

Auto Encode User Manual

2022/4/20

Version:1.1

DEMONSTRATION SOFTWARE LICENSE

Please read this agreement carefully before you start to install this demonstration software. If you do not agree please stop the installation of the software.

Software developed by GIGA-TMS INC. is provided "AS IS" without warranty of any kind, either express or implied, including, but not limited to, the implied warranties of fitness for a purpose, or the warranty of non-infringement. Without limiting the forgoing GIGA-TMS INC. makes no warranty that:

- The software will meet your requirements.
- The software will be uninterrupted, timely, secure or error-free.
- The results that may be obtained from the use of the software will be effective, accurate or reliable.
- The quality of the software will meet your expectations.
- Any errors in the software obtained from GIGA-TMS INC. will be corrected.

The software and its documentation made available for test or demo purpose

- could include technical or other errors, GIGA-TMS INC. may make changes to the software or documentation made available to shipped with the conjunction products
- may be out of date, and GIGA-TMS INC. makes no responsibility to update such materials

In no event shall GIGA-TMS INC. be liable to you or any third party for any special incidental, indirect or consequential damages of any kind, or any damages whatsoever, including, without limitation, those resulting from loss of use, data or profits, whether or not GIGA-TMS INC. has been advised of the possibility of damage, and on any theory of liability, arising out of or in connection with the use of the software.

The installation of the software is done at your own consideration and risk and with agreement that you will be solely responsibility for any damage to your system or loss of data that results from such activities.

LIMITED WARRANTY

GIGA-TMS INC. (GIGA-TMS) warrants that the products sold pursuant to this Agreement will perform in accordance with GIGA-TMS's published specifications. This warranty shall be provided only for a period of **one year** from the date of the shipment of the product from GIGA-TMS (the "Warranty Period"). This warranty shall apply only to the "Buyer" (the original purchaser, unless that entity resells the product as authorized by GIGA-TMS, in which event this warranty shall apply only to the first re-purchaser).

During the Warranty Period, should this product fail to conform to GIGA-TMS's specifications, GIGA-TMS will, at its option, repair or replace this product at no additional charge except as set forth below. Repair parts and replacement products will be furnished on an exchange basis and will be either reconditioned or new. All replaced parts and products become the property of GIGA-TMS. This limited warranty does not include service to repair damage to the product resulting from accident, disaster, unreasonable use, misuse, abuse, negligence, or modification of the product not authorized by GIGA-TMS. GIGA-TMS reserves the right to examine the alleged defective goods to determine whether the warranty is applicable.

Without limiting the generality of the foregoing, GIGA-TMS specifically disclaims any liability or warranty for goods resold in other than GIGA-TMS's original packages, and for goods modified, altered, or treated without authorization by GIGA-TMS.

Service may be obtained by delivering the product during the warranty period to GIGA-TMS (8F No. 31 Lane 169, Kang Ning Street, Hsi Chih Dist. New Taipei City, Taiwan). If this product is delivered by mail or by an equivalent shipping carrier, the customer agrees to insure the product or assume the risk of loss or damage in transit, to prepay shipping charges to the warranty service location, and to use the original shipping container or equivalent. GIGA-TMSs will return the product, prepaid, via a three (3) day shipping service. A Return Material Authorization ("RMA") number must accompany all returns. Buyers may obtain an RMA number by contacting Technical Support at +886-2-26954214.

EACH BUYER UNDERSTANDS THAT THIS GIGA-TMS PRODUCT IS OFFERED AS IS. GIGA-TMS MAKES NO OTHER WARRANTY, EXPRESS OR IMPLIED, AND GIGA-TMS DISCLAIMS ANY WARRANTY OF ANY OTHER KIND, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

IF THIS PRODUCT DOES NOT CONFORM TO GIGA-TMS'S SPECIFICATIONS, THE SOLE REMEDY SHALL BE REPAIR OR REPLACEMENT AS PROVIDED ABOVE. GIGA-TMS'S LIABILITY, IF ANY, SHALL IN NO EVENT EXCEED THE TOTAL AMOUNT PAID TO GIGA-TMS UNDER THIS AGREEMENT. IN NO EVENT WILL GIGA-TMS BE LIABLE TO THE BUYER FOR ANY DAMAGES, INCLUDING ANY LOST PROFITS, LOST SAVINGS, OR OTHER INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF THE USE OF, OR INABILITY TO USE, SUCH PRODUCT, EVEN IF GIGA-TMS HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES, OR FOR ANY CLAIM BY ANY OTHER PARTY.

LIMITATION ON LIABILITY

EXCEPT AS PROVIDED IN THE SECTIONS RELATING TO GIGA-TMS'S LIMITED WARRANTY, GIGA-TMS'S LIABILITY UNDER THIS AGREEMENT IS LIMITED TO THE CONTRACT PRICE OF THIS PRODUCT. GIGA-TMS MAKES NO OTHER WARRANTIES WITH RESPECT TO THE PRODUCT, EXPRESSED OR IMPLIED, EXCEPT AS MAY BE STATED IN THIS AGREEMENT, AND GIGA-TMS DISCLAIMS ANY IMPLIED WARRANTY, INCLUDING WITHOUT LIMITATION ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

GIGA-TMS SHALL NOT BE LIABLE FOR CONTINGENT, INCIDENTAL, OR CONSEQUENTIAL DAMAGES TO PERSONS OR PROPERTY. GIGA-TMS FURTHER LIMITS ITS LIABILITY OF ANY KIND WITH RESPECT TO THE PRODUCT, INCLUDING ANY NEGLIGENCE ON ITS PART, TO THE CONTRACT PRICE FOR THE GOODS. GIGA-TMS'S SOLE LIABILITY AND BUYER'S EXCLUSIVE REMEDIES ARE STATED IN THIS SECTION AND IN THE SECTION RELATING TO GIGA-TMS'S LIMITED WARRANTY.

Contents

1. Installation.....	1
1.1. System Requirements	1
1.2. Install Auto Encode	1
2. Getting started	2
2.1. Communication.....	2
2.2. Terminologies.....	2
3. Auto Encode Interface	4
3.1. Layout Overview	4
3.2. Edit Tag.....	5
3.2.1. Tag List	5
3.2.2. Access Password	5
3.2.3. Tag Protection Mode.....	5
3.2.4. Memory Bank	6
3.2.5. Start Address	6
3.2.6. Length.....	6
3.2.7. Read	6
3.2.8. Write	6
3.2.9. Reset	6
3.2.10. Message	6
3.2.11. Address Unit	6
3.2.12. Data Table	6
3.3. Batch Write Tag	7
3.3.1. Control	7
3.3.2. Message.....	7
3.3.3. Data List	7
3.3.4. Options	8
3.4. Log.....	8
4. Tutorials	9
4.1. To connect a reader	9
4.2. To modify Tag's Access Password	9
4.3. To modify Tag's EPC (same length).....	9
4.4. To modify Tag's EPC (different length).....	9
4.5. To Write Tag EPC in a batch	9
5. Troubleshooting	11
5.1. My reader does not appear in the reader list	11
5.2. Connect reader failed	11
5.3. My tag does not appear in the tag list.....	11
5.4. My tag appears multiple times in the tag list	11
5.5. Read/Write tag failed	11
5.6. What are the possible causes of RF communication error?	12
6. Revision History	13

1. Installation

1.1. System Requirements

- Windows XP/7/10
- .NET Framework 4.0

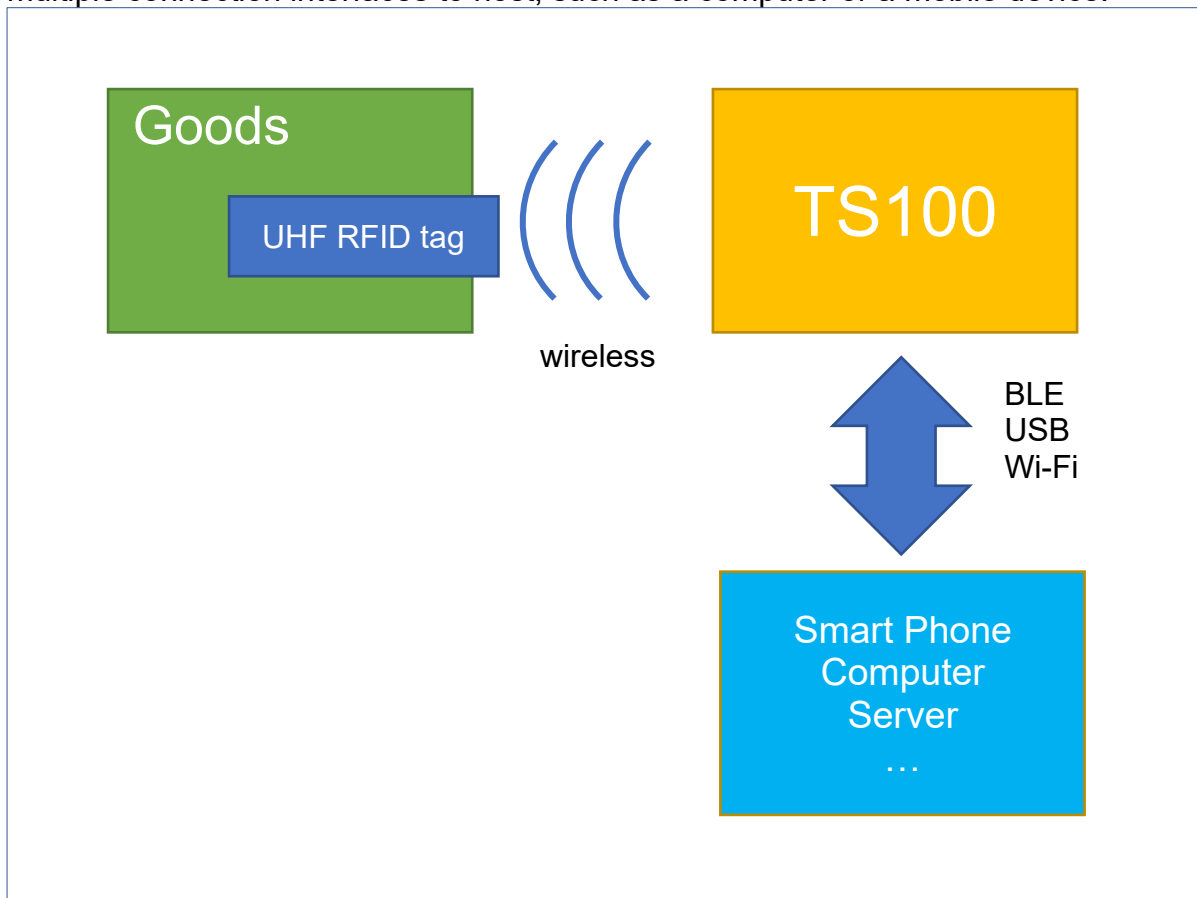
1.2. Install Auto Encode

1. Download installer from [Disk5472](#).
2. Execute Setup.msi to install the application on your computer.
3. Double-click Auto Encode shortcut icon on desktop to execute the application.

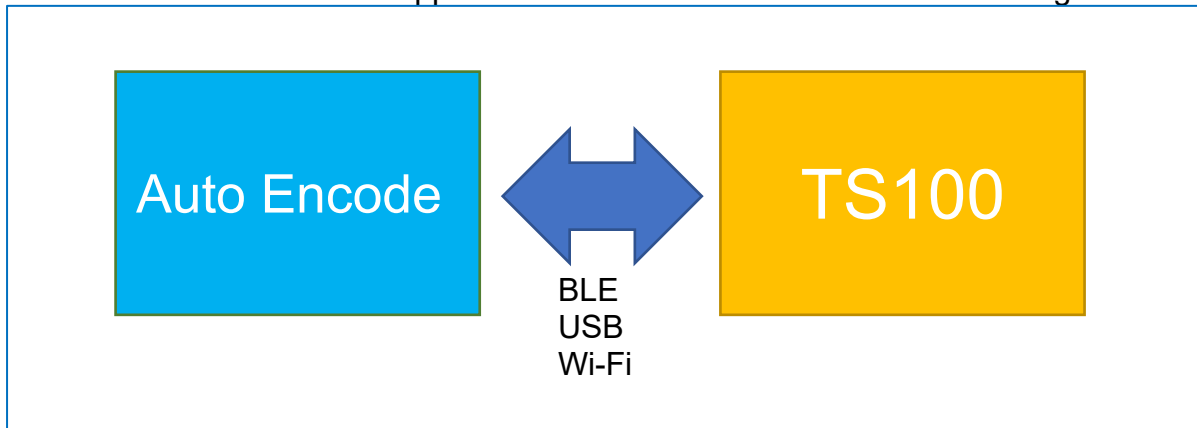
2. Getting started

2.1. Communication

TS100 is an UHF RFID reader that can read or write tags. Read tag data can be sent via multiple connection interfaces to host, such as a computer or a mobile device.



Auto Encode is a Windows application that can be used to read or write tag data.



2.2. Terminologies

UHF

Ultra high Frequency RFID that communications at 860 MHz – 960 MHz.

RFID

Radio-frequency identification that can be used to track tags attached to goods.

Reader

A reader transmits information to a tag by an RF signal. The tag receives both information and operating energy from this RF signal.

Tag

An RFID tag is a small circuit that can attach to goods so RFID readers can inventory them. Tags are passive, meaning that they receive all their operating energy from the Interrogator's RF signal.

Inventory

The process of a RFID reader scan and identify a tag.

Tag Memory Bank

Tag memory shall be logically separated into the four distinct memory banks shown as following, each of which may comprise zero or more memory words. There are 4 memory banks: Reserved memory, EPC memory, TID memory and User memory.

Reserved Memory

The reserved memory contains kill password and access password.

Kill Password

The two-word password is used to kill the tag. Located at Reserved Bank word address 0x00.

Access Password

The two-word password is used to access the tag. Tag will enter secured state with a correct access password. Located at Reserved Bank word address 0x02.

EPC memory

Electronic Product Code, part of the tag memory. Note the EPC start from EPC memory word address 0x02.

TID memory

Tag-identification, part of the tag memory.

User memory

Part of the tag memory. It is optional. If a tag implements User memory then it may partition the User memory into one or more files. If the Tag implements a single file, then that file is File_0.

Lock

The lock status of a tag will affect whether each memory area can be read or write. TS100 may issue a Lock command to lock, permanently lock, unlock, or permanently unlock the kill password, access password, EPC memory bank, TID memory bank, or File_0 of User memory.

	No Access Password (Open State)				With Access Password (Secured State)			
Tag Lock State	Unlocked	Permanently Unlocked	Locked	Permanently Locked	Unlocked	Permanently Unlocked	Locked	Permanently Locked
Kill Password	Read/Write	Read/Write			Read/Write	Read/Write	Read/Write	
Access Password	Read/Write	Read/Write			Read/Write	Read/Write	Read/Write	
EPC	Read/Write	Read/Write	Read	Read	Read/Write	Read/Write	Read/Write	Read
TID	Read/Write	Read/Write	Read	Read	Read/Write	Read/Write	Read/Write	Read
File_0	Read/Write	Read/Write	Read	Read	Read/Write	Read/Write	Read/Write	Read

Word

2 bytes.

TS100

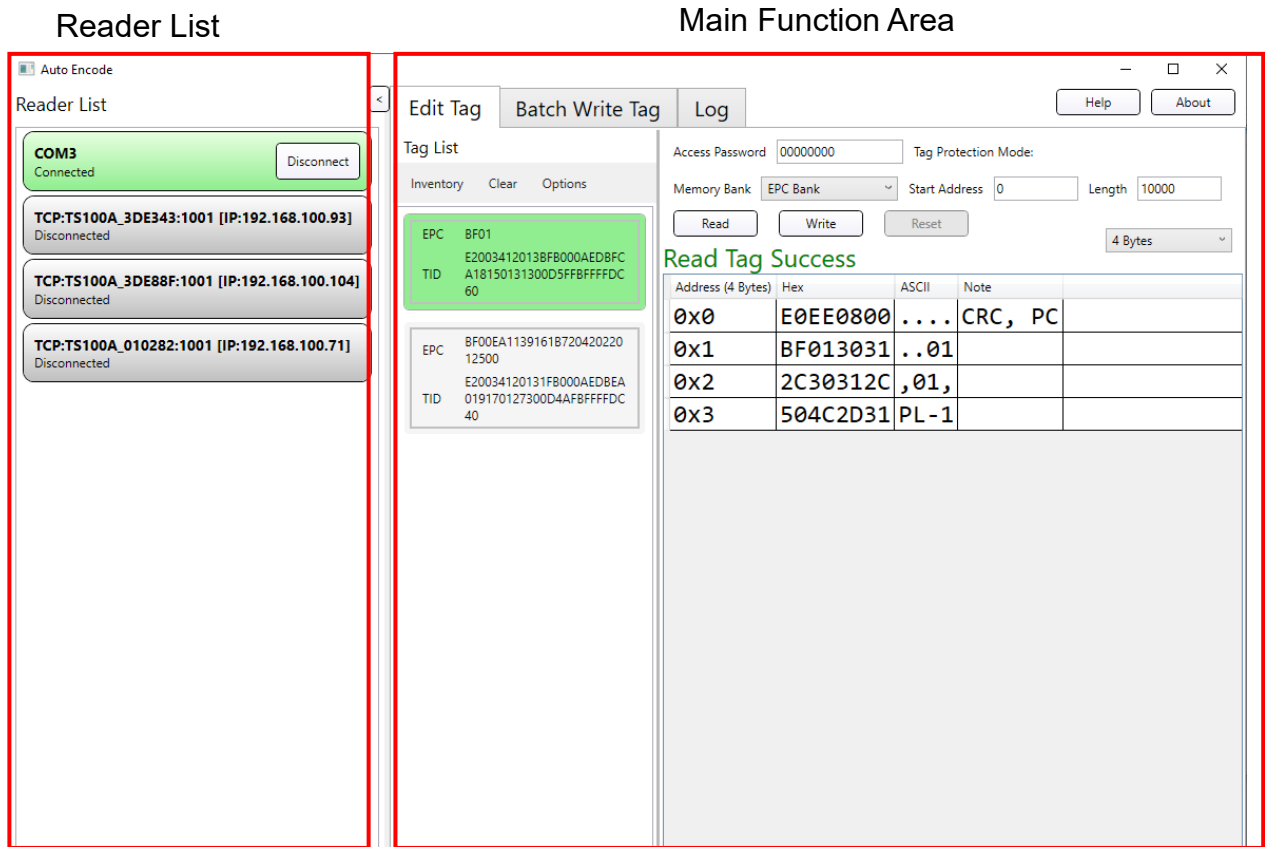
A UHF RFID reader.

TS100 Utility

A software used to configure TS100.

3. Auto Encode Interface

3.1. Layout Overview



Reader List

Detected readers will automatically appear in the list.

Main Function Area

Including **Edit Tag**, **Batch Write Tag**, **Log**.

3.2. Edit Tag

Message

Access Password 00000000 Tag Protection Mode: Disabled

Memory Bank EPC Bank Start Address 2 Length 6

Read Write Reset Read Tag Success Word

Address (Word)	Hex	ASCII	Note
0x2	9999	..	
0x3	8888	..	
0x4	AABB	..	
0x5	3738	78	
0x6	3961	9a	
0x7	6263	bc	

Data Table Address Unit

3.2.1. Tag List

Inventoried tags will be displayed here.

Inventory:

Inventory tags.

Clear:

Clear **Tag List**.

Options:

Include TID

Selected:

Inventory tag's EPC and TID. Tags with random TID might appear in the list multiple times but make it possible to distinguish tags of the same EPC.

Cleared:

Inventory only tag's EPC. Tags with random TID will appear in the list only once but make it impossible to distinguish tags of the same EPC.

3.2.2. Access Password

Target tag's current access password.

Note

Tag's access password will be changed to password saved inside TS100 or hashed password (**NOT** the **Access Password** on the interface) if TS100 **Tag Protection Mode** is not **Disabled**.

3.2.3. Tag Protection Mode

Tag Protection Mode Settings in TS100. This setting will affect whether TS100 automatically locks the tag after writing and changes its access password.

Disabled	After any write tag operation: The lock state and access password of the tag remains unchanged.
Specific Password	After any write tag operation: <ol style="list-style-type: none"> 1. Tag EPC and access password will be locked. 2. Tag access password will be changed to Password saved in TS100 (NOT the Access Password on the interface).
Dynamic Password	After any write tag operation: <ol style="list-style-type: none"> 1. Tag EPC and access password will be locked. 2. Tag access password will be changed to hashed password computed with TID (NOT the Access Password on the interface).

3.2.4. Memory Bank

Target memory bank to read/write.

3.2.5. Start Address

Target address to read/write. The unit is determined by **Address Unit**. Must be even number if **Address Unit** is **Byte**.

3.2.6. Length

Target length to read/write. The unit is determined by **Address Unit**. Must be even number if **Address Unit** is **Byte**. Reader will try to read all the data if set to 0.

3.2.7. Read

Read tag data and display on **Data Table**.

3.2.8. Write

Write tag with **Data Table**.

3.2.9. Reset

Reset data to last successful read or write data.

3.2.10. Message

Show whether the operation result is successful.

3.2.11. Address Unit

The unit of **Start Address** and **Length**. Note for the minimum unit for a tag operation is word (2 bytes), so **Start Address** and **Length** must be even numbers if **Address Unit** is set to **Byte**.

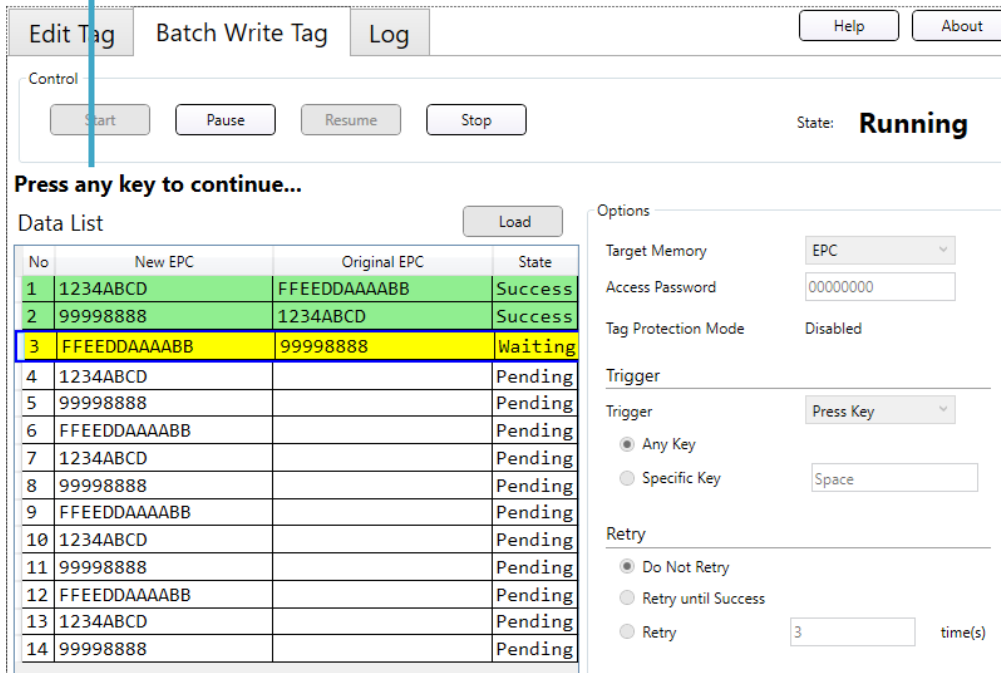
3.2.12. Data Table

Read/Write tag data will be displayed here.

3.3. Batch Write Tag

Write tags in a batch with an EPC list file (txt, csv).

Message



Control

Start Pause Resume Stop State: **Running**

Press any key to continue...

Data List

No	New EPC	Original EPC	State
1	1234ABCD	FFEEDDAAAABB	Success
2	99998888	1234ABCD	Success
3	FFEEDDAAAABB	99998888	Waiting
4	1234ABCD		Pending
5	99998888		Pending
6	FFEEDDAAAABB		Pending
7	1234ABCD		Pending
8	99998888		Pending
9	FFEEDDAAAABB		Pending
10	1234ABCD		Pending
11	99998888		Pending
12	FFEEDDAAAABB		Pending
13	1234ABCD		Pending
14	99998888		Pending

Options

Target Memory: EPC
Access Password: 00000000
Tag Protection Mode: Disabled
Trigger: Press Key
Trigger: Any Key (Selected), Specific Key: Space
Retry: Do Not Retry (Selected), Retry until Success, Retry: 3 time(s)

3.3.1. Control

Control batch write tag process.

Start/Stop

Start or stop write tag in batch process. A tag will be written when the trigger condition is met in the process.

Pause/Resume

Pause or resume the process.

State

Batch write process states, include Running, Paused, Stopped.

3.3.2. Message

Process indication message.

3.3.3. Data List

Load

Open txt or csv data list file. Each line represents a bank data waiting to be written. Only hexadecimal characters (0-9, A-F) are allowed. Length of each line must be a multiple of 4.

```
1234ABCD
99998888
FFEEDDAAAABB|
```

Data Table

Loaded data list.

3.3.4. Options

Target Memory

Which memory bank you want to write to

Access Password

Target tag's current access password.

Tag Protection Mode

See "Tag Protection Mode".

Trigger

The condition to write next tag.

Press Key

Start writing next tag when the user press any or specific keyboard key.

Time Interval

Start writing next tag every N millisecond(s).

Retry

What to do if write tag fails.

Do Not Retry

The batch writing is consider failed and the state will become stopped.

Retry until Success

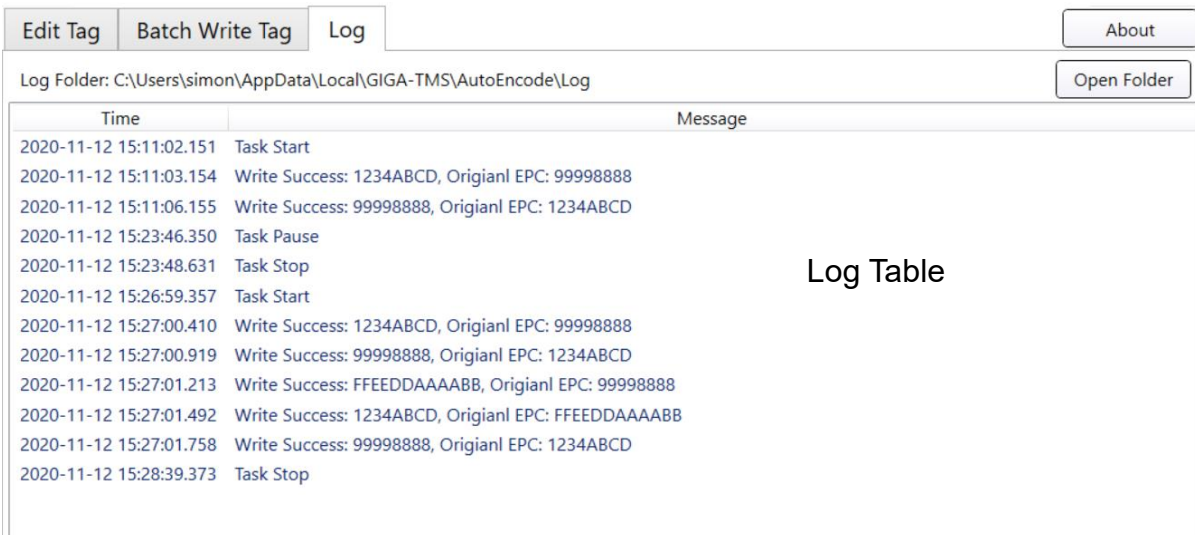
The batch writing will continue until success or user stop the process.

Retry N time(s)

The batch writing will consider failed after N times unsuccessful retry.

3.4. Log

Batch Write result logs will be saved automatically. The log file name is based on date.



The screenshot shows a software window titled "Log" with a menu bar containing "Edit Tag", "Batch Write Tag", "Log", and "About". Below the menu bar, the log folder path is displayed as "C:\Users\simon\AppData\Local\GIGA-TMS\AutoEncode\Log" with an "Open Folder" button. The main area contains a table with two columns: "Time" and "Message".

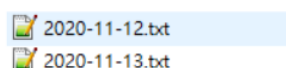
Time	Message
2020-11-12 15:11:02.151	Task Start
2020-11-12 15:11:03.154	Write Success: 1234ABCD, Origianl EPC: 99998888
2020-11-12 15:11:06.155	Write Success: 99998888, Origianl EPC: 1234ABCD
2020-11-12 15:23:46.350	Task Pause
2020-11-12 15:23:48.631	Task Stop
2020-11-12 15:26:59.357	Task Start
2020-11-12 15:27:00.410	Write Success: 1234ABCD, Origianl EPC: 99998888
2020-11-12 15:27:00.919	Write Success: 99998888, Origianl EPC: 1234ABCD
2020-11-12 15:27:01.213	Write Success: FFEEDDAAAABB, Origianl EPC: 99998888
2020-11-12 15:27:01.492	Write Success: 1234ABCD, Origianl EPC: FFEEDDAAAABB
2020-11-12 15:27:01.758	Write Success: 99998888, Origianl EPC: 1234ABCD
2020-11-12 15:28:39.373	Task Stop

Log Folder

Where the log files are stored.

Open Folder

Open the log folder with Windows Explorer.



Log Table

Each line is a log entry which includes what happened and when.

4. Tutorials

4.1. To connect a reader

1. For USB connection, plug reader into your computer USB port.
2. For Wi-Fi connection, use TS100 Utility to configure TS100 to connect a Wi-Fi access point which is in the same local network of your computer.
3. For BLE connection, turn on your computer's Bluetooth.
4. On **Reader List**, click your reader to connect.

4.2. To modify Tag's Access Password

1. Connect a reader with steps "To connect a reader".
2. Select **Edit Tag** tab.
3. If **Tag Protection Mode** is NOT **Disabled**, open TS100 Utility and set it to **Disabled**.
4. On **Tag List**, click **Inventory**.
5. On **Tag List**, click target tag.
6. On **Access Password**, enter tag's current access password.
7. On **Memory Bank**, select **Reserved Bank**.
8. On **Address Unit**, select **4 Bytes**.
9. On **Start Address**, enter 1.
10. On **Length**, enter 1.
11. Click **Read**.
12. Modify **Hex** values with valid hexadecimal numbers.
13. Click **Write**.

4.3. To modify Tag's EPC (same length)

1. Connect a reader with steps "To connect a reader".
2. Select **Edit Tag** tab.
3. If **Tag Protection Mode** is NOT **Disabled**, open TS100 Utility and set it to **Disabled**.
4. On **Tag List**, click **Inventory**.
5. On **Tag List**, click target tag.
6. On **Access Password**, enter tag's current access password.
7. On **Memory Bank**, select **EPC Bank**.
8. On **Address Unit**, select **Word**.
9. On **Start Address**, enter 2.
10. On **Length**, enter 0.
11. Click **Read**.
12. Modify **Hex** values with valid hexadecimal numbers.
13. Click **Write**.

4.4. To modify Tag's EPC (different length)

Follow the steps of "To Write Tag EPC in a batch".

4.5. To Write Tag EPC in a batch

1. Open notepad or any text editor, create a txt file.
2. For each line, enter hexadecimal numbers with a multiple of 4 digits. For example:1234ABCD.
3. Save the txt file.
4. Connect a reader with steps "To connect a reader".

5. Select **Batch Write Tag** tab.
6. Click **Load**, select the txt file you have created.
7. On **Options**, enter tag's current access password.
8. If **Tag Protection Mode** is NOT **Disabled**, open TS100 Utility and set it to **Disabled**.
9. On **Control**, click **Start**.
10. Place a tag on the reader.
11. Press keyboard **Space** Key.
12. On **Data List**, wait until the **State** of the line become **Success**.
13. Remove current tag.
14. Place next tag and repeat the above steps until all tags are written.

5. Troubleshooting

5.1. My reader does not appear in the reader list

For each type of connection:

USB

- The USB port is not plugged in properly.
- Your reader is connected by other application

Wi-Fi

- Your computer and reader are not in the same local network.
- Your reader is connected by other application.

BLE

- Bluetooth is off on your computer.
- Your reader is too far away from your computer.
- Your reader is connected by other application.

5.2. Connect reader failed

- Your reader is connected by other application
- Connection might fail if your TS100 is inventorying with keyboard output. Remove tags or use TS100 Utility to disable keyboard output.

5.3. My tag does not appear in the tag list

- On **Tag List**, Click **Inventory**.
- The **Tag List** will not display duplicate tags. Only one of them will appear in the list if there are multiple tags with the same EPC but different TIDs

To include TID as part of the tag:

1. On **Tag List**, click **Options**.
2. Select **Include TID**.
3. On **Tag List**, Click **Inventory**.

- RF communication failed, refer to “What are the possible causes of RF communication error?”.

5.4. My tag appears multiple times in the tag list

- Some tags include a random part in their TID and might change in each inventory round. Exclude TID as part of the tag if you are sure that there are no tags with duplicate EPC.
 1. On **Tag List**, click **Options**.
 2. Clear **Include TID**.
 3. On **Tag List**, Click **Inventory**.

5.5. Read/Write tag failed

- The tag memory is locked, and your access password is wrong.
- If tag's Access Password or Kill Password is permanently locked, there is no way to read or write these memories. See “Lock”.
- Some tag does not have user memory.
- TS100 Tag Protection Mode is Specific and the access password saved inside TS100 is not match with current tag's access password.
 1. Open TS100 Utility and modify the Tag Protection settings to disabled.
 2. If you want to keep the Tag Protection setting to Specific Password and know the tag's access password, use TS100 Utility to set the saved access password inside TS100.

- TS100 Tag Protection Mode is Dynamic the access password computed by TS100 is not match with current tag's access password.
- RF communication failed, refer to "What are the possible causes of RF communication error?".

5.6. What are the possible causes of RF communication error?

- The RF Power settings of TS100 is too low.
- The power supply current might not be enough (Laptop or desktop).
- The tag is too far away.
- The tag is blocked by other objects.

6. Revision History

- 2022/04/20

Version: 1.1

- ✓ Update app images.

- 2020/11/13

Version: 1.0