



e*Tag[®] Communications Protocol

Version 3.10

20301 Nordhoff Street, Chatsworth, CA 91311
PHONE (818) 882-0020 • FAX (818) 882-7052
TOLL-FREE (800) 891-0020
Website: www.securakey.com • E-mail: mail@securakey.com

9/25/02 revisions are shown in a **blue** font
 10/17/02 revisions are shown in a **red** font
 11/22/02 revisions are shown in a **green** font
 01/05/04 revisions are shown in **blue**
 04/28/04 change inventory command shown in **orange**
 05/19/04 revisions shown in **red**
 08/01/05 revisions shown in **Rose**, eTagiV, v3.03
 08/10/05 revisions shown in **Lime**, eTagiV, v4.00
 08/24/05 revisions shown in **Gold**, eTagiV, v4.00
 02/28/08 revisions are shown in **Teal**, eTagiV v4.05

1.1 Request Packet (Host to Reader)

Name	Size(bytes)	Value (Hex)	Description
SOF	1	01h	Start of Frame
Length	2	Packet Dependent	Describes the length of the entire packet including the SOF
Device Type	1	10h	Describes the device or app.as Secura Key access control. Same for all packets.
Command Flags	1	Varies by Command	Specifies action to be taken by the Reader
Command	1	Varies by Command	Specifies action to be taken by the Reader
Data	0-1000	Command Dependent	Contains the parameters and data for the command
BCC	2	16 bit packet LRC	LRC includes all preceding packet bytes, including SOF

1.2 Request Packet Command Flags:

Bit(s)	Description
0	(ISO 15693) 0 = Downlink 1/256; 1 = 1/4
1	(ISO 15693) 0 = Slow Read; 1 = Fast Read
2	Xmit Modulation 0 = 100%; 1 = 10%
3	Tag Modulation 0 = FSK; 1 = ASK
4	Tag address flag - See note 2
5	Reader address flag - See note 1
6	Spare - Don't care
7	Request flag - Must be 1 for all request messages

Note 1: If set, the message will include 8 bytes in ASCII which designates the reader serial number. Only the reader with a matching serial number will respond.

Note 2: If set for an ISO 15693 command, the message will contain 8 bytes of the tag UID.

Example Read a Single Block with Reader and Tag addressed.

SOF	Length	Device ID	CMD Flgs	CMD	Address	Address	Data	BCC
01h	19h	10h	B3h	20h	Reader	UID	Blk #	
1 Byte	2 Bytes	1 Byte	1 Byte	1 Byte	8 Bytes	8 Bytes	1 Byte	2 Bytes

1.3 Response Packet (Reader to Host)

Name	Size(bytes)	Value (Hex)	Description
SOF	1	01h	Start of Frame
Length	2	Packet Dependent	Describes the length of the entire packet including the SOF
Device Type	1	10h	Describes the device or app.as Secura Key access control. Same for all packets.
Response Flags	1	Varies by Command	Specifies action just taken by the Reader
Command	1	Varies by Command	Specifies action just taken by the Reader
Data	0-100	Command Dependent	Contains parameters and data for the command just processed
BCC	2	16 bit packet LRC	LRC includes all preceding packet bytes, including SOF

1.4 Response Packet Flags:

Bit(s)	Description
0-1	Error Flags - Indicates Error in Command. (See Table 2)
2-6	Future use
7	Request flag - must be 0 for all response messages

Table 2: Error Flags Code

Bit 1	Bit 0	Definition
0	0	No Error
0	1	Error From Tag
1	0	Error From Interrogator
1	1	Future Use

1.4.1 Response Packet Error Data Codes:

Table 3: Tag Error Codes

Value	Description
01	Command not supported (i.e. request code not recognised)
02	Command not recognised (i.e. format error occurred)
03	Command option not supported
0F	Error with no information given or a specific error code is not supported
10	Specified block not available (doesn't exist)
11	Specified block already locked, cannot be locked again
12	Specified block locked, contents cannot be changed
13	Specified block was not successfully programmed
14	Specified block was not successfully locked
A0-DF	Custom command error codes
all others	RFU

Table 4: Interrogator Error Codes

Value	Description
01	Transponder not found
02	Command not supported
03	Packet BCC invalid
05	General write failure
0F	Undefined error
00	No error

2.1 Command Definitions

2.1.1 ISO 15693-3 Command Codes

Table 5: ISO 15693 Command Codes

ISO 15693 Commands	Command Code
Inventory	01h
RFU	02h
Read a Single Block	20h
Write a Single Block	21h
Lock a Single Block	22h
Read Multi-block	23h
Write Multi-block	24h
RFU	25h
RFU	26h
Write Tag AFI	27h
Lock Tag AFI	28h
Write Tag DSFID	29h
Lock Tag DSFID	2Ah
Read Tag Information	2Bh
Read Multi-block Security Status	2Ch

2.1.1.1

Read a Single Block Command: 20h

Read a Single Block (unaddressed)

SOF	Length	Device ID	CMD Flgs	CMD	Data	BCC
01h	09h	10h		20h	Blk #	
1 Byte	2 Bytes	1 Byte	1 Byte	1 Byte	1 Byte	2 Bytes

Read a Single Block (addressed)

SOF	Length	Device ID	CMD Flgs	CMD	Address	Data	BCC
01h	11h	10h		20h	UID	Blk #	
1 Byte	2 Bytes	1 Byte	1 Byte	1 Byte	8 Bytes	1 Byte	2 Bytes

Read a Single Block Response (32 bits)

SOF	Length	Device ID	Resp. Flgs	CMD	Data	Spare	Data	BCC
01h	0Eh	10h	00h*	20h	Blk Data	00h	Blk #	
1 Byte	2 Bytes	1 Byte	1 Byte	1 Byte	4 Bytes	1 Byte	1 Byte	2 Bytes

* 00h indicates successful read

Read a Single Block Response (64 bits)

SOF	Length	Device ID	Resp. Flgs	CMD	Data	Spare	Data	BCC
01h	12h	10h	00h*	20h	Blk Data	00h	Blk #	
1 Byte	2 Bytes	1 Byte	1 Byte	1 Byte	8 Bytes	1 Byte	1 Byte	2 Bytes

* 00h indicates successful read

2.1.1.2

Write a Single Block Command: 21h

Write a Single Block (unaddressed, 32 bits)

SOF	Length	Device ID	CMD Flgs	CMD	Data	Data	BCC
01h	0Dh	10h		21h	Blk #	Blk Data	
1 Byte	2 Bytes	1 Byte	1 Byte	1 Byte	1 Byte	4 Bytes	2 Bytes

Write a Single Block (unaddressed, 64 bits)

SOF	Length	Device ID	CMD Flgs	CMD	Data	Data	BCC
01h	11h	10h		21h	Blk #	Blk Data	
1 Byte	2 Bytes	1 Byte	1 Byte	1 Byte	1 Byte	8 Bytes	2 Bytes

Write a Single Block (addressed, 32 bits)

SOF	Length	Device ID	CMD Flgs	CMD	Address	Data	Data	BCC
01h	16h	10h		21h	UID	Blk #	Blk Data	
1 Byte	2 Bytes	1 Byte	1 Byte	1 Byte	8 Bytes	1 Byte	4 Bytes	2 Bytes

Write a Single Block (addressed, 64 bits)

SOF	Length	Device ID	CMD Flgs	CMD	Address	Data	Data	BCC
01h	1Ah	10h		21h	UID	Blk #	Blk Data	
1 Byte	2 Bytes	1 Byte	1 Byte	1 Byte	8 Bytes	1 Byte	8 Bytes	2 Bytes

Write a Single Block Response

SOF	Length	Device ID	Resp. Flgs	CMD	Data	BCC
01h	09h	10h	00h*	21h	Error Code	
1 Byte	2 Bytes	1 Byte	1 Byte	1 Byte	1 Byte	2 Bytes

* 00h indicates successful write

2.1.1.3

Lock a Single Block Command: 22h**Lock a Single Block (unaddressed)**

SOF	Length	Device ID	CMD Flgs	CMD	Data	BCC
01h	09h	10h		22h	Blk #	
1 Byte	2 Bytes	1 Byte	1 Byte	1 Byte	1 Byte	2 Bytes

Lock a Single Block (addressed)

SOF	Length	Device ID	CMD Flgs	CMD	Address	Data	BCC
01h	11h	10h		22h	UID	Blk #	
1 Byte	2 Bytes	1 Byte	1 Byte	1 Byte	8 Bytes	1 Byte	2 Bytes

Lock a Single Block Response

SOF	Length	Device ID	Resp. Flgs	CMD	Data	BCC
01h	09h	10h	00h*	22h	Error Code	
1 Byte	2 Bytes	1 Byte	1 Byte	1 Byte	1 Byte	2 Bytes

* 00h indicates successful Lock

2.1.1.4

Read a Multi-Block Command: 23h**Read a Multi-Block (unaddressed)**

SOF	Length	Device ID	CMD Flgs	CMD	Data	Data	BCC
01h	0Ah	10h		23h	Blk #	Nun Blk	
1 Byte	2 Bytes	1 Byte	1 Byte	1 Byte	1 Byte	1 Byte	2 Bytes

Read a Multi-Block (addressed)

SOF	Length	Device ID	CMD Flgs	CMD	Address	Data	Data	BCC
01h	12h	10h		23h	UID	Blk #	Nun Blk	
1 Byte	2 Bytes	1 Byte	1 Byte	1 Byte	8 Bytes	1 Byte	1 Byte	2 Bytes

Read a Multi-Block Response

SOF	Length	Device ID	Resp. Flgs	CMD	RFU	Data	Data	Data	BCC
01h	***0Bh	10h	00h*	23h	00h	Nun Blk	Blk #**	Blk Data**	
1 Byte	2 Bytes	1 Byte	1 Byte	1 Byte	1 Byte	1 Byte	1 Byte	4 Bytes	2 Bytes

* 00h indicates successful read

** Repeated depending on the value of the Num Blk byte

*** 0Bh + 5*(Num Blk)

2.1.1.5

Write Multi-Block Command: 24h

Not implemented in eTagIV

Write Multi-Block (unaddressed)

SOF	Length	Device ID	CMD Flgs	CMD	Data	Data	Data	BCC
01h	0Ah***	10h		24h	Blk #	Nun Blk	Blk Data**	
1 Byte	2 Bytes	1 Byte	1 Byte	1 Byte	1 Byte	1 Byte	4 Bytes	2 Bytes

** Repeated depending on the value of the Num Blk byte

*** 0Ah + 4*(Num Blk)

Write Multi-Block (addressed)

SOF	Length	Device ID	CMD Flgs	CMD	Address	Data	Data	Data	BCC
01h	12h***	10h		24h	UID	Blk #	Nun Blk	Blk Data**	
1 Byte	2 Bytes	1 Byte	1 Byte	1 Byte	8 Bytes	1 Byte	1 Byte	4 Bytes	2 Bytes

** Repeated depending on the value of the Num Blk byte

*** 12h + 4*(Num Blk)

Write Multi-Block Response

SOF	Length	Device ID	Resp. Flgs	CMD	Data	BCC
01h	09h	10h	00h*	24h	Error Code	
1 Byte	2 Bytes	1 Byte	1 Byte	1 Byte	1 Byte	2 Bytes

* 00h indicates successful write

2.1.1.6

Select Command: 25h

Not implemented in eTagIV

2.1.1.7

Reset to Ready Command: 26h

Not implemented in eTagIV

2.1.1.8

Write AFI Command: 27h**Write AFI (unaddressed)**

SOF	Length	Device ID	CMD Flgs	CMD	Data	BCC
01h	09h	10h		27h	AFI Data	
1 Byte	2 Bytes	1 Byte	1 Byte	1 Byte	1 Byte	2 Bytes

Write AFI (addressed)

SOF	Length	Device ID	CMD Flgs	CMD	Address	Data	BCC
01h	11h	10h		27h	UID	AFI Data	
1 Byte	2 Bytes	1 Byte	1 Byte	1 Byte	8 Bytes	1 Byte	2 Bytes

Write AFI Response

SOF	Length	Device ID	Resp. Flgs	CMD	Data	BCC
01h	09h	10h	00h*	27h	Error Code	
1 Byte	2 Bytes	1 Byte	1 Byte	1 Byte	1 Byte	2 Bytes

* 00h indicates successful write

2.1.1.9

Lock AFI Command: 28h**Lock AFI (unaddressed)**

SOF	Length	Device ID	CMD Flgs	CMD	BCC
01h	08h	10h		28h	
1 Byte	2 Bytes	1 Byte	1 Byte	1 Byte	2 Bytes

Lock AFI (addressed)

SOF	Length	Device ID	CMD Flgs	CMD	Address	BCC
01h	10h	10h		28h	UID	
1 Byte	2 Bytes	1 Byte	1 Byte	1 Byte	8 Bytes	2 Bytes

Lock AFI Response

SOF	Length	Device ID	Resp. Flgs	CMD	Data	BCC
01h	09h	10h	00h*	28h	Error Code	
1 Byte	2 Bytes	1 Byte	1 Byte	1 Byte	1 Byte	2 Bytes

* 00h indicates successful write

2.1.1.9

Write DSFID Command: 29h**Write DSFID (unaddressed)**

SOF	Length	Device ID	CMD Flgs	CMD	Data	BCC
01h	09h	10h		29h	DSFID Val	
1 Byte	2 Bytes	1 Byte	1 Byte	1 Byte	1 Byte	2 Bytes

Write DSFID (addressed)

SOF	Length	Device ID	CMD Flgs	CMD	Address	Data	BCC
01h	11h	10h		29h	UID	DSFID Val	
1 Byte	2 Bytes	1 Byte	1 Byte	1 Byte	8 Bytes	1 Byte	2 Bytes

Write DSFID Response

SOF	Length	Device ID	Resp. Flgs	CMD	Data	BCC
01h	09h	10h	00h*	29h	Error Code	
1 Byte	2 Bytes	1 Byte	1 Byte	1 Byte	1 Byte	2 Bytes

* 00h indicates successful write

2.1.1.10

Lock DSFID Command: 2Ah**Lock DSFID (unaddressed)**

SOF	Length	Device ID	CMD Flgs	CMD	BCC
01h	08h	10h		2Ah	
1 Byte	2 Bytes	1 Byte	1 Byte	1 Byte	2 Bytes

Lock DSFID (addressed)

SOF	Length	Device ID	CMD Flgs	CMD	Address	BCC
01h	10h	10h		2Ah	UID	
1 Byte	2 Bytes	1 Byte	1 Byte	1 Byte	8 Bytes	2 Bytes

Lock DSFID Response

SOF	Length	Device ID	Resp. Flgs	CMD	Data	BCC
01h	09h	10h	00h*	2Ah	Error Code	
1 Byte	2 Bytes	1 Byte	1 Byte	1 Byte	1 Byte	2 Bytes

* 00h indicates successful write

2.1.1.11

Read Tag Information Command: 2Bh**Read Tag Information (unaddressed)**

SOF	Length	Device ID	CMD Flgs	CMD	BCC
01h	08h	10h		2Bh	
1 Byte	2 Bytes	1 Byte	1 Byte	1 Byte	2 Bytes

Read Tag Information (addressed)

SOF	Length	Device ID	CMD Flgs	CMD	Address	BCC
01h	10h	10h		2Bh	UID	
1 Byte	2 Bytes	1 Byte	1 Byte	1 Byte	8 Bytes	2 Bytes

Read Tag Information Response

SOF	Length	Device ID	Resp. Flgs	CMD	Data	Address	Data	Data	Data	Data	Data	BCC
01h	11h***	10h	00h*	2Bh	Data Flg**	UID	DSFID Val	AFI Data	Num Blk	Blk Size	IC Ref	
1 Byte	2 Bytes	1 Byte	1 Byte	1 Byte	1 Byte	8 Bytes	1 Byte	1 Byte	1 Byte	1 Byte	1 Byte	2 Bytes

* 00h indicates successful read

**Data fields present flag byte - see below for definitions

bit 0 = DSFID Present, bit 1 = AFI Present, bit 2 = VICC Memory size(2 bytes) present, bit 3 = IC reference present

***11h + bytes associated with fields added by data flag byte

2.1.1.12

Read Multi-block Security Status Command: 2Ch**Read Multi-block Security Status (unaddressed)**

SOF	Length	Device ID	CMD Flgs	CMD	Data	Data	BCC
01h	09h	10h		2Ch	Blk #	Nun Blk	
1 Byte	2 Bytes	1 Byte	1 Byte	1 Byte	1 Byte	1 Byte	2 Bytes

Read Multi-block Security Status (addressed)

SOF	Length	Device ID	CMD Flgs	CMD	Address	Data	Data	BCC
01h	11h	10h		2Ch	UID	Blk #	Nun Blk	
1 Byte	2 Bytes	1 Byte	1 Byte	1 Byte	8 Bytes	1 Byte	1 Byte	2 Bytes

Read Multi-block Security Status Response

SOF	Length	Device ID	Resp. Flgs	CMD	Data	Data	Data	BCC
01h	***0Ah	10h	00h*	2Ch	Blk #	Nun Blk	Lck Stat**	
1 Byte	2 Bytes	1 Byte	1 Byte	1 Byte	1 Byte	1 Byte	1 Byte	2 Bytes

* 00h indicates successful read

** Repeated depending on the value of the Num Blk byte, 0 = unlocked

*** 0Ah + 5*(Num Blk)

2.1.1.13

Inventory Command: 01h**Inventory (unaddressed)**

SOF	Length	Device ID	CMD Flgs	CMD	BCC
01h	08h	10h		01h	
1 Byte	2 Bytes	1 Byte	1 Byte	1 Byte	2 Bytes

Inventory Command with AFI: 01h**Inventory (unaddressed)**

SOF	Length	Device ID	CMD Flgs	CMD	AFI	BCC
01h	09h	10h		01h	*	
1 Byte	2 Bytes	1 Byte	1 Byte	1 Byte	1 Byte	2 Bytes

* 00 for no AFI

eTagHost uses this packet structure to fetch Inventory

Inventory Response

SOF	Length	Device ID	Resp. Flgs	CMD	Data	Address	BCC
01h	09h***	10h	00h*	01h	Num Tags	UID**	
1 Byte	2 Bytes	1 Byte	1 Byte	1 Byte	1 Byte	8 Bytes	2 Bytes

* 00h indicates successful read

**Repeated based on number of tags field

***09h + 8*(num tags)

2.1.1.14

Stay Quiet Command: 02h

Not implemented in host protocol

2.2.1 Reader Commands

Table 6: Reader Command Codes

ISO 15693 Commands	Command Code
Reader Version	E0h
Set Tag Mode	E1h
RFU	E2h
RFU	E3h
RFU	E4h
Reader Reset	E5h
Antenna Tune	E6h
Reader Setup	E7h
Start Flash Loader	E8h
RFU	E9h
Reserved	EAh
Reader Information	EBh
Set Secondary DES Key	ECh
Reader Mode	EDh
Activate LED	EEh
Activate Audio	EFh

2.2.1.1

Reader Version Command: E0h**Request Reader Version**

SOF	Length	Device ID	CMD Flgs	CMD	BCC
01h	08h	10h		E0h	
1 Byte	2 Bytes	1 Byte	1 Byte	1 Byte	2 Bytes

Reader Version Response

SOF	Length	Device ID	Resp. Flgs	CMD	Version*	RFU	Product**	Serial #***	BCC
01h	0Dh	10h	00h	E0h		07h	02h		
1 Byte	2 Bytes	1 Byte	1 Byte	1 Byte	2 Bytes	1 Byte	1 Byte	8 Bytes	2 Bytes

* - MSB = Version ".00", LSB = version "01"

** - 02 = eTagIV

*** - 03 = ETO - L

***- Serial Number is 8 ASCII bytes

2.2.1.2

Reader Tag Type: E1h

Request Set Tag Type

SOF	Length	Device ID	CMD Flgs	CMD	Sub-Cmd	Tag	BCC
01h	0Ah	10h		E1h			
1 Byte	2 Bytes	1 Byte	1 Byte	1 Byte	1 Byte	1 Byte	2 Bytes

Sub-Cmd Set bit 0 Read Tag Type (Mode)
 Clr bit 0 Write Tag Type (Mode)

Tag Set bit 0 ST-LRI-64 supported, this setting may reduce the read range.
 Clr bit 0 Maximize read range (default setting).
 Set bit 1 Bias towards Philips and ST tags.
 Clr bit 1 Bias towards TI tags (default setting).
 Set bit 2 Change the bias based upon the most recent successful write.
 Clr bit 2 Don't change the tag bias (default setting).

Set Tag Type Response for a Write Command

SOF	Length	Device ID	Resp. Flgs	CMD	Status	BCC
01h	09h	10h	00h	E1h	00h	
1 Byte	2 Bytes	1 Byte	1 Byte	1 Byte	1 Byte	2 Bytes

Set Tag Type Response for a Read Command

SOF	Length	Device ID	Resp. Flgs	CMD	Tag	BCC
01h	09h	10h	00h	E1h		
1 Byte	2 Bytes	1 Byte	1 Byte	1 Byte	1 Byte	2 Bytes

Tag See definitions above.

2.2.1.3

Reader Reset Command: E5h

Request Reader Version

SOF	Length	Device ID	CMD Flgs	CMD	BCC
01h	08h	10h		E5h	
1 Byte	2 Bytes	1 Byte	1 Byte	1 Byte	2 Bytes

Reader Version Response

SOF	Length	Device ID	Resp. Flgs	CMD	BCC
01h	08h	10h	00h	E5h	
1 Byte	2 Bytes	1 Byte	1 Byte	1 Byte	2 Bytes

2.2.1.4

Reader Antenna Tune Command: E6h

Request Set Antenna Tune

SOF	Length	Device ID	CMD Flgs	CMD	Write	Value*	BCC
01h	0Ah	10h		E6h	01h		
1 Byte	2 Bytes	1 Byte	1 Byte	1 Byte	1 Byte	1 Byte	2 Bytes

Value* 3 most significant bits, i.e. 00 - E0

Set Antenna Tune Response

SOF	Length	Device ID	Resp. Flgs	CMD	Status	BCC
01h	09h	10h	00h	E6h	00h	
1 Byte	2 Bytes	1 Byte	1 Byte	1 Byte	1 Byte	2 Bytes

Request Read Antenna Current Setting

SOF	Length	Device ID	CMD Flgs	CMD	Read	BCC
01h	09h	10h		E6h	00h	
1 Byte	2 Bytes	1 Byte	1 Byte	1 Byte	1 Byte	2 Bytes

Read Antenna Current Setting Response

SOF	Length	Device ID	Resp. Flgs	CMD	Value*	BCC
01h	09h	10h	00h	E6h		
1 Byte	2 Bytes	1 Byte	1 Byte	1 Byte	1 Byte	2 Bytes

Value* 3 most significant bits, i.e. 00 - E0

2.2.1.5 Reader Setup Command: E7h

Request Setup, Legacy Version

SOF	Length	Device ID	CMD Flgs	CMD	BCC
01h	08h	10h		E7h	
1 Byte	2 Bytes	1 Byte	1 Byte	1 Byte	2 Bytes

Reader Setup Response

SOF	Length	Device ID	Resp. Flgs	CMD	Mode 1*	Mode 2**	Baudrate	Wgn AFI	Enc Mode	BCC
01h	0Dh	10h	00h	E7h						
1 Byte	2 Bytes	1 Byte	1 Byte	1 Byte	1 Byte	1 Byte	1 Byte	1 Byte	1 Byte	2 Bytes

* - Mode Byte 1:

bit	Definition
6	Weigand UID Mode
7	Weigand Encrypted Data

Baud rate: 0 = 9600bps, 1 = 19200bps,
2 = 38400bps

** - Mode Byte 2:

bit	Definition
0	RF On
2	LED w/success cmd
3	Audio " "
4	Wiegand Rd 14443-A
5	Weigand Rd 15693
6	Weigand Read Tag-it

Encryption Mode:

bit	Definition
0	Use Custom Key
1	Plain Text/No encrypt

Request Setup, Extended Version

SOF	Length	Device ID	CMD Flgs	CMD	BCC
01h	08h	10h		E7h	
1 Byte	2 Bytes	1 Byte	1 Byte	1 Byte	2 Bytes

Reader Setup Response, Extended Version, Ext Cmd = 0

SOF	Length	Device ID	Resp. Flgs	CMD	Mode 1*	Mode 2**	Baudrate	Wgn AFI	Enc Mode	BCC
01h	0Dh	10h	00h	E7h						
1 Byte	2 Bytes	1 Byte	1 Byte	1 Byte	1 Byte	1 Byte	1 Byte	1 Byte	1 Byte	2 Bytes

* - Mode Byte 1:

bit	Definition
6	Weigand UID Mode
7	Weigand Encrypted Data

Baud rate: 0 = 9600bps, 1 = 19200bps,
2 = 38400bps

** - Mode Byte 2:

bit	Definition
0	RF On
2	LED w/success cmd
3	Audio " "
4	Wiegand Rd 14443-A
5	Weigand Rd 15693
6	Weigand Read Tag-it

Encryption Mode:

bit	Definition
0	Use Custom Key
1	Plain Text/No encrypt

2.2.1.6

Start Flash Loader Command: E8h

Request Start Flash Loader

SOF	Length	Device ID	CMD Flgs	CMD	BCC
01h	08h	10h		E8h	
1 Byte	2 Bytes	1 Byte	1 Byte	1 Byte	2 Bytes

Start Flash Loader Response

Flash loader function starts at 38400 baud

2.2.1.7

Get Reader Information Command: EBh

Request Reader Information

SOF	Length	Device ID	CMD Flgs	CMD	BCC
01h	08h	10h		EBh	
1 Byte	2 Bytes	1 Byte	1 Byte	1 Byte	2 Bytes

Reader Information Response

SOF	Length	Device ID	Resp. Flgs	CMD	Serial #	Life (hrs)	Version	BCC
01h	14h	10h	00h	EBh				
1 Byte	2 Bytes	1 Byte	1 Byte	1 Byte	8 Bytes	2 Bytes	2 Bytes	2 Bytes

2.2.1.8

Set Secondary DES Key: ECh

Request Reader Information

SOF	Length	Device ID	CMD Flgs	CMD	DES Mode	Key Val	BCC
01h	11h	10h		ECh			
1 Byte	2 Bytes	1 Byte	1 Byte	1 Byte	1 Byte	8 Bytes	2 Bytes

DES Mode bit 0 = Use Secondary Key, bit 1 = Plain text/no encryption

Reader Information Response

SOF	Length	Device ID	Resp. Flgs	CMD	BCC
01h	08h	10h	00h	ECh	
1 Byte	2 Bytes	1 Byte	1 Byte	1 Byte	2 Bytes

2.2.1.9 Set Reader Mode: Edh

Set Reader Weigand Mode

SOF	Length	Device ID	CMD Flgs	CMD	Mode 1*	Mode 2**	AFI***	BCC
01h	0Bh****	10h		EDh				
1 Byte	2 Bytes	1 Byte	1 Byte	1 Byte	1 Byte	1 Byte	1 Byte	2 Bytes

* - Mode 1 Definition

Value	Definition
3	Turn On RF Transmitter
4	Turn Off RF Transmitter
7	Set LED and Audio options
9	Wiegand Read ISO 14443-A tags
10	Wiegand Read ISO 15693 tags
11	Wiegand Read Tag-it Tags
14	Set Baud Rate 9600 bps
14	Set Baud Rate 19200 bps
16	Set Baud Rate 38400 bps
17	Set Baud Rate 57600 bps
18	Cmd Mode 15693 Tag Type

**Mode 2 Definition for Mode 1 Value = 9, 10, 11

**Mode 2 Definition for Wiegand Modes

Value	Definition
0	Report UID 26 bits
1	Report Encrypted Wiegand
2	Report UID 32 bits
3	Report UID 36 bits
4	Report UID 64 bits

**Mode 2 Definition for LED and Audio Modes

bit	Definition
2	LED On w/successful cmd
3	Audio On w/successful cmd

2.2.1.10

Activate LED: EEh

Activate LED

SOF	Length	Device ID	CMD Flgs	CMD	Spare	Color*	Time**	BCC
01h	0Ch	10h		EEh	0			
1 Byte	2 Bytes	1 Byte	1 Byte	1 Byte	1 Byte	1 Byte	2 Bytes	2 Bytes

* - Color is defined as 1 = red, 2 = Green, 3 = Amber

** - Time is in 5 msec increments, i.e. 1 = 5msec.

Activate LED Response

SOF	Length	Device ID	Resp. Flgs	CMD	BCC
01h	08h	10h	00h	EEh	
1 Byte	2 Bytes	1 Byte	1 Byte	1 Byte	2 Bytes

2.2.1.11

Activate Audio: EFh

Activate Audio

SOF	Length	Device ID	CMD Flgs	CMD	Spare	Time**	BCC
01h	0Bh	10h		EFh	0		
1 Byte	2 Bytes	1 Byte	1 Byte	1 Byte	1 Byte	2 Bytes	2 Bytes

** - Time is in 5 msec increments, i.e. 1 = 5msec.

Activate Audio Response

SOF	Length	Device ID	Resp. Flgs	CMD	BCC
01h	08h	10h	00h	EFh	
1 Byte	2 Bytes	1 Byte	1 Byte	1 Byte	2 Bytes

2.3.0 ISO 14443-A Commands

2.3.1.1

View UID: 40h

View UID

SOF	Length	Device ID	CMD Flgs	CMD	Spare	BCC
01h	09h	10h	80h	40h	00h	
1 Byte	2 Bytes	1 Byte	1 Byte	1 Byte	1 Bytes	2 Bytes

View UID Response

SOF	Length	Device ID	Resp. Flgs	CMD	Address	BCC
01h	0Dh	10h	00h	40h	UID	
1 Byte	2 Bytes	1 Byte	1 Byte	1 Byte	4 Bytes	2 Bytes

2.4.0 Tag-it Command Codes

Table 6: Tag-it Command Codes

ISO 15693 Commands	Command Code
Inventory	0Dh
Read a Single Block	07h
Write a Single Block	03h
Lock a Single Block	04h
Read Tag Information	05h
Write and Lock Block	06h

2.4.1.1

Tag-it Inventory Command: 0Dh

Inventory (unaddressed)

SOF	Length	Device ID	CMD Flgs	CMD	BCC
01h	08h	10h	80h	0Dh	
1 Byte	2 Bytes	1 Byte	1 Byte	1 Byte	2 Bytes

Inventory Response

SOF	Length	Device ID	Resp. Flgs	CMD	Data	Address	Data	BCC
01h	0Ah***	10h	00h*	0Dh	Num Tags	UID**	Last Flag	
1 Byte	2 Bytes	1 Byte	1 Byte	1 Byte	1 Byte	4 Bytes	1 Byte	2 Bytes

* 00h indicates successful read

** Repeated based on number of tags field

*** 0Ah + 4*(num tags)

2.4.1.2

Read a Single Block Command: 07h

Read a Single Block (unaddressed)

SOF	Length	Device ID	CMD Flgs	CMD	Data	BCC
01h	09h	10h		07h	Blk #	
1 Byte	2 Bytes	1 Byte	1 Byte	1 Byte	1 Byte	2 Bytes

01 0D 00 10 90 07 82 FB B3 00 03 42 B

Read a Single Block (addressed)

SOF	Length	Device ID	CMD Flgs	CMD	Address	Data	BCC
01h	0Dh	10h	90h	07h	UID	Blk #	
1 Byte	2 Bytes	1 Byte	1 Byte	1 Byte	4 Bytes	1 Byte	2 Bytes

Read a Single Block Response (32 bits)

SOF	Length	Device ID	Resp. Flgs	CMD	Data	Spare	Data	BCC
01h	0Eh	10h	00h*	07h	Blk Data	00h	Blk #	
1 Byte	2 Bytes	1 Byte	1 Byte	1 Byte	4 Bytes	1 Byte	1 Byte	2 Bytes

* 00h indicates successful read

2.5.1 EAS Commands

Table 7: EAS Command Codes

ISO 15693 Custom Commands	Command Code
RFU	A0h
RFU	A1h
Set EAS	A2h
Reset EAS	A3h
RFU	A4h
Test EAS	A5h
RFU	A6h
RFU	A7h
RFU	A8h
RFU	A9h
RFU	AAh
RFU	ABh
RFU	ACH
RFU	ADh
RFU	Aeh
RFU	Afh

2.5.1.1 Set EAS: A2h

Set EAS (unaddressed)

SOF	Length	Device ID	CMD Flgs	CMD	MfgID*	BCC
01h	09h	10h		A2h		
1 Byte	2 Bytes	1 Byte	1 Byte	1 Byte	1 Byte	2 Bytes

*04=Philips, 02=ST Micro

Set EAS (addressed)

SOF	Length	Device ID	CMD Flgs	CMD	MfgID*	UID	BCC
01h	11h	10h		A2h			
1 Byte	2 Bytes	1 Byte	1 Byte	1 Byte	1 Byte	8 Bytes	2 Bytes

*04=Philips, 02=ST Micro

Set EAS Response

SOF	Length	Device ID	Resp. Flgs*	CMD	Error**	BCC
01h	09h	10h		A2h		
1 Byte	2 Bytes	1 Byte	1 Byte	1 Byte	1 Byte	2 Bytes

*00=Pass, *02=Fail

**00=Pass, *01=Fail

2.5.1.2 Reset EAS: A3h

Reset EAS (unaddressed)

SOF	Length	Device ID	CMD Flgs	CMD	MfgID*	BCC
01h	09h	10h		A3h		
1 Byte	2 Bytes	1 Byte	1 Byte	1 Byte	1 Byte	2 Bytes

*04=Philips, 02=ST Micro

Reset EAS (addressed)

SOF	Length	Device ID	CMD Flgs	CMD	MfgID*	UID
01h	11h	10h		A3h		
1 Byte	2 Bytes	1 Byte	1 Byte	1 Byte	1 Byte	8 Bytes

*04=Philips, 02=ST Micro

Reset EAS Response

SOF	Length	Device ID	Resp. Flgs*	CMD	Error**	BCC
01h	09h	10h		A3h		
1 Byte	2 Bytes	1 Byte	1 Byte	1 Byte	1 Byte	2 Bytes

*00=Pass, *02=Fail

**00=Pass, *01=Fail

2.5.1.3 Test EAS: A5h**Test EAS (unaddressed)**

SOF	Length	Device ID	CMD Flgs	CMD	MfgID*	BCC
01h	09h	10h		A5h		
1 Byte	2 Bytes	1 Byte	1 Byte	1 Byte	1 Byte	2 Bytes

*04=Philips, 02=ST Micro

Test EAS (addressed)

SOF	Length	Device ID	CMD Flgs	CMD	MfgID*	UID
01h	11h	10h		A5h		
1 Byte	2 Bytes	1 Byte	1 Byte	1 Byte	1 Byte	8 Bytes

*04=Philips, 02=ST Micro

Test EAS Response

SOF	Length	Device ID	Resp. Flgs*	CMD	Error**	BCC
01h	09h	10h		A5h		
1 Byte	2 Bytes	1 Byte	1 Byte	1 Byte	1 Byte	2 Bytes

*00=Pass, *02=Fail

**00=Pass, *01=Fail