

1. Description

The "RFID Snap-on Module" reads and writes RFID tags. It was designed for the Mobile Computer MC 959x series.

A C# package containing all the components and resources that are required for software integration is available to software developers. A demonstration program (programmed in Visual Studio 2008) in Open Source makes it possible to conduct a simple demonstration and test for correct functioning.



Type	RFID frequency range
LF	125 kHz / 134 kHz
HF	13.56 MHz
UHF (EU)	865.6 to 867.5 MHz
UHF (US)	902 to 928 MHz

The RFID reader is supplied voltage through the external interface at the back of the MC 959x. Data communication is enabled by the USB interface.

The reader is available in a standard version (non-Ex) and in an explosion-proof version.

Device	Configuration Motorola Solutions	Device	Configuration BARTEC
MC 9590	Standard version	MC 9590 ^{ex} -NI	Ex-proof
MC 9596	Standard version GSM	MC 9596 ^{ex} -NI	Ex-proof GSM
MC 9598	Standard version CDMA	MC 9598 ^{ex} -NI	Ex-proof CDMA

Use in Accordance with the Intended Purpose

The RFID Snap-on Modules are electrical apparatus designed as accessories for the hand-held mobile computers in the MC 959x and MC 959x^{ex}-NI series. The modules can be used only in combination with the Mobile Computer. They capture, process and transmit data inside and outside hazardous areas.

Available for:

- Standard version – not explosion-proof
- ATEX/IECEX Zone 2 and Zone 22
- UL Class I, II Division 2, Class III

It is used exclusively in combination with operating equipment items which conform to the requirements of Overvoltage Category I.

Other applicable documents

- Technical data sheet for the explosion-proof and standard versions of the RFID snap-on module
- Description of BARTEC's Open Source software packet for RFID snap-on module implementation in one customer application.
- Technical data sheet for the explosion-proof version of the MC 959x^{ex}-NI Mobile Computer series
- User manual for the MC 959x Mobile Computer series

The retention of these documents is mandatory!

2. Safety Instructions

The "RFID Snap-on Module" may be operated only if it is clean and free of any damage and only within the specified temperature class and the temperature range indicated for it. It is essential to comply with the permissible operating data for the device being used. Utilisation in areas other than those specified and the modification of the product by anyone other than the manufacturer is not permitted and will exempt BARTEC from liability for defects and any further liability. The generally applicable statutory rules and other binding directives relating to workplace safety, accident prevention and environmental protection must be observed.

Danger, Warning and Information Symbols

Safety instructions and warnings are specially highlighted in this manual and marked by symbols.

DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.

WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

ATTENTION identifies a potentially damaging situation which, if not avoided, could damage the equipment or something in its environment.



Important instructions and information on effective, economical and environmentally compatible handling.

3. Technical Data

Explosion Protection

ATEX Zone 2 and Zone 22 and IECEx Zone 2 and 22		
Types	B7-A2Z0-0020	B7-A2Z0-0022
	B7-A2Z0-0021	B7-A2Z0-0023
ATEX approval	EPS 13 ATEX 1588 X	
ATEX marking	⚠ II 3G Ex ic IIC T6 Gc ⚠ II 3D Ex ic IIIC T90°C Dc	
IECEX approval	IECEX EPS 13.0028 X	
IECEX marking	Ex ic IIC T6 Gc Ex ic IIIC T90°C Dc	
Directives	94/9/EC	
Standards	EN 60079-0	EN 60079-11
UL Class I Division 2		
Types	B7-A2Z0-0020	B7-A2Z0-0022
	B7-A2Z0-0021	B7-A2Z0-0023
UL approval	E321557	
UL marking	Class I Division 2 groups A, B, C and D Class II Division 2 groups F and G Class III	
Temperature class	T5	

Special Conditions for ATEX and UL

It is not permissible to attach or remove the RFID Snap-on Module inside the hazardous area.

Conditions particulières applicables aux équipements ATEX et UL

Il est strictement interdit de clipser ou déclipser le module RFID en zone dangereuse.

Non-explosion-proof

Standard version		
Types	G7-A0Z0-0001 G7-A0Z0-0002	G7-A0Z0-0003 G7-A0Z0-0004
Approval	G1-A0Z0-7C0001	
Marking		

General Data

Physical Features	
Dimensions in mm/inches (length x width x depth)	80 x 61 x 31 mm / 3.15 x 2.4 x 1.22 inches
Weight	approx. 75 g / approx. 0.165 oz
User environment	
Operating temperature	-20 °C to +50 °C / -4 °F to +122 °F
Storage temperature outside the hazardous area	-40 °C to +70 °C / -40 °F to +158 °F
Air humidity	5 % to 95 % (non-condensing)
Degree of protection (EN 60529)	IP 54 (snapped on)

Application development

RFID SDK (Software Developer Kit) in Open Source including demonstration program on the application development	
Available for	C#
Download	http://www.bartec.de/automation-download/mobile.htm

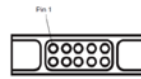
Supported RFID standards

Reader	Standard
LF Reader B7-A2Z0-0020 G7-A0Z0-0001	ATA5567
	HITAG 2
	EM4xxx (UNIQUE)
	HITAG S 2 kb
	EM4305
	HITAG S256
	EM4450/4550
HF Reader B7-A2Z0-0021 and G7-A0Z0-0002	ISO 11784/5
	HDX (Multipage)
	ISO 11784/5
	HDX-RO
UHF EU and US Reader B7-A2Z0-0022, B7-A2Z0-0023 G7-A0Z0-0003, G7-A0Z0-0004	ISO Animal
	ISO 15693
UHF EU and US Reader B7-A2Z0-0022, B7-A2Z0-0023 G7-A0Z0-0003, G7-A0Z0-0004	HITAG 1
	Q5
HF Reader B7-A2Z0-0021 and G7-A0Z0-0002	ISO 14443 (e.g. Mifare Ultralight)
	ISO 15693
UHF EU and US Reader B7-A2Z0-0022, B7-A2Z0-0023 G7-A0Z0-0003, G7-A0Z0-0004	EPC Gen 2

Radio standard

Types	Directives/Standards							
	G7-A0Z0-0001	G7-A0Z0-0002	G7-A0Z0-0003	G7-A0Z0-0004	B7-A2Z0-0020	B7-A2Z0-0021	B7-A2Z0-0022	B7-A2Z0-0023
EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011 + AC2011	X	X	X	X	X	X	X	X
EN 301 489-1 V1.9.2: 2011	X	X	X		X	X		X
EN 301 489-3 V1.4.1: 2002	X	X	X		X	X		X
EN 300 220-1 V2.4.1: 2012			X					X
EN 300 220-2 V2.4.1: 2012			X					X
EN 300 330-1 V1.7.1: 2009	X	X			X	X		
EN 300 330-2 V1.5.1: 2010	X	X			X	X		
EN 50364: 2010	X	X	X	X	X	X	X	X
CFR 47 Part 15, Subpart B, Class B				X			X	
RSS-210 Issue 8				X			X	
RSS-102 Issue 4				X			X	
RSS-GEN Issue 3				X			X	

External interfaces

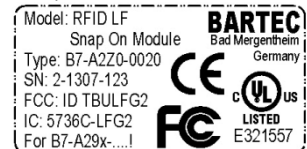


PIN	Assignment	PIN	Assignment
1	Ground	6	USB_DPin
2	Reserved	7	USB_D+
3	5.4 VDC	8	USB_Vbus
4	Cradle_Detect	9	Reserved
5	Power Gnd	10	USB_ID

Product marking – Manufacturer's label



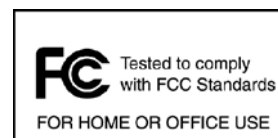
Example:



4. Radio Frequency Interference Requirements - FCC

Please observe all warning notices with regard to the usage of wireless devices.

Radio Frequency Interference Requirements - FCC



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.

FCC Note according to 15.21

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

Radio Transmitters (Part 15)

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.

Radio Frequency Interference Requirements - Canada

This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

Radio Transmitter

This device complies with RSS 210 of Industry & Science Canada. 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.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes:

- (1) *l'appareil ne doit pas produire de brouillage, et*
- (2) *l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.*

Label Marking: The Term "IC:" before the radio certification only signifies that "Industry Canada" technical specifications were met.

5. Transport and Storage

ATTENTION

Damage due to inappropriate transport or incorrect storage!

- ▶ Observe the admissible storage and transport temperatures.
- ▶ Keep the RFID snap-on module away from moisture.
- ▶ Use the original packaging for transport/storage.

6. Commissioning and Operation

Basic Safety and Health protection requirements

Consult the health and safety officer on your site to ensure that you are familiar with your company's safety regulations which serve to protect employees in the workplace.

Ergonomic Recommendation

Follow the recommendations in the User Manual for the Mobile Computer MC 959x^{ex}-NI.

Before assembling the device, make sure that all components and documents are there.

Scope of supply: 1 x RFID snap-on module
1 x quick-start guide
1 x CD with RFID SDK, RFID demonstration and user manual

⚠ DANGER

Any use which is not in accordance with the intended purpose will endanger explosion protection. There is a risk of a fatal injury in an explosive atmosphere!

- ▶ Do not alter the RFID snap-on module in any way.
- ▶ If any damage is done to the enclosure or if the device malfunctions, remove the equipment from the hazardous area into the safe area and put it out of operation!

⚠ DANGER

Avoid electrostatic charging in hazardous areas! There is a risk to life in explosive atmospheres!

- ▶ Do not use a dry cloth to wipe or clean the devices.
- ▶ Wear suitable clothing and shoes.
- ▶ Do not use rubber gloves or suchlike.

Requirements in hazardous areas

- (1) The RFID snap-on module must not be opened.
- (2) Do not use, swap for or replace with any non-specified components.
- (3) Protect the RFID snap-on module from impacts!
- (4) Do not expose the RFID snap-on module to caustic/aggressive liquids, vapours, mists!
- (5) Avoid the impacts of moisture that exceeds specified levels.
- (6) Avoid thermal impacts that exceed the specified temperature range.
- (7) The 10-pin data interface may only be clicked onto devices specified by the manufacturer and only outside the hazardous area!

Construction

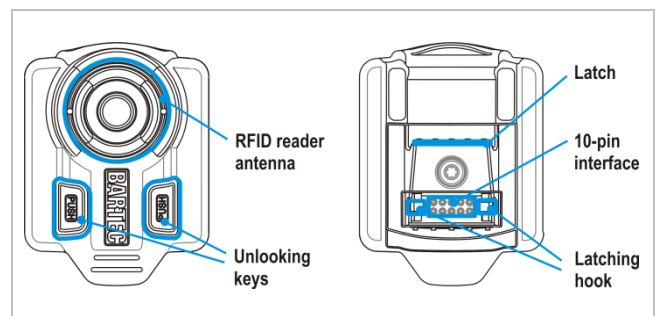


Figure 1

First Steps

- Unpack the RFID snap-on module and the CD.
- Connect the Mobile Computer to the PC via a cradle.
- Install the RFID demonstration from the CD onto the Mobile Computer.
- Take the Mobile Computer out of the cradle and switch it off.
- Snap the RFID snap-on module onto the Mobile Computer.
- Switch on the Mobile Computer.
- Call up the RFID demonstration in the Start menu.

The RFID software automatically initialises and detects the snapped-on RFID snap-on module. The device is ready.

The individual steps are explained on the following pages.

Clipping on the RFID snap-on module

⚠ DANGER

Non-certified accessories endanger explosion protection. There is a risk of a fatal injury in an explosive atmosphere!

- ▶ Use only original accessories from BARTEC.
- ▶ Do not unlatch, unlock and remove the RFID snap-on module inside the hazardous area.

Releasing/removing the RFID snap-on-module

- ▶ On the top of the RFID snap-on module there are two keys for locking and unlocking.
- ▶ Both keys are used to open or close the latching hooks on the underside.
- ▶ The latching hooks fix the snap-on module in place on the Mobile Computer and ensures the necessary contact pressure for the interface contacts.

Worksteps for unlocking/removal

- (1) Press the two "PUSH" keys simultaneously to open the lock (Figure 2).

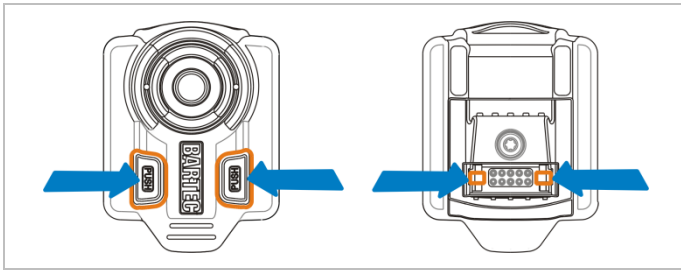


Figure 2

Worksteps for mounting / snapping on

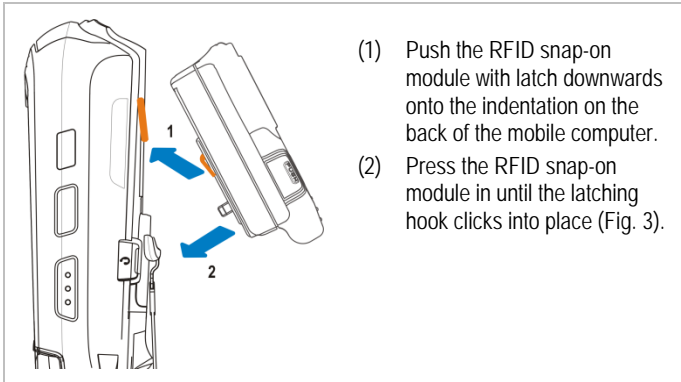
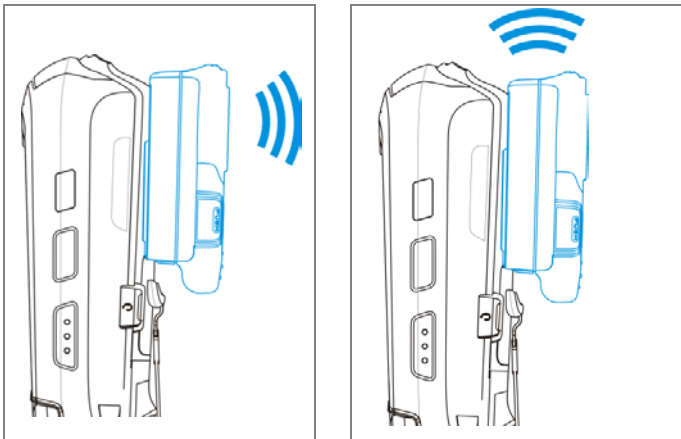


Figure 3

Reading range of the RFID snap-on module



Reading range	Distance	Reading range	Distance
LF reader	up to 6.0 cm	UHF (EU) reader	up to 30.0 cm
HF reader	up to 6.0 cm	UHF (US) reader	up to 30.0 cm

The reading range depends on factors such as, for example:

- tag size
- site of installation (metal, wood or other supporting surface)
- ambient conditions
- magnetic influences from outside
- temperature
- moisture

Software Version - RFID SDK

The software is not relevant for the explosion protection for the devices. You will find information on this in the documentation relating to the RFID SDK on the CD or on the BARTEC download page.



BARTEC download page:

<http://www.bartec.de/automation-download/>

Final inspection

The following preconditions must be checked before putting the device into operation:

- ▶ Is there any damage to the enclosure?
- ▶ Is the correct RFID snap-on module for the Mobile Computer snapped on?
- ▶ Has the software been installed?

Do not switch on the Mobile Computer with snap-on module until you have completed the final inspection.

7. Malfunctioning and Troubleshooting



In the event of malfunctioning, take the Mobile Computer with the RFID snap-on module out of the hazardous area.

Malfunctioning	Possible Cause	Remedy
RFID tags are not detected.	No power supply.	Release and latch the snap-on module on again.
	Incorrect standard set	Select the right standard in the software setting.
	Tag defective	Test another RFID tag.
RFID demonstration software is not detected and identified.	The snap-on module has not snapped on correctly.	Unlock and snap on the snap-on module again.
	Software does not react	Perform a cold boot on the Mobile Computer by simultaneously pressing the "Power" and 1 and 9)
	Software has not been installed correctly	Uninstall the software and re-install it again.



The RFID snap-on module is only ready for operation if it is snapped on and the software has been installed.

Remedying the software installation

- (1) Unlock and remove the snap-on module.
- (2) Uninstall all files on the Mobile Computer for the RFID reader.



- (3) Connect the mobile computer via a cradle to the PC.
- (4) Install the demonstration software on the Mobile Computer.
- (5) Take the Mobile Computer out of the cradle and switch it off.
- (6) Snap the RFID snap-on module onto the Mobile Computer.
- (7) Switch on the Mobile Computer.
- (8) Call up the RFID demonstration in the Start menu.
- (9) The RFID Software automatically initialises and detects the snapped on RFID snap-on module.

8. Maintenance, Care and Cleaning

For smooth and trouble-free operation we recommend cleaning the devices at regular intervals depending on the degree of stress to which they are exposed and handling them with care.

The owner / managing operator of an electrical system in a hazardous environment must keep the operating apparatus in good condition and operate it correctly. Only an electrician may perform maintenance work or troubleshooting.

Before starting operation again, check conformance to the applicable laws and directives. The given safety instructions must be observed when performing maintenance and/or troubleshooting.

DANGER

There is a risk of a fatal injury in an explosive atmosphere!

- ▶ Take the devices and/or accessories out of the hazardous area before cleaning them.
- ▶ Devices can be destroyed if handled inappropriately.

Care	Recommendation
Enclosure	<ul style="list-style-type: none"> - Protect the device from impacts. - Do not expose the device to any extreme stress, e.g. violent jolts or drops from great heights.
Environment	<ul style="list-style-type: none"> - Do not expose the device to any extreme temperatures (e.g. do not put it down on the dashboard in a car) - Do not put it down in a dirty, damp or wet environment.

Cleaning	Suitable cleaning agents
Enclosure	<ul style="list-style-type: none"> - Alcohol wipes
Interface contacts	<ul style="list-style-type: none"> - Use a cotton bud dipped in an alcohol solution to remove all grease and dirt deposits from the contacts. - Repeat cleaning several times. - Before the device is inserted again, the interface contacts must be completely dry and there must not be any fluff left hanging on them. - If necessary, use compressed air to clean the contacts.

CAUTION

Personal injury due to incorrect use of compressed air!

- ▶ Do not point the nozzle on the compressed-air hose towards yourself or any other person. In particular, never point it at a person's face.

9. Disposal

The components in the RFID snap-on modules contain metal, plastic and electronic parts.



Our devices are intended as professional electric devices for business use only, referred to as B2B devices under the WEEE directive. The WEEE directive sets the framework conditions for the applicable EU-wide handling of waste electric and electronic equipment. This means that you are not permitted to dispose of this equipment in normal household waste. It should not be given to the collection sites set up by the public waste management authorities either but instead it should be disposed of in a separate collection in an environmentally sound manner.

All products acquired from us can be sent back to us when our customers are disposing of them. We ensure that they are disposed of in accordance with the respective applicable statutory regulations.

The sender pays the costs of the dispatch/packageing.

10. Order numbers

Configuration			
Type number	Version	Type	Frequency range
B7-A2Z0-0020	Ex	RFID LF Reader	125 kHz / 134 kHz
B7-A2Z0-0021	Ex	RFID HF Reader	13.56 MHz
B7-A2Z0-0022	Ex	RFID UHF (US) Reader	902 to 928 MHz
B7-A2Z0-0023	Ex	RFID UHF (EU) Reader	865.6 to 867.5 MHz
G7-A0Z0-0001	Non-Ex	RFID LF Reader	125 kHz / 134 kHz
G7-A0Z0-0002	Non-Ex	RFID HF Reader	13.56 MHz
G7-A0Z0-0003	Non-Ex	RFID UHF (EU) Reader	865.6 to 867.5 MHz
G7-A0Z0-0004	Non-Ex	RFID UHF (US) Reader	902 to 928 MHz

11. Service Address

BARTEC GmbH
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97980 Bad Mergentheim
Deutschland

Tel. +49 7931 597-444
Fax +49 7931 597-119
Internet: www.bartec.de
E-Mail: service@bartec.de

Compliance Information Statement

Compliance Information Statement (Declaration of Conformity Procedure)	
Responsible Party:	BARTEC US Corp
Address:	600 Century Plaza Drive Suite C160 Houston, TX 77073 USA
Telephone:	+ 1 281 214 8542
Type of Equipment:	RFID snap-on-modules Type B7-A2Z0-0020 and Type B7-A2Z0-0021 and Type B7-A2Z0-0022 Type G7-A0Z0-0001 and Type G7-A0Z0-0002 and Type G7-A0Z0-0004
Model Name:	RFID LF Snap-on-modules FCC ID: TBULFG2 RFID HF Snap-on-modules FCC ID: TBUHFG2 RFID UHF (US) Snap-on-modules FCC ID: TBUHFG2