



-power in control



## QUICK START GUIDE



## TCM-2 replacement guide

- What's in the delivery?
- Getting started
- The first steps
- PC utility software



DEIF A/S · Frisenborgvej 33 · DK-7800 Skive  
Tel.: +45 9614 9614 · Fax: +45 9614 9615  
info@deif.com · www.deif.com

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## 1. About this document

### 1.1 General purpose

This document is the Quick Start Guide for the TCM-2 (Thyristor Control Module).

The document mainly includes general product information, mounting instructions and wiring descriptions.

**The parameter settings and operation mode may vary, depending on the type of controller.**

The TCM-2 module can operate in diff communication mod (CAN-BUS or traditional in COMBI-mode)

This guide is a description only for the traditional COMBI-mode

The general purpose of this Quick Start Guide is to help the user with the first steps of installing and using the unit.



**Please make sure that you also read the DESIGNER REFERENCE HANDBOOK <http://www.deifwindpower.com/Files/File/Documentation/Files/4189340613uk.pdf> before starting to work with the TCM-2. Failure to do this could result in human injury or damage to the equipment.**

### 1.2 Intended users

This Quick Start Guide is mainly intended for the educated engineers in charge. On the basis of this document, the educated engineers will give the electrician the information he needs in order to get started to install the unit. For detailed electrical drawings, the Installation Instructions must be used.

### 1.3 Contents/overall structure

This document is divided into chapters, and in order to make the structure simple and easy to use, each chapter will begin from the top of a new page.

## 2. Warnings and legal information

This chapter includes important information about general legal issues relevant in the handling of DEIF products. Furthermore, some overall safety precautions will be introduced and recommended. Finally, the highlighted notes and warnings, which will be used throughout this document, are presented.

### 2.1 Legal information and responsibility

DEIF takes no responsibility for installation or operation of the generator set. If there is any doubt about how to install or operate the generator controlled by the unit, the company responsible for the installation or the operation of the set must be contacted.

**The units are not to be opened by unauthorised personnel. If opened anyway, the warranty will be lost.**

### 2.2 Electrostatic discharge awareness

Sufficient care must be taken to protect the terminals against static discharges during the installation. Once the unit is installed and connected, these precautions are no longer necessary.

### 2.3 Safety issues

Installing the unit implies work with dangerous currents and voltages. Therefore, the installation of the unit should only be carried out by authorised personnel who understand the risks involved in the working with live electrical equipment.



**Be aware of the hazardous live currents and voltages. Do not touch any AC measurement inputs as this could lead to injury or death.**

### 2.4 Definitions

Throughout this document, a number of notes with helpful user information will be presented. To ensure that these are noticed, they will be highlighted in order to separate them from the general text.

### 2.5 Note symbol



**The notes provide general information which will be helpful for the reader to bear in mind.**

### 2.6 Warnings



**The warnings indicate a potentially dangerous situation which could result in death, personal injury or damaged equipment if certain guidelines are not followed.**

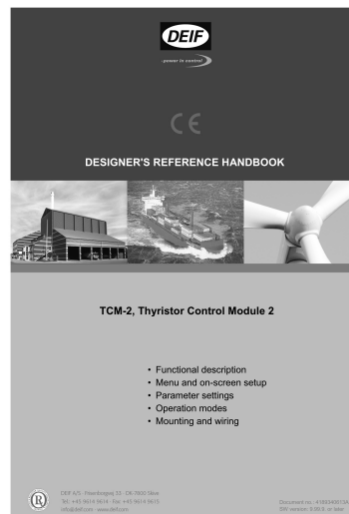
### 3. What's in the delivery?

#### 3.1 Standard delivery

##### The TCM-2 unit



##### DESIGNER'S REFERENCE HANDBOOK



##### PC cable for utility software (USB service cable)

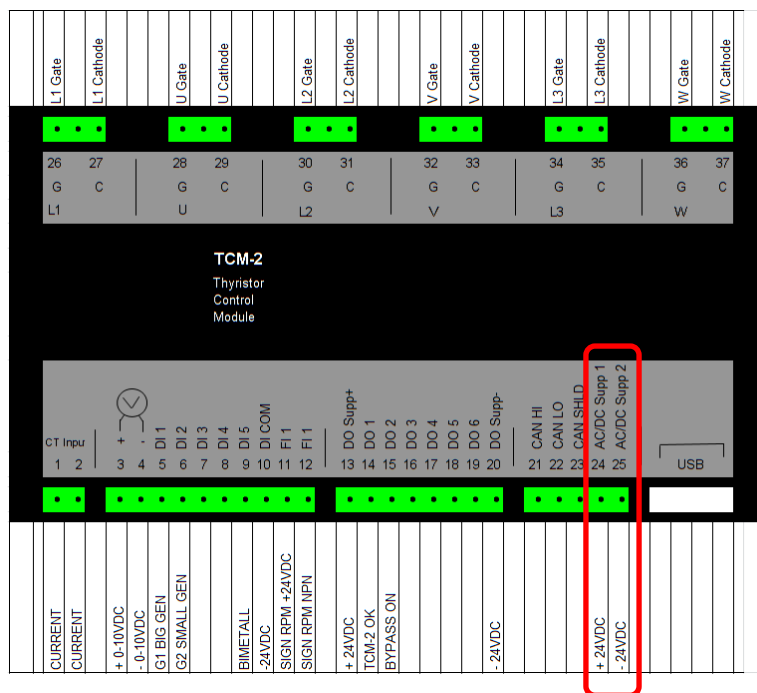


## 4. Getting started

### 4.1 Terminal description

Description of the terminals on TCM-2 for change request for double speed generator application!!

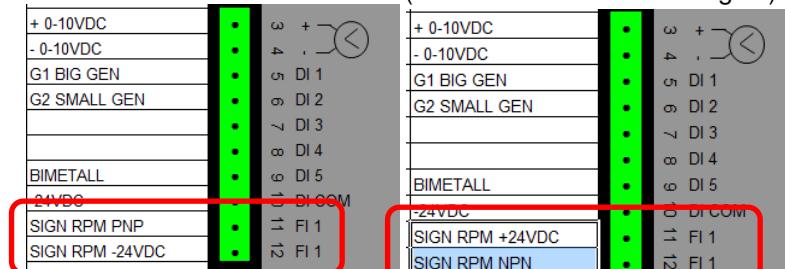
### 4.2 Power supply



### 4.3 Generator RPM signal

Generator RPM signal is required in the TCM-2. The RPM signal is connected to the TCM-2 by parallel connection to the main controller rpm input.

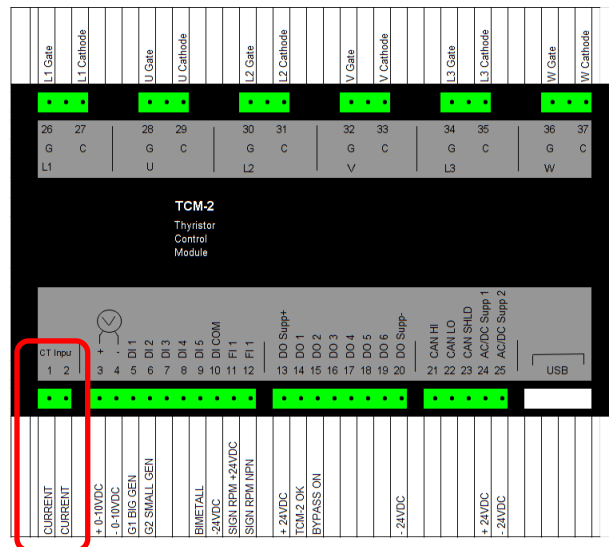
Both signals (PNP or NPN) can be used in the TCM-2  
TCM-2 terminal: 11 and 12 (ex. PNP and NPN RPM signal)



#### 4.4 Change of current measurement of the TCM-2

When the existing current measurement is connected as a direct (parallel) connection from the existing CT in the main controller, we have to change the CT signal to the TCM-2 from parallel connection into serial connection, in line with the main controller. But only if you are using the same CT for main controller and TCM-2.

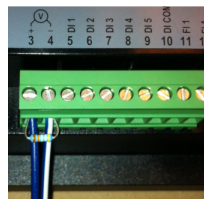
If you have a separate CT to the TCM-2, then connect S1 and S2 directly to the terminals 1 and 2.



#### 4.5 Modify the analogue input signal

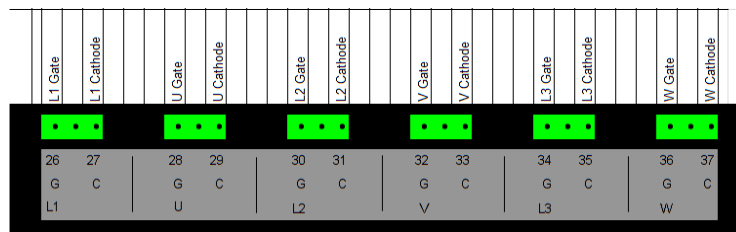
Only if the input signal is not 0-10 V but 0-20 mA, you have to modify the analogue input signal to TCM-2 from current signal (0-20 mA) to voltage signal (0-10V DC).

Mount a 500 ohm resistor parallel to the terminals 3 and 4 on the TCM-2, to change current signal into voltage signal.

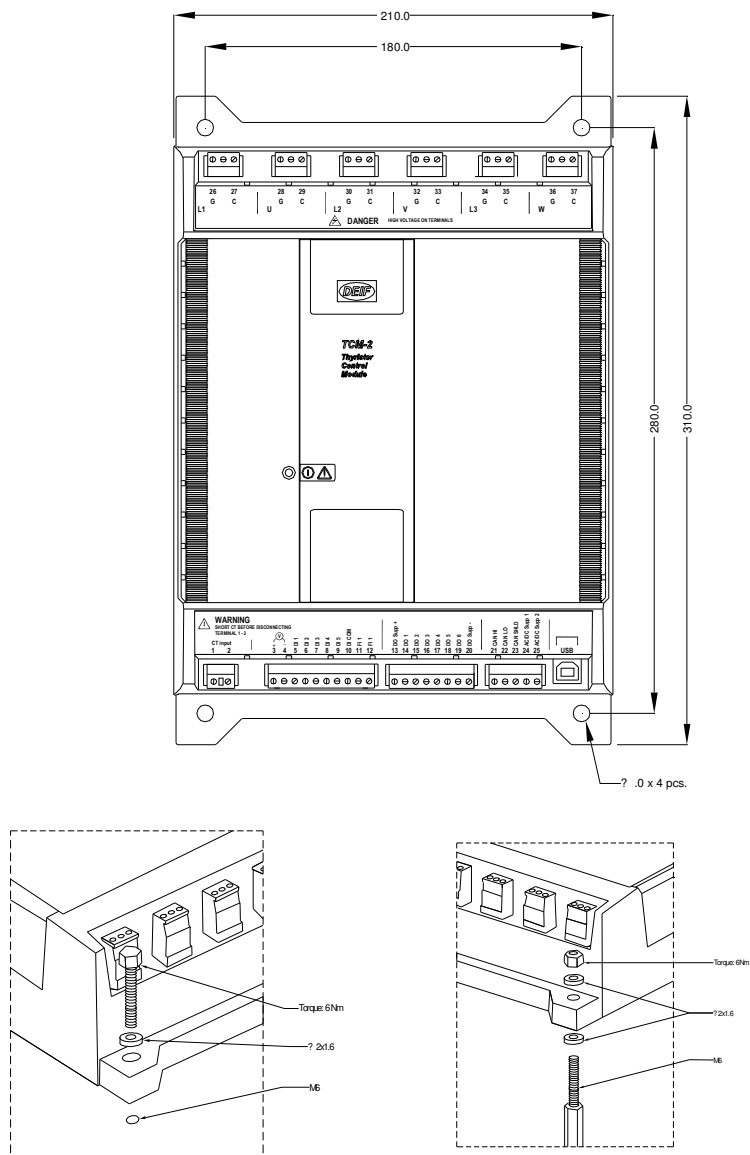


#### 4.6 Attention! Thyristor signal and terminals

Pay attention to the thyristor signal wires and the terminal sequence

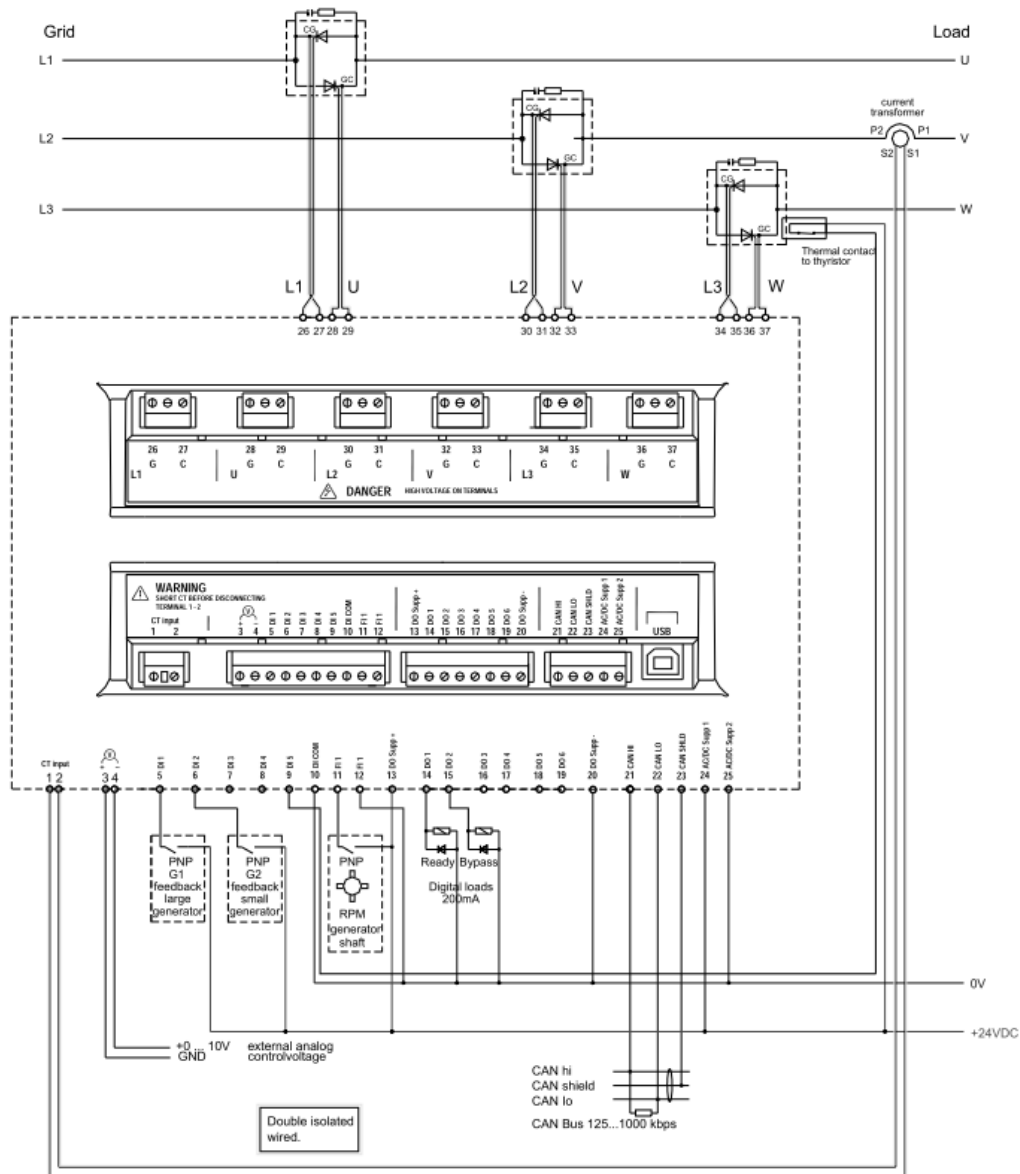


#### 4.7 Dimensions, size and torque

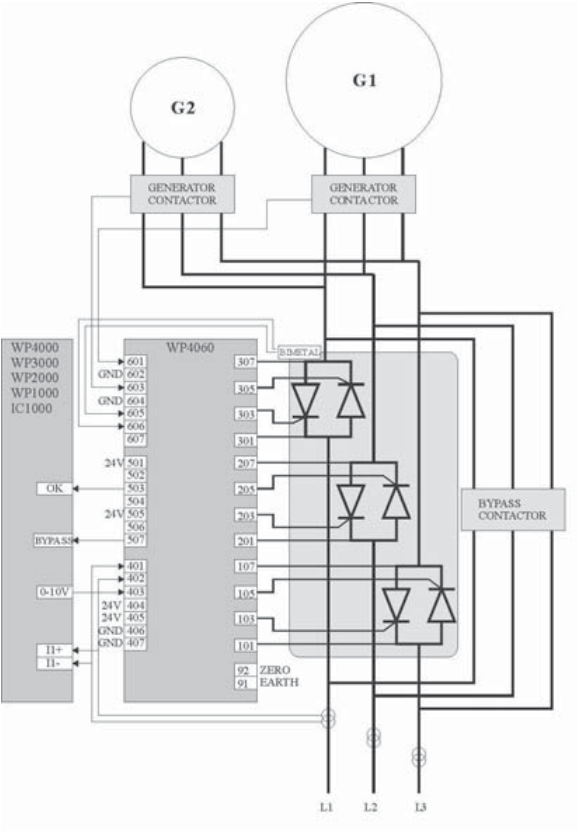




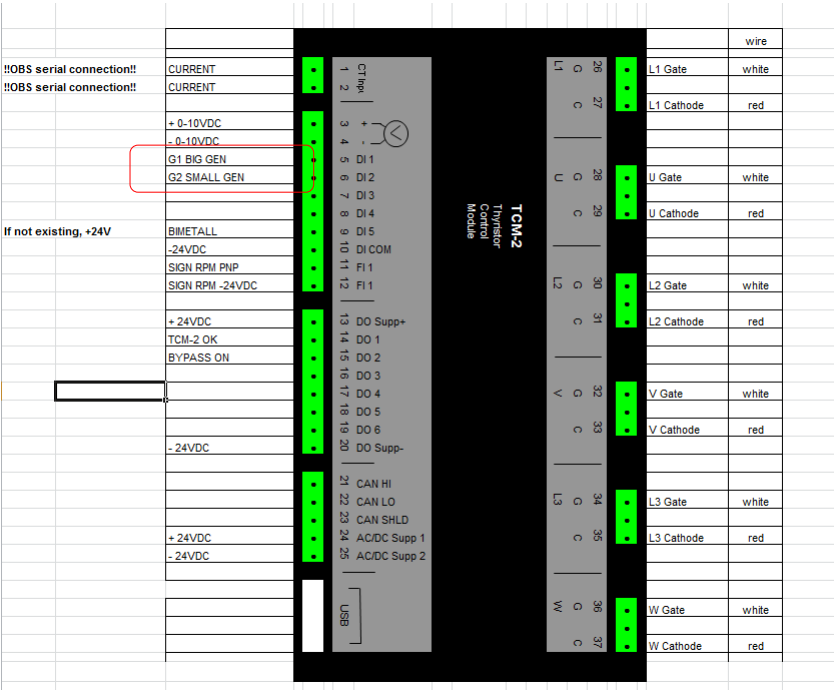
## 4.8 Connection diagram



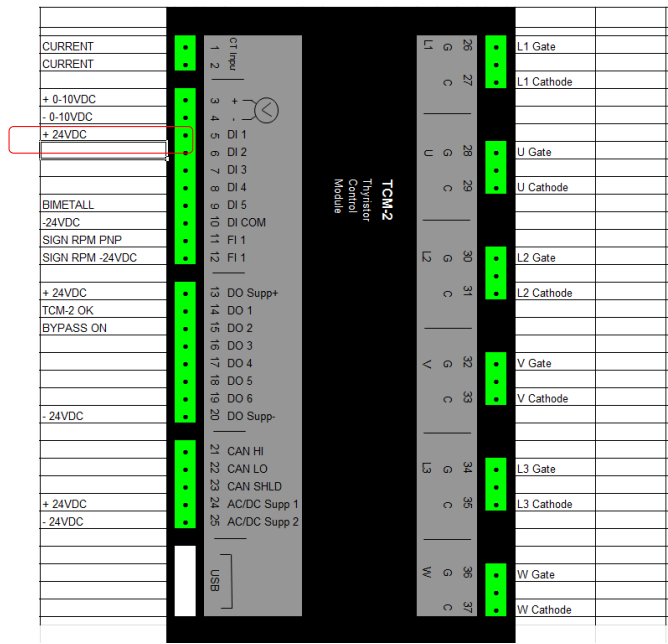
4.9 Example: basic wiring existing system



4.10 Transform the connections to TCM-2



Ex.: 2 speed generator in "COMBI" mode



*Ex.: 1 speed generator in "COMBI" mode*



For further information about the installation from existing systems, please contact DEIF for assistance.

## 5. TCM-2 utility Software

### 5.1 Download TCM-2 utility SW from the internet

Link: [http://www.deif.com/download\\_centre/Software\\_download.aspx](http://www.deif.com/download_centre/Software_download.aspx)

- Select the software to download <TCM utility software>

The image displays two screenshots of the DEIF software download page. The top screenshot shows the 'Software download' section with a dropdown menu labeled 'Select software to download...'. The bottom screenshot shows the same page with 'TCM Utility Software' selected in the dropdown menu. The page includes a sidebar with navigation links, a main content area with instructions and disclaimers, and a 'Contact Us' section on the right.

Documentation & Software > Software download

### Software download

On this page, you can download software updates for your product(s) and help yourself to various utility tools and add-ons that will assist you in setting up, detecting faults and configuring your product(s).

Please be advised that not all of our products can be updated by the user. Nor do all of our products come with a utility tool. Consequently, the list on this page cannot be considered an overview of our product programme.

DEIF A/S will register your download along with the used e-mail address for the purpose of sending out information on future updates, if requested.

DEIF A/S cannot be made responsible for any consequences of failed product updates or use of utility tools. Nor can DEIF A/S be made responsible for consequences of changes in behaviour of products due to a software upgrade. It is always the responsibility of the user to ensure correct set-up and configuration before commissioning. Please study the version log of the software before updating the product.

Select software to download...

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TCM Utility Software

- Fill in your e-mail address and click "Submit"

Documentation & Software > Software download

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### Recent version

<< Back to software selection

You have chosen to download **TCM Utility Software**.  
This software applies to the following DEIF products:

- **TCM-2**

Downloading and installing this software you should be aware that:

- **Prior to downloading this software you should be sure your product is a TCM-2 product. In case of any doubt please contact our Support & Service department at support@deif.com**

The recent version of this software is **2.00.0**  
Compared to last revision the recent has changed as follows:

- **Initial release**

[Click here to see the entire change log.](#)

If you wish to download the recent version of this software please fill in your e-mail address and click 'submit' below – you will receive an e-mail with a link to download the software a few seconds after having submitted your request.

E-mail:

E-mail notification on future releases: ☒

<< Back to software selection

- Subsequently, you will receive an e-mail containing a link. Click the link and follow the instructions.

## 5.2 Install TCM-2 Utility SW

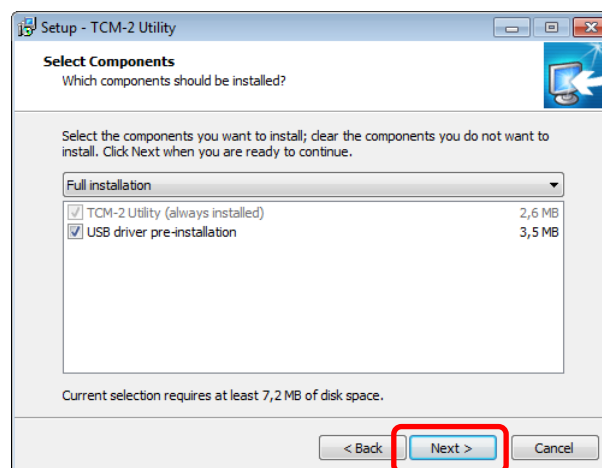
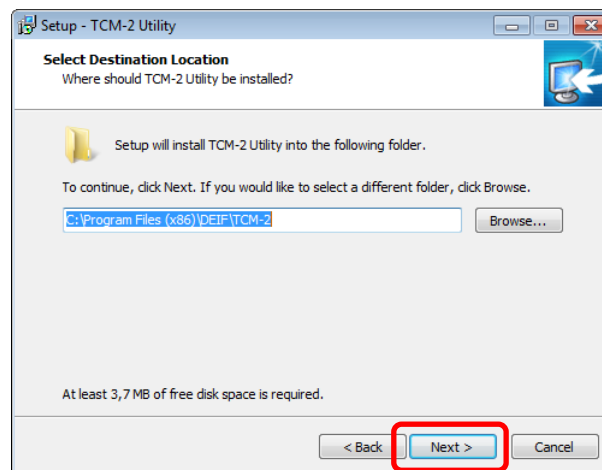
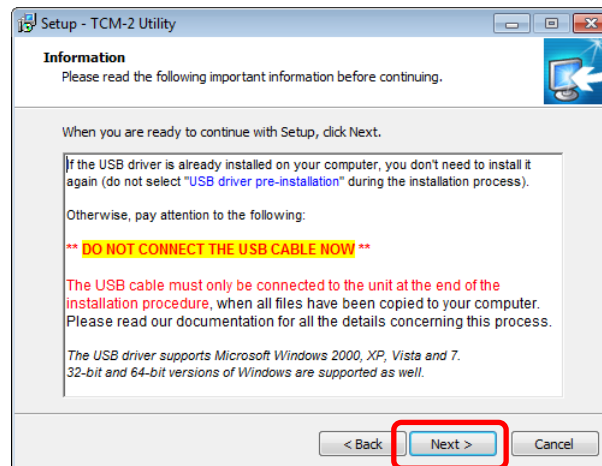
Run the <Setup\_TCM-2\_Utility\_2.0.0.exe> and follow the instructions through the installation

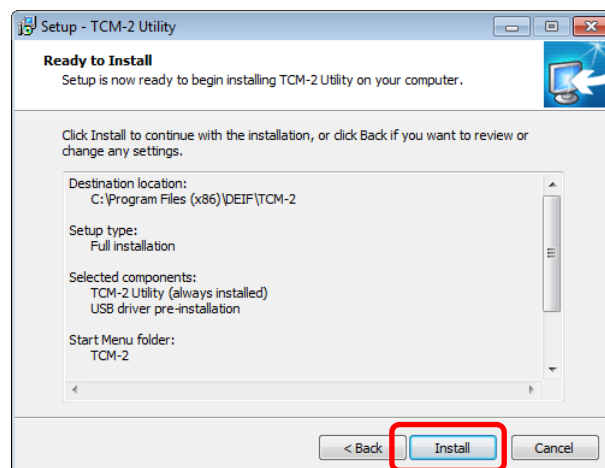
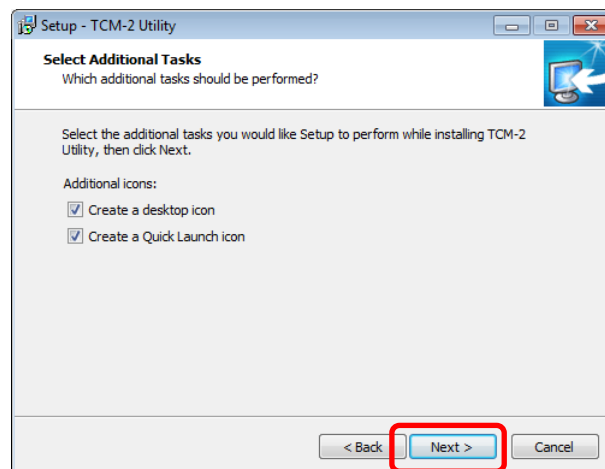
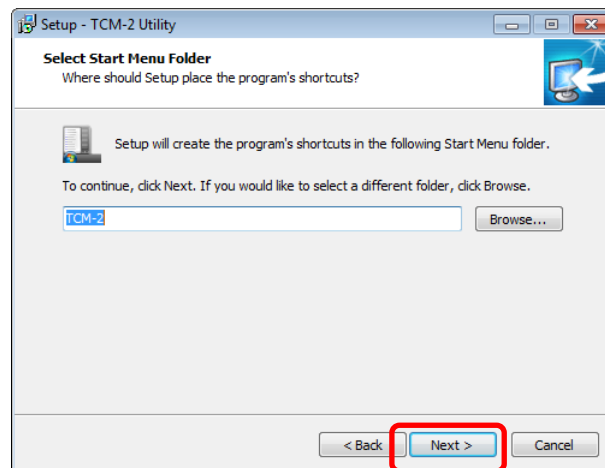
Setup\_TCM-2\_Utility\_2.0.0.exe 16-11-2010 13:30 Application 4.510 KB

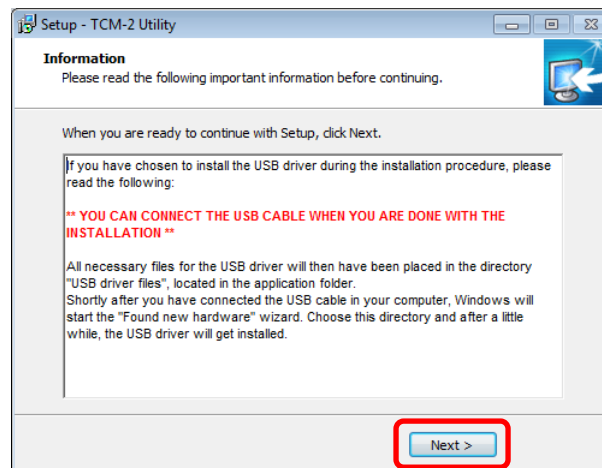




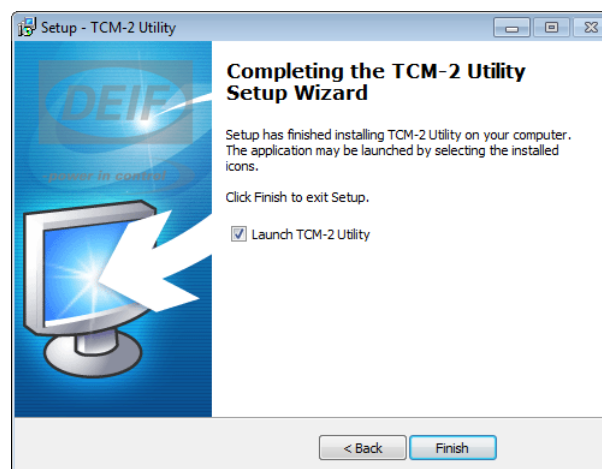
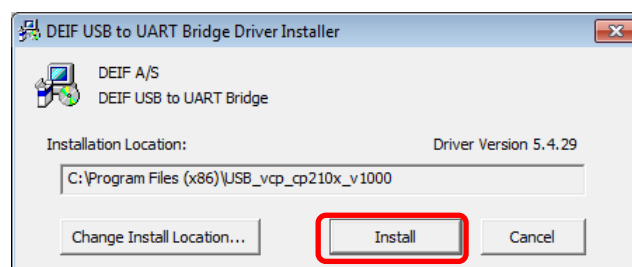
**If the TCM-2 is connected with a USB cable, then disconnect the cable from the unit now.**







....and install the <USB to UART Bridge> driver



....done, and Launch the TCM-2 utility application



Installation guideline: link:

<http://www.deifwindpower.com/Files/Filer/Documentation/Files/4189340606.pdf>

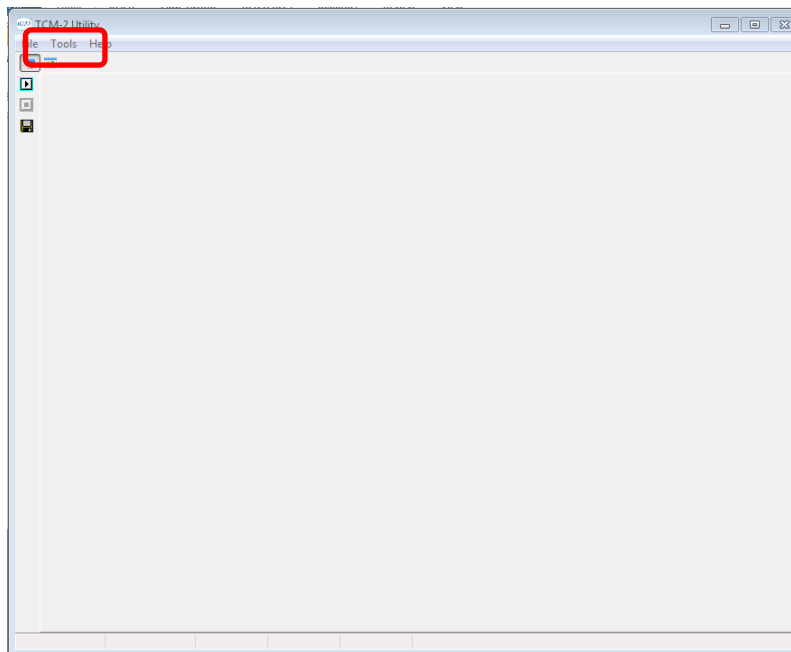


## 6. The first steps

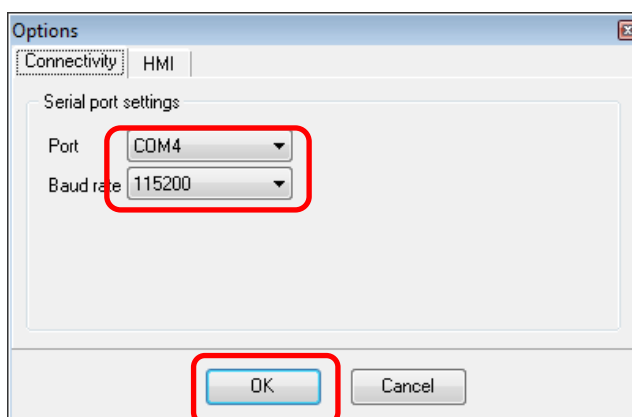
### 6.1 Getting connected with the unit

After successful download and installation of Utility SW, continue with switch on the power, 24V DC supply from the main controller to the TCM-2 and the main controller.

- Connect 24V DC supply to the TCM-2 and measure the supply on terminal
- Connect USB cable from the service port (TCM-2) to the PC
- Open TCM-2 utility SW




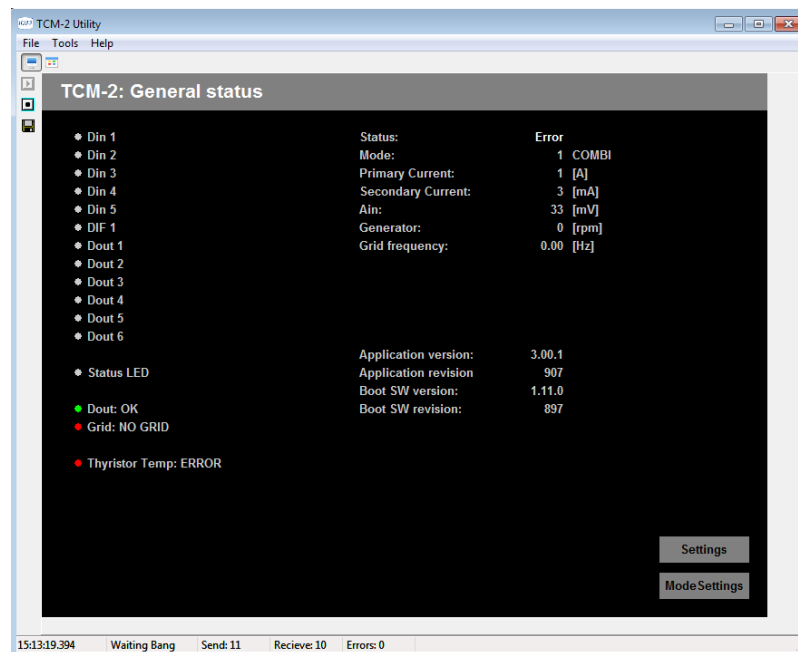
- Select <Tools> and <Options> for adjusting the correct connection
- Adjust the correct comport and baud rate (115200) to your unit and confirm with <OK>



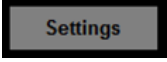
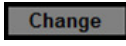
## 7. Settings

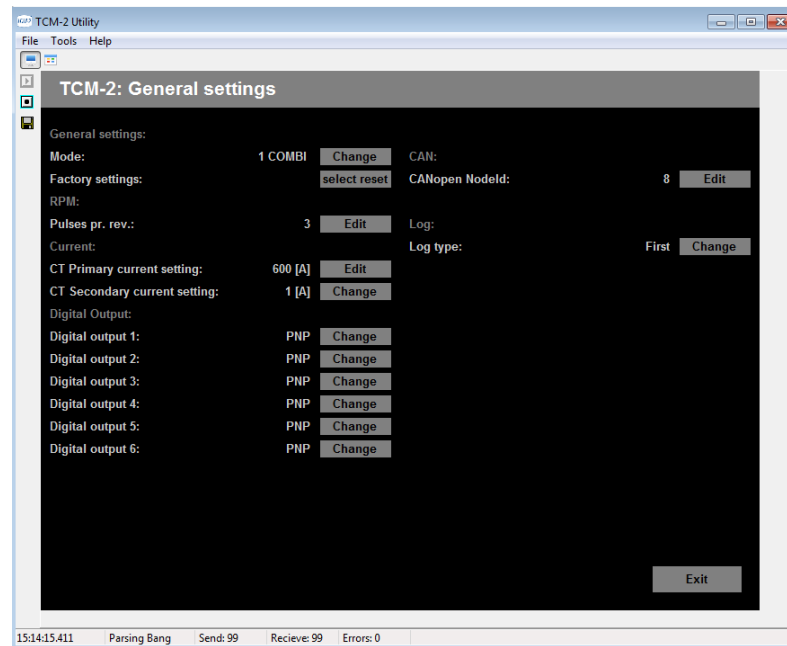


- Select <Tools> and <Open HMI> (**H**uman **M**achine **I**nterface) for connecting to the TCM-2
- Select <File> and <Option> to set the baud rate. Baud rate should be 115200.
- Start HMI screen by selecting 



### 7.1 Mode settings

- Select settings for the correct mode: 
- Change the required mode from **CANopen** to **COMBI**, by selecting 

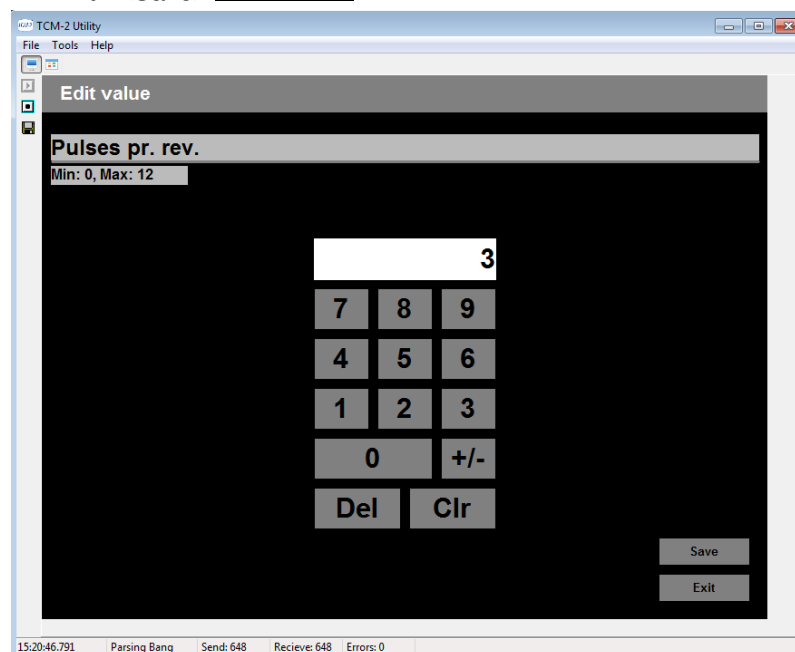


## 7.2 RPM sensor settings

- Adjust the correct pulse per revolution for the generator RPM sensor, by selecting <Edit>

**Pulses pr. rev.:** 3 **Edit**

...and confirm with <Save>



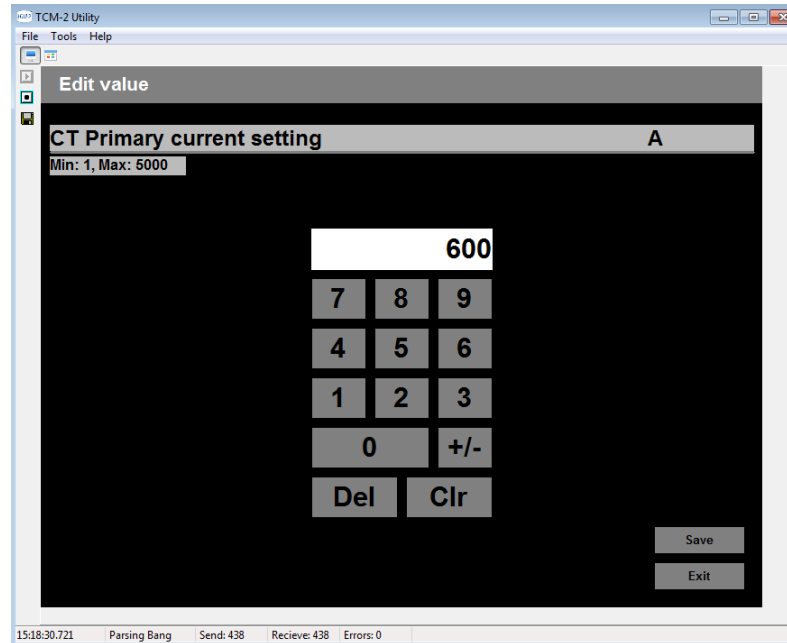
### 7.3 CT Primary current settings

- Change the correct settings for the current measurement CT, by selecting <Edit>

CT Primary current setting: 600 [A] Edit

...and confirm with <Save>

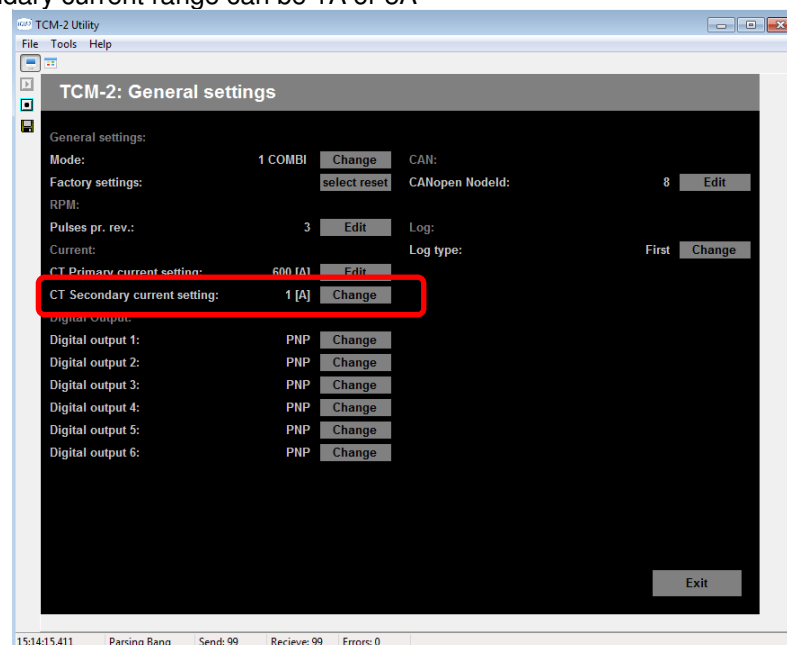
Save



### 7.4 CT Secondary current settings

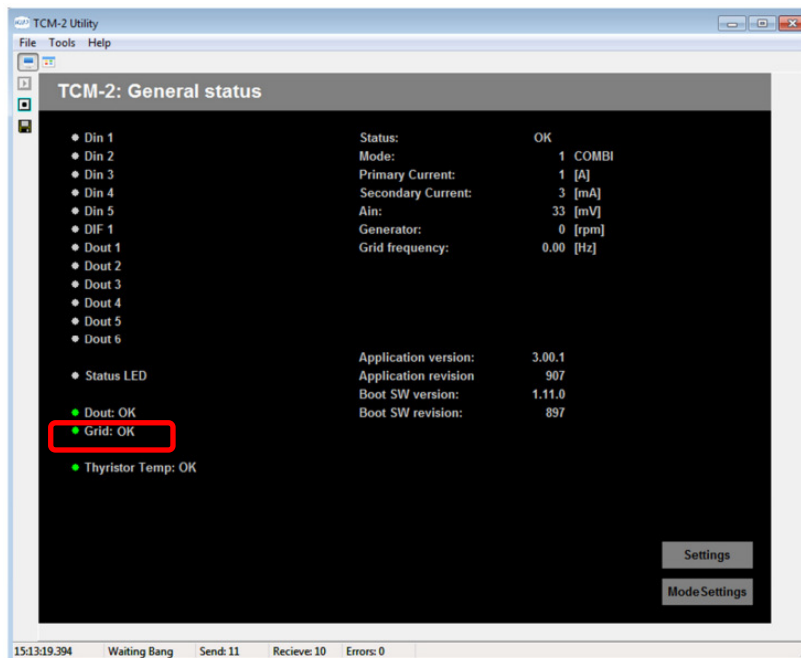
- Change the correct CT Secondary current settings by selecting the secondary current range can be 1A or 5A

Change



## 8. Switch on the Power 400/690V AC

- Cross-check the connection L1, L2, L3 between the TCM-2 to the grid connection and to the generator connection, before you switch on the power
- Switch on the power (400V AC/690V AC) and the LED on the HMI for grid ok, will change from red to green
- Measure with an authorised multi-meter the grid between each phases and to the neutral



## 9. Test run

- Connect a clamp multi-meter on the grid line (for instance L1) to measure the current under a motor start, and confirm all correct settings from the clamp multi-meter and the value from the main controller.
- Adjust the settings on the main controller for instance 50 A for motor start (small g or big G)
  - Parameter xxx.xx for cut-in motor start changes to 50 A
  - Parameter 0 < G1 changes from 20 s to 100 s
  - Parameter 0 < G2 changes from 20 s to 100 s

- If the current values are not identical (in the range of 10%), you have to adjust the I/U ratio

**TCM-2: Mode 1 settings - Combi**

Advanced Normal

General settings:

I/U ratio	100 [A/V]	Edit
G1 Poles on large generator	4 [poles]	Edit
G2 Poles on small generator	6 [poles]	Edit
Bypass ignition delta	100 [deg/sec]	Edit

G1>G2 braking:

G1>G2 ignition delta	100 [deg/sec]	Edit
G1>G2 ignition start	103.00 [deg]	Edit
G1>G2 ignition limit 1	108.00 [deg]	Edit
G1>G2 ignition limit 2	107.00 [deg]	Edit
G1>G2 sync. limit 1	125 [%]	Edit
G1>G2 sync. limit 2	101 [%]	Edit

Motor start:

Motor start ignition delta	30 [deg/sec]	Edit
G1 MS Start ignition	70.00 [deg]	Edit
G1 Motor start current	100 [A]	Edit
G2 MS Start ignition	70.00 [deg]	Edit
G2 Motor start current	100 [A]	Edit

G1 cutin

G1 Ignition offset	3.00 [%]	Edit
G1 Start ignition	70.00 [deg]	Edit
G1 Sync. ignition	100.00 [deg]	Edit
G1 End ignition	110.00 [deg]	Edit
G1 Bypass ignition	135.00 [deg]	Edit

G2 cutin

G2 Ignition offset	3.00 [%]	Edit
G2 Start ignition	70.00 [deg]	Edit
G2 Sync. ignition	100.00 [deg]	Edit
G2 End ignition	110.00 [deg]	Edit
G2 Bypass ignition	135.00 [deg]	Edit
G2 Over sync. ignition start	75.00 [deg]	Edit
G2 Over sync. ignition delta	70 [deg/sec]	Edit

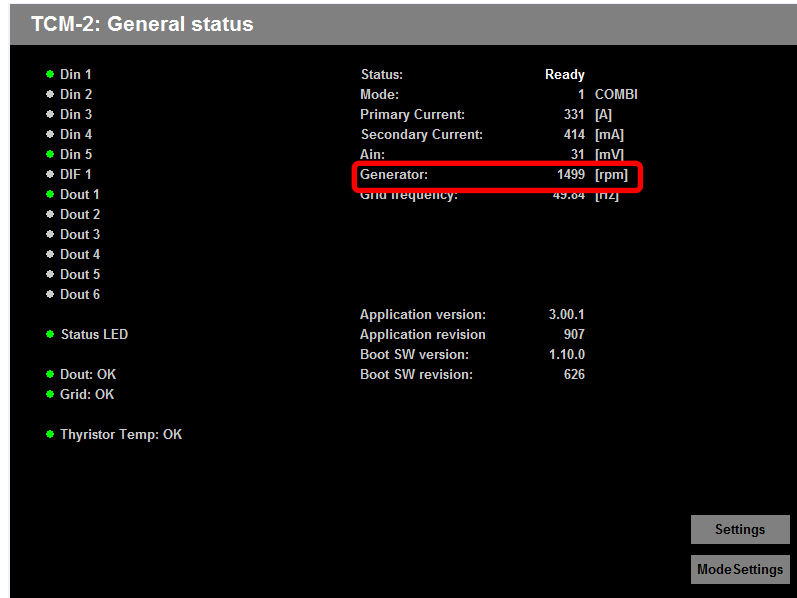
Exit

## 9.1 Motor start with G2 (small generator)

- In the service menu, make a motor start for G2 and read/confirm the current in
- Clamp multi-meter
  - In the display from the main controller
  - TCM-2 HMI overview page

## 9.2 RPM sensor check

- Yaw out of the wind
- Release the brake so you smoothly get a rotation on the generator
- Confirm that the readings are identical on
  - the display from the main controller
  - TCM-2 HMI



## 9.3 Final check

- Switch off the power
- Disconnect all measurement equipment
- Check-up that the wires are tight and correctly connected
- Switch on the power and close the panel from the main controller
- Parameter for motor start has to be set as default value before testing