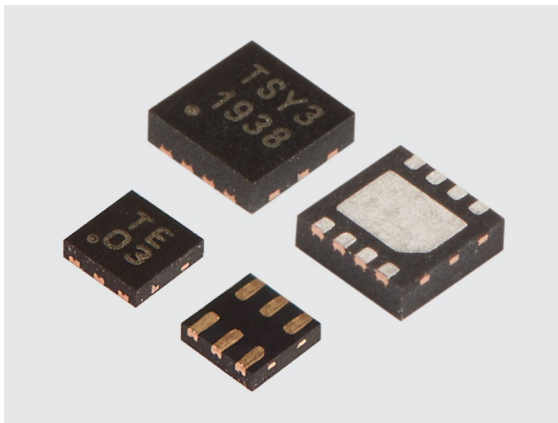# PROGRAMMING AN ALTERNATIVE I²C-ADDRESS: TSYS03 DIGITAL TEMPERATURE SENSOR

APPLICATION NOTE

The TSYS03 digital temperature sensor offers the option to write an alternative I²C-address statically to the memory that will be used by the TSYS03 to communicate

If this is done post production, the CRC value of the von-volatile memory (NVM) will be wrong after the new I²C-address is written. However, the sensor will work fine and perform normally.

The original and alternative I²C-address will behave the same. They are both written to the 0x40 address by default. The user can program a different address to the NVM.

The alternative I²C-address can be changed between 0x40 to 0x7E (64dec to 126dec). Please note, ONLY the even addresses can be used.

The LSB of the 7 bit address is always set to 0.

Changing the Address of the TSYS03:

!! ATTENTION: Writing to the NVM could cause irreparable damage to the sensor !!

- Connect the TSYS03
- Send a „UNLOCK"-command
- Write to the NVM
- Reset the TSYS03
- The NVM is structured and written word-wise.

The alternative I²C-Address can be found in Configregister2 (address 5).

The LSB is not mapped. Due to this, only the bits 1 to 6 of the address are written to the memory and these are stored in bits 8 to 15 of Configregister2.

Address	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
0	Reserved															
1	Reserved															
2	Reserved															
3	Reserved															
4	Reserved															
5	Reserved				Reserved				Alternative I²C (6:1)				Reserved			
6	Reserved															
7	Reserved															

Example for an Alternative Address: 0x46 (70dec)

0x46 = 0b01000110 LSB is set by external circuit. The address has only 7 bit, so there is no 8 bit.

Shift the address by 1 to the right

➔   0b00100011

The rest of the word is written as 0. So, a possible existing value isn't overwritten.

The value, written to the configregister is:
0x2300 (0b 0010 0011 0000 0000).

Code Example:

```
iByte[0] = 0x00
iByte[1] = ((iI2cAdressAlt >> 1)&0x3F); //right shift by 1 and mask

ConfigWord = iByte[1]<<8 | iByte[0] //build the word to write into configregister
TSYS03_ServiceUnlock(iI2CAdress) //Unlock NVM

TSYS03_WriteNvm(iI2CAdress, NVMAddress, ConfigWord) //write content
TSYS03_Reset(iI2cAdress) //Reset Sensor
```

your distributor
AMSYS GmbH & Co.KG
An der Fahrt 4, 55124 Mainz, Germany
Tel. +49 (0) 6131 469 875 0
info@amsys.de | www.amsys.de

te.com/sensorsolutions