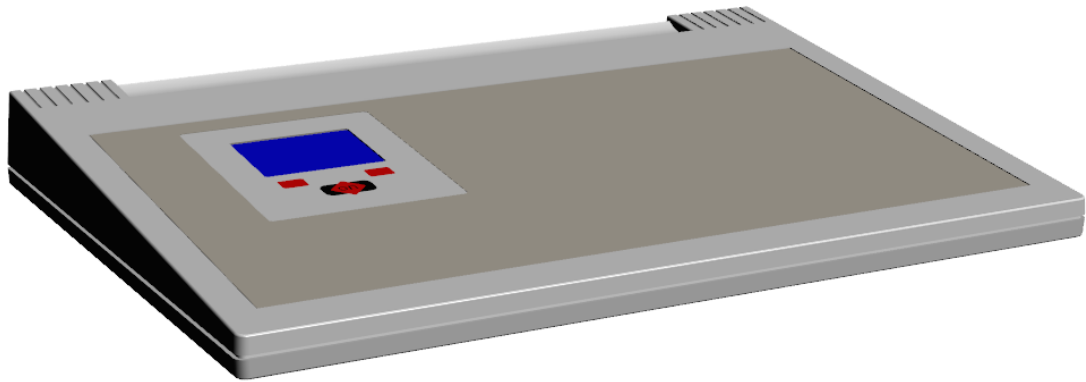


**D**ATAMARS

**LAB MAX III**  
**User Manual**  
Version 0.0



DK

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# 1 Description

---

## 1.1 General description

The LAB MAX III is a RF-ID reader designed to identify animal in laboratory. For this reason it is recommended to use the reader in an indoor environment. It reads only ISO FDX-B transponder in accordance to ISO Standard 11784/5. It allows fast and efficient reading of any animal which has been given an electronic ID device.

## 1.2 Front overview

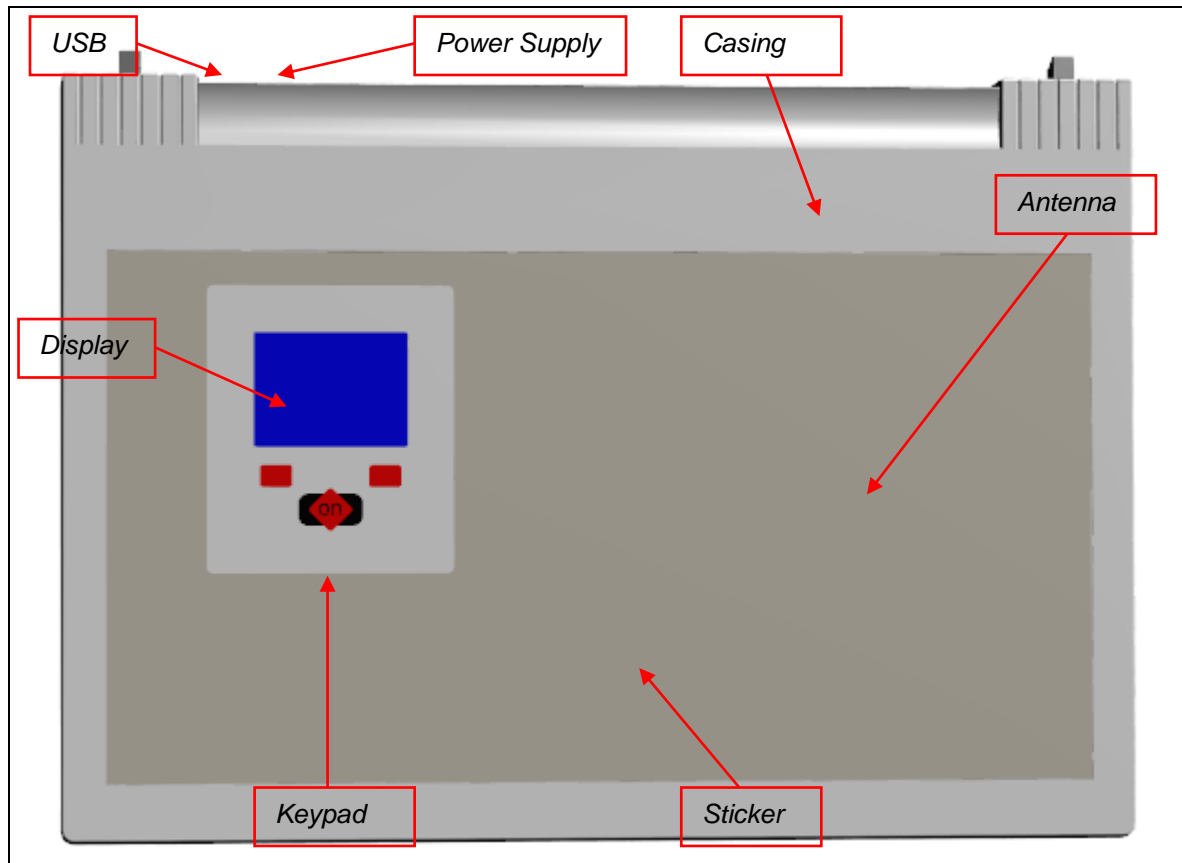


Figure 1.2.1

## 1.3 Connection

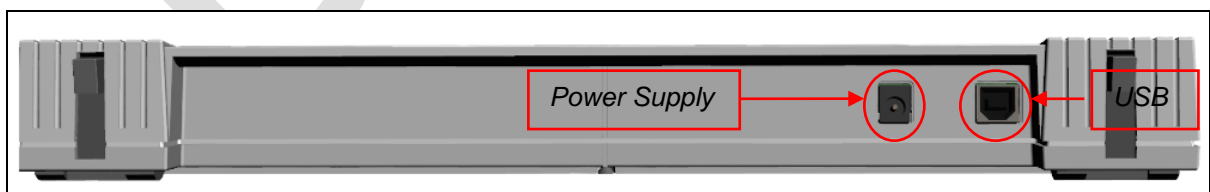


Figure 1.3.1

## 2 User interface

---

### 2.1 Keypad

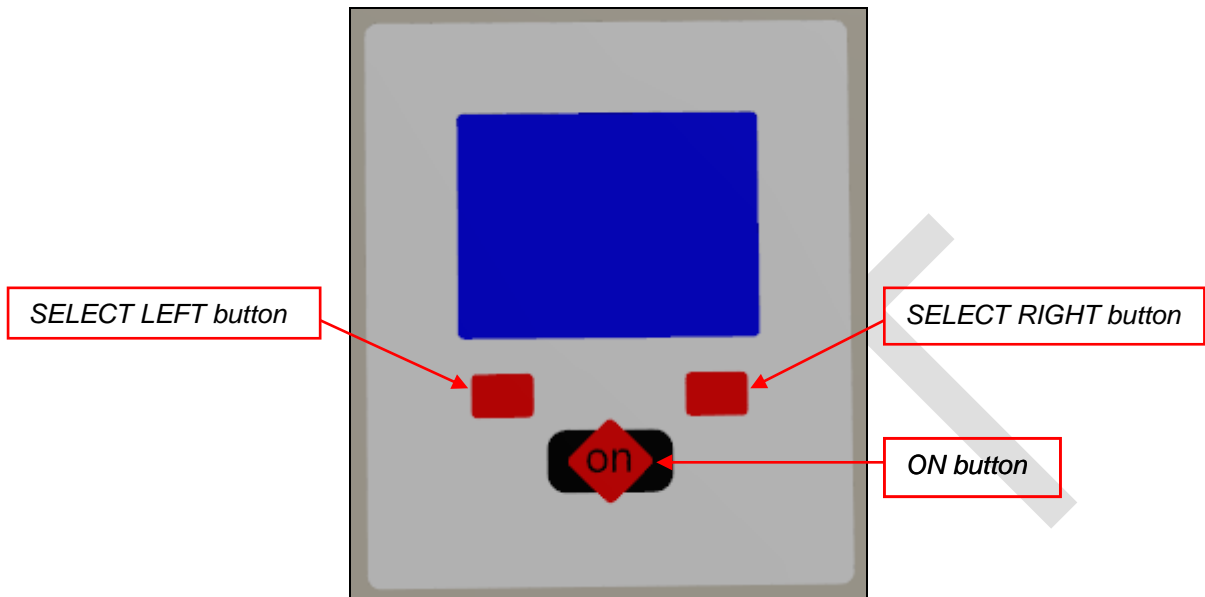


Figure 2.1.1

### 2.2 ON button

#### 2.2.1 Power ON the reader


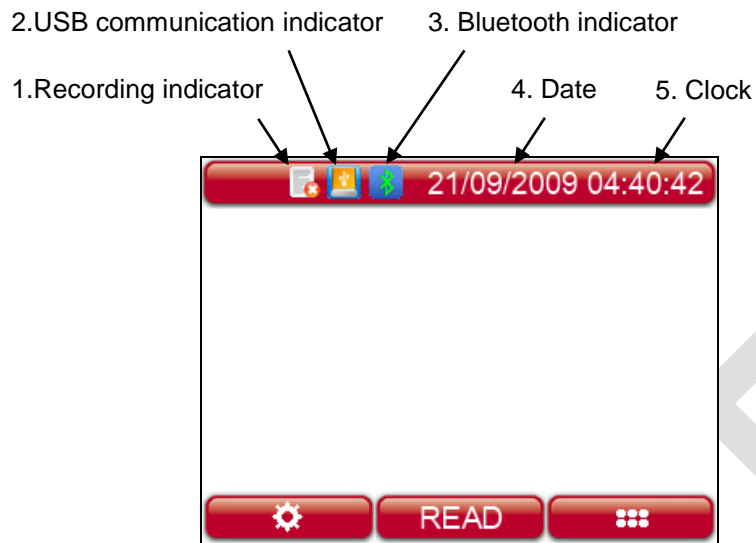
The  button has to be pressed in order to switch on the reader. The display shows the following start-up picture:








Figure 2.2.1

Under the Datamars logo, you can see the firmware version and the bootloader version in brackets.

After a few seconds the main screen shot appears:





**Figure 2.2.2**

1. The Recording indicator shows if the reader is saving output on file or not.
2. The USB communication indicator shows if the reader is set on Mass Storage Mode or in Virtual COM Port.
3. Bluetooth indicator: Bluetooth is optional.  = Bluetooth module on,  = Bluetooth connection established and ready to use.
4. Date format can be selected between EU/US/TIMESTAMP.
5. Clock time is in 24 hour mode.
6. Press  to enter the main menu of reader
7. Press  to start a reading session
8. Press  to enter in the settings menu of reader

### 2.2.2 Turn OFF the reader

After a period of non-use the device goes automatically in “pause mode”, which means the backlight of the display turns down, the screen is “frozen” and the keyboard is disabled. In order to “unlock” your

reader, please press the  button.

In order to manually switch off the reader, keep pushing the  button for about 2 seconds or select the *Shutdown* function in the main menu. The reader has also an automatic shutdown function activated after a period of non-use.

### 2.3 Read a transponder

In order to start with a reading session you must be sure that the LAB MAX III reader is turned on, if not you should proceed with the step 2.2.1.


The  button has to be pressed in order to start with the reading session, as shown in the following picture:



Figure 2.3.1

Place the animal over the reader and wait for the reading result, which can have followings results:

- Successful read, as shown in **Figure 2.3.2**:



1. Transponder type + Field bit info
2. Country Code
3. ID Code

Figure 2.3.2

- a. When the reader displays the word “Industry” as transponder type, it means that this transponder is not coded for animals.
  - b. The Alpha country code is according to ISO 3166, ISO 11784/5.
  - c. The Identity Code number is according to ISO 11784/5.
- Unsuccessful read, as shown in the following picture:



**Figure 2.3.3**

After a while the reading mode times out. The reader stops and shows the message “TAG NOT FOUND”. This time can be set by the user in the reader menu.


#### 2.3.1 Interrupt a reading session

The ON button has to be pressed in order to stop a reading session, this operation is possible to make in any time of a reading session.



## 3 Managing the menu


### 3.1 Find your way in the menu

Switch on the reader by pressing the  button, please refer to **chapter 2.2.1**. In order to open the main menu press SELECT LEFT button on the keypad, as shown in the following picture:

The display shows the following figure:



Figure 3.1.1

You can scroll through the menu by pressing the SELECT LEFT button. In order to enter a sub menu, you have to press the  button while it is highlighted. In order to exit the main menu and return in initial state of reader you have to press the SELECT RIGHT.

#### 3.1.1 Parameters

The  button is used to select and confirm the changes made through the parameters. While the parameter is selected you must press the  button for more than 2 seconds to cancel the change and go back into the main menu. The SELECT LEFT and the SELECT RIGHT buttons are used for change the parameter value, as shown in followings pictures:



Figure 3.1.2



Figure 3.1.3

### 3.2 RFID

The *RFID* menu allows you to manage the configuration.



Figure 3.2.1

#### 3.2.1 *Reading Timeout*

The Reading timeout feature defines the maximum period while the reader has to stay in reading mode.



Figure 3.2.2

### 3.2.2 AID Format

The AID format menu defines how to show on the display, and over Bluetooth, the transponder information.



Figure 3.2.3

It allows six different AID download formats to be defined:

- **ISO Long (default):**
  - Animal: "A0000000964000000123456" (23 char)
  - Industrial: "R000600000000000123456" (21 char)
- **ISO Short:**
  - Animal: "964 000000123456" (16 char)
  - Industrial: "0006 0000000000123456" (21 char)
- **ISO Tiris (Texas Instruments):**
  - Animal: "A 00000 0 964 000000123456" (26 char)
  - Industrial: "R 0006 0000000000123456" (23 char)
- **F-210:**
  - Animal: "A 00000 0 0999 000000123456" (27 char)
  - Industrial: "R 0006 0000000000123456" (23 char)
- **BDN-Ita:**
  - Animal: "10000000964000000123456" (23 char)
  - Industrial: "R000600000000000123456" (21 char)
- **ISO Short South America (SA):**
  - Animal: "964000000123456" (15 char)
  - Industrial: "0006 0000000000123456" (21 char)

### 3.2.3 *No Display*

The *No Display* feature allows choosing if the Display will shutdown while reading or not (default setting).



Figure 3.2.4

### 3.2.4 *FDX-B*

The *FDX-B* feature allows enabling or disabling the FDX-B tags.

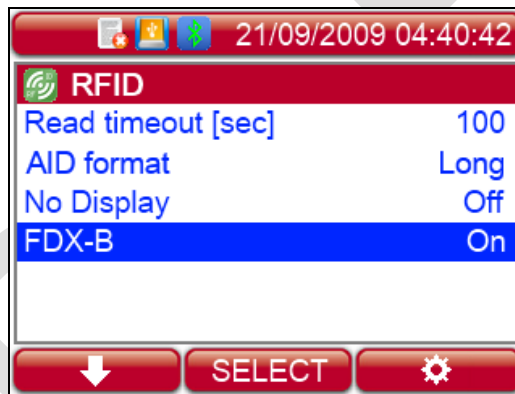


Figure 3.2.5

### 3.3 Setup

The Setup menu allows you to manage all the configuration options of the reader.



Figure 3.3.1

There are various features in the 'setup' menu. You can scroll through the features by pressing the SELECT LEFT button.

#### 3.3.1 *Startup file*

The *Startup file* feature allows choosing if the reader will save data on file when it is switched on. The recording indicator shows this setting.



Figure 3.3.2

### 3.3.2 Update loader

This feature allows uploading the bootloader in the reader.

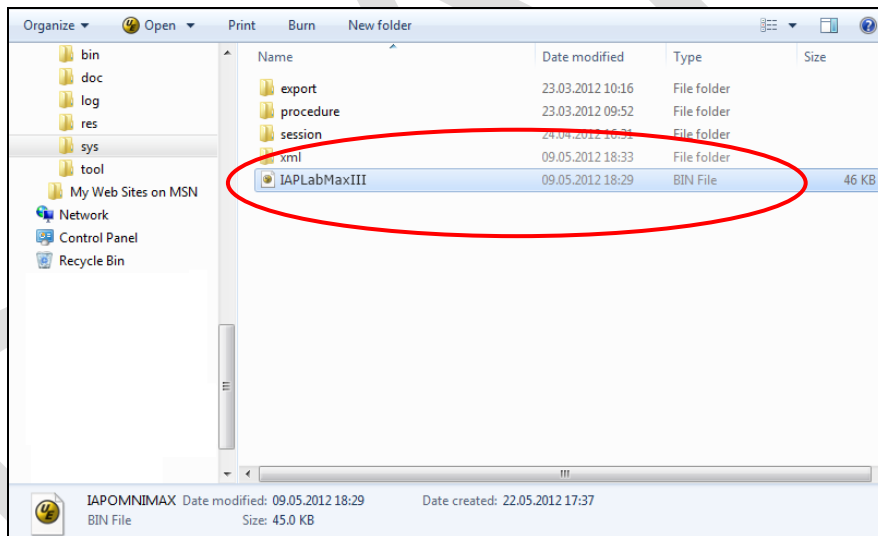
A valid bootloader image must be downloaded in the reader, using the following procedure:

- a) Shutdown the reader and connect it to the PC , using the USB cable.
- b) Open Computer and select the LAB MAX III (typically E:), as shown in **Figure 3.3.3**.



**Figure 3.3.3**

- c) Open the folder "sys" and insert the file *IAPLabMaxIII.bin*, as shown in **Figure 3.3.4**.




**Figure 3.3.4**

- d) Disconnect the reader from the PC.

- e) Wait until the reader restart and go in *Setup* menu, then choose Update loader as shown in the following picture.



Figure 3.3.5

- f) If the update has been successfully executed the reader sends a firmware update audio signal and makes a shutdown, otherwise it makes an error short sound.
- g) Press the  button to start the reader.
- h) In case of error, restart from step a), since no valid file has been found by the reader to start the firmware update.

### 3.3.3 *Bluetooth*

This feature allows switching on or off the Bluetooth communication.

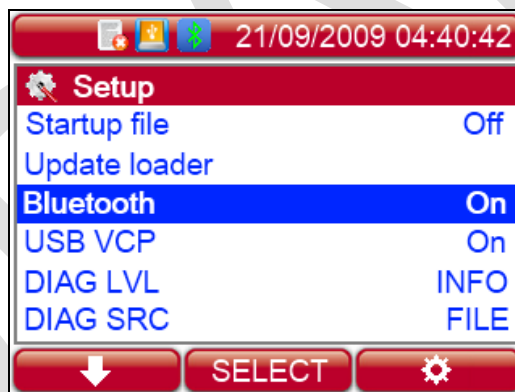


Figure 3.3.6

### 3.3.4 USB VCP

This feature allows choosing the Mass Storage or Virtual Com Port. The first has to be selected when we want to use the reader like a normal storage support. The second allows exchanging data to the PC using program like Hyperterminal.

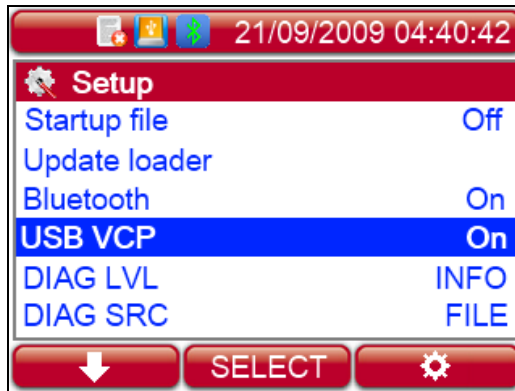


Figure 3.3.7

### 3.3.5 DIAG LVL

This feature allows choosing which level of tracing we want to send in output. There are four levels and higher levels enable also lower levels:

1. DEBUG           all firmware tracing
2. INFO            diagnostic information like battery level, Operating System status or statistic test outputs
3. ERROR          hardware and firmware errors
4. NONE           no tracing only reading

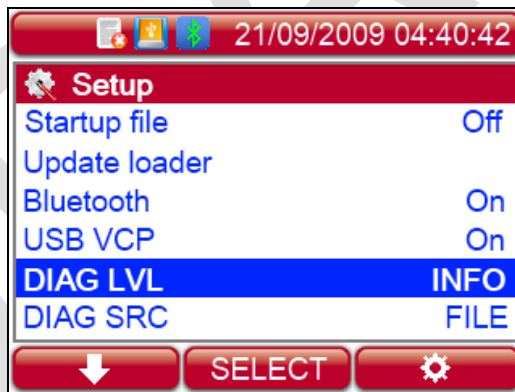


Figure 3.3.8



### 3.3.6 DIAG SRC

This feature allows choosing where we want to send the output.

There are four choices:

1. FILE               the device save the output in an internal file.
2. USB               the device communicate its outputs via USB.
3. BT                 the device communicate its outputs via Bluetooth.
4. ALL                the device uses all the previous output features together.



Figure 3.3.9

### 3.3.7 Send reading

This feature allows choosing

There are two choices:

1. EIC
2. None

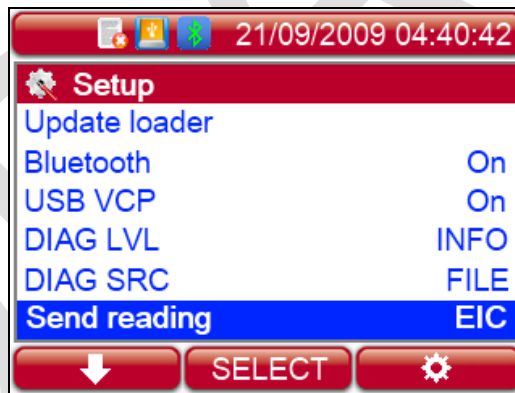


Figure 3.3.10

### 3.3.8 *Auto Shutdown*

The *Auto Shutdown* feature defines the maximum period that the reader stays on while no buttons are pressed. After this period the reader automatically switches off.



Figure 3.3.11

### 3.4 Info

This menu only gives information about the version of the Bootloader and the Firmware on the reader.



Figure 3.4.1

### 3.5 Language

This menu allows you to select the language on your device.



Figure 3.5.1



Figure 3.5.2

### 3.6 Date & Time

The *Data Time* menu allows changing settings about the current data and time.



Figure 3.6.1

#### 3.6.1 *Format*

This menu allows you to adjust the date and time including the date format (EU format if you prefer to have the day before the month, US format if you prefer to have the month before the day and the TIMESTAMP format).

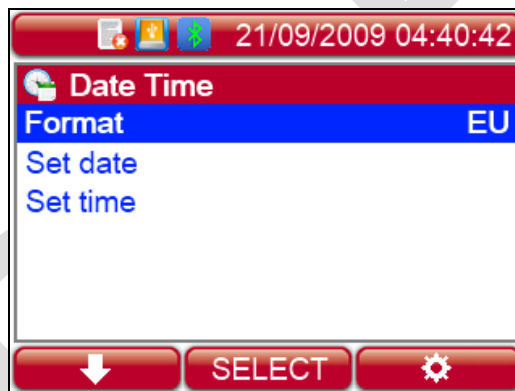


Figure 3.6.2

#### 3.6.2 *Set date*

To set the date, select SET DATE and insert the current date.



Figure 3.6.3

### 3.6.3 Set time

To set the clock, select SET TIME and insert the current time.

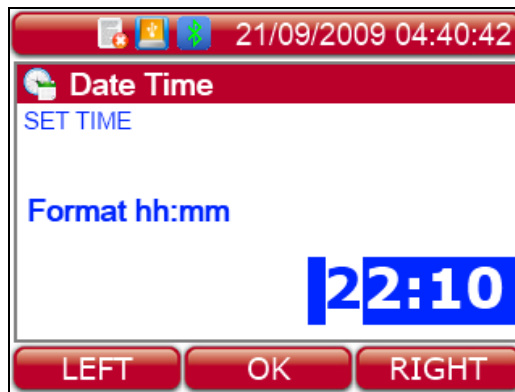


Figure 3.6.4

## 3.7 Display

The *Display* menu allows managing all visual features.



Figure 3.7.1

### 3.7.1 Timeout backlight

The *Timeout backlight* feature allows you to decide how many seconds the display has to stay on.

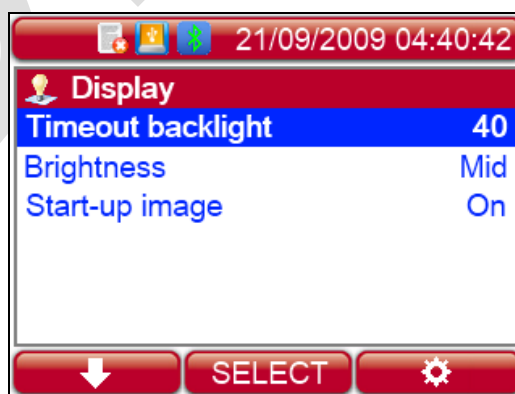


Figure 3.7.2

### 3.7.2 Display brightness

The Display brightness feature defines the level of the brightness of the display.

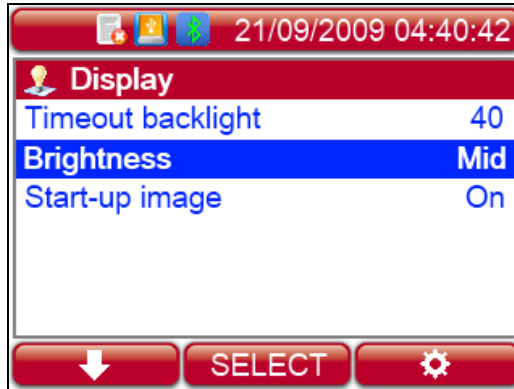


Figure 3.7.3

### 3.7.3 Start-up image

The Start-up image feature defines whether or not to display the image while the reader is switching on. When the feature is OFF, the image is disabled. When it is ON, the image is enabled.

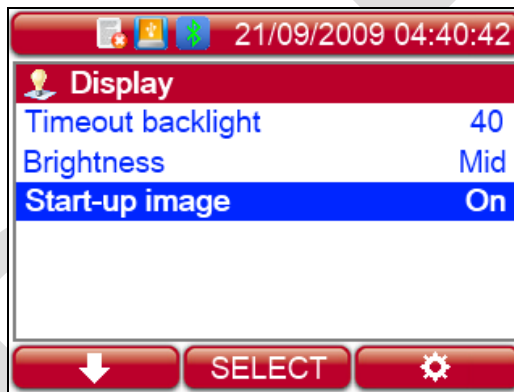


Figure 3.7.4

## 3.8 **Audio**

The *Audio* menu allows changing sound's features.



Figure 3.8.1

### 3.8.1 *Audio level*

The Audio Level feature defines the volume of the sounds of the device and allows you to disable the audio.



Figure 3.8.2

### 3.8.2 *Keyboard sound*

The Keyboard sound feature enables or disables the acoustic signal when a button is pressed. When the key feature is OFF, the sound is disabled. When it is ON, the sound is enabled.



Figure 3.8.3

### 3.8.3 *Start-up sound*

The Start-up sound feature enables or disables the acoustic signal when the reader is switched on. When the feature is OFF, the sound is disabled. When it is ON, the sound is enabled.

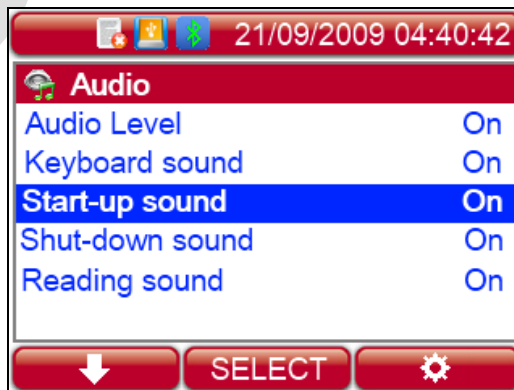


Figure 3.8.4

### 3.8.4 Shutdown sound

The Shutdown sound feature enables or disables the acoustic signal when the device is turned off. When the feature is OFF, the sound is disabled. When it is ON, the sound is enabled.



Figure 3.8.5

### 3.8.5 Reading Sound

The Reading sound feature enables or disables the acoustic signal when a tag is found/not found. When the key feature is OFF, the sound is disabled. When it is ON, the sound is enabled.

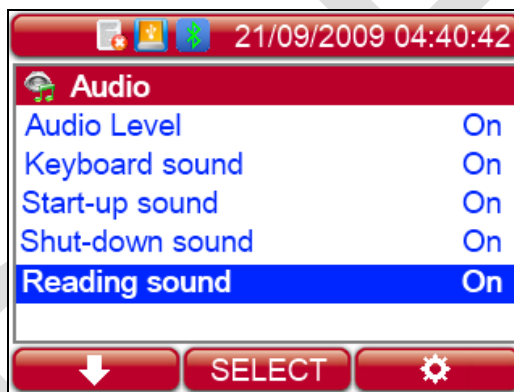


Figure 3.8.6

## 3.9 Test

The Test unit feature allows you to test your device.



Figure 3.9.1

### 3.9.1 Autotuning RFID

The Autotuning RFID test shows the values of tuning position and power.

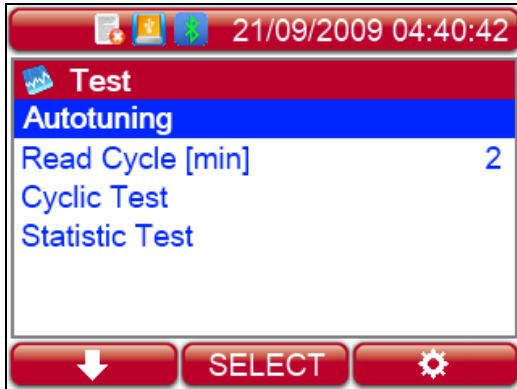


Figure 3.9.2



Figure 3.9.3

### 3.9.2 Read Cycle

This feature allows changing the time of one cycle of reading. Note that it has to be higher than the *Read timeout* set in *RFID* menu.

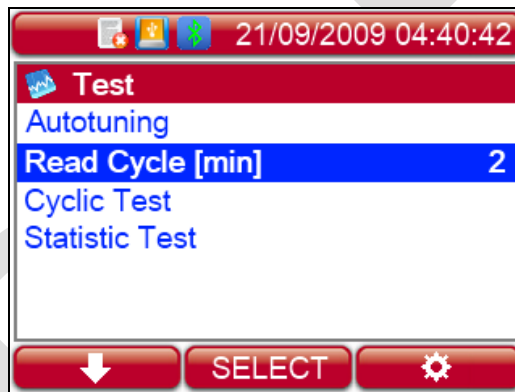


Figure 3.9.4

### 3.9.3 Cyclic Test

This feature starts the reading cyclic test.

The cycle is composed by two parts:

1. A reading time of the amount of seconds set in the *Read timeout* in *RFID* menu
2. A pause time of the amount of time set in *Read Cycle* minus the reading time.

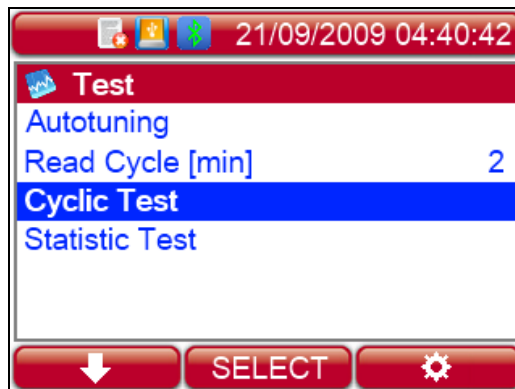


Figure 3.9.5



### 3.9.4 *Statistic Test*

This feature starts the reading test of a standard time and visualizes the percentage of reading done of all the tags.

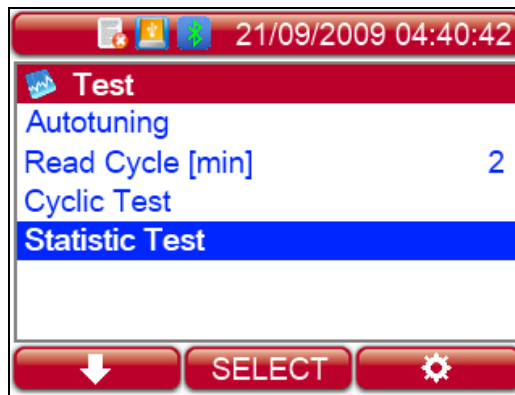


Figure 3.9.6

The final result of a Statistic Test looks like:

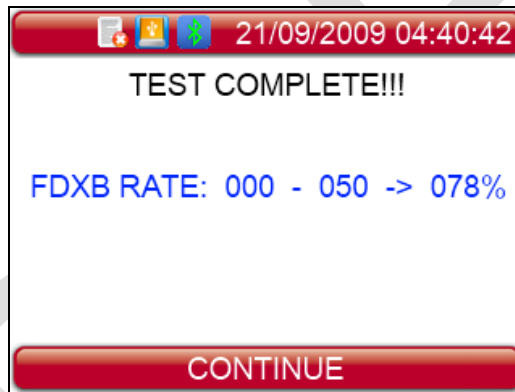


Figure 3.9.7

## 4 Control

---

The control menu allows enabling various features like Recording mode or Bluetooth communication.



Figure 3.9.1

### 4.1 Shutdown

The *Shutdown* feature allows shutting down the reader.



Figure 4.1.1

## 4.2 Recording

This feature allows recording data on file.

### 4.2.1 *Recording Stopped*

If we choose the *Recording Stopped* feature, the reader stops saving data on the file.



Figure 4.2.1

### 4.2.2 *Recording Started*

If we choose the *Recording Started* feature, the reader start saving data on the file.



Figure 4.2.2

### 4.3 Bluetooth

The *Bluetooth* feature enables or disables the Bluetooth communication.

#### 4.3.1 *Bluetooth Disabled*

If we choose the *Bluetooth Disabled* feature, the reader stops the Bluetooth communication.



Figure 4.3.1

#### 4.3.2 *Bluetooth Enabled*

If we choose the *Bluetooth Enabled* feature, the reader starts the Bluetooth communication.

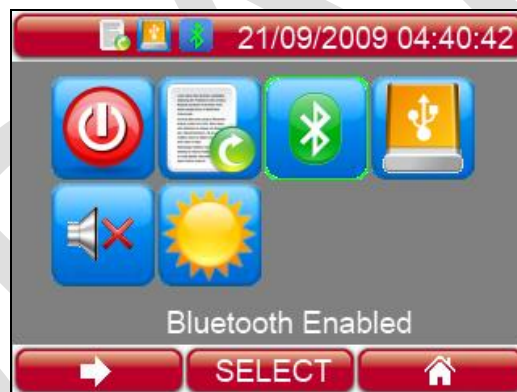


Figure 4.3.2

#### 4.4 PC communication

This feature defines how the reader communicates with the computer via USB.

##### 4.4.1 Mass Storage Mode

This feature enables the reader to be used like a mass storage memory.



Figure 4.4.1

##### 4.4.2 Serial USB Mode

This feature enables the serial communication through the reader and the computer.



Figure 4.4.2

## 4.5 Audio Level

The *Audio Level* feature defines the volume of the sounds of the device.

### 4.5.1 *Audio Off*

This feature allows switching off the audio of the reader.



Figure 4.5.1

### 4.5.2 *Audio On*

This feature enables the audio of the reader.



Figure 4.5.2

## 4.6 Brightness Level

The *Brightness Level* feature defines the darkness of the video on the device.

### 4.6.1 *Brightness High*

This feature sets the *Brightness Level* to the highest value.



Figure 4.6.1

### 4.6.2 *Brightness Mid*

This feature sets the *Brightness Level* to the average value. The video becomes darker.



Figure 4.6.2

### 4.6.3 *Brightness Low*

This feature sets the *Brightness Level* to the lowest value.



Figure 4.6.3

## 5 Connectors

---

### 5.1 Power Supply Input

The LAB MAX III has to be connected to the Power Switching Adapter in order to supply the reader. The power supply is a switching unit used by laptop computers and is compatible with the power source worldwide, and the output power is 12VDC with 2A.

Power supply: 100-240VAC/0.5A/47-63Hz 12 VDC 2 A. The power supply has the earth connected to the GND. On the Jack connector the positive (plus) is at the center pin.



Figure 5.1.1

### 5.2 USB interface

The reader is provided with an USB cable in order to connect it to the PC as Mass Storage Device or via Virtual COM Port as explained in next chapter.



## 6 Command interface

### 6.1 Command overview

LAB MAX III is controlled through a serial interface, configured as following:

- Baud rate: 9600, 14400, 38400, 57600, 115200 (default).
- Data: 8 bit
- Parity: none
- Stop: 1 bit
- Flow control: none

TeraTerm VT or HyperTerminal are examples of available PC software that allow to setup and control the reader LAB MAX III.

Connect a PC running HyperTerminal to the LAB MAX III, setup the serial port and turn on the LAB MAX III. The following output is displayed:

*DATAMARS S.A. LabMaxIII firmware version: (x.x) x.x.x*

The following table summarizes the LAB MAX III commands which were present in the old version of the reader:

CMD	Description Old commands	Parameter
.v	Get reader version	
.n	Get noise level	
.i	Get unit Serial Number	
.isNNNN	Set unit Serial Number	

The following table summarizes the new LAB MAX III commands:

CMD	Description New commands	Parameter
.T	Save FDXB acquired signal	
.ATNG	Start antenna autotuning	
.DTNG	Start/Stop debugging antenna tuning level	
.SDATE	Set Date using format dd/mm/yyyy	dd/mm/yyyy
.STIME	Set Time using format hh:mm:ss	hh:mm:ss
.GDATE	Get Date using format dd/mm/yyyy	
.GTIME	Get Time using format hh:mm:ss	
.BLUD	Reserved	

An online command short description can be displayed typing the '?' on the keyboard:

```
----- Command Line Help -----
.v      →   Get reader version
.n      →   Get noise level
.i      →   Get unit Serial Number
.isNNNN →   Set unit Serial Number
-----

----- New Commands -----
.T      →   Save FDXB acquired signal
.ATNG   →   Start antenna autotuning
.DTNG   →   Start/Stop debugging antenna tuning level
.SDATE  →   Set Date using format dd/mm/yyyy
.STIME  →   Set Time using format hh:mm:ss
.GDATE  →   Get Date using format dd/mm/yyyy
.GTIME  →   Get Time using format hh:mm:ss
.BLUD   →   Reserved
-----
```

## 6.2 Command description

The back compatibility commands are identical for the LabMaxII and the LAB MAX III readers. They don't need any other special character to be executed.

All commands available starts always with a '.' (DOT) followed by the **command name** (CMD), and end with a **carriage return** ([CR] = 13 dec).

### .CMD [CR]

#### 6.2.1 Command: .v

It returns the firmware version from LAB MAX III, as shown in the following example:

```
User: .v
LAB MAX III answer: FW Vx.x.x (Vx.x)
```

#### 6.2.2 Command: .n

It returns the measured noise level. Values of 10 are a bad level end values of 0 are good level, as shown in the following example:

```
User: .n
LAB MAX III answer: 1
```

#### 6.2.3 Command: .i

It returns the 4 character of the unit **Serial Number**. If the unit is not equipped with the feature, the message is: "**noID**", as shown in the following example:

```
User: .i
LAB MAX III answer: noID
```

#### 6.2.4 Command: .isNNNN

It sets up the unit **Serial Number**, in order to set this **SN** enter a 4 digit number after typing the command. If the code entered is not valid it will be changed to "noID", as shown in following example.

```
User: .is4A58
LAB MAX III answer: noID
```

*Else*

```
User: .is1234
LAB MAX III answer: 1234
```

**Note that the number will be accepted also if the feature is not installed but the number will be lost at the next power off.**

## 6.3 New commands

### 6.3.1 Command: .T (only for debug mode)

Only for debug mode: it saves FDXB and HDX acquired signal, as shown in following example:

```
User: .T
LAB MAX III answer: DC Level: 2051
                    FDX Noise Floor: 1929740 (2500000)
                    fdxbDC: 2056
                    fdxbSynch: 17
                    fdxbHeader: 224
                    FDXB Done: decoderTAGFOUND
                    Decoding total time: 30
```

### 6.3.2 Command: .ATNG

It starts the antenna autotuning, as shown in following example:

User: **.ATNG**  
LAB MAX III answer: *Autotuning: 7 : 3087*

### 6.3.3 Command: .DTNG (only for debug mode)

It starts/stop the debugging antenna tuning level, as shown in following example:

User: **.DTNG**  
LAB MAX III answer: *Tuning level: 3913 (3856, 385)*  
*Tuning level: 3907 (3856, 385)*  
*Tuning level: 3920 (3856, 385)*  
*Tuning level: 3917 (3856, 385)*  
*Tuning level: 3915 (3856, 385)*  
*Tuning level: 3908 (3856, 385)*  
User: **.DTNG**

### 6.3.4 Command: .SDATE

It set the date using dd/mm/yyyy format, as shown in following example:

User: **.SDATE 31/10/2011**  
LAB MAX III answer: *Date: 31/10/2011*

### 6.3.5 Command: .STIME

It set the time using hh:mm:ss format, as shown in following example:

User: **.STIME 16:40:30**  
LAB MAX III answer: *Time: 16:40:30*

### 6.3.6 Command: .GDATE

It gets the date using the dd/mm/yyyy format, as shown in following example:

User: **.GDATE**  
LAB MAX III answer: *Date:31/10/2011*

### 6.3.7 Command: .GTIME

It get the time using the hh:mm:ss format, as shown in following example:

User: **.GTIME**  
LAB MAX III answer: *Time: 10:07:18*

### 6.3.8 Command: .BLUD

Command reserved to specialized personnel (service and support and/or repair centers).

## 7 Take care of your reader

---

Ensure that the reader does not get damaged. Do not drop it onto a hard surface or subject it to wet conditions.

If the outer casing of the reader becomes soiled, it can be cleaned with a damp cloth. First ensure that it is not connected to the charger.

If for any reason the reader is not working, please do not attempt to repair it, but return it for repair to your local dealer.

The display of the reader LAB MAX III may change color if exposed to temperatures higher than 50°C. It will return to its original color as soon as the temperature gets below 50°C.

At very low temperatures the display may lose its contrast, but at normal temperatures it will return to its normal contrast.

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## 8 Specification

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- Storage temperature: -20°C to 65°, 85% RH non condensing
- Operating temperature: -5°C to 55°, 85% RH non condensing
- Housing material: ABS (UL94 HB)
- Housing dimension: 340mm (L) x 240mm (W) x 40mm (H)
- Housing protection level: IP--
- Power supply: +12V Switching Power Supply Adapter
- Interface to host PC: USB connection
- Transmission frequency: 134.2 kHz
- Tag compatibility: FDX-B
- Standards: ISO 11784/5
- Typical reading distance: xxxmm FDX-B: up to 25cm
- Certificate: CE, FCC
- Reader weight: xxxx g

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## 9 Information to user

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### FCC Part 15

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) This device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for 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 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

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

## 10 Do you have a problem identifying an animal?

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### 10.1 The reading distance is too short

The maximum reading distance is obtained with the transponder (tag) perpendicular to the antenna and aimed at the centre of the antenna coil. If the tag is implanted into an animal its orientation may not be optimal and therefore the reading distance may be reduced.

You might be close to a source of electromagnetic disturbances like video or TV. Move a few meters away and try again.

Do not use the reader on a steel table. The metal will reduce the performance of the antenna.

The reading distance is reduced if the transponder is still in the needle.

### 10.2 The reader does not read the transponder

Change the angle of the reader and try again.

Some types of transponders from other manufacturers are disturbed if placed in the centre of the reader-antenna. It is possible that some tags will not function if placed in parallel and at the centre of the antenna. Change the direction of the tag or of the antenna.

### 10.3 The reader does not work

Check the ambient temperature: it has to be between **-5°C and +45° C**.

If you're still having problems, please contact your dealer.

The LAB MAX III reader is a product developed and produced by DATAMARS, Switzerland.

Should you have any suggestions or require information regarding this or other DATAMARS products, please contact your dealer.

## 11 Advanced user instructions

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### 11.1 Console commands description

This section is meant to describe the console commands implemented in the LAB MAX III in order to remote control the features and the functions of the reader.

"answer string" [CR][LF]

#### 11.1.1 *Get firmware version command*

- Command syntax: ".v" [CR]
- Command answer: " DATAMARS S.A. LabMaxIII Firmware version: (1.XX) 1.X.X" [CR][LF]
- Command action: none
- Parameter range: none

Description: this command returns the firmware version.



## 12 Certifications

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### European directives

Datamars, Via ai Prati, CH-6930 Bedano declares, under its own responsibility, that the product LAB MAX III is in accordance with the following standards:

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ETSI EN 300 330-1 / ETSI EN 300 330-2	Electromagnetic compatibility and Radio spectrum matters (ERM) - Short Range Devices.
ETSI EN 301 489-1 / ETSI EN 301 489-3	Electromagnetic compatibility (EMC) standard for radio equipment and services.
IEC/EN 61000-4-2 / IEC/EN 61000-4-3/ IEC/EN 61000-4-4/ IEC/EN 61000-4-6	Electrostatic discharge, electromagnetic field, electrical fast transient/burst, radio-frequency fields' immunity.

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LAB MAX III satisfies the essential requirements of directives [99/5/EC](#).

## 13 End of life

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### Disassembly Instructions for OMNI MAX reader




Product Name / Model	Description
OMNI MAX / Any models	Universal portable reader

Only authorized recyclers are permitted to use these disassembly instructions. Any attempted disassembly by a user or unauthorized party will void the product warranty and may irreparably damage the product.

### Tools Required

Tool Description	Tool Size (if applicable)
Nipper	Medium
Philips screwdriver (0)	Small
Cutter pliers	Medium
Hot Air Gun	Big

## Product Disassembly Process

1	<ul style="list-style-type: none"> <li>All external plastics have to be removed from the reader (use Philips screwdriver to remove all screws).</li> <li>The Keypad has to be removed from the top cover casing (use the Hot Air Gun with the cutter pliers in order to easily remove the keypad).</li> </ul>	
2	Dispose plastic parts of the reader in accordance with local recycling laws.	
3	Dispose electronics parts of the reader in accordance with local recycling laws.	
4	Dispose cables of the reader in accordance with local recycling laws.	