



## Flow Fluid Logging Systems type KLL-M1 and KLL-Q-M1

for vertical measuring of flow velocity and water quality

### Measuring parameters

- Flow velocity
- Water level
- Temperature
- Conductivity
  - Total Dissolved Solids (TDS)
  - Salinity
  - Density



KLL-Q-M1  
water flow & quality  
logging



KLL-M1  
flow logging



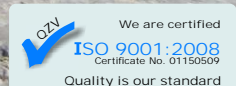
Groundwater Monitoring



Field Test



KLL-Q-M1 for flow logging



# Flow Fluid Logging with KLL-Q-2

The SEBA flow/fluid-logging system has been designed to measure the vertical distribution of groundwater inflow from the tapped aquifer into the well. In addition it is possible to record depth dependent relevant groundwater quality parameters such as electrical conductivity, groundwater temperature (and others).

The system can be implemented for two different procedures: a static- and dynamic- log. For a static log, the unit is lowered into the well to automatically record a depth-dependent groundwater quality profile (e.g. electrical conductivity) and -if existent- a natural groundwater inflow. For a dynamic log, the unit is placed beneath the submersible pump and then lowered down through the water column between pump and well-bottom during pumping conditions (in increased, constant discharge rates).

The flow/fluid-logging system is suitable for casing diameters starting from 6". The 6" funnel can be additionally equipped with centralizers for 8" and 10" wells. The instrument has an extremely compact design, easy operation with fast and precise acquisition of many water quality parameters. The current water quality parameters are clearly displayed and the velocity is counted with the signal counter Z6.

## KLL-Q-M1 in Detail

### Display

3-lines display with background lighting for clear indication of current measuring values (e.g. water level, temperature, conductivity)

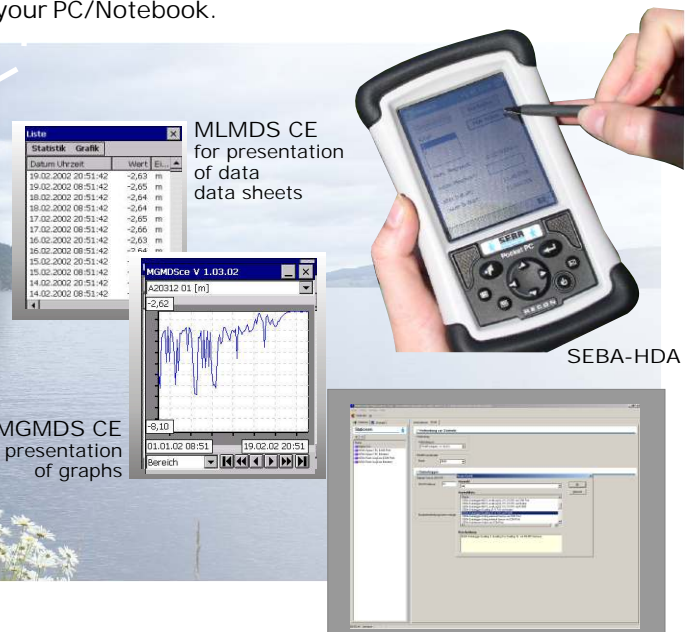


### Keys

The instrument can be operated via 3 keys on the front. It is very user-friendly and menu-guided.

### RS232 Interface

Comfortable calibration of Multiparameter sensors via operation Software SEBAConfig and your PC/Notebook.



### SEBA-HDA

Your alternative to using a notebook for programming, read-out of the stored files as well as for local visualisation of measuring data.

SEBAConfig operation with Laptop

### Data Logger

Optionally, the instrument can be equipped with an integrated data logger. Full data logger functionality (optional) is possible for the automatic storage of up to 280,000 measured values. Instant logs can be obtained manually at the push of a button, suitable for quick assimilation of water quality profiles.

# SEBA Signal Counter Z6 - SEBA HDA

## Description of Product

With this fully-electronic counter it is possible to receive frequencies for all flow velocities. The impulses generated by the current meter are added and indicated in relation to the preselected time. The timing starts from the first impulse.

With the basic version, the impulses can be counted in freely pre-definable measurement intervals. Optionally, the impulse number to be counted can be pre-selected (Z6-I). A further option is the direct calculation of the current velocity by means of pre-definable equations (Z6-V). There are several memory locations for all adjustments. All the user-defined adjustments can be made directly at the device or via connected PC and can be saved permanently.

## Technical Data

### SEBA - Signal Counter Z6

Counter:  
5-digit LCD-indication, automatic battery control and insertable buzzer.

Accuracy:  
time measurement 0.01 s  
impulse counting 1 Impulse

Connection to current meter:  
2 x 4 mm socket for the connection of the connection cable current meter/signal counter with 4 mm bunch plugs („banana plug“) delivered by the producer of the current meter

Maximum impulse frequency:  
40 Impulse/s

Input signal:  
contact input (closed = active)  
or TTL-Signal with up to 5V span

Power supply:  
internal 9V block battery,  
optionally  
8.4V block accumulators  
with integrated loading function

Connection to PC / Notebook:  
RS232, 2400Baud, 8Bits, no parity, 1 stopbit  
9-pole RS232-cable, "modem cable"

Housing:  
aluminium, black anodized  
protection class: IP 64  
dimensions: 122mm x 117mm x 45mm  
weight: 450g



Signal Counter Z6

### SEBA - Signal Counter Z6 - V

technical data as for type Z6  
but with input of up to 20 calibration results  
and additional indication of the flow velocity in cm/s

### SEBA - Signal Counter Z6 - I

technical data as for type Z6  
but with preselection of time and impulses

### SEBA HDA, the Multifunctions-Handheld

Size: 165 x 95 x 45 (mm) LxBxH  
Weight: 490 g incl. battery  
Protection class: IP 67  
Drop: 26 fall from 1.2 m on concrete  
Operating temperature: -30 °C up to +60 °C  
Humidity resistance: MIL-STD 810F method 507.4  
Processor/memory: Intel PXA 255 X-Scale CPU  
RECON200 - 200 MHz, 64 MB SDRAM, 64 MB NAND Flash  
Display: 1/4 VGA, 240 x 320 pixel  
colour TFT display with touch screen and front light  
Battery: Rechargeable battery pack NiMH 3.800 mAh for  
up to 30 hours operation period depending  
on operating status  
Operating system: Windows Mobile 2003  
Connections: 1 x USB-B Slave (12 Mbps),  
1 x RS232 (115 Kbps)  
1 x charging, 2 x CF-Card slots Typ II  
Keyboard: 10 keys, onscreen qwerty softkeyboard

#### included in delivery:

- battery charger
- software Qce
- with impuls converter



impuls converter



HDA



# Flow Fluid logging with KLL-M1



The SEBA Borehole flowmeter / Flow fluid logger type KLL-M1 serves for determination of the current velocities e.g. in boreholes (starting from 4" to 12" diameter)

- Special advantages:**
- universal application
  - low starting speed
  - frictionless contact transmission
  - non-corrosive materials
  - unit composed system

**Description:**

A complete equipment comprises the electrical current meter type KLL, the current meter M1 as well as the signal counter Z6 for indication of the measured values.

## Technical Data M1

### Propellers and measuring ranges

propeller-diameter	propeller-pitch	V max.	start-velocity	(standard)	other on request
50 mm	50 mm	1,0 m/s	0,025 m/s		

### Determination of the current velocity

A calibration of the mini current meter with the particular propellers will be recommended, so that the flow velocity can be determined according to formula

$$V = k \cdot n + D$$

V = flow velocity m/s

k = hydraulic pitch (m) \*)

n = propeller revolutions per second

D = characteristic of the current meter (m/s) \*)

\*) to be determined by tests in a hydraulic towing channel.



Ø 50/500



Ø50/250



Ø50/100



Ø 50/50



Ø30/100



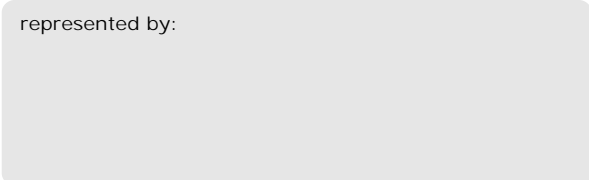
Ø30/50

The right is reserved to change or amend the foregoing technical specification without prior notice.



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represented by:





### Funnel

Both multiparameter probe and current meter can be detached from the funnel for standard calibration procedures and maintenance.

6" funnel  
with centralizers for 6"/8"/10" casing diameters

### Cable & Cable Drum

Due to the drum-combined supporting-frame the Multiparameter-probe can easily be lowered with our cable made of robust steel, with handle on the back side for easy lowering of the probe



### Multiparameter Sensor

Plug-in, maintenance-friendly high-quality-steel probe for connection to KLL-Q-M1. Individually configurable with different sensor-systems (e.g. water level, electrical conductivity etc.)

*For a detailed description of the Multiparameterprobe please see our Water Quality Monitoring brochure.*



### connection to Signal Counter Z6

*detailed description please see page 5 of this brochure*



## Water Quality parameters

- Water level
- Temperature
- Conductivity
  - total dissolved solids(TDS)
  - salinity
  - water density
- pH-value

additionally one of the following parameters can be measured:

- Redox (ORP)
- Ammonia
- Nitrate
- Chloride
- Ammonium
- Sodium
- Calcium
- Fluoride
- Potassium



multiparameter sensor  
type MPS-D8

current meter  
type M1  
with 50/50 propeller



signal counter  
type Z6

## Technical Data basic modul

**Cable**  
6-cores round cable, steel armored

**Cable drum**  
impact-resistant, temperature stable synthetic material, with supporting frame made of steel

**Power supply**  
rechargeable batteries 4x 2 V  
operation period: 8...15 hours depending on cable length and configuration

Cable lengths: 50, 100, 200, 300, other lengths on request

**Digital indication**  
alphanumeric 3 lined LC-Display for indication of current value

**Sensor body**  
non corrosive stainless steel V4a

**Connectable Sensors:**  
- multiparameter sensor MPS-D8

## Data Logger Function (Option)

**Electronic System:**

- internal power supply: 8V (4x2V Lead gel akku)
- external charger
- power consumption in power-down Mode: 140µA
- Flash-Controller M16C 16-Bit with integrated Watch-dog
- IC-Clock
- serial Flash-Memory with 4MB (approx. 280,000 measuring values)
- channels: maximal 32

**Operation and indication:**

- display (3 lines, 16 characters 3.65mm)
- keyboard with 3 keys

**Interface:**

- RS 232

**Input /Output sensor connection:**

- RS 485

## Technical Data sensors

### Parameter Measuring ranges

<b>water level</b>	0...200 m temperature: -5...50°C
<b>temperature</b>	-5...50°C pressure: 0...50 bar
<b>conductivity</b>	0...200mS temperature: -5...50°C pressure: 0...50 bar
<b>total dissolved solids (TDS)</b>	0...200,000mg/l temperature: -5...50°C pressure: 0...50 bar
<b>salinity</b>	0...70 temperature: -5...50°C pressure: 0...50 bar
<b>density</b>	988...1,060 g/l temperature: -5...50°C
<b>pH</b>	0.14 temperature: 0...50°C pressure: 0...20 bar
<b>redox (ORP)</b>	-1,200mV...1,200mV temperature: 0...50°C pressure: 0...20 bar

### Parameter Measuring ranges

<b>ammonia</b>	0.01...17000mg/l temperature: 0...50°C pressure: 0...0,5 bar
<b>nitrate</b>	0.4...60,000mg/l temperature: 0...40°C pressure: 0...20 bar
<b>chloride</b>	1...35,000mg/l temperature: 0...50°C pressure: 0...20 bar
<b>ammonium</b>	0.2...18,000mg/l temperature: 0...40°C pressure: 0...1 bar
<b>natrium</b>	0.2...20,000mg/l temperature: 0...50°C pressure: 0...6 bar
<b>calcium</b>	0.5...40,000mg/l temperature: 0...40°C pressure: 0...1 bar
<b>fluoride</b>	0.2...20,000mg/l temperature: 0...40°C pressure: 0...1 bar
<b>potassium</b>	0.4...39,000mg/l temperature: 0...40°C pressure: 0...1 bar

## Technical Data current meter

### Propellers and measuring ranges

propeller-diameter	propeller-pitch	V max.	start-velocity	
50 mm	50 mm	1,0 m/s	0,025 m/s	(standard) other on request

further information please see last page of this brochure

