

Saunum Modbus interface

SPECIFICATION

VERSION 1.2 (12.10.2026)

Author: Kevin Pärnaste

1. Overview

Modbus TCP allows a building automation system or other Modbus master to monitor and control normal sauna operation through the Saunum Control Panel. The interface exposes session controls, current operating values, alarms, AutoLeil settings and selected diagnostics.

2. Installation and connection

- Connect the Saunum Control Panel and the Modbus master to the same IP network.
- Use Modbus TCP port 502.
- Configure the Modbus master according to the register tables in this document.
- A Modbus TCP to KNX gateway may be used when integration with KNX is required.

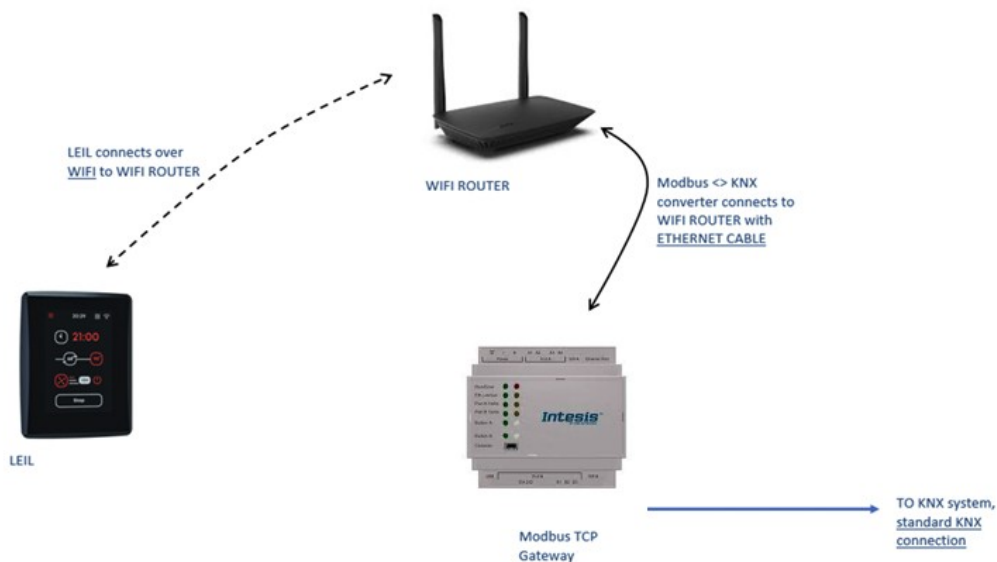


Figure 1 - Example system setup

3. Modbus TCP settings

Control Panel: Settings > Modbus. The page shows the Control Panel IP address and Modbus TCP port.

Tested gateway: Intesis Modbus TCP to KNX gateway.

Modbus polling intervals must be at least 500 ms; 1,000 ms is recommended, or 2-5 seconds for lower-traffic integrations. Use a Modbus request timeout of at least 2,000 ms. To keep a persistent connection open when otherwise idle, read every 5-10 seconds; the Control Panel closes connections after 20 seconds of inactivity.

4. Register structure

Registers begin at address 0 (40001). Each register is a 16-bit integer. RW registers may be read and written; R registers are read-only. Reserved addresses must not be used.

Legacy register addresses 0-6, 100-104 and 200-205 are either unchanged or extended. New functions are added only in previously reserved ranges.

4.1 Read/Write registers

Name	Address	R/W	Description	Values / notes
Sauna session active	0	RW	Start or stop a sauna session.	0=Off, 1=Active
Sauna type	1	RW	Sauna type / preset index used for the next session.	0..N-1
Sauna duration	2	RW	Sauna session duration. 0 uses the selected type value.	60-720 min private; 60-1080 min public
Fan duration	3	RW	Session fan duration. 0 uses the selected type value.	minutes; 0=type value; range 0-20

Name	Address	R/W	Description	Values / notes
Temperature setpoint	4	RW	Target sauna temperature. 0 uses the selected type value before start.	0 or 40-100 °C
Fan speed	5	RW	Before start: sets the fan speed for the next Modbus-started session; 0 uses the selected sauna type value. During an active session or Cooling: 0=Off, 1-3=fan speed.	0-3
Light	6	RW	Sauna light.	0=Off, 1=On
Software reboot	7	RW	Restarts the Control Panel for remote recovery.	Write 0xA55A (42330); reads as 0
Dismiss Cooling	8	RW	Ends the current Cooling/post-session ventilation view, equivalent to the Control Panel dismiss action.	Write 1; reads as 0; no effect when Cooling is not active
Dismiss notifications	9	RW	Dismisses all currently dismissible on-screen notifications.	Write 1; reads as 0; does not clear an active alarm or underlying condition
AutoLeil mode	10	RW	AutoLeil automatic mode.	0=Humidity, 1=Interval
AutoLeil target humidity	11	RW	Humidity target used in Humidity mode.	0 to (130 - target temperature) %
AutoLeil interval	12	RW	Time between automatic water throws in Interval mode.	1-25 min
AutoLeil water quantity	13	RW	Water valve opening time.	3-40 = 0.3-4.0 s
AutoLeil duration	14	RW	Maximum AutoLeil automatic-operation duration.	60-1080 min, 30 min steps; not longer than sauna duration
AutoLeil Ready Mode	15	RW	Automatically enables AutoLeil operation when the sauna is ready.	0=Off, 1=On
AutoLeil Auto Vent	16	RW	Turns the circulation fan on after water is dispensed, when supported.	0=Off, 1=On
AutoLeil Button Enabled	17	RW	Enables the physical AutoLeil water button.	0=Disabled, 1=Enabled
AutoLeil Button Timeout	18	RW	Minimum time between physical button activations.	5,15,30,60,120,180,240,300 s
Reserved	19-99	-	Reserved for future standard controls.	

Registers 7-9 are one-shot actions. Software reboot is intended for remote recovery; the Control Panel responds to the Modbus request before restarting. Dismissing Cooling ends the current post-session Cooling state. Dismissing notifications closes currently dismissible notifications only; alarms and their underlying conditions remain active until they clear normally.

AutoLeil registers are used only when AutoLeil is available. Before session start they define the values used for a Modbus-started session; during an active session they represent the current AutoLeil settings. Selecting a sauna type loads that type's configured AutoLeil values before any Modbus overrides are applied.

4.2 Read-only status registers

Name	Address	R/W	Description	Values / notes
Current temperature	100	R	Current sauna temperature.	°C, 1 °C resolution
On time high	101	R	Upper 16 bits of the accumulated sauna runtime.	See note below
On time low	102	R	Lower 16 bits of the accumulated sauna runtime.	See note below
Heater status	103	R	Number of active heater elements.	0=Off, 1-3 active elements
Door status	104	R	Door input state.	0=Closed, 1=Open
Humidity	105	R	Current relative humidity.	0-100 %
Active session duration	106	R	Configured total duration of the current active sauna session.	minutes; 0 when no session is active
Session time remaining	107	R	Time remaining until the current active sauna session ends.	seconds; 0 when no session is active
Fan time remaining	108	R	Remaining circulation-fan timer during an active sauna session or Cooling.	seconds; 0 when fan timer is inactive
Controller state	109	R	Current sauna operating state.	1=Standby, 2=Scheduled, 3=Heating, 4=Ready, 5=Cooling, 6=Waiting for door
AutoLeil connected	110	R	AutoLeil communication / device availability.	0=No, 1=Yes
AutoLeil active	111	R	AutoLeil automatic operation currently active.	0=No, 1=Yes
AutoLeil button presses	112	R	Total physical AutoLeil button presses reported for the current session.	0-65535
AutoLeil manual water dispenses	113	R	Total successful manual water dispenses reported for the current session.	0-65535
AutoLeil automatic water dispenses	114	R	Total successful automatic water dispenses reported for the current session.	0-65535
Active notifications high	115	R	Upper 16 bits of the 32-bit active notification mask.	See section 5
Active notifications low	116	R	Lower 16 bits of the 32-bit active notification mask.	See section 5
Start inhibit high	117	R	Upper 16 bits of the separate 32-bit start-inhibit mask.	See section 5

Name	Address	R/W	Description	Values / notes
Start inhibit low	118	R	Lower 16 bits of the separate 32-bit start-inhibit mask.	See section 5
Reserved	119-199	-	Reserved for future standard status values.	

Registers 101 and 102 together form a 32-bit accumulated sauna runtime in seconds. Register 101 contains the upper 16 bits and register 102 the lower 16 bits. Runtime (seconds) = (R101 x 65536) + R102.

4.3 Alarm registers

Name	Address	R/W	Description	Values / notes
Alarm Door open	200	R	Door is open during a start/heating condition.	0=Clear, 1=Active
Alarm Door sensor	201	R	Door has remained open too long.	0=Clear, 1=Active
Alarm Thermal cutoff	202	R	Thermal cutoff alarm.	0=Clear, 1=Active
Alarm internal temp	203	R	Control system internal overtemperature.	0=Clear, 1=Active
Alarm temp sensor shorted	204	R	Temperature sensor shorted.	0=Clear, 1=Active
Alarm temp sensor not connected	205	R	Temperature sensor not connected.	0=Clear, 1=Active
Alarm Power Unit update needed	206	R	Power Unit firmware update required.	0=Clear, 1=Active
Alarm Power Unit communication	207	R	Control Panel cannot communicate reliably with the Power Unit.	0=Clear, 1=Active
Alarm Power Unit firmware old	208	R	Power Unit firmware is incompatible / too old.	0=Clear, 1=Active
Reserved	209-299	-	Reserved for alarms and diagnostics.	

4.4 IR registers and reserved expansion

Name	Address	R/W	Description	Values / notes
IR intensity	300	RW	User-selected IR intensity level. Used only in IR mode.	1-10
Reserved	301-399	-	Reserved for IR and future expansion.	
IR mode active	400	R	Indicates whether the controller is operating in IR heating mode.	0=No, 1=Yes
Reserved	401-499	-	Reserved for IR and future expansion.	

5. Notifications and start inhibit reasons

Active notifications and start inhibits are two separate 32-bit masks. Because each Modbus register is 16-bit, each mask uses two consecutive addresses. The active-notification mask uses registers 115 (upper 16 bits) and 116 (lower 16 bits). The start-inhibit mask uses registers 117 (upper 16 bits) and 118 (lower 16 bits). Several bits may be active at the same time.

Bit	Notification
0	Door open
1	Door sensor alarm
2	Thermal cutoff
3	Internal overtemperature
4	Temperature sensor shorted
5	Temperature sensor not connected
6	Power Unit firmware update needed
7	Power Unit communication error
8	Power Unit firmware old / incompatible
9	Control Panel update available
10	Power Unit update available
11	AutoLeil update available
12	Light Module update available
13	Update failed
14	Firmware update in progress
15-31	Reserved

Notification-mask examples:

No notifications: R115 = 0000 0000 0000 0000 R116 = 0000 0000 0000 0000

Power Unit comm. error: R115 = 0000 0000 0000 0000 R116 = 0000 0000 1000 0000

Door open + CP update: R115 = 0000 0000 0000 0000 R116 = 0000 0010 0000 0001

Start-inhibit example: R117 = 0000 0000 0000 0000 R118 = 0000 0001 0000 0000

The start-inhibit mask reports all conditions currently preventing a new immediate session from starting.

Bit	Start inhibit condition
0	Session already active
1	Door open alarm
2	Door sensor alarm
3	Thermal cutoff
4	Internal overtemperature
5	Temperature sensor shorted
6	Temperature sensor not connected
7	Power Unit firmware update needed
8	Power Unit communication error
9	Power Unit firmware old / incompatible
10	Firmware update in progress
11	Invalid sauna type
12-30	Reserved
31	Other controller error