

## Hydraulic Testers of the PPC Series



The STAUFF measuring and test equipment from the PPC Series is ideal for measuring all relevant parameters in fluid technology systems such as pressure, differential pressure, temperature, flow rate and power.

Depending on the type, they allow evaluation, storing and further processing on PCs or notebooks. They have been developed specifically for the growing demands of system monitoring, fault tracing and parameter measuring in hydraulic and pneumatic systems.

There are many different areas of application:

- Industrial hydraulics
- Mobile, agricultural and forestry hydraulics
- Ship and offshore hydraulics
- Chemicals and petrochemicals
- Energy and air-conditioning systems
- Heating and sanitary systems

One of the features of the new generation of the PPC-04-plus Hydraulic Tester is its uncomplicated operation. Even in difficult lighting situations, the multi-line backlit LCD display allows the user to read out the measured values quickly and reliably. The new Hydraulic Tester is available in two variants, either with two inputs for analogue sensors or with a CAN interface for connecting up to three digital sensors. Both versions are equipped with an internal data memory and a USB port and are operated with an internal power supply (lithium-ion battery pack).

The Hydraulic Testers from the PPC-06/-08-plus Series offer the option of connecting three or four analogue sensors, depending on the model. Older sensors from the STAUFF Diagtronics product range and third-party sensors can also be used with these devices without problems. Both Hydraulic Testers are equipped with a large internal data memory and an integrated USB interface and can run for several hours in battery mode. The supplied software makes it possible to view the measured values not only as numbers but also as diagrams on a PC.

The powerful PPC-PAD-plus is the latest device in this range of Hydraulic Testers. This multifunction device is a new development and was specially adapted to the increased requirements in fluid technology and the user demands. This powerful analytics device features a touch screen that makes operation even easier and more efficient.

The obtained measured values can be shown on the 7" touch display in different modes to allow effective, solution-based analyses. The modular structure of the sensor inputs is also new. This allows the basic unit to be expanded with a variety of different sensor inputs by adding more input modules.






Another new feature are the extensive options of storing a countless variety of measuring tasks as templates, which can be called up immediately when needed. This means that even complex recurring measuring tasks can be started more or less straight away.

The CAN bus sensors from STAUFF use the automatic sensor detection to enable a plug-and-play solution that is easy to install.

The hydraulic testers and the sensors from the PPC Series are available as calibrated models and are supplied with a calibration certificate. Subsequent calibration can be requested with a special order designation.



## Hydraulic Testers of the PPC Series ■ Product Overview

Hydraulic Testers					
Options	PPC-04-plus	PPC-04-plus-CAN	PPC-06-plus	PPC-08-plus	PPC-PAD-plus

Battery mode	●	●	●	●	●
Number of sensor inputs	2 (max. 2 analogue sensors)	1 x CAN (max. 3 CAN sensors)	3	4	Analogue max. 6 + 6 CAN channels each with max. 24 sensors
Option for adding sensor inputs	—	—	—	—	●
PC interface	USB	USB	USB	USB	USB/Ethernet/WiFi
Online function	●	●	●	●	●
Internal data memory	●	●	●	●	●
Programming of automatic test sequence	—	—	●	●	●
Internal trigger function	—	—	●	●	●
Touch screen	—	—	—	—	●
Illuminated display	●	●	●	●	●
Curve shown on the display	—	—	—	—	●
PC software kit	●	●	●	●	●

Pressure measurement	●	●	●	●	●
Temperature measurement	●	●	●	●	●
Flow rate measurement	●	●	●	●	●
Rotational speed measurement	●	—	●	●	●
Frequency measurement	with optional current/voltage/ frequency converter	with optional current/voltage/ frequency converter	with optional current/voltage/ frequency converter	with optional current/voltage/ frequency converter	integrated into the device
Analogue third-party sensors	with optional current/voltage/ frequency converter	with optional current/voltage/ frequency converter	with optional current/voltage/ frequency converter	with optional current/voltage/ frequency converter	integrated into the device
STAUFF CAN Sensor	—	●	—	—	●
Third-party CAN sensors	—	—	—	—	max. 5 third-party sensors on CAN-Y

● = standard, — = not available



## Hydraulic Testers of the PPC Series



- ① Hydraulic Tester **PPC-04-plus**  
max. two analogue sensors can be connected at the same time
- ② Hydraulic Tester **PPC-06-plus**  
max. three analogue sensors can be connected at the same time
- ③ Hydraulic Tester **PPC-08-plus**  
max. four analogue sensors can be connected at the same time
- ④ Hydraulic Tester **PPC-PAD-plus**  
max. six analogue sensors can be connected at the same time
- ⑤ Pressure Sensor **Sensor-PPC-04/12-P**

- ⑥ Pressure/Temperature Sensor **Sensor-PPC-04/12-PT**
- ⑦ Rotational Speed Sensor **Sensor-PPC-04/12-SDS-CAB** with integrated connection cable, either with Contact Adaptor **Adaptor-PPC-04/12-SKA-Contact** or Focusing Adaptor **Adaptor-PPC-04/12-SKA-Focus**
- ⑧ Temperature Sensor **Sensor-PPC-04/12-T**
- ⑧ Rod-Type Temperature Sensor **Sensor-PPC-04/12-TSH**
- ⑨ Turbine Flow Meter **Flow-meter-PPC-04/12-SFM** with integrated signal converter, with option for connecting pressure and temperature sensors

- ⑩ 5-pin Connection Cable for sensors **Cable-PPC-04/12-3** (3 m/9.84 ft), alternatively with extension cable **Cable-PPC-04/12-5-EXT** (5 m/16.40 ft)
- ⑪ PPC Connection Cable as part of the PC set **PC-SET-06/08-plus-SW-CAB** (USB)
- ⑫ Standard micro USB cable (included in the delivery)
- ⑬ Standard micro USB cable (included in the delivery) or Ethernet cable

## Hydraulic Testers PPC-Series (CAN Version)



- ① Hydraulic Tester **PPC-04-plus-CAN** with one CAN interface
- ② Hydraulic Tester **PPC-PAD-plus** with 6 CAN interfaces
- ③ CAN Pressure Sensor **Sensor-PPC-CAN-P**
- ④ CAN Temperature Sensor **Sensor-PPC-CAN-T**

- ⑤ CAN Pressure/Temperature Sensor **Sensor-PPC-CAN-PT**
- ⑥ CAN Turbine Flow Meter **Flow-meter-PPC-CAN-SFM** with integrated signal converter, with option for connecting pressure and temperature sensors
- ⑦ CAN Connection Cable **Cable-PPC-CAN-X**
- ⑧ CAN Y-Splitter Cable **Cable-PPC-CAN-Y**

- ⑨ CAN Terminating Resistor **Resistor-PPC-CAN**
- ⑩ Standard micro USB cable (included in the delivery)
- ⑪ Standard micro USB cable (included in the delivery) or Ethernet cable



## Hydraulic Testers ■ Type PPC-04-plus / PPC-04-plus-CAN

B



PPC-04-plus with 2 sensor inputs  
for max. 2 analogue sensors



PPC-04-plus-CAN with CAN interface for  
max. 3 sensors (max. 50 m / 164 ft cable length)

### Product Description

The PPC-04-plus and PPC-04-plus-CAN Hydraulic Testers have been developed for the growing demands in mobile and industrial hydraulic systems. They are perfectly suited for the precise determination of pressure, temperature, volume flow and rotational speed.

- Multi-line, backlit LCD display
- Max. two analogue sensors can be connected at the same time
- With CAN interface, max. three digital sensors can be connected at the same time
- Integrated data memory for 15000 data records
- External storage by using a USB memory stick (1 GB included)
- Max. CAN bus length: 50 m / 164 ft (CAN version)

The Hydraulic Testers are available in two versions. The PPC-04-plus, analogue version, comes with two inputs for connecting up to two analogue sensors at the same time. The PPC-04-plus-CAN comes with an CAN interface for connecting up to three digital sensors at the same time. Both versions provide automatic sensor recognition, thus making the tedious and often time-consuming parameterization of sensors redundant. The units can be easily operated via the keyboard and the individual device configurations can be viewed and managed.

Due to its extremely robust construction and oil-resistant rubber coating, the Hydraulic Testers can withstand impacts, vibrations, dust and moisture (protection class up to IP 67) and is designed for use in particularly harsh conditions.

The internal battery (Lithium Ion pack) can be charged via an micro USB connection, this connection can be also used to transfer the internally stored datas to a PC or notebook. Furthermore, this connection is also provided for real-time presentation of the measured values on the PC.

The PPC-04-plus devices can store up to 15000 data records and 270000 measured values. The included PPC software is compatible with popular PC operating systems (Windows XP®, Windows Vista®, Windows 7®, Windows 8® and Windows 10®) and permits various evaluation methods.

It is also possible to connect the Pressure Sensors under load, with the equipment switched on. The temperature and volume flow sensors are to be installed in the pipelines. The Rotational Speed Sensor is a non-contacting sensor and uses an optical mark on the rotating parts.

Measuring the differential pressure requires two Pressure Sensors with identical measuring ranges.

The units are also available as a complete set.  
See pages 46 / 47 for further information.

### Order Codes

PPC-04-plus - CAN - CAL		
①	②	③
<b>① Series and Type</b> Hydraulic Tester <b>PPC-04-plus</b>	<b>③ Calibration</b> Without calibration certificate <b>(none)</b> With calibration certificate <b>CAL</b>	
<b>② Version</b> Analogue version <b>(none)</b> CAN version <b>CAN</b>	Note: Calibration certificate is only available for the analogue Hydraulic Tester PPC-04-plus.	

### Technical Data

#### Materials

- Housing made of ABS in a rubber protective

#### Dimensions and Weight

- W x H x D: 96 x 172 x 54 mm / 3.78 x 6.77 x 2.13 in
- Weight: ca. 540 g / 1.19 lbs

#### Measurements / Display

- Pressure: in bar, PSI, mbar, kPa, MPa
- Temperature: in °C und °F
- Volume flow: in l/min and US GPM
- Rotational speed: in 1/min and RPM
- Display: FSTN-LCD, graphic, LED backlit
- Visible area: 62 x 62 mm / 2.44 x 2.44 in
- Resolution: 130 x 130 Pixel

#### Power Supply

- External: Micro USB socket, type B +5V DC, max. 1000 mA
- Battery: Lithium Ion pack  
3,7 V DC / 2250 mAh or  
3,7 V DC / 4500 mAh CAN version
- Operating time with the rechargeable battery: approx. 8 hours

#### Sensor Inputs

- Push-in connection: 5-pol., push-pull or 5-pol., M12x1, SPEEDCON, connector (CAN version)
- Automatic sensor recognition
- Sampling rate: 1 ms
- Accuracy: < ±0,2% FS\* ±1 Digit

#### Permissible Temperatures

- Ambient: 0°C ... +50 °C / +32 °F ... +122 °F
- Storage: -25 °C ... +60 °C / -13 °F ... +140 °F

- Relative humidity: < 80 %
- CE certified

#### Interfaces

- USB device: Online transmission between unit and PC via PPC-Soft-plus (software)  
Measured value transmission: ACT/MIN/MAX, min. 5 ms  
USB standard: 2.0, fullspeed  
Push-in connection: Micro USB socket, shielded, type B  
Connection for USB stick, max. 4 GB  
USB standard: 2.0, fullspeed, max. 100 mA  
Push-on connection: USB socket, shielded, type A
- USB host:

#### Protection Rating

- IP 54 protection rating: Dust protected and protected against splashing water
- (CAN version)  
IP 67 protection rating: Dust tight and protected against splashing water

#### Software

A PC set, consisting of a USB connection lead, length 1 m / 3.28 ft and the corresponding PC software, is included in the scope of delivery.

The measured data and curves can be easily transferred and processed by using PPC-Soft-plus software as well as exported to Microsoft Excel®.







## Hydraulic Tester ■ Type PPC-PAD-plus

B



### Product Description

The application options for hydraulic technology have increased significantly in all areas of drive and control systems.

This trend is particularly evident in the fields of machinery, plant and automotive engineering. At the same time, hydraulics and electronics are becoming increasingly more interlinked.

The new PPC-PAD-plus Multifunction Hand-Held Hydraulic Tester was developed especially for high demands and helps you to master these new challenges. It has never been so easy to track the complex processes in these industries through measurements, displays and analyses. Possible areas of application include preventive maintenance, commissioning, troubleshooting and machine optimisation. The increased requirements of these modern applications (e.g. more measuring points, longer cables and higher immunity to interference) have driven the further development of the CAN bus.

The new PPC-PAD-plus has a 7" touch screen which makes operation very simple, even for complex tasks.

The modular design also ensures best possible adaptation to a variety of different measuring tasks. Different input modules are offered for connecting additional sensors. These modules can easily be replaced by the user. There is an option of running the basic device with max. two additional modules in the device.

The CAN Bus Sensors from STAUFF use the automatic sensor detection of the bus to allow an easy-to-install plug-and-play solution (max. CAN bus length 100 m/328 ft). The device is compatible with the existing sensors from the PPC Series.

One great advantage is the option to generate a variety of different templates for recurring measuring tasks and saving these in so-called containers. Calling up these templates for recurring measuring tasks ensures interpretation and comparability of the results at all times. This can even go so far as executing these templates automatically at the press of a button.

The newly integrated WIFI function also allows the device to be controlled via remote access, which means that executing measuring tasks and calling up the recorded data from a different location are no longer a challenge.

The PPC-Analyze PC Software offers additional methods for analysis, control and remote service using LAN and USB connections. In combination with this software, the PPC-PAD-plus is a very user-friendly hydraulic tester that is suitable for all types of diagnostic applications.

### Product Features (for basic device)

- Portable multifunction hand-held tester
- Measuring, monitoring and analysis of pressure, temperature, volumetric flow rate and mass flow rate
- Measurement recording with a resolution of up to 1 ms
- Measurement and display of over 50 channels
- Sensor inputs can be expanded with additional input modules
- 2 frequency inputs for connecting third-party sensors or digital inputs/outputs
- 7" touch display, suitable for operation with gloves, robust 3 mm glass, resolution 800 x 480 pixels
- Connection of third-party CAN open sensors possible
- Analogue input module with galvanic isolation available
- Display of measured values: numerical, bar graph, pressure gauge, points, curve diagram
- Saving and loading project templates
- Defining of quick values possible (green, yellow, red)
- Memory for up to 1 billion measured values
- The measured data can be recorded (automatically), saved and analysed with the PPC-Analyze PC Software over a LAN, WIFI or USB connection.
- Max. CAN bus length: 100 m/328 ft

#### Touch Display

- Size/resolution: 7", 800 x 480 pixels
- Brightness: 450 cd.
- Can be operated with gloves

#### Calculation Channels

- Number: 4
- Functions: /, \*, +, -, f'(t), Integral, sin, cos, tan, x<sup>2</sup>, SQRT, xy
- Maximum number of calculation from channels/calc channel: 3

#### Interfaces

- USB device: Data transfer between device and PC
- USB host 1+2: USB 2.0, connection of external memory media
- Internal memory: 12 GB
- LAN: Connection of network cables
- Wireless communication: PPC-PAD-plus-W: WIFI

#### Ambient Conditions

- Ambient temperature: -10...+50 °C
- Storage temperature: -20...+60 °C
- Rel. humidity: < 80%
- Environmental testing: 1 m drop test (EN 60721-3-7)
- Vibrations: EN 60721-3-7, 7M3
- Protection rating: IP 65 (EN/IEC 60529:2014)

- External power supply: 110/240 V AC - 24 V DC/3.5 A
- Connection: 3-pin

#### Rechargeable Battery

- Lithium-ion pack, 14.4 V/3350 mAh

#### Materials

- Housing: ABS/PC (thermoplastic)
- Protective housing cover: TPE (thermoplastic elastomer)
- Flammability rating: UE94V0
- Dimensions (w x h x d): 282 x 195 x 85 mm
- Weight: 1880 g (without input module)
- VESA connection: 100 x 100 mm / M4 metric

### Technical Data (for basic device)

#### Inputs/Outputs

- CAN sensor inputs:
  - 2 CAN bus networks, each with 24 STAUFF CAN bus channels. Alternatively on CAN Y with up to 5 third-party CAN open sensors. Baud rate adjustable for third-party CAN.
  - 24 V DC power supply/max. 250 mA.
  - Mixed operation of STAUFF CAN and third-party CAN within one CAN bus line not possible.
  - Internal terminating resistor 120 Ω.
  - Supports CAN 2.0 A/CAN 2.0 B
- Sampling rate: 1 ms = 1000 measured values/s
- Plug-in connection: M12x1; 5-pin with SPEEDCON®, integrated connector
- Digital input/output and frequency input:
  - Dual assignment input that can be used either as DIGITAL-IN and DIGITAL-OUT, or two frequency inputs are provided through switchover. Also possible as detection of direction of rotation.
- Connection: M12x1 SPEEDCON® female (5-pin)
  - Galvanically isolated
- Input: 24 V DC, 80 mA
- Power supply: Frequency (0 Hz...20 kHz)
- Input signals: Active low: 0...1.4 V, Active high: 3...30 V
- Level/threshold: ≤ ±0.1%
- Accuracy: Flexible addition of up to 2 modules



## Hydraulic Tester ▪ Type PPC-PAD-plus

### Order Codes for Basic Device

PPC-PAD-plus - W - CAL		
①	②	③
① <b>Series and Type</b>		
Hydraulic Tester	PPC-PAD-plus	
② <b>Version</b>		
Without WIFI	(none)	
With WIFI	W	
③ <b>Calibration</b>		
Without calibration certificate	(none)	
With calibration certificate	CAL	

### Delivery Includes

- PPC-PAD-plus Hydraulic Tester
- Connection for 2 CAN bus networks (optional modules, see below)
- Power Supply Unit 110 V/240 V – 24 V DC/2.5 A incl. country-specific adaptor (EN, US, UK, AUS)
- USB 2.0 cable (2 m/6.56 ft)
- Instructions for use
- PC Software

### Expansion Modules (Input Modules) for the PPC-PAD-plus

The PPC-PAD-plus is equipped with two input module slots for individually adapting the device to the application. The input modules are available in various versions and can easily be retrofitted or replaced by the user. The analogue input modules are also available with a calibration certificate.

### Product Characteristics / Technical Data (for input modules)

#### Analogue Input Module

The analogue input module is equipped with three analogue connections IN 1 – 3 for sensors with automatic sensor detection (STAUFF ANALOGUE) and an analogue connection IN 4/5 for up to two third-party sensors without automatic sensor detection (e.g. standard industrial sensors).

- 3 sensor inputs with sensor detection (p/t/Q/n) for PPC sensors
- Plug-in connection: 5-pin, push-pull, combination integrated male/female connector
- Sampling rate: 1 ms = 1000 measured values/s
- Operating temperature range: -10 °C...+50 °C
- Storage temperature range: -20 °C...+60 °C
- Weight: 152 g
- Input for third-party sensors: 2 sensor inputs (analogue), for measuring current and voltage
- Sampling rate: 1 ms = 1000 measured values/s
- Voltage measuring range: -10...+10 V DC
- Current measuring range: 0/4...20 mA
- Supply for ext. sensors: +24 V DC/max. 100 mA
- Plug connection: M12x1; 5-pin female connector

#### Analogue Input Module with Galvanically Isolated Sensor Inputs

This input module offers the same options as the analogue input module, but with the connections galvanically isolated from the PPC-PAD.

- As the "analogue input module", but with sensors inputs galvanically isolated from the PPC-PAD-plus.

#### CAN Input Module

The CAN Input Module is equipped with two passive CAN bus connections for third-party sensors without automatic sensor detection (third-party CAN).

In addition, this slot offers the option of connecting the PPC-PAD to an existing CAN BUS network using the SAE J1939 protocol for the purpose of reading messages from other CAN bus nodes. This can be the bus of a vehicle or machine, for example. The CAN module is passive and cannot be detected by other CAN masters.

Both connections are galvanically isolated from each other and from the device.

- 2 x M12x1 5-pin connector input for connecting to CAN systems such as CANopen, CAN generic and SAE-J1939
- Plug-in connection: 2 x M12 5-pin female, CAN1xx, CAN2xx, each galvanically isolated
- Number of CAN1xx channels: 24
- Number of CAN2xx channels: 24
- Standards: CAN 2.0 A, CAN 2.0 B
- Supported protocols: CANopen, SAEJ1939 and CAN generic, mixed operation of several CAN protocols possible
- Terminating Resistor: Can be activated or deactivated
- Supply for signal connection: Passive, no external supply
- Operating temperature range: -10 °C...+50 °C
- Storage temperature range: -20 °C...+60 °C
- Weight: 127 g

### Order Codes for Input Modules

INPUT-MODUL - ANALOG - PPC-PAD-plus - GALV - CAL				
①	②	③	④	⑤
① <b>Type</b>				
Input Module	INPUT-MODUL			
② <b>Version</b>				
Connection of 3 analogue sensors	ANALOG			
Connection of 2 CAN channels	CAN			
③ <b>Series</b>				
PPC-PAD-plus	PPC-PAD-plus			
④ <b>Galvanically Isolated</b>				
Not galvanically isolated	(none)			
Galvanically isolated (only for Analogue Version)	GALV			
⑤ <b>Calibration</b>				
Without calibration certificate	(none)			
With calibration certificate	CAL			



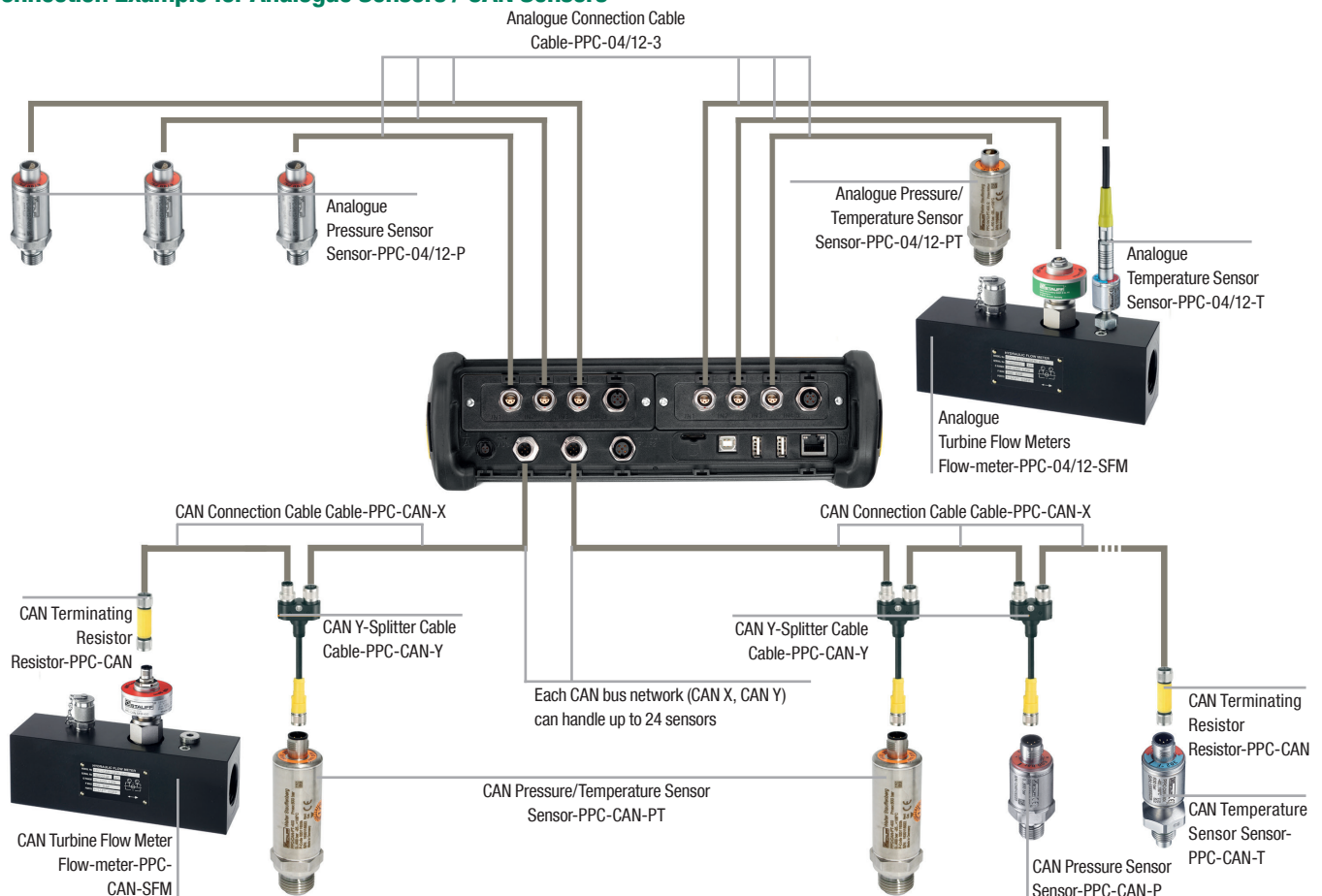
## Hydraulic Tester ▪ Type PPC-PAD-plus



### Function Description

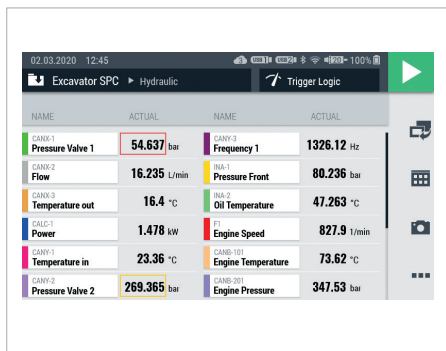
- ① Illuminated, glare-free colour display for good readability in all situations, 7" size for a clear overview of comprehensive information
- ② Suitable for operation with gloves, robust 3 mm glass, resolution 800 x 480 pixels
- ③ High protection against moisture and dirt, protection rating IP 65
- ④ Intuitive operation with clear icons and function-related buttons and apps
- ⑤ Integrated mount for carrying strap
- ⑥ Robust, oil-resistant housing protection for use in rough environments and for absorbing impacts
- ⑦ Additional large tactile keyboard for reliable operation even in difficult conditions
- ⑧ Optional CAN Module for monitoring CAN systems or connecting third-party CAN sensors
- ⑨ Optional analogue input module for connecting STAUFF Sensors with sensor detection
- ⑩ USB host interface for connecting USB mass storage devices
- ⑪ Analogue third-party sensors – also with high speed functionality
- ⑫ Power supply unit with universal country-specific adaptors, strong battery power and fast charging times, energy saving options for extended operating periods
- ⑬ 2 x CAN bus networks, each with up to 24 channels
- ⑭ 2 frequency inputs or D-IN/D-OUT
- ⑮ USB device interface for connecting to a PC, laptop, etc.
- ⑯ LAN interface for remote monitoring, measured value transfer or remote control

### Connection Example for Analogue Sensors / CAN Sensors

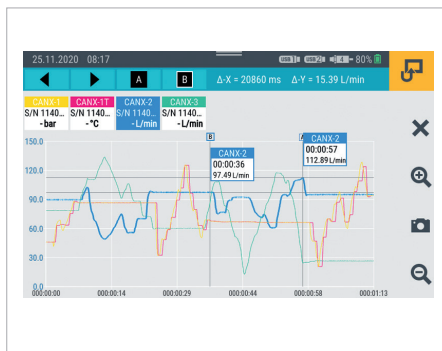




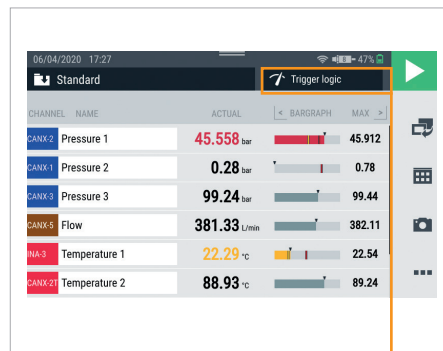
## Hydraulic Tester ■ PPC-PAD-plus Display



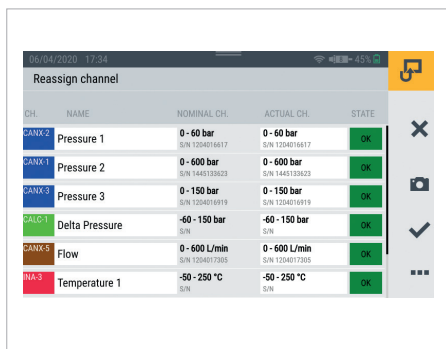
- Up to 12 channels in one display
- Colour assignment for the individual channels
- Display can be changed between ACT, MIN and MAX values



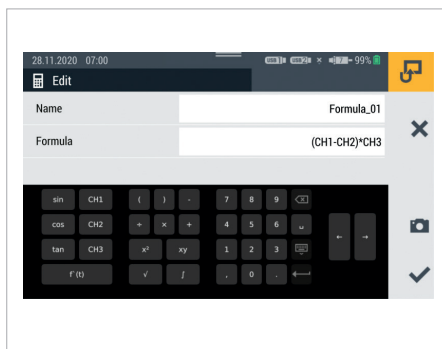
- Up to 8 freely selectable channels simultaneously in one curve display
- Choose between ACT and MIN/MAX value display
- Freely scalable
- For analysis, up to two cursors with measured value and delta display can be shown



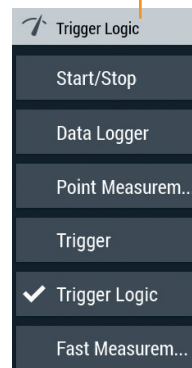
- Numerical display of 6 channels with bar chart
- Display of the measuring range, freely definable warning and alarm values (red, yellow, green) and min/max values



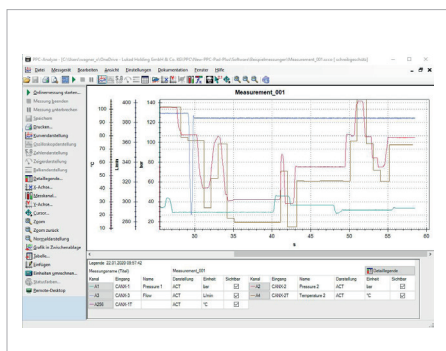
- Repeating measuring tasks can be conveniently saved as a template
- A comparison of the preset measuring setup is also carried out when a template is selected
- Use of a template ensures comparability of the measurements
- An existing template can be duplicated and modified as required



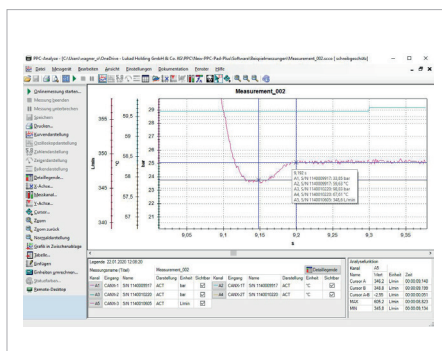
- Up to four measuring channels can be created
- In addition to the predefined standard functions such as delta values or hydraulic output, it is also possible to enter custom formulas



## Hydraulic Tester ■ PPC-PAD-plus PC Software PPC-Analyze



The PPC-Analyze Software that is included with the tester can display, analyse and export the recorded curves.



In addition, measurements can be shown on the monitor in real time using WIFI, Ethernet or USB.

