DAIKIN

EDMT721419

HA

Home Automation

INTERFACE ADAPTOR DTA116A51

Connects *VRV* system to home automation system

HA Interface Adaptor DTA116A51

DIII-NET/Modbus Communication Adaptor

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Part 1

Features

The *VRV* system can be operated from the home automation system.

Use of the Modbus protocol enables the connection of the *VRV* system with a variety of home automation systems from other manufacturers.

Image to use Home Automation Interface Adaptor DTA116A51

Specifications of DTA116A51

Connection	DⅢ-NET (F1F2)
Protocol	Modbus (RS485)
Connectable indoor units	Up to 16 *VRV* indoor units
Connectable outdoor units	Up to 2 *VRV* outdoor units
Installation place	Outdoor unit
Power supply	Supply from outdoor unit PCB

Communication specifications

Communication protocol	Modbus RTU
Communication speed	9600/19200bps
Stop bit	1/2bit
Parity	odd/even/none
Data length	8bit
Modbus address range	1 to 15

Compatible models

Type			Model name
VRV Ⅲ	Heat Pump	50Hz	RXYQ-PAY1(E)
			RXYQ-PAYC(E)
		60Hz	RXYQ-PAYL(E)
			RXYQ-PTL(E)
			RXYQ-PYLT(E)
			RXYQ-PTLT(E)
			RHXYQ-SYL
	Cooling Only	50Hz	RXQ-PAY1
VRV Ⅲ-S	Heat Pump	50/60Hz	RXYMQ-PVE
		50Hz	RXYMQ-PV4A
		60Hz	RXYMQ-PVET
	Cooling Only	50/60Hz	RXMQ-PVE
VRV Ⅲ-Q	Heat Recovery	50Hz	RQCEQ-PY1

＊Models other than those above require a separate power supply for DTA116A51.

Functions

Monitor

On/Off	On/Off status of indoor units
Operation mode	Cooling, Heating, Fan, Dry, Auto (depend on indoor unit capability)
Setpoint	Setpoint of indoor units
Room temperature	Suction temperature of indoor units
Fan direction	Swing, Flap direction (depend on indoor unit capability)
Fan volume	L, M, H (depend on indoor unit capability)
Forced off status	Forced off status of indoor units
Error	Malfunction, Warning with Error code
Filter sign	Filter sign of indoor units
Communication status	Communication normal/error of indoor units

Control

On/Off	On/Off control of indoor units
Operation mode	Cooling, Heating, Fan, Dry, Auto (depend on indoor unit capability)
Setpoint	Cooling/Heating setpoint
Fan direction	Swing, Stop, Flap direction (depend on indoor unit capability)
Fan volume	L, M, H (depend on indoor unit capability)
Filter sign reset	Reset filter sign of indoor units

Retrieve system information

Connected indoor units	DⅢ-NET address of connected indoor units can be retrieved.
Indoor unit capabilities	Indoor unit capabilities such as operation mode, fan control,setpoint HV can be retrieved.

Operating conditions

Power supply	DV16V (+10% , -5%)
Operating temperature limit	-20 to 65℃
Operating humidity limit	0 to 95% Non Condensing
Storage temperature range	-25 to 75℃
Mass	Approximately 80g
Dimensions	100×100mm

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Part 2

Installation

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DⅢ-NET/Modbus Communication adaptor Installation Manual

DTA116A51

Also see installation manual attached to equipment you connect.
Please read these "SAFETY PRECAUTIONS" carefully before installing option adaptor and be sure to install it correctly.

- They both contain important information regarding safety. Be sure to observe all precautions without fail.

⚠ WARNING	Failure to follow these instructions properly may result in personal injury or loss of life.
⚠ CAUTION	Failure to observe these instructions properly may result in property damage or personal injury, which may be serious depending on the circumstances.

- After completing installation, conduct a trial operation to check for faults.
  Ask the customer to store the installation manual.

⚠ WARNING

- Ask your dealer or other qualified personnel to carry out installation work
  Do not attempt to install the unit yourself. Improper installation may result in an electric shock or fire.
- Do not relocate or reinstall the unit yourself
  Improper installation work may result in an electric shock or fire.
  Ask your local dealer to carry out relocation and reinstallation of the unit.
- Install the unit in accordance with the instructions in this installation manual
  Improper installation may result in an electric shock or fire.
- Be sure to use only the specified accessories and parts for installation work
  Failure to use the specified parts may result in the unit falling, an electric shock, or fire.
- Always perform installation work with the power supply shut off
  Touching energized electric parts causes an electric shock.
- Do not disassemble, modify or repair the unit
  An electric shock or fire may be caused.
- Make sure that all wiring is secured, that the specified wires are used, and that there is no strain on the terminal connections or wires
  Improper connection or securing of wires may result in abnormal heat build-up or fire.
- The choice of materials and installations must comply with the applicable national and international standards
- Make sure that a separate power supply circuit is provided for this unit and that all electrical work is carried out by qualified personnel according to local laws and regulations and this installation manual
  An insufficient power supply capacity or improper electrical construction may lead to an electric shock or fire.
- When wiring the power supply and connecting the transmission wiring, position the wires so that the electric parts box lid can be securely fastened
  Improper positioning of the electric parts box lid may result in an abnormal heat buildup, an electric shock, or fire.

⚠ CAUTION

- Be very careful about product transportation
- Safely dispose of the packing materials
  Tear apart and throw away plastic packaging bags so that children will not play with them.
  If children play with a plastic bag which was not torn apart, they face the risk of suffocation.
- In a domestic environment, this product may cause radio interference
  In such case, the user may be required to take adequate measures.
- Disposal requirements Dismantling of the unit, treatment of the refrigerant, of oil and of other parts must be done in accordance with relevant local and national legislation
- Fill the wiring through hole with putty
  Entry of water or insects may result in electric leakage or malfunction.
- Do not operate with wet hands
  An electric shock and malfunction may be caused.
- Do not wash this unit with water
  An electric shock or fire may be caused.

1 System Outline

This adaptor is an interface which is requeired to monitor and control the indoor unit from the Home Automation System manufactured by the other companies. It can stop the indoor unit operation, monitor and control the operation mode, preset temperature, air flow rate and direction via Modbus communication.
It can also carry out emergency supervisory, monitor and reset the filter sign.

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Note
- The total wiring length of the RS-485 communication wire must be within 500m.
- Maximum number of units which can be connected is 16 units for the indoor unit and 2 units for the outdoor unit.

❷ Accessories

The follwing items are packed.

Name	①DⅢ-NET/Modbus Communication adaptor
Form	
No. of pcs.	1

Name	Accessories bag (TypeA)	Accessories bag (TypeB)	Installation Manual
No. of pcs.	1	1	1

Accessories bags use either TypeA or TypeB.
This is determined by the outdoor unit series.

Contents of accessories bag

●TypeA

Application model of outdoor unit

Series	Model name
VRVⅢ-S	RXYMQ-PVE, RXYMQ-PV4A, RXYMQ-PVET, RXMQ-PVE

Name	②Wire of power supply (White/Black)	③Wire of DⅢ-NET Communication (Orange/Yellow)	④Clamp material
No. of pcs.	1 set		1

●TypeB

Application model of outdoor unit

Series	Model name
VRVⅢ	RXYQ-PAY1(E), RXYQ-PAYC(E), RXYQ-PAYL(E), RXYQ-PTL(E) RXYQ-PYLT, RXYQ-PTLT, RHXYQ-SYL, RXQ-PAY1
VRVⅢ-Q	RQCEQ-PY1

Name	⑤Wire of power supply (White/Black)	⑥Wire of DⅢ-NET Communication (Orange/Yellow)	⑦PCB Support	⑧Clamp material	⑨Wire clip
No. of pcs.	1	1	4	1	3

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❸ Parts name and function

DIP Switch(DS1/DS2)

This is the operation setting switch for DⅢ-NET/Modbus communication adaptor.

LED(H1P～H7P:ORANGE)

This lamp to display the status of the communication.

Service Monitor LED(HAP:GREEN)

This lamp flashes while the CPU is operating normally.

Power Supply Connector(X1A)

Connector to supply DC16V from PCB ASSY in the outdoor unit.

DⅢ-NET communication connector(X7A)

Connector to connect the DⅢ-NET communication wire.

Terminal block for Modbus communication(X2M)

Termminal block to connect the Modbus communication wire.

Terminating Resistance(SS1/SS2/SS3)

Setup the terminating resistance for Modbus Communication wire.

❹ Mounting Method

●TypeA(VRVⅢ-S:RXYMQ-PVE, RXYMQ-PV4A, RXYMQ-PVET, RXMQ-PVE)
Connect the①Adaptor in the Electric component box of outdoor unit.
(Mount size of 100 × 100mm in the lower right)

TO BACK

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❺ Electric Wiring

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(1)Power Supply wiring (TypeA/TypeB common)
Connect between this adaptor connector(X1A) and outdoor unit circuit board connector(X37A) with ② or ⑤ wire of power supply.

(2)DⅢ-NET Communication wiring(DⅢ-NET)
Connect with ③ or ⑥ wire of DⅢ-NET Communication. Connecting work changes with the model of outdoor unit.
(TypeA) Connect between this adaptor connector(X7A) and terminal for communication (F1/F2 of "TO OUT/D UNIT") with ③ wire of DⅢ-NET Communication.
(TypeB) Connect between this adaptor connector(X7A) and outdoor unit circuit board terminal (F1/F2 of "TO OUT/D UNIT") with ⑥ wire of DⅢ-NET Communication.

(3)Modbus Communication wiring(Modbus:RS-485) (TypeA/TypeB common, Local procurement parts)
Connect between this adaptor Modbus Commnication Terminal(X2M) and Home Automation System Terminal.
Connect between this adaptor A[+]connector and Home Automation System Terminal +connector, B[-]connector and Home Automation System Terminal -connector.
In case of using shelding wire, do not earth with outdoor unit.
Please earth with connecting device.

See ❹ Mounting Method to know the wiring route.

Note
- Wire Specification of Modbus transmitting
  Use the wire thickness 0.75mm²～1.25mm².
- Maximum wire length between this adaptor and Home Automation System is 500m. Over length of wire causes then transmission error.
  Make sure to the length of wire.
- Modbus transmission wiring has polarity. Be sure to connect after checking the polarity of wire.

❻ Field Configration

(1)DIP Switch(DS1/DS2)

- DS1:Modbus communication setting
  Matching with your Home Automation System, setup in accordance with the table below.

No.	Item	OFF	ON
1	Unused(Note1)	-	-
2	Communication speed	9600bps	19200bps
3	Stop Bit	1	2
4	Parity Check	Even	Odd

:Factory default

(Note1) DS1-1 is not used.
Please do not change.

- DS2:Address setting
  Set the address of this adaptor in accordance with the Fig. on the right.

At Address:0 setting, monitoring and control can not be carried out from the Home Automation System since Modbus communication can not be performed.

(2)Terminating Resistance(SS1/SS2/SS3)
Setup the terminating resistance in accordance with the Fig. on the right.

(Note2) SS1 is not used.
Please do not change.

(3)Group Address setting

Note
- All indoor units be powered on before setting the DⅢ-NET address.
- The DⅢ-NET address needs to be unique between every indoor unit.

To use this adaptor, set the DⅢ-NET address on each indoor unit.
Operation changes with the remote controllers to be used.

After all electrical wiring works, and all indoor/outdoor unit are powered on, set the DⅢ-NET address.

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• Case of Navigation Remote Controller

A Display
B Up button
C Menu/Enter button
D Right button
E Cancel button
F Down button

1. Press and hold the Cancel button (E) for 4 seconds or more.
   The "Filed setting" menu is displayed.

2. Using the Up button(B) and Down button(F), select "Group No. setting" and press the Menu/Enter button(C) .
   The "Group No. setting" menu is displayed.

3. Using the Up button(B) and Down button(F), select "Group No. setting(Group)" and press the Menu/Enter button(C) .
   The current address setting is displayed.

4. Press the Menu/Enter button(C) to release the current address setting. The mode indication changes from "Setting to Release" .
   You are now ready to change the DⅢ-NET address.

5. Using the Up button(B) and Down button(F), select the address you want to set.

6. Press the Menu/Enter button(C).
   The DⅢ-NET address has been set.

7. Press the Cancel button (A) three times.
   You are now brought back to normal mode.

• Case of Wired Remote Controller

A Address display area
B Parameter number display area
C Programming time buttons
D Temperature setting buttons
E Timer ON/OFF button
F Inspection/Test operation button

1. Press and hold the Inspection/Test Operation button (F) for 4 seconds or more. "SETTING" appears in the center of remote controller display(B).

2. Using the Temperature Setting buttons (D), change the value shown in the parameter number display area (B) to "00" .
   In the address display area (A), the current address setting is displayed. (This area will show "?" if no address is set.)

3. Press the Timer ON/OFF button (E) to make the "GROUP" indicator blink.
   You are now ready to change the DⅢ-NET address.

4. Using the Programming time buttons (C), select the address you want to set.

5. Press the Timer ON/OFF button (E) to make the "GROUP" indicator stay lit.
   The DⅢ-NET address has been set.

6. Press the Inspection/Test Operation button (F).
   You are now brought back to normal mode.

■ TRADEMARK
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Part 3

Functional Specification

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1.Introduction

- To use DⅢ-NET/Modbus Communication adaptor, Home Automation system can control VRV with modbus protocol.

1-1.System structure

1-2.Limitations of DⅢ-NET/Modbus Communication adaptor

- The number of control command for one indoor unit must be within 7,000 times per year.
- If HA System controls VRV by using automatic control program, please make sure don't exceed this limitation.

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1-3.Functions

Monitor

On/Off	On/Off status of indoor units
Operation mode	Cooling, Heating, Fan, Dry, Auto (depend on indoor unit capability)
Setpoint	Setpoint of indoor units
Room temperature	Suction temperature of indoor units
Fan direction	Swing, Flap direction (depend on indoor unit capability)
Fan volume	L, M, H (depend on indoor unit capability)
Forced off status	Forced off status of indoor units
Error	Malfunction, Warning with Error code
Filter sign	Filter sign of indoor units
Communication status	Communication error of indoor units

Control

On/Off	On/Off control of indoor units
Operation mode	Cooling, Heating, Fan, Dry, Auto (depend on indoor unit capability)
Setpoint	Cooling/Heating setpoint
Fan direction	Swing, Stop, Flap direction (depend on indoor unit capability)
Fan volume	L, M, H (depend on indoor unit capability)
Filter sign reset	Reset filter sign of indoor units

Retrieve VRV System information

Connected indoor units	How many indoor units are connected and DⅢ-NET address of each indoor unit
Indoor unit capabilities	Cooling/Heating/Fan/Dry/Auto mode, Fan direction, Fan volume and steps(fix, 2step, 3step), Setpoint range(cooling/heating)

LED indication

H1P	Turn on when the adaptor send out DⅢ-NET command
H2P	Turn on when the adaptor receive DⅢ-NET command
H3P	Turn on when the adaptor send out modbus command
H4P	Turn on when the adaptor receive modbus command
H5P	Not use
H6P	Not use
H7P	Not use
HAP	Blink in 400ms interval after power supply

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2.Modbus communication

- This DⅢ-NET/Modbus Communication adaptor is a modbus slave.
- Communication format and function code are according to "Modicon Modbus Protocol Reference Guide"(PI-MBUS-300 Rev.J).

2-1.Adaptor setting

- Modbus communication parameter is set by DS1.
- Modbus address of this adaptor is set by DS2.

DS	pin	Function	OFF	ON
DS1	1	Reserve	-	-
	2	Baud Rate	9600bps	19200bps
	3	Stop Bit	Stop Bit 1 (Parity)	Stop Bit 2 (Non Parity)
	4	Parity*	Even	Odd
		* Parity setting will enable when DS1-3 is off.		
DS2	1	Slave Address	0: No modbus communication 1 – 15: Slave Address 1 –15 *1:off, 2:off, 3:off, 4:on is 1	
	2			
	3			
	4			

2-2.Communication format

2-2-1.Transmission mode

This DⅢ-NET/Modbus Communication adaptor uses RTU mode.

2-2-2.Data types

Following data types are supported.

Data Type	Length	Address range
Input Register	16 bits	30001 – 39999
Holding Register	16 bits	40001 - 49999

* Data bigger than 16 bits can be handled by assigning continuous address to registers.

2-2-3.Function codes

Following function codes are supported. If the DⅢ-NET/Modbus Communication adaptor receive a function code which are not included in this table, the function code will treat as a illegal function and the adaptor returns exception response.

Function Code	Message	broadcast
0x04(04)	Read Input Register	
0x06(06)	Preset single Register	X
0x10(16)	Preset Multiple Registers	X

*"X" : Not Support

2-2-4.Function format

(1) Read Input Register (0x04)

[Function]
Read values of input registers. The address and the content of input registers are described in "3. Modbus registers".

[Query]
The query message specifies the start address of the register and the number of registers. The register addressed starting at zero: register 30001 is addressed as 0.
This function can read up to 32 registers at one query.
Here is an example of a request to slave address 1 to read 3 registers value from register 31001.

Query

Field	Data
Slave Address	0x01
Function Code	0x04
Start Address(Upper)	0x03
Start Address(Lower)	0xE8
Number of Registers(Upper)	0x00
Number of Registers(Lower)	0x03
Error Check CRC16(Lower)	0x30
Error Check CRC16(Upper)	0x7B

Response

Field	Data
Slave Address	0x01
Function Code	0x04
Data Size(Bytes)	0x06
Data1(Upper)	0xXX
Data1(Lower)	0xXX
Data2(Upper)	0xXX
Data2(Lower)	0xXX
Data3(Upper)	0xXX
Data3(Lower)	0xXX
Error Check CRC16(Lower)	0xXX
Error Check CRC16(Upper)	0xXX

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(2) Preset single register (0x06)

[Function]
Write a value to a holding register. In the case of broadcast, the value is written to the same holding register on the all slave units. The address and the content of holding registers are described in “3. Modbus registers”.

[Query]
The query message specifies the start address of the register and a value. The register addressed starting at zero: register 40001 is addressed as 0.
Here is an example of a request to slave address 1 to write a value 2 to register 42002.

Query

Field	Data
Slave Address	0x01
Function Code	0x06
Address(Upper)	0x07
Address(Lower)	0xD1
Value(Upper)	0x00
Value(Lower)	0x02
Error Check CRC16(Lower)	0x59
Error Check CRC16(Upper)	0x46

Response

Field	Data
Slave Address	0x01
Function Code	0x06
Address(Upper)	0x07
Address(Lower)	0xD1
Value(Upper)	0x00
Value(Lower)	0x02
Error Check CRC16(Lower)	0x59
Error Check CRC16(Upper)	0x46

(3) Preset multiple registers (0x10)

[Function]
Write values to holding registers. In the case of broadcast, the value is written to the same holding register on the all slave units. The address and the content of holding registers are described in “3. Modbus registers”.

[Query]
The query message specifies the start address of the register, size of data and values. The register addressed starting at zero: register 40001 is addressed as 0.
This function can write up to 30 registers at one query.
Here is an example of a request to slave address 1 to write 2 values to register 42001 to 42002.

Query

Field	Data
Slave Address	0x01
Function Code	0x10
Start Address(Upper)	0x07
Start Address(Lower)	0xD0
Number of Registers(Upper)	0x00
Number of Registers(Lower)	0x02
Data Size(bytes)	0x04
Value1(Upper)	0x00
Value1(Lower)	0x10
Value2(Upper)	0x00
Value2(Lower)	0x01
Error Check CRC16(Lower)	0x18
Error Check CRC16(Upper)	0xC6

Response

Field	Data
Slave Address	0x01
Function Code	0x10
Start Address(Upper)	0x07
Start Address(Lower)	0xD0
Number of Registers(Upper)	0x00
Number of Registers(Lower)	0x02
Error Check CRC16(Lower)	0x41
Error Check CRC16(Upper)	0x45

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(4) Exception response

In the case query message has a problem, this DⅢ-NET/Modbus Communication adaptor will reply exception response. The function code of exception response is added 0x80 to original function code to inform this response is exception response. And the exception response include exception code which shows reason of the problem.

Exception code	Name	Reason
0x01	Illegal function	This function code is not supported
0x03	Illegal data	This query includes unauthorized data

[Example of exception response]

・In the case of reading values of 36 input registers: start address:31001.
It is up to 32 registers that this function can read at one query.

Query

Field	Data
Slave Address	0x01
Function Code	0x04
Start Address(Upper)	0x03
Start Address(Lower)	0xE8
Number of Registers(Upper)	0x00
Number of Registers(Lower)	0x24
Error Check(Lower)	0x70
Error Check(Upper)	0x61

Response

Field	Data
Slave Address	0x01
Function Code	0x84
Exception Code	0x03
Error Check(Lower)	0x03
Error Check(Upper)	0x01

2-2-5.Character format

Each byte of a message is sent as character data as follows.
A character consists of start bit (0), 8bits data, parity bit and stop bit(1). One character size is always 11btis and stop bit 1 or 2 is selected by parity bit.

[Non Parity]

0(LSB)	1	2	3	4	5	6	7	8	9	10(MSB)
Start bit	Data								Stop bit 1	Stop bit 2

[Parity]

0(LSB)	1	2	3	4	5	6	7	8	9	10(MSB)
Start bit	Data								Parity bit (Odd or Even)	Stop bit 2

2-2-6.Silent interval time

Every frame has to have silent interval time(T1-T2-T3-T4) before and after. The silent interval time is depend on communication speed.

Baud Rate(bps)	9600	19200
Silent Interval Time(ms) (T1-T2-T3-T4)	5	2.5

2-2-7.Response time

This DⅢ-NET/Modbus Communication adaptor response a message after response time(t1) when this adaptor receives a query message. The response time(t1) of this adaptor is “Silent Interval Time(T1-T2-T3-T4) + 20ms”.
Modbus master has to wait to send next query message for time interval(t2) when the modbus master receives a response from the DⅢ-NET/Modbus Communication adaptor . The time interval(t2) should be more than “Silent Interval Time(T1-T2-T3-T4) + 20ms”.

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2-3.Communication procedure

2-3-1.System initialization

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2-3-2.Monitor and operate VRV from HA System

Note

DⅢ-NET/Modbus Communication adaptor send a command to VRV when the value of a Holding Register is changed. So HA System has to update Holding Register values when HA System read current status from Input Registers. Otherwise an operation from the HA system will be ignored.(Refer to 5.Important points on operation by HA system)

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3.Modbus registers

- This section shows registers of this DⅢ-NET/Modbus Communication adaptor.
- Detail of the register is described in 4.Modbus register structure.

3-1.Input register

3-1-1. Adaptor status

Address	Contents
30001	Status of the adaptor

3-1-2. Indoor unit connection status

Address	Contents
30002	Connection status of indoor units (1-00 to 1-15)

3-1-3. Indoor unit communication status

Address	Contents
30006	Communication status of indoor units (1-00 to 1-15)

3-1-4. Indoor unit capability information

Address	Indoor unit address
31001 – 31003	1-00
31004 – 31006	1-01
31007 – 31009	1-02
31010 – 31012	1-03
31013 – 31015	1-04
31016 – 31018	1-05
31019 – 31021	1-06
31022 – 31024	1-07

Address	Indoor unit address
31025 – 31027	1-08
31028 – 31030	1-09
31031 – 31033	1-10
31034 – 31036	1-11
31037 – 31039	1-12
31040 – 31042	1-13
31043 – 31045	1-14
31046 – 31048	1-15

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3-1-5. Indoor unit status information

Address	Indoor unit address
32001 – 32006	1-00
32007 – 32012	1-01
32013 – 32018	1-02
32019 – 32024	1-03
32025 – 32030	1-04
32031 – 32036	1-05
32037 – 32042	1-06
32043 – 32048	1-07

Address	Indoor unit address
32049 – 32054	1-08
32055 – 32060	1-09
32061 – 32066	1-10
32067 – 32072	1-11
32073 – 32078	1-12
32079 – 32084	1-13
32085 – 32090	1-14
32091 – 32096	1-15

3-2.Holding register

3-2-1. Adaptor initial setting

Address	Contents
40001	DⅢ-NET setting

3-2-2. Indoor unit control

Address	Indoor unit address
42001 – 42003	1-00
42004 – 42006	1-01
42007 – 42009	1-02
42010 – 42012	1-03
42013 – 42015	1-04
42016 – 42018	1-05
42019 – 42021	1-06
42022 – 42024	1-07

Address	Indoor unit address
42025 – 42027	1-08
42028 – 42030	1-09
42031 – 42033	1-10
42034 – 42036	1-11
42037 – 42039	1-12
42040 – 42042	1-13
42043 – 42045	1-14
42046 – 42048	1-15

4.Modbus register structure

4-1.Input register

4-1-1. Adaptor status

Register Number	30001
Type	Input Register
Composition	

	7	6	5	4	3	2	1	0	
								(1)	Lower
									Upper
	15	14	13	12	11	10	9	8	

(1) adaptor status (0 or 1)
This register stores adaptor status.
0: Not ready
1: Ready

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4-1-2. Indoor unit connection status

Register Number	30002
Type	Input Register
Composition	

7	6	5	4	3	2	1	0	
(8)	(7)	(6)	(5)	(4)	(3)	(2)	(1)	Lower
(16)	(15)	(14)	(13)	(12)	(11)	(10)	(9)	Upper
15	14	13	12	11	10	9	8	

(1) Indoor unit connection status (0 or 1)
This register stores indoor unit connection status of the DⅢ-NET address 1-00.
0: Unconnected
1: Connected

(2) Indoor unit connection status (0 or 1)
This register stores indoor unit connection status of the DⅢ-NET address 1-01.
0: Unconnected
1: Connected

…..

(16) Indoor unit connection status (0 or 1)
This register stores indoor unit connection status of the DⅢ-NET address 1-15.
0: Unconnected
1: Connected

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4-1-3. Indoor unit communication status

Register Number	30006
Type	Input Register
Composition	

7	6	5	4	3	2	1	0	
(8)	(7)	(6)	(5)	(4)	(3)	(2)	(1)	Lower
(16)	(15)	(14)	(13)	(12)	(11)	(10)	(9)	Upper
15	14	13	12	11	10	9	8	

(1) Indoor unit communication status (0 or 1)
This register stores indoor unit communication status of the DⅢ-NET address 1-00.
0: Normal
1: Communication Error

(2) Indoor unit communication status (0 or 1)
This register stores indoor unit communication status of the DⅢ-NET address 1-01.
0: Normal
1: Communication Error

…..

(16) Indoor unit communication status (0 or 1)
This register stores indoor unit communication status of the DⅢ-NET address 1-15.
0: Normal
1: Communication Error

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4-1-4. Indoor unit capability information

Register Number	31001, 31004, …., 31046
Type	Input Register
Composition	

7	6	5	4	3	2	1	0	
			(5)	(4)	(3)	(2)	(1)	Lower
(9)	(MSB)	(8)	(LSB)	(7)	(MSB)	(6)	(LSB)	Upper
15	14	13	12	11	10	9	8	

(1) Fan mode capability (0 or 1)
This register stores indoor unit capability of “Fan Mode”.
0: Not exist
1: Exist

(2) Cooling mode capability (0 or 1)
This register stores indoor unit capability of “Cooling Mode”.
0: Not exist
1: Exist

(3) Heating mode capability (0 or 1)
This register stores indoor unit capability of “Heating Mode”.
0: Not exist
1: Exist

(4) Auto mode capability (0 or 1)
This register stores indoor unit capability of “Auto Mode”.
0: Not exist
1: Exist

(5) Dry mode capability (0 or 1)
This register stores indoor unit capability of “Dry Mode”.
0: Not exist
1: Exist

(6) Fan direction level capability (0 - 7)
This register stores indoor unit capability of “Fan Direction Level”.
This value has no meaning when (7): Fan direction capability is 0.

Value	0	1	2	3	4	5	6	7
Capability	-	Fix	2 step	3 step	4 step	5 step	-	-

(7) Fan direction capability (0 or 1)
This register stores indoor unit capability of “Fan Direction”.
0: Not exist
1: Exist

(8) Fan volume level capability (0 - 7)
This register stores indoor unit capability of “Fan Volume Level”.
This value has no meaning when (9): Fan volume capability is 0.

Value	0	1	2	3	4	5	6	7
Capability	-	Fix	2 step	3 step	-	-	-	-

(9) Fan volume capability (0 or 1)
This register stores indoor unit capability of “Fan Volume”.
0: Not exist
1: Exist

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Register Number	31002, 31005, …., 31047
Type	Input Register
Composition	

	7	6	5	4	3	2	1	0	
	Signed bit	(MSB)			(1)			(LSB)	Lower
	Signed bit	(MSB)			(2)			(LSB)	Upper
	15	14	13	12	11	10	9	8	

(1) Indoor unit cooling setpoint upper limit (-128 – 127degC)
This register stores indoor unit cooling mode setpoint upper limit.
8bit signed integer
(2) Indoor unit cooling setpoint lower limit (-128 – 127degC)
This register stores indoor unit cooling mode setpoint lower limit.
8bit signed integer

Register Number	31003, 31006, …., 31048
Type	Input Register
Composition	

	7	6	5	4	3	2	1	0	
	Signed bit	(MSB)			(1)			(LSB)	Lower
	Signed bit	(MSB)			(2)			(LSB)	Upper
	15	14	13	12	11	10	9	8	

(1) Indoor unit heating setpoint upper limit (-128 – 127degC)
This register stores indoor unit heating mode setpoint upper limit.
8bit signed integer
(2) Indoor unit heating setpoint lower limit (-128 – 127degC)
This register stores indoor unit heating mode setpoint lower limit.
8bit signed integer

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4-1-5. Indoor unit status information

Register Number	32001, 32007, …., 32091
Type	Input Register
Composition	

7	6	5	4	3	2	1	0	
					(2)		(1)	Lower
	(MSB)	(4)	(LSB)		(MSB)	(3)	(LSB)	Upper
15	14	13	12	11	10	9	8	

(1) On/Off status (0 or 1)
This register stores indoor unit on/off status.
0: Off
1: On

(2) Forced off status (0 or 1)
This register stores indoor unit forced off status.
0: none
1: Forced off

(3) Fan direction (0 - 7)
This register stores indoor unit fan direction position.

Value	0	1	2	3	4	5	6	7
Position	P0	P1	P2	P3	P4	-	-	Swing

*P0: horizontal direction, P4: vertical direction

(4) Fan volume (1 - 7)
This register stores indoor unit fan volume.
The meaning of this value is different from fan volume capabilities as bellow table.

Value	0	1	2	3	4	5	6	7
Fix	-	-	-	-	-	H	-	-
2Step	-	L	-	-	-	H	-	-
3Step	-	L	-	M	-	H	-	-

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Register Number	32002, 32008, …., 32092
Type	Input Register
Composition	

7	6	5	4	3	2	1	0	
(MSB) (2)			(LSB)	(MSB) (1)			(LSB)	Lower
(4)				(MSB) (3)			(LSB)	Upper
15	14	13	12	11	10	9	8	

(1) Operation mode (0 - 7)
This register stores indoor unit operation mode.

Value	0	1	2	3	4	5	6	7
Mode	Fan	Heating	Cooling	Auto	-	-	-	Dry

(2) Filter sign status (0 or 1-15)
This register stores indoor unit filter sign status.
0: Off
1-15: On

(3) Operation status (0 - 2)
This register stores indoor unit current operation status.

Value	0	1	2
Mode	Fan	Heating	Cooling

(4) Cool/Heat master (0 - 2)
This register stores Cool/Heat master information.
If this value is 2, it can be changed cooling/heating for this VRV system through this indoor unit.
If this value is 0, Cool/Heat master for this VRV system is not decided.

Value	0	1	2
Status	Not decided	Slave	Master

Register Number	32003, 32009, …., 32093
Type	Input Register
Composition	

7	6	5	4	3	2	1	0	
Signed bit (MSB)			(1)				(LSB)	Lower
								Upper
15	14	13	12	11	10	9	8	

(1) Setpoint (-127.9 – 127.9 degC)
This register stores indoor unit setpoint (0.1 degC step).
This value multiplied by 10 to store as an integer value.
16bit signed integer

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Register Number	32004, 32010, …., 32094
Type	Input Register
Composition	

(1) Error code mapping value1 (0 - 15)
This register stores indoor unit Error Code mapping value.
This value is used with (2) to find Error Code in “6.Error code mapping table”.
4bit unsigned integer

(2) Error code mapping value2 (0 - 31)
This register stores indoor unit Error Code mapping value.
This value is used with (1) to find Error Code in “6.Error code mapping table”.
5bit unsigned integer

(3) Malfunction (0 or 1)
This register stores indoor unit error level.
0: Normal
1: Malfunction

(4) Warning (0 or 1)
This register stores indoor unit error level.
0: Normal
1: Warning

Register Number	32005, 32011, …., 32095
Type	Input Register
Composition	

(1) Room temperature (-511.9 – 511.9 degC)
This register stores temperature data of indoor unit sensor (0.1 degC step).
This value multiplied by 10 to store as an integer value.
16bit signed integer

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Register Number	32006, 32012, …, 32096
Type	Input Register
Composition	

	7	6	5	4	3	2	1	0	
									Lower
	(2)							(1)	Upper
	15	14	13	12	11	10	9	8	

(1) Indoor unit temperature sensor error (0 or 1)
This register stores indoor unit temperature sensor has error or not.
0: Normal
1: Error

(2) Indoor unit temperature sensor data is received (0 or 1)
This register stores indoor unit temperature sensor data is already received or not.
0: Not received yet
1: Received

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4-2.Holding register

4-2-1. Adaptor initial settings

Register Number	40001
Type	Holding Register
Composition	

	7	6	5	4	3	2	1	0	
								(1)	Lower
	(3)							(2)	Upper
	15	14	13	12	11	10	9	8	

(1) Managed DⅢ-NET address range (0 or 1)
This register defines the DⅢ-NET address(1-00 to 1-15) are managed or not.
Initial value is 1.
0: Out of manage
1: Managed

(2) DⅢ-NET master flag (0 or 1)
This register defines this adaptor is DⅢ-NET master or slave.
Initial value is 0.
If other central controller is installed for the VRV system, then this flag should be set to 0.
0: Slave
1: Master

(3) DⅢ-NET communication start/stop flag (0 or 1)
This register defines DⅢ-NET communication start or stop.
Initial value is 1.
0: Stop
1: Start

* Value of this register is stored to EEPROM, therefore the value will not be discarded when the adaptor power is off.
* When this register value is changed, new value is applied when the adaptor power is off and on.

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4-2-2. Indoor unit control

Register Number	42001, 42004, …, 42046
Type	Holding Register
Composition	

	7	6	5	4	3	2	1	0	
	(MSB)	(2)		(LSB)				(1)	Lower
		(MSB)	(4)	(LSB)		(MSB)	(3)	(LSB)	Upper
	15	14	13	12	11	10	9	8	

(1) On/Off (0 or 1)
This register controls On/Off of the indoor unit.
0: Off
1: On

(2) Fan control flag (6)
This register has to be set to “6”.

(3) Fan direction (0 - 7)
This register controls fan direction position of the indoor unit.

Value	0	1	2	3	4	5	6	7
Position	P0	P1	P2	P3	P4	-	Stop	Swing

*P0: horizontal direction, P4: vertical direction

(4) Fan volume (0 - 7)
This register controls fan volume of the indoor unit.
The meaning of this value is different from fan volume capabilities as bellow table.

Value	0	1	2	3	4	5	6	7
2Step	-	L	-	-	-	H	-	-
3Step	-	L	-	M	-	H	-	-

* In the case of fan volume capability is 0, this value has to be set to “0”.

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Register Number	42002, 42005, …, 42047
Type	Holding Register
Composition	

7	6	5	4	3	2	1	0	
(MSB)	(2)		(LSB)	(MSB)	(1)		(LSB)	Lower
				(MSB)	(3)		(LSB)	Upper
15	14	13	12	11	10	9	8	

(1) Operation mode (0 - 7)
This register controls operation mode of the indoor unit.

Value	0	1	2	3	4	5	6	7
Mode	Fan	Heating	Cooling	Auto	-	-	Setpoint	Dry

* Setpoint is used when the indoor unit is not cool/heat master.

Note

When the following value is set to this register, the value is treated as an unauthorized data and DⅢ-NET/Modbus Communication adaptor sends the exceptional response.

- Set the value 0 for VRV having no Fan mode capability.
- Set the value 1 for VRV having no Heating mode capability.
- Set the value 2 for VRV having no Cooling mode capability.
- Set the value 3 for VRV which Cool/Heat master is 1:Slave.
- Set the value 3 for VRV having no Auto or no Heating and Cooling mode capability.
- Set the value 6 for VRV which Cool/Heat master is 2:Master.
- Set the value 6 for VRV having no Heating and Cooling mode capability.
- Set the value 7 for VRV having no Dry mode capability.
- Set the value shown “-” at the list previous.

(2) Filter sign reset (0 or 15)
This register resets filter sign of the indoor unit.
0: Non
15: Reset

Note

Please set value 0 to this entry after reset the filter sign. Otherwise filter sign will never appeared again.

(3) Operation status (0 - 2)
This register select setpoint for heating or cooling under Auto mode.
Before setting setpoint under Auto mode, this register has to be set to “1” or “2”.
Under other mode, it does not need to care this register.

Value	0	1	2
Mode	Don’t care	Heating	Cooling

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Register Number	42003, 42006, …, 42048
Type	Holding Register
Composition	

(1) Setpoint (-127.9 – 127.9 degC)
This register controls setpoint of the indoor unit (0.1 degC step).
This value multiplied by 10 to store as an integer value.
16bit signed integer.

Note

On setting the Setpoint

In case of connected outdoor units are “RQCEQ-PY1”, “Auto” can be set as operation mode.
If operation mode of each indoor unit is “Auto”, indoor units automatically change operation mode “Auto（Cooling）or Auto（Heating）” with the relation between room temperature and setpoint.

On operation mode “Auto”, setpoint may be changed automatically. In this case, setpoint on “Auto(Cooling)”and setpoint on “Auto(Heating)” may have the differential.

In case of setting setpoint after setting operation mode "Auto” from HA system, even if the operation mode is changed by remote controller, setting setpoint is treated as setpoint of operation mode "Auto", and setpoint may be different from setting value.

If the VRV system contains outdoor unit "RQCEQ-PY1", Holding Resister which contains operation mode must be synchronized on the status of indoor units by getting the status. After the synchronization, the settpoing must be set.

＜Operation for setting setpoint＞
*Please refer to below chart.
1.Get a value of Input Resister(3) which contains an operation mode of target indoor unit.(=“B”)
2.Set the getting value “B” to Holding Resister(1) for the target indoor unit.
3.Set a setpoint “C” for the target indoor unit.

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5. Important points on operation by HA system

DⅢ-NET/Modbus Communication adaptor sends the command to VRV when the value of a Holding Register is changed.
Specially in case that indoor units are operated from remote controller, HA system always have to get the status of indoor units and set the getting status to Holding Resisters.
Below is example for ON/OFF operation.

Note
The interval setting to the same register is over 0.5s.

[Explanatory note]

[Process for On/Off operation]

1.HA system gets the status of indoor units and sets the getting status to Holding resisters.
It is premise that the status of indoor unit is “OFF”.

2.The indoor unit is operated “ON” by HA system

The status of Holding Register changed.
So, DⅢ-NET/Modbus Communication adaptor sends command “ON” to VRV.

3.HA system gets the status of indoor units and sets the getting status to Holding Registers.

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4.The indoor unit is operated “OFF” by remote controller.

5.HA system gets the status of indoor unit and sets the getting status to Holding Register.

<Getting the status of indoor unit>

<Setting the getting status for indoor unit>

6.The indoor unit is operated “ON” by HA system

The status of Holding Register changed.
So, DⅢ-NET/Modbus Communication adaptor sends command “ON” to VRV.

7.HA system gets the status of indoor units and sets the getting status to Holding resisters.

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NOTE: In the case that HA system do not carry out operation 5, and HA system carry out operation 6.

<Status>

<The indoor unit is operated "ON" by HA system>

The status of Holding Register do not change.
So, DⅢ-NET/Modbus Communication adaptor do not send command "ON" to VRV.

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6.Error code mapping table

Value2	Code
0	0
1	A
2	C
3	E
4	H
5	F
6	J
7	L
8	P
9	U
10	9
11	8
12	7
13	6
14	5
15	4
16	3
17	2
18	1
19	G
20	K
21	M
22	N
23	R
24	T
25	V
26	W
27	X
28	Y
29	Z
30	*
31	

Value1	Code
0	0
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	A
11	B
12	C
13	D
14	E
15	F

Example

Value1 = 4
Value2 = 9 ⇨ Error code = U4

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Warning

- Ask a qualified installer or contractor to install this product. Do not try to install the product yourself. Improper installation can result in water or refrigerant leakage, electrical shock, fire or explosion.
- Use only those parts and accessories supplied or specified by Daikin. Ask a qualified installer or contractor to install those parts and accessories. Use of unauthorised parts and accessories or improper installation of parts and accessories can result in water or refrigerant leakage, electrical shock, fire or explosion.
- Read the Installation manual carefully before using this product. The Installation manual provides important safety instructions and warnings. Be sure to follow these instructions and warnings.

If you have any enquiries, please contact your local importer, distributor and/or retailer.

Cautions on product corrosion

1. Air conditioners should not be installed in areas where corrosive gases, such as acid gas or alkaline gas, are produced.
2. If the outdoor unit is to be installed close to the sea shore, direct exposure to the sea breeze should be avoided. If you need to install the outdoor unit close to the sea shore, contact your local distributor.

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