

Modbus Points List



Rev 6
Date 6/27/2024
Notes Added relays section

COMMUNICATIONS Modbus TCP/IP (X7 and X5 Thermostats)

- 1 Port 502
- 2 Default Address 254

GENERAL NOTES

- 1 To initiate modbus, go to the thermostat embedded web page. Select 'Configuration / Network Settings / Service Settings'. Then enable modbus.
- 2 To set modbus parameters, then select 'BAS Settings'

| # Bytes | Type | Object Name | Function | Modbus Address | Function Code | Low Limit | High Limit | Notes |
|----------------------------|----------------|--|----------|----------------|---------------|-----------|------------|--|
| HARDWARE / SOFTWARE | | | | | | | | |
| 2 | input register | Modbus Slave Address | R/W | 46001 | 3 | 1 | 254 | Default = 254; can be set via Modbus or thermostat screen |
| 2 | input register | Hardware Revision | R | 39001 | 4 | N/A | N/A | |
| 2 | input register | Backplate/NT-485 Software Revision Major | R | 39002 | 4 | 0 | 255 | |
| 2 | input register | Backplate/NT-485 Software Revision Minor | R | 39003 | 4 | 0 | 255 | |
| 2 | input register | Model | R | 39004 | 4 | N/A | N/A | NT-485 = 485, X7 = 7, X5 = 5 |
| 2 | input register | Faceplate Revision Major | R | 39005 | 4 | 0 | 255 | |
| 2 | input register | Faceplate Revision Minor | R | 39006 | 4 | 0 | 255 | |
| RELAYS | | | | | | | | |
| 1 bit | coil | Relay 1 Output Y1 | R | 1 | 1 | 0 | 1 | |
| 1 bit | coil | Relay 2 Output Y2 | R | 2 | 1 | 0 | 1 | |
| 1 bit | coil | Relay 3 Output E/W1 | R | 3 | 1 | 0 | 1 | |
| 1 bit | coil | Relay 4 Output B/O/W2 | R | 4 | 1 | 0 | 1 | |
| 1 bit | coil | Relay 5 Output G | R | 5 | 1 | 0 | 1 | |
| 1 bit | coil | Relay 6 Output KHD | R | 6 | 1 | 0 | 1 | |
| 1 bit | coil | Relay 7 Output K2 | R | 7 | 1 | 0 | 1 | |
| INPUTS | | | | | | | | |
| 1 bit | discrete input | LED1 Input | R | 10001 | 2 | 0 | 1 | |
| 1 bit | discrete input | LED2 Input | R | 10002 | 2 | 0 | 1 | |
| 1 bit | discrete input | CLK Input | R | 10003 | 2 | 0 | 1 | |

| # Bytes | Type | Object Name | Function | Modbus Address | Function Code | Low Limit | High Limit | Notes |
|--|----------------|-------------------------------|----------|----------------|---------------|-----------|------------|---|
| REMOTE SENSORS Validity Flags | | | | | | | | |
| 1 bit | discrete input | Remote Room Temperature | R | 11001 | 2 | 0 | 1 | 0=Sensor Invalid, 1=Sensor Valid |
| 1 bit | discrete input | Remote Room Humidity | R | 11002 | 2 | 0 | 1 | 0=Sensor Invalid, 1=Sensor Valid |
| 1 bit | discrete input | Aux1 Temp | R | 11003 | 2 | 0 | 1 | 0=Sensor Invalid, 1=Sensor Valid |
| 1 bit | discrete input | Aux2 Temp | R | 11004 | 2 | 0 | 1 | 0=Sensor Invalid, 1=Sensor Valid |
| 1 bit | discrete input | Aux3 Temp | R | 11005 | 2 | 0 | 1 | 0=Sensor Invalid, 1=Sensor Valid |
| 1 bit | discrete input | Aux4 Temp | R | 11006 | 2 | 0 | 1 | 0=Sensor Invalid, 1=Sensor Valid |
| 1 bit | discrete input | Aux5 Temp | R | 11007 | 2 | 0 | 1 | 0=Sensor Invalid, 1=Sensor Valid |
| 1 bit | discrete input | Aux6 Temp | R | 11008 | 2 | 0 | 1 | 0=Sensor Invalid, 1=Sensor Valid |
| 1 bit | discrete input | Aux7 Temp | R | 11009 | 2 | 0 | 1 | 0=Sensor Invalid, 1=Sensor Valid |
| 1 bit | discrete input | Remote Outdoor Temperature | R | 11010 | 2 | 0 | 1 | 0=Sensor Invalid, 1=Sensor Valid |
| 1 bit | discrete input | Remote Outdoor Humidity | R | 11011 | 2 | 0 | 1 | 0=Sensor Invalid, 1=Sensor Valid |
| 1 bit | discrete input | Water Leak | R | 11012 | 2 | 0 | 1 | 0=Sensor Invalid, 1=Sensor Valid |
| 1 bit | discrete input | CO2 Sensor | R | 11013 | 2 | 0 | 1 | 0=Sensor Invalid, 1=Sensor Valid |
| Fahrenheit Scale | | | | | | | | |
| # Bytes | Type | Object Name | Function | Modbus Address | Function Code | Low Limit | High Limit | Notes |
| THERMOSTAT (Fahrenheit) READ ONLY | | | | | | | | |
| 2 | input register | Room Temperature | R | 30001 | 4 | 28F | 118F | F with resolution 0.01F (72F = 7200) |
| 2 | input register | Room Humidity | R | 30002 | 4 | 0 | 100 | % RH with resolution 1% |
| 2 | input register | Current Heat / Cool Operation | R | 30003 | 4 | 0 | 2 | 0=off, 1=cooling, 2=heating |
| 2 | input register | Stages Active of Heat / Cool | R | 30004 | 4 | 0 | 4 | 0=off, 1=1st stage, 2=2nd stage, 3=3rd stage, 4=4th stage (3, 4 for future release) |
| 2 | input register | Room CO2 Level | R | 30005 | 4 | 0 | 40000 | ppm |
| REMOTE SENSORS (Fahrenheit) READ ONLY | | | | | | | | |
| 2 | input register | Remote Room Temperature | R | 31001 | 4 | 28F | 118F | F with resolution 0.01F (72F = 7200) |
| 2 | input register | Remote Room Humidity | R | 31002 | 4 | 0 | 100 | % RH with resolution 1% |
| 2 | input register | Aux1 Temp | R | 31003 | 4 | -40F | +200F | F with resolution 0.01F (72F = 7200) |
| 2 | input register | Aux2 Temp | R | 31004 | 4 | -40F | +200F | F with resolution 0.01F (72F = 7200) |
| 2 | input register | Aux3 Temp | R | 31005 | 4 | -40F | +200F | F with resolution 0.01F (72F = 7200) |
| 2 | input register | Aux4 Temp | R | 31006 | 4 | -40F | +200F | F with resolution 0.01F (72F = 7200) |
| 2 | input register | Aux5 Temp | R | 31007 | 4 | -40F | +200F | F with resolution 0.01F (72F = 7200) |
| 2 | input register | Aux6 Temp | R | 31008 | 4 | -40F | +200F | F with resolution 0.01F (72F = 7200) |
| 2 | input register | Aux7 Temp | R | 31009 | 4 | -40F | +200F | F with resolution 0.01F (72F = 7200) |
| 2 | input register | Remote Outdoor Temperature | R | 31010 | 4 | -54F | +119F | F with resolution 0.01F (72F = 7200) |
| 2 | input register | Remote Outdoor Humidity | R | 31011 | 4 | 0 | 100 | % RH with resolution 1% |
| 2 | input register | Water Leak | R | 31012 | 4 | 0 | 1 | 0=no water, 1=water |

| # Bytes | Type | Object Name | Function | Modbus Address | Function Code | Low Limit | High Limit | Notes |
|---|------------------|------------------------------|----------|----------------|---------------|-----------|------------|---|
| THERMOSTAT (Fahrenheit) READ / WRITE - WHEN THERMOSTAT SCHEDULES ARE RUNNING | | | | | | | | |
| 2 | holding register | System Mode Heat / Cool Mode | R/W | 40001 | 3 | 0 | 6 | 0=off, 1=cool, 2=heat, 3=auto, 4=eheat |
| 2 | holding register | Fan Mode | R/W | 40002 | 3 | 0 | 5 | 0=auto, 1=on/low, 2=med, 3=high |
| 2 | holding register | Active Cool Set Point | R/W | 40003 | 3 | 60F | 108F | F with 1 degree resolution |
| 2 | holding register | Active Heat Set Point | R/W | 40004 | 3 | 38F | 88F | F with 1 degree resolution |
| 2 | holding register | Outdoor Temperature | R/W | 40005 | 3 | -54F | +119F | F with 1 degree resolution |
| 2 | holding register | Outdoor Humidity | R/W | 40006 | 3 | 0 | 100 | % RH with resolution 1% |
| THERMOSTAT (Fahrenheit) in Manual Mode READ / WRITE - WHEN THERMOSTAT IS IN 'MANUAL MODE' (ALL SCHEDULES INACTIVE) | | | | | | | | |
| 2 | holding register | System Mode Heat / Cool Mode | R/W | 42001 | 3 | 0 | 6 | 0=off, 1=cool, 2=heat, 3=auto, 4=eheat |
| 2 | holding register | Fan Mode | R/W | 42002 | 3 | 0 | 5 | 0=auto, 1=on/low, 2=med, 3=high (2, 3 for future release) |
| 2 | holding register | Occupied Cool Set Point | R/W | 42003 | 3 | 60F | 108F | F with 1 degree resolution |
| 2 | holding register | Occupied Heat Set Point | R/W | 42004 | 3 | 38F | 88F | F with 1 degree resolution |
| 2 | holding register | Unoccupied Cool Set Point | R/W | 42005 | 3 | 60F | 108F | F with 1 degree resolution |
| 2 | holding register | Unoccupied Heat Set Point | R/W | 42006 | 3 | 38F | 88F | F with 1 degree resolution |
| 2 | holding register | Occ/Unocc Toggle | R/W | 42007 | 3 | 0 | 1 | 0=occupied, 1=unoccupied |
| 2 | holding register | Manual Operation / Schedule | R/W | 42008 | 3 | 0 | 1 | 0=schedules, 1>manual (Sets Schedule or Manual) |
| THERMOSTAT (Fahrenheit) in Manual Mode READ / WRITE - KEYPAD LOCKED - OVERRIDE PARAMETERS | | | | | | | | |
| 2 | holding register | Override Mode Status | R/W | 42010 | 3 | 0 | 6 | 0=off, 1=cool, 2=heat, 3=auto, 4=eheat |
| 2 | holding register | Override Fan Status | R/W | 42011 | 3 | 0 | 5 | 0=auto, 1=on/low, 2=med, 3=high |
| 2 | holding register | Override Cool Set Point | R/W | 42012 | 3 | 60F | 108F | F with 1 degree resolution |
| 2 | holding register | Override Heat Set Point | R/W | 42013 | 3 | 38F | 88F | F with 1 degree resolution |
| 2 | holding register | Override Time Parameter | R/W | 42014 | 3 | 0 | 1440 | Minutes with 1 minute resolution |
| 2 | holding register | Override Time Remaining | R/W | 42015 | 3 | 0 | 1440 | Minutes with 1 minute resolution |
| 2 | holding register | Override Range | R/W | 42016 | 3 | 2 | 8 | 2=+/-2F. 3=+/-3F. 4=+/-4F. 5=+/-5F. 6=+/-6F. 7=+/-7F. 8=+/-8F (in 1F increments) |
| 2 | holding register | Touchscreen Lock | R/W | 42017 | 3 | 0 | 2 | 0=unlocked, 1=locked |
| THERMOSTAT KHD RELAY CONTROL | | | | | | | | |
| 2 | holding register | KHD Relay Control Type | R/W | 42020 | 3 | 0 | 7 | 0=off, 1>manual, 2=schedule, 3=damper, 4=iaq, 5=co2, 6=dehum, 7=hum (2 thru 7 for future release) |
| 2 | holding register | KHD Manual Mode Operation | R/W | 42021 | 3 | 0 | 1 | 0=off, 1=on |
| THERMOSTAT K2 RELAY CONTROL | | | | | | | | |
| 2 | holding register | K2 Relay Control Type | R/W | 42040 | 3 | 0 | 5 | 0=off, 1>manual, 2=schedule, 3=damper, 4=iaq, 5=co2 (2 thru 5 for future release) |
| 2 | holding register | K2 Manual Mode Operation | R/W | 42041 | 3 | 0 | 1 | 0=off, 1=on |

| Celsius Scale | | | | | | | | |
|---|------------------|-------------------------------|----------|----------------|---------------|-----------|------------|---|
| # Bytes | Type | Object Name | Function | Modbus Address | Function Code | Low Limit | High Limit | Notes |
| THERMOSTAT (Celsius) READ ONLY | | | | | | | | |
| 2 | input register | Room Temperature | R | 32001 | 4 | 0C | 48C | C with resolution 0.01C (21C = 2100) |
| 2 | input register | Room Humidity | R | 32002 | 4 | 0 | 100 | % RH with resolution 1% |
| 2 | input register | Current Heat / Cool Operation | R | 32003 | 4 | 0 | 2 | 0=off, 1=cooling, 2=heating |
| 2 | input register | Stages Active of Heat / Cool | R | 32004 | 4 | 0 | 4 | 0=off, 1=1st stage, 2=2nd stage, 3=3rd stage, 4=4th stage (3, 4 for future release) |
| 2 | input register | Room CO2 Level | R | 32005 | 4 | 0 | 40000 | ppm |
| REMOTE SENSORS (Celsius) READ ONLY | | | | | | | | |
| 2 | input register | Remote Room Temperature | R | 33001 | 4 | -2C | +48C | C with resolution 0.01C (25C = 2500) |
| 2 | input register | Remote Room Humidity | R | 33002 | 4 | 0 | 100 | % RH with resolution 1% |
| 2 | input register | Aux1 Temp | R | 33003 | 4 | -40C | +93C | C with resolution 0.01C (25C = 2500) |
| 2 | input register | Aux2 Temp | R | 33004 | 4 | -40C | +93C | C with resolution 0.01C (25C = 2500) |
| 2 | input register | Aux3 Temp | R | 33005 | 4 | -40C | +93C | C with resolution 0.01C (25C = 2500) |
| 2 | input register | Aux4 Temp | R | 33006 | 4 | -40C | +93C | C with resolution 0.01C (25C = 2500) |
| 2 | input register | Aux5 Temp | R | 33007 | 4 | -40C | +93C | C with resolution 0.01C (25C = 2500) |
| 2 | input register | Aux6 Temp | R | 33008 | 4 | -40C | +93C | C with resolution 0.01C (25C = 2500) |
| 2 | input register | Aux7 Temp | R | 33009 | 4 | -40C | +93C | C with resolution 0.01C (25C = 2500) |
| 2 | input register | Remote Outdoor Temperature | R | 33010 | 4 | -40C | +93C | C with resolution 0.01C (25C = 2500) |
| 2 | input register | Remote Outdoor Humidity | R | 33011 | 4 | 0 | 100 | % RH with resolution 1% |
| 2 | input register | Water Leak | R | 33012 | 4 | 0 | 1 | 0=no water, 1=water |
| THERMOSTAT (Celsius) READ / WRITE - WHEN THERMOSTAT SCHEDULES ARE RUNNING | | | | | | | | |
| # Bytes | Type | Object Name | Function | Modbus Address | Function Code | Low Limit | High Limit | Notes |
| 2 | holding register | Heat / Cool Mode | R/W | 41001 | 3 | 0 | 6 | 0=off, 1=cool, 2=heat, 3=auto, 4=eheat |
| 2 | holding register | Fan Mode | R/W | 41002 | 3 | 0 | 5 | 0=auto, 1=on/low, 2=med, 3=high |
| 2 | holding register | Active Cool Set Point | R/W | 41003 | 3 | 16C | 40C | C with 1 degree resolution |
| 2 | holding register | Active Heat Set Point | R/W | 41004 | 3 | 6C | 30C | C with 1 degree resolution |
| 2 | holding register | Outdoor Temperature | R/W | 41005 | 3 | -48C | +48C | C with 1 degree resolution |
| 2 | holding register | Outdoor Humidity | R/W | 41006 | 3 | 0 | 100 | % RH with resolution 1% |
| THERMOSTAT (Celsius) READ / WRITE - WHEN THERMOSTAT IS IN 'MANUAL MODE' (ALL SCHEDULES INACTIVE) | | | | | | | | |
| 2 | holding register | System Mode Heat / Cool Mode | R/W | 43001 | 3 | 0 | 6 | 0=off, 1=cool, 2=heat, 3=auto, 4=eheat |
| 2 | holding register | Fan Mode | R/W | 43002 | 3 | 0 | 5 | 0=auto, 1=on/low, 2=med, 3=high (2, 3 for future release) |
| 2 | holding register | Occupied Cool Set Point | R/W | 43003 | 3 | 16C | 40C | C with 1 degree resolution |
| 2 | holding register | Occupied Heat Set Point | R/W | 43004 | 3 | 6C | 30C | C with 1 degree resolution |
| 2 | holding register | Unoccupied Cool Set Point | R/W | 43005 | 3 | 16C | 40C | C with 1 degree resolution |
| 2 | holding register | Unoccupied Heat Set Point | R/W | 43006 | 3 | 6C | 30C | C with 1 degree resolution |
| 2 | holding register | Occ/Unocc Toggle | R/W | 43007 | 3 | 0 | 1 | 0=occupied, 1=unoccupied |
| 2 | holding register | Manual Operation / Schedule | R/W | 43008 | 3 | 0 | 1 | 0=schedules, 1>manual (Sets Schedule or Manual) |

| # Bytes | Type | Object Name | Function | Modbus Address | Function Code | Low Limit | High Limit | Notes |
|---|------------------|---------------------------|----------|----------------|---------------|-----------|------------|---|
| THERMOSTAT (Celsius) in Manual Mode READ / WRITE - KEYPAD LOCKED - OVERRIDE PARAMETERS | | | | | | | | |
| 2 | holding register | Override Mode Status | R/W | 43010 | 3 | 0 | 6 | 0=off, 1=cool, 2=heat, 3=auto, 4=heat |
| 2 | holding register | Override Fan Status | R/W | 43011 | 3 | 0 | 5 | 0=auto, 1=on/low, 2=med, 3=high |
| 2 | holding register | Override Cool Set Point | R/W | 43012 | 3 | 16C | 40C | C with 1 degree resolution |
| 2 | holding register | Override Heat Set Point | R/W | 43013 | 3 | 6C | 30C | C with 1 degree resolution |
| 2 | holding register | Override Time Parameter | R/W | 43014 | 3 | 0 | 1440 | Minutes with 1 minute resolution |
| 2 | holding register | Override Time Remaining | R/W | 43015 | 3 | 0 | 1440 | Minutes with 1 minute resolution |
| 2 | holding register | Override Range | R/W | 43016 | 3 | 2 | 8 | 2=+/-1C, 3=+/-1.5C, 4=+/-2C, 5=+/-2.5C, 6=+/-3C, 7=+/-3.5C, 8=+/-4C (in 0.5C increments) |
| 2 | holding register | Touchscreen Lock | R/W | 43017 | 3 | 0 | 2 | 0=unlocked, 1=locked |
| THERMOSTAT KHD RELAY CONTROL | | | | | | | | |
| 2 | holding register | KHD Relay Control Type | R/W | 43020 | 3 | 0 | 7 | 0=off, 1=manual, 2=schedule, 3=damper, 4=iaq, 5=co2, 6=dehum, 7=hum (2 thru 7 for future release) |
| 2 | holding register | KHD Manual Mode Operation | R/W | 43021 | 3 | 0 | 1 | 0=off, 1=on |
| THERMOSTAT K2 RELAY CONTROL | | | | | | | | |
| 2 | holding register | K2 Relay Control Type | R/W | 43040 | 3 | 0 | 5 | 0=off, 1=manual, 2=schedule, 3=damper, 4=iaq, 5=co2 (2 thru 5 for future release) |
| 2 | holding register | K2 Manual Mode Operation | R/W | 43041 | 3 | 0 | 1 | 0=off, 1=on |