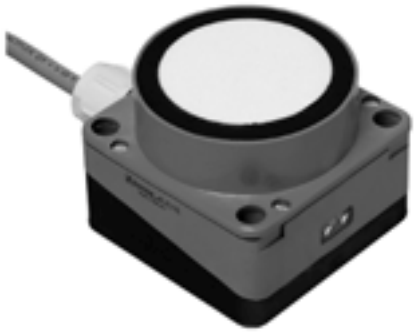
Ultrasonic sensor
UJ6000-FP-8B+RS

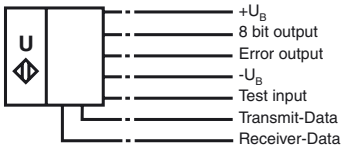


Features

- 8 bit output
- Absolute polarity reversal protection
- Test input
- Fault output
- Serial interface
- Parameterisable with ULTRA 2001

Electrical connection

Standard symbol/Connection:



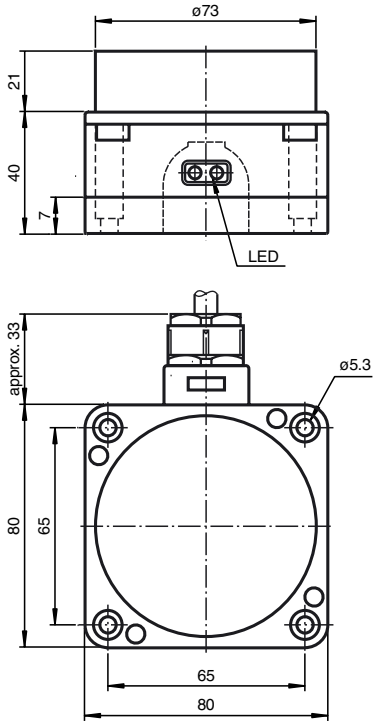
Legend:

$+U_B$ = Brown	Test input = Grey/Pink
$-U_B$ = Blue	Error output = Red/Blue

Interface:
Receiver-Data RD = White/Green
Transmit-Data TD = Brown/Green
8 bit output:

A1 = White	A2 = Yellow
A3 = Pink	A4 = Red
A5 = Green	A6 = Grey
A7 = Black	A8 = Violet

Dimensions



Technical data

CE

General specifications	
Sensing range	800 ... 6000 mm
Unusable area	0 ... 800 mm
Standard target plate	100 mm x 100 mm
Transducer frequency	approx. 65 kHz
Response delay	static 4: ≤ 720 ms (factory setting) static 1: ≤ 180 ms dynamic; ≤ 270 ms
Indicators/operating means	
LED red/green	green LED: Power on red LED, flashing at 2 Hz: error (high level of external noise)
Electrical specifications	
Operating voltage	20 ... 30 V DC , ripple 10 $\%_{SS}$
No-load supply current I_0	≤ 90 mA
Interface	
Interface type	RS 232, 9600 bit/s, no parity, 8 data bits, 1 stop bit
Input	
Input type	1 test input, ($-U_B$ + 5 V) up to $+U_B$, ≤100 kOhm
Output	
Output type	8 bit output for outputting object distance, pnp 1 fault output, pnp NC
Resolution	21 mm , (corresponding to 1 LSB)
Repeat accuracy	21 mm , (corresponding to 1 LSB)
Rated operational current I_e	20 mA , short-circuit/overload protected
Voltage drop U_d	≤ 4 V
Range hysteresis H	21 mm , (corresponding to 1 LSB)
Temperature influence	0.17 % / K
Standard conformity	
Standards	EN 60947-5-2
Ambient conditions	
Ambient temperature	-10 ... 50 °C (263 ... 323 K)
Storage temperature	-40 ... 85 °C (233 ... 358 K)
Mechanical specifications	
Protection degree	IP65
Connection	2 m, cable, 14 x 0.14 mm^2, cast terminal compartment
Material	
Housing	PBT
Transducer	epoxy resin/hollow glass sphere mixture; polyurethane foam
Mass	430 g

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Notes

Description of the sensor functions

The measurement of the distance is realised using the echo time of the ultrasonic pulse. The µ processor calculates the distance on the basis of the echo time and the speed of sound. The distance is directly issued in parallel in the form of an 8-bit data word.

A serial interface (RS 232, 9 600, n, 8, 1) is also available.

The output functions can be set up flexibly. For further information on the sensor's command set, please see the publication "Command Set for Ultrasonic Sensors with RS 232 interface".

In the event of interference that the sensor cannot handle, the sensor goes into failure mode in that the failure output opens and the 8-bit output retains the most recent measuring value. The dual LED goes into the red flashing state.

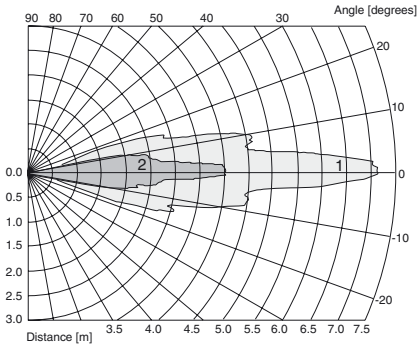
A 1 level at the test input causes the 8-bit output to switch from 00000000 to 11111111 and back every 200 ms.

Model number

UJ6000-FP-8B+RS

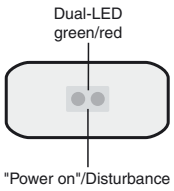
Characteristic curves/additional information

Characteristic response curves



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

LED-Window



Accessories

Mounting aid

MH 04-3505
MHW 11

Mounting flange

PA02

Interface-cable

UC-FP/U9-R2

Service program

ULTRA 2001

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
VS	**V**elocity of **S**ound	VS in [cm/s]	read
SD1	**S**witching **D**istance **1**	SD1 distance in [mm]	read and set
SD2	**S**witching **D**istance **2**	SD2 distance in [mm]	read and set
SH1	**S**witching **H**ysteresis **1**	Hysteresis in [%]	read and set
SH2	**S**witching **H**ysteresis **2**	Hysteresis in [%]	read and set
NDE	**N**ear **D**istance of **E**valuation	Near measuring window limit in [mm]	read and set
FDE	**F**ar **D**istance of **E**valuation	Far measuring window limit in [mm]	read and set
BDE	**B**oth **D**istances of **E**valuation	Measuring window limits in [mm]	read and set
REF	**R**eference measurement	Reference measurement	
FTO	**F**ilter **T**ime**O**ut	Number of measurements without echo to be filtered	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	read and set
FA1	**F**ilter **A**ctivate for Output **1**	Conservative or integrating filter (0 = inactive, 1 = active)	read and set
FA2	**F**ilter **A**ctivate for Output **2**	Conservative or integrating filter (0 = inactive, 1 = active)	read and set
FW	**F**ilter **W**indow	Filter width in % around measured value (5 ... 25)	read and set
OM	**O**utput **M**ode	OM coded [close NO = 0, open NC = 1]	read and set
ODF	**O**utput **D**ata **F**ormat	Data format of the 8-bit output (8B = relative, BCD = absolute)	read and set
MD	**M**aster **D**evice	Function as master {0 = NONE},AD,RD,RT,SS,ATB,RDB,RTB }	read and set
CCT	**C**onstant **C**ycle **T**ime	Cycle time (0 = variable, 1 = constant)	read and set
CBT	**C**onstant **B**urst **T**ime	Length of the ultrasonic burst in µs: 0 = variable, x = fixed (UJ3000: x = 20 ... 500; UJ6000: x = 50 ... 1000)	read and set
RT	**R**andom **T**ime	Random length pause between 2 measurements (= active, 0 = inactive)	read and set
DIP	Read **DIP** switches	DIP switch setting as hexadecimal string	read
AD	**A**bsolute **D**istance	Distance in [mm]	read
RD	**R**elative **D**istance	Relative distance as number {0 ... 4095}	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
ODR	**O**bject in **D**etection **R**ange	Object in detection range (0 = no, 1 = yes)	read
OER	**O**bject in **E**valuation **R**ange	Object in evaluation range (0 = no, 1 = yes)	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 UJ...-..-8B-RS Eprom: xxxx Version yyyy	read
DAT	**DAT**e	Date string: e.g. Date: 06/11/96 Time: 16:14:26	read
FT	**F**unction **T**est	Performs self-test	Command
RST	**R**e**S**e**T**	Performs a reset	Command
DEF	**DEF**ault settings	Restores defaults	Command

Programming instructions

Electrical connection of interface cable UC-FP/U9-R2 (see accessories).

Interface cable Conductor colour	Sensor terminal compartment Terminal no.
brown (TD)	4 (RD)
black (RD)	2 (TD)
blue (GND)	3 ($-U_B$)

Structure of the filter functions