



Energy Measurement and Management

MT830/MT831

Industrial multi-function meter

Installation manual

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Contents

Meter terminals 5 Input - Output modules 7 Communication modules 10 Front plate 12 Power supply 14 2 142 2 142 2 143 2 144 2 142 2 143 2 144 2 143 2 143 2 144 2 143 2 144 2 144 2 144 2 144 2 144 2 144 2 143 2 144 2 144 2 144 2 144 154 154 154 154 154 154 154 154 154 154 154 154 154 154 154 154 154 </th <th>1. Meter parts</th> <th>4</th>	1. Meter parts	4
Input – Output modules 7 Communication modules 10 Front plate 12 Power supply 14 Installation 16 3. Checking the meter 20 Voltages 20 Load 21 4. Meter handling 21 5. Display 22 2.4.2 Power flow direction and quadrant indicator 24 2.4.3 Phase voltages indicator 24 Display handling 25 Meurs on the display 25 Meurs on the display 31 6.1.1 2 GRID menu 34 6.1.3 DIAG menu (for GSM modern only) 36 7. Setup meter time setup by pushbutons 36 8. GSM/GPRS communication module MK - 138a - 3 37 9. Meter reading with MeterView 42 Reading the meter via QSM or PSTN or ISDN modem in the meter 43 Reading the meter via GSM or PSTN or ISDN modem in the meter - selection "Standard modem" 44 Reading the meter via GERS or Oursent type 47 9. 6. Statup the IP number in the Ethernet module - consereth type 47 9. 6. Statup the IP number in the Ethernet m	Meter terminals	5
Communication modules 10 Front plate 12 Power supply 14 2 Installation 3 Checking the meter 20 Voltages 20 20 Voltages 20 24.3 Phase voltages indicator 24.3 Phase voltages indicator 24.3 Phase voltages indicator 24.3 Phase voltages indicator 25 Display test 6 Display indition 8 CBKIGD menu. 8.1.1 Atto menu and Std dAtA display. 8.1.2 Setup meter time setup by pushbuttons 8.6 SGKIGPRS communication module MK – f38a - 3. 9.7 Meter reading with MeterView 21 Reading the meter via GSM or PSTN or ISDN modem in the meter – selection "Custom modem" 44 Reading the meter via GSM or PSTN or ISDN modem in the meter – selection "Custom modem" 44 Reading the meter via GSM or PSTN or ISDN modem in the meter – selection "Custom modem" 44 Reading the meter via GSM or PSTN or ISDN modem in the meter – selection "Custom modem" 44 Reading the meter via GSM or PSTN or ISDN modem in	Input – Output modules	7
Front plate 12 Power supply 14 2. Installation 16 3. Checking the meter 20 Voltages 20 Load 21 4. Meter handling 21 5. Display handling 22 2.4.2 Power flow direction and quadrant indicator 24 2.4.3 Phase voltages indicator 24 2.4.3 Phase voltages indicator 24 Display handling 25 Menus on the display 31 6.1.1 Auto menu and Std dAtA display 31 6.1.2 GRID menu 34 6.1.3 Add menu (for GSM modem only) 36 7. Setup meter time setup by pushbuttors 36 8 GSM/GPRS communication module MK ~138a ~3 37 9. Meter reading with Meter/lew 42 Reading the meter via SGM or PSTN or ISDN modem in the meter – selection "Custom modem" 44 Reading the meter via GSM or PSTN or ISDN modem in the meter – selection "Custom modem" 44 Reading the meter via Ethernet – transparent type 47 9.6.1 Setup the IP number in the Ethernet module – consereth type 47 9.6.1 Setup the IP number in the Ethernet module – conse	Communication modules	10
Power' supply. 14 2. Installation 16 3. Checking the meter 20 Voltages. 20 Load. 21 4. Meter handling 21 5. Display 22 2.4.2 Power flow direction and quadrant indicator 24 2.4.3 Phase voltages indicator 24 Display test 25 6. Display handling. 25 Menus on the display 31 6.1.1 Auto menu and Std dAtA display. 31 6.1.3 DIAG menu (for GSM modem only) 36 7. Setup meter time setup by pushbuttons. 36 6. GSM/GPRS communication module MK ~ 138a ~ 3. 37 9. Meter reading with Meter/View 42 Reading the meter via GSM or PSTN or ISDN modem in the meter - selection "Custom modem" 44 Reading the meter via GSM or PSTN or ISDN modem in the meter - selection "Custom modem" 47 Reading the meter via GSM or PSTN or ISDN modem in the meter - selection "Custom modem" 46 Reading the meter via GSM or PSTN or ISDN modem in the meter - selection "Custom modem" 46 Reading the meter via GSM or PSTN or ISDN modem in the meter - selection "Custom modem" 47 <td< td=""><td>Front plate</td><td>12</td></td<>	Front plate	12
2. Installation 16 3. Checking the meter 20 Voltages 20 Load 21 4. Meter handling 21 5. Display 22 2.4.2 Power flow direction and quadrant indicator 24 2.4.3 Phase voltages indicator 24 2.4.3 Phase voltages indicator 24 Display test 25 6. Display handling 25 Metur hand Std dAtA display 31 6.1.1 Auto menu and Std dAtA display 31 6.1.2 GRID menu 36 6.1.3 LGR Genu (for GSM modem only) 34 6.1.3 LGR Genu (for GSM modem only) 36 7. Setup meter time setup by pushbuttons 36 8. GSM/GPRS communication module MK – 138a – 3. 37 9. Meter reading with Meter/lew 42 Reading the meter via SCM or PSTN or ISDN modem in the meter – selection "Custom modem" 44 Reading the meter via CSM or PSTN or ISDN modem in the meter – selection "Custom modem" 46 Reading the meter via CSM or PSTN or ISDN modem in the meter – selection "Custom modem" 46 Reading the meter via CSM or PSTN or ISDN modem in the meter – selection "Custom modem" 46 </td <td>Power supply</td> <td>14</td>	Power supply	14
3. Checking the meter 20 Voltages. 20 Load. 21 5. Display 22 2.4.2 Power flow direction and quadrant indicator 24 2.4.3 Phase voltages indicator 24 Display test. 25 6. Display nanding. 26 Menus on the display. 31 6.1.1 Auto menu and Std dAtA display. 31 6.1.2 RD menu. 34 6.1.3 DIAG menu (for GSM modern only) 36 7. Setup meter time setup by pushbuttons 36 6. SSM/GPRS communication module MK – 138a –3. 37 9. Meter reading with MeterView 42 Reading the meter via GSM or PSTN or ISDN modem in the meter – selection "Standard moder" 44 Reading the meter via GSM or PSTN or ISDN modem in the meter – selection "Custom moder" 44 Reading the meter via GSM or PSTN or ISDN modem in the meter – selection "Custom moder" 44 Reading the meter via GSM or PSTN or ISDN modem in the meter – selection "Custom moder" 44 Reading the meter via GPRS modern in the meter – selection "Custom moder" 45 9. 6. TScup the IP number in the Etherent module – consereth type 47 9. G TScup the IP number in the	2. Installation	
Voltages. 20 Load	3. Checking the meter	20
Load.	Voltages	
4. Meter handling 21 5. Display 22 2.4.2 Power flow direction and quadrant indicator 24 2.4.3 Phase voltages indicator 24 2.4.1 Auto menu and Std 4AtA display. 31 6.1.2 GRID menu 34 6.1.3 GRID menu 36 7. Setup meter time setup by pushbuttons 36a – 3. 9. Meter reading with MeterView 42 Reading the meter via GSM or PSTN or ISDN modem in the meter – selection "Standard modem" 44 Reading the meter via GSM or PSTN or ISDN modem in the meter – selection "Custorn moder" 46 Reading the meter via GSM or PSTN or ISDN modem in the meter – selection "Custorn moder" 46 Reading the meter via GSM or PSTN	Load	
5. Display 22 2.4.2 Power flow direction and quadrant indicator 24 2.4.3 Phase voltages indicator 24 Display test 25 6. Display handling 25 Menus on the display 31 6.1.1 Auto menu and Std dAtA display. 31 6.1.2 GRD menu 34 6.1.3 DIAG menu (for GSM modern only) 36 7. Setup meter time setup by pushbuttons 36 8. GSMGPRS communication module MK - 138a -3. 37 9. Meter reading with MeterView 42 Reading the meter via optical probe in the meter 42 Reading the meter via GSM or PSTN or ISDN modem in the meter - selection "Custom modem" 44 Reading the meter via GSM or PSTN or ISDN modem in the meter - selection "Custom modem" 44 Reading the meter via GSM or PSTN or ISDN modem in the meter - selection "Custom modem" 44 Reading the meter via GSM or PSTN or ISDN modem in the meter - selection "Custom modem" 44 Reading the meter via GSM or PSTN or ISDN modem in the meter - selection "Custom modem" 44 Reading the meter via GSM or PSTN or ISDN modem in the meter - selection "Custom modem" 46 Reading the meter via GSM or PSTN or ISDN modem inthe meter - selection "Custom modem"	4. Meter handling	
2.4.2 Power flow direction and quadrant indicator .24 2.4.3 Phase voltages indicator .24 2.4.3 Phase voltages indicator .25 Display handling. .25 6. Display handling. .25 Menus on the display. .31 6.1.1 Autor menu and Std dAtA display. .31 6.1.2 GRID menu. .34 6.1.3 DIAG menu (for GSM modem only). .36 7. Setup meter time setup by pushbuttons. .36 8. GSMGPRS communication module MK -138a -3. .37 9. Meter reading with MeterView .42 Reading the meter via optical probe in the meter .42 Reading the meter via GSM or PSTN or ISDN modem in the meter - selection "Standard modem" .44 Reading the meter via GSM or PSTN or ISDN modem in the meter - selection "Custom modem" .44 Reading the meter via GPRS nordme in the meter. .42 Reading the meter via Ethernet module - consereth type. .47 9.6 ISetup the IP number in the Ethernet module - consereth type. .47 Reading the meter via Ethernet module - consereth type. .47 Reading the meter via Ethernet module - consereth type. .47 Reading the meter via Ethernet module - consereth type.	5. Display	
2.4.3 Phase voltages indicator 24 Display test 25 Object A and Ming. 25 Menus on the display 31 6.1.1 Auto menu and Std dAtA display. 31 6.1.2 GRID menu 34 6.1.3 DIAG menu (for GSM modem only) 36 7. Setup meter time setup by pushbuttons 36 8. GSM/GPRS communication module MK – f38a –3. 37 9. Meter reading with MeterView 42 Reading the meter via optical probe in the meter 42 Reading the meter via S232 or RS-485 or current loop communication interface in the meter. 43 Reading the meter via GSM or PSTN or ISDN modem in the meter – selection "Standard modem". 44 Reading the meter via GSM or PSTN or ISDN modem in the meter – selection "Custom modem". 46 Reading the meter via Ethernet – transparent or consereth type. 47 9. 6. 1Setup the IP number in the Ethernet throdule – consereth type. 47 Reading the meter via GPRS modem in the meter. 51 10. GPRS network connection setting in Windows XP system 52 11. Meter data reading with MeterView 56 Data read out reading. 57 Load profile reading. 52 <	2.4.2 Power flow direction and quadrant indicator	
Display test. 25 6. Display handling. 25 Menus on the display. 31 6.1.1 Auto menu and Std dAtA display. 31 6.1.2 GRID menu. 34 6.1.3 DIAG menu (for GSM modem only) 36 7. Setup meter time setup by pushbuttons. 36 8. GSM/GPRS communication module MK – f38a –3. 37 9. Meter reading with MeterView 42 Reading the meter via optical probe in the meter 42 Reading the meter via GSM or PSTN or ISDN modem in the meter – selection "Standard modem" 44 Reading the meter via GSM or PSTN or ISDN modem in the meter – selection "Custom modem" 44 Reading the meter via GSM or PSTN or ISDN modem in the meter – selection "Custom modem" 44 Reading the meter via GSM or PSTN or ISDN modem in the meter – selection "Custom modem" 44 Reading the meter via GSM or PSTN or ISDN modem in the meter – selection "Custom modem" 46 Reading the meter via GSM or PSTN or ISDN modem in the meter – selection "Custom modem" 47 9.6.1Setup the IP number in the Ethernet module – consereth type 47 Reading the meter via GPRS modem in the meter 51 10. GPRS network connection setting in Windows XP system 52 11. Meter	2.4.3 Phase voltages indicator	
6. Display handling. 25 Menus on the display. 31 6.1.1 Auto menu and Std dAtA display. 31 6.1.2 GRID menu. 34 6.1.3 DIAG menu (for GSM modem only) 36 7. Setup meter time setup by pushbutons 36 8. GSM/GPRS communication module MK – f38a –3. 37 9. Meter reading with MeterView 42 Reading the meter via optical probe in the meter 42 Reading the meter via GSM or PSTN or ISDN modem in the meter – selection "Standard modem" 44 Reading the meter via GSM or PSTN or ISDN modem in the meter – selection "Custom modem" 44 Reading the meter via GSM or PSTN or ISDN modem in the meter – selection "Custom modem" 44 Reading the meter via Ethernet – transparent type. 47 9.6.1 Setup the IP number in the Ethernet module – consereth type. 47 9.6.1 Setup the IP number in the Ethernet module – consereth type. 49 Reading the meter via GPRS modem in the meter. 56 Data read out reading. 56 Data read out reading. 56 Load profile reading. 56 Load profile reading. 62 Sting time and date with MeterView. 62	Display test	
Menus on the display 31 6.1.1 Auto menu and Std dAtA display 31 6.1.2 GRID menu 34 6.1.3 DIAG menu (for GSM modem only) 36 7. Setup meter time setup by pushbuttons 36 8. GSM/GPRS communication module MK – f38a –3 37 9. Meter reading with MeterView 42 Reading the meter via optical probe in the meter 42 Reading the meter via GSM or PSTN or ISDN modem in the meter – selection "Standard modem" 44 Reading the meter via GSM or PSTN or ISDN modem in the meter – selection "Custom modem" 44 Reading the meter via GSM or PSTN or ISDN modem in the meter – selection "Custom modem" 44 Reading the meter via GSM or PSTN or ISDN modem in the meter – selection "Custom modem" 44 Reading the meter via GSM or PSTN or ISDN modem in the meter – selection "Custom modem" 44 Reading the meter via GRMs module – transparent or consereth type 47 Reading the meter via GPRS modem in the meter 49 Reading the meter via GPRS modem in the meter 51 10. GPRS network connection setting in Windows XP system 52 11. Meter data reading with MeterView 56 Load profile reading 62 12.1 With command W5	6. Display handling	
6.1.1 Auto menu 31 6.1.2 GRID menu 34 6.1.3 DIAG menu (for GSM modem only) 36 7. Setup meter time setup by pushbuttons 36 8. GSM/GPRS communication module MK – f38a –3 37 9. Meter reading with Meter/lew 42 Reading the meter via optical probe in the meter 42 Reading the meter via GSM or PSTN or ISDN modem in the meter – selection "Standard modem" 44 Reading the meter via GSM or PSTN or ISDN modem in the meter – selection "Custom modem" 44 Reading the meter via GSM or PSTN or ISDN modem in the meter – selection "Custom modem" 44 Reading the meter via GSM or PSTN or ISDN modem in the meter – selection "Custom modem" 44 Reading the meter via Ethernet – transparent or consereth type 47 9.6.1Setup the IP number in the Ethernet module – consereth type 47 Reading the meter via GPRS modem in the meter. 51 10. GPRS network connection setting in Windows XP system 52 11. Meter data reading with MeterView 56 Data read out reading. 56 Load profile reading. 62 11.3.1 With command W1 62 11.3.2 With command W1 62 11.5.1 Entering the Pa	Menus on the display	
6.1.2 GRID menu. 34 6.1.3 DIAG menu (for GSM modem only) 36 7. Setup meter time setup by pushbuttons. 36 8. GSM/GPRS communication module MK – f38a –3. 37 9. Meter reading with MeterView 42 Reading the meter via optical probe in the meter 42 Reading the meter via GSM or PSTN or ISDN modem in the meter – selection "Standard modem" 44 Reading the meter via GSM or PSTN or ISDN modem in the meter – selection "Custom modem" 44 Reading the meter via GSM or PSTN or ISDN modem in the meter – selection "Custom modem" 47 9. 6.1 Setup the IP number in the Ethernet module – consereth type 47 9. 6.1 Setup the IP number in the Ethernet module – consereth type 47 Reading the meter via GPRS modem in the meter. 51 10. GPRS network connection setting in Windows XP system 52 11. Meter data reading. 56 Load profile reading. 56 Load profile reading. 62 11.3.1 With command W5 62 11.3.2 With command W1 63 Programming the meter MT83x. 64 11.5.1 Entering the Parameters. 66 11.5.2 Reading the Parameters. 69 <tr< td=""><td>6.1.1 Auto menu and Std dAtA display</td><td>31</td></tr<>	6.1.1 Auto menu and Std dAtA display	31
6.1.3 DIAG menu (for GSM modem only) 36 7. Setup meter time setup by pushbuttons. 36 8. GSM/GPRS communication module MK – f38a –3. 37 9. Meter reading with MeterView 42 Reading the meter via optical probe in the meter 42 Reading the meter via GSM or PSTN or ISDN modem in the meter – selection "Standard modem" 44 Reading the meter via GSM or PSTN or ISDN modem in the meter – selection "Custom modem" 44 Reading the meter via Ethernet – transparent or conseret type 47 9. 6. I Setup the IP number in the Ethernet module – consereth type 47 Reading the meter via GPRS modem in the meter. 51 10. GPRS network connection setting in Windows XP system 52 11. Meter data reading with MeterView. 56 Data read out reading. 56 Data read out reading. 62 11.3.2 With command W5 62 11.3.2 With command W1 63 Programming the meter MT83x. 64 11.5.3 Writting the Parameters. 69 12.1 Open the existing parameters from the Meter View. 69 12.2 Group → Device information 71 12.2 Group → Device information 71	6 1 2 GRID menu	34
7. Setup meter time setup by pushbuttons	6.1.3 DIAG menu (for GSM modem only)	
8. GSM/GPRS communication module MK – f38a –3	7 Setup meter time, setup by pushbuttons	36
9. Meter reading with MeterView 42 Reading the meter via a SS-232 or RS-485 or current loop communication interface in the meter 43 Reading the meter via GSM or PSTN or ISDN modem in the meter – selection "Standard modem" 44 Reading the meter via GSM or PSTN or ISDN modem in the meter – selection "Standard modem" 44 Reading the meter via GSM or PSTN or ISDN modem in the meter – selection "Custom modem" 44 Reading the meter via Ethernet – transparent or consereth type 47 9.6.1 Setup the IP number in the Ethernet module – consereth type 47 Reading the meter via Ethernet module – transparent type 49 Reading the meter via GPRS modem in the meter 51 10. GPRS network connection setting in Windows XP system 52 11. Meter data reading with MeterViev 56 Data read out reading 56 Log book reading 62 11.3.1 With command W5 62 11.3.2 With command W1 62 11.5.3 Writting the Parameters 66 11.5.1 Entering the Parameters 66 11.5.2 Reading the Parameters 68 12.1 Open the existing parameters from the Meter View 69 12.2.3 Group → Display 73 <td< td=""><td>8. GSM/GPRS communication module MK – f38a –3.</td><td></td></td<>	8. GSM/GPRS communication module MK – f38a –3.	
Reading the meter via optical probe in the meter 42 Reading the meter via RS-232 or RS-485 or current loop communication interface in the meter. 43 Reading the meter via GSM or PSTN or ISDN modem in the meter – selection "Standard modem" 44 Reading the meter via GSM or PSTN or ISDN modem in the meter – selection "Custom modem". 46 Reading the meter via Ethernet – transparent or consereth type 47 9.6.1Setup the IP number in the Ethernet module – consereth type 47 Reading the meter via Ethernet module – transparent type 49 Reading the meter via GPRS modem in the meter. 51 10. GPRS network connection setting in Windows XP system 52 11. Meter data reading with MeterViev. 56 Data read out reading. 62 Setting time and date with MeterView 62 11.3.1 With command W5 62 11.3.2 With command W1 63 Programming the meter MT83x. 64 11.5.3 Writting the Parameters. 66 12.1 Open the existing parameters from the Meter View. 69 12.2.2 Group → Device information 71 12.2.3 Group → Device information 71 12.2.3 Group → Device information 73 1	9. Meter reading with MeterView	
Reading the meter via RS-232 or RS-485 or current loop communication interface in the meter 43 Reading the meter via GSM or PSTN or ISDN modem in the meter – selection "Standard modem" 44 Reading the meter via GSM or PSTN or ISDN modem in the meter – selection "Custom modem" 46 Reading the meter via Ethernet – transparent or consereth type 47 9.6.1Setup the IP number in the Ethernet module – consereth type 47 Reading the meter via Ethernet module – transparent type 49 Reading the meter via GPRS modem in the meter 51 10. GPRS network connection setting in Windows XP system 52 11. Meter data reading with MeterViev 56 Data read out reading. 56 Load profile reading. 57 Log book reading. 62 11.3.1 With command W5 62 11.3.2 With command W5 63 Programming the meter MT83x. 64 11.5.2 Reading the Parameters 66 11.5.3 Writting the Parameters from the Meter View. 69 12.2.2 Group → Device information 71 12.2.3 Group → Display 73 13. Adding support for new meters. 81 14. Installation of SONDA5 USB driver 84 <	Reading the meter via optical probe in the meter	
Reading the meter via GSM or PSTN or ISDN modem in the meter – selection "Standard modem" 44 Reading the meter via GSM or PSTN or ISDN modem in the meter – selection "Custom modem" 46 Reading the meter via Ethernet – transparent or consereth type 47 9.6.1Setup the IP number in the Ethernet module – consereth type 49 Reading the meter via Ethernet module – transparent type 49 Reading the meter via GPRS modem in the meter 51 10. GPRS network connection setting in Windows XP system 52 11. Meter data reading with MeterViev 56 Data read out reading 56 Load profile reading 57 Log book reading 62 Setting time and date with MeterView 62 11.3.1 With command W5 62 11.3.2 With command W1 63 Programming the meter MT83x 64 11.5.2 Reading the Parameters 66 11.5.3 Writting the Parameters 69 12.1 Open the existing parameters from the Meter View 69 12.2.2 Group → Device information 71 12.2.3 Group → Display 73 13. Adding support for new meters 81 14. Installation of SONDA 5 USB driver <td>Reading the meter via RS-232 or RS-485 or current loop communication interface in the meter</td> <td></td>	Reading the meter via RS-232 or RS-485 or current loop communication interface in the meter	
Reading the meter via GSM or PSTN or ISDN modem in the meter – selection "Custom modem". 46 Reading the meter via Ethernet – transparent or consereth type 47 9.6.1Setup the IP number in the Ethernet module – consereth type 47 Reading the meter via Ethernet module – transparent type 49 Reading the meter via Ethernet module – transparent type 49 Reading the meter via GPRS modem in the meter 51 10. GPRS network connection setting in Windows XP system 52 11. Meter data reading with MeterViev 56 Data read out reading 56 Load profile reading 56 Log book reading 62 11.3.1 With command W5 62 11.3.2 With command W1 63 Programming the meter MT83x 64 11.5.1 Entering the Parameters 68 12.1 Open the existing parameters from the Meter View 69 12.2.2 Group → Device information 71 12.2.3 Group → Display 73 13. Adding support for new meters 81 14. Installation of SONDA 5 USB driver 81 14. Installation of SONDA 5 USB driver 81	Reading the meter via GSM or PSTN or ISDN modem in the meter – selection "Standard modem"	
Reading the meter via Ethernet – transparent or consereth type 47 9.6.1Setup the IP number in the Ethernet module – consereth type 47 Reading the meter via Ethernet module – transparent type 49 Reading the meter via GPRS modem in the meter 51 10. GPRS network connection setting in Windows XP system 52 11. Meter data reading with MeterViev 56 Data read out reading 56 Load profile reading 57 Log book reading 62 11.3.1 With command W5 62 11.3.2 With command W5 62 11.3.2 With command W1 63 Programming the meter MT83x 64 11.5.1 Entering the Parameters 66 11.5.3 Writting the Parameters 68 12.1 Open the existing parameters from the Meter View 69 12.2 Group → Device information 71 12.2.3 Group → Display 73 13.4 Adding support for new meters 81 14. Installation of SONDA 5 USB driver 81 14. Installation of SONDA 5 USB driver 84	Reading the meter via GSM or PSTN or ISDN modem in the meter – selection "Custom modem"	
9.6.1 Setup the IP number in the Ethernet module – conserveth type 47 Reading the meter via Ethernet module – transparent type 49 Reading the meter via GPRS modem in the meter 51 10. GPRS network connection setting in Windows XP system 52 11. Meter data reading with MeterViev 56 Data read out reading. 56 Load profile reading. 57 Log book reading. 62 Stiting time and date with MeterView 62 11.3.1 With command W5 62 11.3.2 With command W5 62 11.5.1 Entering the Password 64 11.5.2 Reading the Parameters. 66 11.5.3 Writting the Parameters. 68 12.1 Open the existing parameters from the Meter View 69 12.2.2 Group → Device information 71 12.3 Group → Display. 73 13.4 Adding support for new meters 81 14. Installation of SONDA 5 USB driver 84 14. Installation of SONDA 5 USB driver 84	Reading the meter via Ethernet – transparent or conserveth type	
Reading the meter via Ethernet module – transparent type 49 Reading the meter via GPRS modem in the meter 51 10. GPRS network connection setting in Windows XP system 52 11. Meter data reading with MeterViev 56 Data read out reading 56 Load profile reading 56 Load profile reading 62 Setting time and date with MeterView 62 11.3.1 With command W5 62 11.3.2 With command W1 63 Programming the meter MT83x 64 11.5.1 Entering the Password 64 11.5.2 Reading the Parameters 66 11.5.3 Writting the Parameters 66 12.1 Open the existing parameters from the Meter View 69 12.2.2 Group → Device information 71 12.2.3 Group → Display 73 13. Adding support for new meters 81 14. Installation of SONDA 5 USB driver 84 15. Technical data 90	9.6.1Setup the IP number in the Ethernet module – conserveth type	
Reading the meter via GPRS modem in the meter 51 10. GPRS network connection setting in Windows XP system 52 11. Meter data reading with MeterViev 56 Data read out reading 56 Load profile reading 57 Log book reading 62 Sting time and date with MeterView 62 11.3.1 With command W5 62 11.3.2 With command W1 63 Programming the meter MT83x 64 11.5.1 Entering the Parameters 66 11.5.3 Writting the Parameters 68 12. Open the existing parameters from the Meter View 69 12.2.2 Group → Device information 71 12.2.3 Group → Display 73 13. Adding support for new meters 81 14. Installation of SONDA 5 USB driver 81 15. Technical data 90	Reading the meter via Ethernet module – transparent type	
10. GPRS network connection setting in Windows XP system 52 11. Meter data reading with MeterViev 56 Data read out reading 56 Load profile reading 57 Log book reading 62 Setting time and date with MeterView 62 11.3.1 With command W5 62 11.3.2 With command W1 63 Programming the meter MT83x 64 11.5.1 Entering the Password 64 11.5.2 Reading the Parameters 66 11.5.3 Writting the Parameters 68 12. MT83x meter parameters 69 12.1 Open the existing parameters from the Meter View 69 12.2.2 Group → Device information 71 12.2.3 Group → Display 73 13. Adding support for new meters 81 14. Installation of SONDA 5 USB driver 81 15. Technical data 90	Reading the meter via GPRS modem in the meter.	
11. Meter data reading with MeterViev 56 Data read out reading. 56 Load profile reading. 57 Log book reading. 62 Setting time and date with MeterView. 62 11.3.1 With command W5 62 11.3.2 With command W1 63 Programming the meter MT83x. 64 11.5.1 Entering the Password 64 11.5.2 Reading the Parameters. 66 11.5.3 Writting the Parameters. 66 12. MT83x meter parameters. 69 12.1 Open the existing parameters from the Meter View. 69 12.2.2 Group → Device information 71 12.2.3 Group → Display 73 13. Adding support for new meters. 81 14. Installation of SONDA 5 USB driver 84 15. Technical data 90	10. GPRS network connection setting in Windows XP system	
Data read out reading.56Load profile reading.57Log book reading.62Setting time and date with MeterView.6211.3.1 With command W56211.3.2 With command W163Programming the meter MT83x.6411.5.1 Entering the Password6411.5.2 Reading the Parameters.6611.5.3 Writting the Parameters.6812. MT83x meter parameters.6912.1 Open the existing parameters from the Meter View.6912.2.2 Group → Device information7112.2.3 Group → Display7313. Adding support for new meters.8114. Installation of SONDA 5 USB driver80909015. Technical data90	11. Meter data reading with MeterViev	
Load profile reading.57Log book reading.62Setting time and date with MeterView.6211.3.1 With command W56211.3.2 With command W163Programming the meter MT83x.6411.5.1 Entering the Password6411.5.2 Reading the Parameters.6611.5.3 Writting the Parameters.6812. MT83x meter parameters.6912.1 Open the existing parameters from the Meter View.6912.2.2 Group → Device information7112.2.3 Group → Display.7313. Adding support for new meters.8114. Installation of SONDA 5 USB driver8415. Technical data90	Data read out reading	
Log book reading. 62 Setting time and date with MeterView. 62 11.3.1 With command W5 62 11.3.2 With command W1 63 Programming the meter MT83x. 64 11.5.1 Entering the Password 64 11.5.2 Reading the Parameters. 66 11.5.3 Writting the Parameters. 66 12. MT83x meter parameters. 69 12.1 Open the existing parameters from the Meter View. 69 12.2.2 Group → Device information 71 12.2.3 Group → Display 73 13. Adding support for new meters. 81 14. Installation of SONDA 5 USB driver 81 15. Technical data 90	Load profile reading.	
Setting time and date with MeterView 62 11.3.1 With command W5 62 11.3.2 With command W1 63 Programming the meter MT83x 64 11.5.1 Entering the Password 64 11.5.2 Reading the Parameters 66 11.5.3 Writting the Parameters 68 12. MT83x meter parameters 69 12.1 Open the existing parameters from the Meter View 69 12.2.2 Group → Device information 71 12.2.3 Group → Display 73 13. Adding support for new meters 81 14. Installation of SONDA 5 USB driver 84 15. Technical data 90	Log book reading	
11.3.1 With command W5 62 11.3.2 With command W1 63 Programming the meter MT83x 64 11.5.1 Entering the Password 64 11.5.2 Reading the Parameters 66 11.5.3 Writting the Parameters 66 12. MT83x meter parameters 69 12.1 Open the existing parameters from the Meter View 69 12.2.2 Group → Device information 71 12.2.3 Group → Display 73 13. Adding support for new meters 81 14. Installation of SONDA 5 USB driver 84 15. Technical data 90	Setting time and date with MeterView	62
11.3.2 With command W1 63 Programming the meter MT83x. 64 11.5.1 Entering the Password 64 11.5.2 Reading the Parameters 66 11.5.3 Writting the Parameters 66 11.5.3 Writting the Parameters 68 12. MT83x meter parameters 69 12.1 Open the existing parameters from the Meter View. 69 12.2.2 Group → Device information 71 12.2.3 Group → Display 73 13. Adding support for new meters 81 14. Installation of SONDA 5 USB driver 84 15. Technical data 90	11.3.1 With command W5	62
Programming the meter MT83x. 64 11.5.1 Entering the Password 64 11.5.2 Reading the Parameters 66 11.5.3 Writting the Parameters 68 12. MT83x meter parameters 69 12.1 Open the existing parameters from the Meter View. 69 12.2.2 Group → Device information 71 12.2.3 Group → Display 73 13. Adding support for new meters 81 14. Installation of SONDA 5 USB driver 84 15. Technical data 90	11.3.2 With command W1	63
11.5.1 Entering the Password .64 11.5.2 Reading the Parameters .66 11.5.3 Writting the Parameters .68 12. MT83x meter parameters .69 12.1 Open the existing parameters from the Meter View .69 12.2.2 Group → Device information .71 12.2.3 Group → Display .73 13. Adding support for new meters .81 14. Installation of SONDA 5 USB driver .84 15. Technical data .90	Programming the meter MT83x	64
11.5.2 Reading the Parameters.	11.5.1 Entering the Password	64
11.5.3 Writting the Parameters .68 12. MT83x meter parameters .69 12.1 Open the existing parameters from the Meter View .69 12.2.2 Group → Device information .71 12.2.3 Group → Display .73 13. Adding support for new meters .81 14. Installation of SONDA 5 USB driver .84 15. Technical data .90	11.5.2 Reading the Parameters	66
12. MT83x meter parameters. 69 12.1 Open the existing parameters from the Meter View. 69 12.2.2 Group → Device information 71 12.2.3 Group → Display 73 13. Adding support for new meters. 81 14. Installation of SONDA 5 USB driver 84 15. Technical data 90	11.5.3 Writting the Parameters	68
12.1 Open the existing parameters from the Meter View. 69 12.2.2 Group → Device information 71 12.2.3 Group → Display 73 13. Adding support for new meters 81 14. Installation of SONDA 5 USB driver 84 15. Technical data 90	12. MT83x meter parameters	69
12.2.2 Group → Device information	12.1 Open the existing parameters from the Meter View	69
12.2.3 Group → Display	12.2.2 Group → Device information	71
13. Adding support for new meters	12.2.3 Group → Display	73
14. Installation of SONDA 5 USB driver	13. Adding support for new meters	
15 Technical data 90	14. Installation of SONDA 5 USB driver	
	15. Technical data	90



DOCUMENTATION

Technical and programming details on the MT830/MT831 meter can be found in:

- MT830-MT831_ENG V1,1.pdf: Technical description,
- MeterView 4: Users manual.

Note: MT83x meters comply with the current valid FNN instructions "Leitfaden zur Bewertung der Zuverlässigkeit und Messbeständigkeit von Elektrizitätszählern und Zusatzeinrichtungen" from november 2011 and can be installed in photovoltaic and cogeneration systems.

WARNING!

The meter installation must be performed by authorized persons, who are familiar with security against electric current stroke. Feed-through terminals and auxiliary terminals are under voltage that can be lethal!

1. Meter parts



- 1. LCD display
- Meter technical data 2.
- 3. IR optical interface
- 4. Input/output module mark
- Legend of displaying registers on LCD 5.
- Meter cover sealing screw 6.
- Terminal cover 7.
- Terminal cover sealing screw 8.
- 9.
- Communication module mark RESET key blocking element 10.
- RESET key 11.
- DISPLAY key 12.
- 13. Impulse diode - active and reactive energy
- 14. Meter cover

Fig. 1: Meter parts

Meter and fixing dimensions comply with the DIN 43857 standard.







Fig. 3: Dimensions (MT830 meter)

A compact plastic casing is made of high quality self-extinguishable materials and is resistant to water and dust (IP53).

Meter terminals

ISKRAEMECO

MT830 meter



Fig.4: Terminal block – direct connected meter MT830



Closed - opened voltage link:



Fig. 5: Voltage link – direct connected meter

There are 6 auxiliary terminals on the meter basic board. They could be defined as inputs (max. 2), outputs (max. 4), communication (CS or RS-232 or RS-485) and external power supply. To access terminal block remove terminal cover (8, Fig. 1: Meter parts), fixed with two screws (9). Seals from screws must be removed.



Voltage and current terminals Auxiliary terminals

Fig. 6: Terminal block – indirect connected meter MT830

MT831 meter (with input/output and communication module)

There are 6 auxiliary terminals on the meter basic board. They could be defind as inputs (max. 2) and external power supply. Additional inputs and outputs are located in the module.



Voltage and current terminals

Fig. 7: Terminal block – indirect connected meter MT831



Voltage and current terminals

Fig. 8: Terminal block – direct connected meter MT831

Input – Output modules

Regarding the module programming, two versions exists:

- "Factory preprogrammed" modules: terminal function is burned in the module memory, meter automatically acccept the module setting, terminals are denotated according to the VDEW denotation, modules could be reprogrammed only in the factory or with special factory tool Module Programmator
- "Empty" modules: modules are programmed as empty, terminal function is defined by meter parameters meter defines the terminal function, terminals are denotated as T1, ... Tn for outputs and I1, In for inputs

When moudule is inserted into the meter, cursor IM must be ON. If it blinks, module is not programmed properly or it is not programmed at all. Module must be sent back to the factory.

Connection diagram for modules is printed on the module itself and on the label, on the bottom side of the terminal cover. **Definition of input terminals – factory programmed input – output module (function is define in the module)**



Fig. 9: Factory programmed input -output module

Terminal	Terminal designation	Additional explanation
15	СОМ	Common terminal for functional inputs
13, 33	TE1/2, TE3/4	Energy tariff input T1 – T4
14, 34	ME1/2, ME3/4	Demand tariff input M1 – M4
16	MPE	External time/measurement period synchronization input
17	MZE	External input for disabling of demand measurement
18	MREa	Input a for external billing reset
19	MREb	Input b for external billing reset
35	СОМ	Common terminal
36	MKA	Alarm output
37	MPA	Measurement period output
38	ERA+A	Energy flow direction +A
39	ERA+R	Energy flow direction +R
40	СОМ	Common terminal
41	+AA	Pulse output +A
42	-AA	Pulse output -A
43	+RA	Pulse output +R
44	-RA	Pulse output -R
45	RA1	Pulse output RA1
46	RA2	Pulse output RA2
47	RA3	Pulse output RA3
48	RA4	Pulse output RA4
65	СОМ	Common terminal
61, 63	TA1/2, TA3/4	Demand tariff outputs T1 – T4
62, 64	MA1/2, MA3/4	Demand tariff outputs M1 – M4
67	MZA	Output for disabled max. demand measurement
68	MRAa	Output for external billing reset a
69	MRAb	Output for external billing reset b

Definition of input terminals – non-programmed input – output module (function is defined by the parameters in the meter)



Fig. 10: Default »non-programmed« input -output module

Terminal	Additional explanation
C1, C2, C3	Common terminal for functional inputs or outputs
11, 11, 13, 14	Input terminals
T1,, T8	Output terminals

Function of input (output) terminal is written on the meter connection diagram (sticked on the bottom terminal cover side). It could be also read out with the MeterView program:

Input pins		Input pins
	In 1	MP
Output pins		Output pins
	Out 1	МКА
	Out 2	A+
	Out 3	A-
	Out 4	Q+
	Out 5	Q-

Module designation	
MIO-V12L51	1 x input, 4 x OPTOMOS outputs, 1 x OPTOMOS output
MIO-V42L81	4 x input, 4 x OPTOMOS outputs, 4 x OPTOMOS output
MIO-V12L41B11	1 x input, 4 x OPTOMOS outputs, 1 x bistable 5A relay output

Definition of external power supply

Terminal	Terminal designation	Additional explanation
30	50 – 240 V AC/DC	External power supply
31	50 – 240 V AC/DC	External power supply

Communication modules

Regarding the module programming, two versions exists:

- "Factory preprogrammed" modules: communication parameters are burned in the module memory, meter automatically acccept the module setting, modules could be reprogrammed only in the factory or with special factory tool Module Programmator
- "Empty" modules: modules are programmed as empty, communication parameters could be changed by meter parameters

When moudule is inserted into the meter, cursor CM must be ON. If it blinks, module is not programmed properly or it is not programmed at all. Module must be sent back to the factory.

Each module has two independend communication interfaces:

- primary
- secondary

"Passive" communication modules (modules without modem):

MK-2-3 → RS-232 & RS-485 MK-3-3 → RS-485 & RS-485 MK-1-3 → CS & RS-485

Module designation	Primary interface	Secondary interface
MK-2-3	RS-232	RS-485
MK-3-3	RS-485	RS-485
MK-1-3	Curent loop	RS-485

Primary and secondary communication interfaces are defined by the hardware in the module. Denotation expresess, which interface is primary and which is secondary.

Communication module MK-2-3 (RS-232 & RS-485) :



Meter enables simultaneously reading via the both interfaces at the same time. Secondary communication interface is shared with IR optical interface – when communication runs via optical probe, communication via interface in the module is not possible.

"Active" communication modules (modules with modem):

Module designation	Primary interface	Secondary interface
MK-f37 - 3	PSTN modem +CS+RS-485	RS-485
MK-f39 - 3	ISDN modem +CS+RS-485	RS-485
MK-f3a - 3	GSM/GPRS modem +CS+RS-485	RS-485
	 – old version 	
MK-f38a - 3	GSM/GPRS modem +CS+RS-485	RS-485
MK-3e - 3	Ethernet+RS-485	RS-485

Modules composed of primary interface (modem+CS+RS-485 – these two interfaces are intended for multidrop communication) and secondary RS-485 interface.

Meter enables simultaneously reading via the both interfaces at the same time. Secondary communication interface is shared with IR optical interface – when communication runs via optical probe, communication via interface in the module is not possible.



Secondary RS-485 interface

FME antenna for GSM/GPRS modem

RS-485 and CS interface intended for multi drop communication. If CS is not used, it must be shortcuted!

Fig. 12: Communication module

Note: ISKRAEMECO suggest, that primary communication channel on multi-drop meter is used for cascading.



Fig. 13: Example of multidrop connectionwith MK-f38-3 communication module



Front plate

The following data is printed on the meter front plate:

- serial number,
- ownership number,
- type and version designation,
- accuracy,
- year of manufacturing,
- approval mark,
- rated voltage,
- rated and maximum currents,
- rated frequency,
- LED and output pulse constants,
- software version,
- owner's name or logo,
- bar code,
- code of connection diagram and program number.

ISKRA	(Made In S			Made in Slovenia			200>		
40 9 Db /	▼ ▼ 11 12	▼ ▼ T3 T4	▼ ▼ IM CM	▼ I AV	▼ RV	▼ COM	▼ FF	▼ SET	~ □	(6
Type MT831-T1A No. 12 345 678	+ VV IT E \32R46S43-E Rox=10 K ¹	1-M3K0Z4 Wh/imp	3x1	132 kV, Ro	/√3 // n=10	/ 3x11 kvarh	10/√3 /Imp	ĪV	500/1 A	50 Hz
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Fig. 14: Front plate (MT831)



Fig. 15: Front plate (MT830)

Power supply

Meter could be supplied from:

- multi-range internal power supply from main voltages,
- external power supply (50-230 V AC/DC) on request
- "no power reading option" with SONDA 6 on request



Fig. 16: Optical-magnetic interface, Iskraemeco SONDA 6, connected to portable computer

"No power reading" – meter is powered via SONDA 6 optical interface. SONDA 6 could be connected to the portable computer – in such case is possible to read meter manually via LCE or reading and programming (parameters and time setting) with MeterView.

SONDA 6 could also be powered via soecial battery pack. In such case it is possible to read meter only manually via LCD.



Fig. 17: Optical-magnetic interface, Iskraemeco SONDA 6, connected tospecial battery pack



2. Installation

To install meter follow next steps:

1 - Adjust hook height to fit installation position of the meter. Sliding hanger enables installation for all fixing dimensions from 165 to 230 mm.



Fig. 18: Adjustable hook at meter back

2 - Fasten the meter to the measuring spot by three screws.



Fig. 19: Screw positions

3 - Connect measuring, input and output circuits and communication cables in conformity with the connection diagram stuck inside the terminal block cover on the meter and modules.

Connection diagram 3P4W for direct connected meter



Connection diagram for indirect connected meter (3P4W connection, connection via current and (or) voltage transformer)



Connection diagram for indirect connected meter (3P3W connection – external Aaron, connection via current and voltage transformer)



Connection diagram for indirect connected meter (3P3W connection, connection via current and voltage transformer)



Note: Such connection could be used only for maximal nominal voltage 3x100V ... 3x230V and with implemented vector registration only!

4. Connect inputs, outputs and communication interfaces.



5. Install the terminal block cover and fasten it by two screws. Seal the terminal block cover screws by wire and seal.

6. If reset key has to be locked, hang up the overhang and lock it up. The overhang hole diameter is 5 mm.

7. Power-up the meter. By connecting to the voltage the light emitting diodes illuminate. After 3s measuring data from the auto-scroll sequence are cyclically shown on the display.

8. Select GRID menu on the meter LCD and check phase voltages, currents, frequency and phase angles:



1 <u>.</u> ,	L1 L2 L3 A			Current phase 11
31.7.0 •	2.1		31.7.0	2.1 A
¶ <u>u</u> r	L1 L 2 L 3 A			Current - phase L2.
51.7.0 •	3.9		51.7.0	3.9 A
1 <u>"</u> ,	L1 L2 L3 A			Current - phase 13
71.7.0 ,	. 4.1		71.7.0	4.1 A
1 <u>4</u> ,	L1 L2 L3 KW			Three phase instantaneous
15.7.0 •	2.0		15.7.0	active power (abs(QI+QIV) + (abs(QII+QIII)) 2.0 kW
r ← ↓	Lí Lí Li kVAr		130.7.0	Three phase instantaneous reactive
130.7.0 •	0.3			power (abs(QI+QIV) + (abs(QII+QIII))
r ← <u>'</u> † <u>'</u> -,, ,,	L'1 L'2 L 3 KVA		131.7.0	Three phase instantaneous apparent
131.1.0				power (abs(QI+QIV) + (abs(QII+QIII))
1 <u>4</u> ,	L1 L2 L3			
13.1.0 •	0.9998		13.7.0	Three phsae instantaneous power factor 0.9998
*† <u>4</u> ₽	L1 L2 L3			
14.7.0 •	50.0 •		14.7.0	Frequency
←1ª 	L'1 L'2 L 3	-	81.7.1 Ph vo	hase angle between Itage R and voltage S
81.7.1	120.0			
۹۰ <mark>→ ا⁴ا ماراً</mark> بو	L'1 L'2 L 3		81.7.2 Ph vo	nase angle between Itage R and voltage T
81.7.2	240.0			



3. Checking the meter

Voltages

The meter enables detection and alarming of the presence of phase voltages. Presence of voltage and phase sequence is marked with L1L2L3 characters in the LCD.

- If all three symbols L1L2L3 are displayed, it means that all three phase voltages are present.
- If cursors L1L2L3 are blinking, phase sequence is not correct (because of natural connection, the reactive energy is also properly measured).
- Any not displayed symbol (L1, L2 or L3) means certain phase voltage is not present ot lower than predifined value Un 90%
- When one phase voltage is over or under the predefined limits, the AV status starts to blink. In such case check the **nominal alarm voltage**.

Keter¥iew - Device parameters schem	e I					
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Load

If no load or lower than the meter sensitivity threshold is connected to the meter, the light emitting diodes illuminate permanently, and the power flow direction symbols or quadrant respectively pulse.

If the load is higher than the meter sensitivity threshold, the light emitting diodes pulse with a frequency proportional to the load and the power flow direction symbols and quadrant are shown on the display.

Factory pulse constants settings (values are programmable):

Direct connected meter

- 3x230/400V, 5(60)A → 1.000 imp/kWh
- 3x230/400V, 5(120)A → 500 imp/kWh
- Transformer connected meter
 - o 3x57.7/100 3x240/415V, 1(6)A → 10.000 imp/kWh
 - o 3x57.7/100 3x240/415V, 5(20)A → 2.000 imp/kWh

4. Meter handling

LCD display on the MT83x meters can present different several of data - menu. It serves by two buttons: **Data** (black key) and **Reset** (red key). Both keys are on the meter front. The reset key can be sealed separately from the meter cover, or a padlock could lock it.



Fig. 20: Meter buttons

Keys, depending on the sequence they were pressed in and how long we kept them pressed, could execute various actions. Such handling with the display, as well as the meter parameters programming is executed by one hand, signifying that no simultaneous pressing of several control elements is required.

The following commands can be executed:

Black key (Data)

- Short press (t_{pressing} < 2 s) we select the next value in the list or the next chapter in the menu
- Long press (2 s ≤ t_{pressing} < 5 s) activates the displayed chapter in the menu or it skips past months data readout
- **Extended press** ($t_{pressing} \ge 5 s$) interrupts data readout in the selected chapter, and returns back to the AUTO display mode

Note: all specified time values are programmable!

Red key (Reset)

- Short press (tpressing < 2 s) goes to next value (when time is setting with buttons), executes meter billing reset (MD reset) (meter must be in AUTO display mode)
- Long press (2 s ≤ t_{pressing} < 5 s) factory SET mode

Pushbuttons perform next actions:

Activation time	Scroll (black)	Reset (red)
Short	Move to next	Next value,

	selection	Increase value, Billing reset
Long	Confirm selection	Confirm setting,
Extended	Meter returns back to "Auto" sequence	Factory SET mode

Table 1: Pushbutton actions



The measuring data on an LCD are displayed with eight 7-segment 8 mm x 4 mm high numbers. Displayed data are identified with a five-digit OBIS identification codes (IEC 62056 - 61), 6 mm x 3 mm high numbers. Dimension of LCD (visible area) is 69 mm x 20 mm.

Meter operates in different display modes

• Automatic data circulation → Auto mode

Time between two register presentations on the LCD in "Auto" sequence is programmable. For registers identification only 5 digits is used \rightarrow 9 register previous values could be presented on the LCD (in case, when all energies (demands): A+, A-... S+, S- is presented on the LCD).

Some commands in the meter could be performed only in Auto mode:

billing reset

Additional modes are accessible by the black and red button. Displaying modes accessible by the **black** one:

- Manual data display registers → Std data mode
- Manual data display– Load Profile mode (P.01 and/or P.02 (programmable))
- Manual data display network parameters (voltage, current, phase angle, ..) → Grid mode
- Presentation of the GSM modem parameters → DiAg mode

Displaying modes accessible by the **red** button:

- Manual setting of time, date, ... → SET mode
- Registers presented in Auto mode with enhanced energy registers presentation → TEST mode
- Resetting the LCD statuses of meter and terminal cover opening → Intrusion restart mode

Format and data units are programmed. Transformer connected meters, displayed values could be presented as primary, semi-primary or secondary values (presentation of line voltage and current are secondary by default). Besides measuring data, the energy flow direction, presence of phase voltages, display of individual events, meter statuses and alarms can be displayed.



Meters have back-light illumination for easy data reading at metering place with bad light condition. The LCD is illuminated when any pushbutton is pressed. The illumination is switched-off after 3 minutes, if no pushbutton was pressed at that time (illumination time is programmable).

Explanation of the statuses, presented on the LCD:



Fig. 22: Meter statuses presented on the LCD

Status **ON**:

T1 – T4 Tariff for energy M1 – M4 Tariff for demand Input/output module recognized correctly IM Communication module recognized correctly СМ Reverse flow RV Reading of the data via communication COM Meter in SET mode SET MCO Meter cover opening TCO Terminal cover opening

Status BLINKING:

- IM Input/output module is NOT recognized correctly (module is not programmed correctly)
- CM Communication module is NOT recognized correctly (module is not programmed correctly)
- AV Alarm voltage
- FF Fatal error
- SET Meter in TEST mode

Note: the meaning of each status is programmable and defined according to the customer wish!

2.4.2 Power flow direction and quadrant indicator

The active energy flow direction graphic symbol and the reactive energy quadrant are displayed in the left upper angle.

Symbol	Power flow direction and quadrant	
È	Active energy reception (A+)	
Æ	Active energy transmission (A-)	
ÇÈ Q1	Active energy reception (A+) Reactive energy 1st quadrant (Q1)	
ÆÇ Q2	Active energy transmission (A-) Reactive energy 2nd quadrant (Q2)	
Æ _{É Q3}	Active energy reception (A+) Reactive energy 3rd quadrant (Q3)	
É Q4	Active energy transmission (A-) Reactive energy 4th quadrant (Q4)	
Q1, Q4	Two phases in Q1, one phase in Q4	

The displayed symbol shows the active energy flow direction and the reactive energy quadrant. The pulsing symbols show that the load is lower than the meter sensitivity threshold or the load does not exist at all. At the same time, the meter calibration light emitting diodes illuminate without interruption.

Load character can be detected from the arrows indicator; exact values are possible to read from GRID menu.

Note: We don't need any additional equipment to define is meter connected properly or not.

2.4.3 Phase voltages indicator

The phase voltages indicator shows whether each individual phase voltage is present or not.

L1 L2 L3

If all three symbols (L1, L2 and L3) are displayed, it means that all three phase voltages are present. Any not displayed symbol (L1, L2 or L3) shows this phase voltage failure. If symbols L1 L2 L3 pulse, it means a wrong phase sequence. In this case it is required to change the cables phase sequence. The phase sequence does not impact on measurement and registration of the active and reactive energy.



Phase L3 is not present



Wrong phase sequence

Display is able to show data automatically or manually with using black button on the top of device. Changing between different groups of data, shown on a display, is realised by pressing this button for short period. Groups, shown on display are: Std data, P.01, Grid, Diag.



Display test

We perform the display test to ascertain whether all segments of the display function. All segments are switched ON by once pressing the black key (Data) in the AUTO display mode.



Fig. 23: LCD test activated by one pressing of black button in Auto mode

In the AUTO mode, the display is not illuminated in order to reduce power consumption of the meter. For illumination of the display, press the black key (data) and keep it pressed for less than 2 seconds. The display will remain illuminated for three minutes, unless in the meantime some other key is pressed.

6. Display handling

Display is able to show data automatically or manually with using black butto. Changing between different groups of data, shown on a display, is realised by pressing this button for short period. Groups, shown on display are: Std data, P.01, Grid, Diag.

- Short press (tpressing < 2 s)
- Long press $(2 \text{ s} \le \text{t}_{\text{pressing}} < 5 \text{ s})$
- Extended press (tpressing ≥ 5 s)

Basic handling with the meter and data readout

Basic handlings with the meter and data readout are shown in the following diagrams of progress.



Figure 24: Diagram of data readout mode changing progress

ISKRAEMECO +_



Figure 25: Diagram of data lists selection progress in the Data key menu





Figure 26: Diagram of data readout progress from the Standard data list



Figure 27: Diagram of data readout progress from the Load-profile list





Figure 28: Diagram of options selection progress in the Reset key menu



Figure 29: Diagram of parameters setting progress by keys in the Set mode



Figure 30: Diagram of progress in the Test calibration mode

Menus on the display

6.1.1 Auto menu and Std dAtA display

When the meter is connected to the network voltage, LCD test appears on the LCD.



After that, the readout shows data from the AUTO collection. Data to be displayed in the AUTO mode can be selected by a customer when ordering meters and could be entered (reprogrammed) during the process of meter (parameter) programming. Data are cyclically displayed on the screen in ten-second intervals (interval is programmable). In the AUTO mode, the display is not illuminated.





The list of data on request, Std-dAtA, contains registers defined by customer or standard factory setting. Data on request from the Std-dAtA list appear on the display until the black key is pressed (long press) or until the time equal to measurement period elapses. In order to allow the next value to appear, press the black key (data) again and keep it pressed for less than 2 seconds. OBIS (or special) code of history data records has on its right side an additional one (two)-digit number indicating the month for which the read out data is valid (1 - to the number indicating previous month, 2 - to the number indicating two months ago). In order to skip readout of history data records (measurement data for previous months) keep the black key pressed longer than 2 and less than 5 seconds. If the black key (data) is not pressed during the measurement period, the display returns to the AUTO mode.

Note: register list, presented for Auto and Std dAtA mode is programmable

Auto mode	Std dAtA mode	Register	Explanation
	STD DATA	Menu "Std d	AtA"
	F.F.O CO	F.F.0	Fatal error (00 , no error)
		0.0.0	Device address (38422315)
•		0.9.1	Time 14:21:14 (hours, minutes, seconds) Format: hh:mm:ss
0.9.2 0.1.11.28		0.9.2	Date 7 th , November 2007 (year, month , day) Format: yy-mm-dd or dd-mm-yy
	0.1.0 12	0.1.0	Reset numbers 12
^{1°} , La La kWh 1.8.0 33425.54	I° L₁ L₂ L₃ kWh 1.8.0 33425.54	1.8.0	Active energy import (A+), total 33425.54 kWh

MT830/MT831 Installation manual

	1 <u>'</u> L 1.8.0.1	+ L2 L3 kWh 28674.66	1.8.0.1	Active energy import (A+), total – one months ago 28674.66 kWh
1 <u></u> , L+L2L8 kWh 1.8.1 22355.22	1 <u>'</u> ∟ 1.8.1	• L2 L3 kWh 22355.22	1.8.1	Active energy import (A+), tariff T1 22355,22 kWh
	1 <u>°</u> , ∟ 1.8.1.1	• L2 L2 KWh 12465.22	1.8.1.1	Active energy import (A+), tariff T1 - one month ago 12465,22 kWh
1 ⁴ , L1 L2 L3 kWh 1.8.2 6816.69	1 <u>"</u> , ⊾ 1.8.2	• L 2 L 3 kWh 6816.69	1.8.2	Active energy import (A+), tariff T2 06816,69 kWh
	1 <u>*</u> , L 1.8.2.1	⁴ L2 L3 kWh 9563.23	1.8.2.1	Active energy import (A+), tariff T2 – one months ago 09563,23 kWh
1 [•] , L+ L ₂ L ₃ kWh <i>1.8.3 4253.63</i>	1 <u> </u>	+ L 2 L 3 kWh 4253.63	1.8.3	Active energy import (A+), tariff T3. 04253.63 kWh
	1 <u>*</u> , L 1.8.3.1	* L 2 L 3 kWh 6646.21	1.8.3.1	Active energy import (A+), tariff T3 – one months ago 06646.21 kWh
1 L₁ L₂ L₃ kVArh 3.8.0 557.92	1	* L2 L3 kVArh 567.92	3.8.0	Reactive energy import (R+), total 00567,92 kVArh
	1 <u>"</u> , L 3.8.1	• L 2 L 3 kVArh 246.15	3.8.1	Reactive energy import (R+), tariff T1. 00246,15 kVArh

MT830/MT831 Installation manual

۳ <u>۰</u> ۰۰	L1 L2 L3 kVArh		Reactive energy import
3.8.2 •	186.20	3.8.2	(R+), tariff T2 00186,20 kVArh
¶ <u>u</u> ₽	L1L2L3 kVArh		
3.8.3 •	135.57	3.8.3	Reactive energy import (R+), tariff T3 00567,92 kVArh

6.1.2 GRID menu

† -	1 1 2 2		
•	GRID		Menu "GRID"
1 <u>.</u>	L1 L2 L3 V	32.7.0	Voltage - phase L1
32.7.0	225.3		226.3 V
1 <u>"</u> , 52.1.0	L1 L2 L3 V 228.3	52.7.0	Voltage - phase L2. 228.3 V
1 <u>' .</u>	L1 L2 L3 V	72.7.0	Voltage - phase L3.
72.1.0	229.7		229.7 V
1 <u>"</u> ,	L+ L2 L3 A	31.7.0	Current - phase L1.
31.7.0	2.1		2.1 A
1 <u>"</u> ,	L+ L2 L3 A	51.7.0	Current - phase L2.
51.7.0	3.9		3.9 A
1 <u></u> ,	L1 L2 L3 A 4.1	71.7.0	Current - phase L3. 4.1 A

1 <u>"</u> , 15.7.0	L1 L 2 L 3 KW 2.0	15.7.0	Three phase instantaneous active power (abs(QI+QIV) + (abs(QII+QIII)) 2.0 kW	
t^	Lí Lí Li kVAr D.3	130.7.0	Three phase instantaneous reactive power (abs(QI+QIV) + (abs(QII+QIII))	
r ← 1º	LÍ LÍ L 3 KVA 2.0	131.7.0	Three phase instantaneous apparent power (abs(QI+QIV) + (abs(QII+QIII))	
1 <u>"</u> , 13.7.0	L1 L2 L3 0.9998	13.7.0	Three phsae instantaneous power factor 0.9998	
1 <u>"</u> , 14.7.0	L1 L2 L3 50.0 -	14.7.0	Frequency	
81.7.1	Lí Lí La 120.0	- 81.7.1 Pł vc	nase angle between bltage R and voltage S	
° ← ∱' ↓ · · ·	L'I L'E L B 240.0	81.7.2 Pł vc	nase angle between oltage R and voltage T	
° ← ↓ 81.7.40	ι΄ι μ΄ μ΄ μ΄ μ΄ 44.3	81.7.40 Phase angle between voltage R and current R		
 ↓ ₿1.1.51	L'1 L'2 L 3 47.1	81.7.51 Pł vol	nase angle between tage S and current S	
- <u>_1</u> • <u>1</u> 81.1.62	Li Li Li 39.2	81.7.62 Pł voł	nase angle between tage T and current T	



6.1.3 DIAG menu (for GSM modem only)



7. Setup meter time setup by pushbuttons

With the Reset (red key) and Data (black key) key we can change certain meter parameters, e.g. time, date, etc. Remove the seal from the red key (Reset), i.e. unlock the overhang and pull pin to the left to release the key. Press the black key \rightarrow LCD test appears on the display, than press the red key once.



The message showing that the meter will go in the SET mode.

If you want to use the keys to change the meter parameters, press the black key (Data) and hold it pressed it for more than two but less than five seconds. The display will show the first data from the list of data you can set in the SET mode (factory setting time and date). If you want to change the displayed data, press the red key (Reset) and hold it pressed until the first character on the display starts pulsing. Otherwise, press the black key (Data) to display the next group of data from the Set list.



0.9.1 Setting the time (format hh:mm).

In the first segment of the display, a number and a cursor will pulse. If you want to change the first value, press the black key (Data). The pulsing value will be increased by one. Continue pressing the black key until you reach the desired value. Press the red key (Reset) to enter the new value into the registers. At the same time, the cursor will move right to the next segment.



The second value starts pulsing. If you want to change the second value, press the black key until you reach the desired value and then confirm it with the red key (Reset). Otherwise, press the red key to move the cursor right to the next segment. After the last value has been changed and the change has been confirmed with the red key, all numbers start pulsing.




If you want to store the changed value in the register memory, press the red key (Reset). Otherwise, press the black key to keep the old value. The display will now show the next group of data from the Set list.

After you have finished changing the parameters, push the pin to the right to block the red key and seal it, i.e. cover it with the overhang and lock it and press the black button for more than 5 seconds to go out of the SET mode.

8. GSM/GPRS communication module MK – f38a –3



Installation of the SIM card (SIM card must be enabled for data transfer) 1. Remove the GSM/GPRS modem from the meter



- 2. SIM card must be without PIN code (IP address must be known related to the SIM card not public)
- 3. Insert the SIM card into the SIM cardholder





- 4. Insert GSM/GPRS module back into the meter
- 5. Connect antenna into the modem



6. Write APN, username and password into the meter (via optical probe)

	APN	iskraemeco.si
ISKMT830-1031	Username	
	Password	remoeteie

7. For enabling multidrop communication via CS and RS-485 interface check the group CONSERETH settings.

Subtype	GSM/GPRS	
Protocol	IEC1107(fixed baud)	•
Baudrate	9600	
Data bits	7	
Parity	Even	
Stop bits	1.	
Address		
Port	2010	

8. Check if module is logged in the GPRS network \rightarrow Command prompt



Command \rightarrow telnet <IP address> \rightarrow

 $\mathsf{Command} \rightarrow \mathsf{dis}$

ISKRAEMECO

Login: Password: OK >dis 1. Mode on OTA port: 2. APN for GPRS access: 3. Username for GPRS access: 4. Password for GPRS access: 5. Local IP Address: 6. Subnet Mask: 10,253.49.18 [-tg]	
Password: OK >dis 1. Mode on OTA port: 2. APN for GPRS access: 3. Username for GPRS access: 4. Password for GPRS access: 5. Local IP Address: 6. Subnet Mask: 10.253.49.18 [-tg]	
OK >dis 1. Mode on OIA port: 3 [-mod] 2. APN for GPRS access: iskraemeco.si [-apn] 3. Username for GPRS access: p2ccs2 [-gun] 4. Password for GPRS access: remoteie [-gpw] 5. Local IP Address: 10,253.49.18 6. Subnet Mask: [-tg]	
7. Gateway IP Address:[-ts]8. Consereth ICP Port Number:2010 [-tp]9. Telnet Port Number:23 [-tt]10. Telnet Username:[-tun]11. Telnet Password:[-tpw]12. FIP Server Address:255.255.255 [-fip]13. Username for FIP access:P2CCM [-fun]14. Password for FIP access:P2CCM [-fpw]15. File path on FIP server:. [-fpt]16. File name on FIP server:. [-fpt]17. Alarm process status:0 (0=INACTIVE, 1=ACTIVE) [-aps]18. Alarm capture status:0 (0=INACTIVE, 1=ACTIVE) [-accs]19. Alarm TCP Port number:2011 [-alp]20. Remote computer IP address for alarms:206[-ard]21. Alarm repetitions count:3 (0=10) [-arc]22. Alarm repetitions count:0 [-ard]23. Alarm time out (sec.):20 [-ato]24. Serial port!0 [-sp]25. Serial port 0 data bits:7 [-sd]27. Serial port 0 stop bits:1 [-ss]28. Serial port 0 parity:0 (0=NONE, 1=EVEN, 2=ODD) [-sr]29. Serial port 1 band rate:9600 [-sb]30. Serial port 1 stop bits:1 [-ss]32. Serial port 1 band rate:9600 [-sb]33. Serial port 1 parity:0 (0=NONE, 1=EVEN, 2=ODD) [-sr]34. Serial port 1 parity:0 (0=NONE, 1=RISCIS, 2=XONXOFF, 331. Serial port 1 handshake:0 (0=NONE, 1=RISCIS, 2=XONXOFF, 333. Serial port 1 handshake:0 (0=NONE, 1=RISCIS, 2=CONXOFF, 334. Serial port 1 handshake:0 (0=NONE, 1=RISCIS, 2=CONXOFF, 335. Consereth iec1107 monitor stat	=RTS =RTS

Telnet commands:

Command	Description
telnet <ip></ip>	Connection to the module
dis	Parameter list
core	Core version
fwident	FW Version
hw	HW version of Wavecom modem
modem	Modem state
reset	Activate 3 minutes postponed module reset
imei	Modem's IMEI number
upgcomm	FW upgrade
quit	Save settings and close Telnet connection
debug_i	Send additional module information
set	Parameter change (see parameter description)

Parameter	Description	Command line
-tt	Set Telnet gate number	set -tt <tcp num="" port=""></tcp>
-tun	Set Telnet Username (Max, length = 9)	set -tun <username></username>
-tpw	Set Telnet password (Max. length = 9)	set -tpw <password></password>
dis	Phonebook	phonebook dis
add	Add phone number into the phonebook	phonebook add <phone#></phone#>
		<restriction></restriction>
del	Delete phonebook – selected index	phonebook del <index></index>
delall	Delete all phonebook	phonebook delall
gsr	Set restrictions for the specified phone	phonebook gsr <restriction></restriction>
	numbers	
-apn	Set APN	set -apn <gprs_apn></gprs_apn>
	(max. length = 40)	
-gun	Set user name	set -gun <username></username>
	(max. length = 20)	
-apw	Set password N	set -qpw <password></password>
31-11		
	(max length = 20)	
	(maxi longtri = 20)	
to	Set TCD goto number	act the stan heart hume
-tp	Set TCP gate number	set -tp <tcp_port_nums< td=""></tcp_port_nums<>
	• · · ·	· -
-sp	Activate serial port	<pre>set -sp <serial_port_num></serial_port_num></pre>
-sb	Baud rate	set -sb <baud_rate></baud_rate>
-sd	Data bits (7 or 8)	set -sd <data_bits></data_bits>
-SS	Stop bit (0 or 1)	set -ss <stop bits=""></stop>
-er	Parity (0-pope 1-even 2-odd)	get _gr charitys
-51		Set SI (parity)
-sn	Handshake (0-none, 1-RTS/CTS,	set -sh <handshake></handshake>
	2-Xon/Xoff, 3-RTS toggle)	
-cim	Set IEC 62056-21 monitor status	
	(0-inactive, 1-active) – read only	
-fip	Set IP address for FTP server	set -fip <ip_address></ip_address>
-fun	Set username for FTP access	set -fun <username></username>
four	Sat pageword for ETD assoc	act for accord
-ipw	Set password for FTP access	set -ipw <password></password>
-fpt	Set file path on the FTP server	set -fpt <file_path></file_path>



-fnm	Set file name on the FTP server	Set -fnm <file_name></file_name>

9. Meter reading with MeterView

The basic procedure for using Meter View communications is as below. Each of the steps is explained in detail in the following sections.

1. Set the communication parameters.



3. Read or program the device.

If you wish to create a scheme (changing the parameters) , then the procedure is:

- 1. Select the device for which you want to create a scheme.
- 2. Define the parameters
- 3. Save to disk or write to device.

Reading the meter via optical probe in the meter

Set up the:

- Protocol → IEC6256-21 (former IEC1107)
- Media → Optical
- Port/modem \rightarrow appropriate COM port in your computer
- Retries $\rightarrow 1$

With click to Advanced ... , select:

- Baud rate → 300
- Data bits \rightarrow 7
- Parity → even
- Stop bits $\rightarrow 1$

Device address is not obligatory.







Profile	Opt	ical settings	_	🗙 🕒 🐴
Protocol	IEC	62056-21 (former IE	EC1107)	_
Media	Opt	ical		•
Port / mod	dem COI	M8		•
Baud rate	300	1		Ŧ
Retries	1		Advance	ed
C Devic	e address			
Init comma	and			
Dial comm	nand			
Communica V Show	ition Log communication log			
Help			🗸 ок	X Cancel
ut				
l rate	30)		
bits	7			
	evi	en		

Reading the meter via RS-232 or RS-485 or current loop communication interface in the meter

Set up the:

- Protocol → IEC6256-21 (former IEC1107) •
- Media → RS-232/Current loop
- Port/modem → appropriate COM port in your computer
- Retries \rightarrow 1

Advanced ... With click to

, select:

- Baud rate \rightarrow 9600 (or select baud rate in the meter) .
- Data bits \rightarrow 7 •
- Parity \rightarrow even •
- Stop bits $\rightarrow 1$
 - Device address \rightarrow it is on the meter front plate or read value in from the 0.0.0 register
 - Obligatory for RS-485 and current loop interface (RS-485 and current loop interface in the MT83x meter 0 is defined as "multidrop" interface, reading the meter with "device address is obligatory)
 - Not obligatory for RS-232 interface 0

Tip 1: How to check if Rx, Tx and GND terminals are connected properly? The voltage between Rx –GND and Tx-GND must be around 9V.

Tip 2: When you connect meter to modem \rightarrow connect Rx – Rx and Tx – Tx and when you connect meter to computer \rightarrow connect Rx – Tx and Tx – Rx.

Profile	RS-232/RS-4	85/Current loop 💌 📙	🗙 🕒 🐴
Protocol	IEC62056-21	(former IEC1107)	•
Media	RS232 / Curr	ent loop	•
Port / modem	СОМО		•
Baud rate	9600		_
Retries	3	Advance	ed
Device add	ress 00000000		
Init command			
Dial command			
Communication L	og nunication log		
Help		🗸 ок	X Cancel
ate	9600		
its	7		
	even		
its	1		

Reading the meter via GSM or PSTN or ISDN modem in the meter - selection "Standard modem"

Set up the:

With click to

- Protocol → IEC6256-21 (former IEC1107) •
- Media \rightarrow Modem (standard)
- Port/modem \rightarrow select appropriate modem, which is installed under windows system •
- Retries \rightarrow 1 •

Advanced ...

```
select:
```

- Baud rate \rightarrow 9600 (or select baud rate in the meter) ٠
 - Data bits \rightarrow 7
 - Parity \rightarrow even •
 - Stop bits $\rightarrow 1$

All these data are related to the meter's communication interface setting. Settings in the meter and in the modem must be same.

- Device address \rightarrow it is on the meter front plate or read value in from the 0.0.0 register • Obligatory - if more then one meter is connected to the GSM/PSTN/ISDN module
- Dial command \rightarrow write phone number

Profile		GSM/PSTN/ISDN 💽 🚼 🔀 🖒 🕈		
Protocol		IEC62056-21 (former IEC1107)		
Media		Modem (standard)		
Port / m	odem	ThinkPad Integrated 56K Modem		
Baud rai	e	9600		
Retries		3 Advanced		
🔽 Dev	ice address	0000001		
Init com	mand	ate0		
Dial com	mand	041640179		
Communic	ation Log w communicati	ion log		
<u>H</u> elp		🗸 OK 🛛 🗶 Can		
ate		9600		
ts		7		
		even		

Note: Computer modem settings and meter modem settings must be the same. **Note:** Modem settings could be checked – changed under:



MT830/MT831 Installation manual

Možnosti modema in telefo	na	?		2		and a
Pravila za klicanje Modemi	hinkPad Integrate	d 56K Modem	- lastnosti	? 🗙	Internetne	Krmil
Nameščeni so nas	Gonilnik Splošno	Sredstv. Modem	a Upravlja Diagnostika	nje porabe Dodatno	moznosti	
Modem GPRS WLAN Combo C HUAWEI Mobile Conne HUAWEI Mobile Conne Standard 9600 bps Mc Standard 9600 bps Mc Standard 9600 bps Mc Standard 9600 bps Mc Standard 9600 bps Mc U.S. Robotics 56K FAX	Posebne nastavitvi Dodatni ukazi za ir	e nicializacijo: Dodatne Spremeni	Nastavitve strojne o Podatkovni biti: Parnost: Zaključni biti: Modulacija:	preme 7 Soda 1	ivzete n ?	
				V rec	lu Preklič	:

Note: Meter connected to ISDN modem can be read out only via ISDN modem!

Reading the meter via GSM or PSTN or ISDN modem in the meter - selection "Custom modem"

Set up the:

- Protocol → IEC6256-21 (former IEC1107)
- Media \rightarrow Modem (custom)
- Port/modem → select COM port on the computer, where modem is connected
- Retries → 1

Advanced ...

With click to _____, select:

- Baud rate \rightarrow 9600 (or select baud rate in the meter)
 - Data bits \rightarrow 7
 - Parity → even
 - Stop bits $\rightarrow 1$

All these data are related to the meter's communication interface setting. Settings in the meter and in the modem must be same.

- Device address \rightarrow it is on the meter front plate or read value in from the 0.0.0 register
 - Obligatory- if more then one meter is connected to the GSM/PSTN/ISDN module
 - Init command \rightarrow write appropriate AT command to program your modem properly
- Dial command \rightarrow write phone number

Profile	GSM/PSTN/ISDN 🔄 📙 🛛 🖒 🍋
Protocol	IEC62056-21 (former IEC1107)
Media	Modem (custom)
Port / modem	СОМ1 _
Baud rate	9600
Retries	3 Advanced
✓ Device address	00000001
Init command	ate0
Dial command	041640179
Communication Log	ation log
	🗸 OK 🛛 🗶 Cancel
-	
ate	9600
ts	7
	even

Reading the meter via Ethernet - transparent or consereth type

Transparent or consereth type is programmable.

9.6.1Setup the IP number in the Ethernet module – conserveth type

Ethernet module parameters could be read out with Telenet server. Personal computer and module must be connected with "crossover" LAN cable.

1. Set the computer IP address in the same subnet as the consereth module

Example:		
👝 🕑 Uporabi ta IP naslov:		
IP naslov:	17 . 25 . 22 . 42	
Maska podomrežja:	255 . 255 . 255 . 0	Subnet mask, that should be
Privzeti prehod:	17 . 25 . 22 . 1	



> Username : user > Password : **** (user)

Original computer subnet mask must be changed to

-💽 Uporabi ta IP naslov:	
IP naslov:	10 . 3 . 11 . 02
Maska podomrežja:	255 . 255 . 255 . 0
Privzeti prehod:	10 . 3 . 11 . 1

Connect the LAN cable (crossover) to module and computer and read/change parameters. Default (factory) settings (could be read out via Telnet by utilising > telnet IP number > command:

C:\Documents and Settings Connecting To 10.3.11.119	\M_Hribar>telnet 10.3.11.119
Consereth Telnet Server	
> Username : uusseerr	
> Password : u*s*e*r* ** USAGE: > [COMMAND] -[PARAMETER] Commands : set, display, >	[VALUE] exit
1. Local IP Add.:10.22. Gateway IP Add.:10.33. Subnet Mask:2554. TCP Port num.:2005. Telnet Port num.:236. Serial Port:07. Serial Baud Rate:9608. Data Bits:7 b9. Stop Bits:1 b10. Parity Bits:1 c11. Handshake:0 c12. MAC Address:0-113. SwSignature:8D-614. Change Username (4 S)15. Change Transfer Mode	<pre>2.6.187 [-tm] 2.6.1 [-tg] .255.255.0 [-tg] .255.255.0 [-ts] 0 [-tp] [-tt] [-sp] 0 [-sb] its [-ss] 0 = NONE, 1 = EVEN, 2 = ODD) [-sr] 0 = NONE, 1 = EVEN, 2 = ODD) [-sr] 0 = NONE, 1 = RTSCTS, 2=XONXOFF, 3=RTS TOGGLE) [-sh] -2-3-4-5 8-29-80 ignMax):'user' [-pu] ignMax):'***** [-pp] : 1 (0 = Conserveth, 1 = transparent) [-pr]</pre>

Username and password are by default settings the same \rightarrow »user«'. Telnet server requests username (printed out), then also password (not printed out). After setting the username and password, menu is listed out (lines 1 to 15). Each parameter could be changed with command SET.

Example:

Set -tm 10.2.6.186	setting of IP module address
Set -tg 10.2.6.1	setting of gateway IP address
Set –pr 0	setting Consereth module type

9.1.1.1. Reset of module parameters to "default"



In case, that module parameters are lost and we don't know the module parameters, it is possible to set up the original – factory settings.

1. Dismantle the Ethernet PCB out of the module



- 1. Make a shortcut on the jumper J3
- 2. Insert the module for 10 seconds into the meter module accepts the default (factory) settings.
- 3. Remove module from the meter
- 4. Remove jumper J3.
- 5. Put Ethernet PCB back to the module.

Reading the meter via Ethernet module - transparent type

Set up the:

- Protocol → IEC 62056-21 (former 1107)
- Media → Consereth (TCP-IP)
- Retries $\rightarrow 1$

Advanced ...

- With click to
 IP address → IP address, to which the module is connected
 - Port \rightarrow Port programmed in the Ethernet module
 - Type → Transparent

Note: Serial communication settings must be the same for the meter and the Ethernet modem.

Device address → it is on the meter front plate or read value in from the 0.0.0 register
 Obligatory – if more then one meter is connected to the Ethernet module

1 📥	Preferences		
	Communication General of	options Supported meters Comments	
	Profile	consereth 💌 📕 🔛 🍋	
B	Protocol	IEC62056-21 (former IEC1107)	
	Media	Consereth (TCP-IP)	
5	Port / modem	СОМО	
	Baud rate	9600	
	Retries	0 Advanced	
	Device address	0000007	
	Init command		
	Dial command		
	Communication Log	ion log	
	Help	V OK X Cancel	
Input			
IP addres	8	10.2.9.72	_
Port		2000	_
Timeout [i	ms]	8000	_
Туре		Transparent	
		🔷 OK 🛛 🗶 Car	ncel

Reading the meter via Ethernet module - Consereth type:

Set up the:

- Protocol → IEC 62056-21 (former IEC1107)
- Media \rightarrow Consereth (TCP-IP)
- Retries → 1

With click to Advanced ...

- , select:
- IP address \rightarrow IP address, to which the module is connected
- Port \rightarrow Port programmed in the Ethernet module
- Type → Consereth head

Note: Serial communication settings must be the same for the meter and the Ethernet modem.

Device address → it is on the meter front plate or read value in from the 0.0.0 register
 Obligatory – if more then one meter is connected to the Ethernet module

) 📥	Preferences	×
	Communication General of	ptions Supported meters Comments
	Profile	consereth 💽 📕 🔛 🍋
e	Protocol	IEC62056-21 (former IEC1107)
	Media	Consereth (TCP-IP)
s	Port / modem	СОМО
	Baud rate	9600
	Retries	Advanced
	✓ Device address	00000007
	Init command	
	Dial command	
	Communication Log	
	j snow communicatio	in log
	Help	🗸 OK 🛛 🗶 Cancel
Input		
IP addres	35	10.2.9.72
Port		2000
Timeout	[ms]	8000
Туре		Consereth head
		🗸 OK 🛛 🗶 Cancel

Reading the meter via GPRS modem in the meter

Set up the:

- Protocol → IEC 62056-21 (former IEC1107)
- Media → Consereth (TCP-IP)
- Retries → 1
 Advanced

With click to

• IP address → IP address, to which the module is connected

. select:

- Port → Port programmed in the Ethernet module
- Type \rightarrow Conservth head

Note: Serial communication settings must be the same for the meter and the GPRS modem.

Device address → it is on the meter front plate or read value in from the 0.0.0 register

o **Obligatory** – if more then one meter is connected to the Ethernet module

00	Preferences	
	Communication General o	ptions Supported meters Comments
,ре	Profile	gprs 💽 🛃 陆 🎦
ofile table	Protocol	IEC62056-21 (former IEC1107)
	Media	Consereth (TCP-IP)
channels	Port / modem	СОМО
	Baud rate	9600
	Retries	0 Advanced
	✓ Device address	12345678
	Init command Dial command	0 041640179
	Communication Log	on log
		✓ OK X Cancel
Input		
IP addres:	8	10.253.49.18
Port		2010
Timeout (r	ns]	8000
Туре		Consereth head
		🗸 OK 🛛 🗶 Cancel

10. GPRS network connection setting in Windows XP system

In case that connection to GPRS network is via LAN interface, no additional setting is needed.

General Packet Radio Service (GPRS) is service that enables data transfer via mobile phone network (GSM). GPRS enables service, that is known as "always on" data connection for GSM mobile phones. It enables faster WEB searching and data transmission and also faster access to online services, like WAP and email. The major benefit \rightarrow only transmitted data are charged, connection time is not charged.

For connection into the GPRS network APN (Access Point Node), username and password must be known. These data are published by mobile provider.

Instalation and modem settings:

Start \rightarrow Settings \rightarrow Control Panel \rightarrow Printers and Other Hardware \rightarrow Phone and Modem Options

Modems → Add

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one and Modem Options	?
ialing Rules Modems Advanced	
The following modems are install	ed:
Modem	Attached To
Standard 9600 bps Modem	COM1
Add (Remove Properties

Select: Don't detect my modem; I will select it from a list

Select: Standard 9600 bps Modem and select communication port, where modem is connected, for example ..: COM 1

Add Hardware Wizar	4
Install New Modem Select the port(s) yo	ou want to install the modem on.
	You have selected the following modem:
	Standard 9600 bps Modem
	On which ports do you want to install it?
ALL OF THE	C All ports
The second second	Selected ports
	COM1 COM11
dia.	
C. Company	
	Cancel

Select installed modem, then press button Properties. In the window Advanced write:

at+cgdcont=1,"IP","iskraemeco.si" \rightarrow where Iskraemeco.si is test APN

In window Diagnostic \rightarrow Query Modem chech the modem response.

Check the modem settings, by pressing Change Default Preferences...

tandard 9600 bps Modem Properties	? 🔀 Standard 9600 bps Modem Default Preferences 🛛 🕐
General Modern Diagnostics Advanced Driver	General Advancod
Extra Settings	
Extra initialization commands:	
at+ogdoont=1,"IH"."Iskraemeco.si'	
	-Herdware Settings
	Databrs: 0
	Parity: None
	Stop bits: 1
	Modulation
Change Ecfault Proferences	
OK Canc	

Creation of GPRS connection on the computer:

Start \rightarrow Settings \rightarrow Control Panel \rightarrow . Network Connections \rightarrow Create a new connection \rightarrow Connect to the internet \rightarrow Set up my connection manually \rightarrow Connect using a dial-up modem \rightarrow select modem \rightarrow nominate the connection, for example.: GPRS test connection \rightarrow phone number: *99***1#

Phone W	e Number to Dial hatis your ISP's phone numb	uer?			Ì
Ту	pe the phone number belew.				
	Phone humber:				
	*95***1#				
	You might need to incluce, you need the extra number neer a modern sound, the t	a '1' or the a s. dial the prio iumber dialed	rca code, or bolf ine number on ye is carrect.	n If you aro no: sura ur telephone, it you	

Write: user name: *XXXXX* and password: *remoteie* When connection is created, set up the preferences:

onnect krn	eki 🥐 🔀
0	
User name:	p2ccs1
Password:	[] o change the saved password, click here]
Save this (Me only Anyone	user name and password for the following users: who uses this computer
Dial:	×99***1#
Dial	Cancel Properties Help

Properties \rightarrow Security \rightarrow select Advanced (Custom settings) and press Settings \rightarrow select only Unencrypted password (PAP)



Under Networking select Internet Protocol (TCP/IP) and press Properties \rightarrow Advanced \rightarrow Switch off both options: Use default gateway on remote network and Use IP header compression

iternet Protocol (TCP/IP) Properties	Advanced TCP/IP Settings	?
General	General DNS WINS	
You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.	This checkbox only applies when you are connected to a local network and a dial-up network simultaneously. When checked, data that cannot be sent on the local network is forwarded to the dial-up network.	
Obtain an IP address automatically	Use default gateway on remote network	
Use the following IP address:		
IP address:	PPP link	
	Use IP header compression	
 Obtain DNS server address automatically 		
O Use the following DNS server addresses:		
Preferred DNS server:		
Alternate DNS server:		
Advanced	$\overline{\mathbf{b}}$	
OK Cancel		
	OK Can	ncel

In Window Advanced must be Windows Firewall switched off or enabled with exception - only this connection.

When you make are new connection to GPRS network, is preferred to disable local area connection.



11. Meter data reading with MeterViev

Data read out reading

Data read out \rightarrow meter sends data, w hich are defined for meter "Readout sequences".

- Reading coud be started on two different ways:
 - By selecting command via Meter → Read → Registers (readout)



Data read out reading could not be protected with password.

			~ ~		~~g		•
=	xam	nole	of	data	read	out.	

🚟 MeterView - [Tabu	lar data readout D:\temp\35567528_dro.dr	<u>]</u>	_ 2 🛛
File Meter Settings	Window Help		- 8 x
	🔍 🖲 🎬 ┢ 🔗 🖳 🕝 🖸 📥 🤹		
		ISKMT830-1020	
Code	Value	Comment	<u>^</u>
0.0.F.F.0	0000000	Error message	
0.9.1	0140834	Time	
0.9.2	071204	Date	
0.0.0	35567528	Device address 0	
0.0.1	0000000	Device address 1	
0.0.2	0000000	Device address 2	
0.0.3	0000000	Device address 3	
0.0.4	2005	Device address 4	
0.4.2	1	Transformer ratio - current	
0.4.3	1	Transformer ratio - voltage	
0.8.0	15	Measurement period 1 [min]	
0.8.4	60	Measurement period - Load profile 1 [min]	
0.8.5	60	Measurement period - Load profile 2 [min]	
0.1.0	10	Reset counter	
0.1.2*01	0712041228	PV TST (RTC,Comm.JN)	
0.1.2*02	0711010000	PV TST (RTC,Comm.JN)	
0.1.2*03	0710010000	PV TST (RTC,Comm.,IN)	
0.1.2*04	0709010000	PV TST (RTC,Comm.JN)	
0.1.2*05	0708010000	PV TST (RTC,Comm.JN)	
0.1.2*06	0707010000	PV TST (RTC,Comm.,IN)	
0.1.2*07	0706010000	PV TST (RTC,Comm.JN)	
0.1.2×08	0705010000	PV TST (RTC,Comm.,IN)	~

Registers, which are presented by data read out are defined in "Read sequence".



Load profile reading

Load profile reading coud be started on two different ways:

• By selecting command via Meter → Read → Load profile



Load profile reading could be protected with password (protection is defined in the meter firmware and is requested by custemer specification).

is used!

	P.0x
	P.02 P.03Selecting of profile P.01,P.04 P.05P.02, which we want toP.05read
Input Enter the time limits (if desired) and optional block size for load profile reading.	OK X Cancel
P.0x P.01	<<< << 2008 > >> >>>
from	Jan Feb Mar Apr May Jun
to block size	Jul Aug Sep Uct Nov Dec Mon Tue Wed Thu Fri Sat Sun 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
	21 22 23 24 25 26 27
Selecting of block size (number of records), that we want to read (profile period of 15 minutes, creates 96 records per day). With reducing of "block size", automatically "R6" reading command	28 29 30 31 Specifying of start and end time - date block, which we want to read

Enter the time limits (if for load profile reading.	desired) and optional block size		
P.0x	P.01		
from	1/1/2008 0:00		
to	1/2/2008 0:00		
block size			
Help		🖊 ок	X Cancel

Result:

			- I	SKMT860-1007				
Time	Status	1.5 [kW]	2.5 [kW]	5.5 [kvar]	6.5 (kvar)	7.5 [kvar]	8.5 [kvar]	^
1/12/2007 9:30:00	00000000	0.1636	0	0.1144	0	0	0	
1/12/2007 9:45:00	00000000	0.152	0	0.1104	0	0	0	
1/12/2007 10:00:00	00000000	0.1388	0	0.1056	0	0	0	
1/12/2007 10:15:00	0000000	0.152	0	0.11	0	0	0	
1/12/2007 10:30:00	00000000	0.1552	0	0.1108	0	0	0	
1/12/2007 10:45:00	00000000	0.1628	0	0.1172	0	Ō	0	
1/12/2007 11:00:00	0000000	0.1548	0	0.1128	0	0	0	
1/12/2007 11:15:00	0000000	0.1368	0	0.1036	0	0	0	
1/12/2007 11:30:00	00000000	0.1536	0	0.1108	0	0	0	_
1/12/2007 11:45:00	0000000	0.1536	0	0.1068	0	0	0	
1/12/2007 12:00:00	0000000	0.1468	0	0.108	0	0	0	
1/12/2007 12:15:00	00000000	0.1484	0	0.1112	0	0	0	
1/12/2007 12:30:00	0000000	0.1424	0	0.1024	0	0	0	
1/12/2007 12:45:00	0000000	0.1436	0	0.1108	0	0	0	
1/12/2007 13:00:00	0000000	0.1472	0	0.1124	0	0	0	
1/12/2007 13:15:00	0000000	0.144	0	0.106	0	0	0	
1/12/2007 13:30:00	00000000	0.1356	0	0.0976	0	0	0	
1/12/2007 13:45:00	0000000	0.1376	0	0.1012	0	0	0	
1/12/2007 14:00:00	0000000	0.134	0	0.098	0	0	0	
1/12/2007 14:15:00	0000000	0.1272	0	0.0924	0	0	0	
1/12/2007 14:30:00	0000000	0.1204	0	0.0884	0	0	0	
1/12/2007 14:45:00	00000000	0.1176	0	0.088	0	0	0	~

Button	Function
ш	Selects graphical mode for displaying the data.
ш	Opens the graphing options. This button is only available when the data is viewed in graphical mode.
I	Presentation of load profile in tabulated form
E	Presentation of load profile as raw data
- Page 1 -	These buttons are only available when viewing the data in graphical mode one day at a time. The left arrow moves backward and the right arrow moves forward one day at a time.

2	Mete	rView	/ - [Tabu	lar load	profi	le D:	\ten	np\Te	st LP	1.lp			
	File	Meter	Settings	Window	Help								
D				۳		•		<u>.</u>	Θ	6	å	ø	
		L 🗖		I F W	, ù	ц́	<				-		

Presented as raw data:

P.01(0712010930)(00)(15)(6) (1.5)(kW)(2.5)(kW)(5.5)(kvar)(6.5)(kvar) (7.5)(kvar)(8.5)(kvar) (0.1636)(0.0000)(0.1144)(0.0000)(0.0000)(0.0000) (0.1520)(0.0000)(0.1104)(0.0000)(0.0000)(0.0000) (0.1388)(0.0000)(0.1056)(0.0000)(0.0000)(0.0000)

(0.1520)(0.0000)(0.1100)(0.0000)(0.0000)(0.0000)
(0.1552)(0.0000)(0.1108)(0.0000)(0.0000)(0.0000)
(0.1628)(0.0000)(0.1172)(0.0000)(0.0000)(0.0000)
(0.1548)(0.0000)(0.1128)(0.0000)(0.0000)(0.0000)
(0.1368)(0.0000)(0.1036)(0.0000)(0.0000)(0.0000)
(0.1536)(0.0000)(0.1108)(0.0000)(0.0000)(0.0000)
(0.1536)(0.0000)(0.1068)(0.0000)(0.0000)(0.0000)
(0.1468)(0.0000)(0.1080)(0.0000)(0.0000)(0.0000)
(0.1484)(0.0000)(0.1112)(0.0000)(0.0000)(0.0000)
(0.1424)(0.0000)(0.1024)(0.0000)(0.0000)(0.0000)
(0.1436)(0.0000)(0.1108)(0.0000)(0.0000)(0.0000)
(0.1472)(0.0000)(0.1124)(0.0000)(0.0000)(0.0000)
(0.1440)(0.0000)(0.1060)(0.0000)(0.0000)(0.0000)
(0.1356)(0.0000)(0.0976)(0.0000)(0.0000)(0.0000)
(0.1376)(0.0000)(0.1012)(0.0000)(0.0000)(0.0000)
(0.1340)(0.0000)(0.0980)(0.0000)(0.0000)(0.0000)
(0.1272)(0.0000)(0.0924)(0.0000)(0.0000)(0.0000)
(0.1204)(0.0000)(0.0884)(0.0000)(0.0000)(0.0000)
(0.1176)(0.0000)(0.0880)(0.0000)(0.0000)(0.0000)
(0.1240)(0.0000)(0.0928)(0.0000)(0.0000)(0.0000)
(0.1472)(0.0000)(0.1080)(0.0000)(0.0000)(0.0000)
(0.1508)(0.0000)(0.1092)(0.0000)(0.0000)(0.0000)
(0.1536)(0.0000)(0.1124)(0.0000)(0.0000)(0.0000)
(0.1408)(0.0000)(0.0984)(0.0000)(0.0000)(0.0000)
(0.1404)(0.0000)(0.1048)(0.0000)(0.0000)(0.0000)
(0.1524)(0.0000)(0.1100)(0.0000)(0.0000)(0.0000)
(0.1576)(0.0000)(0.1148)(0.0000)(0.0000)(0.0000)
(0.1516)(0.0000)(0.1116)(0.0000)(0.0000)(0.0000)
(0.1436)(0.0000)(0.1072)(0.0000)(0.0000)(0.0000)
(0.1508)(0.0000)(0.1104)(0.0000)(0.0000)(0.0000)
(0.1488)(0.0000)(0.1060)(0.0000)(0.0000)(0.0000)
(0.1476)(0.0000)(0.1068)(0.0000)(0.0000)(0.0000)







Presented as »bar« graph:

LP graph options	×
Channel selection	
 ✓ 1.5 [kW] ✓ 2.5 [kW] ✓ 5.5 [kvar] ✓ 6.5 [kvar] ✓ 7.5 [kvar] ✓ 8.5 [kvar] 	
Appearance C complete I by day	
<u>Н</u> еір 🗸 ОК	X Cancel



Log book reading

The log book is a list of events, each with a time stamp, that have occurred since the log book was last cleared. The following events are logged.

Log book reading coud be started on two different ways:

By selecting command via Meter → Read → Log book



Setting time and date with MeterView

11.3.1 With command W5

Time setting with W5 command is protected with W5 password. Write password for W5 command:

🗮 MeterView		
File Meter Settings Window Help		
	i 🕨 🗇 🖳 🥝 🖸 📥 🗐	
Input		
Enter passwords for subsequent meter acc	essi	
Password		
Password W5		
<u>H</u> elp	V OK X Cancel	
or write password direct in the wind		
or write password direct in the wind		_
Set device time	X	Write W5 password (it is automatically copied from the »password« window!
Password W5	***	Select »System (PC time)« or custom
System time		time!
Time	3/ 2/2008 9:07:07	In case, that »System« time was not
	Summer time	selected, select specific date & time, also with option of "Summer" time
Help	VOK X Cancel	selection!
		Time
		<<< << < 2008 > >> >>>
Set device time	×	Jan Feb Mar Apr May Jun
Password W5	***	Mon Tue Wed Thu Fri Sat Sun
System time	Г	1 2 3
Time	3/2/2008 9:13:04	11 12 13 14 15 16 17
	✓ Summer time	18 19 20 21 22 23 24 25 26 27 28 29
Help	🗸 OK 🛛 🗶 Cancel	
		UK Kuncel

11.3.2 With command W1

Time setting with W1 command is protected with password, for programming the meter. Write password for W1 command:

222 h	lete	rViev	v											
File	Met	er Se	etting	js Wi	ndow	Help	5							
۵			6	4	Q	-		-	0	Θ	٦	č	ß	

Input						
Enter passwords	for subse	quent me	ter access	l.		
Password		×	****			
Password W5		Γ				
Help					🖌 ОК	🗙 Cancel
	leterVie	w				
File	Meter	Settings	Window	Help		
D	Passv Read Comn	vord 🕨 Mand 🕨	3	1	30	
	Set					

Select \rightarrow

Set		
 ▼ Time □ Device address □ Password for settings 		3.2.2008 9:17:44
Password for Password for Code	parametrisation W5 Value	
Help		V OK X Cancel

Note: Only "System" time could be selected!

Disconnect View Log

Programming the meter MT83x

11.5.1 Entering the Password

MT83x meters have up to four different protections level (which password level is implemented in the meter, depends on customer request):

- Password for reading the data (raeding of load profile data, log book data, registers reading, parameter reading)
- Password for programming the meter parameters
- Password W5 for time setting
- PARAM button (located under meter cover) the highest protection

Parameters in the meter could be protected with password for programming or PARAM button. If there is no customer request for specific parameter protection level, factory set up is used. Protection for each parameter is defined and burned in the meter firmware.

From the main window, select Meter	Password	Enter Password.
------------------------------------	----------	-----------------

	🕮 MeterView				
File	Meter	Settin	gs	Window Help	
D	Pass Rea	word d	•	Enter Password Clear All Passwords	
	Com Set	mand 	P.		
	Disc View	onnect / Log			or click on the icon

The following window appears.

Input	
Enter passwords for sub	sequent meter access!
Password	
Password W5	
Help	OK X Cancel

Meter View password-entry window.

Enter the passwords that will be used to access protected registers in the meter. This table summarises which password is required for which operation.

Operation	Required Password
Reading the registers	No password required
Reading the load profile data	No password required or password for reading or password for programming (depends on customer request)
Reading the log book	No password required or password for reading or password for programming (depends on customer request)
Reading the SEP (Combined) data	No password required or password for reading or password for programming (depends on customer request)
Writing a new scheme (parameters)	Password for programming or PARAM button
Setting the time	Password for programming or password W5 or PARAM button
Reset of log book data	Password for programming or PARAM button
Reset of load-profile data	Password for programming or PARAM button



Summary of password protection

11.5.2 Reading the Parameters

Time

Check that no password is entered using the steps described in section Entering the Password. To find how a meter is configured, from the Meter View main menu select Meter Read Parameters scheme. 🕮 MeterView File Meter Settings Window Help Password . a SC 102 B Read Parameters scheme Command Registers (readout) ٠ Load profile Set Log book Disconnect Combined (SEP) View Log Status

The device parameters window appears, and the main window status bar indicates communications activity. When the communications are complete, the following window appears.



Meter View's Device Parameters window

There are more parameters available than can be displayed on one window, so parameters are divided into pages called "Groups". You can select the group that you wish to view using the Group drop-down list on the toolbar.

Parameters for the specific program number (saved in the MeterView base – factory settigs)) could also be opened directly from MeterView list:

🚟 MeterView			
File	Meter	Settings	Window
N	ew para	meters sch	eme
0	pen		•
S	ave		
S	ave as .	ä –	
C	lose		
Pi	rint		
E	xit		





Select appropriate programme number and parameter window will automatically appear.

The functions of the other buttons on the toolbar are summarised in the following table.

Button Function

Button	Function
	Saves the scheme to a file, thus creating a new scheme from existing parameters in a meter. You are prompted to choose to save all the groups, just the currently displayed group or a free selection of groups. This button is the same a selecting File you've saved the work, you can use File Save to save to the same file.
	Prints the scheme as a report. Just like save function, you can print all the groups, just the currently displayed group or a free selection of groups.
	Writes the currently selected parameters to any connected meter using the password selected in the password window. (The Meter Password Enter Password option from the main menu is still available when the parameters window is displayed.) You can use this function to copy the scheme from one meter to another. Note: Change ONLY parameters of one group at the same time!!!
	Reads parameters from a connected meter into the current set. You can read all the groups, just the currently displayed group or a free selection of groups.
	Aborts a communications session in progress. Available only when communications are active.
4	Exports the data to a .ncs (this file is a list of IEC 62056 - 21 commands for use with another Iskraemeco software product called MeterRead)or .cix file (this file is a list of IEC 62056 - 21 commands for use with another Iskraemeco software product called Meter View Light)
	Creates or loads a parameter patch. A parameter patch is a small subset of one parameter page. You can use this feature, for example, to export a frequently used tariff. This tariff can then be imported into future schemes that you create thus saving you time.
	Compares the current parameters with those from either a file or the default.

The lower part of the Device Parameters window is used to display information such as errors in entered values as you changes the parameters.

11.5.3 Writting the Parameters

Parameters could be protected with two different levels:

- Password low level
- PARAM button high level (PARAM button is located under meter cover)



Location of the PARAM button

Procedure to change the parameters in the meter:

- 2. Set appropriate password (password or PARAM button)
- 3. Read the parameters in the meter or open parameters from the MeterView data base
- 4. Adopt the parameters according the request.
- 5. Set appropriate password (password or PARAM button)
- 6. Set up the communication settings in the MeterView
- 7. Write parameters

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Note: Write only group of parameters that you want to change, not all of them!

Answers from the meter:

- Done! → Parameter was changed successfully
- Access denied! → Protection level doesn't open the parameter lock, wrong protection level or wrong password
- Failed! → Parameter doesn't exist in the meter

12. MT83x meter parameters

Parameters in MT83x meter can be protected with three different levels:

- Password for reading
- Password for programming
- PARAM button (located under meter cover)

12.1 Open the existing parameters from the Meter View

Parameters in the Meter View data base are set up by the meter type, customer (or country) and can differ from the parameters that are stored in the meter. For viewing the parameters stored in a meter, we recommend the reading the parameters. See capture "11.5.2 Reading the Parameters".

To create a new scheme for the MT83x meter, from Meter View's main menu select File New Parameters scheme...

. 10	netter vi	IEW DLINO	
File	Meter	Database	Settings
N	ew parai	meters schei	me
0	pen		•
Sa	ave		
Sa	ave as		
C	lose		
Pr	rint		
E:	xit		

Alternatively, you can click D, the leftmost button on the main window toolbar. The following window will appear.

Supported devices				
Devices	Description	Туре	Country/Customer	<u>^</u>
SKME420	Iskraemeco MT830	0001	Default	
ISKMT171	Iskraemeco MT830	0002	Slovenia	
ISKMT172	Iskraemeco MT830	0017	Moldavia	
ISKMT173	Iskraemeco MT830	0019	South Africa	
ISKMT400	Iskraemeco MT830	0020	Turkey	
ISKMT401	Iskraemeco MT830	0022	Urugvay	
ISKMT420	Iskraemeco MT830	0024	Israel	
ISKM1821	Iskraemeco MT830	0026	Poland	
	Iskraemeco MT830	0028	Oman	
	Iskraemeco MT830	0030	Slovenia	
	Iskraemeco MT830	0031	Italia	
	Iskraemeco MT830	0034	Russia_RES	
ISKP2W	Iskraemeco MT830	0038	Croatia	
ISKTE340	Iskraemeco MT830	0039	Croatia	
	Iskraemeco MT830	0044	South Africa	
Select all Deselect all	Iskraemeco MT830	0045	Italia	
	Iskraemeco MT830	0049	PTB	
Country / Customer	Iskraemeco MT830	1002	Slovenia	
Australia	Iskraemeco MT830	1003	Finland	
🗸 Austria	Iskraemeco MT830	1007	Samples	
🗹 Belgium	Iskraemeco MT830	1013	Indonesia	
✓ BULGARIA	Iskraemeco MT830	1019	South Africa	
🗹 Bulgaria	Iskraemeco MT830	1020	Turkey	
China	Iskraemeco MT830	1022	Urugvay	_
✓ Colombia	Iskraemeco MT830	1023	Bulgaria	
✓ Croatia	Iskraemeco MT830	1024	Israel	
	Iskraemeco MT830	1025	China	
	Iskraemeco MT830	1026	Poland	
✓ ENDESA ✓ Estonia	Iskraemeco MT830	1028	Oman	
V Estonia	Iskraemeco MT830	1029	Russia	
	Iskraemeco MT830	1030	Slovenia	
	Iskraemeco MT830	1031	Italia	
✓ Indonesia	Iskraemeco MT830	1032	Iran	
🗹 Iran 🧔	Iskraemeco MT830	1034	Russia_RES	
	Iskraemeco MT830	1035	Turkey_AKTIF	
Select all Deselect all	Iskraemeco MT830	1036	Italia	-
	1.1	1007	Delitera	
Help			🗸 ок	🗙 Cancel

List of MT83x devices supported by Meter View

Scroll down the extensive list to find the entry that represents the entry for your meter; perhaps the highlighted entry in the above screen-shot.

Tip: If you're not sure of your meter's exact model code, but you have an example meter available, try reading its parameters. The exact model code is displayed at the top of the parameters window.

OK when you have selected the meter you wish to configure.

Note: Parameters that are available in Meter View can differ from one version of Meter View to another, according to customer requests. In this manual, only the most common parameters are described.

Click



Note: parameters presented contained in the meter, could be different as presented bellow. They are dependent on the functions, which are implemented in the meter and also reading protection level (on customer request, some parameters are not visible).

12.2.2 Group → Device information

Group Device information contains identification numbers of the meter. It is divided into Device identifiers and electricity identifiers

12.2.2.1 Device information → Device

Device identifiers are related to the factory specific identifications.

ID: device	cdevID
ID: program_version	ver 1.0
Identifier #1	
Identifier #2	MT830
Identifier #3	34000515
Identifier #4	Jan 7 2008
Identifier #5	
Identifier #6	
Identifier #7	
Identifier #8	
Identifier #9	
Identifier #10	

ID: device (0.0.96.1.255) → contains complete device identifications **ID**: program_version (1.0.0.2.0) → meter program version **Identifier #1** (0.0.96.1.0) → factory number **Identifier #2** (0.0.96.1.1) → meter identification **Identifier #3** (0.0.96.1.2) → software package, related to the ISKRAEMECO production data base **Identifier #4** (0.0.96.1.3) → date of creaition of the firmware **Identifier #5** (0.0.96.1.4) → production year **Identifier #6** (0.0.96.1.5) → reserved value **Identifier #7** (0.0.96.1.6) → reserved value **Identifier #8** (0.0.96.1.7) → reserved value **Identifier #8** (0.0.96.1.8) → reserved value **Identifier #10** (0.0.96.1.9) → meter's calibration date

12.2.2.2 Device information → Electricity

Device identifiers are related to the factory specific identifications. Parameters, except ID: electricity, are protected with password.
ID: electricity	cellD
Identifier #1	12345678
Identifier #2	00000000
Identifier #3	00000000
Identifier #4	2008
Identifier #5	00000000
Identifier #6	00000000
Identifier #7	00000000
Identifier #8	00000000
Identifier #9	00000000
Identifier #10	00000000

ID: electricity (1.0.0.255) → contains complete electricity identifications **Identifier #1 (**1.0.0.0.0) → device address, register value is automatically copied into 0.0.128.4.7 register **Identifier #2 (**1.0.0.0.1) → reserved value for customer identification **Identifier #3 (**1.0.0.0.2) → reserved value for customer identification **Identifier #4 (**1.0.0.0.3) → production year **Identifier #5 (**1.0.0.0.4) → reserved value for customer identification **Identifier #6 (**1.0.0.0.5) → reserved value for customer identification **Identifier #7 (**1.0.0.0.6) → reserved value for customer identification **Identifier #8 (**1.0.0.7) → reserved value for customer identification **Identifier #9 (**1.0.0.0.8) → reserved value for customer identification **Identifier #10 (**1.0.0.0.9) → reserved value for customer identification

12.2.3 Group → Display

Group Display consists of the parameters, which are related to the display parameters and register presentation, current and voltage ratio,

12.2.3.1 Display → LCD settings

Group consists of the following parameters:

Key down minimum [s]	0.1		-
Key down long [s]	2.0		
Key down extra long [s]	5.0		-
Display backlight on time [s]	10.0		
Sequence item timeout [s]	6.0		
Console menu timeout [s]	1800.0		-
LCD flags	Displaying flag:	s 🗖	Į
	T1		
	T2		
	ТЗ		
	T4		
	IO MODULE		
	СОММ МОДИ	LE	
	ALARM VOLT	AGE	
	REVERSE FLOW		
	0000	~	
LCD date format	Date format	Date mark]
	YYMMDD	HYPHEN(-)	

Key down minimum [s] $(0.0.128.0.1) \rightarrow$ minimum duration for activation of "short button press"

Key down long [s] (0.0.128.0.2) → minimum duration for activation of "long button press"

Key down extra long [s] (0.0.128.0.3) → minimum duration for activation of "extra long button press"

Display backlight on time [s] (0.0.128.0.5) → definition of LCD backlight time

Sequence item timeout [s] $(0.0.128.0.6) \rightarrow$ definition of sequence item time out – time for rolling the register in Auto sequence mode

Console menu time out [s] $(0.0.128.0.84) \rightarrow$ definition of console menu time out – in this time, meter automatically goes into Auto sequence

LCD flags $(0.0.128.5.1) \rightarrow$ status meanings on the LCD (flag meaning is burned on the front plate)

NONE – status is not active

Status	Status ON	Status BLINKS
Т1 Т8	tariff for energy	-
M1 M8	tariff for demand	
RCR1 RCR4		
ERROR		
COMM	meter is in communication mode	
DST		
INTERNAL TARIFF		
IO MODULE	MIO module is recognised by the meter	MIO module is not recognised by the meter (module is not programmed properly)
COMM MODULE	MK module is recognised by the meter	MK module is not recognised by the meter (module is not programmed properly)
MAIN COVER	Meter cover is opened	
TERMINAL COVER	Terminal cover is opened	-
FRAUD	Fraud conditions exists on the meter	-
DRO		

FF	-	Fatal error occurs on the meter
SET	Meter in SET mode	
TEST	Meter in TEST mode	
RTC	Internal tariff is controlled by internal	
	meter clock	
RS		
MEAS IDLE		
PHASE ORDER	Voltage phase sequence is not OK	
REVERSE FLOW		Current in one phase is inverted
R IMPORT		
S IMPORT		
T IMPORT		
CRITICAL ALARM		
NON CRITICAL ALARM		
BATTERY ALARM	Internal Li battery should be replaced	-
ALARM VOLTAGE	-	At least one phase missing or is over/under specified limits
CURRENT WITHOUT VOLTAGE R	Current without voltage state on	
	phase R	
CURRENT WITHOUT VOLTAGE S	Current without voltage state on	
	phase S	
CURRENT WITHOUT VOLTAGE T	Current without voltage state on	
	phase T	

LCD date format (0.0.128.5.3) \rightarrow Definition of the date format, presented on the LCD \rightarrow YYMMDD or YYYYMMDD or DDMMYY and Date mark \rightarrow SPACE or UNDERSCORE (_) or HYPEN (-) mark.

YY or YYYY \rightarrow year presentation MM \rightarrow month's presentation DD \rightarrow day presentation



12.2.3.2 Display → Formats, constants, units

Nominal current [A]	5				
Transformer correction	0		10000 0	ppm	
Current fraud alarm limit [% of RMS]	30				
Formats and units table					
	Digits	Decimals	Unit prefix	Rollover [h]	
Energy	8	4	÷ k	7983	
Max. demand	5	<u>÷</u> 4	<u>k</u>	<u> </u>	
Lumulative demand	7	4	k	<u>*</u>	
Vokage	4		none	<u> </u>	
Erequencu	4	- 3	none	<u> </u>	
Angle	3		none		
Power factor	4			-	
	1*	_	- none		
Current ratio	1 /	1			
Voltage ratio		1			
Nominal voltage [V]	58.0				
Limit current [A]	6				
	Repetition p	eriod Resolution pe	riod		
Time	day	▼ 8	•		
Date	none	💌 day	-		
Stamp	none	▼ s	-		
2.0000000	Digits				
Baudrate	3	_ <u>÷</u>			
Device identifier	8	÷			
urrent without voltage limit [mA]	100				
.CD time format	Time format	Time mark			
	HHMMSS	COLON			
CD date format					
	Date format	Date mark			
	YYMMDD	DOT(.)			

Nominal current [A] (0.0.128.0.8)– definition of meter's nominal current \rightarrow 5A or 1A **Transformer correction [ppm]** (0.0.128.0.12)- transformer correction factor up to + 10000 ppm. It is used also for implementation of non- integer CT & VT values.

For example: VT ratio is 13800V / 110V = 125,4545454545

Note	
Warning: CT/VT is not an integer constant! CT/VT changed to: CT*VT*tcorr = 1A / 1A * 13800V / 110V = 1 * 125 * (1 + 3640 ppm). This produces error in energy measurement of 3.62 ppm!	
	🗸 ок

Current fraud alarm limit [% of RMS] (0.0.128.0.71)- in case, that meter is equipped with neutral measurment system

Formats and units table (0.0.128.3.1) – definition of formats and units for energy, demand, cumulative demand, voltage, current, frequency, angle, power factor. Format for demand is adopted automatically regarding the **maximum current** and **nominal voltage.** Related to these two values "rollover" time for energy registers is automatically calculated (time needed, that meter register goes from 00000000 to 99999999). In case, that "rollover time" is shorter then 17500 hours (standard value), MeterView replies with note:

Note				
You are about to make roll	over shorter than	17500 h!		
			🗸 ок	and rollover time is red coloured

All other formats must be adopted manually.

Formats and units for presented data:

	Digits	Decimals	Unit prefix	Rollover
			none k	
Energy	number of digits (8)	number of decimals (4)	М	7389 h

Example:

2345. 7653kWh

Rollover time: if meter is connected to voltage 58V and current is 6A, then meter register will go in 7398h from 0000.0000 kWh to 9999.9999 kWh and then back to 0000.0000 kWh. Rollover time is only informational value and doesn't affect to other parameters.

Max. Demand Example:	number of digits (5)	number of decimals (4) 1.4	none k M \$564 kW
Cum. Demand	number of digits (5)	number of decimals (4)	none k M
Voltage Example:	number of digits (4)	number of decimals (1) 05	none k M 8.3 V
Current	number of digits (4)	number of decimals (3)	none k M



Current ratio (0.0.128.0.11)- current transformer ratio. Example : CT ratio is inserted like 100/5, but value 20 is written into and read out from the meter. When CT ration is written into the meter, meter automatically multiplies all energy and register values with inserted CT ration. Current is presented as secondary value by default. Primary current presentation must be done manually, by writing appropriate register.

Voltage ratio (0.0.128.0.10) – voltage transformer ratio. Example : VT ratio is inserted like 13800/100, but value 128 is written into and read out from the meter. When VT ration is written into the meter, meter automatically multiplies all energy and register values with inserted VT ration. Voltage is presented as secondary value by default.Primary voltage presentation must be done manually, by writing appropriate register.

Nominal voltage (0.0.128.0.7) – nominal voltage on the measurement place, to which is meter connected, It is used also as Alarm voltage, used for detecting over / under voltages.

Limit current (0.0.128.0.9) – current value, used only for calculation of "roll over" time for energy registers presentation

Note, which could appears:

Note			
Warning: you should rew	ite "Excess power limit" in	to meter!	
			🗸 ок

Information, that you use excess demand function in the meter, should check the "Excess power limit", because of eventual change of CT and VT ratio.

Time Date Stamp

Baud rate Device identifier

Current without voltage [mA] $(0.0.128.0.119) \rightarrow$ definition of the minimum current that flows through the meter and voltage is not present (voltage is disconnected or voltage fuse is broken – fraud detection). Such condition is registered in meter's Log Book or presented via Alarm Output (MKA) – optional function in the meter

LCD time format (0.0.128.0.154) \rightarrow definition of time format presented on LCD \rightarrow HH MM SS or HH MM. Default value HH MM SS. HH – hour

MM – minute SS - second

LCD date format (0.0.128.0.152) \rightarrow definition of date format presented on LCD \rightarrow YYYY MM DD or DD MM YYYY or YY MM DD or DD MM YY. Default value YY MM DD. YYYY or YY – year MM – month DD - day

12.2.4 Common

LED source A+ A- R1 R2 R3 R4 S+ S- Left x	
Left x x Right x x	
Right x x x x	
Billing reset	
Calendar Lock console [min] Lock comm [min] Lock Input [min]	
Enabled 15 15 15	
Active disp. contract 1	
Default profile type (1)	
MP mode Contract Mode	
1 Synchronous M	
Measurement period [min] Contract Measurement period [min]	
1 15	
Integrating periode (UI regs) [min]	
1 15	
Tariff control Tariff program	
Number of subperiods Contract Number of subperiods	
1 15	

LED constant [imp/kW(VAr)h) (0.0.128.0.13) → LED constant, presented as imp/kWh/kvarh/kVAh. Default value for multi range meter is 10.000 imp/kWh/kvarh/kVAh. LED constant could be presented also in LCD and parameter change

	20000
	40000
is written in Technical Log Book – optional function. Possible values:	100000
	200000
	300000

LED source (0.0.128.0.14) \rightarrow definition of the energy sources, forward to the LED diode. Default value: left LED \rightarrow active energy (all four quadrants), right LED \rightarrow reactive energy (all four quadrants). Other combinations on request.

Billing reset (0.0.128.0.20) \rightarrow enabling or disabling billing calendar (automatically billing reset)

- \rightarrow blockade of billing reset performed via the red button (console)
 - → blockade of billing reset performed via communication interface (comm)

1000 2000 5000

→ blockade of billing reset performed via billing reset inputs MRA and MRB (Input) Values could be set from 1 minute to 65534 minutes. In case, that 65535 blockade is written into the meter, manual billing reset is disabled.

ISKRAEMECO

Active disp. Contract (0.0.128.0.21) \rightarrow definition of presented contract on the LCD (Contract 1 or contract 2). Default value is Contract 1

	No profile
	Cumulative Energy
	Incremental Energy
)1 →	Current Power

Default profile type (1) $(0.0.128.0.22) \rightarrow$ type of profile P.0

 \rightarrow No profile \rightarrow disabling of profile

 \rightarrow Cumulative energy (1.8, 2.8, ..) \rightarrow registers states are written in the profile

 \rightarrow Incremental energy (1.9, 2.9, .) \rightarrow Increments of energy registered in the load profile period are written into the profile

 \rightarrow current power (1.5, 2.5, ..)

Synchronous MP + RTC synchronisation

 \rightarrow Power registered in the load profile period is written into the profile

MP on input

- MP mode (0.0.128.0.118) → measurement period mode definition : Asynchronous MP → Synchronous MP + RTC synchronisation : block measurment period mode and RTC synchronisation via MPE input
 - → MP on input: measurement period is controlled via MPE input
 - → Asynchronous MP: sliding measurement period

Note: definition of block or sliding measurement period is related to the firmware configuration. If measurement period is defined in the firmware as "Synchronous MP", then is not possible to have in the same meter sliding period.

Load											
Limit		Histere:	sis					Tł	nreshold		_
10000		2						20)		
0		0						0			
Battery low alarm [%]	5				7						
Diagnostics status info mask	Digit\Bit	8	7	6	5	4	3	2	1		
	Digit 3			1		1		1			
	Digit 2										
	Digit 1										
	Digit 0										
Test mode timeout [s]	180										
Console diag menu	Г										
Profile register	Register 1				•						
Format for actual demand	min				•						
Delay billing reset until end of measuerement period	Contract	[)elay]						
	1										
Excess power limit	Contract	A+ [k	w] [4	4-[k₩]	1						
	1	0.00	00 0	0.0000							

•			Instal	llation manual
Billing reset start MP	Г			
Tariff change start MP				
Map 1107 mode	LP header mode	Seconds in LP	Always use units	
	Auto	×	×	

MT83x

13. Adding support for new meters

ISKRAEMECO +.

If meter Program Number is not supported in MeterView, the following window appears.

In this case, the meter producer will prepare DEVICE.INF, (the floppy disk with necessary files is normally added to the delivered meters). If the files are in ZIP form, first unzip them to your choice of folder; for example C:\TEMP.

Example: supporting the 3100189v Program version in Meter View:

Select Settings Preferences Supported meters the Meter View main menu. The following window appears.

Device	Description
42-49	Iskraemeco Tipo4
DLMS	DLMS device
ISKDE851	Iskraemeco DE851
ISKGE22P	Iskraemeco GE22P
ISKME162	Iskraemeco ME162
ISKME168	Iskraemeco ME168
ISKME320	Iskraemeco ME320
EURIDIS_22	Iskraemeco ME340
EURIDIS_23	Iskraemeco ME340 1/2 Taux
EURIDIS_28	Iskraemeco ME341
EURIDIS_29	Iskraemeco ME341 1/2 Taux
EURIDIS 11	Iskraemeco ME345
	Add Remove

Select Add and the following window appears.

Input		
Please insert disk co or enter location whe Location	ntaining device infomation re "*.inf" files reside.	
		✓ OK X Cancel

Click on the _____ icon and select folder, where you have copied the files:

lskanje mape	? 🛛	
	C044-Mandela C045 - Italija C046 - Finland C047 - UAE MeterView	
	(048 - Iran (49 - PTB (050 - Indonezija (051 - Rusija Ike_direktne AS	
	V redu Prekliči	/
Click OK :		
Input		
Please insert disk contair or enter location where '*	ing device infomation inf' files reside.	
Location	D:\MT830\SM_liste	»\x49 - PTB
		VOK X Cancel

Click green check mark OK:



And another green arrow:

Preferences		×
Communication Gene	ral options Supported meters Comments	
Device	Description	<u> </u>
42-49	Iskraemeco Tipo4	
DLMS	DLMS device	-
ISKDE851	Iskraemeco DE851	1
ISKGE22P	Iskraemeco GE22P	
ISKME162	Iskraemeco ME162	
ISKME168	Iskraemeco ME168	
ISKME320	Iskraemeco ME320	
EURIDIS_22	Iskraemeco ME340	
EURIDIS_23	Iskraemeco ME340 1/2 Taux	÷
EURIDIS_28	Iskraemeco ME341	N.
EURIDIS_29	Iskraemeco ME341 1/2 Taux	
EURIDIS 11	Iskraemeco ME345	~
	Add Remove	
Help	🗸 ОК 🛛 🗶 Са	ncel

At the end you can check if the requested program number is supported in the Meter View.

14. Installation of SONDA 5 USB driver

Before using SONDA 5 USB, driver must insalled to the computer. From the responsible Iskraemeco sales support, you need to receive driver for SONDA 5 USB.

1. (Copy this files to folder in	your	computer.	
1	FTSERMOU, VXD	10 KB	Virtual device driver	10/04/2003 15:00
٠	FTSENUM.VXD	8 KB	Virtual device driver	17/12/2003 17:38
3	FTCOMMS.VXD	24 KB	Virtual device driver	17/12/2003 17:38
1	FTSERIAL.SYS	69 KB	System file	17/12/2003 17:38
	ftser2k.sys	57 KB	System file	20/04/2004 10:05
1	FTSENUM.SYS	25 KB	System file	17/12/2003 17:38
	ftdibus.sys	24 KB	System file	20/04/2004 10:04
3	FTSERMOU.INF	2 KB	Podatki o namestitvi	30/10/2003 17:12
3	FTDIPORT.INF	5 KB	Podatki o namestitvi	16/04/2004 16:11
3	FTDIBUS.INF	4 KB	Podatki o namestitvi	16/04/2004 16:12
•	FTDIBUS_OPTIONS.rtf	4 KB	Obogateno besedilo	19/01/2004 12:53
•	2154 Release Info.DOC	9 KB	Microsoft Wordov d	20/04/2004 10:06
•	905 Release Info.DOC	6 KB	Microsoft Wordov d	20/04/2004 10:07
	ftsermou.cat	10 KB	Katalog varnosti	11/06/2004 19:12
	ftdiport.cat	11 KB	Katalog varnosti	11/06/2004 19:16
	ftdibus.cat	11 KB	Katalog varnosti	11/06/2004 19:15
	README.TXT	2 KB	Dokument z besedilom	16/04/2004 15:47
-	FTDIUNIN.INI	1 KB	Configuration Settings	10/04/2003 15:00
3	FTDIUN2K.INI	1 KB	Configuration Settings	10/04/2003 15:00
1	FTSERUI.DLL	23 KB	Application Extension	20/05/2003 14:04
٠	ftserui2.dll	51 KB	Application Extension	14/04/2004 13:32
٩	FTLang.dll	36 KB	Application Extension	16/04/2004 15:15
-	FTDIUNIN.EXE	405 KB	Application	10/04/2003 15:00
A	COMPORT.PDF	6 KB	Adobe Acrobat Doc	10/04/2003 15:00

2. Connect SONDA 5 USB to appropriate port in your computer and follow the procedure.

Installation of USB serial converter:







Installation of USB serial port:

Čarovnik za najdeno novo strojno opremo

	 Dobrodošli v čarovniku za najdeno novo strojno opremo Windows bo trenutno in posodobljeno programsko opremo svjetal poiskati v računalniku, na CD-ju za namestitev strojne opreme ali na spletnem mestu Windows Update (z vašim dovoljenjem). Preberite naš pravilnik o zasebnosti Mi lahko Windows vzpostavi povezavo s spletnim mestom su podate in išče programsko opremo? Ma samo tokrat Da, tokrat in vsakič, ko priključim napravo Ne, tokrat ne
	< Nazaj Naprej> Prekliči
Čarovnik za najdeno novo	Šarovnik vam pomaga namestiti programsko opremo za: USB Serial Port Še ste skupaj s strojno opremo dobili namestitveni CD ali disketo, vstavite medij zdaj. Kaj želite, da naredi čarovnik? Samodejno namesti programsko opremo (priporočeno) Namesti s seznama ali z določenega mesta (zahtevnejše) Če želite nadaljevati, kliknite »Naprej«.
Čarovnik za najdeno novo	strojno opremo
Izberite svoje možnosti za	a iskanje in namestitev.
 Poišči najboljši gonilnik S spodnjimi potrditvenir izmenljive medije. Nam Poišči izmenljiv r Poišči izmenljiv r Vključi to mesto C:\Temp Ne išči. Sam bom izbra Za to možnost se odloču Vindovse ne izměli do 	na teh mestih. ni polji skrčite ali razširite privzeto iskanje, ki vključuje lokalne poti in eščen bo najboljši najdeni medij. nedij (disketo, CD-ROM) pri iskanju: v Prebrskaj I gonilnik za namestitev. site, če želite gonilnik za napravo izbrati na seznamu. Program se bo izbrani gonilnik za napravo izbrati na seznamu. Program
	< Nazaj Naprej > Prekliči

Čarovnik za najdeno novo sl	trojno opremo
Prosimo, počakajte, medter	n ko čarovnik išče
USB Serial Port	
	<u>S</u>
	< Nazaj Naprej > Prekliči
Čarovnik za najdeno novo st	trojno opremo
	Dokončevanje čarovnika za najdeno novo strojno opremo Čarovnik je dokončal namestitev programske opreme za: USB Serial Port
	Že želite zapreti čarovnika, kliknite »Dokončaj«.
	< Nazaj Dokončaj Prekliči

Sonda 5 USB is ready for use. It is possible to check in the Windows system – serial port number:

Go to Control panel \rightarrow select System



C 1		La constante		
Ubnovite	ev sistema	Auton	natic Updates	Uddaljeno
Splošno	Ime rad	čunalnika	Strojna oprema	Dodatn
Upravitelj	naprav Upravitelj nap računalniku, l koli naprave,	rav prikaže vs Jporabite ga, i	e naprave, namešče če želite spremeniti la:	ne v stnosti katere
			Upravitelj r	naprav
6 1 1 1				
	S podpisovan nameščeni go Windows Upo iskanju goniln Update.	ijem gonilnikov pnilniki združljiv date omogoča ikov vzpostav	v se lahko prepričate, vi s programom Windo , da nastavite, kako V i povezavo z mestom	ali so ws. Windows pri Windows
(Podpisovar	nje gonilnikov	Windows L	Jpdate
Profili stroi				
	Profili strojne (shranjevanje i	opreme vam o različnih konfig	mogočajo nastavljanje guracij strojne opreme	e in
-			Profili strojne	
vice Mar eka Deja	nager anje Pogled	V re Pomoč	edu Prekliči	
vice Mar eka Deja	nager anje Pogled 🗊 🚭 😫	V re Pomoč	edu Prekliči	
vice Mar eka Deja MA16323	nager anje Pogled E S C	Pomoč	edu Prekliči	
vice Man eka Deja MA16323 Comp	nager anje Pogled E de Pogled -JUSTIN uter Irives	Pomoč	edu Prekliči	
VICE Mar eka Deja MA16323 Comp Comp Disk d Disk d	nager anje Pogled DUSTIN uter rives ny adapters HDZ12	Pomoč	edu Prekliči	
Vice Mar eka Deja MA16323 Oisk d Disk d Displa Comp Disk d	nager anje Pogled DUSTIN uter trives wy adapters HPZ12 SETUP HPO08	Pomoč	edu Prekliči	
vice Mar eka Deje MA16323 Osho Diskd Displa Dot4 I Dot4 I Dot4	nager anje Pogled E S C -JUSTIN uter Irives IV adapters HPZ12 SETUP HPO08 Print HPZ12	Pomoč	edu Prekliči	
vice Man eka Deje MA16323 Disk d Disk d Dot4 I Dot4 I Dot4 Dot4 Dot4 Dot4 Dot4 Dot4	nager anje Pogled DUSTIN uter kives w adapters HPZ12 SETUP HPO08 Vrint HPZ12 Isb HPZ12 ISb HPZ12 ISb HPZ12 ISb HPZ12	Pomoč	edu Prekliči	
Vice Mar eka Deja MA16323 Obisha Diska Dot4 I Dot4 I Dot4 Dot4 Dot4 Dot4 Dot4 Dot4 C	nager anje Pogled DUSTIN uter vives vadapters HP212 SETUP HP008 Print HP212 Isb HP212 Isb HP212 Isb HP212	Pomoč	edu Prekliči	
Vice Mar eka Deja MA16323 Comp Disk d Disk d Dot4 I Dot4 I Dot4F Dot4F Dot4U Dot4F Dot4U	nager anje Pogled DUSTIN uter HPZ12 SETUP HPO08 Vrint HPZ12 Jsb HPZ12 Jsb HPZ12 D-ROM drives y disk drives y disk drives	Pomoč	edu Prekliči	
Vice Mar eka Deji MA16323 Ocmp Dishd	anje Pogled anje Pogled -JUSTIN uter rives y adapters HPZ12 SETUP HPO08 Print HPZ12 Jsb HPZ12 Isb HPZ12 Isb HPZ12 Isb HPZ12 TD-ROM drives y disk controller y disk controller y disk controller y disk controller to disk controller	Pomoč	edu Prekliči	
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15. Technical data

Accuracy class	
Active energy	A or B or C (EN 50470 - 3)
	Class 2 or 1 (IEC $62053-21$)
	Class 0.5S (IEC 62053-21)
Reactive energy	Classes 2, 3 (IEC 62053-23), calibrated up to 1%
Apparent energy	Class 2 or 3, calibrated up to 1%
Voltages (V)	
Voltage range	3 x 57.7/100V 3 x 240/415V
	3x100V 3x415V (3P3W - external Aaron connection)
	3x100V 3x230V (3P3W connection)
	0.8 - 1.13 O _n
Reference frequency	50 Hz ±5 % or 60Hz ±5 %
Currents (A)	
Direct connection	0.25 – 5(120)A, (Class A or B)
Indirect connection	0.01 – 1(6)A. (Class A or B or C)
	0.01 – 1(10)A, (Class A or B or C)
	0.05 – 5(6)A, (Class A or B or C)
	0.01 - 5(10)A, (Class A or B or C)
	0.05 – 5(20)A, (Class A or B or C)
Start up current	0.002In for class A or B (EN 50470 - 3)
	0.002In for class 2 or 1 (EN 62053 - 21)
	0.001 lp for class C (EN 50470 - 3)
	0.001In for class 0.5S (EN 62053 - 21)
Short-circuit	30 Imax for direct connected 20 Imax for indirect connected
Outputs	
Туре	PHOTO-MOS voltage-free relay
Contact	Make or break contact
Permitted load	25 VA (100 mA, 275 V AC)
Pulse length	From 20 ms to 240 ms (adjustable in steps by 20 ms)
Transmission distance	Up to 1 km
Inputs	
Voltage level	100 – 240 V AC
	ON: $U \ge 80 V$
	UFF: U < 20 V
Current consumption	< 2 mA @ 50V
	< 10 mA @ 240V

Self consumption of circuit	< 0,1 VA / phase
Self consumption of voltage circuits	0.5 W / 1.1 VA (self consumption of voltage circuits, when meter is supplied from the measuring voltages)
	0.2 W / 0.4 VA (self consumption of voltage circuits, when meter is supplied from the external voltage)
	1.1 W / 3.7 VA (self consumption of the external power supply, when meter is supplied from the external voltage)
	max. 2.5 W / 3 VA (GSM module)
Communication	· · · · · · · · · · · · · · · · · · ·
IR	Max. 9600 Baud IEC62056-21 (62056-21)
CS	Max. 9600 Baud, passive, CL0 in compliance with DIN 66348, Part 1.
RS232	Max. 9600 Baud
RS485	Max. 9600 Baud
Protocols	62056-21 mode C with or without a password.
LED output	Impulse frequency \leq 40 Hz
Deel time ale ale	Impulse length approx. 8 ms
Accuracy	Crystal: 6 ppm = $\leq \pm 3$ min./year (at T _{op} = +25°C)
Back-up power supply	Super-Cap: 0.1F and Li-battery
External power supply	50 - 240 V AC/DC
EMC	
Electrostatic discharge	15 kV (IEC 60801-2)
VF magnetic field	10 V/m (IEC 60801-3)
Transient test	
Insulation strength	4 KV (IEC 60801-4)
inoulation offorigin	4 kV _{rms} , 50 Hz, 1 min
Impulse voltage	6 kV. 1.2/50 us
Temperature ranges	
Operation	-25°C +70°C
Storing	-40°C +80°C
Humidity	> 95%
Terminals (diameter)	CT connection: 5 mm (2 screws per terminal)
	Direct connection: 9.5 mm (one screw per terminal)
Dimensions	$327 \times 177 \times 90 \text{ mm}$
Mass	Approx. 1.4 kg

Owing to periodical improvements of our products the supplied products can differ in some details from the data stated in the prospectus material.

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