Solaria

User Guide

Enabling Smart Cities™

ersion 1.0

WWW.STAR-INT.NET

Release Notes

Dates	Release	Description
2023 03 14	Version 1.0	Initial Release

Content

1. Regulatory Regions

1.1. FCC Statement and IC Statement

FCC STATEMENT

1. This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference.

(2) This device must accept any interference received, including interference that may cause undesired operation.

2. Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.

- Increase the separation between the equipment and receiver.

-Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

-Consult the dealer or an experienced radio/TV technician for help.

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment.

This equipment should be installed and operated with minimum distance 20cm between the radiator & your body

IC STATEMENT

This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation of the device. In additional, this device complies with ICES-003 of the Industry Canada (IC) Rules.

Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Industry Canada licence-exempt RSS standard(s). These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

-Reorient or relocate the receiving antenna.

-Increase the separation between the equipment and receiver.

-Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

-Consult the dealer or an experienced radio/TV technician for help.

This equipment complies with RSS-102 radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

Note: French version please see end page.

1.2. European CE

Frequency range (CE) for RFID operation comprises:

1. 865-868 MHz band with 4 frequency channels

2. Introduction

2.1. SOLARIA Intelligent Integrated Reader with 1 External Port

The SOLARIA Integrated reader is an intelligent reader designed to work standalone in an autonomous manner. An intelligent Event Engine is embedded with configurable complex logic sequence, triggers and resultant actions that are automatically activated on power up. The settings can be saved and further deployed to as many readers, as many sites as you want, thus providing easy scalability for system integrators. SOLARIA integrated reader has 1 embedded antenna, plus 1 RF port that connects to an external antenna.

Figure 1. The SOLARIA reader has the following connectivity: Ethernet; GPIO; N-Type Antenna Port.

2.2. Software development kits

Software development kits are available in SSI website:

1) .NET API (HTTP)

2) .JAVA API

3) Custom Embedded RFID: sample codes in /opt

3. Reader Basics

3.1. Basic Hardware

The SOLARIA is an Integrated RFID reader.

Below is a side view of the SOLARIA Integrated Reader.

The LED indicators show the operating status of the reader.

Figure 2. SOLARIA connectors and LED indicators

LED	Operational description
Power [PWR]	GREEN indicates power is applied to the reader
Transmit [TX]	GREEN when transmitting
Error [ERR]	RED indicates one or more radio error have occurred.
STATUS	Ethernet Status. AMBER indicates the Link while the GREEN indicates the activity of the ethernet connection

Figure 3. SOLARIA connection diagram

Interface	Description
LAN	PoE+ (IEEE 802.3at Compliant (Type 2); Ethernet interface: IEEE 802.3 10BASE-T/100BASE-TX IEEE 802.3 compliant Ethernet transceiver through an RJ-45 connector that has PoE+ magnetics.
Power	DC power supply - 12V, 5A (60 Watts) Or PoE+ (IEEE 802.3at Compliant, 30W)
GPIO	4 pairs Opto-isolated inputs and outputs
Antenna Port	External Antenna port with N-type connector

3.2. Connectors pin out details.

The following diagram provides specific details regarding each connector type:

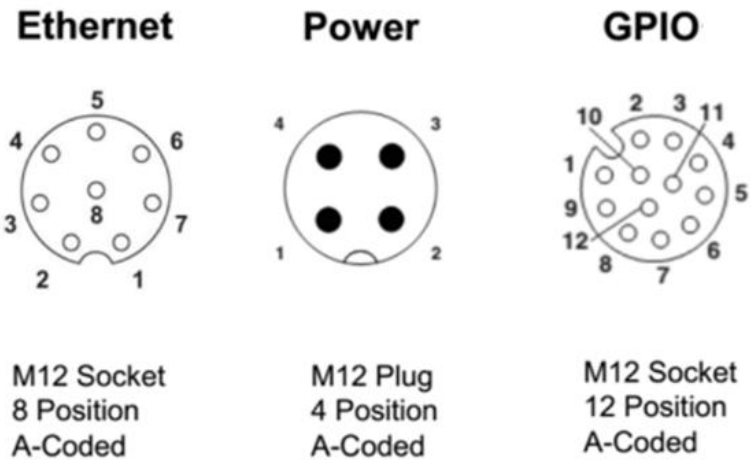


Figure 4. Different types of M12 connectors

Ethernet - LAN(PoE+):

Pin	Mode A	Mode B	Description
1	Rx+, DC+	Rx+	LAN Rx+, DC+ for Mode A PoE Spec
2	Rx-, DC+	Rx-	LAN Rx-, DC+ for Mode A PoE Spec
3	Tx+, DC-	Tx+	LAN Tx+, DC- for Mode A PoE Spec
4	Unused	DC+	DC+ for Mode B PoE Spec
5	Unused	DC+	DC+ for Mode B PoE Spec
6	Tx-, DC-	Tx-	LAN Tx-, DC- for Mode A PoE Spec
7	Unused	DC-	DC- for Mode B PoE Spec
8	Unused	DC-	DC- for Mode B PoE Spec

Power - DC:

Pin	Signal	Description	Color
1	+V	Voltage (12-57v)	Brown
2	GND	Ground	White

GPIO

PIN	Signal	Description	Color
1	GPO3	Open Collector General Purpose Output #3	Brown
2	GPI1_3_Return	Optically isolated Input #1 and #3 common return	Blue
3	GPI2	Optically isolated input #2	White
4	GPI3	Optically isolated input#3	Green
5	GPO2_3_Return	Open Collector General purpose output #2 and #3 common return	Pink
6	GPI1	Optically isolated input #1	Yellow
7	GPO2	Open Collector General Purpose Output #2	Black
8	GPO0_1_Return	Open Collector General purpose output #0 and #1 common return	Gray
9	GPI0	Optically isolated input #0	Red
10	GPO1	Open Collector General Purpose Output #1	Purple
11	GPI0_2_Return	Optically isolated Input #0 and #2 common return	Red/Gray
12	GPO0	Open Collector General Purpose Output #0	Red/Blue

3.3. Hardware set up

a) DC Power

The Solaria reader can be powered up by (1) AC/DC power or (2) PoE+ (802.3at PSE,30W) injector

1) Option 1: By AC Adaptor Unit [Optional Accessory]

SOLARIA connect the AC adapter via the M12 Power cable and DC converter (optional).

Please screw tight the lock on the M12 connector to ensure reliable power connection.

By that way, the connector pair would not loosen up over time.

With the power connected, the Power LED indicator should light up immediately.

2) Option 2: PoE+ (802.3at PSE,30W)

SOLARIA also supports the use of Power over Ethernet (PoE+) to power up.

NOTE: It must be PoE Plus (comply with 802.3at) rated at 30W PSE to make sure enough power to SOLARIA.

Make sure you use PoE+ port or a PoE+ Switch to ensure SOLARIA receive enough power to operate. Alternatively, use a PoE+ injector for the power source.

b) RFID External Antenna Connection

With the external antenna port, SOLARIA can connect with one external RFID antenna with wrench (8mm torque with 100 N-cm).

Note: External antenna info as below:

1) Model: Kuma Gain：10dBi Manufacturer: STAR Systems International Ltd.

2) Model: Avalon Gain：13 dBi Manufacturer: STAR Systems International Ltd.

3) Model: Cheetah Gain：12dBi Manufacturer: STAR Systems International Ltd.

4) Model: Avior Gain：15dBi Manufacturer: STAR Systems International Ltd.

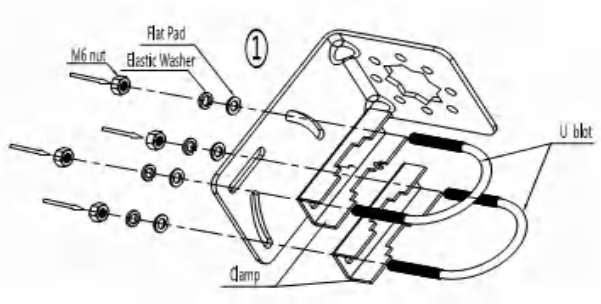
3.4. Mounting of the SOLARIA Reader

Installation method on metal poles:

Using the mounting bracket provided, the reader can be mounted onto a pole with a diameter of 40-60 mm.

1. Put on the mounting bracket in the orientation needed and put on the bolts. Tighten the bolts using a wrench.
   IMPORTANT: ONLY USE THE BOLTS PROVIDED

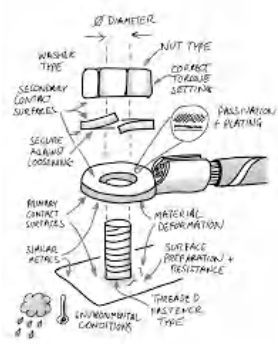
2. Assemble the mounting bracket according to the figure shown.



3. **Installing the Earth Cable on metal poles:**

For proper and safe installation, you must properly ground the reader using a piece of suitable length earth wire connected on the reader side which is also attached the other end to a properly earthed location.

THIS IS REQUIRED TO FULFILL SAFETY AND REGULATORY REQUIREMENTS!



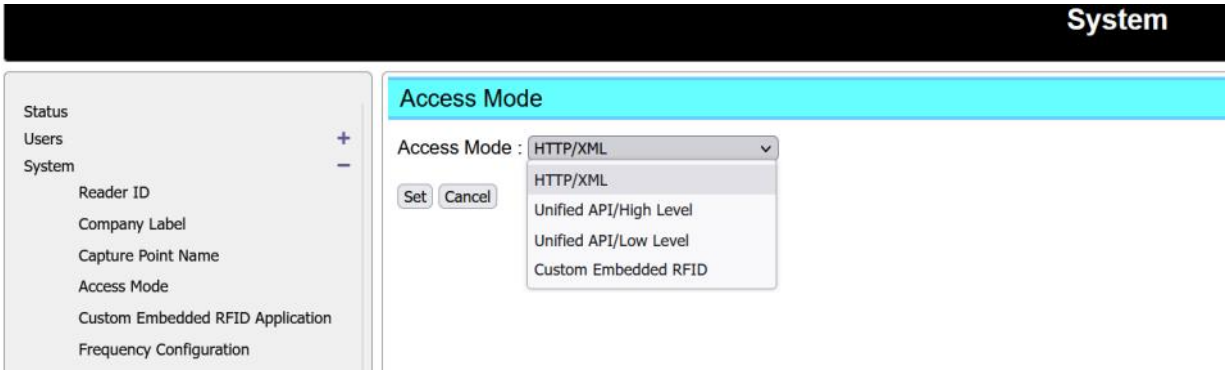
3.5. How to Connect to and Configure SOLARIA

User can connect to SOLARIA reader via Ethernet in the following ways:

1) Use the browser interface and the built-in event engine to configure the reader to run automatically based on certain logic sequence.

2) Write embedded program in the Linux OS inside directly to configure and control the reader.

To switch the connection interface, go to the browser interface, System/Access Mode page, and then choose the Access Mode, as shown below:



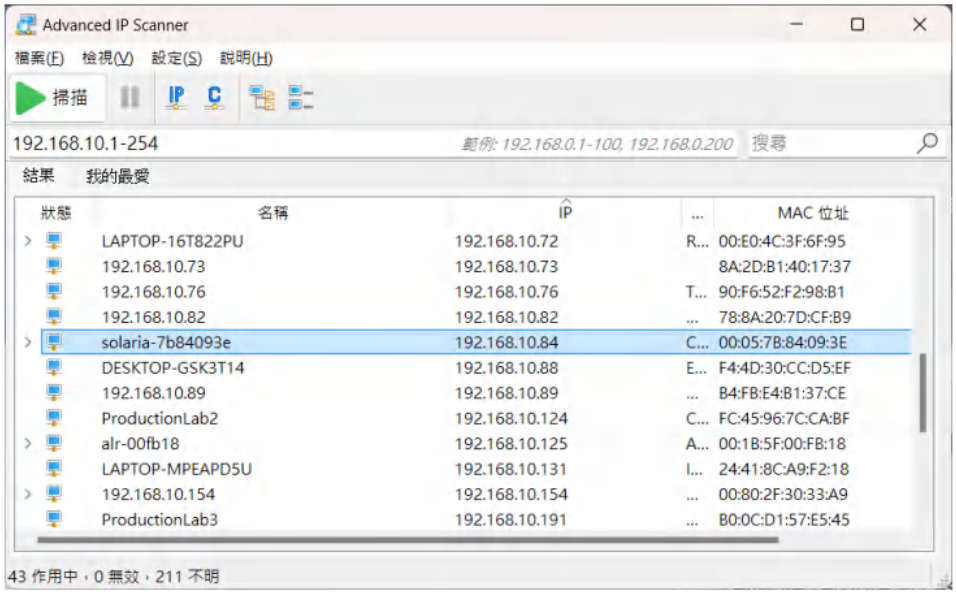
3.6. Connecting to the SOLARIA reader using Browser

SOLARA Reader is set to connect to Ethernet in DHCP mode.

Connect Ethernet cable from your PC to the reader directly, or via an Ethernet switch while the reader is powered by DC adapter. Make sure the host is configured to work as a DHCP server. If the reader is powered up by PoE+ Switch or PoE+ injector, make sure the host is set in the same subnet and there should be a DHCP server in the subnet.

The reader may take up to 1 minute to boot up after connected the power.

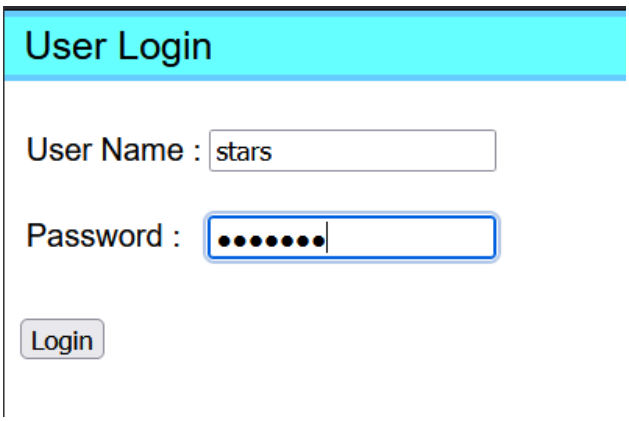
Use a 3rd party IP scanning tool like Advance IP Scanner. Look for the Solaria Reader and its corresponding IP:



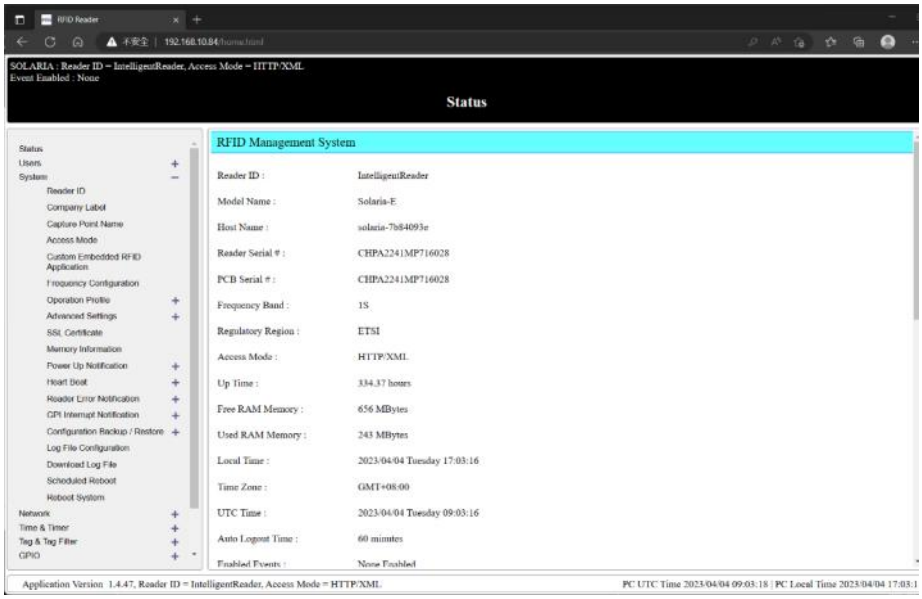
Open the browser and type in the IP found in the previous step. It is 192.168.10.84 in this example.

A User Login page will be shown

Key in User Name: **stars**, Password: **systems** then click Login

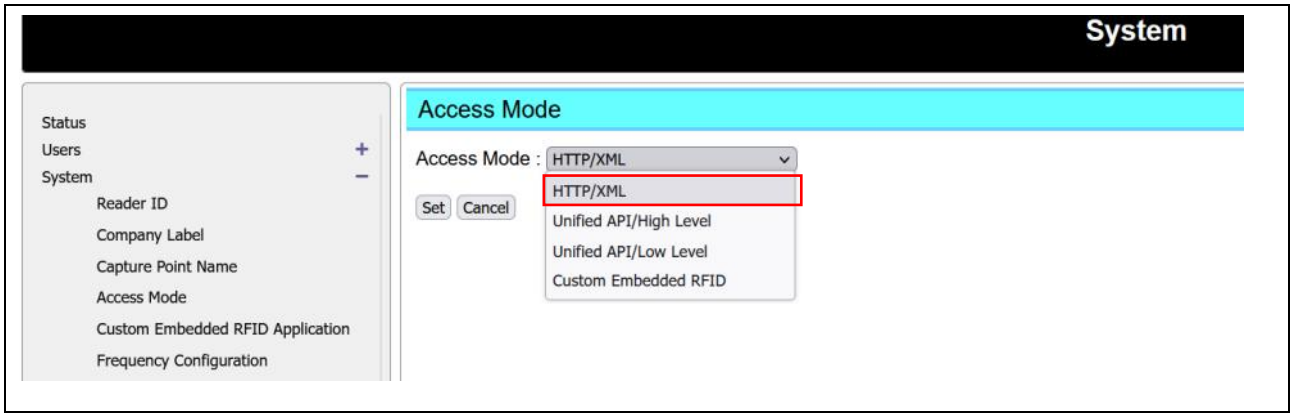


The Status page is showed up after login.



Default Access Mode should be HTTP/XML. Change the Access Mode if reader is not in HTTP/XML mode

- In order to read and show RFID tags in Web page, please change the Access Mode to “HTTP/XML“ as shown below in System page.
- Please click “Set” to confirm the change.

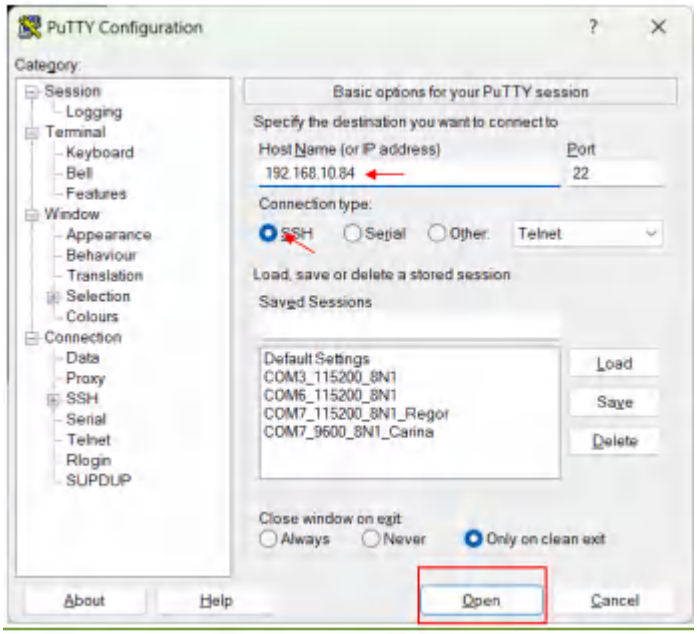


3.7. Connecting to the SOLARIA reader via SSH

Another popular way to connect to a Linux device is via SSH.

Choose SSH on the front page if using the application PuTTY or other SSH terminal program:

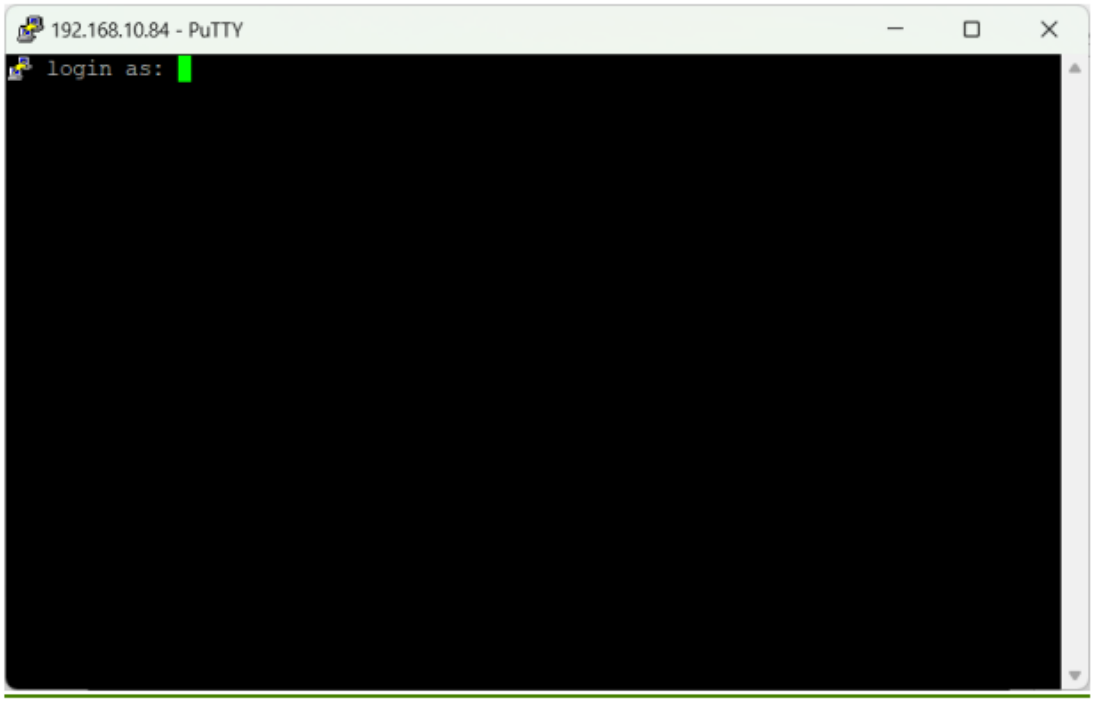
Start Putty, select SSH on Connection Type and type in IP address of SOLARIA, then click Open

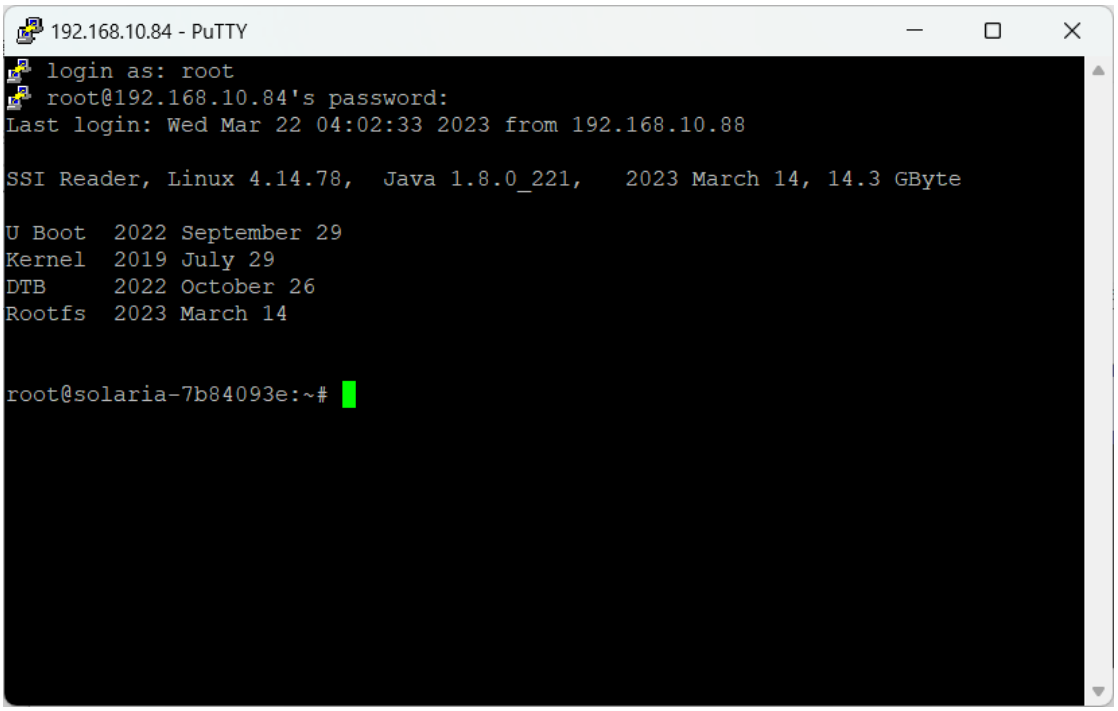


Next, you should type in

Login name : root

Password : hRd29sLr23





3.8. Embedded Linux Applications Development

By using SSH of SOLARIA reader, you can develop embedded Linux codes in the usual Linux development manner.

The SOLARIA Reader is using Yocto Linux.

For popular open source software, you can use the command "dnf" to download popular precompiled binaries (dnf is similar to apt-get) by the following steps below:

Step 1: type the command "dnf --refresh makecache" (beware of the double dash) to refresh the directory of available precompiled binaries

Step 2: type the command "dnf list" to list the available precompiled binaries in long name format.

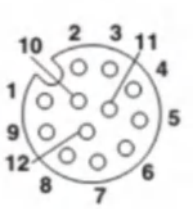
Step 3: type the command "dnf list | grep <keyword of the application you want>" to narrow your search to those in long name format.

Step 4: type the command "dnf install <long name of the application as obtained from Step 3>"

3.9. GPIO Port and Accessories for Connection

SOLARIA has 4 General Purpose Inputs and 4 General Purpose Outputs, all of them are optically isolated, and also an isolated 12 Volt DC output power supply with a rating of 2 Watt.

GPIO



M12 Socket
12 Position
A-Coded

4. GPIO Ports Connection Guide

SOLARIA GPIO ports are optically isolated switches only. There are various ways one can connect them up for common peripheral control. The following sub-chapters describe typical ways to connect up for General Purpose Input (GPI) and General-Purpose Output (GPO) operations.

The GPIO ports are optically isolated. To work with external relays or switches, an external power supply is needed. Some of the examples show how this is done in a safe manner. The important thing to remember is to handle exception cases when the load encounters a shorting failure, and the unlimited current can pass through that, and the optical isolated switch can be damaged if a protective resistor (high power resistor) is not placed in series with the power supply path. As long as a protective resistor is there, the overall circuit is protected. This is a standard industry practice.

4.1. General Purpose Input (GPI)

GPI ports contain an optical isolator inside. The input line has a series resistor of 1K Ohm with 1.5 Watt rating for protection. This will withstand external voltage up to 36 volts as shown below.

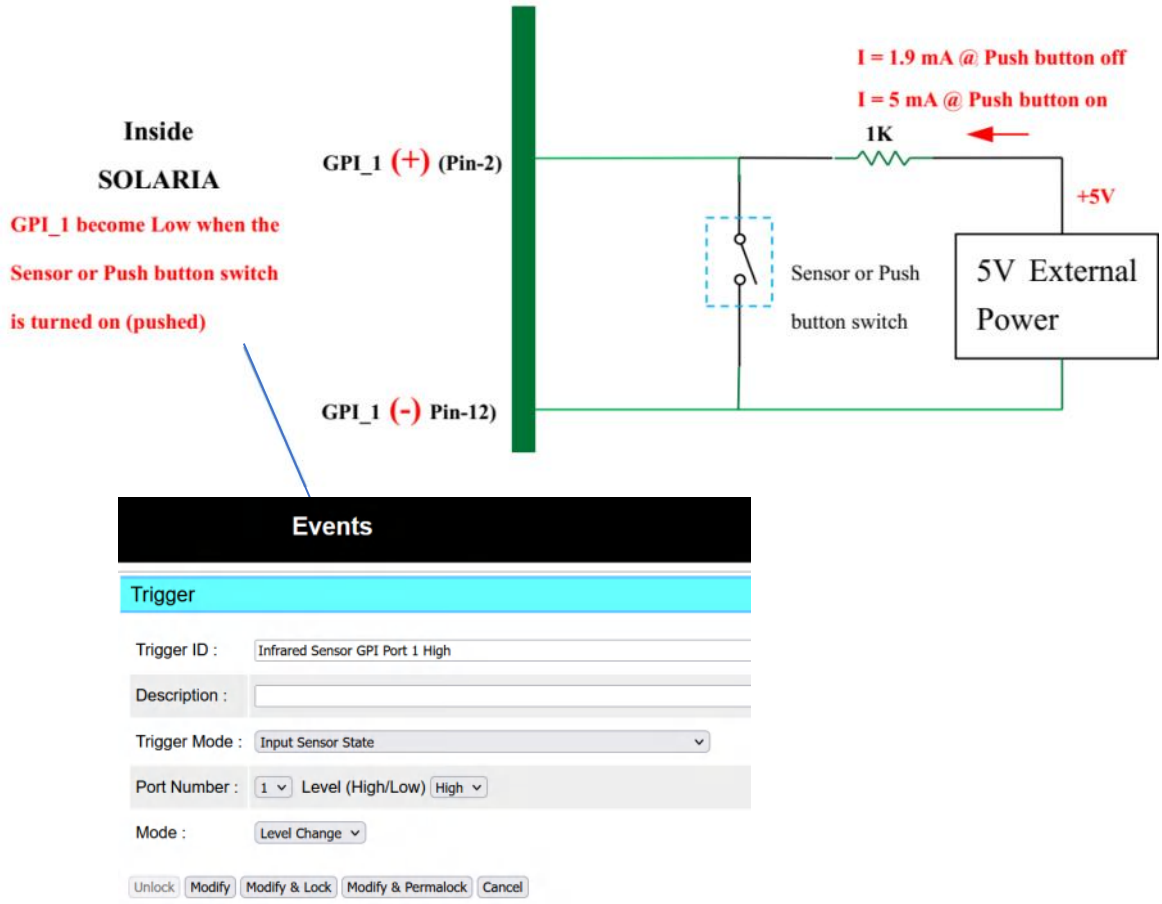
$$P = V^2 / R$$

$$P = 36^2 / 1000 = 1.296 \text{ Watt} < 1.5 \text{ Watt}$$

As such, the highest voltage the GPI port of the SOLARIA reader can be “seen” to be 36 volts.

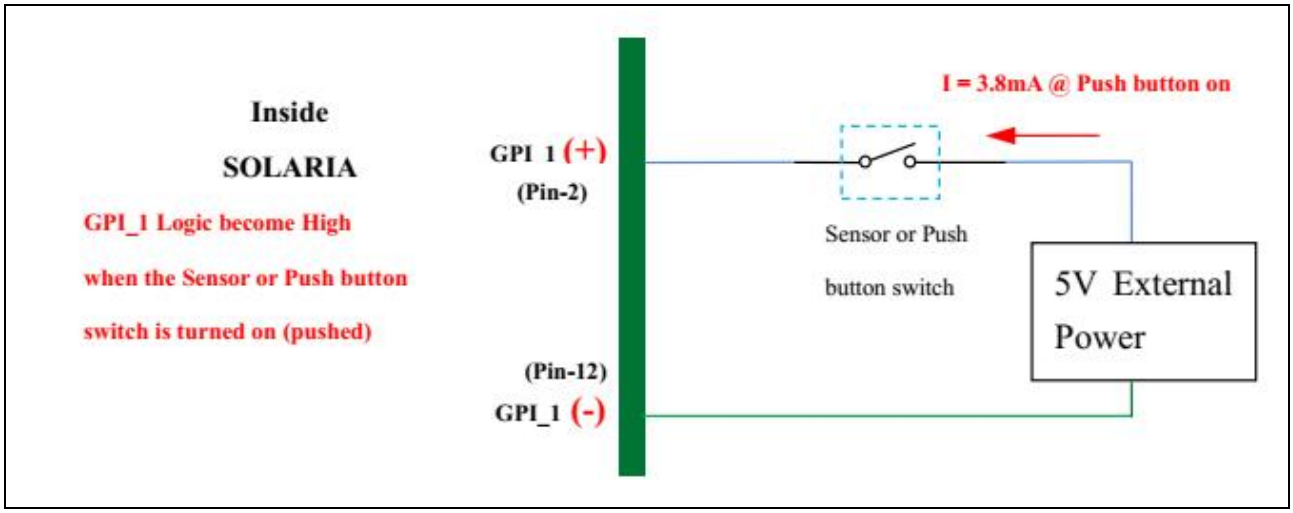
Example 1: (GPI with +5V External Power Supply)

Each GPI pin pair "looks" into an optical isolator with an operational forward voltage of 1.2 Volt, maximum 50 mA current. An internal series 1K Ohm 1.5 Watt resistor is also present for protection.



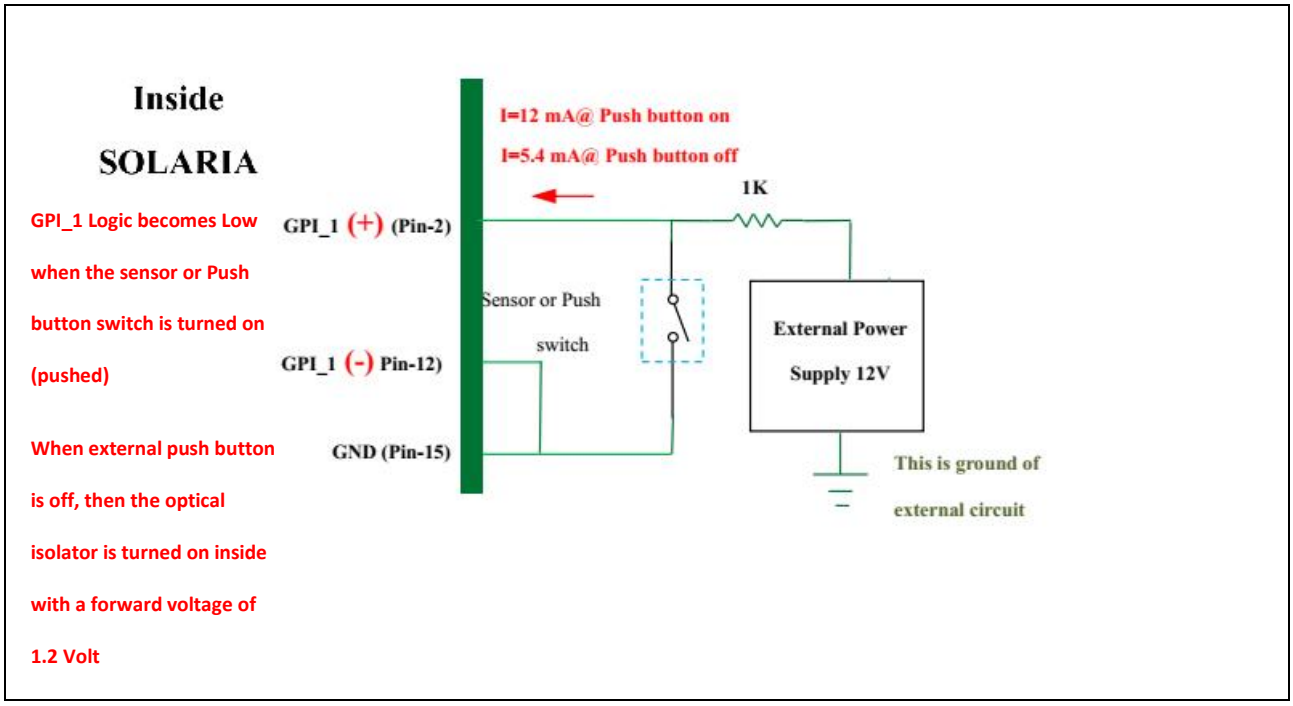
Example 2: (GPI with +5V External Power Supply)

Each GPI pin pair "looks" into an optical isolator with an operational forward voltage of 1.2 Volt, maximum 50 mA current. An internal series 1K Ohm 1.5 Watt resistor is also present for protection.



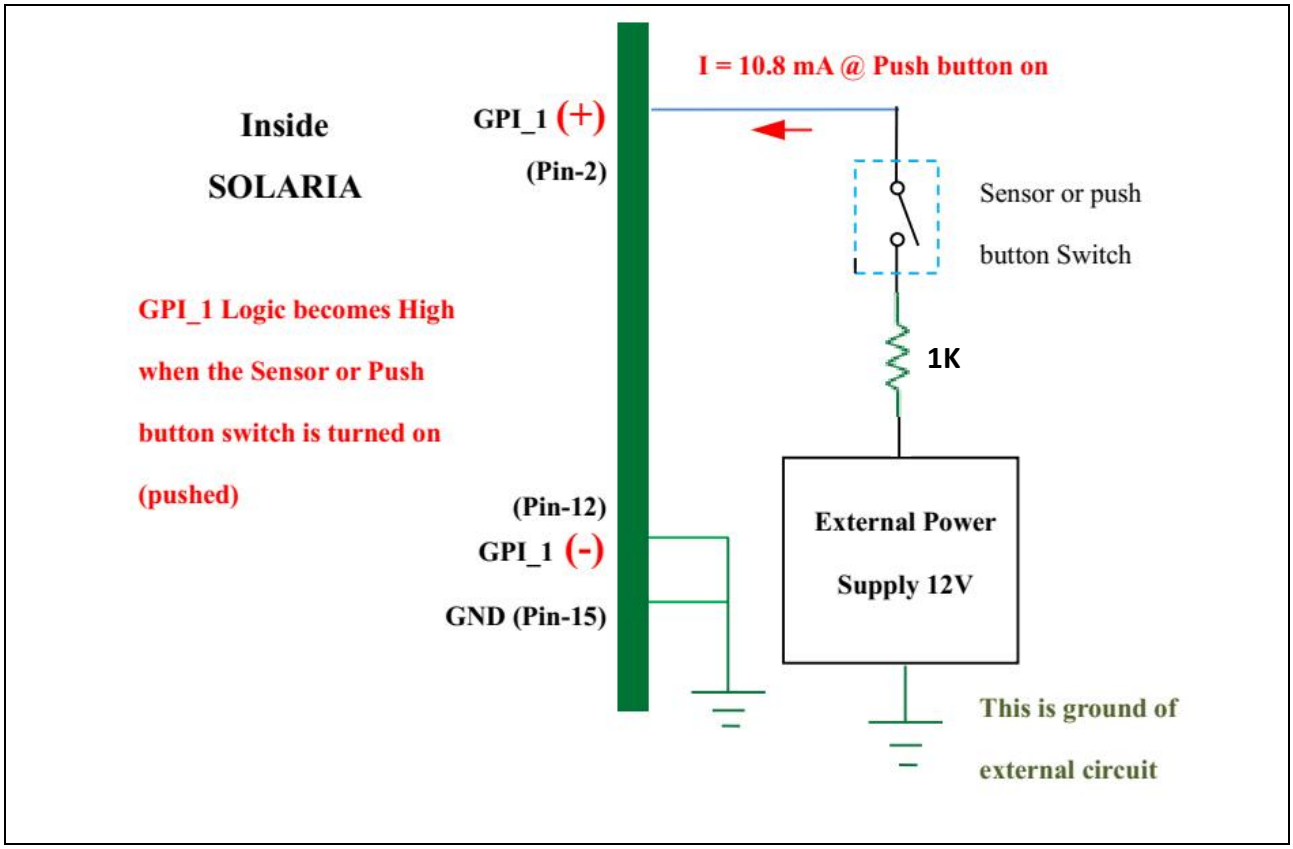
Example 3: (GPI using the External +12V, 2 Watt Power Supply)

Each GPI pin pair "looks" into an optical isolator with an operational forward voltage of 1.2 Volt, maximum 50 mA current. An internal series 1K Ohm 1.5 Watt resistor is also present for protection.



Example 4: (GPI using the External+12V, 2 Watt Power Supply)

Each GPI pin pair "looks" into an optical isolator with an operational forward voltage of 1.2 Volt, maximum 50 mA current. An internal series 1K Ohm 1.5 Watt resistor is also present for protection.



4.2. General Purpose Output (GPO)

The maximum current that can pass through the GPO optically isolated switches of the SOLARIA reader is 2 Ampere.

Therefore, a protection resistor with very high-power rating must be added in series to the external circuit to limit the current to 2 Ampere. The value of this resistor should be such that the current cannot exceed 2 A.

Resistor Value = External Voltage / 2 A.

In addition, there is a resettable fuse internal to the GPO circuit in series with the circuit that will protect the switch as a last-ditch defense.

Example 1: GPO with +10V External Power Supply for High Load Current

A high wattage external resistor of **N** Ohm and rated to **P** Watt must be connected in case the LOAD shorts out. N and P must satisfy the following equation to limit current to 2 Ampere in such LOAD shorting situation: Resistance Value of Resistor:

N > Voltage of External Power Supply / 2

Power Rating of Resistor:

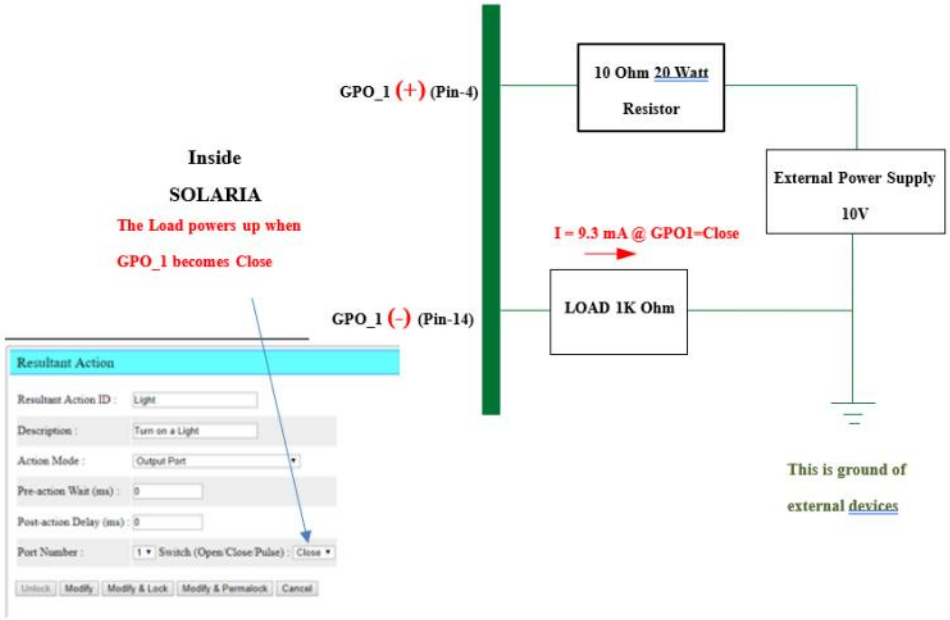
P > (Voltage of External Power Supply / N) ^2 * N

In this example, current in the load (e.g. a buzzer with 1K Ohm internal resistance) is calculated by the following equation:

$$I_{LOAD} = (\text{Voltage of External Power Supply} - 0.6) / (N + R_{LOAD})$$

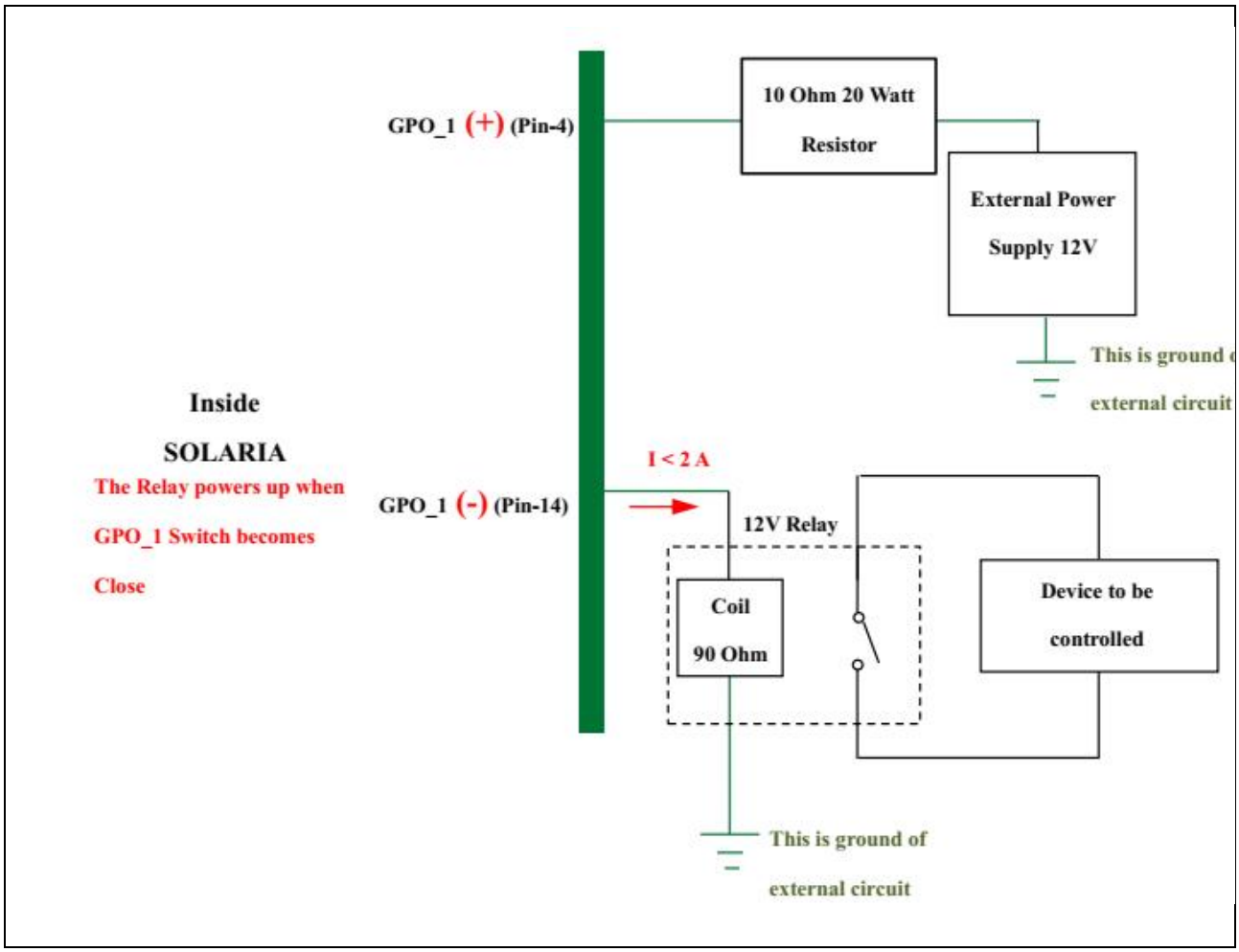
$$= (10 - 0.6) / (10 + 1000)$$

$$= 9.3 \text{ mA}$$



Remark: The maximum current flowing through GPO pin pair is 2A

Example 2: GPO using relay for full isolation and high coil current (with External Power Supply)



Remark: The maximum current flowing through GPO pin pair is 2A

5. Web Browser Interface Details

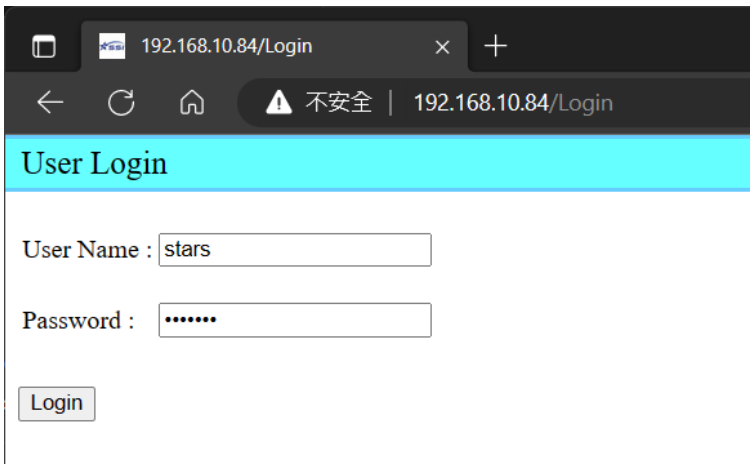
This chapter describes in detail the web browser interface. With SOLARIA, this web browser enables full control of the reader, including the event engine.

5.1. Home Page

The home page of the web-based administration interface can be entered by typing the IP address of the reader (default IP address is printed on the label) on the web browser.

For example, if the IP address of the reader is 192.168.10.84, you should type:

http://192.168.25.84

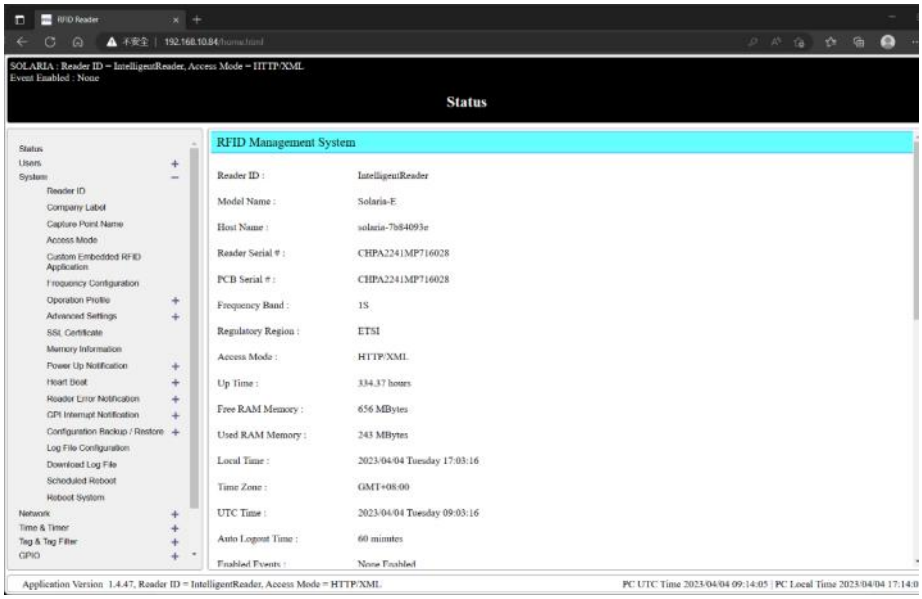


Use default User Name: **stars** and Password: **systems** and click Login to login to the Reader

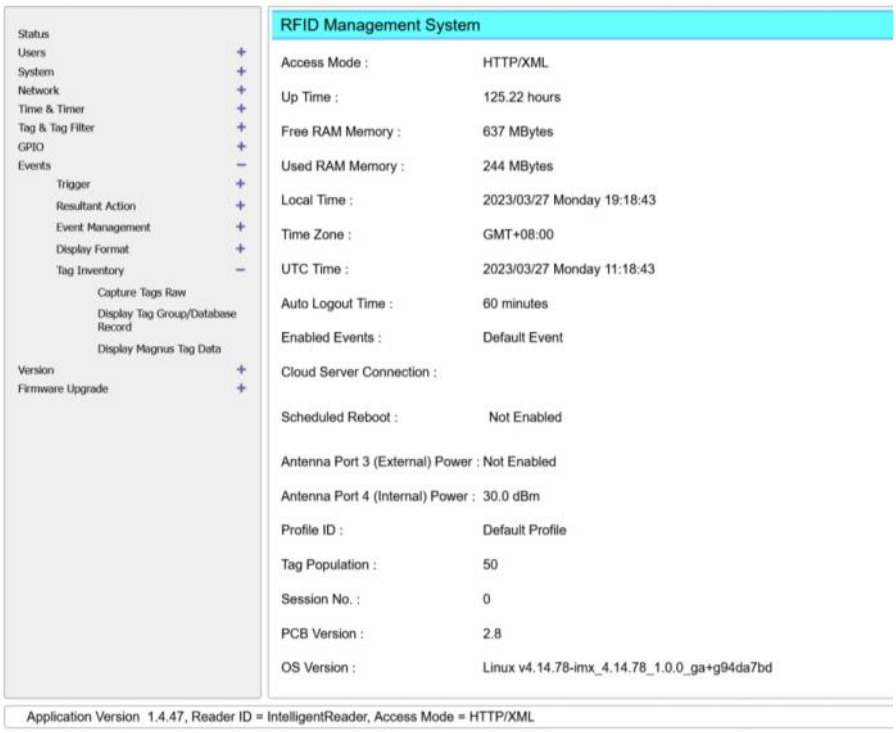
5.2. Status

The “Status” page gives a quick overview of the status of the reader.

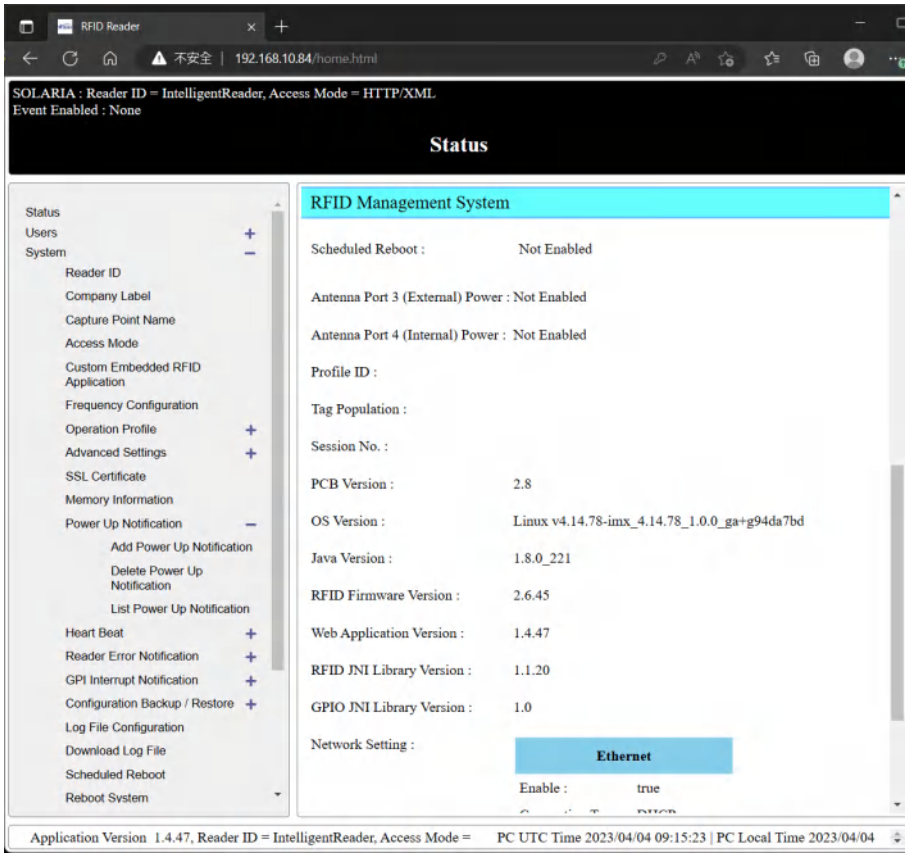
The reader basic information such as serial number and access mode can be found on the first page of status page



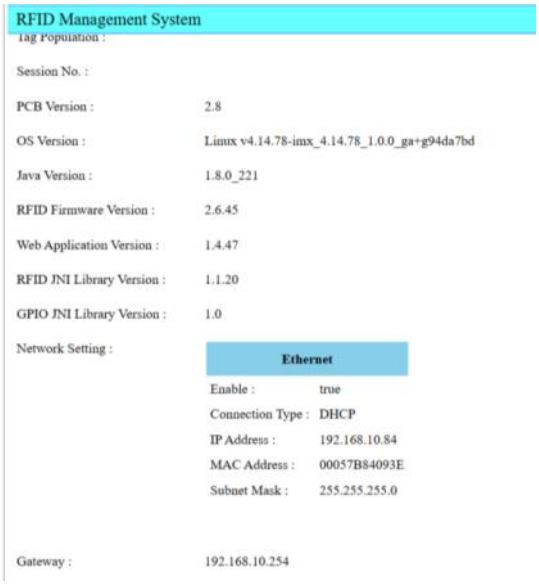
If any event was enabled and reading tag, the basic RFID related parameters will show on status page such as transmitting power, profile and session as below:



All firmware versions are shown on status page.

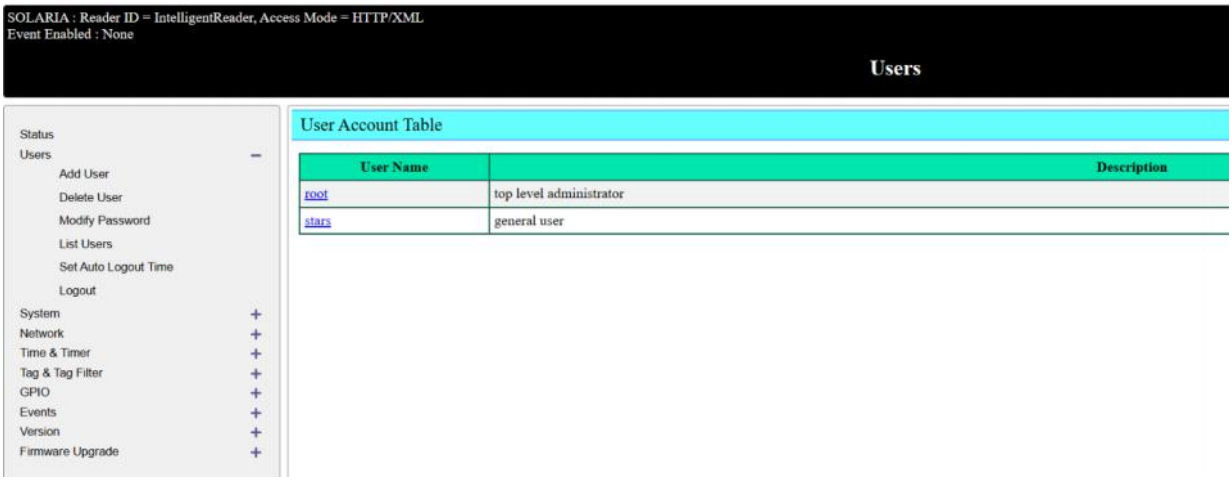


Network information can be found on status page such as IP and Mac address



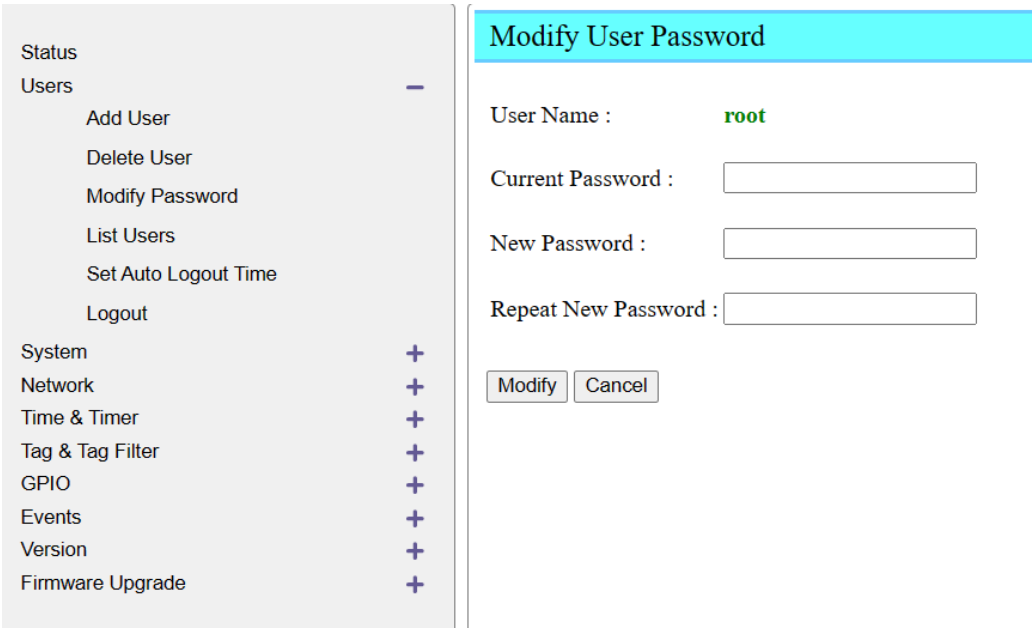
5.3. Users Management

The “Users Management” page contains sub-menu for adding, deleting and modifying password, set auto-logout time and login/logout.



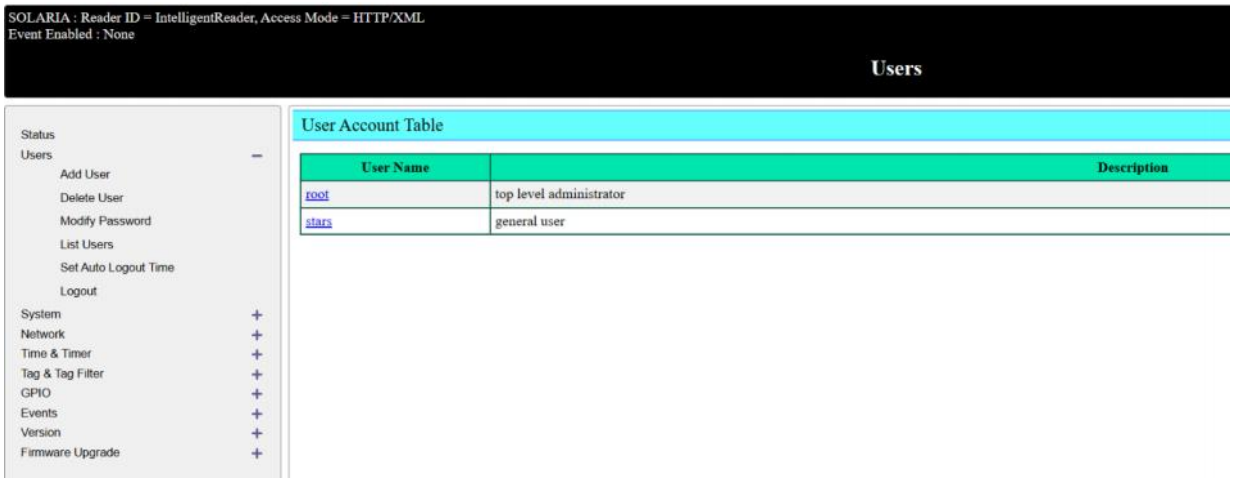
5.3.1. Modify Password

To modify password, input the current password, new password and retype new password. Then click “Modify”.



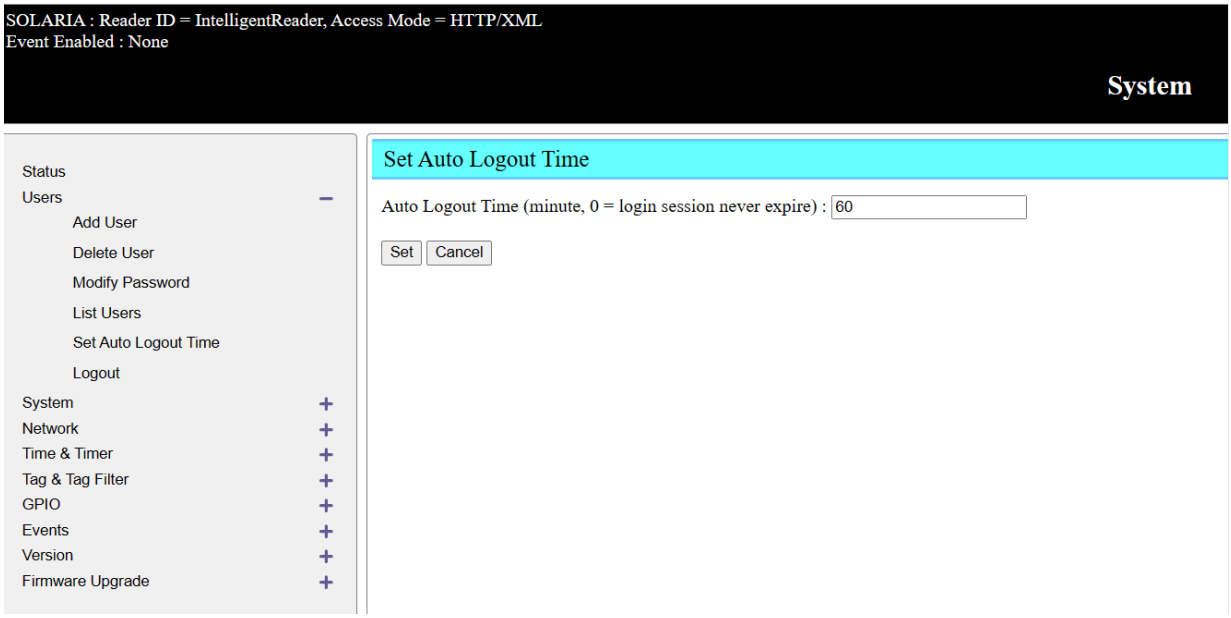
5.3.2. List Users

The “List Users” page lists all the users and his/her authority.



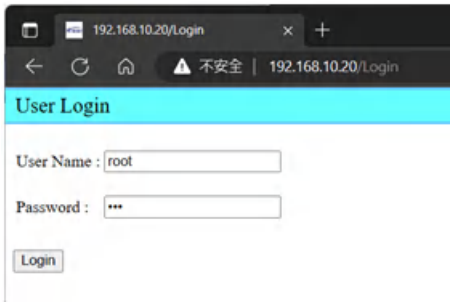
5.3.3. Set Auto Logout Time

The “Set Auto Logout Time” page allows ones to set the time for automatic logout if the user is idle.



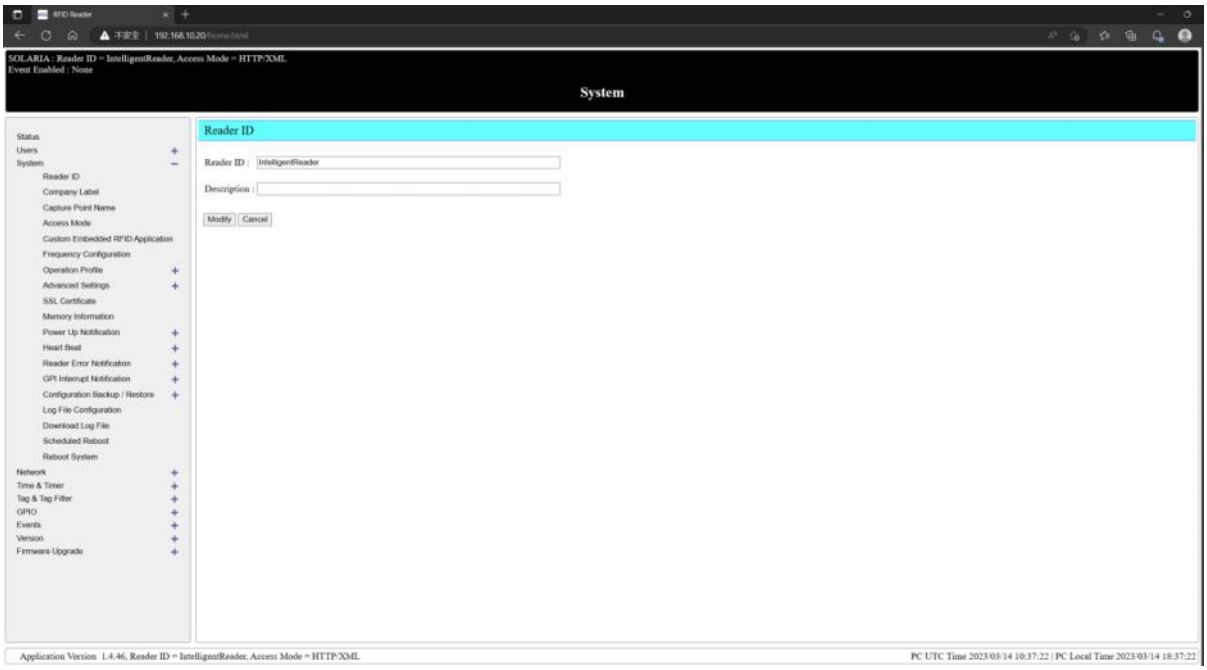
5.3.4. Login/Logout

The “Login/Logout” page is for users to login or logout the web browser interface.



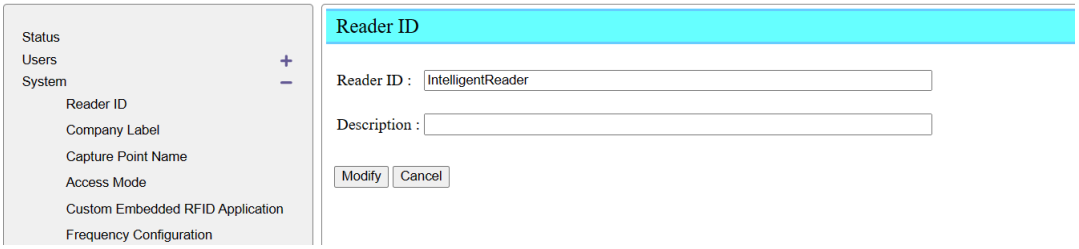
5.4. System

The “System” page contains many sub-menus to configure the reader for operation. Users are recommended to access these pages to determine the required settings before any operation.



5.4.1. Reader ID

Here is the “Reader ID” submenu:

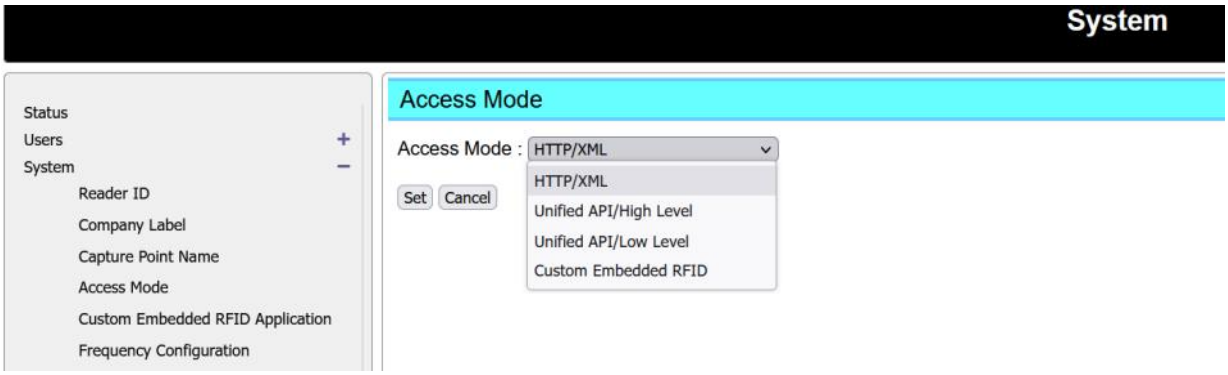


5.4.2. The Capture Point Name can be modified in this page

The name of each antenna port refers to the Capture Point Name (Some may refer to read point name). This name can be configured. In other words, each antenna port (or capture point, or read point) can be uniquely identified and accessed or referred to. Note that the word capture and read are interchangeably used in the context of this reader. A capture point is the same as a read point.

5.4.3. Access Mode

Here is the “Access Mode” submenu:



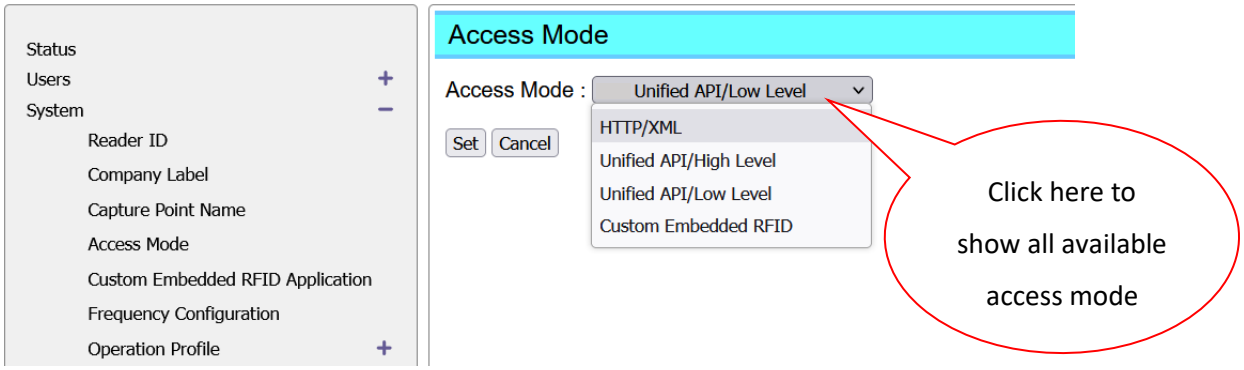
SOLARIA offers 4 access modes:

1. HTTP/XML
2. Unified API/High Level
3. Unified API/Low Level
4. Custom Embedded RFID

5.4.3.1. Set Access Mode

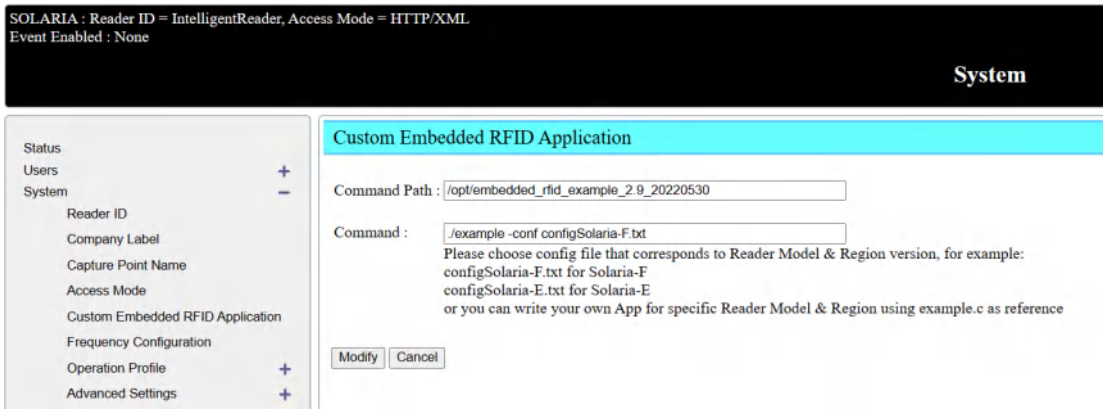
If you configure the reader on the web interface (e.g. Network setting, Time settings, Event Engine, etc.), you must set the Access Mode to “HTTP/XML”.

If you configure the reader using your own embedded control system, please set the Access Mode to “Custom Embedded RFID HTTP” and then configure it accordingly.



5.4.3.2. Custom Embedded RFID application

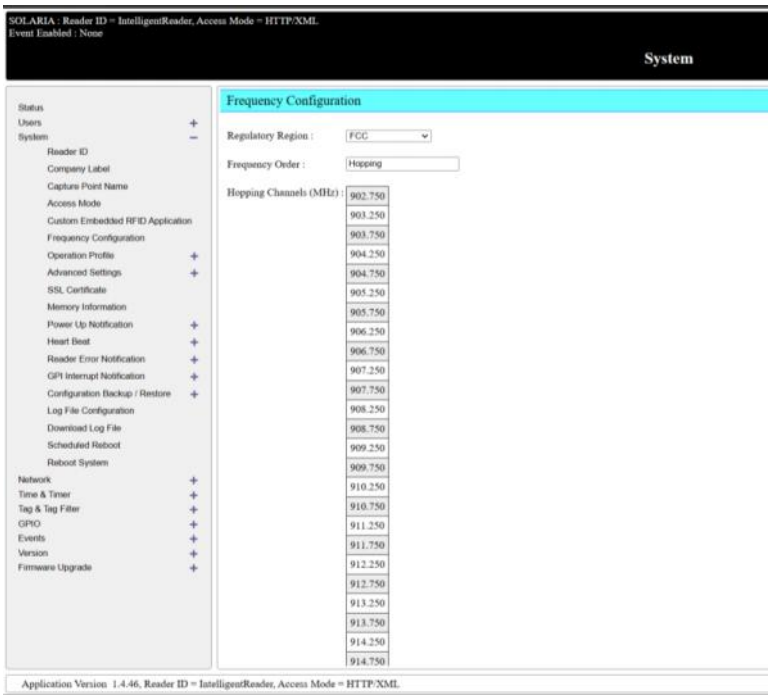
This page is used to input custom embedded RFID application path and its command. This command will be run on power on – provided **Access Mode has been changed to “Custom Embedded RFID HTTP”**.



If one SSH into the reader, and change directory to /opt, you will indeed see a sub-directory with that name. If you go into that sub-directory, you will then see the program example.c and the related makefile and other resources. This example.c code demonstrates how to run the RFID circuits inside to do inventory. You can modify that code or build your own company’s code based on that.

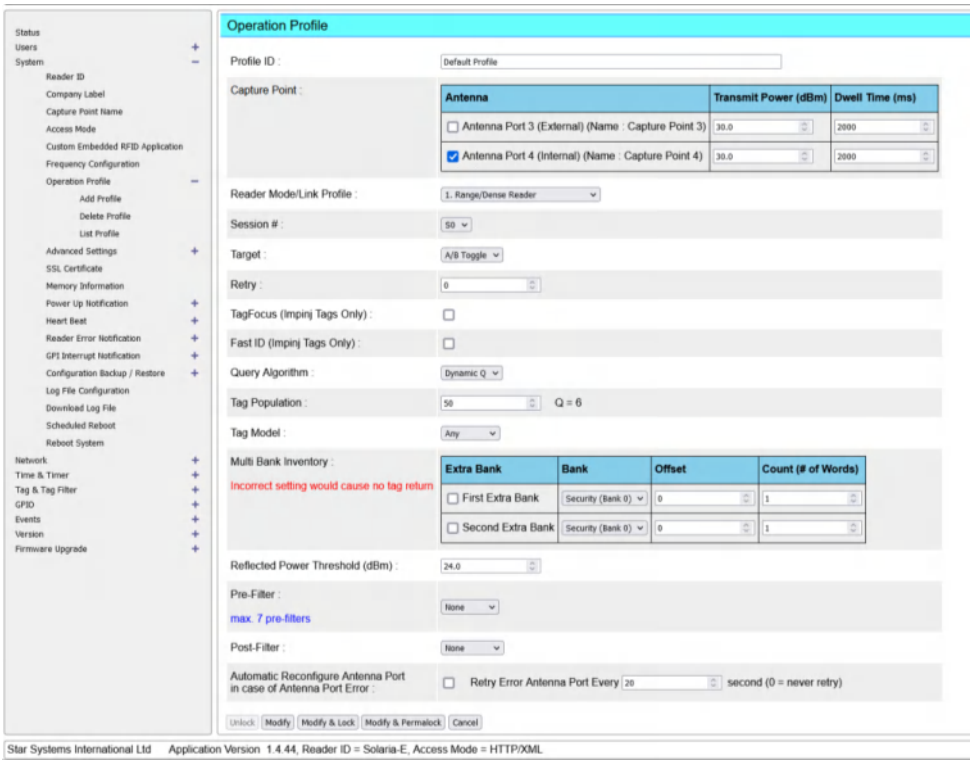
5.4.4. Frequency Configuration

The “Frequency Configuration” page allows user to configure the frequency to be used by the reader. Please refer to the regulatory law of your region for the allowed frequency to be used. Here is the “Frequency Configuration” submenu:



5.4.5. Operation Profile

The “Operation Profile” page is extremely important as it sets the basic RFID parameters of the reader.



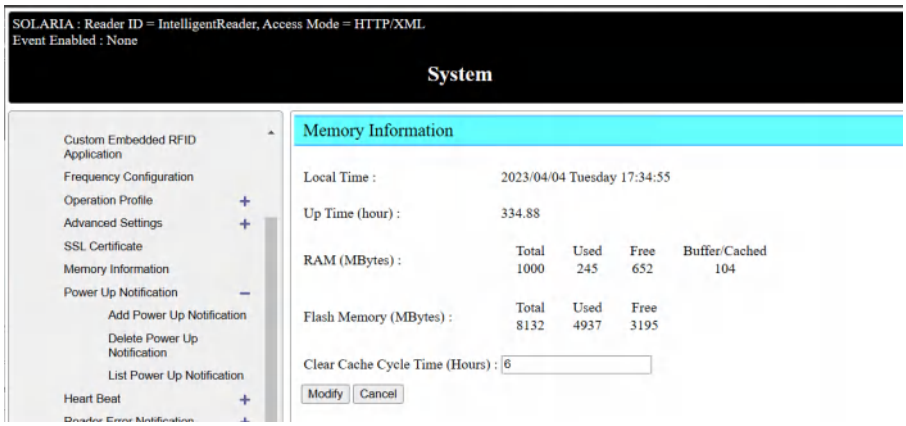
Parameter	Description
Profile ID	Each profile can be saved and recall for use in Event Engine, or be uploaded and redeployed to other SOLARIA reader in the field.
Capture Point	Which antenna port to enable (turn power on) and the output conducted power of each antenna port, in terms of 10 x Power (dBm) Dwell time of each antenna port – how long the reader will stay in that particular antenna port to do RFID tag inventory in each antenna cycle.

Reader Mode/Link Profile	There are different Reader Modes: *0* – Best Multipath Fading Resistance *1* – Longest Read Range, Dense Reader Mode *2* – Read Range and Throughput, Dense Reader Mode *3* – Maximum Throughput Please see Appendix B for more details
Session #	Session # S0, S1, S2, and S3, as defined by EPC
Target	Flag A, B or A/B Toggle of the tag to be inventoried
Query Algorithm	Fixed Q or Dynamic Q Algorithm
Tag Population	Estimated population of tags to be read at a time. Based on this tag population estimate, the corresponding Q parameter to be broadcasted during a Query will be displayed on the right side of the edit box
Multi Bank Inventory	SOLARIA has a unique multi-bank inventory capability: up to 2 more banks, with each bank's starting address and length of words to be captured configurable
LNA	Control RF front end gain of reader
TagFocus	Enabling TagFocus feature can reduce the time to finish reading high number of tags. Pls note this feature can only work with those tags got this feature
FastID	If this feature was enabled, the tag chip with this feature, will backscatters the EPC and TID together during an inventory. Pls note this feature can only work with those tags got this feature
Tag Model	For special feature tag such as temperature reading, right model must be chosen

5.4.6. Memory Information

The “Memory Information” page shows the RAM and Flash memory used and free (available for use).

It also displays the Clear Cache cycle time. This is the periodic time when the Linux OS cache is cleared.

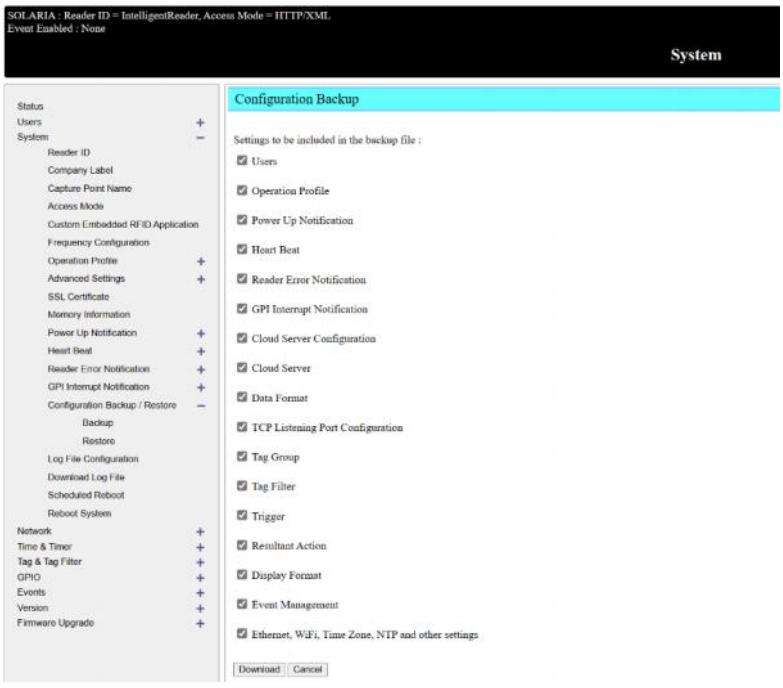


5.4.7. Configuration Backup/Restore

The “Configuration Backup/Restore” page allows backup of configurations, restoring of configurations.

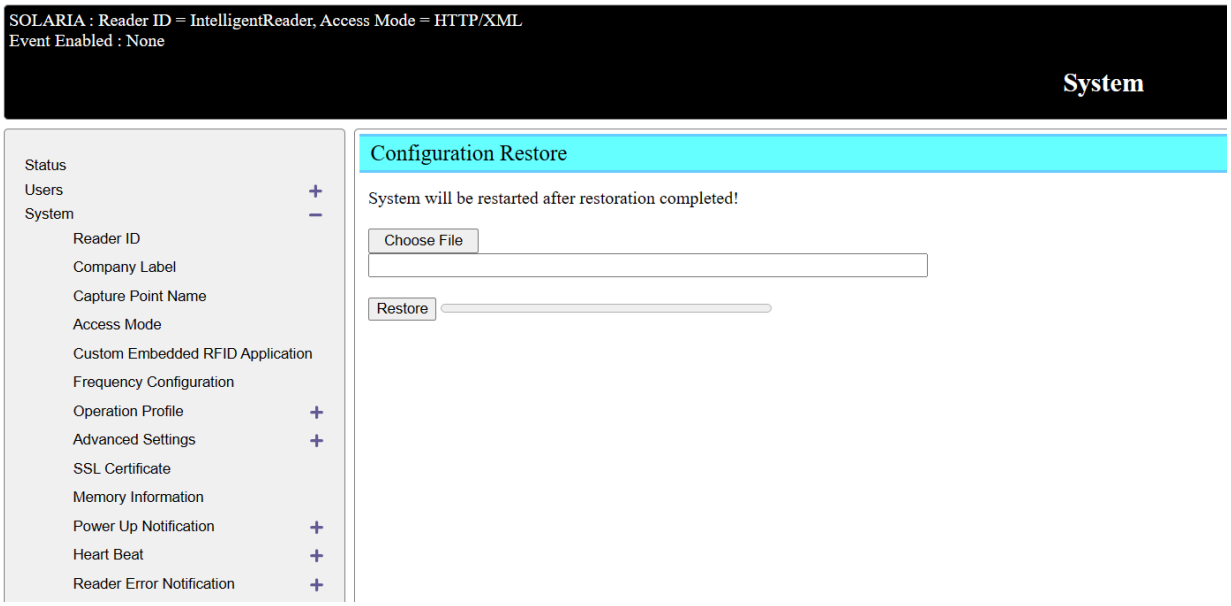
5.4.7.1. Configuration Backup

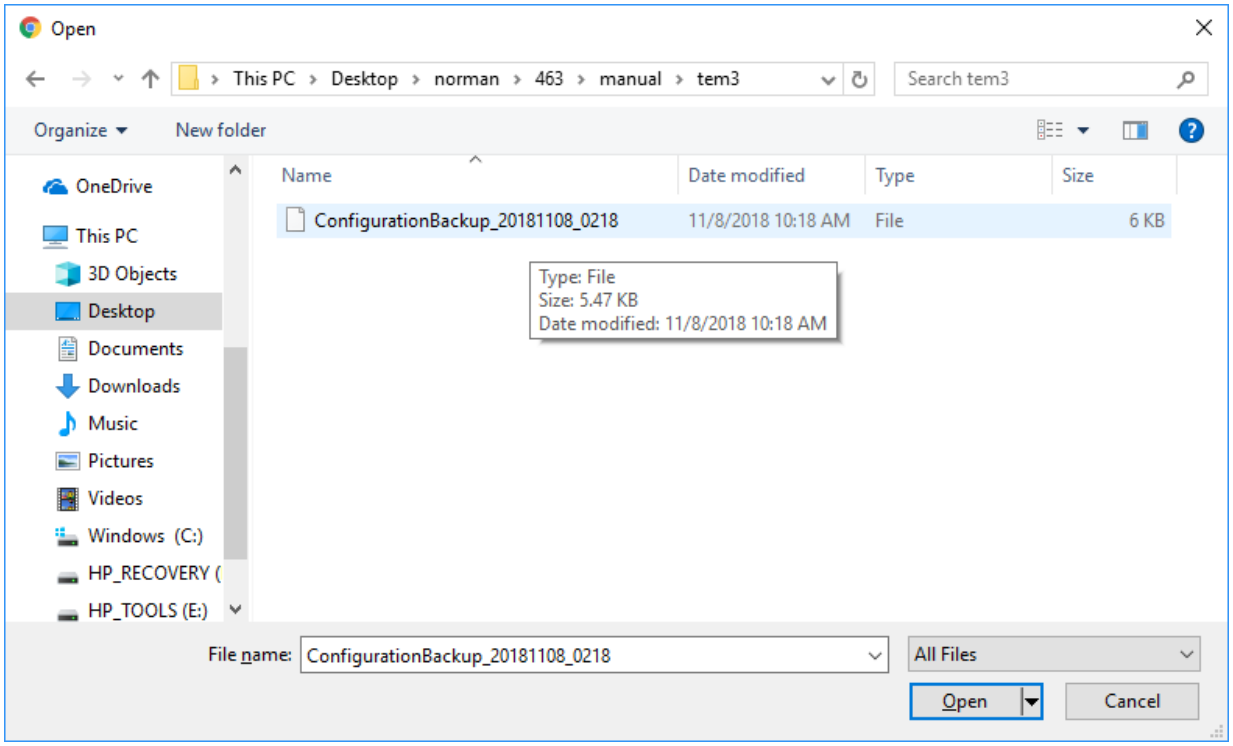
To backup configuration, click “Download” in “Configuration Backup” page. The system would start to backup the configuration to file.



5.4.7.2. Configuration Restore

To restore backup configuration, click “Choose File”. Then select the backup configuration file and click “Open”.

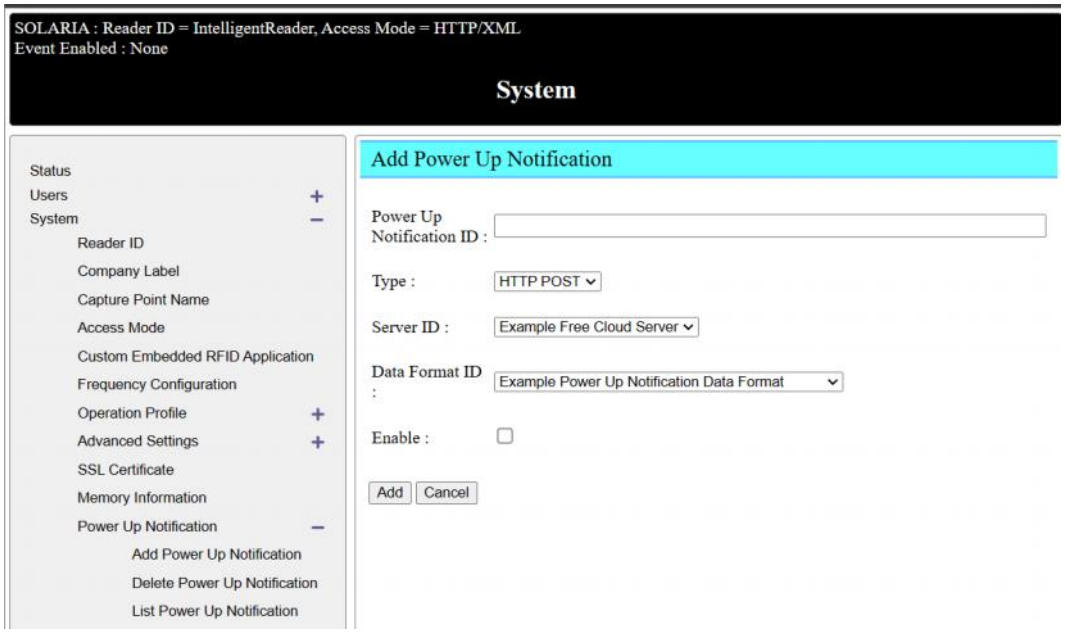




5.4.8. Power Up Notification

System can send power up notification to server with a particular format if it is enabled

5.4.8.1. Add Power Up Notification

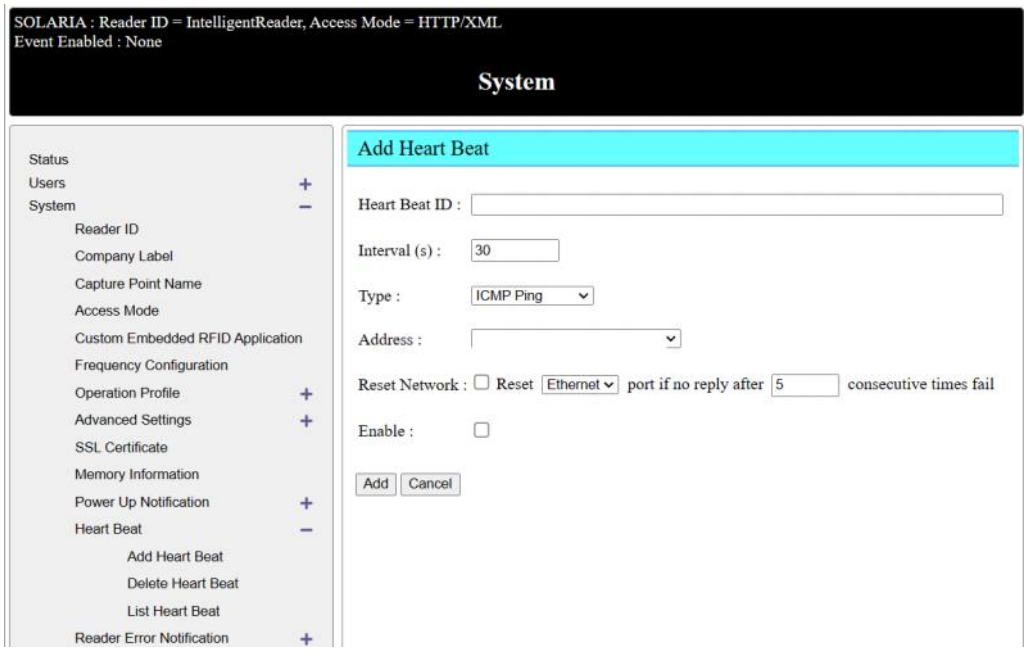


5.4.9. Heartbeat

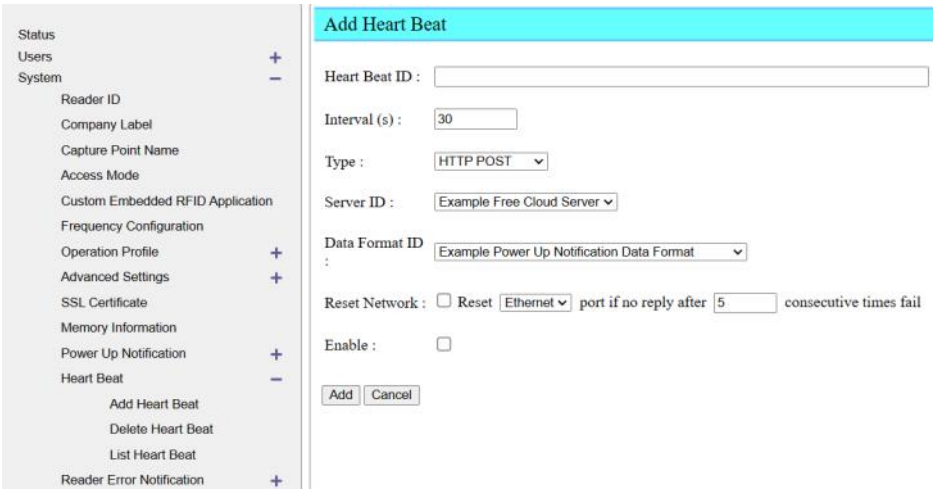
Heartbeat is used to monitor the system if it is running

5.4.9.1. Add Heat Beat

The Heartbeat sending interval, type and address sending should be set on Add Heart Beat as below.



If the HTTP Post type server is selected, corresponding Server and Data Format should be selected as below. Server and Data Format was defined in Cloud Server page.

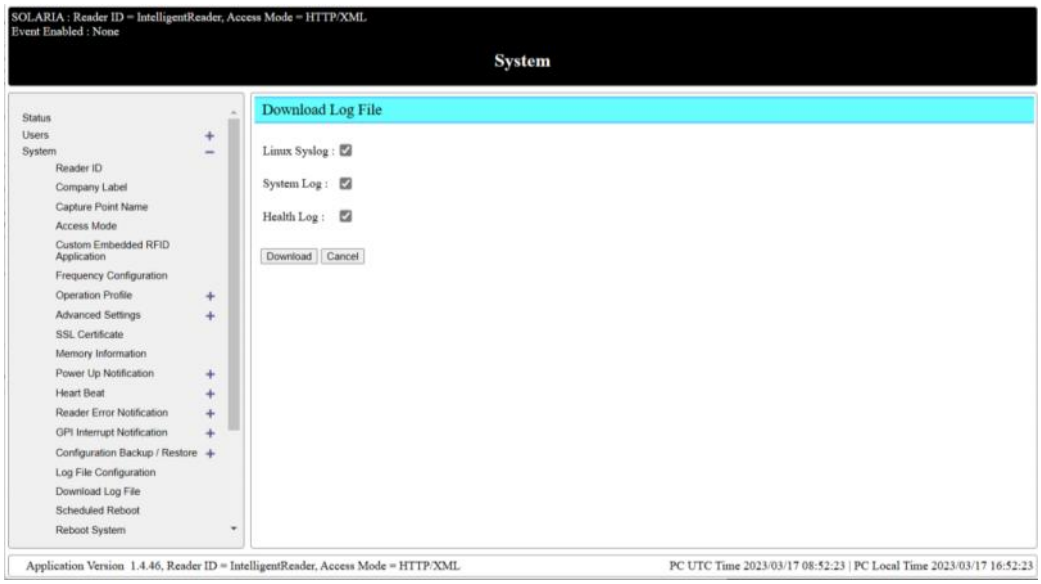


5.4.10. Log File Configuration

There are different types of log files which can be enabled as shown below.

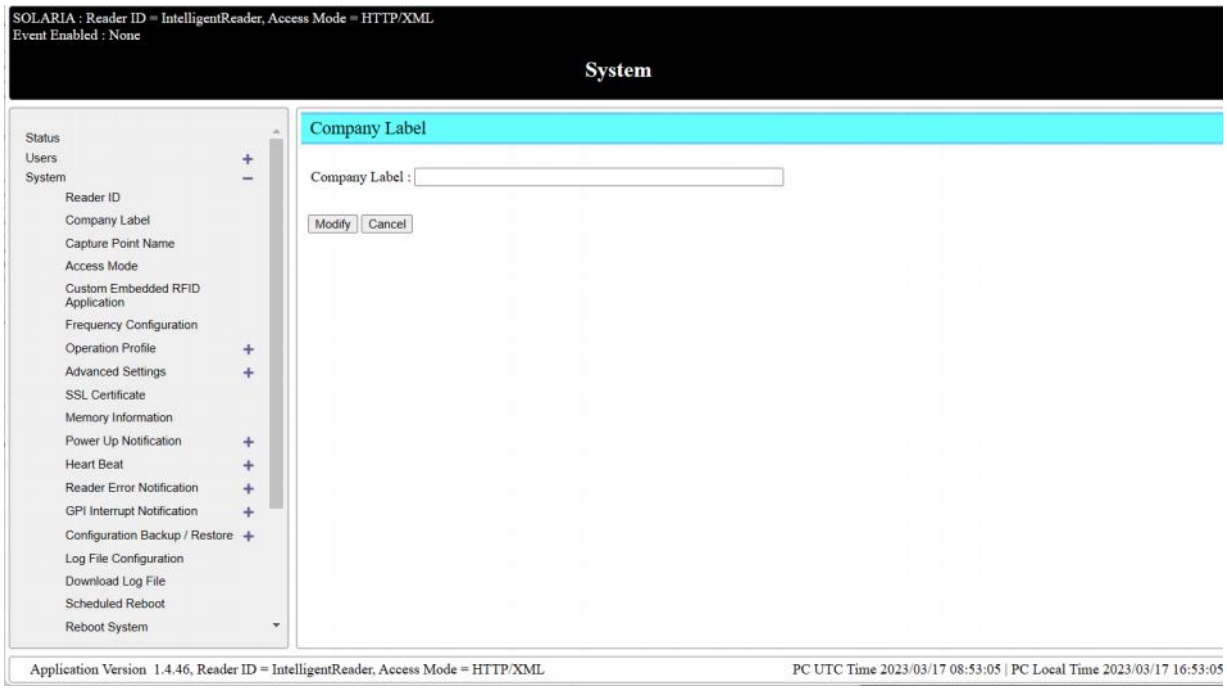
5.4.11. Download Log file

All Log files can be download on this page, select Log files type going to download then click Download to start download.



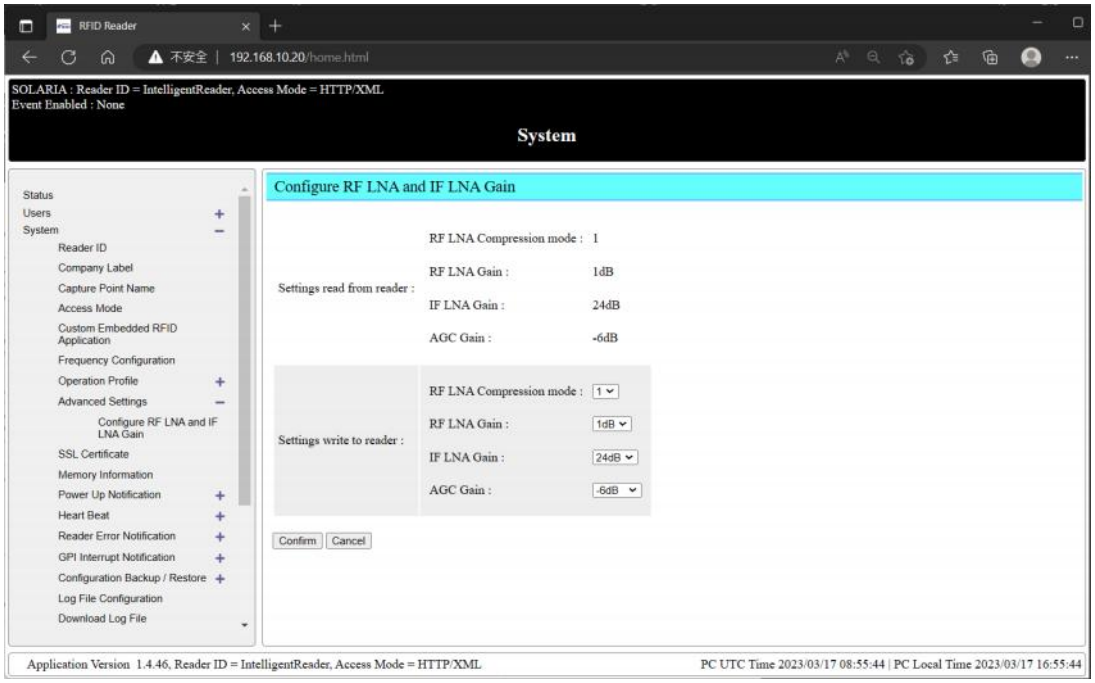
5.4.12. Company Label

Company label can be shown on web page and was defined on this page



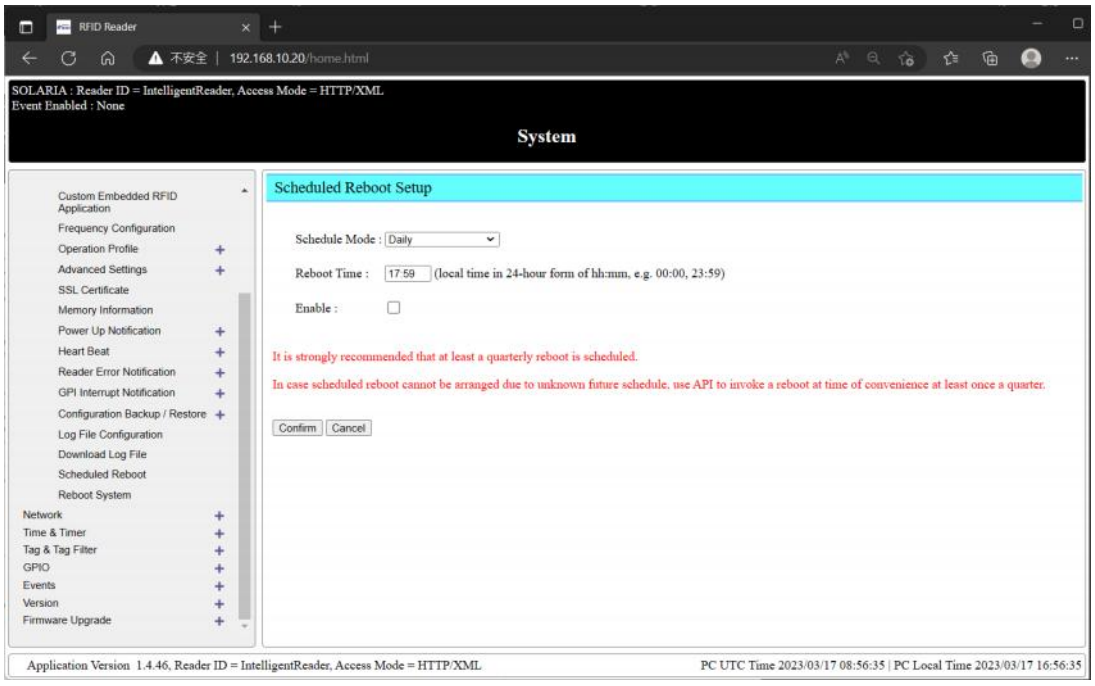
5.4.13. Advanced Settings

The reader sensitivity can be set on this page by changing the parameters below.



5.4.14. Scheduled Restart

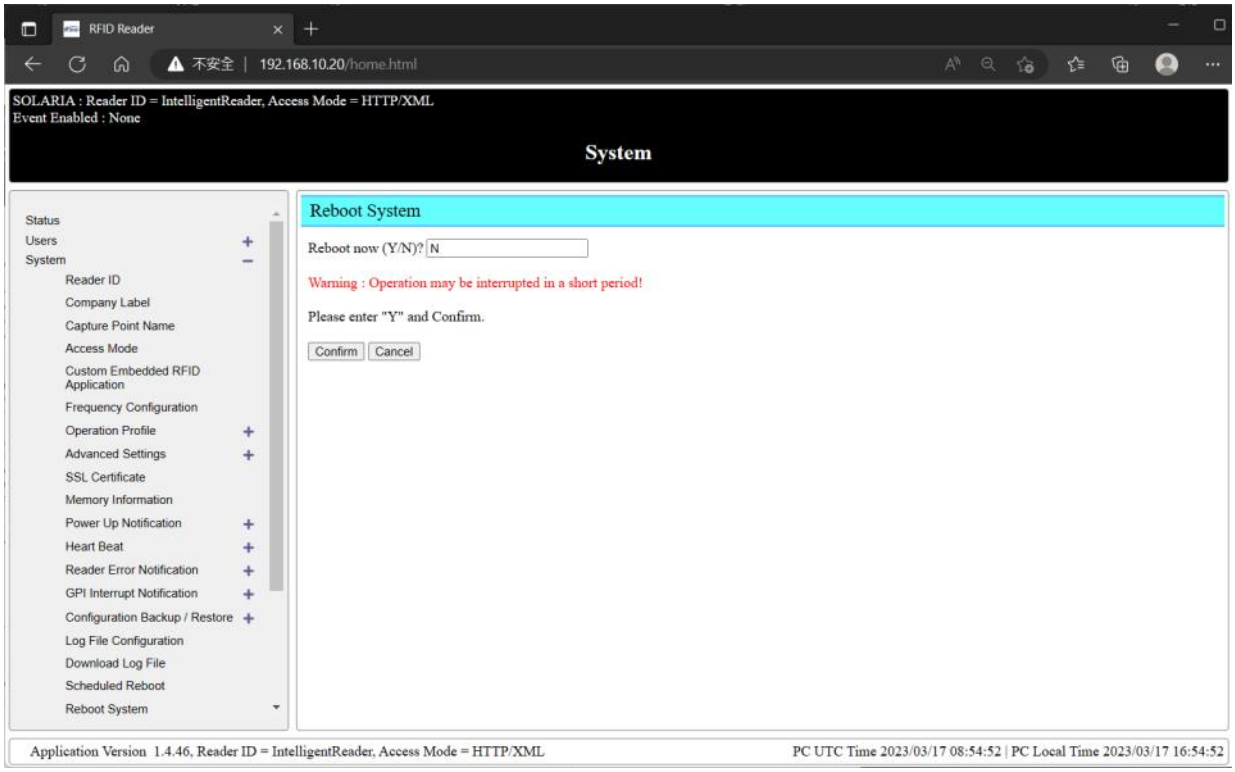
System Restart can be scheduled on this page



5.5. Restart System

To restart the system, input “Y” and click “Confirm”

Y must be capital letter

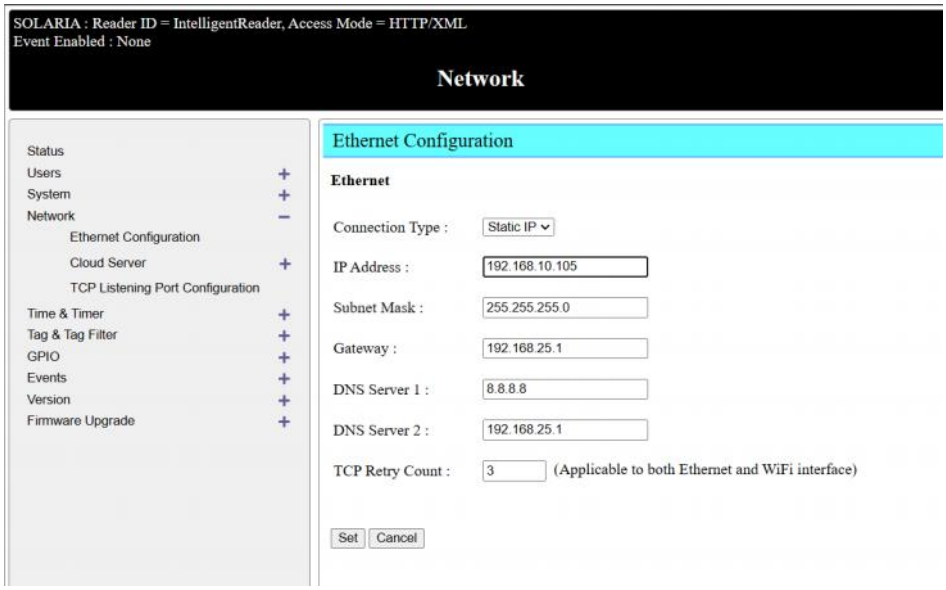


5.6. Network Management

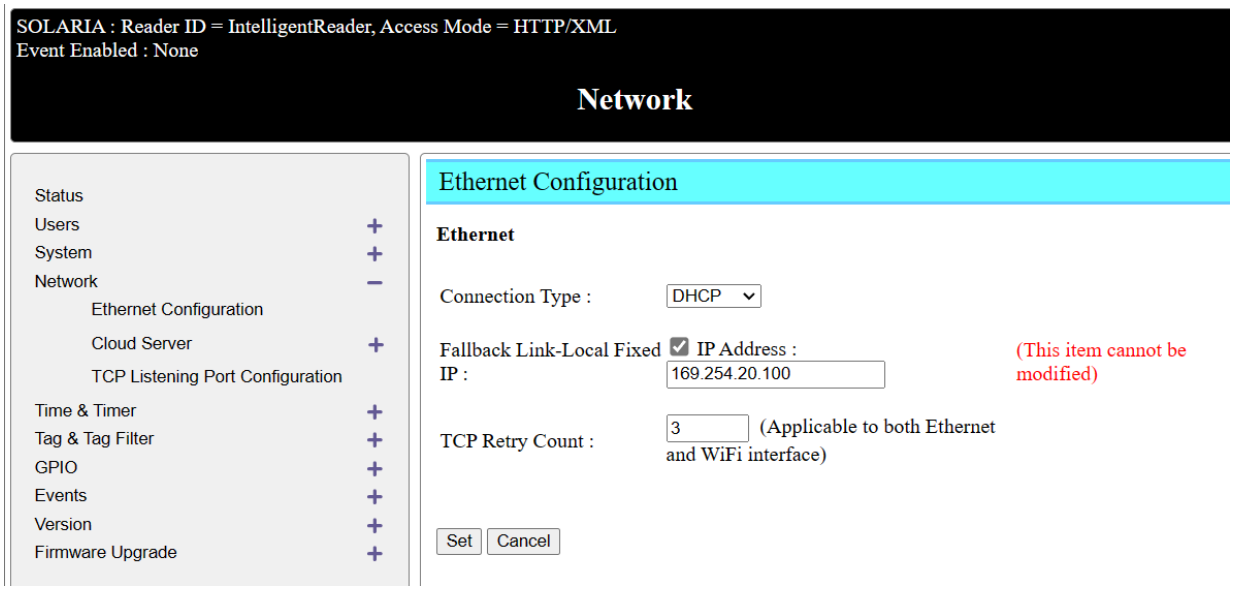
“Network Management” page allows the user to set the network parameters. Here is the network management sub-menu:

The connection can be static IP or DHCP

Connection Type can be set to static IP as below

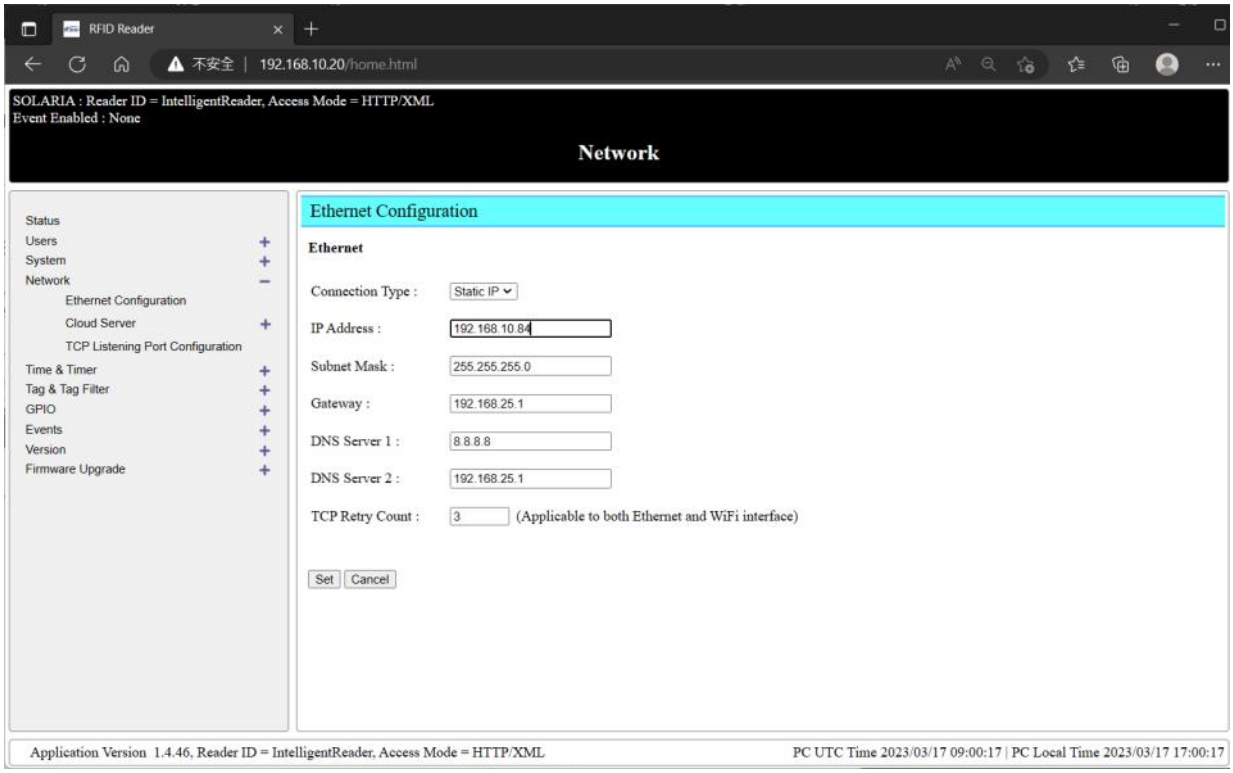


Connection Type can be set to DHCP as below.



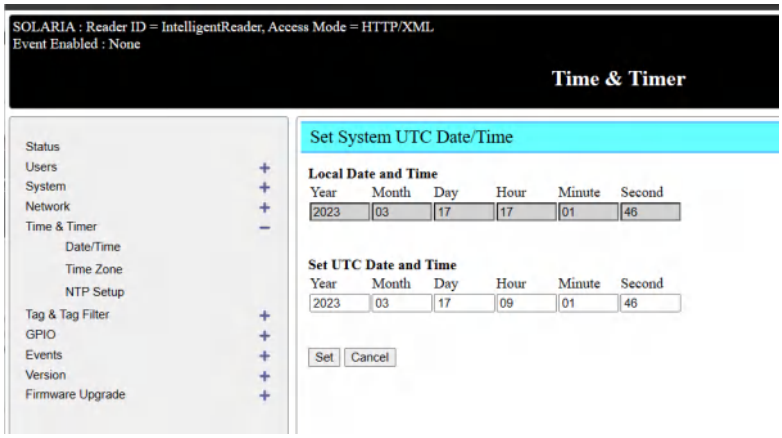
5.6.1. Ethernet Configuration

In “Network Configuration” page, one can configure the network parameters such as the reader IP address, Subnet mask, Gateway and DNS server.



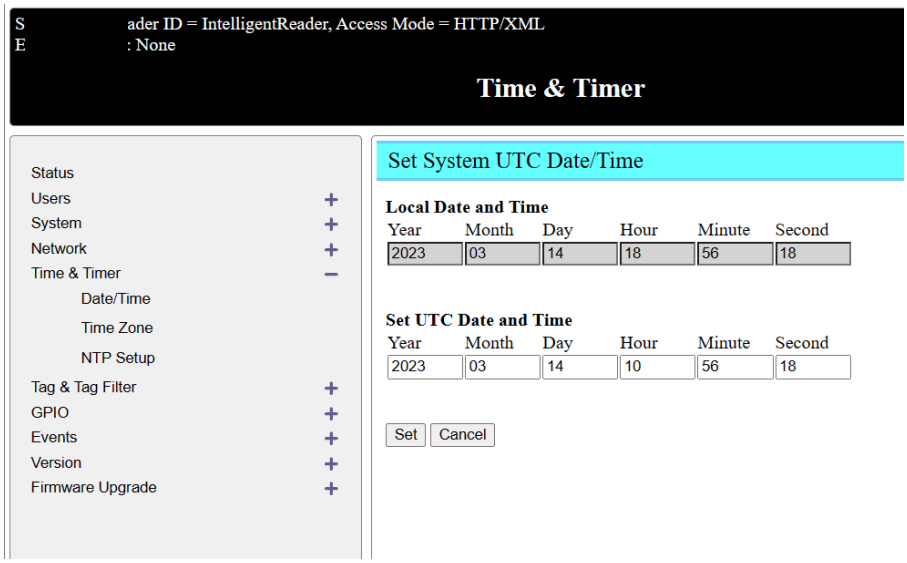
5.7. Time and Timer Setting

Here is the “Time and Timer Setting” submenu:



5.7.1. Date/Time

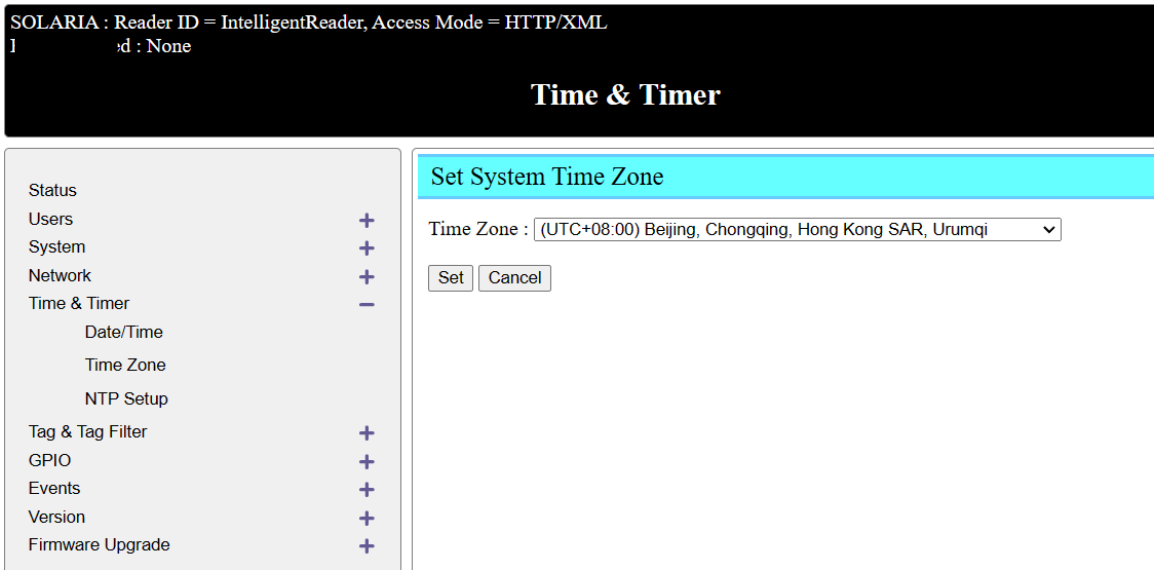
The “Date/Time” page allows the user to set the real time clock inside the reader. Please configure the UTC (GMT) time on the reader. The local time will then be calculated based on the time zone that is being set. Note that for some countries, Daylight Savings Time is applied.



Warning: After changing the date and time, the reader may pause reading 30-60 seconds for re-initiation. It is recommended not to open the “Capture Tags Testing” page in “Tag & Tag Filter” for viewing tags during this period.

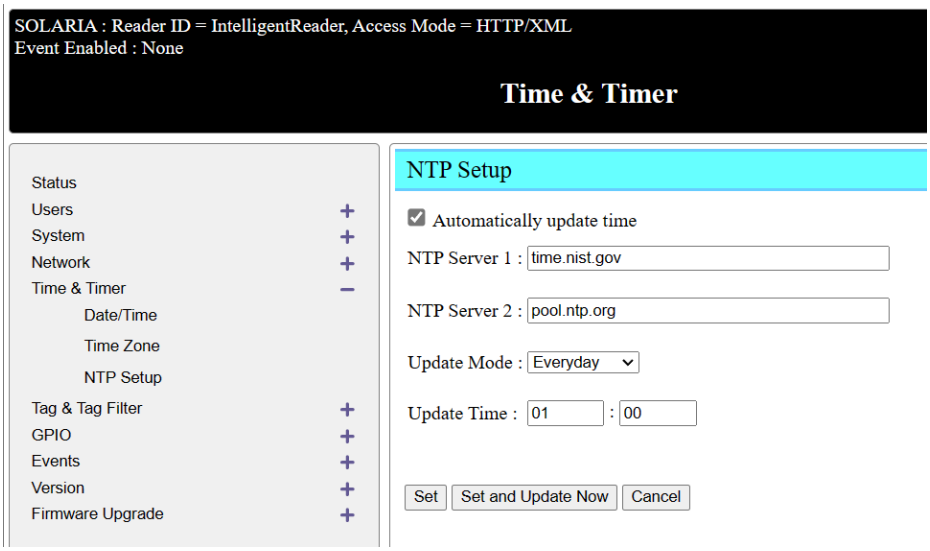
5.7.2. Time Zone

The time zone can be set on this page



5.7.3. NTP Setup

This page allows one to setup the NTP server. The SOLARIA reader will update its time by connecting to the NTP server at a preset time and preset mode. Be sure to enter the gateway and DNS server in the network configuration page in order for the NTP server be reachable by the reader.



5.8. Tag & Tag Filter

The “Tag & Tag Filter” page allows you to create the Tag group or Tag database which will be used in Trigger page and define filter to be enabled on operation profile. In actual deployment, RFID reader is used to do security screening of incoming or outgoing objects. A list of predefined tag IDs can be downloaded to each RFID reader so that the RFID reader will distinguish whether that tag belongs to that list (tag group or tag database). Only when a tag belongs to that group would the RFID reader carry out further action as stipulated by the event – for example open the gate.

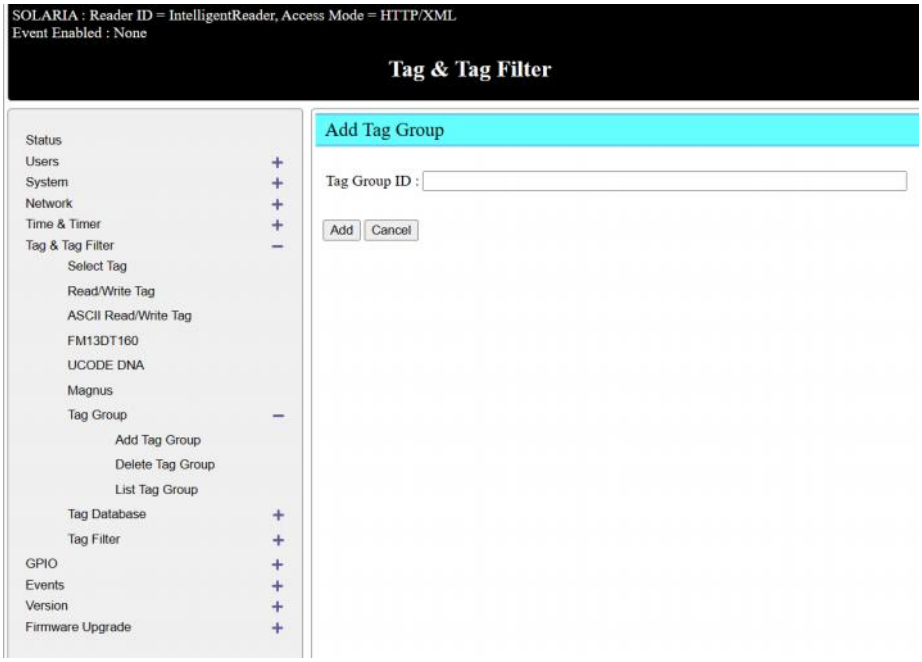
5.8.1. Tag Group

Tag groups can be created and download from the SOLARIA reader as follow

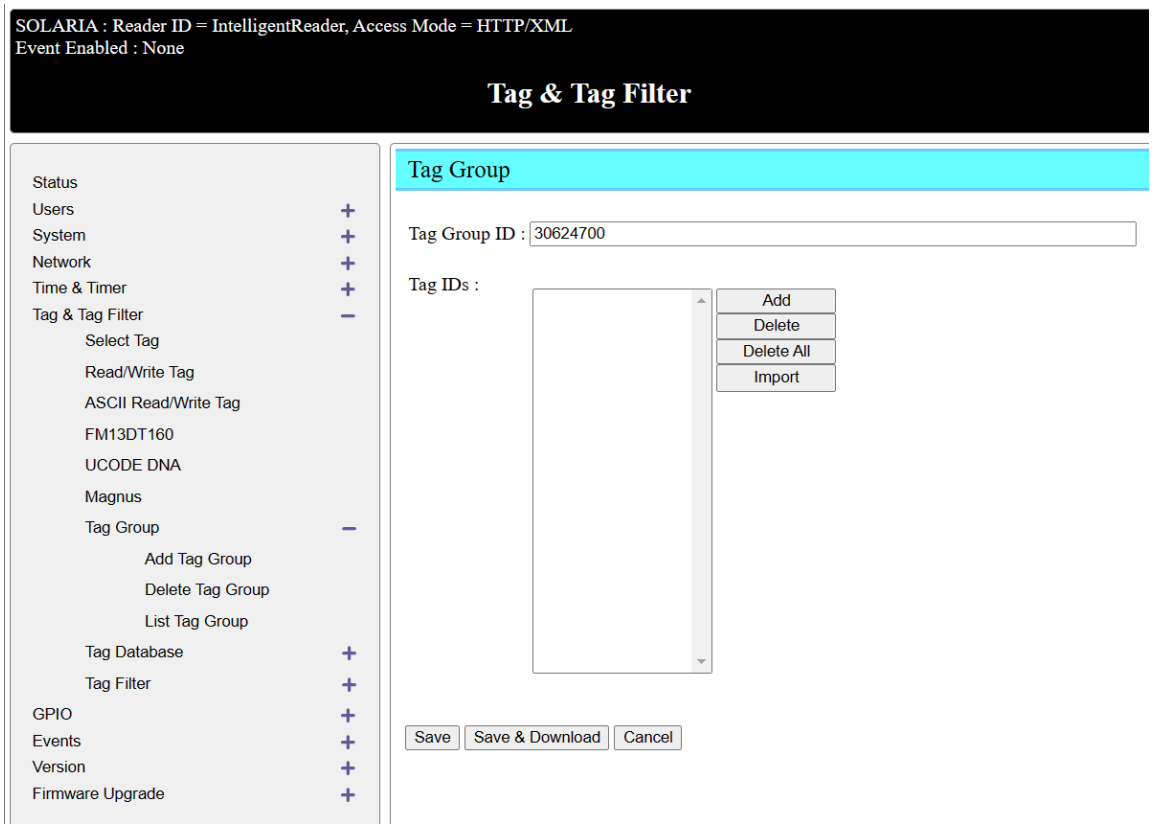
- Add tag group

Go to Tag group in *Tag & Tag Filter* and click Add Tag Group

Input the new tag group name as below



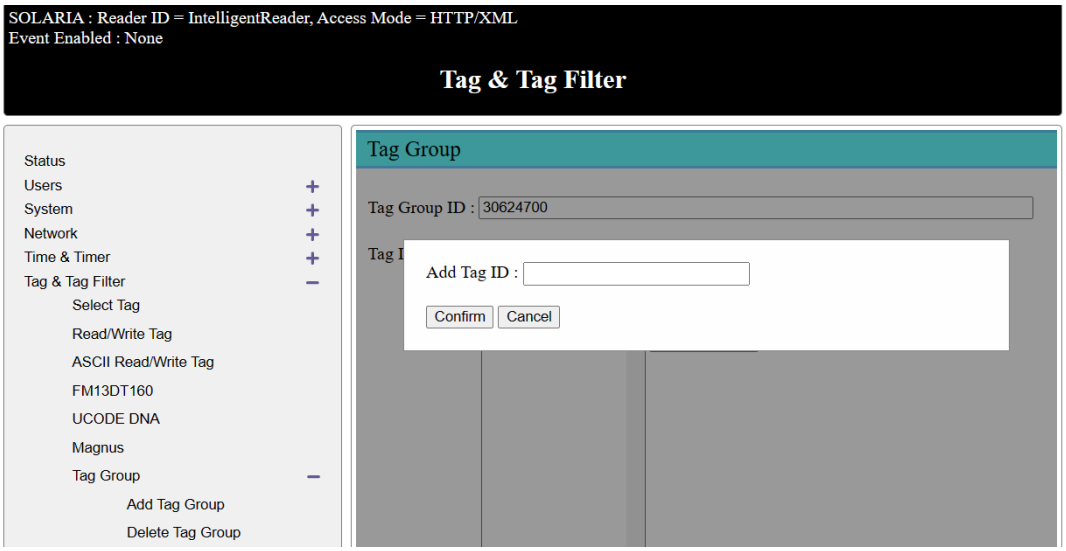
Click Add to confirm the new group



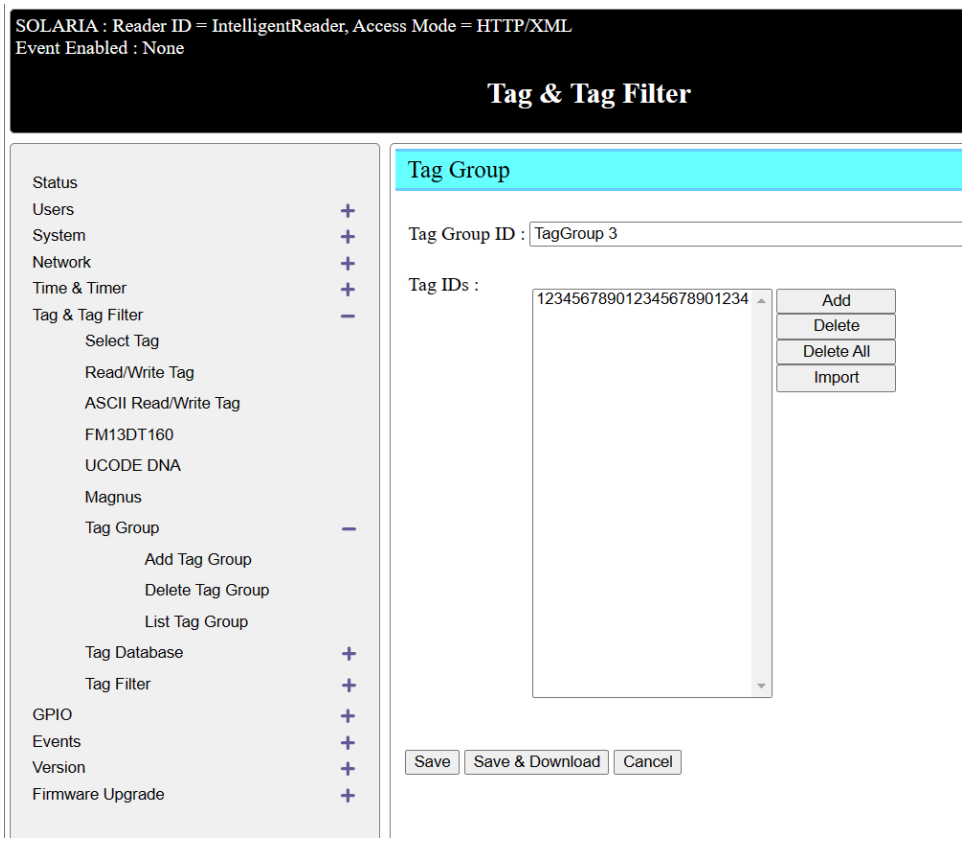
Add Tag ID to the group

Click Add to add new tags to the group and below menu will pop up

Click confirm the to confirm the addition of new tag to the tag group

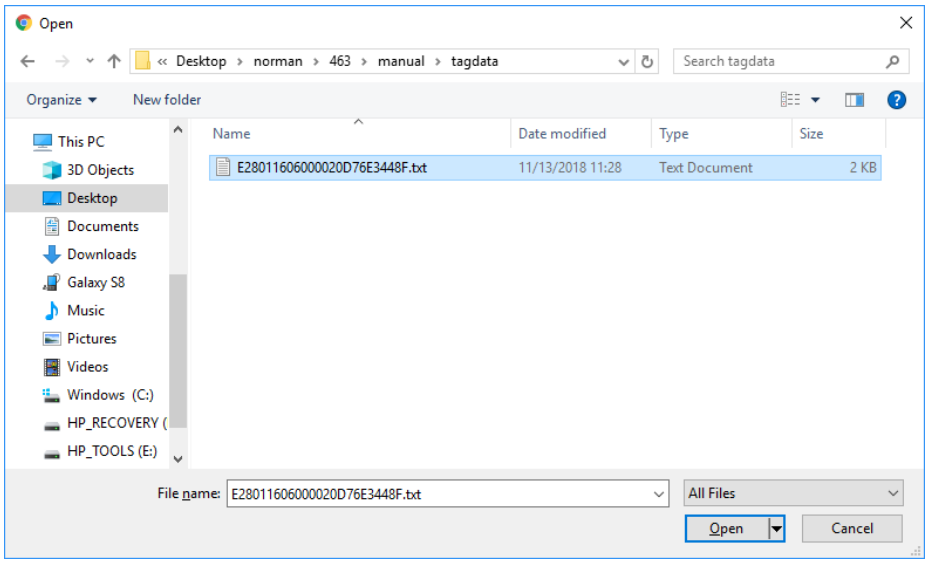


Click Save to save the new tag group

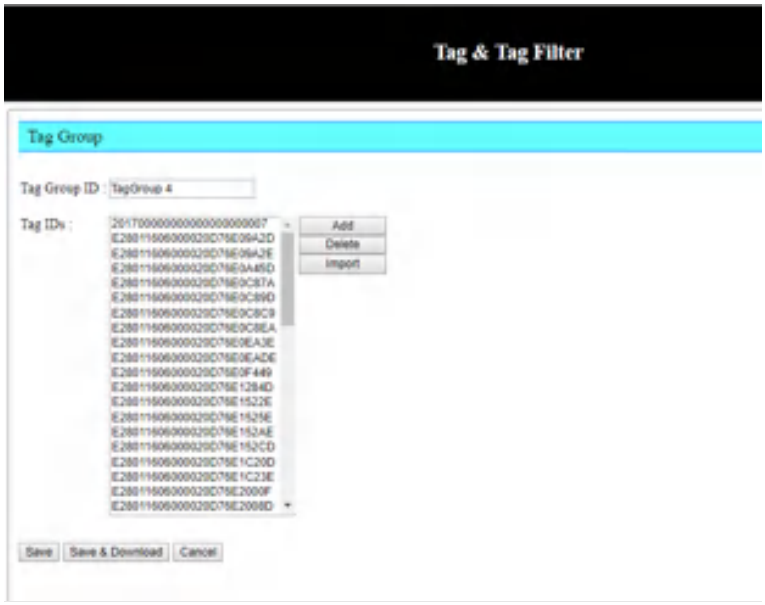


Import New tag ID

Click Import then select the tags record file



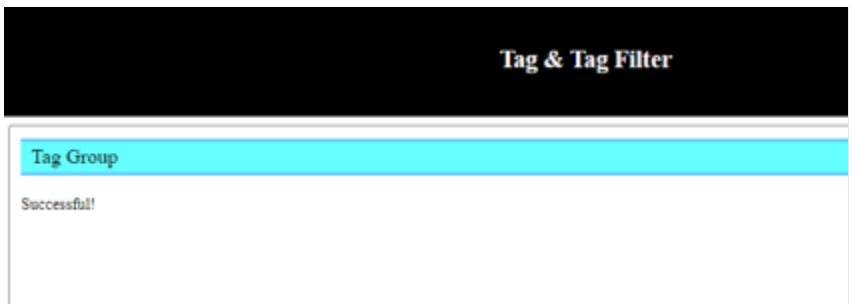
New Tag ID was added to the window



Click Save to save new record to the tag group

Click Save & Download

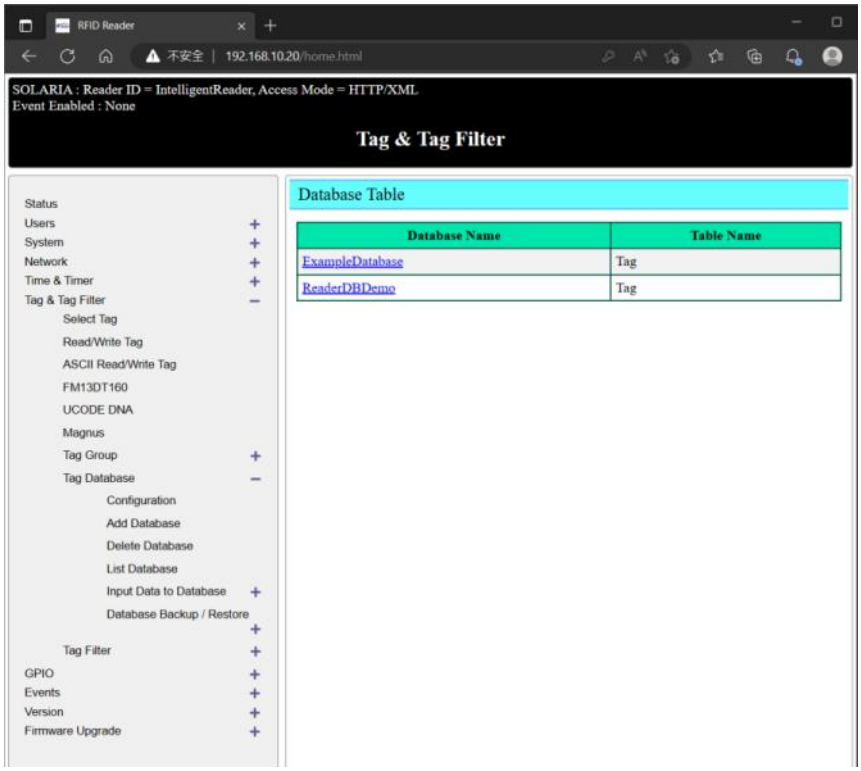
All record in the tag group was saved to file as below



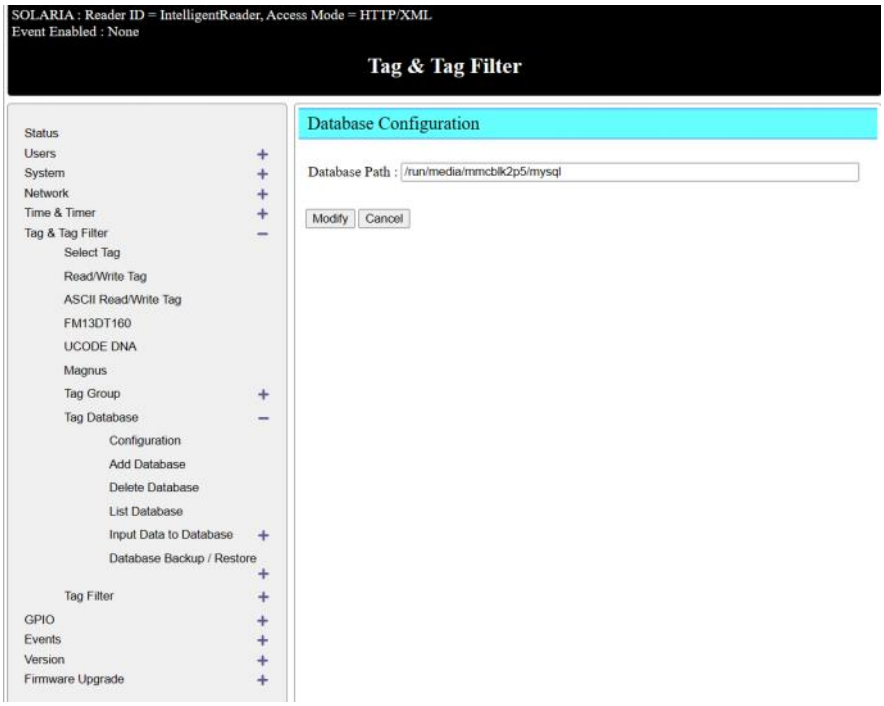
5.8.2. Tag Database

Database can be created in reader for user to link tag with database record include basic information such as Vehicle name, plate number and corresponding photo, then show the record on web page after proper event defined.

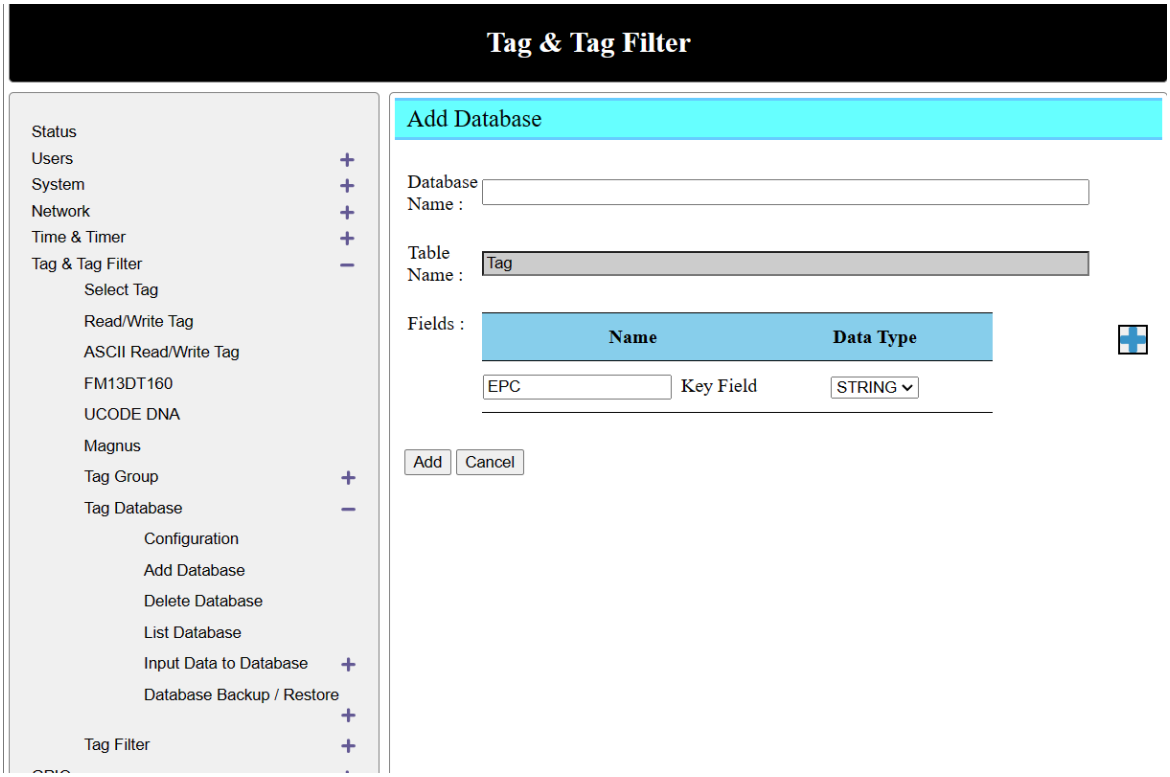
The defined database can be shown on page List Database



The location of Database in reader can be set on Database Configuration submenu.

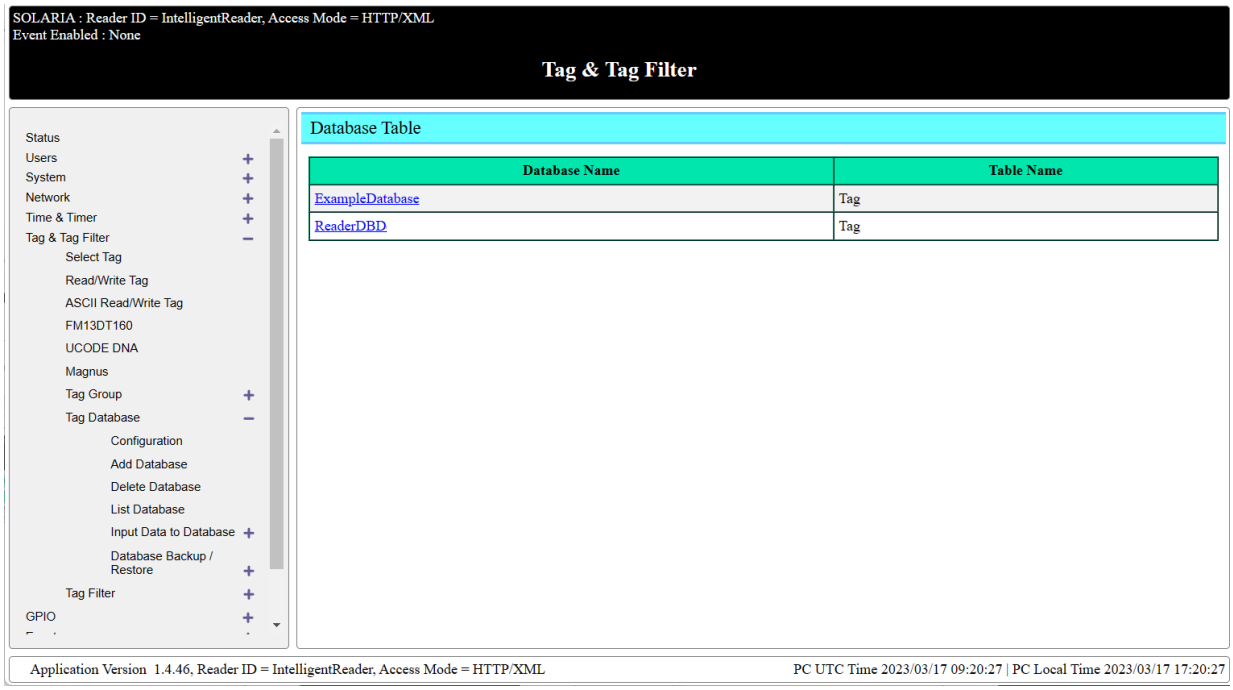


Database can be added on Add Database submenu as below

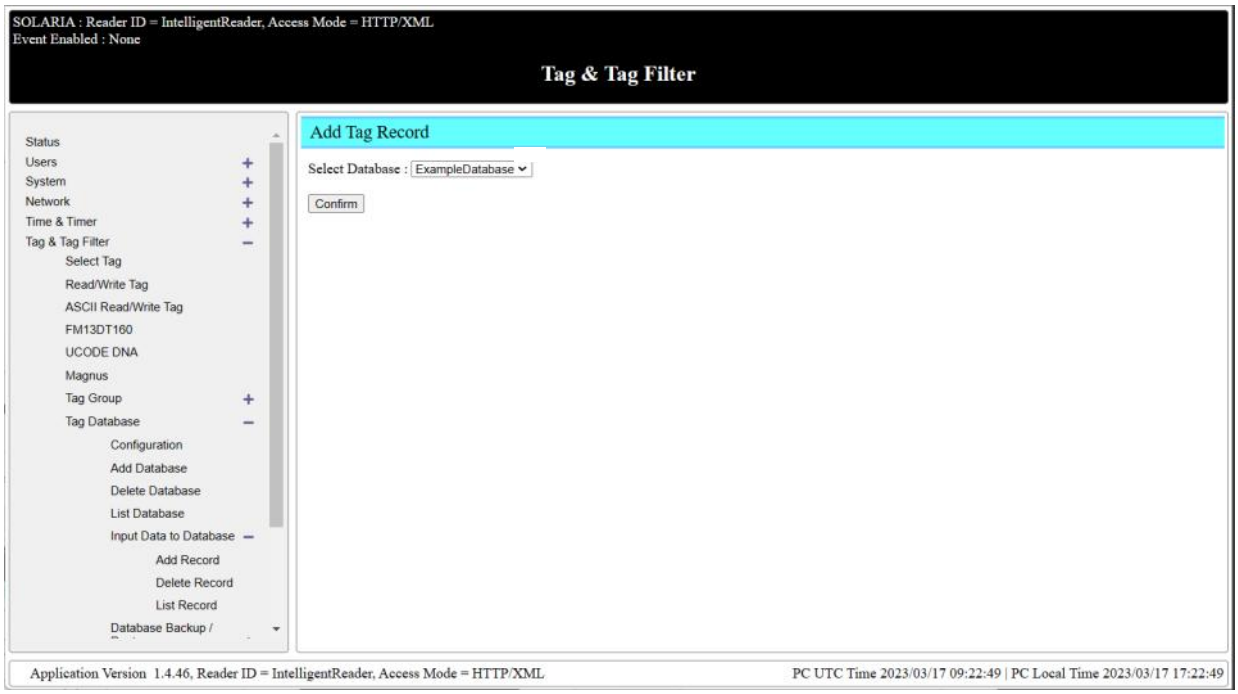


Particular Database can be deleted on Delete Database

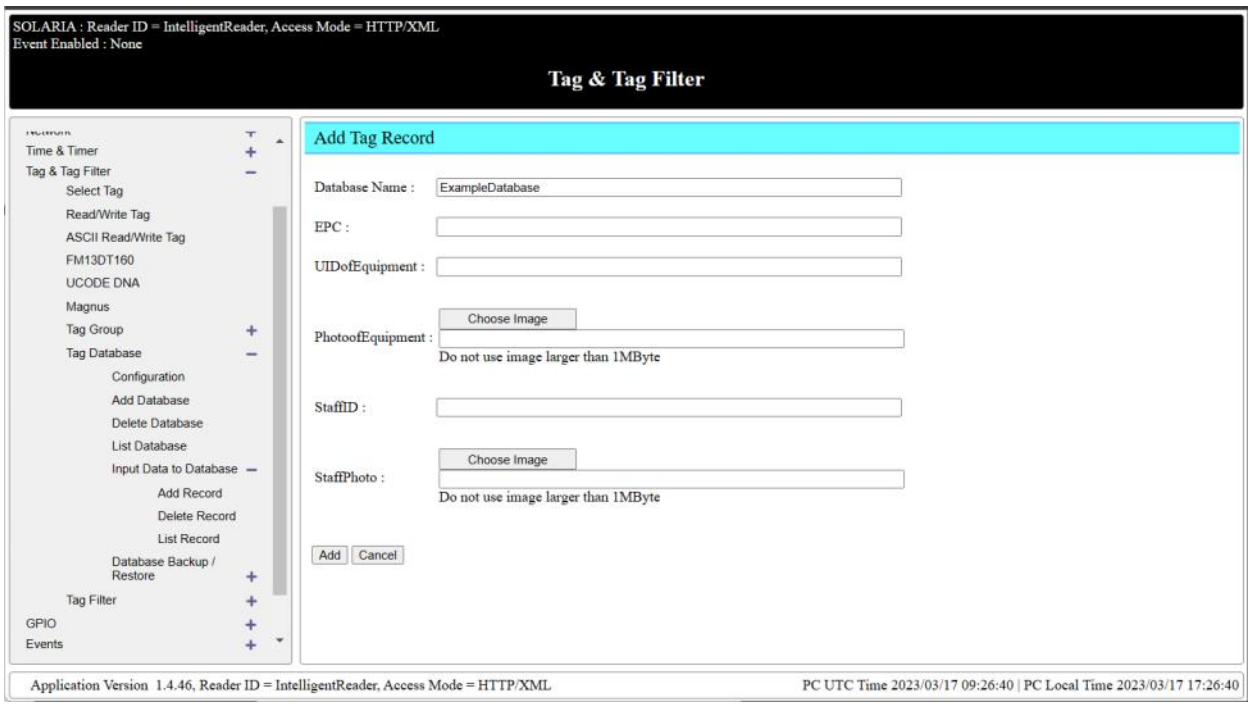
All defined database can be shown on List Database Submenu as below



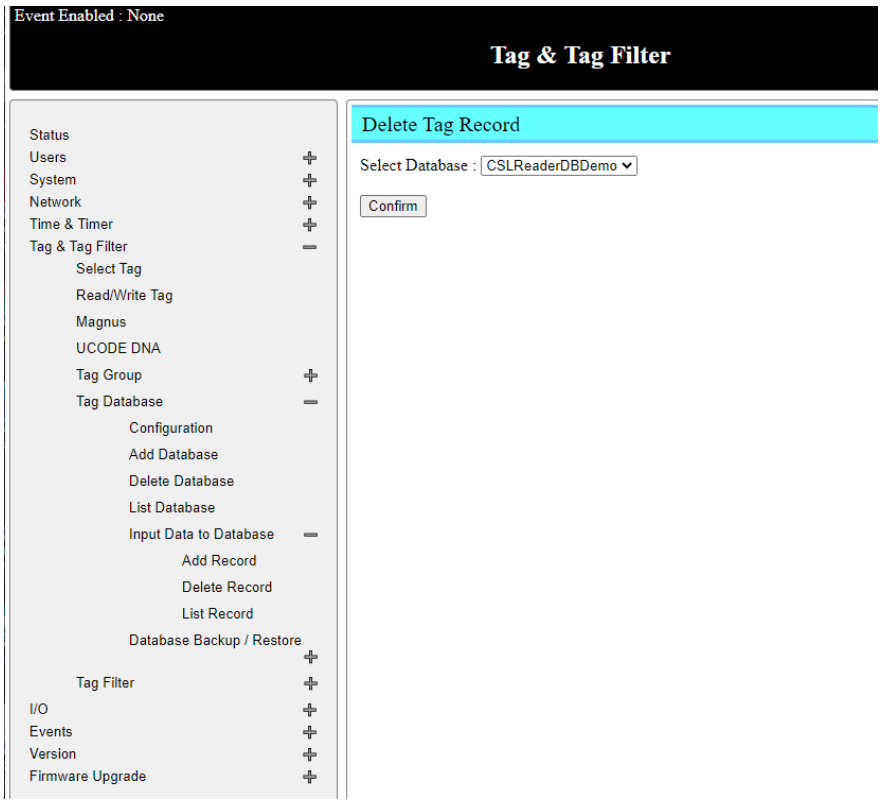
Tag Record in a particular database can be added after choosing right database



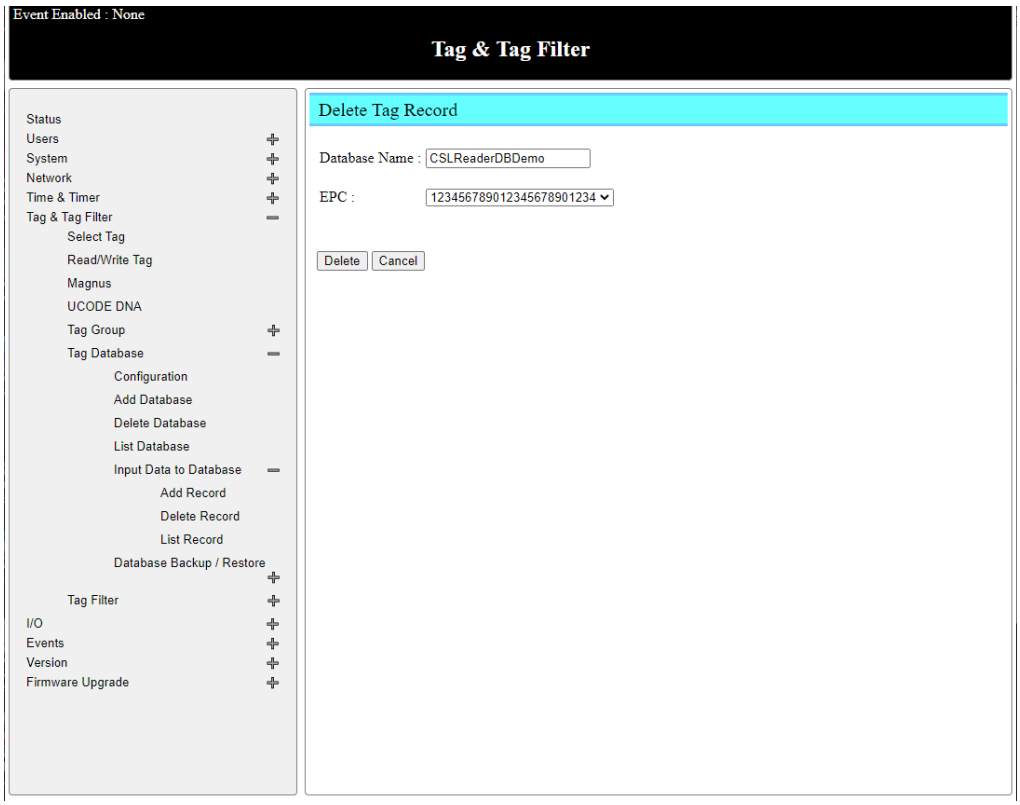
The Tag Record content can be added to database on this page



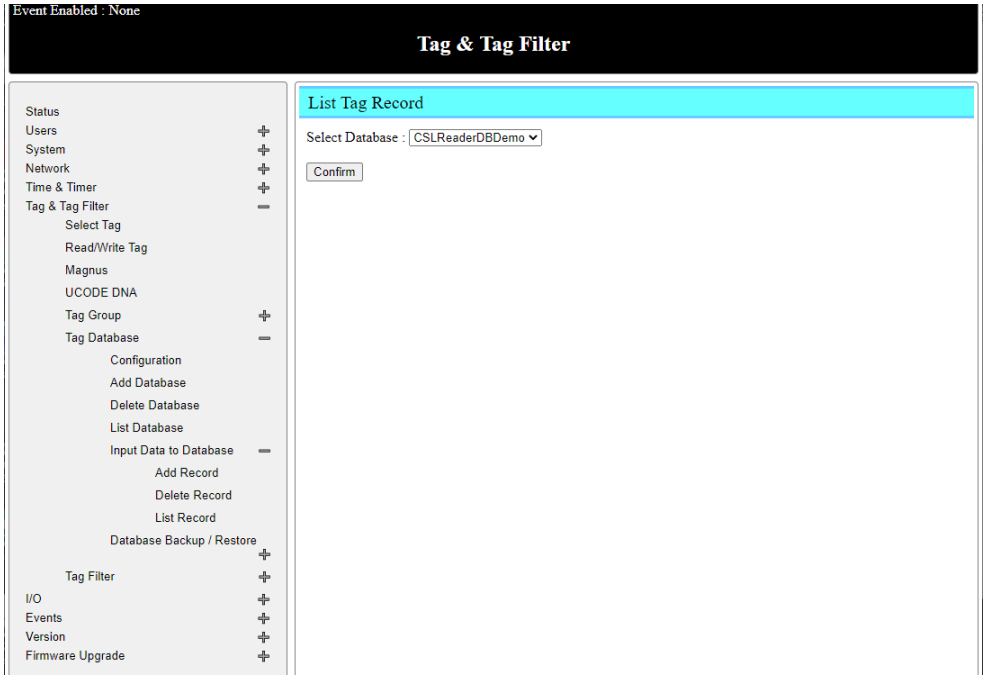
Tag Record in a particular database can be deleted after choosing right database

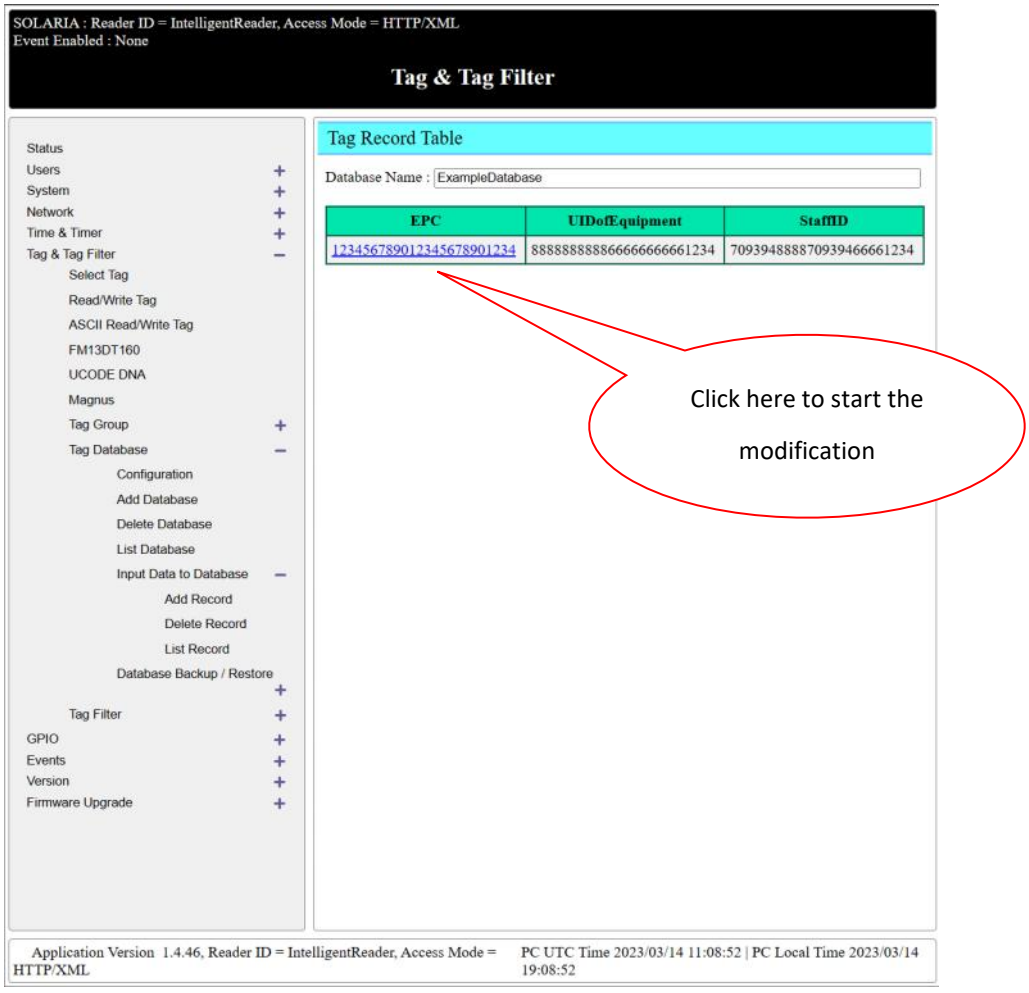


Click Delete to delete a particular record on selected Database as shown on below

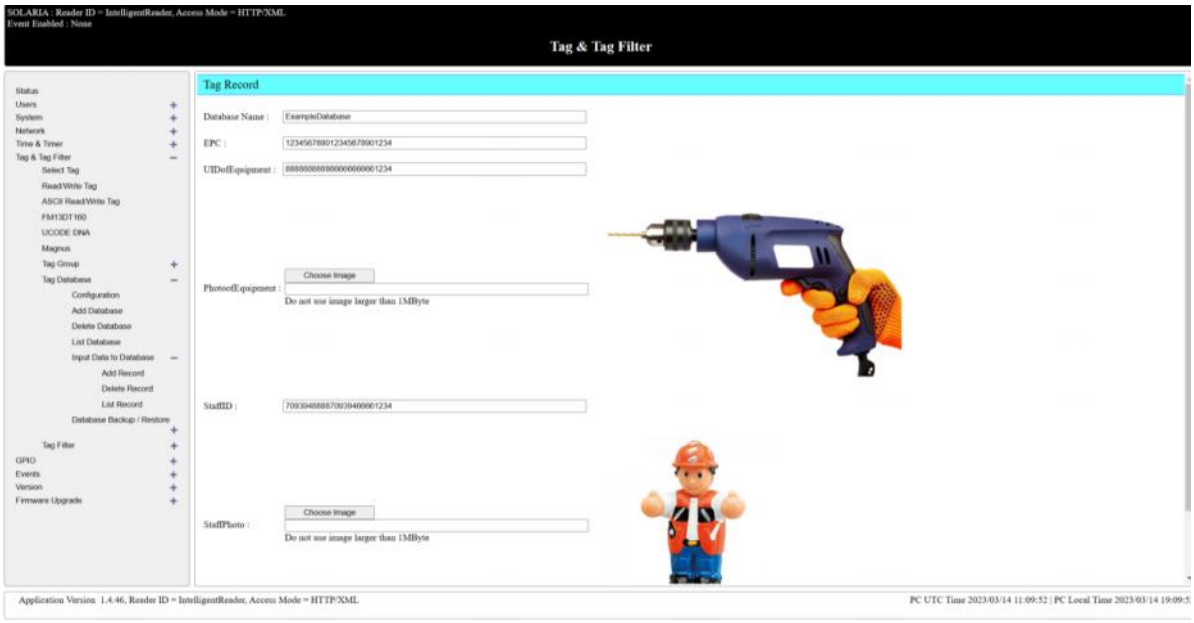


Tag Record in a particular database can be modified on List Tag Record submenu after choosing right database as below



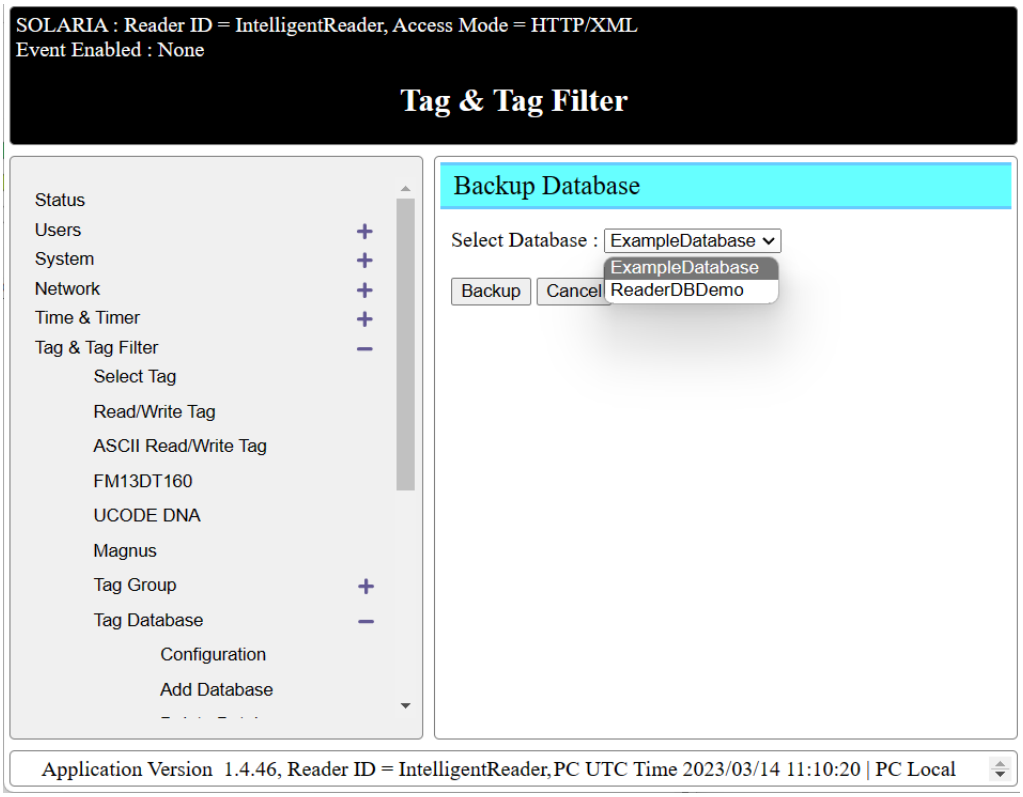


The content of database on particular record can be modified on this page as below



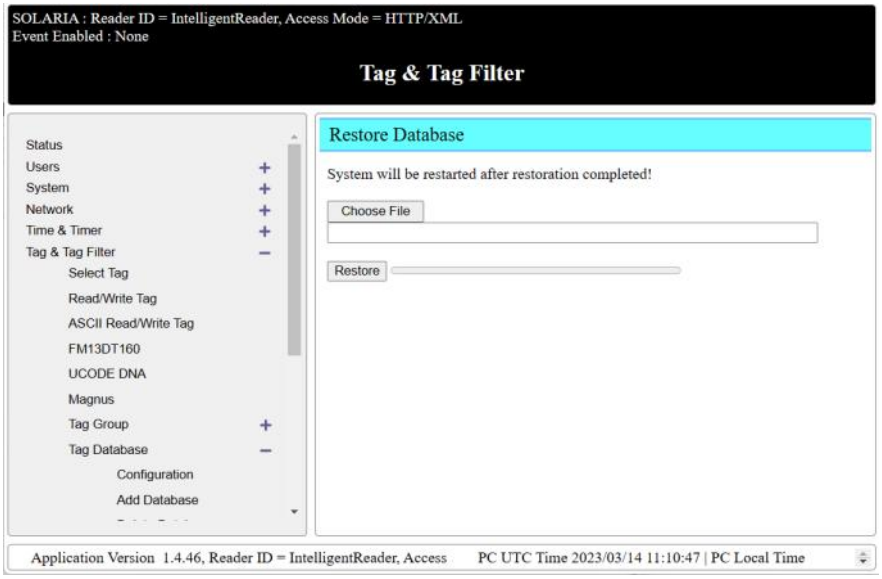
Then click Modify to confirm the modification

Each Database can be backup on Database Backup/Restore submenu as below after choosing target database



Click Backup to start the backup

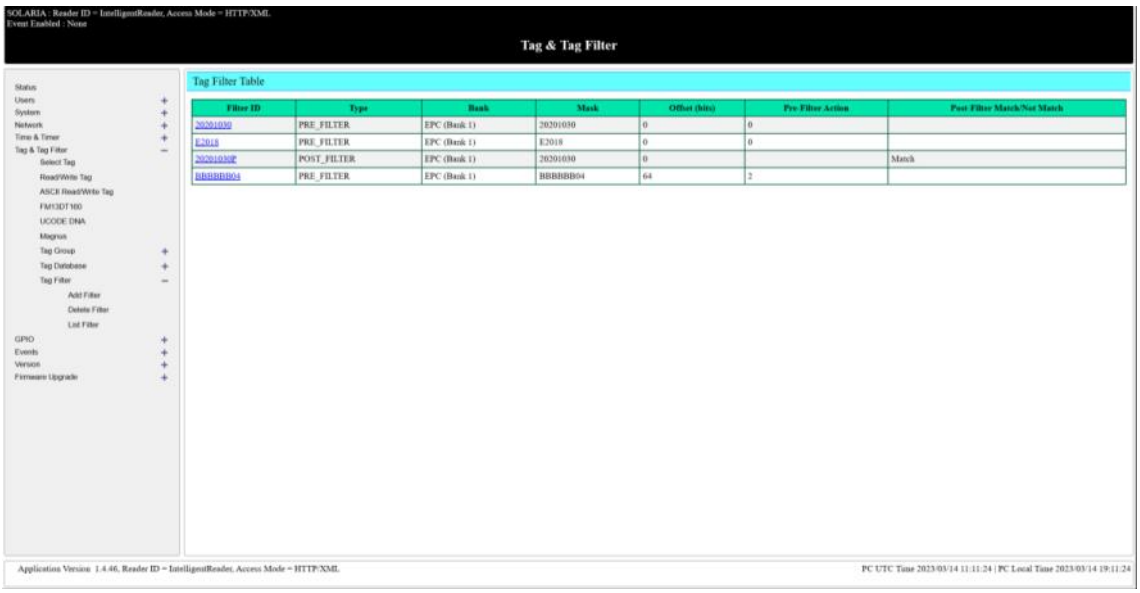
Databases can be restored to system from pervious backup file as below



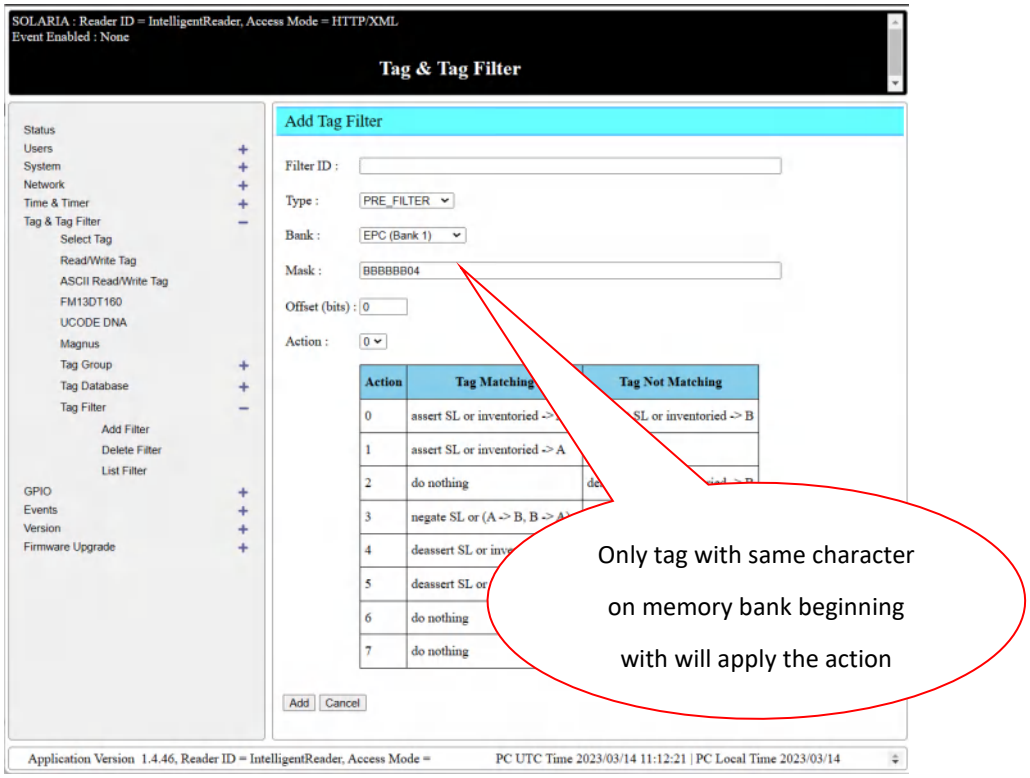
5.8.3. Tag Filter

The tag filter was used to identify particular tags from a large population. There are two types of filter can be used including pre filter and post filter. If the pre filter is used, tags not matching filter will not respond while post filter, the reader will filter out all non matching tags after received all tags response.

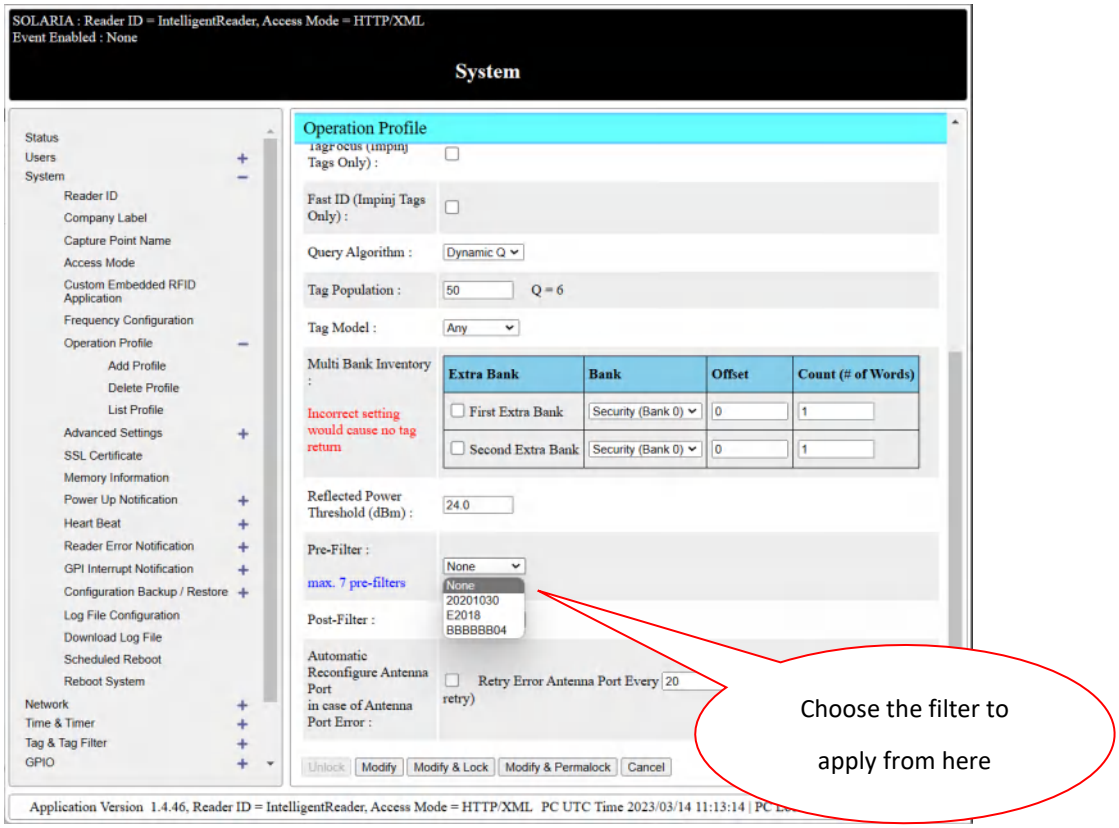
All defined filters can be found in page *List Filter* under *Tag & Tag Filter* page as below



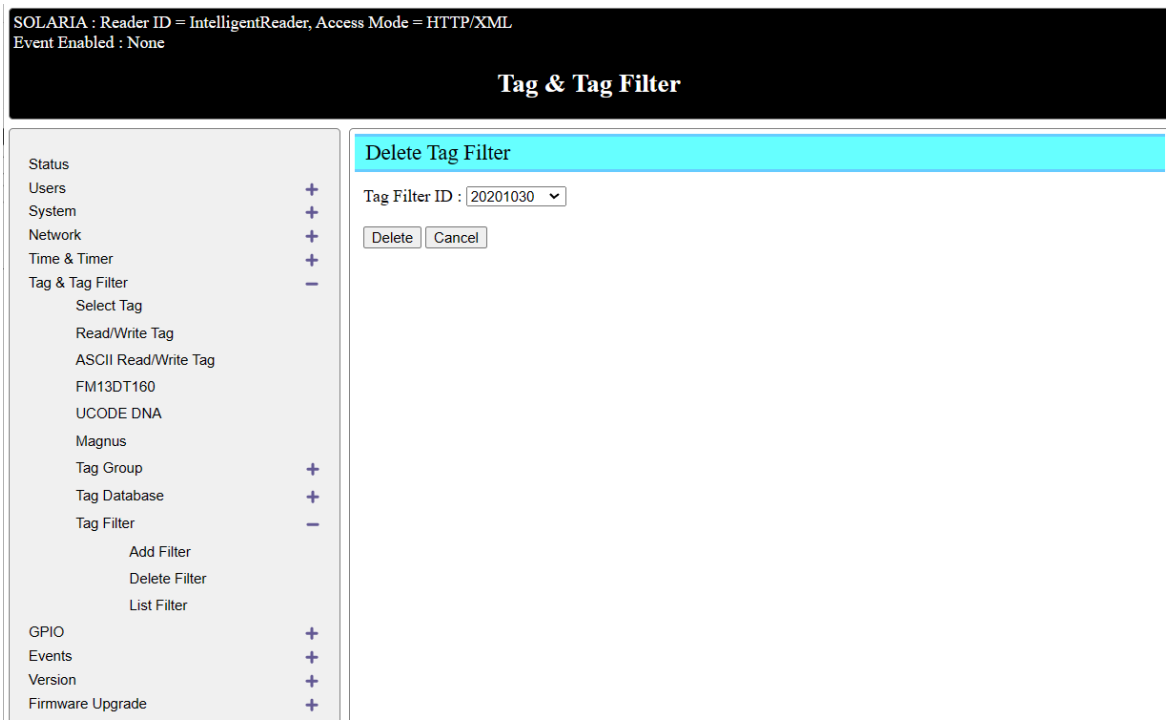
Filters can be added in Add Filter as shown below



Once filters are defined, they can be enabled in operation profile then take effect as shown below



Any filters can be deleted from this page

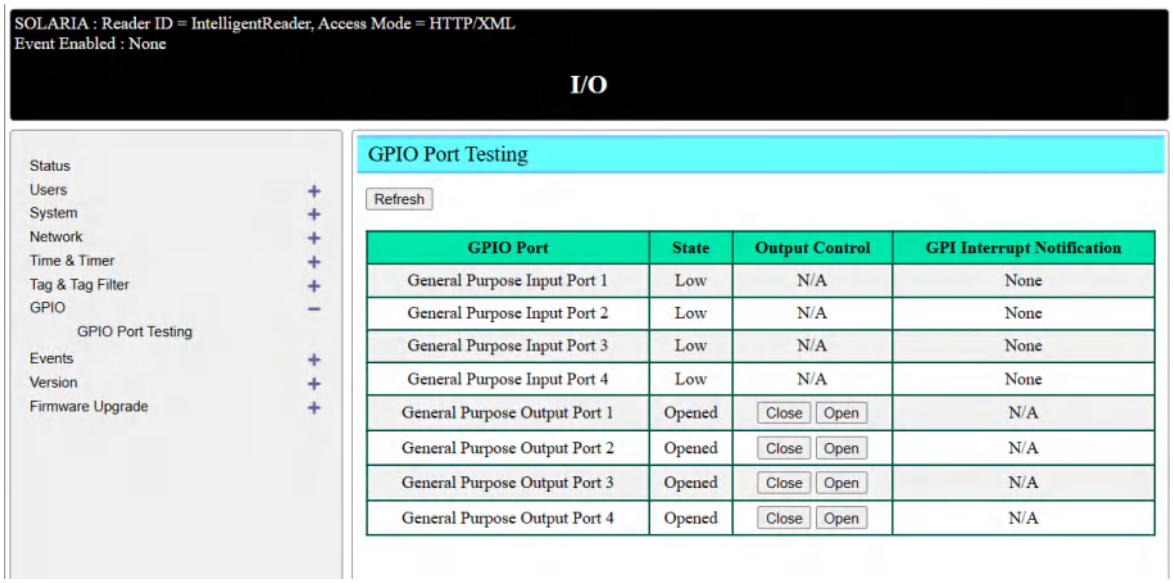


5.9. I/O Management

The "*I/O Port Testing*" page allows users to test functionality of I/O port

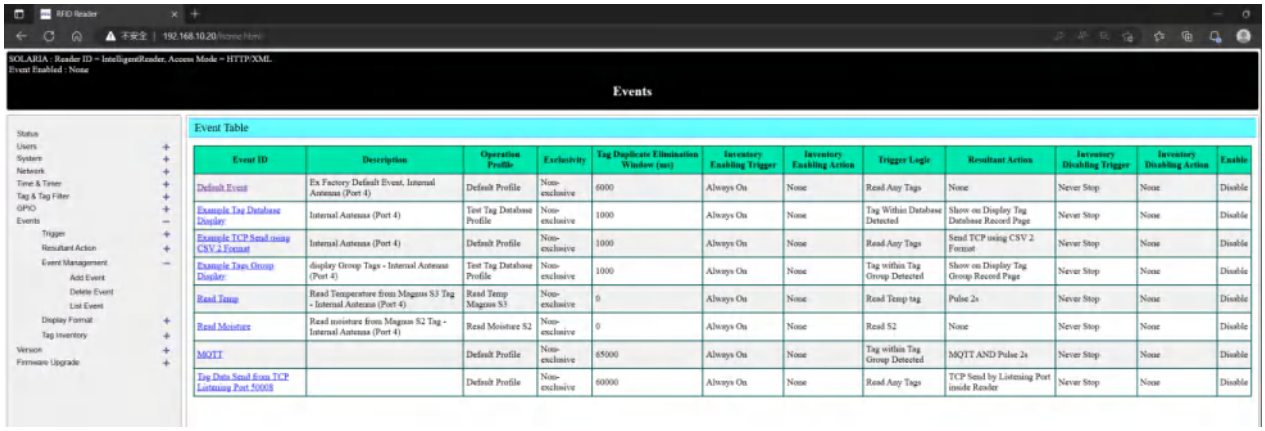
5.9.1. I/O Port Testing

Below is the "*I/O Port Testing*" page, it allows one to look at sensor input (you MUST press the "Refresh" button to update the input state), and control the outputs for system testing.



5.10. Event Management

Event management is the most important part of the reader configuration. By setting it properly, you can handle business applications more efficient and autonomous. To create and enable an event, one needs to set up triggers, resultant actions, and then use that to assemble events. Once an event is created, the reader would run it accordingly. In other words, the reader is running autonomously.



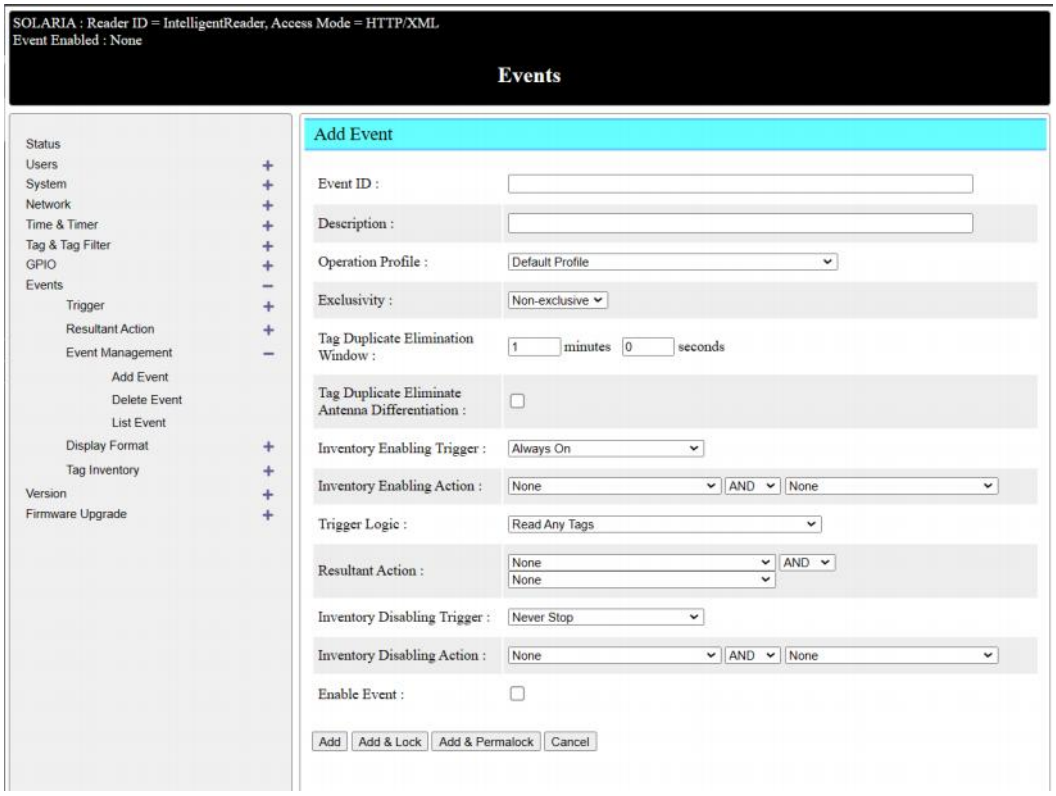
5.10.1. Event Management

Here is the “Event management” submenu:

Note that there is ex-factory a “Default Event” running the “Default Profile”. It comes disabled (in the Enable column, it is False). Once you enable it, it will start reading RFID tags from Port 1 (assuming an antenna is connected to Port 1 for model SOLARIA and there are RFID tags in front of the antenna)

5.10.1.1. Add Event

Below is the “*Add Event*” page:



Input *Event ID* field for each event.

One should select the operation profile for the event. This operation profile is defined in the “System” page “Operation Profile” submenu.

The *Inventory Enabling Trigger* is the initial trigger that turns on the RF power of the reader to start doing inventory. This trigger can be set to be “Always On” and then the reader will do inventory the moment the reader is powered on. Note that this trigger has to be defined in the Trigger page. Note that if one wants the reader to be always on, simply choose “Always On” in the *Inventory Enabling Trigger* field.

The *Inventory Enabling Action* is the action that accompanies an inventory enabling trigger. For example, one may want to turn on a signal light when the inventory starts.

Once the inventory enabling cycle is entered, then the event engine would look for actual event triggers, and these triggers can be Boolean operated together as defined in the entry “*Trigger Logic*”. The Trigger Logic is a Boolean combination of triggers that are defined in the “Trigger” page which will be described later.

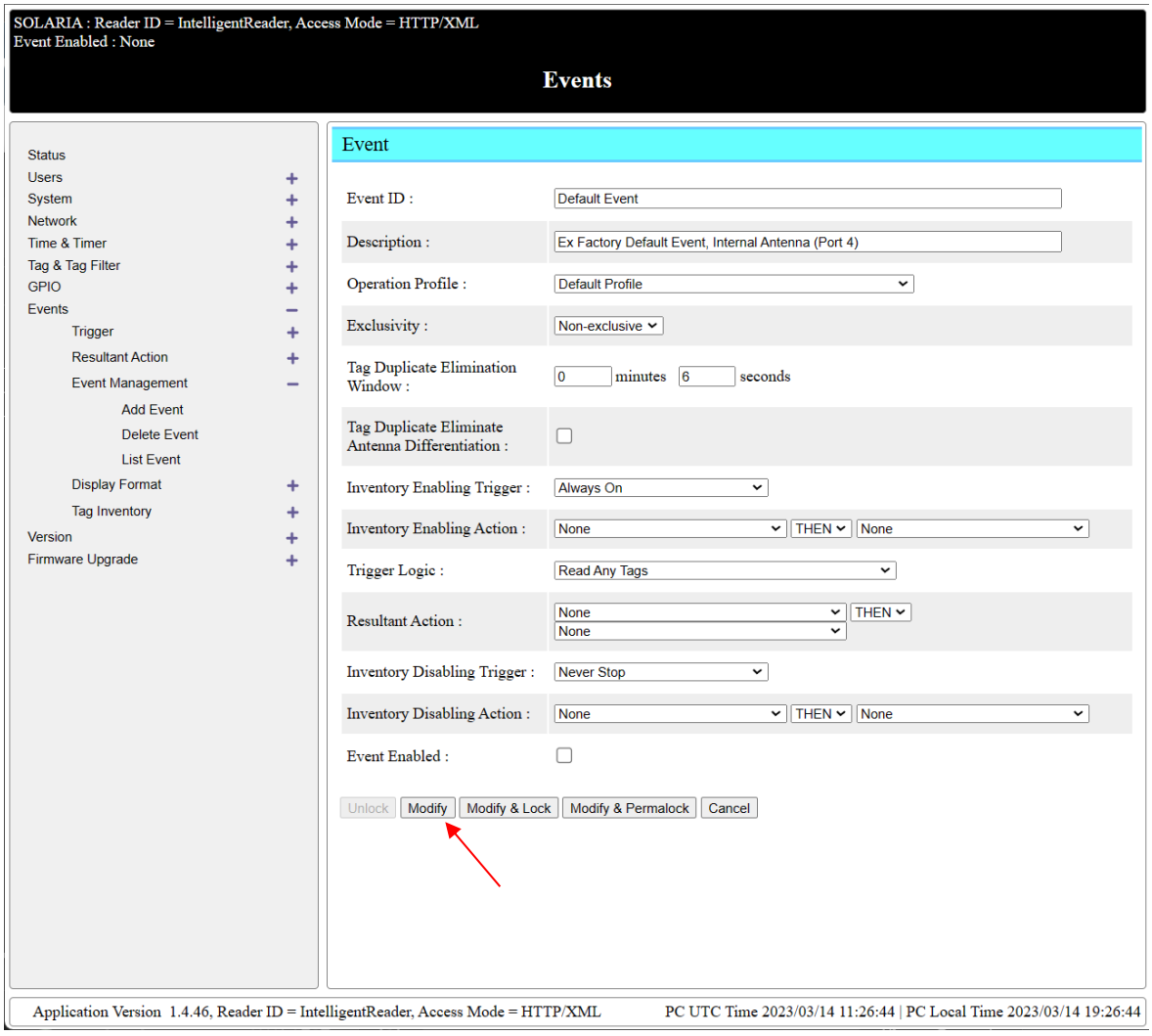
When the Trigger Logic is satisfied, the event is established, and the resultant actions are defined in “*Resultant Action*” section. Again, it can be a combination, sequential (THEN) or (AND), of actions.

The overall inventory enabling cycle is ended based on the triggers defined in “*Inventory Disabling Trigger*” section. Sometimes this can be other sensor at the exit of the reader read zone, or it can be defined as a period of time of no tag reads. If the user wants the reader to be always reading tags, then the selection “Never Stop” should be chosen here.

The *Inventory Disabling Action* is the action that accompanies the inventory disabling trigger. For example, one may want to turn off a signal light (that was turned on due to an inventory enabling action as described before) when the inventory is stopped.

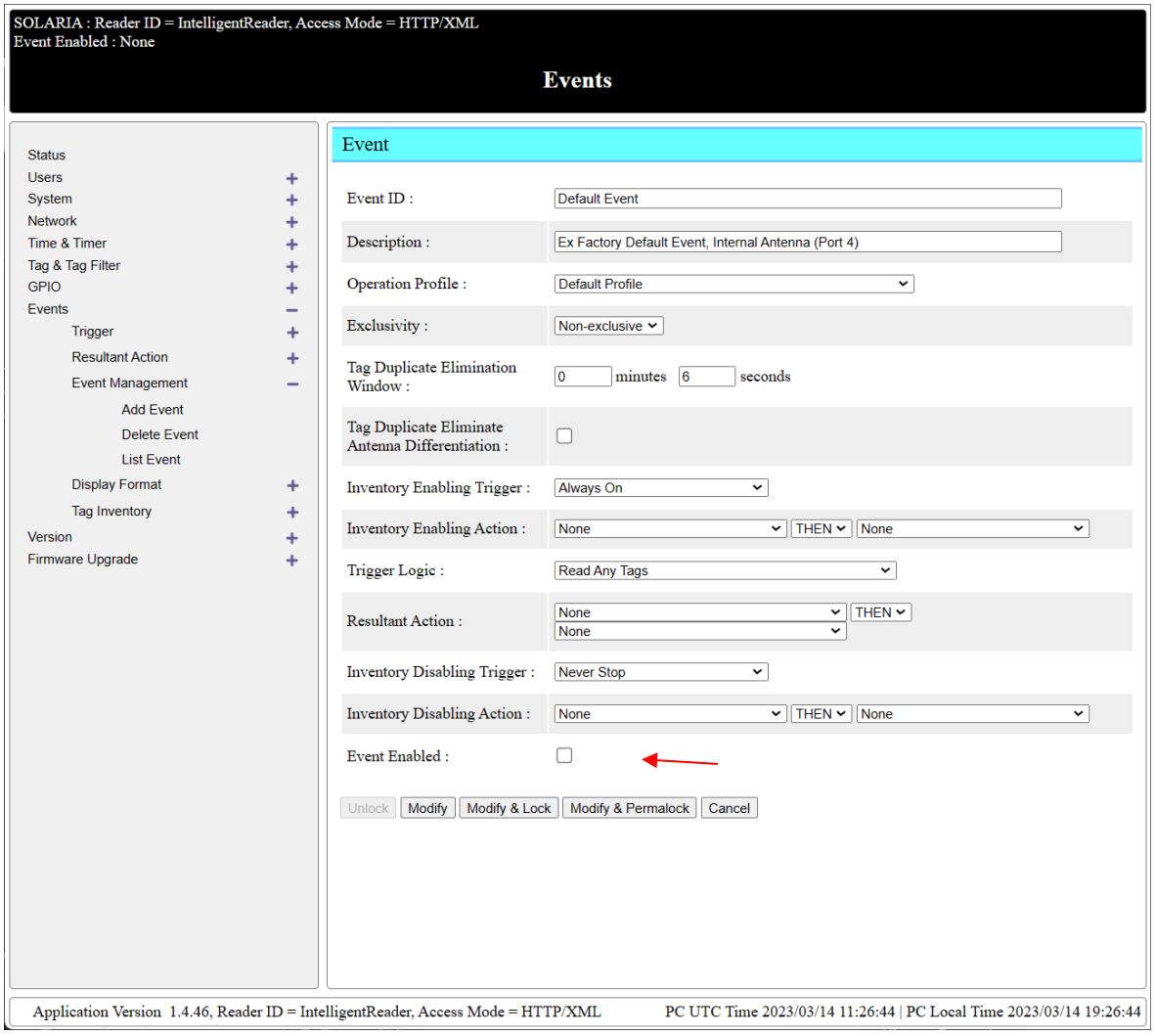
5.10.1.2. Modify Event

To modify event, go to “List Event” page and select the “Event ID”, modify the event and click “Modify”.



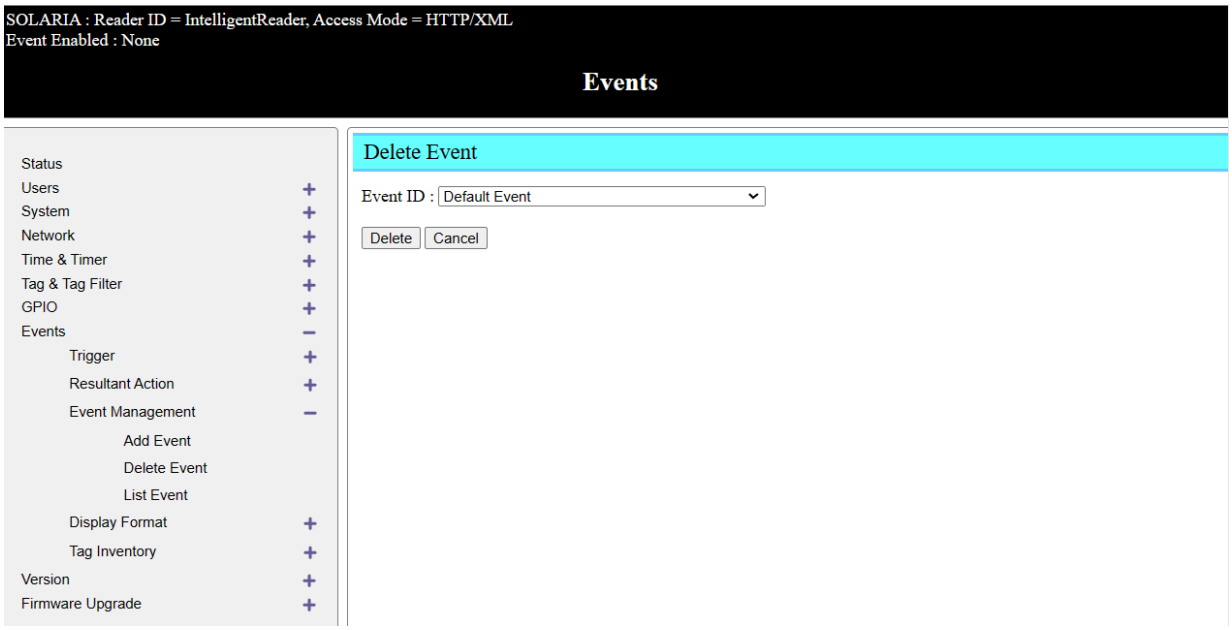
5.10.1.3. Enable/Disable Event

To enable/disable event, select/de-select the checkbox “Enable Event” and click “Modify”.



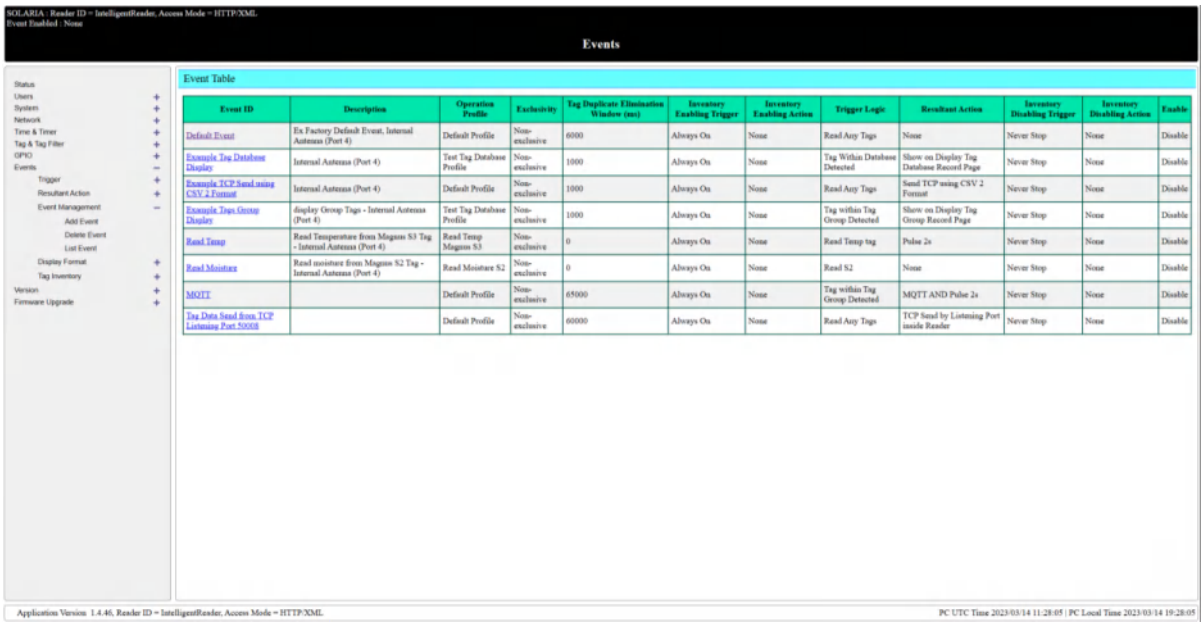
5.10.1.4. Delete Event

To delete event, select the “Event ID” and click “Delete”.



5.10.1.5. List Event

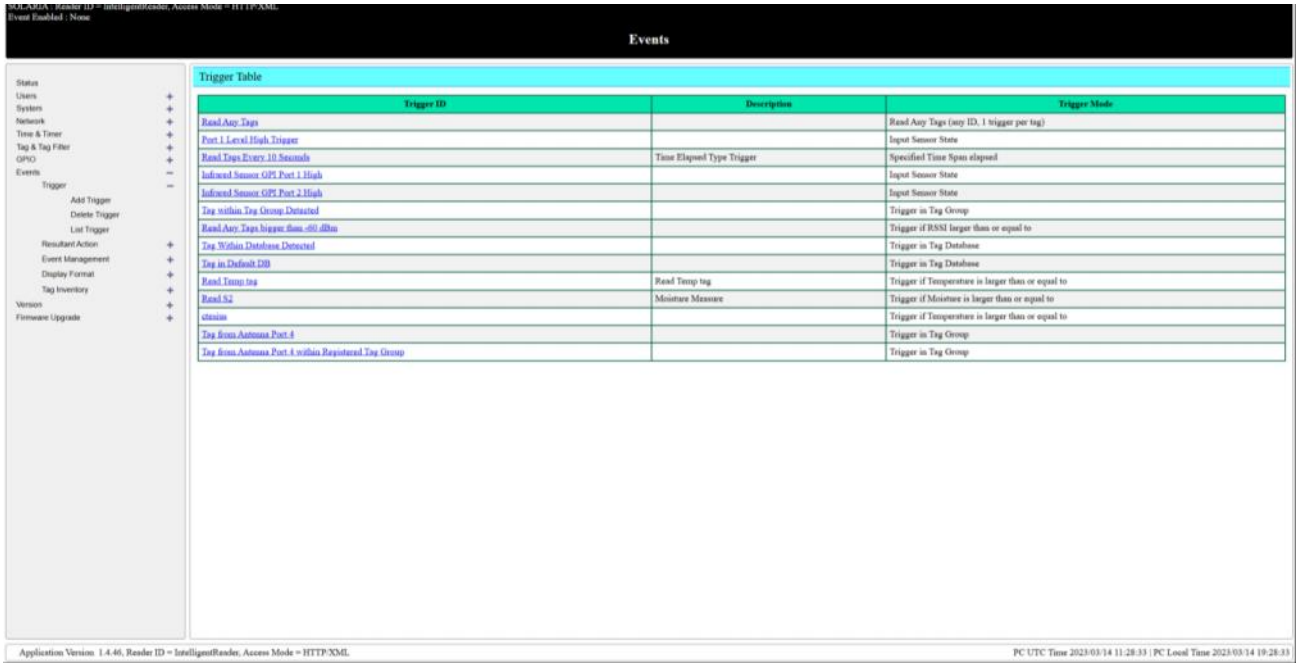
Below is the “List Event” page:



5.10.2. Trigger

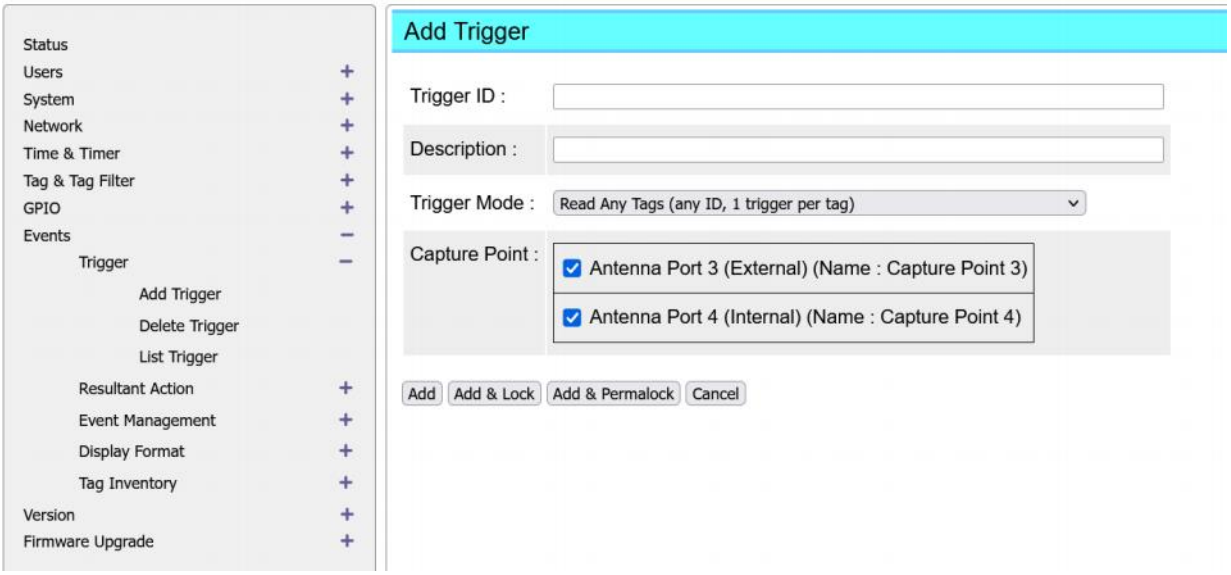
A trigger is a stimulus that causes the reader to recognize it and do something about it.

The trigger is used in Inventory Enabling, Inventory Disabling, and of course inside the actual Event Triggering Logic section. Below is the “Trigger” submenu:

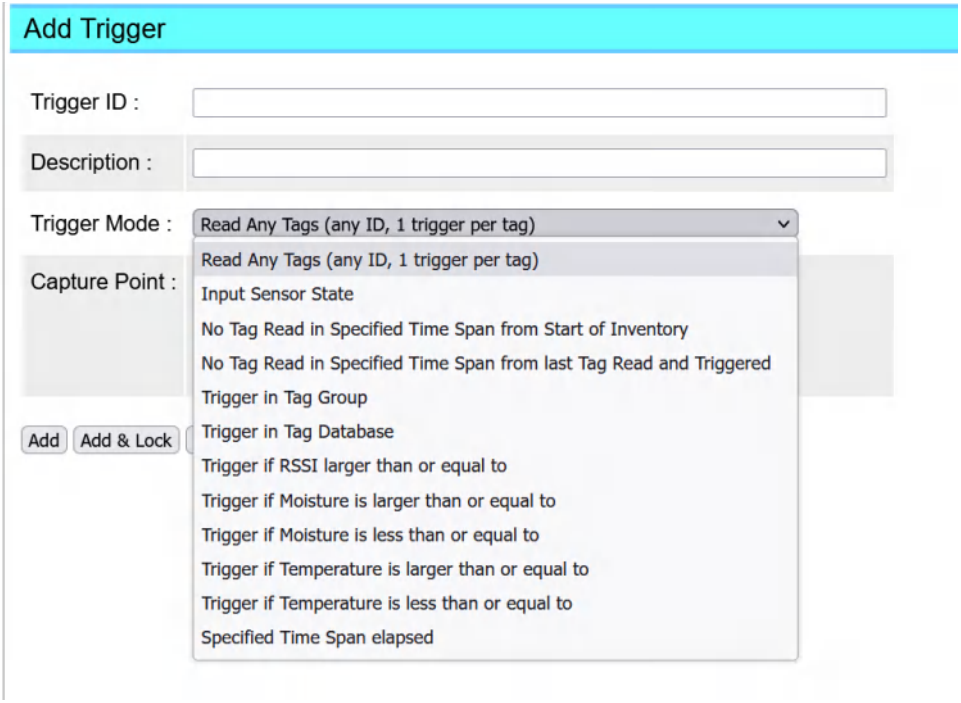


5.10.2.1. Add Trigger

Below is the “*Add Trigger*” page:

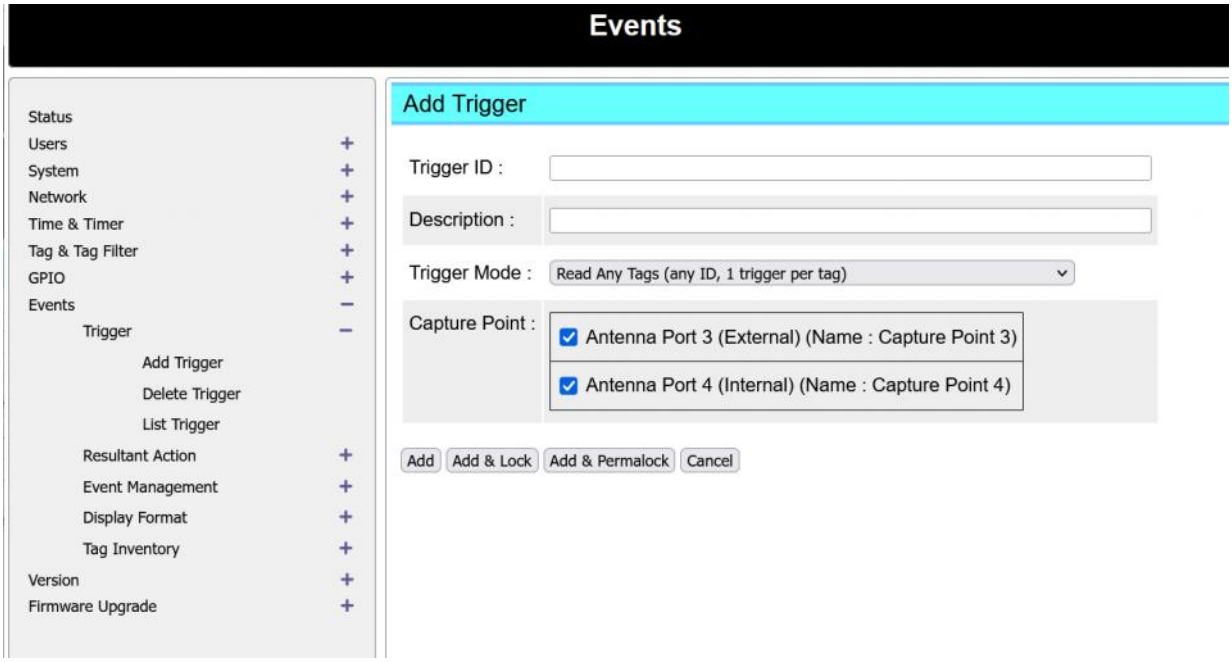


There are many different types of triggers shown below:



1. “Read Any Tags (any ID, 1 trigger per tag)” would look at tags coming into the antenna ports (or capture points), the ones being ticked here would be selected, and will generate 1 trigger per tag (different ID) notification. By selecting which antenna port one can then select tags read by specific antennas to trigger an event. Note that in Time Windowed Mode there is a duplicate elimination action within each time window, and for the same ID within that window, it will only be recorded once into the buffer – unless the box called “Antenna Differentiation” in the Event Management page is ticked, in that case the same tag read by different antennas will generate different triggers. Hence for each different ID within that duplicate elimination time it will generate an event.
2. “Input Sensor State” would look at the state (high or low) of one of the general-purpose IO input.
3. “No Tag Read in Specified Time Span” would check if for a specified time read, no tag passes through the reader read zone.
4. “Trigger in Tag Group” would check if any tag is within a pre-defined tag group.
5. “Trigger if RSSI larger than or equal to” would check if read tag rssi is larger or equal to defined value
6. Specified Time Span elapsed”.

For “read any tags” trigger, the user also has to specify which antenna port or capture point it is collecting the tags from. To choose it, just tick the box on the left of each entry.

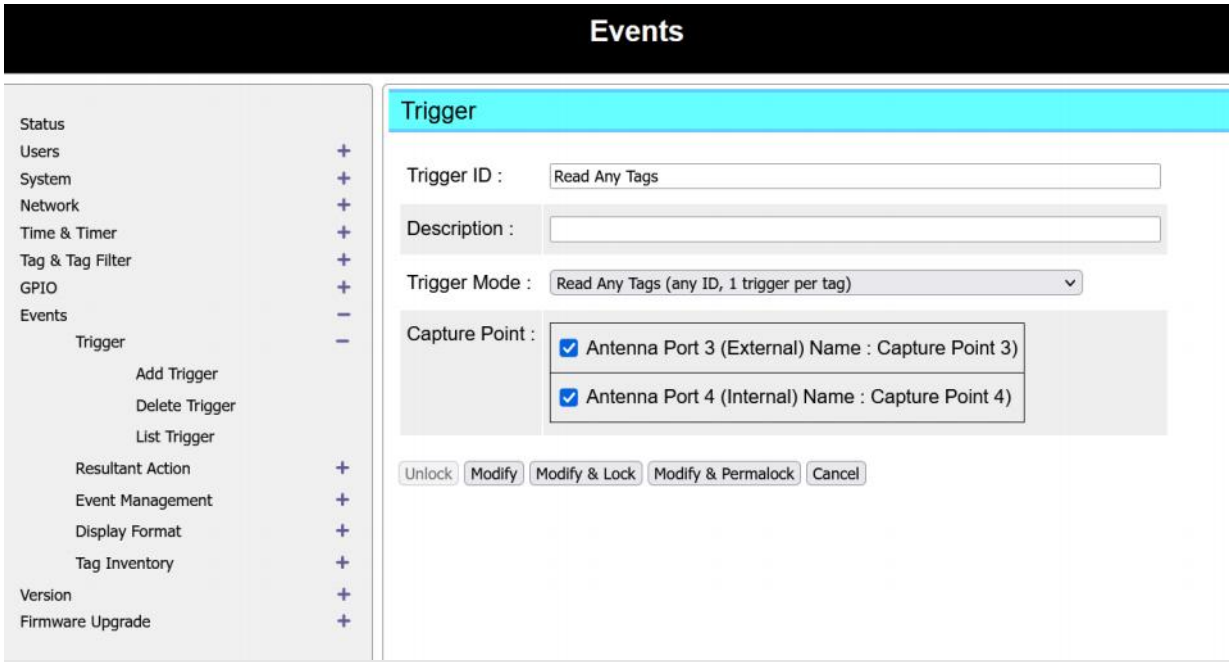


For “*Input Sensor State*” trigger, the Port Number 1 shown on below, is mapped to physical GPI1 port which using pin 2 /pin12 of GPI1 terminal (GPI1 ports details see section 5.8).

Level “*High”* was selected on below case so the trigger will be set if there is high voltage applied on pin2 (GPI1(+)) and pin 12 (GPI1(-)) is properly connected

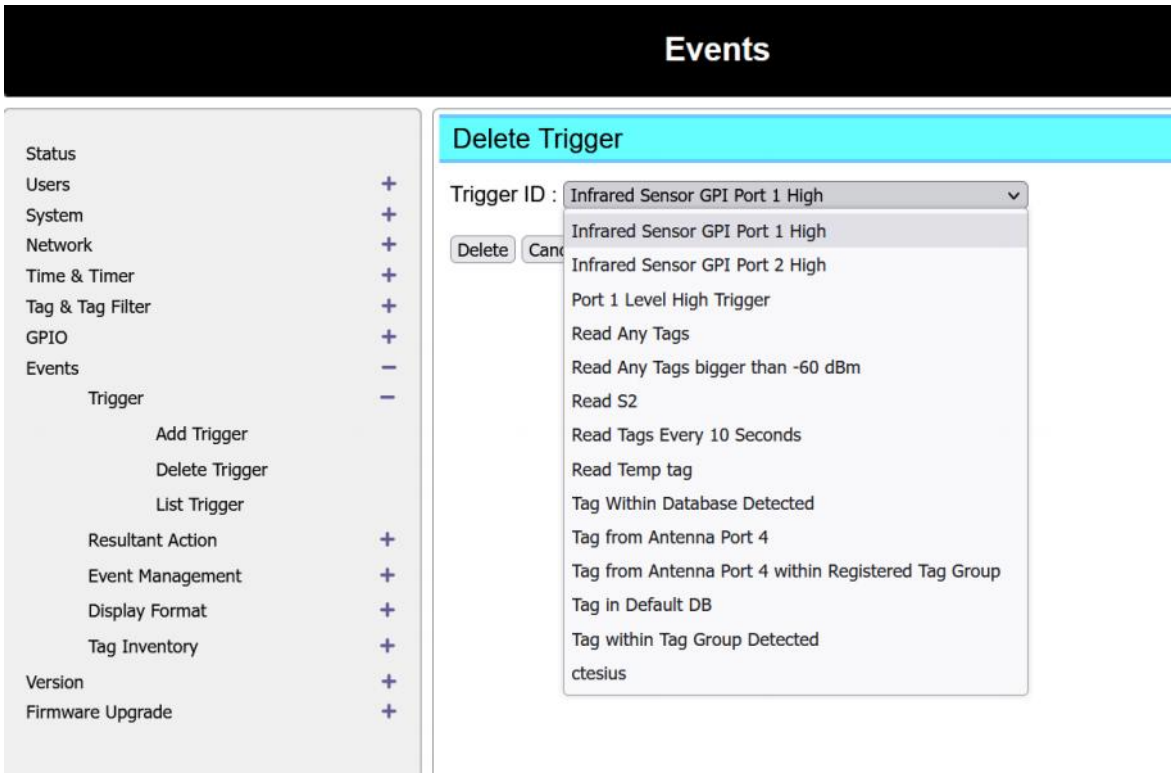
5.10.2.2. Modify Trigger

To modify trigger, go to *List Trigger* and select the “Trigger ID”, modify the Trigger and click “Modify”.



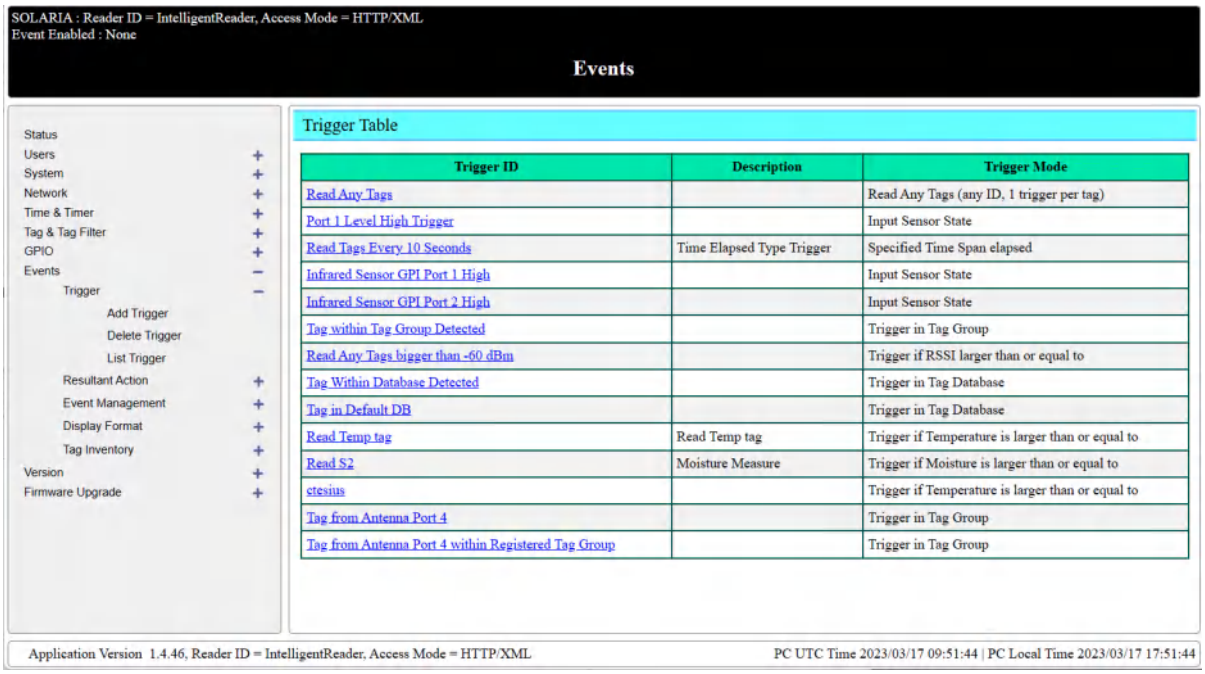
5.10.2.3. Delete Trigger

To delete trigger, select the "*Delete Trigger*" and click "Delete".



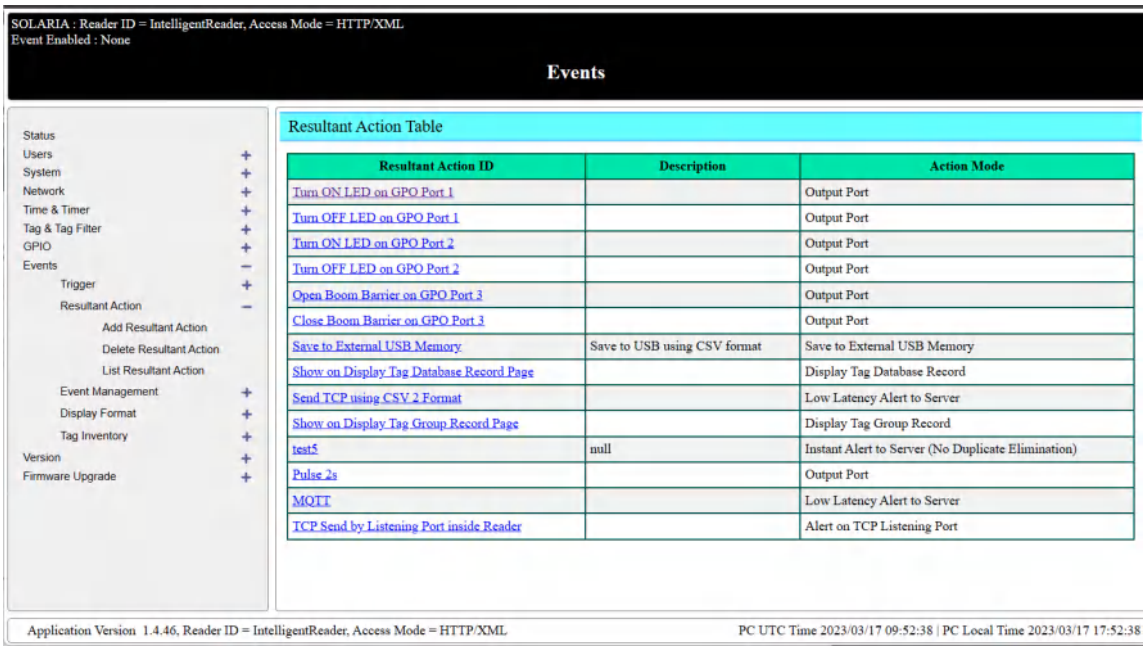
5.10.2.4. List Trigger

Below is the “List Trigger” page.



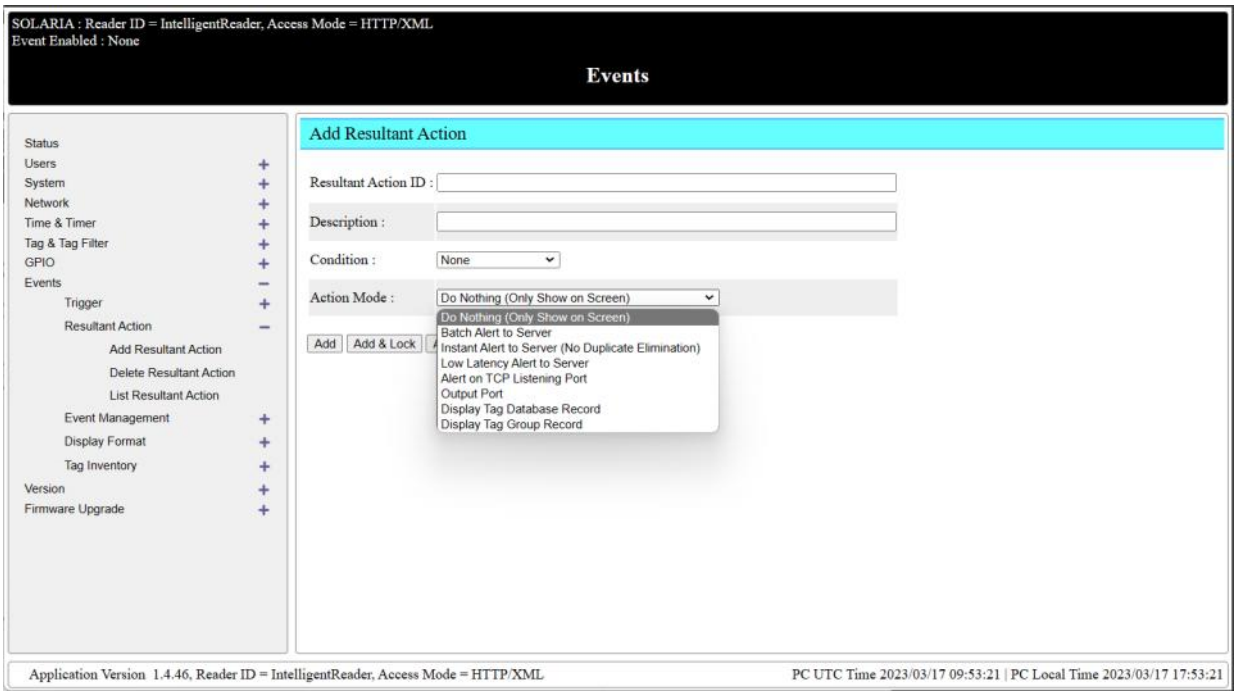
5.10.3. Resultant Action

The “Resultant Action” pages define the resultant action that will be enforced when an event logic is established. Below is the “Resultant Action” submenu:



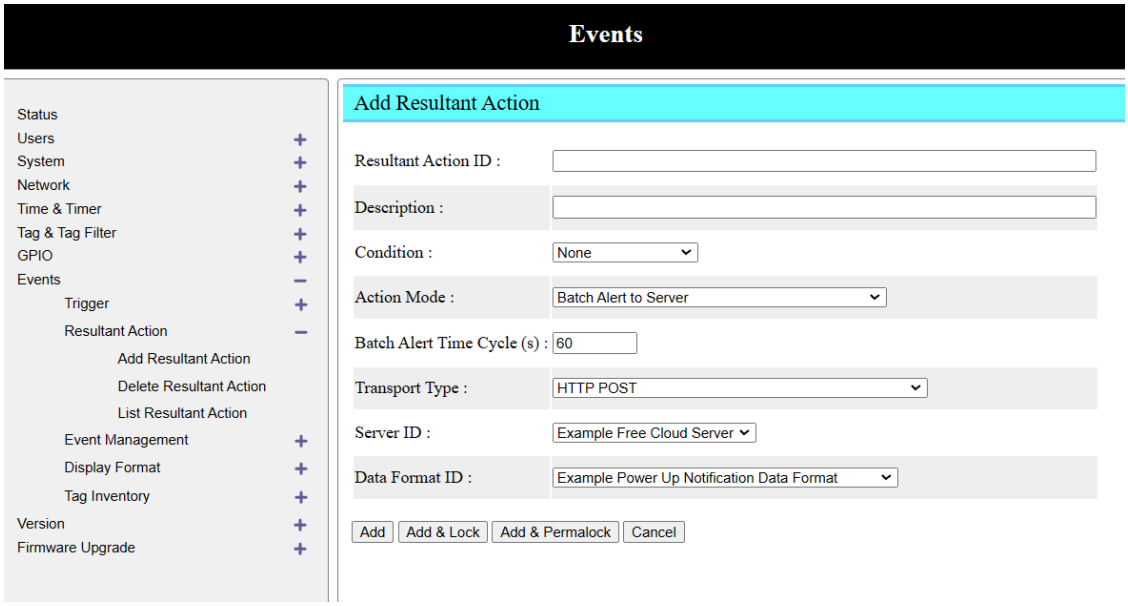
5.10.3.1. Add Resultant Action

There are 8 types of action:

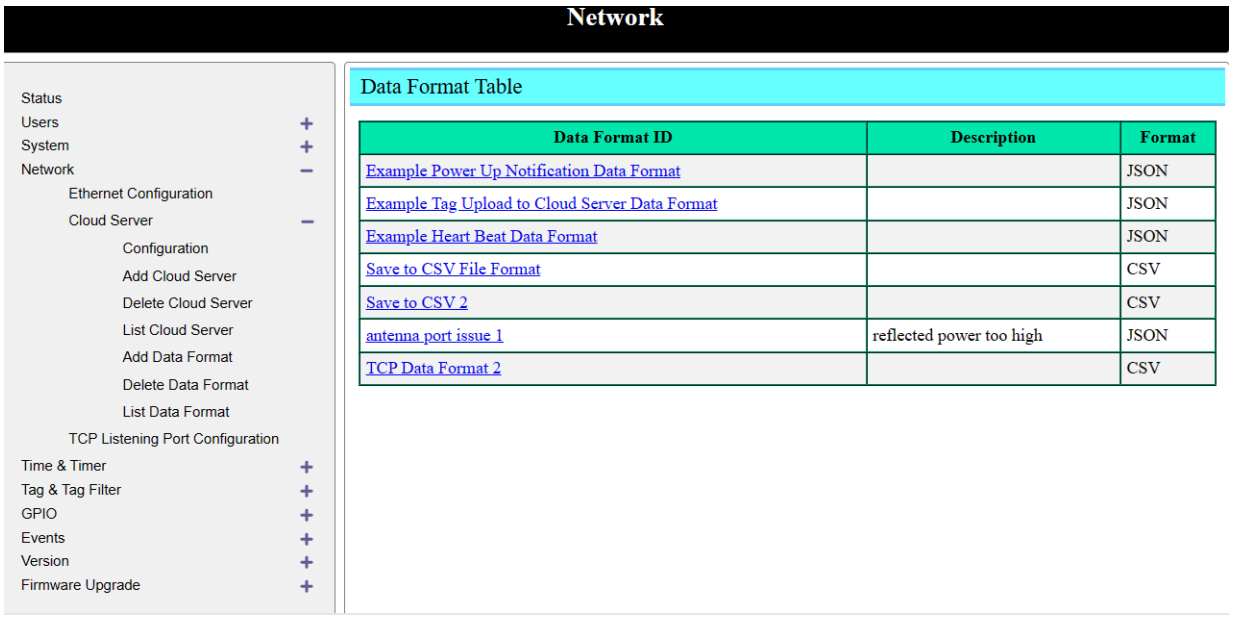


1. Do Nothing (Only Show on Screen) – Nothing is affected, except the tags collected can be shown on browser screen. Note that there are APIs that can collect the tag IDs or information on demand from the remote server. So, this is actually a polling mode in terms of collecting tag information.
2. Batch Alert to Server – here the collected tag information is sent to Server at the end of each duplicate elimination cycle (Time Window)
3. Instant Alert to Server – here the collected tag information is sent to Server immediately as it is read.
4. Low Latency Alert to Server
5. Output Port – here the General-Purpose IO output port would be controlled to have certain level change or pulse or even pulse train.
6. Save to External USB Memory – here the tag information was sent to external USB flash memory.
7. Display Tag Database Record
8. Display Tag Group Record

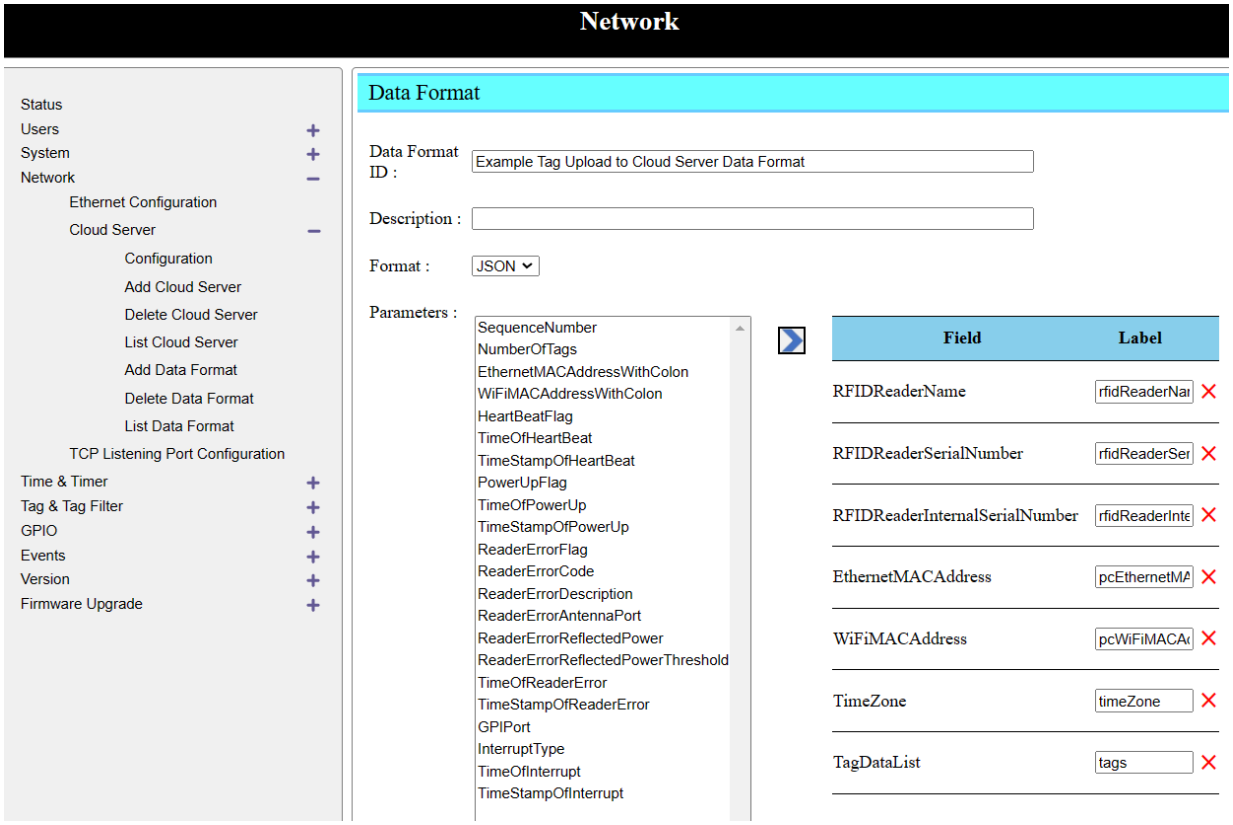
If one selects “Batch Alert to Server”, “Low Latency Alert to Server” or the “Instant Alert to Server”, then one has to select the Server ID, which is defined in the Trusted Server page of the Network page. The user has to select the Server ID and Data format ID that are going to use.



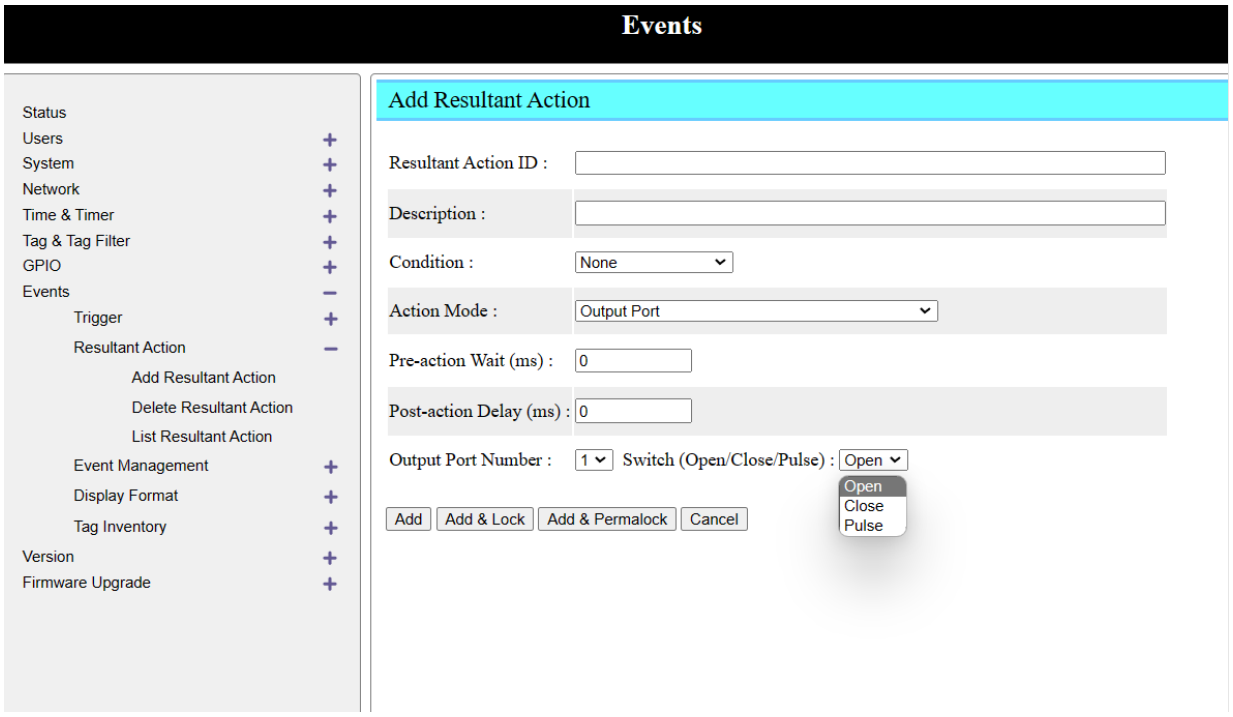
Data Format ID is defined in Cloud Server page



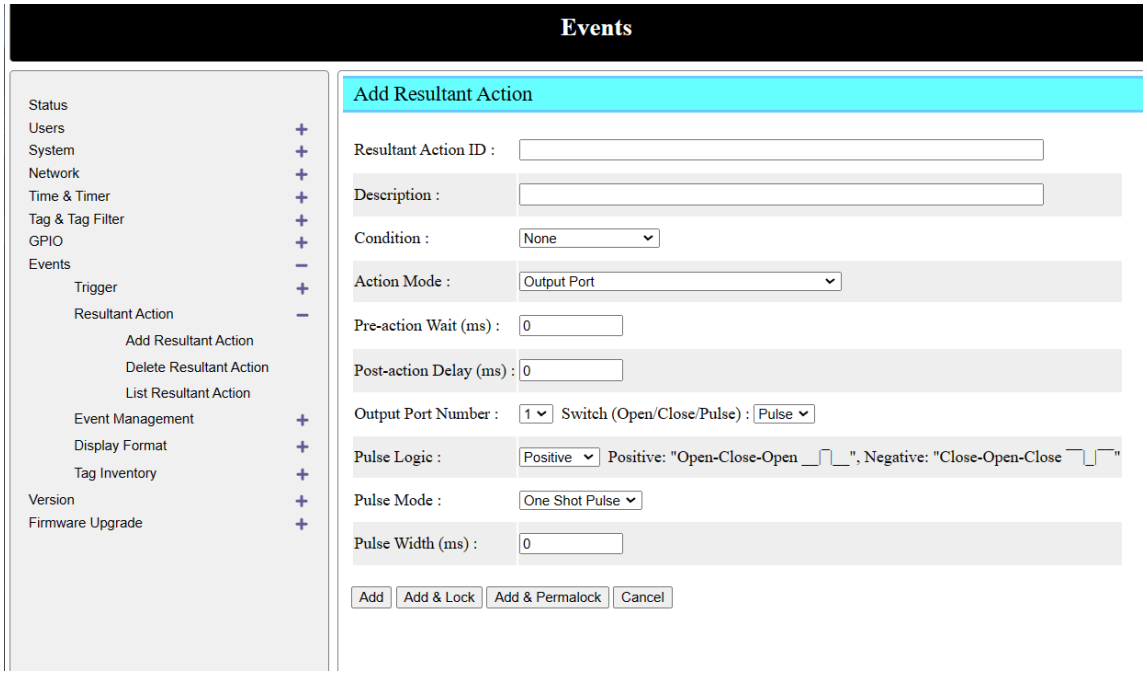
Different field can be added to reporting format as below



If one selects “Output Port” then one has to input few more fields. The user has to select the Port Number, 1 to 4. The Output Logic has to be selected, which can be either Open, Close or Pulse.

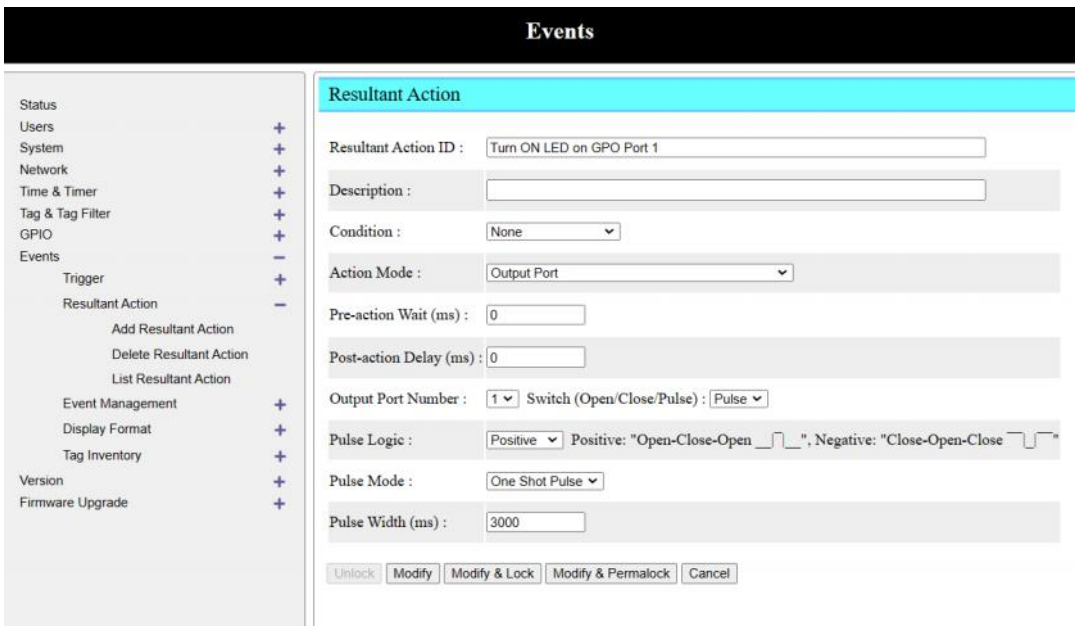


For Pulse, there are more parameters to be configured. The Pulse Logic, which can Open-Close-Open, or Close-Open-Close, and Pulse Mode, which can be One Shot Pulse or Pulse Train, the Pulse Width in msec., and for Pulse Train, the duty cycle and Pulse Duration. These are all self-explanatory.



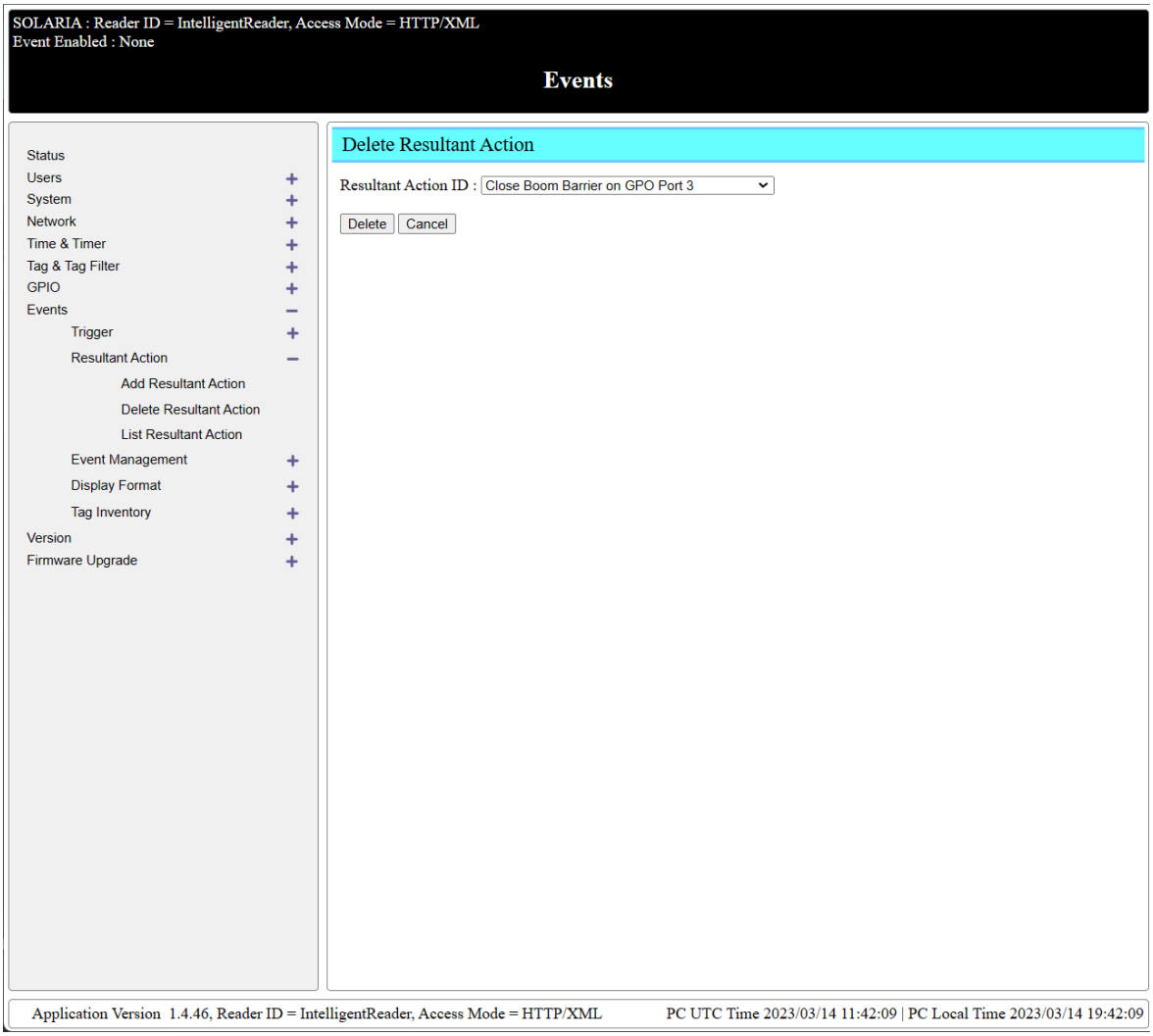
5.10.3.2. Modify Resultant Action

To modify resultant action, select the “Resultant Action ID” from list table, modify it and then click “Modify”.



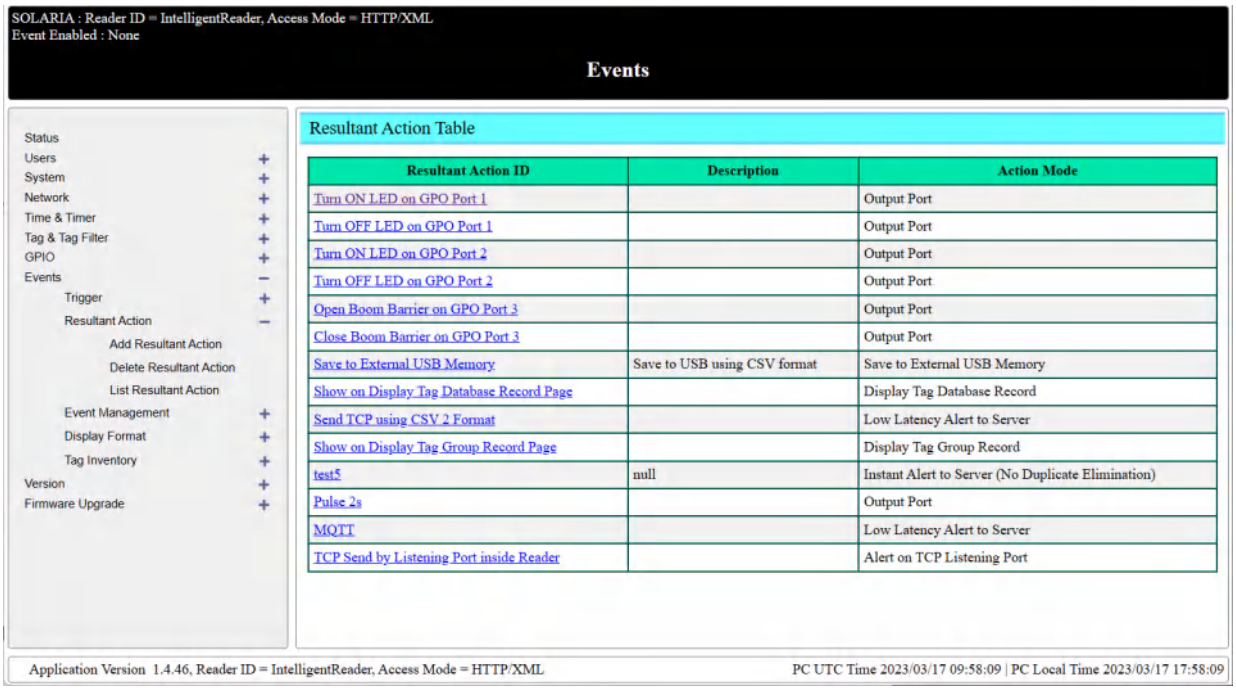
5.10.3.3. Delete Resultant Action

To delete resultant action, select the “Resultant Action ID” and click “Delete”.



5.10.3.4. List Resultant Action

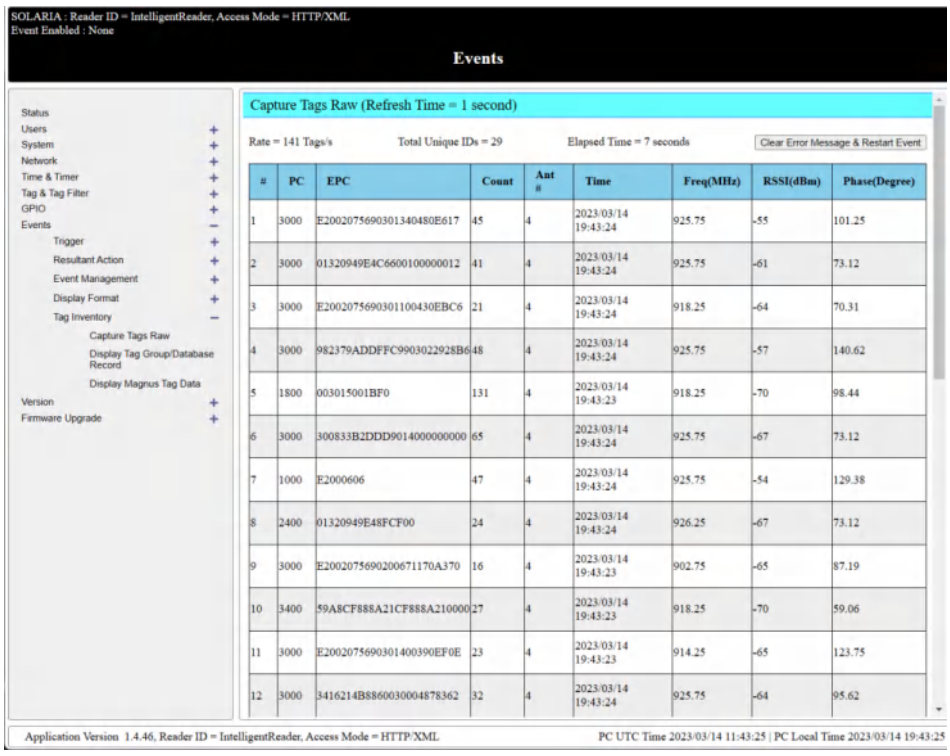
Below is the “List Resultant Action” action page.



5.10.4. Tag Inventory

Capture Tags Raw

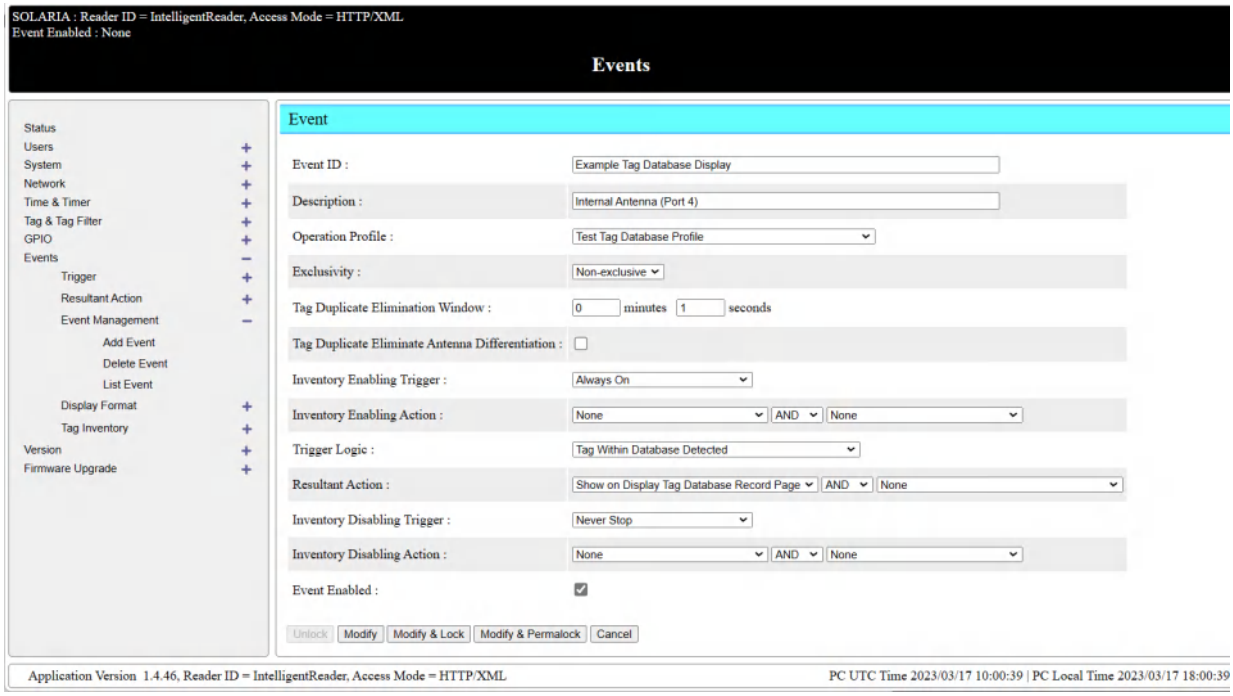
If there is any Event was enabled to read tags, all raw tags data can be found on this page



5.10.4.1. Display Tag Group/Database Record

When tag record within particular database was read by reader, the database content can be shown on this page as below

Below is the Event called “Example Tag Database Display”, once the Event was enabled and right tag was detected, the database content will be shown as previous diagram

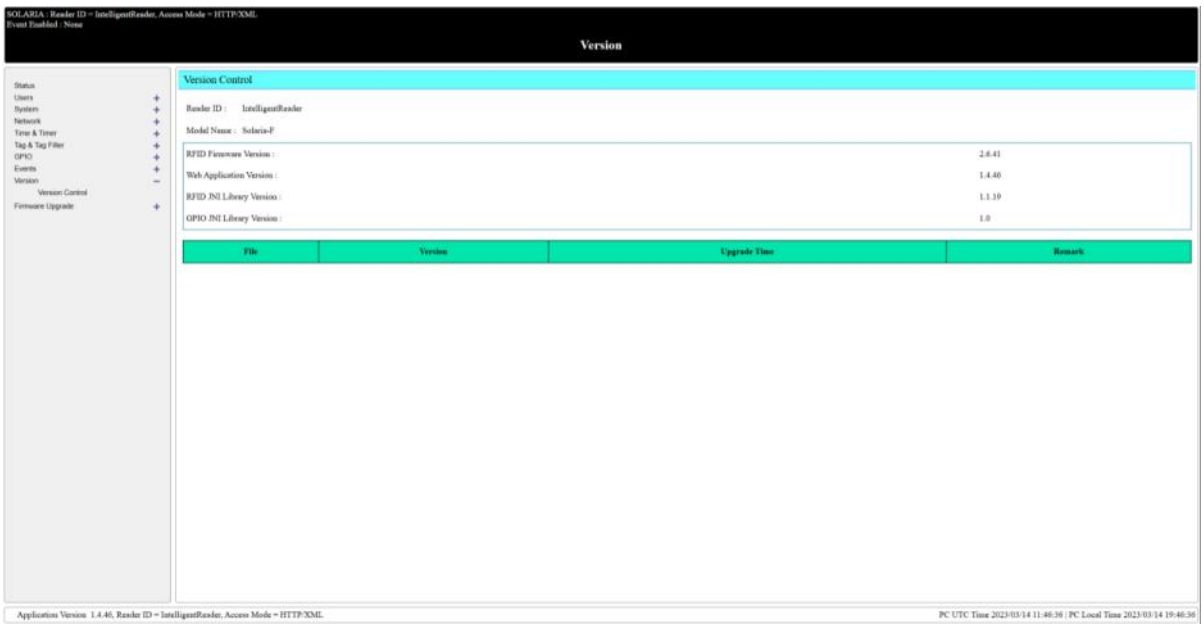


5.11. Version Management

The “Version Management” page allows you to review the version upgrade history (in the Version Control Submenu), and to do firmware upgrade (in the Firmware Upgrade Submenu).

5.11.1. Version Control

In the “Version Control” sub-menu page, one can see the version number of the software. This is an important page to check if the versions are correct, especially after a firmware upgrade. It also shows the upgrade history of the reader.



5.12. Firmware Upgrade

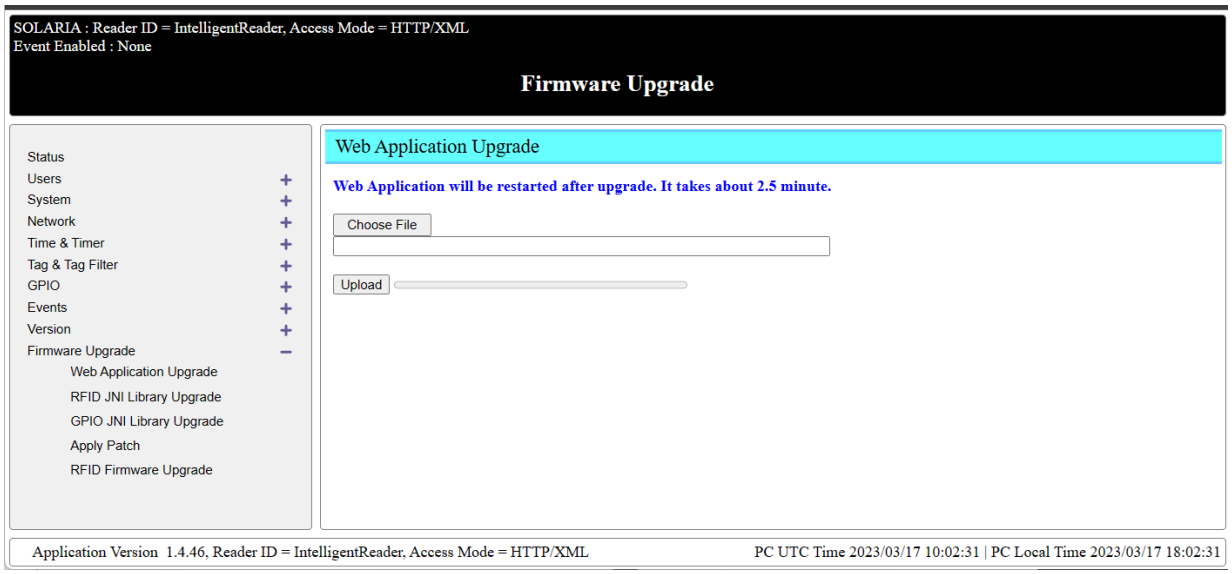
In the “Firmware Upgrade” submenu, just press the “Choose File” button and find the upgrade file. Then press the “Firmware Upgrade” button. The upgrade takes a few minutes, depending on the size of that particular upgrade. Please wait until you see the success message. After that please wait for the WebApplication to automatically restart to the login page.

Firmware upgrades include the following 5 items:

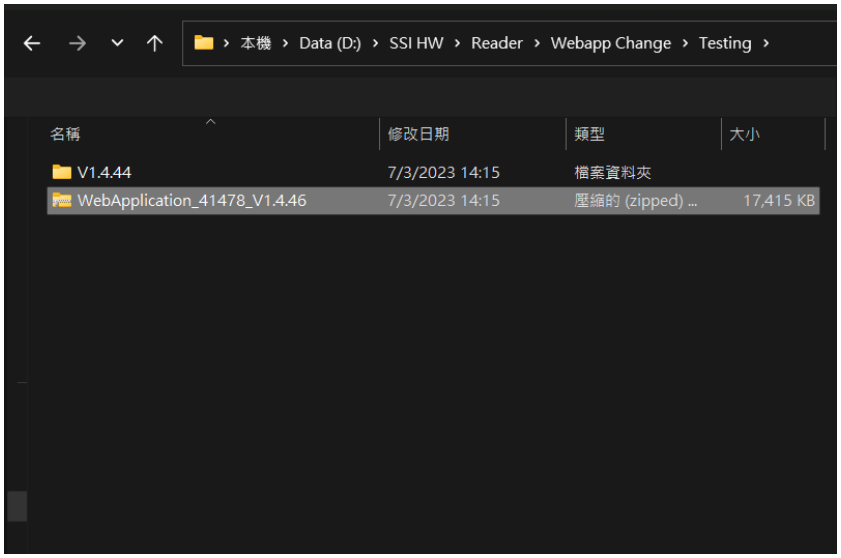
1. Web Application Upgrade
2. JNI Library Upgrade
3. SSI API Library Upgrade
4. Apply Patch
5. RFID Firmware Upgrade

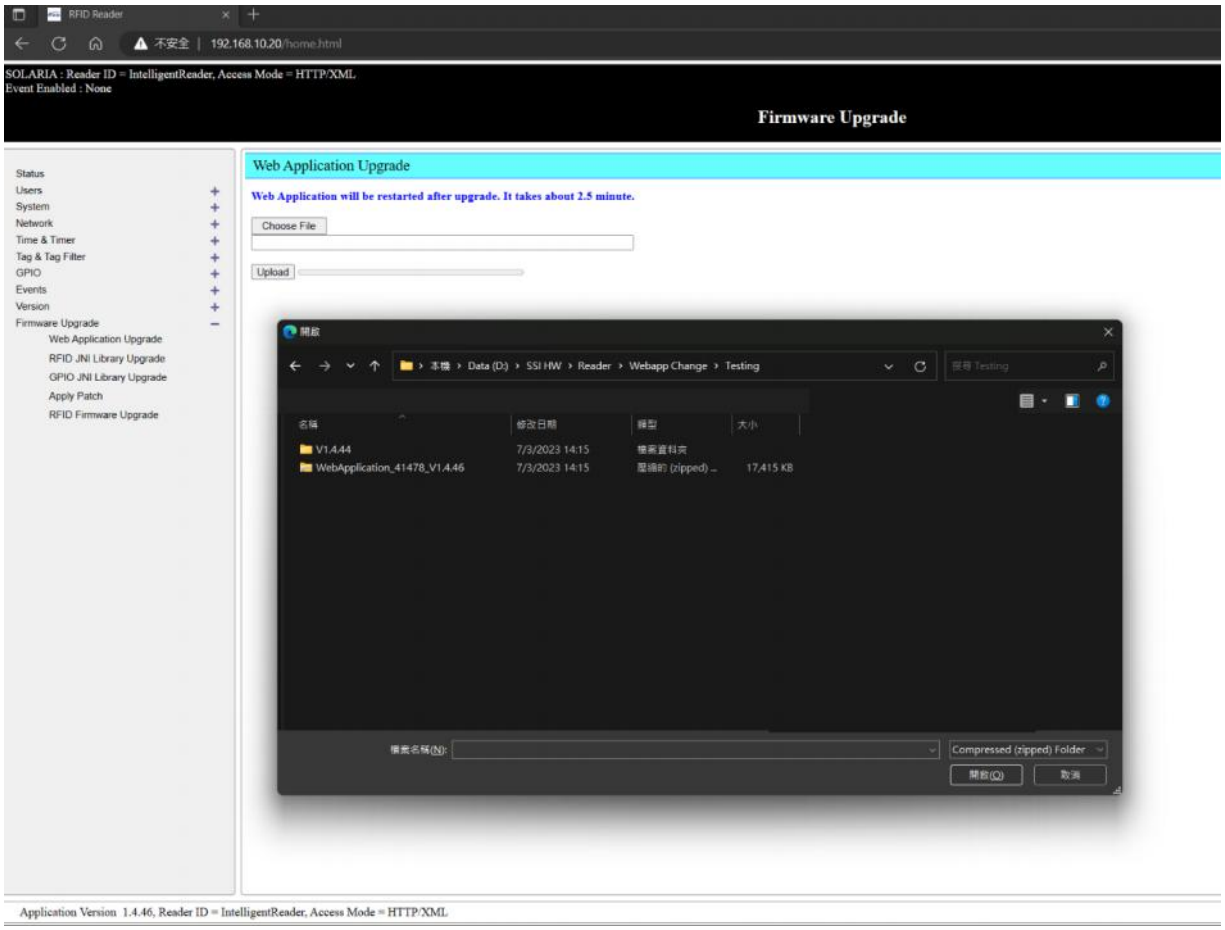
5.12.1. Upgrading Web Application

Below is the page to upgrade Web application.

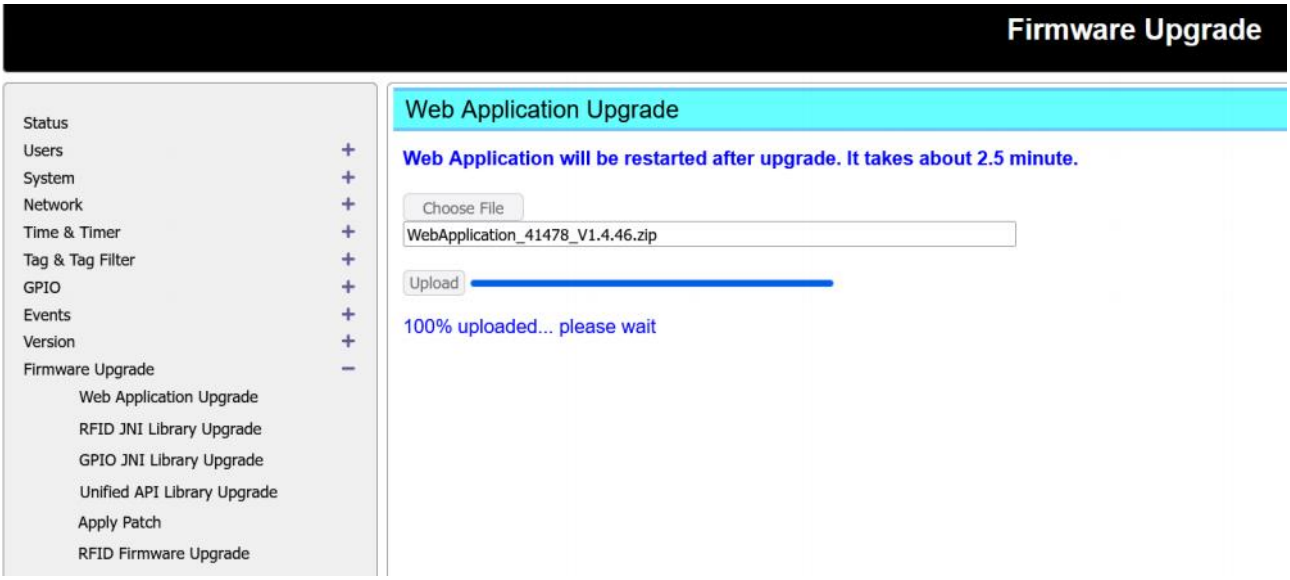


the upgrading can be done directly using the zipped file



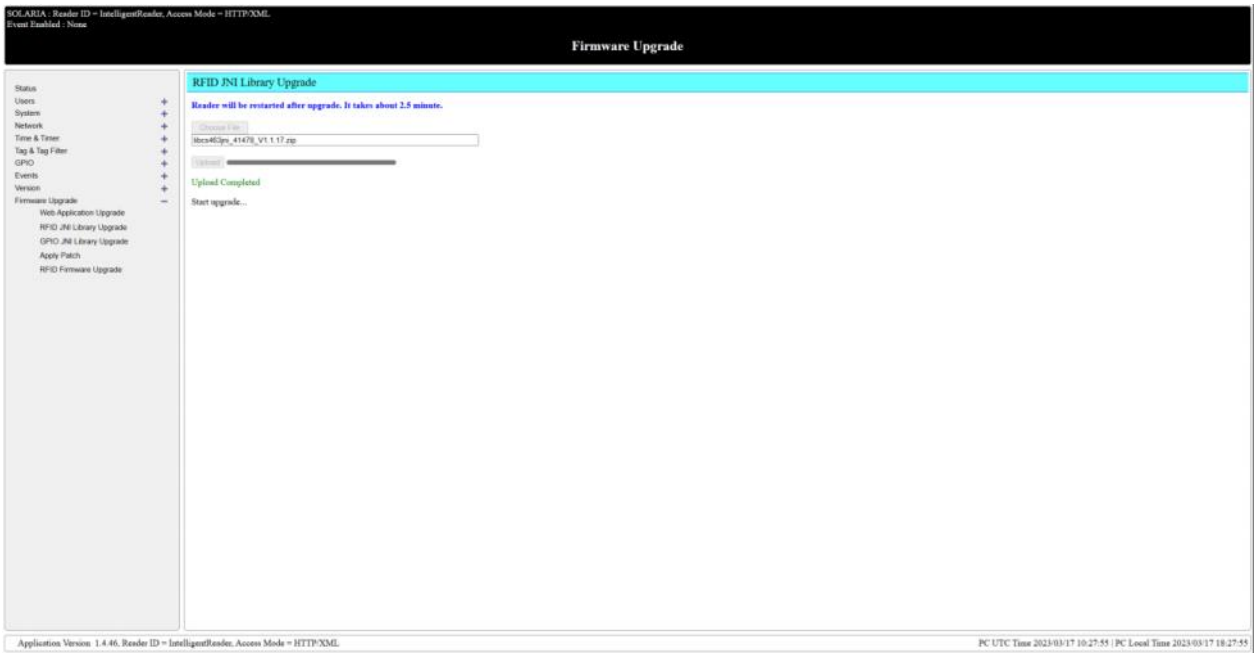


Then click Upload after choosing the Web application file and upgrading will start



5.12.2. Upgrading JNI Library

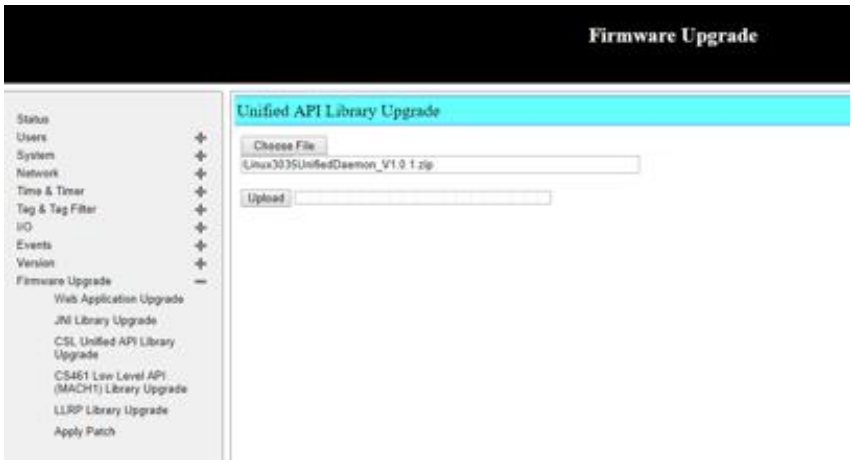
Choose the JNI Library zipped file (no need to unzip)



Then click Upload

Upgrading Unified API library

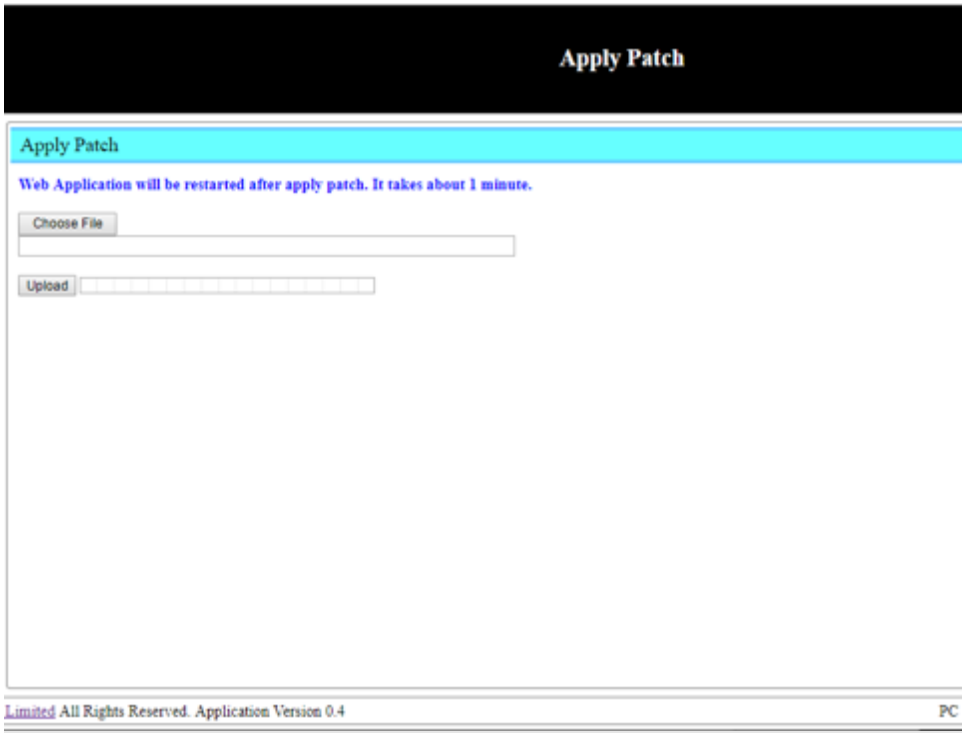
Choose the zipped Daemon file.



Then click upload.

Applying Patch to System

If there is any patch for system, it can be done on this page. Linux OS versions: 3.0.35 or 4.x.x can use same Patch file



Choose the zipped patch file then click upload

6. Read Tag using Web

Interface and Event Engine

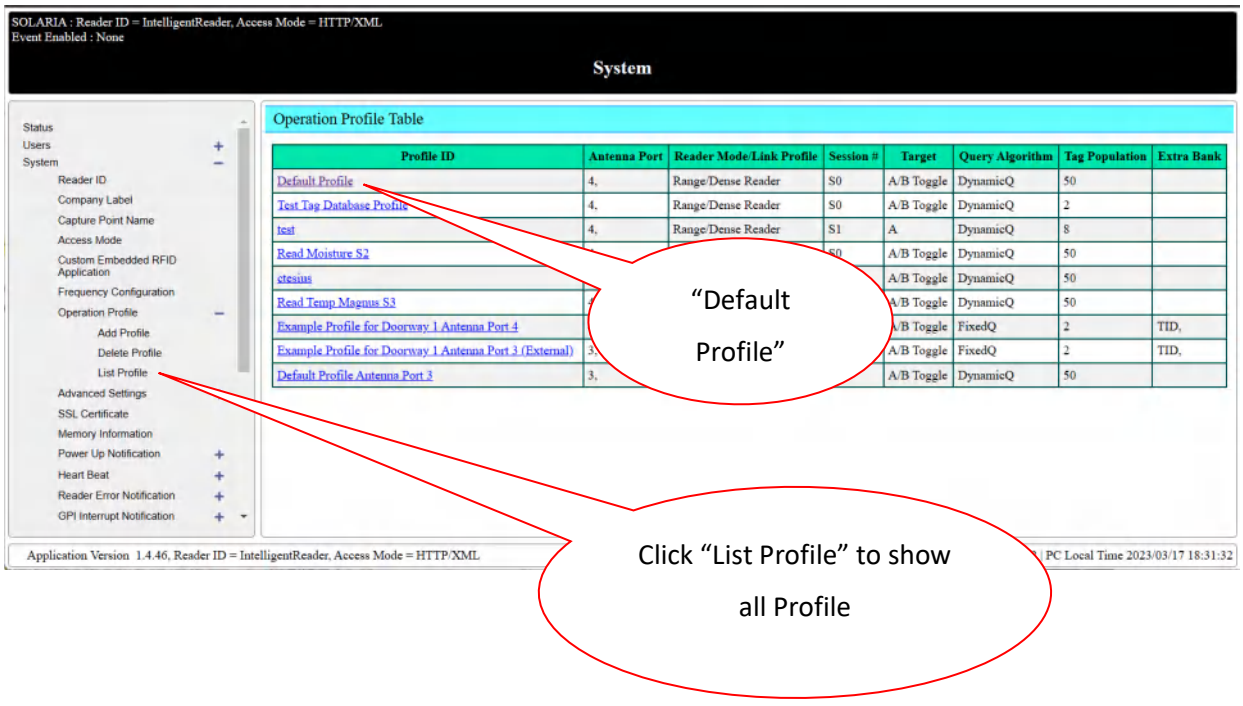
One can use a browser to quickly configure the SOLARIA reader to autonomously read tags based on certain logic sequence defined in the event engine and operation profile.

6.1. Read Tag using Default Profile and Default Event

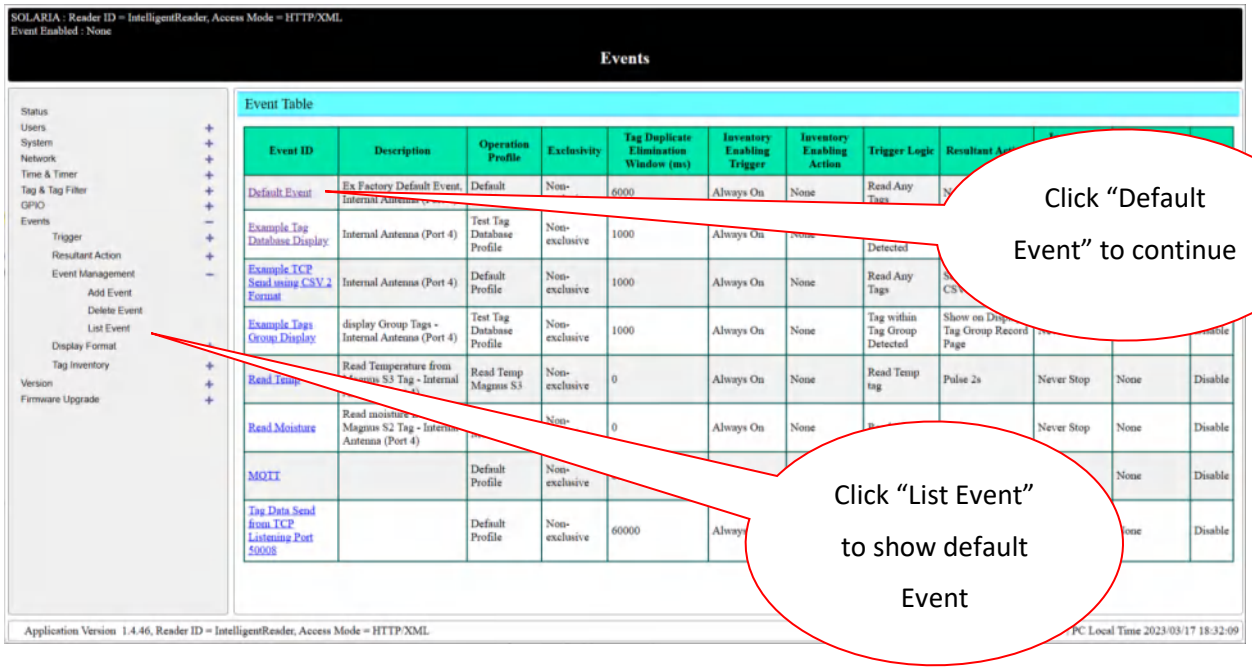
The SOLARIA reader comes with a Default Profile and a Default Event. The Default Event is not enabled yet. Once the user enables that event, then the user can use that to immediately read RFID tags from antenna Port.

After login to the reader and ensuring the reader is in HTTP/XML access mode as explained in section 4.3.

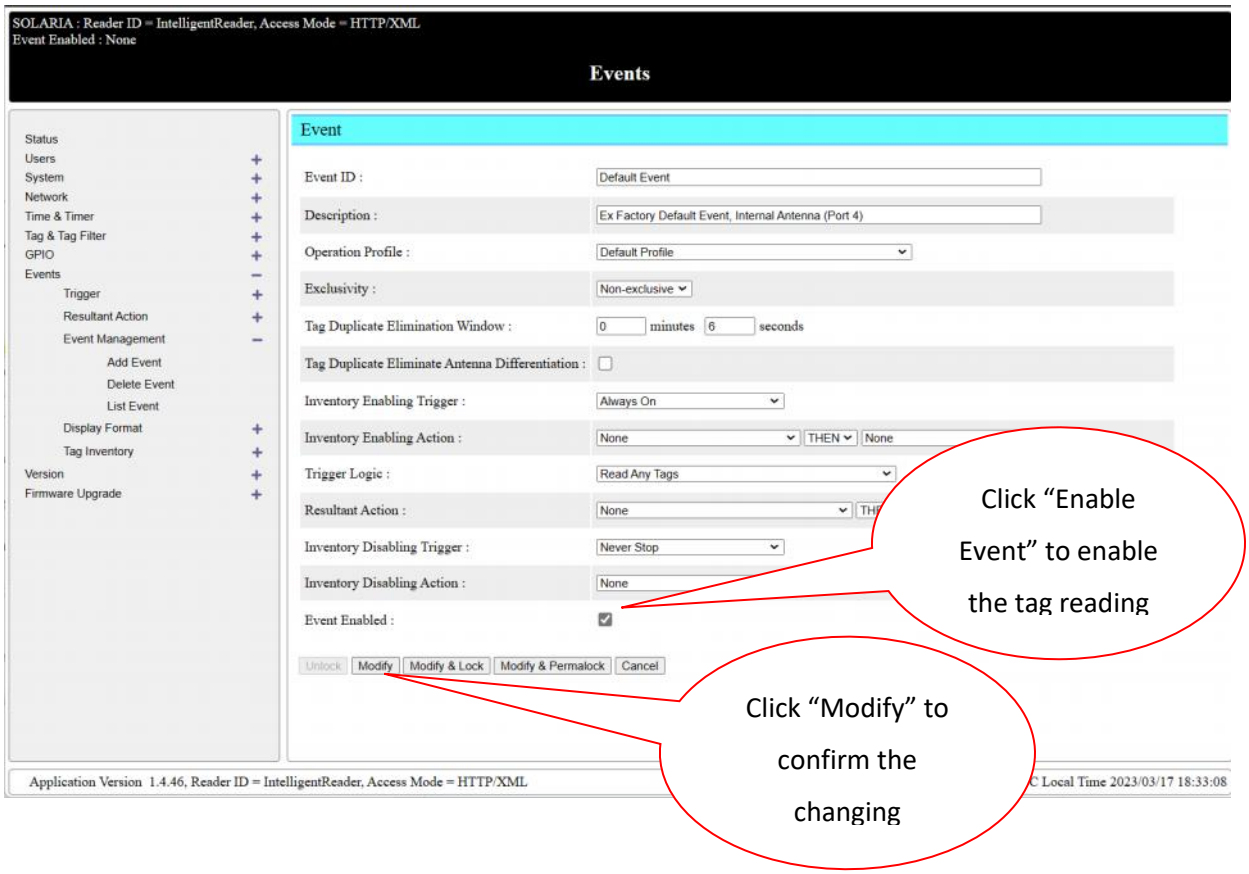
Go to the Operation Profile in System page and select List Profile to ensure there is Default Profile can be found as below:



Go to the List Event of Event Management in Event page and click List Event to show the Default Event



In Default Event, the reading tag from antenna port 4 can be started after the default event was enable and click Modify to confirm the change



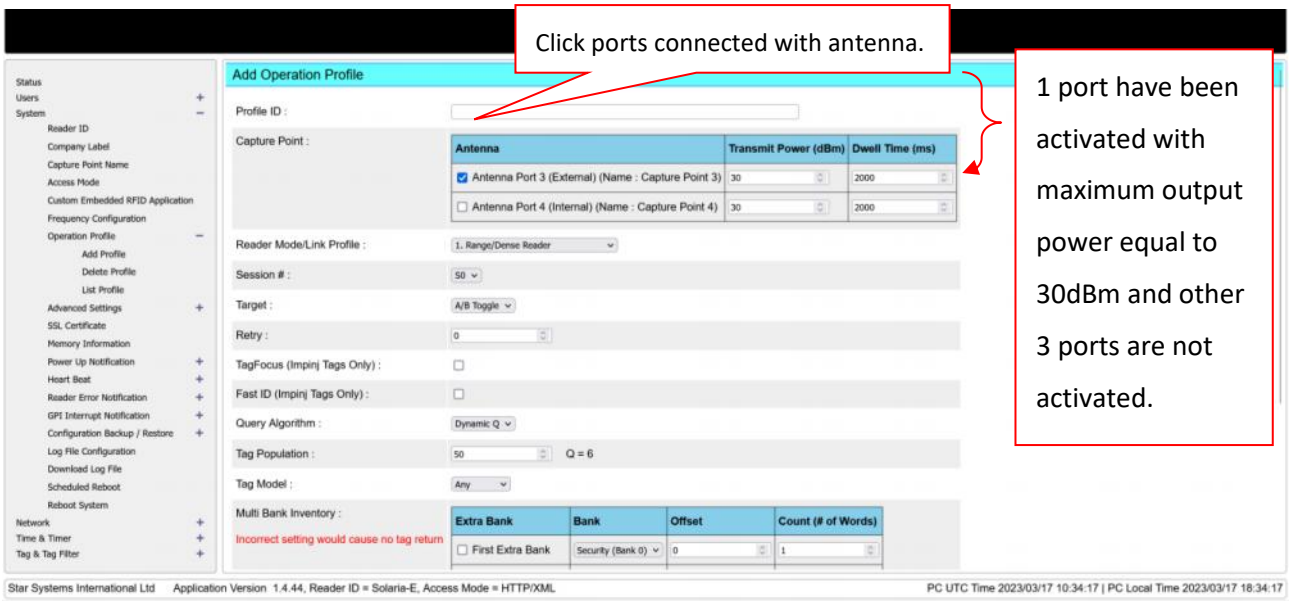
Reading tag from antenna port 1 can be stopped once the default event was disable by unchecking Enable Event and click Modify to confirm the change

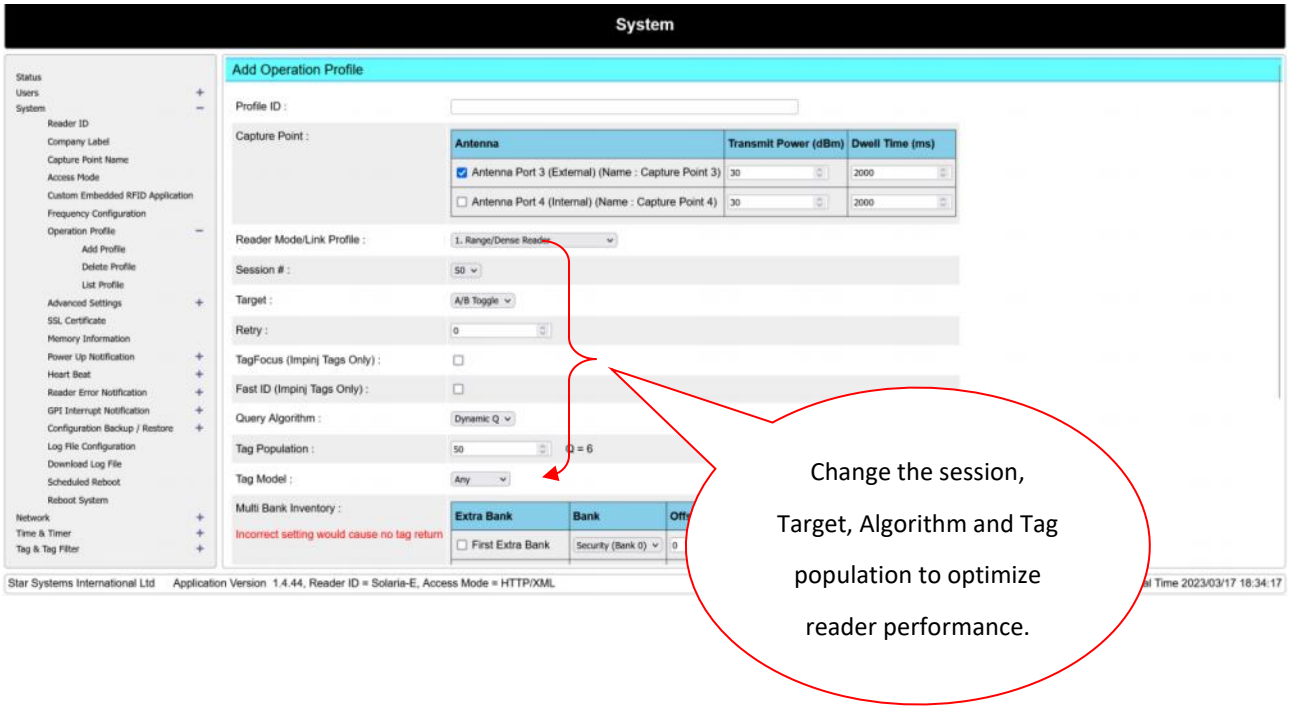
6.2. Example 1: Read Tag using Custom Profile and Custom Event

To define your own profile and event, the following steps are needed:

Add Profile:

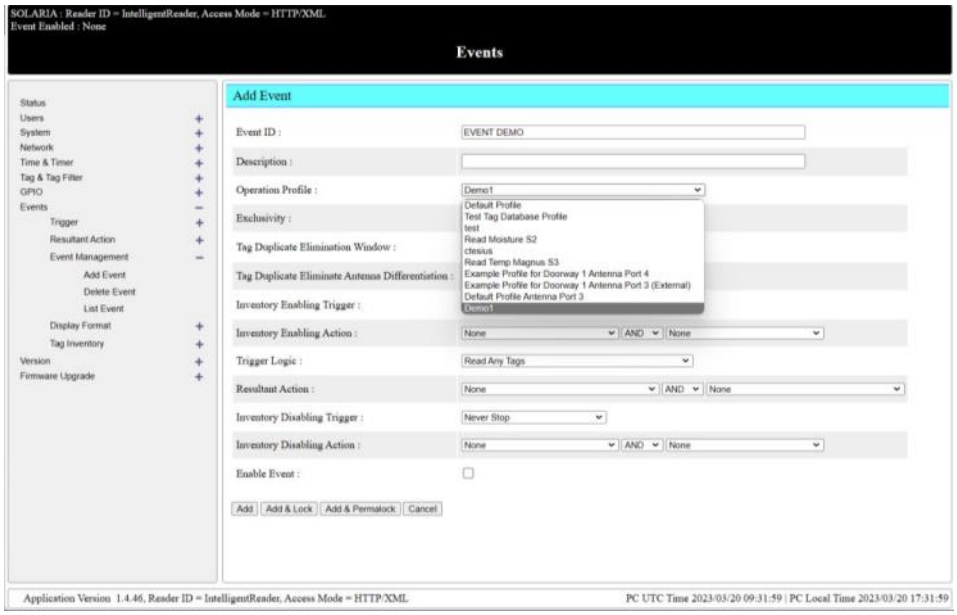
Go to the Operation Profile in System page, then click Add Profile as below


Click ports connected with antenna.
1 port have been activated with maximum output power equal to 30dBm and other 3 ports are not activated.
Add Operation Profile
Profile ID :
Capture Point :
Antenna
Transmit Power (dBm)
Dwell Time (ms)
Antenna Port 3 (External) (Name : Capture Point 3)
Antenna Port 4 (Internal) (Name : Capture Point 4)
Reader Mode/Link Profile :
Session # :
Target :
Retry :
TagFocus (Impinj Tags Only) :
Fast ID (Impinj Tags Only) :
Query Algorithm :
Tag Population :
Tag Model :
Multi Bank Inventory :
Incorrect setting would cause no tag return
Extra Bank
Bank
Offset
Count (# of Words)
First Extra Bank
Star Systems International Ltd
Application Version 1.4.44, Reader ID = Solaria-E, Access Mode = HTTP/XML


System
Add Operation Profile
Change the session, Target, Algorithm and Tag population to optimize reader performance.
Star Systems International Ltd
Application Version 1.4.44, Reader ID = Solaria-E, Access Mode = HTTP/XML

Please click “Add” to confirm the change.

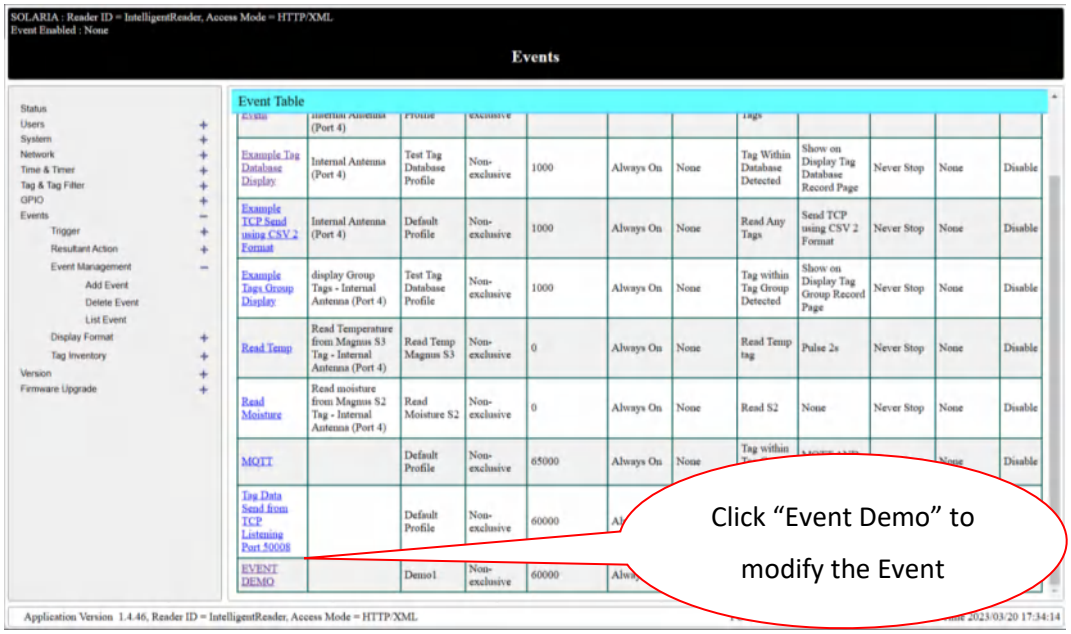
Add Event and change to use Demo1 which created before

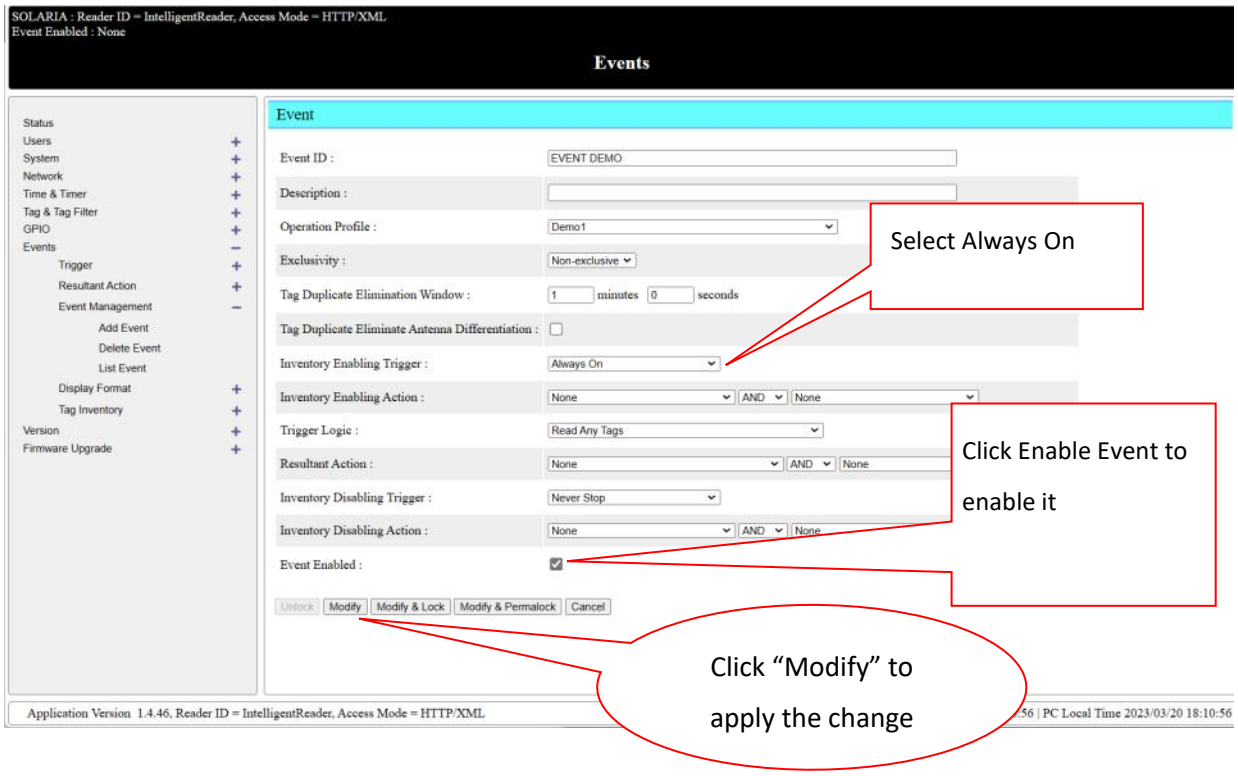


Click Add to create new event.

Start inventory reading using Event Demo:

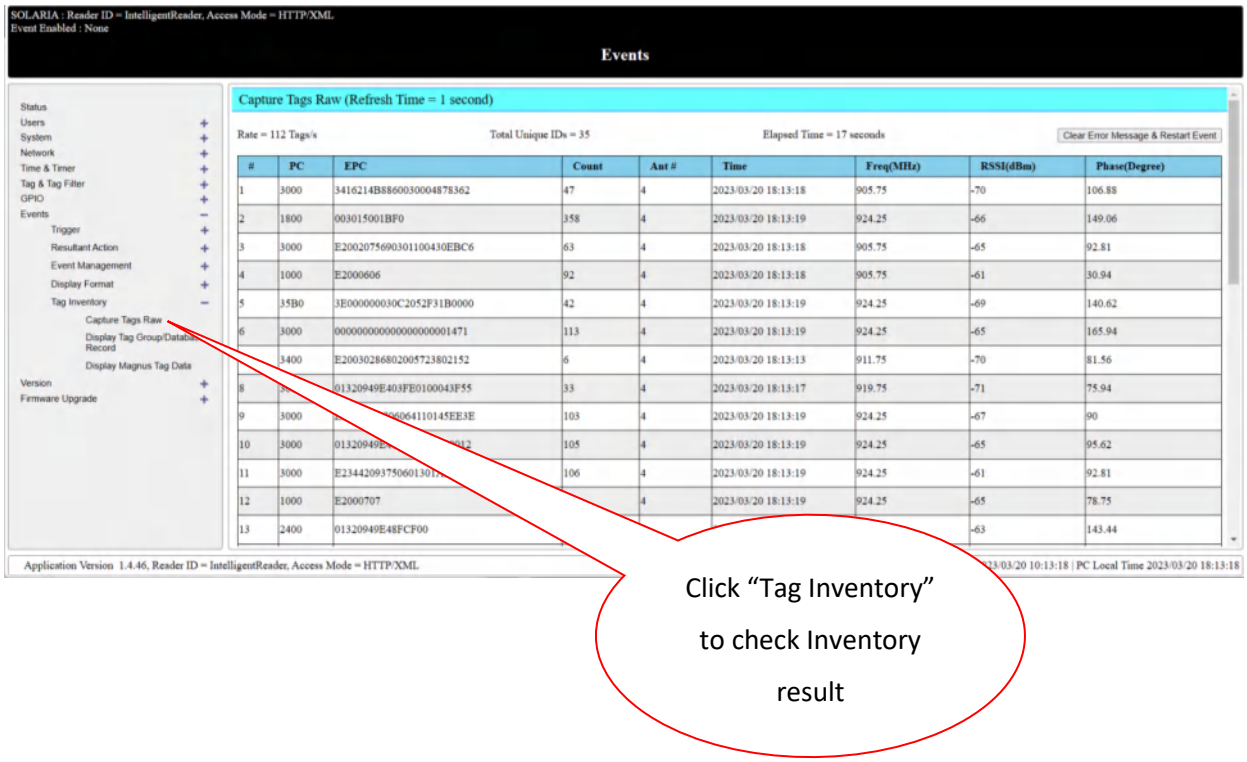
Go to List Event in Event Management and click “Event Demo” to modify the Event.



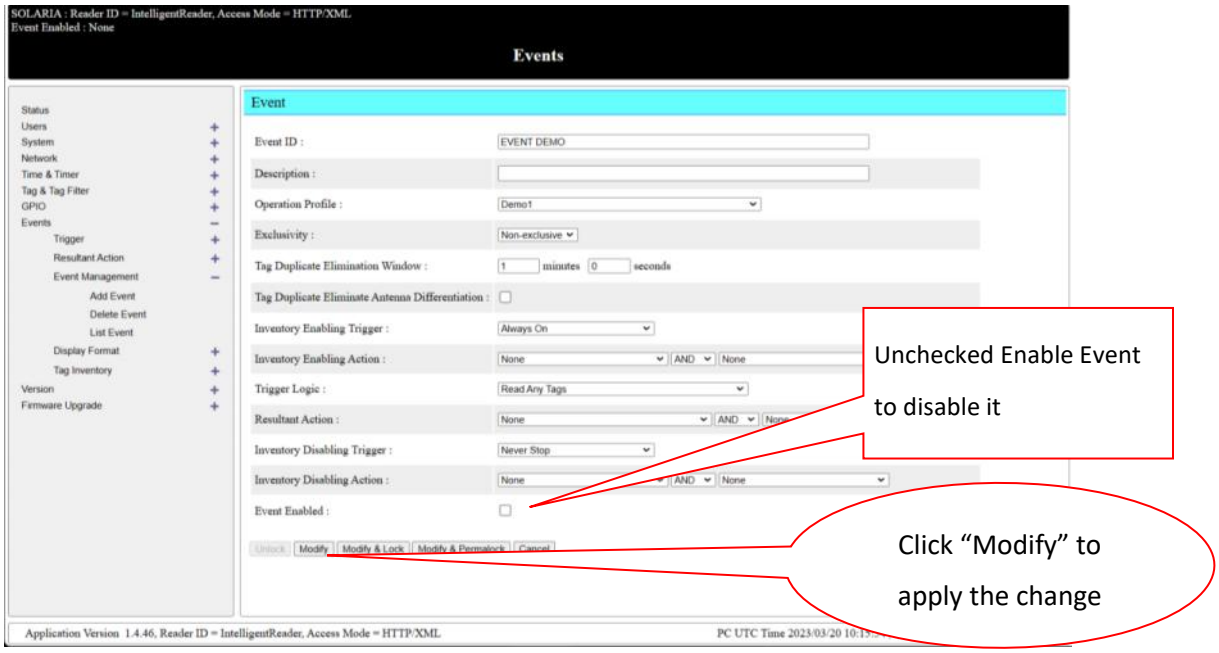


Please click “Modify” to confirm the change and inventory will start.

Go to Tag inventory to check inventory result.



The Inventory can be stopped by disabling the Event 1 on Event Management as below

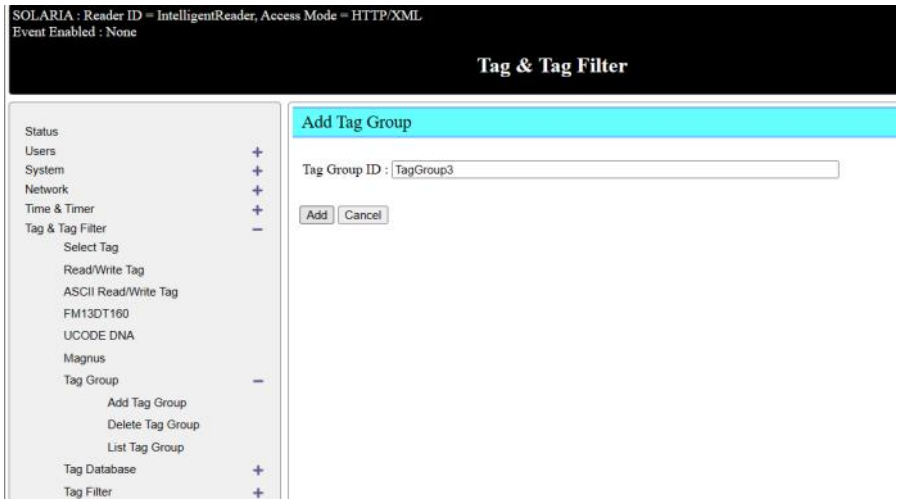


Below procedure to enable particular group of tag to be detected and used this group as trigger

Add tag group:

Go to Tag group in Tag & Tag Filter and click Add Tag Group

Input the new tags group name as below

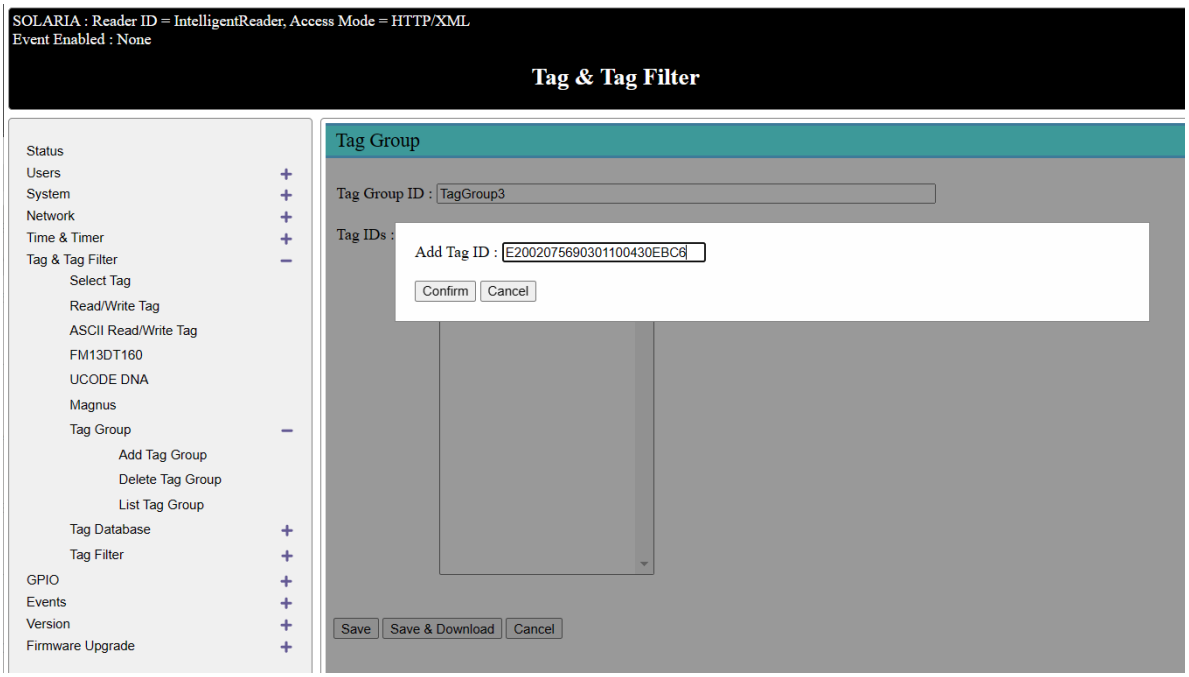


Click Add to confirm the new group

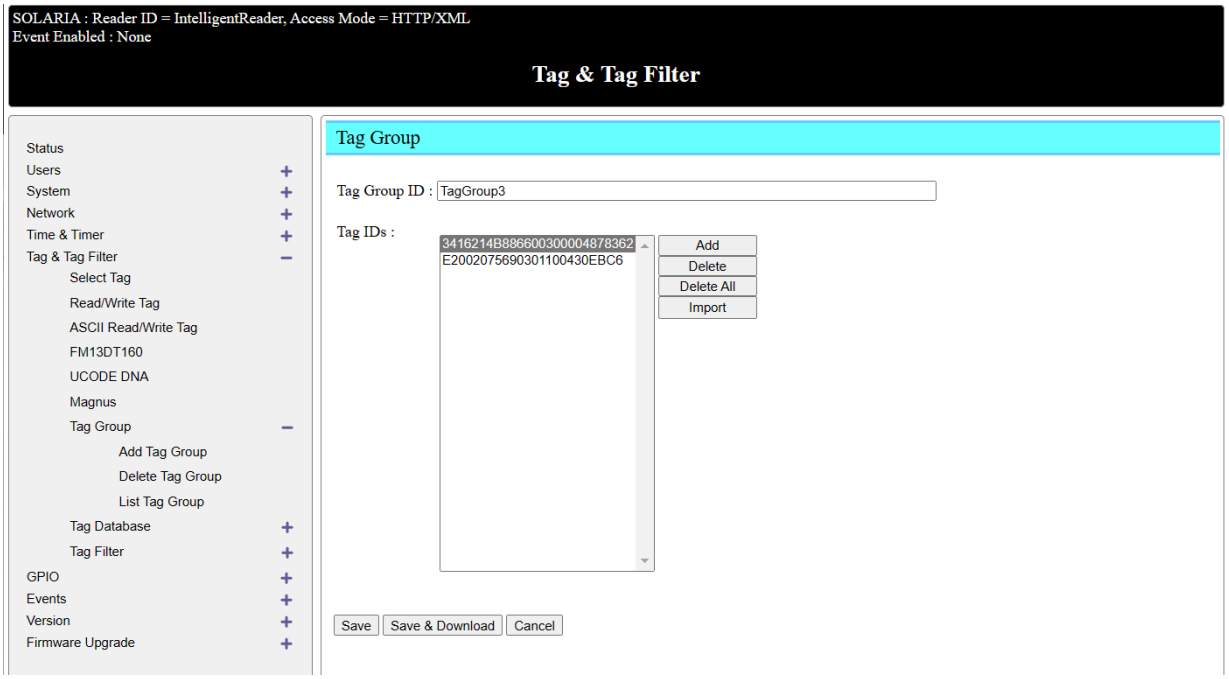
Add Tags to the group

Click Add to add new tags to the group and below menu will pop up.

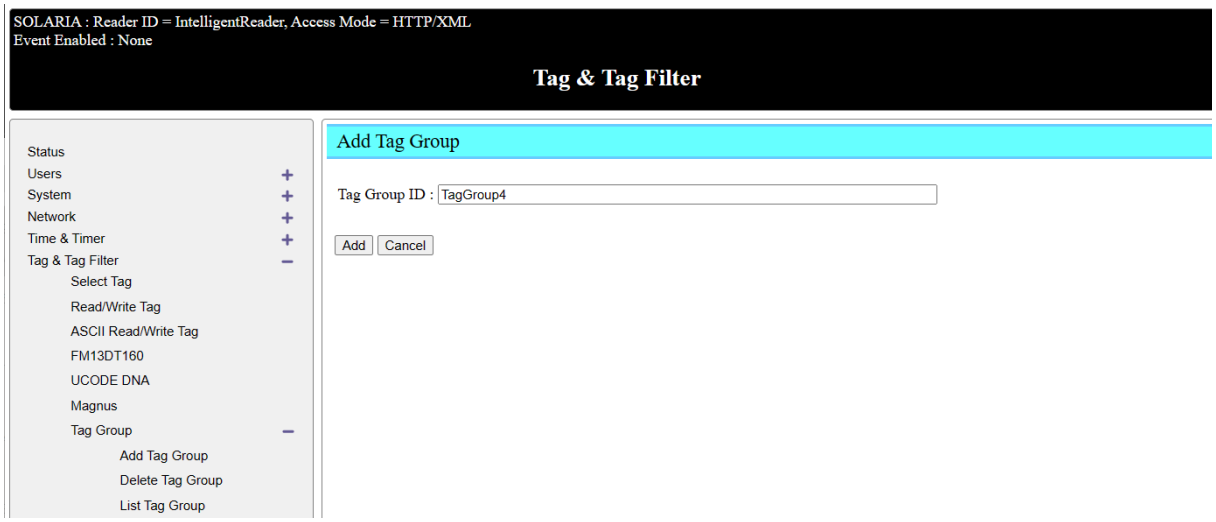
Click confirm to confirm the addition of new tag to the tag group



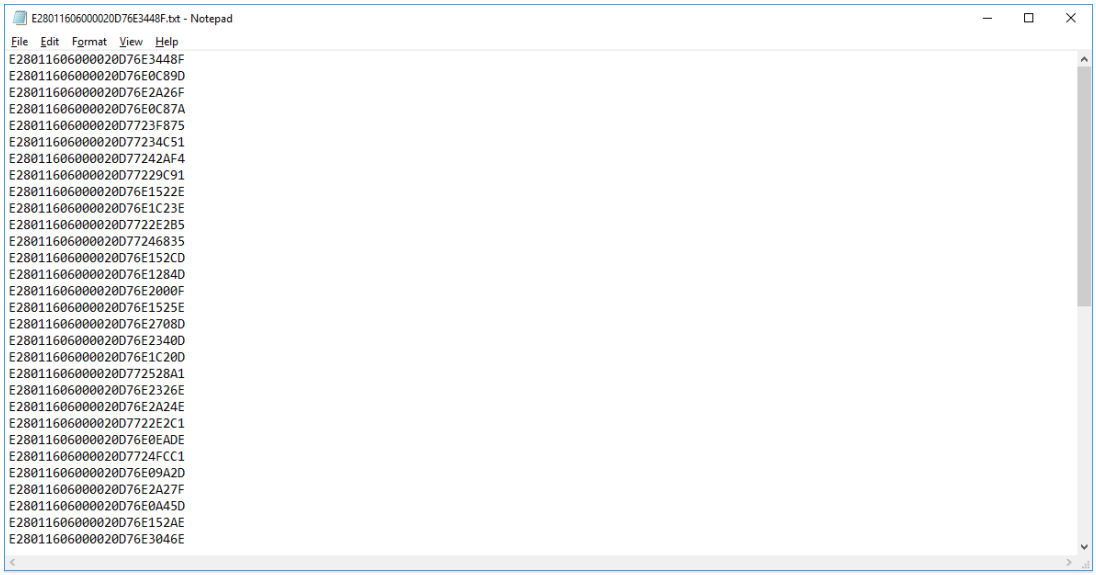
Click Save to save the new tag group



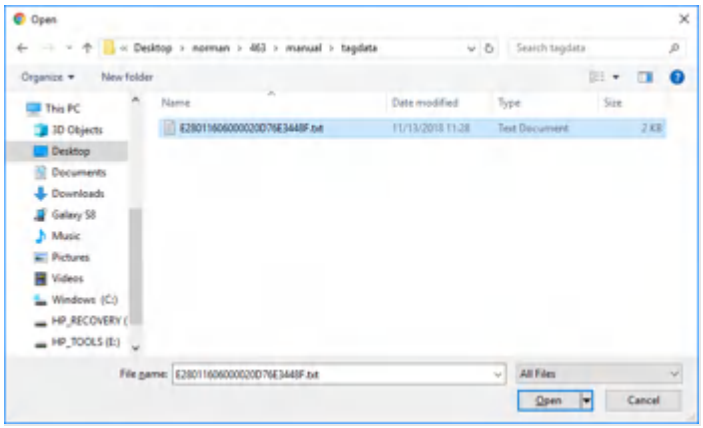
Import New tags:



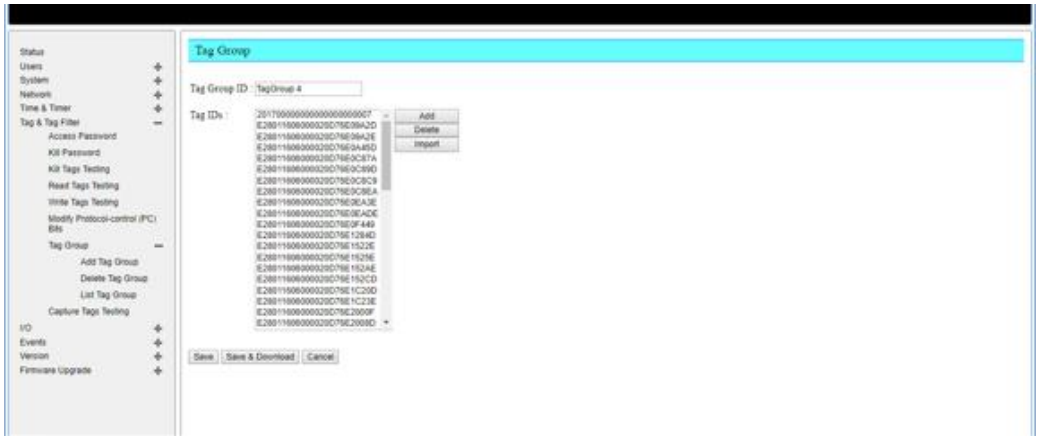
Prepare tag record file, below is the example file and view by notepad



Click Import then select the tags record file

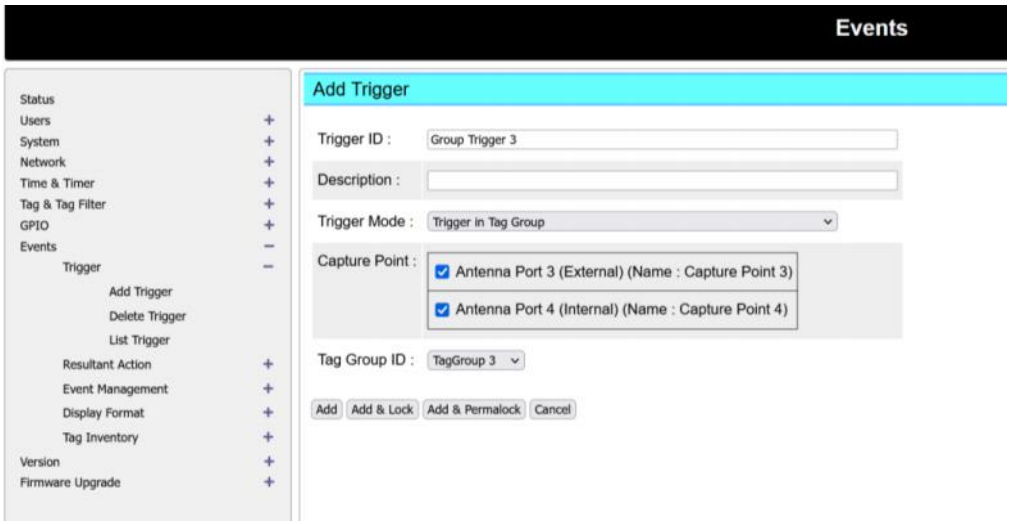


New Tags was added to the window

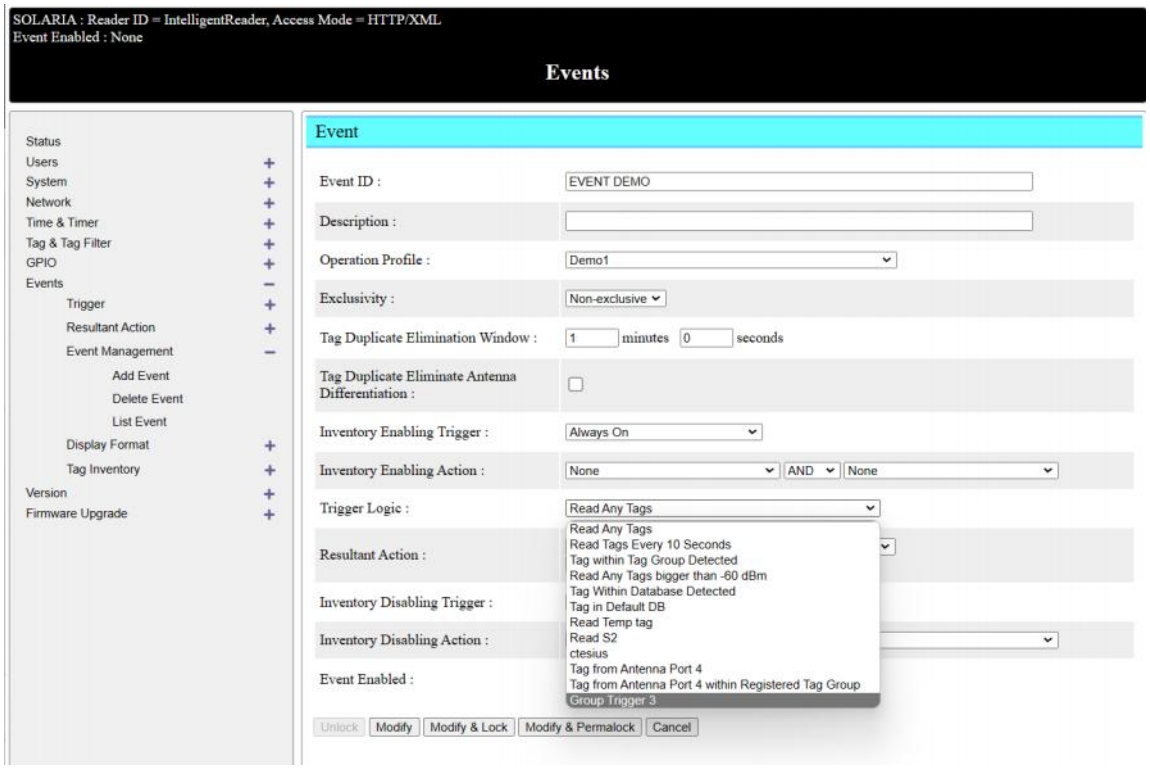


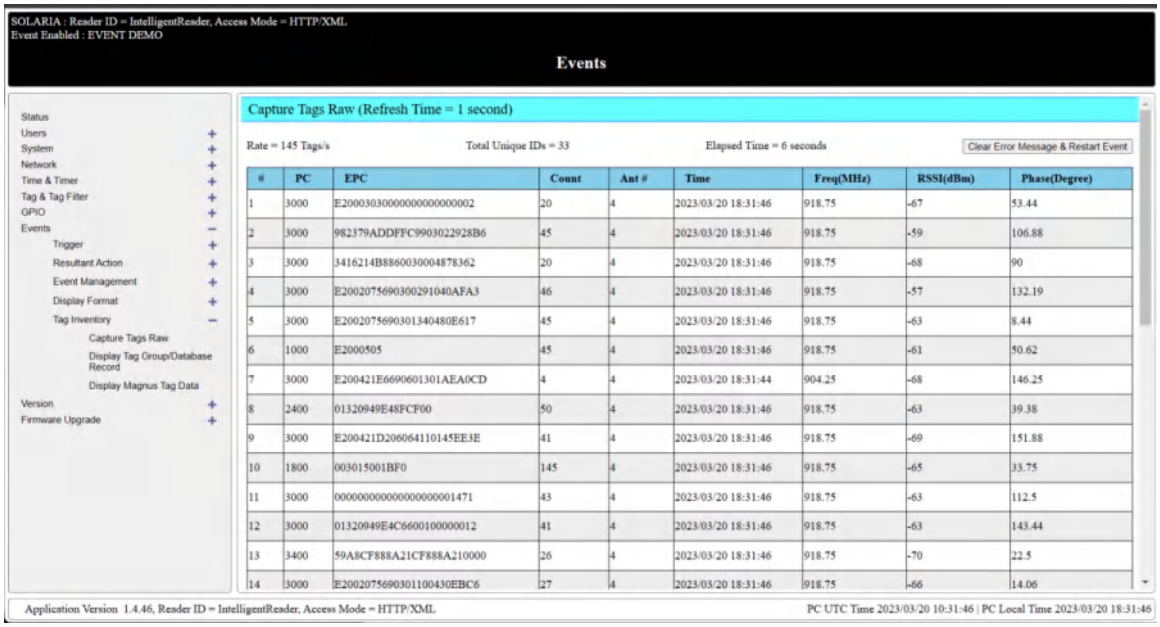
Click Save to save new record to the tag group

In the Add trigger of Event menu, new tag group (TagGroup 3) is available as shown below



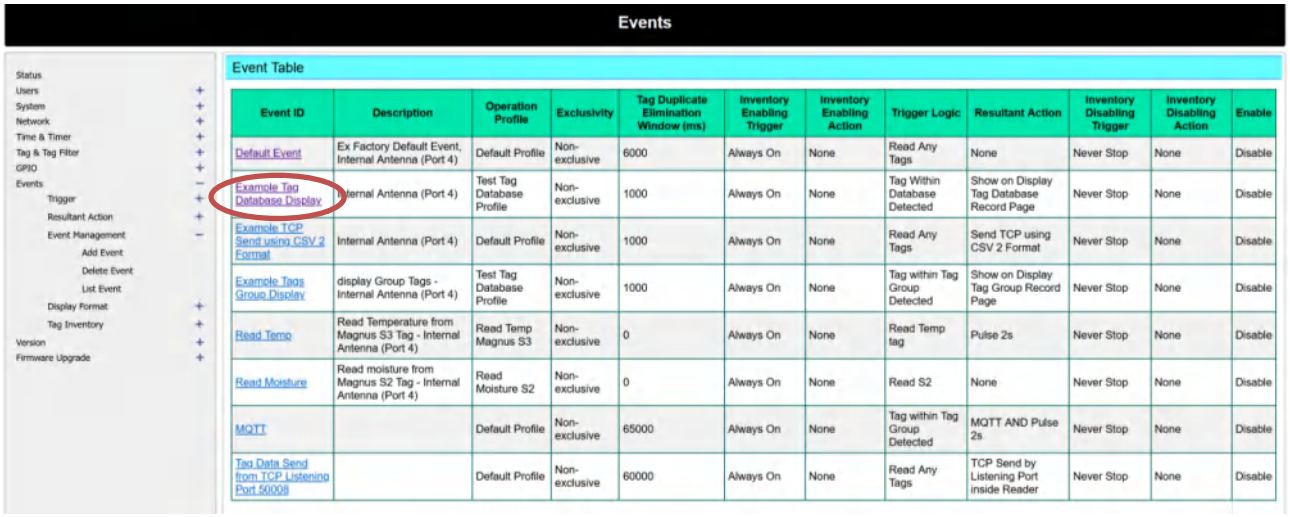
Go to Event management, Group Trigger can be used in Trigger Logic on Event Demo


SOLARIA : Reader ID = IntelligentReader, Access Mode = HTTP/XML
Event Enabled : None
Events
Status
Users
System
Network
Time & Timer
Tag & Tag Filter
GPIO
Events
Trigger
Resultant Action
Event Management
Add Event
Delete Event
List Event
Display Format
Tag Inventory
Version
Firmware Upgrade
Event
Event ID :
EVENT DEMO
Description :
Operation Profile :
Demo1
Exclusivity :
Non-exclusive
Tag Duplicate Elimination Window :
1
minutes
0
seconds
Tag Duplicate Eliminate Antenna Differentiation :
Inventory Enabling Trigger :
Always On
Inventory Enabling Action :
None
AND
None
Trigger Logic :
Read Any Tags
Read Any Tags
Read Tags Every 10 Seconds
Tag within Tag Group Detected
Read Any Tags bigger than -60 dBm
Tag Within Database Detected
Tag in Default DB
Read Temp tag
Read S2
ctesius
Tag from Antenna Port 4
Tag from Antenna Port 4 within Registered Tag Group
Group Trigger 3
Resultant Action :
Inventory Disabling Trigger :
Inventory Disabling Action :
Event Enabled :
Unlock
Modify
Modify & Lock
Modify & Permalock
Cancel


SOLARIA : Reader ID = IntelligentReader, Access Mode = HTTP/XML
Event Enabled : EVENT DEMO
Events
Capture Tags Raw (Refresh Time = 1 second)
Rate = 145 Tags/s
Total Unique IDs = 33
Elapsed Time = 6 seconds
Clear Error Message & Restart Event
PC EPC Count Ant # Time Freq(MHz) RSSI(dBm) Phase(Degree)
1 3000 E2003030000000000000002 20 4 2023/03/20 18:31:46 918.75 -67 53.44
2 3000 982379ADDFFC9903022928B6 45 4 2023/03/20 18:31:46 918.75 -59 106.88
3 3000 3416214B8860030004878362 20 4 2023/03/20 18:31:46 918.75 -68 90
4 3000 E2002075690300291040AFA3 46 4 2023/03/20 18:31:46 918.75 -57 132.19
5 3000 E2002075690301340480E617 45 4 2023/03/20 18:31:46 918.75 -63 8.44
6 1000 E2000505 45 4 2023/03/20 18:31:46 918.75 -61 50.62
7 3000 E200421E6690601301AEA0CD 4 4 2023/03/20 18:31:44 904.25 -68 146.25
8 2400 01320949E48FCF00 50 4 2023/03/20 18:31:46 918.75 -63 39.38
9 3000 E200421D206064110145EE3E 41 4 2023/03/20 18:31:46 918.75 -69 151.88
10 1800 003015001BF0 145 4 2023/03/20 18:31:46 918.75 -65 33.75
11 3000 00000000000000000001471 43 4 2023/03/20 18:31:46 918.75 -63 112.5
12 3000 01320949E4C6600100000012 41 4 2023/03/20 18:31:46 918.75 -63 143.44
13 3400 59A8CF888A21CF888A210000 26 4 2023/03/20 18:31:46 918.75 -70 22.5
14 3000 E2002075690301100430EBC6 27 4 2023/03/20 18:31:46 918.75 -66 14.06
Application Version 1.4.46, Reader ID = IntelligentReader, Access Mode = HTTP/XML
PC UTC Time 2023/03/20 10:31:46 | PC Local Time 2023/03/20 18:31:46

6.3. Example 2: Example Event using Database Tag Group and Database Display

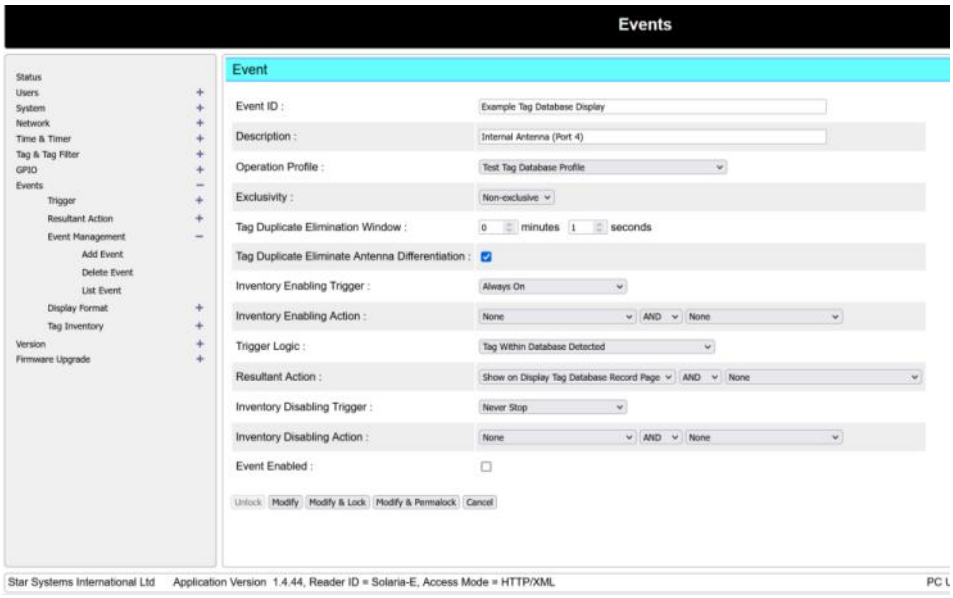
The event Example Tag Database Display can display content of database located in reader if tag within database tag group was detected from antenna port 1 on SOLARIA or antenna port 4 on SOLARIA. This database record can contain Picture/Photo and text such as equipment photo, staff photo and corresponding text



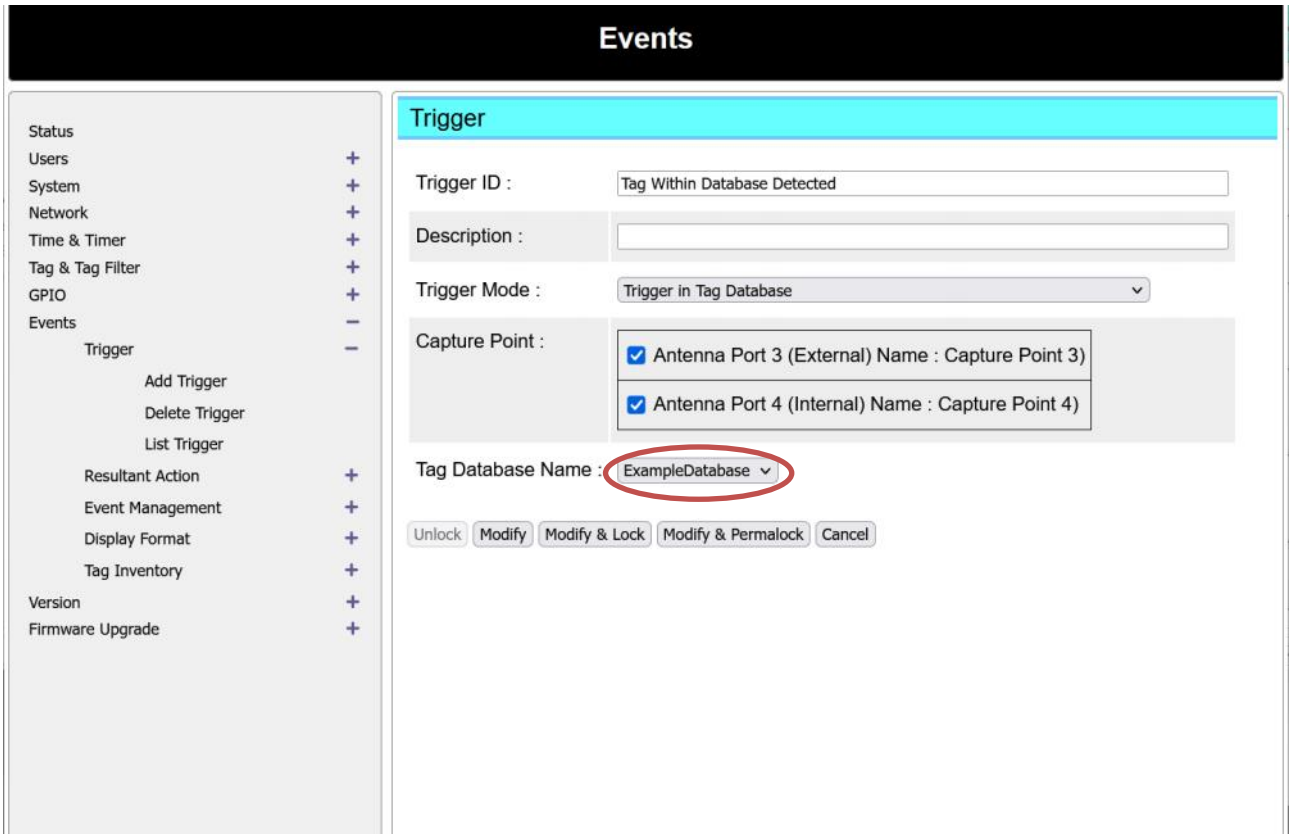
Event ID	Description	Operation Profile	Exclusivity	Tag Duplicate Elimination Window (ms)	Inventory Enabling Trigger	Inventory Enabling Action	Trigger Logic	Resultant Action	Inventory Disabling Trigger	Inventory Disabling Action	Enable
Default Event	Ex Factory Default Event, Internal Antenna (Port 4)	Default Profile	Non-exclusive	6000	Always On	None	Read Any Tags	None	Never Stop	None	Disable
Example Tag Database Display	Internal Antenna (Port 4)	Test Tag Database Profile	Non-exclusive	1000	Always On	None	Tag Within Database Detected	Show on Display Tag Database Record Page	Never Stop	None	Disable
Example TCP Send using CSV 2 Format	Internal Antenna (Port 4)	Default Profile	Non-exclusive	1000	Always On	None	Read Any Tags	Send TCP using CSV 2 Format	Never Stop	None	Disable
Example Tags Group Display	display Group Tags - Internal Antenna (Port 4)	Test Tag Database Profile	Non-exclusive	1000	Always On	None	Tag within Tag Group Detected	Show on Display Tag Group Record Page	Never Stop	None	Disable
Read Temp	Read Temperature from Magnus S3 Tag - Internal Antenna (Port 4)	Read Temp Magnus S3	Non-exclusive	0	Always On	None	Read Temp tag	Pulse 2s	Never Stop	None	Disable
Read Moisture	Read moisture from Magnus S2 Tag - Internal Antenna (Port 4)	Read Moisture S2	Non-exclusive	0	Always On	None	Read S2	None	Never Stop	None	Disable
MQTT		Default Profile	Non-exclusive	65000	Always On	None	Tag within Tag Group Detected	MQTT AND Pulse 2s	Never Stop	None	Disable
Tag Data Send from TCP Listening Port 50008		Default Profile	Non-exclusive	60000	Always On	None	Read Any Tags	TCP Send by Listening Port inside Reader	Never Stop	None	Disable

After corresponding even was enabled, database content will be shown on below page if the tag in database was detected and its corresponding record can be found in database

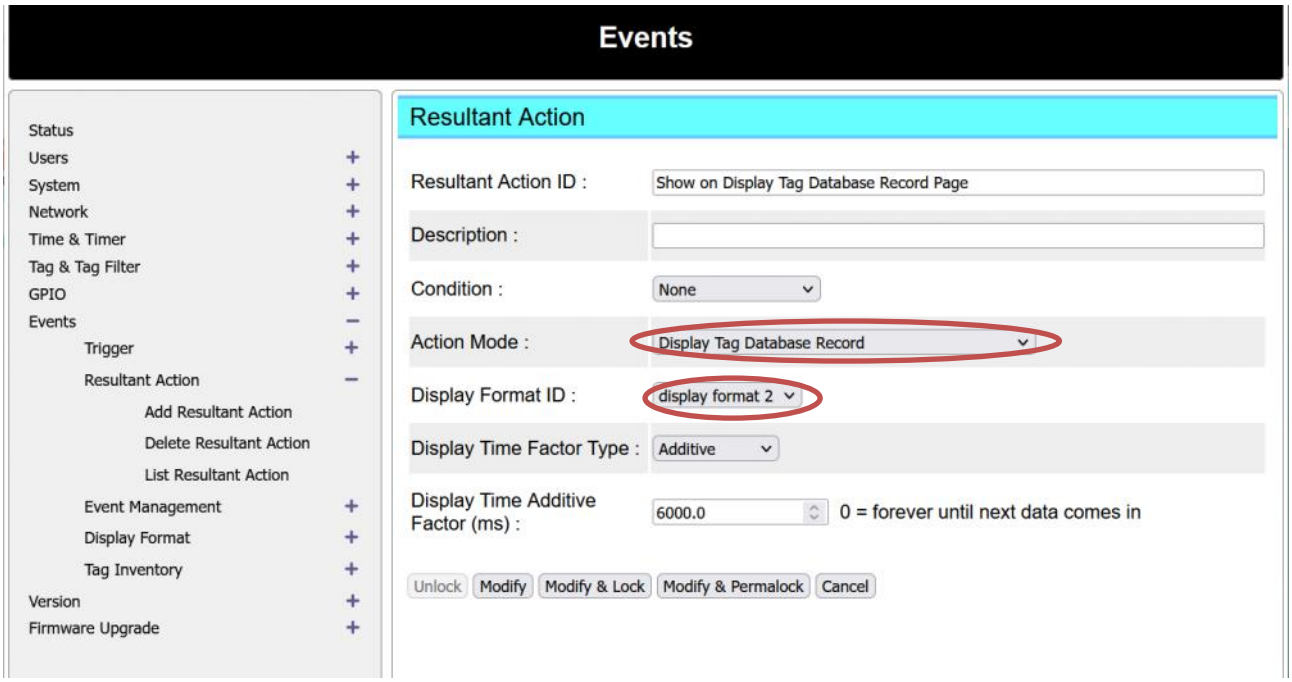
Below show the database event details.



The database is going to use in this event, was choose in Trigger page as shown below

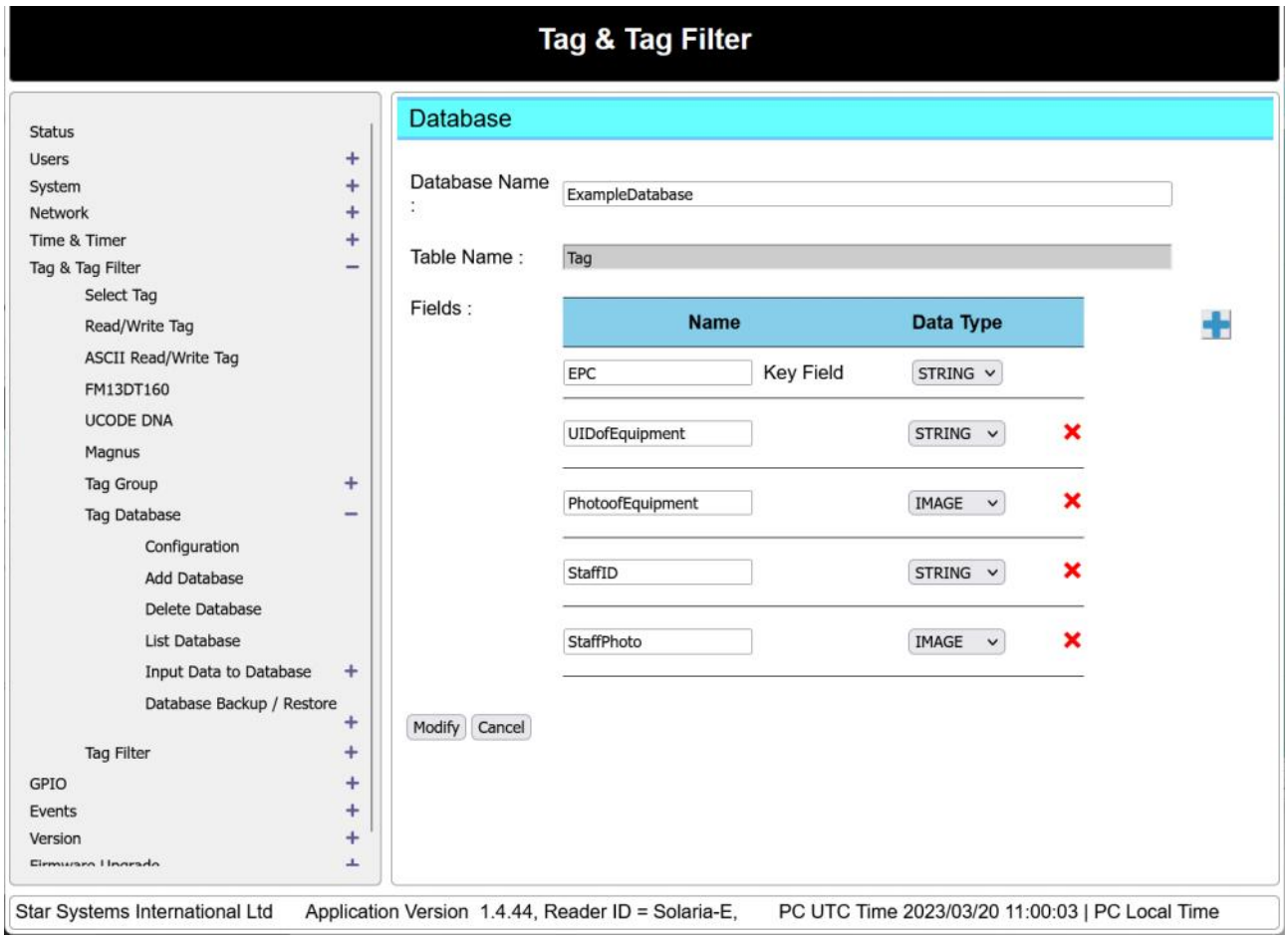


The way showing database content was defined in Display Format, so, you need choose right display format in Resultant Action page as shown below on Display Tag Database Record Action Mode

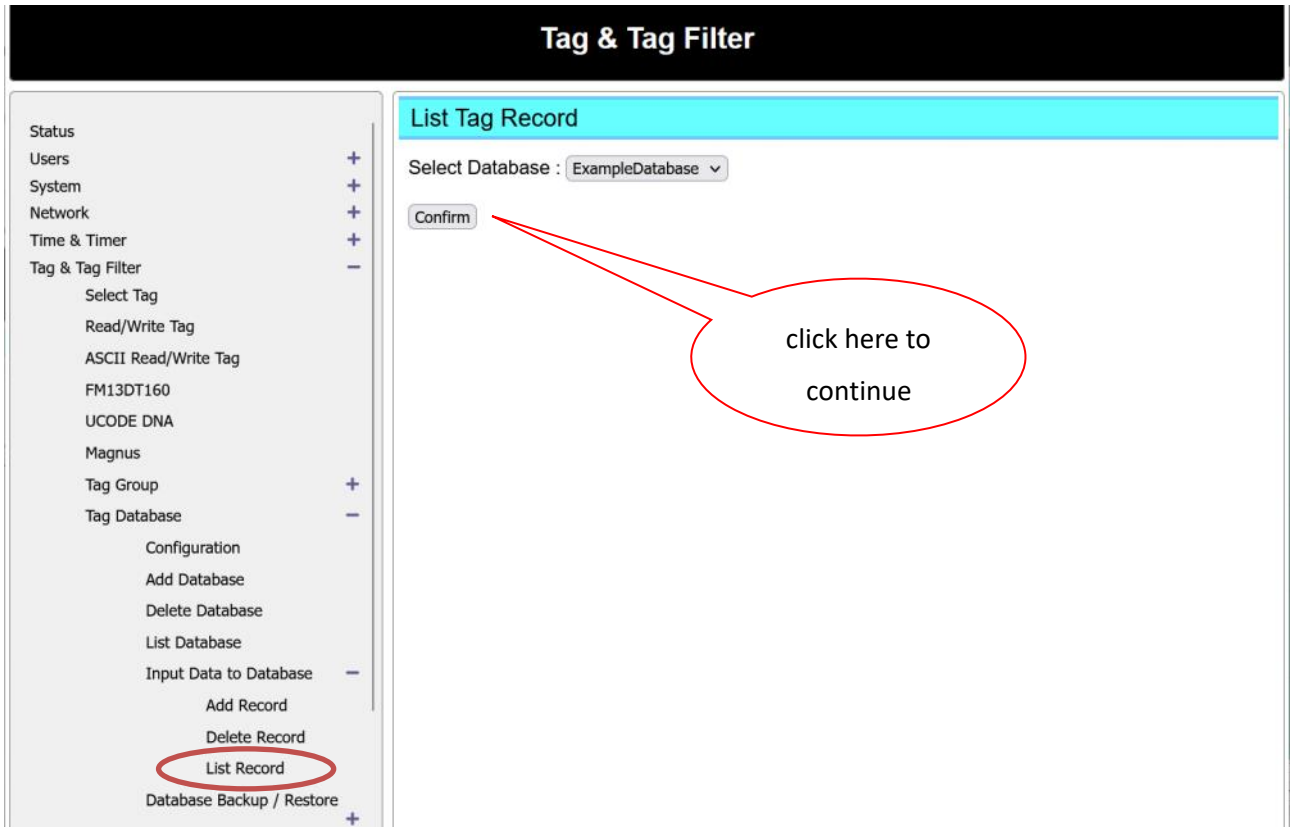


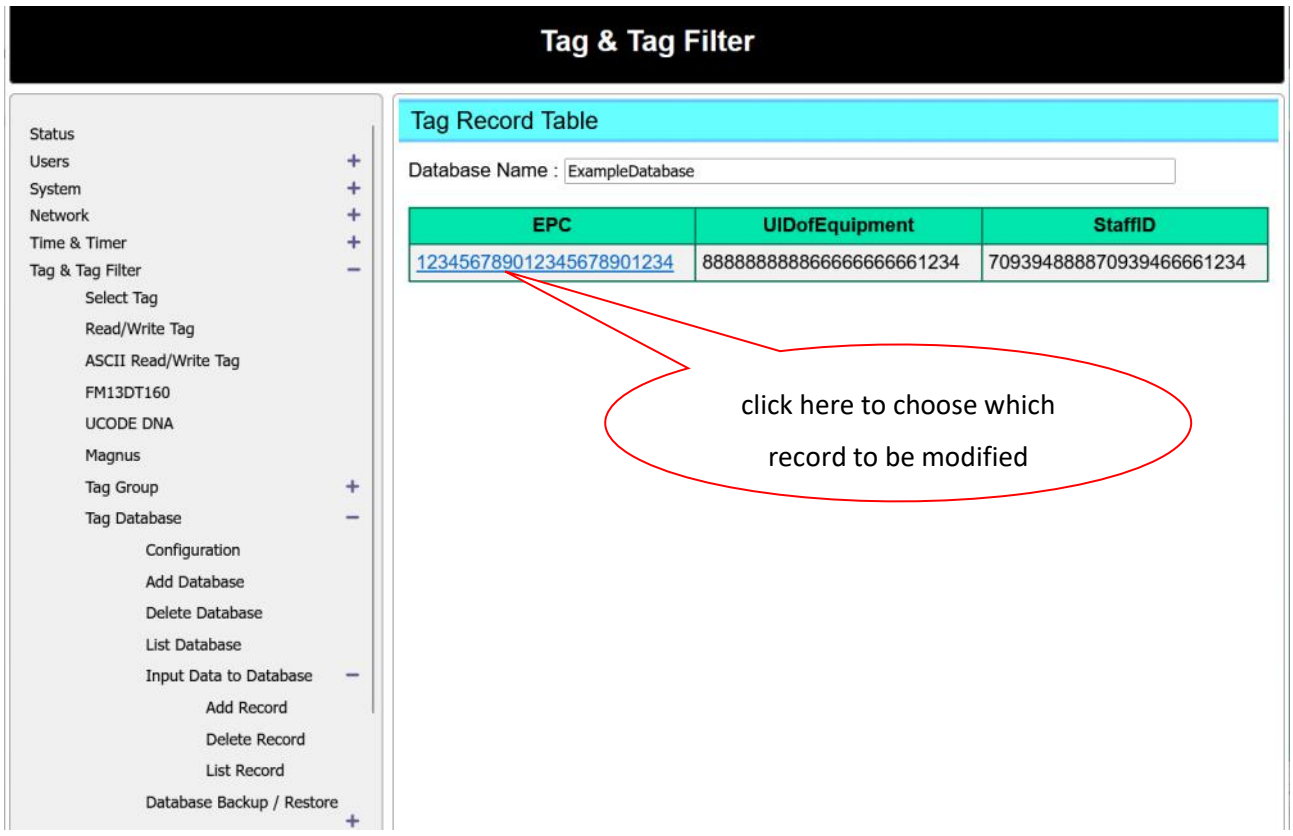
Display Format can be modified/added in Display format page as shown below

Type of record on database can be listed in List Database as shown below.

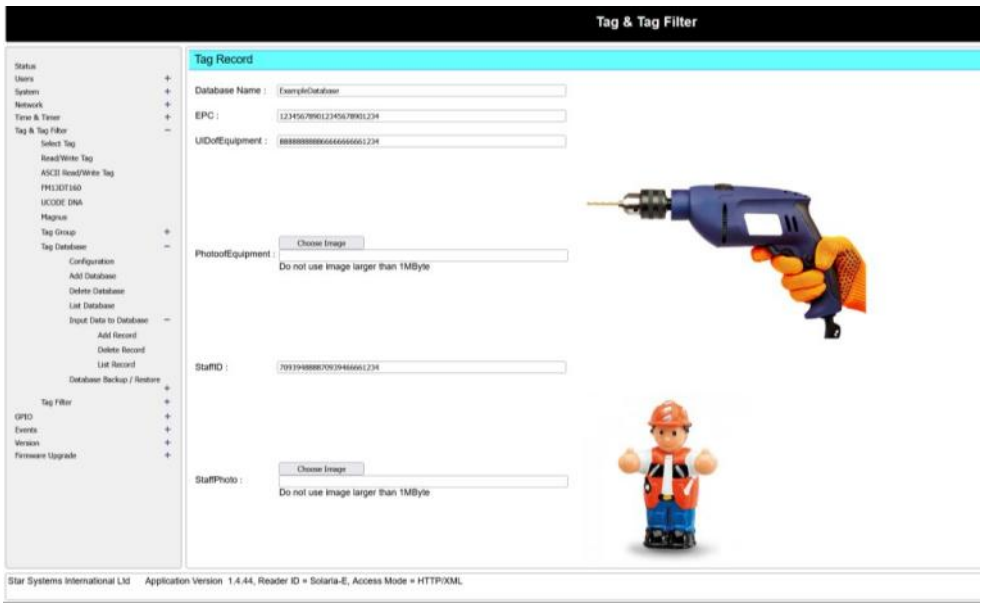


The content of each record on each database can be changed from List Tag Record as shown below

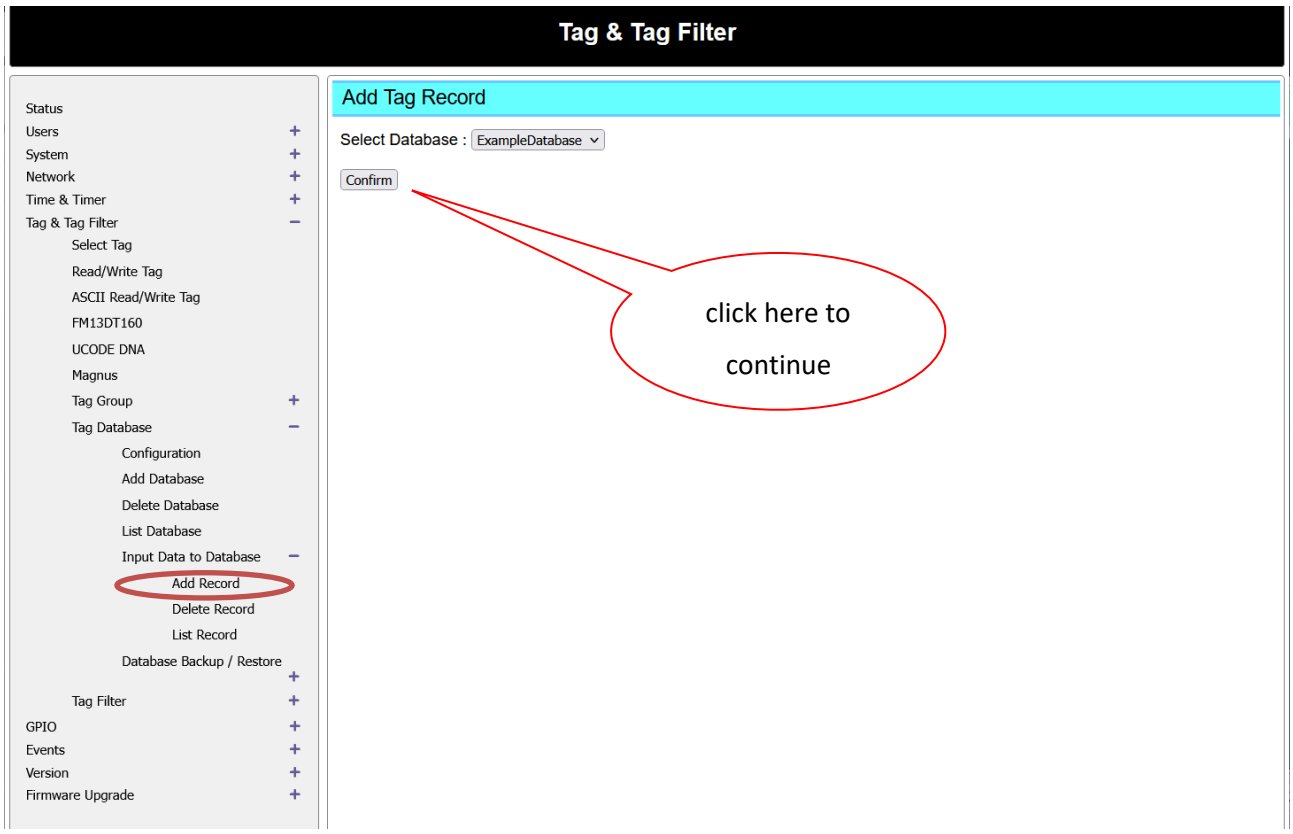




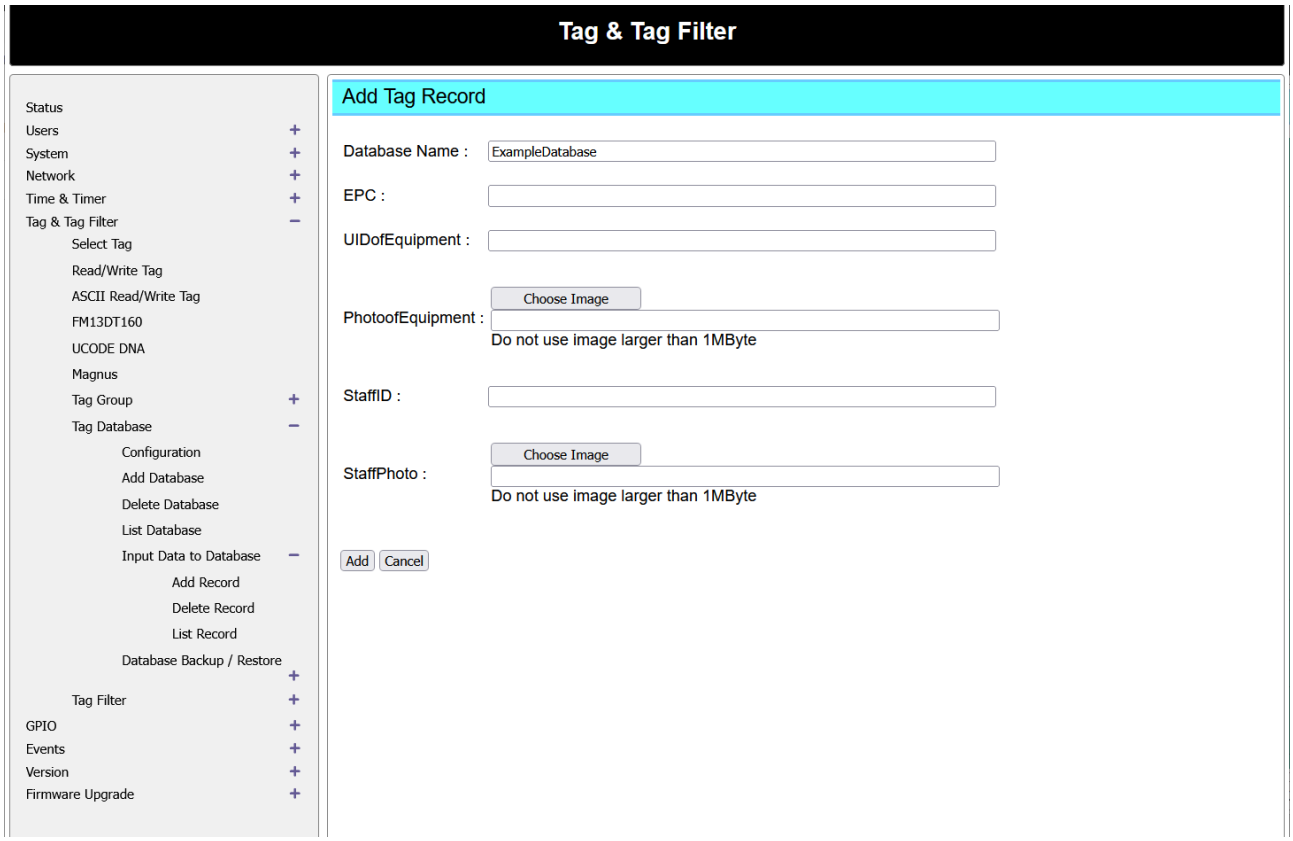
The content of record can be modified on this page



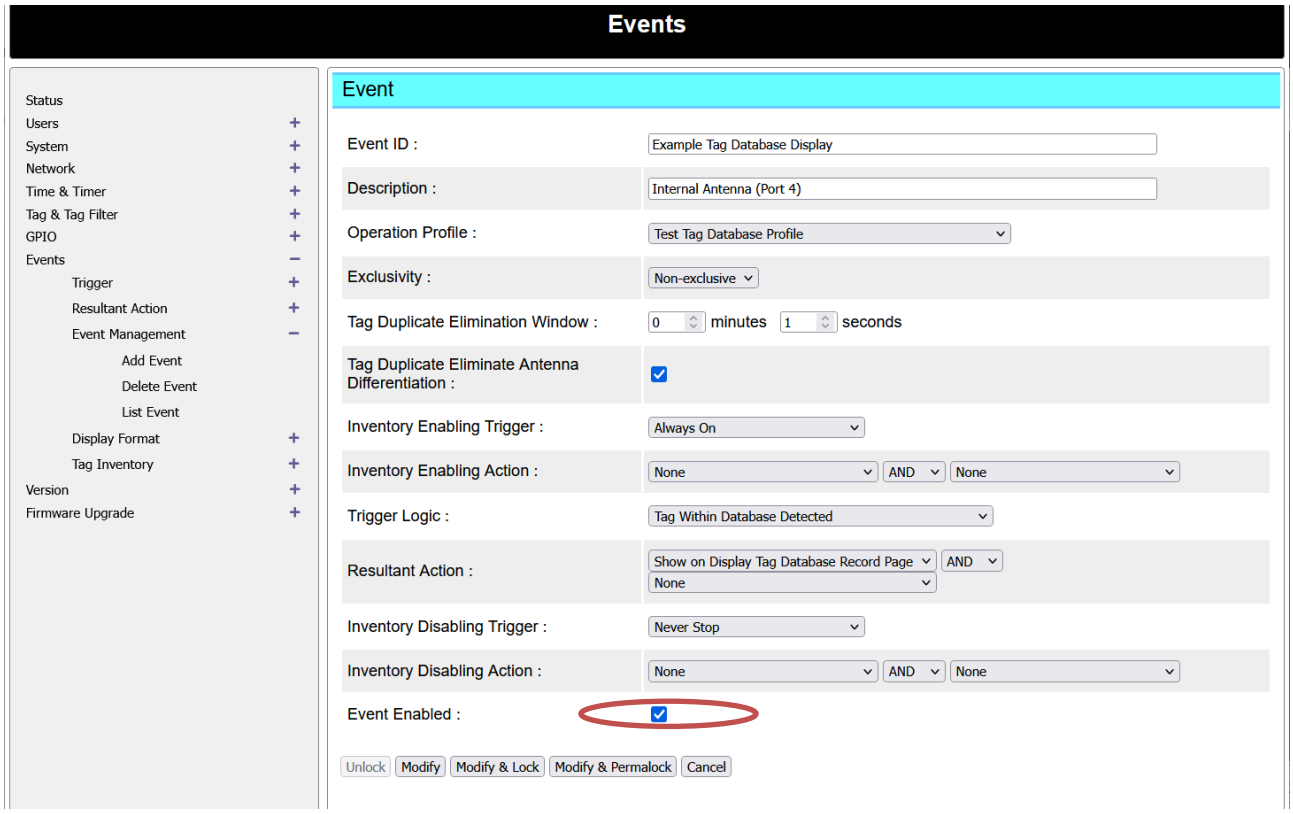
The new record can be added to particular database in Add Record as shown below



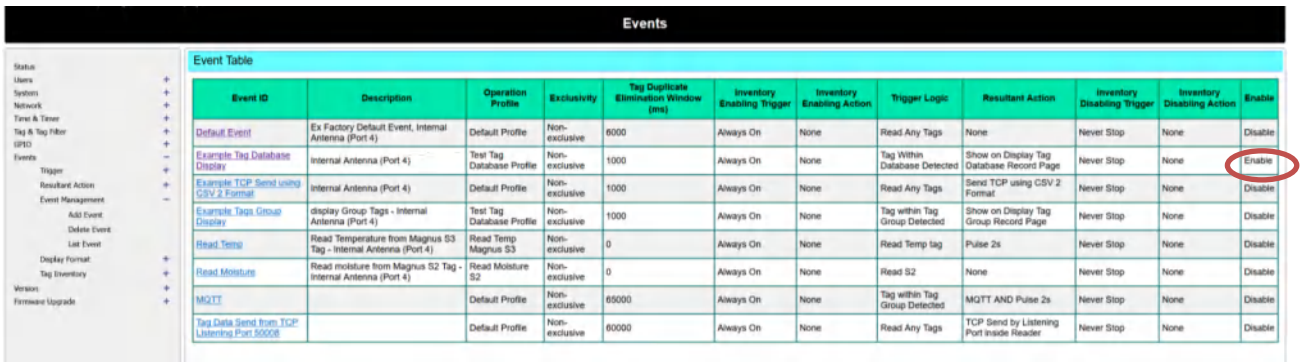
The content of each record on particular database can be added on this page as shown below



After all necessary modification was done, the event can be run again by clicking Even Enabled as shown below



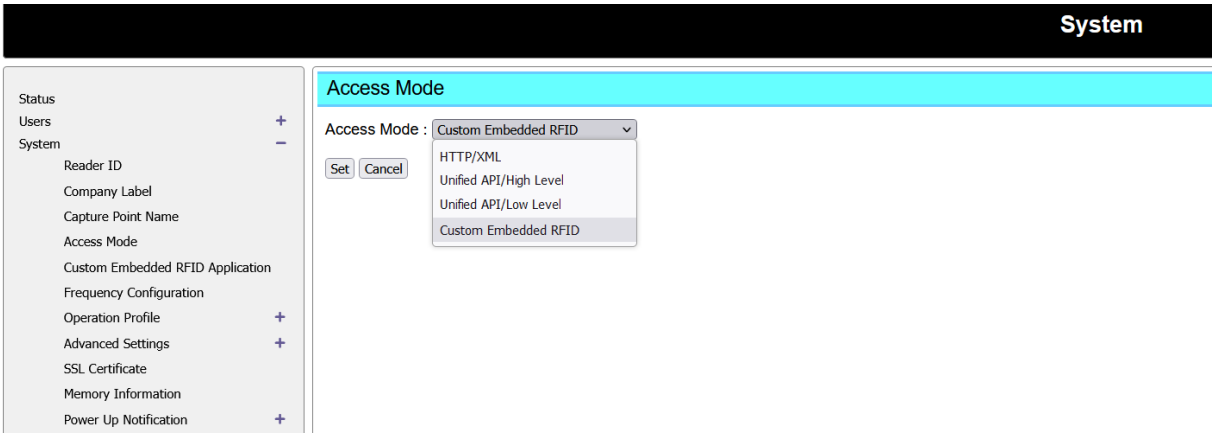
You should see the event status changed to Enabled



If you go to Display Tag Group/Database Record, you can see the database record content linking to the detected tag (The tag with EPC 123456789012345678901234 was used in this event Example Tag Database Display shipped with reader).

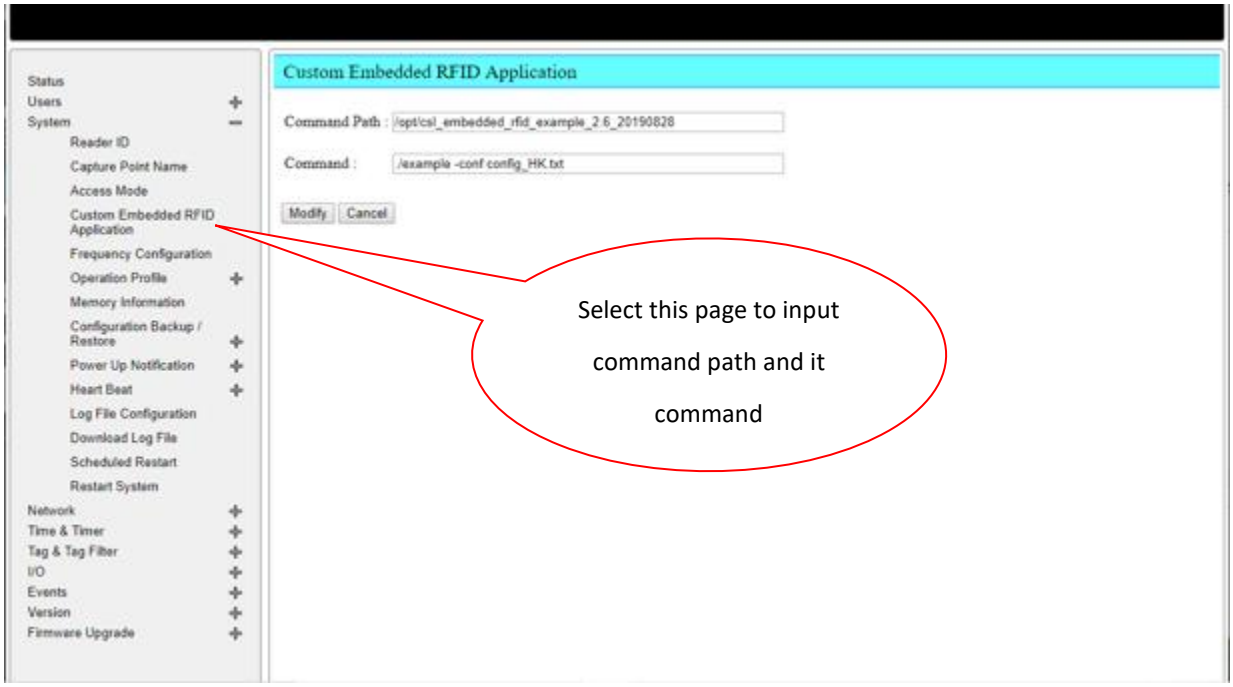
6.4. Read Tag using Custom Embedded RFID

Change the access mode to Custom Embedded RFID



Click Set to confirm the change

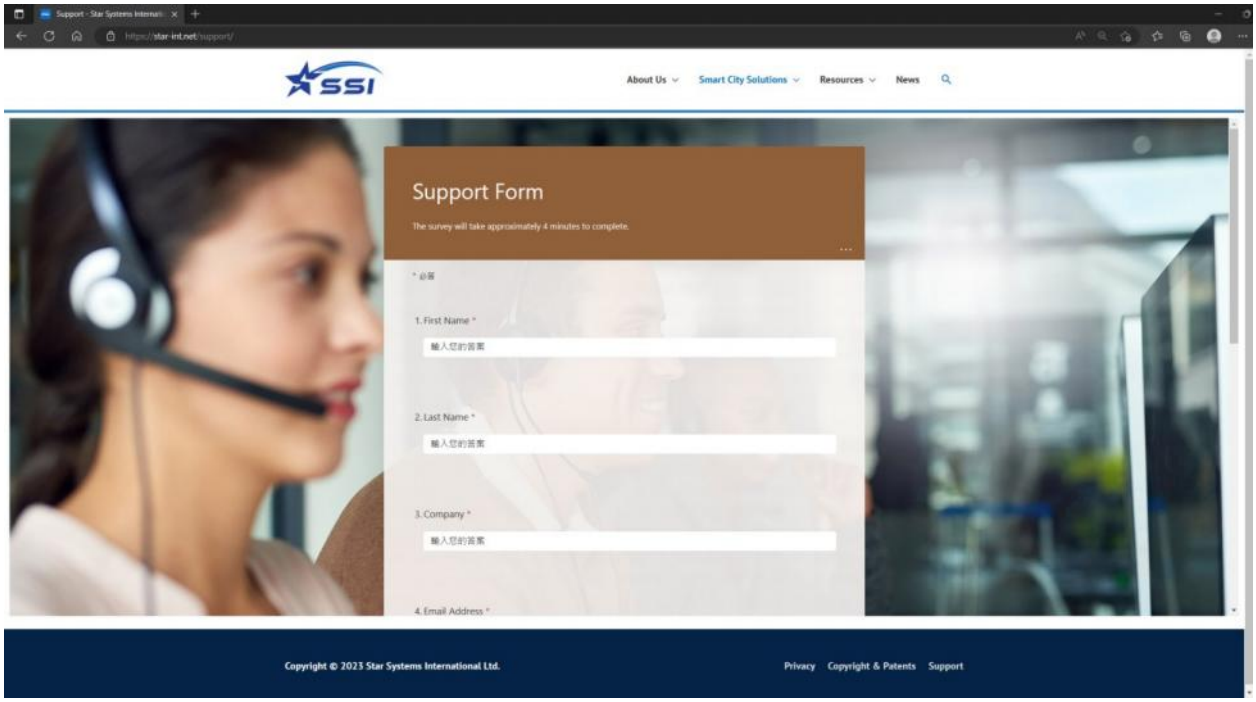
Input the Embedded RFID application path and its command on this page as shown below, the application will run once the access mode changed to “Custom Embedded RFID”



Demo Source Codes for Download

The source codes are available on request. The support page could be found in the below link

https://star-int.net/support/



Historical Firmware Versions

The following are lists of historical firmware versions of each firmware:

Web Application:

Version Number	Date	Description

JNI Library:

Version Number	Date	Description

Patch:

Version Number	Date	Description

Unified API Library (Daemon):

Version Number	Date	Description

About Us

Founded in 2013, STAR Systems International (SSI) is a world leader in Automatic Vehicle Identification Technologies. SSI focuses on providing best-in-class transponders, readers and professional consulting services for Smart City Initiatives, including Electronic Tolling (ETC), Electronic Vehicle Registration (EVR), Fleet Management, Parking and Secure Access Control applications.

SSI is guided by three principles: Outstanding People, Innovative Products and Service Excellence. These principles reflect the Company's long-term expansive strategy to advance Smart City Technologies. SSI strives to ensure customer success by leveraging the Company's technical expertise and implementation experience. "Your Success Is Our Vision".

For more information on SSI, visit **www.star-int.net**.

Technical Support

Visit the SSI's Support at **www.star-int.net** and click **Smart Cities Solutions** > **Technical Support**, or go to **https://star-int.net/support/** to apply support request for your RFID product.

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INDUSTEY CANADA STATEMENT(French):
Cet appareil est conforme aux normes RSS exemptes de licence d'Industrie Canada. Son fonctionnement est soumis aux deux conditions suivantes : (1) Cet appareil ne doit pas causer d'interférences nuisibles et (2) cet appareil doit accepter toute interférence reçue, y compris les interférences susceptibles de provoquer un fonctionnement indésirable de l' appareil. De plus, cet appareil est conforme à la norme ICES-003 des règles d'Industrie Canada (IC).
Tout changement ou modification non expressément approuvé par la partie responsable de la conformité pourrait annuler l'autorité de l'utilisateur à faire fonctionner l'équipement.
Remarque : cet équipement a été testé et déclaré conforme aux limites d'un appareil numérique de classe B, conformément aux normes RSS exemptes de licence d'Industrie Canada. Ces limites sont conçues pour fournir une protection raisonnable contre les interférences nuisibles dans une installation résidentielle. Cet équipement génère des utilisations et peut émettre de l' énergie de radiofréquence et, s'il n'est pas installé et utilisé conformément aux instructions , peut causer des interférences nuisibles aux communications radio. Cependant, il n'y a aucune garantie que des interférences ne se produiront pas dans une installation particulière. Si cet équipement cause des interférences nuisibles à la réception radio ou télévision, ce qui peut être déterminé en éteignant et en rallumant l'équipement, l'utilisateur est encouragé à essayer de corriger l'interférence par une ou plusieurs des mesures suivantes :
-Réorientez ou déplacez l'antenne de réception.
-Augmenter la distance entre l'équipement et le récepteur.
-Connectez l'équipement à une prise sur un circuit différent de celui auquel le récepteur est connecté.
-Consultez le revendeur ou un technicien radio/TV expérimenté pour obtenir de l'aide.
Cet équipement est conforme aux limites d'exposition aux rayonnements RSS-102 établies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé avec une distance minimale de 20 cm entre le radiateur et votre corps.

Declaration of EIRP compliance

We, Star Systems International Limited, hereby to declare that product name: RFID Reader, model name: SOLARIA (HDR29000), will have professional installation or authorized service personnel to configure radio parameters of the transmitter using the software for adjusting total EIRP (36 dBm) power at local installation to ensure compliance with FCC rules, based on KDB594280. e.g. If the antenna cable at the site of installation has 12 dB loss, with a 15 dBi gain antenna, the professional installer could adjust the conducted power from the reader to 30 dBm to comply with the EIRP limit (36 dBm) stated in FCC part 15.