FieldMan

Measurement Device for Electromagnetic Fields

User manual

narda
Safety Test Solutions

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1 About this product

In this chapter you will find some useful information about measuring electromagnetic fields, about the Narda FieldMan and about the probes.

1.1 About the measurement of electromagnetic fields

In the modern world, people live and work virtually permanently in the vicinity of technical equipment that generates electromagnetic fields. With increasing research into their effect on humans, there is an increasing awareness of the problem and availability of information on this topic. Limits have long since been defined by various bodies to protect users from exposure to emissions.

1.2 About the Narda FieldMan

1.2.1 Features

The Narda FieldMan measures non-ionizing radiation and low frequency fields with the highest accuracy. With its digital measuring probes for electric and magnetic field strengths, the instrument covers the range from static and low-frequency fields in medical and industrial applications to mobile phone frequencies and millimeter waves. Both broadband HF probes with a flat frequency response and “shaped probes” are available, which evaluate the field strength according to a personal protection standard. Probes with integrated FFT analysis allow spectral measurements and analysis in the time domain up to frequencies of 400 kHz. All probes have a digital interface that transmits the measurement data to the base unit without interference. This eliminates the need for calibration of the base unit.

The newly developed, extremely powerful Narda-TSX PC software is available for evaluating and documenting the measurement results, media and other information. It is Narda's new software platform that will support other Narda products in the future in addition to FieldMan. The firmware update is also performed via the PC software
(see *11 PC software and updates on page 113*).

1.2.2 Device versions

FieldMan is offered in two different device versions:

- **2460/01:** This Version is prepared for radio operation via WiFi and Bluetooth and may only be imported and operated in countries with valid radio approval.
- **2460/02:** This version does not contain any radio components (radio free) and may be imported and operated without restriction. This device version also does not have a microphone, which means that it is not possible to record voice comments.

1.2.3 Applications and standards

The FieldMan enables precision measurements to ensure the safety of people, especially in working environments where high electric or magnetic field strengths are expected. A key task is to demonstrate compliance with general safety regulations such as FCC, IEEE, ICNIRP or the EMF Directive 2013/35/EU. Examples of measurement environments are:

- Broadcast transmitters (e.g. IEC 62577)
- Radio base stations (e.g. IEC/EN 62232)
- Induction heating and melting (e.g. EN 50519)
- Household appliances (e.g. IEC/EN 62233)
- Electric welding equipment (e.g. IEC/EN 62822)
- Railroad environment (e.g. EN 50500)
- Vehicle environment (e.g. IEC 62764)
- Power supply systems (e.g. IEC/EN 62110)
- Medical electrical equipment (e.g. IEC/EN 60601)
- TEM cells and absorber chambers for the verification of electromagnetic compatibility (EMC)

1.3 Supported probes

A variety of isotropic field probes are available for the FieldMan. All of them transmit their information and measurement data as a digital signal to the FieldMan, either via an electrical USB interface or via an optical COM interface. In this way, interference is almost completely eliminated compared to high-impedance analog interfaces. The specially developed screw connectors and electrical contacts are extremely robust and resistant. The probes are automatically detected after connection to the FieldMan.

The characteristics of the probes are listed in the respective data sheet. The following probe types are supported:

- Broadband probes with digital interface for FieldMan (P/N 2462/xx)
- Selective probes with digital interface for FieldMan (P/N 2463/xx)
- EHP-50F and EHP-50G field analyzers with optical interface (P/N 2404/xxx)
- HP-01 magnetometer with optical interface (P/N 2405/xxx)

1.4 Technical Data

The technical data for the FieldMan and the Repeater can be found in the respective data sheet on the Narda website at www.narda-sts.com

2 General safety instructions

This chapter contains important information on the safe use of the FieldMan. You should therefore read this chapter carefully and follow the instructions given.

2.1 Using these operating instructions

⇒ Read these operating instructions carefully and completely before working with the device and follow all instructions.

⇒ Keep these operating instructions at hand so that they are always available to all users when working with the device.

⇒ Only pass the device on to third parties together with these operating instructions.

2.2 Applicable documents

⇒ Pay particular attention to the **General Safety Instructions** supplied.

2.3 Intended use

The Narda FieldMan is used to measure and evaluate electromagnetic fields.

⇒ Only operate the device under the conditions and for the purposes for which it was designed.

⇒ Pay particular attention to the technical specifications in the data sheet for the device.

Intended use also includes the following:

⇒ Observe the national accident prevention regulations at the deployment location.

⇒ The device may only be operated by appropriately qualified and trained personnel.

2.4 Non-intended use

The Narda FieldMan is not a warning device that actively warns of the existence of dangerous fields by means of visual or acoustic signals.

⇒ Always consider the device as a measuring device, never as a warning device.

⇒ Only approach unknown field sources while carefully observing the current measured value display.

⇒ In case of doubt, use an additional warning device such as **RadMan** or **Nardalert** from Narda Safety Test Solutions.

2.5 Dangers due to electromagnetic fields

2.5.1 Strong fields

Very strong electromagnetic fields occur near many radiation sources.

⇒ Observe safety barriers and markings.

⇒ In particular, persons with electronic implants must keep away from dangerous areas.

2.5.2 Undervaluation of the field strength

Metallic stickers in the sensor area of the probe can lead to measurement errors, especially to undervaluation of the electromagnetic field strength.

⇒ Attach all types of stickers to the black probe shaft only.

⇒ An automatic self-test function can detect any probe faults, alerts the user and does not allow further measurement in case of serious faults. In case of doubt, a suitable test source can also be used for checking.

⇒ If a malfunction is suspected, take the unit out of operation and contact your Narda service center. Addresses can be found at the end of these operating instructions and on the Internet at www.narda-sts.com.

2.6 Correct handling of rechargeable batteries

Rechargeable batteries can overheat, explode or ignite if handled incorrectly.

⇒ Observe the following notes when handling rechargeable batteries:

- Always handle the rechargeable battery with care.
- Do not drop, damage or expose the rechargeable battery to excessively high temperatures.
- Never store the rechargeable battery under very high temperatures (e.g. in the car) for more than one to two days.
- Never leave the discharged rechargeable battery in the unused measuring instrument for a long time.
- Never store the rechargeable battery for more than six months without charging it in between.
- Close the rechargeable battery compartment again after replacing the rechargeable battery and never operate the FieldMan with the rechargeable battery compartment open.
- Defective rechargeable batteries are special waste and must therefore not be disposed of with the usual household waste.
- Observe the national regulations for the disposal of rechargeable batteries.

3 About this operating manual

This chapter contains information on the structure and layout of the operating instructions.

3.1 Structure of the operating instructions

These operating instructions are divided into the following main sections:

- **General operation:** Here you will find basic operations such as switching on and off.
- **Device settings (DEVICE SETTINGS):** Device settings describes all settings that relate to the device in general.
- **Operating modes:** The operating modes and the operating mode-specific settings (**MEASUREMENT SETTINGS**) are described here.
- **DATA LOGGER:** In this chapter you will find all of the information about retrieving stored measurements.
- **Cross-mode functions:** Some functions affect several or all operating modes. These functions are described here.

3.2 Language of the user interface

In these operating instructions, screen contents are presented in English. However, the user interface of the FieldMan can also be displayed in other languages
(see *4.8.2 Selecting the language of the interface on page 30*.

⇒ Please note that in this case the displayed terms differ from those described.

3.3 Characters and symbols used

In these operating instructions, various elements are used to indicate special text meanings or especially important text passages.

3.3.1 Symbols and signal words in warning instructions

In accordance with American National Standard ANSI Z535.6-2006, the following warning instructions, symbols and signal words are used in this document:

	In combination with the signal words **CAUTION**, **WARNING** and **DANGER**, the general danger symbol warns of a risk of serious injuries. Observe all the following instructions to avoid injuries or death.
NOTICE	Indicates a danger that will result in damage to or destruction of the device.
CAUTION	Indicates a danger with low to moderate risk of injury.
WARNING	Indicates a danger that may result in death or serious injury.
DANGER	Indicates a danger that will result in immediate death or severe injury.

Structure of the warning instructions

All warnings are structured as follows:

⚠ SIGNAL WORD

Type and source of the danger

Consequences resulting from non-observance

⇒ Action for danger avoidance

3.3.2 Symbols and text markings in the document

Symbol	Meaning
✓	**Prerequisite** Indicates a prerequisite that must be satisfied before one of the following actions is performed, e.g.: ✓ The device is switched off.
⇒	**Action** Indicates a single action, e.g.: ⇒ Switch on device.
1. **2.** **3.**	**Sequence of actions** Indicates a sequence of actions that must be performed in the specified order.
↳	**Result** Indicates the result of an action, e.g.: ↳ The device starts a self-test.
Bold text	**Controls and display elements** Identifies controls and display elements, e.g.: ⇒ Press **ENTER** key.

3.3.3 Terms and abbreviations

Term	Meaning
Rechargeable battery	Rechargeable battery
Battery	Non-rechargeable battery
SK1 – **SK4**	Softkey 1 – Softkey 4

4 Connection and commissioning

This chapter provides information about the connection options of the Narda FieldMan, gives instructions for commissioning and describes the connection options.

4.1 Unpacking

ATTENTION

Device/accessories damaged during transport

Commissioning of damaged equipment/accessories may cause consequential damage.

⇒ After unpacking, check the device and all accessories for any damage that may have occurred during shipping.

⇒ In case of damage to the device or components, contact your Narda service center. The addresses of your Narda service center can be found at the end of these operating instructions manual and on the Internet at www.narda-sts.com.

4.1.1 Packaging

The packaging is designed so that it can be reused if not damaged during a prior transport.

⇒ Do not throw away the packaging and use the original packaging for all further transportation.

4.1.2 Package contents

⇒ Check the delivery for completeness.

- **Narda FieldMan**
- Rechargeable battery (already inserted)
- Case
- Probe (type and quantity according to order)
- Charging power supply
- Shoulder strap
- USB cable
- Bag with 5 colored marking rings for broadband probes
- PC software (free download from www.narda-sts.com)
- General safety instructions
- Operating instructions on USB stick
- Calibration certificate (for probes)

4.2 Equipping the case

In addition to the components included in the scope of delivery, numerous other optionally available accessories can be stored in the supplied case. The following diagrams show the distribution in the top and bottom of the case.

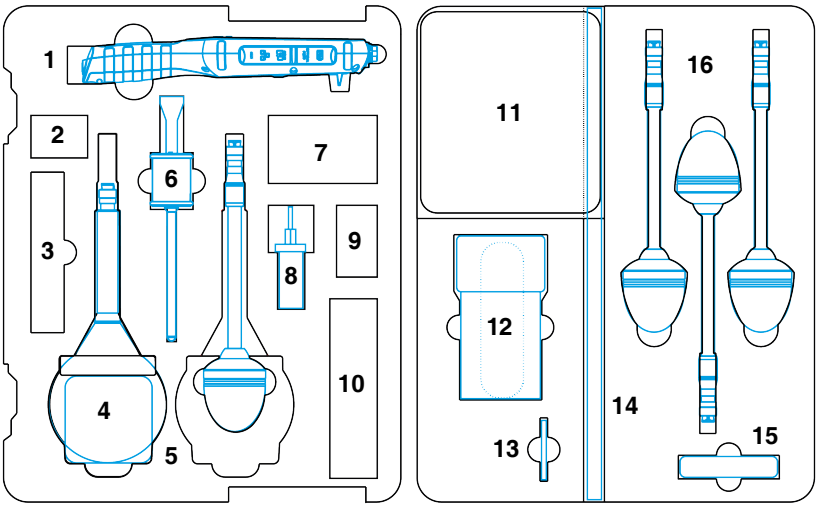


Fig. 1: Case with equipment

1 FieldMan
2 Small parts and bag with marking rings
3 Shoulder strap (2244/90.49)
4 EHP-50F
5 Suitable for all probes
6 HP-01
7 EHP/HP-01 charging power supply with country adapter (2259/92.08)
8 FieldMan charging power supply (2259/92.29)
9 Country adapter for FieldMan charging power supply
10 EHP-50 table-top tripod (2404/90.02) or Digital Broadband Probe Repeater (2464/01)
11 Folding bag for USB cable, optical cables, safety instructions and USB stick
12 RadMan belt bag (2250/92.06)
13 O/E converter (2260/90.06)
14 Tripod extension (2244/90.45)
15 Test generator (2244/90.38) (no longer available)
16 Broadband probes

4.3 Device overview

Fig. 2: Device overview FieldMan

1	**Connector plug for probes** With USB-C socket
2	**Elements in the header area (from left)** • **Status LED** Operating display and charging status (see *5.2 LED display on page 36*) • **Brightness sensor** • **Microphone (2460/01 only):** for recording comments, **humidity sensor** • **Loudspeaker:** for playback of recordings
3	**Display** Display area with LEDs for the operating and charging status (top) and the softkey fields.
4	**On/Off key**
5	**Keypad** With the soft keys, cross key, Back and Save key
6	**Tripod connection** With thread (1/4-inch 20-thread UNC) for vertical mounting on a tripod
7	**USB-C socket** For charging the rechargeable battery, remote control and data transmission
8	**Optical port** For connecting components (e.g. EHP-50F/G, HP-01)
9	**Memory card (micro SD)** For saving measurement data, setups, user standards and media files
10	**Network connection** Gigabit Ethernet LAN connection for remote control and data transmission
11	**Auxiliary** MMCX connector (for future applications)
12	**Flap** • Closed: to store the device with small probes • Opened: to store the device with large probes **Ultrasonic range finder (flap open)** For distance measurement in conjunction with the **GNSS/Range Finder** option
13	**Tripod connection** With thread (1/4-inch 20-thread UNC) for horizontal mounting on a tripod
14	**Battery compartment** ⇒ To change the rechargeable battery (see *12.2 Replacing/removing rechargeable batteries on page 119).*

4.4 Power supply/rechargeable battery operation

This device uses a rechargeable Li-ion battery pack, which is installed and pre-charged in the device. The included USB-C Power Delivery charger (12 V, 3 A) enables fast charging of the built-in rechargeable batteries. A full charge takes place within 4 hours, with 80% of capacity reached after just 2.5 hours.

4.4.1 Operation with charger connected

Measuring with the charger connected can influence the measurement properties. This means that compliance with the technical data is no longer guaranteed.

With the above restriction, the FieldMan can be powered from any USB interface that supplies a current of at least 1 A. Operation is then also possible without a built-in rechargeable battery.

⇒ Use a floating power supply for long-term operation, e.g. a suitable power bank (PD 12 V, 2.5 A, BC1.2 and QC3.0).

⇒ To ensure compliance with the permissible radio interference emissions, use only the supplied charging power supply or the car charger (optional accessory) from Narda.

4.4.2 Operation with rechargeable battery

⇒ Fully charge the rechargeable battery pack before commissioning.

Charging rechargeable batteries

If the device is not expected to be used for several months:

⇒ Charge the device before storage to avoid deep discharge.

Starting the charging process:

1. Plug the included USB-C charging power supply with the matching country adapter into a power outlet.
2. Connect the FieldMan with the supplied USB-C cable.
   ↳ The charging process begins.

Not all USB-C cables support fast charging with Power Delivery.

Display of rechargeable battery and charge status

The charge status is indicated by the status LED:

- Rechargeable batteries are being charged: Status LED lights up **red**.
- Rechargeable batteries are charged: The device automatically switches to trickle charge, status LED lights up **green**.

In addition, the display shows the rechargeable battery capacity as well as the charging or rechargeable battery mode:

- **Device on:** Rechargeable battery capacity in percent and charge status are displayed in the upper right corner (see *5.5 Status bar symbols on page 39*).
- **Device off:** When charging begins, the current charging process, the capacity and the charging mode are displayed for approx. 1 minute.
  - **Fast Charging**: Fast charging
  - **Charging**: Normal charging

⇒ Activate the display again by pressing any key.

4.5 Connect probe

Probes can be connected directly to the probe connector on the top of the FieldMan or to the optical input:

- **Connection at the probe connector:** All digital HF and LFFieldMan probes
- **Connection at the optical input:** HP-01 and EHP-50F/G field analyzers, Digital Broadband Probe Repeater (see chapter *4.6 Operate probe via repeater on page 26*)

4.5.1 Connect the probe to the probe connector

1. Hold the probe so that the lug on the probe connector faces the groove in the socket on the top of the instrument.
   NOTICE Do not push in the connector by force. Check position of lug and groove.
2. Insert the probe connector straight into the probe socket all the way from the top.
3. Tighten the locking nut finger-tight. Do not use tools.

Removing the probe:

⇒ Loosen the locking nut and pull the probe upwards and out at the metal plug.

4.5.2 Connecting the probe to the optical input

The HP-01 and EHP-50F/G field analyzers are connected to the optical input of the FieldMan. A suitable optical cable is included with the probes.

Connecting a probe:

1. Go to **GENERAL SETTINGS** > **CONNECTIVITY** > **OPTICAL INTERFACE** and select **Probe**.
2. Connect a suitable probe via the optical cable to the optical connector on the FieldMan (see *Fig. 2:* **7**).

⇒ For more information on using a probe via the optical link, refer to the operating instructions for the probe.

4.5.3 Attaching marking rings

Broadband probes are provided with a groove for a marking ring in the area of the connector. Probes are generally supplied with a black ring. Users of different probes are offered the possibility to distinguish the probes more easily by attaching colored rings. The scope of delivery includes 5 colored rings for this purpose.

4.6 Operate probe via repeater

The optionally available Digital Broadband Probe Repeater (hereinafter referred to as repeater) converts the digital electrical signal of a connected FieldMan broadband probe into an optical signal. The optical signal is transmitted to the FieldMan via an optical fiber. In this way, distances of up to 50 m to the measurement location can be bridged without interference.

The particularly high irradiation resistance of the housing enables measurements even at extremely high field strengths where people are not allowed to be present. Due to the digital interface of the FieldMan probes, the intermediate repeater has no influence on the measurement result and makes calibration unnecessary.

As an alternative to the FieldMan probes, NBM probes with an additional A/D sample converter can also be connected.

4.6.1 Repeater device overview

1 **Connector plug for probes**
2 **Charge status display**
3 **Status LED**
4 **On/Off button**
5 **Tripod connector** (thread1/4-in,
6 20-turn UNC female thread)
7 **USB-C jack** (charging port)
8 **Optical interface**

4.6.2 Repeater battery charging

A rechargeable battery is used in the repeater. The battery is permanently installed and cannot be replaced. Charging is done via the USB-C port on the bottom. The battery's runtime is up to 130 hours. The device switches off automatically when the charge level drops below 3%

Measuring with a charger connected can influence the measuring characteristics. This means that compliance with the technical data can no longer be guaranteed.

Start the charging process:

1. Plug the FieldMan USB-C charger or a comparable power supply unit (5 V / 2 A) with a suitable country adapter into a power outlet.
2. Connect the repeater to the power supply unit via a USB-C cable.
   ↳ The charging process begins.

Charging time is approx. 3 hours from 0 - 80 % and 4.5 hours to 100 %.

Charging process indicator:

- Red: Battery is charging
- Green: Battery is fully charged

Battery charge status display:

- 1 LED: < 25 %, 2 LED‘s: 25 – 50 %, 3 LED‘s: 50 – 75 %, 4 LED‘s: > 75 %

4.6.3 Connect repeater

Connect the probe to the repeater:

Connecting a probe to the repeater is identical to the FieldMan.

⇒ See chapter*4.5.1 Connect the probe to the probe connector on page 25*

Connect the repeater to the FieldMan:

The connection to the FieldMan is made via an optical cable. Optical cables up to a length of 50 m are available from Narda.

⇒ Plug the optical cable into the repeater and the FieldMan. Make sure that the plugs are inserted in the correct direction and that you can feel them click into place. For the repeater, the plug must be inserted the other way round, with the recessed grip pointing downwards. Symbols on the device indicate the position of the flattened connector pins.

4.6.4 Operate repeater

Switch repeater on/off:

⇒ Switch on: Press on/off button briefly.

↳ Status LED and battery charge status LEDs light up. The repeater is in operation.

⇒ Switch off: Press the On/Off key for a long time (> 1 s).

↳ Status LED and battery status LEDs go out. The repeater is switched off.

4.7 Test probe

After connecting a probe to the probe connector, a self-test is automatically started. The digital part, the analog part and the measuring sensors of the probe are checked for correct function. If a fault is detected that could affect the measurement, a corresponding message is displayed and measurements are not possible.

⚠ WARNING

Probe is not working properly

Due to a defective probe, any high radiation levels that may be present cannot be detected.

⇒ Observe the information displayed during and after the self-test of a probe. If there is any doubt about the correct functioning of the probe, a suitable test source can be helpful to check the probe.

⇒ In order to make the correct probe selection, you should always obtain knowledge of the expected frequency and field strength before starting a measurement.

4.8 Initial commissioning

4.8.1 Switch on the device

NOTICE

Damage to a device covered in dew during commissioning

A device stored or transported at low temperatures may become covered in dew when brought into a warm room. If it is put into operation in this condition, it may be damaged.

⇒ To prevent damage, wait until all dew on the surface of the device has evaporated.

⇒ The device is not ready for operation until it has reached the operating range of ?20 to +50 °C.

The device is switched on via the **Power** key on the left side of the housing.

⇒ Press **Power** key for > 1 s to switch on the device.

↳ After the system start, the device is ready for operation.

Change settings:

⇒ During initial commissioning, change the following settings if necessary:
- The language of the interface
- Local time
- Time zone
- Country of use (for WiFi/Bluetooth option)
- Type of data storage: **internally** or on **memory card.** Memory card is recommended and the default setting.

4.8.2 Selecting the language of the interface

1. Press **SK4** to open the device settings.
2. Under **GENERAL SETTINGS** > **Language**, select the language (see *7.3.1 DISPLAY on page 49*).

4.8.3 Setting the local time and time zone

1. Press **SK4** to open the device settings.
2. Under **POSITION AND TIME** > **DATE / TIME** > **Time**, set the time, under... > **Time Zone**, set the time zone (see *7.6.3 DATE / TIME on page 53)*.

4.8.4 Selecting the country of use (for WiFi/ Bluetooth option)

The WiFi/Bluetooth option is only available with the device version 2460/01.

During the initial start-up and after a factory reset, a selection list of the countries for which a radio licence exists appears. Then select the country in which the device will be operated. The country selection configures the radio module for this region and selects the corresponding radio standard.

The device may only be operated with the correct country setting! Operation of the radio module in countries not listed is not permitted.

Select the country of use:

✓ The device is being operated for the first time or a factory reset has been performed.

⇒ On the start screen, select the country of use from the drop-down menu and confirm with **OK**.

Changing the country setting at a later date:

A factory reset must be performed for this purpose.

1. Press **SK4** to open the device settings.
2. Perform the reset under **GENERAL SETTINGS** > **DEVICE** > **Factory Reset** (see *7.3.5 DEVICE on page 51*).
3. On the start screen, select the country of use from the drop-down menu and confirm with **OK**.

5 Controls and display elements

In this chapter you will find descriptions of the device with its connections and keys as well as the display.

5.1 Controls


1
2
3
4
5
6
narda
Safety Test Solutions
14:05:00
2021-05-12
100%
24°C 45% 1.6 m
EFD-0691
100 kHz - 6 GHz
E-Feld
ACTUAL
RMS
2.769
V/m
X 1.346
Y 0.893
Z 2.249
MAX 5.634
MIN 0.456
MAX AVG 4.691
AVG 3.335
V/m AVG
ACT
6.0
5.0
4.0
3.0
2.0
1.0
0
-120
-90
-60
-30
0 s
FS

No.	Description
1	**Status LED** Operating display and charge status (see *5.2 LED display on page 36*).
2	**Power key** • **Switch device on/off:** Press and hold key > 1 s • **Screen saver:** With the device switched on, briefly press the key (see *6.2.2 Using the screen saver on page 43*) • **Hardware reset:** Press key for a very long time (> 10 s)
3	**Softkeys SK1... SK4: (from left to right)** Performs different functions depending on the associated screen display. The labeling mainly takes the form of symbols (see *5.6 Symbols of function keys on page 40*).
4	**Back key** Change back to the next higher menu level. However, a paused measurement remains in **HOLD** mode (display is paused). A long key press resets the measured values (**Reset Results**).
5	**Cross key ◄** Navigation in menus and input fields, move marker horizontally, change result type for large measurement display, peak marker to left.
	Cross key ► Navigation in menus and input fields, move marker horizontally, change result type for large measurement display, peak marker to right.
	Cross key ▲ Navigation in menus and selection lists, change values in selection fields, move peak marker to the next higher peak.
	Cross key ▼ Navigation in menus and selection lists, change values in selection fields, move peak marker to the next lower peak.
	Cross key ● Confirmation of a selection (**OK** key).
6	**Save key** A short key press saves the displayed measurement results, if desired also with a screen copy. A long key press saves a screen copy as a PNG file.

5.2 LED display

The device status is indicated via the 3-color status LED above the display.

When the device is switched on:

✓ The status LED immediately lights up red and signals the device response.

✓ The screen remains dark.

✓ Shortly after, the boot screen is displayed with the Narda logo and FieldMan lettering.

✓ After the operating system is loaded, the status LED lights up according to the following conditions:

USB connected

Device status	Display
Device off	**Red:** Device charging rechargeable battery **Green:** Rechargeable battery is full
Device on	**Red:** Device charging rechargeable battery **Green:** Rechargeable battery is full **Red flashing fast:** Fault, has priority over red

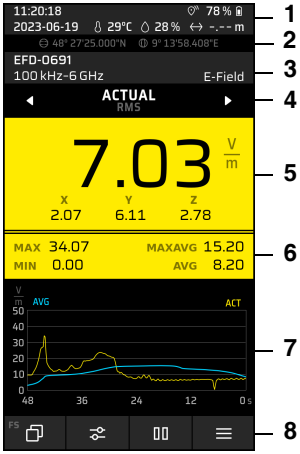
USB not connected

Device status	Display
Device off	LED off
Device on	**Yellow:** Power-On status **Red flashing slowly:** Rechargeable battery almost empty (operating time < 15 min), has priority over white **Red flashing fast:** Fault, has priority over red flashing slowly

Alarms or remote operation are indicated on the display and not via the status LED.

5.3 Display overview

The display is divided into different display areas:

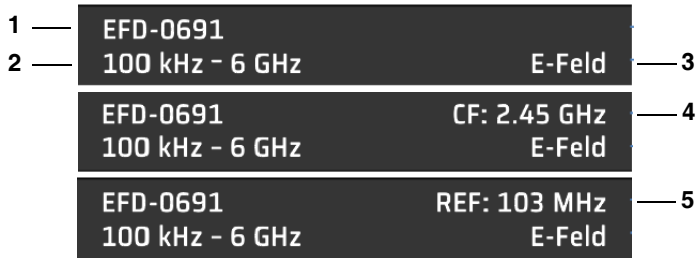


No.	Area	Description
1	Status bar	Time, alarm, GPS, BT, WiFi, charge status, mute, date, air temperature, humidity, distance meter
2	GNSS	Display of latitude and longitude when GNSS is switched on
3	Probe information	Probe model, charge status, correction frequency, frequency range/span, field type, filter setting, pulse detection (**Pulse Detection** = **On**, short integration time e.g. for radar signals)
4	Information about the measured values	Result type, detector
5	Main display of the measured values	Isotropic measured value (RSS) and measuring unit, measured values for spatial axes (if available)
6	Additional display of the measured values	Statistical measured values over the entire period of the measurement, depending on the operating mode
7	Measurement sequence or measurement graphic	Graphical display of measured values in the time or frequency range, bar display, or information on the measurement process
8	Function keys (softkeys)	**SK1** – **SK4**

5.4 Display of probe info on the display

The most important probe information and its settings are shown on the display during the measurement. This means that the result of a measurement can also be clearly assessed on the basis of a screenshot. Some examples of the probe info field are explained below.

HF broadband probes

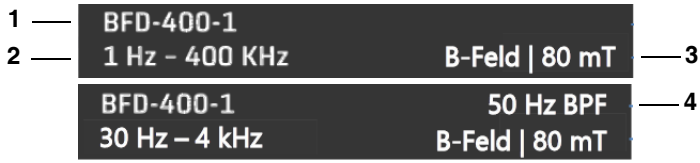


1 Probe model
2 Probe frequency range
3 Field type, filter setting, **Pulse** when pulse detection is switched on (probe-dependent)
4 Correction frequency
5 Reference frequency

EHP-50F/G and HP-01

1 Probe model
2 Configured span
3 Probe rechargeable battery charge
4 Field type and range

BFD-400



1 Probe model
2 Configured span incl. low-pass filter setting
3 Field type and range
4 Pass or stop filter

5.5 Status bar symbols

Symbol	Function	Symbol	Function	Symbol	Function
	Rechargeable battery charge full		WiFi switched on		WiFi connected
	Rechargeable battery charge half full		Bluetooth switched on		Bluetooth connected
	Rechargeable battery charge low		GNSS switched on, no position yet		GNSS position found
	Rechargeable battery charge critical		Speaker muted		GNSS signal lost, position frozen
	Rechargeable battery is charging		Alarm switched on		Memory card missing
	Ambient temperature		Relative humidity		Distance measurement

5.6 Symbols of function keys

Symbol	Function	Symbol	Function	Symbol	Function
	Operating mode[1)]		Zoom out		Add text comment
	Measurement settings		Axis selection		Edit text comment
	Menu		Exit		Upper case
	Pause		Edit or rename		Lower case
	Start		Confirm		Backspace
	Stop		Delete		Move data to another project
	Marker on/off		Activate timer		Jump to next record
	Peak marker on/off		Apply current time		Jump to previous record
	Zoom on/off		Record voice comment		Restart audio/video
	Zoom in or add		Edit voice comment		Stand-by (only for **TIMER LOGGING**)

*1) Initials indicate the active operating mode (e.g. FS = **FIELD STRENGTH**)*

6 General operation

In this chapter you will find information on the general operation of the FieldMan. Operating mode-specific operating instructions can be found in the descriptions of the respective operating mode.

6.1 The operating concept

The combination of the context-dependent softkeys (**SK1** - **SK4**) and the permanently assigned keys (**cross key**, **Back**, **Save**) enables intuitive and fast operation of the Narda FieldMan.

6.1.1 Basic functions of the softkeys

The softkeys **SK1** - **SK4** provide access to all instrument and measurement settings as well as to all measurement functions. At the top level, the softkeys **SK1**, **SK2** and **SK4** have identical functions in all operating modes. **SK3** has an operation-specific function (e.g. starting the measurement)

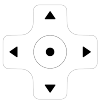
SK1	SK2	SK3	SK4
Operating mode selection	Measurement settings	Operating mode-specific function	Device settings

Display of the active function

The symbol above a softkey always shows the function that is activated when the softkey is pressed (i.e. not the one that is currently active), e.g.:

Key	Function
	The symbol indicates that pressing the softkey will turn on the marker (i.e. not that it is already on).

6.1.2 Functions of the fixed keys

Key	Function
	**Back**: Return from all submenus to the next higher level. Press and hold the button (> 2 s): reset the measured values.
	**Save**: Save measurements (short press) and screenshots (long press).
	**Cross key**: Navigate in menus, select entries, change values, change cursor position in a graphical display ● **key**: Confirm selection
	**Power**: Short press activates the screen saver

6.2 Basic operating steps

Even if some functions and displays differ in the various operating modes, the operation is basically identical. These identical functions and displays are described below. Differences and details can be found in the descriptions of the operating modes and the menus (e.g. **DATA LOGGER**).

6.2.1 Switching the device on/off

The device is switched on and off via the **Power** key on the left side of the housing.

Switch device on/off:

⇒ Press **Power** key and hold for > 1 s.

6.2.2 Using the screen saver

When the screen saver is activated, the screen is turned off, thus saving power. However, the device continues to measure normally. The screen saver can either be activated immediately by briefly pressing the **Power** key or configured via a timer in the device settings.

Activate/deactivate screen saver immediately:

✓ The device is switched on.

⇒ Press the **Power** key briefly (< 1 s).

↳ The screen is switched off.
The operating indicator (yellow LED) remains lit.

⇒ Press any key briefly to turn the screen back on.

Configure screen saver:

1. Press **SK4** to open the device settings.
2. Select **GENERAL SETTINGS** > **DISPLAY** > **Screen Saver**.
3. Select the desired time after which the screen saver is to be activated without pressing any keys (see *7.3.1 DISPLAY on page 49*).

⇒ If the screen saver was automatically turned off after the selected time, press any key briefly to turn the screen back on.

6.2.3 Selecting an operating mode

⇒ Press **SK1** [⧉], use the ▲▼ keys to highlight an entry, and use the ● key to select it.

⇒ For information on the operating modes, see *8 Operating modes on page 61.*

6.2.4 Changing the measurement settings in an operating mode

✓ The desired operating mode is active.

⇒ Press **SK2** [⚙], use the ▲▼ keys to highlight an entry, and use the ● key to select it.

⇒ For information on the menus and functions, see the descriptions of the respective operating mode.

Simplified representation

In the following descriptions, this simplified representation is used for changes in the measurement settings:

⇒ **MEASUREMENT SETTINGS**: ... (corresponding action).

6.2.5 Starting and pausing/stopping a measurement

⇒ Press **SK3**.

6.2.6 Changing the device settings

⇒ Press **SK4** [☰].

⇒ For information on device settings, see *7 Device settings on page 47*.

6.2.7 Exiting a submenu

⇒ Press ↩ key.

6.2.8 Saving a measurement

⇒ Briefly press the ⬇ key.

↳ A message confirms that the measurement has been saved.

⇒ To manage stored measurements, see *9 DATA LOGGER on page 95*.

6.2.9 Taking a screenshot

⇒ Press the key for approx. 2 s.

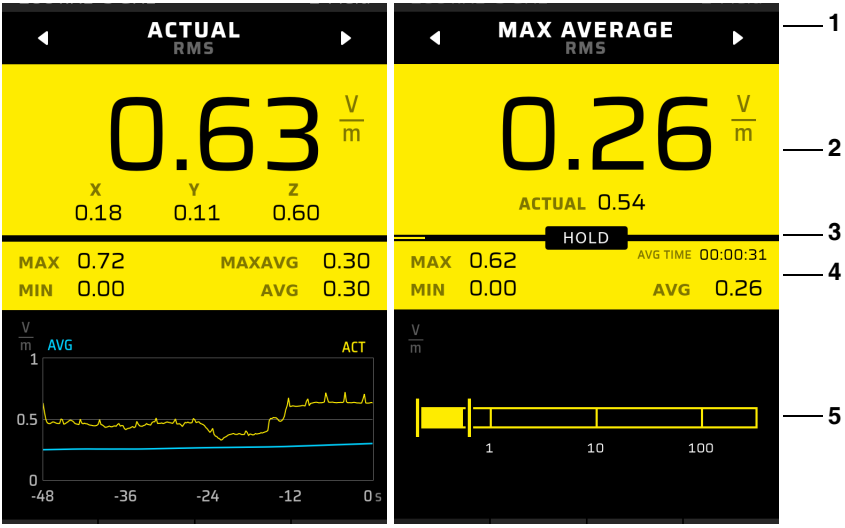
↳ A message confirms that the screenshot has been taken.

⇒ To manage saved screenshots see *9 DATA LOGGER on page 95.*

6.3 The display in measuring mode

The displays in the operating modes are always structured in the same way. The displayed measured values, evaluations and graphical representations then differ depending on the operating mode, the probe used and the selected settings.

⇒ Detailed information on the displays can be found in the descriptions of the operating modes.



No.	Area	Values
1	**Selection field**	• **Display type**: **ACTUAL**, **AVERAGE**... • **Detector type**: **RMS**, **Peak**
2	**Main field**	Measured value display X/Y/Z only for **ACTUAL**, the unit can be selected
3	**Status bar**	When the measurement is running, a bar indicates the progress of the averaging.
4	**Supplementary field**	Evaluations **MAX**, **MIN**, **MAXAVG**, **AVG** and the current averaging time until the set time is reached.
5	**Graphic display**	• Temporal or spectral display of the measurement results • Bar graph of the instantaneous value.

7 Device settings

The menu can be used to change the device settings and to display the information about the measuring instrument and a connected probe. In addition, the menu allows access to user-defined setups and stored measurement results in **DATA LOGGER**.

7.1 Setting types

On this device, a distinction is made between **Device settings** and **Measurement settings**.

7.1.1 Device settings

Device settings include all parameters that affect the general device behavior or the form of the display, but do not affect the measurement itself. The device always remembers the last used device settings, stores them in the selected storage location and loads them the next time the device is started. Device settings, with the exception of **EXPERT SETTINGS**, are not saved in a setup.

Open device settings:

⇒ Press **SK4**.

For information on device settings, see the following sections:

- *GENERAL SETTINGS on page 49*
- *EXPERT SETTINGS on page 51*
- *POSITION AND TIME on page 52*
- *CONNECTIVITY on page 54*
- *INFORMATION on page 55*
- *SETUPS on page 57*
- *DATA LOGGER on page 95*

7.1.2 Measurement settings

These include all parameters that influence a measurement. They are grouped under the softkey **SK2** and are supplemented by the settings under **EXPERT SETTINGS** (see *7.5 EXPERT SETTINGS on page 51*). Only measurement settings are used for saving and loading a setup.

Open measurement settings:

⇒ Press **SK2** in the respective operating mode.

Information on the measurement settings can be found in the description of the respective operating modes.

7.1.3 Resetting settings

Via **Factory Reset** (see *7.3 GENERAL SETTINGS on page 49*), both setting types can be reset to the delivery state.

7.2 Personalizing device settings

Measuring instruments are often used by several people. The FieldMan offers a quick and easy way to personalize settings, setups and measurement results through its removable memory card. We therefore recommend every user to use their own personal memory card.

Personalization is not possible when using the internal memory.

Using a new memory card:

✓ Narda recommends the use of high quality memory cards for industrial applications.

⇒ Insert new memory card.

↳ The required directory structure is created automatically.

7.3 GENERAL SETTINGS

In this submenu, settings are made for the device behavior that affect the screen display, acoustic notifications, and the power-on and power-off behavior of the device.

7.3.1 DISPLAY

Parameter	Default	Description
Language	English	Language of the user interface
Color Scheme	Normal	Color scheme of display
Auto-Brightness Control	**On**	Automatic adjustment of screen brightness (via light sensor)
Brightness Level	40%	Setting of screen brightness
Screen Saver	10 min	Screen saver. Reactivation of screen by pressing any key.
Temperature Unit	°C	Temperature unit

7.3.2 SAVE OPTIONS

Parameter	Default	Description
Add Voice Comment	**Off**	Add a voice comment when saving. (only 2460/01)
Add Text Comment	**Off**	Add a text comment when saving.
Default Text	...	Default text when adding text comments.
Auto Save Screenshot	**Off**	When saving manually, a screen copy is automatically created.

7.3.3 SOUND

Parameter	Default	Description
Mute	**Off**	Muting of the speaker, symbol in the status bar
Sound Level	50%	Playback volume
Audible RF Indicator	**Off**	Acoustic intensity display with 3 sensitivity settings (parameter appears only with HF probes in mode **FIELD STRENGTH**)

7.3.4 ALARM

Parameter	Default	Description
Alarm Function	**Off**	Alarm when limit exceeded ⇒ For description, see *10.5 Alarm function on page 108.*
E-Field Unit	V/m	Unit of E-field
E-Field Limit	61 V/m	Limit of E-field
B/H-Field Unit	A/m	Unit of B/H field
B/H-Field Limit	0.16 A/m	Limit of B/H field
Limit for Results in %	100%	For evaluating probes and **SHAPED TIME DOMAIN**

7.3.5 DEVICE

Parameter	Default	Description
Delete Device Memory	**DELETE**	Delete internal memory
Format Memory Card	**FORMAT**	Format memory card after confirmation
Automatic Shutdown	30 min	Power off during inactivity
Calibration Reminder	**When due**	Can be activated on expiry or in advance, or generally deactivated
Factory Reset	**RESET**	Sets all adjustable parameters back to the factory defaults

7.4 LEGAL NOTICES

In this submenu you will find information about the radio approvals, and the Electronic Label (E-Label).

To access the E-Label:

⇒ Press **SK4**, ▼ key and **OK**.

⇒ For more information, see *13.5 Radio approval (only 2460/01) on page 124*.

7.5 EXPERT SETTINGS

This submenu is probe-dependent and can only be selected if an HF probe or BFD-400 is connected. There are no adjustment options for other probes.

7.5.1 POST-PROCESSING

In this submenu, settings can be made for HF probes that require precise knowledge of the prevailing field. If the frequency of a field source is known and is specified here as the reference frequency, a more accurate display result can be obtained by applying the correction factor stored in the probe, or the percentage of the limit that has been reached can be displayed in % relative to a safety standard (see *10.1 Post-Processing on page 102)*.

HF probes are broadband probes and cannot measure selectively at the set frequency. In the case of incorrect frequency specification or multifrequency fields, these settings can therefore lead to incorrect results.

Parameter	Default	Description
Apply Correction Factor CF	**Off**	Apply correction factor on/off
Reference Frequency	Fmin (probe dependent)	Reference frequency for correction factor and for % of standard
% of Standard	**Off**	Conversion to display in % of standard for measured field strengths at a reference frequency
Standard	ICNIRP 1998 Occ	Applied standard

7.5.2 Band-Filter

In this submenu, settings for a bandpass or bandstop filter with variable center frequency can be made for suitable probes (currently only BFD-400). After switching on, the filter has an effect only in the broadband modes **FIELD STRENGTH**, **SPATIAL AVERAGE** and **TIMER LOGGING**.

Parameter	Default	Description
Band-Filter	**Off**	Switch band filter on/off
Filter Type	Band-pass	Filter type
Center Frequency	50 Hz	Center frequency of the filter

7.6 POSITION AND TIME

In this submenu, settings are made which affect the position determination by means of the satellite receiver and the integrated ultrasonic distance sensor. The system time of the device can also be set or synchronized with the very accurate satellite time. The results of the GNSS position determination are also displayed.

7.6.1 DISTANCE METER (optional)

Parameter	Default	Description
Distance Meter	**Off**	Distance meter on/off
Status at Power-on	**Off**	Activate function automatically after device start
Distance Unit	Meter (m)	Distance unit

7.6.2 LOCATION SERVICES (optional)

Parameter	Default	Description
GNSS Receiver	**Off**	GNSS receiver on/off
Status at Power-on	**Off**	Activate function automatically after device start
GNSS Format	DMS	GNSS format
Latitude	48°27'29.718"N	Current latitude
Longitude	9°13'49.425"E	Current longitude
Altitude (MSL)	440 m	Current altitude
Accuracy H/V	4.3/8.0 m	Approximate horizontal and vertical position accuracy
Systems	GPS/ Galileo/ GLONASS	GNSS systems to be used

7.6.3 DATE / TIME

Parameter	Default	Description
Date Format	YYYY-MM-DD	Date format
Date	2022-08-18	Current date
Time Format	24 h	Time format
Time	13:30:59	Current time
Time Zone	UTC+01:00	Time zone
Daylight Saving Time	Off	Daylight saving time on/off
Sync with GNSS	SYNC	Synchronization of time with GNSS

7.7 CONNECTIVITY

In this submenu, connection settings are made for remote operation.

7.7.1 SERIAL INTERFACE

Parameter	Default	Description
USB	**On**	USB on/off
Optical Interface	Probe	Optical interface selection: • **Off** • **Remote**: Remote control function • **Probe**: Probe connection

7.7.2 NETWORK

Parameter	Default	Description
TCP Remote Port	5025	Port for TCP Remote
Host Name	fieldman_<S/N>	Predefined host name

7.7.3 WIRELESS INTERFACE (optional)

This group only appears if the chargeable **WiFi/BT** option has been activated.

Parameter	Default	Description
WiFi	**Off**	WiFi on/off
Bluetooth	**Off**	Bluetooth on/off

7.7.4 ETHERNET

Parameter	Default	Description
Ethernet	**Off**	LAN on/off With LAN = **Off** the following lines are grayed out
DHCP	**On**	If DHCP is enabled, the following lines are grayed out
IPv4 Address	192.168.128.128	Settings menu, individually scrollable digit groups
Subnet Mask	255.255.255.0	Settings menu default masks 1...32, default 24
IPv6 Address	fc00::192:168:128:128	Settings menu, individually scrollable digit groups
Prefix	7	Prefix length of the IPv6 address
MAC	Device-dependent	Individual MAC address of the FieldMan

7.8 INFORMATION

This submenu displays device and probe-specific information. In addition, the user or a calibration laboratory can update the third-party calibration date and recommended calibration interval for all probes except the HP-01 and EHP-50F/G. For probes with self-test capability, the test can be performed here.

7.8.1 DEVICE INFORMATION

Parameter	Default	Description
Device Self-Test	START	Starts self-test to be performed in separate window (also performed at each restart)
Product Name	FieldMan	Product name
Part Number	2460/01	Article number
Serial Number	A-0051	Serial number
Firmware Version	V1.0.0	Firmware version

Parameter	Default	Description
Bootloader Version	V1.0.1	Bootloader version
Image Version	V1.0.2	The image contains all SW components
<option name>	P/N of the option	Display only if option is enabled

7.8.2 PROBE INFORMATION

Parameter	Default	Description
Probe Self-Test	START	Starts self-test to be performed in separate window (also performed each time the probe is connected)
Product Name	EFD-0691	Probe product name
Part Number	2462/14	Probe article number
Serial Number	A-0051	Probe serial number
Field Type	E	Field type
Shaping Standard	No shaping	Standard
Lower Frequency Limit	0.1 MHz	Lower cutoff frequency
Upper Frequency Limit	6000 MHz	Upper cutoff frequency
Firmware Version	V1.0.0	Firmware version of the probe
Bootloader Version	V1.0.0	Bootloader version of the probe
Temperature Sensor	15.7 °C	Probe temperature
Narda Calibration Date	2022-12-15	Last calibration by Narda
Third-Party Calibration Date	–	Calibration date of other suppliers can be entered here by the user.
Recalibration after (months)	24	Number can be edited here by the user.
<option name>	P/N of the option	Display only if option is enabled

The information under **Narda Calibration Date** or **Third-Party Calibration Date** (most recent date counts) and **Recalibration after (months)** are used as a reminder function for an upcoming calibration. The values are stored in the EEPROM of the connected probe. No values can be changed for the EHP-50F/G and HP-01 probes. There is therefore no Third-Party Calibration Date here and the recommended calibration interval is always 24 months.

7.9 SETUPS

A setup contains all changeable settings that can influence a measurement and its measurement result. This includes all settings under **MEASUREMENT SETTINGS** (see in the respective operating mode) and **EXPERT SETTINGS** (see *7.5 EXPERT SETTINGS on page 51*).

Using a setup can greatly simplify and speed up the preparation of recurring measurements. In addition, faulty measurements due to incorrectly selected settings can be ruled out.

Since the selection options offered and the saved setups depend on the type of probe connected in each case, the submenu can only be activated when the probe is plugged in. The setups are stored separately according to the 4 defined probe groups in the selected storage location.

7.9.1 Directory structure

The setups are stored in the directory structure specified below. A maximum of 99 setups can be created per subdirectory.

Directory	Setups
Setups / RF /	HF probes (high frequency broadband probes)
Setups / HP /	HP-01 (probes for static fields)
Setups / EHP /	EHP-50F, EHP-50G (FFT field analyzers)
Setups / LF /	BFD-400, 100 cm^2 and 3 cm^2 (and other low frequency probes)

In the delivery state, the directories are empty. Measurement settings are saved to one of the above directories whenever the instrument is turned off, a probe is disconnected or unplugged, or the user saves the current measurement settings as a setup with the probe connected.

The last general device settings used (see *7.3 GENERAL SETTINGS on page 49*) are also saved in the selected storage location when the device is switched off. Since the settings are probe-independent, they are stored in the **DeviceSettings.xml** file. When the device is switched on, these settings are loaded or – if the file is missing – the factory settings are loaded.

7.9.2 Switching on the device without a probe connected

Without a connected probe, only the probe-independent, last-used device settings are loaded. The last measurement settings **Default.xml** are only loaded after a connected probe has been recognised..

7.9.3 Switching on the device with a probe connected

After switching on the device, the last used device and measurement settings are restored by loading the two settings files. If one of the files is not available, the factory settings are loaded instead.

7.9.4 Probe change during operation

If a probe is unplugged while the device is running, the current measurement settings are saved as **Default.xml** for this probe type. When reconnecting the same probe type, the same settings will be used. If another probe type is detected instead, the **Default.xml** settings for this probe type will be loaded.

7.9.5 Creating and managing setups

Open the setup menu:

✓ The desired probe is connected.

✓ To create a new setup, make the desired settings.

⇒ Open **MAIN MENU** > **SETUPS**.

↳ Only the setups created for the currently connected probe type are displayed in alphabetical order.

Create a new setup:

⇒ Press **SK4**.

↳ A new setup is created under the default name **Setup [n]** with the current settings. The digit [n] is incremented up automatically.

Rename a setup:

1. Highlight a setup with ▲▼, then press **SK2**.
   ↳ The editor opens.
2. Edit the setup title:
   - **Cross key**: Navigate to the character area and select with the central key.
   - **SK1**: Cancel editing
   - **SK2**: Switch upper/lower case letters
   - **SK3**: Delete character to the left of the cursor
   - **SK4**: Accept input and finish

Load a setup:

⇒ Use ▲▼ to highlight a setup and select it with the central key.

↳ The parameters are loaded and the measurement screen is displayed.

Delete a setup:

1. Use ▲▼ to highlight a setup, then press **SK1**.
2. Confirm deletion with **SK4** or cancel with **SK1**.

Delete multiple setups:

Setups can only be deleted individually in the device.

⇒ To delete multiple setups, remove the memory card and edit the setup directories externally (not possible with internal storage).

⇒ Alternatively, format the memory card or delete the internal storage.
ATTENTION! This will cause all stored data to be lost.

With the Narda-TSX software, all setups and the limit standards stored on the unit can be transferred to a PC as a configuration. The configuration can be edited and saved on the PC. Conversely, a configuration can be transferred from the PC to the unit. The current configuration of the FieldMan will be overwritten.

The software can be downloaded from the address www.narda-sts.com.

7.10 DATA LOGGER

⇒ For a description of the settings for the **DATA LOGGER**, see *9 DATA LOGGER on page 95*.

8 Operating modes

In this chapter, after an overview of the operating modes, you will find detailed information on each operating mode, with the specific settings and the measurement procedures.

8.1 Overview of operating modes and probe types

Depending on the connected and recognized probe type, the following operating modes are available for selection in the FieldMan:

Operating mode (abbreviation[1)])	HF probes	HP-01 (DC/LF)	EHP-50F/G (LF)	BFD-400-1 (LF)
FIELD STRENGTH (FS)	X	X	X	X
SPATIAL AVERAGE (SA)	X	X	X	X
TIMER LOGGING (TL)	X	X	X	X
SPECTRUM (SP)	–	X	X	X
SHAPED TIME DOMAIN (ST)	–	–	X	X

1) Name displayed on the soft key in connection with the mode symbol

The operating mode is selected and displayed on the device via **SK1**. **SK1** is only available for selection when a valid probe has been detected.

FIELD STRENGTH (FS)

Measurement of field strength or flux density and numerical representation of the measurement results for a defined frequency range, which may be broadband or band-limited. A time curve (**Time Curve**) can be optionally activated for the measurement results, which is implemented as a rolling memory.

⇒ See *8.2 FIELD STRENGTH on page 64*.

SPATIAL AVERAGE (SA)

Allows spatial averaging of measured field strength values from multiple measurement positions and is mostly required for measuring thermal effects with HF probes. Averaging is done via the square of the field strength values (RMS averaging). In addition, a delay can be set for the measurement start. This allows the person performing the measurement to move away from the measuring location to avoid influencing the field.

⇒ See *8.3 SPATIAL AVERAGE on page 71*.

TIMER LOGGING (TL)

Time-controlled broadband measurement of field strength values in a definable period of time. With the RMS detector type, all measured values (samples) acquired in a measurement interval are condensed into isotropic min/avg/max values that characterize the measurement interval. With the peak detector type (BFD-400 only), the acquired measured values (samples) are compressed to an isotropic max value.

⇒ See *8.4 TIMER LOGGING on page 75*.

SPECTRUM (SP)

FFT analysis of the measurement signal in the selected frequency range with display of the frequency spectrum, frequency marker evaluation and display of the broadband level. With the **%** unit selected, a normalized representation of the frequency response is shown, related to the limit values of a selected standard.

⇒ See *8.5 SPECTRUM on page 82*.

SHAPED TIME DOMAIN (ST)

Evaluation method in the time domain for the gapless recording of the weighted peak or RMS values with display of the exposure index in **%** related to a selectable personal protection standard. Whether the peak or RMS detector is used is defined in the measurement method standards IEC/EN 62233 for household appliances (Weighted RMS) or IEC/EN 62311 for other appliances (Weighted Peak).

⇒ See *8.6 Shaped Time Domain on page 87*.

8.2 FIELD STRENGTH

The **FIELD STRENGTH** operating mode is used to measure the field strength or flux density and enables the numerical display of the measurement results for a defined frequency range. This frequency range can be broadband or band-limited. A time curve (**Time Curve**) can be activated as a rolling memory for the measurement results.

This is the most commonly used mode for broadband or band-limited measurements.

8.2.1 Measurement settings

The **MEASUREMENT SETTINGS** menu provides quick access to the most important measurement settings for the selected operating mode.

Function[1)]	Description
Reset Results	Reset measurement results. Can also be done via a long press (> 2s) of the **Back** button.
Zero	Offset correction (HP-01 probe only) ⇒ See *10.3 Offset correction – Zero on page 106*.
Frequency Span	Frequency range
Field	Electric or magnetic field
Range	Measuring range
Unit	Unit
Low Cut Filter	Filter for suppression of low frequencies (low cut filter)
Detector	Detector type
Time Curve	Show/hide time curve display
Time Span	Timeline for time curve display
Single Run	Automatic stop of the measuring sequence (only visible if **Time Curve** = **On**)
Pulse Detection	Short integration time for HF measurement, e.g. for more accurate measurement of short radar pulses (only visible with suitable HF probes)
Averaging Time	Time for moving averaging

1) The available parameters depend on the selected operating mode and the connected probe type.

8.2.2 Numerical display

Two fields are available for numerical display:

- **Main field:** Displays current or statistical measured values depending on the selected result type and detection type
- **Supplementary field:** Always displays statistical values

Detector

Select a detector:

⇒ **MEASUREMENT SETTINGS**: Select a detector under **Detector**.

↳ The selection option depends on the probe used:

Detector	Description	Availability
RMS	All measured values are recorded and displayed as RMS values.	All probes
Peak	All measured values are recorded and displayed as peak values.	BFD-400-1 probe only

Result type

The result types are always displayed in the supplementary field. To display them in the main field, the result type must be selected in the selection field using the cross key.

Select a result type:

⇒ Press the ◄ ► keys repeatedly until the desired result type is displayed.

↳ The selection option depends on the selected detector:

Detector	Result types	Display in supplementary field	Evaluation
RMS	**ACTUAL**	-	Current measured value
	MINIMUM	**MIN**	Smallest value
	MAXIMUM	**MAX**	Highest value
	AVERAGE	**AVG**	Averaged value
	MAX AVERAGE	**MAXAVG**	Highest averaged value
Peak	**ACTUAL**	-	Current measured value
	MINIMUM	**MIN**	Smallest peak value
	MAXIMUM	**MAX**	Highest peak value

The display in detail

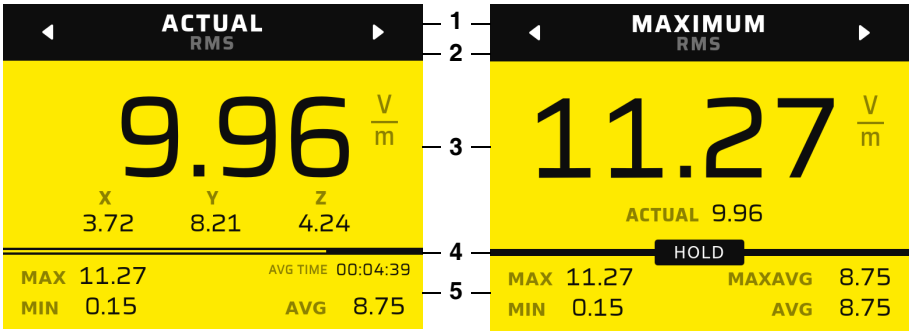


Fig. 3: Numerical display in the **FIELD STRENGTH** operating mode

1 Result type selection field
2 Selected detector (selection in **MEASUREMENT SETTINGS**)
3 Main field:
  – Left: Result type **ACTUAL** (current isotropic value and three axes)
  – Right: Other result type (maximum value and current value)
4 Display status of measurement (e.g. **HOLD**) and averaging time until the set value was reached.
5 Supplementary field with statistical values

Result types AVG and MAXAVG

The time window defined by the **Averaging Time** (see *8.3 SPATIAL AVERAGE on page 71*) for the formation of the moving average for the result types **AVG** and **MAXAVG** shifts continuously. As long as not all measured values are available to fill the time window, the averaging time is reduced to the actual acquisition time. The progress of the averaging is displayed in the **AVG TIME** field and in the progress bar between the main field and the supplementary field. After the set averaging time has been reached, the status display disappears. For **MAXAVG**, a valid value can only be displayed after the averaging time has elapsed.

Reset the measured values:

⇒ Press and hold ↺ key (> 2 s).

– oder –

1. Press **SK2**.

↳ **Reset Results** is already selected as the first entry.

2. Press ● key.

↳ The measured values are reset and the menu is closed.

8.2.3 Bar display

The bar represents the **ACTUAL** values with logarithmic scaling. The left and right limits are specified by the measuring range limits of the connected probe. **MIN** and **MAX** are displayed as marker lines.

Activate the bar display:

To display the bar graph, the time curve graph must be turned off.

⇒ **MEASUREMENT SETTINGS**: Deactivate **Time Curve**.

Start and stop the measurement:

⇒ Press **SK3**.

The display in detail

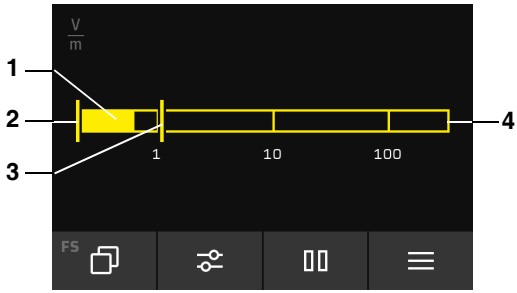


Fig. 4: Bar display in the **FIELD STRENGTH** operating mode

1 Current measured value
2 **MIN** value
3 **MAX** value
4 Overall bar scaled to measuring range

8.2.4 Time curve display

The time curve display shows the isotropic result of the field strength running from right to left with a rolling memory. The individual axes are not displayed graphically.

Activate the time curve display:

⇒ **MEASUREMENT SETTINGS**: Activate **Time Curve**.

↳ Since the curve memory is always active in the **FIELD STRENGTH** operating mode (even with **Time Curve** = **Off**), the complete curves of **ACTUAL** and, if applicable, **AVG** since the last operating mode change or reset appear immediately.

Start and stop the measurement:

⇒ Press **SK3**.

The display in detail

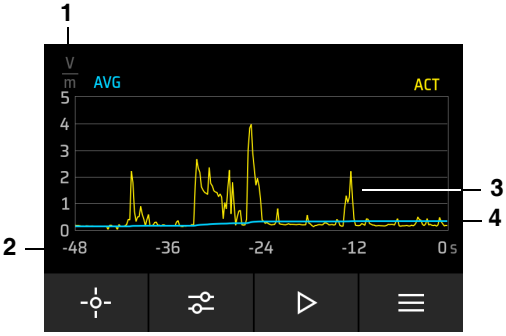


Fig. 5: Time curve display in the **FIELD STRENGTH** operating mode

1 Y-axis with automatic scaling
2 X-axis manually adjustable via **Time Span**
3 Yellow curve: Time curve of the current measured values (**ACTUAL**)
4 Blue curve: Time curve of the averaged measured values (**AVG**)

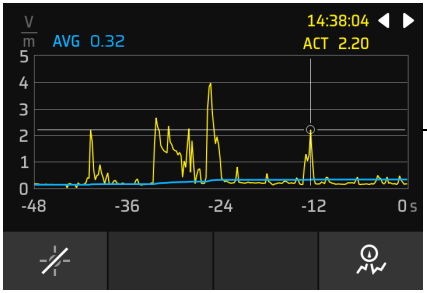
The display of the **AVG** curve is omitted if the peak detector was selected instead of the RMS detector for LF probes.

Using the marker

The measurement results can be evaluated via the marker.

Switch on the marker:

1. Press **SK3** to stop the display (**HOLD**).
   ↳ **SK1** now shows the marker symbol.
2. Press **SK1** to show the marker.
   ↳ A circle shows the marker position in the diagram (**1**), the time and measured value are indicated on the right above the diagram.



3. Use the ◄ ► keys to move the marker.
4. Press **SK1** to turn the marker off again.

If the display was stopped via **HOLD**, the measurement continues in the background. As soon as the display is restarted, there is therefore continuous recording and updating of the time curve display.

Using the peak marker

The peak values can be evaluated via the peak marker.

⇒ For information on the peak marker, see *10.7 Peak marker on page 110*.

Stopping the measurement sequence automatically

If required, the measurement sequence can be stopped automatically after a run via the **Single Run** function.

Activate automatic stop:

⇒ **MEASUREMENT SETTINGS**: Activate **Single Run**.

↳ When activated, the results memory is deleted and a measurement sequence is performed over the set time period. After the time period is reached, the measurement is stopped completely. The measurement sequence can be restarted at any time via a reset.

8.3 SPATIAL AVERAGE

The **SPATIAL AVERAGE** operating mode enables the spatial averaging of measured field strength values over 1 to a maximum of 100 measuring positions. It can also be useful to measure at a single measuring position, in order to record the field strength in a specific spatial volume there, averaged over the desired measuring time, by continuous movement of the measuring probe.

The spatial averaging is determined by quadratic averaging over all measured positions and displayed as a horizontal line in the bar graph. The measurement per position can be stopped automatically after a preset time or manually. An adjustable delay allows the person performing the measurement to leave the measurement site before the measurement starts.

8.3.1 Measurement settings

The **MEASUREMENT SETTINGS** menu provides quick access to the most important measurement settings for the selected operating mode.

Function[1)]	Description
Zero	Offset correction (HP-01 probe only) ⇒ See *10.3 Offset correction – Zero on page 106*.
Frequency Span	Frequency range
Field	Electric or magnetic field
Range	Measuring range
Unit	Display unit
Low Cut Filter	Filter for suppression of low frequencies (low cut filter)
Detector	Detector type
Measurement Time	Stop measurements: • **Manual**: The measurement must be ended manually. • **5 s, 10 s...**: The measurement stops after the preselected time.

Function[1)]	Description
Start Delay	Start type of measurement: • **No delay**: The measurement starts immediately • **5 s, 10 s...**: The measurement starts after the selected time. A countdown shows the time until the start.
Pulse Detection	Short integration time for HF measurements, e.g. for more accurate measurement of short radar pulses (only visible with suitable HF probes).

1) The available parameters depend on the operating mode and the probe type.

8.3.2 Measurement

✓ Automatic or manual stop was selected.

✓ Immediate or delayed start was selected.

1. Press **SK3**.
   ↳ The measurement starts immediately or after the selected time.
2. Press **SK3** to stop the measurement manually or wait for the preselected time to elapse. Even with automatic stop, a measurement in progress can be stopped manually.
   ↳ After the measurement has been completed, a selection window appears:
   – **Next Position**: Start the measurement at the next position
   – **Repeat Position**: Start a new measurement at the same position
   – **Cancel All**: Delete all measurements. The deletion must be confirmed again.
   – **SAVE AND FINISH**: Save measurements and end measurement.
3. Select an entry. **Cancel All** must be confirmed again.
   ↳ The function is executed immediately and the selection window is closed.

Set start with or without delay:

1. **MEASUREMENT SETTINGS**: Select **Start Delay**.
2. Select the desired setting and press the ● key:
   – **No delay**: The measurement starts immediately
   – **Time**: The measurement starts after the selected time. A countdown shows the time until the start.
3. Exit the menu with the **Back** key.

8.3.3 Numerical display

Two fields are available for numerical display:

- **Main field:** Displays the current measured values isotropically and for the three axes
- **Supplementary field:** Displays the averaged values of the last measured position as well as over all positions

Detector

In the **SPATIAL AVERAGE** operating mode, **RMS** is always used.

Result type

In the **SPATIAL AVERAGE** operating mode, **ACTUAL** is always used.

The display in detail

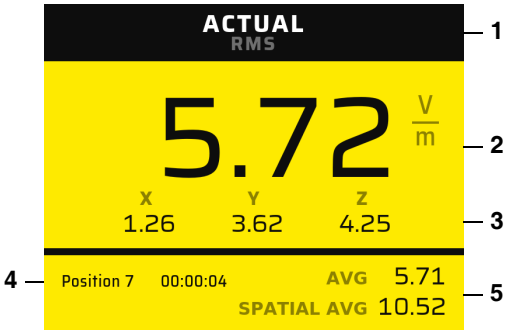


Fig. 6: Numerical display in the **SPATIAL AVERAGE** operating mode

1 Result type always **ACTUAL**, detector always **RMS**

2 Current isotropic measured value

3 Current measured values of the three axes

4 Number of the position and current time over which averaging is currently being performed

5 Evaluations:

- **AVG**: Average value of the displayed position
- **SPATIAL AVG**: Spatial average of all measured positions

8.3.4 Bar display

In the vertical bar graph, the successively measured values for each measuring position are displayed from left to right. The spatial average is shown as a horizontal line. To evaluate all positions, you can scroll to the left and right with the arrow keys after the measurement has been completed.

The display in detail

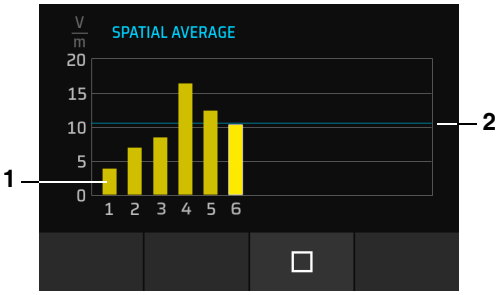


Fig. 7: Bar display in the **SPATIAL AVERAGE** operating mode

1 Average value of the respective position
2 Spatial average over all measured positions

Evaluating the bar display

✓ The measurement is completed (**SAVE AND FINISH**).

⇒ Select a measuring position with the ◄ ► keys.

↳ In the bar display: The selected bar is highlighted brighter.

↳ In the supplementary field: The position as well as the associated measured value (**AVG**) is displayed. Up to 13 bars can be displayed simultaneously in the graph. If there are more than 13 positions, the bar display can be scrolled using the ◄ ► keys.

8.4 TIMER LOGGING

The **TIMER LOGGING** operating mode enables time-controlled measurement of field strength values in a definable time period of up to 100 hours. During recording, the progress is displayed via a time bar. After the measurement has been completed, the saved result can be viewed as a time curve display in the data logger (see *9 DATA LOGGER on page 95*).

8.4.1 Measurement settings

The **MEASUREMENT SETTINGS** menu provides quick access to the most important measurement settings for the selected operating mode.

Function[1)]	Description
Zero	Offset correction (HP-01 probe only) ⇒ See *10.3 Offset correction – Zero on page 106*.
Start Time	Timer start time
Timer Duration	Timer runtime
Storage Interval	Storage interval
Frequency Span	Frequency range
Field	Electric or magnetic field
Range	Measuring range
Unit	Display unit
Low Cut Filter	Filter for suppression of low frequencies (low cut filter)
Detector	Detector type (only available with BFD-400-1 probe)
Pulse Detection	Short integration time for HF measurements, e.g. for more accurate measurement of short radar pulses (only visible with suitable HF probes)
Averaging Time	Averaging time

1) The available parameters depend on the operating mode and the probe type.

A maximum of 32,000 storage intervals can be recorded. If a short storage interval is set with a long runtime, one of the values is automatically corrected. Example: With a storage interval of 1 s, the maximum possible runtime is 8 h 53 min 20 s.

8.4.2 Sequence of a time-controlled measurement

1. Select timer settings

- **Start Time**
- **Timer Duration**
- **Storage Interval**

⇒ See *8.4.1 Measurement settings on page 75.*

2. Activate comment functions (if required)

- **Add Text Comment**
- **Add Voice Comment** (only version 2460/01)

⇒ See *7.3 GENERAL SETTINGS on page 49.*

3. Activate timer

⇒ Press **SK3**.

↳ When the comment function is activated, the user is prompted for a voice comment and/or text input.

↳ The device waits until the specified start time for the measurement.

↳ The setting for automatic shutdown (**Automatic Shutdown**) is ignored and the device remains switched on (see *7.3.5 DEVICE on page 51*).

The following actions are possible during this time:

Start recording immediately:

⇒ Press **SK3**.

Deactivate timer again:

⇒ Press **SK1**.

↳ In this case, previously recorded voice or text comments will be deleted.

Activate stand-by until recording starts:

⇒ Press **SK2**.

↳ The device is put into a power-saving sleep mode (stand-by), wakes up again at the specified time, and then performs the measurements. A certain lead time is required to reactivate the connected probes.

This function is only available for long periods of 5 minutes or more and for probes with electrical interface.

4. Timer is started

- When recording is started, the previously recorded measurement data is reset.
- Then the measurement data are stored cyclically until the measuring duration (**Timer Duration**) is reached.

The following actions are possible during this time:

End measurement prematurely:

⇒ Press **SK3**.

↳ Even if the measurement is terminated prematurely, all intervals measured up to that point are saved.

↳ Afterwards, the timer is automatically deactivated again.

The rechargeable battery life can be extended by activating the screen saver. This makes longer measuring times possible.

⇒ See *7.3.1 DISPLAY on page 49*.

5. After the measurement

The device switches off automatically after the set measuring time (**Timer Duration**) has elapsed (regardless of the setting for **Automatic Shutdown**).

Automatic shutdown does not take place in the following cases:

- The user has ended the measurement prematurely.
- Immediately after the measuring time (**Timer Duration**) has elapsed, a message appears to switch off with the possibility of cancellation by the user.

8.4.3 Numerical display

Two fields are available for numerical display:

- **Main field:** Displays current or statistical measured values depending on the selected result type and detection type
- **Supplementary field:** Always displays statistical values

Detector

A selection is only available for the BFD-400-1 probe. For all other probes, **RMS** is specified.

Select a detector:

⇒ **MEASUREMENT SETTINGS**: Select a detector under **Detector**.

Detector	Description	Availability
RMS	All measured values are recorded and displayed as RMS values.	All probes
Peak	All measured values are recorded and displayed as peak values.	BFD-400-1 probe only

Result type

The result types are always displayed in the supplementary field. To display them in the main field, the result type must be selected in the selection field using the cross key.

Select a result type:

⇒ Press the ◄ ► keys repeatedly until the desired result type is displayed.

↳ The selection option depends on the selected detector:

Detector	Selection via cross key	Main field		Supplementary field
		Top	Bottom	
RMS (all probes)	**ACTUAL**	**ACTUAL**	**X Y Z**	**MAX**, **MIN**, **MAXAVG**, **AVG**
	MINIMUM	**MIN**	**ACTUAL**	
	MAXIMUM	**MAX**	**ACTUAL**	
	AVERAGE	**AVG**	**ACTUAL**	
	MAX AVERAGE	**MAXAVG**	**ACTUAL**	
Peak (BFD-400-1 only)	**ACTUAL**	**ACTUAL**	**X Y Z**	**MAX**, **MIN**
	MINIMUM	**MIN**	**ACTUAL**	
	MAXIMUM	**MAX**	**ACTUAL**	

The display in detail

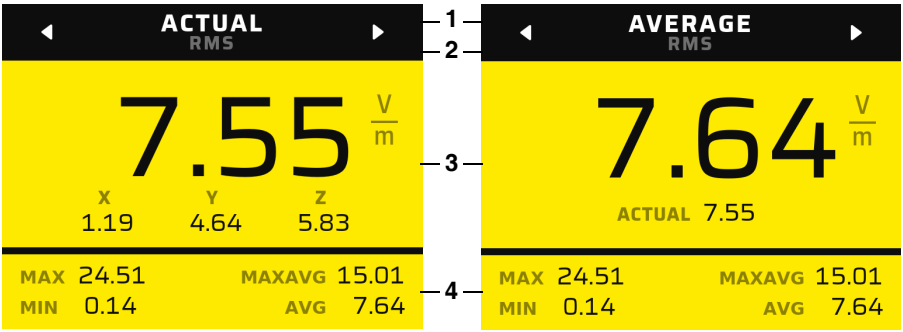


Fig. 8: Numerical display in the **TIMER LOGGING** operating mode

1 Result type selection field

2 Selected detector (selection in **MEASUREMENT SETTINGS**)

3 Main field:

- Left: Result type **ACTUAL**.
  The current isotropic value and the three axes are displayed.
- Right: Other result type, here as an example **AVERAGE**.
  The selected result type is displayed and **ACTUAL** is always displayed as well

4 Supplementary field

The measured values are always displayed, regardless of whether data is being recorded.

8.4.4 Bar display

The bar display graphically shows the progress of the measurement. In addition, the start time, timer duration and storage interval are specified numerically.

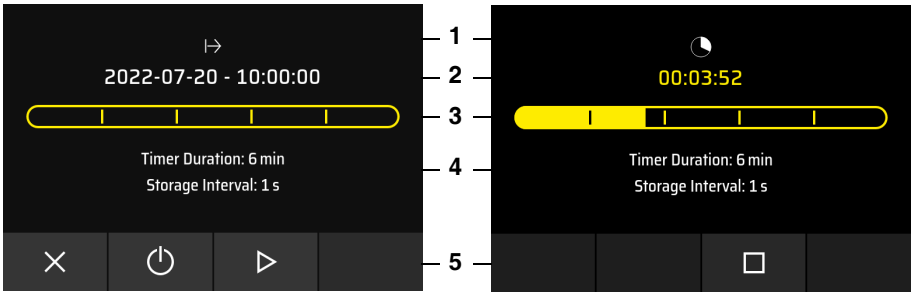


Fig. 9: Progress display via time bar: Activated timer (left), after start (right)

No.	Activated timer	Timer started
1	Animated symbol for activated timer	Animated symbol for remaining time
2	Start time of recording	Remaining time
3	Time bar of recording duration	
4	Recording duration and storage interval	
5	Softkey for cancel, stand-by and start	Softkey for stop

8.4.5 Time curve display in the DATA LOGGER

When viewing saved results via the **DATA LOGGER**, the results are displayed graphically as a progression over time. In the process, the up to 32,000 measurement intervals are condensed to a maximum of 240 measurement intervals to enable display and evaluation with the **Marker** and **Peak Marker**. In case of later data evaluation on the PC, detailed evaluation in full time resolution is possible.

The time axis displayed on the device is labeled with the total measurement duration in the format hh:mm:ss. When the marker is switched on, the maximum value that occurred in the (condensed) measurement interval is displayed as **ACT** value together with the time of the interval end.

The display in detail

⇒ To call up the time curve display in the **DATA LOGGER**, see *9 DATA LOGGER on page 95*.

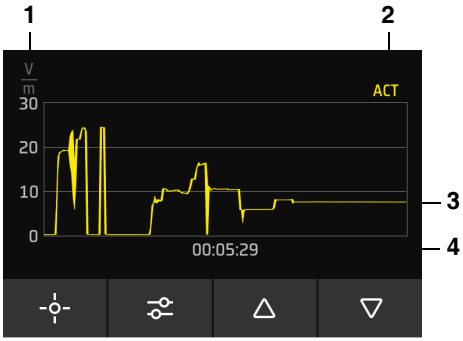


Fig. 10: Graphic display in the **TIMER LOGGING** operating mode after calling it up in the **DATA LOGGER**

1 Unit
2 Time and ACT measured value with marker switched on
3 Graphical display of the current values
4 Measuring duration in the format hh:mm:ss

Using the marker

1. Press **SK1** to turn on the marker.
   ↳ A circle shows the marker position in the diagram, the time and measured value are indicated on the right above the diagram.
2. Use the ◄ ► keys to move the marker.
3. Press **SK1** to turn the marker off again.

Using the peak marker

The peak values can be evaluated via the peak marker.

⇒ For information on the peak marker, see *10.7 Peak marker on page 110*.

8.5 SPECTRUM

The **SPECTRUM** operating mode enables the FFT analysis of the measurement signal in the selected frequency range with display of the frequency spectrum, evaluation via a frequency marker and display of the broadband level. Either one of the single axes **X**, **Y** or **Z** or **Isotropic** can be selected as the measuring axis. In addition, a selectable limit value curve can be displayed in the spectrum. When the unit **%** is selected, the spectrum is normalized to the field strength limits of a personal protection standard.

8.5.1 Measurement settings

The **MEASUREMENT SETTINGS** menu provides quick access to the most important measurement settings for the selected operating mode.

Function[1)]	Description
Reset Results	Reset measurement results
Zero	Offset correction (HP01 probe only) ⇒ See *10.3 Offset correction – Zero on page 106*.
Result Type	Result type (see *Result type on page 83*)
Frequency Span	Frequency range
Frequency Scale	Linear or logarithmic scaling
Field	Electric or magnetic field
FFT Points	Determines the frequency resolution of the FFT analysis (number of frequency values = FFT points / 2)
Range	Measuring range
Axis	Spatial axis of the probe shown in the graph
Unit	Display unit
Low Cut Filter	Filter for suppression of low frequencies (low cut filter)
Detector	Detector type: **RMS**, **Peak**
Standard	Displays a selection list of the standards according to whose limits normalization is performed or the limit progression is displayed in the spectrum (see *8.5 SPECTRUM on page 82*).
Number of Averages	Number of spectra over which averaging is performed

1) The available parameters depend on the selected operating mode and the connected probe type.

8.5.2 Measuring and evaluating a spectrum

The measurement starts immediately after selecting the operating mode.

The ◄ ► keys can be used to move and evaluate the marker at any time during the measurement. However, to use the peak marker, the display must be stopped.

Stop and start measurement:

⇒ Press **SK3**.

In the graphical display, the measured values can be evaluated using the **Peak Marker** function (see *8.5.4 Graphic display on page 85).*

8.5.3 Numerical display

Two fields are available for numerical display:

- **Main field:** Displays current or statistical broadband values depending on the selected result type and detection type
- **Supplementary field:** Always displays statistical broadband values

Detector

A selection is only available for the BFD-400-1 probe. For all other probes, **RMS** is specified.

Select a detector:

⇒ **MEASUREMENT SETTINGS**: Select a detector under **Detector**.

Detector	Description	Availability
RMS	All measured values are recorded and displayed as RMS values.	All probes
Peak	All measured values are recorded and displayed as peak values.	BFD-400-1 probe only

Result type

In **SPECTRUM** mode, the control pad is used for the marker. The selection of the result type is therefore made in the measurement settings.

Select a result type:

⇒ **MEASUREMENT SETTINGS**: Select the desired result type under **Result Type**.

↳ The selection option depends on the detector and the probe.

When the result type is selected in the measurement settings, the result type displayed in the graphical display also switches over automatically.

Detector	Selection via measurement settings	Main field		Supplementary field
		Top	Bottom	
RMS (no HF probes)	**ACTUAL**	**ACTUAL**	**X Y Z**	**MAX**, **AVG**
	MAXIMUM	**MAX**	**ACTUAL**	
	AVERAGE	**AVG**	**ACTUAL**	
Peak (BFD-400-1 only)	**ACTUAL**	**ACTUAL**	**X Y Z**	**MAX**
	MAXIMUM	**MAX**	**ACTUAL**	

The display in detail

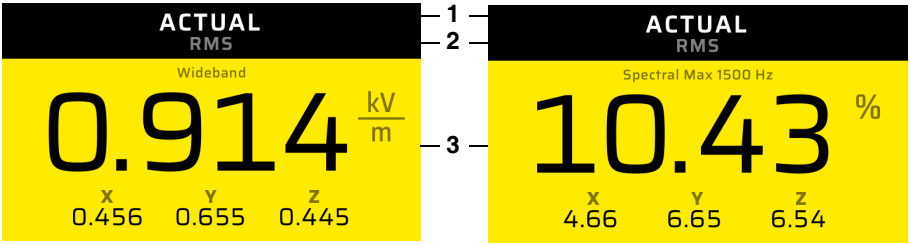


Fig. 11: **SPECTRUM** operating mode: Numerical display of the broadband values (left) and the highest spectral line in % of the selected standard (right).

1 Selected result type (selection in **MEASUREMENT SETTINGS**)
2 Selected detector (selection in **MEASUREMENT SETTINGS**)
3 Main field: Result type **ACTUAL**
- **Left:** Current isotropic value and the three axes
- **Right:** Current isotropic value and the three axes for the highest line of the normalized spectrum with frequency indicated

Reset the measured values:

⇒ **MEASUREMENT SETTINGS** > **Reset Results** > ● **key**.
↳ The measured values are reset and the menu is closed.

8.5.4 Graphic display

Properties of the graphical representation:

X-axis

- The entire frequency range up to the set span is always displayed (**MEASUREMENT SETTINGS** > **Frequency Span**).
- The frequency scaling can be set to either linear from 0 Hz or logarithmic (**MEASUREMENT SETTINGS** > **Frequency Scale**).

Y-axis

- The field strength is displayed on a logarithmic scale.

Measuring curve

- **Representation:** Maximum of one measuring curve (X, Y, Z axis or isotropic)
- **If standard is selected:** The associated limit value curve is additionally displayed. The field strength axis is scaled automatically. Some standards are only defined from higher frequencies and can therefore only be displayed partially or not at all.
- **% unit selected:** Spectrum is displayed normalized, related to the selected standard.
- **If no standard is selected (Standard = None):** A message prompts to select a standard.

The display in detail

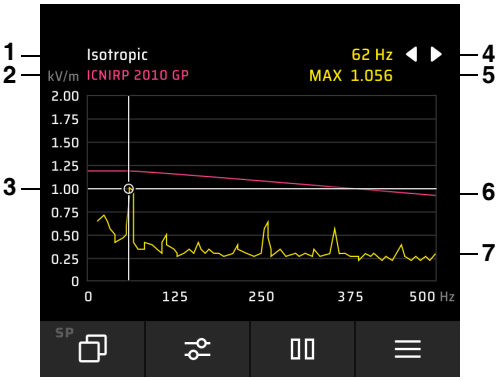


Fig. 12: Graphical display of the spectrum

1 Type of measuring curve (X, Y, Z-axis or isotropic)
2 Selected standard
3 Marker position
4 Marker functions (see *Using the marker on page 86*)
5 Values at the marker position
6 Limit curve of the selected standard
7 Spectrum

Using the marker

⇒ Use the ◄ ► keys to move the marker to the desired position on the measuring curve.

Using the peak marker

The highest spectral lines can be evaluated via the peak marker.

✓ The peak marker can only be selected after the display has been stopped.

⇒ For information on the peak marker, see *10.7 Peak marker on page 110*.

8.6 Shaped Time Domain

In the **SHAPED TIME DOMAIN** operating mode, an evaluation method is used in the time domain, which ensures gapless recording of the weighted peak or RMS values related to a selectable personal protection standard. The result is displayed as an exposure index in %.

The applied measurement method is described in international standards and is generally referred to as **Weighted Peak Method** or **Weighted RMS Method** respectively.

In addition to the numerical result display, a logarithmically scaled bar display shows the exposure index graphically over the entire measurement range of the probe. Instead of the bar display, a time curve graph can also be displayed.

The **SHAPED TIME DOMAIN** operating mode is only available for the EHP-50F/G and BFD-400-1 probes.

8.6.1 Measurement settings

The **MEASUREMENT SETTINGS** menu provides quick access to the most important measurement settings for the selected operating mode.

Function[1)]	Description
Reset Results	Reset measurement results
Field	Electric or magnetic field
Range	Measuring range
Low Cut Filter (BFD-400-1 only)	Selection of the lower cutoff frequency, e.g. to reduce the influence of the earth's magnetic field
Method	Method for weighting: • WPM-TD (IEC/EN 62311): Weighted Peak Method (fixed for the EHP-50F/G probe) • WRM-TD (IEC/EN 62233): Weighted RMS Method
Weighting	Displays a selection list of standards according to whose limits the evaluation is performed.
Time Curve	Graphic display: • Bar display: **Time Curve** = **Off** • Time curve graph: **Time Curve** = **On**

Function[1)]	Description
Time Span	Time domain (X axis)
Single Run	Measurement ends after set **Time Span**

1) The available parameters depend on the selected operating mode and the connected probe type.

8.6.2 Numerical display

Two fields are available for numerical display:

- **Main field:** Displays current or statistical measured values, depending on the selected result type and detection type, as well as the selected evaluation standard
- **Supplementary field:** Always displays statistical values

Detector

The **Peak** or **RMS** detector to be used is determined by the selected measurement method (see *8.6.1 Measurement settings on page 87*, **Method**).

Evaluation curve

The limits to be used for calculating the exposure index are determined by selecting a standard (see *8.6.1 Measurement settings on page 87*, **Weighting**).

Result type

The result types are always displayed in the supplementary field. To display them in the main field, the result type must be selected in the selection field using the cross key.

Select a result type:

⇒ Press the ◄ ► keys repeatedly until the desired result type is displayed.

Detector[1)]	Selection via cross key	Main field		Supplementary field
		Top	Bottom	
RMS + Peak	**ACTUAL**	**ACTUAL**	**X Y Z**	**MAX**, **MIN**
	MINIMUM	**MIN**	**ACTUAL**	
	MAXIMUM	**MAX**	**ACTUAL**	

*1) In this mode of operation, the EHP-50F/G probe has only the **Peak** detector type, on the EHP-50G the WPM option must be enabled.*

The display in detail

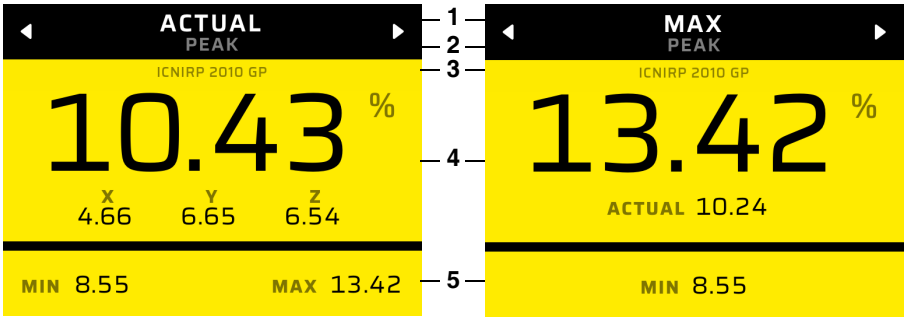


Fig. 13: Numerical display in the **SHAPED TIME DOMAIN** operating mode

1 Selected result type (selection via cross key)
2 Selected detector (selection in **MEASUREMENT SETTINGS**)
3 Selected evaluation standard
4 Main field:
- **Left:** Result type **ACTUAL**.
  The current isotropic value and the three axes are displayed.
- **Right:** Other result type, here as an example **MAXIMUM**.
  The selected result type is displayed and **ACTUAL** is always displayed as well

5 Supplementary field:
- Statistical values **MIN** and **MAX**

8.6.3 Bar display

The bar represents the **ACTUAL** values with logarithmic scaling. The left and right limits are specified by the measuring range limits of the connected probe. **MIN** and **MAX** are displayed as marker lines.

Activate the bar display:

To display the bar graph, the time curve graph must be turned off.

⇒ **MEASUREMENT SETTINGS**: Select **Time Curve** = **Off**.

The display in detail

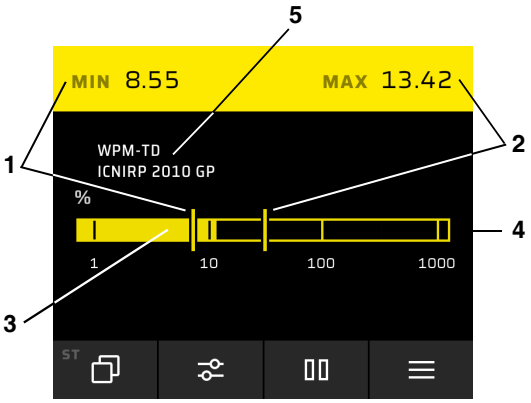


Fig. 14: Bar display in the **SHAPED TIME DOMAIN** operating mode

1 **MIN** value numerical and graphical
2 **MAX** value numerical and graphical
3 Current measured value (**ACTUAL**)
4 Overall bar scaled to measuring range
5 Measurement method and weighting standard

8.6.4 Time curve display

The time curve graph represents the isotropic result of the exposure index running from right to left with a rolling memory.

Activate the time curve display:

⇒ **MEASUREMENT SETTINGS**: Activate **Time Curve**.

↳ Since the curve memory is always active in the **SHAPED TIME DOMAIN** operating mode (even with **Time Curve** = **Off**), the complete curve progression since the last operating mode change or reset appears immediately.

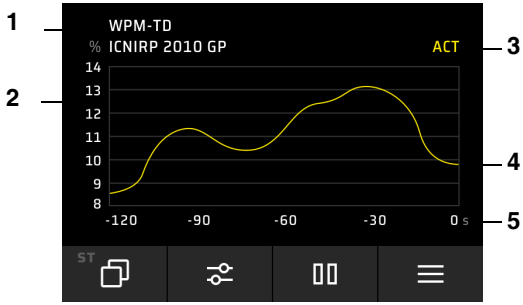


Fig. 15: Time curve display in the **SHAPED TIME DOMAIN** operating mode

1 Selected standard
2 Measured values in % of standard
3 Result type
4 Time curve of the measurement
5 Time axis

Using the marker

✓ The display is in **HOLD** mode.

1. Press **SK1** to turn on the marker.
2. Use the ◄ ► keys to move the marker to the desired position on the measuring curve.
3. Press **SK1** to turn the default marker off again.

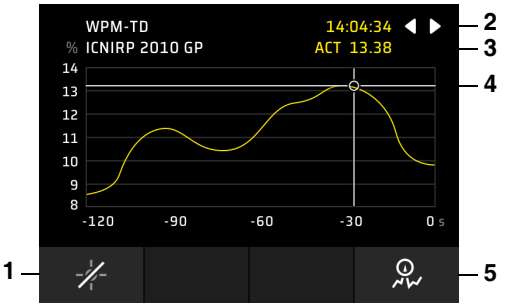


Fig. 16: Marker in the **SHAPED TIME DOMAIN** operating mode

1 **SK1**: Switch marker on/off
2 Movement symbols for standard markers
3 Measured values at the marker position
4 Marker position
5 **SK4**: Switch peak marker on/off

If the display was stopped via Hold, the measurement continues in the background. As soon as the display is restarted, there is therefore continuous recording and updating of the time curve display.

Using the peak marker

The peak values can be evaluated via the peak marker.

⇒ For information on the peak marker, see *10.7 Peak marker on page 110*.

Stopping the measurement sequence automatically

If required, the measurement sequence can be stopped automatically after a run via the **Single Run** function.

Activate automatic stop:

⇒ **MEASUREMENT SETTINGS**: Activate **Single Run**.

↳ When activated, the results memory is deleted and a measurement sequence is performed over the set time period. After the time period is reached, the measurement is stopped completely. The measurement sequence can be restarted at any time via a reset.

9 DATA LOGGER

The data memory manages the stored measurement results, screenshots and media (photos and videos). Selected data can be displayed and evaluated with the Data Viewer. All acquired data is stored in the selected storage location, organized by projects.

9.1 Structure of the DATA LOGGER

All content (measurements, screenshots, media) is managed in projects. Up to 99 projects can be created, edited and deleted. To call up the saved content, first select the desired project. Then the associated content can be selected.

Open the data memory:

✓ The device is in the measuring mode of any operating mode.

⇒ Open the device settings with **SK4**, then select **DATA LOGGER**.

↳ The main menu opens.

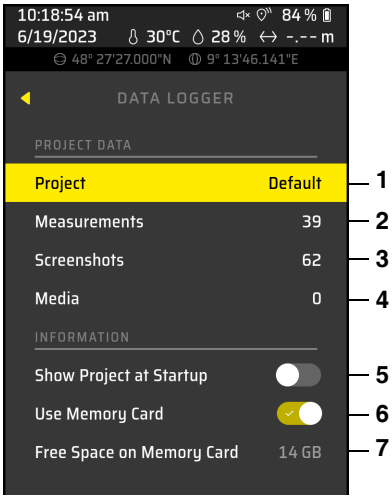


Fig. 17: Main menu **DATA LOGGER**

1 Selected project

2 Number of saved measurements in the selected project

3 Number of saved screenshots in the selected project

4 Number of stored media in the selected project

5 Selection to display the project at startup

6 Selection of whether the memory card is to be used when loading the settings and for saving data. If switch = **Off**, only the internal memory is used.

7 Free memory space on the memory card or in the internal device memory (depending on selection).

9.2 Managing projects (PROJECT)

⇒ Select **PROJECT** in the main menu.
↳ The submenu opens.

9.2.1 Creating a new project

⇒ Press **SK4**.
↳ The project is created and named **Project n**. **n** is incremented up continuously (to 99).

9.2.2 Renaming a project

1. Select the project and press **SK2**.
2. Change the project title in the editor.
   To do this, use the ◄ ► and ▲▼ keys to select the desired characters in the character area and accept them with the ● key.

Move the cursor in the title window:

◁ Move one character to the left in the title window

▷ Move one character to the right in the title window

Functions of the keys SK1 to SK4:

✕ Cancel input

⇧ Toggle upper/lower case

⌫ Delete last character

✓ Save changes

9.2.3 Deleting a project

1. Select the project and press **SK1**.
2. Confirm the deletion.

9.3 Managing measurements (MEASUREMENTS)

In the **MEASUREMENTS** menu, the measurements stored in a project can be called up and evaluated, supplemented with comments or deleted.

Select a measurement:

✓ The desired project has been selected
(see *9.2 Managing projects (PROJECT) on page 97*).

1. Mark **MEASUREMENTS** and select it with the ● or ► key.
   ↳ The submenu opens.
2. Mark the desired measurement.

You now have the following options:

- Open and evaluate the measurement
- Add a text comment
- Add a voice comment
- Delete the measurement

9.3.1 Open and evaluate a measurement

⇒ Open the marked measurement with the ● or ► key.
↳ The measurement is displayed.
Additional functions are available via the keys **SK1** to **SK4**:

- Turn on the marker
- Change measurement settings
  (limited selection, e.g. change the measurement unit)
- △ Show previous measurement of the selected project
- ▽ Show next measurement of the selected project

Using the marker

1. Press **SK1** to turn on the marker.
2. Use the ◄ ► keys to move the marker to the desired position on the measuring curve.
3. Press **SK1** to turn the default marker off again.

⇒ For more information on the marker functions, see the descriptions in the operating modes.

Using the peak marker

The peak values can be evaluated via the peak marker.

⇒ For information on the peak marker, see *10.7 Peak marker on page 110*.

9.3.2 Adding a text comment

✓ The measurement is marked in the overview page (**MEASUREMENTS**).

1. Press **SK3**.
   ↳ The editor for entering a comment opens.
2. Use the ◄ ► and ▲▼ keys to select the desired characters in the character area and accept them with the ● key.
3. Press **SK4** to save the comment.

Move the cursor in the title window:

◁ Move one character to the left in the title window

▷ Move one character to the right in the title window

Functions of the keys SK1 to SK4:

✕ Cancel input

⇧ Toggle upper/lower case

⌫ Delete last character

✓ Save changes

9.3.3 Adding a voice comment

This function is only available in version 2460/01.

✓ The measurement is marked in the overview page (**MEASUREMENTS**).

1. Press **SK4**.
   ↳ The recording starts immediately.
2. Press **SK4** to stop the recording.
   ↳ The recording is played back.
3. After that, the following functions of the keys **SK1** to **SK4** are available:

   🗑 Delete recording

   ●REC Repeat recording

▷ Play recording

✓ Save recording

4. Press **SK4** to save the recording.
   ↳ In the overview page (**MEASUREMENTS**), the symbol for the voice comment appears behind the selected measurement.

9.3.4 Deleting a measurement

✓ The measurement is marked in the overview page (**MEASUREMENTS**).

⇒ Press **SK1** and confirm the deletion.
   ↳ The measurement is deleted.

9.4 Managing screenshots (SCREENSHOTS)

In the **SCREENSHOTS** menu, the screenshots stored in a project can be called up and deleted.

Select a screenshot:

✓ The desired project has been selected
(see *9.2 Managing projects (PROJECT) on page 97*).

1. Mark **SCREENSHOTS** and select it with the ● or ► key.
   ↳ The submenu opens.
2. Mark the desired screenshot.

Show the marked screenshot:

⇒ Press the ● or ► key to open the marked screenshot.

⇒ **SK3** key: Show previous screenshot

⇒ **SK4** key: Show next screenshot

⇒ Press the **Back** key to return to the menu.

Delete the marked screenshot:

1. Press **SK1**.
2. Confirm deletion with **SK4** or cancel with **SK1**.

9.5 Managing media (MEDIA)

In conjunction with a smartphone and the associated app, images and videos can be stored and accessed in the media area. This function is not available at the moment.

10 Cross-mode functions

This chapter describes functions and settings that affect several operating modes or are not mode-specific.

10.1 Post-Processing

⇒ See *7.5.1 POST-PROCESSING on page 51.*

This menu contains settings for post-processing the measurement data of broadband HF probes. These setting options are thus limited to the operating modes of **FIELD STRENGTH**, **SPATIAL AVERAGE** and **TIMER LOGGING**. Two types of post-processing are available:

- The application of a correction factor
- The conversion to display in % of the standard for measured field strengths at a reference frequency

For evaluating probes, only the correction factor can be applied.

10.1.1 Applying a correction factor

⇒ See *7.5.1 POST-PROCESSING on page 51:* ***Apply Correction Factor CF***

When calibrating the HF probes, the measuring error at the defined calibration frequencies is recorded and stored in the probe. If the correction is applied (**Apply Correction Factor CF** = **On**), then the measuring error is taken into account in the measurement result and thus a higher measurement accuracy is achieved. However, the correction can only be applied meaningfully when measuring at a single prevailing frequency, which must also be known. If this frequency does not exactly correspond to a calibration frequency, it can still be entered as a reference frequency (**Reference Frequency**) and the corresponding correction factor is then determined by interpolation from the adjacent correction factors.

10.1.2 Setting the reference frequency

⇒ See *7.5.1 POST-PROCESSING on page 51:* ***Reference Frequency***

Reference Frequency provides a selection list of probe-specific calibration frequencies. In addition, the input of any frequency is possible with a resolution of up to 1 kHz.

The last set value in MHz is always displayed, even if the frequency no longer matches the probe after a probe change. Only when the calibration factor or the display in % of the standard are activated is the frequency list updated by reading from the probe data and set to the lowest value.

Set the reference frequency:

1. Select **Reference Frequency**.
   ↳ A list opens with the calibration frequencies stored in the probe. The last selected value is automatically highlighted.
2. If necessary, select another value from the list.

In addition to the values from the list, any intermediate value can be set with a resolution of 1 kHz.

Set any value:

1. After selecting **Reference Frequency**, press the **SK1** softkey.
2. Set the digit and value with the cross key.
3. Press **SK4** to transfer the new value to the selection list.
   ↳ The pen symbol indicates a frequency where calibration has not been performed and where the calibration factor is determined by interpolation. There can be only one entry with pen symbol at a time. This remains in the list until another frequency value is selected and is then deleted again.

HF probes are broadband probes and cannot measure selectively at the set frequency. In the case of incorrect frequency specification or multifrequency fields, these settings can therefore lead to incorrect results.

10.1.3 Display in % of standard

Non-evaluating probes measure the field strength. The **% of Standard** unit is only available for selection for these probes if the conversion for a specific personal protection standard has been activated in the menu. The measured value display in % is related to the power density and not to the field strength.

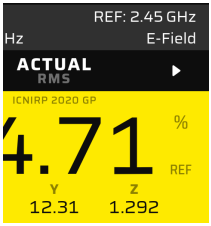
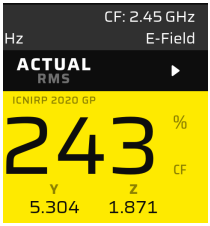
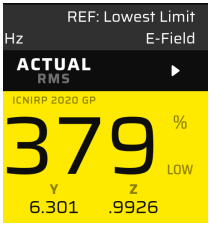
Activate conversion:

✓ **DEVICE SETTINGS** > **EXPERT SETTINGS**

1. Select **Standard**.
2. Reference frequency of the field (**Reference Frequency**) indicated.
3. Activate **% of Standard**: Select **Lowest Limit** or **Reference Frequency**.

The reference to the lowest limit value of a standard (**Lowest Limit**) is recommended when the frequency of the field source is not known.

The **Lowest Limit** setting is not available if the use of the correction factor is switched on.

Reference Frequency	Correction Factor	Lowest Limit
		
The reference frequency (**Reference Frequency**) is displayed in the probe info field, e.g. with **REF: 2.45 GHz**.	If the correction factor is applied at the same time, the entry **CF: 2.45 GHz** appears instead.	When referring to the smallest (strictest) limit value, **REF**: **Lowest Limit** is displayed.
The standard selected in the menu is also shown in the display (in the yellow field above the isotropic measured value).		

10.2 Selection of a standard

There is a wide range of national and international standards setting exposure limits for electric and magnetic fields. They can differ in frequency range and range of effect (influence on the body).

The standards (limit value curves) to be available for selection on the FieldMan can be configured via the Narda-TSX PC software. Predefined standards are available, which can be extended by self-created standards.

User-defined standards are saved in the selected storage location during configuration and are marked on the device with a preceding asterisk. Predefined standards, on the other hand, are stored in the FieldMan.

The standards for evaluative measurements of the **SHAPED TIME DOMAIN** operating mode are implemented in the measuring probes and can only be changed by a firmware update of the manufacturer.

10.2.1 Standards for HF probes

The HF probes of the FieldMan measure broadband frequencies and cannot be set to a specific frequency. The measurement result can be displayed as the percentage of the limit value that has been reached if the frequency of a field source is known or in relation to the lowest limit value above the frequency of a standard. The settings are made in the menu under **EXPERT SETTINGS**.

A selection of predefined standards appears below. The selection options in the FieldMan may differ from this and depend on the device configuration.

Standard[1)]	Frequency range
2013/35/EU LAL	1 Hz to 10 MHz
2013/35/EU HAL	1 Hz to 10 MHz
2013/35/EU Limbs	1 Hz to 10 MHz
2013/35/EU Thermal	100 kHz to 300 GHz
26. BImSchV 2013 (1a)	1 Hz to 10 MHz
26. BImSchV 2013 (1b)	100 kHz to 300 GHz
EMFV 2016 LAL	1 Hz to 10 MHz
EMFV 2016 HAL	1 Hz to 10 MHz
EMFV 2016 Limbs	1 Hz to 10 MHz
EMFV 2016 Thermal	100 kHz to 300 GHz
FCC 96-326 GP	300 kHz to 100 GHz
FCC 96-326 Occ	300 kHz to 100 GHz
GB8702-2014 GP	1 Hz to 300 GHz
ICNIRP 1998 GP	1 Hz to 300 GHz
ICNIRP 1998 Occ	1 Hz to 300 GHz
ICNIRP 2010 GP	1 Hz to 10 MHz
ICNIRP 2010 Occ	1 Hz to 10 MHz
ICNIRP 2020 GP	100 kHz to 300 GHz
ICNIRP 2020 Occ	100 kHz to 300 GHz
IEEE 2019 Unrest NS	1 Hz to 5 MHz
IEEE 2019 Restrd NS	1 Hz to 5 MHz
IEEE 2019 Unrestricted	100 kHz to 300 GHz
IEEE 2019 Restricted	100 kHz to 300 GHz

Standard[1)]	Frequency range
SC6-2015 Unctrld NS	3 kHz to 10 MHz
SC6-2015 Ctrld NS	3 kHz to 10 MHz
SC6-2015 Uncontrolled	0.1(1) MHz to 300 GHz (E-field ≥ 1,1 MHz)
SC6-2015 Controlled	0.1(1) MHz to 300 GHz (E-field ≥ 1,29 MHz)

*1) **LAL**: Low, ALs; **HAL**: High ALs; **Limbs**: Limbs ALs; **Thermal**: ALs Thermal; **GP**: General Public; **Occ**: Occupational; **Unrest**: Unrestricted; **Restrd**: Restricted; **Unctrld**: Uncontrolled; **Ctrld**: Controlled; **NS**: Nerve Stimulation*

10.2.2 Standards for LF probes

For the LF probes, the standard is used to display the limit curve graphically in the spectrum or to display the measurement result as a normalized spectrum. The selection is made under **MEASUREMENT SETTINGS** > **Standard**. The same table applies as for HF probes. The selection **None** is used to switch off the display of a limit value curve in the **SPECTRUM** operating mode.

10.3 Offset correction – Zero

⇒ See measurement settings in the operating modes.

Manual offset correction is only required for the HP-01 probe. The correction process is started by triggering **Zero** in the measurement settings and is recommended before measuring small static fields. For offset correction of the HP-01, the sensor tip must be placed in a zero field chamber before the correction process is started, in order to exclude the influence of external fields and especially that of the earth's magnetic field.

Perform the offset correction:

1. Press **SK2**, then select **Zero**.
   ↳ A dialog box opens.
2. Follow the instructions in the dialog box.
3. Continue with **SK4** or cancel with **SK1**.
   ↳ The progress and completion of the offset correction are displayed.
4. Follow the instructions in the dialog box.
5. Press the **Back** key to return to the measuring mode.

10.4 Commenting on measurement results

✓ **DEVICE SETTINGS** > **GENERAL SETTINGS**

⇒ See *7.3.2 SAVE OPTIONS on page 50*.

In this menu you can set whether a comment is to be recorded with the saving of measurement results via **voice or text input**. Both functions can also be activated. Voice input is only possible with the version 2460/01.

If the respective type of comment is activated and a measurement result (not a screenshot) was saved via the save key, the menu navigation for the voice comment opens first and then the menu navigation for the text input via the editor. In the **TIMER LOGGING** operating mode, the prompt for entering a voice or text comment already appears after pressing **Enable Timer**, i.e. before the actual start of measurement.

Text comments and voice comments can also be added or changed at any time later in **DATA LOGGER**.

10.4.1 Activating voice comments

Activate voice comments:

1. **Add Voice Comment** = **On**
2. Return to the measuring interface.

Enter a voice comment:

⇒ See *9.3.3 Adding a voice comment on page 99.*

10.4.2 Activating text comments

For simplified text input, a predefined text (**Default Text**) can be used and added to during input.

Activate text comments:

1. **Add Text Comment** = **On**
2. Edit **Default Text** if necessary.
3. Return to the measuring interface.

Enter a text comment:

⇒ See *9.3.2 Adding a text comment on page 99.*

10.5 Alarm function

⇒ See *7.3.4 ALARM on page 50*: **Alarm Function**

In this menu, alarm thresholds can be set and the alarm function can be activated. After activating the alarm function, an alarm symbol appears in the status bar of the display.

When the alarm threshold is exceeded, a conspicuous acoustic signal sounds with a visual alarm message. If the mute function is activated (Mute = **On**), only the visual alarm is available.

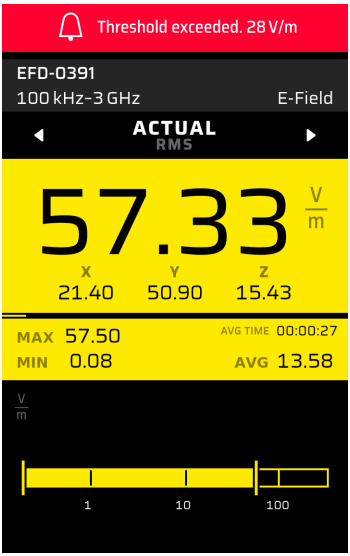


Fig. 18: Display of alarm function

10.6 Acoustic intensity display (HF probes only)

⇒ See *7.3.3 SOUND on page 50*: **Audible Field Indicator**

In this menu, the acoustic display can be activated and the sensitivity can be adjusted by selecting the gain. In principle, the audio frequency increases as the field strength level increases in order to be able to detect field maxima or leaks on HF lines. Sound search is only available in **FIELD STRENGTH** mode.

Setting	Scope of application
Off	Inoperative
High Gain	Up to 20 V/m or 20%
Normal Gain	Up to 80 V/m or 80%
Low Gain	Up to 240 V/m or 240%

If another unit of measurement is used, the specified values must be converted into V/m accordingly.

10.7 Peak marker

In addition to the marker, the peak marker is available for evaluating the peak values in the following operating modes.

- **FIELD STRENGTH**
- **SPECTRUM**
- **SHAPED TIME DOMAIN**
- **TIMER LOGGING** (after calling the measurement in the **DATA LOGGER**)

For this purpose, up to 25 peak values are recorded and sorted in descending order. Number 1 is the highest peak value. The selected peak value is displayed within the cross key symbol.

Marker type	On/Off	Symbols		Representation on the display	Control via cross key
		Off	On		
Marker	**SK1**			◄ ►	◄ ►
Peak Marker	**SK4**			▲ ◄ 1/25 ► ▼	◄ ► ▲ ▼

Use the Peak Marker:

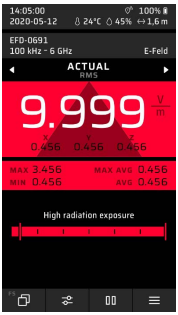
✓ The marker is switched on (see the descriptions in the respective operating modes).

1. Press **SK4** to switch on the peak marker.
2. Move the marker:
   a. Use the ◄ ► keys to move the marker to the nearest peak on the left or right.
   b. Use the ▲ ▼ keys to move the marker to the next higher or next lower peak.
      ↳ The selected peak value is displayed within the cross key symbol.
3. Press **SK4** to turn the peak marker off again.

10.8 Display of overdriven measured values

Overdriving can lead to damage or even destruction of a measuring probe. In addition, during overdriving, the measurement results are undervalued due to the occurring compression and thus recorded as too low. Measurement data stored in data records are identified by override symbols.

A currently overdriven state is indicated by a red instead of a yellow display field in connection with an upward pointing triangle symbol



Due to previous overdriving, the statistical measured values of **MAX**, **MAXAVG** and **AVG** are also undervalued and are therefore displayed in red after overdriving has occurred. In this case, the values in the measurement settings should be reset.

11 PC software and updates

In this chapter you will find instructions for using the Narda-TSX PC software as well as for updating the firmware of the Narda FieldMan.

11.1 Narda-TSX PC software

The newly developed, extremely powerful Narda-TSX PC software is available for evaluating and documenting the measurement results, media and other information. It is Narda's new software platform that will support other Narda products in the future in addition to FieldMan. Remote measurements are also possible with an optionally available plugin.

For connection to a PC, the FieldMan has the following interfaces:

- Serial COM interface via the USB-C port
- Network interface via the Ethernet port
- Serial COM interface via the optical port

11.1.1 Establishing a USB connection

The device comes with a USB cable that can be used for power supply and connection to a PC.

Establish a USB connection:

1. Under **GENERAL SETTINGS** > **CONNECTIVITY** > **SERIAL INTERFACE**, activate the **USB** function.
2. Connect the device at the USB-C port (see *Fig. 2:* **6** on page 22) to a USB port on the PC using the supplied USB cable.
   ↳ The first time you connect, the FieldMan is automatically set up on the PC.
   ↳ After setup, the FieldMan can be used.

⇒ Instructions for further use of the device can be found in the online help for the Narda-TSX PC software.

11.1.2 Establishing a network connection

An Ethernet cable with RJ45 connector is required to establish a network connection.

Establishing a network connection:

1. Under **GENERAL SETTINGS** > **CONNECTIVITY** > **ETHERNET**, activate the **Ethernet** function. Select the appropriate network settings and activate **DHCP** or enter the address settings manually.
2. Connect the device using a suitable Ethernet cable at the Ethernet port (see *Fig. 2:* **9**) to a router or network hub.
3. Instructions for further use of the device can be found in the online help for the Narda-TSX PC software.

11.1.3 Establishing an optical connection

In principle, an optical connection can also be established with a PC and the PC software can be used via this connection. However, due to the higher transmission speed, a USB or Ethernet connection is much better suited for this purpose. However, for remote measurements with HF probes, the optical connection via fiber optic cable and optical-electrical converter to USB is the best solution, because in this way interference is avoided.

Establish an optical connection:

1. Under **GENERAL SETTINGS** > **CONNECTIVITY** > **OPTICAL INTERFACE**, select the **Remote** function.
2. Connect the device at the optical connector (see *Fig. 2:* **7** on page 22) to a PC via the optical cable.
   - ↳ The first time the device is connected, it is automatically set up on the PC.
   - ↳ After the setup, the device can be used.
3. For information on remote control of the device, refer to the online help for the NardaTSX PC software.

11.2 Firmware update

The latest firmware version can be found on the Narda website at www.narda-sts.com.

Update the firmware:

1. Copy the update file to the top directory level of the FieldMan memory card.
2. Restart the device.
   - ↳ If the file was recognized, a query is displayed asking whether the update should be performed.
3. Confirm the update.
   - ↳ The update starts automatically and is completed after a few minutes.

12 Care, maintenance and disposal

This chapter describes how to clean the device and replace the rechargeable batteries.

12.1 Cleaning the device

ATTENTION

Penetrating liquids

Liquids that get inside can damage or destroy the device.

⇒ Make absolutely sure that no liquids get into the interior of the device.

ATTENTION

Solvents

Solvents can attack the surfaces of the device.

⇒ Do not use solvents to clean the basic unit, probe and Netzteil/Ladegerät.

To clean the device:

1. Clean the device with a soft cloth. As cleaning agent, we recommend the use of lukewarm water to which a drop of liquid detergent has been added.
2. To avoid streaks and stains, wipe the still damp parts of the device with a dry cloth.

12.2 Replacing/removing rechargeable batteries

⚠ CAUTION

Defective rechargeable battery

A defective rechargeable battery can lead to injuries and damage to the device.

⇒ Do not operate the device if the rechargeable battery is damaged.

⇒ Replace a defective rechargeable battery immediately.

⇒ Replace the rechargeable battery when the capacity noticeably decreases. You can obtain a replacement rechargeable battery as a spare part from your Narda sales partner (order number 2460/90.07).

Replace the rechargeable battery:

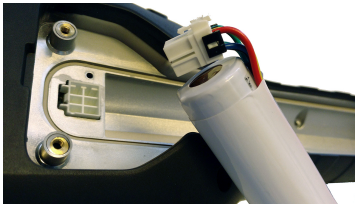
✓ The device is switched off.

1. Open the 3 screws on the rechargeable battery compartment with a screwdriver and remove the cover.

2. Unlock the connector at the top and pull it off.

3. Insert the new rechargeable battery and place it in the handle.

4. Replace the cover and screw it tight.



⇒ Fully charge the rechargeable battery before use.

12.3 Disposal

12.3.1 Disposal of end-of-life equipment

The crossed-out wheeled garbage can symbol indicates that this product is subject to the European WEEE Directive 2012/19/EU on the disposal of waste electrical and electronic equipment and must be disposed of separately from household waste in accordance with your national regulations.

In the European Union, all electronic measuring systems purchased from Narda after August 13, 2005 can be returned at the end of their useful life.

⇒ Further information is available from your Narda sales partner.

12.3.2 Disposal of removable batteries

Batteries must not be disposed of in household waste, but must be disposed of separately from the product in accordance with the applicable regulations. Batteries can be returned for free at the corresponding collection points, your dealer or directly via Narda.

⇒ Please discharge the batteries before disposal.

12.3.3 Deletion of private data

⇒ Remove the memory card and delete the internal storage before passing on or disposing of the device.

13 Conformity

In this chapter you will find important information on declarations of conformity and approvals.

13.1 EU Declaration of Conformity

Narda STS hereby declares that this equipment is in compliance with following directives and product standards.

FieldMan device version no. 2460/01 (with radio)

- **Directives:** 2014/53/EU (RED), 2011/65/EU (RoHS)
- **Product standards:** EN 301 489-1 V2.2.3, EN 301 489-1 V1.9.2, EN 301 489-17 V3.2.4, EN 300 328 V2.2.2, EN 61326-1:2021, EN 61010-1:2010

FieldMan device version no. 2460/02 (without radio)

- **Directives:** 2014/30/EU (EMC), 2014/35/EU (LVD), 2011/65/EU (RoHS)
- **Product standards:** EN 61326-1:2021, EN 61010-1:2010

⇒ The full text of the EU declaration of conformity is available at www.narda-sts.com.

13.2 UKCA Declaration of Conformity

Narda STS hereby declares that this equipment is in compliance with following regulations and product standards.

FieldMan device version no. 2460/01 (with radio)

- **Regulations:**
  - S.I. 2017 No. 1206 "Radio Equipment Regulations"
  - S.I. 2012 No. 3032 "The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations"
- **Product standards:** EN 301 489-1 V2.2.3, EN 301 489-1 V1.9.2, EN 301 489-17 V3.2.4, EN 300 328 V2.2.2, EN 61326-1:2021, EN 61010-1:2010.

FieldMan device version no. 2460/02 (without radio)

- **Regulations:**
  - S.I. 2016 No. 1091 "Electromagnetic Compatibility Regulations 2016"
  - S.I. 2016 No. 1101 "Electrical Equipment (Safety) Regulations 2016"
  - S.I. 2012 No. 3032 "The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012".
- **Product standards:** EN 61326-1:2021, EN 61010-1:2010

⇒ The full text of the UKCA declaration of conformity is available at www.narda-sts.com.

13.3 Regulatory Compliance Mark (RCM) (only 2460/01)

13.4 FCC / IC and NCC statement (only 2460/01)

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:
(1) This device may not cause harmful interference, and
(2) this device must accept any interference received, including interference that may cause undesired operation.

Per RSS-Gen, Section 8.4 this device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions:
(1) This device may not cause harmful interference, and
(2) this device must accept any interference received, including interference that may cause undesired operation of the device.

Without permission granted by the NCC, any company, enterprise, or user is not allowed to change frequency, enhance transmitting power or alter original characteristic as well as performance to an approved low power radio-frequency device. The low power radio-frequency devices shall not influence aircraft security and interfere legal communications; If found, the user shall cease operating immediately until no interference is achieved. The said legal communications means radio communications is operated in compliance with the Telecommunications Management Act. The low power radio-frequency devices must be susceptible with the interference from legal communications or ISM radio wave radiating devices.

13.5 Radio approval (only 2460/01)

This device contains components for radio communication via WiFi and Bluetooth and therefore represents a radio system. To use radio communication, the device option 2460/95.12 must be purchased and enabled.

⇒ For initial setup and country configuration, see *4.8 Initial commissioning on page 29.*

Country	Approval number
China	CMIIT ID: 2022DJ18564
Japan	020-220193
USA	FCC ID: 2A77Y-246001A
Canada	IC: 28882-246001A
Taiwan	CCAH23LP2070T0

13.6 Technical data radio (only 2460/01)

Parameter	Value
Frequency range	2.4 GHz – 2.495 GHz
Bandwidth	20 MHz
Max. transmitting power	≤ 17.5 dBm (56.2 mW)

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