

Multi ISO RFID 1059 User Guide



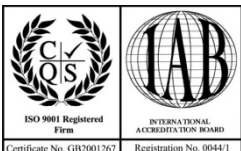
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part of **HID**

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History

Version	Date	Modifications
1.0	9/10/06	Document Creation
1.1	1/11/06	Added FCC Compliance to Regulatory section
1.2	9/03/07	Added SmartWedge and Configuration instructions.
1.3	16/05/08	Updated to new document template
1.4	23/07/08	Removed references to Motorola Hardware library dependency in SmartWedge.
1.5	5/6/2011	Updated application screenshots. Moved Smart Wedge and Configuration instructions to separate document.

1 Introduction

Technology Solutions' Multi ISO RFID 1059 provides the Motorola MC70/75/75A with Radio Frequency Identification (RFID) functionality. The unit attaches as a snap on to the MC70/75/75. The mechanical design of the unit allows it to be quickly and easily removed, alternatively two screws may be used to make the installation semi-permanent. The unit is designed to retain compatibility with standard MC70/75/75A accessories such as desktop cradles and chargers.

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The RFID 1059 is powered from the MC70/75/75A. It can be used with the majority of transponders operating at 13.56MHz, including ISO15693 and ISO14443 compliant types.

2 Parts of the RFID 1059



Figure 1: The parts of the RFID 1059

3 Attaching to an MC70/75/75A



Figure 2: Attaching to an MC70/75/75A

4 Detaching from an MC70/75/75A



Figure 3: Detaching from an MC70/75/75A

5 Using the RFID 1059

5.1 Basic operation

RFID transponders can be read when they are in range of the antenna. The antenna is located behind the label on the front of the RFID 1059. The range at which a transponder can be read depends on the transponder type and size. Larger transponders can be read further away from the antenna. In many cases it will be possible to read transponders behind and to the side of the RFID 1059. For best performance the transponder must be orientated correctly with the antenna. In most cases this means that the transponder should be parallel to the RFID 1059 cover as shown below:



Correct orientation; the transponder is parallel to the reader antenna and read range will be good.



Incorrect orientation; the transponder is perpendicular to the reader antenna and read range will be poor.

Figure 4: Presenting a transponder to the RFID 1059

There are no drivers required for the RFID 1059. The unit is automatically powered up when the serial port on the bottom of the MC70/75/75A (COM1) is opened.

The default operating mode of the RFID 1059 as supplied from Technology Solutions is continuous polling for transponders with the unique identification number (UID) of any compatible transponder being sent out to the MC70/75/75A in ASCII format (COM1, 19200 baud).

The status LEDs on the front of the RFID 1059 provide an indication of the operating status of the RFID 1059.

LED colour	Status
Green flash	The previous command was successfully received and processed by the reader. OR A transponder was read.
Red flash	The previous command was not successfully processed by the reader.

Note that custom configuration of the RFID 1059 may prevent it from operating as described above.

5.2 Reader demonstration software

Technology Solutions provide a demonstration application which can be used to explore some of the functionality of the RFID 1059 and test the read range for a particular transponder. This application and full instructions are available for download from the Technology Solutions website at <http://www.tsl.uk.com/downloads.htm> . An example screenshot of the Demonstration software is shown in Figure 5.

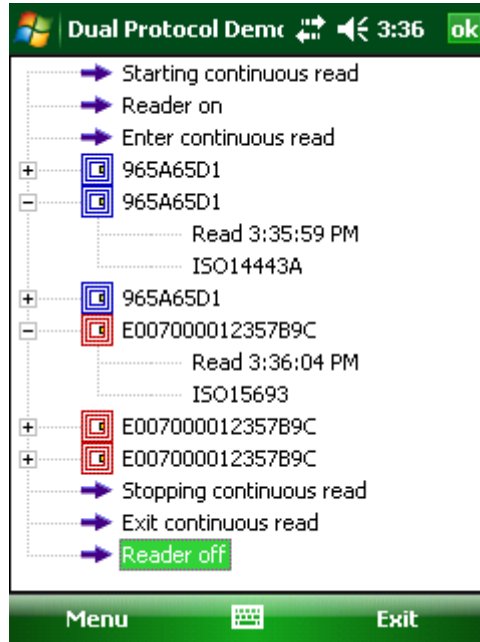


Figure 5 : Demonstration software

5.3 SmartWedge RFID application

A Wedge application has been developed for use with the 1059 and other Technology Solutions RFID readers. This activates the RFID reader whilst any of the yellow scan buttons are held down. Any transponder serial numbers that are read are sent out as though they had been typed on the keypad to whichever application has focus.

Instructions for installing and using the Wedge application are provided separately from the Technology Solutions website at <http://www.tsl.uk.com/downloads.htm> .

5.4 RFID 1059 Configuration

A Configuration application has been developed for use with the 1059 and other Technology Solutions RFID readers. This allows common operating parameters to be changed and stored.

Instructions for installing and using the Configuration Application are provided separately from the Technology Solutions website at <http://www.tsl.uk.com/downloads.htm> .

5.5 Software support for the RFID 1059

To make full use of the functionality of the RFID 1059, a customised software application will be required. Technology Solutions support two approaches to this; direct communication with the reader using the low level command set or the use of an API to simplify application development.

5.5.1 Low level command set

The Low level command set supports two modes; ASCII and binary. ASCII mode is typically used for simple applications, for example collecting transponder unique identifiers (UIDs). The binary protocol is more suited where complex interaction with transponders is required, for example a Mifare ticketing or vending application.

The command set format and content is described in the document 'Multi ISO RFID 1059 Protocol.pdf' which is available for download from the Technology Solutions website at <http://www.tsl.uk.com/downloads.htm> .

5.5.2 API

An API is provided for use with the RFID 1059. This can be downloaded from the Technology Solutions website at <http://www.tsl.uk.com/downloads.htm> .

A document is provided as part of the .zip folder which introduces the API. The RFID API is provided with Microsoft style compiled HTML help (.chm) and an intelli-sense file for general reference to the API. A sample application is also provided which demonstrates the use of the API.

5.6 Power management with the RFID 1059

All power for the RFID 1059 is drawn from the MC70/75/75. Maximum operating time is therefore obtained by managing the operation of the RFID 1059 optimally.

The RFID 1059 has two operating modes; continuous read mode and standby mode. The third mode is fully powered off. The reader is switched between the two operating modes by software commands, documented in the Low level command set. The reader is fully powered off when the COM port on the MC70/75/75A is closed.

The recommended power saving method is to close the serial port when the reader is not being used. The current consumption in Standby mode is high enough to reduce the MC70/75/75A battery life and the time taken to exit Standby mode is not much shorter than that from the serial port being opened. Any application using the RFID 1059 should therefore only open the COM port when an RFID transaction is to be performed. This is the approach taken with the Demonstration application and with SmartWedge RFID.

5.7 Fitting a SAM

To fit a SAM it is necessary to remove the cover of the RFID 1059. This must only be done in an ESD safe area with appropriate precautions to avoid the possibility of damage to the RFID 1059.

Remove the four Pozidriv screws securing the front cover:

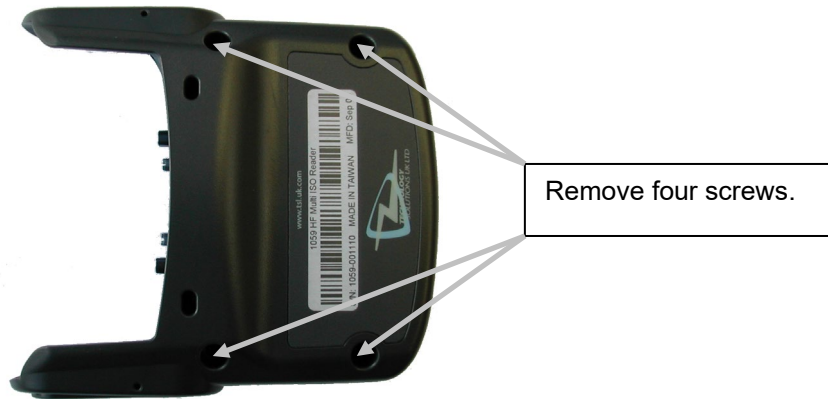


Figure 6: Location of cover fixing screws

Remove the front cover by pulling it away from the body of the RFID 1059, starting at the docking connector end.

The SAM socket is unlocked by sliding the metal cover towards the MC70/75/75A mating connector:



Figure 7: Unlocking the SAM socket

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Slide in the SAM, making sure that it is orientated correctly and then relock the SAM socket by sliding the metal cover back away from the MC70/75/75A mating connector:

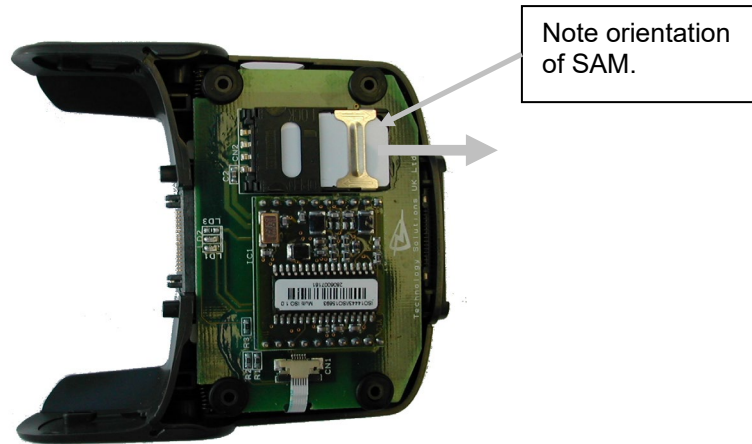


Figure 8: Inserting the SAM

Reassemble the RFID 1059 by refitting the cover and securing it with the four screws.

5.8 Compatible peripherals

The HF RFID 1059 is compatible with any standard Motorola peripheral that does not use the serial port (COM1) because this is used for RFID data. The serial port is not connected to the Docking Connector on the bottom of the HF RFID 1059. A list of compatible peripherals for the HF RFID 1059 is available for download from the Technology Solutions website at <http://www.tsl.uk.com/downloads.htm> .

It is not possible to use the HF RFID 1059 with the vehicle cradle (part number VCD7000-P000R). To charge the MC70/75/75A in a vehicle it is necessary to remove the HF RFID 1059 from the MC70/75/75A or to use the Auto charge cable (part number 25-70979-01). Third Party vehicle cradles are available and are listed in the compatible peripheral list.

5.9 ActiveSync

The MC70/75/75A with HF RFID 1059 attached can be used with ActiveSync, but the USB rather than the serial connection must be used.

6 Troubleshooting and Maintenance

6.1 Maintenance

For trouble-free service treat the RFID 1059 in the same way as you would the MC70/75/75A and observe the following tips when using the RFID 1059:

- + Do not store or use the RFID 1059 in any location that is dusty, damp, or wet.
- + Protect the RFID 1059 from temperature extremes. Do not leave it on the dashboard of a car on a hot day, and keep it away from heat sources.

6.2 Troubleshooting

Symptoms	Possible Cause	Action
The Application on the MC70/75/75A cannot communicate with the RFID 1059.	The MC70/75/75A is not firmly seated into the RFID 1059.	Remove and re-insert the MC70/75/75A from the RFID 1059, ensuring it is firmly seated.
	The port has not been opened.	Check that the Application has been configured to use COM1.
	The port is in use by another application.	Close the other application and try again.
	The baud rate is set incorrectly in the application.	Check that the application is set to 19200 baud, 8 data bits, no parity and one stop bit (settings may be different if the RFID 1059 has been reconfigured).
The RFID 1059 does not read a particular transponder	The RFID 1059 has been configured to exclude some transponder types.	Refer to the command documentation to include the appropriate transponder type.
	The transponder is out of range of the RFID 1059.	Move the transponder closer to the antenna.
MC70/75/75A battery does not charge	The battery is faulty.	Verify that other batteries charge properly. If so, replace the faulty battery.
	Ambient temperature is too warm.	Move the unit to an area where the ambient temperature is between 0°C and 35°C.
	The MC70/75/75A is not firmly seated into the RFID 1059.	Remove and re-insert the MC70/75/75A from the RFID 1059, ensuring it is firmly seated.
ActiveSync cannot connect to the MC70/75/75A	ActiveSync is not correctly configured on the PC or the MC70/75/75A.	Detach the RFID 1059 from the MC70/75/75A and try to ActiveSync directly to the MC70/75/75A. If this does

Symptoms	Possible Cause	Action
		not work then consult the MC70/75/75A User Guide.
	ActiveSync is using a serial connection.	ActiveSync must use USB with the RFID 1059 connected.
	The MC70/75/75A is not firmly seated into the RFID 1059.	Remove and re-insert the MC70/75/75A from the RFID 1059, ensuring it is firmly seated.
An accessory connected to the RFID 1059 does not work	The accessory uses a serial connection to the MC70/75/75A.	The accessory is not compatible with the RFID 1059 because only the USB port is available on the docking connector.
	The MC70/75/75A is not firmly seated into the RFID 1059.	Remove and re-insert the MC70/75/75A from the RFID 1059, ensuring it is firmly seated.

7 Technical specifications

7.1 Summary of specifications

The following table summarises the RFID 1059's intended operating environment and technical hardware specifications:

Performance Characteristics		
RF Transmit Frequency	13.56MHz	
Supported RFID Standards	ISO14443A, ISO14443B, ISO 15693, ISO 18000-3, ICODE	
Supported Tag-ICs	Tag-it HF-I	SR176
	Tag-it HF-I Light S	SRIX4K
	Philips ICODE SL2	LRI 12
	Infineon ISO15693	LRI 64
	MIFARE® Standard	LRI 512
	MIFARE® 4k	EM4135
	MIFARE® Pro	KSW Temp Sense
	MIFARE® Ultralight	Sharp S
	MIFARE® SmartMX	ASK GTML
	SLE 55Rxx	ASK GTML2ISO
	SRF55VxxP +S	TOSMART P064
	SLE 66CL160S	Jewel Tag (IRT0302B11 KSW)
	SLE 66CLX320P	ISO14443A Tags
	ISO14443B Tags	
	ISO15693 Tags	
Reading distance	Up to 8cm (3") using ISO7810 size credit card format transponders.	
RF Transmission Speed	Up to 848 kBit/s	
SAM support		
SAM clock	3.39MHz	
SAM VCC	5V	
SAM type	Form factor compatible with GSM SIM footprint	
Current consumption		
Current Consumption	< 150mA during RFID read	
	< 30mA in standby mode	
	0mA in shutdown mode	

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User indication	
Red, Green LEDs	Flash indicating activity (function may also be customised).
Connection Interfaces	
Physical interface	USB and power in to charge MC70/75
Reader power supply	Powered from host terminal
ActiveSync	via USB
Physical Characteristics	
Dimensions	90×82×32mm (3.54"x3.23"x1.26")
Weight	95g (3.35 oz)
Enclosure material	PC/ABS
Colour	Grey
Material finish	Sparked surface
Mechanical attachment	Snap-on action with optional locking screws
Docking	Attachment maintains dockability with Motorola docking cradle for charging and ActiveSync
Environmental	
Operating Temperature	-10°C to +50°C (14°F to 122°F)
Storage Temperature	-40°C to +60°C (-40°F to 140°F)
Humidity	Up to 90% Relative humidity Non Condensing
Drop specification	1.3m (4.26ft) to concrete, 6 drops per 6 sides over operating temperature; 1.5m (5ft) to concrete, 2 drops per 6 sides at ambient temperature 23°C (73°F)
Sealing	Internal components conformal coated
Electrostatic discharge	+/-15kV air discharge, +/-8kV direct discharge
Construction	RoHS compliant
Regulatory	
EMI/RFI	EN 300 330, EN 301 489, CE marked
	USA - FCC Part 15
Electrical Safety	Europe - EN60950-1
	USA - UL60950
Notes	
All PCBs are conformally coated	



7.2 Pin-outs



PIN	Docking Connector (Socket)
1	Power Ground
2	Cradle Detect
3	RS232 DCD/Trigger
4	USB_D-
5	USB_D+
6	USB_Gnd
7	USB_Vbus
8	USB_ID
9	Not Connected
10	Not Connected
11	Not Connected
12	Not Connected
13	Not Connected
14	Not Connected
15	Not Connected
16	External DC In 5.4V

7.3 Regulatory Information

All TSL devices are designed to be compliant with appropriate regulations and standards and are CE marked. Any changes or modifications to TSL equipment, not expressly approved by TSL, could void the user's authority to operate the equipment.

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.

7.4 Statement of compliance

Technology Solutions hereby declares that this device is in compliance with the essential requirements and other relevant provisions of Directives 1999/5/EC, 89/336/EEC and 73/23/EEC. Declaration of Conformities may be obtained from Technology Solutions on request.

The RFID 1059 has been tested to and found to comply with the following standards for use within the Economic Union:

EMC Directive 89/336/EEC, R&TTE Directive 99/5/EC:

EN 301 489-3 V1.4.1 (2002-08)

EN 300 330-2 V1.1.1 (2001-06)

Low Voltage Directive 73/23/EEC:

IEC 60950-1 1st Edition 2001 (National and group differences in accordance with CB Bulletin No. 109A December 2005)

The RFID 1059 has also been tested and found to comply with:

Title 47 of the CFR:2004, Part 15, Subpart (c)

FCC emission requirements for Intentional Radiators; Parts 15.207, 15.209 & 15.225

The RFID 1059 complies with:

RoHS Directive 2002/95/EC

8 Health and Safety Recommendations

Ergonomic Recommendations

Caution: In order to avoid or minimize the potential risk of ergonomic injury, follow the recommendations below. Consult with your local Health & Safety Manager to ensure that you are adhering to your company's safety programs to prevent employee injury.

- + Reduce or eliminate repetitive motion
- + Maintain a natural position
- + Reduce or eliminate excessive force
- + Keep objects that are used frequently within easy reach
- + Perform tasks at correct heights
- + Reduce or eliminate vibration
- + Reduce or eliminate direct pressure
- + Provide adjustable workstations
- + Provide adequate clearance
- + Provide a suitable working environment
- + Improve work procedures.

For vehicle installation and use

An air bag inflates with great force. DO NOT place objects, including either installed or portable wireless equipment, in the area over the air bag or in the air bag deployment area. If in-vehicle wireless equipment is improperly installed and the air bag inflates, serious injury could result.

RF signals may affect improperly installed or inadequately shielded electronic systems in motor vehicles (including safety systems). Check with the manufacturer or its representative regarding your vehicle. You should also consult the manufacturer of any equipment that has been added to your vehicle.

Power Supply

Use only Motorola-approved cradles, chargers and power supplies with the HF RFID 1059. Use of an alternative power supply will invalidate any approval given to this device, void the warranty for the product and may be dangerous.

9 Waste Electrical and Electronic Equipment (WEEE)

For EU Customers: All products at the end of their life must be returned to TSL for recycling. For information on how to return product please contact TSL.

10 Warranty

(A) Warranty TSL's hardware Products are warranted against defects in workmanship and materials for a period of twelve (12) months from the date of shipment, unless otherwise provided by TSL in writing, provided the Product remains unmodified and is operated under normal and proper conditions. Warranty provisions and durations on software, integrated installed systems, Product modified or designed to meet specific customer specifications ("Custom Products"), remanufactured products, and reconditioned or upgraded products, shall be as provided in the applicable Product specification in effect at the time of purchase or in the accompanying software license.

(B) Spare Parts Spare parts (i.e. parts, components, or subassemblies sold by TSL for use in the service and maintenance of Products) are warranted against defects in workmanship and materials for a period of thirty (30) days from the date of shipment. Spare parts may be new or originate from returned units under the conditions set forth in subsection D below.

(C) Repair of TSL branded hardware For repairs on TSL branded hardware Products under this Agreement, including repairs covered by warranty, the repair services provided are warranted against defects in workmanship and materials on the repaired component of the Product for a period of thirty (30) days from the shipment date of the repaired Product, or until the end of the original warranty period, whichever is longer. Any such defects shall be notified to TSL in writing within 7 days of the same becoming apparent.

(D) Product Service Products may be serviced or manufactured with parts, components, or subassemblies that originate from returned products and that have been tested as meeting applicable specifications for equivalent new material and Products. The sole obligation of TSL for defective hardware Products is limited to repair or replacement (at TSL's option) on a "return to base (RTB)" basis with prior TSL authorisation.

Customer is responsible for prompt shipment to TSL and assumes all costs and risks associated with this transportation; return shipment to the Customer will be at TSL's expense. Customer shall be responsible for return shipment charges for product returned where TSL determines there is no defect ("No Defect Found"), or for product returned that TSL determines is not eligible for warranty repair. No charge will be made to Buyer for replacement parts for warranty repairs. TSL is not responsible for any damage to or loss of any software programs, data or removable data storage media, or the restoration or reinstallation of any software programs or data other than the software, if any, installed by TSL during manufacture of the Product.

(E) Original Warranty Period Except for the warranty applying solely to the repaired component arising from a repair service as provided in Section C above, the aforementioned provisions do not extend the original warranty period of any Product that had either been repaired or replaced by TSL.

(F) Warranty Provisions The above warranty provisions shall not apply to any Product

(i) which has been repaired, tampered with, altered or modified, except by TSL's authorized service personnel; (ii) in which the defects or damage to the Product result from normal wear and tear, misuse, negligence, improper storage, water or other liquids, battery leakage, use of parts or accessories not approved or supplied by TSL, or failure to perform operator handling and scheduled maintenance instructions supplied by TSL;

(iii) which has been subjected to unusual physical or electrical stress, abuse, or accident, or forces or exposure beyond normal use within the specified operational and environmental parameters set forth in the applicable Product specification; nor shall the above warranty provisions apply to any expendable or consumable items, such as batteries, supplied with the Product.

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About TSL[®]



Technology Solutions UK Ltd (TSL[®]), part of HID Global, is a leading manufacturer of high performance mobile RFID readers used to identify and track products, assets, data or personnel.

For over two decades, TSL[®] has delivered innovative data capture solutions to Fortune 500 companies around the world using a global network of distributors and system integrators. Specialist in-house teams design all aspects of the finished products and software ecosystems, including electronics, firmware, application development tools, RF design and injection mould tooling.

TSL[®] is an ISO 9001:2015 certified company.



ISO 9001: 2015

Contact

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About HID Global



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We make it possible for people to transact safely, work productively and travel freely. Our trusted identity solutions give **people** convenient access to physical and digital **places** and connect **things** that can be identified, verified and tracked digitally. Millions of people around the world use HID products and services to navigate their everyday lives, and billions of things are connected through HID technology. We work with governments, educational institutions, hospitals, financial institutions, industrial businesses and some of the most innovative companies on the planet. Headquartered in Austin, Texas, HID Global has over 4,000 employees worldwide and operates international offices that support more than 100 countries. HID Global is an ASSA ABLOY Group brand.

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