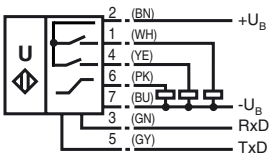
Ultrasonic sensor
UC2000-F43-2KIR2-V17

Features

- Current output 4 mA ... 20 mA
- 2 relay outputs
- Serial interface
- Temperature compensation
- Reverse polarity protection
- Parameterisable with ULTRA 2001

Electrical connection

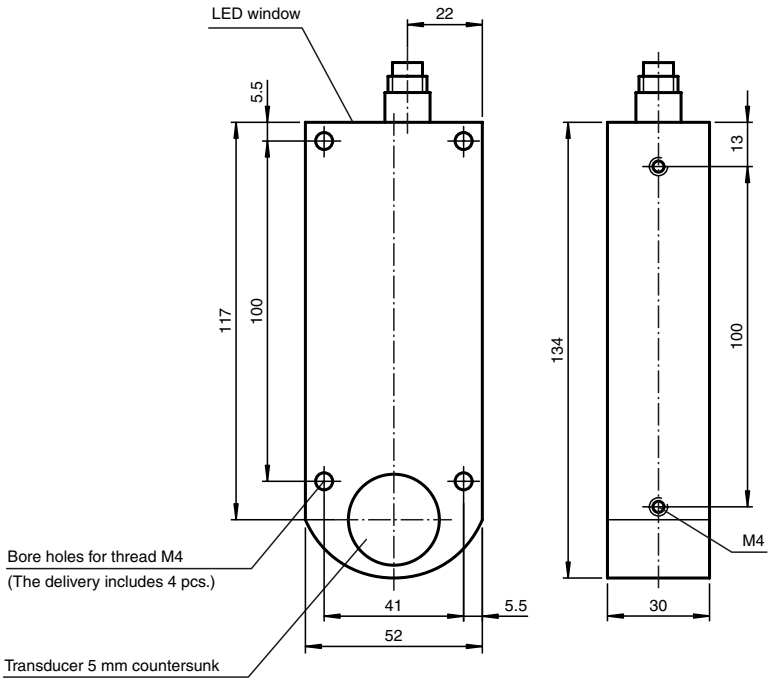
Standard symbol/Connection:



Core colours in accordance with EN 60947-5-2.

Connector V17

Dimensions



Technical data

CE

General specifications	
Sensing range	80 ... 2000 mm
Adjustment range	100 ... 2000 mm
Unusable area	0 ... 80 mm
Standard target plate	100 mm x 100 mm
Transducer frequency	approx. 175 kHz
Response delay	minimum (EM; NONE): ≤50 ms (2 measuring cycles) factory setting (EM, MXN, 5, 2): ≤150 ms (6 measuring cycles) dynamic (EM, DYN): ≤75 ms (3 measuring cycles)
Indicators/operating means	
LED green	continuous: object in the measuring window flashing: object outside the measuring window
LED red	error (e. g. interference level too high)
Electrical specifications	
Operating voltage	10 ... 30 V DC ripple ± 10 $\%_{SS}$
Power consumption P_0	≤ 2 W (all relays pulled-in, current output 20 mA) no-load power consumption ≤ 0.7 W
Interface	
Interface type	RS 232, 9600 bit/s, no parity, 8 data bits, 1 stop bit
Output	
Output type	2 relay outputs, 1 analogue output 4 ... 20 mA
Resolution	0.6 mm
Deviation of the characteristic curve	< 0.2 % of full-scale value
Repeat accuracy	≤ 0.1 % of full-scale value
Range hysteresis H	0 ... 15 % parameterisable with ULTRA 2001
Load impedance	current output: ≤ 500 Ω at U_B ≥ 17V ≤ 200 Ω at U_B < 17V
Contact loading	60 V DC / 1 A (max. 24 W DC), ohmic
Lifetime	electrical: 3 x 10^5 switching cycles at resistive load (1 A / 24 V DC) mechanical: 10^7 switching cycles
Temperature influence	≤ 2 % of full-scale value
Standard conformity	
Standards	EN 60947-5-2
Ambient conditions	
Ambient temperature	-25 ... 70 °C (248 ... 343 K)
Storage temperature	-40 ... 85 °C (233 ... 358 K)
Mechanical specifications	
Protection degree	IP65
Connection	8-pin round connector, Lumberg type RSF 8
Material	
Housing	PBT
Transducer	epoxy resin/hollow glass sphere mixture; polyurethane foam
Mass	290 g

120329_ENG.xml

2005-10-07

Notes

Thanks to its extensive command set, the sensor can be configured to suit the application via the RS 232 interface.

RS 232 command set (overview)

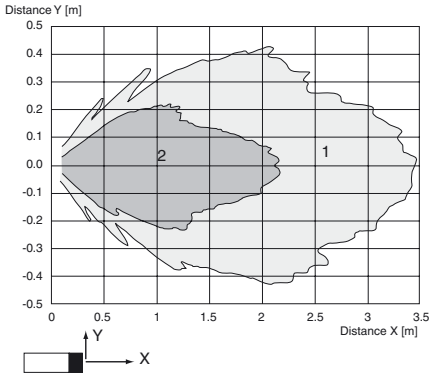
Command	Meaning	Parameter	Access
VS0	**V**elocity of **S**ound at **0** °C	Velocity of sound at 0 °centigrade VS0 in [cm/s] {12000 ... 60000)	read and set
VS	**V**elocity of **S**ound	Velocity of sound VS in [cm/s]	read
TO	**T**emperature **O**ffset	TO in [0.1K]	read and set
TEM	**TEM**perature	TEM in [0.1K]	read and adapt to TO
REF	**REF**erence measurement	REF distance in [mm] {100 ... 4000}	adaptation of VS0
SD1	**S**witching **D**istance **1**	Switching point, relay 1 SD1 in [mm] {100 ... 4000}	read and set
SD2	**S**witching **D**istance **2**	Switching point, relay 2 SD1 in [mm] {100 ... 4000}	read and set
SH1	**S**witching **H**ysteresis **1**	Hysteresis, relay 1 in [%] {0 ... 15}	read and set
SH2	**S**witching **H**ysteresis **2**	Hysteresis, relay 2 in [%] {0 ... 15}	read and set
NDE	**N**ear **D**istance of **E**valuation	Near measuring window limit in [mm] {100 ... 4000}	read and set
FDE	**F**ar **D**istance of **E**valuation	Far measuring window limit in [mm] {100 ... 4000}	read and set
BR	Unusable area (**B**lind **R**ange)	Unusable area in [mm] {0 ... 4000}	read and set
RR	**R**ange **R**eduction	reduces sensing range [in mm] {100 ... 4000}	read and set
CBT	**C**onstant **B**urst **T**ime	Burst length {0,1, 2, 3}	read and set
CCT	**C**onstant **C**ycle **T**ime	Time in [ms] {0 ... 1000}	read and set
FTO	**F**ilter **T**ime**O**ut	Number of measurements without echo to be filtered {0 ... 255}	read and set
EM	**E**valuation **M**ethod	Evaluation method { 0 = NONE; PT1[,f,p,c]; MXN[,m,n]; DYN[,p] }	read and set
CON	**CON**servative filter	Counter threshold as number {0 ... 255}	read and set
OM	**O**utput **M**ode	OM coded [normally-open = 0, normally-closed = 1, inactive = I]	read and set
FSF	**F**ail **S**afe **F**unction	Failure function type e.g. FSF,11,35 {0,1,2}, [fault current in 0.1 mA], -1 = current output indifferently	read and set
MD	**M**aster **D**evice	Function as master {0 = NONE},AD,RD,RT,SS,ADB,RDB,RTB }	read and set
MA	**M**ain **A**pplication	Determines whether the green LED orients on analogue output or switching outputs {A,S}	read and set
NEF	**N**o **E**cho **F**ailure	Sensor behaviour when no echo is present {0,1}	read and set
AD	**A**bsolute **D**istance	Distance in [mm]	read
RD	**R**elative **D**istance	Relative distance as number {0 ... 4095}	read
RT	**R**un**T**ime	Echo run time in machine cycles [1 machine cycle = 1.085µs]	read
SS1	**S**witching **S**tate **1**	SS1 binary [0: inactive, 1 active] (independent of OM)	read
SS2	**S**witching **S**tate **2**	SS2 binary [0: inactive, 1 active] (independent of OM)	read
ADB	**A**bsolute **D**istance **B**inary	Distance in [mm] not as ASCII	read
RDB	**R**elative **D**istance **B**inary	Relative distance as number {0 ... 4095} not as ASCII	read
RTB	**R**un**T**ime **B**inary	Echo run time in machine cycles [1 machine cycle = 1.085µs] not as ASCII	read
ER	**E**cho **R**eceived	Echo detected: no, yes [0/1]	read
VER	**VER**sion	Version string: xxxx	read
ID	**ID**entification	ID string: P&F UC2000-F43-2KIR2-V17...	read
DAT	**DAT**e	Date string: e.g. Date: 04/12/02 Time: 11:14:35	read
ST	**ST**atus	Status as hexadecimal string	read
RST	**R**e**S**e**T**	Performs a reset	Command
DEF	**DEF**ault settings	Restores defaults	Command
SUC	**S**tore **U**ser **C**onfiguration	Stores all settings	Command
RUC	**R**ecall **U**ser **C**onfiguration	Restores stored settings	Command

Model number

UC2000-F43-2KIR2-V17

Characteristic curves/additional information

Characteristic response curve



Curve 1: flat surface 100 mm x 100 mm
Curve 2: round bar, Ø 25 mm

Basic setting

OM:
Relay 1: NO
Relay 2: NO

SD1/SD2:
Switch point relay 1 = 100 mm
Switch point relay 2 = 2000 mm

NDE/FDE:
Analogue output: 4 mA ⇒ 100 mm
20 mA ⇒ 2000 mm

FSF:
Error ⇒ Relay 1 and 2: latest state
⇒ Analogue output: I_{OUT} = 3,9 mA

NEF:
No echo ⇒ error message

MA,S:
Switching mode

Accessories

RS 232 interface
UC-F43-R2

Service program
ULTRA 2001

Cable sockets *)
V17-G-2M-PUR
V17-G-5M-PUR

*) For additional cable sockets see section „Accessories“.