LUMEL

DATA CONCENTRATOR PD22 TYPE

USER'S MANUAL

CE

Contents:

1. APPLICATION

The PD22 data concentrator is destined for telemetering computer systems as an intermediate element in the data exchange between the object side and the master system.

The data concentrator speeds up the data exchange between devices and the master system. Moreover it allows to increase the number of devices connected to the system.

Two serial ports are used for communication. The first port (Port 1) having two RS-485 interface systems, destined to communicate with devices working in the object. The second port (Port 2) has RS-485, RS-232 C and USB interfaces, destined to communicate with the master system through wire links.

An asynchronous MODBUS character communication protocol has been implemented on the serial link. The concentrator has a real time clock.

Parameter set of the concentrator serial link:

- address 1... 247
- baud rate 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200 bit/s,
- working mode ASCII, RTU,
- information unit ASCII: 8N1, 7E1, 7O1, 7N2
  RTU: 8N2, 8E1, 8O1, 8N1

The data concentrator realises following functions:

- readout of process parameters values from devices which are accessible as concentrator parameters,
- archiving of process data with a defined frequency, which are made available on demand for the master system (390000 records),
- archiving of emergency events (44400 events),
- data exchange consisting in transmission of demands from the master system to the specific device, eg. readout or parameter record.

The exemplary network topology with the use of data concentrators is shown on the Fig.1.

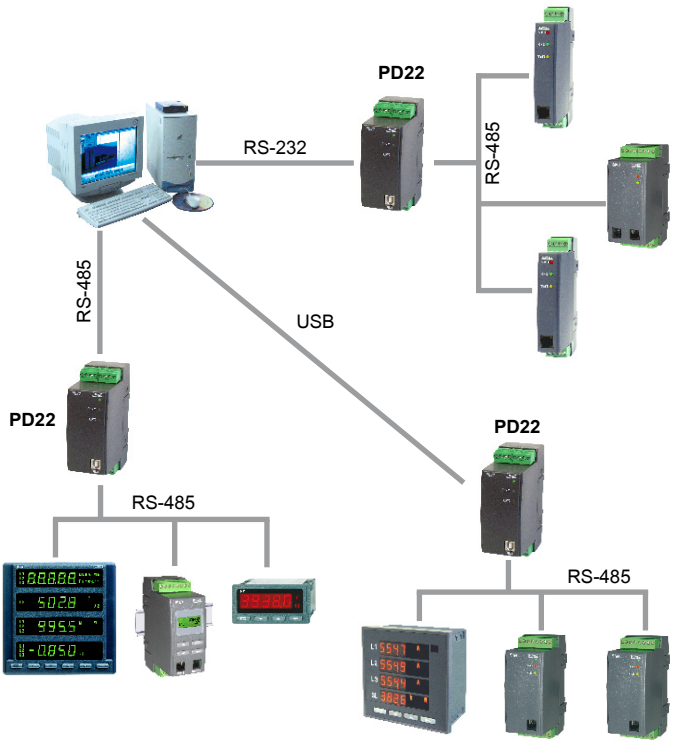


Fig 1 Exemplary network topology with the application of PD22 data concentrators

2. PD22 DATA CONCENTRATOR SET

The PD22 data concentrator set includes:

- PD22 data concentrator ..... 1 pc
- PD22 user's manual ..... 1 pc
- guarantee card ..... 1 pc
- CD diskette with the PD22Wiz configuration program and controllers of the USB port ..... 1 pc

When unpacking the data concentrator, please check whether the type and version code on the data plate correspond to the order code.

3. BASIC REQUIREMENTS, SAFETY SERVICE

Symbols located in this user's manual mean:

WARNING!

Warning of potential, hazardous situations. Especially important. One must acquaint with this before connecting the concentrator. The non-observance of notices marked by these symbols can occasion the damage of the instrument.

CAUTION!

Designates a general useful note. If you observe it, handling of the concentrator is made easier. One must take note of this, when the instrument is working inconsistently to the expectations.

Possible consequences if disregarded!

The removal of the concentrator housing during the guarantee contract period may cause its cancellation.

In the security scope the concentrator meets the requirements of the EN 61010 -1 standard.

Remarks concerning the operator safety service:

- The PD22 converter is destined to be mounted on a 35 mm rail.
- Non-authorized removal of the required housing, inappropriate use, incorrect installation or operation creates the risk of injury to personnel or damage to equipment. For more detailed information please study the User's Manual.
- All operations concerning transport, installation, and commissioning as well as maintenance must be carried out by qualified, skilled personnel and national regulations for the prevention of accidents must be observed.
- According to this basic safety information, qualified, skilled personnel are persons who are familiar with the installation, assembly, commissioning, and operation of the product and who have qualifications necessary for their occupation.
- Before switching the concentrator on, one must check the correctness of connection to the network.
- Do not connect the concentrator to the network through an autotransformer.

4. DESCRIPTION OF THE DESIGN AND INSTALLATION

4.1. Description of the design

The PD21 data concentrator is destined to be fixed on a 35 mm rail support (acc. to EN 60715) in the way showed on the fig. 2.

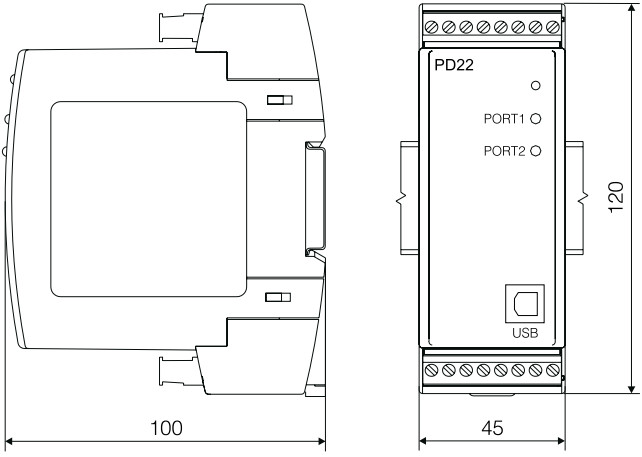


Fig. 2 Fixing way of the PD22 data concentrator

4.2. Terminal description

One must connect the supply and external signals acc. to the fig. 3. Particular leads are described in the table 1.

Notice:

One must take a special note to the correct connection of external signals (see table1).

Na płycie czołowej znajdują się
3 diody sygnalizacyjne:

D1 dioda dwukolorowa

kolor zielony - świecenie ciągłe - sygnalizuje poprawną pracę koncentratora.

kolor zielony - migająca - sygnalizuje pracę w trybie konfiguracji

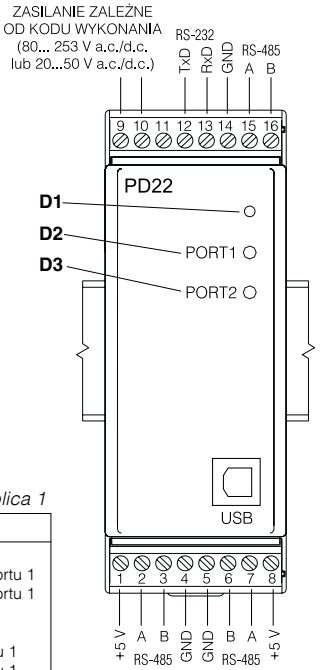
kolor czerwony - sygnalizuje błąd konfiguracji

D2 dioda zielona

sygnalizuje transmisję danych od strony urządzeń typu Slave

D3 dioda żółta

sygnalizuje transmisję danych od strony urządzeń typu Master



Opis wyprowadzeń koncentratora *Tablica 1*

Zacisk	Opis zacisku
1	Wejście +5 V (do polaryzacji magistrali
2	Linia A pierwszego interfejsu RS-485 Portu 1
3	Linia B pierwszego interfejsu RS-485 Portu 1
4	Linia GND interfejsu RS-485 Portu 1
5	Linia GND interfejsu RS-485 Portu 1
6	Linia B drugiego interfejsu RS-485 Portu 1
7	Linia A drugiego interfejsu RS-485 Portu 1
8	Wejście +5 V (do polaryzacji magistrali
9, 10	**Linie zasilania koncentratora**
11	Nie wykorzystane
12	Wyjście TxD interfejsu RS-232 Portu 2
13	Wejście RxD interfejsu RS-232 Portu 2
14	Linia GND interfejsu RS-232 i RS-485 Portu 2
14	Linia A interfejsu RS-485 Portu 2
14	Linia B interfejsu RS-485 Portu 2

Fig.3 Electrical connections of the PD22 data concentrator.

The PD22 data concentrator has two serial ports, the port 1 and the port 2. The Port 1 is destined to communicate with devices of Slave type. Two RS-485 interfaces systems are connected to the Port 1.

The operation of the two systems is identical. Interface systems are electrically connected and galvanically isolated from the remaining system. Interface lines are connected to terminals 1,2,3,4 for the first system, and 5,6,7,8 for the second system.

The port 2 is connected to the RS-232C and RS-485 interface system. The RS-485 interface systems are electrically connected to the port.

The RS-485 bus enables the direct addition up to 32 systems of the RS-485 interface.

The maximal length of the bus depends on the baud rate and includes itself in limits from several tens of meters for high speeds, and up to ca 1200 meters for small speeds, e.g. 9600 bps.

The Port 2 is destined to communicate the concentrator with an external device of Master type. The port 2 is connected to RS-485, RS-232 and USB interface systems.

Interface systems are connected electrically to the port. The RS-485 interface system enables to connect the concentrator to the RS-485 serial bus. Its lines are led out to terminals 14, 15, 16.

RS-232C and USB interfaces are destined to the connection with devices having such interfaces, such as e.g.: computer. Signals of the RS-232 interface are led out on terminals 12, 13, 14. The USB interface is accessible on the concentrator frontal plate.

RS-485, RS-232 and USB interfaces cannot be used simultaneously.

The PD22Wiz program is added to the concentrator on a CD diskette and it is destined for configuration and PD22 service.

4.3. Installation of the COM port for Windows

The USB port for the PD22 concentrator uses controllers FTDIBUS Driver and FTDIPORT Driver licensed by the Future Technology Devices International Ltd. Company.

This software creates in the system, the new USB Serial Converter device and assigned to it Port(Com) - USB Serial Port.

The installation of the controller in the Windows system causes the addition of a successive COM serial port to the list of ports serviced by the operating system.

4.4. Installation of COM port controllers on the computer

On the CD diskette added to the concentrator there are catalogues with controllers for following operating systems:

- WIN_XP: Windows 2000, Windows XP, Windows Vista, Windows Server 2003.
- WIN_XP_64: Windows Vista x64, Windows XP x64, Windows Server 2003 x64.

NOTICE:

Controllers do not co-operate with 98 and ME Windows systems

Installation in systems: Windows 2000, Windows XP, Windows Vista and Windows Server 2003.

In order to install controllers for these systems, one must start the program workable from the catalogue with the controller for the given system:

- WIN_XP\CDM_Setup.exe (for Windows 2000, Windows XP, Windows Vista and Windows Server 2003)
- WIN_XP_64\ CDM_x64_Setup.exe (for Windows XP x64, Windows Vista x64 and Windows Server 2003 x64).

This software will install in the system controllers for new devices and ports.

Next, one must connect the concentrator which will be found and identified by the system as USB Serial Converter and will be assigned a port (COM) for it - USB Serial Port.

4.5. Koncentrator configuration

Before starting concentrator applications, one must set transmission parameters for the port, that means define the network address, baud rate and the transmission mode for the port 2.

Manufacturer settings for these parameters arte as follows:

Address	254
Mode	RTU 8N1
Baud rate	115200 bit/s

In order to perform changes of these settings, one must:

- connect the concentrator by the USB interface with the PC computer,
- turn the concentrator supply on,
- press the push-button of the concentrator configuration (fig.4), untill the green diode begins to flicker signaling the configuration mode.

Start the PD22Wiz program and by its help configure parameters into required.

Exit from the concentrator configuration mode by p[ressing the configuration push-button till the moment as the green diode transits to a continuous lighting, signaling the normal working mode.

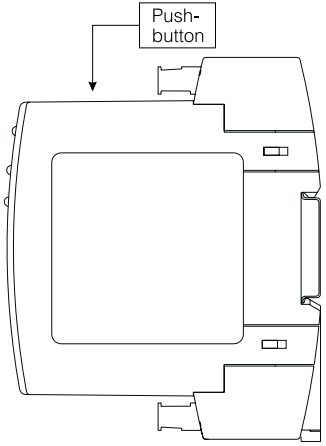


Fig. 4 Location of the push-button to configure the PD22 data concentrator

5. DESCRIPTION OF THE TRANSMISSION PROTOCOL FUNCTIONS

In the PD22 concentrator following protocol functions has been implemented:

Code	Signitication
03	Readout of n-register
06	Record of a single register
16	Record of n-registers
17	Slave device identification

5.1. Read-out of n-registers (code 03)

Demand:

The function enables the readout of values included in registers in being addressed slave device. Registers are 16 or 32-bit units, which can include numerical values bounded with changeable processes, and the like. The demand frame defines the 16-bit start address and the number of registers to readout.

The signification of the register contents with address data can be different for different device types.

The function is not accessible in the broadcast mode.

Example: Readout of 3 registers beginning by the register with 6Bh address.

Address	Function	Register address		Number of registers		Checksum	
		Hi	Lo	Hi	Lo		
11	03	00	6B	00	03	7E	LRC

Answer:

Register data are packed beginning from the smallest address: first the higher byte, then the lower register byte.

Example: the answer frame

Address	Function	Number of bytes	Value in the regist. 107		Value in the regist. 108		Value in the regist. 109		Checksum	
			Hi	Lo	Hi	Lo	Hi	Lo		
11	03	06	02	2B	00	00	00	64	55	LRC

5.2. Record of values into the register (code 06)

Demand:

The function enables the modification of the register contents. It is accessible in the broadcast mode.

Example:

Address	Function	Register address		Value		Checksum	
		Hi	Lo	Hi	Lo		
11	06	00	87	03	9E	C1	LRC

Answer:

The right answer to the demand to record the value into the register is the message retransmission after the operation carrying out.

Example:

Address	Function	Register address		Value		Checksum	
		Hi	Lo	Hi	Lo		
11	06	00	87	03	9E	C1	LRC

5.3. Record into n-registers (code 16)

Demand:

The function is accessible in the broadcast mode. It enables the modification of the register contents.

Example: Record of two registers beginning from the register with the address 136.

Address	Function	Register address		Number of registers		Number of bytes	Data		Data		Check-sum	
		Hi	Lo	Hi	Lo		Hi	Lo	Hi	Lo		
11	10	00	87	00	02	04	00	0A	01	02	45	LRC

Answer:

The correct answer includes the unit slave address, function code, starting address and the number of recorded registers.

Example:

Address	Function	Register address		Number of registers		Checksum	
		Hi	Lo	Hi	Lo		
11	10	00	87	00	02	56	LRC

5.4. Report identifying the device (code 17)

Demand:

This function enables the user to obtain information about the device type, status and configuration depending on this.

Example

Address	Function	Checksum	
11	11	DE	LRC

Answer:

The field „Device identifier" in the answer frame means the unique identifier of this class of devices, however the other fields include parameters depended on this function.

Example concerning the PD21 concentrator

Slave address	Function	Number of bytes	Device identifier	Device state	Checksum
11	11	2	0xAB	FF	

6. ERROR CODES

When the master device is transmitting a demand to the slave device then, except for messages in the broadcast mode, it expects a correct answer. After transmitting the demand of the master unit, one of the four possibilities can occur:

- If the slave unit receives the demand without a transmission error and can execute it correctly, then it returns a correct answer,
- If the slave unit does not receive the demand, no answer is returned. Timeout conditions for the demand will be fulfilled in the master device program.
- If the slave unit receives the demand, but with transmission errors (even parity error, checking sum LRC or CRC error), no answer is returned. Timeout condition for the demand will be fulfilled in the master device program.
- If the slave unit receives the demand without a transmission error but cannot execute it correctly (e.g. if the demand is the readout of a non-existent bit output or register), then it returns the answer including the error code, informing the master device about the error reason.

A message with an incorrect answer includes two fields distinguishing it from the correct answer.

The function code field:

In the correct answer, the slave unit retransmits the function code from the demand message in the field of the answer function code. All function codes have the most significant bit (MSB) equal zero (code values are under 80h). In the incorrect answer, the slave unit sets up the MSB bit of the function code at 1. This causes that the function code value in the incorrect answer is exactly of 80h greater than it would be in a correct answer.

On the base of the function code with a set up MSB bit, the program of the master device can recognize an incorrect answer and can check the error code on the data field.

The data field:

In a correct answer, the slave device can return data to the data field (certain information required by the master unit). In the incorrect answer, the slave unit returns the error code to the data field. It defines conditions of the slave device that had produced the error.

An example considering a demand of a master device and the incorrect answer of the slave unit has been shown below. Data are in the hexadecimal shape.

Example: demand

Slave address	Function	Variable address		Number of variables		Checksum	
		Hi	Lo	Hi	Lo		
0A	01	04	A1	00	01	4F	LRC

Example: incorrect answer

Slave address	Function	Error	Checksum	
0A	81	01	73	LRC

In this example, the master device addresses the demand to the slave unit with number 0 (0Ah). The function with code (01) is not implemented in the concentrator, then the device returns the incorrect answer with the number 01 error code. It means a forbidden function in the slave device.

Possible error codes and their meanings are shown in the table below.

Code	Meaning
01	Forbidden function
02	Forbidden data address
03	Forbidden data value
04	Demand during the realization
05	Impossible demand realization

7. REGISTER MAP OF THE PD22 DATA CONCENTRATOR

In the PD22 data concentrator data are placed in 16-bit or 32-bit registers.

Process variables and concentrator parameters are situated in the area of registers in the way depended on the variable value type. Bits in the 16-bit and 32-bit registers are numbered from the lowest to the highest bit (b0-b15) or (b0-b32).

32-bit registers with addresses 1-999 include float numbers according to the IEEE-754 standard. 32-bit registers with addresses 8000-8169 include long type numbers.

The map of registers is divided in following areas: *Table 1*

Address range	Value type	Description
1 - 999	float (32 bits)	The value is placed in the 32-bit register. The register includes data read out from devices connected to the port 1 of the concentrator. The signification of particular registers depends on the configuration. Registers can be read out and recorded.
1000 - 2999	float (32 bits)	The value is placed in two successive 16-bit registers. Registers contain the same data as 32-bit registers from the area 1...999, e.g. registers 1000 and 1001 contain the value from the register 1, registers 1002 and 1003 contain the value from the register 2, etc. Registers can be read out and recorded.
4000 - 4569	integer (16 bits)	The value is placed in one 16-bit register. The description of registers is included in the Table 1. Registers can be read out and recorded.
8000	long (32 bits)	The register contains the device status. Successive register bits of value 1 mean: b0 - error of the RAM memory, b1 - transmission error from the device side, b2 - filled data archiving buffer, b3 - filled event archiving buffer. The register is for readout only.

8001, 8002	long (32 bity)	The value is placed in the 32-bit register. Successive register bits contain the index of current event occurrence. The bit 0 value means that the event does not occur. Registers are for readout only.
8003 - 8034	long (32 bity)	The value is placed in the 32-bit register. Successive register bits contain the index of data credibility from registers 1...999. The bit 0 value means that the data is not credible (e.g. because of the lack of transmission from the device). Registers are for readout only.
8100 - 8169	long (32 bity)	The value is placed in two successive 16-bit registers. Registers contain the same data as 32-bit registers from the area 8000-8034. E.g. registers 8100 and 8101 contain value from the register 8000, registers 8102 and 8103 contain value from the register 8001, etc. Registers are for readout only.

The PD22 concentrator is an active device (master) in relation to the devices connected from the object side, however it is a passive (slave) device in relation to the devices connected from the computer side.

According the entered configuration, the concentrator reads out parameters from devices connected from the Port 1 side, with a defined frequency.

The archiving of data read out from the devices follows with the frequency defined in the configuration.

Data are stored in the concentrator memory which is battery supported. Moreover, alarm events defined in the configuration are recognised and archived at the moment of their occurrence.

In the archive buffer, one can store maximum 390000 data records and 44400 events.

After the buffer filling. current data are stored and the oldest are lost.

The PD22 concentrator additionally enables the transmission of demands to particular devices. Each demand to the slave devices depends on the device type and is defined in the User's Manuals of interfaces of particular devices.

Concentrator tasks are defined through registers described in the table 2.

Contents of 16-bit registers with addresses from 4000 to 6999.

Operations mean admissible actions on registers R - readout, W - Record

Table 2.

Item	Register address	opera -tions	Range unit	Description
	4000...4009			**Configuration of readout operations or parameter recording from/ to scanned devices**
1	4000	RW	0...32000	Safety code
2	4001	RW	0...3	Operation code: 0 - readout of the configuration table element, 1 - record of the configuration table element, 2 - erasing of the configuration table element, 3 - erasing of all table elements. Operations with codes 1, 2, 3 require a correct code in the register 4000.
3	4002	RW	0...99	No of the configuration table element
4	4003	RW	0, 1	Status: 0 - operation disabled, 1 - operation enabled
5	4004	RW	1...999	PD22 register address
6	4005	RW	1...255	Address of the scanned device

continuation Table 2.

7	4006	RW		Address of the basic device register
8	4007	RW	1...20	Number of registers
9	4008	RW	Lower byte 0...7 higher byte	Register type: **0** - char (8-bit int), **1** - 16-bit int, **2** - 32-bit long, **3** - 32-bit float, **4** - 32-bit float in the shape of 2*16 bit (sequence of bytes 12 34), **5** - 32-bit float in the shape of 2*16 bit (sequence of bytes 21 43), **6** - 32-bit float in the shape of 2*16 bit (sequence of bytes 43 21), **7** - 32-bit float in the shape of 2*16 bit (sequence of bytes 34 12) Particular bits define the readout way and the record of device registers: 7 6 5 4 | 3 2 1 0 bit 0..3 - 0 readout function fc=03 1 readout function fc=04 bit 4..7 - 0 record function fc=16 1 record function fc=06
10	4009	RW	1...64000s	Scanning frequency
	4010...4019			**Configuration of archived parameters**
11	4010	RW	0...32000	Safety code
12	4011		0...3	Operation code: 0 - read-out of the element from the configuration table, 1 - record of the configuration table element, 2 - erasing of the configuration table element, 3 - erasing of all configuration table elements. Operations with codes 1, 2, 3 require a correct code in the register 4010.

continuation Table 2.

Item	Register address	Opera -tions	Range unit	Description
13	4012	RW	0...99	No of the configuration table element
14	4013	RW	0, 1	Status: 0 - archiving disabled, 1 - archiving enabled
15	4014	RW	1...999	PD22 register address
16	4015	RW	0...3	Archiving condition: 0 - always, 1 - >dn, 2 - <dn, 3 - change >ldnl
17	4016			reserved
18	4017	RW	0...64000s	Archiving frequency
19	4018	RW		High (dn) highest part of dn data to the archiving condition (dn data of float type)
20	4019	RW		Low (dn) lowest part of dn data to the archiving condition.
	4020...4029			**Configuration of archived events**
21	4020	RW	0...32000	Safety code
22	4021	RW	0...3	Operation code: 0 - read-out of the element from the configuration table, 1 - record of the configuration table element, 2 - erasing of the configuration table element, 3 - erasing of all configuration table elements. Operations with codes 1, 2, 3 require a correct code in the register 4020.
23	4022	RW	0...99	No of the event configuration table element (event ID)

continuation Table 2.

24	4023	RW	0, 1	Status: 0 - archiving disabled, 1 - archiving enabled
25	4024	RW	1...999	PD21 register address
26	4025	RW	1...3	Event archiving condition: 1 - >dn, 2 - <dn, 3 - change > ldnl
27	4026			Reserved
28	4027			Reserved
29	4028	RW		High (dn) highest part of dn data for the event archiving condition (dn data of float type)
30	4029	RW		Low (dn) lowest part of the dn data for the archiving condition.
	4100...4122			**Configuration of a single demand into the device**
31	4100	RW	0...3	Operation code: 0 - do nothing, 1 - send the frame to the device, 2 - read out the answer when the status = 1, 3 - erase the demand.
32	4101	RW	0...4	Status: 0 - lack of demand, 1 - ready answer, 2 - demand received for realisation, 3 - demand under realisation, 4 - demand realisation impossible
33	4102	RW	2...40	Number of frame bytes
34	4103	RW		Frame beginning: address + FC
35	4104	RW		Register address Hi + Lo
36	. . .	RW		Successive frame bytes
37	4122	RW		Last two frame bytes

continuation Table 2.

Item	Register address	Opera -tions	Range unit	Description
	4200...4255			**Data read-out from the archive buffer**
38	4200	RW	0...5	Operation code. Record of below values into the register occasions the realisation of following functions: 0 - do nothing 1 - set the time on the value from registers 4201, 4202 or later 2 - set the time on the buffer beginning 3 - time readout of the current readout from the archive buffer 4 -readout from the archive buffer of n registers (n in the register No 4203) 5 - the readout of the register 4205 occasions the readout of n registers from the archive buffer (n in the register No 4203).
39	4201	RW		High (tm) highest part of the time in seconds since 1.01.1970 on which one must set the data readout from the archive buffer (tm - data of long type).
40	4202	RW		Low (tm) lowest time part as above.
41	4003	RW	5...90	Number of registers which is to be read out from the buffer (multiplicity of 5)
42	4004	RW	0...4	Readout status: 0 - out of date data, lack of order (instruction), 1 - order realised with success, 2 - impossible realisation of task, buffer empty, 3 - less of data have been read out than required 4 - lack of data in the buffer from the defined time in registers 4201, 4202 and later.

continuation Table 2.

43	4205	R	0,5...90	Number of registers read out from the buffer
44	4206	R	0...999	No of the archived register
45	4207, 4208	R		Archiving time in the format given at the description of registers 4201, 4202
46	4209	R		High (x) highest part of the archived register value (x - data of float type)
47	4210	R		Low (x) lowest part of the archived register value.
48	4211...4215	R		Analogous contents as in registers 4206...4210 for the next archived parameter.
49	4216...4220	R		Analogous contents as in registers 4206...4210 for the next archived parameter.
50	4221...4225	R		Analogous contents as in registers 4206...4210 for the next archived parameter.
51	4226...4230 . . . 4251...4255	R		Analogous contents as in registers 4206...4210 for the next archived parameter.
	4300...4345			**Read-out of events from archiving buffer**
52	4300	RW	0...5	Operation code. 0 - do nothing 1 - set the time on the value from registers 4301, 4302 or later 2 - set the time on the buffer beginning 3 - time readout of the current readout from the event buffer 4 - readout from the event buffer f n registers (n in the register No 4303) 5 - the read-out of the register 4305 occasions the readout from the event buffer of n registers (n in the register No 4303)

continuation Table 2.

Item	Register address	Opera -tions	Range unit	Description
53	4301	RW		High (tm) highest time part in seconds since 1.01.1970 on which one must set the data readout from the event buffer (tm - data of long type)
54	4302	RW		Low (tm) lowest time part as above.
55	4303	RW	4...80	Number of registers which is to be read-out from the buffer (multiplicity of 4)
56	4304	RW	0...4	Readout status: 0 - out of date data, 1 - order realised with success, 2 - realisation of task impossible, buffer empty 3 - less of events has been read out than required, 4 - lack of events in the buffer from the defined time in registers 4201, 4202 and later.
57	4305	R	0,4,...80	Number of registers read out from the buffer
58	4306	R	0...99	Event identifier ID
59	4307, 4308	R		Archiving time in the format given when describing registers 4301, 4302.
60	4309	R	0,1	Event status: 1 - occurrence, 0 - withdrawal
61	4310...4313	R		Analogous contents as in registers 4306...4309 for the next archived event.
62	4314...4317	R		Analogous contents as in registers 4306...4309 for the next archived event.

continuation Table 2.

63	4318...4321	R		Analogous contents as in registers 4306...4309 for the next archived event.
64	4322...4325 . . . 4342...4345	R		Analogous contents as in registers 4306...4309 for the next archived event.
65	4400	RW	0,1	Index (=1) defining whether the device reset has occurred. The record of 0 into the register causes the index erasing.
66	4500	RW	0,1	Standard settings. The writing of 1 into the register and the data concentrator renewed switching on causes the erasing of the configuration tables and the erasing of the archiving and event buffer. After carrying out these operations the register value is set on 0.
67	4505	RW	0...32000	Safety code to create the configuration.
	4510...4512			**Date and internal clock time**
68	4510	RW		Year (rrrr-2000), month (2 * 8 bitów)
69	4511	RW		Day, hour (2 * 8 bitów)
70	4512	RW		Min., sec. (2 * 8 bitów)
71	4513	RW	0...7	Baud rate for the port 1 (from device side): 0 - 1200, 1 - 2400, 2 - 4800, 3 - 9600, 4 - 19200, 5 - 38400, 6 - 57600, 7 - 115200 bps.
72	4514	RW	0...7	Transmission mode for the port 1: 0 - A8N1, 1 - A7N2, 2 - A7E1, 3 - A7O1, 4 - R8N2, 5 - R8E1, 6 - R8O1, 7 - R8N1
73	4515	RW	1...50	Timeout for devices (*0.1 s)

continuation Table 2.

Item	Register address	Opera -tions	Range unit	Description
74	4516	RW	1...254	Address
75	4517	RW	0...7	Baud rate for the Port 2 (from the master device): 0 - 1200, 1 - 2400, 2 - 4800, 3 - 9600, 4 - 19200, 5 - 38400, 6 - 57600, 7 - 115200 bps.
76	4518	RW	0...7	Transmission mode for the Port 2: 0 - A8N1, 1 - A7N2, 2 - A7E1, 3 - A7O1, 4 - R8N2, 5 - R8E1, 6 - R8O1, 7 - R8N1
77	4519	RW	0	Connection type for the Port 2: 0 - direct connection
78	4520	RW	0,1	Apply: force the apply of settings from registers 4516...4519
	4550...4569	RW		Initiating a sequence of orders sent to the modem after switching the data concentrator and the modem on. Each register includes two ASCII characters. The sequence must be ended by the CR character (0DH). Standard sequence of orders: „ATQ0V0&C1&D1M1L1S0=10\r"

8. TECHNICAL DATA

Serial port 1:	
- baud rate	1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200 bit/s,
- information unit	1 start bit, 7 or 8 data bits, 1 bit nieparzystości, parzystości, 1, 2 bity stopu,
- interfejs	2 x RS-485
Port szeregowy 2:	
- prędkość transmisji	1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200 bitów/s,
- jednostka informacyjna	1 bit startu, 7, 8 bitów danych, 1 bit nieparzystości, parzystości, 1, 2 bity stopu,
- interfejs	RS-485, RS-232, USB 1.1 - **przewód nie dłuższy niż 3 metry**
Protokół transmisji	MODBUS - ASCII, RTU
Moc pobierana przez koncentrator	≤ 4 VA
Znamionowe warunki użytkowania:	
- napięcie zasilania	20...24...50 V a.c./d.c. lub 85...230...253 V a.c./d.c.
- częstotliwość napięcia zasilania	40...50/60...440 Hz
- temperatura otoczenia	0...23...55°C
- wilgotność względna powietrza	< 95% (niedopuszczalna kondensacja pary wodnej)

- zewnętrzne pole magnetyczne < 400 A/m
- położenie pracy dowolne

Warunki magazynowania i transportu:

- temperatura otoczenia - 20...70°C
- wilgotność względna powietrza < 95% (niedopuszczalna kondensacja pary wodnej)

Zapewniane stopnie ochrony:

- od strony obudowy IP 40
- od strony zacisków IP 20

Wymiary 45 × 120 × 100 mm

Masa < 0,25 kg

Obudowa PD22 do montażu na szynę

Kompatybilność elektromagnetyczna:

- odporność na zakłócenia według normy PN-EN 61000-6-2
- emisja zakłóceń według PN-EN 61000-6-4

Wymagania bezpieczeństwa wg PN-EN 61010-1:

- kategoria instalacji III
- stopień zanieczyszczenia 2

Maksymalne napięcie pracy względem ziemi:

- dla obwodu zasilania 300 V
- dla pozostałych obwodów 50 V

9. KOD WYKONANIA

Kod wykonania koncentratora danych.

Koncentrator danych	**PD22 -**	**X**	**XX**	**X**
Napięcie zasilania				
85... 253 V a.c./d.c. **1**				
20... 50 V a.c./d.c. **2**				
na zamówienie ..... **X**				
Rodzaj wykonania				
katalogowe **00**				
specjalne* ..... **XX**				
Próby odbiorcze				
bez dodatkowych wymagań **0**				
z atestem Kontroli Jakości **1**				
inne wymagania* ..... **X**				

***** numerację wykonania ustali producent

Przykład kodowania:

Kod **PD22 1 00 1** oznacza wykonanie koncentratora z zasilaniem 85...230...253 V a.c./d.c, katalogowe, z atestem Kontroli Jakości.

10. KONSERWACJA I SERWIS

Zastosowana w koncentratorze bateria wymaga wymiany co 5 lat. W celu wymiany baterii, koncentrator należy przesłać do naprawy do Działu Serwisu Lubuskich Zakładów Aparatów Elektrycznych LUMEL S.A.

W przypadku uszkodzenia koncentrator należy przesłać do naprawy do Działu Serwisu Lubuskich Zakładów Aparatów Elektrycznych LUMEL S.A.

Lubuskie Zakłady Aparatów Elektrycznych LUMEL S.A.
ul. Sulechowska 1, 65-022 **Zielona Góra**
http://www.lumel.com.pl

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fax 068 325 56 50