DLP-RFID1

LEAD-FREE

OEM Version

FEATURES:

- ISO 15693 Tag-it™ HF-I Compatible
- Read UID of Up to 15 Tags Simultaneously
- 13.56MHz Reader/Writer
- Built-in Antenna: Up to 4-Inch Read Range
- FCC/IC/RED (CE) Modular Approval in Place
- Permanent Unique Serial Number Accessible Via USB
- Integrated Pass/Fail Beeper
- USB Port Powered from Host PC (USB 1.1/2.0 Compatible)
- USB Drivers Provided for current versions of Windows
- Software Development Support for Visual C++

APPLICATIONS:

- Real-Time Security
- Personal Identification
- Pharmaceutical Tracking
- Inventory/Asset Management & Tracking
- Library/Book Management & Tracking
- Baggage Tagging
- Sports Event Timing

Retail Version: Includes reader, USB cable and five peel & stick RFID tags

1.0 INTRODUCTION

The DLP-RFID1 is a low-cost, USB-powered module for reading from and writing to ISO 15693 and Tag-it™ intelligent RFID transponder tags. It has the ability to both read and write up to 256 bytes of data in addition to reading the unique identifier (UID). All of the DLP-RFID1's electronics and antenna reside within the compact unit, and all operational power is taken from the host PC via the USB interface. The range of the internal antenna is up to 4 inches depending upon the size of the tag being read.

2.0 RFID BASICS

RFID stands for Radio Frequency IDentification. It is an electronic technology whereby digital data encoded in an RFID Tag (or transponder) is retrieved utilizing a reader. In contrast to bar code technology, RFID systems do not require line-of-sight access to the tag in order to retrieve the tag's data, and they are well suited to harsh environments.

An RFID tag consists of an integrated circuit attached to an antenna. In the case of the tags used with the DLP-RFID1, the antenna is in the form of conductive ink "printed" on a material that allows for connection to the integrated circuit. This type of passive (battery-free) tag is commonly referred to as an "inlay".

The RFID reader (or "interrogator") is typically a microcontroller-based radio transceiver that powers the tag with a time-varying electromagnetic radio frequency (RF) field. When the RF field passes through the tag's antenna, AC voltage is generated in the antenna and rectified to supply power to the tag. Once powered, the tag can receive commands from the reader. The information stored in the tag can then be read by the reader and sent back to the host PC for processing.

The data in the tag consists of a hard-coded, permanent serial number (or UID) and user memory that can be written to, read from and locked if desired. Once locked, user data can still be read but not changed.

3.0 SPECIFICATIONS

Reader Frequency	13.56MHz
Output Power	200mW MAX
Range (Integral Antenna)	4 Inches MAX
Tags/Protocols Supported	Tag-It*, ISO15693
Communications Interface	USB 1.1/2.0 Compatible, Mini-B 5-Pin Connector
Operational Power – Active	120mA
Operational Power – Idle	15mA
Antenna	On-Board Antenna, SMA Position Available**
USB Driver Support	Most current versions of Windows
Physical Dimensions – OEM	PCB: .20x2.17x3.12" typ. (5.1x55.1x79.3mm)
Physical Dimensions – Retail	Enclosure: .83x2.3x3.25" typ. (21.1x58.4x82.6mm)
Operating Temperature	0-70°C

***** Limited Support
****** See Integral Antenna Section for important regulatory details.

4.0 PERMANENT READER SERIAL NUMBER

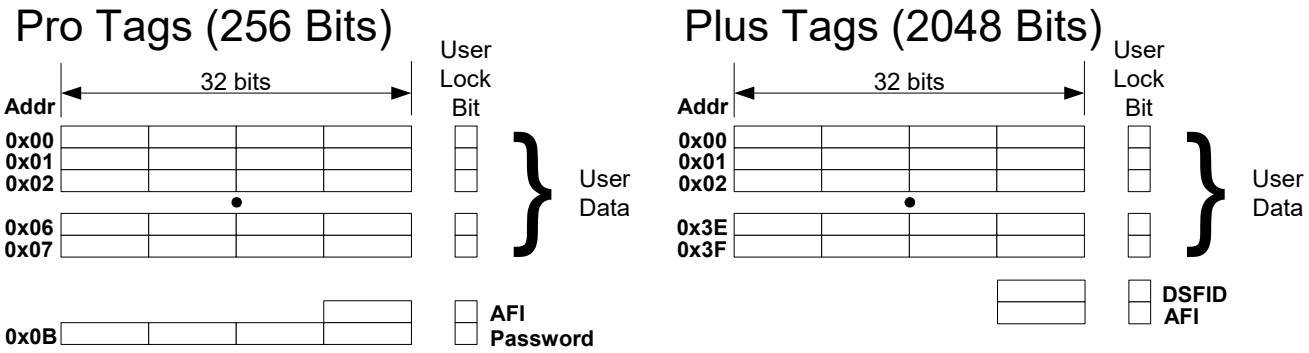
Each DLP-RFID1 contains a unique, 32-bit, hard-coded serial number that cannot be altered by any means. The serial number can be read via the USB interface and used to identify the reader via the host software.

5.0 DEMONSTRATION SOURCE CODE

Demonstration source code showing the available read/write features of the DLP-RFID1 is available for download from the DLP Design website. Access to this download page becomes available upon purchase of the DLP-RFID1 reader. The source code was developed using Visual Studio VC++.

6.0 TAG MEMORY MAP

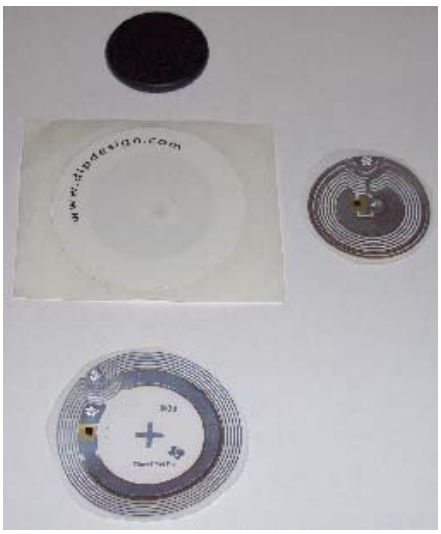
The user memory in the transponder tags is arranged in “blocks” or groups of 4 bytes each. Each block can be written (until locked) and read. The Pro tags have 8 blocks, and the Plus tags have 64 blocks.



7.0 SUPPORTED TRANSPONDER TAGS

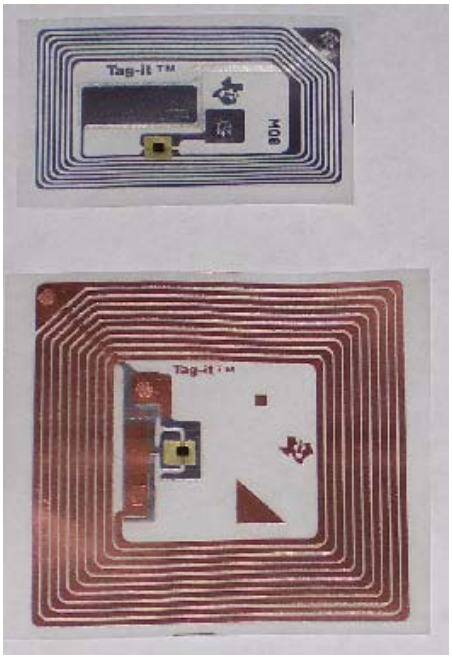
The DLP-RFID1 was designed to support transponder tags manufactured by Texas Instruments. The following Texas Instruments tags have been tested and approved for use with the DLP-RFID1:

	Dimensions In. (mm):
Laundry Tags:	
Pro: RX-HDT-DVBS-N0	.87 x .12
Plus: RF-HDT-DVBB	(22 x 3)
24mm Circular:	
Pro: RI-I16-114A-S1	.95 (24)
Plus: RI-I16-112A (Peel-N-Stick Version Sold in 10- Packs under Part Number DLP-RFIDTAG)	DLP-RFIDTAG: 1.5 (38)
CD/DVD Circular:	
Pro: RI-I17-114A-S1	1.29 (32.6)
Plus: RI-I17-112A	



Mini-Rectangle:
Pro: RI-I03-114A-S1
Plus: RI-I03-112A

1.5 x .89
(38 x 22.6)

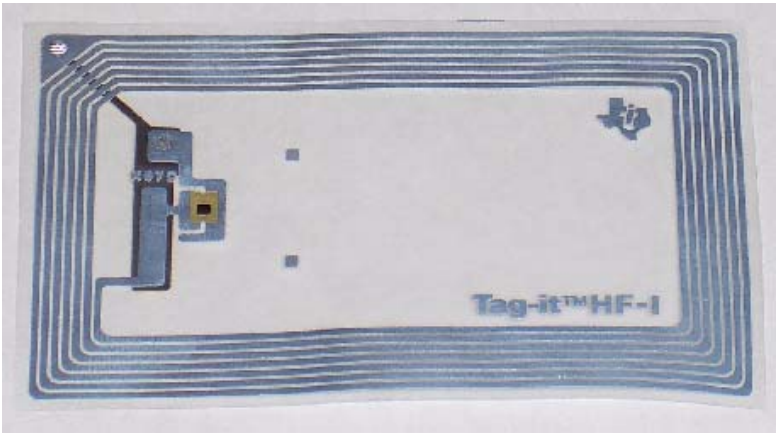


Square:
Pro: RI-I11-114A-S1
Plus: RI-I11-112A

1.78 x 1.78
(45.2 x 45.2)

Large Rectangle:
Pro: RI-I02-114A-S1
Plus: RI-I02-112A

3.0 x 1.78
(76.2 x 45.2)



8.0 REGULATORY AGENCY CONSIDERATIONS

8.1 AGENCY IDENTIFICATION NUMBERS

Compliance with the appropriate regulatory agencies is essential in the deployment of all transceiver devices. DLP Design has obtained modular approval for this RF product such that an OEM need only meet a few basic requirements in order to utilize their end product under this approval. Corresponding agency identification numbers are listed below:

Part Number	US / FCC	CANADA / IC
DLP-RFID1	SX90RFID1	5675A-0RFID1

8.2 INTEGRAL ANTENNA

The DLP-RFID1 is approved for use with the integral antenna only. Modifying the DLP-RFID1's PCB antenna or modifying the PCB to use an external antenna will void all agency compliance approvals.

A location for mounting an SMA connector (purchased separately) is available on the DLP-RFID1's printed circuit board. Mounting the SMA connector requires the removal of the RF shield from the PCB. Additionally, the on-board antenna must be isolated from the signal path leading to the SMA connector via the removal of capacitor C37. This output is designed to drive a 13.56MHz, 50-Ohm antenna. The use of any other type of antenna may cause permanent damage to the DLP-RFID1.

8.3 FCC/IC REQUIREMENTS FOR MODULAR APPROVAL

Any changes or modifications to the DLP-RFID1's printed circuit board could void the user's authority to operate the equipment.

8.4 WARNINGS

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 undesirable operation.

This device is intended for use under the following conditions:

1. The transmitter module may not be co-located with any other transmitter or antenna; and

2. The module is approved using the FCC's "unlicensed modular transmitter approval" method.

As long as these two conditions are met, further transmitter testing will not be required. However, the OEM integrator is still responsible for testing their end product for any additional compliance measures necessitated by the installation of this module (i.e. digital device emissions, PC peripheral requirements, etc.).

Note: In the event that these conditions cannot be met (i.e. co-location with another transmitter), then the FCC authorization is no longer valid, and the corresponding FCC ID may *not* be used on the final product. Under these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

8.5 OEM PRODUCT LABELING

The final end product must be labeled in a visible area with the following text:

"Contains TX FCC ID: SX90RFID1"

8.6 RF EXPOSURE

In order to comply with FCC RF exposure requirements, the antenna used for this transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.