Overview

• BACnet is a standard communication protocol typically used in commercial environments
• BACnet MS/TP refers to one of the communication mediums used by the BACnet protocol
• BACnet MS/TP is an RS-485 hardware based protocol

This document shall serve to describe the proper setup and configuration of a Rheem BACnet MS/TP control. Setup does not require detailed knowledge of the internals of the BACnet protocol and this document does not serve as documentation or instruction on that protocol. Numerous on-line and print documents provide that information for the interested user. However, specific values for some parameters based upon the existing BACnet internetwork are required in order to accomplish the setup. If the structure of that existing network is unknown, consultation with a system administrator before starting the setup process is recommended.

Configuration

The following configurations must be set properly for a BACnet MS/TP device to properly exist on a BACnet network.

BACnet MAC Address

The hardware address of the MS/TP interface associated with a device on an MS/TP BACnet network segment:
• default value = 1
• 0 to 254 if BACnet Config = MS/TP Master
• 0 to 127 if BACnet Config = MS/TP Slave

The BACnet MAC Address must be unique amongst devices on a given BACnet network segment. This address may be duplicated for BACnet devices on other segments connected across routers. Duplicate MAC addresses on the same segment can cause unpredictable network behavior/malfunction and are in fact illegal.

It is common, but not a required practice to restrict values for slave devices to the range 128 to 254 in order to limit the address area in which BACnet devices configured as "MS/TP Master" exist. This may serve to reduce network traffic.

Avoid a value of 0 if possible because of common use by routers that may be added to the internetwork.

With the considerations above notwithstanding, values are arbitrary. However, it is common practice to cluster MAC addresses sequentially, or in a small range, in order to reduce network traffic. In addition, local installations may impose additional guidelines.

BACnet Baud Rate

For a given BACnet installation, all devices on the same network segment must be set to the same BAUD rate.

The possible communication baud rate selections for the BACnet MS/TP interface are:
• 9.6 kbps (kbps = kilo-bits per second)
• 19.2 kbps
• 38.4 kbps [default]
• 57.6 kbps
• 76.8 kbps
• 115.2 kbps

BACnet Configuration

The operational mode of the BACnet MS/TP interface:
• MS/TP Master [default]
• MS/TP Slave

There is typically no need to adjust this config. Being a "Master" allows the device to be easily identified on a BACnet network. If there are severe network bandwidth issues, this configuration may be of assistance in the "Slave" setting

BACnet Max Master Address

This is the maximum expected hardware address of a master device on a given BACnet MS/TP network segment.

The installer should consider the following parameter only if BACnet Config is set to "MS/TP Master".
• 0 – 127 [default 127*]

It should be noted that the control will function at its default value, but a wise installer will typically limit this value to constrain network bandwidth in order to limit unnecessary bus traffic.

BACnet Device Instance

The object identifier of the device object associated with a BACnet physical device.

This configuration MUST be set and must be unique when the installation occurs.
• 0 to 4,194,303 default = 4,194,303 (initially unassigned)

Ruleset for configuration:
• MUST be unique across all devices on all BACnet network segments of the BACnet internetwork. Duplicate values can cause unpredictable network behavior/malfunction.
• Allowed values are from 0 to 4,194,303, however, "4,194,303" is a restricted value used to indicate unassigned instances.
• Values are arbitrary but should be chosen carefully. Local installations may impose additional guidelines.

If the system consists of exactly one MS/TP BACnet network segment, meaning that it is not a part of an internetwork, it is a common practice to set the BACnet Device Instance to the same value as the BACnet MAC Address; however, these settings are independent and do not track each other.

For questions related to the initial set up of BACnet Controls, please contact Rheem Technical Support at 800.432.8373.

All questions concerning your systems set-up should be referred to your BACnet service provider.

BACnet Object List

OBJECT NAME	OBJECT TYPE	DESCRIPTION	ACCESS	EEPROM	GROUP
Device	Device	BACnet Device	RO	N	BACnet Identifier
DISPUNIT	Binary	Temperature Display	R/W	Y	Display Config
SCRNLOCK	Binary	Screen Adjustment Lock	R/W	Y	Display Config
ALRMBEEP	Binary	Beep On Alarm	R/W	Y	Display Config
WHTRCNFG	Multi-State	Water Heater Config	R/W	Y	Water Heater Config
WHTRSETP	Analog	Water Heater Set Point	R/W	Y	Water Heater Config
WHTRDIFF	Analog	Differential Temp Set Point	R/W	Y	Water Heater Config
RCIRCNFG	Multi-State	Recirc. Pump Config	R/W	Y	Water Heater Config
WHTR_AUX	Multi-State	Aux Input Select	R/W	Y	Water Heater Config
AUX_CNFG	Multi-State	Auxiliary Relay Function	R/W	Y	Water Heater Config
SHUTCNFG	Multi-State	Shutoff Valve Config	R/W	Y	Water Heater Config
VLVSTATE	Multi-State	Current Operating State	RO	N	Water Heater Status
S4_GLINE	Binary	Gas Line Press. Switch	RO	N	Water Heater Status
GASVALVE	Binary	Gas Valve State	RO	N	Water Heater Status
S1_AIRFL	Binary	Fan Prove Press. Switch	RO	N	Water Heater Status
S2_INPRS	Binary	Air Intake Press. Switch	RO	N	Water Heater Status
S3_EXPRS	Binary	Exhaust Press. Switch	RO	N	Water Heater Status
FANSPEED	Analog	Current Fan Speed	RO	N	Water Heater Status
TANKTEMP	Analog	Upper Tank Temp	RO	N	Water Heater Status
INLTTEMP	Analog	Lower Tank Temp	RO	N	Water Heater Status
FLUETEMP	Analog	Flue Temperature	RO	N	Water Heater Status
ECOSTATE	Binary	ECO Switch State	RO	N	Water Heater Status
ANODFAIL	Binary	Powered Anode Failed	RO	N	Water Heater Status
PMPSTRNG	Character String	Auxiliary Relay State	RO	N	Water Heater Status
SHUTSTAT	Multi-State	Shut-off Valve State	RO	N	Water Heater Status
VACA_NET	Analog	Vacation Network Command	R/W	N	Water Heater Command
PROVISIN	Binary	Command WiFi to Provisin	R/W	N	WiFi Setup Command
SWMVERSN	Character String	Econet SW Version (WiFi)	RO	N	WiFi Status
AW_SWVER	Character String	WiFi Chip SW Version	RO	N	WiFi Status
AWMACADR	Character String	WiFi Chip MAC address	RO	N	WiFi Status
WLSTATUS	Character String	WiFi Network Status	RO	N	WiFi Status
WFSIGNAL	Analog	WF Signal Strength (dBm)	RO	N	WiFi Status
INSTANCE	Analog	Econet Network Instance	R/W	Y	OS Config
PRODMODN	Character String	Product Model Number:	R/W	Y	OS Config
PRODSERN	Character String	Product Serial Number:	R/W	Y	OS Config
PRODLOCA	Character String	Product Location:	R/W	Y	OS Config
PRODDESC	Character String	Product Description:	R/W	Y	OS Config
SW_VERSN	Character String	Software Version Number:	RO	N	Control SW Version
RESETDEV	Binary	Reset Microcontroller	R/W	N	OS Command
DEFAULTS	Binary	Restore Program Defaults	R/W	N	OS Command
ALARM01C	Character String	Alarm 1	RO	N	OS Status
ALARM02C	Character String	Alarm 2	RO	N	OS Status
ALARM03C	Character String	Alarm 3	RO	N	OS Status

BACnet Object List

OBJECT NAME	OBJECT TYPE	DESCRIPTION	ACCESS	EEPROM	GROUP
ALARM04C	Character String	Alarm 4	RO	N	OS Status
ALARM05C	Character String	Alarm 5	RO	N	OS Status
ALERTS	Analog	Current Alerts Count	RO	N	OS Status
ALARMS	Analog	Current Alarms Count	RO	N	OS Status
ALRMALRT	Analog	Current Alarms & Alerts	RO	N	OS Status
ALRESET	Binary	Current Alarms Clear	R/W	N	OS Status
ALHISCLR	Binary	Alarm History Clear	R/W	N	OS Status
SECCOUNT	Analog	Seconds Since Last Reset	RO	N	OS Status
ALARM01H	Character String	Alarm History 1	RO	Y	OS Status
ALARM02H	Character String	Alarm History 2	RO	Y	OS Status
ALARM03H	Character String	Alarm History 3	RO	Y	OS Status
ALARM04H	Character String	Alarm History 4	RO	Y	OS Status
ALARM05H	Character String	Alarm History 5	RO	Y	OS Status
ALARM06H	Character String	Alarm History 6	RO	Y	OS Status
ALARM07H	Character String	Alarm History 7	RO	Y	OS Status
ALARM08H	Character String	Alarm History 8	RO	Y	OS Status
ALARM09H	Character String	Alarm History 9	RO	Y	OS Status
ALARM10H	Character String	Alarm History 10	RO	Y	OS Status
ALARM11H	Character String	Alarm History 11	RO	Y	OS Status
ALARM12H	Character String	Alarm History 12	RO	Y	OS Status
ALARM13H	Character String	Alarm History 13	RO	Y	OS Status
ALARM14H	Character String	Alarm History 14	RO	Y	OS Status
ALARM15H	Character String	Alarm History 15	RO	Y	OS Status
ALARM16H	Character String	Alarm History 16	RO	Y	OS Status
ALARM17H	Character String	Alarm History 17	RO	Y	OS Status
ALARM18H	Character String	Alarm History 18	RO	Y	OS Status
ALARM19H	Character String	Alarm History 19	RO	Y	OS Status
ALARM20H	Character String	Alarm History 20	RO	Y	OS Status
ALARM21H	Character String	Alarm History 21	RO	Y	OS Status
ALARM22H	Character String	Alarm History 22	RO	Y	OS Status
ALARM23H	Character String	Alarm History 23	RO	Y	OS Status
ALARM24H	Character String	Alarm History 24	RO	Y	OS Status
ALARM25H	Character String	Alarm History 25	RO	Y	OS Status
WF_SSID	Character String	Wi-Fi SSID	RO	N	Wi-Fi Status
WIFIPADDR	Character String	Wi-Fi IP Address	RO	N	Wi-Fi Status
WFNETMASK	Character String	Wi-Fi Subnet Mask	RO	N	Wi-Fi Status
WFGTWYAD	Character String	Wi-Fi Gateway	RO	N	Wi-Fi Status
ALTITUDE	Multi State	Device Elevation	RO	Y	Water Heater Config
DST_ENAB	Binary	Daylight Saving Enable	R/W	Y	Water Heater Config

In keeping with its policy of continuous progress and product improvement, Rheem reserves the right to make changes without notice.

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