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Modbus Gateway



Inledning

Översikt

Modbus Gateway ansluter Snö & Is-smältningssystem Base, Expand till överordnat system med kommunikation via Modbus RTU.

- Namn: Modbus Gateway
- DIN skena montage, touch-display
- Strömförsörjning 230V AC
- Intern kommunikation: COM protokoll TGN
- Modbus Kommunikation: RS485, RTU protokoll, Modbus slav
- Modbus parametrar: inställbart i menyn
- Register antal: Modbus register från 1 till 65,535, beroende på applikation.
- Option: USB loggning av data-överföring med tidsangivelser i realtid.

Modbus specifikationer:

- MODBUS Application Protocol Specification V1.1b3 (Issue date: 2012-04-26)
- MODBUS over Serial Line V1.02 (Issue: 2006-12-20)



Funktion

Modbus Gateway fungerar som en proxy-server som tillfälligt lagrar önskad data i ett RAM minne som sedan skickas till eller ifrån en enhet, Base eller Expand.

- Ett skriv kommando i ett Modbus telegram lagras i ett internminne och skickas vidare till enheten inom snabbast möjliga tid.
- Ett läs kommando från Modbus master hämtas från internminnet som uppdateras med reguljära tidsintervaller synkroniserade med de anslutna enheterna.

Display

Inställningar med statusvisning finns tillgängliga direkt i touchdisplay.

- Konfigurering av gateway görs via touchdisplay.
- Modbusinställningar - Slavadress, Baudrate, Startadress, Paritet.
- Avancerade inställningar - Modbus timeout, Synkronisering, Tidsfördröjning mm.
- Almänna inställningar - Språk, Kontrast, Ljusstyrka, Lösenord mm.
- Statusvisning - Realtidsklocka, Felkod, Funktionskod, Datamängd, Adress.

Krav mjukvara

Kommunikation via Modbus kräver följande mjukvara-versioner:

- För basenhet (Base) - version 6.09, B2501 eller högre.
- För expansionsenhet (Expand) - version 6.09, B2501 eller högre.

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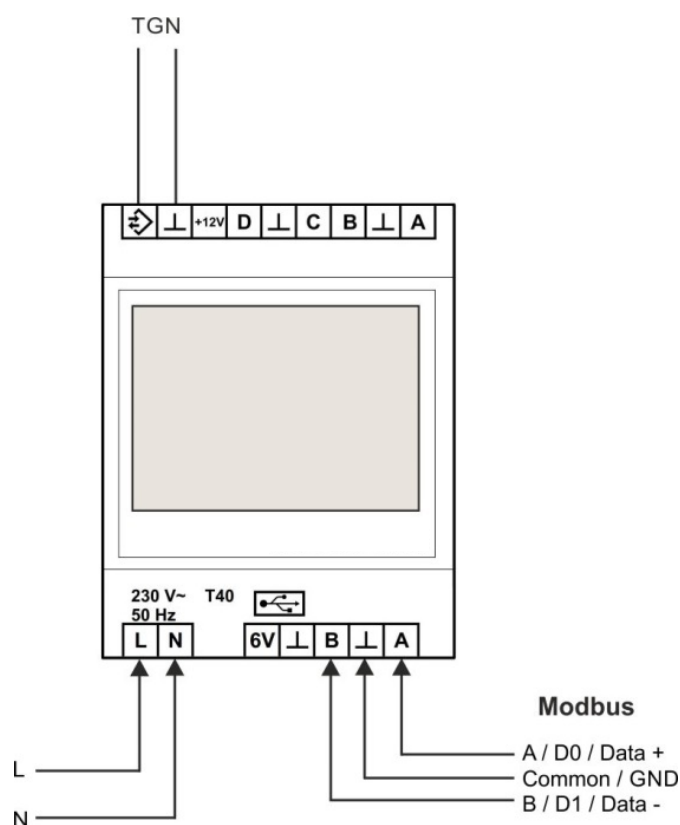


Installation

Följ alltid säkerhetsanvisningar och gällande regelverk för el-installationer vid installation, drifttagning och användning av utrustningen.

Enheten är avsedd för montering på 35 mm DIN skena och installeras i elskåp, kopplingslåda eller motsvarande kapsling. För torra utrymmen.

Observera specifikationer för RS485 bus-system vid installation av Modbus kommunikation.



Notera:

När Modbus Gateway installeras som sista slav i RS-485 nätverket skall den termineras mellan plint A & B med en resistor på 120 Ω . För ändamålet avsedd partvinnad kommunikationskabel skall användas, exempel:

- LAPP UNITRONIC BUS FD P LD
- BELDEN 9842
- NEXANS LIYCY-TP

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Menysystem Modbus Gateway

Nedan visas Modbus Gateway hemma vy i display:

Display	Kommentar
Datum + Tid	Aktuellt datum och tid
Timeout xxx min	Återstående tid tills Modbus kommunikation går i time out
Fc Adress Dat Err	Rubriker till nästa rad
ff aaaaa ddd ff	Funktionskod, Adress, Datamängd, Felkod (Avser senast mottagna Modbus telegram)

Menyer manövreras genom att trycka på knappen <Menu> i hemma vyn.

Menyspråk på Engelska - (Menyspråk på Svenska) - [Menyspråk på Norska]

Level 1	Level 2	Level 3	Level 4	Comment
Information (Information) [Informasjon]				
	Modbus server			
		Modbus-timeout xxx min		Disable control after xxx min without a Modbus telegram
	Device data (Intern data) [Interne data]			
		Serial number (Serienummer) [Serienummer] 1234567		
		Version (Version) [Versjon] V 8.06, B2502		
	Set passwords (Ställ lösenord) [Sette passord]			
		Set level 1 (Sätt nivå 1) [Sette nivå 1]		
			Set password for level 1 (Sätt lösenord för nivå 1) [Sette passord for nivå 1]	Level 1 = Information (Information) [Informasjon]
		Set level 2 (Sätt nivå 2) [Sette nivå 2]		
			Set password for level 2 (Sätt lösenord för nivå 2) [Sette passord for nivå 2]	Level 2 = Setup (Inställning) [Innstilling]

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Level 1	Level 2	Level 3	Level 4	Comment
Information (Information) [Informasjon]	Set passwords (Ställ lösenord) [Sette passord]	Set level 3 (Sätt nivå 3) [Sette nivå 3]		
			Set password for level 3) (Sätt lösenord för nivå 3) [Sette passord for nivå 3]	Level 3 = Installer (Installation) [Installasjon]
Setup (Inställning) [Innstilling]				
	Date/Time (Datum/Tid) [Dato/Tid]			
		Date/Time (Datum/Tid) [Dato/Tid] xx.xx.xx xx.xx		
		Type of summertime (Sommartid typ) [Sommartid typ] / Europe		
	Language (Språk) [Språk]			
		Language (Språk) [Språk]		German/English/ Swedish/Norwegian
	Display			
		Contrast (Kontrast) [Kontrast] +/- x		
		Brightness menu (Ljusstyrka vid inställningar) [Lysstyrke ved innstillinger] xx %		
		Brightness idle (Ljusstyrka vid drift) [Lysstyrke ved drift] xx %		

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Level 1	Level 2	Level 3	Level 4	Comment
Installer (Installation) [Installasjon]				
	Startup (Grund- inställningar) [Grunninnstill.]			
		Modbus Slave-ID xxx		Modbus slave address
		Base address xxxxx		Shift registers addresses by xxxx
		Baudrate		Baudrate settings 1200, 2400, 4800, 9600, 19200, 38400, 57600 Default value: 19200
		Parity		Parity settings Default value: Even
	Information (Information) [Informasjon]			
		Modbus server		
			Modbus-Timeout xxx min	Disable control after xxx min without a Modbus telegram
		Device data (Intern data) [Interne data]		
			Serial number (Serienummer) [Serienummer]	
			Version (Version) [Versjon] V8.06 B2502	

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Level 1	Level 2	Level 3	Level 4	Comment
Installer (Installation) [Installasjon]				
	Configuration (Konfigurerings) [Konfigurasjon]			
		Modbus server		
			Timeout Modbus Connection xxx min	Disable control after xxx min without a Modbus telegram
			Base address	Shift register addresses by xxxx
		Device proxy		
			Interval synchronisation xxx s	Time lag between two consecutive access operations on the system's TGN bus
			Time base read interval xxx s	Timing cycle for waiting time between read operations
			Interval read-read participant xxx s	Time lag between two read operations in the same module of a device within the system
			Interval write-read participant xxx s	Time lag between a write and a read operation in the same module of a device within the system
			max. ta tries until next channel	Number of unsuccessful read operations until the current channel is skipped (ta = transaction)

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Level 1	Level 2	Level 3	Level 4	Comment
Installer (Installation) [Installasjon]	Configuration (Konfigurering) [Konfigurasjon]	Device proxy		
			max. ta tries until end of validity	Number of unsuccessful read operations on a device until measured values are declared invalid (ta = transaction)
			Write without changes? no / yes	Send the respective value with each Modbus telegram to a device even if the value has not changed
		Interface		
			Baudrate	Baudrate settings 1200, 2400, 4800, 9600, 19200, 38400, 57600 Default value: 19200
			Parity	Parity settings Default value: Even
	Service			
		Restart Restart device (Omstart) [Omstart enhet]		Re-start of the gateway
			Execute restart? (Genomför omstart?) [Gjennomføre omstart?]	
		Factory settings Restart device (Fabriks- inställningar Återställ enhet) [Tilbake til- fabrikkinnt. Reset enhet]		
			Reset all settings? (Återställ alla inställningar?) [Reset alle innstillinger?]	Re-setting the gateway to factory defaults

Modbus Register

General information

- Related tables can be read or written as an entity. Writing is only possible if RW access has been granted.
- The Modbus gateway has a base address which is added to the register numbers below.
- A detailed explanation of the functionality of connected devices can be found in the operating manual of the device.

Modbus function codes

The Modbus gateway can be addressed via the following Modbus function codes:

- 04 (0x04) Read Input Registers
- 06 (0x06) Write Single Register
- 16 (0x10) Write Multiple Registers

Further explanations regarding the function codes can be found in the "MODBUS Application Protocol Specification V1.1b3".

Setting limits

Some register definitions have a defined value range. If an attempt is made to write to the relevant register with values outside these limits, the value is set to the next possible setting limit and the Modbus error "Illegal Data Value" is returned.

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Register Definitions

Control

The following table contains the registers for setting and reading settings of the ice and snow detector.

The x stands for channel - 1. There are up to 8 channels.

For example: The "Zone number" of channel 6 is located in register 502.

Register	Content	Description	Data type	Unit	Value range	Error/default values	Access
x01	Operating mode	Operating mode of the channel	16 bit signed	-	See below	-1 value is not set	R/W
x02	Zone number	Number of the zone the corresponding channel is assigned to	16 bit signed	-	0 = none, 1..4 = zone	-1 value is not set	R/W
x03	Minimum heating time	Minimum time for the heating to be active after exceeding the moisture threshold	16 bit signed	Minute s	30-600	-1 value is not set	R/W
x04	Follow up time	Time during which the heating continues to be active after a heating action (The lag time of channel 7 for example has the address 604 + base address.)	16 bit signed	Minute s	0-180	-1 value is not set	R/W
x05	Upper temperature limit	Within this temperature window, the moisture detection is active.	16 bit signed	Deci-celsius	-30 to 50		R/W
x06	Lower temperature limit		16 bit signed	Deci-celsius	-300 to -50		R/W
x07	Base temperature	Temperature of the slab which is maintained by the controller	16 bit signed	Deci-celsius	-150 to 50		R/W
x08	PWM interval time	Time interval of the emergency operation, where the heating circuit is switched on and off once.	16 bit signed	Minute s	30-240	-1 value is not set	R/W
x09	Emergency duty cycle	Setting of the emergency operation duty cycle (through PWM)	16 bit signed	Percent	0-100	-1 value is not set	R/W
x10	Command bits channel	Flag set which allows to send certain commands	16 bit unsigned	Flags	See below		R/W
x11	Moisture threshold	Moisture limit value above which the heating must be activated	16 bit signed	-	5-95	-1 value is not set	R/W

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Operating mode (channel)		
Value	Operating mode	Description
0	Off	Channel inactive
1	Temp. -> Moisture	Moisture measurement and heating as needed
2	T->Moi+BaseTemp	Moisture measurement and heating as needed plus minimum temperature (base temperatur)
3	Temperature	On-off control of slab temperature based on upper temperature limit
4	Emergency operation	PWM operation as neither temperature nor moisture measurement are available

Command bits channel			
Bit	Bit value	Command	Description
0	0x01	StartMinHeatingTime	Activate heating for the minimum heating time (menu item: "Start minimum heating time?")
1	0x02	StopHeating	De-activate heating temporarily (can be re-activated by moisture measurement) (menu item: "Stop heating?")
2	0x04	MoistureMeasurement	Activate moisture measurement independent of temperature conditions (test measurement)(menu item: "Start moisture measurement?")
3	0x08	ResetCounter	Reset operating counter (menu item: "Operating time: Reset counters")

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Measured values

The following table contains the channel-specific measured values that the Modbus gateway receives and stores for retrieval via the registers. These are generated by the devices every 15 minutes. The two registers before the respective measurement date indicate when the measurement date was recorded. The x stands for channel - 1. There are up to 8 channels. For example: The "Total operating time" of channel 4 is located in register 329.

Register	Content	Descriptions	Data type	Unit	Value range	Error/default values	Access
x21 + x22	UTC timestamp	Point in time at which the subsequent measured value was captured	32 bit unsigned	-	-		R
x23	Channel state	Value of the finite state machine of the channel control module	16 bit unsigned	-	See below		R
x24 + x25	UTC timestamp	Point in time at which the subsequent measured value was captured	32 bit unsigned	-	-		R
x26	Operating time	Operating time since last reset	16 bit unsigned	Hours	-		R
x27 + x28	UTC timestamp	Point in time at which the subsequent measured value was captured	32 bit unsigned	-	-		R
x29	Operating time total	Total operating time	16 bit unsigned	Hours	-		R
x30 + x31	UTC timestamp	Point in time at which the subsequent measured value was captured	32 bit unsigned	-	-		R
x32	Remaining heating time	Remaining heating time	16 bit unsigned	Minutes	-		R
x33 + x34	UTC timestamp	Point in time at which the subsequent measured value was captured	32 bit unsigned	-	-		R
x35	Moisture sensor error flag	Flag set containing the moisture sensor errors	16 bit unsigned	Flags	See below		R
x36 + x37	UTC timestamp	Point in time at which the subsequent measured value was captured	32 bit unsigned	-	-		R
x38	Moisture sensor state	Value of the finite state machine of the moisture sensor module	16 bit unsigned	-	See below		R
x39 + x40	UTC timestamp	Point in time at which the subsequent measured value was captured	32 bit unsigned	-	-		R
x41	Sensor temperature	Most recently measured temperature	16 bit signed	Deci-celsius	-		R

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Register	Content	Descriptions	Data type	Unit	Value range	Error/default values	Access
x42 + x43	UTC timestamp	Point in time at which the subsequent measured value was captured	32 bit unsigned	-	-		R
x44	Last moisture measurement	Most recently measured moisture	16 bit unsigned	-	0 to 100		R
x45 + x46	UTC timestamp	Point in time at which the subsequent measured value was captured	32 bit unsigned	-	-		R
x47	Remaining inhibition time moisture	Denotes how long the moisture measurement is disabled	16 bit unsigned	Minutes			R
x48 + x49	UTC timestamp	Point in time at which the subsequent measured value was captured	32 bit unsigned	-	-		R
x50	Channel status flags	Status bits of the channel control	16 bit unsigned	Flags	See below		R

In the following tables the values of some registers from the previous table are explained in detail.

Channel state		
Value	State	Description
0	Reset	Module not in operation
1	StartUp	Module is about to start
2	Deactivated	Channel inactive
3	Ready	Channel active, temperature outside temperature window
4	Active	Temperature within temperature window
5	Heating minimum time	Minimum heating time for channel is active
6	Heating on demand	Check heating demand
7	Additional heating	Continue heating after regular heating
8	Temperature operation	Channel is controlled through temperature mode
9	Emergency operation	Module in emergency operation due to sensor failure
10	Error	Internal error occurred
11	Error heating on	Error while heating

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Moisture sensor error flags			
Bit	Value	Name	Description
0	E xxx1	internal error	Unforeseen software error, reason cannot be determined
1	E xxx2	configuration error of the module	Defined sensor type does not match the measurement values
2	E xxx4	temperature sensor cannot be evaluated	Temperature cannot be measured
3	E xxx8	error voltage measurement	Voltage at sensor cannot be measured
4	E xx1x	error current measurement	Current through sensor cannot be measured or current is too low for the defined sensor type
5	E xx2x	error current too high in idle mode	Current in idle mode too high, i.e. also outside the measurement cycle current flows through the sensor heating. This indicates an error in the device.
6	E xx4x	error upon start of moisture measurement	Error when moisture measurement is started.
7	E xx8x	temperature too high upon start of measurement or during measurement	Temperature at start of measurement (>30 °C) or during the measurement (>55 °C) too high; evaluation impossible
8	E x1xx	moisture could not be determined	Moisture determination during the measurement impossible

Moisture sensor state		
Value	State	Description
0	Reset	Module not in operation
1	StartUp	Wait for zone control to be ready
2	Off	Module ready, no measurement
3	Temp	Function temperature measurement, temperature ok
4	Temp_Err_ET	Function temperature measurement, temperature error
5	Moisture	Function moisture measurement, temperature & moisture ok
6	Moisture_Err_EF	Function moisture measurement, moisture error
7	Moisture_Err_ET_XF	Function moisture measurement, temperature error, thus moisture measurement impossible
8	Measurement	Measurement active
9	Error	Final state in case of error

Channel status flags			
Bit	Bit value	Error	Description
4	0x0100	HeatingOn	Heating output active
5	0x0020	MoistureActive	Moisture measurement active
6	0x0040	Alarm	A channel has reported an error.

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Ice detection zones

In the ice detection zones several ice and snow detectors can be grouped and a week program can be assigned to the devices. Each channel may be assigned to one of 4 ice detection zones. The following table contains all registers for the settings of the ice detection zones, starting with the settings that are valid for all ice detection zones. After that the settings specific to the 4 zones are listed.

Block*	Register	Content	Descriptions	Data type	Unit	Value range	Error/default values	Access
Ice detection zones-zone-independent settings	801	Alarm delay	An occurring alarm will not be propagated before this time has elapsed.	16 bit unsigned	Minutes	0 to 300		R/W
	802	OT-Limit preHeating	Lower outdoor temperature limit for pre-heating operation or base temperature operation	16 bit signed	Deci-celsius	-300 to 0		R/W
	803-805	Reserved						R/W
Ice detection zone 1	806	Control mode	Selected control mode of the zone	16 bit unsigned	-	See below		R/W
	807	Zone options	Selected zone options	16 bit unsigned	Flags	See below		R/W
	808-810	Reserved						R/W
Ice detection zone 2	811	Control mode	Selected control mode of the zone	16 bit unsigned	-	See below		R/W
	812	Zone options	Selected zone options	16 bit unsigned	Flags	See below		R/W
	813-815	Reserved						R/W
Ice detection zone 3	816	Control mode	Selected control mode of the zone	16 bit unsigned	-	See below		R/W
	817	Zone options	Selected zone options	16 bit unsigned	Flags	See below		R/W
	818-820	Reserved						R/W

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Block*	Register	Content	Descriptions	Data type	Unit	Value range	Error/default values	Access
Ice detection zone 4	821	Control mode	Selected control mode of the zone	16 bit unsigned	-	See below		R/W
	822	Zone options	Selected zone options	16 bit unsigned	Flags	See below		R/W
	823-825	Reserved						R/W

In the following tables the values of the registers for the ice detection zones are explained in detail.

Control mode		
Value	Name	Description
0	Channel	Channel acts independently
1	Channel+preHeat	Channel receives pre-heating value through PWM
2	Off	Heating disabled

Zone options (Flags)			
Bit	Bit value	Option	Description
0	0x01	Alarm indication	Alarm indication generally enabled
1	0x02	Alarm relay inverted	Alarm output inverted
2	0x04	Time program available	Time program available
3	0x08	Check OT value continuously	Outdoor temperature permanently monitored

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General measured values

The following table contains measured values that cannot be directly assigned to any channel but are valid for the entire system. The two registers before the respective measurement date indicate when the measurement date was recorded.

Register	Content	Descriptions	Data type	Unit	Value range	Error/default values	Access
829	Version	Version of the Modbus communication interface	16 bit un-signed	-	-		R
830 + 831	UTC timestamp	Point in time at which the subsequent measured value was captured	32 bit un-signed	-	-		R
832	Channel flags	Login/online flags of the individual channels	16 bit un-signed	Flags	See below		R
833 + 834	UTC timestamp	Point in time at which the subsequent measured value was captured	32 bit un-signed	-	-		R
835	Alarm flags	Alarm flags of the individual channels	16 bit un-signed	Flags	See below		R
836 + 837	UTC timestamp	Point in time at which the subsequent measured value was captured	32 bit un-signed	-	-		R
838	Mode	4 Nibbles (one for each zone) for the operation modes of the timer programs	16 bit un-signed	-	See ice detection zones		R
839 + 840	UTC timestamp	Point in time at which the subsequent measured value was captured	32 bit un-signed	-	-		R
841	State (of heat demand determination)	State of heat demand determination	16 bit signed	-	See State of heat demand determination		R
842 + 843	UTC timestamp	Point in time at which the subsequent measured value was captured	32 bit un-signed	-	-		R
844	Effective outside temperature	Effective outdoor temperature used by the system as a basis for the calculations	16 bit signed	Deci-celsius	-		R
845 + 846	UTC timestamp	Point in time at which the subsequent measured value was captured	32 bit un-signed	-	-		R
847	Pre-heating demand	Calculated pre-heating demand	16 bit signed	-	-	-1 value is not set	R

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In the following tables the values of some registers from the previous table are explained in detail.

Channel flags	
High_Byte	Bit flags of accessible channels (see below)
Low_Byte	Bit flags of registered channels (see below)

Channel flags - Bit flag		
Bit	Bit value	Channel
0	0x01	Channel 1
1	0x02	Channel 2
2	0x04	Channel 3
3	0x08	Channel 4
4	0x10	Channel 5
5	0x20	Channel 6
6	0x40	Channel 7
7	0x80	Channel 8

Alarm flags		
Bit	Bit value	Meaning
0	0x0001	Channel 1 Alarm active
1	0x0002	Channel 2 Alarm active
2	0x0004	Channel 3 Alarm active
3	0x0008	Channel 4 Alarm active
4	0x0010	Channel 5 Alarm active
5	0x0020	Channel 6 Alarm active
6	0x0040	Channel 7 Alarm active
7	0x0080	Channel 8 Alarm active
8	0x0100	Outdoor temperature failure
9	0x0200	At least one registered channel offline

State of heat demand determination		
Value	Name	Description
0	Reset	Module not in operation
1	Substitute value	No temperature available. Use of internal default value
2	OAT measurement	Current measurement value available
3	OAT value now	Measurements with historical values from outdoor temperature sensor available
4	OAT value future	Measurements with historical values from outdoor temperature sensor available, prospective values calculated (not applicable)
5	Weather now	Weather data for actual period available (not applicable)
6	Weather future	Weather forecast available (not applicable)
7	Error	No temperature data available at all

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Outdoor temperature

The following table describes the register definitions for transmitting a weather forecast to the system. The system interpolates these values to full hours, which is why there may be calculation deviations if the weather forecast does not start on the hour. (weather forecast not applicable)

Register	Content	Descriptions	Data type	Unit	Value range	Error/default values	Access
901	Outdoor temperature + 0h	Outdoor temperature current value	16 bit signed	Deci-celsius	-		R/W
902	Outdoor temperature + 1h	Outdoor temperature value 1 h ahead	16 bit signed	Deci-celsius		(not applicable)	R/W
...	Outdoor temperature + 2h to + 23h	Outdoor temperature value x h ahead	16 bit signed	Deci-celsius		(not applicable)	R/W
926 + 927	UTC timestamp	UTC timestamp where the weather report starts. The weather report is transferred when writing the last register (927).	32 bit un-signed		See below	(not applicable)	R/W

Week programs

Up to 4 week programs may be written or read. The following table presents the registers of the first week program. The register structure of all week programs is the same, only the register numbers differ. They are listed below for the other week programs. Each week program applies to the respective ice detection zone, i.e. week program 1 to ice detection zone 1 etc.

Week program 1:

Register	Content	Descriptions	Data type	Unit	Value range	Error/default values	Access
1001	Switchpoint 1 options	Control mode and days of week of switchpoint	16 bit un-signed		See below		R/W
1002	Switchpoint 1 time of day	Time of day from which the switchpoint is valid	16 bit un-signed				R/W
...	Switchpoint 2..16	The above 2 registers are repeated for 16 switchpoints.					R/W R/W
1033	Write week program	After writing a "1" into the register the week program is transferred.	16 bit un-signed		0 1		R/W
1034	Write error	Returned value of a writing attempt	16 bit un-signed		See below		R/W

Week program 2: register 1035 - 1068

Week program 3: register 1069 - 1102

Week program 4: register 1103 - 1136

Explanation of the registers of a switchpoint:

Options	
High_Byte	Mode
Low_Byte	Days of week

Mode		
Value	Name	Description
0	Channel	Channel acts independently
1	Channel + preHeat	Channel receives pre-heating value through PWM
2	Off	Heating disabled

Days of week		
Bit	Bit value	Value
0	0x01	Monday
1	0x02	Tuesday
2	0x04	Wednesday
3	0x08	Thursday
4	0x10	Friday
5	0x20	Saturday
6	0x40	Sunday

Time of day	
Time in decimal notation	0 - 2359
Decimal time of day = (hours * 100) + minutes Time = (dec. time of day/100) : (dec. time of day%60)	
e.g.: 14:17 -> 1417 2256 -> 22:56	

Error writing	
Value	Description
0	No error
1-5	Internal error (caused by faulty software)
6	Error in the switchpoint values
7	Week program is the same as the old one

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General values

The following tables list fixed values and calculations which are used in several registers.

Timestamp → Register example	
UTC timestamp	1581300000
Register 1	24128
Register 2	47392

Register → Timestamp example	
Register 1	24128
Register 2	47392
UTC timestamp	1581300000

Error values - temperature	
-3000	Register was never written
-3001	Sensor value/temperature undefined

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References registers - menusystem

The following table shows the references between the registers and the menus of the Base unit (I Multi Channel mode).

Svenska menyer

Level 1	Level 2	Level 3	Level 4	Level 5	Register Address	Parameter No.
Driftinställningar	System	Tidprogram	Veckoprogram 1		1001-1034	40
			Veckoprogram 2		1035 -1068	
			Veckoprogram 3		1069 -1102	
			Veckoprogram 4		1103 -1136	
		Helg program	Helg start			41
			Helg slut			
			Helg driftläge			
	Värmekanaler	Värmekanal <Nr.>	Driftsätt		X01	1
			Övre temp. gräns		X05	2
			Fuktgräns		X11	3
			Värmetid		X03	4
			Start inställd värmetid		X10 Bit 0	5
Information	System	Registrerade kanaler			832 Low Byte	60
			Utetemperatur snittvärde		844	42
			Förvärmning PWM Värmebehov %		847	43
	Zoner	Zon <Nr.>	Aktuellt driftläge		806 811 816 821	44
	Värmekanaler	Värmekanal <Nr.>	Aktuell driftstatus		X23	6
			Reläutgång		X50 Bit 4	68
			Aktuell temperatur		X41	7
			Senaste fuktmätning		X44	8
			Återstående värmetid		X32	9
			Zon Nr.		X02	61
			Drifttid		X26	10
			Energiförbrukning			11
	Server	for details refer to <i>Installation and Operation Instructions: Gateway Internet</i>				
	Intern data	Serienummer				12
		Version				13
	Lösenord	Sätt nivå 1	Lösenord för nivå 1			14
		Sätt nivå 2	Lösenord för nivå 2			
		Sätt nivå 3	Lösenord för nivå 3			
Inställningar	Datum/ Tid	Datum/Tid				45
		Sommartid typ				46
	Språk	Språk				15
	Display	Kontrast				16
		Ljusstyrka vid inställningar				17
Installation	Grundinställningar	Ljusstyrka vid vila				18
		Applikation				19
		Datum/Tid				45
		Värmekanaler	Värmekanal <Nr.>	Sensortyp		20
		Serverkommunikation aktiv				47

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Svenska menyer fortsättning

Level 1	Level 2	Level 3	Level 4	Level 5	Register Address	Parameter No.
Installation	Information	System	Registrerade värmekanaler		832 Low Byte	60
			Utetemperatur snittvärde		844	42
			Förvärmning PWM Värmebehov %		847	43
		Zoner	Zon <Nr.>	Aktuellt driftläge	806 811 816 821	44
		Värmekanaler	Värmekanal <Nr.>	Aktuell driftstatus	X23	6
				Status reläutgång	X50 Bit 4	68
				Aktuell felkod		21
				Aktuell temperatur	X41	7
				Senaste fuktmätning	X44	8
				Återstående värmetid	X32	9
				Tid till nästa fuktmätning	X47	22
				Zon Nr.	X02	61
				Drifttid	X26	10
				Drifttid total	X29	23
				Energiförbrukning		11
				Energiförbrukning totalt		24
		Värmebehov	Info utetemperatur		841	48
			Status utetemperatur mätserier			49
			Status väderserier			50
			Utetemperatur aktuell			51
			Utetemperatur snittvärde		844	42
		Server	For details refer to <i>Installation and Operation Instructions: Gateway Internet</i>			
		Intern data	Serienummer			12
			Version			13
	Inställningar	System	Nedre temperaturgräns förvärmning		802	52
			Övervakning utetemperatur		807 Bit 3	53
			Larmfördröjning		801	30
			Larmutgång inverterad		807 Bit 1	31
			Radera registrerad kanal			62
		Zoner	Zon <Nr.>	Tidstyrning aktivera Kanalkoppling		63 64
		Värmekanaler	Värmekanal <Nr.>	Driftsätt	X01	1
				Sensortyp		20
				Övre temperaturgräns	X05	2
				Nedre temperaturgräns	X06	25
				Fuktgräns	X11	3
				Värmetid	X03	4
				Eftervärme	X04	26
				Marktemperatur (Grundvärme)	X07	54
				Zon nummer	X02	65
				Installerad effekt		27
				PWM intervalltid	X08	28
				Nöddrift styrvärde (PWM, i % av intervalltid)	X09	29
				Nöddrift via feltemperatur		32
				Fastkörningsskydd pump aktiv		33
				Övervakning utgång aktiv		69
				Drifttid - Reset drifttid	X11 Bit 3	34

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Svenska menyer fortsättning

Level 1	Level 2	Level 3	Level 4	Level 5	Register Address	Parameter No.
Installation	Inställningar	Värmebehov	Förvärme PWM starttemperatur			55
			Förvärme PWM startvärde %			56
			Förvärme PWM sluttemperatur			57
			Mark-karaktäristik			58
			Uppvärmnings-karaktäristik			59
		Server	For details refer to <i>Installation and Operation Instructions: Gateway Internet</i>			66
		LAN setup	For details refer to <i>Installation and Operation Instructions: Gateway Internet</i>			66
	Service	Värmekanaler	Värmekanal <Nr.>	Start inställd värmetid?	X11 Bit 0	5
				Stop värme?	X11 Bit 1	35
				Start fuktmätning?	X11 Bit 2	36
				Sensortemperatur	X41	37
				Senaste fuktmätning	X44	8
				Tid till nästa fuktmätning	X47	22
		Omstart				38
		Återställning till fabriksinställningar				39
		Setup expansionsenhet (anslut bara en enhet)				67

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English menus

The following table shows the references between the registers and the menus of the Base unit (In Multi Channel mode).

Level 1	Level 2	Level 3	Level 4	Level 5	Register Address	Parameter No.
Operation	System	Week programs	Week progr. 1		1001-1034	40
			Week progr. 2		1035 - 1068	
			Week progr. 3		1069 - 1102	
			Week progr. 4		1103 - 1136	
		Holiday program	Start of holiday			41
			End of holiday			
			Control mode holiday			
	ISD channels	ISD channel <No.>	Operating mode		X01	1
			Upper temperature limit		X05	2
			Moisture threshold		X11	3
			Minimum heating time		X03	4
			Start minimum heating time?		X10 Bit 0	5
Information	System	Registered channels			832 Low Byte	60
		Effective outside temperature			844	42
		Pre-heating demand			847	43
	Zones	Zone <No.>	Control mode		806 811 816 821	44
	ISD channels	ISD channel <No.>	Channel state		X23	6
			Heating output		X50 Bit 4	68
			Temperature heating area		X41	7
			Last moisture measurement		X44	8
			Remaining heating time		X32	9
			Zone number		X02	61
			Operating time		X26	10
			Energy consumption			11
	Server Gateway	for details refer to <i>Installation and Operation Instructions: Gateway Internet</i>				
	Device data	Serial number				12
		Version				13
	Set passwords	Set level 1	Set password for level 1			14
		Set level 2	Set password for level 2			
		Set level 3	Set password for level 3			

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English menus continues

Level 1	Level 2	Level 3	Level 4	Level 5	Register	Par. No.
Setup	Date/ Time	Date/Time				45
		Type of summertime				46
	Language					15
	Display	Contrast				16
		Brightness menu				17
		Brightness idle				18
Installer	Startup	Application				19
		Date/ Time	Date/Time			45
		ISD channels	ISD channel <No.>	Sensor type		20
		Server communication active				47
	Information	System	Registered channels		832 Low_Byte	60
			Effective outside temperature		844	42
			Heat demand		847	43
			Preheating mode			
		Zones	Zone <No.>	Control mode	806 811 816 821	44
		ISD channels	ISD channel <No.>	Channel state	X23	6
				Heating output	X50 Bit 4	68
				Error code		21
				Temperature heating area		7
				Last moisture measurement	X44	8
				Remaining heating time	X32	9
				Remaining inhibition time moisture	X47	22
				Zone number	X02	61
				Operating time	X26	10
				Operating time total	X29	23
				Energy consumption		11
				Energy consumption total		24
		Heat demand	State		841	48
			Status OAT measurement series			49
			Status weather series			50
			Outside temp. measured			51
			Outside temp. effective		844	42
		Server Gateway	for details refer to <i>Installation and Operation Instructions: Gateway Internet</i>			
		Device data	Serial number			12
			Version			13
	Config. modules	System	OT-Limit preHeating		802	52
			Check OT value continuously		807 Bit 3	53
			Alarm delay		801	30
			Alarm relay inverted		807 Bit 1	31
			Delete registered channel			62
		Zones	Zone <No.>	Time control		63
				Channel coupling		64

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English menus continues

Level 1	Level 2	Level 3	Level 4	Level 5	Register Address	Parameter No.
Installer	Config. modules	ISD channels	ISD channel <No.>	Operating mode	X01	1
				Sensor type		20
				Upper temperature limit	X05	22
				Lower temperature limit	X06	25
				Moisture threshold	X11	3
				Minimum heating time	X03	4
				Follow up time	X04	26
				Base temperature	X07	54
				Zone number	X02	65
				Heating performance		27
				PWM interval time	X08	28
				Emergency duty cycle	X09	29
				Emergency mode with error temperature		32
				Blocking protection active		33
				Monitoring heating output active		69
				Operating time: Reset counters	X11 Bit 3	34
		Heat demand	Pre-heating start temperature			55
			Pre-heating start value			56
			Pre-heating end temperature			57
			Ground characteristic			58
			Heat-up characteristic			59
		Server Gateway	for details refer to <i>Installation and Operation Instructions: Gateway Internet</i>			66
		LAN setup	for details refer to <i>Installation and Operation Instructions: Gateway Internet</i>			66
	Service	ISD channels	ISD channel <No.>	Start minimum heating time?	X11 Bit 0	5
				Stop heating?	X11 Bit 1	35
				Start moisture measurement?	X11 Bit 2	36
				Sensor temperature	X41	37
				Last moisture measurement	X44	8
				Remaining inhibition time moisture	X47	22
		Restart				38
		Factory settings				39
		Setup channel (connect only one device!)				67

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Norwegian menus

The following table shows the references between the registers and the menus of the Base unit.
(In Multi Channel mode)

Level 1	Level 2	Level 3	Level 4	Level 5	Register Address	Parameter No.
Driftsinnstill.	System	Ukeprogram	Ukeprogram 1		1001-1034	40
			Ukeprogram 2		1035 -1068	
			Ukeprogram 3		1069 -1102	
			Ukeprogram 4		1103 -1136	
		Helg/Ferieprogram	Helg/ferie start			41
			Helg/ferie stop			
			Helg/ferie driftsfunksjon			
	Enhet	Enhet nummer <Nr.>	Driftsfunksjon		X01	1
			Øvre temp. grense		X05	2
			Fuktighetsnivå		X11	3
			Varmetid		X03	4
			Start innstilt varmetid		X10 Bit 0	5
Informasjon	System	Registrerte enheter			832 Low Byte	60
			Utetemperatur snittverdi		844	42
			Forvarming PBM %		847	43
	Soner	Sone <Nr.>	Driftsfunksjon		806 811 816 821	44
	Enhet	Enhet nummer <Nr.>	Aktuell driftstatus		X23	6
			Relé utgang		X50 Bit 4	68
			Aktuell temperatur		X41	7
			Siste fuktmåling		X44	8
			Resterende varmetid		X32	9
			Sone nummer		X02	61
			Driftstid		X26	10
			Energiforbruk			11
	Server	For details refer to <i>Installation and Operation Instructions: Gateway Internet</i>				
	Interne data	Serienummer				12
		Versjon				13
	Sette passord	Sette nivå 1	Sette passord for-nivå 1			14
		Sette nivå 2	Sette passord for-nivå 2			
		Sette nivå 3	Sette passord for-nivå 3			
Innstilling	Dato/Tid	Dato/Tid				45
		Sommertid				46
	Språk	Språk				15
	Display	Kontrast				16
		Lysstyrke ved-innstillinger				17
		Lysstyrke ved drift				18
Installasjon	Grunninnstill.	Bruksområde				19
		Dato/Tid				45
		Enheter	Enhet nummer <Nr.>	Sensortype		20
		Serverkommunikasjon aktiv				47

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Norwegian menus continues

Level 1	Level 2	Level 3	Level 4	Level 5	Register Address	Parameter No.
Installasjon	Informasjon	System	Registrerte enheter		832 Low Byte	60
			Utetemperatur snittverdi		844	42
			Forvarming PBM %		847	43
		Soner	Sone <Nr.>	Driftsfunksjon	806 811 816 821	44
		Enhet	Enhet nummer <Nr.>	Aktuell driftsstatus	X23	6
				Relé utgang	X50 Bit 4	68
				Feilkode		21
				Aktuell temperatur	X41	7
				Siste fuktmåling	X44	8
				Resterende varmetid	X32	9
				Tid till neste fuktmåling	X47	22
				Sone nummer	X02	61
				Driftstid	X26	10
				Driftstid totalt	X29	23
				Energiforbruk		11
				Energiforbruk totalt		24
		Varmebehov	Info utetemp		841	48
			Status utetemp måling serier			49
			Status vaer serie			50
			Aktuell utetemperatur			51
			Utetemperatur snittverdi		844	42
		Server	For details refer to <i>Installation and Operation Instructions: Gateway Internet</i>			
		Interne data	Serienummer			12
			Versjon			13
	Innstillinger	System	Nedre temp. grense forvarming		802	52
			Overvåkning utetemperatur		807 Bit 3	53
			Alarmforsinkelse		801	30
			Endre alarmfunksjon		807 Bit 1	31
			Slett registrert enhet			62
		Soner	Sone <Nr.>	Akiver tidsstyring		63
				Sammenkobling av enheter		64
		Enhet	Enhet <Nr.>	Driftsfunksjon	X01	1
				Sensortype		20
				Øvre temperaturgrense	X05	2
				Nedre temperaturgrense	X06	25
				Fuktighetsnivå	X11	3
				Varmetid	X03	4
				Ettervarme	X04	26
				Bakketemperatur	X07	54
				Sone nummer	X02	65
				Installert effekt		27
				PBM intervalltid	X08	28
				Nøddrift PBM	X09	29
				Nøddrift ved feil temperatur		32
				Tvangskjøring av sirk. pumpe		33
				Øvervåking utgang aktiv		69
				Driftstid Nullst. driftstid	X11 Bit 3	34

Norwegian menus continues

Level 1	Level 2	Level 3	Level 4	Level 5	Register Address	Parameter No.
Installasjon	Innstillinger	Varmebehov	Starttemperatur forvarme			55
			Startverdi forvarme PBM			56
			Stoppverdi forvarme PBM			57
			Egenskaper bakke			58
			Oppvarmings egenskaper			59
		Server	For details refer to <i>Installation and Operation Instructions: Gateway Internet</i>			66
		LAN-innstill.	For details refer to <i>Installation and Operation Instructions: Gateway Internet</i>			66
	Service	Enheter	Enhet nummer <Nr.>	Start innstilt varmetid?	X11 Bit 0	5
				Stopp varme?	X11 Bit 1	35
				Start fuktmåling?	X11 Bit 2	36
				Sensor temperatur	X41	37
				Siste fuktmåling	X44	8
				Tid till neste fuktmåling	X47	22
		Omstart				38
		Tilbake til fabrikk-innst.				39
		Koble til enhet (koble til kun en enhet)				67

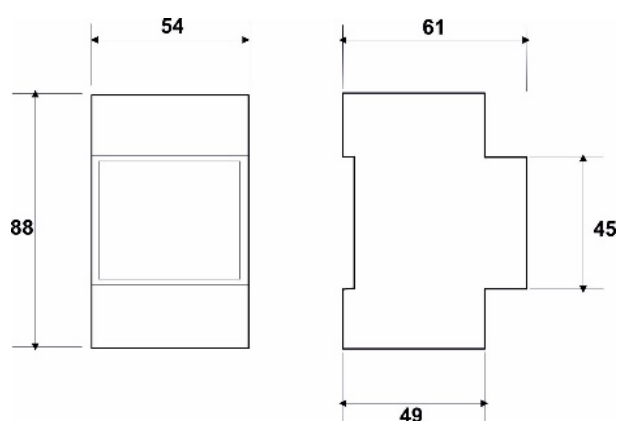
Teknisk Data

Spänning	230 V AC +10%/-15%, 50 Hz
Tillåtna spänningsvariationer	Min 195 V, Max 253 V
Effekt förbrukning	3 W
Kommunikation	Modbus RTU Slav - RS485
Anslutningsplint	Skruvplint för max 2,5 mm ² Åtdragningsmoment ≤ 0,5 Nm
Kapsling	För montering i elkapsling min IP54
Kapslingsklass	IP 20 (enligt EN 60529)
Skyddsklass	II vid korrekt installation
Drifttemperatur	-15 °C till +40 °C, ej kondensering
Förvaringstemperatur	-20 °C till +70 °C, ej kondensering
Montering	Dinskena montage TH-35 (enligt DIN EN 60715)
Miljöklass	2 (normal)
Erforderligt utrymme	3 HP (enligt DIN 43880)
Vikt	ca 0.25 kg

Specifikationer enligt EN 60730-1:

Heat and fire resistance:	Category B/D
Ball pressure test:	+125 °C
Rated surge voltage:	4 kV
Action type:	Type 1B
Rated power and load for EMC emission test:	230 V~, load 0.5 A

Dimensioner



Direktiv

Produkten uppfyller följande direktiv och regelverk:

EMC Directive
Low-voltage Directive
RoHS Directive





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