

**MS9530 Series Voyager® RF**  
Single Line Hand-Held RF Bar Code Scanner

**Installation and User's Guide**  
PRELIMINARY



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## Product Overview

The MS9530 Series Voyager RF is a wireless single line hand-held scanner with one bi-directional RF channel radio which provides about 20-30 meters portability.

It has got a battery pack which can be removed from the unit to be charged through a Wall-Power supply in about 110 min. No charging stand is required.

Once charged the unit can read and transmit more than 30,000 readings. In order to save the battery charge, the unit will enter into standby mode, when left idle. To “wake” the unit, and begin scanning, simply press the CodeGate button located on the head of the scanner. When idle mode, the battery is still supplying the unit and its charge will last for approximately 5 days.

To interface with the host, a Base Station is provided which allows the scanner to transfer data to Host via various interfaces, including: Wedge, RS232, Light Pen and OCIA emulation.

Every time the unit is activated, it will try to link with the Base Station for a few seconds. In the event that there is no response, for example, the Base Station is turned off or the unit is out of range etc, the scanner will give an error beep and will keep the unit locked with the Green and Red LEDs “on” until the user presses the CodeGate button. Once pressed, the unit will work normally once the problem is solved.

The unit has Green and Red LED indicators to inform the user of the scanner’s status. Basically, the Green LED is used for scanning issues and the Red LED is used for radio transmissions.

There is also a beeper which provides an audible indicator for low battery, errors, successful operations, programming mode and start up diagnostics.

As long as the Voyager RF has got a decoder built-in, it has got its own programming manual which can be used to program decoding issues as well as the RF interface (Base Station serial number, Mobil ID, and so on....)

## **BASE STATION**

The Base Station is a interface decoder to which the Voyager is connected via a virtual RS232 port. Its function is to receive RF data from Voyager RF and transmit it to the Host.

Therefore, all the standard features that can be used when connecting a RS232 device to a Base Station, as explained in the *Base Station Configuration Guide*, can be obtained from the Base Station when working with the Voyager RF.

It is very easy to change a Base Station parameter. Once the Voyager RF is linked with the base, simply read the ENTER/EXIT barcode from *Base Station Configuration Guide* and change the desired parameter. Once finished, read the ENTER/EXIT bar code again to return it back to *Standard Operation* mode.

The Base Station can support several output interfaces such as; Wedge, RS232, Light Pen and OCIA.

When a **Wedge** connection is desired, a Y-XX cable is required as well as Power Supply when required\*. Please refer to the *Base Station Configuration Guide* to choose the configuration number as well as cable required to interface with HOST

When **RS232 Output** interface is desired, an M-01 (DB25/DB9) and a power supply are required.

For Light Pen and OCIA, no special cable is designed. Normally, it is designed for each specific Host.

Each Base Station has got a unique serial number (Factory defined) and can work with up to 5 Voyager RF at the same time. Each Voyager must have an Identifier (ID: 1 to 5) defined as well as the serial number of the base station which will receive the transmitted data. In case of RF collision, each Voyager RF will wait its turn based upon its ID before re-trying. This means that Units with a lower ID will be more aggressive whilst transmitting.

As long as the Voyager RF has got its own decoder and the Base Station also has its own, then two manuals should be used.

***Voyager RF manual*** is used for Barcode Decoding issues  
***Base Station Manual*** is used for interface issues.

User should combine both manual parameters to perform best functionality which fits the desired application.

\* Although not always necessary to utilise a power supply when the Base Station is in wedge mode, it is good practice to power it with an external power supply to avoid any loss in RF performance

## UNPACKING LIST

The kit is packed according to its functionality:

### Transmitter:

- Voyager RF: Reader + Battery Pack
- Wall-Power Supply for Battery Pack charging
- Voyager RF Configuration Manual
- Voyager RF installation and User guide

### Base Station:

- Base Station
- Base Station Manual
- For Wedge interface:
  1. Cable Y-XX
  2. Power Supply (Required to ensure better RF performance)
- For RS232 interface:
  1. Cable M-01 (DB25/DB9)
  2. Power Supply (if Host can't provide it)

## **CONNECTING THE BASE STATION TO THE HOST**

### **WEDGE INTERFACE**

1. Turn off the Host system
2. Connect the cable Y-XX between the keyboard and Host
3. When Power supply required (it is recommended all the times for better RF transmissions), check that the voltage matches the AC outlet and then connect
4. Power up the Host system

### **RS232 INTERFACE**

1. Turn off the Host system
2. Connect the cable RS232(DB25/DB9) to the desired RS232 input port of the Host
3. When Host can't provide power supply, check that the voltage matches the AC outlet and then connect
4. Power up the Host system

### **LIGHT PEN AND OCIA INTERFACES**

Technical assistance will be required depending on the HOST interface.

Now follow the matching procedures to link the Voyager RF to the Base Station

## LINKING THE VOYAGER RF TO THE BASE STATION

This section explains how to link the Voyager RF to the Base Station. It is supposed that the software is already loaded into the unit and that the Base Station is configured with its own serial number.

- Power ON the Base Station
- Insert Battery Pack and press CodeGate button to power ON the unit.
  - Voyager will show its ID number by keeping RED and GREEN LEDs on while flashing YELLOW on as many times as the ID value ( 1 to 5 )
  - Voyager will try several attempts to link with Base Station. Every try will make the Red LED flashing.
  - If no Link is performed, an error beep will sound. In this case press Code Gate button to continue. Otherwise, if link is performed the scanner will operate normally.
- Read **Enter/Exit Configuration Mode** barcode



- Read the **Recall Defaults** barcode (MetroSelect Single Line Voyager Configuration guide) to default Voyager parameters.



- Read the **RF Defaults** barcode to default RF engine



- Read **Fix Serial RF Number** barcode to load Base Station's serial number into the Voyager.



- Read Base Station Serial Number barcode. (located on the Base Station).
- Read **Enter/Exit Configuration Mode** barcode.



- After reading this barcode the Voyager will try to link the Base Station. Now a linking should be performed.

At this moment the Voyager RF is linked to Base Station with ID =1.

**Two Voyager RF's with the same ID cannot be linked to the same Base Station.** In this case, follow the "Changing ID procedures" to change the ID of the appropriate Voyager RF

The user can change any parameter of MetroSelect's Single Line Configuration Guide apart from the following:

**RS-232, Keyboard, OCIA, Light Pen Parameters, IBM 46xx Configuration, Custom Defaults, Scanner Operation-Led Options, Scanner Operation-Host Scanner Commands, Scanner Operation-Test Modes, MS 9500 Voyager-Activation Range, MS 9500 Voyager-CodeGate Status**

Failure to observe the above will result in the scanner operating with reduced functionality.

**NOTE ABOUT RF DEFAULTS:**

This barcode will default the RF parameters of Scanner:

- RF interface will be fixed
- Serial Number will be fixed to 9999999999
- ID number will be fixed to 1
- Minimum length will be fixed to 1



## FIXING VOYAGER RF ID NUMBERS

This section explains how to fix an Identifier number to each Voyager RF. Basically, each Base Station can work with up to 5 VoyagerRF's at the same time. To enable this facility, an Identifier Number (ID) must be configured to each Voyager RF. By reading RF Defaults, ID=1 is configured.

**There cannot be more than one Voyager RF with the same ID and Serial Number.**

In the case of two Voyager RF's trying to communicate with the base station at the same time, the unit with the lower ID will re-try first. That means that the lower a number ID the VoyagerRF has, the more aggressive it will be. To change the ID, follow the steps below,

- Read desired **Voyager ID:i** ( $i=1, \dots, 5$ ) barcode to load the ID = i into the Voyager RF



VOYAGER ID: 1



VOYAGER ID: 2



VOYAGER ID: 3



VOYAGER ID: 4



VOYAGER ID: 5

The system is ready to work.

Please note again, that each time a Voyager RF is activated, it indicates its ID number just before linking with Base Station with steady RED and GREEN LED's whilst the YELLOW LED flashes an appropriate number of times in relation to its ID number. Ie; one YELLOW led flash means ID=1 and 5 YELLOW LED flashes would indicate that that unit's ID=5

## **BASE STATION TESTING BARCODE**

The Base Station will accept all data from Voyager RF where the Base Serial Number is "0000000000".

Use this Test Barcode as Base Serial Number when programming the Voyager RF Serial Number to fix the Voyager RF in test Mode.



This Barcode is for testing purposes and should NEVER be considered as functional Base Station Serial Number.

Once Testing is performed, a valid Base Station Serial Number should be loaded into the Voyager RF

## BATTERY PACK

In order to charge the Battery Pack, there is no need to use a cradle. It can be re-charged when disconnected from the scanner with the Voyager RF 5V, 1.5A Wall Power Supply.

The Battery Pack can't be recharged while inserted into the Voyager. Therefore it is recommended that two battery packs are used. One can be in use with the scanner while the other one is being recharged.

Once the Voyager RF gives a "Low Battery" warning, the user should remove the Battery Pack from Voyager by pressing the two side clips and pulling the pack vertically from the scanner.

Once removed, the user can see a socket to insert the jack of the 5V, 1.5 A Power Supply. See figure: Batt1

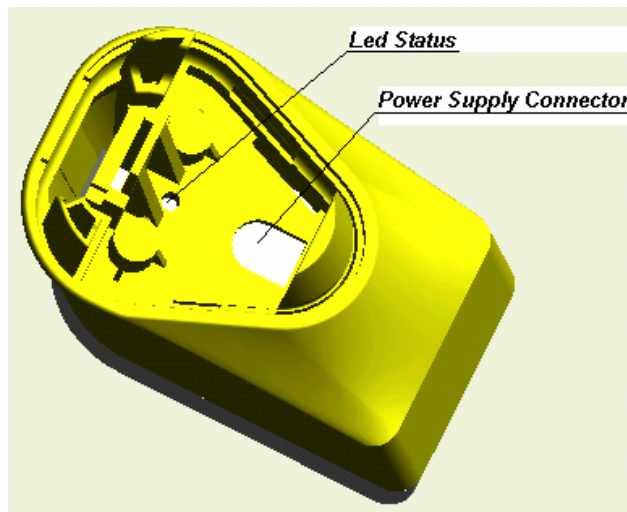


Figure: Batt1

There is an LED which indicates the status of the charge as Table 1.0 shows:

CHARGE STATUS	RED	GREEN
Charging	ON	OFF
Done	OFF	ON
FAULT	Flashing (1 sec.)	OFF
No Battery	OFF	OFF

Table 1.0

It takes a charge of around 100 min. for a Battery to be fully charged. Once charged, the unit is able to handle around 30,000 continuous first pass readings over a period of approximately 5 hours. Taking into account that the scanner will go into standby mode while not in use for an average of 2.5 minutes, you can expect that in normal use the unit can be used for in excess of 8 hours per day with one battery pack.

Standby mode will discharge the battery pack in around 5 days. The number of readings will naturally decrease as the standby time increases. To avoid having low battery messages appearing, it is recommended that the battery pack is disconnected from the scanner when not in use over an extended period of time.

## VISUAL INDICATORS

The scanner has RED and GREEN LED's. When the scanner is on, these visual indicators show the state of the scanner functionality.

### **Start Up Sequence**

From Stand-by, once the user presses CodeGate button, the scanner goes into start-up mode.

Whilst in this mode, the YELLOW LED is displayed.

1. The scanner starts checking its OS (Operating system). If there is an error, RED and GREEN will be on and YELLOW will flash continuously.
2. The scanner will check Flash integrity. If there is an error, RED and GREEN will be on and YELLOW will flash once. After this the unit will enter into user RF Flash mode (Same as when METEOR RF Barcode is read. See how to load software via RF with METEOR RF for details)

After OS and Flash has been successfully checked, YELLOW LED is off and the unit will enter its own start-up sequence.

### **Synchronisation Sequence**

Once the unit has finished all start-up sequences including Laser, Motor, Flash,.... tests, Voyager RF will take the following actions:

- **Show its ID( Mobile Identification number)** by keeping RED and GREEN LEDs on while flashing YELLOW LED as many times as its own ID (1 to 5)
- **Link with base station.**

The RED LED will flash several times while trying to synchronise. In case no link is made, the scanner will make a Razzberry tone with RED and GREEN LED's on.

Once the reason why the link was not made (out of coverage area, Base powered off etc) is solved, the user is requested to press the CodeGate button to continue. A Beep tone will be executed and the RED and GREEN LED's will be off.

### **Data Transmission Sequence**

Once the unit has read a barcode, it will try to transmit the data to Base Station. Every time a transmission is performed, the RED led will flash and the scanner will wait for an acknowledgement from Base Station. If no ACK arrives after 14 tries, the unit will emit a Razzberry tone and the user will be requested to press the CodeGate button to continue.

### **Low Battery Message**

When the battery starts to lose its charge, the scanner detects it and makes a Razzberry sound every time a new reading is performed. The YELLOW, RED and GREEN LED's will also flash alternatively. However, the Voyager RF will continue to operate.

The operator should, at this point, remove the battery pack and recharge it.

## **PROGRAMING MODES**

Voyager RF can be programmed via Barcodes. Use Metrologic's *MetroSelect Single Line Configuration Guide* to configure the unit.

This configuration guide is common to all Voyagers. When using Voyager RF, this one should be used and the following sections of the *Single Line Configuration Guide* should be avoided:

**RS-232, Keyboard, OCIA, Light Pen Parameters, IBM 46xx Configuration, Custom Defaults, Scanner Operation-Led Options, Scanner Operation-Host Scanner Commands, Scanner Operation-Test Modes, MS 9500 Voyager-Activation Range.**

The Base Station also can be programmed via *Base Station Configuration Guide*.

Meanwhile, the *MetroSelect Single Line Configuration Guide* is used to control scanner and reading parameters, the *Base Station Configuration Guide* is mostly used to control data transmission to Host.

PC Windows Based programs are provided to configure both Base Station and Voyager RF units:

**MetroSelect2 (RF version)** to configure Voyager RF via RF (not yet available).  
**BaseSet** to configure Base Station.

Both of them request that Base Station is RS232 connected to the PC.



## MetroSet

It is possible to download/upload settings from MetroSet 2 (PC based software) to each Voyager RF by radio.

In order to do that, read the MetroSet RF barcode with the Voyager RF that you want to work with and follow MetroSet RF instructions.



Always read this barcode before running the MetroSet RF upload/download commands.

Keep the Voyager RF close to Base station to get the best RF performance. Base Station must be connected to the comport of the PC via M-01 DB9 Cable. Only one Voyager can perform this operation at a time.

While uploading/downloading settings, the base Station will not communicate with any other Voyager RF's and communications will be temporarily locked until the settings are transferred.

## SOFTWARE VERSION

It is possible to find out the software of Voyager RF as well as the Base Station to which the unit is linked with.

Scanning the following barcode, the Base Station will transmit the actual software revision with the following format:

***MI9530 BASE STATION: #50200, MARCH 2002. | MS9530: BODY/OS  
#14655/50100***



## EML

EML Handshake is a defined data formatting handshake that allows the Voyager RF to send and receive data from the Host System through the Base Station.

To be able to use this feature, the Base Station:

- Must be connected via RS232 to the Host System using the M-01 cable
- Must have EML feature activated (see *Base Station's manual* to know how to activate EML into Base Station as well as EML Packets description).

### EML Handshaking Process

When EML is active, every time a Voyager RF reads a barcode, the Base Station will send "Data Packets" to Host (via Wedge or RS232) so that the Host will know which Base Station and Voyager RF is sending data.

Furthermore, the system provides a way to inform the Voyager RF whether its data was found in Data Base by activating **EML Handshake** within the Base Station. The process is as follows:

The Voyager RF sends data to Base Station and a "WAIT" radio command is sent from Base to Voyager RF. After that, Base sends the "Data packet" to the Host and waits for "EML Command" from Host. When this has been received, Base acknowledges it with "ACK Packet" and transfers it to Voyager RF which performs the corresponding action.

If Host Delays its answer, Voyager will timeout and will consider an error in transmission, informing the Base Station that timeout (1 – 17 sec) has elapsed. Base will send "RESET Packet" to Host to inform of this situation and will answer with a "NAK Packet" to every command coming from Host until a new "Data Packet" is received from the Voyager RF.

The possible Voyager RF timeout values must be between 1 – 255 in steps of 70 msec. This will give us a range of 1 to 17 sec. By default is 2 Sec.

### EML HANDSHAKING TIMEOUT



## SPECIFICATIONS

### RF LINK SPECIFICATIONS

Frequencies:	434 MHz
Bandwidth:	2 x 75 kHz
Modulation:	FM
RF Protocol:	Two way data transmission, One channel. 39062.5 Baud speed.
Output Power Voyager RF:	<10 mw
Output Power Base Station:	6 mw
Operating Range:	Up to 30 Mts. (Open Air)

**Specifications subject to change without notice**

### ELECTRICAL

#### **VOYAGER RF**

Input Voltage:	3,7/3,8 V (1400mA-hour) rechargeable Lithium-Ion Battery Pack.
Battery Operating Life:	30,000 scans in 5 Hours (at first read rate with full battery charge)
Battery Idle Time:	Approximately 5 days
Operating current:	10mA – STANDBY 110mA – NORMAL with LASER OFF 250mA – NORMAL with LASER ON
DC Transformer:	5VDC @1.5A. Battery wall charger.
Laser Class:	

#### **BASE STATION**

Input Voltage:	5VDC
Operating current:	40mA
DC Transformer:	INPUT: 220V 50/60Hz OUTPUT: 5VDC @700mA POWER: 200mW

**Specifications subject to change without notice**