



UHF RFID Passwords and Locks

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1 Memory Types on The RFID Tag

1.1 Reserved Memory

This memory bank is 8 Byte (= 16 nibbles = 64 bit in size. The first 4 Bytes (blocks 0 & 1) contain the KILL password, and the following 4 Bytes (blocks 2 & 3) the ACCESS password. After you have written a password, this memory bank should be locked, so the passwords cannot be easily read out and overwritten (pls. see below).

1.2 EPC Memory

This memory bank contains the EPC (electronic product code) and further bytes (PC – Protocol Control, CRC – Checksum of EPC). It is at least 12 Bytes = 24 nibbles = 96 bits in size. Some RFID tag types can allocate bytes from the user memory bank to the EPC memory bank, so larger EPCs can be stored.

Minimum size: 2 bytes CRC + 2 Bytes PC + 12 Bytes EPC

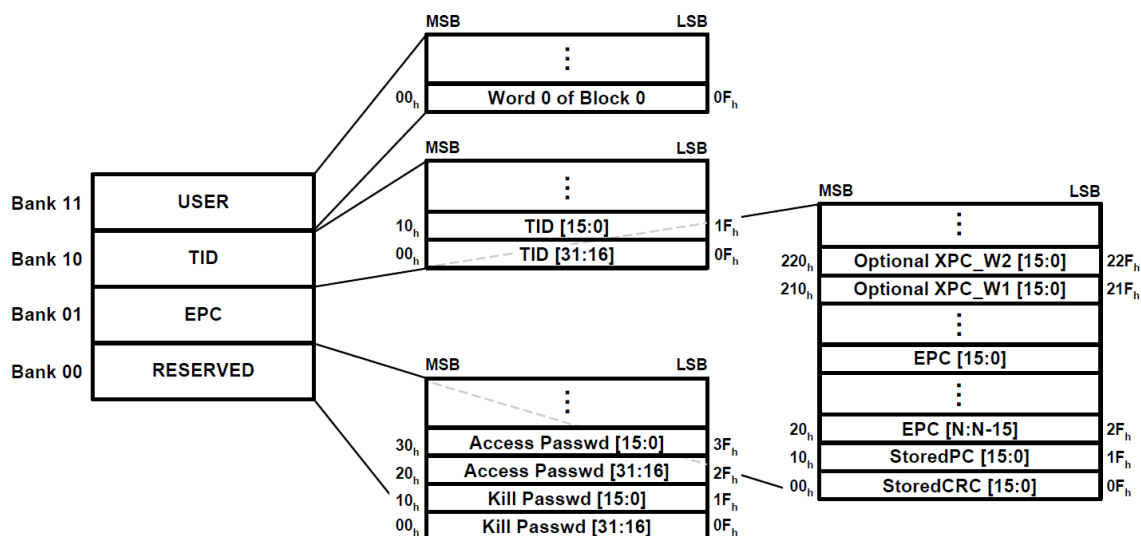
1.3 TID Memory

This unique tag ID is written in chip factory and can typically not be altered.

1.4 User Memory

The user memory is not available for all types of RFID tag types. Some have only 64 bytes (= 128 nibbles = 512 bits). There are also RFID tag types with up to 8 kbytes of memory.

1.5 Chart of Memory Bank Layout



2 Locks

2.1 Important Note

Only reserved memory bank (access and kill passwords) can be both write and READ locked—all others (EPC, TID, and User) can be write-locked only. Typically the Tag Identification (TID) memory bank is perma-locked at the chip factory.

2.2 Set Password Protection

1. Write password into reserved memory bank.
2. Lock access password.

3. Lock the desired memory bank (EPC or User) against changes (write lock memory bank).

If the access password is not locked, the password can simply be read from the reserved memory bank and used. Unless they were permanently locked (perma-locked, always not writable / accessible).

2.3 Security of Lock Status

The lock status cannot be retrieved from the tag, it can only be altered. It can only be detected by error messages when access to locked functions is performed.

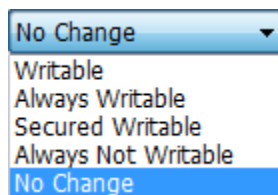
2.4 Possible Locks of Memory Banks EPC, TID, User

These memory banks are always readable. They can only be locked against alteration.

There are these 4 lock states:

1. Unlocked and writable.
2. Perma-UNlocked and always writable (can never be locked).
3. Locked, locked, secured writable with password.
4. Perma-locked, memory content can no longer be altered (can never be unlocked, always not writable).

Selection in BLUEBOX Show



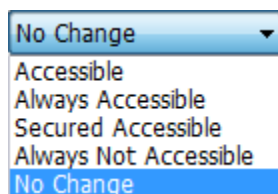
2.5 Possible Locks of Password in Reserved Memory

This memory bank can also be disabled against read-out. The access password can be blocked separately from the kill password.

There are these 4 lock states:

1. Unlocked and fully accessible (read + write).
2. Perma-UNlocked, can never be locked, always accessible (read + write).
3. locked, secured accessible with password (read + write).
4. Perma-locked, can never be unlocked, always not accessible

Selection in BLUEBOX Show



3 Setting Access Restrictions with the Reader Demo Tool

Gen2 - Tag Settings

EPC: **00-00-00-18-83-10-00-28-15-20-78-88**

Reader Id: **PUR RM1 - 00-00-23-a0 @ \\.\COM15**

Information

Manufacturer: **Alien Technology** Refresh

Model Number: **0x000412**

User Memory Size: **-**

Functions

Read / Write Set EPC Text Edit

Set Password Lock Kill

3.1 Set Password

Gen2 - Set Password

EPC **00-00-00-18-83-10-00-28-15-20-78-88**

Current Access Password: **00-00-00-00**

Password Type: **Access**

New Password: **00-00-00-00**

Ok Cancel

Select which password to set:

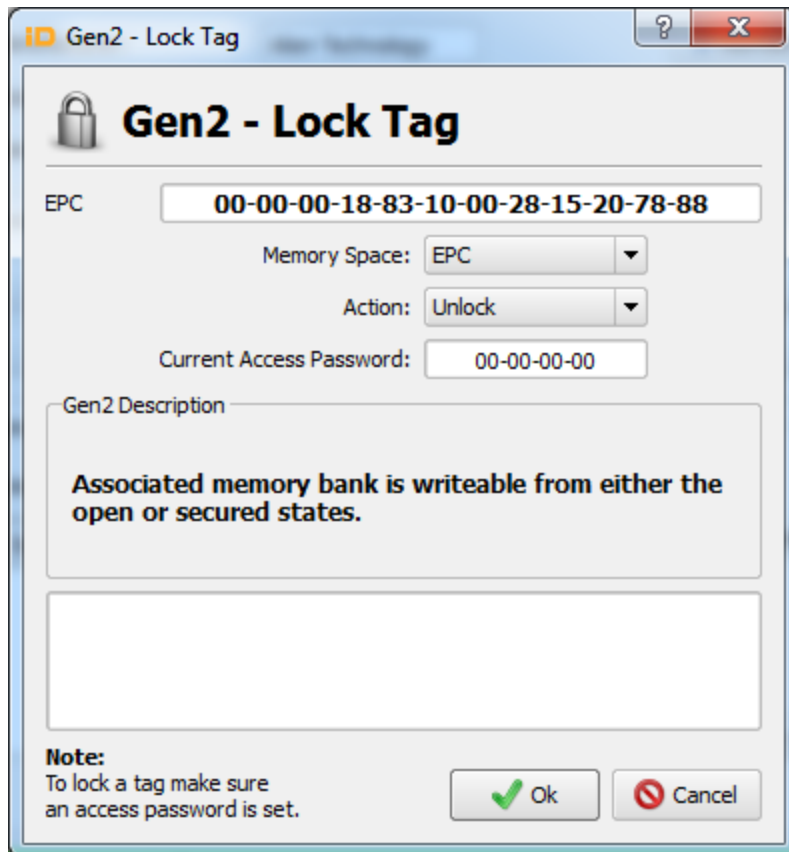
EPC **00-00-00-18-83-10-00-28-15-20-78-88**

Current Access Password: **00-00-00-00**

Password Type: **Access**

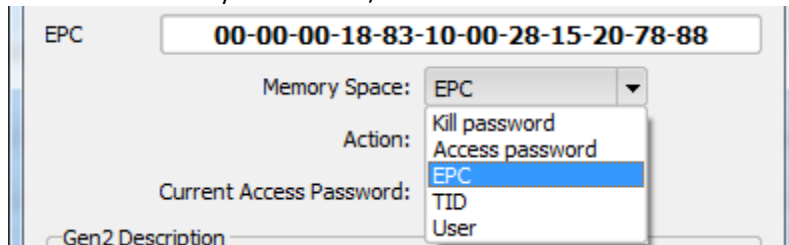
New Password: **Access**

3.2 Set Locks



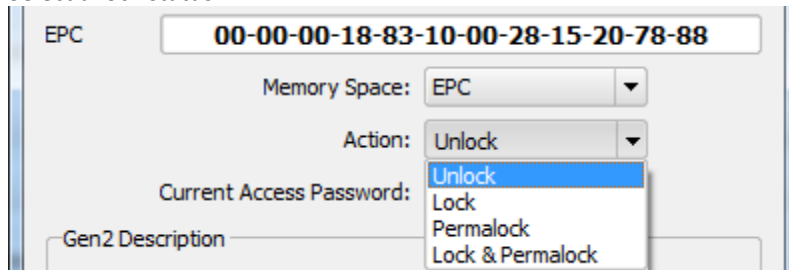
The screenshot shows the 'Gen2 - Lock Tag' dialog box. It features a title bar with a question mark and a close button. The main area has a lock icon and the title 'Gen2 - Lock Tag'. Below this, there is an 'EPC' field with the value '00-00-00-18-83-10-00-28-15-20-78-88'. A 'Memory Space' dropdown menu is set to 'EPC'. An 'Action' dropdown menu is set to 'Unlock'. A 'Current Access Password' field contains '00-00-00-00'. A 'Gen2 Description' text area contains the text: 'Associated memory bank is writeable from either the open or secured states.' At the bottom, there is a 'Note' section with the text: 'To lock a tag make sure an access password is set.' and two buttons: 'Ok' (with a green checkmark) and 'Cancel' (with a red X).

Select what memory bank to lock/unlock:



This screenshot shows the 'Gen2 - Lock Tag' dialog box with the 'Action' dropdown menu open. The menu options are: 'Kill password', 'Access password', 'EPC' (highlighted), 'TID', and 'User'. The other fields remain the same as in the previous screenshot.

Select a lock status:



This screenshot shows the 'Gen2 - Lock Tag' dialog box with the 'Action' dropdown menu open. The menu options are: 'Unlock' (highlighted), 'Lock', 'Permalock', and 'Lock & Permalock'. The other fields remain the same as in the previous screenshot.