X34

MODBUS COMMUNICATION PROTOCOL

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ASCON TECNOLOGIC S.r.l.
VIA INDIPENDENZA 56
27029 VIGEVANO (PV) ITALY
TEL.: +39 0381 69871
FAX: +39 0381 698730
http:\\www.ascontecnologic.com
e-mail: info@ascontecnologic.com

FOREWORD

This document aims to describe the communication capacities of the ASCON TECNOLOGIC X34 series that use the MODBUS protocol and is mainly intended for technicians, system integrators and software engineers.

ASCONT ECNOLOGIC reserves the right to make any formal or functional changes at any moment and without any notice.

Whenever a failure or a malfunction of the device may cause dangerous situations for persons, thing or animals, please remember that the plant has to be equipped with additional devices which will guarantee safety.

ASCON TECNOLOGIC and its legal representatives do not assume any responsibility for any damage to people, things or animals deriving from violation, wrong or improper use or in any case not in compliance with the instrument's features.

INDEX

1 - CONNECTION

1.1 - INTERFACE

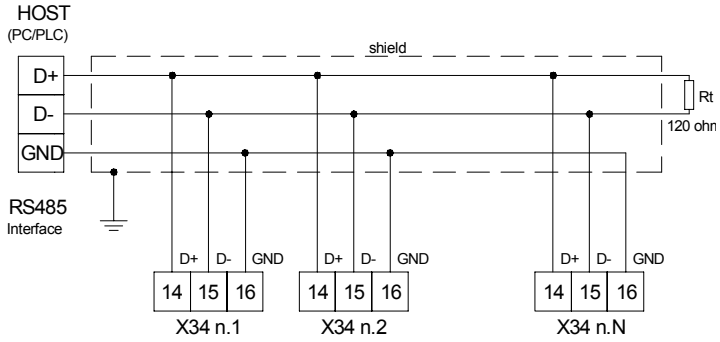
The X34 series is equipped with a serial communication interface RS485 insulated available on 3 terminals on the back of the instrument.

By means of this terminals it is possible to connect the regulator with a net to which other instruments (regulators of PLC) are connected, all depending typically on a personal computer used as plant supervisor.

When resting the instruments are in reception mode and pass to transmission after receiving and decoding a correct message addressed to them.

1.2 - RS 485 LINE

The instrument is equipped with two terminals called D+ and D- which have to be connected with all the namesake terminals of the net. For the wiring operation it is advisable to adopt a screened cable wired as in the drawing.



The interface circuit allows the connection of up to 32 instruments on the same line.

The total length of the line can reach a maximum of 1000 metres.

To maintain the line in rest conditions a 120 Ohm resistance (Rt) must be connected to the end of the line.

Once you have created the network must be programmed in par. "t.AS" (**in "tS" group**) of each instrument station address.

You can set a different number for each station, from 1 to 255.

Set a different number for each station, from 1 to 255.

Note: The baud-rate communication are fixed at 9600 baud.

2 - MODBUS COMMUNICATION PROTOCOL

The protocol adopted by the X34 series is a sub-group of the widely used protocol MODBUS RTU .

This choice guarantees easiness of connections to many PLCs and to all the commercial supervisory programmes.

For those who intend to develop their own application software all the necessary suggestions and information are available.
The functions of the MODBUS RTU protocol used in the X34 series are:

- function 3 - reading of n words

- function 6 - writing of a word

These functions allow the supervisory programme to read and change any data from the instrument.
Communication is based on messages sent by the master station to a slave station (X34) and vice versa.
The slave station that recognises its own address in the message analyses the content and, if it finds it to be semantically and formally correct, it then creates a reply message for the master.
The communication process involves five types of message:

from the master to the slave	**from the slave to the master**
function 3: request for reading of n words	function 3: reply containing n words read
function 6: request for writing of a word	function 6: confirmation of writing of one word
	Exceptional reply (in reply to both functions, in the event of an irregularity)

Each message contains four fields:

- slave's address: the values included between 1 and 255 are valid ; the address 0 (zero) is reserved by MODBUS RTU for the broadcasting messages but is not used for the TLY series due to the implicit reliability of this type of communication;

- function code : this contains 3 or 6 depending on the specified function;

- information field : this contains the addresses or the value of the words, as requested by the function in use;

- control word : this contains a cyclic redundancy check (CRC) calculated according to the rules foreseen for the CRC16.

The characteristics of the asynchronous communication are : 8 bit, no correspondence one stop bit.

2.1 - FUNCTION 3 - READING OF N WORDS

The number of words to be read must be less or equal to four.
The request has the following structure :

num. slave	3	address first word MSB	address first word LSB	numbers of words MSB	numbers of words LSB	CRC LSB	CRC MSB
byte 0	byte 1	byte 2	byte 3	byte 4	byte 5	byte 6	byte 7

The normal reply (unlike an exceptional reply) has the following structure:

num. slave	3	NB num. of bytes lread	value of the first word MSB	value of the first word LSB	Later words	CRC LSB	CRC MSB
byte 0	byte 1	byte 2	byte 3	byte 4	byte 5	byte NB+2	byte NB+3

2.2 - FUNCTION 6 - WRITING A WORD

The request has the following structure:

num. slave	6	address first word MSB	address first word LSB	value to be written MSB	value to be written LSB	CRC LSB	CRC MSB
byte 0	byte 1	byte 2	byte 3	byte 4	byte 5	byte 6	byte 7

The normal reply (unlike the exceptional reply) is purely an echo of the request message:

num. slave	6	address first word MSB	address first word LSB	value to be written MSB	value to be written LSB	CRC LSB	CRC MSB
byte 0	byte 1	byte 2	byte 3	byte 4	byte 5	byte 6	byte 7

2.3 - THE EXCEPTIONAL REPLY

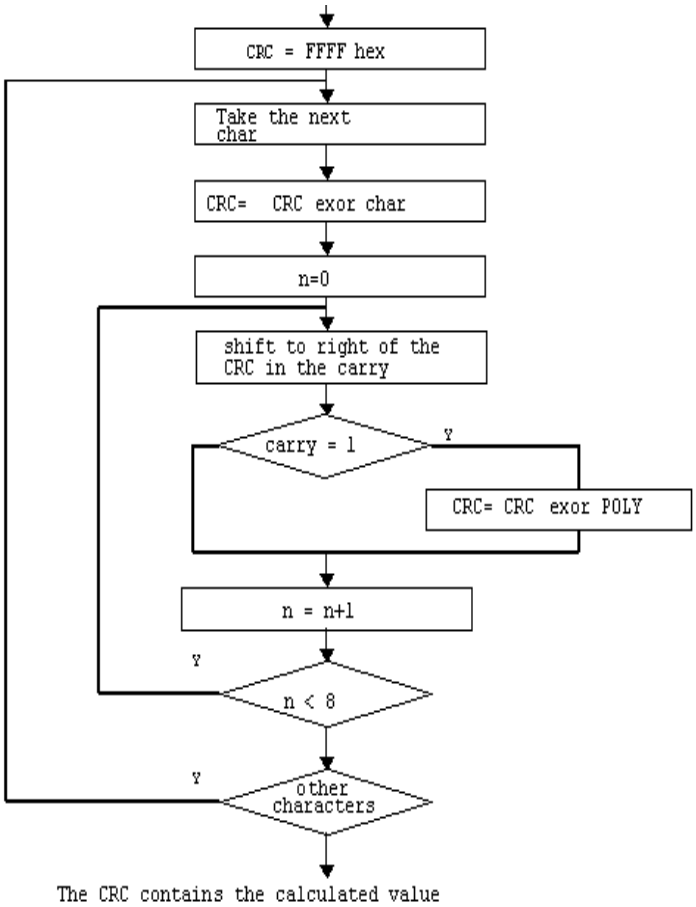
The X34 series supply an exceptional reply after having received a formally correct request but which cannot be met. The exceptional reply contains a code that indicates the cause of lack of a regular reply.
The reply structure is as follows :

num. slave	function code with MSB a 1	exception code	CRC LSB	CRC MSB
byte 0	byte 1	byte 2	byte 3	byte 4

The X34 series s adopt a sub-group of exception codes of the MODBUS RTU :

unknown function code	**1**
invalid memory address	**2**
invalid value in data field	**3**
controller not ready	**6**

2.4 – CYCLIC REDUNDANCY CHECK (CRC)



The CRC contains the calculated value

The CRC is a control word that allows the integrity of a message to be checked.
Each message, sent or received, contains the CRC word in the last two characters.
After receiving a request, the controller checks the validity of the message received, comparing the CRC contained in the message with the one calculated during reception .
In transmission, the controller calculates the CRC and places the two characters at the end of the message.
The calculation of the CRC is carried out on each character of the message except for the last two.
As the X34 instruments are compatible with the MODBUS RTU (JBUS) protocol, these use the same algorithm for the calculation of the CRC.

2.5 - EXCANGE OF DATA

All the data exchanged are made up of 16 bit words.
There are two types of data: numerical and symbolic (or non numerical).
The numerical data represent the value of a size (e.g. the measured variable etc)
The symbolic data represent a particular value within a range of choices (e.g. unit of measurement can "be "°C" or "°F").

Both types are encoded with whole numbers: whole numbers with a sign are adopted for numerical data and whole numbers without a sign for symbolic data.
Numerical data must be associated with the appropriate number of decimal figures, so that it represents a size with the same engineering units adopted in the X34 instrument.
The numerical data are represented in fixed decimal according to the number of decimal places shown in the tables in the section "MEMORY AREA".

2.6 - PERFORMANCE

After receiving a valid request, the instrument prepares the reply and then sends it to the master station, according to the modes specified below:
- a time equal to three characters is guaranteed before the reply to allow switching of the line;
- the answer is ready to be transmitted within a time that is less than 20 ms, with the exception made for function 3;

A silence on line time of 20 ms is necessary to recover any irregular conditions or error messages: this means that the time that runs between two consecutive characters in the same message must be less than 20 ms.
It's possible to write one word per time only.

3 - MEMORY ADDRESS AREA

For the functions adopted, all the data that can be read and written appear as 16 bit words allocated in the instrument's memory.
The map of the memory has the following areas:
- Variables
- Commands
- Operating and configuration parameters
- Events that can be programmed to occur at defined times by clock
- Calendar Clock
- HACCP Record Alarms
- Identification code of the instrument

3.1 - VARIABLES AREA

The variables include measures of the instrument and the states of the instrument (control, outputs, etc..).
The data are read-only

Var.	Add. HEX	Description	Data type	n. dec.	Range
Pr1	**200**	Pr1 temperature	N	1	-99.9 ÷ 999.0
Pr2	**201**	Pr2 temperature	N	1	-99.9 ÷ 999.0
dP	**202**	Decimal Point	S		1
Pr3	**203**	Pr3 temperature	N	1	-99.9 ÷ 999.0
Lt	**204**	lowest Pr1 peak temperature.	N	1	-99.9 ÷ 999.0
Ht	**205**	highest Pr1 peak temperature	N	1	-99.9 ÷ 999.0
	206	Control mode	N		0=off 1=temp. contr. 2=defrost 3= post-defrost
	207	Alarms state (part one)	N		b0: not used b1: 1 = Pr1 overrange(E1) b2: 1 = Pr1 underrange(-E1) b3: 1 = Pr2 overrange(E2) b4: 1 = Pr2 underrange (-E2) b5: 1 = Pr3 overrange(E3) b6: 1 = Pr3 underrange (-E3) b7: 1 = Pr4 overrange(E4) b8: 1 = Pr4 underrange (-E4) b9: 1 = High temp. alarm H1 b10: 1 = Low temp. alarm L1 b11: 1 = High temp. alarm H2 b12: 1 = Low temp. alarm L2 b13: not used b14: 1 = AL alarm b15: 1 = PrA alarm
DT0	**208**	First reference dynamic defrost	N	1	-99.9 ÷ 999.0
DTn	**209**	Last reference dynamic defrost	N	1	-99.9 ÷ 999.0
	20A	Phase temperatures detection Dynamic Defrost	N		
	20B	Number Reductions performed dynamic defrost	N	0	0 256
	20C	Time to start defrost cycle	N	0	0 .... 5989 min.
	20D	Digital input 1	S		0 = OFF 1 = ON
	20E	minutes-seconds clock	N	2	0.00 ÷ 59.59 (min.sec)
	20F	day of week - hour clock	N	2	0.00 ÷ 7.23 (day.hrs)
ot	**210**	Temperature control output	S		0 = OFF 1 = ON
dF	**211**	Defrost output (1)	S		0 = OFF 1 = ON
d2	**212**	Defrost output (2)	S		0 = OFF 1 = ON
Fn	**213**	Fan output	S		0 = OFF 1 = ON
Au	**214**	Auxiliary output	S		0 = OFF 1 = ON
At	**215**	Silenceable alarm output	S		0 = OFF 1 = ON
AL	**216**	Not silenceable alarm output	S		0 = OFF 1 = ON
HE	**217**	HE heating output	S		0 = OFF 1 = ON
	218	Temperature control output request (without delays)	S		0 = OFF 1 = ON
	219	Fan output request (without delays)	S		0 = OFF 1 = ON
	21A	"Turbo" Cycle request	S		0 = OFF 1 = ON
	21B	Defrost cycle request	S		0 = OFF 1 = ON
	21C	End defrost cycle request	S		0 = OFF 1 = ON
	21D	Auxiliary output request	S		0 = OFF 1 = ON
	21E	Fan switch off when door is open	S		0 = OFF 1 = ON
	21F	Temperature control output (ot) switch off when door is open	S		0 = OFF 1 = ON
	220	Door open	S		0 = OFF 1 = ON
	221	Defrost display lock (for TVRY)	S		0 = OFF 1 = ON
	222	Outputs switch off by digital input alarm	S		0 = OFF 1 = ON
	223	Temperature control output (ot) switch off by digital input alarm	S		0 = OFF 1 = ON
	224	Temperature control outputs (ot and HE) switch off by alarm	S		0 = OFF 1 = ON
Pr1	**225**	Pr1 temperature	N	1	-99.9 ÷ 999.0
Pr2	**226**	Pr2 temperature	N	1	-99.9 ÷ 999.0
Pr3	**227**	Pr3 temperature	N	1	-99.9 ÷ 999.0
Pr4	**228**	Pr4 temperature	N	1	-99.9 ÷ 999.0
di1	**229**	Digital input 1	S		0 = OFF 1 = ON

di2	**22A**	Digital input 2	S		0 = OFF 1 = ON
di3	**22B**	Digital input 3	S		0 = OFF 1 = ON
di4	**22C**	Digital input 4	S		0 = OFF 1 = ON
Out1	**22D**	Output 1	S		0 = OFF 1 = ON
Out2	**22E**	Output 2	S		0 = OFF 1 = ON
Out3	**22F**	Output 3	S		0 = OFF 1 = ON
Out4	**230**	Output 4	S		0 = OFF 1 = ON
	231	Alarms state (part two)	N		b0: 1 = HP alarm b1: 1 = LP alarm b2: 1 = delay at power on (od) b3: 1 = opened door alarm (oP) b4: 1 = allarme HACCP alarm in progress b5..b15: not used
	232	HACCP Alarm Recording Disabled	S		0 = OFF 1 = ON
	233	"Eco" mode in progress	S		0 = OFF 1 = ON
	234	"Turbo" mode in progress	S		0 = OFF 1 = ON

Irregular conditions of the process variables are shown as special values of the measurement :

irregular condition	Returned value to relative address	Display Error
The probe may be in short circuit	-10000	**-E**
The probe may be interrupted	10000	**E**
overflow (A/D conv.)	10001	
Variable not available	10003	**---**

3.2 - COMMANDS AREA

The controls of the instrument include the commands that can be made from the keyboard of the instrument in order to perform special actions or functions.
The data are for writing and reading.

Add. HEX	Description	Data Type	Range (writing)	Range (reading)
280	"Turbo" mode	S	1 = Start "turbo" cycle 0 = Stop "turbo" cycle	0 = "turbo" cycle not in progress 1 = "turbo cycle in progress
281	Start Defrost Cycle	S	1 = Start defrost 0 = Stop defrost	0 = defrost cycle not in progress 1 = defrost cycle in progress
282	Stop Defrost Cycle	S	1 = Stop defrost 0 = Start defrost	0 = defrost cycle in progress 1 = defrost cycle not in progress
283	Aux output	S	1 = Switch on Aux output 0 = Switch off Aux output	0 = Aux output off 1 = Aux output on
284	Stand-by	S	1 = Stand-by 0 = Switch on the instrument	0 = Instr. on cond. 1 = Stand-by cond.
285	Switch on	S	1 = Switch on the instrument 0 = Stand-by	0 = Stand-by cond. 1 = Instr. on cond.
286	Reset Low peak memory (Lt)	S	1 = Reset Lt	0
287	Reset High peak memory (Ht)	S	1 = Reset Ht	0
288	Alarm silencing	S	1 = Alarm silencing	0
289				
28A				
28B	Switch to "Eco" mode	S	1 = Switch to "Eco" mode 0 = Switch to normal mode	0 = Normal mode 1 = "Eco" mode in progress
28C	Enable/Disable HACCP Alarm Recording	S	1 = Enable HACCP Alarm Recording 0 = Disable HACCP Alarm Recording	0 = HACCP Alarm Recording Disabled 1 = HACCP Alarm Recording Enabled
28D	Reset recorded HACCP alarms	S	1 = Reset recorded HACCP alarms	0

3.3 - OPERATING AND CONFIGURATION PARAMETERS AREA

The operating and configuration parameters can be read and written through serial communication.
If one tries to read or write a parameter not available for a certain instrument configuration, a message of error is displayed : data not available. (6).
After have written into the parameters zone, it's necessary to start the **CHECKSUM** calculation, writing any value at the address HEX **0500**.

Par.	Add. HEX	Description	Data Type	n. dec	Range	Notes
S.LS	**2800**	Minimum Set Point	N	1	-99.9 ÷ S.HS	
S.HS	**2801**	Maximum Set Point	N	1	S.LS ÷ 999	
SP	**2802**	Set Point	N	1	S.LS ÷ S.HS	
SPE	**2803**	Eco Set Point	N	1	SP ÷ S.HS	
SPH	**2804**	"Turbo" Set Point (or ind. Heating Set Point mod. HC)	S		S.LS ÷ SP	
i.SE	**2805**	Probes Type Pt = PTC nt = NTC P1 = Pt1000	S		nt / Pt / P1	nt = 0 Pt = 1 P1 = 2
i.uP	**2806**	Unit of measurement and resolution (decimal point) C0 = °C with 1° res. F0 = °F with 1° res. C1 =°C with 0,1° res. F1 = °F with 0,1° res.	N	1	C0 / F0 / C1 / F1	C0 = 0 F0 = 1 C1 = 2 F1 = 3
i.Ft	**2807**	Measurement filter	N	1	oF ÷ 20.0 sec	oF = 0
i.C1	**2808**	Pr1 Probe Calibration	N	1	-30.0 ÷ 30.0 °C/°F	
i.C2	**2809**	Pr2 Probe Calibration	N	1	-30.0 ÷ 30.0 °C/°F	
i.C3	**280A**	Pr3 Probe Calibration	N	1	-30.0 ÷ 30.0 °C/°F	
i.C4	**280B**	Pr4 Probe Calibration	N	1	-30.0 ÷ 30.0 °C/°F	
i.CU	**280C**	Measure offset on the display	N	1	-30.0 ÷ 30.0 °C/°F	
i.P2	**280D**	Pr2 input function: oF = No function EP = Evaporator (1) Au = Aux cd = condenser 2E = Evaporator2	S		oF / EP / Au / cd / 2E	oF = 0 EP = 1 Au = 2 cd = 3 2E = 4
i.P3	**280E**	Pr3 input function: oF = No function EP = Evaporator (1)	S		oF / EP / Au / cd / 2E / dG	oF = 0 EP = 1 Au = 2 cd = 3

		Au = Aux cd = condenser 2E = Evaporator2 dG = digital input				2E = 4 dG = 5
i.P4	**280F**	Pr3 input function: see i.P3	S		oF / EP / Au / cd / 2E / dG	
i.1F	**2810**	Function and function logic of digital input di1: 0 = No function 1= Door open 2= Door open with fan stop 3= Door open with fan and compressor stop 4= External “AL” alarm 5= External “AL” alarm with deactivation of control outputs 6=Selection of active Set Point (SP-SPE) 7= Switch on/ off (Stand - by) 8= “Turbo" cycle activation 9= Remote command of AUX output 10= Disable recording of HACCP alarms 11= Reset of HACCP alarms 12= External "PrA" alarm 13= External “HP” alarm 14= External “LP” alarm 15= Forcing events Switch on/ off (Stand - by) 16= Start Defrost 17= Stop Defrost	N	0	-17 / -16/ -15 / -14 / -13 / -12 / -11 / -10 / -9 / -8 / -7 / -6 / -5 / -4 / -3 / -2 / -1 / 0 / 1 / 2 / 3 / 4 / 5 / 6 / 7 / 8 / 9 / 10 / 11 / 12 / 13 / 14 / 15 /16 /17	
i.1t	**2811**	Delay in acquiring digital input di1	N	2	oF/ 0.01 ÷ 99.59 99.59 (min.sec.)	oF = 0
i.2F	**2812**	Function and function logic of digital input di2: see i.1F	N	0	-17 ... 0 ... 17	
i.2t	**2813**	Delay in acquiring digital input di2	N	2	oF/ 0.01 ÷ 99.59 99.59 (min.sec.)	oF = 0
i.3F	**2814**	Function and function logic of digital input Pr3 : see i.1F	N	0	-17 ... 0 ... 17	
i.4F	**2815**	Function and function logic of digital input Pr4 : see i.1F	N	0	-17 ... 0 ... 17	
i.Et	**2816**	Delay to Eco mode with door closed oF = No function	N	2	oF/ 0.01 ÷ 99.59 99.59 (hrs.min.)	oF = 0
i.tt	**2817**	Time-out ECO mode. oF = No function	N	2	oF/ 0.01 ÷ 99.59 99.59 (hrs.min.)	oF = 0
i.dS	**2818**	Variable visualized normally on display: P1 = meas. probe Pr1 P2 = meas. probe Pr2 P3 = meas. probe Pr3 P4 = meas. probe Pr4 Ec = Pr1 in normal mode, Eco in Eco mode SP= Active Set Point rE = No function oF = Display off	S		P1 / P2 / P3 / P4 / Ec / SP / rE / oF	P1 = 0 P2 = 1 P3 = 2 P4 = 3 Ec = 4 SP = 5 rE = 6 oF = 7
d.dt	**2819**	Defrosting Type: EL= Electrical heating/stop. compr. in= hot gas/reverse cycle no= without compr. output condictioning Et= Electrical heating with evaporator temperature control	S		EL / in / no / Et	EL = 0 in = 1 no = 2 Et = 3
d.dC	**281A**	Defrosting starting mode: rt = real time intervals ct = “ot” output on time intervals cS = defrost every “ot” switching off (+ rt intervals) cL = by real time clock	S		rt / ct / cS / cL	rt = 1 ct = 2 cS = 3 cL = 0
d.di	**281B**	Defrosting interval	N	2	oF/ 0.01 ÷ 99.59 (hrs.min.)	oF = 0
d.Sd	**281C**	Delay first defrost after power-on (oF = Defrost at power-on)	N	2	oF/ 0.01 ÷ 99.59 (hrs.min.)	oF = 0
d.dd	**281D**	Dynamic Defrost Percentage reduction	N	0	0 ÷ 100 %	
d.dE	**281E**	Lenght (max.) of defrost cycle (evap. 1)	N	2	oF/ 0.01 ÷ 99.59 (min.sec.)	oF = 0
d.dL	**281F**	Defrost display Lock oF= display free on= Lock on temperature Pr1 before defrost Lb= Lock on label “dEF” (during defrosting) and “PdF” (during post-defrosting)	S		oF - on - Lb	oF = 0 on = 1 Lb = 2
d.tE	**2820**	Defrost stop temperature (evap. 1)	N	1	- 99.9 ÷ 999.0°C/°F	
d.Ei	**2821**	Defrosting interval for evaporator probe error	N	2	oF/ 0.01 ÷ 99.59 99.59 (hrs.min.)	oF = 0
d.EE	**2822**	Lengh of defrost cycle for evaporator probe error	N	2	oF/ 0.01 ÷ 99.59 99.59 (min.sec.)	oF = 0
d.tS	**2823**	Defrost enable temperature	N	1	- 99.9 ÷ 999.0°C/°F	
d.tF	**2824**	Defrost start temperature	N	1	- 99.9 ÷ 999.0°C/°F	
d.St	**2825**	Ritardo avvio sbrinamento per temperatura evaporatore	N	2	oF/ 0.01 ÷ 99.59 99.59 (min.sec.)	
d.cd	**2826**	Delay start Defrost by continuous	N	2	oF/ 0.01 ÷	oF = 0

		compressor running time			99.59 99.59 (hrs.min.)	
d.td	**2827**	Compressor delay after defrost (drainage time)	N	2	oF/ 0.01 ÷ 99.59 99.59 (min.sec.)	
d.d2	**2828**	Lenght (max.) of defrost cycle evaporator2	N	2	oF/ 0.01 ÷ 99.59 99.59 (min.sec.)	
d.t2	**2829**	Defrost stop temperature evaporator2	N	1	- 99.9 ÷ 999.0°C/°F	
r.d	**282A**	Differential (Hysteresis)	N	1	0.0 ÷ 30.0 °C/°F	
r.Ed	**282B**	Differential (Hysteresis) in Eco mode	N	1	0.0 ÷ 30.0 °C/°F	
r.Hd	**282C**	Differential (Hysteresis) in "turbo" mode or Heating HC mode.	N	1	0.0 ÷ 30.0 °C/°F	
r.t1	**282D**	Output activation time for probe error	N	2	oF/ 0.01 ÷ 99.59 99.59 (min.sec.)	oF = 0
r.t2	**282E**	Output deactivation time for probe error	N	2	oF/ 0.01 ÷ 99.59 99.59 (min.sec.)	oF = 0
r.HC	**282F**	Output operating mode: H= Heating C= Cooling nr = Neutral Zone HC =Neutral Zone with ind. Set point C3 = Cooling with 3 aut. switch modes	S		H / C / nr / HC / C3	H = 0 C = 1 nr = 2 HC = 3 C3 = 4
r.tC	**2830**	Lengh of "turbo" cycle	N	2	oF/ 0.01 ÷ 99.59 99.59 (hrs.min.)	oF = 0
F.tn	**2831**	Fan time activation with ot output (compressor) off	N	2	oF/ 0.01 ÷ 99.59 (min.sec.)	oF = 0
F.tF	**2832**	Fan time deactivation with ot output (compressor) off	N	2	oF/ 0.01 ÷ 99.59 (min.sec.)	oF = 0
F.FL	**2833**	High temperature fan deactivation	N	1	- 99.9 ÷ 999.0°C/°F	
F.LF	**2834**	Low temperature fan deactivation	N	1	- 99.9 ÷ 999.0°C/°F	
F.dF	**2835**	Differential fan control	N	1	0.0 ÷ 30.0 °C/°F	
F.FE	**2836**	Fan status during defrost	S		oF / on	oF = 0 on = 1
F.Fd	**2837**	Fan delay after defrost	N	2	oF/ 0.01 ÷ 99.59 (min.sec.)	oF = 0
P.P1	**2838**	Output "ot" delay at switch on	N	2	oF/ 0.01 ÷ 99.59 (min.sec.)	oF = 0
P.P2	**2839**	Output "ot" delay after switch off	N	2	oF/ 0.01 ÷ 99.59 (min.sec.)	oF = 0
P.P3	**283A**	Output "ot" delay between switching-on	N	2	oF/ 0.01 ÷ 99.59 (min.sec.)	oF = 0
P.od	**283B**	Delay outputs at power on	N	2	oF/ 0.01 ÷ 99.59 (min.sec.)	oF = 0
A.y1	**283C**	Temperature alarms 1 Type: 1 =Pr1 absolute with label (H - L) 2 =Pr1 Relative with label (H - L) 3 = "Au" absolute with label (H - L) 4 ="Au" Relative with label (H - L) 5 = "cd" absolute with label (H - L) 6 = Pr1 absolute without label 7 = Pr1 relative without label 8 = "Au" absolute without label 9 = "Au" relative without label 10 = "cd" absolute without label	N	0	1 / 2 / 3 / 4 / 5 / 6 / 7 / 8 / 9 / 10	
A.H1	**283D**	High temperature Alarm 1 threshold	N	1	oF / -99.9 ÷ 999.0 °C/°F	oF = -100.0
A.L1	**283E**	Low temperature Alarm 1 threshold	N	1	oF / -99.9 ÷ 999.0 °C/°F	oF = -100.0
A.d1	**283F**	Alarms A.H1 and A.L1 Hysteresis)	N	1	0.0 ÷ 30.0 °C/°F	
A.t1	**2840**	Alarms A.H1 and A.L1 delay	N	2	oF/ 0.01 ÷ 99.59 (min.sec.)	oF = 0
A.P1	**2841**	Temperature Alarms 1 delay at power on	N	2	oF/ 0.01 ÷ 99.59 99.59 (hrs.min.)	oF = 0
A.A1	**2842**	Alarms H1 e L1 actions 0 = no actions 1 = activate alarm outputs 2 = disable control outputs (ot e HE) but not activate alarm outputs 3 = disable control outputs (ot e HE) and activate alarm outputs	N		0 / 1 / 2 / 3	
A.y2	**2843**	Temperature alarms 2 Type see "A.y1"	N	0	1 / 2 / 3 / 4 / 5 / 6 / 7 / 8 / 9 / 10	
A.H2	**2844**	High temperature Alarm 2 threshold	N	1	oF / -99.9 ÷ 999.0 °C/°F	oF = -100.0
A.L2	**2845**	Low temperature Alarm 2 threshold	N	1	oF / -99.9 ÷ 999.0 °C/°F	oF = -100.0
A.d2	**2846**	Alarms A.H2 and A.L2 Hysteresis)	N	1	0.0 ÷ 30.0 °C/°F	
A.t2	**2847**	Alarms A.H2 and A.L2 delay	N	2	oF/ 0.01 ÷ 99.59 (min.sec.)	oF = 0
A.P2	**2848**	Temperature Alarms 2 delay at power on	N	2	oF/ 0.01 ÷ 99.59 99.59 (hrs.min.)	oF = 0
A.A2	**2849**	Alarms H2 e L2 actions 0 = no actions 1 = activate alarm outputs 2 = disable control outputs (ot e HE) but not activate alarm outputs 3 = disable control outputs (ot e HE) and activate alarm outputs	N		0 / 1 / 2 / 3	
A.dA	**284A**	Temperature Alarms 1 delay after defrost, and unlock display delay after defrost	N	2	oF/ 0.01 ÷ 99.59 (hrs.min.)	oF = 0
A.oA	**284B**	Alarm delay with door open	N	2	oF/ 0.01 ÷ 99.59 (min.sec.)	oF = 0
A.r1	**284C**	A.H1 and A.L1 delay to be recorded as an HACCP alarm (se =oF gli allarmi non sono mai	N	2	oF/ 0.01 ÷ 99.59 (min.sec.)	oF = 0

		registrati come HACCP)				
A.r2	**284D**	A.H2 and A.L2 delay to be recorded as an HACCP alarm (=oF HACCP rec. disable)	N	2	oF/ 0.01 ÷ 99.59 (min.sec.)	oF = 0
A.bo	**284E**	Black out alarm delay to be recorded as an HACCP alarm (=oF HACCP rec. disable)	N	2	oF/ 0.01 ÷ 99.59 (min.sec.)	oF = 0
A.di	**284F**	Digital input alarm AL delay to be recorded as an HACCP alarm (=oF HACCP rec. disable)	N	2	oF/ 0.01 ÷ 99.59 (min.sec.)	oF = 0
o.o1	**2850**	OUT1 function: oF= No function ot= Temperature control (compressor) dF=Defrosting(1) Fn= fan Au= Auxiliary At/-t= Silenceable alarm AL/-L= Not silenceable Alarm An/-n= Memorised alarm on = on when instrument switch on HE= Heating (Neutral zone control) 2d = Defrosting 2 L1 = light with economy mode (on with “SP” and off with “SPE”) L2 = internal light (off with door closed and on with door opened)	S		oF/ot/dF/ Fn/Au/At/ AL/An/ -t/ -L/ -n/on/HE/2d/ L1/L2	oF = 0 ot = 1 dF =2 Fn = 3 Au = 4 At = 5 AL = 6 An = 7 -t = 8 -L = 9 -n = 10 on = 11 HE = 12 2d = 13 L1 = 14 L2 = 15
o.o2	**2851**	OUT2 function: see “o.o1”	S		oF/ot/dF/ Fn/Au/At/ AL/An/ -t/ -L/ -n/on/HE/2d/ L1/L2	see “o1”
o.o3	**2852**	OUT3 function: see “o.o1”	S		oF/ot/dF/ Fn/Au/At/ AL/An/ -t/ -L/ -n/on/HE/2d/ L1/L2	see “o1”
o.o4	**2853**	OUT4 function: see “o.o1”	S		oF/ot/dF/ Fn/Au/At/ AL/An/ -t/ -L/ -n/on/HE/2d/ L1/L2	see “o1”
o.bu	**2854**	Buzzer function mode oF = disable 1 = active alarms only 2 = key pressed only 3 = active alarms and key pressed	S	0	oF / 1 / 2 / 3	oF = 0
o.Fo	**2855**	Function mode auxiliary output: oF= No Function 1= control output “ot” delayed 2= manual activation by key or digital input.	N	0	oF / 1 / 2	oF = 0
o.tu	**2856**	Time relative to auxiliary output	N	2	oF/ 0.01 ÷ 99.59 (min.sec.)	oF = 0
t.UF	**2857**	Function mode key U: oF= No function 1= Auxiliary output command 2= Norm. / Eco mode Selection 3= Switch on/off (Stand-by) 4= “Turbo” cycle command 5 = Manual Switch on/off (Stand-by) when set by clock 6= HACCP Alarms Reset 7= HACCP Alarms rec. disable/enable	N	0	oF / 1 / 2 / 3 / 4 / 5 / 6 / 7	oF = 0
t.Fb	**2858**	Function mode key Down/Aux: see “t.UF”	N	0	oF / 1 / 2 / 3 / 4 / 5 / 6 / 7	oF = 0
t.Lo	**2859**	Keyboard lock function delay	N	2	oF/ 0.01 ÷ 30.00 (min.sec.)	oF = 0
t.Ed	**285A**	Set Visibility with fast procedure by key P: oF = None 1 = SP 2 = SPE 3 = SP e SPE 4 = Active SP 5 = SP and SPH 6 = SP, SPE and SPH	N	0	oF / 1 / 2 / 3 / 4 / 5 / 6	oF = 0
t.PP	**285B**	Access Password to parameter functions	N	0	oF ÷ 999	oF = 0
t.HA	**285C**	HACCP Alarms Parameters level 1 = protected parameters 2 = unprotected parameters	N	0	1 / 2	
t.AS	**285D**	MODBUS Station address (for serial communication)	N	0	0 ÷ 255	
	285E	*not used*				
	285F	*not used*				
	2860	*not used*				
	2861	*not used*				
c.CL	**2862**	Current time and current day of the week: h = hour n = min. d = day of the week *(d.1 = Monday ... d.7 = Sunday)* d.oF = clock disable			h. = 0 ÷ 23 n. = 0 ÷ 59 d. = oF/ 1 ÷ 7	b0..b4 = ore. b5..b10 = min. b11...14 = daysi (0=oF) b15 = not used.
c.dt	**2863**	Current date: y = year M = month d = date			y. = 10 ÷ 99 M. = 0 ÷ 12 d. = 1 ÷ 31	b0..b6 = year b7..b10 = month b11...15 = date
c.01	**2864**	Hour Event 1 h = hour n = min. d = day of the week			h. = 0 ÷ 23 n. = 0 ÷ 59 d. = oF/ 1 ÷ 11	b0..b4 = hour b5.b10 = min.

		(d.1 = Monday ... d.7 = Sunday d. 8 = every day d. 9 = from Monday to Friday d.10 = from Monday to Saturday d.11 = Sat. and Sun. d.oF = no day (event disabled)				b11...14 = day (0=oF) b15 = not used
c.02	**2865**	Hour Event 2			see hour "c.01"	see hour "c.01"
c.03	**2866**	Hour Event 3			see hour "c.01"	see hour "c.01"
c.04	**2867**	Hour Event 4			see hour "c.01"	see hour "c.01"
c.05	**2868**	Hour Event 5			see hour "c.01"	see hour "c.01"
c.06	**2869**	Hour Event 6			see hour "c.01"	see hour "c.01"
c.07	**286A**	Hour Event 7			see hour "c.01"	see hour "c.01"
c.08	**286B**	Hour Event 8			see hour "c.01"	see hour "c.01"
c.09	**286C**	Hour Event 9			see hour "c.01"	see hour "c.01"
c.10	**286D**	Hour Event 10			see hour "c.01"	see hour "c.01"
c.11	**286E**	Hour Event 11			see hour "c.01"	see hour "c.01"
c.12	**286F**	Hour Event 12			see hour "c.01"	see hour "c.01"
c.13	**2870**	Hour Event 13			see hour "c.01"	see hour "c.01"
c.14	**2871**	Hour Event 14			see hour "c.01"	see hour "c.01"
H.01	**2872**	Stored Alarm n. 1			(In reading = 0, In writing always responds OK but takes no action)	
H.02	**2873**	Stored Alarm n. 2			see "H.01"	
H.03	**2874**	Stored Alarm n. 3			see "H.01"	
H.04	**2875**	Stored Alarm n. 4			see "H.01"	
H.05	**2876**	Stored Alarm n. 5			see "H.01"	
H.06	**2877**	Stored Alarm n. 6			see "H.01"	
H.07	**2878**	Stored Alarm n. 7			see "H.01"	
H.08	**2879**	Stored Alarm n. 8			see "H.01"	
H.09	**287A**	Stored Alarm n. 9			see "H.01"	
H.10	**287B**	Stored Alarm n. 10			see "H.01"	
H.dL	**287C**	Number of HACCP alarms deleted because exceeded			see "H.01"	
c.01	**287D**	Event 1 type *t.1 = Switch on t.2 = Stand-by t.3 = Switch on Aux output t.4 = Switch off Aux output t.5 = Start defrost t.6 = Switch to Eco mode (SPE) t.7 = Switch to normal mode (SP)*	N		1 ÷ 7	
c.02	**287E**	Event 2 type	N		1 ÷ 7	
c.03	**287F**	Event 3 type	N		1 ÷ 7	
c.04	**2880**	Event 4 type	N		1 ÷ 7	
c.05	**2881**	Event 5 type	N		1 ÷ 7	
c.06	**2882**	Event 6 type	N		1 ÷ 7	
c.07	**2883**	Event 7 type	N		1 ÷ 7	
c.08	**2884**	Event 8 type	N		1 ÷ 7	
c.09	**2885**	Event 9 type	N		1 ÷ 7	
c.10	**2886**	Event 10 type	N		1 ÷ 7	
c.11	**2887**	Event 11 type	N		1 ÷ 7	
c.12	**2888**	Event 12 type	N		1 ÷ 7	
c.13	**2889**	Event 13 type	N		1 ÷ 7	
c.14	**288A**	Event 14 type	N		1 ÷ 7	

3.4 - EVENTS THAT CAN BE PROGRAMMED TO OCCUR AT DEFINED TIMES AREA

In this area are sorted in single word the programmable event data in the X34 instruments.
The events of the instrument can be read and written.

Par.	Add. HEX	Description	Data Type	n. dec	Range	Notes
c.01	**2C00**	hour prog. event 1	N	0	0 ÷ 23	
c.01	**2C01**	min. prog. event 1	N	0	0 ÷ 59	
c.01	**2C02**	day prog. event 1	N	0	0 ÷ 11	
c.01	**2C03**	type prog. event 1	N	0	1 ÷ 7	
c.02	**2C04**	hour prog. event 2	N	0	0 ÷ 23	
c.02	**2C05**	min. prog. event 2	N	0	0 ÷ 59	
c.02	**2C06**	day prog. event 2	N	0	0 ÷ 11	
c.02	**2C07**	type prog. event 2	N	0	1 ÷ 7	
c.03	**2C08**	hour prog. event 3	N	0	0 ÷ 23	
c.03	**2C09**	min. prog. event 3	N	0	0 ÷ 59	
c.03	**2C0A**	day prog. event 3	N	0	0 ÷ 11	
c.03	**2C0B**	type prog. event 3	N	0	1 ÷ 7	
c.04	**2C0C**	hour prog. event 4	N	0	0 ÷ 23	
c.04	**2C0D**	min. prog. event 4	N	0	0 ÷ 59	
c.04	**2C0E**	day prog. event 4	N	0	0 ÷ 11	
c.04	**2C0F**	type prog. event 4	N	0	1 ÷ 7	
c.05	**2C10**	hour prog. event 5	N	0	0 ÷ 23	
c.05	**2C11**	min. prog. event 5	N	0	0 ÷ 59	
c.05	**2C12**	day prog. event 5	N	0	0 ÷ 11	
c.05	**2C13**	type prog. event 5	N	0	1 ÷ 7	
c.06	**2C14**	hour prog. event 6	N	0	0 ÷ 23	
c.06	**2C15**	min. prog. event 6	N	0	0 ÷ 59	
c.06	**2C16**	day prog. event 6	N	0	0 ÷ 11	
c.06	**2C17**	type prog. event 6	N	0	1 ÷ 7	
c.07	**2C18**	hour prog. event 7	N	0	0 ÷ 23	
c.07	**2C19**	min. prog. event 7	N	0	0 ÷ 59	
c.07	**2C1A**	day prog. event 7	N	0	0 ÷ 11	
c.07	**2C1B**	type prog. event 7	N	0	1 ÷ 7	
c.08	**2C1C**	hour prog. event 8	N	0	0 ÷ 23	
c.08	**2C1D**	min. prog. event 8	N	0	0 ÷ 59	
c.08	**2C1E**	day prog. event 8	N	0	0 ÷ 11	
c.08	**2C1F**	type prog. event 8	N	0	1 ÷ 7	
c.09	**2C20**	hour prog. event 9	N	0	0 ÷ 23	
c.09	**2C21**	min. prog. event 9	N	0	0 ÷ 59	
c.09	**2C22**	day prog. event 9	N	0	0 ÷ 11	
c.09	**2C23**	type prog. event 9	N	0	1 ÷ 7	
c.10	**2C24**	hour prog. event 10	N	0	0 ÷ 23	
c.10	**2C25**	min. prog. event 10	N	0	0 ÷ 59	
c.10	**2C26**	day prog. event 10	N	0	0 ÷ 11	
c.10	**2C27**	type prog. event 10	N	0	1 ÷ 7	
c.11	**2C28**	hour prog. event 11	N	0	0 ÷ 23	
c.11	**2C29**	min. prog. event 11	N	0	0 ÷ 59	
c.11	**2C2A**	day prog. event 11	N	0	0 ÷ 11	
c.11	**2C2B**	type prog. event 11	N	0	1 ÷ 7	
c.12	**2C2C**	hour prog. event 12	N	0	0 ÷ 23	
c.12	**2C2D**	min. prog. event 12	N	0	0 ÷ 59	
c.12	**2C2E**	day prog. event 12	N	0	0 ÷ 11	
c.12	**2C2F**	type prog. event 12	N	0	1 ÷ 7	
c.13	**2C30**	hour prog. event 13	N	0	0 ÷ 23	
c.13	**2C31**	min. prog. event 13	N	0	0 ÷ 59	
c.13	**2C32**	day prog. event 13	N	0	0 ÷ 11	
c.13	**2C33**	type prog. event 13	N	0	1 ÷ 7	

c.14	**2C34**	hour prog. event 14	N	0	0 ÷ 23	
c.14	**2C35**	min. prog. event 14	N	0	0 ÷ 59	
c.14	**2C36**	day prog. event 14	N	0	0 ÷ 11	
c.14	**2C37**	type prog. event 14	N	0	1 ÷ 7	

3.5 - CALENDAR CLOCK AREA

In this area are sorted in single word data real-time clock of the X34 family instruments.
The data of calendar clock of the instrument can be read and written.

Par.	Add. HEX	Description	Data Type	n. dec	Range	Notes
c.dt	**2D00**	Year	N	0	0 ÷ 99	
c.dt	**2D01**	Month	N	0	1 ÷ 12	
c.dt	**2D02**	Date	N	0	1 ÷ 31	
c.CL	**2D03**	Day of the week	N	0	1 ÷ 7	
c.CL	**2D04**	Hour	N	0	0 ÷ 23	
c.CL	**2D05**	Minutes	N	0	0 ÷ 59	
	2D06	Seconds	N	0	0 ÷ 59	

3.6 - STORED DATA HACCP ALARMS AREA

In this area, are sorted the HACCP alarm data of X34 instruments.
The HACCP data can only be read .
If the alarm is not stored all addresses for alarm be set to the value 10003.

Par.	Add. HEX	Description	Data Type	n. dec	Range	Notes
H.01	**2E00**	Stored Alarm n. 1: *A. = Alarm type*	N	0	0 ÷ 5	0= H1 1=L1 2=H2 3=L2 4=bo 5=AL
H.01	**2E01**	Stored Alarm n. 1: *y.= start year*	N	0	00 ÷ 99	
H.01	**2E02**	Stored Alarm n. 1: *M.= start month*	N	0	1 ÷ 12	
H.01	**2E03**	Stored Alarm n. 1: *d.= start date*	N	0	1 ÷ 31	
H.01	**2E04**	Stored Alarm n. 1: *h. = start hour*	N	0	0 ÷ 23	
H.01	**2E05**	Stored Alarm n. 1: *n. = start min.*	N	0	0 ÷ 59	
H.01	**2E06**	Stored Alarm n. 1: *E. = duration(hrs)*	N	0	0 ÷ 99	
H.01	**2E07**	Stored Alarm n. 1: *e. = duration (min.)*	N	0	0 ÷ 59	
H.01	**2E08**	Stored Alarm n. 1: *_= peak max./min. (critical temp.) °C/°F*	N	1	- 99.9 ÷ 999.0	
H.02	**2E09**	Stored Alarm n. 2: *A. = Alarm type*	N	0	0 ÷ 5	
H.02	**2E0A**	Stored Alarm n. 2: *y.= start year*	N	0	0 ÷ 99	
H.02	**2E0B**	Stored Alarm n. 2: *M.= start month*	N	0	1 ÷ 12	
H.02	**2E0C**	Stored Alarm n. 2: *d.= start date*	N	0	1 ÷ 31	
H.02	**2E0D**	Stored Alarm n. 2: *h. = start hour*	N	0	0 ÷ 23	
H.02	**2E0E**	Stored Alarm n. 2: *n. = start min.*	N	0	0 ÷ 59	
H.02	**2E0F**	Stored Alarm n. 2: *E. = duration(hrs)*	N	0	0 ÷ 99	
H.02	**2E10**	Stored Alarm n. 2: *e. = duration (min.)*	N	0	0 ÷ 59	
H.02	**2E11**	Stored Alarm n. 2: *_= peak max./min. (critical temp.) °C/°F*	N	1	- 99.9 ÷ 999.0	
H.03	**2E12**	Stored Alarm n. 3: *A. = Alarm type*	N	0	0 ÷ 5	
H.03	**2E13**	Stored Alarm n. 3: *y.= start year*	N	0	0 ÷ 99	
H.03	**2E14**	Stored Alarm n. 3: *M.= start month*	N	0	1 ÷ 12	
H.03	**2E15**	Stored Alarm n. 3: *d.= start date*	N	0	1 ÷ 31	
H.03	**2E16**	Stored Alarm n. 3: *h. = start hour*	N	0	0 ÷ 23	
H.03	**2E17**	Stored Alarm n. 3: *n. = start min.*	N	0	0 ÷ 59	
H.03	**2E18**	Stored Alarm n. 3: *E. = duration(hrs)*	N	0	0 ÷ 99	
H.03	**2E19**	Stored Alarm n. 3: *e. = duration (min.)*	N	0	0 ÷ 59	
H.03	**2E1A**	Stored Alarm n. 3: *_= peak max./min. (critical temp.) °C/°F*	N	1	- 99.9 ÷ 999.0	
H.04	**2E1B**	Stored Alarm n. 4: *A. = Alarm type*	N	0	0 ÷ 5	
H.04	**2E1C**	Stored Alarm n. 4: *y.= start year*	N	0	0 ÷ 99	
H.04	**2E1D**	Stored Alarm n. 4: *M.= start month*	N	0	1 ÷ 12	
H.04	**2E1E**	Stored Alarm n. 4: *d.= start date*	N	0	1 ÷ 31	
H.04	**2E1F**	Stored Alarm n. 4: *h. = start hour*	N	0	0 ÷ 23	
H.04	**2E20**	Stored Alarm n. 4: *n. = start min.*	N	0	0 ÷ 59	
H.04	**2E21**	Stored Alarm n. 4: *E. = duration(hrs)*	N	0	0 ÷ 99	
H.04	**2E22**	Stored Alarm n. 4: *e. = duration (min.)*	N	0	0 ÷ 59	
H.04	**2E23**	Stored Alarm n. 4: *_= peak max./min. (critical temp.) °C/°F*	N	1	- 99.9 ÷ 999.0	
H.05	**2E24**	Stored Alarm n. 5: *A. = Alarm type*	N	0	0 ÷ 5	
H.05	**2E25**	Stored Alarm n. 5: *y.= start year*	N	0	0 ÷ 99	
H.05	**2E26**	Stored Alarm n. 5: *M.= start month*	N	0	1 ÷ 12	
H.05	**2E27**	Stored Alarm n. 5: *d.= start date*	N	0	1 ÷ 31	
H.05	**2E28**	Stored Alarm n. 5: *h. = start hour*	N	0	0 ÷ 23	
H.05	**2E29**	Stored Alarm n. 5: *n. = start min.*	N	0	0 ÷ 59	
H.05	**2E2A**	Stored Alarm n. 5: *E. = duration(hrs)*	N	0	0 ÷ 99	
H.05	**2E2B**	Stored Alarm n. 5: *e. = duration (min.)*	N	0	0 ÷ 59	
H.05	**2E2C**	Stored Alarm n. 5: *_= peak max./min. (critical temp.) °C/°F*	N	1	- 99.9 ÷ 999.0	
H.06	**2E2D**	Stored Alarm n. 6: *A. = Alarm type*	N	0	0 ÷ 5	
H.06	**2E2E**	Stored Alarm n. 6: *y.= start year*	N	0	0 ÷ 99	
H.06	**2E2F**	Stored Alarm n. 6: *M.= start month*	N	0	1 ÷ 12	

H.06	**2E30**	Stored Alarm n. 6: *d.= start date*	N	0	1 ÷ 31	
H.06	**2E31**	Stored Alarm n. 6: *h. = start hour*	N	0	0 ÷ 23	
H.06	**2E32**	Stored Alarm n. 6: *n. = start min.*	N	0	0 ÷ 59	
H.06	**2E33**	Stored Alarm n. 6: *E. = duration(hrs)*	N	0	0 ÷ 99	
H.06	**2E34**	Stored Alarm n. 6: *e. = duration (min.)*	N	0	0 ÷ 59	
H.06	**2E35**	Stored Alarm n. 6: *_= peak max./min. (critical temp.) °C/°F*	N	1	- 99.9 ÷ 999.0	
H.07	**2E36**	Stored Alarm n. 7: *A. = Alarm type*	N	0	0 ÷ 5	
H.07	**2E37**	Stored Alarm n. 7: *y.= start year*	N	0	0 ÷ 99	
H.07	**2E38**	Stored Alarm n. 7: *M.= start month*	N	0	1 ÷ 12	
H.07	**2E39**	Stored Alarm n. 7: *d.= start date*	N	0	1 ÷ 31	
H.07	**2E3A**	Stored Alarm n. 7: *h. = start hour*	N	0	0 ÷ 23	
H.07	**2E3B**	Stored Alarm n. 7: *n. = start min.*	N	0	0 ÷ 59	
H.07	**2E3C**	Stored Alarm n. 7: *E. = duration(hrs)*	N	0	0 ÷ 99	
H.07	**2E3D**	Stored Alarm n. 7: *e. = duration (min.)*	N	0	0 ÷ 59	
H.07	**2E3E**	Stored Alarm n. 7: *_= peak max./min. (critical temp.) °C/°F*	N	1	- 99.9 ÷ 999.0	
H.08	**2E3F**	Stored Alarm n. 8: *A. = Alarm type*	N	0	0 ÷ 5	
H.08	**2E40**	Stored Alarm n. 8: *y.= start year*	N	0	0 ÷ 99	
H.08	**2E41**	Stored Alarm n. 8: *M.= start month*	N	0	1 ÷ 12	
H.08	**2E42**	Stored Alarm n. 8: *d.= start date*	N	0	1 ÷ 31	
H.08	**2E43**	Stored Alarm n. 8: *h. = start hour*	N	0	0 ÷ 23	
H.08	**2E44**	Stored Alarm n. 8: *n. = start min.*	N	0	0 ÷ 59	
H.08	**2E45**	Stored Alarm n. 8: *E. = duration(hrs)*	N	0	0 ÷ 99	
H.08	**2E46**	Stored Alarm n. 8: *e. = duration (min.)*	N	0	0 ÷ 59	
H.08	**2E47**	Stored Alarm n. 8: *_= peak max./min. (critical temp.) °C/°F*	N	1	- 99.9 ÷ 999.0	
H.09	**2E48**	Stored Alarm n. 9: *A. = Alarm type*	N	0	0 ÷ 5	
H.09	**2E49**	Stored Alarm n. 9: *y.= start year*	N	0	0 ÷ 99	
H.09	**2E4A**	Stored Alarm n. 9: *M.= start month*	N	0	1 ÷ 12	
H.09	**2E4B**	Stored Alarm n. 9: *d.= start date*	N	0	1 ÷ 31	
H.09	**2E4C**	Stored Alarm n. 9: *h. = start hour*	N	0	0 ÷ 23	
H.09	**2E4D**	Stored Alarm n. 9: *n. = start min.*	N	0	0 ÷ 59	
H.09	**2E4E**	Stored Alarm n. 9: *E. = duration(hrs)*	N	0	0 ÷ 99	
H.09	**2E4F**	Stored Alarm n. 9: *e. = duration (min.)*	N	0	0 ÷ 59	
H.09	**2E50**	Stored Alarm n. 9: *_= peak max./min. (critical temp.) °C/°F*	N	1	- 99.9 ÷ 999.0	
H.10	**2E51**	Stored Alarm n. 10: *A. = Alarm type*	N	0	0 ÷ 5	
H.10	**2E52**	Stored Alarm n. 10: *y.= start year*	N	0	0 ÷ 99	
H.10	**2E53**	Stored Alarm n. 10: *M.= start month*	N	0	1 ÷ 12	
H.10	**2E54**	Stored Alarm n. 10: *d.= start date*	N	0	1 ÷ 31	
H.10	**2E55**	Stored Alarm n. 10: *h. = start hour*	N	0	0 ÷ 23	
H.10	**2E56**	Stored Alarm n. 10: *n. = start min.*	N	0	0 ÷ 59	
H.10	**2E57**	Stored Alarm n. 10: *E. = duration(hrs)*	N	0	0 ÷ 99	
H.10	**2E58**	Stored Alarm n. 10: *e. = duration (min.)*	N	0	0 ÷ 59	