aDynamo

Technical Reference Manual

PART NUMBER 99870002-2.02

October 2014

REVISIONS

Rev Number	Date	Notes
1.01	3/14/13	Initial release
2.01	12/18/2013	Changed warranty period to 90-days
2.02	10/2/2014	Updated meta tag

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FCC WARNING STATEMENT

This equipment has been tested and was found to comply with the limits for a Class B digital device pursuant to Part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a residential environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference with radio communications. However, there is no guarantee that interference will not occur in a particular installation.

FCC COMPLIANCE STATEMENT

This device complies with Part 15 of the FCC Rules. Operation of this device 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.

CANADIAN DOC STATEMENT

This digital apparatus does not exceed the Class B limits for radio noise from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la classe B prescrites dans le Réglement sur le brouillage radioélectrique édicté par le ministère des Communications du Canada.

This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numériqué de la classe B est conformé à la norme NMB-003 du Canada.

CE STANDARDS

Testing for compliance with CE requirements was performed by an independent laboratory. The unit under test was found compliant with standards established for Class B devices.

UL/CSA

This product is recognized per Underwriter Laboratories and Canadian Underwriter Laboratories 1950.

RoHS STATEMENT

When ordered as RoHS compliant, this product meets the Electrical and Electronic Equipment (EEE) Reduction of Hazardous Substances (RoHS) European Directive 2002/95/EC. The marking is clearly recognizable, either as written words like "Pb-free", "lead-free", or as another clear symbol (Ⓟⓑ).

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SECTION 1: DESCRIPTION OF THE SYSTEM

The aDynamo is a magnetic stripe secure card reader (SCR) designed to allow the reading of tracks one and two of financial and other cards to be read using the multimedia audio connector of a mobile device such as those built into iOS and Android devices. The aDynamo interfaces to mobile devices through the audio head set jack and communicates with the host device through the microphone input and the audio output signals.

The aDynamo is powered by internal Lithium cells that are not replaceable. The reader is designed to draw extremely low current and only during the time that transactions are actually being performed, allowing the device to operate on batteries for extended periods. Card data are encrypted within the reader prior to being sent to the host application. The host application has no knowledge of the decryption key ensuring that cardholder data are protected. This also provides the merchant the confidence that their customer data cannot be compromised by malicious software on their systems. To allow verification of the transaction, a partly obfuscated account number, cardholder name and card expiration date are sent to the host application as clear text where they may be displayed, retained, or become part of a receipt.

The aDynamo is capable of reading tracks one and two of ISO 7813 Magnetic cards containing financial and AAMVA data (Track 1 and 2 only) found on many US drivers' licenses. NOTE: AAMVA card data is available in the clear only after the track data has been securely decrypted.
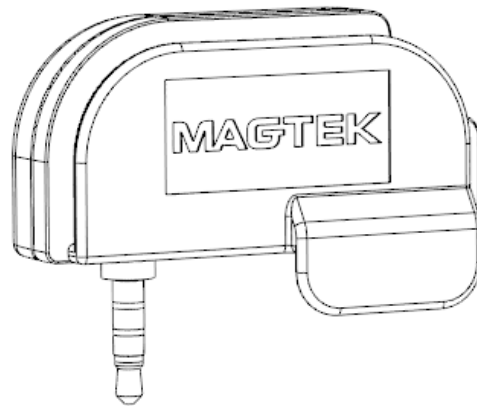

Figure 1 - aDynamo

FEATURES

Major features of the aDynamo are as follows:
- The aDynamo is designed to interface with iOS and Android devices using the multimedia audio connector
- Bi-directional card reading
- Reads encoded data that meets ANSI/ISO/ AAMVA/JIS Type 2 standards
- Reads up to two tracks of card data (Track 1 and 2)
- Contains a unique, non-changeable serial number which allows tracking each reader
- Encrypts all track data using 3DES and DUKPT key management
- Provides clear text confirmation data including card holder's name, expiration date, and a portion of the PAN as part of the Masked Track Data

SPECIFICATIONS

The table below shows the specifications for the aDynamo.

GENERAL

Reference Standards	ISO 7810 and ISO 7811/ AAMVA*
Message Format	ASCII
Card Speed	6 to 60 ips (15 to 152 cm/s)
Dimensions	2.50 in. X 1.55 in. X 0.62 in. (63.5 mm X 39.4 mm X 15.7 mm)
Weight	16.8 grams (0.59 oz)
Connector	3.5mm TRRS audio headset connector (CTIA)

ELECTRICAL

Internal Battery	Two Primary 3 Volt Lithium Cells

ENVIRONMENTAL

Temperature	
Operating	0 °C to 45 °C (32 °F to 113 °F)
Storage	-10 °C to 60 °C (14 °F to 140 °F)
Humidity	
Operating	10% to 90% noncondensing
Storage	10% to 90% noncondensing
Operating Altitude	3000m (10,000 ft)

* ISO (International Standards Organization) and AAMVA (American Association of Motor Vehicle Administrators). AAMVA compatibility limited to track 1 and track 2 data only.

SECTION 2:   CONTROLS

The aDynamo has no user controls. Control, status and data functions are provided by the host interface. The system requires software on the host device to direct the operation of the card reader through the application programming interface (API).

SECTION 3:   INDICATORS AND ANNUNCIATORS

The aDynamo has no indicators or annunciators. All user prompts and feedback are provided via the host's user interface under the control of the software on the host device.

SECTION 4:   CONNECTING THE SYSTEM

GETTING STARTED

The aDynamo connects to the host by plugging the integral audio connector into the host's audio connection. The aDynamo works with iOS and many Android devices.

1. Install the appropriate MagTek demo or custom application.

2. Disconnect any headsets or devices that may be connected to the audio jack of your mobile device.

3. Connect the aDynamo to the audio jack of your mobile device.

4. Run the MagTek demo or custom application.

You are now ready to swipe cards using your aDynamo.

Note

When the aDynamo is plugged into a Mobile device while the mobile App is already launched, volume will automatically be adjust to the maximum.

SECTION 5:   USE OF THE DEMONSTRATION APPLICATIONS

MOBILE DEVICE

MagTek has created a demonstration program for iOS devices that can be used to demonstrate the features of the aDynamo, and to verify its proper operation. Once the program is launched, it continually checks for the existence of an audio reader. The user interface provides the connection status in the display.
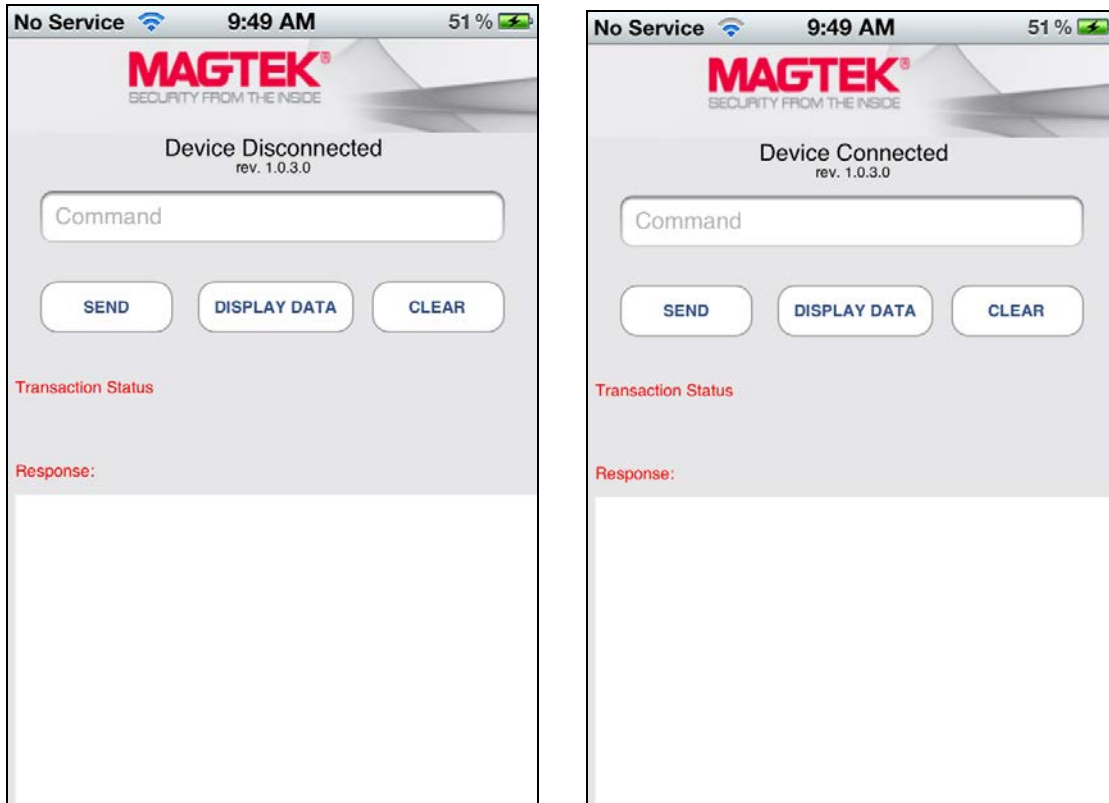

Figure 2 Demonstration GUI showing the connection status of the reader.

If a reader is attached and the demonstration software reflects "Device Connected", but there is no response from the reader after a card swipe, it is possible that the media volume for the phone is turned down or is muted. Using the phone or tablet controls, turn the media volume to maximum.

When the reader is attached and is detected, swiping a card through the reader will cause the data from that card to be read. When the card swipe is detected, the GUI will indicate that the card has been swiped while the data are transferred to the host. Once the data have been transferred, the display is updated with the card data. The data include the encrypted track data from all available tracks, a partially obfuscated account number, Card holder name, the service code and the card expiration date.
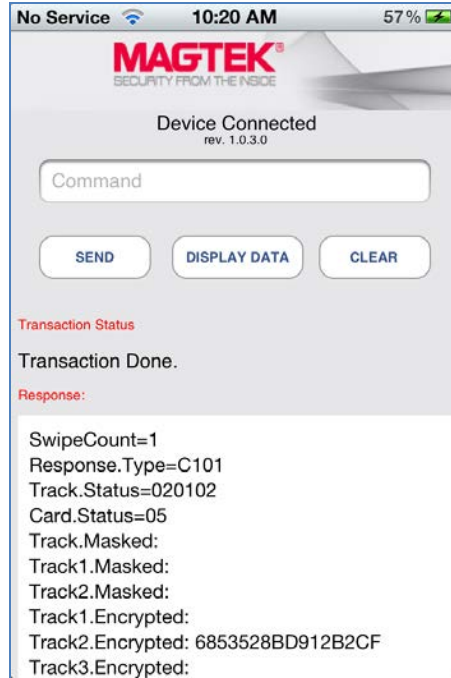
Figure 3 Indication that a card has been swiped, followed by the display of the card data

If an error occurs during the card read, the display will indicate an error by reporting a card status that does not equal 000002, and will display those data which it can. It should be noted that the card status contains two digits for each of the three tracks that can exist on a financial card. As this reader is a two track reader, the last two digits of the status will always report 02, indicating that track three cannot be read.

Figure 4 Demonstration GUI program display after a card read error

SECTION 6:   MAINTENANCE

The aDynamo contains no moving parts and requires no regular maintenance. The outside of the unit may be cleaned using a damp cloth and ammonia, detergent, or isopropanol.

The read head may be cleaned using a MagTek head cleaning card, part number 96700004.