

TWN4

Simple Protocol

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1 Simple Protocol

This document describes the serial protocol of TWN4.

In order to operate this protocol, a firmware type TWN4_Cxvvv_PRSwww.bix is required, where vvv and www are the version numbers.

A firmware as mentioned above combines virtual USB (CDC) or true serial communication with an TWN4 app, which implements the simple protocol (PRS = PRotocol Simple).

This protocol is called simple because it is based on a communication with ASCII characters which can also be tested manually by using a terminal program. There is no additional overhead for things like packet repetition, address bytes...

The communication is based on a command/response structure: TWN4 will only send data to the host as a response of a command. Command and response are lines of bytes terminated by a carriage return. Carriage return is not shown explicitly anymore in the following documentation. A byte is always represented and transmitted by two hexadecimal ASCII characters.

1.1 Command

A command always starts with two bytes which reflect the API and function number to be executed.

1.2 Response

A response always starts with a byte, which reflects execution of the command on protocol level. Following possible error values:

ERR_NONE	0
ERR_UNKNOWN_FUNCTION	1
ERR_MISSING_PARAMETER	2

ERR_UNUSED_PARAMETERS 3
ERR_INVALID_FUNCTION 4
ERR_PARSER 5

The description of the commands is using data types, which have to be built-up as follows:

Data Type	Description
[Byte]:	One single byte (sent as two hex digits)
[UInt16]:	Two bytes (LSB first)
[UInt32]:	Four bytes (LSB first)
[Bool]:	One single byte which can hold two values: 0 or 1
[Byte Array(n)]:	A sequence of bytes with known and fixed number of bytes. The number of bytes is not transferred explicitly, because both host and TWN4 do know this number.
[Byte Array(Var)]:	A sequence of bytes, where the first byte holds the number of following bytes

1.3 Commands

1.3.1 API SYS

1.3.1.1 Reset

Command:	[0001]
Response:	[00]
Example	
Command:	00 01
Response:	-

1.3.1.2 StartBootloader

Command:	[0002]
Response:	[00]
Example	
Command:	00 02
Response:	-

1.3.1.3 GetSysTicks

Command:	[0003]
Response:	[00][UInt32: <i>Ticks</i>]
Example	
Command:	00 03
Response:	00 D3 48 07 00 (Ticks: 477395)

1.3.1.4 GetVersionString

Command:	[0004][Byte: <i>MaxLen</i>]
Response:	[00][AS: <i>Version</i>]
Example	
Command:	00 04 1E (MaxLen: 30)
Response:	00 1B 54 57 4E 34 2F 42 31 2E 30 33 2F 43 46 31 2E 32 32 2F 50 52 53 31 2E 32 32 2F 50 (Version: TWN4/B1.03/CF1.22/PRS1.22/P)

1.3.1.5 GetUSBType

Command:	[0005]
Response:	[00][Byte: <i>Type</i>]
Example	
Command:	00 05
Response:	00 01 (Type: 01)

1.3.1.6 GetDeviceType

Command:	[0006]
Response:	[00][Byte: <i>Type</i>]
Example	
Command:	00 06
Response:	00 0B (Type: 0B(11))

1.3.2 API IO**1.3.2.1 WriteByte**

Command:	[0100][Byte: <i>Channel</i>][Byte: <i>Byte</i>]
Response:	[00]
Example	
Command:	01 00 01 61 (Channel: 01 (USB), Byte: 61 ('a'))
Response:	a00

1.3.2.2 ReadByte

Command:	[0101][Byte: <i>Channel</i>]
Response:	[00][Byte: <i>Byte</i>]
Example Command:	01 01 01
Response:	

1.3.2.3 TestEmpty

Command:	[0102][Byte: <i>Channel</i>][Byte: <i>Dir</i>]
Response:	[00][Bool: <i>Result</i>]
Example Command:	01 02 01 01 (Channel: 01 (USB), Dir: 01 (IN))
Response:	00 01 (Result: 01 (true))

1.3.2.4 TestFull

Command:	[0103][Byte: <i>Channel</i>][Byte: <i>Dir</i>]
Response:	[00][Bool: <i>Result</i>]
Example Command:	01 03 01 01 (Channel: 01 (USB), Dir: 01 (IN))
Response:	00 00 (Result: 00 (false))

1.3.2.5 GetBufferSize

Command:	[0104][Byte: <i>Channel</i>][Byte: <i>Dir</i>]
Response:	[00][UInt16: <i>BufferSize</i>]
Example	
Command:	01 04 01 01 (Cannel: 01 (USB), Dir: 01 (IN))
Response:	00 C8 00 (BufferSize: C8 00 (200))

1.3.2.6 GetByteCount

Command:	[0105][Byte: <i>Channel</i>][Byte: <i>Dir</i>]
Response:	[00][UInt16: <i>ByteCount</i>]
Example	
Command:	01 05 01 01 (Cannel: 01 (USB), Dir: 01 (IN))
Response:	00 00 00 (ByteCount: 00 00)

1.3.2.7 HostWriteByte

Command:	[0106][Byte: <i>Byte</i>]
Response:	[00]
Example	
Command:	01 06 61 (Byte: 61 ('a'))
Response:	a00

1.3.2.8 HostTestByte

Command:	[0107]
Response:	[00][Bool: <i>Result</i>]
Example	
Command:	01 07
Response:	00 00 (Result: 00 (false))

1.3.2.9 HostReadByte

Command:	[0108]
Response:	[00][Byte: <i>Byte</i>]
Example	
Command:	01 08
Response:	

1.3.2.10 SetCOMParameters

Command:	[0109][Byte: <i>Channel</i>][UInt32: <i>Baudrate</i>][Byte: <i>WordLength</i>][Byte: <i>Parity</i>][Byte: <i>StopBits</i>][Byte: <i>FlowControl</i>]
Response:	[00][Bool: <i>Result</i>]
Example	
Command:	01 09 03 80 25 00 00 08 00 02 00 (Channel: 03 (COM2), Baudrate: 80 25 00 00 (9600), WordLength: 08, Parity: 00, StopBits: 02 (1), FlowControl: 00)
Response:	00 01

1.3.2.11 GetUSBDeviceState

Command:	[010A]
Response:	[00][Byte: <i>State</i>]
Example	
Command:	01 0A
Response:	00 03 (State: 03 (USB_DEVICE_STATE_CONFIGURED))

1.3.2.12 GetHostChannel

Command:	[010B]
Response:	[00][Byte: <i>Channel</i>]
Example	
Command:	01 0B
Response:	00 01 (Channel: 01 (CHANNEL_USB))

1.3.3 API PERIPH**1.3.3.1 GPIOConfigureOutputs**

Command:	[0400][Byte: <i>Bits</i>][Byte: <i>PullUpDown</i>][Byte: <i>OutputType</i>]
Response:	[00]
Example	
Command:	04 00 01 00 00 (Bits: 01 (REDLED), PullUpDown: 00 (GPIO_PUPD_NOPULL), Output-Type: 00 (GPIO_OTYPE_PUSH_PULL))
Response:	00

1.3.3.2 GPIOConfigureInputs

Command:	[0401][Byte: <i>Bits</i>][Byte: <i>PullUpDown</i>]
Response:	[00]
Example	
Command:	04 01 01 00 (Bits: 01 (GPIO0), 00 (GPIO_PUPD_NOPULL))
Response:	00

1.3.3.3 GPIOSetBits

Command:	[0402][Byte: <i>Bits</i>]
Response:	[00]
Example	
Command:	04 02 01 (Bits: 01 (REDLED))
Response:	00

1.3.3.4 GPIOClearBits

Command:	[0403][Byte: <i>Bits</i>]
Response:	[00]
Example	
Command:	04 03 01 (Bits: 01 (REDLED))
Response:	00

1.3.3.5 GPiOToggleBits

Command:	[0404][Byte: <i>Bits</i>]
Response:	[00]
Example	
Command:	04 04 01 (Bits: 01 (REDLED))
Response:	00

1.3.3.6 GPiOBlinkBits

Command:	[0405][Byte: <i>Bits</i>][UInt16: <i>TimeHi</i>][UInt16: <i>TimeLo</i>]
Response:	[00]
Example	
Command:	04 05 01 64 00 64 00 (Bits: 01 (REDLED), TimeHi: 64 00 (100ms), TimeLo: 64 00 (100ms))
Response:	00

1.3.3.7 GPiOTestBit

Command:	[0406][Byte: <i>Bit</i>]
Response:	[00][Byte: <i>Result</i>]
Example	
Command:	04 06 01 (Bit: 01 (REDLED))
Response:	00 00 (Result: 00)

1.3.3.8 Beep

Command:	[0407][Byte: <i>Volume</i>][UInt16: <i>Frequency</i>][UInt16: <i>OnTime</i>][UInt16: <i>OffTime</i>]
Response:	[00]
Example	
Command:	04 07 64 60 09 F4 01 F4 01 (Volume: 64 (100), Frequency: 60 09 (BEEP_FREQUENCY_HIGH), OnTime: F4 01 (500ms), OffTime: F4 01 (500ms))
Response:	00

1.3.3.9 DiagLEDOn

Command:	[0408]
Response:	[00]
Example	
Command:	04 08
Response:	00

1.3.3.10 DiagLEDOff

Command:	[0409]
Response:	[00]
Example	
Command:	04 09
Response:	00

1.3.3.11 DiagLEDToggle

Command:	[040A]
Response:	[00]
Example	
Command:	04 0A
Response:	00

1.3.3.12 DiagLEDIsOn

Command:	[040B]
Response:	[00][Bool: <i>Result</i>]
Example	
Command:	04 0B
Response:	00 01 (Result: 01 (true))

1.3.3.13 SendWiegand

Command:	[040C][Byte: <i>GPIOData0</i>][Byte: <i>GPIOData1</i>][UInt16: <i>PulseTime</i>][UInt16: <i>IntervalTime</i>][Byte Array(Var): <i>Bits</i>][Byte: <i>BitCount</i>]
Response:	[00]
Example	
Command:	04 0C 04 08 64 00 E8 03 01 AA 08 (GPIOData0: 04 (GPIO2), GPIOData1: 08 (GPIO3), PulseTime: 64 00 (100ms), IntervalTime: E8 03 (1000ms), Bits: 01 AA (Length = 1 Byte, Value = AA), BitCount: 08)
Response:	00

1.3.3.14 SendOmron

Command:	[040D][Byte: <i>GPIOClock</i>][Byte: <i>GPIOData</i>][UInt16: <i>T1</i>][UInt16: <i>T2</i>][UInt16: <i>T3</i>][Byte Array(Var): <i>Bits</i>][Byte: <i>BitCount</i>]
Response:	[00]
Example	
Command:	04 0D 04 08 F4 01 F4 01 F4 01 01 AA 08 (GPIOClock: 04 (GPIO2), GPIOData: 08 (GPIO3), T1: F4 01 (500ms), T2: F4 01 (500ms), T3: F4 01 (500ms), Bits: 01 AA (Length = 1 Byte, Value = AA), BitCount: 08)
Response:	00

1.3.4 API RF

1.3.4.1 SearchTag

Command:	[0500][Byte: <i>MaxIDBytes</i>]
Response:	[00][Bool: <i>Result</i>][Byte: <i>TagType</i>][Byte: <i>IDBitCount</i>][Byte Array(Var): <i>ID</i>]
Example	
Command:	05 00 10 MaxIDBytes: 10 (16)
Response:	00 01 80 20 04 9E C3 94 12 (Result: 01 (true), TagType: 80(ISO14443A / Mifare), IDBitCount: 20(32), ID: 04 9E C3 94 12 (Lenth: 04, Value: 9E C3 94 12))

1.3.4.2 SetRFOff

Command:	[0501]
Response:	[00]
Example	
Command:	05 01
Response:	00

1.3.4.3 SetTagTypes

Command:	[0502][UInt32: <i>TagTypesLF</i>][UInt32: <i>TagTypesHF</i>]
Response:	[00]
Example	
Command:	05 02 FF FF 0F 00 FF FF 0F 00 (TagTypesLF: FF FF 0F 00 (ALLTAGS), TagTypesHF: FF FF 0F 00 (ALLTAGS))
Response:	00

1.3.4.4 GetTagTypes

Command:	[0503]
Response:	[00][UInt32: <i>LFTagTypes</i>][UInt32: <i>HFTagTypes</i>]
Example	
Command:	05 03
Response:	00 07 7E 00 00 77 00 00 00 (LFTagTypes: 07 7E 00 00 (32263), HFTagTypes: 77 00 00 00 (119))

1.3.4.5 GetSupportedTagTypes

Command:	[0504]
Response:	[00][UInt32: <i>LFTagTypes</i>][UInt32: <i>HFTagTypes</i>]
Example	
Command:	05 04
Response:	00 07 7E 00 00 77 00 00 00 (LFTagTypes: 07 7E 00 00 (32263), HFTagTypes: 77 00 00 00 (119))

1.3.5 API TILF

1.3.5.1 TILF_SearchTag

Command:	[0600][Byte: <i>MaxIDBytes</i>]
Response:	[00][Bool: <i>Result</i>][Byte: <i>IDBitCount</i>][Byte Array(Var): <i>ID</i>]
Example	
Command:	06 00 10
Response:	00 01 40 08 00 00 00 00 05 5E F7 A1 (Result: 01 (true), IDBitCount: 40 (64), ID: 08 00 00 00 00 05 5E F7 A1 (Length: 08, Value: 00 00 00 00 05 5E F7 A1))

1.3.5.2 TILF_ChargeOnlyRead

Command:	[0601]
Response:	[00][Bool: <i>Result</i>][Byte Array(8): <i>Data</i>]
Example	
Command:	06 01
Response:	00 01 00 00 00 00 05 5E F7 A1 (Result: 01 (true), Data: 00 00 00 00 05 5E F7 A1)

1.3.5.3 TILF_ChargeOnlyReadLo

Command:	[0602]
Response:	[00][Bool: <i>Result</i>][Byte Array(16): <i>ReadData</i>]
Example	
Command:	06 02
Response:	00 01 00 00 7E 85 EF 7A A0 00 00 00 00 CE CF 7E 00 00 (Result: 01 (true), ReadData: 00 00 7E 85 EF 7A A0 00 00 00 00 CE CF 7E 00 00)

1.3.5.4 TILF_SPPProgramPage

Command:	[0603][Byte Array(8): <i>WriteData</i>]
Response:	[00][Bool: <i>Result</i>][Byte Array(16): <i>ReadData</i>]
Example	
Command:	06 03 xx xx xx xx xx xx xx xx
Response:	

1.3.5.5 TILF_SPPProgramPageLo

Command:	[0604][Byte Array(10): <i>WriteData</i>]
Response:	[00][Bool: <i>Result</i>][Byte Array(16): <i>ReadData</i>]
Example	
Command:	06 04 xx xx xx xx xx xx xx xx xx xx
Response:	

1.3.5.6 TILF_MPGeneralReadPage

Command:	[0605][Byte: <i>Address</i>]
Response:	[00][Bool: <i>Result</i>][Byte Array(8): <i>ReadData</i>]
Example	
Command:	060500 (Address: 00)
Response:	00 01 00 00 00 00 05 5E F7 A1 (Result: 01 (true), ReadData: 00 00 00 00 05 5E F7 A1)

1.3.5.7 TILF_MPSelectiveReadPage

Command:	[0606][Byte: <i>Address</i>][Byte Array(3): <i>SelectiveAddress</i>]
Response:	[00][Bool: <i>Result</i>][Byte Array(8): <i>ReadData</i>]
Example	
Command:	06 06 00 00 00 00 (Address: 00, SelectiveAddress: 00 00 00)
Response:	00 01 00 00 00 00 05 5E F7 A1 (Result: 01 (true), ReadData: 00 00 00 00 05 5E F7 A1)

1.3.5.8 TILF_MPProgramPage

Command:	[0607][Byte: <i>Address</i>][Byte Array(8): <i>WriteData</i>]
Response:	[00][Bool: <i>Result</i>][Byte Array(8): <i>ReadData</i>]
Example	
Command:	06 07 xx xx xx xx xx xx xx xx
Response:	

1.3.5.9 TILF_MPSelectiveProgramPage

Command:	[0608][Byte: <i>Address</i>][Byte Array(3): <i>SelectiveAddress</i>][Byte Array(8): <i>WriteData</i>]
Response:	[00][Bool: <i>Result</i>][Byte Array(8): <i>ReadData</i>]
Example	
Command:	06 08 xx xx xx xx xx xx xx xx xx xx xx xx
Response:	

1.3.5.10 TILF_MPLockPage

Command:	[0609][Byte: <i>Address</i>]
Response:	[00][Bool: <i>Result</i>][Byte Array(8): <i>ReadData</i>]
Example	
Command:	06 09 00 (Address: 00)
Response:	00 01 00 00 00 00 05 5E F7 A1 (Result: 01 (true), ReadData: 00 00 00 00 05 5E F7 A1)

1.3.5.11 TILF_MPSelectiveLockPage

Command:	[060A][Byte: <i>Address</i>][Byte Array(3): <i>SelectiveAddress</i>]
Response:	[00][Bool: <i>Result</i>][Byte Array(8): <i>ReadData</i>]
Example	
Command:	06 0A 00 00 00 00
Response:	00 01 00 00 00 00 05 5E F7 A1 (Result: 01 (true), ReadData: 00 00 00 00 05 5E F7 A1)

1.3.5.12 TILF_MPGeneralReadPageLo

Command:	[060B][Byte: <i>Address</i>]
Response:	[00][Bool: <i>Result</i>][Byte Array(16): <i>ReadData</i>]
Example	
Command:	06 0B 00 (Address: 00)
Response:	00 01 00 00 7E 85 EF 7A A0 00 00 00 00 CE CF 7E 00 00 (Result: 01 (true), ReadData: 00 00 7E 85 EF 7A A0 00 00 00 00 CE CF 7E 00 00)

1.3.5.13 TILF_MPSelectiveReadPageLo

Command:	[060C][Byte: <i>Address</i>][Byte Array(3): <i>SelectiveAddress</i>]
Response:	[00][Bool: <i>Result</i>][Byte Array(16): <i>ReadData</i>]
Example	
Command:	06 0C 00 00 00 00 (Address: 00), SelectiveAddress: 00 00 00
Response:	00 01 00 00 7E 85 EF 7A A0 00 00 00 00 CE CF 7E 00 00 (Result: 01 (true), ReadData: 00 00 7E 85 EF 7A A0 00 00 00 00 CE CF 7E 00 00)

1.3.5.14 TILF_MPProgramPageLo

Command:	[060D][Byte: <i>Address</i>][Byte Array(10): <i>WriteData</i>]
Response:	[00][Bool: <i>Result</i>][Byte Array(16): <i>ReadData</i>]
Example	
Command:	06 0D xx xx xx xx xx xx xx xx xx xx
Response:	

1.3.5.15 TILF_MPSelectiveProgramPageLo

Command:	[060E][Byte: <i>Address</i>][Byte Array(3): <i>SelectiveAddress</i>][Byte Array(10): <i>WriteData</i>]
Response:	[00][Bool: <i>Result</i>][Byte Array(16): <i>ReadData</i>]
Example	
Command:	06 0E xx xx xx xx xx xx xx xx xx xx xx xx xx xx
Response:	

1.3.5.16 TILF_MPLockPageLo

Command:	[060F][Byte: <i>Address</i>]
Response:	[00][Bool: <i>Result</i>][Byte Array(16): <i>ReadData</i>]
Example	
Command:	06 0F 00 (Address: 00)
Response:	00 01 00 00 7E 85 EF 7A A0 00 00 00 00 CE CF 7E 00 00 (Result: 01 (true), ReadData: 00 00 7E 85 EF 7A A0 00 00 00 00 CE CF 7E 00 00)

1.3.5.17 TILF_MPSelectiveLockPageLo

Command:	[0610][Byte: <i>Address</i>][Byte Array(3): <i>SelectiveAddress</i>]
Response:	[00][Bool: <i>Result</i>][Byte Array(16): <i>ReadData</i>]
Example	
Command:	06 10 00 00 00 00 (Address: 00, SelectiveAddress: 00 00 00)
Response:	00 01 00 00 7E 85 EF 7A A0 00 00 00 00 CE CF 7E 00 00 (Result: 01 (true), ReadData: 00 00 7E 85 EF 7A A0 00 00 00 00 CE CF 7E 00 00)

1.3.5.18 TILF_MUGeneralReadPage

Command:	[0611][Byte: <i>Address</i>]
Response:	[00][Bool: <i>Result</i>][Byte Array(7): <i>Data</i>]
Example	
Command:	06 11 xx
Response:	

1.3.5.19 TILF_MUSelectiveReadPage

Command:	[0612][Byte: <i>Address</i>][Byte: <i>SelectiveAddress</i>]
Response:	[00][Bool: <i>Result</i>][Byte Array(7): <i>Data</i>]
Example	
Command:	06 12 xx xx
Response:	

1.3.5.20 TILF_MUSpecialReadPage

Command:	[0613][Byte: <i>Address</i>][Byte Array(5): <i>SpecialAddress1</i>][Byte Array(3): <i>SpecialAddress2</i>]
Response:	[00][Bool: <i>Result</i>][Byte Array(7): <i>Data</i>]
Example	
Command:	06 13 xx xx xx xx xx xx xx xx xx
Response:	

1.3.5.21 TILF_MUProgramPage

Command:	[0614][Byte: <i>Address</i>][Byte Array(5): <i>WriteData</i>]
Response:	[00][Bool: <i>Result</i>][Byte Array(7): <i>ReadData</i>]
Example	
Command:	06 14 xx xx xx xx xx xx
Response:	

1.3.5.22 TILF_MUSelectiveProgramPage

Command:	[0615][Byte: <i>Address</i>][Byte: <i>SelectiveAddress</i>][Byte Array(5): <i>WriteData</i>]
Response:	[00][Bool: <i>Result</i>][Byte Array(7): <i>ReadData</i>]
Example	
Command:	06 15 xx xx xx xx xx xx xx
Response:	

1.3.5.23 TILF_MUSpecialProgramPage

Command:	[0616][Byte: <i>Address</i>][Byte Array(5): <i>SpecialAddress1</i>][Byte Array(3): <i>SpecialAddress2</i>][Byte Array(5): <i>WriteData</i>]
Response:	[00][Bool: <i>Result</i>][Byte Array(7): <i>ReadData</i>]
Example	
Command:	06 16 xx xx xx xx xx xx xx xx xx xx xx xx xx xx
Response:	

1.3.5.24 TILF_MULockPage

Command:	[0617][Byte: <i>Address</i>]
Response:	[00][Bool: <i>Result</i>][Byte Array(7): <i>ReadData</i>]
Example	
Command:	06 17 xx
Response:	

1.3.5.25 TILF_MUSelectiveLockPage

Command:	[0618][Byte: <i>Address</i>][Byte: <i>SelectiveAddress</i>]
Response:	[00][Bool: <i>Result</i>][Byte Array(7): <i>ReadData</i>]
Example	
Command:	06 18 xx xx
Response:	

1.3.5.26 TILF_MUSpecialLockPage

Command:	[0619][Byte: <i>Address</i>][Byte Array(5): <i>SpecialAddress1</i>][Byte Array(3): <i>SpecialAddress2</i>]
Response:	[00][Bool: <i>Result</i>][Byte Array(7): <i>ReadData</i>]
Example	
Command:	06 19 xx xx xx xx xx xx xx xx
Response:	

1.3.6 API HITAG1S**1.3.6.1 Hitag1S_ReadPage**

Command:	[0701][Byte: <i>PageAddress</i>]
Response:	[00][Bool: <i>Result</i>][Byte Array(4): <i>Data</i>]
Example	
Command:	07 01 04 (PageAddress: 04)
Response:	00 01 11 22 33 44 (Result: 01 (true), Data: 11 22 33 44)

1.3.6.2 Hitag1S_ReadBlock

Command:	[0702][Byte: <i>BlockAddress</i>]
Response:	[00][Bool: <i>Result</i>][Byte Array(Var): <i>Data</i>]
Example	
Command:	07 02 04 (BlockAddress: 04)
Response:	00 01 10 00 11 22 33 44 55 66 77 88 99 AA BB CC DD EE FF (Result: 01 (true), Data: 00 11 22 33 44 55 66 77 88 99 AA BB CC DD EE FF)

1.3.6.3 Hitag1S_WritePage

Command:	[0703][Byte: <i>PageAddress</i>][Byte Array(4): <i>Data</i>]
Response:	[00][Bool: <i>Result</i>]
Example	
Command:	07 03 04 11 22 33 44 (PageAddress: 04)
Response:	Response: 00 01 (Result: 01 (true))

1.3.6.4 Hitag1S_WriteBlock

Command:	[0704][Byte: <i>BlockAddress</i>][Byte Array(16): <i>Data</i>]
Response:	[00][Bool: <i>Result</i>][Byte: <i>BytesWritten</i>]
Example	
Command:	07 04 04 00 11 22 33 44 55 66 77 88 99 AA BB CC DD EE FF (BlockAddress: 04, Data: 00 11 22 33 44 55 66 77 88 99 AA BB CC DD EE FF)
Response:	00 01 10 (Result: 01 (true), BytesWritten: 10 (16))

1.3.6.5 Hitag1S_Halt

Command:	[0705]
Response:	[00][Bool: <i>Result</i>]
Example	
Command:	07 05
Response:	00 01 (Result: 01 (true))

1.3.7 API HITAG2

1.3.7.1 Hitag2_ReadPage

Command:	[0801][Byte: <i>PageAddress</i>]
Response:	[00][Bool: <i>Result</i>][Byte Array(4): <i>Data</i>]
Example	
Command:	08 01 xx
Response:	

1.3.7.2 Hitag2_WritePage

Command:	[0802][Byte: <i>PageAddress</i>][Byte Array(4): <i>Data</i>]
Response:	[00][Bool: <i>Result</i>]
Example	
Command:	08 02 xx xx xx xx xx
Response:	

1.3.7.3 Hitag2_Halt

Command:	[0803]
Response:	[00][Bool: <i>Result</i>]
Example	
Command:	08 03
Response:	

1.3.7.4 Hitag2_SetPassword

Command:	[0804][Byte Array(4): <i>Password</i>]
Response:	[00]
Example	
Command:	08 04 xx xx xx xx
Response:	

1.3.8 API SM4200

1.3.8.1 SM4200_GenericRaw

Command:	[0900][Byte Array(Var): <i>TXData</i>][Byte: <i>MaxRXDataLength</i>][UInt16: <i>Timeout</i>]
Response:	[00][Bool: <i>Result</i>][Byte Array(Var): <i>RXData</i>]
Example	
Command:	09 00 04 0A 00 00 00 40 B8 0B
Response:	

1.3.8.2 SM4200_Generic

Command:	[0901][Byte Array(Var): <i>TXData</i>][Byte: <i>MaxRXDataLength</i>][UInt16: <i>Timeout</i>]
Response:	[00][Bool: <i>Result</i>][Byte Array(Var): <i>RXData</i>]
Example	
Command:	09 01 0A 00 40 B8 0B
Response:	

1.3.9 API I2C

1.3.9.1 I2CInit

Command:	[0A00][UInt16: <i>Mode</i>]
Response:	[00][Bool: <i>Result</i>]
Example	
Command:	0A 00 00 00 Mode: 00 00 (I2CMODE_MASTER))
Response:	00 01 (Result: 01 (true))

1.3.9.2 I2CDeInit

Command:	[0A01]
Response:	[00]
Example	
Command:	0A 01
Response:	00

1.3.9.3 I2CMasterStart

Command:	[0A02]
Response:	[00]
Example	
Command:	0A 02
Response:	00

1.3.9.4 I2CMasterStop

Command:	[0A03]
Response:	[00]
Example	
Command:	0A 03
Response:	00

1.3.9.5 I2CMasterTransmitByte

Command:	[0A04][Byte: <i>Data</i>]
Response:	[00]
Example	
Command:	0A 04 AA (Data: 0xAA)
Response:	00

1.3.9.6 I2CMasterReceiveByte

Command:	[0A05]
Response:	[00][Byte: <i>Data</i>]
Example Command:	0A 05
Response:	

1.3.9.7 I2CMasterBeginWrite

Command:	[0A06][Byte: <i>Address</i>]
Response:	[00]
Example Command:	0A 06 30
Response:	

1.3.9.8 I2CMasterBeginRead

Command:	[0A07][Byte: <i>Address</i>]
Response:	[00]
Example Command:	0A 07 30
Response:	

1.3.9.9 I2CMasterSetAck

Command:	[0A08][Byte: <i>SetOn</i>]
Response:	[00]
Example Command:	0A 08 xx
Response:	

1.3.10 API MIFARECLASSIC

1.3.10.1 MifareClassic_Login

Command:	[0B00][Byte Array(6): <i>Key</i>][Byte: <i>KeyType</i>][Byte: <i>Sector</i>]
Response:	[00][Bool: <i>Result</i>]
Example	
Command:	0B 00 FF FF FF FF FF 00 00 (Key: FF FF FF FF FF FF, KeyType: 00 (KEYA), Sector: 00)
Response:	00 01 (Result: 01 (true))

1.3.10.2 MifareClassic_ReadBlock

Command:	[0B01][Byte: <i>Block</i>]
Response:	[00][Bool: <i>Result</i>][Byte Array(16): <i>Data</i>]
Example	
Command:	0B 01 02 (Block: 02)
Response:	00 01 00 11 22 33 44 55 66 77 88 99 AA BB CC DD EE FF (Result: 01 (true), Data: 00 11 22 33 44 55 66 77 88 99 AA BB CC DD EE FF)

1.3.10.3 MifareClassic_WriteBlock

Command:	[0B02][Byte: <i>Block</i>][Byte Array(16): <i>Data</i>]
Response:	[00][Bool: <i>Result</i>]
Example	
Command:	0B 02 02 00 11 22 33 44 55 66 77 88 99 AA BB CC DD EE FF (Block: 02, Data: 00 11 22 33 44 55 66 77 88 99 AA BB CC DD EE FF)
Response:	00 01 (Result: 01 (true))

1.3.10.4 MifareClassic_ReadValueBlock

Command:	[0B03][Byte: <i>Block</i>]
Response:	[00][Bool: <i>Result</i>][UInt32: <i>Value</i>]
Example	
Command:	0B 03 02 (Block: 02)
Response:	00 01 DD CC BB AA (Result: 01 (true), Value: DD CC BB AA (2864434397))

1.3.10.5 MifareClassic_WriteValueBlock

Command:	[0B04][Byte: <i>Block</i>][UInt32: <i>Value</i>]
Response:	[00][Bool: <i>Result</i>]
Example	
Command:	0B 04 02 DD CC BB AA (Block: 02, Value: DD CC BB AA)
Response:	00 01 (Result: 01 (true))

1.3.10.6 MifareClassic_IncrementValueBlock

Command:	[0B05][Byte: <i>Block</i>][UInt32: <i>Value</i>]
Response:	[00][Bool: <i>Result</i>]
Example	
Command:	0B 05 02 01 00 00 00 (Block: 02, Value: 01 00 00 00 (1))
Response:	00 01 (Result: 01 (true))

1.3.10.7 MifareClassic_DecrementValueBlock

Command:	[0B06][Byte: <i>Block</i>][UInt32: <i>Value</i>]
Response:	[00][Bool: <i>Result</i>]
Example	
Command:	Request: 0B 06 02 01 00 00 00 (Block: 02, Value: 01 00 00 00 (1))
Response:	00 01 (Result: 01 (true))

1.3.10.8 MifareClassic_CopyValueBlock

Command:	[0B07][Byte: <i>SourceBlock</i>][Byte: <i>DestBlock</i>]
Response:	[00][Bool: <i>Result</i>]
Example	
Command:	0B 07 02 01 (SourceBlock: 02, DestBlock: 01)
Response:	00 01 (Result: 01 (true))

1.3.11 API MIFAREULTRALIGHT**1.3.11.1 MifareUltralight_ReadPage**

Command:	[0C00][Byte: <i>Page</i>]
Response:	[00][Bool: <i>Result</i>][Byte Array(16): <i>Data</i>]
Example	
Command:	0C 00 04 (Page: 04)
Response:	00 01 0F 1E 2D 3C 08 55 03 74 65 73 74 2E 64 65 FE 00 (Result: 01 (true), Data: 0F 1E 2D 3C 08 55 03 74 65 73 74 2E 64 65 FE 00)

1.3.11.2 MifareUltralight_WritePage

Command:	[0C01][Byte: <i>Page</i>][Byte Array(4): <i>Data</i>]
Response:	[00][Bool: <i>Result</i>]
Example	
Command:	0C 01 04 0F 1E 2D 3C (Page: 04, Data: 0F 1E 2D 3C)
Response:	00 01 (Result: 01 (true))

1.3.11.3 MifareUltralightC_Authenticate

Command:	[0C02][Byte Array(16): <i>Key</i>]
Response:	[00][Bool: <i>Result</i>]
Example	
Command:	0C 02 49 45 4D 4B 41 45 52 42 21 4E 41 43 55 4F 59 46 (Key: 49 45 4D 4B 41 45 52 42 21 4E 41 43 55 4F 59 46)
Response:	00 01 (Result: 01 (true))

1.3.12 API ISO15693

1.3.12.1 ISO15693_GenericCommand

Command:	[0D00][Byte: <i>Flags</i>][Byte: <i>Command</i>][Byte Array(Var): <i>Data</i>][Byte: <i>Buffer-Size</i>]
Response:	[00][Bool: <i>Result</i>][Byte Array(Var): <i>Data</i>]
Example	
Command:	0D 00 xx xx xx xx xx
Response:	

1.3.12.2 ISO15693_GetSystemInformation

Command:	[0D01]
Response:	[00][Bool: <i>Result</i>][Byte Array(15): <i>SystemInfo</i>]
Example	
Command:	0D 01
Response:	

1.3.12.3 ISO15693_GetSystemInformationExt

Command:	[0D02]
Response:	[00][Bool: <i>Result</i>][Byte Array(15): <i>SystemInfo</i>]
Example	
Command:	0D 02
Response:	

1.3.12.4 ISO15693_GetTagTypeFromUID

Command:	[0D03][Byte Array(8): <i>UID</i>]
Response:	[00][Byte: <i>TagType</i>]
Example	
Command:	0D 03 xx xx xx xx xx xx xx xx
Response:	

1.3.12.5 ISO15693_GetTagTypeFromSystemInfo

Command:	[0D04][Byte Array(15): <i>SystemInfo</i>]
Response:	[00][Byte: <i>TagType</i>]
Example	
Command:	0D 04 xx xx xx xx xx xx xx xx xx xx xx xx xx xx
Response:	

1.3.12.6 ISO15693_ReadSingleBlock

Command:	[0D05][UInt16: <i>BlockNumber</i>][Byte: <i>BufferSize</i>]
Response:	[00][Bool: <i>Result</i>][Byte Array(Var): <i>BlockData</i>]
Example	
Command:	0D 05 xx xx xx
Response:	

1.3.12.7 ISO15693_ReadSingleBlockExt

Command:	[0D06][UInt16: <i>BlockNumber</i>][Byte: <i>BufferSize</i>]
Response:	[00][Bool: <i>Result</i>][Byte Array(Var): <i>BlockData</i>]
Example	
Command:	0D 06 xx xx xx
Response:	

1.3.12.8 ISO15693_WriteSingleBlock

Command:	[0D07][UInt16: <i>BlockNumber</i>][Byte Array(Var): <i>BlockData</i>]
Response:	[00][Bool: <i>Result</i>]
Example	
Command:	0D 07 xx xx xx xx
Response:	

1.3.12.9 ISO15693_WriteSingleBlockExt

Command:	[0D08][UInt16: <i>BlockNumber</i>][Byte Array(Var): <i>BlockData</i>]
Response:	[00][Bool: <i>Result</i>]
Example	
Command:	0D 08 xx xx xx xx
Response:	

1.3.13 API CRYPTO**1.3.13.1 AES128_Init**

Command:	[0E00][Byte: <i>CryptoEnv</i>][Byte Array(16): <i>Key</i>]
Response:	[00]
Example	
Command:	0E 00 00 80 00 00 00 00 00 00 00 00 00 00 00 00 00 00 (CryptoEnv: 00, Key: 80 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00)
Response:	00

1.3.13.2 AES128_Encode

Command:	[0E01][Byte: <i>CryptoEnv</i>][Byte Array(16): <i>Plain</i>]
Response:	[00][Byte Array(16): <i>Cipher</i>]
Example	
Command:	0E 01 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 (CryptoEnv: 00, Plain: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00)
Response:	00 0E DD 33 D3 C6 21 E5 46 45 5B D8 BA 14 18 BE C8 (Cipher: 0E DD 33 D3 C6 21 E5 46 45 5B D8 BA 14 18 BE C8)

1.3.13.3 AES128_Decode

Command:	[0E02][Byte: <i>CryptoEnv</i>][Byte Array(16): <i>Cipher</i>]
Response:	[00][Byte Array(16): <i>Plain</i>]
Example	
Command:	0E 02 00 0E DD 33 D3 C6 21 E5 46 45 5B D8 BA 14 18 BE C8 (CryptoEnv: 00, Cipher: 0E DD 33 D3 C6 21 E5 46 45 5B D8 BA 14 18 BE C8)
Response:	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 (Plain: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00)

1.3.13.4 TDEA_Init

Command:	[0E03][Byte: <i>CryptoEnv</i>][Byte Array(16): <i>Key</i>]
Response:	[00]
Example	
Command:	0E 03 00 01 01 01 01 01 01 01 01 01 00 00 00 00 00 00 00 00 (CryptoEnv: 00, Key: 01 01 01 01 01 01 01 01 00 00 00 00 00 00 00 00 (only first 8 bytes are used))
Response:	00

1.3.13.5 TDEA_Encrypt

Command:	[0E04][Byte: <i>CryptoEnv</i>][Byte Array(8): <i>Plain</i>]
Response:	[00][Byte Array(8): <i>Cipher</i>]
Example	
Command:	0E 04 00 80 00 00 00 00 00 00 00 00 (CryptoEnv: 00, Plain: 80 00 00 00 00 00 00 00)
Response:	00 95 F8 A5 E5 DD 31 D9 00 (Cipher: 95 F8 A5 E5 DD 31 D9 00)

1.3.13.6 TDEA_Decrypt

Command:	[0E05][Byte: <i>CryptoEnv</i>][Byte Array(8): <i>Cipher</i>]
Response:	[00][Byte Array(8): <i>Plain</i>]
Example	
Command:	0E 05 00 95 F8 A5 E5 DD 31 D9 00 (CryptoEnv: 00, Cipher: 95 F8 A5 E5 DD 31 D9 00)
Response:	00 80 00 00 00 00 00 00 00 (Plain: 80 00 00 00 00 00 00 00)

1.3.13.7 TDES3K_Init

Command:	[0E06][Byte: <i>CryptoEnv</i>][Byte Array(24): <i>Key</i>]
Response:	[00]
Example	
Command:	0E 06 00 01 (CryptoEnv: 00, Key: 01)
Response:	00

1.3.13.8 TDES3K_Encrypt

Command:	[0E07][Byte: <i>CryptoEnv</i>][Byte Array(8): <i>Plain</i>]
Response:	[00][Byte Array(8): <i>Cipher</i>]
Example	
Command:	0E 07 00 95 F8 A5 E5 DD 31 D9 00 (CryptoEnv: 00, Plain: 95 F8 A5 E5 DD 31 D9 00)
Response:	00 80 00 00 00 00 00 00 (Cipher: 80 00 00 00 00 00 00 00)

1.3.13.9 TDES3K_Decrypt

Command:	[0E08][Byte: <i>CryptoEnv</i>][Byte Array(8): <i>Cipher</i>]
Response:	[00][Byte Array(8): <i>Plain</i>]
Example	
Command:	0E 08 00 80 00 00 00 00 00 00 (CryptoEnv: 00, Cipher: 80 00 00 00 00 00 00 00)
Response:	00 95 F8 A5 E5 DD 31 D9 00 (Plain: 95 F8 A5 E5 DD 31 D9 00)

1.3.14 API DESFIRE**1.3.14.1 DESFire_GetApplicationIDs**

Command:	[0F00][Byte: <i>CryptoEnv</i>][Byte: <i>MaxAIDCnt</i>]
Response:	[00][Bool: <i>Result</i>][C?L: <i>AIDs</i>]
Example	
Command:	0F 00 00 1C (CryptoEnv: 00, MaxAIDCnt: 1C (28))
Response:	00 01 01 33 22 11 00 (Result: 01 (true), AIDs: 11 22 33)

1.3.14.2 DESFire_CreateApplication

Command:	[0F01][Byte: <i>CryptoEnv</i>][UInt32: <i>AID</i>][Byte: <i>AllowChangeMasterKey</i>][Byte: <i>FreeDirectoryList</i>][Byte: <i>FreeCreateDelete</i>][Byte: <i>ConfigurationChangeable</i>][Byte: <i>ChangeKeyAccessRights</i>][UInt16: <i>NumberOfKeys</i>][UInt16: <i>KeyType</i>]
Response:	[00][Bool: <i>Result</i>]
Example	
Command:	0F 01 00 33 22 11 00 01 01 01 01 0E 00 00 00 00 (CryptoEnv: 00, AID: 33 22 11 (0x112233), AllowChangeMasterKey: 00, FreeDirectoryList: 01, FreeCreateDelete: 01, ConfigurationChangeable: 01, ChangeKeyAccessRights: 0E, NumberOfKeys: 00 00, KeyType: 00 00)
Response:	00 01 (Result: 01 (true))

1.3.14.3 DESFire_DeleteApplication

Command:	[0F02][Byte: <i>CryptoEnv</i>][UInt32: <i>AID</i>]
Response:	[00][Bool: <i>Result</i>]
Example	
Command:	0F 02 00 33 22 11 00 (CryptoEnv: 00, AID: 33 22 11 00 (0x112233))
Response:	00 01 (Result: 01 (true))

1.3.14.4 DESFire_SelectApplication

Command:	[0F03][Byte: <i>CryptoEnv</i>][UInt32: <i>AID</i>]
Response:	[00][Bool: <i>Result</i>]
Example	
Command:	0F 03 00 33 22 11 00 CryptoEnv: 00, AID: 33 22 11 00 (0x112233))
Response:	00 01 (Result: 01 (true))

1.3.14.5 DESFire_Authenticate

Command:	[0F04][Byte: <i>CryptoEnv</i>][Byte: <i>KeyNoTag</i>][Byte Array(Var): <i>Key</i>][Byte: <i>Key-Type</i>][Byte: <i>Mode</i>]
Response:	[00][Bool: <i>Result</i>]
Example	
Command:	0F 04 00 00 10 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 (CryptoEnv: 00, KeyNoTag: 00, Key: Length = 10, Value = 00 00 00 00 00 00 00 00 00 00, KeyType: 00, Mode: 00)
Response:	00 01 (Result: 01 (true))

1.3.14.6 DESFire_GetKeySettings

Command:	[0F05][Byte: <i>CryptoEnv</i>]
Response:	[00][Bool: <i>Result</i>][Byte: <i>AllowChangeMasterKey</i>][Byte: <i>FreeDirectoryList</i>][Byte: <i>FreeCreateDelete</i>][Byte: <i>ConfigurationChangeable</i>][Byte: <i>ChangeKeyAccessRights</i>][UInt16: <i>NumberOfKeys</i>][UInt16: <i>KeyType</i>]
Example	
Command:	0F 05 00 (CryptoEnv: 00)
Response:	00 01 01 01 00 00 00 00 00 00 00 (Result: 01 (true), AllowChangeMasterKey: 01, FreeDirectoryList: 01, FreeCreateDelete: 00, ConfigurationChangeable: 00, ChangeKeyAccessRights: 00, NumberOfKeys: 00 00, KeyType: 00 00)

1.3.14.7 DESFire_GetFileIDs

Command:	[0F06][Byte: <i>CryptoEnv</i>][Byte: <i>MaxFileIDCount</i>]
Response:	[00][Bool: <i>Result</i>][C?B: <i>FileIDList</i>]
Example	
Command:	0F 06 00 xx
Response:	

1.3.14.8 DESFire_GetFileSettings

Command:	[0F07][Byte: <i>CryptoEnv</i>][Byte: <i>FileNo</i>]
Response:	[00][Bool: <i>Result</i>][Byte Array(20): <i>FileSettings</i>]
Example	
Command:	0F 07 00 00
Response:	

1.3.14.9 DESFire_ReadData

Command:	[0F08][Byte: <i>CryptoEnv</i>][Byte: <i>FileNo</i>][UInt16: <i>Offset</i>][Byte: <i>Length</i>][Byte: <i>CommSet</i>]
Response:	[00][Bool: <i>Result</i>][Byte Array(Var): <i>Data</i>]
Example	
Command:	0F 08 00 00 00 00 01 00
Response:	

1.3.14.10 DESFire_WriteData

Command:	[0F09][Byte: <i>CryptoEnv</i>][Byte: <i>FileNo</i>][UInt16: <i>Offset</i>][Byte Array(Var): <i>Data</i>][Byte: <i>CommSet</i>]
Response:	[00][Bool: <i>Result</i>]
Example	
Command:	0F 09 00 00 00 00 xx xx 00
Response:	

1.3.14.11 DESFire_GetValue

Command:	[0F0A][Byte: <i>CryptoEnv</i>][Byte: <i>FileNo</i>][Byte: <i>CommSet</i>]
Response:	[00][Bool: <i>Result</i>][UInt32: <i>Value</i>]
Example	
Command:	0F 0A 00 00 00
Response:	

1.3.14.12 DESFire_Credit

Command:	[0F0B][Byte: <i>CryptoEnv</i>][Byte: <i>FileNo</i>][UInt32: <i>Value</i>][Byte: <i>CommSet</i>]
Response:	[00][Bool: <i>Result</i>]
Example	
Command:	0F 0B 00 00 00 00 00 00 00
Response:	

1.3.14.13 DESFire_Debit

Command:	[0F0C][Byte: <i>CryptoEnv</i>][Byte: <i>FileNo</i>][UInt32: <i>Value</i>][Byte: <i>CommSet</i>]
Response:	[00][Bool: <i>Result</i>]
Example	
Command:	0F 0C 00 00 00 00 00 00 00
Response:	

1.3.14.14 DESFire_LimitedCredit

Command:	[0F0D][Byte: <i>CryptoEnv</i>][Byte: <i>FileNo</i>][UInt32: <i>Value</i>][Byte: <i>CommSet</i>]
Response:	[00][Bool: <i>Result</i>]
Example	
Command:	0F 0D 00 00 00 00 00 00 00
Response:	

1.3.14.15 DESFire_FreeMem

Command:	[0F0E][Byte: <i>CryptoEnv</i>]
Response:	[00][Bool: <i>Result</i>][UInt16: <i>FreeMemory</i>]
Example	
Command:	0F 0E 00
Response:	00 01 00 13 Result: 01 (true), FreeMemory: 00 13 (4864 bytes))

1.3.14.16 DESFire_FormatPICC

Command:	[0F0F][Byte: <i>CryptoEnv</i>]
Response:	[00][Bool: <i>Result</i>]
Example	
Command:	0F 0F 00
Response:	00 01 Result: 01 (true))

1.3.14.17 DESFire_CreateDataFile

Command:	[0F10][Byte: <i>CryptoEnv</i>][Byte: <i>FileNo</i>][Byte Array(20): <i>FileSettings</i>]
Response:	[00][Bool: <i>Result</i>]
Example	
Command:	0F 10 00 00 00 00 00 00 00 00 00 01
Response:	

1.3.14.18 DESFire_CreateValueFile

Command:	[0F11][Byte: <i>CryptoEnv</i>][Byte: <i>FileNo</i>][Byte Array(20): <i>FileSettings</i>]
Response:	[00][Bool: <i>Result</i>]
Example	
Command:	0F 11 00 00 00 00 00 00 00 00 00 01
Response:	

1.3.14.19 DESFire_GetVersion

Command:	[0F12][Byte: <i>CryptoEnv</i>]
Response:	[00][Bool: <i>Result</i>][Byte Array(34): <i>Version</i>]
Example	
Command:	0F 12 00 (<i>CryptoEnv</i> : 00)
Response:	00 01 04 01 01 01 00 00 10 00 00 05 04 01 01 01 03 00 10 00 00 05 00 00 00 00 00 00 00 BA 14 D0 A7 10 31 10 (<i>Result</i> : 01 (true), <i>Version</i> : 04 01 01 01 00 00 10 00 00 05 04 01 01 01 03 00 10 00 00 05 00 00 00 00 00 00 00 BA 14 D0 A7 10 31 10)

1.3.14.20 DESFire_DeleteFile

Command:	[0F13][Byte: <i>CryptoEnv</i>][Byte: <i>FileNo</i>]
Response:	[00][Bool: <i>Result</i>]
Example	
Command:	0F 13 00 xx
Response:	

1.3.14.21 DESFire_CommitTransaction

Command:	[0F14][Byte: <i>CryptoEnv</i>]
Response:	[00][Bool: <i>Result</i>]
Example	
Command:	0F 14 00
Response:	

1.3.14.22 DESFire_AbortTransaction

Command:	[0F15][Byte: <i>CryptoEnv</i>]
Response:	[00][Bool: <i>Result</i>]
Example	
Command:	0F 15 00
Response:	

1.3.14.23 DESFire_GetCardUID

Command:	[0F16][Byte: <i>CryptoEnv</i>][Byte: <i>BufferSize</i>]
Response:	[00][Bool: <i>Result</i>][Byte Array(Var): <i>UID</i>]
Example	
Command:	0F 16 00 07 (<i>CryptoEnv</i> : 00, <i>BufferSize</i> : 07)
Response:	00 01 07 04 52 43 52 3D 24 80 (<i>Result</i> : 01 (true), <i>UID</i> : Length = 07, Value = 04 52 43 52 3D 24 80)

1.3.14.24 DESFire_GetKeyVersion

Command:	[0F17][Byte: <i>CryptoEnv</i>][Byte: <i>KeyNo</i>]
Response:	[00][Bool: <i>Result</i>][Byte Array(1): <i>KeyVersion</i>]
Example	
Command:	0F 17 00 00 (CryptoEnv: 00, KeyNo: 00)
Response:	00 01 00 Result: 01 (true), KeyVersion: 00)

1.3.14.25 DESFire_ChangeKeySettings

Command:	[0F18][Byte: <i>CryptoEnv</i>][Byte: <i>AllowChangeMasterKey</i>][Byte: <i>FreeDirectoryList</i>][Byte: <i>FreeCreateDelete</i>][Byte: <i>ConfigurationChangeable</i>][Byte: <i>ChangeKeyAccessRights</i>][UInt16: <i>NumberOfKeys</i>][UInt16: <i>KeyType</i>]
Response:	[00][Bool: <i>Result</i>]
Example	
Command:	0F 18 00 01 01 01 01 0E 00 00 00 00 (CryptoEnv: 00, AllowChangeMasterKey: 01, FreeDirectoryList: 01, FreeCreateDelete: 01, ConfigurationChangeable: 01, ChangeKeyAccessRights: 0E, NumberOfKeys: 00 00, KeyType: 00 00)
Response:	00 01 Result: 01 (true)

1.3.14.26 DESFire_ChangeKey

Command:	[0F19][Byte: <i>CryptoEnv</i>][Byte: <i>KeyNo</i>][Byte Array(Var): <i>OldKey</i>][Byte Array(Var): <i>NewKey</i>][Byte: <i>KeyVersion</i>][Byte: <i>AllowChangeMasterKey</i>][Byte: <i>FreeDirectoryList</i>][Byte: <i>FreeCreateDelete</i>][Byte: <i>ConfigurationChangeable</i>][Byte: <i>ChangeKeyAccessRights</i>][UInt16: <i>NumberOfKeys</i>][UInt16: <i>KeyType</i>]
Response:	[00][Bool: <i>Result</i>]
Example	
Command:	0F 19 00 xx xx xx xx xx xx 01 01 01 01 0E 00 00 00 00
Response:	

1.3.14.27 DESFire_ChangeFileSettings

Command:	[0F1A][Byte: <i>CryptoEnv</i>][Byte: <i>FileNo</i>][Byte: <i>NewCommSet</i>][UInt16: <i>OldAccessRights</i>][UInt16: <i>NewAccessRights</i>]
Response:	[00][Bool: <i>Result</i>]
Example	
Command:	0F 1A 00 xx 00 xx xx xx xx
Response:	

1.3.14.28 DESFire_DisableFormatCard

Command:	[0F1B][Byte: <i>CryptoEnv</i>]
Response:	[00][Bool: <i>Result</i>]
Example	
Command:	0F 1B 00
Response:	

1.3.14.29 DESFire_EnableRandomID

Command:	[0F1C][Byte: <i>CryptoEnv</i>]
Response:	[00][Bool: <i>Result</i>]
Example	
Command:	0F 1C 00
Response:	00 01 (Result: 01 (true))

1.3.14.30 DESFire_SetDefaultKey

Command:	[0F1D][Byte: <i>CryptoEnv</i>][Byte Array(Var): <i>Key</i>][Byte: <i>KeyVersion</i>]
Response:	[00][Bool: <i>Result</i>]
Example	
Command:	0F 1D 00 xx xx xx
Response:	

1.3.14.31 DESFire_SetATS

Command:	[0F1E][Byte: <i>CryptoEnv</i>][Byte Array(Var): <i>ATS</i>]
Response:	[00][Bool: <i>Result</i>]
Example	
Command:	0F 1E 00 xx xx
Response:	