Fast-Installation-Tester FIT-USB

Quick Start Guide (Software Version 1.05)

RF – Head

- Directional Coupler in the range of 25 MHz to 3000 MHz available.
- Power Measurement in the range of 0,1mW to 300W.
- Simultanious reading of Power and VSWR.
- Measures CW and Burst Power.
- Automatic Identification of CW, GSM, TETRA und DMR.
- VSWR Measurement.
- User Offset in 0,1 dB Steps.
- USB Functionality for PC - or FIT – Viewer operation.

FIT – Viewer

- Handheld for battery powered RF – Head usage.
- Min. / Max. – Memory.
- DC-Voltmeter with History Buffer.
- Easy data exchange and firmware update via USB – Flash Drive.

	Parameter	RF - Head 1G030	RF - Head 1G300
General Data	**Power Range**	1,0 mW to 30 W 0,1 mW to 3 W [3]	10,0 mW to 300 W
	Uncertainty	< 1,0 dB [1] [2]	< 1,0 dB [1] [2]
	Frequency Range	25 MHz to 1000 MHz	25 MHz to 1000 MHz
	SWR (50 Ω)	1,10 to ∞	1,10 to ∞
	Insertion Loss	max. 0,1 dB	max. 0,1 dB
	Directivity	min. 30dB	min. 30dB
Resolution	**dBm**	0,1 dB	0,1 dB
	Watt	0,01 W (P < 30,0 W) 0,001 W (P < 10,0 W)	0,1 W (P ≥ 100,0 W) 0,01 W (P < 100,0 W) 0,001 W (P < 10,0 W)
	VSWR	0,01 (SWR < 2,0) 0,10 (SWR < 5,0) 0,50 (SWR < 10,0)	0,01 (SWR < 2,0) 0,10 (SWR < 5,0) 0,50 (SWR < 10,0)

1) Temperature Range 20°C to 25°C 2) Power 1,0 W (+30 dBm) 3) Only in 2 >1 Mode.

	Parameter	FIT – Viewer Handheld
General Data	**Voltage Range**	10V – 20V – 50V
	Uncertainty	< 1,0 % of voltage range
	Operation Time	Up to 8 hours
	Charge Time	< 4 hours
	Temperature range	Operating temperature +5…+45 °C (+41…+113 °F) Storage temperature -20…+60 °C (-4…+140 °F)

1. General Hints:

This device is equipped with a powerful Lithium-Polymer battery. Please take care of the special safety instructions.

Prior to first operation the device requires a full charge with the enclosed power adapter.
The end of the charge cycle is achieved, when the yellow Charge control LED turnes off.

2. Recalibrating the Battery Gas Gauge

In case of wrong battery lifetime readout a battery gas gauge recalibration can be carried out.
Please follow these step-by-step instructions:

1) First of all the device has to be discharged until it turns to Power Off state itself.
2) Connect the FIT-USB to your enclosed AC power supply unit. The yellow battery charging indicator should turn on.
3) Power on the device. Please note the blinking battery symbol on the display.
4) In the CONFIG menu please set the AUTO PWRDOWN to OFF.
5) The FIT-USB has to stay in Power On state until the battery is fully charged. In this case the yellow battery charging indicator turns off and the battery symbol on the display stops blinking.
6) Now your battery lifetime readout should be valid.

3. Operation:

Operating FIT-USB is very easy and intuitive. The touchscreen supports the easy to use concept, too. Every Menu can be activated with a short fingertip on the display. You may use a touch pen as well. After Power On the Main Menu is shown:

RF Measurement Menu

Voltage Measurement

Configuration Settings

Identification Number for Saving Measurement Data

File Menu

Info Menu

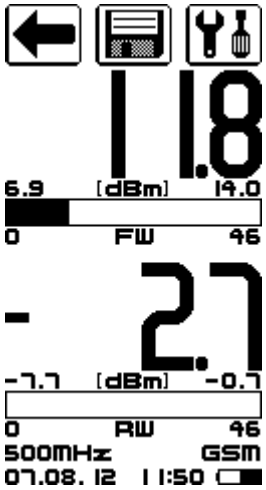
Date, Time, Battery

4. RF Measurement Menu [RF]:

Please connect the FIT-USB RF Head with the FIT-USB Handheld prior to activating the RF Menu. After touching the RF Button following menu shows up:

Back

Store



Setup (RF)

Forward Power

Peak Buffer for current measurement
Bargraph for Forward Power

Reverse Power

Peak Buffer for current measurement
Bargraph for Reverse Power

Back:	Back to main menu.
Store:	Stores the actual measurement values in a .csv file and a screen shot in a .bmp file.
Setup (RF):	Setup Menu for RF Measurements.
Forward Power:	Displays the current Forward Power readout. Unit change (dBm or Watt) can be achieved by touching the Forward Power readout on the display.
Peak Buffer:	The device stores minimum and maximum values of the current measurerment. Touching the bargraph results in a reset of the Peak Buffer. A Peak Buffer reset writes the current measurement readout into the min. and max. value.
Bargraph:	This bargraph is helpful with fluctuating measurement readouts.
Reverse Power:	Displays the current Reverse Power readout. Unit change (dBm or Watt) can be achieved by touching the Reverse Power readout on the display. Touching the Reverse Power readout on the display once more changes this measurement readout to VSWR.

Example: This setting shows Forward Power readout in Watt and VSWR instead of Reverse Power.

Back

Store

Setup (RF)

Forward Power

Peak Buffer for current measurement
Bargraph for Forward Power

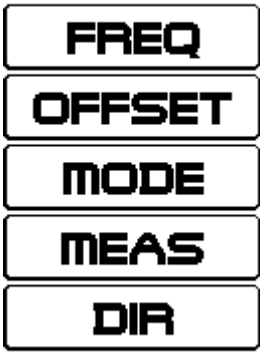
VSWR

Peak Buffer for current measurement
Bargraph for Reverse Power

5. Setup (RF):

Touching the Setup Button in the RF Menu activates the Setup (RF) menu:

Back



Frequency to be measured.

Offset in dB, e.g. to compensate cable losses.

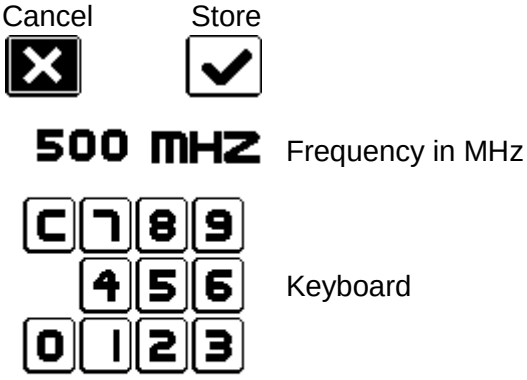
Measurement Mode selection (OFF, AUTO, GSM, TETRA, DMR)

Measurement selection (AVER, MBAV)

Direction selection(1 > 2 oder 2 > 1)

5.1. Frequency Selection [FREQ]:

Enter the frequency to be measured. This entry increases measurement accuracy. After entry touch the Store Button to save the frequency permanently.

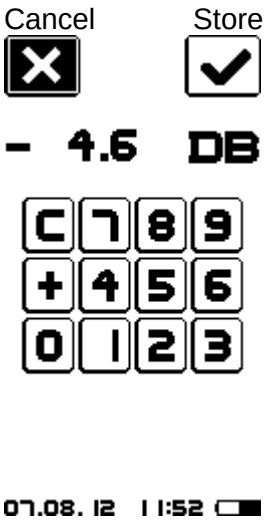


Frequency in MHz

Keyboard

5.2. Offset Setting [OFFSET]:

By entering an offset in dB cable losses can be taken into account. After entry touch the Store Button to save the offset permanently.



5.3. Measurement Mode [MODE]:

Measurement Mode selection specifies the modulation standard for measuring burst power. Wrong mode selection results in a power measurement error. In AUTO mode the device is able to recognize the standard itself. Please be aware of slightly longer measurement cycles due to the additional search mode.
CW mode deactivates the burst mode and the device uses a average mode for the supplied signal. This is used to measure continuous wave (CW) signals.

	Back
AUTO	Automatic Burst Power mode (only modulated signals)
GSM	Burst Power according to GSM standard
TETRA	Burst Power according to TETRA standard
DMR	Burst Power according to DMR standard
CW	Burst Power deactivated (only unmodulated signals)

5.4. Measurement [MEAS]:

This setting changes between Average Power measurement [AVER] and Burst Average Power measurement [MBAV].

Back

Average Power (Average)

Burst Average Power (Burst Average)

Peak Power

Hold-Mode, wait for Trigger

5.5. Direction [DIR]:

This setting changes the measurement direction of the RF Head.

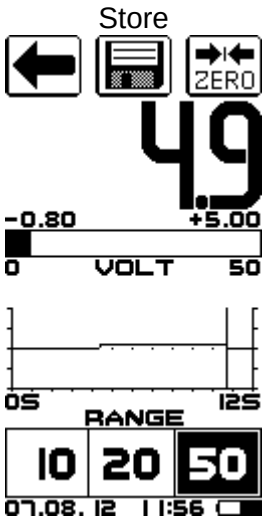
Back

Direction 1 > 2 (Default setting)

Direction 2 > 1

6. Voltage Measurement [VOLT]:

For zeroing, please connect both voltage inputs (black, red) with a appropriate cable and touch the [ZERO] button.



Zeroing

Voltage Readout

Peak Buffer for current measurement
Bargraph for Voltage

History for past 12 seconds

Range 10V, 20V, 50V

7. Menu [CONFIG]:

Back

Activate / deactivate Touch Beep

Automatic Power Down after 10 minutes idle mode

Date and Time setting

Backlight setting

8. Identification Number for storing measurements [ID.NR]:

In this menu you can enter a 8-digit Identification Number for storing measurement data. Everytime a measurement is stored, the device creates two files. One file contains the measurement data (.csv) the other contains the graphic with a screenshot (.bmp). For each Identification Number 100 measurement sets can be stored. These measurement sets start at 00 and are auto incremented up to 99.
Screen shot graphic is labeled with the Identification Number in the following form.
[the IdentificationNumber.MeasurementSet]

Example: 12345678.00 is the first measurement set for the Identification Number 12345678
Example: 12345678.01 is the second measurement set for the Identification Number 12345678

All data are hold on the FIT-USB handheld and can be transferred on a USB-Flash Drive after completing measurements.

9. File Menu [FILE]:

Transferring the stored measurements to a PC for further process, it is required to insert a USB-Flash Drive into the USB-FIT Handheld.

Back

Transfer all stored measurements from Handheld to the USB-Flash Drive.

Attention: All stored measurements on the Handheld are deleted!

10. Menu [INFO]:

Back

Software Version Handheld (View)

Software Version Display (Disp)

Software Version RF-Head (Head)

Type RF-Head

Factory Preset

11. Menu UPDATE:

FIT-USB Handheld is easy to update firmware using a USB-Flash Drive. It is necessary to copy the firmware files onto USB-Flash Drive first.
There are three different firmware files:

FIT_VIEW.BIN	Firmware for Handheld (Viewer)
FIT_DISP.BIN	Firmware for intelligent Touch Display
FIT_HEAD.BIN	Firmware for RF-Head (Head)

Correct recognition of the firmware files requires the firmware files to be copied into the root directory of the USB-Flash Drive without changing the filenames.

After inserting this USB-Flash Drive into a powered on handheld, the device recognizes the firmware files automatically and shows the Update Menu:

Depending on the number of files (one, two or all three of them) on the USB-Flash Drive, the Update Menu shows up with different options.

Back to main menu.

During FIT-USB handheld update the green USB control light near the USB-Flash Drive flashes. Never unplug the USB-Flash Drive during update process !

A RF-Head update requires the RF-Head to be connected to the handheld device.

In the unlikely case of update failure, there is an emergency update possibillity:

- Turn handheld off.
- Insert USB-Flash Drive with firmware file FIT_VIEW.BIN.
- Turn handheld on.
- Wait fort he Update Menu showing up before removing the USB-Flash Drive.

12. Safety Instructions:

This device has been built and tested in accordance with the EU certificate of conformity and left the factory in a safe condition. To retain this condition and to ensure hazard-free operation, the user must comply with all instructions, warnings and warning markings.

Symbols used on Schomandl devices and in descriptions:


Follow the operating instructions


Earth conductor connection point, ground connection points, caution!


Hazardous voltage on physical contact


Electrostatic sensitive components, requiring special handling


Caution Earth!

1. The device may only be operated in the operating states and positions stated by the manufacturer (ensure adequate ventilation). The following applies: IP protection class 2X, degree of soiling 2, overvoltage category 2. The power supply unit is for indoor use only. The device may be used outdoors for a brief time, provided it is protected against rain and moisture, at altitudes up to 2000 m above mean sea level. The power supply unit may be not be operated on mains supplies with fuse ratings greater than 16 A. Unless stated otherwise on the data sheet, a tolerance of ± 10 % applies to the mains voltage and a tolerance of ± 5 % to the mains frequency.
2. Where measurements are taken on circuits with voltages Ueff > 30 V, precautions must be taken using suitable measures to exclude any hazard to persons (e.g. suitable measuring equipment, fuse protection, current limitation, isolation, insulation, etc.).
3. Ensure by means of suitable overvoltage protection and earthing that the device cannot be exposed to overvoltage (e.g. due to electrical storms). Otherwise there is a risk of electric shock to the operating personnel.
4. If a device is installed in a fixed position, the connection between the earth conductor connection on site and the device's earth conductor must be made before any other connections. Installation and connection may be performed only by trained electricians.
5. If devices in a fixed installation have no integral fuse, circuit breaker or similar protective device, the supply circuit must be fused such that device and user are adequately protected.
6. Prior to switching the device on, check that the nominal voltage of the mains supply matches the nominal mains voltage stated on the external AC power supply unit.
7. Where devices of protection class I are fitted with a flexible mains cable and mains plug (external AC power supply unit from the scope of supply), operation is permissible only by connection to wall socket outlets with an earth contact and wired-in earth conductor.
8. Intentional interruption of the earth conductor, either in the supply cable or in the device itself, is not permissible and can result in dangerous voltages at the device. If extension cables or socket strips are used, these must be checked for safe condition at regular intervals.
9. If the device is not fitted with a mains switch for mains disconnection, the plug on the connecting cable should be considered a mains power disconnection element. In such cases it must be ensured the mains plug is easily accessible at all times. Function switches or electronic switches are not suitable for mains isolation. If devices without a mains switch are integrated into racks or system, the mains power disconnection element must be moved to the system level.

10. Never use the device if the mains cable is damaged. Regularly check that the mains cable is in good condition. Take appropriate safety precautions and lay the mains cable so that it cannot be damaged and that no-one can be injured by stumbling over it or by suffering an electric shock from it. During all work, comply with local and national health, safety and accident prevention regulations.
11. Prior to working on the device or opening it, isolate it from the mains supply. Calibration, replacement of parts, maintenance and repair may be undertaken only by trained electricians. If safety-related parts (e.g. mains switches, mains transformers or fuses) are replaced, they must only be replaced with original spare parts. A safety test must be performed after any replacement of safety-related parts (visual inspection, earth continuity test, insulation resistance test, leakage current test and test for correct operation).
12. If connections are made to information technology devices, it must be ensured they comply with EN 60950.
13. Do not place the device on equipment that generates heat. The ambient temperature must not exceed the maximum specified in the operating manual.
14. Do not insert any objects other than those for which the device is intended into the openings in the casing. Never pour any sort of liquids over or into the casing. Doing so can cause short circuits within the device and/or electric shocks, fire or injuries.
15. Lithium batteries must not be exposed to high temperatures or fire. Keep batteries out of reach of children. If a battery is replaced incorrectly, there is a risk of explosion. Replace the batteries only with the original type (see list of spare parts). Lithium batteries are hazardous waste. Only dispose of them in containers provided for this purpose. Do not short-circuit batteries.
16. Devices that are returned or sent for repair must be packed in the original packaging or in packaging that provides protection against electrostatic charges and discharges as well as against mechanical damage. When returning the unit remove the fuse so that the unit cannot be switched on accidentally!
17. Electrostatic discharges via plug connectors can damage the device. The device must be protected against electrostatic discharge in use and operation.
18. Use a soft lint-free cloth to clean the exterior of the device. Under no circumstances use solvents such as nitro-cellulose thinners, acetone or the like, as these can remove the markings from the front panel or damage plastic parts.
19. Note that in the event of fire, poisonous substances (gases, liquids etc.) can escape from the device; these substances can be hazardous to health.
20. The handles on the device are provided exclusively for use by persons handling the device. It is therefore not permissible to use these handles for securing the device. Disregard of this instruction can lead to damage to equipment and injuries to persons.
21. If the device is transported or used in a vehicle, the driver bears sole responsibility for driving the vehicle in a safe manner. Adequately secure the device within the vehicle so as to prevent injuries or damage of any sort in the event of an accident. Never use the device in a moving vehicle if this may distract the driver of the vehicle. The responsibility for the safety of the vehicle rests with the driver of the vehicle at all times. The manufacturer accepts no liability for accidents.
22. Additional safety instructions in the operating manual for the device should also be complied with.

Customer information in respect of the battery regulations (BattV)
This device contains a battery which incorporates hazardous substances. It must not be disposed of in domestic waste. At the end of its working life it should be disposed of only through the manufacturer or at a designated collection point.

Service

The FIT USB requires no regular service of maintanance, however should you experience any malfunctions, the instrument may be returned for service according to the service agreement you have chosen.

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