

Bus Bar Module

Features

- Very compact and low profile mechanical package
- Custom design bus bar geometries possible
- Single + 5V Power Supply at less than 25 mA
- High Level $0V \pm 4V$ differential linear signal output
- Signal output electrically isolated from primary Bus Bar
- DC Currents.
- Clean recovery from very high overload (to 100x nominal current)

Applications

- Power Electronics
- Motor & Generator Control
- Electromechanical Systems
- Battery Charging
- Transit & Off Road Vehicles

Description:

The Senis Bus Bar DC Current Sensor locates two magnetic field sensors on each side of an electric current bus bar. Two Sentron CSA-1V precision Hall Effect IC sense the magnetic field as a function of current on both sides of the bus bar. This enables effective cancellation of external magnetic fields without magnetic cores or shielding which can give rise to non-linearity and hysteresis effects. The BBM-01 has two analog outputs, A1 and A2. Each output has a range of $2.5VDC \pm 2.0V$. The differential voltage between the two outputs, A1-A2, provides a full scale output of $0V \pm 4.0V$. DC current ranges that can be sensed will be dependant on the physical parameters of the bus bars. The BBM-01 is supplied with a 1M long Cat 5e cable connected to a RJ-11 plug



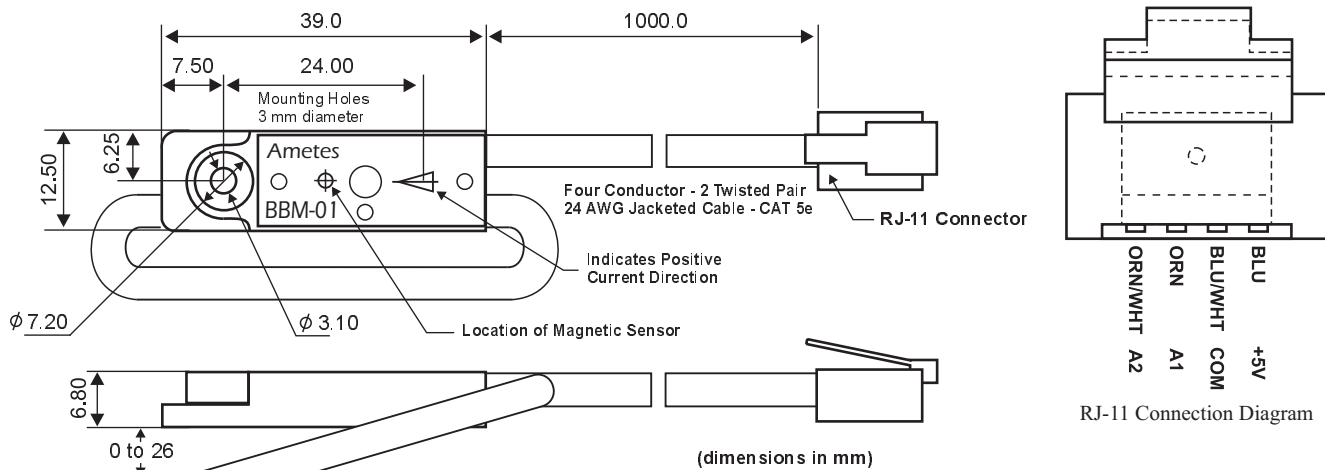
SPECIFICATIONS

Symbol	Parameter	Units	Specification
S_{DIFF}	Output Sensitivity (Nominal) A1-A2	mV/mT	560
B_L	Linear Magnetic Field Range - A1&A2	mT	± 5
B_{FS}	Full Scale Magnetic Field Range - A1&A2	mT	± 8
$V_{OS-DIFF}$	Differential Offset Voltage, A1-A2 at B=0 (Nominal)	V	0 ± 0.030
V_O	Linear Output Voltage Range, A1&A2	V	2.5 ± 2.0
$V_{O\ DIFF}$	Differential Linear Output Voltage Range, A1-A2	V	0 ± 4.0
V_C	Supply Voltage, DC (25mA max)	V	5.0 ± 0.5
V_D	Voltage for AC Isolation Test	V	2000
X	Accuracy at B_{FS} - A1-A2	%	<2
X_L	Non Linearity, $B < B_L$ - A1-A2	%	<2
TC V_O -DIFF	Temperature Coefficient, Offset Voltage, A1-A2	mV/°C	<0.3
TC V_S -DIFF	Temperature Coefficient, Sensitivity, A1-A2	ppm/°C	< ± 300
tr	Response Time, A1-A2	uSec	6
r	Resolution, B, A1-A2	mT	0.005

Temperature			
Symbol	Parameter	Units	BBM-01
TA	Ambient Operating Temperature	°C	-40 to 85
TS	Ambient Storage Temperature	°C	-40 to 100

Mechanica			
Symbol	Parameter	Units	BBM-01
W _R	Range in width of Bus Bar	mm	12 to 160
C _L	Interconnecting cable length	mm	400
M	Mass including cable	g	37

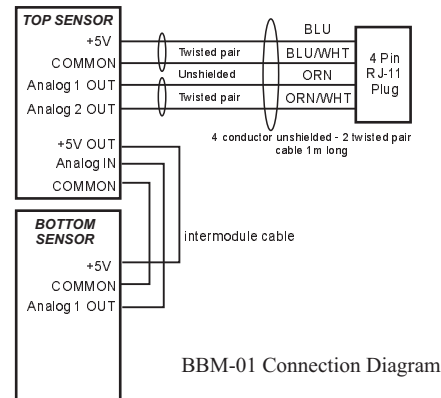
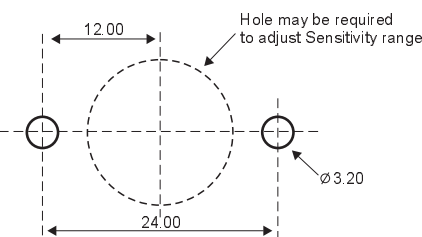
BBM-01 Outline Drawing



Recommended Mounting Hardware-2ea NonMagnetic Screws.316SS per DIN912-A4

BB Thickness	M3-0.5 Thread Length	
1/8"	8mm	Socket Head Screw
1/4"	12mm	Socket Head Screw
1/2"	18mm	Socket Head Screw
3mm	8mm	Socket Head Screw
5mm	10mm	Socket Head Screw
10mm	16mm	Socket Head Screw

Recommended Mounting Holes for BusBar Located in Center of BusBar



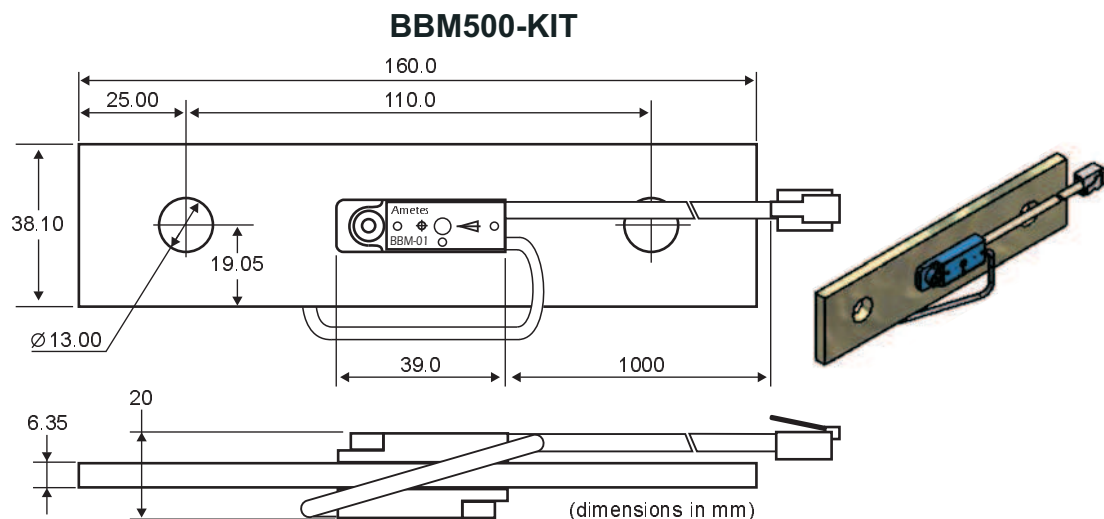
Application Note:

The output sensitivity (mV/A) of the sensing system depends on the bus bar geometry. The BBM-01's has a nominal magnetic sensitivity of 560mV/mT, therefore the actual output voltage will depend on the magnetic field the bus bar creates for a given current. Application note AN_BBM-01 (Bus Bar DC Current Sensor Design Guide) provides guidance for determining the relationship of the bus bar size and the BBM-01 output sensitivity.

Bus Bar Module Engineering Evaluation kits

Description:

The Senis BBMXX-KIT Bus Bar Module Current Sensor Engineering Evaluation kit provides a tool to evaluate the BBM-01 current sensing module. There are five kits available that cover a range of currents from 200A to 3000A. The kit locates two magnetic field sensors on each side of an electric current bus bar. Two Sentron CSA-1VG precision Hall Effect IC's sense the magnetic field as a function of current on both sides of the bus bar. This enables effective cancellation of external magnetic fields without magnetic cores or shielding which can give rise to non-linearity and hysteresis effects. The BBM-01 has two analog differential outputs, A1 and A2. Each output has a range of 2.5VDC \pm 2.0V. The differential voltage between the two outputs provides a full scale output VO-A1-VO-A2 of 0V \pm 4.0V.



SPECIFICATIONS

Symbol	Parameter	Units	BBM200 KIT-I	BBM500 KIT-I	BBM1000 KIT-I	BBM2000 KIT-I	BBM3000 KIT-I
I_{PN}	Primary Current, nominal	A	\pm 200	\pm 500	\pm 1000	\pm 2000	\pm 3000
I_{PM}	Primary Current, max	A	\pm 312	\pm 700	\pm 1400	\pm 2800	\pm 4200
V_{PN}	Bus Bar Voltage drop at I_{PN}	mV	<5	<5	<5	<5	<5
V_{S-DIFF}	Voltage Sensitivity V_{O-DIFF} / I_P	mV/A	16 \pm 1.2	8 \pm 0.6	4 \pm 0.3	2 \pm 0.15	1.33 \pm 0.1
V_O	Output Voltage A1 & Output Voltage A2	V	2.5 \pm 2.0	2.5 \pm 2.0	2.5 \pm 2.0	2.5 \pm 2.0	2.5 \pm 2.0
$V_{ON-DIFF}$	Differential Output Voltage at I_{PN}	V	0 \pm 4.0	0 \pm 4.0	0 \pm 4.0	0 \pm 4.0	0 \pm 4.0
$V_{OS-DIFF}$	Differential Output Offset Voltage at $I_P=0$	mV	< \pm 30	< \pm 30	< \pm 30	< \pm 30	< \pm 30
V_{DD}	Supply Voltage, DC	V	5.0 \pm 0.5	5.0 \pm 0.5	5.0 \pm 0.5	5.0 \pm 0.5	5.0 \pm 0.5
V_D	Voltage for AC Isolation Test	Vrms	600	600	600	600	600
V_L	Linearity Error $I_P < I_{PN}$	%	<1.5	<1.5	<1.5	<1.5	<1.5
TCV _o	Temperature Coefficient, V_O	mV/ $^{\circ}$ C	<0.3	<0.3	<0.3	<0.3	<0.3
TCV _s	Temperature Coefficient of V_{S-DIFF}	ppm/ $^{\circ}$ C	<300	<300	<300	<300	<300
r	Resolution, I_P	A	0.1	0.25	0.5	1.0	2.0