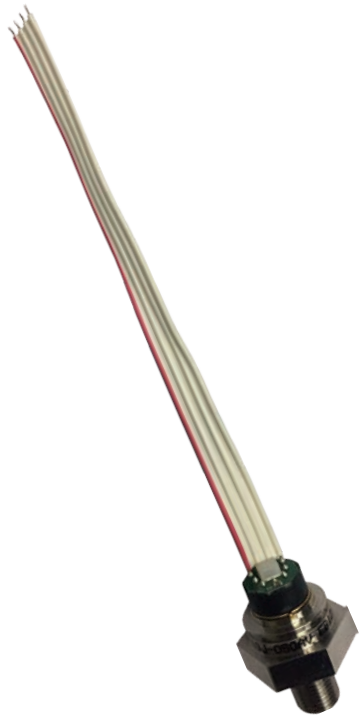
NOVA SENSOR

NPI-19 Series

Digital Pressure Sensor I^2C



Applications

- Level control
- Tank level measurement
- Corrosive fluids and gas measurement
- Barometric pressure measurement

Features

- Weldable or threaded process fittings
- Linearity +/- 0.25% FSO (BFSL)
- +/- 1% total error band
- I^2C interface protocols
- 14 bit I^2C output
- Absolute and gage pressure
- Pressure range from 0 to 1 psi to 0 to 1000 psi

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NPI-19 I²C Series Specifications

Supply Voltage:
- 2.7V to 5.5V (typ: 3.3V)

Pressure Output:
- 5% to 95% / 10% to 90%

Linearity:
- +/- 0.25% FSO

Total Error:
- +/- 1%

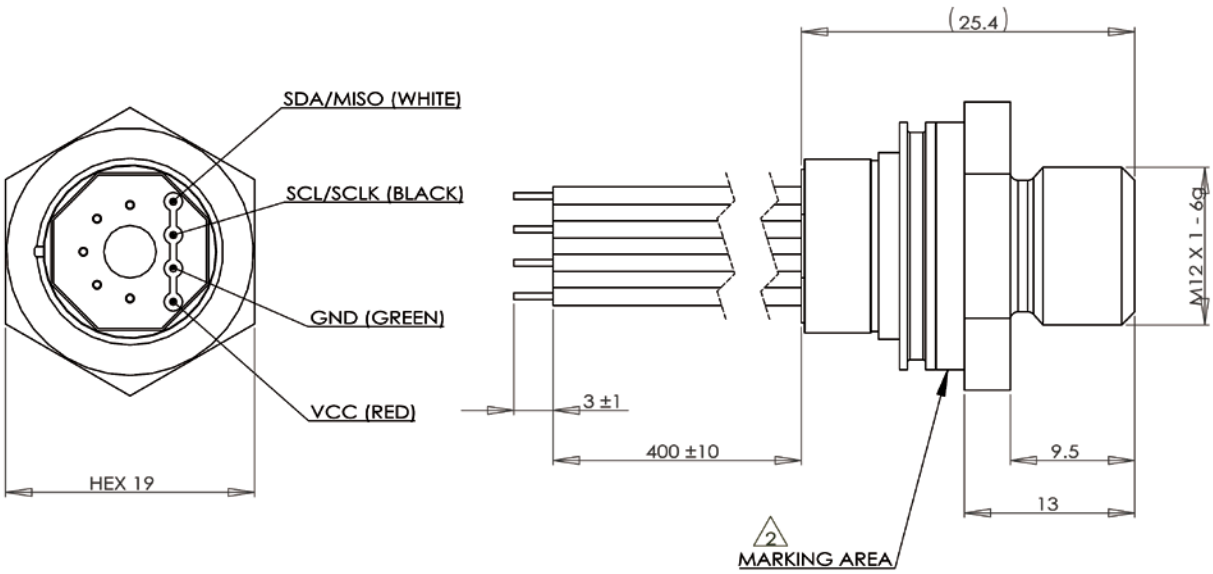
Over Pressure:
- 2X

Burst Pressure:
- 3X

Long Term Stability:
- +/- 0.5% span / year typ.

Operating Temperature:
- -40 to 125°C

Storage Temperature:
- -40 to 125°C



NPI-19 I2C Dimensions

Parameter	Specification
Pressure output	5% to 95%
Interface type	I²C (Addr 0x28H)
Linearity	+/- 0.25 % FSO
Total error band	+/- 1 % FSO
Supply voltage	3.3V
Pressure range	0 to 50 psi A
Overpressure	100 psi A
Burst pressure	200 psi A
Operating temperature	-40 to 125°C
Storage temperature	-40 to 125°C

NPI-19 I²C Series Specifications

Sensor Output

Parameters	Min.	Typ.	Max.	Units
Zero Pressure Output (10% - 90%)		666		Count Hex
Zero Pressure Output (5% - 95%)		333		Count Hex
Full Scale Pressure Output (10% - 90%)		399A		Count Hex
Full Scale Pressure Output (5% - 95%)		3CCB		Count Hex

Electrical Specifications

POWER UP						
Symbol	**Parameter**	**Limits**			**Unit**	**Remark**
		Min	**Typ**	**Max**		
T_{STA1}	Start-up Time			1	ms	VDD ramp up to interface communication
T_{STA2}				2.5	ms	VDD ramp up to analog operation
T_{WUP1}	Wake-up Time			0.5	ms	Sleep to Active State interface communication
T_{WUP2}				2	ms	Sleep to Active State analog operation

Absolute Maximum Ratings

Symbol	Parameter	Limits			Unit
		Min	Typ	Max	
V_{SS}	Voltage Reference	0	-	0	V
V_{dd}	Supply Voltage	2.5	3.3	5.5	V
P	Over Pressure	-	-	20,000	mBar
V_{HBM1}	Electrostatic Discharge Tolerance – Human Body Model	-8	-	8	kV
T_{STOR}	Storage Temperature	-40	-	120	°C

Functional Description

I²C

In I²C Mode, each command is started as shown in Figure 1. Only the number of bytes that is needed for the command has to be sent. After the execution of a command (busy = 0) the expected data can be read as illustrated in Figure 3, or if no data are returned by the command the next command can be sent. The status can be read at any time as described in Figure 2.

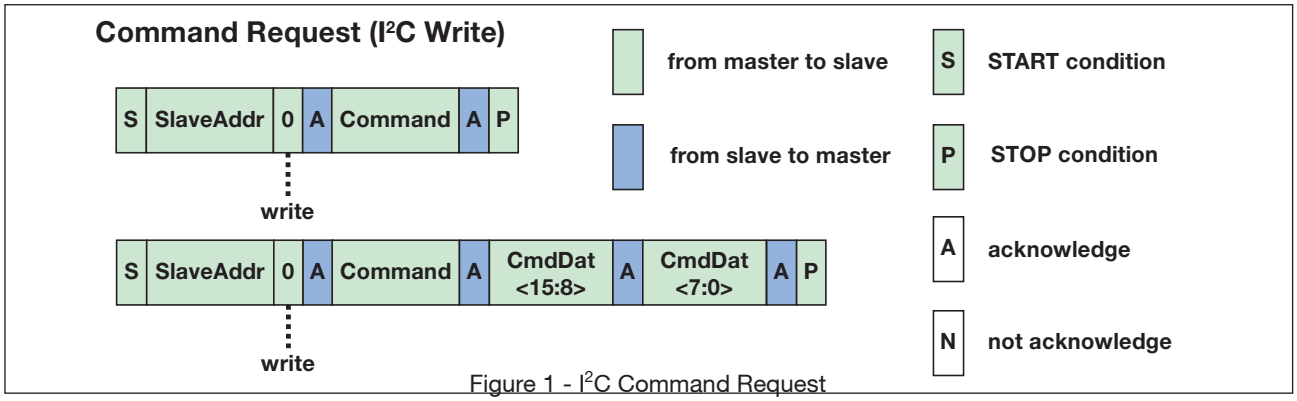


Figure 1 - I²C Command Request

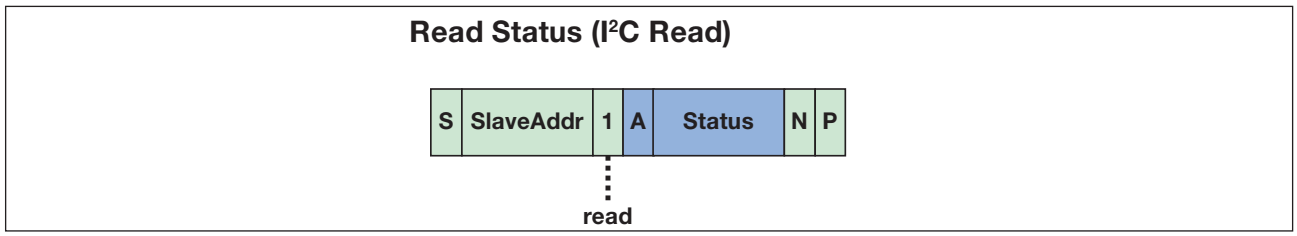


Figure 2 - I²C Read Status

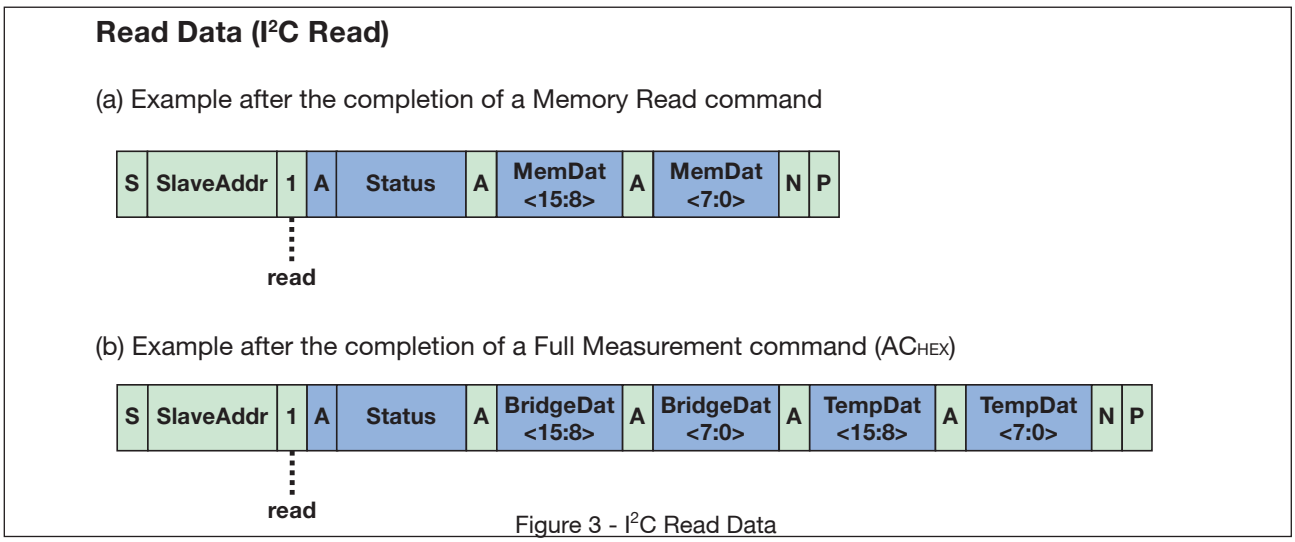


Figure 3 - I²C Read Data

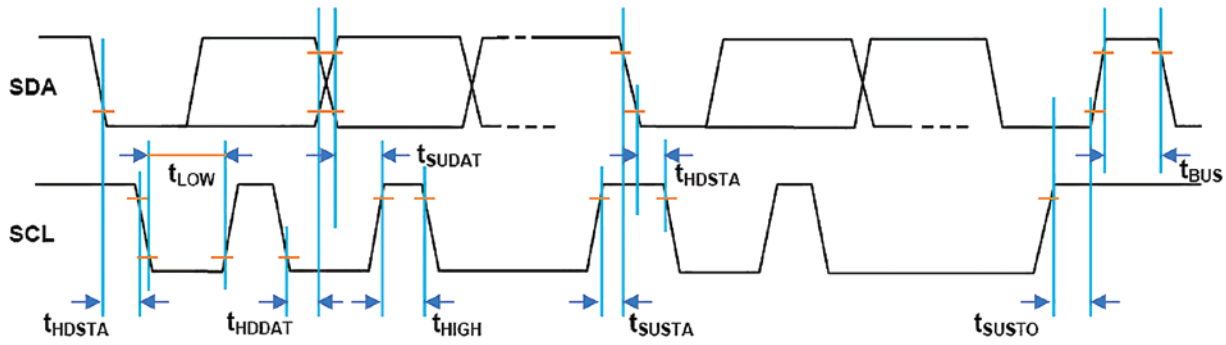
All mandatory I²C-bus protocol features are implemented. Optional features like clock stretching, 10bit slave address, etc., are not supported by the NPA 201's interface.

In I²C-High Speed Mode, a command consists of a fixed length of three bytes.

I²C Parameters

Parameter	Symbol	Min.	Typ.	Max.	Units
SCL clock frequency	f_{FCL}	100		400	kHz
Start condition hold time relative to SCL edge	t_{HDSTA}	0.1			µS
Minimum SCL clock low width [1)]	t_{LOW}	0.6			µS
Minimum SCL clock high width [1)]	t_{HIGH}	0.6			µS
Start condition setup time relative to SCL edge	t_{SUSTA}	0.1			µS
Data hold time on SDA relative to SCL edge	t_{HDDAT}	0			µS
Data setup time on SDA relative to SCL edge	t_{SUDAT}	0.1			µS
Stop condition setup time on SCL	t_{SUSTO}	0.1			µS
Bus free time between stop condition and start condition	t_{BUS}	2			µS
[1)] Combined low and high widths must equal or exceed minimum SCLK period.					

I²C Timing Diagram



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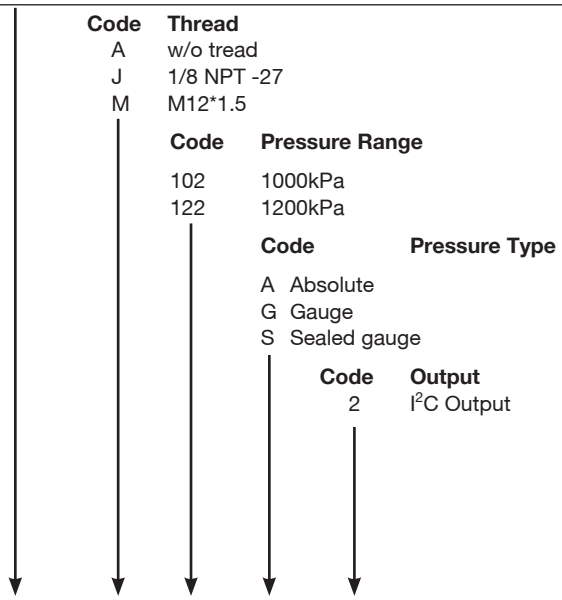
NPI-19 I²C Series Ordering Information

NPI-19 NovaSensor Digital Pressure Sensor



NPI-19	M	-	102	A	-	2

Typical model number (NPI-19M-102A-2)

Note: page counts have to be divisible by 4, so this doc has to be either 4 pages or 8.

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