savic-net Remote Unit
BMIF (VRV Interface)
BRY05000

General

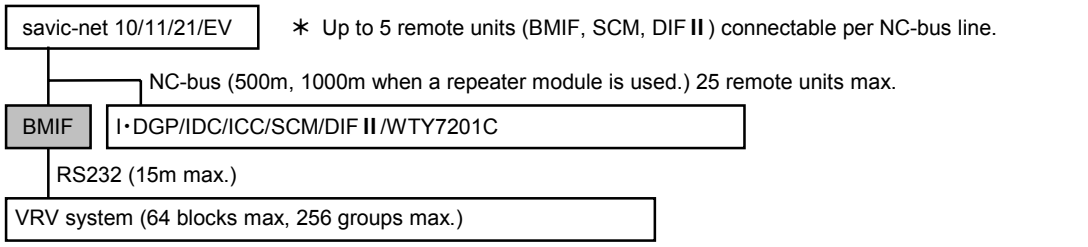
In conjunction with Yamatake's building automation system, the BMIF controls Daikin Industrie's VRV, modular air conditioning system.

The BMIF communicates with the VRV and enables the central control system to start/stop modules, monitor status and set and measure temperatures.

Features

1) Controls and monitors up to 64 groups of VRVs start/stop control, (status monitoring, and remote control inhibition) fault monitoring, temperature setting/measurement, filter sign/reset, and cooling/heating changeover (heating/cooling/ventilation, manual/automatic operation).
2) Increases monitoring speed and reduces downtime through advanced programs including : time schedule, analog alarm monitoring, runtime/cycle count, totalization.
3) Supports industry standard RS232 communications protocol.

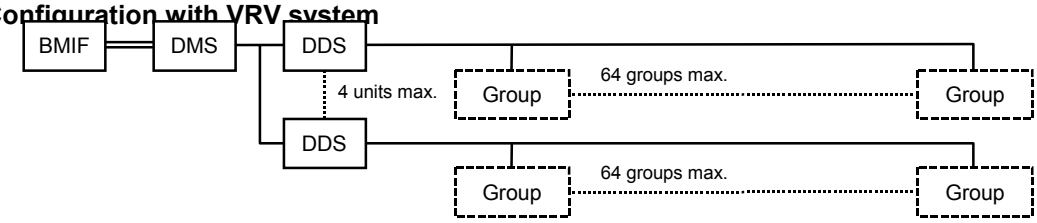
System Configuration



∗ A block is a management unit for the central control system consisting of multiple groups (or 1 block = 1 group)

∗ A group is a unit of a system consisting of multiple indoor units (or 1 group = 1 unit)

Configuration with VRV system



Safety Instructions

Please read instructions carefully and use the product properly. Please keep this instruction on hand for reference at any time.

Usage Restrictions

This product is targeted for general air conditioning. Do not use this product in a situation where human life may be affected. If this product is used in clean rooms or places where reliability or control accuracy is particularly required, please contact Yamatake's sales representatives. Yamatake Building Systems Co., Ltd. bears no responsibility for any benefit, or lack of benefit, derived from the operation by the customer.

⚠ CAUTION

- Disconnect power supply before beginning wiring to prevent electrical shock or equipment damage.
- Establish a proper ground. An improper ground may cause a fire due to an electrical short or equipment damage.
- Do not remove or disassemble the cover except for wiring or part replacement. Equipment damage or electrical shock may result,
- Only a technician may open the cover. Electrical shock may result.
- Check for loose wiring to prevent heat generation or equipment damage.

⚠ CAUTION

- Installer must be a trained, experienced technicain.
- Check the ratings given in this instructions to prevent equipment damage.
- Check the environment given in this instructions to prevent equipment damage.
- All wiring must comply with local codes and ordinances.
- Use crimp contacts with insulation jackets for wire terminals.
- Lightning prevention must be considered or malfunction may expand.

Functional segregation

Item	Function	Description	Functional Segregation			Notes
			YC		Daikin	
			savic-net	BMIF		
1. Monitoring	1. Status monitoring	Monitors operation status of VRV	✓			Daikin Industries transmits COS
	2. Alarm monitoring	Monitors fault of VRV	✓			Daikin Industries transmits COS
	3. Analog alarm monitoring	Monitors high/low limit and differenital of room temperature	✓			Yamatake Corporation scans data and monitors
	4. Runtime monitoring	Monitors runtime and duty cycles of VRV	✓			Yamatake Corporation calculates runtime and cycle count
	5. Buzzer	Generates alarm when fault occurs	✓			Yamatake Corporation generates buzzer for specified events only.
	6. Equipment monitoring	Monitors units consisting VRV system	✓		△	Monitor details using remote controlle
2. Operation setup	1. Individual ON/OFF	Issued on/off operation by manual operation	✓		△	Operate using remote controller during back-up
	2. Remote setup	Remote setup of room temperature	✓		△	Operate using remote controller during back-up
	3. Time setup	Sets/modifies time system manages	✓			
	4. Season setup	Sets seasonal period	✓			
	5. Fire restoration	Restores VRV system after fire	✓			Restoration method varies depending on stop control in case of fire
3. Reporting	1. Reporting	Prints change of status of VRV	✓			Yamatake Corpotation prints specified events only
	2. Fault occurrence/ restoration report	Prints occurrence and restrotation of fault	✓			Yamatake Corpotation prints specified events only
	3. On/off operation report	Prints on/off operation of VRV	✓			Yamatake Corpotation prints specified events only
	4. Unit error/ restoration report	Prints error/restoration of units consisting VRV system	✓			Yamatake Corporation cannot print malfunction code
4. Basic function	1. Schedule management	Manages time schedule of start/stop points of VRV	✓			
	2. Schedule on/off	Starts/stops VRV system at the specific time		✓		
	3. Holiday setting	Specifies holidays	✓			
	4. Analog alarm monitoring value setting	Sets/modifies high/low limit and differential of room temperature	✓			
	5. Analog alarm monitoring comparison	Monitors high/low limit and differential of room temperature		✓		
	6. Runtime monitoring value setting	Sets/modifies runtime/cycle count target values	✓			
	7. Runtime/ cycle count totalization	Totalizes runtime/cycle count for monitoring		✓		
	8. Group definition	Defines relationship between the position of indoor unit and group			✓	Group is define by Daikin Industries address
	9. Block definition	Defines relationship between block and group		✓		Block definition is transmitted to Daikin Industries by BMIF when it is initialized

Functional segregation

Item	Function	Description	Functional Segregation			Notes
			YC		Daikin	
			savic-net	BMIF		
5. Control function	1. Power demand control	Turns off thermostat of VRV indoor unit by power demand control	∨			
	2. Power restoration control	Restores operation status by restoration command	∨			
	3. Stop control in case of fire	Stops specified VRV units when fire occurs	∨			
	4. HVAC temperature control	Controls temperature of VRV units			∨	
	5. Optimum start/stop control		∨			
	6. Duty cycling	Turns VRV units on and off to reduce energy consumption	∨			
	7. Power metering	Power metering of VRV system	△		∨	Yamatake Corporation system performs metering in some cases
	8. Billing	Billing based on power metering and runtime	∨			

Functions

1) Block Monitoring Points

No	Point name	Type	Range, unit	Notes
1	ON/OFF status	Start/ stop Point	On/off/auto	On/off = Issues batch ON/OFF commands to all groups in a block Status = OR of each group's status in a block Auto = Remote controller operation (On/Off, temperature setting, cooling/heating changeover) enabled In the default setting, remote controller operation is disabled after on/off command;. By parameter change, remote controller operations during on/off is enabled In the default setting, previous status is retained when auto command is issued. By parameter change, auto command can be set after on/off command
2	Fault	Alarm point	Normal/faulty	OR of fault of each group in a block
3	Temperature setting	Setpoint	16 to 32℃	Operation = Batch command to all groups in a block Monitoring = Monitor setup of representative group in a block
4	Temperature measurement	Analog point	0～50℃	Monitor measured temperature of representative group in a block
5	Filter sign/reset	Start/ stop point	Reset/sign	Operation = Reset setup of all groups in a block Monitoring = Monitor signs of representative groups in a block
6	Cooling/Heating changeover	Start/ stop point	Heating/cooling/ ventilation	Operation = Changeover to all groups in a block Monitoring = Monitor cooling/heating of representative group in a block
7	Cooling/heating auto	Start/ stop point	Man/auto	This point is used only when both cooling and heating exist in the same outdoor unit.
8	Billing data	Totalizer point	0 to 99999.9	Power metering or thermo ON time with weight

2) BMIF Batch Monitoring Point

No	Point name	Type	Range, unit	Notes
1	Malfunction error code 1	Totalizer point	0 to 99.9999	Indicates block No. where fault occurred and it's description
2	Malfunction error code 2	Totalizer point	0 to 9999.99	Indicates location where fault occurred (address and manufacturer)

savic-net/VRV System Malfunction Code Reference

Malfunction code	Malfunction code = AA. CCDD	Malfunction code = EEEE. FF
	Block No(00 to 64)	Group No(0000 to 0256) / Group address(Master = 00・Slave 01 to 15)

CCDD	Malfunction Code of VRV system	
	Code	Description
1100	A0	Indoor unit: Error of external protection device
No display	A1	Indoor unit: PC board defect
1103	A3	Indoor unit: Malfunction of drain level control system (33H)
1106	A6	Indoor unit: Fan motor (51F) lock, overload
No display	A7	Indoor unit: Malfunction of swing flap motor (MA)
1109	A9	Indoor unit: Malfunction of driving part of electronic expansion valve (20E)
No display	AF	Indoor unit: Drain level abnormal
No display	AH	Indoor unit: Malfunction of air cleaner
1120	AJ	Indoor unit: Malfunction of capacity setting
1304	C4	Indoor unit: Malfunction of thermistor (Th2) for liquid pipe (loose connection, disconnection, shot circuit, defective)
1305	C5	Indoor unit: Malfunction of the thermistor (Th3) for gas pipes (loose connection, disconnection, short circuit, defective)
1309	C9	Indoor unit: Malfunction of thermistor (Th1) for air inlet (loose connection, disconnection, shot circuit, defective)
No display	CJ	Indoor unit: Malfunction of thermostat sensor in remote controller
1500	E0	Outdoor unit: Actuation of safety device
No display	E1	Outdoor unit: PC board defect
1503	E3	Outdoor unit: Actuation of high pressure switch
1504	E4	Outdoor unit: Actuation of low pressure switch
1509	E9	Outdoor unit: Malfunction of driving part of electronic expansion valve (20E)

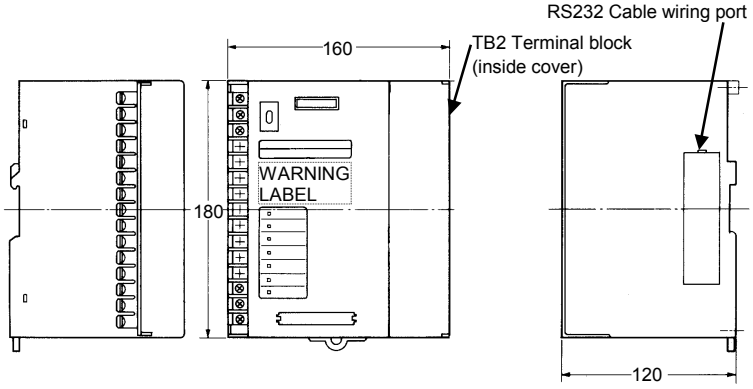
CCDD	Malfunction Code of VRV system	
	Code	Description
1603	F3	Outdoor unit: Abnormal discharge pipe temperature
No display	H3	Outdoor unit: High pressure switch defect
1804	H4	Outdoor unit: Actuation of low pressure switch
1809	H9	Outdoor unit: Malfunction of thermistor (Th1) for outdoor air (loose connection, disconnection, short circuit, defective)
2001	J1	Outdoor unit: Malfunction of pressure sensor
2003	J3	Outdoor unit: Malfunction of discharge pipe thermistor (Th3) (loose connection, disconnection, short circuit, defective)
2005	J5	Outdoor unit: Malfunction of thermistor (Th4) for suction pipe (loose connection, disconnection, short circuit, defective)
2006	J6	Outdoor unit: Malfunction of thermistor (Th2) for heat exchanger
2011	JA	Outdoor unit: Malfunction of discharge pipe pressure sensor
2013	JC	Outdoor unit: Malfunction of suction pipe pressure sensor
2200	L0	Outdoor unit: Failure of inverter system
2204	L4	Outdoor unit: Failure of inverter cooling
2205	L5	Outdoor unit: Compressor motor grounded, short circuit, power unit short circuit
2208	L8	Outdoor unit: Compressor overload, compressor unit wire cut
2209	L9	Outdoor unit: Compressor lock
2213	LC	Outdoor unit: Malfunction of transmission between inverter and outdoor control unit
2604	P4	Outdoor unit: Malfunction of power unit temperature sendor
No display	U0	Outdoor uiit:: Refrigerant shortage, low pressure drop due to defect of driving part of electronic expansion valve

CCDD	Malfunction Code of VRV system	
	Code	Description
3101	U1	Negative phase/open phase ※abnormal
3102	U2	※Power supply instantaneous power drop
3104	U4	Malfunction of transmission between indoor unit and outdoor unit
3105	U5	Malfunction of transmission between remote controller and indoor unit
No display	U5	Defect of remote controller PC board or setting during control by remote controller
3106	U6	Malfunction of transmission between indoor units
3107	U7	Malfunction of transmission between outdoor units (cool/heat unified, low noise)
3108	U8	Malfunction of transmission between main remote controller and sub remote controller (malfunction of sub remote controller) Defect of combination of other indoor unit or remote controller in same system (model)
3109	U9	Malfunction of transmission between indoor unit and outdoor unit in same system
3111	UA	Defect of combination of indoor/outdoor units (model, No. of units, etc.) Defect of combination of indoor unit and remote controller (applicable remote controller)
No display	UA	Defect of field set
No display	UC	Address duplication of central remote controller
3115	UE	Malfunction of transmission between indoor unit and central remote controller

Model number

Model number			Distribution
BRY05000			BMIF
	A		Power supply: 100V AC
	B		Power supply: 200V AC
	G		Power supply: 220V AC
	H		Power supply: 240V AC
		1001	NC-bus Standard
		1011	NC-bus transmission redundancy

Dimensions (mm)



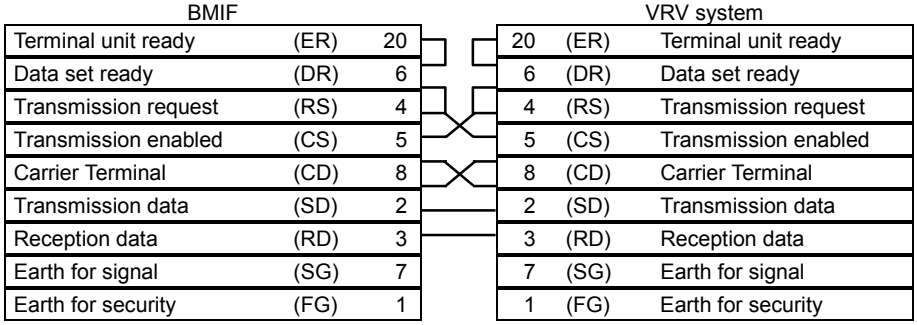
警告
WARNING

- **感電の恐れがありますので、サービス担当者以外はカバーをあけないでください。**
- Do not open the cover.
  Trained service personnel only.

＊ This warning is not the label same label on the product.

Warning label

Specifications

<table>
<tr><th>Item</th><th>Specifications</th></tr>
<tr><td>Power supply
Power consumption</td><td>100/200/220/240V AC ± 10 % (50/60 Hz)
20 VA max.</td></tr>
<tr><td>Status information</td><td>
<table>
<tr><th>LED</th><th>Blink</th><th>ON</th><th>OFF</th></tr>
<tr><td>Power</td><td>—</td><td>ON</td><td>OFF</td></tr>
<tr><td>NC-bus Tx</td><td>Normal</td><td>Abnormal</td><td>—</td></tr>
<tr><td>NC-bus Rx</td><td>Normal</td><td>Abnormal</td><td>—</td></tr>
<tr><td>RS232 Tx</td><td>Normal</td><td>Abnormal</td><td>—</td></tr>
<tr><td>RS232 Rx</td><td>Normal</td><td>Abnormal</td><td>—</td></tr>
<tr><td>Err 1</td><td>—</td><td>Abnormal</td><td>—</td></tr>
<tr><td>Err 2</td><td>—</td><td>Abnormal</td><td>—</td></tr>
</table>
</td></tr>
<tr><td>Mnmory protection</td><td>EEPROM Backup
RAM Back up: Lithium battery</td></tr>
<tr><td>Communication</td><td>
<table>
<tr><th></th><th>NC-bus Transmission</th><th>VRV connection</th></tr>
<tr><td>Line method</td><td>Two-wire tow-way current transmission
(0:30 mA・1:4 mA)</td><td>RS232 4-wire</td></tr>
<tr><td>Transmission method</td><td>Half duplex</td><td>Half duplex</td></tr>
<tr><td>Synchronization method</td><td>Asynchronization method</td><td>Asynchronization method</td></tr>
<tr><td>Communication control procedure</td><td>Time slot</td><td>Polling/selecting
(Centralized method)</td></tr>
<tr><td>Transmission speed</td><td>4,800 bps</td><td>4,800 bps</td></tr>
<tr><td>Transmission code</td><td>Total 11 bits
Start bit: 1 bit
Data bit: 8 bit
Stop bit: 2 bit</td><td>JIS7 unit + 1 parity</td></tr>
<tr><td>Error detection</td><td>CRC Check method</td><td>Veritical parity
Horizontal parity
Transmission time monitoring timer</td></tr>
</table>


</td></tr>
<tr><td>Rated operating conditions</td><td>Ambient temperature: 0 to 50 ℃
Ambient humidity: 10 to 95 %RH (Non-condensing)
Vibration: 3.2 m/s^2 max.</td></tr>
<tr><td>Transport/storage conditions</td><td>Ambient temperature: -20 to 60 ℃
Ambient humidity: 5 to 95 %RH (Non-condensing)
Vibration: Transport 9.8 m/s^2 max. (10 to 55 Hz)
Storage 3.2 m/s^2 max. (10 to 55 Hz)</td></tr>
<tr><td>Weight</td><td>1.65 kg</td></tr>
<tr><td>Color</td><td>Light beige</td></tr>
<tr><td>Materials</td><td>Plastic molding</td></tr>
</table>

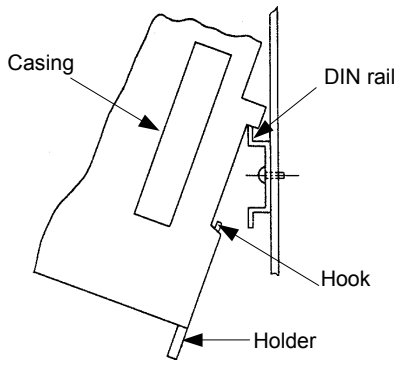
Handling Precautions

1) Take care not to drop the BMIF.
2) Check the wiring is correct before powering ON.
3) After power on, several ten seconds are required before the normal operation and the Error 1 LED on front panel goes on (red LED). This is not an error.
4) Do not make connections at empty terminals.
5) Do not completely cover the top and bottom of the BMIF. Remove the dustproof label on the top of the BMIF before starting-up.
6) It is recommended that the BMIF is installed vertically. However, it may also be installed horizontally.

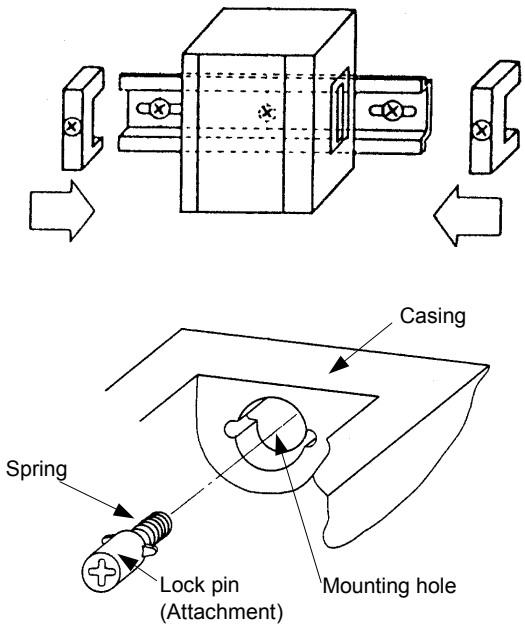
Installation

Install the BMIF in a control panel with a DIN rail. Do not mount the BMIF in a power panel or in locations where it may be affected by:

1) High/low temperature
2) High/low humidity
3) Corrosive atmosphere
4) Vibration
5) Water damage



Mount with DIN rail



Fix the BMIF

Wiring

⚠ WARNING
● Disconnect the power supply befor beginning wiring to prevent electrical shock.

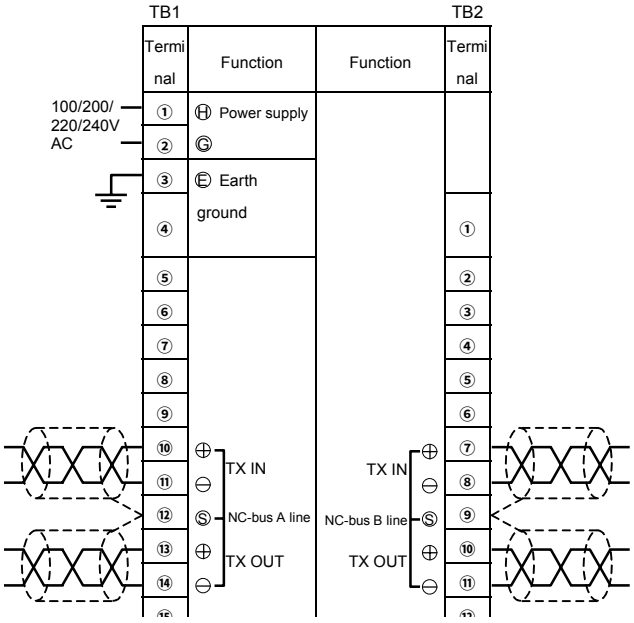
⚠ CAUTION
● ALL wiring must conform to local codes, ordinances, and regulations.
● Install proper groud wires. Improper grounding result in electrical shock or equipment damage.
● Use connector terminal with insulation sleeve.

Witing specifications

Line	Input/output	Wiring	Wiring length
NC-bus	4800 bps current transmission	IPEVS cable	500 m
RS232	RS232 4-wire	RS232 cable	15 m
Power supply	100/200/220/240V AC ± 10 % (50/60 Hz)	IV 2.0 mm^2	50 m
Ground	100 Ω	IV 2.0 mm^2	50 m

∗ Wirings to NC-bus, power source and earth ground are connected to screw terminal blocks (M4).

∗ Use D-sub connector 25P (both ends are male.) for RS232 cable.



Adjustment/maintenance

After installation of BMIF, adjustment is required to confirm parameter settings and operation. Adjustment must be performed by a trained service person. (For adjustment refer to AB-5151 “BMIF Start-up Manual”)
For maintenance, a lithium battery must be exchanged each 5 years. If electric is not charged for more than an year, batteries must be replaced. This procedure also must be performed by a service technician.

Specifications are subject to change without notice.

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