LoRa2ModBus

Version 1.0.2

User Manual

www.vega-absolute.ru

Contents

LoRa2ModBUS Description

Vega LoRa2ModBus application is designed to convert data received from end devices over the LoRaWAN network into a map of ModBus registers view with the ability to read them using the standard ModBus TCP protocol.

With Vega LoRa2ModBus application the user connects to the IOT Vega Server entering a login and a password into special field. After successfully connection to the server the application displays the data of early connected devices as a ModBUS register. Also, the application allows to connect new devices which already were on the server, delete and edit early connected devices. All those changes are local and does not affect the server data.

Every device connects through its own TCP port and has its own map of ModBus registers.

Thus, data from the end device can be read by any external program using the ModBus TCP protocol in transparent mode, which allows the use of the LoRaWAN end devices in automated process control systems such as SCADA.

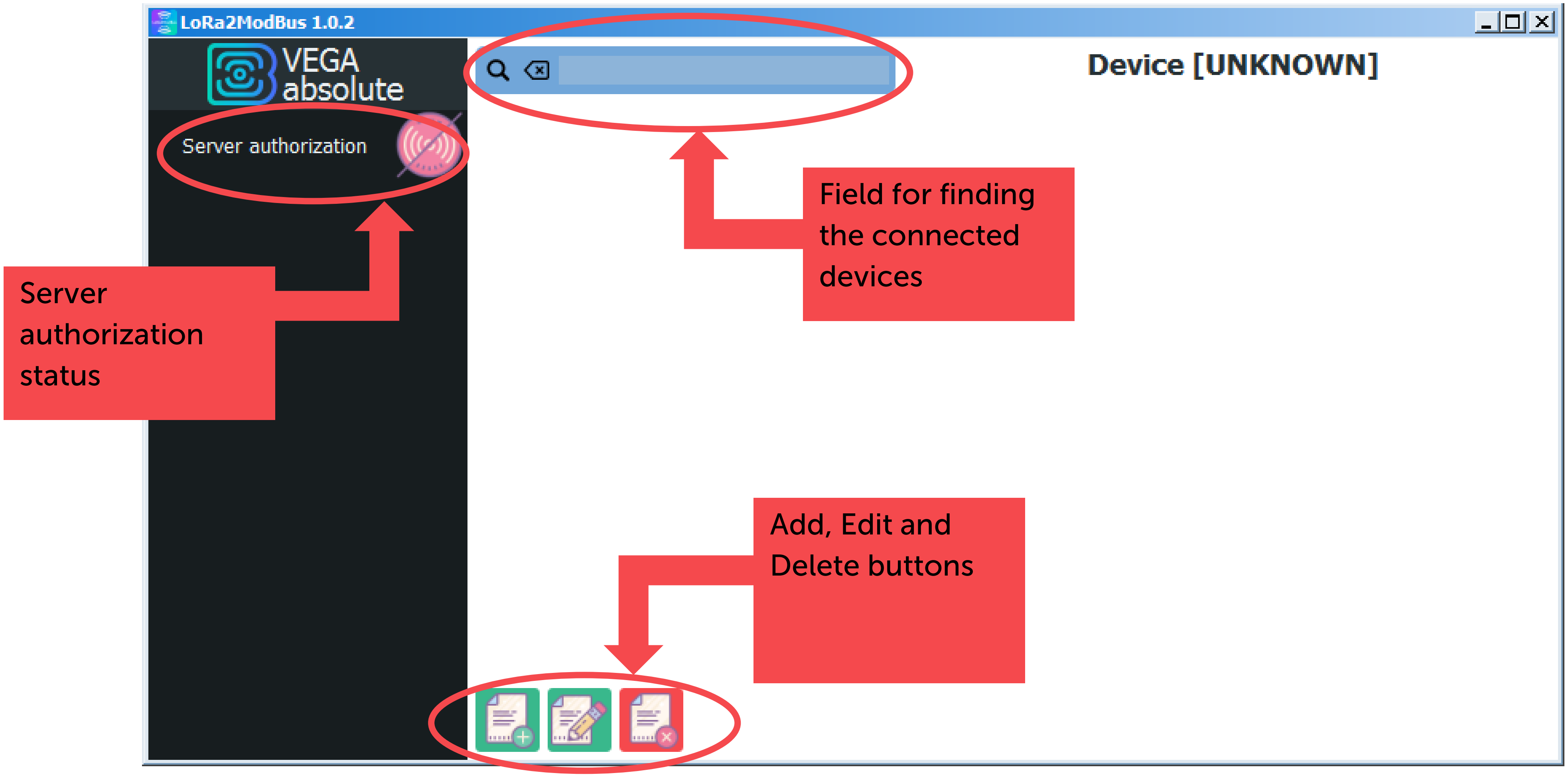
The program does not require installation and is ready to work just after launch.

Abilities

- Does not require installation
- Supporting the end devices:
    - SI-11
    - SI -12
    - SI -13
    - SI -21
    - M-BUS-1
    - TD-11
    - TP-11
    - Smart-MC0101
- Compatible with **IOT Vega Server**
- Transparent change with devices through ModBus TCP protocol
- Access to the server by login and password
- Flexible configuration of the parameters displaying of the connected devices
- Online data update from each device
- Ability to connect a few devices on the same TCP port with a shift in the register map

Interface and work beginning

When the program starts, a window appears with the following interface elements.



Server authorization status

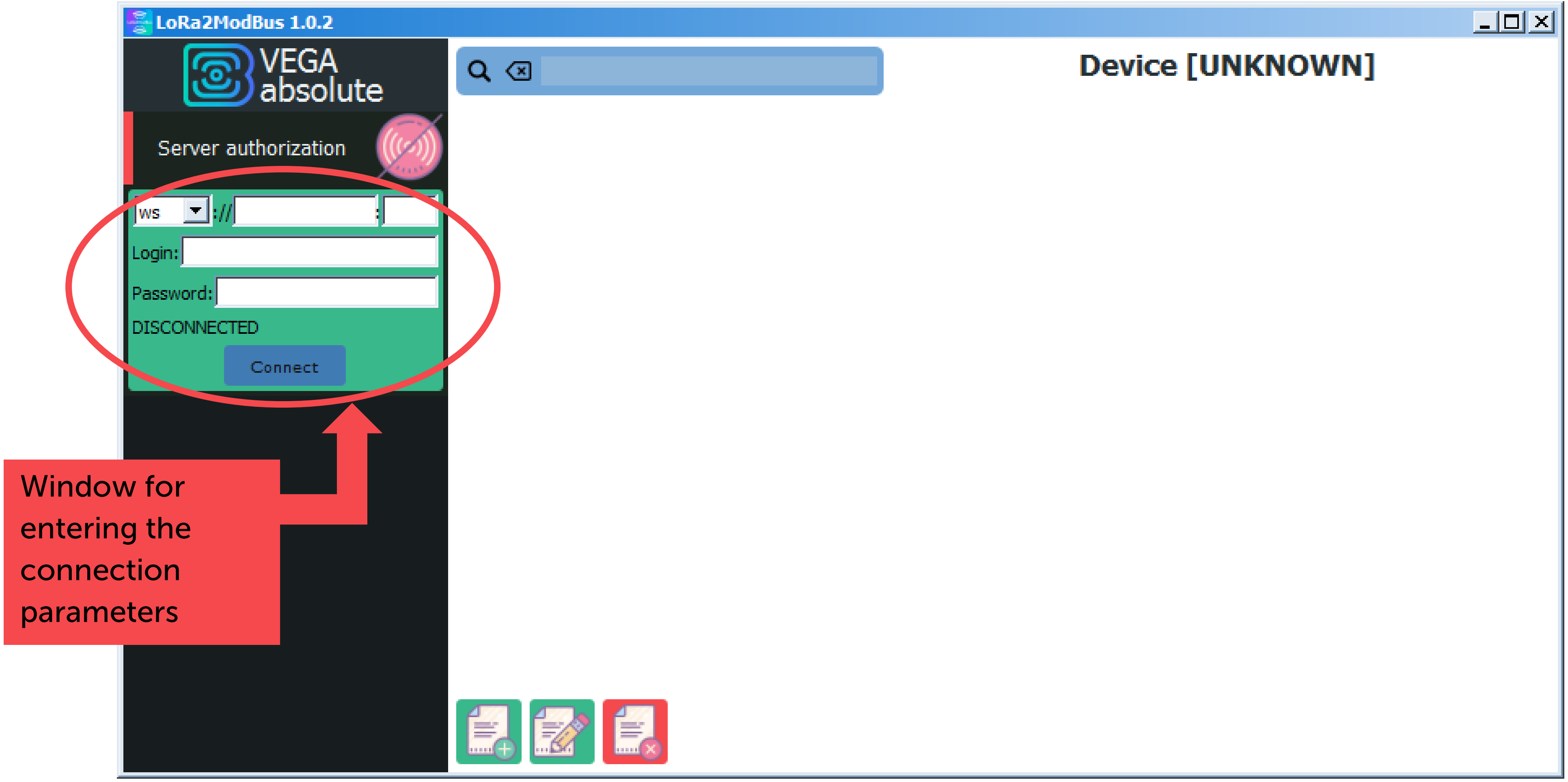
Field for finding the connected devices

Add, Edit and Delete buttons

The authorization status on the server is indicated by the radio signal icon. Icon may be green or red.

🟢 - means that connection to the server is successful.

🔴 - means that there is no connection with the server.



To connect to the server, you need:

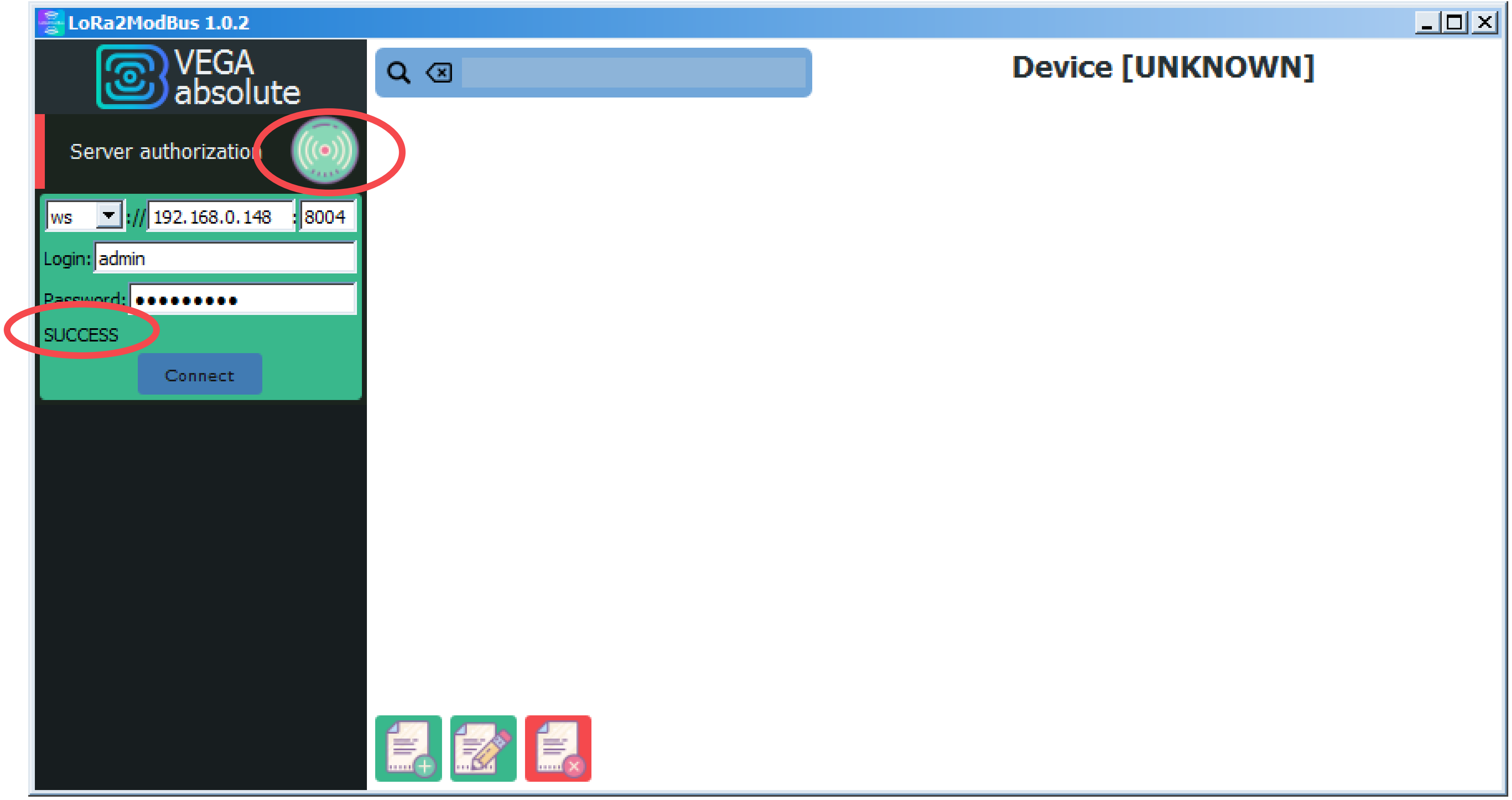
- to expand the window for entering the connection parameters;
- to enter **IOT Vega Server** address, port number, and a user login and password. User must have rights for receiving the registered devices list, devices data reading, and he must also receive online messages about data receiving from the devices;
- to press the "Connect" button.

If authorization is successful, the status icon will turn green and **SUCCESS** will appear under the password field. The program will remember the entered parameters and will use them in the future for automatic connection (for example, when you restart the program).

If the authorization data was entered incorrectly, the status **INVALID AUTH** will be displayed.

If the server IP address or port is incorrect, the **DISCONNECTED** status will be displayed.

The **ws/wss** parameter determines whether SSL encryption is used when connecting to the server or not. If your server does not use encryption, then you should connect via **ws**, if it uses - via **wss.**



ws :// 192.168.0.148 : 8004

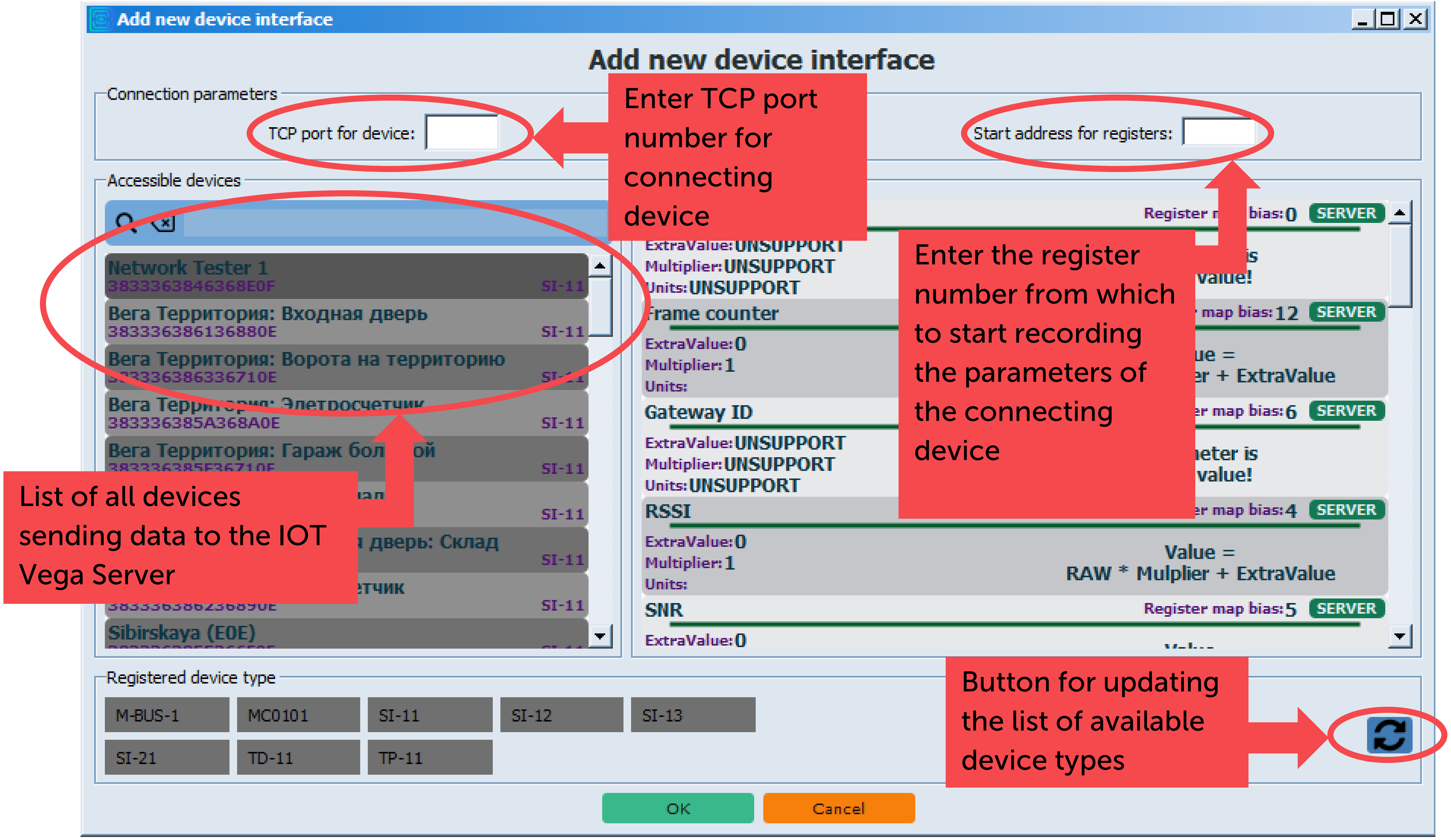
Login: admin

Password: •••••••••

SUCCESS

To add a new device, click «». The window appears with the list of all devices of known types (types corresponds to AppEui which are known by the application) sending data to the **IOT Vega Server**.

Each device type is described by a configuration file in the JSON format, which was compiled by the developers of Vega-Absolute. Changing it may lead to incorrect program operation.



Enter TCP port number for connecting device

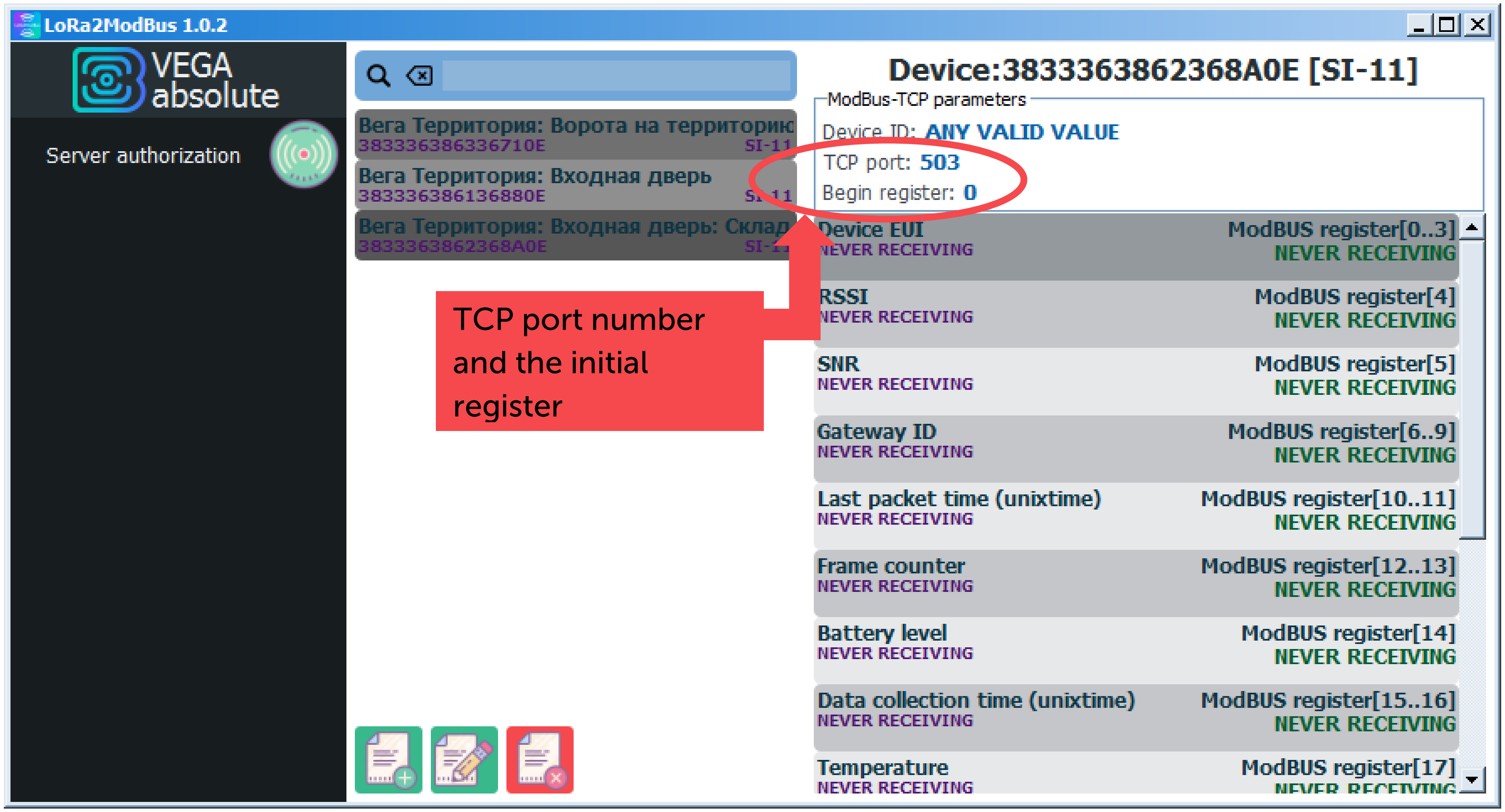
Enter the register number from which to start recording the parameters of the connecting device

List of all devices sending data to the IOT Vega Server

Button for updating the list of available device types

Next, select one of the devices in the left list, enter the port number and serial number of the register, from which the recording of the parameters of the connected device will begin, and click the "OK" button. Device added. Now, on the main screen, devices connected to the **LoRa2ModBus** program are displayed. You can select a device in this list, and a list of parameters of the selected device with the registers, its TCP port number and the initial register number will be displayed in the right field.

Pay attention to the sequence numbers occupied by the register map of a specific device. When two register maps are superimposed on each other, the external application will read the data that was updated last. Thus, you will receive mixed data: once from one device, then from another.



LoRa2ModBus 1.0.2

VEGA absolute

Server authorization

Вега Территория: Ворота на территорию
38333638633671 0E SI-11

Вега Территория: Входная дверь
383336386136880E SI-11

Вега Территория: Входная дверь: Склад
383336386 2368A0E SI-11

Device:383336386 2368A0E [SI-11]

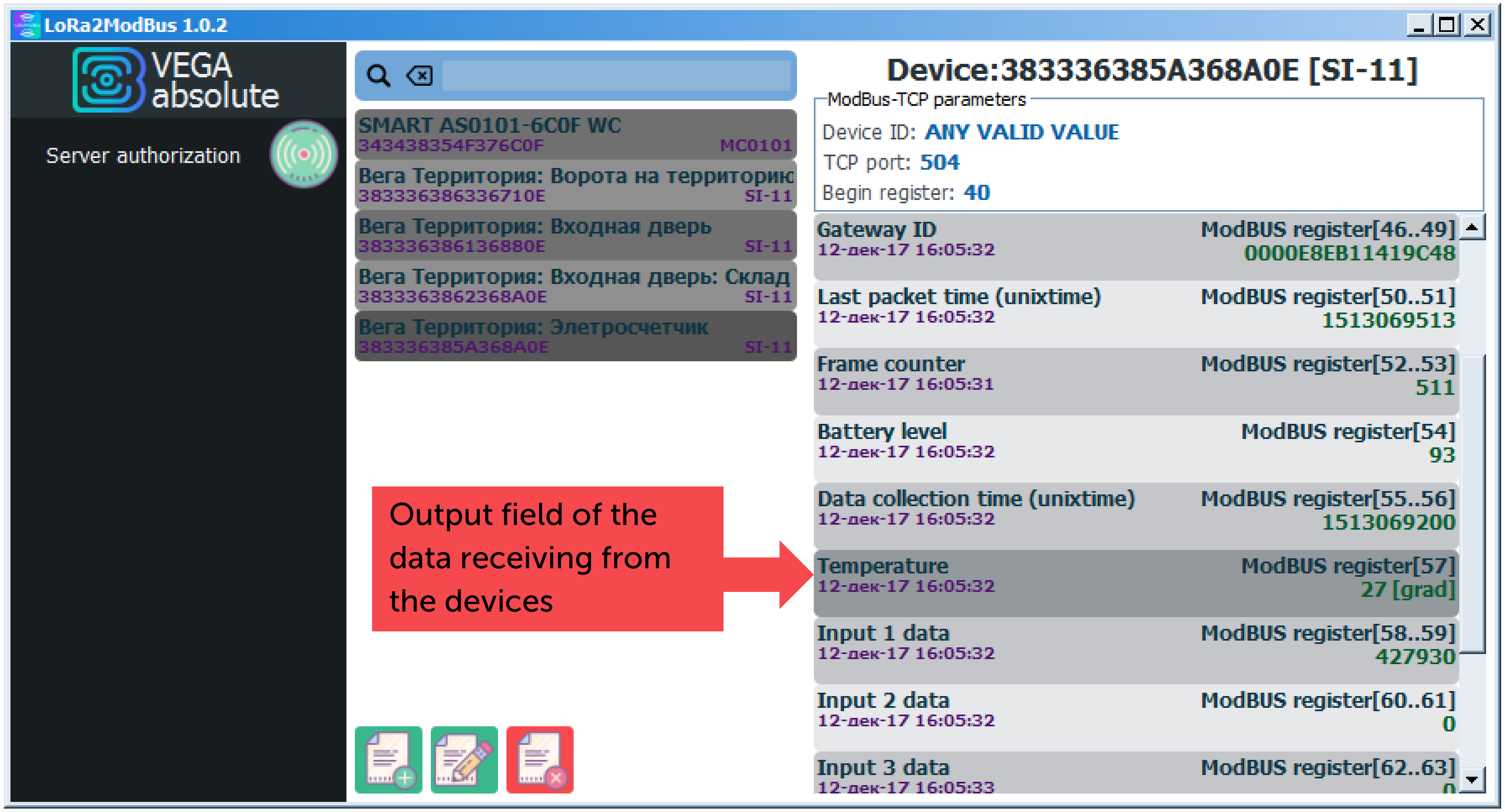
ModBus-TCP parameters

Device ID: ANY VALID VALUE
TCP port: 503
Begin register: 0

Device EUI NEVER RECEIVING	ModBUS register[0..3] NEVER RECEIVING
RSSI NEVER RECEIVING	ModBUS register[4] NEVER RECEIVING
SNR NEVER RECEIVING	ModBUS register[5] NEVER RECEIVING
Gateway ID NEVER RECEIVING	ModBUS register[6..9] NEVER RECEIVING
Last packet time (unixtime) NEVER RECEIVING	ModBUS register[10..11] NEVER RECEIVING
Frame counter NEVER RECEIVING	ModBUS register[12..13] NEVER RECEIVING
Battery level NEVER RECEIVING	ModBUS register[14] NEVER RECEIVING
Data collection time (unixtime) NEVER RECEIVING	ModBUS register[15..16] NEVER RECEIVING
Temperature NEVER RECEIVING	ModBUS register[17] NEVER RECEIVING

TCP port number and the initial register

Let us consider in more detail the output field of data received from the device. If after starting the **LoRa2ModBus** program, data from the device was not transferred to the IOT Vega Server, then instead of the date and value of the parameter, **Never Receiving** is displayed in the information field. As soon as the data arrives at the server, they are immediately updated in the data output field.



LoRa2ModBus 1.0.2

VEGA absolute

Server authorization

SMART AS0101-6C0F WC
343438354F376C0F MC0101

Вега Территория: Ворота на территорию
383336386336710E SI-11

Вега Территория: Входная дверь
383336386136880E SI-11

Вега Территория: Входная дверь: Склад
3833363862368A0E SI-11

Вега Территория: Элетросчетчик
383336385A368A0E SI-11

Device:383336385A368A0E [SI-11]

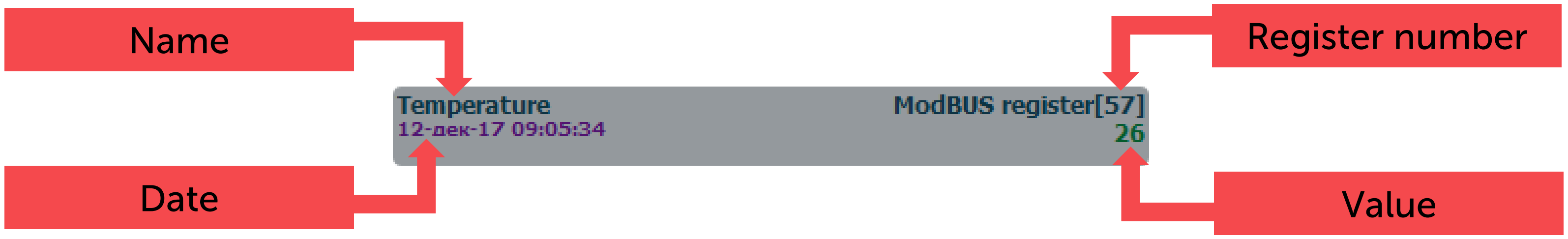
ModBus-TCP parameters
Device ID: ANY VALID VALUE
TCP port: 504
Begin register: 40

```
Gateway ID                              ModBUS register[46..49]
12-дек-17 16:05:32                         0000E8EB11419C48
Last packet time (unixtime)             ModBUS register[50..51]
12-дек-17 16:05:32                               1513069513
Frame counter                           ModBUS register[52..53]
12-дек-17 16:05:31                                      511
Battery level                              ModBUS register[54]
12-дек-17 16:05:32                                       93
Data collection time (unixtime)         ModBUS register[55..56]
12-дек-17 16:05:32                               1513069200
Temperature                                ModBUS register[57]
12-дек-17 16:05:32                                27 [grad]
Input 1 data                            ModBUS register[58..59]
12-дек-17 16:05:32                                   427930
Input 2 data                            ModBUS register[60..61]
12-дек-17 16:05:32                                        0
Input 3 data                            ModBUS register[62..63]
12-дек-17 16:05:33                                        0
```

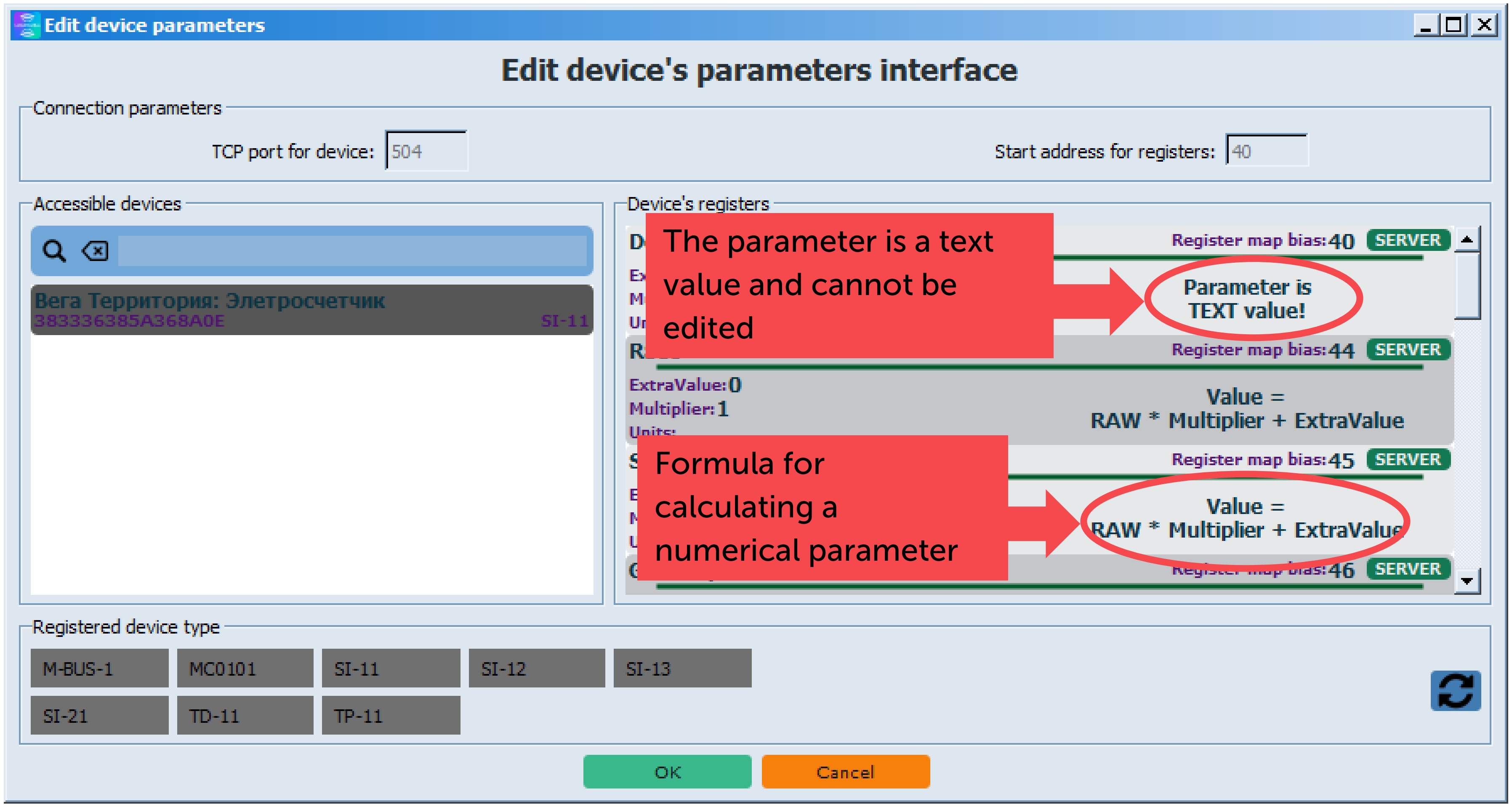
Output field of the data receiving from the devices

So, the following information is displayed in the data output field:

- parameter name (its designation in the configuration file);
- date of the last update of this parameter (day-month-year hours:minutes:seconds);
- sequence numbers of ModBus registers reserved for writing this parameter;
- last parameter value received.



In this field, the data is displayed in the form in which it will be transmitted to an external application operating through the ModBus TCP protocol. To change the data view, click the button of the selected device edit « ». The following window will appear.



Edit device parameters

Edit device's parameters interface

Connection parameters

TCP port for device: 504

Start address for registers: 40

Accessible devices

Вега Территория: Элетросчетчик
383336385A368A0E SI-11

Device's registers

Register map bias:40 SERVER

Parameter is
TEXT value!

Register map bias:44 SERVER

ExtraValue:0
Multiplier:1
Units:

Value =
RAW * Multiplier + ExtraValue

Register map bias:45 SERVER

Value =
RAW * Multiplier + ExtraValue

Register map bias:46 SERVER

Registered device type

M-BUS-1 | MC0101 | SI-11 | SI-12 | SI-13
SI-21 | TD-11 | TP-11

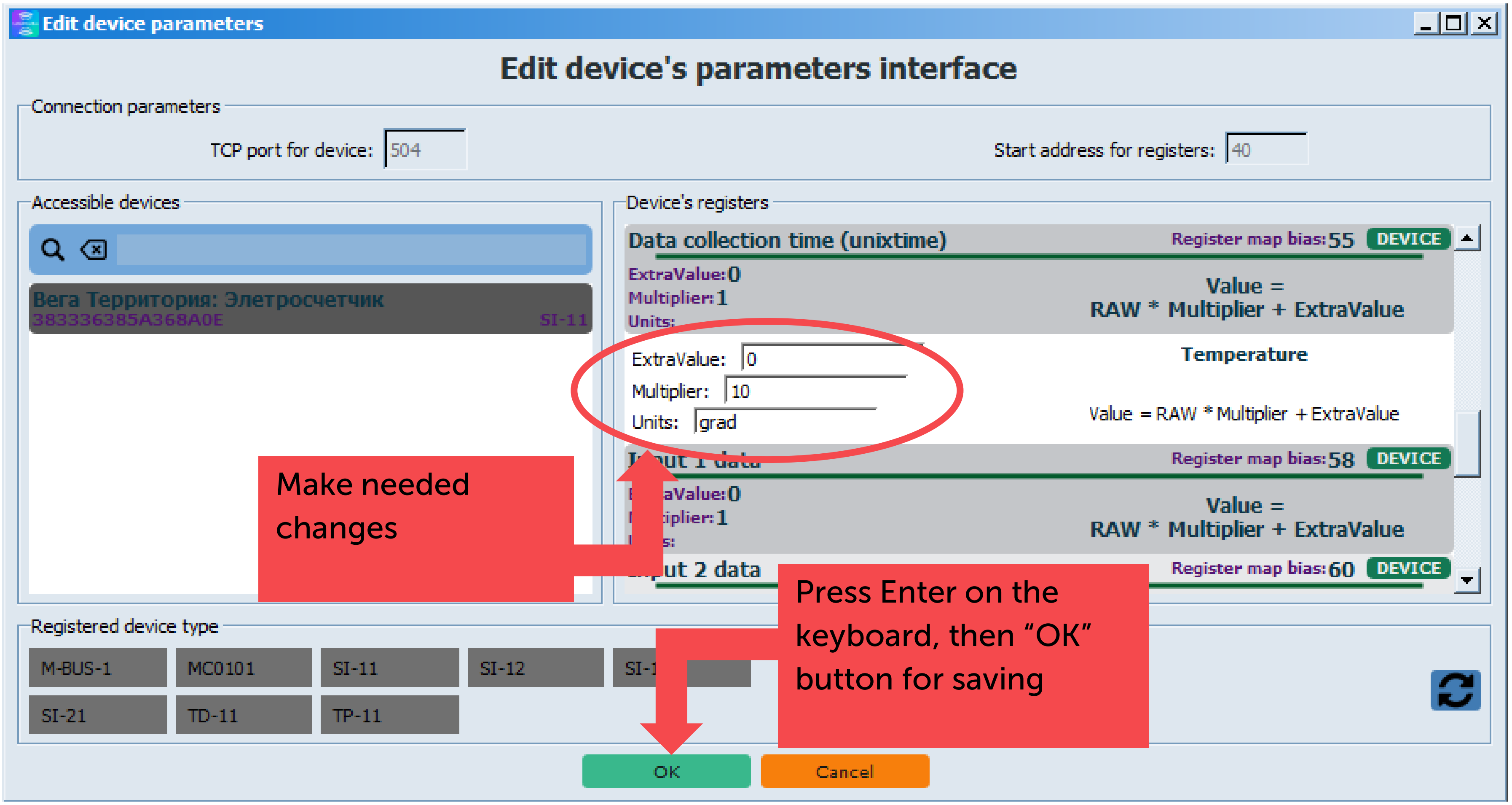
OK | Cancel

The parameter is a text value and cannot be edited

Formula for calculating a numerical parameter

The TCP port number and initial register number are not editable. In the right part of the window there is a list of parameters, some of which are available for editing by double-clicking the mouse. For each parameter, a formula is displayed by which it is calculated, or it is indicated as a text field that is transmitted unchanged.

Consider the example parameter **Temperature**.



Edit device parameters

Edit device's parameters interface

Connection parameters

TCP port for device: 504

Start address for registers: 40

Accessible devices

Вега Территория: Элетросчетчик
383336385A368A0E SI-11

Device's registers

Data collection time (unixtime) Register map bias:55 DEVICE
ExtraValue:0
Multiplier:1
Units:
Value = RAW * Multiplier + ExtraValue

ExtraValue: 0
Multiplier: 10
Units: grad
Temperature
Value = RAW * Multiplier + ExtraValue

Input 1 data Register map bias:58 DEVICE
ExtraValue:0
Multiplier:1
Units:
Value = RAW * Multiplier + ExtraValue

Input 2 data Register map bias:60 DEVICE

Registered device type

M-BUS-1 | MC0101 | SI-11 | SI-12 | SI-1
SI-21 | TD-11 | TP-11

OK Cancel

Make needed changes

Press Enter on the keyboard, then "OK" button for saving

The formula for calculating the parameter is: **Value** = **RAW** * **Multiplier** + **ExtraValue**, where

Value – output value for use by an external application;

RAW – value received from the server;

Multiplier – the multiplier, by default is 1, can take any natural value up to 999999999 inclusive;

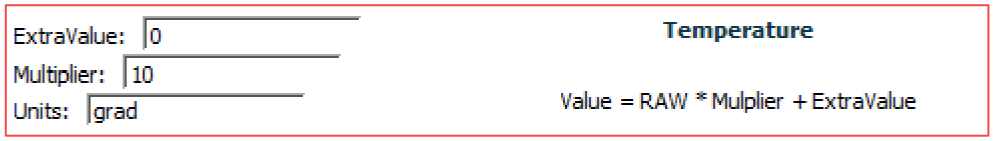
ExtraValue – shift value, the default is 0, can take any natural value up to 999999999 inclusive.

Variable parameters are **Multiplier**, **ExtraValue** and **Units.**

Units – text box for any comments or indication of units.

To apply the changes, press Enter on the keyboard, after which you can proceed to change other parameters or close the editing window by clicking the "OK" button to save all changes. When you click "Cancel", all made changes will be reset.

In our case, the parameters **Multiplier** and **Units** have been changed.



ExtraValue: 0

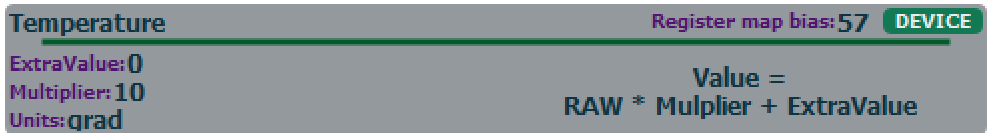
Multiplier: 10

Units: grad

Temperature

Value = RAW * Mulplier + ExtraValue

before pressing Enter on the keyboard



Temperature

Register map bias: 57 DEVICE

ExtraValue: 0

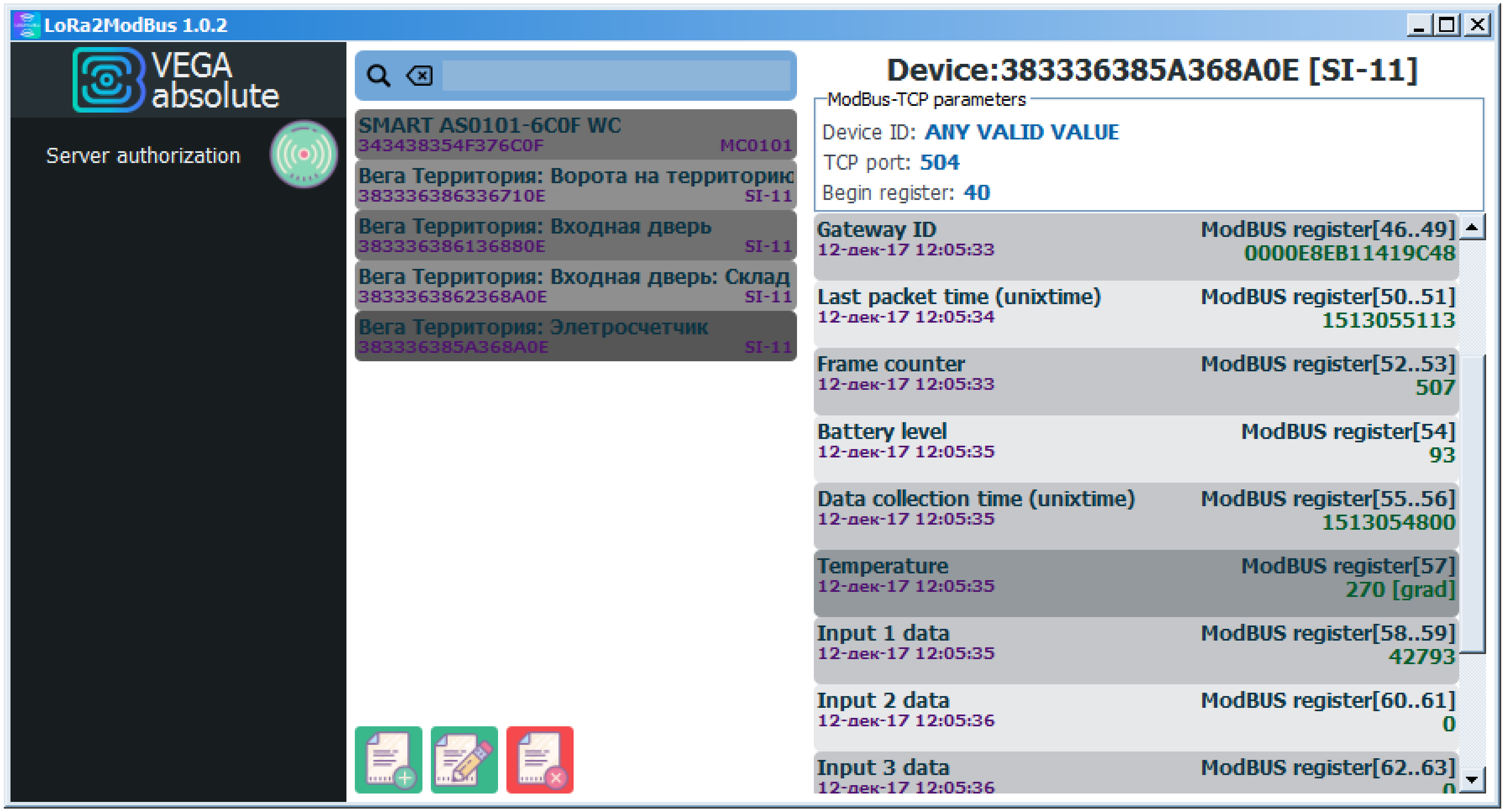
Multiplier: 10

Units: grad

Value = RAW * Mulplier + ExtraValue

after pressing Enter on the keyboard

Now in the main program window in the **Temperature** parameter line the value 270 is displayed with the mark [grad].



SMART AS0101-6C0F WC
343438354F376C0F MC0101

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383336386336710E SI-11

Вега Территория: Входная дверь
383336386136880E SI-11

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3833363862368A0E SI-11

Вега Территория: Элетросчетчик
383336385A368A0E SI-11

Device:383336385A368A0E [SI-11]

ModBus-TCP parameters

Device ID: ANY VALID VALUE

TCP port: 504

Begin register: 40

Gateway ID 12-дек-17 12:05:33	ModBUS register[46..49] 0000E8EB11419C48
Last packet time (unixtime) 12-дек-17 12:05:34	ModBUS register[50..51] 1513055113
Frame counter 12-дек-17 12:05:33	ModBUS register[52..53] 507
Battery level 12-дек-17 12:05:35	ModBUS register[54] 93
Data collection time (unixtime) 12-дек-17 12:05:35	ModBUS register[55..56] 1513054800
Temperature 12-дек-17 12:05:35	ModBUS register[57] 270 [grad]
Input 1 data 12-дек-17 12:05:35	ModBUS register[58..59] 42793
Input 2 data 12-дек-17 12:05:36	ModBUS register[60..61] 0
Input 3 data 12-дек-17 12:05:36	ModBUS register[62..63] 0

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Product Name	Type Number
Software	LoRa2ModBus

Revision History

Revision	Date	Name	Comments
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