

# RS 232 communication

**Configuration**

**Vestas**

**Fiber optic**

# RS 232 communication

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## **1. Introduction**

This document shows how to enable RS232 communication on a Vestas VMP 3500 or VMP5000.2 controller with fiber optic connections.

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.

## 2. Vestas turbines (RCS)

### 2.1. VMP 3500 / VMP 5000 controller



The following parameters must be configured to get a Vestas controller to communicate over the current loop:

- |                           |          |                                |
|---------------------------|----------|--------------------------------|
| ▪ RCS number              | 1        | (Can be between 1 to 255)      |
| ▪ Communication baud rate | 4800     | (Can be between 1200 and 9600) |
| ▪ Communication parity    | 0 (None) |                                |
| ▪ Communication mode      | 205      |                                |

This is how to change parameters in the controller:

In this example is baud rate set to 4800, the parity is set to none and the RCS ID number is 1.

- Press “MENU” then “FUNC”
  - Enter username 1 and “ENTER” (Can be any number)
  - Enter password 246 and “ENTER”
- Press 24 “ENTER” to enter parameter menu
- Scroll down to line 12 (RCS) and press “ENTER”
- Scroll down to line 1 (Communication mode) press “FUNC” 205 “ENTER”
- Scroll down to line 2 (Baud rate) press FUNC” 4800 “ENTER” (Baudrate: 4800)
- Scroll down to line 3 (Parity) press FUNC” 0 “ENTER”
- Press “\*” “ENTER” to activate new parameters
- Press “MENU” to step one menu level back
- Scroll down to line 14 (Miscellaneous) “ENTER”
- Scroll down to line 4 (RCS number) press FUNC” 1 “ENTER” (Id number: 1)
- Press “\*” “ENTER” to activate new parameters
- Press “MENU” twice
- Press 1 “ENTER”

The communication is now set to 4800 8N1 and the turbine is answering on id 1.

Depending on the loop can the communication speed be set to a higher value like 9600. This has to be tested on site.

### 2.2. Configuration of the WICotech Fiber optic driver

The fiber optic driver from WICotech is used to convert the Vestas plastic fiber signals from the CT291 panel, the VPN (Vestas Park Network) drivers CT264/5 or the CT3211.



Connection of the fiber cable.

The Tx cable from the WICotech driver must be connected to the black connector on the turbine  
The Rx cable from the WICotech driver must be connected to the white connector on the turbine

The white connector on the CT module is the transmitter.

The black connector on the CT module is the receiver.

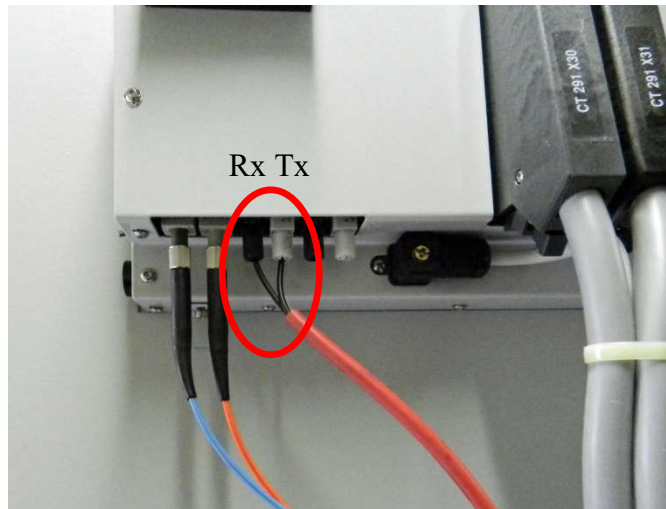
## 2.3. Connection directly to Vestas VMP 5000.2 controller

The WICOtech fiber converter is connected to the Turbines CT 291 control panel.

The fiber is connected directly on the backside of the CT291



CT291 Front



CT291 Backside



CT291 Side view

The RCS lights indicate how the communication is flowing:

The first 4 lights (Marked 1 to 4) is a binary counter that increases each time a valid question is received and answered. 0000 -> 0001 -> 0010 -> 0011 -> 0100 etc.

RXD blinks every time a question is received.

TXD blinks every time the turbine answers a question.

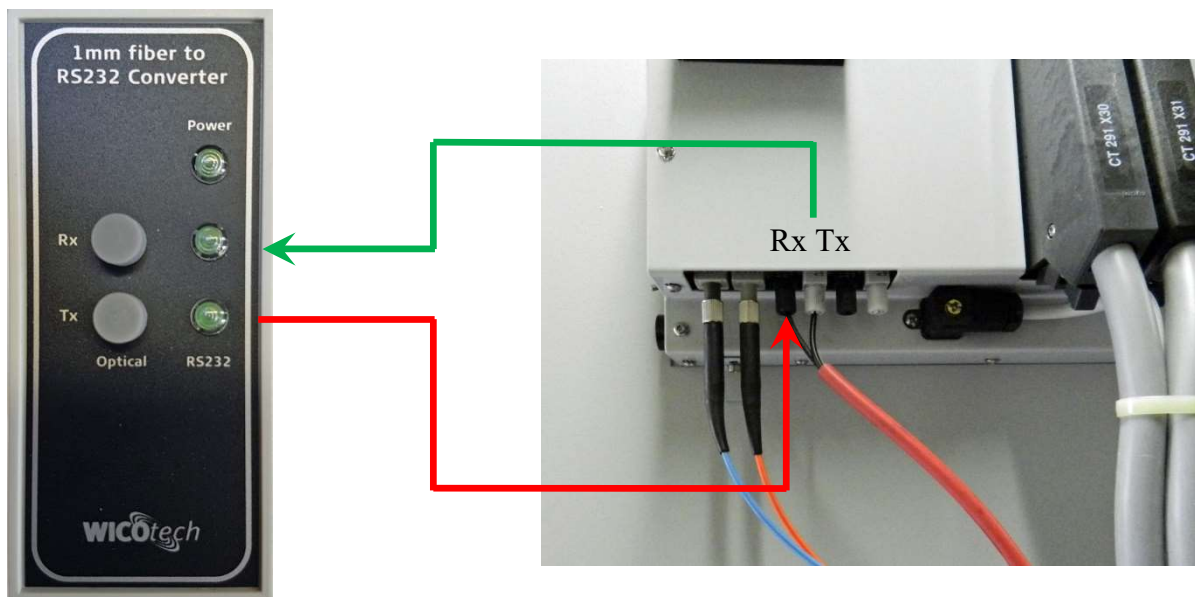
## RS 232 communication

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The fiber is then connected to the WICotech fiber driver and the RS232 is directly connected to the Four-Faith F2403 GPRS modem.



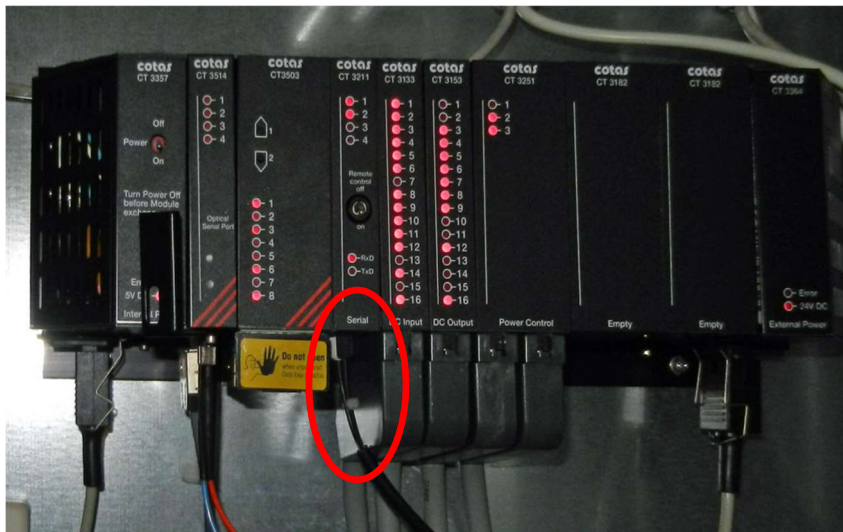
Fiber connection between the WICotech module and the CT291



## 2.4. Connection directly to Vestas VMP 3500 controller

The WICotech fiber converter is connected a VMP 3500 controller with a CT 3211 Fiber optic module.

The fiber is connected directly on the CT 3211 module on the controller



White connector: Tx

Black connector: Rx

The fiber is then connected to the WICotech fiber driver and the RS232 is directly connected to the Four Faith F2403 GPRS modem.



Tx on the WICotech driver must be connected to the black connector on the CT3211 module.  
Rx on the WICotech driver must be connected to the white connector on the CT3211 module.

## 2.5. Connection directly to Vestas VPN network

When connecting Vestas turbines that are connected together via the Vestas VPN network using the CT264 and CT265 VPN drivers.



Vestas Telecom with fiber optic



Rx Tx

Fiber connectors

The Fiber optic cable that runs between the Telecom and the CT 265 master, is replaced and instead of connecting it to the Telemaster is it now connected to the WICOtech fiber driver converter.



CT 265 VPN Master



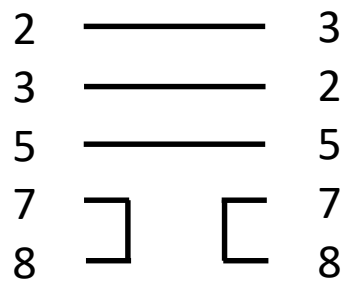
CT264 VPN slave driver



### 3. Cables

#### 3.1. Cable layout for F2403

Four-Faith		Optic driver
<u>DB9 Female</u>		<u>DB9 Male</u>



### 3.2. Cable layout for F2816 - COM 1

Four-Faith 2816		TAC-I	
<u>Terminal</u>		<u>DB9 Male</u>	
3	—————	3	White
4	—————	2	Green
5	—————	5	Brown
1 PWR		7	
2 GND		8	

### 3.3. Cable layout for F2816 - COM 2

Four-Faith 2816		TAC-I	
<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.

## 4. Four Faith Signal monitoring

### 4.1. 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.

## 4.2. 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.