

# Fadensensor RLS-1-WP

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## 1 Product description

### 1.1 *General*

This sensor allows non-contact and stress-free measurement of the speed and length of moving non-conductive mediums to be measured. Mediums such as filament yarns, yarns, twisted yarn and ribbons of various materials and yarn counts can be measured.

Some material examples are cotton, polyamid, PET (Trevira, Diolen, Vestan, Dacron), PE (Dyneema, Hostalen, Vestolen), PTFE (Teflon, Dyneon, Gore-Tex), cellulosic fibers (Viskose, Tencel, Lyocell), elastane (Spandex, Elaspán, Linel), aramid (Kevlar, Nomex, Twaron). The trade names are indicated in parentheses.

The measuring method is free from wear, because there are no moving parts inside the sensor. Consequently it is also applicable for flexible, smooth or very sensitive materials, like filament yarns with a low yarn count or Teflon materials.

The Sensor is specifically designed for use in winding machines and weaving machines to achieve the maximum accuracy for this application.

### 1.2 *Working principle*

The measurement method is based on the analysis of the natural electrostatic and randomly distributed charge of the yarn. This is gathered during the movement of the thread through the gap of the sensor. The very efficient signal processing unit inside the sensor transforms this information in output pulses.

One pulse corresponds to a continuous length of the Thread of 4 mm.

## 2 Operation / display elements

LED	description
red	<ul style="list-style-type: none"> <li>- power not ok</li> <li>- yarn motion stop or machine stop</li> <li>- signal output (M12 Pin 4) low</li> <li>- status output (M12 Pin 2) TTL-level low</li> </ul>
green	<ul style="list-style-type: none"> <li>- power ok</li> <li>- thread detected</li> <li>- signal output (M12 Pin 4) delivers impulse train</li> <li>- status output (M12 Pin 2) TTL-level high</li> </ul>

## 3 Specifications

sensor	
power	$V_{CC} = 12 \dots 24 V_{DC}$
current consumption	$\leq 54 \text{ mA}$
measuring range of thread speed	$400 \dots 1200 \text{ m/min}^1$
thread material	CO, PA, PET, PE, Viskose, Elastan, Aramid and other
titer	tested from 100dTex / Nm100, e.g. Elastan also from 22dTex
accuracy	$< 1\%$
weight	370 g
dimension	130 x 64 x 17 mm
color	RAL4004 (violet bordeaux)
interface	M12-plug A-COD 5-pins 2m PVC shielded

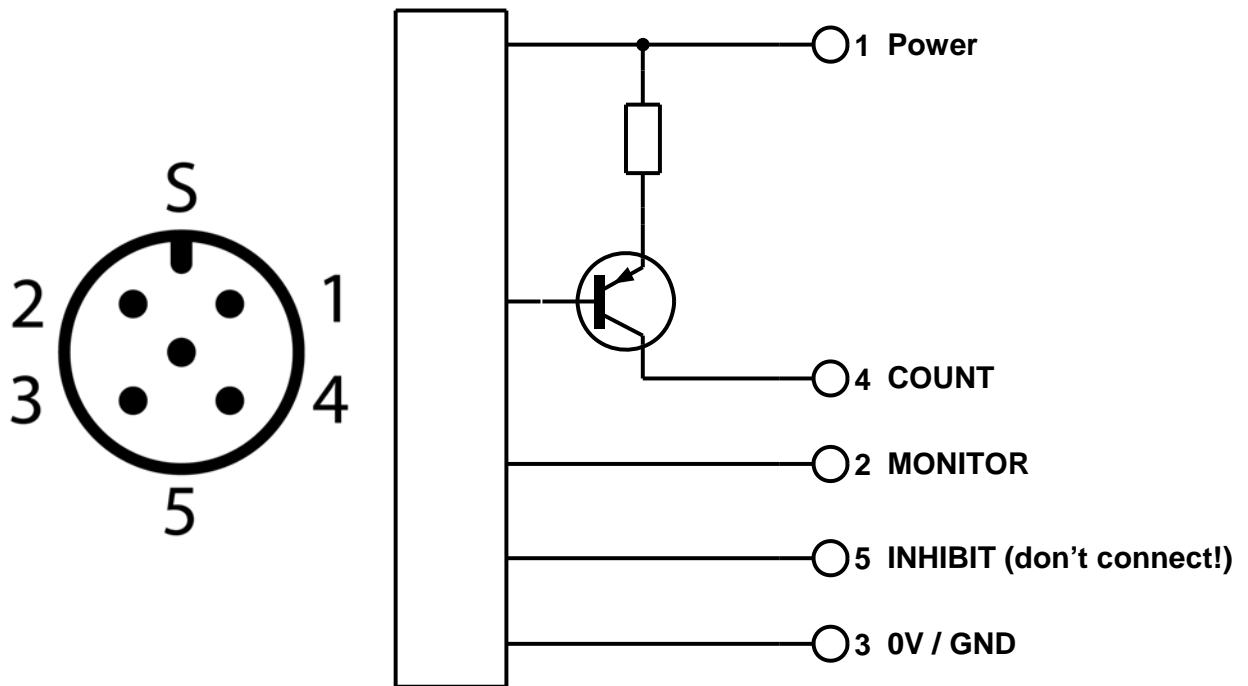
output	
X1 - COUNT	length (countable pulses) PNP $U_{out} = V_{CC} - 1V$ at $R_{load} = 15k\Omega$ $R_{load} \leq 100k\Omega$ $f_{max} \leq 5000\text{Hz}$ corresponds to 1200m/min
X2 - MONITOR	status of sensor TTL level
common electric potential	0V

<sup>1</sup> other ranges on request (maximum thread speed 6000m/min)

<b>output</b>	
protection against overload and reverse polarity	yes (ESD)
status indicator	LED

<b>input</b>	
X3 - INHIBIT	deactivation of sensor TTL level
common electric potential	0V
protection against overload and reverse polarity	yes (ESD)
status indicator	LED

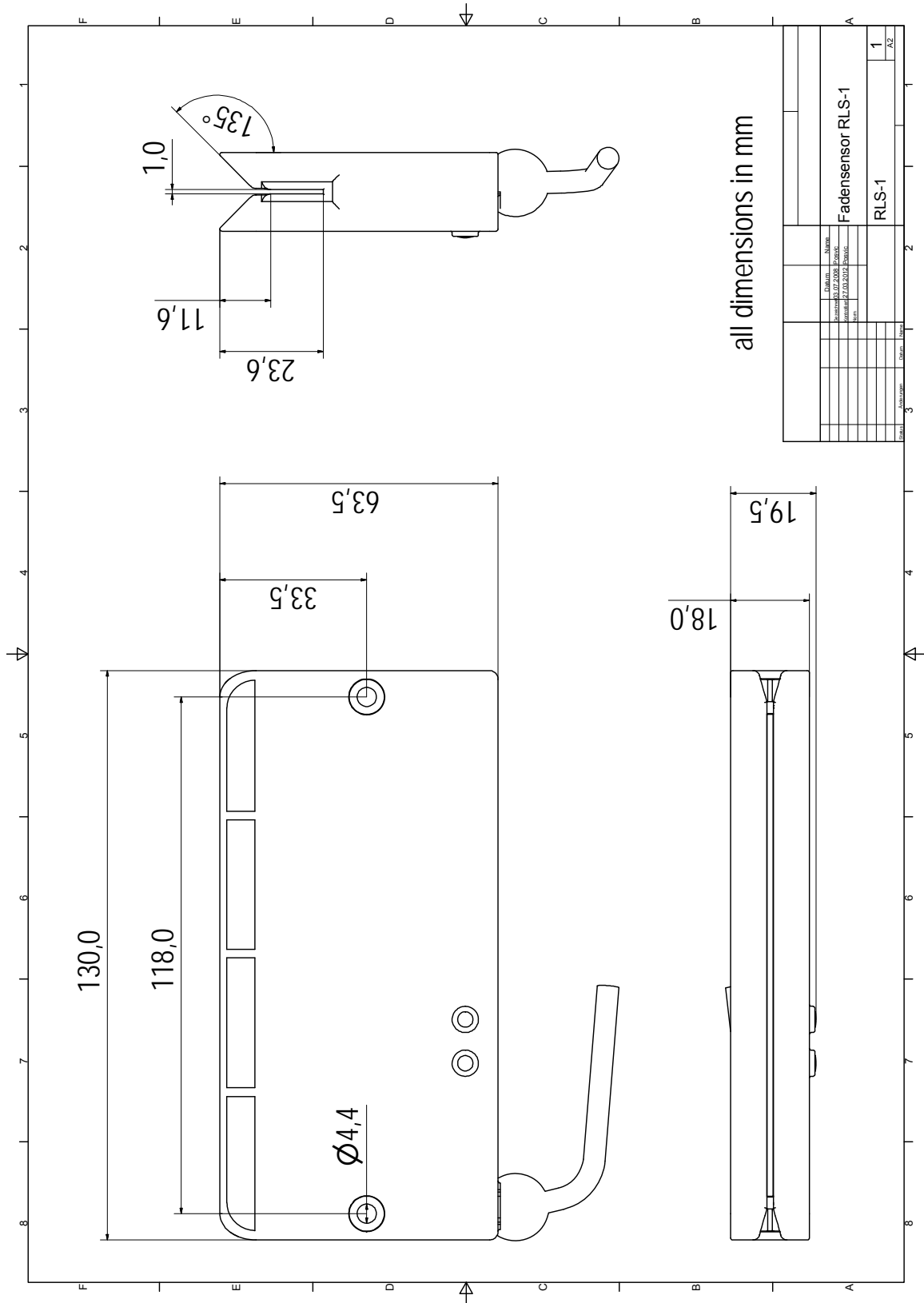
<b>terminal layout M12 plug</b>				
pin	color	desc.	function	direction
1	brown	V <sub>CC</sub>	power	power
2	white	X2	MONITOR	output
3	blue	0V	0V / GND	power
4	black	X1	COUNT	output
5	gray	X3	INHIBIT (don't connect!)	input
S		S	shield, <b>connection to 0V is important!</b>	



M12 male connector pinout; view at the pins

PNP output

#### 4 Housing drawing



Revision 1.14e