Product registration:

Please register the products shortly after obtaining at our website

www.x-log.de/synx

and enjoy extended warranty!

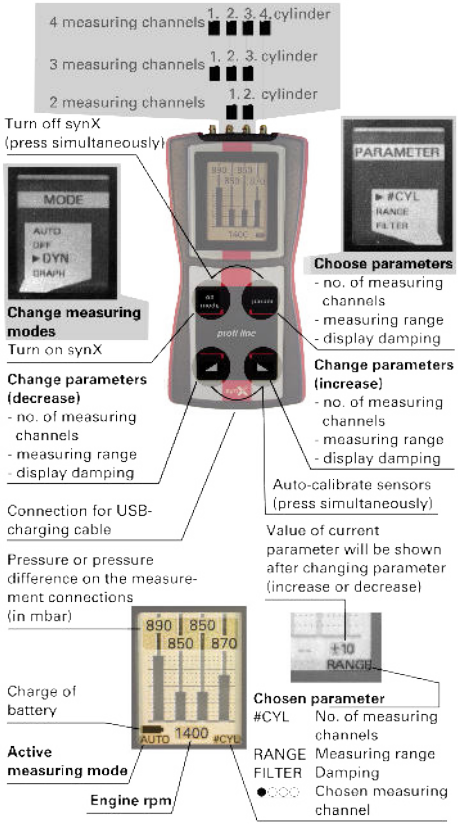
DER SYNCHRONTESTER.

x-log Elektronik GmbH
Adlerfarnstr. 4
D 80935 Munich
www.x-log.de/synX

synX profi line

fast – easy – accurate

INSTRUCTION MANUAL



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Measuring modes

Change measuring modes (mode button)

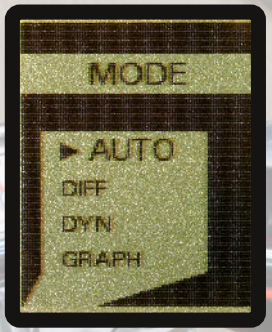
Pressing the mode button allows you to choose the following measuring modes

- Automatic Mode (AUTO)
- Differential Pressure (DIFF)
- Pressure Dynamics (DYN)
- Pressure OverTime (GRAPH)

With each keystroke you can switch to the next mode in cyclic order. In doing so, the function menu is shown and you can see how to switch to the next measuring mode. By pressing the mode button again while the function menu is shown, the next entry will be selected.

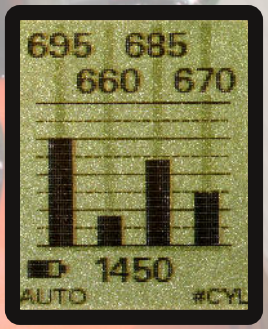
Automatic Mode (AUTO)

Within the Automatic Mode the device sets the measuring range, the display resolution and the display damping automatically, so that well readable indicators are generated by using the most amount of the screen space. The pressure is shown in mbar above each graphic bar.



Change measuring modes

Automatic Mode



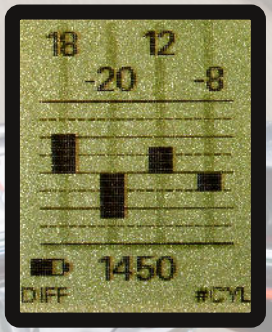
Differential Mode (DIFF)

For a precise calibration you can switch to the Differential Pressure Mode. In this mode the divergence of each measuring channel from the average value will be displayed. For proper calibration the channel with the largest divergence (largest graphic bar) should be corrected.

In this operating mode the automatic selection of the measurment range doesn't take place. For a precise calibration it is important to always set the measuring range with the parameter RANGE, so that the graphic bars would fill the display area as much as possible.

Pressure Dynamics (DYN)

Within two crankshaft revolutions (4 strokes) the intake pressure alternates between a minimum and a maximum value. The span between the minimum and the maximum value as well as the absolute positions of those limits should be almost the same for all intake ports. Larger divergences indicate leaks and defect valves. In the operating mode Pressure Dynamics the span between the minimum and the maximum value of the intake pressure is shown for each measuring channel. Above each graphic bar the span is displayed as a numerical value in mbar.



Differential Mode Display

Pressure Dynamics Display

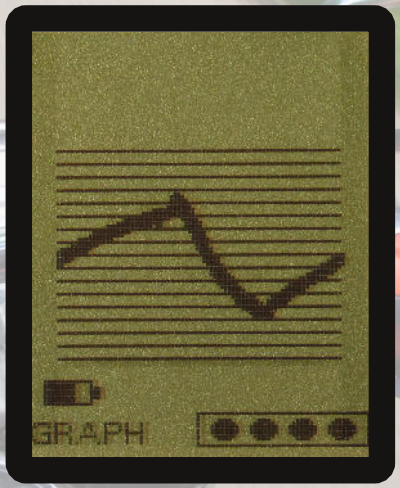
Pressure Over Time (GRAPH)

In the operating mode GRAPH the current intake pressure is shown graphically over all four strokes (two crankshaft revolutions). Within this operating mode either all measuring channels can be displayed simultaneously in a diagram or each measuring channel can be displayed separately.

By pressing the buttons "increase" or decrease and by choosing the parameter channel (as shown in the picture on the bottom) you can switch between the indicator which shows all measuring channels and the indicators for separate measuring channels. With the buttons ▲ and ▼ you can then switch between the following indicators:

- all measuring channels simultaneously
- channel 1
- channel 2
- channel 3
- channel 4

For a well running engine the pressure over time-graphs of all intake ports should lay on the top of each other.



Pressure Over Time Display

The only parameter which can be set manually is the number of the measuring channels. It can be set by pressing the buttons ▲ and ▼. By changing the number of measuring channels the number of the displayed graphic bars also changes accordingly.

Adjust parameter

Parameter menu

The parameter menu will be displayed by pressing the **param** button. With the buttons ▲ and ▼ you can choose which measuring parameter you want to change. Depending on which measuring mode is chosen, different parameters are available.

After pressing the **param** button once, the parameter menu and the available parameters will be displayed and the menu switches to the next parameter in cyclic order. By pressing the **param** button again while the parameter menu is displayed, you switch to the next parameter.

The active parameter which can be adjusted with the buttons ▲ and ▼ will be shown in the bottom right corner of the display. After pressing one of those buttons, the current value will be displayed above it.

Parameter #CYL

Parameter #CYL: Number of measuring channels

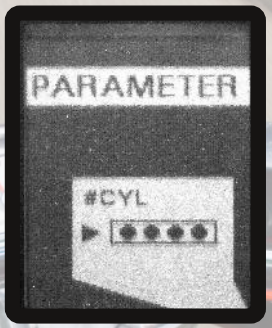
Before calibrating, basically the number of measuring channels (2, 3, 4) should be adjusted. This parameter is available in every measuring mode.

Parameter RANGE: Measuring range

In the operating mode DIFF (Differential Pressure) the measuring range and thereby the resolution of the display can be adjusted manually between ±25 and ±1000 mbar.

Parameter FILTER: Display damping

As the momentary pressure concurrently differs within the four strokes, it has to be filtered (damped) to receive a smooth display. The intensity of the damping can be adjusted in three steps (1.0 s, 0.5 s, 0.25 s) with the parameter mode FILTER. 1.0 s means the highest and 0.25 s the lowest intensity of the damping. For proper calibration a high intensity of the damping often is beneficial. If, on the other hand, you'd like to observe the dynamic variation of the calibration while accelerating the engine, a lower intensity of the damping should be chosen, so that the display can properly follow the faster changing pressure proportions. The parameter FILTER is available only in the operating mode DIFF (Differential Pressure).



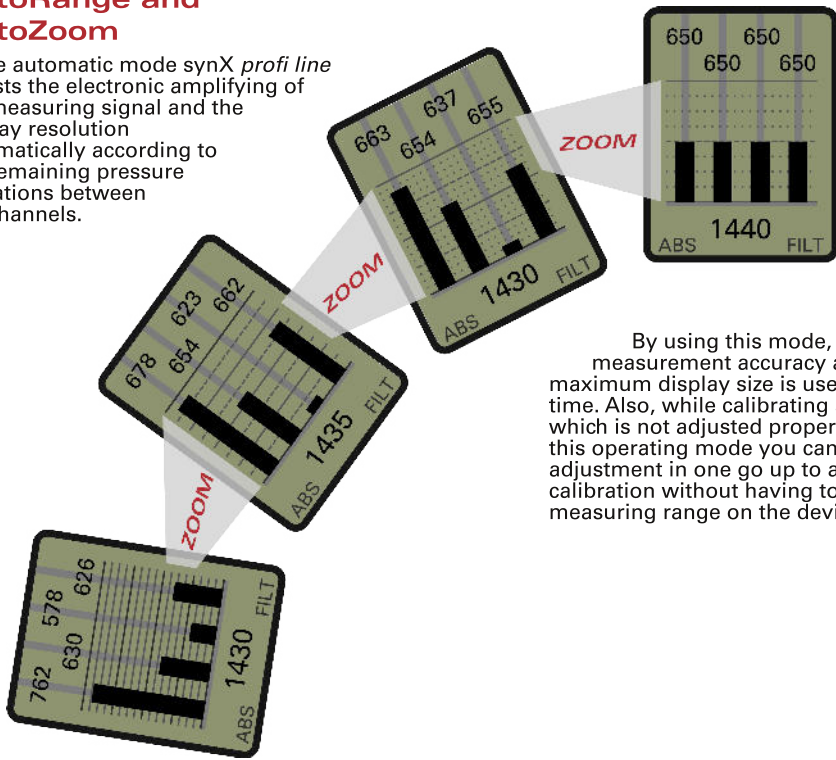
Parameter Channel

Parameter Channel

In the operating mode GRAPH (Pressure Over Time) you can switch between the measuring channels. This is explained in detail in the chapter Pressure Over Time (GRAPH).

AutoRange and AutoZoom

In the automatic mode synX *profi line* adjusts the electronic amplifying of the measuring signal and the display resolution automatically according to the remaining pressure deviations between the channels.

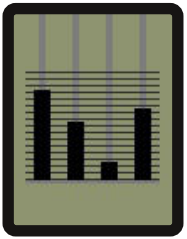


By using this mode, the highest measurement accuracy and the maximum display size is used at any time. Also, while calibrating an engine which is not adjusted properly yet, with this operating mode you can improve the adjustment in one go up to an optimal calibration without having to change the measuring range on the device manually.

Measuring ranges and display resolutions

Fully displayable pressure difference [mbar]

1024

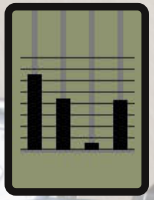


16

Display resolution [mbar/pixel]

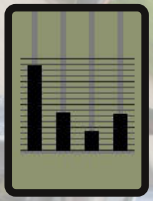
While using the largest measuring range, pressure differences up to 1024 mbar can be displayed – which should occur only very rarely in practice. One pixel (the lowest displayable difference between two graphic bars, which depends on its displayability) in this range is 16 mbar. During the adjustment process the pressure differences will decrease. The device step by step switches to lesser measuring ranges until the most sensitive measuring range is reached. Here the full-scale deflection is only 16 mbar, one pixel correlates with 0,25 mbar.

512



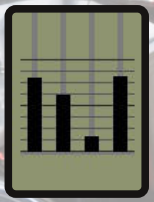
8

256



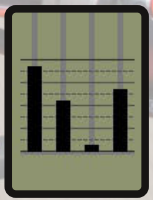
4

128



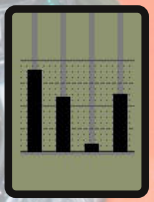
2

64



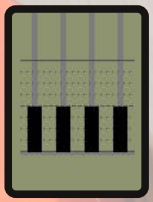
1

32



0,5

16



0,25

Power supply

Rechargeable battery operation

synX *profi line* is delivered with 3 NiMH rechargeable batteries of the size LR6 (AA, Mignon). The remaining battery life will be displayed by the battery icon on the display. A filled icon indicates that the rechargeable battery is full. If an empty icon is displayed, the batteries should be recharged or exchanged with full batteries as soon as possible.

Charge

For charging the batteries synX *profi line* can be attached to any USB charging cable, USB port of a PC or to any USB hubs by using a customary micro USB cable. The USB power supply source should provide at least 500 mA.

Power supply operation

synX *profi line* can be used for measurement while being connected to the power supply adapter with a charging cable. That way synX *profi line* can be used for measurement even if the batteries are fully discharged. The charging process takes a little longer compared to the case when the device is turned off while charging.

Battery operation

Instead of using the factory-provided NiMH batteries, also non-rechargeable batteries can be used. That way, over a longer time period an operation is possible regardless of mains power. In doing so, the following has to be noted:

- Do not connect a charging cable while using non-rechargeable batteries.
- The rechargeable battery icon on the display is calibrated for the use of NiMH batteries. Non-rechargeable batteries have different voltage curves while discharging. For that reason, the rechargeable battery icon for a relatively long time shows full capacity of the battery life and then quickly decreases when the batteries are exhausted.

Exchange batteries

For exchanging the batteries:

- Loosen both screws holding the battery cover and lift battery cover.
- Remove batteries and insert new ones. Note the correct polarity.
- Fix battery cover and note the right orientation of the caption, tighten the screws.

In the case of extensively empty batteries the device cannot be turned on or it will switch itself off immediately. Also, after connecting the device to a battery charger, no charging indicator will be displayed untill the batteries reach a minimum load.

Accessoires

Non-slip tank and seat belt

For a steady fixation of synX during measurement it can be attached to the mounting plate of the tank and seat non-slip belt using the mounting button on the back side of synX. The belt is equipped with an anti-slide band and weights on its ends so that it can lie secure and slide-free on all smooth surfaces.

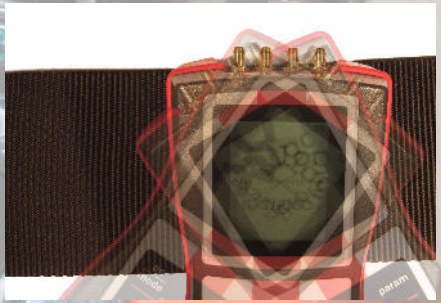
The gumming of synX lies on the mounting plate of the tank or seat belt so that synX remains in the chosen rotating position. Hence it can be positioned on the left or right side of the engine especially on flat twin engines. Thereby it always stays in visual range.

Battery charging device

The attached battery charger can be connected to synX with the micro USB cable. With fully discharged batteries the approximate charging time is 5 hours.

CAUTION: synX must NEVER be connected to a power supply (battery charger or USB port of a computer) if non-rechargeable batteries are inserted. Any damage which may arise from this is excluded from warranty and guarantee.

Attach non-slip belt



Advice for measurement and operating

Warming up the engine

Previous to the adjustment process the engine should reach its operating temperature. Many engines emit a mixture strongly enriched with gasoline through the measurement connections for calibration. This mixture may condense on the pressure sensors. Therefore synX should be connected just before measurement. During the warm-up phase the measurement connections can be sealed with the included rubber caps.

Gasoline condensate and electronic sensors

Due to their construction the electronic sensors are sensitive to gasoline condensate. synX *profi line* is equipped with an extra strong sensor heating for keeping the sensors as dry as possible. However, gasoline may condense on the sensors, for example while using certain types of engines, due to long measurement times and a strong accelarating of the engine. This can be noticed on the display if it doesn't return to idle mode while synX is not connected to the engine. If this case occurs, remove the measuring cables, clean them from condensed gasoline, turn synX on and leave it to air dry for approx. for 30 minutes.

Calibration of six-cylinder engines

With the four measuring channels of synX also six-cylinder engines can be calibrated. Therefore cylinders 1 - 4 have to be calibrated first. In the next step synX has to be connected to the cylinders 3 - 6. Now only the cylinders 5 and 6 are being adjusted, cylinders 3 and 4 stay unaltered. In the last step, cylinders 1 and 2 should be compared with cylinders 5 and 6 for checking purposes. If the result still is non-satisfying, repeat the steps above.

Battery charge level indicator

The charge level indicator on the bottom right corner of the display is set up for operation with NiMH batteries. synX can alternatively be used with non-rechargeable alkaline-manganese batteries. In this case the charge level indicator shows a high battery life status of 100 % (full battery life) for a longer time and then rapidly drops.

Frequently asked questions

A regular updated collection of frequently asked questions is to be found on the x-log website:

x-log.de/synx/faq.html

Warranty

According to §§ 434, 435 BGB, x-log assures that the products are free from defects and defects of title at the time of the transfer of risk. The warranty period is two years. The warranty period begins at the time of the customer recieving his/her goods. In the case of defects, the customer at his/her own choice can ask for remedy of the defects or for delivery of goods which are free from defects. Also after the expiration of the time limit of six months according to § 476 BGB, x-log doesn't require proof that the goods haven't been free from defects at the time of the transfer of risk.

According to § 439 BGB, x-log has the right to refuse the by the customer chosen supplementary performance if this were possible only by disproportional costs. If the remedy of defects wasn't successful even after the second repair attempt, the customer has the right to ask for the delivery of goods which are free from defects, for a lower purchasing price or for cancelation of the purchase according to § 439 BGB. Canceling the purchase is impossible if the defects are marginal or insignificant.

Regarding possible claims for damages due to defects statutory provisions apply. Precondition for warranty claim is, that the defects are not the result of improper or excessive use.

Guarantee

In accordance with the following regulations, x-log grants an optional guarantee of five years for products with a serial number. Precondition for that is, that the customer registers his/her purchaised product at the x-log website (www.x-log.de) before expiration of the implied warranty. In doing so, the customer supplies such details as the products' serial number, the time of delivery and his/her complete personal information regarding name and address. The guarantee period is five years and begins contemporaneously with the implied warranty period.

If defects occur during the guarantee period and the customer wants to activate the guarantee, he/she shows this to x-log by filling the designated forms which can be found at the website (www.x-log.de/service). Afterwards the customer has to print the displayed form for returning the product and attach it to the reshipment or alternatively write down the displayed number on the parcel clearly visible.

x-log will remedy the defect at its sole discretion or deliver a similar product as replacement free of charge. Each party shall bear their own costs for shipping.

The guarantee doesn't cover defects resulting from improper use (eg. leaking

batteries) or excessive use (eg. usage outside of specification). If such device is sent to x-log within the guarantee, x-log will inform the customer about estimated costs of repairing damage or will offer him/her a substitutional device.

Claims for the implied warranty won't be affected by the guarantee. As long as both of the customer's rights coexist and the customer doesn't exclude one of them explicitly, x-log will treat the customer as if he/she had chosen the right, that is for him/her more economically beneficial.

Important addresses

Manufacturer:

x-log Elektronik GmbH
Adlerfarnstr. 4
D- 80935 München

Malfunctions

Please report errors or defects on www.x-log.de/synx first. This will allow us rapid treatment of returned devices and will reduce your waiting time. Service address:

x-log Elektronik GmbH
Werk Amtronik
Kapellenstr. 5
D-92245 Kümmersbruck

Used batteries

If you like to send back used batteries, pleaseusethefollowingreturnaddress:

x-log Elektronik GmbH
Werk Amtronik
Kapellenstr. 5
D-92245 Kümmersbruck

Please pay attention to adequate franking.

Spare parts

Replacement for lost or not working parts you can find under

www.x-log.de/shop

or at your retailer.

x-log Elektronik GmbH

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