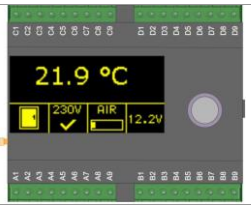
Naslov : **AVTOMATSKI MERILNI SISTEM ZA SPREMLJANJE STANJA OKOLJA**
xoberl : **hoberl**
št. projekta : hoberl_1000
verzija : 1000.5.0
naslov : Hidrološki merilni sistem - napajanje 230V**: 1000_1000EO700-230V**
vrsta dokumentacije : tehnične specifikacije
Arhiv: : 1000_ts_1000EO700-230V.doc

1.		**EMBEDDED COMPUTER**
1.a	PROIZVAJALEC	**LEDATO**
1.b	TIP	**NanosG20**
1.c	KODA ZA NAROČANJE	**DEVELOPER BUNDLE NANOSG20 (128R/512F) (ITEM NO.: 544104)**
2.	COMPUTER	
2.a	CPU:	Atmel® AT91SAM9G20 with ARM926EJ-S processor core
2.b	OS (pre-installed):	Linux Debian and on target development, Linux ≥ 2.6.35
2.c	DRAM:	128 MB SDRAM
2.d	Flash:	512 MB NAND Flash
2.e	Storage Expansion:	MicroSD card slot
2.f	Storage flash card:	8GB Micro SD card with Debian Operating temperature: -25..85°C
2.g	USB:	2 x USB host 2.0 Full Speed (12 Mbit/s)
3.	ETHERNET INTERFACE	
3.a	LAN:	10/100 Ethernet MAC
4.	SERIAL INTERFACE	
4.a		1 x RS232
4.b		1 x RS232/RS485 Multiplex-Port
4.c		1 x USB device
5.	Interfaces (internal)	
5.a		2-channel 10-bit ADC
5.b		1 x TWI (I²C compatible)
5.c		2 x SPI
5.d		Up to 3 USART (TTL)
5.e		Up to 20 digital I/O ports
5.f		DBGU (TTL)
6.	MISCELLANEOUS	
6.a		Battery backed-up Real-Time Clock
6.b		1000 Kbit write-once EEPROM
6.c		Power consumption max. 680 mW (with Ethernet)
6.d		ROHS compliant
7.	PHYSICAL CHARACTERISTICS	
7.a	Dimensions:	100 x 79.8 x 16 mm
	ENVIRONMENTAL LIMITS	
8.	OPERATING TEMPERATURE:	
8.a	Temp. Models:	-30 to 55°C (-40 to 167°F)
8.b	Operating Humidity:	5 to 90% RH
9.	STORAGE TEMPERATURE:	
9.a	Wide Temp. Models:	-45 to 85°C (-40 to 185°F)
9.b	Operating Humidity:	5 to 90% RH
10.	POWER REQUIREMENTS	
10.a	Input Voltage:	5V DC
10.b	Power Consumption:	< 680 mW

1.		**ZAJEMALNO-KOMUNIKACIJSKI KRMILNIK**

1.a	PROIZVAJALEC	**ELTRATEC D.O.O.**
1.b	TIP	**MBIO1803 (4G)**
1.c	KODA ZA NAROČANJE	**KOMUNIKACIJSKI VMESNIK MBIO1803 (4G)**
1.d	PROGRAMSKO JEDRO (FIRMWARE)	**≥V1.0R3**
2.	COMPUTER	
2.a	CPU:	32 bit Ultra-low-power with FPU Arm Cortex-M4 MCU 80 MHz 512 kB Flash LCD, USB OTG, DFSDM
3.	HARDWARE INTERFACE	
3.a	UART ports:	2 x RS485, 9600/8/none/1 1 x RS232C, 115200/8/none/1
3.b	BUS ports:	I2C bus 1-wirebus SDI12
3.c	Digital ports:	2x digital inputs
3.d	Analog ports:	2 x 4...20mA, 12 bit
4.	INTEGRATED	
4.a	Integrated modem :	RS232-GSM/GPRS/LTE, 115200/8/none/1, hadshaking support
4.b	Display	OLED, 65x40 mm
4.c	Integrated temperautre sensor	Implemented Measurement Range: -40…85°C Accuracy (0...65°c): ±0.5 °C Resolution: 0.01 °C
4.d	Integrated humidity sensor	Implemented Measurement range: 0...100% Accuracy: ±3.0 %RH Response time (τ63%) 1 s Hysteresis ±1% %RH Resolution: 0.008 %RH
4.e	Integrated pressure sensor	Implemented Measurement range: 300...1100 hPa Accuracy (0...65°c): ±1 hPa RMS Noise: 0.2Pa (equiv. to 1.7cm) Sensitivity Error: ±0.25% Temperature coefficient offset: ±1.5Pa/K Resolution: 0.18 Pa
4.f	Power Supply Voltage measurement	implemented
5.	POWER SUPPLY	
5.a	Input:	7-28 VDC
5.b	Output Power supply:	5VDC/500mA
	ENVIRONMENTAL LIMITS	
6.	OPERATING TEMPERATURE:	
6.a	Temp. Models:	-40 to 60°C
6.b	Operating Humidity:	0 to 100% RH
7.	STORAGE TEMPERATURE:	
7.a	Wide Temp. Models:	-40 to 70°C
7.b	Operating Humidity:	5 to 90% RH
8.	POWER REQUIREMENTS	
8.a	Power Consumption:	cca 250 mW (LCD off, modem on and registered in network) Max. 1 W at modem communication active
9.	SOFTWARE	
9.a	main protocol implemented:	SDI12 master (connection to CBS-bubble-sensor)
9.b		1-wire (connection to temeperaute sensor DS18B20)
9.c		Modbus ASCII slave on port 1 - implemented reading (function 03) and writing (function 16) Available data for reading: • dc voltage (Modbus reg. 1-3) • rel_humidity (Modbus reg. 4-6) • ams_temperature (Modbus reg. 7-9)

		• digital input 1 (Modbus reg. 10-12) • 4/20mA input 1 (Modbus reg. 13-15) • 4/20mA input 2 (Modbus reg. 16-18) • SDI12 water level (Modbus reg. 19-21) • 1-wire temperature (Modbus reg. 22-24) • air pressure (Modbus reg. 25-27) • digital input 2 (Modbus reg. 28-30) • virtual digital input (Modbus reg. 31-33) • SN mbIO (Modbus reg. 2001-2008) • FW version mbIO (Modbus reg. 2009) Data for writing: »mbIO1803« • dc voltage (Modbus reg. 1001-1003) • rel_humidity (Modbus reg. 1004-1006) • ams_temperature (Modbus reg. 1007-1009) • digital input 1 (Modbus reg. 1010-1012) • 4/20mA input 1 (Modbus reg. 1013-1015) • 4/20mA input 2 (Modbus reg. 1016-1018) • SDI12 water level (Modbus reg. 1019-1021) • 1-wire temperature (Modbus reg. 1022-1024) • air pressure (Modbus reg. 1025-1027) • digital input 2 (Modbus reg. 1028-1030) • virtual digital input (Modbus reg. 1031-1033) »gsr120 #1« • level_diff_pressure (Modbus reg. 1101-1103) • water temperature (Modbus reg. 1104-1106) • conductivity (Modbus reg. 1107-1109) »gsr120 #2« • level_diff_pressure (Modbus reg. 1201-1203) • water temperature (Modbus reg. 1204-1206) • conductivity (Modbus reg. 1207-1209)
9.d		Modbus ASCII/RTU master on port 2 - implemented reading (function 03) Available data for reading: »gsr120 #1« • level_diff_pressure (Modbus reg. 101-103) • water temperature (Modbus reg. 104-106) • conductivity (Modbus reg. 107-109) »gsr120 #2« • level_diff_pressure (Modbus reg. 201-203) • water temperature (Modbus reg. 204-206) • conductivity (Modbus reg. 207-209)
9.e	Data reading and parameterization:	mbio_config software tool
10.	SPECIFIKACIJA MERJENIH PODATKOV (MEASURED DATA SPECIFICATION)	
10.a	OBDELAVA PODATKOV (DATA PROCESSING)	Internal processing algorithm
10.b	PERIODA VZORČENJA MERITEV (SAMPLING RATE)	DEF = 10 s
10.c	MERJENE VELIČINE (MEASURED QUANTITIES)	***main measurements:*** • dc_voltage • ams_temperature • ams_rel_humidity • Din_door_status • Ain1_4/20mA_water_level • air_pressure • SN
10.d	FORMAT IZHODNIH PODATKOV V TELEGRAMU MERILNIKA (OUTPUT DATA FORMAT)	See document mbIO1803_data_telegram.pdf
11.	DISPLAY OPTION	
11.a	Displayed data:	Raw values from all channels (up to 10 raw values are displayed after predefined timeout if upper level controller is not writing to mbIO)
11.b		Processed (scaled) data from integrated and external

		connected sensors (displayed if upper level controller is writing to mbIO): • gsr120 #1: level_diff_pressure • gsr120 #1: water temperature • gsr120 #1: conductivity • gsr120 #2: level_diff_pressure • gsr120 #2: water temperature • gsr120 #2: conductivity • dc voltage • rel_humidity • ams_temperature • digital input 1 • 4/20mA input 1 • 4/20mA input 2 • SDI12 water level • 1-wire temperature • air pressure • digital input 2
11.c		Other data (displayed as additional information on display): • virtual digital input (communication status) • SN mbIO • FW version mbIO
12.	OTHER FUNCTIONALITIES	
12.a	Modem:	• Modem reset (modem could be reset via Modbus command by upper level controller using RS485 on port 1)
12.b	Overvoltage protection:	Bulit-in on all inputs
12.c	Scaling options:	Yes (for all measurements)
13.	PIN DESCRIPTION	
13.a	Power supply - input:	From battery: GND, Ub 7,2V From auxiliary supply: Us-, Us+
13.b	Power supply – output:	GND, 5V out
13.c	UART ports:	RS485-1: GND, RS485-1A, RS485-1B, RS485-2: GND, RS485-2A, RS485-2B, RS232C-modem: GND, RxD, TxD, RTS, CTS
13.d	BUS ports:	SMDbus/12C (I2C): GND, SCK, SDA, 5V out, 1-wire: GND-1W, 1W, 5V-1W, SDI12: GND, SDI-12, Us+out
13.e	Digital ports:	GND, Din 1, Din 2, Us+out
13.f	Analog ports (4-20mA):	GND, Ain 1, Ain 2, Us+out

1.		**ETEHERNET SWITCH**
1.a	**PROIZVAJALEC**	**MOXA**
1.b	**TIP**	**EDS-G205-1GTXSFP-T**
1.c	**KODA ZA NAROČANJE**	**EDS-G205-1GTXSFP-T (ETHERNET SWITCH)** **SFP-1GSXLC-T (OPTICAL SFP MODULE)**
2.	TECHNOLOGY	
2.a	Standards:	IEEE 802.3 for 10BaseT IEEE 802.3ab for 1000BaseT(X) IEEE 802.3u for 100BaseT(X) and 100BaseFX IEEE 802.3x for flow control IEEE 802.3z for 1000BaseX IEEE 802.3az for Energy-Efficient Ethernet
2.b	Processing Type:	Store and Forward
3.	SWITCH PROPERTIES	
3.a	MAC Table Size:	1 K
3.b	Packet Buffer Size:	1 Mbits
4.	INTERFACE	

4.a	RJ45 Ports:	4 RJ45 ports 10/100/1000BaseT(X) Ports Auto negotiation speed Full/Half duplex mode Auto MDI/MDI-X connection
4.b	Combo Ports (10/100/1000BaseT(X) or 100/ 1000BaseSFP+)	1 combo port
4.c	LED Indicators:	PWR1, PWR2, FAULT, 10/100/1000
5.	POWER REQUIREMENTS:	
5.a	Input Voltage:	9.6 to 60 VDC VDC, redundant inputs
5.b	Input Current:	0.14 A @ 24 VDC
5.c	Connection:	1 removable 6-contact terminal block
5.d	Reverse Polarity Protection:	Present
6.	PHYSICAL CHARACTERISTICS	
6.a	Housing:	Metal, IP30 protection
6.b	Dimensions:	29 x 135 x 105 mm
6.c	Weight:	290 g
6.d	Installation:	DIN-Rail mounting, wall mounting (with optional kit)
7.	ENVIRONMENTAL LIMITS	
7.a	Operating Temperature:	-40 to 75°C
7.b	Storage Temperature:	-40 to 85°C
7.c	Ambient Relative Humidity:	5 to 95% (non-condensing)
8.	STANDARDS AND CERTIFICATIONS	
8.a	Safety:	EN 60950-1, UL 508, EN 60950-1 (LVD)
8.b	EMI:	CISPR 32, FCC Part 15B Class A
8.c	EMS:	IEC 61000-4-2 ESD: Contact: 6 kV; Air: 8 kV IEC 61000-4-3 RS: 80 MHz to 1 GHz: 20 V/m IEC 61000-4-4 EFT: Power: 2 kV; Signal: 2 kV IEC 61000-4-5 Surge: Power: 2 kV; Signal: 2 kV IEC 61000-4-6 CS: 10 V IEC 61000-4-8 PFMF
9.	SFP MODULE PROPERTIES	
9.a	Type of transceiver:	Multi-mode
9.b	Wavelength:	850 nm
9.c	Distance:	300 m (OM1) / 550 m (OM2)
9.d	Temperature range:	-40 to 85°C

1.		**POWER SUPPLY**
1.a	**PROIZVAJALEC**	**PULS**
1.b	**TIP**	**ML60.242**
1.c	**KODA ZA NAROČANJE**	**ML60.242**
2.	TECHNOLOGY	
2.a	Power supply:	switch mode power supplies
3.	INTERFACE	
3.a	Connection:	Screw terminals; Input: L Phase; N Neutral; PE Output: Dual terminals for the negative and positive pole. Both poles are equal
4.	PHYSICAL CHARACTERISTICS	
4.a	Housing:	Robust plastic housing, IP20
4.b	Weight:	250 g
4.c	Dimensions:	45 mm x 75 mm x 91 mm (+ DIN rail)
4.d	Mounting:	DIN-Rail mounting, wall mounting (with optional kit)
4.e	Ventilation/Cooling:	Normal convection, no fan required
	ENVIRONMENTAL LIMITS	
5.	OPERATING TEMPERATURE:	
5.a	operation:	-40°C ... +70°C
5.b	Operating Humidity:	max. 95% (without condensation)
6.	STORAGE TEMPERATURE:	
6.a	storage/transport:	-40°C ... +85°C
6.b	Operating Humidity:	max. 95% (without condensation)
7.	POWER REQUIREMENTS	

7.a	Input Voltage:	AC 100-240V -15%/+10%, 50-60Hz ± 6%
7.b	Input Current:	1.05/0.66A at 120/230Vac
7.c	DC Input:	88-375Vdc
7.d	Output Voltage:	DC 24V Adjustment range 24-28V
7.e	Output Current:	2.5A at 24V, 2.1A at 28V
7.f	Output power:	60W
7.g	Ripple/Noise:	<50mVpp (20Hz to 20MHz)
7.h	Overvoltage prot.:	<31V
7.i	Protection:	Electronically protected against overload, no-load and short-circuits
7.j	Derating:	1.5W/°C +60 to 70°C;
8.	REGULATORY APPROVALS	
8.a	EMI:	EN 61000-6-2 (includes EN 61000-6-1)
8.b	EME:	EN 61000-6-3 (includes EN 61000-6-4) Class B (EN 55011, EN 55022) EN 61000-3-2 (PFC)
8.c	Safety:	EU (EN 60 950, EN 60204-1, EN 50178), Hazardous Location Class I Div. 2 (UL 1604)

1.		**DC-UPS POWER SUPPLY**
1.a	**PROIZVAJALEC**	**PULS**
1.b	**TIP**	**UB10.241**
1.c	**KODA ZA NAROČANJE**	**UB10.241**
2.	TECHNOLOGY	
2.a	Power supply:	DC-UPS
3.	INTERFACE	
3.a	Connection:	by Spring Clamp terminals; uniformly firm hold, vibration-resistant and maintenance-free: 2 terminals per output
4.	PHYSICAL CHARACTERISTICS	
4.a	Housing:	Metal housing, IP20
4.b	Weight:	650 g
4.c	Dimensions:	49mm x 124mm x 117mm (+ DIN Rail))
4.d	Mounting:	DIN-Rail mounting
4.e	Ventilation/Cooling:	Normal convection, no fan required
	ENVIRONMENTAL LIMITS	
5.	OPERATING TEMPERATURE:	
5.a	operation:	-25°C to +70°C
5.b	Operating Humidity:	5 to 95% r.H.
6.	STORAGE TEMPERATURE:	
6.a	storage/transport:	-40 °C to +85°C
6.b	Operating Humidity:	max. 95% (without condensation)
7.	POWER REQUIREMENTS	
7.a	Input Voltage:	22.5 to 30Vdc, Continuous operation
7.b	Input Current:	120mA Internal current consumption 1.1A Current consumption for battery charging in constant current mode at 24V input
7.c	Battery Input Voltage:	9.0 – 15.0V Continuously allowed, except deep discharge protection
7.d	Output voltage: (normal mode)	0.3V lower as input voltage
7.e	Output voltage: (buffer mode)	22.45V 22.25V output at 10A
7.f	Output current:	0-15A 24V output
7.g	Output power:	360W Normal mode
7.h	Allowed batteries:	3.9Ah to 40Ah lead acide
8.	REGULATORY APPROVALS	

8.a	EMI:	EN 61000-6-2 (includes EN 61000-6-1)
8.b	EME:	EN 61000-6-3 (includes EN 61000-6-4) Class B (EN 55011, EN 55022) EN 61000-3-2 (PFC)
8.c	Safety:	EU (EN 60 950, EN 60204-1, EN 50178), Hazardous Location Class I Div. 2 (UL 1604)

1.		**BATTERY**
1.a	PROIZVAJALEC	**FIAMM**
1.b	TIP	**12FGL42**
1.c	KODA ZA NAROČANJE	**12FGL42**
2.	TECHNOLOGY	
2.a	Power supply:	Pb battery, VRLA AGM
2.b	Standards:	IEC 60896 Part 21 - VRLA methods of testing IEC 60896 Part 22 - VRLA requirements Eurobat "10-12 years LONG LIFE" UL Recognized
3.	POWER REQUIREMENTS	
3.a	Capacity:	42 Ah
3.b	Output Voltage:	DC 12V
3.c	Self-Discharge at 25°C:	<2%/month
4.	INTERFACE	
4.a	Connection:	ROUND M6
5.	PHYSICAL CHARACTERISTICS	
5.a	Weight:	13,8kg
5.b	Dimensions:	197mm x 165mm x 170mm
	ENVIRONMENTAL LIMITS	
6.	OPERATING TEMPERATURE:	
6.a	operation:	Charge: 0°C ... +40°C Discharge: -20°C ... +50°C
7.	STORAGE TEMPERATURE:	
7.a	storage/transport:	-20°C ... +50°C
8.		

- zahteve za ***sistemsko programsko opremo*** dobavljenega merilnega sistema

1	**Operating System** • Boot Loader Redboot • Kernel Linux > 2.6.35 • Protocol Stack ARP, PPP, CHAP, PAP, IPv4, ICMP, TCP, UDP, DHCP, FTP, SNMP V1, • HTTP, NTP, NFS, SMTP, SSH 1.0/2.0, SSL, Telnet, PPPoE, OpenVPN • File System JFFS2, NFS, Ext2, Ext3, VFAT/FAT • OS shell command bash • **Debian GNU/Linux 5.0 (»*lenny*«)**	
2	**Utilities** • **login** and **user** manager utility • **telnet** client program • **ftp** client program • **smtpclient** email utility • **scp** Secure file transfer Client Program • **ipkg-cl** package manager • **wget** file retrieving from web servers • **ntpdate** NTP client	

3	**Daemons** • **pppd** dial in/out over serial port daemon • **snmpd** snmpd agent daemon • **telnetd** telnet server daemon • **inetd** TCP server manager program • **ftpd** ftp server daemon • **apache** web server daemon • **sshd** secure shell server • **openvpn** virtual private network	
4	**Linux Tool Chain** • **Gcc** C/C++ Cross Compiler • **GDB** Source Level Debug Servis • **Glibc** POSIX standard C library • **libxml2, libpthread, librt, ppp, support**	
5	**Linux libraries** • **libxml2** XML C parser and toolkit • **libpthread** (linuxthreads supported, NPTL preffered) • **librt** POSIX.1b Realtime Extensions library	