![Brooks RFID DIVISION logo]

Ready for
RFID?
Radio Frequency IDentifiation

Product Manual

RFID Reader LF40C THR

The product manual must be read prior to the initial start-up. Observe the safety instructions!
Store for future use. This documentation is not subject to revisions.

ID140040   07/2014

This product manual corresponds with "Directive 1999/5/EC of the European Parliament and the Council on radio equipment and telecommunications transmission equipment and the mutual recognition of the conformity".

CE

This product manual is addressed to the operating company who must pass it on to the personnel responsible for installation, connection, use and repairs of the machine.

The plant manager must ensure that the information contained in this product manual and in the accompanying documents has been read and understood.

The product manual must be stored in a place that is familiar and easily accessible to employees and must be consulted whenever an employee is unsure of how to proceed.

The manufacturer does not assume any responsibility for injuries to persons or animals, or damage to property or to the device arising from incorrect use or disregard or insufficient consideration of the safety criteria contained in this product manual or based on modifications of the device or the use of unsuitable spare parts.

The copyright for this product manual is held solely by

Brooks
RFID DIVISION

Brooks Automation (Germany) GmbH
RFID Division
Gartenstr. 19
95490 Mistelgau
Germany

or its legal successor.

Status: Juli 2014

Archiving

➲ Store the product manual in the vicinity of the device!

➲ Always keep the product manual handy!

Symbols and signal words

The following symbols and signal words are used in this documentation. The combination of a pictograph and a signal word classifies the respective safety information. The symbol can vary depending on the type of danger.

	Symbol	Signal word	Description
Death	⚠	**DANGER**	This signal word must be used if death or irreversible damage to health can occur if the hazard information is not followed.
Risk of injury and property damage	⚠	**WARNING**	This signal word indicates bodily injuries and property damage including injuries, accidents, and health risks.
	⚠	**CAUTION**	This signal word indicates a risk of property damage. In addition, there is a slight risk of injuries.
No damage	❗	**ATTENTION**	This signal word warns of malfunctions and may only be used if no damage to health can occur.
	❗	**IMPORTANT**	This signal word indicates cross-references and ways in which operations are facilitated. It excludes all risks of property damage and injury risks.

Target group

This product manual is addressed to personnel with the following areas of responsibility:

Area of responsibility	Competence
Installation	Specialized personnel
Commissioning, operation and decommissioning	Instructed personnel
Troubleshooting	Specialized personnel

Definition according to DIN EN 60204-1:

Instructed personnel
Persons who have been instructed and, if required, trained by a specialist as to the tasks assigned to them, the possible risks of incorrect behavior and the required safety equipment and safety measures.

Specialized personnel
Persons who can evaluate the work assigned to them and recognize possible risks based on their specialized training, knowledge, experience and familiarity with the relevant standards.

Contents

Contents

1 Identification

This chapter gives you an overview of the following topics:

- ➔ Model
- ➔ Designated use
- ➔ Incorrect use

1.1 Model

LF40C THR

Serial number   e. g. 1301MIS10017

Part number   TLH-U2K-0R30-SM-0010 (cable length of 3 m, smooth cable)
TLH-U2K-0R50-SM-0010 (cable length of 5 m, smooth cable)
TLH-U2K-0R50-SM-0020 (cable length of 5 m, coiled cable)

Manufacturer

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Website	www.brooks-rfid.com

For information on the label, see ➔ Device label.

1.2 Designated use

This product is exclusively developed for reading and writing of transponders. Any other use of this device constitutes misuse and renders the user's authority to install and operate the device invalid.

This product is designed to be mounted and operated in an industrial setting as a built-in-device only. It is not designed to be used as a stand-alone or portable device or in a non-industrial setting, such as a household, vehicle or in the open-air.

Intended use also includes the following:

- following all instructions in the product manual
- following all safety information

Before using the device, the user should ensure that the national approval requirements for use are met.

1.3   Incorrect use

Incorrect use, which can endanger the device, the user and third parties, includes:

- the use of the device, contrary to its intended use (➜ Designated use)
- modifying, extending or reconstructing the device without first consulting Brooks Automation (Germany) GmbH
- operating the device when there are obvious problems

WARNING	**Risk of injury through incorrect modifications**
⚠	There are risks from unauthorized modifications to the machine.
	Only use original spare parts from the manufacturer. Do not make any changes, attachments or modifications to the device without the approval of Brooks Automation (Germany) GmbH.

WARNING	**Risk of injury and malfunction of machine operation through incorrect use**
⚠	There are risks attached to using the device incorrectly.
	Use the device exclusively according to its intended use.

Declaration of Conformity

2 Declaration of Conformity

This chapter gives you an overview of the following topics:

- ➜ USA - Federal Communications Commission (FCC)

- ➜ Europe - CE conformity

2.1 USA - Federal Communications Commission (FCC)

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

- This device may not cause harmful interference and followed, read and understood by all persons working with the device (especially the safety information)

- 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 instruction manual, 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.

Declaration of Conformity

FCC ID N5GLF40C

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

WARNING

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

Compliance Information Statement (Declaration of Conformity)

Brooks Automation, Inc.
46702 Bayside Parkway
Fremont, CA 94538
Tel: +1 510-661-5000
Fax: +1 510-661-5166

2.2 Europe - CE conformity

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*	**LF40C THR**
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*	**1**

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 60950-1:2006 + A11:2009**
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)*	- - -

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	**EN 301 489-1 V1.8.1**
Harmonized standards applied	**EN 301 489-3 V1.4.1**

Einhaltung der grundlegenden Anforderungen auf andere Art und Weise (hierzu verwendete Standards/ Spezifikationen)
Other means of proving conformity with the essential requirements (standards / interface 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	**EN 302 330-1 V1.3.1**
Harmonized standards applied	**EN 302 330-2 V1.3.1**

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)	

Mit der CE-Kennzeichnung bestätigt Brooks Automation die Übereinstimmung mit der europäischen RoHS-Richtlinie 2011/65/EU.

With the CE marking Brooks Automation confirms compliance with the European Directive 2011/65/EU concerning RoHS.

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Mistelgau, December 03, 2012

Gerald Dittrich

(Place and date of issue)

(Name and signature)

3 General Instructions

This chapter gives you an overview of the following topics:

- ➔ Liability and warranty
- ➔ Objectives of the product manual

3.1 Liability and warranty

The "General sales and delivery conditions" of Brooks Automation (Germany) GmbH always apply.

The warranty period is 12 months beginning with the delivery of the device, which is verified by the invoice or other documents.

The warranty includes repairs of all damage to the device that occurs during the warranty period and was clearly caused by material or manufacturing defects.

Liability and warranty claims in cases of injury to persons or damage to property are excluded if they can be attributed to one or more of the following causes:

- incorrect use of the device
- disregard of the information in the product manual
- unauthorized structural modifications of the device
- insufficient maintenance and repairs
- disasters due to foreign objects or force majeure

3.2 Objectives of the product manual

This product manual serves as support and contains all the necessary safety information that must be followed for general safety, transport, installation and operation.

This product manual with all safety information (as well as all additional documents) must be:

- followed, read and understood by all persons working with the device (especially the safety information)
- easily available to all persons at all times
- immediately consulted in case of the least doubt (safety)

General Instructions

Objectives:

- avoid accidents

- increase the service life and reliability of the device

- reduce costs due to production downtimes

4 Safety Instructions

This chapter gives you an overview of the following topics:

- ➜ Area of application and symbols
- ➜ Obligations
- ➜ ESD instructions
- ➜ Residual risks
- ➜ Additional information

4.1 Area of application and symbols

DANGER

Danger to life, risk of injuries or damage to property

Risks exist when disregarding the product manual and the safety instructions therein.

Carefully read the product manual before initial commissioning. Perform the required safety measures before initial commissioning.

Follow the general safety information as well as the special safety information given in other chapters.

The device was constructed according to state-of-the-art technology and recognized safety regulations. In order to prevent any risks to life and limb of the user, third parties or damage to the device, only use the device for its intended purpose and in perfect condition with regard to safety.

Bodily injuries and/or property damage resulting from non-compliance with the instructions given in the product manual are the responsibility of the company operating the device or of the assigned personnel. Malfunctions that could compromise safety must be eliminated immediately.

Safety Instructions

4.1.1 Safety symbols – in compliance with 4844-2

WARNING	**Risk of injuries when disregarding safety symbols**
	Risks exist when disregarding warnings in the product manual.
	Please heed the warnings.

Special safety symbols in accordance with DIN 4844-2 are used in the corresponding passages in the text of this product manual and require special attention depending on the combination of signal word and symbol.

4.1.2 Warning symbols

Warning against hazardous area

Warning against hazardous electrical voltage

Warning against electromagnetic radiation

Warning against flammable materials

Warning against potentially explosive atmosphere

Warning against electrostatically sensitive components

4.1.3 Prohibition symbols

Unauthorized access is prohibited

Fire, open flame and smoking is prohibited

Switching is prohibited

Prohibition

4.1.4 Other symbols

Dispose of packing material according to regulations

Recycling

Important information

Refer to manual

Disconnect from power supply

4.2 Obligations

4.2.1 Operating company's obligations

The safe condition and use of the device is a requirement for the safe operation of the device. The company operating the device therefore has the obligation to ensure that the following points are adhered to:

- The device may only be operated by trained and authorized personnel!

- Avoid unsafe and/or dangerous work procedures! If necessary, check employees' actions!

- Only permit personnel to be trained or instructed within the scope of a general training work on the device under the supervision of an experienced person!

- Personnel must have understood the product manual. Have this confirmed by signature!

- Precisely establish responsibilities according to the various task areas (operation, installation)!

- Operating personnel must be committed to immediately reporting to their superior any identifiable safety deficiencies which occur!

4.2.2 Operating personnel's obligations

Operators are obligated to contribute to the prevention of work accidents and the consequences of them by their personal conduct.

WARNING	**Risk of injuries due to insufficient personnel qualifications**
	A risk exists for personnel and the proper operation due to insufficiently qualified personnel.
	Only trained personnel may operate the device. New operators must be instructed by the current operating personnel. The operating company must precisely regulate and monitor the personnel's areas of responsibility and competence.
	Personnel for the areas of responsibility mentioned above must have the corresponding qualification for this work (training, instructions). If necessary, this can be done by the manufacturer on behalf of the operating company.
	All warranty claims are void when disregarded.

4.3 ESD instructions

CAUTION	Static electricity can damage electronic components in the device. All persons installing or maintaining the device must be trained in ESD protection.
	ESD protective measures must be applied when opening the device.

- ⭢ Disconnect the power supply prior to removing or adding components.
- ⭢ Discharge your body and all tools used prior to contacting any components on the interior of the device!
- ⭢ Touch electronically sensitive parts carefully and at the corners!

Safety Instructions

4.4 Residual risks

Even if all precautions have been taken, there may be unapparent residual risks!

Adhering to the safety instructions, the intended use, and the product manual as a whole can reduce residual risks!

DANGER	**Risks from electric current**
	Electrical energy remains in lines, equipment and devices even when the device is switched off.
	Only allow qualified electricians to perform work on the electrical supply system.

ATTENTION	Disconnect the device from the power supply system if active parts of the device can be accessed by using tools. Access is only permitted for authorized personnel.
	Regularly check the electrical equipment of the device. Regularly check all moving cables for damage within the scope of maintenance and repairs.

DANGER	**Risk of fire and explosions**
	Fire and explosions may occur within the vicinity of the device.
	Smoking, open flames and fire are strictly prohibited in the vicinity of the device. Do not store any flammable liquids within the hazardous area. Keep a fire extinguisher in the vicinity of the device.

WARNING	**Warning against electromagnetic radiation**
	Electromagnetic radiation develops when transmitting and receiving data.

4.5 Additional information

■ Read and understand all safety and product manuals prior to installing and operating the device.

■ This documentation was written for specifically trained personnel. Installation, operation and troubleshooting may only be carried out by specifically trained personnel.

■ Retain these instructions. Keep this documentation in a location that is accessible to all personnel involved with the installation, use and troubleshooting of the device.

■ Follow all warnings. Follow all warnings on and in the device and in the documentation.

■ Install the device only in accordance with the manufacturer's instructions.

■ Use only the accessories and cables from the manufacturer.

■ Troubleshooting that is not described in Chapter ➜ Service and Troubleshooting may only be performed by the manufacturer.

■ People with hearing aids should be aware that the radio signals emitted by the device can cause annoying noises in the hearing aid.

■ Do not connect the device to power supplies such as normal household electrical outlets. The device should only be connected to power supplies as specified in this document.

■ When removing a cable, only pull on the plug and not on the cable. Connect cable connectors straight and carefully to avoid damaging the contacts.

■ Never overbend the antenna cables or subject these to mechanical forces.

■ When replacement parts are required, use only the replacement parts that were specified by the manufacturer. Unauthorized spare parts can result in fire, electric shock or other hazards.

Rules and regulations The provisions of the accident prevention regulations of the government safety organizations always apply to all work on the device.

The following must also be observed:

- applicable legally binding accident-prevention regulations

- applicable binding regulations at the place of use

- the recognized technical rules for safe and professional work

- existing environmental protection regulations

- other applicable regulations

5 Product Specifications

This chapter gives you an overview of the following topics:

- ➜ Function
- ➜ Images
- ➜ Description of components
- ➜ Technical data

5.1 Function

The BROOKS RFID reader is a radio-frequency identification system.

The reader of the system sends an electromagnetic field to the battery-free transponder via the antenna. This activates the transponder and sends the stored data back to the reader.

The total reading cycle takes less than 100 ms.

Since 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 RFID reader reads TIRIS transponders at a frequency of 134.2 kHz.

Product Specifications

5.2 Images

5.2.1 Foil keypad

1   Power LED

2   Set button

3   Read LED

4   Read button

Product Specifications

5.2.2 Side view

1   Antenna

2   Read button

5.3 Description of components

Components	Description
Power LED	The Power LED indicates that operating voltage is connected.
Set button	With the Set button you access setup mode. Here you can configure the reader and control parameterization using the Set and Read buttons (➜ Status diagram as overview).

Product Specifications

Components	Description
Read LED	The Read LED indicates the execution of automatic reading triggered by the Read button.
Read button	The read button triggers automatic reading. If a transponder is being read, the Read LED is lit and the buzzer sounds briefly (1x short). If, on the other hand, no transponder is being read, the Read LED is lit and the buzzer sounds twice (1x short, brief interval, 1x long). If reading is successful, the read data is output. In setup mode you can configure the reader and control parameterization using the Set and Read buttons (➜ Status diagram as overview).

5.4   Technical data

Technical data	
Operating temperature	-25 °C to +70 ° I -13 °F to 158 °F
Storage temperature	-40 °C to +85 °C I -40 °F to 185 °F
Permissible humidity at 50 °C I 122 °F	25 - 80 %
Transmitting frequency	134.2 kHz
Protection class	IP 40
Housing material	ABS
Weight	220 g
Output format	ASCII or Hex
Dimensions	approx. 185 x 90 x 60 mm
Voltage	5 V +/- 5 %
Current (active mode)	approx. 150 mA
Current (passive mode)	approx. 100 mA

Product Specifications

Device label   The device label with the CE and FCC mark, part/ serial number is on the device housing.
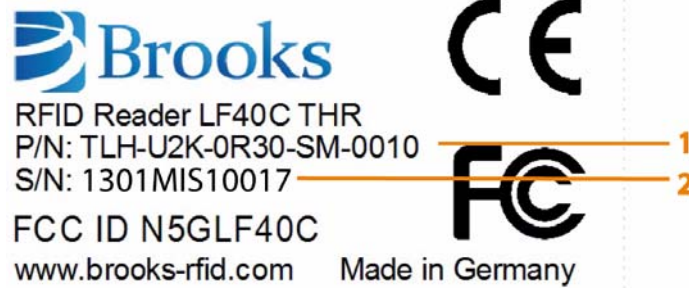
1	Part number
2	Serial number (example)

6 Installation

This chapter gives you an overview of the following topics:

- ■ → Safety instructions
- ■ → Qualified installation personnel
- ■ → Unpacking
- ■ → Dimensions
- ■ → Connecting the RFID reader

Follow the instructions specified in the safety chapter.

Follow the general safety instructions in the chapter → Safety Instructions.

6.1 Safety instructions

CAUTION	The device is exclusively designed for indoor use in an industrial environment.
	Installation is only allowed in an interior room at a constant temperature between -25 °C and +70 °C I -13 °F and 158 °F, and a relative humidity between 25 % and 80 %.

	Never use the device near or in water.
	Never pour liquids of any type over the device. If the device should accidentally come in contact with liquid, disconnect it and have it checked by a technician.

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

CAUTION	Never expose the device to extreme temperature fluctuations, since otherwise condensation develops in the device, which can cause damage.

	Do not install the device in the vicinity of voltage lines or other power lines with which they could collide (for example, when drilling), which could result in serious injuries or even death.
	The device (especially the antenna) should not be installed in the immediate vicinity of electrical equipment such as medical devices, monitors, telephones, TV sets, magnetic disks and metal objects. This could result in reduced read and write ranges.
	Never use the device in explosive areas (such as paint warehouses).
CAUTION	Do not use the device in areas where it is exposed to vibrations or shocks.
ATTENTION	The installation location must be adequately illuminated during the installation.
	Never install the device during a lightning storm.
ATTENTION	When determining the installation site, keep in mind the length of the antenna wire and the read/ write range of the antenna used.

6.2 Qualified installation personnel

CAUTION	The installation is to be carried out by specially trained personnel only. If you are uncertain about their qualification, contact the manufacturer.

CAUTION	Operating the device without special training can result in damage to the reader and/or connected devices.

6.3 Unpacking

The device and the accessories are packed under clean-room conditions. In order to maintain this condition, the device must also be unpacked in clean-room conditions.

Disposing of the packaging material

The packaging material consists of cardboard and foil. Dispose of these materials separately, and observing the legal regulations of your country.

6.4   Dimensions
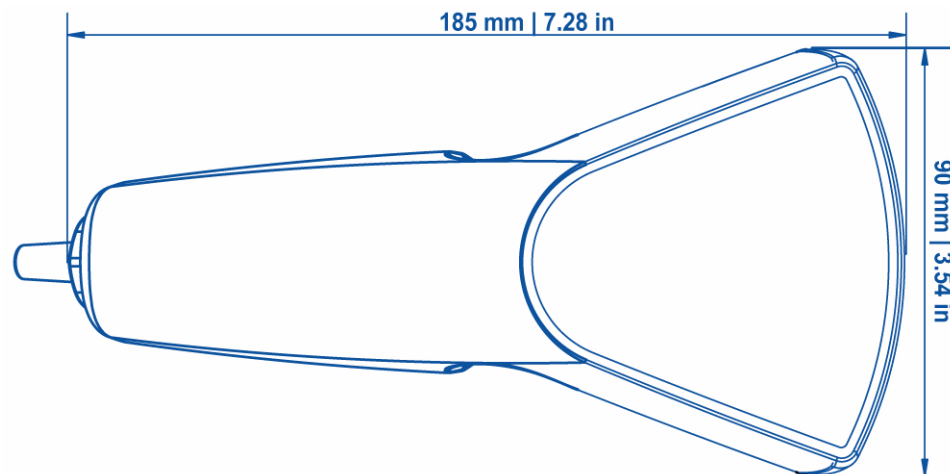
6.5   Connecting the RFID reader

The device can be connected to a running PC. The driver is automatically detected and installed. This takes approx. 20 seconds. The operating system of the computer reports that installation has been successfull, and the reader is then ready for use.

7 Operation

This chapter gives you an overview of the following topics:

- ➜ Operating personnel
- ➜ Normal operating mode
- ➜ Setup mode
- ➜ Status diagram as overview
- ➜ Flow chart
- ➜ ASCII values for setup

7.1 Operating personnel

CAUTION

The RFID reader LF40C THR should only be operated by specially trained personnel. If you have doubts about the required qualifications, contact the manufacturer.

Operating the device without special training can result in damage to the reader and/or connected devices.

7.2 Normal operating mode

The reader works like a connected keyboard. Place the cursor into a text document or into a text input field of the active application to read a transponder. Hold the device near a transponder and press one of the two read buttons (see ➜ Foil keypad and ➜ Side view).

The reader reads the transponder and, via the USB interface, writes the read data into the text document or input field. The data format (ASCII or HEX) depends on the setup setting (see chapter ➜ Setup mode).

If the read operation has been successful, the reader confirms this by a short sound signal (per page read). If the read operation has not been successful, you can hear an additional long sound signal.

7.3   Setup mode

To enter setup mode, connect the device as described in the chapter
➜ Connecting the RFID reader, and start a text editor (we recommend Editor or WordPad, Numlock activated). Then press the set button on the reader until the setup menu appears in the editor (see ➜ Foil keypad). The Setup menu can be specially protected, depending on the settings of ➜ Parameter 0 (0x00).

The reader switches to setup mode. On the screen, this is indicated by the following line (software version can differ):

Software:
USBL_V30
Parameter Select

The settings in setup mode are adjusted via the read button and the set button (press as well as press and hold).

A flow chart of the setup is illustrated in the chapter ➜ Flow chart.

7.3.1   Parameter

No. (dec.)	No. (hex)	Parameter name
0	0x00	➜ Customer
6	0x06	➜ Retry
32	0x32	➜ ShowTagType
33	0x21	➜ ReadPage
34	0x22	➜ ReadLength
35	0x23	➜ MIDFormat
39	0x27	➜ Polling
80	0x50	➜ AddTabCR
81	0x51	➜ ASCIICoded
82	0x52	➜ Prefix
83	0x53	➜ Suffix
85	0x55	➜ Language
86	0x56	➜ Buzzer

No. (dec.)	No. (hex)	Parameter name
97	0x61	➜ ShowNoneVisibleASCII
98	0x62	➜ NumPrefix
99	0x63	➜ NumSuffix

Parameter 0 (0x00)

Customer

Defines whether the reader is configured with the standard settings of the parameters or with customer-specific settings.

Values:
Standard = 00
Customer mode 1 = 01
Customer mode 2 = 02

Default: 00

If the reader is in customer mode 1, the following parameters differ from the standard settings:

Parameter 0x21 → 00
Parameter 0x50 → add Tab
Parameter 0x55 → English

If the reader is in customer mode 2, the following parameters differ from the standard settings:

Parameter 0x21 → 00
Parameter 0x52 → 19
Parameter 0x55 → English

Furthermore, the setup menu is blocked as soon as the reader has entered customer mode 1. To unblock the setup menu, press the following button combination: Press and hold the set button while pressing the read button three times. Then stop pressing the set button. The parameter menu is displayed again.

Parameter 6 (0x06)

Retry

Determines the internal repetitions of the read operation if the read operation has not been successful.

Values:
00... 1F   (0 to 31)

Default: 03

**Parameter 32
(0x20)**

ShowTagType

The transponder type can also be displayed. For this purpose, a number for the transponder type is displayed in front of the actual transponder data. This behavior can be activated or deactivated.

Values:
on   - transponder type is displayed
off   - transponder type is not displayed

Default: off

The transponder types are displayed by the following values:
01 - Read Only Transponder
02 - Read/Write Transponder
03 - Multipage Transponder

**Parameter 33
(0x21)**

ReadPage

This parameter determines the start position of a read operation on a multipage transponder.

Values:
0x01 .. 0x11   - page 1 to 17

Default: 0x01 (standard value for scanning)

When the value is 0, the different transponder types are read as follows:

Multipage transponder   - only page 1 is read (8 bytes)
Read Only   - entire transponder is read (8 bytes)
Read/Write   - entire transponder is read (8 bytes)

The transponder types Read Only and Read/Write can only be read when the value is 0.

**Parameter 34
(0x22)**

ReadLength

This parameter defines the length of the data (intervals of 8 bytes) that are to be read during a read operation.

The displayed value adjusts to the value of the parameter ReadPage. This means that if the read operation starts from page 1, a maximum of 136 (= 17 pages x 8) bytes can be read. However, if the read operation starts from page 2, then a maximum of only 128 (16 pages x 8) bytes can be read.

Values:
0x08...0x88   - read (n*8) bytes, with n = 1..17 (page)

Default: 08 (read 8 bytes)

Parameter 35
(0x23)

MIDFormat

This parameter defines the format in which the MID data of the transponder is to be displayed.

Values:

0 ... 4

0	: not formatted
1	: MSB first end page first, then start page
2	: LSB first end page first, then start page
3	: MSB first start page first, then end page
4	: LSB first from start page

Default: 0

Example: data in transponder (∪ = space character 0x20):
> Data page 1: ∪ ∪ ∪ ∪ 1234 (HEX: 20 20 20 20 31 32 33 34)
> Data page 2: 56789531 (HEX: 35 36 37 38 39 35 33 31)

Display for different formats with start page = 0 and data length = 16 (0x10):

Format 0: (unformatted, start from start page)
> 123456789531 (HEX: 20 20 20 20 31 32 33 34 35 36 37 38 39 35 33 31)

Format 1: (start from page 2, followed by start page)
> 567895311234 (HEX: 35 36 37 38 39 35 33 31 20 20 20 20 31 32 33 34)

Format 2: (the format 1 data bytes in reverse order)
> 135987654321 (HEX: 31 33 35 39 38 37 36 35 34 33 32 31 20 20 20 20)

Format 3: (start from start page, followed by end page)
> 123456789531 (HEX: 20 20 20 20 31 32 33 34 35 36 37 38 39 35 33 31)

Format 4: (the data bytes in reverse order, starting from start page)
> 432113598765 (HEX: 34 33 32 31 20 20 20 20 31 33 35 39 38 37 36 35)

Parameter 39
(0x27)

Polling

This parameter determines whether the reader should operate in polling mode (constant reading with intervals of approx. 1 s). After the polling mode has been activated in the parameter, the user has to press the read button for the reader to start polling. If you press the read button again, polling stops. The data is displayed for each successful read operation.

Values:

off = 00	– polling off
on = 01	– polling on

Default: off (00)

Parameter 80
(0x50)

AddTabCR

This parameter determines whether a Carriage Return or a TAB - or both - is added at the end of the read result.

Values:

none	- 00 – do not add CR or TAB
add CR	- 01 – add CR
add Tab	- 02 – add TAB
add CR Tab	- 03 – add CR and TAB

Default: add CR (01)

Parameter 81
(0x51)

ASCIICoded

The read data can be displayed in HEX or ASCII format.

Values:

HEX	- 00 – HEX
ASCII	- 01 – ASCII

Default: ASCII - 01

Parameter 82
(0x52)

Prefix

This parameter determines whether an additional character is to be placed in front of the read result. These are shown in the chapter ➔ ASCII values for setup.

Values:
0....0x80   - HEX code for desired prefix

Default: 0 (no prefix)

Parameter 83
(0x53)

Suffix

This parameter determines whether an additional character is to be placed after the read result (suffix). These are shown in the chapter ➔ ASCII values for setup. These settings can influence the display of data on the screen.

Values:
0....0x80   - HEX code for desired suffix

Default: 0 (no suffix)

ATTENTION

When using Microsoft Word, the numlock key has to be activated so that prefix or suffix control characters can be interpreted correctly.

**Parameter 85
(0x55)**

Language

This parameter defines the keyboard layout.

Values:
English   - 00 – English (QWERTY)
German   - 01 – German (QWERTZ)
French   - 02 – French (AZERTY)

Default: German (01)

**Parameter 86
(0x56)**

Buzzer

Activates or deactivates the internal buzzer (sound signal) of the reader.

Values:
off   - 00 – buzzer off
on   - 01 – buzzer on

Default: on (01)

**Parameter 97
(0x61)**

ShowNoneVisibleASCII

This parameter determines whether a non-visible ASCII character is displayed on the screen by a □, or is not displayed.

Values:
off   - 00 – do not display □
on   - 01 – display □

Default: off (00)

**Parameter 98
(0x62)**

NumPrefix

Defines the number of prefix characters that are to be added in front of the read result. This parameter is only valid in combination with parameter 82.

Values:
00…. 10   - number of prefixes

Default: 00 (no prefix)
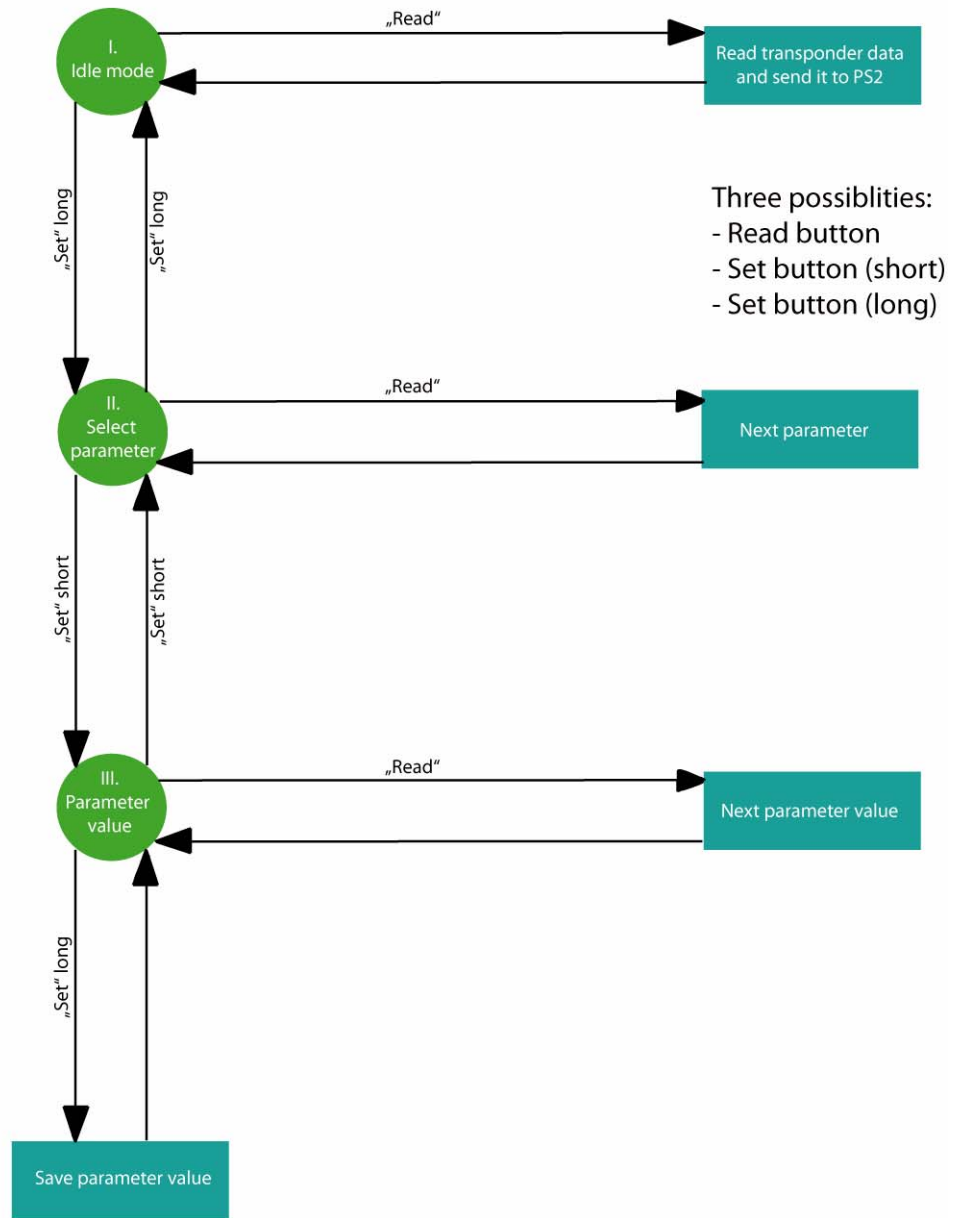
**Parameter 99
(0x63)**

NumSuffix

Defines the number of suffix characters that are to be added after the read result. This parameter is only valid in combination with parameter 83.
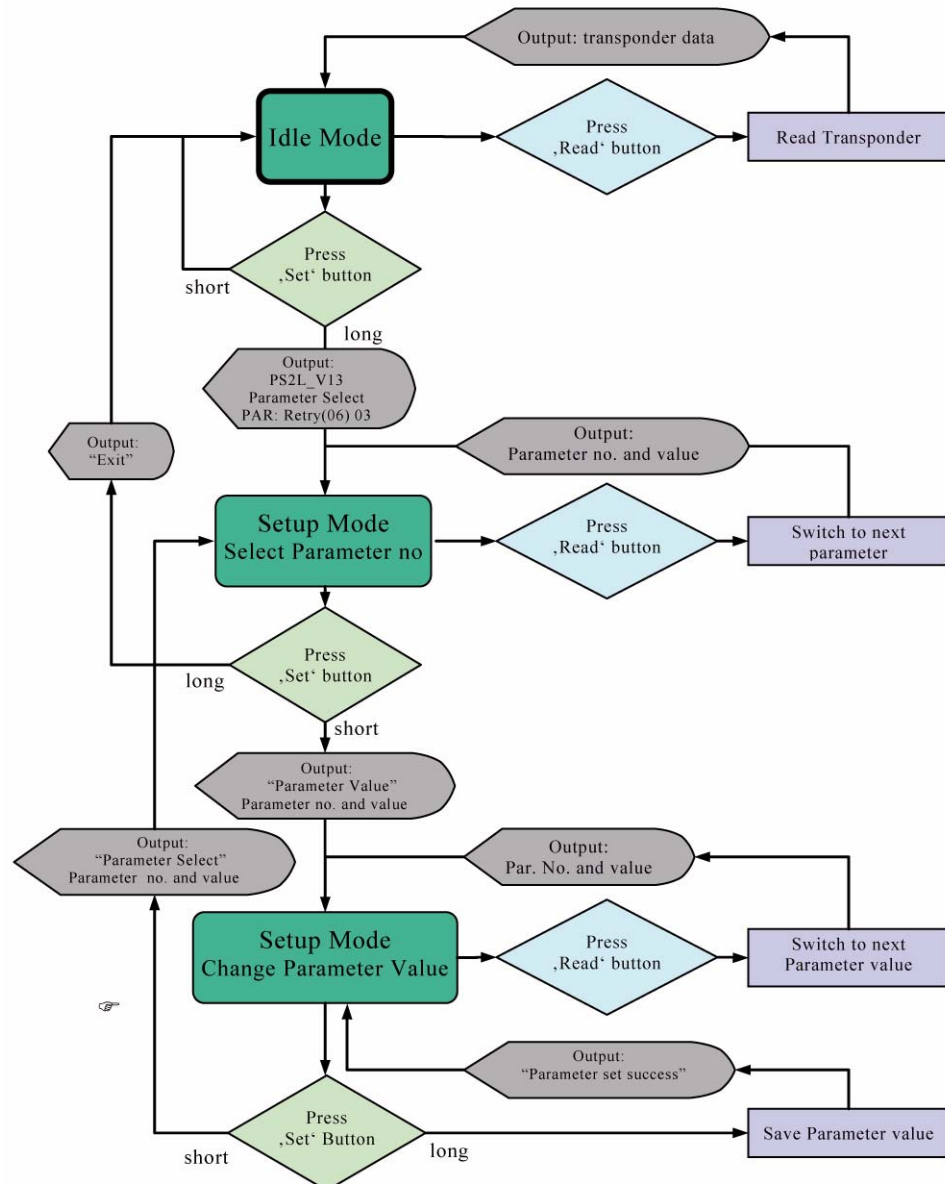
Values:
00…. 10   - number of suffixes

Default: 00 (no suffix)

7.4 Status diagram as overview

Operation

7.5 Flow chart

Operation

7.6 ASCII values for setup

Dec	Hex	Ctrl	Code		Dec	Hex	Ctrl	Code
0	00	^@	NUL		25	19	^Y	EM
1	01	^A	SOH		26	1A	^Z	SUB
2	02	^B	STX		27	1B	^[	ESC
3	03	^C	ETX		28	1C	^\	FS
4	04	^D	EOT		29	1D	^]	GS
5	05	^E	ENQ		30	1E	^^	RS
6	06	^F	ACK		31	1F	^_	US
7	07	^G	BEL					
8	08	^H	BS					
9	09	^I	HT					
10	0A	^J	LF					
11	0B	^K	VT					
12	0C	^L	FF					
13	0D	^M	CR					
14	0E	^N	SO					
15	0F	^O	SI					
16	10	^P	DLE					
17	11	^Q	DC1					
18	12	^R	DC2					
19	13	^S	DC3					
20	14	^T	DC4					
21	15	^U	NAK					
22	16	^V	SYN					
23	17	^W	ETB					
24	18	^X	CAN					

Dec	Hex	Char
32	20	
33	21	!
34	22	"
35	23	#
36	24	$
37	25	%
38	26	&
39	27	'
40	28	(
41	29	)
42	2A	*
43	2B	+
44	2C	,
45	2D	-
46	2E	.
47	2F	/
48	30	0
49	31	1
50	32	2
51	33	3
52	34	4
53	35	5
54	36	6
55	37	7
56	38	8

Dec	Hex	Char
57	39	9
58	3A	:
59	3B	;
60	3C	<
61	3D	=
62	3E	>
63	3F	?
64	40	@
65	41	A
66	42	B
67	43	C
68	44	D
69	45	E
70	46	F
71	47	G
72	48	H
73	49	I
74	4A	J
75	4B	K
76	4C	L
77	4D	M
78	4E	N
79	4F	O
80	50	P
81	51	Q

Dec	Hex	Char	Dec	Hex	Char
82	52	R	107	6B	k
83	53	S	108	6C	l
84	54	T	109	6D	m
85	55	U	110	6E	n
86	56	V	111	6F	o
87	57	W	112	70	p
88	58	X	113	71	q
89	59	Y	114	72	r
90	5A	Z	115	73	s
91	5B	[	116	74	t
92	5C	\	117	75	u
93	5D	]	118	76	v
94	5E	^	119	77	w
95	5F	_	120	78	x
96	60	'	121	79	y
97	61	a	122	7A	z
98	62	b	123	7B	{
99	63	c	124	7C		
100	64	d	125	7D	}
101	65	e	126	7E	~
102	66	f	127	7F	□
103	67	g			
104	68	h			
105	69	i			
106	6A	j			

8   Service and Troubleshooting

This chapter gives you an overview of the following topics:

- ■   ➜ General remarks
- ■   ➜ Qualified troubleshooting personnel
- ■   ➜ Safety instructions
- ■   ➜ Reader does not respond
- ■   ➜ Software releases
- ■   ➜ Customer service

8.1   General remarks

Follow the instructions specified in the safety chapter.

Follow the general safety instructions in the chapter ➜ Safety Instructions.

⟳   The RFID 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 ➜ Customer service. Have the serial number of the transponder reader ready as shown on the label (see ➜ Device label) when contacting the manufacturer!

Service and Troubleshooting

8.2 Qualified troubleshooting personnel

CAUTION

Error handling must only be carried out by specially trained personnel. If you are uncertain about the qualifications that are required, contact the manufacturer.

CAUTION

Error handling of the device without the special skills required and unqualified interference with the device can result in personal injury and damage to the reader and/or connected devices.

8.3 Safety instructions

All antenna resonant circuit components carry high voltages.

WARNING

When replacement parts are required, use only manufacturer-specified parts.

Unauthorized substitution of parts can result in fire, electric shock or other hazards.

Electrostatic charges can damage electronic components within the device.

ESD protective measures must be applied when opening the device (➜ ESD instructions).

CAUTION

Never short-circuit the fuse! This may result in fire or damage to the device.

Only use fuses specified by the manufacturer.

Service and Troubleshooting

8.4 Reader does not respond

⮑ Check if the interface connection cable is undamaged and correctly connected to both reader and PC!

⮑ If these measures do not solve the problem, contact the manufacturer!

8.5 Software releases

Release date	Version	Description
December 2011	USBL_V30	First version with cortex controller

8.6 Customer service

Brooks Automation (Germany) GmbH
RFID Division
Gartenstr. 19
D-95490 Mistelgau
GERMANY

Telephone	+49 (0) 9279 - 991 550
Fax	+49 (0) 9279 - 991 501
E-mail	rfid.support@brooks.com

24-hour technical support hotline (Brooks):

USA and Canada	+1 978 262 2900
Europe	+49 1804 2255 4887
Japan	+81 45 477 5980
China	+86 21 5131 7066
Taiwan	+886 3 5525225
Korea	+82 31 288 2500
Singapore	+65 6464 1481

9 Dismantling and Storage

This chapter gives you an overview of the following topics:

- ➔ Dismantling
- ➔ Storage

9.1 Dismantling

⟳ Remove the cable from your PC!

9.2 Storage

Store the reader and its components in a clean and dry environment with the power supply disconnected.

Make sure the contacts remain clean. Observe the necessary storage conditions.

10   Transport and Disposal

This chapter gives you an overview of the following topics:

■   ➜ Transport

■   ➜ Disposal

10.1 Transport

For transportation purposes such as mailing, use a firm cardboard box.

Use adequate padding material to protect the device on all sides.

10.2 Disposal

The device and its components are made of various materials.

Dispose of these materials separately, and observing the legal regulations of your country.

Do not dispose of the unit in normal household waste.

Disconnect the electronic components from the housing and dispose of them as follows:

■   the housing as plastic trash

■   the electronic components, antennas and cables as electronic waste

Index

W
Warning symbols 16