



Logistic Tray mLog2 User Manual Rev. 1.0

Model: mLog2



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FCC statement

FCC NOTICE:

To comply with FCC part 15 rules in the United States, the system must be professionally installed to ensure compliance with the Part 15 certification. It is the responsibility of the operator and professional installer to ensure that only certified systems are deployed in the United States.

The use of the system in any other combination (such as co-located antennas transmitting the same information) is expressly forbidden.

CE statement

CE NOTICE:

The CE Mark applies to products regulated by certain European health, safety and environmental protection legislation. The CE Mark is obligatory for products it applies to: the manufacturer affixes the marking in order to be allowed to sell his product in the European market.

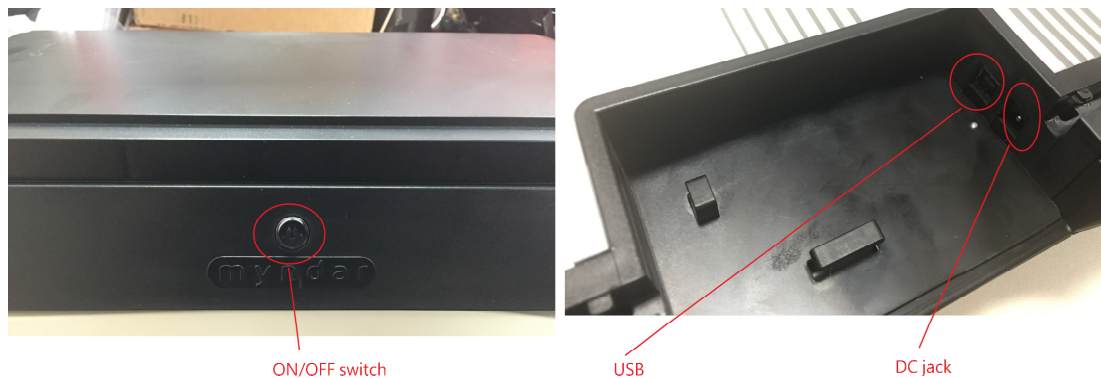
Chapter 1 Introduction of Logistic Tray mLog2

1.1 Overview of Logistic Tray mLog2:

Logistic Tray is an UHF EPC C1G2 RFID fixed reader, it is embedded with strong near field antenna and only read tag on the tray, minimize the false reading issue.

- The Logistic Tray mLog2 Intelligent RFID Reader supports protocols, UHF CLASS 1 GEN2 EPC C1G2/ISO 18000-6C, (865-868 MHz RFID frequency band) in Europe as well as (902-928 MHz RFID frequency band) in United States.

1.2 Ports Description



The Logistic Tray mLog2 has several types of input/output port:

Items no.	Name	Description
1	DC jack	6.5V/3A dc power supply input
2	USB port	One standard USB port
3	On_OFF switch	One switch on and off button

1.3 Indicators LEDs in Logistic Tray mLog2



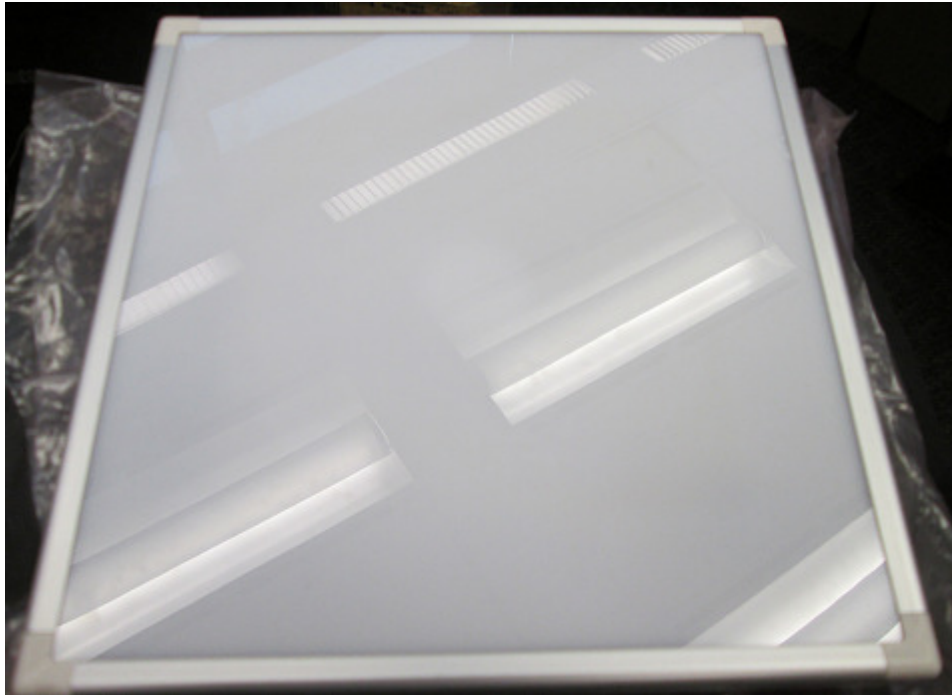
The Logistic Tray mLog2 has different LEDs to indicate the reader status.

Items no.	Name	Description
4	Red LED	Powered On but USB not connect
5	Blue LED	Powered On and USB Connected

1.4 Antenna for Logistic Tray mLog2

There are two identical antennas are used with Logistic Tray mLog2. The following antennas are used for Logistic Tray mLog2:

RFID NEAR FIELD FLAT PANEL ANTENNA: antenna gain = 0dBi



1.5 Specification:

Item	Specification
Input	1 power key button
	1 USB port
Indicator	● Red LED indicate for Powered On but USB not connected ● Blue LED indicate for Powered On and USB Connected
Connectivity	USB2.0
Charger	6.5V 3A ac to dc power adapter
	DC jack with inner post of “+ve” and outer post of “-ve”
Operation temp.	0 to +55 deg C
Storage temp.	-20 to +60 deg C
Operating Humidity	20% to 90%
Features	● 1 Watt (30dBm) Tx output levels ● Adjustable output Tx power levels over +5 to 30dBm range in 1dB steps, ● High durability in harsh environments, ● Easy installation and maintenance, ● All-in-one compact design, ● Fanless Design for protection of dirt, dust, insects, liquids, ● Supporting tag interface of EPC C1G2/ISO 18000-6C(UHF C1G2), ● Dense Reader Mode Capability

Chapter 2 Installation of Logistic Tray mLog2

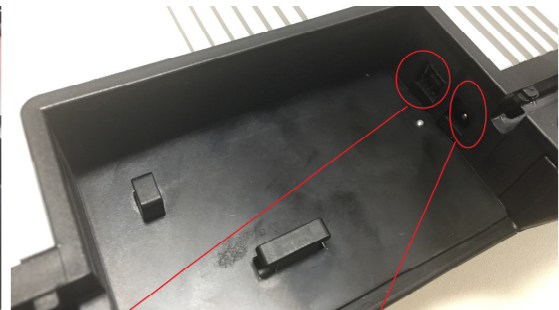
2.1 Start-up Procedure of Logistic Tray mLog2

This section explains how to set-up Logistic Tray mLog2 and connect the Logistic Tray mLog2 to your computer and antenna:

- I. Plug in the power adapter.
- II. Power on the mLog2 by switching the Power on button. Then, the Red LED will be turned on.



ON/OFF switch



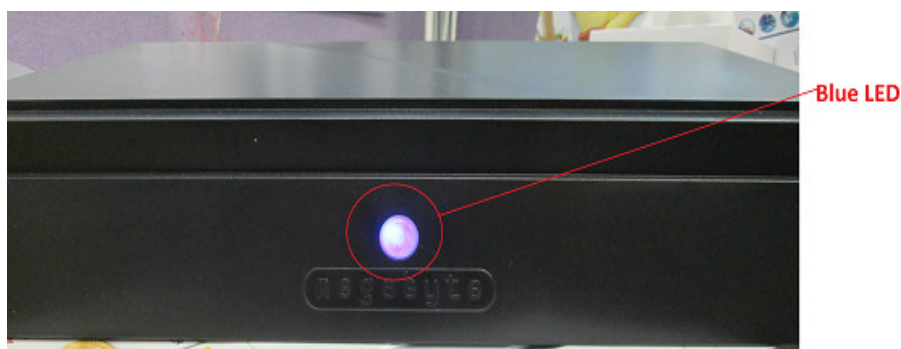
USB

DC jack



Red LED

- III. Plug in the USB to the tray and connect the USB with the computer. Then, the Blue LED will be turned on.



- IV. Select the test tools or apps for application.
- V. Logistic Tray mLog2 operates at UHF frequency band, ranging from 865MHz to 928MHz (ETSI 865-868 MHz, FCC 902-928 MHz, SRRC 920-925 MHz and NCC 922-928 MHz); the setting depends on countries' regulations.

2.2 Environmental Requirements

The next table includes environmental requirements for the Logistic Tray mLog2. Choose a location that meets these requirements.

Description	Minimum	Maximum
Operating temperature	0°C	55°C
Storage temperature	-20°C	60°C
Humidity (non-condensing)	20%	90%

2.3 Caution

Danger of Electric Shock

- Disconnect the device from the electric supply before cleaning or performing maintenance on the machine.
- Keep this device dry.
- Turn off or unplug the machine when it is not in use.

Please read the information contained within this user manual prior to attempting installation and operation of the RFID Reader. Failure to install and operate the RFID Terminal (Logistic Tray mLog2) in accordance with the information contained in this manual may result in unsatisfactory performance.

2.4 Professional Installation Instructions

Safety and Regulatory Compliance Information

This document contains important safety and regulatory compliance information for the following products:

Please read this document before installing and using your product and see the following sections for more information:

- Safety Information
- Federal Communications Commission (FCC) Compliance
- Modifications
- Warnings
- Information for Professional Installers
- Regulatory Compliance Certifications Summary

Safety Information

All products are intended to be installed, used, and maintained by experienced telecommunications personnel only.

When using this device, basic safety precautions should always be followed to reduce the risk of fire, electrical shock, and injury to persons, including the following:

- Operate and install these products as described in this manual. Equipment must be installed and used in strict accordance with the manufacturer's instructions as described in the user documentation provided.
- Installation of these products in the end use must conform to local regulations and codes.
- Products are to be used with and powered by only the power injector provided.
- A 13-amp circuit breaker is required at the power source.
- Do not connect or disconnect the power cable to the equipment when the power injector is plugged into an AC power outlet.
- Servicing of these products should be performed only by trained personnel. Do not disassemble. By opening or removing any covers, you may expose yourself to hazardous energy parts. Incorrect reassembly of these products can cause a malfunction and/or electric shock when the units are subsequently used. No user serviceable parts; all repairs and service must be handled by a qualified service center.
- Do not insert any objects of any shape or size inside these products while powered on. Object may contact hazardous energy parts that could result in a risk of fire or personal injury.
- Do not remove or alter the Marking label provided on these products.
- To avoid the risk of electric shock from lightning, do not use these products during an electrical storm.
- When using these products with an external antenna, see the installation documentation provided with the antenna system.

Federal Communications Commission (FCC) Compliance

These products operate at the following frequencies in compliance with Part 15 of the FCC rules:

- RFID; 902 MHz - 928 MHz,

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.

To comply with the FCC radio frequency exposure requirements, the following antenna installation and device operating configurations must be satisfied:

- Product models using external antennas require professional installation. The antennas used for professional installation must be fixed-mounted on indoor/outdoor permanent structures with a separation distance from all persons of at least 25 cm (approximately 8 inches).
- Antennas must not be co-located and must not operate in conjunction with any other antenna or transmitter.
- Shielded cables must be used with this unit to ensure compliance with the Class B FCC limits.

Warnings

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

The equipment has been tested and found to comply with 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 and 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 or on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio / technician for help.

To ensure safety of users, the FCC has established criteria for the amount of radio

frequency energy that can be safely absorbed by a user or bystander according to the intended usage of the product. This product has been tested and found to comply with the FCC criteria. The LOGISTIC TRAY mLog2 shall be installed & used such that parts of the user's body and the hands should be maintained at a comfortable distance of approximately 25 cm or more.

In some situations or environments, the use of wireless devices may be restricted by the proprietor of the building or responsible representatives of the organization. These situations may, for example, include the use of wireless equipment on board airplanes, or in any other environment where the risk of interference to other devices or services is perceived or identified as harmful.

If you are uncertain of the policy that applies on the use of wireless equipment in a specific organization or environment (such as airports), you are encouraged to ask for authorization to use this device prior to turning on the equipment.

Modifications

The FCC requires the user to be notified that any changes or modifications to this device that are not expressly approved by the manufacturer may void the user's authority to operate the equipment. The correction of interference caused by unauthorized modification, substitution or attachment will be the responsibility of the user. The manufacturer and its authorized resellers or distributors are not liable for any damage or violation of government regulations that may arise from failing to comply with these guidelines.

Information for Professional Installers

All products must be professionally installed, and the transmit power of the system must be adjusted by the professional installers to ensure that the system EIRP is in compliance with the limit specified by the regulatory authority of the country of application.

See the following sections for more information:

Professional installers should select only the antenna types listed in the following table

Frequency Band	Antenna Type
902-928MHz	RFID NEAR FIELD FLAT PANEL ANTENNA

Chapter 3 Demonstration of RFID Applications

3.1 Creating RFID Application with Logistic Tray mLog2

Logistic Tray mLog2 is an intelligent reader and compliance with EPC global C1G2/ISO 18000-6C, Users can develop own UHF RFID application on this platform.

3.1.1 Delivering Application to Logistic Tray mLog2

When the user wants to deliver applications to the Logistic Tray mLog2, they just simply install the program in Windows and Linux platform.

3.1.2 Programming Language compatibility

Users may use several types of programming language, for examples, C++, C#.NET, Java and Java script.

Chapter 4 Regulatory Information

4.1 Federal Communications Commission (FCC) Compliance

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 when the equipment is operated in a commercial environment. 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
- Consult the dealer or an qualified radio/TV technician for assistance

FCC NOTICE: To comply with FCC part 15 rules in the United States, the system must be professionally installed to ensure compliance with the Part 15 certification. It is the responsibility of the operator and professional installer to ensure that only certified systems are deployed in the United States. The use of the system in any other combination (such as co-located antennas transmitting the same information) is expressly forbidden.

WARNING: DO NOT ATTEMPT TO SERVICE THE WIRELESS COMMUNICATION DEVICE YOURSELF. SUCH ACTION MAY VOID THE WARRANTY. THE LOGISTIC TRAY mLog2 IS FACTORY TUNED. NO CUSTOMER CALIBRATION OR TUNING IS REQUIRED. CONTACT MEGABYTE LTD. TECHNICAL SUPPORT FOR INFORMATION ABOUT SERVICING YOUR WIRELESS COMMUNICATION DEVICE.

Note:

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

4.1.1 Radio Frequency Radiation Exposure

The highest RF output power of the unit was measured at 30.0dBm at 915 MHz. According to §1.1310 of the FCC rules, the power density limit for General Population/Uncontrolled Exposure at 915 MHz is $f_{\text{(MHz)}}/1500 = 0.610\text{mW/cm}^2$. The

MPE is calculated to show the required separation distance that must be maintained during installation to maintain compliance with the power density limit.

The following formula was used to calculate the Power Density:

$$S = \frac{PG}{4\pi R^2}$$

Where:

S = Power Density

P = Power input to the external antenna (Output power from the EUT antenna Port_(dBm) – cable loss_(dB))

G = Gain of Transmit Antenna (Linear gain)

R = Distance from Transmitting Antenna

The power density at 25cm separation is:

$$S = \frac{PG}{4\pi R^2}$$

For this device, the calculation is as follows:

P = 30.0dBm (Output power from the EUT antenna Port) – 1dB (Cable Loss*)
= 29dBm (794.33mW)

G = Worst Case Antenna Gain = 0dBi = anti-log (0.0/10) = 1.00

At 25cm separation,

$$S = ((794.33) \times (1.00)) / (4\pi (25)^2) = 0.101\text{mW/cm}^2$$

Based on the above calculation for 25cm separation, the power density does not exceed FCC limit of 0.6014mW/cm².

4.2 CE Compliance

This device has been tested to and conforms to the regulatory requirements of the European Union and has attained CE Marking. The CE Mark is a conformity marking consisting of the letters "CE". The CE Mark applies to products regulated by certain European health, safety and environmental protection legislation. The CE Mark is obligatory for products it applies to: the manufacturer affixes the marking in order to be allowed to sell his product in the European market.

The CE Marking is not a quality-mark. Foremost, it refers to the safety rather than to the quality of a product. Secondly, CE Marking is mandatory for the product it applies to, whereas most quality markings are voluntary.

Chapter 5 Disclaimer Notice

Disclaimer Notice

The manufacturer shall not be liable for errors contained herein or for incidental or consequential damages in connection with the furnishing, performance or use of this material. This document contains proprietary information, which is protected by international patent applications and copyright. All rights reserved. No part of this document may be copied, reproduced or translated without prior written consent of the manufacturer. The manufacturer reserves the right to revise this publication and to make changes from time to time in the contents hereof without obligation to notify any person of such revisions or changes. The manufacturer also reserves the right to change the specifications without notice.

Chapter 6 Warranty

1. Megabyte Ltd warrants to the User that the Products sold to the User will comply with their published specifications and will be of satisfactory quality and that Megabyte Ltd is entitled to sell the Products to the User. Megabyte Ltd warrants that for a period of twelve (12) months from date of purchase (“the Warranty Period”), the products will be free from defects in materials and workmanship.
2. During the Warranty Period, Megabyte Ltd will repair, or if in Megabyte Ltd’s opinion necessary replace, the defective product returned to Megabyte Ltd’s head office in Hong Kong. The defective production must be returned in its original packaging and all shipping and handling charges shall be borne by the Users.
3. The Warranty Period shall not be extended by reason of any repair or replacement.
4. Megabyte Ltd shall have no liability to the User for any damage to or defects in any of the Products caused by fair wear and tear, improper use, negligent handling, failure to observe this User Manual and the instructions accompanying the Products or any alterations maintenance or repair to the Products by any person other than Megabyte Ltd, use of non-Megabyte Ltd parts, accessories or equipment, or third party software which would damage the Products.
5. Unless in the case of any damage to or defect in the Products which would have been apparent on reasonable visual inspection, the User notifies Megabyte Ltd of the same in writing within 7 days after the date of purchase thereof, or in the case of any damage to or defects in the Products which would not have been apparent on reasonable visual inspection the User notifies Megabyte Ltd of the same in writing 7 days after the defect becomes apparent to the User, the User shall not be entitled to reject the Products concerned.
6. The User shall be responsible for properly storing and making backup copies of all data which may be stored in the Products. Megabyte Ltd shall not be responsible for any lost of data as a result of any repair or replacement.
7. Except as expressly provided in this User Manual no warranty, condition, undertaking, or term, express or implied, statutory or otherwise, as to the condition, quality, performance, durability or fitness for purpose of the Products is given or assumed by Megabyte Ltd and all such warranties, conditions, undertakings and terms are hereby excluded to the fullest extent permitted by law.

Chapter 7 Support

Technical support/Sales Enquiry can be obtained from Megabyte Ltd.

Please email to: raymondli@myndar.com