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MicroTech[®] II and MicroTech[®] III Applied Air Handling Unit Controller Integration Points Comparison

BACnet[®] Networks
LONWORKS[®] Networks



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Introduction

The purpose of this document is to define the network integration data available for McQuay MicroTech II and MicroTech III Applied Air Handling (Rooftop and Self-Contained) Unit Controllers. This document contains two tables that highlight the commonalities as well as differences between MicroTech II and MicroTech III control integration points. The first table summarizes the MicroTech II and MicroTech III BACnet® objects. The second table summarizes the MicroTech II and MicroTech III LONWORKS® variables. Changes to the tables are depicted in colored text and italicized or boldface font type.

Unit Controller Data Points

The McQuay Applied Air Handling Unit Controller contains data points or unit variables that are accessible from three user interfaces: the unit keypad, a BACnet network (BACnet/IP or MS/TP), or a LONWORKS network. Not all points are accessible from each interface. This document lists all important data points and a brief description of each applicable interface available for integrating the MicroTech II or MicroTech III Applied Air Handling Unit Controller into the network. Refer to the respective Unit Controller Operation Manuals (available on www.mcquay.com) for keypad details:

OM 920 – MicroTech III Unit Controller for Applied Rooftop and Self-Contained Systems

OM 137 – MicroTech II Applied Rooftop Unit Controller, Discharge Air Control (DAC) Profile

OM 138 – MicroTech II Applied Rooftop Unit Controller, Space Comfort Control (SCC) Profile

Protocol Definitions

The McQuay Applied Air Unit Controller must have the corresponding MicroTech II or MicroTech III communication module installed for proper network integration. There are three communication module protocols supported: BACnet/IP, BACnet MS/TP (Master/Slave Token Passing), and LONWORKS. There are two types of LONWORKS modules: one in accordance with the LonMark Space Comfort Controller (General) functional profile and one in accordance with the Discharge Air Controller functional profile. Refer to the complete Protocol Documents (available on www.mcquay.com) for detailed integration information:

- ED 15060 – MicroTech II Applied Rooftop Unit Controller
- ED 15061 – MicroTech II Vertical Self Contained Unit Controller
- ED 15112 - MicroTech III Applied Air Handler Unit Controller (Applied Rooftop and Self-Contained)

BACnet Standard Objects

The following table defines the complete list of BACnet object supported by both MicroTech II and MicroTech III Applied Air Unit Controllers. Network properties that are unique to McQuay (in other words, non-standard objects) are denoted with an asterisk. The changes are depicted in the table as follows:

Black- MicroTech III Only

Blue – MicroTech II Self-Contained Only

Red – MicroTech II Applied Rooftop Only

Network Control Property	MTII Object Type	MTII Instance	MTIII Object Type	MTIII Instance	Description
Unit State	AV AV	3810 3915	MSV	15	1=Off, 2=Start, 3=Recirc, 4=FanOnly, 5=MinDAT, 6=Htg, 7=Econo, 8=Clg <i>0=OffUnoc, 1=OffNet, 2=Off Sw, 3=OffAlm, 4=Calib, 5=Startup, 6=Recirc, 7=FanOnly, 8=Econo, 9=Cooling, 10=MWU, 11=Heating, 12=MinDAT, 13=UnocEcon, 14=UnocFanO, 15=UnocDAT, 16=UnocClg, 17=UnocHtg, 18=Balance, 19=OffMan, 20=ManCtrl</i> 1=OffNet, 2=Off Sw, 3=OffAlm, 4=Calib, 5=Startup, 6=Recirc, 7=FanOnly, 8=Econo, 9=Cooling, 10=MWU, 11=Heating, 12=MinDAT, 13=UnocEcon, 14=UnocFanO, 15=UnocDAT, 16=UnocClg, 17=UnocHtg, 18=Balance, 19=OffMan, 20=ManCtrl
McQuay AHU Unit Status			MSV	1	Mode: 1=Enabled, 2=OffMan, 3=OffManCtrl, 4=OffNet, 5=OffAlm, 6=OffFanRetry
Cooling Status	AV AV	3665 3775	MSV	2	1=Enabled, 2=None, 3=OffAmb, 4=OffAlarm, 5=OffNet, 6=OffMan <i>0=All Clg, 1=Econo, 2= Mech Clg, 3=Off Amb, 4=Off Alarm, 5=Off None, 6=Off Bal, 7=Off Sw, 8=Off Net, 9=Off Man</i> 0=All Clg, 1=Econo, 2= Mech Clg, 3=Off Amb, 4=Off Alarm, 5=Off None, 6=Off No Flow, 7=Off Sw, 8=Off Net, 9=Off Man
Heating Status	AV AV	3715 3825	MSV	4	1=Enabled, 2=None, 3=OffAmb, 4=OffAlarm (Not Used), 5=OffNet, 6=OffMan <i>0=HtEna, 1=OffAmb, 2=OffAlarm, 3=OffNone, 4=N/A, 5=OffSw, 6=OffNet, 7=OffMan</i> 0=HtEna, 1=OffAmb, 2=OffAlarm, 3=OffNone, 4=N/A, 5=OffSw, 6=OffNet, 7=OffMan
Economizer Status			MSV	3	1=Enabled, 2=None, 3=OffAmb, 4=OffAlarm (Not Used), 5=OffNet, 6=OffMan
Cooling Capacity	AV AV	3620 3730	AV	1	cooling capacity (%)
Heating Capacity	AV AV	3695 3805	AV	2	heating capacity (%)
Supply Fan Capacity	AV AV	3735 3845	AI	8	Current supply fan capacity (%)
Return/Exhaust Fan Capacity	AV	3745	AI	10	Current return or exhaust fan capacity (%)
Economizer Capacity	AI	460	AV	15	Feedback value (%)
Economizer Valve Position (Waterside)	AI	1320			
Outdoor Air Damper Position (Airsides)	AI	1315			
Emergency Override	AV AV	3610 3720	MSV	10	1=Normal, 2=Off (Shuts unit off via a network signal, puts Unit Status = OffNet) <i>0=Norm, 1=Off (Shuts unit off via a network signal, puts Unit Status = OffNet)</i> 0=Norm, 1=Off (Completely shuts unit off via a network signal -Unit Status = OffNet)

Network Control Property	MTII Object Type	MTII Instance	MTIII Object Type	MTIII Instance	Description
Application Mode	AV AV	3605 3715	MSV	5	1=Off, 2=HeatOnly, 3=CoolOnly, 4=FanOnly, 5=Auto <i>0=Auto, 1=Off, 2=HeatOnly, 3=CoolOnly, 4=FanOnly</i> 0=Heat/Cool, 1=Off, 2=HeatOnly, 3=CoolOnly, 4=FanOnly
Occupancy					
Occupancy	AV AV	3815 3920	MSV	6	1=Occ, 2=Unocc, 3=TntOvrD <i>0=Occ, 1=Unocc, 2=Bypass</i> 0=Occ, 1=Unocc, 2=Tnt OvrD
Occupancy Mode	AV AV	3825 3930	MSV	7	1=Occ, 2=Unocc, 3=TntOvrD, 4=Standby (not used) 5=Auto. <i>0=Occ, 1=Unocc, 2=Bypass, 3=Auto.</i> 0=Occ, 1=Unocc, 2=Tnt OvrD, 3=Auto
Occupancy Source	AV AV	3820 3925			0=None, 1=Int Sched, 2=Net Sched, 3=Occ Mode, 4=Remote Sw, 5=N/A 0=None, 1=Int Sched, 2=Net Sched, 3=Occ Mode, 4=Remote Sw, 5=N/A
Temperature					
Control Temperature	AV AV	135 165	AI	14	Current reading of sensor
Discharge Air Temperature	AI AI	115 135	AI	1	Current reading of sensor
Return Air Temperature	AI AI	120 140	AI	2	Current reading of sensor
Space Temperature	AI AI	100 120	AI	3	Current reading of sensor
Outdoor Air Temperature	AI AI	125 145	AI	4	Current reading of sensor
Entering Fan / Leaving Coil Temp Leaving Water Temp	AI AI	130 160	AI	7	Current reading of sensor
Entering Water Temperature	AI	155	AI	6	Current reading of sensor
Mixed Air Temperature	AI	150	AI	5	Current reading of sensor
Exhaust Fan Status			BV	1	0=Off, 1=On
VAV Box Output	BO BV	265 3950	MSV	14	1=Heat (Off), 2=Cool (On) <i>Indicates the state of VAV box output (MCB-BO # 12) 0=Off, 1=On</i> Indicates the state of VAV box output (MCB-BO # 12) 0=Heat, 1=Cool, 2=N/A
Discharge Fan Status	BO BV	255 3935			0=Off, 1=On (Indicates if controller is commanding the discharge fan on)
Return Fan Status	BO	260			0=Off, 1=On (Controller's command to the return or exhaust fan)
Fan Operation Output	BO BV	250 3945			0=Off, 1=On (Relay output which indicates that fans are ON (MCB BO # 3))
Duct Static Pressure	AV AV	3790 3895	AV	6	Current reading of sensor. If unit has two sensors the lower of the two is displayed
Duct Static Pressure Setpoint	AV AV	3730 3840	AV	7	Default = 1.00" WC
Remote Supply Fan Capacity Control Flag	AV	3720	MSV	11	1=DSP, 2=Speed <i>0=Duct Pres, 1=Position</i>
Supply Fan Capacity Input	AV	3725	AV	21	Default = 163.835 (Null) <i>Default = 25%</i>
Building Static Pressure	AI AI	1505 1425	AI	9	Current reading of sensor value or network input
Building Static Pressure Setpoint	AV	3755	AV	8	Default = 0.050" WC
Remote Return/Exhaust Fan Capacity Control Flag	AV	3750	MSV	12	1=None, 2=Tracking, 3=BldgP, 4=Speed <i>0=None, 1=Tracking, 2=Bldg Press, 3=Position</i>
Return Fan Capacity Input <i>Remote Return Fan Capacity Spt</i>	AV	3740	AV	22	Default = 163.835 (Null) <i>Default = 25%</i>
Exhaust Fan Capacity Input <i>Remote Return Fan Capacity Spt</i>	AV	3740	AV	23	Default = 163.835 (Null) <i>Default = 25%</i>

Network Control Property	MTII Object Type	MTII Instance	MTIII Object Type	MTIII Instance	Description
Cooling					
Occupied Cooling Setpoint	AV AV	3655 3765	AV	9	Default = 72°F / 22.22°C Default = 75°F, 75°F
Unoccupied Cooling Setpoint	AV AV	3795 3900	AV	10	Default = 85°F / 29.44°C
Network Discharge Air Cooling Setpoint	AV AV	3630 3740	AV	13	Default = 55°F / 12.75°C
Min Discharge Air Cooling Setpoint	AV AV	3645 3755	AV	14	Default = 55°F / 12.75°C
Effective Cooling Enable Setpoint	AV AV	3640 3750			If Control Temp > (this setpoint + ½ Cool Enable Dead Band), Then cooling is enabled
Cooling Operating Hours	Runtime Total. Runtime Total.	1515 290			Indicates hours of unit mechanical cooling.
Cooling Reset Enable State*	Application Application	790 635			Enables or disables discharge air temperature cooling reset control for DAC. Note: When this object is enabled, the type of cooling discharge temp reset is determined by the object.
Cooling Reset Enable Value*	Application Application	790 635			Indicates the type of discharge air temperature cooling reset control enabled. Note: Cooling Reset Enable State must be enabled or this property has no effect.
Control Temperature Source	AV AV	3600 3710			0=Return, 1=Space, 2=OAT
Max Discharge Air Cooling Setpoint	AV AV	3650 3760			Default = 65°F
Conductivity			AI	12	This variable provides the conductivity of the water in the sump of an evaporative cooled condenser.
Space CO ₂			AI	13	This variable provides the concentration of CO ₂ in the space (PPM).
Outdoor Airflow	AV	3780	AV	42	Current outdoor air flow on units with optional DesignFlow (CFM)
Effective Min Outdoor Damper Pos Spt	AV	3765			Current OA damper min position setpoint (%)
Min Outdoor Airflow/Damper Position	AV	3770			Sets the Effective Min Outdoor Damper Position Stp when Design Flow is set to YES
Economizer Changeover Method	AV AV	3785 3890			0=Enthalpy, 1=Dry Bulb
Economizer Changeover Temp Spt	AV AV	3760 3865			Default=60°F, Makes changeover decision if Economizer Changeover Method=Dry Bulb
Occupied Heating Setpoint	AV AV	3710 3820	AV	11	Default = 68°F / 20°C Default = 70°F, 70°F
Unoccupied Heating Setpoint	AV AV	3800 3905	AV	12	Default = 55°F / 12.78°C
Network Discharge Air Heating Setpoint	AV AV	3680 3790	AV	17	Default = 100°F / 37.78°C
Max Discharge Air Heating Setpoint	AV AV	3705 3815	AV	18	Default = 120°F / 48.89°C
Effective Heating Enable Setpoint	AV AV	3690 3800			If Control Temp < (this setpoint – ½ Heat Enable Dead Band), Then heating is enabled
Heating Reset Enable State*	Application Application	615 480			Enables or disables the discharge air temperature heating reset control for the Discharge Air Controller. Note: when this property is enabled, the type of heating discharge temperature reset is determined by the Heating Reset Enable Value.
Heating Reset Enable Value*	Application Application	615 480			Enables or disables the discharge air temperature heating reset control for the Discharge Air Controller. Note: Heating Reset Enable State must be enabled or this property has no effect.
Min Discharge Air Temperature Limit	AV AV	3805 3910			Default = 55°F Sets low limit on units equipped with modulating or multistage heating
Min Discharge Air Heating Setpoint	AV AV	3700 3810			Default = 60°F
Energy Recovery Exhaust Temperature	AV	4210			Current reading of sensor

Network Control Property	MTII Object Type	MTII Instance	MTIII Object Type	MTIII Instance	Description
Energy Recovery Supply Temperature	AV	4205			Current reading of sensor
Effective Min Outdoor Damper Pos Spt	AV	3870			Reveals the OA damper min position setpoint the controller is currently using (%)
Outdoor Air Temperature* (OA Ambient)	Application	90			0=Low, 1=High Indicates whether the outdoor air is suitable for free cooling
Relative Humidity	AI AV	805 1505	AI	11	Displays value of optional relative humidity sensor
Dew Point Temperature	AV AV	810 660	AV	20	Indicates current calculated dew point
Relative Humidity Setpoint	AV AV	3660 3770	AV	40	
Dew Point Setpoint	AV AV	3625 3735	AV	41	
Reheat Capacity			AV	44	0-100%
Dehumidification Status	AV AV	3675 3785			Indicates if dehumidification is active
<i>Relative Humidity Control Type</i> Dehumidification Method	AV AV	3670 3780			0=None, 1=RelHum, 2=DewPnt (Turns Dehumidification ON and OFF)
Receive Heartbeat			AV	43	Default is 0 seconds. This disables this feature.
Unit Support			MSV	16	1=No (Metric), 2=Yes (Default)
Outdoor Air Temperature Input			AV	29	Network input of Outdoor Air Temp (-10°C to 50°C) default = 327.67 (Null)
Space Temperature Input			AV	28	Network input of Space Temp (-10°C to 50°C) default = 327.67 (Null)
Occupancy Scheduler Input Current State Next State Time To Next State	BV BV	1455 1380	MSV MSV AV	8 9 3	<i>Note: This BV is used to command Occupied & Unoccupied operation when Occupancy Mode is set to Auto. The BAS must write to this object at a priority less than 15.</i> Note: This BV is used to command Occupied & Unoccupied operation when Occupancy Mode is set to Auto. The BAS must write to this object at a priority less than 15. 1=Occ, 2=Unocc, 3=TntOvrD (not used), 4=Standby (not used), 5=Auto (default). 1=Occ, 2=Unocc, 3=TntOvrD (not used), 4=Standby (not used), 5=Auto (default). Default = 65535.0 (Null)
Primary Cool Enable			AV	34 & 35	Allows the network to partially or completely disable cooling.
Primary Heat Enable			AV	36 & 37	Allows the network to partially or completely disable heating.
Economizer Enable			AV	32 & 33	Allows the network to partially or completely disable economizer functions.
Waterflow Switch Input Water Flow	BI	255	AV	38	Allows the network to set the waterflow status. 0=No Flow, 1=Flow. 0=Yes, 1=No
Space IAQ Input			AV	31	This input may be set by the network and is used for minimum OA damper control (0-5000 PPM). Default=32767 (Null)
Relative Humidity Input			AV	19	Network relative humidity value. Default=163.835 (Null)
Outdoor Air Damper Min Position Input	AV AV	3775 3875	AV	16	Current OA damper min position setpoint (%)
Eff Discharge Air Temp Setpoint <i>Effective Heating Discharge Setpoint</i> Effective Heating Discharge Setpoint	AV AV	3685 3795	AV	39	This parameter will equal the Effective Heating Discharge Temperature Setpoint if the unit is in the heating state. Otherwise, it will equal the Effective Cooling Discharge Temperature Setpoint. <i>Current discharge air setpoint which the unit uses in the heating mode</i> Current discharge air setpoint which the unit uses in the heating mode

Network Control Property	MTII Object Type	MTII Instance	MTIII Object Type	MTIII Instance	Description
Eff Discharge Air Temp Setpoint <i>Effective Cooling Discharge Setpoint</i> Effective Cooling Discharge Setpoint	AV AV	3635 3745	AV	39	This parameter will equal the Effective Heating Discharge Temperature Setpoint if the unit is in the heating state. Otherwise, it will equal the Effective <i>Current Discharge air setpoint which the unit will use in the cooling mode</i> Current Discharge air setpoint which the unit will use in the cooling mode
Clear Alarms			MSV	13	1=None, 2=ClrFlts, 3=ClrPrblms, 4=ClrWrngs, 5=ClrAllAlms
Alarm, Faults: Clear All	BV BV	4150 4150			Indicates Fault Alarm has occurred
Alarm, Problems: Clear All	BV BV	4145 4145			Indicates Problem Alarm has occurred
Alarm, Warnings: Clear All	BV BV	4140 4140			Indicates Warning Alarm has occurred
Application Version			Device	*	Read the Application_Software_Version property. This is the version of the software loaded in the MTIII unit controller.
Local Space Temperature			AV	4	Current reading of the local sensor
Local OA Temperature			AV	5	Current reading of the local sensor
Notification Class - Faults			NC	1	Generates notifications for fault alarms.
Notification Class - Problems			NC	2	Generates notifications for problem alarms.
Notification Class - Warnings			NC	3	Generates notifications for warning alarms.
Warning Alarm	AV AV	4863 (Series 100) or 4873 (Series 200) 5326	AV	24	0=No Active Warnings, 24=Dirty Filter, 28=Airflow Sw, 32=Conductivity
Problem Alarm	AV AV	4861 (Series 100) or 4872 (Series 200) 5327	AV	25	0=No Active Problems, 137=Waterflow Sw, 140=Water Regulating Valve, 154=Low Pressure – Circuit 6, 155=Low Pressure – Circuit 5, 156=Low Pressure – Circuit 4, 157=Low Pressure – Circuit 3, 158=Low Pressure – Circuit 2, 159=Low Pressure – Circuit 1, 162=High Pressure – Circuit 6, 163=High Pressure – Circuit 5, 164=High Pressure – Circuit 4, 165=High Pressure – Circuit 3, 166=High Pressure – Circuit 2, 167=High Pressure – Circuit 1, 169=Sump Pump Fail, 179=EFT_LCT Problem, 182=Return Air Sensor Problem, 185=Space Sensor Problem, 188=OAT Sensor Problem, 191=EWT Problem, 194=MAT Problem, 197=Freeze Problem
Fault Alarm	AV AV	4862 (Series 100) or 4870 (Series 200) 5328	AV	26	0=No Active Faults, 208=Airflow Fault, 212=Low Discharge Air Temp, 216=High Discharge Air Temp , 220=High Return Air Temp, 224=Duct High Limit, 228=Discharge Sensor Fail, 244=Control Temp Fault, 250=Emergency Stop Fault, 252=Freeze Fault
Alarm Value			AV	27	0=No Active Warnings, 24=Dirty Filter, 28=Airflow Sw, 32=Conductivity, 137=Waterflow Sw, 140=Water Regulating Valve, 154=Low Pressure – Circuit 6, 155=Low Pressure – Circuit 5, 156=Low Pressure – Circuit 4, 157=Low Pressure – Circuit 3, 158=Low Pressure – Circuit 2, 159=Low Pressure – Circuit 1, 162=High Pressure – Circuit 6, 163=High Pressure – Circuit 5, 164=High Pressure – Circuit 4, 165=High Pressure – Circuit 3, 166=High Pressure – Circuit 2, 167=High Pressure – Circuit 1, 169=Sump Pump Fail, 179=EFT_LCT Problem, 182=Return Air Sensor Problem, 185=Space Sensor Problem, 188=OAT Sensor Problem, 191=EWT Problem, 194=MAT Problem, 197=Freeze Problem, 208=Airflow Fault, 212=Low Discharge Air Temp, 216=High Discharge Air Temp , 220=High Return Air Temp, 224=Duct High Limit, 228=Discharge Sensor Fail, 244=Control Temp Fault, 250=Emergency Stop Fault, 252=Freeze Fault

Network Control Property	MTII Object Type	MTII Instance	MTIII Object Type	MTIII Instance	Description
Airflow Fault			BV	27	0=normal, 1=Alarm
Airflow Switch Warning			BV	2	0=normal, 1=Alarm
Conductivity Warning			BV	3	0=normal, 1=Alarm
Control Temp Fault			BV	28	0=normal, 1=Alarm
Dirty Filter Warning			BV	4	0=normal, 1=Alarm
Discharge Sensor Fault			BV	29	0=normal, 1=Alarm
Duct High Limit Fault			BV	30	0=normal, 1=Alarm
Emergency Off Fault			BV	31	0=normal, 1=Alarm
Entering Fan Temp / Leaving Coil Temp Problem			BV	5	0=normal, 1=Alarm
Entering Water Temp Problem			BV	6	0=normal, 1=Alarm
Freeze Fault			BV	32	0=normal, 1=Alarm
Freeze Problem			BV	7	0=normal, 1=Alarm
High Discharge Temp Fault			BV	33	0=normal, 1=Alarm
High Pressure Circuit 1 Problem			BV	8	0=normal, 1=Alarm
High Pressure Circuit 2 Problem			BV	9	0=normal, 1=Alarm
High Pressure Circuit 3 Problem			BV	10	0=normal, 1=Alarm
High Pressure Circuit 4 Problem			BV	11	0=normal, 1=Alarm
High Pressure Circuit 5 Problem			BV	12	0=normal, 1=Alarm
High Pressure Circuit 6 Problem			BV	13	0=normal, 1=Alarm
High Return Temp Fault			BV	34	0=normal, 1=Alarm
Low Discharge Temp Fault			BV	35	0=normal, 1=Alarm
Low Pressure Circuit 1 Problem			BV	14	0=normal, 1=Alarm
Low Pressure Circuit 2 Problem			BV	15	0=normal, 1=Alarm
Low Pressure Circuit 3 Problem			BV	16	0=normal, 1=Alarm
Low Pressure Circuit 4 Problem			BV	17	0=normal, 1=Alarm
Low Pressure Circuit 5 Problem			BV	18	0=normal, 1=Alarm
Low Pressure Circuit 6 Problem			BV	19	0=normal, 1=Alarm
Mixed Air Temp Problem			BV	20	0=normal, 1=Alarm
Outdoor Temp Problem			BV	21	0=normal, 1=Alarm
Return Temp Problem			BV	22	0=normal, 1=Alarm
Space Temp Problem			BV	23	0=normal, 1=Alarm
Sump Pump Fail Problem			BV	24	0=normal, 1=Alarm
Waterflow Switch Problem			BV	25	0=normal, 1=Alarm
Water Regulating Valve Problem			BV	26	0=normal, 1=Alarm
Airflow Switch <i>Airflow Status</i> Airflow Status	BI BI	160 190	BI	1	0=Open, 1=Closed <i>0=Noflo, 1=Flow (Differential pressure switch sensing discharge airflow)</i> 0=Noflo, 1=Flow (Differential pressure switch sensing discharge airflow)
Airflow Switch (Warning)			BI	2	0=Open, 1=Closed
Dirty Filter Switch			BI	3	0=Open, 1=Closed
High Pressure Circuit 1 Switch			BI	4	0=Open, 1=Closed
High Pressure Circuit 2 Switch			BI	5	0=Open, 1=Closed
High Pressure Circuit 3 Switch			BI	6	0=Open, 1=Closed
High Pressure Circuit 4 Switch			BI	7	0=Open, 1=Closed
High Pressure Circuit 5 Switch			BI	8	0=Open, 1=Closed
High Pressure Circuit 6 Switch			BI	9	0=Open, 1=Closed
Low Pressure Circuit 1 Switch			BI	10	0=Open, 1=Closed
Low Pressure Circuit 2 Switch			BI	11	0=Open, 1=Closed
Low Pressure Circuit 3 Switch			BI	12	0=Open, 1=Closed
Low Pressure Circuit 4 Switch			BI	13	0=Open, 1=Closed
Low Pressure Circuit 5 Switch			BI	14	0=Open, 1=Closed
Low Pressure Circuit 6 Switch			BI	15	0=Open, 1=Closed
Sump Pump Switch			BI	16	0=Open, 1=Closed
Water Flow Switch			BI	17	0=Open, 1=Closed
Water Regulating Valve			BI	18	0=Open, 1=Closed
Freeze Switch (Fault)			BI	19	0=Open, 1=Closed

Network Control Property	MTII Object Type	MTII Instance	MTIII Object Type	MTIII Instance	Description
Freeze Switch (Problem)			BI	20	0=Open, 1=Closed
Duct High Limit Switch			BI	21	0=Open, 1=Closed
Emergency Off Switch			BI	22	0=Open, 1=Closed
<i>Daily Schedule</i>	<i>Sch</i> <i>Sch</i>	<i>1460</i> <i>1385</i>			<i>MicroTech II keypad daily schedule (writes to Occupancy BV-1455 at priority level 15). Not used if network scheduling provided through supervisory controller</i>
<i>Holidays</i>	<i>Cal</i> <i>Cal</i>	<i>1465</i> <i>1390</i>			<i>MicroTech II keypad holiday date list (writes to Occupancy BV-1455 at priority level 15). Not used if network scheduling provided through supervisory controller</i>
<i>Space Setpoint Type</i>	<i>AV</i> <i>AV</i>	<i>3615</i> <i>3725</i>			<i>0=Tstat, 1=Keypad/Network (Set to Network for network control of setpoints)</i>
Outdoor Air Damper Open/Close	BV	3940			0=Close, 1=OpenManually (at operator's discretion) force OA damper open/close
Head Pressure Setpoint	AV	3885			Sets the refrigeration setpoint used for controlling the water regulating valve

*Indicates properties with non-standard BACnet (McQuay-specific) object types.

LonWorks Variables

The following table defines the complete list of LONWORKS variables supported by both MicroTech II and MicroTech III Applied Air Unit Controllers. Network properties that are unique to McQuay (in other words, non-standard variables) are denoted with an asterisk. The changes to the variables are depicted in the table below as follows:

Black: MicroTech II and MicroTech III Common Variables

Blue: MicroTech III Only Variables

Red: MicroTech II Only Variables

Network Control Property	Variable Name	SNVT/SCPT Index	SCC	DAC	Description
Unit State	nvoUnitStatus	112	✓	✓	Mode 0=AUTO, 1=HEAT, 2=MRNG_WRMUP, 3=COOL, 6=OFF, 9=FAN_ONLY, 10=FREE_COOL, 0xFF=NUL
McQuay AHU Unit Status*	nvoMcQAHUStatus	N/A	✓	✓	Mode: 0=Enabled, 1=OffManCtrl, 2=OffMan, 3=OffNet, 4=OffAlm, 5=OffFanRetry
Cooling Status*	nvoMcQAHUStatus	N/A	✓	✓	0=Enabled, 1=None, 2=Off Amb, 3=Off Alarm, 4=Off Net, 5=Off Man
Heating Status*	nvoMcQAHUStatus	N/A	✓	✓	0=Enabled, 1=None, 2=Off Amb, 3=Off Alarm (Not Used), 4=Off Net, 5=Off Man
Economizer Status*	nvoMcQAHUStatus	N/A	✓	✓	0=Enabled, 1=None, 2=Off Amb, 3=Off Alarm (Not Used), 4=Off Net, 5=Off Man
Cooling Capacity	nvoUnitStatus	112	✓	✓	nvoUnitStatus.cool_output(%)
Heating Capacity	nvoUnitStatus	112	✓	✓	nvoUnitStatus.heat_output_primary(%)
Supply Fan Capacity <i>Discharge Fan Status</i> <i>Discharge Fan Capacity</i>	nvoUnitStatus	112	✓	✓	Fan_Output Current supply fan capacity (%) <i>Fan_Output 0% = OFF, 100% = ON</i> <i>Fan_Output Current discharge fan capacity (%)</i>
Return/Exhaust Fan Capacity <i>Return Fan Capacity</i>	nvoExhFanStatus <i>nvoRetFanStatus</i>	95	✓	✓	Current return or exhaust fan capacity (%)
Economizer Capacity <i>Outdoor Air Damper Position</i>	nvoUnitStatus	112	✓	✓	Economizer_Output Feedback value (%)
Emergency Override	nviEmergOverride	103	✓	✓	0=NORMAL, 4=SHUTDOWN, 0xFF=NUL (other states not used)
Application Mode	nviApplicMode	108	✓	✓	0=AUTO, 1=HEAT, 3=COOL, 6=OFF, 9=FAN_ONLY (other states not used) <i>0=AUTO, 1=HEAT, 2=MRNG_WRMUP, 3=COOL, 4=NIGHT_PURGE, 5=PRE_COOL, 6=OFF, 7=TEST, 8=EMERG_HEAT, 9=FAN_ONLY, 10=FREE_COOL, 11=ICE, 12=MAX_HEAT</i>
Occupancy	nvoEffectOccup	109	✓	✓	0=OCCUPIED, 1=UNOCCUPIED, 2=BYPASS, 3=STANDBY, 0xFF=NUL
Occupancy Mode	nviOccManCmd	109	✓	✓	0=OCCUPIED, 1=UNOCCUPIED, 2= BYPASS, 3=STANDBY, 0xFF=NUL
Discharge Air Temperature	nvoDischAirTemp	105	✓	✓	Current reading of sensor
Return Air Temperature	nvoRATemp	105	✓	✓	Current reading of sensor
Space Temperature	nvoSpaceTemp	105	✓	✓	Current reading of sensor
Outdoor Air Temperature	nvoOutdoorTemp	105	✓	✓	Current reading of sensor
Entering Fan / Leaving Coil Temp	nvoEFT_LCT	105	✓	✓	Current value of sensor
Entering Water Temperature	nvoCWTemp	105	✓	✓	Current value of sensor
Mixed Air Temperature	nvoMATemp	105	N/A	✓	Current value of sensor
Mixed Air Temperature	nvoMixedAirTemp	105	✓	N/A	Current value of sensor
Return/Exhaust Fan Status	nvoExhFanStatus	95	✓	✓	State: 0=Off, 1=On , -1(0xFF)=Undefined
VAV Box Output*	nvoVAVBoxOut	N/A	N/A	✓	0=Heat (Off), 1=Cool (On)
Duct Static Pressure	nvoDuctStatPress	113	N/A	✓	Current reading of sensor. If unit has two sensors the lower of the two is displayed
Duct Static Pressure Setpoint	nviDuctStaticSP	113	N/A	✓	Default = 1.00" WC

Network Control Property	Variable Name	SNVT/SCPT Index	SCC	DAC	Description
Remote Supply Fan Cap Control Flag*	nviSupFanCtrl		N/A	✓	0=Duct Press, 1=Speed
Supply Fan Capacity Input	nviSupFanCap	81	N/A	✓	Default = 25% Sets the discharge air VFD speed when Supply Fan Capacity Control Flag is set to Speed
<i>Building Static Pressure</i>	<i>nviBldgStatPress</i>	<i>113</i>	<i>✓</i>	<i>✓</i>	<i>Network input of Building Static Pressure</i>
<i>Return Fan Status</i>	<i>nvoRetFanStatus</i>	<i>95</i>	<i>✓</i>	<i>✓</i>	<i>0=Off, 1=On, 0xFF=Undefined</i>
Building Static Pressure	nvoBldgStatPress	113	✓	✓	Current reading of sensor value
Building Static Pressure Setpoint	nviBldgStaticSP	113	✓	✓	Default = 0.050" WC
Remote Return/Exhaust Fan Cap Control Flag*	nviExhRetFanCtrl	N/A	✓	✓	0=None, 1=Tracking, 2=Bldg Press, 3=Speed
Return Fan Capacity Input	nviRetFanCap	81	✓	✓	
Exhaust Fan Capacity Input	nviExhFanCap	81	✓	✓	
Occupied Cooling Setpoint	nciSetpoints SCPTsetPnts	106/60	✓	✓	Occupied_Cool Default = 72°F / 22.22°C Occupied_Cool Default = 75°F
Unoccupied Cooling Setpoint	nciSetpoints SCPTsetPnts	106/60	✓	✓	Unoccupied_Cool Default = 85°F / 29.44°C
Discharge Air Cooling Setpoint	nviDACISP	105	N/A	✓	Default = 55°F (32-86°F) / 12.78°C
Minimum Discharge Air Cooling Setpoint	nciDACISP nciMinDACISP	105	N/A	✓	Used to set the discharge air cooling setpoint via the network.
<i>Effective Cooling Enable Setpoint</i>	<i>nvoEffectSetpt</i>	<i>105</i>	<i>✓</i>	<i>✓</i>	<i>Current cooling enable setpoint which the unit will use in the cooling mode</i>
<i>Effective Heating Enable Setpoint</i>	<i>nvoEffectSetpt</i>	<i>105</i>	<i>✓</i>	<i>✓</i>	<i>Current heating enable setpoint which the unit will use in the heating mode</i>
<i>Max Discharge Air Cooling Setpoint</i>	<i>nciMaxDACISP SCPTmaxDischargeAirCoolingSetpoint</i>	<i>105/205</i>	<i>✓</i>	<i>✓</i>	<i>Default = 65°F</i>
<i>Clg Reset</i>	<i>nciCoolResetEn SCPTcoolingResetEnable</i>	<i>95/211</i>	<i>N/A</i>	<i>✓</i>	<i>State 0 = None, 1 = Value has meaning Value 0 = None, 1 = Space, 2 = Return, 3 = OAT, 4 = Ext mA, 5 = Ext V, 6 = Airflow</i>
Conductivity*	nvoConductivity	N/A	✓	✓	This variable provides the conductivity of the water in the sump of an evaporative cooled condenser.
Space CO₂	nvoSpaceCO2	29	✓	✓	0-5000ppm
Outdoor Airflow	nvoOAFlow	15	✓	✓	
Occupied Heating Setpoint	nciSetpoints SCPTsetPnts	106/60	✓	✓	Occupied_Heat Default = 68°F / 20°C <i>Occupied_Heat Default = 70°F</i>
Unoccupied Heating Setpoint	nciSetpoints SCPTsetPnts	106/60	✓	✓	Unoccupied_Heat Default = 55°F / 12.78°C
Discharge Air Heating Setpoint	nviDAHtSP	105	N/A	✓	Default = 100°F (50-158°F) / 37.78°C
Maximum Discharge Air Heating Setpoint	nciDAHtSP <i>nciMaxDAHtSP</i>	184	N/A	✓	
<i>Min Discharge Air Heating Setpoint</i>	<i>nciMinDAHtSP SCPTminDischargeAirHeatingSetpoint</i>	<i>105/208</i>	<i>✓</i>	<i>✓</i>	<i>Default = 60°F</i>
<i>Htg Reset</i>	<i>nciHeatResetEn SCPTheatingResetEnable</i>	<i>95/212</i>	<i>N/A</i>	<i>✓</i>	<i>State 0 = None, 1 = Value has meaning Value 0 = None, 1 = Space, 2 = Return, 3 = OAT, 4 = Ext mA, 5 = Ext V</i>
Relative Humidity	nvoSpaceRH	81	✓	✓	Value of optional relative humidity sensor or network input
Dew Point Temperature	nvoSpaceDewPt	105	✓	✓	Indicates current calculated dew point (calculated from Relative Humidity)
Relative Humidity Setpoint	nviSpaceDehumSP	81	✓	✓	
Dew Point Setpoint	nviSpaceDewPtSP	105	✓	✓	
Reheat Capacity	nvoUnitStatus	112	✓	✓	nvoUnitStatus.heat_output_secondary(%)
<i>Dehumidification Status</i>	<i>nvoDehumidifier</i>	<i>95</i>	<i>✓</i>	<i>N/A</i>	<i>0% = Off, 100% = On</i>
<i>Minimum Send Time</i>	<i>nciMinOutTm SCPTminSendTime</i>	<i>107/52</i>	<i>✓</i>	<i>✓</i>	<i>Defines min period of time between automatic network variable output time (reducing traffic on network)</i>
Receive Heartbeat	nciRcvHrtBt SCPTmaxRcvTime	107/48	✓	✓	Default is 0 seconds

Network Control Property	Variable Name	SNVT/SCPT Index	SCC	DAC	Description
Send Heartbeat	nciSndHrtBt SCPTmaxSendTime	107/49	✓	✓	Default is 60 seconds <i>Default is 0 seconds</i>
<i>Return Air Temperature</i>	<i>nviRATemp</i>	<i>105</i>	<i>✓</i>	<i>✓</i>	<i>Network input of Return Temperature</i>
Outdoor Air Temperature Input	nviOutdoorTemp	105	✓	✓	Network input of Outdoor Air Temp (–10°C to 50°C)
Space Temperature Input	nviSpaceTemp	105	✓	✓	Network input of Space Temp (–10°C to 50°C)
Occupancy Scheduler Input	nviOccSchedule	128	✓	✓	Network schedule
Primary Cool Enable	nviPriCoolEnable	95	✓	✓	Enables or disables cooling via two properties: State=0, cooling disabled State=1 and Value=0, cooling disabled State=1 and Value>0, cooling enabled State=-1, network is not cooling economizer
Primary Heat Enable	nviPriHeatEnable	95	✓	✓	Enables or disables heating via two properties: State=0, heating disabled State=1 and Value=0, heating disabled State=1 and Value>0, heating enabled State=-1, network is not effecting heating
Economizer Enable	nviEconEnable	95	✓	✓	Enables or disables economizer via two properties: State=0, economizer disabled State=1 and Value=0, economizer disabled State=1 and Value>0, economizer enabled State=-1, network is not effecting economizer
Waterflow Switch Input	nviCWFlow	95	✓	✓	
Space IAQ Input	nviSpaceIAQ	29	✓	✓	This input may be set by the network and is used for minimum OA damper control (0-5000 PPM).
Relative Humidity Input	nviSpaceRH	81	✓	✓	Network input
Temperature Setpoint Input	nviSetpoint	105	✓	✓	Adjusts effective heat enable and effective cool enable setpoint via the network. Effective Heat SP = nviSetpoint – 0.5 (Occupied_Cool – Occupied_Heat). Effective Cool SP = nviSetpoint + 0.5 (Occupied_Cool – Occupied_Heat).
Outdoor Air Damper Min Position Input <i>Effective Min Outdoor Damper Pos Spt</i>	nviOAMinPos	81	✓	✓	Current OA damper min position setpoint (%)
Effective Enable Setpoint	nvoEffectSetpt	105	✓	✓	Current enable setpoint which the unit will use.
HVAC Unit Type Identifier	nciHvacType SCPTHvacType	145/169	✓	N/A	Equipment Type = HVT_GENERIC (Read Only) Equipment Type = RoofTop
Clear Alarms*	nviClearAlarms	N/A	✓	✓	0=None, 1=Clear All Faults, 2=Clear All Problems, 3=Clear All Warnings, 4=Clear All Alarms
<i>Alarm, Fault: Clear All</i>	<i>nviAlarmFault</i>	<i>95</i>	<i>✓</i>	<i>✓</i>	<i>Clear all Fault Alarms. Change state part of SNVT from 1 (Alarm) to 0 (Normal).</i>
<i>Alarm, Problems: Clear All</i>	<i>nviAlarmProblem</i>	<i>95</i>	<i>✓</i>	<i>✓</i>	<i>Clear all Problem Alarms. Change state part of SNVT from 1 (Alarm) to 0 (Normal).</i>
<i>Alarm, Warnings: Clear All</i>	<i>nviAlarmWarning</i>	<i>95</i>	<i>✓</i>	<i>✓</i>	<i>Clear all Warning Alarms. Change state part of SNVT from 1 (Alarm) to 0 (Normal).</i>
Local Space Temperature	nvoLocalSpaceTmp	105	✓	✓	Current reading of the local space sensor
Local OA Temperature	nvoLocalOATemp	105	✓	✓	Current reading of the local outdoor air temperature sensor
Effective Discharge Setpoint	nvoEffDATempSp	105	N/A	✓	Current discharge air setpoint which the unit will use.
Minimum Send Time	nciMinOutTm SCPTminSendTime	107/52	✓	✓	Defines min period of time between automatic network variable output time (reducing traffic on network)
Warning Alarm	nvoWarnAlarm	N/A	✓	✓	0=No Active Warnings, 24=Dirty Filter, 28=Airflow Sw, 32=Conductivity
Problem Alarm	nvoProbAlarm	N/A	✓	✓	0=No Active Problems, 137=Waterflow Sw, 140=Water Regulating Valve, 154=Low Pressure – Circuit 6, 155=Low Pressure – Circuit 5, 156=Low Pressure – Circuit 4, 157=Low Pressure – Circuit 3,

Network Control Property	Variable Name	SNVT/SCPT Index	SCC	DAC	Description
					158=Low Pressure – Circuit 2, 159=Low Pressure – Circuit 1, 162=High Pressure – Circuit 6, 163=High Pressure – Circuit 5, 164=High Pressure – Circuit 4, 165=High Pressure – Circuit 3, 166=High Pressure – Circuit 2, 167=High Pressure – Circuit 1, 169=Sump Pump Fail, 179=EFT_LCT Problem, 182=Return Air Sensor Problem, 185=Space Sensor Problem, 188=OAT Sensor Problem, 191=EWT Problem, 194=MAT Problem, 197=Freeze Problem
Fault Alarm	nvoFaultAlarm	N/A	✓	✓	0=No Active Faults, 208=Airflow Fault, 212=Low Discharge Air Temp, 216=High Discharge Air Temp, 220=High Return Air Temp, 224=Duct High Limit, 228=Discharge Sensor Fail, 244=Control Temp Fault, 250=Emergency Stop Fault, 252=Freeze Fault
Alarm Value	nvoUnitStatus	112	✓	✓	0=No Active Alarms, 24=Dirty Filter, 28=Airflow Sw, 32=Conductivity, 137=Waterflow Sw, 140=Water Regulating Valve, 154=Low Pressure – Circuit 6, 155=Low Pressure – Circuit 5, 156=Low Pressure – Circuit 4, 157=Low Pressure – Circuit 3, 158=Low Pressure – Circuit 2, 159=Low Pressure – Circuit 1, 162=High Pressure – Circuit 6, 163=High Pressure – Circuit 5, 164=High Pressure – Circuit 4, 165=High Pressure – Circuit 3, 166=High Pressure – Circuit 2, 167=High Pressure – Circuit 1, 169=Sump Pump Fail, 179=EFT_LCT Problem, 182=Return Air Sensor Problem, 185=Space Sensor Problem, 188=OAT Sensor Problem, 191=EWT Problem, 194=MAT Problem, 197=Freeze Problem, 208=Airflow Fault, 212=Low Discharge Air Temp, 216=High Discharge Air Temp, 220=High Return Air Temp, 224=Duct High Limit, 228=Discharge Sensor Fail, 244=Control Temp Fault, 250=Emergency Stop Fault, 252=Freeze Fault In_Alarm 0 = No Alarm
Object Status	nvoStatus	92	✓	✓	This variable is part of the Node Object and reports the status of the requested functional block in the device.
Object Request	nviRequest	93	✓	✓	This variable is part of the Node Object and requests a particular mode for a particular functional block in the device. Only the required RQ_NORMAL, RP_UPDATE_STATUS AND RQ_REPORT_MASK are implemented.
<i>Local Bypass Time</i>	<i>nciBypassTime SCPTbypassTime</i>	<i>123/34</i>	<i>✓</i>	<i>✓</i>	<i>Sets the max amount of time that the controller can be in Bypass mode</i>
<i>Outdoor Air Damper Min Position</i>	<i>nciOAMinPos SCPTminRnge</i>	<i>81/23</i>	<i>✓</i>	<i>✓</i>	<i>Default = 10%</i>
<i>Min Outdoor Airflow/Damper Position</i>	<i>nviMinOAFflowSP</i>	<i>15</i>	<i>✓</i>	<i>✓</i>	<i>Sets the Effective Min Outdoor Damper Position Stp when Design Flow is set to YES</i>
<i>OA Ambient</i>	<i>nvoEconEnabled</i>	<i>95</i>	<i>✓</i>	<i>✓</i>	<i>Indicates whether outside air is suitable for free cooling</i>

*Indicates non-standard, McQuay-specific LONWORKS variables (User Network Variable Type (UNVTs)).

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