AC-01 (M7E)

User Guide

PLT-07592 A.1

Public

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Contacts

For technical support, please contact: **acura.support@hidglobal.com**.

What's new

Date	Description	Revision
August 2025	Two new sections added: lettercase, and delayhid.	A.1

A complete list of revisions is available in **Revision history**.

Products covered by this document

Model	Code	Power Supply
AC-01 (M7E)	Please consult.	-

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Section 01

Introduction

1.1 Introduction

The AC-01 is a compact desktop RFID reader. The reader uses Ultra High Frequency (UHF) RFID technology and has an integrated antenna. The antenna integration makes the reader ideal for small read range applications, as no external antenna or RF cables are needed.

1.2 Applications

The AC-01 can be used for the following (non-restricted) applications:

- Tag registration.
- Credential enrollment.
- Tag read/write stations.
- Production line points identification.
- Suitable for smartphones and tablets.
- Libraries.

1.3 Mode features

Autonomous Mode:

- Automatically reads tags in a continuous loop.
- Turn off/on the RF via command.
- Sends the results of the tags reads in the following interfaces:
  - Via keyboard emulation (HID class).
  - Via serial communication (CDC class).
  - Via keyboard emulation + serial communication.
- Various configuration parameters via serial terminal:
  - Reading power.
  - RF period times.
  - Gen2 parameters, (tag >> reader) and (reader << tag).
  - Reader information.
  - Read operations.
  - Read filter by RSSI value of the tag.
- Can decode tags with **GS1 SGTIN-96** and **SGTIN-198** standards for checkout applications, sends in the following formats:
  - gs1string, for example - "(01)03608449920322(21)1540341".
  - gs1epcuri, for example - "urn:epc:tag:sgtin-96:1.360844.0992032.1540341".
  - gs1epcpureuri, for example - "urn:epc:id:sgtin:360844.0992032.1540341".
  - gs1gtin13, for example - "3608449920322".
  - gs1sgtin13, for example - "3608449920322 1540341".
- Can decode tags with the Acura's Autoid System standard for registering tags for vehicle identification application:
  - autoid + autoidcs
    - wiegand26, for example - "172 13259".
      - clock and data, for example - "00001034695627".
- Can decode tags with ASCII standard.
- Can convert from hexadecimal to decimal with configurable range.

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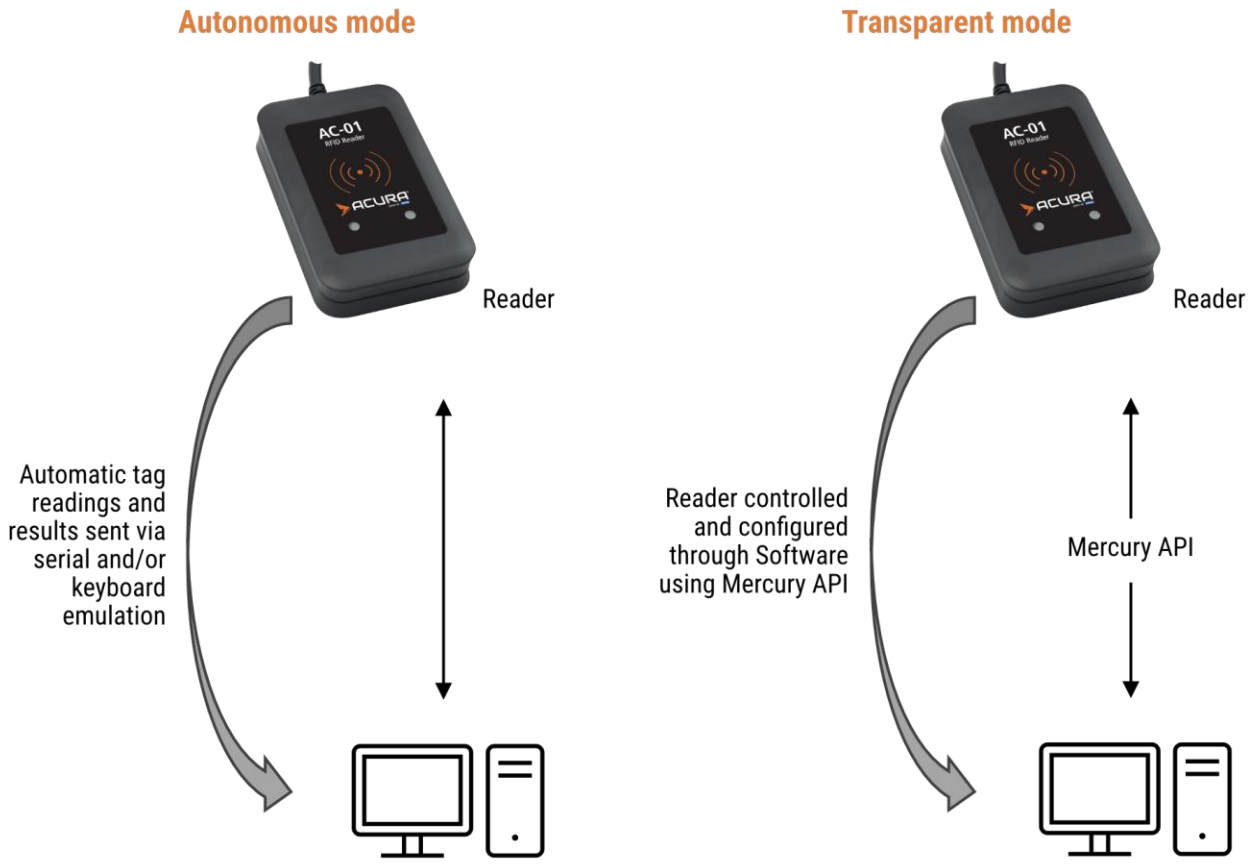
- Can split the tag EPC identifier with a configurable range.
- Option to not decode and send the tag EPC hexadecimal raw value.
- Can read any memory bank of the tag as additional information to the tag EPC identifier.

Transparent Mode:

- The reader stays idle, does not perform autonomous tag readings.
- The reader must be controlled by a Software that uses the mercuryapi, a complete API/SDK for reading and writing tags supporting the following languages:
  - C, .Net (C#) and Java.
- Compatible with Windows 10, Mac and Linux without driver required, for Windows 7 and 8 the driver is provided for installation.
- Wide variation of reading power: 0 to 27dBm.



1.4 Interfaces

The AC-01 reader only support USB interface. They do not need an external power supply, the power transmitted through the USB cable from a host Computer is sufficient to power the readers.

HID (keyboard) and Serial modes are enabled by default. When you connect the reader USB cable to a host PC, HID will be detected under the Human Interface Devices section and the CDC port will be detected under the Ports section of the Device Manager (Windows OS). The readers can be configured to either HID mode, Serial mode, or both.

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1.5 Approval notes

1.5.1 Anatel (Brazil)

AC-01 was tested and approved under the Regulation for Certification and Homologation of telecommunications Products, approved by Anatel Resolution No. 242 of November 30, 2000.

- **Types:** Radio Frequency Identification Systems - Category II.
- **Service/Application:** Restricted Radiation Radiocommunication.

This equipment is not entitled to protection against harmful interference and may not cause interference to duly authorized systems.
For more information, see the Anatel website - https://www.gov.br/anatel/pt-br/

Este equipamento não tem direito à proteção contra interferência prejudicial e não pode causar interferência em sistemas devidamente autorizados.
Para maiores informações, consulte o site da Anatel – https://www.gov.br/anatel/pt-br/

1.5.2 FCC (USA)

Federal Communication Commission Interference Statement (FCC)

This equipment has been tested and found to comply with the limits for a Class A 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 operating in a commercial environment. This equipment generates, uses, and can radiate radiofrequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

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.

MPE Warning:	Radiation Exposure Statement - This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 21cm between the radiator & your body. Contains FCCID: QV5MERCURY7EP

1.5.3 Authorized antennas

Vendor	MTI Wireless Edge
Vendor	ABRACON LLC
Model	APAE915R2540ABDB1-T
Frequency Range (MHz)	915-928 MHz
Circular Peak Gain (dBic)	4.5 dBic
Linear Peak Gain (dBi)	1.5 dBi
Polarization	Circular (RHCP)
Type	Ceramic Patch Antenna

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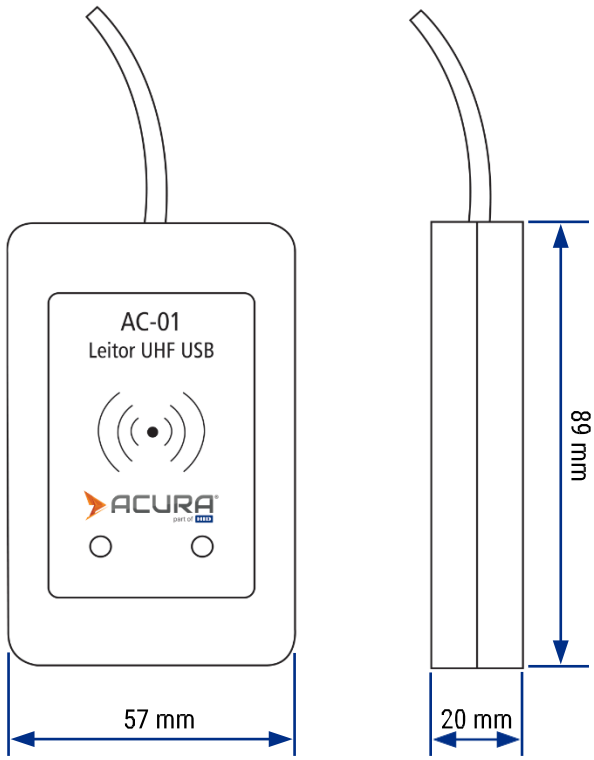
Section 02

General information

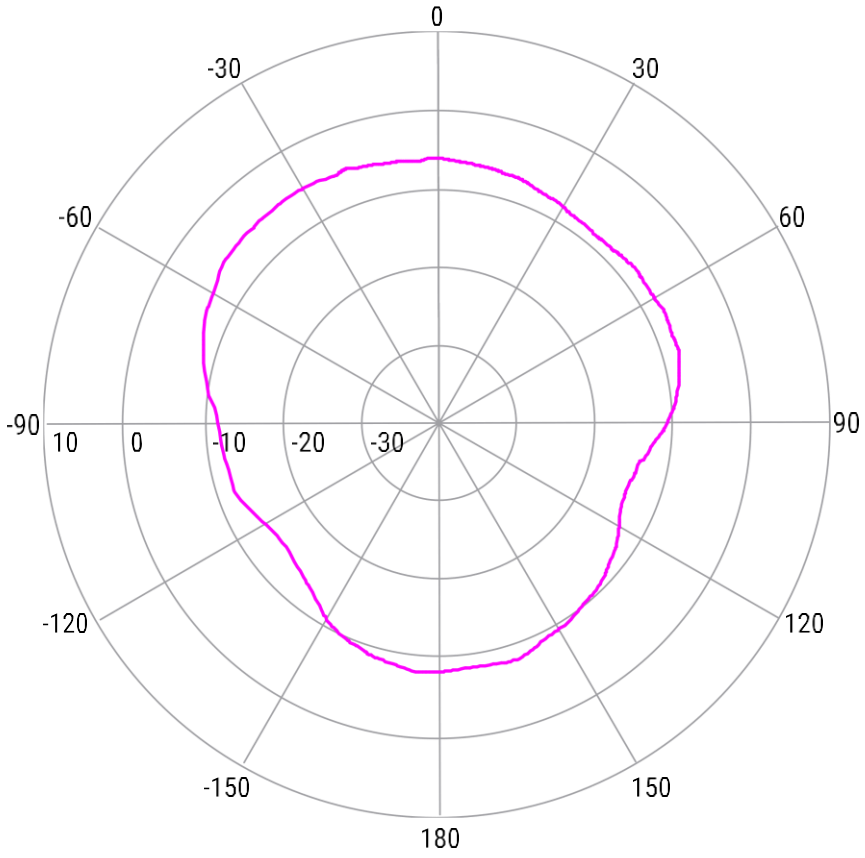
2.1 AC-01

2.1.1 Dimensions



2.1.2 Built-in antenna radiation pattern in 2D

Side view



2.2 Specification

Transponder Protocol	
Protocol	Protocol ISO 18000-6C (EPC Gen2) ISO 18000-63 (EPC Gen2 V2) (Transparent Mode)
RF interface	
RF Output power	From 0 to 27 dBm with 0.5 dBm increment
Regulation	ANATEL (BR) 902 – 907MHz and 915 – 928MHz FCC (USA) 902 – 928MHz
Mode	Frequency Hopping
Modulation/RF Coding	PR-ASK/M2, M4, M8
Backscatter Link Frequency (BLF)	250KHz
Performance	
Reading distance (the reading distance can vary depending on the antenna, rf cable, tag model, usage mode, and environment)	20 cm
Data/Control Interface	
Connectors	Communication and Power: USB Type-A male connector Serial RS232 DB9 connector
Communication interface	USB HID keyboard: The reader is recognized by the Operating System (Windows, macOS and Linux) as a HID device. USB Serial CDC: When the reader is connected via USB, a serial port is automatically created on Windows 10, macOS, and Linux operating systems. (For Windows 7 and 8, driver installation is required).
Programming	Autonomous mode: The reader can be configured via serial communication using ASCII commands through a terminal application (such as Putty, Minicom, or Screen) without the need to use any API or SDK. It supports tag read-only functionality. Transparent mode: The reader responds to software using the Mercury API and has tag read and write functionality. Android not supported.
Energy	
Power	5 VDC +/- 1% (Host USB port). Maximum ripple from source: 200 m Vpp @ 20 MHz Power Supply 5VDC, 3A model: NLD300050W1U3
Consumption	Max 3,8 W@ 5 VCC for +27 dBm out.

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Physical characteristics	
IP rating	Internal use
Dimension (H x W x D)	89 x 57 x 20 mm
Weight	134 g / 4.7 oz / 0.3 lb
Cable length	2 meters
Operation temperature	-10°C to 55°C (14°F to 131°F)
Storage temperature	-10°C to 60°C (14°F to 140°F)
Humidity	95%
Mounting type	Desktop reader
Built-in antenna	
Frequency range	902 - 928MHz
Circular Peak Gain	4.5 dBic
Linear Peak Gain	1.5 dBi
VSWR	1.5:1 (max.)
Polarization	Circular (RHCP)

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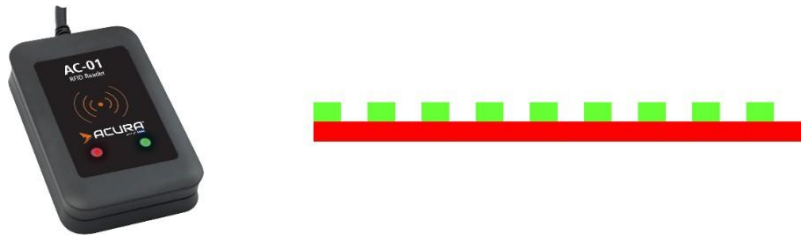
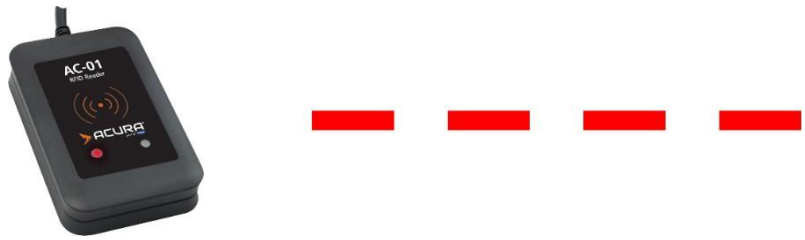
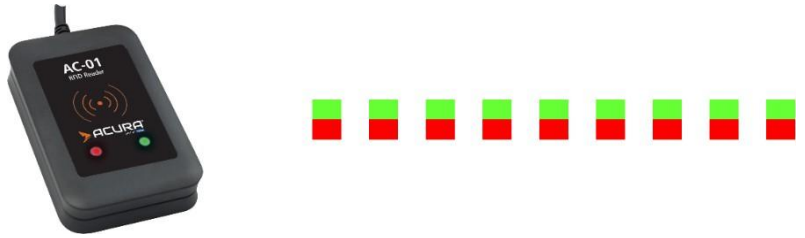
Section 03

Operation

3.1 Turning on the reader

After connecting the reader to a host Computer USB port, the LED status will exhibit the following combinations:

	Green LED: flashes fast. Red LED: solid on. Reader: in Autonomous Mode. Reading tags: activated (RF on).
	Green LED: turned off. Red LED: flashing at a consistent interval. Reader: in Autonomous Mode. Reading tags: deactivated (RF idle).
	Green and Red LED: flashing at same time in a consistent interval. Reader is powered on but with no USB communication with the Computer host.
	Green LED: flashing at a consistent interval. Red LED: turned off. Reader: in Transparent Mode. Note: In Transparent Mode, the red LED and beep are controlled by the users software.
(LEDs turned off)	The reader is not powered on or is not functioning.

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3.2 Driver installation

> **Note:** Any computer running an OS prior to Windows 10, will require a driver to be installed for the creation of the COMxx serial communication port. Please contact our support channel **support@acura.com.br** for more information.

For Linux, Android, and macOS, the driver is not required. When the reader is turned on, the following devices will be created in the Operating System:

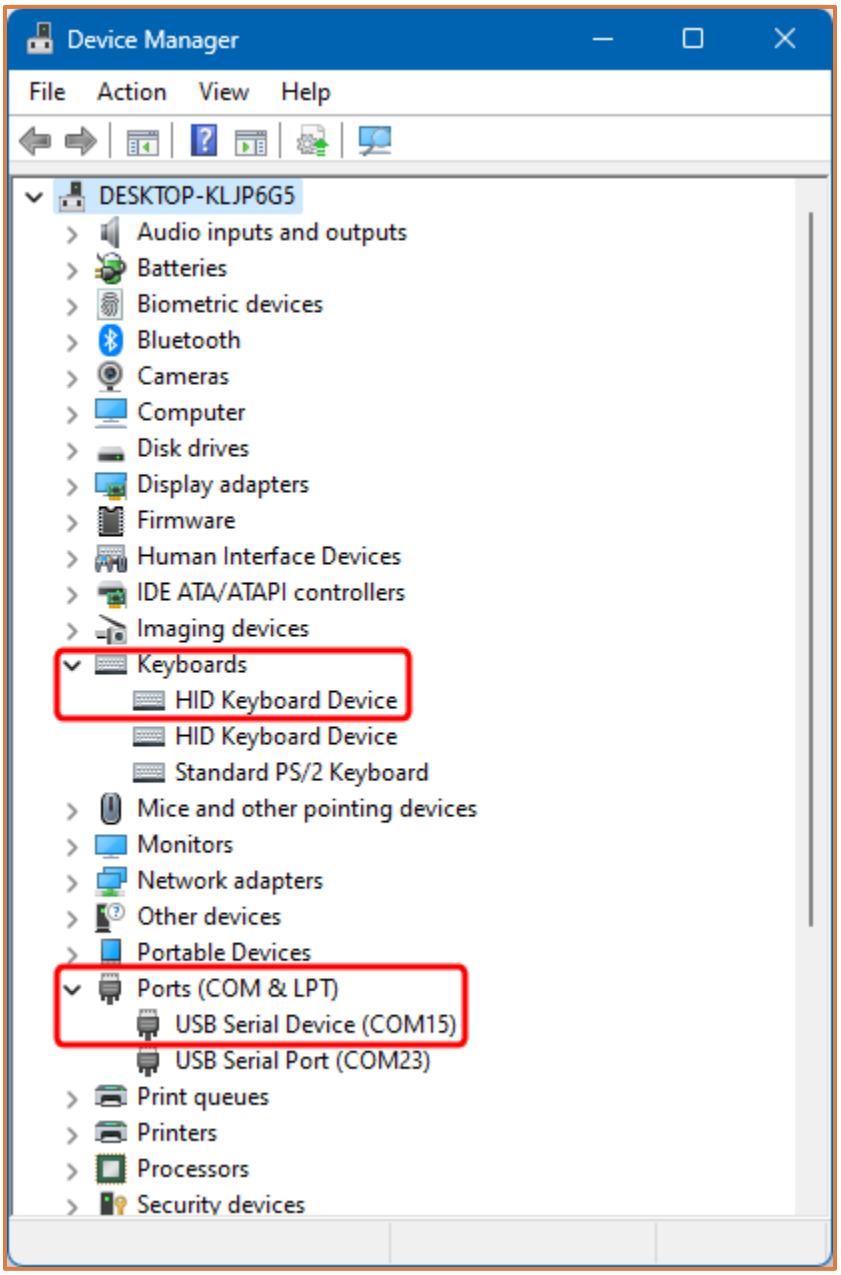
- HID class type keyboard.
- Serial port, (COM&LPT on Windows), (CDC on Linux, Android, and macOS).

Since the reader uses the HID class keyboard type for keyboard emulation when sending reading results in Autonomous Mode, the Serial Port will be used for communication and configuration in both Autonomous and Transparent modes.

3.2.1 Windows 10 and 11 - Identifying a serial port

After turning on the reader, open the **Device Manager**. In **Ports (COM and LPT)**, a virtual serial communication port should appear a few seconds after the reader is connected. A new **HID Keyboard Device** will also appear in **Keyboards**.

Once the reader has been recognized by the Operating System, it is ready to start work.

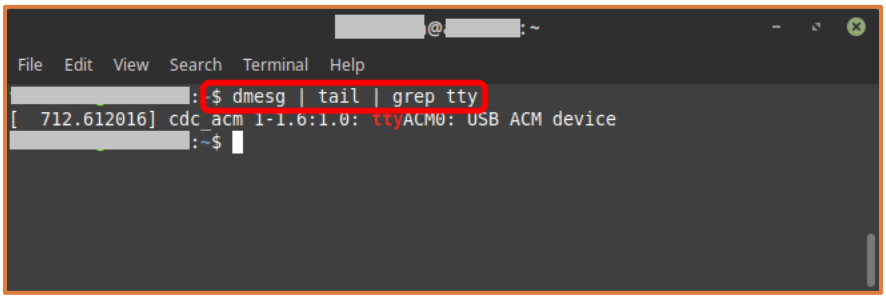


-

3.2.2 Linux - Identifying a serial port

To identify the name of the serial port created after connecting the reader to a USB port, type the following in the Terminal:

```
$dmesg | tail | grep tty
```



In the example, serial communication with the reader will be through **/dev/ttyACM0**.

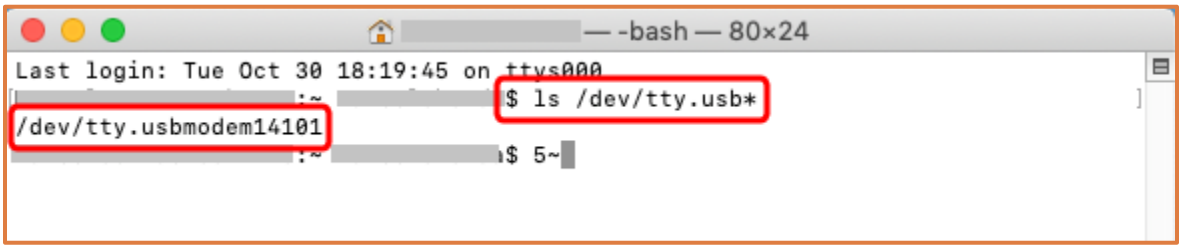
For some Linux distribution like Ubuntu, Mint, Fedora, OpenSuse. it is recommended to disable the ModemManager service to not try to connect to the serial port every time the reader is connect to the USB port:

```
$sudo systemctl stop ModemManager.service
$sudo systemctl disable ModemManager.service
```

3.2.3 macOS - Identifying a serial port

To identify the serial port name created after connecting the reader to USB port, type the following in the Terminal:

```
$ls /dev/tty.usb*
```



In the example, serial communication with the reader will be via **/dev/tty.usbmodem14101**.

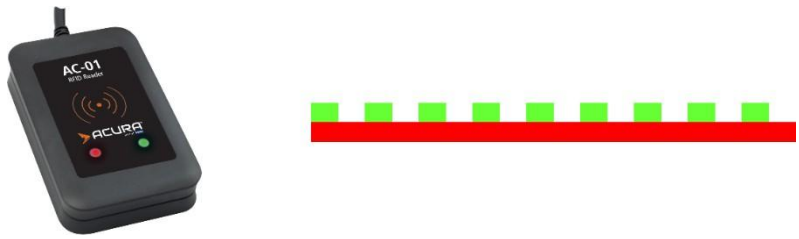
3.3 Reader operating modes

3.3.1 Autonomous mode

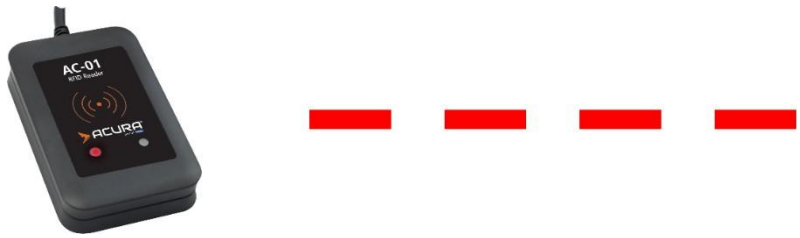
In Autonomous mode, the reader continuously attempts to read a tag. When a tag is successfully read, the information is transmitted through the configured communication interface. Starting from firmware version 1.1.3, the option to disable tag reading has been introduced. This is achieved by deactivating the RF signal using the **readtag** command or the **CapsLock** key, effectively putting the reader into an idle state until tag reading is reactivated.

The **antennaport** command must be used to indicate which antenna will transmit RF.

Visual feedback from the reader when it is in Autonomous mode, and performing tag reading:

	Green LED: flashes fast. Red LED: solid on.

Visual feedback from the reader when it is in Autonomous mode, and not performing tag reading:

	Green LED: turned off. Red LED: flashing at a consistent interval.

3.3.2 Turning tag reading ON and OFF - Autonomous mode

To turn tag reading **ON** and **OFF**, the following options can be used:

1. Using the **readtag command**:
   a. The command **readtag off<CR>** disables the RF (Radio Frequency) and stops reading tags and results report.
   b. The command **readtag on<CR>** activates the RF (Radio Frequency) and resumes tag reading and results report.

   > **Note: <CR>** indicates a carriage return.

2. Using the **Caps Lock** key from the keyboard (Windows and Linux only):
   To switch between **ON** and **OFF** for reading tags, quickly **press the Caps Lock key two times**, then check that the readers LEDs flash and the reader beeps.

   > **Note:** The command **enablecapslock** enables or disables this function. To use it, **enablecapslock** must be on.

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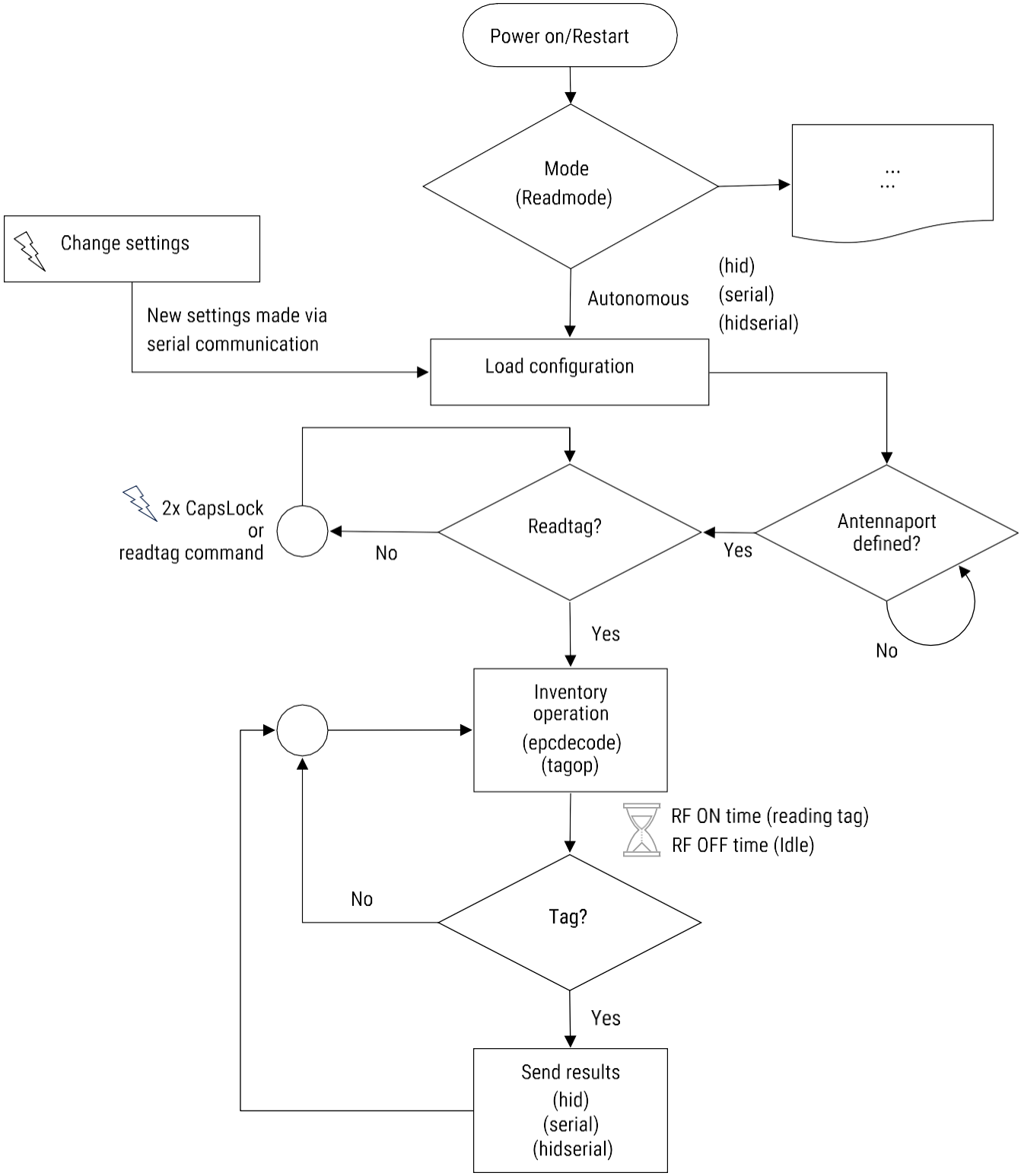
3.3.3 General diagram



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3.3.4 Reading tags engine

The algorithm for reading tags in Autonomous mode is described as follows:

- The tag reading result string format is fixed, not configurable, this is explained in **Reading result format** section.
- The EPC id of the tag will always be reported by the reader in a format determined by the **epcdecode** command.
- Additionally, to the EPC id, a tag memory bank read operation, configured by the **tagop** command, will be reported by the reader concatenated with a configurable **separator** character.
- More tag reading data can be included in the tag reading result report, such as **readcount** and signal level **rssi**, separated by the **separator** character.

If the interface chosen by the **readmode** command is serial, and a tag is read while there is no connection in the serial port generated, the reader will generate audible feedback with fast beeps every time the tag is read.

3.3.5 Reading result format

In Autonomous mode, the reader transmits a fixed formatted string containing the results of tag reads via the selected communication interface.

> **Note:** The size of the result string may vary depending on the tags read. The software that will receive this string, must always handle it using the **<separator>** and **<endofline>** fields to split the desired fields.

The format of the string is as follows:

<epcdecode><separator><tagop><separator><readcount><separator><rssi><endofline>

Command	Description
<epcdecode>	EPC id read result, decoded as specified by the epcdecode command. Note: Always reported by the reader in Autonomous mode.
<separator>	Separator character specified by the separator command. Note: It is only reported by the reader if there are more fields in addition to <epcdecode> to report.
<tagop>	The result of the reading operation specified by the tagop command. Note: Optional.
<readcount>	The quantity of readings for the same tag during an inventory period. The choice to display this value or not is determined by the reportreadcount command. Note: Optional.
<rssi>	The RF signal level value in dBm and negative of tag response. The decision to display or hide this value is determined by the reportrssi command. Note: Optional.
<endofline>	The end-of-line type is configured using the endofline command. Note: The reader reports this in Autonomous mode if it is configured as anything other than none.

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3.3.6 Configuring the reader - Autonomous mode

When the reader is in Autonomous mode, the following configurations can be made:

- Type of communication
- Perform tag reading or stay idle
- Reading power
- Reading time
- Idle time
- EPC id tag decoding type
- Reading operation in the tags memory bank
- EPC Gen2 protocol parameters:
  - BLF (Backscatter Link Frequency)
  - Tari
  - Tag Encoding
  - Session
  - Target
  - Q (Anti-collision)
  - Access password
- Character that separates the fields in the result string
- Type of end-of-line in the result string
- Typing speed for keyboard emulation
- Filter by RSSI (Received Signal Strength Indicator)
- Show or do not show the RSSI value of the read tag
- Show or do not show the quantity of tag reads
- Audible tag reading alert (beep)
- Check internal temperature, status, and firmware versions

3.3.7 How to set up the reader

When the reader is powered **on** in Autonomous mode, it must be configured using ASCII commands sent through the serial port created by the operating system.

> **Note:** To find out on which serial port the reader will connect to, please consult **Turning on the reader**.

3.3.8 Operating logic

The configuration of the reader via ASCII commands works with the Message/Response structure:

1. An external host sends a command to the reader.
2. The reader interprets and executes the command included in the received message.
3. The reader responds to the external host.

The messages and responses use ASCII characters with a carriage return terminator **<CR>** (13d) (0x0D), which is the **[ENTER]** in terminal. The messages may be in uppercase, lowercase, or a mixture of both.

> **Note:** The reader echoes each character typed in the serial terminal, and with each new line the reader sends the character **>** to indicate the cursor.

3.3.9 Syntax of messages and responses

> **Note:** Only one value must be passed for each command, the reader will not accept more than one value per command.

The syntax of messages from the host to the reader:

COMMAND VALUE<CR>	Changes the value of the command/parameter.
COMMAND<CR>	Reads the value of the command/parameter.

The syntax of reader response messages to host:

RESULT<CR>	Returns the result of the execution of the last command sent to the reader.

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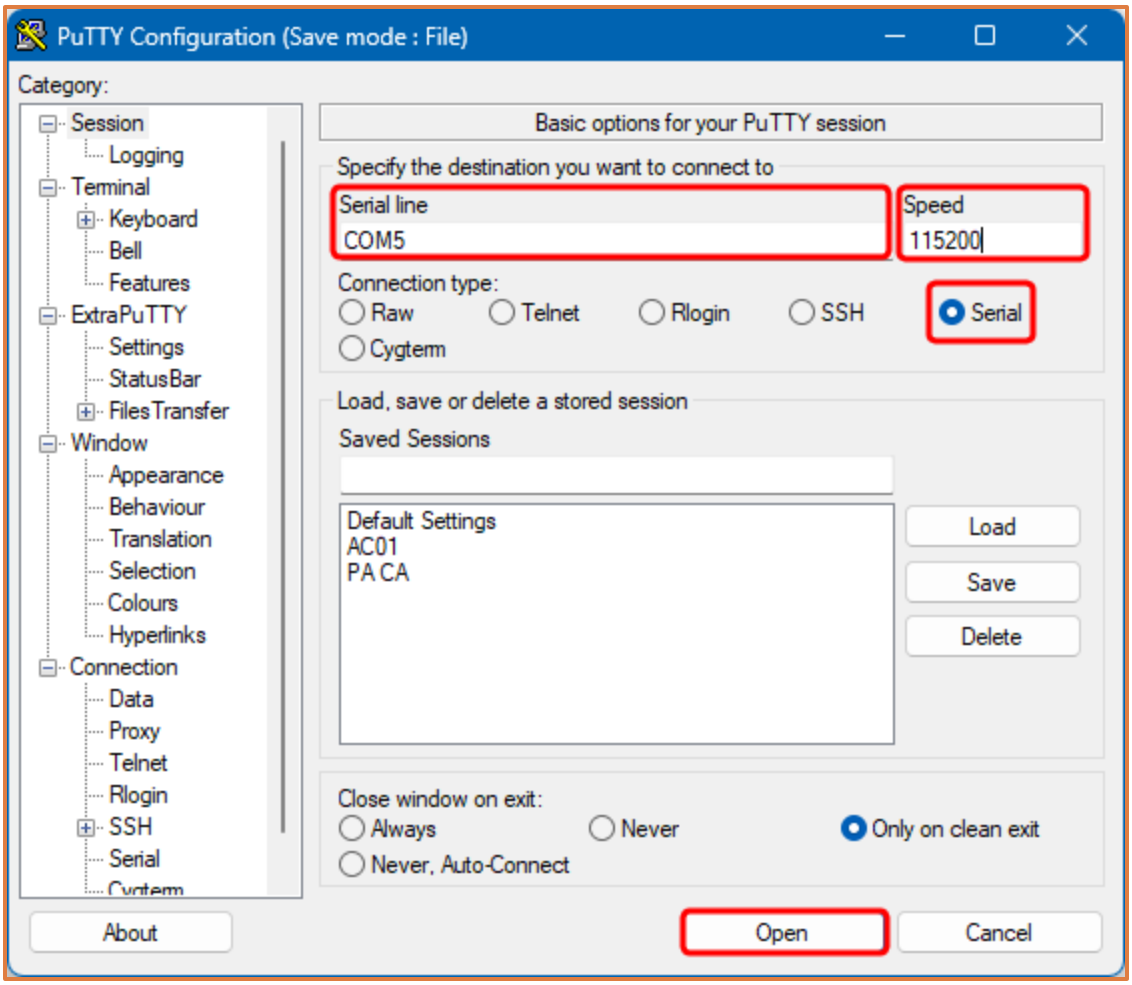
3.3.10 Windows - how to send commands to the reader

To change the readers settings in Autonomous mode, a terminal emulation software can be used. Putty is a free open-source terminal emulation application: **https://www.chiark.greenend.org.uk/~sgtatham/putty/latest.html**

To configure Putty:

1. Open Putty and select **Connection type:** > **Serial**, enter the **Serial line** as the port generated by the reader **(COMxx)** and set the **Speed** to **115200**.



2. Click **Open** to open the terminal screen for entering commands.

3.3.11 Linux and macOS - how to send commands to the reader

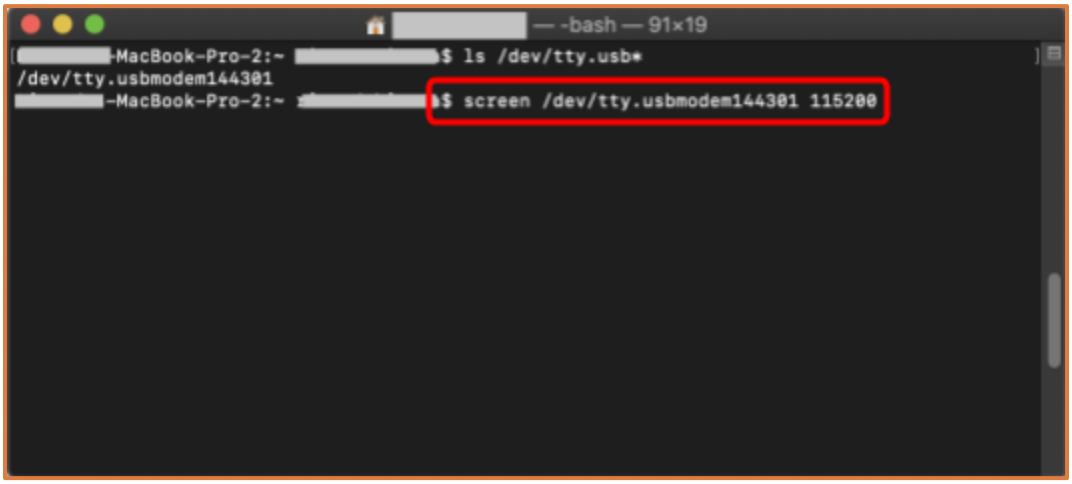
> **Note:** On the Linux operating system, you can also use Putty, see: **Windows - how to send commands to the reader**.

For macOS and Linux, you can use the **screen** program.

> **Note:** To find out on which serial port the reader will respond, please consult **Turning on the reader**.

macOS:

```
$ screen /dev/tty.usbmodemXXXXXX 115200
```

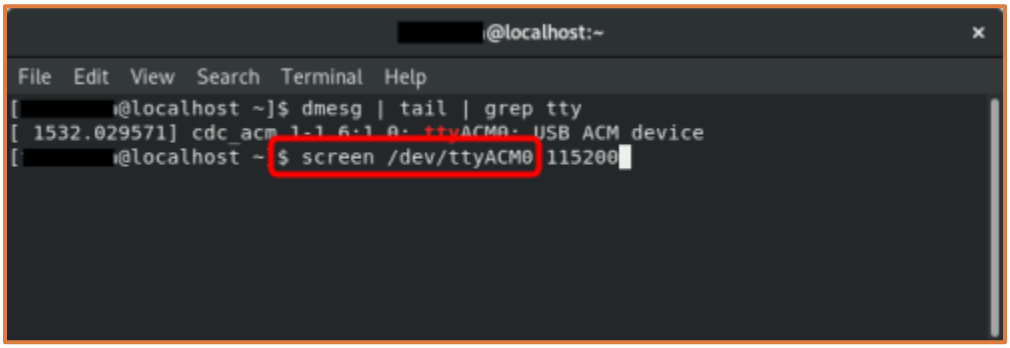


Linux – using screen:

> **Note:** In Linux, to have permission to use the serial port, run the command with superuser privileges (sudo) or add your user to the dialout group using the following command: **$ sudo usermod -a -G dialout $USER**
> For this to take effect, you need to restart the system.

To connect using the screen:

```
$ screen /dev/ttyACMx
```



3.4 Configuration commands

Note: It is not always easy to remember the command name or accepted values, for that, use the **help** command. When executed without any values, it lists all the commands supported by the reader. To get details on a specific command, simply type **help (command)<CR>** – this is a quick way to access the readers configuration information.

3.4.1 help command

Public

3.4.2 summary command

The **summary** command returns all the current values and status of the reader parameters in a formatted list as follows:

```
COM5 - PuTTY
Session  Special Command  Window  Logging  Files Transfer  Hangup  ?
>summary

Summary of all commands with their respective values.
        Command                 Value:

        readmode                serial
        readpower               10 dbm
        rfon                    250 ms
        rfoff                   250 ms

        gen2blf                 250 KHz
        gen2tari                25 us
        gen2tagencoding         m4
        gen2session             s1
        gen2target              a
        gen2q                   dynamic
        gen2accesspassword      00000000

        selectfilter            none
        temperature             40 C
        version                 1.5.1
        rfidversion             01.0B.01.25-20
        rfidmodule              nano-module
        rfidregion              FCC Reduced
        serialnumber            0000000

        tagop                   none
        reportonlytagopok       off
        epcdecode               none
        separator               ' '
        endofline               windows
        lettercase              none
        delayhid                0 ms
        keystrokespeed          fast
        keyboardlayout          english_us

        rssifilter              0 (no filter)
        reportrssi              off
        reportreadcount         off
        enablebeep              on
        enablecapslock          on
        initreadtag             on
        readtag                 off
        echochar                on
        tagtimeout              0 ms (no filter)

>
00:00:32 Connected   SERIAL/115200 8 N 1
```

3.4.3 dumpconfig command

The **dumpconfig** command returns all the current values of the reader parameters in a simple formatted list. This entire list can be copied from the terminal and be pasted to another terminal connected to another reader.

3.4.4 Summary of configuration commands and default values

	Command	Short description	Default value
Operation	readmode	Reader operating mode.	hid
	readpower	Read power in dBm.	10
	rfon	Time in milliseconds of RF ON.	250
	rfoff	Time in milliseconds of RF OFF.	250
Tag Gen2 protocol	gen2blf	Air Backscatter Link Frequency in KHz.	250
	gen2tari	Tari (bit pulse length) in us.	25
	gen2tagencoding	Air tag-reader communication encoding.	m4
	gen2session	Tag Session value.	s1
	gen2target	Tag Target value.	a
	gen2q	q value, which determine the tag population.	dynamic
	gen2accesspassword	Tag gen2 access password.	00000000
	selectfilter	Tag select filter.	none
Tag reading	initreadtag	Initial state of reading tag.	on
	readtag	Current reading tag condition.	on
	tagtimeout	Same tag id filter, in milliseconds.	0
	rssifilter	Filter by the value of tag RSSI in dbm.	0
	tagop	Read tag operation.	none
	reportonlytagopok	Report only if the tagop was successfully executed.	off
	epcdecode	How to decode the tag EPC.	none
	autoidcs	Secure code for the Acura Autoid tags.	900001
Messages reply	separator	Character between the results fields.	"space"
	endofline	Endofline for tag reads report string.	windows
	keystrokespeed	Keystroke speed for Wedge emulation.	fast
	keyboardlayout	Layout for Wedge emulation.	english_us
	reportrssi	Report the tag rssi value.	off
	lettercase	Letter case for keyboard emulation (hid mode) none	none
	delayhid	Delay in ms between multiple transmission via keyboard emulation	0
	reportantenna	Report the antenna the tag was read.	off
	reportreadcount	Report the tag readcount value of each rfon.	off

Public

	Command	Short description	Default value
Information	summary	List all commands with their respective values.	
	temperature	Temperature of the reader in Celsius degree.	
	version	Processor firmware version.	
	rfidversion	RFID firmware version.	
	rfidmodule	RFID module type.	
	rfidregion	Current RFID region.	
	serialnumber	Reader serial number.	
	dumpconfig	Lists all the current configuration of the device in a format that can be copied and pasted via terminal in another device.	
Miscellaneous	enablebeep	Enable beep sound.	on
	enablecapslock	CapsLock to switch readmode Transparent/Hid.	on
	echochar	Echo character through serial comm.	on
	facreset	Returns all configuration to factory default.	
	upgradefirmware	Run the Bootloader to perform a firmware upgrade.	
	clear	To clear the terminal screen.	
	status	Status of the reader.	
	help	List all commands or display details of specific one.	

Public

3.4.5 Response messages to commands

Type	Message
Success	ok - command executed. ok - parameter has been changed. ok - parameter already has this value. ok - transparent mode off, resetting reader. !!! Factory Reset in action !!! The reader will be restarted. !!! Bootloader will be executed !!! The reader will be restarted.
Errors	error - command not found. error - too many args. error - value not supported for this RF Module. error - command not supported for this hardware. error - command not supported for this comm interface. error - value out of range. error - gen2 wrong parameters combination. error - internal buffer full. error - need a command to send.

Public

3.5 Configuration command descriptions

3.5.1 readmode

Syntax	readmode<CR> readmode value<CR>
Function	Check (no arguments) or change the mode of operation of the reader.
Description	The reader can work in Autonomous mode, with automatic tag readings, or in Transparent mode, where a software can have full control of the reader for tag reading and writing.
Values	hid - Keyboard emulation mode. serial - Serial communication mode, the read result is sent via serial communication on the USB virtual port. hidserial - Keyboard emulation mode and USB Serial, the reading result is sent via keyboard emulation and via serial communication on the USB virtual port. transparent - The reader must be controlled by a software that has full control to read and write tags.
Default	hid
Example	To get the current operation mode: readmode<CR> hid<CR> To change the mode of operation (Autonomous reporting via serial only): readmode serial<CR> ok - parameter has been changed.<CR>
Returns	"value"<CR> ok - parameter already has this value.<CR> ok - parameter has been changed.<CR> error - value out of range<CR> error - too many args.<CR>

Public

3.5.2 readpower

Note: The reading power directly influences the tags reading distance, the temperature at which the reader operates, and its power consumption. We recommend adjusting the reading power according to your specific application.

Syntax	readpower<CR> readpower value<CR>
Function	Check (no arguments) or change the read power in dBm.
Description	Tag reading distance is directly related with the reading power.
Values	0..27
Default	10
Example	To get the current reading power: readpower<CR> 10<CR> To change the reading power to 18 dBm: readpower 18<CR> ok - parameter has been changed.<CR>
Returns	"value"<CR> ok - parameter already has this value.<CR> ok - parameter has been changed.<CR> error - value out of range<CR> error - too many args.<CR>

Public

3.5.3 rfon

Note:

- The reading results are reported by the reader after the sum of the **RF On** and **RF Off** time periods.
- If the application requires reading multiple tags simultaneously, set **RF On** time to more than **250ms** to allow sufficient time to power up all tags within the readers field.

Syntax	rfon<CR> rfon value<CR>
Function	Check (no arguments) or change the read time in ms (milliseconds).
Description	The reading time is equivalent to the time when the reader transmits RF power to its antenna. When you have large number of tags to read at the same time, the reading time should be increased.
Values	50..5000
Default	250
Note	Tag reading results are reported by the reader after the sum rfon + rfoff time periods.
Example	To get the current reading period: rfon<CR> 250<CR> To change the reading time to 320ms: rfon 320<CR> ok - parameter has been changed.<CR>
Returns	"value"<CR> ok - parameter already has this value.<CR> ok - parameter has been changed.<CR> error - value out of range<CR> error - too many args.<CR>

Public

3.5.4 rfoff

Note: The reading results are reported by the reader after the sum of the **RF On** and **RF Off** time periods.

Syntax	rfoff<CR> rfoff value<CR>
Function	Check (no arguments) or change the period of RF idle in ms (milliseconds).
Description	This is the period of RF idle with no tag reading.
Values	0..1000
Default	250
Note	Tag reading results are reported by the reader after the sum rfon + rfoff periods.
Example	To get the current reading period: rfoff<CR> 250<CR> To change the RF idle to 0ms: rfoff 0<CR> ok - parameter has been changed.<CR>
Returns	"value"<CR> ok - parameter already has this value.<CR> ok - parameter has been changed.<CR> error - value out of range<CR> error - too many args.<CR>

3.5.5 gen2blf

Syntax	gen2blf<CR> gen2blf value<CR>
Function	Check (no arguments) or change the "Backscatter Link Frequency" parameter of the Gen2 air protocol.
Description	BLF is the data rate in KHz of transmission by air between a tag and the reader.
Values	250 320 640
Default	250
Note	By changing the BLF to 640 or 320 KHz, the tari value and tag encoding will automatically change to 6.25 us and fm0 respectively.
Example	To get the current BLF: gen2blf<CR> 250<CR> To change the BLF to 640Khz gen2blf 640<CR> ok - parameter has been changed.<CR>
Returns	"value"<CR> ok - parameter already has this value.<CR> ok - parameter has been changed.<CR> error - value out of range<CR> error - too many args.<CR> error - value not supported for this RF Module.<CR>

3.5.6 gen2tari

Note: The value of Tari should be combined with the value of BLF.

Syntax	gen2tari<CR> gen2tari value<CR>
Function	Check (no arguments) or change the "Tari" parameter of the Gen2 air protocol.
Description	Tari is the time in us (microseconds) of the pulse of each bit transmitted by the tag.
Values	6.25 12.5 25
Default	25
Note	Values 12.5 us and 25 us can only be set if the gen2blf is set to 250 KHz. The values 6.25 us and 12.5 us are supported only by the internal RF module micro-module type, which can be checked by rfidmodule command.
Example	To get the current Tari: gen2tari<CR> 25<CR> To change the Tari to 6.25Khz gen2tari 6.25<CR> ok - parameter has been changed.<CR>
Returns	"value"<CR> ok - parameter already has this value.<CR> ok - parameter has been changed.<CR> error - value out of range<CR> error - too many args.<CR> error - value not supported for this RF Module.<CR> error - gen2 wrong parameters combination.<CR>

3.5.7 gen2tagencoding

Syntax	gen2tagencoding<CR> gen2tagencoding value<CR>
Function	Check (no arguments) or change the "Tag data encoding" parameter of the Gen2 air protocol.
Description	It is the encoding format of the tag response.
Values	fm0 m2 m4 m8
Default	m4
Note	m2, m4 and m8 can only be configured if the blf is 250 KHz. fm0 has a low read sensitivity rate but a higher speed in decoding each bit. m8 has a high read sensitivity rate but a lower speed in decoding each bit.
Example	To get the current Tari: gen2tagencoding<CR> m4<CR> To change the Encoding format to FM0Khz gen2tagencoding FM0<CR> ok - parameter has been changed.<CR>
Returns	"value"<CR> ok - parameter already has this value.<CR> ok - parameter has been changed.<CR> error - value out of range<CR> error - too many args.<CR> error - value not supported for this RF Module.<CR> error - gen2 wrong parameters combination.<CR>

3.5.8 gen2session

Syntax	gen2session<CR> gen2session value<CR>
Function	Check (no arguments) or change the "Session" parameter the Gen2 air protocol inventory operation.
Description	In which session the reader will read the tag.
Values	s0 s1 s2 s3
Default	s1
Note	The combination of gen2session and gen2target values reflects the read rate of the same tag.
Example	To get the current Session: gen2session<CR> s1<CR> To change the Session to S0 gen2session s0<CR> ok - parameter has been changed.<CR>
Returns	"value"<CR> ok - parameter already has this value.<CR> ok - parameter has been changed.<CR> error - value out of range<CR> error - too many args.<CR>

Public

3.5.9 gen2target

Syntax	gen2target<CR> gen2target value<CR>
Function	Check (no arguments) or change the "Target", or Inventory Flag of the Gen2 air protocol.
Description	Which inventory flag (target), the reader should search for a tag.
Values	a b ab ba
Default	a
Note	The combination of gen2session and gen2target values reflects the read rate of the same tag.
Example	To get the current Target: gen2target<CR> a<CR> To change the Target to ab gen2target ab<CR> ok - parameter has been changed.<CR>
Returns	"value"<CR> ok - parameter already has this value.<CR> ok - parameter has been changed.<CR> error - value out of range<CR> error - too many args.<CR>

3.5.10 gen2q

Note: Use **gen2q** as **dynamic** if the quantity of tags in the reading field varies or is unknown.

Syntax	gen2q<CR> gen2q value<CR>
Function	Check (no arguments) or change the "Q" parameter of the Gen2 air protocol.
Description	It is a numeric value that the reader uses to regulate the probability of a tags response, used for anti-collision when multiple tags are in the readers reading field. 2^q equals the number of tags to be read at the same time.
Values	dynamic - The reader automatically adjusts the Q value during readings. 0..15 - Fixed value for 2^q number of tags in the reading field of the reader.
Default	dynamic
Note	If the number of tags to be read at the same time varies, leave the q value in dynamic, so the reader automatically adjusts the best value for each reading.
Example	To get the current Q value: gen2q<CR> dynamic<CR> To change the Q value to an estimated tag population of 8 tags. gen2q 3<CR> ok - parameter has been changed.<CR>
Returns	"value"<CR> ok - parameter already has this value.<CR> ok - parameter has been changed.<CR> error - value out of range<CR> error - too many args.<CR>

Public

3.5.11 gen2accesspassword

Note: To read the protected memory region of the tag (Reserved), the tags access password must be provided to the reader through this command.

Syntax	gen2accesspassword<CR> gen2accesspassword value<CR>
Function	Check (no arguments) or change the "Access password" of the tag.
Description	It is 32 bits length hexa number.
Values	00000000..ffffffff
Default	0
Note	To read the reserved memory bank of the tag with the tagop command, the password must be the same as the tag.
Example	To get the current access password: gen2accesspassword<CR> 00000000<CR> To change the access password to 12345678. gen2accesspassword 12345678<CR> ok - parameter has been changed.<CR>
Returns	"value"<CR> ok - parameter already has this value.<CR> ok - parameter has been changed.<CR> error - value out of range<CR> error - too many args.<CR>

Public

3.5.12 selectfilter

Syntax	selectfilter<CR> selectfilter value<CR>
Function	Check (no arguments) or set the Select filter tag using a mask value in a specific bank.
Description	This filter allows you to specify which tags should respond in an inventory. This feature allows you to isolate specific tags in large population. Tags that do not match the specified filter will not transmit a response, which greatly reduces the amount of RF traffic.
Values	res:mask:bp:bl - Reserved bank.* epc:mask:bp:bl - EPC bank.* tid:mask:bp:bl - TID bank.* user:mask:bp:bl - User bank.* none - No Select filter. * mask - mask value [hexa], bp - bit pointer, bl - bit length, max 96.
Default	none
Example	To get the current Select filter: selectfilter<CR> none<CR> To read only tags with EPC id starting with 0xAC01: selectfilter epc:AC01:32:16 ok - parameter has been changed.<CR>
Returns	"value"<CR> ok - parameter already has this value.<CR> ok - parameter has been changed.<CR> error - value out of range<CR> error - too many args.<CR>

Public

3.5.13 initreadtag

Syntax	initreadtag<CR> initreadtag value<CR>
Function	Check (no arguments) or set the read tag state (on/off) of the reader when it is initialized.
Description	The reader can always be preset to have the RF signal either turned off or turned on when initialized.
Values	on off
Default	on
Example	To check the initreadtag value: initreadtag<CR> on<CR> To disable the reader (RF signal) when it is initialized: initreadtag off<CR> ok - parameter has been changed.<CR>
Returns	"value"<CR> ok - parameter already has this value.<CR> ok - parameter has been changed.<CR> error - value out of range<CR> error - too many args.<CR>

Public

3.5.14 readtag

Syntax	readtag<CR> readtag value<CR>
Function	Check (no arguments) or turn RF on/off.
Description	Enables or disables tag reading by turning off the readers RF signal.
Values	on - Enables tag reading, RF on. off - Disables tag reading, RF idle.
Default	Depends on how initreadtag is setup. Volatile data.
Note	RF on/off can be toggled by pressing 2x fast the CapsLock key, the enablecapslock must be set to on.
Example	To check the current value: readtag<CR> on<CR> To change the RF to idle: readtag off<CR> ok - parameter has been changed.<CR>
Returns	"value"<CR> ok - parameter already has this value.<CR> ok - parameter has been changed.<CR> error - value out of range<CR> error - too many args.<CR>

3.5.15 tagtimeout

Syntax	tagtimeout<CR> tagtimeout value<CR>
Function	Check (no arguments) or change the reading interval time in milliseconds (ms) for the same reported tag (same EPC filter).
Description	With this time filter it is possible to manipulate the same tag read rate.
Values	0..300000 (time in milliseconds)
Default	0 ms
Example	To check the reading interval time of the same tag: tagtimeout<CR> 1000<CR> To change the reading interval time of the same tag to 500 ms (0.5 s): tagtimeout 500<CR> ok - parameter has been changed.<CR>
Returns	"value"<CR> ok - parameter already has this value.<CR> ok - parameter has been changed.<CR> error - value out of range<CR> error - too many args.<CR>

Public

3.5.16 rssifilter

Note: The filter based on the tags RSSI value is used to restrict undesired reading areas around the reader. It should always be used in conjunction with the reading power.

Syntax	rssifilter<CR> rssifilter value<CR>
Function	Check (no arguments) or change the cutoff value of the RSSI filter for reading.
Description	The signal level of the tag indicates whether the tag is near or away from the antenna, when closer to the antenna, the stronger the RSSI (closer to zero) and vice versa. If a value is specified for the filter, only tags with RSSI equal to or greater than that specified will be reported by the reader. The signal level of the tag is measured in dBm and is a negative value, for example, the power in Watts is always less than 1mW.
Values	0..99
Default	0
Notes	To disable the filter, write the value 0. The specified value should not contain the minus sign.
Example	To check the RSSI filter value: rssifilter<CR> 0<CR> To change the RSSI filter value to 45: rssifilter 45<CR> ok - parameter has been changed.<CR>
Returns	"value"<CR> ok - parameter already has this value.<CR> ok - parameter has been changed.<CR> error - value out of range<CR> error - too many args.<CR>

Public

3.5.17 tagop

Syntax	tagop<CR> tagop value<CR>
Function	Check (no arguments) or change the tag read operation.
Description	With the tag read operation, it is possible to read any memory bank of the tag.
Values	none - No memory bank read operation. autoid - Reads Acura Autoid System tags. reserved:wp:wl - Reads the Reserved memory bank of the tag. epc:wp:wl - Reads the EPC memory bank of the tag. tid:wp:wl - Reads the TID memory bank of the tag. user:wp:wl - Reads the USER memory bank of the tag.
Default	none
Note	wp - word pointer, indicates the initial word (16 bits) read position in the specified memory bank. wl - word length, indicates the number of words to read in the specified memory bank. Maximum value for wp and wl is 32. To read the entire memory bank, simply specify zero for wp and wl.
Example	To read all the contents of the User memory bank of the tag: tagop user:0:0<CR> ok - parameter has been changed.<CR> To read four words of the Tid memory bank from the second word: tagop tid:2:4<CR> ok - parameter has been changed.<CR> To not read any specific tag memory bank, just the EPC number: tagop none<CR> ok - parameter has been changed.<CR>
Returns	ok - parameter already has this value.<CR> ok - parameter has been changed.<CR> error - value out of range<CR> error - too many args.<CR>

Public

3.5.18 reportonlytagopok

Syntax	reportonlytagopok <CR> reportonlytagopok value<CR>
Function	Check (no arguments) or set the choice of report only if the tagop was successfully executed.
Description	This command is used to force the reader to send only the results when the tagop command is executed successfully.
Values	on off
Default	off
Note	This has effect only if the command tagop is other than none.
Example	To check the reportonlytagopok value: reportonlytagopok <CR> off<CR> To change the value to set the reportonlytagopok on: reportonlytagopok on <CR> ok - parameter has been changed.<CR>
Returns	ok - parameter already has this value.<CR> ok - parameter has been changed.<CR> error - value out of range<CR> error - too many args.<CR>

3.5.19 epcdecode

Syntax	epcdecode<CR> epcdecode value<CR>
Function	Check (no arguments) or change the type of decodification will be used to process the EPC id of the tag.
Description	The tag to be read can be encoded for a specific application; for example, in checkout applications, the tag will be encoded using the GS1 standard, while in maintenance applications, the tag may be encoded using the ASCII table. The EPCID decoding provides a readable result for each respective application.
Values	none - No decoding is performed and the epcid result of the tag is reported in hexadecimal. gs1string - GS1 standard, that returns the "GS1 element string". gs1epcuri - GS1 standard, that returns the "EPC Tag URI". gs1epcpureuri - GS1 standard, that returns the "EPC Pure Identity URI". gs1gtin13 - GS1 standard, that returns code GTIN13 without the serial number. gs1sgtin13 - GS1 standard, that returns code GTIN13 + serial number. gs1crystal - Crystal custom standard, that returns GTIN13 + RFID + serial 12. ascii - Decodes the EPCID of the tag according to the Ascii table. wiegand26 - Decodes the last 3 bytes of tag EPCID in Sitecode + ID. magstripe - Decodes the last 4 bytes of the EPCID of the tag in decimal. decimal:dp:dl - Decimal value of EPC split range of dp:dl. mid:dp:dl - Substring of EPC in hexadecimal. Max of 64 digits.
Default	None
Note	For the GS1 standard, the sgtin-96 and sgtin-198 schemes are supported. The wiegand26 and magstripe values can be used in conjunction with the autoid type tagop. If the reader is set to a specific epcdecode type and the tag being reading has a wrong format, a beep sound pattern different from the read sound pattern is executed by the reader. dp - digit pointer, indicates the initial digit to read in the EPC. dl - digit length, indicates the number of digits to read in the EPC. Maximum value for dl is 64.
Example	To read the GTIN13 + serial number of a tag encoded using the GS1 standard: epcdecode gs1sgtin13<CR> ok - parameter has been changed.<CR> To read the GS1 element string of a tag encoded using the GS1 standard: epcdecode gs1string<CR> ok - parameter has been changed.<CR>
Returns	ok - parameter already has this value.<CR> ok - parameter has been changed.<CR> error - value out of range<CR> error - too many args.<CR>

Public

3.5.20 separator

Note: The separator character, along with the end-of-line, should be used to split the result string by the software that will receive this string.

Syntax	separator<CR> separator value<CR>
Function	Check (no arguments) or change the separation character of the fields of the reading result of a tag.
Description	It is a character that separates the fields in the tag reading result string.
Values	space To have a space as a separator. ‘char’ Any readable character in the Ascii table.
Default	' ' (space)
Notes	For space, you must write space as a value for the command.
Example	To check the separator: separator<CR> space<CR> To change the tab to '|': separator |<CR> ok - parameter has been changed.<CR>
Returns	ok - parameter already has this value.<CR> ok - parameter has been changed.<CR> error - value out of range<CR> error - too many args.<CR>

3.5.21 endofline

Note: The separator character, along with the end-of-line, should be used to split the result string by the software that will receive this string.

Syntax	endofline<CR> endofline value<CR>
Function	Check (no arguments) or change the end-of-line character.
Description	Get (no arguments) or set the endofline for tag reads report string.
Values	windows:qt Windows standard end-of-line <CR><LF>. unix:qt Unix standard end-of-line <LF>. macintosh:qt macOS standard end-of-line <CR>. tab:qt The end-of-line will be the tabulation character Tab. none No end-of-line in the result string.
Default	windows
Notes	qt - Number of end-of-line repetitions, values 1 to 10. If :qt is omitted, it is considered only one end of line.
Example	To check which end-of-line is configured: endofline<CR> windows<CR> To change the end of line to Tab and repeat 3 times: endofine tab:3<CR> ok - parameter has been changed.<CR> To change the end-of-line to Windows and repeat it 5 times: endofline windows:5<CR> ok - parameter has been changed.<CR>
Returns	ok - parameter already has this value.<CR> ok - parameter has been changed.<CR> error - value out of range<CR> error - too many args.<CR>

Public

3.5.22 keystrokespeed

Note: This value should only be changed if the Host that will receive the result string via keyboard emulation experiences issues due to the typing speed exerted by the reader.

Syntax	keystrokespeed<CR> keystrokespeed value<CR>
Function	Check (no arguments) or change the typing speed of the keyboard emulation.
Description	The typing speed in keyboard emulation, when readmode is as hid or hidserial, can be changed to three different values (fast, medium, and slow).
Values	fast Keystroke at fast speed, T=4ms. medium Keystroke at medium speed, T=32ms. slow Keystroke at slow speed, T=64ms.
Default	fast
Example	To check the typing speed: keystrokespeed<CR> fast<CR> To change to slow speed: keystrokespeed slow<CR> ok - parameter has been changed.<CR>
Returns	ok - parameter already has this value.<CR> ok - parameter has been changed.<CR> error - value out of range<CR> error - too many args.<CR>

Public

3.5.23 keyboardlayout

Syntax	keyboardlayout<CR> keyboardlayout value<CR>
Function	Check (no arguments) or change the keyboard layout when the readmode is hid or hidserial (wedge emulation).
Description	Select the keyboard layout for use with the reader when it is configured to emulate a keyboard. This ensures that characters and letters follow the defined layout.
Values	english_us English (United States). portuguese_br Portuguese (Brazil). spanish_latam Spanish (Latim America)
Default	english_us
Example	To check the keyboard layout: keyboardlayout <CR> english_us<CR> To change to brazilian layout: keyboardlayout portuguese_br<CR> ok - parameter has been changed.<CR>
Returns	ok - parameter already has this value.<CR> ok - parameter has been changed.<CR> error - value out of range<CR> error - too many args.<CR>

3.5.24 lettercase

Command	lettercase<CR> lettercase value<CR>
Function	Get (no arguments) or set the letter case, both for keyboard emulation and serial interface.
Description	Force the letter case when using serial and/or hid mode.
Values	none uppercase lowercase
Default	none
Notes	For keyboard emulation the physical caps-lock/shift key will overwrite this configuration.
Example	To check the value: lettercase <CR> none<CR> To change the value to reporte only uppercase: lettercase uppercase <CR> ok - parameter has been changed.<CR>
Returns	ok - parameter already has this value.<CR> ok - parameter has been changed.<CR> error - value out of range<CR> error - too many args.<CR>

Public

3.5.25 delayhid

Command	delayhid<CR> delayhid value<CR>
Function	Get (no arguments) or set the delay in ms between multiple transmission via keyboard emulation.
Description	It is used to delay the transmissions via hid when multiple tags are read.
Values	0..1000 (time in milliseconds) (0..1s)
Default	0 ms
Example	To check the current delay: delayhid<CR> 0<CR> To change the delay to 500 ms (0.5 s): delayhid 500<CR> ok - parameter has been changed.<CR>
Returns	"value"<CR> ok - parameter already has this value.<CR> ok - parameter has been changed.<CR> error - value out of range<CR> error - too many args.<CR>

Public

3.5.26 reportrssi

Command	reportrssi<CR> reportrssi value<CR>
Function	Check (no arguments) or change the transmission of the RSSI value from the read tag.
Description	Enables or disables sending the RSSI value of the tag read in the result string.
Values	on off
Default	off
Notes	The RSSI value is reported with the negative sign '-'.
Example	To check the value: reportrssi<CR> off<CR> To change the value to include the RSSI value in the result string: reportrssi on<CR> ok - parameter has been changed.<CR>
Returns	ok - parameter already has this value.<CR> ok - parameter has been changed.<CR> error - value out of range<CR> error - too many args.<CR>

3.5.27 reportantenna

Command	reportantenna<CR> reportantenna value<CR>
Function	Check (no arguments) or change the transmission of the antenna from the read tag.
Description	Enables or disables sending the antenna the tag was read in the result string.
Values	on off
Default	off
Example	To check the value: reportrssi<CR> off<CR> To change the value to include the RSSI value in the result string: reportrssi on<CR> ok - parameter has been changed.<CR>
Returns	ok - parameter already has this value.<CR> ok - parameter has been changed.<CR> error - value out of range<CR> error - too many args.<CR>

3.5.28 reportreadcount

Syntax	reportreadcount<CR> reportreadcount value<CR>
Function	Check (no arguments) or change the transmission of the tags read quantity.
Description	Enables or disables the transmission of the tags read quantity during the "rfon" period in the result string.
Values	on off
Default	off
Notes	The maximum value for the read quantity is 255.
Example	To check the value: reportreadcount<CR> off<CR> To change the value to include the read quantity in the result string: reportreadcount on<CR> ok - parameter has been changed.<CR>
Returns	ok - parameter already has this value.<CR> ok - parameter has been changed.<CR> error - value out of range<CR> error - too many args.<CR>

3.5.29 summary

Syntax	summary<CR>
Function	Lists all the values configured in the reader.
Errors	error - too many args.<CR>

3.5.30 temperature

Syntax	temperature<CR>
Function	Check (no arguments) the internal temperature of the reader in Celsius degree.
Errors	error - too many args.<CR>

3.5.31 version

Syntax	version<CR>
Function	Get (no arguments) the processor firmware version.
Errors	error - too many args.<CR>

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3.5.32 rfidversion

Syntax	rfidversion<CR>
Function	Get (no arguments) the RFID firmware version.
Errors	error - too many args.<CR>

3.5.33 rfidmodule

Syntax	rfidmodule<CR>
Function	Get (no arguments) the RFID module type.
Errors	error - too many args.<CR>

3.5.34 rfidregion

Note: The readers regional configuration is established within the firmware.

Syntax	rfidregion<CR>
Function	Get (no arguments) the current RFID region.
Errors	error - too many args.<CR>

3.5.35 serialnumber

Syntax	serialnumber<CR>
Function	Get (no arguments) the reader serial number.
Errors	error - too many args.<CR>

3.5.36 dumpconfig

Syntax	dumpconfig<CR>
Function	Lists all the current configuration of the device in a format that can be copied and pasted via terminal in another device.
Description	This command can compile a list of the present reader configurations, streamlining the process of archiving or duplicating them across other readers with greater efficiency.
Errors	error - too many args.<CR>

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3.5.37 enablebeep

Syntax	enablebeep<CR> enablebeep value<CR>
Function	Check (no arguments) or change the beep with each reading of the tag.
Description	Enables or disables beeping with each tag reading.
Values	on off
Default	on
Example	To check the value: enablebeep<CR > off<CR> To turn off the tag read alert sound: enablebeep off<CR> ok - parameter has been changed.<CR>
Returns	ok - parameter already has this value.<CR> ok - parameter has been changed.<CR> error - value out of range<CR> error - too many args.<CR>

3.5.38 enablecapslock

Note: For more details on changing the readers operating mode, please refer to **Switching between Autonomous and Transparent modes**.

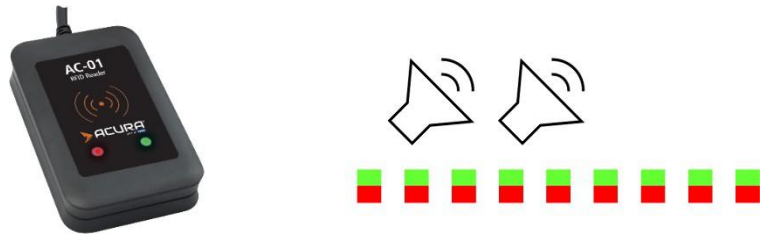
Syntax	enablecapslock<CR> enablecapslock value<CR>
Function	Check (no arguments) or change the use of the shortcut to change read mode.
Description	Enables or disables the use of the CapsLock 5x quick-type key, to switch between Autonomous and Transparent modes.
Values	on off
Default	on
Notes	This feature only works on Windows and Linux operating systems. An alternative to exit Transparent mode is to send the command $ off<CR> to the reader.
Example	To check the value: enablecapslock<CR> off<CR> To change the value to disable shortcut use: enablecapslock on<CR> ok - parameter has been changed.<CR>
Returns	ok - parameter already has this value.<CR> ok - parameter has been changed.<CR> error - value out of range<CR> error - too many args.<CR>

3.5.39 echochar

Syntax	echochar<CR> echochar value<CR>
Function	Check (no arguments) or turn echo on/off.
Description	Enables or disables the echo of each byte sent by serial communication in Autonomous mode.
Values	on off
Default	on
Notes	When configured to off" typing in terminal software will not appear unless character echoing is set up in the terminal software. It is recommended to turn off the echochar when custom developed software will send the ASCII commands to the reader.
Example	To check the value: echochar<CR> on<CR> To disable the echo of sent bytes: echochar off<CR> ok - parameter has been changed.<CR>
Returns	ok - parameter already has this value.<CR> ok - parameter has been changed.<CR> error - value out of range<CR> error - too many args.<CR>

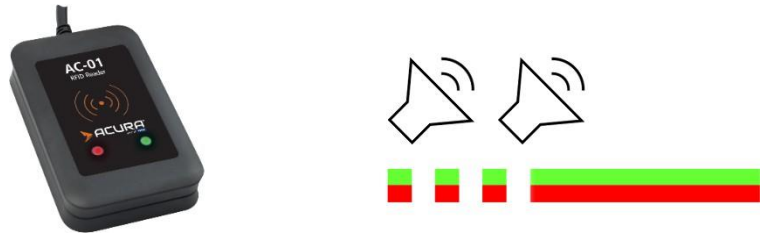
3.5.40 facreset

Syntax	facreset<CR>
Function	Returns all values to the factory default.
Errors	error - too many args.<CR>

	Beep, Green and Red LEDs flash rapidly simultaneously for five seconds to indicate that it is in the factory reset process.

3.5.41 upgradefirmware

Syntax	upgradefirmware<CR>
Function	Starts the reader firmware update process.
Example	To check the commands accepted by the reader: help<CR> command list... <CR> upgradefirmware !!! Bootloader will be executed!!! The reader will be restarted.
Errors	error - too many args.<CR>

	Beep, Green and Red LEDs flash rapidly three times, and then both LEDs are solid, to indicate the bootloader execution.

3.5.42 help

Syntax	help<CR> help value<CR>
Function	Lists all commands (no arguments) or provides detailed help for the given command.
Description	For detailed help on a particular command just type: "help command<CR>".
Example	To check the commands accepted by the reader: help<CR> command list... <CR> For detailed help on the tagop command: help tagop<CR> Command: tagop arg<CR> Description: Get (no arguments) or set the read tag operation.<CR> Arguments: reserved:wp:wl Reserved bank.*<CR> epc:wp:wl EPC bank.*<CR> tid:wp:wl TID bank.*<CR> user:wp:wl User bank.*<CR> autoid Acura Autoid tags.<CR> pa Artefato SJ5511 tags.<CR> none No tagop.<CR> * wp - word pointer, wl - word length, max 32, membank:0:0 entire bank Default: none<CR>
Returns	ok - parameter already has this value.<CR> ok - parameter has been changed.<CR> error - value out of range<CR> error - too many args.<CR>

3.6 Switching between Autonomous and Transparent modes

The following options can be used for changing the operation mode of the reader:

3.6.1 Use the readmode command

Example:

> **Note:** When in Transparent mode, the reader does not echo the characters typed in the serial terminal.

1. The reader is in Autonomous mode, and the command **readmode transparent<CR>** is sent. The reader enters Transparent mode of operation.
2. The reader is in Transparent mode and the command **$ off<CR>** is sent. The reader enters Autonomous mode with hid interface.

3.6.2 Use the Caps Lock key (Windows and Linux only)

Example:

> **Important: Using the Caps Lock shortcut for changing the operating mode will only works if the readers serial port is not connected (not being used by any software).**

1. Close any serial communication with the reader.
2. To switch between one operating mode and another, **quickly click the Caps Lock key five times**, and check the readers LEDs to see the change.

   > **Note:** The command **enablecapslock** enables or disables this function. To use it, **enablecapslock** must be on.

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3.7 Read rate of the same tag

To control the read rate, it is recommended to use the **tagtimeout** command.

The read rate of the same tag can be controlled through the following commands:

- **gen2session**
- **gen2target**
- **rfon**
- **rfoff**
- **tagtimeout**

The listed commands, with the exception of **tagtimeout**, change the parameters of the UHF EPC Gen2 air protocol, and influence the communication between the tag and reader.

Combinations of values for the Session and Target of the tag reflect how often a tag that has already responded to an inventory will respond again.

Examples:

a. I would like to read the EPC id of a tag only once, and I do not want the same EPC id to be repeated while the tag is in the reading field.
   Configure it as follows:
   gen2session s2<CR>
   gen2target a<CR>
b. I would like to read the same tag again and again while it is in the reading field.
   Configure it as follows:
   gen2session s0<CR>
   gen2target ab<CR>
   In this case, what will determine the read repetition rate are the **rfon** and **rfoff** commands, meaning the total time will dictate the repetition rate.
   The highest possible read repetition rate is every 50ms:
   rfon 50<CR>
   rfoff 0<CR>

The read rate of the same tag can also be tweaked through the **tagtimeout** command. This command acts as a filter for tag reading, unlike the EPC Gen2 commands (Session and Target) mentioned above, which are part of the air protocol definition.

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The **tagtimeout** command ranges from 0 to 300000 ms, up to 5 minutes. During this time, the same tag EPC id will not be reported by the reader again, even if it remains in the reading field.

Example:

- I would like to read the tag and only be able to read it again after 20 seconds. Configure the reader as follows:
  tagtimeout 20000<CR>
  gen2session s0<CR>
  gen2target ab<CR>

> **Note:** An important point is that depending on the Session and Target configurations in the reader, the tag response time can override the time defined in **tagtimeout**.

Example:

- I would like to configure the tagtimeout to 1 second, but I will keep the UHF Gen2 configuration as Session 2.
  tagtimeout 1000<CR>
  gen2session s2<CR>
  gen2target a<CR>

> **Important: The tag read rate can be much faster than the rate at which results are sent through keyboard emulation (HID). If a high reading rate is chosen, and the chosen interface is keyboard emulation, the reader will store the reading result and continue sending it even after the tag is removed from the reading field.**

3.8 Use cases - Autonomous mode

The following are examples of using and applying the reader, with details of the configuration commands used.

3.8.1 Checkout – GS1/EAN standard

For applications that use UHF EPC Gen2 tags encoded according to the GS1 EPC Tag Data Standards (TDS) 1.11 standard, the reader can be used and supports the following tag encodings:

- **sgtin-96**
- **sgtin-198**

Is an encoding scheme that stands for Serialized Global Trade Identification Number and is sometimes called a serialized GTIN. The 96 in the name refers to the number of bits in the final EPC binary form.

If you need alphanumeric characters in the serial numbers, SGTIN-198 must be used. This means that you must use RFID tags with higher capacity in the EPC memory, than if you use the SGTIN-96.

The results of reading the encoded tag can be sent in the following formats:

- **GS1 element string**, example "(01)03608449920322(21)1540341";
- **EPC Tag URI**, example "urn:epc:tag:sgtin-96:1.360844.0992032.1540341";
- **EPC Pure Identity URI**, example "urn:epc:id:sgtin:360844.0992032.1540341";
- **GTIN13 without the serial number**, example "3608449920322";
- **GTIN13 + serial number**, example "3608449920322 1540341";

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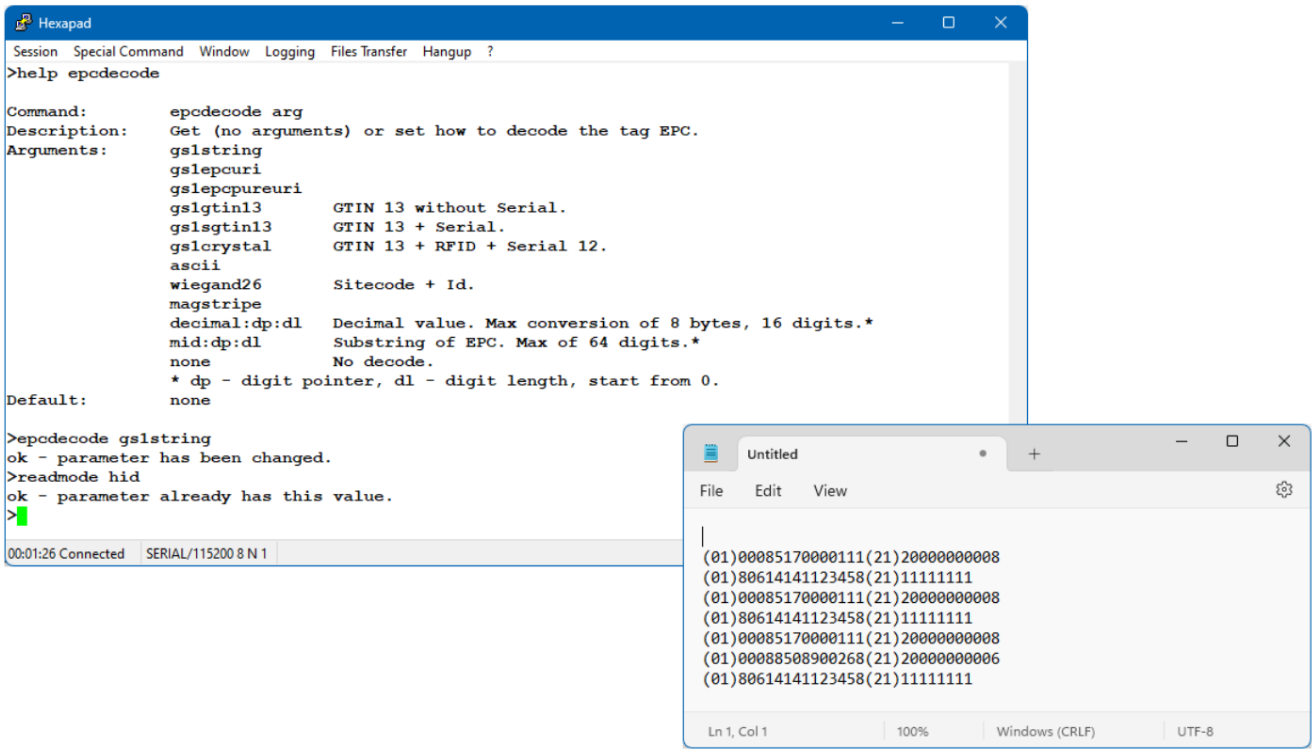
3.8.2 Read tag encoded in SGTIN-96/198 and show result in GS1 element string format

Configure the reader as follows:

epcdecode gs1string<CR>

(to decode sgtin-96 or sgtin-198 and send in GS1 element string format)

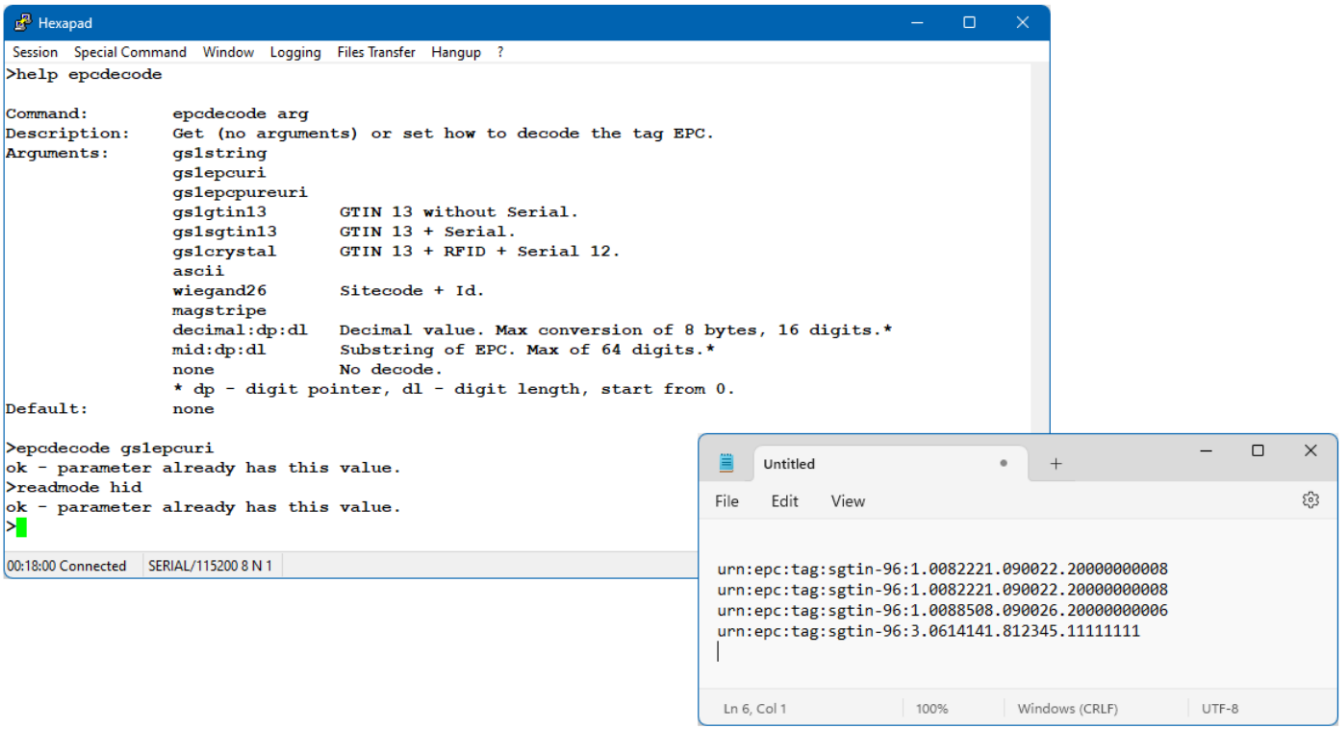


3.8.3 Read tag encoded in SGTIN-96/198 and show result in EPC Tag URI format

Configure the reader as follows:

epcdecode gs1epcuri<CR>

(to decode sgtin-96 or sgtin-198 and send in EPC Tag URI format)



For the other formats use the **epcdecode** command with the equivalent format that can be checked in **Configuration commands > epcdecode**.

> **Note:** The keyboard/language layout configured in the Operating System can change the "**:**" character of the result string of the epcdecode type **gs1epcuri** and **gs1pureepcuri**.

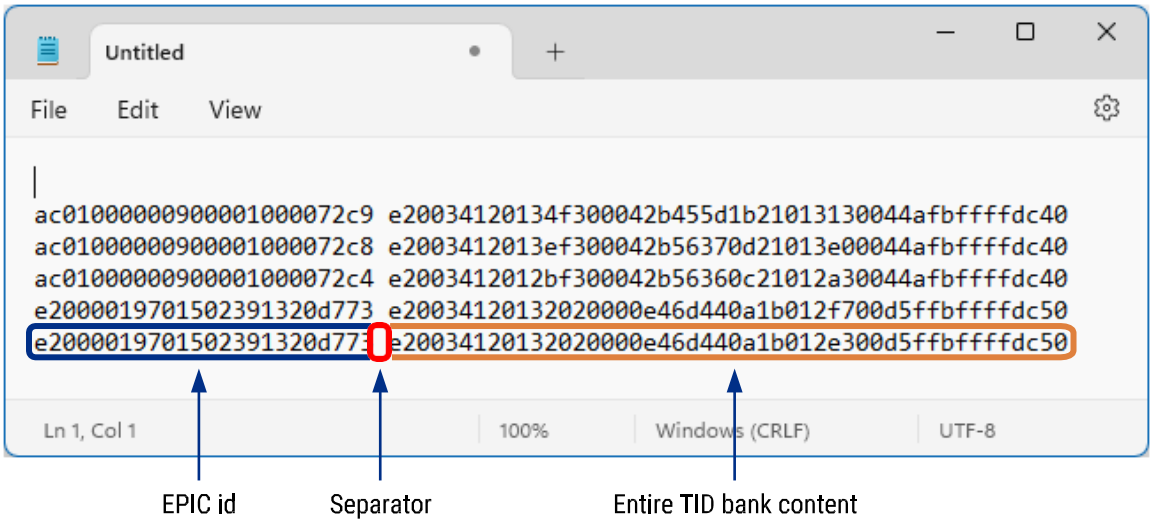
3.8.4 Read TID memory bank and EPC id

The readers are able to read any memory bank of the EPC Gen2 tag, (reserved, EPC, TID and user memory). Configure using the **tagop** command in whichever database you desire to read, along with the initial position and the size of the data (in word) that you want to read.

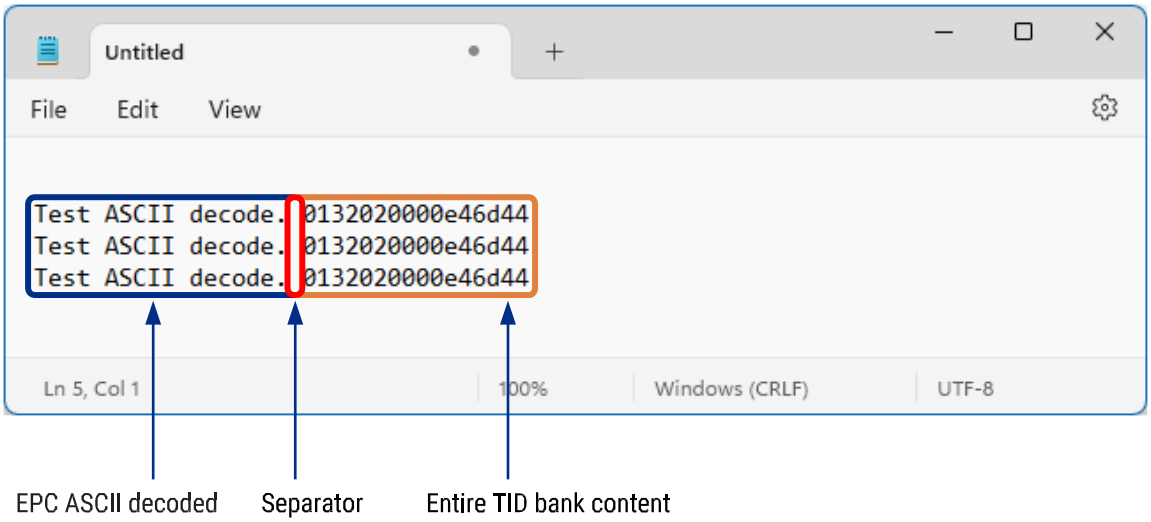
The syntax of the **tagop** command is explained in detail in the **tagop** section.

For example:

1. Read the entire TID bank of the tag plus the EPC id in hexa:
   tagop tid:0:0<CR>
   epcdecode none<CR>
   Example of reading two tags with different sizes from the TID bank:



2. Read from the TID bank 4 words skipping the first 2 words and decoding the EPC id by the ASCII table:
   tagop tid:2:4<CR>
   epcdecode ascii<CR>
   Example of reading two different tags:



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In addition to TID bank, RESERVED, USER, and EPC banks can also be read in conjunction with the EPC tag id.

Note:
- The count unit in the EPC Gen2 standard is **word**, which is equivalent to 2 bytes or 16 bits.
- For the RESERVED bank, if the tag has an access password other than 0x00000000, the tags password must be configured in the reader using the **gen2accesspassword** command.
- More details of commands in **Configuration commands**.

3.9 Reader - Transparent mode

In Transparent mode, the reader starts to respond through the serial to a software developed using the Mercury API, which is a library package for C#/.Net, Java and C languages. With this development package, it is possible to develop software that can have full control of the reader, for reading and writing UHF EPC Gen2 tags (ISO 18000-6C) and UHF EPC Gen2 V2 (ISO 18000-63).

Visual feedback from the reader when in Transparent mode:

	Green LED flashes slowly, and the red LED is turned off.

The default operation mode of the reader is the Autonomous mode, to change to Transparent mode please refer to **Switching between Autonomous and Transparent modes**.

3.9.1 readmode

The readers red LED and buzzer are controlled by the users software through the manipulation of two available GPIOs in MercuryAPI. For more details, refer to **Controlling the LED and Beep**.

Communication between the user software and the reader is conducted through a serial port created by the operating system when the reader is connected via USB. To identify this port, please refer to section **Turning on the reader**.

3.9.2 Software programming and development

For software development, it is necessary to use the MercuryAPI SDK.

The latest recommended version for development can be found at:

https://drive.google.com/drive/folders/1AOXUCQPtyAfcvyUeZf2gsHyLh3vfAEsf?usp=drive_link

In the API file package, there are numerous examples and source code in all supported languages. This development package has no additional cost and is open-source.

The complete API documentation is also available at the same link.

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3.9.3 Demo software – Universal Reader Assistant (URA)

The reader in Transparent mode can be tested using the Jadak Universal Reader Assistant software. The software download and its manual are available at:

https://drive.google.com/drive/folders/1SsEdqQSkHQI_n-WqaQb7Kx8oi2INgzj2?usp=drive_link

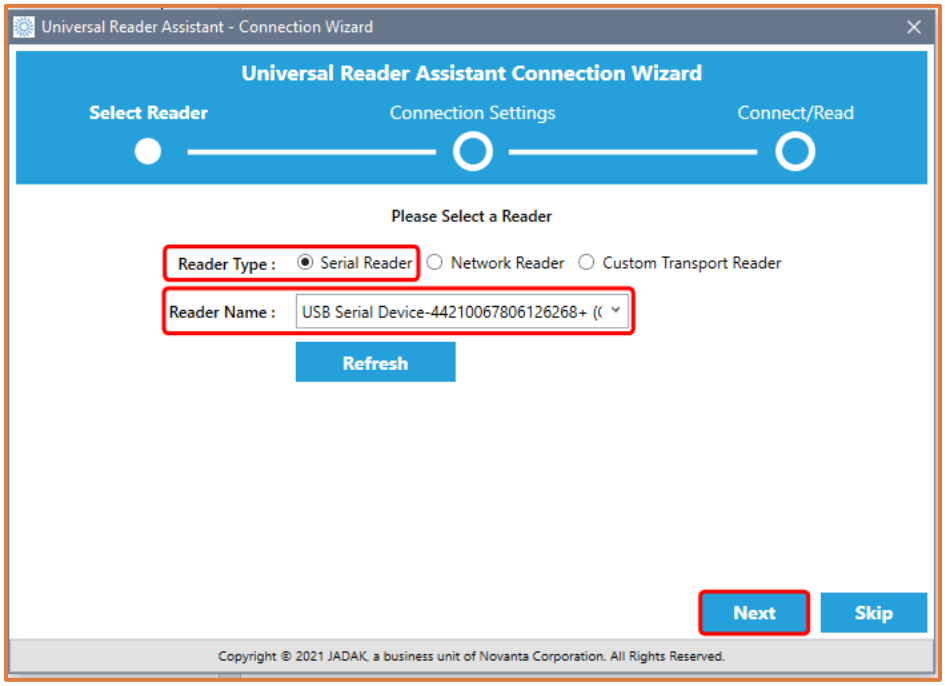
3.9.4 Demo software instructions

> **Note:** Ensure that the reader is set to Transparent mode. Please refer to **Reader - Transparent mode**.

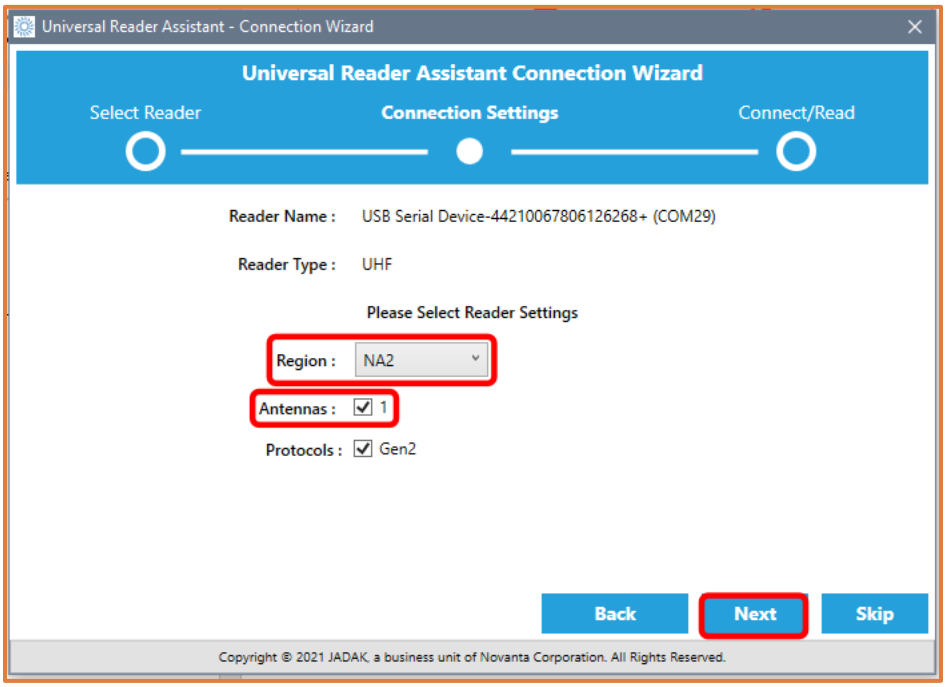
1. Launch the Universal Reader Assistant.

   > **Note:** The software will automatically identify the device connected to your computer.

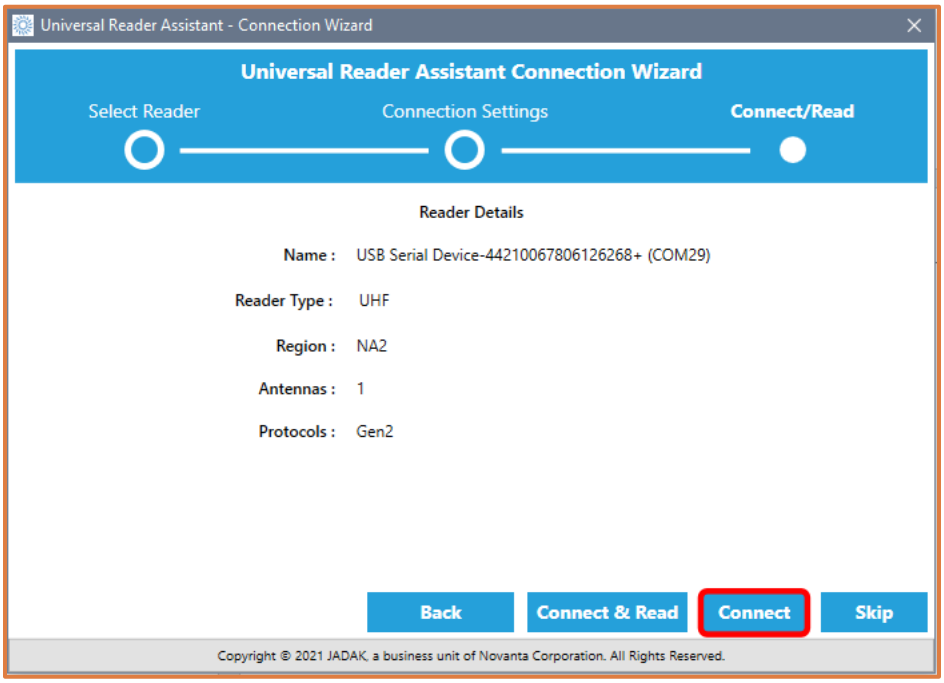
2. Click **Next**.



3. Select **Region** and **Antennas**.
4. Click **Next**.



5. Click **Connect**.



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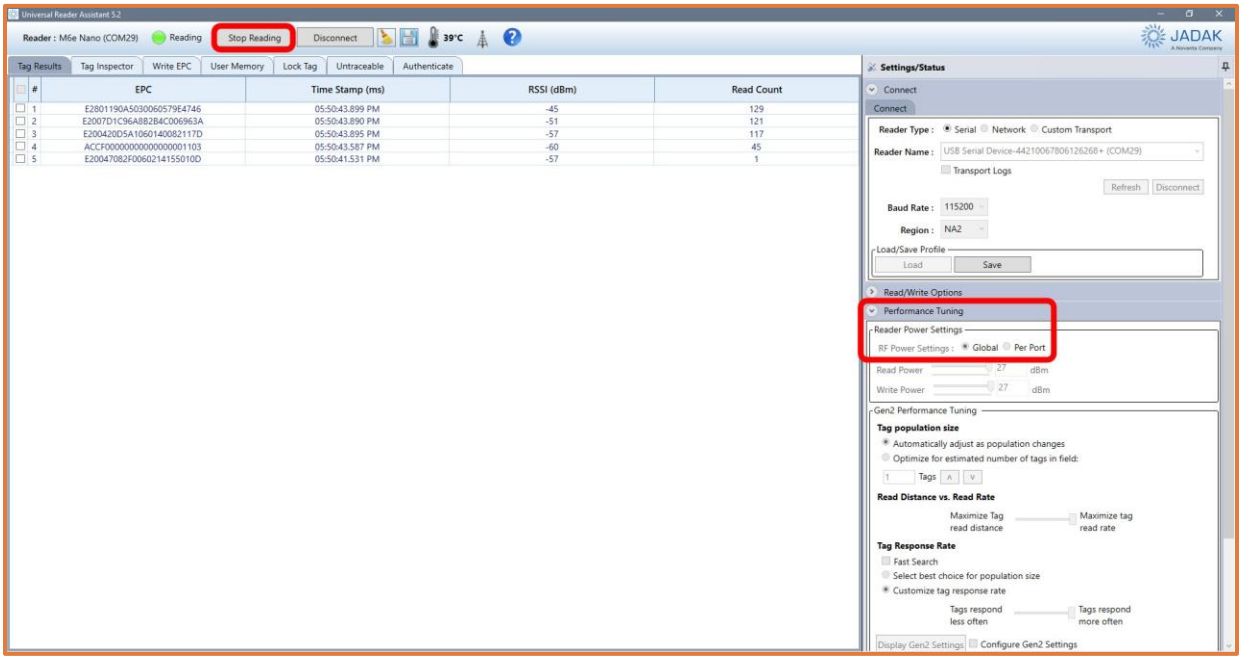
6. In **Performance Tuning** select the **RF Power Setting**.
7. Click **Read** to start the data readings.



3.10 Controlling the LED and Beep

In Transparent mode, control of the red LED and the beep should be managed by the users software using the MercuryAPI.

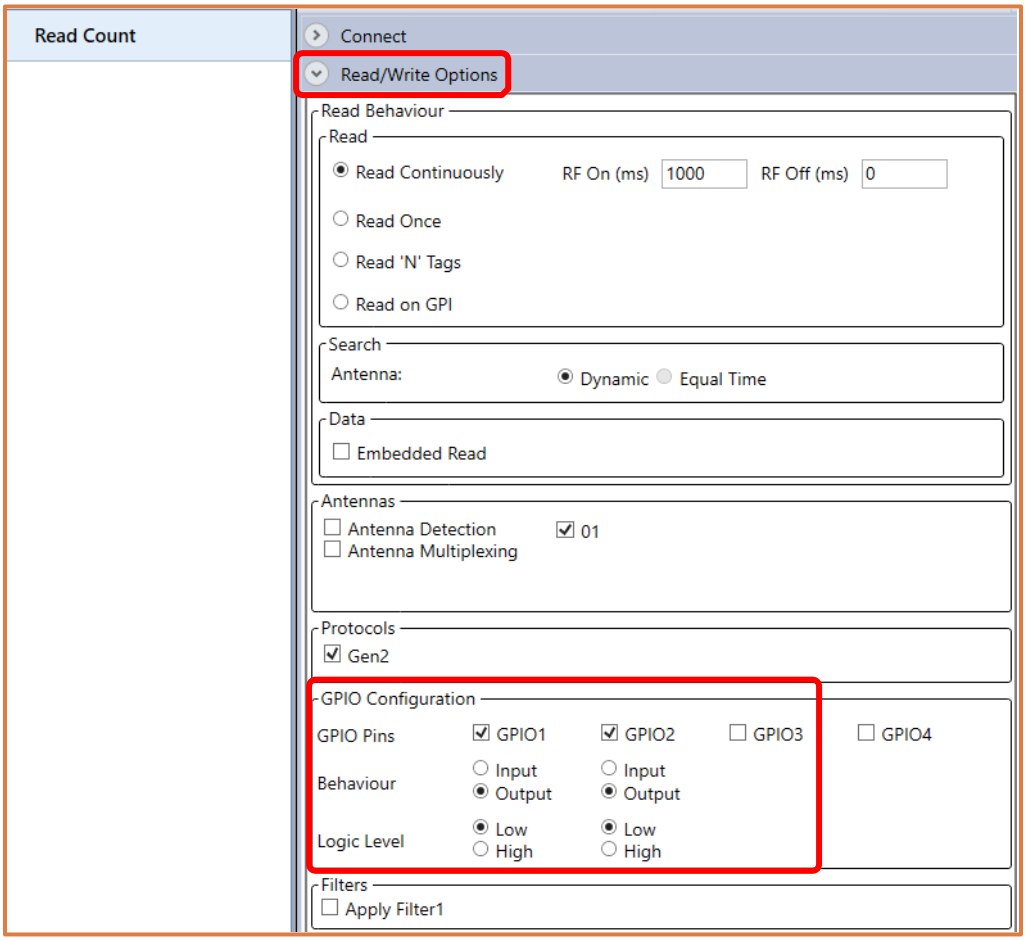
> **Note:** In the MercuryAPI file package for all languages, there is an example for manipulating the readers GPIO called "**gpiocommands.**"

The usage map for the respective GPIOs:

Output	Type feedback	Drive (on)
GPIO1	Red LED	High
GPIO2	Beep	High

Using the URA for controlling the red LED and beep of the reader in Transparent mode:

1. Expand the **Read/Write Options** to access the configuration menu.
2. In **GPIO Configuration** check **GPIO Pins GPIO1** (for the LED) and **GPIO2** (for the buzzer).
3. In **Behavior** set to **Output**.
4. The **Logic Level** when set to **Low**, causes the LED or buzzer to **turn off**. Setting the **Logic Level** to **High**, causes the LED or buzzer to **turn on**.



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Revision history

Date	Description	Revision
August 2025	Two new sections added: lettercase, and delayhid.	A.1
February 2024	Initial release.	A.0

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