

Modbus Points List



Rev 5
Date 7/31/2023

Notes Added comments regarding future release of additional KHD/K2 relay control. No register updates.

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	
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	
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
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=ehat
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

# Bytes	Type	Object Name	Function	Modbus Address	Function Code	Low Limit	High Limit	Notes
THERMOSTAT (Celsius) READ / WRITE - WHEN THERMOSTAT SCHEDULES ARE RUNNING								
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)
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=eheat
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