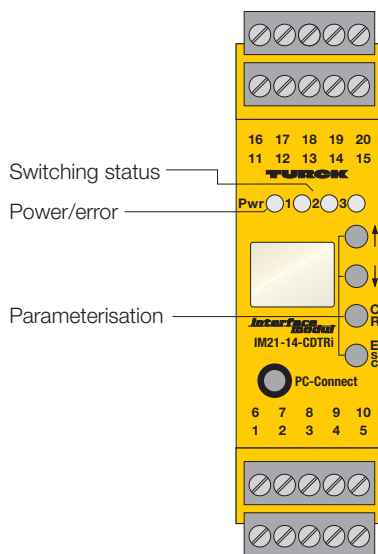


Rotational Speed Monitor IM21-14-CDTRi 1-channel



- **1-channel rotational speed monitor**
- **Frequency to current converter**
- **Overspeed and underspeed detection plus window function**
- **Detection range 1 mHz...10 kHz (0.06...600 000 pulses/min⁻¹)**
- **For use with sensors according to EN 60947-5-6 (NAMUR)**
- **Connection of three-wire sensors and external signal sources 5...30 VDC**
- **2 Relay and 1 transistor output which can be configured as**
 - alarm output
 - two-point controllers (switch on/off point)
 - four point controllers (window function)
 - pulse divider (transistor only)
- **Current output 0/4...20 mA (invertible)**
- **Pulse output**
- **Programmable behaviour of the analogue output with faults in the input circuit**
- **Simple parameterisation and measured value detection via**
 - four panel push buttons
 - FDT/DTM and PACTware™ interface
 - current interface with HART® protocol
- **Ring buffer for storing the measured values**
- **Read access to diagnostic bits via FDT/DTM**
- **Universal operating voltage (20...250 VAC/20...250 VDC)**

The IM21-14-CDTRi is a rotational speed monitor designed to monitor pulse sequences from rotating shafts on motors, gears, turbines etc., for overspeed and underspeed conditions. A display located on the front cover indicates the actual value.

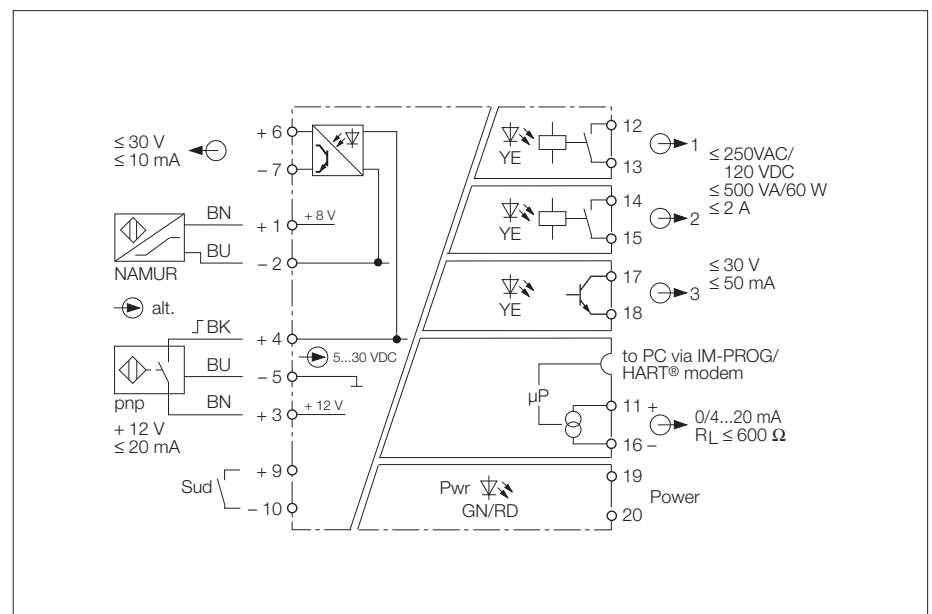
The switching status of the correspondent output relay i.e. transistor is indicated by a yellow LED; operational readiness is indicated by a green LED. The input pulse is indicated on the display.

Sensors per EN 60947-5-6 (NAMUR), 3-wire sensors or external signal sources (5...30 VDC) may be used for signal detection. When using NAMUR sensors, line monitoring for short-circuit and/or wire-break conditions may be adjusted.

In case of input-circuit errors the relays are de-energised, the transistor is blocked and the Power-LED (Pwr) changes to red. 3-wire pnp sensors can be powered with 12 V (≤ 20 mA) by the rotational speed monitor.

External signal sources must have a signal range from 5...30 VDC. The potential-free pulse output provides the input signal for additional processors.

To provide fast response times for applications with relatively low speed, the device operates on a digital pulse principle. High speed monitoring is based on a time window. In low-speed applications, the response time depends on the pulse period.



Rotational Speed Monitor IM21-14-CDTRi

The menu-assisted parameterisation is implemented with four push buttons
The settings are shown on the display.

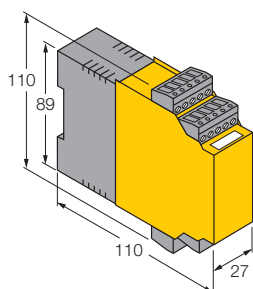
All outputs can be programmed separately for either overspeed or underspeed detection. The both relay outputs can be programmed as a window function – a combination of both. The transistor output can also be used as a pulse divider.

The measured value is written permanently into a ring buffer with 8000 measuring points. A predefined trigger event is necessary to stop the write procedure, e.g. when a limit value is exceeded. The recorded behaviour of the signal can be read out afterwards.

The switching hysteresis is defined by the adjustable switch ON and OFF points. Further it is possible to adjust a separate switch-off time for each output to prevent the device from shutting down due to sudden short-term changes of the frequency. An adjustable latching function prevents the output relay from re-energizing.

The outputs operate in the normally open mode; i.e. the output is switch-on if the speed is within the acceptable range.

The actual speed and the limit value settings are displayed in Hz. By adjusting a time basis and programming the number of pulses per rotation, it is possible to adjust all settings and the display to the required measuring unit. Suppose, the display should be in min^{-1} instead of Hz, the time-based factor adjustment would be 60.

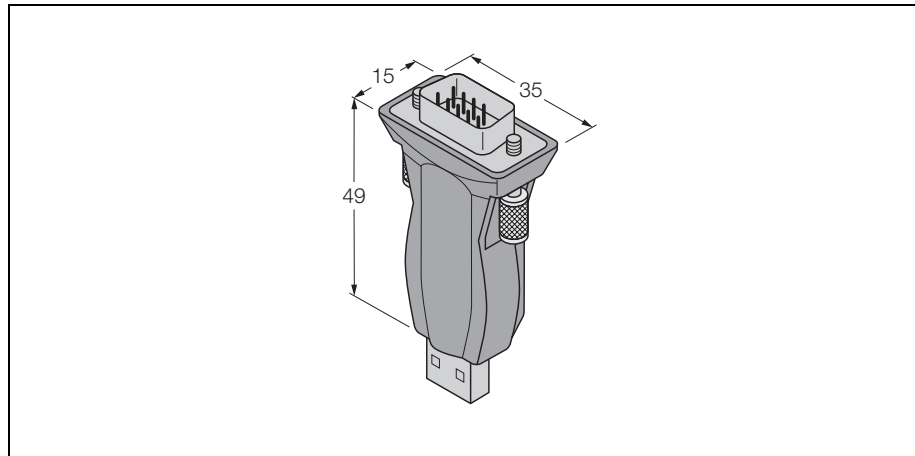


Type	IM21-14-CDTRi
Ident-no.	7505650
Supply voltage U_b	20...250 VAC/20...250 VDC
Line frequency (AC)	40...70 Hz
Current consumption	≤ 3 W (unipolar)
Galvanic isolation	between input circuit and output circuit and supply voltage for 250 V _{rms} test voltage 2,5 kV _{rms}
Rotational speed monitoring	underspeed/overspeed
Monitoring range/adjustable range	0.06...600000 min^{-1} (digitally adjustable)
– Input frequency	≤ 1200000 min^{-1} (20 kHz)
Pulse duration	≥ 0.02 ms
Pulse pause	≥ 0.02 ms
Start-up time delay	0...1000 s (adjustable)
Input circuits	
NAMUR input	acc. to EN 60947-5-6, (NAMUR)
– Operating values	$U_0 = 8.2$ V; $I_k = 8.2$ mA
– Switching threshold	1.55 mA
– Switching hysteresis	0.2 mA
– Wire-break threshold	≤ 0.1 mA
– Short-circuit threshold	≥ 6 mA
3-wire sensor	
– voltage	12 V
– current (no-load current)	≤ 20 mA
External signal source	
– 0-signal	0...3 V
– 1-signal	5...30 V
– Input resistance	26 k Ω
Output circuits	
Relay output	two relays / one transistor 2 change-over contacts
– Switching voltage	≤ 250 V
– Switching current	≤ 2 A
– Switching capacity	≤ 500 VA/60 W
– Switching frequency	≤ 5 Hz
– Contact material	Ag-alloy + 3 μm Au
Pulse output	
– External voltage	< 30 V
– Current	≤ 10 mA
Transistor output	potential-free, short-circuit protected
– Switching voltage	≤ 30 VDC
– Switching current per output	≤ 50 mA
– Switching frequency	≤ 10 kHz
– Voltage drop	$\leq 1,3$ V
Current output	0/4...20 mA (invertible)
Measured value memory	
Number of measuring points	8000
Measurement interval and trigger event	adjustable via DTM
Pre-trigger/post-trigger length, minimum...maximum (increment size):	1st range: 0 s...600 s (1 s), 2nd range: 10 min...600 min (1 min) 3rd range: 10 h...600 h (1 h)
LED indications	
Power/Error	green/red (two-colour LED)
Switching status	3 x yellow
Display	LCD
Pulse indication	on display
Housing	
Mounting	20 poles, 27 mm wide, Polycarbonat/ABS, flammability class V-0 per UL94 snap-on hat rail (DIN 50022) or panel screw mounting
Connection	removable terminal blocks, polarity protected screw connection, self-lifting
Connection profile	$\leq 1 \times 2.5$ mm ² , 2 x 1.5 mm ² or 2 x 1.0 mm ² with wire sleeves
Degree of protection (IEC 60529/EN 60529)	IP20
Operating temperature	-25...+70 °C



D201347 0907

**UBS-RS232 adapter cable
USB-2-RS232**



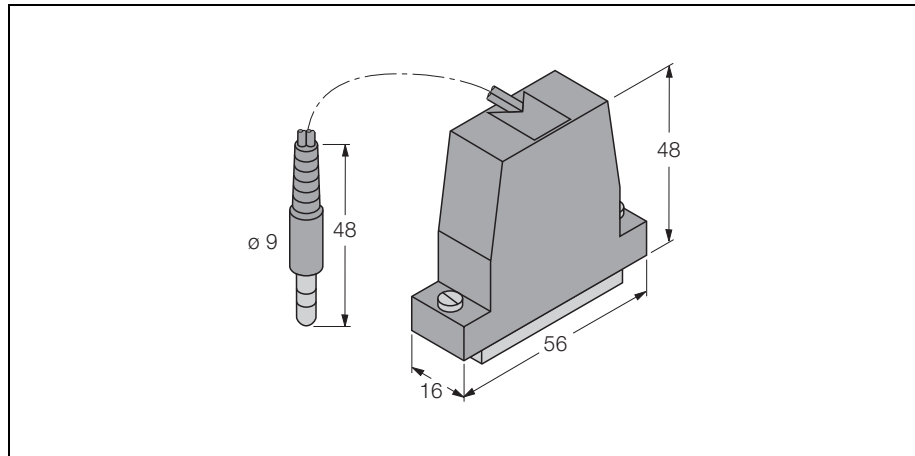
- serial adapter DSUB9 female to DSUB25 male connector included in delivery
- driver for Microsoft® 98/ME/2000/XP
- Cable length: 1.7m
- compatible with USB 1.1 and AMP 1.2
- data rate up to 1.2 MBps

Type	USB-2-RS232
Ident-No.	6900426
Textmodule for individual datasheets	The adapter cable UBS-RS232 is a user friendly interface adapter from USB (version 1.1 and higher) to RS232.
Textmodule for individual datasheets	Each PC equipped with a USB port can be fitted with an additional serial interface according to RS232 standards. This is particularly interesting for users of notebooks, as these are often not equipped with an interface or only with a serial interface.
Textmodule for individual datasheets	The adapter cable can be used for all TURCK devices which feature a serial port, e.g. the programming adapter IM-PROG or the fieldbus systems BL20 and BL67.
Textmodule for individual datasheets	The delivery includes the driver for Microsoft® Windows 98/ME/2000/XP.
Textmodule for individual datasheets	Power supply is provided via USB port at the PC.
Degree of protection	IP40
Weight	95 g

programming adapter IM-PROG

TURCK

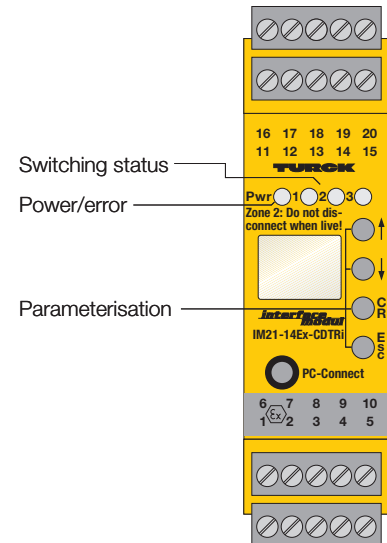
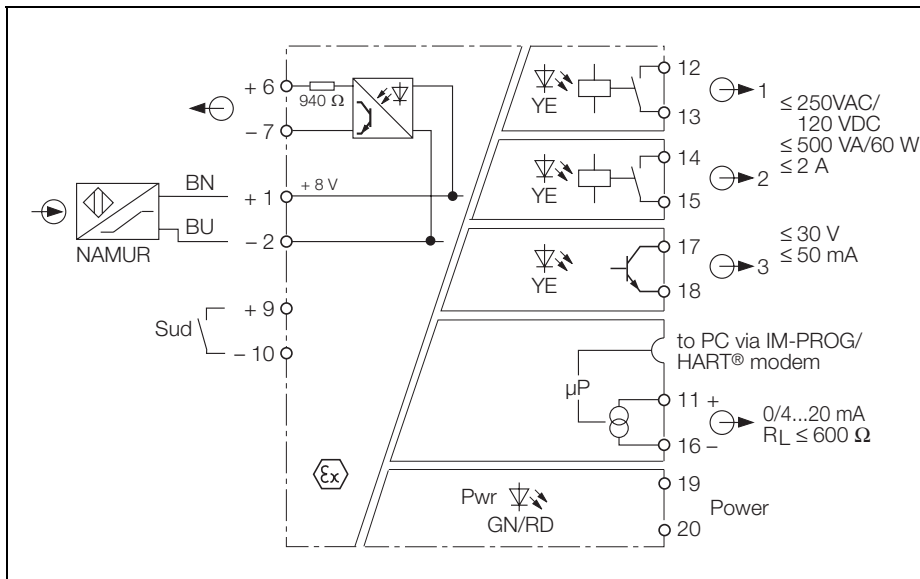
Industrial
Automation



- PC adapter for programming of TURCK-PACTware-devices
- galvanically isolated signal transmission

Type	IM-PROG
Ident-No.	6890422
Textmodule for individual datasheets	The IM-PROG is used to parameterize TURCK devices with PACTware™ via the serial interface of a PC.
Textmodule for individual datasheets	For this purpose, the interface module to be parameterized is connected via the IM-PROG to the serial interface of the PC, using the included connection cable.
Textmodule for individual datasheets	The interface device has to be powered for parameterization.
Textmodule for individual datasheets	The IM-PROG converts the signal level and implements the galvanic isolation.
Textmodule for individual datasheets	Additionally, the parameters can be stored on the PC or printed.
Weight	116 g

rotational speed monitor
1-channel
IM21-14EX-CDTRI



The rotation speed monitor IM21-14EX-CDTRI monitors pulse sequences, rotation speed and pulse trains of rotating motor, gear or turbine parts for over and under range of programmed limit values. A display integrated in the front cover indicates the current value.

The switching status of the corresponding output relay i.e. transistor is indicated by a yellow LED and operational readiness by a green LED. Input pulses are shown on the display. For signal detection intrinsically safe sensors acc. to EN 60947-5-6 (NAMUR) can be used. The line is monitored according to wire-break and/or short-circuit depending on the setting. In case of input circuit errors the relays are de-energized, the transistor is inhibited and the Power-LED (Pwr) changes to red. The input pulse signal is transmitted to the potential-free pulse output and from there to further processing units.

In order to achieve short response times, low frequencies are monitored according to the principle of period duration measurement and high frequencies are monitored with a time window. In case of low frequencies the response time depends only on the period duration of the signal. The device is programmed with four push buttons. The parameters are shown on the display.

Each of the three outputs can be programmed for *overspeed* or *underspeed* control. Moreover a *window* function can be programmed, combining both functions over and underspeed control of both relay outputs. The transistor output can also be used as pulse divider. Up to 8000 measuring points can be saved to a ring buffer. To stop the writing process a highly defined trigger event is needed, like for example the exceedance of a limit value. After that the stored signal sequence can be read out.

The switching hysteresis is defined by programming the switch-on and switch-off point. Additionally, output cut-off due to sudden frequency changes can be avoided if a switch-off delay is programmed for each output. Select the interlocking function to avoid accidental switch-on of the output. The outputs are operated in NO mode; in "good-condition" the corresponding output is in switched state.

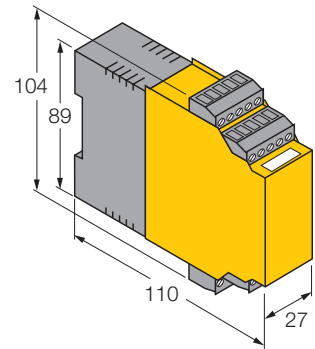
Rotation speed and limit value settings are displayed in Hz. The display and the settings can be adjusted to the required measuring unit by setting a time base and the number of pulses per rotation. For example, if min^{-1} is the selected unit, the time base has to be set to 60.

- **Rotational speed monitor**
- **Selectable line monitoring for wire-break/short-circuit (ON/OFF mode)**
- **Galvanic isolation of input circuits, output circuits and supply voltage**
- **Rotation speed monitoring for over/underspeed and window function**
- **Operating range 0.06...600,000/min**
- **Activation of sensors acc. to EN60947-5-6 (NAMUR)**
- **Connection of 3-wire sensors and external voltage supply 5 ... 30VDC**
- **2 relay and 1 transistor outputs**
- **Pulse divider**
- **Current output 0/4...20 mA reversible**
- **Pulse output**
- **Analog output adjustable with faults in the input circuit**
- **FDT/DTM with diagnostic function**
- **HART**
- **Ring buffer for storing of the measured values**
- **Removable terminal blocks**
- **Universal operating voltage (20...250VAC/ 20...125VDC)**
- **Galvanic isolation of input circuits to output circuits and supply voltage**

rotational speed monitor
1-channel
IM21-14EX-CDTRI



Type	IM21-14EX-CDTRI
Ident-No.	7505651
Nominal voltage	Universal voltage supply unit
Operational voltage range:	20 ... 250 VAC
Frequency	$\geq 40 \dots \leq 70$ Hz
Operational voltage range:	20 ... 125 VDC
Power consumption	≤ 3 W
Monitoring range / setting range:	$\leq 0.06 \dots 600000$ min ⁻¹
Input frequency	600000 min ⁻¹
Pulse time	≥ 0.02 ms
Pulse stop	≥ 0.02 ms
NAMUR	EN-60947-5-6
No-load voltage	8.2 VDC
Short-circuit current	8.2 mA
Input resistance	1 k Ω
Output resistance	≤ 50 Ω
Switch-on threshold:	1.55 mA
Switch-off threshold:	1.75 mA
Wire breakage threshold	≤ 0.1 mA
Short-circuit threshold	≥ 6 mA
Output current	0/4...20 mA
Load resistance current output	≤ 0.6 k Ω
Output circuits (digital)	2 x relay (normally open)
Relay switching voltage	≤ 250 VAC/120 VDC
Switching current per output	≤ 2 A
Switching capacity per output	≤ 500 VA/60 W
Switching frequency	≤ 10 Hz
Voltage drop	≤ 2.5 V
Contact quality	AgNi, 3 μ Au
Semiconductor output circuit(s)	
Output circuits (digital)	1 x transistor (potential-free, short-circuit protected)
Switching voltage	≤ 30 VDC
Switching current per output	≤ 50 mA
Switching frequency	≤ 10000 Hz
Test voltage	2.5 kV
Constant voltage supply	250 V



rotational speed monitor
1-channel
IM21-14EX-CDTRI

Ex approval acc. to conformity certificate

Ex approval acc. to conformity certificate
Application area
Max. output voltage U_o
Max. output current I_o
Max. output power P_o
External inductance/capacitance L_o/C_o

placeholder

IBExU 07 ATEX B010 X
II (1) GD
 ≤ 9.6 V
 ≤ 10.7 mA
 ≤ 25 mW

	EEx ia IIC	EEx ia IIB
Lo [mH]	100 5 1 0.01	100 5 1 0.01
Co [μ F]	0.51 0.84 1.2 3.6	2.7 4.4 6.3 26

Ex approval acc. to conformity certificate

Application area
Max. output voltage U_o
Max. output current I_o
Max. output power P_o
External inductance/capacitance L_o/C_o

IBExU 07 ATEX B010 X

II 3 G
 ≤ 9.6 V
 ≤ 10.7 mA
 ≤ 25

	Ex nL IIC	Ex nL IIB
Lo [mH]	100 5 1 0.01	100 5 1 0.01
Co [μ F]	0.765 1.2 1.8 5.4	4 6.6 9.4 39

Indication

Operational readiness
Pulse input
Error indication

placeholder

green
yellow
red

Degree of protection

Ambient temperature
Housing length
Housing width
Housing height
Weight
Mounting instruction
Housing material
Electrical connection
Terminal cross-section

IP20

-25 ...+ 70 °C
104 mm
27 mm
110 mm
212 g
Mounting on DIN rail or mounting panel
polycarbonate/ABS
4 x 5-pole removable terminal blocks, reverse
polarity protected, screw connection
 1×2.5 mm² / 2×1.5 mm²