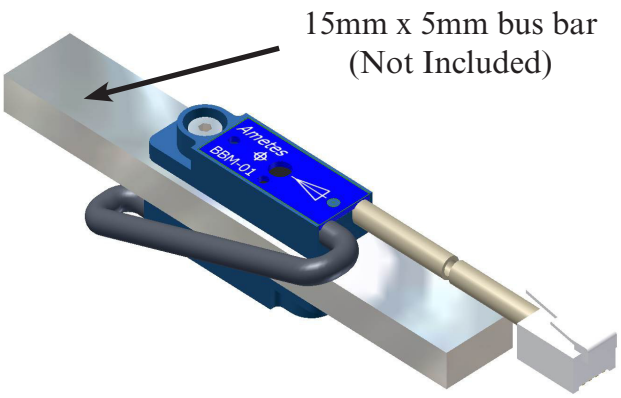
Ametes Bus Bar Module DC Current Sensor, BBM-01

The Ametes 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 ± 2.0V. The differential voltage between the two outputs, A1-A2, provides a full scale output of 0V ±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-11plug



BBM-01 shown on a 15mm wide 5mm bus bar

Applications

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

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 ± 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)

Specifications - Electrical

Symbol	Parameter	Units	Specification
S_{DIFF}	Output Sensitivity (Nominal) A1-A2 1)	mV/mT	560
B_L	Linear Magnetic Field Range - A1&A2 1)	mT	± 5
B_{FS}	Full Scale Magnetic Field Range - A1&A2 1)	mT	± 8
$V_{OS-DIFF}$	Differential Offset Voltage, A1-A2 1) at B=0 (Nominal)	V	0 ±0.030
V_O	Linear Output Voltage Range, A1&A2 1)	V	2.5 ±2.0
$V_{O\ DIFFF}$	Differential Linear Output Voltage Range, A1-A2 1)	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 1)	%	<2
X_L	Non Linearity, B < B_L - A1-A2 1)	%	<2
TC Vo-DIFF	Temperature Coefficient, Offset Voltage, A1-A2 1)	mV/ºC	<0.3
TC VS-DIFF	Temperature Coefficient, Sensitivity, A1-A2 1)	ppm/ºC	<±300
tr	Response Time, A1-A2 2)	uSec	6
r	Resolution, B, A1-A2 1)	mT	0.005

Note 1: A1 & A2 are complimentary outputs A2 = -A1
Note 2: Response time of the assembly depends on the bus bar geometry

Revision Date: 15 MAY, 2008

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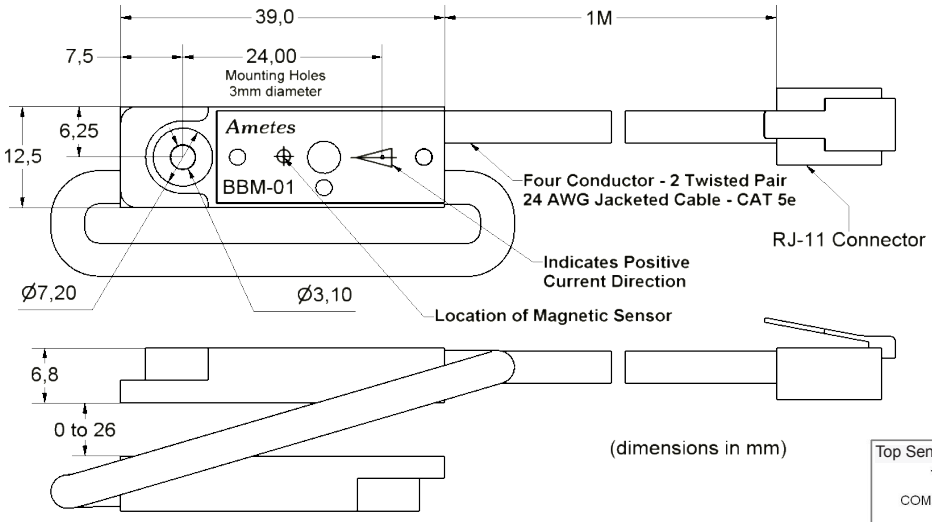
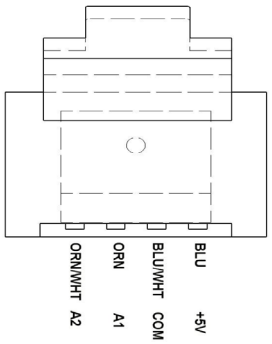
Temperature			
Symbol	**Parameter**	**Units**	**BBM-01**
TA	Ambient Operating Temperature	ºC	-40 to 85
TS	Ambient Storage Temperature	ºC	-40 to 100

Mecahnical			
W_R	Range in width of Bus Bar	mm	12 to 160
C_L	Intermodule cable length	mm	400
M	Mass including cable	g	37

BBM-01 Outline Drawing



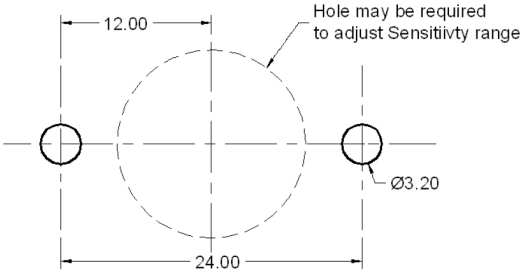


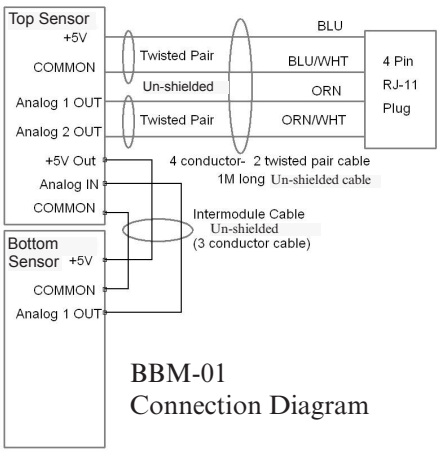
RJ-11 Connection Diagram

Recommended Mounting Hardware - 2ea
Non Magnetic Screws. 316 SS per DIN 912-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 Bus Bar
Located in Center of Bus Bar





BBM-01
Connection Diagram

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_xxx provides guidence for determining the relationship of the bus bar size and the BBM-01 output sensitivity. GMW can provide assistance in determining actual sensitivity for customers unique bus bar structure. Contact GMW technical support.

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