

Instruction manual

PX Combi 800



System	Lykketronic PX Combi 800
Part number	
Serial number	
Installed by	
Installation date	

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1. General use

Congratulations with your new PX Combi 800.

The PX Combi 800 gives the opportunity to monitor up to four shafts/axles. This enables the monitor to be used in connection with almost any agricultural implement.

If the monitor is used in accordance with the guidelines in this manual, the PX Combi 800 will be a useful and reliable tool for many years to come.

1.1 Overview of included functions and displays

The following functions is included in the computer:

"Rpm1"	Programmable rotation counter with audio- and visual alarm (revolutions per minute). Can be connected to generator terminals or can be used with sensor to monitor shaft speeds.
"Rpm2"	Programmable rotation counter with audio- and visual alarm (revolutions per minute). Can be connected to generator terminals or can be used with sensor to monitor shaft speeds.
"Rpm3"	Programmable rotation counter with audio- and visual alarm (revolutions per minute). Can be connected to generator terminals or can be used with sensor to monitor shaft speeds.
"Rpm4"	Programmable rotation counter with audio- and visual alarm (revolutions per minute). Can be connected to generator terminals or can be used with sensor to monitor shaft speeds.
"Rpmh"	Aggregated rotation time on the Rpm1 input i.e. total working time of generator/shaft/axle (times/minutes)
"⌚"	Chronometer/watch (times/minutes) – no display marker
"A on/off"	Enabling/disabling acoustic alarm – no display marker

The individual functions and their characteristics are described in chapter 2.

1.2 Overview of monitor

Marker

"Segment" (vertical or horizontal) in the left side of the display indicating the function currently displayed

Display



Control keys

- Change of active parameter displayed
- Activation of the change function related to the value marked/ highlighted
- Change/programming of the actual value marked/ highlighted including resetting

Plug

- Input for the attached sensors

Display indications
Indicates the possible functions (values) that can be displayed

1.3 Brief explanation of control keys

-Key

Pressing the key  shifts between the different display indications (indicated in the two end fields of the display), i.e. shifts between the different monitor functions. For each push on the button the marker will change position by one step. The marker will start in the upper left hand corner and move downwards. On the figure the marker is placed opposite the display indication of the first rotation counter i.e. Rpm1 (2915 rpm).

- Please note, that the display indications for the chronometer and enabling/disabling of the acoustic alarm do not have a marker indication

Furthermore the key is used to quit the change menu (cf. next paragraph).

-Key

The -key is used to enter the change menu where parameters/values in the computer can be changed/reset, e.g. programming of threshold values for rotation counters and setting the chronometer.

Initially the user must navigate to the function or display indication that needs to be changed by using the -key. Hereafter the -key is pressed for approx. 1 sec. until the display value starts flashing. With the -key the first digit can now be changed/reset. By subsequently pressing the -key the marker will move to the next digit of the display value. This is done until all digits have been changed. At the end the change menu is quitted by pressing the -key.

-Key

The -key is used to change/reset parameters and values (after entering the change menu by using the -key).

Besides, please see the examples in the following chapters and paragraphs.

2. Operating the functions

2.1 Specification of functions and threshold values

Symbol:	Explanation:	Threshold value:
Rpm1	Rotation counter1 with alarm	12 – 9999 Revolutions/min.
Rpm2	Rotation counter 2 with alarm	12 – 9999 Revolutions/min.
Rpm3	Rotation counter 3 with alarm	12 – 9999 Revolutions/min.
Rpm4	Rotation counter 4 with alarm	12 – 9999 Revolutions/min.
Rpm.h	Aggregated rotation time on the Rpm1 sensor	0:0 – 9999:59 Hours:minutes
	Chronometer/watch	0:00 – 23:59 Hours:minutes

The computer is supplied with an internal memory that safes all values and parameters when the power supply is cut-off.

2.2 Rotation counter and alarm (revolutions per minute) – Rpm1 - Rpm4

The alarm functions of the rotation counters are programmable, i.e. it is possible to key in or alter the threshold values of the alarms. Both upper and lower threshold levels can be programmed.

2.2.1 Display of current revolutions per minute

In this display indication the upper horizontal (opposite the text "Rpm1"), upper vertical (opposite the text "Rpm2"), mid horizontal (opposite the text "Rpm3") or lower vertical (opposite the text "Rpm4") marker is activated, cf. the following figure (Rpm1: 2915)



Marker position when displaying Rpm1

2.2.2 Encoding the alarm threshold values

An example of how to program the alarm threshold values on one of the rotation counters is represented in the following scheme.

Example: Changing the lower limit to 110 rpm and the upper limit to 1356 rpm		
Key press:	Display indication:	Explanation:
	0	Find rotation counter 1, 2, 3 or 4 by pressing the key repeatedly
	L _ _ _ 0	Hold the key for 1 sec. until "L" is lit at the left side and the first (out of four) digit is flashing.
	L <u>X</u> _ _ _	Press the key until the digit has the correct value. Please note, that zero (0) cannot be entered in this position.
	L _ <u>X</u> _ _	Press the key to set/change the next digit (the second digit will now start to flash)
	L _ <u>1</u> 0 0	Press the key until the digit has the correct value
	L <u>1</u> 0 0	Press the key to set/change the next digit (the third digit will now start to flash)
	L <u>11</u> 0	Press the key until the digit has the correct value
	L <u>110</u>	Press the key to set/change the last digit
	L <u>100</u>	Press the key until the digit has the correct value
	H <u>X</u> 0 0 0	Press the "arrow" key for 1 sec. until "H" (high) is lit at the left side and the first digit starts to flash.
	H <u>1</u> 0 0 0	Press the key until the digit has the correct value
	H <u>10</u> 0 0	Press the key to set/change the next digit (the second digit will now start to flash)
	H <u>13</u> 0 0	Press the key until the digit has the correct value
	H <u>130</u> 0	Press the key to set/change the next digit (the third digit will now start to flash)
	H <u>135</u> 0	Press the key until the digit has the correct value
	H <u>1350</u>	Press the key to set/change the last digit
	H <u>1356</u>	Press the key until the digit has the correct value
		Press the "arrow" key to quit the change menu

An illustration of the change menu for setting the lower respectively the upper threshold value is represented below.



Exceeding the threshold values will activate the visual alarm (and acoustic alarm if this is activated) by flashing the marker opposite the text “Rpm1”, “Rpm2”, “Rpm3” or “Rpm4”.

In case the axle/shaft triggering the alarm is currently displayed the alarm marker will flash slowly. In any other case the alarm marker will flash relatively fast opposite the relevant symbol. Hereby it is made possible to see which display indication is active even though several rotation guards have triggered an alarm.

To disable an alarm on one of the inputs the lower threshold value is set to “0” and the upper threshold value is set to “9999”.

2.2.3 Enabling/disabling the acoustic alarm

The PX Combi is provided with an optional internal acoustic alarm, which can be activated when one of the rotation counters (Rpm1/Rpm2/Rpm3/Rpm4) exceeds the programmed alarm threshold values.

An example on how to enable the acoustic alarm is represented in the following:

The -key is pressed until the alarm display ”A on” or ”A off” appears, cf. the following figure.



Hereafter the following is keyed in:

Key press:	Display indication:	Explanation:
	A <u>off</u>	Hold the key for approx. 1 sec. until “on” or “oFF” starts flashing.
	A on	Press the key until the acoustic alarm is enabled or disabled (on/oFF).
	A on	Press the ”arrow” key to quit the change menu.

- The visual alarm (i.e. the flashing marker opposite the text “Rpm1”, “Rpm2”, “Rpm3” or “Rpm4”) will continue to be displayed even though the acoustic alarm is disabled.

2.3 Working time/aggregated rotation time on the Rpm1 sensor - Rpm.h

2.3.1 Display of aggregated rotation time on Rpm1 (Rpm.h)

In this display indication the lower horizontal (opposite the text ”Rpm.h”) marker is activated, cf. the following figure (Total working time: 131 hours and 40 minutes)



- Above 999:59 hours/minutes only total hours is displayed

2.3.2 Resetting the aggregate rotation time on Rpm1 (Rpm.h)

The Rpmh counter can be reset at any time.

The -key is pressed until the display indication “Rpmh” appear.

Hereafter the following is keyed in:

Key press:	Display indication:	Explanation:
	131:40 (Example)	Press the key for 1 sec. until value starts flashing
	00:00	Press the key to reset rotation time
	00:00	Press the "arrow" key to quit the change menu.

2.4 Chronometer/watch

2.4.1 Display of chronometer/watch

In this display indication *no marker* is displayed. This display is found by pressing the -key once when the computer displays (Rpmh). Hereafter the chronometer will be displayed as indicated in the following figure (10:02 AM).



2.4.2 Setting the chronometer/watch

An example on how to change the setting to 9:55 (from 13:47) is represented in the following:

Key press:	Display indication:	Explanation:
	13:47	Find chronometer by pressing the key repeatedly
	<u>1</u> 3:47	Press the key for 1 sec. until the first digit flashes.
	_ 3:47	Press the key until the digit has the correct value.
	<u>3</u> :47	Press the key to set/change the next digit
	_ 9:47	Press the key until the digit has the correct value
	<u>9</u> :47	Press the key to set/change the next digit
	_ 9: <u>5</u> 7	Press the key until the digit has the correct value
	_ 9:5 <u>7</u>	Press the key to set/change the last digit
	_ 9:5 <u>5</u>	Press the key until the digit has the correct value
	_ 9:55	Press the "arrow" key to quit the change menu.

3. Installation guide

3.1 Fitting the computer

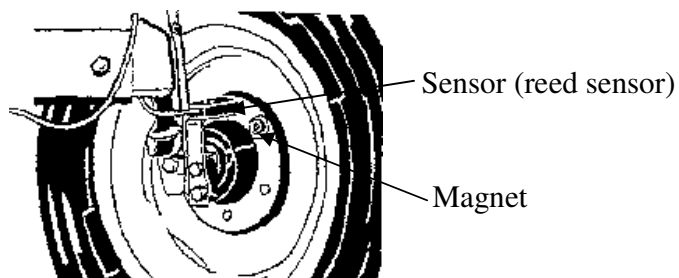
The back panel of the computer is equipped with 2 slots in which the mounting bracket is to be slit into for fixation of the computer. The mounting bracket is fitted in the drivers cabin in a way that suits the driver the best.

The sensors to the computer are to be connected as indicated in the supplied diagram. Lead the cables in a way so they are as protected as possible when the tractor turns and the hydraulics is operated. If possible it is recommended to lead the cables alongside existing cables, hydraulic pipes etc.

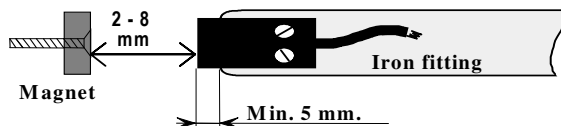
In order for the chronometer to work as 24-hour clock, the computer needs 12 Vdc power supply directly from the tractor battery.

3.2 Fitting sensors for rotation measurements

The magnets are fitted next to the wheel bolts, on an axle or pulley and the sensors are fitted on fitting plates, please see the example below for fitting next to the wheel bolts.



The distance between the magnets and sensors must be between 2 - 8 mm.:



- In case the sensor is fitted on a mounting bracket of a material that can be magnetized (e.g. iron) it should be emphasized that the sensor must be placed at least 5 mm. beyond the edge of the mounting bracket

It is recommended that a wheel sensor be fitted on a trailing wheel. On a four-wheel drive vehicle it is recommended to fit the sensor on the rear wheel.

- The computer *is not* prepared to work with multiple magnets/pulses per revolution.

3.3 Different types of sensors

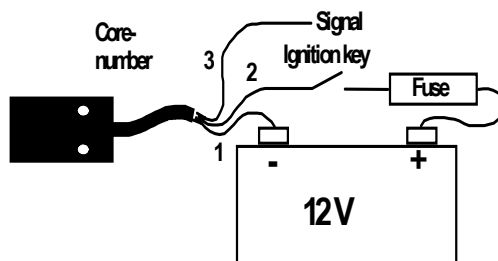
Primarily two different types of sensors are available:

- a) Mechanical, with 2 core cable (- 0V and signal) – often referred to as "reed sensor"
- b) Electronically, with 3 core cable (+V, -0V and signal) – often referred to as "hall sensor"

As wheel sensor it is recommended to use mechanical sensors (reed).

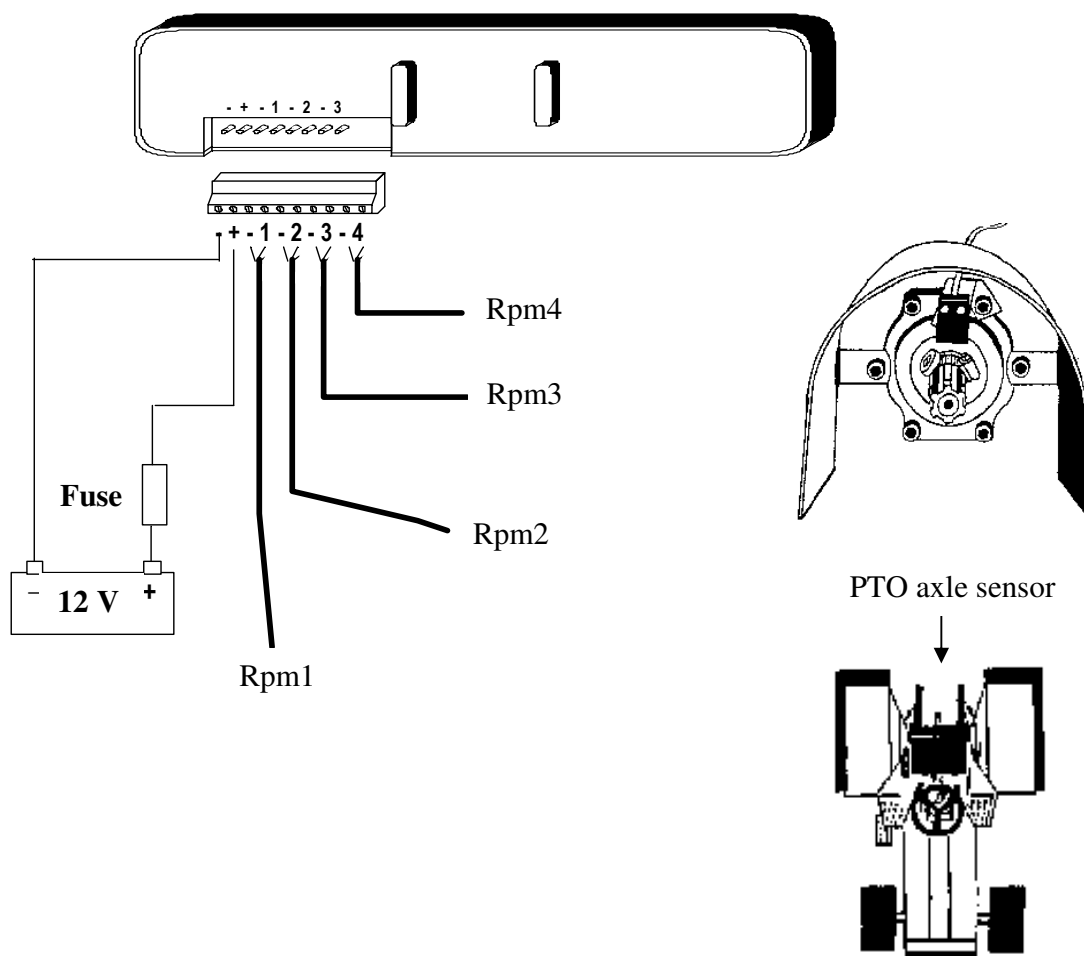
As sensors for rotation counting on axles/shafts both the mechanical and the electronic sensors can be applied. In case of a large number of revolutions per minute the electronic sensor is often used due to larger resistance towards vibrations from rotating axles or similar.

- The electronic sensor (hall) consumes power. In order to prevent power loss from the battery when the vehicle is stopped it is recommended that "+V" on these sensors should be connected over the ignition key as shown on the diagram below.



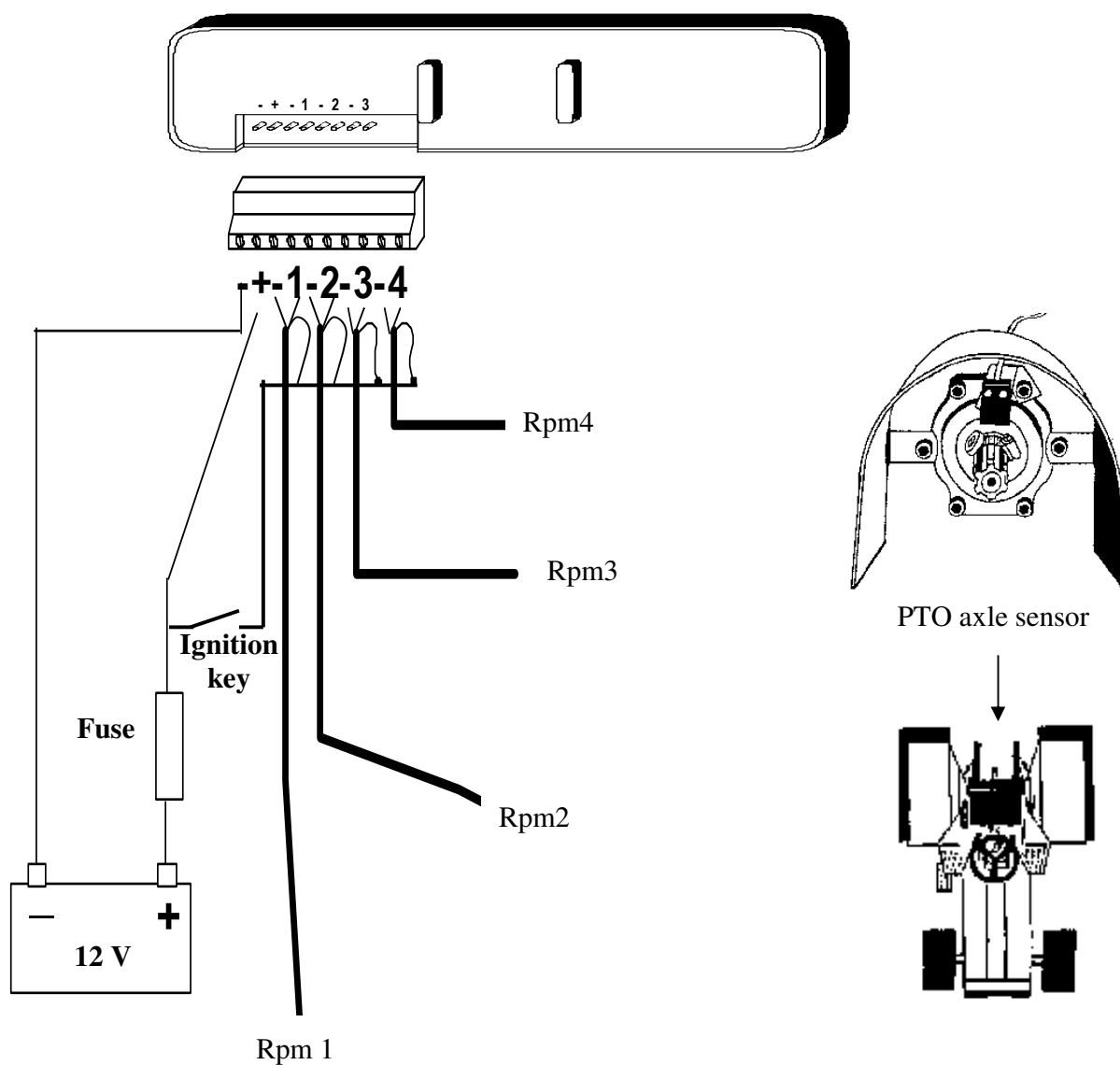
3.4 Fitting diagrams

Fitting diagram to be used for mechanical sensors (reed sensors):



In case electronic sensors (hall or inductive) are used their "+"-core is mounted over the ignition key to the "+"-pole of the battery. The power supply to the computer is still taken round the ignition key.

Fitting diagram to be used for electronic sensors (hall or inductive sensors):



4. Technical data

Display:	6 digits.
Power supply:	12 Vdc
Temperature limits:	The PX Combi is fully operational within -10 - 70c ⁰ .
Pulse signals from the sensor:	Max. 225 pulses/second

5. Final remarks

The controller/monitor is only to be used in connection with the functions described in this instruction manual. Any other use of the controller/monitor can potentially involve significant risk and disclaim the supplier of this controller/monitor for any responsibilities/liabilities.

Please note, that Lykketronic A/S solely is responsible for the electronic controller/monitor and not for the complete function of the machine, including the safety aspects of the entire machine.