DLR-DK001-XX Family

RFID UHF Desktop Reader EU/US

Product Reference Guide

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Disclaimer

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RFID Reader DLR-DK001-XX

Description

The DLR-DK001-XX is a multipurpose desktop UHF RFID reader. It is offered in two different models to fit the different frequency standards in the EU and US regions.

It is compliant with UHF RFID ISO 18000-63 and EPC Class 1 Gen 2 standards. The Reference Document is:

'EPC Radio-Frequency Identity Protocols Class-1 Generation-2 UHF RFID", Protocol for Communications at 860 MHz – 960 MHz, Version 2.0.1 (April 23, 2015).

The DLR-DK001-XX has an integrated antenna suited for short to medium range applications. This reader is powered and controlled by a USB cable that allows it to read EPC codes tags in an easy desktop environment.

Thanks to its low profile and size, the DLR-DK001-XX reader is the right choice for various applications such as point-of-sales, document tracking, RFID Tag programming and control stations.

It can be used as a building block for smart shelves and displays. The two versions are covering most of the RFID needs worldwide (retailers, forwarders, warehouses, etc).

Models P/N

Model P/N	RF carrier frequency range
DLR-DK001-EU	865.6 ÷ 867.6 MHz
DLR-DK001-US	902.0 ÷ 928.0 MHz

General Features

The DLR-DK001-XX is mainly dedicated to fixed Desktop setups, but a fixed wall-mount point-of-access is possible as well. The Desktop configuration allows it to interact directly with legacy application, office automation SW and many other generic service and maintenance applications.

The integrated circular antenna makes the radiation pattern a good compromise in terms of directivity. This means practically no orientation problems will be experienced for a population of UHF Tags being located in its proximity.

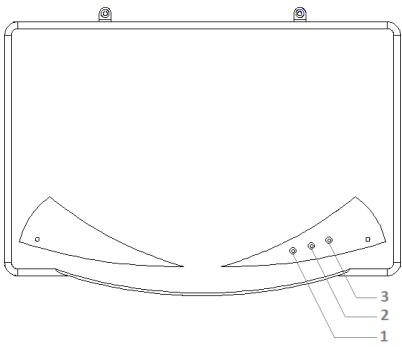
Special attention has been given to minimizing the mean current consumption by limiting the active read time.

The USB 2.0 is seen as a serial Virtual Com Port (VCP). All machines with Windows OS versions, Linux vers. 2.40 and greater, having proper VCP drivers could be interfaced. The port is used for powering, too, so it must be connected to 500 mA rated USB Ports.

Using the DLR-DK001-XX

The DLR-DK001-XX normal behavior is to capture all the sensed identification codes associated to the reachable UHF Tags. The reader's Top Panel is the User Interface. All the commands are issued from the host's application.

Figure 1. DLR-DK001-XX Top Panel



The DLR-DK001-XX Top Panel

With reference to the Fig. 1 above, here is a Table with the three main elements of the User Interface located on the Top Panel:

Table 1- DLR-DK001 Top Panel LEDs

N°	Name	Description
1	POWER	Power ON - Green LED
2	TAG-ID	Tag Detection - Red Blinking LED
3	TX/RX	USB Communication Activity - Yellow Blinking LED

Acoustic

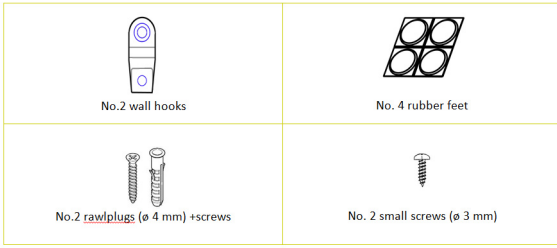
For events signaling, one more resource exists to complete the User Interface: a buzzer than can be programmed by the host application as a local user alarm.

Accessories

A standard Type A connector cable comes with the product.

A kit of accessories for an easy mounting to wall or desk is supplied (screws, rubber-feets, wall-hooks, rawl plugs, etc).

Figure 2. DLR-DK001-XX Wall Mount Accessories



Disposal of the product

Do not dispose the product in municipal or household waste. Please check your local regulations for recycle & disposal of electronic products.

Technical Specifications

Item	Description
Physical Characteristics	
Reader Dimension	(WLH) 29.7 x 20.5 x 1.5 cm^3 / 11.7 x 8.1 x 0.6 in^3
Length of USB	1.5 m / 4.9 ft
Weight	525 g / 18.42 oz
Electrical Characteristics	
Electrical Power	max 400 mA - 5 V dc bus powered (USB)
Reader - Tag Link	
Type	UHF - RFID
Standard	ISO 18000-63/EPC C1G2
Frequency Bands	865.60 ÷ 867.60 MHz European standard 902.00 ÷ 928.00 MHz US standard
RF Power	Programmable in 18 levels from 5dBm e.r.p. (3mW e.r.p.) to 22dBm e.r.p. (150mW e.r.p.)
Antenna	Integrated circular polarized (horizontal)
Number of Channels	4 channels compliant to European Standard 50 hopping channels compliant to US standard
Reading Range	Up to 90cm
Reader - Host Link	
USB type	USB 2.0 Full Speed (12 Mbit/s) Type A dev. port
Virtual COM Port	Baudrate: 115.200 kbps Databits: 8; Stopbits: 1; Parity: none; Flow control: none
User Environment	
Partic. & Water	IP40
Operating	0°C to 50°C / 32°F to 122°F
Storage	-20°C to 60°C / -4°F to 140°F
ESD	Air ± 16kV Contact ± 8kV

Reader-Tag Link Profiles

The DLR-DK001-XX readers support different modulations and RF return link profiles according to EPC Class1 Gen2 protocols.

Main profiles have been tested for the compliance with ETSI and FCC regulations.

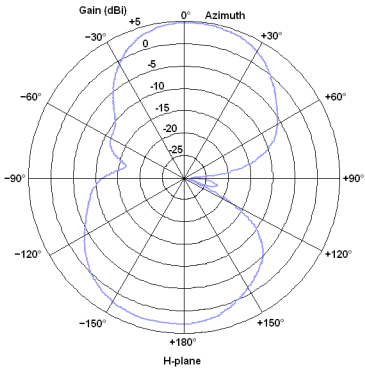
Table 2- DLR-DK001-XX Reader to tag link profiles

Link Profile	Regulation	Modulation	Return Link
0	ETSI - FCC	DSB-ASK; f=40KHz	FM0; f=40KHz
1	ETSI - FCC	DSB-ASK; f=40KHz	Miller (M=4); f=256 KHz

Radiation Patterns

Both the DLR_DK001-XX products, due to their internally placed antenna, have a non-ideal radiation pattern. Here below are reported their radiation patterns.

Figure 3. DLR-DK001 Radiation pattern H plane



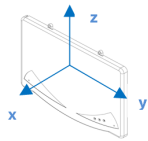
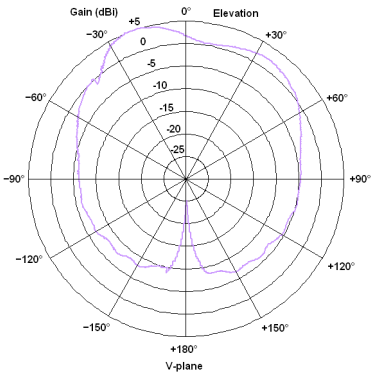


Figure 4. DLR-DK001 Radiation pattern V plane



Getting Started

The reader can be connected to all the hosts with 500 mA rated USB ports and recognized as a serial Virtual COM Port: Win-PC, Linux-PC, etc.

Please, first verify to have installed framework 2.0 or higher in your PC.NET before proceeding.

Driver Installation for Serial Port Emulator

VCP drivers for your operating system can be downloaded from the **Products** section of the Datalogic website. Get the last version driver.

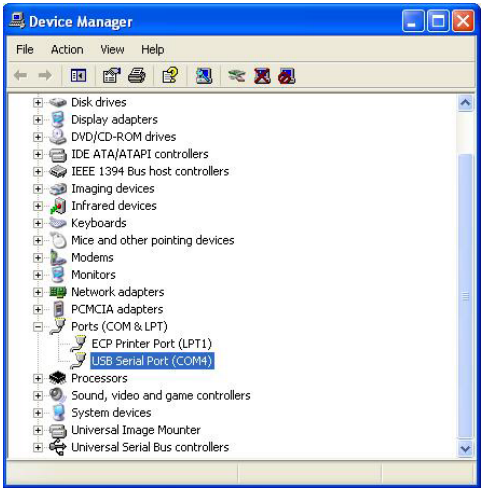
The following is a sample procedure for Windows-based systems:l

1. Connect the reader to the USB port of your PC.
2. If the driver is not yet installed, the **Found New HW Wizard** pop-up window is displayed.

3. The Wizard will guide you step by step to get the driver or its link and to run its installation.
4. Once the installation is completed, the wizard will inform you that your **USB Serial Port** is ready.

5. Click **Finish** to complete the procedure.
6. Check the **COM X** name assumed by the USB serial port. Follow the **Control Panel** > **System** > **Hardware** > **Device Manager** > **Ports** > **USB Serial Port (COM X)** path.

7. In our example below the USB Serial Port is named as **COM 4**.



Connecting to the DLR-DK001-XX

From the **Products** section of the Datalogic website you can download the **DL RFID Software Tool Controller for Windows** file.

After its installation, you will get its icon on the PC desktop. Click the icon to launch it:

- Click on **File** > **Connect** to select the RS232 Connection Type and to associate the COM X port. Click **connect** to complete your action.
- Place a Tag on the reader; click **Start Inventory** to see the tag's EPC code displayed on the main window.

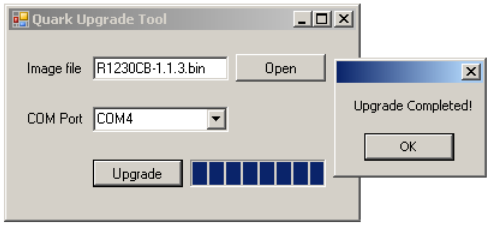
For more details on the demo **DL RFID Software Tool Controller for Windows** application and its additional features, refer to the dedicated manual, downloadable from the **Products** section of the Datalogic website.

Firmware Upgrade

The Firmware Upgrade tool is available for free download at the **RFID Products** SW/FW section of the Datalogic website.

To upgrade the firmware, follow the steps below:

1. Connect the reader to the USB port of your PC.
2. Verify the correct COM port associated to the reader.
3. Run the FW upgrade program.
4. Click **Open** to select the COM port and the image (bin) file.
5. Click **Upgrade**.



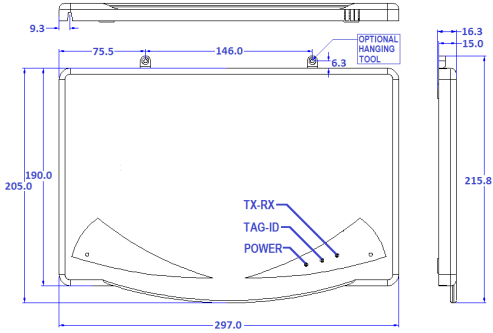
6. Once the upgrade is completed, disconnect and reconnect the USB cable for a power-on reset. At the power-up, the new FW will be operative in the reader.

Mechanical Specification

Here below is the drawing of the DLR-DK001 reader.

The optional hanging tools for wall-mounting could be found in the associated kit.

Figure 5. DLR-DK001-XX Mechanical & Dimensions



Datalogic Limited Factory Warranty

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(iv) any claimed defect or damage caused by the failure to provide proper maintenance, including but not limited to cleaning the upper window in accordance with product manual;
(v) any defect or damage caused by natural or man-made disaster such as but not limited to fire, water damage, floods, other natural disasters, vandalism or abusive events that would cause internal and external component damage or destruction of the whole unit, consumable items;
(vi) any damage or malfunctioning caused by non-restoring action as for example firmware or software upgrades, software or hardware reconfigurations etc.;
(vii) the replacement of upper window/cartridge due to scratching, stains or other degradation and/or
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