

## GENERAL

The protocol I<sup>2</sup>C was developed and specified by Phillips. The PMST transducers are compatible to this protocol but without the 10-bit address extension. PMST transducers can only be used in slave-mode.

## ABBREVIATIONS

I <sup>2</sup> C	Inter-Integrated-Circuit-Bus
SDA	Serial Data
SCL	Serial Clock
ACK	Acknowledge-bit

## BUS-SETUP / TOPOLOGY OF I<sup>2</sup>C-BUS

The I<sup>2</sup>C bus has a line-structure (see Abbildung 1). The data is transmitted and received synchronous via SDA line. SCL line is used for synchronization.

In this bus system both lines must be equipped with pull-up resistors. The dimension of these resistors must be selected depending on the bus capacity. Abbildung 2 can be used as a rough reference and indication. More information can be verified from Specification [1].

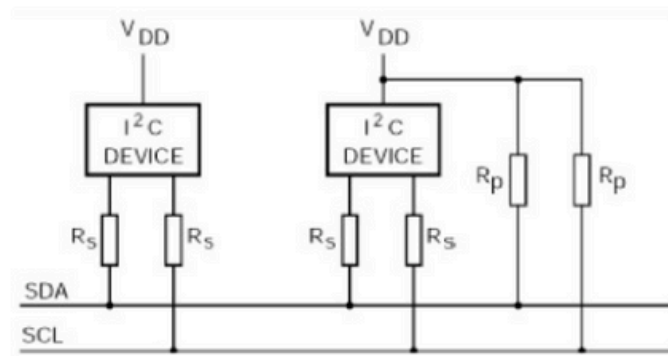


Figure 1: I<sup>2</sup>C-Bus in line-structure with Pull-Up resistors [1]

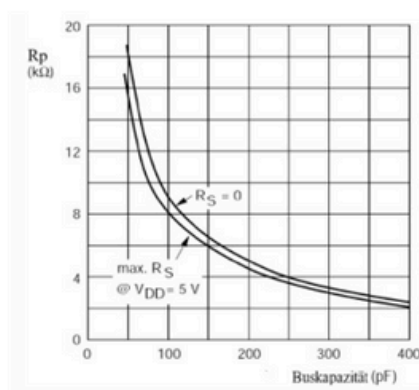


Figure 2: Size of pull-up-resistors depending on the bus-capacity [1]

## TRANSMISSION SPEED

The standardized transmission speeds from 100kHz up to 400kHz are supported.

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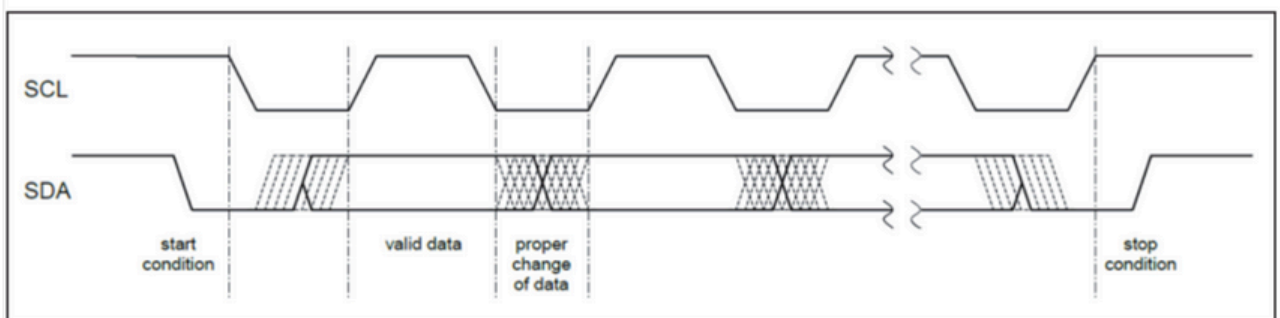
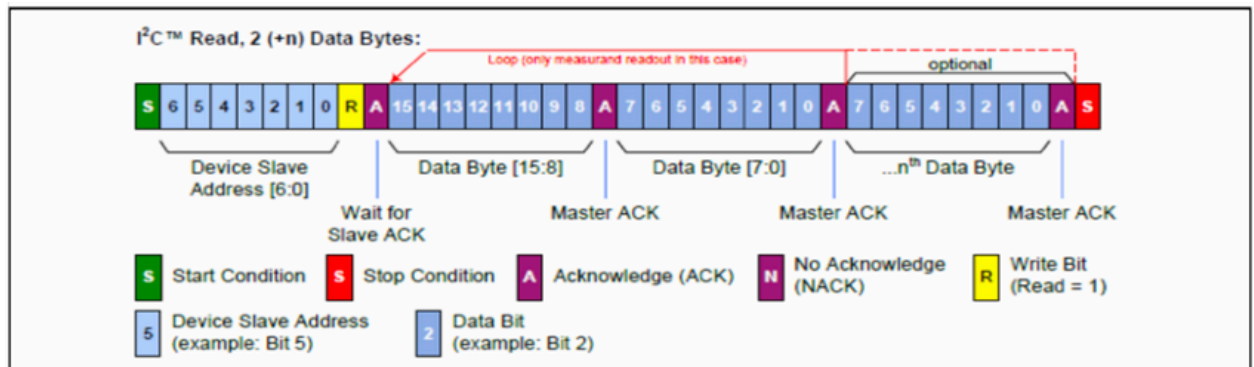


Figure 3: Configuration of an I<sup>2</sup>C-Message

An I2C message starts with a start-condition. It is followed by the address-byte including the read/write bit. The read/write bit determines the data direction. It is followed by the acknowledge-bit which confirms the receipt of the first byte. Now data will be transmitted. The receiver confirms the receipt with the ACK-bit. If the transmission is not successful the transmission is stopped. A message is terminated with a stop-condition.

## START-CONDITION

The Start-Condition is prepared on the bus by setting SDA to LOW while SCL remains HIGH.

## STOP-CONDITION

The Stop-Condition is prepared on the bus by setting SDA to HIGH while SCL remains HIGH.

## DATA TRANSMISSION

The Level of SDA line may only be changed during transmission, if SCL line is LOW.  
Start and Stop conditions as an exception.  
The SCL line is master driven.

## DATA FORMAT

4 byte can be read from the transducer. The first 2 byte contain the pressure value. The last two byte are temperature value. Data must be interpreted as Big Endian. The scaling must be taken from the individual datasheet, because it always depends on the specific pressure range and configuration.

## STANDARD CONFIGURATION OF PRESSURE TRANSDUCERS

The following table shows possible standard configurations and scaling. Each part number may differ and the actual scaling must be taken from the individual datasheet.

Parameter	Value	description
SCL clock frequency	100 kHz	Data transmission speed
Address	0x78	
Standard Range	2500-25000 digits	Digital range scaled on pressure range

## ERROR CODES

If bit 15 is set in the message then the value has to be interpreted as an error code.  
The following errors are detected and provided:

Error Code	Description
0xCAAA	Memory Error EEPROM
0xCF0F	Memory Error RAM
0xCE38	Memory Error Register
0xCCCC	Memory Error EEPROM
0xC1C7	Calculation error
0xC5555	Watchdog detection
0xCFCF	Sensor bridge damaged, bond wire

## REFERENCES

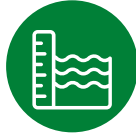
[1] Stefan-Xp, "Wikimedia Commons (CC BY-SA 3.0)," 24 Nov. 2016. [Online].  
Available: <https://commons.wikimedia.org/w/index.php?curid=3607670>.

# PRIGNITZ

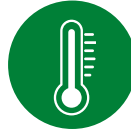
## MIKROSYSTEMTECHNIK



PRESSURE



LEVEL



TEMPERATURE



CALIBRATION &  
SERVICE

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