



UFD40 FAULT DETECTION UNIVERSAL FAULT-DETECTION-SYSTEM

- 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
- Visualization and operation of the measurement channels via Host-PC



UFD40 FAULT DETECTION

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.

Function:

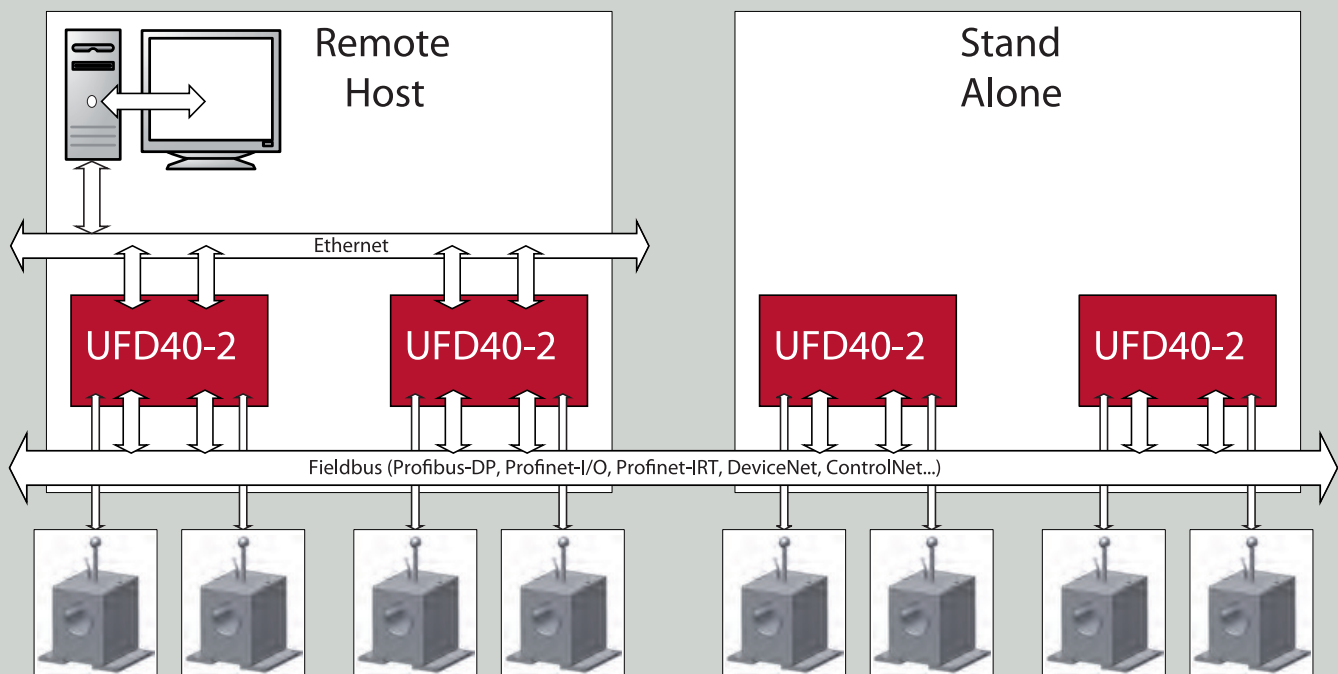
When the material transits the sensor, irregularities (faulty spot, connection or seam) will be detected by the changing forming of eddy currents within the material. The evaluation electronics will transmit the measurement result directly to the machine PLC via Fieldbus network and to the Host PC via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

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.

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.

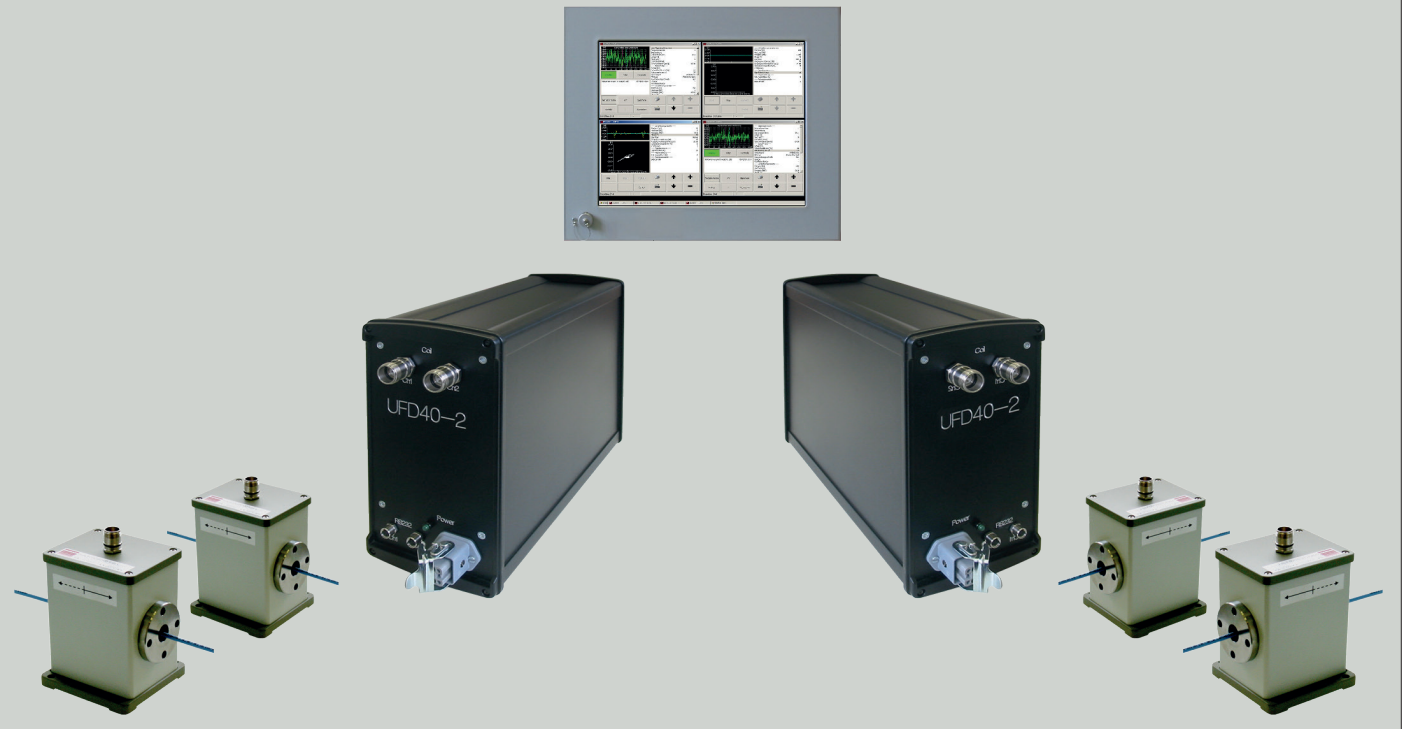
Among 24 V I/O systems, bus systems with Profibus DP and Profinet IO are also available. Other Fieldbus systems are in preparation. A PC / Laptop with suitable network interfaces can be used as Host PC.

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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 Ethernet.

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	Sensor	Type	Exchangeable coils for material diameter
	EC5x25IDN...	max. 4.5 mm		EC15	max. 1 mm - 15 mm, in steps of 1 mm
	EC13x25PDN...	max. 12 mm		EC90	max. 16 mm - 90 mm, in steps of 2 mm
	EC20x25IDN...	max. 16 mm		...	Additional coil diameters are under preparation
Suitable sensor cable: SM18CECM18S-GG			Suitable sensor cable: SM18CEPPS-GG		



Technical Data

UFD40			
Eddy current electronics		Further Data	
Type:	Differential channel	Voltage supply:	24 VDC +/- 20%
Frequencies:	0.8 / 1.5 / 3 / 6 / 12 / 25 / 50 / 100 / 400 / 800 kHz	Power consumption:	approx. 18 W (1-channel unit) , 30 W bei (2-channel unit)
Low pass filter:	5 - 1000 Hz in 18 steps	Protection class:	IP65
High pass filter:	(0) , 1 - 1000 Hz in 23 steps	Dimensions in mm:	233×121×300 (420 inkl. Stecker)
AC gain:	20 - 100 dB in steps of 1 dB	Ambient temperature:	+5 to +45°C (operation)
DC gain:	0 - 58 dB in 100 steps	Weight:	4.5 kg
Phase:	selectable in 72 steps	PLC interface:	Profinet IO, Baud rate up to 100 Mbit/s, Profibus DP-Slave, Baud rate up to 12 Mbit/s (other Fieldbus systems upon request)
Transmitter:	2 - 20 V _{ss} / 0,5 A _{ss}		24 V E/A
Evaluation:		Control signals:	Standby, Measurement Start, Fault detected, Confirming, Program selection 1 of 31 (I/O version), 1 of 99 (bus version)
Signal / Thresholds:	Y component / positive, negative, absolute	Host interface:	Ethernet 10/100 Mbit/s
Sampling rate:	15 kHz	Sensor interface:	Differential coil with separate transmitter and receiver
		Connections:	pluggable at front side
Add-Ons on request : UFD40 with analog outputs for external evaluation		CE Conformity:	EMV-Directive 2004/108/EG, EN 61000-6-2: 2005-08, EN 61000-6-4:2
Host software			
Function:	Operation, visualization, administration and storage of the measurement programs for different products		

Order Information

UFD40 Fieldbus version		UFD40 IO	
Part no.	Description	Part no.	Description
UFD40-1EC-XX-S-CP	Universal Fault Detector in compact version, 1 differential channel	UFD40-1EC-IO-S-CP	Universal Fault Detector in compact version, 1 differential channel, I/O connection
UFD40-2EC-XX-S-CP	Universal Fault Detector in compact version, 2 differential channels	UFD40-2EC-IO-S-CP	Universal Fault Detector in compact version, 2 differential channels, I/O connection
XX: PR=ProfiBus DP, PN=ProfiNet IO			
Sensors			
Part no.	Description		
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		
...	Multiple different designs of EC probes are available		
Cables			
Part no.	Description		
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		
Accessories			
Part no.	Description		
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		

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