User Guide
GPS based Automatic Vehicle Location equipment

midiGPS v6   **Versions: 6**   **Date: 02.07.2015**

Our products are CE certified and complies with the following harmonized standards

Disturbance emission:	Radiated RF emission test: 2004/104/EC ENECE 10/2012
	Conducted transient on the DC power line : 2004/104/EC ENECE 10/2012
	Immunity against RF radiation: 2004/104/EC UNECE 10/2012 (15V/m (20-80MHz), 25V/m (0.08GHz-2GHz) modulation AM and PM
Disturbance Susceptibility:	Immunity against conducted transients: 2004/104/EC UNECE 10/2012, level III, pulse 1, 2a, 3a, 3b criteria D

1. Safety instructions

This chapter contains information regarding the safety usage of the GPS unit. The device was designed based on the most relevant International regulations regarding safety and compliance.

Please disconnect the ten pole connector before dismounting the top cover of the device.

Internal use only!

Keep away from excessive moisture!

2. About this document

This document contains information related to the usage and extended possibilities of the device. Also it contains electrical and mechanical characteristics of the device.

Glossary:

- GPRS   – General Packet Radio Service
- GPS   – Global Positioning System
- GSM   – Global System for Mobile Communications
- CAN   - Controller Area Network
- FMS   - Fleet management System
- SMS   – Short Message Service
- I/O   – Input/Output Intrare/Ieşire

3. Basic description

midiGPS is a terminal equipent for navigation data collection which transfers the collected datas to the server using the GSM network. This equipment suits well for asset tracking and or vehicle rela time location. Among the datas aquisitioned are the location, speed, battery level fule level and many more. It is important to be noted that the equipment has several IO's usable for many different purposes.

4. Deliverables

You'll receive:

- midiGPS equipment

- external active antena
- mating 10 pole and 4 pole equipment

5. Mechanical characteristics

- Sizes: 112mm x 74mm x 25mm
- Weight: 135g
- GPS connector: SMA
- 4 and 10 pole connector: Eurocontact or compatible with 3.5mm pitch

6. Basic characteristics

- GSM/GPRS characteristics:
  - Quad band module (GSM 850 / 900 / 1800 / 1900 MHz); GPRS class 12
- Caracteristici GPS characteristics:
  - Dual constellation receiver GPS//GLONASS (SBAS WAAS, EGNOS, MSAS,GAGAN)
  - Sensibility of -163 dBm
- Voltage supply: 10 ÷ 30V;
- Digital inputs: 1
- Digital outputs: 1
- 1W input: 1 (Dallas thermometer)
- Analog inputs: 2
- Output: 1, open-drain
- LED for state signaling
- RS485 interface port
- CAN FMS input for standard FMS compliant messages
- Optional:
  - Tachograph download module
  - Bluetooth module for communication
  - RF module for short range communication

7. Electrical characteristics

Values	Min.	Typ.	Max.	UM
Power supply				
Voltage supply (recomended working conditions)	9	-	28	V
Internal battery voltage (in recomended working conditions)	3,35	-	4,3	V
Current consumption				
Deep Sleep, average current	-	1.5	4	mA
U_{BATT} =12.6V, all the modules are working the battery is under charge	-	-	210	mA
U_{BATT} =12.6V, all the modules are working the battery is charged	-	-	155	mA
U_{BATT} =12.6V, only GPS is working GPRS is in stand-by, battery charged	-	-	60	mA
Output				
Maximum output current	-	-	900	mA
R_{DS_on}, Drain-Source	-	-	200	mOhm
Digital inputs				
Input resistance	1,5	-	-	kOhm
Recomended input voltage	10	-	U_{BATT}	V
Treshold voltage for transition L to H	-	8	-	V
1Wire input				

Voltage domain on this pin	0	-	+3V3	V
Maximum cable lenght (with two sensors connected to the bus)	0	-	23	m
Analog Inputs				
Input resistance for input range 0..6V	-	164	-	kOhm
Input resistance for input range 0..30V	-	91,1	-	kOhm
Input voltage divided into two subranges	0	-	30	V
RS485 interface				
Load resistance	-	120	-	Ohm
Survival absolut maximum voltage applied to pins A or B, long term	-13	-	16	V
Survival absolut maximum voltage applied to pins A or B, short term (spikes)	-100	-	100	V
Differential treshold voltage	2	2.5	-	V

8. Environmental conditions

- Storage temperature: -40°C … +70°C
- Storage moisture: 5 … 95 % (no condensable)
- Working temperature: -25°C … +50°C

9. LED status

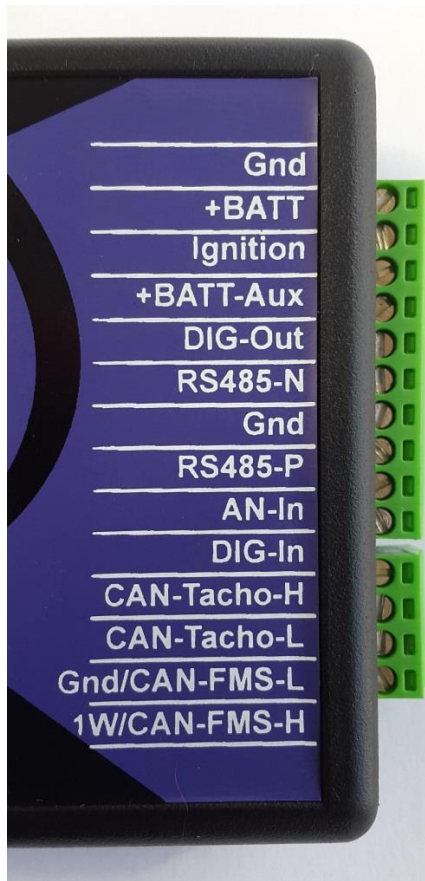| Green	Blue	Amber	Red	Meaning
⊗ 0,1s				Internal battery charged, GPS signal lost, missing GSM/GPRS network.
	⊗ 0,1s			Internal battery charging, missing GSM/GPRS network.
	⊗ 0,5s			Connected to GSM network, connected to the ecoMotive server.
	⊗ 0,1s			Connected to GSM network, running from internal battery
⊗ 0,5s	⊗ 0,1s			Valid GPS fix, RTC valid and GSM network received.
⊗ 0,5s	⊗ 0,5s			Valid GPS fix, RTC valid and GSM network received, connected to the ecoMotive server.
⊗ 0,5s	⊗ 0,5s	⊗ 0,1s		Valid GPS fix, RTC valid and GSM network received, connected to the ecoMotive server, battery charging
			⊗ 1s	Error, error code = number of flashes (See the belows tabel!)

10. Error codes:

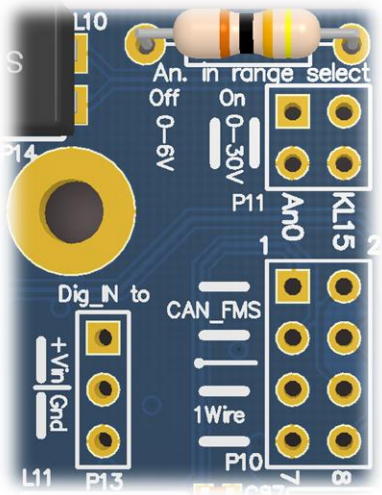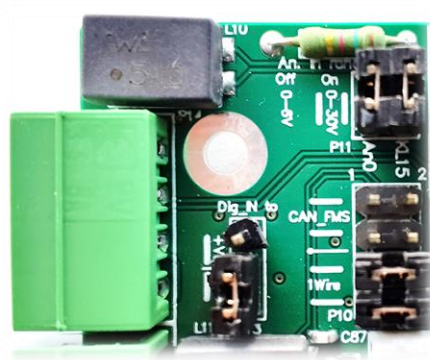| Number of flashing	Meaning
1	DeviceRestart occured
2	GPRSRestart
3	GPSRestart
4	DieselMeterRestart
5	DieselMeter1_NotResponding
6	DieselMeter2_NotResponding
7	DieselMeterSaturated
8	BatteryCharged
9	BatteryCharging
10	BatteryFault
11	RunningFromBattery
12	PowerManagementFailed
13	Invalid_Packet
14	RS485LRCError
15	RS485LengthError
16	FWUpdateWasPerformed
17	GPRSEmergencyRestart
18	RAMPushError
19	RAMPopError
20	FWUpdateError
21	WakeUpFromDeepSleep
22	SendingSMS
23	SMSSendSuccessfull
24	GSMNoNetworkRestart
25	GSMNoServerRestart
26	DebugAntiStuck
27	DebugChangeLevel

Notes:
- *The green LED reflects the GPS state and if the battery is fully charged.*
- *The blue LED shows the GPRS modem state.*
- *The red LED shows any occured error.*

A

The fleet management solution

11. Connector layout

Pin Nr.	Pin name	Description
1	GND	Ground or battery return
2	+Batt	Voltrage supply or battery (permanent +12V or +24V from the vehicle's battery)
3	Ignition	Ignition (+12V or +24V)
4	+BATT-aux	Output for supplying any auxiliary equipment (capacitive probe , RFID reader or else)
5	DIG-out	Digital Output, the external load will be connected to this pin and +Batt.
6	RS485_N	RS485 interface lower line (or B)
7	GND	Ground for RS485
8	RS485_P	RS485 interface higher line (or A)
9	An-in	Thermometer input 1W or Analog input, 0-6V or 0-30V, (selectable from the internal
10	DIG-in	Ground or battery return
1	CAN-Tacho-L	CAN H for tachograph download
2	CAN-Tacho-L	CAN L for tachograph download
3	Gnd/CAN-FMS-L	CAN L for FMS and Gnd for 1W interface selected from internal jumpers
4	1W/CAN-FMS-H	CAN H for FMS and 1W interface (dataline) selected from internal jumpers

12. Jumpers

	Jumper	Function	Description
	KL15	ON	Analog iunput scaled to 0-6V input range, KL15 (Ignition)
		OFF	Analog iunput scaled to 0-30V input range, KL15 (Ignition)
	An0	ON	Analog iunput scaled to 0-6V input range, An0 (Analog 0 input)
		OFF	Analog iunput scaled to 0-30V input range, An0 (Analog 0 input)
	CAN_FMS	ON	When this two jumpers are ON than the inputs have the functionaly of CAN-FMS
		OFF	When this two jumpers are OFF the another two jumers must be in place.
	1Wire	ON	When this two jumpers are ON than the inputs have the functionaly of 1W.
		OFF	When this two jumpers are OFF the another two jumersmust be in place.
	Dig_IN	+Vin	Digital input is rferenced to +Vin.
		Gnd	Digital input is referenced to Gnd.

	Function	Default state
	KL15	**ON** as 0-30V range
	An_0	**ON** as 0-30V range
	CAN_FMS/1Wire	**In the two lower position**: 1Wire
	Dig_IN	**Gnd**: Digital input is referenced to Gnd.

13. Identification of the equipment

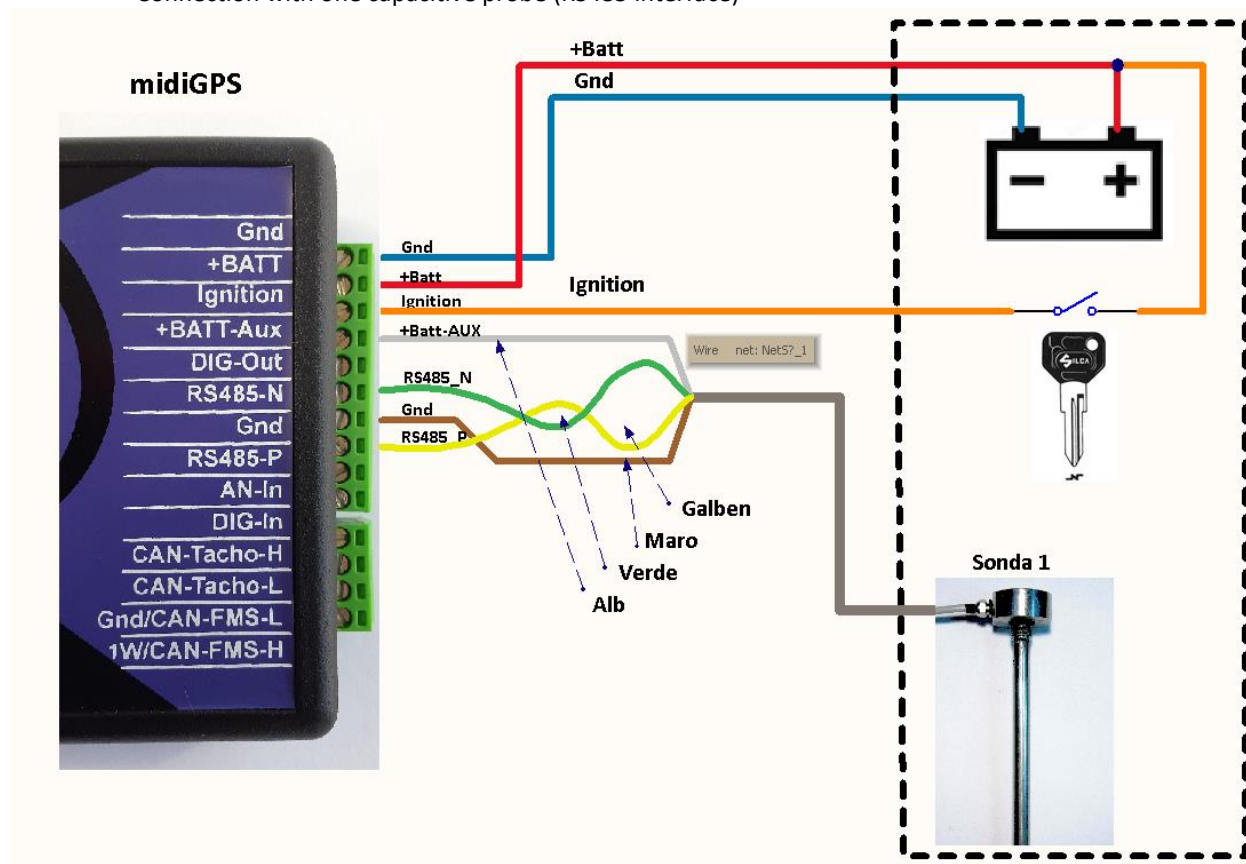| Serial number	Equipment type	Subtype of the equipment	Versions
2B6B	midiGPS	M	6.0
			6.T
			6.B
			6.RF

Possible version (at the issue of this document):
- 6.0- Version without any optionboard fitted
- 6.T- Version with tachograph download module fitted
- 6.B- Version with Bluethooth module fitted
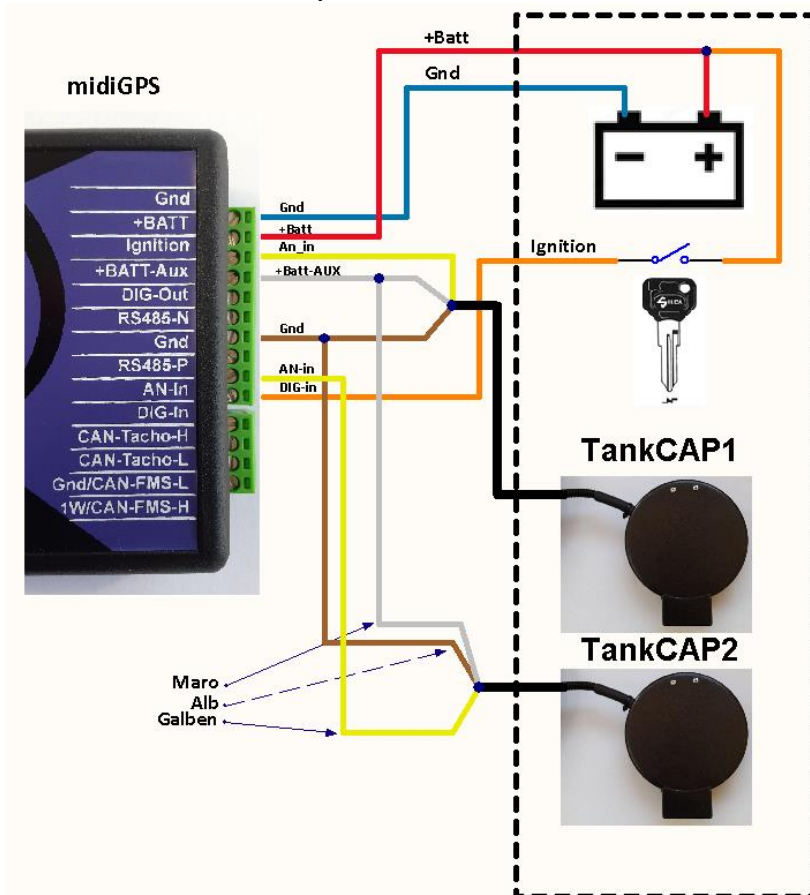- 6.RF- Version with RF module fitted

14. Connection examples

- Basic connection
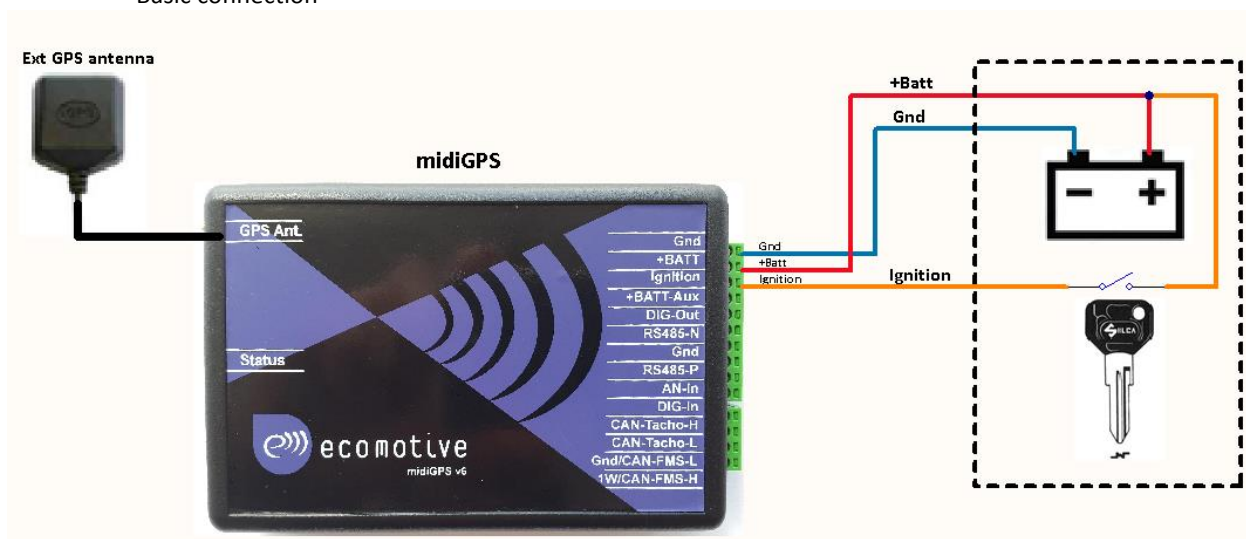
- Connection with one capacitive probe (RS485 interface)

- **Connection with RFID reader connected to the RS485 interface**

- **Connection with RFID reader and digital capacitive probe connected to the RS485 interface**

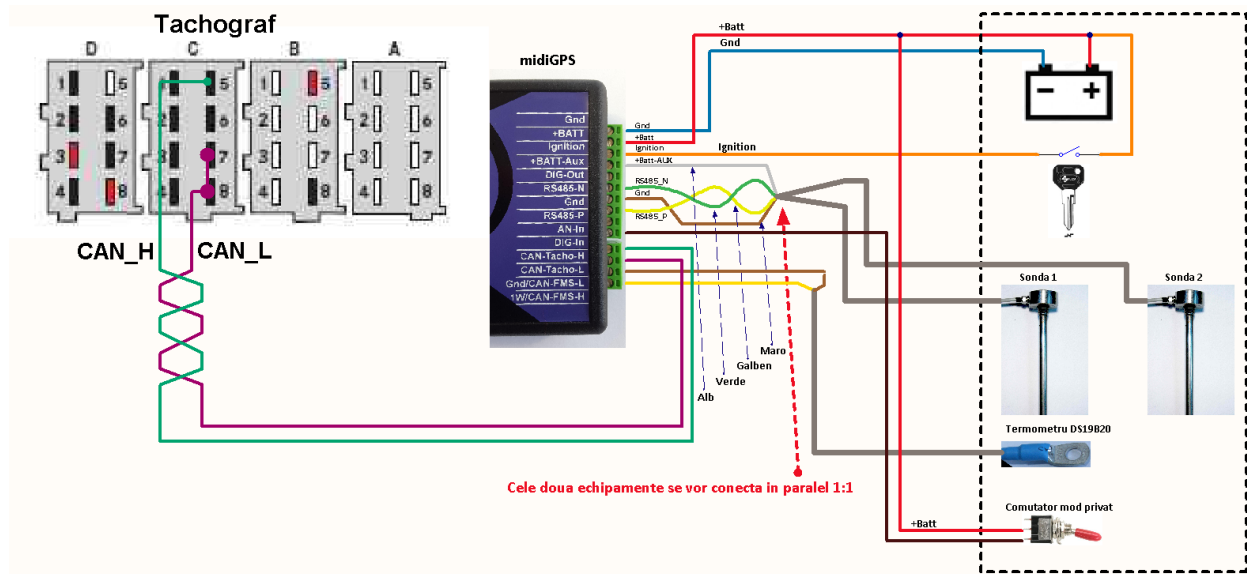Cele doua echipamente se vor conecta in paralel 1:1

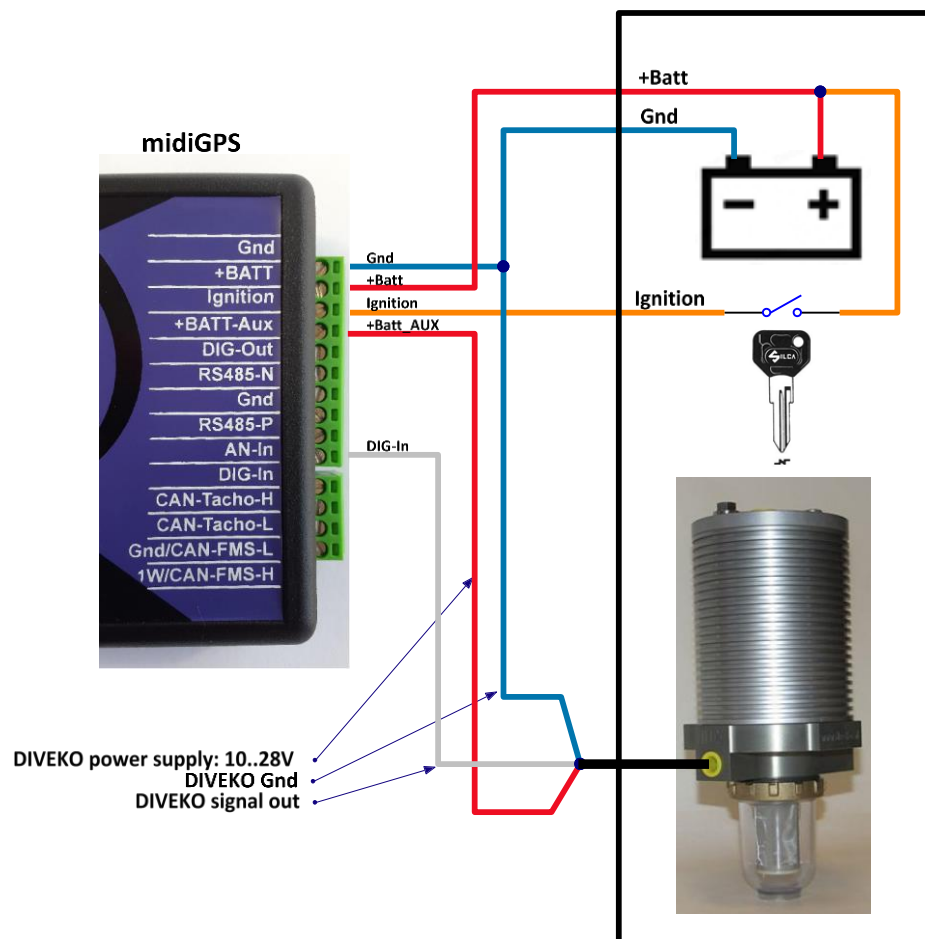- **Connection where a two tankcaps are used**

- **Connection with thermometer added, two probes and private switch connected**
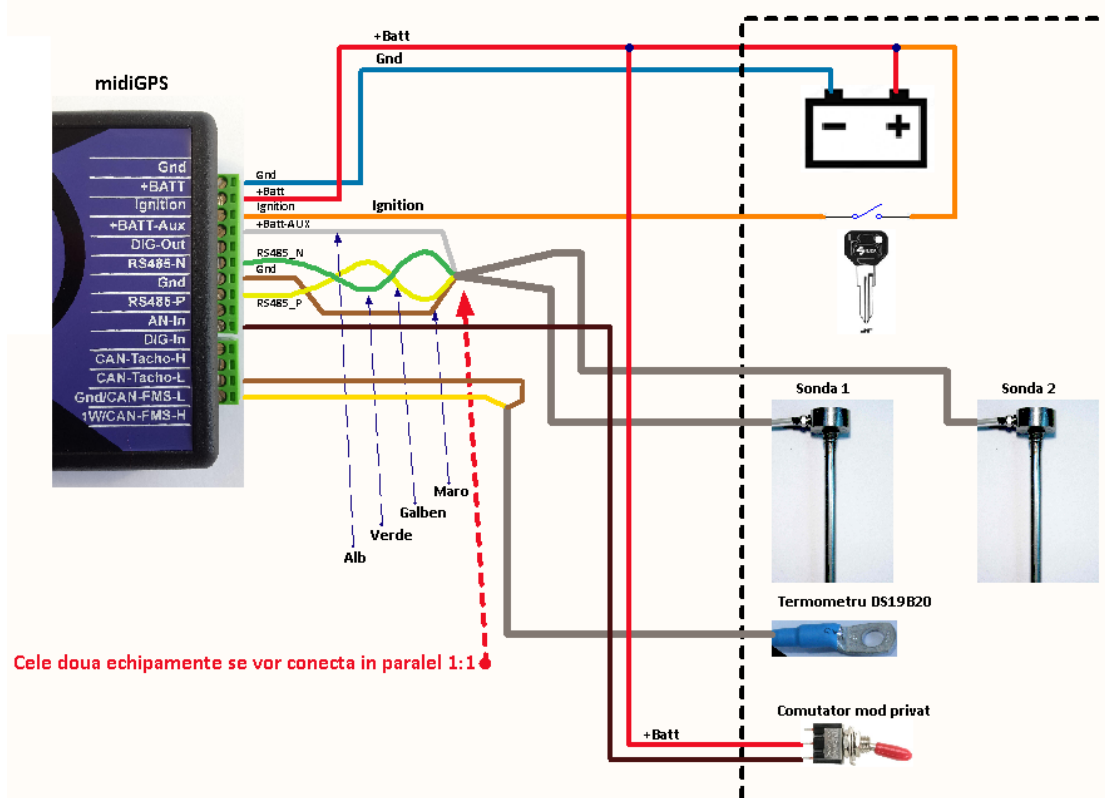
- **Connection example with two probes, one temperature sensor, private switch and Tachograf connected**

Cele doua echipamente se vor conecta in paralel 1:1

- **Connection example to a DIVEKO type flometer**

Notes regarding the usage of the 1W interface:

- *Maximum 3 sensors can be connected to the 1W bus.*
- *Conection has to be made with standard two wires connection, the wires are not interchangeable!*

- ***Please consider maximum cable lenght!***

Please note:
- ***Digital output refers to +Batt (DIG_out is open drain), in active state the DIG_out is connected to Gnd***
- ***Digital input has internal current limiting resistor.***