



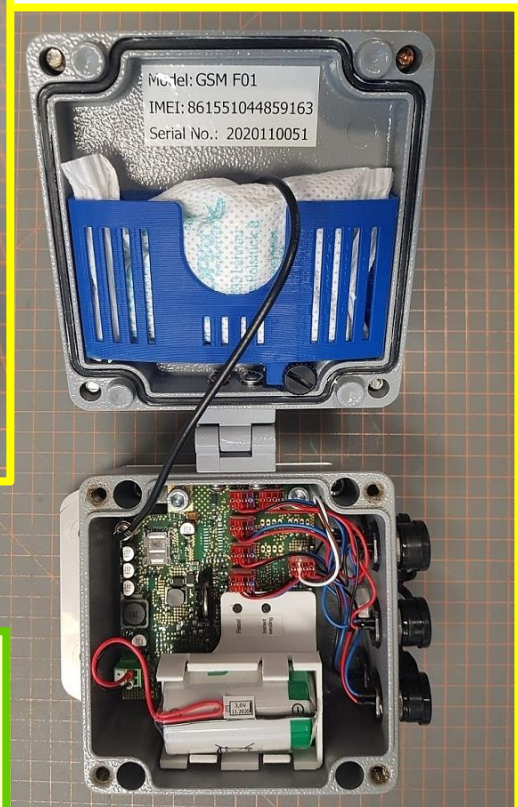
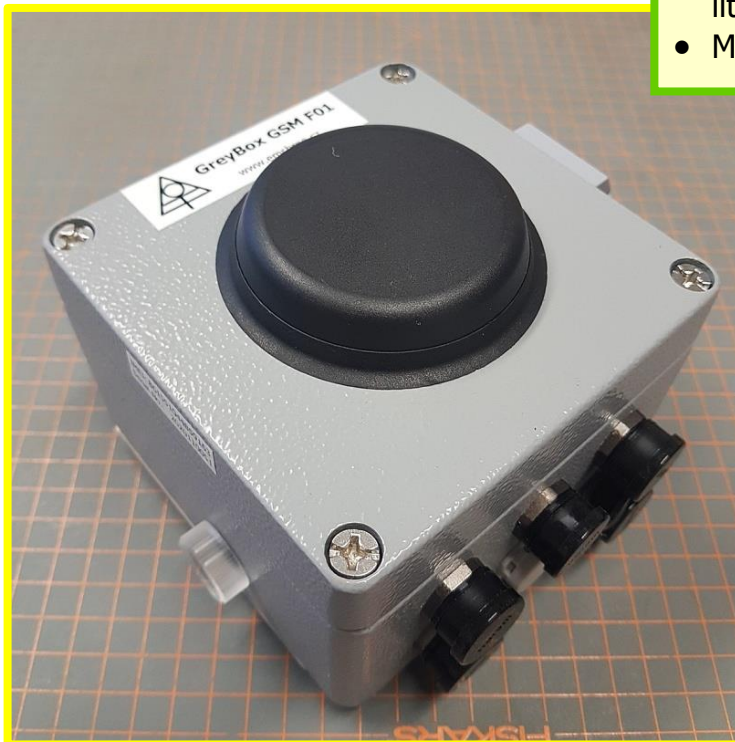
**EMS Brno**

**Data Acquisition Environment**  
Hardware – Software – Cloud application  
[www.emsbrno.cz](http://www.emsbrno.cz)

## Customer-tailored Datalogger GreyBox GSM

### Main features:

- General purpose datalogger intended for collecting data from analog and SDI-12 sensors and for on-line sending via GSM network to EMScloud application
- Ready for harsh environment
- Powered from internal primary lithium cell SAFT LSH20
- Manufactured by EMS



### Specification:

- Memory capacity ca 200,000 values
- Self-adjusting GPRS modem
- Battery saving mode active under -8°C (only measuring and storing; no sending)
- Configuration and data processing fully supported by Mini32 software
- Size 120 x 120 x 100 mm, IP rating IP 66
- Weight 1.5 kg

# GreyBox GSM

GreyBox GSM is datalogger intended for measurement and on-line transmitting data in GSM network to manufacturer cloud application. It contains also a backup memory for ca 200 000 values. This datalogger composes the base of customer-tailored versions for certain measuring purpose. Those versions are configured with respect to connected sensors and time period of data collection makes compromise between battery lasting and data density. Set-up of each version ensures the functionality of the system and it is not recommended to change it without prior consultation with the supplier.

## General specification

Memory capacity	512 kB (2 bytes per value)
SDI-12 ports	max 2 (up to 10 sensor each)
Frequency channels	max 4
Pulse channels	max 2
Voltage channels	max 2
Internal temperature sensor	YES
Internal humidity sensor	YES
Available energy countdown	YES
Measuring interval	1 min up to 4 hrs (limited by number and type of sensors)
Averaging interval	1 min up to 4 hrs (limited by number and type of sensors)
Operating range	-40 to 60 °C
Exciting SDI-12 sensors voltage	9 V (adj. 6 – 15 V)
Modem activity	each 2, 4, 8 or 12 hrs in daily cycles
Power supply	SAFT LSH20 (with connector MRT9-2); 3.6 V; 13 Ah
Protection	IP 66
Weight	1.5 kg
Size (L x W x H)	120 x 120 x 100 mm

## Maintenance notes

Info about datalogger status via LED (response to magnet):

**RED + GREEN** 3 times

- in 0.5 sec interval – correct status

**RED** 5 times

- in 0.1 sec interval – low battery voltage

**GREEN** 5 times

- in 0.1 sec interval – logger time issue, computer needed for further inspection

**RED** alternating with **GREEN** 5 times

- in 0.1 sec interval – memory issue, computer needed for further inspection

## Software

Mini32 universal software running under Windows® 7, 8 and 10. The software assures all necessary operations – system setup, data saving, data processing. It includes basic statistic features, creates and prints graphs and exports data to different file formats.

## GreyBox GSM F07

GreyBox GSM F07 is the version equipped with rain gauge (with pulse output), two leaf wetness sensors PHYTOS 31 (voltage output) and two air temperature and humidity sensor EMS33S (SDI-12 output). Data visualization, archiving and downloading is fully supported by EMScloud Internet application.



### Specification GreyBox GSM F07

SDI-12 sensors	2 (4 variables)
Pulse sensors	1
Voltage sensors	2
Measuring interval	5 min
Averaging interval	5 min
Warm-up	0 sec
Operating range	-40 to 60 °C
Modem activity	each 8 hrs
Backup memory lasting	2 months
Battery lasting	8 months

### Factory default configuration - guaranteed eight-months battery lifetime

PC Time: 14.06.2021 10:17:43 DL Time: 14.06.2021 9:17:28 <div> <input type="button" value="ON/off"/> <input checked="" type="button" value="ON"/> </div>	Device type: GSM F07 Device code <input type="text" value="72"/> Batt: 3,54 V	<table border="1"> <tr> <td></td> <td>Periods:</td> <td>Warm-up:</td> </tr> <tr> <td>measuring</td> <td><input type="text" value="5 m"/></td> <td><input type="text" value="0 s"/></td> </tr> <tr> <td>storing</td> <td><input type="text" value="5 m"/></td> <td><input type="text" value="0 s"/></td> </tr> </table>		Periods:	Warm-up:	measuring	<input type="text" value="5 m"/>	<input type="text" value="0 s"/>	storing	<input type="text" value="5 m"/>	<input type="text" value="0 s"/>
	Periods:	Warm-up:									
measuring	<input type="text" value="5 m"/>	<input type="text" value="0 s"/>									
storing	<input type="text" value="5 m"/>	<input type="text" value="0 s"/>									

#### Data sending

#	Type	ON/off	Range	Gauge	Description
1.	Voltage	ON	2500 mV	Voltage	Phytos 31 output [mV] #1 upper
2.	Voltage	ON	2500 mV	Voltage	Phytos 31 output [mV] #2 lower
3.	Pulse	ON	16 bit	$Y = A+B*Ps$	Precipitation [mm]
4.	Voltage	ON	---	Supply voltage [V]	Supply Voltage [V]
5.	Temperature	ON	---	Temperature [oC]	Internal Temp. [°C]
6.	Humidity	ON	---	Humidity [%]	Internal Humidity [%]
7.	Internal	ON	---	Available energy [%]	Availiable Energy [%]
8.	SDI-12 1(1)/1	ON	---	Temperature [°C] EMS33S	Air Temperature [°C] 1/1 upper
9.	SDI-12 1(1)/1	ON	---	Humidity [%] EMS33S	Air Humidity [%] 1/1 upper
10.	SDI-12 2(2)/1	ON	---	Temperature [°C] EMS33S	Air Temperature [°C] 2/1 lower
11.	SDI-12 2(2)/1	ON	---	Humidity [%] EMS33S	Air Humidity [%] 2/1 lower