Lynx™ BT

Reference Manual

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DATALOGIC

Lynx™ BT

REFERENCE MANUAL

DATALOGIC

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Lynx™ BT

Ed.: 10/2005

This manual refers to software version 1.00 and later.

20/10/05

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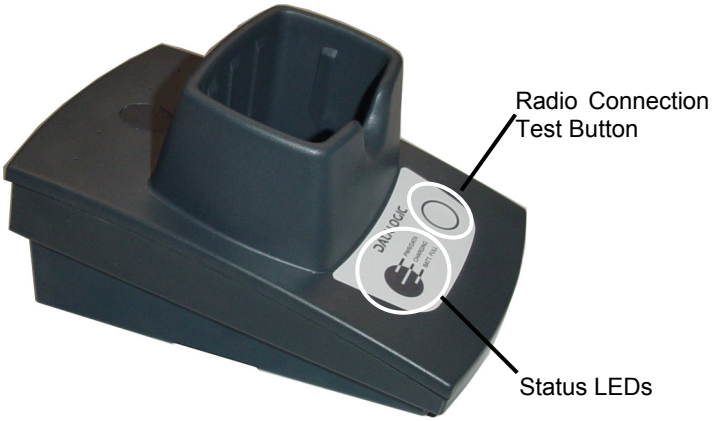
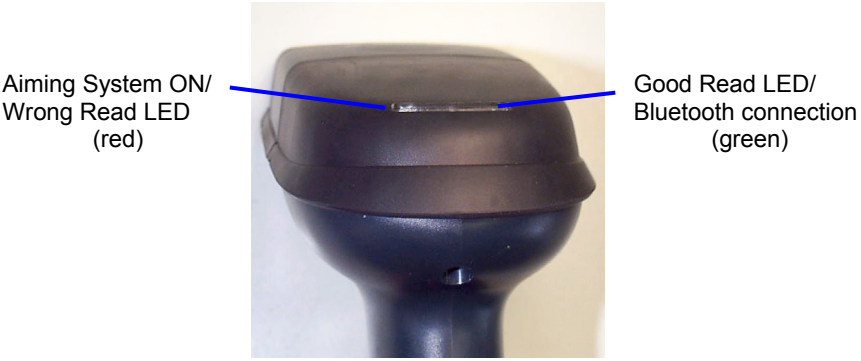
GENERAL VIEW

LYNX™ BT

OM-1000 BT

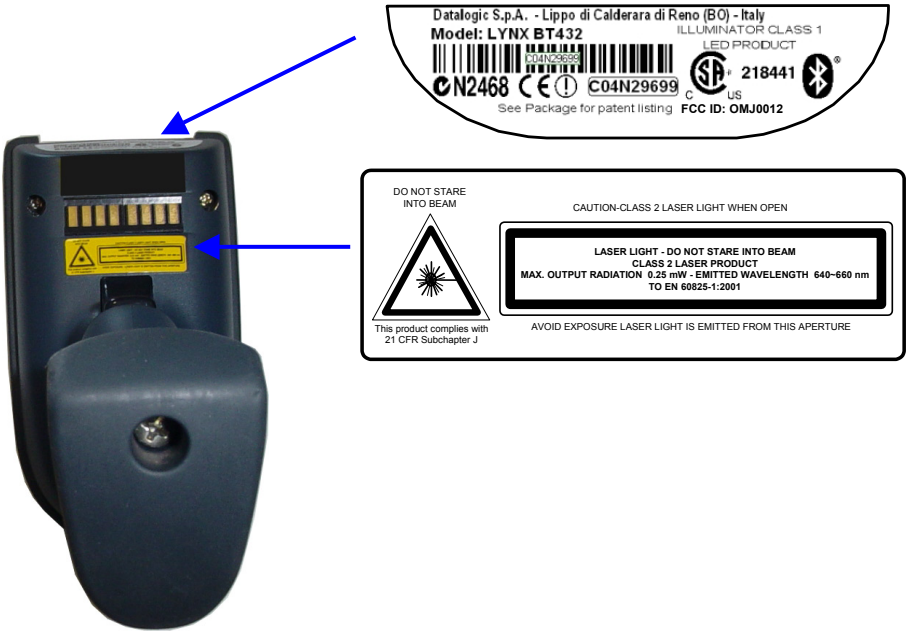


C-1000

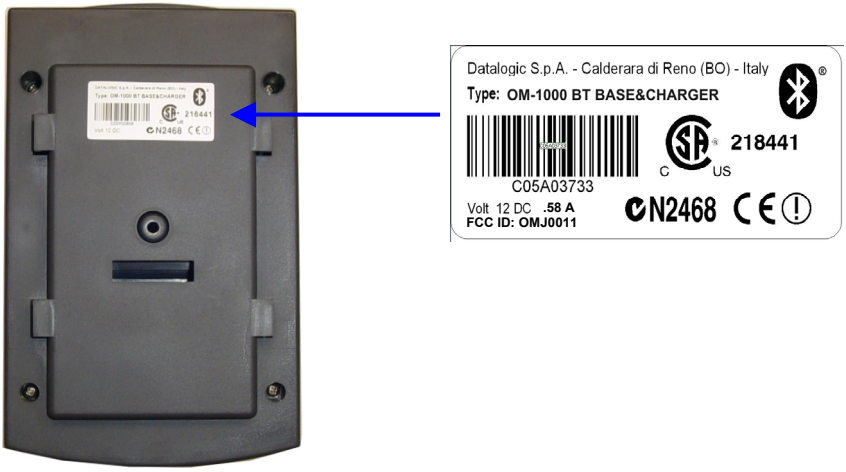


Lynx™ BT LEDs

COMPLIANCE



Lynx™ BT Product Labels



OM-1000 BT Product Label

FCC COMPLIANCE

Modifications or changes to this equipment without the expressed written approval of Datalogic could void the authority to use 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 which may cause undesired operation.

OM-1000 BT

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. 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.

RADIO COMPLIANCE

Contact the competent authority responsible for the management of radio frequency devices of your country to verify the eventual necessity of a user license.
Refer to the web site http://europa.eu.int/comm/enterprise/rtte/spectr.htm for further information.

WEEE COMPLIANCE

LASER SAFETY

The Lynx™ BT hand-held reader is a Class 1 LED product regarding its Illuminator and a Class 2 laser product regarding its Aiming System.

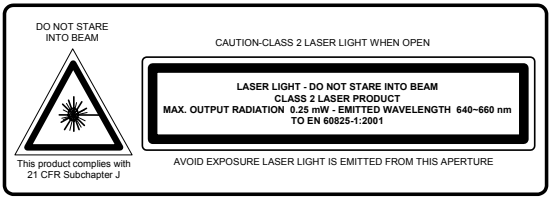
LED Illuminator

The use of an illuminator in the Lynx™ BT hand-held reader is a Class 1 LED product:

ILLUMINATORE LED CLASSE 1
AUSLEUCHTER LED KLASSE 1
ILLUMINATEUR A LED DE CLASSE 1
ILUMINADOR LED DE CLASE 1

Aiming System

The Lynx™ BT aiming system meets the requirements for laser safety.



I	D	F	E
LA LUCE LASER È VISIBILE ALL'OCCHIO UMANO E VIENE EMESSA DALLA FINESTRA INDICATA NELLA FIGURA.	DIE LASER-STRAHLUNG IST FÜR DAS MENSCHLICHE AUGE SICHTBAR UND WIRD AM STRAHLAUS-TRITTSFENTSTER AUSGESENDET (SIEHE BILD)	LE RAYON LASER EST VISIBLE À L'OEIL MU ET IL EST ÉMIS PAR LA FENÊTRE DÉSIGNÉE SUR L'ILLUSTRATION DANS LA FIGURE	A LUZ LÁSER ES VISIBLE AL OJO HUMANO Y ES EMITIDA POR LA VENTANA INDICADA EN LA FIGURA.
LUCE LASER NON FISSARE IL FASCIO APPARECCHIO LASER DI CLASSE 2 MASSIMA POTENZA D'USCITA: LUNGHEZZA D'ONDA EMESSA: CONFORME A EN 60825-1 (2001)	LASERSTRAHLUNG NICHT IN DEN STRAHL BLICKEN PRODUKT DER LASERKLASSE 2 MAXIMALE AUSGANGSLEISTUNG: WELLENLÄGE: ENTSPR. EN 60825-1 (2001)	RAYON LASER EVITER DE REGARDER LE RAYON APPAREIL LASER DE CLASSE 2 PUISSANCE DE SORTIE: LONGUER D'ONDE EMISE: CONFORME A EN 60825-1 (2001)	RAYO LÁSER NO MIRAR FIJO EL RAYO APARATO LÁSER DE CLASE 2 MÁXIMA POTENCIA DE SALIDA: LONGITUD DE ONDA EMITIDA: CONFORME A EN 60825-1 (2001)

ENGLISH

The following information is provided to comply with the rules imposed by international authorities and refers to the correct use of your terminal.

STANDARD LASER SAFETY REGULATIONS

This product conforms to the applicable requirements of both CDRH 21 CFR 1040 and EN 60825-1 at the date of manufacture.

For installation, use and maintenance, it is not necessary to open the device.

WARNING

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

The product utilizes a low-power laser diode. Although staring directly at the laser beam momentarily causes no known biological damage, avoid staring at the beam as one would with any very strong light source, such as the sun. Avoid that the laser beam hits the eye of an observer, even through reflective surfaces such as mirrors, etc.

ITALIANO

Le seguenti informazioni vengono fornite dietro direttive delle autorità internazionali e si riferiscono all'uso corretto del terminale.

NORMATIVE STANDARD PER LA SICUREZZA LASER

Questo prodotto risulta conforme alle normative vigenti sulla sicurezza laser alla data di produzione: CDRH 21 CFR 1040 e EN 60825-1.

Non si rende mai necessario aprire l'appa-recchio per motivi di installazione, utilizzo o manutenzione.

ATTENZIONE

L'utilizzo di procedure o regolazioni differenti da quelle descritte nella documentazione può provocare un'esposizione pericolosa a luce laser visibile.

Il prodotto utilizza un diodo laser a bassa potenza. Sebbene non siano noti danni riportati dall'occhio umano in seguito ad una esposizione di breve durata, evitare di fissare il raggio laser così come si eviterebbe qualsiasi altra sorgente di luminosità intensa, ad esempio il sole. Evitare inoltre di dirigere il raggio laser negli occhi di un osservatore, anche attraverso superfici riflettenti come gli specchi.

DEUTSCH

Die folgenden Informationen stimmen mit den Sicherheitshinweisen überein, die von internationalen Behörden auferlegt wurden, und sie beziehen sich auf den korrekten Gebrauch vom Terminal.

NORM FÜR DIE LASERSICHERHEIT

Dies Produkt entspricht am Tag der Herstellung den gültigen EN 60825-1 und CDRH 21 CFR 1040 Normen für die Lasersicherheit.
Es ist nicht notwendig, das Gerät wegen Betrieb oder Installations-, und Wartungsarbeiten zu öffnen.

ACHTUNG

Jegliche Änderungen am Gerät sowie Vorgehensweisen, die nicht in dieser Betriebsanleitung beschreiben werden, können ein gefährliches Laserlicht verursachen.

Der Produkt benutzt eine Laserdiode. Obwohl zur Zeit keine Augenschäden von kurzen Einstrahlungen bekannt sind, sollten Sie es vermeiden für längere Zeit in den Laserstrahl zu schauen, genauso wenig wie in starke Lichtquellen (z.B. die Sonne). Vermeiden Sie es, den Laserstrahl weder gegen die Augen eines Beobachters, noch gegen reflektierende Oberflächen zu richten.

FRANÇAIS

Les informations suivantes sont fournies selon les règles fixées par les autorités internationales et se réfèrent à une correcte utilisation du terminal.

NORMES DE SECURITE LASER

Ce produit est conforme aux normes de sécurité laser en vigueur à sa date de fabrication: CDRH 21 CFR 1040 et EN 60825-1.
Il n'est pas nécessaire d'ouvrir l'appareil pour l'installation, l'utilisation ou l'entretien.

ATTENTION

L'utilisation de procédures ou réglages différents de ceux donnés ici peut entrainer une dangereuse exposition à lumière laser visible.

Le produit utilise une diode laser. Aucun dommage aux yeux humains n'a été constaté à la suite d'une exposition au rayon laser. Eviter de regarder fixement le rayon, comme toute autre source lumineuse intense telle que le soleil. Eviter aussi de diriger le rayon vers les yeux d'un observateur, même à travers des surfaces réfléchissantes (miroirs, par example).

ESPAÑOL

Las informaciones siguientes son presentadas en conformidad con las disposiciones de las autoridades internacionales y se refieren al uso correcto del terminal.

NORMATIVAS ESTÁNDAR PARA LA SEGURIDAD LÁSER

Este aparato resulta conforme a las normativas vigentes de seguridad láser a la fecha de producción: CDRH 21 CFR 1040 y EN 60825-1.

No es necesario abrir el aparato para la instalación, la utilización o la manutención.

ATENCIÓN

La utilización de procedimientos o regulaciones diferentes de aquellas describidas en la documentación puede causar una exposición peligrosa a la luz láser visible.

El aparato utiliza un diodo láser a baja potencia. No son notorios daños a los ojos humanos a consecuencia de una exposición de corta duración. Eviten de mirar fijo el rayo láser así como evitarían cualquiera otra fuente de luminosidad intensa, por ejemplo el sol. Además, eviten de dirigir el rayo láser hacia los ojos de un observador, también a través de superficies reflectantes como los espejos.

This device must be opened by qualified personnel only.

CAUTION

The Lynx™ BT Hand-Held Reader is not user-serviceable. Opening the case of the unit can cause internal damage and will void the warranty.

OM-1000 BT POWER SUPPLY

This device is intended to be supplied by a UL Listed or CSA Certified Power Unit marked "Class 2" or "LPS" output rated 12 V, minimum 0.75 A which supplies power directly to the unit via the jack connector.

BLUETOOTH® APPROVAL

This product is equipped with the following certified Bluetooth module:

Product Name	Bluetooth ID
Panasonic Serial Port Module	B01839

1 INTRODUCTION

1.1 LYNX™ BT DESCRIPTION

The Lynx™ BT Hand-Held Reader packs a lot of performance into an attractive, rugged, hand-held device. It operates in commercial and industrial environments as well as the front office.

Omnidirectional Operating — To read a symbol you simply aim the reader and pull the trigger. Since the orientation of the symbol is not important, the Lynx™ BT reader is a powerful, omni-directional device.

Decoding — Thanks to powerful algorithms, Lynx™ BT reliably decodes all major 1D (linear) barcodes, 2D stacked codes (such as PDF417), 2D matrix symbols (such as DataMatrix), postal codes (such as POSTNET, PLANET). The data stream — acquired from decoding a symbol — is rapidly sent to the host. The reader is immediately available to read another symbol.

FLASH MEMORY — Flash technology allows to upgrade the Lynx™ BT reader as new symbologies are supported or as improved decoding algorithms become available.

Lynx™ BT communicates in the 2.4 GHz ISM band and uses the Serial Port Profile (SPP). Paired with an OM-1000 BT cradle, Lynx™ BT builds a Cordless Reading System for the collection, decoding and transmission of barcoded data. OM-1000 BT can be connected to a Host PC through a USB, RS232 or Wedge emulation cable. By using the radio connection test button it is possible to verify whether the Lynx™ BT reader is connected to the cradle via radio or not. If connected, the reader will emit a single beep, otherwise no beep will be generated.
Thanks to the batch mode (see par. 5.6.1) Lynx™ BT continues to collect codes even when out of radio range. OM-1000 BT also serves as a battery charger for Lynx™ BT.

Together with a Bluetooth® compatible remote device, Lynx™ BT also builds a Cordless Reading System for the collection, decoding and transmission of barcoded data. The Bluetooth® compatible remote device can be a PC, PDA, printer, etc with a built-in Bluetooth® device or with external Bluetooth® adapter (i.e. Bluetooth® dongle).

1.2 LYNX™ BT BATTERIES

To begin using your Lynx™ BT you must charge its Li-Ion batteries using the OM-1000 cradle or the C-1000 battery charger as described in the following paragraph.

Battery Charging

The first operation to perform is to connect the OM-1000 or the C-1000 to the power converter and firmly insert the Lynx™ BT into the cradle to charge the batteries. The red Charging LED will light. When the battery is completely discharged, a full charge takes up to 4 hours. The Batt. Full LED will light when charging is completed. Press the reader trigger to turn it on.

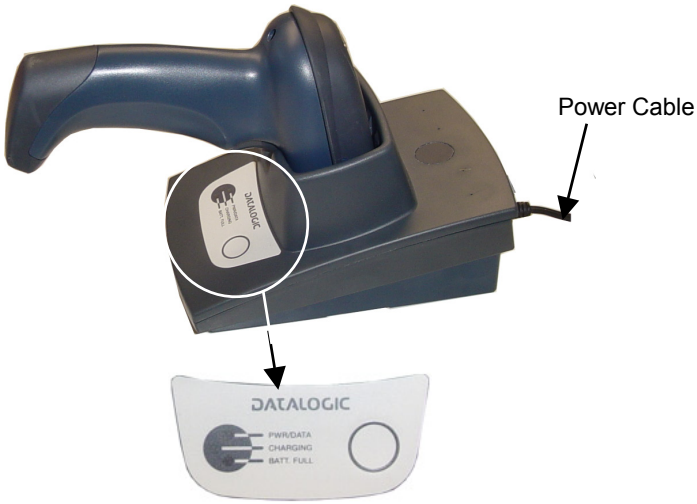


Figure 1 – OM-1000 BT Charging Batteries

The LEDs positioned on the cradle or on the battery charger signal the charge status, as described in the following table:

LED	STATUS
Charging	Red On = the battery charge is in progress
Batt Full	Green On = the battery is completely charged

NOTE

The batteries must be charged at a temperature ranging from 0° to 45 °C (+32° to +113 °F).

Replacing Lynx™ BT Batteries

To change the batteries in the Lynx™ BT, unscrew the battery cover screw, replace the old battery pack with a new one of the same type, then insert the cover onto the handle and screw it back into place. See the following figures.

To turn on the reader, press the trigger.

WARNING

Risk of explosion if the battery is replaced by an incorrect type. Dispose of the batteries as required by the relevant laws in force.

1.3 CONFIGURATION METHODS

1.3.1 Reading Configuration Barcodes

This manual can be used for complete setup and configuration. If you wish to change the default settings, you can configure the Lynx™ BT reader by reading the programming barcode symbols in this manual. Configuration commands and their relative arguments are read individually using the symbols in this manual. See Appendix C.

1.3.2 Using VisualSetup

The Datalogic VisualSetup program, available on the CD-ROM provided, allows programming the reader through the OM-1000 BT or a Bluetooth® device by selecting configuration commands or printing them through a user-friendly graphical interface running on the PC. These commands are sent to the reader over the current communication interface; or they can be printed to be read. The program also allows configuring the OM-1000 BT.

1.3.3 Sending Configuration Strings from Host

An alternative configuration method is provided in Appendix A using the RS232 or USB COM interface. This method is particularly useful when many devices need to be configured with the same settings. Batch files containing the desired parameter settings can be prepared to configure devices quickly and easily.

1.4 BLUETOOTH® DEFINITIONS

Bluetooth® address:	a unique 12-character hexadecimal, IEEE 48-bit address (BT_ADDR) that represents a Bluetooth® device.
Bluetooth® controller:	a sub-system containing Bluetooth® RF, baseband, resource controller, link manager, device manager, and Bluetooth® HCI.
Bluetooth® device:	a device that is capable of short-range wireless communication using the Bluetooth® system.
BT:	abbreviation for Bluetooth®. Bluetooth® protocol is a predefined rule that sets out a specific system for devices to communicate with each other and a protocol stack is the layering of the protocols that are used in a specific technology. The Bluetooth® Radio protocol operates in the 2.4GHz ISM band.
Remote Bluetooth® device:	any Bluetooth® device the reader can communicate with.
SPP:	Serial Port Profile. Bluetooth® profile creating an RS232 cable replacement.
Master:	the first Bluetooth® device initiating the radio connection (Discovery procedure).
Slave:	a Bluetooth® device which can only wait for a Bluetooth® Master device to initiate a connection with it.
User-Friendly name:	a human-readable name to set for a Lynx™ BT to make it easily recognizable when operating together with other Bluetooth® devices.
Piconet:	Bluetooth® device network where a Master can communicate with up to 7 Slaves.

For further information about Bluetooth technology see the website:

https://www.bluetooth.org/

2 USING LYNX™ BT

2.1 AIMING SYSTEM

The LYNX™ BT reader uses an intelligent aiming system similar to those on cameras. The aiming system indicates the field of view to be positioned over the code:

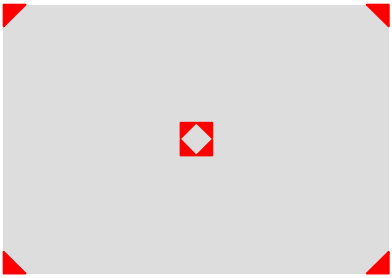


Figure 2 - Aiming System

When you pull the trigger completely a red beam illuminates the code. If the aiming system is centered and the entire symbology is within the aiming system, you will get a good read. The field of view changes size as you move the reader closer or farther away from the code.

Linear barcode **2D Matrix symbol**

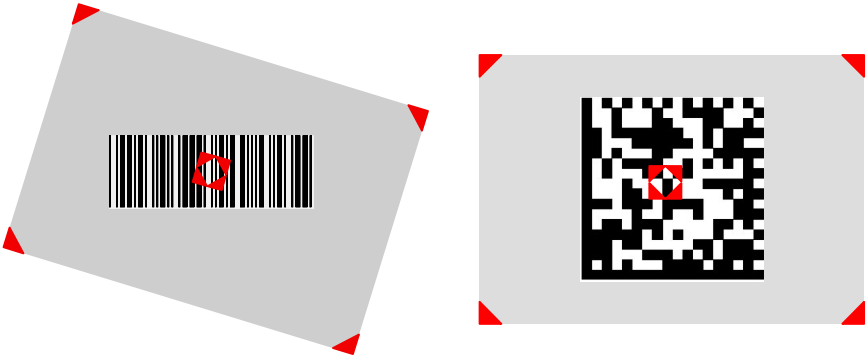


Figure 3 - Relative Size and Location of Aiming System Pattern

The field of view indicated by the aiming system will be smaller when the Lynx™ BT is closer to the code and larger when it is farther from the code. Symbologies with smaller bars or elements (mil size) should be read closer to the unit. Symbologies with larger bars or elements (mil size) should be read farther from the unit. (See chapter 8 for further details).

2.2 NORMAL OPERATION

Lynx™ BT normally functions by capturing and decoding codes.

Point the reader at the target and pull the trigger partially to enable the aiming system. Then, pull it completely to capture and decode the image. The reader will repeatedly flash until the symbol is decoded or timeout is reached. In between the flashes of the reader, the aiming system keeps on showing the field of view on the target (see Figure 3).

As you are reading code symbols, adjust the distance at which you are holding the reader.

NOTE

The LYNX™ BT hand-held reader aiming system is designed for general reading and decoding of 1D and 2D symbols. Some variation in reading distance will occur due to narrow bar width and other factors.

2.3 IMAGE CAPTURING

Lynx™ BT can also function as a camera by capturing images of labels, signatures, and other items.

In order to capture an image, the user should read a Capture Image code, then point at the image subject and pull the trigger. This way, the image will be captured and sent to the host PC. Lynx™ BT then returns to normal operation. To capture another image you must read another Capture Image Code of the same or a different Preset Configuration.

You can use the aiming system to position the reader from the object (ensure the reader is about centered over the target). Adjust the distance at which you are holding the reader (see Figure 3).

The image will be transferred to the host PC through the OM-10000 BT cradle or a BT device. If using the cradle with the RS232 interface or a BT device, the image will be transferred via XMODEM_1K protocol; while using the cradle with USB COM interface no protocol is required.

NOTE

Image capturing is not available in Wedge and USB Keyboard Emulation interfaces and is not compatible with Autoscanning nor when the Software trigger type is selected.

Up to four different and independent Image Presets can be defined (see on page 82). For each Image Preset you may set up to three Basic Configuration Parameters, and up to five Advanced Configuration Parameters. Therefore an image is processed before being sent to the Host, according to a preset group of parameters.

2.3.1 Basic Configuration Parameters

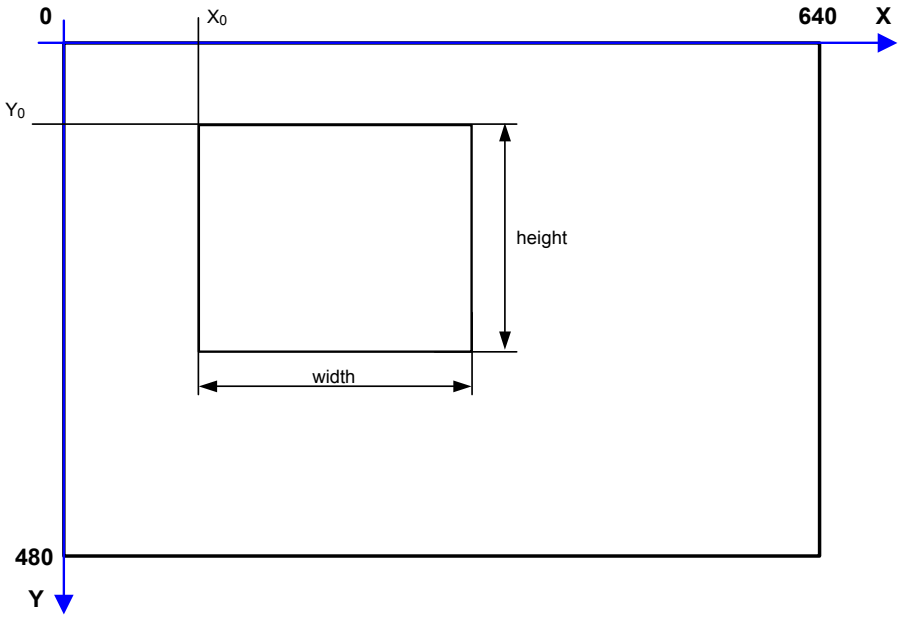
The Image file formats supported are: BMP, TIFF, JPEG (default).

Two resolution options are available: VGA Resolution (640 x 480 pixels) (default), and CIF Resolution (320 x 240 pixels). The lower resolution setting yields smaller file sizes, so the transfer time decreases.

For JPEG images it is possible to define the Image Quality level to address tradeoff between image file size and quality.

2.3.2 Advanced Configuration Parameters

An image portion (Window), instead of an entire image, can be captured. This parameter is generally used for particular fixed reading position applications.



An Image Window may either be as large as the image itself or smaller (10 x 10 pixels minimum), and is defined by its origin (the coordinate X_0, Y_0), its width (number of pixels along the X Axis) and its height (number of pixels along the Y Axis).

By default, for all Image Presets, the window has its origin coordinates equal to zero, its width equal to 640 pixels and its height to 480 pixels.

It is possible to perform Zooming of the image. The zoom range varies from 20% up to 200% in steps of 20%, so ten different settings are available. Default is 100% (no zoom).

In addition to Windowing and Zoom you can adjust Brightness and Contrast levels.

Brightness Adjustment is available in the range from –100% up to 100%, in steps of 1%. Positive values shift the luminance up so that the image will result brighter. Default value is 0%, meaning that no brightness adjustment is performed.

The same range of values (–100% up to 100%, in steps of 1%) is available for Contrast Adjustment. Positive values will increase the contrast, so that dark and bright objects inside the image will be better distinguishable. Default value is 0%, which means that no contrast adjustment is performed.

You can set the Image Color Depth by selecting 256 gray levels (default), 16 gray levels, or 2 gray levels. Higher color depths yield larger image files. This option is ignored if the JPEG format is selected,(256 gray levels only).

2.4 AUTOSCANNING

NOTE

The Autoscan mode requires a rapid consumption of the Lynx™ BT batteries.

2.4.1 Normal Mode

Lynx™ BT provides an **autoscan** command, which when enabled, causes the reader to scan continuously and to monitor the central zone of its reading area. In this way, Lynx™ BT is ready to capture any image (containing a potential code) positioned on a uniform background.

The aiming system can be enabled to indicate the reading area of the potential code to be captured. The illumination system can also be enabled when the ambient light conditions are not sufficient to autodetect the potential code to be captured; furthermore, the illumination system increases in intensity for an instant when capturing and decoding an image. A safety time may be defined to prevent Lynx™ BT from reading the same code repeatedly.

If the decoding is completed successfully, the reader starts monitoring the reading area again. In case of decoding failure, Lynx™ BT keeps on decoding until a potential code is present in the central zone of the reading area.

2.4.2 Pattern Mode

The Autoscan pattern mode is particularly advised when reading barcodes positioned on a non-uniform background. In these cases Lynx™ BT may perceive some elements of the background as barcodes and start the decoding. To avoid this undesired effect, the Autoscan Pattern Code is placed in the Lynx™ BT reading area which prevents decoding. Using this code as the background, code reading takes place normally by presenting desired codes to be read over the Pattern Code. Between each code read, the Pattern Code must be represented to Lynx™ BT.
The Pattern Code can be printed from Appendix C.

In case of low ambient light conditions, Lynx™ BT automatically activates the illumination system. If desired, the illumination system can be enabled so that it is always active.

2.5 CAMERA CONTROL

Exposure and Calibration

Two different control modes are available for managing the camera: automatic mode and fixed mode.

The automatic mode provides three different options to get the best tuning of the image to be captured:

- Automatic based on entire image: camera control mode based on the analysis of the whole image. This mode works well in most standard applications. It is the default setting.
- Automatic based on central image: camera control mode based on the analysis of a restricted area positioned in the central zone of the image. This mode is suggested when reading small codes positioned in a dark and extensive background.
- Automatic for highly reflective surfaces: camera control mode allowing to read codes on highly reflective surfaces. This mode is suggested, for example, when reading codes positioned on plastic or metal surfaces.

The fixed mode is particularly suggested for expert users. It requires a camera calibration to adjust the acquisition parameters to the ambient light conditions. The defined values will always be used when working with a fixed exposure.

These values are permanently saved in the reader memory.

Refer to page 47 for configuration barcodes.

Aiming System Calibration

The factory-defined Lynx™ BT aiming system is already correctly and precisely calibrated to the Lynx™ BT focus distance and therefore works for the most typical applications. However, it is possible to modify the aiming system precision for the following condition:

when a fixed reading distance **different** from the Lynx™ BT focus distance is used. The Lynx™ BT focus distance is 115 mm for Lynx™ BT432, and 65 mm for Lynx™ BT 432E.

Refer to the VisualSetup software program for performing the aiming system calibration.

2.6 DEFINING DATA FORMATTING

CAUTION

Headers and terminators can be set for both cradle and reader. If working with a Lynx™ BT paired with an OM-1000, the cradle headers and terminators have the priority while the reader's ones are ignored (refer to page 45 and 48).

The string of a decoded code to be sent to the host may be formatted as follows:

- defining simple **data formatting** (see "Data Format" on page 48);
- defining **advanced data formatting** giving complete flexibility in changing the format of data (see par. 4.3).

When both simple and advanced data formatting are selected the info is processed in the following order:

1. the string of the decoded code is processed according to the advanced formatting rules;
2. the resulting string is processed according to the selection type rules of the simple data formatting;
3. character substitution is performed on the resulting string;
4. character deletion is performed on the resulting string;
5. code concatenation is performed;
6. code ID is attached to the resulting string;
7. Bluetooth® reader address is added at the beginning of the resulting string;
8. global headers and terminators are attached to the resulting string;

The codes to be sent to the host may also be selected or ordered depending on the following two conditions:

- **one code per scan**: Lynx™ BT sends the code being closest to the image center. If the "Central Code Transmission" command is enabled, only the code containing the image center will be transmitted (see "Reading Parameters" on page 73);

- **all codes per scan**: the codes to be sent to the host may be ordered either by length or by symbology starting from the code being closest to the image center (see par. "Reading Parameters" on page 73). When enabling both these criteria, codes belonging to the same symbology are sent to the host depending on their length.

2.6.1 Concatenation

It is possible to concatenate up to 4 different codes, set their length and enable a separate transmission between them. When enabling the separate transmission one or more global headers and terminators are added to the decoded data. The concatenation procedure may occur in different ways depending on the number of codes to be decoded per image:

One Code Per Scan

- If the code resulting from the single decoding of an image belongs to one of the code families to be concatenated, it is saved to the Lynx™ BT memory waiting for other codes to complete the concatenation.
- If the code belongs to the same family of a code previously saved, it overwrites the old one.
- If the code resulting from the decoding does not belong to one of the code families to be concatenated, it causes the concatenation failure and clears the temporary memory. If the "Concatenation Failure Transmission" command is set to "Tx codes causing failure", this code will be sent in the output message.

All Codes Per Scan

- All codes resulting from the decoding of an image and belonging to one of the families to be concatenated are saved to the Lynx™ BT memory waiting for other codes to complete the concatenation.
- If one or more codes resulting from the decoding belong to the same family of codes previously saved, they overwrite the old ones.

When the image contains no code to be concatenated, the concatenation fails and the reader temporary memory is cleared. If the "Concatenation Failure Transmission" command is set to "Tx codes causing failure", the codes causing the concatenation failure will be sent in the output message.

3 INITIAL SETUP

This procedure allows setting up the reader to operate with the default settings.

Two different procedures are available according to the type of application you are working with:

- Lynx™ BT paired to the OM-1000 BT (follow procedure in par. 3.2);
- Lynx™ BT communicating with a Bluetooth® device (follow procedure in par. 3.3).

Whenever you need to change the default values refer to par. 4.2.

3.1 OM-1000 BT INTERFACE CABLE CONNECTIONS

The OM-1000™ can be connected to a Host by means of an RS232, Wedge or USB cable which must be simply plugged into the Host connector, visible on the rear panel of the cradle.

To disconnect the cable, insert a paper clip or other similar objects into the hole corresponding to the Host connector on the body of the cradle. Push down on the clip while unplugging the cable. Refer to the following figure:

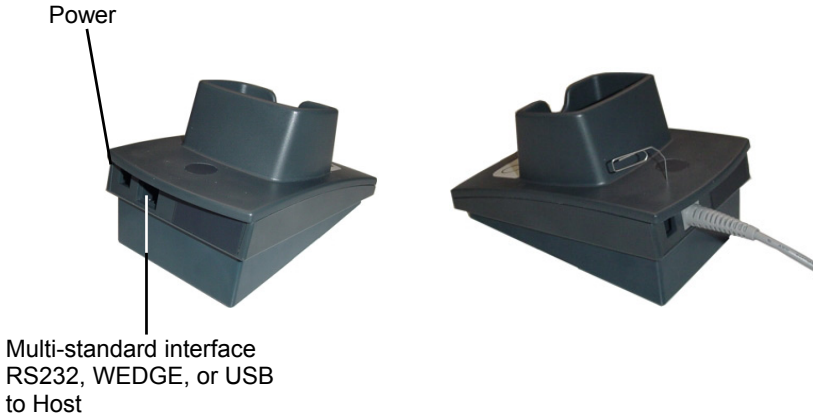


Figure 4 – Connecting/Disconnecting the Cable

3.2 SETTING UP LYNX™ BT WITH OM-1000 BT

To begin using your Lynx™ BT reader you must charge the Lynx™ BT battery using OM-1000™ BT as described in par. 1.2. When the battery is completely discharged, a full charge takes up to 4 hours with Li-Ion batteries.

The Lynx™ BT, paired with an OM-1000 BT cradle, builds a Cordless Reading System for the collection, decoding and transmission of barcoded data.

Follow the given procedure to make Lynx™ BT communicating with OM-1000 BT.

1. **Apply power to the OM-1000 BT.**

2. Read the **Bind** code to pair the Lynx™ BT to the OM-1000 BT cradle.
   The reader is dedicated to the cradle. Any previously **bound** reader will be excluded.

   Bind

   The green LED on the Lynx™ BT will blink; the reader is ready to be inserted into the cradle.

3. Place the Lynx™ BT series reader into the OM-1000 BT cradle, a series of beeps will be emitted. After a short pause, the reader will then emit four ascending tones signaling the correct radio connection.

5. Proceed with the system connection and configuration according to your application:
   - RS232 Interface (par. 3.2.1)
   - Wedge Interface (par. 3.2.2)
   - USB Interface (par. 3.2.3)

3.2.1 RS232 Interface Selection

The OM-1000 cradle requires the RS232 interface cable and the AC/DC power adapter to be connected.

To install and configure your cradle, follow these instructions:

1. Make all system connection as shown in Figure 5;

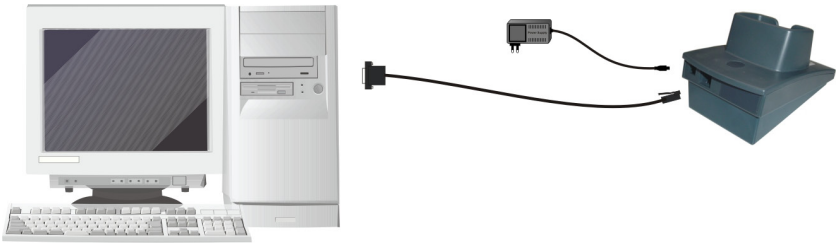


Figure 5 - RS232 Connection

2. Read the OM-1000 BT restore default parameter code below.

Restore OM-1000 BT Default

3. Read the RS232 interface selection code:

RS232

4. Power up your PC.

3.2.2 Wedge Interface Selection

The OM-1000 cradle requires the Wedge interface cable and the AC/DC power adapter to be connected.
To install and configure your cradle follow these instructions:

1. Make all cradle system connections as shown in Figure 6 (not making connections to the PC);

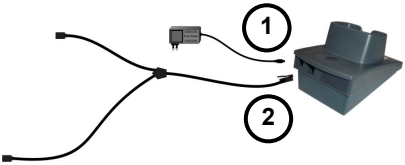


Figure 6 – Cradle Wedge Connections

2. Read the OM-1000 BT restore default parameter code below.

Restore OM-1000 BT Default

3. Read the interface selection code for your application:

Wedge - IBM AT

4. Make all PC system connections as shown in Figure 7;

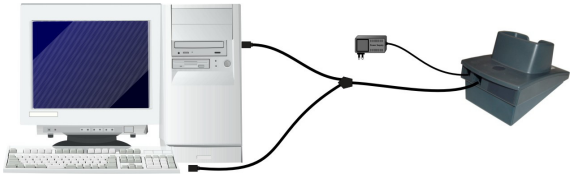


Figure 7 – PC Wedge Connections

5. Power up your PC.

CAUTION

When not using the OM-1000 cradle remember to disconnect the Wedge interface from the PC before disconnecting the power cord.

NOTE

It is always necessary to use an external power supply connected to the OM-1000 cradle.

3.2.3 USB Configuration and Selection

The USB interface is compatible with:

Windows 98 (and later)	IBM POS for Windows
Mac OS 8.0 (and later)	4690 Operating System

The OM-1000 cradle requires the USB interface cable and the AC/DC power adapter to be connected.

To install your cradle to your host system, follow these instructions:

1. Disconnect OM-1000 BT power (if connected);
2. Connect the USB cable to OM-1000 BT as shown in Figure 8, 1;
3. Connect power supply to OM-1000 BT as shown in Figure 8, 2;
4. Read the desired USB interface code:

USB-KBD (default)

USB-COM[1]

5. Connect the USB cable to PC as shown in Figure 8, 3;

6. Load drivers (if requested).

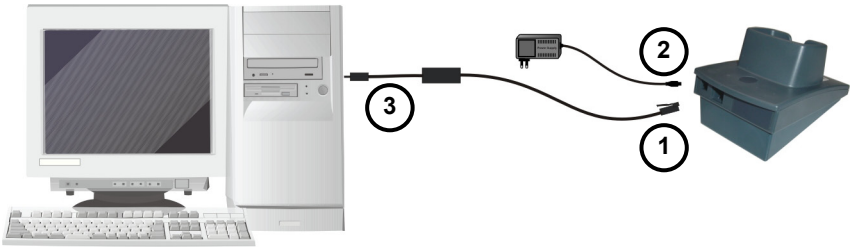


Figure 8 – USB Connection

NOTE

The OM-1000 cradle is a USB self-powered device.

Successive start-ups will automatically recognize the previously loaded drivers.

[1] When configuring USB-COM, the relevant files and drivers must be installed from the USB Device Installation software which can be downloaded from the web page (see http://www.datalogic.com).

3.3 SETTING UP LYNX™ BT WITH BLUETOOTH DEVICE

During typical operation a physical radio channel is shared by a group of devices that are synchronized to a common clock and frequency hopping pattern. One device provides the synchronization reference and is known as the Master. All other devices are known as Slaves. A group of devices synchronized in this fashion form a piconet.

Most Bluetooth® devices can be both Master or Slave. The Master will be the first unit to initiate the connection (page procedure).

Some devices can only be Slaves (i.e. printers). They can only wait for a Bluetooth® Master device to initiate a connection with them.

Lynx™ BT can be either Master or Slave. As Master it can initiate a connection with only one Slave device.

NOTE

Lynx™ BT uses the Serial Port Profile (SPP) for communication, creating an RS232 cable replacement. It is also possible to emulate a Wedge connection by means of the Wedge Emulation Utility provided on the CD-ROM. When using the Wedge Emulation Utility, it is advised to correctly set the terminators depending on the expected format for the program in which the data will be collected.

Follow one of the following two procedures to set up Lynx™ BT as Slave or as Master according to your application.

3.3.1 Setup for Lynx™ BT Slave

Once set as Slave, a Lynx™ BT reader requires no particular configuration for communication, however some radio parameters can be set to increase system performance and data transmission security. At startup the reader can only wait for the Master to initialize the radio communication.
The following is a general procedure recommended for Lynx™ BT Slave applications:

1. Power up the remote Bluetooth® Master device (example Laptop or PC).
2. Power up the Lynx™ BT reader within radio range (10 meters).
   Any modifications to the radio configuration should be made at this time before the radio connection takes place.
3. From the remote Bluetooth® Master device, execute the Discovery procedure, (according to the procedure given in the documentation of the Bluetooth® Master device), to recognize the Lynx™ BT reader(s) within radio range.
4. Check that "**Datalogic BT Device s/n:** xxxxxxxxx" (where X = Lynx™ BT serial number) is shown among the discovered devices.

Request to open an SPP connection with Lynx™ BT, making sure to disable any required PIN and/or pairing parameters. Lynx™ BT is discoverable and connectable without any required PIN (default).

NOTE

If the PIN of the Bluetooth® Master device cannot be disabled, use the PIN "1234". The Lynx™ BT Slave will emit four ascending tones indicating radio connection.

After the Lynx™ BT reader(s) indicate radio connection (see also par. 8.1), you can start sending barcodes.

The following figure shows an example Lynx™ BT Slave application.

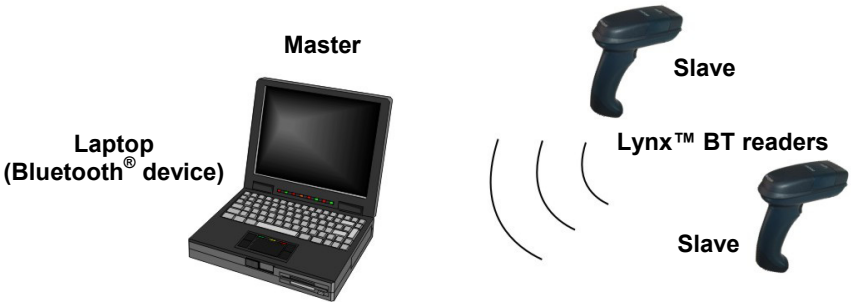


Figure 1 - Lynx™ BT Slave Application

If the Master Bluetooth® device can support a **piconet**, the communication can be established with up to **7 seven Slave** readers at the same time.

To configure your Lynx™ BT as Slave, follow the given procedure:

1. **Restore Lynx™ BT Default**

2. **Set Lynx™ BT as Slave**

3. **Reset Lynx™ BT**

YOUR READER IS NOW READY TO BE DISCOVERED (CONNECTED VIA RADIO) BY A BLUETOOTH® MASTER DEVICE AND READ BARCODES.

3.3.2 Setup for Lynx™ BT Master

Once set as Master, a Lynx™ BT reader must be configured with the address of the Slave device to which it wants to communicate.

By default, at startup the reader initializes the communication with the Slave. If the connection is successful, the reader can send barcodes to the Slave device. Radio connections can also be managed manually as described in pars. 5.5.2, 5.5.3 and 5.8.

During the request of radio connection or disconnection with a remote Bluetooth® Slave device, the reader emits a series of ticks and short blinks of the green LED.

The following figure shows an example Lynx™ BT Master application.

Figure 2 - Lynx™ BT Master Application

To set the Lynx™ BT as Master follow the given procedure:

1. **Restore Lynx™ BT default**

2. **Set Lynx™ BT as Master**

3. **Enter configuration**

4. **Set Remote Bluetooth® Device Address (slave)**

+

12 characters for the remote Bluetooth® device address specified in each Bluetooth® device.

5. **Exit and Save configuration**

6. **Reset Lynx™ BT**

If the connection is not successful, you can attempt a connection manually by double-clicking the reader trigger.

YOUR READER IS NOW READY TO READ BARCODES.

4 CONFIGURATION

This section describes the programming method of using configuration barcode symbols to program your reader. By using the Lynx™ BT reader to read/decode these special configuration symbols, you can configure, and obtain information from its system software.

When you are reading configuration barcode symbols, carefully aim the 2D reader to avoid reading adjacent symbols.

The configuration barcode symbols in this chapter are divided into logical sections according to the type of configuration required, (RS232 configuration, Code selection, etc.). On top of each section it is indicated the device (Lynx™ BT reader or OM-1000 BT cradle) to be configured through the selected parameter group, see the example:

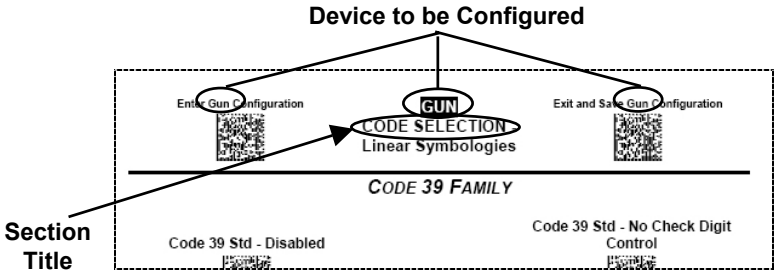


Figure 9 – Configuration Page Example

If arguments are required with a command, you can read additional barcode labels (typically digits) from Appendix A.

NOTE

During configuration be careful that the selected section contains parameters configuring the device you are working with.

4.1 DEFAULT SETTINGS

Configuration Field	Default Setting
RS232 Communication	
Baud Rate	115200
Parity, Data Bits, Stop Bits	No parity; 8 Data bits; 1 Stop bit
Handshake	None
ACK/NACK Protocol	None
RX Timeout	10 seconds
USB COM Emulation	
Handshake	None
ACK/NACK Protocol	None
RX Timeout	10 seconds
USB Keyboard Emulation	
*Keyboard Nationality	USA
WEDGE-Communication	
*Keyboard Nationality	USA
CapsLock	OFF
CapsLock Auto-Recognition	ON
NumLock	OFF
Data Format - Cradle	
*Header	No headers
*Terminator	CR and LF terminators for RS232, and USB COM ENTER terminator for Wedge, USB Keyboard
Camera Control	
Exposure Mode	Automatic, based on entire image
Data Format-Symbology Independent Parameters	
Code Identifier	Disabled
Code Length	Disabled
*Header	No headers
*Terminator	CR and LF terminators for RS232, USB COM ENTER terminator for Wedge, USB Keyboard
Address Stamping	Disabled
Address Delimiter	Disabled

* The default values of these parameters are set when reading the interface selection.

Configuration Field	Default Setting
Data Format-Symbology Dependent Parameters	
Custom Code Identifier	Disabled
Symbology Specific Format	Select All
Header Symbology	No headers
Terminator Symbology	No terminators
Symbology Character Substitution	No character to substitute
Symbology Character Deletion	No character to delete
Data Format-Concatenation	
Concatenation	Disabled
Define Concatenation	2 EAN/UPC codes concatenated
Set First Concatenated Code Length	000 = any length
Set Second Concatenated Code Length	000 = any length
Set Third Concatenated Code Length	000 = any length
Set Fourth Concatenated Code Length	000 = any length
Concatenation with Separate Code Transmission	Disabled
Concatenation Timeout	10 seconds
Concatenation Failure Transmission	Tx codes causing failure
Transmission after Timeout	No code transmission
Concatenation Result Code ID	No code Identifier
Advanced Formatting	
Format enable/disable	Disabled
Power Save	
Illumination System Power	Max power
Power Off Timeout with BT Connection	240 minutes
Power Off Timeout without BT Connection	15 minutes
Code Selection	
Issue Identical Codes	Enabled
EAN/UPC	
Selection	Enabled
Add-On	Disabled
UPCE Expansion	Disabled
Code 39	
Selection	Enabled - no check digit
Code39 Full ASCII	Disabled
Code Length Check	Disabled
Minimum Length	001
Maximum Length	255

Configuration Field	Default Setting
Code 39	
Start/Stop Character	Disabled
Code 32	
Selection	Disabled
Interleaved 2 of 5	
Selection	Enabled - check digit control and tx
Code Length Check	Disabled
Minimum Length	014
Maximum Length	255
Codabar	
Selection	Disabled
Code Length Check	Disabled
Minimum Length	001
Maximum Length	255
Code 128	
Code128 Selection	Enabled
Code Length Check	Disabled
Minimum Length	001
Maximum Length	255
EAN128	
Selection	Disabled
Code Length Check	Disabled
Minimum Length	001
Maximum Length	255
Code 93	
Selection	Disabled
Code Length Check	Disabled
Minimum Length	001
Maximum Length	255
PDF-417	
Selection	Enabled
Option	Macro PDF417 Buffered Mode
Micro PDF417	Disabled
RSS Family	
RSS Expanded	Disabled
RSS Limited	Disabled
RSS 14	Disabled
RSS Expanded Stacked	Disabled
RSS 14 Stacked	Disabled

Configuration Field	Default Setting
Data Matrix	
Selection	Enabled - normal & inverted
Rectangular Style	Enabled
Minimum Code Length	0001
Maximum Code Length	3600
QR	
Selection	Enabled
Postal Codes	
Selection	Disabled
Maxicode	
Maxicode Mode 1	Disabled
Maxicode Mode 2	Disabled
Maxicode Mode 3	Disabled
Maxicode Mode 4	Disabled
Maxicode Mode 5	Disabled
Maxicode Mode 6	Disabled
Composite Codes	
Selection	Disabled
Discard Linear Part	Enabled
Reading Parameters	
Trigger Mode	Trigger level
Trigger Type	Normal trigger
Flash ON	2 sec
Flash OFF	2 sec
Beeper Tone	Tone 1
Beeper Volume	High volume
Beeper Duration	50 ms
Read per Cycle	One read per cycle
Scan Timeout	5 sec
User Defined Beeper Tone	Tone 1
User Defined Beeper Volume	High Volume
User Defined Beeper Duration	100 ms
Code per Scan	One code per scan
Central Code Transmission	Enabled
Order by Code Length	Disabled
Order by Code Symbology	Disabled
Autoscan Mode	Disabled
Autoscan Aiming System	Enabled
Autoscan Hardware Trigger	Enabled

Configuration Field	Default Setting
Reading Parameters	
Autoscan Illumination System	Disabled
Safety Time	500 ms (if Autoscan mode or Software trigger type is selected and the More Reads per Cycle option is enabled).
Image Formatting	
Image Preset 1, 2, 3, 4	
Image Format	JPEG format
Resolution	Full (640x480)
Set JPEG Quality Factor	50
Window Origin	(0,0)
Window Dimensions	(640x480)
Brightness	0%
Contrast	0%
Zoom	100%
Color Depth	256 gray levels
Radio Parameters – Lynx™ BT with BT Device	
ACK/NACK Protocol with BT Device	None
Auto-Connection (for Master Only)	Enabled
Auto Reconnection (for Master Only)	Enabled
RX Timeout with BT Device	10 seconds
User-Friendly Name	Datalogic BT Device s/n: xxxxxxxxx (where x = Lynx™ serial number)
Authentication &Encryption with BT Device	Disabled
Radio Parameters – Lynx™ BT with OM-1000 BT	
Radio Protocol Timeout	3 seconds
Beeper Control for Radio Response	Good Decode and Good Reception
Transmission Mode	One Way
Authentication & Encryption with Cradle	Disabled
Batch Mode	Enabled

4.2 CHANGING DEFAULT SETTINGS

Once your reader is setup, you can change the default parameters to meet your application needs. Refer to the preceding paragraphs for initial configuration in order to set the default values and select the interface for your application.

In this manual, the configuration parameters are divided into logical groups making it easy to find the desired function based on its reference group.

The first four groups are for Cradle parameter configuration:

- **RS232**
- **USB**
- **WEDGE**
- **DATA FORMAT**

The following parameter groups are for Gun parameter configuration :

DATA FORMAT parameters regard the messages sent to the Host system.

CAMERA CONTROL parameters regard the control mode managing the camera.

POWER SAVE parameters manage overall current consumption in the reading device.

CODE SELECTION parameters allow configuration of a personalized mix of codes, code families and their options.

READING PARAMETERS control various operating modes and indicator status functioning.

CAPTURE IMAGE parameters activate image capturing.

ADVANCED CAPTURE IMAGE parameters define options of the image to capture.

RADIO PARAMETERS allow configuration of radio control parameters.

ADVANCED DATA FORMAT parameters allow advanced formatting of messages towards the Host.

RS232 INTERFACE

BAUD RATE

9600 baud

38400 baud

57600 baud

115200 baud

PARITY

None

Odd

Even

Enter Cradle Configuration

CRADLE
RS232

Exit and Save Cradle Configuration

DATA BITS

7 Bits

8 Bits

STOP BITS

1 Bit

2 Bits

ACK/NACK PROTOCOL

Disabled

Enabled

See par. 5.1.1 for details.

HANDSHAKE

None

XON/XOFF

RTS/CTS

RX TIMEOUT

RX Timeout

Read a number in the range **00-99,** where:
00 = disabled
01-99 = timeout from 1 to 99 secs

See par. 5.1.2 for details.

USB

USB COM Emulation

HANDSHAKE

None

XON/XOFF

RTS/CTS

ACK/NACK PROTOCOL

Disabled

Enabled

See par. 5.1.1 for details.

RX TIMEOUT

RX Timeout

Read a number in the range **00-99,** where:
00 = disabled
01-99 = timeout from 1 to 99 secs

See par. 5.1.2 for details.

USB KB Emulation

KEYBOARD NATIONALITY

This parameter default value is restored through the Interface Selection code and not Restore Default.

Belgian

English

French

German

Italian

Japanese

Spanish

Swedish

USA

WEDGE INTERFACE

CAPS LOCK

Caps Lock Off

Caps Lock On

CAPS LOCK AUTO-RECOGNITION

Disabled

Enabled

Note: Caps lock manual configuration is ignored when Caps Lock Auto-Recognition is enabled

NUM LOCK

Num Lock Off

Num Lock On

KEYBOARD NATIONALITY

This parameter default value is restored through the Interface Selection code and not Restore Default.

Belgian

English

French

German

Italian

Japanese

Spanish

Swedish

USA

KEYBOARD SETTING

This parameter values are restored through the Interface Selection code and not Restore Default.

Set Alphanumeric Keys

The reader can be used with terminals or PCs with various keyboard types and nationalities through a simple keyboard setting procedure.

Keyboard setting consists of communicating to the cradle how to send data corresponding to the keyboard used in the application. The keys must be set in a specific order.

Press and release a key to set it.

Some characters may require more than one key pressed simultaneously during normal use (refer to the manual of your PC or terminal for keyboard use). The exact sequence must be indicated to the reader in this case pressing and releasing the different keys.

Example:
If one has to press the "Shift" and "4" keys simultaneously on the keyboard to transmit the character "$" to the video, to set the "$", press and release "Shift" then press and release "4".

Each pressed and released key must generate an acoustic signal on the reader, otherwise repress the key. Never press more than one key at the same time, even if this corresponds to the normal use of your keyboard.

Press "Backspace" to correct a wrong key entry. In this case the reader emits 2 beeps.

Note: "CAPS LOCK" and "NUM LOCK" must be off before starting the keyboard setting procedure. "SHIFT" must be repressed for each character and cannot be substituted by "CAPS LOCK".

1. Read the "Set Alphanumeric Keys" code.

2. Press the keys shown in the following table according to their numerical order:

Enter Cradle Configuration

CRADLE
WEDGE

Exit and Save Cradle Configuration

Some ASCII characters may be missing as this depends on the type of keyboard: these are generally particular characters relative to the various national symbologies. In this case:

- **The first 4 characters (Shift, Alt, Ctrl, and Backspace) can only be substituted with keys not used, or substituted with each other.**
- Characters can be substituted with other single symbols (e.g. "SPACE") even if not included in the barcode set used.
- Characters can be substituted with others corresponding to your keyboard.

The reader signals the end of the procedure with 2 beeps indicating the keys have been registered.

01 : **Shift**		
02 : **Alt**		
03 : **Ctrl**		
04 : **Backspace**		
05 : **SPACE**	28 : **7**	51 : **N**
06 : **!**	29 : **8**	52 : **O**
07 : **"**	30 : **9**	53 : **P**
08 : **#**	31 : **:**	54 : **Q**
09 : **$**	32 : **;**	55 : **R**
10 : **%**	33 : **<**	56 : **S**
11 : **&**	34 : **=**	57 : **T**
12 : **'**	35 : **>**	58 : **U**
13 : **(**	36 : **?**	59 : **V**
14 : **)**	37 : **@**	60 : **W**
15 : *	38 : **A**	61 : **X**
16 : **+**	39 : **B**	62 : **Y**
17 : ,	40 : **C**	63 : **Z**
18 : **-**	41 : **D**	64 : **[**
19 : .	42 : **E**	65 : \
20 : /	43 : **F**	66 : **]**
21 : **0**	44 : **G**	67 : **^**
22 : **1**	45 : **H**	68 : _ (underscore)
23 : **2**	46 : **I**	69 : `
24 : **3**	47 : **J**	70 : **{**
25 : **4**	48 : **K**	71 : |
26 : **5**	49 : **L**	72 : **}**
27 : **6**	50 : **M**	73 : **~**
		74 : **DEL**

Acoustic Signals

When Lynx™ BT is connected to an OM-1000 BT, four types of acoustic signals are associated with the following steps:

1. Enter keyboard setup
2. Exit keyboard setup
3. SHIFT, ALT, CTRL, BACKSPACE keys
4. Keyboard keys (SHIFT, ALT, CTRL, BACKSPACE excluded)

These signals facilitate the selection of those characters requiring more than one key pressed simultaneously.

Example

The transmission of the "%" character implies two different steps:

1. Press the SHIFT key
2. Press the "5" key

The different tones produced by the reader indicate that both steps have been successful and that the character has been transmitted.

EXTENDED HEADER/TERMINATOR KEYS

For the WEDGE interface, the following extended keyboard values can also be configured:

These values are restored through the Interface Selection code and not Restore Default.

EXTENDED KEYBOARD TO HEX CONVERSION	
	IBM AT
HEX	KEY
83	ENTER
84	TAB
85	F1
86	F2
87	F3
88	F4
89	F5
8A	F6
8B	F7
8C	F8
8D	F9
8E	F10
8F	F11
90	F12
91	HOME
92	END
93	PG UP
94	PG DOWN
95	↑
96	↓
97	←
98	→
99	ESC
9A	CTRL (Right)
9B	Euro

SET CUSTOM EXTENDED HEADER/TERMINATOR KEYS

Set Extended Keys

The extended Header/Terminator keys for **Wedge Interface users** can be customized by defining them through a simple keyboard setting procedure.

For example, the Numeric Keypad keys can be set for use as Headers or Terminators by substituting the default extended keys during this procedure.

Press and release a key to set it.

Some characters may require more than one key pressed simultaneously during normal use (refer to the manual of your PC or terminal for keyboard use). The exact sequence must be indicated to the reader in this case pressing and releasing the different keys.

Example:
If one has to press the "Shift" and "4" keys simultaneously on the keyboard to transmit the character "$" to the video, to set the "$", press and release "Shift" then press and release "4".

Each pressed and released key must generate an acoustic signal on the reader, otherwise repress the key. Never press more than one key at the same time, even if this corresponds to the normal use of your keyboard.

Press "Backspace" to correct a wrong key entry. In this case the reader emits 2 beeps.

Note: "CAPS LOCK" and "NUM LOCK" must be off before starting the keyboard setting procedure. "SHIFT" must be repressed for each character and cannot be substituted by "CAPS LOCK".

1. Read the "Set Extended Keys" code.
2. Press the first 4 keys indicated in the following table.
3. Define all keys from 5 to 28 in the following table.

Enter Cradle Configuration

CRADLE
WEDGE

Exit and Save Cradle Configuration

If the first 4 KEYS (Shift, Alt, Ctrl, and Backspace) are not available on your keyboard, you can only substitute them with keys not used, or substitute them with each other.

The reader signals the end of the procedure with 2 beeps indicating the keys have been registered.

CUSTOM EXTENDED KEYBOARD SETTING TABLE		
		Custom
Order	HEX	KEY
01	-	Shift
02	-	Alt
03	-	Ctrl
04	-	Backspace
05	**83**	
06	**84**	
07	**85**	
08	**86**	
09	**87**	
10	**88**	
11	**89**	
12	**8A**	
13	**8B**	
14	**8C**	
15	**8D**	
16	**8E**	
17	**8F**	
18	**90**	
19	**91**	
20	**92**	
21	**93**	
22	**94**	
23	**95**	
24	**96**	
25	**97**	
26	**98**	
27	**99**	
28	**9A**	

Enter Cradle Configuration

CRADLE
WEDGE

Exit and Save Cradle Configuration

Acoustic Signals

When Lynx™ BT is connected to an OM-1000 BT, four types of acoustic signals are associated with the following steps:

1. Enter keyboard setup
2. Exit keyboard setup
3. SHIFT, ALT, CTRL, BACKSPACE keys
4. Keyboard keys (SHIFT, ALT, CTRL, BACKSPACE excluded)

These signals facilitate the selection of those characters requiring more than one key pressed simultaneously.

Example

The transmission of the "%" character implies two different steps:

1. Press the SHIFT key
2. Press the "5" key

The different tones produced by the reader indicate that both steps have been successful and that the character has been transmitted.

DATA FORMAT

SET HEADERS

Set Headers

1. Set the number of characters in the range **00-10**.
2. Read the corresponding characters as Hex values from the Hex/Numeric table. Valid values are in the range:
   00-7F for RS232 and USB COM
   00-9B for Wedge and USB Keyboard
3. Read the following code to enable the configuration you have set.

HEADERS

Disabled

Enabled

SET TERMINATORS

Set Terminators

1. Set the number of characters in the range **00-10**.
2. Read the corresponding characters as Hex values from the Hex/Numeric table. Valid values are in the range:
   00-7F for RS232 and, USB COM
   00-9B for Wedge and USB Keyboard
3. Read the following code to enable the configuration you have set.

TERMINATORS

Disabled

Enabled

CAMERA CONTROL

EXPOSURE MODE

Fixed

Automatic (Entire Image)

Automatic (Central Part of Image)

Automatic for Highly Reflective Surfaces

See par. 2.5 for details.

CAMERA CALIBRATION

Calibrate

Calibrates the correct exposure parameter values when using fixed exposure. The parameters defined will be permanently saved in the reader memory (see par. 2.5 for details).

DATA FORMAT

With the exception of the Symbology Independent Header and Terminator selections, the parameters of this group can be restored to their default values using the following default code settings:

1) the general “Restore Default” code restores all the configuration parameter groups to their default values;
2) the “Data Format Default” code restores the Data Format Symbology Independent and Symbology Dependent parameters to their default values and disables the defined concatenation by resetting all its parameters.

The default values of the Symbology Independent Header and Terminator selections are set when reading the interface selection.

DATA FORMAT DEFAULT

Data Format Default

Symbology Independent Parameters

CODE IDENTIFIER

Disabled

Custom Code ID

AIM Standard Code ID

CODE LENGTH

Disabled

Enabled

SET HEADERS

Set Headers

1. Set the number of characters in the range **00-10**.
2. Read the corresponding characters as Hex values from the Hex/Numeric table. Valid values are in the range **00-7F**
3. Read the following code to enable the configuration you have set.

HEADERS

Disabled

Enabled

SET TERMINATORS

Set Terminators

1. Set the number of characters in the range **00-10**.
2. Read the corresponding characters as Hex values from the Hex/Numeric table. Valid values are in the range **00-7F**
3. Read the following code to enable the configuration you have set.

TERMINATORS

Disabled

Enabled

ADDRESS STAMPING

Disabled

Enabled

See par. 5.2.2 for details.

ADDRESS DELIMITER

disabled

enabled

Read 2 HEX character in the range **00-FE**.

See par. 5.2.3 for details.

Symbology Dependent Parameters

The “Symbology Specific Format Default” code on page 55 allows restoring the symbology dependent parameters related to a specific code family to the default values.

CUSTOM CODE IDENTIFIER

Custom Code Identifier

1. Select a Datalogic Standard Code Identifier from the Code Identifier Table in Appendix B.
2. Set the number of characters in the range **0-3**, where **0** = Code ID disabled.
3. Read the corresponding characters as Hex values from the Hex/Numeric table. Valid values are in the range **00-7F.**

SYMBOLOGY SPECIFIC FORMAT

Symbology Specific Format

1. Select a Datalogic Standard Code Identifier from the Code Identifier Table in Appendix B.
2. Formatting:
   - 0 = select all - Stop
   - 1 = select right - followed by Step 3
   - 2 = select left - followed by Step 3
   - 3 = select middle - followed by a number in the range **000-999** for the starting character and then, by Step 3
   - 4 = discard right - followed by Step 3
   - 5 = discard left - followed by Step 3
   - 6 = discard middle - followed by a number in the range **000-999** for the starting character and then, by Step 3
3. Set the number of characters to select/discard in the range **000-999**.

SYMBOLOGY HEADERS

Symbology Headers

1. Select a Datalogic Standard Code Identifier from the Code Identifier Table in Appendix B.
2. Set the number of characters in the range **0-5**.
3. Read the corresponding characters as Hex values from the Hex/Numeric table. Valid values are in the range **00-7F**
4. Read the following code to enable the configuration you have set.

HEADERS

Headers

1. Select a Datalogic Standard Code Identifier from the Code Identifier Table in Appendix B.
2. 0 = disabled
   1 = enabled

SYMBOLOGY TERMINATORS

Symbology Terminators

1. Select a Datalogic Standard Code Identifier from the Code Identifier Table in Appendix B.
2. Set the number of characters in the range **0-5**.
3. Read the corresponding characters as Hex values from the Hex/Numeric table. Valid values are in the range **00-7F**
4. Read the following code to enable the configuration you have set.

TERMINATORS

Terminators

1. Select a Datalogic Standard Code Identifier from the Code Identifier Table in Appendix B.
2. 0 = disabled
   1 = enabled

SYMBOLOGY CHARACTER SUBSTITUTION

Symbology Character Substitution

1. Select a Datalogic Standard Code Identifier from the Code Identifier Table in Appendix B.
2. Read the corresponding character as Hex value from the Hex/Numeric table which identifies the character to be substituted. Valid value is in the range **00-7F**.
3. Read the corresponding character as Hex value from the Hex/Numeric table which identifies the new substituting character. Valid value is in the range **00-7F**.
4. Read the following code to enable the configuration you have set.

CHARACTER SUBSTITUTION

Character Substitution

1. Select a Datalogic Standard Code Identifier from the Code Identifier Table in Appendix B.
2. 0 = disabled
   1 = enabled

SYMBOLOGY CHARACTER DELETION

Symbology Character Deletion

1. Select a Datalogic Standard Code Identifier from the Code Identifier Table in Appendix B.
2. Read the corresponding character as Hex value from the Hex/Numeric table which identifies the character to be deleted.
   Valid value is in the range **00-7F**.
3. Read the following code to enable the configuration you have set.

CHARACTER DELETION

Character Deletion

1. Select a Datalogic Standard Code Identifier from the Code Identifier Table in Appendix B.
2. 0 = disabled
   1 = enabled

SYMBOLOGY SPECIFIC FORMAT DEFAULT

Symbology Specific Format Default

Select a Datalogic Standard Code Identifier from the Code Identifier Table in Appendix B.

Concatenation

DEFINE CONCATENATION

Define Concatenation

1. Select the number of codes to concatenate in the range **2-4**.
2. Select the Datalogic Standard Code Identifier for each code to concatenate (repeat for same code types) from the table in Appendix B.
3. Read the following Code to enable the configuration you have set.

CONCATENATION ENABLE/DISABLE

Disabled

Enabled

Concatenation Options

FIRST CONCATENATED CODE LENGTH

Set First Concatenated Code Length

Read the number in the range **000-255**.
000 = any code length

SECOND CONCATENATED CODE LENGTH

Set Second Concatenated Code Length

Read the number in the range **000-255**.
000 = any code length

THIRD CONCATENATED CODE LENGTH

Set Third Concatenated Code Length

Read the number in the range **000-255**.
000 = any code length

FOURTH CONCATENATED CODE LENGTH

Set Fourth Concatenated Code Length

Read the number in the range **000-255**.
000 = any code length

CONCATENATION WITH SEPARATE CODE TRANSMISSION

Disabled

Enabled

This parameter is enabled with concatenation activated (see par. 2.6.1 for details).

See par. 5.2.4 for details.

CONCATENATION FAILURE TRANSMISSION

TX Codes Causing Failure

No Code TX

See par. 2.6.1for details

CONCATENATION TIMEOUT

Concatenation Timeout

05-99 = timeout from 5 to 99 seconds.

TRANSMISSION AFTER TIMEOUT

No Code Transmission

First Code Transmission

Second Code Transmission

Third Code Transmission

Fourth Code Transmission

CONCATENATION RESULT CODE ID

No Code Identifier

Use First Code Identifier

Use Second Code Identifier

Use Third Code Identifier

Use Fourth Code Identifier

POWER SAVE

ILLUMINATION SYSTEM POWER

Illumination System OFF

Low Power

Intermediate Power

Maximum Power

POWER OFF TIMEOUT WITH BT CONNECTION

Power Off Timeout with BT Connection

Read a number in the range **001-255,** where:
001-255 = timeout from 1 to 255 min

See par. 5.3.1 for details.

POWER OFF TIMEOUT WITH NO BT CONNECTION

Power Off Timeout with No BT Connection

Read a number in the range **001-255,** where:
001-255 = timeout from 1 to 255 min

See par. 5.3.2 for details.

CODE SELECTION

Disable All Symbologies

Disable All Linear Symbologies

Disable All 2D Symbologies

ISSUE IDENTICAL CODES

Disabled

Enabled

Linear Symbologies

UPC/EAN/JAN FAMILY

EAN/UPC/JAN Disabled

EAN/UPC/JAN Enabled

Add-On Disabled

Add-On Enabled

UPCE Expansion Disabled

UPCE Expansion Enabled

CODE 39 FAMILY

Code 39 Std - Disabled

Code 39 Std - No Check Digit Control

Code 39 Std - Check Digit Control without Transmission

Code 39 Std - Check Digit Control and Transmission

Code 39 Full ASCII - Disabled

Code 39 Full ASCII- Enabled

Code Length Check - Disabled

Code Length Check - Enabled

Minimum Code Length

Read the number in the range **001-255**.

Maximum Code Length

Read the number in the range **001-255**.

Start-Stop Character Transmission - Disabled

Start-Stop Character Transmission - Enabled

CODE 32 FAMILY

Disabled

Enabled

INTERLEAVED 2 OF 5 FAMILY

Disabled

Enabled - No Check Digit Control

Enabled - Check Digit Control and without Transmission

Enabled - Check Digit Control and Transmission

Code Length Check - Disabled

Code Length Check - Enabled

Minimum Code Length

Read the number in the range **001-255**.

Maximum Code Length

Read the number in the range **001-255**.

CODABAR FAMILY

Disabled

Enabled - No Check Digit Control

Enabled - Check Digit Control without Transmission

Enabled - Check Digit Control and Transmission

Code Length Check - Disabled

Code Length Check - Enabled

Minimum Code Length

Read the number in the range **001-255**.

Maximum Code Length

Read the number in the range **001-255**.

CODE 128 FAMILY

Code 128 - Disabled

Code 128 - Enabled

Code Length Check - Disabled

Code Length Check - Enabled

Code 128 - Min. Code Length

Read the number in the range **001-255**.

Code 128 - Max. Code Length

Read the number in the range **001-255**.

EAN 128 - Disabled

EAN 128 - Enabled

EAN 128 - Code Length Check Disabled

EAN 128 - Code Length Check Enabled

EAN 128 - Min. Code Length

Read the number in the range **001-255**.

Maximum Code Length

Read the number in the range **001-255**.

CODE 93 FAMILY

Disabled

Enabled

Code Length Check - Disabled

Code Length Check - Enabled

Minimum Code Length

Read the number in the range **001-255**.

Maximum Code Length

Read the number in the range **001-255**.

RSS FAMILY

Disable RSS Expanded

Enable RSS Expanded

Disable RSS Limited

Enable RSS Limited

Disable RSS 14

Enable RSS 14

Disable RSS Expanded Stacked

Enable RSS Expanded Stacked

Disable RSS 14 Stacked

Enable RSS 14 Stacked

2D Symbologies

PDF417

Disabled

Enabled

Macro PDF417 Unbuffered Mode

Macro PDF417 Buffered Mode

The following command carries out its specific function.

Abort Macro PDF417 Buffered Mode

It stops buffering the read codes at any time. All the buffered codes will not be saved.

MICRO PDF417

Disabled

Enabled

DATAMATRIX FAMILY

Disabled

Enabled

Minimum Code Length

Read the number in the range **0001-3600**.

Maximum Code Length

Read the number in the range **0001-3600**.

Rectangular Style – Disabled

Rectangular Style - Enabled

QR FAMILY

Disabled

Enabled

POSTAL CODES FAMILY

All Disabled

Australian Post - Enabled

Japan Post - Enabled

PLANET - Enabled

POSTNET - Enabled

POSTNET with B and B' - Enabled

POSTNET and PLANET - Enabled

POSTNET with B and B' and PLANET - Enabled

KIX Code - Enabled

Royal Mail Code (RM4SCC) - Enabled

MAXICODE FAMILY

Maxicode Mode 0 - Disabled

Maxicode Mode 0 Enabled

Maxicode Mode 1 - Disabled

Maxicode Mode 1 - Enabled

Maxicode Mode 2 - Disabled

Maxicode Mode 2 - Enabled

Maxicode Mode 3 - Disabled

Maxicode Mode 3 - Enabled

Maxicode Mode 4 - Disabled

Maxicode Mode 4 - Enabled

Maxicode Mode 5 - Disabled

Maxicode Mode 5 - Enabled

Maxicode Mode 6 - Disabled

Maxicode Mode 6 - Enabled

COMPOSITE CODES

NOTE

Before enabling this symbology, it is necessary to enable the linear barcode family (among RSS, EAN128 or UPC/EAN) contained in the composite code to be read.

Disabled

Enabled

Discard Linear Part - Disabled

Discard Linear Part - Enabled

READING PARAMETERS

TRIGGER MODE

Trigger Level

Trigger Pulse

TRIGGER TYPE

Normal Trigger

Software Trigger

FLASH MODE

Flash ON Duration

Read a number in the range **01-99**, which corresponds to a max 9.9 seconds duration.

Flash OFF Duration

Read a number in the range **01-99**, which corresponds to a max 9.9 seconds duration.

BEEPER TONE

Tone 1

Tone 2

Tone 3

Tone 4

BEEPER VOLUME

Beeper OFF

Low Volume

Medium Volume

High Volume

BEEPER DURATION

Beeper Duration

Read a number in the range **01-99**, which corresponds to a max 99 ms duration.

READ PER CYCLE

One Read per Cycle

More Reads per Cycle

SCAN TIMEOUT

Define Timeout

Read a number in the range **01**-**99**, which corresponds to a max 99 seconds duration. The timeout is activated when the decoding fails.

User Defined Beeper

USER DEFINED BEEPER TONE

Tone 1

Tone 2

Tone 3

Tone 4

USER DEFINED BEEPER VOLUME

Beeper OFF

Low Volume

Medium Volume

High Volume

USER DEFINED BEEPER DURATION

Set Duration

Read a number in the range **01**-**99**, which corresponds to a max 990 ms duration.

TEST USER DEFINED BEEPER

The following command carries out its specific function.

Test User Defined Beeper

See par. 8.1.3 for details.

Code Ordering and Selection

CODE PER SCAN

One Code per Scan

All Codes per Scan

CENTRAL CODE TRANSMISSION

The following command is available when working in "one code per scan".

Disabled

Enabled

See par. 2.6 for details.

ORDER BY CODE LENGTH

The following commands are available when working in "all codes per scan".

Disabled

Enabled - Increasing Order

Enabled - Decreasing Order

ORDER BY CODE SYMBOLOGY

The following commands are available when working in "all codes per scan".

Set Order

1. Select the number of codes in the range **0-9**.
2. Select the Datalogic Standard Code Identifier for each above defined code from the table in Appendix B.

See par. 2.6 for details.

Autoscan

AUTOSCAN MODE

Disabled

Enabled in Normal Mode

Enabled in Pattern Mode

See par. **2.4** for details.

AUTOSCAN AIMING SYSTEM

Disabled

Enabled

AUTOSCAN HARDWARE TRIGGER

Disabled

Enabled

AUTOSCAN ILLUMINATION SYSTEM

Disabled

Enabled

The following commands can be activated when it is possible to read one code per image only.

SAFETY TIME

Disabled

Enabled

Valid only with software trigger or autoscan enabled.

SAFETY TIME DURATION

Set Duration

Read a number in the range **01-99**, where 01 corresponds to 100 ms and 99 to 9.9 seconds.

CAPTURE IMAGE

In order to capture an image, you should read one of these codes (for further details see. par 2.3), then point at the image subject and pull the trigger. The image will be captured and sent to the host PC according to the Preset Configuration.

Capture Image using Preset 1

Capture Image using Preset 2

Capture Image using Preset 3

Capture Image using Preset 4

ADVANCED IMAGE CAPTURE

Image Preset 1

Basic Configuration

IMAGE FORMAT – PRESET 1

Bitmap Format


JPEG Format


TIFF Format


RESOLUTION – PRESET 1

Full Resolution (640 x 480)


Quarter Resolution (320 x 240)


JPEG QUALITY FACTOR – PRESET 1

JPEG Quality Factor

Set the JPEG compression level in the range **000-100**.

Advanced Configuration

WINDOW DIMENSIONS – PRESET 1

Origin along X Axis

Read a number in the range **0-630**

Origin along Y Axis

Read a number in the range **0-470**

Width

Read a number in the range **10-640**

Height

Read a number in the range **10-480**

BRIGHTNESS – PRESET 1

Increase

Read a number in the range **0-100**

Decrease

Read a number in the range **0-100**

CONTRAST – PRESET 1

Increase

Read a number in the range **0-100**

Decrease

Read a number in the range **0-100**

ZOOM – PRESET 1

20%

40%

60%

80%

100%

120%

140%

160%

180%

200%

COLOR DEPTH – PRESET 1

2 Grey Levels*

16 Grey Levels*

256 Grey Levels

* only for TIFF and BMP Images.

Image Preset 2

Basic Configuration

IMAGE FORMAT – PRESET 2

Bitmap Format

JPEG Format

TIFF Format

RESOLUTION – PRESET 2

Full Resolution (640 x 480)

Quarter Resolution (320 x 240)

JPEG QUALITY FACTOR – PRESET 2

JPEG Quality Factor

Set the JPEG compression level in the range **000-100**.

WINDOW DIMENSIONS – PRESET 2

Origin along X Axis

Read a number in the range **0-630**

Origin along Y Axis

Read a number in the range **0-470**

Width

Read a number in the range **10-640**

Height

Read a number in the range **10-480**

BRIGHTNESS – PRESET 2

Increase

Read a number in the range **0-100**

Decrease

Read a number in the range **0-100**

CONTRAST – PRESET 2

Increase

Read a number in the range **0-100**

Decrease

Read a number in the range **0-100**

ZOOM – PRESET 2

20%

40%

60%

80%

100%

120%

140%

160%

180%

200%

COLOR DEPTH – PRESET 2

2 Grey Levels*

16 Grey Levels*

256 Grey Levels

* only for TIFF and BMP Images.

Image Preset 3

Basic Configuration

IMAGE FORMAT – PRESET 3

Bitmap Format

JPEG Format

TIFF Format

RESOLUTION – PRESET 3

Full Resolution (640x 480)

Quarter Resolution (320 x 240)

JPEG QUALITY FACTOR – PRESET 3

JPEG Quality Factor

Set the JPEG compression level in the range **000-100**.

WINDOW DIMENSIONS – PRESET 3

Origin along X Axis

Read a number in the range **0-630**

Origin along Y Axis

Read a number in the range **0-470**

Width

Read a number in the range **10-640**

Height

Read a number in the range **10-480**

BRIGHTNESS – PRESET 3

Increase

Read a number in the range **0-100**

Decrease

Read a number in the range **0-100**

CONTRAST – PRESET 3

Increase

Read a number in the range **0-100**

Decrease

Read a number in the range **0-100**

ZOOM – PRESET 3

20%

40%

60%

80%

100%

120%

140%

160%

180%

200%

COLOR DEPTH – PRESET 3

2 Grey Levels*

16 Grey Levels*

256 Grey Levels

* only for TIFF and BMP Images.

Image Preset 4

Basic Configuration

IMAGE FORMAT – PRESET 4

Bitmap Format

JPEG Format

TIFF Format

RESOLUTION – PRESET 4

Full Resolution (640 x 480)

Quarter Resolution (320 x 240)

JPEG QUALITY FACTOR – PRESET 4

JPEG Quality Factor

Set the JPEG compression level in the range **000-100**.

WINDOW DIMENSIONS – PRESET 4

Origin along X Axis

Read a number in the range **0-630**

Origin along Y Axis

Read a number in the range **0-470**

Width

Read a number in the range **10-640**

Height

Read a number in the range **10-480**

BRIGHTNESS – PRESET 4

Increase

Read a number in the range **0-100**

Decrease

Read a number in the range **0-100**

CONTRAST – PRESET 4

Increase

Read a number in the range **0-100**

Decrease

Read a number in the range **0-100**

ZOOM – PRESET 4

20%

40%

60%

80%

100%

120%

140%

160%

180%

200%

COLOR DEPTH – PRESET 4

2 Grey Levels*

16 Grey Levels*

256 Grey Levels

- only for TIFF and BMP Images.

RADIO PARAMETERS

Lynx™ BT with BT Device

ACK/NACK PROTOCOL WITH BT DEVICE

Disabled


Enabled


See par. 5.5.1 for details.

AUTO-CONNECTION (FOR MASTER ONLY)

Disabled


Enabled


See par. 5.5.2 for details.

AUTO RECONNECTION (FOR MASTER ONLY)

Disabled


Enabled


See par. 5.5.3 for details.

RX TIMEOUT WITH BT DEVICE

Radio RX Timeout

Read a number in the range **00-99,** where:
00 = disabled
01-99 = timeout from 1 to 99 secs

See par. 5.5.4 for details.

USER-FRIENDLY NAME

Change User-Friendly Name

1. Enter up to 50 characters to define the desired user-friendly name;
2. Read the following code to validate the name you have entered.

Validate User-Friendly Name

Restore Factory User-Friendly Name

See par. 5.5.5 for details.

AUTHENTICATION & ENCRYPTION WITH BT DEVICE (FOR MASTER ONLY)

Disabled

Enabled

PIN Code

1. Enter 16 characters max. to define the desired pin code;
2. Read the following code to validate the code you have entered.

Validate PIN Code

See par. 5.5.6 for details.

Lynx™ BT with OM-1000 BT

BATCH MODE

Disabled

Enabled

See par. 5.6.1 for details.

BEEPER CONTROL FOR RADIO RESPONSE

Good Decode and Good Reception

Only Good Decode

Only Good Reception

Off

See par. 5.6.2 for details.

TRANSMISSION MODE

One Way

Two Ways

See par. 5.6.3 for details.

AUTHENTICATION & ENCRYPTION WITH CRADLE

Disabled

Enabled

After changing this parameter, read the Software Reset code in par. 5.9.

RADIO PROTOCOL TIMEOUT

Radio Protocol Timeout

Read a number in the range **03-19**, where:
03-19 = timeout from 3 to 19 secs

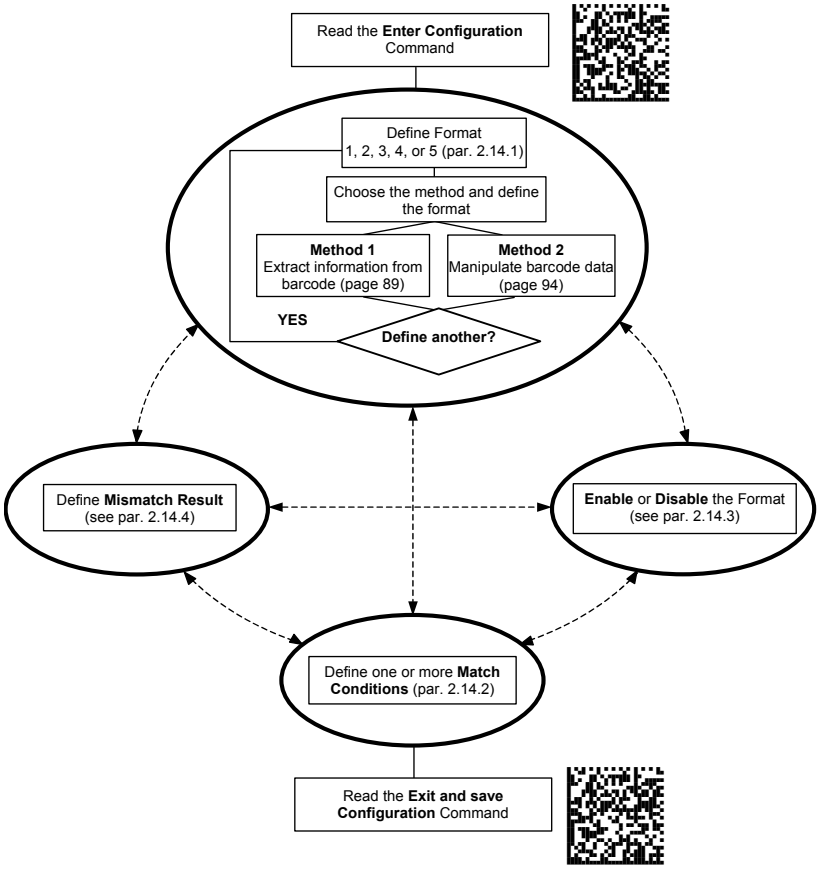
See par. 5.6.4 for details.

4.3 ADVANCED DATA FORMAT

Advanced data format has been designed to offer you complete flexibility in changing the format of barcode data **before** transmitting it to the host system.
Up to 5 advanced code management formats can be defined by completing the four given procedures following the desired order:

- Format Definition
- Mismatch Result
- Enable/Disable Format
- Match Conditions

The formats defined will be restored to default values when reading the general "Restore Lynx™ BT Default" code.



4.3.1 Format Definition

STEP 1	FORMAT DEFINITION

Define Format 1

Define Format 2

Define Format 3

Define Format 4

Define Format 5

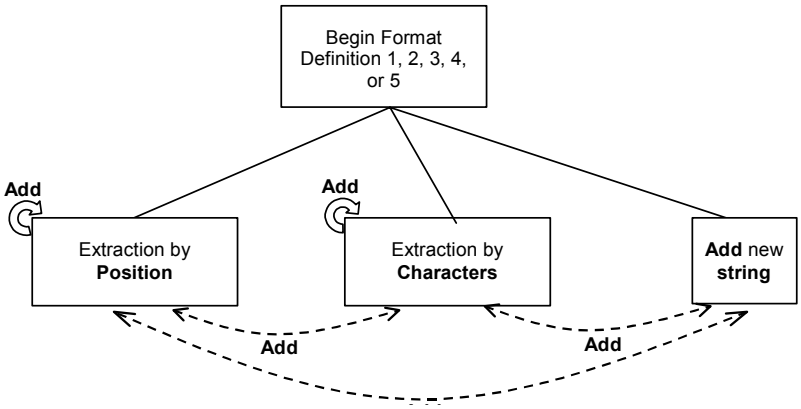
STEP 2 FORMAT DEFINITION

Method 1 - Extracting Information from Barcode

Method 1 allows extracting one or more fields by position or by characters from the decoded barcode. These fields are sent to the host computer as data of the output message, while the characters not included in the formatting procedure will be deleted and not inserted in the output message.

These two kinds of extraction (by position / by character) can be used together within the same format definition; furthermore, it possible to complete the new format by adding a new string of characters. Since there is no fixed rule, the procedures can be freely put in order and repeated according to your requirement.

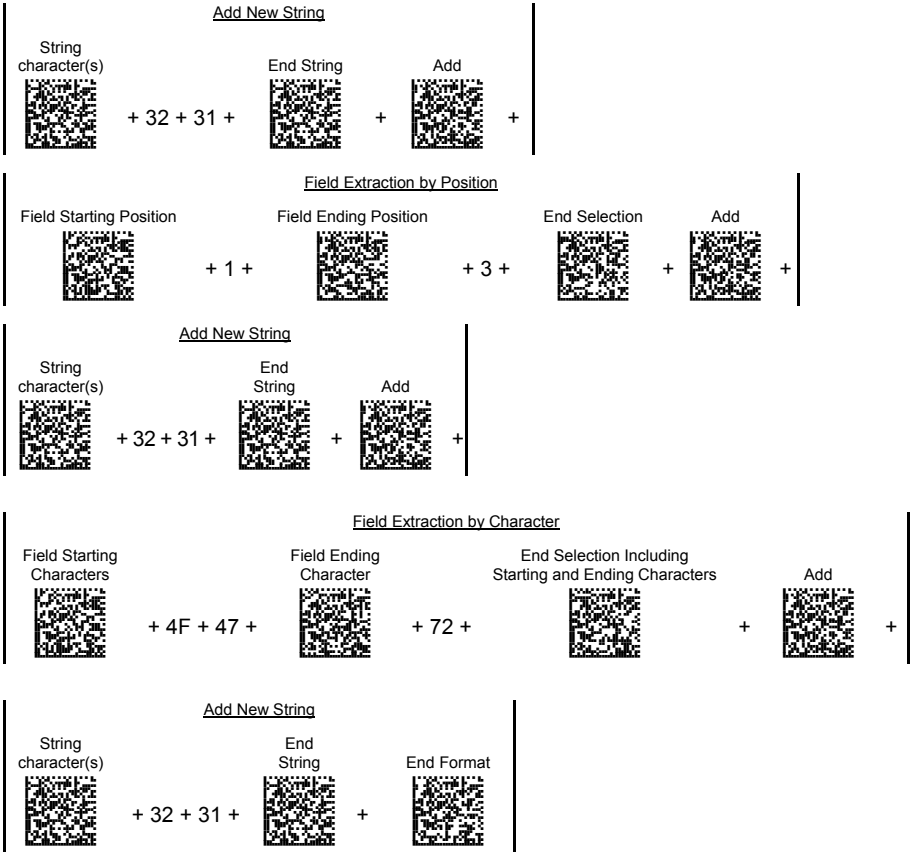
The only limit is determined by the size of the internal reserved memory used to define the format.



Example **Method 1 Extracting Information from Barcode**

Decoded code: <DATALOGICproduct>

Formatting procedure: Add new string + Extract field by position + Add new string + Extract field by character + Add new string



Output message: <21DAT21OGICpr21>

FIELD EXTRACTION BY CHARACTER

a) Define Field Starting Character(s)

Field Starting Character(s)

Read the Hex value from the Hex/Numeric table identifying the starting character(s) of the field to be extracted. Valid values are in the range **00-7F**.

b) Define Field Ending Character(s)

Field Ending Character(s)

Read the Hex value from the Hex/Numeric table identifying the ending character(s) of the field to be extracted. Valid values are in the range **00-7F**.

c) Field Delimiter Selection

Include Start/End Characters

OR

Discard Start/End Characters

d) EITHER Add Field or String

Add

- To add other fields selected by characters read the code and repeat this procedure from step **a** for each field to be selected;
- To add a new string of characters read the barcode and follow the procedure described on page 113 ;
- To add the procedure selecting new fields by position read the code and follow the description given on page 112.

OR End Format Definition

End Format Definition

Read the code to end the format definition.

FIELD EXTRACTION BY POSITION

a) Define Field Starting Position

Field Starting Position

Read a number corresponding to the field starting position.

b) Define Field Ending Position

Field Ending Position

Read a number corresponding to the field ending position.

OR

Last Position

Read this code to set the field ending position to the last position of the code:

c) End Field Selection

End Selection

Read the code to end the field selection.

d) EITHER Add Field or String

Add

- To add other fields selected by position read the code and repeat this procedure from step **a** for each field to be selected;
- To add a new string of characters read the barcode and follow the procedure described on page 113;
- To add the procedure selecting new fields by characters read the code and follow the description given on page 111.

OR End Format Definition

End Format Definition

Read the code to end the format definition.

ADD NEW STRING

a) Define New String

String Character(s)

Read the Hex value from the Hex/Numeric table identifying the character(s). Valid values are in the range **00-7F**.

b) End String

End String

Read the code to end the string defined in step **a**.

c) EITHER Add Procedure

Add

- To add the procedure extracting fields by characters follow the steps given on page 111;
- To add the procedure extracting fields by position follow the steps given on page 112;

OR End Format Definition

End Format Definition

Read the code to end the format definition.

Method 2 - Manipulating the Barcode Data

Method 2 allows modifying the barcode data by means of one of the following procedures:

- String insertion;
- String deletion;
- String substitution;
- Field deletion.

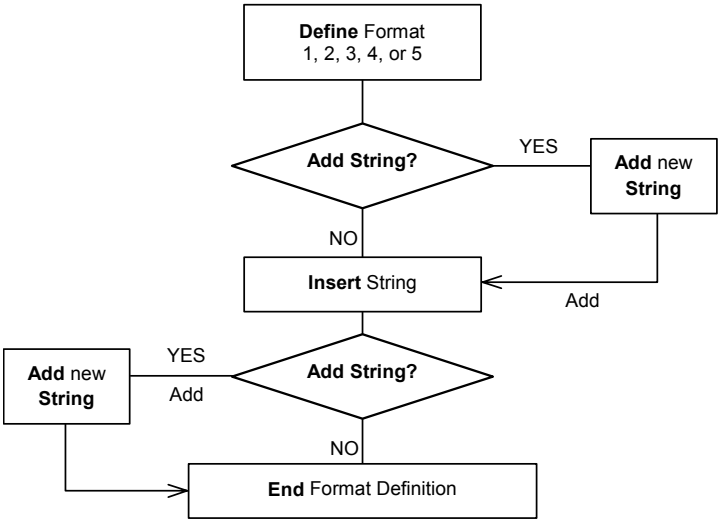
Once the data has been modified, it is sent to the host computer as data of the output message.

Unlike Method 1 this method does not allow associating different procedures together. This means that each format definition corresponds to a single procedure. Despite this, it possible to add a new string of characters to the beginning or ending part of the formatted barcode.

The only limit is determined by the size of the internal reserved memory used to define the format.

STRING INSERTION

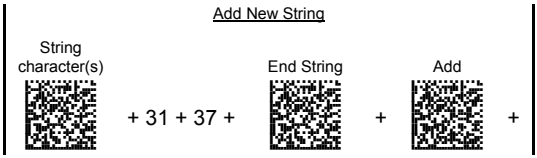
To complete this procedure proceed as follows:

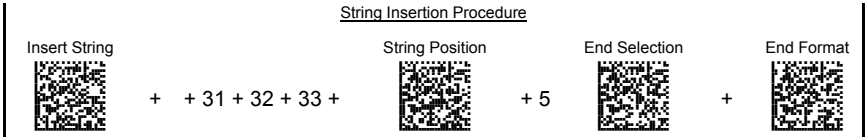


Example

Decoded code: <DATALOGICproduct>

Formatting procedure: Add new string + Insert String





Output message: <17DATA123LOGICproduct>

String Insertion Procedure

a) Insert String

Insert String

Read the Hex value from the Hex/Numeric table identifying the characters to be inserted. Valid values are in the range **00-7F**.

b) Define String Position

String Position

Read a number corresponding to the string position within the barcode.

c) End Selection

End Selection

Read the code to end the field selection.

d) EITHER Add String

Add

To add a new string of characters read the barcode and follow the procedure described on page 124;

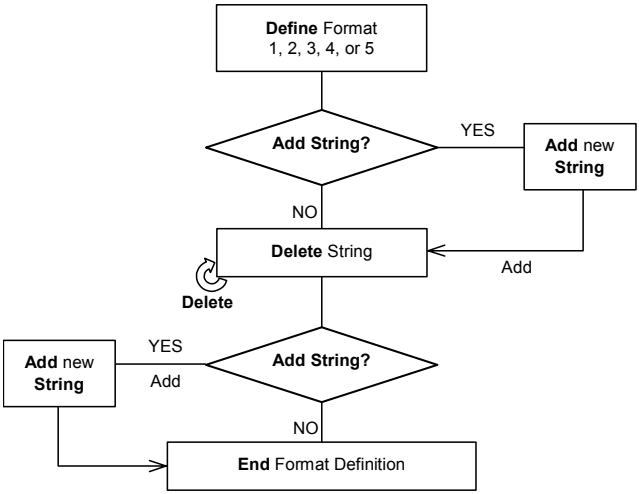
OR End Format Definition

End Format Definition

Read the code to end the format definition.

STRING DELETION

To complete this procedure proceed as follows:



Example

Decoded code: <DATALOGICproduct>

Formatting procedure: Delete First String + Delete Second String + Add New String.

String Deletion Procedure

Delete String + 4C +4F + Loop + 6F +64 + End Selection + Add +

Add New String

String Character(s) + 33 + 31 + End String + End Format

Output message: <DATAGICpruct31>

String Deletion Procedure

a) Delete String

Delete

Read the Hex value from the Hex/Numeric table identifying the string character(s) to be deleted. Valid values are in the range **00-7F**.

b) (optional) Select Other Strings to be Deleted

Loop

Read the code above and repeat the procedure from step **a**.

c) End Selection

End Selection

Read the code to end the selection.

d) EITHER Add String

Add

To add a new string of characters read the barcode and follow the procedure described on page 124;

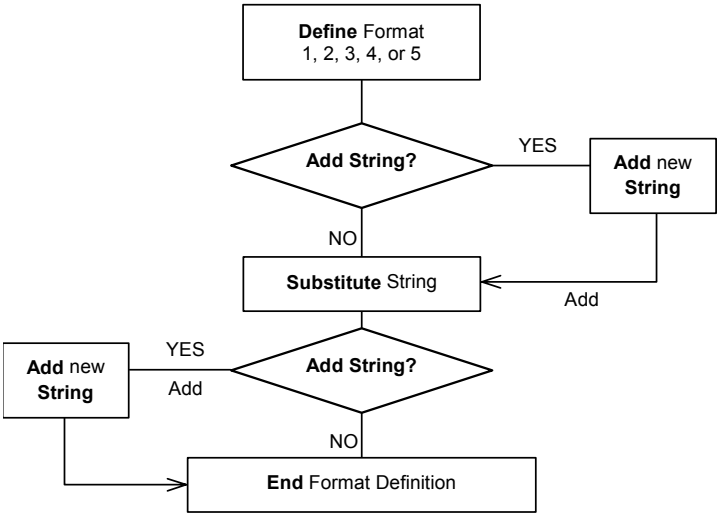
OR End Format Definition

End Format Definition

Read the code to end the format definition.

STRING SUBSTITUTION

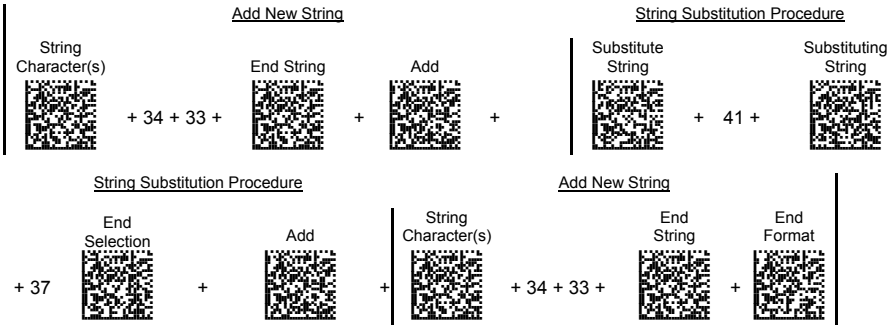
To complete this procedure proceed as follows:



Example

Decoded code: <DATALOGICproduct>

Formatting procedure: Add new string + String substitution + Add new string.



Output message: <43D7T7LOGICproduct43>

String Substitution Procedure

a) Define String to be Substituted

Substitute String

Read the Hex value from the Hex/Numeric table identifying the characters of the string to be substituted. Valid values are in the range **00-7F**.

b) Define Substituting String

Substituting String

Read the Hex value from the Hex/Numeric table identifying the characters of the substituting string. Valid values are in the range **00-7F**.

c) End Selection

End Selection

Read the code to end the selection.

d) EITHER Add String

Add

To add a new string of characters read the barcode and follow the procedure described on page 124;

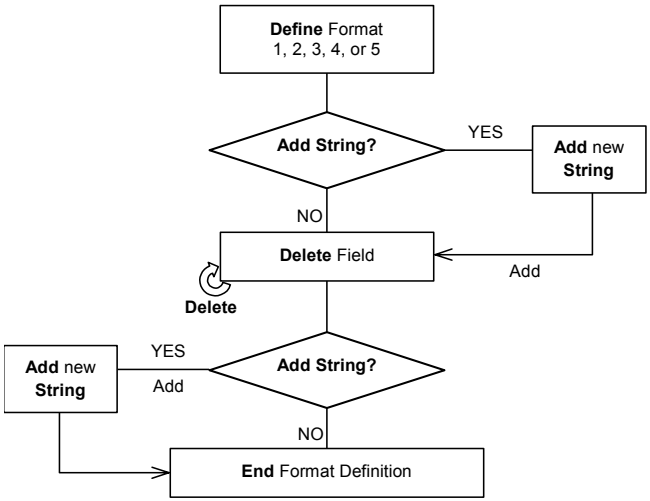
OR End Format Definition

End Format Definition

Read the code to end the format definition.

FIELD DELETION

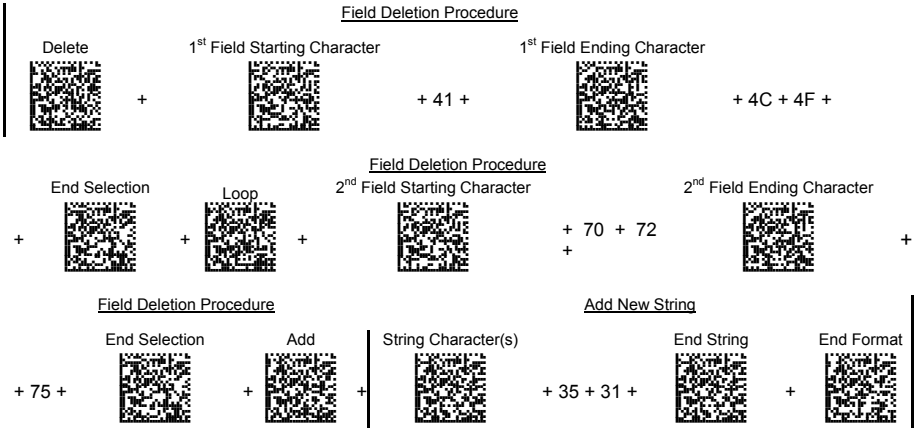
To complete this procedure proceed as follows:



Example

Decoded code: <DATALOGICproduct>

Formatting procedure: Delete First Field + Delete Second Field + Add New String.



Output message: <DGICct51>

Field Deletion Procedure

a) Delete Field

Delete

Read the code to enable the command deleting the field.

b) Define Field Starting Character

Field Starting Character

Read the Hex value from the Hex/Numeric table identifying the starting characters. Valid values are in the range **00-7F**.

c) Define Field Ending Character

Field Ending Character

Read the Hex value from the Hex/Numeric table identifying the ending character/s. Valid values are in the range **00-7F**.

d) End Field Selection

End Selection

Read the code to end the field selection.

e) (optional) Select Other Fields to be Deleted

Loop

Read the following code and repeat the procedure from step **b** for each field to be deleted:

f) EITHER Add String

Add

To add a new string of characters read the barcode and follow the procedure described on page 124;

OR

End Format Definition

End Format Definition

Read the code to end the format definition.

ADD NEW STRING

a) Define New String

String Character

Read the Hex value from the Hex/Numeric table identifying the starting characters. Valid values are in the range **00-7F**.

b) End String and Define Procedure

End String Plus Procedure

Read the code to end the string selection and continue defining a new procedure belonging to Method 1.

OR End String and Format

End String & Format

Read the code to end the string and the format definition.

4.3.2 Match Conditions

By setting one or more of the following conditions it is possible to select the codes to be formatted. Follow the given steps to define the desired condition:

MATCH WITH PREDEFINED SUBSTRING

Define Matching Substring

Match with Substring

Read the above code and:
1. read a number in the range **1-5** corresponding to the desired format number;
2. set the number of characters defining the matching string in the range **00-10**;
3. read the corresponding character as Hex value from the Hex/Numeric table identifying the substring character/s. Valid values are in the range **00-7F**.

(optional) Define Substring Position

Matching Substring Position

Read the above code and:
1. read a number in the range **1-5** corresponding to the desired format number;
2. read the number corresponding to the substring position in the range **0-255**;

AND/OR

MATCH CODE LENGTH

Define Code Length

Match Code Length

Read the above code and:
1. read a number in the range **1-5** corresponding to the desired format number;
2. read the number in the range **0-255**;

AND/OR

MATCH SYMBOLOGY

Define Code Symbology

Match Symbology

Read the above code and:

1. read a number in the range **1**-**5** corresponding to the desired format number;
2. set the number of the matching code symbologies in the range **0**-**4**;
3. select the Datalogic Standard Code Identifier from the Code Identifier Table in Appendix B.

4.3.3 Format Enable/Disable

Format 1

0 = disabled
1 = enabled

Format 2

0 = disabled
1 = enabled

Format 3

0 = disabled
1 = enabled

Format 4

0 = disabled
1 = enabled

Format 5

0 = disabled
1 = enabled

Disable All Formats

4.3.4 Mismatch Result

The result of each format may be set in case the match conditions previously selected are not satisfied.
Once the desired formats have been enabled and a code has been read, the results corresponding to each format will be concatenated together and transmitted in the output message. For this reason, it is strongly advised to set the mismatch result for each format.

Example

Decoded Code: <DATALOGICproduct>

Format definition:

Format	Enable/Disable	Match Condition	Function	Mismatch Result
Format 1	Enabled	Code having a length of 16 characters	Select field from position1 to position3	No string
Format 2	Disabled	/	/	/
Format 3	Enabled	Code having a length of 25 characters	Substitute string "ab" with string "12"	Unformatted read code
Format 4	Enabled	Code having the substring "AT" in position 2	Insert string "789" in position 7	Unformatted read code
Format 5	Enabled	Code belonging to the PDF417 symbology	Delete string "DA" and "pr"	Unformatted read code

Output message: <DATDATALOGICproductDATALO789GICproductDATALOGICproduct>

Format 1 **Format 3** **Format 4** **Format 5**

Mismatch Result

Define Mismatch Result

Read the above code and:
1. read a number in the range **1-5** corresponding to the desired format number;
2. 0 = empty string as output
   1 = unformatted read code as output.

5 REFERENCES

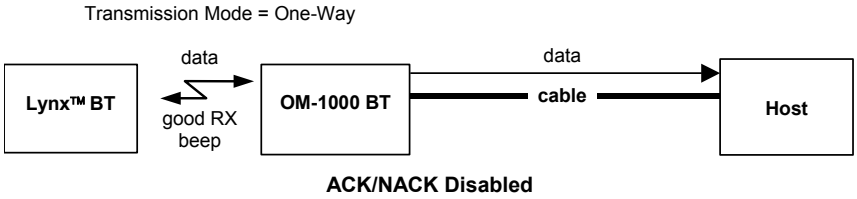
5.1 RS232 – USB COM

5.1.1 ACK/NACK Protocol

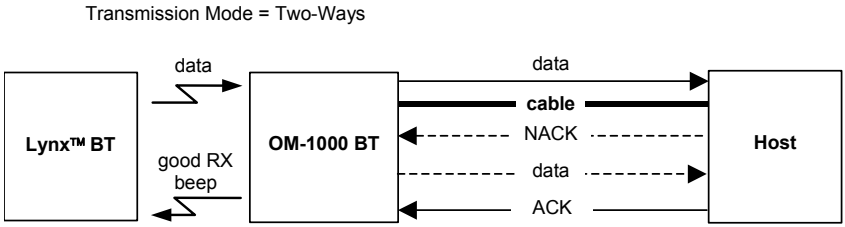
The transmission protocol takes place between reader, cradle and Host. The reader passes its data (code read) to the cradle which sends it to the Host. The management of responses (from Host or cradle) depends on the Transmission Mode parameter, see par. 5.6.3.

In the following descriptions the completed transmission is indicated by the Beeper Control for Radio Response parameter with its default setting to "Good Decode and Good Reception" beep, see par. 5.6.2.

When ACK/NACK is disabled (in One-Way tx mode), there is no control from cradle to Host transmission, the reader responds with the good reception tone.



ACK/NACK Disabled



ACK/NACK Enabled

When ACK/NACK is enabled (in Two-Way tx mode), the Host sends an ACK character (06 HEX) in the case of good reception or the NACK character (15 HEX) requesting re-transmission, in the case of bad reception. Only after the ACK character is received by the OM-1000 BT does the reader respond with the good reception tone.

If the OM-1000 BT does not receive an ACK or NACK, transmission is ended after the RX Timeout, see par. 5.1.2. See also Radio Protocol Timeout, par. 5.6.

5.1.2 RX Timeout

This parameter can be used to automatically end data reception from the Host after the specific period of time.

If no character is received from Host, after the timeout expires, any incomplete string (any string not terminated by <CR>) is flushed from the device buffer.

5.2 DATA FORMAT

5.2.1 Global Headers and Terminators

If setting global headers and terminators for both the Lynx™ BT and the OM-1000 BT, those configured for the reader are ignored and only the cradle headers/terminators will be transmitted.

5.2.2 Address Stamping

It is possible to include the reader's Bluetooth® address in the message sent to the Host. This is a 12-character hexadecimal string that is unique to every Bluetooth® device.

5.2.3 Address Delimiter

The Address Delimiter allows a character to included to separate the reader's Bluetooth® address stamping field from the next field in the message,. Any character can be included in the hexadecimal range from 00 to FE.

5.2.4 Concatenation with Separate Code Transmission

If disabled, all concatenated codes are transmitted together as a single code preceded and followed respectively by global headers and terminators (if working with OM-1000 BT, only the cradle headers/terminators will be transmitted). When enabling this parameter, all concatenated codes are transmitted separately and each of them is preceded and followed by the defined headers and terminators (if working with OM-1000 BT, only the cradle headers/terminators will be transmitted).

5.3 POWER SAVE

5.3.1 Power Off Timeout with BT Connection

When Lynx™ BT is radio connected to the system, after the desired timeout in minutes, the Lynx™ BT batteries are disconnected and all power consumption ceases. To restore power, press the trigger once. The reader will now be read to read codes. Power-off does not effect configuration parameters.

5.3.2 Power Off Timeout with No BT Connection

When Lynx™ BT is not radio connected to the system, after the desired timeout in minutes, the Lynx™ BT batteries are disconnected and all power consumption ceases. To restore power, press the trigger once. The reader will now be read to read codes. Power-off does not effect configuration parameters.

5.4 READING PARAMETERS

5.4.1 Safety Time

Safety time prevents the device from immediately decoding the same code more than once. A timeout can be set up to 9.9 seconds before the decoder will accept the same code. Reading is immediate if the code changes.
The safety time parameter is not applicable when all codes per scan is enabled or when setting one read per cycle in hardware trigger operating mode.

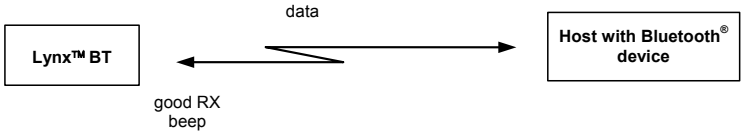
5.5 RADIO PARAMETERS – LYNX™ BT WITH BT DEVICE

5.5.1 ACK/NACK Protocol with BT Device

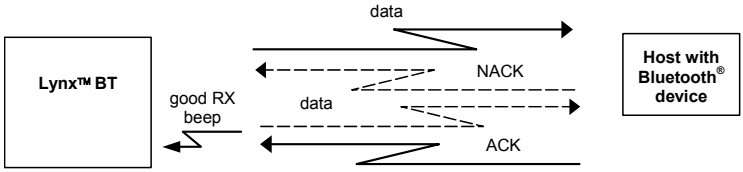
The transmission protocol takes place between the reader and the Host. The reader passes its data (code read) to the remote Bluetooth® device (Host).

In the following descriptions the completed transmission is indicated by the Beeper Control for Radio Response parameter with its default setting to "Good Decode and Good Reception" beep, see par. 5.6.2.

When ACK/NACK is disabled, there is no control from reader to Host transmission, therefore the reader responds with the good reception tone.



ACK/NACK Disabled



ACK/NACK Enabled

When ACK/NACK is enabled, the Host sends an ACK character (06 HEX) in the case of good reception or the NACK character (15 HEX) requesting re-transmission, in the case of bad reception. Only after the ACK character is received by Lynx™ BT does the reader respond with the good reception tone.
If the reader does not receive an ACK or NACK, transmission is ended after the Radio Protocol Timeout, par. 5.6.

5.5.2 Auto-Connection (For Master Only)

Upon power-up, the Lynx ™ BT reader makes attempts to connect with the remote Bluetooth® device (Slave). If the connection is not successful, the reader remains on, but not connected.
In this case reconnection can be requested by double clicking the reader trigger or by reading the "Request Radio Connection" command in par. 5.8.

5.5.3 Auto Reconnection (For Master Only)

If a radio connection is interrupted, the Lynx™ BT reader makes attempts to reconnect with the remote Bluetooth® device (Slave). If the connection is not successful, the reader remains on, but not connected.
In this case reconnection can be requested by double clicking the reader trigger or by reading the "Request Radio Connection" command in par. 5.8.

5.5.4 RX Timeout with BT Device

This parameter can be used to automatically end data reception from the remote BT device (Host) after the specific period of time.

If no character is received from the BT device (Host), after the timeout expires, any incomplete string (any string not terminated by <CR>) is flushed from the device buffer.

5.5.5 User-Friendly Name

This parameter provides a way to identify the Lynx™ BT reader in a human readable (user-friendly), format. This name is returned with the reader configuration parameters (see par. 5.7). The name is made up of a fixed 50-character field.

The user-friendly name default value is: “**Datalogic BT Device s/n: xxxxxxxxx**“, where x = Lynx™ BT serial number.

5.5.6 Authentication & Encryption with BT Device (for Master Only)

If enabled, this parameter encrypts the radio communication between the Lynx™ BT working as Master and the BT device. To start the encrypted communication it is possible to define an entering PIN code. If it is not set, the default PIN code (1234) will be used.

5.6 RADIO PARAMETERS – LYNX™ BT WITH OM-1000 BT

5.6.1 Batch Mode

Batch mode allows codes to be stored in the gun on a FIFO basis whenever the reader is out of range. If transmission cannot be successfully completed, then the code is added to the list. When the reader returns in range, transmission of the codes to the cradle resumes automatically.

5.6.2 Beeper Control for Radio Response

The data entry good read tone normally results in two beeps; the first indicates that the reader has decoded the code, the second indicates whether the cradle has received the data.

This can be changed according to the following selections:

- Good Decode and Good Reception: both good decode and good reception are signaled (two beeps).
- Only Good Decode: only the first beep indicating a good read is signaled.
- Only Good Reception: only the second beep indicating a good reception is signaled.
- Off: Neither good read nor good reception beeps are signaled.

For all configurations, any transmission errors will always be signaled.

5.6.3 Transmission Mode

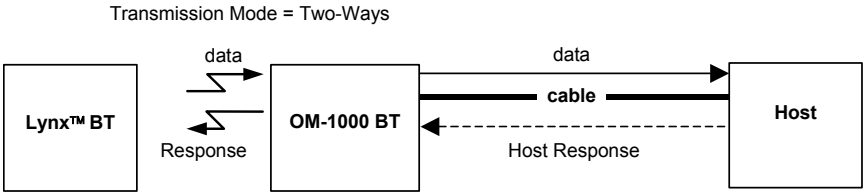
This parameter determines whether the reader receives responses from the Host or not. In One-Way tx mode, neither Host nor cradle responds to the reader.

In Two-Way tx mode, the reader must receive a response from either the cradle or the Host.

The response sent to the reader depends on the following conditions:

Two-Ways

Condition	Response to Reader
RS232 ACK/NACK enabled	host ACK==> cradle==> reader
RS232 ACK/NACK disabled	cradle==> reader
USB COM ACK/NACK enabled	USB protocol + host ACK==> cradle==>reader
USB COM ACK/NACK disabled	USB protocol==> cradle==> reader
USB-KB Emulation	USB protocol==> cradle==> reader
Wedge	cradle==> reader



5.6.4 Radio Protocol Timeout

This parameter sets the valid time to wait before transmission between the Lynx™ BT reader and the remote Bluetooth® device is considered failed.
This parameter should be set taking into consideration the radio traffic (number of readers in the same area). It can be set between 3 and 19 seconds.

5.7 CONFIGURATION EDITING COMMANDS

The following commands carry out their specific function and then exit the configuration environment.

Command	Description
	Restore Lynx™ BT reader default configuration: This command does not reset: • role (master/slave) • remote Bluetooth® address • user-friendly name
	Transmit the Lynx™ BT reader Software release.
	Transmit the Lynx™ BT current configuration in ASCII format to Host via Radio.
	Transmit the Lynx™ BT current data format configuration in ASCII format to Host via Radio.
	Transmit the BT device address (BT_ADDR).

	Restore OM-1000 BT default.
	Transmit the OM-1000 BT Software release to the Host.
	Transmit the OM-1000 BT current configuration in ASCII format to Host.

5.8 RADIO CONTROL COMMANDS

The following commands carry out their specific function and then exit the configuration environment.

Command	Description
	Request Radio Connection *(Master only)* This request can be also performed by double clicking the reader trigger.
	Request Radio Disconnection *(Master only)*

5.9 SYSTEM MANAGEMENT COMMANDS

The following commands carry out their specific function and then exit the configuration environment.

Command	Description
	Request immediate Power-off.
	Unbind the Lynx™ BT reader from the OM-1000 BT.
After reading this code, read the Software Reset code below.	
	Software reset.

6 TEST BARCODE SYMBOLS

Use these test 1D and 2D symbols to check that the reader is imaging and decoding properly, according to your configuration.

UPC-A

UPC-E

EAN-8

EAN-13

Code 39 (Normal)

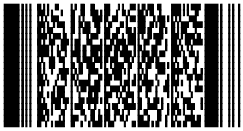
Code 39 (Full ASCII)

Codabar

Code 128

Interleaved 2 of 5

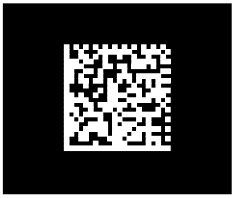
PDF417



QR

DATA MATRIX NORMAL

INVERSE DATA MATRIX



7 MAINTENANCE

7.1 MAINTENANCE

You do not need to perform regular preventative maintenance on the LYNX™ BT reader.

Do not try to open the case, because you might damage the interior electronic components and such action voids the warranty.

You can keep your reader in good operating condition by:

- periodically cleaning the reading window using water or a mild detergent solution and a soft cloth or tissue.
- watching for any damage to the housing.

CAUTION

Do not use abrasive cleaning agents on the reader's window to avoid scratches. Do not use solvents on the housing or window to avoid damage. Do not submerge the reader in water. It is not waterproof.

8 TECHNICAL FEATURES

OM-1000 BT

Electrical Features	
Operating Voltage	12 V
Power Consumption @ 12V Charging	8 W max.
Communications Features	
Standard Interfaces	RS232, Keyboard emulation IBM AT, USB COM emulation, USB Keyboard emulation
Indicators	Power/Data LED, Charging LED, Batt. Full LED
Radio Features	
Bluetooth®	version 1.2 IEEE 802.15 (class 2)
Profile Supported	Serial Port Profile
Environmental Features	
Operating Temperature	0° to+ 50 °C (+32° to +122 °F)
Storage Temperature	-20° to +70 °C (-4° to +158 °F)
Humidity	0 to 95% NC
Mechanical Features	
Dimensions	185 x 115 x 104 mm / 7.2 x 4.5 x 4 in
Weight	570 g (20.1 oz.)

C-1000

Electrical Features	
Operating Voltage	12 V
Power Consumption @ 12V Charging	8 W max.
Communications Features	
Indicators	Power LED, Charging LED, Batt. Full LED
Environmental Features	
Operating Temperature	0° to+ 50 °C (+32° to +122 °F)
Storage Temperature	-20° to +70 °C (-4° to +158 °F)
Humidity	0 to 95% NC
Mechanical Features	
Dimensions	185 x 115 x 104 mm / 7.2 x 4.5 x 4 in
Weight	570 g (20.1 oz.)

LYNX™ BT432 / BT432E Common Features

Electrical Features	
Power Source	Li-Ion battery (2150 mAh)
Recharge Time	4 hours max.
Operating Autonomy	typical 12 h (> 6000 reads)
Radio Features	
Bluetooth®	version 1.2 IEEE 802.15 (class 2)
Profile Supported	Serial Port Profile
Environmental Features	
Operating Temperature	0° to+ 50 °C (+32° to +122 °F)
Storage Temperature	-20° to +70 °C (-4° to +158 °F)
Humidity	0 to 95% NC
Shock resistance	IEC 68-2-32 Test ED – 1,8 m.
Mechanical Features	
Dimensions	203 x 117 x 69 mm (8 x 4.6 x 2.7 inches)
Weight	340 g (12 oz) with battery pack
Decoding Capability	
1D	Interleaved 2 of 5, Code39, Code32, Code128, EAN 128, Code93, UPC/EAN/JAN, Codabar, RSS
2D	PDF417, Micro PDF417, Macro PDF417, Maxicode, DataMatrix (ECC200), QR, Composite Codes
Postal Codes	POSTNET, PLANET, Japan Post, Australia Post, KIX Code, Royal Mail Code (RM4SCC)
Imaging Option	
Image	640 x 480 pixel format (VGA)
	320 x 240 pixel format (CIF);
Graphic Format	JPEG, 256 gray levels
	BMP, 2, 16, 256 gray levels
	TIFF, 2, 16, 256 gray levels
Optical Features	
Sensor	640 x 480 pixel element, 2D CMOS Array
Illuminator	LED array
Wavelength	In the range 630 ~ 670 nm
Max. LED Output Power	0.896 mW
LED Safety Class	Class 1 to EN 60825-1
Aiming System	Visible Laser Diode
Wavelength	650 nm
Laser Safety Class	Class 2 - EN 60825-1; Class II CDRH
Ambient light	0 - 100000 lux (artificial)

LYNX™ BT 432

Optical Features			
Focus distance	115 mm		
Field of view	21.8° (H) x 16.7° (V)		
Horizontal field of view at distance (**d**) in mm	0.4**d** + 12		
Vertical field of view at distance (**d**) in mm	0.3**d** + 9		
Max Resolution	**Linear codes - mm (mils)**		**Datamatrix – mm (mils)**
	0.10 (4)		0.17 (6.6)
Depth of field*			
1D (linear):	**X-dimension mm (mils)**	**Symbol size cm (in)**	**DOF cm (in)**
Code39	0.13 (5)	1.2 (0.47)	8.0 to 15.0 (3.15 to 5.90)
	0.5 (20)	3.2 (1.26)	8.0 to 33.0 (3.15 to 12.99)
EAN13	0.33 (13)	3.1 (1.22)	7.5 to 24.5 (2.95 to 9.65)
2D:	**X-dimension mm (mils)**	**Symbol size cm (in)**	**DOF cm (in)**
POSTNET	0.5 (20)	4.0 x 0.4 (1.57 x 0.16)	11.5 to 30.0 (4.53 to 11.81)
PDF417	0.13 (5)	1.1 x 0.9 (0.43 x 0.35)	8.5 to 15.5 (3.35 to 6.10)
	0.17 (6.6)	1.4 x 1.2 (0.55 x 0.47)	7.0 to 19.0 (2.76 to 7.48)
	0.25 (10)	2.2 x 1.8 (0.86 x 0.71)	4.5 to 24.0 (1.77 to 9.45)
DataMatrix	0.19 (7.5)	0.8 x 0.8 (0.31 x0.31)	9.0 to 13.0 (3.54 to 5.12)
	0.25 (10)	0.8 x 0.8 (0.31 x 0.31)	7.5 to 16.5 (2.95 to 6.50)
	0.38 (15)	1.0 x 1.0 (0.39 x 0.39)	6.0 to 22.0 (2.36 to 8.66)
Skew	±40°		
Pitch	±35°		
Rotation	360°		
Print Contrast (Min.)	23%		

* Reading distances are measured from the nose of the reader.

LYNX™ BT 432E

Optical Features			
Focus distance	65 mm		
Field of view	20° (H) x 15° (V)		
Horizontal field of view at distance (**d**) in mm	0.32**d** + 8.67		
Vertical field of view at distance (**d**) in mm	0.24**d** + 6.50		
Max Resolution	**Linear codes - mm (mils)**		**Datamatrix – mm (mils)**
	0.05 (2.0)		0.10 (4.0)
Depth of field*			
1D (linear):	**X-dimension mm (mils)**	**Symbol size cm (in)**	**DOF cm (in)**
Code39	0.076 (3)	1.2 (0.47)	5.0 to 7.5 (1.96 to 2.95)
	0.13 (5)	1.2 (0.47)	4.0 to 9.5 (1.57 to 3.74)
2D:	**X-dimension mm (mils)**	**Symbol size cm (in)**	**DOF cm (in)**
PDF417	0.76 (3)	0.65 x 0.55 (0.26 x 0.22)	5.0 to 8.0 (1.96 to 3.15)
	0.25 (10)	2.2 x 1.8 (0.86 x 0.71)	4.0 to 13.3 (1.57 to 5.24)
DataMatrix	0.13 (5)	0.5 x 0.5 (0.20 x0.20)	5.0 to 7.5 (1.96 to 2.95)
	0.25 (10)	0.8 x 0.8 (0.31 x 0.31)	4.5 to 10.5 (1.77 to 4.13)
Skew	±40°		
Pitch	±35°		
Rotation	360°		
Print Contrast (Min.)	27%		

* Reading distances are measured from the nose of the reader.

8.1 INDICATORS

8.1.1 Lynx™ BT LED Indicators

The following LED indicators signal the reader functions.

LED	Behavior
Red *(Figure A,1)*	at power on, blinks briefly, then a beep occurs. Then, it turns off. lights when a wrong read occurs. lights briefly when the aiming system is enabled.
Green *(Figure A,2)*	lights when a symbol has been read and decoded. blinks during binding with OM-1000 BT. single blink every 2 seconds when BT connection is active. double blink every 2 seconds when BT connection is not active.

8.1.2 OM-1000 BT LED Indicators

LED	Behavior
Pwr/Data	yellow on = cradle is powered yellow blinking = cradle receives commands from Host
Charging	red on = the battery charge is in progress
Batt Full	green on = the battery is completely charged

8.1.3 Beeper

The Lynx™ BT basic software provides beeper signals for power on, good/wrong reading and BT connection activation/deactivation.

Beeper Behavior	Condition
4 ascending tones	during radio connection initialization.
4 descending tones	upon radio disconnection.
2 beeps	upon good read of a code, when paired to OM-1000 BT cradle.
1 beep	upon good read of a code, when communicating with BT device.

A HOST CONFIGURATION STRINGS

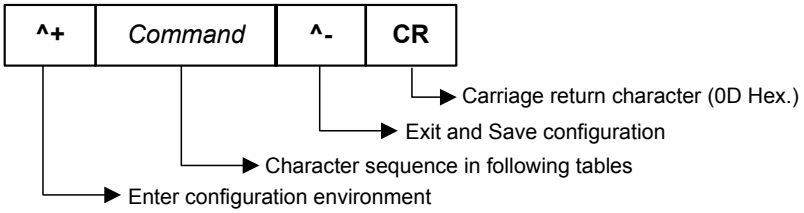
In this section we provide a description of how to modify the Lynx™ BT and OM-1000 BT configuration using serial strings sent from the Host.

The configuration must be performed in different ways according to the device to be configured:

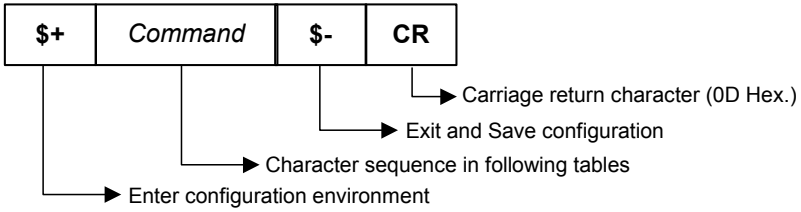
- **OM-1000 BT**
  the configuration strings are sent from the Host directly to the device through the RS232/USB COM interface;
- **Lynx™ BT connected with a BT device**
  the configuration strings are sent from the Host directly to the reader through the BT device using the Serial Port Profile (SPP);
- **Lynx™ BT connected with OM-1000 BT**
  the configuration of the reader when paired to its cradle (bound) is sent through the RS232/USB COM interface. Configuration is performed as follows:
  1. verify that the Lynx™ BT and the OM-1000 BT have an active radio connection;
  2. send the **^?DRA** command string to the cradle to make it work in transparent mode (the yellow LED on the cradle starts blinking);
  3. define and send the configuration strings for the Lynx™ BT reader;
  4. send the **$?DQE** command string to the cradle to exit the transparent mode (the yellow LED on the cradle stops blinking).

When sending the configuration strings, the programming sequence format is the following:

Sequence Format for Cradle Configuration

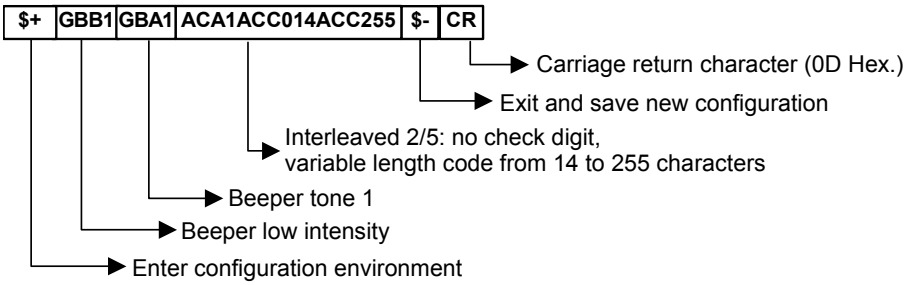


Sequence Format for Gun Configuration



Example:

Multiple command programming sequence for Lynx™ BT with BT device:



Each configuration parameter setting removes the condition previously active for that parameter.

NOTE

The device buffer can contain about 400 characters. If your programming string goes over this value, you must split it into separate groups and send each group after a delay of at least 3 seconds to give the reader time to empty the buffer and interpret the commands.

NOTE

Configuring some configuration commands, such as those of advanced formatting, through strings may result very complex. For this reason they are not provided in the following tables but can be configured by using VisualSetup configuration program or referring to the related section in chapter 4 of this manual.

SERIAL CONFIGURATION STRINGS

ENTER/EXIT CONFIGURATION COMMANDS	
DESCRIPTION	**STRING**
Enter Cradle Configuration	**^+**
Exit and Save Cradle Configuration	**^-**
Cradle Restore Default	**^+^***
Transmit Cradle Software Release	**^+^!**
Transmit Cradle Configuration in ASCII	**^?^&**
Enter Gun Configuration	**$+**
Exit and Save Gun Configuration	**$-**
Restore Default	**$+$***
Transmit Software Release	**$+$!**
Transmit Device Configuration in ASCII	**$?$&**
Transmit BT Device Address	**$?DPD**

These commands do not require ^- for cradle and $- for reader.

INTERFACE SELECTION (CRADLE)		
DESCRIPTION		**STRING**
RS232	Standard	**CPA0**
WEDGE	for IBM AT	**CPA1**
USB	USB COM	**CPA2**
	USB-KB	**CPA3**

RS232 (CRADLE)		
DESCRIPTION		**STRING**
Baud rate	9600	**DAA05**
	38400	**DAA06**
	57600	**DAA07**
	115200	**DAA08**
Parity	none	**DBA0**
	even	**DBA2**
	odd	**DBA1**
Data bits	7	**DCA0**
	8	**DCA1**
Stop bits	1	**DCB0**
	2	**DCB1**
Handshake	none	**DDA0**
	RTS/CTS	**DDA2**
	XON/XOFF	**DDA1**
ACK/NACK Protocol	disabled	**DDB0**
	enabled	**DDB1**
RX Timeout		**DEB00 - DEB99**

USB (CRADLE)		
DESCRIPTION		**STRING**
USB-COM		
Handshake	none	**UDA0**
	RTS/CTS	**UDA2**
	XON/XOFF	**UDA1**
ACK/NACK Protocol	disabled	**UDB0**
	enabled	**UDB1**
RX Timeout		**DEB00 - DEB99**
USB-KBD		
Keyboard nationality	Belgian	**UIA7**
	English	**UIA4**
	French	**UIA2**
	German	**UIA3**
	Italian	**UIA1**
	Japanese	**UIA8**
	Spanish	**UIA6**
	Swedish	**UIA5**
	USA	**UIA0**

WEDGE (CRADLE)		
DESCRIPTION		**STRING**
Keyboard nationality	BELGIAN	**FAA7**
	English	**FAA4**
	French	**FAA2**
	German	**FAA3**
	Italian	**FAA1**
	Japanese	**FAA8**
	Spanish	**FAA6**
	Swedish	**FAA5**
	USA	**FAA0**
Caps Lock	caps Lock ON	**FAC1**
	caps Lock OFF	**FAC0**
Caps Lock Auto-Recognition	disabled	**FCL0**
	enabled	**FCL1**
Num Lock	num Lock Off	**FAD0**
	num Lock On	**FAD1**

DATA FORMAT (CRADLE)		
DESCRIPTION		**STRING**
Set Headers	no header	**EDA00**
	one character	**EDA01x**
	two characters	**EDA02xx**
	three characters	**EDA03xxx**
	four characters	**EDA04xxxx**
	five characters	**EDA05xxxxx**
	six characters	**EDA06xxxxxx**
	seven characters	**EDA07xxxxxxx**
	eight characters	**EDA08xxxxxxxx**
	nine characters	**EDA09xxxxxxxxx**
	ten characters	**EDA10xxxxxxxxxx**
Headers	disabled	**EDB0**
	enabled	**EDB1**
Set Terminators	no terminator	**EEA00**
	one character	**EEA01x**
	two characters	**EEA02xx**
	three characters	**EEA03xxx**
	four characters	**EEA04xxxx**
	five characters	**EEA05xxxxx**
	six characters	**EEA06xxxxxx**
	seven characters	**EEA07xxxxxxx**
	eight characters	**EEA08xxxxxxxx**
	nine characters	**EEA09xxxxxxxxx**
	ten characters	**EEA10xxxxxxxxxx**
Terminators	disabled	**EEB0**
	enabled	**EEB1**

x **=** HEX values representing an ASCII character.

x **=** Hex value from **00** to **7F** for RS232 and USB COM interfaces
Hex value from **00** to **9B** for Wedge and USB-KB interfaces

CAMERA CONTROL (GUN)		
DESCRIPTION		**STRING**
Exposure Mode	fixed	**FFA0**
	automatic (entire image)	**FFA1**
	automatic (central part of image)	**FFA2**
	automatic for highly reflective surfaces	**FFA3**

DATA FORMAT (GUN)		
DESCRIPTION		**STRING**
Data Format Restore Default		**EZ0**
SYMBOLOGY INDEPENDENT PARAMETERS		
Code Identifier	disabled	**EAA0**
	AIM standard Code ID	**EAA2**
Code Length	disabled	**ECA0**
	enabled	**ECA1**
Set Headers	no header	**EDA00**
	one character	**EDA01x**
	two characters	**EDA02xx**
	three characters	**EDA03xxx**
	four characters	**EDA04xxxx**
	five characters	**EDA05xxxxx**
	six characters	**EDA06xxxxxx**
	seven characters	**EDA07xxxxxxx**
	eight characters	**EDA08xxxxxxxx**
	nine characters	**EDA09xxxxxxxxx**
	ten characters	**EDA10xxxxxxxxxx**
Headers	disabled	**EDB0**
	enabled	**EDB1**
Set Terminators	no terminator	**EEA00**
	one character	**EEA01x**
	two characters	**EEA02xx**
	three characters	**EEA03xxx**
	four characters	**EEA04xxxx**
	five characters	**EEA05xxxxx**
	six characters	**EEA06xxxxxx**
	seven characters	**EEA07xxxxxxx**
	eight characters	**EEA08xxxxxxxx**
	nine characters	**EEA09xxxxxxxxx**
	ten characters	**EEA10xxxxxxxxxx**
Terminators	disabled	**EEB0**
	enabled	**EEB1**
Address Stamping	disabled	**EAB0**
	enabled	**EAB1**
Address Delimiter	disabled	**EAC0**
	enabled	**EAC1a**

X, a = HEX values representing an ASCII character.

x = Hex value from **00** to **7F** for RS232 and USB COM interfaces
Hex value from **00** to **9B** for Wedge and USB-KB interfaces

a = Hex value from **00** to **FE**

POWER SAVE (GUN)		
DESCRIPTION		**STRING**
Illumination System Power	Illumination System OFF	**HAA0**
	Low Power	**HAA1**
	Intermediate Power	**HAA2**
	Maximum Power	**HAA3**
Power Off Timeout with BT Connection		**XACd**
Power Off Timeout with no BT Connection		**XAEd**

d = a number from the HEX/Numeric Table

d = a number in the range 001-255

CODE SELECTION (GUN)			
DESCRIPTION			**STRING**
Disable All Symbologies			**AZA0**
Disable All Linear Symbologies			**AXA0**
Disable All 2D Symbologies			**AYA0**
Issue Identical Codes	disabled		**AWB0**
	enabled		**AWB1**
LINEAR SYMBOLOGIES			
UPC/EAN/JAN	disabled		**AEA0**
	enabled		**AEA1**
	Add-on	disabled	**AEB0**
		enabled	**AEB1**
	UPCE extension	enabled	**AEC0**
		disabled	**AEC1**
Code 39	Standard	disabled	**ABA0**
		no ckeck digit control	**ABA1**
		ckeck digit control without transmission	**ABA2**
		ckeck digit control and transmission	**ABA3**
	Full ASCII	disabled	**ABB0**
		enabled	**ABB1**
	Code Len Check	disabled	**ABC0**
		enabled	**ABC1**
	Minimum Code Length		**ABDd**
	Maximum Code Length		**ABEd**
	Start/Stop Char TX	enabled	**ABF0**
		disabled	**ABF1**
Code 32	disabled		**ABL0**
	enabled		**ABL1**

d = a number from the HEX/Numeric Table

d = a number in the range 001-255

CODE SELECTION (GUN)			
DESCRIPTION			**STRING**
LINEAR SYMBOLOGIES			
Interleaved 2/5	disabled		**ACA0**
	enabled – no check digit control		**ACA1**
	enabled – check digit control and without transmission		**ACA2**
	enabled – check digit control and transmission		**ACA3**
	Code Len Check	disabled	**ACB0**
		enabled	**ACB1**
	Minimum Code Length		**ACCd**
	Maximum Code Length		**ACDd**
Codabar	disabled		**ADA0**
	enabled – no check digit control		**ADA1**
	enabled – check digit control and without transmission		**ADA2**
	enabled – check digit control and transmission		**ADA3**
	Code Len Check	disabled	**ADB0**
		enabled	**ADB1**
	Minimum Code Length		**ADCd**
	Maximum Code Length		**ADDd**
Code 128	disabled		**AAA0**
	enabled		**AAA1**
	Code Len Check	disabled	**AAB0**
		enabled	**AAB1**
	Minimum Code Length		**AACd**
	Maximum Code Length		**AADd**
EAN 128	disabled		**AOA0**
	enabled		**AOA1**
	Code Len Check	disabled	**AOB0**
		enabled	**AOB1**
	Minimum Code Length		**AOCd**
	Maximum Code Length		**AODd**
Code 93	disabled		**AFA0**
	enabled		**AFA1**
	Code Len Check	disabled	**AFB0**
		enabled	**AFB1**
	Minimum Code Length		**AFCd**
	Maximum Code Length		**AFDd**
RSS Family	RSS Expanded	disabled	**AMA0**
		enabled	**AMA1**
	RSS Limited	disabled	**AMB0**
		enabled	**AMB1**
	RSS 14	disabled	**AMC0**
		enabled	**AMC1**
	RSS Expanded Stacked	disabled	**AMD0**
		enabled	**AMD1**
	RSS 14 Stacked	disabled	**AME0**
		enabled	**AME1**

d = a number from the HEX/Numeric Table

d = a number in the range 001-255

CODE SELECTION (GUN)			
DESCRIPTION			**STRING**
2D SYMBOLOGIES			
PDF417	disabled		**AGA0**
	enabled		**AGA1**
	Macro PDF417	unbuffered mode	**AVB0**
		buffered mode	**AVB1**
	Micro PDF417	disabled	**AGB0**
		enabled	**AGB1**
DataMatrix	disabled		**AHA0**
	enabled		**AHA1**
	Minimum Code Length		**AHCe**
	Maximum Code Length		**AHDe**
	Rectangular Style	disabled	**AHE0**
		enabled	**AHE1**
QR Family	disabled		**AIA0**
	enabled		**AIA1**
Postal Codes	all disabled		**ALA0**
	Australian Post - enabled		**ALA1**
	Japan Post - enabled		**ALA2**
	PLANET - enabled		**ALA3**
	POSTNET - enabled		**ALA4**
	POSTNET with B and B' - enabled		**ALA5**
	POSTNET and PLANET - enabled		**ALA6**
	POSTNET with B and B' and PLANET - enabled		**ALA7**
	KIX Code - enabled		**ALA8**
	Royal Mail Code (RM4SCC) - enabled		**ALA9**
Maxicode	Mode 0	disabled	**AJL0**
		enabled	**AJL1**
	Mode 1	disabled	**AJM0**
		enabled	**AJM1**
	Mode 2	disabled	**AJN0**
		enabled	**AJN1**
	Mode 3	disabled	**AJO0**
		enabled	**AJO1**
	Mode 4	disabled	**AJP0**
		enabled	**AJP1**
	Mode 5	disabled	**AJQ0**
		enabled	**AJQ1**
	Mode 6	disabled	**AJR0**
		enabled	**AJR1**
Composite Code	disabled		**ANA0**
	enabled		**ANA1**
	Discard Linear Part	disabled	**ANB0**
		enabled	**ANB1**

e = a number from the HEX/Numeric Table

e = a number in the range 0001-3600

READING PARAMETERS (GUN)		
DESCRIPTION		**STRING**
Trigger Mode	trigger level	**BAA0**
	trigger pulse	**BAA1**
Trigger Type	normal trigger	**BAB0**
	software trigger	**BAB1**
Flash On Duration		**BF0f**
Flash Off Duration		**BF1f**
Beeper Tone	tone 1	**GBA1**
	tone 2	**GBA2**
	tone 3	**GBA3**
	tone 4	**GBA4**
Beeper Volume	off	**GBB0**
	low	**GBB1**
	medium	**GBB2**
	high	**GBB3**
Beeper Duration		**GBCf**
Reads per Cycle	one read per cycle	**BCA0**
	more reads per cycle	**BCA1**
Scan Timeout		**BEAf**
User Defined Beeper Tone	tone 1	**GBD1**
	tone 2	**GBD2**
	tone 3	**GBD3**
	tone 4	**GBD4**
User Defined Beeper Volume	off	**GBE0**
	low	**GBE1**
	medium	**GBE2**
	high	**GBE3**
User Defined Beeper Duration		**GBFf**
Perform User Defined Beep**		**$?GGG**
CODE ORDERING AND SELECTION		
Code per Scan	one code per scan	**BCB0**
	all codes per scan	**BCB1**
Central Code Transmission	disabled	**OAA0**
	enabled	**OAA1**
Order by Code Length	disabled	**OAB0**
	enabled - increasing order	**OAB1**
	enabled - decreasing order	**OAB2**

f **=** a number from the HEX/Numeric Table

f **=** a number in the range 01-99

** this command carries out its specific function and does not need $+ and $-.

READING PARAMETERS (GUN)		
DESCRIPTION		**STRING**
AUTOSCAN		
Autoscan Mode	disabled	**BBA0**
	enabled in normal mode	**BBA1**
	enabled in pattern mode	**BBA2**
Autoscan Aiming System	disabled	**BBB0**
	enabled	**BBB1**
Autoscan Hardware Trigger	disabled	**BBC0**
	enabled	**BBC1**
Autoscan Illumination System	disabled	**BBD0**
	enabled	**BBD1**
Safety Time	disabled	**BGA0**
	enabled	**BGA1**
Safety Time Duration		**BGBf**

f **=** a number from the HEX/Numeric Table

f **=** a number in the range 01-99

ADVANCED IMAGE CAPTURE (GUN)		
DESCRIPTION		**STRING**
IMAGE PRESET 1		
Basic Configuration		
Image Format	Bitmap format	**IAA0**
	JPEG format	**IAA1**
	TIFF format	**IAA2**
Resolution	full resolution (640x480)	**IAB0**
	quarter resolution (320x240)	**IAB1**
JPEG Quality Factor		**IACg**

g **=** a number from the HEX/Numeric Table

g **=** a number in the range 000-100

ADVANCED IMAGE CAPTURE (GUN)		
DESCRIPTION		**STRING**
IMAGE PRESET 1		
Advanced Configuration		
Window Dimensions	origin along X axis	**IAlh**
	origin along Y axis	**IALh**
	width	**IAMh**
	height	**IANh**
Brightness	increase	**IAO0IAFi**
	decrease	**IAO1IAF1i**
Contrast	increase	**IAP0IAEi**
	decrease	**IAP1IAEi**
Zoom	20%	**IAH0**
	40%	**IAH1**
	60%	**IAH2**
	80%	**IAH3**
	100%	**IAH4**
	120%	**IAH5**
	140%	**IAH6**
	160%	**IAH7**
	180%	**IAH8**
	200%	**IAH9**
Color Depth	2 gray levels	**IAG0**
	16 gray levels	**IAG1**
	256 gray levels	**IAG2**

h, i = a number from the HEX/Numeric Table

h = for X axis a number in the range 0-630
for Y axis a number in the range 0-470
for width a number in the range 10-640
for height a number in the range 10-480

i = a number in the range 0-100

ADVANCED IMAGE CAPTURE (GUN)		
DESCRIPTION		**STRING**
IMAGE PRESET 2		
Basic Configuration		
Image Format	Bitmap format	**IBA0**
	JPEG format	**IBA1**
	TIFF format	**IBA2**
Resolution	full resolution (640x480)	**IBB0**
	quarter resolution (320x240)	**IBB1**
JPEG Quality Factor		**IBCg**
Advanced Configuration		
Window Dimensions	origin along X axis	**IBIh**
	origin along Y axis	**IBLh**
	width	**IBMh**
	height	**IBNh**
Brightness	increase	**IBO0IBFi**
	decrease	**IBO1IBF1i**
Contrast	increase	**IBP0IBEi**
	decrease	**IBP1IBEi**
Zoom	20%	**IBH0**
	40%	**IBH1**
	60%	**IBH2**
	80%	**IBH3**
	100%	**IBH4**
	120%	**IBH5**
	140%	**IBH6**
	160%	**IBH7**
	180%	**IBH8**
	200%	**IBH9**
Color Depth	2 gray levels	**IBG0**
	16 gray levels	**IBG1**
	256 gray levels	**IBG2**

g, h, i = a number from the HEX/Numeric Table

g = a number in the range 000-100

h = for X axis a number in the range 0-630
for Y axis a number in the range 0-470
for width a number in the range 10-640
for height a number in the range 10-480

i = a number in the range 0-100

ADVANCED IMAGE CAPTURE (GUN)		
DESCRIPTION		**STRING**
IMAGE PRESET 3		
Basic Configuration		
Image Format	Bitmap format	**ICA0**
	JPEG format	**ICA1**
	TIFF format	**ICA2**
Resolution	full resolution (640x480)	**ICB0**
	quarter resolution (320x240)	**ICB1**
JPEG Quality Factor		**ICCg**
Advanced Configuration		
Window Dimensions	origin along X axis	**ICIh**
	origin along Y axis	**ICLh**
	width	**ICMh**
	height	**ICNh**
Brightness	increase	**ICO0ICFi**
	decrease	**ICO1ICF1i**
Contrast	increase	**ICP0ICEi**
	decrease	**ICP1ICEi**
Zoom	20%	**ICH0**
	40%	**ICH1**
	60%	**ICH2**
	80%	**ICH3**
	100%	**ICH4**
	120%	**ICH5**
	140%	**ICH6**
	160%	**ICH7**
	180%	**ICH8**
	200%	**ICH9**
Color Depth	2 gray levels	**ICG0**
	16 gray levels	**ICG1**
	256 gray levels	**ICG2**

g, h, i = a number from the HEX/Numeric Table

g = a number in the range 000-100

h = for X axis a number in the range 0-630
for Y axis a number in the range 0-470
for width a number in the range 10-640
for height a number in the range 10-480

i = a number in the range 0-100

ADVANCED IMAGE CAPTURE (GUN)		
DESCRIPTION		**STRING**
IMAGE PRESET 4		
Basic Configuration		
Image Format	Bitmap format	**IDA0**
	JPEG format	**IDA1**
	TIFF format	**IDA2**
Resolution	full resolution (640x480)	**IDB0**
	quarter resolution (320x240)	**IDB1**
JPEG Quality Factor		**IDCg**
Advanced Configuration		
Window Dimensions	origin along X axis	**IDIh**
	origin along Y axis	**IDLh**
	width	**IDMh**
	height	**IDNh**
Brightness	increase	**IDO0IDFi**
	decrease	**IDO1IDF1i**
Contrast	increase	**IDP0IDEi**
	decrease	**IDP1IDEi**
Zoom	20%	**IDH0**
	40%	**IDH1**
	60%	**IDH2**
	80%	**IDH3**
	100%	**IDH4**
	120%	**IDH5**
	140%	**IDH6**
	160%	**IDH7**
	180%	**IDH8**
	200%	**IDH9**
Color Depth	2 gray levels	**IDG0**
	16 gray levels	**IDG1**
	256 gray levels	**IDG2**

g, h, i = a number from the HEX/Numeric Table

g = a number in the range 000-100

h = for X axis a number in the range 0-630
for Y axis a number in the range 0-470
for width a number in the range 10-640
for height a number in the range 10-480

i = a number in the range 0-100

RADIO PARAMETERS (GUN)		
DESCRIPTION		**STRING**
Lynx™ BT with BT Device		
ACK/NACK Protocol with BT Device	disabled	**DDB0**
	enabled	**DDB1**
Auto-Connection (for Master only)	disabled	**DFH0**
	enabled	**DFH1**
Auto Reconnection (for Master only)	disabled	**DFI0**
	enabled	**DFI1**
RX Timeout with BT Device		**DEBf**
User-Friendly Name*	change user-friendly name	**DFC**
	validate user-friendly name	**Ctrl C**
Authentication & Encryption with BT Device	disabled	**DFE0**
	enabled	**DFE1**
	PIN code*	**DFG**
	validate PIN code	**Ctrl C**
Lynx™ BT with OM-1000 BT		
Radio Protocol Timeout		**WAAg**
Beeper Control for Radio Response	good decode and good reception	**GBI3**
	only good decode	**GBI1**
	only good reception	**GBI2**
	off	**GBI0**
Transmission Mode	one way	**DFQ0**
	two ways	**DFQ1**
Authentication & Encryption with Cradle	disabled	**DFO0**
	enabled	**DFO1**
Batch Mode	disabled	**DFP0**
	enabled	**DFP1**

f, g = a number from the HEX/Numeric Table

f = a number in the range 01-99

g = a number in the range 03-19

* After inserting the string complete with the character insertion as described in the relative procedure within the Radio Parameters parameter group on page 103.

B PROGRAMMING FOR EXPERT USERS

This document is addressed to expert users who are familiar with software programming languages and want to define a personalized code formatting. The provided programming language allows creating either simple or complex formatting expressions by means of the basic functions connected together through the following operators: **(**, **)**, **-**, **+**.

The syntax to be used to transmit the expressions to the Lynx™ BT is the following:

$+ELB<n>formatting expression<ETX>$-

where:

- <n> is a number in the range 1-5 corresponding to the format to be defined;
- <ETX> is the conventional character used as terminator of the command;
- the formatting expression uses ASCII characters when containing text strings. For this reason, the string must be inserted between two quotation marks. The following example shows the ASCII conversion of the "ABC" string:

  $+ELB1**“**414243**”**+#DS^C$-.

FUNCTION DESCRIPTION

All the functions and conventions to be used within the formatting expressions are listed below:

FUNCTION NAME	DESCRIPTION
FSTR	Searches for a defined substring by its starting and ending string.
FLSTR	Searches for a defined substring by its starting string and its length.
SSTR	Extracts a defined substring from the original string.
FPOS	Searches for a position of a defined substring within the original string.
LSTR	Returns a string length.
ISTR	Insert a substring in the original string.
RSTR	Substitutes a defined substring contained in the original string with a new one.

CONVENTIONS	DESCRIPTION
+	Concatenates two strings or fields.
-	Deletes a substring or a field from the original string.
#DS	Returns the string which has been decoded by the library.
#F<n>	Returns the result of a format which has been previously defined. The <n> value is in the range 1-4.

FindStringByStarting&EndingChar (FSTR)

This function has the following syntax:

FSTR<source_string, string_start, string_stop, mode>⇨string

This function searches for a substring having a defined starting character ("string_start") and a defined ending character ("string_stop") within the "source_string". It returns the string you searched for, or an empty one in case of failure.
If searching for a substring having characters already known, the "string_start" and "string_stop" arguments must share the same value.
The "mode" argument allows managing the starting character ("string_start") and the ending character ("string_stop"):
0 = include both starting and ending character
1 = include only starting character
2 = include only ending character
3 = discard both starting and ending character

FindStringByStartingChar&Len (FLSTR)

This function has the following syntax:

FLSTR<source_string, string_start, len, mode>⇨string

This function searches for a substring having a defined starting character ("string_start") and a defined length ("len") within the "source_string". It returns the string you searched for, or an empty one in case of failure.
If searching for a substring having a length already known, the "string_start" and "string_stop" arguments must share the same number.
The "mode" argument allows managing the starting character ("string_start"):
0 = include starting character
1 = discard starting character

SelectString (SSTR)

This function has the following syntax:

SSTR<source_string, pos_start, pos_end>⇨string

It extracts a substring whose characters are between "pos_start" and "pos_end" from the "source_string".
If "pos_end" is longer than the "source_string" length, no error will be generated since the exceeding characters are ignored.
The first character of every string is in position 1.

FindPosition (FPOS)

This function has the following syntax:

FPOS<source_string, search_string>⇨position

This function searches for a defined substring within the "source_string" and returns its position. If the substring is not found, the returned value is 1.

StringLength (LSTR)

This function has the following syntax:

LSTR<string>⇨length

This function returns the length of the defined string.

StringConcatenation

This function has the following syntax:

string1 + string2⇨string

This function allows concatenating two different strings in order to get a single string as result.

StringDiscard

This function has the following syntax:

string1 - string2⇨string

This function discards all the strings having the same value as "string2" which can be found in "string1". If no "string2" is found within "string1", the result returns "string1".

InsertString (ISTR)

This function has the following syntax:

ISTR<source_string, string1, position>⇨string

This function inserts a new string ("string1") within the "source_string" and places it in the defined "position".
If the value of the "position" argument is longer than "source_string" length, "string1" will be placed after the last character of the source string.

ReplaceString (RSTR)

This function has the following syntax:

RSTR<source_string, string1, string2>⇨string

This function searches for "string1" within the "source_string". All the strings having the same value as "string1" within the "source_string" will be replaced by "string2".
If no "string1" is found in the "source_string", the result returns the "source_string".

Examples

The string transmitted is **"**12345abcdef3790**"** and corresponds to the #DS function, as defined in the programming language.

1) expression ⇨ **SSTR<#DS,1,5> + SSTR<#DS,11,15> + SSTR<#DS,6,9>**
   result ⇨ **"12345f3790abcd"**
2) expression ⇨ **FSTR<#DS, "616263", "616263", 0> + SSTR<#DS,LSTR<#DS> -3, LSTR<#DS>**
   result ⇨ **"abc3790"**
3) expression ⇨ **FSTR<#DS, "616272", "616261", 0>**
   result ⇨ **"" null string**
4) expression ⇨ **#DS - FSTR<#DS, "616263", "6566", 0>**
   result ⇨ **"123453790"**

During the format definition the decoded string represented by #DS does not change.

Using Format Output in Format Definition

The input used by the above functions to define the code formatting usually corresponds to the decoded code (#DS). Actually, the formatting expression of each function can also format the result (output) produced by a preceding code formatting.
The format output is represented as follow:

#F<n>, where:

<n> = format number in the range **1-4**
#F = format output

Being Format 5 not included in other format expression, the format number is in the range 1-4. Furthermore, since a format expression operates upon the output of the preceding formats, the expression defining Format 1 will never contain the result of another format.

Example

The following expression is used to define Format 3:

#DS + FSTR<#F2, "6173", "6263", 0>

The expression input consists of the decoded code and the result produced by Format 2 (#F2).
The FSTR function searches for a defined substring within the #F2 result; then, it concatenates this substring and the decoded code. The result corresponds to #F3 output
.

C CODE IDENTIFIER TABLE

EAN/UPC

CODABAR

CODE 128

EAN 128

CODE 93

CODE 32

CODE 39

INTERLEAVED 2 OF 5

PDF417

MICRO PDF417

DATAMATRIX

MAXICODE

QR

AUSTRALIA POST

JAPAN POST

POSTNET

PLANET

RSS

KIX CODE

RM4SCC

D HEX AND NUMERIC TABLE

CHARACTER TO HEX CONVERSION TABLE								
char	**decimal**	**hex**	**char**	**decimal**	**hex**	**char**	**decimal**	**hex**
NUL	000	00	*	042	2A	**U**	085	55
SOH	001	01	+	043	2B	**V**	086	56
STX	002	02	,	044	2C	**W**	087	57
ETX	003	03	-	045	2D	**X**	088	58
EOT	004	04	.	046	2E	**Y**	089	59
ENQ	005	05	/	047	2F	**Z**	090	5A
ACK	006	06	**0**	048	30	**[**	091	5B
BEL	007	07	**1**	049	31	\	092	5C
BS	008	08	**2**	050	32	**]**	093	5D
HT	009	09	**3**	051	33	**^**	094	5E
LF	010	0A	**4**	052	34	**_**	095	5F
VT	011	0B	**5**	053	35	`	096	60
FF	012	0C	**6**	054	36	**a**	097	61
CR	013	0D	**7**	055	37	**b**	098	62
SO	014	0E	**8**	056	38	**c**	099	63
SI	015	0F	**9**	057	39	**d**	100	64
DLE	016	10	:	058	3A	**e**	101	65
DC1	017	11	;	059	3B	**f**	102	66
DC2	018	12	<	060	3C	**g**	103	67
DC3	019	13	=	061	3D	**h**	104	68
DC4	020	14	>	062	3E	**i**	105	69
NAK	021	15	?	063	3F	**j**	106	6A
SYN	022	16	@	064	40	**k**	107	6B
ETB	023	17	**A**	065	41	**l**	108	6C
CAN	024	18	**B**	066	42	**m**	109	6D
EM	025	19	**C**	067	43	**n**	110	6E
SUB	026	1A	**D**	068	44	**o**	111	6F
ESC	027	1B	**E**	069	45	**p**	112	70
FS	028	1C	**F**	070	46	**q**	113	71
GS	029	1D	**G**	071	47	**r**	114	72
RS	030	1E	**H**	072	48	**s**	115	73
US	031	1F	**I**	073	49	**t**	116	74
SPACE	032	20	**J**	074	4A	**u**	117	75
!	033	21	**K**	075	4B	**v**	118	76
"	034	22	**L**	076	4C	**w**	119	77
#	035	23	**M**	077	4D	**x**	120	78
$	036	24	**N**	078	4E	**y**	121	79
%	037	25	**O**	079	4F	**z**	122	7A
&	038	26	**P**	080	50	**{**	123	7B
'	039	27	**Q**	081	51	|	124	7C
(	040	28	**R**	082	52	**}**	125	7D
)	041	29	**S**	083	53	~	126	7E
			T	084	54	**DEL**	127	7F

0

1

2

3

4

5

6

7

8

9

A

B

C

D

E

F

G

H

I

J

K

L

M

N

O

P

Q

R

S

T

U

V

W

X

Y

Z

SPACE

COLON

AUTOSCAN PATTERN CODE