LUMBUS - Driver for LUMEL Meters
User's Manual

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1. LUMBUS - Driver for LUMEL Meters

1.1. Driver Use

The LUMBUS driver is used for data exchange between RG72 controllers manufactured by Lubuskie Zakłady Aparatów Elektrycznych (Electrical Measuring Instrument Works) "LUMEL" in Zielona Góra and an **asix** system computer. The communication is executed by means of serial interfaces in the RS485 standard.

1.2. Declaration of Transmission Channel

The full syntax of declaration of transmission channel operating according to the LUMBUS protocol is given below:

logical_channel_name=LUMBUS*, number, port, baud*

where:

LUMBUS	- driver name,
number	- controller no. in the network,
port	- port name: COM1, COM2 etc.,
baud	- transmission speed in the range 1200 – 9600 Bd.

By default it is assumed:

- transmission speed 9600 Bd,
- number of character bits - 8,
- without parity check (PARITY NONE),
- number of stop bits - 1.

EXAMPLE

The declaration of the logical channel named CHANNEL, which works according to the LUMBUS driver protocol and exchanges data with the RG72 regulator numbered 1 through the COM2 port with a speed of 4800 Bd, is as follows:

CHANNEL=LUMBUS, 1, COM2, 4800

The LUMBUS driver is loaded as a DLL automatically.

1.3. Addressing the Process Variables

The syntax of symbolic address which is used for variables belonging to the LUMBUS driver channel is as follows:

<*type*><*index*>[.*subindex*]

where:

type - variable type; allowed types:
- P - single measurement,
- PT - table of measurements,
- WT - array of free days,

DT - array of holiday's dates;

index - according to the specification given in point 3 of the *"Serial interface RS-485 in RG7-07/2 controller"* documentation;
for single measures *index* takes the index value assigned to the measurement in the table;
for the values transferred in the form of arrays *index* takes the index value assigned to the array, and the item of the variable under consideration in the array is specified by *subindex*;

subindex - applies to the specification of variables transferred in the form of arrays and determines the variable location in the array; the subindex of the first element in the array takes a value of 0.

The raw value of measure is of FLOAT type.
The raw value of free day and holiday date is an ASCII string in dd.mm.yyyy format ended by zero (including 11 character).

EXAMPLES

Examples of declarations of variables the values of which are transferred individually:

```
X13,  hour of turning on night reduction,    P13,    CHANNEL, 1, 1,  NOTHING_FP
X23,  set temperature c.w.u,                 P23,    CHANNEL, 1, 1,  NOTHING_FP
```

Examples of declarations of variables, the values of which are transferred in form of arrays:

```
X39,  set temperature in control room,       PT38.0,  CHANNEL, 1, 1,  NOTHING_FP
X40,  ext. temp (A) – initial point of curve, PT38.1,  CHANNEL, 1, 1,  NOTHING_FP
X50,  max. allowed temperature of return,    PT48.1,  CHANNEL, 1, 1,  NOTHING_FP
X56,  dead band of c.h.,                     PT52.3,  CHANNEL, 1, 1,  NOTHING_FP

X68,  economies – holidays day 1,            WT67.0,  CHANNEL, 11, 1,
                                             NOTHING_TEXT
X69,  economies – holidays day 2,            WT67.1,  CHANNEL, 11, 1,
                                             NOTHING_TEXT
X70,  economies – holidays day 3,            WT67.2,  CHANNEL, 11, 1,
                                             NOTHING_TEXT

X119, first period of vacation – from,       DT119.0, CHANNEL, 11,
                                             1,NOTHING_TEXT
X120, first period of vacation – from,       DT119.1, CHANNEL, 11,
                                             1,NOTHING_TEXT
X121, second period of vacation – from,      DT121.0, CHANNEL, 11,
                                             1,NOTHING_TEXT
X122, second period of vacation – from,      DT121.1, CHANNEL, 11,
                                             1,NOTHING_TEXT
X123, third period of vacation – from,       DT123.0, CHANNEL, 11,
                                             1,NOTHING_TEXT
X124, third period of vacation – from,       DT123.1, CHANNEL, 11,
                                             1,NOTHING_TEXT
```

1.4. Driver Configuration

The LUMBUS protocol driver may be configured by means of the **[LUMBUS]** section placed in the application INI file. Individual parameters are transferred in separated items of the section. Each item has the following syntax:

item_name=[number [,number]] [YES] [NO]

 ***LOG_FILE=file_name***

Meaning - the item allows to define a file where all diagnostic messages of the LUMBUS driver and the information about the contents of telegrams received by the driver are written. If the item does not define the full path, then the LOG_FILE is created in the current directory. The log file should be used only while the **asix** start-up.

Default value - by default, the log file is not created.

EXAMPLE

LOG_FILE=D:\asix\LUMBUS.LOG

 ***LOG_OF_TELEGRAMS=YES|NO***

Meaning -the item allows to write to the log file (declared by using the item LOG_FILE) the contents of telegrams sent within the communication with the RG72 regulator. Writing the contents of telegrams to the log file should be used only while the **asix** start-up.

Default value - by default, telegrams are not written.

 ***NUMBER_OF_REPETITIONS=number***

Meaning - the item allows to determine a number of repetitions in case of an appearance of transmission error.

Default value - by default, the item assumes a value of 0 (no repetitions).

1.5. List of Symbolic Addresses

See ***Table 1***.

Table 1. List of Symbolic Addresses.

Symb. Address	Index	Designation of Measurements From RG72	Conversion Type	Allowed Operation
P9	9		Word->Float	R
P10	10	f.active	Byte->Float	RW
P11	11	Tpwrt	Word->Float	RW
P12	12	DeltaT	Float->Float	RW
P13	13	night hours	Char->Float	RW
P14	14	day hours	Char->Float	RW
P15	15	free days	Byte->Float	RW
P16	16	temp. of summer	Float->Float	RW
P17	17	l. Days	Char->Float	RW
P18	18	hours Pom	Char->Float	RW
P19	19	Pump	Byte->Float	RW
P20	20	cw_oszcz	Byte->Float	RW
P21	21	Tzew	Byte->Float	RW
P22	22	St.pompa	Byte->Float	RW
P23	23	T.zad.cw	Float->Float	RW
P24	24	Priority	Byte->Float	RW
P25	25	t.prio	Byte->Float	RW
P26	26	t_pwrcwu	Byte->Float	RW
P27	27	t_progcwu	Byte->Float	RW
P28	28	Disinfection	Byte->Float	RW
P29	29	clock mode	Byte->Float	RW
PT31.0	31	Lkan	Char->Float	R
PT31.1	31	selection of curve, Sommer_is	Char->Float	R
P36	36	lock_full	Bit->Float	W
P37	37	lock_part	Bit->Float	W
		co – heating function		
PT38.0	39	T.zad.pk	Float->Float	RW
PT38.1	40	T.zew(A)	Float->Float	RW
PT38.2	41	T.co(A)	Float->Float	RW
PT38.3	42	tg.alfa	Float->Float	RW
PT38.4	43	T.zew(B)	Float->Float	RW
PT38.5	44	tg.beta	Float->Float	RW
PT38.6	45	T.co_max	Float->Float	RW
PT38.7	46	delta_co	Float->Float	RW
P47	47	T.freeze	Float->Float	RW
		co (centr. heat.) – return curve		

Table 2. List of Symbolic Addresses (continuation).

Symb. Address	Index	Designation of Measurements from RG72	Conversion Type	Allowed Operation
PT48.0	49	T.pwr_min	Float->Float	RW
PT48.1	50	T.pwr_max	Float->Float	RW
PT48.2	51	tg (pwrt)	Float->Float	RW
		Pid		
PT52.0	53	xp co	Int->Float	RW
PT52.1	54	ti co	Int->Float	RW
PT52.2	55	td co	Int->Float	RW
PT52.3	56	2N co	Int->Float	RW
PT52.4	57	H co	Int->Float	RW
PT52.5	58	to co	Int->Float	RW
PT52.6	59	tp co	Int->Float	RW
PT52.7	60	xp cw	Int->Float	RW
PT52.8	61	ti cw	Int->Float	RW
PT52.9	62	td cw	Int->Float	RW
PT52.10	63	2N cw	Int->Float	RW
PT52.11	64	H cw	Int->Float	RW
PT52.12	65	to cw	Int->Float	RW
PT52.13	66	tp cw	Int->Float	RW
		Holidays and free days		
WT67.0	68	holidays/free no. 1	Word->ASCII(11)	RW
WT67.1	69	holidays/free no. 2	Word->ASCII(11)	RW
WT67.2	70	holidays/free no. 3	Word->ASCII(11)	RW
WT67.3	71	holidays/free no. 4	Word->ASCII(11)	RW
WT67.4	72	holidays/free no. 5	Word->ASCII(11)	RW
WT67.5	73	holidays/free no. 6	Word->ASCII(11)	RW
WT67.6	74	holidays/free no. 7	Word->ASCII(11)	RW
WT67.7	75	holidays/free no. 8	Word->ASCII(11)	RW
WT67.8	76	holidays/free no. 9	Word->ASCII(11)	RW
WT67.9	77	holidays/free no. 10	Word->ASCII(11)	RW
WT67.10	78	holidays/free no. 11	Word->ASCII(11)	RW
WT67.11	79	holidays/free no. 12	Word->ASCII(11)	RW
WT67.12	80	holidays/free no. 13	Word->ASCII(11)	RW
WT67.13	81	holidays/free no. 14	Word->ASCII(11)	RW
WT67.14	82	holidays/free no. 15	Word->ASCII(11)	RW
WT67.15	83	holidays/free no. 16	Word->ASCII(11)	RW
WT67.16	84	holidays/free no. 17	Word->ASCII(11)	RW
WT67.17	85	holidays/free no. 18	Word->ASCII(11)	RW
WT67.18	86	holidays/free no. 19	Word->ASCII(11)	RW
WT67.19	87	holidays/free no. 20	Word->ASCII(11)	RW

Table 3. List of Symbolic Addresses (continuation).

Symb. Address	Index	Designation of Measurements from RG72	Conversion Type	Allowed Operation
WT67.20	88	holidays/free no. 21	Word->ASCII(11)	RW
WT67.21	89	holidays/free no. 22	Word->ASCII(11)	RW
WT67.22	90	holidays/free no. 23	Word->ASCII(11)	RW
WT67.23	91	holidays/free no. 24	Word->ASCII(11)	RW
WT67.24	92	holidays/free no. 25	Word->ASCII(11)	RW
WT67.25	93	holidays/free no. 26	Word->ASCII(11)	RW
WT67.26	94	holidays/free no. 27	Word->ASCII(11)	RW
WT67.27	95	holidays/free no. 28	Word->ASCII(11)	RW
WT67.28	96	holidays/free no. 29	Word->ASCII(11)	RW
WT67.29	97	holidays/free no. 30	Word->ASCII(11)	RW
WT67.30	98	holidays/free no. 31	Word->ASCII(11)	RW
WT67.31	99	holidays/free no. 32	Word->ASCII(11)	RW
WT67.32	100	holidays/free no. 33	Word->ASCII(11)	RW
WT67.33	101	holidays/free no. 34	Word->ASCII(11)	RW
WT67.34	102	holidays/free no. 35	Word->ASCII(11)	RW
WT67.35	103	holidays/free no. 36	Word->ASCII(11)	RW
WT67.36	104	holidays/free no. 37	Word->ASCII(11)	RW
WT67.37	105	holidays/free no. 38	Word->ASCII(11)	RW
WT67.38	106	holidays/free no. 39	Word->ASCII(11)	RW
WT67.39	107	holidays/free no. 40	Word->ASCII(11)	RW
WT67.40	108	holidays/free no. 41	Word->ASCII(11)	RW
WT67.41	109	holidays/free no. 42	Word->ASCII(11)	RW
WT67.42	110	holidays/free no. 43	Word->ASCII(11)	RW
WT67.43	111	holidays/free no. 44	Word->ASCII(11)	RW
WT67.44	112	holidays/free no. 45	Word->ASCII(11)	RW
WT67.45	113	holidays/free no. 46	Word->ASCII(11)	RW
WT67.46	114	holidays/free no. 47	Word->ASCII(11)	RW
WT67.47	115	holidays/free no. 48	Word->ASCII(11)	RW
WT67.48	116	holidays/free no. 49	Word->ASCII(11)	RW
WT67.49	117	holidays/free no. 50	Word->ASCII(11)	RW
		Holidays and free days		
DT119.0	119	first period of vacation (from)	Int->ASCII(11)	RW
DT119.1	120	first period of vacation (from)	Int->ASCII(11)	RW
DT121.0	121	second period of vacation (from)	Int->ASCII(11)	RW
DT121.1	122	second period of vacation (from)	Int->ASCII(11)	RW
DT123.0	123	third period of vacation (from)	Int->ASCII(11)	RW
DT123.1	124	third period of vacation (from)	Int->ASCII(11)	RW
DT125.0	125	forth period of vacation (from)	Int->ASCII(11)	RW
DT125.1	126	forth period of vacation (from)	Int->ASCII(11)	RW
DT127.0	127	fifth period of vacation (from)	Int->ASCII(11)	RW
DT127.1	128	fifth period of vacation (from)	Int->ASCII(11)	RW
		presence or lack of sensors		

Table 4. List of Symbolic Addresses (continuation).

Symb. Address	Index	Designation of Measurements from RG72	Conversion Type	Allowed Operation
PT129.0	130	sensor 1	Byte->Float	RW
PT129.1	131	sensor 2	Byte->Float	RW
PT129.2	132	sensor 3	Byte->Float	RW
PT129.3	133	sensor 4	Byte->Float	RW
PT129.4	134	sensor 5	Byte->Float	RW
PT129.5	135	sensor 6	Byte->Float	RW
		temperature differences for sensors		
PT136.0	137	sensor 1	Byte->Float	RW
PT136.1	138	sensor 2	Byte->Float	RW
PT136.2	139	sensor 3	Byte->Float	RW
PT136.3	140	sensor 4	Byte->Float	RW
PT136.4	141	sensor 5	Byte->Float	RW
PT136.5	142	sensor 6	Byte->Float	RW
		time of full valve opening		
PT143.0	144		Byte->Float	RW
PT143.1	145		Byte->Float	RW
		start/stop		
PT146.0	147		Byte->Float	RW
PT146.1	148		Byte->Float	RW
		safety codes		
PT149.0	150		Word->Float	RW
PT149.1	151		Word->Float	RW
PT149.2	152		Word->Float	RW
		current time		
PT153.0	154	Year	Byte->Float	RW
PT153.1	155	Month	Byte->Float	RW
PT153.2	156	Day	Byte->Float	RW
PT153.3	157	Hour	Byte->Float	RW
PT153.4	158	Minute	Byte->Float	RW
		sensor error		
PT173.0	174	error of sensor 1	Char->Float	R
PT173.1	175	error of sensor 2	Char->Float	R
PT173.2	176	error of sensor 3	Char->Float	R
PT173.3	177	error of sensor 4	Char->Float	R
PT173.4	178	error of sensor 5	Char->Float	R
PT173.5	179	error of sensor 6	Char->Float	R
		control signal		
PT180.0	181		Float->Float	R
PT180.1	182		Float->Float	R

Table 5. List of Symbolic Addresses (continuation).

Symb. Address	Index	Designation of Measurements from RG72	Conversion Type	Allowed Operation
		measured temperatures		
PT183.0	184	temperature 1	Float->Float	R
PT183.1	185	temperature 2	Float->Float	R
PT183.2	186	temperature 3	Float->Float	R
PT183.3	187	temperature 4	Float->Float	R
PT183.4	188	temperature 5	Float->Float	R
PT183.5	189	temperature 6	Float->Float	R
		alarm data		
PT240.0	241	alarm 1	Float->Float	R
PT240.1	242	alarm 2	Float->Float	R
PT240.2	243	alarm 3	Float->Float	R
		remote control of valve of centr. heat. (co) and heat water (cw)		
PT247.0	248		Char->Float	RW
PT247.1	249		Char->Float	RW
		remote control of pump of co and cw		
PT250.0	251		Char->Float	RW
PT250.1	252		Char->Float	RW
		switching on/off the pump of co and cw		
PT253.0	254		Char->Float	W
PT253.1	255		Char->Float	W
		opening the valve of co and cw		
PT256.0	257		Char->Float	W
PT256.1	258		Char->Float	W
		closing the valve of co, cw		
PT259.0	260		Char->Float	W
PT259.1	261		Char->Float	W
		factory settings		
P262	262		Byte->Float	W
P263	263	fact. settings Co	Byte->Float	W
P264	264	fact. settings Cwu	Byte->Float	W
P265	265	fact. settings Others	Byte->Float	W

2. List of Tables