NPA 201

Pressure Sensor

1. Changing the I²C Slave Address

When multiple devices are connected to the I²C bus, each device must be assigned a unique slave address to ensure correct operation.

NPA 201 sensors are supplied with the slave address set to a default value. This address is stored within the sensor's internal EEPROM memory. It is possible to change the address by modifying specific data bits in the EEPROM via the I²C interface. The sensor is put into a special command / programming mode and the I²C master then sends instructions to change the address.

Table 1 details the sequence of commands required to change the address. Before attempting this procedure, users should familiarise themselves with the following points:

1. There must not be any other devices on the I²C data bus sharing the default or proposed address of the NPA 201 sensor. This can be achieved by one of the following methods:

   a. Sensor programmed individually before connection to application circuitry

   b. Application hardware configured to allow isolation of individual sensor for programming

2. To programme memory the supply voltage VDD must be > 2.9V.

3. The procedure in Table 1 must be performed immediately after power-on.

4. The new address will be effective after the next power-on sequence.

5. Care must be taken to ensure that only the specified data bits are changed. Writing data to other locations may cause the sensor to become permanently unusable.

6. The address can be changed up to 3 times, after which no further memory changes are possible.

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Table 1: Changing I²C Slave Address

Step	Action	Data on I²C Bus (hex values)					Notes
		Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	
		Send		Return			
1	Start command mode	[7 bit address *] + [Write bit = 0]	A9				
2	Read data from sensor memory Save in local memory of I²C master device	[7 bit address *] + [Read bit = 1]	XX	Status byte (Table 2)	Word[15:8]	Word[7:0]	Perform command for each word 00 to 16 Word 00 : XX = 20 Word 01 : XX = 21 Word 16 : XX = 36 etc
3	Modify address details in local copy of data						Word 02 [Bits 6:0] : New address required
4	Increment sensor memory page counter	[7 bit address *] + [Write bit = 0]	5E				
5	Write new memory page to sensor	[7 bit address *] + [Write bit = 0]	XX	Word[15:8]	Word[7:0]		Perform command for each word 00 to 16 Word 00 : XX = 40 Word 01 : XX = 41 Word 16 : XX = 56 etc
6	Create memory page checksum	[7 bit address *] + [Write bit = 0]	AA				
7	Exit programming mode	[7 bit address *] + [Write bit = 0]	A8				

*Default I2C address of NPA 201 sensor as supplied (0x27 for standard parts, 0x00 for initial release samples)

Table 2: Status Byte for Read Operations

Bit	7	6	5	4	3	2	1	0
Meaning	0	Powered?	Busy?	Mode		Memory error?	Data corrected?	ALU saturation?

Table 3 : Mode Status

Status[4:3]	Mode
00	Normal Mode
01	Command Mode
10	Reserved
11	Command Mode & Reserved

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