Symbol MiniScan Family of Scanners

Quick Reference Guide

Motorola, Inc.
One Motorola Plaza
Holtsville, N.Y. 11742-1300
http://www.motorola.com/enterprisemobility

Warranty

For the complete Motorola hardware product warranty statement, go to:
http://www.motorola.com/enterprisemobility/warranty.

Patents

This product is covered by one or more patents. For patent information go to:
http://www.motorola.com/enterprisemobility/patents.

Introduction

The new Symbol MiniScan family is the next generation of industrial fixed scanners. The scanners provide the quickest, easiest and most flexible integration of bar code scanning into all types of devices. The Symbol MiniScan family offers high performance scan engines, along with a housing, exit window, decoder and variety of interfaces (including USB) in a compact durable housing. All Symbol MiniScan products can be easily used as stand-alone, fixed-mount or embedded scanners.

The following models are available:

- **Symbol MS320x**
  The Symbol MS320x offers a high speed omnidirectional scan pattern that reads bar codes quickly and accurately, minimizing the need for precise positioning of linear 1-D bar codes. The Symbol MS320x scanner is also capable of reading RSS and 2-D bar codes such as PDF417 and composite codes.

- **Symbol MS220x**
  The Symbol MS220x offers a high-speed "Smart" raster pattern optimized for 2-D bar code applications and poorly printed 1-D codes. The high scan rate of 640 scans per second ensures fast and reliable data on all 1-D and 2-D bar codes such as PDF417, Micro-PDF and RSS.

- **Symbol MS120xFZY**
  The Symbol MS120xFZY incorporates fuzzy logic for premium scanning performance on all types of 1-D and RSS bar codes including poorly printed and low contrast.

- **Symbol MS120xWA**
  The Symbol MS120xWA features a broad 60° scan angle to accommodate large 1-D and RSS bar codes within an extremely close range.

- **Symbol MS954**
  The Symbol MS954, packaged in the smaller MiniScan enclosure, offers customers easier integration into tight areas. In addition, the Symbol MS954 offers excellent 1-D data capture performance. The Symbol MS954 supports RS232 only.

- **Symbol MS440x**
  The Symbol MS440x integrates Symbol's SE4400 imager engine and PL4407 decoder to offer the highest performance in the smallest enclosure. This tiny MiniScan captures all 1-D and 2-D bar codes omnidirectionally and also features signature and image capture.

Accessories

- For power connection:
  - 110V power supply, US,
    p/n KT-14001-001R
  - 220V power supply, Europe,
    p/n 50-14000-009R

- 100V power supply, Asia,
  p/n 50-14000-010R.

- For data connection:

  ✓ *NOTE* Only Symbol MiniScan scanner models
  ending in '07' (e.g., Symbol MSxx07) can
  communicate over USB.

  - Push button trigger and cable,
    p/n 25-04950-01R

  - Female DB9 in straight connector to
    RS-232 host,
    p/n 25-58918-01R

  - Female DB9 in right angle connector to RS-232
    host,
    p/n 25-58919-01R

  - Female DB9 in right angle connector to USB host
    (Type A connector),
    p/n 25-58923-01R

  - Female DB9 in straight connector with trigger jack
    and beeper to USB (Type A connector),
    p/n 25-58925-01R

  - Female DB9 in straight connector to Synapse
    Adapter Cable (6 ft. straight), p/n 25-58921-01

  - Photo sensor trigger and cable,
    p/n 25-13176-01R

  - USB Cable (6 ft. straight) without trigger jack;
    without beeper,
    p/n 25-58926-01R

- Low Profile DB9 USB Cable (18 in. straight); without trigger jack; without beeper, p/n 25-58926-02R.

- Other:
  - Fixed mount stand, p/n 20-60136-01R
  - Simple Serial Interface Software Developer's Kit (SSISDK). To download an SSISDK, go to: http://www.motorola.com/enterprisemobility/support

Connecting the Symbol MiniScan

The Symbol MiniScan can be triggered either by a software trigger command, or by an external switch. If the Symbol MiniScan scanner came without a host cable, or if you are constructing an external triggering switch, consult the *Symbol MiniScan Integration Guide.*

To connect the Symbol MiniScan:

1. Plug the 9-pin D-connector with the end marked "TO SCANNER" into the Symbol MiniScan scanner.
2. If using an external switch and applicable host cable, plug the trigger cable into the female stereo connector on the flying lead of the 9-pin D-connector.
3. Plug the output cable from the power supply into the receptacle on the end of the connector near the host end of the cable. (USB and Synapse cables do not require a power supply.)
4. Plug the host side connector into the appropriate port on your host terminal.
5. Check all connections to ensure they are secure.

6. Program the Symbol MiniScan. Triggering option bar codes begin on . Refer to the *Symbol MiniScan Integration Guide* for more information on selecting specific parameters.

Scanning

1. Ensure all connections are secure.

2. Once power is applied to the Symbol MiniScan scanner the LED lights a continuous red.

3. Ensure the bar code is within scanning range. Align the bar code and trigger the unit.

4. Upon successful decode, the scanner LED turns green.

Aiming Tips

Scan the Entire Symbol

1. The scan beam must cross every bar and space on the symbol.

RIGHT

012345

WRONG

012345
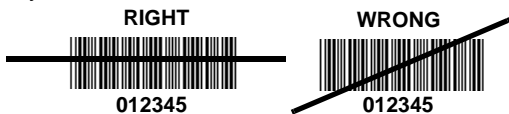
2. Adjust the aim so that the thin, red laser beam covers the entire length of the bar code.

3. If the decode is successful, the green LED lights and the data is transmitted to the host. The scanner may also beep.

Triggering Options

Level Trigger

The laser is enabled and decode processing begins when the trigger line is activated. Decode processing continues until a good decode occurs, the trigger is released, or the Laser-On time expires. The laser is disabled once decode processing is complete. The next decode attempt does not occur until the trigger line is released and then reactivated.

Level

Pulse Trigger

The laser is enabled and decode processing begins when the trigger line is activated. The laser remains on and decode processing continues regardless of the trigger line until a good decode occurs, or until the Laser-On time expires. The laser is disabled once decode processing is complete. The next decode attempt does not occur until the trigger line is released and then reactivated.

Pulse

Continuous

The laser is enabled continuously and decode processing is continuously active. In this mode, the scanner can be configured to scan and transmit a bar code and then not decode the same bar code for a set period of time (**Time Between Same Bar Code**) and not decode ANY bar code for a period of time (**Time Between Different Bar Codes**). This allows the user to tailor the application to the rate at which bar codes are presented. Refer to the *Symbol MiniScan Integration Guide* for these bar codes.

Continuous

Host Trigger

The laser is enabled and decode processing begins in response to an SSI Start Decode message from the host. Refer to the *Symbol MiniScan Integration Guide* for more information. Decode processing continues until a good decode occurs, an SSI Stop Decode message is received, or the Laser-On time expires. The laser is disabled once decode processing is complete. The next decode attempt does not occur until the next Start Decode message is received.

Host

Beeper Indications

The beeper indicates the scanner status as follows:

Beeper	Indication
3 Beeps	Power up (or reset) occurred. (Symbol MS220x and MS320x models only.)
1 Beep	A bar code is successfully decoded.
4 Beeps	Transmission error. Bar code data was not received by the host.
Fast warble	A programming parameter was entered successfully.

LED Indicators

LED	Indication
Red	Scanner is on.
Green	A bar code is successfully decoded.

Laser Patterns

Depending on the configuration, the Symbol MiniScan scanner can emit one of five laser patterns.

### Omnidirectional Scan Pattern (Symbol MS220x, MS320x)

This scan pattern is a high speed rotating omnidirectional scan pattern that provides very aggressive performance on 1-D bar codes because there are virtually no "holes" in the pattern. This ensures fast throughput at the point of activity and the ability to read 1-D symbols in 360° of

rotation, eliminating the need to orient the bar code in the field of view.
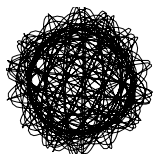
Semi-omnidirectional Scan Pattern (Symbol MS220x, MS320x)

The semi-omnidirectional pattern is an alternative to the full omnidirectional pattern, that scans highly truncated 1-D and RSS bar codes. The bar code must be presented horizontally with no more than a 20° tilt.
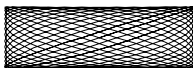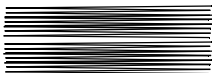
Smart Raster Scan Pattern (Symbol MS220x, MS320x)

The Symbol MS220x and MS320x can create a single line which opens vertically to read PDF417 symbols using the Smart raster feature. This feature auto detects the type of bar code scanned and adjusts its pattern accordingly. This provides optimal performance on 1-D, PDF417, RSS and Composite bar codes.

Stage 1:

Stage 2:

High Density Single Scan Line (Symbol MS220x, MS320x)

The single scan line appears as a "mini" raster and scans multiple areas of 1-D bar codes to swiftly and accurately capture data on poorly printed and damaged bar codes. The single line is ideal for 1-D bar codes.

Always Raster Pattern (Symbol MS220x, MS320x)

The Symbol MS220x and MS320x can create an adjustable raster pattern of a programmed height. This pattern is best for PDF417 environments.
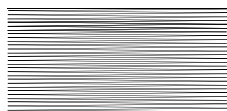
Imaging (Symbol MS440x)

The Symbol MS440x 650 nm laser and diffractive optical element (DOE) generate a laser-aiming pattern that represents the imager field of view. The aiming pattern center cross hairs indicate the center of the field of view to decode 1-D and 2-D bar codes, and capture signatures and images.

True Single Scan Line
(Symbol MS120x, MS954)

The Symbol MS120x and MS954 are 1-D scanners and emit a single scan line.

Bar Codes

Following are some frequently used bar codes for some of the Symbol MiniScan scanners.

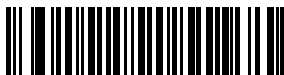✓ *NOTE* The bar codes that follow are not supported by all Symbol MiniScan scanners. See the section Laser Patterns beginning on page 10 for more information.

Set All Defaults

Smart Raster

Bar Codes (continued)

Always Raster

Semi-omnidirectional Pattern

Bar Codes (continued)

Slab Pattern

Troubleshooting

Problem	Possible Cause	Possible Solutions
No red LED or nothing happens when you attempt to scan.	No power to the scanner.	Check the system power. Confirm that the correct host interface cable is used.
		Power supply not plugged in.
		Check for loose cable connections.
Scanner cannot read the bar code.	Interface/power cables are loose.	Check for loose cable connections.
	Scanner is not programmed for the correct bar code type.	Ensure the scanner is programmed to read the type of bar code to be scanned. Try scanning other bar codes and other bar code types.
	Incorrect communication parameters.	Check that the communication parameters (baud rate, parity, stop bits, etc.) are set properly.

Problem	Possible Cause	Possible Solutions
Scanner cannot read the bar code (continued)	Bar code symbol is unreadable.	Check the symbol to ensure it is not defaced. Try scanning similar symbols of the same code type.
	Inappropriately hot environment.	Remove the scanner from the hot environment and allow it to cool down.
Laser activates, followed by a beep sequence.	Beeper is configured.	See Beeper Indications for beeper indication descriptions.

Problem	Possible Cause	Possible Solutions
Scanner does not function.	Accidentally scanned Host Trigger, Level Trigger, or Pulse Trigger from *Triggering Options on page 8*.	**Symbol MSXX04 Non-Imager Models**: Download the *SSI Demonstration Utility for MiniScan* from http://www.motorola.com/enterprisemobility/contactsupport. Use the utility to change the **Trigger Mode** parameter 138 (8Ah) to the value 04h (Continuous Mode) via SSI. Alternatively, use the utility's soft trigger button to activate the scanner, and scan the **Continuous** option of the **Trigger Mode** parameter.
		Symbol MSXX07 Non-Imager Models: Cycle power to the scanner. As the laser briefly appears after power up, scan *Continuous on page 9*.
		All Models: Connect an interface cable which has an external trigger jack, a push button trigger cable, and a power supply to the scanner. You can purchase these cables from Motorola, or make a similar one using the scanner's pinouts as a reference. See your Symbol MiniScan model's *Integration Guide* for pinouts. Using a momentary switch, short the scanner's trigger line to ground to activate the laser, then scan *Continuous on page 9*.

Regulatory Information

This device is approved under the Symbol Technologies brand; Symbol Technologies, Inc., is the Enterprise Mobility business of Motorola, Inc. ("Motorola").

All Symbol devices are designed to be compliant with rules and regulations in locations they are sold and will be labeled as required.

Any changes or modifications to Symbol Technologies equipment, not expressly approved by Symbol Technologies, could void the user's authority to operate the equipment.

Laser Devices

Symbol devices using lasers comply with US 21CFR1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50 dated July 26, 2002 and IEC60825-1:+A1:1997+A2:2001 The laser classification is marked on one of the labels on the device.

Class 1 Laser devices are not considered to be hazardous when used for their intended purpose. The following statement is required to comply with US and international regulations:

Caution: Use of controls, adjustments or performance of procedures other than those specified herein may result in hazardous laser light exposure.

Class 2 laser scanners use a low power, visible light diode. As with any very bright light source, such as the sun, the user should avoid staring directly into the light beam. Momentary exposure to a Class 2 laser is not known to be harmful.

Scanner Labeling


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LASER LIGHT- DO NOT STARE INTO BEAM .
CLASS 2 LASER PRODUCT.  LASERLICHT -
NICHT IN DEN STRAHL BLICKEN. LASER
KLASSE 2.    LUMIÈRE LASER - NE PAS
REGARDER DANS LE FAISCEAU. APPAREIL
À LASER DE CLASSE 2    630-680nm, 1mW
```
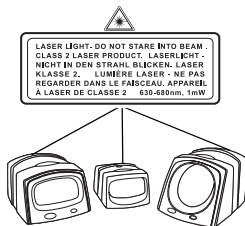
Power Supply

Note: Use only an approved power supply KT-14001-001R, 50-14000-009R, 50-14000-010R output rated 5.2Vdc and minimum 0.650A. The power supply is certified to EN60950 with SELV outputs.

Hinweis: Benutzen Sie nur eine genehmigt Stromversorgung KT-14001-001R, 50-14000-009R, 50-14000-010R in den Ausgabe: 5.2Vdc und minimum 0.650A. Die Stromversorgung ist bescheinigt nach EN60950 mit SELV Ausgaben.

In accordance with Clause 5, IEC 825 and EN60825, the following information is provided to the user:

ENGLISH
CLASS 1   CLASS 1 LASER PRODUCT
CLASS 2   LASER LIGHT
             DO NOT STARE INTO BEAM
             CLASS 2 LASER PRODUCT

DANISH / DANSK
KLASSE 1   KLASSE 1 LASERPRODUKT
KLASSE 2   LASERLYF
             SE IKKE IND I STRÅLEN
             KLASSE 2 LASERPRODUKT

DUTCH / NEDERLANDS
KLASSE 1   KLASSE-1 LASERPRODUKT
KLASSE 2   LASERLICHT
             NIET IN STRAAL STAREN
             KLASSE-2 LASERPRODUKT

FINNISH / SUOMI
LUOKKA 1   LUOKKA 1 LASERTUOTE
LUOKKA 2   LASERVALO
             ÄLÄ TUIJOTA SÄDETTÄ
             LUOKKA 2 LASERTUOTE

FRENCH / FRANÇAIS
CLASSE 1   PRODUIT LASER DE CLASSE 1
CLASSE 2   LUMIERE LASER
             NE PAS REGARDER LE RAYON FIXEMENT
             PRODUIT LASER DE CLASSE 2

GERMAN / DEUTCH
KLASSE 1   LASERPRODUKT DER KLASSE 1
KLASSE 2   LASERSTRAHLEN
             NICHT DIREKT IN DEN LASERSTRAHL SCHAUEN
             LASERPRODUKT DER KLASSE 2

CHINESE / 简体中文
1 类   1 类激光产品
2 类   激光
       切勿注视光束
       2 类激光产品

KOREAN / 한국어
1등급   1등급 레이저 제품
2등급   레이저 광선
       이 광선을 주시하지 마십시오.
       2등급 레이저 제품

HEBREW
רמה 1   מוצר לייזר רמה 1

רמה 2   אור לייזר
       אין להביט אל תוך הזרם
       מוצר לייזר רמה 2

ITALIAN / ITALIANO
CLASE 1   PRODOTTO AL LASER DI CLASSE 1
CLASSE 2   LUCE LASER
             NON FISSARE IL RAGGIOPRODOTTO
             AL LASER DI CLASSE 2

NORWEGIAN / NORSK
KLASSE 1   LASERPRODUKT, KLASSE 1
KLASSE 2   LASERLYS IKKE STIRR INN I LYSSTRÅLEN
             LASERPRODUKT, KLASSE 2

PORTUGUESE / PORTUGUÊS
CLASSE 1   PRODUTO LASER DA CLASSE 1
CLASSE 2   LUZ DE LASER NÃO FIXAR O RAIO LUMINOSO
             PRODUTO LASER DA CLASSE 2

SPANISH / ESPAÑOL
CLASE 1   PRODUCTO LASER DE LA CLASSE 1
CLASE 2   LUZ LASER
            NO MIRE FIJAMENTE EL HAZ
            PRODUCTO LASER DE LA CLASSE 2

SWEDISH / SVENSKA
KLASS 1   LASERPRODUKT KLASS 1
KLASS 2   LASERLJUS STIRRA INTE MOT STRÅLEN
           LASERPRODUKT KLASS 2

JAPANESE / 日本語
クラス1   クラス1 レーザ製品
クラス2   レーザ光線
       光線を直視しないでください
       クラス2 レーザ製品

Radio Frequency Interference Requirements

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.

FC Tested to comply with FCC Standards
FOR HOME OR OFFICE USE

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.
• This device must be used with a properly shielded cable as specified in the product integration guide

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.

Marking and European Economic Area (EEA)

CE **Statement of Compliance**

Symbol Technologies, Inc., hereby declares that this device is in compliance with all the applicable Directives, 89/336/EEC, 73/23/EEC. A Declaration of Conformity may be obtained from http://www.motorola.com/enterprisemobility/doc/.

Waste Electrical and Electronic Equipment (WEEE)

English: For EU Customers: All products at the end of their life must be returned to Motorola for recycling. For information on how to return product, please go to: http://www.motorola.com/recycling/weee.

Bulgarish: За клиенти от ЕС: След края на полезния им живот всички продукти трябва да се връщат на Motorola за рециклиране. За информация относно връщането на продукти, моля отидете на адрес: http://www.motorola.com/recycling/weee.

Čeština: Pro zákazníky z EU: Všechny produkty je nutné po skončení jejich ž společnosti Symbol k recyklaci. Informace o způsobu vrácení produktu najde stránce: http://www.motorola.com/recycling/weee.

Dansk: Til kunder i EU: Alle produkter skal returneres til Motorola til recirkulering, når de er udtjent. Læs oplysningerne om returnering af produkter på: http://www.motorola.com/recycling/weee.

Deutsch: Für Kunden innerhalb der EU: Alle Produkte müssen am Ende ihrer Lebensdauer zum Recycling an Motorola zurückgesandt werden. Informationen zur Rücksendung von Produkten finden Sie unter http://www.motorola.com/recycling/weee.

Eesti: EL klientidele: kõik tooted tuleb nende eluea lõppedes tagastada taaskasutamise eesmärgil Motorola'ile. Lisainformatsiooni saamiseks toote tagastamise kohta külastage palun aadressi: http://www.motorola.com/recycling/weee.

Español: Para clientes en la Unión Europea: todos los productos deberán entregarse a Motorola al final de su ciclo de vida para que sean reciclados. Si desea más información sobre cómo devolver un producto, visite: http://www.motorola.com/recycling/weee.

Ελληνικά: Για πελάτες στην Ε.Ε.: Όλα τα προϊόντα, στο τέλος της διάρκεια τους, πρέπει να επιστρέφονται στην Motorola για ανακύκλωση. Για περισσότ σχετικά με την επιστροφή ενός προϊόντος, επισκεφθείτε τη διεύθυνση http://www.motorola.com/recycling/weee στο Διαδίκτυο.

Français : Clients de l'Union Européenne : Tous les produits en fin de cycle de vie doivent être retournés à Motorola pour recyclage. Pour de plus amples informations sur le retour de produits, consultez : http://www.motorola.com/recycling/weee.

Italiano: per i clienti dell'UE: tutti i prodotti che sono giunti al termine del rispettivo ciclo di vita devono essere restituiti a Motorola al fine di consentirne il riciclaggio. Per informazioni sulle modalità di restituzione, visitare il seguente sito Web: http://www.motorola.com/recycling/weee.

Latviešu: ES klientiem: visi produkti pēc to kalpošanas mūža beigām ir j
Motorola otrreizējai pārstrādei. Lai iegūtu informāciju par produktu nogā
lūdzu, skatiet: http://www.motorola.com/recycling/weee.

Lietuvių: ES vartotojams: visi gaminiai, pasibaigus jų eksploatacijos laiku
utilizuoti į kompaniją „Motorola". Daugiau informacijos, kaip grąžinti gan
http://www.motorola.com/recycling/weee.

Magyar: Az EU-ban vásárlóknak: Minden tönkrement terméket a Motorola
vállalathoz kell eljuttatni újrahasznosítás céljából. A termék visszajuttatásának
módjával kapcsolatos tudnivalókért látogasson el a
http://www.motorola.com/recycling/weee weboldalra.

Malti: Għal klijenti fl-UE: il-prodotti kollha li jkunu waslu fl-aħħar tal-ħajja ta
iridu jiġu rritornati għand Motorola għar-riċiklaġġ. Għal aktar tagħrif dwar kif
l-prodott, jekk jogħġbok żur: http://www.motorola.com/recycling/weee.

Nederlands: Voor klanten in de EU: alle producten dienen aan het einde van hun
levensduur naar Motorola te worden teruggezonden voor recycling. Raadpleeg
http://www.motorola.com/recycling/weee voor meer informatie over het
terugzenden van producten.

Polski: Klienci z obszaru Unii Europejskiej: Produkty wycofane z eksploatac
do firmy Motorola w celu ich utylizacji. Informacje na temat zwrotu produktó
stronie internetowej http://www.motorola.com/recycling/weee.

Português: Para clientes da UE: todos os produtos no fim de vida devem ser
devolvidos à Motorola para reciclagem. Para obter informações sobre como
devolver o produto, visite: http://www.motorola.com/recycling/weee.

Românesc: Pentru clienții din UE: Toate produsele, la sfârșitul duratei lor de
funcționare, trebuie returnate la Motorola pentru reciclare. Pentru informații
despre returnarea produsului, accesați: http://www.motorola.com/recycling/weee.

Slovenski: Za kupce v EU: vsi izdelki se morajo po poteku življenjske dobe vrniti
podjetju Motorola za reciklažo. Za informacije o vraèilu izdelka obišèite:
http://www.motorola.com/recycling/weee.

Slovenčina: Pre zákazníkov z krajín EU: Všetky výrobky musia byť po uplyn
životnosti vrátené spoločnosti Motorola na recykláciu. Bližšie informácie o
nájdete na: http://www.motorola.com/recycling/weee.

Suomi: Asiakkaat Euroopan unionin alueella: Kaikki tuotteet on palautettava
kierrätettäväksi Motorola-yhtiöön, kun tuotetta ei enää käytetä. Lisätietoja tuotteen
palauttamisesta on osoitteessa http://www.motorola.com/recycling/weee.

Svenska: För kunder inom EU: Alla produkter som uppnått sin livslängd måste
returneras till Motorola för återvinning. Information om hur du returnerar produkten
finns på http://www.motorola.com/recycling/weee.

Service Information

If you have a problem using the equipment, contact your facility's Technical or Systems Support. If there is a problem with the equipment, they will contact Motorola Enterprise Mobility Support at:
http://www.motorola.com/enterprisemobility/contactsupport.

For the latest version of this guide go to:
http://www.motorola.com/enterprisemobility/manuals.

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