

Smartcard 1060 User Guide

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History

Version	Date	Modifications
0.9	30/10/06	Document Creation
1.0	23/02/07	Updated to reflect full driver release. Added note on memory card support

1 Introduction

Technology Solutions' Smartcard 1060 provides the Symbol MC70 with smartcard functionality. The unit attaches as a snap on to the MC70. 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 accessories such as desktop cradles and chargers.

The Smartcard 1060 is powered from the MC70. It can be used with all smartcards compliant with the ISO7816 standard. In addition an extension API is available that allows the smartcard reader to read a wide range of memory cards that use the same physical format.

2 Parts of the Smartcard 1060

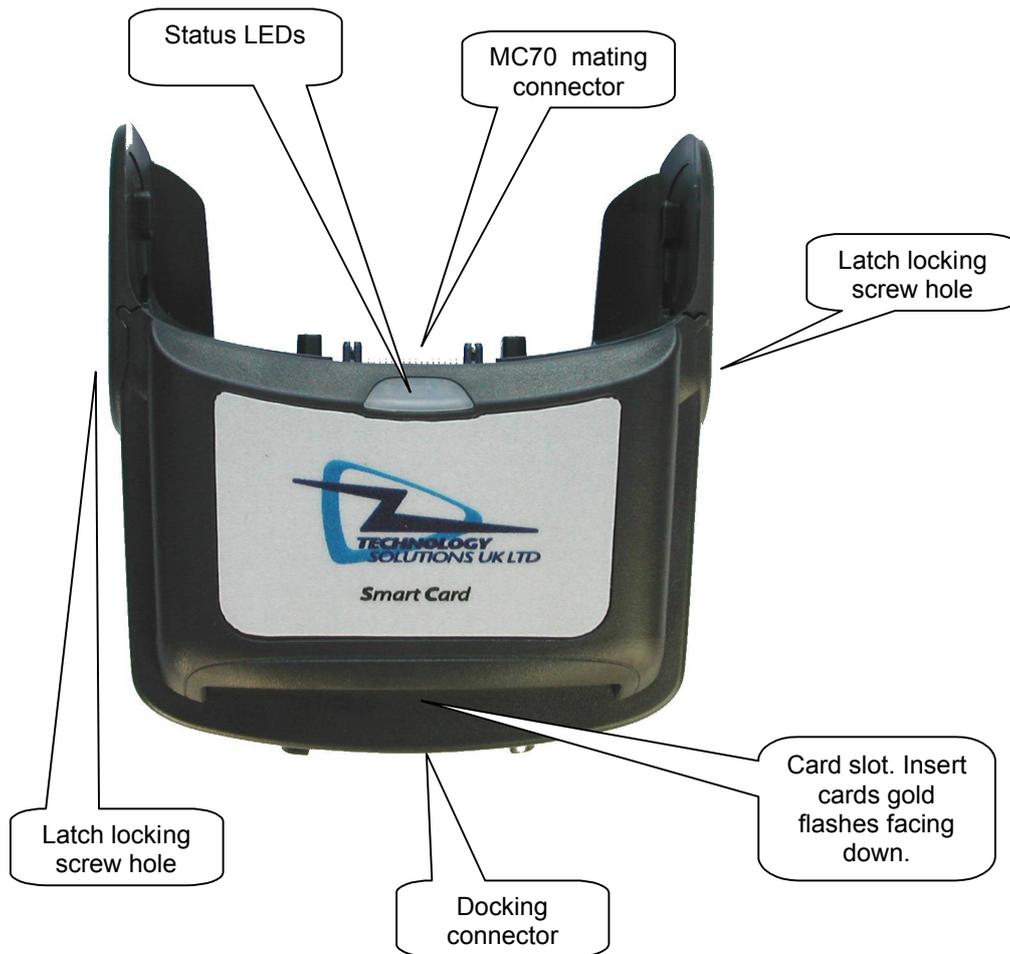


Figure 1: The parts of the Smartcard 1060

3 Attaching to an MC70

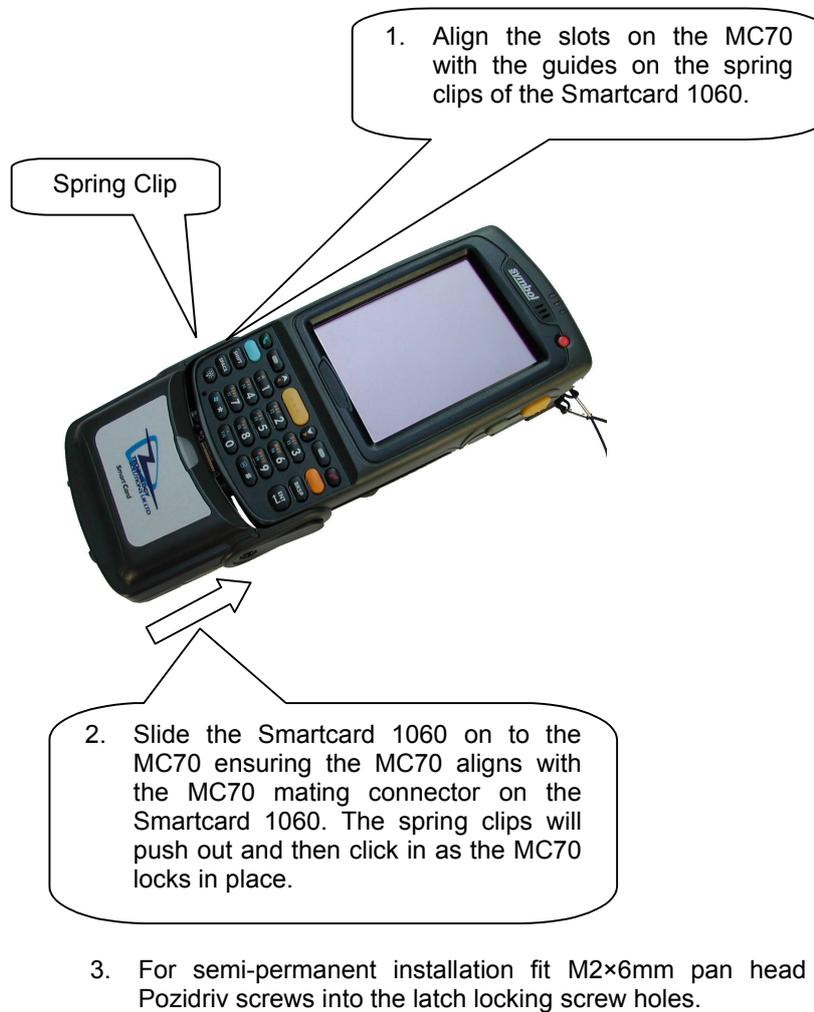


Figure 2: Attaching to an MC70

4 Detaching from an MC70



Figure 3: Detaching from an MC70

5 Using the Smartcard 1060

5.1 Installing the Smartcard Driver

Before the Smartcard 1060 can be used the driver needs to be deployed to the MC70. The driver is supplied as a cab file for quick deployment.

5.1.1 CAB File Install

Copy the .cab file to the device. Run the .cab file on the device. Then warm boot the device to load the driver.

5.1.2 Booting the MC70

The MC70 reset sequences are summarised below. For a more detailed description of resetting the terminals refer to the terminal user guide (The [MC70 User Guide](#) is available from the Symbol website).

Warm Boot

Hold down the power button for approximately five seconds. As soon as the terminal starts to boot release the power button.

Cold Boot

Simultaneously press the Power button and the 1 and 9 keys.

5.2 Memory Card Support

The standard smartcard driver enables the smartcard reader to be accessed from the Windows Mobile Smart Card Resource Manager. This allows the reader and inserted cards to be accessed via the standard PCSC functions provided by this API.

An additional memory card dll is available that talks through the Smart Card Resource Manager to enable non smartcard memory card support. Contact Technology Solutions if you require this dll.

5.3 Basic operation

The smartcard is inserted from the bottom of the Smartcard 1060 unit. The contacts should face downwards. When the reader is powered, the green LED on the unit is on. When communication with a smartcard is being conducted the green LED flashes at a fixed rate. A smartcard should not be removed while the green LED is flashing.



Correct orientation; the smartcard contacts are facing downwards.



Incorrect orientation; the smartcard contacts are facing upwards.

Figure 4: Inserting a smartcard into the Smartcard 1060

Before the Smartcard 1060 can be used the driver must be installed (see section 5.1). The functionality of the Smartcard 1060 is then determined by the application on the MC70 and the smartcard or memory card.

The driver is supplied with a simple test application (TestResMan) that allows basic communication with a smartcard to be tested without writing code.

The following example uses TestResMan to perform a basic functional test of the Smartcard 1060. TestResMan is supplied with the driver install package. This application does not require installing but simply copying to the device. It can then be launched.

If TestResMan exits as soon as it is launched the smart card driver is not deployed. Install the driver as described above (section 5.1). Ensure the device has had a warm boot to load the driver.

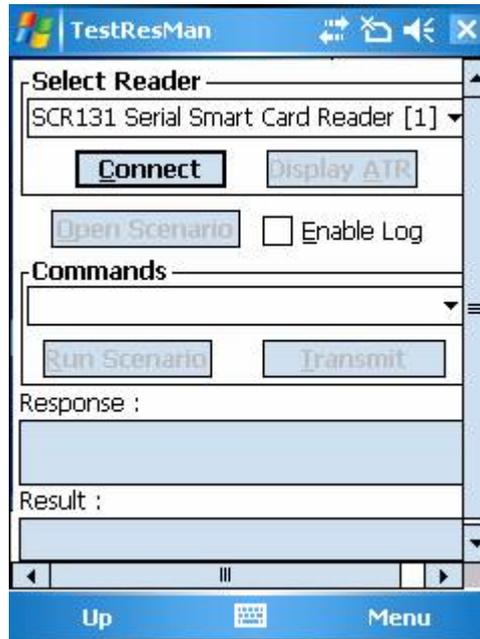


Figure 5: Connecting to a smartcard

On launching TestResMan the installed smartcard readers should be listed in the top dropdown. The Smartcard 1060 will be listed as “SCR131 Serial Smart Card Reader [1]”. Usually this will be the only reader in the list. Tap connect to initiate a connection to the reader, this displays the protocol selection dialog.

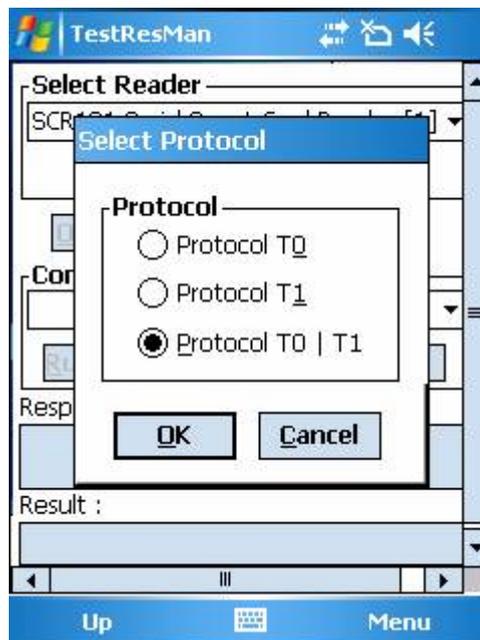


Figure 6: Selecting Card Protocol

Insert a card into the Smartcard 1060 reader. If the supported / required protocol is known it can be selected otherwise use the default option (either protocol).

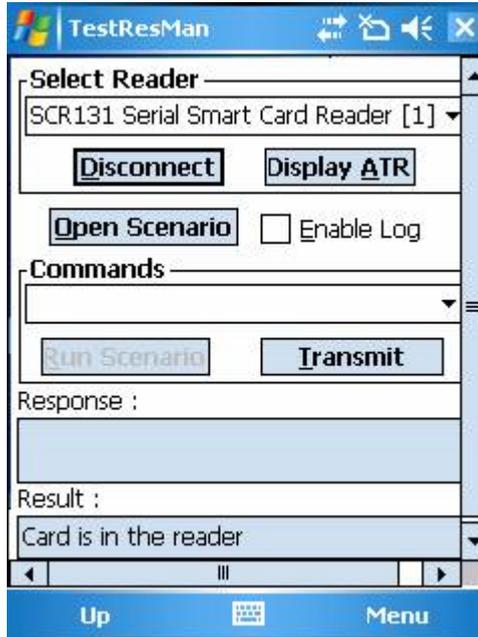


Figure 7: Connected to a smartcard

If connection is successful the 'Result :' displays "Card is in the reader. If not an appropriate error message is displayed.

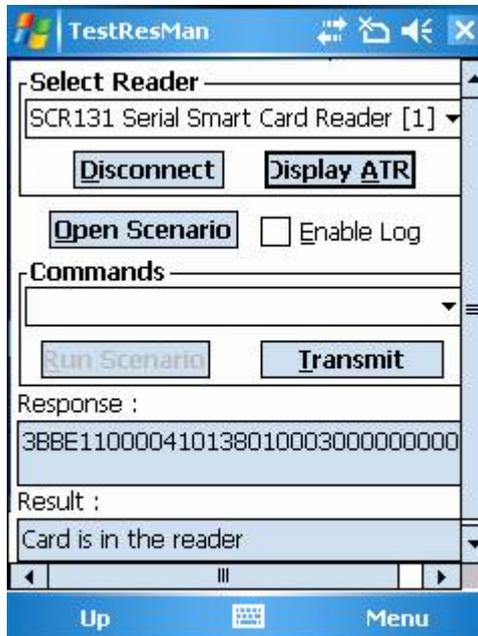


Figure 8: ATR Response

Tapping 'Display ATR' reports the Answer To Reset with which the card responded as it connected.



Figure 9: Send Command

Commands can be manually entered in HEX into the commands drop down. Tapping 'Transmit' will send the command to the card. The response is shown in the 'Response :' area. The example above shows a successful select file command for file ID FF00 sent to an ACOS2 smartcard.

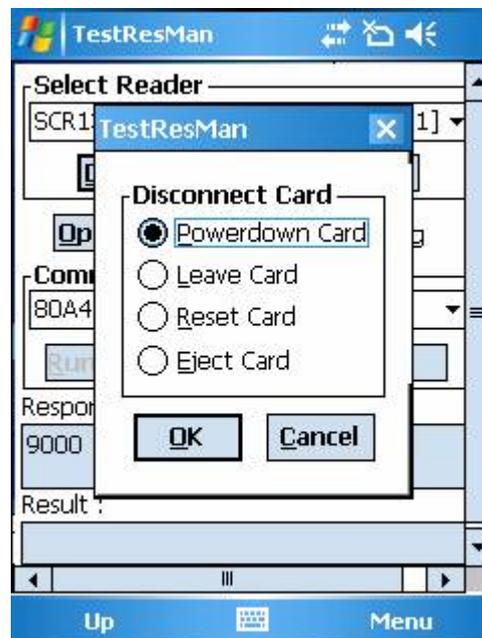


Figure 10: Disconnect Smartcard

Before removing the card you should disconnect. Tap 'Disconnect' to present the disconnect options, then tap OK to disconnect.

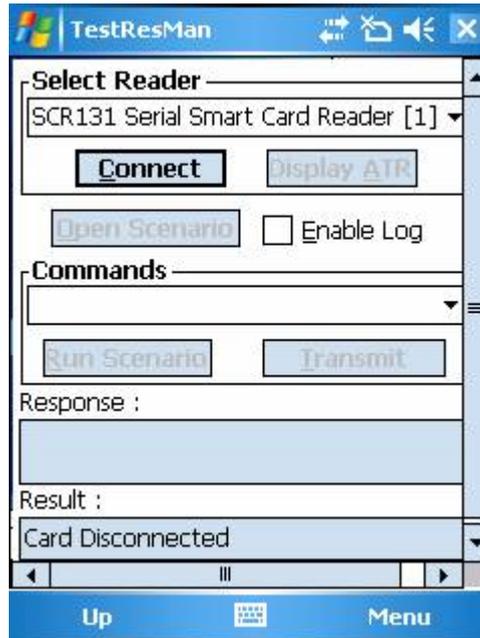


Figure 11: Safe to Remove Smartcard

Once the card is disconnected the card can be removed from the reader.

5.4 Status LEDs

The status LEDs on the front of the Smartcard 1060 provide an indication of the operating status of the Smartcard 1060.

LED colour	Status
Off	The MC70 is not attempting communication with the Smartcard 1060. The unit is powered off.
Green continuous	The MC70 has opened the COM port to communicate with the Smartcard 1060, the Smartcard 1060 is idle.
Green flash	Communication with a smartcard in the Smartcard 1060 is established. The card should not be removed while the LED is flashing.

5.5 Software support for the Smartcard 1060

The Smartcard 1060 is provided with a driver that integrates with the Microsoft Smartcard Resource Manager that is part of the MC70 Windows Mobile 5 operating system. This allows the generic Microsoft API to be used to communicate with smartcards (and memory cards) inserted into the Smartcard 1060. The Microsoft documentation for this API can be found here:

<http://msdn.microsoft.com/library/default.asp?url=/library/en-us/wcesecurity5/html/wce50conSmartCardResourceManager.asp>

The Smartcard 1060 reader name is “SCR131 Serial Smart Card Reader [1]”. This will be returned when using list readers to enumerate available readers or can be passed as a constant for the reader name parameter in the API functions.

This API can also be used from managed code using P/Invoke. There are numerous examples on the web and commercial solutions such as the Smartcard API (Windows CE) from Subsembly (www.subsembly.com).

The reader can also be used with the Memory Card API (MCSCM.dll) to read and write non smart card memory cards.

5.6 Compatible peripherals

The Smartcard 1060 is compatible with any standard Symbol peripheral that does not use the serial port (COM1) because this is used for communication with the Smartcard 1060. The serial port is not connected to the Docking Connector on the bottom of the Smartcard 1060. A list of compatible peripherals for the Smartcard 1060 is available for download from the Technology Solutions website at <http://www.tsl.uk.com/downloads.htm> .

It is not possible to use the Smartcard 1060 with the vehicle cradle (part number VCD7000-P000R). To charge the MC70 in a vehicle it is necessary to remove the Smartcard 1060 from the MC70 or to use the Auto charge cable (part number 25-70979-01).

5.7 ActiveSync

The MC70 with Smartcard 1060 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 Smartcard 1060 in the same way as you would the MC70 and observe the following tips when using the Smartcard 1060:

- Do not store or use the Smartcard 1060 in any location that is dusty, damp, or wet.
- Protect the Smartcard 1060 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 cannot communicate with the Smartcard 1060.	The MC70 is not firmly seated into the Smartcard 1060.	Remove and re-insert the MC70 from the Smartcard 1060, ensuring it is firmly seated.
	The driver is not installed.	Use TestResMan to check the driver is installed (see 5.1).
	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 green LED is on continuous but the application reports reader unavailable.	The comm port is being used by another application	Ensure that all other applications have not opened COM1:
The Smartcard 1060 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

Symptoms	Possible Cause	Action
		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 is not firmly seated into the Smartcard 1060.	Remove and re-insert the MC70 from the Smartcard 1060, ensuring it is firmly seated.
ActiveSync cannot connect to the MC70	ActiveSync is not correctly configured on the PC or the MC70.	Detach the Smartcard 1060 from the MC70 and try to ActiveSync directly to the MC70. If this does not work then consult the MC70 User Guide.
	ActiveSync is using a serial connection.	ActiveSync must use USB with the Smartcard 1060 connected.
	The MC70 is not firmly seated into the Smartcard 1060.	Remove and re-insert the MC70 from the Smartcard 1060, ensuring it is firmly seated.
An accessory connected to the Smartcard 1060 does not work	The accessory uses a serial connection to the MC70.	The accessory is not compatible with the Smartcard 1060 because only the USB port is available on the docking connector.
	The MC70 is not firmly seated into the Smartcard 1060.	Remove and re-insert the MC70 from the Smartcard 1060, ensuring it is firmly seated.

7 Technical specifications

7.1 Summary of specifications

The following table summarises the Smartcard 1060's intended operating environment and technical hardware specifications:

Performance Characteristics	
Compliance	ISO17816-1, 2, 3, 4 T=0, T=1 protocol Synchronous and Asynchronous mode
Supported Smartcards	All ISO7816 compliant T=0, T=1 cards
Supported memory cards	Infineon (and compatibles) SLE4406, SLE4406E, SLE4406S, SLE4406SE, SLE4418, SLE4428, SLE4432, SLE4436, SLE4436E, SLE4442 SLE5536, SLE5536E, SLE4404
	Schlumberger Primflex Store8K, Primeflex Store2K
	Atmel (and compatibles) AT24SC01ASC, AT24C02SC, AT24C04SC, AT24C08SC, AT24C16SC, AT24C32SC, AT24C64SC, AT24C128SC, AT24C256SC, AT24C512SC, AT88SC153, AT88SC1608
Current consumption	
Current Consumption	< 50mA during smartcard read (influenced by smart card current)

	0mA in shutdown mode
User indication	
Green LED	Flash indicating activity (function may also be customised).
Connection Interfaces	
Physical interface	USB and power in to charge MC70
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 Symbol 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 55022:1998, EN 55024:1998, CE marked

	USA - FCC Part 15
Electrical Safety	Europe - EN60950-1
	USA - UL60950
Notes	
All PCBs are conformally coated	

7.2 Pin-outs



<i>PIN</i>	<i>Docking Connector (Socket)</i>
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.

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 Symbol-approved cradles, chargers and power supplies with the Smartcard 1060. Use of an alternative power supply will invalidate any approval given to this device, void the warranty for the product and may be dangerous.

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 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.