

HERMOS

Technical Reports

for

HERMOS

Transponder Reader
System

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1. System description

The HERMOS transponder reader system is used in the semiconductor industry for the identification of the wafer-carrier. It is a high frequency identification system using the FM-transmission.

The basic item is a transponder working as a forgery-proof electronic identity disc. The transponder is welded into the carrier.

The reader of the system sends an energy impulse via the antenna. The capacitor of the passive, battery-less transponder is charged by this impulse. After that, the transponder returns a signal with the stored data.

The total reading cycle takes less than 100 ms.

As a sight-connection between transponder and reader is not absolutely necessary, the transponder can also be identified through non-metallic material.

The HERMOS transponder reading unit is a LON-node. LON is a control network for distributed systems and has been developed by the US company Echelon. The LONWORKS-technology corresponds to the SEMI (Semiconductor Equipment Materials International)-Standard (E54.6).

The data received by the transponder reader is transmitted to equipment, terminalserver or host systems by the LON-network.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- 1) this device may not cause harmful interference , and
- 2) this device must accept any interference received, including interference that may cause undesired operation.

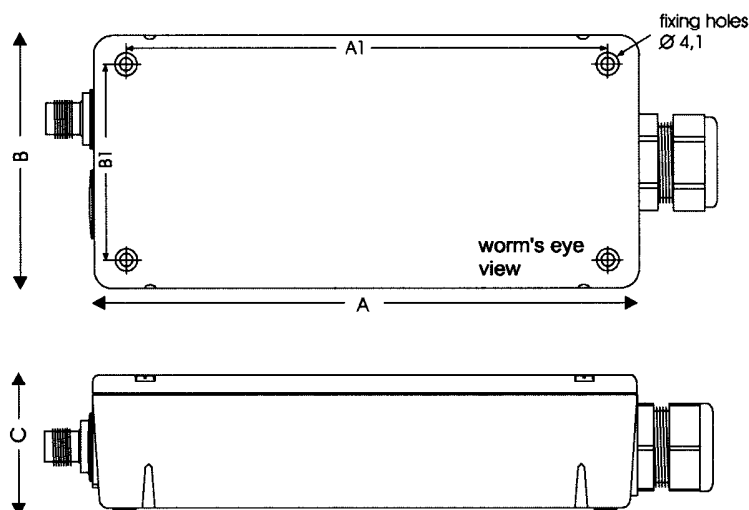
The user's manual or instruction manual for an intentional or unintentional radiator shall caution the user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.



2. Transponder reading unit

2.1 Standard housing

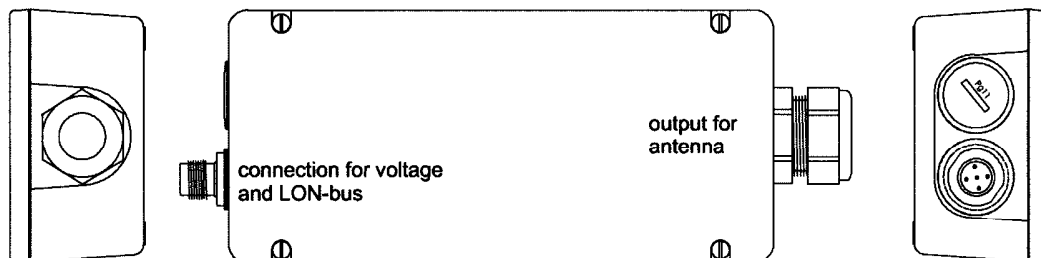
Dimensions and design:



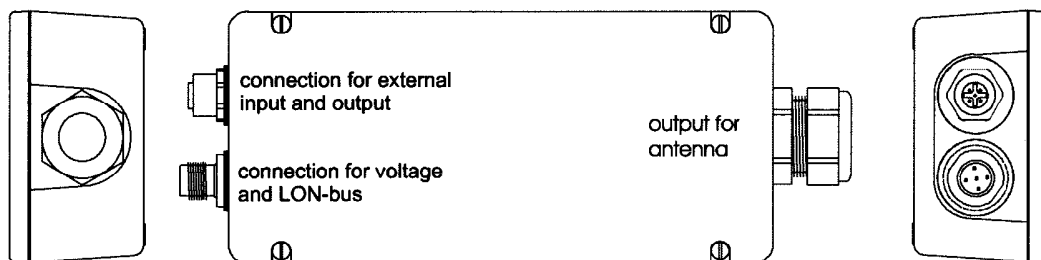
Dimensions in mm:

Housing material	ABS	PP
A	172	170
A1	152	150
B	80	79
B1	62	61
C	43	42,5

Standard version with connection for voltage and LON-bus and output for antenna



Extended version as above with additional external connection for input and output



2.2 Terminal connection

built-in male plug, plastic (supply and LON)

PIN	signal
1	+24V
2	GND
3	LON
4	LON
5	NC

Option: bushing for external sensor/actor

PIN	signal
1	+24V
2	GND
3	IN npn
4	+5V
5	OUT LED

For the **sensor** a **potential free contact** (PIN 2 and 3) or a **24V-sensor** (3 wire version with npn-output connection to PIN 1 to 3) is required.

For the **actor** signal a **LED** without a shunt (PIN 4 and 5) is required.



2.3 Technical data

parameter	value
operation temperature	0 to +50°C
transmitter frequency	134,2 kHz
max. transmitting output level in distance of 3 m	104 dB μ V/m
typ. period of read impulse	50ms
max. repeat of reading	4/s
max. repeat of program	1/s
weight (with rod antenna and presence sensor)	approx. 440g

2.4 Voltage and current

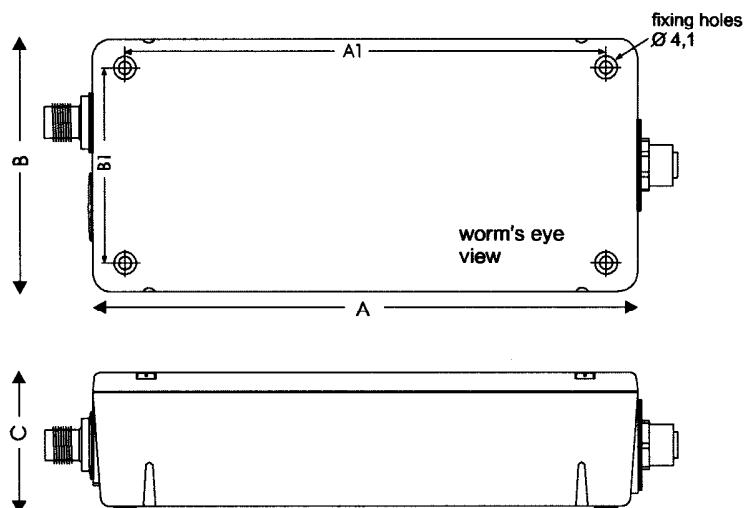
description	min.	typ.	max.	eng. units
voltage without/with optical sensor	18	24	36/30	V
current without/with optical sensor		30 / 55		mA
reading/writing impulse				
- rod antenna without/with presence sensor		160 / 185		mA
- micro antenna without/with presence sensor		140 / 165		mA



3. Gateway

3.1 Standard housing

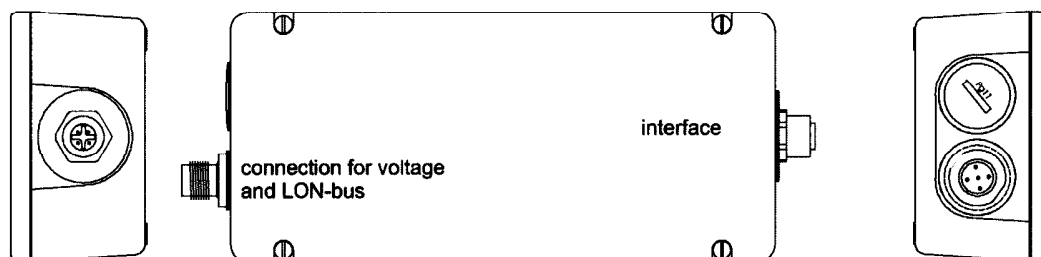
Dimensions and design:



Dimensions in mm:

Housing material	ABS	PP
A	172	170
A1	152	150
B	80	79
B1	62	61
C	43	42,5

Standard version with connection for voltage and LON-bus and interface



3.2 Connections

built-in male plug, plastic (supply and LON)

PIN	signal
1	+24V
2	GND
3	LON
4	LON
5	shield

Pin 5 (shield) has to be connected with earth!

built-in female plug, metal (RS232-interface)

PIN round connector	signal round connector	description
1		
2	GND	signal/ground
3	RxD	sending data
4	TxD	receiving data
housing	shield	earth



3.3 Technical data

parameter	value
operation temperature	0 to +50°C
weight	approx. 280g
serial interface	9600Baud 8 data bits 1 stop bit even parity

3.4 Voltage and current

description	min.	typ.	max.	eng. units
voltage without/with optical sensor	18	24	36/30	V
current		60		mA



4. LON network installation

4.1 Transmission

Every network node needs:

- power supply
- bus connection

The **power supply** of the individual nodes can be followed via different suppliers (net, battery, solar...). It is also allowed to connect it via the bus cable.

The **bus cable** will be realized through a twisted pair, shielded cable.

The shield has to be connected on both sides.

Fibre optic cable, wireless (by radio), infrared is also possible.



4.2 Network topology

There are two different types of network topology:

- free topology
- bus connection

The **free topology** allows a constellation in line-, star, ring- or tree-structure.

So it is able to correspond to the geometrical demands. A mixed architecture is also possible.

Only one connector is required.

On account of the mode of transmission it cannot be connected the wrong way round.

For transceiver FTT-10 following data are applied:

cable type	max. length node to node
Belden 85102	500m
Belden 8471	400m
Level IV, 22AWG	400m
JY (St) Y 2x2x0,8	320m

The **bus topology** consists of a main cable on which the individual nodes will be connected with short stub lines.

For transceiver FTT-10 following lengths of the bus are applied:

cable type	max. length of main cable
Belden 85102	2700m
Belden 8471	2700m
Level IV, 22AWG	1400m
JY (St) Y 2x2x0,8	900m

The maximal length of stub line is 3 m.



5. Accessories

5.1 Cables supply and LON

- female plug straight : KBV-GK
- female plug angled : KBV-WK
- bus cable with two female plugs (0.5m, 1m, 2m, 4m, 6m, 8m, 10m) :
BZK05, BZK10, BZK20, BZK40, BZK60, BZK80, BZK100
- Y-cable, two male plugs : YKB2KS

5.2 Connection of the external sensor/actor

- male plug straight: KSS-GM
- male plug angled : KSS-WM
- external optical coupler for top-hat rail installation (to be connected directly to the LED, output data: 48V DC 100mA) : LDOP

5.3 Cables of the RS232-interface

- male plug straight, shielded (metal) : KSRS-GM
- male plug angled, shielded (metal) : KSRS-WM
- RS232-cable, shielded male plug with SUB-D 9 contacts (0.5m, 1m, 2m, 4m, 6m) :
RSK9-05, RSK9-10, RSK9-20, RSK9-40, RSK9-60
- RS232-cable, shielded male plug with SUB-D 24 contacts (0.5m, 1m, 2m, 4m, 6m) :
RSK24-05, RSK24-10, RSK24-20, RSK24-40, RSK24-60

