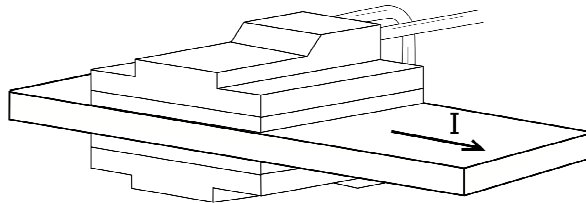
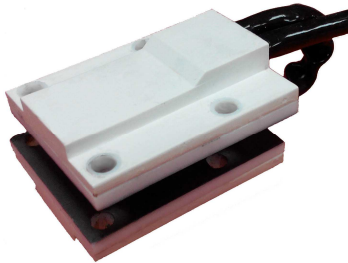


**DESCRIPTION:**

The bus-bar magnetic sensor module BBM-02 is the magnetic sensor part of a bus-bar current transducer. Attached to a rectangular cross-section current bus-bar, the BBM-02 enables contactless measurement of DC and AC currents in the bus-bar. The BBM-02 incorporates two Hall-effect magnetic field sensors, which shall be located at two opposite sides of a bus bar. The sensors generate an output voltage, which is proportional with the magnetic field produced by the electrical current carrying the bus-bar. The signals generated in the two sensors by external magnetic fields are mutually cancelled. The BBM-02 does not contain any ferromagnetic part, so it has no hysteresis. The offset and sensitivity of the BBM-02 are in-factory calibrated. The current sensitivity and the dynamic response of a current transducer based on the BBM-02 depend on the bus-bar geometry and the position of the BBM-02 relative to the bus bar.

**FEATURES:**

- For measuring DC & AC currents, the frequency bandwidth from DC up to 100kHz
- Small size, very compact and low profile mechanical package
- Easy to assemble structure: its installation does not require an interrupt of the circuit
- 5Vdc unipolar power supply
- Signal output electrically isolated from primary bus bar
- Differential output
- Clean recovery from very high transient overload
- Improved HV insulation with a 3mm thick layer of the PTFE (PolyTetraFluoroEthylene - Teflon) available on request

**TYPICAL APPLICATIONS:**

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

**SENIS AG**

Neuhofstrasse 5a, 6340 Baar, Switzerland  
Web: [www.senis.ch](http://www.senis.ch) ; E-mail: [current.sensors@senis.ch](mailto:current.sensors@senis.ch)  
Phone: +41 (44) 508 7029; Fax: +41 (43) 205 2638

North American Distributor: **GMW Associates**  
955 Industrial Road, San Carlos, CA 94070, USA  
Web: [www.gmw.com](http://www.gmw.com); E-mail: [sales@gmw.com](mailto:sales@gmw.com)  
Phone: +1 (650) 802 8292; Fax: +1 (650) 802 8298

**Rev. 2.7**  
Jan 2018

**Page 1/4**

**ABSOLUTE MAXIMUM RATINGS** <sup>(1) (2)</sup>:

In accordance with the absolute maximum rating system (IEC60134).

Symbol	Parameter	Min.	Typ.	Max.	Units	Remarks
T <sub>stg</sub>	Storage Temperature	-40		+100	°C	
T <sub>amb</sub>	Ambient Temperature	-40		+85	°C	
T <sub>B</sub>	Busbar temperature	-40		+100	°C	
V <sub>SUP</sub>	Supply Voltage	4.75	5.0	5.25	V <sub>dc</sub>	±5%
	Duration of output short circuit		1		s	
B	Magnetic Flux Density				T	No limit. The circuit cannot be damaged by magnetic overdrive.
V <sub>D</sub>	Voltage for AC Isolation Test		5		kV <sub>rms</sub>	
I <sub>OUT</sub>	Continuous output current		± 55		mA	R <sub>L</sub> = 50Ω

<sup>(1)</sup> Absolute Maximum Ratings" indicate limits beyond which damage to the device may occur. Operating Ratings indicate conditions for which the device is functional, but do not ensure specific performance limits.

<sup>(2)</sup> The output may be shorted to ground or either power supply.

Stresses beyond those listed under "Absolute maximum ratings" may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of this specification are not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

**RECOMMENDED OPERATING CONDITIONS:**

Symbol	Parameter	Min.	Typ.	Max.	Units	Remarks
T <sub>amb</sub>	Ambient Temperature	-30	+25	+80	°C	
V <sub>CC</sub>	Supply Voltage		+5		V <sub>dc</sub>	
I <sub>OUT</sub>	Output Current	-1		+1	mA	
C <sub>L</sub>	Load Capacitance			1000	pF	

**SENIS AG**

Neuhofstrasse 5a, 6340 Baar, Switzerland  
 Web: [www.senis.ch](http://www.senis.ch) ; E-mail: [current.sensors@senis.ch](mailto:current.sensors@senis.ch)  
 Phone: +41 (44) 508 7029; Fax: +41 (43) 205 2638

North American Distributor: **GMW Associates**  
 955 Industrial Road, San Carlos, CA 94070, USA  
 Web: [www.gmw.com](http://www.gmw.com); E-mail: [sales@gmw.com](mailto:sales@gmw.com)  
 Phone: +1 (650) 802 8292; Fax: +1 (650) 802 8298

**Rev. 2.7**

Jan 2018

**Page 2/4**

## ELECTRICAL CHARACTERISTICS:

Symbol	Parameter	Min.	Typ.	Max.	Units	Remarks
$V_{SUP}$	Supply Voltage	4.75	5	5.25	V <sub>dc</sub>	
$I_{SUP}$	Supply Current	30	35	40	mA	
$V_{off}$	DC offset voltage		10	25	mV	@ T=+25°C, B=0mT, I <sub>OUT</sub> =0mA
$V_{common}$	Common (reference) Output Voltage		2.5		V	I <sub>OUT</sub> =0mA V <sub>common</sub> = V <sub>SUP</sub> /2
$V_{out}$	Output Voltage	0		4.7	V	RR - 0.3V @ 25°C
$V_{iso}$	Dielectric isolation		6		kV	
BW	Bandwidth: DC to		100		kHz	@ -3dB
$t_{RISE}$	Rise Time (from 10% to 90% of a step)			3	μs	1μs Input magnetic field rising/falling
$t_{REAC}$	Reaction Time (10% input – 10% output)			1	μs	1μs Input magnetic field rising/falling
$t_{RES}$	Response Time (90% input – 90% output)			1	μs	1μs Input magnetic field rising/falling
$t_{SUP}$	Start-up Time		15	20	μs	After V <sub>SUP</sub> applied
$t_{REC}$	Recovery time		1	1.5	ms	B ≥ 70mT
$C_b$	Capacitance between the sensor body and bus-bar		13	18	pF	
S	Magnetic Sensitivity	300	350	420	mV/mT	@ +25°C
$T_{CS} = \Delta S/S \cdot \Delta T$	Magnetic Sensitivity Temperature Drift		< ±0.1		%/°C	I <sub>OUT</sub> =0mA, T=-40°C to +100°C
$T_{Coff} = \Delta V_{off}/\Delta T$	Offset Temperature Drift		< ±1		mV/°C	B=0mT, I <sub>OUT</sub> =0mA T=-40°C to +100°C
B <sub>FS</sub>	Full Scale Magnetic Field Range	14	16	18	mT	
B <sub>L</sub>	Linear Magnetic Field Range	12	14	16	mT	
NL	Non Lineariry			0.1	%	B = B <sub>L</sub>
			0.2			B = B <sub>FS</sub>
$\Delta B_{noise}$	Input referred magnetic noise spectrum density		22		μT <sub>p-p</sub>	DC to 100kHz

## MECHANICAL CHARACTERISTICS:

Symbol	Parameter	Min.	Typ.	Max.	Units	Remarks
m	Mass		15		g	Without cable
			60			Including cable
$l_C$	Intermodule cable length		80		mm	
$l_M$	Module cable length		-			On Request

## SENIS AG

Neuhofstrasse 5a, 6340 Baar, Switzerland  
 Web: [www.senis.ch](http://www.senis.ch) ; E-mail: [current.sensors@senis.ch](mailto:current.sensors@senis.ch)  
 Phone: +41 (44) 508 7029; Fax: +41 (43) 205 2638

 North American Distributor: **GMW Associates**

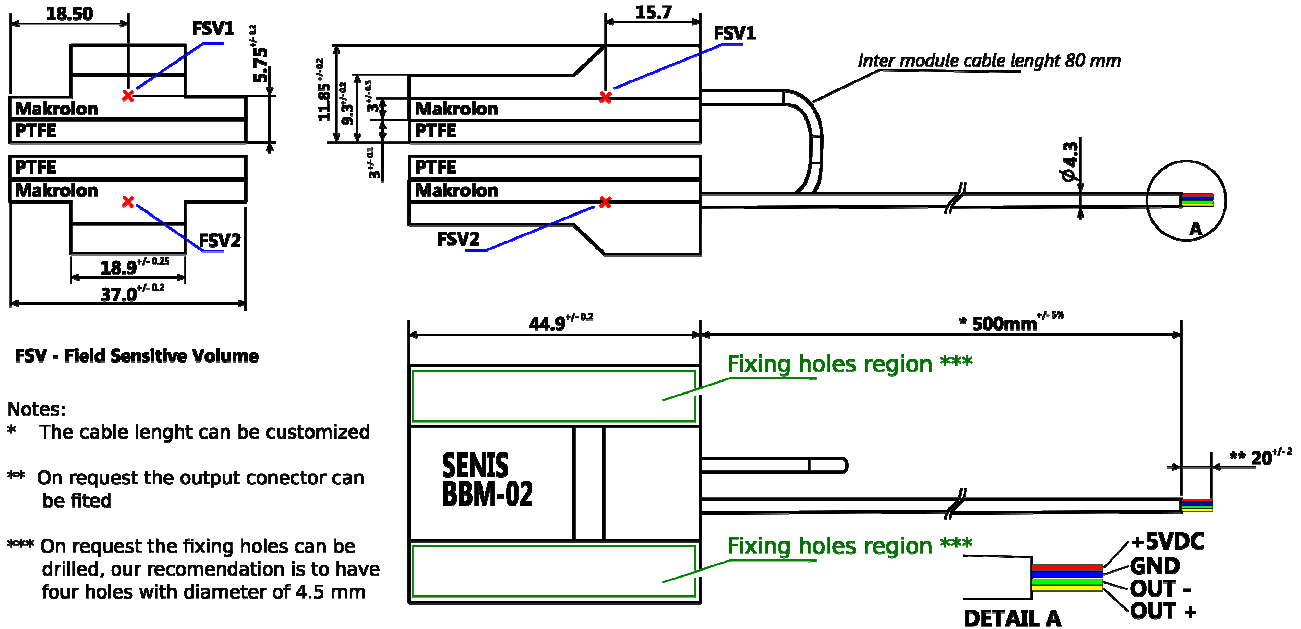
955 Industrial Road, San Carlos, CA 94070, USA  
 Web: [www.gmw.com](http://www.gmw.com); E-mail: [sales@gmw.com](mailto:sales@gmw.com)  
 Phone: +1 (650) 802 8292; Fax: +1 (650) 802 8298

## Rev. 2.7

Jan 2018

Page 3/4

MECHANICAL DIMENSIONS (dimensions are in millimeters):



PACKAGING INFORMATION:

Housing of the bus-bar magnetic sensor module BBM-02 is made of Makrolon® 6265 and PTFE (flame retardant, UL 94V-0/1.5 mm).  
 Fiberglass braided sleeve coated with silicone rubber with high dielectric strength (breakdown strength 3kV) is used for protecting cables.  
 The product is compliant with EU RoHS directives.

**SENIS AG**

Neuhofstrasse 5a, 6340 Baar, Switzerland  
 Web: [www.senis.ch](http://www.senis.ch) ; E-mail: [current.sensors@senis.ch](mailto:current.sensors@senis.ch)  
 Phone: +41 (44) 508 7029; Fax: +41 (43) 205 2638

North American Distributor: **GMW Associates**

955 Industrial Road, San Carlos, CA 94070, USA  
 Web: [www.gmw.com](http://www.gmw.com); E-mail: [sales@gmw.com](mailto:sales@gmw.com)  
 Phone: +1 (650) 802 8292; Fax: +1 (650) 802 8298

**Rev. 2.7**

Jan 2018

Page 4/4