

SWR meter (standing wave meter) wattmeter



This device was designed as an SWR and power meter for radio amateurs. In addition to the SWR, it also shows the forward and reverse power and can therefore also be used as a wattmeter. With the large measuring range from 1 to 1000 watts, it is suitable from QRP to QRO.

DJ9PK
<http://dj9pk.de>

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Shortly

- This standing wave meter (SWR power meter) was developed for the frequency range from 1.8 to 30 MHz. It can be used up to 50 MHz with somewhat reduced accuracy.
- The transmitter and antenna are to be connected via the PL sockets on the back of the device.
- 6 to 16 volts at 120 mA are required for operation. These can come from a plug-in power supply or from the 12V supply of the transceiver
- The graphic display has two display options on two different pages: Page 1 uses pointer instruments for the analog display and a numerical display for the exact measured values. Page 2 has a bar graph for the analog display and a significantly larger digit display for the measured values. You can switch between the two pages by tapping on the display.
- **The power display** in pointer and bar graphs is autoranging, so that a good resolution is always achieved.

Notice

An automatic zero adjustment is carried out each time the device is switched on. If RF power is present at power up, zero is also displayed. The display values are only correct when the HF is removed and reapplied. **It is best to switch on without HF power!**

Note 2

If the displayed values of an HF carrier signal wobble in the "fast" setting (more than just the last digit), then this is not due to the SWR meter. Then the HF signal has a hum component. This has been observed a number of times, particularly with higher powered power amplifiers. In this case, only the PEP indicator will help.

Caution!

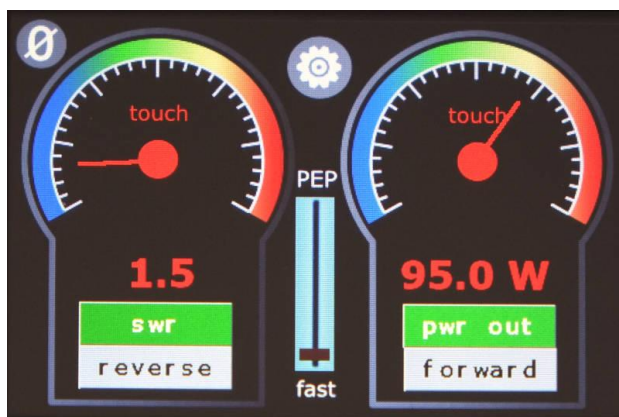
If the SWR meter hangs in the antenna line, it is connected to ground. If it is then to be supplied by the station power supply and the negative pole of the SWR meter accidentally comes into contact with the positive pole of the station power supply, short-circuit current will flow! So be careful when connecting the power supply to the station power supply! In this case, the choke L3 smokes. Should this happen to you, you can request a choke from me.

Detailed:

The display is touch-sensitive (touch screen). This means, all settings are set by “tapping” the screen. The following three images show which functions can be set by tapping the corresponding buttons. The display works “resistively”. That means it responds to a pinpoint pressure and not just a touch. It is therefore best to use a **plastic pen** (ballpoint pen without a metal tip) or your **fingernail** . The fingertip is sometimes a bit too big.

Page 1:

Here, the measured values are displayed analogously by two pointer instruments and a precise numeric display below them. The left instrument can display SWR or reverse power. The selection is made by tapping on one of the buttons below. Similarly, the right display can be toggled between power out and forward power.



The slider between the two instruments is used to set the observation time during which the maximum of the measured values is recorded. If you push it all the way up (PEP), the observation time is about 1 second, while at the bottom end about 14 displays per second are made.

Tapping on the gear icon (top center) takes you to page 3 (Settings).

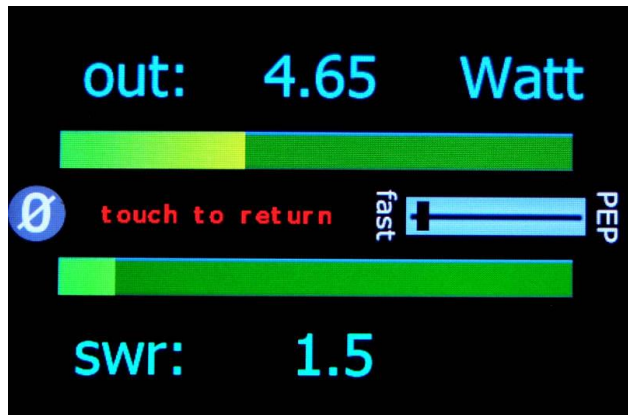
Tapping on the measuring instruments switches to page 2 (bar display).

Page 2:

Here, the analog display is in the form of bar graphs. The numerical display is above respectively below. Switching between out/forward (upper line) is done by tapping the line. In the same way, the bottom line can be toggled between swr and reverse by tapping it.

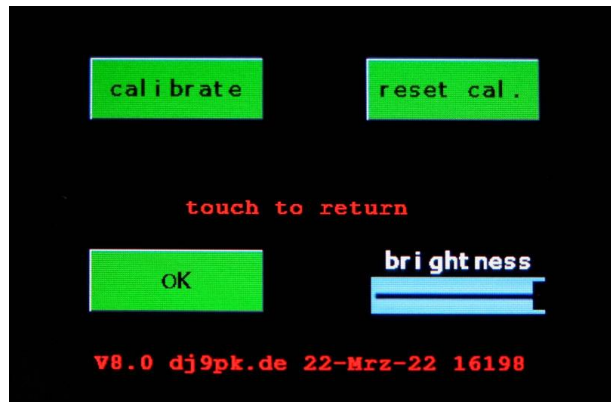
On this page you will also find the slider between fast and PEP.

You can return to page 1 by tapping in the middle of the display.



Page 3:

This page can be reached by tapping on the gear wheel (top center) on page 1. On this page, a calibration can be carried out by tapping on "calibrate" and applying an exact 90 watts. By tapping on "reset cal." can be switched back to the delivery status. A marquee tells you what to do. The slider (bottom right) is used to adjust the brightness of the display. The brightness also has an influence on the power consumption of the device.



technical details

The non-linearity of the rectifier diodes in the SWR sensor is corrected by the microprocessor. This achieves a high degree of accuracy (typically 3%) over a range from 1 to 1000 watts.

The resolution is 10 mW for low power. At higher powers, the resolution is reduced due to the number of digits that can be displayed.

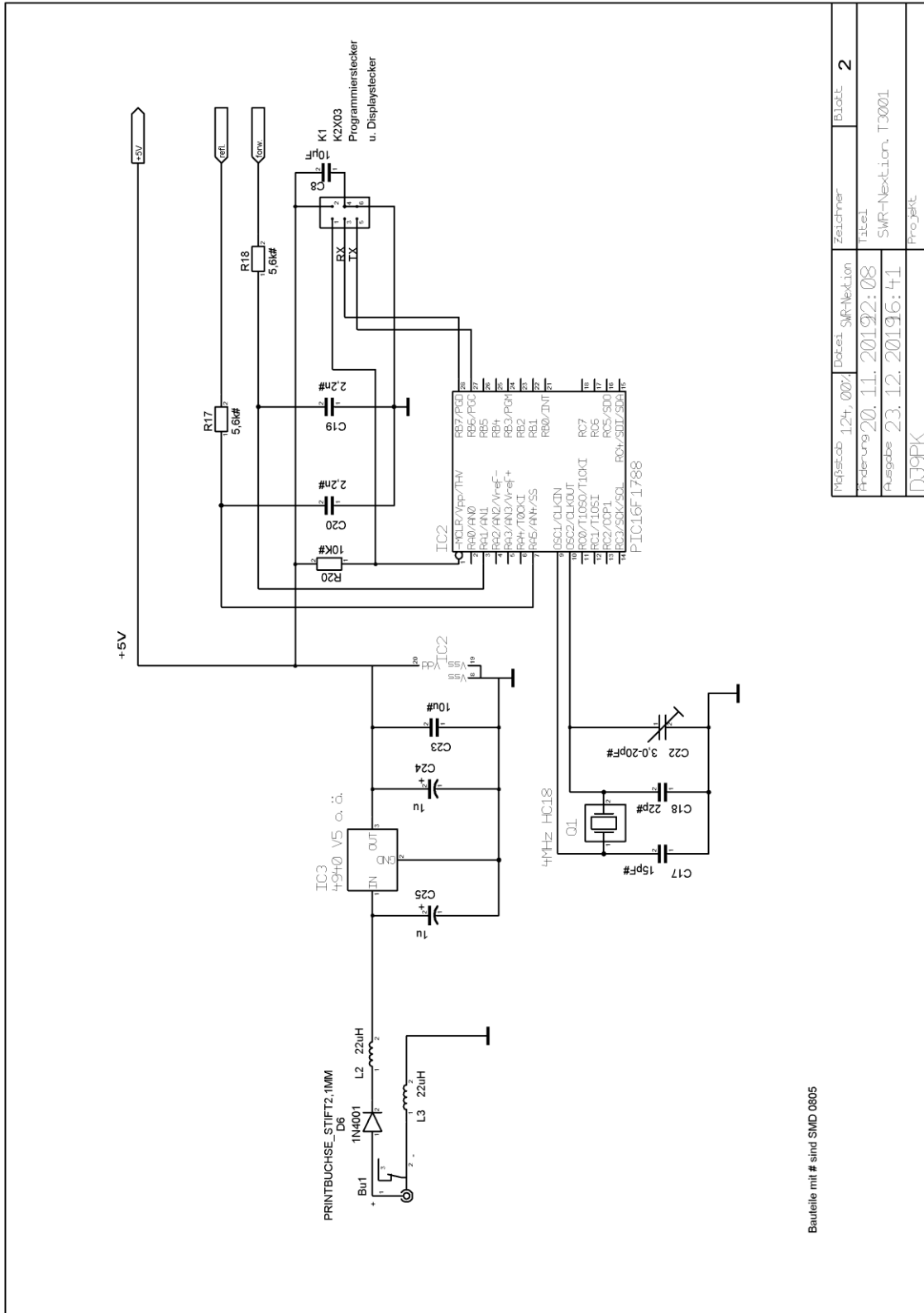
Cleaning:

Do not use Tempo handkerchiefs or other paper towels to clean the surface . They cause scratches. It is best to use alcohol and a **microfiber cloth** . Microfiber cloths are available free of charge from the optician as glasses cleaning cloths.

Technical specifications

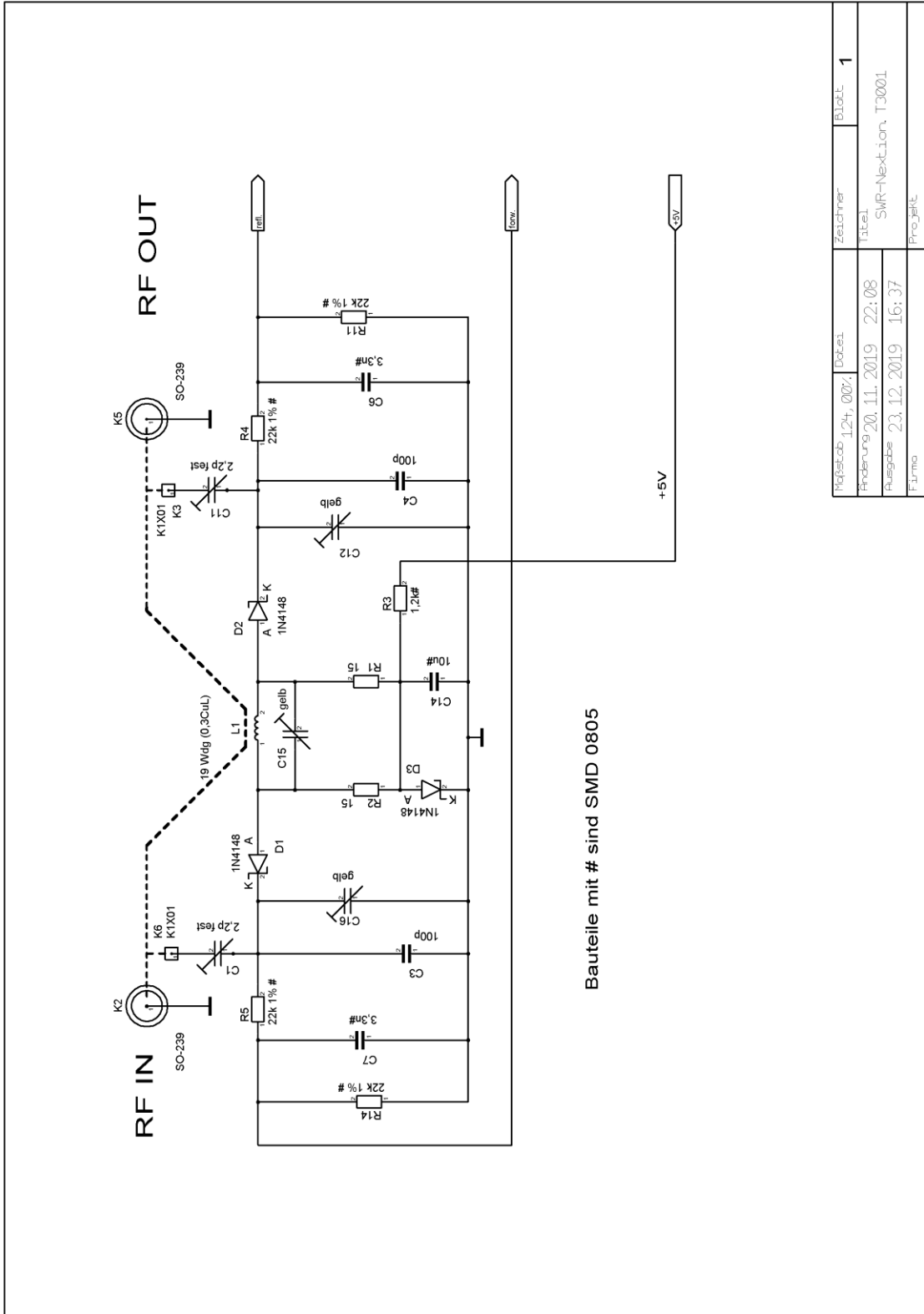
power supply	6 - 15 volts
power consumption	up to 160 mA depending on display brightness
Displayed Values	forward power reverse power SWR (standing wave ratio) Radiated Power (forward minus reverse power)
Measuring range (power)	1 – 1000 watts
resolution (power)	3-digit (10 mW at low power)
Accuracy (Performance)	Typ.+/-3% (1 – 1000 watts and 1.8 – 30 MHz)
Insertion Loss (30MHz)	0.02dB
Insert SWR	1.01
Dimensions	120x78x49mm
display	3.5" (480 x 320 pixels)

Circuit diagram (display):



Titel	124_002	Daten	SWR-Nexion	Zeichner	Blott	2
Änderung	20.11.2019 2:08	Fabel				
Ausgabe	23.12.2019 6:41	SWR-Nexion.T3001				
D39PK						Projekt

Circuit diagram (SWR sensor):



Modellab	124_007	Datent.	Zeichner	Blatt	1
Änderung	20.11.2019	22:08	Titel		
Ausgabe	23.12.2019	16:37	SWR-Nextion T3001		
Projekt					

Layout and assembly plan

