

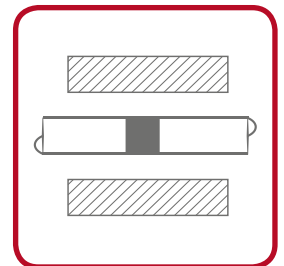
Universal Fault Detection System UFD40

Non contact detection of faults,
butt welds and mechanical connections
in wires, cables and tubes.

- Modular Design
- Independent functions of the measurement channels
- Independent real-time communication of the measurement channels with the machine PLC
- Industrial interfaces for automation
- Host PC for visualization and operation of the measurement channels

THE ROLAND PLUS

- ▶ A separation of Host PC and measurement channels
- ▶ 1 or 2 Eddy Current Channels
- ▶ Interface Profibus or Profinet



Description:

The UFD40 serves the detection of faults, butt welds and mechanical connections in wires, cables and tubes. It has been specifically developed for use in the process control area.

The UFD40 shows features known from classical Eddy current testing equipment used in automated fault inspection, such as selectable working frequency, high pass / low pass filters, Y components and vector evaluation. This enables the system to detect different fault spots and seams with the same hardware.

Measurement principle:

The measurement principle is based on the process of eddy current measurement. Encircling coils are used for measurement, through which the material is guided during the process. For fault detection other differential coils can also be used.

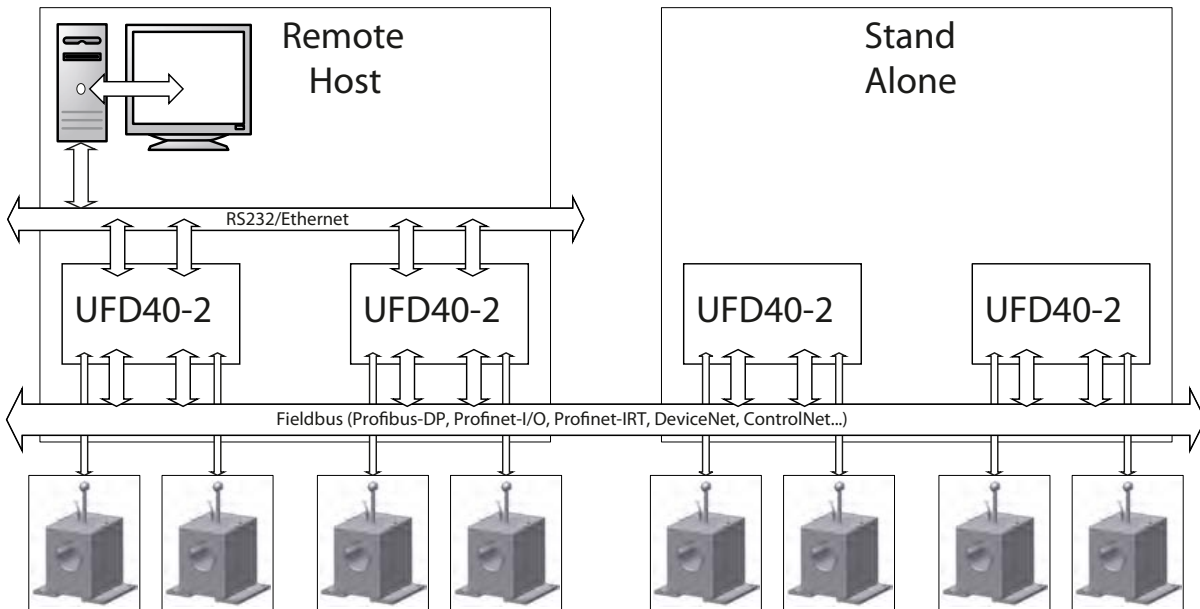
The sample rate during measurement is at 15 kHz. With material speeds of 10 m/sec the system can achieve a path resolution of 0.6 mm.

When the material transits the sensor, irregularities (faulty spot, connection or seam) will be detected by the changing forming of eddy currents within the material. The evaluation electronics will transmit the measurement result directly to the machine PLC via Fieldbus network and to the Host PC via RS232 / Ethernet (if connected).

Modular Design:

The system is designed modular. The Host PC is separate from the measurement channels. The complete electronics for two Eddy current measurement channels is accommodated in one module enclosure (IP65).

Every channel has its independent functionality: measurement, evaluation and real-time communication with the machine PLC. The channels run either autarchic in "Standalone" operation or under control of a Host PC in "Remote" mode. The Host PC serves the visualization of the operation and the operation of the measurement channels connected. In Standalone mode a PC linkage is used only occasionally.



Every channel is equipped with a control interface, so the channel is absolutely independent from other channels. Settings can be stored and selected with the control / operator interface.

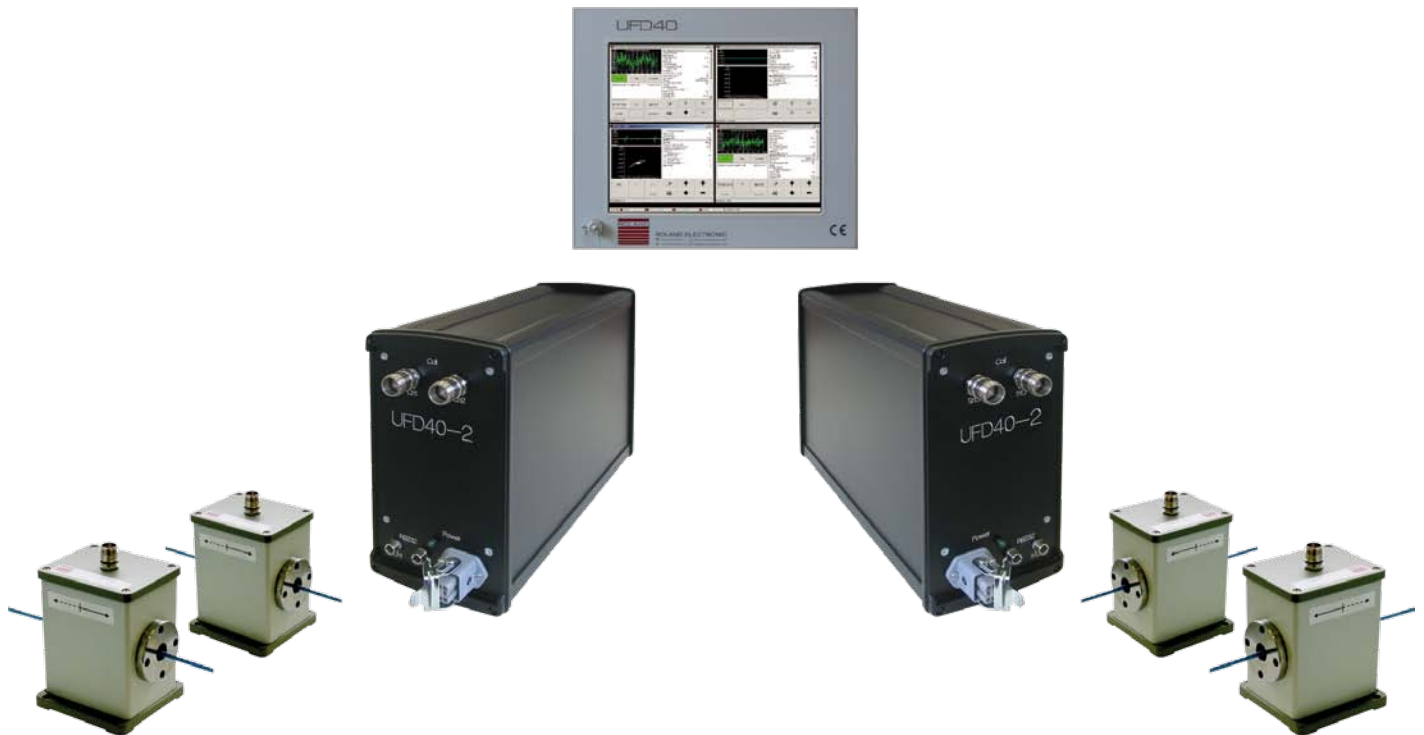
Among 24 V I/O systems, bus systems with Profibus DP and Profinet IO are also available. Other Fieldbus systems are under preparation.

A Roland Panel-PC with Touchscreen (R4000PC) can be used as Host PC, alternatively another PC / Laptop with suitable interfaces will also function.

Visualization and operation:

The visualization and operation of a measurement channel is by a supplied software for the Windows operation system. The software communicates with the appropriate channel by a RS232 connection or Ethernet (under preparation).


The visualization can be separately called up for each channel, the number of channels which can be displayed is limited only by the capability of the Host PC.




Sensorics:

Currently encircling coils are available for material diameters 1 - 90 mm. The well known coils with fixed diameters are complemented by the modular inspection coil systems EC15 - EC90.

With those systems a sensor can be easily and quickly converted to another material diameter.

Sensor	Type	Fixed coils for material diameter
	EC5x25IDN...	max. 4.5 mm
	EC13x25PDN...	max. 12 mm
	EC20x25IDN...	max. 16 mm
Suitable sensor cable: SM18CECPPS-GG		

Sensor	Type	Exchangeable coils for material diameter
	EC15	max. 1 mm - 15 mm, in steps of 1 mm
	EC90	max. 16 mm - 90 mm, in steps of 2 mm
		Additional coil diameters are under preparation
Suitable sensor cable: SM18CECPPS-GG		

Technical Data

Eddy current electronics	
Type:	Differential channel
Frequencies:	0.8 / 1.5 / 3 / 6 / 12 / 25 / 50 / 100 / 400 / 800 kHz
Low pass filter:	5 -1000 Hz in 18 steps
High pass filter:	(0), 1 - 1000 Hz in 23 steps
AC gain / DC gain:	20 - 100 dB in steps of 1 dB / 0 - 58 dB in 100 steps
Phase:	Selectable in 72 steps
Transmitter:	2 - 20 V _{pp} / 0,5 A _{pp}
Evaluation	
Signal / Thresholds:	Y component, amount / Positive, negative, absolute
Sampling rate:	15 kHz
Further data	
Voltage supply:	24 VDC +/- 20%
Power consumption:	Approx. 18 W for 1-channel unit, 30 W for 2-channel unit
Protection class :	IP65 enclosure
Dimensions in mm:	233×121×300 (420 incl. plugs)
Ambient temperature:	+5 to +45°C (operation)
Weight:	4.5 kg
PLC interface:	- Profinet IO, Baud rate to 100 Mbit/s - Profibus DP-Slave, Baud rate to 12 Mbit/s - 24 V I/O - other Fieldbus systems upon request
Control signals:	Standby, Measurement Start, Fault detected, Confirming, Program selection 1 of 31 (I/O version), 1 of 99 (bus version)
Host interface:	Ethernet 10/100 Mbit/s
Sensor interface:	Differential coil with separate transmitter and receiver
Connections:	Pluggable at front side

CE conformity:	EMV-Directive 2004/108/EG, EN 61000-6-2: 2005-08, EN 61000-6-4:2
Add-Ons on request	
UFD40 with analog outputs for external evaluation	
Host Software	
Function:	Operation, visualization, administration and storage of the measurement programs for different products
Requirements to the Host PC	
Operation system:	Windows 7/8/10 x86 or x64
Graphics:	min. 640×480 (for 1-channel); 1280×1024 (for 4-channel)
Interface:	one RS232 or USB interface (with RS232 converter) per channel
Host PC R4000PC	
Type:	Panel PC
Voltage supply:	24 VDC +/- 20%
Power consumption:	Approx. 100 W
Graphics:	1280×1024
Interface:	RS232 (4 pcs.) for connecting the UFD40 modules
Operation system:	Windows 7 embedded

Order information:

Order specification	Description
UFD40-1EC-IO-S-CP	Universal Fault Detector in compact version, 1 differential channel, I/O connection
UFD40-2EC-IO-S-CP	Universal Fault Detector in compact version, 2 differential channels, I/O connection
UFD40-1EC-PR-S-CP	Universal Fault Detector in compact version, 1 differential channel, Profibus DP
UFD40-2EC-PR-S-CP	Universal Fault Detector in compact version, 2 differential channels, Profibus DP
UFD40-1EC-PN-S-CP	Universal Fault Detector in compact version, 1 differential channel, Profinet IO
UFD40-2EC-PN-S-CP	Universal Fault Detector in compact version, 2 differential channels, Profinet IO
R4000PC	Industrial PC for connection of the UFD40 modules, with graphics 1280×1024 (4-channel)
UFD40-PROG-PC	Host-PC, in transport case, application as mobile administration PC
SCB-EC-S	Sensor Interface Box, one side for connection of EC probes with M12 plug, the other side for connecting the UFD with cable SM18CECM18S-GG
EC5×25IDN50-500-S KOMPL.	Encircling coil sensor with fixed coil, for material diameter up to max. 4.5 mm
EC13×25PDN50-500-S KOMPL.	Encircling coil sensor with fixed coil, for material diameter up to max. 12 mm
EC20×25IDN50-500-S KOMPL.	Encircling coil sensor with fixed coil, for material diameter up to max. 16 mm
EC15	Encircling coil with exchangeable coil, for material diameter of max. 1 mm to max. 15 mm, in steps of 1 mm
EC90	Encircling coil with exchangeable coil, for material diameter of max. 16 mm to max. 90 mm, in steps of 2 mm
SM18CECM18S-GG	Sensor cable, for sensors EC5×25..., EC13×25..., EC20×25..., standard length is 5 meters
SM18CECPPS-GG	Sensor cable, for sensors EC15, EC90, standard length is 1.8 meters, push-pull plugs at sensor side
EC probes	Multiple different designs are available

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