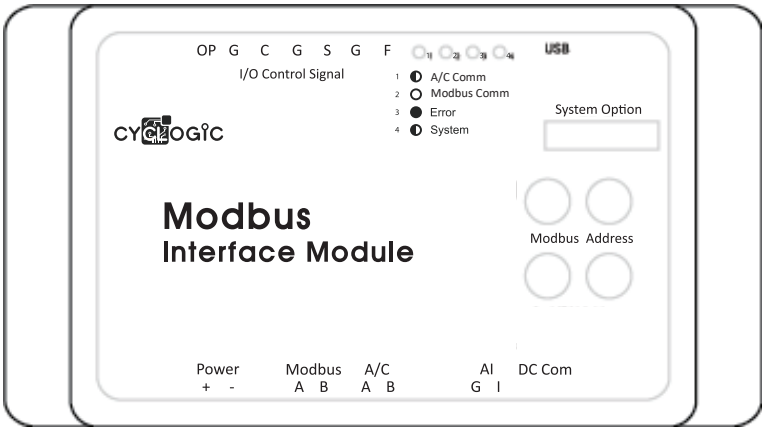
Modbus Interface Module

INSTRUCTION MANUAL

Model : CL-IM06** Series



Document Rev . 1

FOR INSTALLER

Before using the device, carefully read this installation/instruction manual to ensure proper operation. Keep this manual for future reference and give it to the technician when the device is reinstalled or repaired.

Contents

1. Confirming the supplied parts

Check that the box includes the following part(s) in addition to this installation manual:
CL-IM06** Series Modbus Interface Module

2. Safety Precautions

- Thoroughly read the following safety precautions before use.
- Hazards that can occur from incorrect handling are classified by the symbols below:

⚠ Warning	Indicate a potentially hazardous situation which, if not avoided, could result in death or serious injury.
⚠ Caution	Indicate a potentially hazardous situation which, if not avoided, could result in minor or moderate injury. It could also be used to alert against unsafe practices.
Notice	Indicates a situation that could result in equipment or property-damage only accidents.

- After reading this manual, keep this manual for future reference. When the device is reinstalled or repaired, give this manual to those who provide these services. When the user changes, make sure that the new user receives this manual.

⚠ Warning

- **Only a dealer or qualified technician should install, relocate, reinstall, or repair the device.**
  Improper installation or repair may result in electrical shock or fire.
- **Properly install the device on a stable, load-bearing surface.**
  Device installed on an unstable surface may fall and cause injury.

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- **Only use the specified cables; securely connect each so that the terminals do not bear any cable weight.**
  Improperly connected or short-circuited cables may produce heat and cause a fire.
- **All electrical work should be performed by an authorized electrician according to local regulations and instructions outlined in this manual.**
  Capacity shortage to the power supply circuit or improper installation may result in electrical shock or fire.
- **Do not make any modifications or alternations to the device.**
  Modifications or improper repair may result in electric shock or fire. Consult your dealer for repair.
- **Properly install the device according to the instructions in this Installation/Instruction Manual.**
  Improper installation may result in electric shock or fire.

⚠ Caution

- **Do not install the device in a location where a flammable gas leak may occur.**
  Gas may leak, collect around the device, ignite, and/or explode.
- **Do not install the device in environments where large amounts of oil (including machine), sulfidizing gas, or acidic, alkaline, chemical sprays are present.**
  These types of substances may damage internal parts, cause device performance to be reduced, and cause electrical shock.
- **Do not install the device in a bathroom, kitchen, or any room where steam could form.**
  Condensation may develop and cause electrical shock and/or the device to malfunction.
- **Do not install the device in a location where there is direct sunlight or where the temperature may become greater than 40°C (104°F) or less than 0°C (32°F).**
  If the device is installed in such place, it may result in deformation or malfunctions.
- **When installing the device in a hospital, communication facility, etc., provide sufficient protection against frequency noise.**
  Power generators and inverters, high-frequency medical, or radio communication equipment may interfere with the normal operation of this device. Subsequently, the device may also affect medical treatment, image broadcasting, etc., by creating frequency noise.
- **Include some slack in the power supply wires.**
  Tension on the wires may cause them to excessively heat up and/or break, resulting in a fire.
- **Use standard wires with the proper current capacity**
  to avoid the possibility of current leak, excessive heat, and/or fire.
- **Do not touch the main circuit board; also, make sure that dust does not accumulate on the circuit board.**
- **Do not immerse the device in water.**
  Doing so may lead to electric shock or malfunctions.

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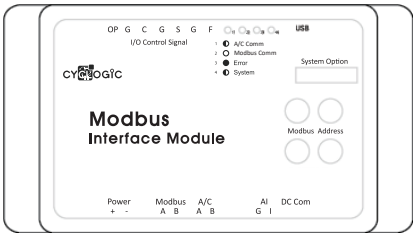
3. Product General

Description

This solution enables full integration of SAMSUNG DVM, CAC, FJM & RAC equipment into BMS systems using Modbus RTU protocol.

Parameters that can be controlled include ON/OFF, Mode, Set Point, Fan Speed and louvre control where applicable. Data can be read back to the BMS system including room temperature and fault status.

3.1. General Specifications



Items	Description
Size (W x H x D)	127mm x 70mm x 20mm (5 x 2.75 x 0.78 inch)
Power Supply	DC 12V
Network	F1/F2 or F3/F4 Control Board Network
AC Units	F1/F2: Up to 64 Indoor units controlled as a group F3/F4: Up to 16 Indoor units controlled as a group
Compatibility	SAMSUNG DVM, CAC, FJM & RAC

Model name	CL-IM06A	CL-IM06B
Communication connection type	F1/F2	F3/F4

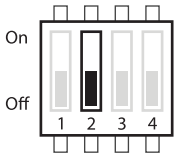
4. System Configuration before installing Modbus Interface Module

4.1. Dip Switch Settings

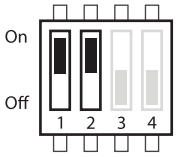
[IMPORTANT] If you set this SW wrong, until will not work or respond.

■ Communication Type

DIP SW1, SW3 : Adjust the initial setting according to the SAMSUNG AC Communication type.



DIP SW1	Access
2:ON	F1/F2
2:OFF	F3/F4 **[NOTICE] Only available for NASA Protocol**



DIP SW3	Access
1:ON, 2:ON, 3:OFF, 4: OFF	F3/F4
1:OFF, 2:OFF, 3:ON, 4:ON	F1/F2

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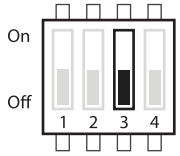
■ Protocol setting to control or monitor SAMSUNG AC

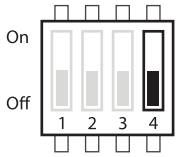
DIP SW1 : Adjust the initial setting according to the SAMSUNG AC Protocol type.



DIP SW1	Access
3:ON	RAC/FJM : Model number AR*****, AJ*****
3:OFF	DVM/CAC : Model number AM*****, AC****

■ Relay Control: OP

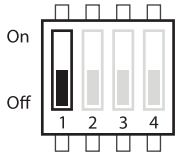
DIP SW1 : Adjust the initial setting for Relay Control: OP point



DIP SW1	Access
4:ON	Operation On, Auto Mode, 20C(68F)
4:OFF	Operation On, Auto Mode, 24C(75F)

■ Relay Control: C

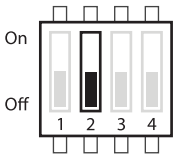
DIP SW2 : Adjust the initial setting for Relay Control: C point



DIP SW2	Access
1:ON	If C point is input, Cooling mode / 18C(64F)
1:OFF	If C point is input, Cooling mode / 22C(72F)

■ Relay Control: S

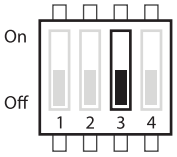
DIP SW2 : Adjust the initial setting for Relay Control: S point



DIP SW2	Access
2:ON	If S point is input, Heating mode / 30C(86F)
2:OFF	If S point is input, Heating mode / 26C(79F)

■ Relay Control: F

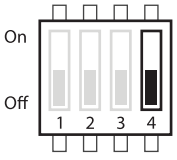
DIP SW2 : Adjust the initial setting for Relay Control: F point



DIP SW2	Access
3:ON	If F point is input, Fanspeed High
3:OFF	If F point is input, Fanspeed Low

■ Temperature unit setting to control or monitor SAMSUNG AC

DIP SW2 : Adjust the initial setting for Relay Control: F point



DIP SW2	Access
4:ON	Temperature unit is Fahrenheit
4:OFF	Temperature unit is Celsius

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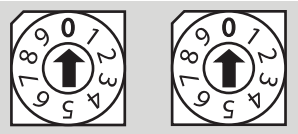
Device Configuration

Initial settings(Modbus Address) can be configured via 2 rotary switches on the circuit board. The circuit board can be accessed by unfastening the four screws on the back of the case.

4.2. Modbus Slave Address Setting with Rotary Switch



RSW1 (Ten) RSW2 (One)

RSW1 RSW1 : 10 digit

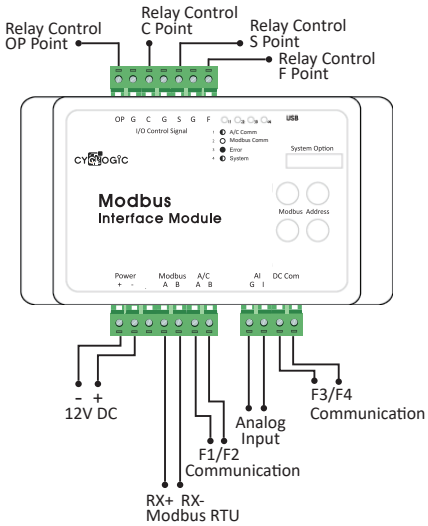
RSW2 RSW2 : 1 digit

5. How to install

NOTICE : Modbus Interface Module needs 12V DC power to operate.

5.1. Wire Connections

1. Choose a place where to install the CL-IM06** series. The device provides two mounting holes that can be used to mechanically affix the case to a solid surface. Double-sided tape may be used to affix the device. When using tape, ensure that the tape is approved for use within the anticipated operating temperature ranges.
2. Connect the CL-IM06** cable to the terminals F1/F2 or F3/F4 on the indoor unit control board for communication between SASMUNG indoor unit and Cyclogic Modbus Interface Module.
3. Connect the CL-IM06** cable to the terminals V1/V2 on the indoor unit control board for supplying power.
4. Connect the CL-IM06**C cable to the 3rd party controller.



No	Connector	Description
1	**MODBUS A B**	Connection for 3rd party controller
2	**A/C A B**	Connection for SAMSUNG AC's F1/F2 communication
3	**DC Com**	Connection for SAMSUNG AC's F3/F4 communication
4	**POWER**	Connection for power supply of DC 12V
5	**AI**	Analog Input(1-5VDC) for Set Temperature Unit / Value Celsius / 1-5V, 18-30C Fahrenheit / 1-5V, 64-86F Not Available
6	**OP**	Contact OP and G, AC will operate
7	**C**	Contact C and G, AC will change Cooling mode
8	**S**	Contact S and G, AC will change Heating mode
8	**F**	Contact F and G, AC will change Fanspeed

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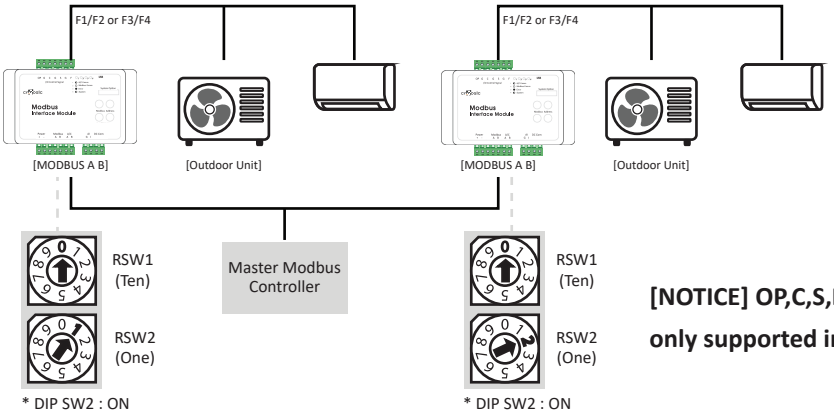

[NOTICE] OP,C,S,F,AI port controls are only supported in F3/F4 communication.

6. Modbus Protocol

6.1 MODBUS CONFIGURATION

Mode	Modbus RTU Slave
Length	500m
Addresses	1 ~ 99
Baud	9600 bps
Parity	No
Stop bits	1

6.2 MODBUS REGISTER

The CL-IM06** supports three types of register, Read Holding Registers, Preset Single Register and Read Input Registers.

Register Type	Access	Function
Read Holding Registers	Read	Readback and Monitoring Registers
Preset Single Register	Write	Controls and Command Registers
Read Input Registers	Read	Readback and Monitoring Registers

All analogue and digital values are accessed through these registers. All register values are 16-bit signed integer values.

Registers are accessed using standard Modbus functions. The following three functions are supported by the CL-IM06**.

Function Code (Hex code)	Function Name
03 (03h)	Read Holding Registers
04 (04h)	Read Input Registers
06 (06h)	Preset Single Register

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6.3 Read and Writeable Indoor Unit Data

The CL-IM06** supports three types of register, Read Holding Registers, Preset Single Register and Read Input Registers..

Unit data is available for each of the indoor units on the F1/F2 network. Unit registers are numbered using the indoor unit numbering in the range 40001~40008 + N(Indoor Unit Address) x 20 added to an offset relating to a specific feature.
In case of F3/F4, only indoor unit (address 0) data is output because it is group control method.

Every data types are a 16-bit signed integer.

Indoor Unit Addresses				Length (Byte)	Name	Value		Notes	Read/ Write
IDU 00	IDU 01	....	IDU 63			DEC	HEX		
40001	40021	....	41261	2	IDU ON/OFF STATUS	0	0X0000	OFF	R/W
						1	0X0001	ON	
40002	40022	....	41262	2	IDU OPERATION MODE	0	0X0000	AUTO	R/W
						1	0X0001	COOL	
						2	0X0002	DRY	
						3	0X0003	FAN	
						4	0X0004	HEAT	
40003	40023	....	41263	2	IDU SET TEMPERATURE	-	-	SET TEMP = Value/10	R/W
40004	40024	....	41264	2	IDU FAN SPEED	0	0X0000	AUTO	R/W
						1	0X0001	LOW	
						2	0X0002	MID	
						3	0X0003	HIGH	
						254	0X00FE	OFF	R
40005	40025	....	41265	2	IDU DECO PANEL LOUVER SWING	0	0X0000	SWING OFF	R/W
						1	0X0001	SWING ON : UPPER & LOWER LOUVER	
						2	0X0002	SWING ON : RIGHT & LEFT LOUVER	
						3	0X0003	SWING ON : ALL LOUVER	
40008	Only AHU F3F4 Connection				DISCHARGE TEMP. CONTROL ENABLE	0	0X0000	DISABLED	R/W
						1	0X0001	ENABLED	
40009					COOLING SET DISCHARGE TEMP.	SET TEMP = Value/10 TEMP. RANGE: 8 ~ 18			R/W
40010					HEATING SET DISCHARGE TEMP.	SET TEMP = Value/10 TEMP. RANGE: 30 ~ 43			R/W
40011	ODU Control				COOLING CAPACITY CALIBRATION	0: 7~9(Default), 1: 5~7, 2: 9~11, 3: 10~12, 4: 11~13, 5: 12~14, 6: 13~15			R/W
40012					HEATING CAPACITY CALIBRATION	0: 30(Default), 1: 25, 2: 26, 3: 27, 4: 28, 5: 29, 6: 31, 7: 32, 8: 33			R/W

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6.4 Read Only Indoor Unit Data

Unit data is available for each of the indoor units on the F1,F2 network. Unit Input registers are numbered using the indoor unit numbering in the range 30001 + N(Indoor Unit Address) x 20 added to an offset relating to a specific feature.

In case of F3/F4, only indoor unit (address 0) data is output because it is group control method.

Indoor Unit Addresses				Length (Byte)	Name	Value		Notes	Read/ Write
IDU 00	IDU 01	....	IDU 63			DEC	HEX		
30001	30021	....	31261	2	IDU ROOM TEMPERTURE	-	-	ROOM TEMP = Value/10	R
30005	30025	....	31265	2	Error Code	-	-	E XXX	R

cf. Error Code returns only numbers except for the capital 'E'.
Please refer to Samsung error code list for more details.

6.5 Read Only Outdoor Unit Data

Unit Input registers are numbered using the outdoor unit numbering in the range 34001 ~ 34004 added to an offset relating to a specific feature.

Outdoor Unit Addresses	Length (Byte)	Name	Value		Notes	Read/ Write
ODU 00			DEC	HEX		
30011	2	ODU ON/OFF STATUS	0	0X0000	OFF	R
			1	0X0001	ON	
30012	2	ODU OPERATION MODE	0	0X0000	UNDEFINED	R
			1	0X0001	COOL	
			2	0X0002	HEAT	
			3	0X0003	COOL MAIN	
			4	0X0004	HEAT MAIN	
30013	2	OUTDOOR TEMPERATURE	-	-	OUTDOOR TEMP = Value/10	R
30014	2	ERROR CODE	-	-	E XXX	R

cf. Error Code returns only numbers except for the capital 'E'.
Please refer to Samsung error code list for more details.

[NOTICE] In case of F3/F4 communication, outdoor unit data is not supported.

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