PCN0411B

VRV® SYSTEM Network Solution

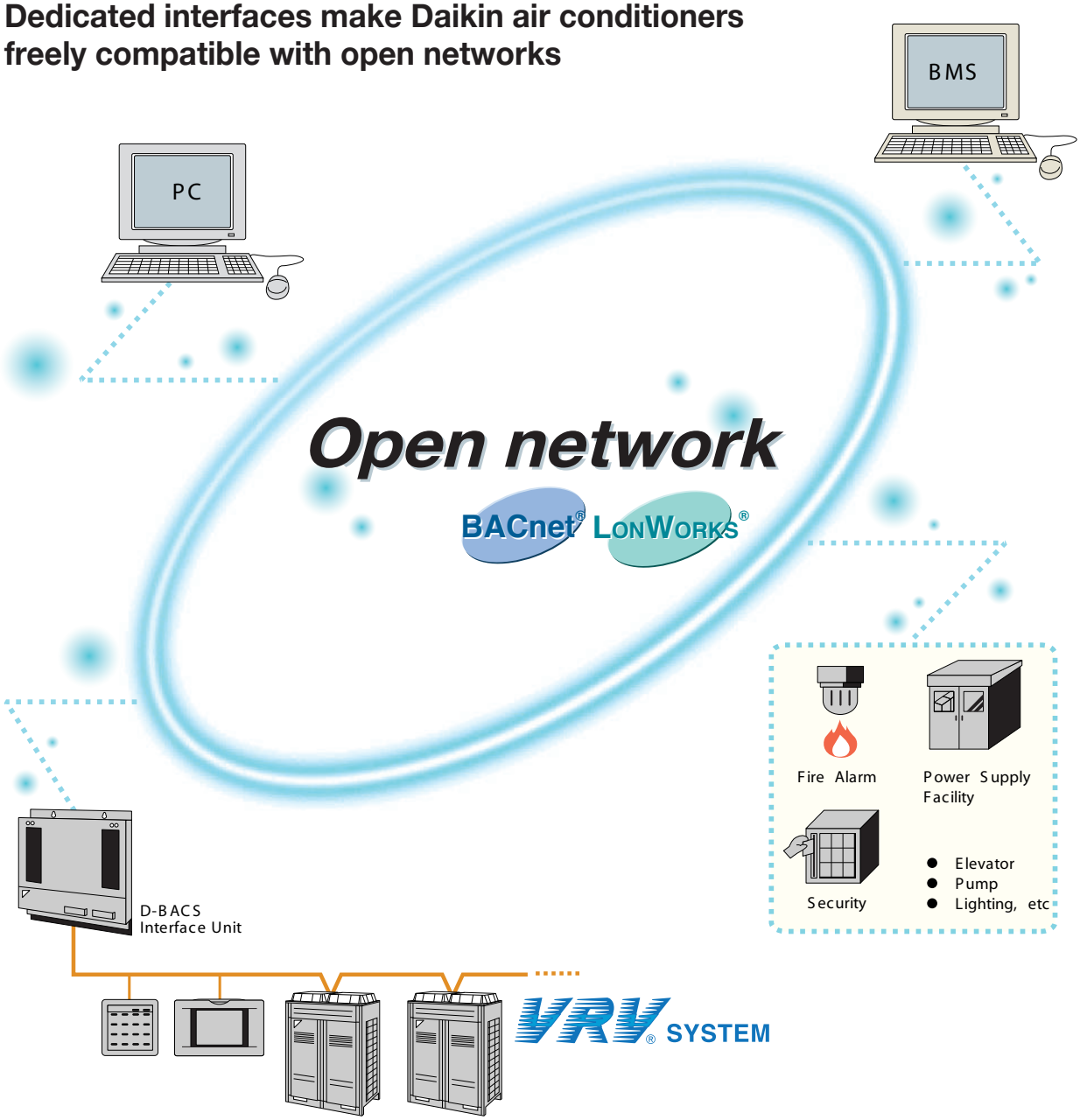
The interface for connecting VRV to BACnet® or LONWORKS® protocols

DAIKIN INDUSTRIES, LTD.

Connect VRV to your BMS via BACnet® or LonWorks® — using Daikin's integrated control system solutions.

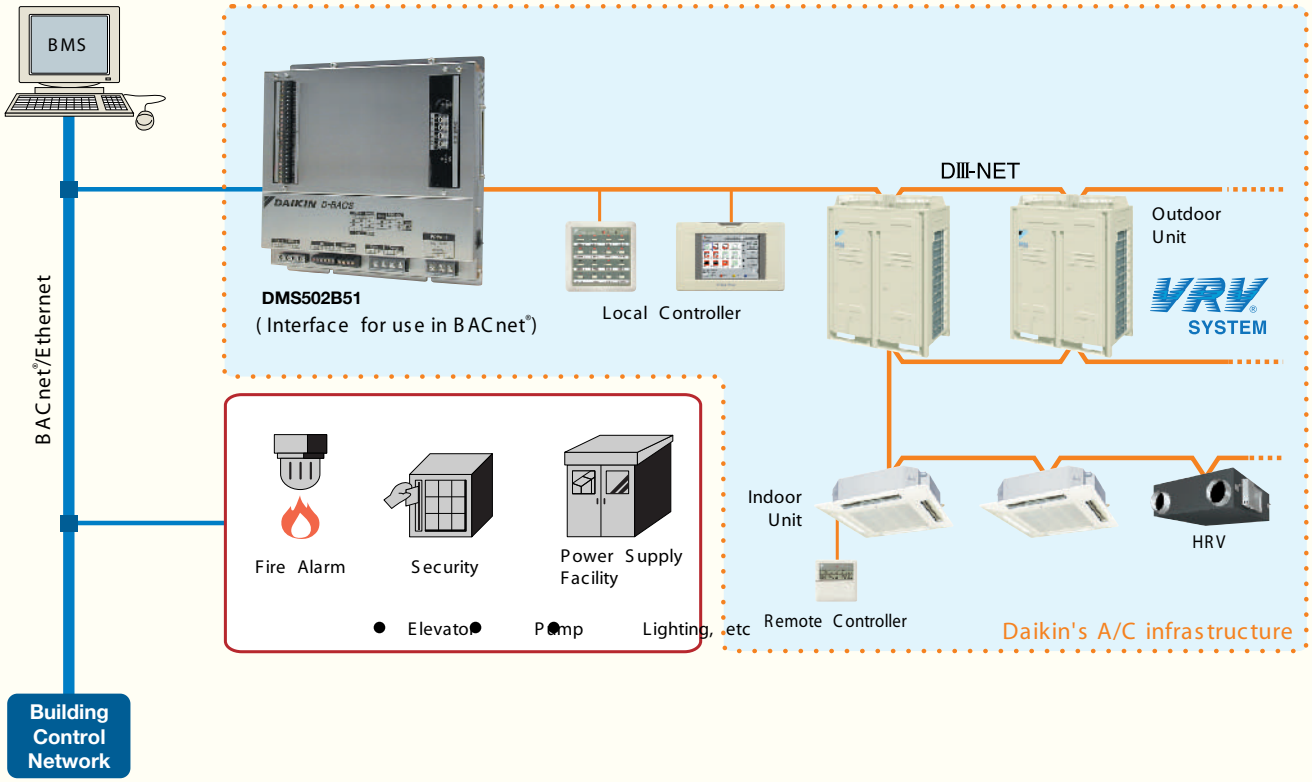
Compatible with BACnet® and LonWorks®, the two leading open network comunication protocols, the interfaces offered by Daikin provide a seamless connection between VRV and your BMS.

Dedicated interfaces make Daikin air conditioners freely compatible with open networks



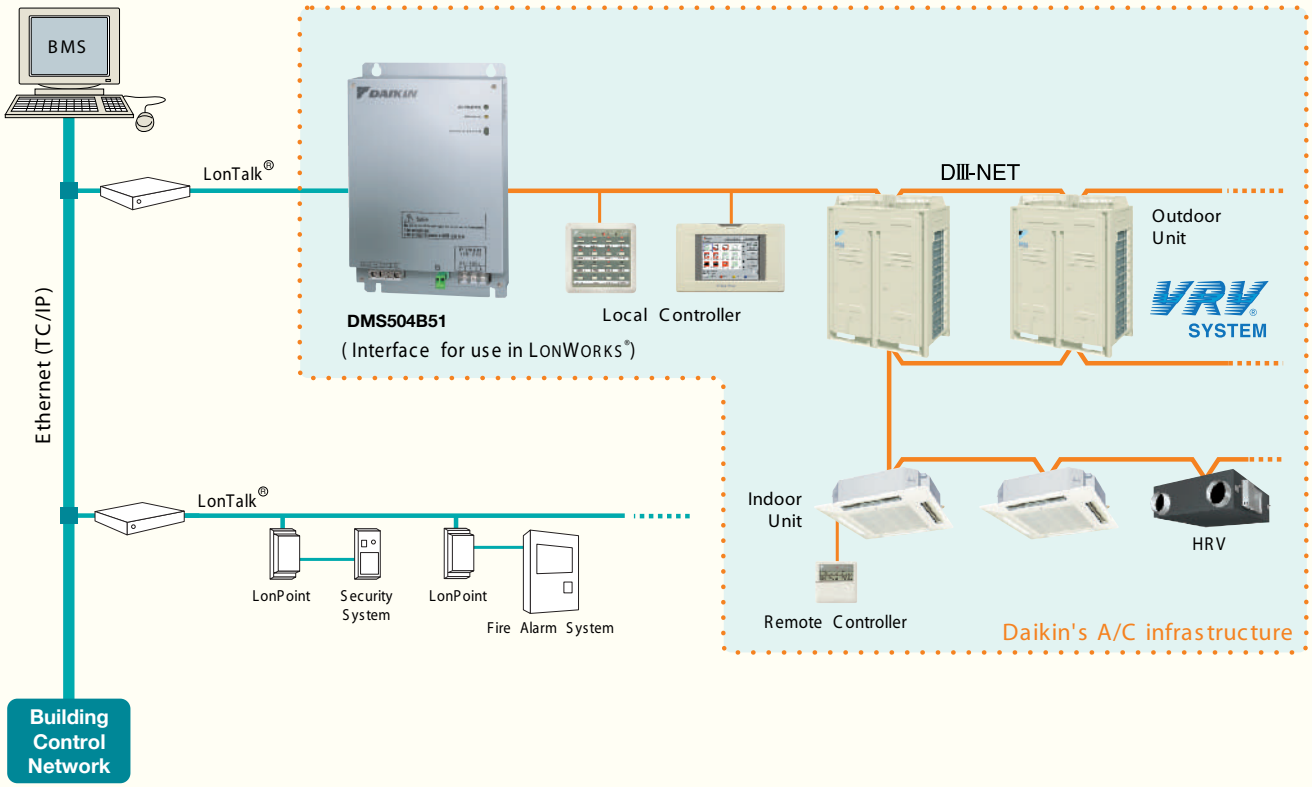
- Air conditioning control systems can be realised with little equipment and lower costs.
- Providing flexible control and monitoring capability that features linked operation with other systems.
- Simple, direct connections make setup quick and easy.
- Units can be added freely and easily to expand the number of control points.
- Dedicated interfaces enhance VRV control.
- Other systems such as those for fire and crime prevention can be easily interlocked with Daikin's unit.

Typical BACnet® application



Daikin air conditioning and control systems help you set up an open network.

Typical LonWorks® application



Seamless connection between VRV® and BACnet® open network protocol.

Functions of operating system version 3.0

(Providing interface from BACnet® to VRV.)

BTL Certification NEW

High reliability product with BTL certification, the symbol of high quality.

*BTL(BACnet Testing Laboratory) was established by BACnet International to support compliance testing and interoperability testing activities.

PPD data

VRV PPD (power proportional distribution) data can be transmitted by BACnet communication for the BMS system.

*Optional Di board (DAM412B51) is required for the PPD system.

ISO 16484-5

Supports BACnet/IP in accordance with ISO16484-5 (Building automation and control systems. Data communication protocol) for BACnet.

Note: Does not support IEEE802.3 protocol for BACnet.

RoHS compliant

We have been making efforts to facilitate the transition to RoHS Directive compliance.

*Refer to the back cover for details of the RoHS Directive.

COV(Change of value)

With the new O.S. a change of object can be automatically read by the BMS without having to constantly scan regularly for any change.

Property array index (Reading of objects)

This is used for objects such as the Schedule Object that use the Property Array included in the device object. The reason why this is sometimes required is so that registration of objects can be done automatically and manual input is not necessary.

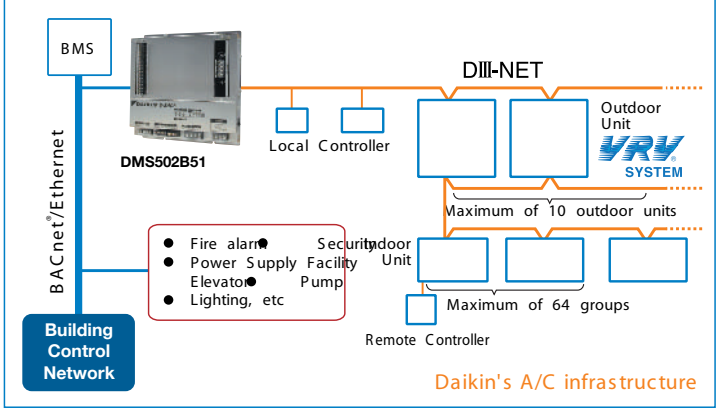
The "Object_List" of the device can be read automatically with this index, there by reducing engineering time of programming the indoor units into the

Segmented requests

This function transmits two or more packets separately, when the amount of data exceeds one packet size.

If there are a large number of indoor units the response is in the "read property request" and the return data are segmented.

Typical BACnet® application



● BACnet® is a registered trademark of the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE).

DMS502B51

Product description

DMS502B51 Specification

Daikin's interface unit for BACnet® communicates with BACnet® clients via BACnet® over an ethernet.
This unit provides information for VRV through BACnet® services.

Conformance Class - 3 Data Link Layer Option - BACnet/IP

Specifications of Communication

Objects

Analog Input Analog Value Binary Input Binary Output
Binary Value Multistate Input Multistate Output

Functionality

Monitor Command Alarm

Monitoring and control of A/C

The items to monitor and control air conditioners from BACnet® communication and descriptions of each item are listed below.

Function		Description
Monitoring	ON/OFF Status	Monitors ON/OFF status of the respective air conditioners.
	Alarm Sign	Monitors whether air conditioners are operating normally and, if not, sends out an alarm sign.
	Error Code	Displays error code specified by the respective manufacturer if an abnormality occurs in the system.
	Operation Mode	Monitors status of cooling, heating and ventilation operation.
	Room Temperature	Monitors room temperature and displays the actual room temperature.
	Filter Limit	Checks the limit of filters in use and monitors if there is a necessity to replace the filters.
	Thermostat Status	Monitors whether the thermostat in the air conditioner is operating properly.
	Compressor Status	Monitors whether compressors in outdoor units that are connected to the indoor units are operating
	Indoor Fan Status	properly.
	Heater Operation Status	Monitors whether fans in the air conditioners are operating properly.
	PPD data	Monitors whether heaters in the air conditioners are operating properly.
Operation, Setting and Monitoring	ON/OFF Operation	Total electric power (number of indoor units) as an object of accumulator.
	Operation Mode Setting	Starts and stops the respective air conditioners and monitors control results.
	Room Temperature Setting	Sets the operation mode (cooling, heating, ventilation or auto mode) and monitors the setting results.
	Filter Limit and Reset	Sets room temperatures of the respective air conditioners and monitors the setting results.
	Remote Control Operation Rejection	Checks whether there is a use limit for the respective filters and then resets the sign as necessary.
	Sub Group Address Control Operation Rejection	Sets the permission/rejection function of remote controllers in order not to allow operation control, such as ON/OFF, operation mode and room temperature, from the remote controllers.
	Airflow Rate Setting Operation	Sets the control permission/rejection function of centralised devices (i.e., air conditioners in a sub group address)
	Air Direction Setting Operation	connected on the D -NET.
	System Forced OFF Setting Rejection	Sets the airflow rate and monitors the setting results.
	Forced Thermostat OFF Setting	Sets the air direction and monitors the setting results.
	Energy Efficiency Setting	Sets the air direction and monitors the setting results.

Series and components

Hardware model name	DMS502B51	DMS502B51+DAM411B51 (Optional DⅢ expansion kit)
Max. number indoor units	128	256 per gateway
Max. number outdoor units	20	40 per gateway
BMS	Local Procurement	

Specifications

Item	Description
Model name	DMS502B51(Interface for use in BACnet®)
Transmission	BACnet®/IP Conformance Class 3 (ASHRAE135-1995) B-ASC (ASHRAE135-2001)
Rated power supply	Single phase AC 100 to 240 ±10% at 50/60 Hz
Rated power consumption	Maximum 20 W
Power supply fluctuation	±10% of the rated value
Operable temperature range	−10°C to 50°C
Storage temperature range	−15°C to 60°C
Operable ambient humidity	0 to 98% (No condensation)
Insulation resistance	50 MΩ or more by DC500 megohmmeter
Installation	Enclosed in electrical panel
Dimensions (W × H × D)	275 × 263 × 81.5 (mm)
Weight	3.0 kg

Optional DⅢ expansion kit

Item	Model name	DAM411B51
DⅢ Board	DⅢ Lines	2

Digital input port

Di (Forced off)	Imbedded in DMS502B51	4
Di (kwh meter connection for PPD)	Optional board (DAM412B51) is required.	12

Note: To achieve a seamless connection between both the BMS and Daikin's BACnet interfaces, it is crucial that you contact us prior to any project consideration.
For a detailed list of BMS and compatibility specifications please contact your local distributor.

Facilitating the network integration of VRV® and LonWorks®

Open network integration

A gateway for connection to LonWorks® network equipment and building control system.
LonWorks® networks are recognised worldwide as the de facto standard in the building control industry.
Systems are available for access control, energy management, fire/life, HVAC, lighting, and more.

Reduction in engineering and cost of wiring

The open protocol specification gives local system integrators complete design freedom.
Plus, the ability to combine individual items of equipment into a LonWorks® network reduces the engineering time and costs required for wiring.

Connectable to up to 64 groups

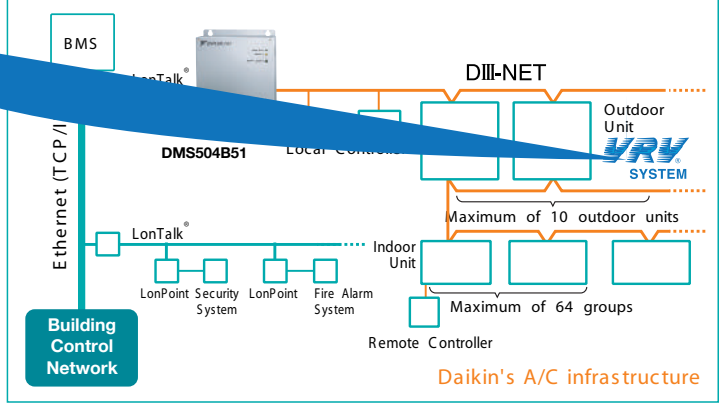
This unit can be connected to up to 64 groups.
(This figure depends on the number of control and monitoring functions used.)
Please consult your Daikin representative for details.

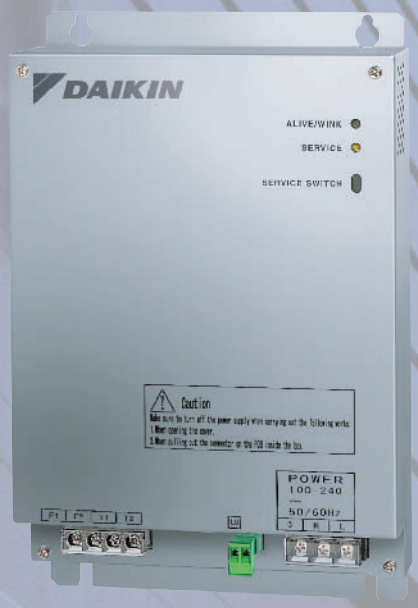
RoHS-compliant hardware

We have been making efforts to facilitate the transition to RoHS Directive compliance.

*Refer to the back cover for details of the RoHS Directive.

Typical LonWorks® application





DMS504B51

● LonWorks®, LON® and LonTalk® are registered tradmarks of Echelon Corporation.

DMS504B51 Specification

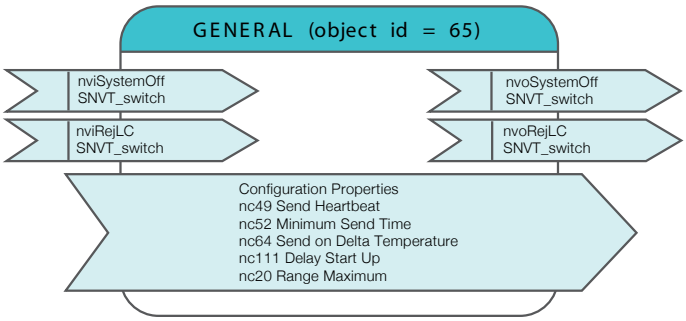
Protocol: LonTalk®
Transmission speed: 78 kbps
Topology: Free topology
Transmission medium: Twist pair

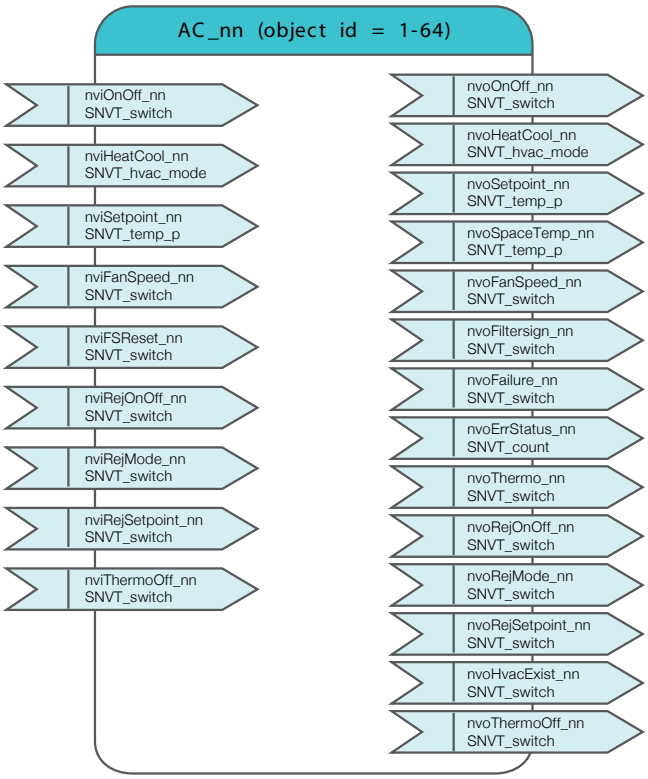
Network parameters

In parameter names, 'nn' refers to air-conditioning unit numbers 01 to 64. For 'NV' with 'nn' attached, a total of 64 NV has been prepared (one for each object).

Network parameter chart

DIII-NET Common Objects





Air Conditioner Objects

This product 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

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

Control and monitor fauction

Control items
ON/OFF Command
Operation Mode Setting
Temperature Setting
Airflow Rate Setting
Filter Sign Reset
Forced Thermostat OFF Setting
Remote ON/OFF Control Rejection
Remote Operation Mode Control Rejection
Remote Temperature Setting Control Rejection
System Forced OFF Setting
Sub Group Address Control Rejection Setting

Monitor items	
ON/OFF Status Report	Remote Control Operation Mode Setting Rejection Report
Operation Mode Status Report	Remote Control Temperature Setting Operation Rejection Report
Temperature Setting Report	System Forced OFF Setting Report
Room Temperature Report	Sub Group Address Control Operation Rejection Setting Report
Airflow Rate Setting Report	A/C Communication Status Report
Filter Sign Report	
Error Status Report	
Error Code Report	
Thermostat Status Report	
Forced Thermostat OFF Setting Status Report	
Remote ON/OFF Operation Rejection Report	

Each item controlled or monitored by the control and monitoring function is subject to a variety of restrictions that are not described here due to space limitations. For details, contact your DAIKIN distributor.

Specifications

Item	Description
Model name	DMS504B51 (Interface for use in LonWorks®)
Transmission	LonWorks® FT-X1 (Free topology 78 kbps)
Rated power supply	Single phase AC 100 to 240 V 50/60 Hz
Rated power consumption	Maximum 5 W
Contact input	Use no voltage contact (Forced off) minimum application load DC16 V and 10 mA
Operable temperature range	-10 to +50°C
Storage temperature range	-20 to +60°C
Operable ambient humidity	0 to 95% (No condensation)
Insulation resistance	50 MΩ or more by DC500 megohmmeter
Installation	Enclosed in electrical panel
Dimensions (W × H × D)	168 × 260 × 50 (mm)
Weight	1.5 kg

Daikin also has various other control devices to suit the specific sizes and conditions of A/C systems.

intelligent Manager III

The A/C management system that offers powerful functions, yet still gives simple navigation for any user.

DAM602B51・B52

intelligent touch Controller

Communication capabilities via a Web browser further expand air conditioning control possibilities.

DCS601C51

* RoHS Directive
The RoHS (Restriction of Hazardous Substances (in electrical and electronic equipment)) Directive is an environmental directive enacted to regulate the use of designated chemical substances (lead, cadmium, hexavalent chromium, mercury, polybrominated biphenyls and polybrominated diphenylether) in electrical equipment. All household products subject to this Directive and sold in Europe from July 1, 2006 are legally bound to comply with the RoHS Directive.

WARNING Using interface

1. Once a month, adjust the clock of the interface.
2. Daikin' s unique P.P.D. system estimates the power consumption of each individual indoor unit based on data communicated from indoor units and compared to the power consumption of an air conditioning installation with a standard setup. Note that P.P.D. is not a " gauge" adapted to the methods
   of measuring power consumption in each country. All countries differ in the ways tenant billing systems are implemented depending on their respective legal systems. Data obtained by P.P.D. is for reference only and should not be used for official financial transactions.
3. JMT (Joint Matching Test) is normally required before project execution.

- **DAIKIN is the first manufacturer (Vendor ID53: Nov 15, 1999) whose VRV System has been officially approved as BACnet® compatible equipment.**
- **Catalog information is as of July 2007.**
- **BACnet® is a registered trademark of the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE).**
- **LonWorks®, LON® and LonTalk® are registered tradmarks of Echelon Corporation.**
- **Ethernet is a registered trademark of Xerox Corporation.**

JMI-0107

JQA-1452

About ISO 9001
ISO 9001 is a plant certification system defined by the International Organization for Standardization (ISO) relating to quality assurance. ISO 9001 certification covers quality assurance aspects related to the " design, development, manufacture, installation, and supplementary service" of products manufactured at the plant.

EC99J2044

About ISO 14001
ISO 14001 is the standard defined by the International Organization for Standardization (ISO) relating to environmental management systems. Our group has been acknowledged by an internationally accredited compliance organisation as having an appropriate programme of environmental protection procedures and activities to meet the requirements of ISO 14001.

Dealer

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