 bps, 9600 bps -default-, 19200 bps, 38400 bps, 57600 bps, 76800 bps and 115200 bps). It also supports 8N1 communication (8 data bits, no parity and 1 stop bit).

Modbus Registers
All registers are type "16-bit unsigned Holding Register" and they use the Modbus big endian notation.

Control and status registers

Register Address (protocol address)	Register Address (PLC address)	R/W	Description
0	1	R/W	AC unit On/Off§ 0: Off§ 1: On
1	2	R/W	AC unit Mode 1§ 0: Auto§ 1: Heat§ 2: Dry§ 3: Fan§ 4: Cool
2	3	R/W	AC unit Fan Speed 1, 2§ 0: Auto§ 1: Quiet§ 2: Low§ 3: Med§ 4: High
3	4	R/W	AC unit Vane Position 1§ 1: Position-1 (Horizontal)§ 2: Position-2 (Horizontal)§ 3: Position-3 (Medium)§ 4: Position-4 (Vertical)§ 10: Swing
4	5	R/W	AC unit Temperature Setpoint 1,3,4,5§ -32768 (Initialization value)§ 16..30 (ºC) (0 = undetermined)§ 61..86 (ºF) (0 = undetermined)
5	6	R	AC unit Temperature reference 1,3,4,4§ 18..30 (ºC) (0 = undetermined)§ 64,4..86 (ºF) (0 = undetermined)§ 0x8000 There is no temperature sent from the Remote controller
6	7	R/W	Window Contact§ 0: Closed (Default)§ 1: Open
7	8	R/W	INMBSFGL001I000 Disablement 6§ 0: INMBSFGL001I000 enabled (Default value)§ 1: INMBSFGL001I000 disabled
8	9	R/W	AC Remote Control Disablement 5§ 0: Remote Control enabled (Default value)§ 1: Remote Control disabled

1. Available values will depend on the AC unit mode. Check the AC unit model functions in its user manual to know the possible values for this register.
2. Number of FanSpeeds configurable via DIP-Switches.
3. Magnitude for this register can be adjusted to Celsius x 1ºC, Celsius x 10ºC (default) or Fahrenheit.
4. It is not possible turn to x10 the value shown in Fahrenheit.
5. See section 4.2.3 CONSIDERATIONS ON TEMPERATURE REGISTERS for more information
6. This value is stored in non-volatile memory.

Register Address (protocol address)	Register Address (PLC address)	R/W	Description
9	10	R/W	AC unit Operation Time§ 0..65535 (hours). Counts the time the AC unit is in "On" state.
10	11	R	AC unit Alarm Status§ 0: No alarm condition§ 1: Alarm condition
11	12	R	Error Code 7§ 0: No error present§ 65535(-1 if it is read as signed value): Error in the communication of INMBSFGL001I000 or Remote Controller with the AC unit.§ Any other value, see the table at the end of this document.
21	22	R	Number of FanSpeeds§ 3…6 FanSpeeds
22	23	R/W	Indoor unit´s ambient temperature from external sensor (at Modbus side) 1,3,4,4§ -32768: (Initialization value). No temperature is being provided from an external sensor.§ Any other: (ºC/x10ºC/ºF)
23	24	R	AC Real temperature setpoint 1,3,4,4§ When no external temperature is provided, this read- only register will have the same value as register 5 (PLC addressing). In all cases, it will show the current setpoint in the indoor unit.§ 16..31ºC (ºC/x10ºC)§ 60..92ºF
24	25	R	Current AC max setpoint 1,3,4§ -32768 (Initialization value)§ Ranges are specific from Manufacturer
25	26	R	Current AC min setpoint 1,3,4§ -32768 (Initialization value)§ Ranges are specific from Manufacturer
26	27	R/W	AC unit Horizontal Vane Position 1§ 0: Auto (Default)§ 1: Position 1§ …§ 5: Position 5§ 10: Swing
31	32	R	Window status (feedback)§ 0: Not active (Default value)§ 1: Active (Window is open)
36	37	R/W	External On/Off disablement:§ 0: Not active (Default value)§ 1: Active
40	41	R	Window contact ON/OFF disablement:§ 0: Window contact is disabled (not working)§ 1: Window contact is enabled (in use)
43	44	W	Filter reset:§ 1: Reset
44	45	R	Filter status§ 0: Off§ 1: Lit
56	57	R/W	Antifreeze operation§ 0: Disabled§ 1: Enabled
64	65	R/W	Economy§ 0: Disabled

See section 7 ERROR CODES for possible error codes and their explanation

Register Address (protocol address)	Register Address (PLC address)	R/W	Description
			§ 1: Enabled
65	66	R	Input reference temperature **1,3,4**§ 0x8000: No temperature's value is being provided from an external sensor. No virtual temperature is being applied.§ Any other: (ºC/x10ºC/ºF)
66	67	R	Return path temperature **1,3,4**§ -32768 (Initialization value)§ Ranges are specific from Manufacturer
97	98	R/W	Block Periodic Sendings 5,8§ 0: Non-blocked (Default value)§ 1: Blocked
98	99	R	Master/Slave (gateway's role)§ 0: Slave§ 1: Master

Configuration Registers

Register Address (protocol address)	Register Address (PLC address)	R/W	Description
13	14	R/W	"Open Window" switch-off timeout 9§ 0..30 (minutes)§ Factory setting: 30 (minutes)
14	15	R	Modbus RTU baud-rate§ 2400bps§ 4800bps§ 9600bps (Default)§ 19200bps§ 38400bps§ 57600bps§ 76800bps§ 115200bps
15	16	R	Modbus Slave Address§ 1..63
49	50	R	Device ID: 0x0D00
50	51	R	Software version
99	100	W	Reset§ 1: Reset

Considerations on Temperature Registers

- AC unit Temperature Setpoint (R/W) (register 5 – in PLC addressing): This is the adjustable temperature setpoint meant to be required by the user. This register can be read (Modbus function 3 or 4) or written (modbus functions 5 or 16). A remote controller connected to the 3-wire bus of the Fujitsu indoor unit willreport the same temperature setpoint value as this register.
- AC unit external reference temperature (R/W) (register 23 – in PLC addressing): This register allows providing an external temperature reference from Modbus side. If an external temperature is provided through this register, indoor unit will use it as reference for its temperature control loop.
    - This register will have no effect in those Fujitsu RAC / domestic line splits Air-Conditioning units – this is, those models requiring an additional communication accessory enabling communication with INMBSFGL001I000.
    - For this temperature to take effect it is required that the Fujitsu AC indoor unit is configured in such a way that it uses the "thermostat sensor in the remote controller" (this is, INMBSFGL001I000 will act as

thermostat sensor providing a temperature sensor reading).

- This configuration is done via a Fujitsu remote controller connected to the indoor unit (Function number "42" – setting value "1" / operation of Thermosensor button) and must be done by Fujitsu authorized installers at the time of the installation of the AC.
- Register value after INMBSFGL001I000 startup is -32768, which means that no temperature reference is provided to the AC indoor unit. In that case, AC indoor unit will use its own return path temperature sensor as reference for its control loop.
- Virtual temperature mechanism will be activated once the first temperature value is received on register 23 – in PLC addressing:

  SAC = Su – (Tu – SU)

  Where:

  SAC – setpoint value currently applied to the indoor unit

  Su – setpoint value

  Tu – external temperature reference written at BACnet side

  When INMBSFGL001I000 detects a change in any of the values of {Su, Tu}, it will send the new setpoint (SAC) to the indoor unit.

  Moreover, notice that temperature's values of all these four registers are expressed according to the temperature´s format configured through its onboard DIP-Switches (See sectin 4.3 for details). These following formats are possible:

- **Celsius value:** Value in Modbus register is the temperature value in Celsius (i.e. a value "22" in the Modbus register must be interpreted as 22ºC).
- **Tenths of value:** Value in Modbus register is the temperature value in decicelsius (i.e. a value "220" in the Modbus register must be interpreted as 22.0ºC).
- **Fahrenheit value:** Value in Modbus register is the temperature value in Fahrenheit (i.e. a value "72" in the Modbus register must be interpreted as 72ºF (~22ºC).

NOTE

- Fujitsu General cannot guarantee the Room Temperature object value is consistently equal to the current actual room temperature.
- The Room Temperature is only allowed for displaying, it cannot be used for controlling other equipment.

DIP-switch Configuration Interface
All the configuration values on INMBSFGL001I000 can be written and read from Modbus interface.
Otherwise,some of them can also be setup from its on-board DIP-switch interface. The device has DIP-switches SW1, SW2 and SW3 on the following locations:

SW2 → | □□□□□□□□ □□□ | ⊘ ⊘ ⊘ | → SW3

B A SG
EIA 485

Intesis®
BY HMS NETWORKS

AC Unit

L1 L2

↓ SW1   ↓ AC Unit

ON   ON
| □□□□□□□□ | | □□□ |
1 2 3 4 5 6 7 8   1 2 3
SW2   **SW3**

ON
| □□□□□□□□ |
1 2 3 4 5 6 7 8
SW1
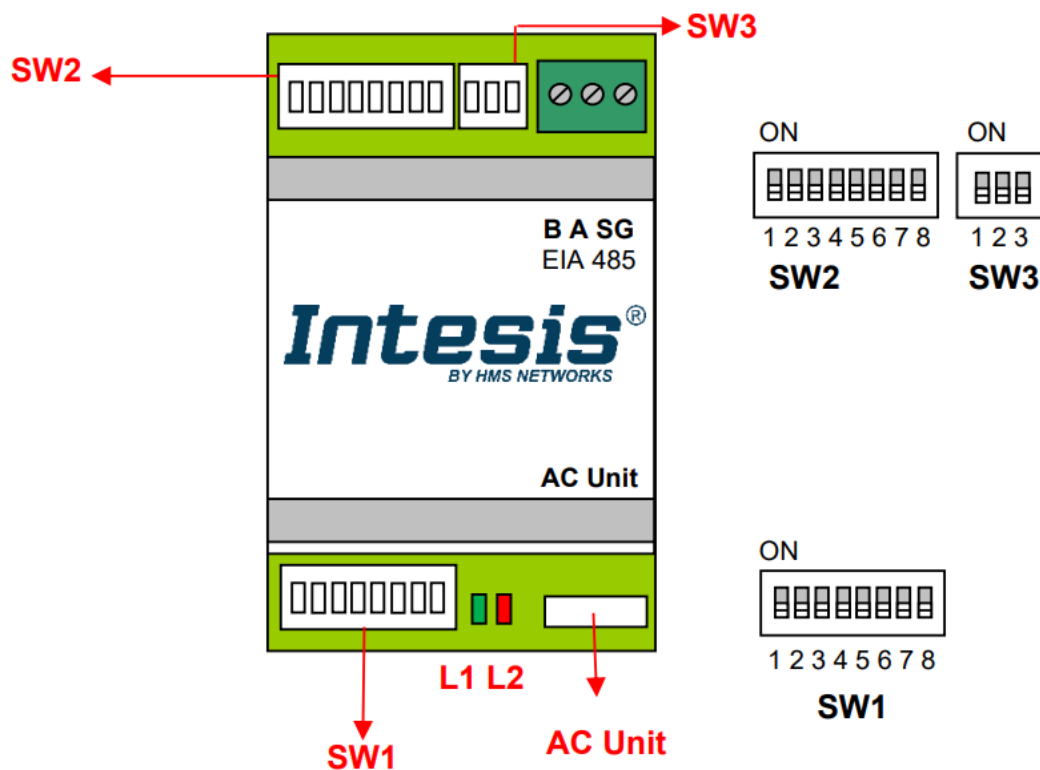
The following tables apply to the interface´s configuration through DIP-switches:

SW1 – AC configuration + Modbus baud rate

SW1								Description
1	2	3	4	5	6	7	8	
↓	↓	X	X	X	X	X	X	3 FanSpeeds
↓	↑	X	X	X	X	X	X	4 FanSpeeds (Default value)
↑	↓	X	X	X	X	X	X	5 FanSpeeds
↑	↑	X	X	X	X	X	X	6 FanSpeeds
X	X	↓	X	X	X	X	X	Not used (Default value)
X	X	↑	X	X	X	X	X	Not used
X	X	X	↓	X	X	X	X	Not used (Default value)
X	X	X	↑	X	X	X	X	Not used
X	X	X	X	↓	X	X	X	Not used (Default value)
X	X	X	X	↑	X	X	X	Not used
X	X	X	X	X	↓	↓	↓	2400 bps
X	X	X	X	X	↑	↓	↓	4800 bps
X	X	X	X	X	↓	↑	↓	9600 bps (default value)
X	X	X	X	X	↑	↑	↓	19200 bps
X	X	X	X	X	↓	↓	↑	38400 bps
X	X	X	X	X	↑	↓	↑	57600 bps
X	X	X	X	X	↓	↑	↑	76800 bps
X	X	X	X	X	↑	↑	↑	115200 bps

Table 4.1 SW1: AC Configuration + Modbus baud rate

SW2 – Modbus Slave address + Degrees/tenths of degrees (x10) + Temp. magnitude (ºC/ºF)

1	2	3	4	5	6	7	8	MBS slave Address
↓	↓	↓	↓	↓	↓	x	x	0
↑	↓	↓	↓	↓	↓	x	x	1 (Default value)
↓	↑	↓	↓	↓	↓	x	x	2
↑	↑	↓	↓	↓	↓	x	x	3
↓	↓	↑	↓	↓	↓	x	x	4
↑	↓	↑	↓	↓	↓	x	x	5
↓	↑	↑	↓	↓	↓	x	x	6
↑	↑	↑	↓	↓	↓	x	x	7
↓	↓	↓	↑	↓	↓	x	x	8
↑	↓	↓	↑	↓	↓	x	x	9
↓	↑	↓	↑	↓	↓	x	x	10
↑	↑	↓	↑	↓	↓	x	x	11
↓	↓	↑	↑	↓	↓	x	x	12
↑	↓	↑	↑	↓	↓	x	x	13
↓	↑	↑	↑	↓	↓	x	x	14
↑	↑	↑	↑	↓	↓	x	x	15
↓	↓	↓	↓	↑	↓	x	x	16
↑	↓	↓	↓	↑	↓	x	x	17
↓	↑	↓	↓	↑	↓	x	x	18
↑	↑	↓	↓	↑	↓	x	x	19
↓	↓	↑	↓	↑	↓	x	x	20
↑	↓	↑	↓	↑	↓	x	x	21
↓	↑	↑	↓	↑	↓	x	x	22
↑	↑	↑	↓	↑	↓	x	x	23
↓	↓	↓	↑	↑	↓	x	x	24
↑	↓	↓	↑	↑	↓	x	x	25
↓	↑	↓	↑	↑	↓	x	x	26
↑	↑	↓	↑	↑	↓	x	x	27
↓	↓	↑	↑	↑	↓	x	x	28
↑	↓	↑	↑	↑	↓	x	x	29
↓	↑	↑	↑	↑	↓	x	x	30
↑	↑	↑	↑	↑	↓	x	x	31

1	2	3	4	5	6	7	8	MBS slave Address
↓	↓	↓	↓	↓	↑	x	x	32
↑	↓	↓	↓	↓	↑	x	x	33
↓	↑	↓	↓	↓	↑	x	x	34
↑	↑	↓	↓	↓	↑	x	x	35
↓	↓	↑	↓	↓	↑	x	x	36
↑	↓	↑	↓	↓	↑	x	x	37
↓	↑	↑	↓	↓	↑	x	x	38
↑	↑	↑	↓	↓	↑	x	x	39
↓	↓	↓	↑	↓	↑	x	x	40
↑	↓	↓	↑	↓	↑	x	x	41
↓	↑	↓	↑	↓	↑	x	x	42
↑	↑	↓	↑	↓	↑	x	x	43
↓	↓	↑	↑	↓	↑	x	x	44
↑	↓	↑	↑	↓	↑	x	x	45
↓	↑	↑	↑	↓	↑	x	x	46
↑	↑	↑	↑	↓	↑	x	x	47
↓	↓	↓	↓	↑	↑	x	x	48
↑	↓	↓	↓	↑	↑	x	x	49
↓	↑	↓	↓	↑	↑	x	x	50
↑	↑	↓	↓	↑	↑	x	x	51
↓	↓	↑	↓	↑	↑	x	x	52
↑	↓	↑	↓	↑	↑	x	x	53
↓	↑	↑	↓	↑	↑	x	x	54
↑	↑	↑	↓	↑	↑	x	x	55
↓	↓	↓	↑	↑	↑	x	x	56
↑	↓	↓	↑	↑	↑	x	x	57
↓	↑	↓	↑	↑	↑	x	x	58
↑	↑	↓	↑	↑	↑	x	x	59
↓	↓	↑	↑	↑	↑	x	x	60
↑	↓	↑	↑	↑	↑	x	x	61
↓	↑	↑	↑	↑	↑	x	x	62
↑	↑	↑	↑	↑	↑	x	x	63

Table 4.2 SW2: Modbus slave address

SW2								Description
1	2	3	4	5	6	7	8	
x	x	x	x	x	x	–	x	Temperature values in ModBus register are represented in degrees (x1) (default value)
x	x	x	x	x	x		x	Temperature values in ModBus register are represented in tenths of degrees (x10)
x	x	x	x	x	x	x	–	Temperature values in ModBus register are represented in Celsius degrees (default value)
x	x	x	x	x	x	x	↓ ↑	Temperature values in ModBus register are represented in Fahrenheit degrees

SW3 – Termination resistor + BUS polarization configuration

SW3			Description
1	**2**	**3**	
↓	x	x	EIA-485/RS-485 bus without termination resistor (Default value).
↑	x	x	Internal termination resistor of 120Ω connected to EIA-485/RS-485 bus.
x	↓	↓	No BUS polarization (Default value).
x	↑	↑	BUS polarization active.

Implemented Functions

INMBSPAN001R000 implements the following standard Modbus functions:

- : Read Holding Registers
- 4: Read Input Registers
- 6: Write Single Register
- 16: Write Multiple Registers (Despite this function is allowed, the interface does not allow to write operations on more than 1 register with the same request, this means that length field should be always be 1 when this function is being used in case of writing)

Device LED indicator
The device includes two LED indicators to show all the possible operational states. In the following table there are written the indicators which can be performed and their meaning.

L1 (green LED)

Device status	LED indication	ON / OFF Period	Description
During not normal operation	LED blinking	500ms ON / 500ms OFF	Communication error
During normal operation	LED flashing	100ms ON / 1900ms OFF	Normal operation (configured and working properly)

L2 (red LED)

Device status	LED indication	ON / OFF Period	Description
During not normal operation	LED Pulse	3sec ON / — OFF	Under voltage

L1 (green LED) & L2 (red LED)

Device status	LED indication	ON / OFF Period	Description
During normal operation	LED Pulse	5sec ON / — OFF	Device Start-up
During not normal operation	LED alternatively blinking	500ms ON / 500ms OFF	EEPROM failure

EIA-485 bus. Termination resistors and Fail-Safe Biasing mechanism
EIA-485 bus requires a 120Ω terminator resistor at each end of the bus to avoid signal reflections.

To prevent fail status detected by the receivers, which are "listening" the bus, when all the transmitters' outputs are
in three-state (high impedance), it is also required a fail-safe biasing mechanism. This mechanism provides a safe status (a correct voltage level) in the bus when all the transmitters' outputs are in three-state. This mechanism must be supplied by the Modbus Master.

The INMBSFGL001I000 device includes an on-board terminator resistor of 120Ω that can be connected to the EIA485 bus by using DIP-switch SW4. Some Modbus RTU EIA-485 Master devices can provide also internal 120Ω terminator resistor and/or fail-safe biasing mechanism (Check the technical documentation of the Master device connected to the EIA-485 network in each case).

Mechanical & electrical characteristics

Enclosure	Plastic, type PC (UL 94 V-0) Net dimensions (dxwxh):93 x 53 x 58 mm / 3.7" x 2.1" x 2.3"Color: Light Grey. RAL 7035	Operation Temperature	0ºC to +70ºC
Weight	85 g.	Stock Temperature	-20ºC to +85ºC
Mounting	WallDIN rail EN60715 TH35.	Operational Humidity	<95% RH, non-condensing
Terminal Wiring (for low-voltage signals)	For terminal: solid wires or stranded wires (twisted or with ferrule)1 core: $0.5mm^2$… $2.5mm^2$ 2 cores: $0.5mm^2$… $1.5mm^2$ 3 cores: not permitted	Stock Humidity	<95% RH, non-condensing
ModBus RTU port	1 x EIA485 Plug-in screw terminal block (2 poles + GND) with 120 Ω resistor termination and polatization selectable by switch.	Isolation voltage	1500 VDC
AC unit port	1 x Specific connector Specific cable included	Isolation resistance	1000 MΩ
Switch 1 (SW1)	1 x DIP-Switch for Air Conditioner Unit + ModBus baud rate	Protection	IP20
Switch 3 (SW3)	1 x DIP-Switch for ModBus RTU slave address + temperature magnitude (ºC/ºF) and scale (x1/x10).	LED indicators	2 x Onboard LED – Operational status

DIMENSIONS
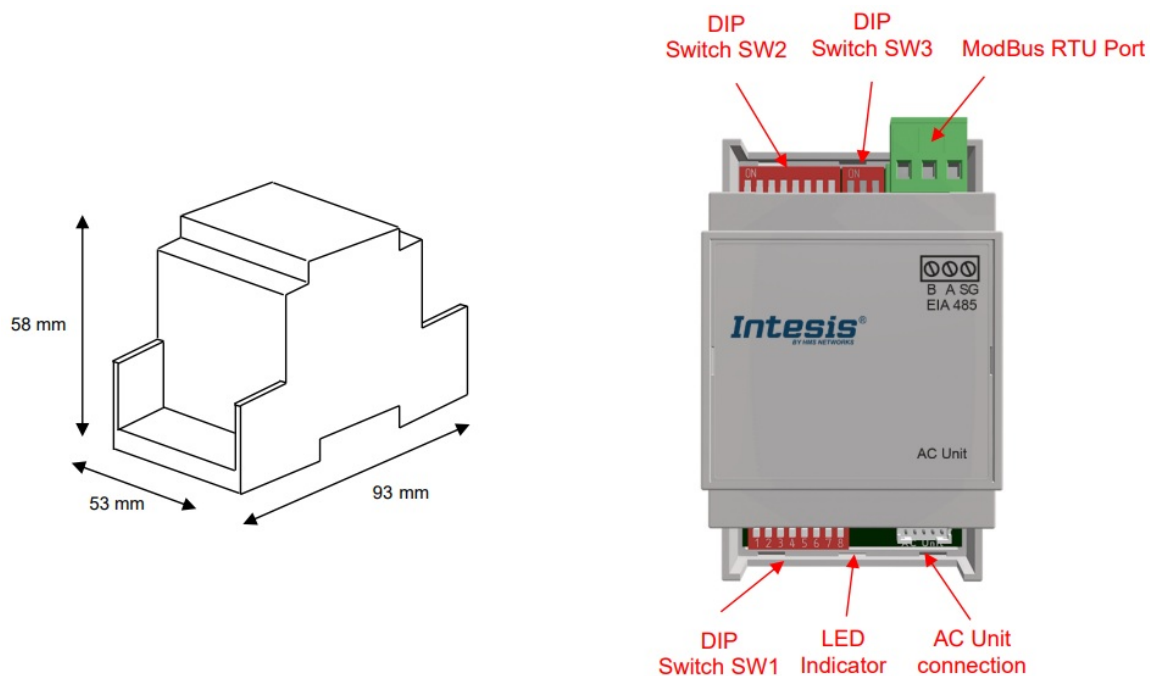
AC Unit Types compatibility

Please, check compatibility list at to know which Fujitsu units are compatible with our gateway.
https://www.intesis.com/docs/compatibilities/inxxxfgl001i000_compatibility

Error codes

Error Code Modbus	Error in Remote Controller	Error Description
0	N/A	No active error
65535(-1)	N/A	Error in the communication of INMBSFGL001I000 or Remote Controller with the AC unit

RAC and VRF J-II / V-II / VR-II series

Error Code Modbus	Error in Remote Controller	System	Error Description
0	00		Wired remote controller error
1	01		Indoor signal error
2	02		Indoor room temperature sensor error
3	03		Indoor room temperature sensor error
4	04		Indoor heat exchanger temperature sensor (middle) error
5	05		Indoor heat exchanger temperature sensor (middle) error

6	06		Outdoor heat exchanger temperature sensor (outlet) error
7	07		Outdoor heat exchanger temperature sensor (outlet) error
8	08		Power voltage error
9	09		Float switch operated
10	0A		Outdoor temperature sensor error
11	0b		Outdoor temperature sensor error
12	0C		Outdoor discharge pipe temperature sensor error
13	0d		Outdoor discharge pipe temperature sensor error
14	0E		Heat sink thermistor (Inverter) error
15	0F		Discharge temperature error
17	11		Indoor unit EEPROM error
18	12		Indoor fan error
19	13		Indoor signal error
20	14		Outdoor EEPROM error
21	15	**RAC**	Compressor temperature sensor error
22	16	Inverter and	Pressure switch abnormal, Pressure sensor error
23	17	Non Inverter	IPM protection
24	18		CT error
25	19		Active filter error
			INV voltage protection
26	1A		Compressor location error
27	1b		Outdoor fan error
28	1C		Outdoor unit computer communication error
29	1d		2-way valve temperature sensor error
30	1E		3-way valve temperature sensor error
31	1F		Connected indoor unit error
32	20		Indoor MANUAL AUTO switch error
33	21		reverse VDD permanent stop protection
34	22		VDD permanent stop protection
36	24		Excessive high pressure protection on cooling
37	25		P.F.C. circuit error
38	26		Indoor signal error
39	27		Indoor signal error

40	28		Indoor heat exchanger temperature sensor (inlet) error
41	29		Outdoor heat exchanger temperature sensor (middle) error
42	2A		Power supply frequency detection error
43	2b		Compressor temperature error
44	2C		4-way valve error

Error Code Modbus	Error inRemote Controller	System	Error Description
45	2d		Heat sink thermistor P.F.C. error
46	2E		Indoor unit damper error
			Inverter error
47	2F	**RAC**	Low pressure error
48	30	Inverter and	Refrigerant circuit address set-up error
49	31	Non Inverter	Master unit, Slave unit set-up error
50	32		Connected the indoor number set-up error
51	33		P.F.C. printed circuit board error
52	34		Indoor fan 2 error
53	35		Control box thermistor error
54	36		Indoor unit CT error
55	37		Indoor fan motor 1 driving circuit error
56	38		Indoor fan motor 2 driving circuit error
117	11		Serial communication error between indoor/outdoor units
118	12		Remote controller communication error
119	13		Communication error between outdoor units
120	14		Network communication error
121	15		Scan error
122	16		Peripheral unit communication error
123	17		Electricity charge apportionment error
133	21		Indoor unit initial setting error
134	22		Indoor unit capacity abnormal
135	23		Incompatible series connection error
136	24		Connection unit number error
137	25		Connection pipe length error
138	26	**RAC**	Indoor unit address setting error

139	27	Inverter	Master/slave unit setting error
140	28	Models G	Other setting error
141	29	series	Connection unit number error in wired remote controller system
149	31		Indoor unit power supply abnormal
150	32	**VRF**	Indoor unit main PCB error
151	33	J-II/V-II/VR-II	Indoor unit display PCB error
152	34	Series	Power relay error
153	35		Indoor unit manual auto switch error
154	36		Heater relay error
155	37		Indoor unit transmission PCB error
156	38		Network convertor PCB error
157	39		Indoor unit power supply circuit error
158	3A		Indoor unit communication circuit (wired remote controller) error
165	41		Indoor unit room temp. thermistor error
166	42		Indoor unit heat ex. temp. thermistor error
167	43		Humidity sensor error
168	44		Light sensor error
169	45		Gas sensor error
170	46		Float sensor error
171	47		Water temperature sensor error
172	48		Warm water flow rate sensor error
173	49		Heater sensor error
181	51		Indoor unit fan motor 1 error
182	52		Indoor unit coil (expansion valve) error
183	53		Indoor unit water drain abnormal
184	54		Air cleaning function error
185	55		Filter cleaning function error
186	56		Water circulation pump error
187	57		Indoor unit damper error
188	58		Indoor unit intake grille position error
189	59		Indoor unit fan motor 2 error

Error Code Modbus	Error inRemote Controller	System	Error Description
195	5U		Indoor unit miscellaneous error
197	61		Outdoor unit power supply abnormal
198	62		Outdoor unit main PCB error
199	63		Outdoor unit inverter PCB error
200	64		Outdoor unit active filter/PFC circuit error
201	65		Outdoor unit IPM error
202	66		Convertor distinction error
203	67		Outdoor unit power short interruption error (protective operation)
204	68		Outdoor unit magnetic relay error
205	69		Outdoor unit transmission PCB error
206	6A		Outdoor unit display PCB error
213	71		Outdoor unit discharge temp. thermistor error
214	72		Outdoor unit compressor temp. thermistor error
215	73		Outdoor unit heat ex. temp. thermistor error
216	74		Outside air temp. thermistor error
217	75		Outdoor unit suction gas temp. thermistor error
218	76		Outdoor unit operating valve thermistor error
219	77		Outdoor unit heat sink temp. thermistor error
220	78		Expansion valve temperature sensor error
229	81		Receiver liquid level detection sensor error
230	82		Outdoor unit sub-cool heat ex. gas temp. thermistor error
231	83		Outdoor unit liquid pipe temp. thermistor error
232	84	**RAC**	Outdoor unit current sensor error
233	85	Inverter	Fan motor current sensor error
234	86	Models G	Outdoor unit pressure sensor error
235	87	series	Oil sensor error
245	91		Outdoor unit compressor 1 error
246	92		Outdoor unit compressor 2 error
247	93	**VRF**	Outdoor unit compressor start up error
248	94	J-II/V-II/VR-II	Outdoor unit trip detection
249	95	Series	Outdoor unit compressor motor control error

250	96		Open loop error (Field-weakening relevant)
251	97		Outdoor unit fan motor 1 error
252	98		Outdoor unit fan motor 2 error
253	99		Outdoor unit 4-way valve error
254	9A		Outdoor unit coil (expansion valve) error
259	9U		Outdoor unit miscellaneous error
261	A1		Outdoor unit discharge temperature 1 error
262	A2		Outdoor unit discharge temperature 2 error
263	A3		Outdoor unit compressor temperature error
264	A4		Outdoor unit pressure error 1
265	A5		Outdoor unit pressure error 2
266	A6		Outdoor unit heat exchanger temperature error
267	A7		Suction temperature abnormal
268	A8		Poor refrigerant circulation
269	A9		Current overload error
270	AA		Outdoor unit special operation error
271	AC		Ambient temperature error
272	AF		Out of the possible operation range
273	AJ		Freeze protection operated
277	C1		Peripheral unit main PCB error
278	C2		Peripheral unit transmission PCB error
279	C3		Peripheral unit PCB 1 error
280	C4		PCB 2 error
281	C5		PCB 3 error
282	C6		PCB 4 error
283	C7		PCB 5 error

Error Code Modbus	Error in Remote Controller	System	Error Description
284	C8		Peripheral unit input device error
285	C9		Display device error
286	CA		EEPROM error
287	CC		Peripheral unit sensor error
288	CF		Peripheral unit external connector error (USB memory)
289	CJ		Other parts error
293	F1	**RAC**	System tool software error
294	F2	Inverter	System tool adaptor error
295	F3	Models G	System tool interface error
296	F4	series	System tool environment error
309	J1		RB unit error
310	J2		Branch boxes error
311	J3	**VRF**	Total heat exchanging, ventilation unit error
312	J4	J-II/V-II/VR-II	Domestic hot water unit error
313	J5	Series	Zone control interface error

VRF V / S / J Series

Error Code Modbus	Error in Remote Controller	System	Error Description
0	00		No Error
2	02		Model information Error
4	04		Power frequency Error
6	06	**VRF**	EEPROM access Error
7	07	V / S / J	EEPROM deletion Error
9	09	Series	Room sensor Error
10	0A		Heat Ex. Middle Sensor Error
11	0b		Heat Ex. Inlet sensor Error
12	0C		Heat Ex. Outlet sensor Error
13	0d		Blower temperature thermistor Error
17	11		Drain Error
18	12		Room temperature Error
19	13		Indoor fan motor Error
20	18	**VRF**	Standard wired remote Error
		V / S / J	Standard wired token Error
31	1F	Series	Network communication Error
32	20		Node setting error
33	21		Communication Error between Main PCB & Transmission PCB
34	32		Outdoor unit Error

In case you detect an error code not listed, contact your nearest Fujitsu technical support service for more information on the error meaning.

Documents / Resources

FUJITSU Modbus RTU RAC and VRF System [pdf] User Manual
INMBSFGL001I000, Modbus RTU RAC and VRF System, RTU RAC and VRF System, RAC and VRF System, VRF System

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