



LODESTONE NEO

DATASHEET

TABLE OF CONTENTS

1	PRODUCT OVERVIEW	4
2	TECHNICAL SPECIFICATION	4
3	INTERFACES	5
3.1	ELECTRICAL	5
3.1.1	POWER INPUT FILTER	6
3.1.1	I ² C BUS PULL-UP RESISTORS	6
3.1.1	SENSOR I ² C ADDRESSES AND INTERRUPT I/O.....	7
3.2	SOFTWARE	8
3.3	MECHANICAL	8
4	DELIVERABLES	9
5	RELATED PRODUCTS	9
6	DISCLAIMER	10

LIST OF FIGURES

Figure 3-1:	Main connector.....	5
Figure 3-2:	Power input filter.....	6
Figure 3-3:	I ² C pull-up position	6
Figure 3-4:	Sensor address selection.....	7
Figure 3-5:	Mechanical interface of LODESTONE NEO module	8
Figure 3-6:	Recommended mounting spacer (brass).....	9

LIST OF TABLES

Table 2-1:	Technical specification.....	4
Table 2-2:	Integrated sensors.....	4
Table 2-3:	Typical sensor performance	4
Table 3-1:	Main connector pinout	5
Table 3-2:	Main connector types	5
Table 3-3:	Electrical ratings	5
Table 3-4:	Thermometer I ² C addresses	7
Table 3-5:	Gyroscope I ² C addresses.....	7
Table 3-6:	Magnetometer I ² C addresses.....	8

GLOSSARY

EMI	Electromagnetic Interference
FSR	Full Scale Range
ICD	Interface Control Document
IC	Inter Integrated Circuit
LSB	Least Significant Bit
MEMS	Micro-ElectroMechanical System

1 PRODUCT OVERVIEW

Lodestone NEO is an updated version of the Lodestone sensor board integrating a more advanced magnetometer (RM3100) and a stand-alone temperature sensor (TMP112), alongside a MEMS gyroscope & accelerometer (ICM-42688-P). All sensors are integrated on one compact board with a common I²C bus for easy integration.

Flight heritage on multiple missions (e.g. CroCube, Veronika and external customers).

2 TECHNICAL SPECIFICATION

Table 2-1: Technical specification

Parameter	Value	Unit
Operating Temperature	-40 to +85	°C
Dimensions	22 x 20 x 6	mm
Mass	<10	g
Power Supply	3.3	V
Power Consumption - average	<10	mW
Power Consumption - peak	<10	mW

Table 2-2: Integrated sensors

Sensor	Hardware	Specific user manual
Magnetometer	RM3100	Link
Gyroscope + Accelerometer	ICM-42688-P	Link
Thermometer	TMP112	Link

Table 2-3: Typical sensor performance

Sensor	Parameter	Value
Magnetometer	Range	±800 μT
	Resolution	20 up to 75 LSB/μT
Gyroscope	Range	±15.625 up to ±2000 °/s
	Resolution	16.4 up to 2097.2 LSB/(°/s)
Accelerometer	Range	±2 up to ±16 g
	Resolution	2048 up to 16384 LSB/g
Thermometer	Range	-40 to 125 °C
	Resolution	0.0625 °C/LSB

Sensor safety disclaimer:

The sensor module and the I²C bus may be susceptible to EMI influence and interference. It is advised to position the module away from radio transmitters or other high-frequency signal sources when in use.

3 INTERFACES

3.1 ELECTRICAL

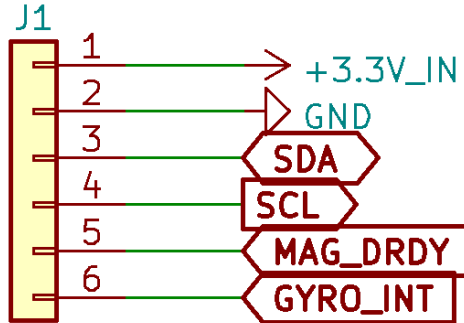


Figure 3-1: Main connector

Table 3-1: Main connector pinout

Pin	Signal
1	Power input
2	Ground
3	I ² C SDA
4	I ² C SCL
5	Magnetometer data ready (DRDY)
6	Gyroscope interrupt (INT1)

Table 3-2: Main connector types

	Connector type
On module	Molex PicoBlade 53261-0671
Mates with (cable)	Molex PicoBlade 51021-0600

Table 3-3: Electrical ratings

Parameter	Min	Typ.	Max	Unit
Power Input	-0.2	3.3	3.6	°C
Current draw	0.2	-	10	mA
I ² C Level		3.3		V

3.1.1 POWER INPUT FILTER

The power input implements a simple input filter.

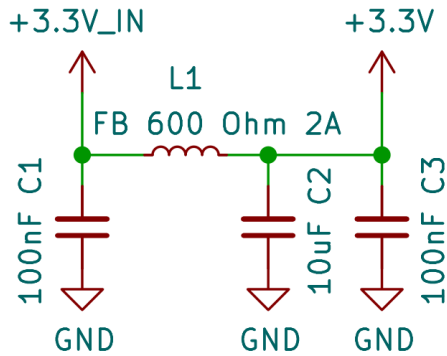


Figure 3-2: Power input filter

3.1.1 I²C BUS PULL-UP RESISTORS

The module implements a place to populate with I²C pull-up resistors. These are **NOT** populated. The recommended value used is 4.7 kΩ.

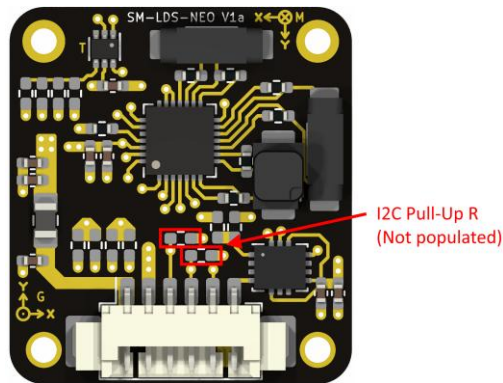


Figure 3-3: I²C pull-up position

3.1.1 SENSOR I²C ADDRESSES AND INTERRUPT I/O

For each I²C device on the module there are a number of addresses available. These can be selected using selectors. The recommended approach is to use 0 Ω resistors.

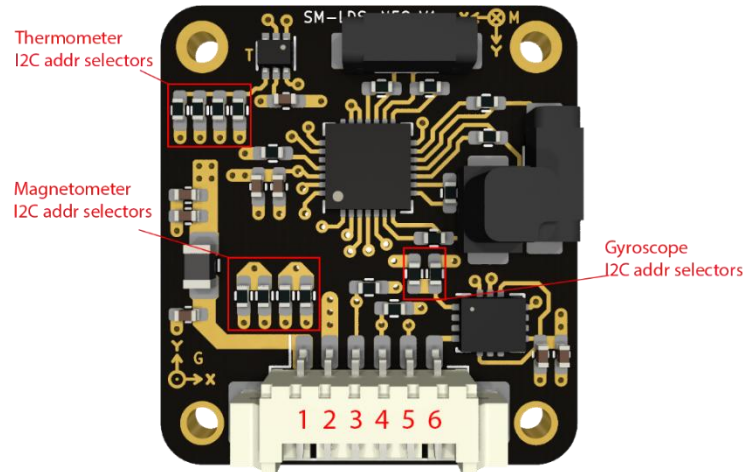


Figure 3-4: Sensor address selection

Thermometer

The thermometer has 4 addresses available in total. Each can be selected using only one selector. Always connect only one address selection jumper.

Table 3-4: Thermometer I²C addresses

Selector pos (from the left)	Address
1 st	0x4A
2 nd	0x4B
3 rd	0x49
4 th	0x48

Gyroscope

The gyroscope and accelerometer sensor have 2 addresses available in total. Each can be selected using only one selector. Always connect only one address selection jumper.

Table 3-5: Gyroscope I²C addresses

Selector pos (from the left)	Address
1 st	0x68
2 nd	0x69

Magnetometer

For the magnetometer, there are 4 addresses available in total. These can be selected using one selector from the first pair and one from the second pair of selectors from the left. Two connections need to be made.

Table 3-6: Magnetometer I²C addresses

Selector pos (from the left)	Address
1 st and 3 rd	0x23
1 st and 4 th	0x22
2 nd and 3 rd	0x21
2 nd and 4 th	0x20

3.2 SOFTWARE

For software integration refer to specific sensor manufacturer documentation.

See Table 2-2: Integrated sensors.

3.3 MECHANICAL

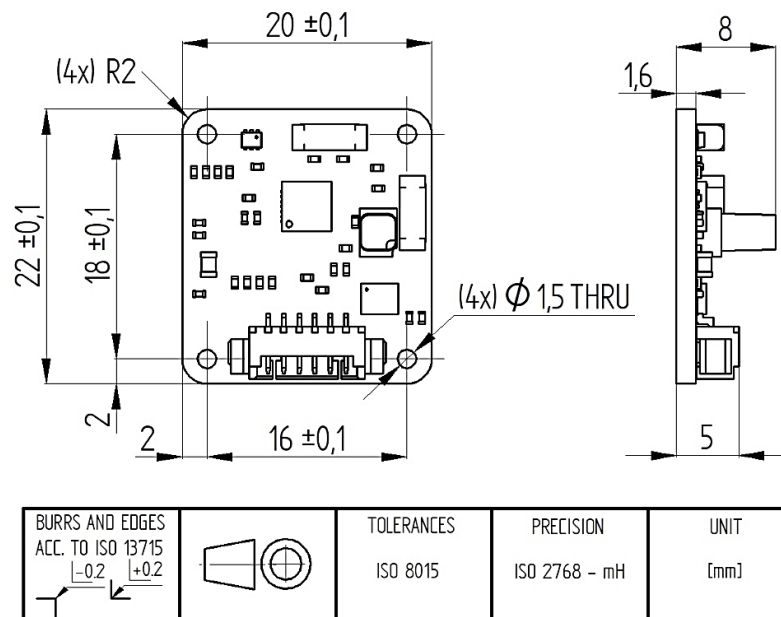


Figure 3-5: Mechanical interface of LODESTONE NEO module

It is recommended to use four BN 612/ISO 4762 hexagon socket head cap M1.4x3 screws against 1.5 mm M3 spacers on the motherboard or other mounting interface.

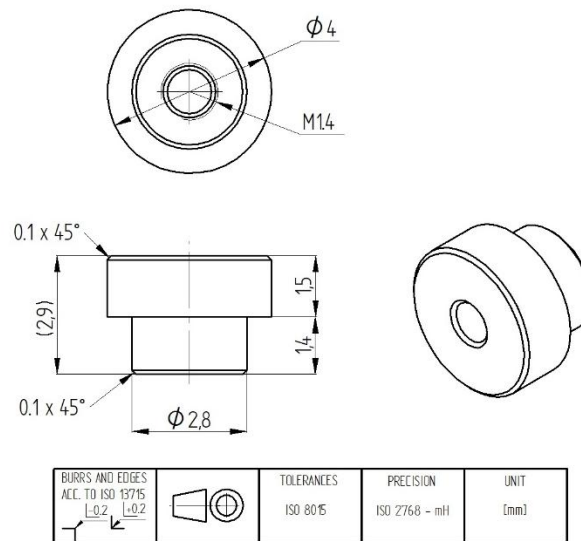


Figure 3-6: Recommended mounting spacer (brass)

4 DELIVERABLES

All information included in datasheet, no additional deliverables

5 RELATED PRODUCTS

You may be also interested in:

- [Lodestone \(different version of Lodestone NEO\)](#)
- [1-16U CubeSat Platforms / Complete Mission](#)

6 DISCLAIMER

Spacemanic shall not be liable for any damages, losses, delays, or other consequences arising from improper use, unauthorized modifications, or incompatibility of the product with other systems, even in cases where these products are deployed in demanding environments such as satellite or space applications. The product is designed for specific use according to the technical specifications outlined in the official documentation, and the company is not responsible for any issues arising from usage beyond this scope.

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