

Daikin Industries, Ltd.

DMS Interface <DMS504B51>

Functional Specifications

VER.1.1



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1. Introduction

This publication describes the functions of the DMS Interface that is used to connect a Daikin A/C control line (DIII-NET) to a LONWORKS[®] network. The LONWORKS[®] network, via the DMS Interface, enables the monitoring and control of Daikin's VRV systems.

2. System Configuration

2.1. A/C Units to be Monitored and Controlled

A/C units

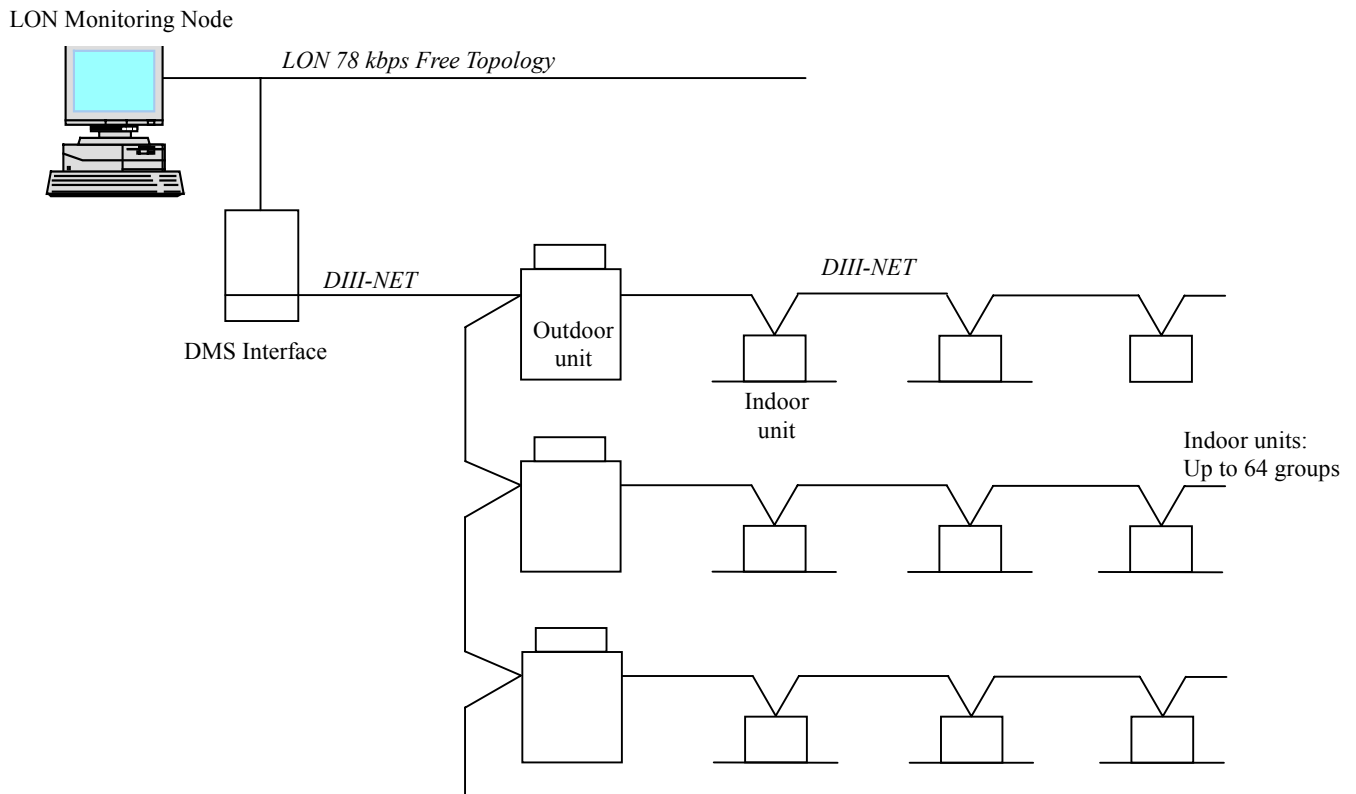
- VRV indoor units (H, K)
- HRV (This refers to systems that are connectable to the DIII-NET. However, only ON/OFF operation can be monitored.)
- SkyAir indoor units (Each indoor unit requires an adapter to connect to the SkyAir.)

Adapters

- General purpose adapter (DTA103A1: Only ON/OFF status can be monitored.)
- Centralized control adapter

2.2. Number of A/C Units to be Monitored and Controlled

A maximum of 64 groups of indoor units connected to a DIII-NET via one DMS Interface can be monitored and controlled. 64 refers to the number of indoor units, each of which is assigned an address on the DIII line. The indoor unit addresses from 1-00 to 4-15 corresponds with the LON A/C numbers from 1 to 64 that are used in communications within the LON. This means that addresses 1-00 and 4-15 indicate A/C numbers 1 and 64, respectively.

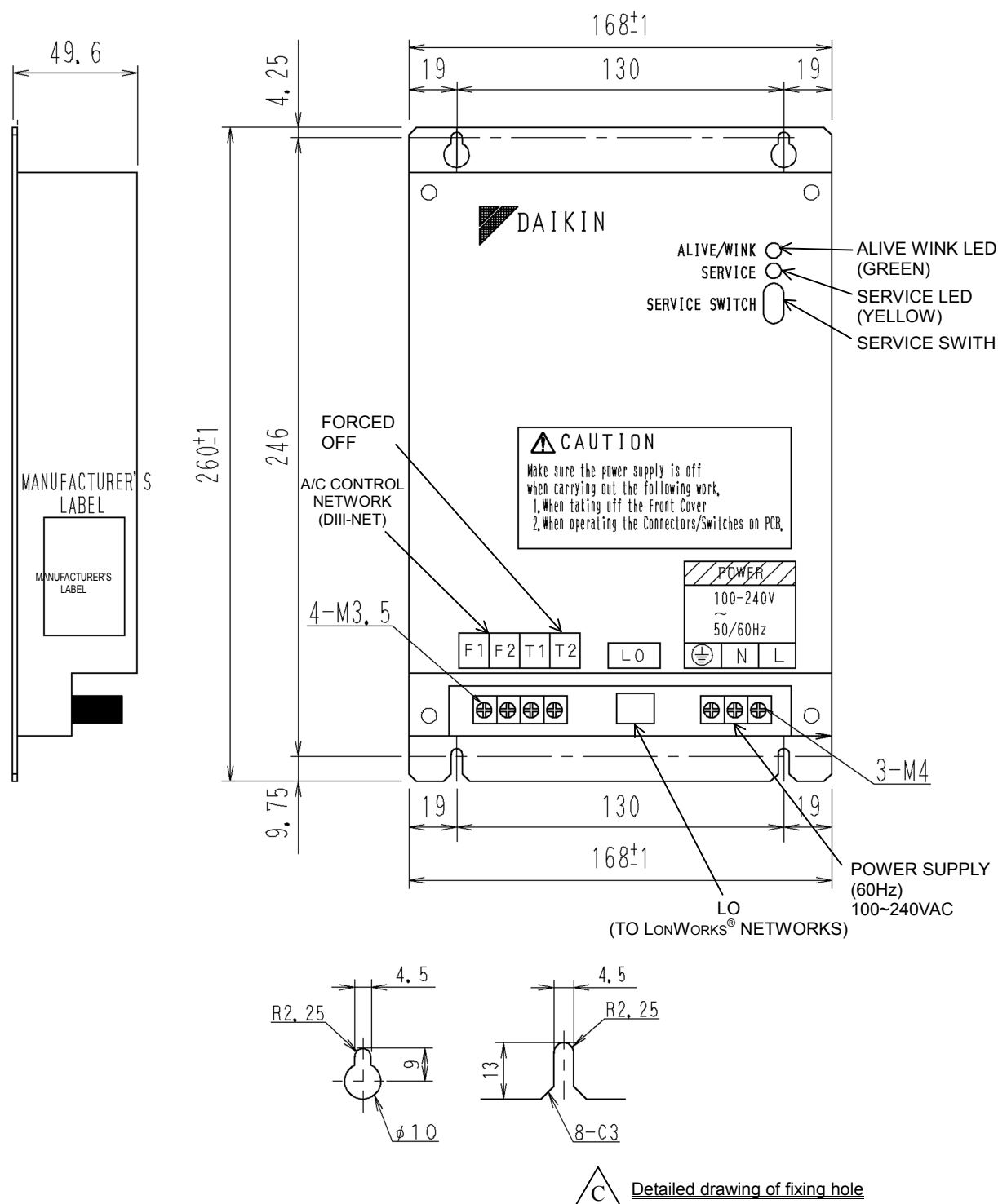


2.3. Location Address Setting and Combined Use of Other Centralized Devices

- Only one DMS Interface can be installed on a DIII line.
- DDS, D-BIPS, BACnet[®] Gateway, and intelligent Manager cannot be installed/used together on the same DIII-NET line.
- A Centralized Controller, intelligent Touch Controller, and ON/OFF Controller can be installed/used together.
- A schedule timer cannot be installed/used together.

3. Hardware

3.1. Schematic Diagram of the Hardware



4. Outline of Functions

4.1. Outline of Function Via LON

The DMS Interface features the following functions.

(A) A/C unit control

The commands directed for each A/C unit are received from the LON monitoring node and command are sent to the respective A/C units.

The commands directed for all the A/C units on the respective DIII line are received from the LON monitoring node and the functions are executed.

(B) A/C unit status monitoring

The A/C unit status is communicated to the LON monitoring node in the form of LON network variables.

(C) Report of A/C unit status change

When the status of an A/C unit changes, the respective value is sent to the LON monitoring node in the form of LON network variables (when output network variables are bound).

4.2. Function of Contact Input

The DMS Interface has a single contact input.

(A) System Forced Off

The forced Off contact input enables a batch Forced Off operation from the disaster monitoring panel or the like.

Precaution:

(1) Input of the Forced Off operation takes one of the following forms:

- Setting to “nviSystemOff” from the LON monitoring node
- Short circuit the T1 and T2 terminals

Make sure that only one of the two forms must be used when an input point is incorporate into a system.

4.3. Control and Monitoring Items

This section shows a list of items to be controlled and monitored.

Table 4.1. Control and Monitoring Items

	Function	Description	Supported
Control items *11	ON/OFF Command	Start/stop of A/C operation	○
	Operation Mode Setting	Heating/Cooling/Ventilation/Auto *1 *16	○
	Temperature Setting	Set room temperature *2	○
	Airflow Rate Setting	Set airflow rate *3	○
	Filter Sign Reset	Filter sign reset *4	○
	Forced Thermostat OFF Setting	Forced thermostat OFF	○
	Remote ON/OFF Control Rejection	Permission/prohibition of ON/OFF operation *10	○
	Remote Operation Mode Control Rejection	Permission/prohibition of operation mode change *10	○
	Remote Temperature Setting Control Rejection	Permission/prohibition of set temperature change *10	○
	System Forced OFF Setting	System Forced Off command	○
	Sub Group Address Control Rejection Setting	Sub Group Address Control Rejection command	○
Monitoring items	ON/OFF Status Report	ON/OFF status *14	○
	Operation Mode Status Report	Heating/Cooling/Ventilation *5	○
	Temperature Setting Report	Set room temperature *2	○
	Room Temperature Report	Room temperature *2 *12	○
	Airflow Rate Setting Report	Set airflow rate *3	○
	Filter Sign Report	Filter sign *6	○
	Error Status Report	Error status *7 *15	○
	Error Code Report	Error code *7	○
	Thermostat Status Report	Thermostat status	○
	Forced Thermostat OFF Setting Status Report	Forced thermostat OFF status	○
	Remote ON/OFF Operation Rejection Report	ON/OFF Operation Rejection Status *10	○
	Remote Operation Mode Setting Control Rejection Report	Operation Mode Setting Control Rejection status *10	○
	Remote Temperature Setting Control Rejection Report	Temperature Setting Control Rejection status *10	○
	System Forced OFF Setting Report	System Forced OFF Setting status (set or reset)	○
	Sub Group Address Control Operation Rejection Setting Report	Sub Group Address Control Operation Rejection Setting status (set or reset)	○
	A/C Communication Status Report	No Occupancy/Communication normal/Communication error *13 *15	○

Symbol in the Supported column

○: Supported

×: Not Supported

Outline of functions Notes

- *1 Auto Mode settings directed for A/C units without a cooling/heating option will be read as a temperature control command. Therefore, the operation mode for these A/C units without the option are aligned with the operation mode for A/C units with the option.
- *2 The set room temperature for outdoor-air processing units is represented by either the set or measured value of discharged air. (Does not apply to some models.)
- *3 Any airflow rates on the LON are classified either High or Low (only 2 speeds). In order to be used as DIII data, airflow rates of “4 or less” and “5 or more” are reread as “Low” and “High”, respectively, for monitoring. In terms of commands, “1” is reread as “Low” and “7” “High”.
- *4 Reset commands to the A/C units are issued/sent to the items displayed at that moment (filter or element).
- *5 The Auto Mode status cannot be monitored. “Dry” operation is reported as cooling.
- *6 The OR status value for the filter sign and element sign.
- *7 An error is reported to the LON only when at or above abnormal levels. The error code is an ASCII 2 characters. Alarm and warning message is not reported.
- *10 Even for A/C units without remote controllers, this appears as if a “Rejection” setting has been conducted.
- *11 The control commands sent to sub machines connected through a remote control group are ignored.
- *12 For A/C units that are not equipped with a temperature sensor, the room temperature is reported as either 0°C or INVALID (0x7fff).
Room temperature refers to an indoor temperature that is measured and used by an A/C unit for temperature control purposes. Therefore, the value may differ from the actual room temperature depending on the location of the sensor.
- *13 Communication errors are reported with nvoHvacExist_nn, nvoErrStatus_nn, or nvoFailure_nn. Messages starting with nvo and ending with _nn (nvo**_nn) maintain the latest value.
- *14 When an error occurs, the A/C unit stays in “operation” status until the OFF command is sent from the remote controller or centralized device.
- *15 U3 to U9 and UJ communication error messages are not sent within the first 5 minutes.
- *16 For room air-conditioners, the operation mode should not be set to “AUTO”.

4.4. Setting/Monitoring Restrictions from LON according to A/C Unit Model/Installation Method

- (1) No special provision are made for A/C units without a cooling/heating option. Operation mode changeover commands directed to A/C units without a cooling/heating option are ignored. If the same command is sent to A/C units with the option, the operation mode of subordinate A/C units (without the option) may be changed over even if there is no direct instruction.



- (2) No special provision are made for A/C units without Auto Mode.
When A/C units without Auto Mode are set on Auto, the Auto Mode (message) is ignored and the temperature control mode at that moment is maintained.
- (3) BS units (if connected) are not handled in any special manner.
- (4) When sub A/C unit within a remote control group have a location address, they are monitored as one A/C unit. However, all commands directed to the A/C units are ignored.
- (5) Upon the occurrence of an error within a remote control group, the DMS Interface reports as follows:
- (a) In cases where only the main A/C units within a remote control group have location addresses:
When any of the indoor units within the group malfunctions, the respective message is sent to the LON monitoring node in the form of the A/C number of the main A/C unit. In other words, if any of the A/C units within the group malfunctions, the message is output. However, the LON cannot recognize in which unit the error is occurring.
 - (b) In cases where all A/C units within a remote control group have location addresses:
When any of the units within a group malfunctions, the corresponding message is sent to the LON monitoring node in the form of the A/C numbers of all main and sub A/C units within the group. In other words, if any one of the A/C units within the group malfunctions, the message is sent reporting all A/C numbers within the group; once again the LON cannot recognize in which unit the error is occurring.
- (6) When the A/C units and HRV are being controlled as a remote control group, the HRV cannot be independently operated by the centralized device. (If the independent operation command is sent to the HRV with a remote controller, the operation mode becomes "ventilation".)

5. LON Interface Specifications

Standard specification:

Protocol : LonTalk protocol
 Transceiver : FT-X1
 Transfer rate : 78 kbps
 Topology : Free topology
 Transmission medium : Twisted pair



6. LON Communication Specifications

6.1. LonMark Template Profiles

There are no LonMark Template Profiles created by the LonMark Interoperability Association for the VRV. Therefore, original specifications for the VRV have been created without using the LonMark Template Profiles. These original specifications conform to standard network variable types established by the Interface Committee of the JRAIA (Japan Refrigeration and Air Conditioning Industry Association).

6.2. LonMark Certification

The network variable types are original and therefore are not LonMark certified.

6.3. Objects

There are 66 objects: NODE Object, GENERAL, and AC_01 to AC_64.

GENERAL uses network variables that relate to all A/C units in the DIII system (such as System Forced OFF).

AC_01 to AC_64 use network variables that relates to each of the A/C units in the DIII system.

Table 6.1. Object Table

Object Name									
NODE Object									
AC_01	AC_02	AC_03	AC_04	AC_05	AC_06	AC_07	AC_08	AC_09	AC_10
AC_11	AC_12	AC_13	AC_14	AC_15	AC_16	AC_17	AC_18	AC_19	AC_20
AC_21	AC_22	AC_23	AC_24	AC_25	AC_26	AC_27	AC_28	AC_29	AC_30
AC_31	AC_32	AC_33	AC_34	AC_35	AC_36	AC_37	AC_38	AC_39	AC_40
AC_41	AC_42	AC_43	AC_44	AC_45	AC_46	AC_47	AC_48	AC_49	AC_50
AC_51	AC_52	AC_53	AC_54	AC_55	AC_56	AC_57	AC_58	AC_59	AC_60
AC_61	AC_62	AC_63	AC_64	GENERAL					

6.4. Configuration Properties (CP)

The following five configuration properties (CP) are supported.

(1) Minimum Send Time: Minimum Transmission Interval

The bound output network variables will not be sent until the minimum transmission interval has passed even if there is a change in status value.

(2) Send Heartbeat: Heartbeat Transmission

The bound output network variables will be sent to notify the system once the minimum transmission interval has passed even if there is no change in status value. The actual interval between transmitted messages will depend upon factors such as the transmission capacity of the DMS Interface, nciMaxRng value, and the network traffic status.

The monitoring items to be sent are bound ON/OFF Status Report, Room Temperature Report, Filter Sign Report, Error Status Report, Error Code Report and A/C Communication Status Report.

(3) Send on Delta Temperature: Detect Minimum Temperature Change

The bound output network variables will be sent to notify the system when there is a change in temperature that is greater than the above specified value between two consecutive transmissions.

(4) Delay Start Up: Transmission Start Delay Time After Start Up

The time lag between turning on the LON node and starting the LON communications. This setting is useful for avoiding communication congestion when LON nodes on the network simultaneously start up.

(5) Range Maximum: Maximum Transmission Limit

The number of messages transmitted from the DMS Interface will be effectively controlled by the bound output network variables. It also specifies the number of messages to be sent per minute. This is used to limit the number of messages to be consecutively sent from the nodes when they are started up.

Table 6.2. List of Configuration Properties

Control items	Variable name	Type	Values and meanings
Minimum Transmission Interval	nciMinOutTm(nc52)	SNVT_time_sec	0 sec. and 1.0 to 1200.0 sec. 0: No control, Default Value: 0
Heartbeat Transmission *1	nciSndHrtBt(nc49)	SNVT_time_sec	0 sec. and 10.0 to 1200.0 sec. 0: No control, Default Value: 0
Detect Minimum Temperature Change	nciMinDelta(nc64)	SNVT_temp_p	Temp. (°C): 0.10 to 10.00 Default Value: 0.10
Transmission Start Delay Time after Start Up	nciStartUpDly(nc111)	SNVT_time_sec	60.0 to 1200.0 sec. Default Value: 60.0
Maximum Transmission Limit (messages/sec.)	nciMaxRng(nc20)	SNVT_count	0 sec. and 1 to 6000 sec. 0: No control, Default Value: 0

Note:

*1: Items to be transmitted are the following 6 items: ON/OFF Status, Room Temperature, Filter Sign, Error Status, Error Code and A/C Communication Status. Please note that the DMS Interface collects room temperature data every 12 seconds, so any heartbeat transmission set at a lower time interval will ultimately result in a 12-second transmission interval.

6.5. Network Variables**6.5.1. NODE Object Network Variables**

The NODE Object has the following two network variables: nviRequest and nvoStatus.

These network variables support the following functions. The nvoStatus response will be the same regardless of which Object_id is specified.

Table 6.3. Support Range of “nviRequest” and “nvoStatus”

Support Item	Value Range
Object_id	0 to 65
Request function	RQ_NORMAL, RQ_UPDATE_STATUS, RQ_REPORT_MASK
Report status item (status mask)	None

An nvoStatus response will be returned for each nviRequest (RQ_UPDATE_STATUS, RQ_REPORT_MASK). Repeating this process at regular intervals enables the operation of the DMS Interface to be monitored.

6.5.2. Input Network Variables

The following table lists input network variables.

The last “nn” in a variable name indicates corresponds to an A/C number (01 to 64).

A variable name ending with “_nn” means that there are 64 network variables available.

Table 6.4. Input Network Variables

Control Item	Variable Name	Type	Value and Meaning
ON/OFF Command	nviOnOff_nn	SNVT_switch	(0, 1) (*, 0): Off (>0, 1): On
Operation Mode Setting	nviHeatCool_nn	SNVT_hvac_mode	0: Auto 1: Heating 3: Cooling 9: Ventilation
Temperature Setting	nviSetpoint_nn	SNVT_temp_p	Temperature °C
Airflow Rate Setting	nviFanSpeed_nn	SNVT_switch	(0, <value≤100, 1): low(>100, 1): high
Filter Sign Reset	nviFSReset_nn	SNVT_switch	Value = 0 or 1: Reset
Forced Thermostat OFF Setting	nviThermoOff_nn	SNVT_switch	(0, 1)(*, 0): Disable (>0, 1): Enable
Remote ON/OFF Control Rejection	nviRejOnOff_nn	SNVT_switch	(0, 1)(*, 0): Permit (>0, 1): Prohibit
Remote Operation Mode Control Rejection	nviRejMode_nn	SNVT_switch	(0, 1)(*, 0): Permit (>0, 1): Prohibit
Remote Temperature Setting Control Rejection	nviRejSetpoint_nn	SNVT_switch	(0, 1)(*, 0): Permit (>0, 1): Prohibit
System Forced OFF Setting	nviSystemOff	SNVT_switch	(0, 1)(*, 0): Normal (>0, 1): Off
Sub Group Address Control Rejection Setting	nviRejLC	SNVT_switch	(0, 1)(*, 0): Normal (>0, 1): Prohibit

6.5.3. Output Network Variables

This section shows a list of output network variables.

The last “nn” in a variable name indicates corresponds to an A/C number (01 to 64).

A variable name ending with “_nn” means that there are 64 network variables available.

Table 6.5. Output Network Variables

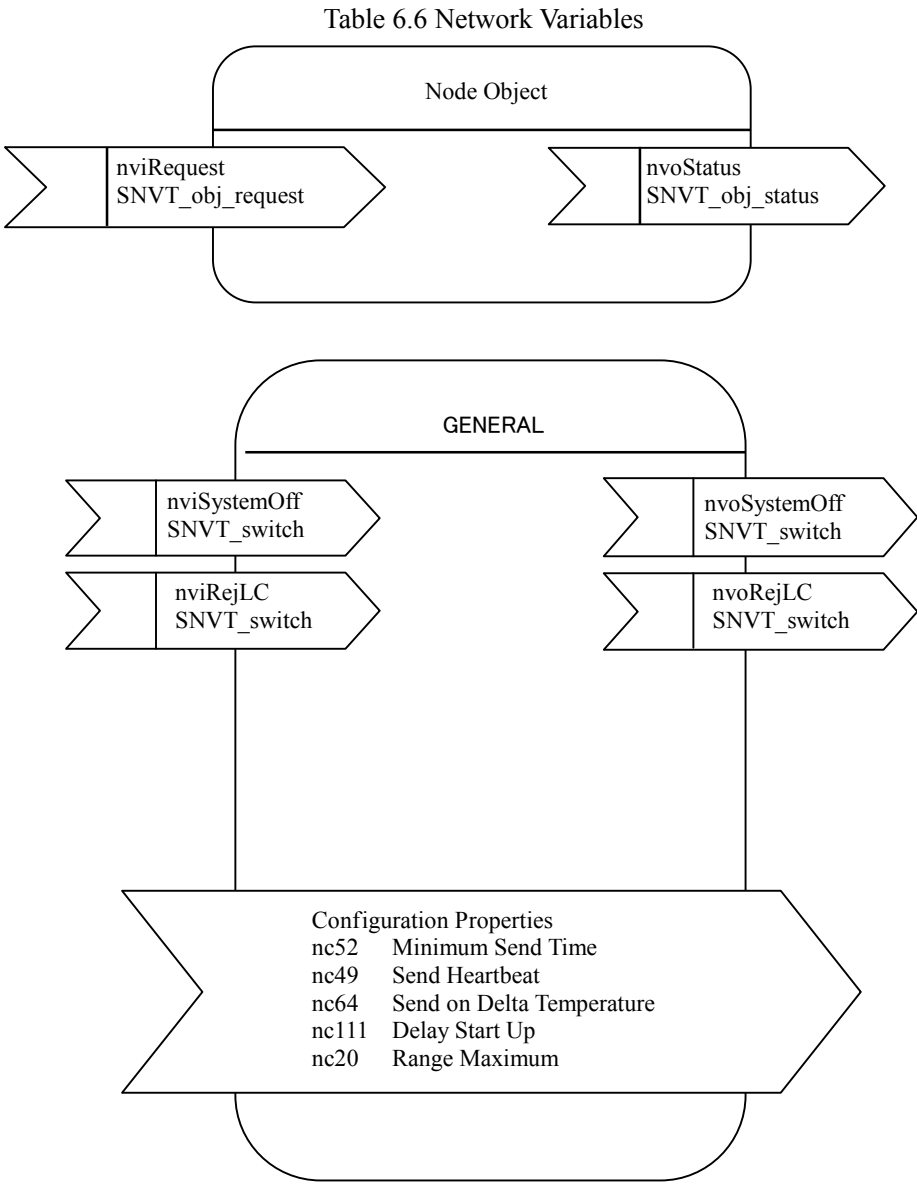
Control items	Variable name	Type	Values and meanings
ON/OFF Status Report	nvoOnOff_nn	SNVT_switch	(0, 0): Off (200, 1): On
Operation Mode Status Report	nvoHeatCool_nn	SNVT_hvac_mode	1: Heating 3: Cooling 9: Ventilation
Temperature Setting Report	nvoSetpoint_nn	SNVT_temp_p	Temp. (°C)
Room Temperature Report	NvoSpaceTemp_nn	SNVT_temp_p	Temp. (°C)
Airflow Rate Setting Report	nvoFanSpeed_nn	SNVT_switch	(100, 1): Low, (200, 1): High
Filter Sign Report	nvoFiltersign_nn	SNVT_switch	(0, 0): Normal, (200, 1): alarm
Error Status Report	nvoFailure_nn	SNVT_switch	(0, 0): Normal, (200, 1): Malfunction
Error Code Report	nvoErrStatus_nn	SNVT_count	0: Normal (Error code: 2 ASCII bytes) *1
Thermostat Status Report	nvoThermo_nn	SNVT_switch	(0, 0): OFF (200, 1): ON
Forced Thermostat OFF Setting Status Report	nvoThermoOff_nn	SNVT_switch	(0, 0): Disable (200, 1): Enable
Remote ON/OFF Operation Rejection Report	nvoRejOnOff_nn	SNVT_switch	(0, 0): Permit (200, 1): Prohibit
Remote Operation Mode Setting Control Rejection Report	nvoRejMode_nn	SNVT_switch	(0, 0): Permit (200, 1): Prohibit
Remote Temperature Setting Control Operation Rejection Report	nvoRejSetpoint_nn	SNVT_switch	(0, 0): Permit (200, 1): Prohibit
System Forced OFF Setting Report	nvoSystemOff	SNVT_switch	(0, 0): Normal (200, 1): Off
Sub Group Address Control Operation Rejection Setting Report	nvoRejLC	SNVT_switch	(0, 0): Normal (200, 1): Prohibit
A/C Communication Status Report	nvoHvacExist_nn	SNVT_switch	Value = 0: No Occupancy, 1: Normal, 2: Communication Error State = 1

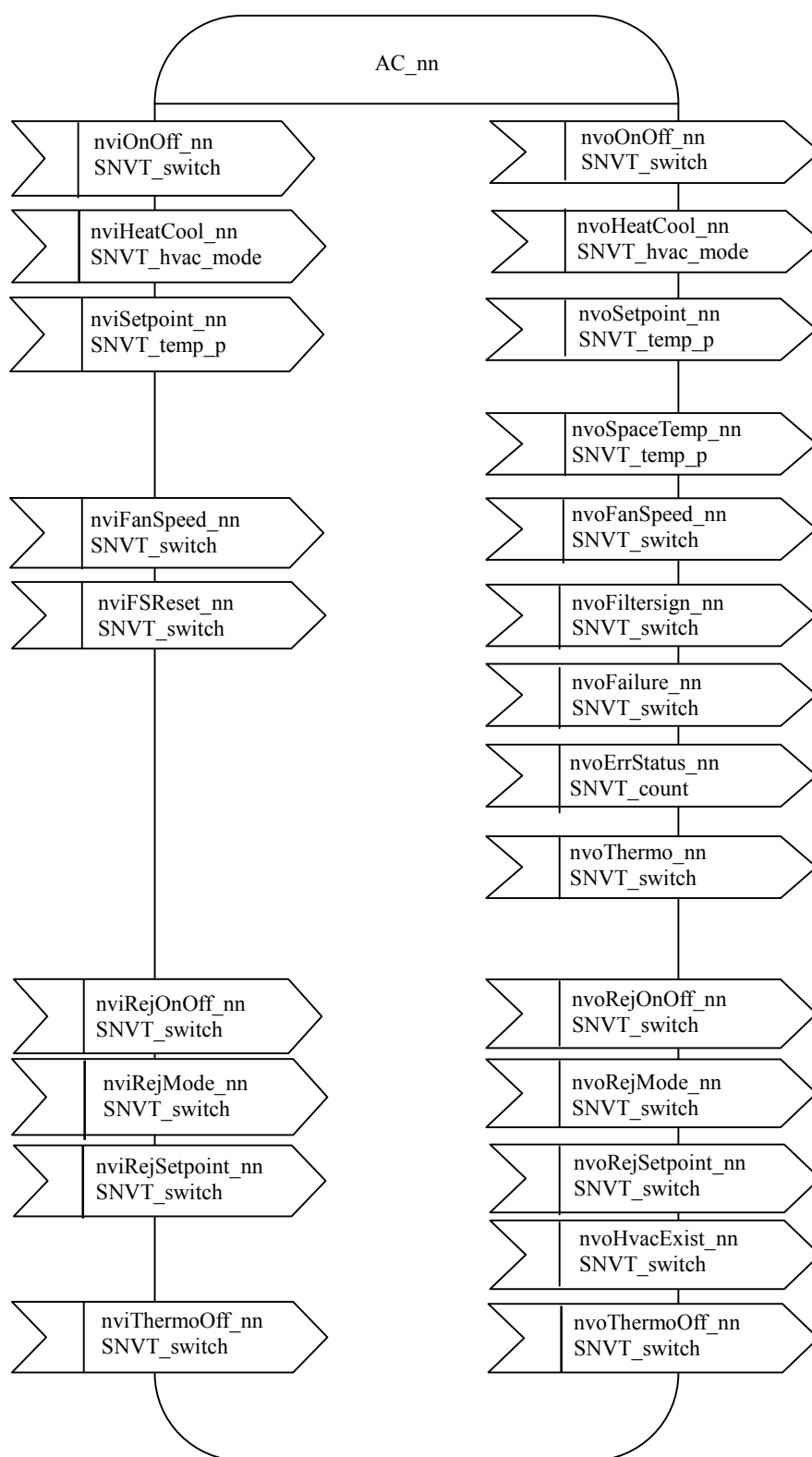
*1: A high-order byte (= the high-order byte of an error code) and a low-order byte (= the low-order byte of an error code) will be reported as ASCII codes.



6.5.4. General Network Variables

General network variables are shown below.
“nn” in a variable name indicates an A/C number (01 to 64).
Each number (01-64) corresponds to a specific A/C location address (1-00 to 4-15) on the DIII-NET.
A network variable ending with “_nn” means that one network variable is available for each AC_nn object, so there can be a total of 64 network variables.





7. Monitoring and Control Restrictions

7.1. Restrictions Regarding the “System Forced OFF” Function

- What is forced system-stop?

When the LON monitoring nodes send a “System Forced OFF” command to the DMS Interface, all of the A/C units on the DIII-NET controlled by the DMS Interface stop operating. Until the LON monitoring nodes send a message to deactivate the “System Forced OFF” command, no operating command for A/C units can be issued either from LON or from hand-held remote controller or other centralized devices, with the result that the units remain stopped. When the LON monitoring nodes send a message to deactivate the “System Forced OFF” command to the DMS Interface, it becomes possible to issue operating commands for A/C units from LON, hand-held remote controller, and other centralized devices.

The A/C units remain stopped after a message to deactivate the “System Forced OFF” command is issued. That is, it is not automatically restored to operation. Operating commands must then be issued via the DMS Interface or another central controller or a hand-held remote controller.

- When the System Forced OFF command is issued, the hand-held remote controller for the A/C units becomes “Inoperable status”. However, the output message of Remote ON/OFF Operation Rejection Report is not sent to the LON monitoring nodes.

The System Forced OFF status is output as a network variable “System Forced OFF Setting Report”.

- There is one System Forced OFF contact point per A/C control network (DIII-NET) system. Input in the DMS Interface is conducted either contact input or via the LON. Moreover, the centralized device for the System Forced OFF input point is set as the DIII main A/C unit.

- When the System Forced OFF Reset command and A/C Operation command from the LON monitoring nodes are sent at, more or less, the same time, the latter may not be properly sent to the A/C units. The entire A/C control network (DIII-NET) controlled by the DMS Interface becomes System Forced OFF reset status, so the operation command for the A/C units may be rejected (See Note 1)

If the A/C Operation command is to be sent after deactivation (reset), it is recommended that it be issued after confirming that the System Forced OFF has actually been deactivated (reset).

7.2. Operation Mode Changeover Restrictions

- When the Operation Mode Changeover command and Temperature Setting command from the LON monitoring nodes are sent at, more or less, the same time, the latter may not be properly sent to the A/C units. For example, if a Temperature Setting command is issued soon after an order to change from cooling to heating, the Temperature Setting command may be processed first, initially causing a change in the cooling temperature setting value, so that when the system then switches to heating it will be set to the default heating temperature setting. (See Note 1)

It is recommended that the commands to change the set temperature be issued after confirming the Operation Mode Changeover command has actually been sent and processed.

Note 1

LON communications do not and cannot guarantee the startup order of processing when more than one status change are reported.

7.3. LON Address Table Restriction

- The entry numbers in the address tables used to bind the network variables are limited to a maximum of 15. This must be taken into consideration when using several parameters upon binding.
- The DMS Interface continues to use space in the address table when the input network variables are used to bind.



7.4. Suspension of Message Transmission when Receiving Set Node Mode Online

- The DMS Interface suspends spontaneous message transmission, such as reports of the bound output network variable changes and heartbeat, as well as responding to the Node Object, for one minute after receiving “Set Node Mode Online”, a management message. However, it responds to other network management requests such as “poll” and “fetch”. This function is a mechanism to prevent time out errors because of transmission of messages spontaneously issued by the DMS Interface when it comes online due to use of an installation tool such as the LonMaker during commissioning.

7.5. Group Binding Restrictions

- It is impossible to bind one of the LON monitoring node output network variables and more than one input network variable in the DMS Interface. For example, setting one of the output networks of the monitoring node at ‘ON’ cannot turn the A/C units in the 10 groups under the LON monitoring node ‘ON’. The restriction is based on the LON regulations.

7.6. Prohibition Time of Commands from LON (Central Monitoring Panel) when Power is Restored after Power to A/C Units is Cut

- After restoration of electrical power that was cut to A/C units, commands must be sent from the LON (central monitoring panel) at least 5 or so minutes after the restoration. A/C communications are initialized for approximately 5 minutes upon power restoration and, thus, the A/C units will not receive any commands from the LON during this time period.



Precaution:

- LON communication performance limit value: Set command control packet interval at 100 ms or higher.

<Rough Estimate of Number of Groups Connected>



Control and Monitoring Items n (individual groups)	Max. number of groups connected	Remarks
23 items	13 groups	- One LON can monitor up to 300 items - The maximum number of control and monitoring items is 23 per A/C unit. If the number of control and monitoring items per A/C unit is assumed as 'n', the number of A/C groups connectable would be: $\text{No. of A/C groups (G)} \leq 300 \div n$ [Note: The maximum No. of A/C groups is 64.]
20 items	15 groups	
18 items	16 groups	
16 items	18 groups	
15 items	20 groups	
12 items	25 groups	
10 items	30 groups	
4 items	64 groups	

Assuming that acknowledged service is 10 items per second on a 30-second interval data collection cycle.

- ◆ Acknowledged service (possible communication volume): 10 items/second
This is one of the performance features of a DMS Interface. It can process 10 items per second.

- ◆ 30-second interval data collection cycle:
This is the time interval whereby device data (status) is collected from the central monitoring panel. In this case, the data regarding the connected A/C units is collected in 30 seconds. This figure differs with respect to the specifications of the central monitoring panel.

- ◆ DMS Interface performance: Acknowledged service of 10 items/second (fixed value)
- ◆ Central Monitoring Panel performance: 30-second data collection cycle
10 items per second being collected for 30 seconds translates into a total of 300 control items.
 $T = 10 \times 30 = 300 \text{ items}$
Number of control items per group: Assuming the number of items per group is 23, the number of groups connectable is 13.
 $n = T \div (\text{No. of control items per group}) = 300 \div 23 = 13 \text{ groups}$

- ◆ DMS Interface performance: Acknowledged service of 10 items/second (fixed value)
- ◆ Central Monitoring Panel performance: 60-second data collection cycle
10 items per second being collected for 60 seconds translates into a total of 600 control items.
 $T = 10 \times 60 = 600 \text{ items}$
Number of control items per group: Assuming the number of items per group is 23, the number of groups connectable is 26.
 $n = T \div (\text{No. of control items per group}) = 600 \div 23 = 26 \text{ groups}$

- ◆ DMS Interface performance: Acknowledged service of 10 items/second (fixed value)
- ◆ Central Monitoring Panel performance: 120-second data collection cycle
10 items per second being collected for 120 seconds translates into a total of 1200 control items.
 $T = 10 \times 120 = 1200 \text{ items}$
Number of control items per group: Assuming the number of items per group is 23, the number of groups connectable is 52.
 $n = T \div (\text{No. of control items per group}) = 1200 \div 23 = 52 \text{ groups}$

DMS Interface

(DMS504B51)

8. Product Specifications

Revision History		
Version	Contents	Remarks
First		

Note: Echelon, LON and LONWORKS[®] are trademarks of Echelon Corporation registered in the United States and other countries.

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1. Introduction

This document specifies the LONWORKS[®] network variables used when Daikin's VRV or other DIII-NET-compatible A/C units are connected to a LONWORKS[®] network.

2. Applicable Models

Function	Air Conditioners				
	VRV	Sky Air (Adapter for Sky Air)	Facility A/C (Centralized control adapter)	HRV	RA (General purpose adapter)
ON/OFF Operation and Monitoring	○	○	○	○	○
A/C Error Report	○	○	○	○	○
Room Temperature Monitoring	○	○	○	×	×
Temperature Setting and Monitoring	○	○	○	×	×
Operation Mode Setting and Monitoring (Note 3)	○	○	○	×	×
Remote Control Mode Setting and Monitoring	○	○	○	○	×
Filter Sign Monitoring and Reset	○	○	×	○	×
Thermostat Status Monitoring	○	○	×	×	×
Airflow Rate Setting and Monitoring	○	○	×	△Only monitoring (Note 2)	×
Forced Thermostat OFF Setting and Monitoring	○ (Note 1)	○	×	×	×

Note 1: When this is set from a remote controller, it is not reported to the upper system and, therefore, this setting cannot be monitored by the upper system.

Note 2: The triangle mark denotes a function that is only available for some models.

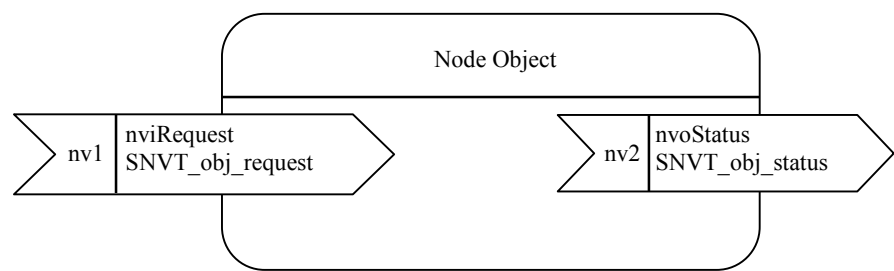
Note 3: Operation mode can be changed only on indoor units that allow a selection between heating and cooling.

3. Specifications of Devices

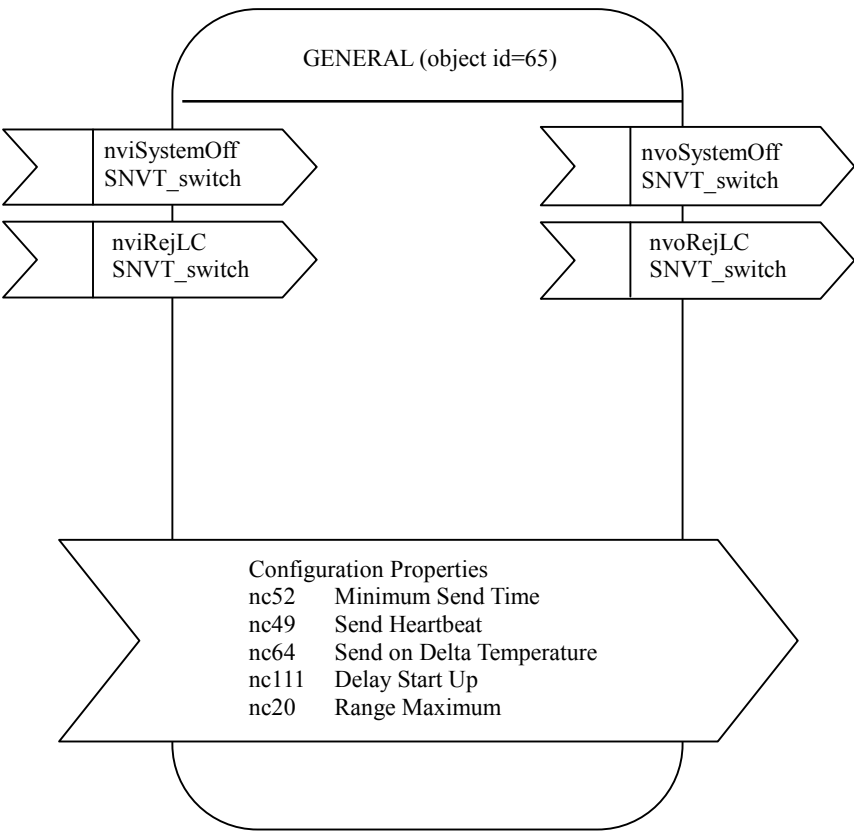
Item	Specifications	
Model	DMS504B51	DMS504B71
Dimensions	168 (W) x 260 (H) x 50 (D) mm	
Weight	1.5 kg	
Power source	Single phase AC100~240V 50/60Hz	Single phase AC24V 60Hz
Power consumption	Max. 5W	
Operable temperature range	-10 to 50 °C	
Storage temperature range	-20 to 60 °C	
Humidity	Up to 95% (No condensation)	
Installation	Mounted to indoor distribution board	
LONWORKS [®]	FT-X1 (Free topology 78Kbps)	
Contact input	Forced OFF x 1 (A/Cs en bloc)	

4. Object Details

4-1. Node Objects



4-2. DIII-NET Common Objects

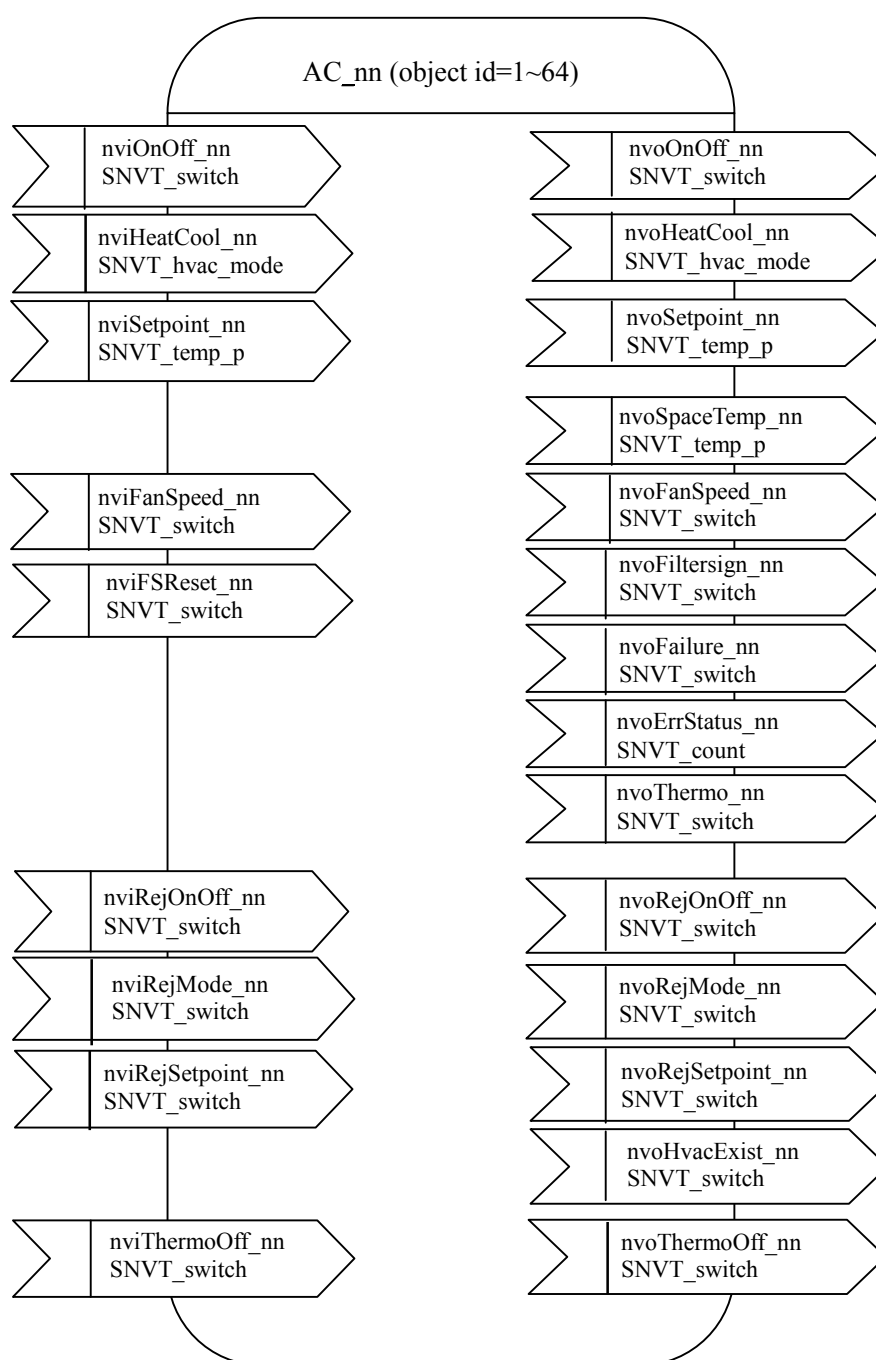


4-3. Air Conditioner Objects

It features objects for a group of 64 indoor units.

As shown below, the object name and the last “_nn” in the “nv Name” correspond with the DIII-NET location setting address.

Indoor Unit Location Setting Address	A/C Object	nv Name (Example)
1-00 – 1-15	AC_01 – AC_16	nviOnOff_01 – nviOnOff_16
2-00 – 2-15	AC_17 – AC_32	nviOnOff_17 – nviOnOff_32
3-00 – 3-15	AC_33 – AC_48	nviOnOff_33 – nviOnOff_48
4-00 – 4-15	AC_49 – AC_64	NviOnOff_49 – nviOnOff_64



5. Details of Network Variables

5-1. Node Objects

(1) Object Request Input (Node Request)

network input SNVT_obj_request nviRequest;

Valid Range

object_id :	0 – 65	0 = Node object, 1 – 64 = AC_01 – AC_64, 65 = GENERAL
	Other than above	Invalid

object_request :	RQ_NOEMAL	Returns the object to the normal condition
	RQ_UPDATE_STATUS	Request for information regarding the object status
	RQ_REPORT_MASK	Request for a report status bit mask
	Other than above	Invalid

Default Value

object_id = 0, object_request = RQ_NORMAL

(2) Object Status Output (Object Status)

network output SNVT_obj_status nvoStatus;

Valid Range

object_id :	0 – 65	Returns Object IDs requested.
	Other than above	Invalid

invalid_id :	0	Represents that it is a valid ID.
	1	Represents that it is an invalid ID.

invalid_request :	0	Request for an object that is supported
	1	Request for an object that is not supported

report_mask :	0	It is not an RQ_REPORT_MASK request.
	1	Replies Support Bits in response to an RQ_REPORT_MASK request

Transmission Timing

It is output when an Object Request is input.

Default Service Type

acknowledged

5-2. DIII-NET Common Objects

(1) System Forced OFF Setting Input (System OFF)

network input SNVT_switch nviSystemOff;

This input network variable is used to forcibly stop/reset all indoor units connected to the LON Gateway. This forced OFF status differs from the normal OFF state in that the units cannot be started up via a remote controller or any other centralized device. Moreover, even when the forced OFF setting is reset, the A/C system does not return to the operation status prior to the OFF setting, but remains in the OFF status. This function cannot be used when a forced OFF sign is input to the LON Gateway's contact points (T1 and T2) that are used for forced OFF.

Valid Range

Value	State	Indoor unit operation
Any (0 – 255)	0	Reset
0	1	Reset
1 – 255	1	Forced OFF

Default Value

After turning the DMS Interface ON, the value and state remain at “0” until the communication with air conditioners is established.

(2) Sub Group Address Control Operation Rejection Setting Input (Reject LC)

network input SNVT_swicth nviRejLC;

This input network variable is used to permit/prohibit the operation of centralized devices on the DIII-NET.

Valid Range

Value	State	Indoor unit operation
Any (0 – 255)	0	Permitted
0	1	Permitted
1 – 255	1	Prohibited

Default Value

After turning the DMS Interface ON, the value and state remain at “0” until updated.

(3) System Forced OFF Status Output (System Forced OFF State)

network output SNVT_swicth nvoSystemOff;

This output network variable indicates whether the system on the DIII-NET for the DMS Interface is in a System Forced OFF state.

Valid Range

Value	State	Indoor unit operation
0	0	Normal state
200	1	Forced OFF state

The value and state will remain at 255 until the DMS Interface is turned on and communication with A/C units is established.

Transmission Timing

It is output when there is a change in the System Forced OFF status.

Update Interval

There is no function to regularly transmit the output variable.

Default Service Type

acknowledged

(4) Sub Group Address Control Operation Rejection Setting Output (Reject LC State)

network output SNVT_switch nvoRejLC;

This output network variable indicates whether the operation of centralized devices on the DIII-NET for the DMS Interface is permitted/prohibited.

Valid Range

Value	State	Indoor unit operation
0	0	Permitted
200	1	Prohibited

The value and state will remain at 255 until the DMS Interface is turned on and communication with A/C units is established.

Transmission Timing

It is output when there is a change in the Sub Group Address Control Operation Rejection status.

Update Interval

There is no function to regularly transmit the output variable.

Default Service Type

acknowledged

5-3. A/C Objects (AC_01 to AC_64)

(1) ON/OFF Command Input (Start/Stop)

network input SNVT_switch nviOnOff_nn;

This input network variable is used to start/stop indoor units.

Value	State	Indoor unit operation
Any (0 – 255)	0	OFF
0	1	OFF
1 – 255	1	ON

Default Value

After turning the DMS Interface ON, the value and state remain at “0” updated.

(2) Operation Mode Setting Input (Operating Mode)

network input SNVT_hvac_mode nviHeatCool_nn;

This input network variable is used to set the operation mode of the indoor unit(s).

The operation mode is valid only for indoor units that allow a selection between cooling and heating modes.

Valid Range

HVAC_AUTO	: 0	= Auto
HVAC_HEAT	: 1	= Heating
HVAC_COOL	: 3	= Cooling
HVAC_FAN_ONLY	: 9	= Ventilation

Default Value

After turning the DMS Interface ON, the value remains at “0” until updated.

(3) Temperature Setting Input (Setpoint)

This input network variable is used to set the temperature for the indoor unit(s). The range at which temperatures can be set differs with respect to whether it is for cooling operation or heating operation. Therefore, please be sure to confirm the operation mode before setting the temperature.

Valid Range

When cooling 20 to 35°C

When heating 15 to 30°C

Temperature setting increments: 0.1°C

Note: The range at which the temperature can be set may differ depending on the model of the indoor and outdoor units.

For details, please refer to the specifications of the air conditioners in use.

Default Value

After turning the DMS Interface ON, the value remains at “0” until updated.

(4) Airflow Rate Setting Input (Fan Speed)

network input SNVT_switch nviFanSpeed_nn;

This input network variable is used to set the airflow rate of the fan in the indoor unit(s).

Valid Range

Value	State	Indoor unit operation
1 – 100	1	Weak
101 – 255	1	Strong

Default Value

After turning the DMS Interface ON, the value and state remain at “0” until updated.

(5) Filter Sign Reset Input (Reset Filter Sign)

network input SNVT_swicth nviFSReset_nn;

This input network variable is used to reset the filter sign when the filter sign on the indoor unit is malfunctioning.

Valid Range

Value	State	Indoor unit operation
0, 1	Any (0 – 255)	Reset

Default Value

After turning the DMS Interface ON, the value and state remain at “0” until updated.

(6) Forced Thermostat OFF Setting Input (Forced Thermo OFF)

network input SNVT_swicth nviThermoOff_nn;

This input network variable is used to forcibly set/reset an OFF setting for the indoor unit thermostat operation.

Valid Range

Value	State	Indoor unit operation
Any (0 – 255)	0	Reset
0	1	Reset
1 – 255	1	OFF Setting

Default Value

After turning the DMS Interface ON, the value and state remain at “0” until updated.

(7) Remote Control ON/OFF Operation Rejection Input (Reject RM Start/Stop)

network input SNVT_switch nviRejOnOff_nn;

This input network variable is used to set whether to permit/prohibit the ON/OFF operation of the indoor unit(s) from a remote controller.

Valid Range

Value	State	Indoor unit operation
Any (0 – 255)	0	Permitted
0	1	Permitted
1 – 255	1	Prohibited

Default Value

After turning the DMS Interface ON, the value and state remain at “0” until updated.

(8) Remote Control Operation Mode Setting Rejection Input (Reject RM Mode)

network input SNVT_swicth nviRejMode_nn;

This input network variable is used to permit/prohibit the setting of an indoor unit’s operation mode from a remote controller.

Valid Range

Value	State	Indoor unit operation
Any (0 – 255)	0	Permitted
0	1	Permitted
1 – 255	1	Prohibited

Default Value

After turning the DMS Interface ON, the value and state remain at “0” until updated.

(9) Remote Control Temperature Setting Operation Rejection Input (Reject RM Setpoint)

network input SNVT_swicth nviRejSetpoint_nn;

This input network variable is used to permit/prohibit the setting of an indoor unit’s temperature value from a remote controller.

Valid Range

Value	State	Indoor unit operation
Any (0 – 255)	0	Permitted
0	1	Permitted
1 – 255	1	Prohibited

Default Value

After turning the DMS Interface ON, the value and state remain at “0” until updated.

(10) ON/OFF Status Output (OnOff State)

network output SNVT_switch nvoOnOff_nn;

This output network variable indicates the ON/OFF status of the indoor unit(s) at that time. However, it maintains an ON status if an error occurs in an air conditioner so that the system error reset can be conducted through an OFF command.

Valid Range

Value	State	Indoor unit status
0	0	OFF
200	1	ON

The value and state will remain at 255 until the DMS Interface is turned on and communication with A/C units is established.

If an error occurs in the communication between the DMS Interface and any indoor units (such as when the power to an A/C unit is cut due to power failure), the values of the parameters immediately before the error occurred will be retained.

Transmission Timing

It is output when there is a change in the ON/OFF status. It is also output when the ON/OFF status is changed by a remote controller or centralized device on the DIII-NET.

Update Interval

The value set at nciSndHrtBt takes effect.

Default Service Type

acknowledged

(11) Operation Mode Status Output (Operating Mode State)

network output SNVT_hvac_mode nvoHeatCool_nn;

This output network variable indicates the status of the indoor unit's operation mode. When operation mode is set to "Auto", the output network returns the operation mode (either Heating, Cooling or Ventilation) at that time. If operation mode is set to "Dry" by a remote controller, it returns to "Cooling" mode.

Valid Range

HVAC_HEAT : 1 = Heating
 HVAC_COOL : 3 = Cooling
 HVAC_FAN_ONLY : 9 = Ventilation

The value for these parameters will remain at 255 until the DMS Interface is turned on and communication with A/C units is established.

If an error occurs in the communication between the DMS Interface and any indoor units (such as when the power to an A/C unit is cut due to power failure), the values of the parameters immediately before the error occurred will be retained.

Transmission Timing

It is output when there is a change in the Operation Mode status. It is also output when the Operation Mode status is changed by a remote controller or centralized device on the DIII-NET.

Update Interval

There is no function to regularly transmit the output variable.

Default Service Type

acknowledged.

(12) Temperature Setting Status Output (Setpoint State)

network output SNVT_temp_p nvoSetpoint_nn;

This output network variable indicates the status of the temperature setting of the indoor unit(s) at that time.

Valid Range

When cooling 20 to 35°C

When heating 15 to 30°C

Temperature setting increments: 0.1°C

Note: The range at which the temperature can be set may differ depending on the model of the indoor and outdoor units.

For details, please refer to the specifications of the air conditioners in use.

The values for these parameters will remain at 327.67°C (Invalid) until the DMS Interface is turned on and communication with A/C units is established.

If an error occurs in the communication between the DMS Interface and any indoor units (such as when the power to an A/C unit is cut due to power failure), the values of the parameters immediately before the error occurred will be retained.

Transmission Timing

It is output when there is a change in the room temperature setting status. It is also output when the temperature setting status is changed by a remote controller or centralized device on the DIII-NET.

Update Interval

There is no function to regularly transmit the output variable.

Default Service Type

acknowledged

(13) Room Temperature Status Output (Space Temperature State)

network output SNVT_temp_p nvoSpaceTemp_nn;

This output network variable indicates the temperature state of the indoor unit(s). The temperature refers to either suction temperature or discharge temperature depending on the specific air conditioner model.

Valid Range

Output range -10 to 50°C

Temperature setting increments: 0.1°C

In the event of a sensor error, the temperature will be displayed as “327.67°C (Invalid)”.

The values for these parameters will remain at 327.67°C (Invalid) until the DMS Interface is turned on and communication with A/C units is established.

If an error occurs in the communication between the DMS Interface and any indoor units (such as when the power to an A/C unit is cut due to power failure), the values of the parameters immediately before the error occurred will be retained.

Transmission Timing

It is output when there is a change in room temperature.

Update Interval

The value set at nciSndHrtBt takes effect.

Default Service Type

acknowledged

(14) Airflow Rate Setting Status Output (Fan Speed State)

network output SNVT_switch nvoFanSpeed_nn;

This output network variable indicates the status of the airflow rate setting for the indoor unit(s) at that time.

Valid Range

Value	State	Indoor unit status
100	1	Weak
200	1	Strong

Note: A/C units with 3 or more speeds (airflow rate) are also roughly classified into either “Strong” or “Weak”.

Transmission Timing

It is output when there is a change in the Airflow Rate Setting status. It is also output when the Airflow Rate Setting status is changed by a remote controller or centralized device on the DIII-NET.

Update Interval

There is no function to regularly transmit the output variable.

Default Service Type

acknowledged

(15) Filter Sign Status Output (Filter Sign State)

network output SNVT_switch nvoFiltersign_nn;

This output network variable indicates the status of the indoor unit's filter sign at the time.

Valid Range

Value	State	Indoor unit condition
0	0	No Filter Sign
200	1	Filter Sign

The value and state will remain at 255 until the DMS Interface is turned on and communication with A/C units is established.

If an error occurs in the communication between the DMS Interface and any indoor units (such as when the power to an A/C unit is cut due to power failure), the values of the parameters immediately before the error occurred will be retained.

Transmission Timing

It is output when there is a change in the Filter Sign status.

Update Interval

The value set at nciSndHrtBt takes effect.

Default Service Type

acknowledged

(16) Error Status Output (Trip State)

network output SNVT_switch nvoFailure_nn;

This output network variable indicates the error state of the indoor unit(s) at that time. Even if one of the sub machines connected through a remote control group malfunctions, it is reported as an error in the main machine connected to the DIII-NET. Moreover, when sub machines in a remote control group are connected to the DIII-NET and either of them malfunctions, all of the indoor units within the remote control group are displayed as malfunctioning.

Valid Range

Value	State	Indoor unit condition
0	0	Normal
200	1	Error

The value and state will remain at 255 until the DMS Interface is turned on and communication with A/C units is established.

Transmission Timing

It is output when there is a change in the error status.

Update Interval

The value set at nciSndHrtBt takes effect.

Default Service Type

acknowledged

(17) Error Code Output (Malfunction Code)

network output SNVT_counter nvoErrStatus_nn;

This output network variable indicates the details of error codes transmitted when an error occurs in an indoor unit.

Valid Range

0 No Error
1–23110 Error Code

Note: These error codes are shown in a 2-character ASC decimal code specified by Daikin. The details are shown below.

In the case of error code A0:

A0 (ASC code) = 0x4130 (hexadecimal) = 16688 (decimal)

Therefore, in order to understand an error code, after converting the output network variable to a hexadecimal, alter it into an ASCII code and then link the high and low bytes. Confirm the details of error codes obtained with Daikin's service divisions, or refer to the respective A/C service manual.

After turning the DMS Interface ON, the value remains at "0" until the communication with air conditioners is established.

Transmission Timing

It is also output when there is a change in the error status if the A/C unit(s).

Update Interval

The value set at nciSndHrtBt takes effect.

Default Service Type

acknowledged

(18) Thermostat Status Output (Thermo State)

network output SNVT_switch nvoThermo_nn;

This output network variable indicates if the indoor unit is regulating the temperature (Thermo ON/OFF status).

Valid Range

Value	State	Indoor unit condition
0	0	Thermo OFF
200	1	Thermo ON

The value and state will remain at 255 until the DMS Interface is turned on and communication with A/C units is established.

If an error occurs in the communication between the DMS Interface and any indoor units (such as when the power to an A/C unit is cut due to power failure), the values of the parameters immediately before the error occurred will be retained.

Transmission Timing

It is output when there is a change in the Thermo ON/OFF status.

Update Interval

There is no function to regularly transmit the output variable.

Default Service Type

acknowledged

(19) Forced Thermostat OFF Setting Status Output (Forced Thermo OFF State)

network output SNVT_swicth nvoThermoOff_nn;

This output network variable indicates whether the Forced Thermo OFF Setting status is set or reset.

Valid Range

Value	State	Indoor unit condition
0	0	Reset
200	1	Set

The value and state will remain at 255 until the DMS Interface is turned on and communication with A/C units is established.

If an error occurs in the communication between the DMS Interface and any indoor units (such as when the power to an A/C unit is cut due to power failure), the values of the parameters immediately before the error occurred will be retained.

Transmission Timing

It is output when there is a change in the Thermo ON/OFF Setting status.

Update Interval

There is no function to regularly transmit the output variable.

Default Service Type

acknowledged

(20) Remote Control ON/OFF Operation Rejection Output (Reject RM ON/OFF State)

network output SNVT_switch nvoRejOnOff_nn;

This output network variable indicates whether the ON/OFF operation of the indoor unit(s) is permitted or prohibited from a remote controller.

Valid Range

Value	State	Indoor unit operation
0	0	Permitted
200	1	Prohibited

The value and state will remain at 255 until the DMS Interface is turned on and communication with A/C units is established.

If an error occurs in the communication between the DMS Interface and any indoor units (such as when the power to an A/C unit is cut due to power failure), the values of the parameters immediately before the error occurred will be retained.

Transmission Timing

It is output when there is a change in the Remote Control ON/OFF Operation Rejection status.

Update Interval

There is no function to regularly transmit the output variable.

Default Service Type

acknowledged

(21) Remote Control Operation Mode Setting Rejection Output (Reject RM Mode State)

network output SNVT_swicth nvoRejMode_nn;

This output network variable indicates whether a setting of operation mode of the indoor unit(s) is permitted or prohibited from a remote controller.

Valid Range

Value	State	Indoor unit operation
0	0	Permitted
200	1	Prohibited

The value and state will remain at 255 until the DMS Interface is turned on and communication with A/C units is established.

If an error occurs in the communication between the DMS Interface and any indoor units (such as when the power to an A/C unit is cut due to power failure), the values of the parameters immediately before the error occurred will be retained.

Transmission Timing

It is output when there is a change in the Remote Control Operation Mode Setting Rejection status.

Update Interval

There is no function to regularly transmit the output variable.

Default Service Type

acknowledged

(22) Remote Control Temperature Setting Operation Rejection Output (Reject RM Setpoint State)

network output SNVT_switch nvoRejSetpoint_nn;

This output network variable indicates whether the temperature setting operation for the indoor unit from a remote controller is permitted or prohibited.

Valid Range

Value	State	Indoor unit condition
0	0	Permitted
200	1	Prohibited

The value and state will remain at 255 until the DMS Interface is turned on and communication with A/C units is established.

If an error occurs in the communication between the DMS Interface and any indoor units (such as when the power to an A/C unit is cut due to power failure), the values of the parameters immediately before the error occurred will be retained.

Transmission Timing

It is output when there is a change in the Remote Control Temperature Setting Operation Rejection status.

Update Interval

There is no function to regularly transmit the output variable.

Default Service Type

acknowledged.

(23) A/C Connection Status Output (Communication State)

network output SNVT_swicth nvoHvacExist_nn;

This output network variable indicates whether the connection status of the A/C unit(s).

Valid Range

Value	State	Indoor unit condition
0	1	No connection
1	1	Normal connection
2	1	Communication error

The value and state will remain at 255 until the DMS Interface is turned on and communication with A/C units is established.

“Value = 0” means that no communication has been established at all after the power was turned on. “Value=2” means that communication was established after the power was tuned on, but a communication error has occurred.

Transmission Timing

It is output when there is a change in the A/C Connection status.

Update Interval

The value set at nciSndHrtBt takes effect.

Default Service Type

acknowledged

5-4. Configuration Properties

(1) Transmission Interval Setting (Send Heartbeat)

network input config SNVT_time_sec nciSndHrtBt;

These configuration properties are used to set the transmission interval between two consecutive output network variables. This interval is regulated by the value for the transmission limit, nciMaxRng.

Applicable network variables are as follows:

nvoOnOff_nn (ON/OFF Status Output)
 nvoSpaceTemp_nn (Room Temperature Status Output)
 nvoFiltersign_nn (Filter Sign Status Output)
 nvoFailure_nn (Error Status Output)
 nvoErrStatus_nn (Error Code Output)
 nvoHvacExist_nn (A/C Connection Status Output)

Valid Range

0.0 and 10.0–1200.0 seconds

There is no regular transmission function if the value is 0.0 sec. However, communications with A/C units are conducted every 12 seconds so, even if transmission interval is set at less than 12 seconds, the value does not change.

Default Value

0.0 seconds (No regular transmission function)

(2) Minimum Transmission Interval Setting (Minimum Send Time)

network input config SNVT_time_sec nciMinOutTm;

These configuration properties are used to set the minimum transmission interval between two consecutive output network variables.

Applicable network variables are as follows:

nvoOnOff_nn (ON/OFF Status Output)
 nvoHeatCool_nn (Operation Mode Status Output)
 nvoSetpoint_nn (Temperature Setting Status Output)
 nvoSpaceTemp_nn (Room Temperature Status Output)
 nvoFanSpeed_nn (Airflow Rate Setting Status Output)
 nvoFiltersign_nn (Filter Sign Status Output)
 nvoFailure_nn (Error Status Output)
 nvoErrStatus_nn (Error Code Output)
 nvoThermo_nn (Thermostat Status Output)
 nvoThermoOff_nn (Forced Thermostat OFF Status Output)
 nvoRejOnOff_nn (Remote Control ON/OFF Operation Rejection Output)
 nvoRejMode_nn (Remote Control Operation Mode Operation Rejection Output)
 nvoRejSetpoint_nn (Remote Control Temperature Setting Operation Rejection Output)
 nvoSystemOff (System Forced OFF Status Output)
 nvoRejLC (Sub Group Address Control Operation Rejection Status Output)
 nvoHvacExist_nn (A/C Connection Status Output)

Valid Range

0.0 and 10.0–1200.0 seconds

There is no regular transmission function if the value is 0.0 sec.

Default Value

0.0 seconds (No minimum transmission interval control)

(3) Detect Minimum Temperature Change Setting (Send on Delta Temperature)

network input config SNVT_temp_p nciMinDelta;

This configuration property represents an output network variable to be transmitted when there is a change in temperature that is greater than the specified value between two consecutive transmissions.

Applicable network variables are as follows:

nvoSpaceTemp_nn (Room Temperature Status Output)

Valid Range

0.10–10.00°C

Default Value

0.10°C

(4) Transmission Start Delay Time Setting (Delay Start up Time)

network input config SNVT_time_sec nciStartUpDly;

These configuration properties are used to set the time lag between turning on the DMS Interface and starting the LON communications. This setting is useful for avoiding communication congestion when LON nodes on the network simultaneously start up.

Applicable network variables are as follows:

nvoOnOff_nn (ON/OFF Status Output)

nvoHeatCool_nn (Operation Mode Status Output)

nvoSetpoint_nn (Temperature Setting Status Output)

nvoSpaceTemp_nn (Room Temperature Status Output)

nvoFanSpeed_nn (Airflow Rate Setting Status Output)

nvoFiltersign_nn (Filter Sign Status Output)

nvoFailure_nn (Error Status Output)

nvoErrStatus_nn (Error Code Output)

nvoThermo_nn (Thermostat Status Output)

nvoThermoOff_nn (Forced Thermostat OFF Status Output)

nvoRejOnOff_nn (Remote Control ON/OFF Operation Rejection Output)

nvoRejMode_nn (Remote Control Operation Mode Setting Rejection Output)

nvoRejSetpoint_nn (Remote Control Temperature Setting Rejection Output)

nvoSystemOff (System Forced OFF Status Output)

nvoRejLC (Sub Group Address Control Operation Rejection Status Output)

nvoHvacExist_nn (A/C Connection Status Output)

Valid Range

60.0–1200.0 seconds

Default Value

60.0 seconds

(5) Maximum Transmission Limit Setting (Range Maximum)

network input config SNVT_count nciMaxRng;

These configuration properties represent output network variables and are used to set the number of messages transmitted per minute from the DMS Interface.

Applicable network variables are as follows:

nvoOnOff_nn (ON/OFF Status Output)
 nvoHeatCool_nn (Operation Mode Status Output)
 nvoSetpoint_nn (Temperature Setting Status Output)
 nvoSpaceTemp_nn (Room Temperature Status Output)
 nvoFanSpeed_nn (Airflow Rate Setting Status Output)
 nvoFiltersign_nn (Filter Sign Status Output)
 nvoFailure_nn (Error Status Output)
 nvoErrStatus_nn (Error Code Output)
 nvoThermo_nn (Thermostat Status Output)
 nvoThermoOff_nn (Forced Thermostat OFF Status Output)
 nvoRejOnOff_nn (Remote Control ON/OFF Operation Rejection Output)
 nvoRejMode_nn (Remote Control Operation Mode Setting Rejection Output)
 nvoRejSetpoint_nn (Remote Control Temperature Setting Rejection Output)
 nvoSystemOff (System Forced OFF Status Output)
 nvoRejLC (Sub Group Address Control Operation Rejection Status Output)
 nvoHvacExist_nn (A/C Connection Status Output)

Valid Range

0–6000 messages/sec.

No limitation in cases of 0.

Default Value

0 (No limit)

6. Precautions regarding XIF Files

6-1. File Name

DMS_IF02.XIF

6-2. Limitations with Version 3

Daikin's XIF file is written in the Version 3 format, and the default values for configuration properties (CP) are not written within the XIF file. Therefore, when using a LonMaker to add devices, be sure to conduct the procedures at the CP value of "Current values in device" and not that of "Default values in the XIF file".

6-3. Unused Network Variables

The network variables listed below do exist within our XIF file, but are not explained in these specifications. These are intended strictly for internal use and should not be used.

nvoWattmeter_nn
nviSetTime
nvi SetNetDB
nvoSetNetDB

7. Notes for when commissioning

7-1. Suspension of Message Transmission when Receiving Set Node Mode Online

The LON Gateway suspends spontaneous message transmission, such as reports of the bound output network variable changes and heartbeat, as well as responding to the Node Object, for one minute after receiving "Set Node Mode Online", a management message. However, it responds to other network management requests such as "poll" and "fetch". This function is a mechanism to prevent time out errors because of transmission of messages spontaneously issued by the DMS Interface when it comes online due to use of an installation tool such as the LonMaker during commissioning.

8. Reference Materials 1 (Error Code Conversion Table)

Error code	Value (Decimal)	Error code	Value (Decimal)	Error code	Value (Decimal)	Error code	Value (Decimal)	Error code	Value (Decimal)
A0	16688	C0	17200	E0	17712	H0	18480	F0	17968
A1	16689	C1	17201	E1	17713	H1	18481	F1	17969
A2	16690	C2	17202	E2	17714	H2	18482	F2	17970
A3	16691	C3	17203	E3	17715	H3	18483	F3	17971
A4	16692	C4	17204	E4	17716	H4	18484	F4	17972
A5	16693	C5	17205	E5	17717	H5	18485	F5	17973
A6	16694	C6	17206	E6	17718	H6	18486	F6	17974
A7	16695	C7	17207	E7	17719	H7	18487	F7	17975
A8	16696	C8	17208	E8	17720	H8	18488	F8	17976
A9	16697	C9	17209	E9	17721	H9	18489	F9	17977
AA	16705	CA	17217	EA	17729	HA	18497	FA	17985
AH	16712	CH	17224	EH	17736	HH	18504	FH	17992
AC	16707	CC	17219	EC	17731	HC	18499	FC	17987
AJ	16714	CJ	17226	EJ	17738	HJ	18506	FJ	17994
AE	16709	CE	17221	EE	17733	HE	18501	FE	17989
AF	16710	CF	17222	EF	17734	HF	18502	FF	17990

Error code	Value (Decimal)	Error code	Value (Decimal)	Error code	Value (Decimal)	Error code	Value (Decimal)	Error code	Value (Decimal)
J0	18992	L0	19504	P0	20528	U0	21808	M0	19760
J1	18993	L1	19505	P1	20529	U1	21809	M1	19761
J2	18994	L2	19506	P2	20530	U2	21810	M2	19762
J3	18995	L3	19507	P3	20531	U3	21811	M3	19763
J4	18996	L4	19508	P4	20532	U4	21812	M4	19764
J5	18997	L5	19509	P5	20533	U5	21813	M5	19765
J6	18998	L6	19510	P6	20534	U6	21814	M6	19766
J7	18999	L7	19511	P7	20535	U7	21815	M7	19767
J8	19000	L8	19512	P8	20536	U8	21816	M8	19768
J9	19001	L9	19513	P9	20537	U9	21817	M9	19769
JA	19009	LA	19521	PA	20545	UA	21825	MA	19777
JH	19016	LH	19528	PH	20552	UH	21832	MH	19784
JC	19011	LL	19523	PP	20547	UC	21827	MC	19779
JJ	19018	LJ	19530	PJ	20554	UJ	21834	MJ	19786
JE	19013	LE	19525	PP	20549	UE	21829	ME	19781
JF	19014	LF	19526	PF	20550	UF	21830	MF	19782

Error code	Value (Decimal)	Error code	Value (Decimal)	Error code	Value (Decimal)	Error code	Value (Decimal)
30	13104	40	13360	50	13616	60	13872
31	13105	41	13361	51	13617	61	13873
32	13106	42	13362	52	13618	62	13874
33	13107	43	13363	53	13619	63	13875
34	13108	44	13364	54	13620	64	13876
35	13109	45	13365	55	13621	65	13877
36	13110	46	13366	56	13622	66	13878
37	13111	47	13367	57	13623	67	13879
38	13112	48	13368	58	13624	68	13880
39	13113	49	13369	59	13625	69	13881
3A	13121	4A	13377	5A	13633	6A	13889
3H	13128	4H	13384	5H	13640	6H	13896
3C	13123	4C	13379	5C	13635	6C	13891
3J	13130	4J	13386	5J	13642	6J	13898
3E	13125	4E	13381	5E	13637	6E	13893
3F	13126	4F	13382	5F	13638	6F	13894

9. Reference Materials 2 (Celsius-Fahrenheit Conversion Table)

Celsius to Fahrenheit: $F = (9/5) C + 32$

Fahrenheit to Celsius: $C = (F - 32) * 5/9$

Fahrenheit	Celsius
14	-10.0
15	-9.4
16	-8.9
17	-8.3
18	-7.8
19	-7.2
20	-6.7
21	-6.1
22	-5.6
23	-5.0
24	-4.4
25	-3.9
26	-3.3
27	-2.8
28	-2.2
29	-1.7
30	-1.1
31	-0.6
32	0.0
33	0.6
34	1.1
35	1.7
36	2.2
37	2.8
38	3.3
39	3.9
40	4.4
41	5.0
42	5.6
43	6.1
44	6.7
45	7.2
46	7.8
47	8.3
48	8.9
49	9.4
50	10.0
51	10.6
52	11.1
53	11.7
54	12.2
55	12.8
56	13.3
57	13.9
58	14.4
59	15.0

Fahrenheit	Celsius
60	16.0
61	16.1
62	16.7
63	17.2
64	17.8
65	18.3
66	18.9
67	19.4
68	20.0
69	20.6
70	21.1
71	21.7
72	22.2
73	22.8
74	23.3
75	23.9
76	24.4
77	25.0
78	25.6
79	26.1
80	26.7
81	27.2
82	27.8
83	28.3
84	28.9
85	29.4
86	30.0
87	30.6
88	31.1
89	31.7
90	32.0

Fahrenheit	Celsius
91	32.8
92	33.3
93	33.9
94	34.4
95	35.0
96	35.6
97	36.1
98	36.7
99	37.2
100	37.8
101	38.3
102	38.9
103	39.4
104	40.0
105	40.6
106	41.1
107	41.7
108	42.2
109	42.8
110	43.3
111	43.9
112	44.4
113	45.0
114	45.6
115	46.1
116	46.7
117	47.2
118	47.8
119	48.3
120	48.9
121	49.4
122	50.0

9. Precautions

As the indoor fan stops when the operation is in special operation mode such as thermostat off, at rest or defrosting, the 'Room Temperature Report' is affected by the heat exchanger and the sensor may happen to detect the temperature different from that of the indoor and transmit the signal.

Due to the above mentioned reason, consider the temperature as a rule of thumb.

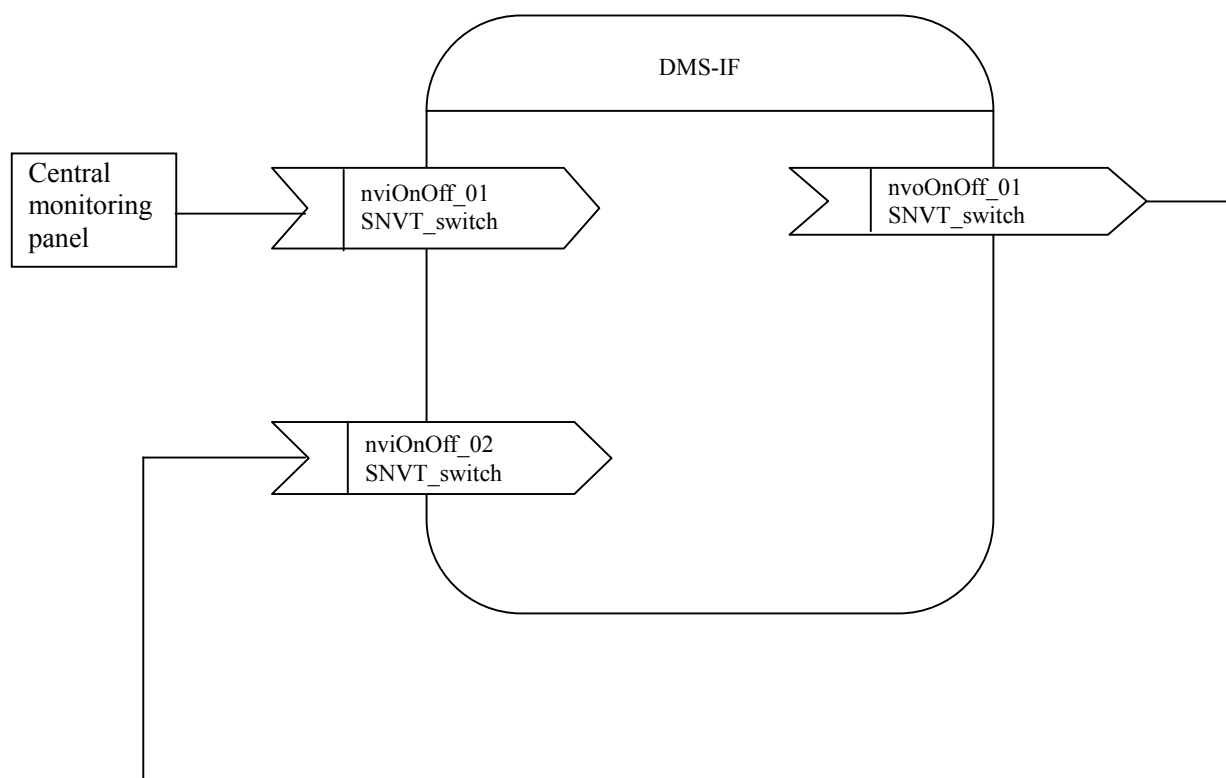
If the system control is to be based on this temperature (such as changeover of operation mode and changing the set temperature), the manufacturer of the building management system is kindly requested to carry out on its own responsibility.

The system is designed to keep the memory of the set conditions even when the air conditioner stops due to a power failure. Each time when the setting of temperature, ON/OFF, heat/cool mode, or airflow rate is changed, it is written into the non-volatile memory. The frequency of writing the setting into the non-volatile memory is limited and if the setting is frequently written into memory after exceeding the limit, it may cause malfunction.

Therefore, **take caution so that the frequency of changing the setting of each indoor unit may not exceed 7000 times/year** when changing the setting of temperature, ON/OFF, heat/cool mode, or airflow rate frequently by automatic control or the like from the central monitoring panel.

Precautions

The DMS Interface does not have the “turnaround” capacity to bind the output network variable of its own node with the input network variable of the same node.



Example:

To trigger operation of A/C unit 2 through operation of A/C unit 1, use interlocking control on the central monitoring panel.

It is not possible to perform interlocking control by binding the “ON/OFF Status Report” output network variable of A/C unit 1 with the “ON/OFF command” input network variable of A/C unit 2.

