

Cloudburst

SW Cloudburst

USER MANUAL

Software Version 2.1.0

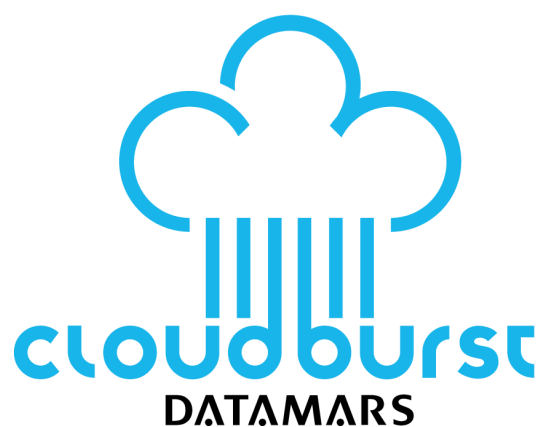


Table of contents

1	Introduction	3
2	Getting started with Cloudburst	4
2.1	Connection through the Ethernet interface	4
2.2	Installation of Cloudburst on the Speedway Revolution Reader	6
2.3	Access Cloudburst Web GUI and first reading	9
2.4	Cloudburst license.....	12
3	Network configuration	13
4	Web GUI description	14
5	Operating modes.....	15
6	Interfacing Cloudburst	16
6.1	Cloudburst messages and data	16
6.2	Physical interfaces.....	17
6.3	Protocols and data formats available over the physical interfaces	17
6.4	JSON data format	17
6.5	JSON data format in HTTP POST	18
6.6	RAW string data format	18
6.7	Form encoded RAW string in HTTP POST.....	19
6.8	FTP file transfer	20
7	Communication error.....	21
8	Command Line Interface.....	22
9	Cloudburst logs	23
10	Hardware accessories and combo installation	24
10.1	P-UHF-CBO (Art. N.: 800 3075-967)	24
10.2	P-UHF-RS232 (Art. N.: 800 3075-969)	24
10.3	P-UHF-SRMIX (Art. N.: 400 5009-358).....	25
	Appendix A – Impinj speedway revolution reader ports and LEDs.....	26
	Appendix B – GPIO pinout configuration	27
	Appendix C – LEDs status	29
	Appendix D – Troubleshooting	30

1 Introduction

Datamars Cloudburst is a licensed software that runs on the Impinj Speedway® Revolution readers. Cloudburst reduces the overall complexity related to RFID implementation while maximizing the reader performances in a laundry environment.

Cloudburst enables laundry managers to quickly deploy the RFID system. Web oriented, it simplifies integration with cloud-based ERP software and allows to easily integrate UHF readers with no need for software development and deep RFID knowledge.

The reader's activity and parameters setting are managed through a simple yet powerful Web based GUI.

It comes with pre-configured reading modes that optimize RFID reading performances depending on the reading station. Cloudburst also provides autonomous start-reading and a set of parameters to control its functionality that are automatically restored at power up.

Cloudburst supports Ethernet, RS-232 and USB keyboard wedge hardware interfaces. It handles Websocket, HTTP POST, RAW TCP/IP socket and FTP protocols and provides flexible and customizable data formats.

The Cloudburst software is also aimed to control the UHF hardware in combination with existing LF and HF installations, allowing a smooth transition between the three RFID technologies.

2 Getting started with Cloudburst

2.1 Connection through the Ethernet interface

By default, the Impinj Speedway Revolution reader has DHCP client enabled. The IP address given by the DHCP server or the host name of the Impinj Speedway Revolution reader is needed to reach it via Ethernet interface.

The default hostname of your reader is `speedway-XX-XX-XX` where `XX-XX-XX` shall be replaced with the last 6 digits of the reader' MAC address (e.g. `speedway-11-4b-73`).

Alternatively, if the reader is connected directly to a PC set to automatically obtain an IP address, the reader can usually be reached at the `169.254.1.1` IP address. Follow the next steps to properly set the configuration of the Ethernet adapter of your Windows based PC for a direct connection before connecting the reader.

Any other operating system can be configured to properly connect to the reader, please refer to the documentation of your operating system to know how to change the network settings.

Press the **Win+R** keys on the keyboard to show the Run window. Type `ncpa.cpl` and click "OK" to open the Network Connections window.

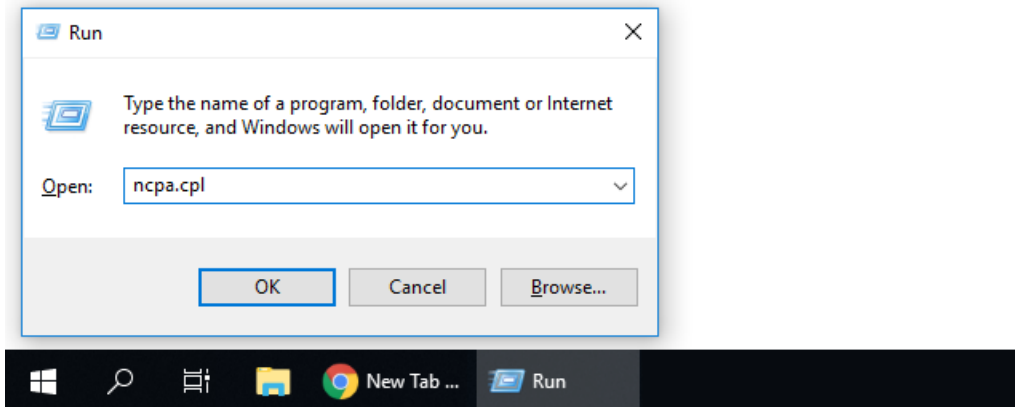


Figure 1 - Open Network Connections

Right click on the Local Area Connection icon and then click on Properties.

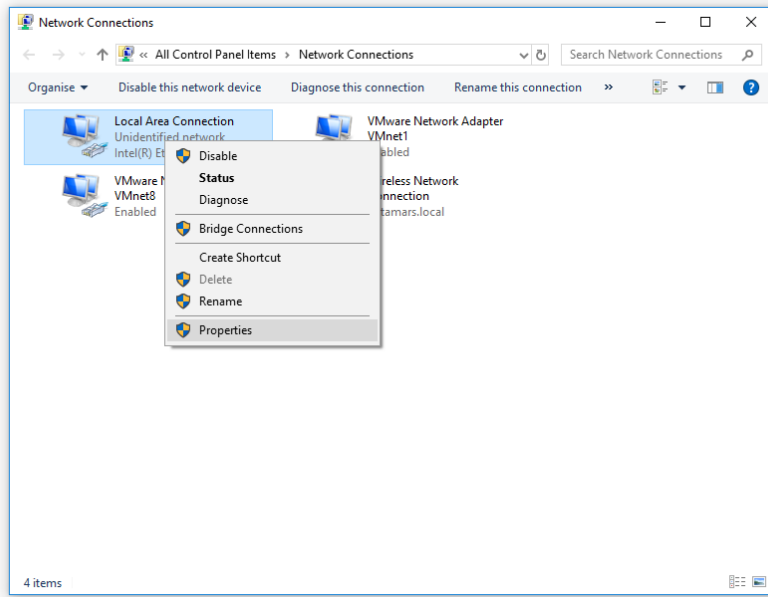


Figure 2 - Local Area Connection

Select the Internet Protocol Version 4 (TCP/IPv4) item and click on the Properties button.

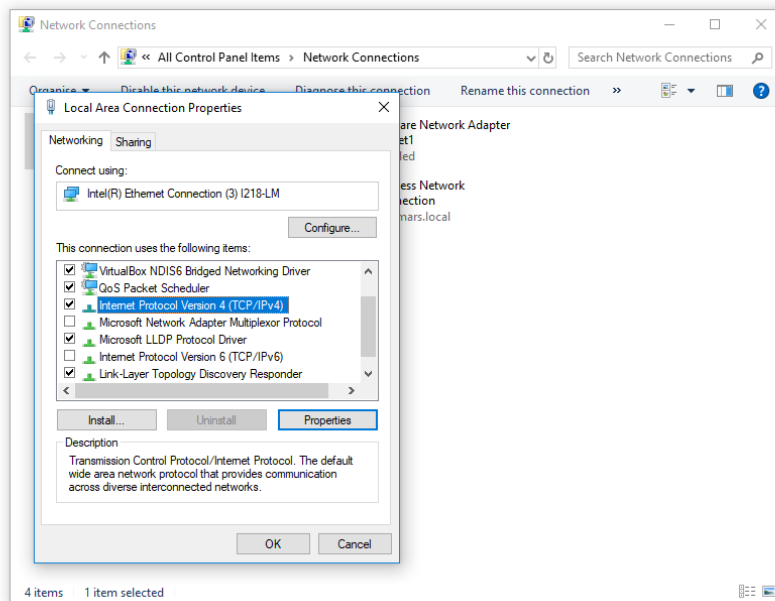


Figure 3 - Local Area Connection Properties

Make sure that “Obtain an IP address automatically” is selected in the Internet Protocol Version 4 (TCP/IPv4) Properties window.

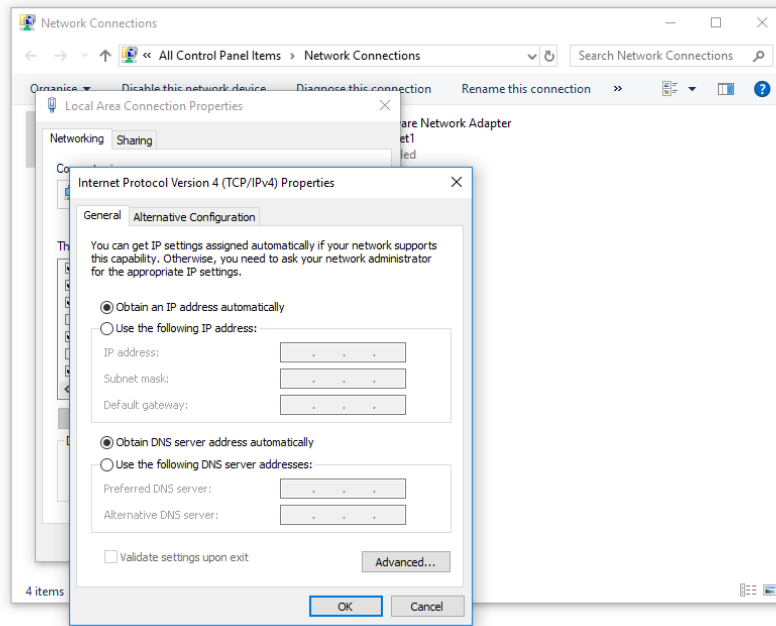


Figure 4 - Internet Protocol Version 4 (TCP/IPv4) Properties

Connect the RFID reader directly to the PC with an Ethernet cable and power it up plugging in the power supply plug.

2.2 Installation of Cloudburst on the Speedway Revolution Reader

Please note that the following instructions are needed only if Cloudburst is not installed already or in case of a Cloudburst software update is required. If Cloudburst is already installed on the RFID reader proceed to chapter 2.3.

Download Cloudburst from the Datamars Textile ID website clicking the “Download” button at the following address <https://www.textile-id.com/cloudburst> and unzip the downloaded file.

Make sure the UHF reader is ready. It takes about 45 seconds to boot up after power up, it is ready when both Power LED Status LED are solid green.

Open a web browser (e.g. Google Chrome), type http:// followed by the IP address (e.g. <http://169.254.1.1>) or the host name (e.g. <http://speedwayr-11-4b-73.local>) in the address bar and press Enter.

Once the connection is established the reader prompts for user name and password. Default Username is: **root**. Default password is: **impinj**. Click on the Sign in button.

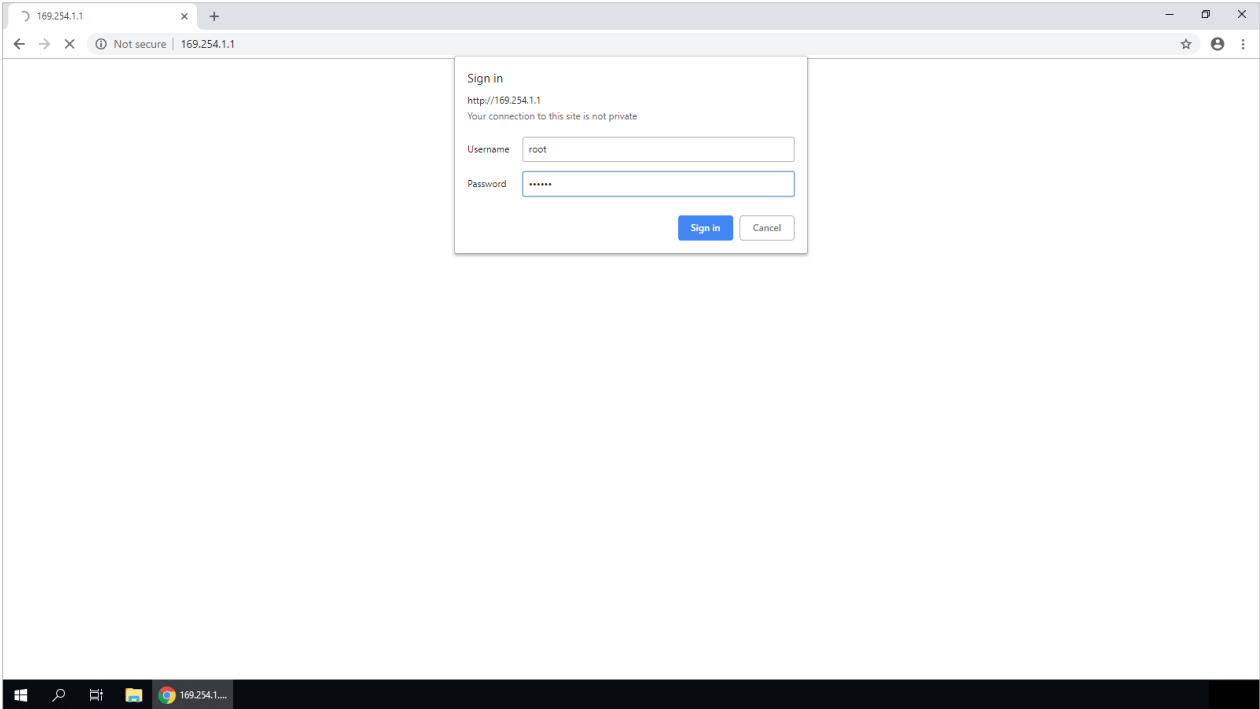


Figure 5 - Impinj Speedway Revolution reader Web management interface login

Cloudburst is tested and validated on readers running a Software version 6.2.0.240. Check on the “Software Version” in the “Details” section. Running Cloudburst on a reader with a different software version is still possible although not officially validated, in case of doubts, please contact Datamars support.

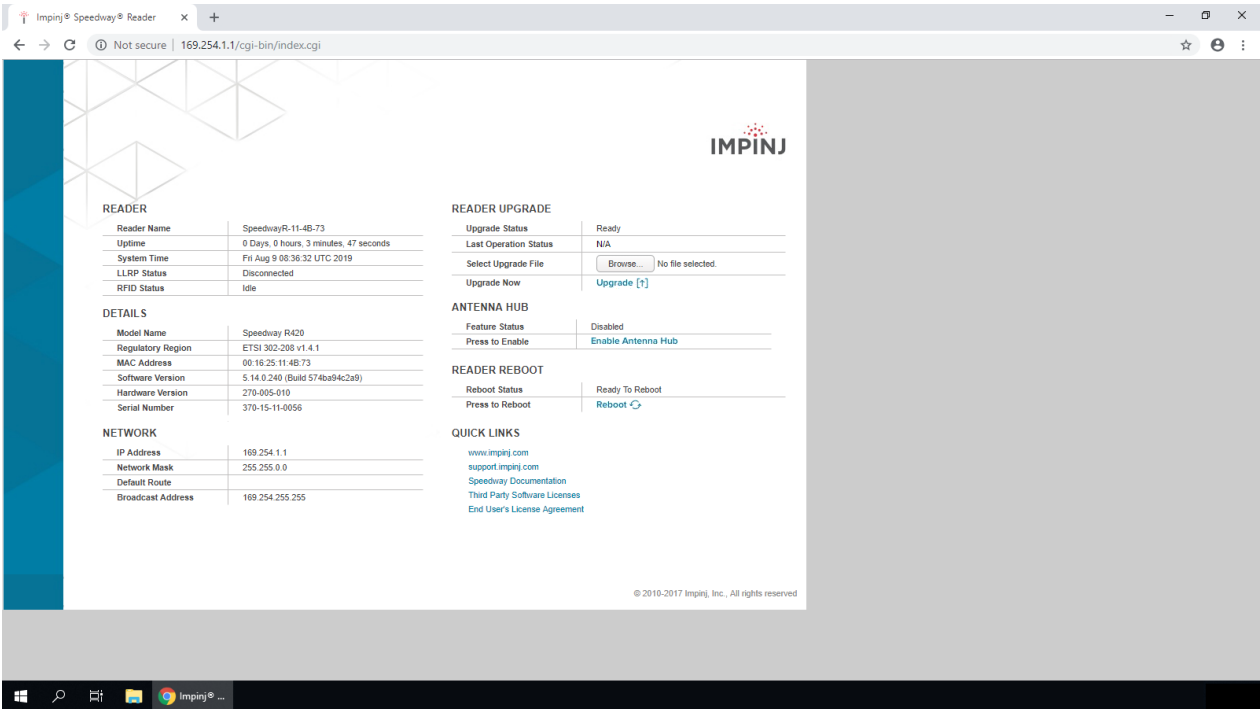


Figure 6 - Impinj Speedway Revolution reader Web management interface

Click the “Browse...” button in the “Reader Upgrade” section. Select the .upg file (e.g. Cloudburst_2_0_0.upg) in the unzipped folder of the previously downloaded file and click “Open”.

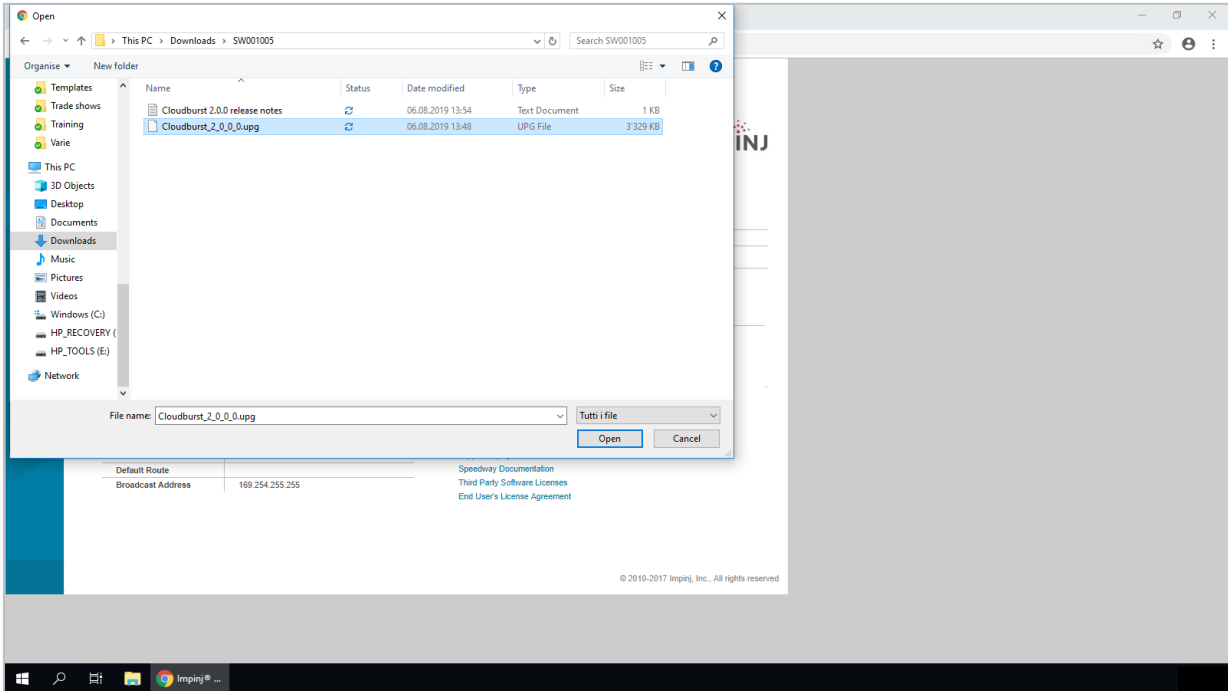


Figure 7 - Select the .upg file

Click on the “Upgrade [↑]” button. The reader uploads Cloudburst and then commits the SW image. The process is shown in the “Last Operation Status” in the “Reader Upgrade” section and it lasts about 30 seconds.

When the “Last Operation Status” turns to “Waiting for manual reboot” click on the “Reboot ↻” button in the “Reader Reboot” section and then click “OK” in the pop-up window.

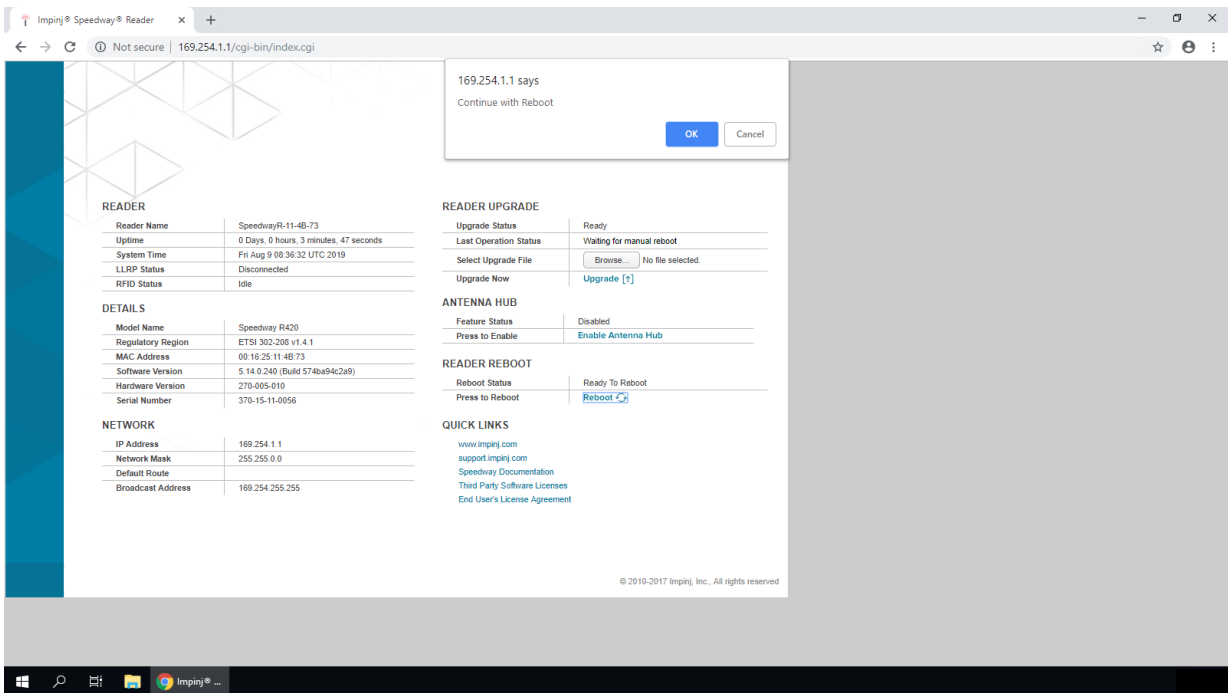


Figure 8 - Reboot

The reboot process takes about 1 minute. Wait until the reader is rebooted and the web management interface is reloaded. If the web page is not automatically refreshed, try refreshing it manually.

When the Web management interface is reloaded you can verify if the installation was successful by checking the “Application SW Version” shown in the “Details” section of the Web page. The version number must match the Cloudburst version just installed.

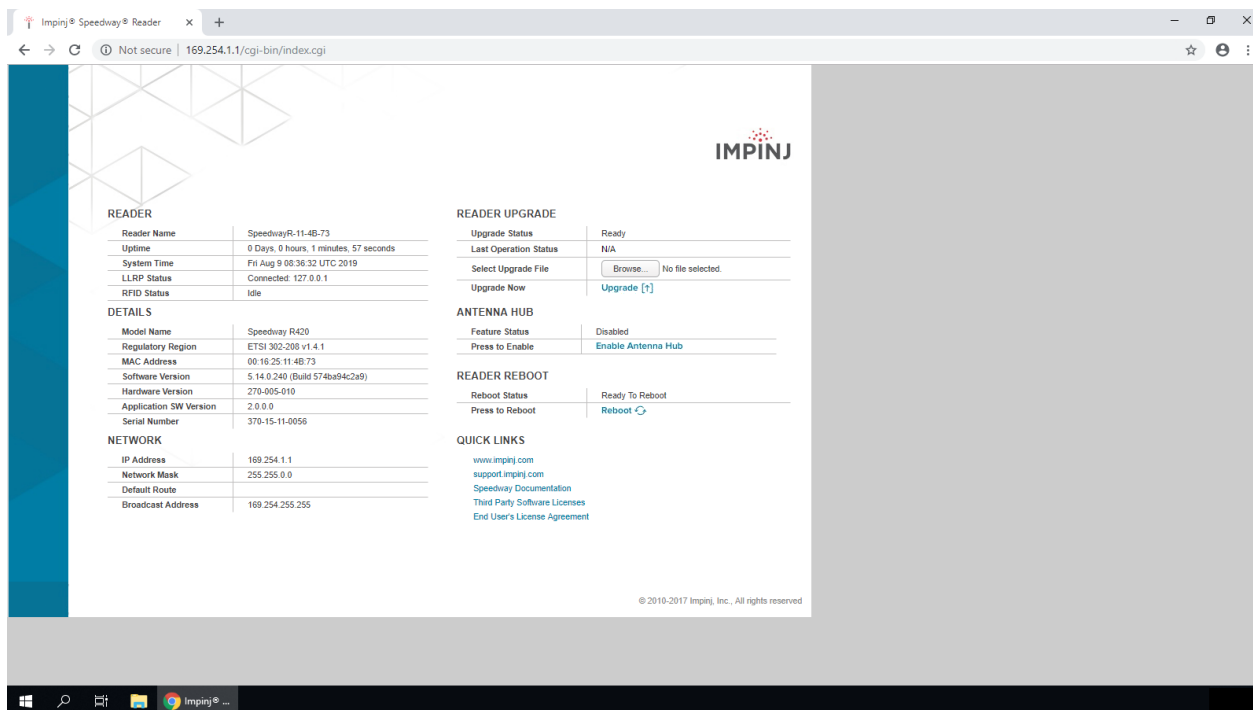


Figure 9 - Verify Cloudburst installed version

If Cloudburst is correctly running the Status LED of the Speedway Revolution reader blinks green.

2.3 Access Cloudburst Web GUI and first reading

The Web GUI (Graphical User Interface) allows to configure Cloudburst, manually start and stop the reading and check the tag codes read by the reader.

Make sure the UHF reader is ready. It takes about 45 seconds to boot up after power up and it is ready when the Power LED is solid green and the Status LED blinks green.

Open a web browser (e.g. Google Chrome), type https:// followed by the IP address (e.g. <https://169.254.1.1>) or the host name (e.g. <http://speedwayr-11-4b-73.local>) in the address bar and press Enter.

Depending on the browser privacy settings a security warning may show up. It is totally safe to proceed and accept the security exception.

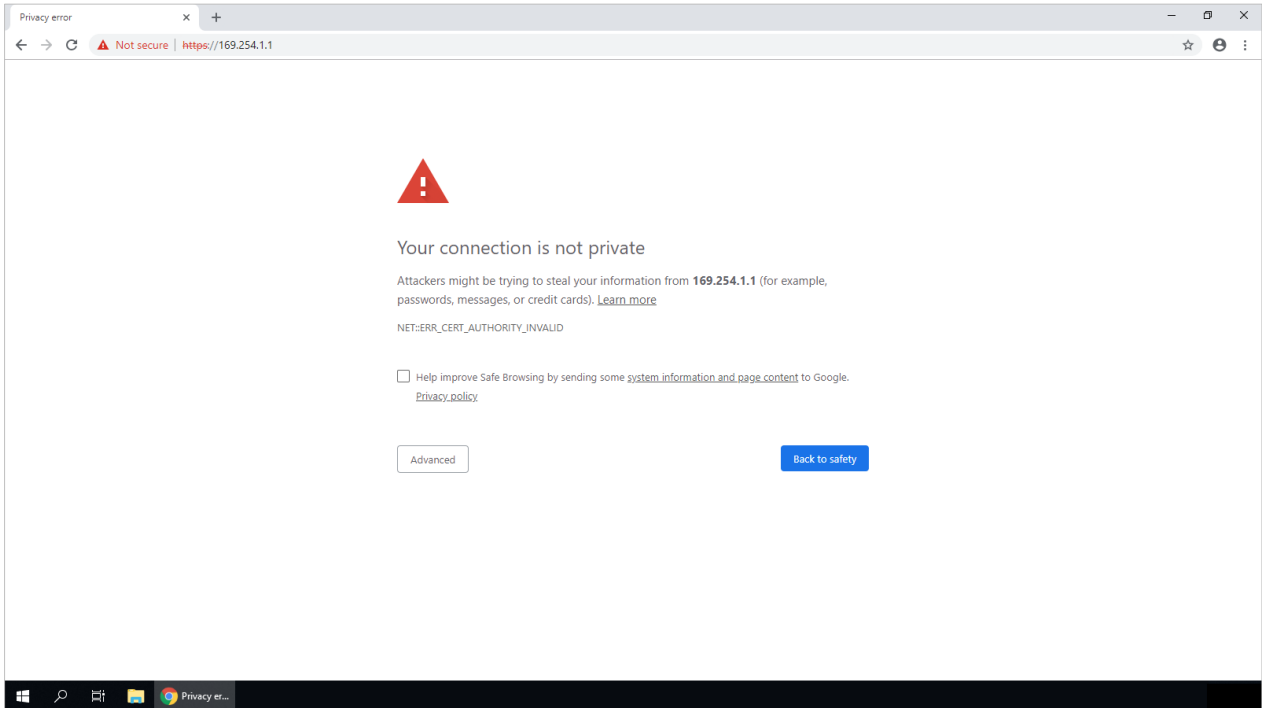


Figure 10 - Security warning

Click on the advanced button (depending on the browser the security warning may be different from the one shown here) and then click on the “Proceed to 169.254.1.1”. The security exception can also be permanently stored to avoid the message showing up every time. Additional information can be found in the browser help section.

Now the Cloudburst login page is shown. The default password is: **password**

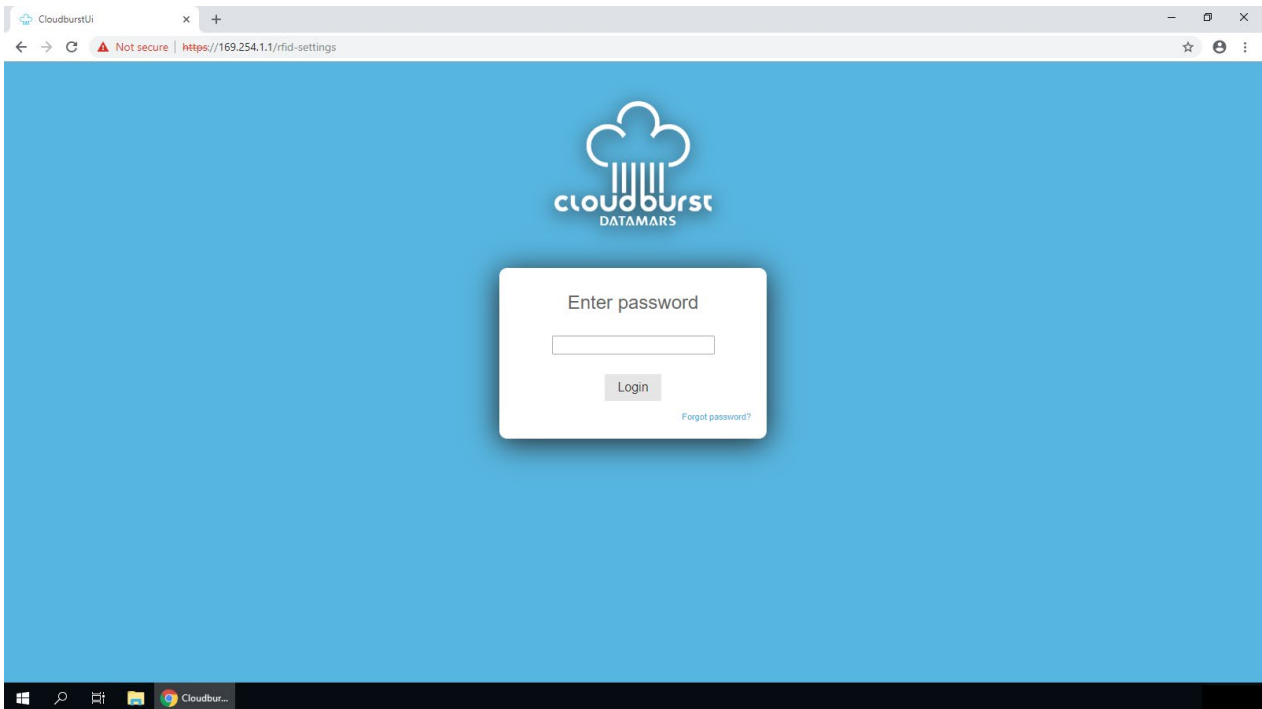


Figure 11 - Cloudburst login page

Type the password and click the “Login” button. The Cloudburst Web GUI (Graphical User Interface) shows up.

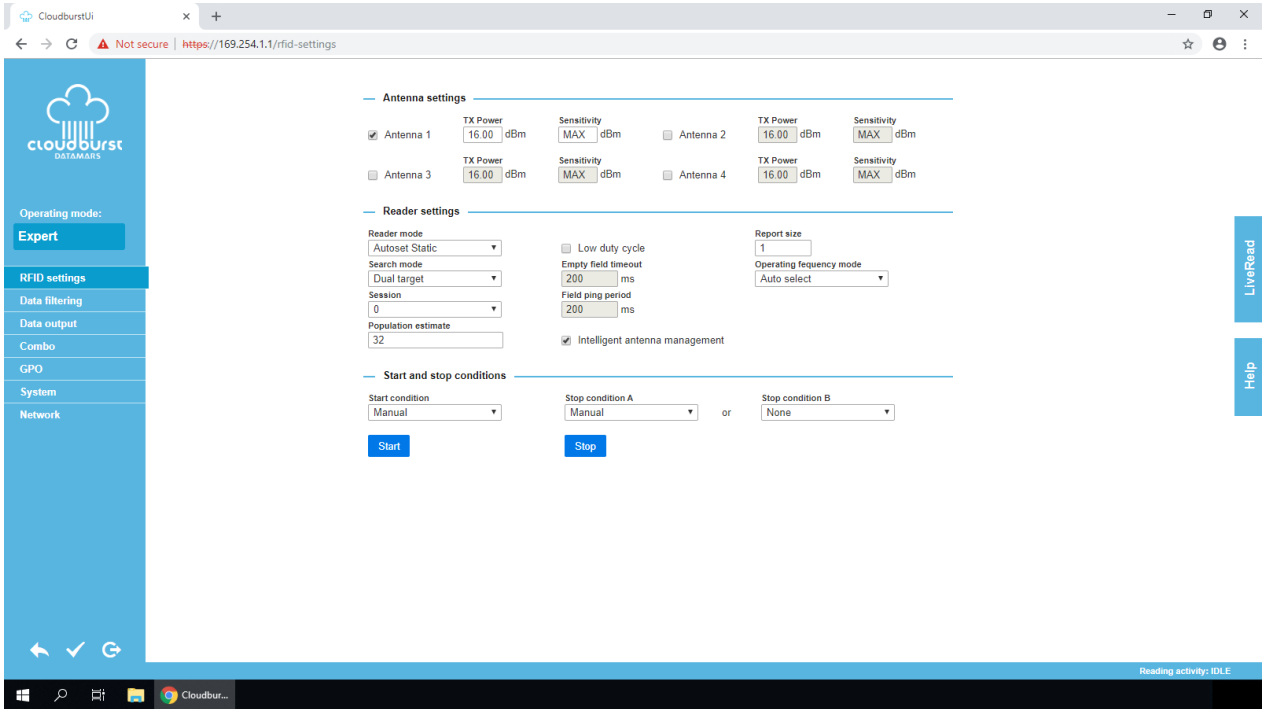


Figure 12 - Cloudburst Web GUI

Connect an antenna to the ANT1 connector on the RFID reader and put an RFID tag on the antenna.

Click on the “LiveRead” button on the right side of the page and then click on the “Start” button. The LiveRead allows to immediately see the EPC (Electronic Product Code) of the RFID tags read.

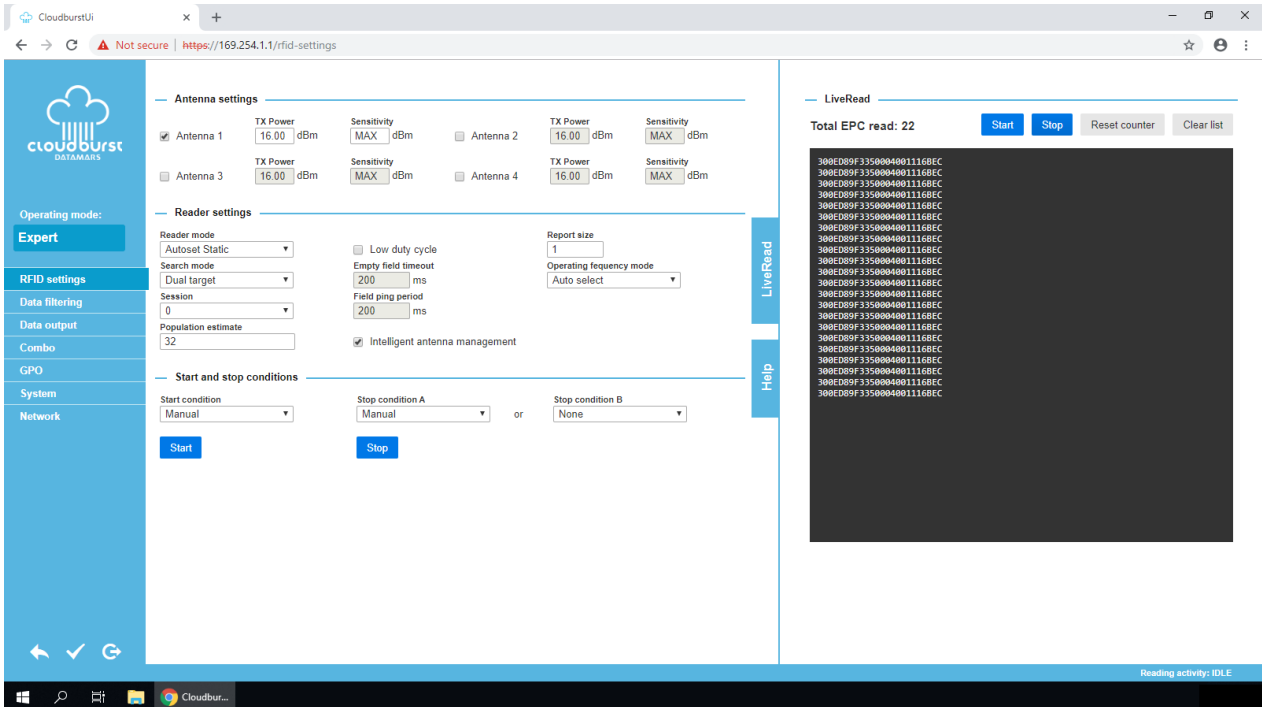


Figure 13 - LiveRead test

2.4 Cloudburst license

Without a valid license file provided by Datamars, Cloudburst allows to read approximately 500 tags for evaluation purpose. After 500 tags read, Cloudburst stops working and a valid license file is required to unlock all the Cloudburst functionalities.

The license file can be loaded in the “System” tab of the Web GUI. The license file name is the serial number of the reader the license has been generated for (e.g.: 37015110056.clf).

Depending on the options included in the purchased license, Cloudburst unlocks additional features. The list of enabled options is shown on the Web GUI.

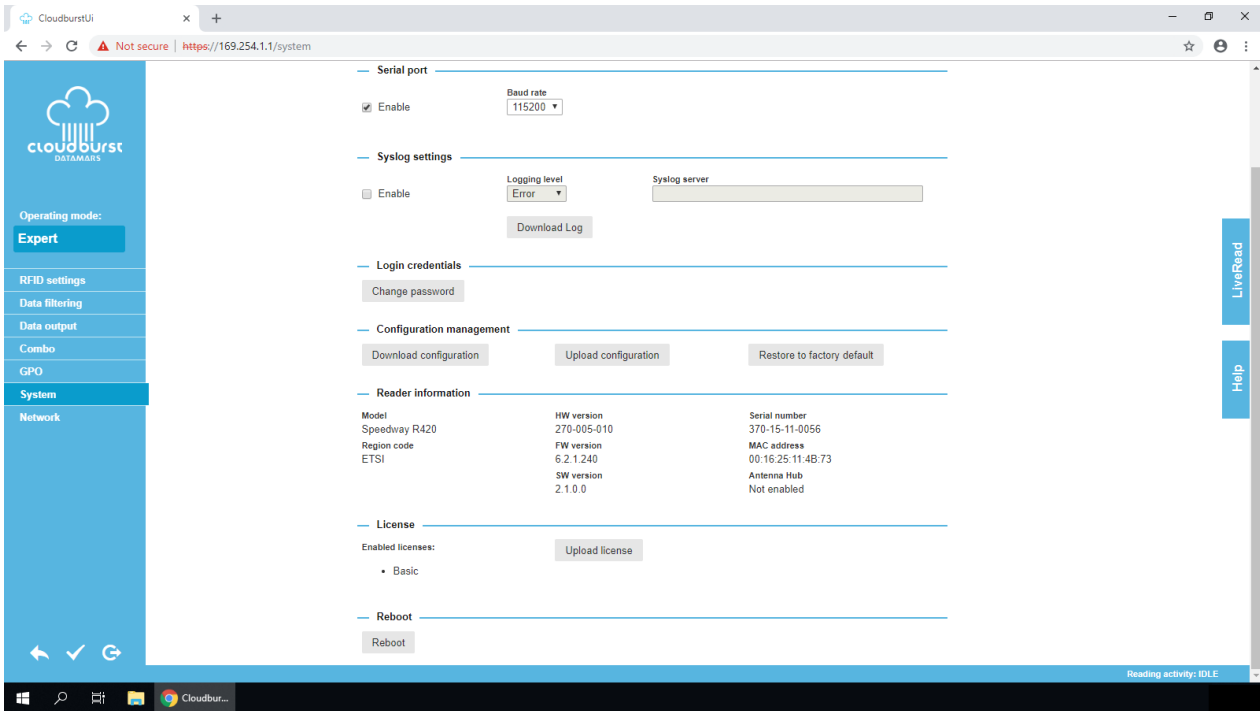


Figure 14 – System tab, license loaded

3 Network configuration

The network configuration of the reader can be changed in the “Network” tab of the Cloudburst Web GUI.

Any changes to the “Network” tab will automatically reboot the reader after the new settings are applied. When the reboot process completes the Cloudburst Web GUI shall be manually reloaded with the new IP address or hostname.

In case of static address mode, remember to double check that all the settings are correct before applying the new changes. In case of a mistake, the reader could potentially not be reachable anymore through the ethernet interface. If this happen, please refer to Appendix D.

None of the network settings are saved in the Cloudburst configuration file. The network configuration is stored and managed by the operating system running on the Impinj Speedway Revolution reader.

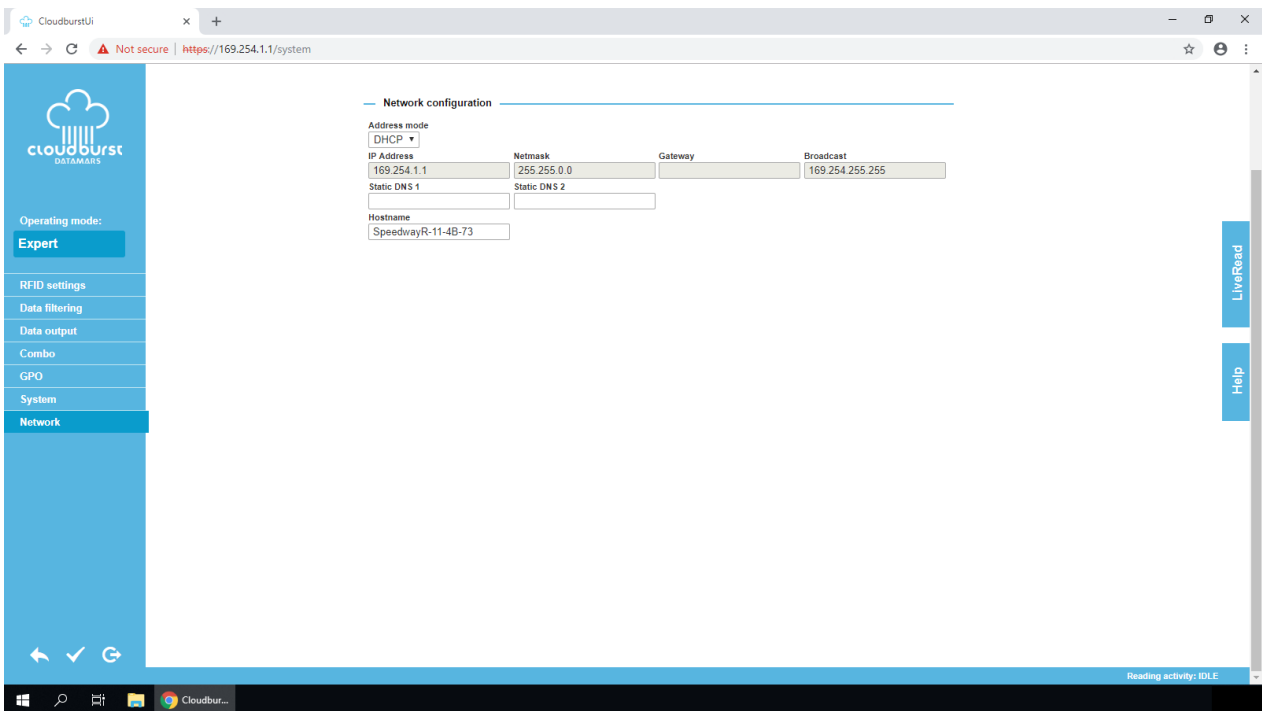


Figure 15 – Network configuration

4 Web GUI description

The Cloudburst Web GUI has four sections, the menu bar on the left, the main section in the middle, the LiveRead and Help tabs on the right and the status bar in the bottom left corner.

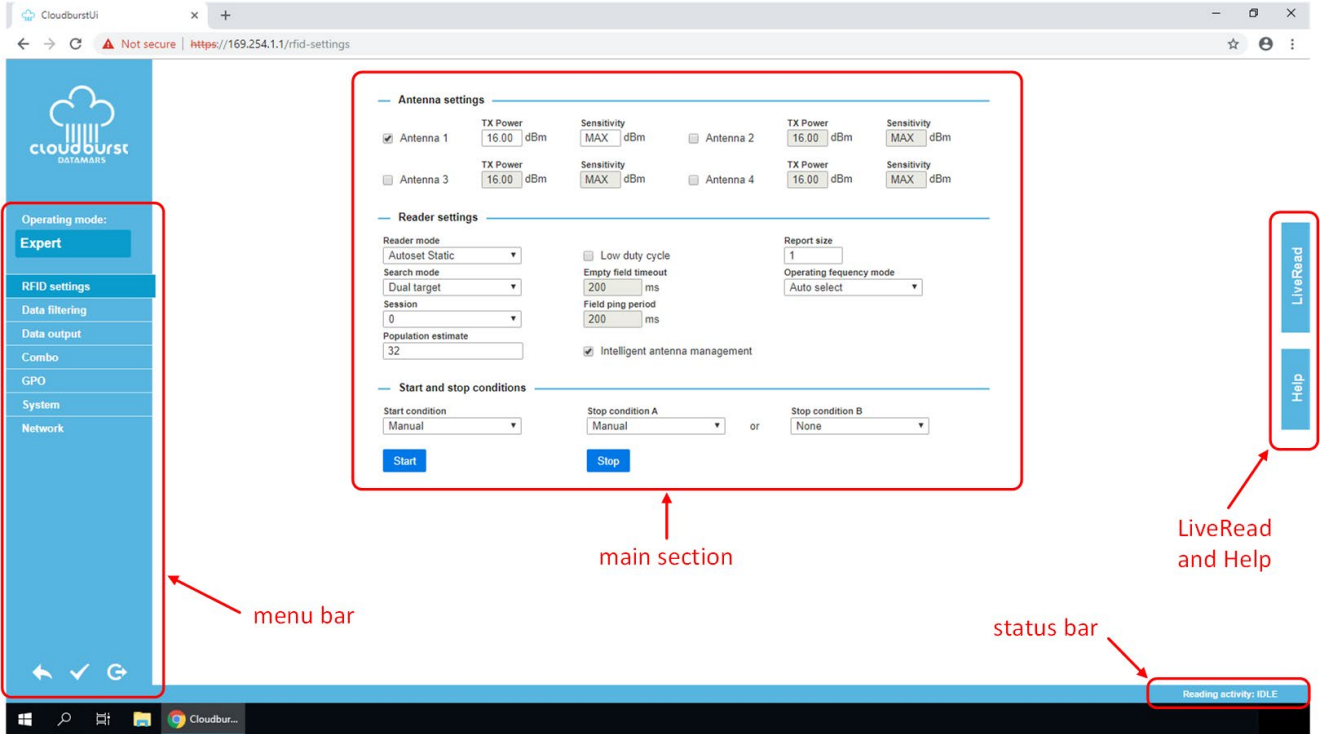


Figure 16 - Cloudburst Web GUI sections

The menu bar allows to select the operating mode, navigate through the different tabs and at the bottom there are three buttons to discard changes, apply changes and log out.

The main section shows the settings and the parameters available depending on the selected tab.

The LiveRead and Help tabs on the right side of the page allow to open the LiveRead tab and see the online Help.

The online Help provides detailed description of every parameter and functionality.

The status bar provides information on the current status of the reader.

5 Operating modes

The Operating modes are Datamars made pre-sets to allow easier and quicker RFID setup without requiring deep RFID knowledge.

Depending on the reader Cloudburst is installed on, some operating modes are not available. The full list of available modes is:

- Disabled
- Expert
- S-UHF-LITECAB
- S-UHF-CAB
- S-UHF-PORTAL
- S-UHF-PORTAL+
- TableTop
- S-UHF-ARCH

The Disabled operating mode allows to establish an LLRP connection to the RFID reader with an external application without having to remove Cloudburst. The disabled operating mode is not permanently saved, the previous Cloudburst configuration will be restored after reboot. If the LLRP connection is not available (because the external application is still connected) Cloudburst will refuse to switch to back to another operating mode.

The Expert operating mode allows to set every parameter of the reader. It is intended for installations where a standard setup is not applicable.

The Datamars reading systems work properly only if the appropriate Operating mode is selected.

Please visit Datamars Textile ID website for more information about our reading systems: <https://www.textile-id.com/textile-id-rfid-products>

6 Interfacing Cloudburst

6.1 Cloudburst messages and data

Cloudburst data output is flexible and customizable. The Web GUI allows to specify which information shall be included in the output simply dragging and dropping tokens in the desired order.

— Tag data output format —

Prefix	Suffix	New line	Separator	EPC length	EPC pointer	Antenna ID offset
<input type="text"/>	<input type="text"/>	LF/CR	,	0	0	0

Prefix EPC Timestamp RSSI Suffix New Line

Drop tokens to disable here:

Figure 17 - Tag data output format

Tag data include:

- EPC (HEX format, supports any EPC length e.g. 96 or 128 bits, customizable length filter to cut the EPC)
- Timestamp
- Antenna port
- RSSI
- Customizable prefix and suffix

Cloudburst also allows to send some status messages to indicate the status of the system and ongoing operations. They can be enabled if needed.

The following messages are currently available:

- <START> sent when the reading starts. Any following EPC shall be considered part of the current acquisition.
- <STOP> sent when the reading stops. It is guaranteed that all the EPCs which are part of the just ended acquisition are sent before this message.
- <ABORT> sent when the reading has been stopped due to a failure or a misuse of the reading system. EPCs of the current acquisition should be discarded.
- <KEEPALIVE> periodically sent to allow the upper SW layers to check if the RFID system and the physical link is alive.
- <GPIXXXX> sent every time the status of a GPI changes. X represents the logic level of the respective GPI and it can be 0 or 1, e.g. <GPI0110>

Every message is followed by a new line character(s).

Please note that other messages can be added in the future. The upper SW layer shall be able to handle “unexpected” messages.

6.2 Physical interfaces

Cloudburst manages the following physical interfaces of the RFID reader:

- Ethernet
- RS-232 serial port
- USB keyboard wedge (HID)

6.3 Protocols and data formats available over the physical interfaces

Over the Ethernet interface the following protocols and data formats are available:

- WebSocket (client and server)
 - JSON
 - RAW string
- HTTP POST
 - JSON
 - Form encoded RAW string
- RAW TCP/IP socket (server)
 - RAW string
- FTP (client)
 - CSV file containing RAW string

Remember that the HTTP POST data transmission cannot be always immediate. Only the first POST message is sent as soon as (at least) one tag is read. Consecutive messages are periodically sent on a configurable time base if EPCs come faster than the minimum POST period.

Over the RS-232 serial interface the RAW string is the only format available.

Over the USB keyboard wedge interface, the RAW string is the only format available and only the EPC code is “transmitted”, no matter what is selected on the Web GUI.

6.4 JSON data format

The JSON format is the following:

```
{
  antennaPort:integer
  epc:string
  timestamp:string
  peakRssi:integer
  statusMessage:string
}
```

Please note that the content of the structure is dynamic, it depends on the configuration in the tag data output format.

Here are two examples of how JSON messages look like:

```
{
  antennaPort:1
  epc:"300ED89F3350008CCCD5387D"
  timestamp:"27.11.2018 09:15:52"
  peakRssi:-32
}
```

```
{
  statusMessage:"<START>"
}
```

6.5 JSON data format in HTTP POST

The following is an example of a JSON message in the HTTP POST:

```
{
  reader_name:"test"
  mac_address:"00:16:25:11:4B:73"
  tag_reads[
    {
      antennaPort:1
      epc:"300ED89F3350008CCCD5387D"
      timestamp:"27.11.2018 09:15:52"
      peakRssi:-32
    }
    {
      antennaPort:2
      epc:"300ED89F3350008CCCD47A20"
      timestamp:"27.11.2018 09:15:52"
      peakRssi:-41
    }
  ]
}
```

6.6 RAW string data format

In the RAW string format the information is sent out as a regular string terminated by a configurable new line character(s).

The string content and format as well as the separator and the new line character(s) are highly customizable through Cloudburst Web GUI.

Strings are sent out over the selected output interface(s) one after the other when tags are read.

The following picture show some RAW strings collected with a terminal emulator.

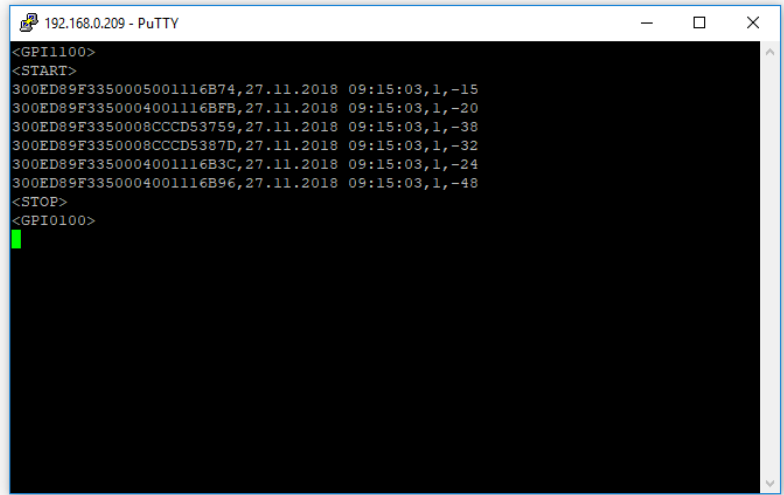


Figure 18 - RAW string data format example

6.7 Form encoded RAW string in HTTP POST

The form encoded RAW string is available only for HTTP POST. RAW strings are encoded in the form of the POST message.

The following is an example of how an HTTP POST message looks like:

```

Details
-----
ID: 1620001
Timestamp: 2018-11-13 17:27:18.766579 +0000 UTC
Method: POST
IP: 46.140.130.59
Headers
-----
Accept: */*
Content-Length: 490
Content-Type: application/x-www-form-urlencoded
Host: ptsv2.com
X-Cloud-Trace-Context: b5801757a8a3dfbffcec2133c48a6924/12616760292335380827
X-Google-Apps-Metadata: domain=gmail.com,host=ptsv2.com
Parameters
-----
reader_name="test"
mac_address="00:16:25:11:4B:73"
field_delim=,
field_names=epc,timestamp,antenna_port,peak_rssi
field_values=300ED89F3350005001116B74,27.11.2018 09:15:03,1,-15
300ED89F3350004001116BFB,27.11.2018 09:15:03,1,-20
300ED89F3350008CCCD53759,27.11.2018 09:15:03,1,-38
300ED89F3350008CCCD5387D,27.11.2018 09:15:03,1,-32
300ED89F3350004001116B3C,27.11.2018 09:15:03,1,-24
300ED89F3350004001116B96,27.11.2018 09:15:03,1,-48
Body
----
No body
Files
-----
No files
Multipart Values
-----
No Multipart Values
    
```

6.8 FTP file transfer

Cloudburst allows to save on an FTP server a .csv file containing the EPCs and status messages.

The supported FTP protocols are: FTP, FTPS and SFTP.

There are three conditions that trigger the file transfer:

- End of reading window
- Timeout
- Number of tag observations

The file name header is customizable, and it is followed by the timestamp and the .csv extension e.g.: filename_20190809153423.csv

When FTP is enabled, keep alive can be used to periodically verify that a file can be written on the server. Every time the keep alive is triggered a “.keepalive” file is saved on the FTP server.

The FTP output protocol is optional, it is not included in the basic license.

7 Communication error

When HTTP POST or FTP output interfaces are enabled Cloudburst can trigger a communication error.

The communication error is shown in the status bar of the Web GUI. The communication error state can also be linked to a GPO allowing to turn on a physical alert (e.g. a buzzer or an LED) whenever a communication error occurs.

The HTTP POST set the communication error when a POST does not end up successfully.

The FTP set the communication error only when the keep alive is enabled (keep alive period different from 0). If a keepalive message cannot be successfully saved on the FTP server the communication error is set.

The communication error is cleared as soon as the POST or FTP communication is restored or when they are disabled in the configuration.

8 Command Line Interface

Cloudburst offers a Command Line Interface. It is available over the RAW TCP/IP socket, WebSocket (server) and RS-232 serial.

Commands may be implemented in the upper SW layer to control the reader operation. For example, start reading when the user clicks a button on the SW's GUI.

Commands must be followed by the enter key to be accepted.

Depending on the selected Operating mode, some commands may not be available, or their behaviour might be different.

The currently available commands are listed in the following table.

command	syntax	n parameter	x parameter
start reading	*d	-	-
stop reading	*j	-	-
set a GPO	*GO[n][x]	GPO number	active level (0 or 1)

A terminal emulator (e.g. Putty) can be used to manually send commands to Cloudburst' Command Line Interface.

9 Cloudburst logs

Cloudburst allows to log useful information to help checking the status of the system and make troubleshooting easier in case of problems.

Logs are saved on the reader’s memory, additionally, the address of a syslog server can also be specified. Syslog is a standard and widely used protocol to manage logs.

Local logs can be downloaded directly from the Cloudburst Web GUI.

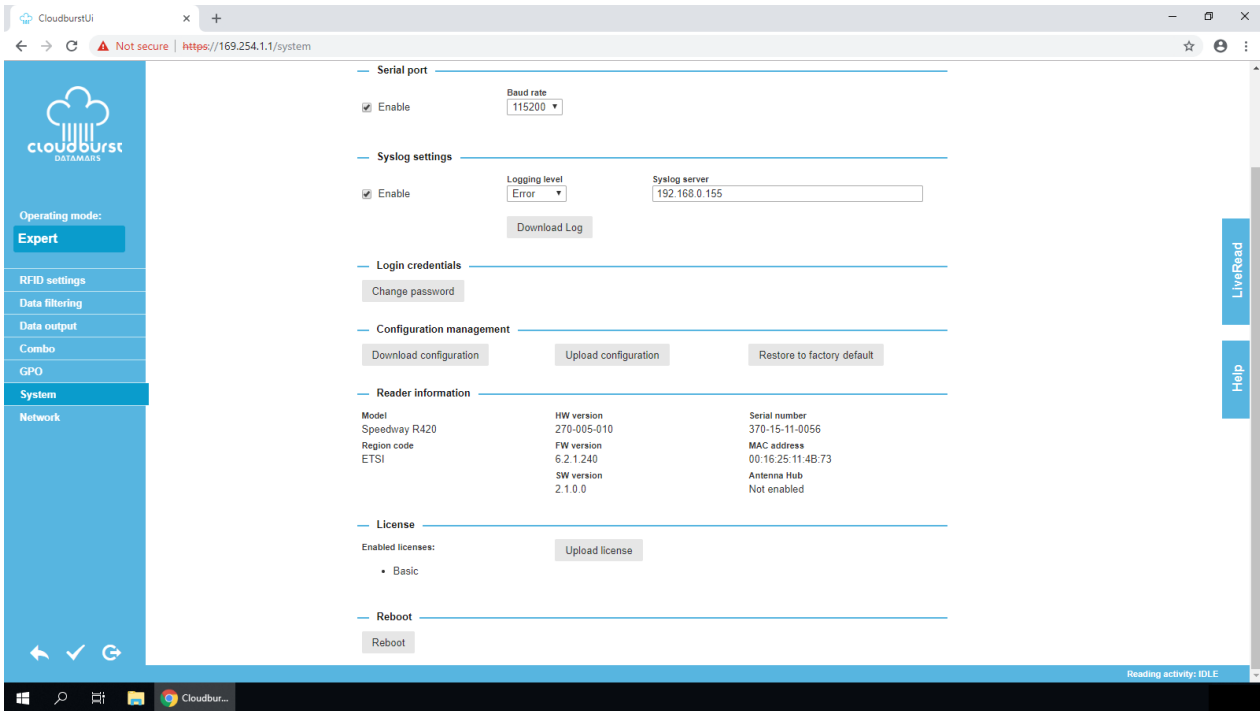


Figure 19 – System tab, syslog settings

10 Hardware accessories and combo installation

One of the main features of Cloudburst is the Combo mode. It allows to connect together LF, HF and UHF readers through the serial interface to make the coexistence of different RFID technologies easy and to simplify the migration between different technologies.

Special cables are needed to connect the LF and HF readers to the UHF reader.

When in combo mode the Impinj Speedway Revolution reader can act as a master, collecting the data from the LF or HF reader connected to it and sending the tag ID codes of both systems on the selected communication interfaces. An example is an LF and UHF combo installation, the tagIDs and the EPCs are collected by Cloudburst and sent over the Ethernet interface.

Several settings and combo modes are available in Cloudburst. Refer the online Help in the Web GUI for more information.

10.1 P-UHF-CBO (Art. N.: 800 3075-967)

The P-UHF-CBO cable allows to connect an LF or HF reader to the UHF reader and take advantage of the combo mode available in Cloudburst.

With this special cable LF/HF data is sent to the UHF reader and it still allows, depending on Cloudburst settings, to combo codes to the PC via serial port if needed. It is important to note that when this cable is used, the Cloudburst Command Line Interface over serial port is not accessible anymore.

Connect the male DB-9 connector to the serial port of the LF or HF reader. Connect the HDB-15 connector to the GPIO port of the UHF reader. The female DB-9 connector allows to connect the PC.



Figure 20 - P-UHF-CBO cable

When using the system in combo mode the baud rate of the UHF reader shall match the one of the LF or HF reader.

Using this cable and the combo mode continuous reading is allowed without any risk of data collision.

10.2 P-UHF-RS232 (Art. N.: 800 3075-969)

To connect the UHF RFID reader via RS-232 interface, the P-UHF-RS232 is needed. Connect the HDB-15 connector to the GPIO port of the UHF reader and the DB-9 connector to the PC.



Figure 21 - P-UHF-RS232 cable

10.3 P-UHF-SRMIX (Art. N.: 400 5009-358)

The P-UHF-SRMIX cable allows to connect an LF or HF reader and the UHF reader to a PC via RS-232 interface.

With this special cable LF/HF data and UHF data is mixed and sent to the PC directly. It is important to note that it is not possible to read at the same time LF/HF and UHF codes, only single readings are allowed. A collision would make impossible to correctly receive the tag codes.

The Cloudburst combo mode does not work with this cable.

Connect the male DB-9 connector to the serial port of the LF or HF reader. Connect the HDB-15 connector to the GPIO port of the UHF reader. The female DB-9 connector allows to connect the PC.



Figure 22 - P-UHF-SRMIX cable

When using this cable, the baud rate of the UHF reader shall match the one of the LF or HF reader.

Appendix A – Impinj Speedway Revolution reader ports and LEDs

The Impinj Speedway Revolution reader is equipped with standard communication interfaces like Ethernet, USB and RS-232.

It offers four General Purpose Inputs (GPI) and four General Purpose Outputs (GPO) which allow to integrate its operation in automated systems or connect sensors and actuators to it.

Four, two or one antenna ports are available depending on the model of the reader (SR420 / SR220 / SR120).

See Appendix B “GPIO Configuration”, for functional and electrical specifications and details for each pin of the GPIO DE-15 connector.

Status LEDs are also available, see Appendix C for details about LEDs status meaning.

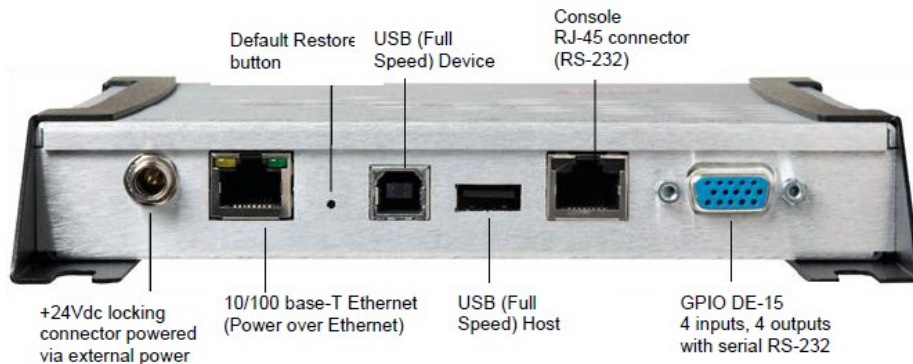


Figure 23 - Impinj Speedway Revolution reader interfaces

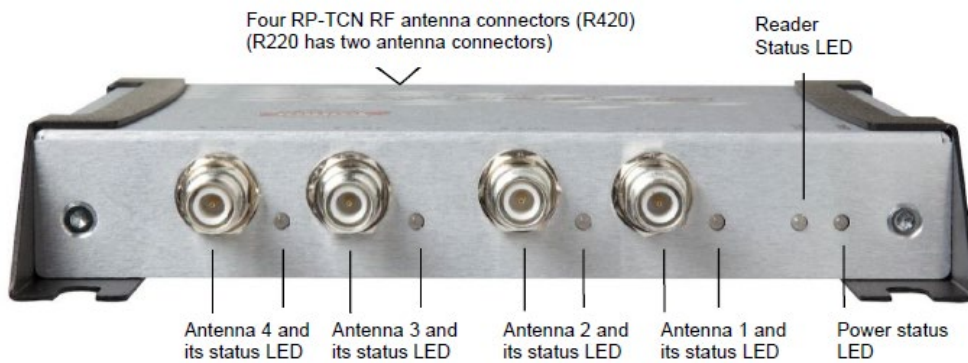


Figure 24 - Impinj Speedway Revolution reader antenna ports and status LEDs

Appendix B – GPIO pinout configuration

Speedway R420 / R220 / R120 include a multipurpose I/O port that contains an RS-232 serial port, four opto-isolated inputs, four opto-isolated outputs and a +5V supply. They can be accessed through a DE15 connector mounted on the side of the Reader.

The reader considers an input of 0-0.8V as a logic 0, and an input of 3-30V as a logic 1 on the GPIOs. The four opto-isolated inputs allowed voltage range is 0-30V DC.

The reader also provides four opto-isolated DC outputs. An external provided supply must be connected between V+ and V-. The maximum allowed voltage is 30V DC.

When the user configures a GPO to logic 0, an isolated FET switch within the reader effectively shorts that output to V- with a current sink capability of up to 100mA. When the user configures a GPO to logic 1, the selected output is pulled to V+ through a 10K resistor. If GPIO isolation is not required, the reader provides a +5V supply and a ground pin on the DE-15 that can be connected to V+ and V-.

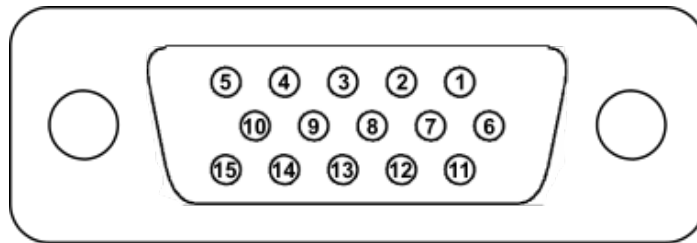


Figure B.1 - GPIO connector pin numbering

Pin	I/O Name	I/O Function
1	+5V Supply	Reader supplied (not isolated) power source
2	RS-232 RX	For auxiliary serial port functions
3	RS-232 TX	For auxiliary serial port functions
4	Processor Reset	Reserved for future use. Do not connect this pin to any signal
5	V+	Power source for isolated outputs
6	V-	Return for isolated inputs and outputs
7	Ground	Reader (not isolated) return
8	User OUT 1	Isolated output 1 (active pull down to V-)
9	User OUT 2	Isolated output 2 (active pull down to V-)
10	User OUT 3	Isolated output 3 (active pull down to V-)
11	User OUT 4	Isolated output 4 (active pull down to V-)
12	User IN 1	Isolated input 1
13	User IN 2	Isolated input 2
14	User IN 3	Isolated input 3
15	User IN 4	Isolated input 4

Table B.1 - DB15 connector pinout

Pin	Parameter	Description	Min	Max	Unit	Conditions
+5V Supply	IO	Output current		200	mA	
User IN 1-4	VIH	HIGH level input voltage	3	30	V	
User IN 1-4	VIL	LOW level input voltage	0	0.8	V	
User IN 1-4	VLI	Input current		5	mA	24V input
User IN 1-4	VI	Input voltage range	0	30	V	No damage
User Out 1-4	VOH	Output high voltage		V+*	V	10KΩ pull-up
User Out 1-4	VOL	Output low voltage		(V-)+0.5	V	100mA load
V+*	IO	Input voltage range	0	30	V	

* User-supplied voltage.

Table B.2 - GPIO Interface, electrical specification

Appendix C – LEDs status

The following table describes the LEDs behavior for various reader states:

Reader operation		LED	Expected behaviour
Start-up (power on) normal completion	Power applied, Attempting to start boot code	Power	Solid red
		Status	Off
	Bootloader calling firmware image	Power	Solid green
		Status	Off
	Bootloader completed successfully, Reader is ready	Power	Solid green
		Status	Solid green
Startup (reset) normal completion	Default restore button pressed	Power	Turns off
		Status	Off
	Default restore button pressed for 3 seconds	Power	Blinks once (red), indicates a configuration default restore will occur
Default restore button pressed for 10 seconds	Power	Blinks twice (red), indicates a factory default restore will occur. Resets reader configuration and removes CAP (if present)	
Startup (failure)	Hardware problems detected, unable to boot	Power	Continuous blinking red
		Status	Off
Upgrade activity	Upgrading the firmware during boot process	Status	Alternates between red and green
Detection of antenna activity	Detects no activity on antenna port	Antenna	Off
	Detects antenna transmission activity on antenna port	Antenna	Solid green
Inventory activity	Performing an inventory operation	Status	Blinks orange, blinks faster as tag volume increases
LLRP activity	Active LLRP connection	Status	Double blink pattern (green)
LLRP activity	Disconnect operation	Status	Single blink pattern (green)

Table C.1 - LEDs status description

Appendix D – Troubleshooting

If any problem arises while using Cloudburst, the following table should help to correct the issue. If the problem persists, contact Datamars support at support-tid@datamars.com or call the landline support at: +41 91 935 73 80.

Symptom	Cause and/or corrective actions
There are UHF transponder on the antenna but no EPCs are sent over the interface	<ul style="list-style-type: none"> • Is the reading running, check the status bar in the Web GUI? • Open the LiveRead tab and check if EPCs are shown. • Is the antenna connected to the right antenna port? (by default, the antenna 1 is enabled and set to 16 dBm transmitting power) • Check if the LED beside the antenna connector is light up in green.
Cloudburst is not running right after power up	<ul style="list-style-type: none"> • If the reader is not connected to the LAN through the Ethernet cable, Cloudburst could take about 2 minutes before start-up. This behaviour can be avoided assigning a fixed IP to the Ethernet interface of the reader even if it is not used or connecting it to the LAN.
The network configuration is unknown, or the reader is not reachable through ethernet interface	<ul style="list-style-type: none"> • Restore the Default Configuration of the reader. The procedure is explained in the next page. • The network configuration can be change via console port. A CISCO console cable is required. For more information about the IP settings see “Impinj Speedway Revolution Operation and Installation Guide” and “Impinj RShell Reference Manual”, both documents are available at: https://support.impinj.com/hc/en-us/articles/202755298-Reader-Documentation

Table D.1 – Troubleshooting

Restoring to the Default Configuration

If the experienced problem with the reader and it is difficulty pinpointing its cause, it is useful to return the reader to a known state. We recommend resetting to the default configuration. Then try the reader again.

Please read carefully the whole paragraph before proceeding with this procedure. Important: Configuration Default Restore returns the reader configuration to its default state. It leaves any custom applications, such as Cloudburst, installed in the CAP (Custom Application Partition) intact. To restore the reader to its default state and remove any CAP contents, use Factory Default Restore.

There are two ways to return Speedway R420 / R220 / R120 to its defaults:

- Issue an RShell command.
- Push the Default Restore button on the device.

To use RShell to return the Reader to its default configuration and leave CAP intact

1. At the RShell prompt, enter the following command:
> config image default
When the command completes successfully, the Reader automatically reboots and returns to the login prompt.
2. Log in to the reader. The reader is now running with the default configuration. CAP applications are intact.

To use the Default Restore button on the Reader to restore to its default configuration

1. Use an object with a sharp tip, such as a probe or paper clip to press and hold the default restore button on the back of the reader while applying power to the reader.
2. Continue holding the default restore button for 3 seconds after the power LED light turns off, but not longer than 10 seconds.
3. Release the default restore button when the LED blinks red once. The reader will boot up normally with the default configuration.

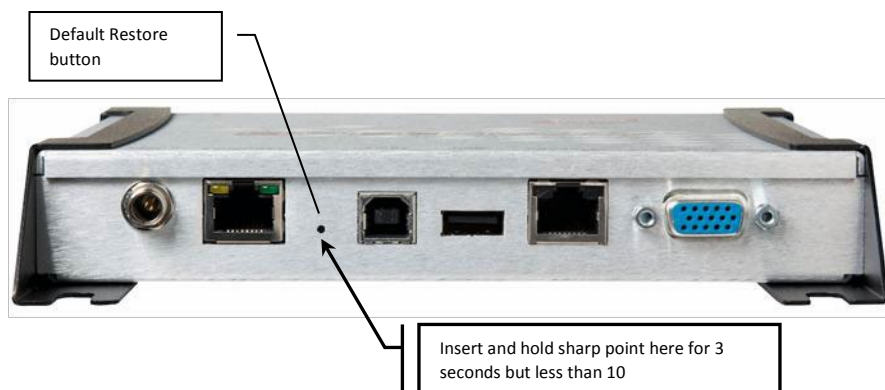



Figure D.1 - Default restore button

 **Warning:** Pressing the Default Restore button for 10 seconds or more will cause a factory default restore to occur. The factory default restore removes the reader's custom application partition (CAP) if one exists. The reader returns to the original, factory shipped state. It is important to avoid accidentally removing the CAP. There may be situations where CAP removal is necessary.