

# 10.050 ELECTROMAGNETIC CURRENT METER (FOR WADING USE)

Approval Date: 6<sup>th</sup>, October 1999

Reviewed on : 23 October 2007

Version: 2

## Purpose

The electromagnetic current meter will be used to take manual readings while wading in shallow water of rivers and streams.

## Conditions & Requirements

- The electromagnetic current meter shall be of such a design that it operates reliably and accurately under the prevailing flow and environmental conditions.
- The current meter shall be capable to withstand the shocks and vibrations as experienced during transport by jeep in rough terrain.
- The current meter shall be easy to operate and maintain.
- The current meter shall be supplied with the accessories as needed for effective use.
- All materials of the current meter shall be non-corrosive.
- An operator's manual, related to the type and model of the current meter, shall be part of the delivery.
- The current meter shall come with the calibration data, i.e. actual calibration velocity versus actual instrument reading as collected during the calibration process. Calibration data should uniquely identify the sensor, the readout unit, observer, rating tank, way of suspension, methodology and similar information.
- A calibration sheet for the sensor shall be provided
- The design shall be sediment resistant.
- The electrical connections shall be of a reliable and robust construction.
- The current meter and accessories shall be supplied in a sturdy transport case.
- Sensors shall be interchangeable without effecting the calibration of the system.
- The direction reference of the X and Y-axes shall be accurate and unambiguously identifiable.
- The current meter shall comply with the specifications in over the full conductivity range that is encountered in surface water, i.e. fresh water to saline water.
- The current meter shall be immune to electrical interference, e.g. 50/60 Hz signals generated by power lines, traffic generated noise like ignition pulses, radio, etc.
- The sensor and its electrodes shall be easy to clean without affecting calibration.

## Specifications

### 1. Sensor

<b>range</b>	0 - 2 m/s; other ranges, if any, may be switch selectable
<b>accuracy</b>	≤1% of reading; independent of salinity, suspended sediment concentration and temperature
<b>zero stability</b>	≤5 mm/s over one day after zero adjustment
<b>directivity</b>	true cosine response
<b>minimum water depth</b>	≤0.1 m
<b>cable length</b>	≥2 m
<b>error of direction reference</b>	≤1° along main axis
<b>enclosure</b>	compliant with IP68, up to a depth of 10 m
<b>operating temperature</b>	0 to 50°C

<b>2. Control unit</b>	
<b>control switches</b>	ergonomic lay out, waterproof
<b>display</b>	LCD
<b>display of</b>	actual and average velocity, averaging time progress, battery status
<b>readability</b>	the display shall be easily readable under all field conditions, i.e. in direct sunlight at midday and with backlight at night
<b>displayed resolution</b>	1 mm/s
<b>display update rate</b>	≥1 per second
<b>averaging</b>	selectable over 0 to ≥60 seconds (0 s means free running)
<b>power supply</b>	standard batteries, e.g. AA, C or D size (rechargeable cells replaceable by primary cells)
<b>power autonomy</b>	≥12 hours continuous operation on a single charge/battery package
<b>electrical cables</b>	polyurethane jacket
<b>enclosure and connectors</b>	compliant with IP67
<b>carrying</b>	shoulder strap
<b>mass</b>	≤2 kg
<b>operating temperature</b>	0 to 50°C
<b>operating humidity</b>	100%
<b>robustness</b>	the control unit should be capable to survive drops on stone

## Accessories

- wading rod for sensor
- tools and spares
- signal and power cables as required for all normal use
- sturdy and shock/drop resistant carrying case
- 220 VAC ±25%, 47 to 53 Hz, charger for optional NiCd, NiMH or Li-ion battery pack

## Consumables

- batteries

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As per HP-1

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