FRIO MODBUS/BACNET POINTS LIST

BACnet							Modbus RTU	
Object	**Name**	**Type**	**Units**	**Range/Options**	**Read/Write**	**Description**	**Type**	**Address**
AI1	Current	Analog Input	Amperes	0-50 A	R	Current consumption of connected heat trace. *NOTE: The controller is only rated to 30 A*	Input Register	30001-30002
AI2	Voltage	Analog Input	Volts AC	0-300 V	R	Voltage measurement from power supply to controller. *NOTE: The controller is only rated to 277 V*	Input Register	30003-30004
AI3	RTD Temperature C	Analog Input	°C	-100°C to 750°C	R	Temperature reading from RTD in Celsius, if connected. *NOTE: If RTD is not connected the read value will be 65535.*	Input Register	30005-30006
AI4	Thermistor Temperature C	Analog Input	°C	-40°C to 105°C	R	Temperature reading from thermistor in Celsius, if connected. *NOTE: If Thermistor is not connected the read value will be 65535.*	Input Register	30007-30008
AI5	RTD Temperature F	Analog Input	°F	-148°F to 1382°F	R	Temperature reading from RTD in Fahrenheit, if connected. *NOTE: If RTD is not connected the read value will be 65535.*	Input Register	30009-30010
AI6	Thermistor Temperature F	Analog Input	°F	-40°F to 221°F	R	Temperature reading from thermistor in Fahrenheit, if connected. *NOTE: If Thermistor is not connected the read value will be 65535.*	Input Register	30011-30012
AI7	Controller Mode	Analog Input	No Units	0 = ALWAYS_OFF 1 = ALWAYS_ON 2 = THERMOSTAT_FP 3 = THERMOSTAT_TM 4 = CLOUD_CONTROL 5 = HYBRID_CLOUD_FP 6 = CLOUD_SCHEDULER_TM	R	Current controller setting. • ALWAYS_OFF = Local manual control heater is always OFF. • ALWAYS_ON = Local manual control heater is always ON. • THERMOSTAT_FP = Local thermostat control for freeze protection • THERMOSTAT_TM = Local thermostat control for temperature maintenance • CLOUD_CONTROL = Cloud-based control for all smart control modes • HYBRID_CLOUD_FP = Freeze protection thermostat with weather forecast data input for efficiency improvements • CLOUD_SCHEDULER_TM = Cloud-based temperature maintenance schedule	Input Register	30013

BACnet							Modbus RTU	
Object	**Name**	**Type**	**Units**	**Range/Options**	**Read/Write**	**Description**	**Type**	**Address**

AI8	State	Analog Input	No Units	0 = CLOUD_CONTROL
				1 = LOCAL_CONTROL
				2 = OVERRIDE
				3 = CRITICAL_ERROR
				4 = MODBUS_CONTROL
				5 = HYBRID_CONTROL
				6 = SPOTCHECK
				7 = CLOUD_SCHEDULER
					R	Current operational state of the control state machine.
						Possible State/Sub-state combinations:
						• CLOUD_CONTROL
						  ○ CLOUD_CONTROL - Device online and controlled by the Frio Cloud Platform
						  ○ THERMOSTAT_FP - Offline fallback to thermostat control for freeze protection
						  ○ THERMOSTAT_TM - Offline fallback to thermostat control for temperature maintenance
						  ○ ALWAYS_ON - Offline fallback to always ON.
						  ○ ALWAYS_OFF - Offline fallback to always OFF.
						• LOCAL_CONTROL
						  ○ THERMOSTAT_FP - Local thermostat control for freeze protection
						  ○ THERMOSTAT_TM - Local thermostat control for temperature maintenance
						  ○ ALWAYS_ON - Local manual control heater is always ON.
						  ○ ALWAYS_OFF - Local manual control heater is always OFF.
						• OVERRIDE
						  ○ ALWAYS_ON - Heater ON due to Local or Cloud override command
						  ○ ALWAYS_OFF - Heater OFF due to Local or Cloud override command
						• CRITICAL_ERROR
						  ○ ALWAYS_OFF - The system has a critical error and the heater is OFF
						NOTE: User must perform a manual test/reset cycle from the HMI to exit the critical error state.
						• MODBUS_CONTROL
						  ○ ALWAYS_ON - Heater is ON due to Modbus force on command
						  ALWAYS_OFF - Heater is OFF due to Modbus force off command
						• HYBRID_CONTROL
						  ○ HYBRID_THERMOSTAT – Weather data indicates that heater operation can be suspended.
						  ○ THERMOSTAT_FP – Operating as local freeze protection thermostat
						• SPOTCHECK
						  ○ ALWAYS_ON – Checking S1 status with heater ON
						  ○ ALWAYS_OFF - Checking S1 status with heater OFF
						• CLOUD_SCHEDULER
						  ○ THERMOSTAT_TM – Heater is ON due to selected schedule
						  ○ ALWAYS_OFF – Heater is OFF due to selected schedule
							Input Register	30014

BACnet							Modbus RTU	
Object	**Name**	**Type**	**Units**	**Range/Options**	**Read/Write**	**Description**	**Type**	**Address**
AI9	Sub-state	Analog Input	No Units	0 = THERMOSTAT_FP 1 = THERMOSTAT_TM 2 = ALWAYS_ON 3 = ALWAYS_OFF 4 = CLOUD_CONTROL 5 = HYBRID_ THERMOSTAT	R	Current operational sub-state of the control state machine. See above for detailed description of possible State/Sub-state combinations.	Input Register	30015
AI10	Network Connection	Analog Input	No Units	0 = CONNECTING 1 = CONNECTED 2 = DISCONNECTED 3 = DISABLED	R	Current network connection status of the S1. The states apply for both ethernet and WiFi connection types.	Input Register	30016
BI11	Alarm	Binary Input	No Units	0 = No Alarms 1 = One or more alarms present	R	Alarm summary indicating whether any alarms are present on the device.	Discrete Input	10001
BI12	Heater Relay State	Binary Input	No Units	0 = Relay is open, heater is OFF 1 = Relay is closed, heater is ON	R	Current state of the heater.	Discrete Input	10002
AO13	Force On/Off	Analog Output	No Units	0=DO_NOTHING 1=FORCE_ON 2=FORCE_OFF	R/W	Force relay into On/Off state, ignoring device's control mode. • DO_NOTHING = Device will operate according to the control mode in settings • FORCE_ON = Device will enter the MODBUS_CONTROL/ALWAYS_ON State/Sub-state • FORCE_OFF = Device will enter the MODBUS_CONTROL/ALWAYS_OFF State/Sub-state *NOTE: Modbus override takes priority over local and cloud override.*	Holding Register	40001

BACnet							Modbus RTU			
Object	**Name**	**Type**	**Units**	**Range/Options**	**Read/Write**	**Description**	**Type**	**Address**	**Bit Extract Bit Offset**	**Bit Extract Length**
BI14	Alarms - GFEP Trip	Binary Input	No Units	0 = No Alarm 1 = Alarm Active	R	Ground fault trip alarm	Input Register	30017	0	1
BI15	Alarms - GFEP System	Binary Input	No Units	0 = No Alarm 1 = Alarm Active	R	Ground fault system alarm	Input Register	30017	1	1
BI16	Alarms - Low Temperature	Binary Input	No Units	0 = No Alarm 1 = Alarm Active	R	Low temperature alarm	Input Register	30017	2	1
BI17	Alarms - High Temperature	Binary Input	No Units	0 = No Alarm 1 = Alarm Active	R	High temperature alarm	Input Register	30017	3	1
BI18	Alarms - Low Current	Binary Input	No Units	0 = No Alarm 1 = Alarm Active	R	Low current alarm	Input Register	30017	4	1
BI19	Alarms - High Current	Binary Input	No Units	0 = No Alarm 1 = Alarm Active	R	High current alarm	Input Register	30017	5	1
BI20	Alarms - Thermistor	Binary Input	No Units	0 = No Alarm 1 = Alarm Active	R	Temperature sensor alarm - thermistor	Input Register	30017	6	1
BI21	Alarms - RTD	Binary Input	No Units	0 = No Alarm 1 = Alarm Active	R	Temperature sensor alarm - RTD	Input Register	30017	7	1
BI22	Alarms - Power Loss	Binary Input	No Units	0 = No Alarm 1 = Alarm Active	R	Power loss alarm	Input Register	30017	8	1
BI23	Alarms - Network	Binary Input	No Units	0 = No Alarm 1 = Alarm Active	R	Internet network connection loss alarm	Input Register	30017	9	1
BI24	Alarms - GF High Current	Binary Input	No Units	0 = No Alarm 1 = Alarm Active	R	Ground fault high current alarm	Input Register	30017	10	1
BI25	Alarms - Power Monitor	Binary Input	No Units	0 = No Alarm 1 = Alarm Active	R	Power monitor system alarm	Input Register	30017	12	1