# BBM-03-LV SERIES

## Low/Medium Bus Bar Current Sensor

## DESCRIPTION:

**The SENIS Bus Bar DC Current Sensor** locates two magnetic field sensors on each side of current bus bar. Two precision Hall ICs sense the magnetic field as a function of current on both sides. This allows to effectively cancel external magnetic fields without magnetic cores or shielding, thus avoiding non-linearities and hysteresis effects. The differential hall voltage between the upper and the lower sensor provides a full scale output of 0±4.0V. DC current ranges that can be sensed depend on the geometry of the bus bar. The BBM-03-LV is supplied with a shielded cable connected to a RJ45 plug. It comes in 2 different mounting variants: BBM-03-LV-N (N. Normal, sensor is placed parallel to the current flow) and BBM-03-LV-R (R: Rotated, sensor is placed perpendicular to the current flow)

**Figure 1:**
BBM-03-LV Bus Bar Current Sensor

## KEY FEATURES:

- Very compact, low profile package
- Custom design bus bar geometries possible, 2 different mounting options available
- Single +5V Power Supply at less than 25mA
- High Level 0±4V linear differential output signal
- Signal output insulated from Bus Bar
- DC Currents
- Clean recovery from very high overload (up to 100x nominal current)

## TYPICAL Applications

Power Generator | Motor & Electronics Control | Electromechanical Systems | Battery Management, Charge Control | Transportation

## PRODUCT DIMENSIONS AND CHARACTERISTICS:

### ABSOLUTE MAXIMUM RATINGS

| Symbol | Parameter | Min | Typ | Max | Units |
|---|---|---|---|---|---|
| Tstg | Storage Temperature | 0 | 20 | 40 | °C |
| VBB | Busbar Operation Voltage | 0 | 600 | 800 | Vdc |
| VD | Dielectric Breakdown (housing and cable) [1] | >2.2 | 3 | | kV |
| B | Magnetic Field | | 8 | | mT |

[1]Voltage for AC Isolation Test (LV version) refers to the entire module including connection cables.

### RECOMMENDED OPERATING CONDITIONS

| Symbol | Parameter | Min | Typ | Max | Units |
|---|---|---|---|---|---|
| Ta | Operating Temperature | -30 | 25 | 80 | °C |
| Vcc | Supply Voltage | 4.5 | 5 | 5.5 | Vdc |
| Isup | Supply Current | 20 | 25 | 30 | mA |

### ELECTRICAL CHARACTERISTICS

| Symbol | Parameter | Min | Typ | Max | Units |
|---|---|---|---|---|---|
| Sdiff | Output Sensitivity (A1-A2) | 520 | 560 | 600 | V/T |
| BL | Linear Magnetic Range | -7 | | +7 | mT |
| $B_{FS}$ | Full scale Magnetic Field Range | -8 | | +8 | mT |
| Voff | DC offset voltage @ T=23°C | -30 | 0 | +30 | mV |
| V0Diff | Differential linear output | -4 | 0 | 4 | V |
| XL | Non Linearity (% of full scale) | -2 | 0.5 | 2 | % |
| Tcs | Temp. coefficient of sensitivity | -300 | 0 | +300 | ppm/K |
| Toff | Temp. coefficient of offset | -0.3 | 0 | 0.3 | mV/K |
| tr | Response time | 2 | 4 | 6 | µs |
| r | Magnetic resolution | | 5 | | µT |

### DIMENSIONS AND WEIGHT

| Symbol | Parameter | Min | Typ | Max | Units |
|---|---|---|---|---|---|
| WR | Width of busbar | 15 | | 160 | mm |
| CL | Interconnecting cable length | | 100 | | mm |
| CT | Module connector type | | RJ45 | | |
| IL | Module cable length [2] | | 200 | | mm |
| M | Weight including cable | | 25 | | g |

[2] The output cable length can be customized on customer request.

## OUTLINE DIMENSIONS:

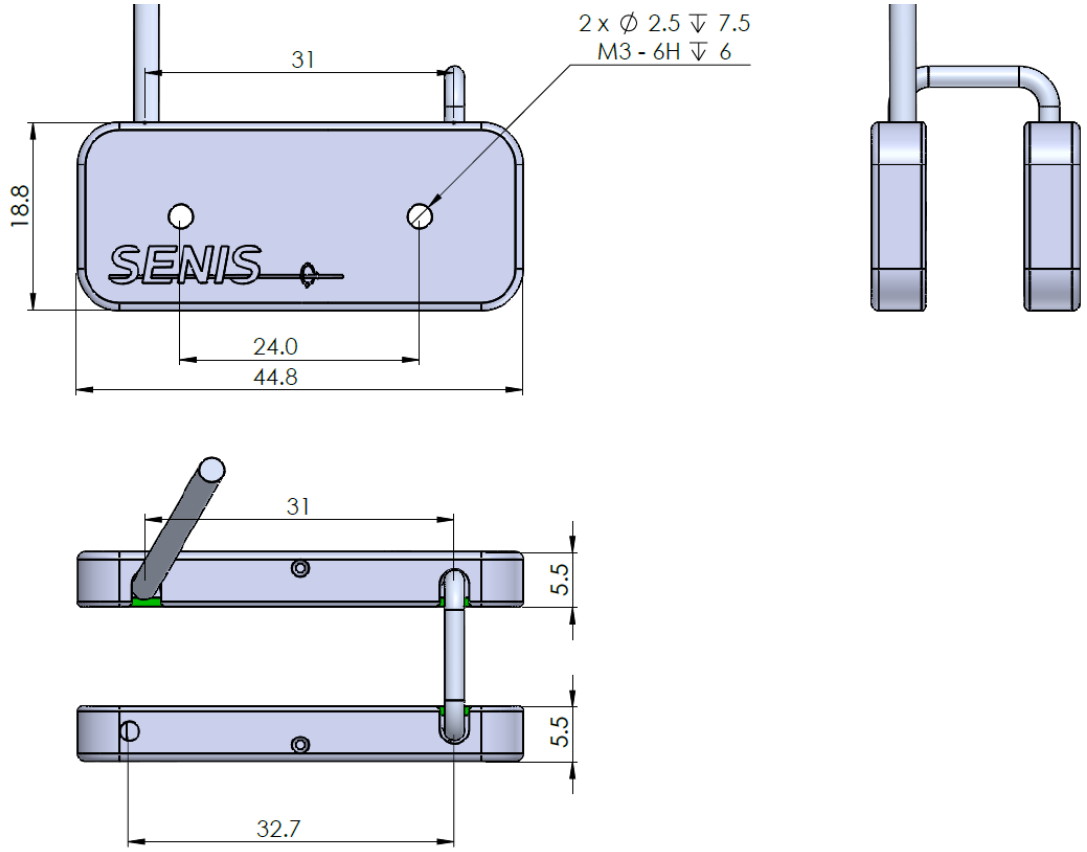


**Figure 2:** Mechanical dimensions (all dimensions are in millimeters).

* Customized geometries can be engineered on request.

## FSV position:

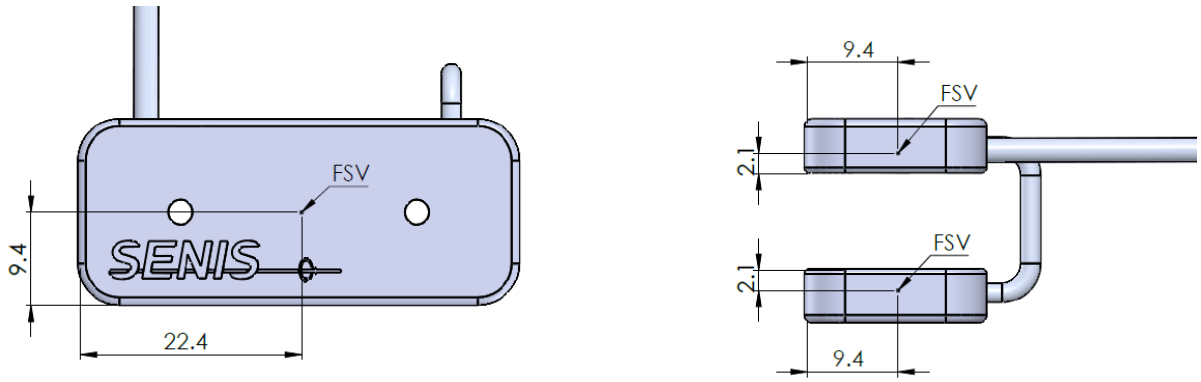


**Figure 3:** Field Sensitive Volume position (all dimensions are in millimeters).

## WIRING DIAGRAM:

### SIGNAL WIRES COLOR CODE

Senis BBM-03 has power and signal connections color code like shown on figure 4.:

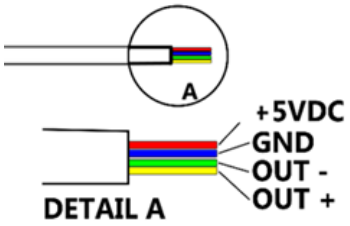


**Figure 4:** BBM-03 wires color scheme

Senis produces BBM-03 modules with main cable length 200mm, terminated with standard RJ-45 connector. Standard length interconnection cable is 100mm. Senis doesn't provide recipient mating connector.
Per customer request, we can deliver BBM-03 modules without RJ-45 connector at the end of the main cable (free wires), in case customer's clump-on system terminal application.

### RJ-45 CONNECTOR PINOUT

Senis BBM-03 is terminated by standard RJ-45 connector, product number SS-39100-039, and coresponding table with signal-pin position is next:

| BBM-03 TO RJ-45 PIN MAPPING | | |
|---|---|---|
| **BBM-03 SIGNAL** | **BBM-03 WIRE COLOR** | **RJ-45 PIN #** |
| +5VDC | RED | 6 |
| GND (COMMON) | BLUE | 5 |
| OUT (-) | GREEN | 4 |
| OUT (+) | YELLOW | 3 |

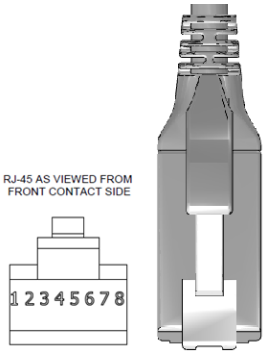


**Figure 5:** RJ-45 Pins positions

## BBM-03 MOUNTING ON BUSBAR:

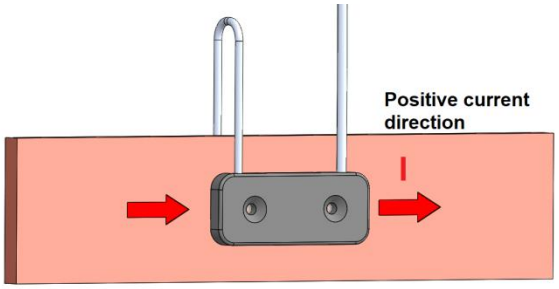


**Figure 6:**
BBM-03-LV-N mounting position
and busbar positive current direction

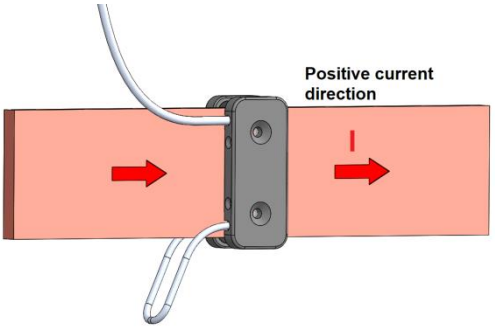


**Figure 7:**
BBM-03-LV-R mounting position
and busbar positive current direction