TOSHIBA

E20-124-1

APPLICATION CONTROL MANUAL
For SMMS-u(-E)

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6 Indoor unit optional devices

7 Indoor unit controls

8 Outdoor unit controls for VRF

9 Common function and specification

1

Outline of system

1-1 Outline of system

1-1-1 Outline of TU2C line

SMMS-u is installed new control system “TU2C-LINK”.

SMMS-u

This control system is designed for next generation VRF (SMMS-u and more)

TU2C has two “U” meanings

- **Universal Communication Link**
  Centralised control on Uh line;
  LC and I/F via RAC, Air to water (6series) can be connected directly
  New and current systems can be connected.
- **Usability Communication Link**
  Comfortable communication speed
  Connectable **max. 128 units***
  * New unit and remote controller system only
  * TU2C-LINK TOSHIBA (Universal/Usability=U2) Communication - Link

Outdoor unit	Indoor unit	Remote controller
SMMS-u	-UP IDU	New

Outdoor unit	Indoor unit	Remote controller
SMMS-u	-UP IDU	Previous model
Previous model	-UP IDU	New
Previous model	-AP IDU	New
Previous model	-AP IDU	Previous model

	TU2C-LINK	TCC-LINK
Indoor/Outdoor communication	Max. 128 units	Max. 64 units
VRF Refrigerant cycle	Max. 28*	Max. 16
Refrigerant cycle (included LC etc.)	Max. 128*	Max. 64
Central remote controller & I/F interface	Max. 20*	Max. 8
Group control	Max. 16 units	Max. 8 units

* If LC model is connected, the number of connected units will decrease.

Uh : maximum connectible units.

ODU	TU2C-LINK	TU2C-LINK + TCC-LINK (1~2systems)	TU2C-LINK + TCC-LINK (3~5systems)	TU2C-LINK + TCC-LINK (6systems)	TU2C-LINK
Central Controller	20	16	12	10	←
Refrigerant System	28	22	16	←	←
Indoor units	128	102	76	64	←

Uv : maximum connectible units.

ODU IDU RC	TU2C-LINK TU2C-LINK TU2C-LINK	TU2C-LINK TCC-LINK TCC-LINK	TCC-LINK TU2C-LINK TCC-LINK	TCC-LINK TCC-LINK TU2C-LINK	TU2C-LINK TCC-LINK TU2C-LINK	TCC-LINK TCC-LINK TCC-LINK
Indoor units	128	64	←	←	←	←
Group/RC	16	8	←	←	←	←

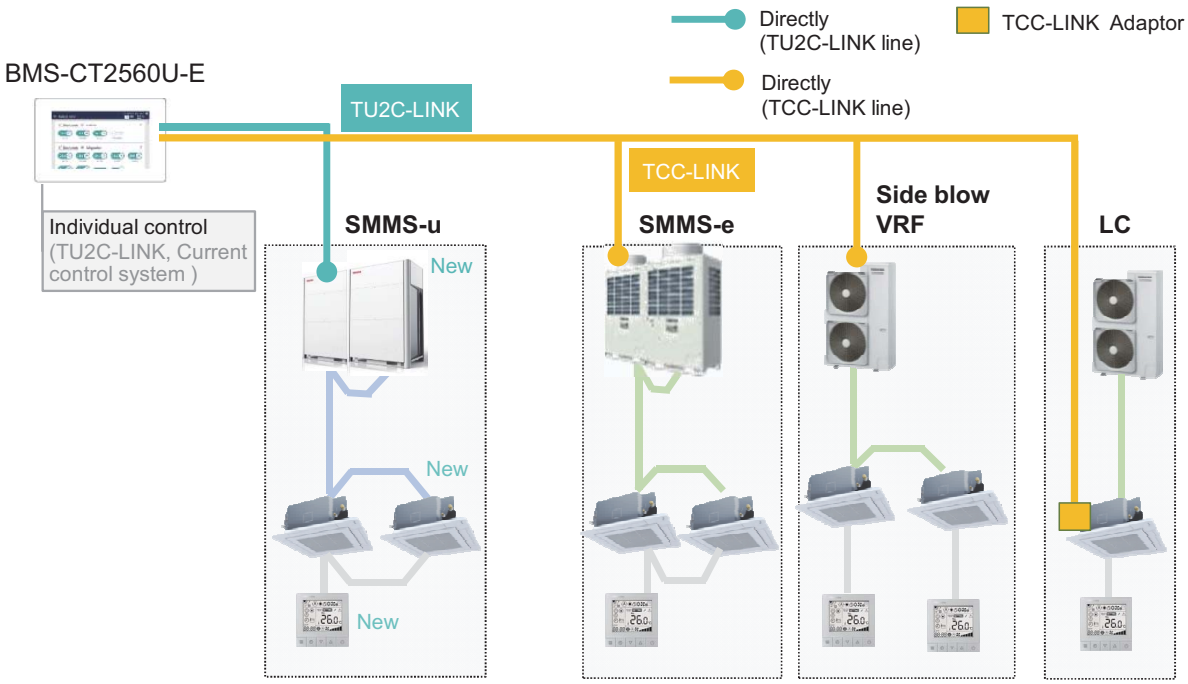
■ Design of Control Wiring

Communication method and model name

The TU2C-LINK model (U series) can be used together with previous models (other than U series).
For details of the model and communication method, see the following table.

Communication method	TU2C-LINK (U series)	TCC-LINK (other than U series)
Outdoor unit	MMY-M**U**P*** U series model	Other than on the left (MMY-MAP***, MCY-MAP***, etc.)
Indoor unit	MM*-**U**P*** U series model	Other than on the left (MM*-AP***, etc.)
Wired remote controller	RBC-AMS**U** U series model	Other than on the left
Wireless remote controller receiver	RBC-AXR**U** U series model TCB-AXR**U** U series model	Other than on the left
Central control device	***-****U*** U series model	Other than on the left

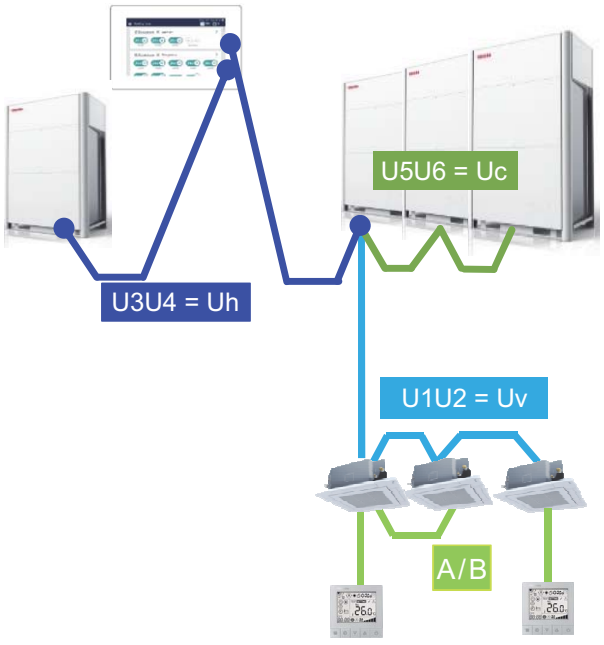
U series outdoor units: Super Multi u series (MMY-MUP***)
Outdoor units other than U series: Super Module Multi i series (MMY-MAP***), etc.



Simplified control wiring

SMMS-u	SMMS-e
Uv	U1 U2
Uh	U3 U4
Uc	U5 U6

Communication cable	
Outdoor unit to Indoor unit	Indoor unit to Indoor unit
To Central remote controller	
To Outdoor unit	



Interface of SMMS-u

Uv	Uv	S	Uh	Uh	Uc	Uc	S
U1	U2	S	U3	U4	U5	U6	S
TO INDOOR UNIT		SHIELD	TO CENTRAL CONTROLLER		TO OUTDOOR UNIT		SHIELD

Interface of SMMS-e

U1	U2	S	U3	U4	U5	U6	S
TO INDOOR UNIT		SHIELD	TO CENTRAL CONTROLLER		TO OUTDOOR UNIT		SHIELD

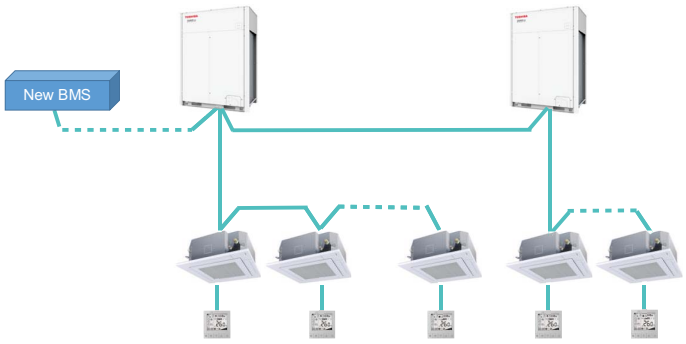
[Indoor unit]

Uv	Uv	A	B
Indoor/Outdoor unit		Remote controller	

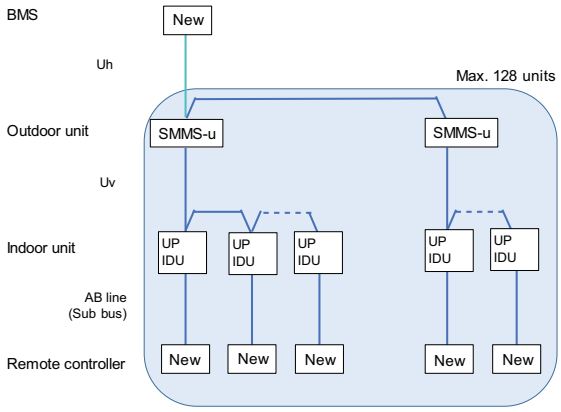
TU2C-LINK

1-1-2 Central control to system combination

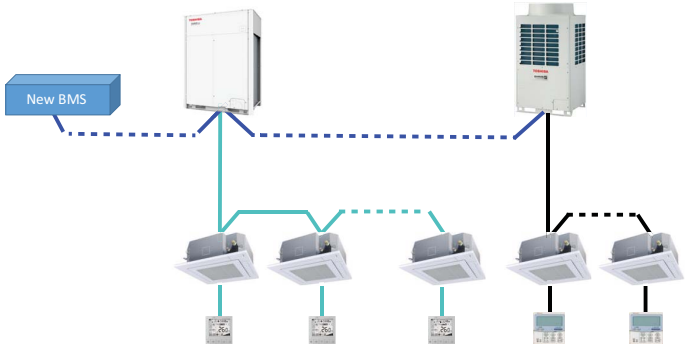
1 TU2C-LINK system



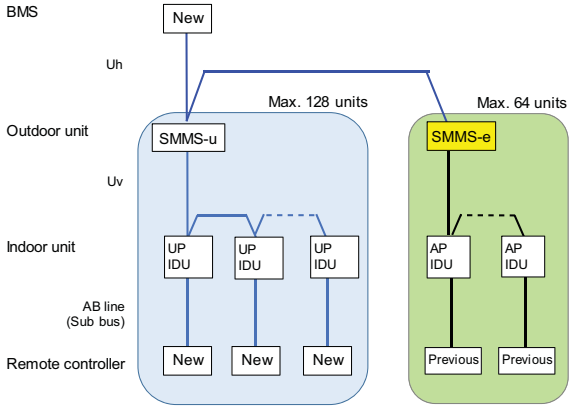
All new communication system



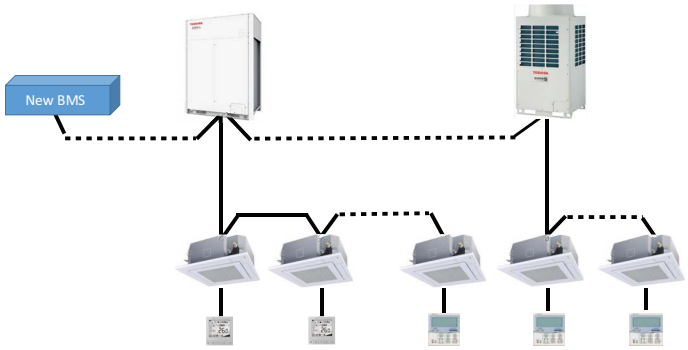
2 TU2C-LINK + TCC-LINK system



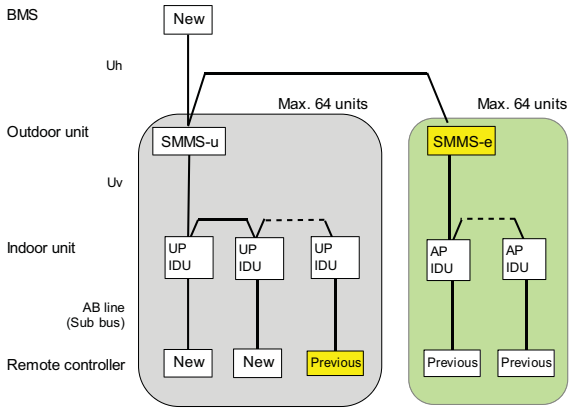
Divided into new communication system and current communication system



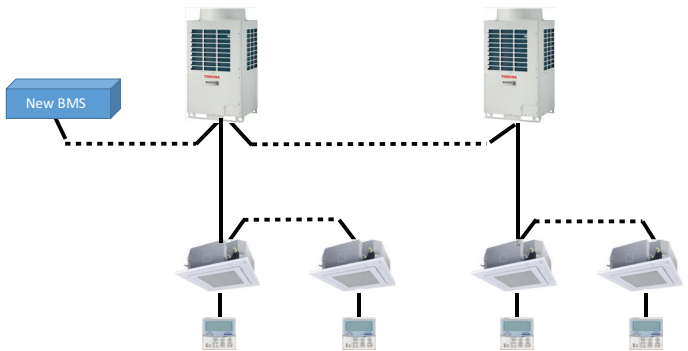
3 TCC-LINK + TCC-LINK system



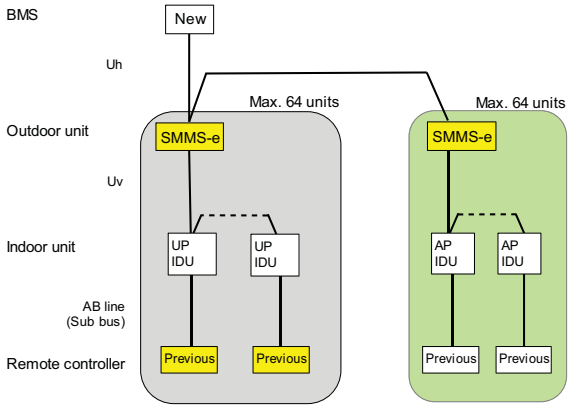
Communication system is changed to current communication system when current remote controller is installed



4 TCC-LINK + TCC-LINK system (Current System)



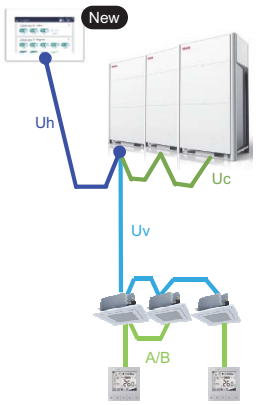
Current communication system

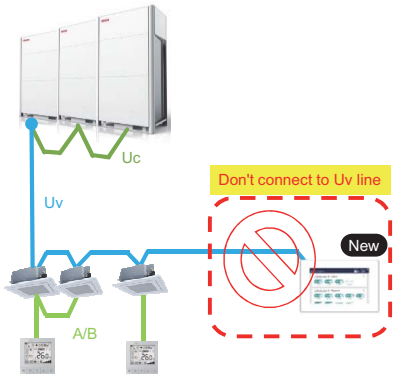


Notice

TU2C Central remote controller

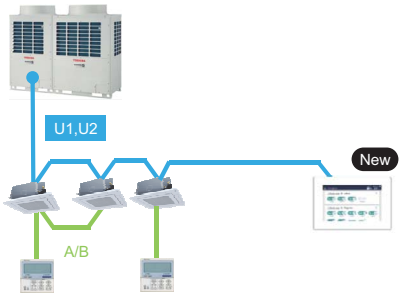
Central remote controller connect on Uh line





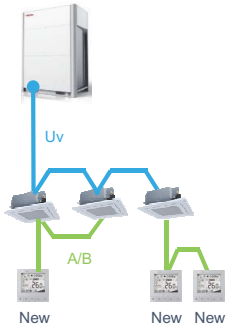
New Central remote controller can connect to TCC-LINK System.
Then this device is restricted same as current model.

Note : Current system connectable U1U2 line

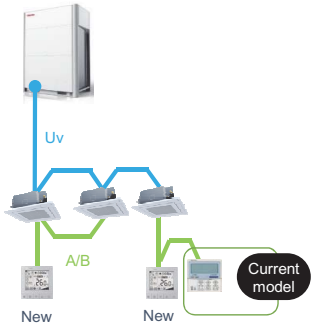


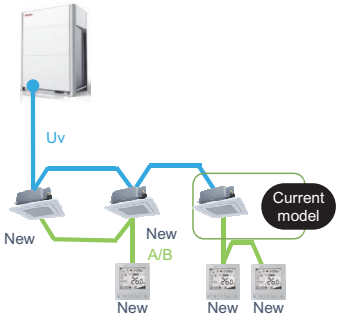
Control system change to current system when the current model (unit, controller) is installed.

TU2C control system



Current Control System

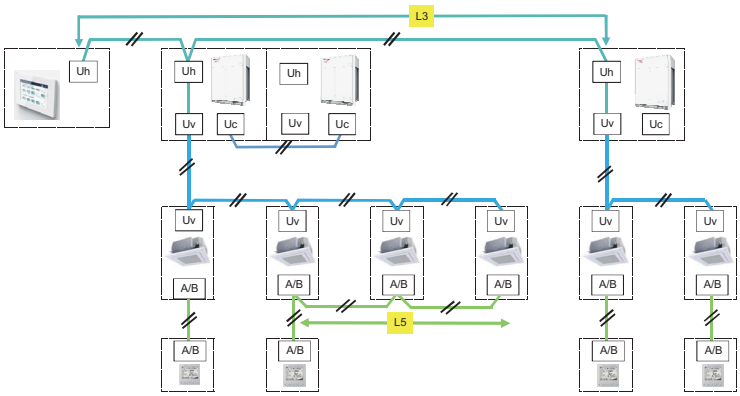




1-1-3 Electrical work

CONTROL WIRING

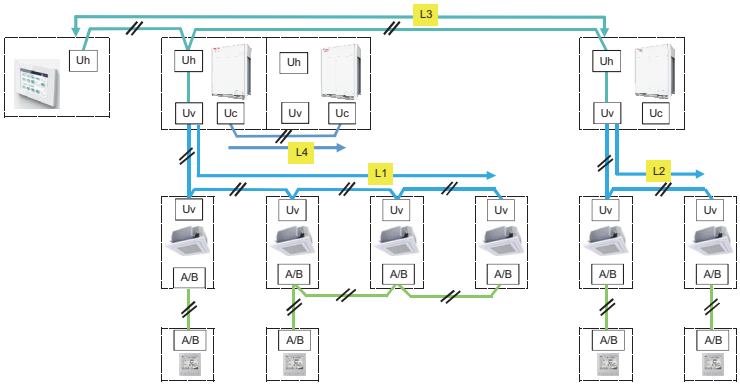
Type Stranded 2-conductor, Non-Polarity, Shielded Wire



CONTROL WIRING: "Uv Line - Control wiring between indoor and outdoor units (L1, L2) + Uc Line - between outdoor units (L4)"

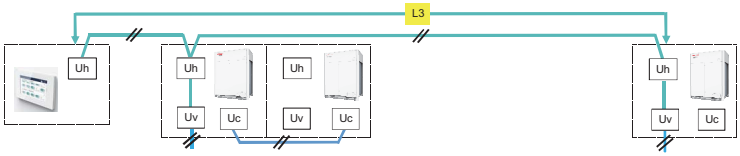
Type Stranded 2-core, Non-Polarity, Shielded wire
Size/ Length 1.00 mm² to 1.25 mm², up to 1000 m (*1)

Note (*1): Uv + Uc Line are independent from another Refrigerant Line. Each Refrigerant Line are up to 1000 m.
(L1 + L4) is up to 1000 m, L2 is up to 1000 m.



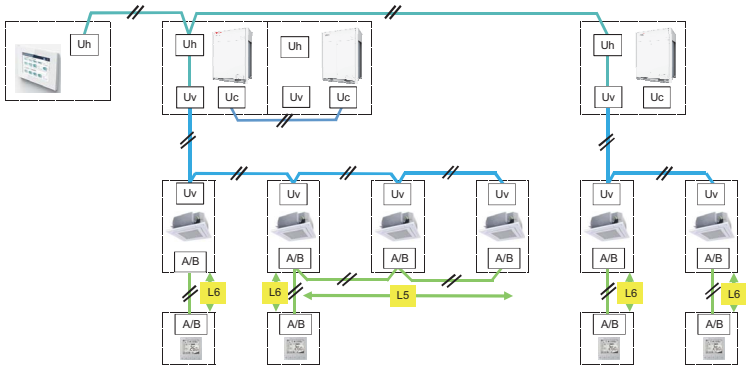
CONTROL WIRING: "Central control wiring"

Type Stranded 2-core, Non-Polarity, Shielded wire
Size/ Length 1.0 mm² to 1.5 mm² : Up to 1000 m
2.0 mm² : Up to 2000 m



CONTROL WIRING: “Remote controller wiring”

Type	2-core, Non-Polarity, Shielded wire
Length	• Up to 500 m (L5 + L6) • Up 400 m in case of wireless remote controller in group control. • Up to 200 m total length of control wiring between indoor units (L5)
Size	0.5 mm² to 2.0 mm²



1-2 List of models and outline

Remote controller For TU2C-LINK

Appliance name	Appearance	Model name	Explanation	Connecting unit	Connecting device or setting method
Wired Remote Controller		RBC-ASCU11-E	Wired Remote Controller		
Wired Remote Controller		RBC-AMSU51-EN/ ES	Wired Remote Controller		
Wired Remote Controller		RBC-AMTU31-E	Wired Remote Controller		
Wireless remote controller kit		RBC-AXU41U-E	4-way Cassette Type (MMU-UP_1H-E)	Indoor unit	Individual control Two remote control (wired & wireless)
		RBC-AXU31U-E	4-way Cassette Type (except for MMU-UP_1HP-E)		
		RBC-AXU31UM-E	Compact 4-way cassette		
		RBC-AXU31UW-E	2-way Air Discharge Cassette		
		RBC-AXU31C-E	Ceiling, 1-way Air Discharge Cassette (SH)		
		RBC-AXU31-E	All other units		
64 Central remote controller		TCB-SC640U-E	Max. 64 indoor units. (1 TU2C-LINK) (10 Zone/16 groups, 64 zone/64 groups) x 1ch, 4 types central setting. Schedule timer mode. (+Schedule timer)		Central control wiring

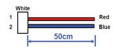
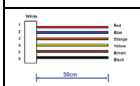
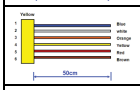
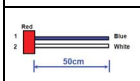
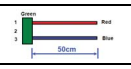
Advanced central control For TU2C-LINK

Appliance name	Appearance	Model name	Explanation	Connecting unit	Connecting device or setting method
Touch Screen Controller		BMS-CT2560U-E	Max. 128 indoor units. (2 TU2C-LINK) Full control / monitoring / Schedule from PC Web with Energy monitoring, Direct DI/DO or Power mater I/P		Central control wiring

Open network

Appliance name	Appearance	Model name	Explanation	Connecting unit	Connecting device or setting method
Modbus Interface		BMS-IFMB1280U-E	Central control by Modbus. Max 64 indoor units / groups with TU2C-LINK.		Central control wiring
BN Interface		BMS-IFBN1280U-E	Central control by BACnet. Max 64 indoor units / groups with TU2C-LINK. BTL certification*6, based on BACnet-2012		Central control wiring

Indoor unit optional devices

Appliance name	Appearance	Model name	Explanation	Connecting unit	Connecting device or setting method
Application control kit		TCB-PCUC2E	External Input / Output connecting	**VRF (UP) FCU:** 4-Way Smart Cassette, Compact 4-way Cassette, Ceiling, High static Duct, Floor Standing, Fresh Air Intake Unit	
				VRF (AP) FCU: 4-Way Smart Cassette, Compact 4-way Cassette, Ceiling, High static Duct (8-10), Floor Standing	
Connectors		TCB-KBCN32VEE	Ventilation fan control from Remote controller	Indoor unit	CN32 on indoor unit
		TCB-KBCN60OPE	Operation status signal output	Indoor unit	CN60 on indoor unit
		TCB-KBCN61HAE	Leaving-ON prevention control by key SW Operation Input / Output	Indoor unit	CN61 on indoor unit
		TCB-KBCN70OAE	Option error input	Indoor unit	CN70 on indoor unit
		TCB-KBCN73DEE	Demand input	Indoor unit	CN73 on indoor unit
		TCB-KBCN80EXE	Outside error input	Indoor unit	CN80 on indoor unit

Advanced central control

Appliance name	Appearance	Model name	Explanation	Connecting unit	Connecting device or setting method
Smart manager		BMS-SM1280HTLE	Max. 128 indoor units. (2 LINK Ports) Full control / monitoring / Schedule from PC Web with Energy monitoring.		Central control wiring Energy Monitoring Relay Interface Digital I/O Relay Interface
Smart manager with data analyzer		BMS-SM1281ETLE	Max. 128 indoor units. (2 LINK Ports) Full control / monitoring / Schedule from PC Web with Energy monitoring, Data analysis.		Central control wiring Energy Monitoring Relay Interface Digital I/O Relay Interface
Touch Screen Controller		BMS-CT5121E	Max. 512 indoor units. Full control / monitoring / Schedule without Energy monitoring, PC web access.		Central control wiring TCS-NET Relay Interface Energy Monitoring Relay Interface Digital I/O Relay Interface

Open network

Appliance name	Appearance	Model name	Explanation	Connecting unit	Connecting device or setting method
Lon Interface		TCB-IFLN642TLE	Central control by LonWorks. Max 64 indoor units / groups. Compliant to LonWorks EIA/ANSI 709.1 (FT-X1 transceiver).		Central control wiring
Modbus Interface		TCB-IFMB640TLE	Central control by Modbus. Max 64 indoor units / groups. Compliant to RS485 Modbus RTU mode.		Central control wiring
BN Interface		BMS-IFBN640TLE	Central control by BACnet. Max 64 indoor units. BACnet server Compliant to ANSI / ASHRAE Standard 135-2008 BACnet IP.		Central control wiring
Analog Interface		TCB-IFCB640TLE	Max. 64 indoor units. Control by DC input voltages.		Central control wiring

Open network optional devices

Appliance name	Appearance	Model name	Explanation	Connecting unit	Connecting device or setting method
Relay I/F	-	BMS-IFLSV4E	Max. 64 indoor units	512 TSC BACnet server	Central control wiring (RS485)
Energy monitoring Relay I/F	-	BMS-IFWH5E	Max. 8		Central control wiring (RS485)
Digital I/O Relay I/F	-	BMS-IFDD3E	Max. 8		Central control wiring (RS485)

Outdoor unit optional devices for VRF

Appliance name	Appearance	Model name	Explanation	Connecting unit	Connecting device or setting method
Power peak-cut control board		TCB-PCDM4E	Power peak-cut (Standard function)	SMMS-u outdoor unit	Header outdoor unit CN513 on outdoor unit
			Power peak-cut Control (For one input function)		
			Power peak-cut Control (Enhanced Function)		
			Power peak-cut (Standard function)	Outdoor unit (Current)	Header outdoor unit CN513 on outdoor unit
			Power peak-cut (Expansion function)		
External master ON/OFF control board		TCB-PCMO4E	Snowfall fan Control	SMMS-u outdoor unit	CN509 (black)
			External master ON/OFF Control		CN512 (blue)
			Night operation (Sound reduction) Control		CN508 (red)
			Operation Mode Selection Control		CN510 (white)
			Operation Mode Selection Control (forced choice)		CN510 (white)
			Snowfall fan control	Outdoor unit (Current)	CN509 on outdoor unit
			External master ON/OFF control		CN512 on outdoor unit
			Night operation (Sound reduction) control		CN508 on outdoor unit
			Operation mode selection control board		CN510 on outdoor unit
Output control board		TCB-PCIN4E	Error/Operation output	SMMS-u outdoor unit	CN511 (green)
			Compressor Operation Output		CN514 (green)
			Operating Rate Output		CN514 (green)
			Error/Operation output control	Outdoor unit (Current)	CN511 on outdoor unit (CN513 Side blow VRF)
			Compressor operation status		CN514 on outdoor unit
			Operation output ratio board		

Outdoor unit controls for VRF

Appliance name	Appearance	Model name	Explanation	Connecting unit	Connecting device or setting method
Outdoor fan high static pressure shift	-		Control standard air volume of outdoor unit.	Outdoor unit	SW10 on outdoor unit
Cooling priority, heating priority control	-		Cooling priority or heating priority can be selected. (Setup at shipment: heating priority)	Outdoor unit	SW11 on outdoor unit
Specific indoor unit priority control	-		Only one indoor unit can be set as priority for changeover of operation mode.	Outdoor unit	SW11 on outdoor unit + Item code (DN) setting from wired remote controller

Indoor unit controls

Appliance name	Appearance	Model name	Explanation	Connecting unit	Connecting device or setting method
Outdoor fan highFunction change of indoor unit static pressure shift	-		Setting functions necessary to perform applied control at the local site.	Indoor unit	Item code (DN) setting from wired remote controller
Ventilation fan control from remote controller	-		Ventilation fan start/stop operation from wired remote controller.	Indoor unit	Setting from wired remote controller and relay wiring (local supply)
Leaving-ON prevention control	-		Control to prevent Leaving-ON of indoor unit.	Indoor unit	
Demand control from indoor unit			Thermo-OFF operation by relay signal.	Indoor unit	Relay wiring (local supply)

Indoor unit optional devices

Appliance name	Appearance	Model name	Explanation	Connecting unit	Connecting device or setting method
Remote sensor		TCB-TC41U-E	Remote sensing of indoor air temperature.	Indoor unit	

Remote controller For Current communication system

Appliance name	Appearance	Model name	Explanation	Connecting unit	Connecting device or setting method
Wired remote controller		RBC-AMT32E	Standard type	Indoor unit	Individual control Group control Two remote control
		RBC-AMS55E-ES/EN	With LCD display and backlight		
		RBC-AMS41E	With schedule timer		
		RBC-AS41E	With simplified control. Start / stop, temperature setting, air flow setting, check code display only.		
		NRC-01HE	For Air to Air Heat Exchanger with DX coil unit		
Wireless remote controller kit		RBC-AX32U(W/WS)-E	For 4-way Air Discharge Cassette	Indoor unit	Individual control Two remote control (wired & wireless)
		RBC-AX32UW(W)-E	For 2-way Air Discharge Cassette		
		RBC-AX33CE	For Under Ceiling, 1-way Air Discharge Cassette (SH)		
		TCB-AX32E2	For All other units (Except AC fan motor unit)		

Central remote controller For Current communication system

Appliance name	Appearance	Model name	Explanation	Connecting unit	Connecting device or setting method
Central remote controller		TCB-SC643TLE	Max. 64 indoor units. (1 LINK Port) (10 Zone / 16 groups, 64 zone / 64 groups) × 1 ch, 4 types central setting. Schedule timer mode. (+Schedule timer)		Central control wiring

2

TU2C-LINK Controller

2-1 Line up & function – Remote controller

Wired Remote Controller

Model Name	RBC-ASCU11-E	RBC-AMTU31-E	RBC-AMSU51-EN / ES	64 Central Remote Controller
Appearance				
On / Off	✓	✓	✓	✓
Mode	✓	✓	✓	✓
Setting Temperature	✓	✓	✓	✓
Fan Speed	✓	✓	✓	✓
Timer Function	✓	✓	✓	✓
Schedule Function	-	-	✓	✓ (*)
Multi language	-	-	✓	✓ (*)
Energy Save Function	-	✓	✓	-
Permit / Prohibit function	-	-	-	✓
Filter dirty indicator	✓	-	✓	✓
Error Display	✓	✓	✓	✓

Wired Remote Controlle

Model Name	RBC-AXU41U-E	RBC-AXU31U-E	RBC-AXU31UM-E	RBC-AXU31UW-E	RBC-AXU31C-E	RBC-AXU31-E
Appearance						
On / Off	✓	✓	✓	✓	✓	✓
Mode	✓	✓	✓	✓	✓	✓
Setting Temperature	✓	✓	✓	✓	✓	✓
Fan Speed	✓	✓	✓	✓	✓	✓
Timer Function	✓	✓	✓	✓	✓	✓
Schedule Function	-	-	-	-	-	-
Multi language	-	-	-	-	-	-
Energy Save Function	-	-	-	-	-	-
Permit / Prohibit function	-	-	-	-	-	-
Filter dirty indicator	-	-	-	-	-	-
Error Display	✓ (*)	✓ (*)	✓ (*)	✓ (*)	✓ (*)	✓ (*)

(*) : The error indication is displayed with LED of the receiver unit.

2-2 Controller comparison table

			Wired Remote Controller		
Model Name			**RBC-ASCU11-E**	**RBC-AMTU31-E**	**RBC-AMSU51-ES/EN**
Part name			Compact	Standard	With LCD display and backlight
Installation place			Wall	Wall	Wall
Max wired length [Note 9]			500 m	500 m	500 m
ON / OFF			✓	✓	✓
Mode	Auto [Note 4]		✓	✓	✓
	cool		✓	✓	✓
	heat		✓	✓	✓
	dry [Note 1]		✓	✓	✓
	fan		✓	✓	✓
Temperature setting range	Auto [Note 4]		18 - 29 °C	18 - 29 °C	18 - 29 °C
	cool		18 - 29 °C	18 - 29 °C	18 - 29 °C
	heat		18 - 29 °C	18 - 29 °C	18 - 29 °C
	dry [Note 1]		18 - 29 °C	18 - 29 °C	18 - 29 °C
FAN [Note 2]	auto / low / med / high		✓	✓	✓
Louver position [Note 3]			✓	✓	✓
Ventilation control			-	✓	✓
Filter sign / reset			-	✓	✓
Return back			-	-	✓
Power Save [Note 10] Individual louver [Note 10] Frost protection (heating at 8 °C) [Note 10] Self cleaning mode [Note 10]			-	-	✓
CLOCK			-	-	-
ECO / HI-POWER / MEMO / AUTO			-	-	-
Grille up / down [Note 10]			-	-	✓
Function setting (DN code)			✓	✓	✓
Temperature sensor [Note 5]			✓	✓	✓
Header / follower		Header	✓	✓	✓
		Follower	✓	✓	✓
Multiple control [Note 8]			Max 2 / 1 indoor or 1group	Max 2 / 1 indoor or 1group	Max 2 / 1 indoor or 1group
Timer			Only “Off Timer”	Off / repeat off / on	Off / repeat off / on
Weekly schedule			-	-	✓ 8 programs / day, Holiday setting
Error output			✓	✓	✓
Error history			-	✓ 4 history	✓ 10 history
Air to Air Heat Exchanger with DX coil unit		On / Off	-	✓	✓ [Note 14]
		Mode	-	-	✓ [Note 14]
		Fan Speed	-	-	✓ [Note 14]

[Note 1] Not provided on the concealed duct high static pressure type.
[Note 2] On the concealed duct high static pressure type, high only displayed and no selection.
[Note 3] No function for concealed duct standard type, high static pressure type, floor standing cabinet type, floor standing concealed type, and slim duct type.
[Note 4] SHRM-e only except DI/SDI.
[Note 5]
- DN code 32 setting is necessary for remote controller sensor.
- Be careful that the surrounding air flow of the remote temperature sensor is not poor.
- When using 2 remote controllers, the Header controller is recognized as remote sensor through the temperature can be set from either Header or Follower remote controller.
- Do not use remote sensor in case of group control except DI/SDI.

[Note 6] Select the remote sensor switch on the controller.
[Note 7] Wireless type max 6 address setting. The address switch position on both receiver and controller shall be selected.
[Note 8] The actual functions depend on the air-conditioner.
[Note 9] Another 200 m for Indoor to Indoor wiring.
[Note 10] For settings, refer to the installation manual of RBC-AMSU51-ES/EN.

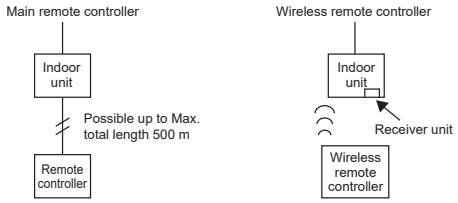
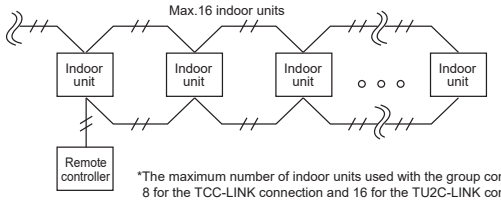
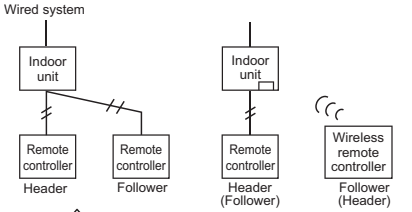
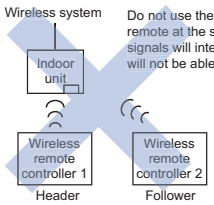
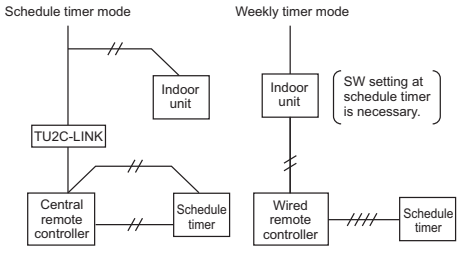
		Wireless Remote Controller					
Model Name		**RBC-AXU41U-E**	**RBC-AXU31U-E**	**RBC-AXU31UM-E**	**RBC-AXU31UW-E**	**RBC-AX33CE**	**RBC-AXU31-E**
Part name		For 4-way Cassette Type (MMU-UP_1H-E)	For 4-way Cassette Type (except for MMUUP_1HP-E)	For Compact 4-way cassette	For 2-way Air Discharge Cassette	For Ceiling, 1-way Air Discharge Cassette (SH)	For All other units
Dimension	Receiver	163 x 163 mm	163 x 163 mm	130 x 130 mm	130 x 130 mm	130 x 65 mm	130 x 65 mm
Installation place		Inside Indoor (receiver)	Inside Indoor (receiver)	Inside Indoor (receiver)	Inside Indoor (receiver)	Inside Indoor (receiver)	Inside Indoor (receiver)
Max wired length [Note 13]		400 m	400 m	400 m	400 m	400 m	400 m
ON / OFF		✓	✓	✓	✓	✓	✓
Mode	Auto [Note 4]	✓	✓	✓	✓	✓	✓
	cool	✓	✓	✓	✓	✓	✓
	heat	✓	✓	✓	✓	✓	✓
	dry [Note 1]	✓	✓	✓	✓	✓	✓
	fan	✓	✓	✓	✓	✓	✓
Temperature setting range	Auto [Note 4]	17 - 30 °C	17 - 30 °C	17 - 30 °C	17 - 30 °C	17 - 30 °C	17 - 30 °C
	cool	17 - 30 °C	17 - 30 °C	17 - 30 °C	17 - 30 °C	17 - 30 °C	17 - 30 °C
	heat	17 - 30 °C	17 - 30 °C	17 - 30 °C	17 - 30 °C	17 - 30 °C	17 - 30 °C
	dry [Note 1]	17 - 30 °C	17 - 30 °C	17 - 30 °C	17 - 30 °C	17 - 30 °C	17 - 30 °C
FAN [Note 2]	auto / low / med / high	✓	✓	✓	✓	✓	✓
Louver position [Note 3]		✓	✓	✓	✓	✓	✓
Ventilation control		-	-	-	-	-	-
Filter sign / reset		- / ✓	- / ✓	- / ✓	- / ✓	- / ✓	- / ✓
Return back		-	-	-	-	-	-
Power Save [Note 10] Individual louver [Note 10] Frost protection (heating at 8 °C) [Note 10] Self cleaning mode [Note 10]		-	-	-	-	-	-
CLOCK		✓	✓	✓	✓	✓	✓
ECO / HI-POWER / MEMO / AUTO		✓	✓	✓	✓	✓	✓
Grille up / down [Note 10]		-	-	-	-	-	-
Function setting (DN code)		-	-	-	-	-	-
Temperature sensor [Note 5]		-	-	-	-	-	-
Header / follower	Header	✓	✓	✓	✓	✓	✓
	Follower	✓	✓	✓	✓	✓	✓
Multiple control [Note 8]		Max 2/1 indoor or 1group	Max 2/1 indoor or 1group	Max 2/1 indoor or 1group	Max 2/1 indoor or 1group	Max 2/1 indoor or 1group	Max 2/1 indoor or 1group
Timer		Off / on / on-off / daily	Off / on / on-off / daily	Off / on / on-off / daily	Off / on / on-off / daily	Off / on / on-off / daily	Off / on / on-off / daily
Weekly schedule		-	-	-	-	-	-
Connectivity to Schedule Timer		-	-	-	-	-	-
Error output		✓ LED on receiver	✓ LED on receiver	✓ LED on receiver	✓ LED on receiver	✓ LED on receiver	✓ LED on receiver
Error history		-	-	-	-	-	-
Air to Air Heat Exchanger with DX coil unit	On / Off	-	-	-	-	-	-
	Mode	-	-	-	-	-	-
	Fan Speed	-	-	-	-	-	-

[Note 1] Not provided on the concealed duct high static pressure type.
[Note 2] On the concealed duct high static pressure type, high only displayed and no selection.
[Note 3] No function for concealed duct standard type, high static pressure type, floor standing cabinet type, floor standing concealed type, and slim duct type.
[Note 4] SHRM-e only except DI/SDI.
[Note 5]
- DN code 32 setting is necessary for remote controller sensor.
- Be careful that the surrounding air flow of the remote temperature sensor is not poor.
- When using 2 remote controllers, the Header controller is recognized as remote sensor through the temperature can be set from either Header or Follower remote controller.
- Do not use remote sensor in case of group control except DI/SDI.

[Note 6] Select the remote sensor switch on the controller.
[Note 7] Wireless type max 6 address setting. The address switch position on both receiver and controller shall be selected.
[Note 8] The actual functions depend on the air-conditioner.
[Note 9] Another 200 m for Indoor to Indoor wiring.
[Note 10] For settings, refer to the installation manual of RBC-AMSU51-ES/EN.

2-3 Application controls for remote controller

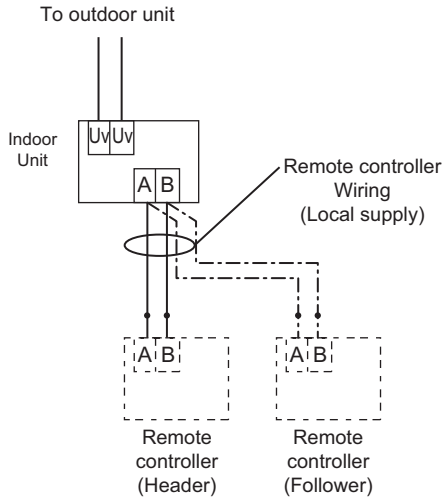
2-3-1 Applications for indoor remote controller

	Basic function	System diagram
1	**Individual control** (Air conditioner is individually operated at a distance.)	
2	**GROUP control** (One remote controller can control a group of up to a maximum of 16 indoor units. Operating on the same setting.)	**VRF example**  *The maximum number of indoor units used with the group control is 8 for the TCC-LINK connection and 16 for the TU2C-LINK connection.
3	**Two remote controller** (Air conditioner is controlled by two remote controllers in two locations.)	  Do not use the Header and Follower wireless remote at the same time; otherwise their IR signals will interfere with each other and you will not be able to control the unit properly.
4	**Control by schedule timer** (Schedule timer mode and Weekly timer mode)	

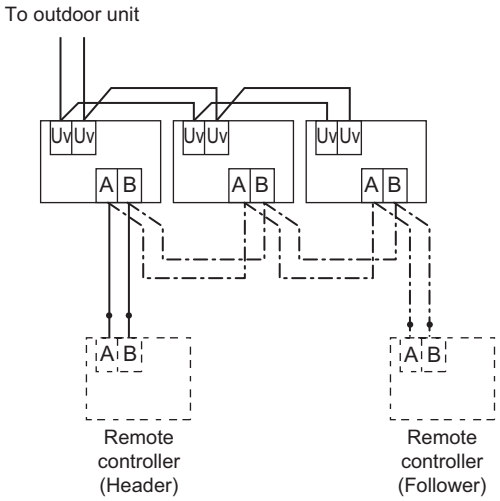
2-3-2 Two remote controllers

This control is for one or more indoor units that are controlled by two separate remote controllers.
(Max. two remote controllers can be connected.)

One indoor unit operated by two remote controllers



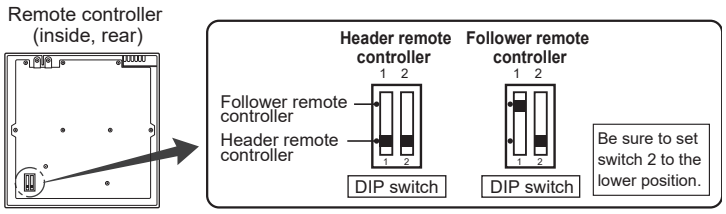
Group control operated by two remote controllers



(Setting method for Follower remote controller)

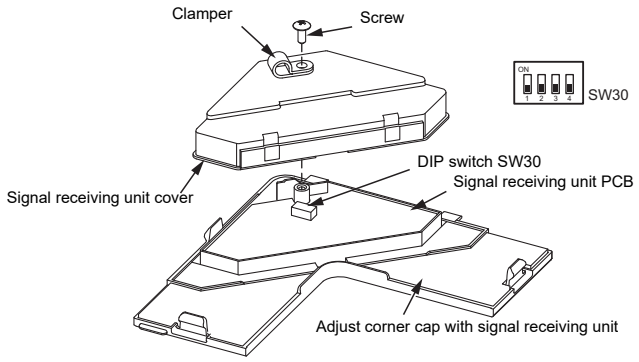
In case of wired remote controller (RBC-AMTU31-E, NRC-01HE)

Change the remote controller address connector on the side of the remote controller on the PCB.



In case of wireless remote controller RBC-U31PG(W)-E, RBC-U31PGS(W)-E

To use the wireless remote controller as a follower, set bit 4 (Follower side) of DIP switch SW30 on the signal receiving unit PCB to ON.



For details, refer to the installation manual of each controller.

(Operation)

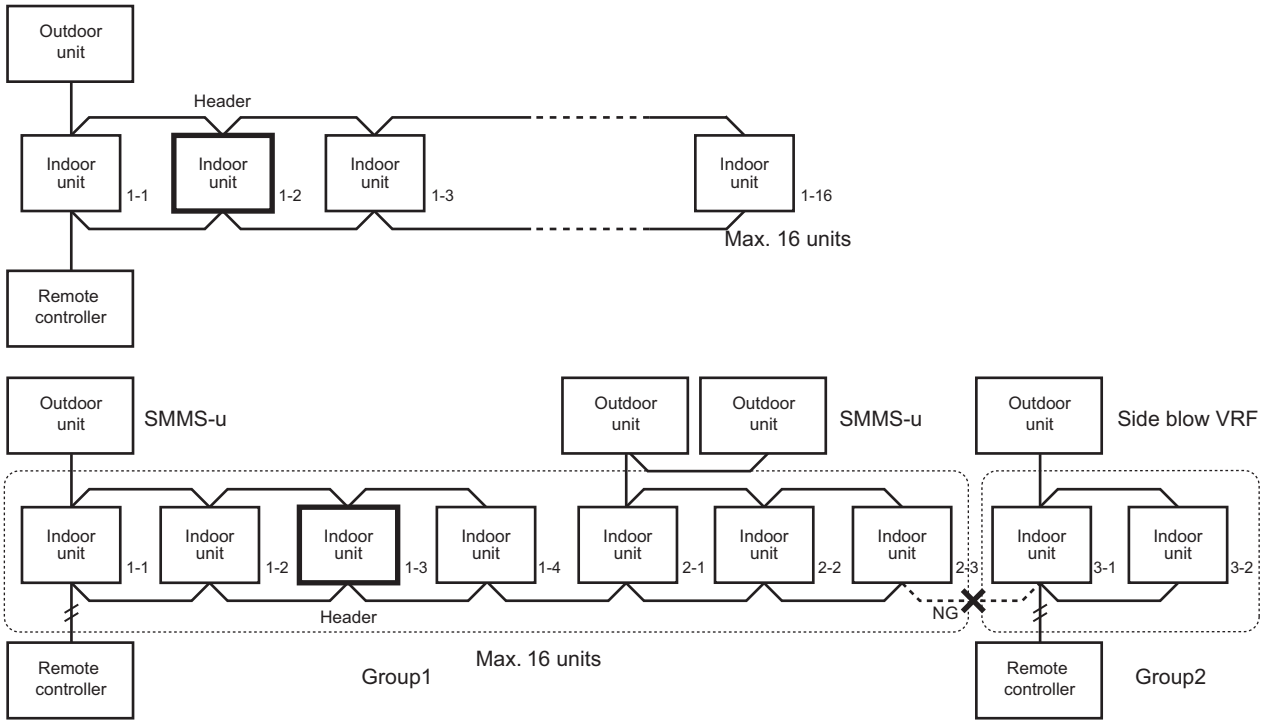
1) Operation items can be changed by “last push priority”.
2) In case of using a timer, connect the timer to either remote controller.

2-3-3 Group control

The maximum number of indoor units used with the group control is 8 for the TCC-LINK connection and 16 for the TU2C-LINK connection.

VRF example

System sample



In case of DI/SDI, each Header indoor unit connected with outdoor unit controls room temperature according to setting on the remote controller. The Header indoor unit in the group is the representative of multiple indoor units and sends/receives signals to/from the remote controller and other indoor units in the group.

[1]The number of indoor units and remote controls

1. Maximum amount of devices in a group:

Indoor unit: up to 8 units, remote control: up to 2 units (1 Header and 1 Follower unit), special remote sensor (TCB-TC41U-E):
1 unit (Remote controller must be one when the sensor is used.)

2. The number of indoor units recognized by the upper central management device when they are grouped:

You cannot regard the group number as that of the recognized indoor units even if they are controlled on a group basis. The number varies depending on type of the system:

- In a VRF system: total number of indoor units
- In a DI/SDI system: number of indoor units equipped with TCC-LINK adaptors. Normally one Header unit in a group
- In a system managed using central control addresses only*: number of indoor units which have a central control address regardless of whether the unit type is VRF or DI/SDI. Normally one Header unit in a group

[NOTE] Systems managed using 64/128 Central Control, ON/OFF Control, Modbus, LonWorks, etc.

[2]Remote location control (HA)

Both header and follower indoor units can respond by remote location control (HA) signals.
Master ON/OFF control can be conducted for all indoor units within the same group.

[NOTE] Don't input two or more HA signals to one group.

[3]Room temperature data

For collecting room temperature data for control purposes, you can choose the body TA sensor or a remote sensor. You can use the special sensor TCB-TC41U-E or the sensor built in to the remote controller. When you use group control, the sensor option varies as shown on the following table, depending on the system you use (VRF or DI/SDI).

Category	Group Control	Room temperature for control		
		Body TA sensor	TCB-TC41U-E	Sensor in Remote controller
VRF	Group	yes(each)	prohibited	prohibited
	Individual	yes(each)	yes(each)	yes(each)
DI/SDI	Group/Twin/Triple	yes(Header)	yes(Header)	yes(Header)
	Single	yes(each)	yes(each)	yes(each)
DN code=32 TA sensor selection setting		Body TA sensor	Body TA sensor [Note 1]	Remote controller sensor. [Note 2]

[Note 1] Switched automatically upon the detection of communication between an indoor unit and the remote sensor. Body TA sensor is used if the remote sensor is detached. Remote controller must be one. Able to use with another sensor at the same time if set to do so in the Header settings.

[Note 2] If two remote controllers are used, the sensor in the Header remote controller is selected by making the switch setting “Header” on the Header remote. However, if the sensor in the wireless remote controller is set as Header, cancelling the selection of the sensor in the remote controller on the wireless remote with its remote controller sensor switch changes the sensor to be used into the body TA sensor.
The sensor in the wireless remote controller is only used when the wireless remote controller operation has been activated with the Start/Stop button operation.

[4]Address setting

When performing automatic addressing of DI/SDI units, turn on all the indoor units of the group to be addressed. Addresses are not distributed to units which have not been turned on within 3 minutes from starting the automatic addressing.

After setting addresses, check the addresses of lines, indoor units and groups, and the central control addresses one by one regardless of the system type (VRF or DI/SDI). In particular, for groups on different refrigerant lines in a VRF system and groups in a DI/SDI system, confirm that each Header unit has a unique address and specify which indoor units are Header ones.

2-4 Wired remote controller for TU2C-LINK

RBC-ASCU11-E

Outline

Appearance	Application
	 Wired remote controller Wired remote controller (In case of control by 2 remote controller)

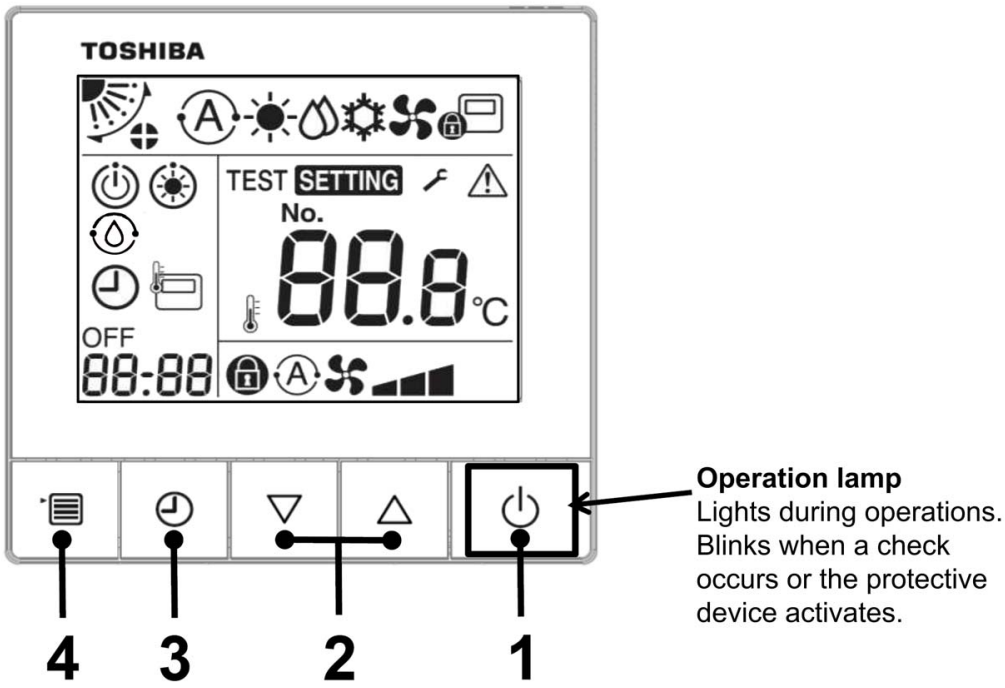
Specifications

Part name	Compact wired remote controller
Model Name	RBC-ASCU11-E
Power supply	No external power supply is required
Dimension	86 × 86 × 16 mm
Notes	This model cannot connect with Hot Water Module.

Main functions

Function	Operation	Monitoring
ON/OFF	✓	✓
Mode	Heat, Cool, Dry, Fan, Auto	✓
Setting Temperature	18 - 29 °C	✓
Fan Speed	Auto, Low, Low+, Med., Med.+, High	✓
Louver position	Swing, Fix	✓
Schedule Function	-	-
Multi language	-	-
Energy Save Function	-	-
Permit/Prohibit function	-	-
Filter sign	-	-
Error Display	Reset	Hexadecimal fault code
Dual automatic mode	-	-
Soft cooling	-	-
Air flow changing	-	-
Power Save mode	-	-
Individual louver setting	-	-
Frost protection setting	-	-
Filter sign	-	-
Control by 2 remote controllers	✓	-

Functions



1 ON/OFF button

Press the button to turn on the air conditioner, and press the button again to turn off the air conditioner.

2 Setting button

It is used for temperature setting in general conditions. In running mode, fan speed mode and wind direction mode, it is used for the change of respective settings.

3 Timer off button

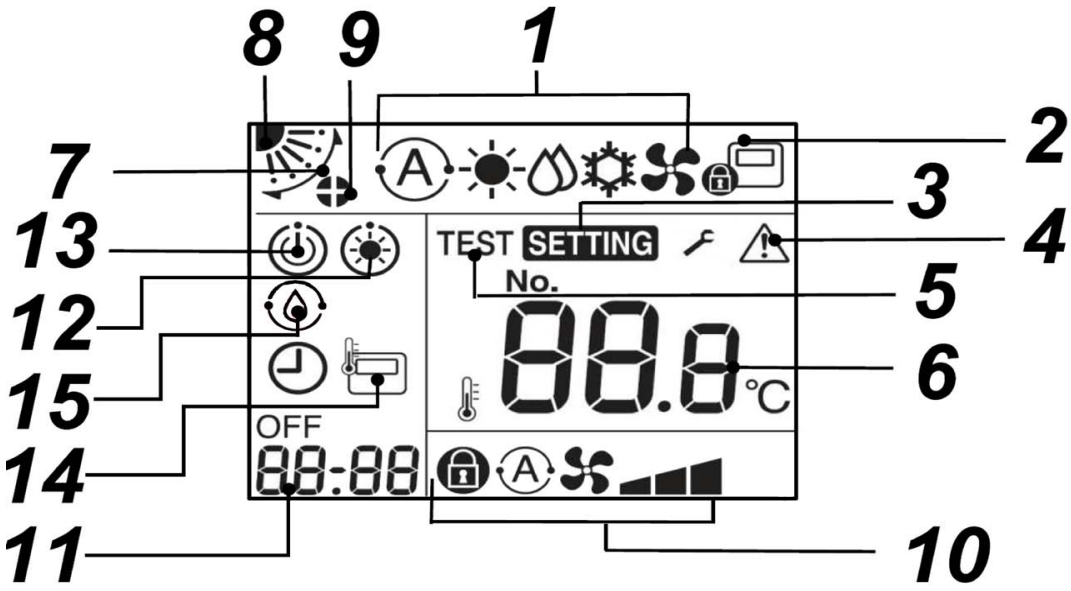
Set the timer off.

4 Menu button

It is used for the selection of the running mode, fan speed and wind direction.
Press of the button each time, then it will switch in the following order.

■ Indication icon

All the icons shown on the display are for illustrative purposes only. Cooling only model do not show heating-related icons. When “SETTING” flickers, the operation will not be accepted.



1 Running mode indication icon
Indicate the selected running mode.

2 Central control indication icon
It will be displayed when the air conditioner is centrally controlled and used by a central remote controller and other central control devices. If the central control prohibits using the remote controller, will flash when pressing the ON/OFF, mode or temperature button on the remote controller, indicating that these buttons do not work. (The settings that can be configured on the remote controller will vary depending on the central control mode. For details, please read the Owner's Manual of the central remote controller.)

3 Setting indication icon
Indicate that the system is checking automatically after the circuit breaker has been disconnected or other conditions have occurred.

4 Repair indication icon
Display when performing an inspection or the protective device is running.

5 Test run indication icon
Display during the test run period.

6 Temperature setting indication icon
Display the selected setting temperature.

7 Wind direction indication icon
Display when the louver moves up and down.

8 Louver position indication icon
Indicate the louver position.

9 Louver locking indication icon
Display when there is a louver locking device. (4-Way cassette type only)

10 Fan speed indication icon

- Indicate the selected fan speed. (Three-speed models)

- Indicate the selected fan speed. (Five-speed models)

11 Timer off indication icon

When an error occurs, display the error code. In normal state, display the time of timer off.

12 Preheating indication icon

Display when the heating mode or the defrosting cycle starts. When this indication icon is displayed, the indoor unit stops the air supply or runs in the fan mode.

13 Running standby indication icon

Indicate that if another indoor unit is under heating/cooling, Toshiba Super Smart multi-connection system cannot cool/heat; Moreover, the super heat recovery multi-connection system cannot heat or cool because the outside temperature exceeds the operating temperature range.

14 Remote controller sensor indication icon

Display when using the remote controller sensor.

15 Self-cleaning operation display

Display when the indoor unit heat exchanger is dehumidified by the self-cleaning operation.

Operation

When you use the air conditioner for the first time or change the settings, please follow the steps below.
From then on, press the On/Off button to run the air conditioner with the selected settings.

■ Standby

When “SETTING” flickers, the operation will not be accepted by system.

Requirements

- During use, keep the power switch in open state.
- When you use it again after a long time, please turn on the power switch at least 12 hours in advance.
- About 1 minute after the power is turned on, the remote controller can work. This is not a fault.

RBC-AMTU31-E

Outline

Appearance	Application
	 Wired remote controller Wired remote controller (In case of control by 2 remote controller)

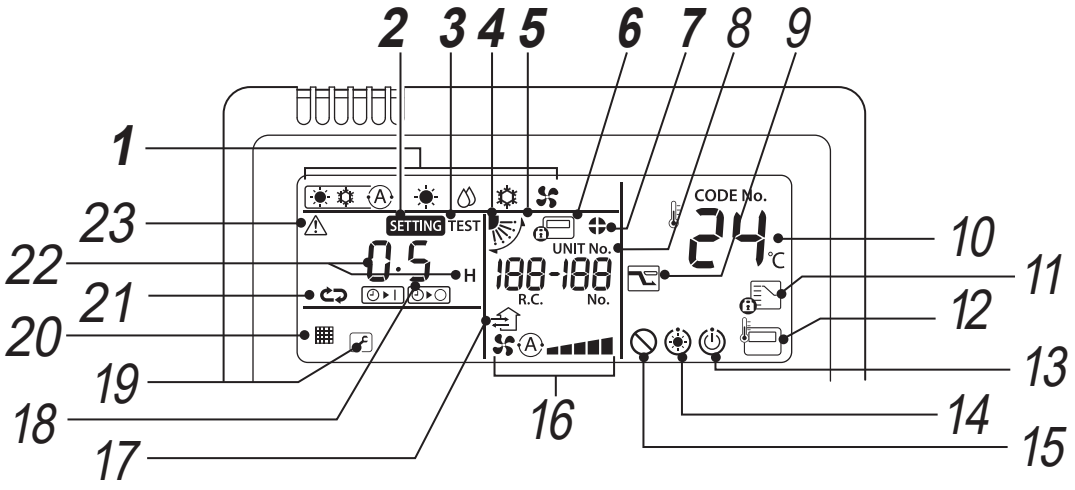
Specifications

Part name	Wired remote controller
Model Name	RBC-AMTU31-E
Power supply	No external power supply is required
Dimension	120 × 120 × 16 mm

Main functions

Function	Operation	Monitoring
ON/OFF	✓	✓
Mode	Heat, Cooling, Dry, Fan, Auto	✓
Setting Temperature	18 - 29 °C	✓
Fan Speed	Auto, Low, Medium, High	✓
Louver position	Swing, Fix	✓
Schedule Function	- (Scheduled timer required)	-
Multi language	-	-
Energy Save Function	✓	-
Permit/Prohibit function	-	-
Filter sign indicator	Reset	✓
Error Display	Reset	Hexadecimal fault code
Dual automatic mode	-	-
Soft cooling	-	-
Air flow changing	✓	✓
Power Save mode	✓	✓
Individual louver setting	✓	✓
Frost protection setting	✓	-
Filter sign flashes	✓	✓
Control by 2 remote controllers	✓	-

Functions



1 **Operation mode indicator**
Indicates the operation mode selected.

2 **SETTING indicator**
Displayed when setting the timer or other functions.

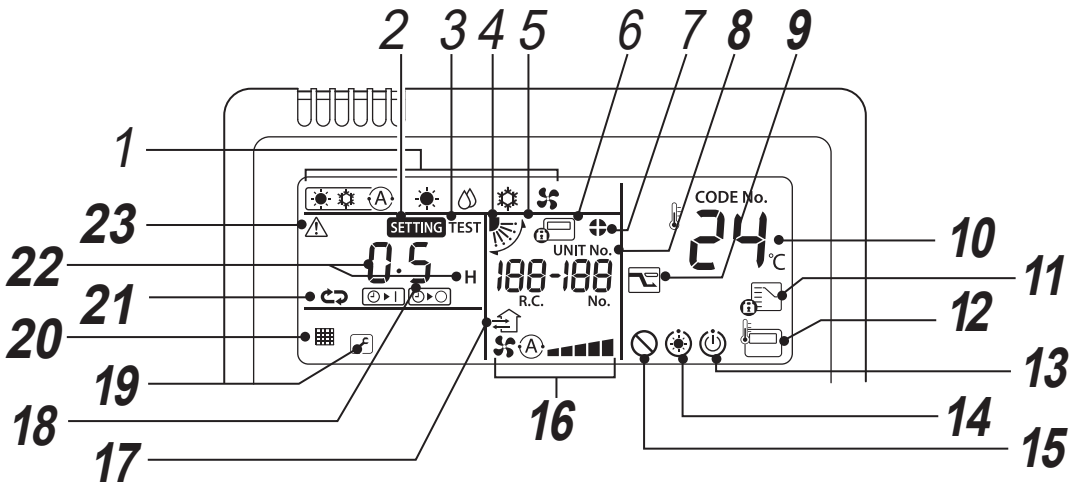
3 **TEST run indicator**
Displayed during test run.

4 **Louver position display**
Indicates the louver position.

5 **Swing indicator**
Displayed during up / down movement of the louver.

6 **Central control indicator**
Displayed when the air conditioner is controlled centrally and used with central control devices such as the central remote controller.
If the use of the remote controller is prohibited by the central control, blinks when the ON / OFF, MODE, or TEMP. button on the remote controller is pushed, and the buttons do not function.
(Settings that can be configured on the remote controller differ depending on the mode of the central control. For details, read the Owner's Manual of the central remote controller.)

7 **Louver lock indicator**
Displayed when a louver is locked.



8 **UNIT No. display**
Displays the number of the indoor unit selected. Also displays check code of indoor and outdoor units.

9 **Power saving mode display**
Limits compressor speed (capacity) to save energy.

10 **Set temperature display**
The selected set temperature is displayed.

11 **Operation mode controlled indicator**
Displayed when MODE button is pushed while operation mode is fixed to cool or heat by the air conditioner administrator.

12 **Remote controller sensor indicator**
Displayed when the remote controller sensor is used.

13 **Operation ready display**
This display appears on some types of unit.

14 **Pre-heat indicator**
Displayed when the heating mode is energized or defrost cycle is initiated.
While this indication is displayed, the indoor fan stops or operate in fan mode.

15 **No function indicator**
Displayed when the function requested is not available on that type of unit.

16 **Fan speed indicator**
Indicates the selected fan speed.

17 **Ventilation operation display**
This is displayed during the operation of a commercially available ventilation fan when it is connected.

18 **Louver Number display**
(example: [01], [02], [03], [04])

19 **Service display**
Displayed while the protective device works or a trouble occurs.
Notice code icon
This icon appears on the display when a notice code has occurred.
For details, contact your dealer (distributor).

20 **Filter indicator**
Reminder to clean the filter.

21 **Timer mode indicator**
Displays the timer mode.

22 **Time display**
Indicates time concerning the timer.
(Indicates an check code when an abnormality occurs)

23 **Check indicator**
Displayed when the protective device activates or an abnormality occurs.

RBC-AMSU51-ES/EN

Outline

Appearance	Application
	   Wired remote controller　Another wired remote controller as follower (Including Wired remote controller)

Specifications

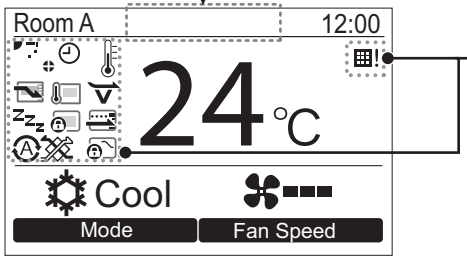
Part name	Wired remote controller
Model Name	RBC-AMSU51-ES/EN
Power supply	No external power supply is required
Dimension	120 × 120 × 20 mm
Multilingual language	-EN　English, Italian, Polish, Greece, Russian, Turkish -ES　English, Spanish, Portuguese, French, Dutch, German

Main functions

Function	Operation	Monitoring
ON/OFF	✓	✓
Mode	Heat, Cooling, Dry, Fan, Auto	✓
Setting Temperature	18 - 29 °C	✓
Fan Speed	Auto, Low, Medium, High	✓
Louver position	Swing, Fix	✓
Schedule Function	8 programs per day, Holiday setting	✓
Multi language	✓ (11 languages) -EN:English, Italian, Polish, Greece, Russian, Turkish -ES :English, Spanish, Portuguese, French, Dutch, German	✓
Energy Save Function	✓	-
Permit/Prohibit function	-	-
Filter dirty indicator	Reset	✓
Error Display	Reset	Hexadecimal fault code
Dual automatic mode	✓	-
Soft cooling	✓	-
Air flow changing	✓	✓
Power Save mode	✓	✓
Individual louver setting	✓	✓
Frost protection setting	✓	-
Filter sign flashes	✓	✓
Control by 2 remote controllers	✓	-
Night operation mode	✓	-
Key Lock	✓	-
Saving operation	expand function for LC model	-
Return back	Setting range 10 to 120 min	-

Functions

Detailed display mode



(*1)

Icons appear on the screen when the detailed display mode is selected.

*1 • The "❋ Preparing to heat" icon appears when the heating operation starts or when defrosting operation.
The indoor fan stops or the operation becomes the blowing operation when it is displayed.
• It may be displayed depending on the model when "⏻ Preparing to operate" is displayed.

▼Icon list

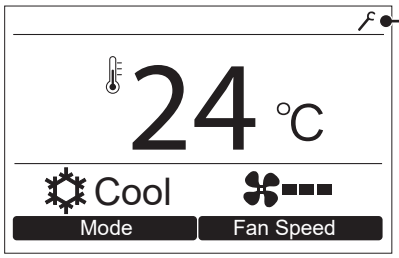
	Shows the Energy saving operation is activated.		Shows a timer function is activated.
	Shows the remote sensor is activated. (*2)		Shows the Louver lock is activated.
	Shows the Night operation is activated.		Shows the setting of the louver.
	Shows the central control device prohibits the use of the remote controller		Shows the filter needs to be cleaned.
	Shows the saving operation is activated.		Shows soft cooling is activated.
			Shows operation switching control is in progress.

*2 Normally the temperature sensor of the indoor unit senses the temperature. The temperature around the remote control can also be sensed. For details, contact the dealer where you purchased the air conditioner. * Do not use the function when the air conditioner is controlled in a group.

▼Ventilation icon list

- Ventilation icons appear on the display only when a ventilation unit is connected.
- Refer to the Owner's Manual supplied with the Air to Air Heat Exchanger for details about the ventilation icons.

	Automatic mode		24-hour ventilation mode
	Bypass mode		Nighttime heat purge mode
	Total heat exchange mode		



Notice code icon

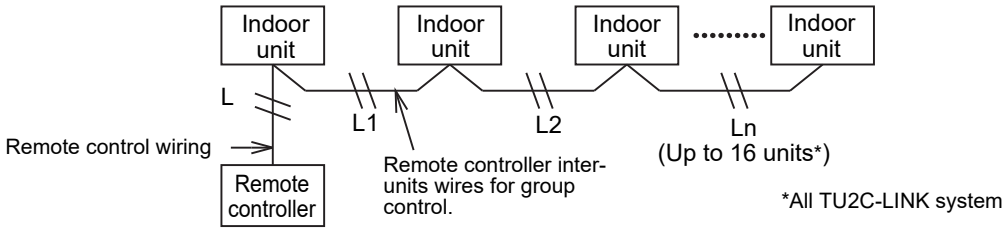
- This icon appears on the display when a notice code has occurred.
For details, contact your dealer (distributor).

◆Remote control wiring and inter-unit wiring between indoor units

Do not allow the wire for the remote controller (communication wire) and the wire for AC220-240 V to come into contact or put them together in one electrical conduit; otherwise, the control system may have trouble due to noise.

* Varies depending on the type of remote controller used.

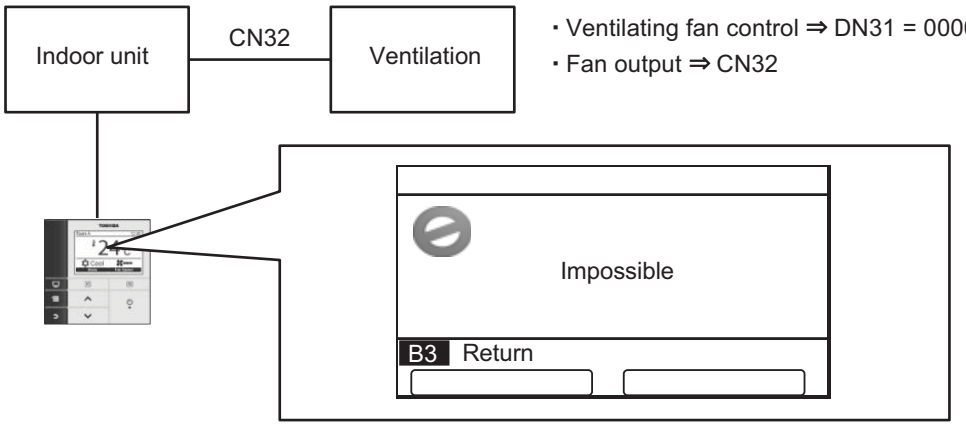
Wiring type	VCTF: 0.5 mm^2 to 2.0 mm^2 x 2		
Total length of remote control wiring and inter-wiring between indoor units (L+L1+L2+...Ln)	1 remote controller	2 remote controllers	2 remote controllers including a wireless remote controller
	Up to 500 m	Up to 300 m	Up to 400 m
Total length of inter-wiring between indoor units (L1+L2+...Ln)	Up to 200 m		



Ventilation pattern

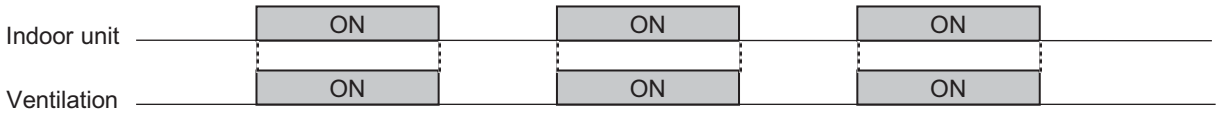
Item	Setting	Contents
Ventilating fan control	DN31	0000: Unavailable, 0001: Available
Fan output	CN32, Group	Connected to indoor unit

◆ Pattern 1

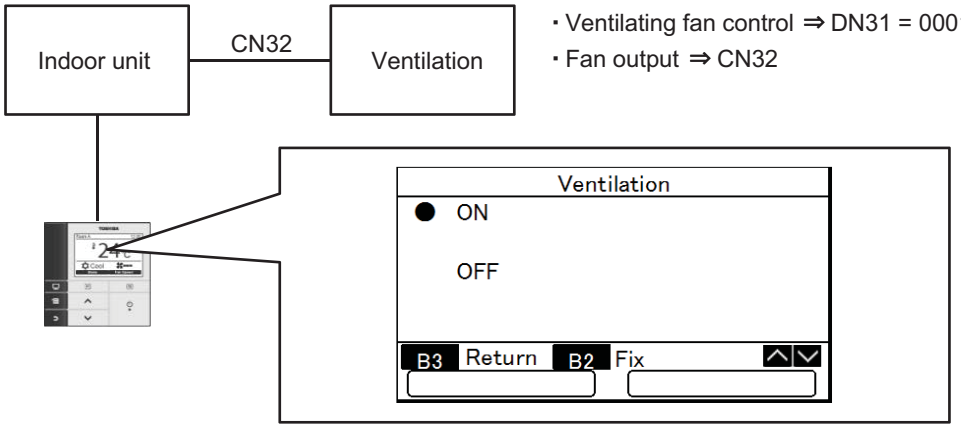


Menu item	Contents
1. ON/OFF	Unavailable
2. Fan speed	Unavailable
3. Mode	Unavailable
4. 24H ventilation off	Unavailable

Action

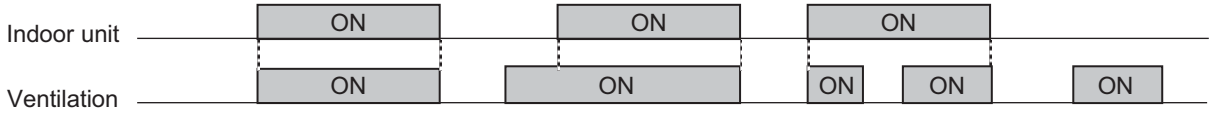


◆ Pattern 2

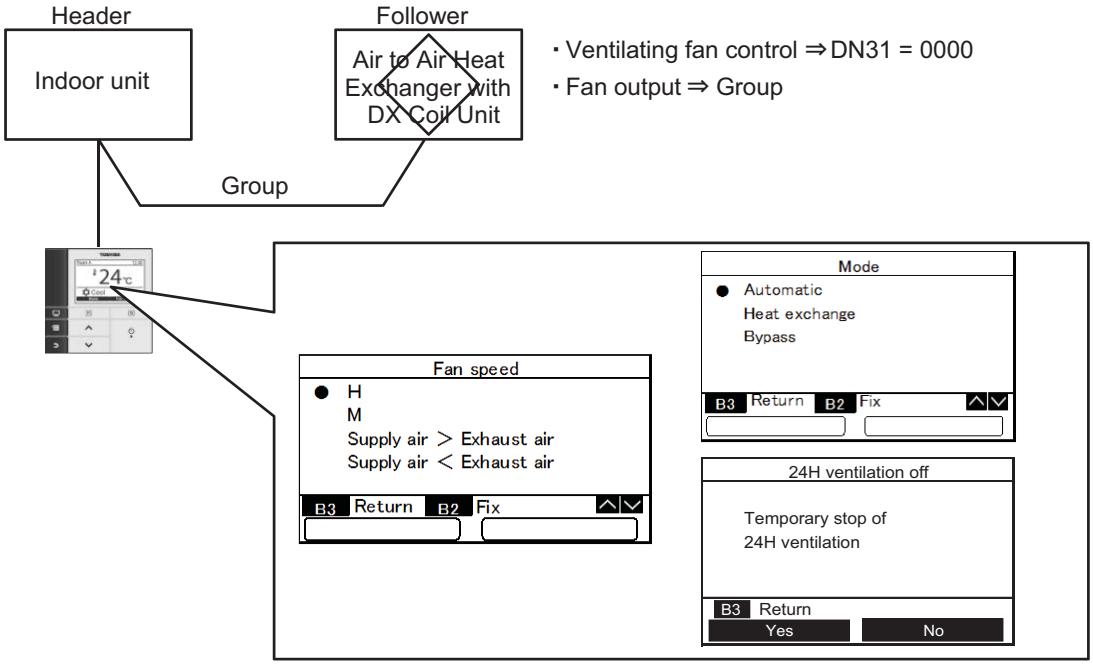


Menu item	Contents
1. ON/OFF	available
2. Fan speed	Unavailable
3. Mode	Unavailable
4. 24H ventilation off	Unavailable

Action

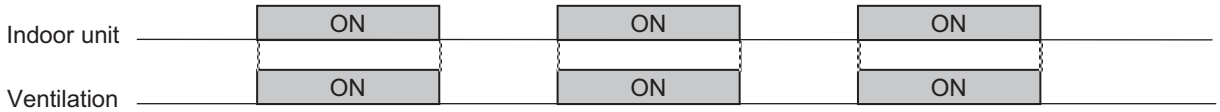


◆ Pattern 3



Menu item	Contents
1. ON/OFF	Unavailable
2. Fan speed	available
3. Mode	available
4. 24H ventilation off	available

Action



2-5 Wireless remote controller kit

The wireless controller is available with a series of receiver unit designs.
These receivers are specially designed to fit into different Indoor Unit models to provide a high standard of finish.
The wireless controller features an easy to use and compact button layout, standard control buttons immediately available and display screen to show all the main operating parameters.

Outline

Appearance		Application
Handset	Receiver	
	 RBC-AXU41U-E RBC-AXU31U-E	 
	 RBC-AXU31UW-E	
	 RBC-AXU31C-E	
	 RBC-AXU31-E	

Specifications

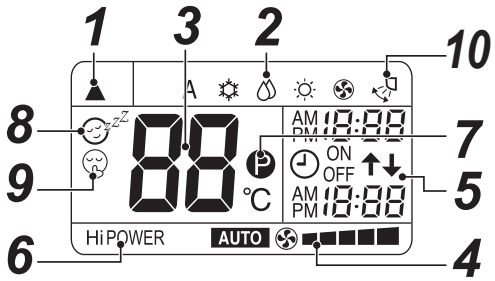
Part name	Wireless remote controller kit	
Model Name	RBC-AXU31U-E	For 4-way cassette
	RBC-AXU41U-E	For 4-way smart cassette (MMU-UP_H-E)
	RBC-AXU31UW-E	For 2-way cassette
	RBC-AXU31C-E	For Ceiling, 1-way cassette (SH)
	RBC-AXU31-E	For All other units
Power supply	No external power supply is required	

Main functions

Function	Operation	Monitoring
ON/OFF	✓	✓
Mode	Heat, Cooling, Dry, Fan, Auto	✓
Setting Temperature	17 - 30 °C	✓
Fan Speed	Auto, Low, Medium, High	✓
Louver position	Swing, Fix	✓
Schedule Function	-	-
Multi language	-	-
Energy Save Function	-	-
Permit/Prohibit function	-	-
Filter dirty indicator	Reset	-
Error Display	Reset	LED on receiver unit
Dual automatic mode	-	-
Soft cooling	-	-
Air flow changing	-	-
Power Save mode	-	-
Individual louver setting	-	-
Frost protection setting	-	-
Filter sign flashes	-	-
Control by 2 remote controllers	-	-

Parts Name of Remote Controller (Display section)

▼WH-TA09NE (RBC-AXU31U-E, RBC-AXU41U-E, RBC-AXU31UW-E, RBC-AXU31C-E, RBC-AXU31-E)



• In the illustration, all indications are indicated for explanation.
During operation, only the relevant indications will be indicated on the remote controller.

1 Transmission mark

This transmission mark (▲) indicates when the remote controller transmits signals to the indoor unit.

2 Mode display

Indicates the current operation mode.
(A : Auto changeover control, ☼ : Cool, 💧 : Dry, ☼ : Heat, 🌀 : Fan only)

3 Temperature display

Indicates the temperature setting (17 °C to 30 °C).
When you set the operating mode to 🌀 : Fan only, no temperature setting is indicated.

4 FAN speed display

Indicates the selected fan speed. AUTO or one of five fan speed levels (LOW ▂ , LOW^{+} ▂▂ , MED ▂▂▂ , MED^{+} ▂▂▂▂ , HIGH ▂▂▂▂▂) can be indicated.
Indicates AUTO when the operating mode is 💧 : Dry.
* Five patterns are displayed. but the actual fan speed varies depending on the indoor unit type.

5 TIMER and clock time display

The time set for timer operation or clock time is indicated.
The present time is always indicated except for TIMER operation.

6 Hi POWER display

Indicates when the high power operation starts.
Push the Hi-POWER button to start and push it again to stop the operation.

7 Ⓟ (PRESET) display

Indicated when memorizing the preferred operation mode or when it has been memorized.
Also, this icon is indicated when the memorized preferred operation is displayed.

8 (COMFORT SLEEP) display

Indicated during the OFF timer operation that automatically adjusts the room temperature and the fan speed. Each time you push the COMFORT SLEEP button, the display changes in the sequence of 1h, 3h, 5h, and 9h.

9 (QUIET) display

Indicated during the quiet operation.

10 Swing display

Indicated during the swinging operation where the horizontal louver automatically moves up and down.

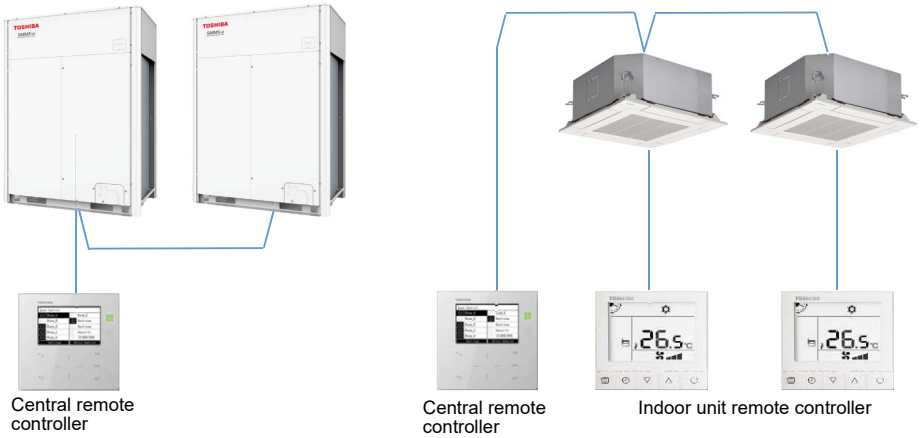
NOTE

When both wired remote controller or central controller and wireless remote controller are used, display on the screen of wireless remote controller may differ from the actual operation in some cases.

2-6 Central remote controller For TU2C-LINK

Compatible with TU2C-LINK and upper exchange of current model.
Maximum connectable indoor units: 64 indoor units

Outline

Appearance	Application
	

Specifications

Part name		Central remote controller
Model Name		TCB-SC640U-E
Power supply		220-240 V AC 50/60 Hz
Dimension		120 × 120 × 20 (+50.6) mm
Max number per one controller	Indoor unit	64
External contact inputs		3
External contact output		2
Indoor view classification		10 zone, up to a total 64 units

Main functions

Function		Operation	Monitoring
ON/OFF		✓	✓
Mode		✓	✓
Setting Temperature		✓	✓
Fan Speed		Auto, Low, Medium, High	✓
Louver position		Swing, Fix	✓
Schedule Function		Scheduled timer required	-
Multi language		-	-
Energy Save Function		✓	-
Permit/Prohibit function		-	-
Filter dirty indicator		-	-
Error Display		Reset	Hexadecimal fault code
Dual automatic mode		-	-
Soft cooling		-	-
Air flow changing		-	-
Power Save mode		-	-
Individual louver setting		✓	✓
Frost protection setting		-	-
Filter sign flashes		✓	✓
Control by 2 remote controllers		-	-
Swing / Direction		✓	✓
Central / Individual (Operation prohibited)		✓	✓
Digital input / output	Alarm output	✓	-
	Run output	✓	-
	All stop input	✓	-
	All start input	✓	-
Ventilation		✓	✓
Connectable Central control devices	Up to 2 devices (Header/Follower) In case of "zone fix mode", Up to 5 units (Header, zone 1, 2, 3, 4)		

3

Advanced central control

3-1 Line up & function

Type		Touch Screen Controller	Smart BMS manager	Smart BMS manager with data analyzer	Touch Screen Controller
System		**TU2C-LINK**	**TCC-LINK**	**TCC-LINK**	**TCC-LINK**
Model name		**BMS-CT2560U-E**	**BMS-SM1280HTLE**	**BMS-SM1281ETLE**	**BMS-CT5121E**
Appearance					
Max number per one controller	Indoor unit	256	128	128	512
	TU2C-LINK / TCC-LINK bus	2	2	2	Using relay interface
	Energy monitoring interface	4	4	4	8
	Digital Input / Output interface	4	4	4	8
Indoor view classification			(4 zone,16 groups/zone)	(4 zone,16 groups/zone)	
			(64 zone, 64 groups/zone)	(64 zone, 64 groups/zone)	
Start / Stop, Mode, Setting Temperature, Fan Speed		✓	✓	✓	✓
Filter dirty indicator, Error Display		✓	✓	✓	✓
Permit/Prohibit function		✓	✓	✓	✓
Schedule Timer Connection		-	✓	-	-
Schedule function		✓	✓	✓	✓
WEB Connection		-	✓	✓	-
Option interface connection		✓	✓ (*1)	✓ (*1)	✓ (*1)
Energy Monitoring		✓	✓ (*2)	✓ (*2)	✓ (*2)
Multi Language		-	✓	✓	-
Demand Function		-	✓	✓	-
Error information transfer function by E-mail		-	-	✓	-

(*1) Digital I/O Relay interface only.
(*2) Energy Monitoring interface needed.

3-2 Central remote controller comparison table

Advanced central control									
System		**TU2C-LINK**		**TCC-LINK**		**TCC-LINK**		**TCC-LINK**	
Type		**Touch screen controller system**		**Smart BMS manager**		**Smart BMS manager with data analyzer**		**Touch screen controller system**	
Model Name		**BMS-CT2560U-E**		**BMS-SM1280HTLE**		**BMS-SM1281ETLE**		**BMS-CT5121E**	
Power supply		220 - 240 VAC* 50/60 Hz		220 - 240 VAC 50/60 Hz		220 - 240 VAC 50/60 Hz		220 - 240 VAC 50/60 Hz	
Dimension	Central Controller	136 × 205 × 10(+80) mm (Embedded dimensions shown in parenthesis)		120 × 180 × 64 mm		120 × 180 × 64 mm		323 × 256 × 49 mm	
	Power Unit			114 × 177 × 50 mm		114 × 177 × 50 mm			
Display		✓ (12.1 inch / Capacitance touch panel method)		✓ (B/W 157 × 42 mm)		✓ (B/W 157 × 42 mm)		✓ (12.1 inch / Capacitance touch panel method)	
Max number per one controller [Note1] [Note2]	Indoor unit	256		128		128		512	
	TCC-LINK	-		2		2		12	
	TU2C-LINK	2		-		-		-	
	Relay I/F	-		-		-		12	
	Energy monitoring I/F	4		4		4		8	
	Digital Input / Output I/F	4		4		4		8	
Communication port	TCC-LINK / TU2C-LINK	2		2		2		- (RS485 via Relay I/F)	
	RS485	Energy monitoring I/F: 4 Digital Input / Output I/F: 4		Energy monitoring I/F: 4 Digital Input / Output I/F: 4		Energy monitoring I/F: 4 Digital Input / Output I/F: 4		Relay I/F: 12 Energy monitoring I/F: 8 Digital Input / Output I/F: 8	
	Ethernet	✓ (Web access / Monthly report PC / Data analyzer)		✓ (Web access / Monthly report PC)		✓ (Web access / Monthly report PC / Data analyzer)		✓ (Web access / Monthly report PC / Data analyzer)	
Indoor view classification		Floor / Tenant / area / group unit		(4 zone, 16 groups/zone)*2 (64 zone, 64groups/zone)*2		(4 zone, 16 groups/zone)*2 (64 zone, 64groups/zone)*2		Floor / Tenant / area / group unit	
Unit / Browser operation		Unit	Browser	Unit	Browser	Unit	Browser	Unit	Browser
Monitoring [Note3]	ON / OFF	✓	✓	✓	✓	✓	✓	✓	✓
	Operation mode	✓	✓	✓	✓	✓	✓	✓	✓
	Set temperature	✓	✓	✓	✓	✓	✓	✓	✓
	Air speed	✓	✓	✓	✓	✓	✓	✓	✓
	Swing / Direction	✓	✓	✓	✓	✓	✓	✓	✓
	Filter sign	✓	✓	✓	✓	✓	✓	✓	✓
	Child lock (Unit operation prohibited)	-	-	✓	-	✓	-	-	-
	Power saving mode	✓	✓	✓	-	✓	-	✓	✓
	Return back	✓	✓	✓	✓	✓	✓	✓	✓
	Central control	✓	✓	✓	-	✓	-	✓	✓
	Room temperature	✓	✓	-	✓	-	✓	✓	✓
	Ventilation	✓	✓	✓	-	✓	-	✓	✓

Operation [Note3]	ON / OFF	✓	✓	✓	✓	✓	✓	✓	✓
	Operation mode setting	✓	✓	✓	✓	✓	✓	✓	✓
	Temperature setting	✓	✓	✓	✓	✓	✓	✓	✓
	Air speed setting	✓	✓	✓	✓	✓	✓	✓	✓
	Swing / Direction	✓	✓	✓	✓	✓	✓	✓	✓
	Filter sign reset	✓	✓	✓	✓	✓	✓	✓	✓
	Child lock (Unit operation prohibited)	✓	-	✓	-	✓	-	✓	-
	Power saving mode (Compatible models only)	✓	✓	✓	-	✓	-	✓	✓
	Return back	✓	✓	✓	✓	✓	✓	✓	✓
	Central / Individual (Operation prohibited)	✓	✓	✓	✓	✓	✓	✓	✓
	Ventilation	✓	✓	✓	-	✓	-	✓	✓
Alarm display	Unit No.	✓	✓	✓	✓	✓	✓	✓	✓
	Occurrence time	✓	✓	-	✓	-	✓	✓	✓
	Alarm code	✓	✓	✓	✓	✓	✓	✓	✓
	Alarm content	✓	✓	-	✓	-	✓	✓	✓
	Alarm history	✓	✓	-	✓	-	✓	✓	✓
Schedule Function	Master	✓ (32 patterns)	✓ (32 patterns)	-	✓ (32 patterns)	-	✓ (32 patterns)	✓ (32 patterns)	✓ (32 patterns)
	Operation execute	✓	✓	-	✓	-	✓	✓	✓
	Special day	✓	✓	-	✓	-	✓	✓	✓
	Daily	✓ (10 operations)	✓ (10 operations)	-	✓ (10 operations)	-	✓ (10 operations)	✓ (10 operations)	✓ (10 operations)
	Weekly	✓ (32 patterns)	✓ (32 patterns)	-	✓ (32 patterns)	-	✓ (32 patterns)	✓ (32 patterns)	✓ (32 patterns)
	Monthly	✓	✓	-	✓	-	✓	✓	✓
	Billing	✓	✓	-	✓	-	✓	✓	✓
Alarm e-mail		✓	-	-	-	-	✓	✓	-
Multilingual language		✓ (14 languages)	✓ (14 languages)	-	✓ (6 languages)	-	✓ (13 languages)	✓ (14 languages)	✓ (14 languages)
Data analyzer		-	✓	-	-	-	✓	-	✓
Digital input / output	Alarm output	✓	-	✓	-	✓	-	✓	-
	Run output	-	-	✓	-	✓	-	-	-
	All stop input	-	-	✓	-	✓	-	-	-
	All start input	-	-	✓	-	✓	-	-	-
	Fire alarm input	✓	-	✓	-	✓	-	✓	-

[Note 1] Restriction by TU2C-LINK or TCC-LINK specification:
1. TU2C-LINK: Max 256 indoors, max
   TCC-LINK: Max 64 indoors, max 16 × 1 header outdoor with max 3 followers per 1 TCC-LINK main bus, Max 48 indoors per 1 VRF refrigerant system.
2. Number of indoor followers shall be counted for VRF, however in case of DI/SDI, number of TCC-LINK adaptor shall be counted.
3. Confirm that max 16 refrigerant systems per 1 main bus for VRF, max 64 refrigerant systems per 1 main bus for only DI/SDI, max 64 total refrigerant systems and max 16 VRF refrigerant systems per 1 main bus for mixed VRF/DI/SDI.

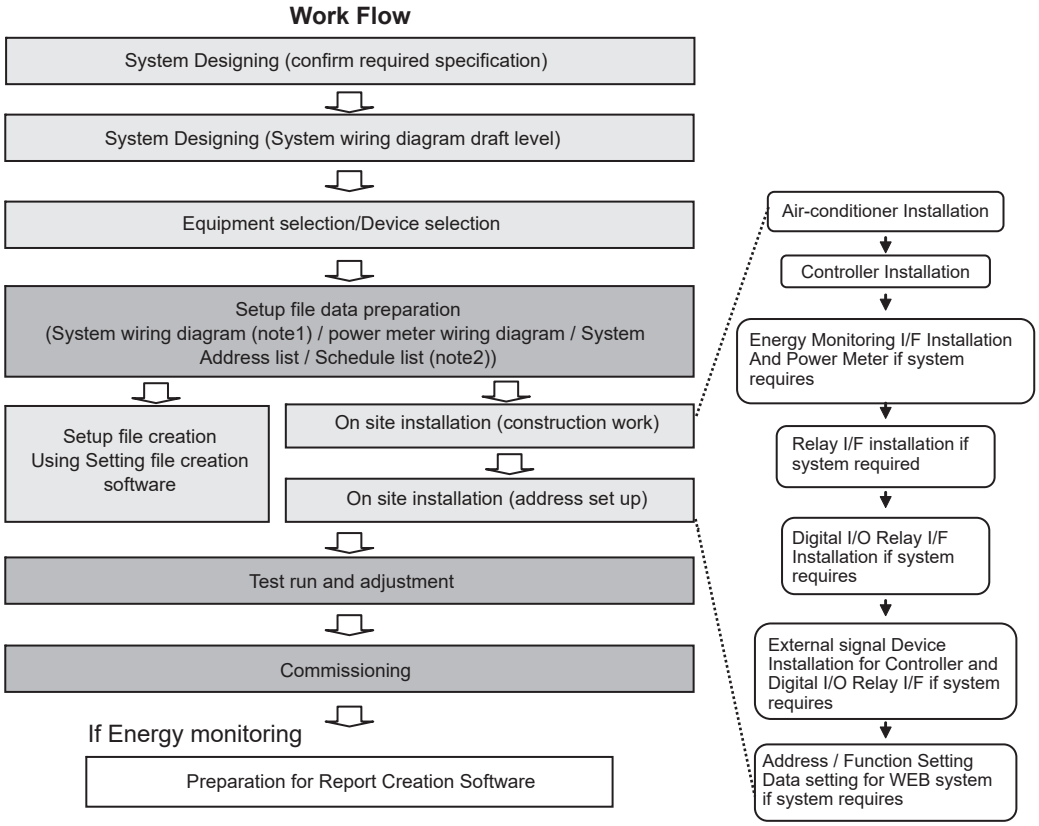
[Note 2] Restriction by Relay Interface specification:
1. Only 1 Relay I/F is connected to 1 TCC-LINK main bus.
2. One Relay Interface covers, Max 64 indoors under the condition of Note1 no2, max 16 refrigerant systems for VRF, max 64 refrigerant systems for only DI/SDI.

[Note 3] Actual functions depend on each air conditioner.

[*] Power cord for 220-240 V power adapter is to be arranged on site.

3-3 Work flow

The BMS work flow (Touch screen/Smart BMS Manager) is shown below.
Documents to be referred to are prepared for each series or product.



Note1)
System wiring diagram
* All air-conditioners (FCU/CDU/controller) layout
* All system devices layout (include local equipment)
* Control Wiring diagram
* Refrigerant system piping information diagram

Note2)
System address list (see below table)
* All air-conditioners address information (line address, indoor unit address, group address, central control address)
* All system devices address information
* Control *classification for connection
* Model name

Building Name	Toshiba Building	IP Address	192.168.2.100

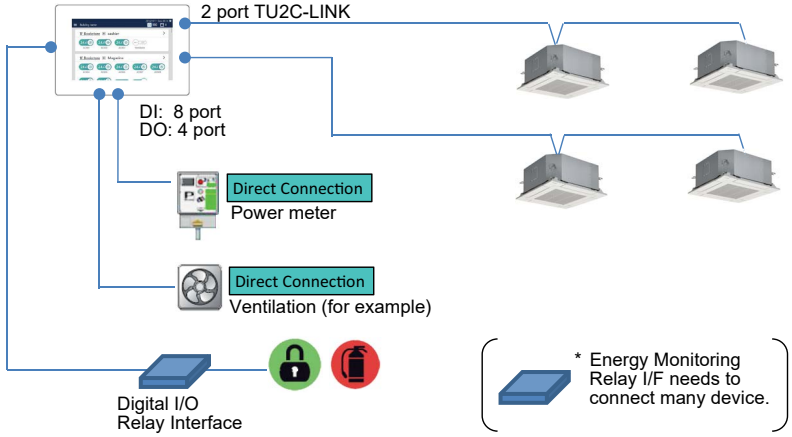
No	Air Conditioner List			Address Information						Display Name				Energy I/F Data	Digital I/F Data	
	Outdoor Refrigerant System	Outdoor unit Model Name	Indoor Unit Model Name	TCC-LINK Line No	Line Address	Indoor Unit Address	Group Address	Group Relation	Central Control Address	Floor Name	Tenant Name	Area Name	R.C. Unit/Group	Power Meter Address - Channel	Key Input Address - Channel	Fire Alarm Address - Channel
1	SYS-1	MMY-AP1401HT8	MMU-AP0181H	1	1	1	0	0	1	1F	TenantA	ShopA	RC-1	1-1	1-1	2-8
2			MMU-AP0091H			2	1	0	2				RC-2	1-1	1-2	2-8
3			MMU-AP0181H			3	2	2	2					1-1		2-8
4			MMU-AP0091H			4	2	2	2					1-1		2-8
5			MMK-AP0091H			5	0	0	3		TenantB	ShopB	RC-3	1-1	1-3	2-8
6			MMK-AP0181H			6	0	0	4			ShopC	RC-4	1-1	1-4	2-8
7			MMK-AP0181H			7	0	0	5			ShopD	RC-5	1-1	1-5	2-8
8			MMK-AP0181H			8	0	0	6				RC-6	1-1	1-6	2-8
9	SYS-2	MMY-AP0801HT8	MMU-AP0181H		2	1	1	0	7	2F	TenantC	ShopE	RC-7	1-2	1-7	2-8
10			MMU-AP0181H			2	2	9	7					1-2		2-8
11			MMK-AP0181H			3	1	0	8			ShopF	RC-8	1-2	1-8	2-8
12			MMK-AP0181H			4	2	11	8					1-2		2-8
13	SYS-3	MMY-AP1001HT8	MMU-AP0181H	2	1	1	0	0	9	3F	Office	CEO	RC-9	1-3	2-1	2-8
14			MMU-AP0181H			2	0	0	10				RC-10	1-3	2-2	2-8
15			MMK-AP0181H			3	0	0	11			Development	RC-11	1-3	2-3	2-8
16			MMK-AP0181H			4	1	0	12				RC-12	1-3	2-4	2-8
17			MMU-AP0181H			5	2	16	12					1-3	2-4	2-8
18			MMU-AP0181H			6	2	16	12					1-3	2-4	2-8
19			MMU-AP0181H			7	0	0	13				RC-13	1-3	2-5	2-8
20			MMU-AP0181H			8	0	0	14					1-3	2-6	2-8

Air conditioner list | Air conditioner address list | Display name Management category | Remote control | I/F Address Information

3-4 Touch Screen Controller for TU2C-LINK

The BMS-CT2560U-E Touch screen controller can be connected to up to 256 Indoor Units via the TU2C-LINK Central Control network.

Outline

Appearance	Application
	

Specifications

Part name		Touch Screen Controller
Model Name		BMS-CT2560U-E
Power supply		220-240 VAC* 50/60 Hz
Dimension		136 × 205 × 10(+80) mm
Max number	Indoor unit	256
per one controller	TU2C-LINK bus	2
Indoor view classification		4 zone, 16 groups/zone
Relay interface		4
Energy monitoring interface		4
Notes		There is some limit on function when connect Hot Water Module with Touch screen controller. Please contact us if you like detailed information.
Documents		Installation manual
		Owner's manual

* Power cord for 220-240 V power adapter is to be arranged on site.

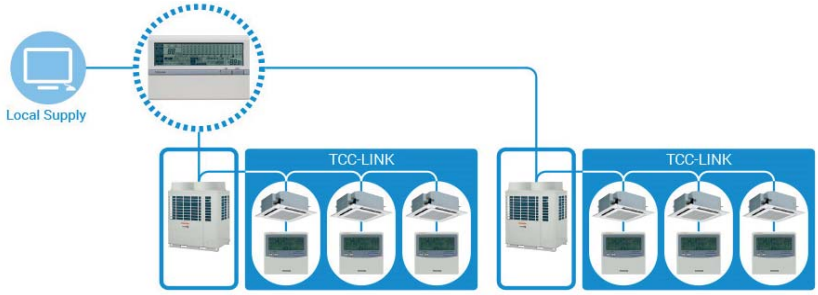
Main functions

Function		Operation	Monitoring
ON/OFF		✓	✓
Mode		✓	✓
Setting Temperature		✓	✓
Fan Speed		Auto, 5speed (MAX)	✓
Louver position		5tap (MAX)	✓
Schedule Function	Weekly	✓	✓
	Special Day	-	-
Multi language		✓	✓
Energy Save Function		✓	✓
Permit/Prohibit function		✓	✓
Filter sign		Clear	✓
Error Display		Reset	Hexadecimal fault code and Description
Dual automatic mode		✓	✓
Soft cooling		✓	✓
Power Save mode		✓	✓
Individual louver setting		-	-
Frost protection setting		-	-
Control by 2 remote controllers		✓	✓
Digital input / output	Alarm output	✓	-
	Run output	✓	-
	All stop input	✓	-
	All start input	✓	-
	ON/OFF	✓ (output)	✓ (input)
	Alarm	✓ (output)	✓ (input)
Ventilation		✓	✓
Connectable Central Control devices	Up to 2 devices (Header/Follower) In case of "zone fix mode", Up to 5 units (Header, zone 1, 2, 3, 4)		

3-5 Smart BMS Manager for TCC-LINK

The Smart BMS Manager has the same hardware Control Function as the BMS-CM1280TLE Controller, but also has the ability of control from a Local Area Network and, with the use of an additional Interface, is capable of Energy Monitoring and Report Creation Functions.
This controller is ideal where advanced control, Energy Monitoring, advanced scheduling or access to individual Air Conditioners is required from networked computer systems.
Same Hardware control features as the BMS-CM1280TLE Controller.
Can be connected to a single PC or LAN to allow advanced control functions from a Multi-Language Web Browser Display Screen.*
Energy Monitoring and report creation functions available.
Advanced operation & master schedules can be set on a calendar.
Additional Digital I/O Device Available.
Thin profile controller and separate power supply unit enables easy installation.

Outline

Appearance	Application
	

Specifications

Part name		Smart BMS Manager
Model Name		BMS-SM1280HTLE
Power supply		220 - 240 VAC 50/60 Hz
Dimension	Central Controller	120 × 180 × 64 mm
	Power Unit	114 × 177 × 50 mm
Max. number per one controller	Indoor unit	128
	TCC-LINK bus	2
	Energy monitoring interface	4
	Digital Input / Output interface	4
Indoor view classification		(4 zone,16 groups/zone)
		(64 zone, 64 groups/zone)
Documents		Installation manual
		Owner's Manual

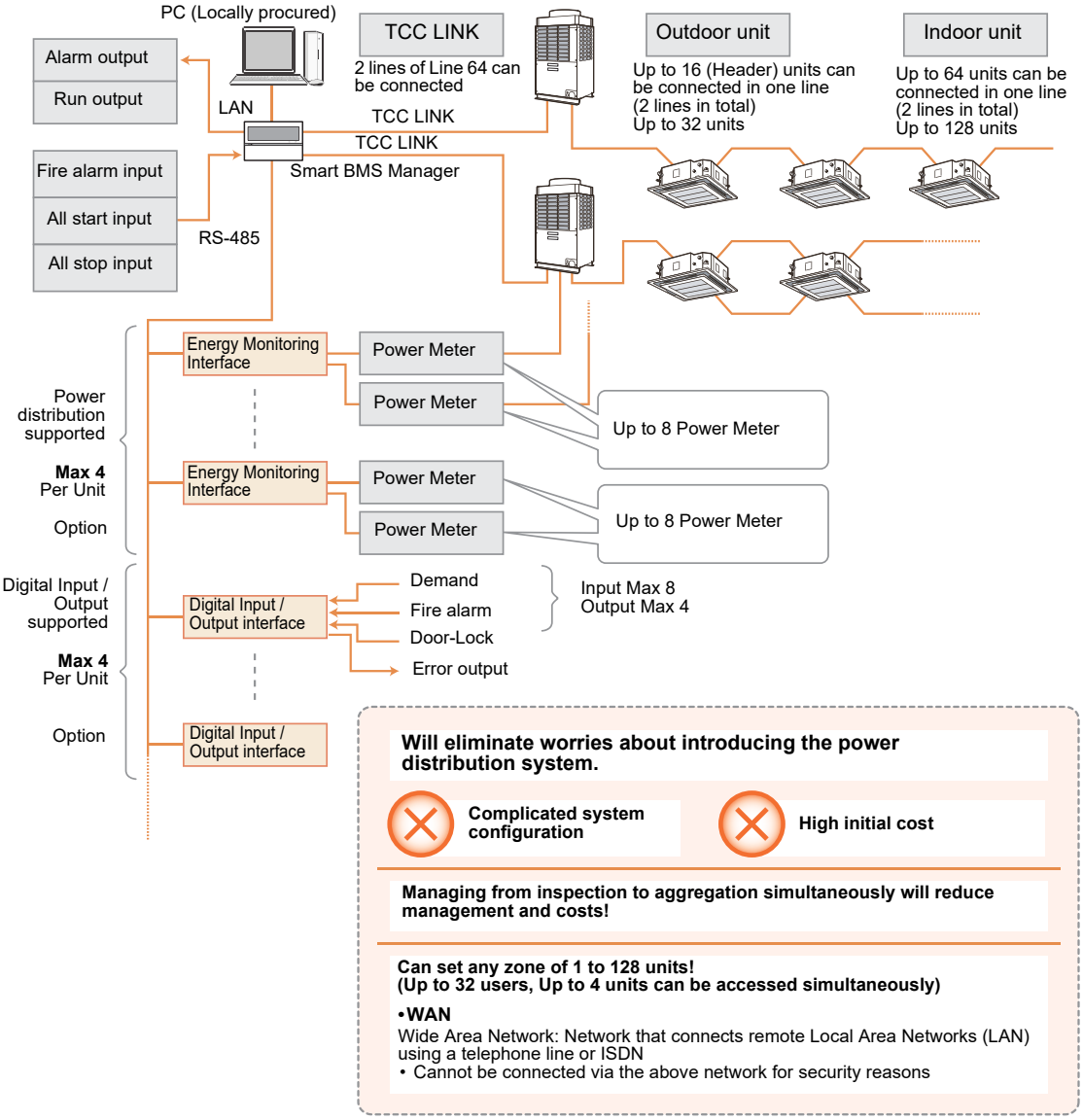
Software

Setting File Creation Software for BMS System	“This software creates a setting file to be used for the air-conditioning management system. Copies created data using the respective system upload function.”
Report Creation Software	This software is a piece of software that is used in a PC to arrange the indoor unit operation results that where tallied up by the Smart BMS Manager in a report format. This software will also allow you to print these reports.
Section Changeover Software	This software renames the zones (Floor, Tenant, Area, Monthly report tenant), and targets.

System configuration (Optional)

Power can be distributed for each indoor unit (*).
Indoor unit can be controlled by external signals.

System image



Will eliminate worries about introducing the power distribution system.

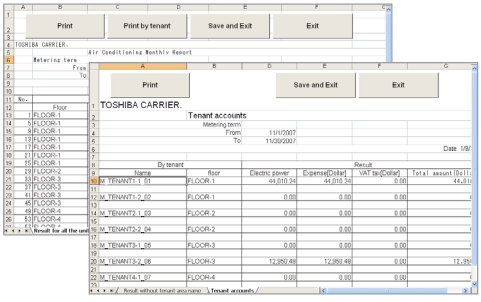
Complicated system configuration

High initial cost

Managing from inspection to aggregation simultaneously will reduce management and costs!

Can set any zone of 1 to 128 units!
(Up to 32 users, Up to 4 units can be accessed simultaneously)

•WAN
Wide Area Network: Network that connects remote Local Area Networks (LAN) using a telephone line or ISDN
• Cannot be connected via the above network for security reasons



- **Daily / Monthly Report creation function**
  Can distribute electric power to each indoor unit using Energy Monitoring Relay Interface. (*)
- **Linkage to external signals**
  Can stop the indoor unit (can stop all units simultaneously) by lock linkage or fire alarm signal using Digital Input / Output Relay Interface.

* In the case of group operation of the VRF indoor units, power is distributed by group.
Power cannot be distributed to the indoor follower unit in the DI/SDI indoor unit group.

Main functions

Function		Unit operation	Browser operation
Monitoring	ON/OFF	✓	✓
	Operation mode	✓	✓ Cool / Heat / Dry / Fan
	Set temperature	✓	✓
	Fan speed	✓	✓ Auto, High, Med., Low (*1)
	Swing / Direction	✓ (*2)	✓ (*3)
	Filter sign	✓	✓
	Child lock (Unit operation prohibited)	✓	-
	Power saving mode	✓	-
	Return back (*4)	✓	✓
	Central / Individual (Operation prohibited)	✓	-
	Operation switch control	✓	-
	Ventilation	✓	-
Operation	ON/OFF	✓	✓
	Operation mode	✓	✓
	Set temperature	✓	✓
	Fan speed	✓	✓
	Swing / Direction	✓ (*2)	✓
	Filter sign	✓	✓
	Child lock (Unit operation prohibited)	✓	-
	Power saving mode	✓	-
	Return back (*4)	✓	✓
	Central / Individual (Operation prohibited)	✓	✓
	Ventilation	✓	-
Schedule	Master schedule setting (Yearly, Weekly)	-	✓ Number of schedules : 32 patterns (Weekly schedule setting)
	ON/OFF	-	✓ Up to 10 per day Can be set in units of one minute
	Operation mode	-	
	Set temperature	-	
	Remote controller valid / invalid	-	
Schedule control	Master schedule	-	✓
	Charging schedule	-	✓
Alarm display	Unit No.	✓	✓ (*5)
	Occurrence time	-	✓
	Alarm code	✓	✓
	Alarm content	-	✓
	Alarm history	-	✓ Number of history records : 1,024
Electric charge calculation (*6)	Create daily report file	-	✓ Daily report file saving period :
	Create monthly report file	-	✓ 45 days
	Automatic inspection	-	✓ Monthly report file saving period :
	Charging schedule	-	✓ 3 months
PC user limitation	Access authority	-	✓ 3 levels
	Number of registered users	-	✓ 32
Web control	Web Access	-	✓ Internet Explorer 7, 8 Firefox 2.0, 3.0, 3.5, 3.6
	Languages	-	✓ English, French, German, Italian, Spanish, Chinese
Separately sold products	Energy Monitoring Relay interface (*7)	-	✓ Maximum number of connected units : 4
	Digital Input/Output Relay interface (*8)	-	✓ Maximum number of connected units : 4
Digital input / output	Alarm output	✓	-
	Run output	✓	-
	All stop input	✓	-
	All start input	✓	-
	Fire alarm input	✓	-

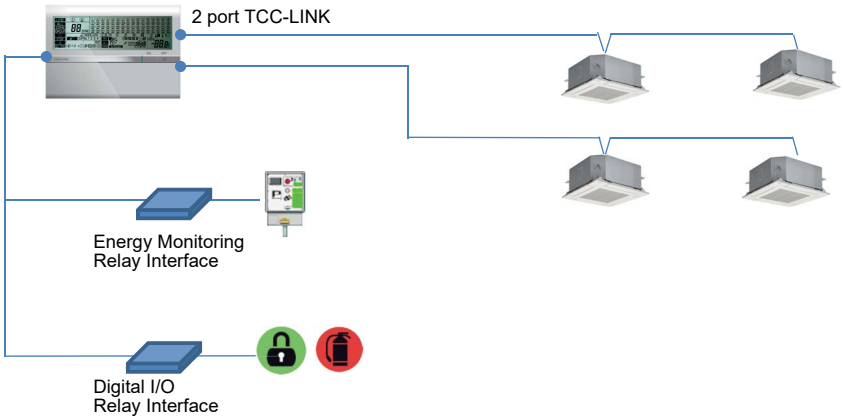
*1: Displayed when a model with the Fan speed setting fixed is connected.
*2: In case that there is no local remote controller. Not compatible with an independent louver of a 4-way cassette type. Only on or off setting for swinging.
*3: Only the on or off swinging setting can be configured on a browser.
*4: The temperature automatically returns to the set one after the set time (remaining time) has elapsed.
* Up to 60 minutes can be set for the remaining time.
*5: The unit name or error description can also be displayed.
*6: Need to set the locally procured products or the unit of electric charges.
*7: A power meter with pulse transmitter locally needs to be connected to the power meter interface in order to measure power of the connected air conditioner.
*8: In digital I/O interface, each air conditioner can be stopped (thermo off by demand alarm) by receiving 1. Lock No., 2. Fire alarm signal, or 3. Demand alarm signal.
* The group control of the central controller does not automatically apply on the browser (web), and needs to be set.

3-6 Smart BMS Manager with data analyzer for TCC-LINK

Data analyzer

On a connected local supplied personal computer is possible to view data analysis and energy monitoring.
Advanced operations and settings can be managed with this tool:
Set temperature restrictions, save operation modes, peak cut controls on condensing unit.
A set of graphs and detailed reports will help to easily monitor the performance of the system.

Outline

Appearance	Application
	

Specifications

Part name		Smart BMS Manager with data analyzer
Model Name		BMS-SM1281ETLE
Power supply		220 - 240 VAC 50/60 Hz
Dimension	Central Controller	120 × 180 × 64 mm
	Power Unit	114 × 177 × 50 mm
Max. number	Indoor unit	128
per one controller	TCC-LINK bus	2
	Energy monitoring interface	4
	Digital Input / Output interface	4
Indoor view classification		(4 zone,16 groups/zone) *
		(64 zone, 64 groups/zone) *

* The indoor savings and outdoor demand settings are functions that can only be set when the Super Module Multi System-e (heat pump model) is connected.

Software

Software name	Explanation
Setting File Creation Software for BMS System	“This software creates a setting file to be used for the air-conditioning management system. Copies created data using the respective system upload function.”
Report Creation Software	This software is a piece of software that is used in a PC to arrange the indoor unit operation results that where tallied up by the Smart BMS Manager in a report format. This software will also allow you to print these reports.
Section Changeover Software	This software renames the zones (Floor, Tenant, Area, Monthly report tenant), and targets.
Data Analyzer	This software displays a history graph of operating power consumption or time of air conditioners managed with Smart BMS Manager.

Main functions

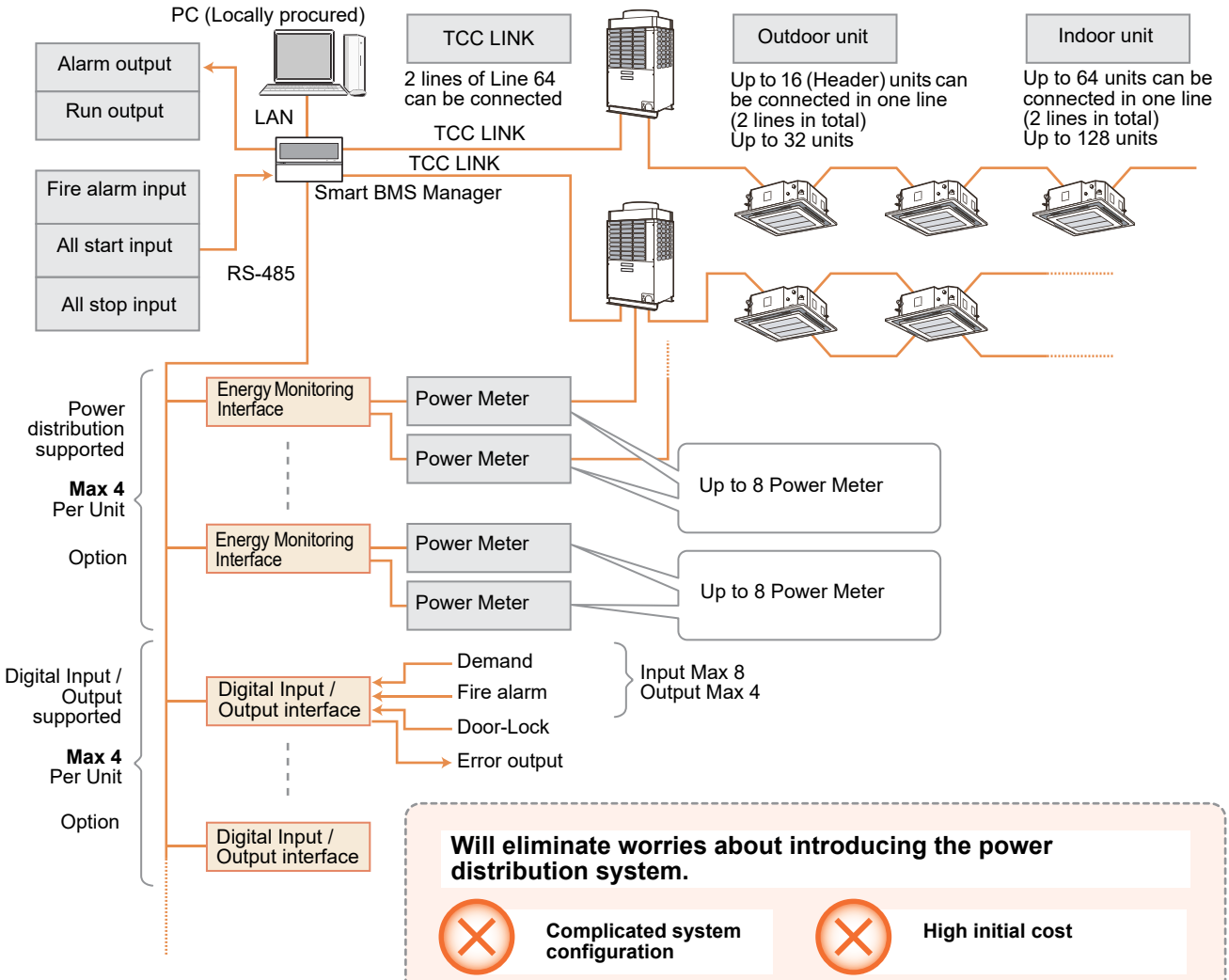
Function		Unit operation	Browser operation
Monitoring	ON/OFF	✓	✓
	Operation mode	✓	✓ Cool / Heat / Dry / Fan
	Set temperature	✓	✓
	Fan speed	✓	✓ Auto, High, Med., Low (*1)
	Swing / Direction	✓ (*2)	✓ (*3)
	Filter sign	✓	✓
	Child lock (Unit operation prohibited)	✓	-
	Power saving mode	✓	-
	Return back (*4)	✓	✓
	Central / Individual (Operation prohibited)	✓	-
	Operation switch control	✓	-
	Ventilation	✓	-
Operation	ON/OFF	✓	✓
	Operation mode	✓	✓
	Set temperature	✓	✓
	Fan speed	✓	✓
	Swing / Direction	✓ (*2)	✓
	Filter sign	✓	✓
	Child lock (Unit operation prohibited)	✓	-
	Power saving mode	✓	-
	Return back (*4)	✓	✓
	Central / Individual (Operation prohibited)	✓	✓
	Ventilation	✓	-
Schedule	Master schedule setting (Yearly, Weekly)	-	✓ Number of schedules : 32 patterns (Weekly schedule setting)
	ON/OFF	-	✓ Up to 10 per day Can be set in units of one minute
	Operation mode	-	
	Set temperature	-	
	Remote controller valid / invalid	-	
Schedule control	Master schedule	-	✓
	Charging schedule	-	✓
Alarm display	Unit No.	✓	✓ (*5)
	Occurrence time	-	✓
	Alarm code	✓	✓
	Alarm content	-	✓
	Alarm history	-	✓ Number of history records : 1,024
Electric charge calculation (*6)	Create daily report file	-	✓ Daily report file saving period :
	Create monthly report file	-	✓ 45 days
	Automatic inspection	-	✓ Monthly report file saving period :
	Charging schedule	-	✓ 3 months
PC user limitation	Access authority	-	✓ 3 levels
	Number of registered users	-	✓ 32
Web control	Web Access	-	✓ Internet Explorer 7, 8 Firefox 2.0, 3.0, 3.5, 3.6
	Languages	-	✓ English, French, German, Italian, Spanish, Chinese
Separately sold products	Energy Monitoring Relay interface (*7)	-	✓ Maximum number of connected units : 4
	Digital Input/Output Relay interface (*8)	-	✓ Maximum number of connected units : 4
Digital input / output	Alarm output	✓	-
	Run output	✓	-
	All stop input	✓	-
	All start input	✓	-
	Fire alarm input	✓	-

*1: Displayed when a model with the Fan speed setting fixed is connected.
*2: In case that there is no local remote controller. Not compatible with an independent louver of a new 4-way cassette type. Only on or off setting for swinging.
*3: Only the on or off swinging setting can be configured on a browser.
*4: The temperature automatically returns to the set one after the set time (remaining time) has elapsed.
* Up to 60 minutes can be set for the remaining time.
*5: The unit name or error description can also be displayed.
*6: Need to set the locally procured products or the unit of electric charges.
*7: A power meter with pulse transmitter locally needs to be connected to the power meter interface in order to measure power of the connected air conditioner.
*8: In digital I/O interface, each air conditioner can be stopped (thermo off by demand alarm) by receiving 1. Lock No., 2. Fire alarm signal, or 3. Demand alarm signal.
* The group control of the central controller does not automatically apply on the browser (web), and needs to be set.
*9: MTP E-mail server can use “SMTP” server or “POP before SMTP” server only.

System configuration (Optional)

Power can be distributed for each indoor unit (*).
Indoor unit can be controlled by external signals.

System image



Will eliminate worries about introducing the power distribution system.

Complicated system configuration

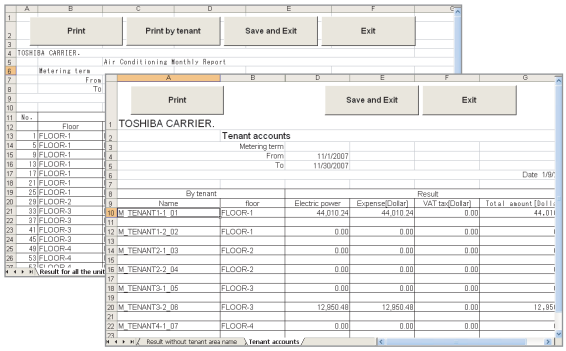
High initial cost

Managing from inspection to aggregation simultaneously will reduce management and costs!

Can set any zone of 1 to 128 units!
(Up to 32 users, Up to 4 units can be accessed simultaneously)

- **WAN**

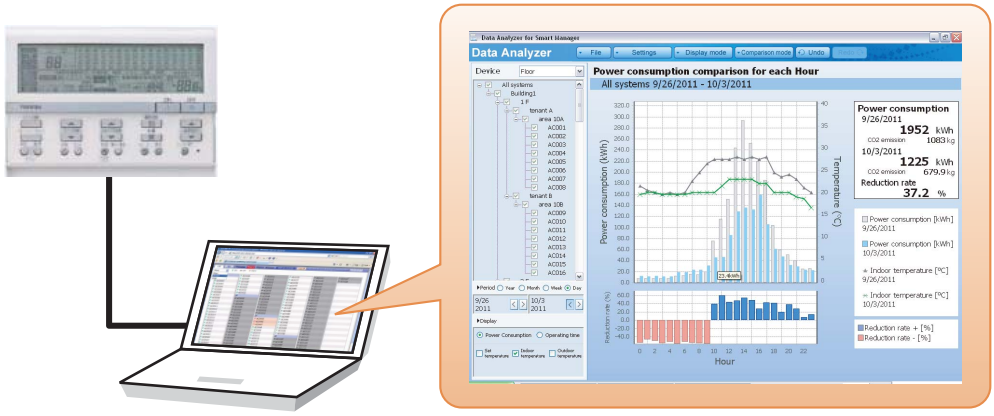
Wide Area Network: Network that connects remote Local Area Networks (LAN) using a telephone line or ISDN
·Cannot be connected via the above network for security reasons



- **Daily / Monthly Report creation function**
  Can distribute electric power to each indoor unit using Energy Monitoring Relay Interface. (*)
- **Linkage to external signals**
  Can stop the indoor unit (can stop all units simultaneously) by lock linkage or fire alarm signal using Digital Input / Output Relay Interface.

* In the case of group operation of the VRF indoor units, power is distributed by group.
Power cannot be distributed to the indoor follower unit in the DI/SDI indoor unit group.

Data Analyzer function



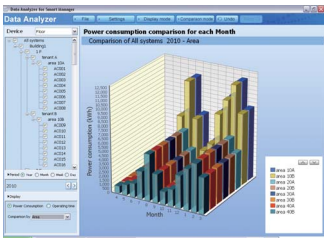
Air conditioner operating status (understanding current status)	• Graphic display of status of power consumption in entire building (for each floor or tenant is also possible). • Graphic display on one screen of outdoor temperature, room side suction temperature, and indoor set temperature which affect power consumption. • Easy to understand graphic display of peak consumption times in time line by month, date, or time. • Quickly spot wasteful air conditioners by displaying ranking of power consumption (all connected air conditioners).
Energy savings control (improving operations)	• Save energy and shift to energy saving temperatures easily. • Matching energy savings to needs of each tenant. ...Settings to control range of set temperature and settings to return to set temperature. • Save energy by pinpointing peak periods. ...Manage schedules for saving energy (suppressing capacity) used by indoor / outdoor units. • Handle power peaks with Peak Cut Controller. (Separate Peak Cut Controller required) • Set up schedules to avoid forgetting to turn off power and more.
Check results of energy savings (evaluating)	• Possible to do comparisons like outside temperature and power consumption from one year to the next. • Easy to understand the times when consumption is not reduced by understanding time line and reduction rates at the bottom of graphs. • More than just comparing entire buildings, comparisons can be done by floor, tenant, or air conditioner making it possible to understand reduction rates for each floor or tenant.

1. **Models that can be connected:**
2. **The indoor savings and outdoor demand settings are functions that can only be set when the Super Module Multi System-e (heat pump model) is connected.**
3. **With the Super Module Multi System-e, it is possible to measure the estimates of power consumption even if a power meter is not attached.**
   1) Just a reference, cannot be used for power distribution.
   2) Does not include power consumption for options that are not provided power from indoor unit power consumption or outdoor unit power.
   3) Cannot measure the estimates of power consumption with VRF and DI/SDI combined system. It is necessary to install separate power meters.

Easy to understand operating status of air conditioners

Graphs for at a glance understanding

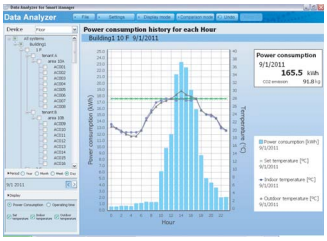
▼Power consumption by floor (simultaneous display)



Power consumption of up to 4 floors displayed simultaneously in 3D graph.
Easy to understand which floor consumes the most power.

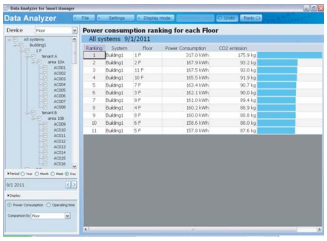
* Also possible to display for each tenant or for each air conditioner.

▼History of power consumption by air conditioners in a time line (month, date, time) and more



More than just power consumption, simultaneously display outdoor temperature, room side suction temperature, and indoor set temperature which affect power consumption. Plus it is possible to analyze operating status by month, date, and time.

▼Ranking of power consumption per air conditioner



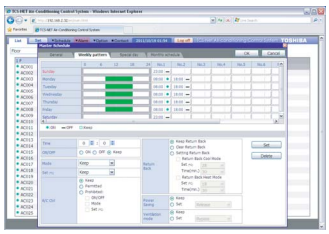
Quickly spot high consumption air conditioners by displaying power consumption ranking.

* Display ranking of all connected air conditioners.

Quickly improve control of energy savings

Easy online settings via the web

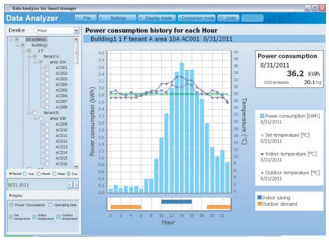
▼Easy to set up management of energy saving operations for air conditioners



1. Targeted air conditions are shifted to energy saving temperatures (while cooling +2ºC, while heating -2ºC) with easy settings.
2. Set temperature range limitation
   Limit temperature setting range with settings defined by building manager.
3. Manage schedules for indoor savings and outdoor demand (suppressing capacity)
   Suppressing capacity for each air conditioner
   (0 / 50 / any % setting with remote control)
   Set upper limit for capacity of outdoor unit systems
   (0 / 60 / 70 / 80 / 90 %)

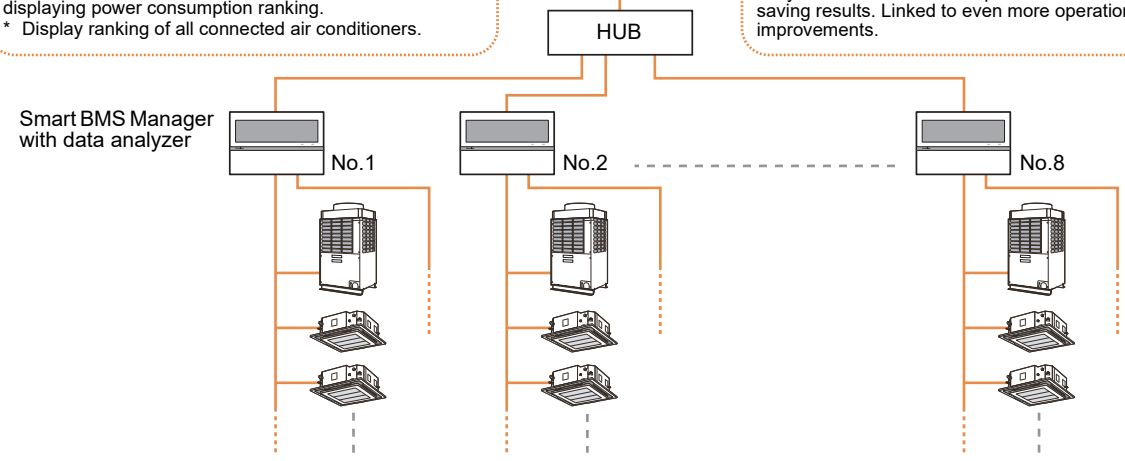
Easy to evaluate results of energy savings with comparative graphs

▼Check results of energy savings by air conditioners in a time line (month, date, time)



Possible to compare months, dates, and times. Plus, it is possible to check reduction results per time period so it is easy to understand the time periods with the lowest energy saving results. Linked to even more operational improvements.

PC
(Locally procured)



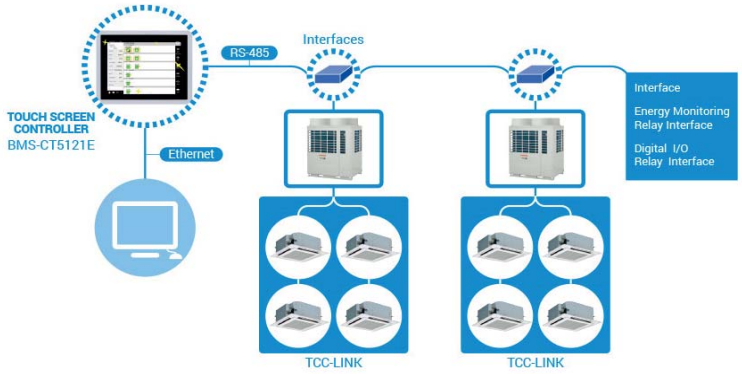
1. **Models that can be connected:**
2. **The indoor savings and outdoor demand settings are functions that can only be set when the Super Module Multi System-e (heat pump model) is connected.**
3. **With the Super Module Multi System-e, it is possible to measure the estimates of power consumption even if a power meter is not attached.**
   1) Just a reference, cannot be used for power distribution.
   2) Does not include power consumption for options that are not provided power from indoor unit power consumption or outdoor unit power.
   3) Cannot measure the estimates of power consumption with VRF and DI/SDI combined system. It is necessary to install separate power meters.

3-7 Touch Screen Controller for TCC-LINK

The Touch Screen Controller can be connected to 64 or 512 Indoor Units depending on model and offers Energy Monitoring* and schedule program functions.
This controller is ideally suited to any small or large installation where Energy monitoring functions are required, or where a professional and highly presentable finish is required.
It can control each of the individual indoor units and is capable of providing information from the indoor unit settings and malfunction check codes.
The Touch Screen is connected to the air conditioner control network directly by relay interfaces.

TOUCH SCREEN CONTROLLER for Air Conditioning Control System (hereafter TOUCH SCREEN CONTROLLER) consists of an operation section and a display section. It is equipped with an LCD display and touch panel, enabling functions such as monitoring of the status of air conditioners, setting changes, scheduled operation, error displays, and output of data for monthly reports.

Outline

Appearance	Application
	

Specifications

Part name		Touch screen controller system
Model Name		BMS-CT5121E
Power supply		220-240 V 50/60 Hz (Main unit supply from AC-adopter: 12V-DC)
Dimension		323 × 256 × 49 mm
Max number	Indoor unit	512
per one controller	TCC-LINK bus	12
	Relay interface	12
	Energy monitoring interface	8
	Digital Input / Output interface	8
Indoor view classification		Floor/Tenant/area/group unit
Documents		Installation manual
		Owner's manual

*1:The power cable is field arrangement.

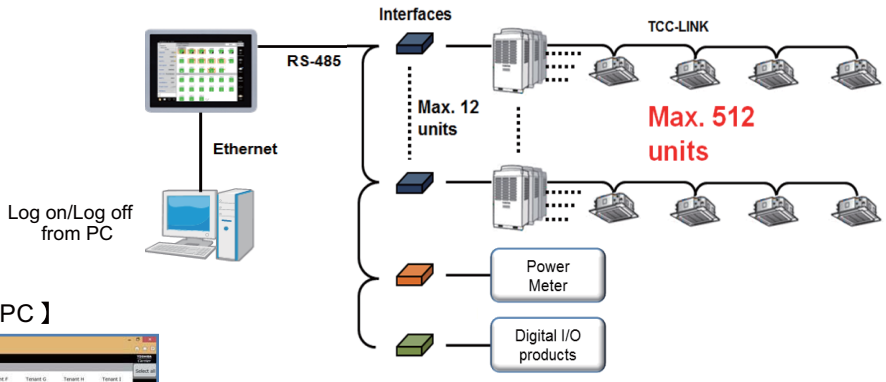
Main functions

Function		Operation	Monitoring
ON/OFF		✓	✓
Mode		✓	✓
Setting Temperature		✓	✓
Fan Speed		Auto, Low, Med., High	✓
Louver position		Swing, Fix	✓
Schedule Function		Scheduled timer required	-
Multi language		-	-
Energy Save Function		-	-
Permit/Prohibit function		-	-
Filter sign		-	-
Error Display		Reset	Hexadecimal fault code
Dual automatic mode		-	-
Soft cooling		-	-
Air flow changing		-	-
Power Save mode		-	-
Individual louver setting		-	-
Frost protection setting		-	-
Filter sign flashes		✓	✓
Control by 2 remote controllers		-	-
Swing / Direction		✓	✓
Central / Individual (Operation prohibited)		✓	✓
Digital input / output	Alarm output	✓	-
	Run output	✓	-
	All stop input	✓	-
	All start input	✓	-
Ventilation		✓	✓
Connectable Central control devices	Up to 2 devices (Header/Follower)		
	In case of "zone fix mode", Up to 5 units (Header, zone 1, 2, 3, 4)		

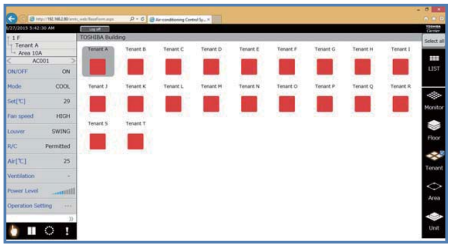
System configuration

1) Monitoring / Controlling using a computer (Web connection function)

You can use your computer to monitor and control air conditioners via the Touch Screen Controller.



【 Web browser screen on PC 】



- **Monitoring and controlling (include scheduling) operation**
- **Similar user interface by mouse operation and the screen.**
- **Up to 2 users can be logged on concurrently.**

Note > O/S : Windows8.1 (R) or Windows10(R).
Web browser : Internet Explorer 11 (R).

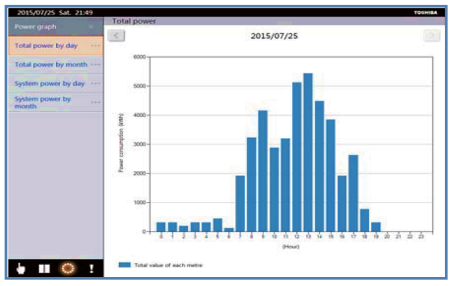
2) Graph function

You can display the indoor temperature, the set temperature, the outdoor temperature, and the power of electricity meter in a graph. (*Cannot use web browser)

【 Indoor unit graph by a day 】

- **Indoor unit graph screen mode :**
  - The value can be selected from indoor temperature ,set temperature of indoor unit and outdoor temperature of connected outdoor unit.
  - When multiple indoor unit are selected, the temperature is shown as average value.

【 Power graph by a day 】



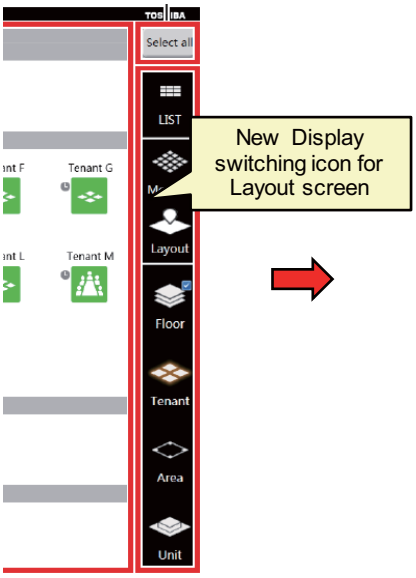
- **Power graph screen mode :**
  - The value can be displayed the power of selected electricity meter or total power.

- This graph function cannot use comparing or analyzing these data.
  In those purpose, please use **"Data analyzer*"** of PC software which is in this package.
  This is also a new feature of BMS-CT5121E.

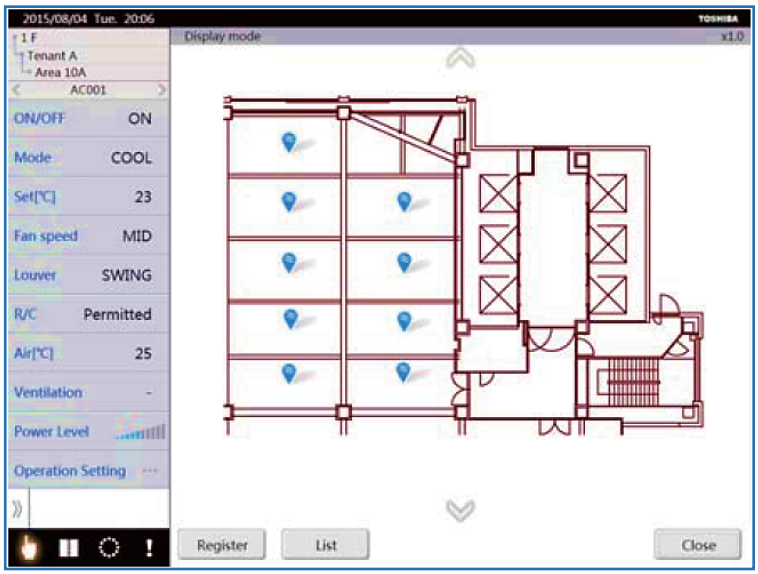
***** This tool is the same as "Smart BMS managers with Data Analyzer".

3) Layout diagram function

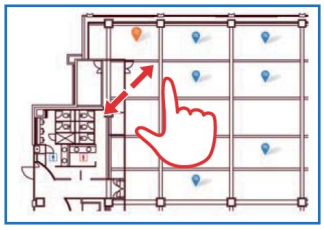
You can display unit icons on the layout diagram[*1,*2] so that you know the potion of the air conditioners.
(*Cannot use web browser)



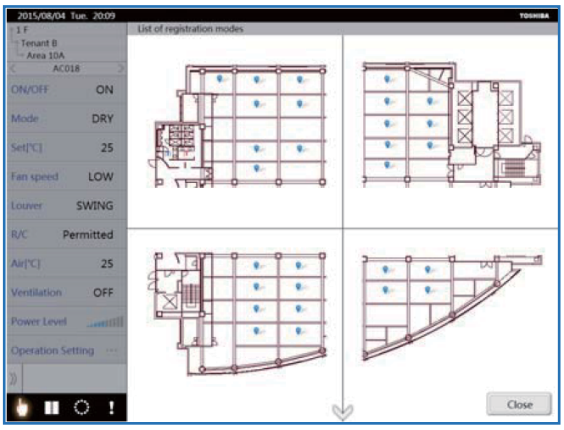
【 Layout diagram 】



- Checking the location of indoor unit on the layout diagram from the control screen.
- Monitoring and controlling operation on the layout diagram.
- 4 layout diagram can display at the same time.
- Smart operation to zoom in and out



【 Multiple display 】



*1 This function need to install “Layout image file”.
When customer/user want to use this function, TCC request the original layout data to customer/user.
After received customer data, TCC make and draw Layout image file.
The Drawing fee require separately.
*2 “Layout image file” can have max. 32 files.

4) Alarm e-mail function

When abnormalities occur in monitoring indoor units, the information about the abnormalities are sent to the e-mail address set as recipients. (*Cannot use web browser)

3-8 Data flow overview

System address list should contains following information.

- All air-conditioners address information
- All system devices address information
- Control classification
- Model name

[NOTE]
This information is essential to prevent troubles.
Be sure to complete before on site installation.

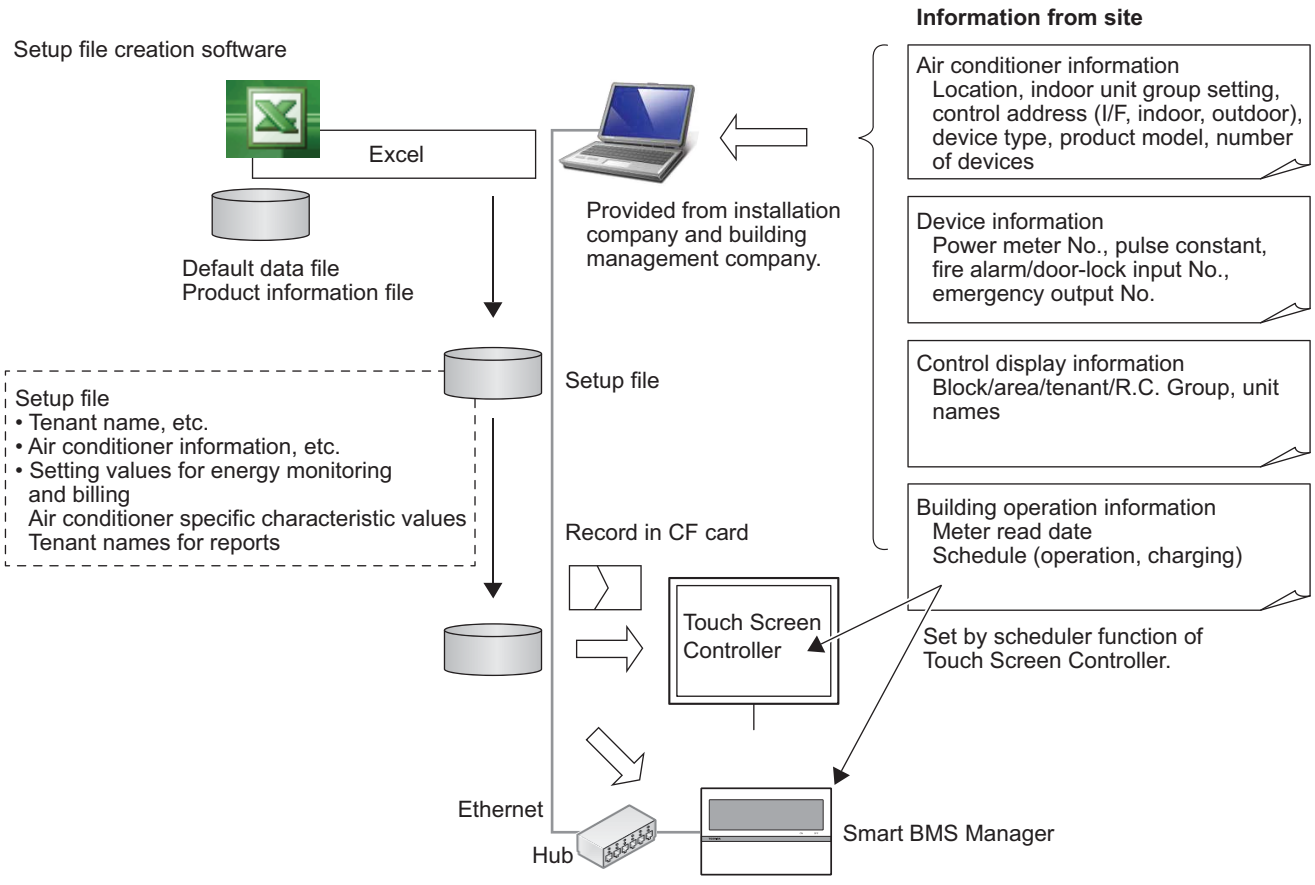
System address list

Building Name	Toshiba Building	IP Address	192.168.2.100

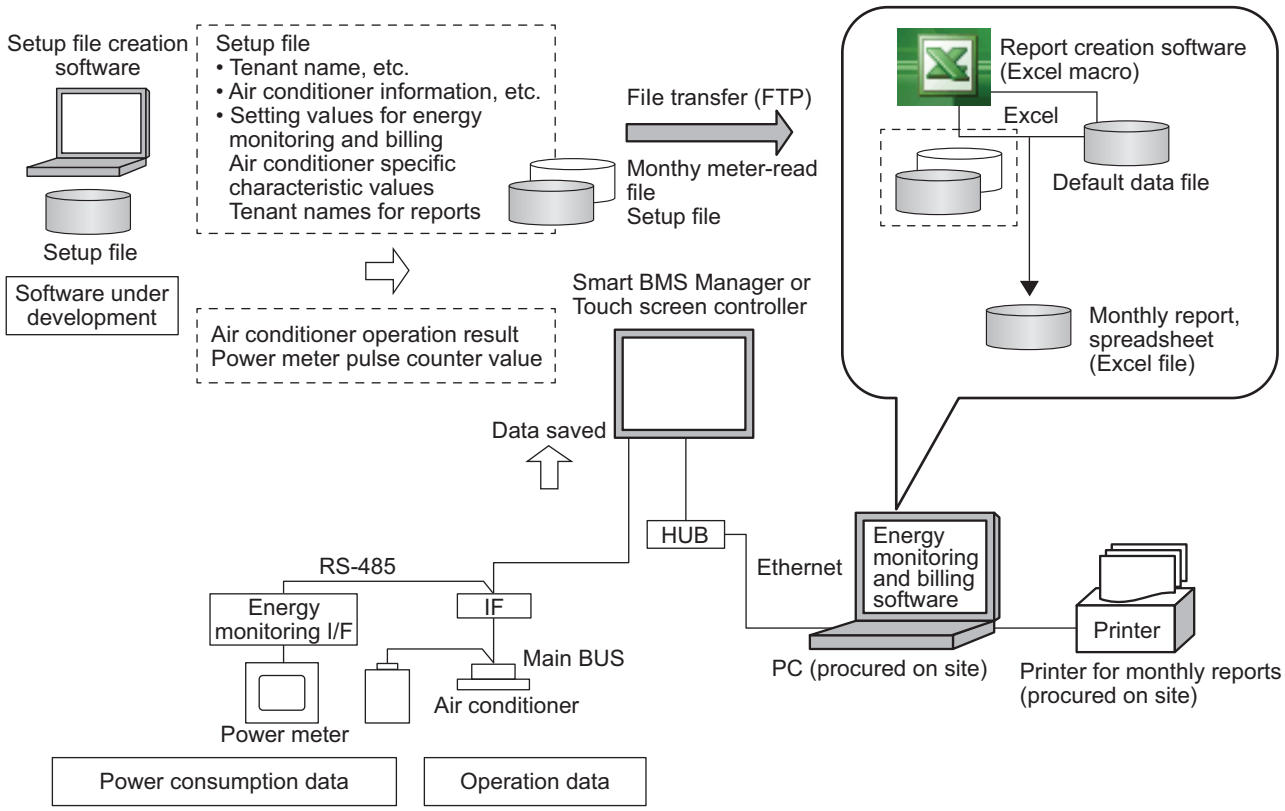
No	Air Conditioner List			Address Information						Display Name			R.C. Unit/Group	Energy I/F Data	Digital I/F Data	
	Outdoor Refrigerant System	Outdoor unit Model Name	Indoor Unit Model Name	TCC-LINK Line No	Line Address	Indoor Unit Address	Group Address	Group Relation	Central Control Address	Floor Name	Tenant Name	Area Name		Power Meter Address - Channel	Key Input Address - Channel	Fire Alarm Address - Channel
1	SYS-1	MMY-AP1401HT8	MMU-AP0181H	1	1	1	0	0	1	1F	TenantA	ShopA	RC-1	1-1	1-1	2-8
2			MMU-AP0091H			2	1	0	2				RC-2	1-1	1-2	2-8
3			MMU-AP0181H			3	2	2	2					1-1		2-8
4			MMU-AP0091H			4	2	2	2					1-1		2-8
5			MMK-AP0091H			5	0	0	3		TenantB	ShopB	RC-3	1-1	1-3	2-8
6			MMK-AP0181H			6	0	0	4			ShopC	RC-4	1-1	1-4	2-8
7			MMK-AP0181H			7	0	0	5			ShopD	RC-5	1-1	1-5	2-8
8			MMK-AP0181H			8	0	0	6				RC-6	1-1	1-6	2-8
9	SYS-2	MMYAP0801HT8	MMU-AP0181H		2	1	1	0	7	2F	TenantC	ShopE	RC-7	1-2	1-7	2-8
10			MMU-AP0181H			2	2	9	7					1-2		2-8
11			MMK-AP0181H			3	1	0	8			ShopF	RC-8	1-2	1-8	2-8
12			MMK-AP0181H			4	2	11	8					1-2		2-8
13	SYS-3	MMYAP1001HT8	MMU-AP0181H	2	1	1	0	0	9	3F	Office	CEO	RC-9	1-3	2-1	2-8
14			MMU-AP0181H			2	0	0	10				RC-10	1-3	2-2	2-8
15			MMK-AP0181H			3	0	0	11			Development	RC-11	1-3	2-3	2-8
16			MMK-AP0181H			4	1	0	12				RC-12	1-3	2-4	2-8
17			MMU-AP0181H			5	2	16	12					1-3	2-4	2-8
18			MMU-AP0181H			6	2	16	12					1-3	2-4	2-8
19			MMU-AP0181H			7	0	0	13				RC-13	1-3	2-5	2-8
20			MMU-AP0181H			8	0	0	14					1-3	2-6	2-8

Air conditioner list | Air conditioner address list | Display name Management category | Remote control | I/F Address Information

Setup file data flow



Energy Monitoring Data Flow



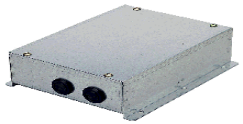
4

Open network and analog interface

4-1 Line up & function

Type	LN Interface		Modbus Interface		BN Interface		Analog Interface	
Model Name	**TCB-IFLN642TLE**		**TCB-IFMB641TLE**		**BMS-IFBN640TLE**		**TCB-IFCB640TLE**	
Appearance								
Object	**Command**	**Monitoring**	**Command**	**Monitoring**	**Command**	**Monitoring**	**Command**	**Monitoring**
ON / OFF status	✓	✓	✓	✓	✓	✓	✓	✓
Operation mode	✓	✓	✓	✓	✓	✓	✓	✓
Fan speed	✓	✓	✓	✓	✓	✓	✓	✓
Louver	✓	✓	✓	✓	✓	✓	✓	✓
Set temperature	✓	✓	✓	✓	✓	✓	✓	✓
Filter sign	✓	✓	✓	✓	✓	✓	-	-
Room temperature	-	✓	-	✓	-	✓	-	-
Permit / Prohibit of Local Operation	✓	✓	✓	✓	✓	✓	-	-
Error status	-	✓	-	✓	-	✓	-	✓
Error code	-	✓	-	✓	-	✓	-	-

▼ Additional devices

Model Name	**BMS-IFLSV4E**	**BMS-IFDD03E**	**BMS-IFWH5E**
Appearance			
Type	Relay Interface	Digital Input/Output interface	Energy monitoring interface
TU2C-LINK / TCC-LINK Line	✓ (1 Line)	-	-
Option interface connection	-	✓	-
Energy Monitoring	-	-	✓
Digital input/output	-	8/4	8/-

4-2 Comparison table

Type		Lon Interface	Modbus Interface	BN Interface	Analog Interface
Model Name		**TCB-IFLN642TLE**	**TCB-IFMB641TLE**	**BMS-IFBN640TLE**	**TCB-IFCB640TLE**
Power supply		220 - 240 VAC 50/60Hz	220 - 240 VAC 50/60Hz	220 - 240 VAC 50/60Hz	15 VDC ±5%
Dimension	Width x Height x Depth	66 × 246 × 193mm	66 × 170 ×200mm	140 × 90 × 45mm	66 × 170 × 200mm
Display		-	-	-	-
Max number per one controller [Note1]	Indoor unit	64	64	64	64
	TU2C-LINK / TCC-LINK bus	1	1	1	1
	Relay I/F	-	-	-	-
Communication port	TU2C-LINK / TCC-LINK	1	1	1	1
	RS485	-	Modbus RTU mode 9.6/19.2/38.4kbps for upper system	-	-
	Ethernet	-	-	10BASE-T/ 100BASE-TX, IPv4	-
	Others	Twisted pair FT-X1 transceiver 78kbps with system	-	-	Analog in 8, out 5 (DC 0-10v variable) Digital in 2, out 5
Indoor view classification		-	-	-	-
Network specification		LonWorks EIA/AnSI 709.1 support	Modbus APPLICATION PROTOCOL SPECIFICATION V1.1b	AnSI/ASHRAE Standard 135-2004 BACnet Advanced Application Controller (B-ASC)	-
Monitoring [Note2]	ON / OFF	✓	✓	✓	✓
	Operation mode	✓	✓	✓	✓
	Set temperature	✓	✓	✓	✓
	Fan speed	✓	✓	✓	✓
	Swing / Direction	✓	✓	✓	✓
	Filter sign	✓	✓	✓	-
	Child lock (Unit operation prohibited)	-	-	-	-
	Power saving mode	-	-	-	-
	Return back	-	-	-	-
	Central control	✓	✓	✓	-
	Room temperature	✓	✓	✓	-
	Ventilation	-	-	✓	-
Operation [Note2]	ON / OFF	✓	✓	✓	✓
	Operation mode setting	✓	✓	✓	✓
	Temperature setting	✓	✓	✓	✓
	Fan speed setting	✓	✓	✓	✓
	Swing / Direction	✓	✓	✓	✓
	Filter sign reset	✓	✓	✓	-
	Child lock (Unit operation prohibited)	-	-	-	-
	Power saving mode (Compatible models only)	-	-	-	-
	Return back	-	-	-	-
	Central / Individual (Operation prohibited)	✓	✓	✓	-
	Ventilation	-	-	-	-
Alarm display	Unit No.	✓	✓	✓	✓
	Occurrence time	-	-	-	-
	Alarm code	✓	✓	✓	-
	Alarm content	-	-	-	-
	Alarm history	-	-	-	-
Schedule Function		Depend on upper system			
Alarm e-mail					

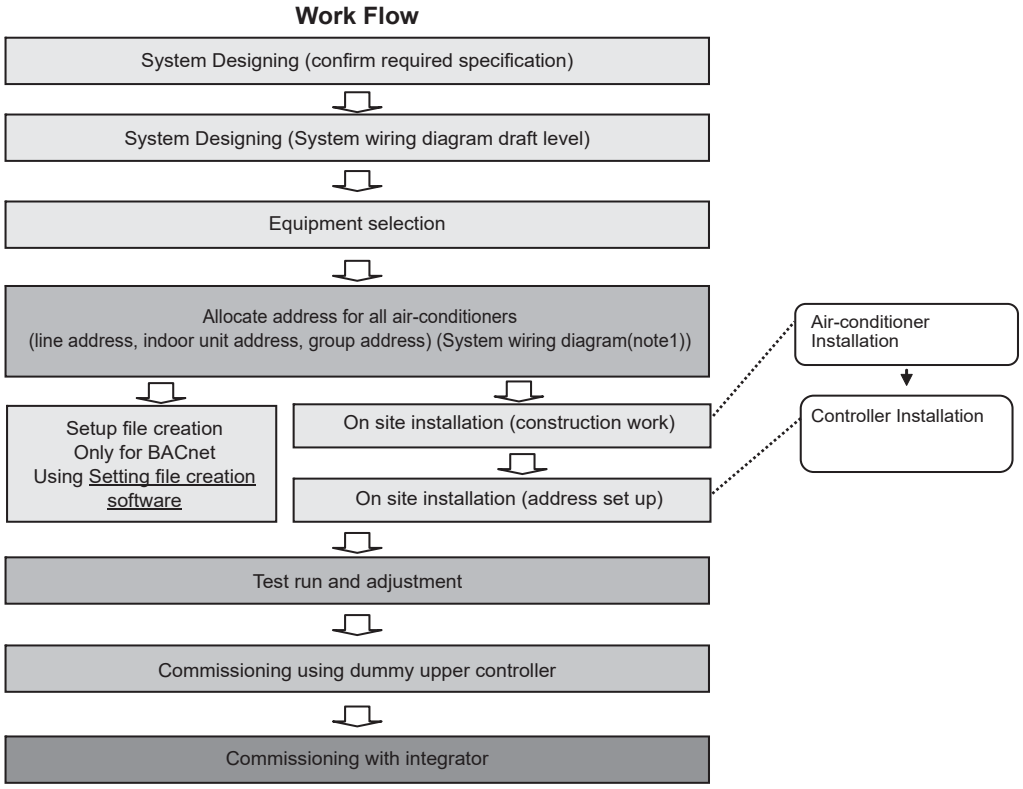
[Note 1] Restriction by TCC-LINK specification:

1. Max 64indoors, max16*1 header outdoor with max 3 followers per 1 TCC-LINK main bus, Max 48 indoors per 1VRF refrigerant system.
2. Number of indoor followers shall be counted for VRF, however in case of DI/SDI, number of TCC-LINK adaptor shall be counted.
3. Confirm that max 16 refrigerant systems per 1 main bus for VRF, max 64 refrigerant systems per 1 main bus for only DI/SDI, max 64 total refrigerant systems and max 16 VRF refrigerant systems per 1 main bus for mixed VRF / DI/SDI.

[Note 2] Actual functions depend on each air conditioner.

4-3 Work flow

The BMS work flow (LonWorks®, Modbus®, BACnet®, Analog I/F) is shown below.
Documents to be referred to are prepared for each series or product. Analog I/F, LonWorks and Modbus use the central control addresses to identify indoor units.



Note1)
System wiring diagram

* All air-conditioners (FCU/CDU/controller) layout
* All system devices layout (include local equipment)
* Control Wiring diagram
* Refrigerant system piping information diagram

	Airconditioner list								
	Outdoor refrigerant system	Outdoor unit model name	Indoor unit model name	Header unit	Intelligent server address	Relay I/F address	Line address	Indoor unit address	Group address
1	CDU-1	MMY-AP3611HT8	MMD-AP0721H	0	192.168.xxx.xxx	1	1	1	0
2			MMD-AP0721H	0				2	0
3			MMD-AP0961H	0				3	0
4			MMK-AP0241H	0				4	0
5			MMK-AP0241H	0				5	0
6			MMK-AP0241H	0				6	0
7			MMK-AP0181H	0				7	0
8			MMK-AP0181H	0				8	0
9			MMU-AP0481H	0				9	0
10			MMK-AP0151H	0				10	1
11			MMK-AP0151H	10				11	2
12			MMK-AP0121H	0				12	0
13			MMK-AP0121H	0				13	0
14	CDU-2	MMY-AP3611HT8	MMK-AP0091H	0		2	2	1	0
15			MMD-AP0721H	0				2	0
16			MMD-AP0721H	0				3	0
17			MMD-AP0361BH	0				4	0
18			MMD-AP0361BH	0				5	0
19			MMD-AP0361BH	0				6	0
20			MMD-AP0361BH	0				7	0
21			MMD-AP0361BH	0				8	0
22			MMD-AP0361BH	0				9	0
23			MMD-AP0271BH	0				10	0
24			MMK-AP0181H	0				11	0
25			MMD-AP0961H	0				1	0
26			MMD-AP0961H	0				2	0

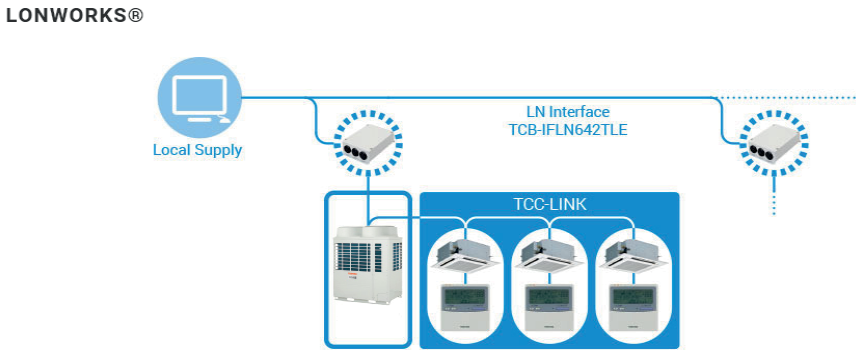
Air conditioner list

BACnet Server/
I/F /Line/Indoor/Group address
information

4-4 LonWorks Interface

The Toshiba LonWorks interface 100% LonMark Compliant and is designed to connect the Toshiba Air Conditioning system to a LonWorks Building Management Control System.
This Interface connects directly to the Toshiba TCC-Link Central Control Network on the Air Conditioner side and can be wired on the Indoor or outdoor side depending on preference.
The Interface is then connected to the LonWorks Building Management Control system where it provides 28 Network variables for the sending of Control Commands and receiving unit information.
Multiple Toshiba LonWorks Interfaces can be connected to a single TCC-Link Network and addressed using simple switches provided on the device.
This is to enable ease of installation, especially in buildings with separate areas where 1 Interface may be used for each area/floor.

Outline

Appearance	Application
	

Specifications

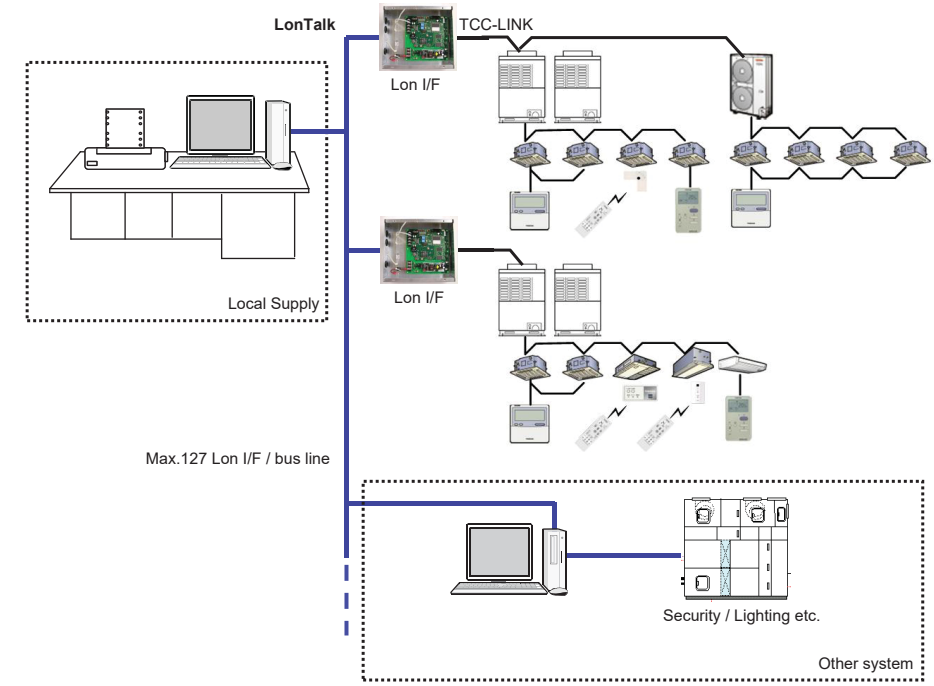
Part name		Lon Interface
Model Name		TCB-IFLN642TLE
Power supply		220 - 240 VAC 50/60 Hz
Dimension		66 × 246 × 193 mm
Max number	Indoor unit	64
per one controller	TU2C-LINK / TCC-LINK bus	1
Lon I/F / bus line		127
Communication port		Twisted pair FT-X1 transceiver 78 kbps with system
Network specification		LonWorks EIA/ANSI 709.1 support
Documents	Included	Installation manual
	Exhibit	Specification manual

Main functions

Function	Command	Monitoring
ON/OFF	✓	✓
Mode	Heat, Cool, Dry, Fan, Auto	✓
Setting Temperature	18 - 29 °C	✓
Fan Speed	Auto, Low, Med., High	✓
Louver position	Swing, Fix	✓
Filter sign	Reset	✓
Room temperature	-	✓
Permit / Prohibit of Local Operation	ON/OFF, Mode, Set temp., Fan Speed, Louver	✓
Error status	-	✓
Error Display	-	✓

System configuration

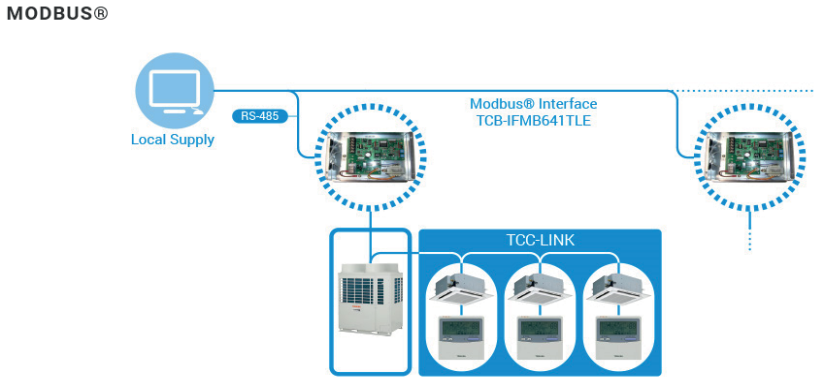
Lon Interface



4-5 Modbus Interface

The Toshiba Modbus® interface is designed to connect the Toshiba Air Conditioning system to a Modbus Building Management System.
The Toshiba Interface connects directly to the Toshiba TCC-Link Central Control Network on the Air Conditioner and can be wired on the Indoor or outdoor side depending on preference.
The Interface then uses the Modbus RTU protocol based on the RS-485 type serial communications protocol to connect to a suitable Modbus Master device.
Finally, this Modbus Master device is connected to the BMS control system and allows control of all connected Toshiba Air Conditioner equipment from that BMS control system.
Multiple Toshiba Modbus Interfaces can be connected to a single TCC-Link Network and addressed using simple switches provided on the device.
This is to enable ease of installation, especially in buildings with separate areas where 1 Interface may be used for each area/floor.

Outline

Appearance	Application
	

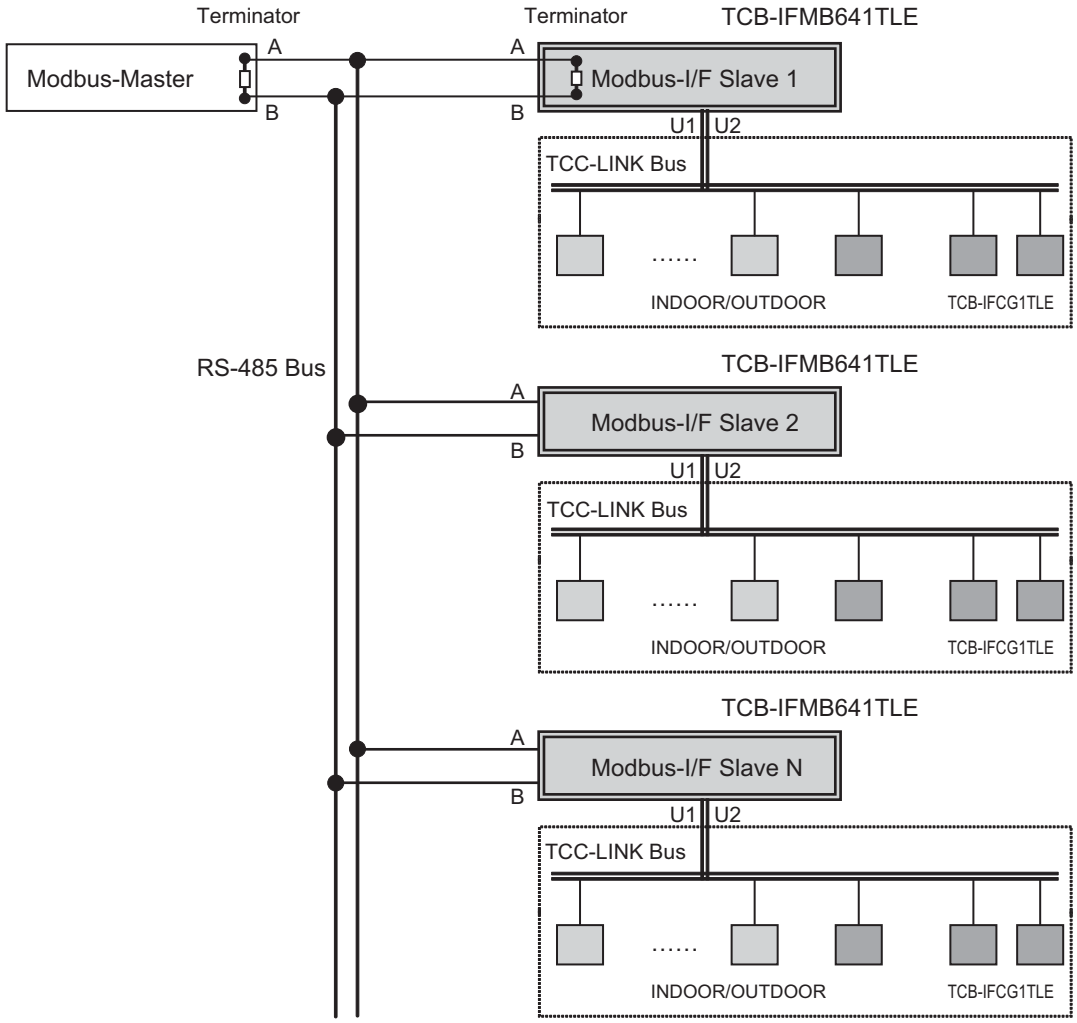
Specifications

Part name		Modbus Interface
Model Name		TCB-IFMB641TLE
Power supply		220 - 240 VAC 50/60Hz
Dimension		66 (H) x 170 (W) x 200 (D) mm
Max number	Indoor unit	64
per one controller	TU2C-LINK / TCC-LINK bus	1
Modbus I/F / bus line		15
Communication port for RS485		Modbus RTU mode 9.6/19.2/38.4kbps
Network specification		Modbus APPLICATION PROTOCOL SPECIFICATION V1.1b
Documents		Installation manual
		Specification manual

Main functions

Function	Command	Monitoring
ON/OFF	✓	✓
Mode	Heat, Cool, Dry, Fan, Auto	✓
Setting Temperature	18 - 29 °C	✓
Fan Speed	Auto, Low, Med., High	✓
Louver position	Swing, Fix	✓
Filter sign	Reset	✓
Room temperature	-	✓
Permit/Prohibit of Local Operation	On/Off, Mode, Set temp., Fan Speed, Louver	✓
Error status	-	✓
Error Display	-	✓

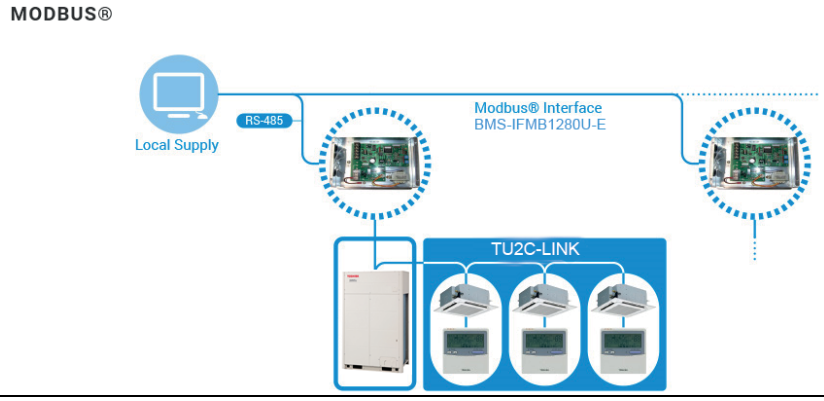
System configuration



N = Max. 15

4-6 Modbus Interface

Outline

Appearance	Application
	

Specifications

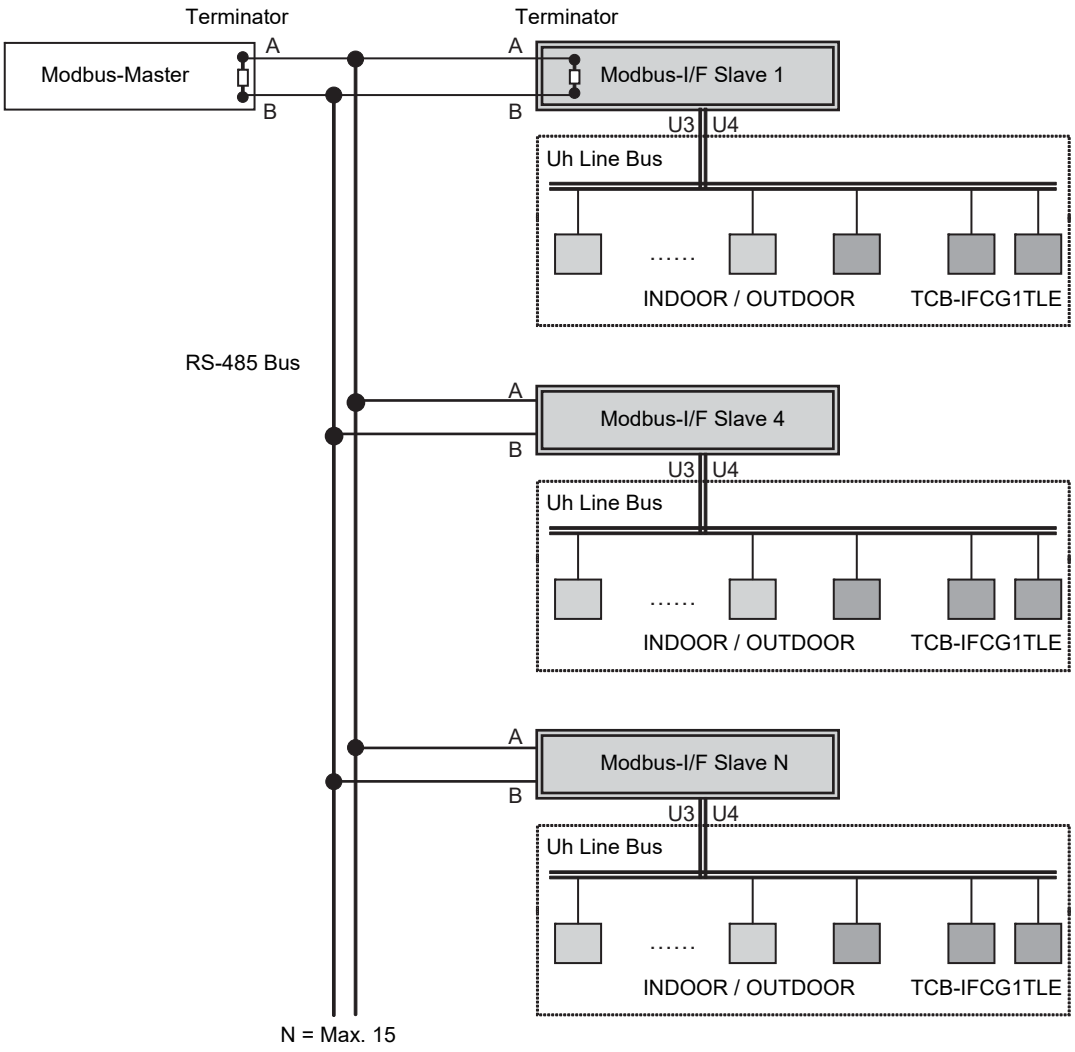
Part name		Modbus Interface
Model Name		BMS-IFMB1280U-E
Power supply		220 - 240 VAC 50/60Hz
Dimension		66 (H) x 170 (W) x 200 (D) mm
Max number	Indoor unit	64
per one controller	TU2C-LINK / TCC-LINK bus	1
Modbus I/F / bus line		15
Communication port for RS485		Modbus RTU mode 9.6/19.2/38.4kbps
Network specification		Modbus APPLICATION PROTOCOL SPECIFICATION V1.1b
Documents		Installation manual
		Specification manual

Main functions

Function	Command	Monitoring
ON/OFF	✓	✓
Mode	Heat, Cool, Dry, Fan, Auto	✓
Setting Temperature	18 - 29 °C	✓
Fan Speed	Auto, Low, Med., High	✓
Louver position	Swing, Fix	✓
Filter sign	Reset	✓
Room temperature	-	✓
Permit/Prohibit of Local Operation	On/Off, Mode, Set temp., Fan Speed, Louver	✓
Error status	-	✓
Error Display	-	✓

System configuration

An example of connection of the Modbus master device, the Modbus interface, and air conditioners is shown in the diagram below.



System devices configuration

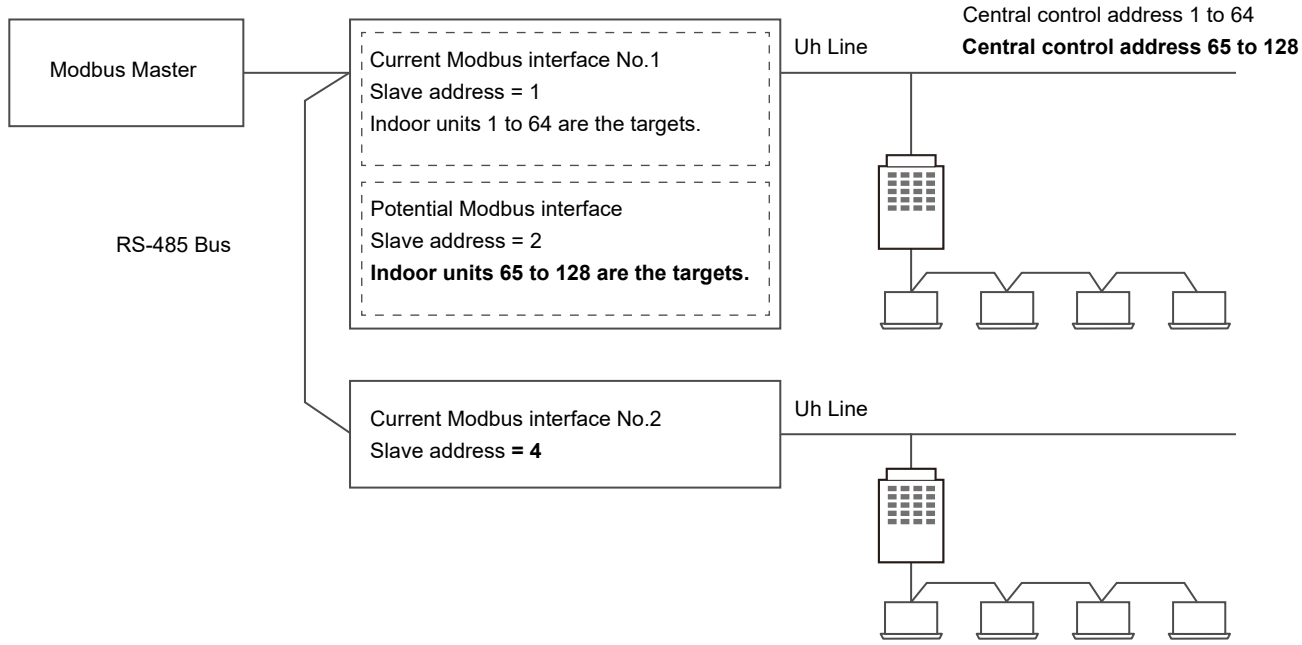
Modbus interface is connected to the Uh Line communication bus. Modbus interface uses central control address assigned to indoor units to read the operating status of indoor units and change settings. The setting range for central control address of indoor units is based on the ranges indicated in the table below.

Indoor unit	Central control address setting range
Indoor unit compatible with Uh Line	1-128
Indoor unit not compatible with Uh Line	1-64

Central control device	Central control address setting range
When used together with a central control device compatible with Uh Line	1-128
When used together with a central control device not compatible with Uh Line	1-64

A single Modbus interface uses three Modbus slave addresses. (One address for the current interface and two addresses for potential interfaces.)
As shown in the table below, the reply target of the Modbus interface varies according to the slave address for Modbus communication.

Slave address	Target air conditioner
Address set in Modbus interface	Operating status can be read and settings can be changed for indoor units with central control address 1 to 64.
Address set in Modbus interface +1	Operating status can be read and settings can be changed for indoor units with central control address 65 to 128.
Address set in Modbus interface +2	Reserved



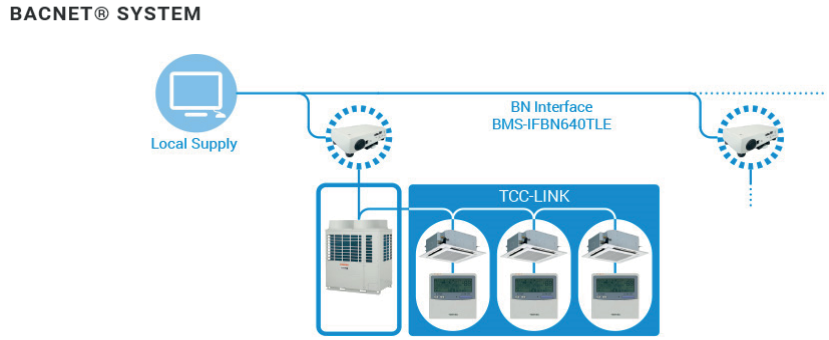
When two or more Modbus interfaces are connected to a single line RS-485 bus, set the slave addresses of the Modbus interface as indicated in the table below.

Modbus interface	Slave address
No.1	1
No.2	4
No.3	7
No.4	10
No.5	13

4-7 BN Interface

The BN interface refers to equipment used for controlling Building Management Systems (Procured locally) and air conditioners (TCC-LINK compatible models) through communications via a network to enable centralized control.

Outline

Appearance	Application
	

Specifications

Part name		BN Interface
Model Name		BMS-IFBN640TLE
Power supply		220 - 240 VAC 50/60Hz
Dimension		140 (H) × 90 (W) × 45 (D) mm
Max number	Indoor unit	64
per one controller	TU2C-LINK / TCC-LINK bus	1
Communication port		10BASE-T/100BASE-TX for upper system
Network specification		ANSI/ASHRAE Standard 135-2008 BACnet Application Specific Controller (B-ASC)
Documents		Installation manual
		BN Interface Specifications
		PROTOCOL IMPLEMENTATION CONFORMANCE STATEMENT

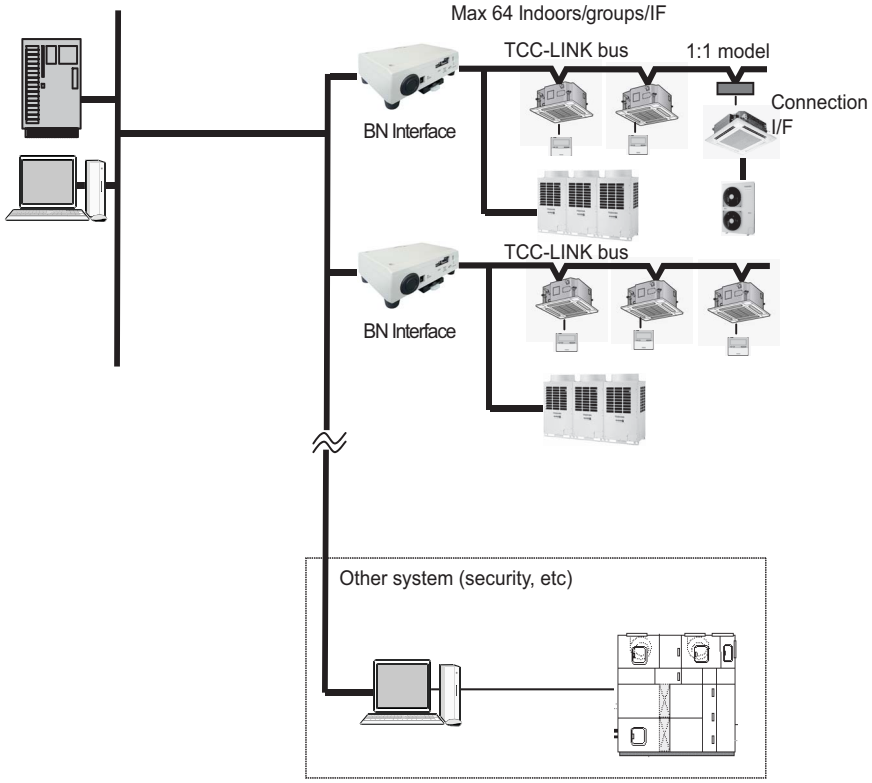
Software

Software name	Explanation
Setting File Creation Software for BMS System	“This software creates a setting file to be used for the air-conditioning management system. Copies created data using the respective system upload function.”

Main functions

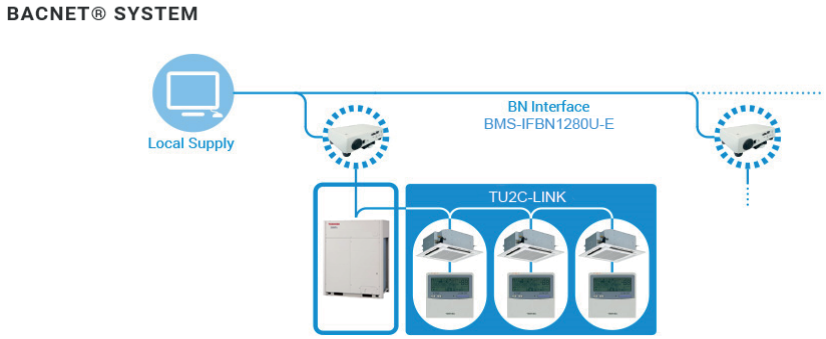
Function	Command	Monitoring
ON/OFF	✓	✓
Mode	Heat, Cool, Dry, Fan, Auto	✓
Setting Temperature	18 - 29 °C	✓
Fan Speed	Auto, Low, Med., High	✓
Louver position	Swing, Fix	✓
Filter sign	✓	✓
Room temperature	-	✓
Permit / Prohibit of Local Operation	On/Off, Mode, Set temp.,	✓
Error status	-	✓
Error Display	-	✓

System configuration



4-8 BN Interface

Outline

Appearance	Application
	

Specifications

Part name		BN Interface	
Model Name		BMS-IFBN1280U-E	
Power supply		220 - 240 VAC 50/60Hz	
Dimension		140 (W) × 90 (H) × 45 (D) mm	
Max number	Indoor unit	64	In the case of system using TCC-LINK communication
		128	In the case of system using TU2C-LINK communication
per one controller	Uh line	1	
Modbus I/F / bus line		15	
Ethernet (LAN)		10BASE-T/100BASE-TX for upper system	
Network specification		ANSI/ASHRAE Standard 135-2008 BACnet Application Specific Controller (B-ASC)	
Documents		Installation manual	
		BN Interface Specifications	
		PROTOCOL IMPLEMENTATION CONFORMANCE STATEMENT	

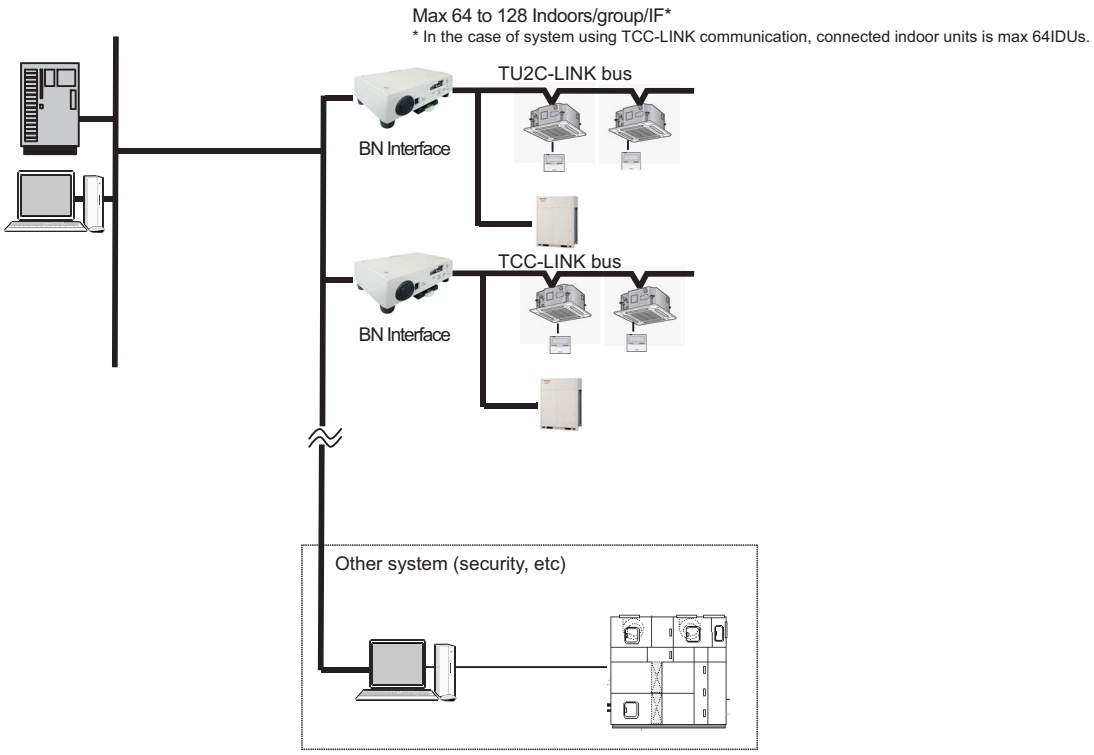
Software

Software name	Explanation
Setting File Creation Software for BMS System	“This software creates a setting file to be used for the air-conditioning management system. Copies created data using the respective system upload function.”

Main functions

Function	Command	Monitoring
ON / OFF	✓	✓
Mode	Heat, Cool, Dry, Fan, Auto	✓
Setting Temperature	18 - 29 °C (Standard FCU) / 16.0 to 27.0 °C (Fresh Air Intake Indoor)	✓
Fan Speed	Auto / HH / H / L / LL	✓
Louver position	Swing, Fix	✓
Filter sign	-	✓
Room temperature	-	✓
Permit/Prohibit of Local Operation	On / Off, Mode, Set temp.,	✓
Error status	-	✓
Error Display	-	✓

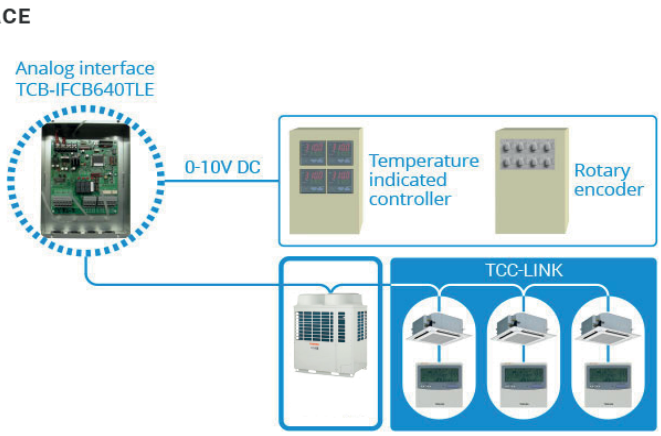
System configuration



4-9 Analog Interface

That Analogue Relay Interface is a device that can be connected directly to the TCC-LINK Central Control network to provide Analogue & Digital Inputs & Outputs for control over Toshiba Air Conditioner products from non-Toshiba Control systems. This Interface is ideal for Integrating the Toshiba Air Conditioner product into basic or PLC BMS control systems, such as may be found in older controls systems.

Outline

Appearance	Application
	

Specifications

Part name		Analog Interface
Model Name		TCB-IFCB640TLE
Power supply		15 VDC ±5%
Dimension		66 × 170 × 200 mm
Max number	Indoor unit	64
per one controller	TU2C-LINK / TCC-LINK bus	1
Input/ Output	Analog input	8
	Analog output	5
	Digital input	2 (*1)
	Digital output	5 (*1)
Documents		Installation manual

(*1) General Purpose Interface (TCB-IFCG1TLE) needed in part.

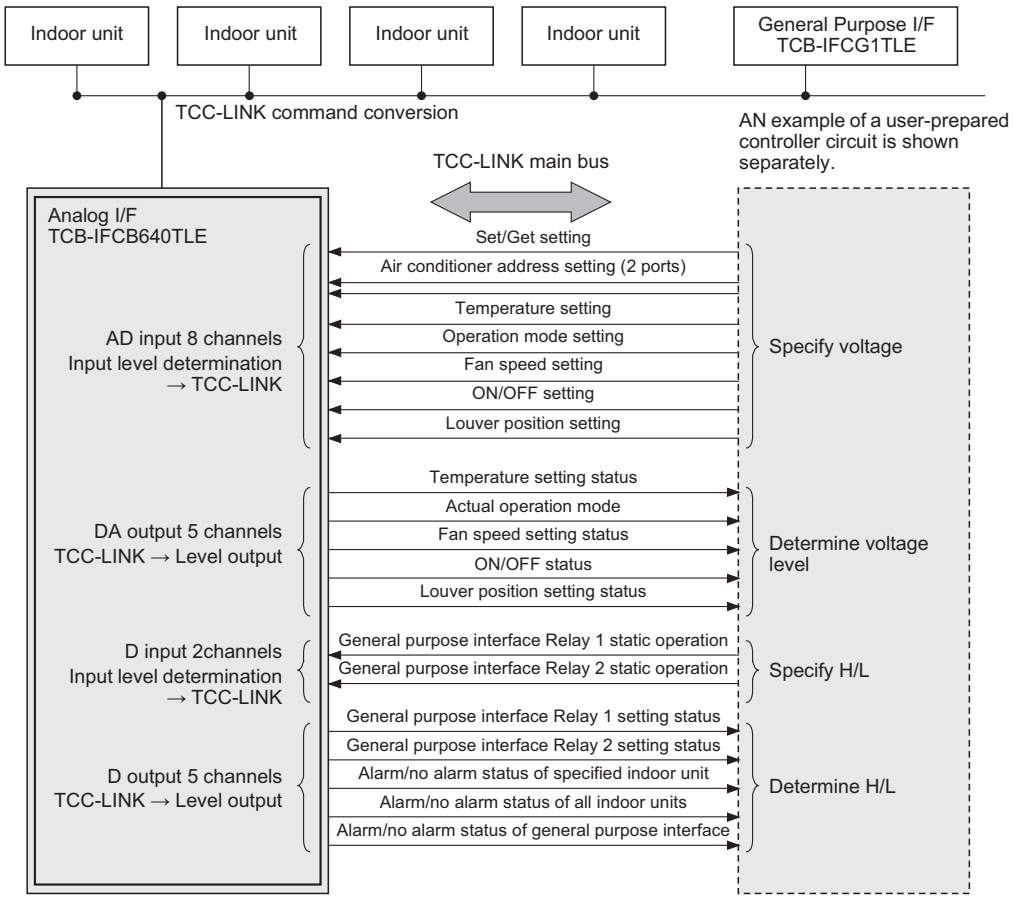
Software

Software name	Explanation
Setting File Creation Software for BMS System	“This software creates a setting file to be used for the air-conditioning management system. Copies created data using the respective system upload function.”

Main functions

Function	Command	Monitoring
ON/OFF	✓	✓
Mode	Heat, Cool, Dry, Fan, Auto	✓
Setting Temperature	18 - 29 °C	✓
Fan Speed	Auto, Low, Med., High	✓
Louver position	Swing, Fix	✓
Filter sign	-	-
Room temperature	-	-
Permit / Prohibit of Local Operation	-	-
Error status	-	✓
Error Display	-	-

System configuration



Input/Output specifications

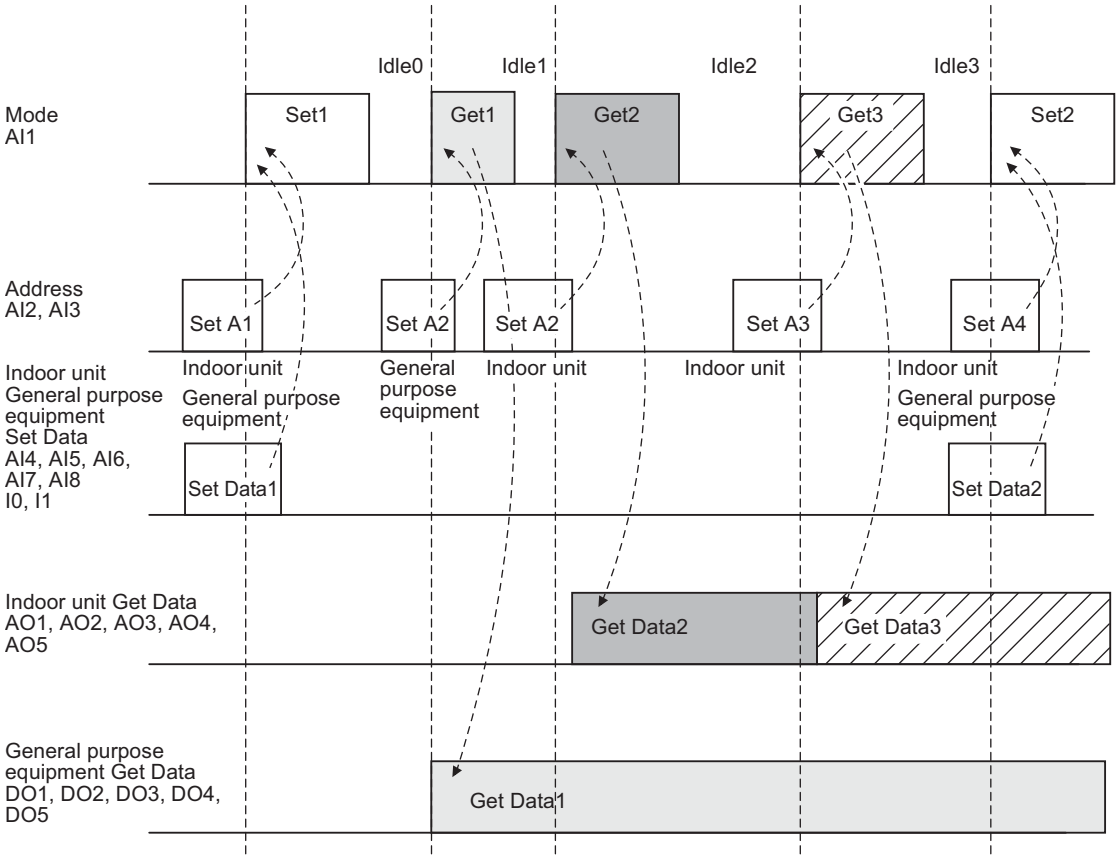
Signal classification		Port name	Data item	Specification
Analog input	0 to 10 V range	AI1 AI2 AI3 AI4 AI5 AI6 AI7 AI8	Input type	Resistor-divided A/D converter input
			Number of input points	2
			Resolution	10 bits, 0 to 1023 levels
			Allowable input voltage range	0.0 V to 10.0 V
			Input resistance	3 k ohm
			Connection circuit output resistance	50 ohm or less
			Conversion time	160 ms
Analog output	0 to 10 V range	AO1 AO2 AO3 AO4 AO5	Output type	Class-C push-pull
			Output point	5
			Resolution	8 bits, 0 to 255 levels
			Output voltage range	0.0 V to 10.0 V
			Maximum output source current	10 mA
			Connection circuit load resistance	10 k ohm or more
			Conversion time	10 μS
Digital output		DO1 DO2 DO3 DO4 DO5	Output type	Insulated by photocoupler
			Output point	5
			Maximum output current	10 mA
			Maximum voltage (between DO and Com)	DC 55 V
			Maximum voltage (between Com and DO)	DC 7 V
Digital input		DI5 DI6	Input type	Insulated by photocoupler
			Input point	2
			Input resistance	100 ohm
			Minimum input ON current	2 mA
			Maximum allowable input ON current	30 mA
			Maximum input OFF current	0.05 mA

Analog/Digital specifications

No.	Name	Description	In/Out	Connector
S0	Set/Get/Idle	Sets mode.	Analog In	AI1
S1	Address set	Sets the lower 3 bits of central control address.		AI2
S2	Address set	Sets the lower 3 bits of central control address.		AI3
S3	Set Point Temperature set	Room temperature setting value 16 to 29°C (in units of 1°C)		AI4
S4	Operation Mode set	Sets operation mode.		AI5
S5	Fan Speed set	Sets fan speed.		AI6
S6	Indoor ON/OFF set	Sets ON/OFF.		AI7
S7	Louver set	Sets louver position.		AI8
SO1	Set Point Temperature set value	Temperature set value status 18 (16) to 29 (27)°C (in units of 1°C)		AO1
SO2	Operation Mode status	Actual operation mode		AO2
SO3	Fan Speed set status	Fan speed set status		AO3
SO4	Indoor ON/OFF status	ON/OFF status, communication failure status, and internal error status		AO4
SO5	Louver set status	Louver position set status		AO5
	Relay 1 set for General Purpose I/F	Relay setting for general purpose interface TCB-IFCG1TLE (1: on, 0: off)		DI5
	Relay 2 set for General Purpose I/F	Relay setting for general purpose interface TCB-IFCG1TLE (1: on, 0: off)		DI6
	Alarm status output for General Purpose I/F	General purpose interface TCB-IFCG1TLE alarm input status (1: alarm, 0: no alarm)		DO3
	Alarm status	Specified indoor unit (1: alarm, 0: no alarm)		DO5
	Alarm status	All indoor units (1: alarm, 0: no alarm)		DO4
	Relay 1 set status for General Purpose I/F	Relay set value for general purpose interface TCB-IFCG1TLE (1: on, 0: off)		DO1
	Relay 2 set status for General Purpose I/F	Relay set value for general purpose interface TCB-IFCG1TLE (1: on, 0: off)		DO2

Setting input timing chart

The AI1 Input Mode will always have an “Idle mode” inserted between and Set (Setting) of Get (Status acquisition) operation when they are transmitted.
During a “Set” operation, the Indoor unit Central Control address specified by AI2 and AI3 immediately after the transition to the “Set” mode is read, and the value to be set is applied to the indoor unit.
The setting value is read and set ONLY during the transition to the Set mode.
During a Get operation, the indoor unit central control address specified by AI2 and AI3 immediately after transition to the Get mode is read, and the address status is output to AO1, AO2, AO3, AO4, and AO5.
This output value is retained until the next Get operation is performed.
General purpose equipment addresses are retained as DO1, DO2, DO3, DO4, and DO5 outputs separately from indoor unit addresses until the next general purpose equipment Get operation is performed.
The process moves to Set or Get mode from the specified idle voltage.
Retain AI4, AI5, AI6, AI7, AI8, I0, and I1 address setting data for 200 ms after transition to the Set mode as input condition.
For AI1 Set or Get, retain the value for 200 ms after transition from the idle mode.



5

Outdoor unit optional devices

5-1 Line up & function

Outdoor unit optional devices for SMMS-u

Type	Power peak-cut control board	External master ON/OFF control board	Output control board
Model Name	**TCB-PCDM4E**	**TCB-PCMO4E**	**TCB-PCIN4E**
Appearance			
Power peak-cut control (Standard)	✓	-	-
Power peak-cut control (Expand)	✓	-	-
Snowfall fan control	-	✓	-
External master ON/OFF control	-	✓	-
Night operation (Sound reduction) control	-	✓	-
Operation mode selection control	-	✓	-
Error /Operation output control	-	-	✓
Compressor operation output	-	-	✓
Operation rate display	-	-	✓
Kind of digital input / output	2 / 1	6 / -	- / 8

5-2 Optional printed circuit board (PCB) of outdoor unit

Optional control P.C. boards provide access to a range of functions as listed below.

No.	Function		Outdoor unit for control P.C. board Connection	Control P.C. board be used			Outdoor unit interface P.C. board setting*			
				TCB-PCDM4E	TCB-PCMO4E	TCB-PCIN4E	Connector No.	DIP SW No.	Bit ON	Outdoor DN Code (O.DN)
1	Power peak-cut Control (Standard)	Threshold capacity setting	Header unit	✓	-	-	CN513 (blue)	-	-	[009] = 0 (factory default)
	Power peak-cut Control (Standard)	Threshold power consumption setting	Header unit	✓	-	-	CN513 (blue)	-	-	[009] = 1
	Power peak-cut Control (For one input function)	Threshold capacity setting	Header unit	✓	-	-	CN513 (blue)	SW105	1	[009] = 0 (factory default)
	Power peak-cut Control (For one input function)	Threshold power consumption setting	Header unit	✓	-	-	CN513 (blue)	SW105	1	[009] =1
2	Power peak-cut Control (Enhanced Function)	Threshold capacity setting	Header unit	✓	-	-	CN513 (blue)	SW105	2	[009] = 0 (factory default)
	Power peak-cut Control (Enhanced Function)	Threshold power consumption setting	Header unit	✓	-	-	CN513 (blue)	SW105	2	[009] = 1
3	Snowfall fan Control		Header unit	-	✓	-	CN509 (black)	-	-	-
4	External master ON/OFF Control		Header unit	-	✓	-	CN512 (blue)	-	-	-
5	Night operation (Sound reduction) Control		Header unit	-	✓	-	CN508 (red)	-	-	-
6	Operation Mode Selection Control		Header unit	-	✓	-	CN510 (white)	-	-	[008] = 0 (factory default)
	Operation Mode Selection Control (forced choice)		Header unit	-	✓	-	CN510 (white)	-	-	[008] = 1
7	Error/Operation output		Header unit	-	-	✓	CN511 (green)	-	-	-
8	Compressor Operation Output		Individual outdoor unit	-	-	✓	CN514 (green)	-	-	[012] = 0 (factory default)
9	Operating Rate Output		Header unit	-	-	✓	CN514 (green)	-	-	[012] = 1

To limit a maximum power, set the outdoor unit O.DN code to [009]=1, and set the criteria value of a maximum power consumption with O.DN code [00A], [00B], [00C] and [00D]. Input the values for both cooling and heating.
Outdoor unit DN Code (O.DN) [00C], [00D]
Criteria value setting for a maximum cooling power
(e.g.) When the maximum standard value of cooling power consumption is set as 19.35 kW = 19.35kW

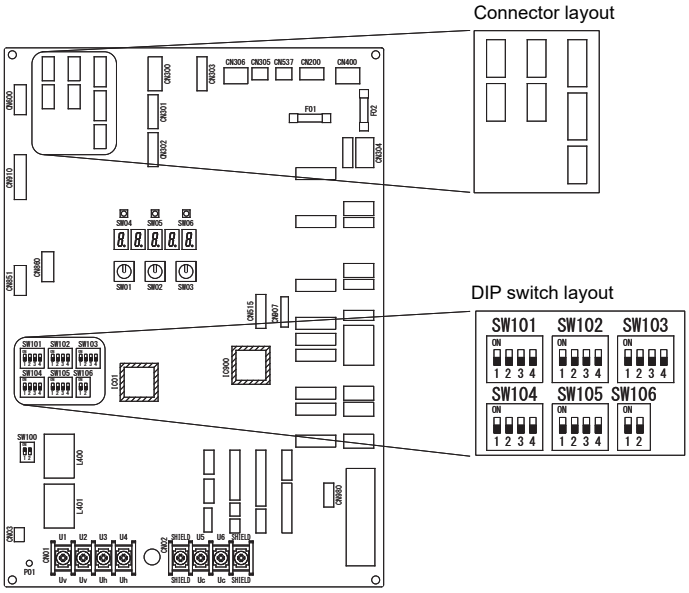
Outdoor unit DN Code (O.DN)	[00C]	[00D]
Value	19	35

Outdoor unit DN Code (O.DN) [00A], [00B]
Criteria value setting for a maximum heating power
(e.g.) When the maximum standard value of heating power consumption is set as 14.00 kW= 14.00kW

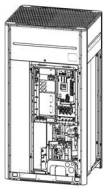
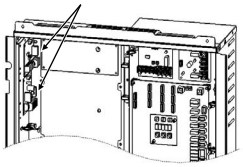
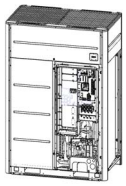
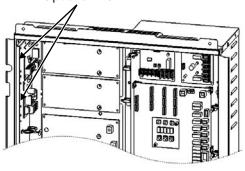
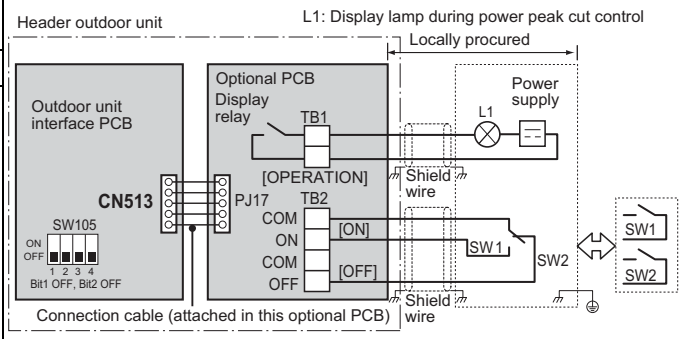
Outdoor unit DN Code (O.DN)	[00A]	[00B]
Value	14	00

Layout of Outdoor Unit Interface P.C. Board

* DIP switch settings vary from function to function.



5-3 Power peak-cut control board (TBC-PCDM4E)

Model name	Appearance	Function
TCB-PCDM4E	 Size: 71 x 85 (mm) **Application**  MMY-MUP080 to140 Optional PCB   MMY-MUP160 to 200, MMY-MUP220 to 240 Optional PCB  (max. number installed: 1pc) * Install the optional PCB in the outdoor header unit.	**[1] Power peak-cut Control** • **Purpose: Limiting air conditioning performance with external signals and decreasing the peak power consumption.** • **Feature** The upper limit capacity of the outdoor unit is restricted based on the outdoor power peak selected setting. **Standard Specifications** (Wiring example)  For SW1 and SW2, be sure to provide no-voltage contacts for each terminal. The input signals of SW1 and SW2 may be pulse input (100 m sec or more) or continuous make. Do not turn on [SW1] and [SW2] simultaneously. **[2-stage switching] < SW105 bit1 OFF, bit2 OFF >**

	Optional PCB			Outdoor unit interface PCB			
	Input		Display relay	SW105		Outdoor DN Code [00E]	
	SW1	SW2	(L1)	Bit1	Bit2	factory default [00E]=15	[00E]=0~10
Input demand OFF signal to release the demand	OFF	ON	OFF	OFF	OFF	100% (normal operation)	100% (normal operation)
Input demand ON signal to control the demand	ON	OFF	ON			0% (forced stop)	Approx. X% (50%~100%) (upper limit regulated)

* The upper limit Z% can be regulated with the outdoor DN Code (O.DN) [00E]

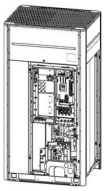
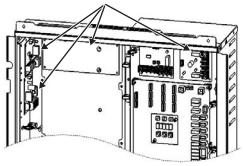
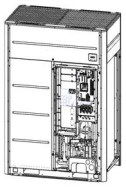
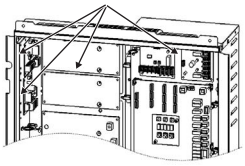
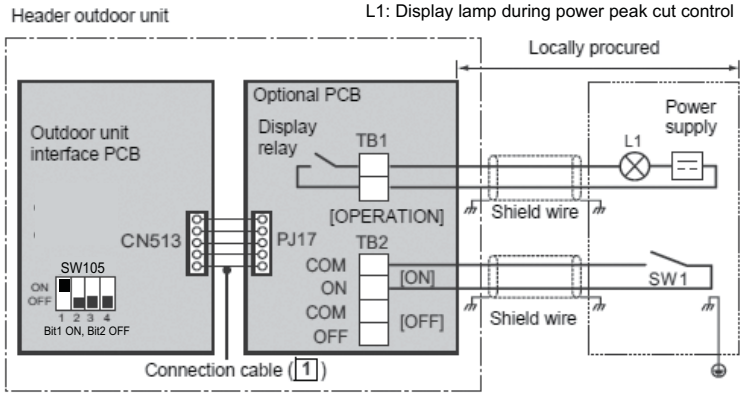
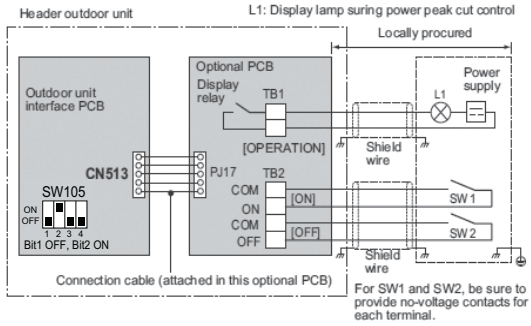
Outdoor unit DN Code (O.DN) [00E]	X
0	100%
1	95%
2	90%
3	85%
4	80%
5	75%
6	70%
7	65%
8	60%
9	55%
10	50%
15 (factory default)	0% (forced stop)

Note1: Specifications of display relay contact
- The terminal for display output ([Operation] terminal) must satisfy the following electrical rating.

<Electrical Rating>
220 to 240 VAC, 10 mA or more, 1 A or less
24 VAC, 10 mA or more, 1 A or less (non-conductive load)

When connecting a conductive load (e.g. relay coil) to the display relay load, insert a surge killer CR (for an AC power supply) or a diode for preventing back electromotive force (for a DC power supply) on the bypass circuit. The optional P.C. board should be connected to the header outdoor unit (U1).

Note2: Specifications of COM terminal
(1) For SW*, be sure to use non-voltage contacts for each terminal.
(2) COM terminals are DC12 V output with a basic insulation.
Use a switch (relay or photo coupler) isolated from a controller (locally procured) for CO (Change-Over) contact or NO (normally-open) contact.
DC12 V has a current-limiting resistor of 3.3 Ω.
To use the relay, confirm a minimum applicable load for each relay and select the suitable relay to avoid a poor contact.

Model name	Appearance	Function
TCB-PCDM4E	 Size: 71 x 85 (mm) **Application**  MMY-MUP080 to 140 Optional PCB   MMY-MUP160 to 200, MMY-MUP220 to 240 Optional PCB  (max. number installed: 1pc) * Install the optional PCB in the outdoor header unit.	**For one input function (This function is possible only on the SMMS-u)** Setting SW105 bit1 on I/F P.C.board of the header outdoor unit to ON allows ON/OFF power peak-cut control to be switched using [ON] terminal input (SW1) alone. (Wiring example)  **[2-stage switching] <SW105 bit1 ON, bit2 OFF>** Power peak-cut control turns ON when SW 1 in the wiring example is ON (continuous make). * The upper limit Z% can be regulated with the outdoor DN Code (O.DN) [00E]. **Enhanced Specifications** (Wiring example)  Note1: Specifications of display relay contact • The terminal for display output ([Operation] terminal) must satisfy the following electrical rating. <Electrical Rating> 220 to 240 VAC, 10 mA or more, 1 A or less 24 VAC, 10 mA or more, 1 A or less (non-conductive load) When connecting a conductive load (e.g. relay coil) to the display relay load, insert a surge killer CR (for an AC power supply) or a diode for preventing back electromotive force (for a DC power supply) on the bypass circuit. The optional P.C. board should be connected to the header outdoor unit (U1). Note2: Specifications of COM terminal (1) For SW*, be sure to use non-voltage contacts for each terminal. (2) COM terminals are DC12 V output with a basic insulation. Use a switch (relay or photo coupler) isolated from a controller (locally procured) for CO (Change-Over) contact or NO (normally-open) contact. DC12 V has a current-limiting resistor of 3.3 Ω. To use the relay, confirm a minimum applicable load for each relay and select the suitable relay to avoid a poor contact.

	Optional PCB		Outdoor unit interface PCB			
	Input	Display relay	SW105		Outdoor DN Code [00E]	
	SW1	(L1)	Bit1	Bit2	factory default [00E]=15	[00E]=0~10
Input demand OFF signal to release the demand	OFF	OFF	ON	OFF	100% (normal operation)	100 % (normal operation)
Input demand ON signal to control the demand	ON	ON			0% (forced stop)	Approx. X% (50%~100%) (upper limit regulated)

Model name	Appearance	Function
TCB-PCDM4E		**[4-stage switching] <SW105 Bit1 ON, Bit2 ON>**

	Optional PCB			Outdoor unit interface PCB			
	Input		Display relay	SW105		Outdoor DN Code [**]	
	SW1	SW2	(L1)	Bit1	Bit2	factory default [00E]=15、[00F]=8、[010]=4	[00E]=X、[00F]=Y、[010]=Z
Input demand OFF signal to release the demand	OFF	OFF	OFF	OFF	ON	100% (normal operation)	100% (normal operation)
Input demand ON signal to control the demand	ON	OFF	ON			Approx. 80% (upper limit regulated)	Approx. Z% (50%～100%) (upper limit regulated)
Input demand ON signal to control the demand	OFF	ON	ON			Approx. 60% (upper limit regulated)	Approx. Y% (50%～100%) (upper limit regulated)
Input demand ON signal to control the demand	ON	ON	ON			0%（forced stop）	Approx. X% (50%～100%) (upper limit regulated)

* The upper limit X%, Y%, Z% can be regulated with the outdoor DN Code (O.DN) [00E] [00F] [010].

Outdoor DN Code (O.DN) [00E]	X
0	100%
1	95%
2	90%
3	85%
4	80%
5	75%
6	70%
7	65%
8	60%
9	55%
10	50%
15（factory default）	0% (forced stop)

Outdoor DN Code (O.DN) [00F]	Y
0	100%
1	95%
2	90%
3	85%
4	80%
5	75%
6	70%
7	65%
8（factory default）	60%
9	55%
10	50%
15	0% (forced stop)

Outdoor DN Code (O.DN) [010]	Z
0	100%
1	95%
2	90%
3	85%
4（factory default）	80%
5	75%
6	70%
7	65%
8	60%
9	55%
10	50%
15	0% (forced stop)

Power peak-cut control by power consumption

Peak cut control by power consumption can be set with Outdoor DN CODE (O.DN) [009].
Peak cut control by power consumption adjusts the outdoor unit output so that the power consumption does not exceed the upper limit control value.

[1] Setting “Outdoor DN [009] = 1” changes the control method to peak cut control by power consumption. (Setting “Outdoor DN [009] = 0” returns the control method to normal peak cut control.)

[2] Check Outdoor DN [00A] to [00D] to make sure that upper power limit reference values for cooling and heating are registered.

Outdoor DN Code (O.DN) [00C], [00D] Threshold cooling power setting
Ex. Factory default setting (Rated cooling power) = 19.35 kW

Outdoor DN Code(O.DN)	[00C]	[00D]
Value	19	35

Outdoor unit DN Code (O.DN) [00A], [00B] Heating upper limit power standard setting
Ex. The upper limit of heating power consumption setting = 14.00kw

Outdoor DN Code(O.DN)	[00A]	[00B]
Value	14	00

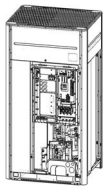
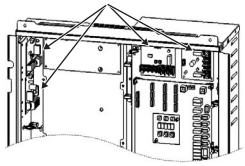
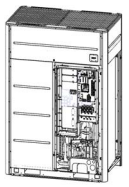
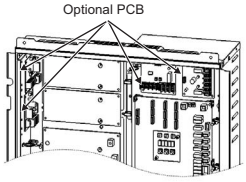
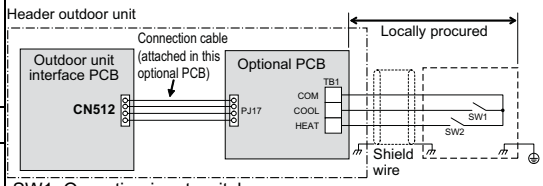
[3] When an ON signal is input from the optional PCB, peak cut control by power consumption is enabled. The way to input the ON signal is the same as with normal peak cut control. Refer to the sections on “Standard Specifications”, “For one input function” and “Enhanced Specifications”.

Based on the upper power limit reference values registered in [2], the outdoor unit capacity is adjusted so that the upper limit control value set with Outdoor DN Code (O.DN) [00E], [00F], and [010] is not exceeded.

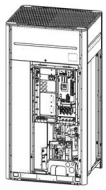
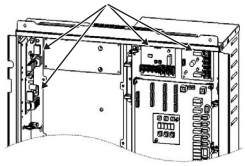
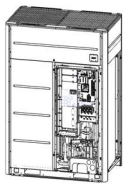
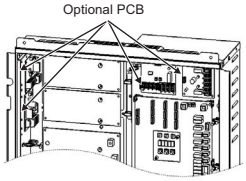
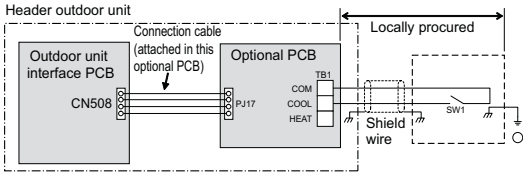
NOTE:

* To protect the cycle, peak cut control by power consumption may not be carried out. (During defrosting operation, oil recovery operation, coolant recovery operation, etc.)
* The value of power consumption is computed by estimation, so an error of about ±5% from the actual value occurs.
  If you want to perform accurate peak cut control by power consumption and demand control, use a power meter and demand controller.
* If the desired effect cannot be obtained, e.g. if the power consumption does not go down as much as expected, make adjustment by changing the set values of power upper limit reference and coefficient α (upper limit control (%)).

5-4 External master ON/OFF control board (TCB-PCMO4E)

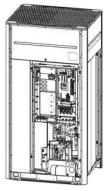
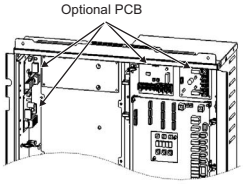
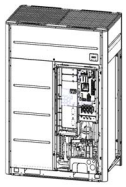
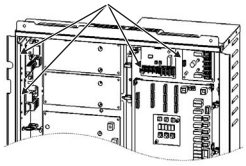
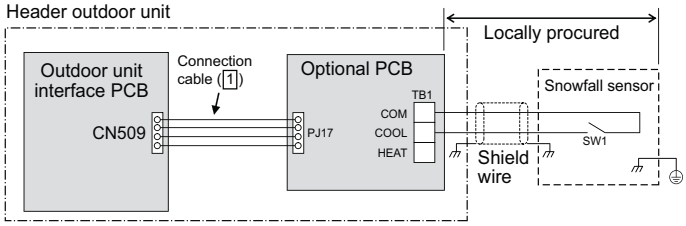
Model name	Appearance	Function
TCB-PCMO4E	 Size: 55.5 x 60 (mm) **Application**  MMY-MUP080 to 140 Optional PCB   MMY-MUP160 to 200, MMY-MUP220 to 240 Optional PCB  (max. number installed: 1pc) * Install the optional PCB in the outdoor header unit.	**[2] External master ON/OFF control** • Feature The outdoor unit starts or stop the system. • Function By connecting the cable (attached in this optional PCB) to the interface PC board on an outdoor unit, all indoor units connected to the outdoor unit enable to operate simultaneously. • Operation The outdoor unit connection is for the header unit (U1).  SW1: Operation input switch SW2: Stop input switch **Terminal** / **Input signal** / **Operation** [SW1] COOL — 100ms; The state of ON/OFF does not matter after 100ms from the signal input; ON; OFF; Accept operation start; SW1 OFF before transmit batch-stop signal — All indoor units operate together [SW2] HEAT — 100ms; ON; OFF; Accept operation stop; Batch-operation; Batch-stop — All indoor units stop together The input signal is recognized during its falling phase. (After reaching the bottom of the falling edge, the signal must remain there for at least 100 ms.) The control turned ON first is valid, and the control turned ON later is not accepted when cooling (SW1) and Heating (SW2) input ON at one time. Note (1) For SW*, be sure to use non-voltage contacts for each terminal. (2) COM terminals are DC12 V output with a basic insulation. Use a switch (relay or photo coupler) isolated from a controller (locally procured) for CO (Change-Over) contact or NO (normally-open) contact. DC12 V has a current-limiting resistor of 3.3 Ω. To use the relay, confirm a minimum applicable load for each relay and select the suitable relay to avoid a poor contact.

5-5 Night time operation (sound reduction) control (TCB-PCMO4E)

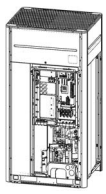
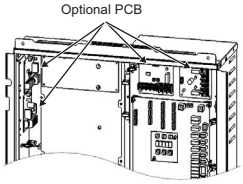
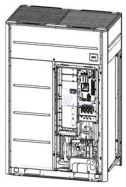
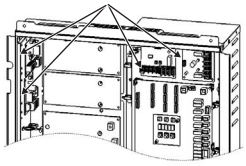
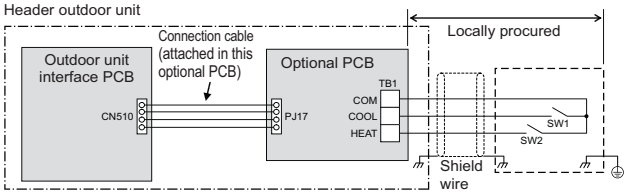
Model name	Appearance	Function
TCB-PCMO4E	 Size: 55.5 x 60 (mm) **Application**  MMY-MUP080 to 140 Optional PCB   MMY-MUP160 to 200, MMY-MUP220 to 240 Optional PCB  (max. number installed: 1pc) * Install the optional PCB in the outdoor header unit.	**[3] Night time operation (sound reduction) control** • Purpose: Reducing noise from an outdoor unit • Feature Sound level can be reduced by restricting the compressor and fan speed • Function As the cable (attached in this optional PCB) is connected to the “Interface PCB” on an outdoor unit, both compressor speed and fan speed are restricted while the signal of the night operation control is input. It makes the noise reduction during the night time operation. • Operation The outdoor unit connection is for the header unit (U1).  SW1: Night time signal switch Terminal / Input signal / Operation COOL (SW1): ON → OFF — All indoor units operate together COOL (SW1): ON → OFF — All indoor units stop together Each terminal should be connected to dry contact. The input signal is recognized during its rising/falling phase. (After reaching the top/bottom of the rising/falling edge, the signal must remain there for at least 100 ms.) Note (1) For SW*, be sure to use non-voltage contacts for each terminal. (2) COM terminals are DC12 V output with a basic insulation. Use a switch (relay or photo coupler) isolated from a controller (locally procured) for CO (Change-Over) contact or NO (normally-open) contact. DC12 V has a current-limiting resistor of 3.3 Ω. To use the relay, confirm a minimum applicable load for each relay and select the suitable relay to avoid a poor contact. **Sound reduction and approximation capacity (reference)** Condition Cooling: (Indoor 27 deg DB, 19 deg WB) (Outdoor temperature 25 deg DB) Heating: (Indoor 20 deg DB) (Outdoor temperature 7 deg DB, 6 deg WB)

Outdoor unit	Night operation sound reduction dB (A) (COOL/HEAT)	Capacity	
		COOL	HEAT
0801 type	50 / 50	Approx. 85%	Approx. 80%
1001 type	50 / 50	Approx. 70%	Approx. 65%
1201 type	50 / 50	Approx. 60%	Approx. 55%
1401 type	50 / 50	Approx. 70%	Approx. 65%
1601 type	53 / 53	Approx. 70%	Approx. 70%
1801 type	54 / 54	Approx. 65%	Approx. 65%
2001 type	54 / 54	Approx. 60%	Approx. 60%
2201 type	54 / 54	Approx. 55%	Approx. 55%
2401 type	54 / 54	Approx. 55%	Approx. 55%

5-6 Snowfall fan control (TCB-PCMO4E)

Model name	Appearance	Function
TCB-PCMO4E	 Size: 55.5 x 60 (mm) **Application**  MMY-MUP080 to 140 Optional PCB   MMY-MUP160 to 200, MMY-MUP220 to 240 Optional PCB  (max. number installed: 1pc) * Install the optional PCB in the outdoor header unit.	**[4] Snowfall fan control** • Purpose: Rotating the fan to prevent snow accumulation • Feature Outdoor fan is operated from the snowfall signal received from the outside. **▼Functions** The outdoor unit fan operates at snowfall by connecting to the outdoor unit interface PCB. **▼Operation**  SW1: Snowfall selection switch (snowfall sensor) **Terminal** / **Input signal** / **Operation** Cooling (SW1): ON / OFF — Snowfall fan control (Fan in outdoor unit operates.) Cooling (SW1): ON / OFF — Normal operation Be sure to provide no-voltage continuous contacts for each terminal. Note (1) For SW*, be sure to use non-voltage contacts for each terminal. (2) COM terminals are DC12 V output with a basic insulation. Use a switch (relay or photo coupler) isolated from a controller (locally procured) for CO (Change-Over) contact or NO (normally-open) contact. DC12 V has a current-limiting resistor of 3.3 Ω. To use the relay, confirm a minimum applicable load for each relay and select the suitable relay to avoid a poor contact.

5-7 Operation mode selection control (TCB-PCMO4E)

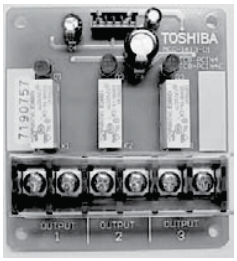
<table>
<tr><th>Model name</th><th>Appearance</th><th>Function</th></tr>
<tr><td rowspan="2">TCB-PCMO4E</td><td> 
Size: 55.5 x 60 (mm)
Application
 
MMY-MUP080 to 140
Optional PCB
 

MMY-MUP160 to 200,
MMY-MUP220 to 240
Optional PCB
 
(max. number installed: 1pc)
* Install the optional PCB in the outdoor header unit.</td><td>
[5] Operation mode selection control
• Purpose: Limiting operation modes to cooling and heating only
• Feature
This control can restrict the selectable operation mode.
▼Functions
The heating/cooling mode of the system can be selected by connecting to the interface PCB of outdoor units.
▼Operation
The outdoor unit connection is for the header unit (U1).


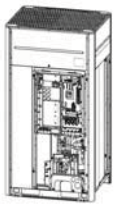
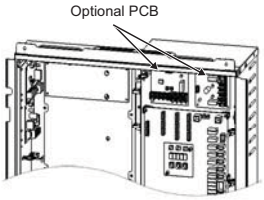
SW1: Cooling mode specified input switch
SW2: Heating mode specified input switch
<table>
<tr><th colspan="2">Input Signal</th><th rowspan="2">Operation: Selected operation mode</th></tr>
<tr><th>Cool (SW1)</th><th>Heat(SW2)</th></tr>
<tr><td>OFF</td><td>OFF</td><td>Normal operation</td></tr>
<tr><td>ON</td><td>OFF</td><td>Cooling operation only</td></tr>
<tr><td>OFF</td><td>ON</td><td>Heating operation only</td></tr>
</table>
Each terminal should be connected to dry contact.
About Switching of Processing of Indoor Unit Operation State
Processing of the operation state can be switched for indoor units in a mode other than the selected operation mode by setting the Outdoor DN code [008] of the header outdoor unit interface PCB.
<table>
<tr><th>Outdoor DN Code (O.DN) [008]</th><th>Details of Processing</th></tr>
<tr><td>O.DN [008] = 0
(factory default)</td><td>Unallowed indoor units in a mode other than the P.C.board selection modes are not treated as priority (thermostat OFF state).
<table>
<tr><th rowspan="2">P.C. board selection mode</th><th colspan="2">Input Signal</th><th rowspan="2">Remote control</th><th rowspan="2">Operation State</th></tr>
<tr><th>COOL (SW1)</th><th>HEAT (SW2)</th></tr>
<tr><td rowspan="3">Normal</td><td rowspan="3">OFF</td><td rowspan="3">OFF</td><td>❄ or 💧</td><td rowspan="3">Follow the remote controller.</td></tr>
<tr><td>☀</td></tr>
<tr><td>🌀</td></tr>
<tr><td rowspan="3">Cooling operation only allowed</td><td rowspan="3">ON</td><td rowspan="3">OFF</td><td>❄ or 💧</td><td>Follow the remote controller (Normal cooling operation).</td></tr>
<tr><td>☀</td><td>Thermostat OFF (Air blow operation at super-slow blow rate)</td></tr>
<tr><td>🌀</td><td>Follow the remote controller (Normal air blow operation).</td></tr>
<tr><td rowspan="3">Heating operation only allowed</td><td rowspan="3">OFF</td><td rowspan="3">ON</td><td>❄ or 💧</td><td>Thermostat OFF (Air blow operation at blow rate set on remote control)</td></tr>
<tr><td>☀</td><td>Follow the remote controller (Normal heating operation).</td></tr>
<tr><td>🌀</td><td>Follow the remote controller (Normal air blow operation).</td></tr>
</table>
</td></tr>
</table>
</td></tr>
</table>

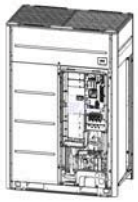
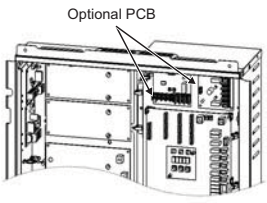
<table>
<tr><th>Model name</th><th>Appearance</th><th>Function</th></tr>
<tr><td>TCB-PCMO4E</td><td></td><td>
<table>
<tr><td>O.DN [008]= 1</td><td>Only operation modes and air blow operation selected on the P.C.board can be selected on the remote controller.
When the input signal is turned ON, indoor units operated in a mode other than the P.C.board selection mode are forcibly switched to the P.C.board selection modes.
<table>
<tr><th rowspan="2">P.C. board selection mode</th><th colspan="2">Input Signal</th><th rowspan="2">Remote control</th><th rowspan="2"></th></tr>
<tr><th>COOL (SW1)</th><th>HEAT (SW2)</th></tr>
<tr><td>Normal</td><td>OFF</td><td>OFF</td><td>❄, 💧, ☀ or 🌀 can be selected.</td><td></td></tr>
<tr><td>COOL</td><td>ON</td><td>OFF</td><td>• Only ❄, 💧 or 🌀 can be selected.
• Indoor units in Heat mode are forcibly switched to the Cool mode.</td><td rowspan="2">When using the remote control, (mode select control) indicator is displayed.</td></tr>
<tr><td>HEAT</td><td>OFF</td><td>ON</td><td>• Only ☀ or 🌀 can be selected.
• Indoor units in Cool or Dry mocle are forcibly switched to the Heat mode.</td></tr>
</table>
</td></tr>
</table>
The jumper lead is not switched.
Indoor units in a mode other than the selected operation mode are forcibly switched to the selected operation mode.

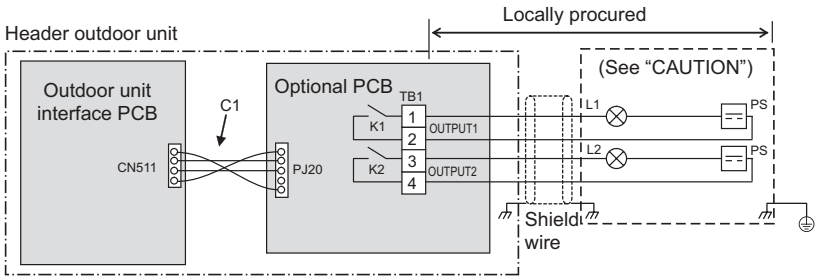
Note
(1) For SW*, be sure to use non-voltage contacts for each terminal.
(2) COM terminals are DC12 V output with a basic insulation.
Use a switch (relay or photo coupler) isolated from a controller (locally procured) for CO (Change-Over) contact or NO (normally-open) contact.
DC12 V has a current-limiting resistor of 3.3 Ω.
To use the relay, confirm a minimum applicable load for each relay and select the suitable relay to avoid a poor contact.
</td></tr>
</table>

5-8 Output control board (TCB-PCIN4E)

<table>
<tr><th>Model name</th><th>Appearance</th><th>Function</th></tr>
<tr><td rowspan="2">TCB-PCIN4E</td><td> 

Size: 73 x 79 (mm)
Application
 
MMY-MUP080 to 140
 


MMY-MUP160 to 200,
MMY-MUP220 to 240
 

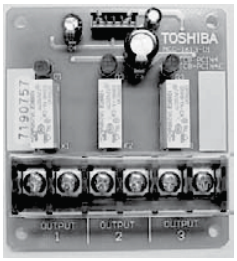
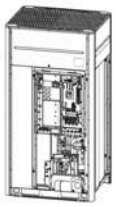
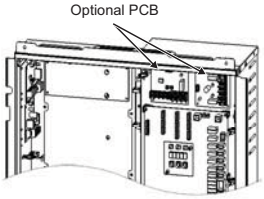
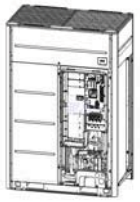
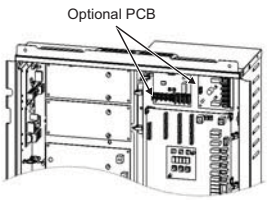
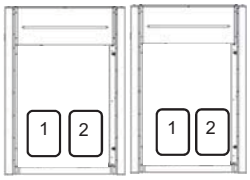
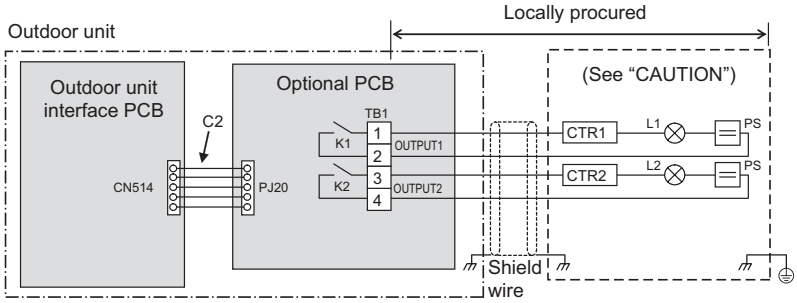
(max. number installed: 1pc)
* Install the optional PCB in the outdoor header unit.</td><td>[6] Error / Operation Output
• Feature
Operation and error monitoring is possible.
▼Function
The operation error output PCB can indicate operation and error states by connecting to the interface PCB of outdoor units.
▼Operation
Operation output: The operation indicator is on while any indoor unit in the system is operating.
Error output: The error indicator is on when an error is occurred on even one of the indoor or outdoor units in the system.
Wiring example
 

<table>
<tr><td>C1</td><td>Attached connection cable 1 (4 wires)</td></tr>
<tr><td>CN511</td><td>Connector on interface side (green)</td></tr>
<tr><td>K1, K2</td><td>Relays</td></tr>
<tr><td>L1</td><td>Error indication Lamp</td></tr>
<tr><td>L2</td><td>Operation indication Lamp</td></tr>
<tr><td>OUTPUT1</td><td>Error output</td></tr>
<tr><td>OUTPUT2</td><td>Operation output</td></tr>
<tr><td>PJ20</td><td>Connector on optional PCB side</td></tr>
<tr><td>PS</td><td>Power supply unit</td></tr>
<tr><td>TB1</td><td>Terminal block</td></tr>
</table>
* [OUTPUT3] is normally output when power is turned out.

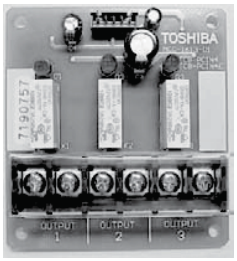
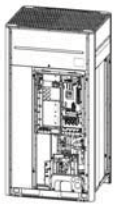
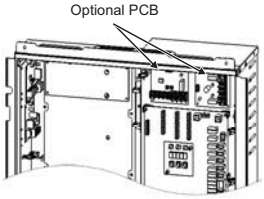
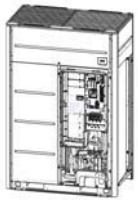
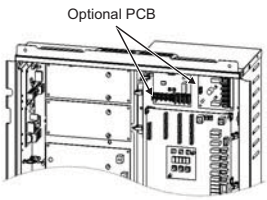
Note1: Output Relay (K1, K2) Contact Specifications
• Output terminals (OUTPUT1, 2) must satisfy the following electrical rating.
• When connecting a conductive load (e.g. relay coil) to loads K1 and K2, insert a surge killer CR (for an AC power supply) or a diode for preventing back electromotive force (for a DC power supply) on the bypass circuit.

<Electrical Rating>
220-240 VAC, 10 mA or more, 1A or less
24 VAC, 10 mA or more, 1 A or less (non-conductive load)</td></tr>
</table>

5-9 Compressor operation output (TCB-PCIN4E)

Model name	Appearance	Function
TCB-PCIN4E	 Size: 73 x 79 (mm) **Application**  MMY-MUP080 to 140 Optional PCB   MMY-MUP160 to 200, MMY-MUP220 to 240 Optional PCB  (max. number installed: 1pc) * Install the optional PCB in the outdoor header unit.	**[7] Compressor Operation Output** • Feature Outputs the operation status of the compressors in each outdoor unit. **▼Function** This function can be applied, for example, to the elapsed operation time count of each compressor mounted on an outdoor unit since the compressor in operation signal can be output externally. **▼Operation** During compressor operation, the relay of the output terminal corresponding to that compressor turns ON (closes) and turns OFF (opens) when compressor operation stops. As shown in the figure, the output terminals are "OUTPUT1" and "OUTPUT2" from the left compressor facing the front of the outdoor unit.  **Wiring example**  Outdoor unit Locally procured Outdoor unit interface PCB Optional PCB (See "CAUTION") C2 CN514 PJ20 TB1 K1 K2 OUTPUT1 OUTPUT2 CTR1 CTR2 L1 L2 PS Shield wire **C2** — **Connector cable 2 (2)** **CN514** — **Connector on interface side (green)** **CTR1** — **Elapsed operation counter 1** **CTR2** — **Elapsed operation counter 2** **K1, K2** — **Relays** **L1, L2** — **Operation indication LEDs** **OUTPUT1** — **Compressor 1 operation output terminal** **OUTPUT2** — **Compressor 2 operation output terminal** **PJ20** — **Connector on optional PCB side** **PS** — **Power supply unit** **TB1** — **Terminal block** Note1: Output Relay (K1, K2) Contact Specifications • Output terminals (OUTPUT1, 2) must satisfy the following electrical rating. • When connecting a conductive load (e.g. relay coil) to loads K1 and K2, insert a surge killer CR (for an AC power supply) or a diode for preventing back electromotive force (for a DC power supply) on the bypass circuit. <Electrical Rating> 220-240 VAC, 10 mA or more, 1A or less 24 VAC, 10 mA or more, 1 A or less (non-conductive load)

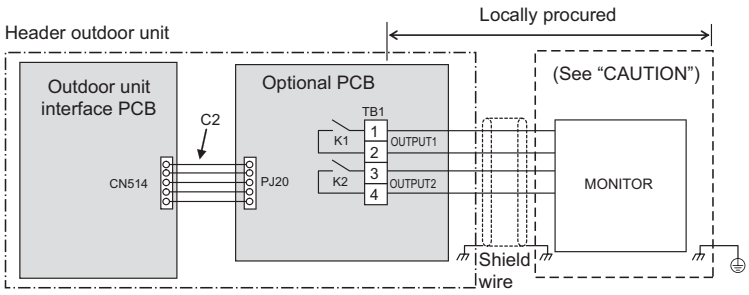
5-10 Operating rate output (TCB-PCIN4E)

Model name	Appearance	Function
TCB-PCIN4E	 Size: 73 x 79 (mm) **Application**  MMY-MUP080 to 140 Optional PCB   MMY-MUP160 to 200, MMY-MUP220 to 240 Optional PCB  (max. number installed: 1pc) * Install the optional PCB in the outdoor header unit.	**[8] Operating Rate Output** • Feature Relay turn ON/OFF depending on the running rate of the system. **▼Functions** The operation state can be remotely checked since the system operating rate signal can be output externally. **▼Operation** As shown in the table, each of the output terminals turns ON (relay closes) and OFF (relay opens) according to the system operating rate.

Functions	Outdoor DN Code (O.DN) [012]	OUTPUT1	OUTPUT2	OUTPUT3	Operating rate FA
System operating rate output	O.DN [012] = 1	OFF	OFF	OFF	FA=0%
		ON	OFF	OFF	0%<FA<20%
		OFF	ON	OFF	20%≤FA<35%
		ON	ON	OFF	35%≤FA<50%
		OFF	OFF	ON	50%≤FA<65%
		ON	OFF	ON	65%≤FA<80%
		OFF	ON	ON	80%≤FA<95%
		ON	ON	ON	95%≤FA

OFF=relay open ON=relay closed

Wiring example



C2	Connector cable 2 (2)
CN514	Connector on interface side (green)
K1, K2, K3	Relays
MONITOR	Monitoring device
OUTPUT1	Output terminal for each function
OUTPUT2	Output terminal for each function
OUTPUT3	Output terminal for each function
PJ20	Connector on optional PCB side
TB1	Terminal block

* Connect optional boards to the center outdoor unit.

Note1: Output Relay (K1, K2) Contact Specifications
- Output terminals (OUTPUT1, 2) must satisfy the following electrical rating.
- When connecting a conductive load (e.g. relay coil) to loads K1 and K2, insert a surge killer CR (for an AC power supply) or a diode for preventing back electromotive force (for a DC power supply) on the bypass circuit.

<Electrical Rating>
220-240 VAC, 10 mA or more, 1A or less
24 VAC, 10 mA or more, 1 A or less (non-conductive load)

6

Indoor unit optional devices

6-1 Line up & function

Type	Remote sensor	Application control kit
Model name	**TCB-TC41U-E**	**TCB-PCUC2E**
Appearance		
On / Off	Remote sensing of indoor air temperature	-
Mode		✓
Setting Temperature		✓
Fan Speed		✓
Permit/Prohibit function		-
Filter dirty indicator		-
Error Display		-
Ventilation		-
TU2C-LINK / TCC-LINK line		-
Digital input / output		-
Analog input / output		-

Type	Fan output (CN32)	Option output (CN60)	Operation terminal (CN61)	Option error input (CN70)	Demand input (CN73)	Outside error input (CN80)
Model Name	**TCB-KBCN32VEE**	**TCB-KBCN60OPE**	**TCB-KBCN61HAE**	**TCB-KBCN70OAE**	**TCB-KBCN73DEE**	**TCB-KBCN80EXE**
Appearance						
On / Off	-	✓ (Monitoring only)	✓	-	-	-
Mode	-	✓ (Monitoring only)	-	-	-	-
Setting Temperature	-	-	-	-	-	-
Fan Speed	-	-	-	-	-	-
Permit/Prohibit function	-	-	✓ (Operation only)	-	-	-
Filter dirty indicator	-	-	-	✓ (Operation only)	-	-
Error Display	-	-	✓	✓ (Operation only)	-	✓ (Operation only)
Ventilation	✓ (Operation only)	-	-	-	-	-
Demand function	-	-	-	-	✓ (Operation only)	-
Digital input / output	1 / -	5 / -	2 / 2	- / 1	- / 1	- / 1

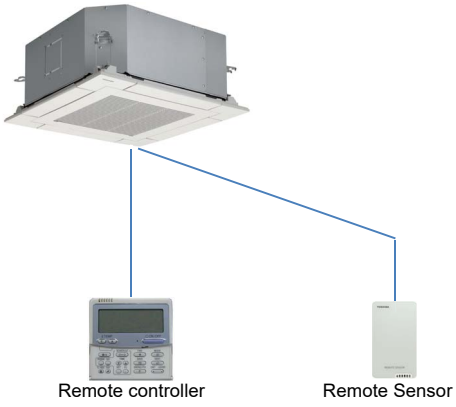
6-2 Indoor connector port existing table

Indoor Unit		Indoor Connector port						TCB-PCUC2E
		CN32	CN60	CN61	CN70	CN73	CN80	
4-way Air Discharge Cassette Type	MMU-UP_1H-E	✓	-	✓	-	-	-	✓
	MMU-UP_1HP-E	✓	-	✓	-	-	-	✓
Compact 4-way Cassette Type	MMU-UP_1MH-E	✓	-	✓	-	-	-	✓
2-way Air Discharge Cassette Type	MMU-UP_1WH-E	✓	-	✓	-	-	-	✓
1-way Air Discharge Cassette Type	MMU-UP_1YH-E	✓	✓	✓	✓	✓	✓	-
	MMU-UP_1SH-E	✓	-	✓	-	-	-	-
Concealed Duct Type	MMD-UP_1BHP-E	✓	✓	✓	✓	✓	✓	-
Slim Duct Type	MMD-UP_1SPH-E	✓	-	✓	-	-	-	✓
Concealed Duct High Static Pressure Type	MMD-UP_1HP-E	✓	✓	✓	✓	✓	✓	-
	MMD-UP_1HP-E (8-10HP)	✓	-	✓	-	-	-	✓
Ceiling Type	MMC-UP_1HP-E	✓	-	✓	-	-	-	✓
High-wall Type	MMK-UP_1HP-E	✓	✓	✓	-	-	✓	-
Floor Standing Concealed Type	MML-UP_1BH-E	✓	✓	✓	✓	✓	✓	-
Floor Standing Cabinet Type	MML-UP_1H-E	✓	✓	✓	✓	✓	✓	-
Floor Standing Type	MMF-UP_1H-E	✓	-	✓	-	-	-	✓
Console Type	MML-UP_1NHP-E	✓	✓	✓	-	-	✓	-
Fresh air intake unit	MMD-UP_1HFP-E (5HP)	✓	✓	✓	✓	✓	✓	-
	MMD-UP_1HFP-E (8-14HP)	✓	-	✓	-	-	-	✓

6-3 Remote sensor

Air temperature sensing at a distance by switching from body sensor max 1 and max 1 wired remote controller on the A/B terminal.

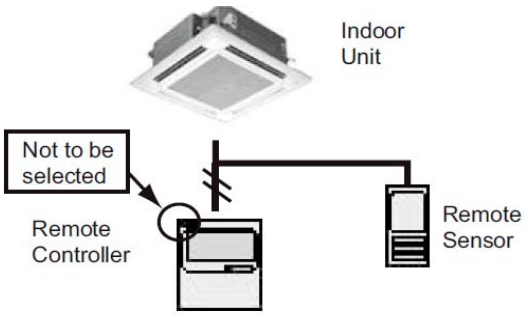
Outline

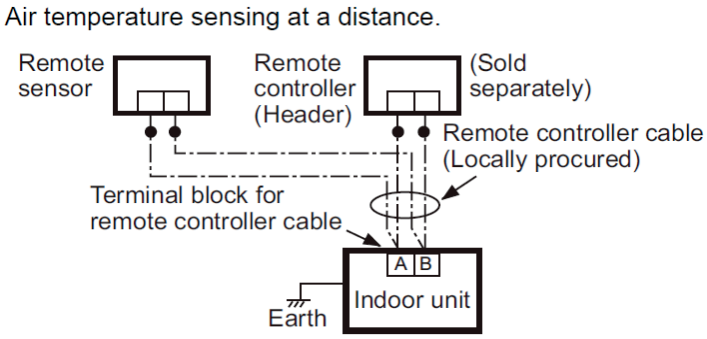
Appearance	Application
	

Specifications

Part name	Remote sensor
Model Name	TCB-TC41U-E
Power supply	DC 7-19 V ± 5% No external power supply is required when CN61 is used.
Dimension	32 × 80 × 125mm
No. of connected indoor units	1 to 8 units for 1 interface (Group connection for 2 or more connected units)
Documents	Installation manual

System configuration



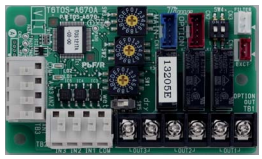
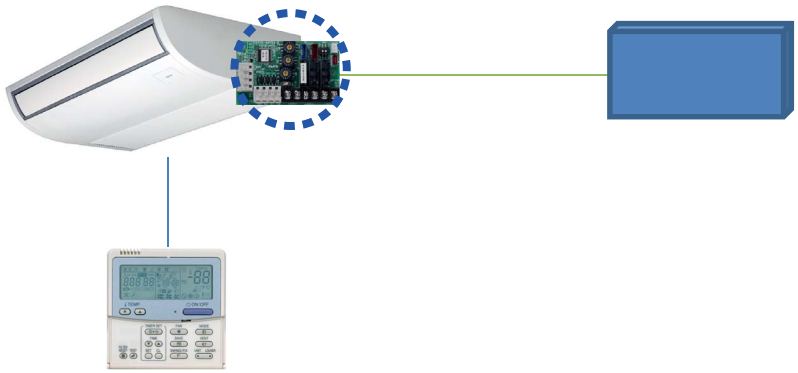


Room temperature data

Category	Group Control	Room temperature for control		
		Body TA sensor	TCB-TC41U-E	Sensor in Remote controller
VRF	Group	yes (each)	prohibited	
	Individual	yes (each)	yes (each)	
DN code = 32 TA sensor selection setting		Body TA sensor	Body TA sensor [Note 1]	Remote controller sensor [Note 2]

6-4 Application control kit

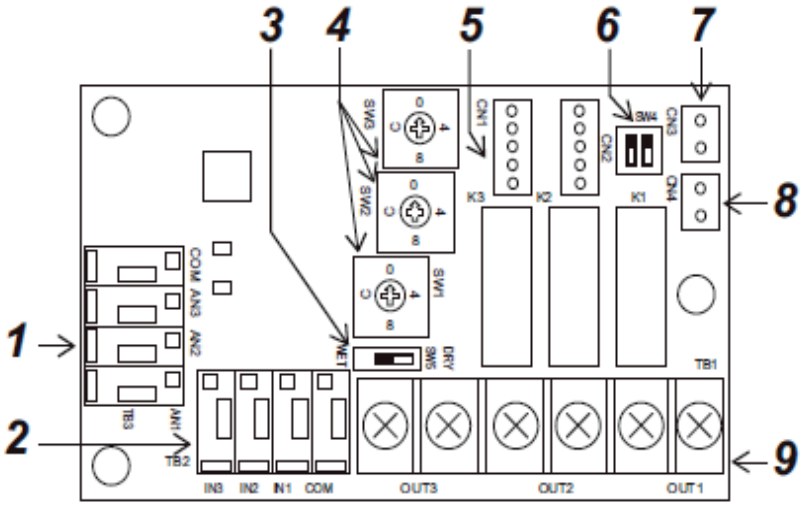
Outline

Appearance	Application
	

Specifications

Part name	Application control kit
Model Name	TCB-PCUC2E
Power supply	DC 7-19 V ± 5% No external power supply is required when CN61 is used.
Dimension	32 × 80 × 125 mm
Documents	Installation manual

System configuration



Function

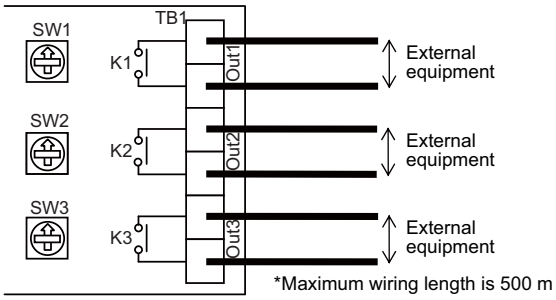
Description / Specification

1 External analog input terminal (TB3)
2 External digital input terminal (TB2)
3 External digital input
4 Switch for setting signal output (Factory default: 0)
5 Connector for connecting to indoor circuit board (CN1)
6 Switch for function select (SW4) (Factory default: OFF)
7 FILTER connector (CN3)
8 EXCT connector (CN4)
9 Signal output terminal block (TB1)

<Signal output terminal: TB1> (*1)

The following signal outputs are extracted from “OUT1”, “OUT2”, and “OUT3”.
It is possible to change the signal outputs with SW1, SW2, and SW3.

*** Always turn off the power to the indoor unit before setting the signal outputs.**
Note that even if you set the signal outputs, the settings do not change if the power to the indoor unit is ON.



<Connectable load>
30 VDC/1 A or less
277 VAC/1 A or less

SW1, 2, and 3 settings	Signal output
0	No output (default)
1	Cool dry output
2	Heat output
3	Defrost output
4	Fan output (indoor unit fan ON)
5	Thermo. ON output
6	Ventilation output
7	Operation output
8	Alarm output
9	Humidify output *1
A	Heater output
B	Actual compressor on output
C	Actual fan status output
D	Filter sign output
E	Demand response output
F	Not used

*1 Attach the short plug provided to CN3 if using humidify output.
*2 Only signal output 3 (OUT3) can change relay (K3) contacts from A contact to B contact by switching the relay output reverse switch (SW4(bit 1)) from OFF to ON.
- A contact: Relay is ON when there is signal output
- B contact: Relay is OFF when there is signal output (Relay is ON when there is no signal output)

Always turn off the power to the air conditioner before doing the settings because the SW4 settings also are not changed even if the settings are changed while the power is ON.

⚠CAUTION

Keep input signal wires and other signal wires away from power supply lines that are 220-240 VAC.

<External digital input terminal: TB2> (*1)

The following controls can be done by inputting signals to the external digital input terminal.

▼ IN1: External trouble input

The air conditioner system stops and check code “L30: Indoor unit external interlock trouble” is displayed on the wired remote controller when an external trouble is input.

▼ IN2: Prohibition of local input

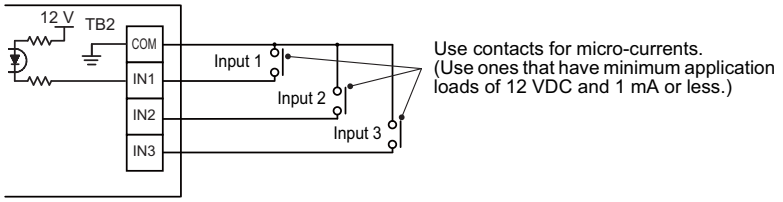
is displayed on the wired remote controller and operations cannot be started or stopped from the wired remote controller during prohibition of local input.
It is also possible to release local prohibition from the central remote controller.
(Most recent input is given priority.)

▼ IN3: Not used

* Do the wiring as shown to the right for input of either “Voltage ON: WET” or “Voltage OFF: DRY”.

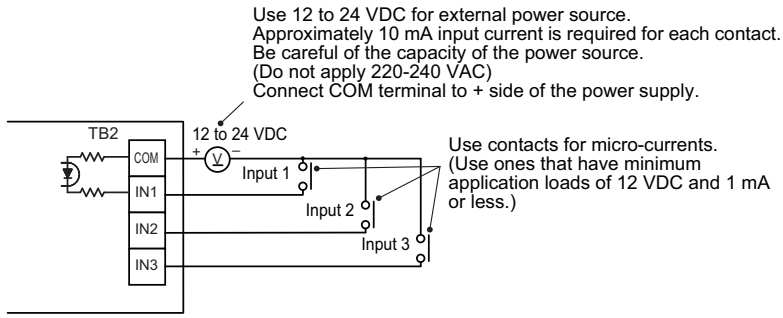
“Voltage OFF” input

Set the input switch (SW5) to the “Voltage OFF: DRY” side.
(Factory default: Voltage OFF (DRY) side)



“Voltage ON” input

Set the input switch (SW5) to the “Voltage ON: WET” side.
(Factory default: Voltage OFF (DRY) side)



<Wiring specifications>
Wire type: Sheathed vinyl cord, single strand
Wire thickness: 1.25 to 2.00 mm^2 (prep 9 to 10 mm of the tips of wires)
Total wire length: Max 70 m
* If you use twisted strand wires, connect a pin terminator.

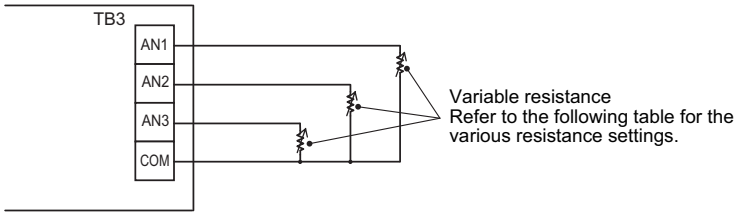
⚠CAUTION

Separate power lines when wiring to prevent misoperations.

<External analog input terminal: TB3> (*2)

It is possible to change the indoor unit's operation mode (AN1), set temperature (AN2), and blower setting (AN3) by connecting a variable resistor to the analog input terminal.

* When both the wired remote controller and the central controller are used, the most recent setting has priority.



Do not apply voltage or current to AN1, AN2, AN3, or COM.

<Operation mode: AN1>

Operation switching	External resistance (Ω)
Stop	30
Blower	60
Cool	90
Warm	120

<Set temperature: AN2>

Set temperature (°C)	External resistance (Ω)
17	10
18	20
19	30
20	40
21	50
22	60
23	70
24	80
25	90
26	100
27	110
28	120
29	130
30	140

<Blower setting: AN3>

Blower setting	External resistance (Ω)
Auto	30
Fast	60
High	90
Low	120

<Wiring specifications>
Wire type: Sheathed vinyl cord, single strand
Wire thickness: 1.25 to 2.00 mm^2 (prep 9 to 10 mm of the tips of wires)
Total wire length: Max 70 m
* If you use twisted strand wires, connect a pin terminator.

⚠CAUTION

Separate power lines when wiring to prevent misoperations.

Other functions

▼ FILTER(CN3)
Install the short plug provided to CN3 if connecting a humidifier.

▼ EXCT(CN4)
Can thermo. OFF by shorting this connector.
Use contacts for micro-currents when using external contacts.
(Use ones that have minimum application loads of 12 VDC and 1 mA or less.)

LED display

▼ Power LED (LD1) [Red]
Lights when running and power is supplied.
Normally lighted, but flashes if a transmission trouble occurs on the indoor unit P.C. board.

▼ Regular operation LED (LD2) [Green]
Lights when transmission with indoor unit P.C. board is established and operation is regular.

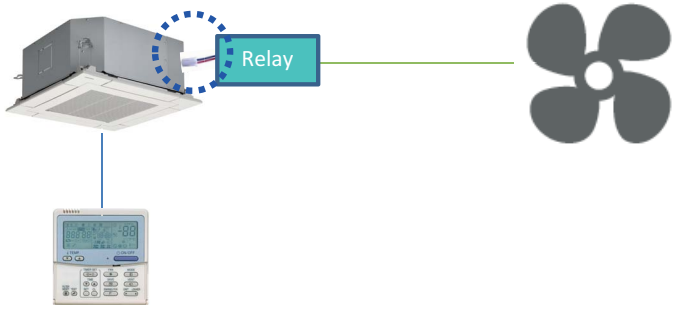
Precautions for using an application control kit together with Air to Air Heat Exchanger (VN-M*HE1).**

(*1) <Signal output terminal: TB1> and <External digital input terminal: TB2> differ from the functions described in this Installation Manual.
Refer to the Installation Manual attached to Air to Air Heat Exchanger product.
(*2) <Signal output terminal: TB3> cannot be used for Air to Air Heat Exchanger.

6-5 Connectors

CN32 - Ventilation Fan control

Outline

Appearance	Connector port on Indoor control P.C. board	Application
		

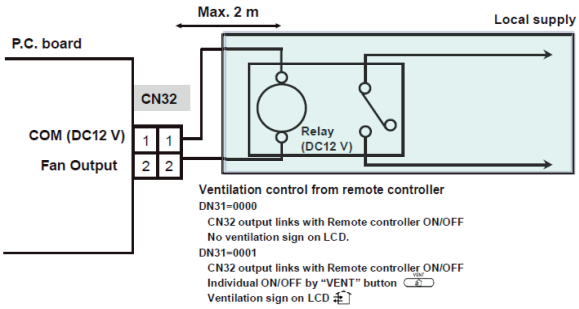
Specifications

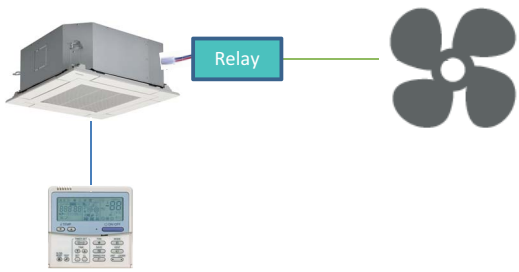
Model Name		TCB-KBCN32VEE
Connector port on Indoor control P.C. board		CN32
Operation		Fan Output
Socket	Color	White
	Housing	XAP-02V-1 (White): UL1007
	Contact	SXA-001T-P0.6: AWG22
Cable	Length	500 mm *The length of cables ought to be 2000mm or less including this connector cable(500mm).
Documents		Installation manual

Pin	Color	Operation	
1	Red	DC12 V (Common)	
2	Blue	Fan output (Open collector)	-Shipment setup (DN31 = 0000)
			-Ventilation control (DN31 = 0001) 
			Remote controller ON Ventilation ON (IF already ON, ON remains)
			Remote controller OFF Ventilation OFF (IF already OFF, OFF remains)

Application

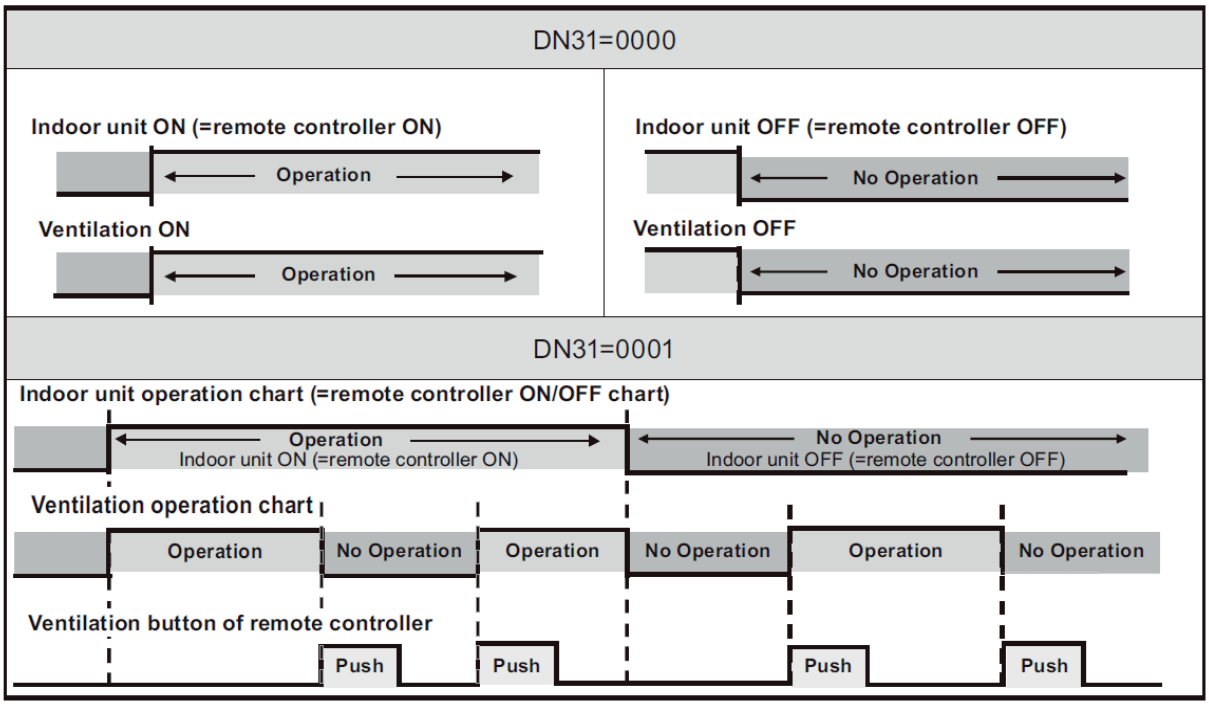
The External ventilation control allows the control of an external fan (or other equipment) via a 12 VDC Relay output





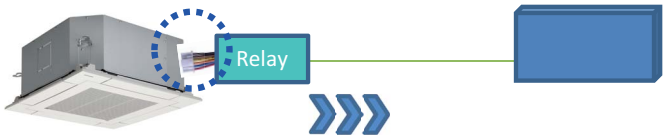
Chart

DN31=0000Ventilation output turn ON/OFF with Indoor unit ON/OFF
DN31=0001Ventilation output is controller using the Ventilation button on Controller



CN60 - Operation status signal output

Outline

Appearance	Connector port on Indoor control P.C. board	Application
		

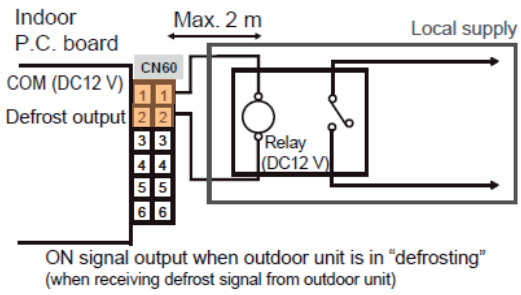
Specifications

Model Name		TCB-KBCN60OPE
Connector port on Indoor control P.C. board		CN60
Operation		Operation status signal output
Socket	Color	White
	Housing	PAP-06V-S (White): UL1007
	Contact	SPHD-002T-P0.5: AWG24
Cable	Length	500 mm
		*The length of cables ought to be 2000mm or less including this connector cable(500mm).
Documents		Installation manual

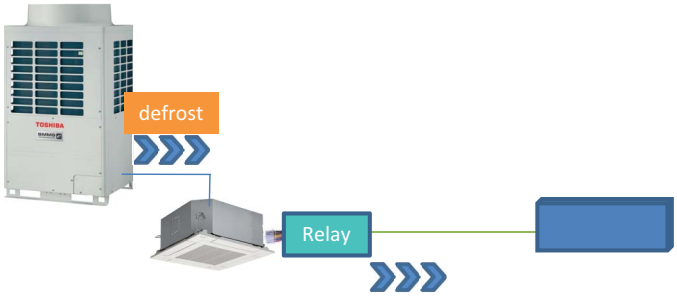
Pin	Color	Operation	
1	Red	DC12 V (COM)	Common for Pin. 2 to 6
2	Blue	Defrost output (Open collector)	ON signal when outdoor unit is in defrosting (when receiving defrost signal from outdoor unit)
3	Orange	Thermo ON output (Open collector)	ON signal when indoor unit is “thermo-ON”
4	Yellow	Cooling output (Open collector)	ON when operation mode is cooling (Cooling, Dry, Cooling in Auto mode)
5	Brown	Heating output (Open collector)	ON when operation mode is heating (Heating, Heating in Auto mode)
6	Black	Fan output (Open collector)	ON when indoor fan is ON (ex. Interlock cabling)

Application

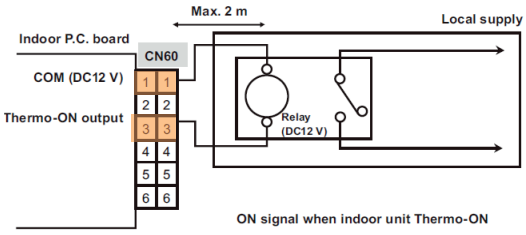
The Operation status Output connector supplies a 12 VDC



ON signal output when outdoor unit is in "defrosting"
(when receiving defrost signal from outdoor unit)

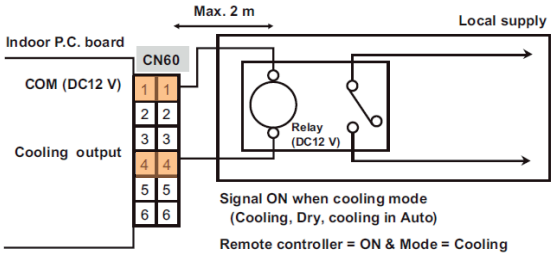


ON signal when indoor unit is "thermo-ON"



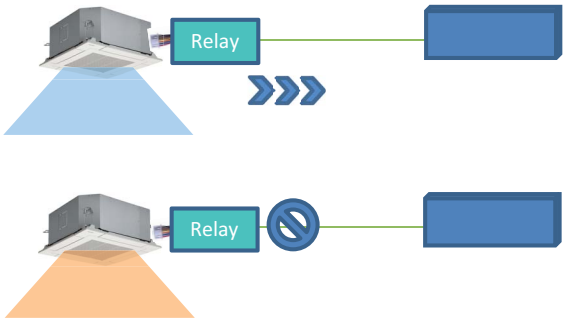
ON signal when indoor unit Thermo-ON

ON when operation mode is cooling

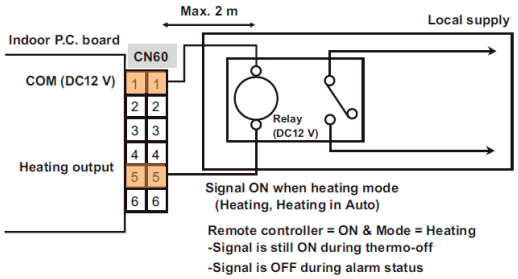


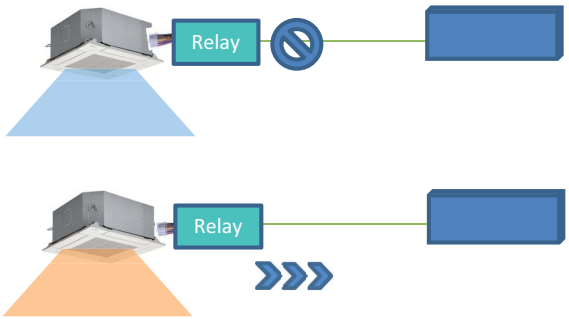
Signal ON when cooling mode
(Cooling, Dry, cooling in Auto)

Remote controller = ON & Mode = Cooling
-Signal is still ON during thermo-off
-Signal is OFF during alarm status

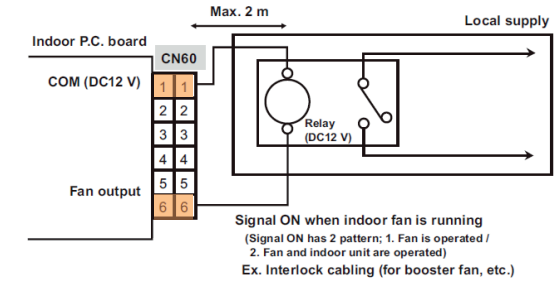


ON when operation mode is heating

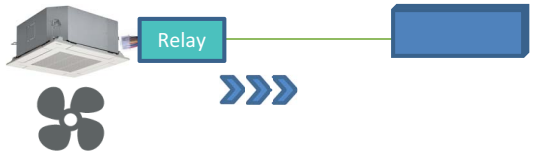




ON when indoor fan is ON

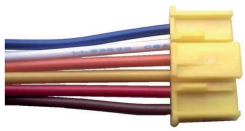
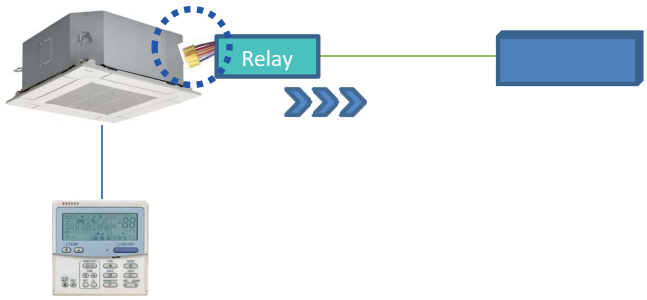


(Note) Signal is OFF when 4-way cassette type performs intermittent operation after oil recovery control.



CN61- Leaving-ON prevention control

Outline

Appearance	Connector port on Indoor control P.C. board	Application
		

Specifications

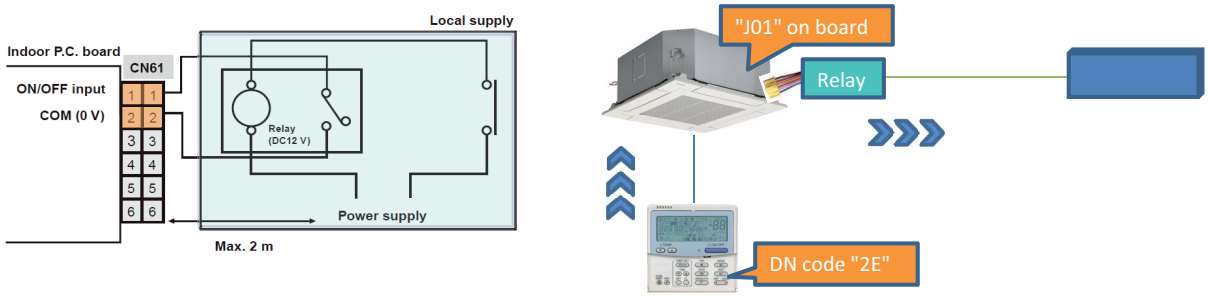
Model Name		TCB-KBCN61HAE
Connector port on Indoor control P.C. board		CN61
Operation		Leaving - ON prevention control
Socket	Color	Yellow
	Housing	XAP-06V-1-Y (Yellow): UL1007
	Contact	SXA-001T-P0.6: AWG22
Cable	Length	500 mm
		*The length of cables ought to be 2000mm or less including this connector cable(500mm).
Documents		Installation manual

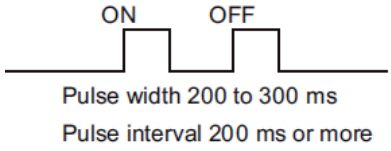
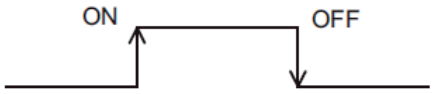
Pin	Color	Operation	
1	Blue	ON/OFF input	External ON/OFF control (DN code 2E, J01)
2	White	0 V (Common for Pin. 1, 3)	
3	Orange	ON/OFF prohibition input	Input signal makes switching of permission / prohibition of individual remote controller ON/OFF (During prohibition, “Central controlling mark” is shown on the LCD.)
4	Yellow	Operation output (Open collector)	On signal during “remote controller ON”
5	Red	DC12 V (Common for Pin. 4, 6)	
6	Brown	Alarm output (Open collector)	On signal during alarm output (non recovery fatal error)

Using a door switch or card entry system etc, the leaving-ON of the indoor unit can be prevented, this is done by the setting of the remote controller and relay wiring.

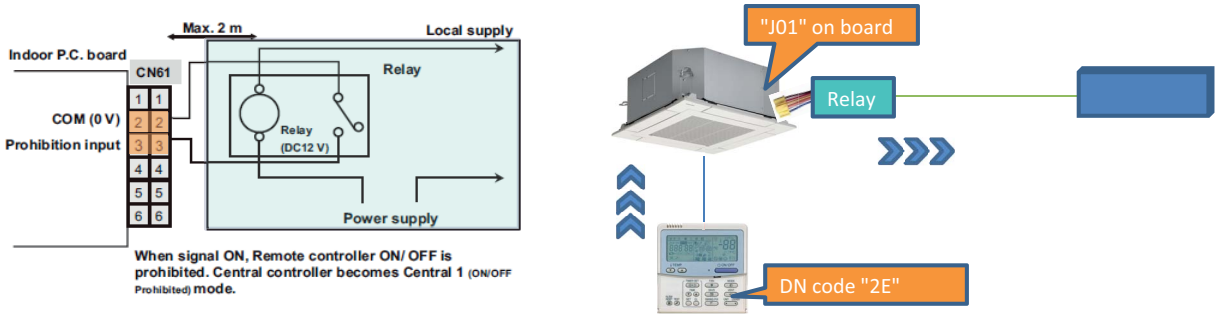
Application

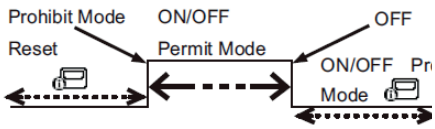
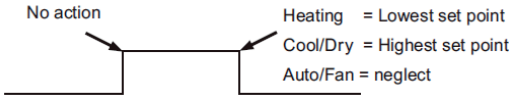
External ON/OFF control (DN code 2E, J01)



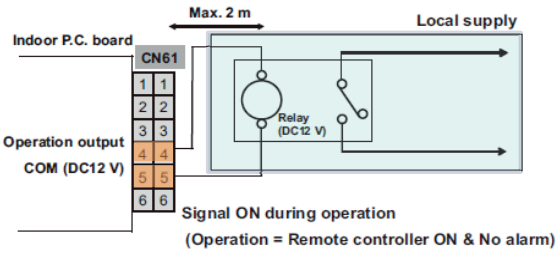
DN 2E 	J01 	Action
0000 (Factory setting)	Connect	Pulse input 
	Cut	Static input 

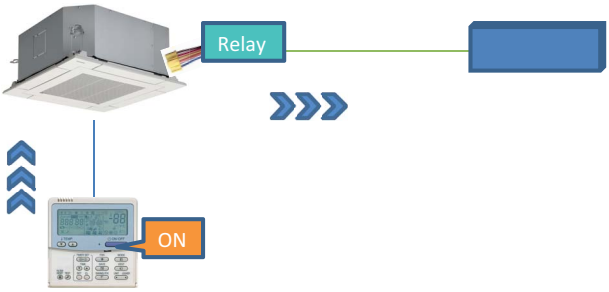
ON/OFF prohibition input



DN 2E 	J01 	Action
0001	Connect	Leaving on prevention control 
	Cut	

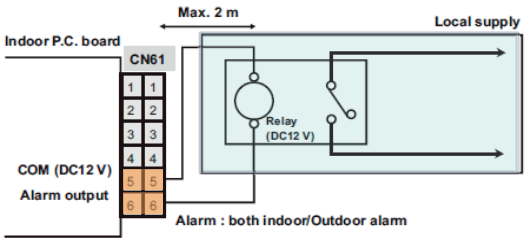
Operation output

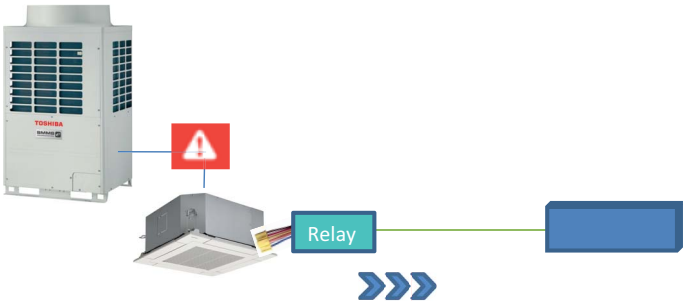




(Note) Individual signal output group control is available.
If follower indoor unit generates alarm, signal becomes OFF in this indoor unit only.

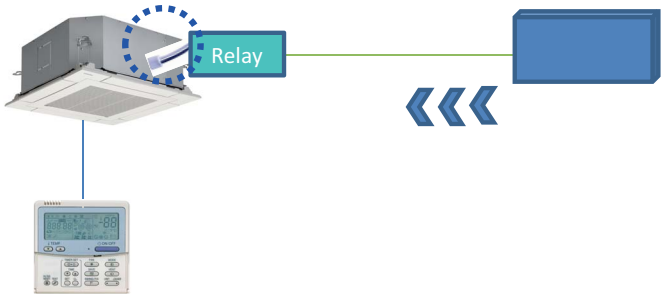
Alarm output





CN70 - Option error input

Outline

Appearance	Connector port on Indoor control P.C. board	Application
		

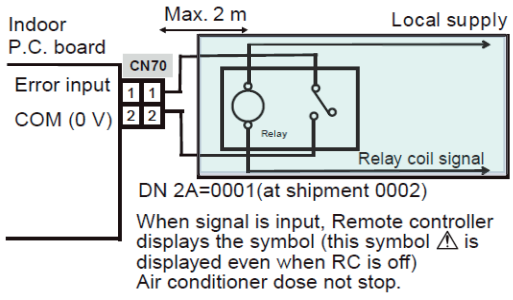
Specifications

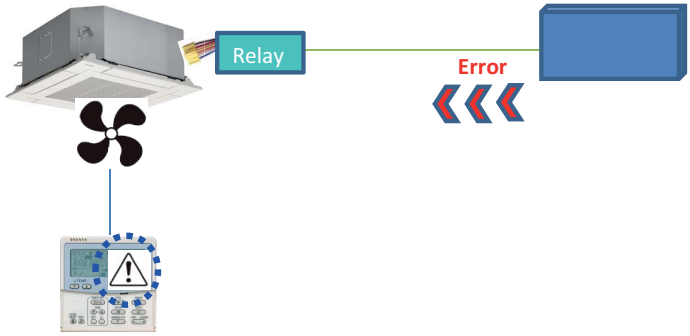
Model Name		TCB-KBCN70OAE
Connector port on Indoor control P.C. board		CN70
Operation		Option error input
Socket	Color	White
	Housing	HER-2 (White): UL1007
	Contact	SEH-001T-P0.6: AWG22
Cable	Length	500 mm
		*The length of cables ought to be 2000mm or less including this connector cable(500mm).
Documents		Installation manual

Terminal	Color	Operation	
1	Blue	Error input	Default : DN2A=0002 (at shipment) No function.
			DN2A=0001 (External error input)
			When signal is input, error symbol is displayed on RC.
			(Indoor unit dose not stop)
			DN2A=0000 (Filter display input) When signal is input, filter sign symbol is displayed on RC.
2	White	0 V (COM)	

Application

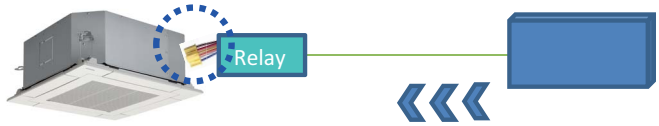
Error input





The CN70 connector enables an external error signal to be input the connected indoor unit and displayed on the connected remote controller without stopping the indoor unit.

CN73 - Demand control
Outline

Appearance	Connector port on Indoor control P.C. board	Application
		

Specifications

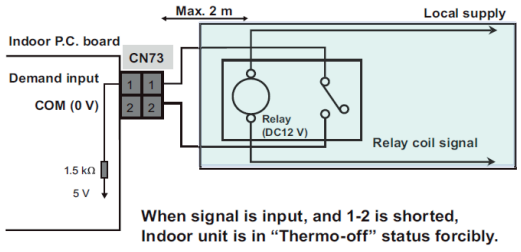
Model Name		TCB-KBCN73DEE
Connector port on Indoor control P.C. board		CN73
Operation		Demand control
Socket	Color	Red
	Housing	HER-2-R (Red): UL1007
	Contact	SHE-001T-P0.6: AWG22
Cable	Length	500 mm
		*The length of cables ought to be 2000mm or less including this connector cable(500mm).
Documents		Installation manual

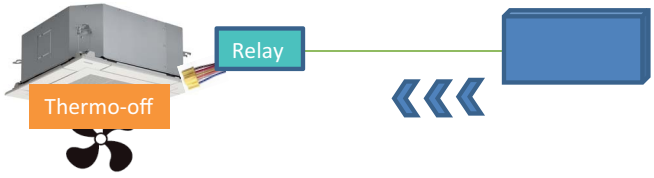
Terminal	Color	Operation	
1	Blue	Demand input	Indoor unit is forced to turn thermo OFF
2	White	0 V (COM)	

DN	DN data	Function
0B	0(factory setting)	Demand input (Imposes thermostat OFF)
	1	O2 sensor input
	2	Card key input (type 1)
	3	Fire prevention input (normal open)
	4	Card key input (type 2)
	5	Fire prevention input (normal close)

Application

Demand input

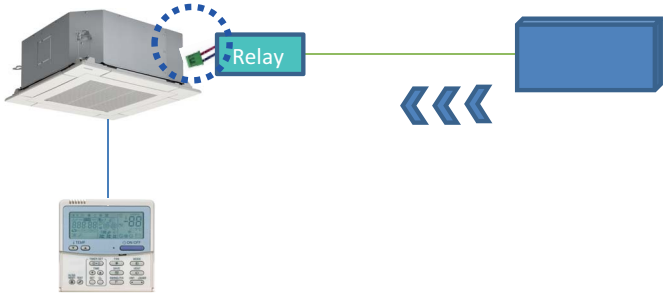




The CN73 Connector enables an external input signal to force the connected indoor unit into thermo OFF status.

CN80 - Outside error input

Outline

Appearance	Connector port on Indoor control P.C. board	Application
		

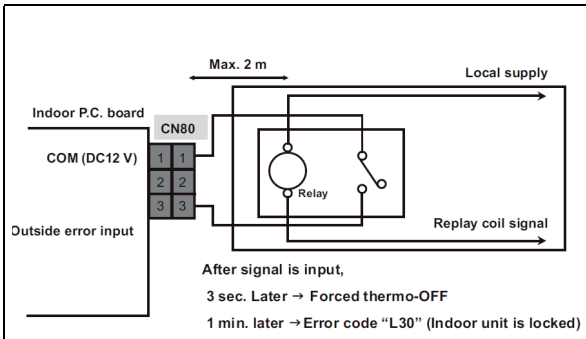
Specifications

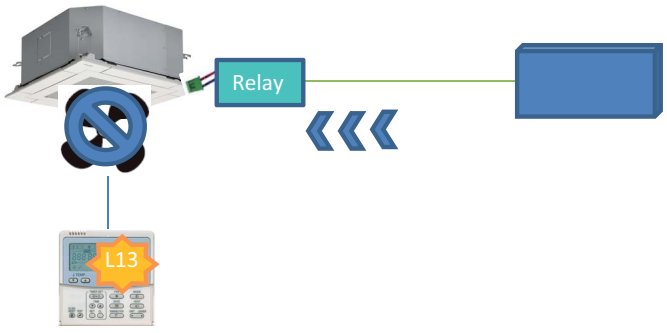
Model Name		TCB-KBCN80EXE
Connector port on Indoor control P.C. board		CN80
Operation		Outside error input
Socket	Color	Green
	Housing	XAP-03V-1-M (Green): UL1007
	Contact	SXA-001T-P0.6: AWG22
Cable	Length	500 mm
		*The length of cables ought to be 2000mm or less including this connector cable(500mm).
Documents		Installation manual

Terminal	Color	Operation	
1	Red	DC12 V (COM)	Common for Pin.3
2	-	-	
3	Blue	Outside error input	After signal is input:
			3 sec.: Thermo-off forcedly
			1 min.: Generates Error code “L30” (Interlock from outside) to stop the operation forcedly.

Application

Outside error input





The CN80 connector enables an external error signal to be input into the connected Indoor unit and that will stop the Indoor unit and be displayed on the connected Remote controller.

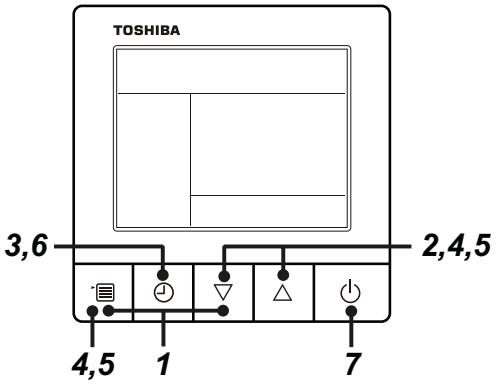
7

Indoor unit controls

7-1 Setup of the selection function in the indoor unit

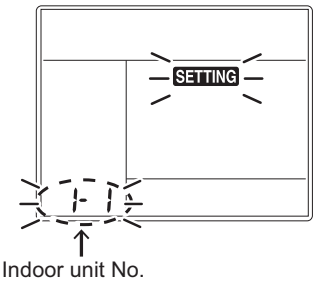
Wired remote controller setting (RBC-ASCU11-E)

<RBC-ASCU11-E >



1 **Push and hold menu button and [▽] setting button simultaneously for 10 seconds or more.**

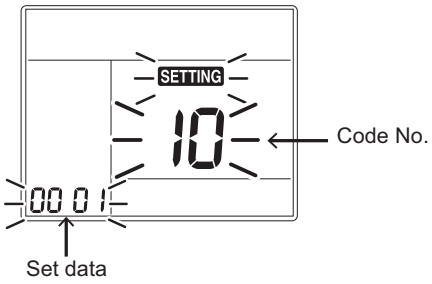
• After a while, the display flashes as shown in the figure. “ALL” is displayed as indoor unit numbers during initial communication immediately after the power has been turned on.



2 **Each time [▽] [△] setting button is pushed, indoor unit numbers in the group control change cyclically. Select the indoor unit to change settings for.**

• The fan of the selected indoor unit runs . The indoor unit can be confirmed for which to change settings.

3 **Push OFF timer button to confirm the selected indoor unit.**



4 **Push the menu button to make Code No. [04] flash. Change Code No. [04] with [▽] [△] setting button.**

5 **Push the menu button to make Set data [0001] flash. Change Set data [0001] with [▽] [△] setting button.**

Priority set 0001 No priority set 0000

6 **Push OFF timer button to complete the set up.**

• To change other settings of the selected indoor unit, repeat from Procedure ***4***.

7 **When all the settings have been completed, push ON/OFF button to finish the settings. (Return to the normal mode)**

• “ SETTING “ flashes and then the display content disappears and the air conditioner enters the normal stop mode. (The remote controller is unavailable while “ SETTING “ is flashing.)

• To change settings of another indoor unit, repeat from Procedure ***1***.

Indoor unit function Code No. (DN Code) table

(includes functions needed to perform applied control on site)

DN	Item	Description	At shipment
01	Filter display delay timer	0000: None 0001: 150H 0002: 2500H 0003: 5000H 0004: 10000H	Depending on model type
02	Dirty state of filter	0000: Standard 0001: High degree of dirt (Half of standard time)	0000: Standard
03	Central control address	0001: No.1 unit to 0064: No.64 unit … TCC-LINK 0001: No.1 unit to 0128: No.128 unit … TU2C-LINK 00Un: Unfixed (When using U series remote controller) 0099: Unfixed (Other than U series remote controller)	00Un/0099: Unfixed
04	Specific indoor unit priority	0000: No priority 0001: Priority	0000: No priority
06	Heating temp. shift	0000: 0 °C 0001: +1 °C 0002: +2 °C to 0010: +10 °C (Up to +6 recommended)	Depending on model type
0b	Demand control (CN73 / CN4)	0000: Demand input 0001: O2 sensor input 0002: Card input setup.1 0003: Fire alarm input (Normal open) 0004: Card input setup.2 0005: Fire alarm input (Normal close)	0000: Demand input
0d	Existence of [AUTO] mode	0000: Provided 0001: Not provided (Automatic selection from connected outdoor unit)	0001: Not provided
0F	Cooling only	0000: Heat pump 0001: Cooling only (No display of [AUTO] [HEAT])	0000: Heat pump
10	Type	Refer to **Type DN code "10" list**	Depending on model type
11	Indoor unit capacity	0000: Unfixed 0001 to 0034 Refer to Indoor Unit Capacity DN code "11" list	According to capacity type
12	Line address	0001: No.1 unit to 0064: No.30 unit … TCC-LINK 0001: No.1 unit to 0128: No.128 unit … TU2C-LINK 00Un: Unfixed (When using U series remote controller) 0099: Unfixed (Other than U series remote controller)	00Un/0099: Unfixed
13	Indoor unit address	0001: No.1 unit to 0064: No.64 unit … TCC-LINK 0001: No.1 unit to 0128: No.128 unit … TU2C-LINK 00Un: Unfixed (When using U series remote controller) 0099: Unfixed (Other than U series remote controller)	00Un/0099: Unfixed
14	Group address	0000: Individual 0001: Header unit of group 0002: Follower unit of group 00Un: Unfixed (When using U series remote controller) 0099: Unfixed (Other than U series remote controller)	00Un/0099: Unfixed
19	Louver type (Air direction adjustment)	0000: No louver 0001: Swing only 0004: (4-way Air Discharge Cassette type, etc.)	Depending on model type
1E	Temp difference of [AUTO] mode selection COOL → HEAT, HEAT → COOL	0000: 0 °C to 0010: 10 °C (Ts ± 5°C) Ts: Remote controller setup temp.	0003: 3 °C (Ts ±1.5 °C)
28	Automatic restart of power failure	0000: None 0001: Restart	0000: None
2A	Selection of option/Trouble input (TCB-PCUC2E: CN3)	0000: Filter input 0001: Alarm input (Air washer, etc.) 0002: None	0002: None
2E	HA terminal (CN61) select	0000: Usual 0001: Card input setup.1 0002: Fire alarm input (arbeit contact) 0003: Card input setup.2	0000: Usual (HA terminal)
31	Ventilating fan control	0000: Unavailable 0001: Available	0000: Unavailable
32	TA sensor selection	0000: Indoor unit TA sensor 0001: Remote controller sensor	0000: Indoor unit TA sensor
33	Temperature unit select	0000: °C 0001: °F	0000: °C

DN	Item	Description	At shipment
5d	External static pressure High-ceiling adjustment (Air flow selection)	Refer to next page.	0000: Standard
60	Timer setting (wired remote controller)	0000: Available (can be performed) 0001: Unavailable (can be performed)	0000: Available
77	Dual set point	0000: Unavailable 0002: Available	0000: Unavailable
79	Alarm output setup of the header unit	0000: Not including the state of following unit 0001: Including the state of following unit	0000: Not including the state of following unit
b3	Soft cooling	0000: Unavailable 0001: Available	0001: Available
b5	Occupancy sensor / Wireless A-B selection Provided / None	0000: None 0001: Occupancy sensor provic 0002: Wireless remote controller provided	0000: None
b6	Occupancy sensor Enable / Invalid (Absence time judgment time)	0000: Invalid 0001: 30min. 0002: 60min. 0004: 120min. 0005: 150min.	0002: Enable (60 min.)
b7	Occupancy sensor operation at absent time	0000: Stand by 0001: operation stop	0000: Stand by
CF	Indoor unit case type	0000: Standard Model 0001: largee case model	Depending on model type
d0	Whether the power saving mode can be set by the remote controller	0000: Invalid 0001: Valid	0001: Valid
E0	Destination	0000: Japan 0001: North America 0002: Australia 0003: China	0003: China
E6	Wireless remote controller A-B selection	0000: A 0001: B	0000: A
F0	Swing mode	0001: Standard 0002: Dual swing 0003: Cycle swing	0001: Standard
F1	Louver fixed position (Louver No.1)	0000: Release 0001: Horizontal discharge pos 0005: Downward discharge position	0000: Not fixed
F2	Louver fixed position (Louver No.2)	0000: Release 0001: Horizontal discharge pos 0005: Downward discharge position	0000: Not fixed
F3	Louver fixed position (Louver No.3)	0000: Release 0001: Horizontal discharge pos 0005: Downward discharge position	0000: Not fixed
F4	Louver fixed position (Louver No.4)	0000: Release 0001: Horizontal discharge pos 0005: Downward discharge position	0000: Not fixed
F6	Presence of Application control kit (TCB-PCUC2E)	0000: None 0001: Exist	0000: None
FC	Communication protocol	0000: TCC-LINK 0001: TU2C-LINK	0000: TCC-LINK
Fd	Priority operation mode (FS unit)	0000: Heating 0001: Cooling	0000: Heating
FE	FS unit address	0001: No.1 unit to 0064: No.64 unit … TCC-LINK 0001: No.1 unit to 0128: No.128 unit … TU2C-LINK 00Un: Unfixed (When using U series remote controller) 0099: Unfixed (Other than U series remote controller)	00Un/0099: Unfixed
103	Remote controller	0000: Use 0001: Do not use	0000: Use
119	Vertical louver type (MMD-UP***M*H* model only)	0000: No louver 0002: 3D LOUVER	0000: No louver
1FC	Indoor Unit terminating resistance	0000: OFF 0001: ON	0000: OFF

*1 Display order of "00Un"and "0099" varies depending on remote controller models or communication types.

For Central control address (DN [03]), Indoor unit address (DN [13]), FS unit address (DN [FE])

Remote controller	Communication type	Display order
U series	TU2C-LINK	··· ⇔ 0128 ⇔ 00Un ⇔ 0001 ⇔ ···
	TCC-LINK	··· ⇔ 0064 ⇔ 00Un ⇔ 0001 ⇔ ···
Other than U series	TCC-LINK	··· ⇔ 0064 ⇔ 0099 ⇔ 0001 ⇔ ···

For Line address (DN [12])

Remote controller	Communication type	Display order
U series	TU2C-LINK	··· ⇔ 0128 ⇔ 00Un ⇔ 0001 ⇔ ···
	TCC-LINK	··· ⇔ 0030 ⇔ 00Un ⇔ 0001 ⇔ ···
Other than U series	TCC-LINK	··· ⇔ 0030 ⇔ 0099 ⇔ 0001 ⇔ ···

For Group address (DN [14])

Remote controller	Communication type	Display order
U series	TU2C-LINK TCC-LINK	··· ⇔ 0002 ⇔ 00Un ⇔ 0000 ⇔ ···
Other than U series	TCC-LINK	··· ⇔ 0002 ⇔ 0099 ⇔ 0000 ⇔ ···

*2 Communication protocol can be automatically switched with the setup in the outdoor unit during installation.

7-2 Indoor model compatibility for remote controller, central controller and remote sensor

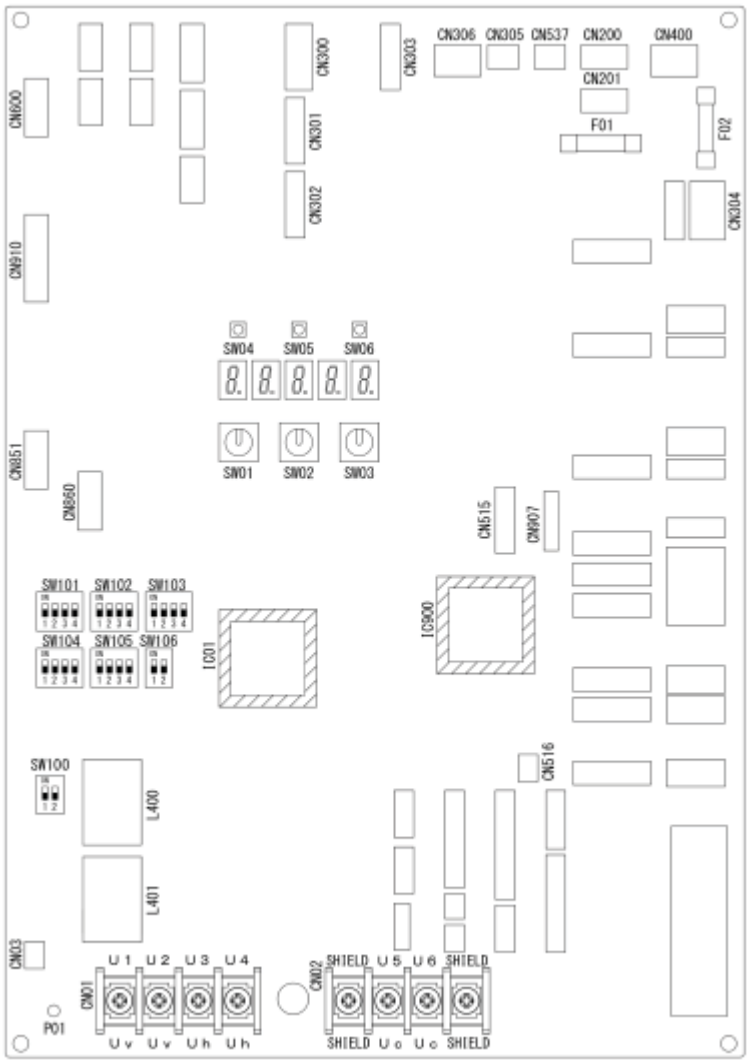
Indoor Unit		Wireless remote controller		Wireless remote controller				
		RBC-ASCU11-E	RBC-AMTU31-E	RBC-AXU41U-E	RBC-AXU31U-E	RBC-AXU31UW-E	RBC-AXU31C-E	RBC-AXU31-E
4-way Air Discharge Cassette Type	MMU-UP_1H-E	✓	✓	✓	-	-	-	✓
	MMU-UP_1HP-E	✓	✓	-	✓	-	-	✓
Compact 4-way Cassette Type	MMU-UP_1MH-E	✓	✓	-	-	-	-	✓
2-way Air Discharge Cassette Type	MMU-UP_1WH-E	✓	✓	-	-	✓	-	✓
1-way Air Discharge Cassette Type	MMU-UP_1YH-E	✓	✓	-	-	-	-	✓
	MMU-UP_1SH-E	✓	✓	-	-	-	✓	✓
Concealed Duct Type	MMD-UP_1BHP-E	✓	✓	-	-	-	-	✓
Slim Duct Type	MMD-UP_1SPH-E	✓	✓	-	-	-	-	✓
Concealed Duct High Static Pressure Type	MMD-UP_1HP-E	✓	✓	-	-	-	-	✓
	MMD-UP_1HP-E (8-10HP)	✓	✓	-	-	-	-	✓
Ceiling Type	MMC-UP_1HP-E	✓	✓	-	-	-	✓	✓
High-wall Type	MMK-UP_1HP-E	✓	✓	-	-	-	-	✓
Floor Standing Concealed Type	MML-UP_1BH-E	✓	✓	–	–	–	–	✓
Floor Standing Cabinet Type	MML-UP_1H-E	✓	✓	–	–	–	–	✓
Floor Standing Type	MMF-UP_1H-E	✓	✓	–	–	–	–	✓
Console Type	MML-UP_1NHP-E	✓	✓	–	–	–	–	✓
Fresh air intake unit	MMD-UP_1HFP-E (5HP)	✓	✓	–	–	–	–	✓
	MMD-UP_1HFP-E (8-14HP)	✓	✓	–	–	–	–	✓

8

Outdoor unit controls for VRF

8-1 Applied control for outdoor unit

The outdoor fan high static pressure support and priority operation mode setting (cooling / heating / number of units / or priority indoor unit) functions are available by setting relevant switches provided on the interface P.C. board of the outdoor unit.



8-2 Outdoor fan high static pressure shift

Purpose/characteristics

This function is used when connecting a duct to the discharge port of an outdoor unit (as part of, for example, unit installation on the floor by floor installation).

Setup

Turn ON the DIP switch [SW10, Bit 2] provided on the interface P.C. board of the outdoor unit.
This function must be enabled with every discharge duct connected outdoor unit for both of the header and follower units.

Specification

Increase the speed of the propeller fan units on the outdoor fan to allow the installation of a duct with a maximum external static pressure not greater than specified in the table below. If a discharge duct with a resistance greater than 15 Pa (1.5 mmAq) is to be used, enable this function. The maximum external static pressures of base units are shown below (Table 1). In the case of combined use of multiple outdoor units, set all the units to the same maximum external static external static pressure as the one with the lowest pressure (see Table 2).

Table 1: Maximum External Static Pressure of Base Outdoor Units

MMY-MUP	0801HT8	1001HT8	1201HT8	1401HT8	1601HT8	1801HT8	2001HT8	2201HT8	2401HT8
Pa	80	80	80	80	80	80	80	80	80
m^3/h	9900	10500	11700	11880	15300	16800	15900	16500	16500

(*) Calculate duct resistance from outdoor unit air flow.

Table 2: Maximum External Static Pressure for Combinated Use of Base Units

Basic models

System	Combination					Maximum external static pressure
HP	HP					Pa
8	8					80
10	10					80
12	12					80
14	14					80
16	16					80
18	18					80
20	20					80
22	22					80
24	24					80
26	14	12				80
28	14	14				80
30	18	12				80
32	20	12				80
34	20	14				80
36	24	12				80
38	24	14				80
40	20	20				80
42	24	18				80
44	24	20				80
46	24	22				80
48	24	24				80
50	24	14	12			80
52	24	14	14			80
54	20	20	14			80
56	24	20	12			80
58	24	20	14			80
60	24	24	12			80
62	24	24	14			80
64	24	20	20			80
66	24	22	20			80
68	24	24	20			80
70	24	24	22			80
72	24	24	24			80
74	24	24	14	12		80
76	24	24	14	14		80
78	24	24	20	12		80
80	24	24	20	12		80
82	24	24	20	14		80
84	24	24	24	12		80
86	24	24	24	14		80
88	24	24	20	20		80
90	24	24	22	20		80

System	Combination					Maximum external static pressure
HP	HP					Pa
92	24	24	24	20		80
94	24	24	24	22		80
96	24	24	24	24		80
98	24	24	24	14	12	80
100	24	24	24	14	14	80
102	20	24	24	20	14	80
104	24	24	24	20	12	80
106	24	24	24	20	14	80
108	24	24	24	24	12	80
110	24	24	24	24	14	80
112	24	24	24	20	20	80
114	24	24	24	22	20	80
116	24	24	24	24	20	80
118	24	24	24	24	22	80
120	24	24	24	24	24	80

8-3 Priority operation mode setting

Purpose/characteristics

This function allows switching between priority cooling and priority heating.
Four patterns of priority operation mode setting are available as shown in the table below. Select a suitable priority mode according to the needs of the customer.

Setup

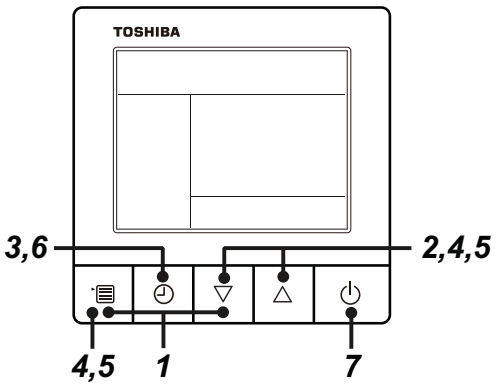
⚠CAUTION

In the case of the priority indoor unit mode, it is necessary to set up the specific indoor unit chosen for priority operation (a single unit only).

(1) Outdoor unit setup method (header unit)

Outdoor DN Code (O.DN) Setting	Operation
O.DN [18] = 0	Priority heating (factory default)
O.DN [18] = 1	Priority cooling
O.DN [18] = 2	Priority operation based on No. of units in operation (priority given to the operation mode with the largest share of units in operation)
O.DN [18] = 3	Priority indoor unit (priority given to the operation mode of the specific indoor unit set up for priority operation)

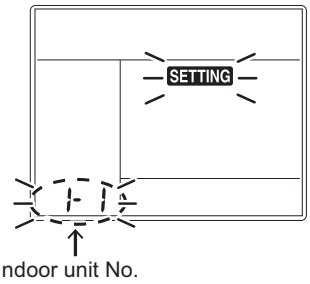
<RBC-ASCU11-E>



Priority set 0001
No priority set 0000

1 **Push and hold menu button and [▽] setting button simultaneously for 10 seconds or more.**

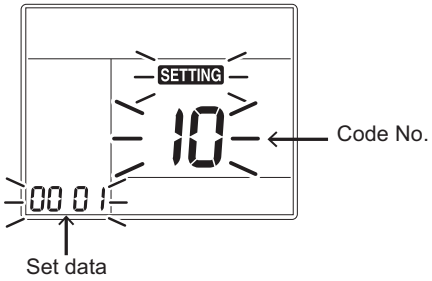
• After a while, the display flashes as shown in the figure. “ALL” is displayed as indoor unit numbers during initial communication immediately after the power has been turned on.



2 **Each time [▽] [△] setting button is pushed, indoor unit numbers in the group control change cyclically. Select the indoor unit to change settings for.**

• The fan of the selected indoor unit runs . The indoor unit can be confirmed for which to change settings.

3 **Push OFF timer button to confirm the selected indoor unit.**



4 **Push the menu button to make Code No. [04] flash. Change Code No. [04] with [▽] [△] setting button.**

5 **Push the menu button to make Set data [0001] flash. Change Set data [0001] with [▽] [△] setting button.**

Priority set 0001 No priority set 0000

6 **Push OFF timer button to complete the set up.**

• To change other settings of the selected indoor unit, repeat from Procedure ***4***.

7 **When all the settings have been completed, push ON/OFF button to finish the settings. (Return to the normal mode)**

• “ SETTING “ flashes and then the display content disappears and the air conditioner enters the normal stop mode. (The remote controller is unavailable while “ SETTING “ is flashing.)

• To change settings of another indoor unit, repeat from Procedure ***1***.

9

Common function and specification

9-1 List of application control function

✓: Command / Monitoring
△: Operation only
◇: Monitoring only

Type	Model Name		System	Function																														AtoA			I/O port				Outdoor unit									Remarks
				Relay Interface BMS-IFLSV4E	Schedule timer TCB-EXS21TLE	TU2C-LINK / TCC-LINK line	Indoor unit	On / Off	Mode	Setting Temperature	Fan Speed	Timer Function	Schedule Function	Multi language	Energy Save Function	Permit/Prohibit function	Filter dirty indicator	Error Display	Error history	Return back	Room temperature monitoring	Ventilation with Indoor	DN code	WEB connection	Option interface connection with BMS-IFDD03E	Digital I/O Relay Interface BMS-IFDD03E	Energy monitoring with BMS-IFWH5E	Energy monitoring Relay Interface BMS-IFWH5E	Demand function	Data analyzer	Error information transfer function by E-mail	On / Off	Mode	Fan Speed	DI	DO	AI	AO	Power peak cut	Snowfall fan	External master ON/OFF	Night operation	Operation mode selection	Error/Operation output	Compressor operation status	Operation output ratio	
1:1	Compact wired remote controller	RBC-ASCU11-E	TU2C-LINK	-	-	-	1	✓	-	✓	✓	-	-	-	-	-	✓	✓	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Wireless remote controller kit	RBC-AXU41U-E		-	-	-	1	✓	✓	✓	✓	✓	-	-	-	-	-	✓ (*1)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
		RBC-AXU31U-E		-	-	-	1	✓	✓	✓	✓	✓	-	-	-	-	-	✓ (*1)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
		RBC-AXU31C-E		-	-	-	1	✓	✓	✓	✓	✓	-	-	-	-	-	✓ (*1)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
		RBC-AXU31-E		-	-	-	1	✓	✓	✓	✓	✓	-	-	-	-	-	✓ (*1)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
		RBC-AXU31UW-E		-	-	-	1	✓	✓	✓	✓	✓	-	-	-	-	-	✓ (*1)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
CRC	Central remote controller	TCB-SC640U-E		-	✓	1	64	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	✓	✓	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	2	-	-	-	-	-	-	-	-	-	
	Touch Screen Controller	BMS-CT2560U-E		-	✓	2	256	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	✓	✓	4	✓	4	✓	✓	✓	✓	✓	✓	✓	8	4	-	-	✓	-	-	-	-	-	-	-	-	
Indoor unit	Remote sensor	TCB-TC41U-E		-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Remote sensing of indoor air temperature
	Connectors	TCB-KBCN32VEE		-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	△	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	CN32 on indoor unit
		TCB-KBCN60OPE		-	-	-	1	◇	◇	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	-	-	-	-	-	-	-	-	-	-	-	CN60 on indoor unit
		TCB-KBCN61HAE		-	-	-	1	✓	-	-	-	-	-	-	-	△	-	✓	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	-	-	-	-	-	-	-	-	-	-	CN61 on indoor unit
		TCB-KBCN70OAE		-	-	-	1	-	-	-	-	-	-	-		-	△	△	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	CN70 on indoor unit
		TCB-KBCN73DEE		-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	△	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	CN73 on indoor unit
		TCB-KBCN80EXE		-	-	-	1	-	-	-	-	-	-	-	-	-	-	△	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	CN80 on indoor unit
Outdoor unit	Power peak-cut control board	TCB-PCDM4E		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	1	-	-	✓	-	-	-	-	-	-	-	-	CN513 on Outdoor unit
	External master ON/OFF control board	TCB-PCMO4E		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6	-	-	-	-	△	△	△	△	-	-	-	-	CN509,CN512, CN508,CN510 on Outdoor unit
	Output control board	TCB-PCIN4E		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8	-	-	-	-	-	-	◇	◇	◇	-	-	-	CN511,CN514 on Outdoor unit
CRC (*6)	Schedule timer	TCB-EXS21TLE		-	-	1	64	✓	-	-	-	✓	✓	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Smart manager	BMS-SM1280HTLE	TCC-INK	-	✓	2	128	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	✓	✓	4	✓	4	✓	-	-	✓	✓	✓	3	2	-	-	-	-	-	-	-	-	-	-	-	-	
	Smart manager with data analyzer	BMS-SM1281ETLE		-	✓	2	128	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	✓	✓	4	✓	4	✓	✓	✓	✓	✓	✓	3	2	-	-	✓	-	-	-	-	-	-	-	-	-	
BMS (*6)	Lon Interface	TCB-IFLN642TLE		-	-	1	64	✓	✓	✓	✓	-	-	-	-	✓	✓	✓	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	BN Interface	BMS-IFBN640TLE		-	-	1	64	✓	✓	✓	✓	-	-	-	-	✓	✓	✓	-	-	✓	✓	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Modbus Interface	TCB-IFMB641TLE	Open network	-	-	1	64	✓	✓	✓	✓	-	-	-	-	✓	✓	✓	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	Analog Interface	TCB-IFCB640TLE		-	-	1	64	✓	✓	✓	✓	-	-	-	-	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	5	8	5	-	-	-	-	-	-	-	-	-	

(*1) : The error indication is displayed with LED of the receiver unit.
(*2) : Error can be recognized by blink of the button on the remote controller. However, error code is not displayed.
(*3) : Schedule timer (TCB-EXS21TLE) needed.
(*4) : Operation of specified indoor units can be controlled with input ports. Setting parameters by programming tool.
(*5) : Accessible to all I/Os from Modbus System TCB-IFMB641TLE.
(*6) : Central control device: Up to 10 units can be connected in one line (TCC-link)

9-2 Specification for Co-existence of each system on the bus line

✓: Compatibility on the same bus line

Model Name		TU2C-LINK		Open network						TCC-LINK						
		64 Central remote controller TCB-SC640U-E	Touch Screen Controller BMS-CT2560U-E	BN interface BMS-IFBN1280U-E	Modbus Interface BMS-IFMB1280U-E	BN interface BMS-IFBN640TLE	LonWorks LN Interface TCB-IFLN642TLE	Modbus Interface TCB-IFMB641TLE	Analog Interface TCB-IFCB640TLE	Touch Screen Controller BMS-CT1280E	Smart Manager BMS-SM1280HTLE	Smart manager with data analyzer BMS-SM1281ETLE	Schedule timer TCB-EXS21TLE	Central remote controller TCB-SC643TLE	ON-OFF controller TCB-CC163TLE2	General Purpose Interface TCB-IFCG1TLE
TU2C-LINK	64 Central remote controller TCB-SC640U-E	✓	✓	✓	✓	✓	✓	✓	-	✓	✓	✓	✓	✓	✓	-
	Touch Screen Controller BMS-CT2560U-E	✓	✓	✓	✓	✓	-	-	-	✓	✓	✓	✓	✓	✓	✓
Open network	BN interface BMS-IFBN1280U-E	✓	✓	-	-	-	-	-	-	✓	✓	✓	✓	✓	✓	✓
	Modbus Interface BMS-IFMB1280U-E	✓	✓	-	-	-	-	-	-	✓	✓	✓	✓	✓	✓	✓
	BN interface BMS-IFBN640TLE	✓	✓	-	-	-	-	-	-	✓	✓	✓	✓	✓	✓	-
	LonWorks LN Interface TCB-IFLN642TLE	✓	-	-	-	-	-	-	-	-	-	-	✓	✓	✓	-
	Modbus Interface TCB-IFMB640TLE	✓	-	-	-	-	-	-	-	-	-	-	✓	✓	✓	✓
	Analog Interface TCB-IFCB640TLE	-	-	-	-	-	-	-	-	-	-	-	✓	-	✓	✓
TCC-LINK	Touch Screen Controller BMS-CT1280E	✓	✓	✓	✓	✓	-	-	-	✓	✓	✓	✓	✓	✓	✓
	Smart Manager BMS-SM1280HTLE	✓	✓	✓	✓	✓	-	-	-	✓	✓	✓	✓	✓	✓	✓
	Smart manager with data analyzer BMS-SM1281ETLE	✓	✓	✓	✓	✓	-	-	-	✓	✓	✓	✓	✓	✓	✓
	Schedule timer TCB-EXS21TLE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Central remote controller TCB-SC643TLE	✓	✓	✓	✓	✓	✓	✓	-	✓	✓	✓	✓	✓	✓	-
	ON-OFF controller TCB-CC163TLE2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	General Purpose Interface TCB-IFCG1TLE	-	✓	✓	✓	-	-	✓	✓	✓	✓	✓	✓	-	✓	✓

9-3 Outline of energy monitoring and billing system

[1] Calculation concept

The following indicates how the energy monitoring system counts for each indoor unit's consumption.

1. **A power meter measures total outdoor power consumption of the corresponding refrigerant systems. Integrated value of pulse signal from power meter is stored in the controller.**
   For example, 40 HP system, a power meter measures power supply line consumption for 40 HP outdoor units.

2. **The controller with energy monitoring function can collect information of how much each indoor unit requests the cooling/heating capacity to the system (demand data) and each unit rating (HP). For example, 40 HP system has 10 units of 4 HP indoor units, each indoor unit has its own capacity request to the system according to the room temp and setting temp history, this demand data are sent to the controller. And all necessary data (demand data, unit rating, power consumption) is stored in the controller.**

3. **The following calculation is performed in Report Creation Software by using stored data in the controller. Demand ratio is the percent figure and calculated by demand data divided by full demand data.**

4. **Calculation**

$$\Psi_A = P_{IN}\left[\frac{R_A \times S_A}{\sum_{n=1}^{n} R_n \times S_n}\right]$$

Where: P_{IN} = Total Power Consumption from power meter (kW) during a period of time

R_n = Unit rating (HP)

S_n = Demand ratio (%)

$_n$ = Number of unit

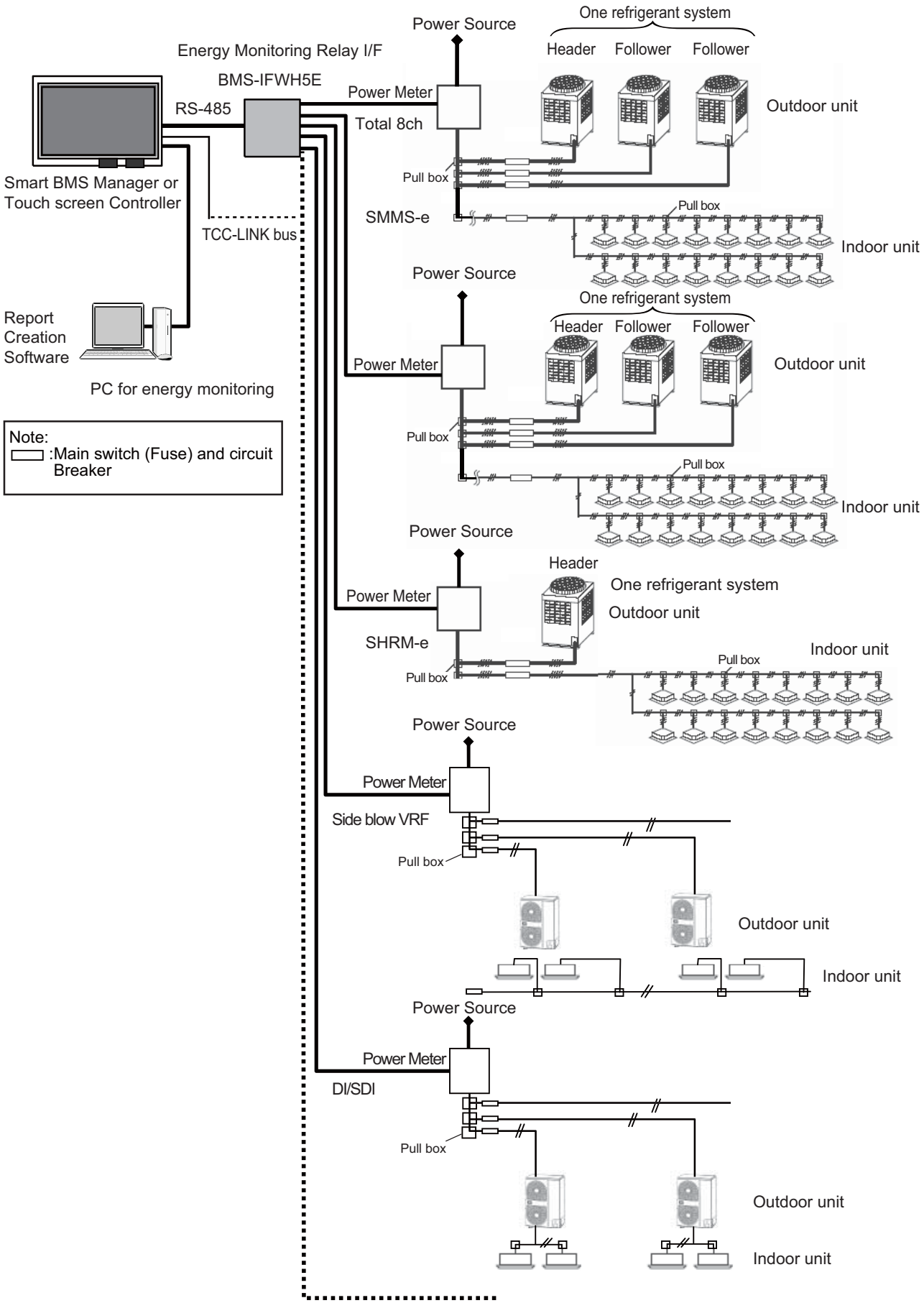
$Ø_A$ = Energy consumption (kW) for a period of time

[2] Power meter Selection and Setting concept

For electricity meters, select an appropriate product which has a non-voltage oscillator output terminal (see note below), considering the required accuracy, phase and wiring of the system and the maximum capacity. Refer to the figure below for installation of electricity meters. Normally, each refrigerant line requires one electricity meter in a SMMS-e/SHRM-e system. Please note that if one refrigerant line consists of plural outdoor units, electricity meter can't be installed on each outdoor unit because of the setting file limitation. In an SMMS-e system, using one meter for two or more refrigerant lines is acceptable if power consumption is expected to be within the range of the measurement accuracy of the meter. In a DI/SDI/Side blow VRF system, normally one electricity meter is used for two or more outdoor units. The pulse generator constants of the electricity meters must be registered on the setting file of the controller. The constants are separated by the channels of the relay I/F connected to the meters.

[NOTE] The pulse width must be 50-1000 ms and the pulse generator constant (kWh/pulse) must be 0.1-99.9.

[Layout]


Power Source
One refrigerant system
Header
Follower
Follower
Energy Monitoring Relay I/F
BMS-IFWH5E
RS-485
Power Meter
Total 8ch
Outdoor unit
Pull box
Smart BMS Manager or
Touch screen Controller
SMMS-e
Pull box
Indoor unit
TCC-LINK bus
Power Source
One refrigerant system
Header
Follower
Follower
Report
Creation
Software
Power Meter
Outdoor unit
Pull box
Pull box
Indoor unit
PC for energy monitoring
Power Source
Header
One refrigerant system
Note:
:Main switch (Fuse) and circuit Breaker
Power Meter
Outdoor unit
SHRM-e
Indoor unit
Pull box
Pull box
Power Source
Power Meter
Side blow VRF
Pull box
Outdoor unit
Indoor unit
Power Source
Power Meter
DI/SDI
Pull box
Outdoor unit
Indoor unit

9-4 Software combination for BMS

Smart BMS manager		
	Setting File Creation Software for BMS System	This software creates a setting file to be used for the air-conditioning management system. Copies created data using the respective system upload function.
	Report Creation Software	This software is a piece of software that is used in a PC to arrange the indoor unit operation results that where tallied up by the Smart BMS Manager in a report format. This software will also allow you to print these reports.
	Section Changeover Software	This software renames the zones (Floor, Tenant, Area, Monthly report tenant), and targets.
Smart BMS manager with data analyzer		
	Setting File Creation Software for BMS System	This software creates a setting file to be used for the air-conditioning management system. Copies created data using the respective system upload function.
	Report Creation Software	This software is a piece of software that is used in a PC to arrange the indoor unit operation results that where tallied up by the Smart BMS Manager in a report format. This software will also allow you to print these reports.
	Section Changeover Software	This software renames the zones (Floor, Tenant, Area, Monthly report tenant), and targets.
	Data Analyzer	This software displays a history graph of operating power consumption or time of air conditioners managed with Smart BMS Manager.
Touch screen controller system		
	Setting File Creation Software for BMS System	This software creates a setting file to be used for the air-conditioning management system. Copies created data using the respective system upload function.
	Report Creation Software	This software is a piece of software that is used in a PC to arrange the indoor unit operation results that where tallied up by the Touch screen controller in a report format. This software will also allow you to print these reports.
	Data Analyzer	This software displays a history graph of operating power consumption or time of air conditioners managed with Smart BMS Manager.
BACnet Server		
	Setting File Creation Software for BMS System	This software creates a setting file to be used for the air-conditioning management system. Copies created data using the respective system upload function.

APPLICATION CONTROL MANUAL

October, 2021

Toshiba Carrier Corporation