



## LON Transponder Reader

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Technical Reports

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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 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 are transmitted to equipment, terminalserver or host systems by the LON-network.

**2 Important Notes:**

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.

**CAUTION:**

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

**NOTE:**

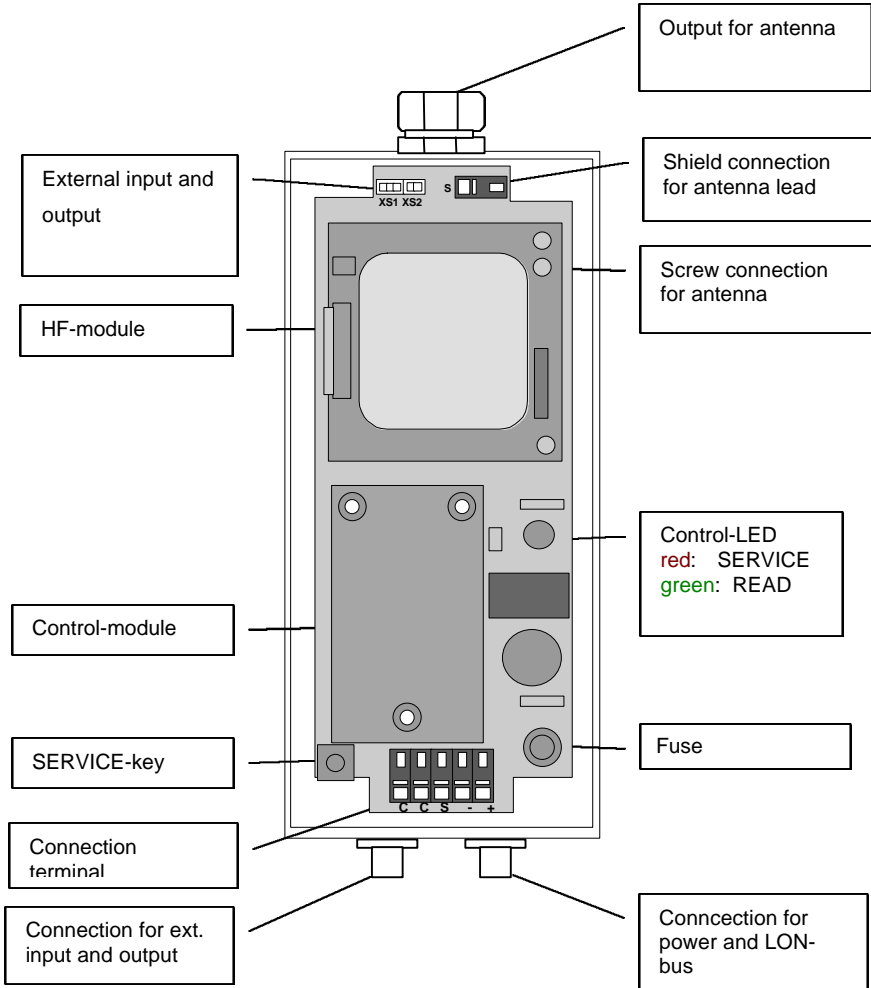
This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

### 3 Hardware

#### 3.1 Construction



**Attention:**

ALL ANTENNA RESONANT CIRCUIT COMPONENTS CAN CARRY HIGH VOLTAGE!

**Control-LED**

The two-coloured control-LED (red/green) shows the actual operation status of the device.

**Red:** The control-LED glows shortly red, if the SERVICE-button had been pushed.

If the LED blinks red or glows red continuously, the device is unconfigured or applicationless. In this case, please contact the manufacturer.

**Green:** The control-LED glows shortly green, if the device tries to read or write.

**SERVICE-button**

The SERVICE-button can be used to install the reader into the network.

**Terminal screw for antenna shielding**

The shield of the antenna has to be stucked on the terminal screw.

**Control-module**

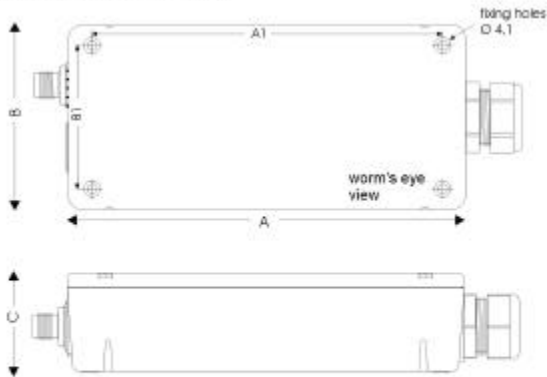
The control-module is the control unit of the device. On the module, there is the controller (Neuron-chip), a plug-in program memory (FlashEEPROM) and the FTT10-A transceiver for the communication on the LON-bus.

**HF-module**

The HF-module is the analog part of the device. It triggers the antenna and transmits the received data to the control-module.

### 3.2 Standard Housing

Dimensions and design:



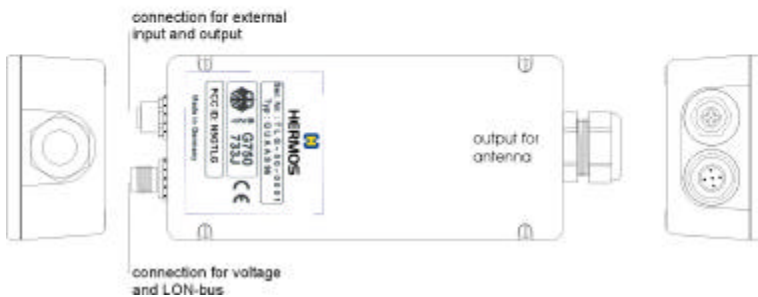
Dimensions in mm

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

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



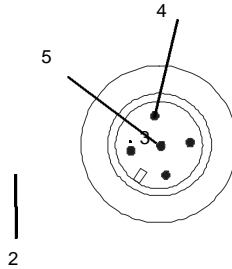
Extended version as above with additional external connection for input and output



### 3.3 Terminal Connection

#### Built-in male plug, plastic (supply and LON)

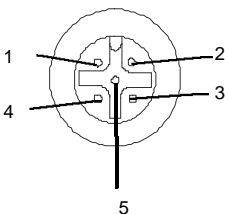
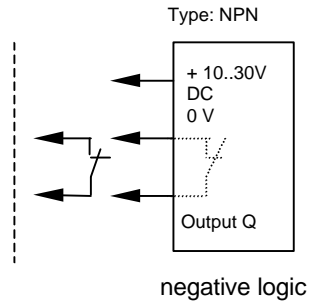
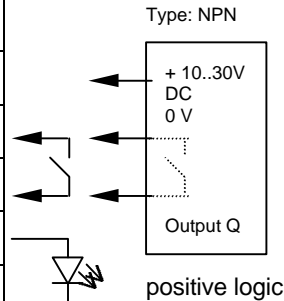
PIN	signal
1	+24V
2	0V <sub>1</sub>
3	LON
4	LON
5	shield



Up to serial-no. TLG-00-1999: Pin 5 (shield) has to be connected!

#### Option: built-in female plug, metal (external sensor/actor)

PIN	signal
1	+24V Output
2	0V
3	IN NPN
4	+5V
5	OUT LED



Sensor is not connected.

Please advise in your order which sensor logic will be used!



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

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

**Important:**

**Up to serial-no: TLG-00-1999**

**For devices which have been delivered before the end of November 1998, please pay attention to the following when selecting the 24V-sensor:**

**In open wiring condition, maximally +5V may be applied to the npn-output!**

**4 Technical Data**

<b>Parameter</b>	<b>Value</b>
Operation temperature	0 to +50°C
Stock temperature	-25 to +70 °C
Permissible humidity @ 50C°	25 - 80 %
Transmitter frequency	134.2 kHz
Max. transmitting level in 3m distance	104 dB $\mu$ V/m
Typ. period of charging impulse	50ms
Max. repeat of reading	4/s
Max. repeat of program	1/s
Protection mode	IP 40
Housing	ABS or PP
Weight (with rod antenna and presence sensor)	about 440g
Fuse type TR4	500mA (T)

#### 4.1 Power Supply and Current Input

Description	min	type	max	unit
Voltage (proof against connecting to the wrong terminal)	18	24	30	VDC
Current with/without presence sensor (starting process excluded)		30 / 55		mA
Reading/writing impulse rod antenna without/with presence sensor		160 / 185		mA
micro antenna without/with presence sensor		140 / 165		mA

Remark to the power supply:

During the starting process (charging of the capacitor in the input filter of the device), you have to ensure that the power supply does not cut off the output current. We recommend to use a power supply with stable current characteristic up to 0V output voltage (for example our part-no. SVG2,5).

#### 4.2 Additional Instruction for Use

Never expose the device to a intense change in temperature. Otherwise, water of condensation can develop inside the device what can lead to damages.

Never bend or extend the antenna cable or expose it to other mechanical loads.

## 5 Installation Description of the LON-Network

The installation can be carried out with the cables and distributors pre-manufactured by HERMOS (see 6. Accessories). Your own cabling is also possible when the following points are noticed.

### 5.1 Transmission Medium

The **bus cable** is realized through an economy-priced twisted pair cable. With carried along operation voltage with 4 cores.  
For shielded cables, the shield has to be connected on both sides.  
Realization with optical fibre, radio and infrared is also possible.

### 5.2 Network Topology

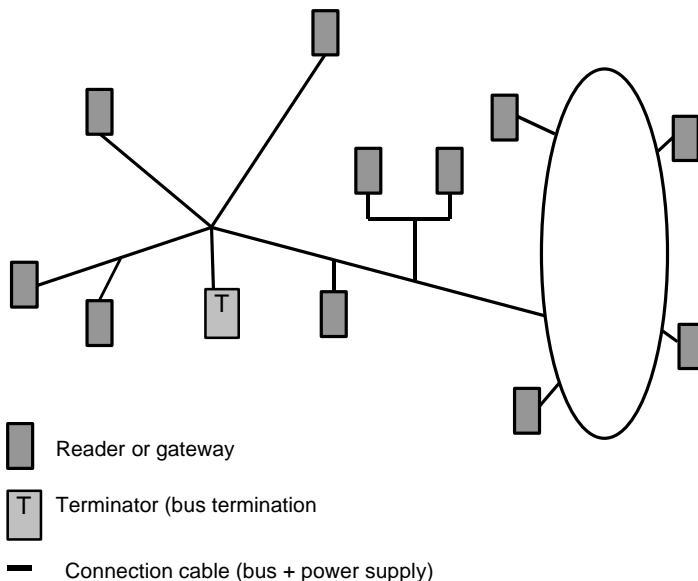
There are two possibilities of network topology:

- Free topology
- Bus-topology

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.



In the standard version, the devices are equipped with a FFT-10A transceiver.

For the transceiver FTT-10 following data are applied:

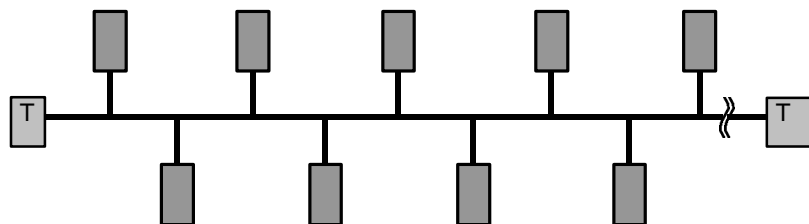
Cable type	Max. length of node to node
Belden 85102	500m
Belden 8471	400m
Level IV, 22AWG	400m
JY (St) Y 2x2x0,8	320m


The **bus-topology** consists of a main cable on which the individual nodes will be connected with short stub lines. Terminators have to be connected on both ends of the cable.


For the transceivers FTT-10 following bus lengths 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 a stub line is 3m.



 Reader or gateway

 Terminator (bus termination)

 Connection cable (bus + power supply)

## **6 Licenses and Certificates**

- BZT Number: G750733J
- EC-Type Certification Registration Number: B132424J
- FCC ID: N5GTLG

## **7      Warranty and Liability**

The warranty period is 6 months and starts with the moment of the delivery of the device which has to be proved by invoice or other documents.

The warranty includes the repair of all damages of the device, occurring within the warranty period, which are evidently caused by faults of the material or productional defects.

Not included into the warranty are damages caused by not prescribed connection, inappropriate handling and non-observance of the technical reports.

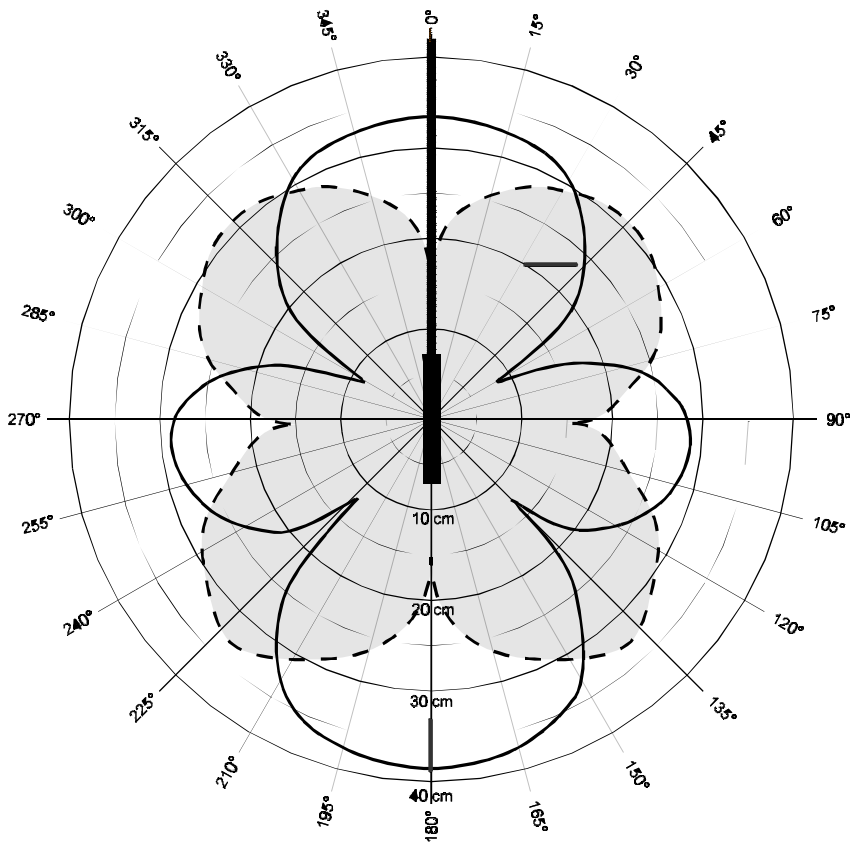
## 8 Reading and Writing Ranges

These diagrams have been taken at optimal conditions.

### 8.1 Reading Range Stick Antenna

Transponder: 32 mm multipage glass transponder

Antenna: HERMOS stick antenna

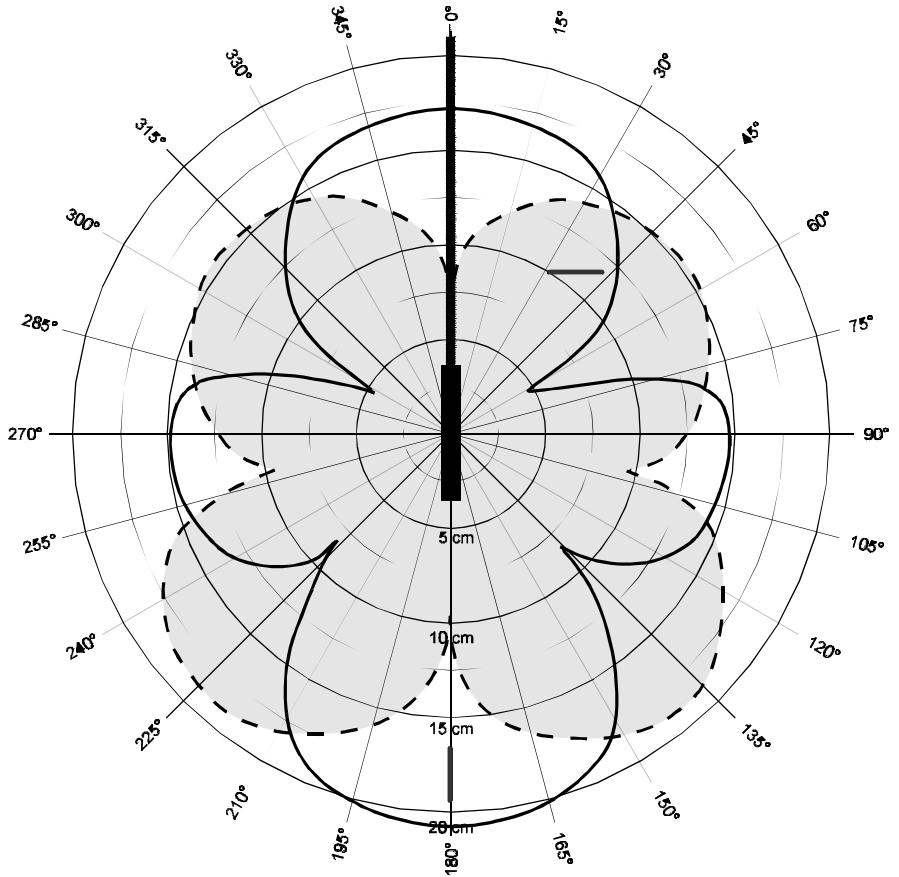


\_\_\_\_\_ Transponder parallel to antenna  
 - - - - - Transponder 90° to antenna



## 8.2 Writing Range Stick Antenna

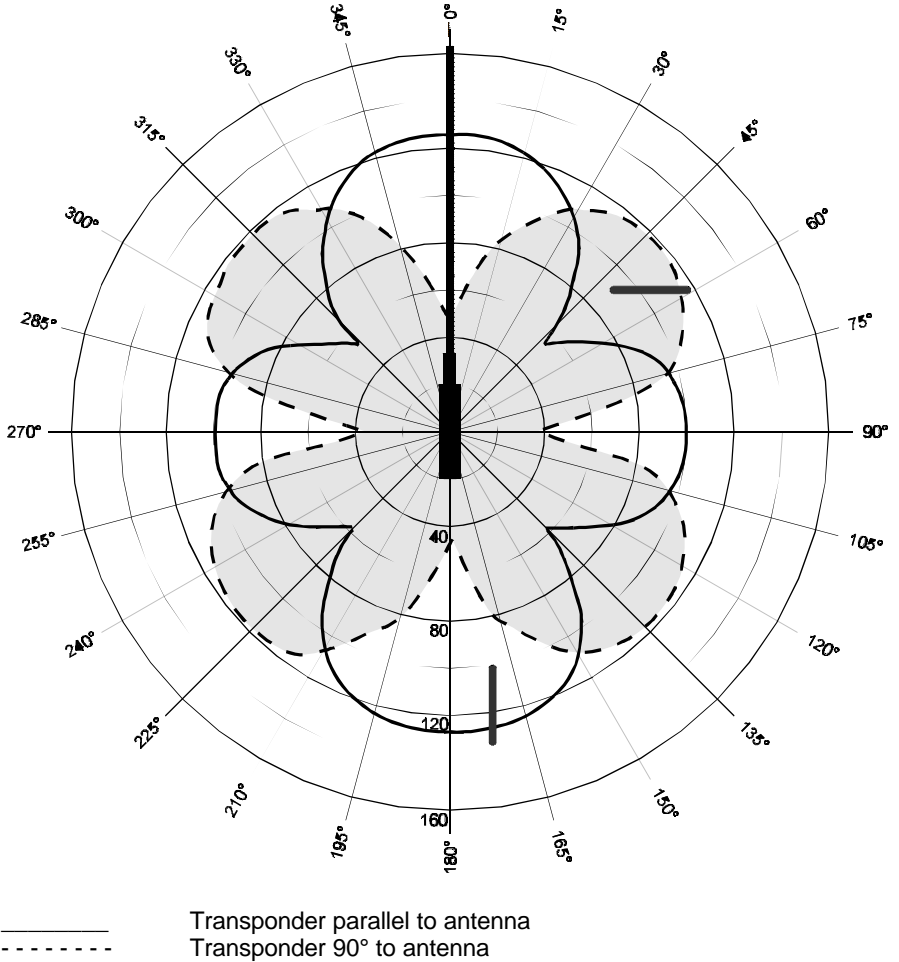
Transponder: 32 mm multipage glass transponder  
Antenna: HERMOS stick antenna



————— Transponder parallel to antenna  
- - - - - Transponder 90° to antenna

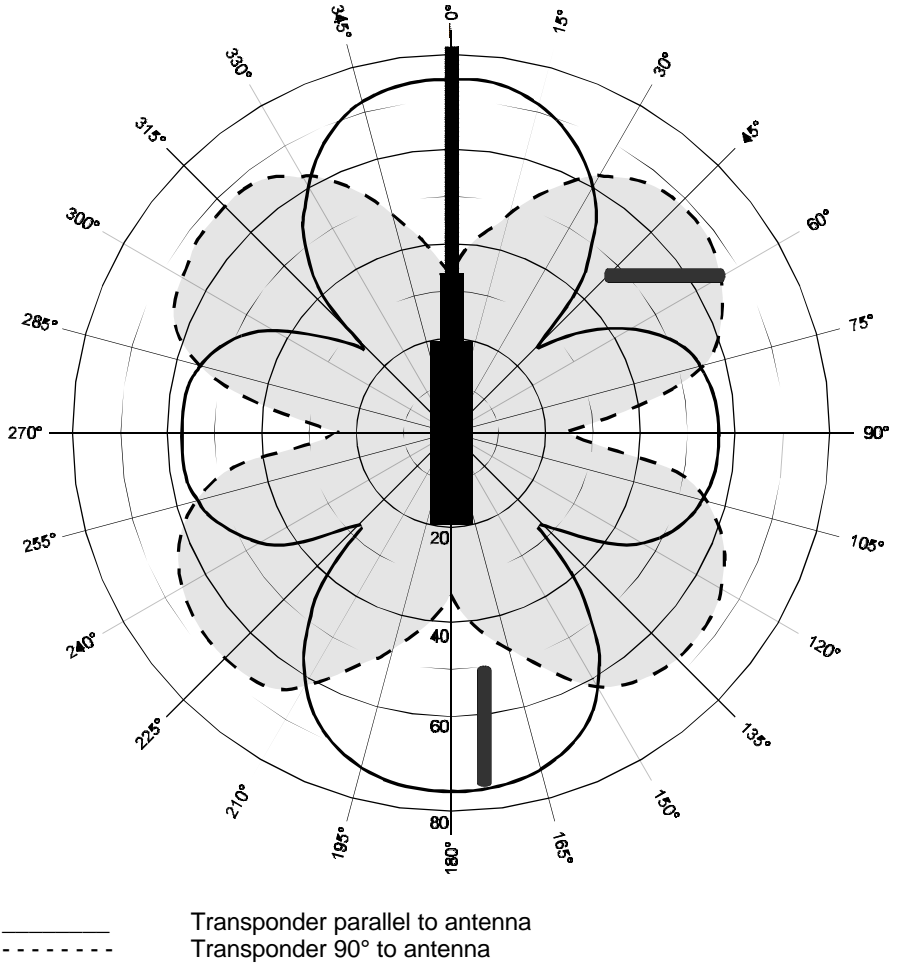
### 8.3 Reading Range Micro Antenna

Transponder: 32 mm multipage glass transponder  
Antenna: HERMOS micro antenna



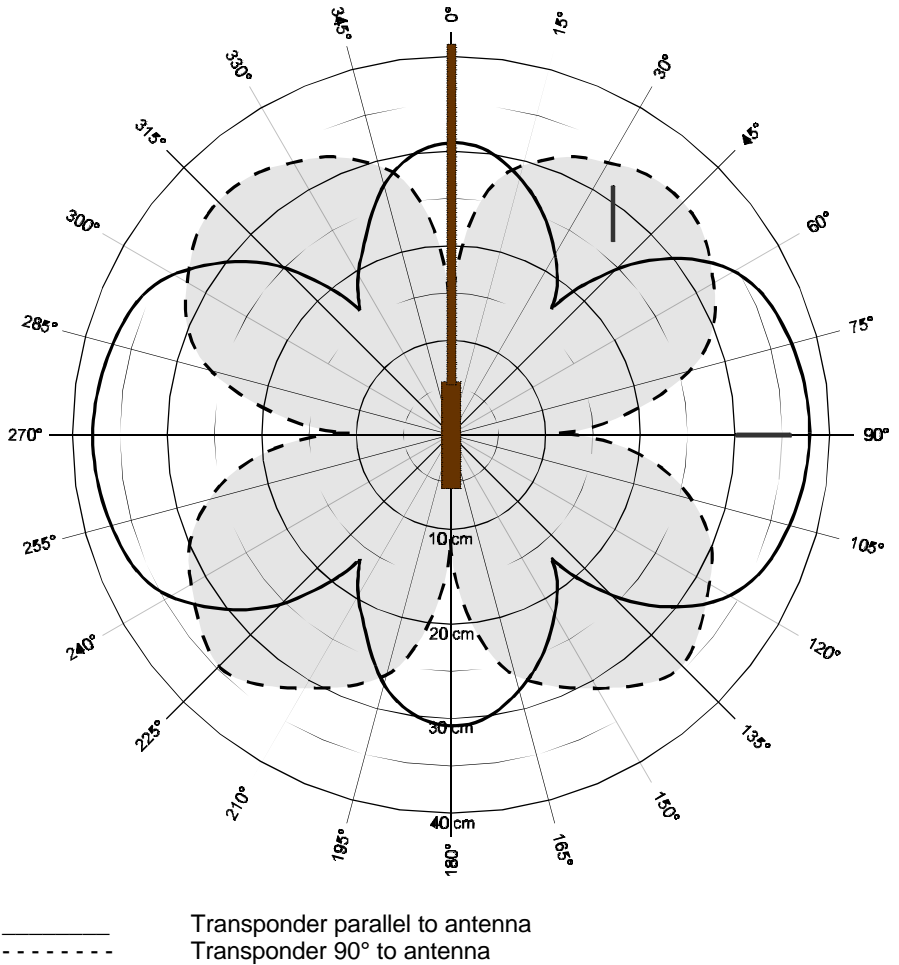
### 8.4 Writing Range Micro Antenna

Transponder: 32 mm multipage glass transponder  
Antenna: HERMOS micro antenna



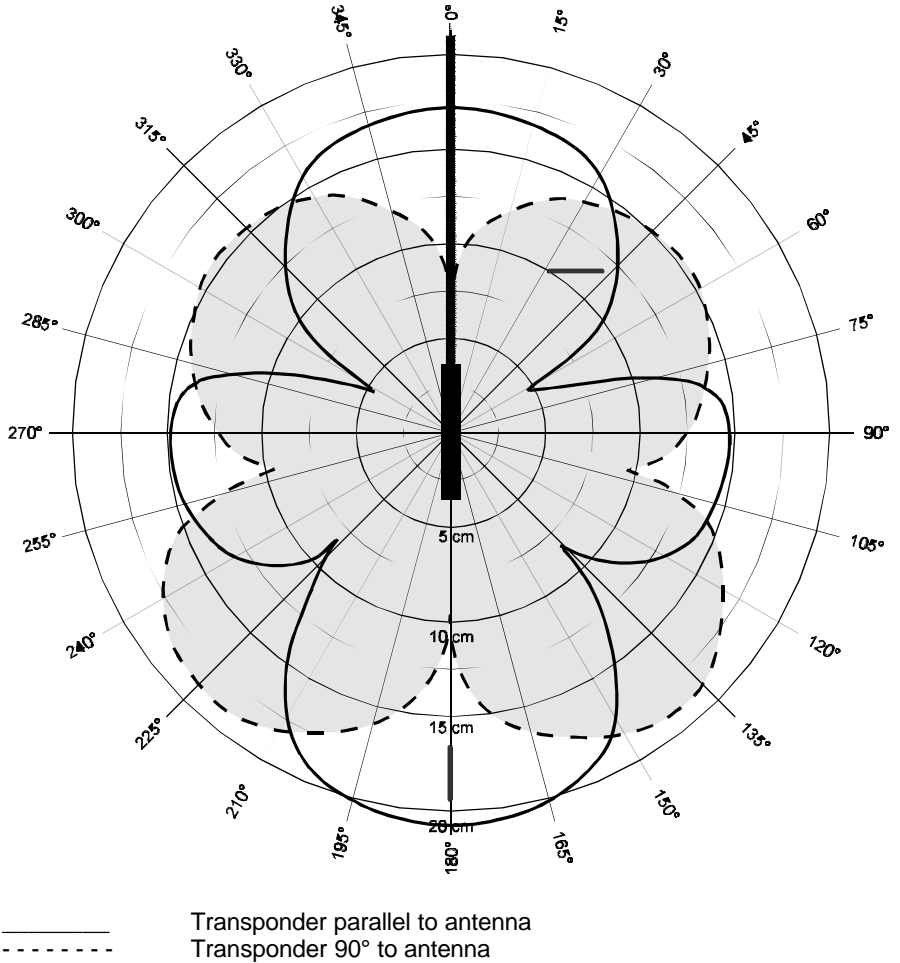
### 8.5 Reading Range Frame Antenna

Transponder: 32 mm multipage glass transponder  
Antenna: HERMOS frame antenna



### 8.6 Writing Range Frame Antenna

Transponder: 32 mm multipage glass transponder  
Antenna: HERMOS frame antenna



## **9 Accessories**

### **9.1 Cabling of Power and LON**

- Female plug, straight : KBV-GK
- Female plug, angled : KBV-WK
- Male plug, straight : KSS-GK
- Current connector with two cores: KBV24
- Bus-cable connector with two male plugs, 0.2m : KVSS02
- Bus-cable with two female plugs (0.5m, 1m, 2m, 4m, 6m, 8m, 10m) : BZK05, BZK10, BZK20, BZK40, BZK60, BZK80, BZK100
- Y-cable: one female plug, two male plugs : YKB2KS
- Bus-cable with 1 female plug (0.5m, 1m, 2m, 4m, 6m, 8m, 10m) : BEK05, BEK10, BEK20, BEK40, BEK60, BEK80, BEK100

### **9.2 Connection of the external Sensor/Actor**

- Male plug, metal : KSS-GM
- Angled male plug, metal : KSS-WM
- External optical coupler for top-hat rail installation (can be connected directly on the LED, output data: 48V DC 100mA ) : LDOP

### **9.3 Power Supply**

- Power supply, input: AC 120-230 V, output: DC 24 V / 2.5 A: SVG2,5
- Power supply, input: AC 120-230 V, output: DC 24 V / 4 A: SVG4