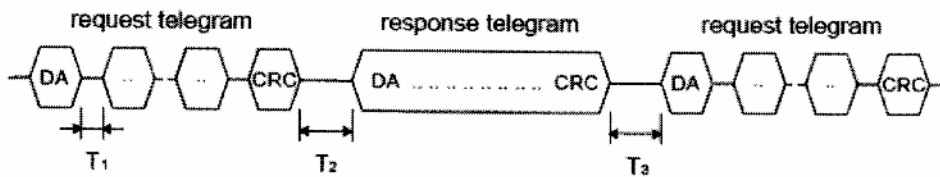


5. MODBUS-PROTOCOL

5.1. Transmission Sequence

In the MODBUS-protocol the data are transmitted from and to the sensor module by means of the following sequence:



- T1: time between two characters
- T2: time between request-telegram and corresponding response-telegram
- T3: time between response-telegram and next request-telegram

You will find the minimum and maximum appearing values for T1, T2 and T3 and the adjustment range in the following table 2.14.

protocol	baud rate	T1min	T1max	T2min	T2max	T3min	T3max
adjustable		no	no	yes	no	no	yes
M	19,200 bps						
O	38,400 bps		1.5 CT	3.5 CT	T2min	3.5 CT	0.1 sec
D	57,600 bps				x		to
B	115,200				1.2		600 sec
U							
S	bps						

Table 5.1 - Values and adjustment range for the times T1, T2 and T3
(CT: character time: 1 CT = character length [bit] / baud rate [bps])

Notice: In the MODBUS-protocol T2max lasts at least 12 msec.

The values for T2min and T3max and the behavior of the e.bloxx if T3max is exceeded (communication timeout) can be adjusted by means of the Configuration Software ICP100. The default value for T2min is 1 CT and for T3max it is 60 sec.

Read Input Register

Description:

With this command input registers (read only registers) can be read.

Request Telegram

ADR	FNR	REGSTA		REGNUM		CRC	
	04	MSB	LSB	MSB	LSB	MSB	LSB

Response Telegram

ADR	FNR	BYTNUM	D0	D1	...	Dn	CRC	
	04						MSB	LSB

ADR ISM address (*hex* 00..7F)
 FNR Function number (*hex* 04)
 REGSTA Address of the first register to be read
 REGNUM .. Number of registers to be read
 BYTNUM ... Number of databytes (max. 64)
 D0 - Dn Data bytes (max. 64)
 CRC Check sum

CRC polynom: $u^{15} + u^{13} + 1$
 CRC start value: *hex* FFFF

5.4. Register Contents

Variable Values in Integer Format

Register	Type	Content	Range
0000	ro/rw	variable 1 integer value	-32768 ... 32767
0001	ro/rw	variable 2 integer value	-32768 ... 32767
⋮	⋮	⋮	⋮
000B	ro/rw	variable 8 integer value	-32768 ... 32767
(000F	ro/rw	variable 16 integer value	-32768 ... 32767)*

* ... Only e.bloxx A6-2CF, which has 16 variables.

Read And Write Variable (Real)

Register	Type	Content	Range
0010	ro/rw	variable 1 real value high word	0 ... 65535
0011	ro/rw	variable 1 real value low word	0 ... 65535
0012	ro/rw	variable 2 real value high word	0 ... 65535
0013	ro/rw	variable 2 real value low word	0 ... 65535
⋮	⋮	⋮	⋮
001E	ro/rw	variable 8 real value high word	0 ... 65535
001F	ro/rw	variable 8 real value low word	0 ... 65535
(002E	ro/rw	variable 16 real value high word	0 ... 65535)*
(002F	ro/rw	variable 16 real value low word	0 ... 65535)*

* ... Only e.bloxx A6-2CF, which has 16 variables.

Attention: The low word and the high word of a variable always have to be read or written simultaneously.

Notice: The possibility of a writing command on the registers 0000 up to 002F depends on the configuration. With the following variable types a writing command is valid if this has been allowed by the Configuration Software ICP100.

Analog Input with Tare Function:

After a writing command for this variable the tare function will be started.

Digital Counter with Reset Function:

After a writing command for this variable the counter will be set to zero.

Arithmetic Variable with min/max-Function and Reset Function:

After a writing command for this variable the pull-pointer will be reset.

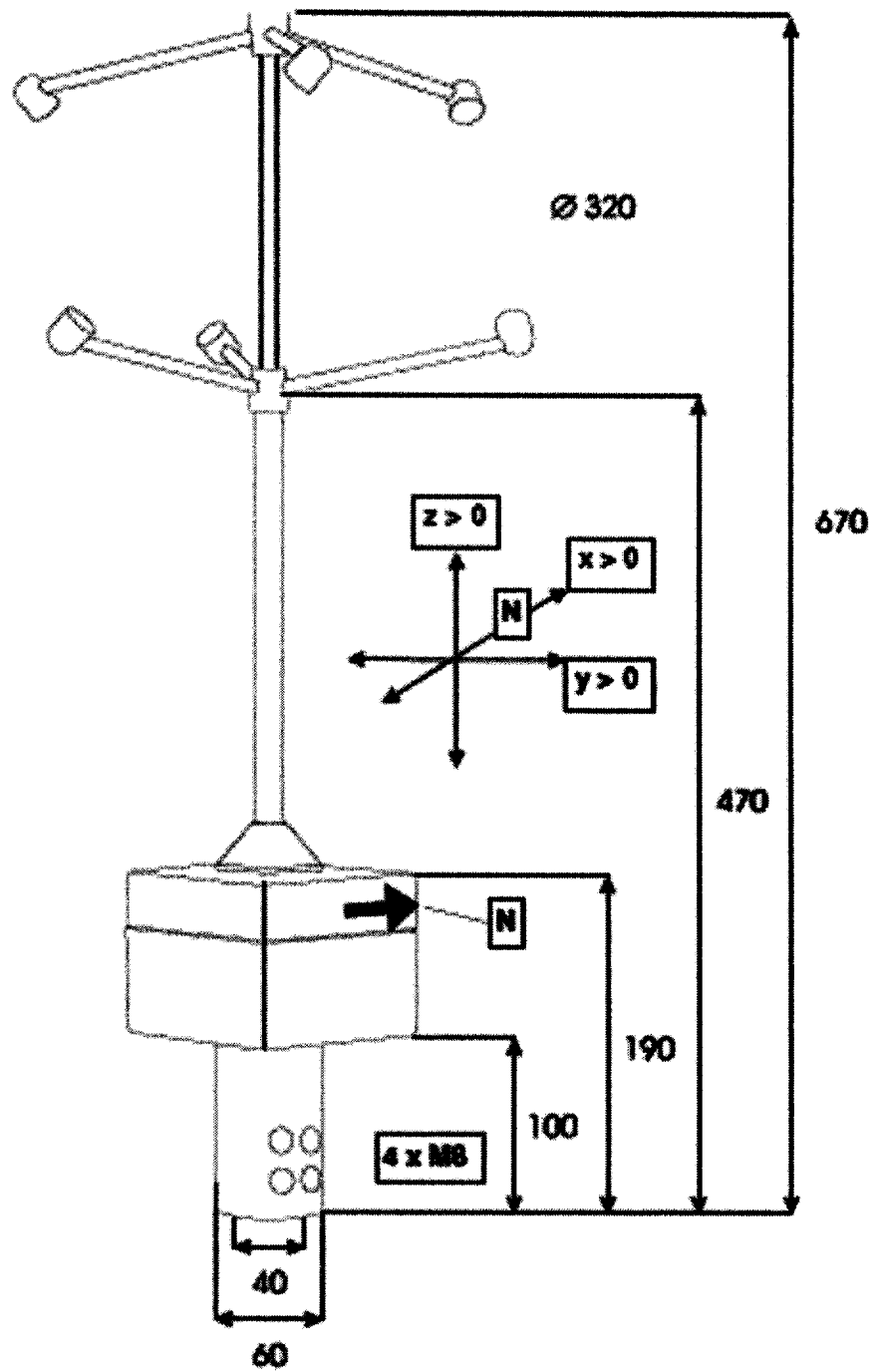
Setpoint Variable:

After a writing command for this variable the new set value will be taken over.

Digital Output Variable (Host Output):

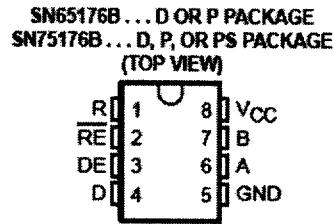
A writing command for this variable will set the corresponding variable to '1' or '0' respectively.

Annexe 9 : Anémomètre à ultrasons USA1 de METEK



Annexe 10 : Driver de lignes RS485 SN65176B (Texas Instruments)

- Bidirectional Transceivers
- Meet or Exceed the Requirements of ANSI Standards TIA/EIA-422-B and TIA/EIA-485-A and ITU Recommendations V.11 and X.27
- Designed for Multipoint Transmission on Long Bus Lines in Noisy Environments
- 3-State Driver and Receiver Outputs
- Individual Driver and Receiver Enables
- Wide Positive and Negative Input/Output Bus Voltage Ranges
- Driver Output Capability . . . ±60 mA Max
- Thermal Shutdown Protection
- Driver Positive and Negative Current Limiting
- Receiver Input Impedance . . . 12 kΩ Min
- Receiver Input Sensitivity . . . ±200 mV
- Receiver Input Hysteresis . . . 60 mV Typ
- Operate From Single 5-V Supply



description/ordering information

The SN65176B and SN75176B differential bus transceivers are integrated circuits designed for bidirectional data communication on multipoint bus transmission lines. They are designed for balanced transmission lines and meet ANSI Standards TIA/EIA-422-B and TIA/EIA-485-A and ITU Recommendations V.11 and X.27.

The SN65176B and SN75176B combine a 3-state differential line driver and a differential input line receiver, both of which operate from a single 5-V power supply. The driver and receiver have active-high and active-low enables, respectively, that can be connected together externally to function as a direction control. The driver differential outputs and the receiver differential inputs are connected internally to form differential input/output (I/O) bus ports that are designed to offer minimum loading to the bus when the driver is disabled or V_{CC} = 0. These ports feature wide positive and negative common-mode voltage ranges, making the device suitable for party-line applications.

ORDERING INFORMATION

T _A	PACKAGE†	TUBE/REEL	ORDERABLE PART NUMBER	TOP-SIDE MARKING
0°C to 70°C	PDIP (P)	Tube of 50	SN75176BP	SN75176BP
	SOIC (D)	Tube of 75	SN75176BD	75176B
		Reel of 2500	SN75176BDR	
	SOP (PS)	Reel of 2000	SN75176BPSR	A176B
-40°C to 105°C	PDIP (P)	Tube of 50	SN65176BP	SN65176BP
	SOIC (D)	Tube of 75	SN65176BD	65176B
		Reel of 2500	SN65176BDR	

† Package drawings, standard packing quantities, thermal data, symbolization, and PCB design guidelines are available at www.ti.com/sc/package.

description/ordering information (continued)

The driver is designed for up to 60 mA of sink or source current. The driver features positive and negative current limiting and thermal shutdown for protection from line-fault conditions. Thermal shutdown is designed to occur at a junction temperature of approximately 150°C. The receiver features a minimum input impedance of 12 kΩ, an input sensitivity of ±200 mV, and a typical input hysteresis of 50 mV.

The SN65176B and SN75176B can be used in transmission-line applications employing the SN75172 and SN75174 quadruple differential line drivers and SN75173 and SN75175 quadruple differential line receivers.

Function Tables

DRIVER

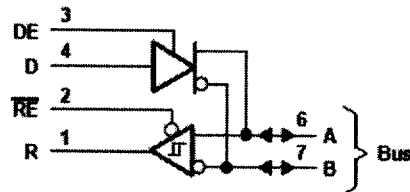
INPUT D	ENABLE DE	OUTPUTS	
		A	B
H	H	H	L
L	H	L	H
X	L	Z	Z

RECEIVER

DIFFERENTIAL INPUTS A-B	ENABLE RE	OUTPUT R
$V_{ID} \geq 0.2V$	L	H
$-0.2V < V_{ID} < 0.2V$	L	?
$V_{ID} \leq -0.2V$	L	L
X	H	Z
Open	L	?

H = high level, L = low level, ? = indeterminate,
X = irrelevant, Z = high impedance (off)

logic diagram (positive logic)



SN65176B 2/2