CR-801

SFP module with

1-wire interface

User’s manual

Ver. 1.0

26.10.2023

Novosibirsk 2023

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1.THE MODULE ASSIGNMENT

The CR-801 module is designed to connect a 1-wire bus to an Ethernet network. The module is made in SFP format and can be installed in the corresponding slots of switches/routers or servers. On the 1-wire bus side, the product is a 1-wire network controller (1-wire master) and allows the connection of a wide variety of 1-wire sensors and actuators. On the SFP port side, the switch/router must support SGMII mode. Transport of ethernet packets between the module and application software, as well as power supply to the module and the 1-wire bus, is carried out through the mother switch.

The CR-801 module can be used in the following applications:

- ✓ Temperature/humidity measurement/access control in server rooms
- ✓ Home automation
- ✓ Environmental monitoring
- ✓ Access control

2. TECHNICAL CHARACTERISTICS

Form factor	SFP module
Dimensions	67x14x14 mm
SFP port operating mode	SGMII, 100 Mbit/s (*)
1-wire interface	DS2484, with active pull-up
1-wire power	From the mother switch, 3.3V
1-wire socket	RJ45, 8 pins
Galvanic isolation	No
Working temperature	-40..+85°C
Applied software	The OWFS project
Configuration	Web interface, http

* A typical sign that a switch port is compatible with SGMII mode is the ability to work with 100base-T wired Ethernet modules.

3. APPLICATION SCHEME

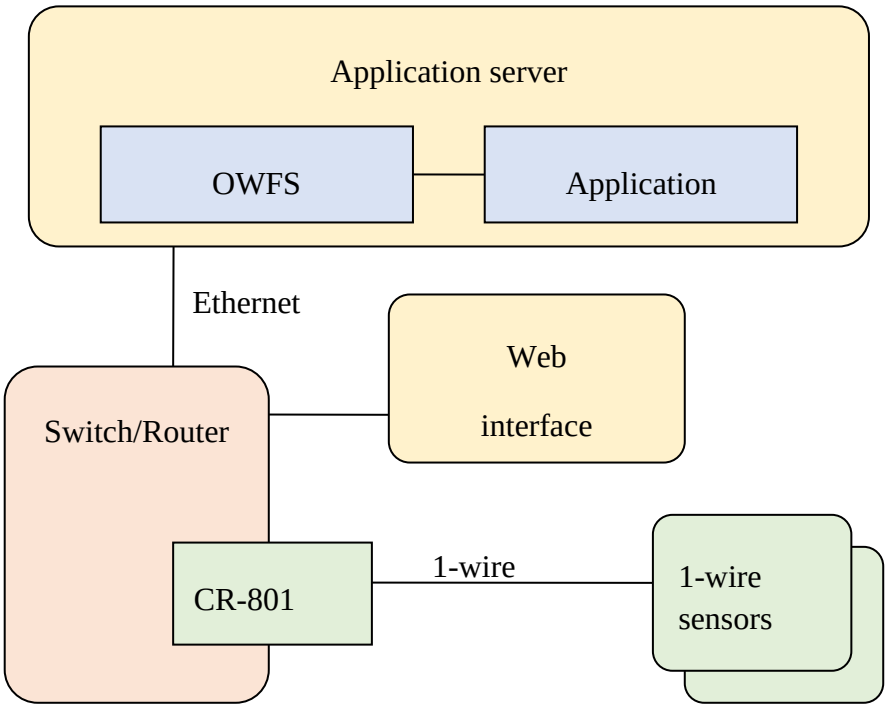
The application diagram is shown in the figure below.

'Application' – application that implements a measurement system using 1-wire sensors.

'Switch/Router' – mother switch with a CR-801 module installed in its SFP slot.

'Web interface' – standard browser with which you can configure the CR-801.

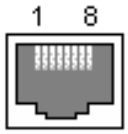
'OWFS' – software package https://owfs.org/ implementing the protocol part of the 1-wire bus.



4. CONNECTION

The CR-801 module is installed in the SFP slot of the switch, supporting SGMII mode. Since the CR-801 for the switch looks like a wired Ethernet SFP module, the slot must support 100base-T modules. This is a sufficient criterion for compatibility.

The 1-wire bus is connected via an external RJ45 connector.



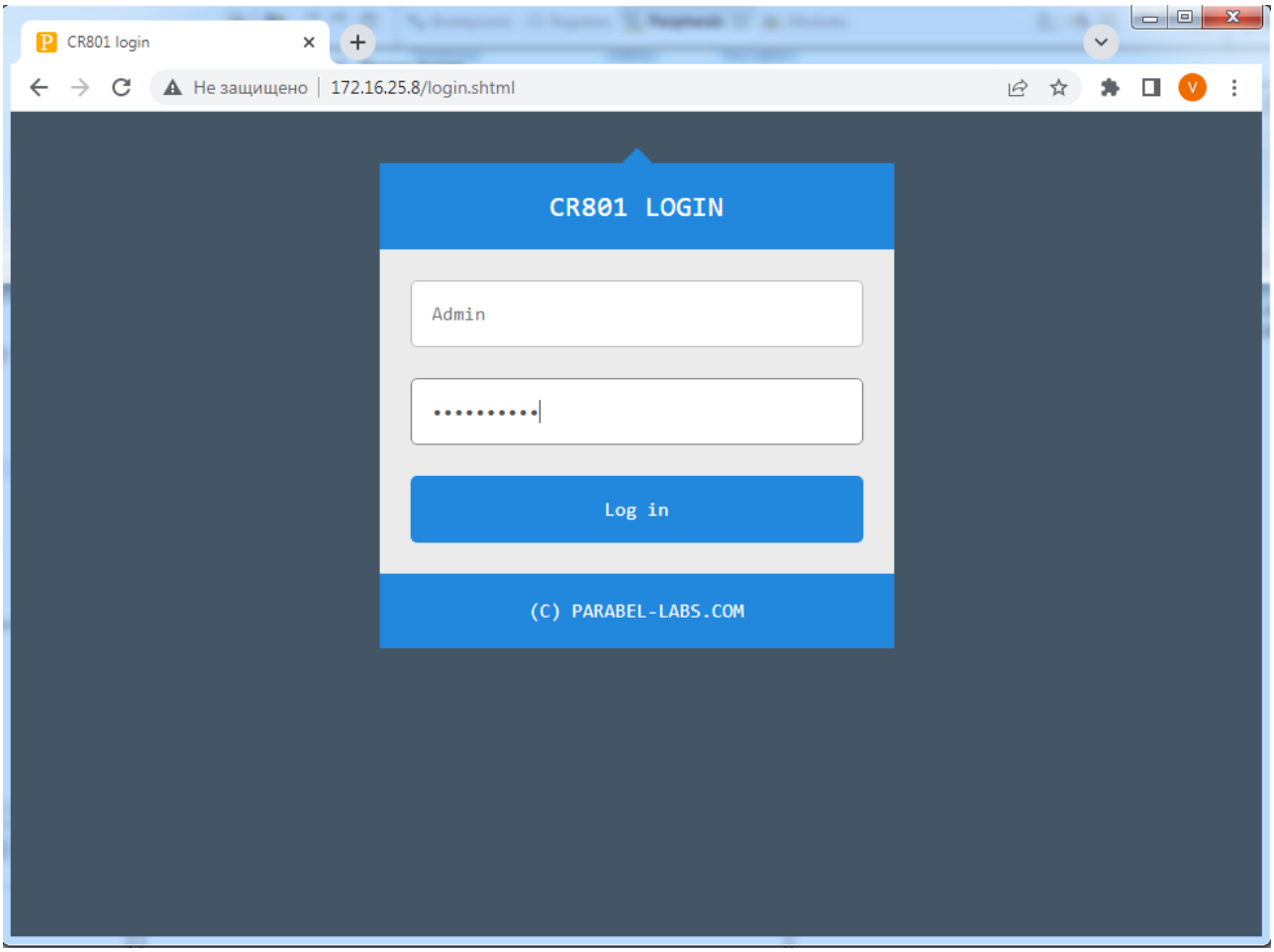
Pin assignment:

1	
2	
3	
4	GND
5	1-Wire
6	
7	
8	DEFAULT

DEFAULT – return default configuration/invoke bootloader. To activate the function, close the input to GND. For a detailed description, see the ‘web interface’ section.

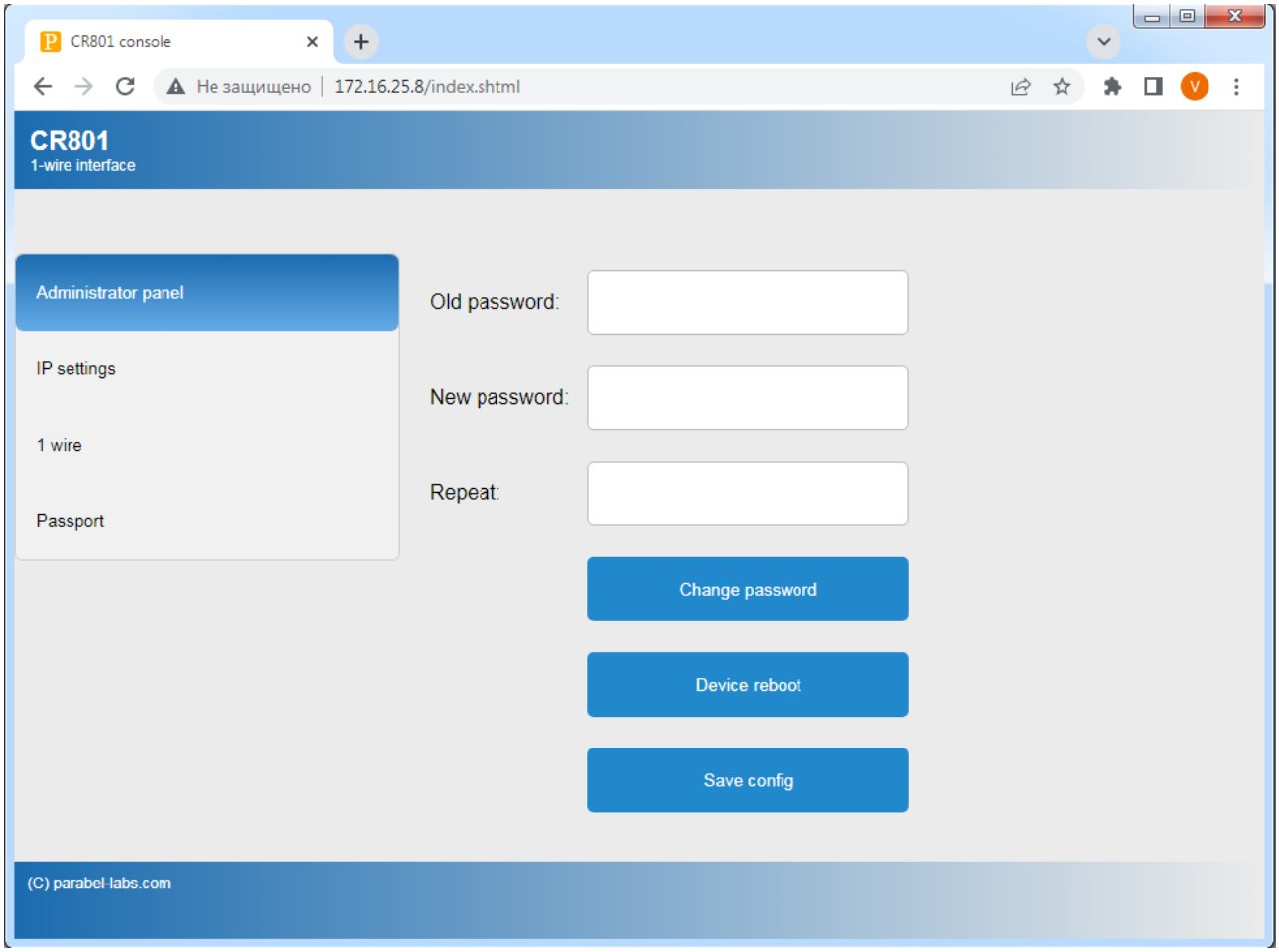
5. WEB INTERFACE

5.1. AUTHENTICATION



When accessing the module address for the first time, the Login page opens and the user password is requested. Authentication is performed only by password, the user name is always Admin.

5.2. ADMIN TAB

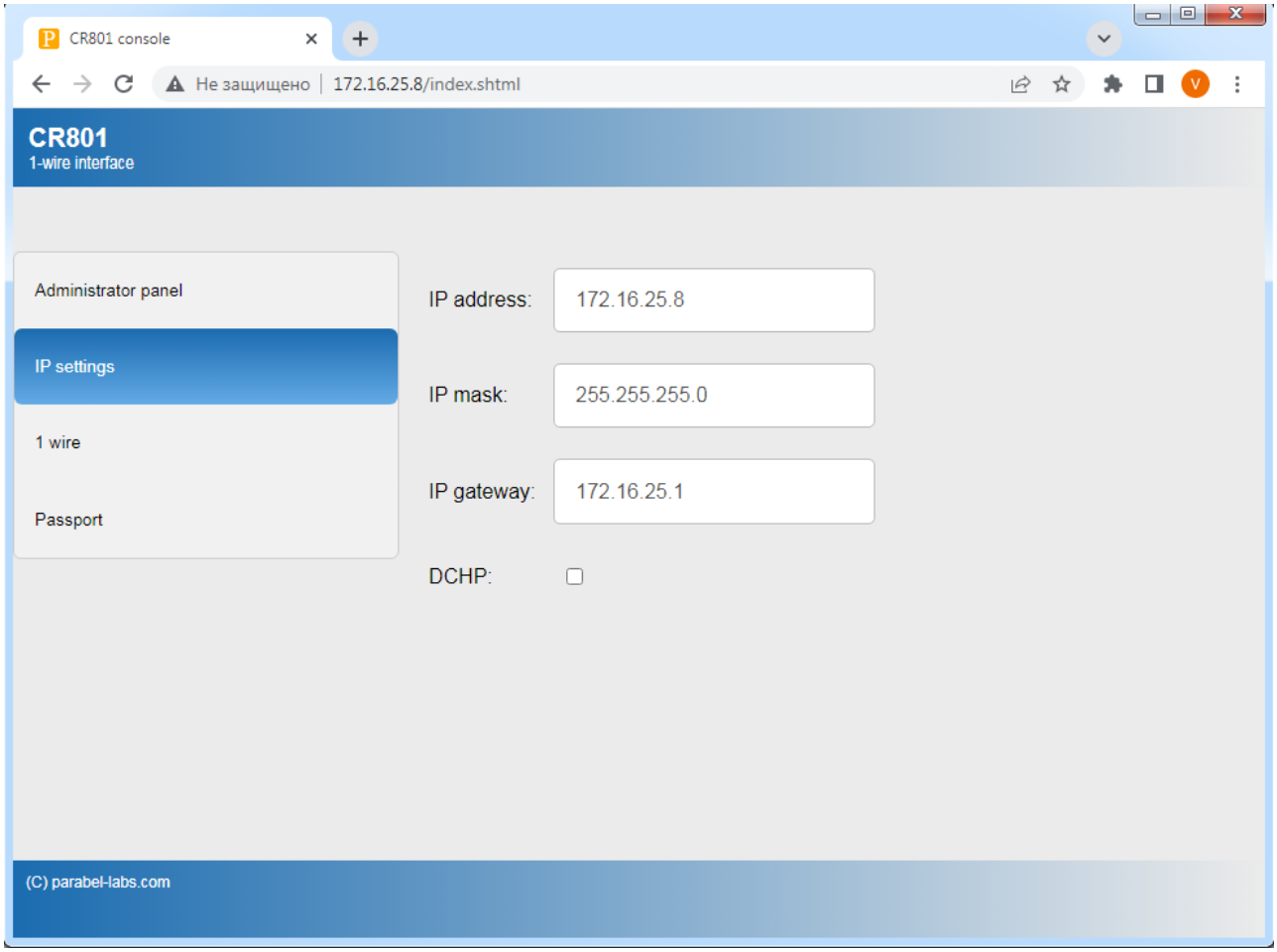


On the administrator tab you can change the module access password. To do this, you need to enter the old password and enter the new one twice. The password will be applied after the device is rebooted.

Save config - writing configuration to module flash memory

Device reboot – firmware restart

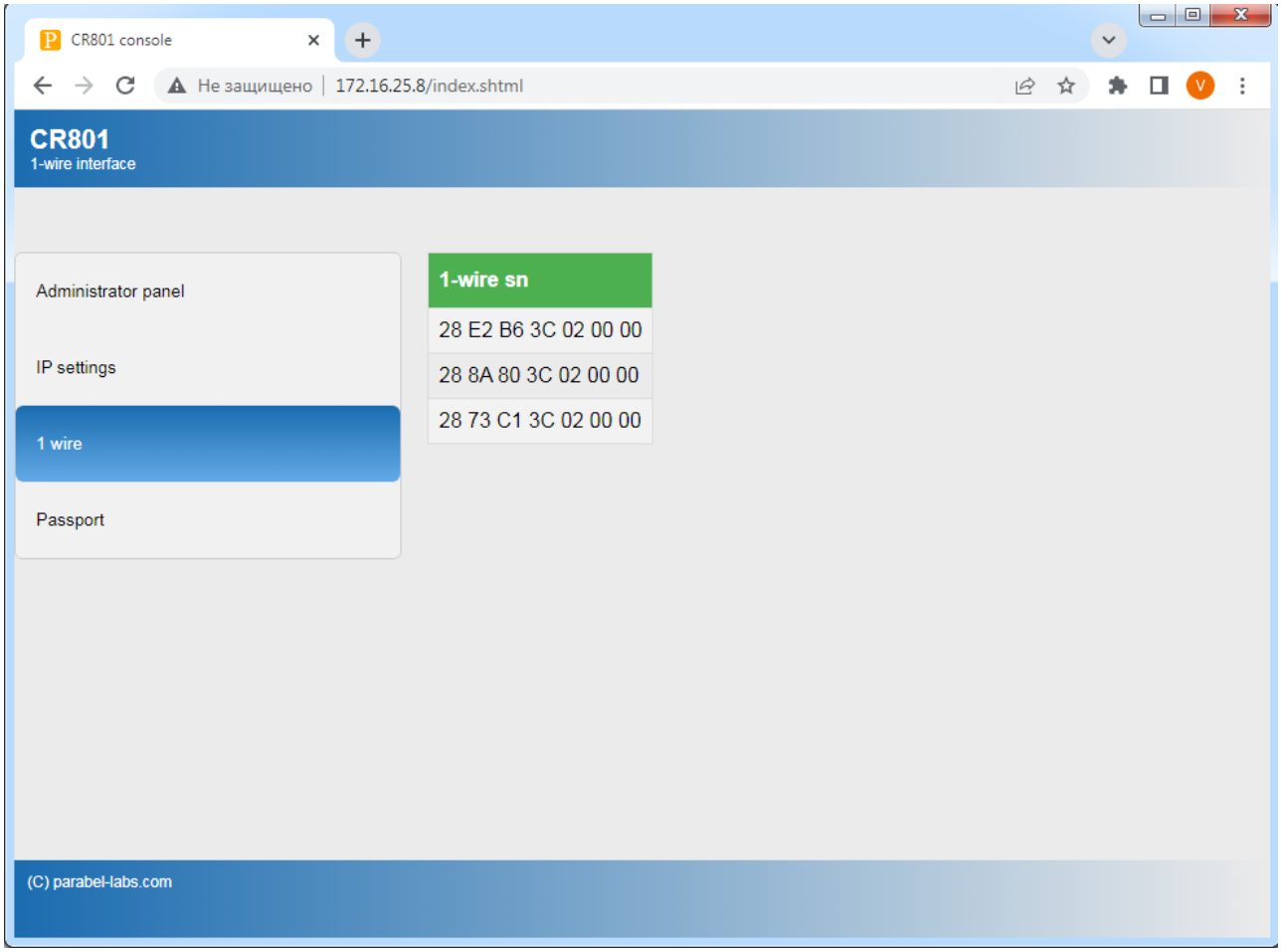
5.3. IP SETTINGS



The page sets the IP address of the module and gateway. The gateway address must be from the same subnet as the module address. Otherwise, when rebooting, the gateway address will be forced to be selected from the "native" subnet. Setting the DHCP flag means automatically receiving parameters from a DHCP server, which in this case must be present on the local network.

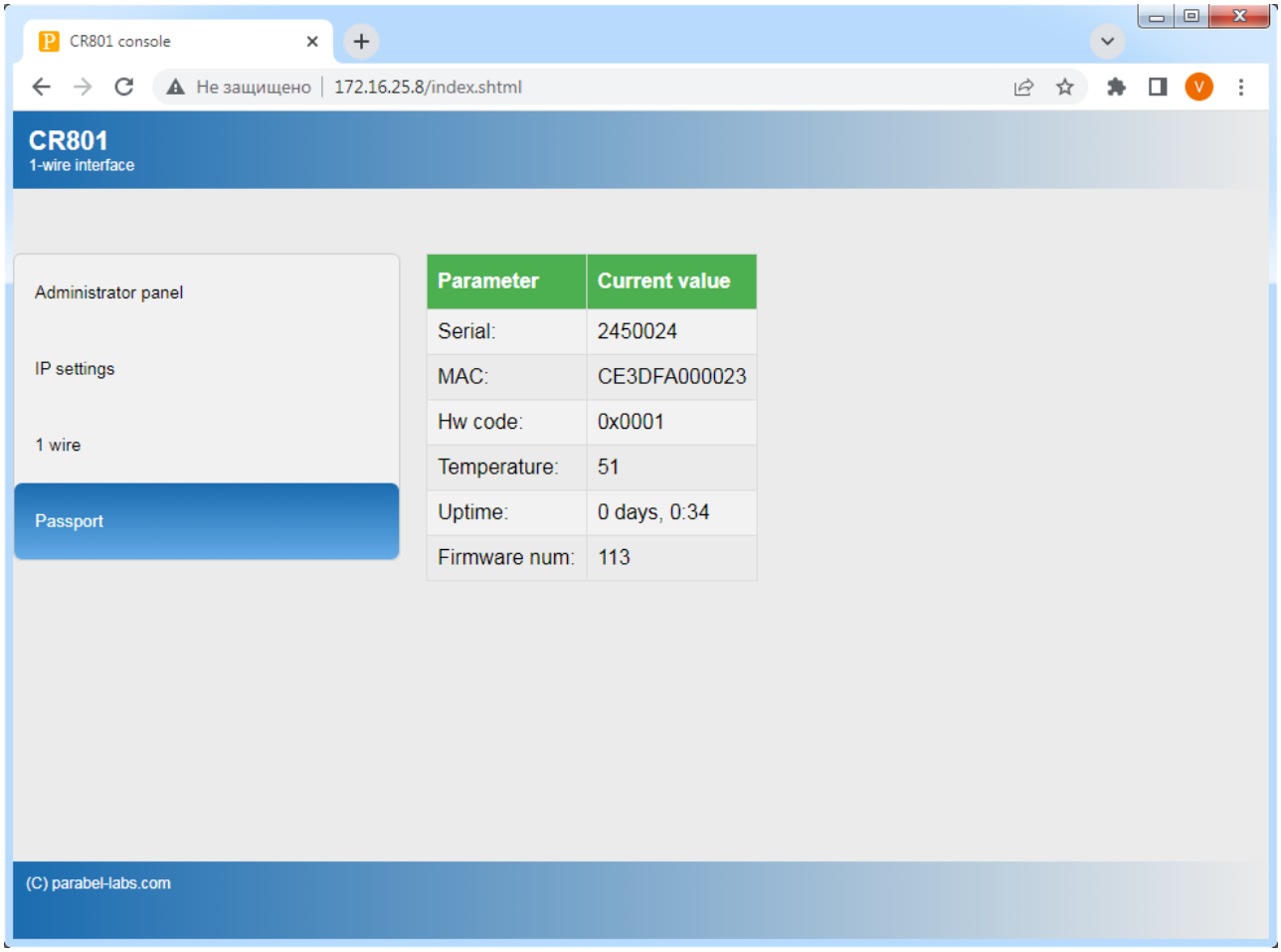
All changes must be saved in flash on the administrator tab; they will take effect the next time the module is rebooted.

5.4. 1-WIRE TAB



When the tab is activated, the module scans the 1-wire bus, after which the serial numbers of the detected sensors are displayed. Scanning is carried out by the built-in software of the CR-801 module, regardless of the presence of an OWFS server. This mode is convenient to use for diagnosing the connection of 1-wire devices.

5.5. PASSPORT TAB



The tab displays the characteristics of a particular instance - module serial number (Serial), ethernet MAC address, temperature of the processor crystal, time since the last reboot (Uptime), firmware version (Firmware num). The Hw code parameter displays the hardware modification of the device.

5.6. THE DEFAULT CONFIGURATION

If the password or module address is lost, the configuration can be reset by briefly shorting the DEFAULT pin to the GND pin. It is important to perform the procedure a few seconds after power is applied to allow the module software to load. The default configuration is the following:

IP/MASK 172.16.25.8/255.255.255.0

GWIP 172.16.25.1

DHCP off

Password: Parabel111

After resetting the configuration, you must restart the module with power off for the new parameters to take effect.

5.7. FIRMWARE UPDATE

To update the software, you must put the module into bootloader mode. To do this, you need to do the following manipulations:

1. Turn off the power

2. Connect the DEFAULT pin to the GND pin

3. Turn on power

4. Open the DEFAULT pin

After this, the module switches to TFTP server mode with the IP address 172.16.25.8. To download new firmware, you need to connect a computer with an interface address, for example, 172.16.25.1 and run the TFTP client.

On Windows, you may need to enable the TFTP Client feature. To do this, go to Control Panel > Programs and Features -> Turn Windows features on or off. In the "Windows Components" window that opens, select the "TFTP Client" component..

After enabling the TFTP component, the client will be available on the command line:

```
>TFTP -i 172.16.25.8 PUT image.bin
```

6. OWFS PROJECT

6.1. INTRODUCTION

OWFS is an open source software project (link https://github.com/owfs/owfs) that implements work with the 1-wire bus. OWFS can be compiled from source for Windows or Linux OS. In addition, OWFS is present in most Linux distributions in binary form.

The CR-801 module in relation to OWFS is an external 1-wire interface with an intermediate ethernet environment. On the ethernet interface, the CR-801 module implements the EtherWeather protocol, for which OWFS has an internal driver. Accordingly, the OS does not require installation of any device drivers; the EtherWeather protocol is built into the OWFS library.

OWFS предоставляет доступ к 1-wire датчикам как через интерфейсы к популярным языкам программирования (python, perl, php), так и через готовые приложения – owfs, owhttpd.

6.2. INSTALLATION AND CONFIGURATION

We'll do the installation using Linux Debian as an example:

apt-get install owfs

After installation, changes must be made to the configuration file /etc/owfs.conf:

```
# This is the main OWFS configuration file. You should read the
# owfs.conf(5) manual page in order to understand the options listed
# here.
etherweather=172.16.25.8
########################## OWFS ##########################
mountpoint = /mnt/1wire
######################## OWHTTPD #########################
http: port = 2121
######################## OWSERVER ########################
server: port = localhost:4305
```

The line 'etherweather=' indicates the IP address of the CR-801 module.

After this, the OWFS package is ready for use. For the test, let's run the owfs utility:

```
# owfs
# cd /mnt/1wire/
# ls -l
28.73C13C020000
28.8A803C020000
28.E2B63C020000
alarm
bus.0
settings
simultaneous
statistics
structure
system
uncached
#
```

1-wire sensors found on the bus are displayed as folders 28.73C13C020000 28.8A803C020000 and 28.E2B63C020000.

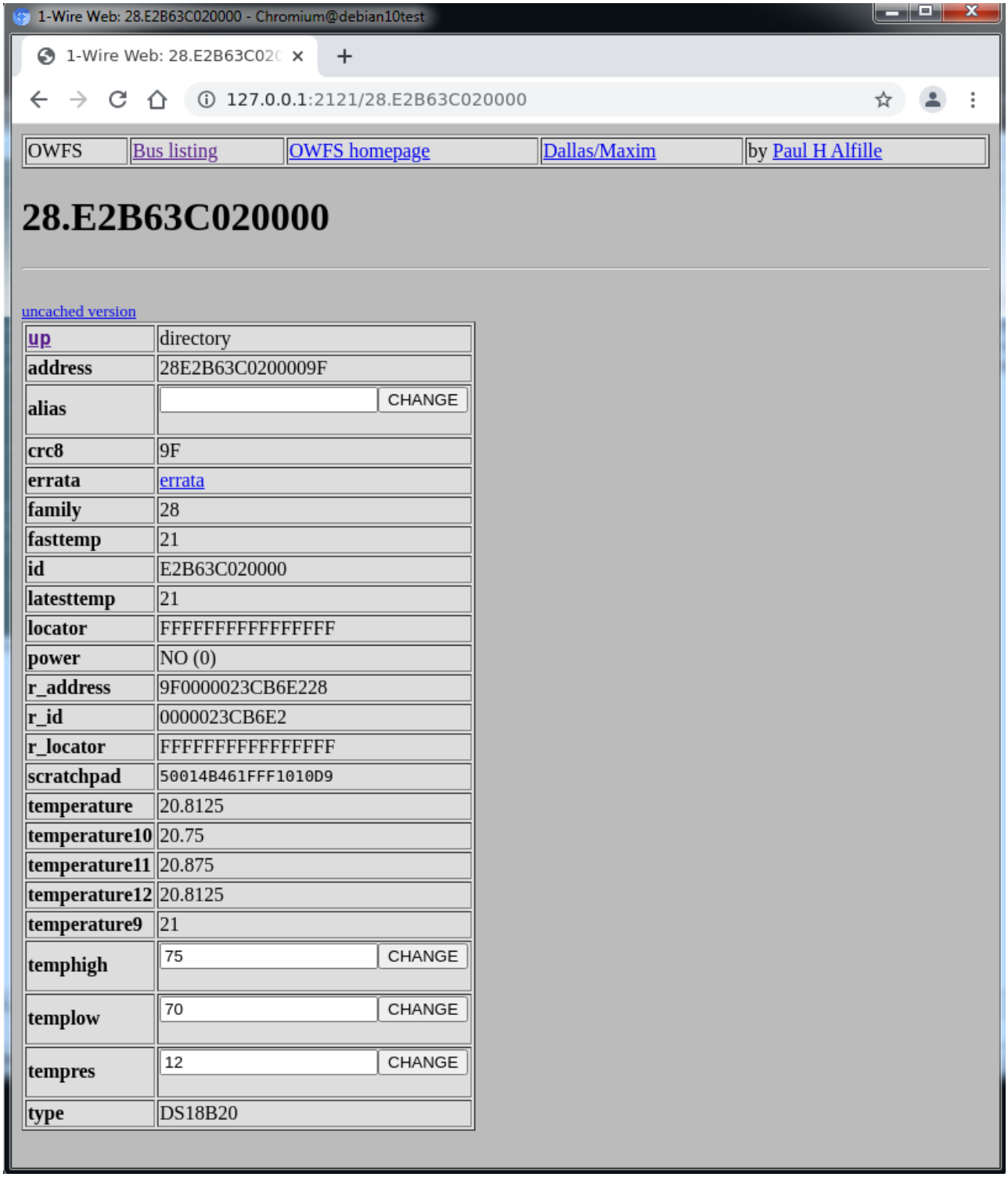
```
# cd 28.73C13C020000/
# ls
address  family locator r_locator   temperature11 templow
alias fasttemp  power  scratchpad  temperature12  tempres
crc8 id  r_address  temperature temperature9  type
errata latesttemp  r_id  temperature10 temphigh
# cat temperature
20.75
```

Next, let's launch owhttpd.

killall owfs

owhttpd -c /etc/owfs.conf

The web interface is available at the client computer address:



In addition to the frontend clients owhttpd and owfs, the package includes the backend service owserver. It provides multiple access to 1-wire and access from programming languages.

```
# killall owhttpd

# killall owfs

# owserver -c /etc/owfs.conf
```

Изменения.

1.0 –