

User Manual for the SmartGeocache



Firmware Version 5.0

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Chapter 1 – Important notes to the operation of the module

Please make sure that your Smartphone/Tablet is connected to the module's WiFi.

Should there be issues loading a website, try to re-load it again. Sometimes the module needs more time to load a website. Wait at least a minute, before you tap again on any button. If nothing works, it most of the times helps to unplug and plug in the battery again. Then you must make sure afterwards, to reconnect to the WiFi of the module.

Other radio signals or wireless networks can significantly interfere with the signal connection! This is an important fact to know, because normally it is NOT the module which is presenting the bug, but it simply is due to something else that is mucking up. You can find out, if you set up the device and try it at home. For the modules being hidden outdoor, as Geocaching is indeed an Outdoor Sport, the usage condition as well as the connection quality are fairly different where the Cacher finds himself than being at home, setting up the device. So please don't let fool yourself, if during the set up there might occur some problems. It could indeed help to set up the device in a different location where there are no or only weak radio signals. If you scan for WiFi networks with your Smartphone, you can easily find out how many networks are in that area and how strong they will interfere with the device. It can then also help to turn off „Mobile Data“ or „smart network change“ of your Smartphone/Tablet, in order to enhance the quality of the WiFi connection between the module and your smart mobile device. Please note, that during the connection to the module's WiFi you won't have access to the WorldWideWeb (Internet)!

Make sure to not drop water or other fluids on the device and that there won't be any humidity like condensation water. This might lead to a permanent failure of the device. You should always use the device in a proper manner. Every user acts under personal responsibility. Always use a voltage supply (power bank / power supply unit) that is short-circuit-proof! Otherwise there might be a damage of the voltage source or the device itself upon a short-circuit (e.g. due to moisture).

oLED-Display:

If your SmartGeocache has mounted an oLED-Display, and you are using it with a battery or a Powersupply and your SmartGeocache will be switched on constantly, and if you always show the same text on the oLED-Display for weeks, the oLED-Display will lose its brightness and this text will "burn" into the Display. IMPORTANT: In this case make sure you choose the "scroll Text" option, for your texts that you show on the oLED-Display. This way the SmartGeocache will not show same the text for weeks! It will only show the text one time, and then the display will stay dark.

Lay out the Cache / Hints for the installation:

When laying out the Cache, make sure to adhere to the guidelines. It is essential to include a log book in paper form! When creating the Listing, set the radio signal attribution, so that every Cacher knows that special radio hardware has been built-in which needs special ECA (Smartphone).

Write also in this Listing that a wireless compatible Smartphone and eventually a Power bank with a Micro-USB-Cable are needed. At the location you can also include a small guide that explains your Cache.

You can, for example, build your SmartGeocache into a bird house, in order to protect it from rain. To make sure that the SmartGeocache won't be stolen, build it into a double bottom or behind a double rear panel, and you should attach the USB Cable in to the area where the Cacher has access to. The cable should be strain-relieved attaching it with cable straps inside the housing, so that it won't be possible to pull it out by mistake.

Energy Management & Solar Power:

You have the Option that the SmartGeocache will enter energysafing mode and wake up after a periode of time. This enables Battery and Solar usage. This way you can build a Station that sleeps some time and is not always accessible.

Only for the SmartGeocache V5.0 Mini Board:

The Voltage Regulator on this Board has a Dropout-Voltage of ca. 200mV, and the SmartGeocache needs 3,3V. This means that we need at least inbetween 3.5V and 5V at the USB Connector. Perfect for this scenario is a 18560 Lithium battery which works exactly inbetween these Voltages 3,7V (empty) 4,2V (full). A Capacity of about 3000-5000mAh should be enough to provide the SGC for 1 hour a day with its needed current. A Solarcell with about 5W / 6V together with a recharging electronic like a very cheap TP4056 for the Lithium Battery would provide enough power to drive the SGC. You should also plan to use a USB Cable with a on/off Switch, so the Geocacher can switch the SGC on and off by themselves. That the SGC won't suck all the current out of the battery if a geocacher forgets to turn off the SGC, you can activate the Energysafing Mode. Navigate to the Admin Area → Energy Management and choose "Awake time during Webpage User activity: 10 minutes"

Only for the SmartGeocache V5.0 Mega Board:

The Voltage Regulator on this Board has a Dropout-Voltage of max. 1300mV, it is very Powerfull and can handle high currents, to provide Power for external Modules which you can be connected to this Board via the 3.3V Pin. At least it needs 4,8V as Power Supply input. This means that the Mega Board can't be connected directly to a 18560 Lithium battery like the Mini Board. A higher Voltage is required. This can be achieved by using a Step-Up-Voltage-Regulator to get the 5V. In general it is not recommended to use Solar Power with the Mega Board because of this reason, because it is very unefficient, but it is not impossible to do so. You would just need a bigger solar cell (5W to 10W & 6Volt), a 18560 Lithium battery with 5000mah, a Step-Up-Regulator with 5V output, and a recharging board for the battery.

Extensions:

The I/O pins of the SmartGeocache can only provide 3.3V // 14mA. If you suck more Current from the Pins the SmartGeocache may be destroyed! Please read

Chapter 5 – Extensions if you want to connect additional Modules to the SmartGeocache!

Technical data: SmartGeocache

Operation temperature range: -40°C to +125°C (typical 20°C)

Power supply: 5Vdc (Micro USB Connector)

Dimensions: ca. 40x32x12 mm

Weight: ca. 10g

WiFi range: Indoor about 10m / Outdoor about 100M

Chapter 2 – Initial setup of the Hardware:

- Attach the USB Power bank with Micro USB Cable at the Micro USB Plug of the WiFi Module. (5V power supply)
- Scan WiFi networks with your Smartphone
- Log into the SmartGeocache WiFi. By default no password has been set.
- Open the Web browser on your Smartphone/Tablet.
- Open the following Web Page: <http://192.168.4.1> or also possible: <http://smart.geocache>

Chapter 3 – The Admin Area:

Do NOT tell your Admin Login Password and your Admin WiFi Password to anybody! These passwords are secret! Even the Manufacturer would never ask for them!

The SmartGeocache has two WiFi Modes: 1. **Normal Mode** 2. **Admin Mode** The difference is, the Normal Mode has NO WiFi password. The Admin Mode has a WiFi password.

How to put the SmartGeocache into Admin Mode:

Open the Webpage: <http://192.168.4.1/adminlogin> or also possible <http://smart.geocache/adminlogin>

After you typed in the **"Admin Login Password"** the SmartGeocache will restart and enter the Admin Mode. It will host a secured WiFi named **"SGC"**. Now connect your device to this WiFi by using the **"Admin WiFi Password"**. After this, open the Webpage again : <http://192.168.4.1/adminlogin> or also possible <http://smart.geocache/adminlogin>

Now you can edit the SmartGeocache settings and create your own Homepage.

Make sure to keep your Passwords in mind and to note them for later reference! If you forget the Passwords you will lose the access to the Admin Area!

If a wrong WiFi Password will be typed in, it might help to delete the login data that is saved in the Smartphone, before you type in the password again.

A timer is running in the background, so if you don't load any webpage in the Admin Area for more than 30 minutes, you will be logged out and the SmartGeocache will restart in normal Geocaching Mode without a WiFi Password. You can also logout by pressing the **"Admin Mode Logout"** Button in the Menu. Make sure to hit this Button when you are finished with your Settings and your WiFi Homepage! Otherwise Geocachers won't be able to view your Webpage!

Chapter 4 – Creation of a custom Homepage for the SmartGeocache:

For the SmartGeocache V4.0 and higher you have two ways to create a Homepage.

The first option is less restricted. You can create your personal Layouts in HTML and CSS and take even more advantage of the Microcontroller's Ressources.

The second option is quite easy to manage and the result is quite good, even if the restrictions are fairly tight. The Onboard Homepage Editor really simplifies the creation of your own Homepage on your Smartphone. This small Homepage Toolkit makes it possible, that for option number 2 you don't even need any knowledge about HTML or CSS.

Option 1 - Homepage design for advanced users with HTML / CSS Knowledge :

Connect your WiFi capable device and log into the Admin Area via the Webbrowser, then go to the Homepage Editor.

There you can upload your *.html* and *.css* files. In the menu tab **"Help and Documentation"** you will find further information, how you can implement items.

For example: Pictures, Audios, Logbook, Buttons to activate the Laserpointer / Door locking etc.

After uploading your Websites, select the uploaded Webpage within the Homepage Editor and click on *"Settings"*. Here you might need to perform further settings. If you have implemented, for example, the Logbook on this Webpage, then you have to select in the drop down menu *"implement Logbook as HTML Code manually"*.

The reason for this is, that the SmartGeocache only has to release/unlock this feature, if exactly that Webpage had been opened by the Geocacher.

This helps to protect from any cheaters who might want to search for a shorter way.

It is important here that you use an App for Text/HTML editing on your Smartphone or your PC (e.g. Windows Notepad) in order to create your *.html* files and then upload these onto the SmartGeocache using the Upload feature. On the Internet you can find Apps and HTML Editors to Download for free that you can use for Version 1. These also provide CODE Highlighting and other Features like Debugging, the Fixing of HTML Errors. Features which simplify and improve the Creation and Editing of your own HTML Files.

Option 2 - The Onboard Homepage Toolkit - without HTML / CSS Knowledge :

Please read the next section completely and chronologically, because the individual passages build on each other!

Connect your WiFi / WLAN capable device and log in to the admin area using the Web browser.

Navigate to the homepage editor.

Create the start page of the SmartGeocache:

Click **"Create New Page"**. First name the page, do not use spaces or special characters. You should then enter a button text for the navigation, e.g. **"Station 1"** or **"Home"** (spaces / special characters are allowed here!). Then select **"This IS the start page of the SmartGeocache"** in the dropdown menu. Then select **"Show a link to this page in the navigation bar"** from the dropdown menu. Furthermore, there are many other options available to you to design your homepage: layouts, styles, navigation elements, automatic implementation of buttons, password entry field, log book etc. in the layout of the page. Now click on **Save** so you will be forwarded to the text content of this page.

Various text fields are available, which are arranged differently depending on the layout and display size (responsive design), whereby the header will always be at the top and the footer will always be at the bottom. If you make a line break with "Enter" in the text fields, then write a **
** to make a line break on your website. For example, you can insert headings into the text as follows: **<H1>** Heading **</H1>**

Header text area:

For example, enter your GC code or the title of your Geocache here. If you do not save any header text, the header field is hidden on your page.

By default, if no header text is stored, a text will be shown, as an example of a header with HTML code. This should be a little help, especially for HTML beginners, to store headings / line breaks / text size. So, for example, simply change the GC code from the header text displayed by default and then press the **"Save"** button.

Footer text area:

Be careful not to make the footer too long if you have selected the option **"Footer always stays at the bottom of the browser"** on the settings page (default setting), otherwise it could cover another text field.

Depending on the size of your page, you could also choose the option **"Footer does NOT always stay at the bottom of the browser"**, but this option should only be selected if the page really has enough content to fill a complete Smartphone display. Enter your GC code in the footer or the title of your Geocache or something like **"A Geocache from Supercacher79"**.

The **footer** and **header** are mainly used to add a personal note to your cache, but be discreet and not too pushy :-D

In principle, you can use the other text fields to save texts. On the start page there is a welcome text or a kind of introductory text for the "Story" of your Geocache. Then press the **"Save"** button and look at the result at the bottom of the iFrame by clicking on the **"Preview Page"** button.

Create a puzzle /mystery page:

In the homepage editor, click on **"Create New Page"**. First set a name for this page, do not use spaces or special characters. You should then enter a button text for the navigation, e.g. **"The riddle"** (spaces / special characters are allowed here!). Then select **"This is NOT the start page of SmartGeocache"** in the dropdown menu. Then select **"Show a link to this page in the navigation bar"** from the drop down menu. After you have chosen a layout & style, it makes sense to implement a password entry field on this page. To do this, select the option **"Embed a Password Field in the 3. Text Area"**. Press **"Save"** and you will be guided to the text content of your new website. Enter your header and footer here as on the start page. Then paste your task text into the text field **"2. Text Area"**, e.g. **"What is 1000 + 1000?"** Then press the **"Save"** button and look at the result at the bottom of the iFrame by clicking on the **"Preview Page"** button.

Create an answer page with a Logbook to match your puzzle /mytery page:

In the homepage editor, click on **"Create New Page"**. First set a name for this page, do not use spaces or special characters.

Then select **"This is NOT the start page of SmartGeocache"** in the dropdown menu. Then select **"Secret Page => Don't show this Page in the Navigation"** from the drop down menu. This means that no link is created in the homepage navigation (Sidebar / Navbar). Now it is important to add a password to this answer page. This page should only be opened if the correct password was entered on the previous puzzle/mystery page. The password that you now save should therefore be the answer to the previously puzzled question. In our example, the password to be saved would be : **2000**

After you have also selected a layout & style, it makes sense to implement a Logbook on this page, for example. To do this, select the option **"Automatically include Logbook in the 2. Text Area"**. Press **"Save"** and you will be guided to the text content of your new website. Enter your header and footer here, as in the start page & puzzle page. Then paste your final text with congratulations in the **"1. Text Area"**. For example, write **"Well done, you can now log in and go to the next station N42 51.323 E8 52.123"**

Press **"Save"** and look at the result at the bottom of the iFrame by clicking the **"Preview Page"** button.

Create a Help Page:

Remember, you have an entire web server at your disposal and therefore a lot of potential to provide the cache with background information and to give your cache more depth. The cachers like that and will reward it with FP. It is therefore always advisable to add a help page to the puzzles. For example, with texts from a free encyclopedia (Wikipedia) specifically for their puzzles.

In the homepage editor, click on **"Create New Page"**. Enter a name for the page **"Help"** and a button text for the navigation bar: **"Help"**. Choose the following options:

"This is NOT the start page of the SmartGeocache"

"Show a link to this page in the navigation"

Then click on **"Save"** and you will be taken to the text input. Save headers and footers as in the previous pages. Then copy your help text from the free encyclopedia into one of the text fields and click on **"Save"**.

Embed files:

Images or media can always be helpful to support the websites and the story of your Geocache. If you have a Morse code, for example, a picture of a Morse apparatus from the 1800s would be nice. If you have uploaded an image, audio or short video to the SmartGeocache in the Homepage Editor, you can also integrate these files into your pages. This can be done manually as HTML code or automatically. Select one of its pages in the Homepage Editor and click on **"Settings"**. Scroll down to **"Embed file in this page"** and select the file first, and then the position (top, middle, left, right) which this file should be included. PNG GIF JPG MP3 MP4 PDF are supported. In the **"Help and Documentation"** of the Homepage Editor you will find additional information on how you can easily implement additional elements yourself as HTML code in the text fields.

Navigation Editor:

In the homepage editor you also have the option to edit your navigation (Navbar / Sidebar). This is done in the navigation editor. You can make changes to the navigation of your homepage afterwards. You can determine the arrangement / order of the buttons and, if necessary, delete or add buttons again. It is quite possible that you delete pages and then these are still displayed in the navigation, remove them using the navigation editor.

Create a backup of the pages:

Unfortunately the RAM of the module is very limited, which is why it was not easily possible to offer a backup function or a download of the saved websites. As a workaround, however, you can do the following relatively easily: First open a text editing program such as Windows Notepad with which you can also save files as .html. Then open your website in the Web browser and use the possibility to display the source code using a Web browser. Now copy this source code into your text editing program (Notepad) and save it as an .html file, with the exact same name as your website, and pay attention to upper and lower case in the name. Repeat these steps with your remaining pages. Now you have saved all pages on your device and can upload them to your SmartGeocache in the homepage editor using the upload function. You also now have full access to the CSS / HTML source code and can edit it as you wish without the tight corset of the onboard homepage editor.

Chapter 5 – Extentions: How to connect additional Modules to the SmartGeocache

Important: please read this chapter completely if you want to connect Extention Modules to the SmartGeocache.

I/O Pin-Settings must be changed if you want to connect Extentions to the SmartGeocache in the **Admin Area** → **"Extention Menu"**

It is also possible to use the Pins as digital Inputs, to connect your own maker electronics, for example an Arduino with your own designed "Hot-Wire-Game" or other stuff like this.

Please be very careful when connecting external Modules, a wrong connection or choosing the wrong settings in the Extention Menu could damage the SmartGeocache or your Modules! The SmartGeocache works with 3.3Volt and 0Volt on its Input/Output-Pins. Never connect a higher or lower Voltage to the I/O-Pins of the SmartGeocache! Pin2 has a Pulldown-Resistor (0V) connected, while all other I/O-Pins will have a "pullup-Resistor" (3.3V) in the "digital Input Mode". Attention: The SmartGeocache will not boot if you connect the following Level : Pin2-HIGH // Pin3-LOW // Pin4-LOW

Additionally Pin3 and Pin4 will toggle for 0.5 sec during the boot progress (startup) of the SmartGeocache.

The I/O Pins of the SmartGeocache can only provide 3.3V // 14mA. If you draw more Current from them the SmartGeocache can be damaged.

First step BEFORE you connect your Extentions: Choose a I/O-Pin and choose the right options in the Extention Menu within the Admin Area

Pin3 and Pin4 can be used with all Extentions, but they will toggle for 0.5 sec during the boot progress (startup) of the SmartGeocache. Pin2 should **NOT** be connected to Relay Extention and Morsecode Extention, if you do so the SmartGeocache boot will fail! It won't start anymore until you disconnect these Extentions from Pin2. Best way to use Pin2 is to use it with a Servo as a "WiFi Door Lock" but you can also use it in digital Output Mode with LED / Laser / UV Extentions. In the lower section of this Chapter you will find Pictures of how to connect your Extentions to the SmartGeocache and a discription of how to set them up and how test them.

Different Settings in the Extention Menu:

Mode: Digital Static Output & Digital Impulsive Output

For the Relay-Extention, LED-Extention, UV-Extention, Laser-Extention, Morsecode-Extention, Audio-Extention please choose **"Mode: Digital Static Output"** or **"Mode: Digital Impulsive Output"**. With **"Output-Start-State: "** you can choose, whether the Extention will be **on (HIGH)** or **off (LOW)** after the SmartGeocache was turned on. If you choose **Digital Static Output**, the Output-Pin will only change its State when you push the On/Off Button on your Homepage, in opposite to that, if you choose **"Digital Impulsive Output"** the Output-Pin will turn off again after 2 sec.

Mode: Servo

For the Extention: WiFi-Door-Lock please choose **"Mode: Servo"**

Additionally you can set the Servo-Start-Position and the Servo-End-Position. These Values are there to adjust the Rotation of the Door Lock to your Door. If you make the Servo-Start-Position higher than the Servo-End-Position the Door Lock will change its rotation direction (clockwise / counterclockwise). Type in Values in between 0 and 180.

Mode: Digital Input

The SmartGeocache V5.0 has the Option to enable / disable Webpages externally. For example: If you have built a "Hot-Wire-Game" with an Arduino that works with 3.3Volt, you can connect it to a I/O-Pin of the SmartGeocache. The SmartGeocache works with 0Volt to 3,3Volt! Do NEVER connect higher or lower Voltages to the I/O-Pins of the SmartGeocache. Your Arduino will recognize if the "Hot-Wire-Game" was played successfully by the Geocacher, then it will switch the Output-Pin from High (3.3V) to Low(0V). The Output Pin of the Arduino is connected to the Input Pin of the SmartGeocache e.g. Pin 1. Choose Pin1 in the Extention Menu and connect your Arduino Output there. Navigate in the Admin Area to → **"Homepage Editor"**, then choose one of your Webpages, and click on **"Settings"**. Then choose the Pin that is connected to your Arduino in the Menu: **"Enable this Page via external connection"** → **"Enable 1 / Input Pin 1 or Serial"** and save the Settings.

As a conclusion: If you choose **"digital Input: Low Active"** in the extention Menu, a LOW-Level (0Volt) at the Input Pin 1 will now enable your Webpage, while a HIGH-Level (3,3 Volt) will disable your Webpage, which means this page can't be loaded. If you choose **"digital Input: High Active"** the logic will be inverted. This makes it possible to get a better interaction between your DIY-Projects and the SmartGeocache, you can also connect digital Sensors pretty easy. For example, first your Riddles must be solved on the Webpage, then your own DIY-Electronic games must be solved, and after this, the Geocacher can continue on the Webpage of the SmartGeocache or open a Door-Lock and log the cache in the Logbook.

I/O Pin-Description SmartGeocache V5.0 Mini :

Pin1 – Pin6: Input / Output Control Signals for external Modules (Extentions)

5V – Pins: 5Volt Supply for Servos or other external Modules (Extentions)

0V – Pins: GND Supply for Servos and other external Modules (Extentions)

Attention! Pin1 work s with 0Volt to 3.3V! A higher or Lower Voltage can damage the Module! The 5 Volt Pins are only there to serve the needed Power for Extention-Modules like Servos and so on.



I/O Pin-Description SmartGeocache V5.0 Mega :

RX-Pin: Serial Input for Enable 1-10
Transmission Rate: 115200 BAUD

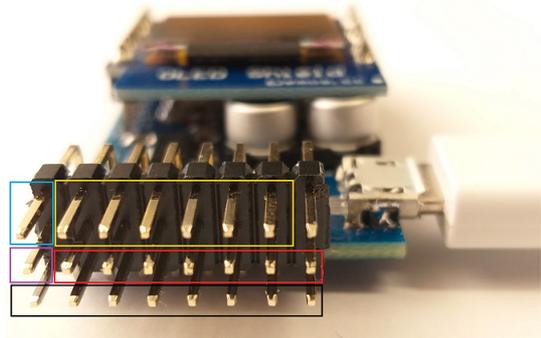
3V3 Pin: Supply Power (3.3Volt) for external
Modules (Extentions)

Pin1 – Pin6: Input / Output Control Signals for
external Modules (Extentions)

5V – Pins: 5Volt Supply for Servos or other
external Modules (Extentions)

0V – Pins: GND Supply for Servos and other
external Modules (Extentions)

Attention! Pin1 – Pin6 and the RX-Pin work with 0Volt to 3.3V! A higher or Lower Voltage can damage the Module! The 5 Volt Pins are only there to serve the needed Power for Extention-Modules like Servos and so on.



Rx-Pin the UART-Connection for professional DIY-Makers:

This Pin belongs to the UART-Connection, and is a digital Input. The SmartGeocache reads all serial Messages which are coming into this Pin. The data rate is 115200 BAUD. For example you can connect the TX-Pin of an Arduino to the RX-Pin of your SmartGeocache. **Your Arduino must work with 3.3V and 0V!** For Example your Arduino can belong to a hot-wire-game or something like that. When the game is finished, the Arduino can send up to 10 "Enable Messages" to the SmartGeocache. These "Enable Messages" will lock or unlock Webpages that you can select in the Homepage Editor. This makes it possible to keep your I/O Pins free to use for other Extentions like Servo Door Locks or Laserpointer or LEDs. This way your external Arduino can tell the SmartGeocache, if a game was successfully done or not. If the Geocacher has finished the game, your Webpage with Logbook or Door Lock can be opened, or other stuff can be activated via the Webpage like a Laserpointer or LEDs.

In the following Section you can see the ASCII-Instructions ("Enable Messages") that the SmartGeocache will understand and interprete to lock / unlock Webpages that are stored in the SmartGeocache

Enable / Disable:

```
<en1=1>    <en1=0>
<en2=1>    <en2=0>
<en3=1>    <en3=0>
...
<en10=1>   <en10=0>
```

In the following Section you will find Examples with Pictures of how to connect the different Extention Modules, and which options to choose in the Admin Area → Extention Menu

Please always double check the Wire connections and its Colors! A wrong Connection could damage the electronics!

Wire Color:	Voltage:	Position:
Orange / White	3.3V Control Signal	Upper Contact
Red	5 V Supply Power	Mid Contact
Black / Brown	0 V Supply Power	Lower Contact

Example: How to connect a Servo (Door Lock) to Pin 1:

1. Navigate in the Admin Area to → Extension Menu. Then choose the Settings

Pin-Mode: "Servo", then click → "Save"

In principal you can use all Pins 1 – 6 for Servo Mode

2. Disconnect the Power from the SmartGeocache (Micro-USB-Port) so that it is shut down.

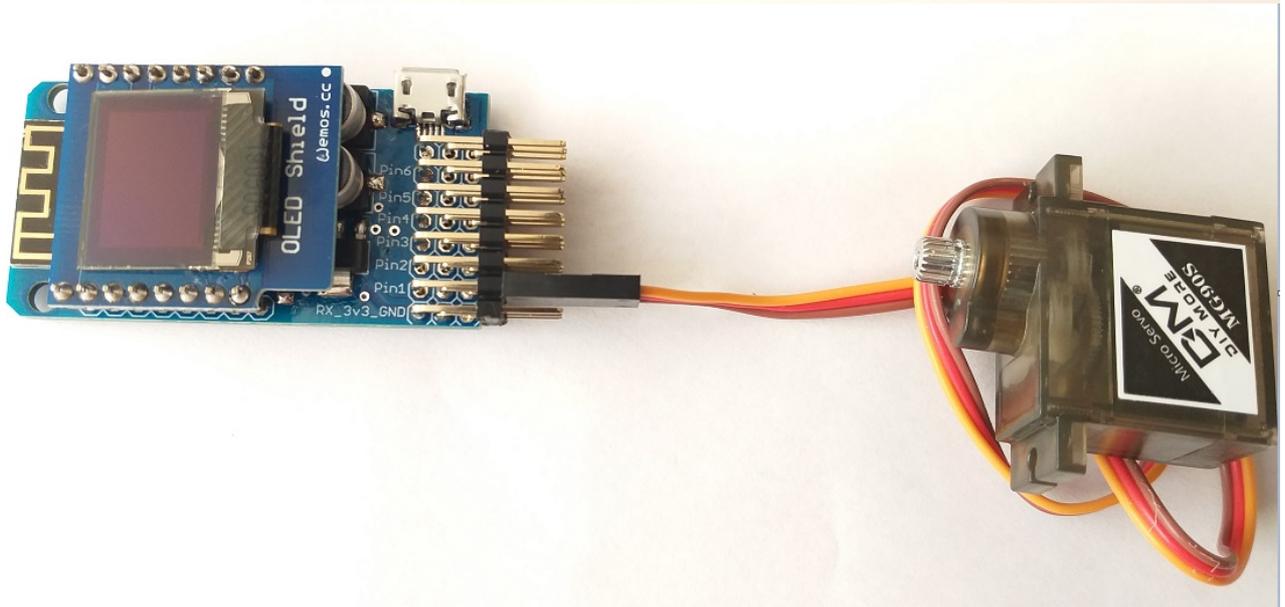
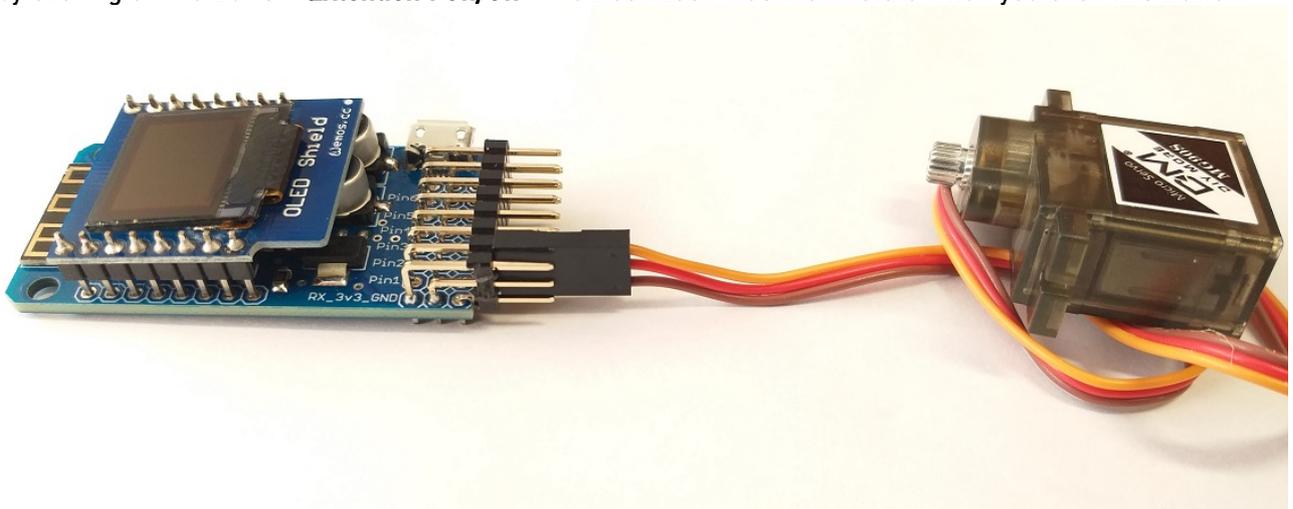
3. Connect your Extension to the Pin that you chose (e.g. Pin 1 like shown in the Picture below!)

4. Connect Power to the SmartGeocache Micro-USB-Port again.

5. Make a Test Webpage: Navigate in the **Admin Area** → **Homepage Editor** → **"Create new Page"**

Type in a Name for the Page: "test" and a Button Name for the Page: "test"

If you connected the Extension Module to Pin 1, then you must choose the Option: **"Embed Extension 1 Button in 1. Text Area"** then click **"Save"**. Now click on the **"Page Preview"** Button and test the Door Lock Extension by clicking on the Button **"Extension 1 On/Off"**. The Door Lock must now rotate when you click this Button.

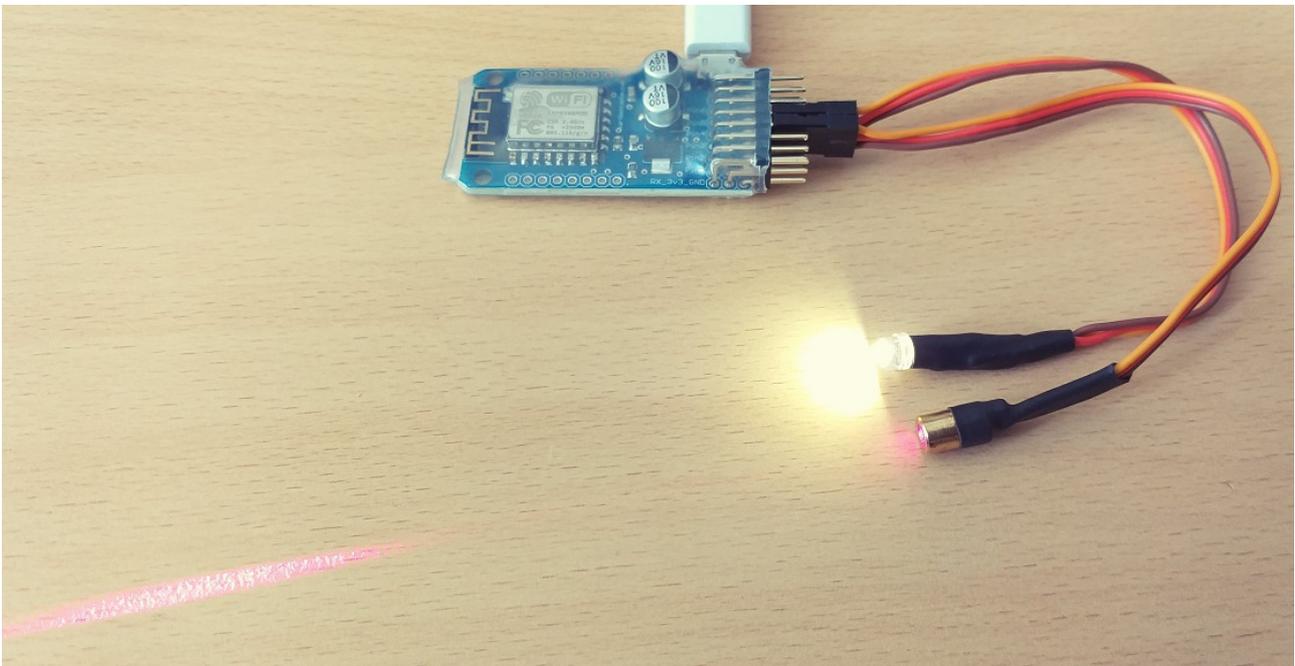


Please always double check the Wire connections and its Colors! A wrong Connection could damage the electronics!

Wire Color:	Voltage:	Position:
Orange / White	3.3V Control Signal	Upper Contact
Red	5 V Supply Power	Mid Contact
Black / Brown	0 V Supply Power	Lower Contact

Example: How to connect Laserpointer & LED & UV Station:

1. Navigate in the Admin Area to → Extention Menu. Then choose the Settings
Pin-Mode: "Digital Static Output" & Output-Start-State: "LOW" then click → **"Save"**
In principal you can use all Pins 1 - 6 for these Extentions, but it is not recommended to use Pin3 and Pin4, because they will toggle on and off for 0,5 sec during the startup (boot) of the SmartGeocache.
2. Disconnect the Power from the SmartGeocache (Micro-USB-Port) so that it is shut down.
3. Connect your Extention to the Pin that you chose (e.g. like shown in the Picture below!)
4. Connect Power to the SmartGeocache Micro-USB-Port again.
5. Make a Test Webpage: Navigate in the **Admin Area** → **Homepage Editor** → **"Create new Page"**
Type in a Name for the Page: "test" and a Button Name for the Page: "test"
If you connected the Extention Module to Pin 1, then you must choose the Option: **"Embed Extention 1 Button in 1. Text Area"** then click **"Save"**. Now click on the **"Page Preview"** Button and test the Extention by clicking on the Button **"Extention 1 On/Off"**. The Extention must now switch on and off when you click this Button.

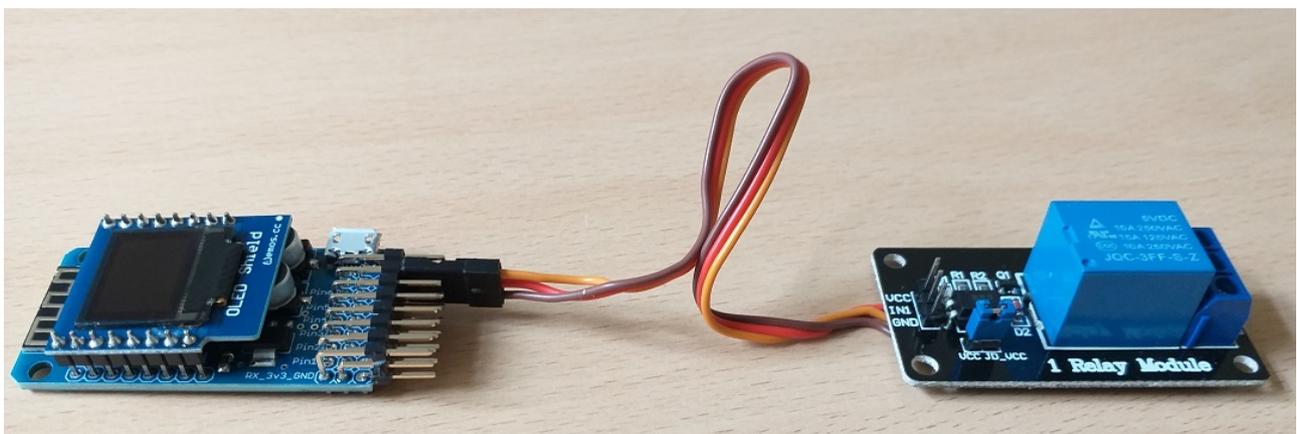
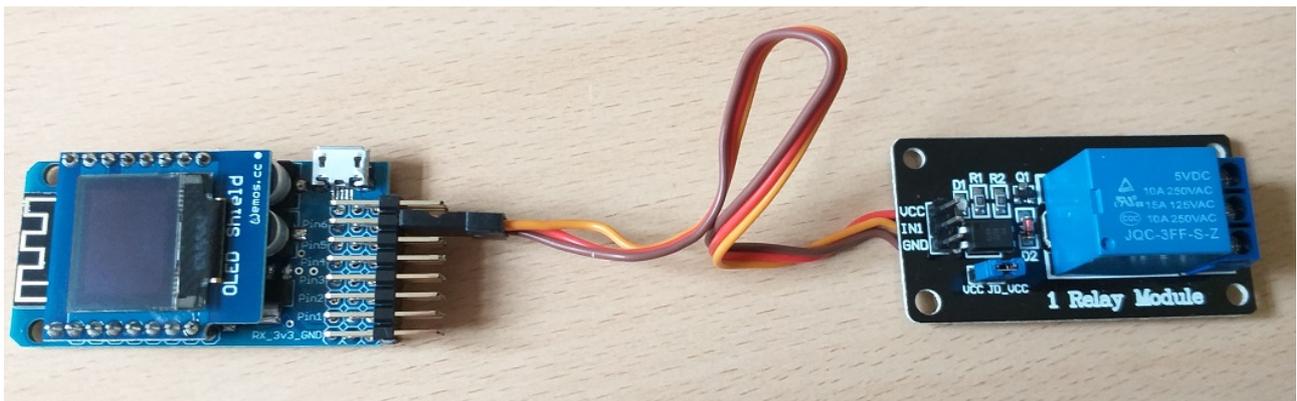


Please always double check the Wire connections and its Colors! A wrong Connection could damage the electronics!

Wire Color:	Voltage:	Position:
Orange / White	3.3V Control Signal	Upper Contact
Red	5 V Supply Power	Mid Contact
Black / Brown	0 V Supply Power	Lower Contact

Example: How to connect WiFi Relay Station:

1. Navigate in the Admin Area to → Extention Menu. Then choose the Settings
Pin-Mode: "Digital Static Output" & Output-Start-State: "HIGH" then click → **"Save"**
In principal you can use the Pins 1, 3, 4, 5, 6. It is not recommended to use Pin3 and Pin4, because they will toggle on and off for 0,5 sec during the startup (boot) of the SmartGeocache.
Furthermore, it is forbidden to use Pin2, because the SmartGeocache won't startup (boot) anymore if you connect this Extention to Pin2!
2. Disconnect the Power from the SmartGeocache (Micro-USB-Port) so that it is shut down.
3. Connect your Extention to the Pin that you chose (e.g. Pin 1 like shown in the Picture below!)
4. Connect Power to the SmartGeocache Micro-USB-Port again.
5. Make a Test Webpage: Navigate in the **Admin Area** → **Homepage Editor** → **"Create new Page"**
Type in a Name for the Page: "test" and a Button Name for the Page: "test"
If you connected the Extention Module to Pin 1 then you must choose the Option: **"Embed Extention 1 Button in 1. Text Area"** then click **"Save"**. Now click on the **"Page Preview"** Button and test the Extention by clicking on the Button **"Extention 1 On/Off"**. The Extention must now switch on and off when you click this Button.



Please always double check the Wire connections and its Colors! A wrong Connection could damage the electronics!

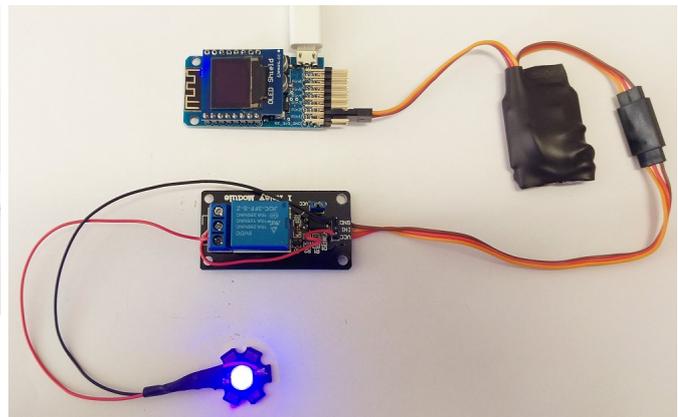
Wire Color:	Voltage:	Position:
Orange / White	3.3V Control Signal	Upper Contact
Red	5 V Supply Power	Mid Contact
Black / Brown	0 V Supply Power	Lower Contact

Example: How to connect WiFi Morsecode Station:

1. Navigate in the Admin Area to → Extention Menu. Then choose the Settings
Pin-Mode: "Digital Static Output" & Output-Start-State: "LOW" then click → **"Save"**
In principal you can use all Pins 1, 3, 4, 5, 6. It is not recommended to use Pin3 and Pin4 because they will toggle on and off for 0,5 sec during startup (boot) of the SmartGeocache.
Furthermore, it is forbidden to use Pin2, because the SmartGeocache won't startup (boot) anymore if you connect this Extention to Pin2 !
2. Disconnect the Power from the SmartGeocache (Micro-USB-Port) so that it is shut down.
3. Connect your Extention to the Pin that you chose (e.g. Pin 1 like shown in the Picture below!)
4. Connect Power to the SmartGeocache Micro-USB-Port again.
5. Make a Test Webpage: Navigate in the **Admin Area** → **Homepage Editor** → **"Create new Page"**
Type in a Name for the Page: "test" and a Button Name for the Page: "test"
If you connected the Extention Module to Pin 1, then you must choose the Option: **"Embed Extention 1 Button in 1. Text Area"** then click **"Save"**. Now click on the **"Page Preview"** Button and test the Extention by clicking on the Button **"Extention 1 On/Off"**. The Extention must now switch on and off when you click this Button.

Setting up the WiFi Morsecode Station:

Now that the Morsecode Station got activated, you can also configure it. The Morsecode Station has its own WiFi and Webserver and Admin Area. Connect your Smartphone to the WiFi of the Morsecode Station, then open the Admin Area in the Webbrowser: <http://smart.geocache/adminlogin> or <http://192.168.4.1/adminlogin> and then log into the Admin Area: The standard password is "admin". Now change the admin password, so that only you will have access to the Admin Area of the Station. Note this Password (write it down), if you lose it, you will lose access to this station! There is no backdoor! After this you can save an optional Password for the Geocacher and the Morsecode. The optional Password is to activate the displaying process of the Morsecode. When the Geocacher opens the Startpage of the Morsecode Station and types in this Password, the Morsecode Station will start displaying your Modsecode. If you don't save a Password, the Station will immediately start displaying the Morsecode. Keep in Mind, the WiFi of the SmartGeocache and the Morsecode Station are NOT the same. Both Modules have different Password functional conditions. Don't forget to connect an LED-Extention or Laser-Extention or Relay Extention to the Output-Cable of the Morsecode Station, otherwise it won't display the Morsecode ;-)

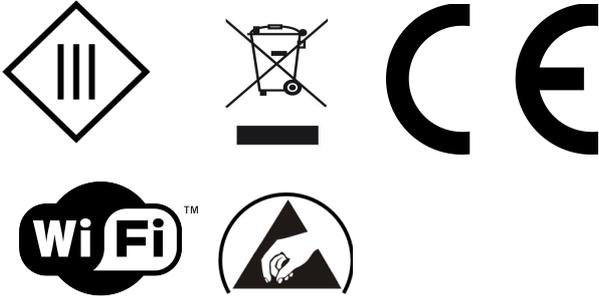


Chapter 6 – Return delivery, Disposal, Miscellaneous:

If you want to send your device back, please log again into the admin area and click on the Button: *"factory reset"*

After pressing the button, wait a minute before disconnecting the supply voltage from the module.

If you dispose of the device, do so in accordance with regulations in electronic waste! You can of course also send the device back to the dealer for environmentally friendly disposal.



Declaration of conformity

This certificate confirms that the product listed below meets the displayed specifications and has been tested as part of our commitments in accordance with the standard of BS EN ISO9001: 2015. It also confirms, where applicable, that products that are sensitive to electrostatics have been handled and packaged with care, in accordance with regulations and technical conditions according to ANSI / ESD S 20.20: 2014 and BS EN 61340-5-1: 2007 electrostatic control specification.

Order#	SmartGeocache
Manufacturer reverence#	ESP12F / ESP12S AI-Thinker

The information above relates to products sold on or after the date below.

Smartest Electronics Stefan Schmidt
Day: March 13, 2020
Smartest Electronics Stefan Schmidt, Max-Planck-Str. 21, 64839 Münster

Information sheet:

Additional information on the extension: WiFi door lock with servo motor:

The MG90s servo has a high-quality and robust aluminum gear and an extremely stable plastic housing. However, make sure that the servo motor cannot be blocked. In the rarest but worst case, this could lead to the destruction of the servo / module. You should also note that a servo motor could be damaged if it gets wet. Install it in the way that it is protected from the rain inside a housing. In our own tests, the servo motor worked very well at -18°C , in the endurance test, over several months. The servo manufacturer specifies -30°C as the minimum operating temperature. At temperatures lower than 0°C , however, the actuating speed and the actuating force decrease. If you want to use the SmartGeocache with servo in winter, make sure that your door lock is easy to move. If you do not want to use the servo in winter, a solution would be to take the SmartGeocache with servo motor home in the cold seasons, for example, and replace it with a "normal" can with a paper log book. You can then simply write in the listing: *"The electronics take a winter break and will be available again from the time(day). A paper log book can be found on site"*. Every Geocacher automatically knows that it is better not to go back to the cache until spring if he wants to have fun.

Performance data: Servomotor MG90s (Door Locking)

Dimensions: 23 x 12.2 x 29mm
Stall Torque (4.8V): 2.2 kg/cm
Stall Torque (6.0V): 2.5 kg/cm
Temperature Range: -30 to $+60$ degree C
Dead Band Width: 10us
Operation Voltage: 4.8 - 6.0 Volts

The performance features are based on the temperature range of 20°C .
In colder temperatures, the performance of the servo drops (actuating force and actuating speed).

Additional information on the extension: WiFi Laser Station

The laser has performance characteristics of 3V / $<5\text{mW}$ / 650nm, the following safety notice should be directed to you: Laser pointers can pose a danger to the human eye. Do not look directly into the laser, if you accidentally look into it, do not suppress the natural eyelid reaction. Make sure to inform third parties who are using the device.

