



GeoPrecision GmbH

Am Dickhäuterplatz 8

D-76275 Ettlingen

Germany

T +49(0)7243-505419-0

F +49(0)7243-505419-9

E info@geoprecision.de

www.geoprecision.de

www.geo-precision.com

FlexGate Windows-Software

User Guide

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1. Version History

- 13.04.17: Initial
- 02.05.18: 4.x: added note to disconnect USB devices; 5.1: added description for dongle connection; 5.2: chapter added.
- 31.01.19: 5.5, 5.5.1: Added warning for short logging period.
- 01.04.19: 5.5.1: Updated procedure of string-configuration.
- 25.10.19: 4. Download links updated.
- 26.11.19: 5.5.1: Changed description for precision Thermistor-Strings; 3.2 added new feature of the FG2_Shell
- 27.11.20: 5.5.1, 5.5.2 and 5.7 added.
- 10.08.21: 4. Downloadlinks updated
- 04.05.23: 5.7.3: DALLAS index-no.; 5.9 added
- 18.11.25: 6 Troubleshooting, Updated section 5.6, new FG2-Shell and firmware-release

2. Abstract

This document will give a short description how to choose, configure and use the Windows-Software required for all GeoPrecision dataloggers.

The first part points out the differences of the “GP5W_Shell” and “FlexGate2_Shell” and will help you to choose the right software.

The next step shows how to install the correct version of the software on your Windows-PC.

➔ Most users can directly go to section “4.2 FG2_Shell Installation”.

Once installed, the main part guides through the basic functions of the software.

This manual links to other documents for more detailed information. Visit the geo-precision.com download-section.

Known issues and trouble-shooting are part of the last section. They are also part of the online-FAQ: <https://www.thermistor-string.com/questions> .

3. Choosing the right software

All GeoPrecision wireless-dataloggers are operated by a system called “FlexGate”. Old dataloggers using an infrared (IR)-dongle are not affected by this document!



There are actually two versions of this operating-system (OS): “**Flexgate 1**” and “**Flexgate 2**” (sometimes called “FG2”). Depending on the OS of your datalogger, you have to use the correct Windows-Software:

- **GP5W_Shell** for dataloggers with FlexGate 1 OS.
- **Flexgate2_Shell** for dataloggers with FlexGate 2 OS.

3.1 Detect the type of Flexgate-OS

If you do not know which type of OS is running on your datalogger or you are using both generations of devices, you have to install both programs on your PC and update the USB-Dongle as described later in this document.

- ➔ Afterwards you can use the FG2_Shell to identify which type of Flexgate-OS is running on your datalogger!
- ➔ Use the following chart to find out, which type of OS is running on your datalogger.
- ➔ The following chapters of this document will help you to understand the single steps of the **chart on the next page**.

The new Flexgate 2 and FG2_Shell containing the latest features and developments of all devices and will provide a lot of improvements for all wireless-dataloggers. For this reason it is not possible to provide a compatibility of both systems and Windows-programs.

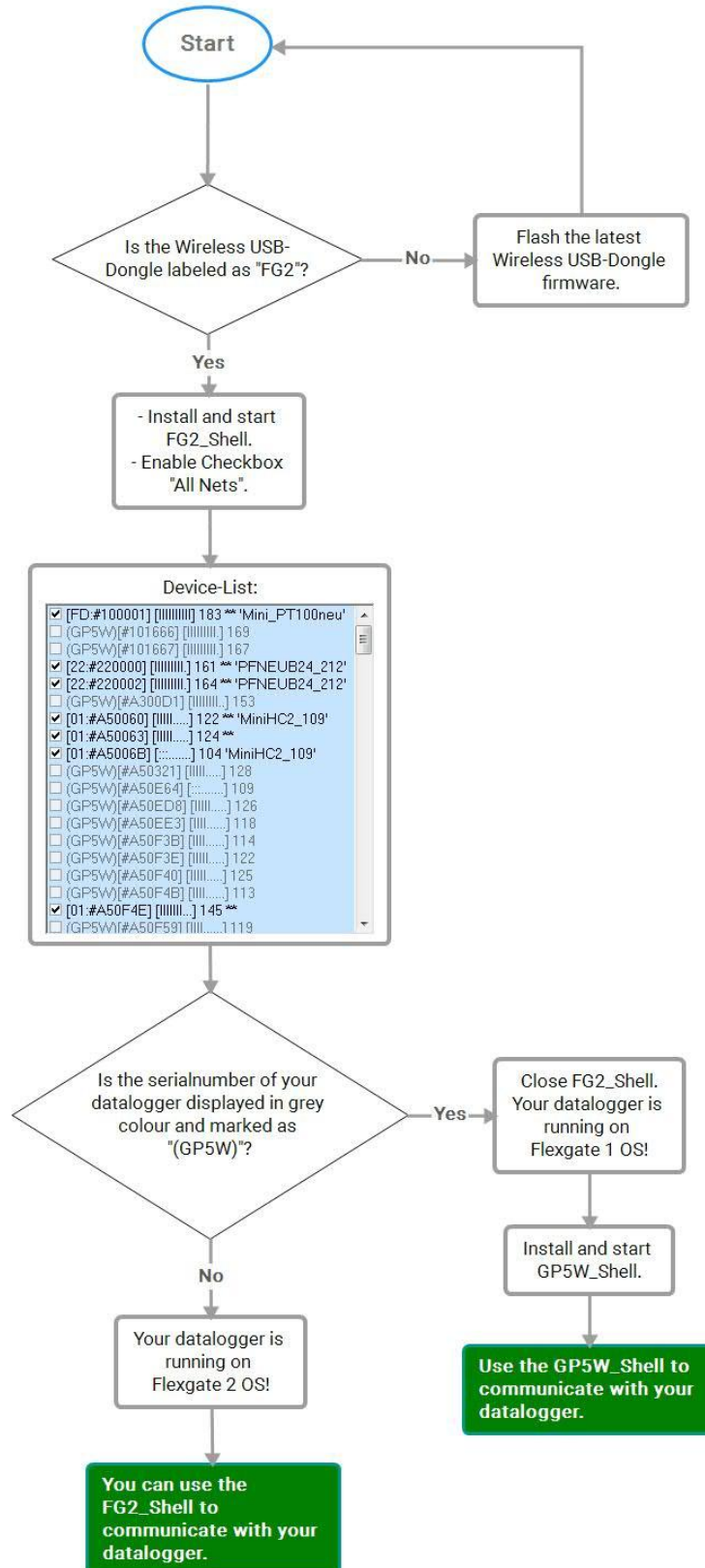
The interface for both, GP5W_Shell and FG2_Shell, is a special **Wireless USB-Dongle**. On this device we have to install the latest firmware which gives the advantage to communicate with both generations of the OS. This will happen later on, after installation of the GP5W_Shell and/or FG2_Shell.

Depending on your local area the datalogger and USB-Dongle are using different frequencies:

- 915 MHz (US-Version) for Canada, Australia and USA
- 433 MHz (EU-Version) for all other areas.



Choose the correct Windows-Software for your datalogger

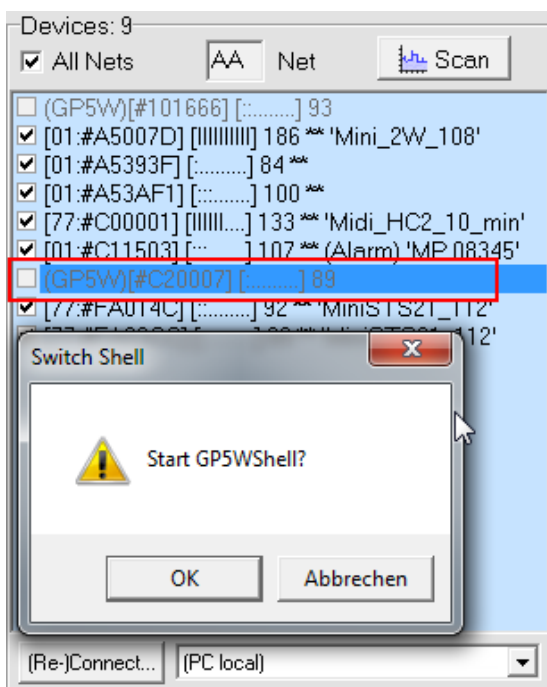


3.2 Auto start of the correct software (Since FG2 V3.99.5)

This is a new feature of the FG2_Shell since version 3.99.5!

You have to install and start this (or a newer) version of the FG2_Shell. Follow the instructions in **4.2.**, using the latest installer.

The GP5WShell now will automatically start by selecting a datalogger running the Flegate1-OS.



- Start the FG2_Shell.
- Enable “All Nets” at the top of the device-list.
- Select the datalogger you want to communicate with:
 - ➔ Devices displayed in “black colour” will use the FG2-Shell. See **5.4** for further information.
 - ➔ Selecting a device displayed in “Grey colour” will open the message box shown in the screenshot above. By clicking “OK” the FG2-Shell will be closed and the GP5WShell starts.

4. Installing the software

Previously check the following requirements:

- Windows-PC (Win 2000 or newer) with a free USB-Port.
- Full administrator rights on your Windows-account.
- Wireless USB-Dongle with antenna.
- Installation files for GP5W_Shell and FG2_Shell, USB-Dongle firmware.
- No additional USB-device is connected to your PC (except mouse and keyboard).

Please download these files to your local hard-drive:

GP5W_Shell or FG2_Shell:

<http://thermistorstring.com/additional-string-information/downloads/category/2-software>

Wireless-USB-Dongle firmware (European 433 MHz **EU**-version or 915 MHz **US**-version):

http://thermistorstring.com/additional-string-information/downloads/category/204-dongle_fg2_usb

Be sure you choose the correct firmware file for your USB-Dongle! This will depend on your local area, devices using the 915 MHz US-Version are marked on the label as “**US**” or “**915 MHz**”!

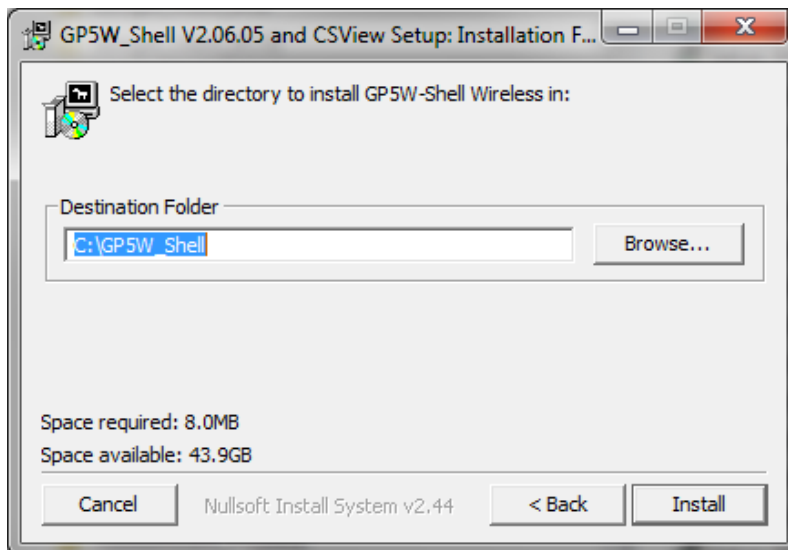
4.1 GP5W_Shell Installation

These steps guide you through the installation of GP5W_Shell.

You have to install this software to use dataloggers with **FlexGate 1 OS!**

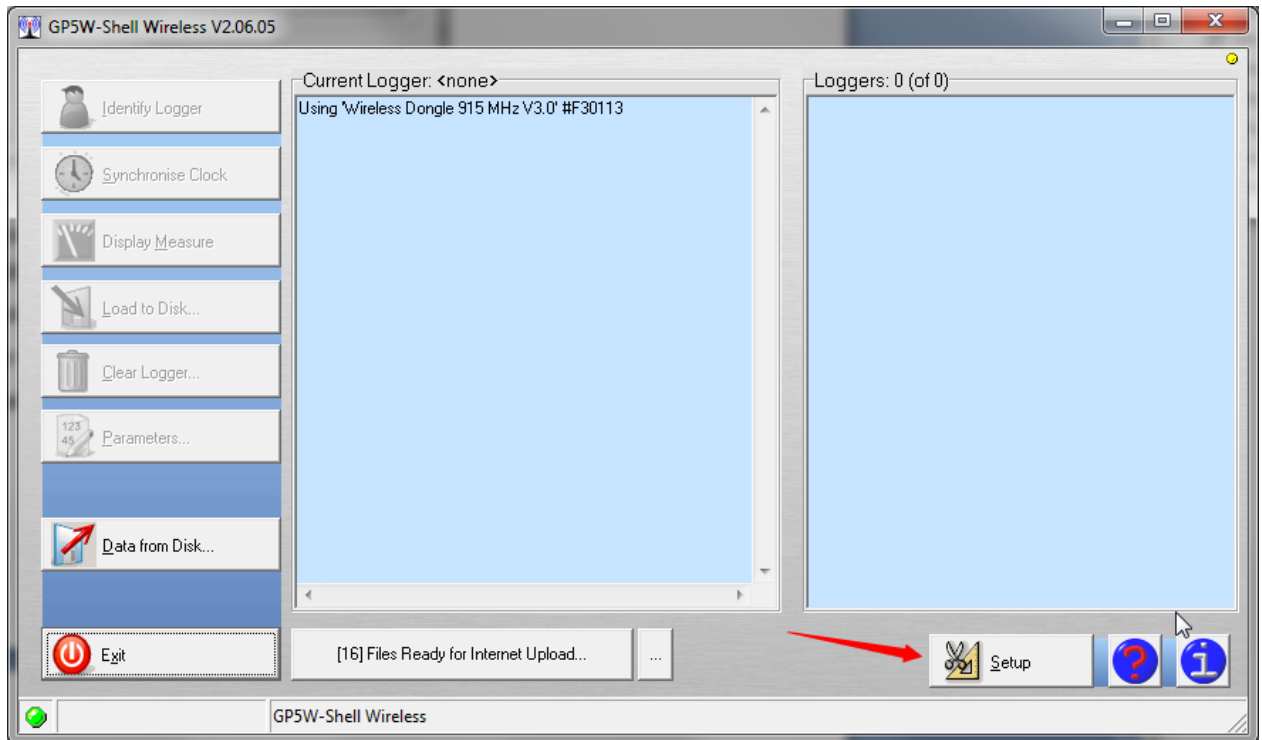
If you already have a **functional installation** or you are using **Flexgate 2 devices only**, you can skip this chapter!

- 1) Login to your Windows-account with admin rights and browse to the location of the GP5W_Shell setup-file you downloaded before.
Disconnect all wireless USB-Dongles and other devices (except mouse and keyboard) from your PC!
- 2) Start installation by double-click on the setup-file, follow the displayed instructions.
- 3) During this progress you can configure the destination-folder. Normally the default location is suitable! In special cases change the location to a blank folder.

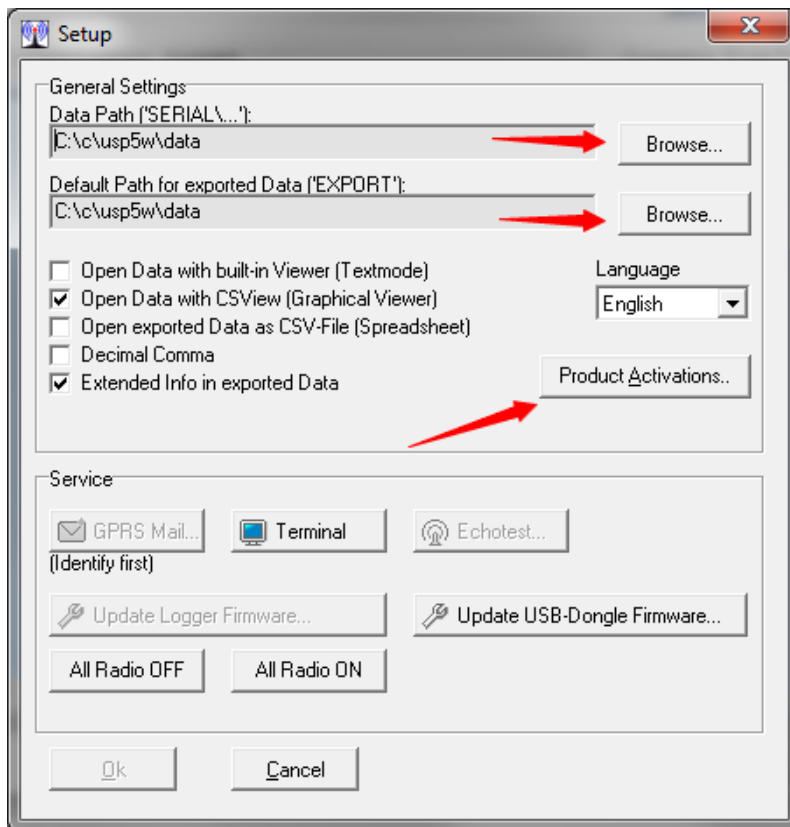


- 4) Complete the installation and wait for the USB drivers to be installed.
- 5) Connect the wireless USB-Dongle to a free USB port. A window will occur during installation of the dongle, wait until finished.

6) Start GP5W_Shell by double clicking on the new icon on your desktop.



7) Click "Setup", a new window will appear:



-
- 8) Click on “Browse” beneath “Data Path” and choose a location for data-files. Do the same for “Default Path”. This step is required only at first startup!

The basic setup is done. For a short manual have a look at the following chapters.

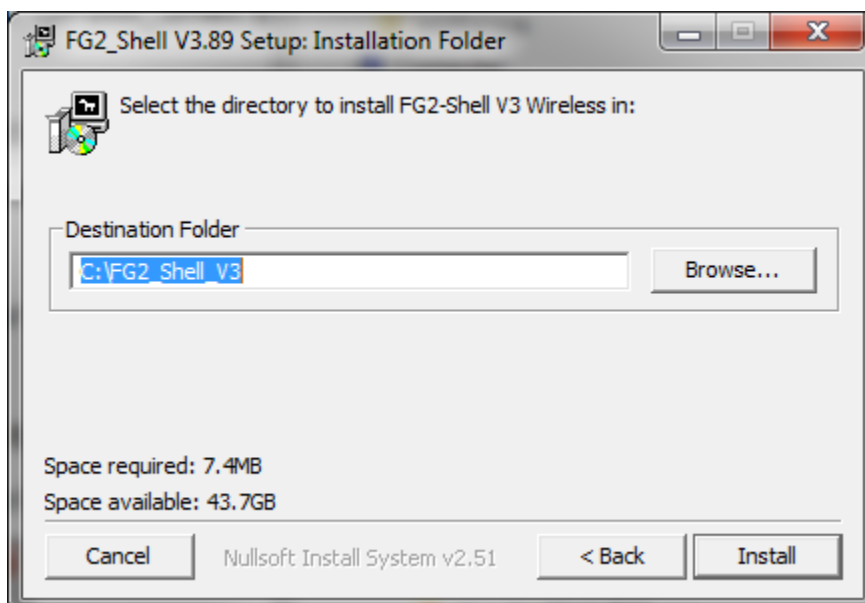
4.2 FG2_Shell Installation

These steps guide you through the installation of FG2_Shell.

You have to install this software to use dataloggers with **FlexGate 2 OS!**

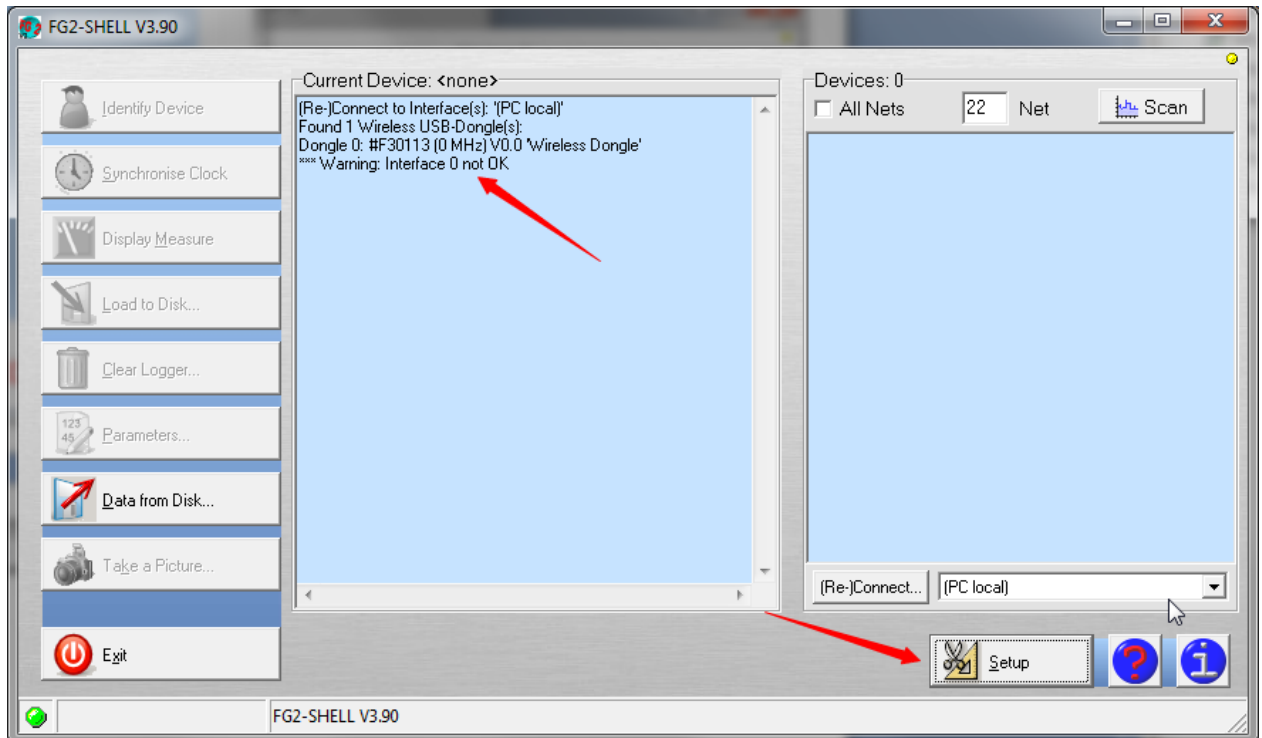
If you already have a **functional installation** you can skip this chapter! If you are using **Flexgate 1 devices only**, please refer to the previous chapter, GP5W_Shell.

- 1) Login to your Windows-account with admin rights and browse to the location of the FG2_Shell setup-file you downloaded before.
Disconnect all wireless USB-Dongles and other devices (except mouse and keyboard) from your PC!
- 2) Start installation by double-click on the setup-file, follow the displayed instructions.
- 3) During this progress you can configure the destination-folder. Normally the default location is suitable! In special cases change the location to a blank folder.



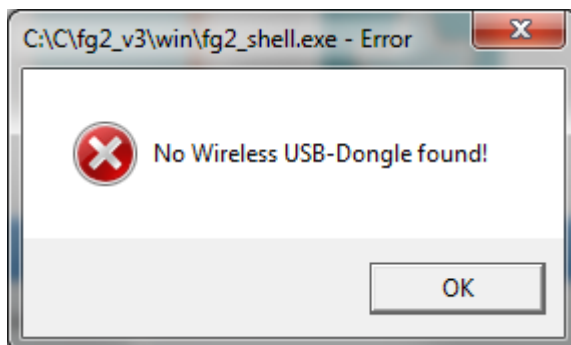
- 4) Complete the installation and wait for the USB drivers to be installed.
- 5) Connect the wireless USB-Dongle to a free USB port. A window will occur during installation of the dongle, wait until finished.

6) Start FG2_Shell by double clicking on the new icon on your desktop.

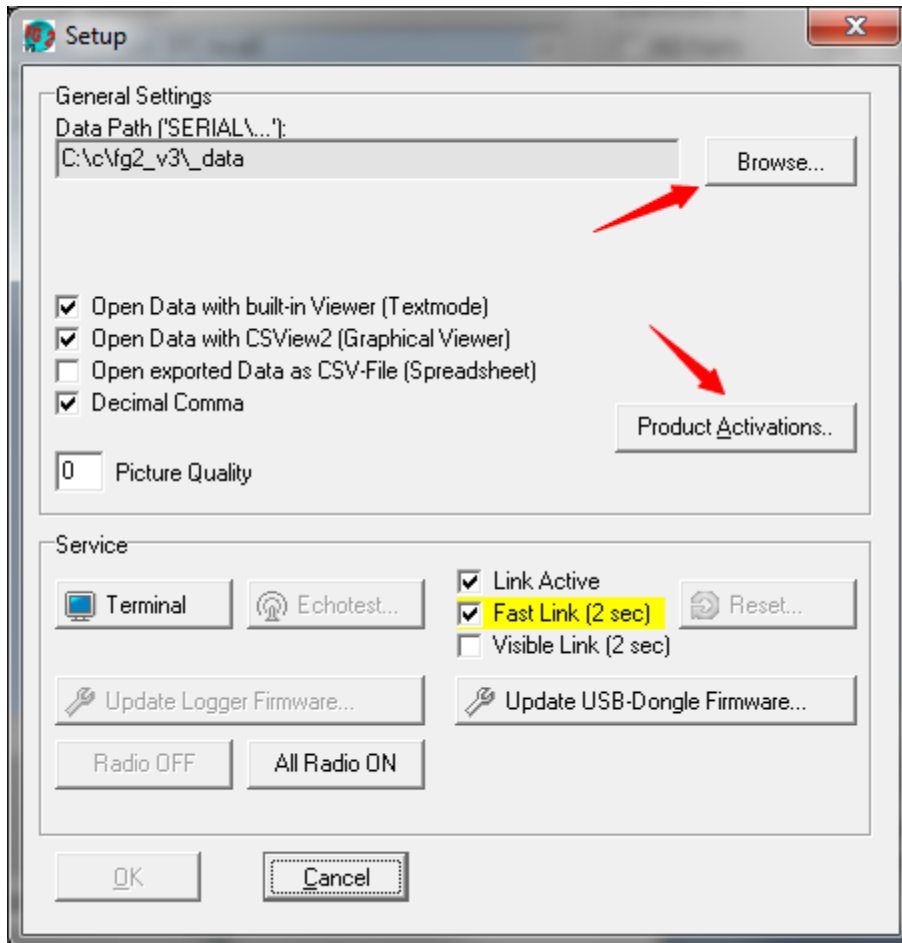


The warning “Interface 0 not OK” is displayed in case of an old USB-Dongle firmware. Complete all steps of this chapter and refer to the chapter “**Update Wireless-USB-Dongle**” later!

If an error is displayed instead of the main-window, click “OK” and close the software. Connect the USB-Dongle to another port, then restart the software.



7) Click “Setup”, a new window will appear:



8) Click on “Browse” beneath “Data Path” and choose a location for data-files.

Enable all checkboxes as shown in the picture above. This step is required only at first startup!

The basic setup is done. For a short manual have a look at the following chapters.

4.3 Wireless-USB-Dongle Firmware Update

The Wireless USB-Dongle needs to be updated to the latest firmware for compatibility with the new FG2_Shell software and dataloggers operating on **Flexgate 2-System**.

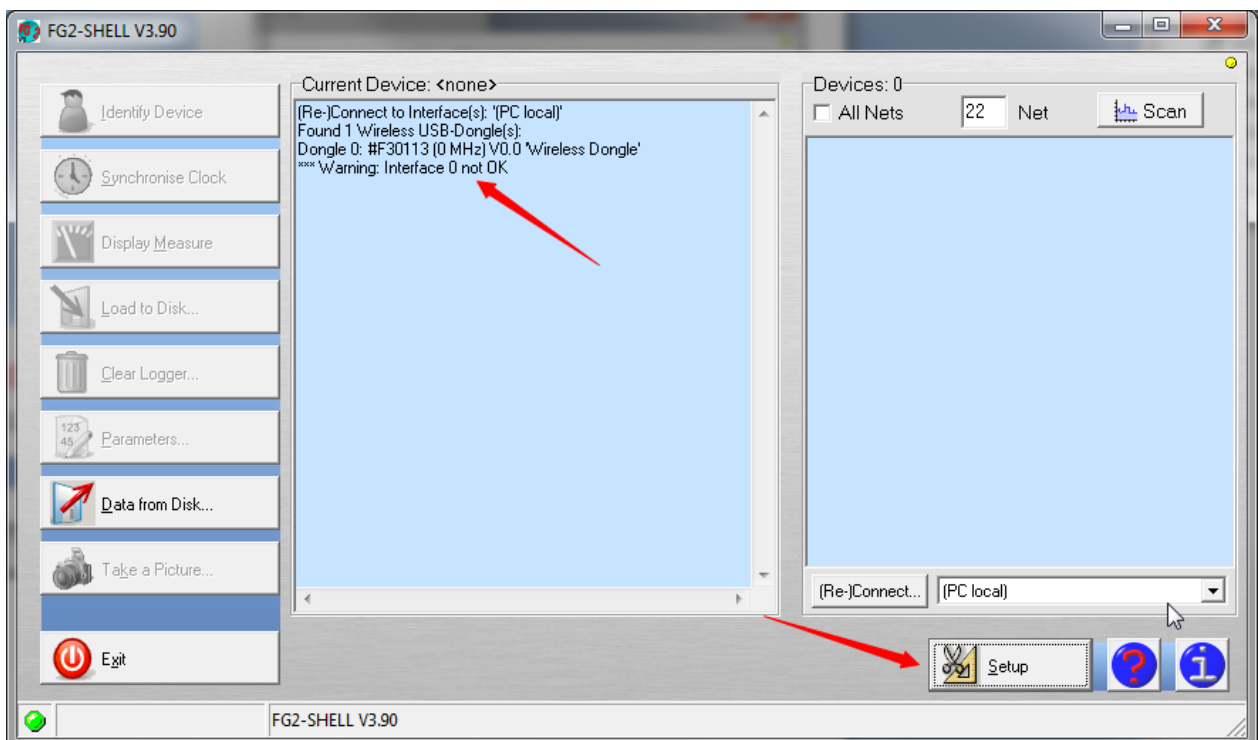
This chapter will explain the procedure to update the firmware. Previously you have to install the **FG2_Shell software**, see chapter “FG2_Shell setup”. Carefully check the frequency of your Wireless USB-Dongle, see label!

Updating the USB-Dongle firmware is necessary in the following cases:

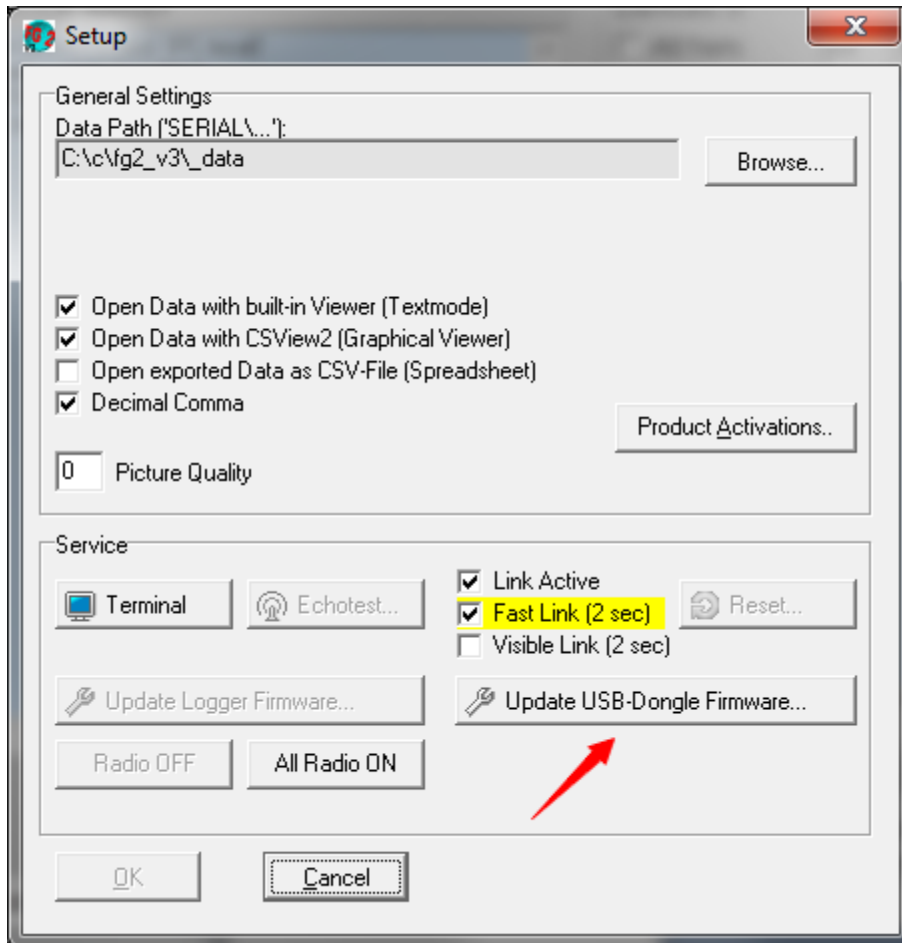
- A warning /error is displayed by FG2_Shell after startup.
- The USB-Dongle was previously in use with **GP5W_Shell only**.

The new firmware for the Wireless USB-Dongle gives the advantage to use this Dongle with both Windows-Software versions, GP5W_Shell and FG2_Shell!

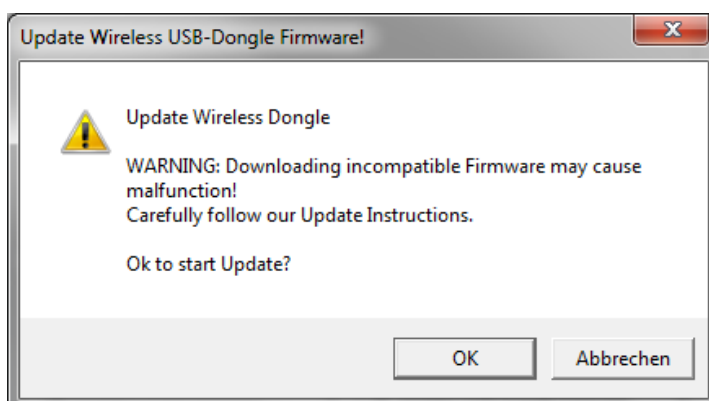
- 1) Disconnect all USB-Devices from your PC, except mouse, keyboard and the Wireless USB-Dongle you want to update.
- 2) Open FG2_Shell by double-click on the desktop-icon.



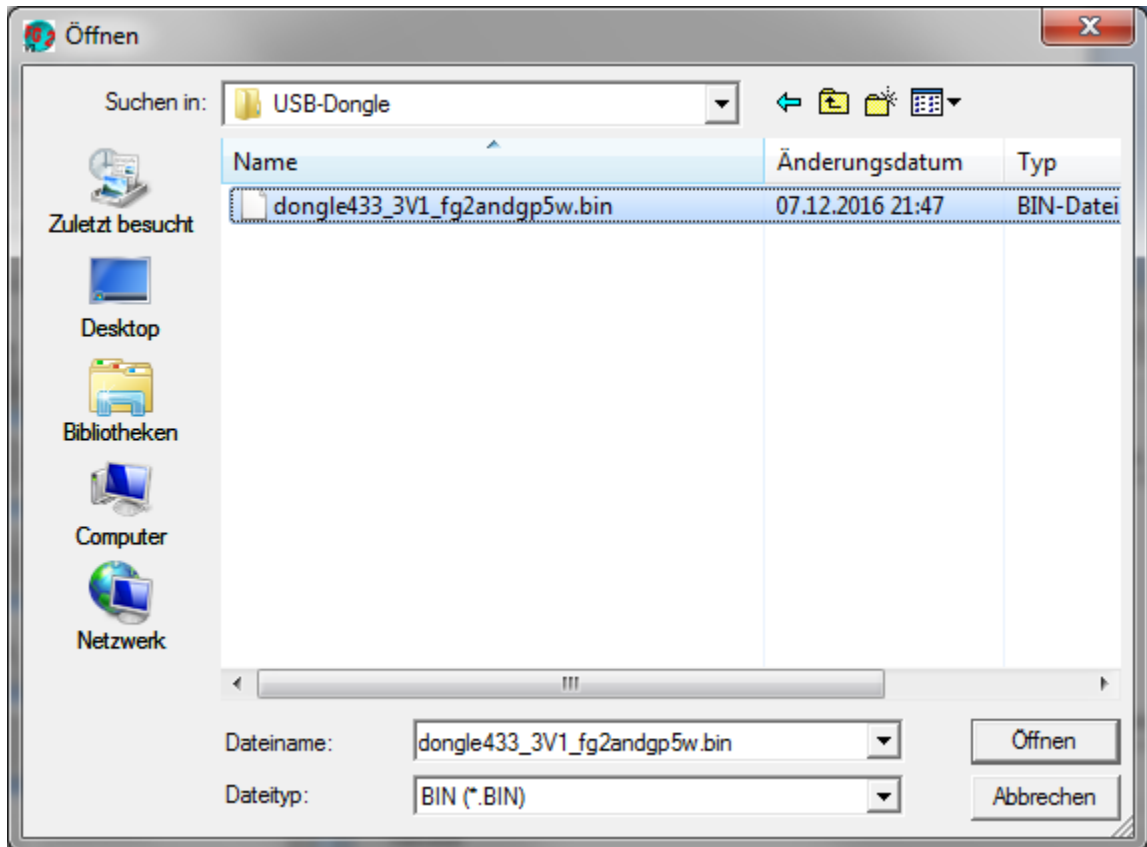
3) Open the setup-form by clicking on “Setup”:



4) Select “Update USB-Dongle Firmware”. A warning will be displayed, click “OK”:



- 5) Browse to the downloaded firmware-file “**dongle433_3V1_fg2andgp5w.bin**” for the 433 MHz EU - or “**dongle905_3v1_fg2andgp5w.bin**” for the 915 MHz US Wireless USB-Dongle, then click “Open”.



- 6) Wait until the update is completed and close the setup-form.

The device-list will now display the message “*Found 1 Wireless USB-Dongle(s): Dongle 0: (433 MHz) V3.1 'Wireless Dongle2 433MHz'*”. The firmware update was successful!

5. FG2_Shell User Guide

This short manual will guide through the most common functions of the new FG2_Shell (Version 3.90 or newer).

The Windows-Software provides all features to discover, manage, communicate, configure and handle recorded data for all types of GeoPrecision dataloggers. Recorded data can be displayed, analyzed and converted to other data-formats.

As a basic of all GeoPrecision dataloggers, a “**MLog5W-Simple-datalogger**” and a “**Wireless USB-Dongle**” will be used to demonstrate and explain the basic functions of the software. All steps shown on the following pages can be used as template for other datalogger-types, which may have some extended and additional features. The related documentation of these devices will give an overview to their special features.

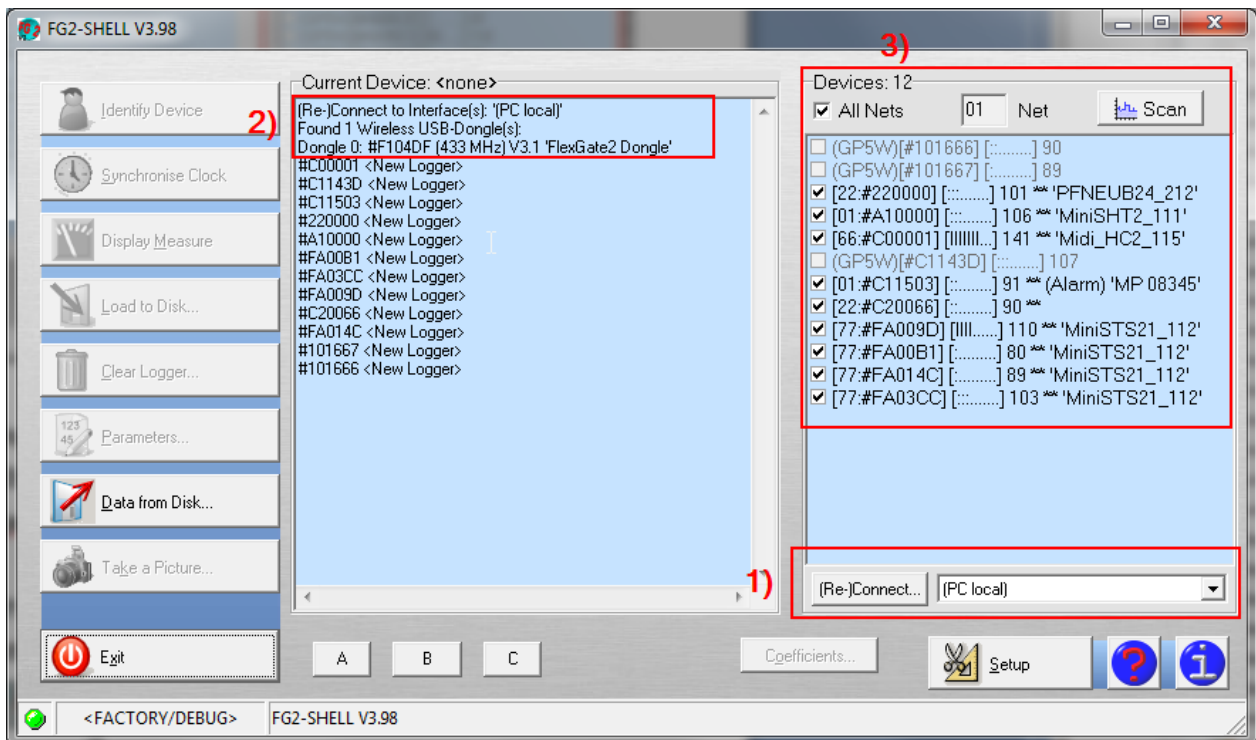
Before you can use the software, the following requirements must be fulfilled:

- Functional installation of the FG2_Shell, see previous pages.
- Installed and connected Wireless USB-Dongle with latest firmware, see previous pages.
- MLog5W-Simple-datalogger running on the new FG2 OS.
 - To detect which Flexgate OS generation is running on your device will be described later on!

5.1 Run the program

1) Connect your Wireless USB-Dongle to a free USB-Port of your PC.

2) Double-Click the desktop-icon “FG2_Shell”



3) At first run proceed the following steps at the main window:

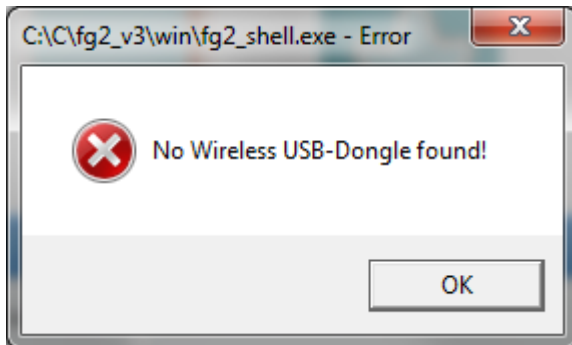
(1) Select “PC local” from the dropdown menu and click “Reconnect”.

(2) If properly connected some information about the USB-Dongle are displayed

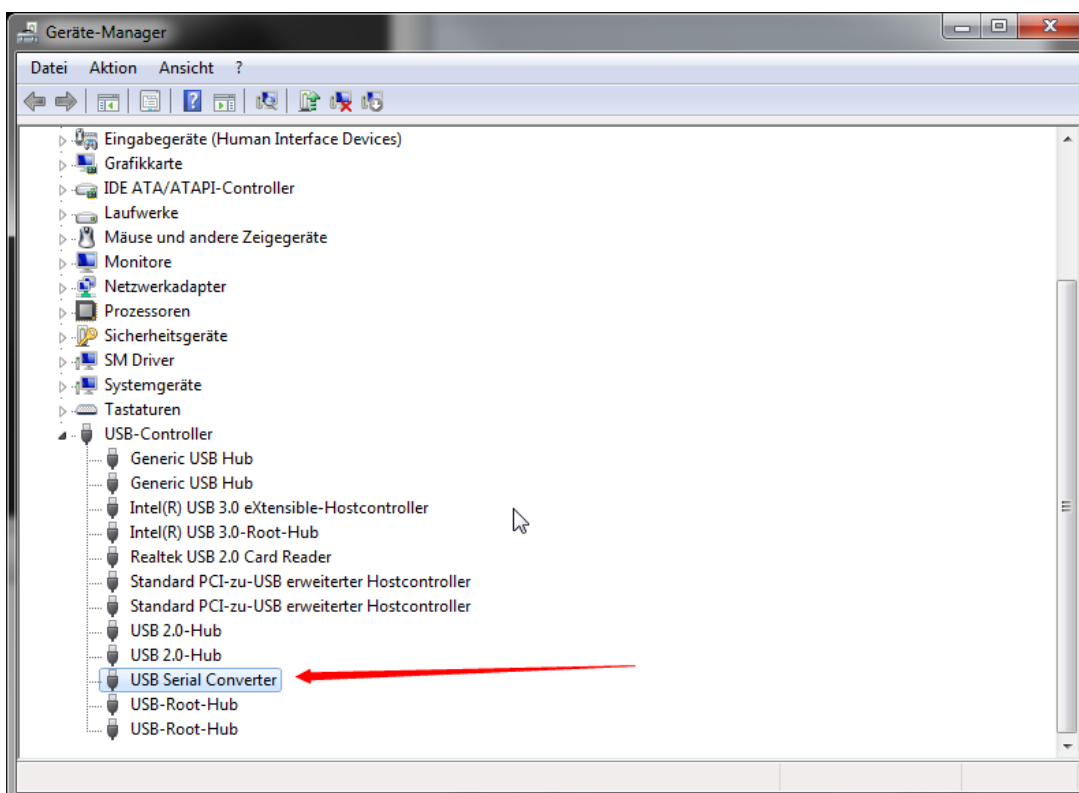
(3) A list of wireless dataloggers in range of your dongle comes up. This may take a few seconds.

5.2 No Wireless USB-Dongle detected

If an error is displayed instead of the main-window, click “OK” and close the software.



- Disconnect the dongle and all other USB devices (except mouse and keyboard) from your PC.
- Connect the dongle to another USB-port of your PC. Check the **Windows Device Manager**, a USB-Device of type “USB Serial Converter”:

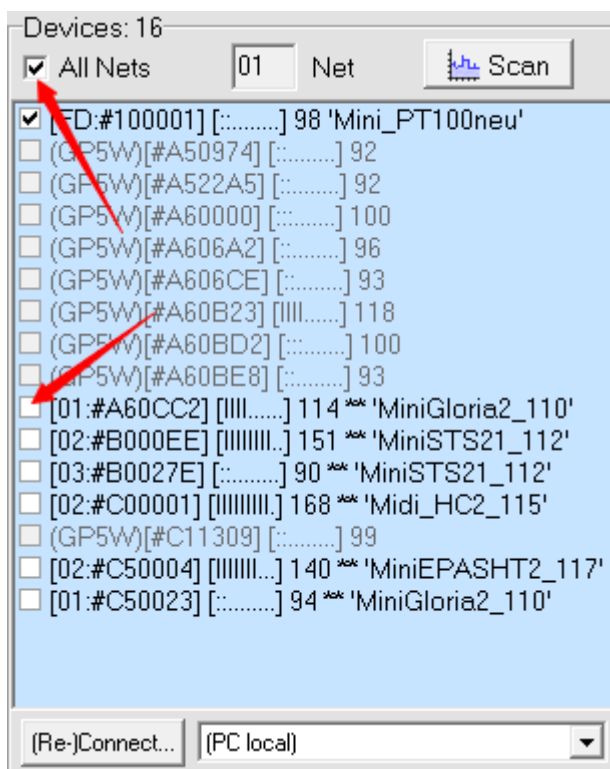


If such device is not displayed and the FG2-Shell still shows the error, disconnect the dongle and uninstall the software. Make a new and clean setup regarding to chapter 4.2.

5.3 Detecting dataloggers and the generation of Flexgate OS

Each datalogger is delivered with a unique 6 digit serial number. The attached label will show the device's serial number, which is also the "radio address" This address is used to identify a single datalogger in the device-list.

- 1) Activate the checkbox "**All Nets**".
- 2) Check the device-list: every wireless-datalogger in radio-range of the USB-Dongle will be displayed here.

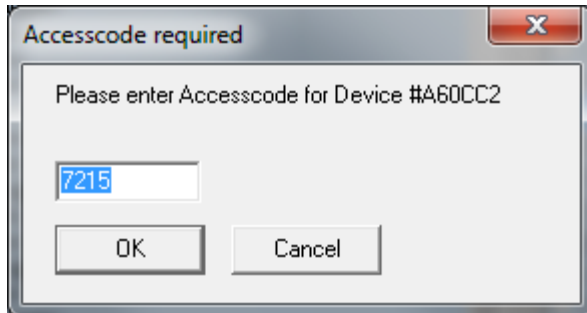


→Dataloggers displayed in grey colour and marked as "(GP5W)" are running **Flexgate 1** OS. They cannot be accessed by this software, use **GP5W_Shell** instead!

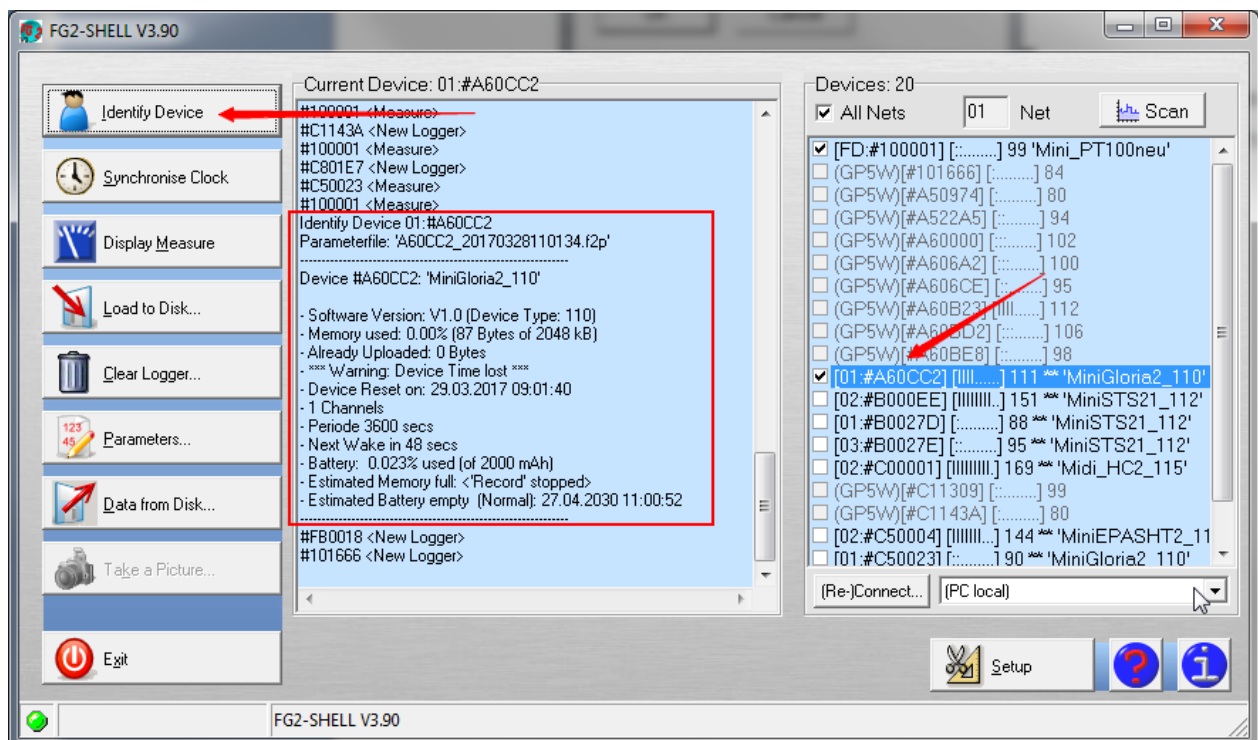
! Update: See 3.2. GP5WShell now will start automatically since Version 3.99.5!

→Dataloggers displayed in **black colour** instead are running the new **Flexgate 2** OS; they can be accessed by the **FG2_Shell**.

- 3) Click the checkbox in front of your datalogger's serial number. A new window will appear:



- 4) Enter the 4 digit Access-Code, printed on the label. Now the device can be accessed from this copy of FG2_Shell and is only required at the first time of access.



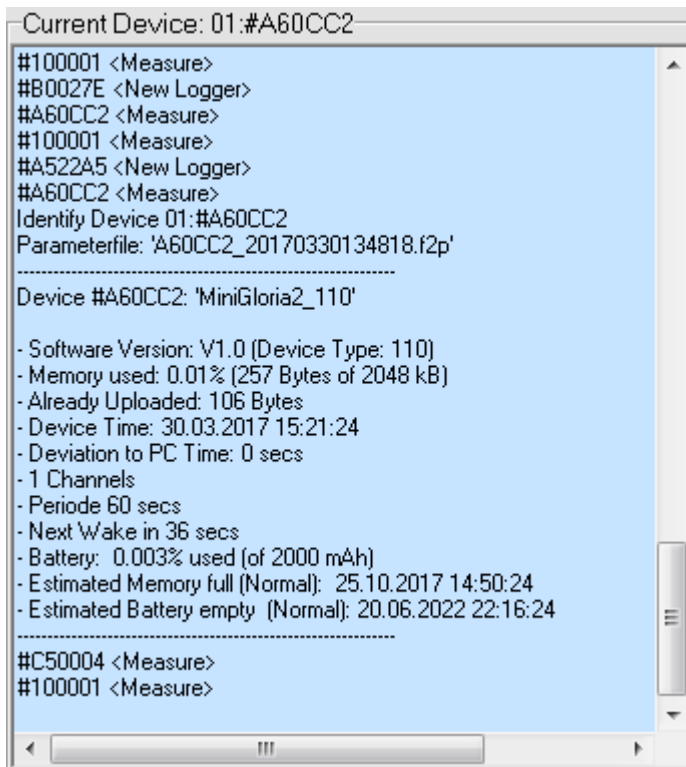
- 5) Now select the datalogger in the list.
- 6) Click "Identify Device".

The main-window now shows a short overview of this datalogger. All action buttons are activated. The next pages will describe the possible actions, step by step.

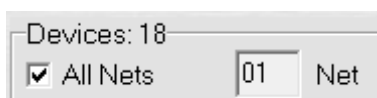
5.4 Basic actions

Your currently “identified” device and all actions are displayed in the middle of the main-window. The information is logged like a “history”, which means all new information is written at the end of the list.

Also some additional information from other active dataloggers within radio-range are displayed, like: New logger in range, active measurements and so on.

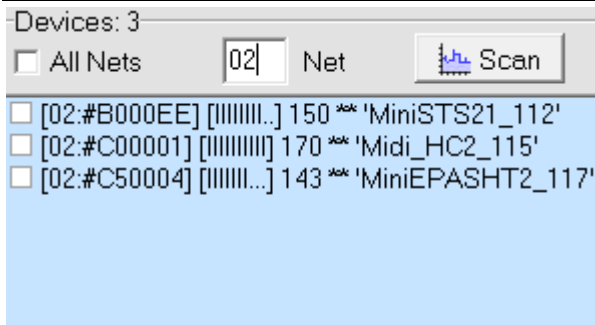


All actions done in the following steps will be applied to the previously identified device until you select another datalogger from the “Device List”. The response from the datalogger is displayed in this list which can be positive (action successful), negative (error during action) or a warning.



Activate the checkbox to display dataloggers with any “radio-net”.

Deactivate and enter a specified net will blank out all devices in the list with another “radio-net”.



For more details about “**Radio-Nets**”, see “5.5 Parameters and configuration”.

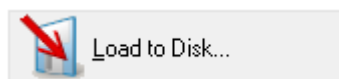


Set the dataloggers date and time. A deviation in date and time between datalogger and PC is displayed directly after “Identify Device”.



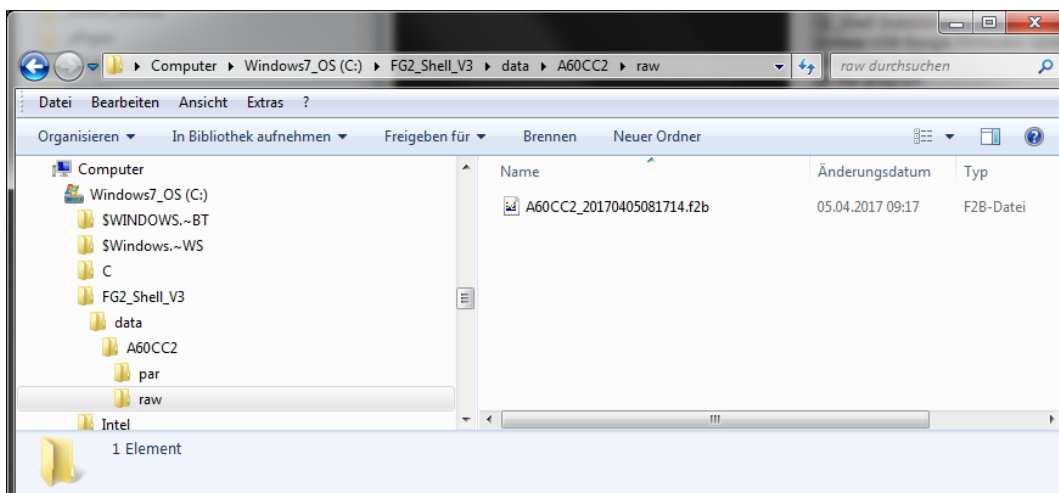
Trigger a new measure. Measured values are displayed.

This measurement will not be written to the datalogger’s flash-memory!



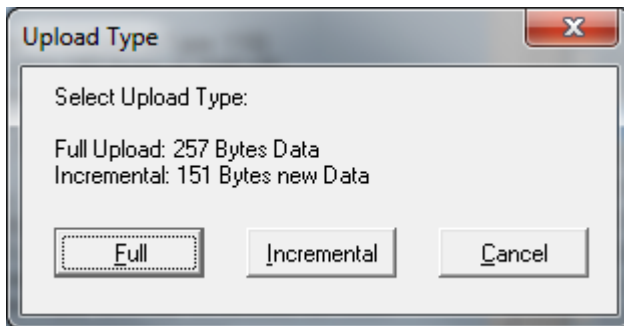
Download recorded measurements from the datalogger’s storage to your PC.

The amount of recorded data is displayed after “Identify Device”. All data is stored in a separate folder on your harddrive, below the path specified in “4.2 FG2_Shell Installation, 8)”.



A complete download will automatically open “**CSVView 2**”, a program to view measurements. An overview to this is given later on.

“Load to Disk” can be triggered more than once. By downloading the next time, you can choose “Incremental” or “Full” download:

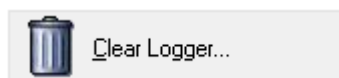


Incremental:

Only new data recorded, since last download, will be loaded. The position of last readout is stored on your device.

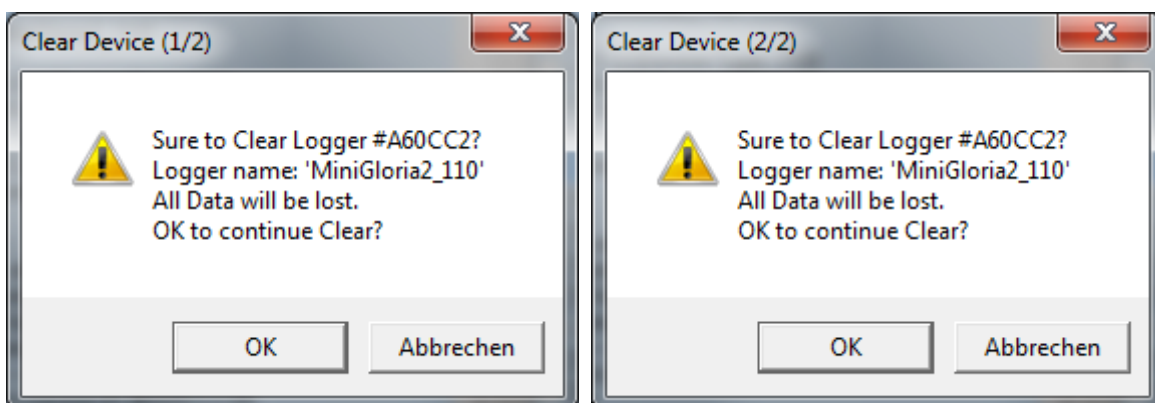
Full:

All data available in memory will be downloaded.



Delete all recorded data from the datalogger’s flash-memory. **Clearing cannot be undone!** Configurations and parameters are not affected.

Two warnings will be displayed to make sure you really want to delete all data:



5.5 Parameters and configuration

Dataloggers can be configured individually to meet your given requirements. Open the parameter window by clicking on:



The current configuration **stored on the datalogger** is shown and can be modified, saved to a file or loaded from a file.

- To undo all changes click "**Cancel**".
- To apply modifications to the datalogger click "**Transfer**".
- To write the currently displayed configuration to file on your harddisk click "**Write Par**".
- To load a parameter-set from file click "**Read Par**".

Keep in mind: Changed parameters are directly written and applied to the datalogger by clicking "**Transfer**"! Every time a changed parameter-set is transferred, a "backup-file" is automatically written to your harddisk.

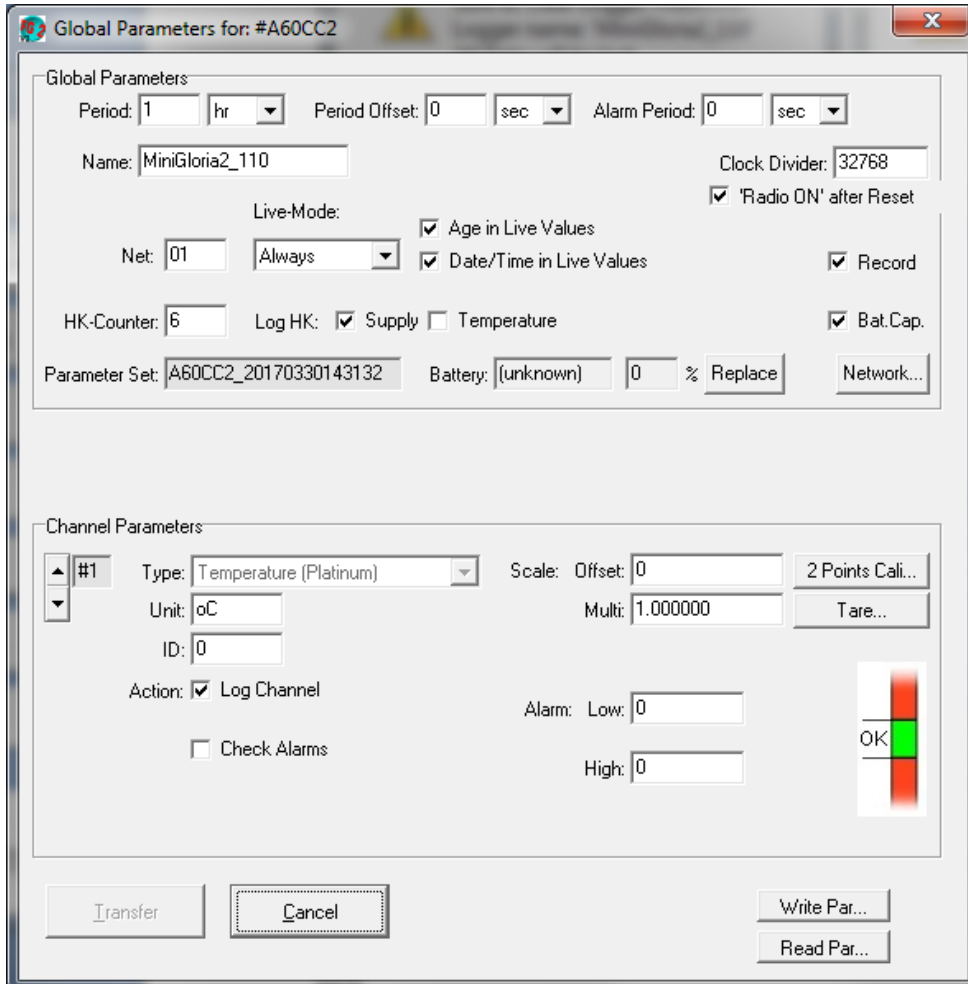
If you want to use the same configuration on different dataloggers of the same device-type, click "**Write Par**" and select a destination on your harddisk to save the configuration to file.

Later on it is possible to load the previously generated file by clicking on "**Read Par**". This can be done to restore an old configuration to the same datalogger or to load identical parameters to different dataloggers.

Parameters are organized in two groups, "**Global Parameters**" and "**Channel Parameters**":

Global parameters

These configurations affect the **basic behaviour** of the datalogger. Like “Period” (interval of measurement and recording) or “Record” (enable /disable recording).



Global Parameters for: #A60CC2

Global Parameters:

Period: 1 hr Period Offset: 0 sec Alarm Period: 0 sec

Name: MiniGloria2_110 Clock Divider: 32768

Live-Mode: Always Age in Live Values 'Radio ON' after Reset

Net: 01 Date/Time in Live Values Record

HK-Counter: 6 Log HK: Supply Temperature Bat.Cap.

Parameter Set: A60CC2_20170330143132 Battery: (unknown) 0 % Replace Network...

Channel Parameters:

#1 Type: Temperature (Platinum) Scale: Offset: 0 2 Points Cali...

Unit: oC Multi: 1.000000 Tare...

ID: 0

Action: Log Channel Alarm: Low: 0 High: 0

Check Alarms

OK

Transfer Cancel Write Par... Read Par...

The most common settings on this form are:

Period /Period Offset:

Interval of measurement and recording. Valid “**Period**” values are:

10 – 59 sec (seconds)

1 – 59 min (minutes)

1 – 23 hr (hours)

Attention!

Do not configure short intervals with a larger number of sensors connected to the device! This will **damage the datalogger!** Recommendation: **At least 1 minute!**

To configure a interval of e.g. 1 hr and 10 min, use “**Period**” + “**Period offset**”. Valid “**Period offset**” values are:

1 – 59 sec (seconds)

1 – 59 min (minutes)

Alarm Period:

The datalogger can be configured to check the measured values of each channel for an over- or underrun. How to setup a channel for “alarm monitoring” is described later on. If configured, data **of all channels** will be recorded with the given interval during an over- or underrun.

Valid “**Alarm Period**” values are:

10 – 59 sec (seconds)

1 – 59 min (minutes)

1 – 23 hr (hours)

0 to deactivate “alarm period”.

Name:

Maximum 20 characters, free text.

Net (Radio-Net):

Valid “**Nets**” are: 01 – FD (hexadecimal values).

Change the “radio net” to organize a larger number of devices in groups.

This gives the advantage to blank out devices of other nets /groups.

By deactivating the checkbox “All Nets” at the device-list in the main window and selecting a specified net instead, will blank out every datalogger from other nets at the device-list.

Example:

10 dataloggers are used in the same area for two different projects. 5 at project ‘A’, 5 at project ‘B’. To separate project ‘A’ and ‘B’, change the net of all devices used at ‘A’ to e.g. “04” and ‘B’ to “06”. By setting the device-list to radio-net “06”, only dataloggers from project ‘B’ will be displayed.

Live-Mode /Age /Date, Time in Live-Values:

Feature to provide the last measured values for other wireless-dataloggers. Keep this setting untouched or select “Off”. Further details can be found at the “Wireless advanced feature manual”.

HK-Counter /Log HK:

Housekeeping (HK) channels are additional values a datalogger can record to monitor the device itself. Depending on the device-type, different “Housekeeping or monitoring” options are available:

- HK-Counter: Select how often HK-Values are recorded. 1: every logging-period, 2: every second period, and so on. Valid values: 1 – 99.
- Supply: Battery voltage.
- Temperature: Internal CPU-Temperature.
- Humidity: %of air-humidity inside the enclosure.
- Pressure: Air-pressure in bar.

Battery /Replace:



Battery: 31.03.2017 12:00 % Replace

After equipping the device with a new battery, click “**Replace**”. This will recalculate the estimated battery-lifetime. Normally an empty battery is replaced by a new, unused one. Enter ‘0’ (zero), no capacity of the battery is used.

Bat.Cap.:

Activate the checkbox to enable extended battery-monitoring and lifetime-calculation. The estimated battery-lifetime will be exactly recalculated anytime the datalogger consumes electrical energy.

Record:

Deactivate the checkbox to disable the dataloggers flash-memory. **No data will be recorded!** Measurements will be triggered but not stored!

Channel Parameters

These are affecting the **selected channel only**. Each channel is configured individually. The number of selectable channels and channel-types depends on the datalogger-type. →“MLog5W-Simple”-datalogger provides one fixed channel for temperature measurement.

Channel number:



Select the channel to configure. These parameters are individual for each channel. The number of selectable channels depends on the type of datalogger. E.g. MLog5W-Simple-types provide 1 channel.

Type:

Some dataloggers have different types of physical channels. E.g. SDI-12, 2-Wire, HC2-Clip, ... Using the drop-down menu will select the physical channel for your connected sensor you would like to configure. MLog5W-Simple provides only a fixed physical channel for the connected Pt1000-sensor.

Unit:

Unit of this channel, max. 5 characters.

ID:

Free selectable number between 0 and 65535, default '0'. Optional, may be used for data analyses or databases.

Action: “Log Channel”:

Enable the checkbox to activate measurement of this channel.

Action: “Check Alarms”:

Enable the checkbox to activate “alarm monitoring”. The measured values will be checked for an over- or underrun. If enabled you have to set the upper and lower limits, shown in the next step.

Alarm: “Low”/”High”:

Set the limits for “alarm monitoring” of this channel. If “Check Alarms” is enabled and a over- or underrun of the given limits is detected after measurement the datalogger will enter “alarm state”.

This state will be retained as long as the measured values are out of limits and Measurement will take place with the given “**Alarm Period**” (if activated)!

Scale: “Offset”/”Multi”:

These options can be used for a “user calibration” of each channel. **Offset** will in- or decrease each measurement by adding the given value (default: 0). Optional, can be used for **zero-point** calibration.

Multi will multiply each measurement with the given value (default: 1. 000000), optional.

Attention!

Changing the configuration has to be done very carefully!

Do **not** change any settings which are not described above!

Changes to these “advanced settings” effect abnormal operations of your device!

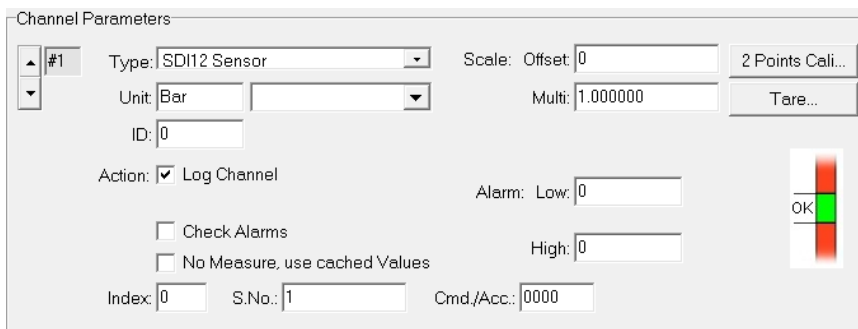
5.5.1. Multi parameter sensors

Some sensors, connected via 2Wire or SDI12 Bus, will provide more than one value. To record these additional values the datalogger has to be configured for “cached values”.

The type of values and their index-assignment depends on the sensor. Check the specific sensor’s datasheet for more information.

For this example the datalogger is configured for a SDI12 sensor, providing two values (pressure and temperature).

First step, value 1:



Channel Parameters

#1 Type: SDI12 Sensor Scale: Offset: 0 2 Points Cali...

Unit: Bar Multi: 1.000000 Tare...

ID: 0

Action: Log Channel Alarm: Low: 0

Check Alarms High: 0

No Measure, use cached Values

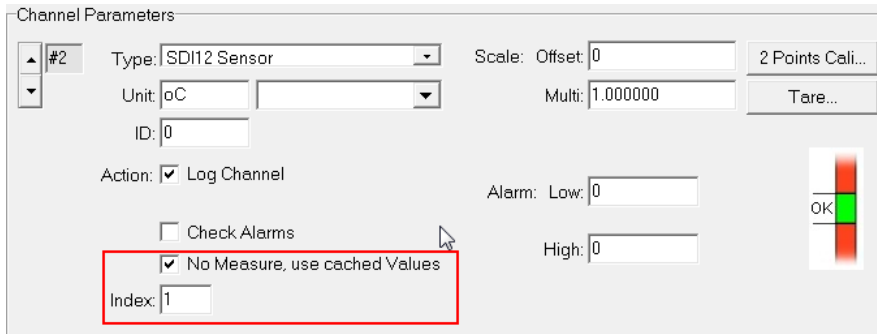
Index: 0 S.No.: 1 Cmd./Acc.: 0000

OK

Configure the desired channel as usual:

- Set the SDI-address, unit and so on.
- “Index” of the first value is ‘0’.
 - If it is necessary to record the sensor’s second or third value first, set “Index” as required.
- Activate the channel.

Second step, value 2:



Channel Parameters

#2 Type: SDI12 Sensor Scale: Offset: 0 2 Points Cali...

Unit: °C Multi: 1.000000 Tare...

ID: 0

Action: Log Channel

Check Alarms

No Measure, use cached Values

Index: 1

Alarm: Low: 0 High: 0

OK

The second value doesn't require measurement. It is captured from cache.

- Activate "No measure, ..."
- Set "Index" to '1' for the second value of the sensor.
 - For other values set "Index" as required. E.g. '3' for the fourth value.
- Activate the channel.

Repeat the second step for all additional values of the sensor by increasing the channel number and index.

Test the configuration:

Click "Display Measure". At the main window the result should look like:

```

— Measure Device #100427 : 6 Value(s) : —
#1 8.42285 Bar (SDI12 Sensor Adr. #1: Chan. 0)
#2 19.3875 °C ((Cached) Chan. 1)
-K-TEMP 20.07 °C
-K-%rH 39.07 %rH
-K-PRES 1005.8 mBar
-K-BAT 3.510 V
  
```

5.5.2.SDI 12 special commands

These commands depend on your sensor. Please check the sensor’s manual for the corresponding SDI-Commands.

The datalogger with SDI12-Bus will automatically apply the standard method to receive data from a sensor. This is the “M0” command and the related “D” commands.

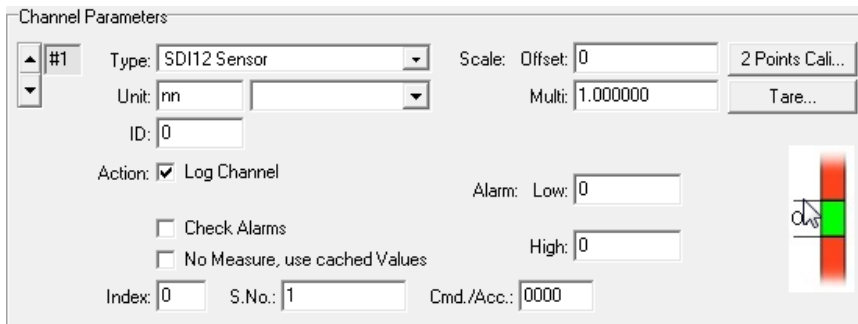
Additional M-Commands:

Example: The sensor provides 6 values. Value 1 to 4 are measured and received by “M0” and the related “D’ commands. Value 5 and 6 require a “M1”.

Valid commands are 0 to 9 for “M0” to “M9”.

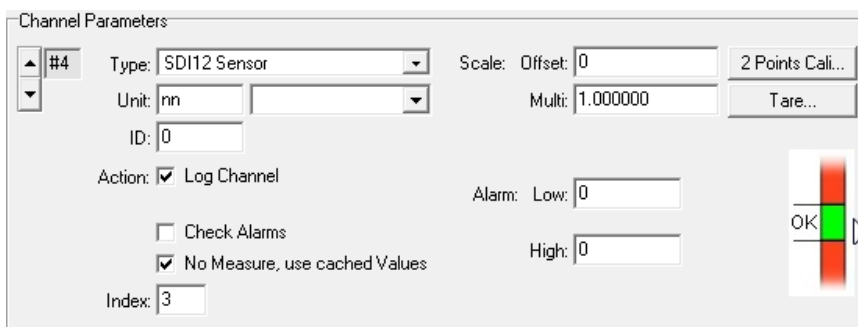
The related “D” commands to read the data are generated automatically.

Channel 1 to 4 (“M0”)



Channel Parameters

#1 Type: SDI12 Sensor Scale: Offset: 0 2 Points Cali...
 Unit: nn Multi: 1.000000 Tare...
 ID: 0
 Action: Log Channel Alarm: Low: 0
 Check Alarms High: 0
 No Measure, use cached Values
 Index: 0 S.No.: 1 Cmd./Acc.: 0000



Channel Parameters

#4 Type: SDI12 Sensor Scale: Offset: 0 2 Points Cali...
 Unit: nn Multi: 1.000000 Tare...
 ID: 0
 Action: Log Channel Alarm: Low: 0
 Check Alarms High: 0
 No Measure, use cached Values
 Index: 3

Channel 5+6 ("M1")

Channel Parameters

#5 Type: SDI12 Sensor Scale: Offset: 0 2 Points Cali...
 Unit: nn Multi: 1.000000 Tare...
 ID: 0
 Action: Log Channel Alarm: Low: 0
 Check Alarms High: 0
 No Measure, use cached Values
 Index: 0 S.No.: 1 Cmd./Acc.: 0001 **M1 command!**

Channel Parameters

#6 Type: SDI12 Sensor Scale: Offset: 0 2 Points Cali...
 Unit: nn Multi: 1.000000 Tare...
 ID: 0
 Action: Log Channel Alarm: Low: 0
 Check Alarms High: 0
 No Measure, use cached Values
 Index: 1

R Command:

To receive data via "R" command from a sensor, adjust the "Cmd/Acc" settings of the corresponding channel.

Valid commands are 10 to 19 for "R0" to "R9".

Address mapping:

To address a SDI12 sensor "S.No" of the corresponding channel must be adjusted.

Valid addresses are:

0 to 9 for sensors address ASCII '0' through ASCII '9'

31 to 36 for sensors address ASCII 'a' through ASCII 'f'

11 to 16 for sensors address ASCII 'A' through ASCII 'F'

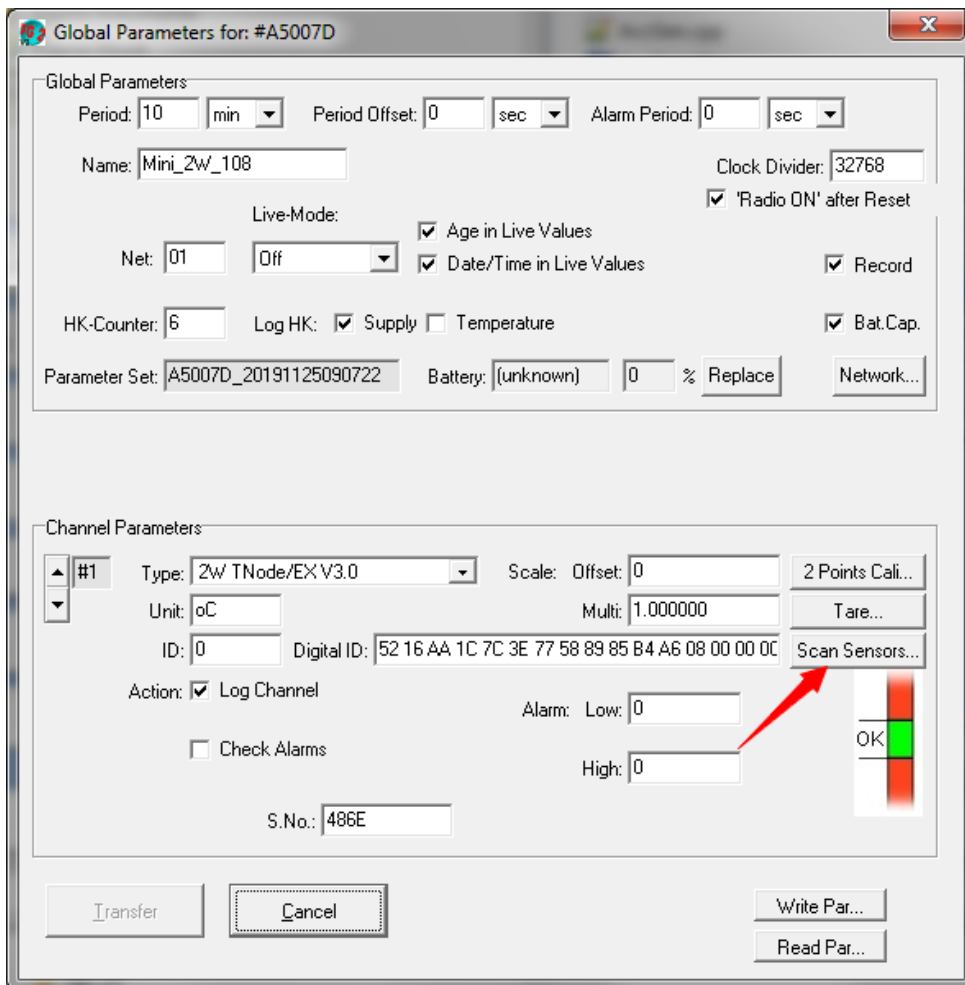
5.6 Advanced configuration for Thermistor-Strings

To use a Precision- or Dallas-Thermistor-string you need a special type of MLog5W. Most strings will contain more than one sensor; in this case you have to configure multiple channels of the datalogger. The following section is divided in two parts, “**Precision-String**” (TNode, TNodeEX, TNodeHD) and “**Dallas-String**”. Ensure you have the correct MLog5W-type for your Thermistor-string!

- ➔ Install the latest version of the FG2-Shell and update your data-logger firmware first!

5.6.1. Precision-Thermistor-string (TNode, TNodeEX, TNodeHD)

The MLog5W for **Precision**-Thermistor-Strings provides the “GeoPrecision 2-Wire Bus”. This bus is used for different sensor-types; up to 48 channels can be recorded. Therefore “Channel Parameters” contain a few more options and different channels are selectable.



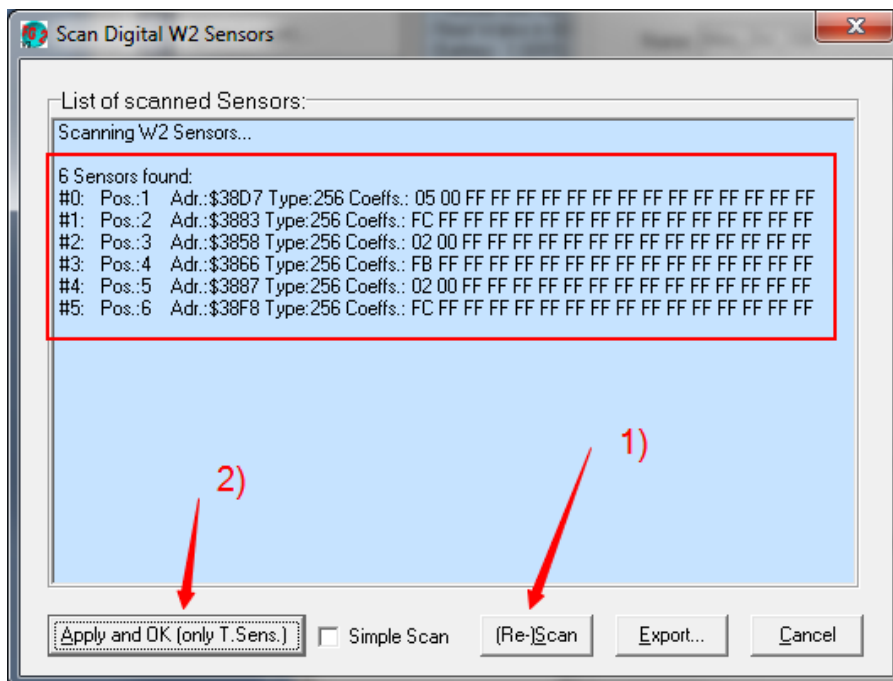
Each sensor of the Thermistor-string requires a separate channel. To record e.g. 10 sensors from a string, 10 channels have to be configured.

Attention!

Do not configure short intervals with a larger number of sensors connected to the device! This will **damage the datalogger!** Recommendation: **At least 1 minute!**

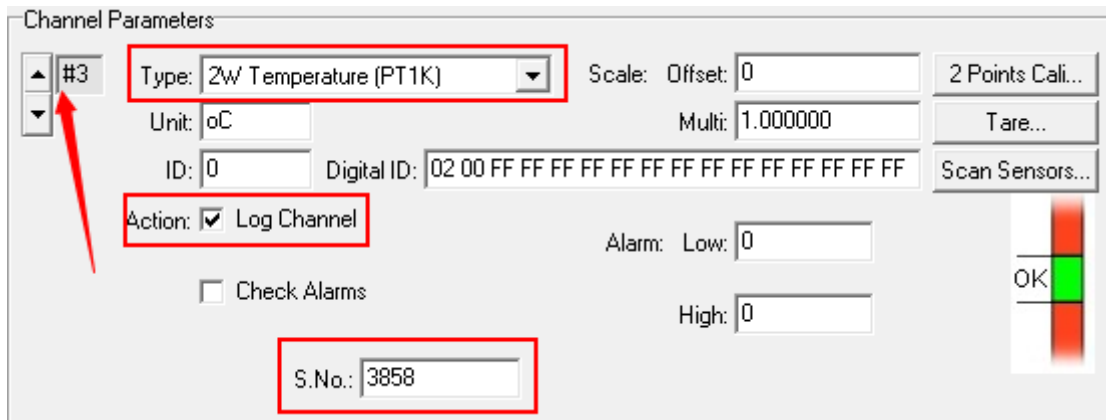
Use the “**Scan Sensors**” button to configure the channels for the sensors of the thermistor-string:

- 1) Connect the string to your datalogger.
- 2) Click “**Scan Sensors**”, a new window is displayed.
- 3) Click “**Re-Scan**” (1) to collect information of the string. This will take a while, depending on the number of sensors!
→ “Simple Scan” not activated!
- 4) A list of sensors is displayed. The string contains information of the position of each sensor. In this case position 1 is associated to channel #0 (the first channel), pos. 2 to channel #1 (second channel) and so on.
- 5) Click “**Apply and OK**” (2) to close the window and apply the configuration to required number of channels as shown at the list of sensors.



- 6) The number of required channels will now provide an individual configuration for each single sensor.

7) Check the following parameters for each channel (see screenshot):



- Type: This value must correspond to the connected sensor-type.
- Action: "Log Channel" activated.
- S.No.: Now contains the digital address for this sensor.
- Digital-ID: Now contains sensor specific coefficients.
- Offset/Multi: Optionally contains factory calibration coefficients.

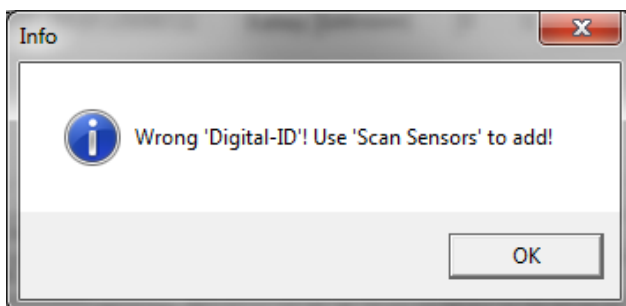
8) Click "Transfer" to write the parameters to the datalogger.

Attention!

If you try to configure the channel manually for a specific temperature-sensor, a warning will be displayed.

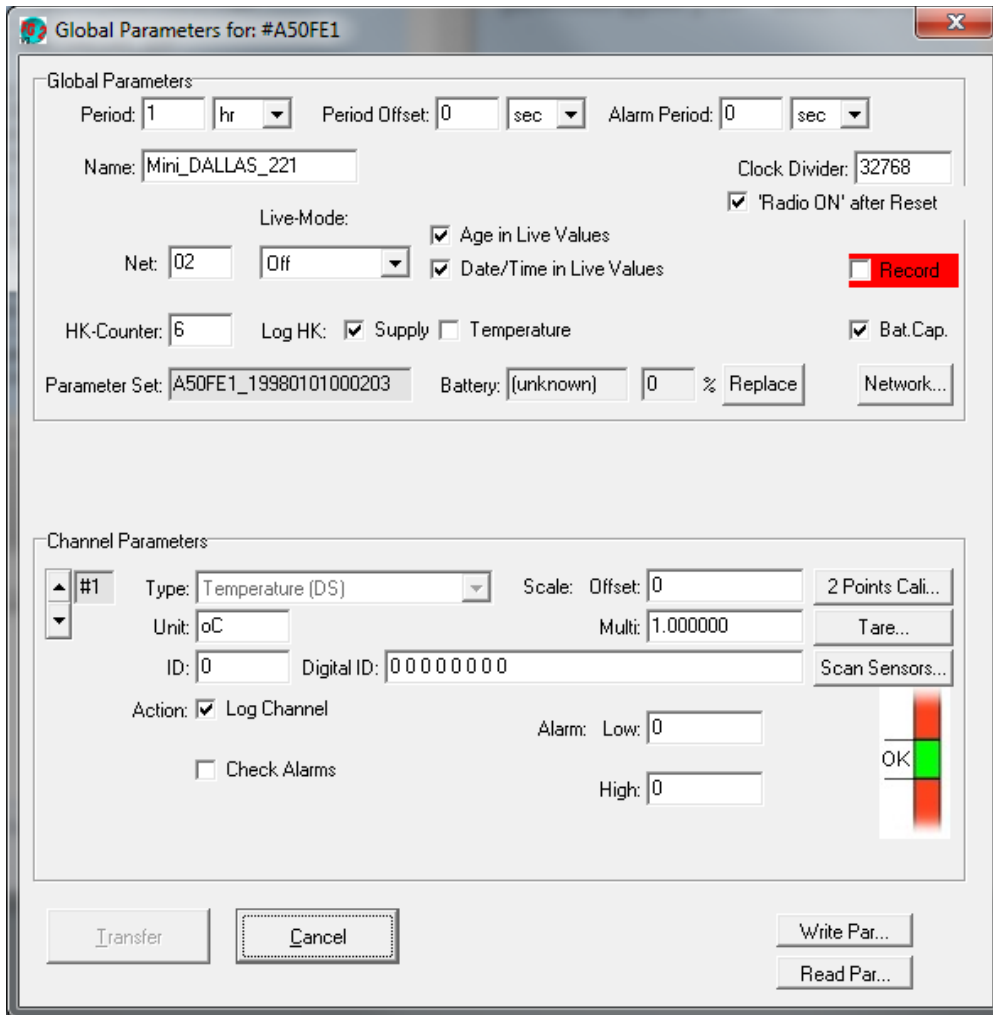
Use "Scan Sensors" to add the configuration for a new sensor!

Otherwise the coefficients and Digital-ID can be wrong, the measurement-result is not correct!



5.6.2. Dallas-Thermistor-string (outdated)

The MLog5W for Dallas-Thermistor-strings provides a special bus to communicate with up to 30 Dallas-Sensors.



Each sensor of the Thermistor-string requires a separate channel. To record e.g. 10 sensors from a string, 10 channels have to be configured.

Attention!

Do not configure short intervals with a larger number of sensors connected to the device! This will **damage the datalogger!** Recommendation: **At least 1 minute!**

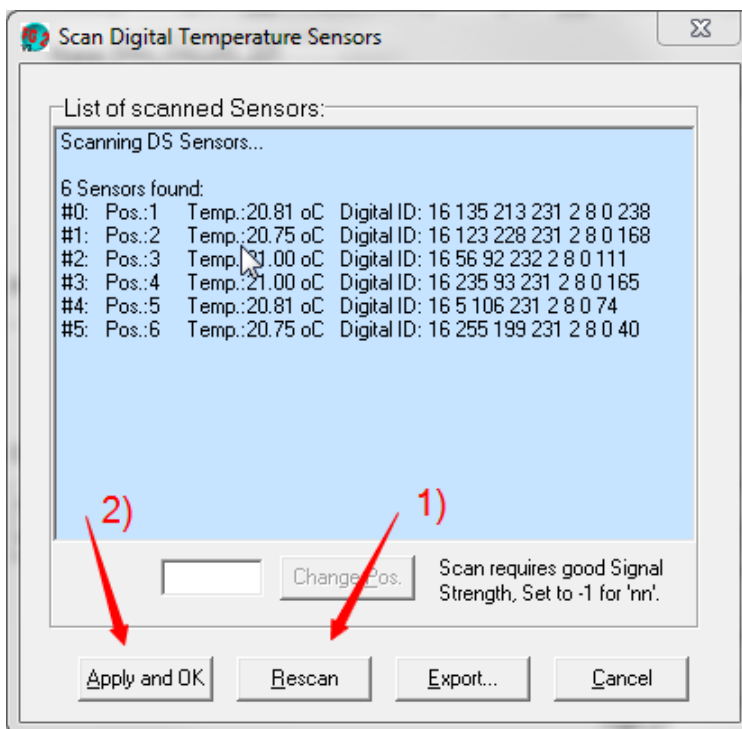
This can be done automatically using the “Scan Sensors” button:

- 1) Connect the string to your datalogger.
- 2) Click “**Scan Sensors**”, after a few seconds a new window is displayed.

3) A list of sensors is displayed. The string may contain information of the position of each sensor. In this case position 1 is associated to channel #0 (the first channel), pos. 2 to channel #1 (second channel) and so on.

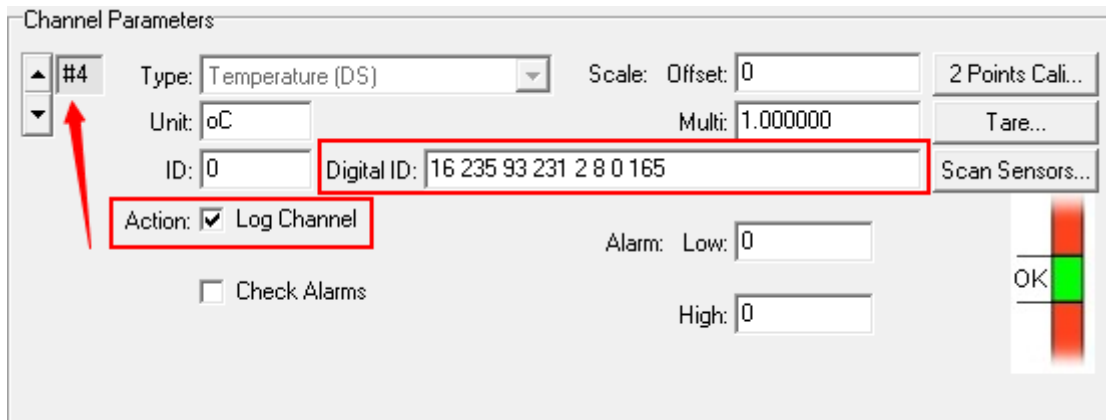
→If an error is shown instead of a list, click “**Re-Scan**” (1) to collect information of the string. This will take a few seconds!

4) Click “**Apply and OK**” (2) to close the window and apply the configuration to required number of channels as shown at the list of sensors.



5) The number of required channels will now provide an individual configuration for each single sensor.

6) Check the following parameters of each channel (see screenshot):



Channel Parameters

▲ #4 ▼

Type: Temperature (DS) Scale: Offset: 0 2 Points Cali...

Unit: °C Multi: 1.000000 Tare...

ID: 0 Digital ID: 16 235 93 231 2 8 0 165 Scan Sensors...

Action: Log Channel

Check Alarms Alarm: Low: 0 High: 0

OK

- Action: "Log Channel" activated.

- Digital ID: contains the digital address for this sensor.

7) Click "Transfer" to write the parameters to the datalogger.

5.7 Advanced configuration for Internet-Dataloggers

Dataloggers with “online” or “internet” feature offer some special features to collect and transfer data. These features will depend on the exact type of datalogger you have ordered.

The following chapter requires a good knowledge of the basic features and handling of GP dataloggers. This means you must have the knowledge how to setup a working installation of the datalogger itself (like antennas, SIM-card, batteries).

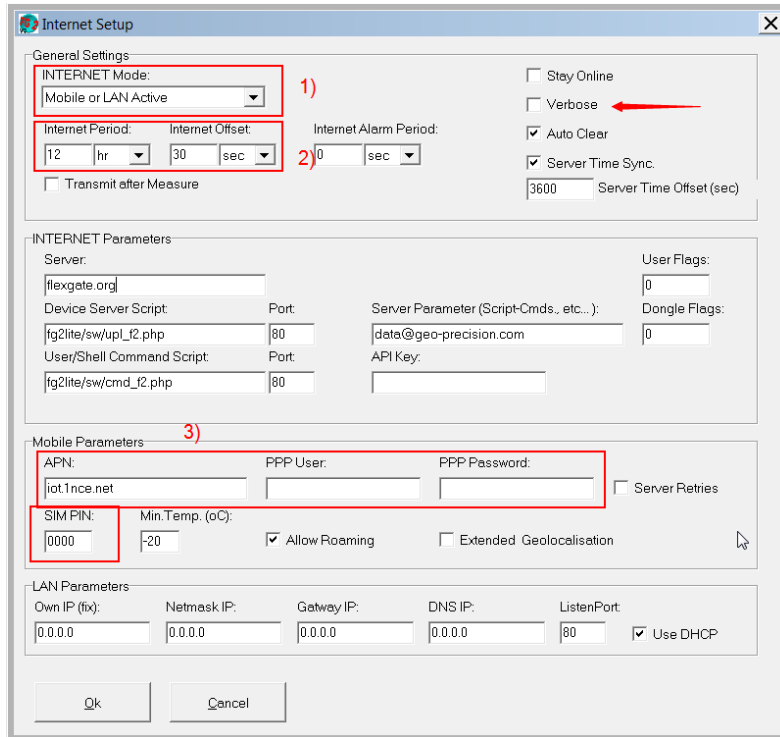
➔ Note: All devices will be delivered fully configured. In most cases it is not necessary to change the configuration!

“**Internet Options**” will show how to setup the device to transfer data through the internet and storing it on a specially prepared webserver.

“**Recording /collecting of wireless live values**” will show how you can collect measured data from a second datalogger, using the wireless communication. The second datalogger has to be configured and placed somewhere within the wireless-range of you internet-datalogger. So you are able to accumulate data from different remote-dataloggers and transfer them to a webserver. Even if the remote-datalogger has no internet-feature.

5.7.1. Internet Options

All devices are pre-configured. By changing these values it is possible that the internet connection will fail!



- 1) Activate internet transfer.
- 2) Set transfer period. A short offset is recommended to avoid high data traffic.
→ Do not set shorter than measurement period! All data stored from measurement between two internet-connections will be transferred!
- 3) Change these corresponding to the information of your SIM-card provider.
- 4) Verbose: Deactivate this after testing.

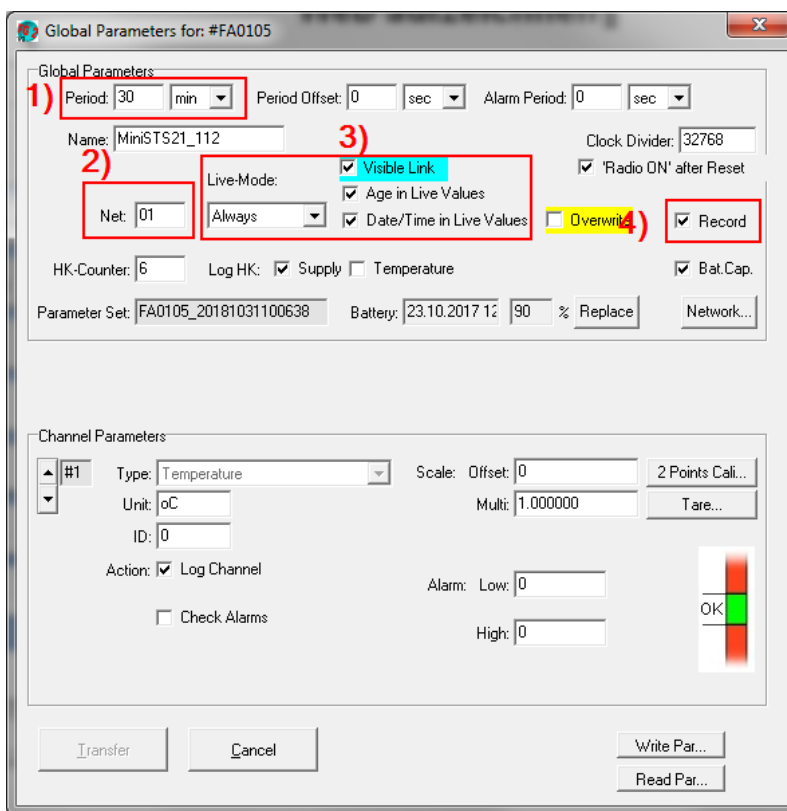
The parameters “server” are configured to transfer data to a GeoPrecision server. You can connect to this server with a webbrowser, using the link you received after purchase.

In case you are hosting you own Flexgate2 online portal, you have to change these parameters according to you webserver setup. Please contact you IT support for these information.

5.7.2. Prepare the remote-datalogger

A remote datalogger (wireless sensor) will provide the latest measured values via wireless. These data can be collected, stored and transferred by a internet-datalogger (data collector).

The following adjustments for the collectable wireless dataloggers (Wireless Sensors) are to be done for each device:



- 1) Set measurement period, it must be **identical** for all wireless sensors!
- 2) Set Net, it must be identical for all devices!
- 3) Live-Mode, as shown.
- 4) Activate recording.

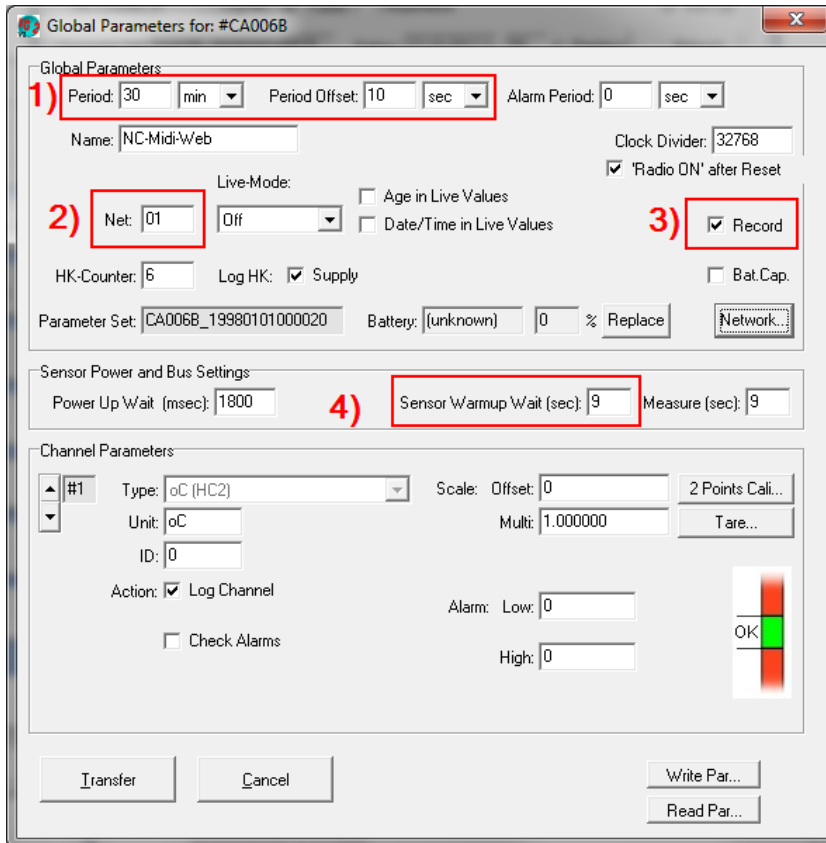
Transfer the configuration to the remote-datalogger by clicking „Transfer“. Conclude with synchronising the time and deleting the datalogger.

5.7.3. Configure the internet-datalogger

The send measured values (live values) of the remote-datalogger (wireless sensor) are to be recorded by the internet-datalogger. Every value of one remote-datalogger uses one channel of the internet datalogger. A remote-datalogger measuring e.g. 6 values requires the configuration of 6 channels on the internet-datalogger.

Global Parameters:

The general options of the internet datalogger are set here.



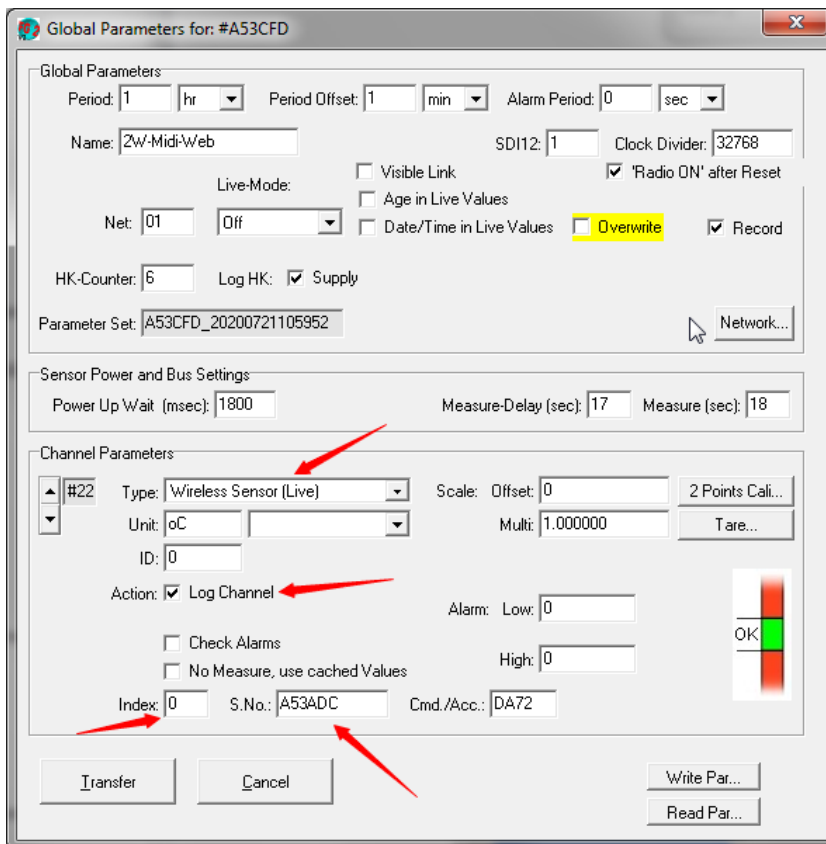
- 1) Set measurement period identical to the wireless sensors period adding a small Offset of 10 seconds or more. This is done to prevent a reading of data during measurement progress of the remote-datalogger.
- 2) Set Net identical.
- 3) Activate recording.
- 4) Set time to 9 seconds.
 - In case of problems while collecting the live data, set time to 18 seconds.
 - The adjacent value, „Measure (sec)“, should be set the same or better a higher value than „Sensor Warmup“.

Channel Parameters:

You have to configure each channel individually to record the data of the corresponding channel on the remote-datalogger.

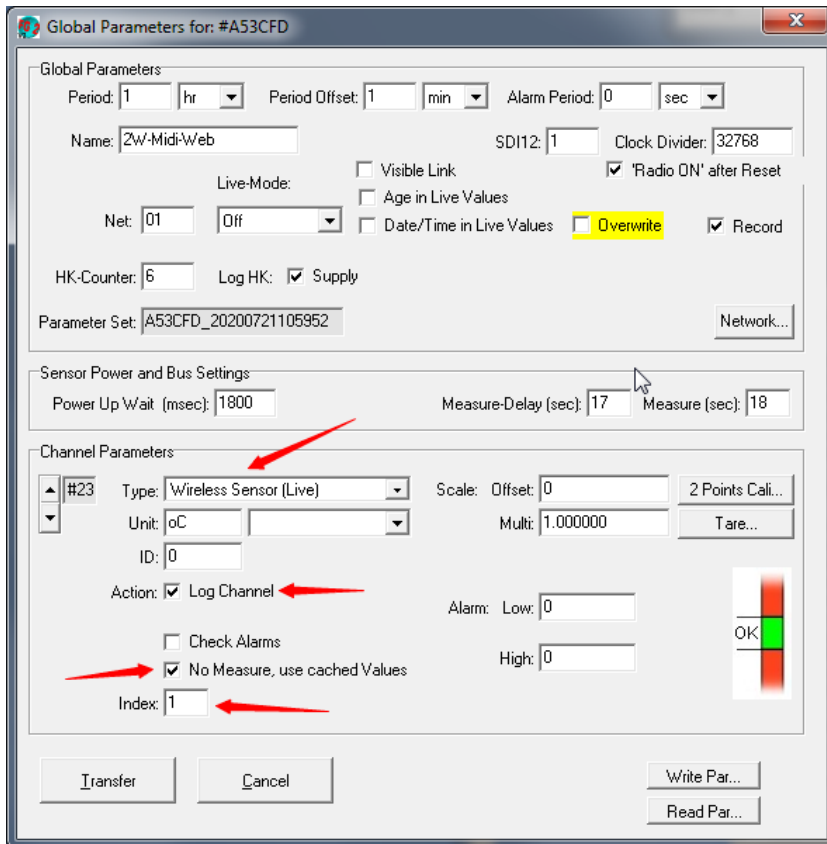
The configuration for this example will record 6 measured values.

Step 1)



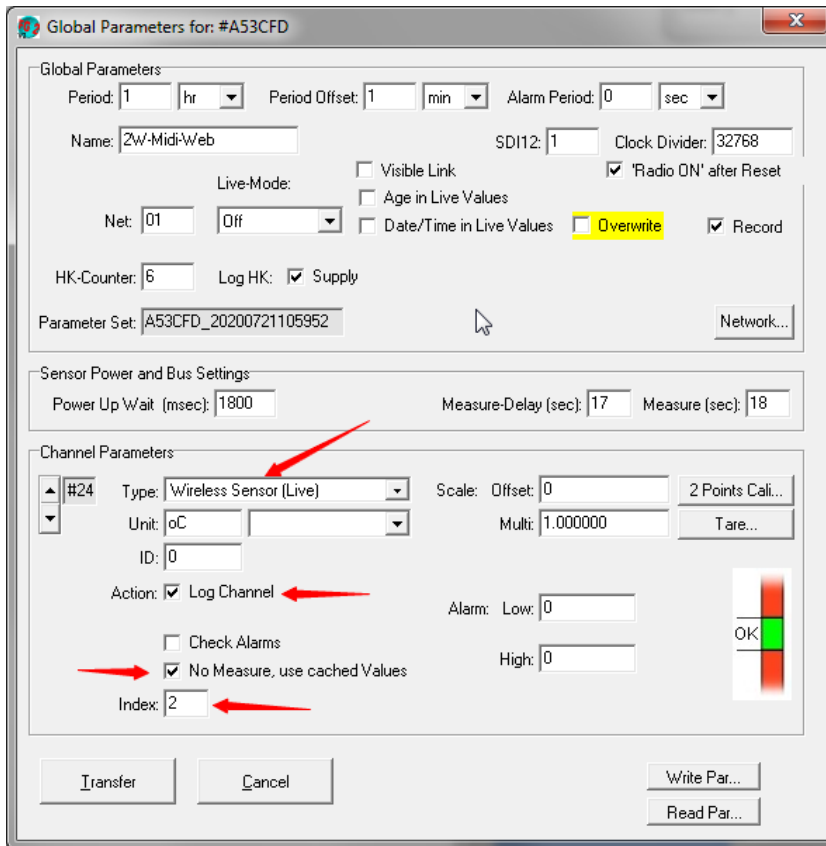
- 1) Choose channel for recording. In the example: Channel 22 for Minilogger A53ADC.
- 2) Set Type to „Wireless“.
- 3) Register the serial number of the Minilogger in „S.No.“. „Cmd/Acc“: see label on the Minilogger.
- 4) Set **Index 0** for the first value of the Minilogger.
 → To receive data from a “DALLAS-type Minilogger” read the note below!
- 5) Activate Log Channel for recording.

Step 2)



- 1) Choose the next channel for the second value of the Minilogger, here 23.
- 2) Set Type to „Wireless“.
- 3) Activate Log Channel for recording.
- 4) Activate „No Measure, use...“, since the data originates from the same source.
See previous channel.
- 5) Set Index 1 for the second value of the Minilogger.

Step 3)



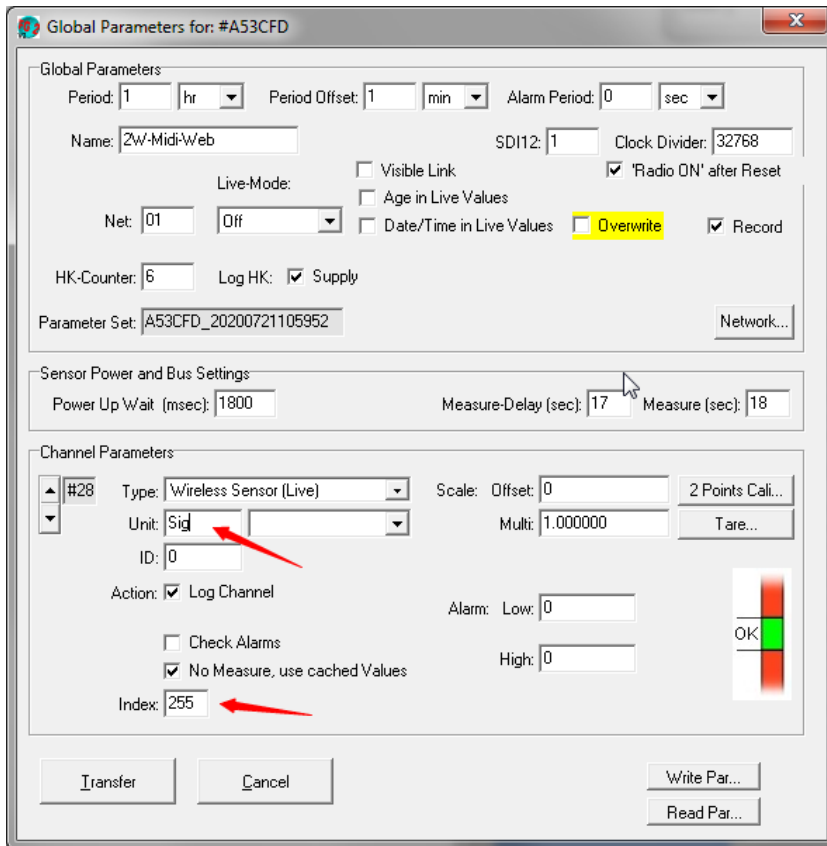
- 1) Choose the next channel for the second value of the Minilogger, here 24.
- 2) Set Type to „Wireless“.
- 3) Activate Log Channel for recording.
- 4) Activate „No Measure, use...“.
- 5) Set Index 2 for the third value of the Minilogger.

➔ Additional step, only necessary for **“DALLAS-type Minilogger”** (see below):
Set “Multi: 0.01” for every single channel.

Step 4)

Repeat this procedure for the 3 remaining channels of the particular wireless Minilogger.

Step 5)



Last channel:

This channel can be recorded optionally via the Index 255. This is the signal strength with which the Minilogger is received by the data collector.

Transfer the configuration to the internet-datalogger by clicking „Transfer“. Conclude with synchronising the time and deleting the datalogger.

- ➔ To deactivate the recording of a Minilogger by the data collector (internet datalogger), remove the ticks at „Log Channel“ for all associated indices with the Minilogger.

Special case for “DALLAS-type Minilogger”

Configure your Internet-Datalogger by following steps 1 – 4.

But use index:

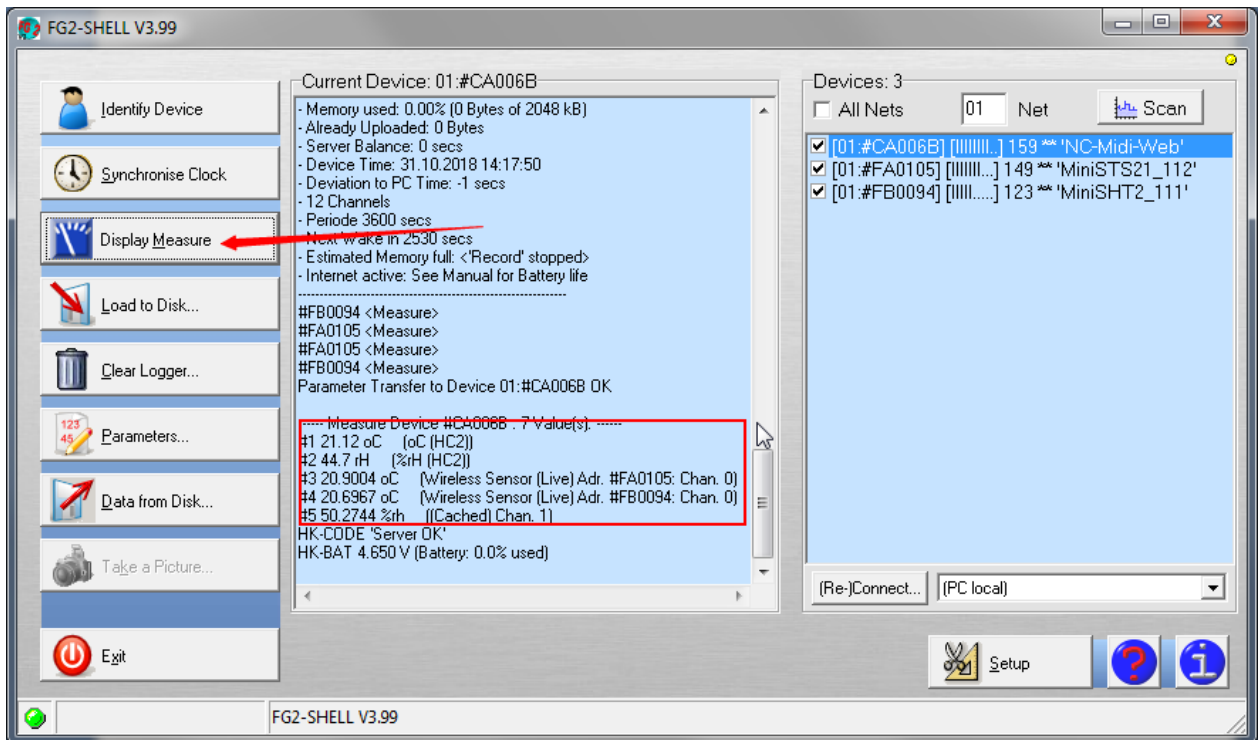
- **192** as first index for the first value.
- **193** for the second value. And so on...

5.7.4. Measurement test, signal strength, troubleshooting

Test:

Click on „Display Measure“ in the middle window.

- Locally connected sensors are displayed-
- The last measured values from the remote datalogger are displayed as “wireless sensor”.



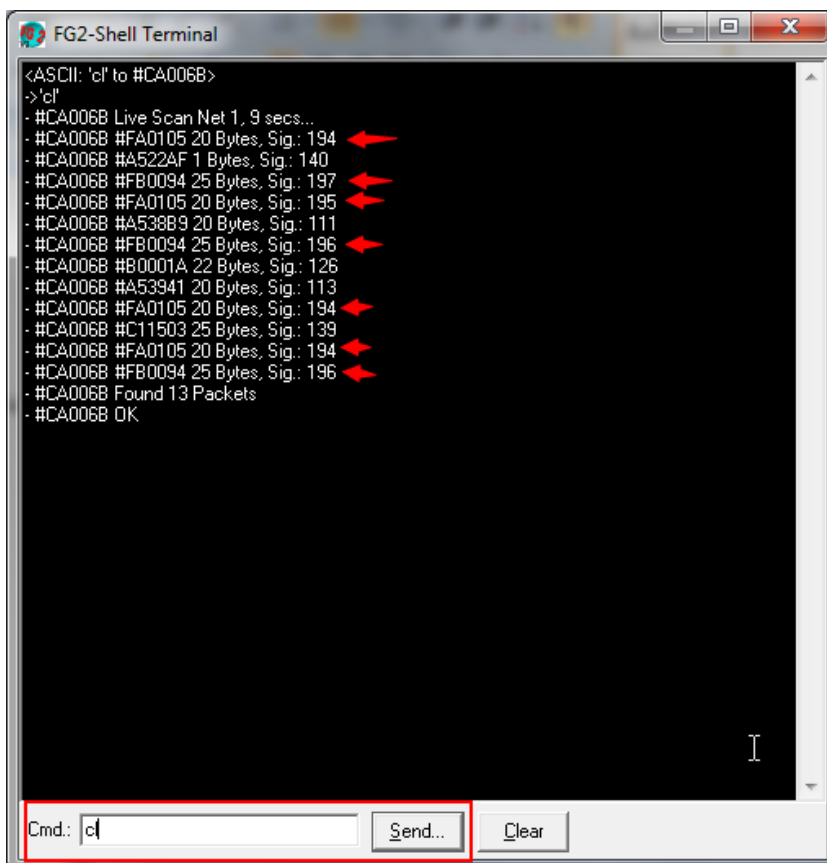
Troubleshooting:

If instead of the measured values „Get Measure Failed“ is shown in the middle window, increase the value of the parameter „Measure (sec)“. See „Global Parameters“, point 4) of chapter 5.7.3.

If there are no live values or gaps in the recorded data while running, check the received Signal Strength of the internet-datalogger:

- 1) Open the FG2-Shells terminal via click on „Setup“, then „Terminal“.
- 2) Type „cl“ in the Cmd. line and click „Send“.
- 3) All visible wireless dataloggers for the internet-datalogger are listed.

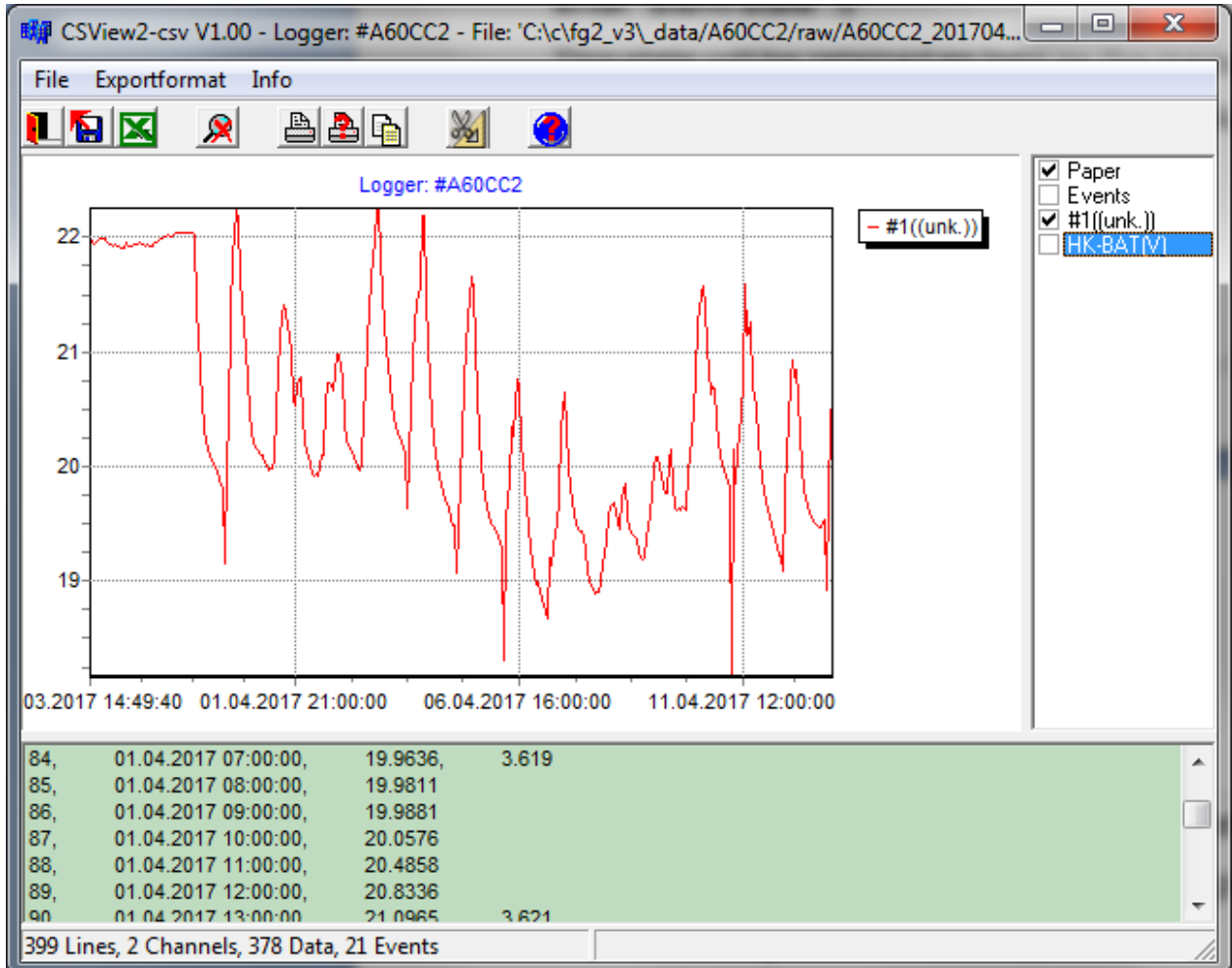
Check the shown Signal strength of the configured wireless sensors. To do so, decrease or increase the distance of the wireless sensors to the internet datalogger and type in „cl“ and send again.



```
<ASCII: 'cl' to #CA006B>
->'cl'
- #CA006B Live Scan Net 1, 9 secs...
- #CA006B #FA0105 20 Bytes, Sig.: 194
- #CA006B #A522AF 1 Bytes, Sig.: 140
- #CA006B #FB0094 25 Bytes, Sig.: 197
- #CA006B #FA0105 20 Bytes, Sig.: 195
- #CA006B #A538B9 20 Bytes, Sig.: 111
- #CA006B #FB0094 25 Bytes, Sig.: 196
- #CA006B #B0001A 22 Bytes, Sig.: 126
- #CA006B #A53941 20 Bytes, Sig.: 113
- #CA006B #FA0105 20 Bytes, Sig.: 194
- #CA006B #C11503 25 Bytes, Sig.: 139
- #CA006B #FA0105 20 Bytes, Sig.: 194
- #CA006B #FB0094 25 Bytes, Sig.: 196
- #CA006B Found 13 Packets
- #CA006B OK
```

Cmd.: cl

5.8 CSView 2



5.9 Action Log

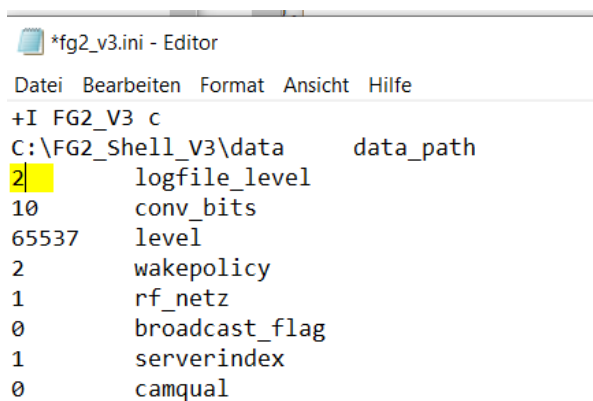
Since version 4.04 an optional “action log file” can be created.

For each data-logger a separate file will be created. All actions for this data-logger, displayed at the “main-windows” of the FG2-Shell, will be written to this file.

- ➔ Wrong settings at “fg2_v3.ini” or changes to any other file at the installation-folder may cause malfunction of the FG2-Shell!

Enable the “activity log”:

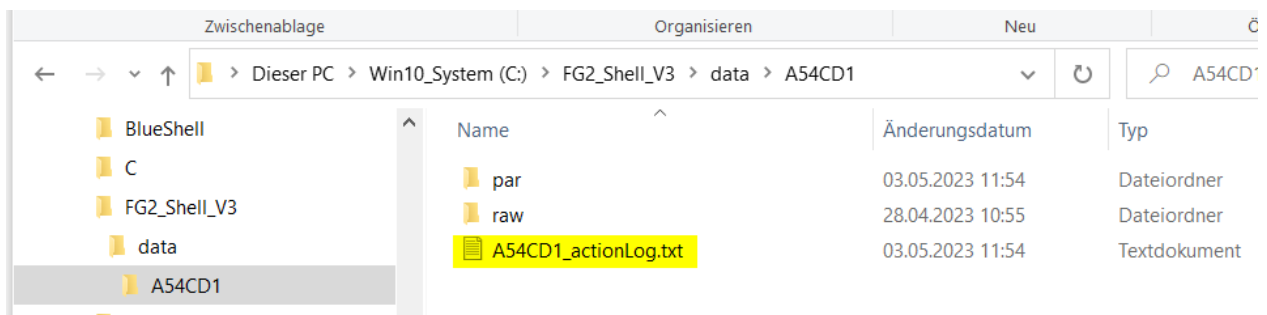
- Navigate to the installation-path of FG2-Shell, default: "C:\FG2_Shell_V3".
- Open the file “fg2_v3.ini” with a text-editor.
- Set “logfile_level” to ‘2’. Default: ‘0’.



```
*fg2_v3.ini - Editor
Datei Bearbeiten Format Ansicht Hilfe
+I FG2_V3 c
C:\FG2_Shell_V3\data data_path
2 logfile_level
10 conv_bits
65537 level
2 wakepolicy
1 rf_netz
0 broadcast_flag
1 serverindex
0 camqual
```

Open the log-file:

- Navigate to the data-path of FG2-Shell. Default:
- Open the sub-folder, named like the serial-number of your data-logger.
- “..._actionLog.txt” can be opened with a text-editor.



6. Troubleshooting

→ For updated FAQ please visit: <https://www.thermistor-string.com/questions>

Why do I get unrealistic values by clicking “Display Measure” or “Load to Disk”?

- Update Firmware and install latest FG2-Shell.
- For Thermistor-Strings: Use “Scan Sensors”, see 5.6.

Parameters of the datalogger are gone?

- You might have updated “xyz_param.bin”.

The device list is empty?

- Check USB Dongle. See: 5.1.

Only a specific datalogger is not shown at device list?

- Check battery or distance between device and USB-Dongle

Bad wireless signal?

- Check antenna, might be broken.
- Use a “USB extension cable” (regular one from electronics store) to connect the USB-Dongle.

Device Clock is wrong?

- Synchronize your PC time with Internet-Time.
- Changes of the ambient temperature can affect the device-time.

No data recorded?

- Check Battery.
- Check parameter “Record”, see “Global Parameters” 5.5.

Firmware reset is displayed /recorded?

- Check battery.