FlexGate Windows-Software

Userguide
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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 fordongle connection; 5.2: chapter added.
31.1.19: 5.5, 5.6: Added warning for short logging period.
1.4.19: 5.6: Updated procedure of string-configuration.
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.

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

For more detailed information this document links to other manuals.
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.
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.
Choose the correct Windows-Software for your datalogger

Start

Is the Wireless USB-Dongle labeled as 'FG2'? No → Flash the latest Wireless USB-Dongle firmware.

Yes

- Install and start FG2_Shell.
- Enable Checkbox 'All Nets'.

Device-List:

Is the serial number of your datalogger displayed in grey colour and marked as 'GPSW'? Yes → Close FG2_Shell. Your datalogger is running on Flexgate 1 0SI.

No → Your datalogger is running on Flexgate 2 0SI!

Use the GPSW_Shell to communicate with your datalogger.

You can use the FG2_Shell to communicate with your datalogger.
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.
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:**
ftp://80.153.164.175/GeoPrec/Docu_Software/GP_Wireless/Setup_GP5W_Shell_2V07_02_GP.exe

**FG2_Shell:**

Wireless-USB-Dongle firmware (European 433 MHz EU-version):
ftp://80.153.164.175/firmware/Flexgate2/dongle_fg2_usb/FG2_FG1_Hybrid_433MHz/dongle433_3V1.bin

Wireless-USB-Dongle firmware (915 MHz US-version):
ftp://80.153.164.175/firmware/Flexgate2/dongle_fg2_usb/FG2_FG1_Hybrid_915MHz/dongle905_3v1_fq2andgp5w.bin

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:

![Setup window with options]

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 no such device is 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!

→ 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:

![Accesscode required window](image)

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.

![FG2-SHELL V3.00 window](image)

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 “CSView 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).

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 an 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:
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 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 an 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!
5.6 Advanced configuration for Termistorstrings

To use a Precision- or Dallas-Termistorstring 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 Termistorstring!

**Precision-Termistorstring (TNode, TNodeEX,TNodeHD):**
The MLog5W for Precision-Termistorstrings 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 Termistorstring 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”, a new window is displayed.
3) Click “Re-Scan” (1) to collect information of the string. This will take a few seconds!
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 and adjust the following parameters for each channel (see screenshot):

- **Type**: Adjust this value to correspond with the connected sensor-type.
- **Action**: "Log Channel" activated.
- **S.No.**: contains the digital address for this sensor.

8) Click “Transfer” to write the parameters to the datalogger.
Dallas-Termistorstring:

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

Each sensor of the Termistorstring 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):
- 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 CSView 2

Tbd.