



# Datasheet



0370 330 6021

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## IMPORTANT ADVISORY NOTICE

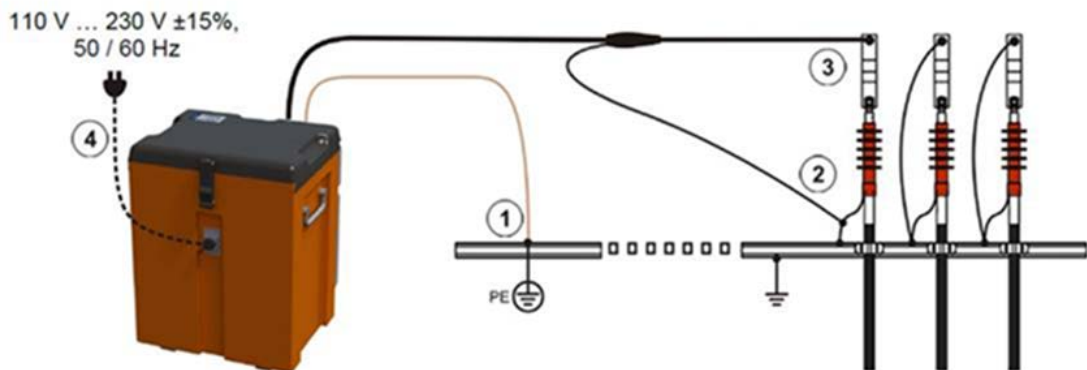
It has recently come to our attention that some users are not connecting the EZ Thump correctly. Safety is paramount and Megger is acting upon this information as a responsible supplier to ensure that it conveys the importance of using this equipment within the guidelines.

The EZ Thump **MUST** be connected as explicitly stated in the User Guide that accompanies the instrument. If the user fails to follow these instructions, a hazard may arise exposing a risk to the user, with subsequent damage to the equipment.

The diagram below is an extract from the User Guide:

The EZ thump has one High Voltage output lead (labelled 3) and two earth return leads. The HV earth return lead (labelled 2) is the measurement lead and must be connected to the test piece and to earth (ground) for safety. The safety earth (labelled 1) is an additional earth return path that must also be connected to ground, close to the user, so that if the HV return is accidentally disconnected this additional safety earth redirects the output current safely through the unit.

*Connection diagram* The following figure shows the simplified connection diagram:



To ensure correct earth connection between return earth (2) and additional safety earth (1), a measurement must be made using an appropriate ohmmeter. The user can then confirm the resistance between earth connections 1 and 2 is no more than 5 ohms. This information is specified in the User Guide.

In Version 1 EZ Thumps it is also advised to check the safety earth, before connection to the test piece. This is done by measuring between the HV earth return and safety earth return leads (labelled 1 and 2 in the diagram). This value should be 100 ohms +/- 10 ohms. If the measurement is not 100 ohms +/- 10 ohms, please return the unit to your local Megger Authorised Service centre for investigation.

V1 EZ Thumps can be identified by the serial number sticker on the operator plate. Another means of identifying V1 units have their associated leads stored in the back of the unit.

Version 2 EZ Thumps have an additional earth measurement functionality (F-Ohm). This continuously monitors the earth return and automatically disables the test if a reading between measurement and safety earth exceeds 5 ohms. Consequently, the advisory comment above regarding the 100 ohm check does not apply.

V2 units can be identified by the serial number sticker on the operator plate. Another means of identifying V2 units is that the leads are stored in a fabric case on top of the lid, as well as an IEC socket on the front of the unit. V2 units are always grey in colour.

All users must be aware that this instrument outputs high voltage and must only be used by competent, trained engineers. Full operational details are in the user guide which shall always accompany the unit. All safety warnings in the user guide must be adhered to. Megger can provide training on the EZ thump and any other Megger products if required.

If you have any queries on the above, please contact Megger.

# EZ-THUMP™ Series

## Portable Fault Location Systems



- Compact, lightweight and rugged field instruments
- Battery and AC line operation
- Automatic end-of-cable and fault locating
- 4-kV or 12-kV output versions available
- Transflective color display
- ARM® Prelocation
- Fault Pinpointing (Thumping)
- Optional Sectionalizing Software\*
- 4 or 12 kV DC testing

### DESCRIPTION

The EZ-THUMP4 and EZ-THUMP12 are compact and lightweight, battery and AC line operated, portable cable fault location systems. They are designed for quick, effective, accurate and safe fault locating operations to greatly reduce system customer outage minutes.

Due to their rugged yet portable enclosure, they are ideally suited either for use in a “satellite” fault locating concept for remote areas that may have less frequent faults, when ease of operation, light weight and economics are important, or for hard to access inner city locations.

The units require no adjustments and are operated via a rotary control knob.

The EZT4/12 series offers:

- Arc Reflection Method (ARM®) cable fault prelocation
- 500 Joule pinpoint surge generator
- DC testing for breakdown detection
- Insulation resistance measurement and sheath testing
- A 4-kV or 12-kV version

### APPLICATIONS

#### HV Testing (proof/insulation testing)

Used to test the dielectric strength of a cable and, if the test fails, to determine the breakdown voltage. For this purpose a test voltage up to 4 kV or 12 kV (model dependent) is applied to the cable under test indicating the resistance value.

#### Sheath Test and Sheath Fault Location / Unshielded Low Voltage Power Cable Fault Locating

An intact jacket and sheath of a solid dielectric insulated cable is required to avoid ingress of water and subsequent cable faults. With this test, the dielectric strength of the cable jacket is tested by applying a DC voltage of up to 10 kV to the cable sheath (concentric neutral).

Sheath fault location requires the additional item ESG NT Digital ground/ earth fault locator with optional “A” frame. Accurate location of sheath faults is achieved using the step-voltage method: as the fault approaches, the step voltage potential increases, decreasing with reversed polarity after it passes the fault. The change in polarity allows the fault to be located precisely. The identical method with the same equipment can also be used for secondary fault locating on unshielded low voltage power cables.

#### Fault pre-location

After identifying the type of fault, prelocation of the fault position is determined using ARM. The fault is stabilized by creating a temporary “bridge” to ground/earth. During this condition, a standard TDR measurement is made into what is basically a short circuit fault.

#### Sectionalizing (Optional)

The sectionalizing mode is used to identify and indicate the location of transformers in a loop or radial system, locating the fault between its 2 closest transformers, which identifies the faulted span.

#### Pinpoint fault location

Accurate pinpoint fault location is achieved using the “Thunder & Lightning” method whereby the 500 Joule surge generator (thumper) and an acoustic/electromagnetic receiver is used.

### FEATURES AND BENEFITS

The EZ-THUMP 4/12 series of portable fault locators combine the following features and benefits in a single device.

- Quick-step and expert modes, especially convenient where operators may not be called upon to use the equipment on a regular basis
- Automatic fault locating procedure
- Operating of unit via rotary control knob
- Automatic end-of-cable and fault detection
- DC testing up to 4 kV or 12 kV (dependent on model) with automatic breakdown detection

- Key switch interlock
- Operation from internal battery or from an ac source
- Rugged, lightweight, high impact resistant IP54 designed enclosure

### SPECIFICATIONS

#### Testing

Output: 0 – 4 kV, 35 mA DC (EZ-THUMP4)  
0 – 12 kV, 12 mA DC (EZ-THUMP12)

#### Prelocation

TDR: Range: 25,000 ft (7.6 km)  
Sampling Rate: 100 Mhz  
Resolution: 2.5 ft @ 250 ft/fs  
0.8 m @ 80 m/fs  
Arc Reflection: 0 – 4 kV or 0 – 12 kV (model dependent)

#### Pinpoint Fault Location

Surge: 0 - 4 kV @ 500 J (EZT4)  
0 – 12 kV @ 500 J (EZT12)  
Impulse Sequence: 10 seconds  
Single shot

#### Display

5.7 in. (14.48 cm)  
Transflective TFT Color LCD  
640 x 480 pixel

#### Memory

1000 traces

#### Interface

USB Port

#### Cables/Terminations

15 ft (4.6 m) HV flexible shielded cable with MC connector and hotline clamp  
HV return with hotline clamp  
15 ft (4.6 m) ground/earth cable with hotline clamp  
6 ft (1.8 m) mains supply lead set (US/SCHUKO/UK)

#### Supply

Battery: Internal 24 V NiMH Battery 5 AH Approx. 30 mins of surge/thumping Approx. 3 hours recharge time  
100-240 VAC – 24 VDC charger with connection lead set (US/SCHUKO/UK)  
AC Line: 100 – 230 VAC ±50/60 Hz

#### Safety

Emergency stop  
Key-switch Interlock  
Auto “time out”

#### Environmental

Operating Temperature: -4 ° to 122 °F (-20 ° to +50 °C)  
Storage Temperature: -12 ° to 160 °F (-25 ° to +70 °C)

#### IP Rating

IP54 (with top open)

#### Weight

71 lbs (32 kgs)

#### Dimensions

14 x 11 x 21 in. (35.5 x 28 x 53.3 cm)

## ORDERING INFORMATION

Order an EZ-Thump configured to your specific needs. To determine the catalog number, fill in the alpha characters with the corresponding numbers from the detailed options. Example: to order a 4-kV EZ-Thump with 15 ft output and ground cables, 14 mm male MC with vise grip cable termination, hand cart and sheath, request catalog number EZT4 - 15 T2 C H

Item	CAT No.	Included Accessories
4-kV Portable Fault Location System	EZT4-yyzzSCHM	6 ft (1.8 m) mains supply lead set (US/SCHUKO/UK) 1002-889
12-kV Portable Fault Location System	EZT12-yyzzSCHM	Universal battery charger kit (US/SCHUKO/UK) 1002-890
<b>Options (must be defined when ordering):</b>		Instruction manual AVTMEZT4/12
Cable length designator (yy):		
15 ft (4.6 m) HV output and ground cables	yy = 15	
50 ft (15 m) HV output and ground cables	yy = 50	
Cable termination designator (zz):		
14 mm male MC with hotline clamp	zz = T1	
14 mm male MC with vise grip	zz = T2	
Hardwired to battery clamps on HV and “G” clamp to ground (no MC connectors)	zz = T3	
10 mm Female MC with battery clamps	zz = T4	
Optional designators (omit when not ordered)		
Sectionalizing software	S	
*Hand cart prep	C	
**Sheath	H	
Voltage selection manual	M	
		<b>Optional Accessories</b>
		Hand cart for EZT4/12 895000180110000
		15-kV elbow 14 mm female MC connector 865000100100000
		25-kV elbow 14 mm female MC connector 865000200100000
		35-kV Elbow 14 mm female MC connector 865000300100000
		Digiphone Plus surge wave receiver 871500500100000
		ESG NT digital earth fault locator 871500200200000

\*Not available with 50 ft cables  
\*\*Sheath fault testing/secondary fault locating

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VFCustomerSupport@megger.com  
(case sensitive email address)

**OTHER TECHNICAL SALES OFFICES**  
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Sydney AUSTRALIA, Täby SWEDEN,  
Ontario CANADA, Trappes FRANCE,  
Aargau SWITZERLAND, Dubai UAE,  
Mumbai INDIA, Johannesburg SOUTH  
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**ISO STATEMENT**  
Registered to ISO 9001:2008 Cert. no.  
110006.01  
**EZT4/12\_DS\_EN\_V10**  
www.megger.com  
Megger is a registered trademark.





## The System

The **digiPHONE+** System consists of:

- the Receiver
- the Sensor
- and the Headset





## Silence

Careful handling, night work and filtering was yesterday

Today we have a new definition of silence

The innovation in fault pinpointing

Several new, innovative methods of the **digiPHONE+** will ensure the silence



The technology that lets you hear the fault – only the fault!

No traffic!

No high heels!

No talking!

No noise!

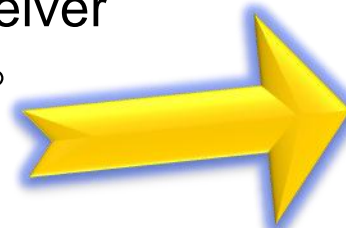
**You hear only what you want to hear,**

- **- “THE” Fault! Nothing else! Your ears will like it!**



## Features

- Highest acoustic quality and external noise immunity
- Automatic Volume Mute with „Bang protection“
- Bright, sun capable display
- Easiest Operation
- Ergonomical, adjustable telescopic handle
- Distance measurement in Milli seconds or meters
- Selectable volume limitation to 84 dB(A)
- Easy tracing with left – right indication
- Fault direction indication
- Automatic adjustment for magnetic and acoustic channel
- Weather proof IP65 Sensor, better IP54 receiver
- High ground stability of the sensor up to 45°
- And...New, high performance connectors!





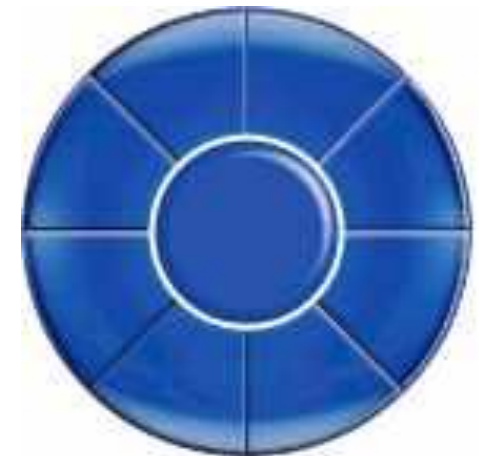
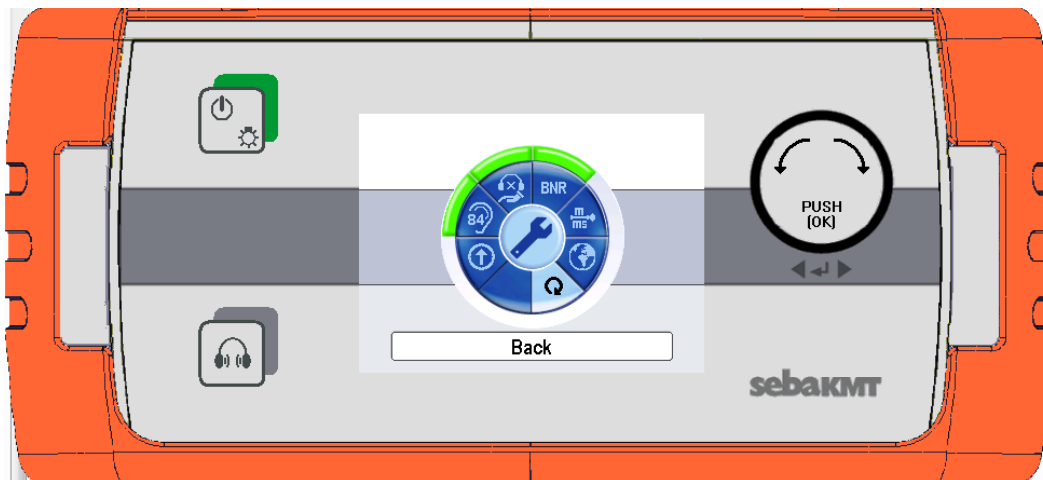


## Operation

Like most new Sebakmt systems, the new **digiPHONE+** is operated by the in the centrix approved jogdial philosophy.

The required possible adjustments are limited to the minimum and need in most cases only once to be adjusted.

But even, if the adjustments need to be changed more frequently, the very Straight forward menue stucture supports an easy navigation





## Noise and Ear protection

The **digiPHONE+** is a pinpointing device, which is generally based on the detection and evaluation of the noises, that result for the flashover at the fault position.

Resulting several new technologies for sound resp. for the reduction of of sound or noise were used.

BNR – Background Noise Reduction

APM – Auto Proximity Mute

A noise reducing construction of the microphone housing

Adjustable filters

84 dB limiter (according to noise and vibration protection laws)

A completely new, soft suspended sound pickup

An easy detachable handle

Explanations will follow!





## Noise reduction

With the new **digiPHONE+**, a new noise reduction technology, the BNR (Background Noise Reduction) was developed

This technology reduces by a specific averaging process the flashover noise to its primary contents.

Disturbing noises disappear and leave an astonishingly clear sound.

The housing itself reduces the body sound significantly by a combination of different composite materials and a free suspension of the microphone

It at all, the noise will come through only very weak





## Bang protection, Automatic Mute

One of the most annoying problems with all ground microphones is the extreme noise during pickup or setting down of the microphone (Bang).

### Automatic Proximity Mute - APM.

The second silent technology of the new Digiphone+.

Get close to the handle and it turns the volume off. No crack or bang. Just off, before the hand even reaches the handle.

After removing the hand, a short time delay ensures that The Sensor has really settled itself into the new position, and any mechanical oscillations have disappeared, before the sound comes back on.



For users, that want to control this still by themselves, there is still the alternative Mute key on the front panel **(in the competitive evaluation, the only key beside the power key!)**





## Working Safety

Research with the previous Digiphone, but also competitive units showed, That in some cases, due to specific exposure to noise, the risk of a hearing loss exists.

The permitted noise exposure is regulated by different local laws or regulations, for example the „Occupational Safety and Health Standards” in the USA

**1910.95(c)(1)** The employer shall administer a continuing, effective hearing conservation program, as described in paragraphs (c) through (o) of this section, whenever employee noise exposures equal or exceed an 8-hour time-weighted average sound level (TWA) of **85 decibels** measured on the A scale (slow response) or, equivalently, a dose of fifty percent. For purposes of the hearing conservation program, employee noise exposures shall be computed in accordance with appendix A and Table G-16a, and without regard to any attenuation provided by the use of personal protective equipment.

When exceeding the permitted 85 db(A) the weekly permitted exposition duration, at least in compliance with the German noise and vibration protection laws, is in the range of only a few minutes!



## Working safety

By a selectable limitation of the maximum permissible noise level to 84 db(A), the use can now safely comply With the according limiting regulations

But here it should also be clear, that a permanent wearing of the headset is not essentially required.

In many cases it is absolutely sufficient, to trust the display and to check occasionally or only during the final pinpointing the acoustic response of the fault.







## Filter

The audial reception of each uses is subjective and also habitually oriented. The various filter adjustment are also a help to find the setting which suit the specific personal audial reception.

Additionally the selectable filter setting are also comparable with existing sound images as the are typical for specific ground microphones as for example The T 16/841, but also for competitive unists.

Whatever decides the setting of the filters,

- the **digiPHONE+** will guide the user reliably to the fault!





## Sensor

Adjustable handle

Exchangeable tips

Active Elektronik – the evaluation happens completely in the sensor!

Housing: Dual shell die casting with telescopic handle

Soft rubber rims for acoustic shielding

Dimensions: Diameter 230mm (at the outer lip)

Height: 140mm

Handle length: 450 ... 750mm

Weight: Sensor mit Teleskopstab ca. 2 kg

Dynamic range: acoustic channel >110dB

Dynamic range: magnetic channel >110dB

Frequency range: 100 ... 1500Hz

4 Filter settings: OFF 100 ... 1500Hz

Low pass 100 ... 400Hz

Band pass 300 ... 500Hz

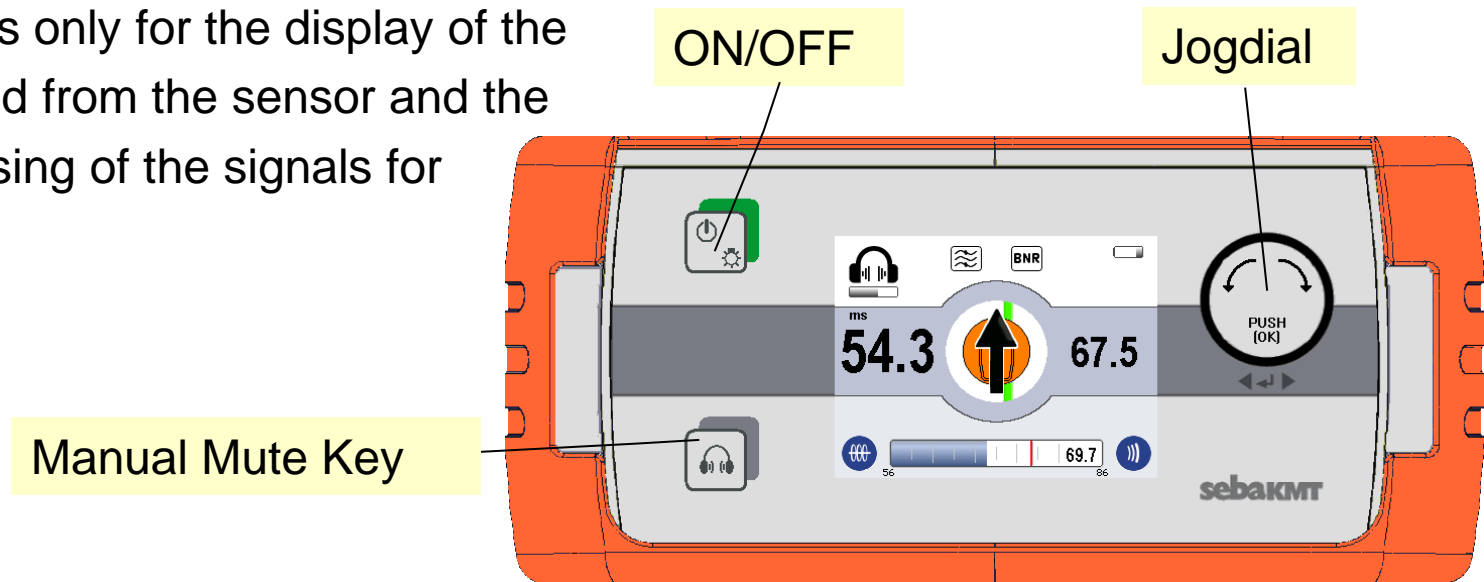
High pass 700 ... 1500Hz





## Receiver

The receiver is only for the display of the data generated from the sensor and the signal processing of the signals for the head set.



Dimensions (with rubber frame): 65 mm x 225 mm x 100mm (H x W x D)

Weight: app. 1kg (incl. Batteries)

Supply: 6 pieces Mignon cells Typ IEC R6 (Alkali-Mangan)

Operation time: @ Mignon cells with 2500 mAh capacity: > 10 Std.

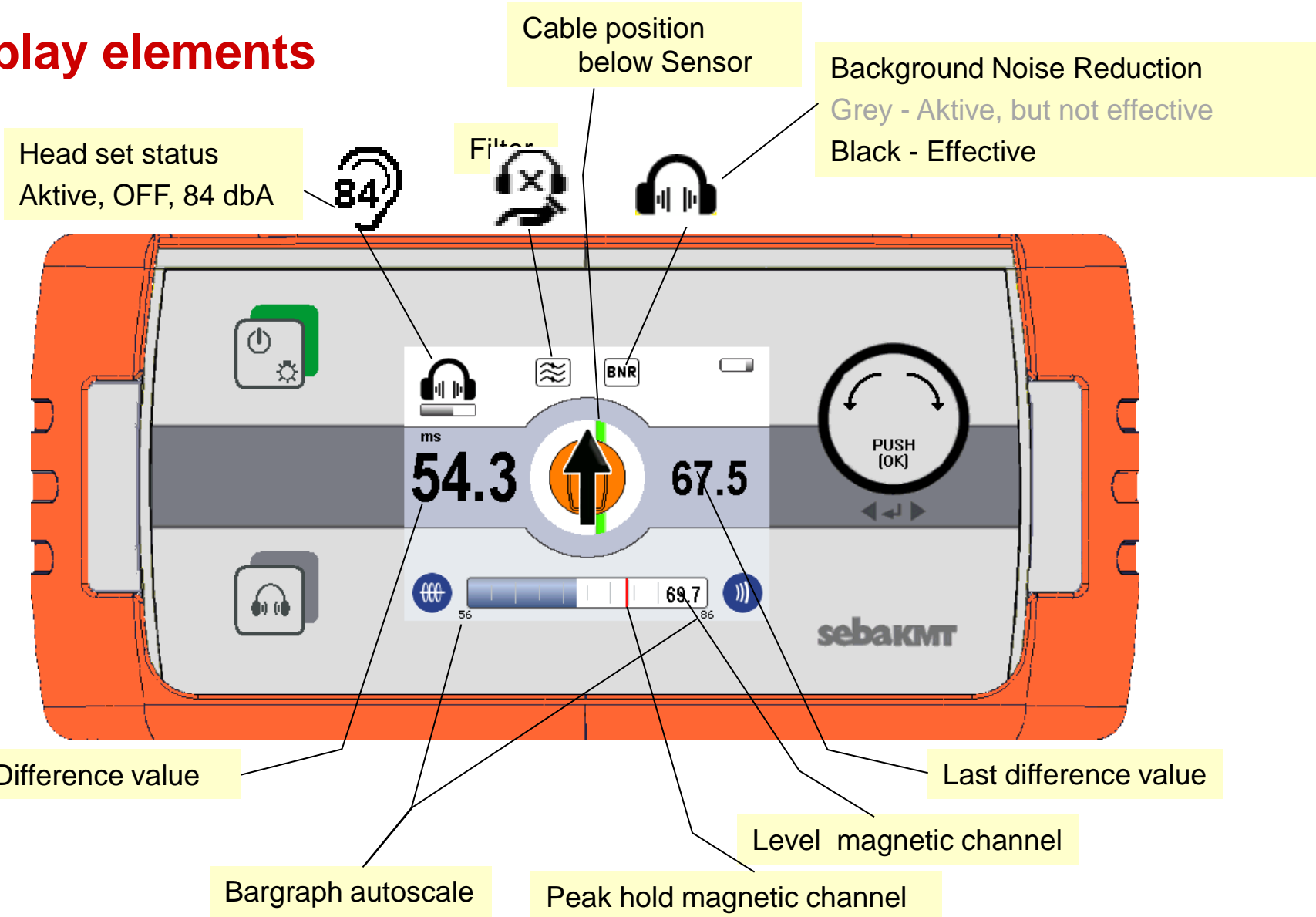
Display: Color TFT - 320x240Pixel

Adjustment: Selectable limitation to 84 dB(A), Volume

Akustic Gain: >120dB



## Display elements



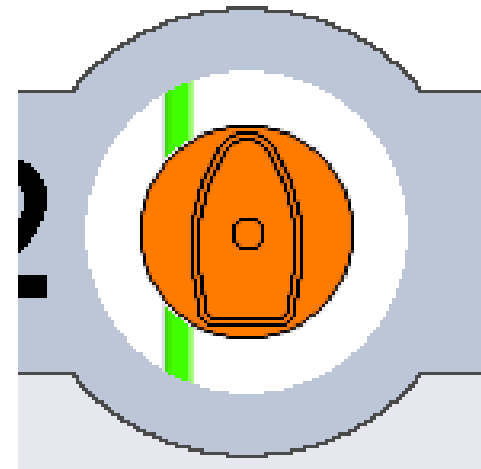
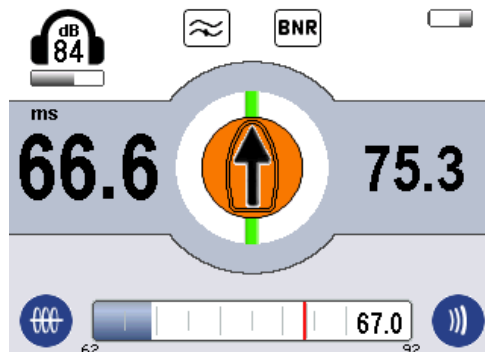


## Tracing

A green cable symbol beneath the sensor symbol in the center of the **digiPHONE+** display shows the side position of the sensor in relation to the cable trace.

This ensures automatically, that the user remains with the sensor directly on top of the cable, which makes the fault location more accurate but also easier. Weak faults are much faster detected and located.

A cross measurement is not required, since the system is positioned automatically in the Y-axis on top of the cable





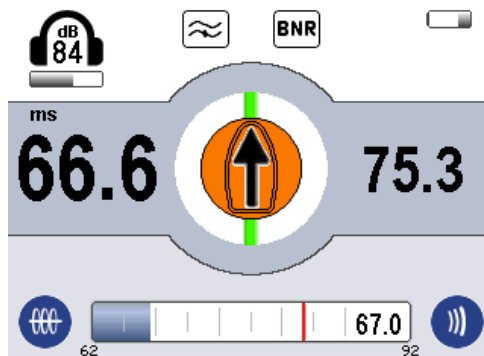
## The Compass

The „Compass“ function of the **digiPHONE+** recognises from the data, especially from the difference time measurement, if the user is moving towards the fault. This is indicated by the arrow in the display. The user follows the arrow and approaches automatically the fault position

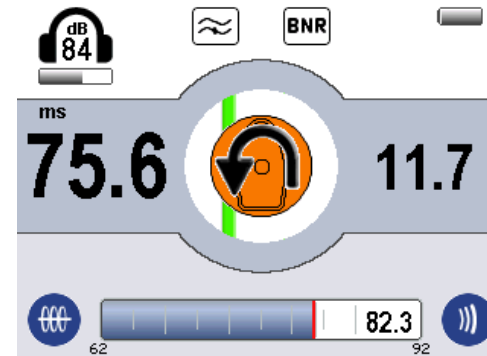


If the **digiPHONE+** detects an increase of the difference time, it means, that the user has passed the fault already. In this case a bent arrow indicates this and requests the user to move backward.

Before the fault:  
The new value is lower than the old difference value



After the fault:  
The new value is higher than the old difference value







## Competiton

The Digiphone (released 1993), as well as its predecessor T 16/8B were the benchmark and handicap for ALL competitors.

Resulting we oriented ourself on these data, but lifted the benchmark in respect to functionality, acoustic, quality and appearance to a new level!  
The **digiPHONE+** is again the trend setter for the pinpointing which sets  
And defines clear limits  
... The technical data reflect this only limited.

Test it ! Let you customer experience and hear the new **digiPHONE+**

The plain data as in the following comparison table mean very little!

We are supporting you to deliver  
a world class service, every day,  
in every sector...

## LOCATIONS

### LONDON, HEATHROW

#### Sunbelt Rentals UK Test & Monitoring

242-252 London Road, Staines, London TW18 4JQ

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### REDCAR

#### Sunbelt Rentals UK Test & Monitoring

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0370 330 6021

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### STOKESLEY

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