

# RS 232 communication

**Configuration**  
**Bonus WTC-2**

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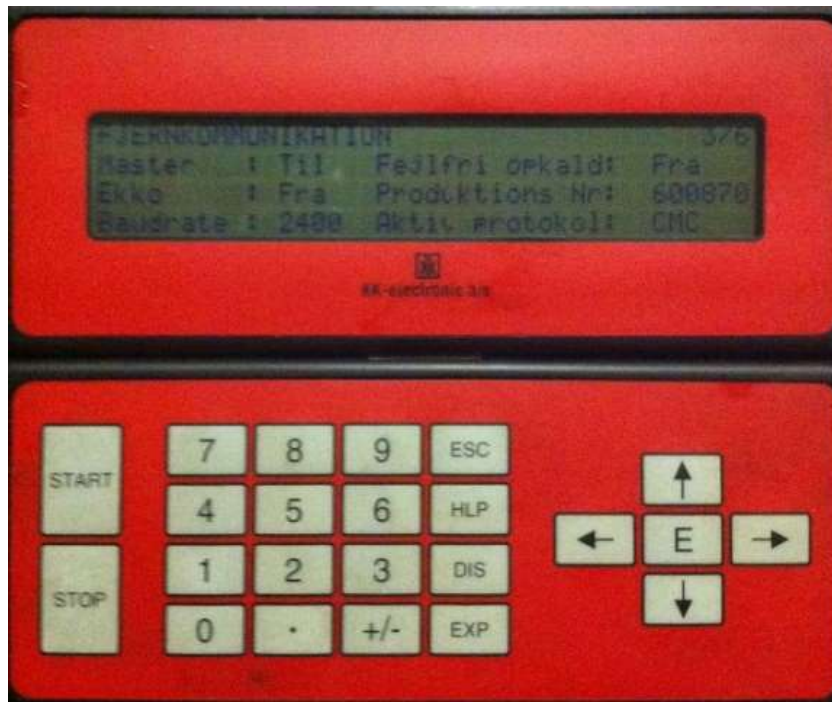
## **2. Introduction**

This document shows how to enable RS232 communication on a Bonus turbine with a WTC2 controller.

The document includes:

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

## 3. Parameters



The following parameters must be configured.

Turbine id (CMC)	01	(Default)
Turbine FDV id	0101	(Default)
Password	0	
Master	ON	(Til)
Echo	Off	(Fra)
Baud rate	9600 Baud	
Fejlfri opkald	Off	(Fra)

They can be found in the menu 16: Remote communication (Fjern kommunikation)

Be aware that the turbine does not answer remote questions, if it is in local mode.

Data bits, Parity and stop bits: 8N1

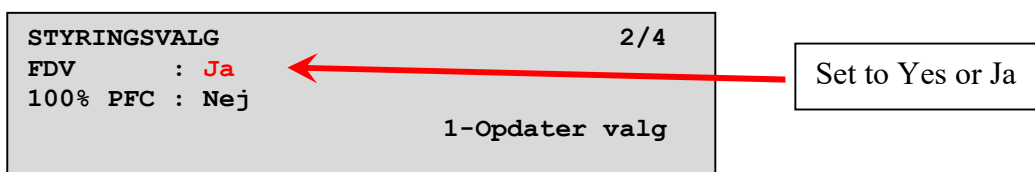
## 3.1. Activate FDV protocol

Some turbines offer access to the service menu. This access is done using the FDV id number.

The FDV id number is default set to 0101. It is important to know this number if the service menu should be accessible from remote. The FDV number is also located in the remote communication menu.

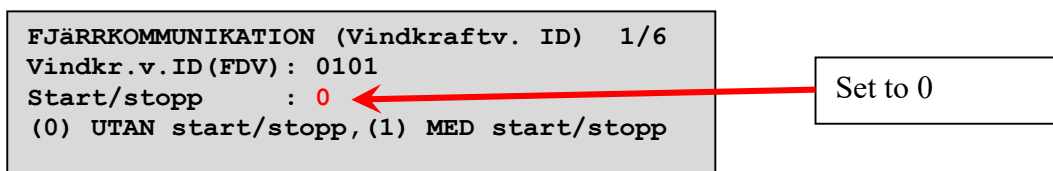
In some cases can the FDV protocol be disabled. The activation of the FDV protocol is done in menu 26: Type/Language select (Type/Sprog-valg). On the second page (2/4) must the FDV be set to Yes (Ja)

```
STYRINGSVALG 2/4
FDV : Ja
100% PFC : Nej
1-Opdater valg
```



In some cases is it necessary to activate the FDV protocol by setting the Start/Stop parameter in the “Remote communication “ (Fjern kommunikation) menu to zero.

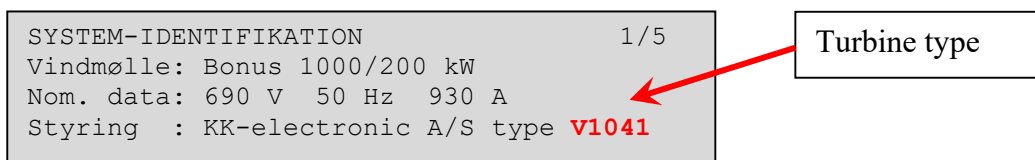
```
FJÄRRKOMMUNIKATION (Vindkraftv. ID) 1/6
Vindkr.v.ID (FDV) : 0101
Start/stopp : 0
(0) UTAN start/stopp, (1) MED start/stopp
```



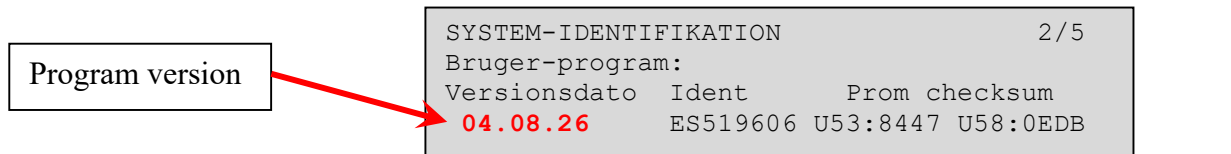
## 3.2. Program version

You can check the program version in menu 09: System-Identification

```
SYSTEM-IDENTIFIKATION 1/5
Vindmølle: Bonus 1000/200 kW
Nom. data: 690 V 50 Hz 930 A
Styring : KK-electronic A/S type v1041
```



```
SYSTEM-IDENTIFIKATION 2/5
Bruger-program:
Versionsdato Ident Prom checksum
04.08.26 ES519606 U53:8447 U58:0EDB
```



## 4. Hardware

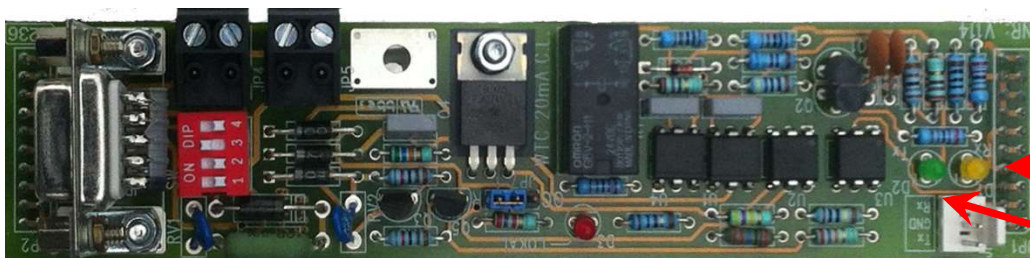
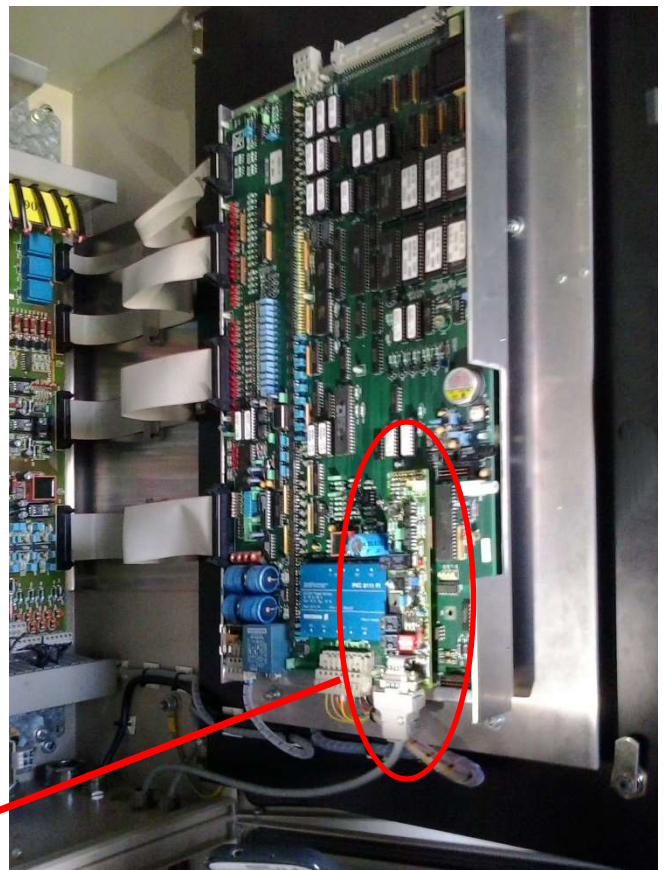
To get the communication working on a WTC-2 controller is it necessary to have the right hardware based on current loop or direct access to the turbine via RS232

### 4.1. Current loop

Current loop is used when there are several turbines in the park.

The WTC controller must be configured with the V114-1 current loop driver board and the current loop must be terminated in a V151 20 mA loop driver board

The V114-1 current loop driver

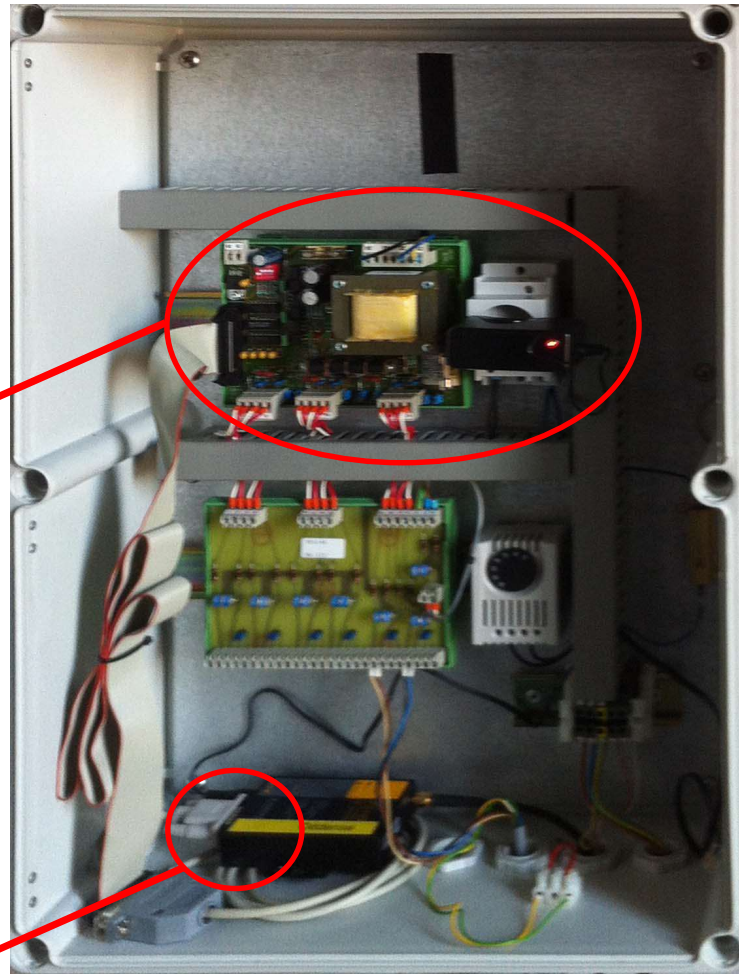


Rx: Receive light  
Tx: Transmit light

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Modem is located in the master communication panel together with the 20mA current loop driver:



The V151 20 mA loop driver board

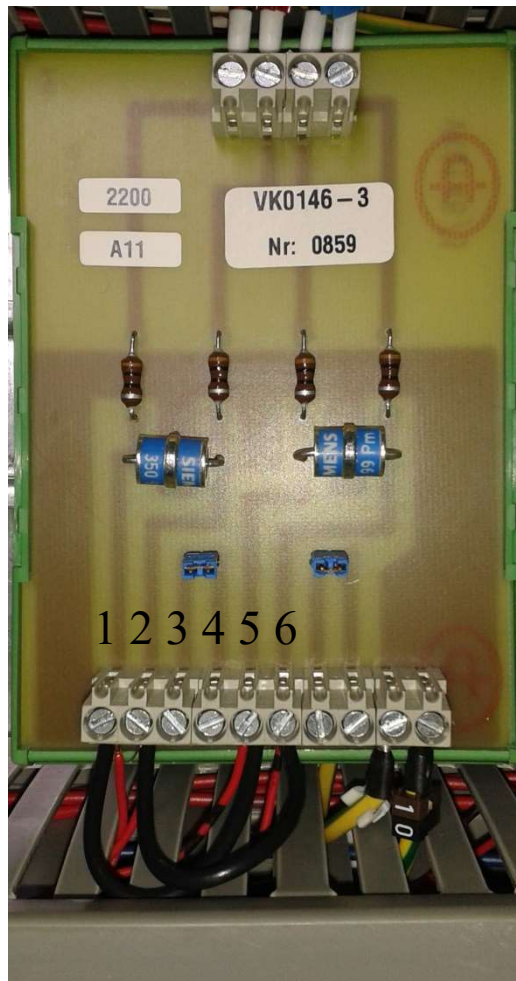
Connector for the RS232 communication

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If a turbine has to be removed from a current loop before it is upgraded to IP. Is it necessary to modify the loop driver wiring to keep the existing loop working.

Since the V114 module will be replaced with a V112 module is it necessary to manually loop the signal on the VK0146 lightning protection module to bypass the V112 module. This is done by adding two wires on the connectors in the bottom of the board.



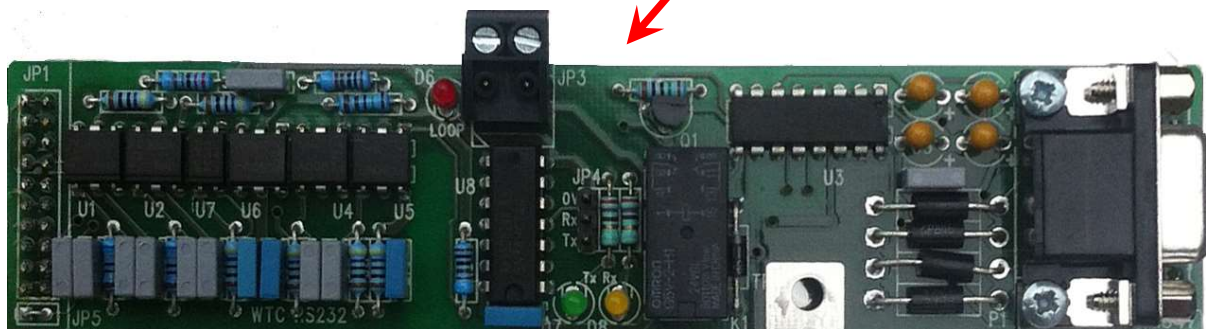
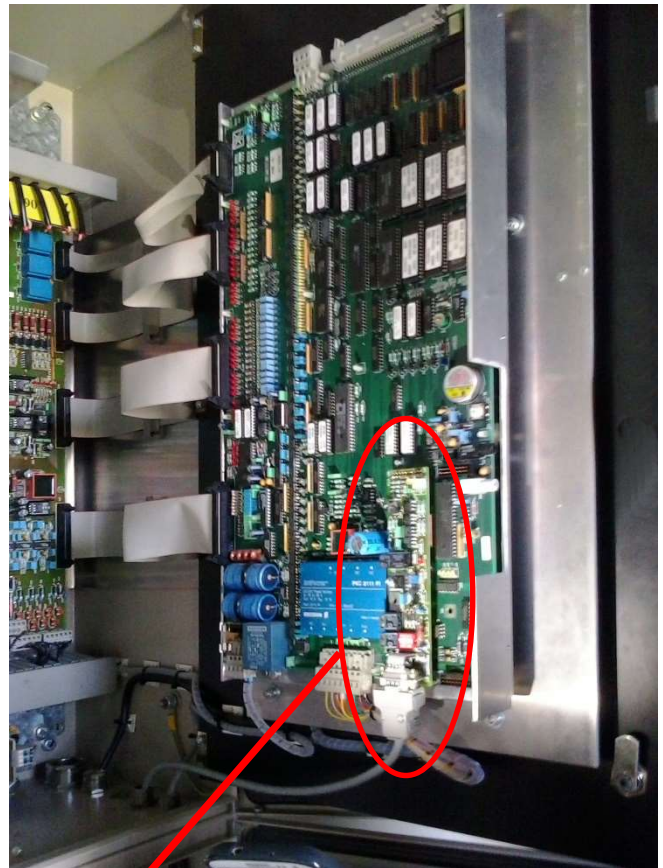
The following wires has to be mounted:

1. A wire between 1 and 5 and
2. A wire between 2 and 6.

## 4.2. RS-232 communication

When connecting the WTC-2 controller via a RS-232 connection is it necessary to have a V112-4 RS-232 communication driver installed in the WTC-2 controller

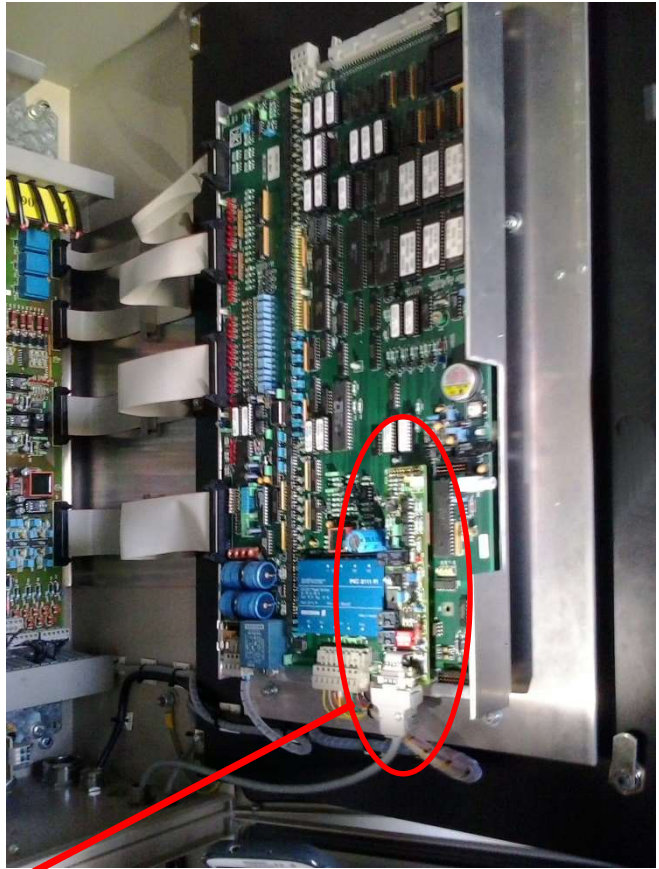
The V112-4 RS 232 communication interface



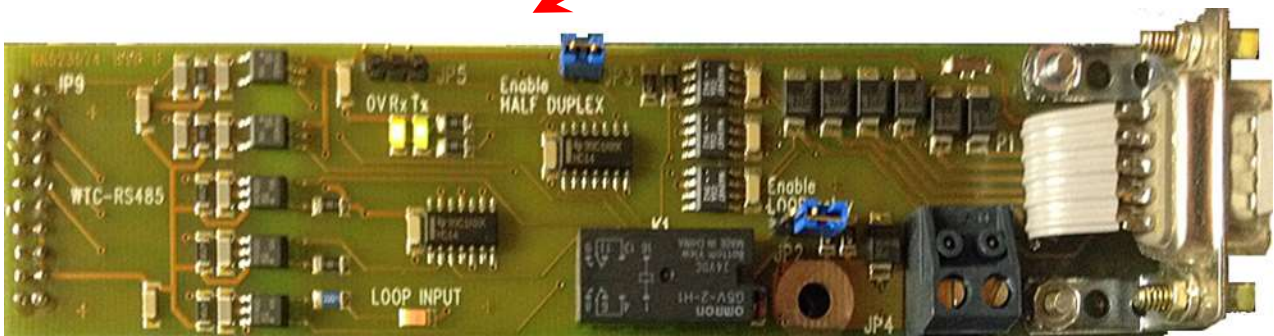
Tx light (Turbine answering)

Rx light (Turbine receiving questions)

## 4.3. RS-485 communication interface



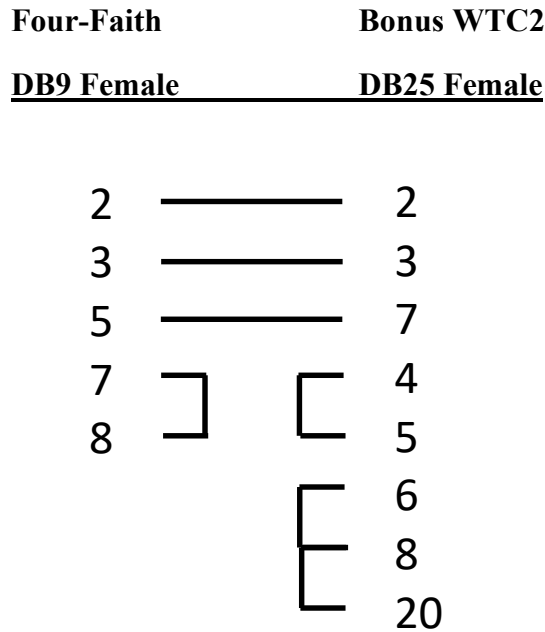
This is the WTC-RS485 card:



This card cannot be used for external serial communication.

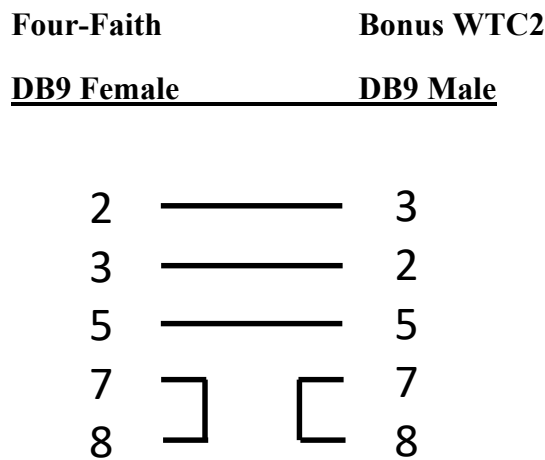
## 5. Cables

### 5.1. Cable layout for F2403 via V151



This cable only fits on RS232 modem connector on the V151 20 mA loop driver board.

### 5.1. Cable layout for F2403



This cable only fits on a WTC2 controller directly on the serial interface card V112-4.

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

Four-Faith 2816		Bonus WTC2	
<u>Terminal</u>		<u>DB9 Male</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		Bonus WTC2	
<u>Terminal</u>		<u>DB9 Male</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.

## 6.2. 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.