Dosimetry

Hands-Free Reader

LDM 320

User's Manual

MIRION TECHNOLOGIES Health Physics Division

Featuring: MGP INSTRUMENTS

Revision Log

Rev.	Date	Verified by	Approved by	Origin and description of revision	Revised pages
A	—	—	—	Not issued	—
B	16/02/2012	Perez J	Salle JL.	Translation of the French version	—
C	2012–06	Perez J	Salle JL	DEVS20569: All document updated	All

Table of Contents

1. Introduction

1.1. Related Documents and Product References

Designation	Reference
Mounting Assembly LDM 320D	147636
Mounting Assembly LDM 320W	150518
LDM 320D	150534
LDM 320W	150517

Note: *The LDM 320S (ref 149119) was designed specifically to operate in a strong magnetic background.*

1.2. Associated Software

Designation	Reference
DMCUser basic Package (Single User)	154646
DosiCare Package	135380
LDM 3000 SW Package	131385
DosiServ	Contact MRION Technologies
Sentinel	HEH-8013
Smart Turnstyle	HEH-5008
DMC Viewer	HEH-8020

2. Description

2.1. Product Description

Both of these hands-free readers are interface hardware which provide a centralized system (DOSICARE, DOSISERV and SENTINEL or configuration software (such as DMCUser)) to communicate with DMC 2000, DMC 3000 and SOR dosimeters.

The LDM 320 is connected to a USB port of a PC. It is available in two versions:

- Desk version (LDM 320D):

Figure 1 - LDM 320D

- Wall mount version (LDM 320W):

Figure 2 - LDM 320W

2.2. General Reader Operation

The dosimeter reader is connected to a "host" PC through a USB link.
Users operate the reader by computer via a USB cord. Most commands are intended for communication with a dosimeter present in the reader coverage area.

Dosimeter reader typical use:

- "Office" use: The reader is used to configure the dosimeters and ommunicate to the PC the dosimeter's stored measurements and event histories.
- "Access control" use: The reader is used to identify presented dosimeters, check them for good condition, switch them to "Measurement" (Run) mode at "area entry" and to "Pause" mode at "area exit", and retrieve their essential data (doses, dose rates, etc.).

2.3. LDM 320 Block Diagram

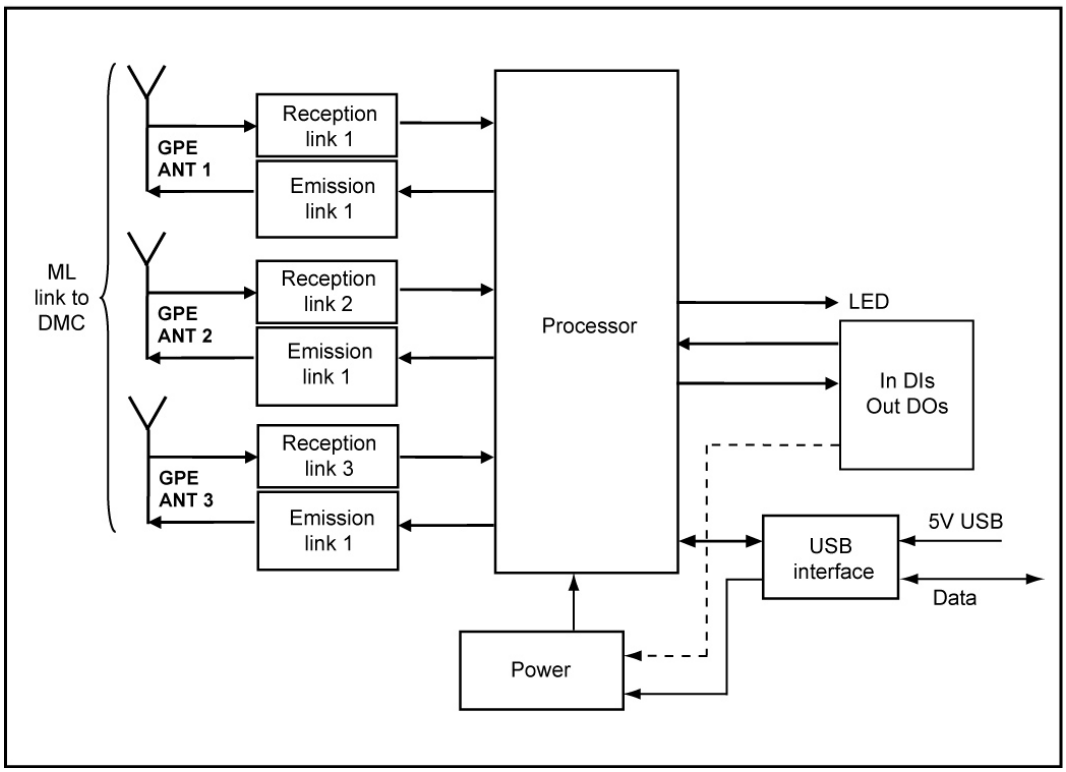


Figure 3 - Block Diagram

2.4. Reader Operating Modes

The reader has several operating modes. Switching from one mode to another is done via computer. Upon power-on, the reader starts in the mode indicated by the associated configuration parameter.

The following modes are available for use:

- Normal mode
- Specific mode
- "Test" modes
- Downloading and Programming mode

2.4.1. Normal Operating Mode

This is the reader operational functioning mode. In this mode the reader operates as a slave to the PC:

- It retrieves the PC commands.
- It searches for dosimeters.
- It runs the commands (reading or writing dosimeter information or parameters).
- It sends a report to the PC.

2.4.2. Specific Mode

This mode is reserved for specific autonomous applications.

2.4.3. Test Modes

These test modes are intended to check reader integrity (Factory use only.)

- "Antenna tuning" test mode
- "AGC programmable amplifier" test mode
- "Autonomous" test mode
- MMI and digital input/output test mode

2.4.4. Downloading and Programming Mode

This mode is used to update the reader firmware (Factory use only.)

3. Installation, Connection and Start-up

	Keep the reader away from sources of electromagnetic fields (f = 125 kHz: video terminals, power supplies, rotary machines, etc.). Install readers in accordance with §4 recommendations.

To install and start up the LDM 320, take the following steps:

- Install the software on the PC.
- Connect the reader to the PC.

3.1. Hardware Installation

- The LDM 320D does not require any installation as it only has to be placed on a desk and connected to a PC through a USB cable.

- The LDM 320W must be wall-mounted through the support plate. It is also connected to a PC through a USB cable.

The USB cable can be positioned as follows:

- by passing it behind the reader, through the partition by drilling a hole for this purpose, or
- by passing it outside, through the notch at the bottom of the reader.

3.1.1. Installation

- Remove the wall mount from the LDM 320W by unscrewing the four side screws.
- Attach the plate to the wall via back-facing holes using four screws (not supplied).

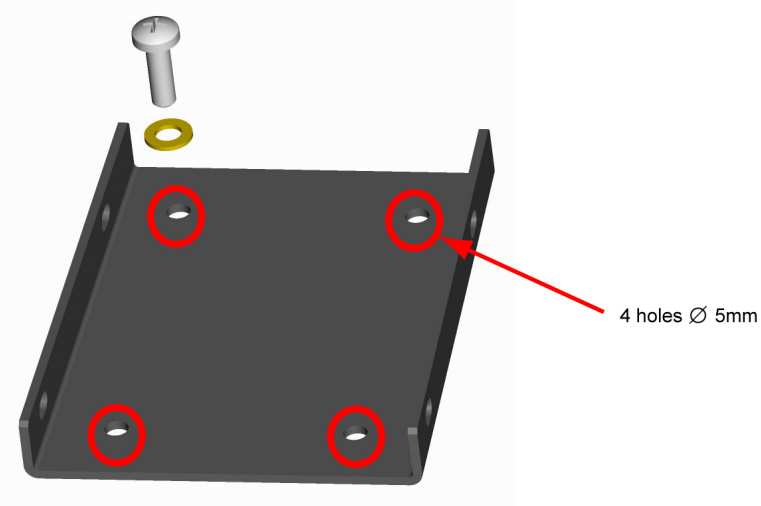


Figure 4 - Back-facing Screw Holes

Then secure the reader using the attaching plate (located behind the reader) to the wall mount by screwing it in on both sides (four 4x10 CHCM screws).

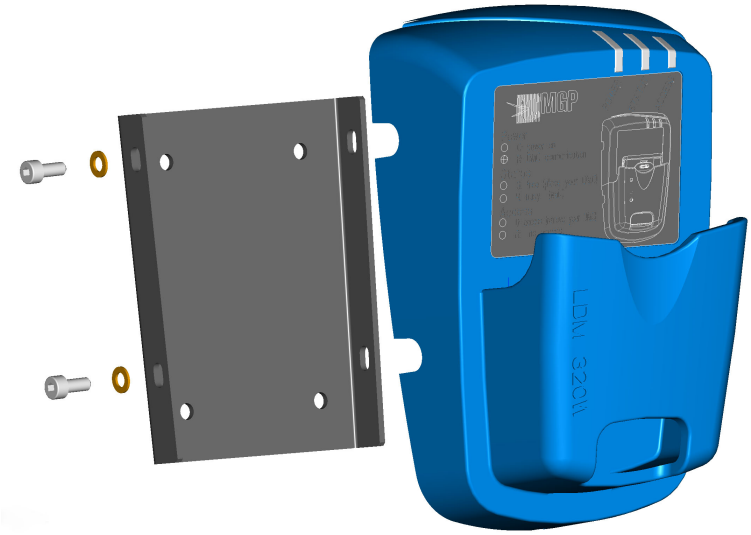


Figure 5 - Mounting Reader

3.2. Installation of USB Driver

Some software programs such as DMCUser automatically install the USB driver specific to the LDM 320 readers.

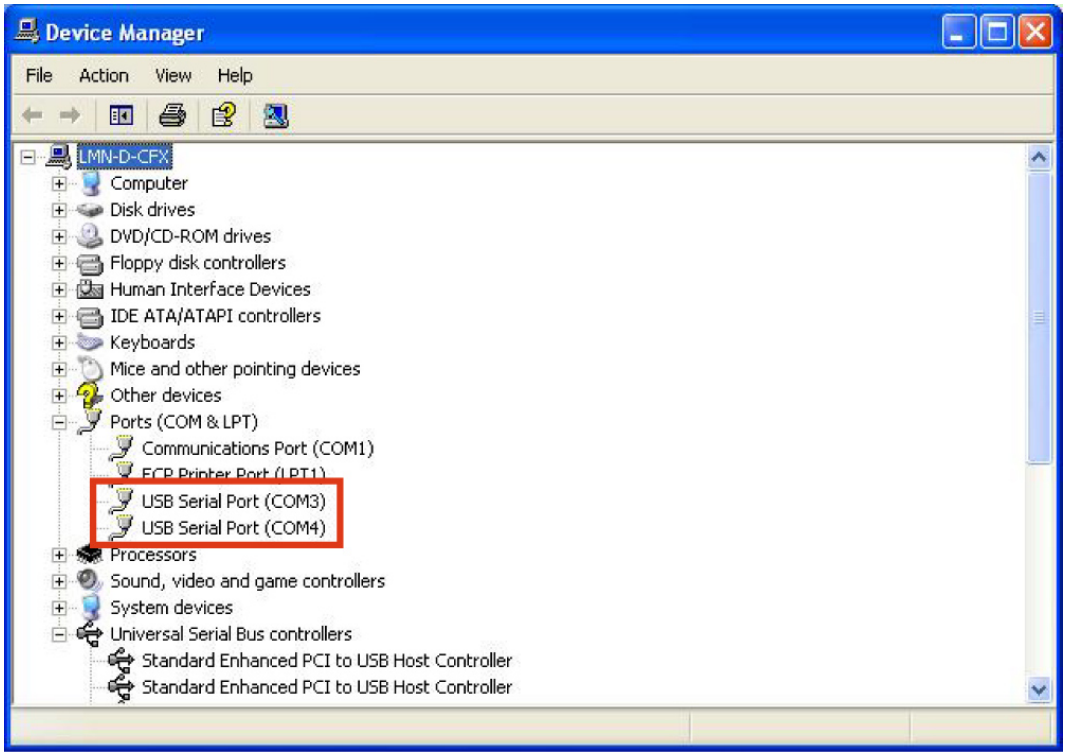
In the event of malfunction (hardware type not detected), the driver can be checked for correct installation by using the instructions below.

3.2.1. Checking the LDM 320 Driver Installation

In order to check this driver for correct installation, follow the instructions below:

- Connect the LDM 320 reader to the computer USB port once the driver is installed.
- Using Windows, select the "Workstation" and right-click with the mouse.
- Select "Properties." The "System Properties" screen will display.
- Select the "Hardware" tab and then "Device Manager."
- Drop down the list of Ports (COM and LPT) and check that the two "USB Serial Ports (ComX)" are present.

Note: *X designates the port number used. It may differ with the PC and available ports. It represents ports 3 and 4 in this example.*



Note: *When you disconnect the LDM 320, the COM Device Port disappears. When you reconnect the LDM 320, the COM Device Port reappears.*

3.2.2. Installation of LDM 320 for Windows XP

The USB driver for the LDM 320 must be installed for Windows XP.

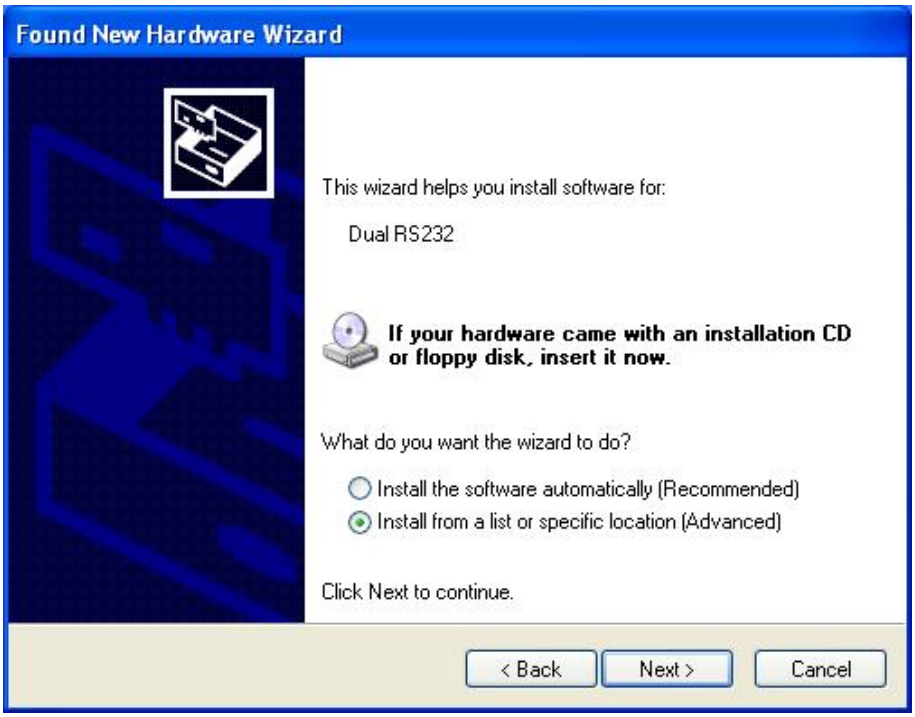
In some cases, after the first LDM 320 connection, Windows XP automatically installs a "Human Interface Devices (HID)" driver. This device does not support the LDM 320.

Drivers are available on request from Mirion Technologies (MGPI) or by downloading it from the following address:

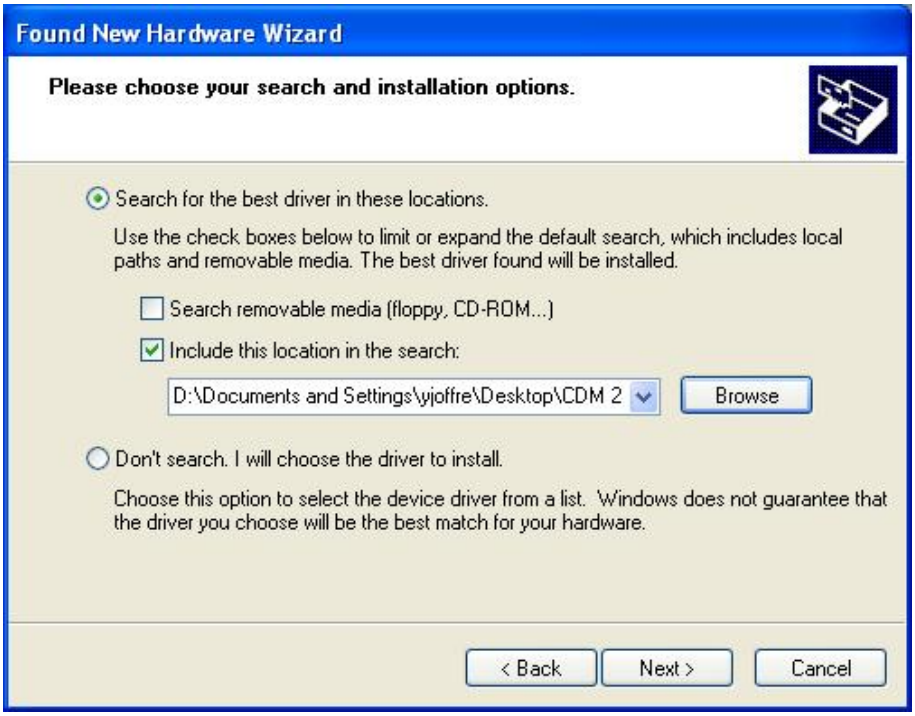
http://www.mirion-hp.com/support

Once the file is recovered, create a folder, and uncompress the compressed file into this folder.

Connect the LDM 320 to a USB port. The computer will recognize a new device:



Click "Next" and indicate the access path to the uncompressed folder.



Once this operation is completed, the following screen will appear:

Once the installation is complete, the computer will again detect a new "USB Serial Port" device.

The LDM 320 is ready for use when the last screen indicates that the installation is completed.

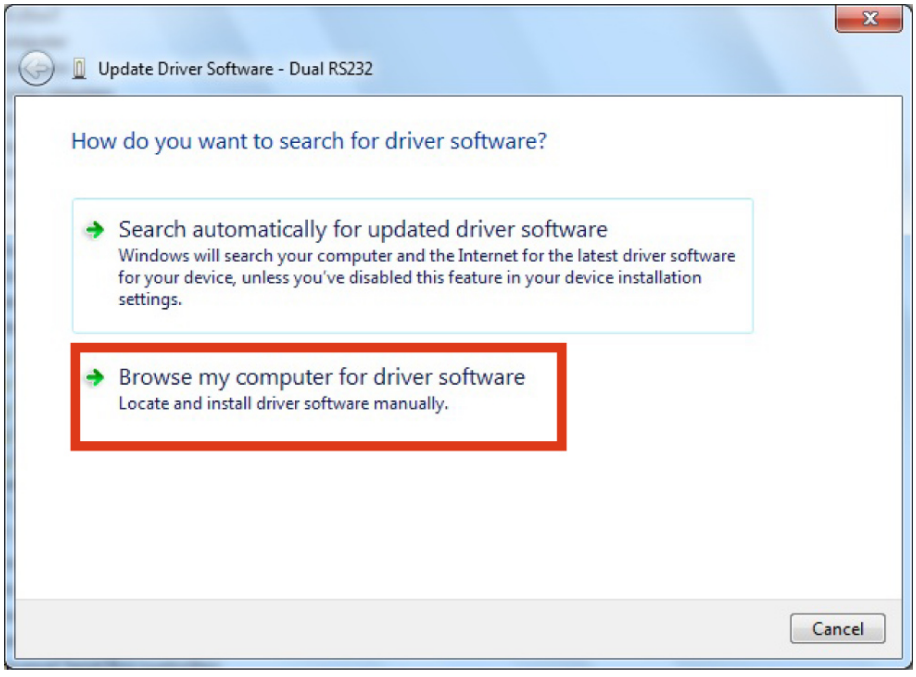
3.2.3. Installation of LDM 320 for Windows Seven

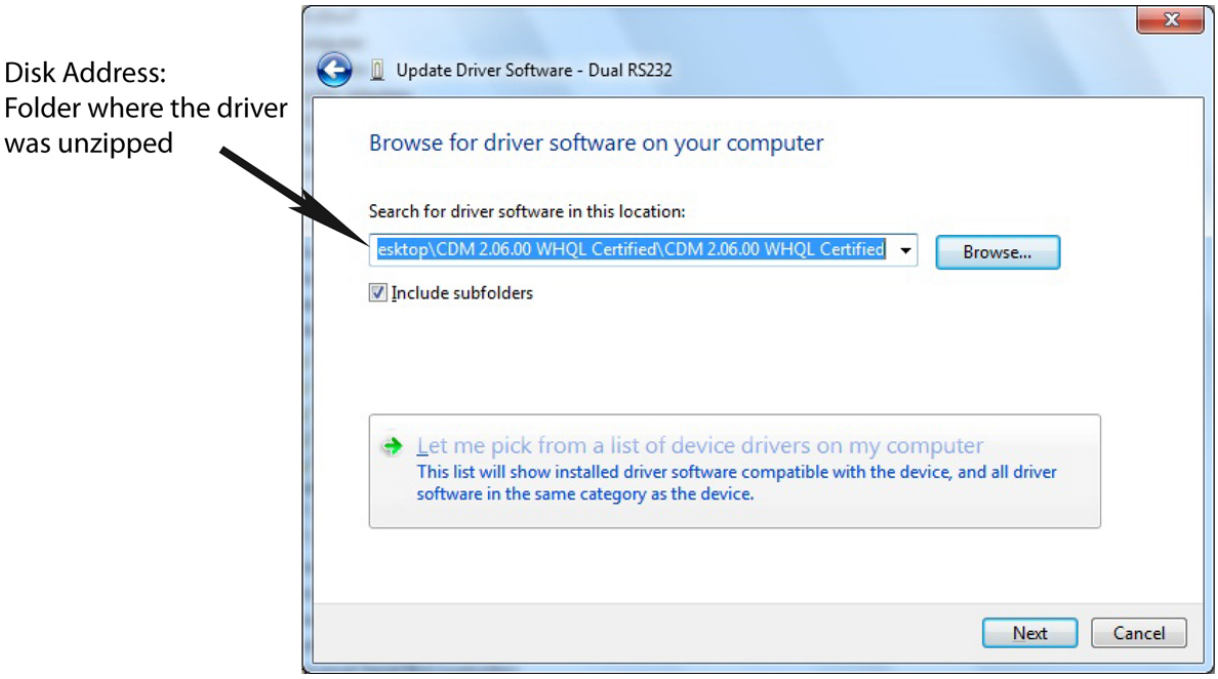
The USB driver for the LDM 320 must be installed for Windows Seven.
Drivers are available on request from Mirion Technologies (MGPI) or by downloading it from the following address:
http://www.mirion-hp.com/support
Once the file is recovered uncompress the file into a folder.

- Connect the LDM 320 to a USB port. The computer will recognize a new device.

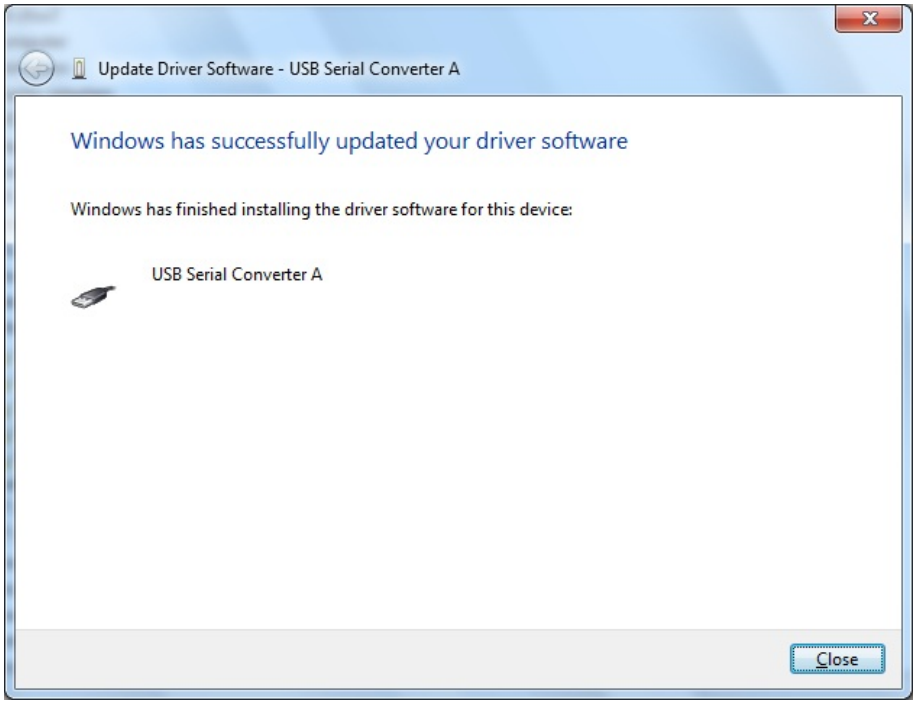
Note: *If Windows does not self start any installation procedure, open the **Device Manager** and apply the following procedure to install the driver.*

- Right-click on "Dual RS232" and then "Update Driver."
- Search for the downloaded and uncompressed driver and then click "Next."

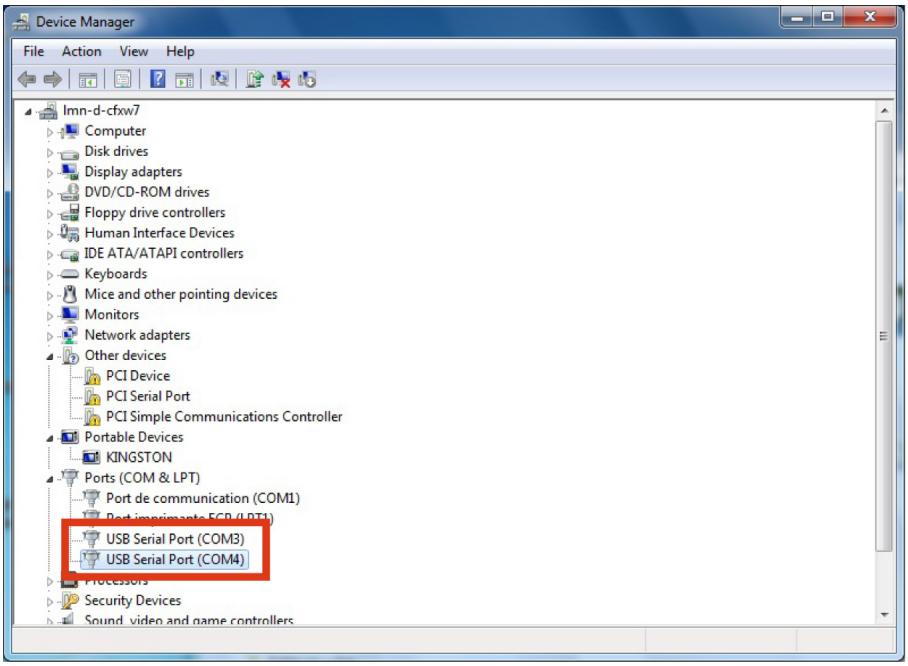




- A security window should appear. Click "Install."
- The port A driver is successfully installed.



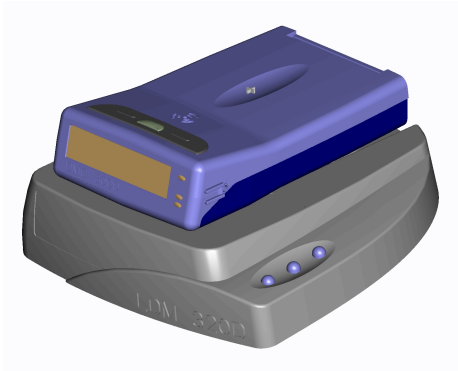
Once the port A driver is installed, repeat the same procedure for port B.
The LDM 320 is ready for use.



4. Operation

4.1. Setting Up the LDM 320D

It is recommended to place the dosimeter on the reader, in the notch provided for this purpose, as represented below:



During the exchanges between the reader and dosimeter, move other dosimeters at least 30 cm away from the reader.

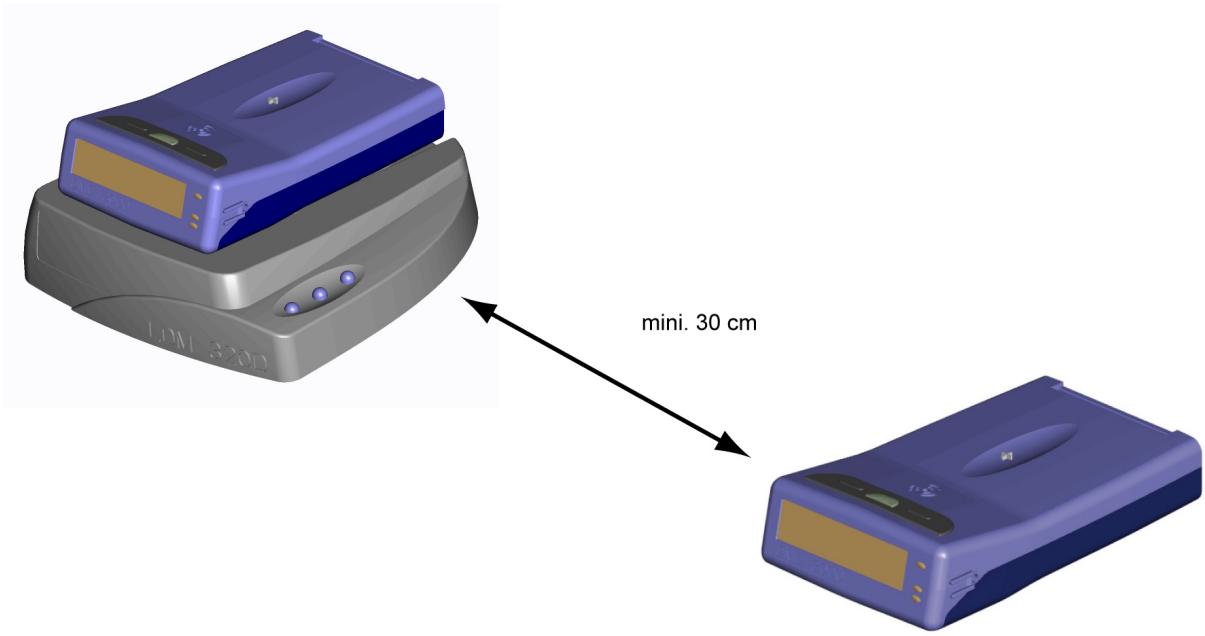


Figure 6 - Minimum Distance

4.2. Setting Up the LDM 320W

The LDM 320W readers feature a sleeve designed to accommodate the following dosimeters:

- DMC 2000
- DMC 3000
- SOR/R
- SOR/T
- IPAM-Tx, complete with dosimeter

Figure 7 - DMC 3000 with and iPAM-Tx

4.2.1. Wall-Mounting Several LDM 320W Readers

It is recommended to install the readers 1 meter apart when working with DMC 2000 dosimeters and 40 cm apart when working with DMC 3000 dosimeters.

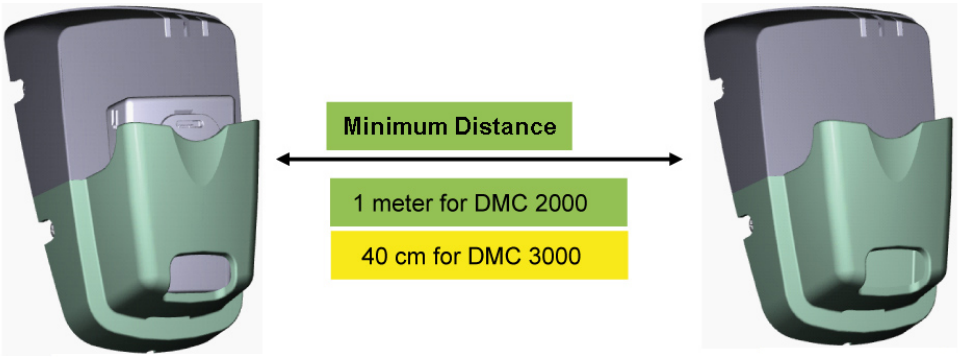


Figure 8 - Minimum Distance between Readers

4.2.2. Installing a Dosimeter Rack

It is recommended to install DMC racks a minimum of 50 cm away from any LDM 320 readers.

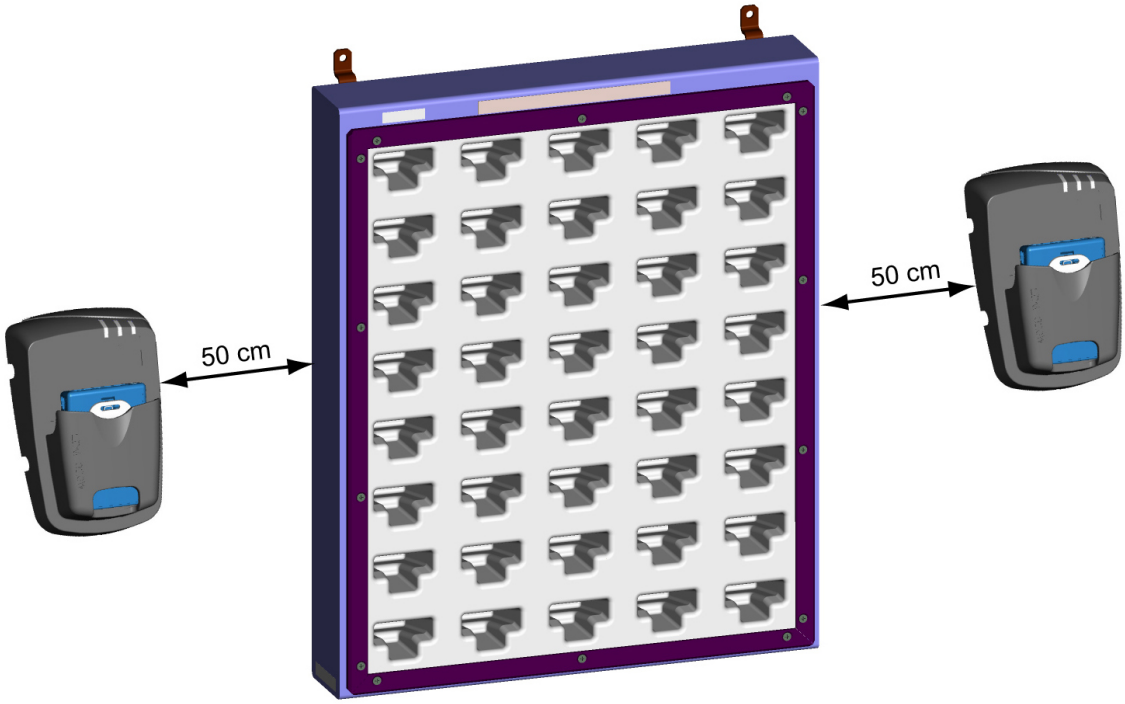


Figure 9 - Readers and Dosimeter Rack

4.3. Operating significance of the lights

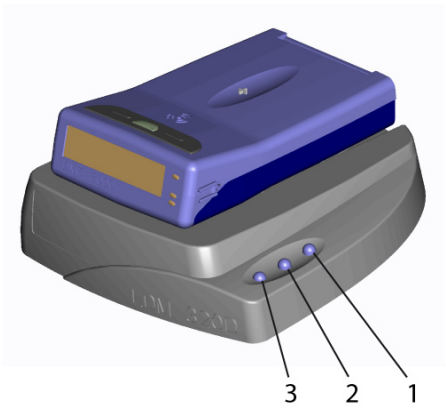
The reader has no stand-alone function; it must be used connected to a PC using software provided by Mirion Technologies (MGPI).

Three bicolor LEDs inform users about the status of exchange sequences with the dosimeter.

1– Verify Run/Operation and Hands Free Operation (POWER)

2– Reader Status Management (FREE/BUSY)

3– Indication of passage (ACCESS/NO ACCESS)



DESIGNATION	VIEW	STATUS
POWER (1)	OFF Lit Green Lit Red	Reader power is OFF or sending a message to the dosimeter Power OK Flashes briefly while receiving a message from the dosimeter
STATUS (2)	Depends on the logic of the software	
ACCESS (3)		

5. Maintenance

5.1. Failure Analysis

Symptoms	Analysis	Action
No communication with the PC	Verify that the reader is powered. Verify good connection with the USB cable.	Start again after checking.
	Verify the proper configuration of the PC port.	Configure the port. If the fault persists, contact Mirion Technologies.
No data exchange with the dosimeter	Eliminate all sources of electromagnetic emissions.	
	Verify that the reader is powered.	
LED power lighting redallumé rouge	The reader is in an error state.	Disconnect and connect the USB cable.

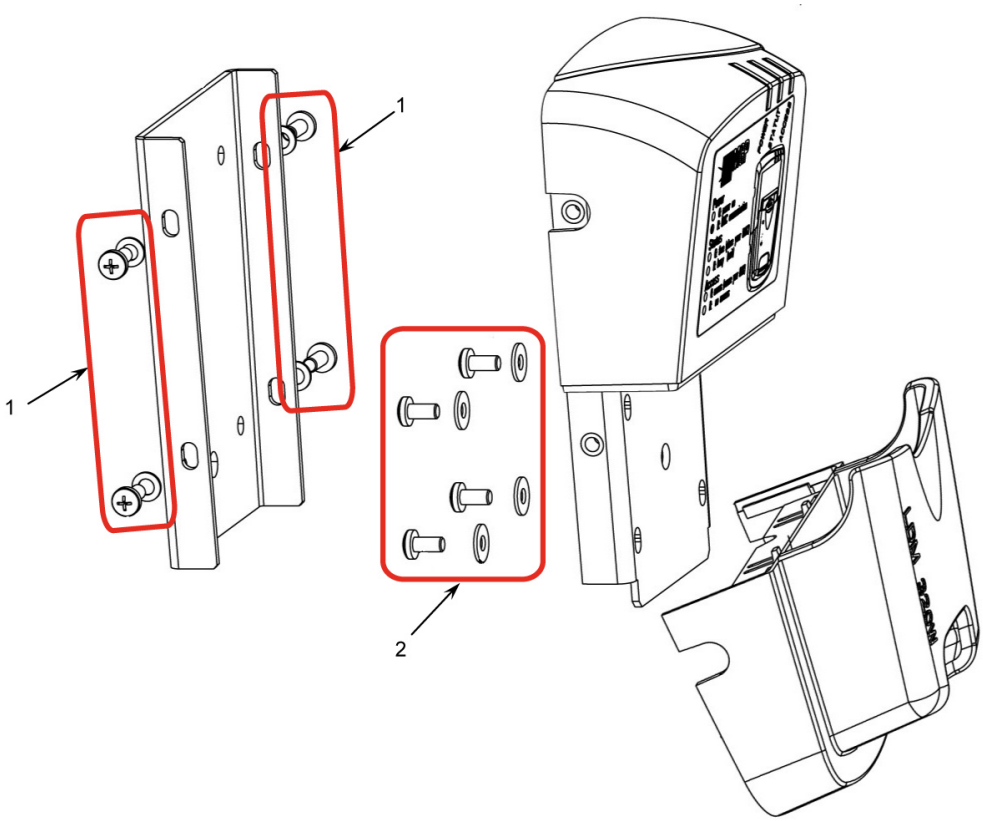
5.2. Replacement of Sleeve

The LDM 320W sleeve can be replaced in the event of breakage (see §7.1 for spare parts part numbers).

Warning: *Prior to performing any maintenance operation, make sure that the LDM is disconnected from the PC (USB disconnected).*

Once the reader is disconnected, follow the procedure below:

- Remove the four side attaching screws and recover the washers **(1)**.
- Once separated, remove the reader without applying excessive force to the cord.
- Remove the four screws and recover the washers **(2)**.
- Remove the sleeve.



- For the reassembly procedure, proceed in reverse order.

Note: *The sleeve must be neatly inserted into the guide prior to fitting back the screws.*

6. Characteristics

6.1. Physical Characteristics

6.1.1. LDM 320D

- Length: 109 mm
- Width: 100 mm
- Depth: 29 mm
- Weight: 150 grams
- PC to reader cable length: 2 m

6.1.2. LDM 320W

- Length: 157 mm
- Width: 99 mm
- Depth: 75 mm
- Weight: 400 grams

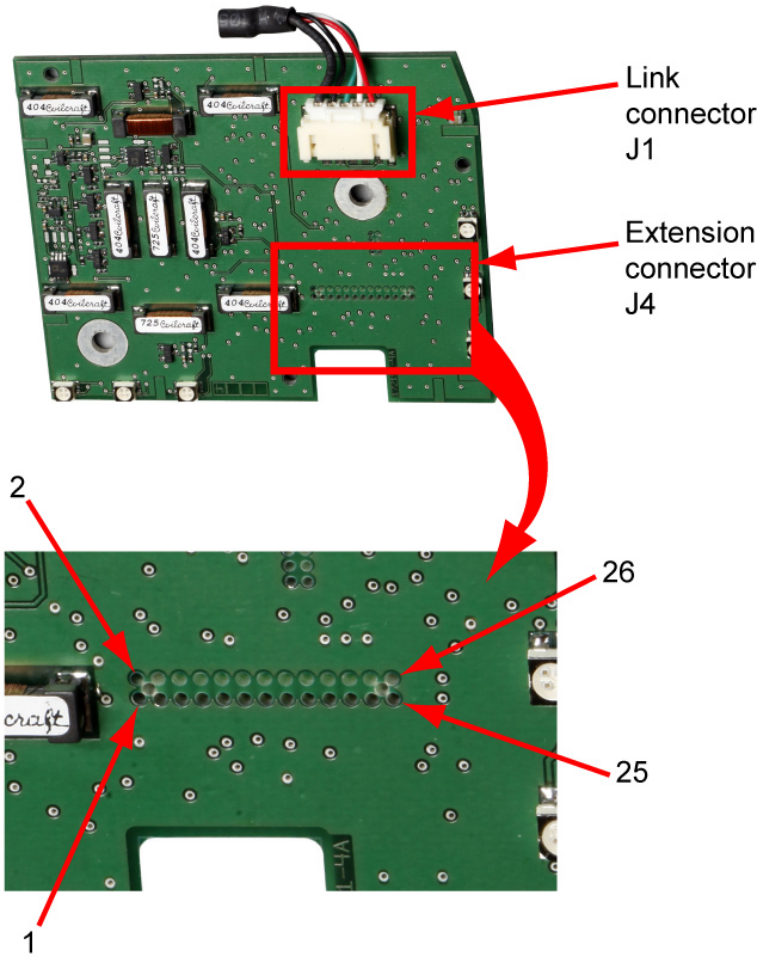
6.2. Electrical Characteristics

- Powered by the USB port: 4.15V to 5.25V
- Conforms to CE requirements.
- RFID Dosimeter Communication Frequency: 125 kHz

6.3. Environmental Conditions

- Operating Temperature: 0 to +50°C
- Storage Temperature: -10°C to +60°C
- Relative humidity (without condensation): 90%
- IP Indice LDM 320D: IP52
- IP Indice LDM 320W: IP30

6.4. USB Link



- Five-pin contact connector.

J1 Pin No.	Description
1	Vbus (red)
2	D- (white)
3	D+ (green)
4	GND (black)
5	GND (Cable shielding)

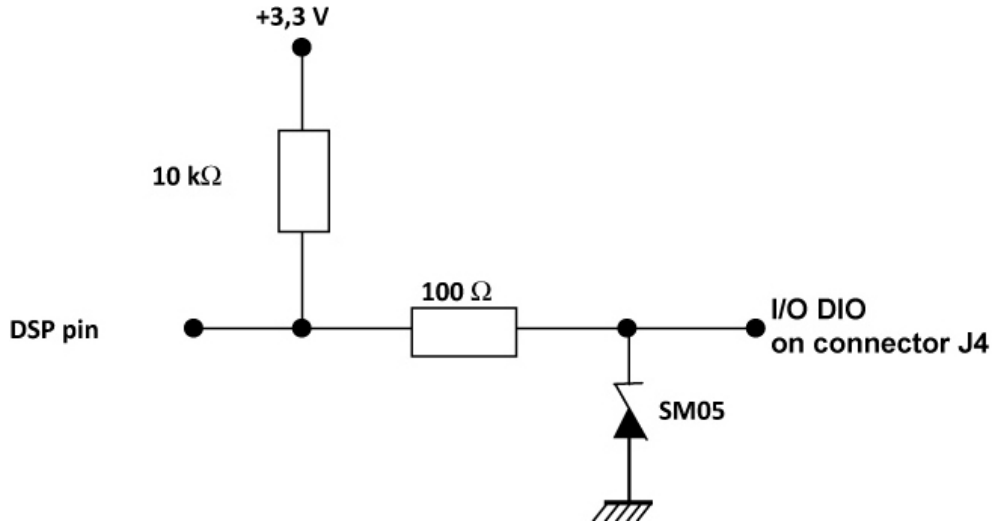
6.5. Extension Connector

Digital Outputs and Inputs can be controlled by the software: DMCUser. See user's manual of this software for details.

J4 is an extension connector available in-house and mainly used to manage inputs/outputs of the 3V3 digital type.

J4 Pin No.	Description
1	GND
2	INPUT Digital Input 3
3	INPUT Digital Input 1
4	OUTPUT Digital Output 1
5	INPUT Digital Input 2
6	OUTPUT Digital Output 2
7	INPUT Digital Input 4
8	OUTPUT Digital Output 3
9	3V3
10	OUTPUT Digital Output 4
11	5V

J4 Pin No.	Description
12	GND
13	5V
14	GND
15	INPUT Digital Input 5
16	Spare for ext. pwr sply
17	Spare for RX-LDM
18	Spare for RX-LDM
19	3V3
20	GND
21	Spare for analog input 1
22	GND
23	Spare for analog input 2
24	GND
25	Spare for external antenna (PWR4A)
26	Spare for external antenna (PWR4B)



7. Spare Parts and Accessories

7.1. Spare Parts

- LDM 320D

Designation	Reference
USB cable	127684–SAV

- LDM 320W

Designation	Reference
Case (Body + sleeve)	153367–SAV
USB cable	127684–SAV

8. Glossary

AGC:	Automatic Gain Control
DIO :	Digital Input Output
GND :	Ground
LED:	Light Emitting Diode
PC :	Personal Computer

9. Certificate

MIRION TECHNOLOGIES
Radiation Monitoring Systems Division
Health Physics Division
Route d'Eyguières – BP n° 1
FR-13113 Lamanon
Tel. +33(0)4 90 59 59 59
Fax +33(0)4 90 59 55 18
www.mirion.com

DECLARATION CE DE CONFORMITE

aux exigences de protection des directives 2004/108/CE
"Compatibilité Electromagnétique", 2006/95/CE "Basse Tension " et 99/5/CEE "R&TTE"

Nous déclarons que le produit :
We declare that the following product:

MINI LECTEUR version LDM 320 D et LDM 320 W
Numéro de légende (invariant) :150534 et 150517
(nom, type ou modèle, options de constitution, numéros de série ou de lot)

est conforme aux normes génériques ou spécifiques harmonisées suivantes:
is in accordance with the following generic or specific harmonised standards :

ETSI EN 300 330-1 (v1.7.1) (2010-02)
ETSI EN 300 330-2 (v1.5.1) (2010-02)
ETSI EN 301 489-1 (v1.8.1) (2008-04)
ETSI EN 301 489-3 (v1.4.1) (2002-08)
(Références, dates de validité)

sur la base du dossier:
on the basis of the file :
numéro : **150995-A**

Nom et titre du signataire (1) :
Name and title of subscriber:
Bruno Morel
Directeur Division HPH

Lieu, date et signature : Lamanon
Place, date, signature : 30 Novembre 2011

Année d'apposition du marquage CE :2011
year when CE mark affixed:

(1)Le signataire doit avoir reçu pouvoir pour engager la société

151508	-	B

Format 111 911 J

MGP Instruments S.A.
A Mirion Technologies Company

Société anonyme au capital de 2 025 000 Euros
Usine et siège social : Route d'Eyguières FR-13113 Lamanon
RCS : Tarascon B 303 375 406, Siret : 303 375 406 00020
N° TVA intracommunautaire : FR 62 303 375 406

Mirion Technologies (MGPI) SA
BP 1
FR 13113 Lamanon
FRANCE
Tel +33 (0) 4 90 59 59 59
Fax +33 (0) 4 90 59 55 18

Mirion Technologies (MGPI) Inc
5000 Highlands Parkway
Suite 150 — Smyma
Georgia 30082
USA
Tel +1 770 432 2744
Fax +1 770 432 9179

Mirion Technologies (MGPI H&B) GmbH
(Kernstrahlungsmesstechnik München)
Landsberger Strasse 328a
D-80687 München
Germany
Tel +49 (0) 89 515 13 0
Fax +49 (0) 89 515 13 169

Published by Mirion Technologies
Format 112175D

www.mirion.com

150532EN-C