



Magdeburger Prüfgerätebau GmbH

## HMP LFG | The Light Weight Deflectometer

By means of the Light Weight Deflectometer HMP LFG you are able to purposefully manage and control your compaction works and to improve the quality of your construction site.

**This gives you confidence,  
saves time and money!**



MADE  
IN  
GERMANY

Calibration  
INSTITUTE  
authorised by the  
Federal Highway  
Research Institute

# THE COMPANY

## HMP Magdeburger Prüfgerätebau GmbH

As a medium-sized family business in second generation we rely on continuity, reliability, confidence and innovation.

More than 30 years of experience in development, production and service, certified quality standards and latest production conditions make us a competent partner for the construction industry.

The from us developed test equipment, as the Light Weight Deflectometer HMP LFG and the Static Plate Load Tester HMP PDG are used all over the world for compaction control and bearing capacity tests at the soil examination. Trained service- and sales partners form a reliable global network.

We only manufacture in Germany and trust in regional suppliers on the basis of strict certification guidelines.

The HMP GmbH is a from the Federal Highway Research Institute (BAST) approved calibration institute for Light Weight Deflectometer.



**MADE  
IN  
GERMANY**

Calibration  
INSTITUTE  
authorised by the  
Federal Highway  
Research Institute



1990-2016

26 YEARS

*Excellence for experts.*



# THE LIGHT WEIGHT DEFLECTOMETER

## The test method

The dynamic plate load test by means of the Light Weight Deflectometer enables an uncomplicated bearing capacity test and compaction control of soils, non-cohesive subbases and soil improvements – with in only 2 minutes – just place the device, measure and evaluate immediately!

Inbuilt soil layers can be tested very quickly and without load abutment, facilitating quick assessments of test lots even under limited space conditions. The test

method is suited for coarse-grain and mixed grain soils having a maximum grain size of 63mm and can be used to determine the dynamic modulus of deformation of soil in the range of  $E_{vd} = 15...70 \text{ MN/m}^2$ .

The dynamic plate load test is described in the Engineering Code for Soil and Rock in Road Construction TP BF-StB part B 8.3 issue 2012.

Detailed correlations to other test methods exist.

## Areas of application

- Road- and railway construction, earthworks
- Quality assurance in canal construction
- Compaction control in pipe trenches
- Testing of pavement beddings
- Testing of foundation backfill
- Quality inspection in boreholes
- Testing of modulus of deformation within the framework of soil examination



## BUILDING CALLS FOR TESTING.



Determine the bearing capacity and compaction quality of soils and non-cohesive subbases fast, reliably and precisely.

By means of the Light Weight Deflectometer **HMP LFG** you are able to purposefully manage and control your compaction works and to improve the quality of your construction.

This gives you confidence, saves time and money!



## Self-monitoring

The Light Weight Deflectometer **HMP LFG** is especially suitable for in-house self-monitoring, due to the easy handling and the immediately available measurement results. This facilitates quick decisions to continue construction work at the site.

Minimize your costs by avoiding unnecessary compaction works but also optimize the quality of your construction project.

Convince your customer by proofing the quality assurance of your construction site. Prevent f. e. expensive recourse claims because of subsidence damages.

Document your measured data directly at the site via printout by means of the thermal printer or as protocol printout after transferring and reliable archiving the measurement series onto your PC.

# SIMPLE MEASUREMENTS

## Advantages

### Fast and cost saving

- › quick examination – only 2 minutes per measuring point
- › measurement result immediately available
- › documentation directly at the site
- › no vehicle as counterweight necessary

### Easy to use

- › low tare weight, ergonomic design
- › can easily be operated by one person
- › testing even in difficult-to-reach places
- › intuitive menu navigation
- › automatic storage, evaluation and archiving
- › detailed correlations to other test methods exist

### Reliable and precise

- › manufactured according to newest technical standards
- › precise, robust, durable
- › calibrated by approved calibration institute
- › in use all over the world for more than 30 years

## German regulations

- › **TP BF-StB B 8.3 issue 2012**  
The Engineering Code for Soil and Rock in Road Construction
- › **ZTV E-StB 09**  
German additional terms of contract and rules for earthwork in road construction
- › **ZTV T-StB 95/02**  
German additional terms of contract and rules for subbases in earthwork
- › **ZTV A-StB 12**  
German additional terms of contract and rules for excavation in traffic access
- › **RIL 836, Deutsche Bahn AG (NGT39)**  
Guideline for the use of the Light Weight Deflectometer in railway construction

## International regulations

- › USA  
**ASTM E2835-11** (2015) Standard Test Method for Measuring Deflections using a Portable Impulse Plate Load Test Device
- › Austria  
**RVS 08.03.04** March 2008 compaction control by means of dynamic plate load test
- › Spain  
**UNE 103807-2:2008** Plate Loading Test of Soils by means of Dynamic Plate - Part 2: Rigid Plate, Diameter  $2r = 300$  mm, Method 2
- › China  
**TB 10102-2004, J338-2004** Standard for soil testing in railway construction

The HMP LFG complies with the standards for its usage according to German and International regulations. Detailed correlations to other test methods ensure the compatibility.

## The handling

The handling of the Light Weight Deflectometer is comfortable and very user-friendly. Measurement errors are excluded. The internal plausibility control guarantees this.

The measuring procedure shown on the right shows the easy and quick implementation of the measurement. The menu navigation is intuitive and easily understandable even without prior knowledge.

The measuring results can be printed out immediately on-site. The measuring point will be recorded by specifying the corresponding GPS data. The measured values can be exported via Bluetooth, usb stick or cable for subsequent processing and protocol creation on tablet or PC.

The comprehensive language selection and individual adjustment possibilities ensure a smooth communication for international operations.



## The measuring process

### Set it up

- level the test area
- lay down the full-size load plate
- put loading mechanism onto it
- connect it with measuring instrument



### Measure

- switch on, confirm mode „Measuring“
- follow the instructions in the display
- perform successively 3 precompacting impacts & 3 measuring impacts
- displaying the settlement after each impact



### Evaluate

- displaying all measured data and the  $E_{vd}$ -value after completion of the measurement series
- store, printout or transfer measurement
- automatic calculation and displaying all measured data when test series is ended



## THE PREMIUM MODEL **HMP LFG<sup>pro</sup>**



### Reliably

The Light Weight Deflectometer can easily be used by one person – even without prior knowledge.

Due to latest technology, the measuring instrument is small, handy, unbeatably easy to use but also extremely accurate.

The measuring device is of course splash-water proof to work under bad weather conditions. All parts of the tester are also surface sealed .

### USB stick 4GB incl. movie regarding application

New user? No problem, the movie on the supplied USB stick explains the test procedure within a few minutes - always available and quickly retrievable.



### Latest device generation

- > large colourful graphic display 3,5"
- > **lightsensor-controlled backlighting**  
> guarantees optimum readability at all weathers!
- > very comfortable menu navigation
- > integrated **GPS**
- > integrated **Bluetooth**
- > interface for thermal **printer, USB**
- > **help** function
- > efficient, fast **32-bit processor**
- > internal memory for up to 1000 tests
- > high-performance rechargeable **lithium-polymer-battery** > guarantees constant readiness for use

### Best communication

- > Data transfer to tablet, smartphone or PC via **Android-App HMPtransfer**, USB stick or cable
- > **web-based evaluation software HMPreport**, password protected > availability of the measurement data in real time at any place
- > menu, app, software in many **languages**



About the movie:  
[www.hmp-online.com](http://www.hmp-online.com)





## It doesn't get any easier! Intuitive menu navigation

The menu navigation of the HMP LFGpro is very user-friendly. In order to perform the test, just follow the instructions in the display.

### Start display

Welcome. The start display shows the charging status of measuring device + printer and also the GPS + Bluetooth activity. Warnings will additionally inform you about critical values, so that your testing device is always optimally ready for operation.

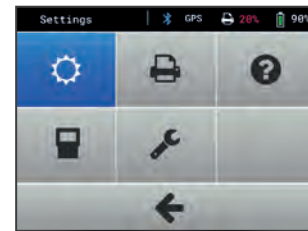
### Measurement

- After activating the menu item with ENTER you will be guided through the measurement process.
- An acoustic signal indicates the readiness to measure.
- The help function provides additional tips regarding test procedure.
- The internal plausibility control avoids measurement errors.



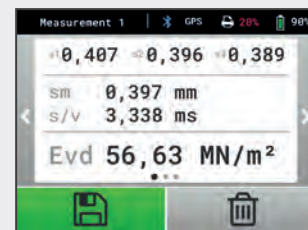
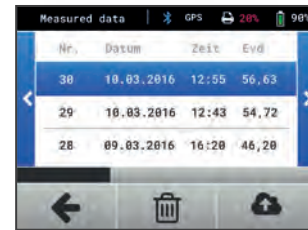
### Settings

Adjust the display and device configurations to your requirements. Regarding menu navigation just choose one of the various languages and use nationally usual measuring units.

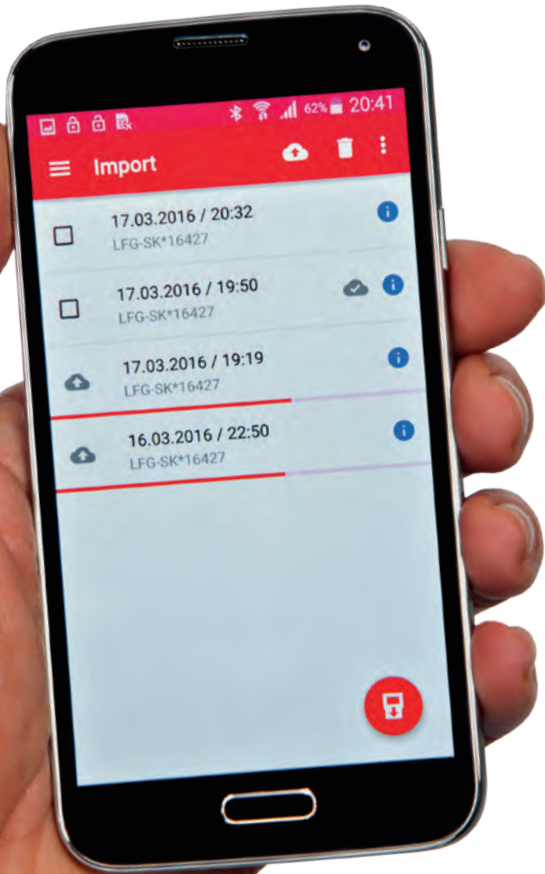


### Measured data

Here you can find all stored measurements clearly arranged for further processing and documentation.

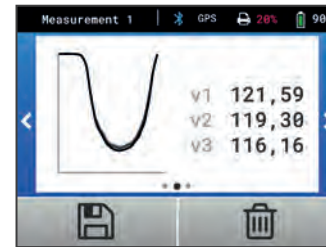


# THE EVALUATION



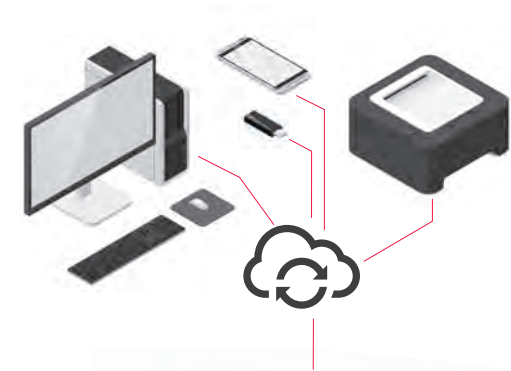
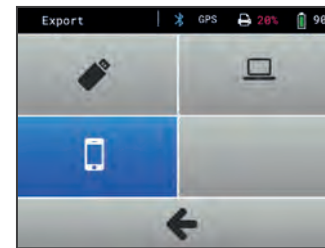
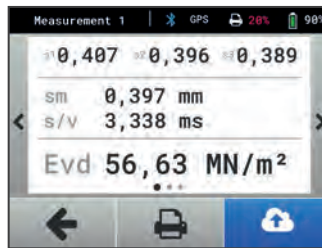
## Measured data

Select the single measurement series & scroll through their details, as curve and GPS data.



## Export

Export your measured data via USB, Bluetooth (HMPtransfer App) directly into the Cloud or to your PC for archiving and further processing. Protocols can already be prepared in the office, while you are still on the construction site.



DYNAMIC PLATE LOAD TEST according to TP BF-StB part B 8.3

contact details contractor

Your professional appearance

HMP LFGpro  
No. 16427

EXAMINER

WEATHER/TEMPERATURE

PROJECT

TEST SURFACE/LAYER

No.: 2

TESTDATE/TIME:  
2016-03-26/ 14:59

Date/time

GPS-position  
N 52°10'36.70  
E 11°39'39.33

Settlement and settlement speed

n	Sn(mm)	Vn(mm/s)
1	0.790	203.6
2	0.785	203.2
3	0.788	202.9

MW | 0.788 | 203.2

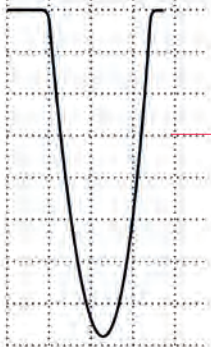
EVALUATION

Dynamic deformation modulus  $E_{vd}$

$E_{vd} = 28.55 \text{ MN/m}^2$   
 $s/v = 3.88 \text{ ms}$

Path/speed ratio  $s/v$

$t = 5\text{ms}/d$ ,  $s = 0, 10\text{mm}/d$ .



## Documentation

### > Print out

Document the measuring results directly on site my means of thermal printer.

### > Create protocols

Use the web-based evaluation software **HMPreport**, in order to create professional protocols for each measuring point including your logo and contact details – wherever and whenever you want. Work with the data from the Cloud or from your PC. The Software also enables you to store the data in a database with comfortable search- and editing options.



Contractor Belegungsanbieter		Customer Gemeinde Mühlendorf Gemeindestraße 17 39270 Mühlendorf	
<b>Dynamic Plate Load Test according to TP BF-StB Teil B8.3</b>			
Project No. 0008	WHG 17-2016	Deadline 21.03.2016/09:10	
Measuring series Bearb.	Mr. Steve Wright	Measuring point Temperatur/Waether	N 50°26'01.00".E 11°09'19.20" 15 C°, dry
Project Measuring point Test surface layer Measuring Nr. Bodenart Plattentiefe	Street segment zum Mühlendamm MD 27 Gravel base layer HMP LFGpro 16427 GW Sand 0-2		
Measuring data		Settlement	Velocity
		$s_1 = 0.429 \text{ mm}$	$v_1 = 174.6 \text{ mm/s}$
		$s_2 = 0.403 \text{ mm}$	$v_2 = 171.5 \text{ mm/s}$
		$s_3 = 0.396 \text{ mm}$	$v_3 = 168.0 \text{ mm/s}$
		$s_4 = 0.409 \text{ mm}$	$v_4 = 171.37 \text{ mm/s}$
		$s/v = 2.38 \text{ ms}$ $E_{vd} = 55.01 \text{ MN/m}^2$	
Settlement/Time-Chart: (mm/ms)			
Remarks:			
		Mühlendorf 21.03.2016 Platz, Date	
		 Signature/Stamp Tester	

# THE HMP LFG4

## Standard model

Reduced to the basics – successfully in use for more than 30 years worldwide!

## Technical features

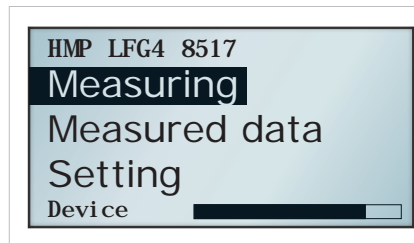
- > large graphic display (62 x 35 mm)
- > comfortable menu navigation
- > acoustic signal when ready to measure
- > Bluetooth interface
- > printer port
- > GPS port
- > internal memory for 500 tests
- > more than 1000 tests with one battery charge

## USB stick 4 GB incl. movie regarding application

New user? No problem, the movie on the supplied USB stick explains the test procedure within a few minutes – always available and quickly retrievable.



Intuitive menu navigation:  
Choose, confirm, done!



Easy and quick selection of  
the stored data

No.	Date	Time	Evd
1	12. 03.	/09: 29	57. 7
2	12. 03.	/09: 40	56. 3
3	12. 03.	/10: 24	51. 0
4	15. 03.	/08: 34	51. 9

scroll forward  
scroll backward  
back

Individual adjustments

Drop weight	10kg	
GPS		X
Unit		MN/m <sup>2</sup>
Calib.datum		✓



## Best communication!

- > Data transfer to tablet, smartphone or PC via Android-App **HMPtransfer**, USB stick or cable
- > web-based evaluation software **HMPreport**, password protected > availability of the measurement data in real time at any place
- > menu, app, software in many **languages**

## Technical data



	LFGpro	LFG4
<b>Electronic settlement measuring instrument</b>		
> Settlement measuring range 0,1 bis 2,0 mm ± 0,02 mm	✓	✓
> Measuring range $E_{vd} < 225 \text{ MN/m}^2$	✓	✓
> Temperature range 0 to 40 °C	✓	✓
> Very robust, splash-water proof, connection cable with high-quality LEMO connectors	✓	✓
> Graphic display in mm	56 x 73	38 x 68
colourful, lightsensor-controlled and illuminated	✓	
black/white		✓
> Help function	✓	
> Fast, efficient 32-bit processor	✓	
> Bluetooth, USB, thermal printer interface	✓	✓
> GPS	✓	optional
> Dimensions in mm	210 x 100 x 31	211 x 100 x 26
> Storage capacity, internal in measurement series	1000	500
> Power supply:		
high-performance rechargeable		
lithium-polymer-battery 3,7 V, 6300 mAh	✓	
4 x R6 Batterien		✓
> Menu navigation (18 languages available)	✓	✓
<b>Loading Mechanism</b>		
> Total weight 15,0 kg	✓	✓
> Drop weight 10,0 kg	✓	✓
> Max. impact force 7,07 kN	✓	✓
> Duration of impact 17,0 ± 1,5 ms	✓	✓
> Material: zinc coated/hard-chrome plated steel	✓	✓
> Spring element 17 disk springs	✓	✓
<b>Load plate</b>		
> Diameter 300 mm, Plate thickness 20,0 mm	✓	✓
> Total weight 15,0 kg, Material: zinc coated steel	✓	✓

## Scope of supply

### Light Weight Deflectometer HMP LFG

according to »German Engineering Code for Soil and Rock in Road Construction TP BF-StB part B 8.3 / issue 2012«

consisting of:

- > **Loading mechanism with bubble level**
- > **Load plate with acceleration sensor**
- > **Electronic settlement measuring instrument** within protective aluminum case, Displaying and storage of settlement values, settlement speed (ratio s/v), deflection module  $E_{vd}$  and settlement curve
- > **USB stick incl. movie** regarding its application and instruction manual, 4 GB

### Optional upgrade

Because of the modular construction you only buy, what is actually needed – basic equipment for the efficient self-monitoring or professional device for exact documentation. An upgrade or modification is possible at any time fast and cost-effective.

### Guaranteed

- > 2 years of guarantee included
- > 10 years of spare part availability guaranteed
- > competent all-round service – even after the sale has been made!
- > certified according to DIN EN ISO 9001:2008
- > development and production within Germany
- > trained service- and distribution partner nearby

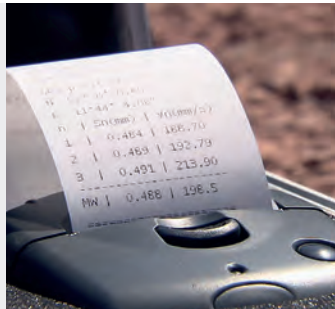


# THE ACCESSORIES

## Additional options

### Thermal printer

- Small, quick printer with light resistant thermal paper.
- State of charge of the printer is shown in the display of the settlement measuring instrument. The actuation is performed automatically.
- Document your measuring results directly at the site.



### Transport cart

- For comfortable transport of the Light Weight Deflectometer at the site to the corresponding measuring points – device and accessories are stored safely but still immediately ready for use.
- Space saving foldable, small enough to fit into the trunk



### HMPtransfer App

- For convenient data transfer via Bluetooth/Smartphone from the site directly to the office.



### Magnetic base plate

- In order to put down the loading mechanism clean and safe.
- Then you have both hands free to align the load plate.



### HMPreport Software

- Web-based Software for comfortable evaluation and processing of measured results. Add details regarding measuring point and take advantage of the clearly arranged user interface to create and archive representative A4 test protocols – anytime, anywhere.



### Robust transport box

- Wooden box for safe storage of device and its transportation



### GPS – External Bluetooth-GPS-Receiver

- Compatible with HMP LFG4, to proof the coordinates of the measuring point



## History



1981

HMP LFG<sup>pro</sup>  
2016

The in-house research- and development department and the cooperation with renowned institutes, f. e. the Fraunhofer Institute Magdeburg guarantee the constant further development of our devices.

More than 30 years of experience and a certified service department with calibration institute ensure you an All-round service and an operational readiness of your device for years!

Basic equipment for the efficient self-monitoring or professional device for exact documentation – you only buy, what is actually needed.

Because of the modular construction of the HMP testing equipment an upgrade or modification is possible at any time fast and cost-effective.

### That you can rely on:

- > German production, certified according to DIN EN ISO 9001:2008
- > Calibration institute – authorized by the Federal Highway Research Institute
- > 2 years of guarantee
- > 10 years of spare part availability
- > More than 30 years of experience in development, production and service.
- > Trained service- and distribution partner nearby



Magdeburger Prüfgerätebau GmbH

Your competent specialised dealer:

- › Development, Production and Service – Soil-mechanical test equipment

### HMP LFG

The Light Weight Deflectometer

TP BF-StB B 8.3 issue 2012  
ASTM E2835-11 (2015)



### HMP PDG

Static Plate Load Tester

DIN 18134 issue 2012  
ASTM D1195, 1196  
BS 1377 Part 9:1990-08



### HMP SON

Automatic acquisition-  
and evaluation unit for  
penetration

EN ISO 22476-2



### HMP DEN

Determination of soil density

DIN 18125 part 2



- › Distribution – Tester for road construction, concrete construction, refurbishment of buildings, laboratory equipment

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