THINGMAGIC USB PRO READER USER GUIDE

TM_USB-Pro-UG
Rev 07282018

JADAK
A Novanta Company

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Version 07282018

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REVISION HISTORY

Date	Version	Description
1/11/18	USB_Pro_Guide_875_0042-03 Rev B	• Manual received with acquisition from Trimble.
7/2/18	TM_USB-Pro-UG Rev 07162018	• Updated to user documentation standards.
7/28/18	TM_USB-Pro-UG Rev 07282018	• Updated amperage measurements page 20.

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1 Introduction

The ThingMagic USBPro RFID Reader allows developers to support applications that require desktop reading and writing of EPC Global Gen2 tags, as well as other protocols such as ISO18000-6B, IPx, and AEI ATA (reading only) through additional licensing. Based on ThingMagic's best-in-class M6e-Micro LTE UHF RFID module, the USBPro RFID Reader is controlled and powered by a host PC or laptop through a USB interface and supports autonomous operation. The ThingMagic USBPro RFID Reader is compatible with the ThingMagic MercuryAPI application development tools, including Universal Reader Assistant, permitting rapid creation of solutions to support a wide range of applications. Applications include tag commissioning, manufacturing Work-in-Progress (WIP), document tracking, retail Point-of-Sale (POS), and workflows for healthcare, events, and hospitality.

This document is for hardware designers and software developers. It describes the hardware specifications and firmware functionality and provides guidance on how to utilize the USBPro Reader.

Applications to control the USBPro and derivative products 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 www.jadaktech.com.

Universal Reader Assistant, a demo application that supports many common functions such as reading and writing, is provided in the MercuryAPI SDK package and as a standalone installer. The executable file for this example is included in the MercuryAPI SDK package. A brief introduction to this application is given in Reading Tags with Universal Reader Assistant.

Release Notes

The information in this document is relevant to USBPro with Firmware Ver. 1.9.1 and later. It explains how to set up the readers, how to configure them for network operation, and how to use the browser-based interface. If you operate the USBPro with firmware newer than this, refer to the corresponding Firmware Release Notes for operational differences from what is in this User Guide. Release notes include new features or known issues as well as all changes since this User Guide was last updated. Release notes are downloaded from the same web site where you obtained this document.

2 Hardware Overview

Hardware Overview

With the USBPro Reader, you receive the following components:

- ThingMagic USBPro Reader
- USB cable

Documentation and software development kit packages can be found at www.JADAKtech.com.

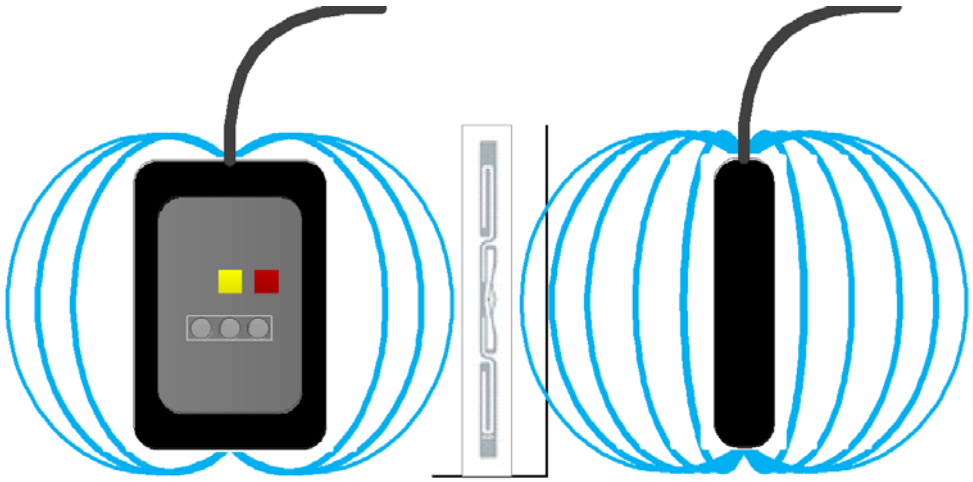
The USBPro Development Kit also supplies the following additional components:

- Selection of UHF RFID tags and tag inlays
- 30cm (1 foot) SMA cable with reverse SMA connector on one side and SMA connector on the other
- Linear antenna with 3 dB gain, supporting a frequency range of 860 to 960 MHz. (The antenna may be labeled **890 to 960 MHz** based on its original intended application as an indoor cell phone repeater.)

Internal Antenna

The USBPro Reader has one internal antenna. The antenna is linear, as are most tags, so the USBPro Reader reads tags best if the tags are aligned with the long side of the reader. The blue lines, below, represent the radiation pattern around the reader.

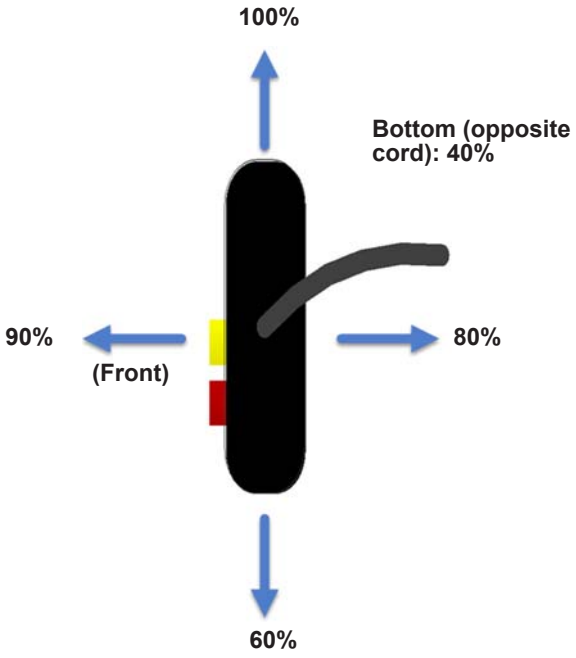
Internal Antenna Radiation Pattern Front and Side Views



Front View **Best Tag Orientation** **Side View**

The radiation pattern is not completely symmetrical on all sides. Looking down on the reader (with the cord facing up), the read distance from each face of the reader is as shown:

Top (Cord and RF Connector Side) View



The absolute performance with a good folded-dipole tag, approximately 9cm long x 1.3cm wide, or 3.5 in. x 0.5 in., is shown in the following table:

Maximum Read Distance for Internal Antenna

Region	Maximum Read Distance for Internal Antenna
North America (902-928 MHz)	1.2m (4 feet)
EU (865-868 MHz)	1.2m (4 feet)

External Antenna Connections

The USBPro Reader supports a monostatic (single port, bidirectional) RF antenna through one reverse-SMA connector.

The maximum RF power that can be delivered to a 50 ohm load from each port is 1 Watt, or +30 dBm (regulatory requirements permitting). Read distances as long as 10 meters (30 feet) can be achieved with high gain antennas and high quality tags.

NOTE: The internal and external RF ports can only be energized one at a time, although switching can be so quick it appears as though both antennas are reading at the same time.

Antenna Requirements

The performance of the USBPro 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 module will not occur for any return loss of 1 dB or greater. Damage may occur if antennas are disconnected during operation, or if the module sees an open or short circuit at its antenna port.

Antenna Detection

Caution: Unlike the Astra-EX, Mercury6, and Vega readers, the USB*Pro* Reader DOES NOT support automatic antenna detection via DC current sensing. It uses a return loss measurement across all channels in the defined region. Unlike the other readers, antenna detection is not done each time the reader is about to switch to a new antenna. Your application should frequently check the status of the antennas and change the antennas to be used based on this information. Using the MercuryAPI this requires creation of a SimpleReadPlan object with the list of antennas set and that object set as the active /reader/read/plan. For more information see the MercuryAPI Programmers Guide **| *Level 2 API* | *Advanced Reading* | *ReadPlan* section.**

Buttons and LEDs

To get the values of the USBPro Reader buttons and turn on/off the LEDs, use the **GPIO** controls under the *Advanced Configuration* | *Advanced Reader Settings* of the *Options* menu. See Button/LED to GPIO Line Mapping for mapping.

- Buttons are “High” when not pressed, “Low” when pressed.
- LEDs are “High” when on, “Low” when off.

Button/LED to GPIO Line Mapping

Button/LED	GPIO Line
Button 1 (yellow)	GPIO Line 1 when configured as “Input”
Button 2 (red)	GPIO Line 2 when configured as “Input”
LED 1 (yellow)	GPIO Line 1 when configured as “Output”
LED 2 (red)	GPIO Line 2 when configured as “Output”

NOTE: If both the Buttons and LEDs are being used, the GPIO lines should be configured as Inputs. If the state of the LED must be changed, then the GPIO line is configured as an Output, its desired state sent to the reader, and the line returned to an Input state. The reader will remember and hold the LED state until it is changed or power is removed from the reader.

NOTE: The buttons are level sensed and not edge sensed so there is no memory of the button having been pushed. If a button is pushed momentarily during a time the application is not checking the state of the Input GPIO lines, the button press will not be detected. For that reason, applications should require the user to push a button until the software senses it and illuminates one of the LEDs. This ensures that the button press has been detected.

Environmental Specifications

Thermal Considerations

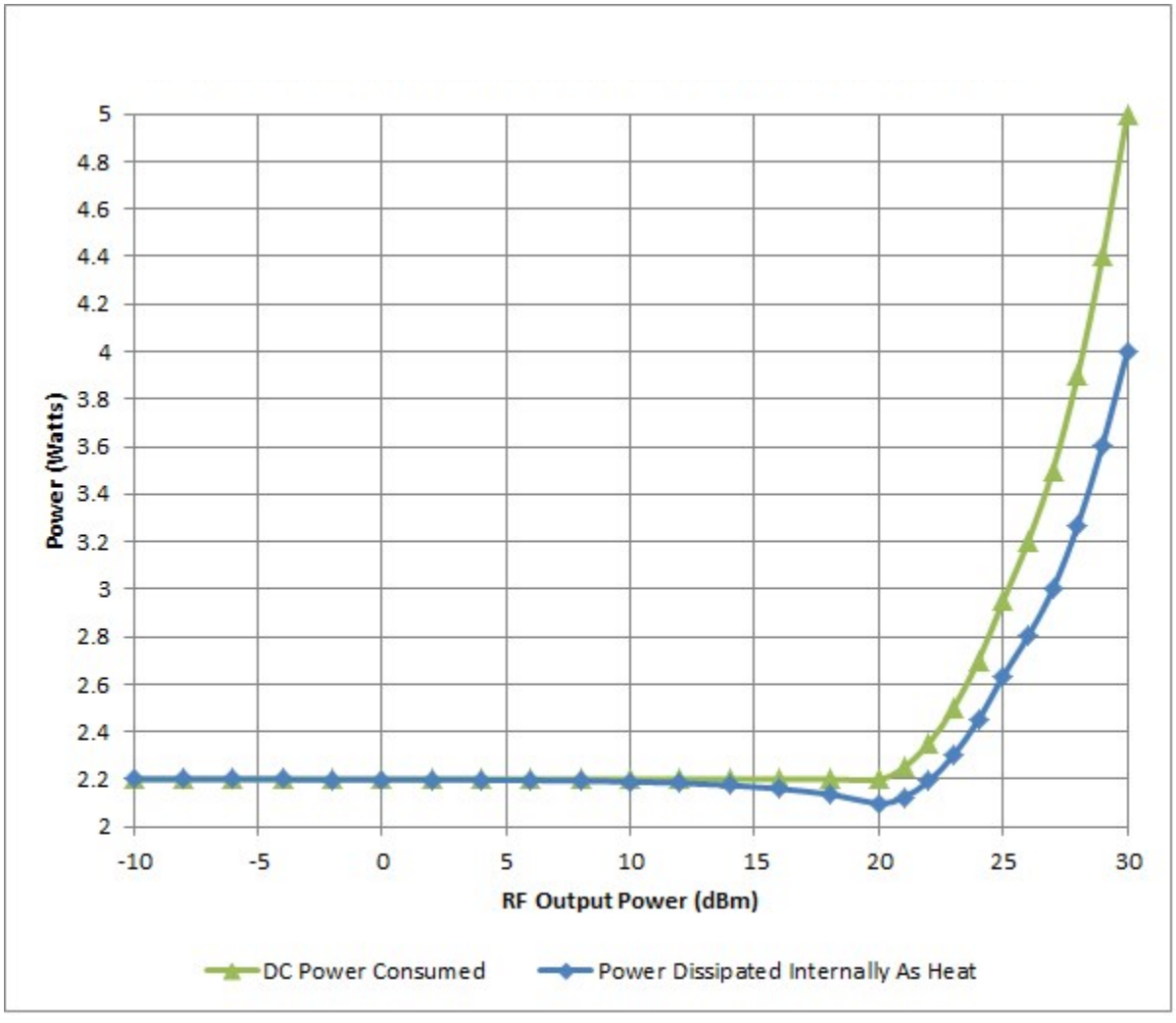
The plastic enclosure of the USBPro reader and the rubber boot that surrounds it have limited ability to transfer heat from inside the reader to the ambient environment. The temperature inside the reader will rise about 25°C for every watt of power dissipated as heat. The reader will not transmit unless its internal temperature is below 85°C, so the total power that can be dissipated depends on the difference between ambient temperature and 85°. For a given temperature, there are only two ways to decrease the amount of power dissipated by the module:

1. Decrease the RF output level at which the module transmits.

2. Lower the duty cycle to lower the percentage of time the reader is transmitting.

The following charts provide the information needed to compensate for temperature rise in your application. The first chart shows the power both drawn from the USB connector and the power dissipated inside the reader (the DC power consumed minus the RF power radiated).

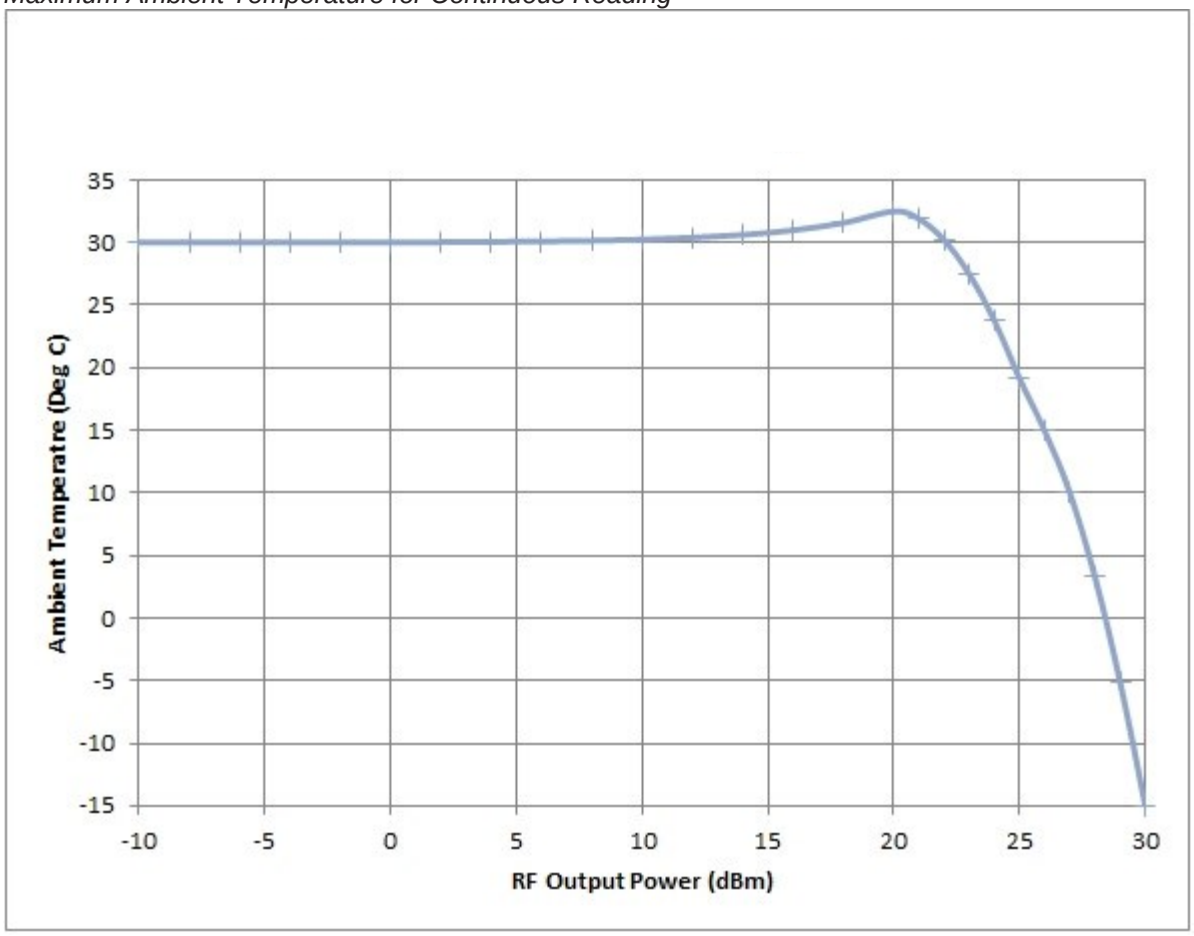
DC Power Consumed and Dissipated as Heat



If continuously reading (duty cycle = 100%), the temperature rise caused by the dissipated power inside the reader must not result in the inside temperature of the reader exceeding 85°C.

The following chart shows the maximum ambient temperature that can be used for continuous reading based on the RF output level.

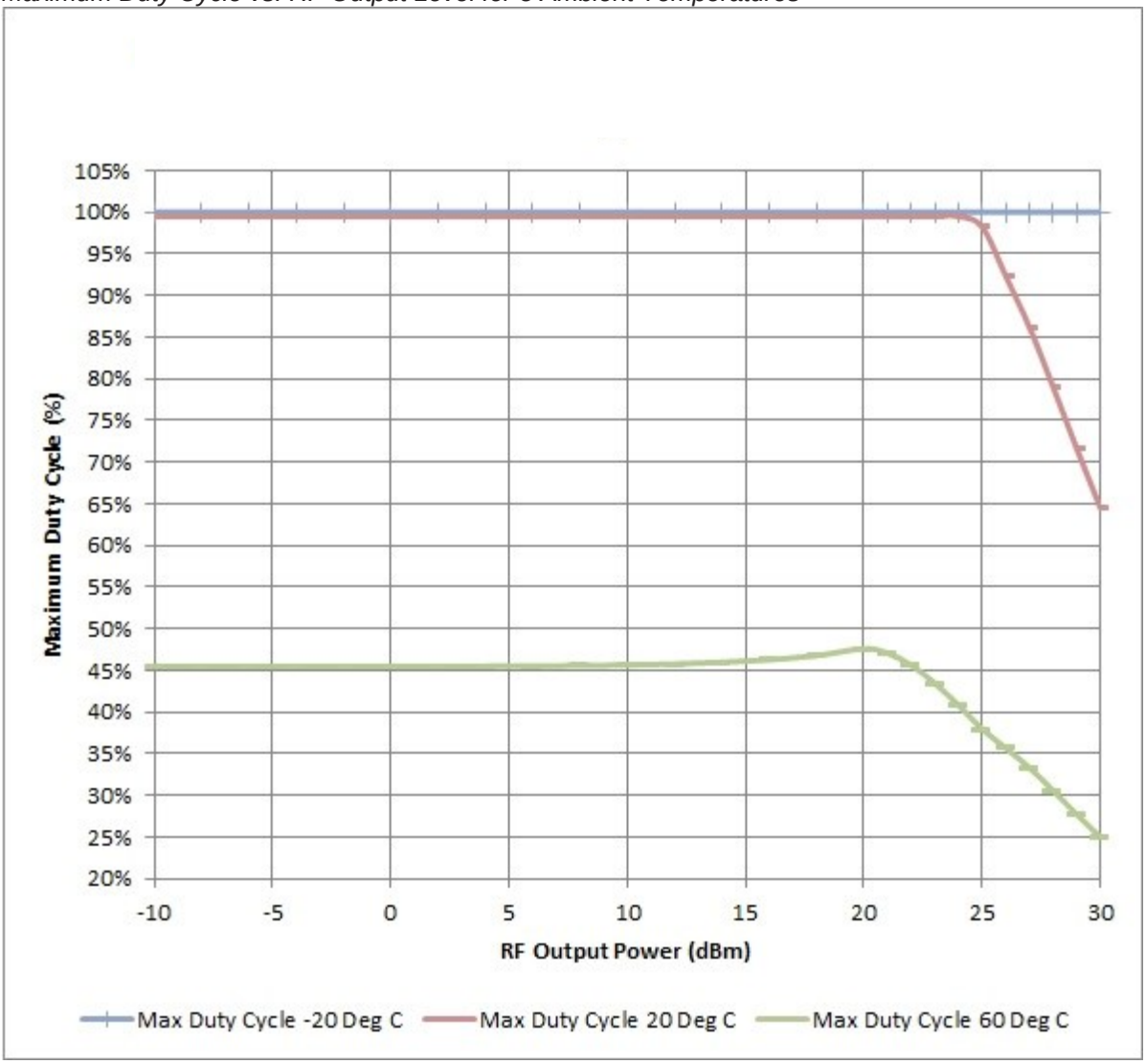
Maximum Ambient Temperature for Continuous Reading



If the RF level cannot be reduced to compensate for the ambient temperature, then the duty cycle (percentage of time RF is on relative to total on/off cycle) must be reduced to limit the temperature rise to acceptable limits.

The following chart gives the maximum duty cycle per RF Output Power level for three temperatures: -20°C, +20°C, and +60°C.

Maximum Duty Cycle vs. RF Output Level for 3 Ambient Temperatures



NOTE: There is no restriction at -20°C. 100% duty cycle is supported at all RF levels.

For any other temperature, determine the maximum power that can be dissipated by subtracting the ambient temperature (in degrees C) from 85°, then dividing that number by 25. Look up the dissipated power for your RF output power setting. If the dissipation for continuous reading is greater than the maximum power that can be dissipated based on the temperature, the duty cycle will have to be reduced. The maximum duty cycle is the power you can dissipate divided by the power you must dissipate.

The duty cycle does not address the maximum transmit time, only the percentage of on-time relative to the on/off cycle time. It is important to keep the on-time as short as possible so that the maximum temperature is not exceeded before the off-time has a chance to cool the reader down. We used a cycle time of 1 second where the on-time plus off-time was one second. For example, if you need to limit the duty cycle to 25%, the recommended on-time would be 250 msec and the off-time 750 msec.

Reduction of the duty cycle may not significantly affect the maximum read rate. The specified maximum rate of 50 tags per second applies even when the reader is not reading for a portion of the time.

Authorized Antennas

This device has been designed to operate with the antennas listed below, and having a maximum gain of 6 dBiL. Antennas having a gain greater than 6 dBiL in any orientation are strictly prohibited for use with this device without regulatory approval. Antennas of the same type as listed here, and equal or lesser gain, are permitted by FCC. The required antenna impedance is 50 ohms.

USBPro Authorized Antennas

Vendor	Model	Type	Polarization	Linear Gain[1] (dBi)
Laird	S9025P	Patch	Circular	4.3
Laird	S8658WPL	Patch	Circular	6.0
MTI Wireless	MTI-262013	Patch	Circular	6.0
MTI Wireless	MTI-242043	Patch	Circular	6.0
MTI Wireless	MT-242025	Patch	Circular	5.1
Laird	FG9026	Dipole	Linear	6.0

[1] These are circularly polarized antennas, but since most tag antennas are linearly polarized, the equivalent linear gain, as provided, of the antenna should be used for all calculations.

3 Firmware Overview

Developing Applications for the USBPro Reader

The USBPro reader must communicate with a host application. It uses a packet-based communication protocol, which cannot be decoded by a simple ASCII-based terminal program. We provide many resources to help you develop your host application, as well as samples of programs you can use while you are developing your own. These include:

- Universal Reader Assistant is a PC-based application that can demonstrate the most commonly used features of the reader. Instructions for installing and using it are provided in the next section.
- 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. Help files and code samples are available within the SDK. For more information on the MercuryAPI see the MercuryAPI Programmers Guide and the MercuryAPI SDK, available on www.jadaktech.com.
- The Autonomous Configuration Tool allows you to pre-configure the reader and have it execute a simple read command every time the reader is powered up, or every time it is powered up and a GPI line is enabled. The output of the reader can be interpreted by a simple program which can be executed in any programming language, such as Python.

Reading Tags with Universal Reader Assistant

Universal Reader Assistant is a Windows application that demonstrates all common UHF RFID reader operations. The following procedure explains how to install and activate Universal Reader Assistant on your PC. A user guide is available on www.jadaktech.com or from the directory inside the SDK.

1. Get Universal Reader Assistant from the website as part of the MercuryAPI SDK package under /cs/samples/exe/Universal-Reader-Assistant.exe, and install it on the computer that is connected to the USB Reader. The file name is **URAx86** or **URAx64.exe**, depending on whether your computer is 32 bit or 64 bit.
2. Set up the computer to the USB Reader as described in Setting up the USBPro Reader.
3. Start the Universal Reader Assistant by double-clicking the executable file **UniversalReader-Assistant.exe**.
4. Select the appropriate COM port for Reader URI.

The Universal Reader Assistant senses the COM ports on your system. USB devices are typically assigned higher value COM ports. If many COM ports are listed in the menu and you aren't sure which is for the USB Reader, you can find the assigned value using the Windows Device Manager as follows:

1. Open the Device Manager (located in **Control Panel > System**)
2. Select the **Hardware** tab and click **Device Manager.**
3. Select **View > Devices by Type > Ports (COM & LPT)**.

The device appears as **USB Serial Port (COM#)**. The USB Reader COM port value is in parentheses.

Follow the Readme.txt in /cs/samples/Universal-Reader-Assistant for steps to read and write tags.

4 Communication Protocol

Serial Communication Protocol

The serial communication between a computer (host) and the USBPro is based on a synchronized command-response/master-slave mechanism. Whenever the host sends a message to the reader, it cannot send another message until after it receives a response. The reader never initiates a communication session; only the host initiates a communication session.

This protocol allows for each command to have its own timeout because some commands require more time to execute than others. The host must manage retries, if necessary. The host must keep track of the state of the intended reader if it reissues a command.

Host-to-Reader Communication

Host-to-reader communication is packetized according to the following diagram. The reader can only accept one command at a time, and commands are executed serially, so the host waits for a reader-to-host response before issuing another host-to-reader command packet.

Host-To-Reader Communication

Header	Data Length	Command	Data	CRC-16 Checksum
Hdr	Len	Cmd	- - - - -	CRC Hi I CRC LO
1 byte	1 byte	1 byte	0 to 250 bytes	2 bytes

Reader-to-Host Communication

The following diagram defines the format of the generic Response Packet sent from the reader to the host. The Response Packet is different in format from the Request Packet.

Reader-To-Host Communication

Header	Data Length	Command	Status Word	Data	CRC-16 Checksum
Hdr	Len	Cmd		- - - - -	CRC Hi I CRC LO
1 byte	1 byte	1 byte	2 bytes	0 to 248 bytes	2 bytes

CCITT CRC-16 Calculation

The same CRC calculation is performed on all serial communications between the host and the reader. The CRC is calculated on the Data Length, Command, Status Word, and Data bytes. The header is not included in the CRC.

User Programming Interface

The USBPro does not support programming to the serial protocol directly. All user interaction with the USBPro must be performed using the 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 www.jadaktech.com.

5 Functionality

Supported Regions

Frequencies are pre-configured for the following regions:

Supported Regions

Region Name	Country or Region	Serial Interface Region Code[1]	Lowest Frequency Permitted (kHz)	Highest Frequency Permitted (kHz)	Smallest Step Size (kHz)	Maximum Dwell Time	Lowest Chan in Hop Table	Highest Chan in Hop Table	LBT Level[2]
NA	North America	0x01	902000	928000	250	0.4 sec	902750	927250	None
IN	India	0x04	865000	867000	100	4 sec	865200	866800	None
JP	Japan	0x05	9168000	920800	100	4 sec	916800	920800	-74 dBm
PRC	Peoples Republic of China	0x06	920125	924875	125	2 sec	920625	924375	None
EU3	Europe	0x08	865600	867600	100	4 sec	865700	867500	Optional at -72 dBm
KR2	Korea	0x09	917000	923500	100	0.4 sec	917300	920300	None
AU	Australia	0x0B	920000	926000	250	0.4 sec	920750	925250	None
NZ	New Zealand	0x0C	922000	927500	250	0.4 sec	922250	927250	None
NA2	North America	0x0D	917400	927200	200	0.4 sec	917400	927200	None
NA3	North America	0x0E	917500	922500	100	0.4 sec	917500	922500	None
MY	Malaysia	0x10	919000	923000	250	0.4 sec	919250	922750	None
ID	Indonesia	0x11	923000	925000	125	0.4 sec	923125	924875	None
PH	Philippines	0x12	918000	920000	250	0.4 sec	918250	919750	None
TW	Taiwan	0x13	922000	928000	250	0.4 sec	922250	927750	None
MO	Macao	0x14	920000	925000	250	0.4 sec	920250	924750	None
RU	Russia	0x15	866000	868000	200	0.4 sec	866200	867800	None
SG	Singapore	0x16	920000	925000	100	0.4 sec	920100	924900	None

[1] If Region=0, it is unconfigured and the module will not transmit. This is represented as "None" in the API and "Select" (to encourage user action) in Universal Reader Assistant.

[2] LBT is "Listen Before Talk". If a carrier is detected above the threshold, the channel will not be used.

6 Specifications

Ordering Information	
Reader	USB-6EP
Development Kit	USB-6EP-DEVKIT
Physical	
97 mm L x 61 mm W x 25 mm H (3.8”L x 2.4” W x 1.0”H)	
Tag/Transponder Protocols	
RFID Protocol Support	EPC Gen2V2 ISO18000-63 standard ISO18000-6B, IPx, AEI ATA (read only) are available through additional license.
RF Interface	
Antenna Ports	Internal antenna with an average gain of +1 dBi from 865-869MHz and 902-928MHz, External RP-SMA antenna connector.
RF Power Output	Separate read and write levels (into the antenna) are command-adjustable from -5 dBm to 30 dBm* (1W), +/- 1.0 dBm accuracy with +20dBm default.
Frequency	Pre-configured for the following regions: FCC 902-928,917.4-927,917.5-922.5 MHz (Americas) ETSI 865.6-867.6 MHz, 869.85 MHz (EU) TRAI 865-867 MHz (India) KCC 917-920.8 MHz (Korea) ACMA 920-926 MHz (Australia) SRRC-MII 920-925 MHz (P. R. China) MIC 916.7-920.9 MHz (Japan) Open (Customizable) 865-869 and 902-928 MHz
Data/Control Interface	
Physical	USB Micro-B connector, with removable six (6) foot cable with dual USB-A type plug.
Signaling	USB 2.0
Input/Output	Two I/O command controlled LEDs and two I/O command queried switches.
Protocol	Command-response protocol protected by length field and 16-bit CRC.
Regulatory Information	
Regulatory	FCC 47 CFR Ch. 1 Part 15, Industrie Canada RSS-21 0, ETSI EN 302 208 v3.1.1 (RED 2014/53/EU)
Safety	IEC 60950-1 (ed.2) US-17650-UL

Power	
DC Power Required	DC Voltage: 4.5 to 5.5 VDC from USB cable DC Power: 6.2 W max. Supplied interface cable terminates in two type-A plugs: one for power and signal, the second for additional power if needed.
Idle Power Consumption	0.35 W max at idle. (Power management modes can be used to reduce this to as little as 0.1 W).
Environment	
Operating Temperature	-40°C to +60°C*
Storage Temperature	-40°C to +85°C
Architecture	
User Memory	16 kB
Tag Buffer	200 tags
Performance	
Tag Read Rate	50 tags/second
Tag Read Distance	Up to 4 feet (1.2m) depending on tag sensitivity and orientation with internal antenna. Up to 20 feet (6.1m) with external 6dBi linearly polarized wideband antenna.

*Duty cycle restrictions based on temperature, tx power >23dB.

7 Compliance and IP Notices

Communication Regulation Information

Contact rfid-support@jadaktech.com before beginning the process of getting regulatory approval for a finished product using the USBPro.

USBPro Regulatory Information

EMC FCC 47 CFR, Part 15

Industrie Canada RSS-210

Federal Communication Commission (FCC) Interference Statement

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 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 to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

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

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

Industry Canada

Under Industry Canada (IC) regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the Equivalent Isotropically Radiated Power (EIRP) is not more than that necessary for successful communication.

This radio transmitter (identify the device by certification number, or model number if Category II) has been approved by Industry Canada to operate with the antenna types listed below with the maximum permissible gain and required antenna impedance for each antenna type indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the Equivalent Isotropically Radiated Power (EIRP) is not more than that permitted for successful communication.

This device has been designed to operate with the antennas listed in the Authorized Antennas table. Antennas not included in these lists are strictly prohibited for use with this device.

To comply with IC RF exposure limits for general population/uncontrolled exposure, the antenna(s) used for this transmitter must be installed to provide a separation distance of at least 25 cm from all persons and must not be colocated or operating in conjunction with any other antenna or transmitter.

Industrie Canada (French Canadian)

Conformément à la réglementation d'Industrie Canada, le présent émetteur radio peut fonctionner avec une antenne d'un type et d'un gain maximal (ou inférieur) approuvé pour l'émetteur par Industrie Canada. Dans le but de réduire les risques de brouillage radioélectrique à l'intention des autres utilisateurs, il faut choisir le type d'antenne et son gain de sorte que la puissance isotrope rayonnée équivalente (p.i.r.e.) ne dépasse pas l'intensité nécessaire à l'établissement d'une communication satisfaisante.

Le présent émetteur radio (identifier le dispositif par son numéro de certification ou son numéro de modèle s'il fait partie du matériel de catégorie I) a été approuvé par Industrie Canada pour fonctionner avec les types d'antenne énumérés ci-dessous et ayant un gain admissible maximal et l'impédance requise pour chaque type d'antenne. Les types d'antenne non inclus dans cette liste, ou dont le gain est supérieur au gain maximal indiqué, sont strictement interdits pour l'exploitation de l'émetteur

Le fonctionnement de l' appareil est soumis aux deux conditions suivantes:

1. Cet appareil ne doit pas perturber les communications radio, et

2. cet appareil doit supporter toute perturbation, y compris les perturbations qui pourraient provoquer son dysfonctionnement.

Pour réduire le risque d'interférence aux autres utilisateurs, le type d'antenne et son gain doivent être choisis de façon que la puissance isotrope rayonnée équivalente (PIRE) ne dépasse pas celle nécessaire pour une communication réussie.

Au but de conformer aux limites d'exposition RF pour la population générale (exposition non-contrôlée), les antennes utilisés doivent être installés à une distance d'au moins 25 cm de toute personne et ne doivent pas être installé en proximité ou utilisé en conjonction avec un autre antenne ou transmetteur.

Authorized Antennas

This device has been designed to operate with the antennas listed in Authorized Antennas. Detailed information on each antenna is available from their respective manufacturers. Antennas not included in this list or having a gain greater than 6 dBiL are strictly prohibited for use with this device. The required antenna impedance is 50 ohms

The internal antenna complies with all these requirements.

To comply with FCC requirements for RF exposure safety, a separation distance of at least 22 cm (8.7 inches) must be maintained between the radiating elements of the external antenna and nearby people. You must also provide strain relief for all Reader connections.

EU RED Declaration of Conformity

Novanta
The Innovation Advantage

European Union Declaration of Conformity for USB-6EP RFID Reader

Manufacturer:	Novanta Corporation
Address:	125, Middlesex Turnpike Bedford, MA 01730
Object of the declaration: Product Model Numbers:	USB-6EP
Object description: Product Description:	865 to 869 MHz and 902 to 928 MHz Radio Frequency Identification (RFID) Reader / Interrogator for desk top use.
This declaration of conformity is issued under the sole responsibility of the manufacturer. The object of the declaration described above is in conformity with the following relevant European Union harmonization Legislation:	
Directives:	
Identifier	Date
2014/53/EU	16 April 2014
2011/65/EU w/ Amendments M1-M30	19 April 2016

The object described above conforms to the requirements of EU directives through full compliance with the following standards:
European Standards

Standard	Amendments
ETSI EN 302 208 V3.1.1 (2016-11)	None
ETSI EN 301 489-3 V2.1.0 (2016-09)	Draft
CENELEC EN 50581:2012	None

The notified body Curtis-Straus LLC, NB1797 performed review of test reports on the object of this declaration and issued the EU-type examination certificate CS22442.

It is required that when an external antenna is used, USB-6EP set power in dBm, less antenna cable loss in dB, plus antenna gain in dBdL, must be +33 dBm ERP or less to allow the object to operate as intended, and to be covered by this EU declaration of conformity.

Authorized on Behalf of Novanta Corporation:	
Name	Eva Gravius
Function	VP Engineering
Address	North Syracuse, New York
Date	May 10, 2017
Signature	

Document No. 875-0224-01 Rev A
Novanta Corporation
125 Middlesex Turnpike Bedford, MA 01730-1409 Tel: 781-266-5700 Fax: 781-266-5114 www.novanta.com

Appendix A: Getting Started

Setting up the USBPro Reader

Use the following procedures when setting up the USBPro Reader. Read all the setup procedures before beginning.

Installing the USB Driver

If on a Windows PC, a few installation steps are required for Windows to recognize the USBPro Reader and properly configure the communications protocol. In order to use the USB interface with Windows you must have the Micro-USBDriver.inf file (available for download from website or automatically installed when the Universal Reader Assistant is installed). The installation steps are:

1. Plug in the USB cable to the USBPro Reader and PC.
2. Windows should report it has **Found New Hardware - Micro** and open the Hardware Installation Wizard.
3. Select **Install** from a list or specific location (Advanced) option, click **Next**.
4. Select **Don't search...**, click **Next**, then **Next** again.
5. Click **Have Disk** and navigate to where the Micro-USBDriver.inf file is stored and select it, click **Open**, then **OK**.
6. "Micro" should now be shown under the Model list. Select it and click **Next,** then **Finished**.

NOTE: The Micro driver file has not been Microsoft certified so compatibility warnings will be displayed. These can be ignored and clicked through.

7. A COM port should now be assigned to the Micro. If you aren't sure what COM port is assigned you can find it using the Windows Device Manager:
   a. Open the Device Manager (located in Control Panel > System).
   b. Select the Hardware tab and click **Device Manager**.
   c. Select View > Devices by Type > Ports (COM & LPT) The device appears as M6eMicro (COM#).

Connecting the USB Reader

1. Plug the micro-USB connector into the USB Reader.
2. Plug the **BLACK** communications USB connector into your PC.

3. If using an RF level of +23 dBm or above, plug the **RED** Auxiliary Power USB connector into your PC for additional power.

NOTE: The USB Reader draws 0.5 A at +23 dBm and 1 A at +30 dBm if the internal antenna is used or a high quality external antenna is used. The current consumption will be a bit higher if the antenna does not have return loss greater than 14 dBm across the band. One USB port is not guaranteed to provide more than 0.5 A, and two ports are not guaranteed to supply more than 1 A, but most do. If you receive an error from your PC that too much current is being drawn, you should reduce the RF output level by 1 dB (+22 dBm for 1 USB port, +29 dBm for 2 USB ports), and may have to reboot your PC to reset the USB port.

4. You will be prompted for driver installation if they are not already installed. If prompted follow the Installing the USB Driver instructions.

Reading Tags with Universal Reader Assistant

See Reading Tags with Universal Reader Assistant for further information.

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