



Communication gateway iHUB-L1

Communication gateway

iHUB-L1

User and Installation manual



Security Advices and Warnings

Please read this chapter carefully and examine the equipment carefully for potential damages which might arise during transport and to become familiar with it before continue to install, energize and work with an iHUB-L1.

This chapter deals with important information and warnings that should be considered for safe installation and handling with a device in order to assure its correct use and continuous operation.

Everyone using the product should become familiar with the contents of chapter »Security Advices and Warnings«.

If equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.



PLEASE NOTE

This booklet contains instructions for installation and use of iHUB-L1. Installation and use of a device also includes handling with dangerous currents and voltages therefore should be installed, operated, serviced and maintained by qualified personnel only. ISKRA Company assumes no responsibility in connection with installation and use of the product. If there is any doubt regarding installation and use of the system in which the device is used for measuring or supervision, please contact a person who is responsible for installation of such system.

Before switching the device ON

Check the following before switching on the device:

- Nominal voltage.
- Terminals integrity.
- Protection fuse for voltage inputs (recommended maximal external fuse size is 10 A).
- External switch or circuit breaker must be included in the installation for disconnection of the devices' aux. power supply. It must be suitably located and properly marked for reliable disconnection of the device when needed.
- Proper connection and voltage level of I/O module.

Used symbols on devices' housing and labels

SYMBOL	EXPLANATION
	DANGER Indicates proximity of hazardous high voltage, which might result in serious injury or death if not handled with care.
\bigwedge	WARNING Indicates situations where careful reading of this manual is required and following requested steps to avoid potential injury is advised.
X	Compliance of the product with directive 2002/96/EC, as first priority, the prevention of waste electrical and electronic equipment (WEEE), and in addition, the reuse, recycling and other forms of recovery of such wastes so as to reduce the disposal of waste. It also seeks to improve the environmental performance of all operators involved in the life cycle of electrical and electronic equipment.
()	Compliance of the product with European CE directives.

Disposal

It is strongly recommended that electrical and electronic equipment (WEEE) is not deposit as municipal waste. The manufacturer or provider shall take waste electrical and electronic equipment free of charge. The complete procedure after lifetime should comply with the Directive 2002/96/EC about restriction on the use of certain hazardous substances in electrical and electronic equipment.

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BASIC DESCRIPTION AND OPERATION

This chapter presents all relevant information about the iHUB-L1 required to understand its purpose, applicability and basic features related to its operation.

In this chapter, you will find:

DESCRIPTION OF THE DEVICE	2
IHUB-L1 APPLICATION	3
MAIN FEATURES	5

Description of the device

The iHUB-L1 communication gateway is intended to connect various equipment into communication network via Wi-Fi communication. The gateway has build-in two optical (IR) communication ports and the RS485 serial communication with the MODBUS protocol. RS485 communication enables data transmission and thus connection of communication gateway into the RS485 network and communication with various equipment, which is equipped with RS485 communication (e.g. energy meters, bi-stable switches, power monitoring devices, etc.), via TCP MODBUS.

The iHUB-L1-IO is also equipped with pulse input and temperature sensor (Pt1000) input.

Appearance

- 1 Power input and temperature sensor (Pt1000) input (iHUB-L1-IO)
- 2 RS485 communication
- **3 IR communication port** (one on each side)
- 4 DIN-rail fitting
- 5 Reset and factory reset switch
- 6 Multifunctional green LED
- 7 Power supply



Figure 1: Appearance of communication gateway iHUB-L1.

A built-in green LED diode indicates different operation states of the iHUB-L1. A tactile switch is built-in for reset and factory reset of a gateway. Short press resets the gateway, pressing button for more than 5 seconds (LED diode starts blinking fast) will do a factory reset (meaning setting iHUB-L1 to factory settings and turn into access point mode). Connecting terminals are built to be fastened according to EN 60715 standard. The iHUB-L1 interface with corresponding equipment enables setting and reading the instruments.

iHUB-L1 application

The iHUB-L1 can be used in a variety of applications including:

- Single-phase single point metering and control.
- > Three-phase single point metering and control.
- > Connecting different devices via IR communication and RS485 communication.
- > Connecting different devices via Wi-Fi (e.g. Pt1000 temperature sensor).
- Monitoring single or multiple devices.

SINGLE-PHASE SINGLE POINT METERING AND CONTROL



Figure 2: Connection diagram for iHUB-L1. It is connected to an energy meter (on the left side of the iHUB-L1) and to latching switch (on the right side of the iHUB-L1) by IR communication. It is possible to read and control data with the computer or mobile phone.



THREE-PHASE MULTI POINT METERING AND CONTROL

Figure 3: Connection diagram for iHUB-L1 for connection to three-phase energy meter. It is connected to an energy meter (on the left side of the iHUB-L1); to one latching switch (on the right side of the iHUB-L1) by IR communication and to two latching switches by RS485 communication. It is possible to read and control data with the computer or mobile phone.

Main features

- AC mains power supply.
- Nominal supply voltage (U_n) from 85 V to 265 V.
- Voltage operating range: 20% to + 15%.
- Nominal frequencies 50 Hz and 60 Hz.
- Multifunctional front green LED.
- RS485 serial communication.
- IR serial communication (2 ports).
- Wi-Fi communication.
- 1-DIN rail width mounting communication gateway according to EN 60715.

CONNECTION

This chapter deals with the instructions for iHUB-L1 connection. Both the use and connection of the device includes handling with dangerous currents and voltages. Connection shall, therefore, be performed ONLY a by a qualified person using an appropriate equipment. ISKRA, d.d. does not take any responsibility regarding the use and connection. If any doubt occurs regarding connection and use in the system which device is intended for, please contact a person who is responsible for such installations.

In this chapter you will find:

MOUNTING ELECTRICAL CONNECTION 7

8

Mounting

The iHUB-L1 is intended only for DIN-rail mounting. It should be mounted on a DIN-rail between an energy meter and latching switch.

WARNING





Figure 4: Dimensional drawing of iHUB-L1

Electrical connection

WARNING

Installation must be carried out and inspected by a specialist or under his supervision. Wrong or incomplete connection of voltage or other terminals can cause non-operation or damage to the device.

The iHUB-L1 should be connected to power supply voltage. Two IR communication ports are assembled into the gateway, one on each side. The left one communicates with energy meter, the right one is meant to connect to latching switch. The latching switch can be turned on/off by energy meter with set limit values or by user via Wi-Fi network using dedicated software (e.g. MiQen software).



Figure 5: IR and RS485 connection of iHUB-L1

Additionally, two devices (e.g. energy meters, bistable switches, power monitoring devices, etc.) can be connected to the gateway via RS485 communication.

Up to 2 devices can be connected to the RS485 network allowing the iHUB-L1 to manage 4 devices altogether (1 energy meter and 1 latching switch via IR MODBUS communication, additionally managing 2 devices via RS485 communication).

PLEASE NOTE

For proper operation of the IR communication, avoid a powerful external source of light.

Communication connection

The complete iHUB-L1 system is assembled with three main units and two optionally units, which are used for communication with outside world:

The power supply unit.

iHUB-L1 is supplied from AC power mains with nominal voltage 230 V. An isolated SMPS power supply is used to supply main MCU as well as Wi-Fi module, communication units and MCU peripherals.

The processing unit (MCU) with IR communication, RS485 communication, LED indicator and Switch for reset/factory reset.

IR communication unit and RS485 unit are connected to MCU via UART interface. Various equipment can be connected to iHUB-L1 communication gateway via IR communication or via RS485 communication. Both IR communication modules using MODBUS protocol.

Wi-Fi module.

Wi-Fi module is equipped on each gateway and enables connection of iHUB-L1 to user's Wi-Fi network using TCP MODBUS protocol. Furthermore, Wi-Fi module communicates with main processing unit via UART interface.

Extension modules of iHUB-L1-IO (pulse input and temperature sensor (Pt1000) input)

iHUB-L1-IO does not have any adjustable elements (e.g. potentiometers), which assures a better long-term stability.

Terminals		
Power supply	N	L
RS485 communication	A	В
Pulse input*	Pulse -	Pulse +
Temperature sensor*	Pt1000	Pt1000
*Only for the iHUR 11 10		

Table 1: Survey of communication connection

Only for the iHUB-L1-IO

PLEASE NOTE

Check labels on the side of the meter to check what modules are built in.

FIRST STEPS

Programming a iHUB-L1is very transparent and user friendly. Numerous settings are organized in groups according to their functionality.

In this chapter you will find basic programming steps:

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IHUB-L1 IP ADDRESS	13
CONFIGURING IHUB-L1 WITH MIQEN CONFIGURATION SW	17
IHUB-L1 IOT	20
SELECTING DEVICE FOR PUBLISHING DATA	20
IHUB-L1 WEB INTERFACE	24

Introduction

Connecting iHUB-L1 is very transparent and user friendly. The flowchart below illustrates the first few steps to more clearly understanding software settings.



Figure 6: Process flowchart

Connecting iHUB-L1 to Wi-Fi Network

After we mounted iHUB-L1 on a DIN-rail and supplied it with AC power (power-up the device), we must connect iHUB-L1 to Wi-Fi network. At first, iHUB-L1 tries to connect to last successfully added Wi-Fi network. If iHUB-L1 cannot connect to Wi-Fi in 60 seconds, it will start configuration procedure. This mode is active for 3 minutes and after that, it cycles to connection mode again.

SETUP iHUB-L1 IN CONFIGURATION MODE



Figure 9:Wi-Fi configuration

Select Wi-Fi network then enter

the password and click on save.

If you have hidden Wi-Fi network, you can manually enter SSID and password. Click on *save* and wait.

PLEASE NOTE

iHUB-L1 will now enter connection mode and connect to the selected Wi-Fi network. You can switch your phone back to your previous Wi-Fi network.

<u> </u>	3.55 K/s	* 🕶 🖌	85% 🔳	11:49
Sign in to 192.168.4.1	network			:
Iskra S-Iski Iskra WIFI1 MCTI MCTI	<u>Guest</u> a Zaposleni 0 EMP17 EMP14		50% 50% 48% 48% 34% 14%	
SSID pass	word	ive		

Scan

Figure 10: Sign in to network

iHUB-L1 IP address

If the previous step is completed, iHUB-L1 will connect to Wi-Fi network. In order to connect to iHUB-L1, you must find its IP address. There are several ways to find it:

- 1. MiQen configuration SW (Browse Ethernet devices)
- 2. Adroid Fling application
- 3. Windows file explorer
- 4. Apple bonjour service

Find IP address with MiQen

MiQen software is a tool for complete programming and monitoring of ISKRA measuring instruments. Remote operation is possible by means of serial (RS485/RS232), USB or TCP/IP communication. A user-friendly interface consists of six segments (Connection, Settings, Measurements, Analysis, My devices, and Upgrades). These segments are easily accessed by means of six icons on the left side.

The latest version of MiQen software can be downloaded from ISKRA d.d. website <u>https://www.iskra.eu/</u>.

PLEASE NOTE

MiQen has a very intuitive help system. All functions and settings are described in Info window on the bottom of MiQen window. In MiQen Help file, detailed instructions about software usage, connection, and communication with a different type of devices, driver installation, etc. are described.

MiQen has a functionality to search for network devices. Your PC must be connected to the same network as iHUB-L1! All settings can be programmed using MiQen software.

🚮 MiQen 2.1 -	Setting Studio		- 🗆 X
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📫 🚔 📂 -	b u l: 4 l. 10 🗞 🗖 🗞 👘		
🍓 Refresh	Address: 34 🛄 HUB-L1	→ Go to: ▼ Device #34, IP Address: 172.2	4.120.41, Port: 10001, Modbus TCP 🔹
9	😼 Connection		
Connection	Selected device	Communication port	Searching
	Type: iHUB-L1, Soft. Ver.: 0.41	Port 172.24.120.41	
(3)	Serial number: IHL00041	Setting: 10001	Scan the network
Settings	Add to My devices	Change settings	🔯 Browse ethernet devices
(Measurement:			
Analysis			
My Devices			
Upgrades			

Figure 11: MiQen programming and monitoring software

Start MiQen application and click on Browse ethernet devices.

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🍓 Refresh	Address: 34 🛗 iHUB-L1	→ Go to: ▼ Device #34, IP Address: 172.	24.120.41, Port: 10001, Modbus TCP 🔹
Connection	Selected device	Communication port	Searching
Settings	Type: iHUB-L1, Soft Ver.: 0.41 Serial number: IHL00041	Port: 172.24.120.41 Setting: 10001	Scan the network
	Ndd to My devices	Change settings	Rowse ethernet devices

Figure 12: Browse ethernet devices selection

MiQen scans Wi-Fi network and displays results. You get a list of all detected devices on your network. You can double click on your device and MiQen will establish a connection with it.



PLEASE NOTE

If you can not see your device, click on Browse Ethernet devices again.

Find IP using Fing application on Android

If you are using Android smartphone, you can use Fing application from Google Play Store. Your smartphone must be connected to same Wi-Fi network as iHUB-L1.

Start Fing application and find the iHUB-L1.	📣 0.03 K/s 🗱 🐨 🚄 🗏 86% 🗋 11:	41
	Fing 💍 🖅	:
	Tsenzor 25/31 Wireless network 5 mins ago V// // // //// 5 mins ago	>
	Generic Espressif 172:24.120.28 60:01:94:23:B3:4A	>
	Generic Espressif 172.24.120.31 60:01:94:23:88:6E	>
	Generic Espressif 172.24.120.33 A0:20:A6:27:85:FC	>
	WTS00119 Espressif 172.24.120.34 A0:20:A6:27:97:C2	>
	OnePlus OnePlus3T OnePlus 172.24.120.35 OnePlus3T	1
	HL00002 Espressif 172.24.120.36 A0:20:A6:27:85:CB	>
Figure 14: iHUB-L1 name in Fling application	Devices My Networks Tools Fingbox	x

Figure 14 applicatio

Find IP using Apple Bonjour

If you have installed Apple Bonjour, than you can find IP address by using iHUB's serial number. In WEB browser's address bar type: <u>http://IHL00002.local</u> where IHL000002 is serial number.

Find IP using Windows file manager

You can find iHUB's IP address also with file explorer in windows. PC must be connected to the same network as iHUB-L1. Open explorer and click on *Network*. If you get prompt that network discovery is disabled, enable it.

Windows will give a list of all network devices. iHUB-L1 device name is starting with IHL. Double click on *IHLxxxxxx* and iHUB's WEB page will open. There you can see its IP address.



Figure 15: iHUB-L1 name in Windows file manager

Configuring iHUB-L1 with MiQen configuration SW

Start the MiQen application and then click on Change settings under Communication port. There are two ways to connect MiQen to iHUB-L1, via Wi-Fi or via the RS485 connection.



Figure 16: Change settings selection

CONNECTING MIQEN TO iHUB-L1 VIA Wi-Fi

For connecting in this mode, we need IP address of iHUB-L1 (see chapter 3.2). Enter iHUB-L1 IP address, IP port (default is 10001) and click OK.

Communication port	×
Serial Ethemet USB IR	LPR Flag
IP Address:	172.24.120.41
IP Port:	10001
Protocol:	Modbus TCP \checkmark
Response timeout (sec):	0
	OK Cancel

Figure 17: Communication port for connecting MiQen to iHUB-L1 via Wi-Fi

Connecting MiQen to iHUB-L1 via RS485

This connection works only is iHUB's RS485 port is configured as a slave (Default setting). If you enable RS485 devices in settings, RS485 on iHUB-L1 becomes master and you ca not use RS485 port for settings.

If you want to connect via RS485, you need to wire your RS485 adapter to iHUB's RS485 port. Set communication port to COM on which you have RS485 adapter. Speed is 115200 bits/s, parity is none and Stop bits is 1.

Click OK.

Figure 18: Communication port for connection MiQen to iHUB-L1 via RS485

Co	mmuni	cation por	t							×
	Serial	Discount	LICD	ID		DD	-			
	Jonar	Ethemet	USB	IN		.FN	гіад			
	<u> </u>					0014	•			
	Co	mmunicatio	n port:			COM	8		\sim	
	Bit	s per secon	id:			1152	00		\sim	
	Pa	arity:				None	•		\sim	
	Da	ata bits:				8			\sim	
	Ste	op bits:				1			\sim	
					Г	Oł	<	Ca	ancel	

Connecting to iHUB-L1

From now on, the procedure is the same, no matter if you connect via Wi-Fi or RS485. Set Address to 34 and click *Refresh*.

WARNING!

It is very important to set address to 34!

If settings are correct, you can see iHUB-L1 under Selected device. Click on *Settings* icon and click *Read settings*.



Figure 19: Set Address to 34

🖙 MiQen 2.1 - Setting Studio	-	×
<u>File Tools View Help</u>		
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🍖 Refresh 🛛 Address: 34 🗮 iHUB-L1 🛹	Go to: - Device #34, IP Address: 172.24.120.36, Port: 10001, Modbus TCP	-
Connection Settings What do you want to do? Read settings		

Figure 20: Read settings selection

MiQen will download settings and you can check and set settings.

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3.	General	Tune		
Connection		Serial Number	IH 0002	
	🔋 IR Devices	Software version	0 17	
	RS485 Devices	Software version WiFi	0.15	
100		Software version WiFi (File system)	0.02	
settings		Hardware version	A	
		MAC Address	A0-20-A6-27-85-CB	
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🍓 Refresh	Address: 34 🗮 iHUB-L1	🔿 Go to: ▼ Device #34, IP Address: 172.2	24.120.36, Port: 10001, Modbus TCP -	
-	🐨 Settings iHUB-L1, Serial number: IHL00002, Read at 11:52:19			
	⊡ 📰 iHUB-L1	Setting	Value	
Connection	Connection General	Description	Description	
		Location	Location	
- 0.0	RS485 Devices	Time zone	(GMT) Greenwich Mean Time (London)	
(3)		Time Synchronization source	No synchronization	



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	RS485 Devices	WiFi Network		
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ettings		Password	mer2senzor_temp33	
		MQTT Server		
_		MQTT Enabled	No	
		MQTT Hostname		
surements		MQTT Port	1883	
		MQTT Usemame		
		MQTT Password		
100		MQTT Topic		
4/1		MQTT Publish interval [s]	600	
nalysis		Time Synchronization		
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Figure 21: MiQen settings

WARNING

If MiQen is connected to iHUB-L1 via RS485, it will lose connection if you change Device Type from not connected to any other type.

iHUB-L1 IoT

The iHUB-L1 can be used to publish one device's measurements to MQTT broker or serve data via TCP REST API. The data format in both cases is JSON.

Selecting device for publishing data

If more than one device is connected to iHUB-L1, there is a priority list for publishing IoT data.

1st priority: left IR device

2nd priority: RS485 Device 1

3rd priority: RS485 Device 2

Measurements data format

```
{
"model":"MC666 Analyzer ",
"measurements":
{
"frequency":"50.032 Hz",
"U1":"221.92 V",
"U2":"228.95 V",
"U3":"228.56 V",
"I1":"0.548 A",
"I2":"0.718 A",
"I3":"0.144 A",
"P0":"213.5 W",
"P1":"63.9 W",
"P2":"127.92 W",
"P3":"21.67 W",
"Q0":"-25.42 var",
"Q1":"-103.7 var",
"Q2":"103.19 var",
"Q3":"-24.92 var",
"S0":"319.19 VA",
"S1":"121.78 VA",
"S2":"164.36 VA",
"S3":"33.0 VA",
"PF0":"0.6689 Cap",
"PF1":"0.5247 Cap",
"PF2":"0.7783 Ind",
"PF3":"0.6568 Cap",
"PA0":"-6.79",
"PA1":"-47.18",
"PA2":"37.93",
"PA3":"41.62",
"tariff":"1"
},
"timestamp":"1539260709",
"local_time":"11.10.2018 12:25:09"}
```

Energy counters data format

```
{
"model":"MC666 Analyzer ",
"measurements":
{
"counter1":"51550.4 kWh",
"counter2":"73835.1 kWh",
"counter3":"125385 kWh",
"counter4":"590.39 kWh"},
"settings":
{
"phase1":"Total",
"phase2":"Total",
"phase3":"Total",
"phase4":"Phase3",
"tariff1":"1",
"tariff2":"2",
"tariff3":"1,2",
"tariff4":"1,2"
},
"timestamp":"1539260946",
"local_time":"11.10.2018 12:29:06"
}
```

IoT use cases

You can use iHUB-L1 to connect energy meter with RS485 communication to home automation SW like "Home assistant".

					20.19 Sun Dnevna 6	8.44 21.60 C C C C C C C C C C C C C C C C C C C	15.87 Zunaj	
Reg	ulacija		мсе	566		Wea	ather	
0	Regulacija	Off	ø	P total	101.7 W	8	Temperature	15.4 °C
0	Gorilec	Off	٥	P1	63.82 W	۵	Relative Humidity	49 %
. .	Regulation 21.5 15 minut		0	P2	15.27 W	٢	Pressure	1011 mb
			0	P3	22.65 W	7	Friday	Showers and thundershowers likely. High
WTS	\$100		o	U1	220.7 V			near 20C. Winds N at 10 to 15 km/h. Chance of rain
8	Zunaj t	15.4 °C	٥	U2	220.7 V			100%. Locally heavy rainfall possible.
o	Zunaj v	83 %	o	U3	229.7 V	÷	Friday Night	Cloudy with periods of rain. Thunder possible. Low 11C.
o	Zunaj p	1012 kPa	٥	Counter T1	50791 kWh			Winds light and variable. Chance of rain 90%.
o	Zunaj batt	94 %	٥	Counter T2	72648 kWh	7	Saturday	Showers and thunderstorms. Warm. High
ø	Zunaj Time	2018-05-04 07:23:25	0	Tariff	1)		23C. Winds NNE at 10 to 15 km/h. Chance of rain 90%.
8	Racunalnica T	23.1 °C				÷	Saturday Night	Showers in the evening, then partly cloudy
0	Racunalnica V	57 %						overnight. Low near 10C. Winds light and variable. Chance of rain 50%.



MC666 is energy meter, Home assistant is configured to read active powers and voltages.

iHUB-L1 WEB interface

The iHUB-L1 WEB interface is intended to display statuses, settings, measuring data and provide an interface for SW upgrade.

Pages for measuring data displays results of the highest priority connected device (if you have more than one device connected).

Status page

Status provides basic device status and settings.

e Iskra	iHUB S	STATUS
iHUB status	General	
	Device Type	iHUB-L1
iHUB Settings	Serial number	IHL00013
DO 105 Davidada	- Description	IHUB-Lite-V1
RS485 Devices	Location	
Counters	WiFi SSID	
	IP address	192.168.1.83
Measurements	MAC address	A0:20:A6:27:85:F3
Power Graph	Wifi Signal Level	-78 dBm
	WiFi uptime	0d 00:33
Max. Demands	CPU Status	
	IHUB Modbus Address	s #34
Device Settings	SPI Flash	S25FL064L
	CPU Uptime	8d 22:45
Bicom control	Version Info	
Upgrade	WiFi SW Version	0.40
opgrade	CPU SW Version	0.40
	Filesystem Version	17
	Bootloader Version	7
	HW Version	Α
	Detected Devices	
	Left IR Device	#
	Right IR Device	
	RS 485 Device 1	MC666 Analyzer #35
	RS 485 Device 2	#
	Bicoms	
	IR Bicom State	N/A
	RS485 1 Bicom State	N/A
	RS485 2 Bicom State	N/A
	Other	
	Temperature	°C
	Digital Input State	OFF
	Time	5.10.2018 14:38:48

Figure 23: ISKRA iHUB status screen

iHUB Settings

iHUB Settings segment consists of General, Communication, IR Devices, and RS485 Devices section. General section is intended for general settings and time settings. Communication section sets iHUB-L1 communication and MQTT settings. IR Devices section is intended for IR relay and IR counter settings. RS485 Devices sets settings of RS485 communication.



Figure 24: iHUB Settings screen, a) General section, b) Communication, c) IR Devices, d) RS485 Devices

RS 485 Device 1 Modbus Address:

RS 485 Device 2 Modbus Address:

Bistable Switch 1 Description: RC4851Bcom RS 485 Device 2 Type: Not Connected Other Modbus Device Chergy Meter Bistable Switch PO Meter

35

RS485 Devices

RS485 Devices segment displays connected devices to the RS485 bus. For the first time, you need to click on Scan RS485 Bus button. Finding connected devices will take around one minute.

e Iskra	RS485 Devices
iHUB status	No. Model Serial Number RS485 Parameters 1 MC666 Analyzer MC009864 #35,115200,8,N,1
iHUB Settings	2 #
DC495 Devices	3 #
R5465 Devices	4 #
Counters	
Measurements	Scan RS485 Bus

Figure 25: RS485 Devices screen

Counters

Counters page displays energy counter values.

e Iskra	C	DUNTERS
IHUB status	Device type	MC666 Analyzer
iHUB Settings	Counters Counter 1 - Total	Counter Value
RS485 Devices	Tariff:1 Direction:	51540.8 kWh
Counters	Counter 2 - Total Tariff:2 Direction:	73827.1 kWh
Measurements	Counter 3 - Total	105267 LWL
Power Graph	Tariff:1,2 Direction:	125507 KWN
Max. Demands	- Counter 4 - Phase 3 Tariff:1,2 Direction:	[°] 585.53 kWh

Figure26: COUNTERS screen

Measurements

Measurements page displays basic measuring data from one connected device.

BISKRA MEASUREMENTS	MEASUREMENTS		
iHUB status Device type MC666 Anal	yzer		
Phase 1 Value iHUB Settings U1 220.59 V			
RS485 Devices Real Power 79.33 W			
Counters Reactive Power -108.31 var Apparent Power 134.24 VA	r		
Measurements Power Factor 0.5909 Cap			
Power Graph Phase 2 Value			
Max. Demands 12 0.413 A			
Device Settings Real Power 92.72 W Reactive Power -15.23 var			
Bicom control Apparent Power 93.97 VA Power Factor 0.9867 Cap			
Upgrade Power Angle -6.37° Dage 3 Value			
U3 228.95 V			
I3 0.4 A			
Real Power 86.36 W			
Reactive Power -30.77 var			
Apparent Power 91.67 VA			
Power Factor 0.9421 Cap			
Power Angle -17.39°			
Total Value			
Total Real Power 258.42 W			
Total Reactive Power -154.32 var	r		
Total Apparent Power 319.94 VA			
Total Power Factor 0.8077 Cap	•		
Total Power Angle -30.85°			
Others Value			
Frequency 49.992 Hz			
Acuve tafim I	6.23		

Figure 27: MEASUREMENTS screen

Power graph

Power graph page displays measurements of energy per time (last 24 hours).



Figure 28: Power graph screen

Maximum demand

Maximum demands are displayed only for a device, which supports this measurement (PQ meters). If energy meter is connected, results will be undefined.

lskra	MAXIMUM DEMANDS				
iHUB status	Device type	MC666 Analyzer			
iHUB Settings	I1	0.608 A			
RS485 Devices	I2 I3	0.488 A 0.398 A			
Counters	Active Power Total+ Active Power Total-	270.92 W 0.0 W			
Measurements	ReActive Power Total L	0.0 var			
Power Graph	ReActive Power Total C Apparent Power	139.67 var 335.91 VA			
Max. Demands	Reset Demand I1	Value 20.318 A	Time MD 15.4.2018 12:19		
Device Settings	12 13	21.231 A 16.491 A	8.9.2018 11:54 15.4.2018 14:12		
Bicom control	Active Power Total+	8883.7 W	15.4.2018 12:32 14 4 2018 8:28		
Upgrade	ReActive Power Total L	744.48 var	10.6.2018 19:35		
	ReActive Power Total C	457.62 var	18.4.2018 16:52		
	Time into period	00000000000000000000000000000000000000	15.4.2018 12:32		
	Time	9 10 2018 14:28:58			

Figure 29: MAXIMUM DEMANDS screen

Device Settings

Settings page also contains value from connected device.

B Iskra	DEVICE SETTINGS			
iHUB status	Device type	MC666 Analyzer		
iHUB Settings	Setting Serial number	Value MC009864		
RS485 Devices	Description Location	MC666		
Counters	Software version	1.26		
Measurements	Hardware version	b		
Power Graph	Accuracy class Calibration Voltage	0 500 V		
Max. Demands	Calibration Current	25 A No communication		
Device Settings	Input / Output 1	-		
Bicom control	Input / Output 2 Time	9.10.2018 14:37:41		

Figure 30: SETTINGS screen

Bicom control

There are three bicom controls on web page. Every Bicom has ON, OFF and Toggle button.



Figure 31: BICOM CONTROL screen

Upgrade

There are two upgrades available on WEB page.

Choose File No file chosen	Update Application
Choose File No file chosen	Update Filesystem

Figure 32: Available upgrades

Top 2 buttons are intended for Wi-Fi application upgrade, while bottom buttons are used for file system upgrade. In both cases, you need to click on Choose File to select upgrade file and then click the right button to start to upgrade.

TECHNICAL DATA

In following chapter all technical data regarding operation of a three-phase electrical energy meter is presented.

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Mechanical characteristics of input

Rail mounting according DIN EN 60715.

Terminals		Max. conductor cross-sections
Main inputs	Contacts capacity:	$0.5 \ mm^2 \dots 3 \ mm^2$
	Connection screws:	МЗ
	Max torque:	0.5 Nm
	Length of removed isolation:	6 mm
RS485 module	Contacts capacity:	$0.5 \ mm^2 \dots 3 \ mm^2$
	Connection screws:	М3
	Max torque:	0.5 Nm
	Length of removed isolation:	6 mm

Power Supply input

Nominal voltage U _n :	From 85 V to 230 V (+15 % - 20%)
Power consumption:	< 3 W
Nominal frequency fn:	50 Hz and 60 Hz
Length of removed isolation:	6 mm

LED

Colour:	green
LED on:	connected
LED blinking slow:	1 /s
LED blinking fast:	10 /s

Wi-Fi

Protocol:	802.11 b/g/n
Frequency range:	2.4 GHz – 2.5 GHz (2400 M – 2483.5 M)
Security:	WPA/WPA2
Encryption:	WEP/TKIP/AES

RS485 Serial communication

Туре:	RS485
Speed:	1200 bit/s to 115200 bit/s (default 115200 bit/s)
Frame:	8, N, 2
Protocol:	MODBUS RTU
Address:	34 (default)

Pulse input (optional)

Subject to safe and correct installation, the equipment will interface to any meter (gas, water or electricity) having a suitable pulse output such as:

- a volt-free contact,
- Reed relay,
- open collector (drain) when connecting the correct polarity should be observed.

Output voltage U _o :	3.3 V (when no pulse output connected to pulse input connection of
	iHUB-L1)

Temperature sensor (Pt1000) input

Measuring method:	two wire connection
Input range with programmable ratings:	
RTD sensors limit values:	200 Ω - 10 kΩ
Measuring voltage:	≤ 3.3 V
Minimum temperature range:	100 K
Minimum differential resistance:	400 Ω (1000 Ω -> 1400 Ω)
Lead resistance:	< 10 Ω per lead
Consumption:	< 0.5 VA

Safety and ambient conditions

According to standards for IEC 60950.

Temperature and climatic condition according to EN 62052-11.

Dust/water protection:	IP50
Operating temperature:	-25 °C - +55 °C
Storage temperature:	-40 °C - + 70 °C
Enclosure:	self extinguish, complying UL94-V

EC DIRECTIVES CONFORMITY

EU Directive on Measuring Instruments 2014/32/EU

EU Directive on EMC 2014/30/EU

EU Directive on Low Voltage 2014/35/EU

EU Directive WEEE 2002/96/EC

EU RED Directive 2014/53/EU

Dimensions

Dimensional drawing



ABBREVIATION/GLOSSARY

Abbreviations are explained within the text where they appear the first time. Most common abbreviations and expressions are explained in the following table:

Term	Explanation
Ethernet	IEEE 802.3 data layer protocol
MODBUS / DNP3	Industrial protocol for data transmission
MiQen	Setting Software for ISKRA instruments
PI	Pulse input module
AC	Alternating quantity
IR	Infrared (optical) communication
Pt1000	Temperature sensor
PQ	Power Quality

List of common abbreviations and expressions



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PE Galvanotehnika Glinek 5 SI-1291 , Škofljica Phone: +386 1 366 80 50

Iskra Tela L, d.o.o. Omladinska 66 78250 . Laktaši Phone: +387 51 535 890

PE Kondenzatorji Vaidova ulica 71 SI-8333 , Semič Phone: +386 7 38 49 200

> Iskra IP, d.o.o. Metliška cesta 8 SI-8333, Semič Phone: +386 7 384 94 54

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