eliwell

ID 985/E LX
Modbus Serial Communication Protocol

1 SUMMARY

2   MODBUS FUNCTIONS AND RESOURCES

Modbus is a client/server communication protocol for communication between devices connected on a *network*.
Modbus devices communicate using a master-slave technique in which only one device (the master) can send queries. The other *network* devices (slaves) respond by supplying the data requested by the master or by taking the action requested in the query. A slave is any device connected to the *network* that processes information and sends its output to the master using the Modbus protocol.
Masters can *address* individual slaves or send broadcast messages to the entire *network* (broadcast), whereas slaves only return a response to queries from masters addressed to them individually.
The Modbus standard used by Eliwell uses the RTU protocol for data transmission.

2.1   Data format (RTU)

The code model used defines the structure of the messages transmitted on the *network* and the way this information is decoded. The type of code is usually selected according to specific parameters (baud rate, parity, etc...), Some devices only support certain code models but the same one must be used for all the devices connected to a Modbus *network*.
The protocol uses the RTU binary method with the bytes containing:
8 data bits, configurable parity bit (see parameter **PtY**, *default* value= none),
1 configurable stop bit (see parameter **StP**, *default* value = 1b)

NOTE: the baud rate must be set to 9600 bauds.

Parameters can be set so that the <u>*device*</u> is fully configurable
Parameters can be changed from the:
- device keyboard
- Copy Card
- by sending the data via the ModBus protocol straight to a single device or by sending a broadcast message using *address* 0 (broadcast *address*)
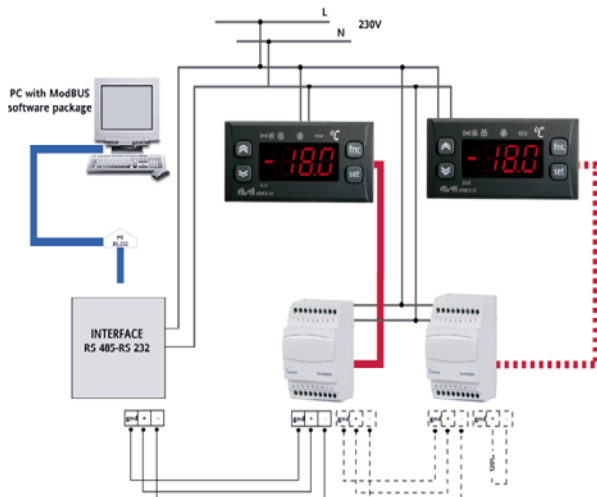
2.2   Network

Diagram of Modbus connection to multi-unit

PC/Interface connection	RS232 cable
Device/Bus Adapter connection	5-path connector TTL cable (30cm) (other sizes/lengths available)
Bus Adapter	BA150
Bus Adapter/Interface connection	RS485 cable shielded and twisted (e.g.: Belden cable model 8762)

2.3 Modbus functions available and data areas

Modbus command	Description of command
3	Reading multiple registers A maximum of 60 consecutive registers can be read. **Parameters belonging to two different non-consecutive blocks cannot be read using a single command.**
16	Writing multiple registers A maximum of 60 consecutive registers can be written.
43	Reading instrument ID.

	The following fields can be read: *Field code*	*Field description*
	0	Manufacturer ID(="Invensys")
	1	Instrument model ID (="0028_0402")
	2	Instrument version ID (="00E2_0001")

2.4 Address configuration

The device *address* in a ModBus message comprises one byte and consists of the family code and the device code, indicated by dBA, made up of parameters FAA and dEA respectively.
The Device *Address* therefore consists of two nibbles:
- **dEA:** low nibble
- **FAA:** high nibble

To calculate the *address* using parameters FAA and dEA:
$$dBA = FAA \times 16 + dEA$$

For example: *address* 01 00 (dEA=00; FAA=01)

Address 0 is used for broadcast queries that are recognized by all the slaves. Slaves do not respond to broadcast queries.

DEVICE CONFIGURATION PARAMETERS				
Par.	Description		Value	Limits
FAA	Family serial *address*		0	0...14
dEA	Serial *address* of device		1	0...14
PtY	Setting parity bits (none, Even, odd)		n	n=none, E=Even, o=odd
Stp	Setting stop bits (1b,2b)		2b	1b 2b
Note: If parameters **PtY** and **Stp** are changed, the controller must be turned off and then on again after they are changed to operate correctly.				

2.5 Address tables

2.5.1 Description of parameters

The *address tables* contain the necessary read, write and decode information for each single resource accessible in the device.
There are two tables:
- the **parameter** table contains all the device configuration parameters stored in the non-volatile memory of the device.
- the *client table* includes all the I/O and alarm status resources available in the volatile memory of the device.

Description of columns:

INDEX | For the **parameter** table this value represents the order in which the parameter is displayed in the device menu. For the *client table* this value is not significant.

FOLDER | This indicates the *folder* in which the **parameter** can be seen. The values have the following meanings:

Value	
0	Parameter not visible
1	Parameter visible at level 1 of menu, You can access the parameters in this level once you have typed Password 1 into the device
2	Parameter visible at level 2 of menu, You can access the parameters in this level once you have typed Password 2 into the device

3	Parameter visible at both menu levels

LABEL Indicates the *label* used to display the **parameters** in the device menu.

ADDRESS The whole part represents the MODBUS register *address* containing the value of the resource to read or write in the instrument. The value after the comma indicates the position of the most significant bit of the data in the register; if it is not stated, it equals zero. This information is always provided when the register contains more than one data element and it is important to understand which bits actually represent the data element (the size of the data indicated in the *DATA SIZE* column is also considered). Since Modbus registers are the size of one WORD (16 bits), the *index* after the comma can vary from 0 (least significant bit –LSb–) to 15 (most significant bit –MSb–).
Examples (in binary representation the least significant bit is the rightmost bit)

ADDRESS	Register contents	*DATA SIZE*	Value
8806	1350 (0000010101000110)	WORD	1350
8806	1350 (000001010**1000110**)	Byte	70
8806,8	1350 (**00000101**01000110)	Byte	5
8806,14	1350 (0**0**00010101000110)	1 bits	0
8806,7	1350 (00000**1010**1000110)	4 bits	10

Please note: when the register contains more than one data element, proceed as follows for the write operation:
- read the current value of the register
- modify the bits that represent the relevant resource
- write the register

R/W Indicates the possibility of reading or writing the resource:

    R   the resource is read only
    W   the resource is write only
    RW   the resource is read/write

DATA SIZE Indicates size of the data in bits.

    WORD =   16 bits
    Byte   =   8 bits
    "n" bit =   0...15 bits depending on "n"

CPL When "Y" is indicated, the value read by the register requires conversion because the value represents a number with a sign. In other instances, the value is always positive or null.
For the conversion, see below:
    if the value of the register is between 0 and 32767, the result is the value itself (zero and positive values)
    if the value of the register is between 32768 and 65535, the result is the value of the register - 65536 (negative values)

RANGE This describes the *range* of values permitted for the parameter. It can be correlated with other device parameters (indicated with parameter *label*).

DEFAULT Indicates the factory set value for the standard model of the device.

EXP This is the multiplier *index* that must be applied to convert the value read by the register to the values indicated in the *RANGE* and *DEFAULT* column to convert them into the final values based on the unit of measurement indicated in the *M.U.* column.
The multiplier is calculated using the exponential function with base 10 and the exponent indicated in the *EXP* column. When not indicated, its value is 0. Valid values are as below:

Value		Corresponding multiplier	
-2	=	10^{-2}	(0,01)
-1	=	10^{-1}	(0,1)
0	=	10^{0}	(1)
1	=	10^{1}	(10)
2	=	10^{2}	(100)

M.U. Unit of measurement of values when converted according to the rules indicated in columns *CPL* and *EXP*.

2.5.2   **Table of parameters**

INDEX	FOLDER	LABEL	ADDRESS	R/W	DESCRIPTION	DATA SIZE	CPL	RANGE	DEFAULT
1		Set	6178	RW	Set point	WORD	Y	LSE … HSE	0
2	3	diF	6146	RW	Operating differential	WORD		1 … 300	20
3	3	HSE	6180	RW	Maximum settable Set point value	WORD	Y	LSE … 3020	50
4	3	LSE	6182	RW	Minimum settable Set point value	WORD	Y	-580 … HSE	-5
5	2	OSP	6148	RW	Set point offset	WORD	Y	-300 … 300	0
7	2	Cit	6715	RW	Minimum compressor output activation time	BYTE		0 … 250	0
8	2	CAt	6716	RW	Maximum compressor output activation time	BYTE		0 … 250	0
9	3	Ont	6719	RW	Compressor output ON time if control probe faulty	BYTE		0 … 250	0
10	3	OFt	6720	RW	Compressor output OFF time if control probe faulty	BYTE		0 … 250	1
11	3	dOn	6721	RW	Delay in activating compressor output after start-up.	BYTE		0 … 250	0
12	3	dOF	6722	RW	Delay in activating compressor output after shut-down.	BYTE		0 … 250	0
13	3	dbi	6723	RW	Delay between two consecutive switch-ons of compressor output	BYTE		0 … 250	0
14	3	OdO	6724	RW	Output in activating output after power-on	BYTE		0 … 250	0
15	3	dtY	6725	RW	Type of defrost	BYTE		0 … 2	0
16	3	dit	6771	RW	Interval between defrosts	BYTE		0 … 250	6
17	2	dt1	6726	RW	Unit of measurement for defrost times	BYTE		0 … 2	0
18	2	dt2	6727	RW	Unit of measurement for duration of defrosting	BYTE		0 … 2	1
19	3	dCt	6728	RW	Defrosting time count mode	BYTE		0 … 3	1
20	3	dOH	6729	RW	Delay in activating defrost cycle after start-up	BYTE		0 … 59	0
21	3	dEt	6730	RW	Defrost time out	BYTE		1 … 250	30
22	3	dSt	6150	RW	End of defrost temperature	WORD	Y	-500 … 1500	80
23	3	dE2	6877	RW	Defrost time out 2nd evaporator	BYTE		1 … 250	30
24	3	dS2	6366	RW	End of defrost temperature 2nd evaporator	WORD	Y	-500 … 1500	80
25	3	dPO	6731	RW	Defrost activation request after power-on	BYTE		0 … 1	0
26	2	tcd	6152	RW	Compressor output activation/deactivation time before defrosting	WORD	Y	-31 … 31	0
27	2	Cod	6732	RW	Time before defrosting during which the compressor output is not activated	BYTE		0 … 60	0
28	2	FPt	6733	RW	FSt parameter mode (absolute or relative)	BYTE		0 … 1	0
29	3	FSt	6154	RW	Evaporator fan shut-down temperature	WORD	Y	-500 … 1500	20
30	2	Fot	6156	RW	Evaporator fan start-up temperature	WORD	Y	-500 … 1500	-5
31	3	FAd	6158	RW	Evaporator fan operating differential.	WORD		10 … 500	20
32	3	Fdt	6734	RW	Delay in enabling evaporator fans after defrost cycle	BYTE		0 … 250	0
33	3	dt	6735	RW	Dripping time	BYTE		0 … 250	0
34	3	dFd	6736	RW	Exclusion of evaporator fans during defrost cycle	BYTE		0 … 1	1

INDEX	FOLDER	LABEL	ADDRESS	R/W	DESCRIPTION	DATA SIZE	CPL	RANGE	DEFAULT
35	3	FCO	6737	RW	Status of evaporator fans when compressor output OFF	BYTE		0 … 2	1
36	2	Fod	6738	RW	Status of evaporator fans when door is open	BYTE		0 … 1	0
37	2	FdC	6739	RW	Delay in shut down of evaporator fans after compressor is disabled	BYTE		0 … 99	0
38	2	Fon	6740	RW	Time evaporator fans are ON in duty cycle mode	BYTE		0 … 99	0
39	2	FoF	6741	RW	Time evaporator fans are OFF in duty cycle mode	BYTE		0 … 99	0
40	2	SCF	6370	RW	Condenser fan activation set point	WORD	Y	-500 … 1500	10
41	2	dCF	6372	RW	Condenser fan operating differential.	WORD	Y	-300 … 300	20
42	2	tCF	6886	RW	Condenser fan start-up delay after defrosting	BYTE		0 … 59	0
43	2	dCd	6887	RW	exclusion of condenser fans during defrosting	BYTE		0 … 1	1
44	2	Att	6744	RW	HAL and LAL parameter modes (absolute or relative)	BYTE		0 … 1	0
45	3	AFd	6160	RW	alarm differential	WORD		10 … 500	20
46	3	HAL	6184	RW	Maximum alarm threshold	WORD	Y	LAL … 1500	50
47	3	LAL	6186	RW	Minimum alarm threshold	WORD	Y	-500 … HAL	-5
48	3	PAO	6745	RW	alarm excluded at power on	BYTE		0 … 10	0
49	3	dAO	6162	RW	Temperature alarm exclusion time after defrost cycle	WORD		0 … 999	0
50	2	OAO	6746	RW	High and low temperature alarm exclusion time after door is closed	BYTE		0 … 10	0
51	2	tdO	6747	RW	Alarm exclusion time when door is open	BYTE		0 … 250	0
52	3	tAO	6748	RW	Temperature alarm signal delay time	BYTE		0 … 250	0
53	2	dAt	6749	RW	Alarm signal for defrost ended timed out	BYTE		0 … 1	0
54	2	rLO	6750	RW	External alarm disables controllers	BYTE		0 … 1	0
55	2	AOP	6751	RW	Polarity of alarm output	BYTE		0 … 1	1
57	2	PbA	6776	RW	Probe enabled for temperature alarm signalling (probe 1 and/or 3)	BYTE		0 … 3	0
58	2	SA3	6196	RW	Alarm set point for 3rd probe	WORD	Y	-500 … 1500	50
59	2	dA3	6198	RW	Alarm differential 3rd probe	WORD	Y	-300 … 300	20
60	2	dSd	6780	RW	Light relay enable from door switch	BYTE		0 … 1	1
61	2	dLt	6781	RW	Delay in switching off of light relay after door is closed	BYTE		0 … 31	0
62	2	OFL	6782	RW	switching off of cell light button-enabled during delay set in parameter dLt	BYTE		0 … 1	0
63	2	dOd	6717	RW	load switching off enabled when door switch is switched on	BYTE		0 … 1	0
64	2	dAd	6718	RW	Delay in enabling digital inputs	BYTE		0 … 255	0
65	2	dOA	6889	RW	FORCED behaviour from digital input	BYTE		0 … 3	0
66	2	PEA	6890	RW	enables forced behaviour from digital input	BYTE		0 … 3	0
67	2	dCO	6891	RW	delay in enabling compressor after activation of digital input	BYTE		0 … 250	0
68	2	dFO	6892	RW	delay in enabling fans after activation of digital input	BYTE		0 … 250	0

INDEX	FOLDER	LABEL	ADDRESS	R/W	DESCRIPTION	DATA SIZE	CPL	RANGE	DEFAULT
69	2	L00	6860	RW	Selection of Master, Slave, Echo	BYTE		0 … 7	0
70	2	L01	6861	RW	Number of Slaves in *network*(refers to Master)	BYTE		0 … 7	0
71	2	L02	6862	RW	Presence of local Echoes referring to single slave	BYTE		0 … 2	0
72	2	L03	6863	RW	Simultaneous or sequential defrosting	BYTE		0 … 1	0
73	2	L04	6864	RW	Distributed display (refers to slave)	BYTE		0 … 1	1
74	2	L05	6865	RW	Activation of *network* functions	BYTE		0 … 1	0
75	2	L06	6866	RW	Locked Resources at end of defrosting	BYTE		0 … 1	1
76	3	dEA	6742	RW	Device *address*	BYTE		0 … 14	1
77	3	FAA	6743	RW	Family *address*	BYTE		0 … 14	0
78	3	Pty	6893	RW	Modbus Parity Bit	BYTE		0 … 2	0
79	3	StP	6894	RW	Modbus Stop Bit	BYTE		0 … 1	1
80	3	LOC	6753	RW	Keyboard lock enabled	BYTE		0 … 1	0
81	3	PA1	6783	RW	Password 1 value	BYTE		0 … 250	0
82	1	PA2	6784	RW	Password 2 value	BYTE		0 … 250	0
83	3	ndt	6754	RW	Display with decimal point	BYTE		0 … 1	0
84	3	CA1	6164	RW	Cell probe calibration	WORD	Y	-120 … 120	0
85	3	CA2	6166	RW	Calibration of evaporator probe	WORD	Y	-120 … 120	0
86	3	CA3	6168	RW	Calibration of probe	WORD	Y	-120 … 120	0
87	2	CAI	6755	RW	Intervention of calibration	BYTE		0 … 2	2
88	2	LdL	6170	RW	Minimum value that can be displayed	WORD	Y	-550 … HdL	-5
89	2	HdL	6172	RW	Maximum value that can be displayed	WORD	Y	LdL … 3020	14
90	3	ddL	6756	RW	Locked Resources at end of defrosting	BYTE		0 … 2	1
91	3	Ldd	6777	RW	Time out for display lock after end of defrosting	BYTE		0 … 255	0
92	3	dro	6786	RW	°C or °F selection	BYTE		0 … 1	0
93	2	ddd	6757	RW	Display of fundamental state	BYTE		0 … 3	1
94	3	Ero	6888	RW	Display on eco	BYTE		1 … 4	1
95	3	H00	6785	RW	Selection of NTC/PTC type of analogue input	BYTE		0 … 1	1
96	2	H02	6758	RW	Time for activation of functions from keyboard	BYTE		0 … 15	5
97	2	H06	6778	RW	Aux/light button or Digital Input active when instrument is off	BYTE		0 … 1	1
98	2	H08	6779	RW	Operating mode on stand-by	BYTE		0 … 2	2
99	2	H11	6174	RW	Configurability and polarity digital input 1	WORD	Y	-9 … 9	0
100	2	H12	6200	RW	Configurability and polarity digital input 2	WORD	Y	-9 … 9	0
101	2	H21	6759	RW	Digital output 1 configurability	BYTE		0 … 10	1

INDEX	FOLDER	LABEL	ADDRESS	R/W	DESCRIPTION	DATA SIZE	CPL	RANGE	DEFAULT
102	2	H22	6760	RW	Digital output 2 configurability	BYTE		0 ... 10	2
103	2	H23	6761	RW	Digital output 3 configurability	BYTE		0 ... 10	3
104	2	H24	6762	RW	Digital output 4 configurability	BYTE		0 ... 10	4
106	2	H31	6764	RW	UP button configurability	BYTE		0 ... 8	1
107	2	H32	6765	RW	DOWN button configurability	BYTE		0 ... 8	0
108	2	H33	6766	RW	ESC button configurability	BYTE		0 ... 8	0
109	2	H40	6767	RW	inversion of ST1 with ST2 enabled	BYTE		0 ... 1	0
110	2	H41	6768	RW	Presence of cell probe	BYTE		0 ... 1	1
111	2	H42	6769	RW	Presence of evaporator probe	BYTE		0 ... 1	1
112	2	H43	6770	RW	Presence of 3rd probe	BYTE		0 ... 2	0
113	2	H45	6876	RW	Defrost start-up mode for applications with two evaporators	BYTE		0 ... 2	1
114	2	H48	6867	RW	Presence of RTC	BYTE		0 ... 1	1
115	3	tAb	6176	R	Map code	WORD		0 ... 1999	2
122	2	Pen	6880	RW	Number of errors allowed per maximum/minimum pressure switch input	BYTE		0 ... 15	10
123	2	Pei	6881	RW	Minimum/maximum pressure switch error count time	BYTE		1 ... 99	60
127	1	dE1-H	6788	RW	Hours of start of 1st daily defrost	BYTE		0 ... 24	24
128	1	dE2-H	6789	RW	Hours of start of 2nd daily defrost	BYTE		0 ... 24	24
129	1	dE3-H	6790	RW	Hours of start of 3rd daily defrost	BYTE		0 ... 24	24
130	1	dE4-H	6791	RW	Hours of start of 4th daily defrost	BYTE		0 ... 24	24
131	1	dE5-H	6792	RW	Hours of start of 5th daily defrost	BYTE		0 ... 24	24
132	1	dE6-H	6793	RW	Hours of start of 6th daily defrost	BYTE		0 ... 24	24
133	1	dE7-H	6794	RW	Hours of start of 7th daily defrost	BYTE		0 ... 24	24
134	1	dE8-H	6795	RW	Hours of start of 8th daily defrost	BYTE		0 ... 24	24
135	1	dE1-m	6796	RW	Minutes of start of 1st daily defrost	BYTE		0 ... 59	0
136	1	dE2-m	6797	RW	Minutes of start of 2nd daily defrost	BYTE		0 ... 59	0
137	1	dE3-m	6798	RW	Minutes of start of 3rd daily defrost	BYTE		0 ... 59	0
138	1	dE4-m	6799	RW	Minutes of start of 4th daily defrost	BYTE		0 ... 59	0
139	1	dE5-m	6800	RW	Minutes of start of 5th daily defrost	BYTE		0 ... 59	0
140	1	dE6-m	6801	RW	Minutes of start of 6th daily defrost	BYTE		0 ... 59	0
141	1	dE7-m	6802	RW	Minutes of start of 7th daily defrost	BYTE		0 ... 59	0
142	1	dE8-m	6803	RW	Minutes of start of 8th daily defrost	BYTE		0 ... 59	0
143	1	F1-H	6804	RW	Hours of start of 1st festive defrost	BYTE		0 ... 24	24
144	1	F2-H	6805	RW	Hours of start of 2nd festive defrost	BYTE		0 ... 24	24

INDEX	FOLDER	LABEL	ADDRESS	R/W	DESCRIPTION	DATA SIZE	CPL	RANGE	DEFAULT
145	1	F3-H	6806	RW	Hours of start of 3rd festive defrost	BYTE		0 ... 24	24
146	1	F4-H	6807	RW	Hours of start of 4th festive defrost	BYTE		0 ... 24	24
147	1	F5-H	6808	RW	Hours of start of 5th festive defrost	BYTE		0 ... 24	24
148	1	F6-H	6809	RW	Hours of start of 6th festive defrost	BYTE		0 ... 24	24
149	1	F7-H	6810	RW	Hours of start of 7th festive defrost	BYTE		0 ... 24	24
150	1	F8-H	6811	RW	Hours of start of 8th festive defrost	BYTE		0 ... 24	24
151	1	F1-m	6812	RW	Minutes of start of 1st festive defrost	BYTE		0 ... 59	0
152	1	F2-m	6813	RW	Minutes of start of 2nd festive defrost	BYTE		0 ... 59	0
153	1	F3-m	6814	RW	Minutes of start of 3rd festive defrost	BYTE		0 ... 59	0
154	1	F4-m	6815	RW	Minutes of start of 4th festive defrost	BYTE		0 ... 59	0
155	1	F5-m	6816	RW	Minutes of start of 5th festive defrost	BYTE		0 ... 59	0
156	1	F6-m	6817	RW	Minutes of start of 6th festive defrost	BYTE		0 ... 59	0
157	1	F7-m	6818	RW	Minutes of start of 7th festive defrost	BYTE		0 ... 59	0
158	1	F8-m	6819	RW	Minutes of start of 8th festive defrost	BYTE		0 ... 59	0
159	2	E00_1	6820	RW	Enables functions during events on 1st day	BYTE		0 ... 4	0
160	2	E00_2	6821	RW	Enables functions during events on 2nd day	BYTE		0 ... 4	0
161	2	E00_3	6822	RW	Enables functions during events on 3rd day	BYTE		0 ... 4	0
162	2	E00_4	6823	RW	Enables functions during events on 4th day	BYTE		0 ... 4	0
163	2	E00_5	6824	RW	Enables functions during events on 5th day	BYTE		0 ... 4	0
164	2	E00_6	6825	RW	Enables functions during events on 6th day	BYTE		0 ... 4	0
165	2	E00_7	6826	RW	Enables functions during events on 7th day	BYTE		0 ... 4	0
166	2	E00_ED	6827	RW	Enables functions during events every day	BYTE		0 ... 4	0
167	2	E02_1	6828	RW	Duration of event 1st day	BYTE		0 ... 99	0
168	2	E02_2	6829	RW	Duration of event 2nd day	BYTE		0 ... 99	0
169	2	E02_3	6830	RW	Duration of event 3rd day	BYTE		0 ... 99	0
170	2	E02_4	6831	RW	Duration of event 4th day	BYTE		0 ... 99	0
171	2	E02_5	6832	RW	Duration of event 5th day	BYTE		0 ... 99	0
172	2	E02_6	6833	RW	Duration of event 6th day	BYTE		0 ... 99	0
173	2	E02_7	6834	RW	Duration of event 7th day	BYTE		0 ... 99	0
174	2	E02_ED	6835	RW	Duration of daily event	BYTE		0 ... 99	0
175	2	E03_1	6836	RW	Enables daily or holiday defrosting 1st day	BYTE		0 ... 1	0
176	2	E03_2	6837	RW	Enables daily or holiday defrosting 2nd day	BYTE		0 ... 1	0
177	2	E03_3	6838	RW	Enables daily or holiday defrosting 3rd day	BYTE		0 ... 1	0

INDEX	FOLDER	LABEL	ADDRESS	R/W	DESCRIPTION	DATA SIZE	CPL	RANGE	DEFAULT
178	2	E03_4	6839	RW	Enables daily or holiday defrosting 4th day	BYTE		0 … 1	0
179	2	E03_5	6840	RW	Enables daily or holiday defrosting 5th day	BYTE		0 … 1	0
180	2	E03_6	6841	RW	Enables daily or holiday defrosting 6th day	BYTE		0 … 1	0
181	2	E03_7	6842	RW	Enables daily or holiday defrosting 7th day	BYTE		0 … 1	0
183	2	E01_1-H	6844	RW	Hour of start of event 1st day	BYTE		0 … 23	0
184	2	E01_2-H	6845	RW	Hour of start of event 2nd day	BYTE		0 … 23	0
185	2	E01_3-H	6846	RW	Hour of start of event 3rd day	BYTE		0 … 23	0
186	2	E01_4-H	6847	RW	Hour of start of event 4th day	BYTE		0 … 23	0
187	2	E01_5-H	6848	RW	Hour of start of event 5th day	BYTE		0 … 23	0
188	2	E01_6-H	6849	RW	Hour of start of event 6th day	BYTE		0 … 23	0
189	2	E01_7-H	6850	RW	Hour of start of event 7th day	BYTE		0 … 23	0
190	2	E11-ED-H	6851	RW	Hour of start of event every day	BYTE		0 … 23	0
191	2	E01_1-m	6852	RW	minutes of start of event 1st day	BYTE		0 … 59	0
192	2	E01_2-m	6853	RW	minutes of start of event 2nd day	BYTE		0 … 59	0
193	2	E01_3-m	6854	RW	minutes of start of event 3rd day	BYTE		0 … 59	0
194	2	E01_4-m	6855	RW	minutes of start of event 4th day	BYTE		0 … 59	0
195	2	E01_5-m	6856	RW	minutes of start of event 5th day	BYTE		0 … 59	0
196	2	E01_6-m	6857	RW	minutes of start of event 6th day	BYTE		0 … 59	0
197	2	E01_7-m	6858	RW	minutes of start of event 7th day	BYTE		0 … 59	0
198	2	E11-ED-m	6859	RW	Minutes of start of event every day	BYTE		0 … 59	0

2.5.3 Client Table

INDEX	FOLDER	ADDRESS	R/W	DESCRIPTION	DATA SIZE	CPL	RANGE	DEFAULT
1		**8504**	R	Analogue input 1	WORD	Y	-670 … 3020	0
2		**8506**	R	Analogue input 2	WORD	Y	-670 … 3020	0
3		**8508**	R	Analogue input 3	WORD	Y	-670 … 3020	0
4		**8510**	R	Analogue input 1 (control) 1	WORD	Y	-670 … 3020	0
5		**8512**	R	Analogue input 2 (control) 1	WORD	Y	-670 … 3020	0
6		**8514**	R	Analogue input 3 (control) 1	WORD	Y	-670 … 3020	0
7		**8801,0**	RW	Lights ON	1 bits		0 … 1	0
8		**8801,1**	RW	Lights OFF	1 bits		0 … 1	0
9		**8801,2**	RW	Enables Economy function	1 bits		0 … 1	0
10		**8801,3**	RW	Disables Economy function	1 bits		0 … 1	0
11		**8801,4**	RW	Auxiliary ON	1 bits		0 … 1	0
12		**8801,5**	RW	Auxiliary OFF	1 bits		0 … 1	0
13		**8801,6**	RW	Instrument ON	1 bits		0 … 1	0
14		**8801,7**	RW	Instrument OFF	1 bits		0 … 1	0
15		**8802,0**	RW	Alarm Silencing	1 bits		0 … 1	0
16		**8802,1**	RW	Enabling of Manual Defrost	1 bits		0 … 1	0
17		**8802,2**	RW	Enables RTC writing	1 bits		0 … 1	0
18		**8802,3**	RW	Reset modified parameter flag	1 bits		0 … 1	0
19		**8802,4**	RW	OFF for maintenance	1 bits		0 … 1	0
20		**8548**	RW	Command enabling timeout from serial.	WORD		0 … 65535	0
21		**9009,4**	R	Status of digital input 1	1 bits		0 … 1	0
22		**9009,5**	R	Status of digital input 2	1 bits		0 … 1	0
23		**8814,0**	R	High temperature alarm analogue input 3	1 bits		0 … 1	0
24		**8814,1**	R	Analogue input 1 faulty	1 bits		0 … 1	0
25		**8823,7**	R	Analogue input 2 faulty	1 bits		0 … 1	0
26		**8826,6**	R	Analogue input 3 faulty	1 bits		0 … 1	0
27		**8814,3**	R	Low temperature alarm analogue input 3	1 bits		0 … 1	0
28		**8814,4**	R	External alarm (digital input)	1 bits		0 … 1	0
29		**8814,5**	R	High temperature alarm analogue input 1	1 bits		0 … 1	0
30		**8814,6**	R	Low temperature alarm analogue input 1	1 bits		0 … 1	0

INDEX	FOLDER	ADDRESS	R/W	DESCRIPTION	DATA SIZE	CPL	RANGE	DEFAULT
31		**8814,7**	R	Open door alarm	1 bits		0 … 1	0
32		**8815,0**	R	Clock error	1 bits		0 … 1	0
33		**8815,1**	R	Communication master/slave failed	1 bits		0 … 1	0
34		**8815,2**	R	End of defrost due to time-out	1 bits		0 … 1	0
35		**8815,4**	R	Flat battery alarm	1 bits		0 … 1	0
36		**8815,5**	R	Pressure switch alarm	1 bits		0 … 1	0
37		**8815,6**	R	Pressure switch alarm	1 bits		0 … 1	0
38		**8818,0**	R	Controller reduced set point active	1 bits		0 … 1	0
39		**8818,1**	R	Controller Stand by active	1 bits		0 … 1	0
40		**8818,2**	R	Lights	1 bits		0 … 1	0
41		**8818,4**	R	Auxiliary controller active 1	1 bits		0 … 1	0
42		**8763,4**	R	Relay 1	1 bits		0 … 1	0
43		**8763,3**	R	Relay 2	1 bits		0 … 1	0
44		**8763,2**	R	Relay 3	1 bits		0 … 1	0
45		**8763,1**	R	Relay 4	1 bits		0 … 1	0
46		**8763,0**	R	Relay 5	1 bits		0 … 1	0

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