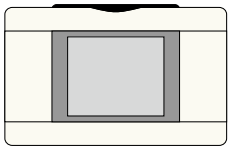
The Daikin Driver



The Daikin driver interfaces to a Daikin air-conditioning system. Compatible with the Daikin VRV, HRV and SkyAir ranges. Available for Commander and ObSys.

This document relates to Daikin driver version 1.0 and 1.1

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

Contents

Compatibility with the Daikin System

The Daikin driver allows North to interface with a Daikin air-conditioning system.

The driver connects, via an Ethernet network, to a single Daikin intelligent Touch (iTouch) Controller or Manager (Fig. 1). Each iTouch can support up to 64 groups of indoor units. Install DIII-Net Plus adapters to expand support to up to 128 groups on the iTouch Controller, or 512 groups on the iTouch Manager.

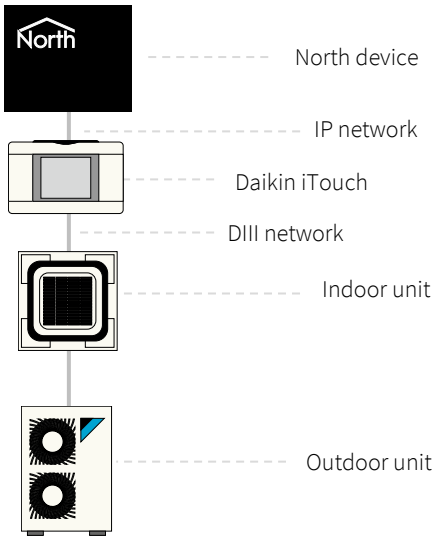


Fig. 1 North to Daikin Air Conditioning

Alternatively, a Daikin BACnet or LonWorks gateway may be installed and connected to the North BACnetIP or Lon drivers respectively. A Daikin Modbus interface is also available and may be connected to the North Modbus driver.

Equipment

Daikin systems compatible with the driver include VRV and HRV ranges, SkyAir and Split ranges via an interface adapter, and digital input-output (DI/DIO) units.

Values

Depending on the type of Daikin indoor units connected, the following values are typically available:

- On/Off state
- Operating mode
- Room temperature
- Temperature set point
- Air direction
- Fan speed
- Filter dirty
- Error state
- Malfunction code

Prerequisites

The Daikin iTouch Controller (DCS601C51) must have the *HTTP Interface* option (DCS007A51) activated. Set the Web Server HTTP port (the default port is 80).

The Daikin iTouch Manager (DCM601A51) must have the *Open Protocol for BMS integration* (DCM007A51) activated. Set the Web I/F Server port (the default port is 8081). The username and password is not used.

Set the Network IP address of the Daikin iTouch. If you are connecting via a firewall, then the driver will require access to the configured TCP port number.

Using the Driver

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

When updating the driver on Commander, the CDM file is available to install in to bank 22.

Starting the Interface

💻 To start an interface using the Daikin driver, follow these steps:

- → **Start Engineering** your North device using ObSys
- → Navigate to **Configuration, Interfaces,** and set an unused **Interface** to 'Daikin' to start the particular interface
- → Navigate to the top-level of your North device and re-scan it

The driver setup object (Mc), labelled **Daikin Setup**, should now be available. If this object is not available, check an interface licence is available and the driver is installed.

Setting up the Driver

💻 To set up the driver, follow these steps:

- → Navigate to the **Daikin Setup** object (Mc). For example, if you started interface 1 with the driver earlier, then the object reference will be 'M1'
- → Select the **iTouch Model** (IM)
- → Set the **iTouch IP Address** (IA) and **iTouch HTTP Port** (PN) to those configured in the Daikin iTouch earlier

Checking Communications

You can check that the interface is communicating by reading the **Device Communicating** object (DS). A value of 'yes' indicates the driver has connected to, and is communicating with, the Daikin iTouch.

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.

Each object is specified below, along with its sub-objects.

Example Object Reference

An example of a reference to an object in the same device: the Daikin system object (S1) contains Network 1 (N1), with group address 1-00 (O1I0), which contains a label object (L). Therefore, the object reference will be 'S1.N1.O1I0.L'.

An example of a reference to an object in a different device: the IP network object (IP) contains Default Commander object (CDIP), which contains the object above (S1.N1.O1I0.L) – therefore the complete object reference is 'IP.CDIP.S1.N1.O1I0.L'.

Device Top-Level Objects

When an interface is started using the Daikin driver, the objects below become available within the top-level object of the device. For example, if Interface 1 is started, then the object with references 'M1' and 'S1' become available.

Description	Reference	Type
Daikin Setup Set up the Daikin driver, started on interface *c* (*c* is the interface number)	M*c*	Fixed Container: On the Commander platform this will be *[CDM v20\Daikin v11]* On the ObSys platform this will be *[OSM v20\Daikin v11]*
Daikin AC System Access Daikin system connected to interface *c* (*c* is the interface number)	S*c*	Variable Container: For an iTouch Controller, this will be *[Daikin v11\Ctlr]* For an iTouch Manager, this will be *[Daikin v11\Mngr]*

Daikin Driver Setup

Object Type: *[OSM v20\Daikin v11]*
Object Type: *[CDM v20\Daikin v11]*
Object Type: *[OSM v20\Daikin v10]*
Object Type: *[CDM v20\Daikin v10]*

The Daikin driver contains the following objects:

Description	Reference	Type
Device Label Label displayed when scanning the system	DL	Obj\Text; Max. 20 chars; Adjustable
iTouch Model Select the model of iTouch installed. Available in driver version 1.1 only	IM	Obj\ENum; Adjustable Values: 0=iTouch Controller, 1=iTouch Manager
iTouch IP Address IP address of the remote Daikin iTouch	IA	Obj\IP; Adjustable
iTouch HTTP Port Port number configured for the HTTP/Web Interface in the remote Daikin iTouch. On iTouch Controllers the default port is 80, on iTouch Managers it is 8081	PN	Obj\Num: 1024…65535; Adjustable
Device Communicating Indicates the driver has connected to and is receiving data from the iTouch	DS	Obj\NoYes
Reset Driver This will clear the driver's database of values and then re-initialize communications with the iTouch	RST	Obj\NoYes; Adjustable
Debug Enable This will store additional debug information in the record file. Use this option only when instructed by North Support	DE	Obj\NoYes; Adjustable

Daikin System

Object Type: *[Daikin v11\Ctlr]*
Object Type: *[Daikin v11\Mngr]*
Object Type: *[Daikin v10]*

The Daikin system contains objects to access the DIII networks. Network 1 is used for the controller's local DIII network; other networks require the optional DIII-NET Plus adapter installing.

Description	Reference	Type
Network *x* The network number, *x,* is in the range 1…2 when connected to an iTouch Controller, or 1…8 when connected to an iTouch Manager	N*x*	Fixed Container: *[Daikin v11\Net]*

Network

Object Type: *[Daikin v11\Net]*
Object Type: *[Daikin v10\Net]*

The Daikin DIII network contains objects to access the configured groups of indoor units. Scan the object to find the groups available. Each network supports up to 64 groups.

Description	Reference	Type
Outdoor y Indoor z The outdoor unit, *y,* is in the range 1…4. The indoor unit, *z*, is in the range 0…15.	O*y*I*z*	Fixed Container, one of the following: Air-conditioning (VRV) *[Daikin v11\VRV]* Ventilation (HRV) *[Daikin v11\HRV]* Digital Input (DI) *[Daikin v11\D3DI]* Digital Input-Output (DIO) *[Daikin v11\D3DIO]* DIII Chiller *[Daikin v11\D3]* Altherma Heating *[Daikin v11\Altherma]* Inverter Chiller *[Daikin v11\INV]*

Daikin VRV Units

Object Type: *[Daikin v11\VRV]*
Object Type: *[Daikin v10\VRV]*

Daikin VRV air-conditioning units contain the following objects:

Description	Reference	Type
Label	L	Obj\Text; Max. 32 chars
Unit Type	T	Obj\ENum: 1…7 Values: 3=VRV
On/Off Status See note 1	S	Obj\OffOn; Adjustable
Operation Mode See note 1	M	Obj\ENum: 0…9; Adjustable Values: 0=Fan, 1=Heat, 2=Cool, 4=Dependent, 5=Ventilation, 6=Dry, 8=Auto (Heat), 9=Auto (Cool)
Set point (°C) Set point is not adjustable when operation mode is fan or dry. See note 1	ST	Obj\Num: 16…32; Adjustable
Room Temperature (°C) Depending on operation mode, the temperature sensor may be inaccurate due to the influence of heat exchangers. Use with caution.	RT	Obj\Float: 2…50
Fan Speed Two-speed fans only support low/middle speeds. See note 1	FS	Obj\ENum: 0…2, 4; Adjustable Values: 0=Low, 1=Medium, 2=High, 4=Auto
Fan Direction See note 1	FD	Obj\ENum: 0…7; Adjustable Values: 0=Horizontal, 1=Mid1, 2=Mid2, 3=Mid3, 4=Mid4, 5=Mid5, 6=Vertical, 7=Swing
Filter Dirty To clear the filter dirty fault, write 'No'(0) to this object	F	Obj\NoYes; Adjustable
Error Detected	E	Obj\NoYes
Malfunction Code See *Appendix A*	FLT	Obj\Text: 2 chars
Malfunction Code – as Number See *Appendix A*	FLTB	Obj\Num: 0…1919

Notes

1. On/Off status, operation mode, set point, fan speed, and fan direction are stored within the Daikin unit in non-volatile memory. This memory has a limitation on the frequency it can be set, so do not adjust these objects more than 7000 times/year.

Daikin HRV Units

Object Type: *[Daikin v11\HRV]*
Object Type: *[Daikin v10\HRV]*

Daikin HRV ventilation units contain the following objects:

Description	Reference	Type
Label	L	Obj\Text; Max. 32 chars
Unit Type	T	Obj\ENum: 1…7 Values: 4=HRV
On/Off Status See note 1	S	Obj\OffOn; Adjustable
Ventilation Mode See note 1	VM	Obj\ENum: 0…9; Adjustable Values: 0=Auto, 1=Heat Exchange, 2=Bypass
Ventilation Amount See note 1	VA	Obj\ENum: 0…5; Adjustable Values: 0=Auto (normal), 1=Low (normal), 2=High (normal), 3=Auto (fresh up), 4=Low (fresh up), 5=High (fresh up)
Error Detected	E	Obj\NoYes
Malfunction Code See *Appendix A*	FLT	Obj\Text: 2 chars
Malfunction Code – as Number See *Appendix A*	FLTB	Obj\Num: 0…1919

Notes

1. On/Off status, ventilation mode, and ventilation amount are stored within the Daikin unit in non-volatile memory. This memory has a limitation on the frequency it can be set, so do not adjust these objects more than 7000 times/year.

Daikin DIO Units

Object Type: *[Daikin v11\D3DIO]*
Object Type: *[Daikin v10\D3DIO]*

Daikin DIO digital input-output units contain the following objects:

Description	Reference	Type
Label	L	Obj\Text; Max. 32 chars
Unit Type	T	Obj\ENum: 1…7 Values: 2=DIO
On/Off Status	S	Obj\OffOn; Adjustable
Error Detected	E	Obj\NoYes
Malfunction Code See *Appendix A*	FLT	Obj\Text: 2 chars
Malfunction Code – as Number See *Appendix A*	FLTB	Obj\Num: 0…1919

Daikin DI Units

Object Type: *[Daikin v11\D3DI]*
Object Type: *[Daikin v10\D3DI]*

Daikin DI digital input units contain the following objects:

Description	Reference	Type
Label	L	Obj\Text; Max. 32 chars
Unit Type	T	Obj\ENum: 1…7 Values: 1=DI
On/Off Status	S	Obj\OffOn
Error Detected	E	Obj\NoYes
Malfunction Code See *Appendix A*	FLT	Obj\Text: 2 chars
Malfunction Code – as Number See *Appendix A*	FLTB	Obj\Num: 0…1919

Daikin Altherma Units

Object Type: *[Daikin v11\Altherma]*

Daikin Altherma heat pumps contain the following objects.

Description	Reference	Type
Label	L	Obj\Text; Max. 32 chars
Unit Type	T	Obj\ENum: 1…7 Values: 6=Altherma
On/Off Status See note 1	S	Obj\OffOn; Adjustable
Operation Mode	M	Obj\ENum: 0…9 Values: 1=Heat
Set point (°C) Support for this object may vary depending on unit model. See note 1	ST	Obj\Num: 16…32; Adjustable
Supply Temperature (°C)	RT	Obj\Float: 2…50
Defrost/Hot Start	DF	Obj\NoYes
Error Detected	E	Obj\NoYes
Malfunction Code See *Appendix A*	FLT	Obj\Text: 2 chars
Malfunction Code – as Number See *Appendix A*	FLTB	Obj\Num: 0…1919

Notes

1. On/Off status and set point are stored within the Daikin unit in non-volatile memory. This memory has a limitation on the frequency it can be set, so do not adjust these objects more than 7000 times/year.

Daikin Generic Units

Object Type: *[Daikin v11\D3]*
Object Type: *[Daikin v11\INV]*
Object Type: *[Daikin v11\Other]*
Object Type: *[Daikin v10\Other]*

Other types of Daikin unit may contain any of the following objects, however not all objects may be supported.

Description	Reference	Type
Label	L	Obj\Text; Max. 32 chars
Unit Type	T	Obj\ENum: 1…7 Values: 1=DI, 2=DIO, 3=VRV, 4=HRV, 5=DIII, 6=Altherma, 7=Inv
On/Off Status See note 1	S	Obj\OffOn; Adjustable
Operation Mode See note 1	M	Obj\ENum: 0…9; Adjustable Values: 0=Fan, 1=Heat, 2=Cool, 4=Dependent, 5=Ventilation, 6=Dry, 8=Auto (Heat), 9=Auto (Cool)
Set point (°C) Set point is not adjustable when operation mode is fan or dry. See note 1	ST	Obj\Num: 16…32; Adjustable
Room Temperature (°C) Depending on operation mode, the temperature sensor may be inaccurate due to the influence of heat exchangers. Use with caution.	RT	Obj\Float: 2…50
Fan Speed Two-speed fans only support low/middle speeds. See note 1	FS	Obj\ENum: 0…2, 4; Adjustable Values: 0=Low, 1=Medium, 2=High, 4=Auto
Fan Direction See note 1	FD	Obj\ENum: 0…7; Adjustable Values: 0=Horizontal, 1=Mid1, 2=Mid2, 3=Mid3, 4=Mid4, 5=Mid5, 6=Vertical, 7=Swing
Filter Dirty To clear the filter dirty fault, write 'No'(0) to this object	F	Obj\NoYes; Adjustable
Defrost/Hot Start	DF	Obj\NoYes
Ventilation Mode See note 1	VM	Obj\ENum: 0…9; Adjustable Values: 0=Auto, 1=Heat Exchange, 2=Bypass
Ventilation Amount See note 1	VA	Obj\ENum: 0…5; Adjustable Values: 0=Auto (normal), 1=Low (normal), 2=High (normal), 3=Auto (fresh up), 4=Low (fresh up), 5=High (fresh up)
Error Detected	E	Obj\NoYes
Malfunction Code See *Appendix A*	FLT	Obj\Text: 2 chars
Malfunction Code – as Number See *Appendix A*	FLTB	Obj\Num: 0…1919

Notes

2. On/Off status, operation mode, set point, fan speed, and fan direction are stored within the Daikin unit in non-volatile memory. This memory has a limitation on the frequency it can be set, so do not adjust these objects more than 7000 times/year.

Appendix A: Daikin Malfunction Codes

Daikin malfunction codes contain two alphanumeric characters, and are available for each unit using the object FLT.

A full list of malfunction codes is available within Daikin documentation for a unit, and from *www.drdaikin.com*.

Summary of VRV and HRV malfunction codes:

	Malfunction Code	Description
Indoor Unit	A0	External protection device activated
	A1	Malfunction of indoor unit PCB
	A6	Fan motor locked, overload, overcurrent
	A7	Malfunction of swing flap motor
	A8	Malfunction of power supply
	A9	Malfunction of electronic expansion valve drive
	AF	Malfunction of a humidifier system
	AH	Malfunction of dust collector of air cleaner
	AJ	Malfunction of capacity setting (Indoor unit PCB)
	C1	Failure of transmission (between indoor unit PCB and fan PCB)
	C4	Malfunction of liquid pipe thermistor for heat exchanger
	C5	Malfunction of gas pipe thermistor for heat exchanger
	C6	Malfunction of fan motor control driver
	C9	Malfunction of suction air thermistor
	CA	Malfunction of discharge air thermistor
	CJ	Malfunction of thermostat sensor in remote controller
	E0	Protection devices actuated (unified)
	E1	Defect of outdoor unit PCB
	E3	Actuation of high pressure switch (HPS)
	E4	Actuation of low pressure switch (LPS)
	E5	Inverter compressor motor lock
	E6	STD compressor motor overcurrent/lock
	E7	Malfunction of outdoor unit fan motor
	E9	Malfunction of electronic expansion valve coil
	EC	Malfunction of entering water temperature
	EF	Malfunction of thermal storage unit
	F3	Malfunction of discharge pipe temperature
	F6	Refrigerant overcharged
Outdoor Unit	H3	Malfunction of high pressure switch (HPS)
	H4	Malfunction of low pressure switch (LPS)
	H7	Malfunction of outdoor fan motor signal
	H9	Malfunction of outdoor air thermistor
	HC	Malfunction of (hot) water temperature thermistor
	HF	Alarm in thermal storage unit with ice
	HJ	Malfunction of thermal storage tank water level
	J1	Malfunction of pressure sensor
	J2	Malfunction of current sensor of compressor
	J3	Malfunction of discharge pipe thermistor
	J5	Malfunction of suction pipe thermistor
	J6	Malfunction of heat exchanger thermistor
	J7	Malfunction of liquid pipe thermistor (Refrigerant circuit and others)
	J9	Malfunction of gas pipe thermistor (Refrigerant circuit and others)
	JA	Malfunction of high pressure sensor
	JC	Malfunction of low pressure sensor
	JE	Malfunction of sub-tank thermistor
	JF	Malfunction of heating thermistor for heat exchanger
	JH	Malfunction of oil temperature thermistor

	Malfunction Code	Description
Outdoor Unit	L0	Malfunction of inverter system
	L1	Malfunction of inverter PCB
	L4	Malfunction of inverter radiating fin temperature rise
	L5	Inverter instantaneous overcurrent (DC)
	L6	Inverter instantaneous overcurrent (AC)
	L8	Overcurrent of inverter compressor
	L9	Malfunction of inverter compressor Startup
	LA	Malfunction of power transistor
	LC	Malfunction of transmission between control and inverter PCB
	P0	Shortage of refrigerant amount (thermal storage unit)
	P1	Power voltage imbalance, open phase
	P2	Automatic refrigerant charge operation stop
	P4	Malfunction of radiating fin temperature sensor
	P8	Heat exchanger freezing protection during automatic refrigerant charging
	P9	Automatic refrigerant charge operation completed
	PA	Empty refrigerant cylinder during automatic refrigerant charging
	PC	Empty refrigerant cylinder during automatic refrigerant charging
	PE	Automatic refrigerant charge operation nearly completed
	PH	Empty refrigerant cylinder during automatic refrigerant charging
	PJ	Improper combination between inverter and fan driver
	U0	Shortage of refrigerant
	U1	Reverse phase, open phase
	U2	Defect of power supply voltage or instantaneous power failure
	U3	Check operation not executed
	U4	Malfunction of transmission between indoor and outdoor unit
	U5	Malfunction of transmission between indoor unit and remote controller
	U6	Malfunction of transmission between indoor units
	U7	Malfunction of transmission between outdoor units
	U8	Malfunction of transmission between remote controllers
	U9	Malfunction of transmission (other system)
	UA	Improper combination of indoor and outdoor units
	UC	Malfunction of setting of centralized controller address
	UE	Malfunction of transmission between indoor unit and centralized controller
	UF	Wiring and piping mismatch
	UH	Malfunction of system
	UJ	Malfunction of transmission (Accessory devices)
System	M1	Malfunction of centralized remote controller PCB
	M8	Malfunction of transmission between optional controllers for centralized control
	MA	Improper combination of optional controllers for centralized control
	MC	Address duplication, improper setting

Malfunction Codes as a Number

The driver can translate the Daikin malfunction code to a number using the object FLTB, providing an more interoperable value.

Each character of the malfunction code is translated into a number in the range 00..19, using this table:

Character	Number
0 to 9	00 to 09
A	10
C	11
E	12
F	13
H	14
J	15
L	16
M	17
P	18
U	19

Examples:

‘UE’ becomes 1912
‘A7’ becomes 1007
‘60’ becomes 600

Driver Versions

Version	Build Date	Details
1.0	18/02/2015	Released
1.1	12/10/2016	Added support for Daikin iTouch Manager
1.1	08/01/2017	Improved speed of processing large response from iTM
1.1	01/06/2019	Modified scanning of Daikin network. iTouch controller now returns label if available. If number of indoor units changes, driver will resync database after 5 mins, otherwise resync will occur in approx. 3hrs.
1.1	29/05/2020	Modification: Added 'auto' state to Fan Speed object (FS)
1.1	30/11/2021	Modification: tidy of disconnect code

Next Steps…

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

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