Parker Serviceman Plus

Portable Hand-Held Measuring Instrument

ENGINEERING **YOUR** SUCCESS.

Foreword

Revisions

Version	Date	Change
1.0	01/2012	First edition

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Contents

1. Safety notes / product selection

1.1 Approved and intended use

This portable hand-held measuring instrument is used for measuring, monitoring and saving measured values. It is useful for servicing, maintenance and machine optimization. This instrument may only be used in conjunction with sensors and accessories from Parker's SensoControl accessories line.

Any other use is not permitted. Such use could lead to accidents or damage to the instrument and will result in the expiration of all warranty and indemnity claims against the manufacturer.

⚠	⚠ **WARNING**
	Serious malfunctions leading to personal injury or damage to property can result when this product is used in applications that do not comply with the given specifications or if you disregard the operating instructions and warnings.
	This instrument must not be used in hazardous areas where there is a risk of explosions!

1.2 Skilled personnel

These operating instructions have been written for skilled personnel who are familiar with the valid regulations and standards relevant to the application area.

1.3 Accuracy of the technical documentation

These operating instructions were created with the utmost care and attention. However, we offer no guarantee that the data, graphics and drawings are correct or complete. This document is subject to alteration without notice.

1.4 High-pressure applications

Selection

⚠	⚠ **DANGER**
	When selecting sensors, ensure that their overload pressure will not be exceeded. It is possible for the sensor to be damaged when the overload pressure is exceeded (depending on the duration, frequency and level of the pressure spike).
	The "diesel effect" caused by entrapped air can result in pressure spikes that far exceed the maximum pressure.
	The nominal pressure of the sensors should be higher than the nominal pressure of the system to be measured.

Installation

❗	**CAUTION**
	Please follow the instructions and observe the correct tightening torques for fittings and adapters.

Connector thread:

1/2" BSPP (with ED seal) = 90 Nm

1/4" BSPP (with ED seal) = 30 Nm

M10x1 (with O-ring seal) = 15 Nm

1.5   Service and repair

Please contact your sales branch for assistance with repairing or calibrating the measuring instruments.

1.6   Notes on disposal

Recycling in compliance with WEEE

After purchasing our product, you have the opportunity to return the instrument to the sales branch at the end of its life cycle.

The EU Directive 2002/96 EC (WEEE) regulates the return and recycling of old electrical and electronic devices. As of 13/8/2005, manufacturers of electrical and electronics equipment in the B-2-B (business-to-business) category are obliged to take back and recycle electrical devices free of charge that have been sold after this date. After that date, electrical devices must not be disposed of through the "normal" waste disposal channels. Electrical equipment must be disposed of and recycled separately. All devices that fall under this directive must feature this logo.

Can we be of assistance?

We offer you the option of returning your old device to us at no extra charge. We will then professionally recycle and dispose of your device in accordance with the applicable laws.

What do you have to do?

Once your device has reached the end of its lifespan, simply return it by parcel service (in the box) to your sales branch. We will then take care of the recycling and disposal. You will incur no costs or suffer any inconvenience.

Any questions?

Please contact us if you have any additional questions.

Battery disposal

The disposal of batteries is subject to the Battery Directive 2006/66/EC in the EU, the BattG battery law of 25.6.2009 in Germany, and the relevant national legislation internationally.

Do not dispose of batteries in normal household rubbish.

2. Hardware version / scope of delivery / updates

The basic configuration of your measuring instrument includes the following:

- "SCM-155-0-02": Connections for two Parker analogue sensors

or

- "SCM-155-2-05": Connection for a CAN bus network for a maximum of three Parker CAN bus sensors:
- USB power supply (5V 1A), including regional adapters
- USB cable
- USB flash drive
- SensoWin software (included in delivery)
- Printed instructions, electronic operating manual (on the enclosed disk)

The "Accessories" Chapter includes more information about the available accessories that are not included in delivery.

2.1 Updates – updating the instrument's firmware

The user can keep the measuring instrument up to date by updating the instrument's firmware. The update process is described in this section.

The current firmware version of the instrument is shown during boot up.

Files with a *.FIMG extension are used for the update. These files are copied to the measuring instrument. The USB flash drive should be used to transfer the files.

1 Copy the file with the extension *. FIMG (without sub-folders) directly from the PC to the USB flash drive. Then plug the flash drive into the instrument while it is switched off.

2 Disconnect all sensors that may be connected to your measuring instrument.

3 Turn the instrument on and wait until the message "NO SENSOR" is displayed and the Save icon appears in the top bar.

4 Briefly press the ON/OFF key.

5 Wait for the following to appear on the display: FIRMWARE UPDATE -> OK

6 OK will initiate the update: FIRMWARE UPDATE. Press Esc to switch off the instrument without updating.

i Register by sending your product information to SMP.Info@Parker.com; you will then be automatically informed of any future firmware updates.

Charging the battery

Charging time on the PC: > 7 hours

Charging time from power supply:

CAN version: about 7 hours

Analogue version: about 3.5 hours

ⓘ	**CAUTION**
	This instrument can be charged using the USB port on your PC. However a PC delivers less power and it will take much longer for the battery to charge.
	If sensors are connected to the instrument, the current consumption of the sensors may be greater than the charging current, in which case the battery will continue to discharge. Thus we recommend using the power supply or car charger (available separately) for charging quickly and when using for continual measurement processes.

Changing the battery

Contact your sales representative for more information if you need to switch batteries.

3. Connecting the sensors

3.1 SCM-155-0-02 with Parker analogue inputs

Analogue cable
SCK-102-XX-02

Analogue cable
SCK-102-XX-02

3.2   SCM-155-2-05 with Parker CAN sensors

CAN cable
SCK-401-XX-4F-4M

CAN Y-junction
SCK-401-0.3-Y

CAN resistor
SCK-401-R
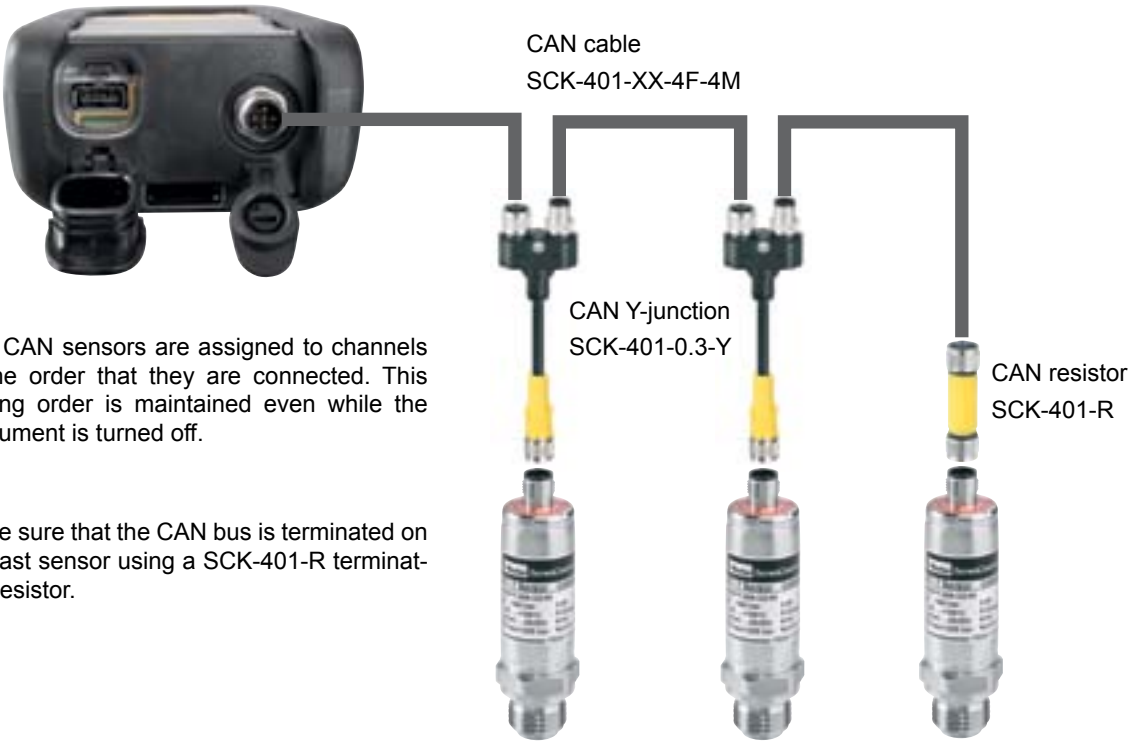
i The CAN sensors are assigned to channels in the order that they are connected. This sorting order is maintained even while the instrument is turned off.

i Make sure that the CAN bus is terminated on the last sensor using a SCK-401-R terminating resistor.

The SORT menu option can be used to change the order of display (see page 12).

The sorting order can be reset using the Reset SORT option (see page 13). The sensors are then sorted in the order that they are connected.

3.2.1 The SpeedCon connection
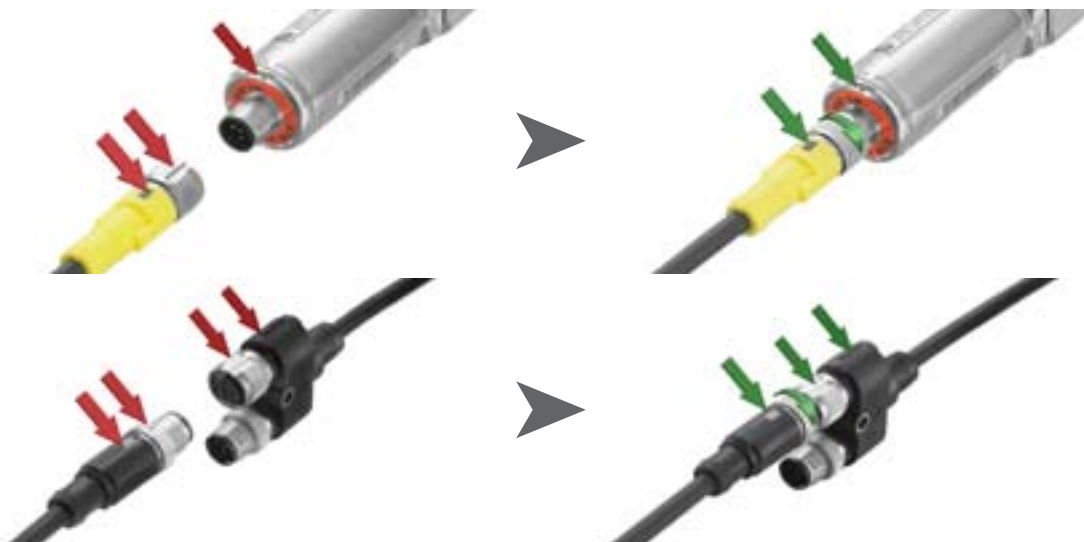
<table>
<tr><td>

⚠ CAUTION

Be sure that the plastic caps are covering any unused ports. There is no guarantee that the instrument will be properly protected against dust and splashed water when the inputs or outputs are uncovered. IP54 or IP67 protection is ensured only when all plastic caps are on, or when the CAN network is in use, or when using the CAN network or analogue sensors.

</td></tr>
</table>

ℹ A sensor that is connected while a measurement is being recorded is not taken into consideration. (i.e., a new channel is not displayed and the measurements from this channel are not saved).

The measurement process is continued even if a sensor is removed during the measuring. Data recorded until the sensor's removed is saved.

3.3   Using the SCMA-VADC-600 current-voltage converter

The current/voltage converter can only be used with the analogue version of the SCM-155-0-02 measuring instrument. Once connected, the display will show the % value. The scale and the measurement size can be changed using the SensoWin software.

3.4   Using the SCMA-FCU-600 frequency converter

The SCMA-FCU-600 frequency converter can be used with both versions of the instrument. The frequency converter is configured using the SensoWin software (please refer to the converter's operating manual).

The CAN version of the instrument can detect the setting ranges of the frequency converter and display them directly.

The analogue version has a sensor detection feature for the setting ranges 0 to 15, 60, 150, 300, 600, 750 l/min and 0 to 10000 1/min. These are displayed directly on the instrument. All other ranges are initially shown as a % value, but can be configured via the SensoWin software.

4.   Instrument settings

i   Some of the buttons are assigned two functions. You can execute the second function (which is printed in grey) by pressing the button for three seconds.

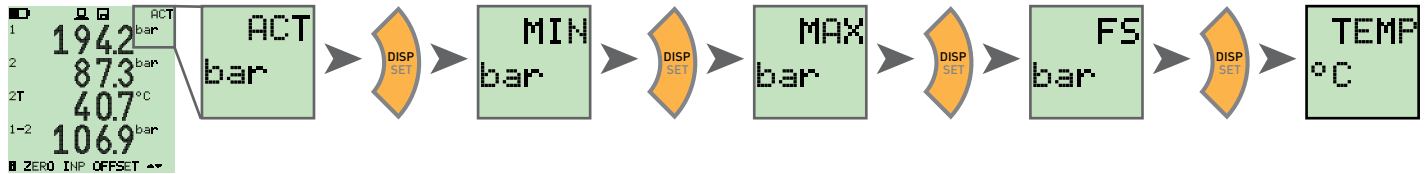### 4.1   RESET – reset the MIN and MAX values

RESET ZERO   Resets the minimum and maximum values for all channels.

4.2 DISP – display the current readings, MIN, MAX values, sensor limit value or temperature.

4.3 SORT – reorder the channels in the display
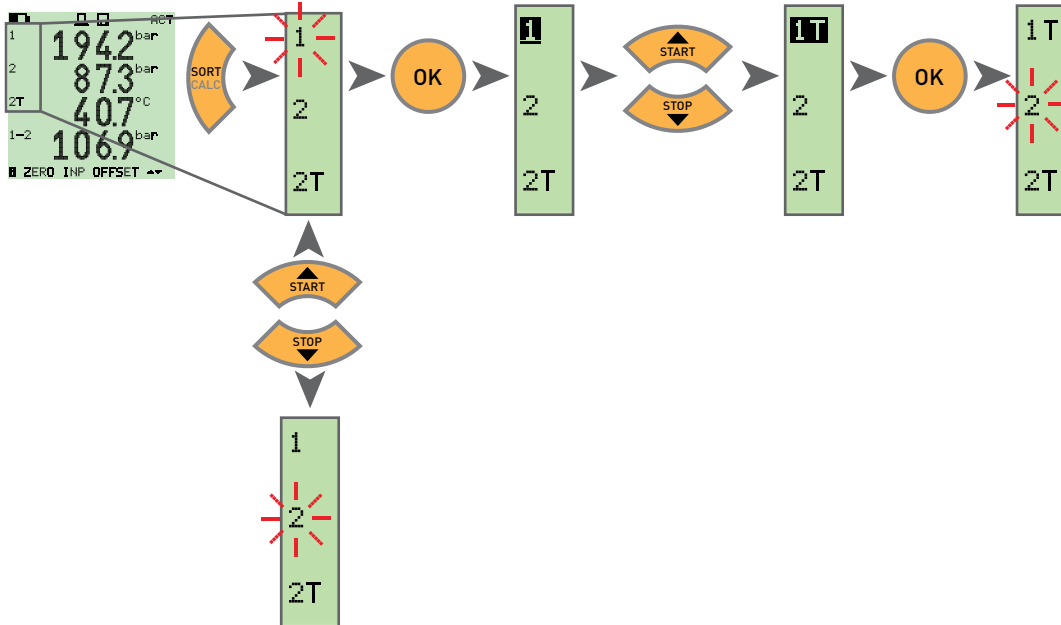
4.4   SORT RESET – reset to the factory default sorting

Unplug all sensors

i NO SENSOR ➤ SORT CALC ➤ **i SORT RESET → OK** ➤ **OK**

4.5   CALC – insert the calculating channel

Difference 1-2
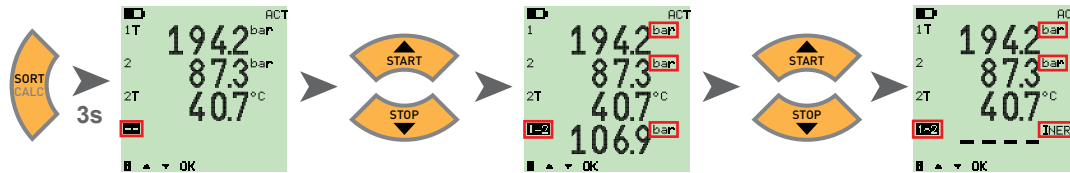
Hydraulic power (1*2 -> p*Q/600)
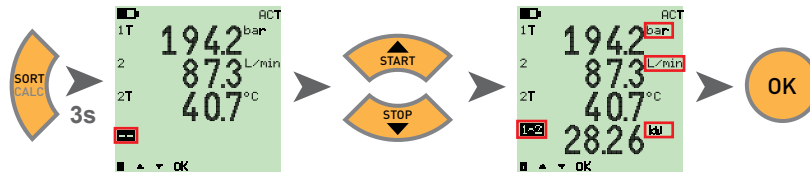
| i | Differential value, addition and power (multiplication) are available as calculating formulas. After the formula has been selected, the measurement variables are checked for plausibility. The error message INERR is displayed if the measurement variables are not plausible. |

4.6   SET – basic instrument settings
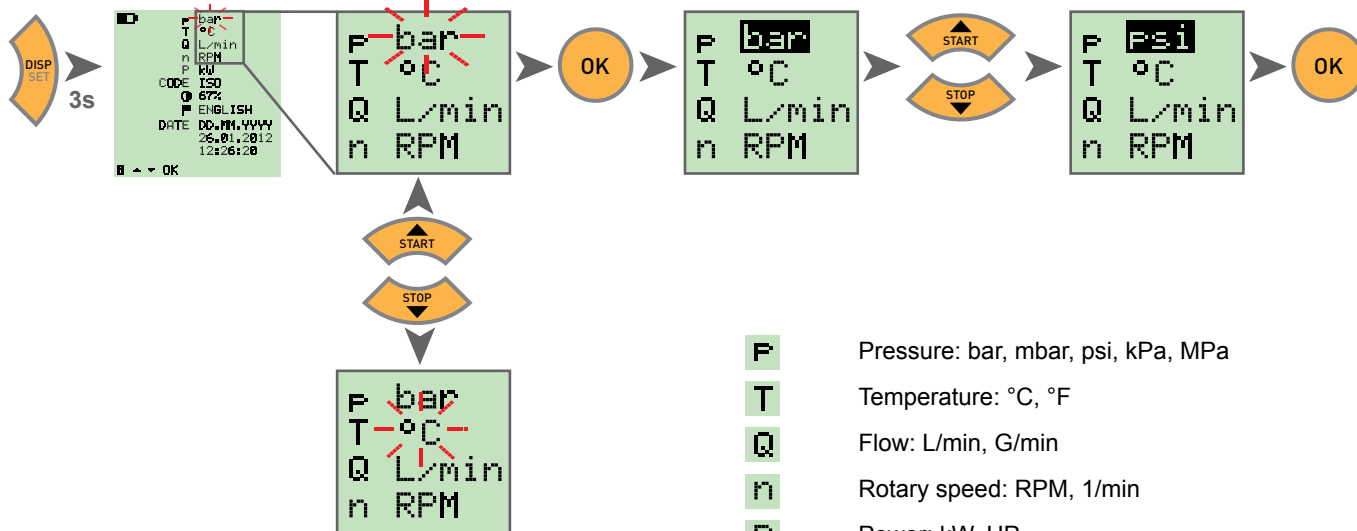
P	Pressure: bar, mbar, psi, kPa, MPa
T	Temperature: °C, °F
Q	Flow: L/min, G/min
n	Rotary speed: RPM, 1/min
P	Power: kW, HP
CODE	Oil quality: ISO, NAS
◑	Contrast: 0 to 100%
▣	Languages: German, English, French, Italian, Spanish
DATE	Date format: DD.MM.YYYY, MM.DD.YYYY Date Time

ℹ The instrument's basic settings can also be changed using the PC software.

You can also set the interval for the instrument's auto-shut-off function, the background illumination and the scaling of external sensors using the software.

4.7   START / STOP – saving the measurements

ℹ This instrument can only save one measurement set in internal memory. The measurement set is overwritten when a new measurement starts.

Use a USB flash drive in order to save multiple measurement sets.
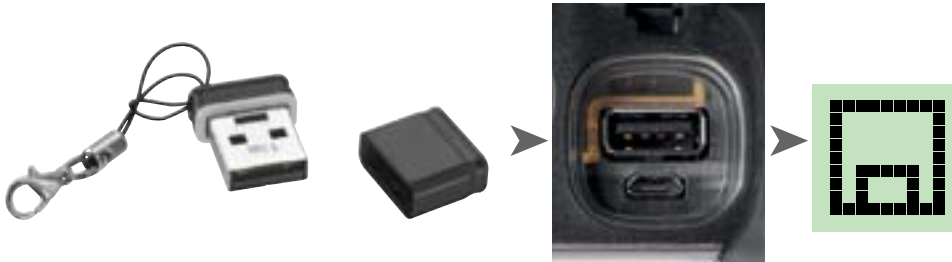
ℹ If a USB flash drive is inserted before the instrumented is turned on, then the measurement saved internally will be transferred to the flash drive.

The display then reads:

⚠ CAUTION
Only insert or remove the flash drive while the instrument is turned off.

4.8   Saving measurements in internal memory
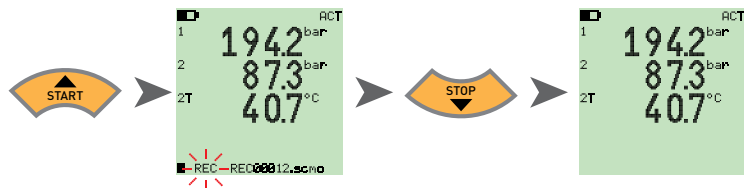
4.8.1   Saving measurements on the USB flash drive
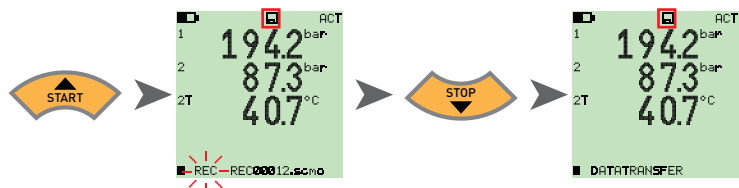
i The file name is incremented for each sequential measurement. The files are stored with date and time.

4.9   Online measurements using the PC software

The measured data can be transmitted directly through the USB interface to the PC software, where they can be displayed and saved. More information can be found within the software's Help menu.

The display then reads: **i** ONLINE DATATRANSFER

4.10 ZERO – calibrate for offset error

4.10.1 ZERO – input offset

ZERO – Input Offset resets the zero point for the connected sensors.

i The zero point calibration is carried out for safety reasons only when the calibrating values are less than 5% of full scale value of the sensors. Otherwise, the display shows OFL.

The offset is saved until the instrument is turned off.

! **CAUTION**

The zero point calibration of pressure sensors should only be carried out in a de-pressurized state.

4.10.2 ZERO – Δ offset

ZERO – Δ offset sets the differential value for a differential pressure measurement to zero.

> **i** Carry out the differential pressure calibration at the operating pressure; the calibration is only valid for this pressure. Connect both sensors to the same port (using a T-adapter). The calibration sets the to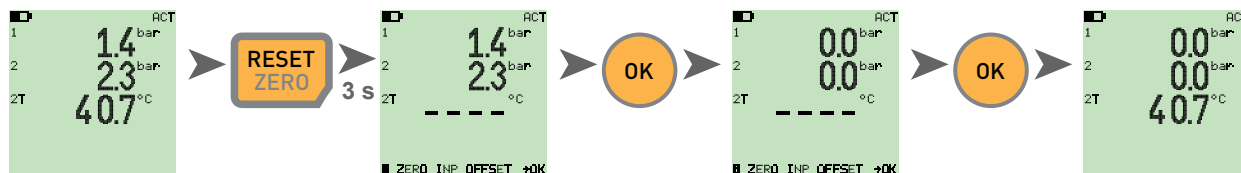lerance of the sensors in relation to one another to zero. The calibration is carried out for safety reasons only when the calibrating values are less than 5% of full scale value of the sensors. Otherwise, the display shows OFL.
>
> The offset is saved until the instrument is turned off.
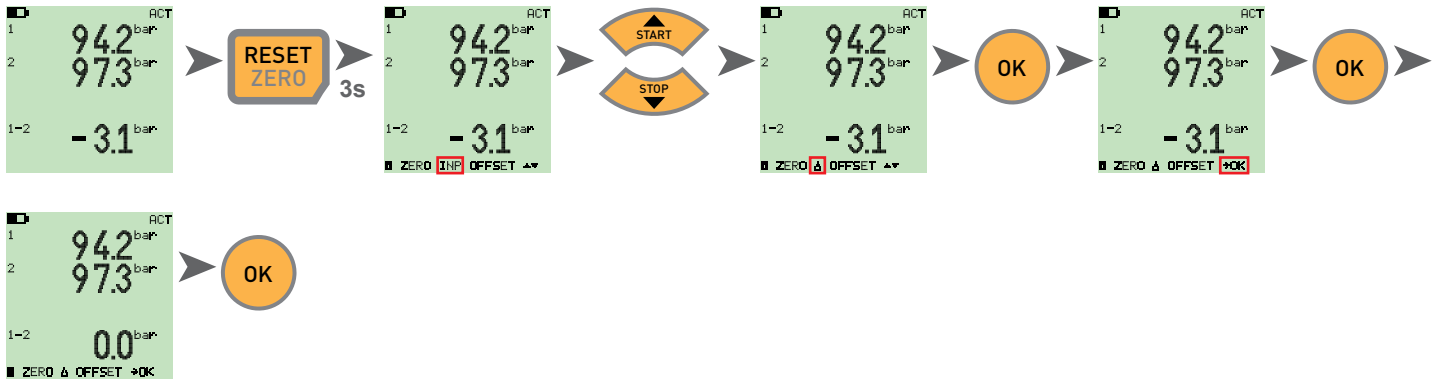
4.11 Instrument reset

Turn the instrument off.

The instrument will be reset to factory settings.

5.   Error messages

Display	Description	Solution
ERROR 1	Internal device error	Confirm by clicking <OK>. If this occurs frequently, please return the unit for repair.
ERROR 2	Memory error	Confirm by clicking <OK>. If this occurs frequently, please return the unit for repair.
USB ERROR	Error when saving to the USB flash drive	USB flash drive is full, defective or not compatible. Please use only USB flash drives that conform to the Technical Specifications (see page 23).
USB FULL ERROR	The USB flash drive is full	Delete files on the USB flash drive or use a new one
FIRMWARE ERROR	The firmware update has failed. This occurs when the transfer of a new firmware from the USB flash drive failed.	Confirm by clicking <OK>. If this occurs frequently, please return the unit for repair.
CAN ERROR	CAN initialization failed. Unknown CAN sensor, or more than three CAN sensors connected	Please make sure you are only using Parker CAN sensors and connecting no more than three sensors.

6. Maintenance, cleaning and repair

> **CAUTION**
>
> Be sure to turn off the instrument and disconnect the power supply before you start cleaning it.

> **CAUTION**
>
> Never use aggressive cleaning agents, solvents, petroleum ether or similar chemicals. These chemicals can damage the housing or display on the instrument.

Clean the instrument's housing with a soft moist cloth. Mild household cleaners may be used for hard-to-remove dirt and debris.

6.1 Notes on maintenance and calibration

This measuring instrument requires no special maintenance. However, it is necessary to calibrate the instrument regularly. A yearly calibration procedure is required if you use the instrument often. Please contact your sales representative for more information.

6.2 Repair

Contact your sales representative if your instrument needs repairs. Have the following information ready:

- The name of your company or organization
- The name of your department
- Your contact person
- Your telephone and fax number
- Your e-mail address
- The article number of the faulty instrument (and serial number, if available).
- A detailed description of the problem

7. Accessories

7.1 Accessories and spare parts for both versions

Car adapter 12/24 VDC	SCNA-USB-CAR
USB cable (2 m) for charging and PC connection	SCK-315-02-36
Power supply (with USB port)	SCSN-440
USB flash drive (1 GB)	SC-USB-MINISTICK

7.2 Analogue sensors (with automatic sensor detection) and connecting cable

(Please refer to Catalogue 4054 for more details.)

Analogue connection cable 3 m 5 m Extension (5 m)	SCK-102-03-02 SCK-102-05-02 SCK-102-05-12
Pressure sensors -25 to +125° C, including SCA-1/4-EMA-3 adapter Pressure ranges: -1 to 015 bar/0 to 060 bar/0 to 150 bar/ 0 to 400 bar/0 to 600 bar/ 0 to 1,000 bar	SCP-XXX-74-02
Pressure/temperature sensors -25 to +125° C, including SCA-1/2-EMA-3 adapter Pressure ranges: -1 to 015 bar/0 to 060 bar/0 to 150 bar/ 0 to 400 bar/0 to 600 bar/ 0 to 1,000 bar	SCPT-XXX-02-02

Temperature sensors (-25 to 125° C) With screw-in probe (M10x1) With stick probe	SCT-150-04-02 SCT-150-0-02
Rotary speed sensor (0 to 10,000 RPM With 2 metres of fixed cable	SCRPM-220
Volumetric flow rate sensors -60 to +60 L/min -150 to 150 L/min	SCQ-060-0-02 SCQ-150-0-02
Flow turbine 015/060/150/300/600/750 L/min	SCFT-XXX-02-02
Flow turbine with load valve 150 L/min 300/750 L/min	SCFT-150-DRV SCFT-PTQ-XXX
Current/voltage converter (0 to 48 V, 0 to 4A) including connecting cable with test terminal	SCMA-VADC-600
Frequency adapter (2 Hz to 5 kHz) Including M8x1 cable adapter with analogue and CAN-bus interfaces	SCMA-FCU-600

7.3 CAN-bus sensors (with automatic sensor ID) and connecting cable

(Please refer to Catalogue 4054 for more details.)

CAN connection cable	
3 m	**SCK-401-02-4F-4M**
5 m	**SCK-401-05-4F-4M**
Extension (10 m)	**SCK-401-10-4F-4M**
CAN Y-junction	
Including 0.3 m cable	**SCK-401-0.3-Y**
CAN terminating resistor	
Female 5-pin socket – female 5-pin socket	**SCK-401-R**
Pressure sensors	
-25 to +125° C, including SCA-1/4-EMA-3 adapter Pressure ranges: -1 to 016 bar/0 to 060 bar/0 to 160 bar/ 0 to 400 bar/0 to 600 bar/ 0 to 1,000 bar	**SCP-XXX-C4-05**
Pressure/temperature sensors	
-25 to +125° C, including SCA-1/2-EMA-3 adapter Pressure ranges: -1 to 016 bar/0 to 060 bar/0 to 160 bar/ 0 to 400 bar/0 to 600 bar/ 0 to 1,000 bar	**SCPT-XXX-C2-05**
Flow turbine	
015/060/150/300/600/750 L/min	**SCFT-XXX-C2-05**

Flow turbine with load valve	
150 L/min	**SCFT-150-DRV-C2-05**
300/750 L/min	**SCFT-PTQ-XXX-C2-05**
Frequency adapter (2 Hz to 5 kHz)	
Including M8x1 cable adapter with analogue and CAN-bus interfaces	**SCMA-FCU-600**

8.   Technical data

Version	SCM-155-0-02 Analogue version	SCM-155-2-05 CAN version
Inputs	Sensor inputs: Two Parker analogue sensor with sensor ID	Sensor inputs: CAN-bus interface for up to three CAN BUS Parker sensors with sensor ID
	Measurement accuracy: ≤0.2 % FS ± 1 digit	Measurement accuracy: -
	Plug connector: 5-pole, Push-Pull	Plug connector: 5-pole, M12x1, SPEEDCON®, plug
	Polling rate for P-channel: 1 ms	Polling rate for P-channel: 1 ms
Interfaces	USB device: Online data transmission between instrument and PC via SensoWin software Measurement transmissions: ACT/MIN/MAX, min. 5 ms USB standard: 2.0, full speed Plug connection: Micro-USB connector, shielded, Type B	
	USB host: Port for USB flash drive (max. 4 GB) Recommended types: Delock USB 2.0 Nano flash drive, Intenso Micro Line USB standard: 2.0, full speed,100 mA max. Plug connection: Micro-USB socket, shielded, type A	
Memory	Internal memory for measurement data: 1 measurement, about 15,000 records (270,000 readings for ACT/MIN/MAX)	
	USB flash drive: 1 GB included	
Functions	Difference; addition; power; ACT; MIN; MAX; FS; TEMP display; Battery status Start-stop measurement	

Version	SCM-155-0-02 Analogue version		SCM-155-2-05 CAN version	
Display	Type:	FSTN LCD, graphic, LED backlit		
	Visible surface:	62 mm x 62 mm		
	Resolution:	130 x 130 pixels		
Battery	Type:	Lithium ion pack 3.7 V DC / 2250 mAh	Type:	Lithium ion battery pack 3.7 V DC / 4500 mAh
	Charging time with power supply: approx. 3.5 hours		Charging time with power supply:	approx. 7 hours
	Time to discharge:	> 8 hours, when using 2 sensors	Time to discharge:	> 8 hours, when using 2 CAN-bus sensors
Power supply (external)	Micro-USB connector, type B, + 5 V DC, max. 1000 mA			
Housing	Housing material:	PC/ABS		
	Material of protective sleeve around housing:	TPU		
	Dimensions (W x H x D):	96 × 172 × 54 mm		
	Weight:	Approx. 540 g		
Ambient conditions	Operating temperature:	0 to +50 °C		
	Storage temperature:	-25 to +60 °C		
	Rel. humidity:	<80%		
	Environmental assessment:	DIN EN 60068-2-32 (1 metre free fall)		
	Protection degree (EN60529):	IP54	Protection degree (EN60529):	IP67
PC software	Export measurement data; display and analyse data on PC			
	Export and edit the instrument's settings			
	Load the instrument settings from library onto measuring instrument			