

BACNET, MODBUS AND YORKTALK 2 COMMUNICATIONS

Data can be read and in some cases modified using a serial communication BACnet, Modbus or YorkTalk 2 network connection. This information allows communications of chiller operating parameters and external control changes to setpoint, load limiting, and start/stop commands.

BACnet and YorkTalk 2 RS485 networks are wired to the + and - terminals of TB1 for port 1 communications. Modbus network connection has the option of RS232 or RS485 connection for port 2 communications. Modbus network is wired to either TB2 or TB3 as follows:

- RS-485: connect to TB2 - Network (-1) to TB2 (-1); Network (+1) to TB2 (+1)
- RS-232: connect to TB3 - Network (RX) to TB3 (TXD); Network (TX) to TB3 (RXD); Network (GND) to TB3 (GND)

Refer to Figure 62 “Micro Panel Connections” for TB1, TB2 and TB3 locations.

In most cases, communication parameters will need to be modified. Table 39 “Values Required for BAS Communication” lists setup parameters for the available protocols. Modification is accomplished by pressing the PROGRAM, DOWN ARROW, DOWN ARROW, DOWN ARROW, DOWN ARROW, and ENTER keys in sequence. The list below shows the displays for the values that may be modified:

| | |
|------------------------------|---|
| DE MODIFIER ADDRESS XXXXX | P2 PROTOCOL XXXXXXXXXXXX |
| DE MODIFIER OFFSET XX | P2 MANUAL MAC ADDRESS XXX |
| P1 PROTOCOL XXXXXX | P2 BAUD RATE XXXXXX |
| P1 MANUAL MAC ADDRESS XXX | P2 PARITY XXXXXX |
| P1 BAUD RATE XXXXX | P2 STOP BITS X |
| P1 PARITY XXXXX | P2 HW SELECT BIT XXXXX |
| P1 STOP BITS X | REAL TIME ERROR ## RESET 1 = YES, 0 = NO 0 |

Note: See Table 29 for error descriptions

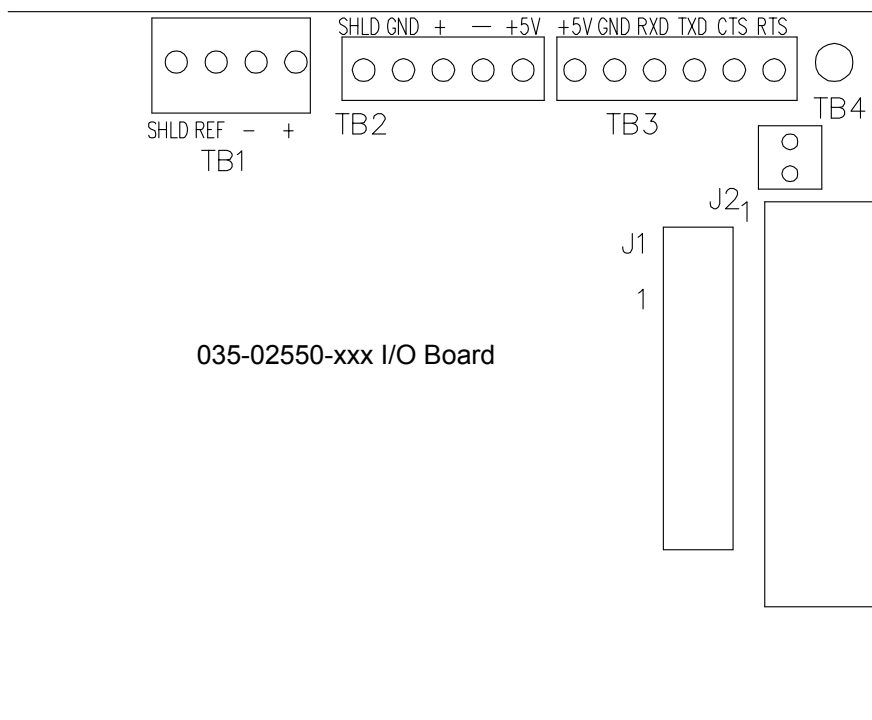


FIGURE 62 - MICRO PANEL CONNECTIONS

The table below shows the minimum, maximum, and default values.

TABLE 38 - MINIMUM, MAXIMUM AND DEFAULT VALUES

| DESCRIPTION | MINIMUM | MAXIMUM | DEFAULT |
|---------------------------|---|---------------|---------|
| DE MODIFIER ADDRESS | -1 | 41943 | -1 |
| DE MODIFIER OFFSET | -1 | 99 | -1 |
| P1 BAUD RATE | 1200 | 76800 | 4800 |
| | 1200, 4800, 9600, 19200, 38400, 76800, AUTO SELECTABLE | | |
| P2 BAUD RATE | 1200 | 57600 | 1200 |
| | 1200, 4800, 9600, 19200, 38400, 57600 SELECTABLE | | |
| P1, P2 MANUAL MAC ADDRESS | -1 | 127 | -1 |
| P1, P2 PARITY | NONE | IGNORE | NONE |
| | NONE, EVEN, ODD, IGNORE SELECTABLE | | |
| P1 PROTOCOL | BACNET | API | BACNET |
| | BACNET, API SELECTABLE | | |
| P2 PROTOCOL | TERMINAL | MODBUS CLIENT | API |
| | TERMINAL, MODBUS IO, MODBUS SERVER, API, MODBUS CLIENT selectable | | |
| P1, P2 STOP BITS | 1 | 2 | 1 |
| RESET REAL TIME ERROR | NO | YES | NO |

TABLE 39 - VALUES REQUIRED FOR BAS COMMUNICATION

| SETTING DESCRIPTION | PROTOCOL | | |
|-----------------------|---|---------------------------------|------------|
| | BACNET MS/TP | MODBUS RTU ⁵ | YORKTALK 2 |
| DE MODIFIER ADDRESS | 0 TO 41943 ⁽³⁾ | 1 | -1 |
| DE MODIFIER OFFSET | 0 TO 99 ⁽⁴⁾ | 0 | N/A |
| P1 PROTOCOL | BACNET | N/A | N/A |
| P1 MANUAL MAC ADDRESS | 0-127 ⁽¹⁾ | N/A | N/A |
| P1 BAUD RATE | 9600 To 76800 or Auto Selectable ⁽¹⁾ | N/A | N/A |
| P1 PARITY | NONE | N/A | N/A |
| P1 STOP BITS | 1 | N/A | N/A |
| P2 PROTOCOL | N/A | MODBUS SVR | N/A |
| P2 MANUAL MAC ADDRESS | N/A | 0-127 ⁽¹⁾ | N/A |
| P2 BAUD RATE | N/A | 19,200 ⁽²⁾ | N/A |
| P2 PARITY | N/A | NONE ⁽²⁾ | N/A |
| P2 STOP BITS | N/A | 1 | N/A |
| P2 HW SELECT BIT | N/A | RS-485 OR RS-232 ⁽¹⁾ | N/A |
| RESET REAL TIME ERROR | N/A | N/A | N/A |
| P1 HW SELECT BIT | N/A | N/A | N/A |
| CHILLER ID | N/A | N/A | 0 |

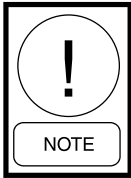
¹as Required By Network

²or Other As Required By Network

³number Is Multiplied By 100, Set As Required By Network

⁴number Is Added To De Modifier Address, Set As Required By Network

⁵unit Operating Software Version C.Mmc.13.03 Or Later Required For Modbus Protocol



Reboot required (cycle power) after settings are changed.

The table below shows the real time error numbers that may be encountered during communication setup and a description of each.

TABLE 40 - REAL TIME ERROR NUMBERS

| ERROR NUMBER (##) | DESCRIPTION |
|-------------------|----------------------------|
| 0 | ALL OK |
| 1 | DATUM TYPE OK TEST FAILED |
| 2 | ENGLISH TEXT TOO LONG |
| 3 | FLOATING POINT EXCEPTION |
| 4 | GET PACKET FAILED |
| 5 | GET TYPE FAILED |
| 6 | INVALID UNIT CONVERSION |
| 7 | INVALID HARDWARE SELECTION |
| 8 | REAL TIME FAULT |
| 9 | SPANISH TEXT TOO LONG |
| 10 | THREAD EXITED |
| 11 | THREAD FAILED |
| 12 | THREAD STALLED |
| 13 | IO BOARD RESET |
| 14 | BRAM INVALID |
| 15 | BACNET SETUP FAILED |

BACnet and Modbus Communications

Chiller data that can be read and modified using specific BACnet or Modbus Register Addresses; and the data associated with the addresses, is outlined in the following description:

Analog Write Points

This data can be read and modified using a BACnet or Modbus network connection. The Modbus Register Address for these points is 1025 + AV #.

Binary Write Points

This data can be read and modified using a BACnet or Modbus network connection. The Modbus Register Address for these points is 1537 + BV #.

Analog Read Only Points

This data can be read using a BACnet or Modbus network connection and can NOT be modified using this connection. The Modbus Register Address for these points is 513 + AI #.

Binary Monitor Only Points

This data can be read using a BACnet or Modbus network connection and can NOT be modified using this connection. The Modbus Register Address for these points is 1281 + BI #.

Refer to Table 41 for complete list of BACnet and Modbus registers.

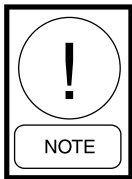
Communications Data Map Notes:

(See Table 41)

1. IPU II based units are configured for Native BACnet MS/TP and Modbus RTU communications. Microgateway or E-Link not required for these two communication protocols.
2. BACnet Object Types:

| | |
|-------------------|--|
| 0 = Analog In | 5 = Binary Value |
| 1 = Analog Out | 8 = Device |
| 2 = Analog Value | 15 = Alarm Notification (0 through 127 are reserved ASHRAE Objects). |
| 3 = Binary In | |
| 4 = Binary Output | |
3. Abbreviations:

| | |
|-----------------------------|----------------------------------|
| WC= Inches of water column | Pa = Pascals |
| CFM = Cubic Feet per Minute | kPa = Kilopascals |
| FPM = Feet per Minute | PPM = Part per Million |
| PSI = Lbs per square inch | kJ/kg = Kilojoules per Kilogram. |
4. Water Cooled Scroll units use the same firmware as Air Cooled Scroll units, ignoring Fan Control.



The latest data map information is listed on the Johnson Controls Equipment Integration website.

YCAL/YCUL/YCWL/YLAA IPU II

Native Modbus and BACnet MS/TP Data Maps

Board: 031-02630-xxx w/ 031-02550

| ITEM | Version | Date | York PN | Check Sum | Comments |
|------|-------------|-----------|---------------|-----------|--|
| 1 | C.MMC.13.00 | 29-Nov-06 | 031-02755-001 | | Standard with Board: 031-02630-xxx w/ 031-02550 |
| 2 | C.MMC.15.00 | 29-Nov-06 | 031-02755-002 | | Basildon with Board: 031-02630-xxx w/ 031-02550 |
| 3 | C.MMC.14.00 | 29-Nov-06 | 031-02755-003 | | MMHP with Board: 031-02630-xxx w/ 031-02550 |
| 4 | C.MMC.16.00 | 29-Nov-06 | 031-02755-004 | | Basildon MMHP with Board: 031-02630-xxx w/ 031-02550 |
| 5 | C.MMC.13.02 | 17-Oct-08 | 031-02755-001 | | Standard Micro Board 031-02550-xxx . Fix native Modbus communications. Fix Café Metric functionality (SCR-766) |
| 6 | C.MMC.14.02 | 17-Oct-08 | 031-02755-003 | | MMHP with Board: 031-02630-xxx w/ 031-02550Fix native Modbus communications. Fix Café Metric functionality (SCR-766) |
| 7 | C.MMC.16.02 | 17-Oct-08 | 031-02755-004 | | Basildon MMHP with Board: 031-02630-xxx w/ 031-02550 Fix native Modbus communications. Fix Café Metric functionality (SCR-766) |
| 8 | | | | | |
| 9 | | | | | |
| 10 | | | | | |

| ITEM REF NUM | BACnet NAME | BACnet Object/Inst ance | MODBUS ADDRESS | MODBUS Data Type Supported | ENG UNITS | READ WRITE | POINT DESCRIPTION | Point List Code | | | | | | | | | |
|--------------|--------------------------------|-------------------------|----------------|----------------------------|------------|------------|--|---|---|---|---|---|---|---|---|---|----|
| | | | | | | | | S=Standard; O = Optional; N = Not Available | | | | | | | | | |
| | | | | | | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 1 | | | | | SEE NOTE 5 | | SEE NOTE 1 | | | | | | | | | | |
| 3 | ANALOG WRITE POINTS | | | | | | | | | | | | | | | | |
| 4 | REM_SETP | AV_1 | 1026 | 03,06,16 | F° | R/W | Setpoint Cooling Setpoint(HP Only), 99 = Auto; (40°F - 70°F) | | | | | | | | | | |
| 5 | SP_REM_SP_S1 | AV_2 | 1027 | 03,06,16 | PSIG | R/W | Sys 1 Setpoint (Suction Pressure Control units only) | | | | | | | | | | |
| 6 | LOAD_LIMIT | AV_3 | 1028 | 03,06,16 | index | R/W | Load Limit Stage (0, 1, 2) | | | | | | | | | | |
| 7 | REM_CR | AV_4 | 1029 | 03,06,16 | F° | R/W | Cooling Range (DAT Mode Only) | | | | | | | | | | |
| 8 | SP_REM_SP_S2 | AV_5 | 1030 | 03,06,16 | PSIG | R/W | Sys 2 Setpoint (Suction Pressure Control) | | | | | | | | | | |
| 9 | REM_SP_HEAT | AV_6 | 1031 | 03,06,16 | F° | R/W | Heating Setpoint (HP Only), 999 = Auto (95°F - 122°F) | | | | | | | | | | |
| 10 | HP_MODE | AV_7 | 1032 | 03,06,16 | index | R/W | Mode (HP Only) (0=Panel, 1=Cooling, 2=Heating) | | | | | | | | | | |
| 11 | | | | | | | | | | | | | | | | | |
| 12 | BINARY WRITE POINTS | | | | | | | | | | | | | | | | |
| 13 | START_STOP | BV_1 | 1538 | 01,03,05,15,06, | 0, 1 | R/W | Stop Start Command | | | | | | | | | | |
| 14 | SS_SYS1 | BV_2 | 1539 | 01,03,05,15,06, | 0, 1 | R/W | Sys 1 Start/Stop (Suction Pressure (SP) Control Only) | | | | | | | | | | |
| 15 | SS_SYS2 | BV_3 | 1540 | 01,03,05,15,06, | 0, 1 | R/W | Sys 2 Start/Stop (Suction Pressure (SP) Control Only) | | | | | | | | | | |
| 16 | ANALOG READ ONLY POINTS | | | | | | | | | | | | | | | | |
| 17 | LCHLT | AI_1 | 514 | 03,04 | F° | R | Leaving Chilled Liquid Temp | | | | | | | | | | |
| 18 | RCHLT | AI_2 | 515 | 03,04 | F° | R | Return Chilled Liquid Temp | | | | | | | | | | |
| 19 | DAT | AI_3 | 516 | 03,04 | F° | R | Condensing Unit Models Only | | | | | | | | | | |
| 20 | S1_SUCT_TEMP | AI_4 | 517 | 03,04 | F° | R | Electronic Expansion Valve Models Only | | | | | | | | | | |
| 21 | OAT | AI_5 | 518 | 03,04 | F° | R | Ambient Air Temperature | | | | | | | | | | |
| 22 | S1_SUCT_SHEAT | AI_6 | 519 | 03,04 | F° | R | Sys 1 Suction Superheat (EEV Models Only) | | | | | | | | | | |
| 23 | S1_RUN_TIME | AI_7 | 520 | 03,04 | seconds | R | Sys 1 Run Time (seconds) | | | | | | | | | | |
| 24 | S1_SUCT_PR | AI_8 | 521 | 03,04 | PSIG | R | Sys 1 Suction Pressure | | | | | | | | | | |
| 25 | S1_DSCH_PR | AI_9 | 522 | 03,04 | PSIG | R | Sys 1 Discharge Pressure | | | | | | | | | | |
| 27 | S1_CIR_TEMP | AI_10 | 523 | 03,04 | F° | R | Sys 1 Cooler Inlet Refrigerant Temp (R-407c Models Only) | | | | | | | | | | |
| 28 | S1_DEF_TEMP | AI_11 | 524 | 03,04 | F° | R | Sys 1 Defrost Temperature (HP Only) | | | | | | | | | | |
| 29 | S1_EEV_OUT | AI_12 | 525 | 03,04 | F° | R | System 1 EEV Output % (EEV Models Only) | | | | | | | | | | |
| 30 | S1_AR_TIMER | AI_13 | 526 | 03,04 | seconds | R | Sys 1 Anti-Recycle Timer | | | | | | | | | | |
| 31 | AC_TIMER | AI_14 | 527 | 03,04 | seconds | R | Anti-Coincident Timer | | | | | | | | | | |
| 32 | S2_SUCT_TEMP | AI_15 | 528 | 03,04 | F° | R | System 2 Suction Temp (EEVModels Only) | | | | | | | | | | |
| 33 | S2_RUN_TIME | AI_16 | 529 | 03,04 | seconds | R | Sys 2 Run Time (seconds) | | | | | | | | | | |
| 34 | S2_SUCT_PR | AI_17 | 530 | 03,04 | PSIG | R | Sys 2 Suction Pressure | | | | | | | | | | |
| 35 | S2_DSCH_PR | AI_18 | 531 | 03,04 | PSIG | R | Sys 2 Discharge Pressure | | | | | | | | | | |
| 36 | S2_CIR_TEMP | AI_19 | 532 | 03,04 | F° | R | Sys 2 Cooler Inlet Refrigerant Temperature(R-407c Only) | | | | | | | | | | |
| 37 | S2_DEF_TEMP | AI_20 | 533 | 03,04 | F° | R | Sys 2 Defrost Temperature (HP Only) | | | | | | | | | | |
| 38 | S2_SUCT_SH | AI_21 | 534 | 03,04 | F° | R | Sys 2 Suction SuperHeat (EEV Models Only) | | | | | | | | | | |
| 39 | S2_AR_TIMER | AI_22 | 535 | 03,04 | F° | R | Sys 2 Anti-Recycle Timer | | | | | | | | | | |
| 40 | S2_EEV_OUT | AI_23 | 536 | 03,04 | seconds | R | Sys 2 Suction Superheat (EEV Models Only) | | | | | | | | | | |



TABLE 41 - BACNET AND MODBUS COMMUNICATIONS DATA MAP (CONT'D)

| ITEM REF NUM | BACnet NAME | BACnet Object/Instance | MODBUS ADDRESS | MODBUS Data Type Supported | ENG UNITS | READ WRITE | POINT DESCRIPTION | Point List Code | | | | | | | | | |
|--------------|-----------------------------------|------------------------|----------------|----------------------------|-----------|------------|---|---|---|---|---|---|---|---|---|---|----|
| | | | | | | | | S=Standard; O = Optional; N = Not Available | | | | | | | | | |
| | | | | | | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 41 | NUM_COMPS | AI_24 | 537 | 03,04 | count | R | Number of Compressors | | | | | | | | | | |
| 42 | S1_OP_CODE | AI_25 | 538 | 03,04 | index | R | Sys 1 Operational Code (See Table A & B) | | | | | | | | | | |
| 43 | S1_FLT_CODE | AI_26 | 539 | 03,04 | index | R | Sys 1 Fault Code (See Table A & B) | | | | | | | | | | |
| 44 | S2_OP_CODE | AI_27 | 540 | 03,04 | index | R | Sys 2 Operational Code (See Table A & B) | | | | | | | | | | |
| 45 | S2_FLT_CODE | AI_28 | 541 | 03,04 | index | R | Sys 2 Fault Code (See Table A & B) | | | | | | | | | | |
| 46 | S1_DBG_CODE | AI_29 | 542 | 03,04 | index | R | Sys 1 Debug Code | | | | | | | | | | |
| 47 | S1_FAN_STAGE | AI_30 | 543 | 03,04 | count | R | Sys 1 Condenser Fan Stage | | | | | | | | | | |
| 48 | S2_DBG_CODE | AI_31 | 544 | 03,04 | index | R | Sys 2 Debug Code | | | | | | | | | | |
| 49 | S2_FAN_STAGE | AI_32 | 545 | 03,04 | count | R | Sys 2 Condenser Fan Stage | | | | | | | | | | |
| 50 | CONTROL_MODE | AI_33 | 546 | 03,04 | count | R | Unit Control Mode (0=Leaving Water, 1=Return Water, 2=Discharge Air, 3=Suction Press, 4=Cooling, 5=Heating) | | | | | | | | | | |
| 51 | AR_TIME | AI_34 | 547 | 03,04 | seconds | R | Anti-Recycle Time (Programmed) | | | | | | | | | | |
| 52 | LCHLT_CUT | AI_35 | 548 | 03,04 | F° | R | Leaving Chilled Liquid Temp Cutout | | | | | | | | | | |
| 53 | LOW_AMB_CUT | AI_36 | 549 | 03,04 | F° | R | Low Ambient Temperature Cutout | | | | | | | | | | |
| 54 | SUCT_P_CO_HT | AI_37 | 550 | 03,04 | PSIG | R | Low Suction Pressure Cutout Heating (HP Only) | | | | | | | | | | |
| 55 | L_SUCT_P_CO | AI_38 | 551 | 03,04 | PSIG | R | Low Suction Pressure Cutout (Cooling on HP units) | | | | | | | | | | |
| 56 | H_DSCH_P_CO | AI_39 | 552 | 03,04 | PSIG | R | High Discharge Pressure Cutout | | | | | | | | | | |
| 57 | COOL_SETP | AI_40 | 553 | 03,04 | F° | R | Setpoint | | | | | | | | | | |
| 58 | SP_SETP_S1 | AI_41 | 554 | 03,04 | F° | R | Setpoint 1 (SP Control) | | | | | | | | | | |
| 59 | CONTROL_RG | AI_42 | 555 | 03,04 | F° | R | Cooling Range | | | | | | | | | | |
| 60 | SP_CTL_RG_S1 | AI_43 | 556 | 03,04 | F° | R | Cooling Range 1 (SP Control) | | | | | | | | | | |
| 61 | SP_SETP_S2 | AI_44 | 557 | 03,04 | F° | R | Setpoint 2 (SP Control) | | | | | | | | | | |
| 62 | HEAT_SETP | AI_45 | 558 | 03,04 | F° | R | Heating Setpoint (HP Only) | | | | | | | | | | |
| 63 | SP_CTL_RG_S2 | AI_46 | 559 | 03,04 | F° | R | Cooling Range 2 (SP Control) | | | | | | | | | | |
| 64 | HEAT_RANGE | AI_47 | 560 | 03,04 | F° | R | Heating Range (HP Only) | | | | | | | | | | |
| 65 | S1_DSCH_TEMP | AI_48 | 561 | 03,04 | F° | R | Sys 1 Discharge Temperature (EEV Only) | | | | | | | | | | |
| 66 | S1_DSCH_SHEAT | AI_49 | 562 | 03,04 | F° | R | Sys 1 Discharge Superheat (EEV Only) | | | | | | | | | | |
| 67 | S2_DSCH_TEMP | AI_50 | 563 | 03,04 | F° | R | Sys 2 Discharge Temperature (EEV Only) | | | | | | | | | | |
| 68 | S2_DSCH_SH | AI_51 | 564 | 03,04 | F° | R | Sys 2 Discharge Superheat (EEV Only) | | | | | | | | | | |
| 69 | LEAVING_HOT | AI_52 | 565 | 03,04 | F° | R | Leaving Liquid Hot Temp (R-410a) | | | | | | | | | | |
| 70 | RETURN_HOT | AI_53 | 566 | 03,04 | F° | R | Return Liquid Hot Temp (R-410a) | | | | | | | | | | |
| 71 | | | | | | | | | | | | | | | | | |
| 72 | | | | | | | | | | | | | | | | | |
| 74 | BINARY MONITOR ONLY POINTS | | | | | | | | | | | | | | | | |
| 75 | S1_ALARM | BI_1 | 1282 | 01,02,03 | 0, 1 | R | Sys 1 Alarm | | | | | | | | | | |
| 76 | S2_ALARM | BI_2 | 1283 | 01,02,03 | 0, 1 | R | Sys 2 Alarm | | | | | | | | | | |
| 77 | EVAP_HTR | BI_3 | 1284 | 01,02,03 | 0, 1 | R | Evaporator Heater Status | | | | | | | | | | |
| 78 | EVAP_PUMP | BI_4 | 1285 | 01,02,03 | 0, 1 | R | Evaporator Pump Status | | | | | | | | | | |
| 79 | S1_C1_RUN | BI_5 | 1286 | 01,02,03 | 0, 1 | R | Sys 1 Comp 1 Run | | | | | | | | | | |
| 80 | S2_C1_RUN | BI_6 | 1287 | 01,02,03 | 0, 1 | R | Sys 2 Comp 1 Run | | | | | | | | | | |
| 81 | S1_LLSV | BI_7 | 1288 | 01,02,03 | 0, 1 | R | Sys 1 Liquid Line Solenoid Valve | | | | | | | | | | |
| 82 | S1_MODE_SV | BI_8 | 1289 | 01,02,03 | 0, 1 | R | Sys 1 Mode Solenoid Valve (HP Only) | | | | | | | | | | |
| 83 | S1_HGBV | BI_9 | 1290 | 01,02,03 | 0, 1 | R | Sys 1 Hot Gas Bypass Valve | | | | | | | | | | |
| 84 | S1_BHS | BI_10 | 1291 | 01,02,03 | 0, 1 | R | Bivalent Heat Source (HP Only) | | | | | | | | | | |
| 85 | S1_C2_RUN | BI_11 | 1292 | 01,02,03 | 0, 1 | R | Sys 1 Comp 2 Run | | | | | | | | | | |
| 86 | S2_C2_RUN | BI_12 | 1293 | 01,02,03 | 0, 1 | R | Sys 2 Comp 2 Run | | | | | | | | | | |
| 87 | S2_LLSV | BI_13 | 1294 | 01,02,03 | 0, 1 | R | Sys 2 Liquid Line Solenoid Valve | | | | | | | | | | |
| 88 | S2_MODE_SV | BI_14 | 1295 | 01,02,03 | 0, 1 | R | Sys 2 Mode Solenoid Valve (HP Only) | | | | | | | | | | |
| 89 | LEAD_SYS | BI_15 | 1296 | 01,02,03 | 0, 1 | R | Lead System (0 = Sys 1, 1 = Sys 2) | | | | | | | | | | |
| 90 | S1_C3_RUN | BI_16 | 1297 | 01,02,03 | 0, 1 | R | Sys 1 Comp 3 Run | | | | | | | | | | |
| 91 | S2_C3_RUN | BI_17 | 1298 | 01,02,03 | 0, 1 | R | Sys 2 Comp 3 Run | | | | | | | | | | |
| 92 | CH_LIQ_TYPE | BI_18 | 1299 | 01,02,03 | 0, 1 | R | Chilled Liquid Type (0=Water, 1=Glycol) | | | | | | | | | | |
| 93 | AMB_MODE | BI_19 | 1300 | 01,02,03 | 0, 1 | R | Ambient Control Mode (0=Std Amb, 1=Low Amb) | | | | | | | | | | |

| ITEM REF NUM | BACnet NAME | BACnet Object/Instance | MODBUS ADDRESS | MODBUS Data Type Supported | ENG UNITS | READ WRITE | POINT DESCRIPTION | Point List Code | | | | | | | | | | | |
|--------------|-------------|------------------------|----------------|----------------------------|-----------|------------|---|---|---|---|---|---|---|---|---|---|----|--|--|
| | | | | | | | | S=Standard; O = Optional; N = Not Available | | | | | | | | | | | |
| | | | | | | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | | |
| 94 | CNTL_MODE | BI_20 | 1301 | 01,02,03 | 0, 1 | R | Local/Remote Control Mode (0=Local, 1=Remote) | | | | | | | | | | | | |
| 95 | DATA_UNIT | BI_21 | 1302 | 01,02,03 | 0, 1 | R | Units (0=Imperial, 1=SI) | | | | | | | | | | | | |
| 96 | AUTO_LL | BI_22 | 1303 | 01,02,03 | 0, 1 | R | Lead/Lag Control Mode (0=Manual, 1=Auto) | | | | | | | | | | | | |

TABLE A

| Code | Operational Codes |
|------|-------------------------------|
| 0 | No Abnormal Condition |
| 1 | Unit Switch Off |
| 2 | System Switch Off |
| 3 | Lock-Out |
| 4 | Unit Fault |
| 5 | System Fault |
| 6 | Remote Shutdown |
| 7 | Daily Schedule Shutdown |
| 8 | No Run Permissive |
| 9 | No Cool Load |
| 10 | Anti-Coincidence Timer Active |
| 11 | Anti-Recycle Timer Active |
| 12 | Manual Override |
| 13 | Suction Limiting |
| 14 | Discharge Limiting |
| 15 | Load Limiting |
| 16 | Compressor(s) Running |
| 17 | |
| 18 | |
| 19 | |
| 20 | |
| 21 | |
| 22 | |
| 23 | |
| 24 | |
| 25 | |
| 26 | |
| 27 | |
| 28 | |
| 29 | |
| 30 | |

TABLE B

| Code | Fault Codes |
|------|--------------------------------------|
| 0 | No Fault |
| 1 | VAC Under Voltage |
| 2 | Low Ambient Temperature |
| 3 | High Ambient Temperature |
| 4 | Low Leaving Chilled Liquid Temp |
| 5 | High Discharge Pressure |
| 6 | High Differential Oil Pressure |
| 7 | Low Suction Pressure |
| 8 | High Motor Current |
| 9 | LLSV Not On |
| 10 | Low Battery Warning |
| 11 | High Oil Temperature |
| 12 | High Discharge Temperature |
| 13 | Improper Phase Rotation |
| 14 | Low Motor Current / MP / HPCO |
| 15 | Motor Current Unbalanced |
| 16 | Low Differential Oil Pressure |
| 17 | Ground Fault |
| 18 | MP/HPCO Fault |
| 19 | Low Evaporator Temperature |
| 20 | Incorrect Refrigerant Programmed |
| 21 | Power Failure, Manual Reset Required |
| 22 | Unit Motor Current |
| 23 | Low Superheat |
| 24 | Sensor Fault |
| 25 | |
| 26 | MP/HPCO Inhibit |
| 27 | |
| 28 | |
| 29 | |
| 30 | |

NOTES

| | |
|----|---|
| 1 | The IPU II based YCAL /YCUL Units are configured for Native BACnet MS/TP and Modbus RTU communications. The Microgateway product is not required for these 2 interfaces |
| 2 | |
| 3 | BACnet Object Types: 0= Analog In, 1 = Analog Out, 2= Analog Value, 3= Binary In, 4 = Binary Output, 5= Binary Value, 8= Device, 15 = Alarm Notification (0 -127 are reserved ASHRAE Objects) |
| 4 | WC= Inches of water column; CFM = Cubic Feet per Minute; FPM = Feet per Minute; PSI = Lbs per square inch; Pa = Pascals; kPa = Kilopascals; PPM = Part Per Million; kJ/kg = Kilojoules per Kilogram |
| 5 | See the applicable Middle Market Chiller Operations Manual for more details |
| 6 | The YCWL uses the same firmware as a YCAL, it just ignores Fan Control |
| 7 | |
| 8 | |
| 9 | |
| 10 | |

TABLE 41 - BACNET AND MODBUS COMMUNICATIONS DATA MAP (CONT'D)