

Safety Precautions

Before performing design, construction, or maintenance thoroughly, read the "Safety Precautions" in the installation manual provided with the product.

1. Introduction

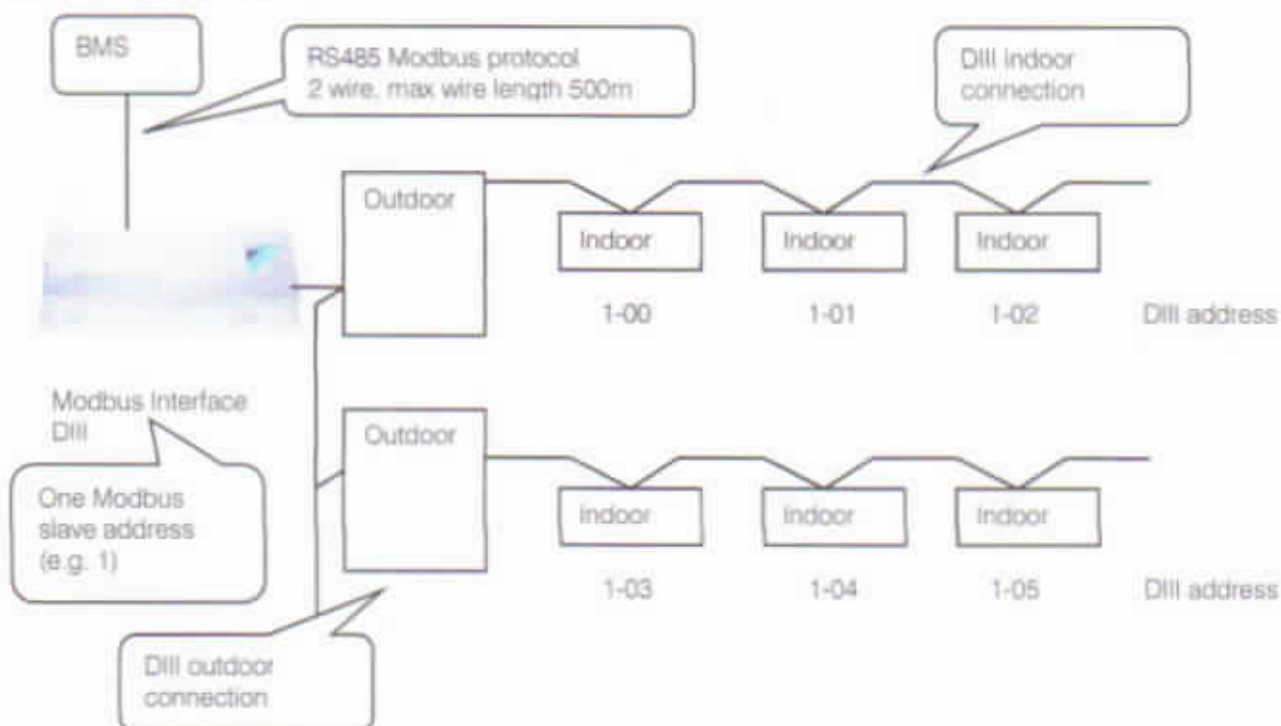
A Building Management System (BMS) can control Daikin units through the Modbus protocol by using the *Modbus Interface DIII* EKMBDXA7V1

Glossary:

- BMS: Building Management System
- DIII unit: Unit with DIII communication connected to the Modbus Interface DIII.
- DIII device: A centralised device from Daikin with DIII communication (e.g. iTM, ...)
- Indoor unit: As the main target is to monitor and control VRV connected indoor units, the DIII units are referred to as *indoor units*. For some systems the connected DIII units are in reality outdoor units (e.g. Applied units)

1.1 System layout

Typical setup (eg VRV)



DIII address (Group NO) needs to be set on an individual indoor unit or group by the connected user interface.

Functions of each indoor unit in a range for each register:

Example:

Register address	DIII address functions
31001 - 31003	1-00
31004 - 31006	1-01
...	...

2. Modbus communication

2.1 Modbus Interface DIII settings

Communication protocol	Modbus RTU (according to "Modicon Modbus Protocol reference guide" PI-MBUS-300 Rev J)	Dipswitch setting
Communication speed	9600 bps Or 19200 bps	DS1 pin 2: Off DS1 pin 2: On
Parity / stop bit	Even 1 stop bit Odd 1 stop bit None 2 stop bit None 1 stop bit	DS1 pin 3: Off 4: Off DS1 pin 3: Off 4: On DS1 pin 3: On 4: Off DS1 pin 3: On 4: On
One dedicated modbus address setting	1..15	DS2 pin 1/2/3/4 Addr 1: Off/Off/Off/On Addr 2: Off/Off/On/Off ... Addr 15: On/On/On/On
Implemented function codes	0x03 Read Holding Registers (broadcast support) 0x04 Read Input Registers (broadcast support) 0x06 Preset Single Registers (No broadcast support) 0x10 Preset Multiple Registers (No broadcast support) (remark: Holding Registers will not reflect the actual value) (other function codes are treated as illegal function and return an exception response)	
Data types	Input Register: Length 16 bits, Address range: 30001 - 39999 Holding Register: Length 16 bits, Address range: 40001 - 49999 (Data larger than 16 bits can be handled by assigning continuous addresses to registers.)	
Register addresses	Same address meaning for each applicable model	

3. Modbus registers

Input registers

30001 till 30009	General Modbus Interface Dll status (incl. Detected Dll units & communication status of Dll units)
31001 and higher	Individual Dll units information

Holding registers

41001	Modbus Interface Dll central "forced off"
42001 and higher	Individual Dll units instructions

Calculation method for input & holding registers of each connected Dll group address:

Dll group address has an "upper address" and a "lower address"

Example for 1-00: "1" is the upper address, "00" is the lower address

Register of a Dll group address: Base register + ((upper address - 1) * 16 + lower address) * step

E.g. capability input register for 4-15: $31001 + ((4 - 1) * 16 + 15) * 3 = 31190$

3.1. Input registers

Input register	Bit	Description	Meaning	
30001	15..2	-		
	1	Other Dll device exists	0: No 1: Yes	Note: When another Dll device is connected or disconnected to the Dll, it can take up till 10 minutes to update the status of the input register. (Remark: Initially delivered from factory the value is 1)
	0	Modbus Interface Dll status	0: Busy 1: ready	
30002	15..0	Dll unit connected status	0: not connected 1: connected	Dll address 1-00 (bit 0) till 1-15 (bit 15)
30003	15..0			Dll address 2-00 (bit 0) till 2-15 (bit 15)
30004	15..0			Dll address 3-00 (bit 0) till 3-15 (bit 15)
30005	15..0			Dll address 4-00 (bit 0) till 4-15 (bit 15)
30006	15..0	Dll unit communication status	0: Normal 1: Communication error	Dll address 1-00 (bit 0) till 1-15 (bit 15)
30007	15..0			Typically when a Dll device is connected once, and then disconnected: it can take up till 10 minutes to discover the communication error.
30008	15..0			Dll address 2-00 (bit 0) till 2-15 (bit 15)
30009	15..0			Dll address 3-00 (bit 0) till 3-15 (bit 15)
				Dll address 4-00 (bit 0) till 4-15 (bit 15)

Input register				VRV	Sky-air	HRV	Split	VRV hydrobox LT & HT	Air curtains	ERQ control box	Heating	Applied																																													
On/Off	On/Off status of indoor units * For VRV hydrobox LT & HT & Heating: On/off "space cooling/heating" status and control			0	0	0	0	0*	0	0	0*	0																																													
"Forced off"	"Forced off" status of indoor unit (for each unit separate) (by T1-T2 or by central "Forced off" from the Modbus Interface Dll) (HRV: no "Forced off" status)			0	0	-	0	0	0	0	0	0																																													
Indoor status	Thermostat status Indoor fan status (if present) Heater status (if present)			0	0	-	0	0	0	0	0	0																																													
Fan speed (Air flow rate)	LL, L, M, H, HH (depending on indoor unit capability) * Air curtain: CYV models: not available CYQ models: available * HRV (ventilation rate): VAM models: available VKM models: not available			0	0	0*	-	-	0*	-	-	-																																													
Fan direction	Swing, Flap direction (depending on indoor unit capability)			0	0	-	-	-	-	-	-	-																																													
32001 (1-00) 32007 (1-01) ... (step of 6) 32379 (4-15)	Bit	Description	Meaning																																																						
	15	-																																																							
	14	Fan speed	0 till 7	This value is depending on "fan speed steps capability" value <table><tr><td>Value</td><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td></tr><tr><td>Fix</td><td>-</td><td>-</td><td>-</td><td>-</td><td>-</td><td>H</td><td>-</td><td>-</td></tr><tr><td>2step</td><td>-</td><td>L</td><td>-</td><td>-</td><td>-</td><td>H</td><td>-</td><td>-</td></tr><tr><td>3step</td><td>-</td><td>L</td><td>-</td><td>M</td><td>-</td><td>H</td><td>-</td><td>-</td></tr><tr><td>5step</td><td>-</td><td>LL</td><td>L</td><td>M</td><td>H</td><td>HH</td><td>-</td><td>-</td></tr></table> HRV (ventilation rate): (note for HRV: fan speed steps capability is fixed to 0) For VAM units: value 3:L, 7:H									Value	0	1	2	3	4	5	6	7	Fix	-	-	-	-	-	H	-	-	2step	-	L	-	-	-	H	-	-	3step	-	L	-	M	-	H	-	-	5step	-	LL	L	M	H	HH	-	-
	Value												0	1	2	3	4	5	6	7																																					
	Fix												-	-	-	-	-	H	-	-																																					
	2step	-	L	-	-	-	H	-	-																																																
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	5step	-	LL	L	M	H	HH	-	-																																																
	13																																																								
	12																																																								
	11	-																																																							
	10	Fan direction	0 till 7	This value has only meaning if "Fan direction capability" exists 0: P0, 1: P1, 2:P2, 3: P3, 4: P4, 5: -, 6: Stop, 7: swing P0 = horizontal direction P4 = vertical direction																																																					
	9																																																								
	8																																																								
	7	Thermo status	0: Off 1: On																																																						
6	Heater status	0: Off 1: On																																																							
5	Fan status	0: Off 1: On																																																							
4	-																																																								

3	-		
2	Forced off status	0: none 1: Forced off	or Indoor status of "Forced off" of digital input T1-T2 or by central "Forced off" by Modbus Interface DIII
1	-		
0	On/off status	0: Off 1: On	

Input register		VRV	Sky-air	HRV	Split	VRV hydrobox LT & HT	Air curtains	ERQ control box	Heating	Applied
Cooling/ Heating Operation setting mode	Depending on indoor unit capability (fan only/Cool/heat/auto/dry) * for split: no fan only mode * for VRV hydrobox LT&HT & heating & applied Only Heating&Cooling * for HRV. Only ventilation	0	0	0*	0*	0*	0	0	0*	0*
Filter sign	Filter sign of indoor units * Air curtain: CYV models: not available CYQ models: available	0	0	0	-	-	0*	-	0	-
Indoor status	Defrost/hot start status	0	0	-	0	0	0	0	0	0
	Operation status	0	0	-	-	0	0	0	0	0
32002 (1-00) 32008 (1-01) (step of 6) 32380 (4-15)	Bit	Description	Meaning							
	15	Cool/heat master	0 till 2	0: not decided 1: Slave 2: Master (means possible to change cool/heat operation mode via this indoor unit)						
	14									
	13	Defrost/ hot start status	0: Off 1: On							
	12	-								
	11	Operation status	0 till 2	0: Fan, 1: Heating, 2: Cooling Actual running status.						
	10									
	9									
	8									
	7	Filter sign status	0: Off 1 till 15: On							
	6									
	5									
	4									
	3	Operation mode setting	0 till 7	0: Fan, 1: Heating, 2: Cooling, 3: Auto 4: Ventilation, 5: -, 6: -, 7: Dry						
	2									
	1									
	0									