

Mercury6(M6) and Astra-EX User Guide

For firmware version 4.17 and later

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M6 and Astra-EX User Guide

Introduction

This document assumes usage of an M6 and Astra-EX with firmware version 4.17 or later.

This document explains how to set up the Mercury6 (M6) and Astra-EX Readers, how to configure them for network operation, and how to use the browser-based interface. See the corresponding *M6 and Astra-EX Firmware Release Notes* for operational differences that what is in this User Guide specific to a firmware version.

Separate appendices contain specifications and antenna information that are specific to the M6 and Astra-EX Reader.

Applications to control the M6 and Astra-EX can be written using the high level MercuryAPI. The MercuryAPI supports Java, .NET and C programming environments. The MercuryAPI Software Development Kit (SDK) contains sample applications and source code to help developers get started demoing and developing functionality. For more information on the MercuryAPI see the *MercuryAPI Programmers Guide* and the *MercuryAPI SDK*, available on the ThingMagic website.

This document is broken down into the following sections:

- ◆ [Hardware Overview](#) - Provides detailed specifications of the M6 and Astra-EX hardware and physical interfaces.

- ◆ [Programming Interfaces](#) - Describes the programming interfaces, including on-reader applications, where to find code samples, and the LLRP interface.
- ◆ [Connecting to the M6 and Astra-EX](#) - Describes the methods available for connecting to the M6 and Astra-EX over the ethernet, WiFi and USB Console interfaces.
 - [Setting Up the Reader](#) - Connect using a direct ethernet connection from a Host PC to the M6 and Astra-EX.
 - [Networking the Reader](#) - Connect over ethernet LAN or WiFi using DHCP or static IP settings.
 - [Connecting to the USB Console Port](#) - Connect to the M6 and Astra-EX console for command-line interface access and troubleshooting.
- ◆ [Using GPIO](#) - Details the GPIO physical interface specs and how to control it via the MercuryAPI.
- ◆ [Controlling the Reader](#) - Describes the browser-based interface and the configuration and testing options available through it.
- ◆ [Advanced Reader Functionality](#) - Provides descriptions of the M6 and Astra-EX advanced protocol specific configuration options that are supported through the use of the MercuryAPI
- ◆ [Reader RF Power](#) - Provides guidelines and limitations for setting the RF Power of the M6 and Astra-EX.
- ◆ [Mounting the Reader](#) and [Appendix B: M6 and Astra-EX Dimensions](#) - Provides details of the physical dimensions of the M6 and Astra-EX.
- ◆ [M6 Specifications](#)
- ◆ [Compliance and IP Notices](#)
- ◆ [Appendix A: M6 and Astra-EX Antenna and Cable Information](#) - Lists the authorized Antennas and cables which can be used with the M6 and Astra-EX-NA in FCC regions.
- ◆ [Appendix C: Advanced Administration](#) - Provides the steps for some advanced administration settings, such as changing reader passwords.
- ◆ [Appendix D: Troubleshooting](#) - Provides recommended debugging steps for common problems along with data to gather when submitting a problem case to ThingMagic support.

Hardware Overview

What's in the Box

M6 Reader

- M6 Reader
- WiFi antenna (with Wifi enabled M6 only)
- Ferrite Bead (to be applied when [Using Power Over Ethernet \(PoE\)](#))

Astra-EX Reader

- Astra-EX Reader
- WiFi antenna (with Wifi enabled Astra-EX only)
- Ferrite Bead (to be applied when [Using Power Over Ethernet \(PoE\)](#))

Ports and Connectors

Antenna Connections

The M6 supports four monostatic bidirectional RF antennas through four Reverse Polarity TNC (RP-TNC or R-TNC) connectors: labeled RFID1 through RFID4 on the M6 - *Figure 1*.

The Astra-EX supports two monostatic bidirectional RF antennas through one integrated antenna and one Reverse Polarity TNC (RP-TNC or R-TNC) connector: labeled RFID - *Figure 2*.

The maximum RF power that can be delivered to a 50 ohm load from the external port is 1.4 Watts, or +31.5 dBm (regulatory requirements permitting).

The RF ports can only be energized one at a time.

Figure 1: M6 RFID and WiFi Antenna Ports



Figure 2: Astra-EX RFID and WiFi Antenna Ports



Antenna Requirements

The performance of the M6 is affected by antenna quality. Antennas that provide good 50 ohm match at the operating frequency band perform best. Specified sensitivity performance is achieved with antennas providing 17 dB return loss or better across the operating band. Damage to the reader will not occur for any return loss of 1 dB or greater.



Damage may occur if antennas are disconnected during operation or if the M6 and Astra-EX sees an open or short circuit at its antenna port.



To comply with FCC’s RF radiation exposure requirements, the antenna(s) used for this transmitter must be installed such that a minimum separation distance of 25cm is maintained between the radiator (antenna) & user’s/nearby people’s body at all times and must not be co-located or operating in conjunction with any other antenna or transmitter.

Antenna Detection

To minimize the chance of damage due to transmitting on open ports or antenna disconnection, the M6 and Astra-EX supports antenna detection. Detection is performed automatically at startup and before RF operations. In order to be detectable antennas must present a DC resistance of ~10k Ohms or less.

Figure 3: M6 and Astra-EX Digital Connectors

Ethernet/PoE

See [Using Power Over Ethernet \(PoE\)](#).

USB Accessory

Reserved for future use.

Console

See [Connecting to the USB Console Port](#).

GPIO

See [Using GPIO](#)

DC Power

See [Power](#) for DC Power supply requirements. The connector used (*Switchcraft Inc. 761KS12*) has the following specifications:

- 2.5mm hollow center pin
- Lock Ring Thread Size: 7/16-32 UN2B thread
- Handle Thread Size: 5/16-24 UNF 2A
- Electrical: Current (carry) 5A at 65°C
- IP68 Rated

Reset Button

Using a non-conductive object press and hold for 2 seconds to perform a soft reset. Press and hold for 4 seconds to [Force M6 and Astra-EX to boot in safe mode](#). For dust and

moisture protection the Reset button is covered by a screw. To press the Reset the screw must be removed.

Programming Interfaces

MercuryAPI

Applications to control the M6 and Astra-EX reader, and all ThingMagic Reader products, can be written using the high level MercuryAPI. The MercuryAPI supports Java, .NET and C (for on-reader applications) programming environments. The MercuryAPI Software Development Kit (SDK) contains sample applications and source code to help developers get started demoing and developing functionality. For more information on the MercuryAPI see the *MercuryAPI Programmers Guide* and the *MercuryAPI SDK*, available on the ThingMagic website.

Demo Applications

The primary, “Quick Start”, demo for reading tags is the [Query Page](#) of the Web Interface.

For more advanced functionality, and also a starting place for building custom applications, a demo application is provided in the MercuryAPI SDK package. The executable for this example is included in the MercuryAPI SDK package (available on rfid.thingmagic.com/devkit) under `/cs/samples/exe/Universal-Reader-Assistant2.0.exe`.

See the *Universal-Reader- Assistant 2.0 User Guide* (on rfid.thingmagic.com/devkit) for usage details.

LLRP

LLRP is the EPCglobal standard (http://www.epcglobalinc.org/standards/llrp/llrp_1_0_1-standard-20070813.pdf) used for communication between the M6 and Astra-EX and a client application. The M6 and Astra-EX should be “drop-in compatible” with systems supporting the standard LLRP protocol. Middleware such as BizTalk and WebSphere have standard LLRP adapters that can work with the M6 and Astra-EX. In many cases custom extensions are implemented to support non-standard configuration options and commands, which are often reader specific. If your LLRP based client uses such custom extensions it is likely that modifications will need to be made to support the M6 and Astra-EX. In addition some M6 and Astra-EX functionality is only available through the use of custom extensions.

For more information on direct use of LLRP, the ThingMagic custom extensions and the open source LLRP ToolKit please contact ThingMagic support (support@thingmagic.com).

On-Reader Applications

The M6 and Astra-EX Reader, starting with firmware v4.9.2 and MercuryAPI v1.11.1 (FW v4.17 and API v1.19 for Astra-EX), support running custom applications on the reader, built using the MercuryAPI C Language interface. Most programs written using the C API can be compiled to run as a client application or run on the reader.

Please see the *MercuryAPI Programmers Guide* | *On-Reader Applications Guide*, available for download from <http://rfid.thingmagid.com/devkit>.

Setting Up the Reader

This section describes the steps to setup all the necessary components and connect to the Reader's browser-based interface.

Equipment Required

To set up Single Reader Operation, you need the and some additional hardware.

The additional hardware required includes:

- ◆ A computer with a Java-enabled web browser
- ◆ Ethernet cable (CAT5e, shielded, 5')
- ◆ Wideband antenna(s) [*not required for Astra-EX*]
- ◆ Coax cable(s) (with RP-TNC connectors) [*not required for Astra-EX*]

Note

To install the M6 and Astra-EX Reader, no software is required.

To set up the Reader as part of a larger scale deployment that uses Wireless Network (WLAN) connection or Power Over Ethernet (PoE), refer to [Networking the Reader](#).

以上内容仅为本文档的试下载部分，为可阅读页数的一半内容。如要下载或阅读全文，请访问：<https://d.book118.com/945220113244012002>