Triscan 1084 User Guide

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History:

Version	Date	Modifications
1.0	27/02/08	Document Creation
1.1	17/02/2009	Update to include MC75 support and revised ESD specifications.
1.2	28/7/2009	Update for new capacitive and optical variants. Software information moved to separate document.
1.3	20/4/2010	Added FCC and IC statement section 7.3.

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1 Introduction

The family of Biometric Tri-Scan Readers combine Contact Smart Card, Contactless Smart Card (RFID) and Finger Biometric capture in a rugged, snap on peripheral for the Motorola MC70/75. This makes them ideal for mobile fingerprint biometric and ID applications. The fingerprint sensors are FIPS201 compliant as single finger capture devices. Tri-Scan readers are powered by the MC70/75 terminal and the mechanical design allows them to remain compatible with existing MC70/75 accessories such as the desktop charge cradle and car charger.

There are three versions of the product in the family:

Capacitive fingerprint sensor used in the reader	1084-02-SO-TSR
Optical fingerprint sensor used in the reader	1084-03-SO-TSR
No fingerprint sensor (smartcard only)	1084-04-SO-TSR

The Tri-Scan Reader is compatible with most contact and contactless Smart Cards including all Mifare contactless cards. The contactless card reader is hardware compatible with the CAC card and ICAO ePassports. The contact Smart Card reader is compliant to ISO7816-1,2,3,4.

Figure 1: Tri-Scan variants

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2 Parts of the Tri-Scan 1084

The photograph below shows the capacitive fingerprint sensor version of the Tri-Scan. The other versions differ only in the type of fingerprint sensor, the other parts identified below remain the same.

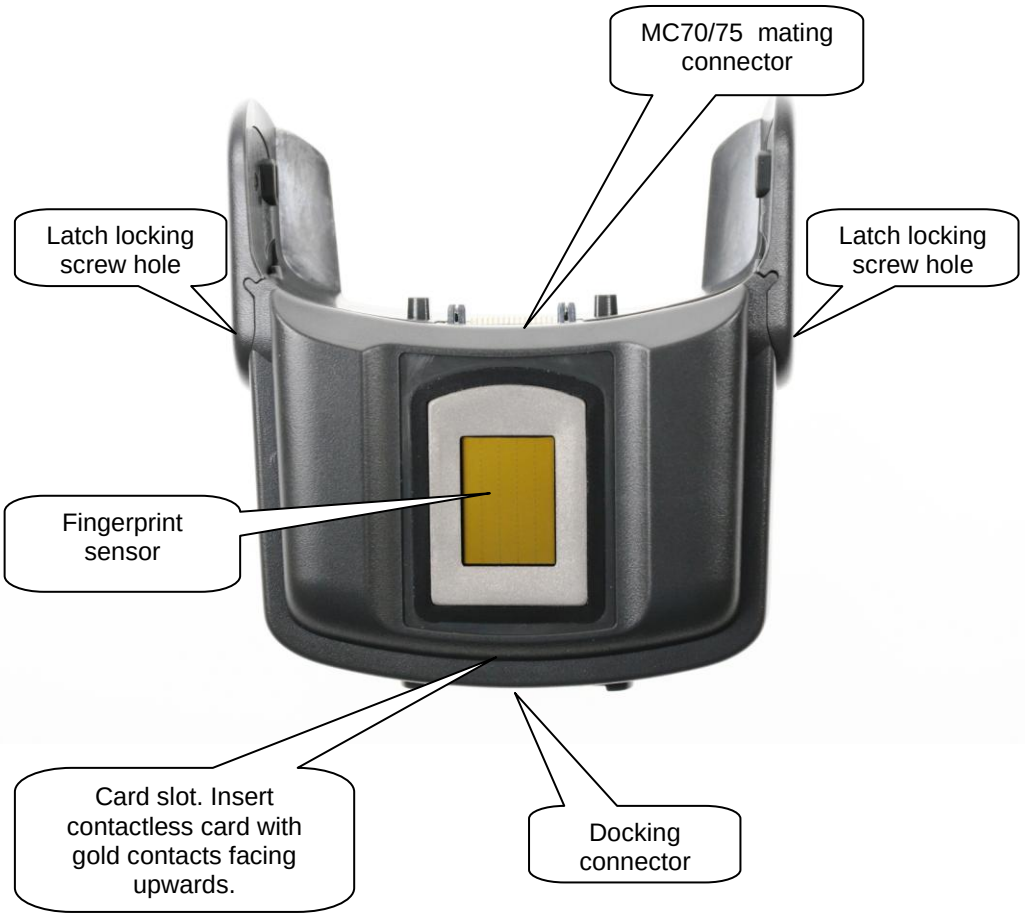

Figure 2: The parts of the Tri-Scan 1084

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3 Attaching to an MC70/75

3. For semi-permanent installation fit M2×6mm pan head Pozidriv screws into the latch locking screw holes.

Figure 3: Attaching to an MC70/75

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4 Detaching from an MC70/75

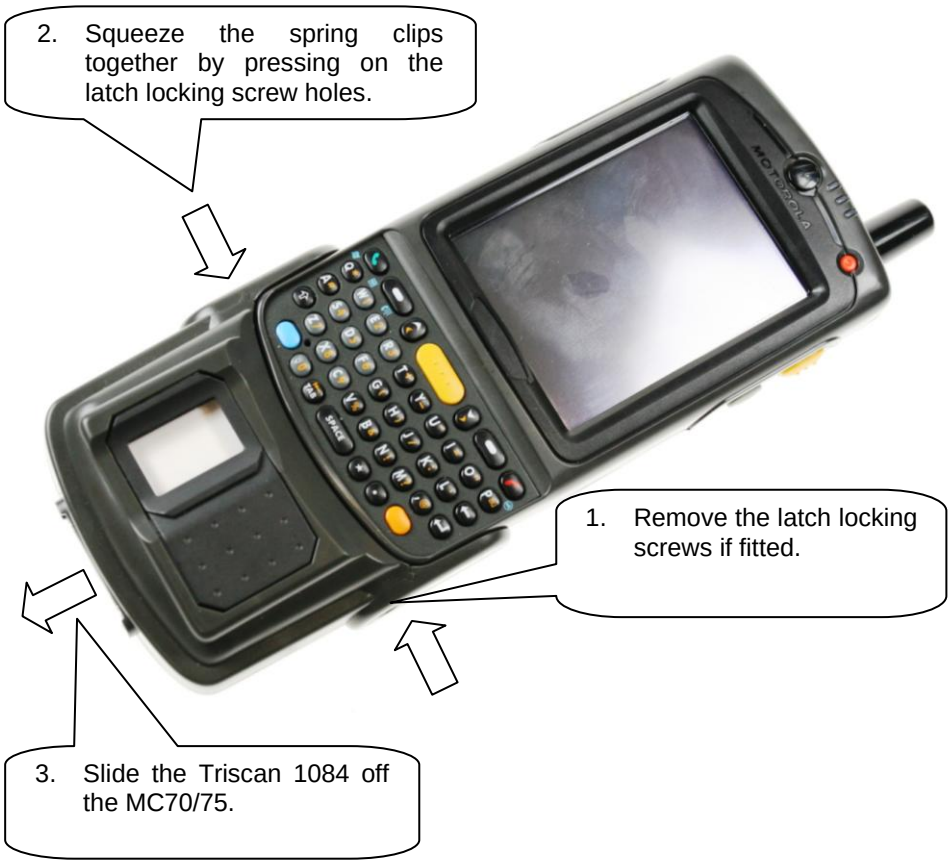

Figure 4: Detaching from an MC70/75

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5 Using the Tri-Scan 1084

5.1 Driver and software installation

Drivers and software are supplied in the Demonstration kit and Software Development kit. Separate documents are provided in these kits providing installation and deployment information.

For information on the installation and operation of third party applications refer to the appropriate software manual.

5.2 Contact smartcard operation

The smartcard is inserted at the bottom of the Tri-Scan 1084 unit. The contacts should face upwards.

Correct orientation; the smartcard contacts are facing upwards.

Incorrect orientation; the smartcard contacts are facing downwards.

Figure 5: Inserting a smartcard into the Tri-Scan 1084

Before the Triscan 1084 can be used the driver must be installed (see section 5.1). The functionality of the Triscan 1084 is then determined by the application on the MC70/75 and the smartcard or memory card.

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5.3 Contactless smartcard and RFID operation

The Tri-Scan is designed to read RFID and contactless smartcards of ISO/IEC 7810 ID-1 size in when they are inserted in the slot. It does not matter which way up the card is inserted.

Other RFID transponders and e-Documents can be read at the back of the Tri-Scan reader. The transponder should be placed parallel to the back of the Tri-Scan reader.

Figure 6: Reading RFID transponders at back of Tri-Scan

5.4 Compatible peripherals

The Tri-Scan 1084 is compatible with any standard Motorola peripheral that does not use the serial port (COM1). The serial port is not connected to the Docking Connector on the bottom of the Tri-Scan 1084. If a peripheral is attached which uses the USB port then the Tri-Scan 1084 will disconnect from the USB port and switch the MC75 USB to the external port. This means that the Tri-Scan 1084 cannot be used at the same time as a USB connection.

It is not possible to use the Tri-Scan 1084 with the Motorola vehicle cradle (part number VCD7000-P000R). Third party vehicle cradle solutions which accommodate the Tri-scan 1084 on an MC70/75 are available from Brodit and RAM Mount.

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5.5 ActiveSync

The MC70/75 with Tri-Scan 1084 attached can be used with ActiveSync, but the USB rather than the serial connection must be used. The USB is automatically switched over to the external port for ActiveSync which means the Tri-Scan 1084 cannot be used at the same time as USB ActiveSync. If ActiveSync is required at the same time as the Tri-Scan 1084 (for application development for example) then ActiveSync should be configured to run over Bluetooth. An application note describing how to configure ActiveSync over Bluetooth is provided on the CD (Bluetooth ActiveSync on MC70.pdf).

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6 Troubleshooting and Maintenance

6.1 Maintenance

For trouble-free service treat the Tri-scan 1084 in the same way as you would the MC70/75 and observe the following tips when using the Tri-scan 1084:

- Do not store or use the Tri-scan 1084 in any location that is dusty, damp, or wet.
- Protect the Tri-Scan 1084 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 cannot communicate with the Tri-scan 1084.	The MC70/75 is not firmly seated into the Tri-Scan 1084.	Remove and re-insert the MC70/75 from the Tri-scan 1084, ensuring it is firmly seated.
	The reader is in use by another application.	Close the other application and try again.
A user application or Smartcard API reports reader unavailable.	The comm port is being used by another application	Ensure that all other applications have not opened COM1:
The Tri-Scan 1084 does not read a particular card	The card is upside down / not inserted fully	Check the smartcard is inserted in the correct orientation. Remove and reinsert fully.
	The wrong protocol / mode is being used to communicate with the card.	Verify the correct protocol (T=0 or T=1) is being used to communicate with the card. If the card is a memory card check that the memory card API is not required.
MC70 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 is not firmly seated into the Tri-Scan 1084.	Remove and re-insert the MC70/75 from the Tri-Scan 1084, ensuring it is firmly seated.

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Symptoms	Possible Cause	Action
ActiveSync cannot connect to the MC70/75	ActiveSync is not correctly configured on the PC or the MC70/75.	Detach the Tri-Scan 1084 from the MC70/75 and try to ActiveSync directly to the MC70/75. If this does not work then consult the MC70/75 User Guide.
	ActiveSync is using a serial connection.	ActiveSync must use USB with the Tri-Scan 1084 connected.
	The MC70/75 is not firmly seated into the Tri-scan 1084.	Remove and re-insert the MC70/75 from the Tri-Scan 1084, ensuring it is firmly seated.
An accessory connected to the Tri-Scan 1084 does not work	The accessory uses a serial connection to the MC70/75.	The accessory is not compatible with the Tri-scan 1084 because only the USB port is available on the docking connector.
	The MC70/75 is not firmly seated into the Tri-Scan 1084.	Remove and re-insert the MC70/75 from the Tri-Scan 1084, ensuring it is firmly seated.

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7 Technical specifications

7.1 Summary of specifications

The following table summarises the Tri-Scan 1084's intended operating environment and technical hardware specifications:

Capacitive Fingerprint Sensor	
Acquisition rate	15 frames/second
Sensor resolution	508dpi
Pixel array	256 x 360 pixels
Sensor area	12.8 x 18.0 mm
ESD protection	IEC 61000-4-2 Level 4 ±15kV
Raw image size	Approximately 100kbyte
Template size	Algorithm dependent – typically 300-400 bytes
Optical Fingerprint Sensor	
Sensor resolution	500dpi
Identification time (1:500)	1s typical
Authentication time (1:1)	0.9s typical
False Acceptance Rate (FAR)	Adjustable down to 10^{-8}
Pixel array	256 x 400 pixels
Sensor area	14 x 22 mm
ESD protection	IEC 61000-4-2 Level 4 ±15kV
Raw image size	Approximately 100kbyte
Template size	Algorithm dependent – typically 100-400 bytes
Local storage capacity	500 users, 1000 templates
Contact Smartcard Reader	
Compliance	ISO7816-1,2,3,4 PC/SC, EMV2000 Level 1 capable. T=0, T=1 Protocol. I2C
Connector	Meets ISO 7816-2, rated for >100 000 insertions.
Card size	Full (ID-1)
Card support	Up to 420Kbps card interface, clock frequency up to 8MHz, 5V, 3V, 1.8V smart cards.

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Contactless Smartcard Reader	
RF Transmit Frequency	13.56MHz
Supported RFID Standards	ISO14443A, ISO14443B, ISO 15693
Supported contactless cards	• ISO15693 • ISO14443A/B • Philips: MIFARE®, DESFire®, MIFARE ProX®, SMART MX, and iCode® • HID: *iCLASS*®
Reading distance	Intended for in-slot card reading, capable of reading up to 2.5cm (1") from back surface dependent on transponder type.
Connection Interfaces	
Charging of host terminal	Host terminal charged through the reader
Reader power supply	Powered from host terminal
ActiveSync	via USB, automatically switched when connected to a PC
Physical Characteristics	
Dimensions	90 (h)×82(w)×36(d)mm (3.54"x3.23"x1.42") maximum
Weight	Capacitive 100g (3.6 oz), Optical 110g (3.9oz)
Enclosure material	Lexan Polycarbonate
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 23ºC (73ºF)
Sealing	Internal components conformal coated
Electrostatic discharge	+/-15kV air discharge, +/-8kV direct discharge
Construction	RoHS compliant

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Regulatory	
EMI/RFI	TBC
Electrical Safety	TBC

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

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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 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.

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.

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7.4 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 Triscan 1084. Use of an alternative power supply will invalidate any approval given to this device, void the warranty for the product and may be dangerous.

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8 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.

9 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

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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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TSL is not responsible for any damages incurred during shipment if the approved shipping container is not used. Shipping the units improperly can possibly void the warranty. If the original shipping container was not kept, contact your local distributor or TSL to have another sent to you.

TSL shall not be responsible for any injury, damage or loss of whatever kind caused directly or indirectly by the goods whether as a result of their manufacture, operation, use or otherwise and the customer shall indemnify TSL from any claim arising from any loss suffered by any third party.

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