

# RS 232 communication

## **Configuration**

DanWind - HEMI

## **1. Table of contents**

1. Table of contents.....	2
2. Introduction.....	3
3. DanWind – HEMI.....	4
4. WICotech Current loop driver .....	6
1.1. Connections / LED's.....	8
5. Cables .....	9
5.1. WICotech driver (HEMI).....	9
5.2. Cable layout for F2816 - COM 1.....	10
5.3. Cable layout for F2816 - COM 2.....	10
6. Four Faith – Signal monitoring.....	11
6.1. F2403 Signal monitoring .....	11
6.1. F2816 Signal monitoring .....	12

## **2. Introduction**

This document shows how to enable RS232 communication on a DanWind turbine with HEMI controller.

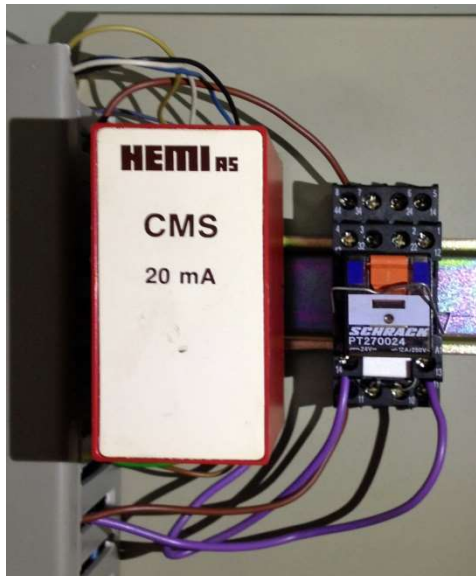
The document includes:

- How to change parameter and which settings needs to be changed.
- Hardware updates and changes.
- What new hardware is needed.
- Cable connections.

## 3. DanWind – HEMI



Communication: 4800 7E1, id no. 1.



Communication based on a 20mA loop.

Use the WICOtech current loop driver to convert the loop to RS232.

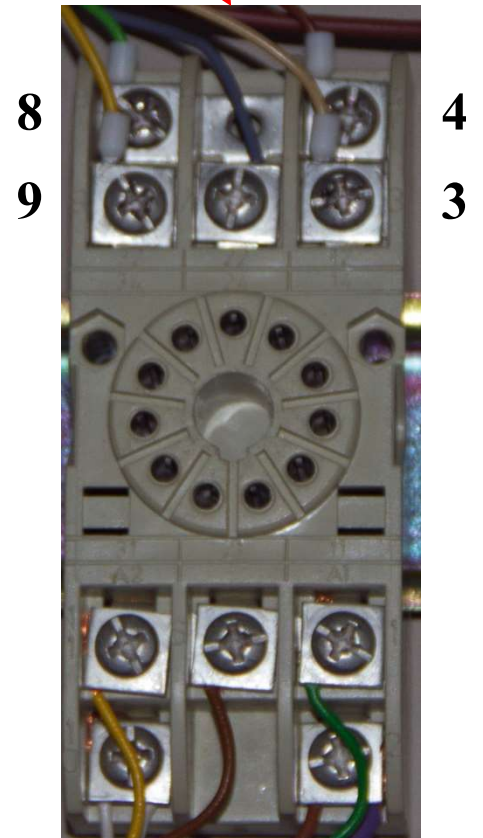
Orbital modem (DanWind) protocol 1200 or 4800 7E1

# RS 232 communication

Location of the WICOftech and the FourFaith modem.



<u>WICOftech</u>		<u>CMS 20 mA</u>
Pin 1	Yellow	Pin 9
Pin 2	Green	Pin 8
Pin 5	Brown	Pin 4
Pin 6	Beige	Pin 3



Dip switches on the WICOftech 20mA driver

Dipswitch 1:

1,2,3 and 5 is off

4 is on

Dipswitch 2:

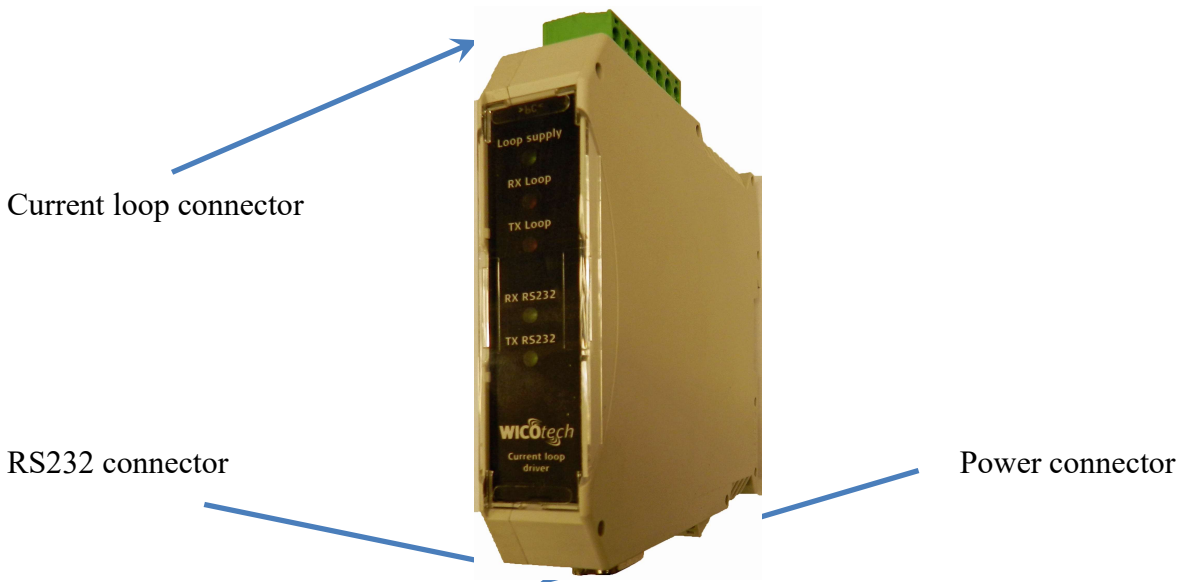
2 is on

1,3,4 and 5 is off



### 4. WICotech Current loop driver

The universal current loop driver from WICotech is used to convert the 20mA loop signals to RS232.



There are two dip switched that are used to configure the unit:

Dip switch 1:	Loop mode, echo and control signals
Dip switch 2:	Current loop voltage setting.

The switched are located on the left side of the unit.

The current loop plug is located in the top.

The RS232 connector is located in the bottom.

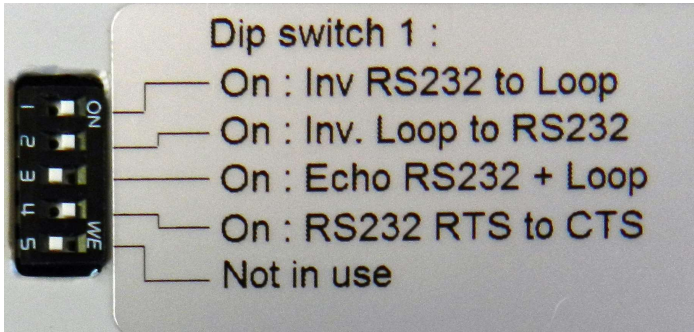
The power plug is located in the bottom. The power plug is used to supply 220 V to the unit. The same plug also gives the possibility to supply an external modem with 24 V from the internal power supply. This is used to feed the Four-Faith F2403 GPRS modem supplied by PS-Data.

## RS 232 communication

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Dip switch settings:

**Dip switch 1:** Default: Dip 4 is ON and 1, 2, 3 and 5 is off.



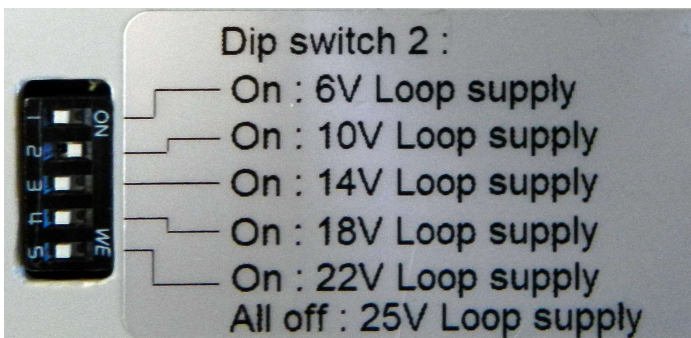
Dip 1 and 2 inverts the signal levels on the current loop.

Dip 3 is used to remove echo on the loop. If this setting is on will all questions send out on the loop be echoed back to the sender.

Dip 4 is used to short RTS and CTS in the RS232 connector. This setting is normally on.

Dip 5 is not used.

**Dip switch 2:** Default: Dip 2 is ON and the rest is off.



Dip switch 2 is used to set the voltage on the current loop.

Default current loop voltage is 10 V (Dip 2 is on)

If the red loop LED lights does not light up clearly try to raise the voltage one step to see if it helps. Be aware that the voltage should be kept as low as possible, since this gives the best change of high communication speeds.

## 1.1. Connections / LED's

### Current loop connector with internal power:

Pin 1	Transmit (+) out on the loop
Pin 2	Transmit (-) out on the loop
Pin 5	Receive (+) from the loop
Pin 6	Receive (-) from the loop

### Current loop connector without internal power:

Pin 2	Transmit (+) out on the loop
Pin 3	Transmit (-) out on the loop
Pin 6	Receive (+) from the loop
Pin 7	Receive (-) from the loop

### Power connector:

Pin 1	110 - 230V AC
Pin 2	110 - 230V AC
Pin 3	+24 V DC
Pin 4	Gnd

Current loop connector



Using the current loop driver without internal power demands that the internal jumpers P3 and P4 are removed.

### Green LED's (RS232 indicators)

TX RS232	Data transmitted out on the RS232 connector.
RX RS232	Data is received on the RS232 connector.
Loop Power supply	Display if the loop driver power supply is working.

### Red LED's (Loop indicators)

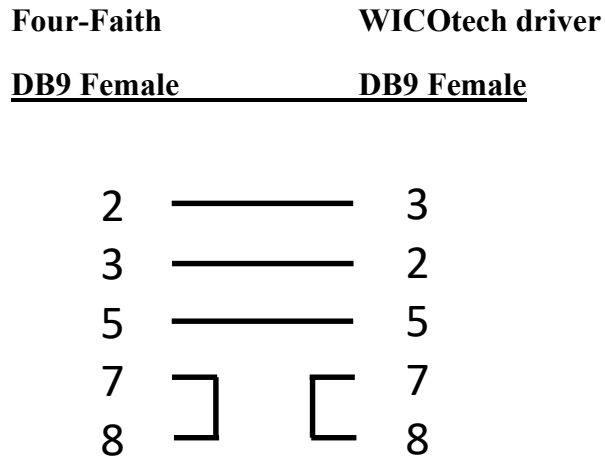
TX Loop	Current is running in the transmit loop.
RX Loop	Current is running in the receive loop.

Depending on dip switch 1's dip 1 and 2 can the red led's be used to see if communication is flowing. Dip 1 is inverting the transmit loop and dip 2 is inverting the receive loop.

If the dip switches are off is the led's on when the loop is in idle.  
If the dip switches are on is the led's off when the loop is in idle.

**5. Cables**

**5.1. WICotech driver (HEMI)**



Same as the standard Four-Faith (Black) communication cable.

**5.2. Cable layout for F2816 - COM 1**

Four-Faith 2816		WICotech driver	
<u>Terminal</u>		<u>DB9 Female</u>	
3	—————	3	White
4	—————	2	Green
5	—————	5	Brown
1 PWR		7	
2 GND		8	

**5.3. Cable layout for F2816 - COM 2**

Four-Faith 2816		WICotech driver	
<u>Terminal</u>		<u>DB9 Female</u>	
6	—————	3	White
7	—————	2	Green
5	—————	5	Brown
1 PWR		7	
2 GND		8	

The Power (PWR) must be between +5V to +36V DC (Standard power supply is 12V DC)

An easy way to check if the wires on pin 3 and 4 (COM1) or pin 6 and 7 (COM2) is mounted correct is to measure the DC voltage on both pins in reference to GND (pin 5). If the Rx and Tx wires are mounted correct, should it be possible to measure a voltage on both pins (Above 3 volts). If there is only voltage on one pin is the wires wrong and they must be flipped.

## 6. Four Faith – Signal monitoring

### 6.1. F2403 Signal monitoring

The Four Faith F2403 GPRS modem can be used to monitor the signal strength during installation.

This can be done on units bought after October 2014 and with firmware versions after this date.

The Signal mode is activated using a special DB9 adaptor that is inserted into the RS232 port on the Four Faith modem. When the adaptor is inserted will the online LED on the modem not display the online status anymore but instead will the signal strength be display. The signal level is illustrated by a number of blinks that is repeated every 3 seconds.

There are 5 different blink levels.

Level	Signal strength (dBm)	Quality
1	-113 -> -103	Bad
2	-101 -> -95	Marginal
3	-93 -> -85	OK
4	-83 -> -75	Good
5	-73 or higher	Excellent



The GPRS modem will not attempt to connect unless the signal strength is 2 or above but the signal should be no less than 3 or more before a stable connection can be expected.

Be aware that when the Signal tester adaptor is inserted will the modem NOT attempt to go online. The modem will return to normal operation when the adaptor is removed.

## 6.1. F2816 Signal monitoring

The Four Faith F2816 GPRS modem can be used to monitor the signal strength during installation.

The Signal mode is activated by pressing the signal tester button on the “Multiport interface” unit. The button has to be kept pressed during the signal testing.

If the kit is not equipped with the signal tester button can the signal mode be activated by connecting pin 11 (IO2) to the ground pin 2 or 5.

When the connection is established will the online LED on the modem not display the online status anymore but instead will the signal strength be display. The signal level is illustrated by a number of blinks that is repeated every 3 seconds.

There are 5 different blink levels.

Level	Signal strength (dBm)	Quality
1	-113 -> -103	Bad
2	-101 -> -95	Marginal
3	-93 -> -85	OK
4	-83 -> -75	Good
5	-73 or higher	Excellent



The GPRS modem will not attempt to connect unless the signal strength is 2 or above but the signal should be no less than 3 or more before a stable connection can be expected.

Be aware that when the Signal tester is active will the modem NOT show the online signal anymore. The modem will return to normal operation when the adaptor is removed.