

# SAC 3690 UHF Reader Software User's Guide v2.1

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## 1. Parameter interface operation

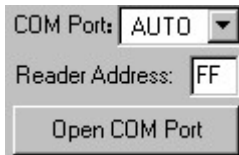
### 1.1 Open COM Port


Before open com port, please make controller properly connected with the host using the communication cable provided and then turn on the power.


#### (1) Auto Open Comport:

Value 255(0xFF) is broadcasting address. All controllers will respond the order with a broadcasting address.

Other value (0x00~0xFE) is controller address. Only will the controller conforming to the address respond the operation.



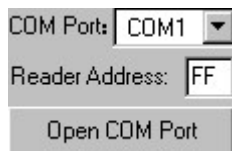
Click , If reader connect the computer's COM1 ~ COM9, we can see the port


display in the place. the demonstration software to  by connecting the port and written communication, the connection to the port to have a beginning, such as :

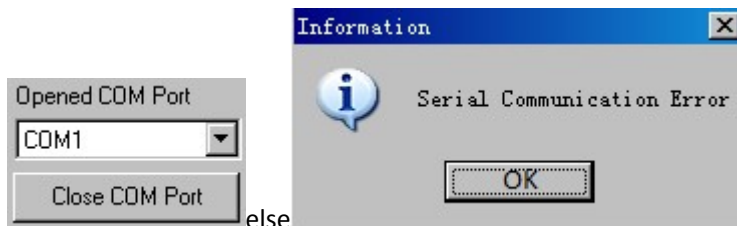


else

#### (2) Open Designated Comport:




Click , the Baud will Auto Select From 115200bps, 57600bps, 38400bps, 19200bps, 9600bps, if success




else


## 1.2 Parameter Setting:


- (1)  the new reader address to set. This address can't be 0xFF.


If set 0xFF, reader will return error information.

- (2)  set and save power configuration.

- (3)  select the reader's band, different band, the frequency of different.

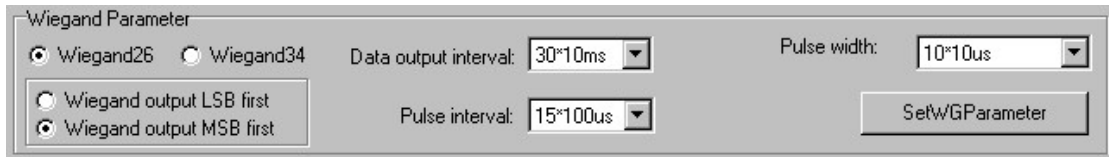
- (4)  Set reader working Min Frequency and Max Frequency. In different places, the radio requires the rule to be different. Users can follow the local situation and choose to read more sensitive frequency range of the card. In single frequency point operation, only need to set two frequencies to the same value. In frequency hopping operation, only need to set two frequencies to the different value.

- (5)  software start run, default use the baud rate 57600 to open COM port, reader power on, reader baud rate default is 57600. After change the baud rate, reader use the new baud rate until power off. Close port and open port, the baud rate no change. The software will use the new baud rate, until close the software.

- (6)  set the inventory scan max response time of reader. If software sends the inventory order, it will wait 30\*10ms for reader response and exits.

### 1.3 Work mode parameter setting

#### (1) Wiegand parameter Setting



<1>  Wiegand26  Wiegand34 Weigand 26、34 select.

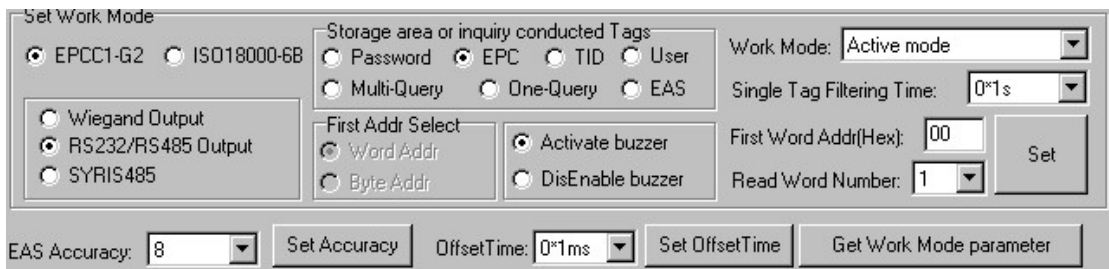
<2>  Wiegand output LSB first  Wiegand output MSB first Weigand output formart select.

<3> Data output interval: 30\*10ms Settings wergen the output of data at regular intervals, the two sets of data gaps between wergen at least 30 - 10ms.

<4> Pulse width: 10\*10us Set weigand Pulse Width, this pulse width is the 10\*10us.

<5> Pulse interval: 15\*100us Set a pulse. the interval between pulses for 15 - 100us, with the interval between pulses weigand agreement. the impulse to burst the interval between pulses.

#### (2) Work mode setting:



Response to the mode of argument is invalid, the initiative in this mode is valid.

<1>  EPCC1-G2  ISO18000-6B Set Reader's support of the protocol. Select  EPCC1-G2

Reader is only support ISO18000-6C; Select  ISO18000-6B Reader is only support ISO18000-6B.

<2>  Wiegand Output  RS232/RS485 Output  SYRIS485 Set output mode of active work mode.when select

RS232/RS485 Output putout Reader data with RS232/RS485. click

show message as

```
07 00 EE 00 0D B7 25 7F
07 00 EE 00 0D B7 25 7F
07 00 EE 00 0D B7 25 7F
07 00 EE 00 0D B7 25 7F
07 00 EE 00 0D B7 25 7F
```

- <3>  Activate buzzer  
 DisEnable buzzer Set up to the reader when the data is there a buzzer prompt sound.

- <4>  Password  EPC  TID  User  
 Multi-Query  One-Query  EAS Set reader of the tag to read some of the data or checks for the tag of EPC. if the data with a password protected areas then can not read.

- <5> Start Addr:   
 Read No.:  Set the start address and number of to be read,a word is 2 bytes.

Starting address (16 binary):when select  EPCC1-G2 , that Reader support ISO18000-6C protocol, 0 read from the first word(The appropriate storage first16 bit), 1 read from second word, four times; when select  ISO18000-6B , that Reader support ISO18000-6B protocol, 0 read from the first byte(The appropriate storage first 8 bit), 1 read from second byte, four times. if“Start Addr+Read NO.” Greater than the corresponding storage area to read, read and write the address of the data will not read data.

Read NO.(10 binary) : when select  RS232/RS485 Output ,  EPCC1-G2 ,

Password  EPC  TID  User  
 Multi-Query  One-Query  EAS , Reader inventory tag's EPC, And the starting address and read is not; when select  Wiegand Output , Read data number is 2, can not setting, for this time,if“Start Addr+2” Greater than the corresponding storage area to read, read and write the address of the data will not read data.

- <6> First Addr Select  
 Word Addr  
 Byte Addr Set the start address

(3) Get work mode parameter:  click this button, can get Reader's waigand and work mode parameter.

- (4) EAS Accuracy:   Set EAS accuracy. Default is 8.

- (5) .Set Syris485 offset time.Default is 0.
- (6)  Used to get or set reader's Tigger time.

## 2. The Necessary Knowledge

### 2.1 EPCC1G2 tag memory

Tag memory divided into four storage areas, each storage area can be made up of one or more memory words. The four storage areas:

EPC areas (EPC): Store the area of EPC number, this module stipulates it can store 15 word EPC number. Can read and can write.

TID areas (TID): Store ID number established by the tag production firm. There are 4 words and 8 words two kinds of ID numbers at present. Can read and not can write.

User areas (User): This area of different manufacturers is different. There is no user area in G2 tag of Inpinj Company. There are 28 words in Philips Company. Can read and can write.

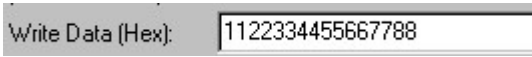
Password areas (Password): The first two words is kill password, the last two words is access password. Can read and can write.

Can write protect in four storage areas. It means this area is never writeable or not writeable under the non-safe state; only password area can set unreadable.

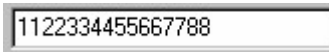
### 2.2 18000-6B tag

6B tag has a memory space, the minimum 8 bytes (byte 0- 7) is UID of the tag, and can't be rewritten. Following byte all can be rewritten, can be locked too, but once locking, can't rewrite again, can't unblock either.

### 2.3 Data display (tag ID, passwords, memory data is display in 16 hexadecimal)



Display in Hex, then 11 is first byte, 22 is second byte, and 1122 is first word.

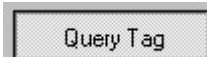


Total 8 bytes, in other words, total 4 words.

## 3. EPCC1-G2 Test operation ( COM IS OPEN )

### 3.1 Query Tag (The operation needing to choose the tag all need to query tag first)

- (1)  Every 50ms issued a command checks.
- (2)



can see 

No.	ID	EPC Length	Times
1	AE534012580A04E0	08	14

(3) Check  TID , input query TID's parameter,

Query TID Parameter	
StartAddr: 00	Len: 03

can see

No.	ID	EPC Length	Times
1	E20034120130	06	19

### 3.2 Read Data, Write Data, Block Erase

EPC Mask Enabled	
<input type="checkbox"/> Enabled	Maskadr: 00 MaskLen: 00
Read Data / Write Data / Block Erase	
<input type="checkbox"/> Calculation PC: 0800	
<input type="radio"/> Password <input checked="" type="radio"/> EPC <input type="radio"/> TID <input type="radio"/> User	213C2000AE534012 213C2000AE534012 213C2000AE534012 213C2000AE534012 213C2000AE534012 213C2000AE534012 213C2000AE534012 213C2000AE534012 213C2000AE534012 213C2000AE534012 213C2000AE534012
Address of Tag Data(Word/Hex): 00	
Length of Data(Read/Block Erase): 4	
Password(Read/Block Erase) (0-120/Word/D): 00000000	
Write Data (Hex): 0000	
<input type="button" value="Read"/> <input type="button" value="Write"/> <input type="button" value="Block Write"/> <input type="button" value="Block Erase"/> <input type="button" value="Clear"/>	

(1) Read data operation

<1> Choose tag

AE534012580A04E0
------------------

<2> Choose memory

<input type="radio"/> Password <input type="radio"/> EPC <input type="radio"/> TID <input checked="" type="radio"/> User
--

<3> Write

Address of Tag Data(Word/Hex): 00
Length of Data(Read/Block Erase): 4
Password(Read/Block Erase) (0-120/Word/D): 00000000

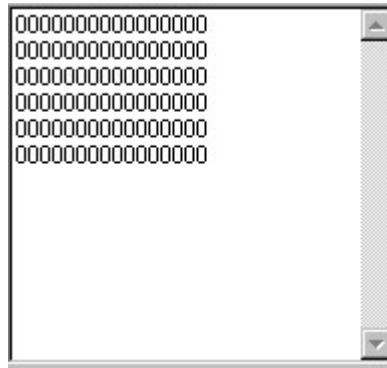
Start address: 0x00 stand in start to read data from first word in the designated storage area, 0x01 stand in start to read data from second word in the designated storage area, and so on.

Read the length: Number of the word to be read. It read 120 words at most. Can not set 0 or 120, otherwise, return the parameter error information.

Access password: From left to right it is the former high-word, low word in the access password. If operation don't need access password, it can be the arbitrary value, but can't lack.

<4> Click  can see

12:01:49 "Read" : successfully



(2) Write data operation

<1> Choose tag

<2> Choose memory  Password  EPC  TID  User

<3> Write 

Address of Tag Data(Word/Hex):	<input type="text" value="00"/>
Length of Data(Read/Block Erase):	<input type="text" value="4"/>
Password(Read/Block Erase) (0-120/Word/D):	<input type="text" value="00000000"/>

(EPC memory Address of tag is 2)

Write Data (Hex):

Start address: 0x00, the first word of data (from left) is written in address 0x00 of the designated storage area, and so on.

<4> Click  can see

17:35:06 "Write" Command Response=0x00 (completely write Data successfully)

(3) Block Erase Operation (write 0 to the designated data )

<1> Choose tag

<2> Choose memory  Password  EPC  TID  User

<3> Write 

Address of Tag Data(Word/Hex):	<input type="text" value="00"/>
Length of Data(Read/Block Erase):	<input type="text" value="4"/>
Password(Read/Block Erase) (0-120/Word/D):	<input type="text" value="00000000"/>

Start address: 0x00 stand in start to erase data from first word in the designated storage area, 0x01 stand in start to erase data from second word in the designated storage area, and so on.

The difference from write operation: Needn't fill in the data.

<4> Click  can see

14:51:32 "Block Erase" Command Response=0x00 (Block Erase successfully)

(4) Write block operation



<1> Choose tag

<2> Choose memory  Password  EPC  TID  User

<3> Write  Address of Tag Data(Word/Hex):  
 Length of Data(Read/Block Erase):  
 Password(Read/Block Erase) (0-120/Word/D): (EPC memory Address of tag is

2)

Write Data (Hex):

Start address: 0x00, the first word of data (from left) is written in address 0x00 of the designated storage area, and so on.

<4> Click  can see

11:54:06 "WriteBlock" Command Response=0x00 (completely write Block successfully)

(4) EPC Mask Enable

EPC Mask Enabled  
 Enabled Maskadr:  MaskLen:

<1>

Maskadr : The mask the first byte address.

MaskLen: The mask of bytes length.

(5) Write EPC

<1>check  Calculation PC:

<2>select  Password  EPC  TID  User

<3>Input new EPC number  Write Data (Hex):

<4>click ,if succeeded, can see

17:35:06 "Write" Command Response=0x00 (completely write Data successfully)

### 3.3 Revise the password

(1) Choose tag

(2) Choose memory

(3) Write access password (0-120/Word/D):

Access password: From left to right it is the former high-word, low word in the access password. If operation don't need access password, it can be the arbitrary value, but can't lack.

(4) Revise the access password 12345678: Write

Click

(5) Revise the kill password 12345678: Write

Click

(6) If succeed, we can see

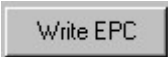
### 3.4 Write EPC (Needn't query tag)

(1) Write access password (If EPC area of the tag has not set password protection, we can write 8 data arbitrarily)

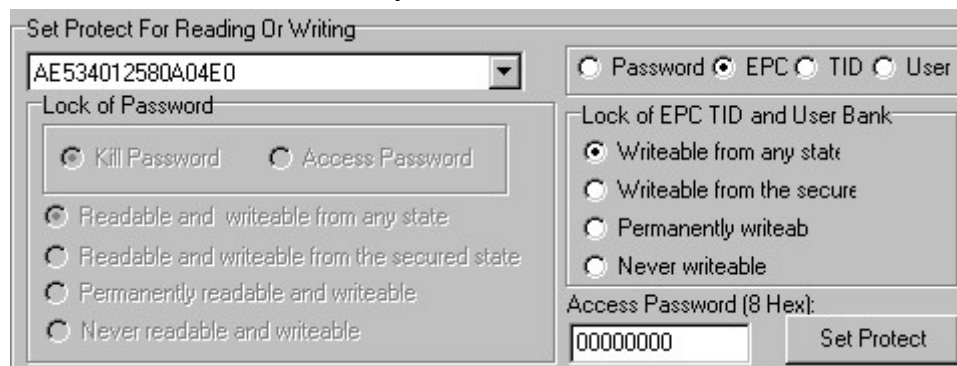
(2) Write EPC.

(3) Click . (Random write one tag in the effective range of antenna)

When there are many or EPC pieces of tag in the effective range of antenna, and the access

password of one tag is the same as you entered, or EPC area of tag set no password protection, click  at a time, random write EPC number of one tag in the effective range of antenna.

### 3.5 Set the state of read and write protection



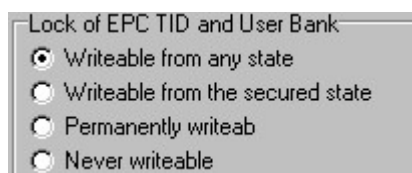
(1) Choose tag



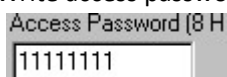
(2) Choose memory



(3) Choose protection type

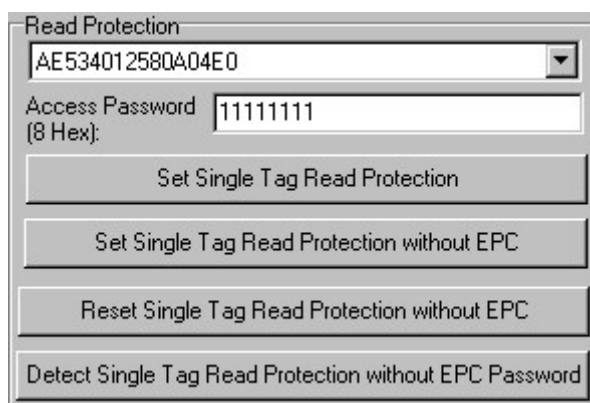


(4) Write access password:





Any storage area in no password protection status still must write the correct access password.(password can not be zero).

### 3.6 Read Protection



(1) Set Single Tag Read Protection


<1> Choose tag 


<2> Write tag access password (8 Hex): 


<3> Click 

According to EPC number of the tag, setting read protection, make tag unable to be read and written by any order, even if query the tag, it is unable to get EPC number of the tag. Only NXP UCODE EPC G2X tags valid.

## (2) Set Single Tag Read Protection without EPC

<1> Write tag access password (8 Hex): 

<2> Click  can set tag read protection in the effective range of antenna

The difference from : When there are several tag in the effective range of antenna, reader don't know the tag which the order operate.

If operate several tags, then the access password of the tag had better be the same. Only NXP UCODE EPC G2X tags valid.

## (3) Reset Single Tag Read Protection without EPC

<1> Write access password (8 Hex): 

<2> Click 

Use for reset the tag read protection.

Only put a tag in the effective range of antenna. Only NXP UCODE EPC G2X tags valid.

Comments: If tag does not support the read protection setting, it must be unprotected.

## (4) Detect Single Tag Read Protection without EPC

<1> Click 

Can't detect tag whether it support read protection order, can only detect single tag whether it is protected. If tag does not support the read protection setting, it must be unprotected.

Make sure that there is single tag in the effective range of antenna. Only NXP UCODE EPC G2X tags valid.

### 3.7 EAS Alarm

(1) Alarm setting

<1> Choose tag

<2> Write access password

<3> Choose alarm

Set or reset the EAS status bit of tag. Only NXP UCODE EPC G2X tags valid.

(2) Check alarm without EPC and access password

<1> Click check alarm

Check the EAS alarm of tag. Only NXP UCODE EPC G2X tags valid.

<2> EAS alarm:

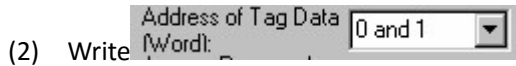
```
15:04:37 "Check EAS Alarm"Command Response=0x00 (EAS alarm detected)
```

No EAS alarm:

```
15:07:29Command Response=0xFB (No Tag Operable)
```

### 3.8 Lock Block for User (Permanently Lock) (After the data locked, it can not be changed again)

(1) Choose tag



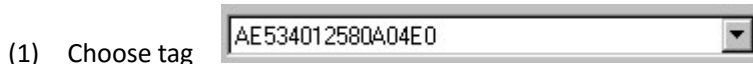
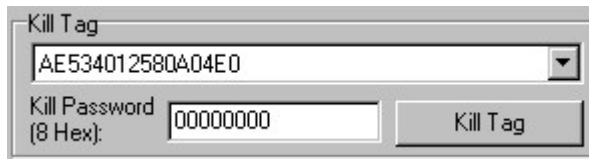
(2) Write Access password can not be the whole 0. Otherwise, the tag can not be locked, and the tag return response with parameter error.

(3) Choose address of tag data (word). The user's area amounts to 14 word. (0- 13)  
 Lock permanently in 2 words. Therefore, the address of tag data is divided into 0 and 1, 2 and 3, 4 and 5, 6 and 7, 8 and 9, 10 and 11, 12 and 13. You can lock the data if you wish:

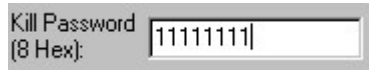


After the data get locked, it can be read only, can't be rewritten, and can't be erased too. Only NXP UCODE EPC G2X tags valid.

### 3.9 Kill Tag (Permanently Kill)



(1) Choose tag



(2) Write

Kill password can not be the whole 0. Otherwise, the tag can not be killed, and the tag return response with parameter error.

## 4. 18000-6B Test Interface Operation (After Open COM Port)

### 4.1 Query Tag

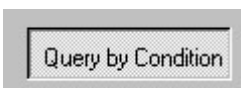
(1) Read Interval: 50ms send a inventory command every 50ms.



(2)

Only query the single tag. If many tags are in the effective range of antenna at the same time, it may be unable to query the tag.

No.	ID	Times
1	E0040000AEE77302	233



(3)

<1> Unequal Condition:

Query Tags by Condition

Equal Condition       Unequal Condition

Less than Condition       Greater than

Address of Tag Data(0-223):

Condition(<=8 Hex Number):

Note:

The 8 bytes of 6B tag number write in the 0~7 which in the address of tag data (0- 233)

Figure, query condition begin to compare from the tag data address 0. The comparative content is 22.

Click

Query by one

Query by Condition

See

No.	ID	Times
1	E0040000AEE77302	186
2	E0040000D4E77302	27

Figure, from the tag number we can see the addresses 0 of tag data: 00, 00, 11, 11.

Unequal condition 22, therefore, the four tags are read.

<2> Equal Condition:

Query Tags by Condition

Equal Condition       Unequal Condition

Less than Condition       Greater than

Address of Tag Data(0-223):

Condition(<=8 Hex Number):

Note:

The 8 bytes of 6B tag number write in the 0~7 which in the address of tag data (0- 233)

Figure, query condition begin to compare from the tag data address 0. The comparative content is 00.

Click

Query by one

Query by Condition

See

List ID of Tags			
No.	ID	Times	
1	0022334455667788	69	
2	0022334455667789	69	

Figure, from the tag number we can see the addresses 0 of tag data: 00, 00.  
Equal condition 00, therefore, the two tags are read.

<3> Greater than

Query Tags by Condition	
<input type="radio"/> Equal Condition	<input type="radio"/> Unequal Condition
<input type="radio"/> Less than Condition	<input checked="" type="radio"/> Greater than
Address of Tag Data(0-233):	<input type="text" value="0"/>
Condition(<=8 Hex Number):	<input type="text" value="00"/>

Note:

The 8 bytes of 6B tag number write in the 0~7 which in the address of tag data (0- 233)

Figure, query condition begin to compare from the tag data address 0. The comparative content is 00.

Click

<input type="radio"/> Query by one	<input checked="" type="radio"/> Query by Condition	<input type="button" value="Query by Condition"/>
------------------------------------	---	---

See

List ID of Tags			
No.	ID	Times	
1	1122334455667788	8	
2	1122334455667789	8	

Figure, from the tag number we can see the addresses 0 of tag data: 11, 11.  
Great than 00, therefore, the two tags are read.



## 4.2 Read and Write Data Block / Permanently Write Protect Block of Byte

(1)

(2) Read data:

Start address: 0x00 stand in start to read data from first word in the designated storage area, 0x01 stand in start to read data from second word in the designated storage area, and so on. Range is 8~223. Beyond this range, reader will return parameter error.

Read length: pointed to the number of bytes to read. Range is 1~32. If **Start address** + **Read length** greater than 224, or Read length greater than 32 or is zero, reader will return parameter error information. The high bytes of Read length write in the low address in tag.

(3) Write data:

Write data: Range is 1~32. If **Start address** + **Write length** greater than 224, or **Write length** greater than 32 or is zero, reader will return parameter error information. The high bytes of Read length write in the low address in tag.

(4) Permanently Write Protect: lock the designated byte.

(5) Check Protect: check whether the designated byte is locked.

Start/Protect Address  
(00-E9)(Hex):

(6) If succeed, we can see:

15:45:14 "Read" successfully

15:44:36 "Write" successfully

15:45:34 "Lock" successfully

15:45:54 "Check Lock" Command Response=0x01 (The Byte is locked)

## 5. Frequency Analysis Operation (After Open COM Port)

Frequency	Times	Percentage

(1) Click , can see

902.60MHz (0)	30/30	100.00%
903.00MHz (1)	30/30	100.00%
903.40MHz (2)	30/30	100.00%
903.80MHz (3)	28/30	93.33%
904.20MHz (4)	30/30	100.00%
904.60MHz (5)	30/30	100.00%
905.00MHz (6)	30/30	100.00%
905.40MHz (7)	30/30	100.00%

The larger of the percentage ,the better of the results.

(2) Frequency hopping mode:

This function can set an get hopping mode.

Click , if succeeded ,can see

12:14:54 "Set" : successfully

Click

Can see the hopping mode at