

2002-09-04  
Release: 1.0  
ID: ID020064



## **PC-Card Transponder Reader**

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**Technical Report**



**HERMOS**

**PC-Card Transponder Reader – Release 1.0**  
HERMOS Informatik GmbH, 95490 Mistelgau, Germany

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## 1 System Description

The HERMOS PC-Card Transponder Reader 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 reading unit 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.

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

The HERMOS PC-Card Transponder Reader is a device to read and write to TIRIS transponder. The card can be used in connection with a notebook or a PDA.



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**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:

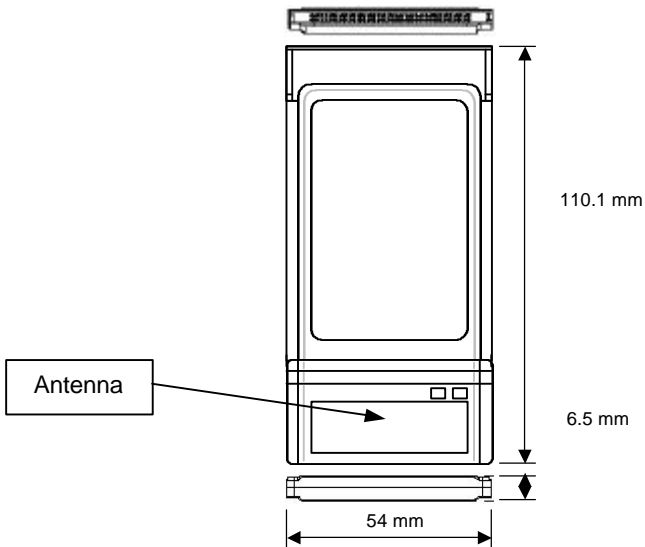
- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.



## 3 Hardware



### 3.1 Dimensions



### 3.2 Technical Data

Parameter	Value
Operation temperature	0°C to +50°C
Stock temperature	-20°C to +70°C
Permissible humidity @ 50°C	25 - 80%
Transmitter frequency	134.2 kHz

#### System Requirements:

Slot Type: PC-Card Type II  
Operating System: Win9x/2000/NT/XP/CE

#### Reading and Writing Range (32mm glass transponder):

Reading range: ~ 60 mm  
Writing range: ~ 35 mm

### 3.3 Power Supply and Current Input

Description	Value
Voltage	5 V DC (+/- 5%)
Current (reading and writing)	100 mA
Current (passive)	50 mA

### 3.4 Additional Instruction for Use

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

Never bend the device or expose it to other mechanical loads.

## **4 Installation to a Notebook or PDA**

The PC-Card Transponder Reader is suitable for all Windows operating systems. The interface of the reader is comparable with the interface of a serial interface PC-card.

### **4.1 Notebook or Desktop PC**

On operating systems which support plug & play, the card will be detected automatically. Then only the delivered \*.inf file must be installed. If the card was installed successfully a new entry "com x" appears in the device manager (for example "com 3").

On operating systems which don't support plug & play, the card must be installed manually. After plug in the card and starting the system, the serial interface must be configured manually. For more information see the Windows help of the device manager.



## 4.2 PDA

On a PDA there is no installation of the PC-Card Reader necessary. The card supports plug & play for an easy use.

To test the card, the HERMOS test tool must be installed on the PDA. To install the test tool, start the setup.exe on the delivered CD-ROM and follow the instructions on the screen.

System requirements for the installation of the test tool:

- ARM processor
- Operating system: PocketPC 2002
- A version of Microsoft ActiveSync must be installed on the host.
- The PDA must be connect to the host and a connection must be established.

### 4.2.1 HERMOS PC-Card Reader Test Software for PDA

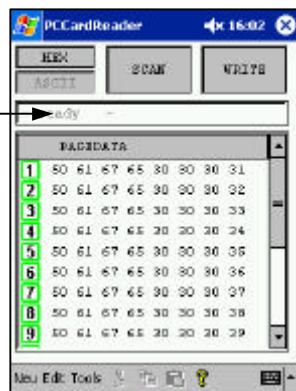
The test software can be used to read and write to a TIRIS transponder.

After starting the software, the tool is searching for the HERMOS PC-Card Reader. Was the PC-Card Reader detected successfully, the message “- PCCard found -” appears in the status line.

Pushing the button ‘SCAN’, starts the reading of the transponder. The transponder data can be displayed in ASCII mode or in HEX mode. (see picture 4.1 and 4.2)



picture 4.1: Scan – ASCII mode



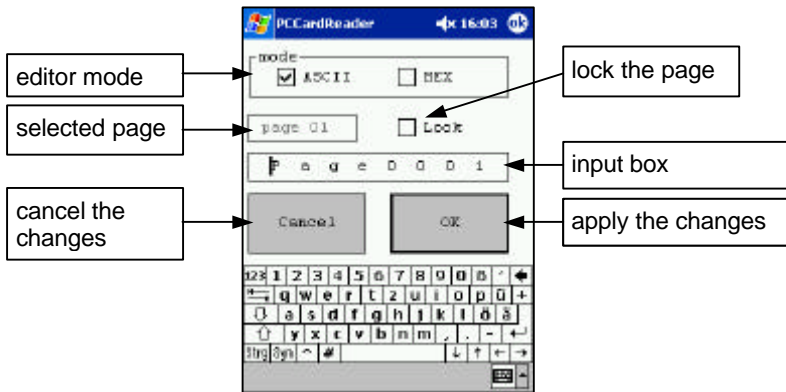
picture 4.2: Scan – HEX mode

status line





A click on a certain page opens the dialog to change the content of the page.  
The content of the selected page can be changed in ASCII mode or in HEX mode.  
(see picture 4.3 and 4.4)






picture 4.3: Write – ASCII mode



picture 4.2: Write – HEX mode

## 5 Licenses and Certificates / Declaration of Conformity

-   
  
- **FCC ID: N5GPCC**  
Compliance with:  
FCC Code of Federal Regulations, Part 15 Subpart C, Section §15.205  
FCC Code of Federal Regulations, Part 15 Subpart C, Section §15.209



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**Konformitätserklärung gemäß dem Gesetz über Funkanlagen und  
Telekommunikationsendeinrichtungen (FTEG) und der Richtlinie  
1999/5/EG (R&TTE)**

*Declaration of Conformity in accordance with the Radio and Telecommunications Terminal  
Equipment Act (FTEG) and Directive 1999/5/EC (R&TTE Directive)*

Hersteller / Verantwortliche Person  
*Manufacturer / responsible person*

**Hermos Informatik GmbH /  
Herr Dittrich**

erklärt, dass das Produkt  
*declares that the product*

**PCC-Reader**

Type (ggf. Anlagenkonfiguration mit Angabe der Module)  
*Type (if applicable, configuration including the modules)*

Telekommunikations(Tk-)endeinrichtung  
*Telecommunications terminal equipment*

Funkanlage  
*Radio equipment*

Verwendungszweck / *Intended purpose*

**Identification system**

Geräteklasse / *Equipment class*

**2**

bei bestimmungsgemäßer Verwendung den grundlegenden Anforderungen des § 3 und den übrigen einschlägigen Bestimmungen des FTEG (Artikel 3 der R&TTE) entspricht.  
*complies with the essential requirements of §3 and the other relevant provisions of the FTEG (Article 3 of the R&TTE Directive), when used for its intended purpose.*

**Gesundheit und Sicherheit gemäß § 3 (1) 1. (Artikel 3 (1) a))**

*Health and safety requirements pursuant to § 3 (1) 1. (Article 3(1) a))*

angewendete harmonisierte Normen  
*Harmonised standards applied*

**EN 60950**

Einhaltung der grundlegenden Anforderungen auf andere Art und Weise (hierzu verwendete Standards / Spezifikationen)  
*Other means of proving conformity with the essential requirements (standards / specifications used)*

**BMPT Decree No. 306/97**



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**Schutzanforderungen in Bezug auf die elektromagnetische  
Verträglichkeit (§ 3 (1) 2, Artikel 3 (1) b)**

*Protection requirements concerning electromagnetic compatibility § 3(1)(2),  
(Article 3(1)(b))*

Angewendete harmonisierte Normen  
*Harmonised standards applied*

**EN 301 489-3 (07/2000)**

Einhaltung der grundlegenden Anforderungen auf andere Art  
und Weise(hierzu verwendete Standards / Spezifikationen)  
*Other means of proving conformity with the essential  
requirements (standards / specifications used)*

**Maßnahmen zur effizienten Nutzung des Funkfrequenzspektrums**

*Measures for the efficient use of the radio frequency spectrum*

- Luftschnittstelle bei Funkanlagen gemäß § 3(2) (Artikel 3(2))  
*Air interface of the radio systems pursuant to § 3(2) (Article 3(2))*

Angewendete harmonisierte Normen  
*Harmonised standards applied*

**EN 300 330-1 (06/2001)**

Einhaltung der grundlegenden Anforderungen auf andere Art  
und Weise (hierzu verwendete Standards  
/Schnittstellenbeschreibungen)  
*Other means of proving conformity with the essential  
requirements (standards/interface specifications used)*

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Mistelgau, 08.08.2002

Gerald Dittrich

## **6 Warranty and Liability**

The warranty period is 24 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 manufacture defects.

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

## 7 Protocol

### 7.1 Message Structure

All messages have the following structure:

Length	Header	Data	Checksum
1 byte	2 bytes	1 or more bytes	2 bytes

Header	
Command	Action #

- Length:** Number of bytes of Header and Data (without Length and Chksum).
- Header:** Consists of Command and Action #
- Command:** Defines the function of the message.
- Action #:** To distinguish the single messages the Action # will be increased for each new message.
- Data:** The content depends of the message type.
- ChkSum:** 2 bytes checksum over Length, Header and Data (sum of byte values).



## 7.2 Commands

### Reading of 'Read Only' or 'Read/Write' transponder

Command: 01H

Message:

Length	Header	Chksum
--------	--------	--------

Response:

Length	Header	Type of Transponder	Page Number (RO,RW → 0)	Transponder Data (8 bytes)	Chksum
--------	--------	---------------------	-------------------------	----------------------------	--------

### Reading of Multipage Transponder

The first data byte contains the page of the multipage transponder which shall be read.

Command: 02H

Message:

Length	Header	Page Number (01-11 Hex)	Chksum
--------	--------	-------------------------	--------

Response:

Length	Header	Type of Transponder	Page Number (01-11 Hex)	Transponder Data (8 bytes)	Chksum
--------	--------	---------------------	-------------------------	----------------------------	--------

### Locking a Page

The first data byte contains the page of the multipage transponder which shall be locked.

Command: 05H

Message:

Length	Header	Page Number (01-11 Hex)	Chksum
--------	--------	-------------------------	--------

Response:

Length	Header	Acknowledge Code	Chksum
--------	--------	------------------	--------



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### Writing to a 'Read/Write' Transponder

The data bytes 1-8 contain the transponder data for writing.

Command: 08H

Message:

Length	Header	Transponder Data (8 bytes)	Chksum
--------	--------	----------------------------	--------

Response:

Length	Header	Acknowledge Code	Chksum
--------	--------	------------------	--------

### Writing to a Multipage Transponder

The first data byte contains the page of the multipage transponder to which shall be written. Byte 2 up to byte 9 contain the page data of the page specified in byte 1.

Command: 09H

Message:

Length	Header	Page Number (01-11 Hex)	Page Data (8 bytes)	Chksum
--------	--------	-------------------------	---------------------	--------

Response:

Length	Header	Acknowledge Code	Chksum
--------	--------	------------------	--------

### Types of Transponder

This item is used in command '01H' and '02H'.

0x00	NONE
0x01	READ_ONLY
0x02	READ_WRITE
0x03	MULTI_PAGE_Read_unlocked
0x04	MULTI_PAGE_Programming
0x05	MULTI_PAGE_Read_locked
0x06	READ_WRITE_Programming
0x07	RW_FAIL





### 7.3 Error Messages

On any error the PC-Card Reader responses an error message.  
The header of the error message is the same like the header of the message which caused the error.

Message:

Length	Header	Error Code (1 byte)	Chksum
--------	--------	---------------------	--------

Error Codes:

0x01	read failed
0x02	write failed
0x03	lock failed
0x04	wrong chksum
0x05	wrong command
0x06	wrong page on read MP

