

RAY-3 DATA LOGGER

USER'S MANUAL



E-mail:sales@viltrus.com Web: <u>www.viltrus.com</u>

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1 Abbreviations and explanations

- Xn is a number of socket. This information are provided for manufacturer's purpose and used in data schemas and connection diagrams.
- **GSM Global Standart for Mobile Communications.** This interfaces is prepared for remote connections and data bidirectional data transfer over Global Standart Mobile network.
- **GPRS** a packet oriented mobile data service on the 2G and 3G cellular communication system's global system for mobile communications (GSM).
- **Ethernet** a family of computer networking technologies for local area networks (LANs) commercially introduced in 1980. Standardized in IEEE 802.3, Ethernet has largely replaced competing wired LAN technologies. This interfaces is prepared for connection LAN (Local Area Network).
- **IP** address An **Internet Protocol (IP) address** is a numerical label that is assigned to devices participating in a network that uses the Internet Protocol for communication between its nodes.
- **TCP/IP** Transmission Control Protocol is for communication between computers, used as a standard for transmitting data over networks and as the basis for standard Internet protocols.
- MAC address Media Access Control address is a unique identifier assigned to most network adapters.
- UART An Universal Asynchronous Receiver/Transmitter is a type of "asynchronous receiver/transmitter, a part of computer hardware that translates data between parallel an serial forms. UART are commonly used in conjunction with communication standards such as EIA RS-232, RS-422 or RS-485. Record (UARTx) on top of enclosure also are used as serial interface number.
- **GND** ground wire contact
- **RS232** the traditional name for a series of standards for serial binary single-ended data and control signals connecting between a DTE (Data Terminal Equipment) and a DCE (Data Circuit-terminating Equipment). It is commonly used in computer serial ports. The standard defines the electrical characteristics and timing of signals, the meaning of signals, and the physical size and pin out of connectors. RS232 interfaces are prepared for connection of pheripherical devices (example energy meters, controllers, machines and etc.).
- TD contact for transfer data wire of RS232 socket
- **RD** contact for read data wire of RS232 socket
- DTR contact for Data Transmit Ready wire of RS232 socket
- **RS485** standard defining the electrical characteristics of drivers and receivers for use in balanced digital multipoint systems. The standard is published by the ANSI Telecommunications Industry Association/Electronic Industries Alliance (TIA/EIA). Digital communications networks implementing the EIA-485 standard can be used effectively over long distances and in electrically noisy environments. Multiple receivers may be connected to such a network in a linear, multi-drop configuration. RS485 interfaces are prepared for connection of pheripherical devices (example energy meters, controllers, machines and etc.).
- A+ contact for positive wire of RS485 socket
- **B-** ontact for negative wire of RS485 socket
- USB Universal Serial Bus is an industry standard, that defines the cables, connectors and protocols used for connection, communication and power supply between computer and electronic devices. USB type B socket is prepared for connection to PC(Personal Computer). USB type A socket is prepared for connection to pheripherical devices (example memory stick's and etc.).
- MBUS+ contact for M-Bus positive wire
- MBUS- contact fot M-Bus negative wire
- **Socket** is an endpoint of a bidirectional inter-process communication flow across an Internet Protocolbased computer network, such as the Internet.
- Status device status indicating LED
- **Uoutput –** status of power for external device indicating LED
- TX/RX data transfer/receive indicating LED
- **Central computer** server or a computer, where data can be sent.



2 Safety instructions

To install and setup device, secial technical knowledges are needed. Call to seller or certified profesionals to connect and setup device !

Before connecting to power supply, be sure that:

- 1. Controller is not damaged (no cracks, melted, broken or exposed areas)
- 2. Controller is used with right and correct thickness cables.
- 3. Controller and antena are installed indoor.
- 4. The controller is intended for supply from a Limited Power Source (LPS) with current rating of overcurrent protective device not greater than 2A
- 5. The highest transients on the DC secondary circuite of LPS, derived from AC main supply, shall be less then 71V peak.
- 6. The associated equipments (AE): PC and PSU (LPS) shall comply with the requirements of Standard EN 60950-1.
- 7. Controller is dry;
- 8. Ambient temperature and humidity is in normal range;
- 9. Other types of devices (counters, etc.) are connected correctly by using manufacturer's regulations.
- 10. The end of stranded conductor shall not be consolidated by soft soldering and must to be terminated
- 11. Device, PC and other pheripherical devices are strictly connected through one double pole breaker (current break less than 5A and space between breaker contacts more than 3mm.) Pole breaker has to be in building's wiring and in reachable place with markings

Don't use:

- 1. Device under open water (in rain and if water are spalshing on controller or connected devices;
- 2. Device if enclosure, connected cables, or other connected devices are damaged;
- 3. External Back-Up batterys for powering of controller.



Use device by manufacturer's regulations otherwise you can damage controller or other devices. In that cace munufacturer's warranty could not be obtained.



If you suspect that device doesn't operate correctly or has visible violations, please contact manufacturer or your distributor to check or run maintanance.



Manufacturer does not affect and is not responsible for GSM/GPRS/Internet operators' provided network service pricing and costs.



Technical Data



Interfaces	Technical data					
RS485	up to 1,2 km, max 32 transivers, speed up to 38,4 Kbits/s					
RS232	up to 15 m, speed up to 38,4 Kbits/s					
M-Bus	Up to 8 devices					
GPRS	4 band 850/900/1800/1900 MHz					
Ethernet	RJ45. Twisted pair Ethernet 10/100 Mb, up to 100 m					
USB	Type B, version 2.0					
Discrete INPUTS	Sink contact					
Discrete OUTPUTS	Relay 3A					
Analog INPUTS	Current 0/4-20mA, 0-5 mA; Voltage 0-5V, 0-10V; Thermoresistor PT100 or PT1000; error ±0,15%					
Analog OUTPUTS	Voltage 0-10V, load up to 5mA					
Galvanic insulation						
Insulation voltage between power supply and second circuits	1000 V					



Indication						
Indication type	LED's					
Indicated parameters	 Each discrete input status Each discrete output status UART/Ethernet Transfer/Receive GSM/GPRS modem status, Transfer and Receive 					
Power supply						
Power supply	9-36 VDC					
Power consumption	12W					
Construction						
Mounting	DIN rail					
Dimensions	147x128x50 mm					
Enclosure protection	IP20					
Climate conditions						
Operating temperature	From - 25 °C to + 60°C					
Storage temperature	From - 40 °C to + 60°C					
Relative humidity	From 5 % to 95 % non-condensing					
Safety parameters						
Safety requirements	EN 60950-1:2006 EN 60950-1:2006/A1:2010 EN 60950-1:2006/A11:2009 EN 60950-1:2006/A12:2011					
Electromagnetic compatibility	EN 55011:2009/A1:2010; EN 55022:2010 EN 61000-4-2:2009; EN 61000-4-3:2006 EN 61000-4-3:2006/A1:2008; EN 61000-4-3:2006/A2:2010 EN 61000-4-4:2012; EN 61000-4-6:2009 EN 61000-4-8:2010; EN 61326-1:2013					
Other parameters						
Storage memory	8 MB					
Configuration settings storage without power supply	More than 5 years					
Real time clock	Yes					
Firmware loading	Yes. Through RS232/USB and Ethernet, GSM/GPRS.					



4 Setting up connection to the device

In order to configure the controller, user must connect its PC to the device by using any of the following interfaces:

- USB port
- ETHERNET interface
- Through a **GPRS** connection (only accessible after configuring GPRS APN, user and password inside the controller).



Pic 2. RAY-3 connection interfaces



4.1 Connecting via USB

Connect the RAY-3 data logger to the any computer via USB and open RAY-3 configuration software. If needed, install the USB driver (the USB driver can be found in VILTRUS web page: http://www.viltrus.com/data-logger-ray-3/).

Open RAY-3 Configuration software. Set up <u>Connection parameters</u> frame. Steps to be followed:

- 1 Step: Under Connection type select ModBus RTU option
- **2 Step**: Select COM port number assigned by your PC to the USB port
- **3 Step:** Click on **Get all** to establish connection with data logger.

					RAY-	3 configurator				
nalog inputs Ar	nalog outputs	Discrete inputs	Discrete outputs	Communication	Archives	Limits verification	Alerts	Time parameters Sta	art	
Other parameters	3						_			
			Reserve p	ower control				Get all configurat	tion	3 Step
			🥚 Externa	al Power						
			After whic	h time switch off	60 1	min.		Save to file		
								l oad from file		
								Load from the		
								Write all configura	ation	
							Get al	l at connection		
			S	et	Get		Connectic	n parametere		
							Connecti	on type		
						[Modbu	us RTU O Mod	Ibus TCP/IP	
User identifica	ator		- Float num	ber format			Stor			
65535 1	1		• E M1 M	2 M3		-	step	2		
			C M2 M3	EM1						
Set	Get		C M3 M2	M1 E						
			○ M1 E M	3 M2		Set				
Number of co	ontroller		Last resta	rt information						
7777	3		Time:				2 Ste	n		
	-		Code:				Select	COM port numbe	er assigne	d by your PC
Set			Ge	et			to the	USB port	Č.	die e
Firmware versio	on				Resta	+	COM Port			
Version of this s	software 141(2017-02-03)			i tootai		COMT	-		

Pic 3. USB connection steps



4.2 Connecting via GPRS



Check GPRS antenna is properly connected to the device. Insert SIM card.

Pic 4. Steps to connect GPRS antenna and insert SIM card

Open RAY-3 Configuration software. Steps to be followed are:

- 1 Step: In "Connection type" area you need to choose Modbus TCP/IP
- **2 Step**: Add data logger **IP address** and **TCP port**. By default controller is set to **502 Port** (this is system standard Modbus TCP/IP port), change it if you need other.
- **3 Step** Click on **Connect** to establish connection with data logger. If connection fails, check GPRS modem, Communication type, IP address and try to connect again.

Analog inputs	Analog outputs	Discrete inputs	Discrete outputs	Communication	Archives	Limits verification	Alerts	Time parameters	Start	
Other paramet	ters		Reserve r e Extern After whi	ower control al Power ch time switch off	60	j min.		Get all config Save to f Load from Write all config	uration file guration	
User identii 65535	flicator		Float num © E M1 N © M2 M3	ber format	Get		Get all Connectio Connectio	at connection In parameters on type Is RTU Is RTU	1 Step Modbus TCP/IP	
Set	Get		○ M3 M2 ○ M1 E M	M1 E 13 M2		Set	Modbus T Host or	2 CP/IP connection IP 192.168.1	2 Step Data logger's IP ad 125	dress
Number of 7777 Set	of controller		Last resta Time: Code: G	rt information			Port	502 •	By default TCP	port is 502
Firmware ve Version of th	ersion iis software 1.41	(2017-02-03)			Resta	art (Co	nnect 3 S	tep	

Pic 5. GPRS connection steps



4.3 Connecting via Ethernet

Connect a RJ45 Ethernet cable to the Ethernet port. Open RAY-3 Configuration software.

Steps to be followed:

- 1 Step: Under Connection type select ModBus TCP/IP option
- **2 Step**: Add data logger **IP address** and **TCP port**. By default Ethernet settings are: IP address **192.168.1.125** (or **192.168.1.126**); TCP port **502.**
- **3 Step** Click on **Connect** to establish connection with data logger. If connection fails, check cables, communication type, IP address and connect again.

Analog inputs Analog outputs Discrete inputs Discrete outputs Communication Archives Limits verification Alerts Time parameters Start Other parameters Reserve power control External Power After which time switch off 60 min.	i k					RAY-	3 configurator						
Other parameters	Analog inputs	Analog outputs	Discrete inputs	Discrete outputs	Communication	Archives	Limits verification	Alerts	Time parameters	Start			
Set Get Connection parameters 1 Step Connection type 1 Step	Analog inputs	Analog outputs aters	Discrete inputs	Discrete outputs Reserve p Externa After whic	Communication ower control al Power h time switch off	Archives	min.	Alerts Alerts Get al Connecti Connecti	Time parameters Get all config Save to Load from Write all confi I at connection on parameters on type	J Start guration file in file iguration 1 Step			
User identificator Float number format 65535 Image: Set Get Set Get M3 M2 M1 E Mumber of controller M1 E M3 M2 Time: Code: Get Get Firmware version Get Version of this software 1.41 (2017-02-03) Restart	User ident 65535 Set Number 7777 Se Firmware ve Version of th	ificator Get of controller	(2017-02-03)	Float numi C E M1 M M2 M3 C M3 M2 C M1 E M Last restar Time: Code: Ge	per format 2 M3 2 M1 V1 E 3 M2 t information	Restar	Set	Modbus Host of Port	TCP/IP connection T TIP 192.168.1 502 (1) at (ms)	2 Step Data logg 125 By de 4000 Step	er's IP add efault TCP	ress port is 502	

Pic 6. Ethernet connection steps



5 RAY-3 General settings and Status indicators

Once user has established communication with RAY-3, basic information such as **User identificator**, **Serial number** (each controller has its own factory serial number), **Last restart**, etc. is shown in the software frame.

Status indicators

Several status indicators are shown in the RAY-3 configuration software in order to inform user about current performance of Modbus communication:

- **Req**: number of Modbus requests performed.
- Answ: Number of Modbus answers received.
- **TOut**: number of Modbus requests not answered (time outs raised).
- Except: number of Modbus errors.

í] k					RAY-	3 configurator		- 🗆 🗾
Analog inputs	Analog outputs	Discrete inputs	Discrete outputs	Communication	Archives	Limits verification	n Alerts	Time parameters Start
Other param	eters		Reserve p	ower control				Get all configuration
			Extern	al Power				
			After whic	h time switch off	60 🔨	min.		Save to file
								Load from file
								Write all configuration
							🔽 Get all	I at connection
			S	et	Get		Connectio	on parameters
							• Modbu	on type us RTU O Modbus TCP/IP
Useriden	tificator		● E M1 M	2 M3				
65535	*		🔿 М2 М3	EM1				
Set	Get		○ M3 M2 ○ M1 E M	M1 E 3 M2		Set		
Number	of controller		Last resta	t information	1			
7777	Setting	Serial numb	er Time: 1	004\2012 15:27:56	Date	and time of	last rest	tart
Se	et of cont	roller	Ge	et				
Firmware v Version of t	ersion his software 1.41 ((2017-02-03)			Resta	rt	COM Port	-
0-175	1700	70.40	F - 1				La constante de	
Heg 1/25 /	Answ 1722	TOUCO	Except:	Except	: num	ber of Mod	bus eri	rors.
And	Number	TOut of Modbu	: number of	Modbus re	equests	s not answ	ered (t	ime outs raised).
Reg: num	ow. Number	dbus reque	s answers n sts perform	ed.				
q. nun		and an incidence	periorini					

Pic 7. General settings and Status indicators



5.1 Configuration files

This feature enables user to save and load configuration files so that programming a number of data loggers with the same configuration becomes an easy process. Steps:

- **1 Step.** Set up all the configuration parameters making use of RAY-3 Configuration software.
- **2 Step**. Then, under **Start** tab, click on **Save to file** button. A dialog will be shown requesting user to select folder destination.
- **3 Step**. Once the file has been stored, connect a new data logger to the PC and then click on **Load from file** and select the file previously stored.
- **4 Step.** Then, click on **Write all configuration** button to load such configuration into the new controller.
- **5 Step.** A restart will be needed so that data logger can start using the loaded configuration. Data logger can be restarted by turning off/on power supply or pressing button **Restart.**

() k	RAY-3 configu	irator – 🗆 🗙
Analog inputs Analog outputs Discrete inputs Disc	crete outputs Communication Archives Limits ver	ification Alerts Time parameters Start
Other parameters		
	Reserve power control	Get all configuration Configuration reading
	After which time switch off 60 7 min.	Save to file Configuration file save to computer
		Load from file Configuration file load from computer
		Write all configuration Configuration sending to data logger
		Get all at connection
	Set Get	Connection parameters
		Connection type
User identificator 65535	Float number format Float number format M2 M3 E M1 M3 M2 M1 E M1 E M3 M2 Set	Modbus RTU C Modbus TCP/IP
Number of controller	Last restart information Time: Note with RED ligh Code: Use RESTART butto Get	t indicates, that Restart is necessary. In to restart controller -COM Port
Firmware version Version of this software 1.41 (2017-02-03)	Restart	COM1 _
Req:0 Answ 0 TOut:0	Except: 0 Necessary restart	

P.S. Repeat from step 3 with all the controllers that need the same configuration.

Pic 8. Configuration files management



6 Time parameters tab

Time parameters tab enables users to set up time synchronization between RAY-3 Real Time Clock (RTC) and external time references. Several parameters can be configured under this tab:

Set PC time - it synchronizes internal RTC with PC time.

(B	RAY-3 configurator											
Analog inputs	Analog outputs	Discrete inputs	Discrete outputs	Communication	Archives	Limits verification	Alerts	Time parameters				
-Clock sync	chronization	-						PC time: 22\02\2017 17:55:12 Controller time: Set PC time				

Pic 9. Time Parameters tab. Set PC time

Clock synchronization: It must be enabled if synchronization between RAY-3 and any Network Time Protocol (NTP) server is requested. This option is particularly accurate since, every given period (**Synchronization period** parameter), device connects to an NTP server to get current UTC time. Also automatic summertime is adjusted.



Pic 10. Time Parameters tab. NTP server configuration



VILTRUS

This tab enables users to set up limits verification raising events for issuing alerts when condition is met. To create the list, follow the next steps:

1. Choose Count of limits in order to start creating the number of positions desired;

2. Choose Type of limit (this must to be done first) among the following options:

- Over H: event will be generated when the value is above the high limit.
- Under L: event will be generated when the value is below the low limit.
- Over H & Under L: event will be generated when the value is out of the range between high and low limit.
- Under H & Over L: event will be generated when the value is within the range between high and low limit.
- Equal L: event will be generated when the value is equal to the low limit.
- 3. Enter **register number** you want to control or choose from Main fields list (To create and/or edit list of limit's values use file limits.csv, that is in program's folder);
- 4. Enter data format, corresponding to data format of used register;
- 5. Choose limits;
- 6. Delay time (in seconds), if you want to filter accidental or short time events;
- 7. Finally, add a code of event (value must to be from 0 to 99 and will be used for alerts SMS sending)

alog input	Analog outputs Discrete	inputs Disc	rete outputs Corr	munication Archives Lin	nits verification Alerts	Time parameters	Start	
ount of lin	nits 4	🔀 1 St	ер					
Pos No	Parameter	Register	Format	Type of limit	Low limit (L)	High limit (H)	Delay	Code of event
1	Doors closed (on Din1)	4200	unsigned char	Equal L	0		10	2
2	Doors closed (on Din1)	4248	unsigned char	Equal L	1		10	1
3	(Ain1) temperature	0	Float	Over H & Under L	0	40,000	120	3
4				None	v 0	40,000		
Lis	t is in limit.csv fil	le	ł	None Over H Under L Over H & Under L Under H & Over L Equal L	2 Step.	Choose "T	ype of	limit"

Pic 11. Limits verification tab



8 "Archives" tab

The RAY-3 has an internal 8MB flash memory. In case, the device is used as data logger, the following steps must be:

- Go to Archives> Configuration
- In **Storage parameters** frame, configure the **Period**: It defines storage interval. Internal memory is organized in different blocks depending on the devices nature which are connected to the RAY-3.

ile.					RAY-	3 configurator					1220	×
Analog inputs	Analog outputs	Discrete inputs	Discrete outputs	Communication	Archives	Limits verification	Alerts	Time parameters	Start			
Configuration	n User archive o	configuration Valu	ies			8						
Here	you car	n set arch	niving per	riod.								
Storage	parameters		01			Records in	archiv	es				
	[Period (min.)	Delay	1				Recor	rds			
User arch	nive	1	0			Events		0		Clear		
						User archive	9	3		Clear		
	Set	Ge	t									

Pic 12. Archives tab. Storage frequency configuration

In case user needs to customize storage blocks, signals acquisition must be configured accordingly. Memory block used will be defined as "User Archive" (see next step).

- Go to Archives>User Archive Configuration
- Under this tab, user can configure datalogging following his own requirements. In the next pages, a configuration example is given by setting the following parameters:
 - ✓ *"Count of parameters"*: number of registers to be stored.
 - ✓ *"Register"*: Specific register to be stored.

NOTE: Timestamp is registered automatically.

9 "Communication" tab

9.1 Communication > Ethernet

Ethernet interface parameters can be configured within this tab:

- "MAC number": Media Access Control address
- "IP address"
- "Gateway IP"
- "Mask"

NOTE: After configuration is completed, click on "SET" button in order to save changes.

RAY-3 configurate	or – 🗆 🗙
Analog inputs Analog outputs Discrete inputs Discrete outputs Communication Archives Limit	verification Alerts Time parameters Start
Ethernet GPRS/GSM Serial interface Modbus devices Data transfer Routing Compressor	
MAC number 00004C014CEB Set unique MAC IP address 192 * 168 * 1 * 125 * Gateways IP 192 * 168 * 1 * 1 * 1 * Mask 255 * 255 * 255 * 0 * •	Modbus TCP/IP server Socket live time 2000 Sec. Set Get
Ping data	
Send to address 255 1 255 1 255 1 255 1	
Time interval(sec.)	
Set Get	Time before restart if no packets received 600

Pic 13. "Ethernet" configuration tab

9.2 Communication > GPRS

RAY-3 can be configured through a GPRS link. In order to do so, user must enable GPRS connection as shown below. Then, click on "*SET*" button in order to save changes.

Î ≱ RA	VY-3 configurator 🗕 🗖 💌
Analog outputs Discrete inputs Discrete outputs Communication Archives Limits verifica	ation Alerts Time parameters Start
Ethernet GPRS/GSM UART Virtual interfaces Connected devices Modbus devices	Modbus register grouping Data transfer FTP server MQTT Subscriber Routing
GPRS-GSM mode Signal lev Enabled GPRS C GPRS-GSM C After m C GSM C Period	el measurement estart Signal level -69 dBm fically Get
GPRS GSM DDNS setting	
1	APN vodafone.es
Number of connection failures before restart : 5 \checkmark Time before restart if no packets received 7200 \checkmark Incoming IP filter Filter enabled: IP 1 1 \checkmark 0 \checkmark 0 \checkmark 0 \checkmark 0 \checkmark IP 2 2 \checkmark 0 \checkmark 0 \checkmark 0 \checkmark 0 \checkmark IP 3 255 \checkmark 255 \checkmark 255 \checkmark 1 \checkmark IP 4 3 \checkmark 232 \checkmark 255 \checkmark 0 \checkmark IP 5 1 \checkmark 1 \checkmark 3 \checkmark 232 \checkmark	GPRS login Image: Comparison of the system of the syst
Reg: 5850 Answ 5849 TOut:0 Except: 1	

Pic 14. GPRS Tab. Enabling communication

Within this tab, different services can be configured or checked. <u>GPRS connection parameters:</u>

• APN: access point name provided by Internet Service Provider (ISP).

If needed by ISP, credentials can also be configured here:

- Username: provided by ISP.
- **Password**: provided by ISP.

NOTE: After configuration is completed, click on "SET" button in order to save changes.



10 Modbus connection configuration



Connecting Modbus meter/device to the RAY-3

Step 1: Click on **Communication tab** - > **UART** and set the **Bode Rate, Parity, Data Bits, Stop Bits**. This information must be the same as indicated on the Modbus meter / device that is being connected to the RAY-3 data logger. After entering the parameters, press "**SET**".

Discrete inputs Comm	nunication Archives	Limits verification A	lerts Time paramete	ers Start
Ethernet UART Vi	rtual interfaces Conr	nected devices Mod	dbus devices Modbu	us register grouping Data transfer FTP server MQTT Subscriber
	UART 1	UART 2	UART 3	
Bode	7 300 600 7 1200 7 2400 7 4800 9600 9 19200 7 38400 7 57600	C 300 C 600 C 1200 C 2400 C 4800 C 9600 # 19200 C 38400 C 38400 C 57600	C 300 C 600 C 1200 C 2400 C 4800 C 9600 C 19200 C 38400 C 57600	You have to set UART (Bode, Parity, Data bits, Stop bits) to which it is connected your Modbus meters. UART settings should be the same as the meters.
Parity	Even Odd Mark Space None	Even Odd Mark Space None	 Even Odd Mark Space None 	
Data bits	C 5 C 6 C 7 G 8	C 5 C 6 C 7 6 8	C 5 C 6 C 7 C 8	
Stop bits	• 1 © 2	• 1 C 2	• 1 C 2	
Packetization	 Time Symbol Length 	 Time Symbol Length 	Time Symbol Length	
Packet. time (msec.)	10	10	100	
Packet. symbol(Hex)	01	01	00	
Packet, byte count	1	100	1	
Mode	Full duplex Half duplex	Full duplex Half duplex	Full duplex Half duplex	
Destination of DTR	Always OFF Always ON OFF when send ON when send	C Always OFF C Always ON C OFF when send C ON when send	 Always OFF Always ON OFF when send ON when send 	After all the settings you need to press the "Set".
Bar 993 Annu 997	TOuto	Event	1	
104.000 Allow 302	TOULO	L'ACEPC		



Step 2: Click on Communication tab - > Virtual Interfaces and set the UART. (Click "SET").

	1		1			1	1		1					
Dis	crete inputs Commu	nication	Archives L	imits ve	rification	Alerts	Time p	arameters	Start					
E	thernet UART Virtu	ual interf	faces Conne	ected de	vices	Modbus	devices	Modbus r	egister grouping	Data transfer	FTP server	MQTT Subscriber		
	COM Client													
		CO	M1 C	OM 2	CC	DM 3								
	Enabled	~												
	UART	UART 3	UART	1	UART	1								
	Stack depth	1	1		1									
	Timeout (msec.)	2500	1000		1000									
	Number of repeats	1	1		1									
	Set		Get											
	Modbus RTU Client													
			1	2										
	Enabled		v											
	UART		UART 1	UART 1	1									
	Stack depth		1	1										
	Timeout (msec.)		2500	1000										
	Number of repeats		1	1										
	Delay before next req.(r	msec.)	100	100										
	Set		Get											

Step 3: Click on Communication tab - > Modbus devices -> Configuring Modbus devices -> Modbus RTU client. Define the reading time (sec) by your requerments. Then set the amount of requests, press "Enter". Also set the Adress, Function, Register, and Coils as indicated in the picture above and press "SET".



Step 4: Click on **Communication tab - > Modbus devices -> Current values.** In this tab you see if the Modbus meter / device is read. The value is being showed in hex formate. Also there is indication of RAY-3 Register adress, where the received modbus value is.



Step 5: Click on **Communication** tab - > **Data transfer** -> **Common parameters**. In this tab are described meter values, formats, headers and dimensions, which will be archived and sent to the FTP. Only archived values can be sent to FTP.

D	iscrete	inputs Communic	ation Archi	ves Limits ver	ification Alerts Time param	eters Start			
E	Etherne	et UART Virtual	interfaces	Connected dev	vices Modbus devices Mod	Ibus register grouping	Data transfer FTF	server MQTT Subscribe	
Ī	Comm	on parameters Mo	dbus TCP/		 απί				_
Ľ	Commi			· _ · · · · ·					
	Amo	unt of groups of reg	isters	8 1			Set user archive		
	/ 1110	Boromotor	Begister/	Amount of	Format	Header		Dimension	
		Parameter	Coil	parameters or string length	Format	Header		Dimension	
	1		100070	1	unsigned long (32b)	Identification Nr.			
	2		100050	1	Float (32b)	Volume(m3)			
	3		100072	1	unsigned long (32b)	On Time(hours)			
	4		100052	1	Float (32b)	Time Point(time & date)			
	5		100074	1	unsigned long (32b)	Time Point(date)			
	6		100076	1	unsigned long (32b)	Fabrication No			
	7		100054	1	Float (32b)	Volume(m3)			
	8		52000	1	unsigned long (32b)				
	He Or	ere are describ	ed the m Ilues car	neter values n be send to	s formats, headers an o the FTP server.	d dimensions, wh	ich will be arcl	hived and sent to th	e FTP.
					Y	ou can load from	CSV file your	description or save	this and use in other devices.
	-	Set	(Cot			and from CSV	Save to CSV	
		Sei		Jei				Save to 0.5v	
Re	1 725	Answ 1722	TO	ut: 0	Except: 3				

Step 6: Cick on Archives -> Values -> User archive. In this tab you see modbus values and those values

can be saved in the computer.

	is Communicat	Archives E	This vehication	Aiens Inne pare					
Configuratio	on User archive o	configuration Val	ues						
Events U	ser archive Diag	nostic							
Pos No	Volume(m3)	On Time(hours)	Time Point/time	Time Point(date)	Eabrication No.	Volume(m3)			
1 03 140	volume(m3)	On mile(nours)	& date)	mile i om(date)	Tablication No	volume(mo)			
1	0.1350	75444	1.4864132E9	943920000	8014388	0.1350	946693740		
2									
¢									

Step 7: Cick on Archives -> Configuration. In this tab you can set the archiving period.



Step 8: Communication -> Data Transfer -> FTP. In this tab you can set the FTP port, transmission channel, FTP server address / name. Then click "SET".

iscrete inputs Communication Archive	Limits verification	n Alerts Time	parameters	Start		
Ethernet UART Virtual interfaces C	onnected devices	Modbus devices	Modbus re	gister grouping Data	transfer FTP server MQTT	Subscriber
Common parameters Modbus TCP/IP	FTP MQTT	You hav	e set y	our FTP po	rt and transmis	sion channel.
	FTP server 1	FTP server 2	FTP serve	er 3 FTP server 4]	
Enabled	I				Name template of the file to	he sent
FTP port	2021	21	21	21		NN
Transfer period (min.)	60	0	10	10	RAY3_YYYY_MM_DD_HH	_NN.CSV
Repeat transfer if failure (min.)	2	0	256	120		
Max number of last records to be sent	10	10	10	10		
Transmission channel	 Ethernet GPRS 	 Ethernet GPBS 	Ethernet GPRS	Ethernet O GPRS		
	Grito	- or no	- Or Ho	GIRO		
FIP server		URL a	nd directory			
1 82.135.139.27 Hor	e vou hav	e set F I	P serve	er address	or name.	
	<i>y</i> o a mar					
2	, journar					
2	, journar					
2 3 4	, jeu nav					
2 3 4 Username of FTP server	, journat					
2 3 4 Username of FTP server FTP server	Jser name		FTP server	Status	Successful/attempt/last	
2 3 4 Username of FTP server FTP server 1 user1	Jser name		FTP server	Status	Successful/attempt/last record transfer times	
2 3 4 Username of FTP server FTP server 1 user1 2	Jser name		FTP server	Status	Successful/attempt/last record transfer times	
2 3 4 Username of FTP server FTP server 1 user1 2 3	Jser name		FTP server	Status Not active	Successful/attempt/last record transfer times 01\01\1998 00:00:00 01\01\1998 00:00:00	
2 3 4 Username of FTP server FTP server 1 2 3 4 4	Jser name		FTP server	Status Not active	Successful/attempt/last record transfer times 01\01\1998 00:00:00 01\01\1998 00:00:00 01\01\1998 00:00:00	
2 3 4 Username of FTP server FTP server 1 user1 2 3 4 FdSSWULU UT 1F Server	Jser name		FTP server	Status Not active Not active	Successful/attempt/last record transfer times 01\01\1998 00:00:00 01\01\1998 00:00:00 01\01\1998 00:00:00 01\01\1998 00:00:00	
2 3 4 Username of FTP server FTP server 1 user1 2 3 4 FTP server FTP server FTP server	Jser name		FTP server	Status Not active Not active	Successful/attempt/last record transfer times 01\01\1998 00:00:00 01\01\1998 00:00:00 01\01\1998 00:00:00 01\01\1998 00:00:00 01\01\1998 00:00:00 01\01\1998 00:00:00	
2 3 4 Username of FTP server FTP server 1 user1 2 3 4 FTP server FTP server 1 user1 2 3 4 FTP server 5 1 1 1 1 1 1 1 1 1 1 1 1 1	Jser name		FTP server 1 2	Status Not active Not active	Successful/attempt/last record transfer times 01\01\1998 00:00:00 01\01\1998 00:00:00 01\01\1998 00:00:00 01\01\1998 00:00:00 01\01\1998 00:00:00 01\01\1998 00:00:00	
2 3 4 Username of FTP server FTP server 1 user1 2 3 4 Fd55wulu Ut 1F Servet FTP server 1 user1 2 3 4 FTP server	Jser name		FTP server 1 2 3	Status Not active Not active Not active	Successful/attempt/last record transfer times 01\01\1998 00:00:00 01\01\1998 00:00:00 01\01\1998 00:00:00 01\01\1998 00:00:00 01\01\1998 00:00:00 01\01\1998 00:00:00 01\01\1998 00:00:00 01\01\1998 00:00:00	
2 3 4 Username of FTP server FTP server 1 user1 2 3 4 FTP server 1 user1 2 3 4 FTP server 1 user1 4 FTP server 1 user1 4 FTP server	Jser name		FTP server 1 2 3	Status Not active Not active Not active	Successful/attempt/last record transfer times 01\01\1998 00:00:00 01\01\1998 00:00:00 01\01\1998 00:00:00 01\01\1998 00:00:00 01\01\1998 00:00:00 01\01\1998 00:00:00 01\01\1998 00:00:00 01\01\1998 00:00:00	
2 3 4 Username of FTP server FTP server 1 user1 2 3 4 FTP server 1 user1 2 3 4 FTP server 1 user1 2 3 4 FTP server 5 5 5 5 5 5 5 5 5 5 5 5 5	Jser name Password		FTP server 1 2 3 4	Status Not active Not active Not active Not active	Successful/attempt/last record transfer times 01\01\1998 00:00:00 01\01\1998 00:00:00 01\01\1998 00:00:00 01\01\1998 00:00:00 01\01\1998 00:00:00 01\01\1998 00:00:00 01\01\1998 00:00:00 01\01\1998 00:00:00 01\01\1998 00:00:00	
2 3 3 4 Username of FTP server FTP server 1 user1 2 3 4 FTP server 1 user1 2 3 4 FTP server 1 user1 2 3 4 Set	Jser name		FTP server 1 2 3 4	Status Not active Not active Not active Not active Not active	Successful/attempt/last record transfer times 01\01\1998 00:00:00 01\01\1998 00:00:00 01\01\1998 00:00:00 01\01\1998 00:00:00 01\01\1998 00:00:00 01\01\1998 00:00:00 01\01\1998 00:00:00 01\01\1998 00:00:00 01\01\1998 00:00:00 01\01\1998 00:00:00	



11 M-Bus connection configuration



Connecting the M-Bus meter/device to the RAY-3 M-Bus interface.

Connecting Modbus meter/device to the RAY-3

Step 1: Click on **Communication tab** - > **UART** and set the Bode Rate, Parity, Data Bits, Stop Bits. This information must be the same as indicated on the M-Bus meter / device that is being connected to the RAY-3 data logger. After entering the parameters, press "**SET**".

Valuable note: If you are not sure which UART to configure, check the which UART is M-Bus interface on the device.

Ethernet UART Vir	tual interfaces Con	nected devices Mo	dbus devices Modb	us register grouping Data transfer FTP server MQTT Subscriber
	UART 1	UART 2	UART 3	
3ode	☐ 300 ☐ 600 ☐ 1200 ☐ 2400 ☐ 4800 ☐ 9600 ☐ 19200 ☐ 38400 ☐ 57600	○ 300 ○ 600 ○ 1200 ○ 2400 ○ 4800 ○ 9600 ○ 19200 ○ 38400 ○ 57600	<pre>7 300 7 600 7 1200 7 1200 7 4800 7 9600 7 19200 7 38400 7 57600</pre>	You have to set UART (Bode, Parity, Data bits, Stop bits) to which it is connected your Mbus meters. UART settings should be the same as the meters.
Parity	Even Odd Mark Space None	Even Odd Mark Space None	Even Odd Mark Space None	
Data bits	C 5 C 6 C 7 F 8	C 5 C 6 C 7 # 8	C 5 C 6 C 7 Ø 8	
Stop bits	€ 1 C 2	€ 1 C 2	€ 1 C 2	
Packetization	 F Time ⊂ Symbol ⊂ Length 	 Time Symbol Length 	 Time ⊂ Symbol ⊂ Length 	
Packet. time (msec.)	10	10	100	
Packet. symbol(Hex)	01	01	00	
Packet, byte count	1	100	1	
Mode	Full duplex Half duplex	Full duplex Half duplex	Full duplex Half duplex	
Destination of DTR	Always OFF Always ON OFF when send	Always OFF Always ON OFF when send ON when send	Always OFF Always ON OFF when send ON when send	After all the settings you need to press the "Set".



Step 2: Click on Communication tab - > Virtual interfaces. Set the UART and press "SET".

0		Arabi			Times	or an atom Chart				
_	Commu	Inication Arch	ives Limits ve	Alert	s _ rime p	barameters Start				
E	Ethernet UART Virt	ual interfaces	Connected de	evices Modbu	s devices	Modbus register grouping	Data transfer	FTP server	MQTT Subscriber	
	COM Client									
		COM 1	COM 2	COM 3						
	Enabled	v			1					
	UART	UART 3	UART 1	UART 1						
	Stack depth	1	1	1						
	Timeout (msec.)	2500	1000	1000						
	Number of repeats	1	1	1						
	Set		Get							
	Set		Get							

Step 3: Click on **Communication tab** -> **Connected devices** -> **M-Bus devices** -> **Configuration** and configure the following parameters:

- "Enabled": Select which M-Bus interface will be active.
- "COM Client": Select COM Client previously configured.
- "Amount of meters": Configure the number of M-Bus devices to be read.
- "Read Period": Set the read period in minutes.

After configuration is completed, click on "SET" button in order to save changes. Also, perform a hardware reset.

Discrete inputs Commu	unication Arc	hives Limits ve	erification Alerts Time p	arame	ters Start						
Ethernet UART Virt	ual interfaces	Connected de	evices Modbus devices	Mod	bus register grou	uping Data transfer	FTP serv	er MQTT Subscribe	r		
MBus devices									_		
Configuration Curren	nt values										
d about				Fire	taroup						
Enabled		2		11113	a group		In succes	sion			
COM Client	1	1			Type	Address	Dat	Device number	Manufacturer	Medium	
Amount of meters	1	1			.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	posit	ion	manaratatata		
Read period	10	1		1	Unknown	000000000000000000000000000000000000000	1	0000000		Other	
Period dimension	e sec.	e sec.									
2 step	C h	O h									
Set		Get									
Matare saarch											
Search begins											
C From the least	significant dig	git in the address	s								
From the most	significant dig	git in the address	s								
Search devic	res in 1st lin	e									
2 stars	763 III 131 III										
3 step											
	1	2									
Status	Active										
Rastø kiekis	1										
					Load from CS	/ Save to (CSV				
Reg: 988 Answ 987	T	Out: 0	Except: 1								

"M-Bus devices" tab. Communication configuration



Once RAY-3 has been reset, go to Communication tab -> Connected devices -> M-Bus devices -> Configuration and click on "Search devices in 1st line" button.

Step 4: After the search is done, click on *"Include newly found"*, then *"Delete missing"* and finaly *"Finnish and send"*.

New founded devices	Prev	iuos founded devices		
Pos Address	Pos No	Address	Data position	
1 0801438865329906	1	000000000000000000000000000000000000000	1	
				3 sten
				Einich and con
				Finish and sen
1 step		2 step		Finish without sen
Include newly found	Merge all	Delete missing	Restore previous	Cancel

Step 5: After a few seconds, a list including all the M-Bus devices connected to the network will be shown. Moreover, a list of its main parameters will be also identified automatically.

Click "Read Available parameters".

hemet UART Vin	tual interfaces	Connected d	levices Modbus devices	Mod	bus register g	rouping Data transfer	TP server	MQTT Subscribe	er			
IBus devices												
Configuration Curren	nt values											
	1	2	1	Firs	st group							
Enabled	~	Г					n successio	1				
COM Client	1	1			Туре	Address	Data	Device number	Manufacturer	Me	edium	
Amount of meters	1	1					position					
Read period	10	1		1	Unknown	0801438865329906	2	08014388	LSE	Hot W *	View/Ed	it list of par
Period dimension	E sec.	a sec.								Г	Read av	silable parar
	ie min.	min.									Read cu	rrent data



VILTRUS

Step 6: On the left you see all available parameters from the meter. On the right, you can select those parameters, that you need from the meter.

05	Parameter	Storage number	Tariff	SubUnit	Type of parameter	Pos No	Parameter	Storage number	Tariff	SubUnit	Type of parameter	Double float index	Double long	Float index	Long
	Identification Nr.	1	1	1	Instantaneous	_							Index		
	Manufacturer, Medium,	1	1	1	Instantaneous	1	Identification Nr.	1	1	1	Instantaneous				1
	Volume(m3)	1	1	1	Instantaneous	2	Volume(m3)	1	1	1	Instantaneous			1	
	On Time(hours)	1	1	1	Instantaneous	3	On Time(hours)	1	1	1	Instantaneous			1520	2
	Time Point(time & date)	1	1	1	Instantaneous	4	Time Point(time & date)	1	1	1	Instantaneous			2	_
	Time Point(date)	1	1	1	Value during	5	Time Point(date)	1	1	1	Value during				3
	Fabrication No	1	1	1	Instantaneous	6	Fabrication No	1	1	1	Instantaneous				4
	Model / Version	1	1	1	Instantaneous	7	Model / Version	1	1	1	Instantaneous				
	Parameter set identification	1	1	1	Instantaneous	8	Parameter set	1	1	1	Instantaneous				_
	Metrology (firmware) version	1	1	1	Instantaneous	9	Metrology (firmware)	1	1	1	Instantaneous				
	Volume(m3)	2	1	1	Instantaneous	10	Volume(m3)	2	1	1	Instantaneous			3	
	Time Point(date)	2	1	1	Instant: Delet	11	Time Point(date)	2	1	1	Instantaneous				
		You o push	an de on it	elete ι the rig	innecessa ht mouse	ry lir butte	ne, on.								
															~

Step 7: Set the name to the M-Bus meter:

ation Nr. cturer, Medium, (m3) e(hours)	1 1 1	1	1	Instantaneous	1			mannoer			parameter	inout index	index	Index	mach
cturer, Medium, (m3) e(hours)	1	1	1		4	Contraction of the local sector									
(m3) e(hours)	1			Instantaneous	1	Identific	ation Nr.	1	1	1	Instantaneous				1
e(hours)		1	1	Instantaneous	2	Volume	(m3)	1	1	1	Instantaneous			1	
	1	1	1	Instantaneous	3	On Tim	e(hours)	1	1	1	Instantaneous				2
pint(time & date)	1	1	1	Instantaneous	4	Time P	oint(time & date)	1	1	1	Instantaneous			2	
pint(date)	1	1	1	Value during	5	Time P	oint(date)	1	1	1	Value during				3
tion No	1	1	1	Instantaneous	6	Fabrica	tion No	1	1	1	Instantaneous				4
Version	1	1	1	Instantaneous	7	Volume	(m3)	2	1	1	Instantaneous			3	
ter set identification	1	1	1	Instantaneous			New type of Mbu	s device				×			
ov (firmware) version	1	1	1	Instantaneous								_			
(m3)	2	1	1	Instantaneous											
pint(date)	2	1	1	Instantaneous			Name	1	LSE						
	ion No /ersion ter set identification jy (firmware) version m3) int(date)	ion No 1 /ersion 1 ter set identification 1 yy (firmware) version 1 m3) 2 int(date) 2	ion No 1 1 /ersion 1 1 ter set identification 1 1 m3) 2 1 int(date) 2 1	ion No 1 1 1 /ersion 1 1 1 ter set identification 1 1 1 ty (firmware) version 1 1 1 m3) 2 1 1 int(date) 2 1 1	ion No 1 1 Instantaneous /ersion 1 1 Instantaneous ter set identification 1 1 Instantaneous gy (firmware) version 1 1 Instantaneous m3) 2 1 1 Instantaneous int(date) 2 1 1 Instantaneous	ion No 1 1 Instantaneous /ersion 1 1 Instantaneous ter set identification 1 1 Instantaneous gy (firmware) version 1 1 Instantaneous m3) 2 1 1 Instantaneous int(date) 2 1 Instantaneous	ion No 1 1 Instantaneous /ersion 1 1 Instantaneous /ersion 1 1 Instantaneous /ersion 1 1 Instantaneous /gr (firmware) version 1 1 Instantaneous m3) 2 1 1 Instantaneous int(date) 2 1 1 Instantaneous	ion No 1 1 Instantaneous Pathcadon No /ersion 1 1 Instantaneous 7 Volume(m3) ter set identification 1 1 Instantaneous New type of Mbu m3) 2 1 1 Instantaneous int(date) 2 1 Instantaneous Name	ion No 1 1 Instantaneous Patricator No 1 /ersion 1 1 Instantaneous 7 Volume(m3) 2 /ersion 1 1 Instantaneous 7 Volume(m3) 2 /ersion 1 1 Instantaneous New type of Mbus device New type of Mbus device m3) 2 1 1 Instantaneous Name	ion No 1 1 Instantaneous Pathtation No 1 1 /ersion 1 1 1 Instantaneous /ersion 1 1 1 Instantaneous /gr (firmware) version 1 1 1 Instantaneous m3) 2 1 1 Instantaneous int(date) 2 1 Instantaneous	ion No 1 1 Instantaneous /ersion 1 1 Instantaneous /ersion 1 1 Instantaneous /gr (firmware) version 1 1 Instantaneous m3) 2 1 Instantaneous int(date) 2 1 Instantaneous	ion No 1 1 Instantaneous /ersion 1 Instantaneous	ion No 1 1 Instantaneous /ersion 1 1 Instantaneous	ion No 1 1 Instantaneous I I I I Instantaneous /ersion 1 1 1 Instantaneous 7 Volume(m3) 2 1 1 Instantaneous /ersion 1 1 1 Instantaneous 7 Volume(m3) 2 1 1 Instantaneous /ersion 1 1 Instantaneous Instantaneous New type of Mbus device X /main 1 1 Instantaneous Instantaneous New type of Mbus device X /main 1 1 Instantaneous Instantaneous Instantaneous Instantaneous	ion No 1 1 Instantaneous I I Instantaneous I /ersion 1 1 1 Instantaneous 2 1 1 Instantaneous 3 /ersion 1 1 1 Instantaneous 2 1 1 Instantaneous 3 /ersion 1 1 1 Instantaneous Instantaneous New type of Mbus device X /m3) 2 1 1 Instantaneous Instantaneous Name LSE X



Discrete inputs Commu	nication Arch	hives Limits ve	rification Alerts Time pa	arame	ters Start							
Ethernet UART Virtu	ual interfaces	Connected d	evices Modbus devices	Mod	bus register g	rou	ping Data transfer	FTP server	MQTT Subscribe	r I		
MBus devices												
Configuration Current	t values											
	1	2		Firs	t group							
Enabled	7	Γ						In succession	n			
COM Client	1	1			Туре		Address	Data	Device number	Manufacturer	Medium	
Amount of meters	1	1		-		_		position				
Read period	10	1		1	Unknown	~	0801 <mark>4</mark> 38865329906	2	08014388	LSE	Hot Water	
Period dimension	ff sec. ⊂ min. ⊂ h	f sec. ⊂ min. ⊂ h			Unknown Weser LSE		You have	to cho	ose the	meter's	s descript	tion,
Set		Get					winori you	, or out		* •		

Step 7: In order to check if data are being received from M-Bus devices, go to "Current values" tab, here

you can see the values of the meters.

Discrete inputs Communication	Archives Limits verifi	ication Ale	ts Time	e paramete	rs Start				
Ethernet UART Virtual inter	faces Connected devi	ces Modb	us device	s Modbu	ıs register grou	ping Data transfe	FTP server	MQTT Subscrib	er
MBus devices									
Configuration Current values	-								
Device/Parameter	Last read time	Storage number	Tariff	SubUnit	Type of parameter	Double float	Double long	Float	Long
<u>2 - LSE (08014388)</u>	01\01\2000 03:28:43								
Identification Nr.		1	1	1	Instantaneou				8014388
Volume(m3)		1	1	1	Instantaneou			0.135	
On Time(hours)		1	1	1	Instantaneou				75371
Time Point(time & date)		1	1	1	Instantaneou			1486149120.0	
Time Point(date)		1	1	1	Value during				943920000
Fabrication No		1	1	1	Instantaneou				8014388
Volume(m3)		2	1	1	Instantaneou			0.135	

Here you can see the values of the counters where reading has been configured before.

All of the values that you see here, you can move to the archiving.

 All values to archive

 If you don't see this button, probably you need update configuration software.

 Req 1239
 Answ 1238

 TOut:0
 Except: 1

"M-Bus devices" tab. Current values



Once the registers are identified, on the "**Communication -> Data Transfer -> Common parameters**" tab, write all the registers as shown in the next figure and click on the "**Set user archive**" checkbox in order to replicate the structure in the internal datalogging archive. To send data to the FTP server, you need to archive values.

Discrete i	nputs Communic	ation Archi	ives Limits ver	ification Alerts Time parame	eters Start			
Ethernet	UART Virtual	interfaces	Connected dev	vices Modbus devices Mod	lbus register grouping	ata transfer FT	P server MQTT Subscriber	
Commo	n parameters M	odbus TCP/		οπί				
Loomine								
			7			Out was such in		
Amou	int of groups of reg	isters	1			Set user archive	e 💌	
	Parameter	Register/ Coil	Amount of parameters or string length	Format	Header		Dimension	
1		100070	1	unsigned long (32b)	Identification Nr.			
2		100050	1	Float (32b)	Volume(m3)			
3		100072	1	unsigned long (32b)	On Time(hours)			
4		100052	1	Float (32b)	Time Point(time & date)			
5		100074	1	unsigned long (32b)	Time Point(date)			
6		100076	1	unsigned long (32b)	Fabrication No			
7		100054	1	Float (32b)	Volume(m3)			
H W O	ere are d hich will l nly archiv	escrit be arc ved va	bed the chived a alues ca	meter values found sent to the an be send to the	ormats, head FTP. ne FTP serv	ders and er.	I dimensions,	
_		You	can load	d from CSV file	your descri	ption or	save this and	use in other devices.
	Set	(Get		Lo	ad from CSV	Save to CSV	
Reg: 904	Answ 903	TO	ut:0	Except 1				

The RAY-3 has an internal 8MB flash memory. In case, the device is used as data logger, the following steps must be:

- Go to Archives -> Configuration tab
- In **Storage parameters** frame, configure the **Period**: It defines storage interval. Internal memory is organized in different blocks depending on the devices nature which are connected to the RAY-3.

Then click on "SET" button in order to save changes.

ile.			RAY-	3 configurator			×
Analog inputs Analog outpu	ts Discrete inputs	Discrete outputs	Communication Archives	Limits verification Alerts T	ime parameters Start		
Configuration User archive	configuration Valu	Jes					
Here you ca	in set arcl	niving pe	riod.				
Storage parameters		01		Records in archives			
	Period (min.)	Delay			Records		
User archive	1	0	-	Events	0	Clear	
				User archive	3	Clear	
Set	G	et					

"Archives" tab. Storage frequency configuration



In order to check current data logged in the internal memory, go to **Archives -> Values -> User archive tab**. Here you can check, what values are archived and save them in your computer.

Discrete i	nputs C	ommunication Ar	chives Limits veri	fication Alerts	Time parameters	Start			
Gonigui		for archive comigan	Values						
Events	User are	hive Diagnostic							
Pos N	lo	Time	Identification Nr.	Volume(m3)	On Time(hours)	Time Point(time & date)	Time Point(date)	Fabrication	
1	0	6\02\2017 14:31:00	8014388	0.1350	75441	1.4864037E9	943920000	8014	
2	0	6\02\2017 14:30:00	8014388	0.1350	75441	1.4864036E9	943920000	8014	
3	0	6\02\2017 14:29:00	8014388	0.1350	75441	1.4864036E9	943920000	8014	
4	0	6\02\2017 14:28:00	8014388	0.1350	75441	1.4864036E9	943920000	8014	
٤	,								
	0	0		New section					
	Get	Save are	chive C	lear archive					
Reg: 1204	Answ	1203 1	fOut:0	Except 1					

"Archives" tab. User archive current values

Configure <u>FTP client</u>: Go to Communication -> Data Transfer -> FTP. In this tab you can set the FTP port, transmission channel, FTP server address / name. You have set your FTP port and transmission channel. Configure the following parameters: "FTP server": Up to 4 different FTP connections to remote FTP servers can be configured.

- "Enabled": Select it to enable an FTP connection
- "FTP Port": By default, 21 but can be changed.
- "Transfer period": It defines interval between CSV file sending tasks.
- "Max number of last records to be sent": It defines maximum number of previous data stored and not sent due to communication error. These data will be sent in a CSV file when communication is restored.
- "Transmission channel": It can be Ethernet or GPRS

"URL and directory of FTP servers": It defines the complete FTP server URL where CSV file will be hosted. *Username and password* of FTP server: to be configured in case credentials are requested by FTP server. In order to save changes click on "SET" button.

iscrete inputs	Communication Archives	Limits verification	Alerts Time	parameters	Start				
Ethernet UAR1	T Virtual interfaces Con	nected devices	Modbus devices	Modbus reg	gister grouping Data t	transfer FTP server MQTT	Subscriber		
Common param	neters Modbus TCP/IP	TP MQTT	You have	e set y	our FTP por	rt and transmis	sion channel.		
		FTP server 1	FTP server 2	FTP serve	er 3 FTP server 4				
Enabled		V				Name template of the file to	ha cont		
FTP port		2021	21	21	21	Name template of the life to be sent			
Transfer perio	d (min.)	60 0 2 0		10	10	RAY3_YYYY_MM_DD_HH_NN.csv			
Repeat transf	er if failure (min.)			256	120				
Max number	of last records to be sent	10	10	10	10				
Transmission	channel	Ethernet COPPS COPPS		Ethernet	Ethernet				
		- orno	o orno	GFR3	O GERO				
FTP server			URL a	nd directory					
1	82.135.139.27 Here	vou hav	e set FT	P serve	er address o	or name.			
2									
3									
4									
Username of I	FTP server								
FTP server	Us	er name		FTP server	Status	Successful/attempt/last			
1	user1					record transfer times			
2									
3				1	Not active	01\01\1998 00:00:00			
4						01\01\1998 00:00:00 01\01\1998 00:00:00			
masswulu ul i	ור שנוענו			2	Not active	01\01\1998.00:00:00			
FTP server	Pa	assword		2	Not duive	01\01\1998 00:00:00			
1	user1					01\01\1998 00:00:00			
2				3	Not active	01\01\1998 00:00:00			
3						01\01\1998 00:00:00			
4						01\01\1998 00:00:00			
Set	Get			4	Not active	01\01\1998 00:00:00			
	OCI					0101(1998 00:00:00			
Set	Get					01\01\1998 00:00:00			
a: 1663 Answ	1662 TOut:0	Exc	ept: 1						

Communication -> "Data transfer" tab. FTP client configuration