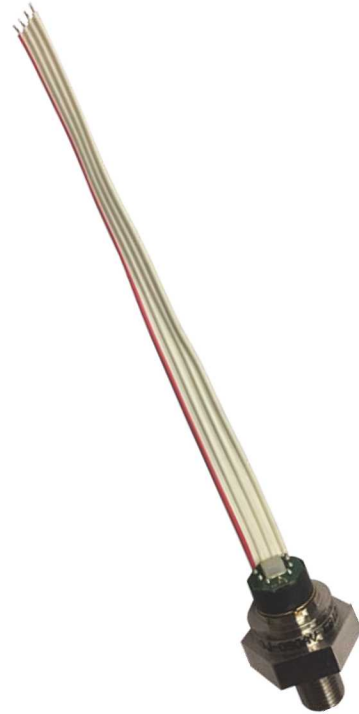


NPI-19 Series

Digital Pressure Sensor I²C



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
- I²C interface protocols
- 14 bit I²C output
- Absolute and gage pressure
- Pressure ranges from 0 to 17 kPa (2.5 psi) to 1700 kPa (247 psi)

NPI-19 I²C Series Specifications

Supply Voltage:

- 2.7V to 5.5V (typical: 3.3V)

Pressure Output:

- 5% to 95% / 10% to 90%

Linearity:

- +/- 0.25% FSO

Total Error:

- +/- 1% FSO

Over Pressure:

- 2X

Burst Pressure:

- 3X

Long Term Stability:

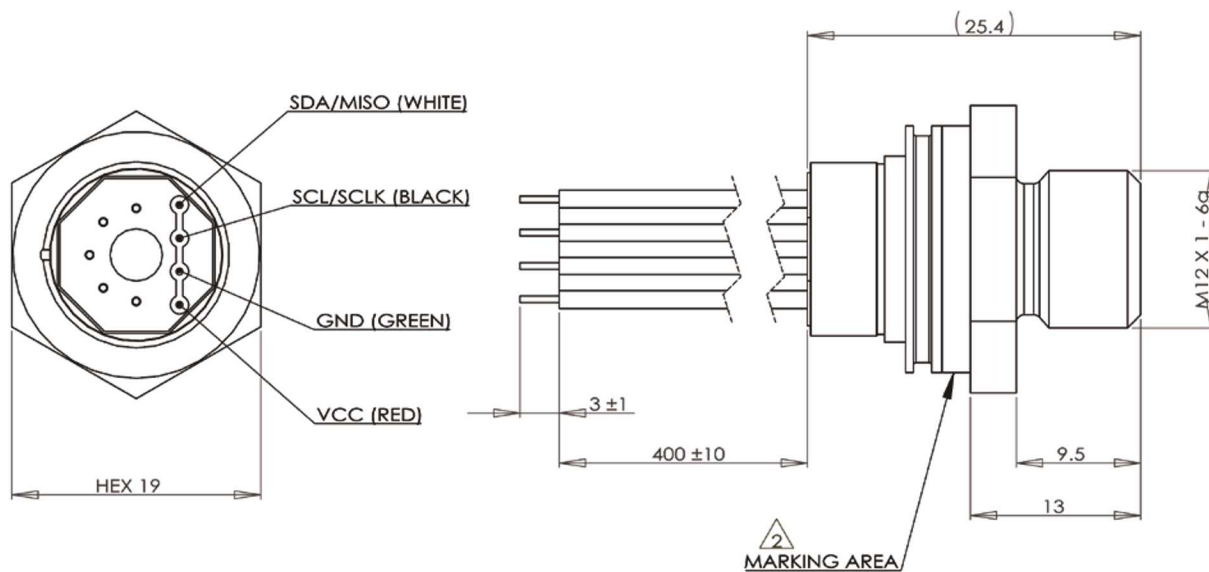
- +/- 0.5% span / year typical

Operating Temperature:

- -40°C to 125°C

Storage Temperature:

- -40°C to 125°C



NPI-19 I²C Dimensions

Parameter	Specification
Pressure output	5% to 95%
Device address	I ² C (Addr 0x28H)
Linearity	+/- 0.25 % FSO
Total error band	+/- 1 % FSO
Supply voltage	3.3V
Overpressure	2X
Burst pressure	3X
Operating temperature	-40°C to 125°C
Storage temperature	-40°C to 125°C

NPI-19 I²C Series Specifications

Sensor Output

Parameters	Typical	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	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	Typical	Max	
V _{dd}	Supply Voltage	2.5	3.3	5.5	V
P	Over Pressure (rated pressure)	-	2X	-	-
V _{HBM1}	Electrostatic Discharge Tolerance – Human Body Model	-	-	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.

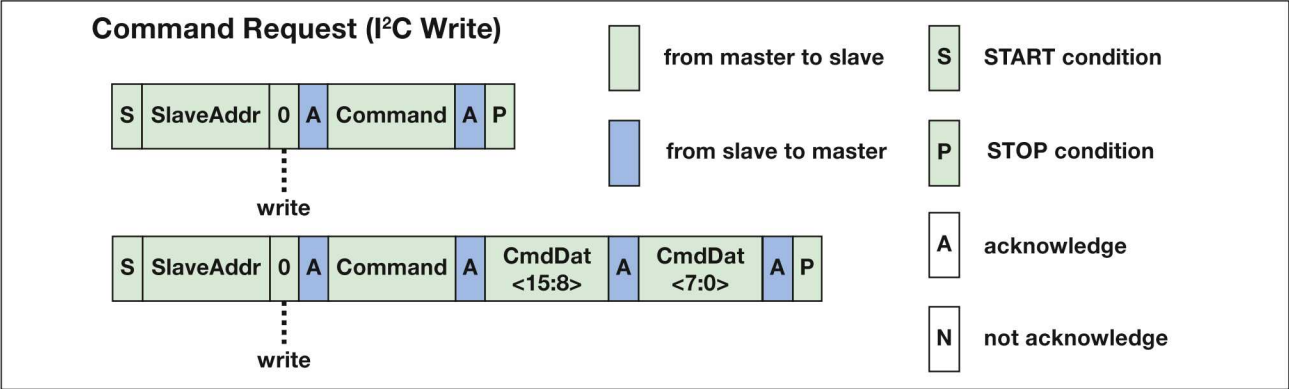


Figure 1 - I²C Command Request

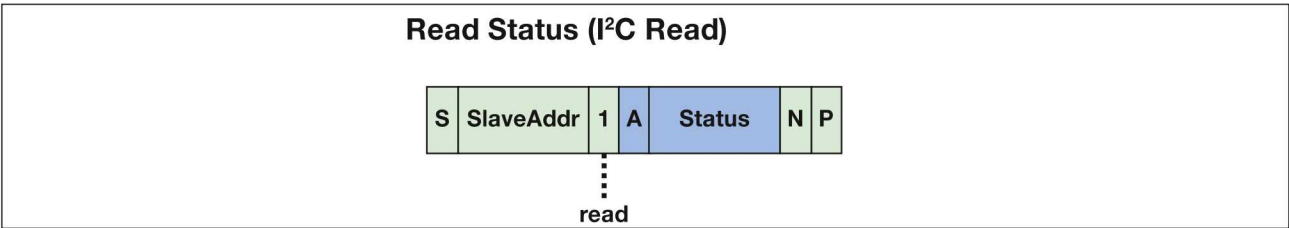


Figure 2 - I²C Read Status

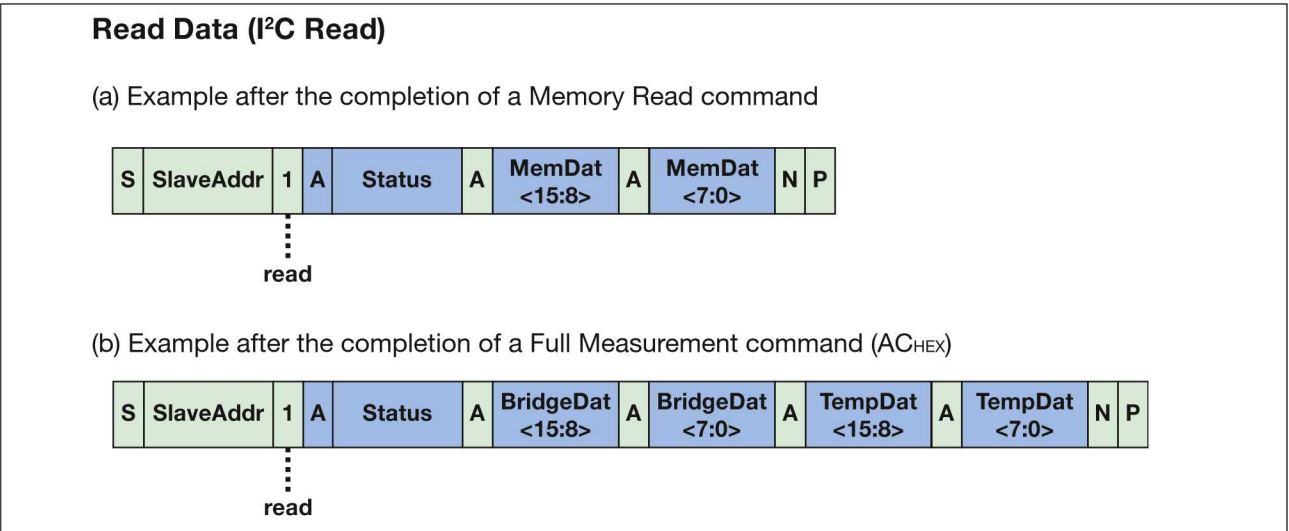


Figure 3 - I²C Read Data

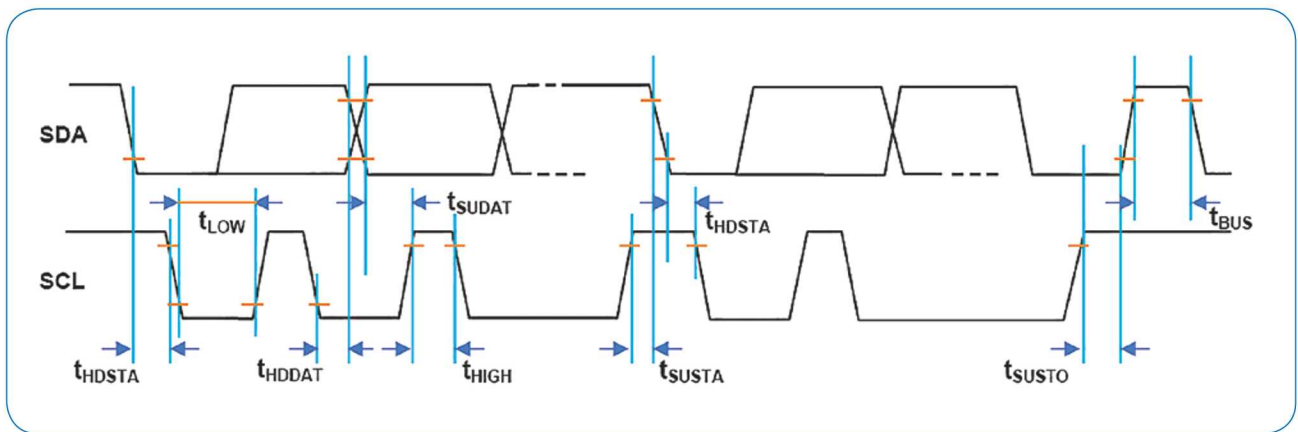
All mandatory I²C-bus protocol features are implemented. Optional features like clock stretching, 10-bit slave address, etc., are not supported by the sensor's interface.

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

I²C Parameters

Parameter	Symbol	Min.	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



Warranty

Amphenol Advanced Sensors warrants its products against defects in material and workmanship for 12 months from the date of shipment. Products not subjected to misuse will be repaired or replaced. Amphenol Advanced Sensors reserves the right to make changes without further notice to any products herein. Amphenol Advanced Sensors makes no warranty, representation or guarantee regarding the suitability of its products for any particular application, nor does Amphenol Advanced Sensors assume any liability arising out of the application or use of any product or circuit and specifically disclaims and all liability without limitation consequential or incidental damages. The foregoing warranties are exclusive and in lieu of all other warranties, whether written, oral, implied or statutory. No implied statutory warranty of merchantability or fitness for particular purpose shall apply.

NPI-19 I²C Series Ordering Information

NPI-19 NovaSensor Digital Pressure Sensor

	Code	Thread			
	A	w/o thread			
	J	1/8 NPT -27			
	M	M12*1.5			
	Code	Pressure Ranges			
	170	17.2 kPa (2.5 psi)			
	350	34.5 kPa (5 psi)			
	101	100 kPa (14.5 psi)			
	201	200 kPa (29 psi)			
	701	700 kPa (101.5 psi)			
	172	1700 Kpa (246.6 psi)			
	Code	Pressure Type			
	A	Absolute (100 kPa and above)			
	G	Gauge			
	Code	Output			
	2	I ² C Output			
NPI-19	M	- 701	A	- 2	Typical model number (NPI-19M-701A-2, M12 Thread, 700 kPa with I ² C output)

