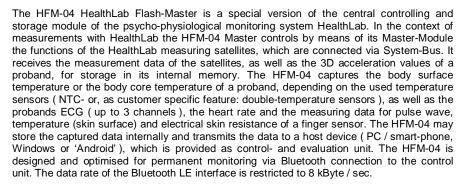






# HealthLab Flash-Master HFM-04





The modular design of HealthLab Flash Master HFM-04 offers the opportunity to provide the device with an alternate satellite module, and thus with a different as herein described measurement technology of the monitoring system HealthLab, details on request.

By means of its serial system bus (HealthLab Serial Slave Bus), up to seven Measuring-Satellites (note the current requirement!) of the HealthLab system can be operated simultaneously at the Health Master HFM-04. Using this bus, the Master provides the Satellites with energy and controls the data exchange. An unique address (0...26) is assigned to each device. For the Master HFM-04, the address is '0'. The HealthLab system is designed as a mobile, autarkic measurement system, but may as well stationary be used, with a Bluetooth connection to the host computer.



#### **Technical Data**

#### **Designation**

HealthLab Flash-Master HFM-04, ECG (up to 3 channel), heart rate, electrical skin resistance, skin temperature, pulse wave, 3D acceleration, barometric air pressure, body core temperature

Power Supply / Consumption internal: 2,0 ... 3,0 V DC (2x Type AA) measuring without Bluetooth: 50 mA measuring with Bluetooth: 60 mA

#### **Data Capturing**

measuring ranges see Channel Index

# Internal Sensors:

3-axis acceleration sensor, barometric pressure sensor

## **External Sensors:**

ECG-electrodes or chest belt finger sensor, double temperature sensor ( *customer specific feature* )

### **Digital Interfaces**

Bluetooth 4.0 LE RS-485 HeallyBus using a four-core shielded cable 460/1840 kbps

#### **Climatic Conditions**

acc. to DIN EN 60204-1 (10-2014)

## **Ambient Temperature**

operation:  $-20 \dots +55 \,^{\circ}\text{C}$  transport / storage:  $-25 \dots +60 \,^{\circ}\text{C}$ 

# **Humidity / Altitude**

 $20\,\ldots\,90~\%$  RH ( without condensation ) up to 8.000 m

## **Dimensions**

W / H / D : 65 x 127 x 23 mm

weight: 120 g





Datasheet\_HFM-04.doc | Status 2016 - 03 -10



For the usage of the HealthLab system, the software package 'HealthLab' is available. It includes the module 'Healty Control', which enables the user to configure the system as well as to display data and to perform measurements. For complex psycho-physiological experiments further software modules are available.



*Note*: The psycho-physiological monitoring system HealthLab is manufactured and delivered in configurations according to customer's request. The HealthLab components are not certified for use in the medical field. Therefore they shall be used solely for research purposes in scientific area.

Ordering Information:	Part No.		
HFM-04 Flash-Master	E1922		
Accessories:			
TPS-02 Temperature Sensor: Tcore <sup>™</sup> Temperature Sensor: Tcore <sup>™</sup> Adapter Cable:	E1288 AD0139 E1952		
EGA-01 ECG Sensor Cable ECG Strap	E1938 VV0069		
VSS-03 Candy Cable (SAT-SAT connection cable)	E1816		

# **Channel Index**

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Channel- Designation	Channel No. ( Identifier )	Signal	Unit	Measuring Range	Resolution	Sample Rate ( Hz )	Gain ( default )	Offset
ACC_X	139	acceleration sensor x- axis	G	±6	0.003	40	340	2048
ACC_Y	140	acceleration sensor y- axis	G	±6	0.003	40	340	2048
ACC_Z	141	acceleration sensor z- axis	G	±6	0.003	40	340	2048
ACTG	61	differential total acceleration	G	0 10	0.003	20	340	0
T_65	65	temperature sensor ( double sensor* inward )	°C	0 +50 ± 0.05	0.01	1	100	0
T_69	69	temperature sensor ( double sensor* outward )	°C	0 +50 ± 0.05	0.01	1	100	0
TC_91	91	body core temperature * ( DS: TI_65, TO_69)	°C	0 +50 ± 0.05	0.01	1	100	0
ECG1	101	Electro-cardiogram	mV	-300+300 ± 0.5	0.005	01000		
SRL_F	51	skin resistance ( at the finger)	kOhm	1 - 10.000	0.01	0 125		
TEMP1	54	peripheral temperature	°C	+10 +50	0.01	0 125		
RR_84	84	cardiac cycle duration	ms	240 2000	1	1	0	
PTT	49	pulse wave runtime	ms	200 500	1	1	0	
PW1	105	pulse wave	mV	-200+200 ± 0.5	0.005	0 1.000		
MHUMI *	109	humidity	%	0 100		0 1		
MTEMP *	110	air- / ambient- temperature	°C	-40 +125		0 1		
MBARO	111	air pressure sensor	hPa	10 1200		0 1		
HR	227	heart rate	bpm	30 300	0,1	1	10	0

<sup>\*</sup> double temperature sensor as customer specific feature;

#### **Links on additional Documents:**

Hardware: Master HFM-01 → <a href="https://secure.turboj.de/documents/HFM-04.pdf">https://secure.turboj.de/documents/HFM-04.pdf</a>
Software: Heally Control → <a href="https://secure.turboj.de/documents/Heally5\_en.pdf">https://secure.turboj.de/documents/Heally5\_en.pdf</a>