



Application Note: Daikin RTD-NET

This application note describes how to integrate a Daikin RTD-NET or RTD-10 Modbus module with North.

Please read the *Modbus Driver Manual*, and *Commander Manual* or *ObSys Manual* alongside this document, available from www.northbt.com

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Compatibility with the Daikin System

Interface to a Daikin RTD-NET or RTD-10 module using the North Modbus driver.

The driver connects to Daikin RTD-NET and RTD-10 modules via an RS485 network. Multiple RTD modules can be networked.

The RTD module is suitable for smaller installations. A dedicated Dakin driver is available when interfacing to a Daikin iTouch Controller or iTouch Manager.

Alternatively, a Daikin BACnet or LonWorks gateway may be installed and connected to the North BACnetIP or Lon drivers respectively.

Equipment

The Daikin RTD module supports Daikin VRV and Skyair ranges of air conditioners, along with VAM and VKM ventilation units.

Values

The driver can typically access the following system values:

- On/Off status
- Mode
- Temperature setpoint
- Fan speed
- Louvre position

And the RTD-NET can additionally monitor the following values for an indoor unit:

- Fault
- Filter alarm
- Return air temperature
- Air outlet temperature
- Air inlet temperature

Prerequisites

Configure the RTD Modbus address. Refer to the RTD Installation Instructions for details, along with other DIP-switch settings.

The RTD-NET has a Modbus Master Timeout setting. If this is enabled, configure an ObvProcessor to write a register value every 60 seconds.

An RS232-485 adapter is required and should be set to 9600 baud, 10 bits.

This application note is based on information available in Realtime RTD-NET document 18870 rev1.06.03, available at www.realtime-controls.co.uk/rtd.

Using the Driver

On ObSys and Commander, the Modbus driver is pre-installed. Using all of these North devices, you can use the driver to create an interface to a Modbus system. Once started, you will need to set up the driver before it can communicate with the Daikin system.

The Modbus driver uses zero licence units.

Starting the Interface

- 📖 To start an interface using the Modbus driver, follow these steps:
 - **Start Engineering** your North device using ObSys
 - Navigate to **Configuration, Interfaces**, and set an unused **Interface** to 'Modbus' to start the particular interface
 - Navigate to the top-level of your North device and re-scan it

The driver setup object (Mc), labelled **Modbus Setup**, should now be available.

Setting up the Driver

- 📖 To set up the driver, follow these steps:
 - Navigate to the **Modbus Setup** object (Mc). For example, if you started interface 1 with the driver earlier, then the object reference will be 'M1'
 - Navigate to **Modbus Serial Setup** and set **Modbus Serial Mode** to 'Client'
 - Set **RS232 COM Port** to select the serial port number on the North device the Daikin RTN network is connected to
 - Set **Baud Rate** to '9600' and **Byte Format** to 'None/1', matching the configuration of the RTD
 - Navigate to **Serial Client Setup**, and set **Default Device Type** to 'Daikin-RTD-NET'.

Checking Communications

Scanning the Modbus System will respond with the connected Daikin RTD modules. You can check the interface is communicating by viewing values within an RTD.

Object Specifications

Once an interface is started, one or more extra objects become available within the top-level object of the device. As with all North objects, each of these extra objects may contain sub-objects, (and each of these may contain sub-objects, and so on) – the whole object structure being a multi-layer hierarchy. It is possible to navigate around the objects using the ObSys Engineering Software.

Refer to the *Modbus Driver Manual* for a complete list of objects for this interface.

Modbus System

Object Type: *[Modbus]*

The Modbus system contains objects to access the Modbus client devices available.

Description	Reference	Type
Address x The unit address, <i>x</i> , can be in the range 1...63	<i>Ax</i>	Fixed container, one of the following: Daikin RTD module <i>[Modbus\Daikin-RTD-NET]</i> Default Modbus Device <i>[Modbus\Default]</i>

Daikin RTD-NET

Object Type: [Modbus\Daikin-RTD-NET]

A Daikin RTD module contains a summary of the group. An RTD-NET module additionally contains access to up to 16 indoor units.

Description	Reference	Type
On/Off Status	D4.B	Obj\OffOn; Adjustable
Mode	D2.B	Obj\Enum; Adjustable Values: 0=Auto, 1=Heat, 2=Cool, 3=Dry
Temperature Setpoint (°C)	D0.B	Obj\Num: 16...32; Adjustable
Fan Speed	D1.B	Obj\Enum; Adjustable Values: 1=Low, 2=Medium, 3=High
Louvre Position	D3.B	Obj\Enum; Adjustable Values: 1=Swing, 2=0°, 3=20°, 4=45°, 5=70°, 6=90°
VAM Damper Control of VAM and VKM units only	D29.B	Obj\Enum; Adjustable Values: 0=Auto, 1=Cross Flow/Heat Recovery, 2=Bypass
VAM Fan Speed Control of VAM and VKM units only	D30.B	Obj\Enum; Adjustable Values: 1=Low, 2=High
RC Mode Remote controller mode of the group	B50.B	Obj\Enum Values: 0=Idle/Fan, 1=Heat, 2=Cool, 3=Heat & Cool
RC Temperature (°C) Remote controller temperature is only available when there is one indoor unit	B49.B27	Obj\Float
Fault Active At least one indoor unit in fault	B20.B	Obj\NoYes
Fault Code (number) Fault code from first unit in fault	B21.B	Obj\Num 255= No fault
Fault Code (text) Fault code from first unit in fault	B21.G	Obj\Text: 2 chars Daikin error code text
Filter Alarm At least one indoor unit with filter alarm	B23.B	Obj\NoYes
Return Air Average (°C) Average of all units return air temperatures	B22.B27	Obj\Float
Return Air Maximum (°C) Maximum of all units return air temperatures	B25.B27	Obj\Float
Return Air Minimum (°C) Minimum of all units return air temperatures	B24.B27	Obj\Float
Mode Feedback Summary of unit mode operation	B29.B	Obj\Enum Values: 0=Idle/Fan, 1=Heat, 2=Cool, 3=Heat & Cool
Defrost Active At least one indoor unit in defrost	B34.B	Obj\NoYes
Update Mode: Global Determines how control commands update the unit – see Installation manual	D9.B	Obj\Enum; Adjustable Values: 0=LastTouch, 1=Central, 2=Local, 3=OnChange
Update Mode: Setpoint Determines how control commands update the unit – see Installation manual	D10.B	Obj\Enum; Adjustable Values: 0=LastTouch, 1=Central, 2=Local, 3=OnChange
Update Mode: Fan Speed Determines how control commands update the unit – see Installation manual	D11.B	Obj\Enum; Adjustable Values: 0=LastTouch, 1=Central, 2=Local, 3=OnChange
Update Mode: Mode Determines how control commands update the unit – see Installation manual	D12.B	Obj\Enum; Adjustable Values: 0=LastTouch, 1=Central, 2=Local, 3=OnChange

Description	Reference	Type
Update Mode: Louvre Position Determines how control commands update the unit – see Installation manual	D13.B	Obj\Enum; Adjustable Values: 0=LastTouch, 1=Central, 2=Local, 3=OnChange
Update Mode: On/Off Status Determines how control commands update the unit – see Installation manual	D14.B	Obj\Enum; Adjustable Values: 0=LastTouch, 1=Central, 2=Local, 3=OnChange
RC Setpoint Maximum (°C) Limits adjustment from the remote controller	D20.B	Obj\Num: 0, 16...32; Adjustable 0=No limit
RC Setpoint Minimum (°C) Limits adjustment from the remote controller	D20.B	Obj\Num: 0, 16...32; Adjustable 0=No limit
RC Inhibit: Fan Speed Limits adjustment from the remote controller	D21.B	Obj\Num: 0,2,13; Adjustable 0=No limit, 2=Inhibit Low, 13=Inhibit High
RC Inhibit: Mode Limits adjustment from the remote controller	D22.B	Obj\Num: 0...31; Adjustable 0=No limit Add values for functions to inhibit: 1:Auto, 2:Heat, 4:Fan, 8:Cool, 16:Dry
RC Inhibit: Louvre Position Limits adjustment from the remote controller	D23.B	Obj\Num: 0...126; Adjustable 0=No limit Add values for functions to inhibit: 2:Swing, 4:0°, 8:20°, 16:45°, 32:70°, 64:90°
Unit Count Number of indoor units detected	B19.B	Obj\Num: 0...16
Unit a Daikin indoor unit. The unit number, a , is in the range 1...16	$X(a*100)$	Fixed container: [Modbus\Daikin-RTD-NET\Unit]

Daikin Unit

Object Type: [Modbus\Daikin-RTD-NET\Unit]

A Daikin Unit is an indoor unit.

Object references have their register address offset with the unit number multiplied by 100. E.g. Unit 2 Present = B219.B

Description	Reference	Type
Unit Present	B19.B	Obj\NoYes
Fault Active	B20.B	Obj\NoYes
Fault Code (number)	B21.B	Obj\Num 255= No fault
Fault Code (text)	B21.G	Obj\Text: 2 chars Daikin error code text
Filter Alarm	B23.B	Obj\NoYes
Return Air Temperature (°C)	B22.B27	Obj\Float
Mode Feedback	B29.B	Obj\Enum Values: 0=Idle/Fan, 1=Heat, 2=Cool, 3=Heat & Cool
Coil In Temperature (°C)	B30.B27	Obj\Float
Coil Out Temperature (°C)	B31.B27	Obj\Float

Document Versions

Version	Issue Date	Details
1.0	28/11/2019	Document released

Next Steps...

If you require help, contact support on 01273 694422 or visit www.northbt.com/support



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