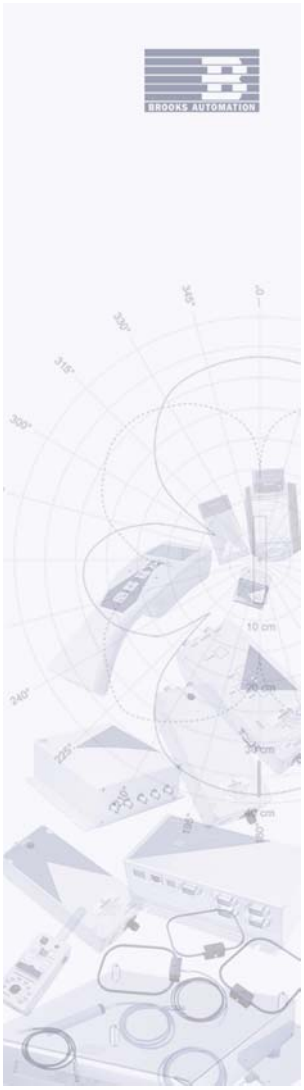

User Manual
Transponder Reader

Compact Flash-Card

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TABLE OF CONTENTS

1 INTRODUCTION

1.1 About this Device

The BROOKS Transponder Reader System is a high-frequency identification system that uses FM transmission.

The basic item is a transponder that works as a forgery-proof electronic identity disk.

The reading unit of the system sends an energy impulse via the antenna. The capacitor of the passive, battery-free 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 the transponder and the reader is not absolutely necessary, the transponder can also be identified through non-metallic material.

The BROOKS CF-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.

1.2 About this Manual

This manual contains information about installing, operating and error handling the BROOKS CF-Card Transponder Reader. It consists of seven chapters:

- Introduction
- Safety Instructions
- Product Description
- Installation
- Operation
- Service and Error Handling
- Transportation, Disposal and Storage

2 SAFETY INSTRUCTIONS

This product is manufactured in accordance with state of the art technology and corresponds to recognized safety regulations. Nevertheless, there are dangers associated with the use of the equipment even for its intended purpose. You should therefore read the following safety information carefully and keep it in mind.

Only install and operate this equipment if it is in perfect condition and with reference to this manual. Do not use the equipment if it is damaged.

2.1 Symbols and Types Used in this Manual

	This symbol alerts you to dangerous voltage
	This symbol alerts you to important instructions
	This symbol indicates electromagnetic radiation
	This symbol alerts you to risk of explosion
	This symbol alerts you to risk of fire
☞	This symbol indicates important additional information
	Electrostatically sensitive components
13:44:33 Incoming: ENQ (05)	This type represents transmitted data display

2.2 General Safety Instructions

1 Read and understand all safety and operating instructions before installing and operating the device.

2 Keep these instructions. Store this manual in a place that can be accessed at any time by all persons involved in installing, operating and error handling the device.

3 Heed all warnings. Follow all warnings on the device and in the operating instructions.

4 Install in accordance with the manufacturer's instructions only.

5 Only use attachments, accessories and connecting cables supplied by the manufacturer.

6 People with hearing aids should remember that radio signals transmitted by the device might cause a very unpleasant buzzing noise in their hearing aids.

7 When you disconnect a cable, pull on its conductor and not on the cable itself. Keep the connector evenly aligned to avoid bending any connector pins. When you connect a cable, ensure that the connector pins are positioned correctly.

8 Never over bend the antenna cable or expose it to mechanical loads.

9 When replacement parts are required, use the replacement parts specified by the manufacturer only. Unauthorized substitutions may result in fire, electric shock, or other hazards.

2.3 Proper Use

This product was developed for reading and writing the TIRIS® transponder only. Any other use of this device would constitute abuse and would render the user’s authority to install and operate the device invalid.

2.4 Declaration of Conformity

2.4.1 USA – Federal Communications Commission (FCC)

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.

☞ **This equipment has been tested and found to comply with the limits for a Class B digital device, in accordance with 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 – this can be determined by turning the equipment off and on – the user is encouraged to try to correct the interference using one or more of the following measures:**

- — Reposition or relocate the receiving antenna.
- — Increase the distance between the equipment and the receiver.
- — Connect the equipment to an outlet to a circuit other than the one to which the receiver is connected.
- — Consult the dealer or an experienced radio/TV technician for assistance.

FCC ID: N5GCFC

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

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

2.4.2 Europe – CE Conformity

CE 0682 ⓘ

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/FC (R&TTE Directive)

Hersteller / Verantwortliche Person *Manufacturer / responsible person*	**BROOKS Automation (Germany) GmbH / Herr Dittrich**
erklärt, dass das Produkt *declares that the product*	**CFC-Reader**
Type (ggf. Anlagenkonfiguration mit Angabe der Module): *Type (if applicable, configuration including the modules)*	
☑ Telekommunikations(Tk-)end-einrichtung *Telecommunications terminal equipment*	Funkanlage *Radio equipment*
Verwendungszweck *lntended 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 *Harmonized 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**

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 *Harmonized 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 *Harmonized standards applied*	

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

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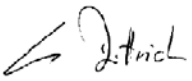


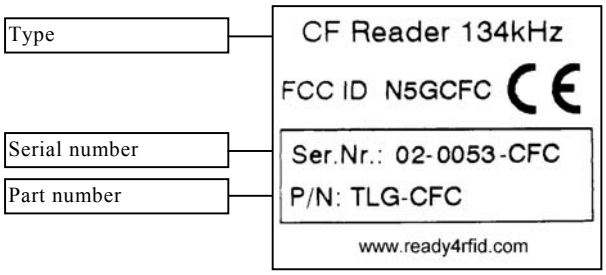
Mistelgau, 20.09.2004	Gerald Dittrich
(Place and date of issue)	(Name and signature)

3 PRODUCT DESCRIPTION

3.1 Hardware

Standard device: TLG-CFC-S-R

3.2 Labeling Information



3.3 Technical Data

3.3.1 Transponder Reader

Parameter	Value
Operation temperature	0°C to +50°C 32°F to 122°F
Stock temperature	-25°C to +70°C -13°F to +158°F
Permissible humidity @ 50C°	25 - 80 %
Transmitter frequency	134.2 kHz

3.3.2 Power Supply and Current Input

Description	Value
Voltage	3,5/5 VDC(+/- 5%)
Current (reading and writing)	100 mA
Current (passive)	50 mA

3.3.3 System Requirements

Slot Type: CF-Card Type I

Operating System: Win9x/2000/NT/XP/CE

3.3.4 Serial Interface

Description	Value
Baud rate	19200
parity	none

3.4 Contents of Delivery

Number	Description
1	Transponder Reader CFC-Card
1	Device driver, test software (CD-ROM)
1	Instruction manual

3.5 Warranty and Liability

The warranty period is 24 months and begins with the moment of delivery of the device as proved by an invoice or other documents.

The warranty includes the repair of all damages to the device that occur within the warranty period, and which are evidently caused by faults of the material or production defects.

The warranty does not include damages caused by incorrect connection, inappropriate handling and non-observance of the technical reports.

4 INSTALLATION

4.1 Installation Environment

This device is designed for use in an indoor environment only. Installation is only permitted in an environmental indoor climate with a constant temperature of between 0°C and +50°C / 32°F and 122°F, humidity between 25% and 80%, and a maximum temperature of +50°C / 122°F.

Do not install or use this device in or near water. Never spill liquids of any kind onto the device. Should spillage occur, unplug the device and have it checked by a technician.

Do not install near heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat. Do not install the device in a flammable environment.

Never expose the device to intense changes in temperature, otherwise condensation can develop inside the device and cause damages.

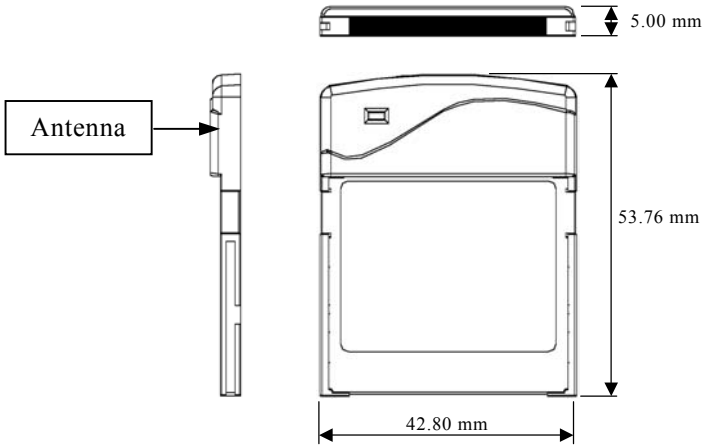
The device should not be used in the immediate vicinity of electrical units (such as medical units, monitors, telephones, televisions and energy-saver lamps), magnetic data carriers, or metallic objects. This could result in reduced reading/writing ranges.

Never use the device in potentially explosive areas (such as paint shops).

Do not position the device in a location where it can suffer from vibration or shock.

4.2 Dimensions

Standard device TLG-CFC-S-R:



4.3 Installation to a Notebook or PDA

The CF-Card Transponder Reader is suitable for all Windows operating systems.

The interface of the reader is comparable with the interface of a serial interface card.

4.3.1 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.

4.3.2 PDA

On a PDA there is no installation of the CF-Card Reader necessary. The card supports plug & play for an easy use. If the card was plugged into the PDA a new COM port will be established automatically (for example “com 3”). Via this COM port, the system can communicate to the card via the serial protocol of the card.

To test the card, the BROOKS 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 connected to the host and a connection must be established.

☞ **The test tool is also available on request for other processor types and OS systems.**

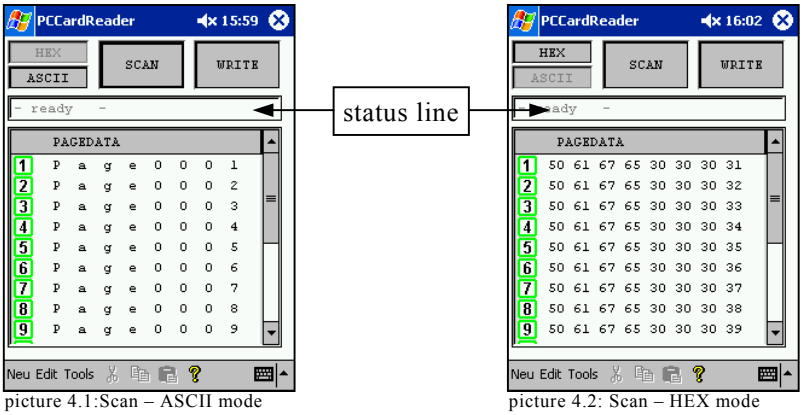
4.3.2.1 BROOKS CF-Card Reader Test Software for PDA

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

After starting the software, the tool is searching for the BROOKS CF-Card Reader.

Was the CF-Card Reader detected successfully, the message "- PCCard found –" appears in the status line.

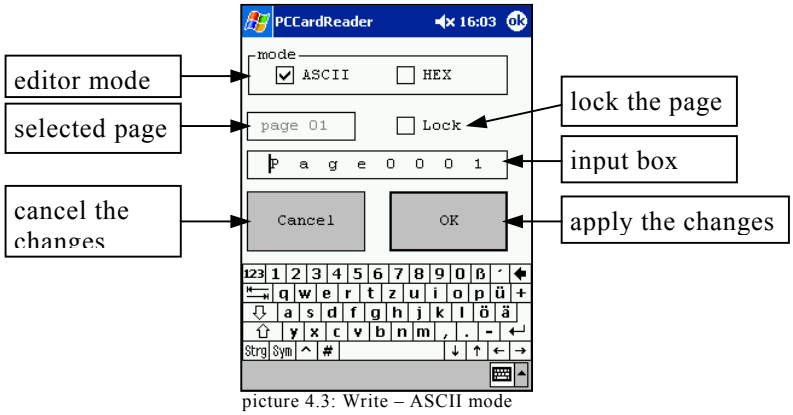
Pushing the button 'SCAN', starts the reading of the transponder. The transponder data can be displayed in ASCII mode or in HEX mode. (see picture 4.1 and picture 4.2)



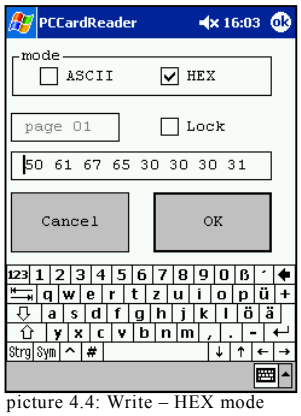
picture 4.1:Scan – ASCII mode

picture 4.2: Scan – HEX mode

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 picture 4.4)



picture 4.3: Write – ASCII mode



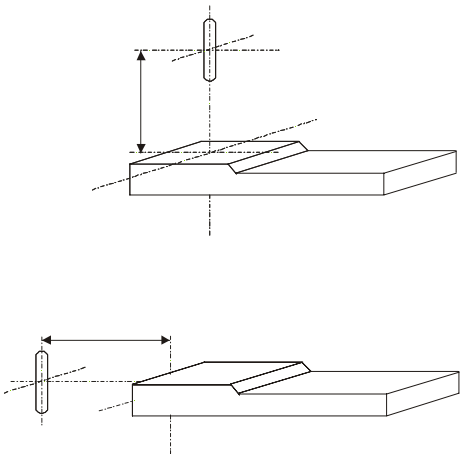
picture 4.4: Write – HEX mode

4.4 Reading and Writing Ranges

Type	Reading range [mm]	Writing range [mm]
TLG-CFC-S-R	55	35

Optimal reading and writing positions:

TLG-CFC-S-R



☞ **The real reading and writing range depends on the type of PDA.**

5 OPERATION

5.1 Protocol

5.1.1 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 Checksum).

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.

Checksum: 2 bytes checksum over Length, Header and Data (sum of byte values).

5.1.2 Commands

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

Command: 01H

Message:

Length	Header	Checksum

Response:

Length	Header	Type of Transponder	Page #	Data (8 bytes)	Checksum

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 #	Checksum

Response:

Length	Header	Type of Transponder	Page #	Data (8 bytes)	Checksum

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

Locking a Page

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

Command: 05H

Message:

Length	Header	Page #	Checksum

Response:

Length	Header	Acknowledge Code	Checksum

Writing to a 'Read/Write' Transponder

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

Command: 08H

Message:

Length	Header	Data (8 bytes)	Checksum

Response:

Length	Header	Acknowledge Code	Checksum

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 #	Data (8 bytes)	Checksum

Response:

Length	Header	Acknowledge Code	Checksum

5.1.3 Error Messages

On any error the CF-Card Reader responses an error message.

The header of the error message is the same like the header of the message which has caused the error.

Message:

Length	Header	Acknowledge Code	Checksum

5.1.4 Acknowledge Codes

0x00	Acknowledge OK
0x01	read failed
0x02	write failed
0x03	lock failed
0x04	wrong checksum
0x05	wrong command
0x06	wrong page on read MP

5.2 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.

6 SERVICE AND ERROR HANDLING

6.1 General

☞ **The transponder reader and its components must be serviced by the manufacturer only.**

☞ **If errors occur, follow the instructions in this section. Do not carry out any error eliminating measures other than the ones described in this section.**

☞ **If you are uncertain about errors and their handling, contact the manufacturer (see the contact information on page 28 of this manual). Have the serial number of the transponder reader ready as shown on the label (see page 14) when contacting the manufacturer.**

6.2 Reader can not be found by the PDA

1 Check the correct position of the card in the CF slot.

2 Remove the card an plug it in again.

3 Check the battery status of the expansion pack.

If these measures do not solve the problem, contact the manufacturer.

6.3 Reader can not be found by the PC/Notebook

1 Check the correct position of the card in the PCMCIA adapter.

2 Check whether the card is installed as COM port in the system settings of your PC.

3 Install the delivered *.inf file again.

If these measures do not solve the problem, contact the manufacturer.

6.4 Customer Service

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Fax: +49 9279 991 900
E-mail: rfid.support@brooks.com
24 hour technical support hotline (Brooks): +1 978 262 2900

7 TRANSPORTATION, DISPOSAL AND STORAGE

7.1 Transportation

For transportation purposes such as mailing, use a firm cardboard box. Use adequate padding material to protect the device on all sides.

7.2 Disposal

Do not throw the reader away with everyday household trash.

Dispose of the electronic components, antennas and cables as electronic trash.

7.3 Storage

Store the reader and its components in a clean and dry environment. Make sure the contacts remain clean. Observe the necessary storage conditions (for technical data, see page 14).

Version	Änderungen	Datum	Autor
1.0	Dokument aus Beschreibung für PCC-Reader erstellt	08.10.04	AM
1.1	FCC Part eingefügt (Seite 10)	16.11.04	AM