

**KRONTEC**

HIGH PERFORMANCE CONNECTS



REV. 01

# MANUAL FLOW METER 20 RFC-FM20

RF-ER20



KRONTEC

# RFC-FM20



Have you known that our Flowmeter is compatible with every fuel system on the market? Mounting the display onto your coupling is easily possible with our **RFC-FM20-C** clamp. Please get in contact with us for more information.

**PS: We do also offer a print @ home version!**



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# 1. DESCRIPTION

## RFC-FM20

Our new KRONTEC RFC - FM20 flow meter system is an addition to our race proven refueling components.

This kit allows you to have a close eye to the amount fueled by using state of the art ultra sonic flow sensors.

The tracked data is visualized on the display which can be easily added to your current refueling coupler but can also be displayed on any other device via WIFI.

### BENEFITS

- + A proper gain in race reliability as you can rely on solid flow rate data rather than measuring fueling time
- + Optimize and train your refueling process based on data
- + Optimize your pit stop strategy during races
- + Clear visualization and control of the flow rate during the refueling



## 2. RFC-FM20

### RFC-FM20



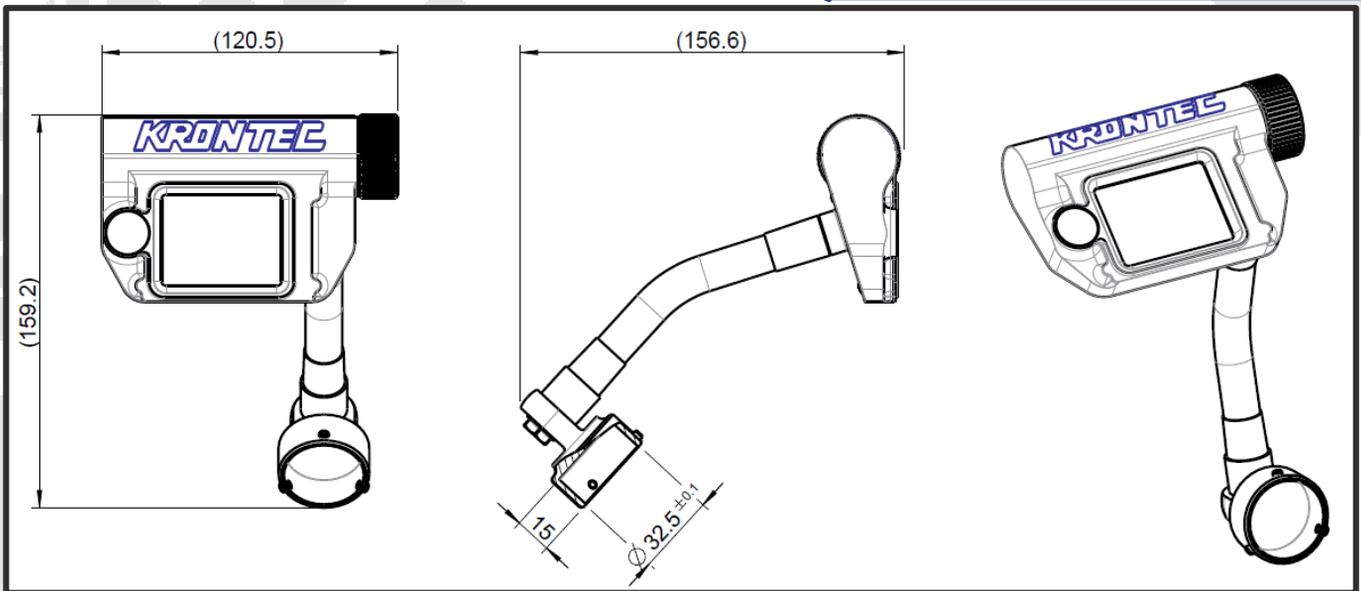
#### Package Content RFC-FM20:

- (1) Displayunit RFC-FM20-D (incl. gooseneck and mounting adapter)
- (2) Sensor Unit RFC-FM20-S38
- (3) Fuel Rig Adapter G1 ½"
- (4) Mounting Tool RFC-FM20-TOOL
- (5) 2x Battery Pack
- (6) FlightCase

## 2. RFC-FM20

### 1. RFC-FM20-D

#### RFC-FM20



#### Powerful intelligent LCD-TFT display:

- 2.4" TFT LCD
- 320 x 240 Resolution
- 65K true to life colours
- full colour images, animations, and icons
- TFT Screen with integrated 4-wire Resistive
- Touch Panel
- 4Mbit (512kb) of Flash memory

#### Maximum flexibility:

- The gooseneck will ensure a perfect orientation of the Display

#### Piezoelectric switch-on:

- anodized aluminium case
- vibration resistance

#### Handlebar adaption:

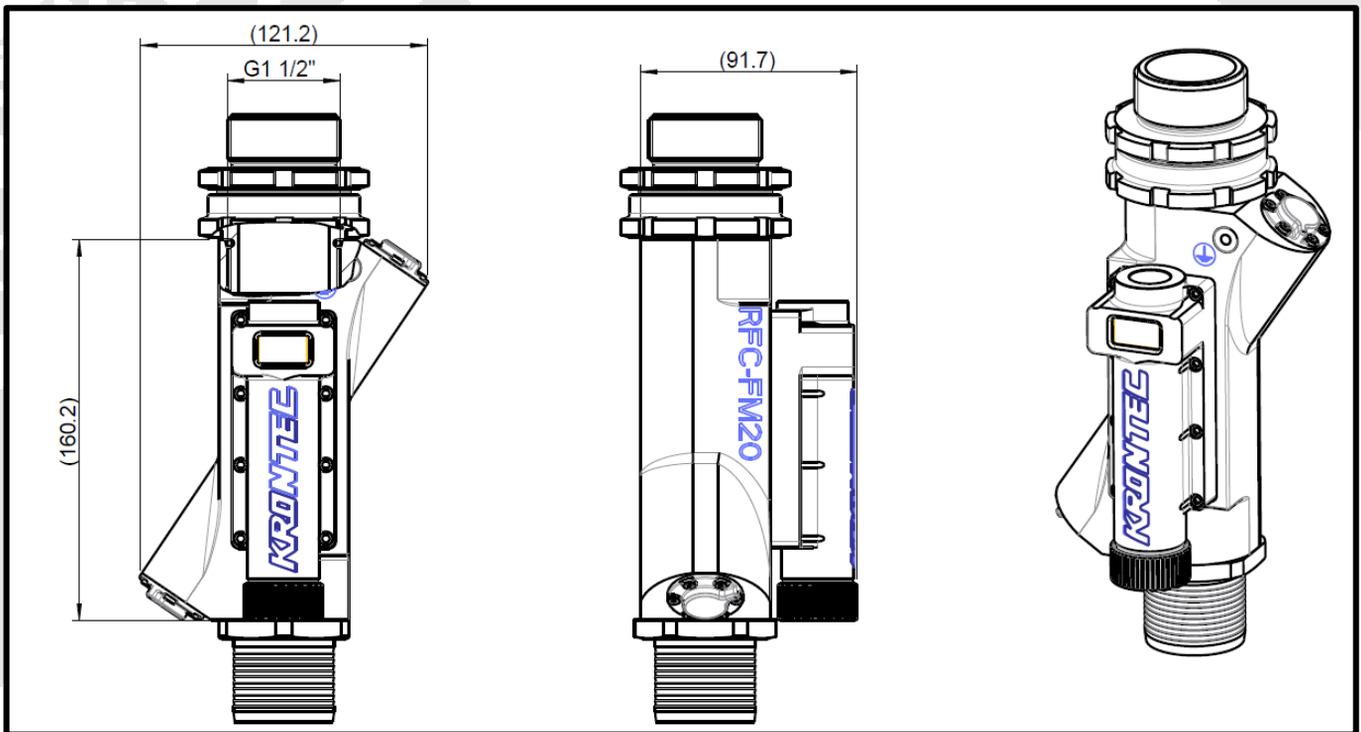
- Display will fit on all existing RFC products

#### Charge via USB micro-B

## 2. RFC-FM20

## 2. RFC-FM20-S38

### RFC-FM20



#### Powerful intelligent LCD-TFT display:

- 0.9" TFT LCD
- 80 x 160 Resolution
- full colour images, animations, and icons
- 4Mbit (512kb) of Flash memory

#### Piezoelectric switch-on:

- anodized aluminium case
- vibration resistance

#### Charge via USB micro-B

#### Swivel Design to orientate sensor on the fuel rig

**!!!To achieve the best performance Krontec recommends using the sensor unit in the delivered configuration. Changing adapters might affect the accuracy of the system!!!**

# 3. INITIAL SETUP

## 1. Sensor Setup

RFC-FM20

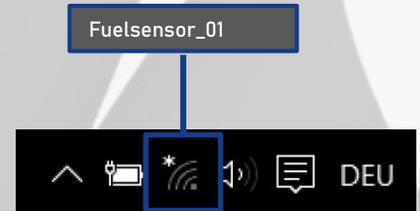
### Step1

- Switch Sensor Unit ON
- **Make sure the whole sensor unit is flooded with fuel**
- During the booting process the display will turn red showing the most important parameters
- Once booting is complete the display will turn yellow, searching for a display unit



### Step2

- Connect your device (tablet, pc, smartphone etc.) to the network of the fuel sensor (30s max.)
- SSID on initial setup is **fuelsensor\_01**
- Password is **password1**



### Step3

- Open browser and go to **192.168.4.1/WiFiNet**
- Change SSID and password for the sensor unit
- **Note that there is no recovery function, so make sure the password will not get lost**



new SSID

new PASSWORD

confirm new PASSWORD

### Step4

- You will need to **reset** the sensor by unplugging the battery and reconnect your device to the new network assigned during step 3

### Step5

- Open your browser and go to **192.168.4.1/DateTime**
- This will allow you to edit date and time



Set Date and Time

Date:

Time:

→ Sensor unit is set up successfully, please continue with the display unit on the next page



# 3. INITIAL SETUP

## 2. Display Setup

RFC-FM20

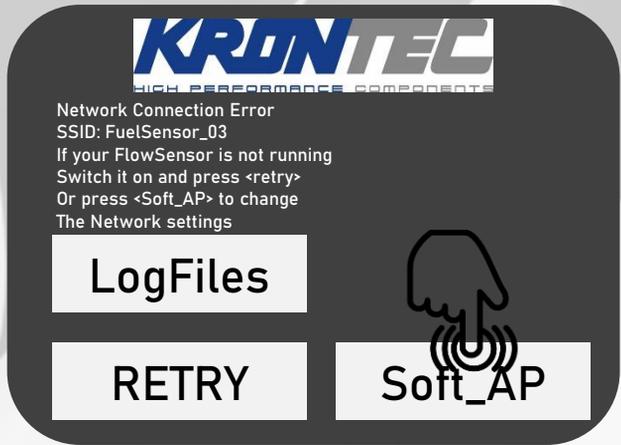


### Step6

- Switch Display Unit ON

### Step7

- Start Soft AP by pressing the button on the touchscreen to pair the display with the sensor unit



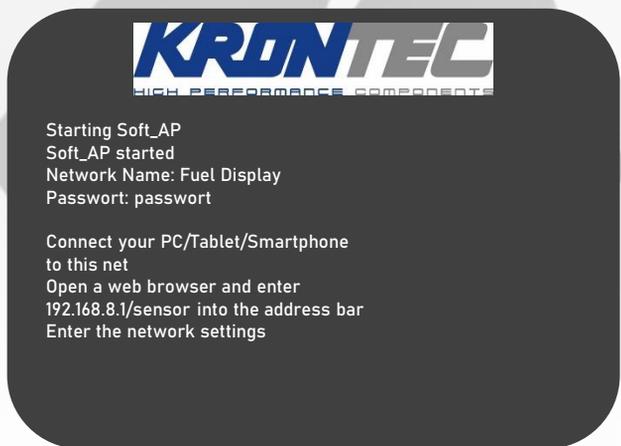
### Step8

- Follow the instructions on the display and connect your device to the network of the fuel display

→ SSID is **FuelDisplay**

→ Password is **password**

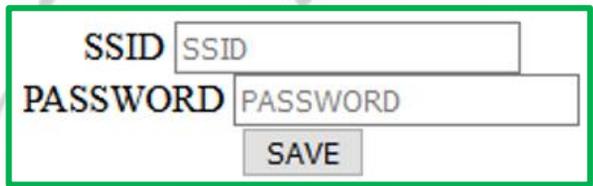
*(Note that the login details of the display can not get changed)*



### Step9

- Once connected open your browser on your device and enter **192.168.8.1/sensor**

→ Enter SSID and password of your sensor unit which was assigned under step3



### Step10

- The display will now connect automatically to the sensor once the sensor is running and the fuel display is switched on

→ **Sensor and Display are now paired successfully, please continue with the websettings described on the next page**



# 3. INITIAL SETUP

## 3. Websettings

RFC-FM20

### Step11

- Tap on the display once to access the menu and web settings afterwards
- The display will show the correct IP address you need to use for the following settings
- Enter **192.168.4.XXX/setting**, as seen on the display in your webbrowser to access websettings (also see 5.4)

→ It is recommended to edit the following values to match your refueling setup

#### Flow Rate Values for the Bargraph

- **FlowRate StartValue**

→ minimum value for the Bargraph

- **FlowRate MaxValue**

→ maximum value for the Bargraph

- **FlowRate AlarmValue**

→ the Bargraph color is **RED** if the FlowRate is less than Alarm value

230 [1/100 l] FlowRate AlarmValue

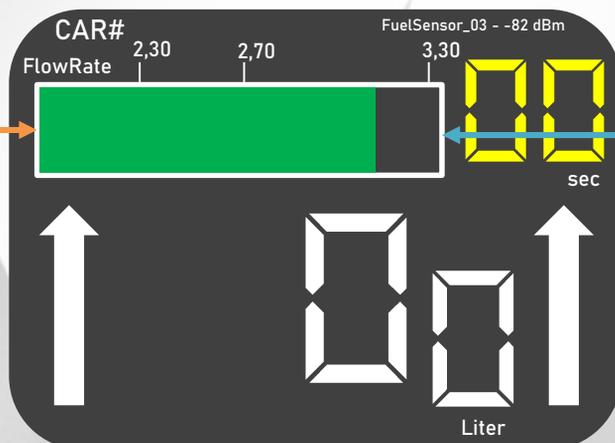
- **FlowRate OKValue**

→ the Bargraph color is **GREEN** if the FlowRate is bigger than OK value

270 [1/100 l] FlowRate OK-Value

- The Bargraph color will turn **YELLOW** once the the value sits between OK and ALARM

330 [1/100 l] FlowRate MaxValue



200 [1/100 l] FlowRate StartValue

# 3. INITIAL SETUP

## 3. Websettings

### Timer

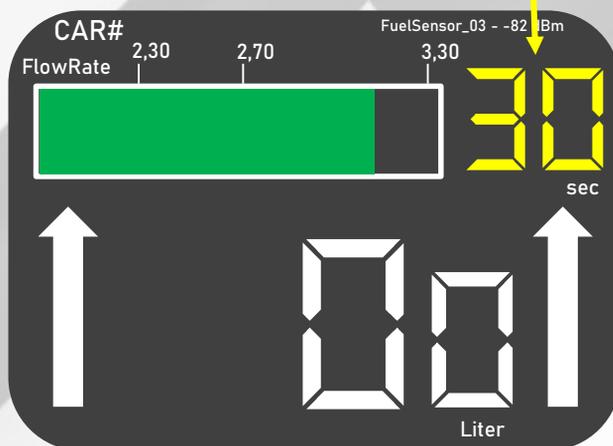
- **Switch off time**  
→ This determines the duration the display will switch off

[sec] SwitchOff Time (Value between 60 and 1800)

- **Min. RefuelTime/ Splash refuel time**  
→ Change Timer duration for PRESET MODEs. Although the Display will round up the values shown below the Timer will work according to the exact given values.  
→ Note that the display colors will invert once the timer reaches zero

[1/10 sec] min. RefuelTime by Regulation (Value between 100 and 999)

[1/10 sec] Splash RefuelTime by Regulation (Value between 50 and 999)



### CAR Names

- Modify car names shown on the display and Logfiles

Name for Car0 (max 8 characters)  
Car0

Name for Car1 (max 8 characters)  
Car1

Name for Car2 (max 8 characters)  
Car2

Name for Car3 (max 8 characters)  
Car3

# 3. INITIAL SETUP

## 4. Calibration

RFC-FM20

### Step13

Make sure your device is connected to network of the fuel sensor.

Open a browser and enter 192.168.4.1/**Calib** in the address bar to access calibration site. There you will be able to modify calibrations values together with the switch off time of the sensor.

The screenshot shows a web-based calibration interface with three input fields and a 'SAVE' button. The first field is 'Enter SwitchOff Time Value [s]' with a range of 'Value between 60 and 1800' and a value of '60'. The second field is 'Enter FlowRate Calibration Value' with a range of 'Value between 0 and 1000' and a value of '100'. The third field is 'Enter Volume Calibration Value' with a range of 'Value between 0 and 1000' and a value of '471'. A 'SAVE' button is located at the bottom. Three callout boxes provide additional information: one on the left notes that the sensor is precalibrated and these values are a good starting point; one on the right explains that the switch-off time determines when the sensor disconnects from the display; and a bracket on the left groups the calibration values.

**Enter SwitchOff Time Value [s]**  
Value between 60 and 1800  
60

**Enter FlowRate Calibration Value**  
Value between 0 and 1000  
100

**Enter Volume Calibration Value**  
Value between 0 and 1000  
471

SAVE

**CALIB VALUES**  
→ Note that the sensor comes precalibrated and the preset values should be a good starting point

This determines the time the sensor will switch off after being disconnected to the display. Note that the sensor will not switch off as long as it is paired to the display.

After the initial setup is done the display should be calibrated to match the actual flow rates of the sensor. Note that this needs to be done once after the initial setup or in case the flow rate will change due to a different rig setup e.g. different restrictor.

Therefore we do recommend using the MODES MIN. REFUEL TIME/ SPLASH REFUEL TIME seen on page 9 & 13 and refuel 5 times each for 10 and 30 seconds. After that you should be able to determine the average values for the total amount of fuel and the flow rate achieved with your setup.

With these informations you will be able to fine tune the preset values seen on both as described on the following page.

# 3. INITIAL SETUP

# 4. Calibration

## REFUEL

- 5x 10 seconds
- 5x 30 seconds

## DATA

- Note actual values
  - Total amount of fuel (weighted)
  - Flow Rate (calculated)
- Note Data shown on the display

## CALC

- Calculate average values
  - Ø Fuel Volume (weighted)
  - Ø Flow Rate (calculated)
  - Ø Fuel Volume (DISPLAY)
  - Ø Flow Rate (DISPLAY)

## COMPARE

- Compare Values and determine a percentage deviation

## ADJUST

- Adjust the values found via 192.168.4.1/Calib to match your percentage deviation determined before. Please find a few examples to the right.

**!!!READY TO RACE!!!**

## RFC-FM20

If test result is **more** than shown:

DISPLAY

CAR: CAR#1  
100.00 ltr in  
31.25 sec  
3.20 l/s

Test results:  
102ltr  
3.36 l/s

Enter Volume Calibration Value

Value between 0 and 1000

471

+2%

480

Enter FlowRate Calibration Value

Value between 0 and 1000

100

-5%

95

If test result is **less** than shown:

DISPLAY

CAR: CAR#1  
100.00 ltr in  
31.25 sec  
3.20 l/s

Test results:  
98ltr  
3.04 l/s

Enter Volume Calibration Value

Value between 0 and 1000

471

-2%

462

Enter FlowRate Calibration Value

Value between 0 and 1000

100

+5%

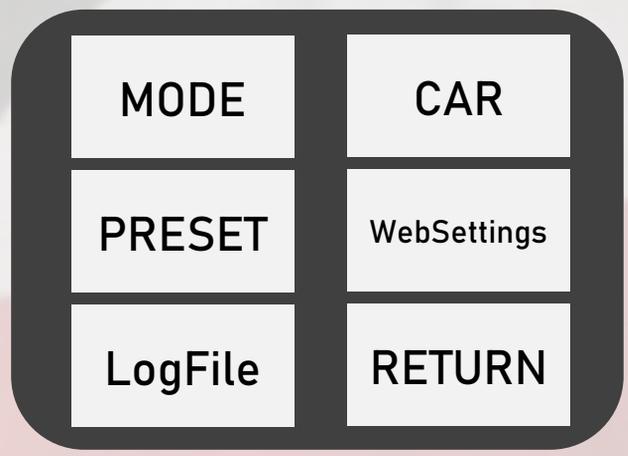
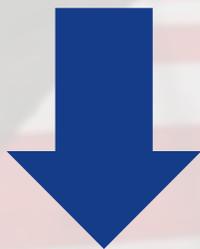
105

# 4. FUNCTIONS

## RFC-FM20



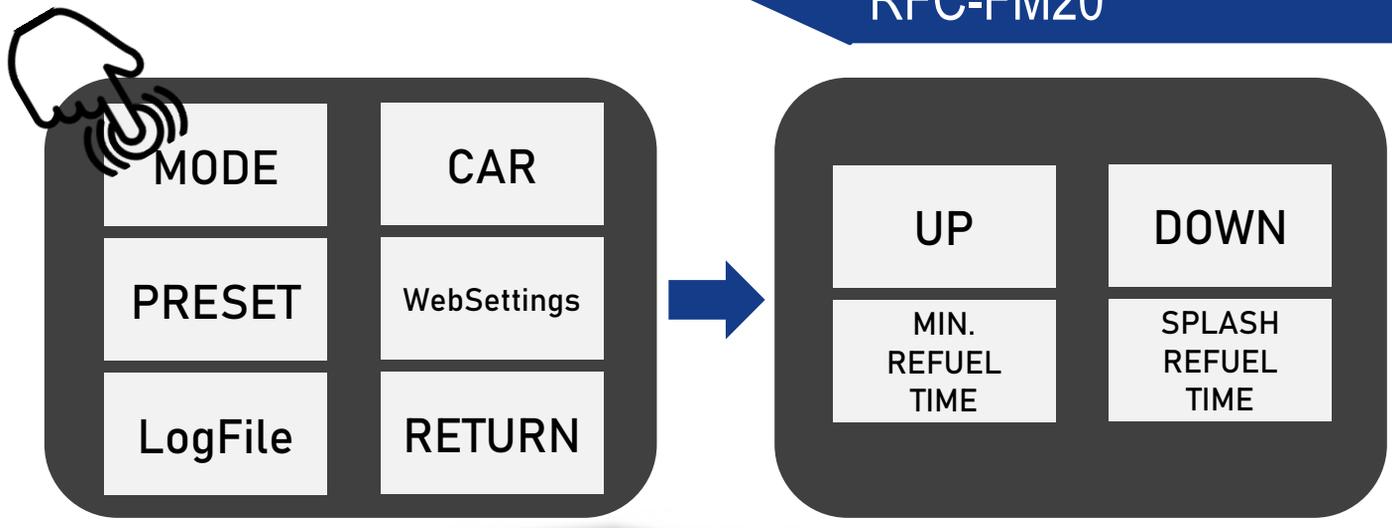
The menu can be accessed by tapping on the homescreen



# 4. FUNCTIONS

## 1. MODE

RFC-FM20

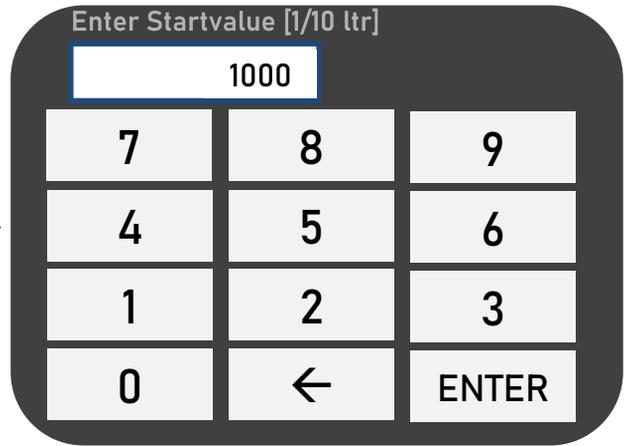
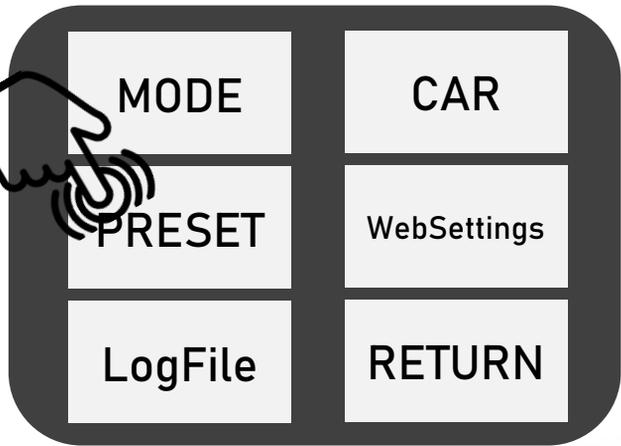


- UP** → Volume [l] counted upwards  
Time [s] counted upwards
- DOWN** → Preset Volume [l] counted backwards  
Time [s] counted upwards  
→ Startvalue of fuel will be determined via **PRESET**  
→ Display colors will invert if preset is reached
- MIN. REFUEL TIME** → Volume [l] counted upwards  
Preset min. Refueling Time [s] counted backwards  
→ Minimum refueling time can get changed via web settings (see 3.3 WEBSETTINGS)  
→ Display colors will invert if preset is reached
- SPLASH REFUEL TIME** → Volume [l] counted upwards  
Preset Splash Time [s] counted backwards  
→ Minimum refueling time can get changed via web settings (see 3.3 WEBSETTINGS)  
→ Display colors will invert if preset is reached

# 4. FUNCTIONS

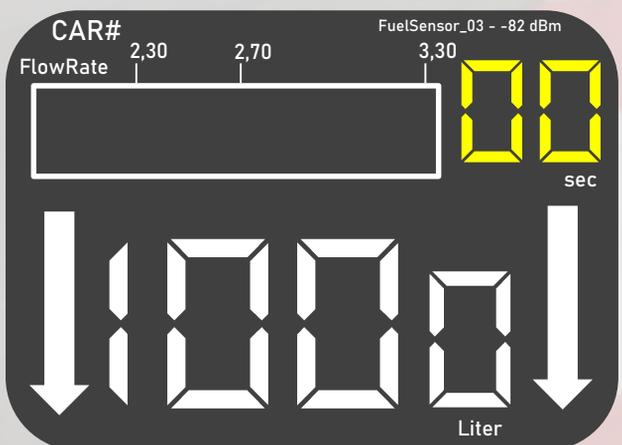
## 2. PRESET

### RFC-FM20

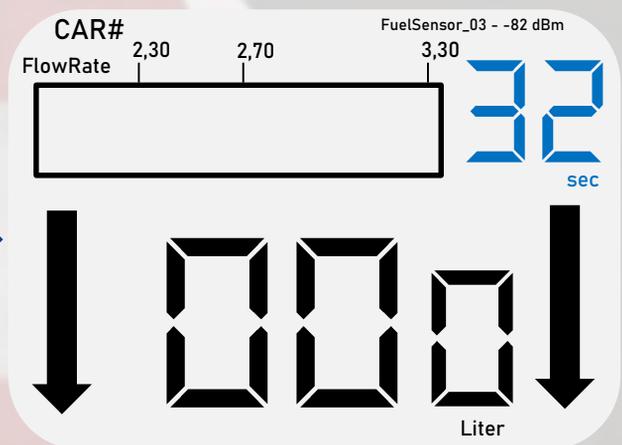


The preset will determine the start value used for MODE DOWN  
**!Attention!** Value is given in 1/10ltr.

Example:  
 DISPLAY Ready For Refueling



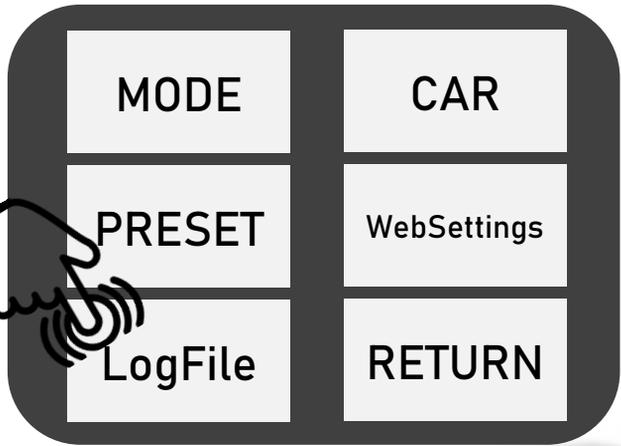
Inverted Display Refueling finished



# 4. FUNCTIONS

## 3. LogFile

RFC-FM20

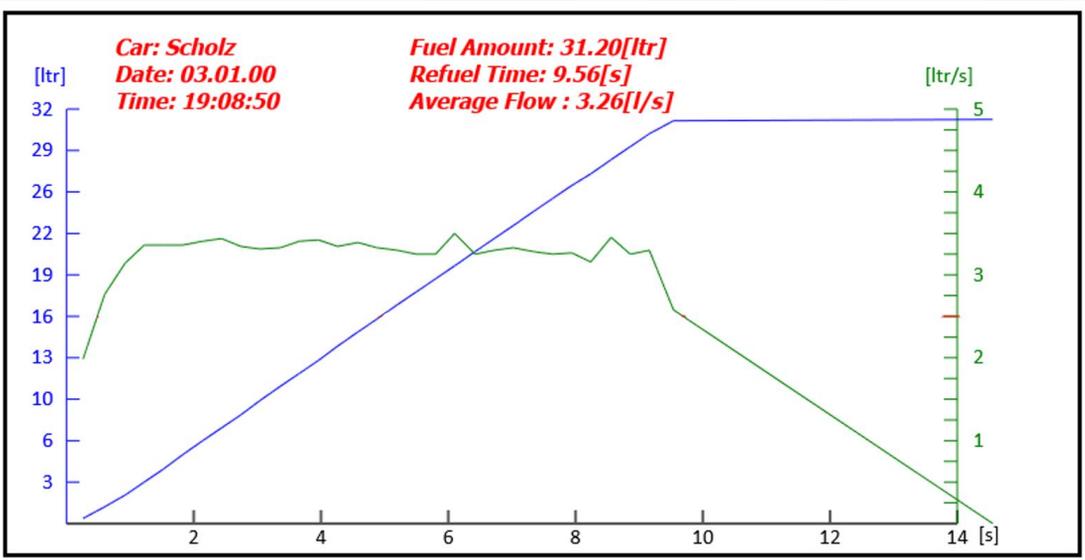
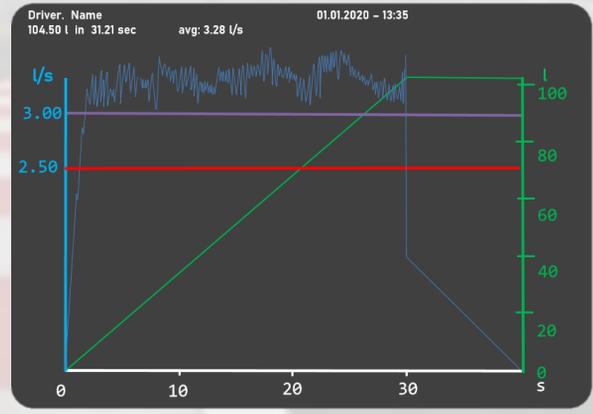


→ Logfiles can also be accessed via:  
SENSOR RUNNING and DISPLAY  
CONNECTED:

192.168.4.XXX/LogFiles

DISPLAY with SOFT AP STARTED (without  
Sensor running):

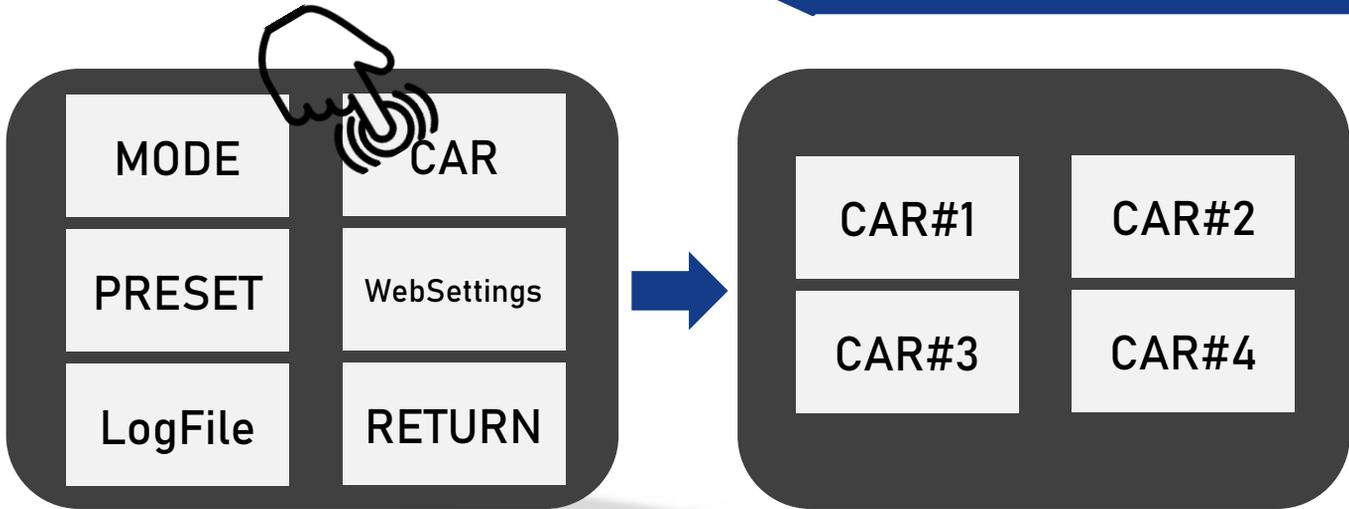
192.168.8.1/LogFiles



# 4. FUNCTIONS

## 4. CAR

RFC-FM20



→ Carnames can be modified via WebSettings (3.3)

**Car Names**

Name for Car0 (max 8 characters)  
Car0

Name for Car1 (max 8 characters)  
Car1

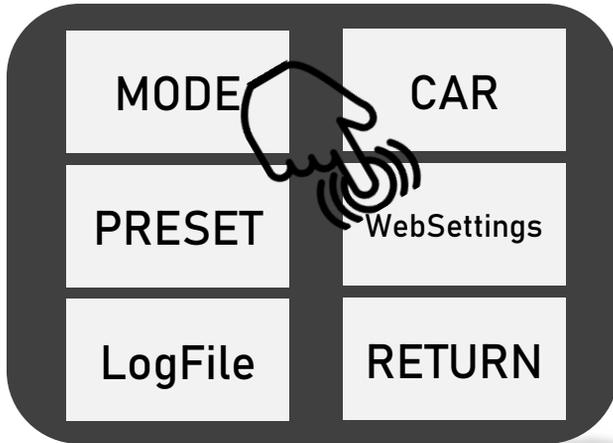
Name for Car2 (max 8 characters)  
Car2

Name for Car3 (max 8 characters)  
Car3

# 4. FUNCTIONS

## 5. WebSettings

RFC-FM20



Connect a PC, tablet or smartPhone to Network

FuelSensor\_03 (SSID)

Open a webbrowser and enter

192.168.4.XXX/setting

In the address bar

→ Websettings will allow you to change:

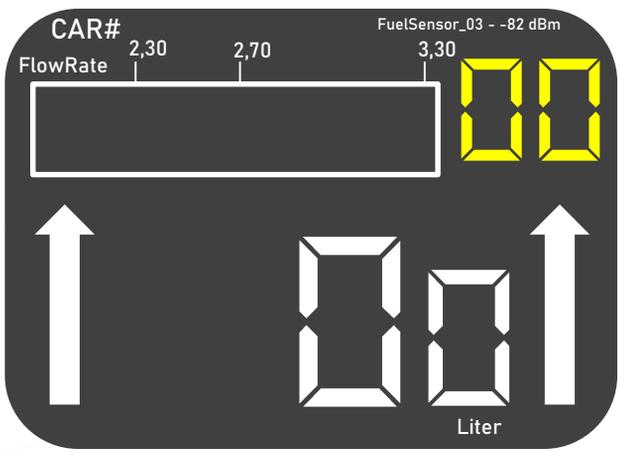
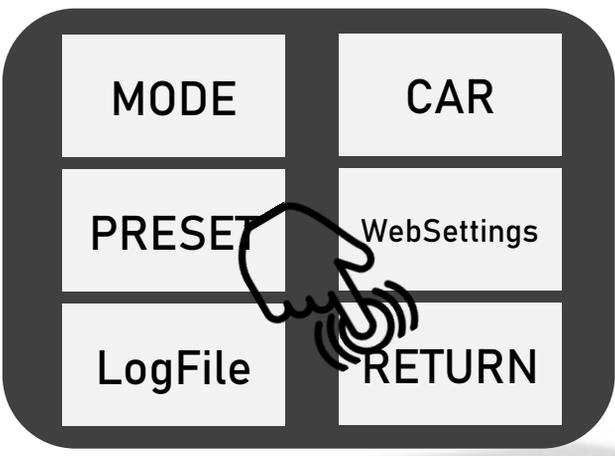
- Timer for MODE Min. Refueling
- Timer for MODE Splash
- Layout of the bargraph
- Car Names

→ Websettings will show the IP address which the display has got from the sensor. You will need this address to access websettings and logfiles if not in SOFT AP

# 4. FUNCTIONS

## 5. Return

RFC-FM20



→ Return will get you back to the homescreen

# 5. REFUELING

RFC-FM20

**Bar Chart** shows current flow rate  
**GREEN:** Good flow rate  
**YELLOW:** Critical flow rate  
**RED:** insufficient flow rate

**Timer** shows the total duration of the refueling process. The timer can also act as a stopwatch depending on the selected preset



**Fuel Counter** shows the current amount of fuel depending on the mode selected. The arrows will indicate if the amount of fuel is counted upwards or backwards starting from a customizable start value.

### Results & Data

Resulting values from fueling cycle incl. date and name

**Flow Rate**  
Flow Rate over time

### Critical Line

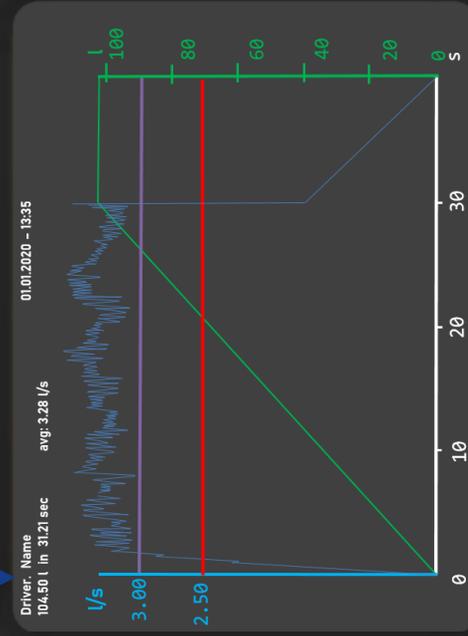
Programmable value which indicates the critical amount of flow

### Worst Case Line

Programmable value which indicates the alarm value

### Amount of fuel

Shows the amount of fuel over refueling time



### Scales

l/s: litres per second  
l: litres  
s: seconds

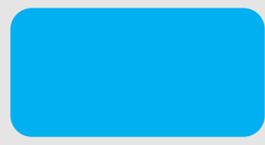
# 7. STATUS DISPLAY RFC-FM20-S38

STATUS DISPLAY RFC-FM20-S38

RFC-FM20

Driver. Name  
01.01.2020 - 13:37  
**READY**

FUEL Sensor SSID  
01.01.2020 - 13:37  
**DISPLAY**



**SENSOR**

READY FOR REFUELING

DISPLAY MISSING

FLOW MEASURING ACTIVE

BOOTING/  
SENSOR FAILURE



# 8. COMMAND LINES / NETWORK SETTINGS

RFC-FM20

## SENSOR UNIT

- SSID on initial setup is ***fuelsensor\_01***
- Password is ***password1***
- ***LOGIN DETAILS can get changed***  
via 192.168.4.1/WifiNet

## COMMANDS

→ If connected to the sensor unit

- 192.168.4.1/DateTime
- 192.168.4.1/WifiNet
- 192.168.4.1/Calib
- 192.168.4.XXX/LogFiles
- 192.168.4.XXX/setting

See 4.5



## DISPLAY UNIT

- SSID: ***FuelDisplay***
- Password: ***password***
- ***LOGIN DETAILS can not get changed***

## COMMANDS

→ If connected to the display via SOFT AP  
(without sensor running)

- 192.168.8.1/sensor
- 192.168.8.1/setting
- 192.168.8.1/LogFiles

# 8. TROUBLESHOOTING

## RFC-FM20

<b>PROBLEM</b>	<b>POSSIBLE ROOT CAUSE</b>	<b>POSSIBLE SOLUTION</b>
<ul style="list-style-type: none"><li>• <u>SENSOR SWITCHES OFF</u></li></ul>	<ol style="list-style-type: none"><li>1) Sensor times out</li><li>2) Low Battery</li><li>3) Unit defective</li></ol>	<ol style="list-style-type: none"><li>1) Extend Time Out Time via websettings</li><li>2) Charge Battery</li><li>3) Contact Krontec</li></ol>
<ul style="list-style-type: none"><li>• <u>SSID &amp; PASSWORD CAN NOT GET CHANGED</u></li></ul>	<ol style="list-style-type: none"><li>1) Password length too short</li><li>2) SSID too short</li></ol>	<ol style="list-style-type: none"><li>1) Use a minimum of 8 characters</li><li>2) Use a minimum of 2 characters</li></ol>
<ul style="list-style-type: none"><li>• <u>SENSOR STAYS RED AND SWITCHES OFF</u></li></ul>	<ol style="list-style-type: none"><li>1) No fluid detected</li></ol>	<ol style="list-style-type: none"><li>1) Make sure the sensor unit is fully flooded</li></ol>
<ul style="list-style-type: none"><li>• <u>MEASUREMENTS OFF</u></li></ul>	<ol style="list-style-type: none"><li>1) Calibration off</li></ol>	<ol style="list-style-type: none"><li>1) Calibrate the sensor as describes on page 11ff</li></ol>
<ul style="list-style-type: none"><li>• <u>DISPLAY OR SENSOR BEHAVIOUR STRANGE</u></li></ul>	<ol style="list-style-type: none"><li>1) Battery low</li></ol>	<ol style="list-style-type: none"><li>1) Charge battery</li></ol>

**LETS GET IN TOUCH**

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**info@krontec.de | [www.krontec.de](http://www.krontec.de)**

