

# P275R

## FM Monitoring Receiver with Two Relays

### User Guide



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## 1 Introduction

### 1.1 Using this guide

This guide covers the P275R FM monitoring receiver. It provides the information needed to install and using the device.

**Please read this entire guide and familiarize yourself with the controls before attempting to use this device.**

If you have any questions or comments regarding this document, please contact us via email.  
We welcome your feedback.

### 1.2 Description of the equipment

This compact device extends the original P275's capabilities with two independent general purpose relays, driven by alarm outputs. The relay function is user configurable. Total four alarm outputs are provided, with LED status indication for each output. The relay pins and the Alarm Outputs are accessible via terminal blocks. The device is equipped with USB B-type socket. The aluminum case provides excellent shielding in strong RF signal environment.

The device is fully compatible with the P275 FM Analyzer. The FM Scope control software for Windows is used for setup and provides access to all measurements and values.

### 1.3 Other documents

This document is not a complete reference manual. Please visit the website for more information:

- P275 FM Broadcast Analyzer User Manual
- FM Scope User Guide
- Support section at <http://www.pira.cz>

### 1.4 Technical parameters

Parameter	Value
Outer dimensions	144 x 105 x 37 mm
Power supply voltage	5 V DC
Ripple allowed	max. 200 mV pp
Supply current	max. 200 mA
Power supply connectors	USB or DC 1.3/3.5mm
RF input	BNC 50 ohms
Max. input RF power	20 mW
Terminal block type	Pluggable, included.
Relay type	SPDT, two independent relays
Relay maximum load	24 V, 2 A



**IMPORTANT!!!** The device power supply voltage is 5 V. Exceeding that voltage will result in permanent damage to the device! Always check the power supply voltage.

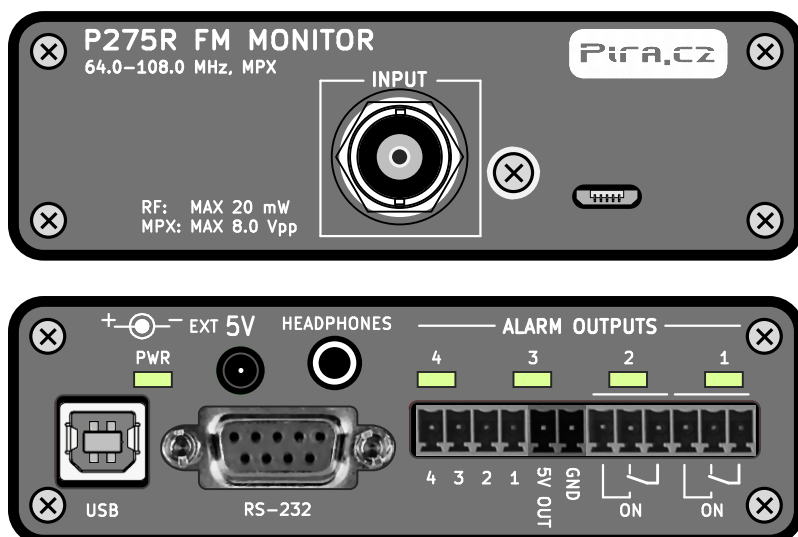


**CAUTION!!!** Never exceed the relay maximum switching voltage: 24 V. Exceeding that voltage may result in permanent damage or electric shock!

## 2 Hardware description

### 2.1 Connectors, control elements and status indicators

All the elements can be found on the side panels:



Connector or element	Description
Input	Input connector for RF or MPX signal. Nominal input impedance is 50 ohms for RF. Max. RF power is 20 mW. Max. MPX signal swing is 8.0 Vpp.
USB	Allows connection of external 5V power supply or connection to a PC. Serial communication speed of this port is currently fixed to 115200 bps.
PWR	Power LED. It signalises that the device is turned on.
EXT 5V	Power supply connector. Recommended power supply adapter: 5 V, min. 1 A, connector 1.3/3.5mm, central is <b>+</b> . <b>IMPORTANT! Exceeding the voltage will result in permanent damage to the device!</b>
Headphones	Stereo 3.5mm JACK connector for optional connection of headphones.
RS-232	Serial RS-232 connector female type. Communication speed of this port can be 19200 or 115200 bps. The device currently does <b>not</b> support concurrent communication on the RS-232 and USB ports. Depending on mechanical characteristics of the connectors, the RS-232, EXT 5V and Headphones may not be usable at the same time.
Alarm Outputs	The device provides four independent digital outputs, marked 1 to 4. Outputs 1 and 2 also drive built-in relays. Status of each output is indicated by LED. Each alarm output can be used either as general purpose output or various conditions may be assigned, like measured value out of range, RDS TA status etc. Wires can be connected to the alarm outputs via pluggable terminal blocks. This accessory is included.

For more information, please follow the document 'P275 FM Broadcast Analyzer User Manual' (available online).

## 3 Installation

### 3.1 Hardware installation

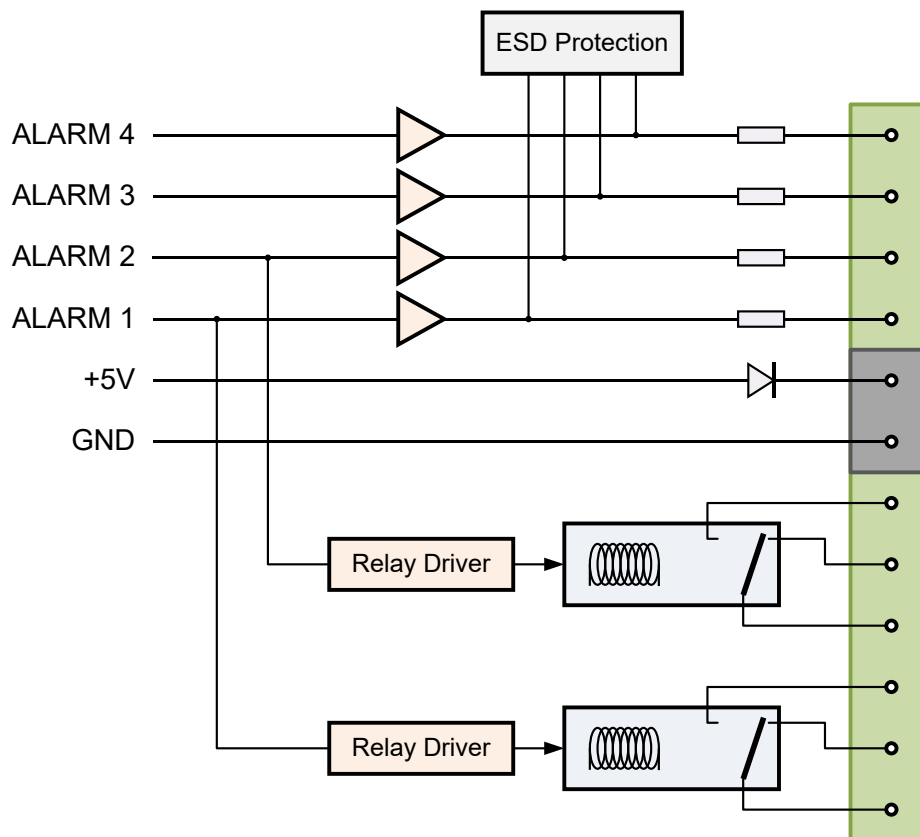
#### 3.1.1 Power supply, antenna input

Please follow the original P275 User Manual.

#### 3.1.2 Alarm Outputs

The device provides four independent digital outputs, marked 1 to 4. Alarm outputs 1 and 2 also drive built-in relays. Status of each output is indicated by LED.

Following block schematic summarizes the Alarm Outputs connection. The relays are drawn in Off position:



Each alarm output can be used either as a general purpose output or various conditions may be assigned, like measured value out of range, RDS TA status etc.

Alarm status	LED indication	Alarm digital output	Relay position
<b>Active</b>	On	High, 5 V	On
<b>Not active</b>	Off	Low, 0 V	Off

Power supply line (+5V) is available as well, for optional use. The relay pins are 'floating' – isolated from the rest of the device's circuits.

Wires can be connected to the alarm outputs via pluggable terminal blocks. This accessory is included.

For more information, please follow the document 'P275 FM Broadcast Analyzer User Manual' (available online).

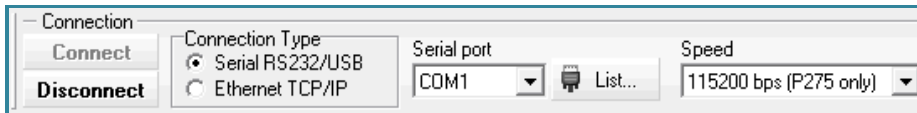
## 3.2 Software installation

### 3.2.1 First communication with the FM Scope application

The FM Scope application is free for download at <https://www.pira.cz>.

In case of USB connection, install the USB drivers first.

In the Connection field, select 'Serial RS232/USB' connection type. Select the COM port assigned to the device by the system. Select 115200 bps communication speed. Finally click on Connect.



The application status bar at the bottom indicates the connection status. Verify the function by selecting a local station and clicking on Tune.

In Options – Preferences – General – Application Settings select the option Online update of deviation and signal.

Finally tune the frequency of interest and if necessary, adjust the antenna position for getting full (5/5) signal quality.

**For more information, please follow the FM Scope help.**

### 3.2.2 Alarm Outputs setup

For setting up the alarm outputs, select Options – Alarm Outputs:

For each output the user can assign a function and additional parameters, if apply. For manual control, the response is immediate upon clicking on the ON/OFF buttons. Other settings take effect when confirmed by the Send button. To make the configuration permanent, follow section 3.2.4.

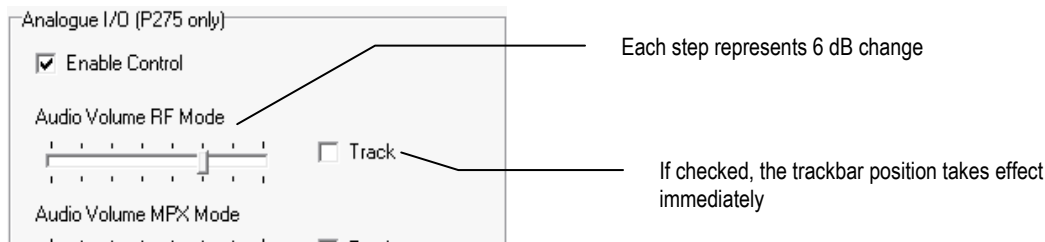
The outputs can be controlled also from a script, like on the examples:

Script command	Meaning
send(ARJ:TA*X)	Alarm 2 output is driven by RDS TA (Traffic Announcement)
send(ARI:GD*X)	Alarm 1 output is used as general purpose output and it's now driven low
send(ARK:GH*X)	Alarm 3 output is used as general purpose output and it's now driven high

**For more information, please follow the document 'P275 FM Broadcast Analyzer User Manual' (available online).**

### 3.2.3 Headphones audio output setup


The analogue audio output may be useful in some specific applications. The audio output options are available in the menu: Options – DIP Switches and Analogue I/O. Here you can adjust volume, pre-emphasis and some more parameters.



*Note: Requires firmware version 2.2b r6 or later and FM Scope version 1.6.1 or later. The headphones audio output is not suitable for audio applications like rebroadcasting. Higher volume results in better S/N.*

### 3.2.4 Saving current configuration

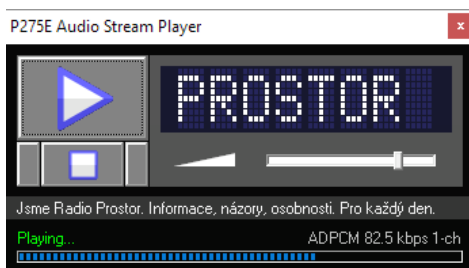
Once all settings are done, save the configuration to the device's non-volatile (permanent) memory:

In toolbar, click on the button 

The device is now ready for stand-alone operation.

### 3.2.5 Remote audio listening

In addition to the headphones output, the device supports remote audio listening of currently tuned station, incl. RDS functions PS, RT and TA. In the FM Scope menu, select Utilities – P275E Audio Stream Player:

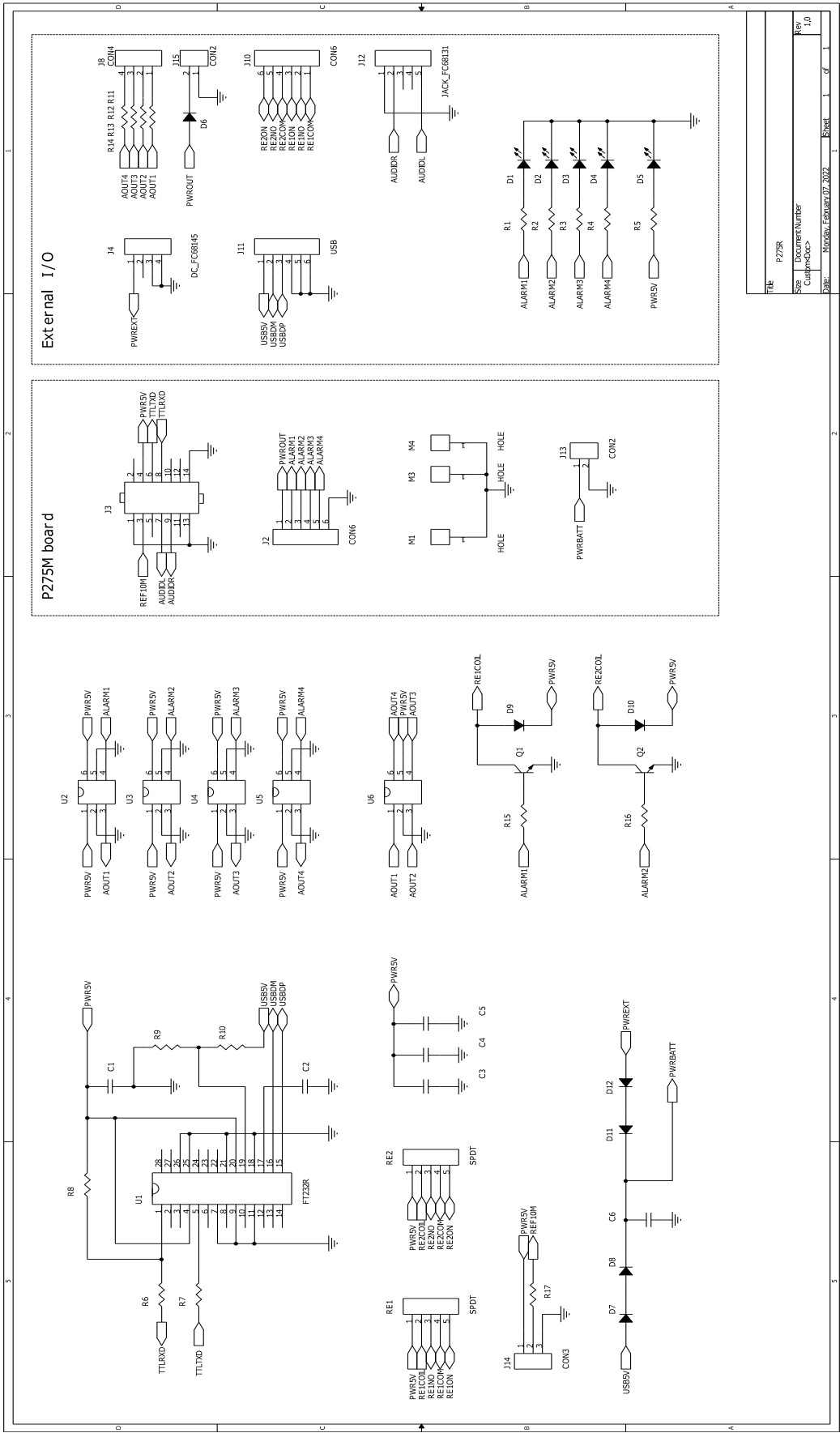


The audio streaming uses lossy audio compression. It is thus not intended for audio quality evaluating. The headphones audio output provides audio without compression.

Minimum version required: FM Scope 1.7, P275E firmware 2.2d.

## 4 ANNEXES

### 4.1 Connection diagram



Title	p275R
Size	Document Number
Rev	1.0
Doc	Modbus, February 07, 2022
Sheet	1 of 1



## 4.2 Part list

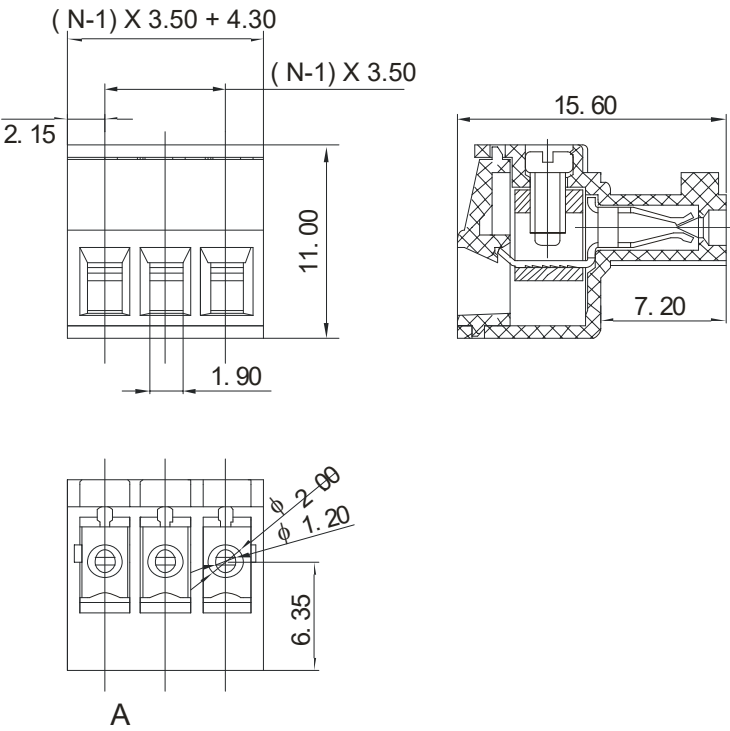
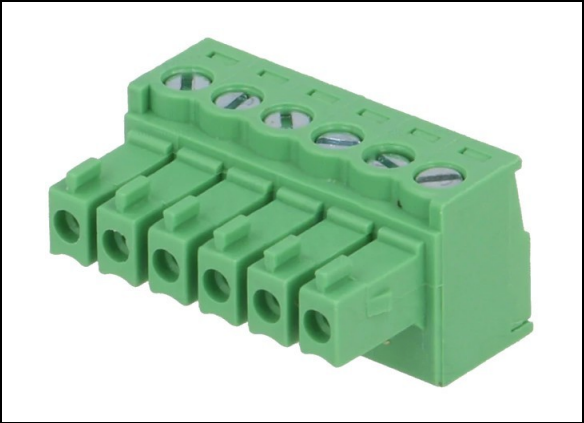
Marking	Description	Ordering code
D1, D2, D3, D4, D5	LED white	OSW54008C1F
D6, D7, D8, D9, D10, D11, D12	Schottky diode 1A	SK13, SK24
Q1, Q2	Transistor	BC847C
U1	Serial to USB	FT232RL
U2, U3, U4, U5	Buffer	74LVC1T45W6-7
U6	ESD protection	SRV05-4ATCT
C1, C2, C3, C4	Capacitor 100n	
C5, C6	Capacitor 10u/16V	
R1, R2, R3, R4, R5, R10	Resistor 1k	
R6, R7, R11, R12, R13, R14, R17	Resistor 220R	
R8, R9, R15, R16	Resistor 2k	
RE1, RE2	Relay SPDT 6V	RY211006
P275M	P275 FM Analyzer Board	
	Housing	1455L1201

## 4.3 Device differences

Feature	P275 FM Analyzer	P275R FM Monitor
HMI (buttons, LCD display)	✓	✗
Operation from AA cells	✓	✗
External DC power supply connector	✗	✓
Built-in relays	✗	✓
Five LED indicators	✗	✓
Terminal blocks	✗	✓
USB connection	USB Micro	USB B

Features which are not listed are common to both device variants.

4.4 Specification of pluggable terminal blocks (included)



Manufacturer	DEGSON ELECTRONICS CO., LTD.
Model names	15EDGK-3.5/2P-13, 15EDGK-3.5/4P, 15EDGK-3.5/6P
Pitch	3.5mm
Wire range	28-16AWG (0.5-1.5mm <sup>2</sup> )
Torque	0.2Nm (1.7Lb-In)
Strip length	7mm
Screws	M2