# Wind Interface S-D

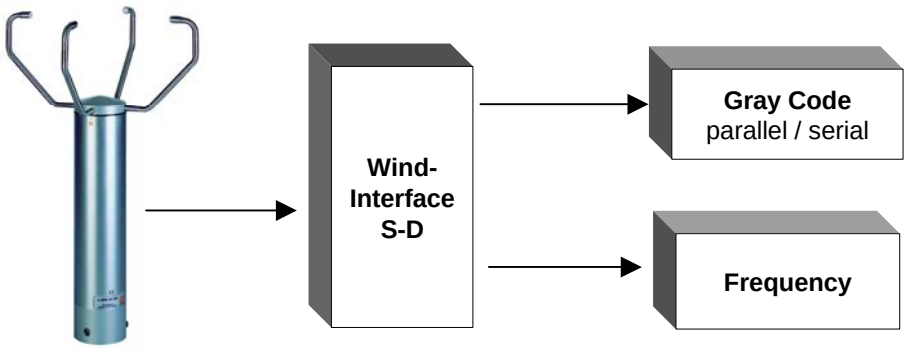
**Operating Instructions 4.4075.xx.xxx**

## Application

The Wind Interface S-D is used to transform the serial data telegram from the Ultrasonic Anemometer 2D into electrical analogue or digital output variables.

These output variables correspond to the output signals of standard mechanical wind speed and wind direction transmitters.

Through this, it is possible to replace the existing mechanical transmitters for an Ultrasonic Anemometer 2D, retaining at the same time the electrical output signals of installed transmitters.




for ex. Ultrasonic Anemometer
4.3800.00.140

## Wind Interface S-D Models

| Interface Type | Wind Direction Transmitter | | Wind Speed Transmitter | |
|---|---|---|---|---|
| Order-No. | Order-No. | Output Signal WD | Order-No. | Output Signal WS |
| **4.4075.02.000** | 4.3121.32.000 | 8 bit parallel * | 4.3303.22.000 | 1042Hz = 50m/s |
| **4.4075.02.010** | 4.3128.x0.000 | 4/5 bit parallel ** | 4.3518.00.000 | 573Hz = 50m/s*** |
| **4.4075.02.020** | 4.3125.32.100 | 8 bit serial * | 4.3303.22.007 | 1042Hz = 50m/s |
| **4.4075.02.021** | 4.3125.32.100 | 8 bit serial * | 4.3303.22.018 | 502Hz = 50m/s |
| **4.4075.02.030** | 4.3129.00.000 | 5 bit serial ** | 4.3519.00.000 | 630Hz = 50m/s |
| **4.4075.02.040** | 4.3323.21.300 | analogue | 4.3303.22.000 | 1042Hz = 50m/s |
| **4.4075.02.050** | 4.3128.x0.000 | 4 bit parallel ** | 4.3520.x0.000 | 573Hz = 50m/s**** |
| **4.4075.02.060** | 4.3125.32.100 | 8 bit serial * | 4.3303.22.007 | 1042Hz = 50m/s |
| | + temperature output 0...10 V ( -30...+ 50 °C ) | | | |

* Thies-Gray-code 8 Bit / 144 steps / 2.5° resolution
** Gray-code 5/4 Bit / 32/16 steps / 11.25° / 22.5° resolution
*** sink-output (WS)
**** source-output (WS)

# Technical Data

| | | | |
|---|---|---|---|
| **Input** | Serial Interface | RS 422 / RS 485 ( for US-type : 4.3800.00.140 or 4.3800.00.141 ) | |
| | Data telegram | Ref. to chapter *data telegram* | |
| **Output WS** | Frequency | 0....1000 Hz | |
| | Accuracy | ± 0,5 % v. m.r.. | |
| | PP-ratio | 1:1 | |
| | Up-date rate | 10 Hz | |
| | WS level (high) | $V_{CC}$ – 2 V | for 4.4075.02.000 / ...020 / ...021/...040 / ...060 |
| | WS level (low) | 0.7 V | for 4.4075.02.000 / ...040 |
| | WS level (low) | < 0.2 V | for 4.4075.02.010 / ...020 / ...021/ ...030 / ...060 |
| | Output WS I(max) | 50 mA (sink) | for 4.4075.02.010 |
| | | all the others | |
| | Output WS I(max) | 50 mA (source) | for 4.4075.02.050 |
| **Output WD digital** | WD resolution | 2.5° (8bit) | for 4.4075.02.000 / ...020 / ...021 |
| | WD resolution | 22.5° (4bit) | for 4.4075.02.010 / ...050 |
| | WD resolution | 11.25° (5bit) | for 4.4075.02.030 |
| | Up-date rate | 10 Hz | |
| | WD level (high) | $V_{CC}$ - 2V | |
| | WD level (low) | 0.7 V | for 4.4075.02.000 |
| | WD level (low) | <0.2 V | for 4.4075.02.010 / ...030 / ...050 |
| | Output load I (max) | 50 mA (source) | for track A - E |
| | Output load I (max) | 20 mA | for track H- I |
| **Output WD analogue** | WR =170°L (350°) | 9.77 V ± 2 % | |
| | WR =0° (180°) | 5.00 V ± 2 % | |
| | WR =170°R (10°) | 0.24 V ± 2 % | |
| | Resolution | < 1° = 0.028 V | |
| | Up-date-rate | 10 Hz | |
| | Output resistance | 220 Ω | |
| | DAC –resolution | 10 bit | |
| **Output Temperature** | Range | -30 ...+ 50 °C = 0....10 V | |
| | Resolution | 0.1 °C = 0.125 V | |
| | Accuracy | ± 1 % of m.r. | |
| | Output resistance | 220 Ω | |
| | DAC –resolution | 10 bit | |
| **Power Supply** | Power supply $V_{CC}$ | 9....24 V DC | |
| | Heating (Ultrasonic) | 24 V AC / DC | |
| | Current consumption | approx. 25 mA | |
| | Fuse | 250 mA (T) | |
| **Housing** | Material | Alu | |
| | Protection | IP 65 | |
| | Dimensions | 179 x 84 x 67 mm | |
| | Weight | 0,85 kg. | |

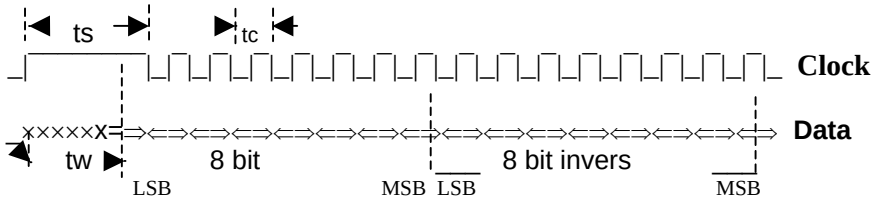
## Remark to Error Message:

In case the data transmission between the Ultrasonic Anemometer and the interface is faulty or fails, the interface sends an error message, outputting the max. wind speed of 50 m/s and the wind direction as 0°.

## Interface Specification for 4.4075.02.020 / ...021

**Wind direction** Serial-synchronous data output of the wind direction

The control, and transmission of the “wind direction” is carried out via the lines “data”, and “clock (CLK)” as follows:
The rising edge of the first CLK-pulse files the “wind direction” into the shift register according to time [tw] in the form of a specific Gray-code. With this, the LSB of the Gray-code is available at the output “data”. With seven further CLK-signals the Gray-code is completely output. Eight further CLK-signals lead to the output of the inverse Gray-code. This allows a plausibility check on the transmission distance.




| Parameters | Symbol | Min | Max | Unit |
|---|---|---|---|---|
| Starting pulse (1. Clock pulse) | ts | 2 | 10 | ms |
| Transforming period until measuring value is achieved | tw | - | 1,5 | ms |
| Length of clock pulse | tc | 0,2 | 10 | ms |
| Query interval of meas. value | f | - | 30 | Hz |

## Interface Specification for 4.4075.02.030

**Wind direction**

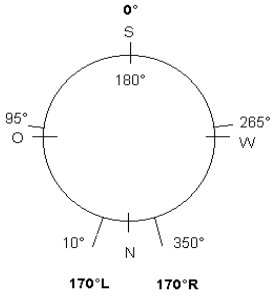
- Gray-code
- Resolution of the wind direction 11.25<° 5 bit (32 steps (360 / 32 = 11.25<°))
- Serial-synchronous data output of the wind direction
  *for description please ref. to type 4.4075.02.020/…021*
- Output of 8 bit/ 16 bit with the following contents:

| Gray-Code | | | | | Special function hard-set | | |
|---|---|---|---|---|---|---|---|
| $2^0$ | $2^1$ | $2^2$ | $2^3$ | $2^4$ | | | |
| X | x | x | x | x | 0 | 1 | 0 |

## Interface Specification for 4.4075.02.040

**Wind direction** Analogue output of meas. value with specific meas. range. Starting from the selected reference mark (=180°) at the wind transmitter (corresp. to 0° (south)), the deviation is stated to the left(170°L) or to the right (170°R) of it.

| Angle of Wind Transmitter | Reference Angle | U(Output) |
|---|---|---|
| 10° | 170°L | 9.77V ±2% |
| 180° | 0° | 5.00V ±2% |
| 350° | 170°R | 0.23V ±2% |



# Serial Interface

The wind interface S-D is equipped with an RS422/RS 485-interface. The interface expects a continuous data flow from the Ultrasonic Anemometer 2 D.

## Konfiguration

There are 4 baud rate to be selected (standard 1200 baud).
The baud rates are selected via the DIP-switch (see configuration).

| Baud-Rate | Data-Bits | Parity | Stop-Bit |
|---|---|---|---|
| 1200 | 8 | no | 1 |

## Data Telegram

The following data telegram is expected (from the Ultrasonic) (WGWRT):

**STXxx.x xxx xxx.x*xx[CR][ETX]**
| | | |
1. 2. 3. 4.

1. Wind speed
2. Wind direction
3. Temperature
4. Check-sum

# Configuration

The configuration of the wind interface is carried out via the DIP-switches 1+2, and the configuration points P2 and P3

- Selecting the output version of the interface
- Test function (wind interface output)
- Selecting the baud rate

## Output Versions of Interface **4.4075.02.**xxx

| **Order-No.** | S2-1 | S2-2 | S2-3 | S2-8 | **S1-1(A)** | **S1-2(B)** | **S1-3©** | **S1-4(D)** | **S1-5(E)** | P2 | P3 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **...000** | OFF | OFF | OFF | ON | **OFF** | **OFF** | **ON** | **ON** | **ON** | X | X |
| **...010** | ON | OFF | OFF | ON | **ON** | **OFF** | **ON** | **ON** | **OFF** | X | X |
| **...020** | OFF | ON | OFF | ON | **ON** | **OFF** | **ON** | **OFF** | **OFF** | X | X |
| **...021** | OFF | ON | ON | ON | **ON** | **OFF** | **ON** | **OFF** | **OFF** | X | X |
| **...030** | ON | ON | OFF | ON | **ON** | **OFF** | **ON** | **OFF** | **OFF** | X | X |
| **...040** | OFF | OFF | ON | ON | **OFF** | **ON** | **OFF** | **OFF** | **OFF** | 1-3 | 1-3 |
| **...050** | ON | OFF | ON | ON | **ON** | **OFF** | **ON** | **ON** | **OFF** | x | X |
| **...060** | OFF | ON | OFF | OFF | **ON** | **ON** | **OFF** | **OFF** | **OFF** | 1-2 | 1-2 |

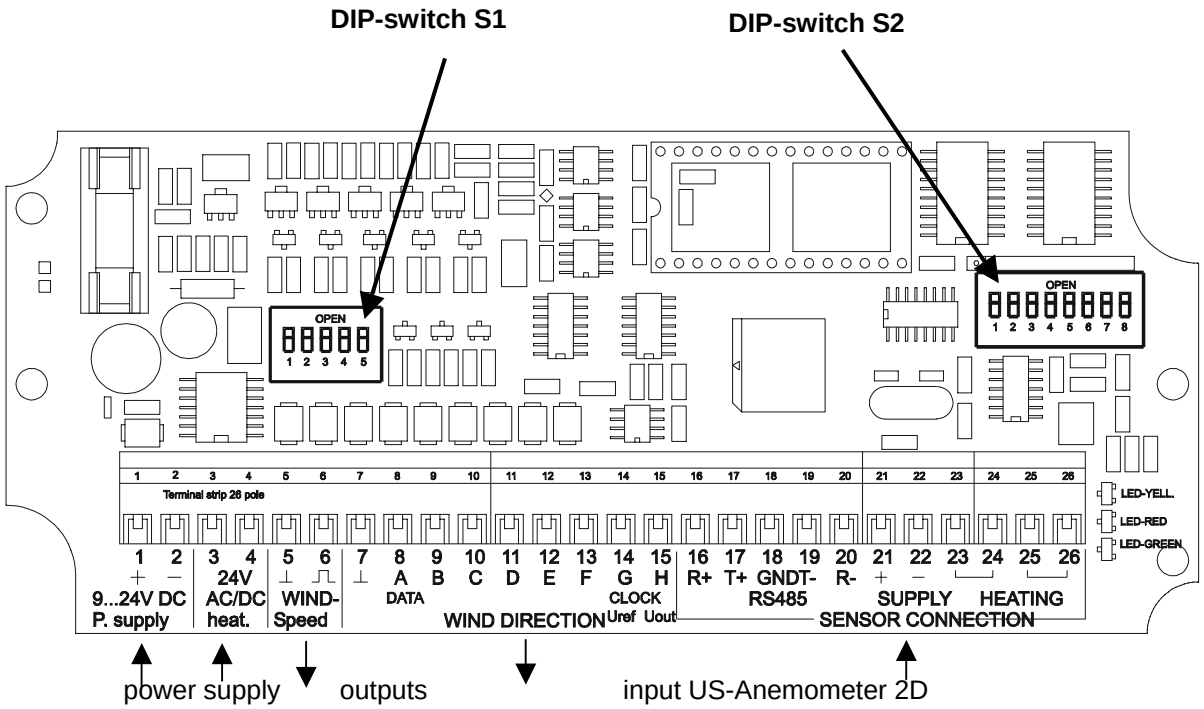
**Test function (Interface output)**

| Function WD/WS | | **Type ...060** | S2-6 | S2-7 |
|---|---|---|---|---|
| Test function OFF | | | ON | ON |
| WD=0° | WD=0 | $U_T$ = 0 V | OFF | ON |
| WD=180° | WS=1/2 | $U_T$ = 5 V | ON | OFF |
| WD=359° | WS=1/1 | $U_T$ = 10 V | OFF | OFF |

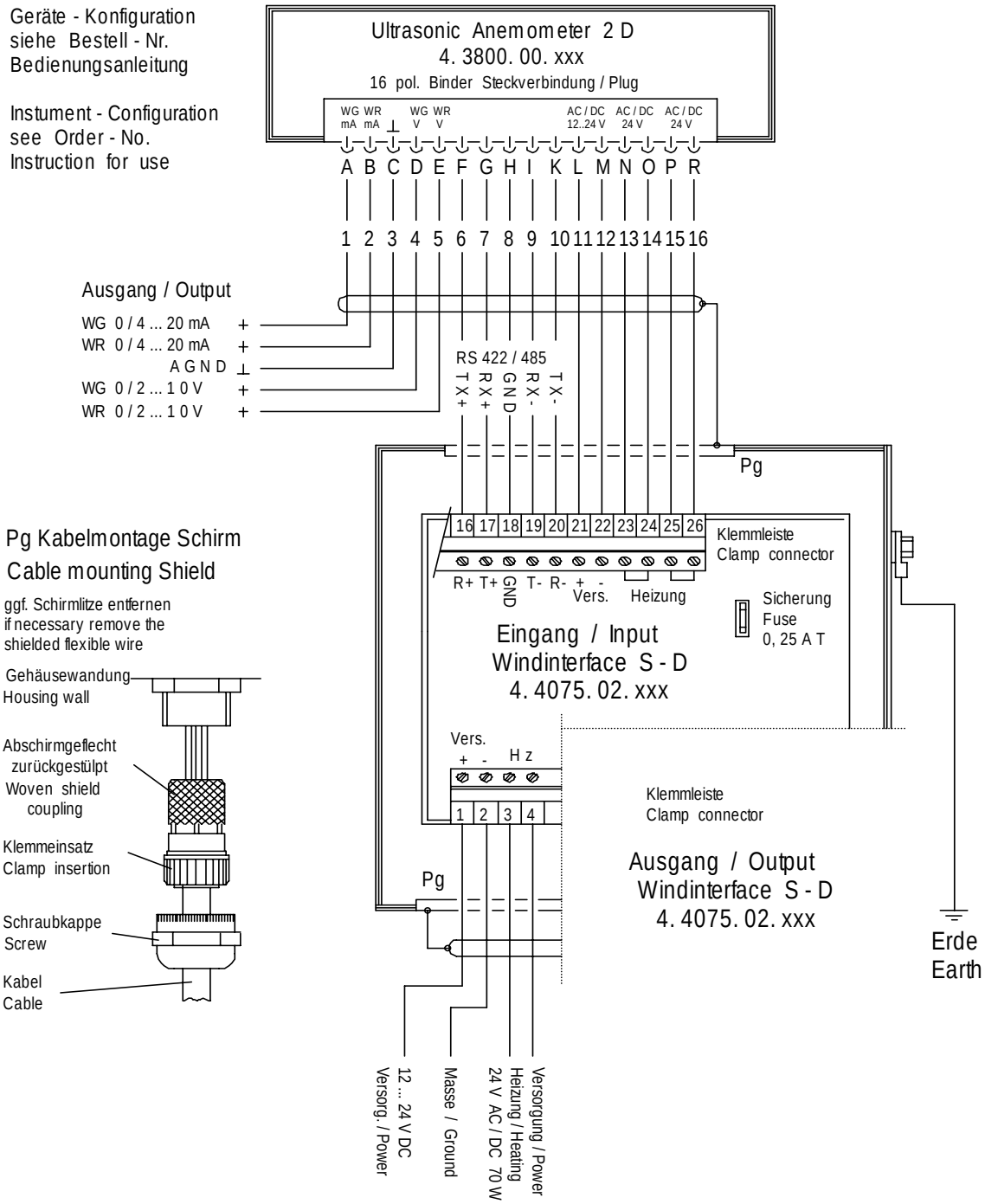
**Baud rate**

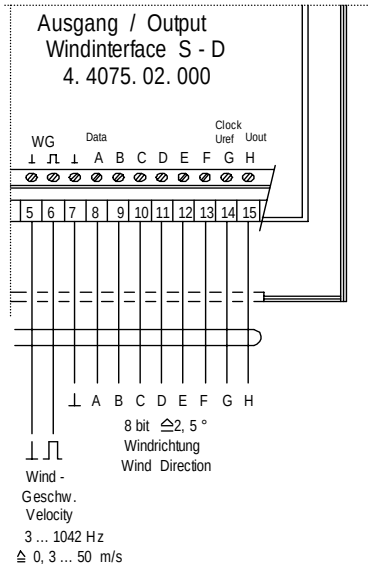
| Function | S2-4 | S2-5 |
|---|---|---|
| 1200 baud | ON | ON |
| 2400 baud | OFF | ON |
| 4800 baud | ON | OFF |
| 9600 baud | OFF | OFF |

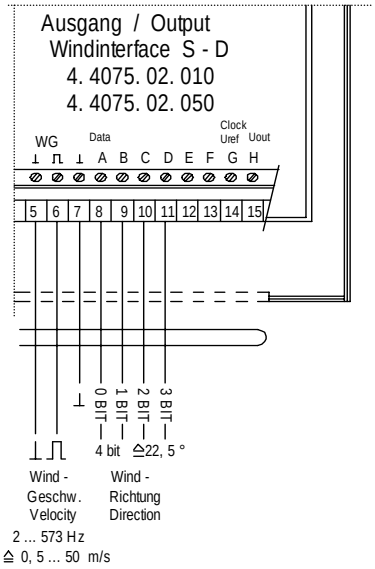
## Arrangement of DIP-Switch

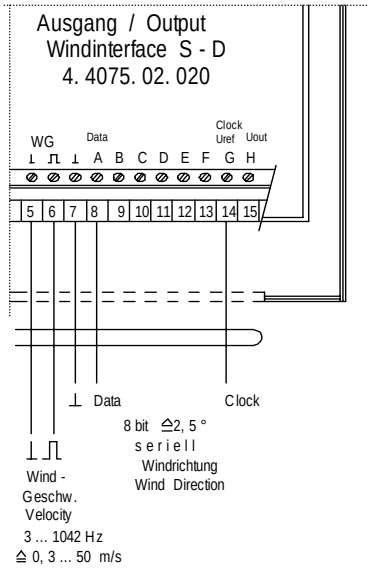


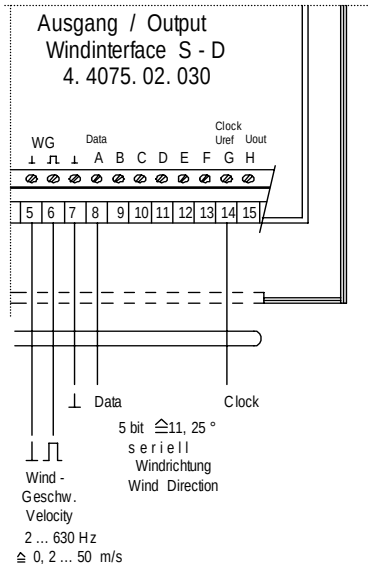
# Connecting Diagram

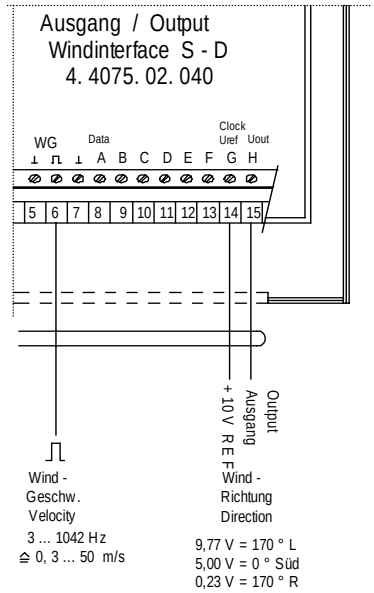


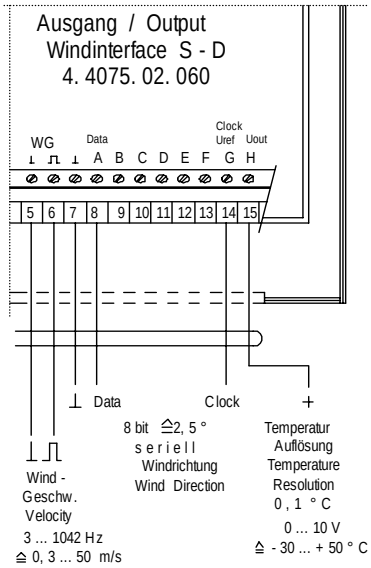

Ausgang / Output
Windinterface S - D
4. 4075. 02. 000
WG
Data
Clock
Uref
Uout
⊥ ⊓ ⊥ A B C D E F G H
5 6 7 8 9 10 11 12 13 14 15
⊥ A B C D E F G H
8 bit ≙2, 5 °
Windrichtung
Wind Direction
⊥ ⊓
Wind -
Geschw.
Velocity
3 ... 1042 Hz
≙ 0, 3 ... 50 m/s


Ausgang / Output
Windinterface S - D
4. 4075. 02. 010
4. 4075. 02. 050
WG
Data
Clock
Uref
Uout
⊥ ⊓ ⊥ A B C D E F G H
5 6 7 8 9 10 11 12 13 14 15
⊥
0 BIT
1 BIT
2 BIT
3 BIT
4 bit ≙22, 5 °
⊥ ⊓
Wind -
Geschw.
Velocity
2 ... 573 Hz
≙ 0, 5 ... 50 m/s
Wind -
Richtung
Direction


Ausgang / Output
Windinterface S - D
4. 4075. 02. 020
WG
Data
Clock
Uref
Uout
⊥ ⊓ ⊥ A B C D E F G H
5 6 7 8 9 10 11 12 13 14 15
⊥ Data
Clock
8 bit ≙2, 5 °
s e r i e l l
Windrichtung
Wind Direction
⊥ ⊓
Wind -
Geschw.
Velocity
3 ... 1042 Hz
≙ 0, 3 ... 50 m/s


Ausgang / Output
Windinterface S - D
4. 4075. 02. 030
WG
Data
Clock
Uref
Uout
⊥ ⊓ ⊥ A B C D E F G H
5 6 7 8 9 10 11 12 13 14 15
⊥ Data
Clock
5 bit ≙11, 25 °
s e r i e l l
Windrichtung
Wind Direction
⊥ ⊓
Wind -
Geschw.
Velocity
2 ... 630 Hz
≙ 0, 2 ... 50 m/s


Ausgang / Output
Windinterface S - D
4. 4075. 02. 040
WG
Data
Clock
Uref
Uout
⊥ ⊓ ⊥ A B C D E F G H
5 6 7 8 9 10 11 12 13 14 15
+ 10 V REF
Ausgang
Output
⊓
Wind -
Geschw.
Velocity
3 ... 1042 Hz
≙ 0, 3 ... 50 m/s
Wind -
Richtung
Direction
9,77 V = 170 ° L
5,00 V = 0 ° Süd
0,23 V = 170 ° R


Ausgang / Output
Windinterface S - D
4. 4075. 02. 060
WG
Data
Clock
Uref
Uout
⊥ ⊓ ⊥ A B C D E F G H
5 6 7 8 9 10 11 12 13 14 15
⊥ Data
Clock
+
8 bit ≙2, 5 °
s e r i e l l
Windrichtung
Wind Direction
Temperatur
Auflösung
Temperature
Resolution
0 , 1 ° C
0 ... 10 V
≙ - 30 ... + 50 ° C
⊥ ⊓
Wind -
Geschw.
Velocity
3 ... 1042 Hz
≙ 0, 3 ... 50 m/s

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