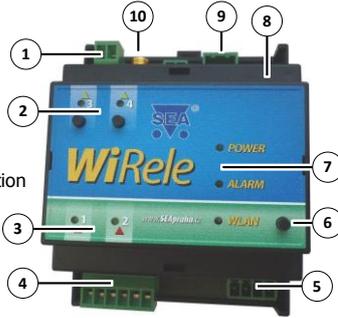# D-W1-DIN (WiRele)

1. Introduction

D-W1-DIN (WiRele for short) is designed for **installation on a DIN rail into a cabinet**. WiRele can control two independent electrical circuits in a building e.g. circuit of an accumulator stove and circuit for garage gate control. The control is made via Web browser from a PC or from a smartphone. During first installation Wirele has to be connected to the local WiFi network.

WiRele has **2 galvanically isolated digital outputs** with a semiconductor switch, which can control directly low power circuits up to 230 V_{AC}/90 mA. It's possible to control directly e.g. a thermoregulator circuit of a gas boiler or a coil of one phase contactor 230 V_{AC}. The contact of the contactor can then control either one phase high power appliance (e.g. electrical radiator) or a coil of three phase contactor of an accumulation stove.

WiRele has also **2 analog inputs for temperature** measuring and **2 digital inputs** which can be activated by voltage in range 3 to 30V_{DC} (it's possible to use 4V_{DC} power provided by WiRele on the input connector). WiRele has built in **2 automatic temperature regulators** for both outputs. The regulators have two modes (for heating and for cooling) and uses analog inputs from temperature sensors to maintain preset temperatures.

(1) Digital outputs 3, 4 (Y3, Y4) connectors
(2) LEDs & Pushbuttons for digital outputs
(3) LEDs indication for digital inputs
(4) Digital inputs 1, 2 (X1, X2) connectors
(5) Temperature sensors (T5, T6) connector
(6) Pushbutton for WiFi connection configuration
(7) WiRele Indication LED diodes
(8) MicroSD card
(9) 230V_{AC} Power supply connector
(10) External WiFi antenna connector

2. Package Content

1 pc **Wi**Rele (order code D-W1-DIN)
1 pc WiFi antenna (order code D-ANT02)
1 pc temperature sensor GSM-C-T2 (based on KTY81-210)
1 pc connector (5.00 mm)
2 pcs connector (3.81 mm)
1 pc connector (3.81 mm)
1 pc connector (3.81 mm)
1 pc screwdriver 2 mm
1 pc uSD card reader
1 pc printed documentation

3. Installation

1. After unpacking and connecting to the 230 V_{AC} power supply, WiRele can be easily tested by pushbuttons for the outputs 3 and 4 which control these outputs.

W A R N I N G

WiRele must be mounted by qualified personnel only!

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2. The next step is to setup connection of the WiRele to local WiFi network. (The following procedures are based on the chapter titled **Configuration**).

3. Perform a "connection settings WiFi network using file on the SD card" or using applications on your smartphone. (The procedure is described in the chapter **Configuration**).

4. Determine the IP address of WiRele obtained from the WiFi AP (Access Point). (See the chapter **Configuration** for details).

5. Enter this IP address into a Web browser. The display shows information about the temperature and digital inputs and outputs status. Digital outputs can be controlled from this screen.

4. Technical specifications

Parameter		Symbol	MIN.	TYP.	MAX.	Unit
Dimensions	Width	W		71		mm
	Height	H		90		mm
	Depth	D		58		mm
Power supply	Voltage	V	180	230	250	V_{AC}
	Current			11	30	mA
Digital inputs	INPUT1, INPUT2					
	Voltage	V_{IN}	3	12	30	V_{DC}
	Current	I_{IN}		3,5		mA$_{DC}$
Digital outputs	OUTPUT3, OUTPUT4 - Semiconductor switch OPTO-MOS					
	Voltage	V_{OUT}	5	230	260 (400)	V_{AC} (V_{DC})
	Current	I_{OUT}			90 (120)	mA$_{AC}$ (mA$_{DC}$)
Analog inputs	2 x temperature sensor GSM-C-T2, Accuracy in range 0 to 30°C … 1°C					
	Temperature	-	-30		+55	°C
Temperature	Storage	tSTG	-40		+85	°C
	Operational	tA	-20		+40	°C

Use D-W1-DIN inside the rack with IP44 or better!
Use breaker max. 10 A before WiRele. For power supply 230 V_{AC} use lines min. 1 mm².

5. Hardware

The front panel of the WiRele contains a set of status indicating LED diodes, pushbuttons for local control of outputs, connectors for connecting power supply, input signals, output signals and temperature sensors.

5.1 Connectors

WiRele enables to connect 2 external digital inputs, 2 external digital outputs and 2 external temperature sensors GSM-C-T2 with temperature range from -30°C to +55°C.

The line length of a connected external temperature sensor is not limited but the wire has a certain resistance which influences the measured temperature (16 Ω means 1 °C).

The recommended type of relay for connection of more appliances is GSM-RELE-OUT.

When using the WiRele for a gate control, it's possible to connect output 3 and COM directly with a pushbutton of the gate control.

Read **Technical specifications** before connecting external devices! Don't overload inputs and outputs.

Examples of connection of WiRele are placed later in this text.
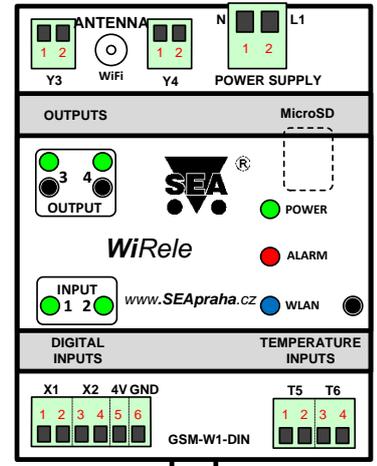
5.2 MicroSD Card

MicroSD card reader is located on the PCB under the front cover, near the LED POWER. MicroSD card is accessible from the side slot, near the power connector. Inserting and removing of the SD card is done by pressing on the MicroSD card, preferably with a fingernail. SD card (FAT32) contains the base software WiRele (Web Server Application and device firmware).

5.3 Pushbuttons for outputs setting

The WiRele has two pushbuttons for local control of outputs. Each press of the pushbutton changes the state of output.

5.4 Pushbutton for WiFi connection setting

The WiRele has a pushbutton for WiFi connection setting. The pushbutton is located next to WLAN LED diode. After a short press of the button the WiRele starts to scan a local WiFi network for available connection and writes the result to the file WLAN.TXT on MicroSD card. (See the chapter **Configuration** for details).

5.5 LED diodes

The front panel of WiRele contains indication LED diodes SUPPLY, ALARM, WLAN and LED diodes which indicates status of logical inputs (INPUT1, INPUT2) a outputs (OUTPUT3, OUTPUT4).

LED	COLOR	Meaning			
		Dark	Light	Blink 1:1 (0.1sec)	Blink 1:1 (0.5 sec)
SUPPLY	green	Device is switched off	Supplied from 230V_{AC}	-	-
ALARM	red	OK	ERROR *1)	-	-
WLAN	blue	no WiFi signal	Connected to WiFi AP	Reading configuration from SD card	Connecting to local WiFi/ Scanning WiFi network
INPUT1 INPUT2	green	Input not activated	Input is activated	-	-
OUTPUT3 OUTPUT4	green	Output switched off	Output switched on	-	-

*1) WiFi connection with WiFi AP is not possible to establish or configuration file "wlan.txt" on SD card is missing.

5.6 External antenna connector

WiRele is supplied with an external antenna D-ANT02.

6. Configuration

## 6.1 Setting connection to the WiFi network using file on the SD card

1) Make sure that a SD Card is inserted in the WiRele

2) Press the configuration button on WiRele and the blue LED blinks several times (1s : 1s). The WiRele scans WiFi for available networks.

3) When the blue LED stops flashing, remove the SD card and insert it into the PC

4) Open the root of the SD card file **wlan.txt**

5) Choose the WiFi network you want to connect to

6) Fill in the network key (= password to WiFi network) to selected network

7) Save the file

8) Return SD card into WiRele

9) The blue LED WLAN should start to blink 0.1: 0.1 seconds (… reading the setting)

then the blue LED goes OFF (… connecting to WiFi network)

and finally stays ON (… connected)

6.2 Determining IP Address of the WiRele

WiRele is set to get an IP address from DHCP server. IP address of the WiRele can be determined either from the WiFi AP to which it is connected or using program called "Fing" which can be downloaded for free from Google Play.
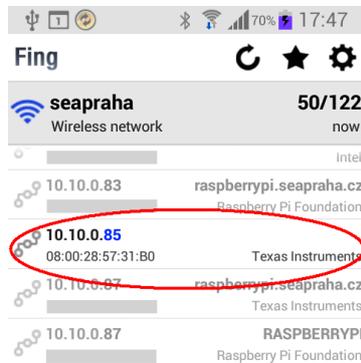
Use your smartphone, run and find the word "Fing".

Install the Program Fing:

Fing - Network Tools
Overlook
PEGI 3
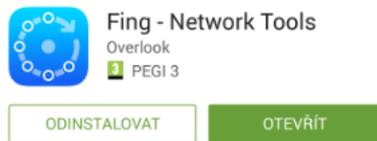
WiRele is identified as the "**Texas Instruments**".

Example: Application Fing (Smartphone version): List of connected devices.

Note: To determine IP address from PC is possible to use **Advanced IP Scanner**
http://www.advanced-ip-scanner.com/

6.3 Remote access from Internet

If you want to control your WiRele from Internet, it is necessary to have a fixed IP address, which can be obtained from your ISP (Internet Service Provider) for your (WiFi) router or use dynamic DNS service, like DynDNS. The second step is to setup port forwarding of the TCP port for WiRele on you router. In the local network WiRele is on port 80. The port number for access from Internet can be set for example to 1234.

Example:
Your router redirects the fix Internet IP address 77.00.212.12 (from your Internet provider), port 1234 to internal IP address 10.10.0.85:80

IP 77.200.212.12 port 1234   redirect to IP 10.10.0.85:80

Now the WiRele is available on Internet IP address:
http://77.200.212.12:1234 from your web browser.

6.4 WiRele Firmware Update

1) Turn off powers supply for WiRele

2) Remove SD card from WiRele and insert it to PC

3) Unzip the contents of the .zip file with new firmware to the root directory of the MicroSD card

4) Insert the MicroSD card into the WiRele

5) Turn on the WiRele

6) All LEDs will start flashing for about 5 seconds. WiRele than starts with the new firmware.

7. WiRele - Control

7.1 Local control using pushbuttons

WiRele has 2 pushbuttons for local control of outputs (see. Chapter 5.3). Local control is mainly used to verify the functionality of the assembly during installation.
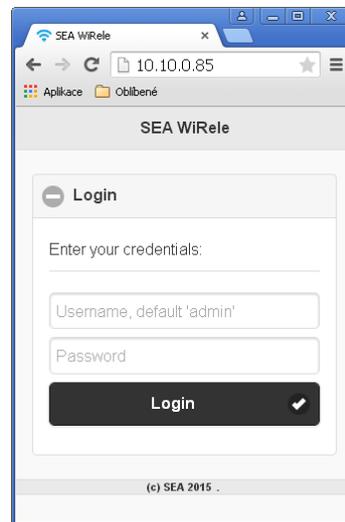
7.2 Remote control using web browser

WiRele can be controlled from a Web browser, either from a PC or a smartphone.

List of tested web browsers: - Internet Explorer, Chrome, Mozilla Firefox, …

The factory setting is login name "**admin**" and the password is also "**admin**".

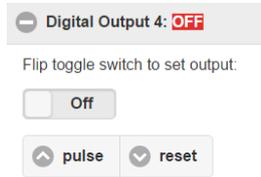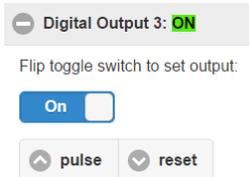Logging screen: Example of displayed data:

Displayed data

Status of digital input 1, 2 (both inputs are OFF).

Temperature inputs T5 (22.1 °C) and T6 (temperature sensor is not connected).

On the last line is displayed data packet counter which indicates that to connection with WiRele is active.


Status of the digital output 3 (ON) and 4 (OFF) can be changed by buttons "On", "Off" "pulse" and "reset".

Button "pulse" switches output for 4 seconds to ON and then to OFF.

Button "reset" switches output for 4s to OFF and then to "ON".

The packet counter on the last row of the window indicates connection activity.

The function of **Temperature Regulator** can be activated by clicking on button "Heating" or "Cooling". Requested temperature in °C can be set by a slider. The regulator switches the output depending on the temperature, hysteresis is 1°C.
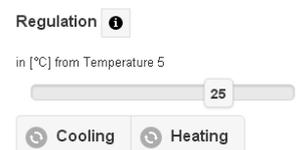
8. Warranty

General warranty period is **24 months after purchase**, when eventual malfunction device will be repaired free of charge in SEA company while shipping to SEA is paid by customer and SEA pays for shipping back to customer. For SW there is 24 months warranty under following conditions:

Both CPU and PC software is sold "as is". The software was created by the best software engineers in SEA and was carefully tested both in SEA and also by SEA customers using GSM applications products made in SEA. In spite of making all possible to get error free software it can happen, that the software in CPU or PC programming SW or their mutual interaction has some error under some specific conditions. If such error is found and the description of the problem including configuration file is sent by E-mail to SEA ltd., the error is removed free of charge and SEA will send new SW by E-mail to customer.

SEA ltd. has NO RESPONSIBILITY for any damage, lost, costs and any other problems direct or inducted, caused by such SW error, by eventual device malfunction from any reason.

CE Declaration of conformity

in accordance with the Radio and Telecommunications Terminal Equipment Directive 1999/5/EC (R&TTE) and Directive 2011/65/EU (ROHS).

We SEA, spol. s r.o., Dolnoměcholupská 21, CZ 102 00 Praha 10, Czech Republic, **ID**: 47117931 (**manufacturer**)
declare under our sole responsibility, that product device for remote control and monitoring **type**   D-W1-DIN
                    is in conformity with the following standards:

health and safety:	EN 60 950-1:2005+A1:2009 EN 60 950-1:2006+A11:2009+A1:2010+A12:2011
EMC:	ETSI EN 301 489-1 ETSI EN 301 489-17
WiFi radio parameters:	EN 300 328 v 1.7.1

**The last two digits of year in which the CE marking was affixed:**   14

|		
Place of issue: Praha	**Name:**	Ing. Mario Vejlupek
Date of issue: 25.11.2014	**Grade:**	technical director

9. Examples of connection

An example of usage WiRele. With two power outputs are controlled two electrical appliances such as heating and boiler with contactors, digital inputs detect voltage on switching / opening a door contact and two analog inputs T5, T6 measure temperatures.

The schematics calculate with usage of the "Load Management Signal". Digital input No. 1 is activated by supplying an external 12 V_{DC} digital input and input 2 uses internal 4 V_{DC} and connects directly to the terminal door contact. The two analog inputs T5, T6 are connected the temperature sensors. Outputs of the WiRele control contactors of heater and boiler.
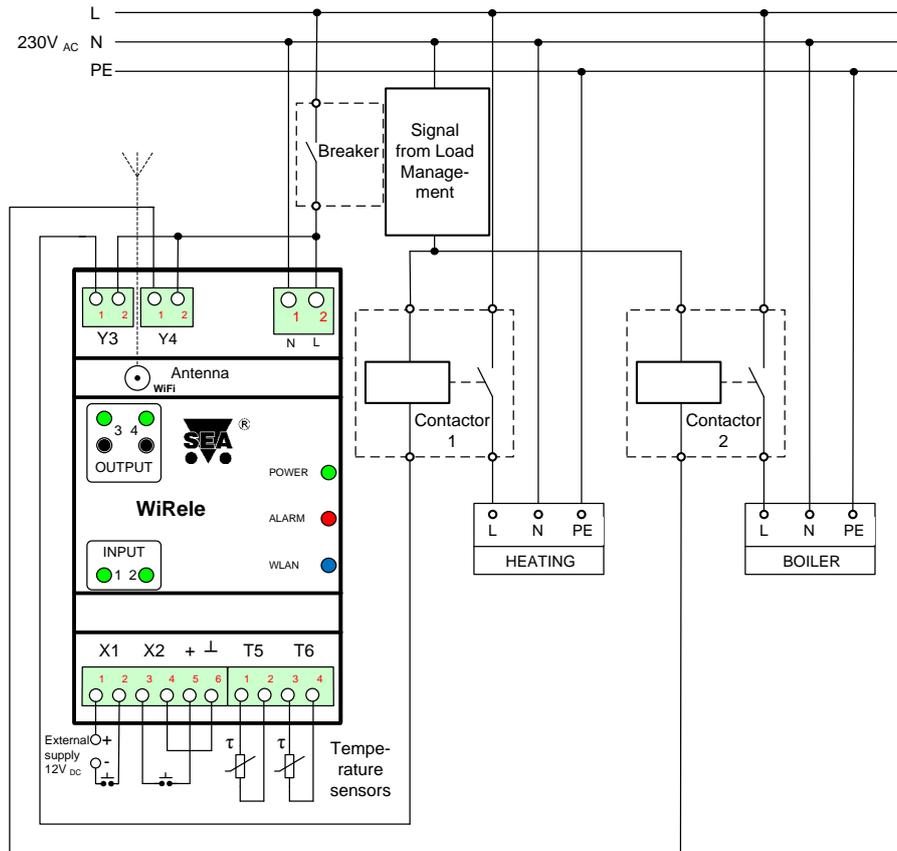
Electrical schematics
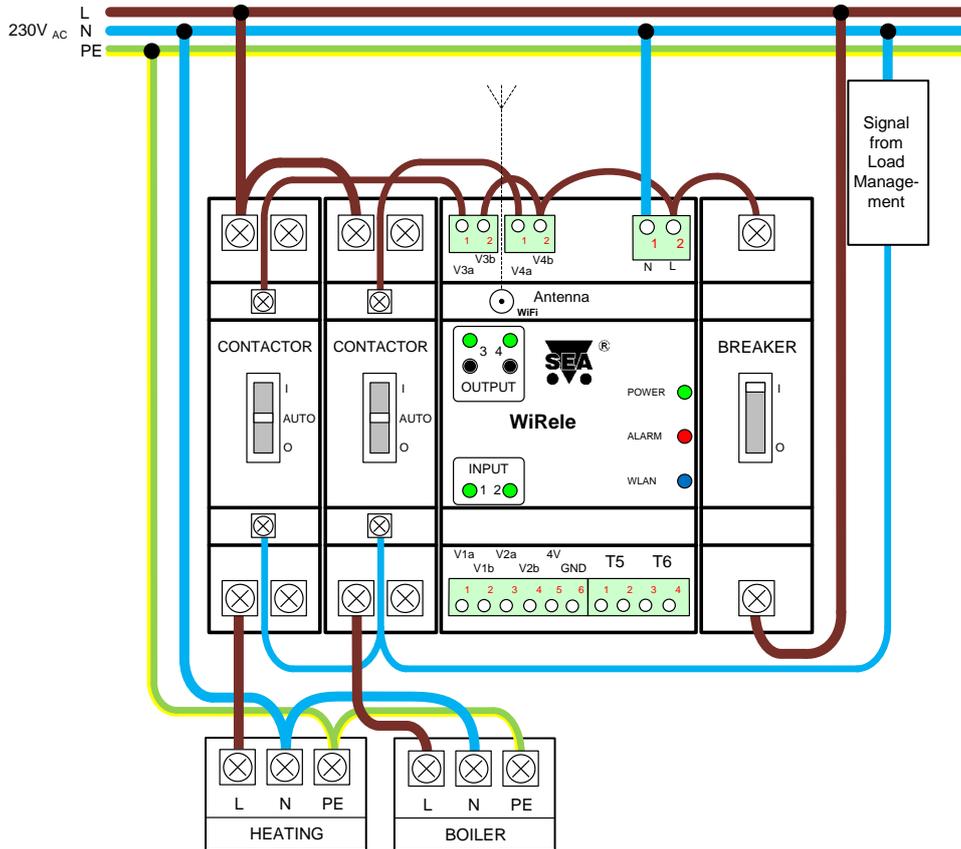
Wiring

10. Frequently Asked Questions (FAQ)

What is necessary to use the WiRele

- WiFi AP (Access Point) – WiRele will be connected to this Access Point
- Smartphone with access to the Internet or PC with an Internet browser
- User - basic technical skills in connecting a device to a WiFi network

Problem description	Possible reason	Solution
It not possible to edit the file wlan.txt on a uSD card.	It's not possible to edit files on uSD card using OS Android	Use any PC with Windows to edit the file wlan.txt
LED ALARM (red) lights	WiRele is not connected to WiFi network	**Check the MicroSD card** • **Is the MicroSD card inserted into WiRele?** • **Is the MicroSD card formatted as FAT32** • **Does the MicroSD card contain firmware and necessary files?** \boot … directory \webapp … directory login.txt … configuration file with login data (username and password) wlan.txt … configuration file with necessary data for connection to local WiFi network
The Web browser displays ERROR 404 There isn't a WiRele page here. Go to main WiRele page	There is probably not inserted MicroSD card with firmware into WiRele	
The temperature from an external temperature sensor is wrong	Too long lines to an external temperature sensor	The accuracy of temperature depends on a line length to an external temperature sensor (16 Ohms means 1°C). Use thicker wires to temperature sensor.