Installation and Start Up Instructions

CONTENTS

SAFETY CONSIDERATIONS

Improper installation, adjustment, alteration, service, maintenance, or use can cause explosion, fire, electrical shock, or other conditions which may cause death, personal injury or property damage. The qualified installer or agency must use factory-authorized kits or accessories when modifying this product.

Follow all safety codes. Wear safety glasses, protective clothing, and work gloves. Use quenching cloth for brazing operations. Have fire extinguisher available. Read these instructions thoroughly and follow all warnings or cautions included in literature and attached to the unit.

Consult local building codes and the current editions of the National Electrical Code (NEC) ANSI/NFPA (American National Standards Institute/National Fire Protection Association) 70. In Canada, refer to the current editions of the Canadian Electrical Code CSA (Canadian Standards Association) C22.1.

Understand the signal words — **DANGER**, **WARNING**, and **CAUTION**. **DANGER** identifies the most serious hazards which will result in severe personal injury or death. **WARNING** signifies hazards that could result in personal injury or death. **CAUTION** is used to identify unsafe practices, which would result in minor personal injury or product and property damage.

Recognize safety information. This is the safety-alert symbol (⚠). When this symbol is displayed on the unit and in instructions or manuals, be alert to the potential for personal injury.

⚠ WARNING

Electrical shock can cause personal injury and death. Shut off all power to this equipment during installation. There may be more than one disconnect switch. Tag all disconnect locations to alert others not to restore power until work is completed.

⚠ WARNING

1. i-Vu Interface components (OPN-MTCC) are exclusively designed to be installed in the i-Vu Interface (OPN-MTCC) controller by Carrier, which is exclusively connected to the i-Vu/IP Protocol. Do not install this product in any other products or use this product for any other purposes and/or protocols without prior written consent.
2. Do not resell or otherwise transfer this product as a stand-alone product.
3. Do not modify or alter this product. Do not try to fix or repair this Product even if the Controller is in need of repair.

OVERVIEW

The i-Vu Interface is an electronic, independently mounted controller that allows the user to monitor and control a Toshiba Carrier VRF system containing up to 64 indoor units.

COMPONENTS

Table 1 lists the components shipped with the unit.

Table 1 —Components Shipped with Unit

NAME/DESCRIPTION	QTY.	FUNCTION
Mounting Brackets	4	Used for mounting the unit on the wall
Mounting Bracket Screws	4	Attaching the mounting brackets to the unit
Front Door Screws	4	Locking the front door using screws

INSTALLATION

Step 1 — Mounting the Cabinet — Units are packaged for shipment to avoid damage during normal transit and handling. It is the receiving party's responsibility to inspect the equipment upon arrival. Any obvious damage to the carton and/or its contents should be reported on the bill of lading and a claim should be filed with the transportation company and the factory. Unit should always be stored in a dry place, and in the proper orientation as marked on the carton. After determining the condition of the carton exterior, carefully remove each unit from the carton and inspect for hidden damage. Any hidden damage should be recorded, a claim should be filed with the transportation company, and the factory should be notified. In the event a claim for shipping damage is filed, the unit, shipping carton, and all packing must be retained for physical inspection by the transportation company. All units should be stored in the factory shipping carton with internal packaging in place until installation.

PROTECTING UNITS FROM DAMAGE — Do not apply force or pressure to the box. The unit must always be properly supported. Temporary supports used during installation or service must be adequate to hold the unit securely. To maintain warranty, protect units against hostile environments (such as rain, snow or extreme temperature), theft, vandalism, and debris on job site. Equipment covered in this manual is not suitable for outdoor installations. Failure to do so may have serious adverse effects on unit operation and in the case of circuit board assembly, may result in immediate or premature failure. Failure of any unit caused by deposits of foreign material will not be covered by the manufacturer's warranty. Some units and/or job conditions may require some form of temporary covering during construction.

PREPARING JOB SITE FOR UNIT INSTALLATION — To save time and to reduce the possibility of costly errors, set up a complete sample installation in a typical room at job site. Check all critical dimensions such as pipe, wire, connections requirements. Refer to job drawings and product dimension drawings as required. Instruct all trades in their parts of the installation. Units must be installed in compliance with all applicable local code requirements.

IDENTIFYING AND PREPARING UNITS — Ensure the power requirements match the available power source.

Refer to the unit's nameplate and wiring diagram. In addition:

- Check all the tags on the unit to determine if the shipping screws should be removed. Remove the screws as instructed.
- Use the supplied accessory kit to install the mounting feet on the back of the control cabinet. The 4 mounting brackets are used for mounting the unit on the wall. The 4 mounting bracket screws are used for attaching the mounting brackets to the unit. The mounting feet measure 17.69" tall and 12.00" wide.
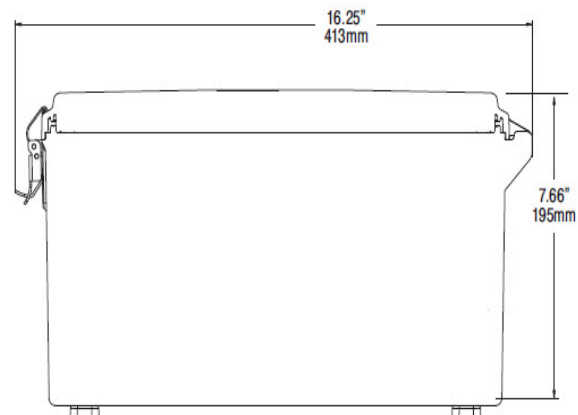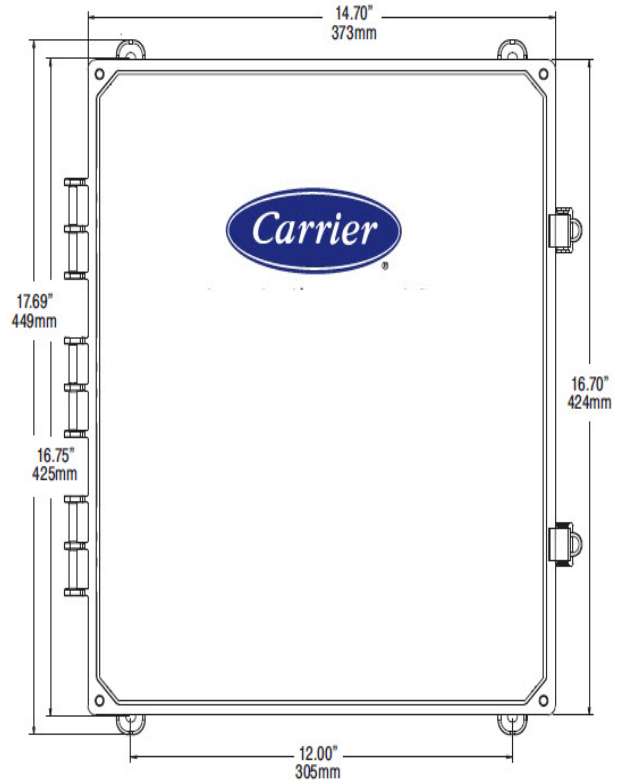
Step 2 — Main Power Connection 115VAC 1P 60Hz

1. Locate the field supplied 14 AWG 3 conductor (L, N, G) power cable.
2. Set the main breaker to the OFF position, and ensure there is no power being supplied through the power cable.
3. Feed the power cable through the pre-drilled hole for high voltage wiring shown in Fig. 2 and secure the line, neutral, and ground leads to their respective terminals.
4. Secure the power cable to the cabinet per local code.

NOTE: The three terminals labeled "LINE" are jumped together. The three terminals labeled "NEU" are jumped together. The two terminals labeled "GND" are jumped together (Fig. 2).
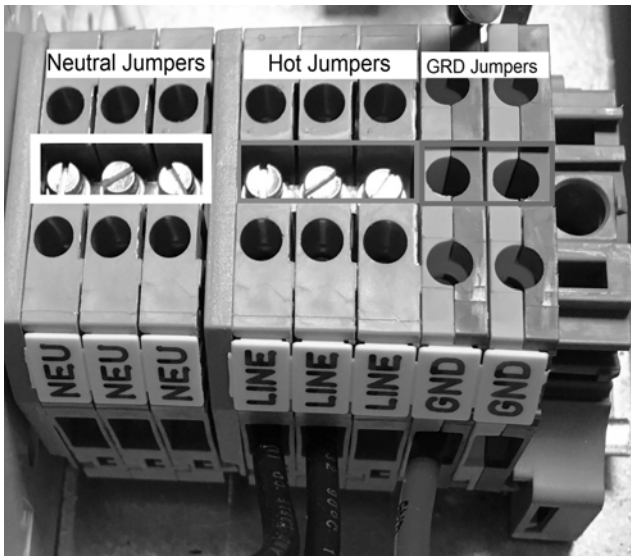

Fig. 2 —Terminal Blocks

Step 3 — Toshiba Carrier VRF System Configuration

1. Use the field supplied communication cables to connect the U1, U2 terminals on the TCC interface board to the U3, U4 communication terminals on the header condensing unit of the Toshiba Carrier VRF system.
2. Feed the communication cables through the pre-drilled hole for low voltage wiring.
3. Secure the U1U2 communication cable to the cabinet per the local code.

Fig. 3 —i-Vu Enclosure

1. Use the following wiring materials to connect the field supplied communication cable.
   Line specification:
   A. Type 2-core shielded wires
   B. Wire size 16 gage, 330 ft. max.
   C. 14 gage, 6500 ft max. Length (total length including air conditioner systems area line length).
2. Central Control address must be set in all indoor units to establish communication with the Toshiba Carrier VRF system.

Step 4 — Connecting the i-Vu Open Link to the i-Vu Server

1. Locate the field supplied Ethernet cable for the i-Vu server.
2. Feed the Ethernet cable through the pre-drilled hole for low voltage wiring along with the U1, U2 communication cables.
3. Secure the U1, U2 cable and Ethernet cable to the cabinet per local code.
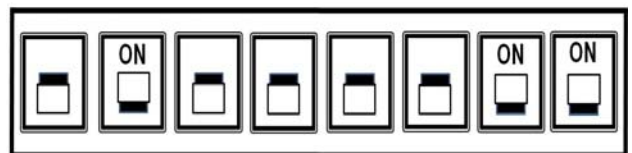4. Ensure all dip switches on the open Link Router are set to default.

Fig. 4 —i-Vu Open Link Default Dipswitch Settings

i-Vu To Toshiba VRF Interface Wiring Diagram: OPN-MTCC

COLOR IDENTIFICATION	
YEL :	YELLOW
RED :	RED
GRN :	GREEN
WHI :	WHITE
Y/W :	YELLOW W/ WHITE STRIPE
BR :	BARE
BLK :	BLACK

Legend
- - Field installed wiring
— Factory installed Wiring
▬ Factory installed twisted pairs (eight twists per
▢ Wire color (See color identification chart for refe
▢ Terminal

See [NOTE 5]

GND | A | B
RS 485

SW200 Dip Switch
SW300 Rotary

Toshiba VRF Modbus Board

Ethernet Port E1

TCC-LNK CN02
U1 | U2

CN20
BLK | WHI

SW100 TCC-Link Dip Switch

Main Bus U1 / U2

See [NOTE 3] & [NOTE 5]

BR
GND | DCD | RX

BLK | RED
RX | RX

Port S2 (Third Party)

10/100 BaseT Ethernet Port E1

i-Vu Open Link

NC
+
+
BLK

WHI

5VDC / 6A Transformer

L BLK
N WHI
GRN

BLK 3A Circuit Breaker BLK

BLK 0.5A Circuit Breaker BLK

Neutral Terminal Block WHI
Neutral Terminal Block WHI
WHI Neutral Terminal Block
BLK Line Terminal Block
BLK Line Terminal Block
BLK Line Terminal Block
GRN Ground Terminal Block
GRN Ground Terminal Block GRN

115VAC 60Hz 1Ph Power supply

See [NOTE 4] and [NOTE 6]

WHI
BLK

24VAC Transformer

24V AC/DC | Ground

Y/W | YEL

[NOTE 1] Low-Voltage Wiring : CLASS 2
[NOTE 2] Use Copper Conductors Only
[NOTE 3] Use 2-core shielded wire 16AWG (1000m maximum) or AWG 14 (2000m maximum) for field installed U1/U2 connections.
[NOTE 4] Use 3 conductor (L, N, G) 14 AWG power cable for 115VAC power connection to the terminal block.
[NOTE 5] Do not ground on this end. Insulate ground from device.
[NOTE 6] The three neutral terminal blocks are jumped together. The three line blocks are jumped together, and the two ground terminal blocks are jumped together.
[NOTE 7] Refer to the installation manual for additional field wiring instructions.

CAUTION : WIRING CONNECTED IN THIS BOX MUST BE RATED AT LEAST 600V.
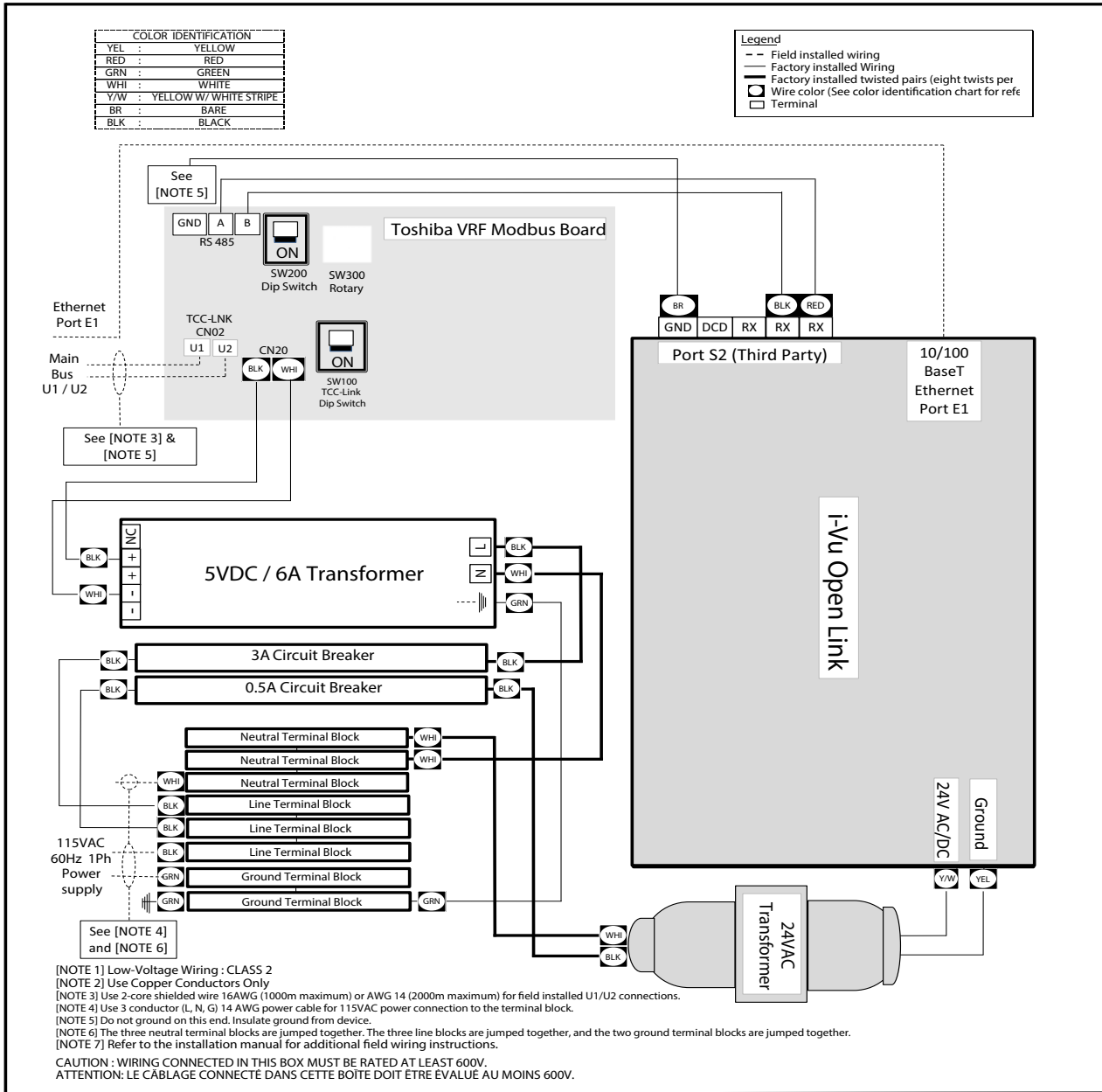ATTENTION: LE CÂBLAGE CONNECTÉ DANS CETTE BOÎTE DOIT ÊTRE ÉVALUÉ AU MOINS 600V.

Fig. 5 —i-Vu to Toshiba Carrier VRF Wiring Diagram

Step 5 — Powering on the Unit

1. Verify all the connections are correct and as per the wiring diagram shown in Fig. 5.
2. Set the main breaker in the unit to **ON** position.
3. Secure the latches, and use the four screws provided to secure the top cover on the enclosure.
4. Supply 115V-1Ph-60Hz power to the i-Vu® interface.

NOTE: For a complete guide to setting up the i-Vu OPenlink router, please refer to the i-Vu Open Link Installation Guide: http://dms.hvacpartners.com/docs/1000/public/03/11-808-462-01.pdf

Step 6 — To obtain an IP address using DHCP

1. Turn the i-Vu® Open Link's power off.
2. Set the IP Addr DIP switch to OFF (DHCP).
3. Turn the i-Vu® Open Link's power on. The DHCP server assigns an IP address to the i-Vu® Open Link.

   To assign a custom IP address:

1. Obtain the IP address, subnet mask, and default gateway address for the controller from the facility network administrator.
2. Set the IP Addr DIP switch #2 to OFF (DHCP).
3. Turn the i-Vu® Open Link's power off.Set the i-Vu® Open Link's IP Addr DIP switch to ON (assigned).
4. Set the i-Vu® Open Link's IP Addr DIP switch to ON (assigned).
5. Configure the i-Vu® Open Link by setting the Router Config Mode set DIP switch #1 to (Console):

   a. **ON** for a terminal program, such as HyperTerminal
   b. **OFF** for Carrier software

NOTE!: The DIP switch on older models was labeled "HyperTerminal".

6. Turn the i-Vu® Open Link's power on.
7. Connect to the Links local access port with the USB-L cable from the USB-TKIT kit or the cable can be purchases separately. (p/n USB-L). The connection is on the left side of the Link. Connect the other end of the cable to a computer's USB port and install the driver for the USB-L if needed.
8. Once this cable is connected to the computer, check the Device Manager to see what COM port the CP210x is connected to, in the example below it is connected to **COM3**.
9. Configure HyperTerminal® or PuTTY® to communicate serially to that COM port at a baud of 115200. Make sure the flow control is set to **NONE**.
10. Once your PuTTY® or HyperTerminal ® is setup, start it, hit the enter key once the communications window is open.
11. Access the different menu items to change the I.P., subnet and default gateway at a minimum.
12. When done changing the information, type 1 to reset the link to lock the values in.
13. After resetting, hit the enter key again to verify the changes have been changed and locked in.
14. Progress to Verifying the i-Vu server can communicate with the i-Vu Interface.

Step 7 — Verifying the i-Vu server can Communicate with the i-Vu Interface

1. Power on the i-Vu server.
2. Select the router on the main page and then click **Upload** (see Fig. 6).

Fig. 6 —Technician Tool

3. Expand the router on the far left and see all the Indoor Units programs up to 64. Select one of possible 64 programs and then along the top, select the **PROPERTIES** tab, then select the **NETWORK POINTS** tab and the following message appears. "**Review the Error column, the messages should be "0 No Error**".

Fig. 7 —Technician Tool

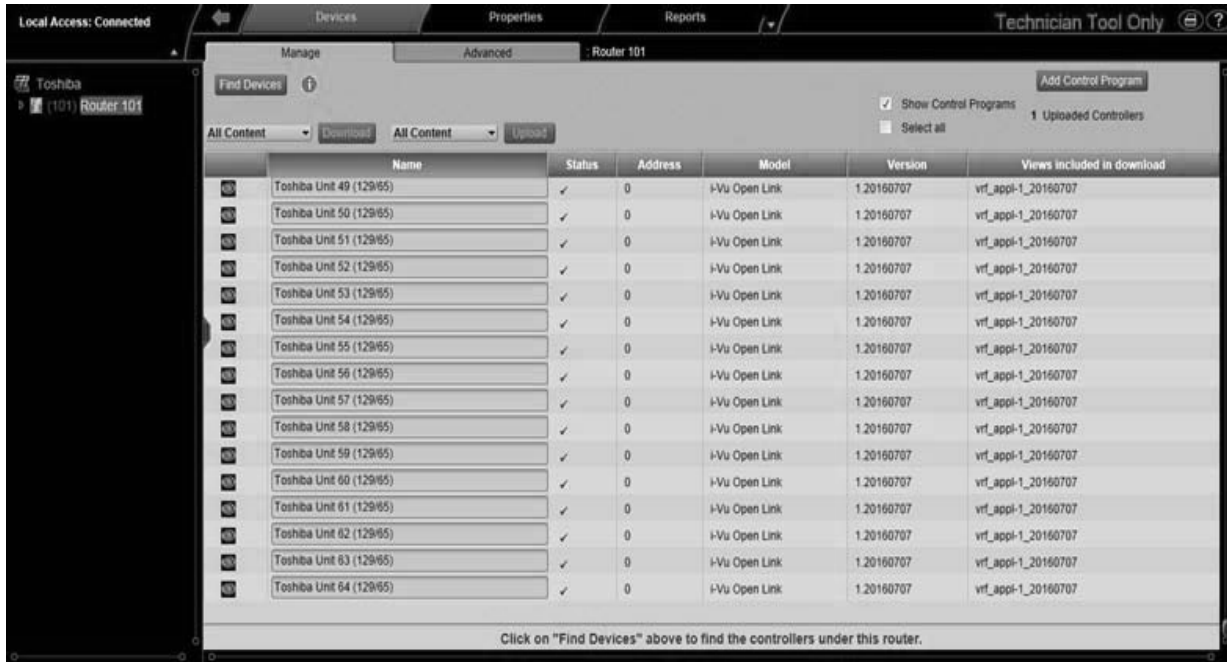4. Once you complete the upload, you should see the programs numbered 1 through 64.

Fig. 8 —Technician Tool

5. To verify communications, select the "**System Info**" program ➝ **Properties** ➝ **Network Points** and check for the message () **No Error** in the **Error** column. This program displays the status of the Modbus registers that reside in the TCC-Link. All Toshiba Carrier Unit X programs have points that reside only in the Controllers and are sent to the TCC-Link when requested. Use the **System Info** tab to get the values from the Toshiba Carrier VRF System to verify that the i-Vu Open Link is communicating with the TCC-Link.

Fig. 9 —Technician Tool

Status Screen

Fig. 10 —Status Screen

Table 2 —Status Screen

Description	Point		States
Unit Status	onoff_stat	R	Off / On
Alarm Status	alarm	R	Normal (0) / Alarm (1)
Alarm Code	alarm_code	R	-1 to 255 (-1 = FSD Alarm, 0 – 255 = unit alarms)
Operation Mode	op_mode_stat	R	Heat (1) / Cool (2) / Fan (3) / Dry (4) / Auto (Heat) (5) / Auto (Cool) (6) / Off (7)
Zone Temp	suc_tmp	R	deg F.
Temp Setpoint	tmp_mon	R	deg F.
Fan Speed	fan_spd_mon	R	Stop (1) / Auto (2) / High (3) / Medium (4) / Low (5) / Very Low (6)
Filter Status	filt	R	Clean (0) / Dirty (1)
Shutdown	Shutdown	R/W	Inactive (0) / Active (1)

Unit Configuration Screen

Fig. 11 —Unit Configuration Screen

Table 3 —Unit Configuration

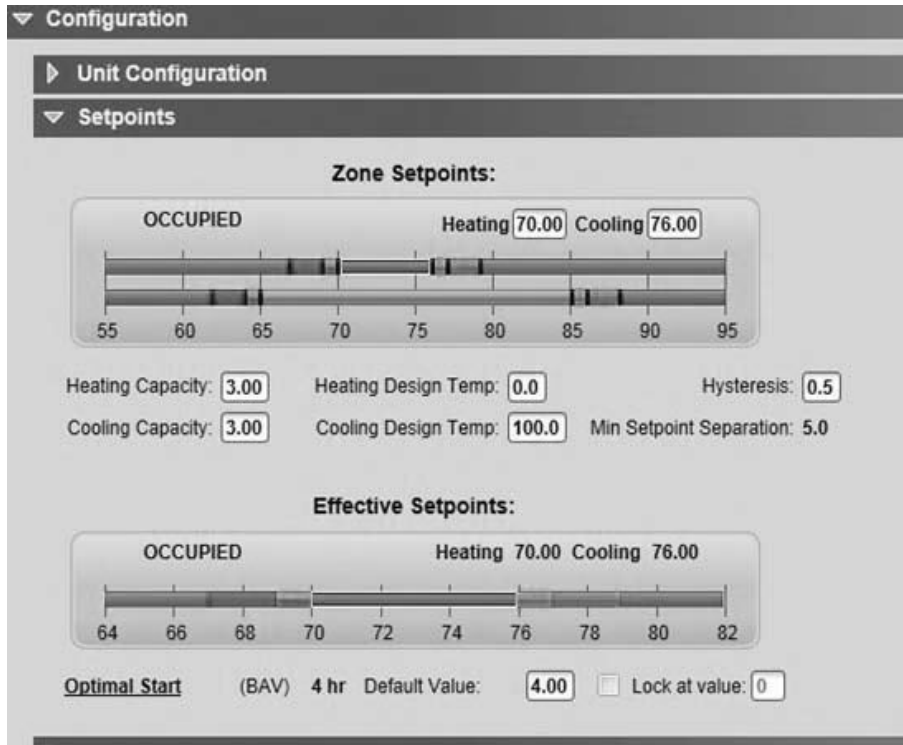| Description	Point	R/W	States	
Control Mode	wc_or_tstat	R/W	Wall T-Stat (0) / I-Vu / BAS (1)	
Unit Commanded State	unit_cmd_state	R/W	Off (0) / On (1)	
Mode Control	zone_mode_ctrl	R/W	Auto (1) / Heat (2) / Cool (3)	
Manual Op Mode Control	op_mode_cmd	R/W	Heat (1) / Cool (2) / Fan (3) / Dry (4) / Auto (5) / Inactive (6)	
Manual Fan Speed Control	fan_spd_cmdx	R/W	Auto (1) / High (2) / Medium (3) / Low (4)	
Louver Setting	luvr_set	R/W	Stop (1) / Swing (2) / Down (3) / 25% Up (4) / 50% Up (5) / 75% Up (6) / 100% Up (7) Se	
Min Setpoint Separation	min_stpt_sep	R/W	2 Deg F – 10 Deg F	(5 Deg F)
Cooling Lockout Temperature	oat_cl_lockout	R/W	-65 deg F - 80 deg F	(45 Deg F)
Heating Lockout Temperature	oat_ht_lockout	R/W	35 deg F - 150 deg F	(65 Deg F)

Setpoint Screen

Fig. 12 —Setpoint Screen

Table 4 —Unit Configuration

Description	Point	States		
Occupied Cooling Setpoint	occ_cl_stpt	R/W	60 deg F - 99 deg F	(76 deg F)
Occupied Heating Setpoint	occ_ht_stpt	R/W	55 deg F - 90 deg F	(70 deg F)
Unoccupied Cooling Setpoint	unocc_cl_stpt	R/W	65 deg F - 99 deg F	(85 deg F)
Unoccupied Heating Setpoint	unocc_ht_stpt	R/W	50 deg F - 80 deg F	(65 deg F)
Effective Cool Setpoint	effective_cl_stpt	R	deg F	
Effective Heat Setpoint	effective_ht_stpt	R	deg F	
Optimal Start	optm_star	R/W	1 hour – 4 hours	(4 hours)

Alarm Configuration Screen

Fig. 13 —Alarm Configuration Screen

Table 5 —Alarm Configuration

Description	Point		States		
High Temperature Alarm Limit	spt_alrm_hi_lm	R/W	40 deg F	- 100 deg F (95 deg F)	
Low Temperature Alarm Limit	spt_alrm_lo_lmt		35 deg F	- 90 deg F (45 deg F)	

Service Configuration Screen

Fig. 14 —Service Configuration Screen

Table 6 —Service Configuration

Description	Point		States
Zone Temp Sensor Location	rs_or_rc	R/W	Return Air Sensor (0) / Local Zone Controller (1)
Unit Type	unit_type	R	Air Conditioning (1) /Ventilator (2)
Local Unit ON/OFF Control	unit_onoff_ena	R/W	Allow (0) / Prohibit (1)
Local Op Mode Control	op_mode_ena	R/W	Allow (0) / Prohibit (1)
Local Setpoint Control	setpoint_ena	R/W	Allow (0) / Prohibit (1)
System Outdoor Air Temperature	bacnet://*/AV:80001		deg F
System Fire / Smoke	bacnet://		Off (0) / On (1)

Table 7 —Maintenance Unit

Fire/Smk Shutdown	BBV	Normal
Mode Control Source		Normal BAS
Controlling Mode Output		
Setpoint Control Source		

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Table 8 —Unit Maintenance Screen

Description	Point		States
Fire/Smk Shutdown	net_fsd	R	Normal (0) / Alarm (1)
Mode Control Source			Normal BAS(0) / User Overridden(1)
Controlling Mode Output			Heat (1) / Cool (2) / Fan (3) / Dry (4) / Auto (5)
Setpoint Control Source			Normal BAS(0) / User Overridden (1)
Controlling Temp Output			deg F
Effective Heat Setpoint			deg F
Effective Cool Setpoint			deg F
Fan Speed Output			Stop (1) / Auto (2) / High (3) / Medium (4) / Low (5) / Very Low (6)
Louver Position	luvr_mon	R	Stop (1) / Swing (2) / Down (3) / 25% Up (4) / 50% Up (5) / 75% Up (6) / 100% Up (7)
Comm Status		R	Normal (0) / Comm Error (1)
Unit Connection		R	No Connection (0) / Connected (1)
Refrigerant System Address			xx
Indoor Unit Number			xx
Max Permitted Temp Setting in Heat Mode			deg F
Min Permitted Temp Setting in Heat Mode			deg F
Max Permitted Temp Setting in Cool Mod			deg F
Min Permitted Temp Setting in Cool Mode			deg F
Max Permitted Temp Setting in Dry Mode			deg F
Min Permitted Temp Setting in Dry Mode			deg F
Max Permitted Temp Setting in Auto Mode			deg F
Min Permitted Temp Setting in Auto Mode			deg F
Permitted Fan Speed Setting BIT1			Off (0) / L (1)
Permitted Fan Speed Setting BIT2			Off (0) / H (1)
Permitted Fan Speed Setting BIT3			Off (0) / HH (1)
Permitted Fan Speed Setting BIT4			Off (0) / Auto (1)
Permitted Operation Heat			Off (0) / Heat (1)
Permitted Operation Cool			Off (0) / Cool (1)
Permitted Operation Fan			Off (0) / Fan (1)
Permitted Operation Dry			Off (0) / Dry (1)
Permitted Operation Auto			Off (0) / Auto (1)
ON / OFF Permit/Prohibit Monitoring	on_off_pp_mon	R	Permit (0) / Prohibit (1)
Op Mode Permit/Prohibit Monitoring	op_mde_pp_mon	R	Permit (0) / Prohibit (1)
Set Temp Permit/Prohibit Monitoring	st_tmp_pp_mon	R	Permit (0) / Prohibit (1)
Reset Filter	flts_sign_reset	R/W	Off (0) / Reset (1)

Table 9 —Unit Maintenance Screen

Description	Point		States
Occupancy Status	occ_status	R	Unoccupied (0) / Occupied (1)
Local BACnet Schedule	schedule	R	Off (0) / ON(1)

Alarms
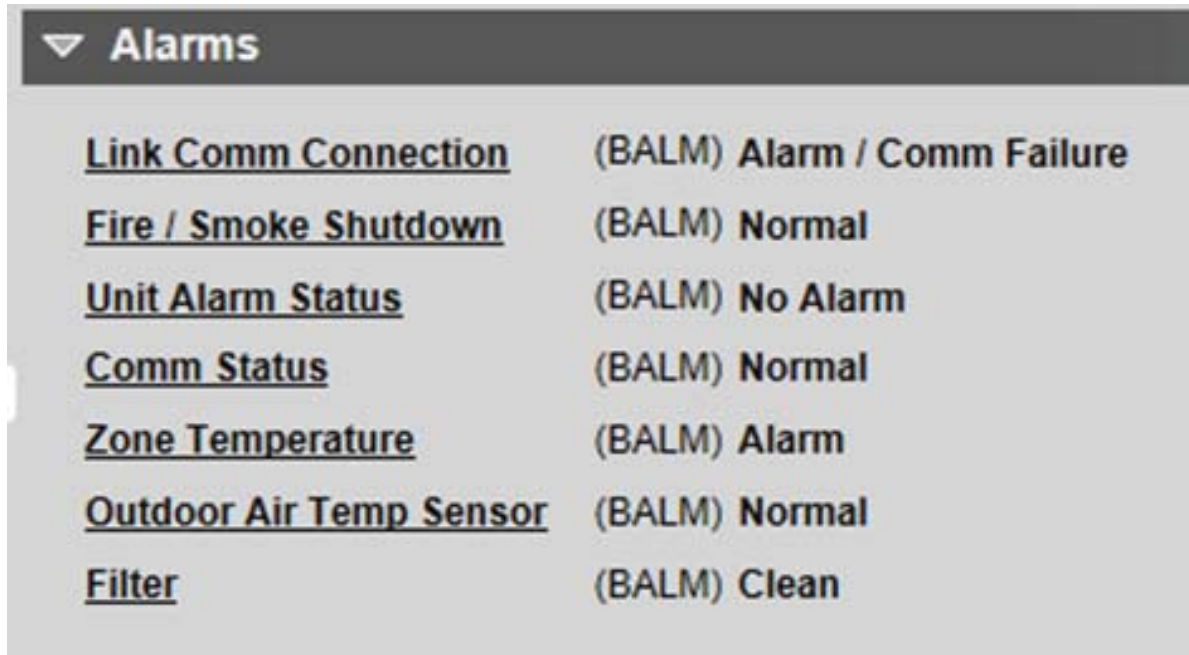
Fig. 15 —Alarms

Table 10 —Alarms

Description	Point		States
Link Comm Connection	uconn_alm	R	Normal / Connect (0) / Alarm / Comm Failure (1)
Fire / Smoke Shutdown	fire_alarm	R	Normal (0) / Alarm (1)
Unit Alarm Status	det_alarm	R	No Alarm (0) / In Alarm (1)
Comm Status	comm_error	R	Normal (0) / Comm Error (1)
Zone Temperature	spt_alarm	R	Normal (0) / Alarm (1)
Outdoor Air Temp Sensor	oat_fail	R	Normal (0) / Alarm (1)
Filter	filter_alarm	R	Clean (0) / Dirty (1)

Table 11 —Status Screen

Name	Description
Unit Status	Displays the operational status of this zone. When OFF, no heating, cooling, or fan operation is provided. Mode must be on for any local or BAS control.
Alarm Status	Indicates if any alarms are currently active.
Alarm Code	If the Alarm Status above is in alarm, then this value represents the alarm code received from the zone control.
Operation Mode	Displays the current operational mode used by the zone control.
Zone Temp	Displays the zone temperature of the zone.
Temp Setpoint	Displays the current setpoint used by the zone controller.
Fan Speed	Displays the current fan operating speed.
Filter Status	Displays the current condition of the filter.
Shutdown	When the Control Mode is set to i-Vu / BAS, this point may be set to Shutdown to stop the equipment operation in this zone.

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Table 12 —Unit Configuration Screen

Name	Description
Control Mode	Use to monitor the operation of the zone when set to Wall T-Stat. When set to i-Vu / BAS, it allows the ability to utilize the occupancy and setpoint schedule programming to operate the zone.
Unit Commanded State	When the Control Mode is set to i-Vu / BAS, this option is used to enable the zone control or disable any control operation.
Mode Control	When the Control Mode is set to i-Vu / BAS, this decision is used to determine and set the allowable mode of operation for automatic control.
Manual Op Mode Control	When the Control Mode is set to i-Vu / BAS, this decision is used to manually initiate any specific mode and hold that mode unless overridden by the local user interface.
Manual Fan Speed Control	When the Control Mode is set to i-Vu / BAS, this decision is used to manually initiate a specific fan speed and hold that mode unless overridden by the local user interface.
Louver Setting	When the Control Mode is set to i-Vu / BAS, this decision is used to manually position the louver if so equipped.
Min Setpoint Separation	Use to determine the minimum amount of separation (deadband) between the heating and cooling setpoints when the setpoint schedule is being used.
Cooling Lockout Temperature	Specifies the temperature at which when the OAT falls below, cooling will no longer be available to operate.
Heating Lockout Temperature	Specifies the temperature at which when the OAT rises above, heating will no longer be available to operate.

Table 13 —Alarm Configuration Screen

Name	Description
High Temperature Alarm Limit	Use to determine the maximum allowable zone temperature that can occur in this zone at any time. If a zone temperature above this value occurs for more than 1 minute, an alarm is generated.
Low Temperature Alarm Limit	Use to determine the minimum allowable zone temperature that can occur in this zone at any time. If a zone temperature below this value occurs for more than 1 minute, an alarm is generated.

Table 14 —Service Configuration Screen

Name	Description
Zone Temp Sensor Location	Use to set the location of the sensor used to sense the zone's temperature. It will be used to properly display that position on the graphic.
Unit Type	Displays the unit type
Local Unit ON/OFF Control	Use to allow or prohibit the local user from setting the unit to On or Off through the local user interface device.
Local Op Mode Control	Use to allow or prohibit the local user from changing the unit mode through the local user interface device.
Local Setpoint Control	Use to allow or prohibit the local user from changing the setpoint through the local user interface device.
System Outdoor Air Temperature	Displays the address and value received from the network OA temperature sensor (if used).
System Fire / Smoke	Displays the address and value received from the network Fire / Smoke Detector point (if used).

Table 15 —Service Configuration Screen

Name	Description
Fire/Smk Shutdown	Displays the state of the Fire/Smoke detector input.
Mode Control Source	Displays the source of the operating mode control.
Controlling Mode Output	Displays the value of the control mode being sent to the local unit control from the application.
Setpoint Control Source	Displays the source of the setpoint control.
Controlling Temp Output	Displays the value of the setpoint being sent to the local control from the application.
Effective Heat Setpoint	Displays the current heating setpoint.
Effective Cool Setpoint	Displays the current cooling setpoint.
Fan Speed Output	Displays the value of the fan speed being sent to the local control from the application.
Louver Position	Displays the position of the louver (valid only if equipped)
Comm Status	Displays whether or not there is a communication error between the TCC Link and the individual VRF units
Unit Connection	Displays whether the individual VRF unit is powered on or off
Refrigerant System Address	Displays the address of the refrigeration system.
Indoor Unit Number	Displays the address of this indoor unit
Max Permitted Temp Setting in Heat Mode	Displays the maximum allowable temperature setting in heat mode
Min Permitted Temp Setting in Heat Mode	Displays the minimum allowable temperature setting in heat mode
Max Permitted Temp Setting in Cool Mode	Displays the maximum allowable temperature setting in cool mode
Min Permitted Temp Setting in Cool Mode	Displays the minimum allowable temperature setting in cool mode
Max Permitted Temp Setting in Dry Mode	Displays the maximum allowable temperature setting in dry mode
Min Permitted Temp Setting in Dry Mode	Displays the minimum allowable temperature setting in dry mode
Max Permitted Temp Setting in Auto Mode	Displays the maximum allowable temperature setting in auto mode
Min Permitted Temp Setting in Auto Mode	Displays the minimum allowable temperature setting in auto mode
Permitted Fan Speed Setting BIT1	Displays if low speed fan operation is permitted
Permitted Fan Speed Setting BIT2	Displays if medium speed fan operation is permitted
Permitted Fan Speed Setting BIT3	Displays if high speed fan operation is permitted
Permitted Fan Speed Setting BIT4	Displays if auto fan speed operation is permitted
Permitted Operation Heat	Displays if Heat mode operation is permitted
Permitted Operation Cool	Displays if Cool mode operation is permitted
Permitted Operation Fan	Displays if Fan mode operation is permitted
Permitted Operation Dry	Displays if Dry mode operation is permitted
Permitted Operation Auto	Displays if Auto mode operation is permitted
ON / OFF Permit/Prohibit Monitoring	Displays if ON /OFF control is permitted at the local user interface
Op Mode Permit/Prohibit Monitoring	Displays if Op Mode changes are permitted at the local user interface
Set Temp Permit/Prohibit Monitoring	Displays if Setpoint adjustments/ changes are permitted at the local User interface
Reset Filter	Provides the ability to reset the filter status alarm after the filter has been cleaned or replaced

Table 16 —Occupancy Maintenance Screen

Name	Description
Occupancy Status	Displays the current occupancy state
Local BACnet Schedule	Displays the current state of the occupancy schedule where OFF is unoccupied and ON is occupied.

Table 17 —Alarms Screen

Name	Description
Link Comm Connection	Displays whether the TCC-Link is communicating to the VRF unit
Fire / Smoke Shutdown	Displays when the operation has been disabled due to an active Fire/Smoke condition
Unit Alarm Status	Displays when an alarm condition is currently active in this zone with this equipment
Comm Status	Displays the state of the communications between the TCC Link and the VRF unit
Zone Temperature	Displays when an abnormal temperature condition is detected in this zone
Filter	Displays when the filter in the unit serving this zone has become clogged or dirty

   NOTE: BACnet Accessible Points: BACnet points are in the following format – "xxxxx_n" where "xxxx" is the points reference name and the _"n" suffix is the zone number for that zone. For example: the BACnet point "alarm_code_7" is made from "alarm_code" (the reference name) and _"7" (VRF unit 7).
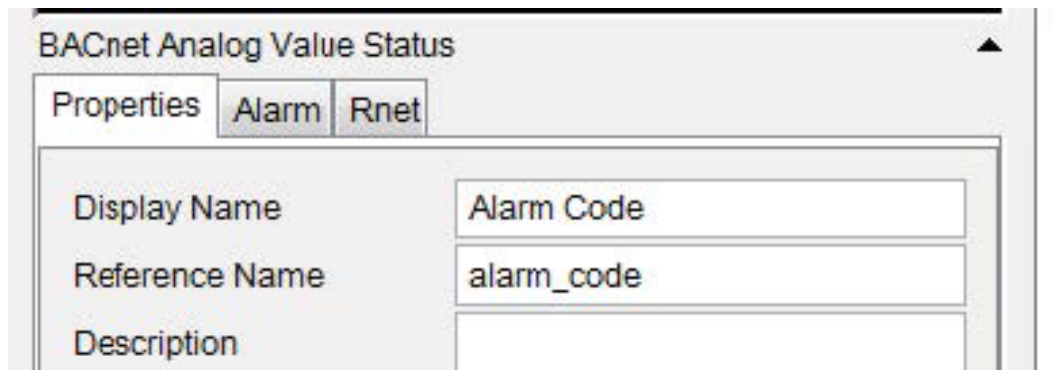

Fig. 16 —BACnet Analog Value Status

The i-Vu interface provides the capability to monitor or control a multi-zone VRF system. When used with the Carrier i-Vu, a graphic is also provided for each zone to display zone information.

Table 18 — Alarm Code Error Description

	Alarm Codes	
Hexadecimal #	Main Remote Controller Display	Error Description] (Sheet 1 of 2)
00		No active error
25	C05	Sending error in TCC-LINK central control device
26	C06	Receiving error in TCC-LINK central control device
2C	C12	Batch alarm of general-purpose equipment control interface
41	E01	Communication error between indoor and remote controller
42	E02	Sending error of remote controller
43	E03	Communication error between indoor and remote controller
44	E04	Communication circuit error between indoor and outdoor
46	E06	Decrease of No. of indoor units
47	E07	Communication circuit error between indoor/outdoor
48	E08	Duplicated indoor addresses
49	E09	Duplicated master remote controllers
4A	E10	Communication error between indoor P.C.board
4C	E12	Automatic address start error
4F	E15	No indoor automatic address
50	E16	Capacity over/No. of connected indoor units
52	E18	Communication error between indoor header and follower units
53	E19	Outdoor header units quantity error
54	E20	Other line connected during automatic address
55	E21	Header thermal storage units quantity error
56	E22	Decease of No. of thermal storage units
57	E23	Sending error in communication between outdoor units
58		Reserved
59	E25	Duplicated follower outdoor address
5A	E26	Decrease of No. of connected outdoor units
5C	E28	Follower outdoor unit error
5F	E31	IPDU communication error
61	F01	Indoor TCJ sensor error
62	F02	Indoor TC2 sensor error
63	F03	Indoor TC1 sensor error
64	F04	TD1 sensor error
65	F05	TD2 sensor error
66	F06	TE1/TE2 sensor error
67	F07	TL sensor error
68	F08	TO sensor error
6A	F10	Indoor TA/TSA sensor error
6B	F11	Indoor TF/TFA sensor error
6C	F12	TS1 sensor error
6D	F13	TH sensor error
6F	F15	Outdoor temp. sensor misconnection (TE1/TL)
70	F16	Outdoor pressure sensor misconnection (Pd/Ps)
71	F17	TOA sensor error
72	F18	TRA sensor error
76	F22	TD3 sensor error
77	F23	Ps sensor error
78	F24	Pd sensor error
7D	F29	Indoor other error
7F	F31	Outdoor EEPROM error
80		Reserved
81	H01	Compressor break down
82	H02	Magnet switch / Overcurrent operation / Compressor error
83	H03	Current detection circuit error
84	H04	Comp-1 case thermo operation
85	H05	Outdoor temp. sensor misconnection (TD1)
86	H06	Low pressure protective operation
87	H07	Low oil level protection

Alarm Codes		
Hexadecimal #	**Main Remote Controller Display**	**Error Description] (Sheet 2 of 2)**
88	H08	Oil level temp. sensor error
8E	H14	Comp-2 case thermo operation
8F	H15	Outdoor temp. sensor misconnection (TD2)
90	H16	Oil level circuit / Magnet switch / Overcurrent error
99	H25	Outdoor temp. sensor misconnection (TD3)
C2	L02	Inconsistency error of outdoor units
C3	L03	Duplicated indoor header units
C4	L04	Duplicated outdoor line address
C5	L05	Duplicated indoor units with priority
C6	L06	Duplicated indoor units with priority
C7	L07	Group line in individual indoor unit
C8	L08	Indoor group/Address unset
C9	L09	Indoor capacity unset
CA	L10	Outdoor capacity unset
D1	L17	Inconsistency error of outdoor units
D2	L18	FS unit error
D4	L20	Duplicated central control addresses
DA	L26	Over No. of connected thermal storage units
DB	L27	Thermal storage units quantity error
DC	L28	Maximum number of outdoor units exceeded
DD	L29	No. of IPDU error
DE	L30	Auxiliary interlock in indoor unit
DF	L31	IC error
E1	P01	Indoor fan motor error
E3	P03	Discharge temp. TD1 error
E4	P04	High-pressure switch detection error
E5	P05	Phase-missing detection / Phase order error
E7	P07	Heat sink overheat error
EA	P10	Indoor overflow error
EC	P12	Indoor fan motor error
ED	P13	Outdoor liquid back detection error
EF	P15	Gas leak detection
F1	P17	Discharge temp. TD2 error
F2	P18	Discharge temp. TD3 error
F3	P19	4-way valve inverse error
F4	P20	High-pressure inverse error
F6	P22	Outdoor fan IPDU error
FA	P26	G-Tr short circuit protection error
FD	P29	Comp position detection circuit error
FE	P30	Group terminal unit error
FF	P31	Follower indoor unit error (Group error)

Monitor Mode

When used only to monitor a system, the Control Mode is set to Wall T-Stat and the interface operates in a monitor only mode. All control for the zone is provided by the local unit control and the wall mounted user interface. The only additional features supported in this mode are:

1. A monitored Network FSD (ANI) input so that a fire or smoke detector can override the local unit's control and stop the unit's operation during this alarm condition. This control overrides any local control by setting the Local Unit ON/OFF Control to Prohibit to prevent the user from operating the equipment.

2. The Zone Temp Sensor Location can be set to appropriately show the correct position on the graphic.

3. Provide a zone temperature alarm for annunciating high or low zone temperature conditions.

4. Provide the ability to Allow or Prohibit three functions at the Toshiba User interface; Local Unit ON/OFF Control, Local Op Mode Control, and Local Setpoint Control.

5. Provide alarming indication for a dirty filter condition and a reset function to clear the alarm condition after the filter has been serviced.

6. Provide the ability to detect and annunciate communication errors and failure conditions.

7. Provide the ability to annunciate alarm conditions present at the zone control.

Building Automation System (BAS) Control Mode

When the Control Mode is set to Wall T-Stat, the interface operates in a control mode. It is used as a BAS level control and in addition to the features listed above (in Monitor Mode), it also provides the ability to schedule occupancy and operate each zone to a setpoint schedule to adjust the zone's temperature setpoints based on the occupancy schedule configured.

A setpoint and occupancy schedule is provided for each zone that is used to determine when the zone is occupied or unoccupied. During the occupied period, the zone uses the heating and cooling setpoints configured for the occupied period. When the schedule has determined the zone is unoccupied, the zone utilizes the unoccupied heating and cooling setpoints.

To allow for setback recovery and provide a smooth transition from unoccupied to occupied operation, the Optimal Start algorithm slowly transitions the setpoints from the unoccupied values to the occupied values over a period of time prior to the start of the occupied period. The amount of time is user adjustable, up to 6 hours.

Manual controls provide the ability to disable any zone by setting the Unit Commanded State to OFF. This parameter must be set to ON for any operation to occur.

The Mode Control parameter provides the ability to choose between heating, cooling or allows the unit to automatically switch modes as required if the Auto mode is selected. Additionally, the Manual Op Mode Control provides the ability to lock the unit in a specific mode (must be set to Inactive for normal operation). Additional manual overrides are provided for fan speed (Manual Fan Speed Control) and Louver positioning (Louver Setting) if applicable.

During the occupied period, the control compares the current zone temperature to the occupied heating and cooling setpoints. A cooling mode is required if the zone temp is above the cooling setpoint while a heat mode is required if the zone temperature is below the heating setpoint. It also compares the Mode Control input to any required mode that may be necessary to determine what operating modes are permitted.

The mode control can be set to allow for heating only, cooling only or both heating and cooling. Finally, if a mode is required and permitted, then if an Outdoor Air Temperature sensor value is available (provided from the Network) then a final check is done to determine if the mode should be disabled due to an OA temp lockout.

If a mode is required and is allowed, the control sends the appropriate occupied setpoint (heating or cooling) as required and sends the AUTO fan control mode to allow the unit to operate the indoor fan at the appropriate speed required by the local zone control. The mode continues until after the zone temperature achieves setpoint plus 1 deg °F for heating or minus 1 deg °F for cooling.

If at any time during the occupied period the local user initiates a manual change of the setpoint, mode or fan speed from the wall mounted user interface, the BAS level control will no longer update those functions until the start of the next unoccupied period.

During the unoccupied period, the control performs the same checks as was done during the occupied period above but utilizes the configured unoccupied setpoints to determine the zone heating or cooling requirements. During the unoccupied periods, the zone is determined to require heat if the zone temperature is greater than 1°F below the unoccupied heating setpoint and is determined to require cooling if the zone temperature is greater than 1°F above the unoccupied cooling setpoint. A 1°F hysteresis is still used so each mode is satisfied when the zone temperature reaches the appropriate unoccupied setpoint. When the unoccupied setpoints are reached, the fan operates at a low speed to maintain air circulation in the zone.

To transition smoothly from the unoccupied setpoints to the occupied setpoints, optimal start will begin to ramp the setpoints starting at the user configured time (4 hours default) prior to the start of the next occupied period. This allows the zone to reach the occupied temperature setpoints at the start of the occupied period.

TROUBLESHOOTING/PRECAUTIONS

1. Initialization processing takes about 1 minute after switching on the TCC-LINK board. The startup time depends on the number of indoor units.

2. When sending a write request from the TCC-LINK board to 64 indoor units, it is necessary to leave an interval of at least 90 seconds before the next request. If write requests and read requests are sent consecutively from the TCC-LINK board, write requests may be temporarily interrupted to give priority to polling processing.

3. Even when polling from the TCC-LINK board has stopped, the TCC-LINK board continues polling to the indoor units.

4. The TCC-LINK board has no function for resetting software.

5. Restarting the TCC-LINK board clears all acquired data on the indoor units. Indoor unit data must be re-acquired each time the power is turned on.

6. If changing the setting of indoor units, it is necessary to reset the TCC-LINK board. **(Address)**

7. Settings for the operating mode, temperature range, air direction, and airflow of the indoor units differ according to the unit type.

8. When the power to the outdoor units of a multi-air-conditioning system is interrupted or when the system is being re-booted, the TCC-LINK board cuts TCC-LINK communication. The response to communication break is

   `"Exception Response = 0 x 06"`

9. The register "TCC-LINK bus error" will be "Error 1" when all the indoor units have a communication fault.

10. The temperature setting, airflow, and air direction of the indoor units vary for each operation mode. For example, if you choose to change both the operation mode and temperature setting at the same time, first change the operation mode before changing the temperature setting.

11. Indoor unit (s) need to set the Central Control Address from Wired Remote Controller or Central Remote Controller. TCC Board communicates with the indoor unit using the Central Control Address.

INDOOR UNIT ADDRESS SETTING

1. Set the central control address of the Toshiba Carrier VRF Indoor Units so that is does not match the address of any other unit.

2. After changing the central control address, reboot the TCC-LINK board.

START-UP

Central Control Address Setting (Group Address)

STEP 1

✓

1. Push the [button] button to display the menu screen.

2. Push and hold the [button] button and the [∨] button at the same time to display the "Field setting menu".
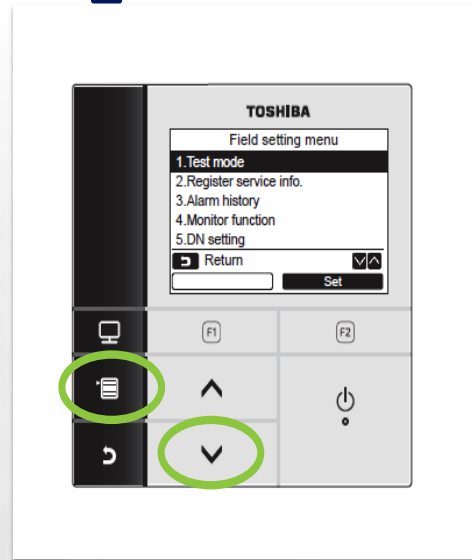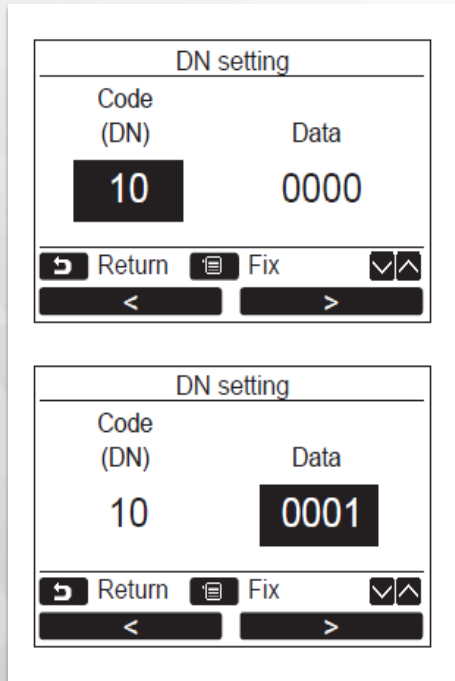
3. Push the [⊃] button to return.

1

Fig. 17 —Start-up

START-UP

Central Control Address Setting (Group Address)

1. Push the [ ] button to display the menu screen.

2. Push and hold the [ ] button and the [∨] button at the same time to display the "Field setting menu".

Fig. 18 —Start-up

START-UP

Central Control Address (Group Address)
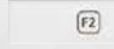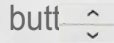
CENTRAL CONTROL ADDRESS SETTING

CENTRAL CONTROL Address

STEP 2 ☑ Using the buttons, set to the item code '03' .

STEP 3 ☑ Press the [F2] button, use the to change line address.

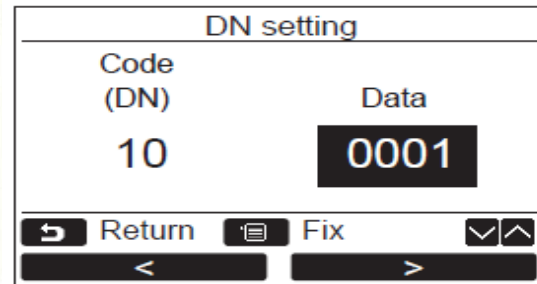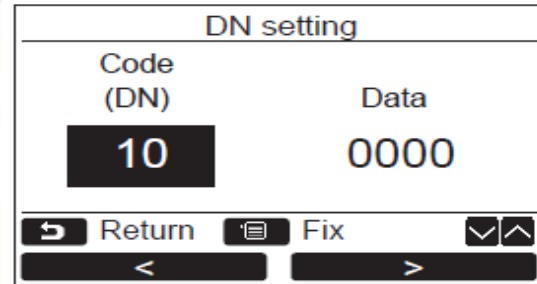**STEP 4** ☑ Push button to fix the changed data.

Fig. 19 —Start-up

START-UP

Control Wire/Addressing (Group Address)

MANUAL ADDRESS SETTING

STEP 5 ✓ Push [↩] button to exit DN menu.

FINISH

Fig. 20 —Start-up