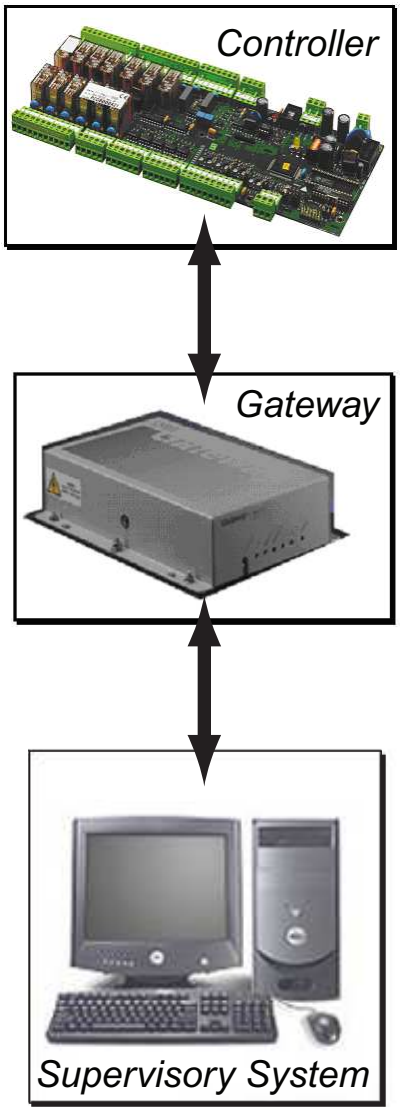
Remote Communications
Configuration of SATS Units



Controller Configuration Manual

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Notice

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Introduction

Purpose

The purpose of this manual is to explain the procedure for correctly configuring SATS units with Remote Communication. The following information is encompassed in this document:

- Configuring the controller software for remote communication.
- Configuring the Carel Gateway for remote communication.
- Memory map for communications to SATS units.
- Troubleshooting/Testing

Please note, any information in this document that pertains to the gateway should be used with the "*Gateway Modbus – User Guide"* by Carel, document #: +030221100.

Addressing the A-Tech-20 Controller Software

Whenever one or more SATS units are configured for remote communication, the user is required to address each unit for proper communication. The following steps must be taken to properly address each unit:

1. Initiate power to the unit.
2. On the keypad, press the 'Config Menu' key to enter the "Password Screen". To access the "Communications Screen" in Level 3, enter the default password: ***9998***. If the above instruction does not permit access to Level 3, then it is possible the password has been changed.
3. In Level 3, press the 'Select' key to scroll to the "Communications Screen". See Figure 1.

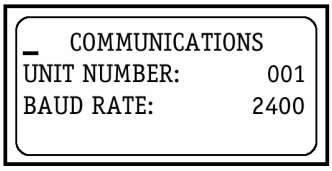


Figure 1

4. At the "Communications Screen", move the cursor to the *"Unit Number"* parameter by pressing the 'Enter' button. If there is more than one unit, change the *"Unit Number"* parameter to the appropriate unit number on each unit by pressing the '↑' or '↓' buttons.

Do not skip unit numbers when addressing each unit. Skipping a unit number will cause communication problems. Ex. – If a site has 3 SATS units, each unit needs to be addressed as *"Unit Number"*: 001, 002, & 003, respectively.

5. After the *"Unit Number"* parameter has been assigned, the *"Baud Rate"* parameter must be addressed on each unit. To address the *"Baud Rate"* parameter, move the cursor by pressing the 'Enter' button. The default baud rate is set at *2400 bits/sec*. Change the *"Baud Rate"* parameter to one of following rates by pressing the '↑' or '↓' buttons: *1200, 2400, 4800, 9600,* or *19200 bits/sec*.

6. Once the *"Unit Number"* and *"Baud Rate"* parameters have been addressed, press the 'Enter' button to return the cursor to its starting position and then the 'Escape' key to return to the "Main Screen". This concludes the setup of the A-Tech-20 controller software.

Configuring the Modbus Gateway

Once all the units have been addressed and wired together properly, then the Modbus Gateway must be configured. The purpose of the Gateway is to enable communication between to different protocols; in this case, Carel protocol and Modbus protocol. To configure a Modbus Gateway, follow the directions below:

1. Make sure the power supply is configured for the site operating voltage. The Gateway can be setup to operate at *24V*, *120V*, and *240V*. (*See "Gateway Modbus – User Guide" pg.3*)

Do not attempt to change the power supply with Modbus Gateway powered.

2. With the power supply setup, the communication port jumpers must now be set. This can be accomplished by adjusting jumpers *A*, *B*, and *C* (Please reference pg. 11 of the *"Gateway Modbus – User Guide"* for added clarity on the jumpers location in the Gateway). Jumpers *A* and *B* are used for designating what type of communications port the Gateway will be communicating to on the host system. Jumper *C* is used for designating what type of communication board the Gateway will be communicating to on the A-Tech-20 Controller.

Jumpers	***Description***
A in position 1-2	Enables the '*modem'* serial port (RS232) for communication with host system.
A in position 2-3	Enables the '*RS422/485'* serial port for communication with host system.
B in position 1-2	When the jumper *A* is in position 2-3, enables RS485 communication with host system.
B in position 2-3	When the jumper *A* is in position 2-3, enables RS422 communication with host system.
C in position 1-2	Enables the '*carel.net'* serial port for RS485 communication with A-Tech-20 Controller.
C in position 2-3	Enables the '*carel.net'* serial port for RS422 communication with A-Tech-20 Controller.

3. After the preceding steps have been completed, secure the cover on the Gateway. The Modbus Gateway software must be configured for proper operation. To configure the Gateway, the user must connect to the *'config.'* port on the Gateway using the RS232 on a PC or laptop. Once these connections have been made, the user can configure the Gateway software. Each Gateway comes with a configuration disk. Using the configuration program on the disk, adjust the following software parameters:

Parameter	***Description***
Serial Port	Selection of the communications port: COM1 or COM2
# of Gateways	Enter the Gateways being used: 1, 2, …
# of Units	Enter the total number units: 1, 2, … 16
Units Baud Rate	Select the baud rate of the units: 1200, 2400, 4800, 9600, 19200
Gateway Baud Rate	Select the baud rate of the gateway: 1200, 2400, 4800, 9600, 19200
Stop Bit #	Select the stop bit: 1-2
Parity Bit	Select the parity bit: NONE or ODD

Use the *"WRITEMB0"* command to set the above parameters. The following is an example of the command line would look in MSDOS: [A:/WRITEMB0 /COM1 1 5 9600 9600 1 NONE]. If the programming is completed correctly the display will confirm upload with:

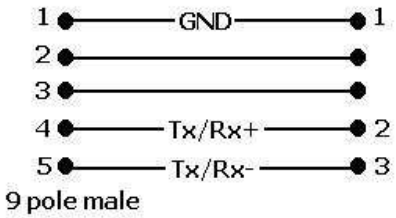
*** GATEWAY PROGRAMMED ***

After the above message is displayed, the Modbus Gateway must be restarted by either pressing the *'Reset'* button or by removing and then reapplying power to the Gateway. If after entering the write command the display shows:

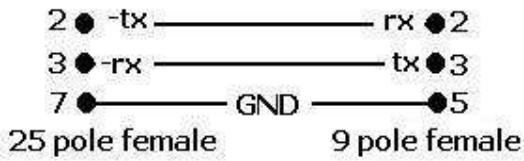
********** ERROR SENDING GATEWAY CONFIGURATION **********

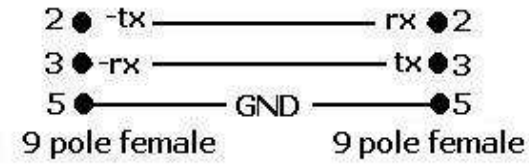
Check the Gateway's power supply and the connection of the cables. (*See "Gateway Modbus – User Guide" pg.5-7 for added information.*)

Pin-out connection for Gateway to A-Tech-20

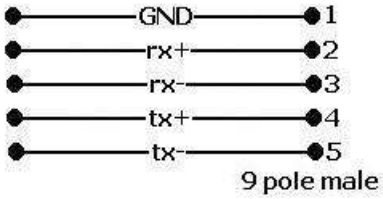


Pin-out RS232 Host System to Gateway

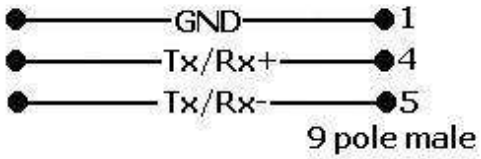




Pin-out RS422 Host System to Gateway



Pin-out RS485 Host System to Gateway



In the case of the RS422 and RS485 connections, the host system pin-out is not shown due to supervisory system being used.

This concludes configuring the Modbus Gateway.

Basic Wiring Considerations

The following are basic wiring considerations to account for when setting up the Remote Communications Configuration. Accounting for these parameters will help insure proper system functionality:

- Do not route shielded control wire near transmission-line cables or radio transmitting sources.
- Make sure all connections are correct.
- Do not exceed the wire length of 1km (3280 ft) on the communication connections.
- Make sure the ground connects to the chassis of the Gateway via the ground stud.
- When making a daisy-chain connection, do not make any interrupt connections with any of the wires.

Communications Memory Map for A-Tech-20

The Modbus addresses shown below are for unit 1 of a Carel Modbus Gateway. The following formulas are used to obtain the addresses of units 2 through 16:

Digital Variables = (unit 1 Modbus address) + (200 * (unit number-1))

Analog & Integer Variables = (unit 1 Modbus address) + (256 * (unit number-1))

Unit Number = Unit of Interest
Unit 1 Modbus Address = Variable of Interest

BACNET		***MODBUS***	***ATS***		***A-TECH-20***		***NEW VERSION***
DIGITAL		***DIGITAL***					
TYPE	*ADD*	*ADD*	*ADD*		*R/W*	*VARIABLE NAME*	*DESCRIPTION*
1	BINARY	10002	1		R	A1_HIAL	ROOM TEMPERATURE HIGH ALARM
2	BINARY	10003	2		R	A1_LOAL	ROOM TEMPERATURE LOW ALARM
3	BINARY	10004	3		R	A1_FAIL	ROOM TEMPERATURE SENSOR FAILURE
4	BINARY	10005	4		R	A2_FAIL	WATER TEMPERATURE SENSOR FAILURE
5	BINARY	10006	5		R	A2_LOAL	WATER TEMPERATURE LOW ALARM
6	BINARY	10007	6		R	A3_FAIL	NOT USED
7	BINARY	10008	7		R	A4_FAIL	NOT USED
8	BINARY	10009	8		R	A5_FAIL	ROOM HUMIDITY SENSOR FAILURE
9	BINARY	10010	9		R	A5_HIAL	ROOM HUMIDITY HIGH ALARM
10	BINARY	10011	10		R	A5_LOAL	ROOM HUMIDITY LOW ALARM
11	BINARY	10012	11			N/A	
12	BINARY	10013	12		R	AIR_AL	AIR PROVING FAILURE ALARM
13	BINARY	00014	13		R/W	AM_PM	TIME CLOCK AM/PM ACTUAL
14	BINARY	00015	14		R/W	BUZZER_ON	BUZZER ENABLE/DISABLE
15	BINARY	10016	15		R	C1_HI_AL	COMPRESSOR 1 HIGH PRESSURE ALARM
16	BINARY	10017	16		R	C1_LP_AL	COMPRESSOR 1 LOW PRESSURE ALARM
17	BINARY	10018	17		R	C2_HI_AL	COMPRESSOR 2 HIGH PRESSURE ALARM
18	BINARY	10019	18		R	C2_LP_AL	COMPERSSOR 2 LOW PRESSURE ALARM
19	BINARY	00020	19		R/W	CENT_ON	TEMPERATURE DISPLAY F/C
20	BINARY	00021	20		R/W	CH_DAY	CHANGE DAY FIELD IN RTC
21	BINARY	00022	21		R/W	CH_HOUR	CHANGE HOUR FIELD IN RTC
22	BINARY	00023	22		R/W	CH_MINUTE	CHANGE MINUTE FIELD IN RTC
23	BINARY	00024	23		R/W	CH_MONTH	CHANGE MONTH FIELD IN RTC
24	BINARY	00025	24		R/W	CH_WEEKDAY	CHANGE WEEKDAY FIELD IN RTC
25	BINARY	00026	25		R/W	CH_YEAR	CHANGE YEAR FIELD IN RTC
26	BINARY	00027	26		R/W	CLOCK_EN	ENABLE NITE SET BACK FUNCTIONS
27	BINARY	10028	27		R	CLOCK_INS	RTC IS PRESENT
28	BINARY	00029	28		R/W	CONT_FAN	BLOWER CONT/DEMAND OPERATIONS
29	BINARY	00030	29		R/W	TL	ENABLE ROOM TEMPERATURE LOW ALARM
30	BINARY	00031	30		R/W	TH	ENABLE ROOM TEMPERATURE HIGH ALARM
31	BINARY	00032	31		R/W	HL	ENABLE ROOM HUMIDITY LOW ALARM
32	BINARY	00033	32		R/W	HH	ENABLE ROOM HUMIDITY HIGH ALARM
33	BINARY	00034	33		R/W	DI3_EN	ENABLE DIRTY FILTER ALARM
34	BINARY	00035	34		R/W	AL_SUM_TYPE	SUMMERY ALARM LATCHED/UNLATCHED
35	BINARY	00036	35		R/W	AL_CUST1_TYPE	CUSTOM ALARM LATCHED/UNLATCHED

36	BINARY	00037	36		R/W	MAN_RESTART	AUTO/MANUAL RESTART AFTER POWER RESTART
37	BINARY	00038	37		R/W	MAN_RS	AUTO/MANUAL RESTART AFTER REMOTE OFF
38	BINARY	00039	38		R/W	PD_EN	ENABLE COMPRESSOR PUMPDOWN
39	BINARY	00040	39		R/W	ROT_EN	ENABLE COMPRESSOR ROTATION
40	BINARY	00041	40		R/W	STBY_FAN_EN	STANDBY UNIT FAN CONT/DEMAND
41	BINARY	00042	41		R/W	NET_ROT_EN	STANDBY UNIT ROTATION
42	BINARY	00043	42		R/W	TF_EN	TRANSFER ALARM ENABLE
43	BINARY	00044	43		R/W	ROT_PM	STANDBY UNIT ROTATION AM/PM
44	BINARY	00045	44		R/W	K_CHANGE	MANUAL ROTATION OF STANDBY UNIT
45	BINARY	00046	45		R/W	PM21	NITE SETBACK WEEKDAY START AM/PM
46	BINARY	10047	46		R	DI10_CUST_AL	CUSTOM ALARM INPUT
47	BINARY	10048	47		R	DI10_PUMP_AL	PUMP FAILURE ALARM
48	BINARY	10049	48		R	DI6_DRAIN_AL	DRAIN FAILURE ALARM
49	BINARY	10050	49		R	DI6_WATER_AL	WATER DETECTION ALARM
50	BINARY	10051	50		R	DO1_OUT	BLOWER STATUS
51	BINARY	10052	51		R	DO10_OUT	SCW/AWS/FC STATUS
52	BINARY	10053	52		R	DO11_OUT	CUSTOM ALARM/HEAT 3 STATUS
53	BINARY	10054	53		R	DO2_OUT	COMPRESSOR 1 STATUS
54	BINARY	10055	54		R	DO3_OUT	COMPRESSOR 2 STATUS
55	BINARY	10056	55		R	DO4_OUT	HEATER 1 STATUS
56	BINARY	10057	56		R	DO5_OUT	HEATER 2 STATUS
57	BINARY	10058	57		R	DO6_OUT	HUMIDIFER STATUS
58	BINARY	10059	58		R	DO7_OUT	SUMMERY ALARM STATUS
59	BINARY	10060	59		R	DO8_OUT	COMPRESSOR 1 LIQUID LINE STATUS
60	BINARY	10061	60		R	DO9_OUT	COMPRESSOR 2 LIQUID LINE/PUMP STATUS
61	BINARY	00062	61		R/W	PM22	NITE SETBACK WEEKDAY END AM/PM
62	BINARY	10063	62			N/A	
63	BINARY	10064	63		R	EPROMNOOK	EEPROM FAILURE ALARM
64	BINARY	10065	64		R	EXTD_EEPROM_ER	EXTENDED EEPROM FAILURE ALARM
65	BINARY	10066	65		R	FILTER_AL	DIRTY FILTER ALARM
66	BINARY	10067	66		R	FIRE_AL	FIRE STAT ALARM
67	BINARY	10068	67		R	HUM_AL	HUMIDIFIER ALARM
68	BINARY	10069	68		R	IN_D1	REMOTE ON/OFF INPUT STATUS
69	BINARY	10070	69		R	IN_D10	CUSTOM ALARM/AWS/PUMP INPUT STATUS
70	BINARY	10071	70		R	IN_D11	COMPRESSOR 1 HIGH PRESSURE INPUT STATUS
71	BINARY	10072	71		R	IN_D12	COMPRESSOR 2 HIGH PRESSURE INPUT STATUS
72	BINARY	10073	72		R	IN_D2	AIR PROVING INPUT STATUS
73	BINARY	10074	73		R	IN_D3	DIRTY FILTER INPUT STATUS
74	BINARY	10075	74		R	IN_D4	SMOKE DETECTOR INPUT STATUS
75	BINARY	10076	75		R	IN_D5	FIRE DETECTOR INPUT STATUS
76	BINARY	10077	76		R	IN_D6	WATER DETECTION/DRAIN PAN INPUT STATUS
77	BINARY	10078	77		R	IN_D7	HUMIDIFIER INPUT STATUS
78	BINARY	10079	78		R	IN_D8	COMPRESSOR 1 LOW PRESSURE INPUT STATUS
79	BINARY	10080	79		R	IN_D9	COMPRESSOR 2 LOW PRESSURE INPUT STATUS
80	BINARY	00081	80		R/W	KEYPAD_LOCK	ENABLE/DISABLE KEYPAD
81	BINARY	00082	81		R/W	RES_SIR	BUZZER RESET
82	BINARY	00083	82		R/W	PM23	NITE SETBACK WEEKEND START AM/PM
83	BINARY	00084	83		R/W	PM24	NITE SETBACK WEEKEND END AM/PM
84	BINARY	00085	84		R/W	RES_AL	ALARM RESET

85	BINARY	00086	85		R/W	NITE_CNTRL_EN	NITE CONTROL ENABLE
86	BINARY	00087	86		R/W	OVERRIDE	CLOCK OVERRIDE STATUS
87	BINARY	00088	87		R/W	SMOKE_AL	SMOKE DETECTOR ALARM
88	BINARY	00089	88		R/W	PM	RTC AM/PM STATUS
89	BINARY	00090	89		R/W	PM1	NITE ON/OFF START WEEKDAY AM/PM
90	BINARY	00091	90		R/W	PM2	NITE ON/OFF END WEEKDAY AM/PM
91	BINARY	00092	91		R/W	PM3	NITE ON/OFF START WEEKEND AM/PM
92	BINARY	00093	92		R/W	PM4	NITE ON/OFF END WEEKEND AM/PM
93	BINARY	00094	93		R/W	SYS_ON	SYSTEM ON/OFF
94	BINARY	10095	94			N/A	
95	BINARY	10096	95			N/A	
96	BINARY	10097	96			N/A	
97	BINARY	10098	97			N/A	
98	BINARY	10099	98			N/A	
99	BINARY	10100	99			N/A	
100	BINARY	10101	100			N/A	
101	BINARY	10102	101			N/A	
102	BINARY	10103	102			N/A	
103	BINARY	10104	103			N/A	
104	BINARY	10105	104			N/A	
105	BINARY	10106	105			N/A	
106	BINARY	10107	106			N/A	
107	BINARY	10108	107			N/A	
108	BINARY	10109	108			N/A	
109	BINARY	10110	109			N/A	
110	BINARY	10111	110			N/A	
111	BINARY	10112	111			N/A	
112	BINARY	10113	112			N/A	
113	BINARY	10114	113			N/A	
114	BINARY	10115	114			N/A	
115	BINARY	10116	115			N/A	
116	BINARY	10117	116			N/A	
117	BINARY	10118	117			N/A	
118	BINARY	10119	118			N/A	
119	BINARY	10120	119			N/A	
120	BINARY	10121	120			N/A	
121	BINARY	10122	121			N/A	
122	BINARY	10123	122			N/A	
123	BINARY	10124	123			N/A	
124	BINARY	10125	124			N/A	
125	BINARY	10126	125			N/A	
126	BINARY	10127	126			N/A	
127	BINARY	10128	127			N/A	
128	BINARY	10129	128			N/A	
129	BINARY	10130	129			N/A	
130	BINARY	10131	130			N/A	
131	BINARY	10132	131			N/A	
132	BINARY	10133	132			N/A	
133	BINARY	10134	133			N/A	

134	BINARY	10135	134			N/A	
135	BINARY	10136	135			N/A	
136	BINARY	10137	136			N/A	
137	BINARY	10138	137			N/A	
138	BINARY	10139	138			N/A	
139	BINARY	10140	139			N/A	
140	BINARY	10141	140			N/A	
141	BINARY	10142	141			N/A	
142	BINARY	10143	142			N/A	
143	BINARY	10144	143			N/A	
144	BINARY	10145	144			N/A	
145	BINARY	10146	145			N/A	
146	BINARY	10147	146			N/A	
147	BINARY	10148	147			N/A	
148	BINARY	10149	148			N/A	
149	BINARY	10150	149			N/A	
150	BINARY	10151	150			N/A	
151	BINARY	10152	151			N/A	
152	BINARY	10153	152			N/A	
153	BINARY	10154	153			N/A	
154	BINARY	10155	154			N/A	
155	BINARY	10156	155			N/A	
156	BINARY	10157	156			N/A	
157	BINARY	10158	157			N/A	
158	BINARY	10159	158			N/A	
159	BINARY	10160	159			N/A	
160	BINARY	10161	160			N/A	
161	BINARY	10162	161			N/A	
162	BINARY	10163	162			N/A	
163	BINARY	10164	163			N/A	
ANALOG		***ANALOG***					
TYPE	*ADD*	*ADD*	*ADD*		*R/W*	*VARIABLE NAME*	*DESCRIPTION*
1	ANALOG	40002	1		R	A1_DISP	ROOM TEMPEATURE DISPLAY
2	ANALOG	40003	2		R	A2_DISP	WATER TEMPERATURE DISPLAY
3	ANALOG	40004	3		R	A3_DISP	NOT USED
4	ANALOG	40005	4		R	A4_DISP	NOT USED
5	ANALOG	40006	5		R	A5_DISP	ROOM HUMIDITY DISPLAY
6	ANALOG	40007	6		R	A6_DISP	REMOTE TEMPERATURE DISPLAY
7	ANALOG	40008	7		R	A7_DISP	REMOTE HUMIDITY DISPLAY
8	ANALOG	40009	8		R	AOUT1DISP	ANALOG OUTPUT 1 DISPLAY
9	ANALOG	40010	9		R	AOUT2DISP	ANALOG OUTPUT 2 DISPLAY
10	ANALOG	40011	10		R	DAY	RTC ACTUAL DAY
11	ANALOG	40012	11		R	MIN_A1	24 HOUR MINIMUM ROOM TEMPERATURE
12	ANALOG	40013	12		R	MIN_A5	24 HOUR MINIMUM ROOM HUMIDITY
13	ANALOG	40014	13		R	HOUR	RTC ACTUAL HOUR
14	ANALOG	40015	14		R/W	LDAY	RTC NEW DAY
15	ANALOG	40016	15		R/W	LMINUTE	RTC NEW MINUTE
16	ANALOG	40017	16		R/W	LMONTH	RTC NEW MONTH

17	ANALOG	40018	17		R/W	LWEEKDAY	RTC NEW WEEKDAY
18	ANALOG	40019	18		R/W	LYEAR	RTC NEW YEAR
19	ANALOG	40020	19		R	MAX_A1	24 HOUR MAXIMUM ROOM TEMPERATURE
20	ANALOG	40021	20		R	MAX_A5	24 HOUR MAXIMUM ROOM HUMIDITY
21	ANALOG	40022	21		R	MINUTE	RTC ACTUAL MINUTE
22	ANALOG	40023	22		R	MONTH	RTC ACTUAL MONTH
23	ANALOG	40024	23		R/W	NL_HOUR	RTC NEW HOUR
24	ANALOG	40025	24		R	PYEAR	RTC ACTUAL YEAR
25	ANALOG	40026	25		R	STATUS_LINE	SYSTEM ON/OFF STATUS
26	ANALOG	40027	26		R	STATUS_LINE2	SYSTEM DEMAND STATUS
27	ANALOG	40028	27		R/W	ROT_HOUR	STANDBY UNIT ROTATION TIME OF DAY HOUR
28	ANALOG	40029	28		R/W	ROT_MIN	STANDBY UNIT ROTATION TIME OF DAY MINUTE
29	ANALOG	40030	29		R	WEEKDAY	RTC ACTUAL WEEKDAY
30	ANALOG	40031	30		R/W	ROTATE_TIME	STANDBY UNIT ROTATION NUMBER OF DAYS
31	ANALOG	40032	31			N/A	
32	ANALOG	40033	32			N/A	
33	ANALOG	40034	33			N/A	
34	ANALOG	40035	34			N/A	
35	ANALOG	40036	35			N/A	
36	ANALOG	40037	36			N/A	
37	ANALOG	40038	37			N/A	
38	ANALOG	40039	38			N/A	
39	ANALOG	40040	39			N/A	
40	ANALOG	40041	40			N/A	
41	ANALOG	40042	41			N/A	
42	ANALOG	40043	42			N/A	
43	ANALOG	40044	43			N/A	
44	ANALOG	40045	44			N/A	
45	ANALOG	40046	45			N/A	
46	ANALOG	40047	46			N/A	
47	ANALOG	40048	47			N/A	
48	ANALOG	40049	48			N/A	
49	ANALOG	40050	49			N/A	
50	ANALOG	40051	50			N/A	
51	ANALOG	40052	51			N/A	
52	ANALOG	40053	52			N/A	
53	ANALOG	40054	53			N/A	
54	ANALOG	40055	54			N/A	
55	ANALOG	40056	55			N/A	
56	ANALOG	40057	56			N/A	
57	ANALOG	40058	57			N/A	
58	ANALOG	40059	58			N/A	
59	ANALOG	40060	59			N/A	
60	ANALOG	40061	60			N/A	
61	ANALOG	40062	61			N/A	
62	ANALOG	40063	62			N/A	
63	ANALOG	40064	63			N/A	
64	ANALOG	40065	64			N/A	
65	ANALOG	40066	65			N/A	

66	ANALOG	40067	66			N/A	
67	ANALOG	40068	67			N/A	
68	ANALOG	40069	68			N/A	
69	ANALOG	40070	69			N/A	
70	ANALOG	40071	70			N/A	
71	ANALOG	40072	71			N/A	
72	ANALOG	40073	72			N/A	
73	ANALOG	40074	73			N/A	
74	ANALOG	40075	74			N/A	
75	ANALOG	40076	75			N/A	
76	ANALOG	40077	76			N/A	
77	ANALOG	40078	77			N/A	
78	ANALOG	40079	78			N/A	
79	ANALOG	40080	79			N/A	
80	ANALOG	40081	80			N/A	
81	ANALOG	40082	81			N/A	
82	ANALOG	40083	82			N/A	
83	ANALOG	40084	83			N/A	
84	ANALOG	40085	84			N/A	
85	ANALOG	40086	85			N/A	
86	ANALOG	40087	86			N/A	
87	ANALOG	40088	87			N/A	
88	ANALOG	40089	88			N/A	
89	ANALOG	40090	89			N/A	
90	ANALOG	40091	90			N/A	
91	ANALOG	40092	91			N/A	
92	ANALOG	40093	92			N/A	
93	ANALOG	40094	93			N/A	
INTEGER		***INTEGER***					
TYPE	*ADD*	*ADD*	*ADD*		*R/W*	*VARIABLE NAME*	*DESCRIPTION*
129	ANALOG	40130	1		R/W	A1_INT	COOLING INTEGRATION TIME
130	ANALOG	40131	2		R/W	A1_INT_HT	HEATING INTEGRATION TIME
131	ANALOG	40132	3		R/W	A1_BAND	COOLING PROPORTIONAL BAND
132	ANALOG	40133	4		R/W	A1_BAND_HT	HEATING PROPORTIONAL BAND
133	ANALOG	40134	5		R/W	A1_HI	ROOM TEMPERATURE HIGH ALARM SETPOINT
134	ANALOG	40135	6		R/W	A1_LO	ROOM TEMPERATURE LOW ALARM SETPOINT
135	ANALOG	40136	7		R/W	A1_SET	ROOM TEMPERATURE SETPOINT
136	ANALOG	40137	8		R/W	A5_INT_HU	HUMIDITY INTEGRATION TIME
137	ANALOG	40138	9		R/W	LP_DEL	COMPRESSOR LOW PRESSURE DELAY
138	ANALOG	40139	10		R/W	A1_SET_MAX	ROOM TEMPERATURE SETPOINT MAXIMUM
139	ANALOG	40140	11		R/W	A1_SET_MIN	ROOM TEMPERATURE SETPOINT MINIMUM
140	ANALOG	40141	12		R/W	RET_DEL	RETURN TO MAIN DISPLAY DELAY
141	ANALOG	40142	13		R/W	A2_HYS	WATER TEMPERATURE ALARM HYSTERISIS
142	ANALOG	40143	14		R/W	A2_LO	WATER TEMPERATURE ALARM SETPOINT
143	ANALOG	40144	15		R/W	A6_Y1	ANALOG INPUT 6 MINIMUM DISPLAY SCALING
144	ANALOG	40145	16		R/W	A6_Y2	ANALOG INPUT 6 MAXIMUM DISPLAY SCALING
145	ANALOG	40146	17		R/W	DI6_SEL	DIGITAL INPUT SELECTION NONE/WATER/DRAIN
146	ANALOG	40147	18		R/W	A5_BAND_HU	ROOM HUMIDITY PROPORTIONAL BAND

147	ANALOG	40148	19		R/W	A5_HI	ROOM HUMIDITY HIGH ALARM SETPOINT
148	ANALOG	40149	20		R/W	A5_LO	ROOM HUMIDITY LOW ALARM SETPOINT
149	ANALOG	40150	21		R/W	A5_SET	ROOM HUMIDITIY SETPOINT
150	ANALOG	40151	22		R/W	A5_SET_MAX	ROOM HUMIIDITY MAXIMUM SETPOINT
151	ANALOG	40152	23		R/W	A5_SET_MIN	ROOM HUMIDITY MINIMUM SETPOINT
152	ANALOG	40153	24		R/W	CL_DBAND	COOLING DEAD BAND
153	ANALOG	40154	25		R/W	CL_STAGE_DIF	COOLING STAGE DIFFERENTIAL
154	ANALOG	40155	26		R/W	DH_DBAND	DEHUMID DEAD BAND
155	ANALOG	40156	27		R/W	DX_DEL	PUMP DELAY
156	ANALOG	40157	28		R/W	A7_Y1	ANALOG INPUT 7 MINIMUM DISPLAY SCALING
157	ANALOG	40158	29		R/W	A7_Y2	ANALOG INPUT 7 MAXIMUM DISPLAY SCALING
158	ANALOG	40159	30		R/W	HI_NITEH	NIGHT DEHUMIDIFIER DIFFERENTIAL
159	ANALOG	40160	31		R/W	HI_NITET	NIGHT COOLING DIFFERENTIAL
160	ANALOG	40161	32		R/W	TBH	HUMIDIFIER STAGE DELAY
161	ANALOG	40162	33		R/W	HT_DBAND	HEATING DEAD BAND
162	ANALOG	40163	34		R/W	HT_STAGE_DIF	HEAT STAGE DIFFERENTIAL
163	ANALOG	40164	35		R/W	HTIME_DO1	BLOWER RUN HOURS *1000
164	ANALOG	40165	36		R/W	HTIME_DO10	HEAT 3 RUN HOURS *1000
165	ANALOG	40166	37		R/W	HTIME_DO2	COMPRESSOR 1 RUN HOURS *1000
166	ANALOG	40167	38		R/W	HTIME_DO3	COMPRESSOR 2 RUN HOURS *1000
167	ANALOG	40168	39		R/W	HTIME_DO6	HUMIDIFIER RUN HOURS *1000
168	ANALOG	40169	40		R/W	HU_DBAND	HUMIDIFIER DEAD BAND
169	ANALOG	40170	41		R/W	INIT_DEL	SYSTEM START INITIAL DELAY
170	ANALOG	40171	42		R/W	RECOVERY_DEL	POWER ON RECOVERY DELAY
171	ANALOG	40172	43		R/W	LO_NITEH	NIGHT HUMIDIFIER DIFFERENTIAL
172	ANALOG	40173	44		R/W	LO_NITET	NIGHT HEAT DIFFERENTIAL
173	ANALOG	40174	45		R/W	LTIME_DO1	BLOWER RUN HOURS
174	ANALOG	40175	46		R/W	LTIME_DO10	HEATER 3 RUN HOURS
175	ANALOG	40176	47		R/W	LTIME_DO2	COMPRESSOR 1 RUN HOURS
176	ANALOG	40177	48		R/W	LTIME_DO3	COMPRESSOR 2 RUN HOURS
177	ANALOG	40178	49		R/W	LTIME_DO6	HUMIDIFIER RUN HOURS
178	ANALOG	40179	50		R/W	MODEL	UNIT CONFIGURATION
179	ANALOG	40180	51		R/W	NET_ADDRESS	PLAN NETWORK ADDRESS
180	ANALOG	40181	52		R/W	OVER_TIME2	NIGHT SETBACK OVERRIDE TIME
181	ANALOG	40182	53		R/W	OVER_TIME	NIGHT ON/OFF ORVERRIDE TIME
182	ANALOG	40183	54		R/W	PASS1	PASSWORD 1
183	ANALOG	40184	55		R/W	PASS2	PASSWORD 2
184	ANALOG	40185	56		R/W	CL_MIN_ON	COMPRESSOR MINIMUM ON
185	ANALOG	40186	57		R/W	CL_MIN_OFF	COMPRESSOR MINIMUM OFF
186	ANALOG	40187	58		R/W	TBC	COMPRESSOR STAGE DELAY
187	ANALOG	40188	59		R/W	TBS	HEATER STAGE DELAY
188	ANALOG	40189	60		R/W	TRANS_DEL	TRANSFER ALARM DELAY
189	ANALOG	40190	61		R/W	NET_A1_BD	COOLING CAPACITY ASSIST DIFFERENTIAL
190	ANALOG	40191	62		R/W	VER_DY	SOFTWARE VERSION DAY
191	ANALOG	40192	63		R/W	VER_MO	SOFTWARE VERSION MONTH
192	ANALOG	40193	64		R/W	VER_YR	SOFTWARE VERSION YEAR
193	ANALOG	40194	65		R/W	WATER_HYS	WATER TEMPERATURE FREECOOL HYSTERISIS
194	ANALOG	40195	66		R/W	NET_A1_BD_HT	HEATING CAPACITY ASSIST DIFFERENTIAL
195	ANALOG	40196	67		R/W	WATER_ON	WATER TEMPERATURE FREECOOL SETPOINT

196	ANALOG	40197	68		R/W	WD_END_HR	WEEKDAY ON/OFF END HOUR
197	ANALOG	40198	69		R/W	WD_END_MIN	WEEKDAY ON/OFF END MINUTE
198	ANALOG	40199	70		R/W	WD_ST_HR	WEEKDAY ON/OFF START HOUR
199	ANALOG	40200	71		R/W	WD_ST_MIN	WEEKDAY ON/OFF START MINUTE
200	ANALOG	40201	72		R/W	WE_END_HR	WEEKEND ON/OFF END HOUR
201	ANALOG	40202	73		R/W	WE_END_MIN	WEEKEND ON/OFF END MINUTE
202	ANALOG	40203	74		R/W	WE_ST_HR	WEEKEND ON/OFF START HOUR
203	ANALOG	40204	75		R/W	WE_ST_MIN	WEEKEND ON/OFF START MINUTE
204	ANALOG	40205	76		R/W	WD_END_HR2	WEEKDAY SETBACK END HOUR
205	ANALOG	40206	77		R/W	WD_END_MIN2	WEEKDAY SETBACK END MINUTE
206	ANALOG	40207	78		R/W	WD_ST_HR2	WEEKDAY SETBACK START HOUR
207	ANALOG	40208	79		R/W	WD_ST_MIN2	WEEKDAY SETBACK START MINUTE
208	ANALOG	40209	80		R/W	WE_END_HR2	WEEKEND SETBACK END HOUR
209	ANALOG	40210	81		R/W	WE_END_MIN2	WEEKEND SETBACK END MINUTE
210	ANALOG	40211	82		R/W	WE_ST_HR2	WEEKEND SETBACK START HOUR
211	ANALOG	40212	83		R/W	WE_ST_MIN2	WEEKEND SETBACK START MINUTE
212	ANALOG	40213	84		R/W	NET_A5_BD	DEHUMIDIFY CAPACITY ASSIST DIFFERENTIAL
213	ANALOG	40214	85		R/W	NET_A5_BD_HU	HUMIDIFY CAPACITY ASSIST DIFFERENTIAL
214	ANALOG	40215	86		R/W	SENSOR_SEL	CNTRL SELECT 0=LOCAL 1= REMOTE 2=HI-SELECT
215	ANALOG	40216	87		R/W	A1_INT2	REMOTE SENSOR COOLING INTEGRATION TIME
216	ANALOG	40217	88		R/W	A1_INT_HT2	REMOTE SENSOR HEATING INTEGRATION TIME
217	ANALOG	40218	89		R/W	A5_INT_HU2	REMOTE SENSOR HUMIDITY INTEGRATION TIME
218	ANALOG	40219	90			N/A	
219	ANALOG	40220	91			N/A	
220	ANALOG	40221	92			N/A	
221	ANALOG	40222	93			N/A	
222	ANALOG	40223	94			N/A	
223	ANALOG	40224	95			N/A	
224	ANALOG	40225	96			N/A	
225	ANALOG	40226	97			N/A	
226	ANALOG	40227	98			N/A	
227	ANALOG	40228	99			N/A	
228	ANALOG	40229	100			N/A	
229	ANALOG	40230	101			N/A	
230	ANALOG	40231	102			N/A	
231	ANALOG	40232	103			N/A	
232	ANALOG	40233	104			N/A	
233	ANALOG	40234	105			N/A	
234	ANALOG	40235	106			N/A	
235	ANALOG	40236	107			N/A	
236	ANALOG	40237	108			N/A	
237	ANALOG	40238	109			N/A	
238	ANALOG	40239	110			N/A	
239	ANALOG	40240	111			N/A	
240	ANALOG	40241	112			N/A	
241	ANALOG	40242	113			N/A	
242	ANALOG	40243	114			N/A	
243	ANALOG	40244	115			N/A	
244	ANALOG	40245	116			N/A	

Troubleshooting/Testing Questions:

Gateway: *(See Modbus Gateway User Guide)*

- **What does the 'Alarm 1 LED' on the Gateway mean?**
  When the 'Alarm 1 LED' is indicated on the Gateway, it is an indication that the Gateway was not configured correctly. The likely solution to this problem is to configure the Gateway. To configure a Gateway properly, the user must write in the system parameters. After the parameters have been written correctly, reset the Gateway. Note, to guarantee "reset" of the Gateway disconnect & reconnect power.

- What does the 'Alarm 2' on the Gateway mean?
  When the 'Alarm 2 LED' is indicated on the Gateway, it is an indication that the Gateway is not communicating with A-Tech-20 board(s). The following are possible reasons for receiving the alarm:
  - One possible solution to this issue is the Gateway was configured for to many units. When the Gateway is configured for too many units, the Gateway will display the alarm because it can not find all the units. It is important to note the 'Alarm 2 LED' will remain until the Gateway can identify **all** the units.
  - The Bridge "C" jumper is not set correctly. If the Bridge "C" jumper is in position 1-2, then the Gateway is expecting to see information from a RS485 connection off the A-Tech-20 board. If the Bridge "C" jumper is in position 2-3, then the Gateway is expecting to see information from a RS422 connection off the A-Tech-20 board. If the wrong jumper setting is utilized, then the Gateway will not be able to communicate with the unit(s) properly and thus initialize the alarm.
  - The SATS units were not setup properly in Level 3 to interact. If the gateway was configured for 1 unit and there were 4 units denoted as "unit 1", then the 'Alarm 2' would initiate because all 4 units would be trying to communicate to the gateway at the same time.
  - The SATS units and/or gateway were not wired correctly. (See *Wiring* section.)

- How do I configure the Gateway?
  To configure the Gateway, the user must connect to the Gateway with a PC using a RS232 port. (See Modbus Gateway User Guide for System Requirements.) The user should make the connection to the *config* connector on the Gateway. Insert the diskette provided with the Gateway. The parameters that need to be entered are as follows: *serial port* -->[COM1 or COM2], *number of Gateways* -->[1,2,…], *number of slave units* -->[up to 16 units], *baud rate for units* -->[defaulted at 2400], *baud rate for Modbus* -->[typically 9600], *stop bit #* -->[1-2], *parity bit* -->[NONE or ODD]. The following is an example of how to write in the parameters:

  A:WRITEMB0 /COM1 1 7 9600 9600 1 NONE

  Also, see the Modbus Gateway User Guide for detail information.

- What are the correct connections to the Gateway?
  See Modbus Gateway User Guide – Section 7(pg. 9-10) for proper connections to the Gateway

- How do you set up the communications port that connects to the A-Tech-20 (pCO) board?
  Each A-Tech-20 (pCO) board has the capability to have either a RS485 or RS422 card added on it, and thus, the Gateway needs to be internally set to communicate properly. Inside each Gateway, there are various jumpers located on the Gateway board. The jumper denoted as "C", on pg. 11 of the Modbus Gateway User Guide, needs to be set accordingly for correct functionality. By setting jumper "C" to the 1-2 position, the Gateway will expect to see communication from an RS485 connector. By setting jumper "C" to the 2-3 position, the Gateway will expect to see communication from an RS422 connector.

- How do you set up the communications port that connects to the host system?
  Each A-Tech-20 (pCO) board has the capability to have either a RS485 or RS422 card added on it, and thus, the Gateway needs to be internally set to communicate properly. Inside each Gateway, there are various jumpers located on the Gateway board. The jumpers denoted as "A" and "B", on pg. 11 of the Modbus Gateway User Guide, need to be set accordingly for correct functionality. By setting jumper "A" to the 1-2 position, the Gateway is set to communicate to a RS232 port on the host. By setting jumper "A" to the 2-3 position, the Gateway is set to communicate to a RS485/RS422 port on the host. By setting jumper "B" to the 1-2 position, the Gateway is set to communicate to a RS485 port on the host. By setting jumper "B" to the 2-3 position, the Gateway is set to communicate to a RS422 port on the host.

Wiring:

- Do not route the shielded control wire near transmission-line cables or radio transmitting sources.
- Make sure all connections are correct. If only one strand of wire connects wrong, the whole system will fail.
- Do not exceed the maximum wire length of 1km (3280 ft) on network connections.
- Make sure the ground connects to the chassis of the Gateway via the stud with the yellow label.
- When making a daisy-chain connection, do not make any interrupt connections with any of the wires.

A-Tech-20 Controller:

- On the A-Tech-20 controller, what parameters need adjusted to the network to work properly?
  The two parameters that need to be set are located on the 'Communications Screen' in Level 3. The customer should enter Level 3 and scroll through the menus until he/she reaches the 'Communication Screen'. The customer should then set the "Unit Number" and "Baud Rate" parameters. The "Unit Number" is a software identification number for the unit. Please note, that the "Unit Number" entered in Level 3 is to identify the unit in a network configuration only. The "Unit Number" is not related to the unit number assigned to the hardware by the clock board. The "Baud Rate" should be set to the required speed for proper communication to the Gateway. Failure to set the "Baud Rate" will result in incorrect communication to the Gateway and a non-functioning network.

- One or more of the units is not communicating to the Gateway.
  There are a couple possible reasons for this scenario. Below are some potential causes:

➢ The RS485/RS422 card is not installed properly. The card could have become loose during shipping or setup of the unit(s). Check and make sure the card is installed correctly.
➢ The wrong network card may be installed. If the Gateway is setup to receive a signal from a RS485 card and the A-Tech-20 controller has a RS422 card on it, then the system will not function properly.
➢ The unit may not have power to it.
➢ The wiring to initialize the A-Tech-20 controller may not be connected.
➢ The units were not setup to communicate properly in Level 3. If there is more than one unit, up to 16, each unit needs to have different unit number. For example, if there are 5 units, each of the units should be setup as units 1 through 5.

Note

All data points that involve a decimal must be multiplied by 0.1 to be displayed properly.

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NOTES

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