

HealthLab Flash-Master HFM-04



The HFM-04 HealthLab Flash-Master is a special version of the central controlling and storage module of the psycho-physiological monitoring system HealthLab. In the context of measurements with HealthLab the HFM-04 Master controls by means of its Master-Module the functions of the HealthLab measuring satellites, which are connected via System-Bus. It receives the measurement data of the satellites, as well as the 3D acceleration values of a proband, for storage in its internal memory. The HFM-04 captures the body surface temperature or the body core temperature of a proband, depending on the used temperature sensors (NTC- or, as customer specific feature: double-temperature sensors), as well as the probands ECG (up to 3 channels), the heart rate and the measuring data for pulse wave, temperature (skin surface) and electrical skin resistance of a finger sensor. The HFM-04 may store the captured data internally and transmits the data to a host device (PC / smart-phone, Windows or 'Android'), which is provided as control- and evaluation unit. The HFM-04 is designed and optimised for permanent monitoring via Bluetooth connection to the control unit. The data rate of the Bluetooth LE interface is restricted to 8 kByte / sec.

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 Heally 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 ... +55 °C
transport / storage: -25 ... +60 °C

Humidity / Altitude

20 ... 90 % RH (without condensation)
up to 8.000 m

Dimensions

W / H / D : 65 x 127 x 23 mm
weight : 120 g



For the usage of the HealthLab system, the software package 'HealthLab' is available. It includes the module 'Heally 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:	E1288
Tcore™ Temperature Sensor:	AD0139
Tcore™ Adapter Cable:	E1952
EGA-01 ECG Sensor Cable	E1938
ECG Strap	VV0069
VSS-03 Candy Cable (SAT-SAT connection cable)	E1816

Channel Index

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 : TL_65, TO_69)	°C	0 ... +50 ± 0.05	0.01	1	100	0
ECG1	101	Electro-cardiogram	mV	-300..+300 ± 0.5	0.005	0..1000		
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

* double temperature sensor as customer specific feature;

Links on additional Documents:

- Hardware: Master HFM-01 → <https://secure.turboj.de/documents/HFM-04.pdf>
- Software: Heally Control → https://secure.turboj.de/documents/Heally5_en.pdf

