TWN4

Simple Protocol

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Contents

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 a 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 simple protocol is also available in binary mode. This means, that the data is not transmitted via ASCII characters but as single bytes.
Moreover it is possible to add a CRC at the end of every transmission. This lets you detect transmission errors.
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

1.3. Data Transmission

Data can be transmitted in two ways:
- by sending ASCII characters
- by sending binary values

Standard communication setting is **ASCII**, **CRC off** with **9600 baud**.
Communication settings can be done in the app **App_PRS104_Simple_Protocol.c** in the folder \Apps\Samples\Simple
Protocol in the TWN4DevPack.

1.3.1. ASCII

To transmit a value of e.g. 0x1F, it is necessary to split this into two ASCII characters '1' and 'F'. These
characters has to be sent sequentially.

1.3.2. Binary

To transmit a value of e.g. 0x1F, it can be sent directly in binary format. The first two bytes (LSB first)
indicate the number of the following bytes.

```
<Length of command bytes (2 bytes, LSB first)> <command bytes>
```

See 1.3.4 for an example.

1.3.3. CRC

On both ASCII and binary format, a CRC can be added at the end of each transmission. In case of binary
format, the length bytes are not part of the CRC calculation. The CRC is calculated as follows:

```
uint16_t UpdateCRC(uint16_t CRC,byte Byte)
{
        // Update CCITT CRC (reverse polynom 0x8408)
        Byte ^= (byte)CRC;
        Byte ^= (byte)(Byte << 4);
        return (uint16_t)(((Byte << 8) | (CRC >> 8)) ^ (Byte >> 4) ^ (Byte << 3));
}
```

The CRC calculation starts with CRC = 0xFFFF

1.3.4. Reference messages

The following table shows reference messages for function GetUSBType

Mode	CRC	Command (Host -> TWN4)	Response (TWN4 -> Host)
ASCII	Off	""0005\r""	""0001\r""
	On	""000515A7\r""	""000131E1\r""
Binary	Off	0x02 0x00 0x00 0x05	0x02 0x00 0x00 0x01
	On	0x04 0x00 0x00 0x05 0x15 0xA7	0x04 0x00 0x00 0x01 0x31 0xE1

1.4. Data Types

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 explicitely, 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
[Byte Array(Var), x LB]:	A sequence of bytes, where the first x bytes hold the number of following bytes
[ASCII string]:	A sequence of bytes which contain ASCII characters, except the first byte which holds the number of following bytes

In Simple Protocol, all numbers are sent with LSB first. For example, the number 0x1234 has to be sent as 3412.

1.5. Commands

1.5.1. API SYS

1.5.1.1. Reset

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

1.5.1.2. StartBootloader

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

1.5.1.3. GetSysTicks

Command:	[0003]
Response:	[00][UInt32: *Ticks*]
Example	
Command:	0003
Response:	00D3480700
	(Ticks: 477395)

1.5.1.4. GetVersionString

Command:	[0004][Byte: *MaxLen*]
Response:	[00][ASCII string: *Version*]
Example	
Command:	0004FF
	(MaxLen: FF)
Response:	001D54574E342F42312E30332F434346312E35372F505253312E3033-2F5049
	(Version: TWN4/B1.03/CCF1.57/PRS1.03/PI)

1.5.1.5. GetUSBType

Command:	[0005]
Response:	[00][Byte: *Type*]
Example	
Command:	0005
Response:	0001
	(Type: 1)

1.5.1.6. GetDeviceType

Command:	[0006]
Response:	[00][Byte: *Type*]
Example	
Command:	0006
Response:	000B
	(Type: 11)

1.5.1.7. Sleep

Command:	[0007][UInt32: *Ticks*][UInt32: *Flags*]
Response:	[00][Byte: *Result*]
Example	
Command:	0007E803000001000000
	(Ticks: E8030000, Flags: 01000000)
Response:	0000
	(Result: 0)

1.5.1.8. GetDeviceUID

Command:	[0008]
Response:	[00][Byte Array(12): *UID*]
Example	
Command:	0008
Response:	002D002F000B47303531353233
	(UID: 2D002F000B47303531353233)

1.5.1.9. SetParameters

Command:	[0009][Byte Array(Var): *TLV*]
Response:	[00][Bool: *Result*]
Example	
Command:	00090707010103010200
	(TLV: 07010103010200)
Response:	0001
	(Result: true)

1.5.1.10. GetLastError

Command:	[000A]
Response:	[00][UInt32: *LastError*]
Example	
Command:	000A
Response:	00CB000000
	(LastError: 203)

1.5.1.11. GetProdSerNo

Command:	[000D][Byte: *MaxLen*]
Response:	[00][ASCII string: *SerNo*]
Example	
Command:	000DFF
	(MaxLen: FF)
Response:	0010313233343536373839303132333435 36
	(SerNo: 1234567890123456)

1.5.2. API IO

1.5.2.1. WriteByte

Command:	[0100][Byte: *Channel*][Byte: *Byte*]
Response:	[00]
Example	
Command:	01000041
	(Channel: 00, Byte: 41)
Response:	00

1.5.2.2. ReadByte

Command:	[0101][Byte: *Channel*]
Response:	[00][Byte: *Byte*]
Example	
Command:	010100
	(Channel: 00)
Response:	0000
	(Byte: 0)

1.5.2.3. TestEmpty

Command:	[0102][Byte: *Channel*][Byte: *Dir*]
Response:	[00][Bool: *Result*]
Example Command:	01020001
	(Channel: 00, Dir: 01)
Response:	0001
	(Result: Yes)

1.5.2.4. TestFull

Command:	[0103][Byte: *Channel*][Byte: *Dir*]
Response:	[00][Bool: *Result*]
Example Command:	01030001
	(Channel: 00, Dir: 01)
Response:	0000
	(Result: No)

1.5.2.5. GetBufferSize

Command:	[0104][Byte: *Channel*][Byte: *Dir*]
Response:	[00][UInt16: *BufferSize*]
Example Command:	01040001
	(Channel: 00, Dir: 01)
Response:	000000
	(BufferSize: 0)

1.5.2.6. GetByteCount

Command:	[0105][Byte: *Channel*][Byte: *Dir*]
Response:	[00][UInt16: *ByteCount*]
Example Command:	01050001
	(Channel: 00, Dir: 01)
Response:	000000
	(ByteCount: 0)

1.5.2.7. SetCOMParameters

Command:	[0109][Byte: *Channel*][UInt32: *Baudrate*][Byte: *WordLength*][Byte: *Parity*][Byte: *Stop-Bits*][Byte: *FlowControl*]
Response:	[00][Bool: *Result*]
Example	
Command:	0109028025000008000100
	(Channel: 02, Baudrate: 80250000, WordLength: 08, Parity: 00, StopBits: 01, FlowControl: 00)
Response:	0001
	(Result: true)

1.5.2.8. GetUSBDeviceState

Command:	[010A]
Response:	[00][Byte: *State*]
Example	
Command:	010A
Response:	0003
	(State: USB_DEVICE_STATE_CONFIGURED)

1.5.2.9. GetHostChannel

Command:	[010B]
Response:	[00][Byte: *Channel*]
Example	
Command:	010B
Response:	0001
	(Channel: CHANNEL_USB)

1.5.2.10. USBRemoteWakeup

Command:	[010C]
Response:	[00]
Example	
Command:	010C
Response:	00

1.5.2.11. WriteBytes

Command:	[010D][Byte: *Channel*][Byte Array(Var), 2 LB: *Bytes*]
Response:	[00][UInt16: *BytesWritten*]
Example	
Command:	010D020300000815
	(Channel: 02, Bytes: 000815)
Response:	000300
	(BytesWritten: 3)

1.5.2.12. ReadBytes

Command:	[010E][Byte: *Channel*][UInt16: *MaxBytes*]
Response:	[00][Byte Array(Var), 2 LB: *Bytes*]
Example	
Command:	010E020F00
	(Channel: 02, MaxBytes: 0F00)
Response:	000300000815
	(Bytes: 000815)

1.5.3. API PERIPH

1.5.3.1. GPIOConfigureOutputs

Command:	[0400][Byte: *Bits*][Byte: *PullUpDown*][Byte: *OutputType*]
Response:	[00]
Example	
Command:	0400010000
	(Bits: 01, PullUpDown: 00, OutputType: 00)
Response:	00

1.5.3.2. GPIOConfigureInputs

Command:	[0401][Byte: *Bits*][Byte: *PullUpDown*]
Response:	[00]
Example	
Command:	04010100
	(Bits: 01, PullUpDown: 00)
Response:	00

1.5.3.3. GPIOSetBits

Command:	[0402][Byte: *Bits*]
Response:	[00]
Example	
Command:	040201
	(Bits: 01)
Response:	00

1.5.3.4. GPIOClearBits

Command:	[0403][Byte: *Bits*]
Response:	[00]
Example	
Command:	040301
	(Bits: 01)
Response:	00

1.5.3.5. GPIOToggleBits

Command:	[0404][Byte: *Bits*]
Response:	[00]
Example	
Command:	040401
	(Bits: 01)
Response:	00

1.5.3.6. GPIOBlinkBits

Command:	[0405][Byte: *Bits*][UInt16: *TimeHi*][UInt16: *TimeLo*]
Response:	[00]
Example	
Command:	04050164006400
	(Bits: 01, TimeHi: 6400, TimeLo: 6400)
Response:	00

1.5.3.7. GPIOTestBit

Command:	[0406][Byte: *Bit*]
Response:	[00][Byte: *Result*]
Example	
Command:	040601
	(Bit: 01)
Response:	0000
	(Result: 0)

1.5.3.8. Beep

Command:	[0407][Byte: *Volume*][UInt16: *Frequency*][UInt16: *OnTime*][UInt16: *OffTime*]
Response:	[00]
Example	
Command:	0407646009F401F401
	(Volume: 64, Frequency: 6009, OnTime: F401, OffTime: F401)
Response:	00

1.5.3.9. DiagLEDOn

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

1.5.3.10. DiagLEDOff

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

1.5.3.11. DiagLEDToggle

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

1.5.3.12. DiagLEDIsOn

Command:	[040B]
Response:	[00][Bool: *Result*]
Example	
Command:	040B
Response:	0000
	(Result: No)

1.5.3.13. SendWiegand

Command:	[040C][Byte: *GPIOData0*][Byte: *GPIOData1*][UInt16: *PulseTime*][UInt16: *Interval-Time*][Byte Array(Var): *Bits*][Byte: *BitCount*]
Response:	[00]
Example	
Command:	040C08106400E80301AA08
	(GPIOData0: 08, GPIOData1: 10, PulseTime: 6400, IntervalTime: E803, Bits: AA, Bit-Count: 08)
Response:	00

1.5.3.14. SendOmron

Command:	[040D][Byte: *GPIOClock*][Byte: *GPIOData*][UInt16: *T1*][UInt16: *T2*][UInt16: *T3*][Byte Array(Var): *Bits*][Byte: *BitCount*]
Response:	[00]
Example	
Command:	040D0810F401F401F40101AA08
	(GPIOClock: 08, GPIOData: 10, T1: F401, T2: F401, T3: F401, Bits: AA, BitCount: 08)
Response:	00

1.5.3.15. LEDInit

Command:	[0410][Byte: *LEDs*]
Response:	[00]
Example	
Command:	041007
	(LEDs: 07)
Response:	00

1.5.3.16. LEDOn

Command:	[0411][Byte: *LEDs*]
Response:	[00]
Example	
Command:	041107
	(LEDs: 07)
Response:	00

1.5.3.17. LEDOff

Command:	[0412][Byte: *LEDs*]
Response:	[00]
Example	
Command:	041207
	(LEDs: 07)
Response:	00

1.5.3.18. LEDToggle

Command:	[0413][Byte: *LEDs*]
Response:	[00]
Example	
Command:	041307
	(LEDs: 07)
Response:	00

1.5.3.19. LEDBlink

Command:	[0414][Byte: *LEDs*][UInt16: *TimeOn*][UInt16: *TimeOff*]
Response:	[00]
Example Command:	041407F401F401
	(LEDs: 07, TimeOn: F401, TimeOff: F401)
Response:	00

1.5.3.20. BeepOn

Command:	[0416][Byte: *Volume*][UInt16: *Frequency*]
Response:	[00]
Example Command:	0416646009
	(Volume: 64, Frequency: 6009)
Response:	00

1.5.3.21. BeepOff

Command:	[0417]
Response:	[00]
Example Command:	0417
Response:	00

1.5.4. API RF

1.5.4.1. SearchTag

Command:	[0500][Byte: *MaxIDBytes*]
Response:	[00][Bool: *Result*][Byte: *TagType*][Byte: *IDBitCount*][Byte Array(Var): *ID*]
Example Command:	050010
	(MaxIDBytes: 10)
Response:	000180200466CF4DC2
	(Result: true, TagType: ISO14443A/MIFARE, IDBitCount: 32, ID: 66CF4DC2)

1.5.4.2. SetRFOff

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

1.5.4.3. SetTagTypes

Command:	[0502][UInt32: *TagTypesLF*][UInt32: *TagTypesHF*]
Response:	[00]
Example	
Command:	0502FFFFFFFFFFFFFFFF
	(TagTypesLF: FFFFFFFF, TagTypesHF: FFFFFFFF)
Response:	00

1.5.4.4. GetTagTypes

Command:	[0503]
Response:	[00][UInt32: *LFTagTypes*][UInt32: *HFTagTypes*]
Example	
Command:	0503
Response:	002FFE0700F7000000
	(LFTagTypes: 523823, HFTagTypes: 247)

1.5.4.5. GetSupportedTagTypes

Command:	[0504]
Response:	[00][UInt32: *LFTagTypes*][UInt32: *HFTagTypes*]
Example	
Command:	0504
Response:	002FFE0700F7000000
	(LFTagTypes: 523823, HFTagTypes: 247)

1.5.5. API TILF

1.5.5.1. TILF_SearchTag

Command:	[0600][Byte: *MaxIDBytes*]
Response:	[00][Bool: *Result*][Byte: *IDBitCount*][Byte Array(Var): *ID*]
Example Command:	060010
	(MaxIDBytes: 10)
Response:	0001400800000000042E8653
	(Result: true, IDBitCount: 64, ID: 00000000042E8653)

1.5.5.2. TILF_ChargeOnlyRead

Command:	[0601]
Response:	[00][Bool: *Result*][Byte Array(8): *Data*]
Example Command:	0601
Response:	000100000000042E8653
	(Result: true, Data: 00000000042E8653)

1.5.5.3. TILF_ChargeOnlyReadLo

Command:	[0602]
Response:	[00][Bool: *Result*][Byte Array(16): *ReadData*]
Example Command:	0602
Response:	000100007F7E7EFFFDFFFFFFFFFFFFFFFFFFFD
	(Result: true, ReadData: 00007F7E7EFFFDFFFFFFFFFFFFFFFFFFFD)

1.5.5.4. TILF_SPProgramPage

Command:	[0603][Byte Array(8): *WriteData*]
Response:	[00][Bool: *Result*][Byte Array(16): *ReadData*]
Example Command:	06030001020304050607
	(WriteData: 0001020304050607)
Response:	000100007ECA61742000000000DADF7E0000
	(Result: true, ReadData: 00007ECA61742000000000DADF7E0000)

1.5.5.5. TILF_SPProgramPageLo

Command:	[0604][Byte Array(10): *WriteData*]
Response:	[00][Bool: *Result*][Byte Array(16): *ReadData*]
Example	
Command:	060400010203040506070809
	(WriteData: 00010203040506070809)
Response:	000100007ECA61742000000000DADF7E0000
	(Result: true, ReadData: 00007ECA61742000000000DADF7E0000)

1.5.5.6. TILF_MPGeneralReadPage

Command:	[0605][Byte: *Address*]
Response:	[00][Bool: *Result*][Byte Array(8): *ReadData*]
Example	
Command:	060500
	(Address: 00)
Response:	000100000000042E8653
	(Result: true, ReadData: 00000000042E8653)

1.5.5.7. TILF_MPSelectiveReadPage

Command:	[0606][Byte: *Address*][Byte Array(3): *SelectiveAddress*]
Response:	[00][Bool: *Result*][Byte Array(8): *ReadData*]
Example	
Command:	060600000102
	(Address: 00, SelectiveAddress: 000102)
Response:	000100000000042E8653
	(Result: true, ReadData: 00000000042E8653)

1.5.5.8. TILF_MPProgramPage

Command:	[0607][Byte: *Address*][Byte Array(8): *WriteData*]
Response:	[00][Bool: *Result*][Byte Array(8): *ReadData*]
Example	
Command:	0607004469726563746F72
	(Address: 00, WriteData: 4469726563746F72)
Response:	000100000000042E8653
	(Result: true, ReadData: 00000000042E8653)

1.5.5.9. TILF_MPSelectiveProgramPage

Command:	[0608][Byte: *Address*][Byte Array(3): *SelectiveAddress*][Byte Array(8): *WriteData*]
Response:	[00][Bool: *Result*][Byte Array(8): *ReadData*]
Example Command:	0608000001024469726563746F72
	(Address: 00, SelectiveAddress: 000102, WriteData: 4469726563746F72)
Response:	000100000000042E8653
	(Result: true, ReadData: 00000000042E8653)

1.5.5.10. TILF_MPLockPage

Command:	[0609][Byte: *Address*]
Response:	[00][Bool: *Result*][Byte Array(8): *ReadData*]
Example Command:	060900
	(Address: 00)
Response:	0000
	(Result: fail, ReadData:)

1.5.5.11. TILF_MPSelectiveLockPage

Command:	[060A][Byte: *Address*][Byte Array(3): *SelectiveAddress*]
Response:	[00][Bool: *Result*][Byte Array(8): *ReadData*]
Example Command:	060A00000102
	(Address: 00, SelectiveAddress: 000102)
Response:	0000
	(Result: fail, ReadData:)

1.5.5.12. TILF_MPGeneralReadPageLo

Command:	[060B][Byte: *Address*]
Response:	[00][Bool: *Result*][Byte Array(16): *ReadData*]
Example Command:	060B00
	(Address: 00)
Response:	000100007ECA61742000000000DADF7E0000
	(Result: true, ReadData: 00007ECA61742000000000DADF7E0000)

1.5.5.13. TILF_MPSelectiveReadPageLo

Command:	[060C][Byte: *Address*][Byte Array(3): *SelectiveAddress*]
Response:	[00][Bool: *Result*][Byte Array(16): *ReadData*]
Example	
Command:	060C00000102
	(Address: 00, SelectiveAddress: 000102)
Response:	000100007ECA61742000000000DADF7E0000
	(Result: true, ReadData: 00007ECA61742000000000DADF7E0000)

1.5.5.14. TILF_MPProgramPageLo

Command:	[060D][Byte: *Address*][Byte Array(10): *WriteData*]
Response:	[00][Bool: *Result*][Byte Array(16): *ReadData*]
Example	
Command:	060D00536F6D6520746578742E
	(Address: 00, WriteData: 536F6D6520746578742E)
Response:	000100007ECA61742000000000DADF7E0000
	(Result: true, ReadData: 00007ECA61742000000000DADF7E0000)

1.5.5.15. TILF_MPSelectiveProgramPageLo

Command:	[060E][Byte: *Address*][Byte Array(3): *SelectiveAddress*][Byte Array(10): *WriteData*]
Response:	[00][Bool: *Result*][Byte Array(16): *ReadData*]
Example	
Command:	060E00000102536F6D6520746578742E
	(Address: 00, SelectiveAddress: 000102, WriteData: 536F6D6520746578742E)
Response:	000100007ECA61742000000000DADF7E0000
	(Result: true, ReadData: 00007ECA61742000000000DADF7E0000)

1.5.5.16. TILF_MPLockPageLo

Command:	[060F][Byte: *Address*]
Response:	[00][Bool: *Result*][Byte Array(16): *ReadData*]
Example	
Command:	060F00
	(Address: 00)
Response:	0000
	(Result: fail, ReadData:)

1.5.5.17. TILF_MPSelectiveLockPageLo

Command:	[0610][Byte: *Address*][Byte Array(3): *SelectiveAddress*]
Response:	[00][Bool: *Result*][Byte Array(16): *ReadData*]
Example	
Command:	061000000102
	(Address: 00, SelectiveAddress: 000102)
Response:	000100007FEFFFFFFFBFF7FFFAFFFFFFFFF7
	(Result: true, ReadData: 00007FEFFFFFFFBFF7FFFAFFFFFFFFF7)

1.5.5.18. TILF_MUGeneralReadPage

Command:	[0611][Byte: *Address*]
Response:	[00][Bool: *Result*][Byte Array(7): *Data*]
Example	
Command:	061100
	(Address: 00)
Response:	0000
	(Result: fail, Data:)

1.5.5.19. TILF_MUSelectiveReadPage

Command:	[0612][Byte: *Address*][Byte: *SelectiveAddress*]
Response:	[00][Bool: *Result*][Byte Array(7): *Data*]
Example	
Command:	06120000
	(Address: 00, SelectiveAddress: 00)
Response:	0000
	(Result: fail, Data:)

1.5.5.20. TILF_MUSpecialReadPage

Command:	[0613][Byte: *Address*][Byte Array(5): *SpecialAddress1*][Byte Array(3): *SpecialAddress2*]
Response:	[00][Bool: *Result*][Byte Array(7): *Data*]
Example	
Command:	06130000010203040000102
	(Address: 00, SpecialAddress1: 0001020304, SpecialAddress2: 000102)
Response:	0000
	(Result: fail, Data:)

1.5.5.21. TILF_MUProgramPage

Command:	[0614][Byte: *Address*][Byte Array(5): *WriteData*]
Response:	[00][Bool: *Result*][Byte Array(7): *ReadData*]
Example	
Command:	06140048656C6C6F
	(Address: 00, WriteData: 48656C6C6F)
Response:	0000
	(Result: fail, ReadData:)

1.5.5.22. TILF_MUSelectiveProgramPage

Command:	[0615][Byte: *Address*][Byte: *SelectiveAddress*][Byte Array(5): *WriteData*]
Response:	[00][Bool: *Result*][Byte Array(7): *ReadData*]
Example	
Command:	0615000048656C6C6F
	(Address: 00, SelectiveAddress: 00, WriteData: 48656C6C6F)
Response:	0000
	(Result: fail, ReadData:)

1.5.5.23. TILF_MUSpecialProgramPage

Command:	[0616][Byte: *Address*][Byte Array(5): *SpecialAddress1*][Byte Array(3): *SpecialAddress2*][Byte Array(5): *WriteData*]
Response:	[00][Bool: *Result*][Byte Array(7): *ReadData*]
Example	
Command:	0616000001020304000010248656C6C6F
	(Address: 00, SpecialAddress1: 0001020304, SpecialAddress2: 000102, WriteData: 48656C6C6F)
Response:	0000
	(Result: fail, ReadData:)

1.5.5.24. TILF_MULockPage

Command:	[0617][Byte: *Address*]
Response:	[00][Bool: *Result*][Byte Array(7): *ReadData*]
Example	
Command:	061700
	(Address: 00)
Response:	0000
	(Result: fail, ReadData:)

1.5.5.25. TILF_MUSelectiveLockPage

Command:	[0618][Byte: *Address*][Byte: *SelectiveAddress*]
Response:	[00][Bool: *Result*][Byte Array(7): *ReadData*]
Example	
Command:	06180000
	(Address: 00, SelectiveAddress: 00)
Response:	0000
	(Result: fail, ReadData:)

1.5.5.26. TILF_MUSpecialLockPage

Command:	[0619][Byte: *Address*][Byte Array(5): *SpecialAddress1*][Byte Array(3): *SpecialAddress2*]
Response:	[00][Bool: *Result*][Byte Array(7): *ReadData*]
Example	
Command:	06190000001020304000102
	(Address: 00, SpecialAddress1: 0001020304, SpecialAddress2: 000102)
Response:	0000
	(Result: fail, ReadData:)

1.5.6. API HITAG1S

1.5.6.1. Hitag1S_ReadPage

Command:	[0701][Byte: *PageAddress*]
Response:	[00][Bool: *Result*][Byte Array(4): *Data*]
Example Command:	070104
	(PageAddress: 04)
Response:	0001FF8CA64A
	(Result: true, Data: FF8CA64A)

1.5.6.2. Hitag1S_ReadBlock

Command:	[0702][Byte: *BlockAddress*]
Response:	[00][Bool: *Result*][Byte Array(Var): *Data*]
Example Command:	070204
	(BlockAddress: 04)
Response:	0001100001020398F8C802FFFFFFFFFFFFFFFF
	(Result: true, Data: 0001020398F8C802FFFFFFFFFFFFFFFF)

1.5.6.3. Hitag1S_WritePage

Command:	[0703][Byte: *PageAddress*][Byte Array(4): *Data*]
Response:	[00][Bool: *Result*]
Example Command:	07030407040400
	(PageAddress: 04, Data: 07040400)
Response:	0001
	(Result: true)

1.5.6.4. Hitag1S_WriteBlock

Command:	[0704][Byte: *BlockAddress*][Byte Array(16): *Data*]
Response:	[00][Bool: *Result*][Byte: *BytesWritten*]
Example	
Command:	07040400000000000000000000000000000000
	(BlockAddress: 04, Data: 00000000000000000000000000000000)
Response:	000110
	(Result: true, BytesWritten: 16)

1.5.6.5. Hitag1S_Halt

Command:	[0705]
Response:	[00][Bool: *Result*]
Example	
Command:	0705
Response:	0001
	(Result: true)

1.5.7. API HITAG2

1.5.7.1. Hitag2_ReadPage

Command:	[0801][Byte: *PageAddress*]
Response:	[00][Bool: *Result*][Byte Array(4): *Data*]
Example	
Command:	080104
	(PageAddress: 04)
Response:	0001FF800000
	(Result: true, Data: FF800000)

1.5.7.2. Hitag2_WritePage

Command:	[0802][Byte: *PageAddress*][Byte Array(4): *Data*]
Response:	[00][Bool: *Result*]
Example	
Command:	080204FF800000
	(PageAddress: 04, Data: FF800000)
Response:	0001
	(Result: true)

1.5.7.3. Hitag2_Halt

Command:	[0803]
Response:	[00][Bool: *Result*]
Example	
Command:	0803
Response:	0001
	(Result: true)

1.5.7.4. Hitag2_SetPassword

Command:	[0804][Byte Array(4): *Password*]
Response:	[00]
Example	
Command:	080400010203
	(Password: 00010203)
Response:	00

1.5.8. API SM4X00

1.5.8.1. SM4X00_GenericRaw

Command:	[0900][Byte Array(Var): *TXData*][Byte: *MaxRXDataLength*][UInt16: *Timeout*]
Response:	[00][Bool: *Result*][Byte Array(Var): *RXData*]
Example	
Command:	090005040A00000040B80B
	(TXData: 040A000000, MaxRXDataLength: 40, Timeout: B80B)
Response:	00010D0A00000901050100180103 0100
	(Result: true, RXData: 0A00000901050100180103 0100)

1.5.8.2. SM4X00_Generic

Command:	[0901][Byte Array(Var): *TXData*][Byte: *MaxRXDataLength*][UInt16: *Timeout*]
Response:	[00][Bool: *Result*][Byte Array(Var): *RXData*]
Example	
Command:	0901020A0040B80B
	(TXData: 0A00, MaxRXDataLength: 40, Timeout: B80B)
Response:	0001100F0A000009010501001801030100EB63
	(Result: true, RXData: 0F0A000009010501001801030100EB63)

1.5.9. API I2C

1.5.9.1. I2CInit

Command:	[0A00][UInt16: *Mode*]
Response:	[00][Bool: *Result*]
Example	
Command:	0A000000
	(Mode: 0000)
Response:	0001
	(Result: true)

1.5.9.2. I2CDeInit

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

1.5.9.3. I2CMasterStart

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

1.5.9.4. I2CMasterStop

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

1.5.9.5. I2CMasterTransmitByte

Command:	[0A04][Byte: *Data*]
Response:	[00]
Example	
Command:	0A0400
	(Data: 00)
Response:	00

1.5.9.6. I2CMasterReceiveByte

Command:	[0A05]
Response:	[00][Byte: *Data*]
Example	
Command:	0A05
Response:	0000
	(Data: 0)

1.5.9.7. I2CMasterBeginWrite

Command:	[0A06][Byte: *Address*]
Response:	[00]
Example	
Command:	0A0630
	(Address: 30)
Response:	00

1.5.9.8. I2CMasterBeginRead

Command:	[0A07][Byte: *Address*]
Response:	[00]
Example	
Command:	0A0730
	(Address: 30)
Response:	00

1.5.9.9. I2CMasterSetAck

Command:	[0A08][Byte: *SetOn*]
Response:	[00]
Example	
Command:	0A0801
	(SetOn: 01)
Response:	00

1.5.10. API MIFARECLASSIC

1.5.10.1. MifareClassic_Login

Command:	[0B00][Byte Array(6): *Key*][Byte: *KeyType*][Byte: *Sector*]
Response:	[00][Bool: *Result*]
Example	
Command:	0B00A0A1A2A3A4A50000
	(Key: A0A1A2A3A4A5, KeyType: 00, Sector: 00)
Response:	0001
	(Result: true)

1.5.10.2. MifareClassic_ReadBlock

Command:	[0B01][Byte: *Block*]
Response:	[00][Bool: *Result*][Byte Array(16): *Data*]
Example	
Command:	0B0102
	(Block: 02)
Response:	00010000000000000000000000000000000000
	(Result: true, Data: 00000000000000000000000000000000)

1.5.10.3. MifareClassic_WriteBlock

Command:	[0B02][Byte: *Block*][Byte Array(16): *Data*]
Response:	[00][Bool: *Result*]
Example	
Command:	0B0202000000000000000000000000000000000000
	(Block: 02, Data: 00000000000000000000000000000000)
Response:	0001
	(Result: true)

1.5.10.4. MifareClassic_ReadValueBlock

Command:	[0B03][Byte: *Block*]
Response:	[00][Bool: *Result*][UInt32: *Value*]
Example	
Command:	0B0302
	(Block: 02)
Response:	000101000000
	(Result: true, Value: 1)

1.5.10.5. MifareClassic_WriteValueBlock

Command:	[0B04][Byte: *Block*][UInt32: *Value*]
Response:	[00][Bool: *Result*]
Example	
Command:	0B040201000000
	(Block: 02, Value: 01000000)
Response:	0001
	(Result: true)

1.5.10.6. MifareClassic_IncrementValueBlock

Command:	[0B05][Byte: *Block*][UInt32: *Value*]
Response:	[00][Bool: *Result*]
Example	
Command:	0B050201000000
	(Block: 02, Value: 01000000)
Response:	0001
	(Result: true)

1.5.10.7. MifareClassic_DecrementValueBlock

Command:	[0B06][Byte: *Block*][UInt32: *Value*]
Response:	[00][Bool: *Result*]
Example Command:	0B060201000000
	(Block: 02, Value: 01000000)
Response:	0001
	(Result: true)

1.5.10.8. MifareClassic_CopyValueBlock

Command:	[0B07][Byte: *SourceBlock*][Byte: *DestBlock*]
Response:	[00][Bool: *Result*]
Example Command:	0B07090A
	(SourceBlock: 09, DestBlock: 0A)
Response:	0001
	(Result: true)

1.5.11. API MIFAREULTRALIGHT

1.5.11.1. MifareUltralight_ReadPage

Command:	[0C00][Byte: *Page*]
Response:	[00][Bool: *Result*][Byte Array(16): *Data*]
Example Command:	0C0004
	(Page: 04)
Response:	00010001020314787 0672E636F6D3A636172
	(Result: true, Data: 00010203147870672E636F6D3A636172)

1.5.11.2. MifareUltralight_WritePage

Command:	[0C01][Byte: *Page*][Byte Array(4): *Data*]
Response:	[00][Bool: *Result*]
Example	
Command:	0C010400010203
	(Page: 04, Data: 00010203)
Response:	0001
	(Result: true)

1.5.11.3. MifareUltralightC_Authenticate

Command:	[0C02][Byte Array(16): *Key*]
Response:	[00][Bool: *Result*]
Example	
Command:	0C0249454D4B41455242214E4143554F5946
	(Key: 49454D4B41455242214E4143554F5946)
Response:	0001
	(Result: true)

1.5.11.4. MifareUltralightC_SAMAuthenticate

Command:	[0C03][Byte: *KeyNo*][Byte: *KeyVersion*][Byte Array(Var): *DIVInput*]
Response:	[00][Bool: *Result*]
Example	
Command:	0C03010000
	(KeyNo: 01, KeyVersion: 00, DIVInput:)
Response:	0001
	(Result: true)

1.5.11.5. MifareUltralightC_WriteKeyFromSAM

Command:	[0C04][Byte: *KeyNo*][Byte: *KeyVersion*][Byte Array(Var): *DIVInput*]
Response:	[00][Bool: *Result*]
Example	
Command:	0C04010000
	(KeyNo: 01, KeyVersion: 00, DIVInput:)
Response:	0000
	(Result: fail)

1.5.11.6. MifareUltralightEV1_FastRead

Command:	[0C05][Byte: *StartPage*][Byte: *NumberOfPages*]
Response:	[00][Bool: *Result*][Byte Array(Var): *Data*]
Example	
Command:	0C050401
	(StartPage: 04, NumberOfPages: 01)
Response:	00010400000000
	(Result: true, Data: 00000000)

1.5.11.7. MifareUltralightEV1_IncCounter

Command:	[0C06][Byte: *CounterAddr*][UInt32: *IncrValue*]
Response:	[00][Bool: *Result*]
Example	
Command:	0C060000000000
	(CounterAddr: 00, IncrValue: 00000000)
Response:	0001
	(Result: true)

1.5.11.8. MifareUltralightEV1_ReadCounter

Command:	[0C07][Byte: *CounterAddr*]
Response:	[00][Bool: *Result*][UInt32: *CounterValue*]
Example	
Command:	0C0700
	(CounterAddr: 00)
Response:	000102000000
	(Result: true, CounterValue: 2)

1.5.11.9. MifareUltralightEV1_ReadSig

Command:	[0C08]
Response:	[00][Bool: *Result*][Byte Array(32): *ECCSig*]
Example	
Command:	0C08
Response:	00013A4F2622AF2039E47F8AA1BF84C52EE949860DD07125BEF75EC4-17833B80C105
	(Result: true, ECCSig:
	3A4F2622AF2039E47F8AA1BF84C52EE949860DD07125BEF75EC417833B80C105)

1.5.11.10. MifareUltralightEV1_GetVersion

Command:	[0C09]
Response:	[00][Bool: *Result*][Byte Array(8): *Version*]
Example	
Command:	0C09
Response:	00010004030101000E03
	(Result: true, Version: 0004030101000E03)

1.5.11.11. MifareUltralightEV1_PwdAuth

Command:	[0C0A][Byte Array(4): *Password*][Byte Array(2): *PwdAck*]
Response:	[00][Bool: *Result*]
Example	
Command:	0C0AFFFFFFFF0000
	(Password: FFFFFFFF, PwdAck: 0000)
Response:	0001
	(Result: true)

1.5.11.12. MifareUltralightEV1_CheckTearingEvent

Command:	[0C0B][Byte: *CounterAddr*]
Response:	[00][Bool: *Result*][Byte: *ValidFlag*]
Example	
Command:	0C0B00
	(CounterAddr: 00)
Response:	0001BD
	(Result: true, ValidFlag: 189)

1.5.12. API ISO15693

1.5.12.1. ISO15693_GenericCommand

Command:	[0D00][Byte: *Flags*][Byte: *Command*][Byte Array(Var): *Data*][Byte: *BufferSize*]
Response:	[00][Bool: *Result*][Byte Array(Var): *Data*]
Example	
Command:	0D001020010020
	(Flags: 10, Command: 20, Data: 00, BufferSize: 20)
Response:	00010400000000
	(Result: true, Data: 00000000)

1.5.12.2. ISO15693_GetSystemInformation

Command:	[0D01]
Response:	[00][Bool: *Result*][Byte Array(15): *SystemInfo*]
Example	
Command:	0D01
Response:	0001EF50781B06013C16E002000442000F
	(Result: true, SystemInfo: EF50781B06013C16E002000442000F)

1.5.12.3. ISO15693_GetSystemInformationExt

Command:	[0D02]
Response:	[00][Bool: *Result*][Byte Array(15): *SystemInfo*]
Example	
Command:	0D02
Response:	0001EF7D50C3ED084402E0000004000844
	(Result: true, SystemInfo: EF7D50C3ED084402E0000004000844)

1.5.12.4. ISO15693_GetTagTypeFromUID

Command:	[0D03][Byte Array(8): *UID*]
Response:	[00][Byte: *TagType*]
Example	
Command:	0D03E0163C01061B7850
	(UID: E0163C01061B7850)
Response:	00FF
	(TagType: 255)

1.5.12.5. ISO15693_GetTagTypeFromSystemInfo

Command:	[0D04][Byte Array(15): *SystemInfo*]
Response:	[00][Byte: *TagType*]
Example Command:	0D04EF7D50C3ED084402E0000004000844
	(SystemInfo: EF7D50C3ED084402E0000004000844)
Response:	0043
	(TagType: 67)

1.5.12.6. ISO15693_ReadSingleBlock

Command:	[0D05][UInt16: *BlockNumber*][Byte: *BufferSize*]
Response:	[00][Bool: *Result*][Byte Array(Var): *BlockData*]
Example Command:	0D050500FF
	(BlockNumber: 0500, BufferSize: FF)
Response:	00010400000000
	(Result: true, BlockData: 00000000)

1.5.12.7. ISO15693_ReadSingleBlockExt

Command:	[0D06][UInt16: *BlockNumber*][Byte: *BufferSize*]
Response:	[00][Bool: *Result*][Byte Array(Var): *BlockData*]
Example Command:	0D060000FF
	(BlockNumber: 0000, BufferSize: FF)
Response:	00010401020304
	(Result: true, BlockData: 01020304)

1.5.12.8. ISO15693_WriteSingleBlock

Command:	[0D07][UInt16: *BlockNumber*][Byte Array(Var): *BlockData*]
Response:	[00][Bool: *Result*]
Example Command:	0D0705000411223344
	(BlockNumber: 0500, BlockData: 11223344)
Response:	0001
	(Result: true)

1.5.12.9. ISO15693_WriteSingleBlockExt

Command:	[0D08][UInt16: *BlockNumber*][Byte Array(Var): *BlockData*]
Response:	[00][Bool: *Result*]
Example	
Command:	0D08000004426C612E
	(BlockNumber: 0000, BlockData: 426C612E)
Response:	0001
	(Result: true)

1.5.13. API CRYPTO

1.5.13.1. Crypto_Init

Command:	[0E00][Byte: *CryptoEnv*][Byte: *CryptoMode*][Byte Array(Var): *Key*]
Response:	[00]
Example	
Command:	0E0000001000000000000000000000000000000000
	(CryptoEnv: 00, CryptoMode: 00, Key: 00000000000000000000000000000000)
Response:	00

1.5.13.2. Encrypt

Command:	[0E01][Byte: *CryptoEnv*][Byte Array(Var): *PlainBlock*]
Response:	[00][Byte Array(Var): *CipheredBlock*]
Example	
Command:	0E010010800000000000000000000000000000000
	(CryptoEnv: 00, PlainBlock: 80000000000000000000000000000000)
Response:	00103AD78E726C1EC02B7EBFE92B23D9EC34
	(CipheredBlock: 3AD78E726C1EC02B7EBFE92B23D9EC34)

1.5.13.3. Decrypt

Command:	[0E02][Byte: *CryptoEnv*][Byte Array(Var): *CipheredBlock*]
Response:	[00][Byte Array(Var): *PlainBlock*]
Example	
Command:	0E0200103AD78E726C1EC02B7EBFE92B23D9EC34
	(CryptoEnv: 00, CipheredBlock: 3AD78E726C1EC02B7EBFE92B23D9EC34)
Response:	0010800000000000000000000000000000000000
	(PlainBlock: 80000000000000000000000000000000)

1.5.13.4. CBC_ResetInitVector

Command:	[0E03][Byte: *CryptoEnv*]
Response:	[00]
Example	
Command:	0E0300
	(CryptoEnv: 00)
Response:	00

1.5.14. API DESFIRE

1.5.14.1. DESFire_GetApplicationIDs

Command:	[0F00][Byte: *CryptoEnv*][Byte: *MaxAIDCnt*]
Response:	[00][Bool: *Result*][variable number of UInt32: *AIDs*]
Example	
Command:	0F00001C
	(CryptoEnv: 00, MaxAIDCnt: 1C)
Response:	00010133221100
	(Result: true, AIDs: 00112233)

1.5.14.2. DESFire_CreateApplication

Command:	[0F01][Byte: *CryptoEnv*][UInt32: *AID*][4 Bit: *ChangeKeyAccessRights*][1 Bit: *ConfigurationChangeable*][1 Bit: *FreeCreateDelete*][1 Bit: *FreeDirectoryList*][1 Bit: *AllowChangeMasterKey*][UInt32: *NumberOfKeys*][UInt32: *KeyType*]
Response:	[00][Bool: *Result*]
Example Command:	0F0100907856000F0100000000000000
	(CryptoEnv: 00, AID: 90785600, ChangeKeyAccessRights: 15, ConfigurationChangeable: 1, FreeCreateDelete: 1, FreeDirectoryList: 1, AllowChangeMasterKey: 1, NumberOfKeys: 01000000, KeyType: 00000000)
Response:	0001
	(Result: true)

1.5.14.3. DESFire_DeleteApplication

Command:	[0F02][Byte: *CryptoEnv*][UInt32: *AID*]
Response:	[00][Bool: *Result*]
Example Command:	0F020090785600
	(CryptoEnv: 00, AID: 90785600)
Response:	0001
	(Result: true)

1.5.14.4. DESFire_SelectApplication

Command:	[0F03][Byte: *CryptoEnv*][UInt32: *AID*]
Response:	[00][Bool: *Result*]
Example Command:	0F030033221100
	(CryptoEnv: 00, AID: 33221100)
Response:	0001
	(Result: true)

1.5.14.5. DESFire_Authenticate

Command:	[0F04][Byte: *CryptoEnv*][Byte: *KeyNoTag*][Byte Array(Var): *Key*][Byte: *KeyType*][Byte: *Mode*]
Response:	[00][Bool: *Result*]
Example Command:	0F04000010000000000000000000000000000000000000
	(CryptoEnv: 00, KeyNoTag: 00, Key: 00000000000000000000000000000000, KeyType: 00, Mode: 00)
Response:	0001
	(Result: true)

1.5.14.6. DESFire_GetKeySettings

Command:	[0F05][Byte: *CryptoEnv*]
Response:	[00][Bool: *Result*][Byte: *KeySettings*][UInt32: *NumberOfKeys*][UInt32: *KeyType*]
Example Command:	0F0500
	(CryptoEnv: 00)
Response:	00010F0100000000000000
	(Result: true, KeySettings: 15, NumberOfKeys: 1, KeyType: 0)

1.5.14.7. DESFire_GetFileIDs

Command:	[0F06][Byte: *CryptoEnv*][Byte: *MaxFileIDCount*]
Response:	[00][Bool: *Result*][variable number of Bytes: *FileIDList*]
Example Command:	0F0600FF
	(CryptoEnv: 00, MaxFileIDCount: FF)
Response:	00010400010203
	(Result: true, FileIDList: 00, 01, 02, 03)

1.5.14.8. DESFire_GetFileSettings

Command:	[0F07][Byte: *CryptoEnv*][Byte: *FileNo*]
Response:	[00][Bool: *Result*][Byte Array(20): *FileSettings*]
Example Command:	0F070000
	(CryptoEnv: 00, FileNo: 00)
Response:	00010000EEEE2000000000000000000000000036322F50
	(Result: true, FileSettings: 0000EEEE2000000000000000000000000036322F50)

1.5.14.9. DESFire_ReadData

Command:	[0F08][Byte: *CryptoEnv*][Byte: *FileNo*][UInt16: *Offset*][Byte: *Length*][Byte: *CommSet*]
Response:	[00][Bool: *Result*][Byte Array(Var): *Data*]
Example Command:	0F08000000000300
	(CryptoEnv: 00, FileNo: 00, Offset: 0000, Length: 03, CommSet: 00)
Response:	000103001122
	(Result: true, Data: 001122)

1.5.14.10. DESFire_WriteData

Command:	[0F09][Byte: *CryptoEnv*][Byte: *FileNo*][UInt16: *Offset*][Byte Array(Var): *Data*][Byte: *CommSet*]
Response:	[00][Bool: *Result*]
Example Command:	0F0900000000300112200
	(CryptoEnv: 00, FileNo: 00, Offset: 0000, Data: 001122, CommSet: 00)
Response:	0001
	(Result: true)

1.5.14.11. DESFire_GetValue

Command:	[0F0A][Byte: *CryptoEnv*][Byte: *FileNo*][Byte: *CommSet*]
Response:	[00][Bool: *Result*][UInt32: *Value*]
Example	
Command:	0F0A000000
	(CryptoEnv: 00, FileNo: 00, CommSet: 00)
Response:	000100000000
	(Result: true, Value: 0)

1.5.14.12. DESFire_Credit

Command:	[0F0B][Byte: *CryptoEnv*][Byte: *FileNo*][UInt32: *Value*][Byte: *CommSet*]
Response:	[00][Bool: *Result*]
Example	
Command:	0F0B00040000000000
	(CryptoEnv: 00, FileNo: 04, Value: 00000000, CommSet: 00)
Response:	0001
	(Result: true)

1.5.14.13. DESFire_Debit

Command:	[0F0C][Byte: *CryptoEnv*][Byte: *FileNo*][UInt32: *Value*][Byte: *CommSet*]
Response:	[00][Bool: *Result*]
Example	
Command:	0F0C00040000000000
	(CryptoEnv: 00, FileNo: 04, Value: 00000000, CommSet: 00)
Response:	0001
	(Result: true)

1.5.14.14. DESFire_LimitedCredit

Command:	[0F0D][Byte: *CryptoEnv*][Byte: *FileNo*][UInt32: *Value*][Byte: *CommSet*]
Response:	[00][Bool: *Result*]
Example	
Command:	0F0D00040000000000
	(CryptoEnv: 00, FileNo: 04, Value: 00000000, CommSet: 00)
Response:	0001
	(Result: true)

1.5.14.15. DESFire_FreeMem

Command:	[0F0E][Byte: *CryptoEnv*]
Response:	[00][Bool: *Result*][UInt16: *FreeMemory*]
Example	
Command:	0F0E00
	(CryptoEnv: 00)
Response:	00016011
	(Result: true, FreeMemory: 4448)

1.5.14.16. DESFire_FormatTag

Command:	[0F0F][Byte: *CryptoEnv*]
Response:	[00][Bool: *Result*]
Example	
Command:	0F0F00
	(CryptoEnv: 00)
Response:	0001
	(Result: true)

1.5.14.17. DESFire_CreateDataFile

Command:	[0F10][Byte: *CryptoEnv*][Byte: *FileNo*][Byte: *FileType*][Byte: *CommSet*][UInt16: *Access-Rights*][UInt32: *FileSize*]appending 0's]
Response:	[00][Bool: *Result*]
Example	
Command:	0F1000050000EEEE0F0000000000000000000000000000000
	(CryptoEnv: 00, FileNo: 05, FileType: 00, CommSet: 00, AccessRights: EEEE, FileSize: 0F000000, appending 0's: 00000000000000000000000)
Response:	0001
	(Result: true)

1.5.14.18. DESFire_CreateValueFile

Command:	[0F11][Byte: *CryptoEnv*][Byte: *FileNo*][Byte: *FileType*][Byte: *CommSet*][UInt16: *AccessRights*][UInt32: *LowerLimit*][UInt32: *UpperLimit*][UInt32: *LimitedCreditValue*][1 Bit: *FreeGetValue*][1 Bit: *LimitedCreditEnabled*]
Response:	[00][Bool: *Result*]
Example Command:	0F1100040200EEEE000000000F0000000F00000001000000 (CryptoEnv: 00, FileNo: 04, FileType: 02, CommSet: 00, AccessRights: EEEE, LowerLimit: 00000000, UpperLimit: 0F000000, LimitedCreditValue: 0F000000, FreeGetValue: 1, LimitedCreditEnabled: 1)
Response:	0001 (Result: true)

1.5.14.19. DESFire_GetVersion

Command:	[0F12][Byte: *CryptoEnv*]
Response:	[00][Bool: *Result*][Byte Array(34): *Version*]
Example Command:	0F1200 (CryptoEnv: 00)
Response:	00010401010100001000000504010101030010000005000000000000-00BA14D0A7103110 (Result: true, Version: 0401010100001000000504010101030010000005000000000000BA14D0A7103110)

1.5.14.20. DESFire_DeleteFile

Command:	[0F13][Byte: *CryptoEnv*][Byte: *FileNo*]
Response:	[00][Bool: *Result*]
Example Command:	0F130005 (CryptoEnv: 00, FileNo: 05)
Response:	0001 (Result: true)

1.5.14.21. DESFire_CommitTransaction

Command:	[0F14][Byte: *CryptoEnv*]
Response:	[00][Bool: *Result*]
Example	
Command:	0F1400
	(CryptoEnv: 00)
Response:	0001
	(Result: true)

1.5.14.22. DESFire_AbortTransaction

Command:	[0F15][Byte: *CryptoEnv*]
Response:	[00][Bool: *Result*]
Example	
Command:	0F1500
	(CryptoEnv: 00)
Response:	0001
	(Result: true)

1.5.14.23. DESFire_GetUID

Command:	[0F16][Byte: *CryptoEnv*][Byte: *BufferSize*]
Response:	[00][Bool: *Result*][Byte Array(Var): *UID*]
Example	
Command:	0F1600FF
	(CryptoEnv: 00, BufferSize: FF)
Response:	000107045243523D2480
	(Result: true, UID: 045243523D2480)

1.5.14.24. DESFire_GetKeyVersion

Command:	[0F17][Byte: *CryptoEnv*][Byte: *KeyNo*]
Response:	[00][Bool: *Result*][Byte Array(1): *KeyVersion*]
Example	
Command:	0F170000
	(CryptoEnv: 00, KeyNo: 00)
Response:	0001FF
	(Result: true, KeyVersion: FF)

1.5.14.25. DESFire_ChangeKeySettings

Command:	[0F18][Byte: *CryptoEnv*][4 Bit: *ChangeKeyAccessRights*][1 Bit: *ConfigurationChangeable*][1 Bit: *FreeCreateDelete*][1 Bit: *FreeDirectoryList*][1 Bit: *AllowChangeMasterKey*][UInt32: *NumberOfKeys*][UInt32: *KeyType*]
Response:	[00][Bool: *Result*]
Example Command:	0F18000F0000000000000000 (CryptoEnv: 00, ChangeKeyAccessRights: 15, ConfigurationChangeable: 1, FreeCreateDelete: 1, FreeDirectoryList: 1, AllowChangeMasterKey: 1, NumberOfKeys: 00000000, KeyType: 00000000)
Response:	0001 (Result: true)

1.5.14.26. DESFire_ChangeKey

Command:	[0F19][Byte: *CryptoEnv*][Byte: *KeyNo*][Byte Array(Var): *OldKey*][Byte Array(Var): *NewKey*][Byte: *KeyVersion*][4 Bit: *ChangeKeyAccessRights*][1 Bit: *ConfigurationChangeable*][1 Bit: *FreeCreateDelete*][1 Bit: *FreeDirectoryList*][1 Bit: *AllowChangeMasterKey*][UInt32: *NumberOfKeys*][UInt32: *KeyType*]
Response:	[00][Bool: *Result*]
Example Command:	0F190000010000000000000000000000000000000010000000000000-000000000000000000000000F0100000000000000 (CryptoEnv: 00, KeyNo: 00, OldKey: 00000000000000000000000000000000, NewKey: 00000000000000000000000000000000, KeyVersion: 00, ChangeKeyAccessRights: 15, ConfigurationChangeable: 1, FreeCreateDelete: 1, FreeDirectoryList: 1, AllowChangeMasterKey: 1, NumberOfKeys: 01000000, KeyType: 00000000)
Response:	0001 (Result: true)

1.5.14.27. DESFire_ChangeFileSettings

Command:	[0F1A][Byte: *CryptoEnv*][Byte: *FileNo*][Byte: *NewCommSet*][UInt16: *OldAccessRights*][UInt16: *NewAccessRights*]
Response:	[00][Bool: *Result*]
Example Command:	0F1A000000EEEEEEEE (CryptoEnv: 00, FileNo: 00, NewCommSet: 00, OldAccessRights: EEEE, NewAccessRights: EEEE)
Response:	0001 (Result: true)

1.5.14.28. DESFire_DisableFormatCard

Command:	[0F1B][Byte: *CryptoEnv*]
Response:	[00][Bool: *Result*]
Example	
Command:	0F1B00
	(CryptoEnv: 00)
Response:	0001
	(Result: true)

1.5.14.29. DESFire_EnableRandomID

Command:	[0F1C][Byte: *CryptoEnv*]
Response:	[00][Bool: *Result*]
Example	
Command:	0F1C00
	(CryptoEnv: 00)
Response:	0001
	(Result: true)

1.5.14.30. DESFire_SetDefaultKey

Command:	[0F1D][Byte: *CryptoEnv*][Byte Array(Var): *Key*][Byte: *KeyVersion*]
Response:	[00][Bool: *Result*]
Example	
Command:	0F1D0010000000000000000000000000000000000000FF
	(CryptoEnv: 00, Key: 00000000000000000000000000000000, KeyVersion: FF)
Response:	0001
	(Result: true)

1.5.14.31. DESFire_SetATS

Command:	[0F1E][Byte: *CryptoEnv*][Byte Array(Var): *ATS*]
Response:	[00][Bool: *Result*]
Example	
Command:	0F1E00080087577810280CAFE
	(CryptoEnv: 00, ATS: 087577810280CAFE)
Response:	0001
	(Result: true)

1.5.14.32. DESFire_CreateRecordFile

Command:	[0F1F][Byte: *CryptoEnv*][Byte: *FileNo*][Byte: *FileType*][Byte: *CommSet*][UInt16: *Access-Rights*][UInt32: *RecordSize*][UInt32: *MaxNumberOfRecords*]appending 0's]
Response:	[00][Bool: *Result*]
Example Command:	0F1F00050000EEEE0F000000010000000000000000000000 (CryptoEnv: 00, FileNo: 05, FileType: 00, CommSet: 00, AccessRights: EEEE, RecordSize: 0F000000, MaxNumberOfRecords: 01000000, appending 0's: 0000000000000000)
Response:	0001 (Result: true)

1.5.14.33. DESFire_ReadRecords

Command:	[0F20][Byte: *CryptoEnv*][Byte: *FileNo*][UInt16: *Offset*][Byte: *NumberOfRecords*][Byte: *RecordSize*][Byte: *CommSet*]
Response:	[00][Bool: *Result*][Byte Array(Var): *Data*]
Example Command:	0F2000000000030000 (CryptoEnv: 00, FileNo: 00, Offset: 0000, NumberOfRecords: 03, RecordSize: 00, CommSet: 00)
Response:	000103001122 (Result: true, Data: 001122)

1.5.14.34. DESFire_WriteRecord

Command:	[0F21][Byte: *CryptoEnv*][Byte: *FileNo*][UInt16: *Offset*][Byte Array(Var): *Data*][Byte: *CommSet*]
Response:	[00][Bool: *Result*]
Example Command:	0F21000000000300112200 (CryptoEnv: 00, FileNo: 00, Offset: 0000, Data: 001122, CommSet: 00)
Response:	0001 (Result: true)

1.5.14.35. DESFire_ClearRecordFile

Command:	[0F22][Byte: *CryptoEnv*][Byte: *FileNo*]
Response:	[00][Bool: *Result*]
Example	
Command:	0F220005
	(CryptoEnv: 00, FileNo: 05)
Response:	0001
	(Result: true)

1.5.15. API ISO7816

1.5.15.1. ISO7816_GetSlotStatus

Command:	[1000][Byte: *Channel*]
Response:	[00][Bool: *Result*][Byte Array(3): *SlotStatus*]
Example	
Command:	100020
	(Channel: 20)
Response:	0001000000
	(Result: true, SlotStatus: 000000)

1.5.15.2. ISO7816_IccPowerOn

Command:	[1001][Byte: *Channel*][Byte: *MaxATRByteCnt*][Byte: *bPowerSelect*]
Response:	[00][Bool: *Result*][Byte Array(Var): *ATR*][Byte: *bStatus*][Byte: *bError*]
Example	
Command:	100120FF00
	(Channel: 20, MaxATRByteCnt: FF, bPowerSelect: 00)
Response:	00010F3B959680B1FE551FC74772616365130000
	(Result: true, ATR: 3B959680B1FE551FC7477261636513, bStatus: 0, bError: 0)

1.5.15.3. ISO7816_IccPowerOff

Command:	[1002][Byte: *Channel*]
Response:	[00][Bool: *Result*][Byte Array(3): *SlotStatus*]
Example	
Command:	100220
	(Channel: 20)
Response:	0001010000
	(Result: true, SlotStatus: 010000)

1.5.15.4. ISO7816_SetCommSettings

Command:	[1003][Byte: *Channel*][Byte Array(14): *CommSettings*]
Response:	[00][Bool: *Result*]
Example	
Command:	1003200100740101000000FF5500FE0000
	(Channel: 20, CommSettings: 0100740101000000FF5500FE0000)
Response:	0001
	(Result: true)

1.5.15.5. ISO7816_Transceive

Command:	[1004][Byte: *Channel*][Byte Array(Var), 2 LB: *TX*][Byte: *MaxRXByteCnt*]
Response:	[00][Bool: *Result*][Byte Array(Var), 2 LB: *RX*]
Example	
Command:	100420050000C10120E0FF
	(Channel: 20, TX: 00C10120E0, MaxRXByteCnt: FF)
Response:	000102006E00
	(Result: true, RX: 6E00)

1.5.15.6. ISO7816_ExchangeAPDU

Command:	[1005][Byte: *Channel*][Byte Array(9): *Header*][Byte Array(Var), 2 LB: *TXData*][UInt16: *MaxRXByteCnt*]
Response:	[00][Bool: *Result*][Byte Array(Var), 2 LB: *RXData*][UInt16: *StatusWord*]
Example Command:	10052000A400040200000000102003F008000
	(Channel: 20, Header: 00A400040200000001, TXData: 3F00, MaxRXByteCnt: 8000)
Response:	00010000006E
	(Result: true, RXData: , StatusWord: 28160)

1.5.15.7. ISO7816_T0_TPDU

Command:	[1006][Byte: *Channel*][Byte Array(5): *Header*][Byte Array(Var), 2 LB: *TXData*][UInt16: *MaxRXByteCnt*]
Response:	[00][Bool: *Result*][Byte Array(Var), 2 LB: *RXData*][UInt16: *StatusWord*]
Example Command:	10062000A400040202003F008000
	(Channel: 20, Header: 00A4000402, TXData: 3F00, MaxRXByteCnt: 8000)
Response:	00010000006E
	(Result: true, RXData: , StatusWord: 28160)

1.5.15.8. ISO7816_CheckWellKnownCards

Command:	[1007][Byte: *Channel*]
Response:	[00][Bool: *Result*][Byte Array(4): *CardType*]
Example Command:	100720
	(Channel: 20)
Response:	000110000000
	(Result: true, CardType: 10000000)

1.5.16. API ICLASS

1.5.16.1. ICLASS_GetPACBits

Command:	[1100][Byte: *MaxPACBytes*]
Response:	[00][Bool: *Result*][Byte: *PACBitCnt*][Byte Array(Var): *PAC*]
Example	
Command:	1100FF
	(MaxPACBytes: FF)
Response:	00011A0405000980
	(Result: true, PACBitCnt: 26, PAC: 00140026)

1.5.16.2. ICLASS_SelectPage

Command:	[1101][Byte: *Book*][Byte: *Page*]
Response:	[00][Bool: *Result*][Byte Array(8): *ConfigBlock*]
Example	
Command:	11010000
	(Book: 00, Page: 00)
Response:	000112FFFFFFE91FFF3C
	(Result: true, ConfigBlock: 12FFFFFFE91FFF3C)

1.5.16.3. ICLASS_Authenticate

Command:	[1102][Byte Array(3): *KeyReferenceOID*][Byte: *KeyType*]
Response:	[00][Bool: *Result*]
Example	
Command:	110203002300
	(KeyReferenceOID: 030023, KeyType: 00)
Response:	0001
	(Result: true)

1.5.16.4. ICLASS_ReadBlock

Command:	[1103][Byte: *Block*]
Response:	[00][Bool: *Result*][Byte Array(8): *BlockData*]
Example	
Command:	110313
	(Block: 13)
Response:	00010000000000000000
	(Result: true, BlockData: 0000000000000000)

1.5.16.5. ICLASS_WriteBlock

Command:	[1104][Byte: *Block*][Byte Array(8): *BlockData*]
Response:	[00][Bool: *Result*]
Example	
Command:	11041300000000000000000000
	(Block: 13, BlockData: 0000000000000000)
Response:	0001
	(Result: true)

1.5.17. API ISO14443

1.5.17.1. ISO14443A_GetATS

Command:	[1200][Byte: *MaxATSByteCnt*]
Response:	[00][Bool: *Result*][Byte Array(Var): *ATS*]
Example	
Command:	120020
	(MaxATSByteCnt: 20)
Response:	000106067577810280
	(Result: true, ATS: 067577810280)

1.5.17.2. ISO14443B_GetATQB

Command:	[1201][Byte: *MaxATQBByteCnt*]
Response:	[00][Bool: *Result*][Byte Array(Var): *ATQB*]
Example	
Command:	1201FF
	(MaxATQBByteCnt: FF)
Response:	00010C5077FB135400000000B37171
	(Result: true, ATQB: 5077FB135400000000B37171)

1.5.17.3. ISO14443_4_CheckPresence

Command:	[1202]
Response:	[00][Bool: *Result*]
Example	
Command:	1202
Response:	0001
	(Result: true)

1.5.17.4. ISO14443_4_TDX

Command:	[1203][Byte Array(Var): *TX*][Byte: *MaxRXByteCnt*]
Response:	[00][Bool: *Result*][Byte Array(Var): *RX*]
Example	
Command:	1203016020
	(TX: 60, MaxRXByteCnt: 20)
Response:	0001026F00
	(Result: true, RX: 6F00)

1.5.17.5. ISO14443A_GetATQA

Command:	[1204]
Response:	[00][Bool: *Result*][Byte Array(2): *ATQA*]
Example	
Command:	1204
Response:	00010403
	(Result: true, ATQA: 0403)

1.5.17.6. ISO14443A_GetSAK

Command:	[1205]
Response:	[00][Bool: *Result*][Byte Array(1): *SAK*]
Example	
Command:	1205
Response:	000120
	(Result: true, SAK: 20)

1.5.17.7. ISO14443B_GetAnswerToATTRIB

Command:	[1206][Byte: *MaxAnswerToATTRIBByteCnt*]
Response:	[00][Bool: *Result*][Byte Array(Var): *AnswerToATTRIB*]
Example	
Command:	1206FF
	(MaxAnswerToATTRIBByteCnt: FF)
Response:	00010100
	(Result: true, AnswerToATTRIB: 00)

1.5.17.8. ISO14443_3_TDX

Command:	[1207][Byte Array(Var): *TX*][Byte: *MaxRXByteCnt*][UInt16: *Timeout*]
Response:	[00][Bool: *Result*][Byte Array(Var): *RX*]
Example	
Command:	1207041A004176FFFF00
	(TX: 1A004176, MaxRXByteCnt: FF, Timeout: FF00)
Response:	00010104
	(Result: true, RX: 04)

1.5.17.9. ISO14443A_SearchMultiTag

Command:	[1208][Byte: *MaxUIDListByteCnt*]
Response:	[00][Bool: *Result*][Byte: *UIDCnt*][variable number of Bytes: *UIDList*]
Example	
Command:	1208FF
	(MaxUIDListByteCnt: FF)
Response:	000103180704D7A79A97378007042DA79A9737800070450A79A973780
	(Result: true, UIDCnt: 3, UIDList: 04D7A79A973780, 042DA79A973780, 0450A79A973780)

1.5.17.10. ISO14443A_SelectTag

Command:	[1209][Byte Array(Var): *UID*]
Response:	[00][Bool: *Result*]
Example	
Command:	12090704D7A79A973780
	(UID: 04D7A79A973780)
Response:	0001
	(Result: true)

1.5.18. API AT55

1.5.18.1. AT55_Begin

Command:	[1500]
Response:	[00]
Example	
Command:	1500
Response:	00

1.5.18.2. AT55_ReadBlock

Command:	[1501][Byte: *Address*]
Response:	[00][Bool: *Result*][Byte Array(4): *Data*]
Example	
Command:	150100
	(Address: 00)
Response:	0001F0148040
	(Result: true, Data: F0148040)

1.5.18.3. AT55_ReadBlockProtected

Command:	[1502][Byte: *Address*][Byte Array(4): *Password*]
Response:	[00][Bool: *Result*][Byte Array(4): *Data*]
Example	
Command:	15020000000000
	(Address: 00, Password: 00000000)
Response:	0001B8A31C02
	(Result: true, Data: B8A31C02)

1.5.18.4. AT55_WriteBlock

Command:	[1503][Byte: *Address*][Byte Array(4): *Data*]
Response:	[00][Bool: *Result*]
Example	
Command:	15030000010203
	(Address: 00, Data: 00010203)
Response:	0001
	(Result: true)

1.5.18.5. AT55_WriteBlockProtected

Command:	[1504][Byte: *Address*][Byte Array(4): *Data*][Byte Array(4): *Password*]
Response:	[00][Bool: *Result*]
Example	
Command:	1504000001020300000000
	(Address: 00, Data: 00010203, Password: 00000000)
Response:	0001
	(Result: true)

1.5.18.6. AT55_WriteBlockAndLock

Command:	[1505][Byte: *Address*][Byte Array(4): *Data*]
Response:	[00][Bool: *Result*]
Example	
Command:	15050000010203
	(Address: 00, Data: 00010203)
Response:	0001
	(Result: true)

1.5.18.7. AT55_WriteBlockProtectedAndLock

Command:	[1506][Byte: *Address*][Byte Array(4): *Data*][Byte Array(4): *Password*]
Response:	[00][Bool: *Result*]
Example	
Command:	1506000001020300000000
	(Address: 00, Data: 00010203, Password: 00000000)
Response:	0001
	(Result: true)

1.5.19. API NFCSNEP

1.5.19.1. SNEP_Init

Command:	[1800]
Response:	[00][Bool: *Result*]
Example Command:	1800
Response:	0001
	(Result: true)

1.5.19.2. SNEP_GetConnectionState

Command:	[1801]
Response:	[00][Byte: *ConnectionState*]
Example Command:	1801
Response:	0002
	(ConnectionState: 2)

1.5.19.3. SNEP_GetFragmentByteCount

Command:	[1802][Byte: *Direction*]
Response:	[00][UInt16: *ByteCount*]
Example Command:	180201
	(Direction: 01)
Response:	000000
	(ByteCount: 0)

1.5.19.4. SNEP_BeginMessage

Command:	[1803][UInt32: *MsgByteCnt*]
Response:	[00][Bool: *Result*]
Example Command:	1803FF000000
	(MsgByteCnt: FF000000)
Response:	0001
	(Result: true)

1.5.19.5. SNEP_SendMessageFragment

Command:	[1804][Byte Array(Var), 2 LB: *MsgFrag*]
Response:	[00][Bool: *Result*]
Example	
Command:	18041500D101115501656C617465632D726669642E636F6D2F
	(MsgFrag: D101115501656C617465632D726669642E636F6D2F)
Response:	0001
	(Result: true)

1.5.19.6. SNEP_TestMessage

Command:	[1805]
Response:	[00][Bool: *Result*][UInt32: *MsgByteCnt*]
Example	
Command:	1805
Response:	0000
	(Result: fail, MsgByteCnt:)

1.5.19.7. SNEP_ReceiveMessageFragment

Command:	[1806][UInt16: *FragByteCnt*]
Response:	[00][Bool: *Result*][Byte Array(Var), 2 LB: *MsgFrag*]
Example	
Command:	1806FF00
	(FragByteCnt: FF00)
Response:	0000
	(Result: fail, MsgFrag:)

1.5.19.8. SNEP_RequestMessage

Command:	[1807][UInt32: *MsgByteCnt*][UInt32: *AcceptableLength*]
Response:	[00][Bool: *Result*]
Example	
Command:	1807FF000000FF000000
	(MsgByteCnt: FF000000, AcceptableLength: FF000000)
Response:	0001
	(Result: true)

1.5.20. API EM4150

1.5.20.1. EM4150_Login

Command:	[1900][Byte Array(4): *Password*]
Response:	[00][Bool: *Result*]
Example Command:	190000000000
	(Password: 00000000)
Response:	0001
	(Result: true)

1.5.20.2. EM4150_ReadWord

Command:	[1901][Byte: *Address*]
Response:	[00][Bool: *Result*][Byte Array(4): *Word*]
Example Command:	190101
	(Address: 01)
Response:	000100010203
	(Result: true, Word: 00010203)

1.5.20.3. EM4150_WriteWord

Command:	[1902][Byte: *Address*][Byte Array(4): *Word*]
Response:	[00][Bool: *Result*]
Example Command:	19020100010203
	(Address: 01, Word: 00010203)
Response:	0001
	(Result: true)

1.5.20.4. EM4150_WritePassword

Command:	[1903][Byte Array(4): *ActualPassword*][Byte Array(4): *NewPassword*]
Response:	[00][Bool: *Result*]
Example	
Command:	19030000000001010101
	(ActualPassword: 00000000, NewPassword: 01010101)
Response:	0001
	(Result: true)

1.5.20.5. EM4150_GetTagInfo

Command:	[1904]
Response:	[00][UInt32: *TagInfo*]
Example	
Command:	1904
Response:	0001000000
	(TagInfo: 1)

1.5.21. API FILESYS

1.5.21.1. FSMount

Command:	[1A00][Byte: *StorageID*][UInt32: *Mode*]
Response:	[00][Bool: *Result*]
Example	
Command:	1A000102000000
	(StorageID: 01, Mode: 02000000)
Response:	0001
	(Result: true)

1.5.21.2. **FSFormat**

Command:	[1A01][Byte: *StorageID*][UInt32: *MagicValue*]
Response:	[00][Bool: *Result*]
Example Command:	1A0101446F4974
	(StorageID: 01, MagicValue: 446F4974)
Response:	0001
	(Result: true)

1.5.21.3. **FSOpen**

Command:	[1A02][Byte: *FileEnv*][Byte: *StorageID*][UInt32: *FileID*][Byte: *Mode*]
Response:	[00][Bool: *Result*]
Example Command:	1A02000133221100000
	(FileEnv: 00, StorageID: 01, FileID: 33221100, Mode: 00)
Response:	0001
	(Result: true)

1.5.21.4. **FSClose**

Command:	[1A03][Byte: *FileEnv*]
Response:	[00][Bool: *Result*]
Example Command:	1A0300
	(FileEnv: 00)
Response:	0001
	(Result: true)

1.5.21.5. **FSCloseAll**

Command:	[1A04]
Response:	[00]
Example Command:	1A04
Response:	00

1.5.21.6. FSSeek

Command:	[1A05][Byte: *FileEnv*][Byte: *Origin*][UInt32: *Pos*]
Response:	[00][Bool: *Result*]
Example	
Command:	1A05000001000000
	(FileEnv: 00, Origin: 00, Pos: 01000000)
Response:	0001
	(Result: true)

1.5.21.7. FSTell

Command:	[1A06][Byte: *FileEnv*][Byte: *Origin*]
Response:	[00][Bool: *Result*][UInt32: *Pos*]
Example	
Command:	1A060000
	(FileEnv: 00, Origin: 00)
Response:	000101000000
	(Result: true, Pos: 1)

1.5.21.8. FSReadBytes

Command:	[1A07][Byte: *FileEnv*][UInt16: *ByteCount*]
Response:	[00][Bool: *Result*][Byte Array(Var), 2 LB: *Data*]
Example	
Command:	1A07001E00
	(FileEnv: 00, ByteCount: 1E00)
Response:	000107004D792064617461
	(Result: true, Data: 4D792064617461)

1.5.21.9. FSWriteBytes

Command:	[1A08][Byte: *FileEnv*][Byte Array(Var), 2 LB: *Data*]
Response:	[00][Bool: *Result*][UInt16: *BytesWritten*]
Example	
Command:	1A080007004D792064617461
	(FileEnv: 00, Data: 4D792064617461)
Response:	00010700
	(Result: true, BytesWritten: 7)

1.5.21.10. FSFindFirst

Command:	[1A09][Byte: *StorageID*]
Response:	[00][Bool: *Result*][Byte Array(8): *FileInfo*]
Example Command:	1A0901
	(StorageID: 01)
Response:	00013322110002000000
	(Result: true, FileInfo: 3322110002000000)

1.5.21.11. FSFindNext

Command:	[1A0A]
Response:	[00][Bool: *Result*][Byte Array(8): *FileInfo*]
Example Command:	1A0A
Response:	00013422110002000000
	(Result: true, FileInfo: 3422110002000000)

1.5.21.12. FSDelete

Command:	[1A0B][Byte: *StorageID*][UInt32: *FileID*]
Response:	[00][Bool: *Result*]
Example Command:	1A0B0133221100
	(StorageID: 01, FileID: 33221100)
Response:	0001
	(Result: true)

1.5.21.13. FSRename

Command:	[1A0C][Byte: *StorageID*][UInt32: *OldFileID*][UInt32: *NewFileID*]
Response:	[00][Bool: *Result*]
Example Command:	1A0C017766554433221100
	(StorageID: 01, OldFileID: 77665544, NewFileID: 33221100)
Response:	0001
	(Result: true)

1.5.21.14. FSGetStorageInfo

Command:	[1A0D][Byte: *StorageID*]
Response:	[00][Bool: *Result*][Byte Array(9): *StorageInfo*]
Example	
Command:	1A0D01
	(StorageID: 01)
Response:	000101204B0000004B0000
	(Result: true, StorageInfo: 01204B0000004B0000)

1.5.22. API MIFAREPLUS

1.5.22.1. MFP_WritePerso

Command:	[1B00][UInt16: *BlockNr*][Byte Array(16): *Data*]
Response:	[00][Bool: *Result*]
Example	
Command:	1B00004000000000000000000000000000000000
	(BlockNr: 0040, Data: 00000000000000000000000000000000)
Response:	0001
	(Result: true)

1.5.22.2. MFP_CommitPerso

Command:	[1B01]
Response:	[00][Bool: *Result*]
Example	
Command:	1B01
Response:	0001
	(Result: true)

1.5.22.3. MFP_Authenticate

Command:	[1B02][Byte: *CryptoEnv*][UInt16: *KeyBNr*][Byte Array(16): *Key*]
Response:	[00][Bool: *Result*]
Example	
Command:	1B0200004000000000000000000000000000000000
	(CryptoEnv: 00, KeyBNr: 0040, Key: 0000000000000000000000000000000)
Response:	0001
	(Result: true)

1.5.22.4. MFP_ReadBlock

Command:	[1B03][Byte: *CryptoEnv*][UInt16: *Block*]
Response:	[00][Bool: *Result*][Byte Array(16): *Data*]
Example	
Command:	1B03000400
	(CryptoEnv: 00, Block: 0400)
Response:	00010102030405060708090010203040506
	(Result: true, Data: 010203040506070809000102030405060)

1.5.22.5. MFP_WriteBlock

Command:	[1B04][Byte: *CryptoEnv*][UInt16: *Block*][Byte Array(16): *Data*]
Response:	[00][Bool: *Result*]
Example	
Command:	1B0400040001020304050607080900010203040506
	(CryptoEnv: 00, Block: 0400, Data: 010203040506070809000102030405060)
Response:	0001
	(Result: true)

1.5.22.6. MFP_ReadValueBlock

Command:	[1B05][Byte: *CryptoEnv*][UInt16: *Block*]
Response:	[00][Bool: *Result*][UInt32: *Value*]
Example	
Command:	1B05000400
	(CryptoEnv: 00, Block: 0400)
Response:	000100000000
	(Result: true, Value: 0)

1.5.22.7. MFP_WriteValueBlock

Command:	[1B06][Byte: *CryptoEnv*][UInt16: *Block*][UInt32: *Value*]
Response:	[00][Bool: *Result*]
Example	
Command:	1B0600040000000000
	(CryptoEnv: 00, Block: 0400, Value: 00000000)
Response:	0001
	(Result: true)

1.5.22.8. MFP_IncrementValueBlock

Command:	[1B07][Byte: *CryptoEnv*][UInt16: *Block*][UInt32: *Value*]
Response:	[00][Bool: *Result*]
Example	
Command:	1B0700040001000000
	(CryptoEnv: 00, Block: 0400, Value: 01000000)
Response:	0001
	(Result: true)

1.5.22.9. MFP_DecrementValueBlock

Command:	[1B08][Byte: *CryptoEnv*][UInt16: *Block*][UInt32: *Value*]
Response:	[00][Bool: *Result*]
Example	
Command:	1B0800040001000000
	(CryptoEnv: 00, Block: 0400, Value: 01000000)
Response:	0001
	(Result: true)

1.5.22.10. MFP_CopyValueBlock

Command:	[1B09][Byte: *CryptoEnv*][UInt16: *SourceBlock*][UInt16: *DestBlock*]
Response:	[00][Bool: *Result*]
Example	
Command:	1B090004000500
	(CryptoEnv: 00, SourceBlock: 0400, DestBlock: 0500)
Response:	0001
	(Result: true)

1.5.23. API ADC

1.5.23.1. ADCInitChannel

Command:	[1C00][Byte: *ADCChannel*]
Response:	[00][Bool: *Result*]
Example Command:	1C0001
	(ADCChannel: 01)
Response:	0001
	(Result: true)

1.5.23.2. ADCGetConversionValue

Command:	[1C01][Byte: *ADCChannel*]
Response:	[00][UInt16: *Value*]
Example Command:	1C0101
	(ADCChannel: 01)
Response:	003700
	(Value: 55)

1.5.24. API FELICA

1.5.24.1. FeliCa_TDX

Command:	[1D00][Byte Array(Var): *TX*][Byte: *MaxRXByteCnt*][Byte: *MaximumResponseTime*][Byte: *NumberOfBlocks*]
Response:	[00][Bool: *Result*][Byte Array(Var): *RX*]
Example Command:	1D00060600FFFF0000FFFF04
	(TX: 0600FFFF0000, MaxRXByteCnt: FF, MaximumResponseTime: FF, NumberOf-Blocks: 04)
Response:	00011212010101010701450F16000120220427674EFF
	(Result: true, RX: 1201010101010701450F16000120220427674EFF)

1.5.24.2. FeliCa_ReadWithoutEncryption

Command:	[1D01][variable number of UInt16: *ServiceCodeList*][variable number of UInt16: *BlockList*]
Response:	[00][Bool: *Result*][Byte Array(Var), 2 LB: *Data*]
Example Command:	1D01010B10010000
	(ServiceCodeList: 100B, BlockList: 0000)
Response:	000110000000000000000000000000000000
	(Result: true, Data: 00000000000000000000000000000000)

1.5.24.3. FeliCa_WriteWithoutEncryption

Command:	[1D02][variable number of UInt16: *ServiceCodeList*][variable number of UInt16: *BlockList*][Byte Array(Var), 2 LB: *Data*]
Response:	[00][Bool: *Result*]
Example Command:	1D0201091001000010000000000000000000000000000000000000
	(ServiceCodeList: 1009, BlockList: 0000, Data: 00000000000000000000000000000000)
Response:	0001
	(Result: true)

1.5.24.4. FeliCa_RequestSystemCode

Command:	[1D03][Byte: *MaxNumberOfSystemCodes*]
Response:	[00][Bool: *Result*][variable number of UInt16: *SystemCodeList*]
Example Command:	1D0308
	(MaxNumberOfSystemCodes: 08)
Response:	000103030000FEA786
	(Result: true, SystemCodeList: 0003, FE00, 86A7)

1.5.24.5. FeliCa_Poll

Command:	[1D04][UInt16: *SystemCode*]
Response:	[00][Bool: *Result*][Byte Array(8): *IDm*][Byte Array(8): *PMm*]
Example	
Command:	1D04FFFF
	(SystemCode: FFFF)
Response:	0001011603002D0CA50B03014B024F4993FF
	(Result: true, IDm: 011603002D0CA50B, PMm: 03014B024F4993FF)

1.5.24.6. FeliCa_RequestService

Command:	[1D05][variable number of UInt16: *ServiceCodeList*]
Response:	[00][Bool: *Result*][variable number of UInt16: *KeyVersionList*]
Example	
Command:	1D05010000
	(ServiceCodeList: 0000)
Response:	0001010100
	(Result: true, KeyVersionList: 0001)

1.5.25. API SLE44XX

1.5.25.1. SLE44XX_GetATR

Command:	[1F00][Byte: *Channel*]
Response:	[00][Bool: *Result*][Byte Array(4): *ATR*]
Example	
Command:	1F0028
	(Channel: 28)
Response:	0001FFFFFFFF
	(Result: true, ATR: FFFFFFFF)

1.5.25.2. SLE444X_ReadMainMemory

Command:	[1F01][Byte: *Channel*][UInt16: *Address*][UInt16: *ByteCnt*]
Response:	[00][Bool: *Result*][Byte Array(Var), 2 LB: *Data*]
Example	
Command:	1F012800000100
	(Channel: 28, Address: 0000, ByteCnt: 0100)
Response:	00010100FF
	(Result: true, Data: FF)

1.5.25.3. SLE444X_UpdateMainMemory

Command:	[1F02][Byte: *Channel*][UInt16: *Address*][Byte: *Value*]
Response:	[00][Bool: *Result*]
Example	
Command:	1F0228000000
	(Channel: 28, Address: 0000, Value: 00)
Response:	0001
	(Result: true)

1.5.25.4. SLE444X_ReadSecurityMemory

Command:	[1F03][Byte: *Channel*]
Response:	[00][Bool: *Result*][Byte Array(4): *SecMemData*]
Example	
Command:	1F0328
	(Channel: 28)
Response:	0001FFFFFFFF
	(Result: true, SecMemData: FFFFFFFF)

1.5.25.5. SLE444X_UpdateSecurityMemory

Command:	[1F04][Byte: *Channel*][Byte: *Address*][Byte: *SecMemData*]
Response:	[00][Bool: *Result*]
Example	
Command:	1F042800FF
	(Channel: 28, Address: 00, SecMemData: FF)
Response:	0001
	(Result: true)

1.5.25.6. SLE444X_ReadProtectionMemory

Command:	[1F05][Byte: *Channel*]
Response:	[00][Bool: *Result*][Byte Array(4): *ProtMemData*]
Example	
Command:	1F0528
	(Channel: 28)
Response:	0001FFFFFFFF
	(Result: true, ProtMemData: FFFFFFFF)

1.5.25.7. SLE444X_WriteProtectionMemory

Command:	[1F06][Byte: *Channel*][Byte: *Address*][Byte: *ProtMemData*]
Response:	[00][Bool: *Result*]
Example	
Command:	1F062800FF
	(Channel: 28, Address: 00, ProtMemData: FF)
Response:	0001
	(Result: true)

1.5.25.8. SLE444X_CompareVerificationData

Command:	[1F07][Byte: *Channel*][Byte: *Address*][Byte: *VerificationData*]
Response:	[00][Bool: *Result*]
Example	
Command:	1F072800FF
	(Channel: 28, Address: 00, VerificationData: FF)
Response:	0001
	(Result: true)

1.5.25.9. SLE44X8_ReadMainMemory

Command:	[1F08][Byte: *Channel*][UInt16: *Address*][UInt16: *ByteCnt*]
Response:	[00][Bool: *Result*][Byte Array(Var), 2 LB: *Data*]
Example	
Command:	1F0828FD030300
	(Channel: 28, Address: FD03, ByteCnt: 0300)
Response:	00010300FFFFFF
	(Result: true, Data: FFFFFF)

1.5.25.10. SLE44X8_WriteErrorCounter

Command:	[1F09][Byte: *Channel*][UInt16: *Address*][Byte: *ErrorCounter*]
Response:	[00][Bool: *Result*]
Example	
Command:	1F0928FD03FE
	(Channel: 28, Address: FD03, ErrorCounter: FE)
Response:	0001
	(Result: true)

1.5.25.11. SLE44X8_VerifyPSCByte

Command:	[1F0A][Byte: *Channel*][UInt16: *Address*][Byte: *PSCByte*]
Response:	[00][Bool: *Result*]
Example	
Command:	1F0A28FE03FF
	(Channel: 28, Address: FE03, PSCByte: FF)
Response:	0001
	(Result: true)

1.5.25.12. SLE44X8_UpdateMainMemory

Command:	[1F0B][Byte: *Channel*][UInt16: *Address*][Byte: *Value*]
Response:	[00][Bool: *Result*]
Example	
Command:	1F0B28FD03FF
	(Channel: 28, Address: FD03, Value: FF)
Response:	0001
	(Result: true)

1.5.26. API NTAG

1.5.26.1. NTAG_Read

Command:	[2000][Byte: *Page*]
Response:	[00][Bool: *Result*][Byte Array(16): *Page*]
Example	
Command:	200004
	(Page: 04)
Response:	000103B691028C537091016855016E78702E
	(Result: true, Page: 03B691028C537091016855016E78702E)

1.5.26.2. NTAG_Write

Command:	[2001][Byte: *Page*][Byte Array(4): *Data*]
Response:	[00][Bool: *Result*]
Example	
Command:	20010400000000
	(Page: 04, Data: 00000000)
Response:	0001
	(Result: true)

1.5.26.3. NTAG_FastRead

Command:	[2002][Byte: *StartPage*][Byte: *NumberOfPages*]
Response:	[00][Bool: *Result*][Byte Array(Var): *Data*]
Example	
Command:	20020401
	(StartPage: 04, NumberOfPages: 01)
Response:	00010403B69102
	(Result: true, Data: 03B69102)

1.5.26.4. NTAG_ReadCounter

Command:	[2003]
Response:	[00][Bool: *Result*][UInt32: *CounterValue*]
Example	
Command:	2003
Response:	000101000000
	(Result: true, CounterValue: 1)

1.5.26.5. NTAG_ReadSig

Command:	[2004]
Response:	[00][Bool: *Result*][Byte Array(32): *ECCSig*]
Example	
Command:	2004
Response:	0001A9AC15AFB52080BA26A45B1DA442F363E31B41271AB12B3E6F67-864615B05321
	(Result: true, ECCSig:
	A9AC15AFB52080BA26A45B1DA442F363E31B41271AB12B3E6F67864615B05321)

1.5.26.6. NTAG_GetVersion

Command:	[2005]
Response:	[00][Bool: *Result*][Byte Array(8): *Version*]
Example	
Command:	2005
Response:	00010004040502011503
	(Result: true, Version: 0004040502011503)

1.5.26.7. NTAG_PwdAuth

Command:	[2006][Byte Array(4): *Password*][Byte Array(2): *PwdAck*]
Response:	[00][Bool: *Result*]
Example	
Command:	2006FFFFFFFF0000
	(Password: FFFFFFFF, PwdAck: 0000)
Response:	0001
	(Result: true)

1.5.26.8. NTAG_SectorSelect

Command:	[2007][Byte: *Sector*]
Response:	[00][Bool: *Result*]
Example	
Command:	200700
	(Sector: 00)
Response:	0001
	(Result: true)

1.5.27. API SRX

1.5.27.1. SRX_ReadBlock

Command:	[2100][Byte: *Block*]
Response:	[00][Bool: *Result*][Byte Array(4): *Data*]
Example	
Command:	210000
	(Block: 00)
Response:	000100000000
	(Result: true, Data: 00000000)

1.5.27.2. SRX_WriteBlock

Command:	[2101][Byte: *Block*][Byte Array(4): *Data*]
Response:	[00][Bool: *Result*]
Example	
Command:	21010000000000
	(Block: 00, Data: 00000000)
Response:	0001
	(Result: true)

1.5.28. API SAMAVX

1.5.28.1. SAMAVx_AuthenticateHost

Command:	[2200][Byte: *CryptoEnv*][Byte: *KeyNo*][Byte Array(Var): *Key*][Byte: *KeyType*]
Response:	[00][Bool: *Result*]
Example	
Command:	220000001000000000000000000000000000000000000
	(CryptoEnv: 00, KeyNo: 00, Key: 00000000000000000000000000000000, KeyType: 00)
Response:	0001
	(Result: true)

1.5.28.2. SAMAVx_GetKeyEntry

Command:	[2201][Byte: *KeyNo*]
Response:	[00][Bool: *Result*][Byte Array(13): *TSAMAVxKeyEntryData*]
Example	
Command:	220101
	(KeyNo: 01)
Response:	00010001020000000000000FF0C00
	(Result: true, TSAMAVxKeyEntryData: 00010200000000000000FF0C00)

1.5.29. API EM4102

1.5.29.1. EM4102_GetTagInfo

Command:	[2300]
Response:	[00][UInt32: *TagInfo*]
Example	
Command:	2300
Response:	0001000000
	(TagInfo: 1)

1.5.30. API SPI

1.5.30.1. SPIInit

Command:	[2400][Byte: *Mode*][Byte: *CPOL*][Byte: *CPHA*][Byte: *ClockRate*][Byte: *BitOrder*]
Response:	[00][Bool: *Result*]
Example	
Command:	24000100000000
	(Mode: 01, CPOL: 00, CPHA: 00, ClockRate: 00, BitOrder: 00)
Response:	0001
	(Result: true)

1.5.30.2. SPIDeInit

Command:	[2401]
Response:	[00]
Example	
Command:	2401
Response:	00

1.5.30.3. SPIMasterBeginTransfer

Command:	[2402]
Response:	[00]
Example	
Command:	2402
Response:	00

1.5.30.4. SPIMasterEndTransfer

Command:	[2403]
Response:	[00]
Example	
Command:	2403
Response:	00

1.5.30.5. SPITransmit

Command:	[2404][Byte Array(Var), 2 LB: *TXData*]
Response:	[00][Bool: *Result*]
Example	
Command:	2404010000
	(TXData: 00)
Response:	0001
	(Result: true)

1.5.30.6. SPIReceive

Command:	[2405][UInt16: *ByteCount*]
Response:	[00][Bool: *Result*][Byte Array(Var), 2 LB: *RXData*]
Example	
Command:	24050100
	(ByteCount: 0100)
Response:	000101005A
	(Result: true, RXData: 5A)

1.5.30.7. SPITransceive

Command:	[2406][Byte Array(Var), 2 LB: *TXData*]
Response:	[00][Bool: *Result*][Byte Array(Var), 2 LB: *RXData*]
Example	
Command:	2406010000
	(TXData: 00)
Response:	000101005A
	(Result: true, RXData: 5A)

1.5.31. API BLE

1.5.31.1. BLEPresetConfig

Command:	[2500][Byte Array(17): *BLEConfig*]
Response:	[00][Bool: *Result*]
Example Command:	 2500881300000A01A0000702020000D2040000
	(BLEConfig: 881300000A01A0000702020000D2040000)
Response:	0001
	(Result: true)

1.5.31.2. BLEPresetUserData

Command:	[2501][Byte: *ScanResp*][Byte Array(Var): *UserData*]
Response:	[00][Bool: *Result*]
Example Command:	 2501001E0201061AFF4C000215E2C56DB5DFFB48D2B060D0F5A71096- E000000000C3
	(ScanResp: 00, UserData:
	0201061AFF4C000215E2C56DB5DFFB48D2B060D0F5A71096E000000000C3)
Response:	0001
	(Result: true)

1.5.31.3. BLEInit

Command:	[2502][Byte: *Mode*]
Response:	[00][Bool: *Result*]
Example Command:	 250201
	(Mode: 01)
Response:	0001
	(Result: true)

1.5.31.4. BLECheckEvent

Command:	[2503]
Response:	[00][Byte: *Event*]
Example	
Command:	2503
Response:	0081000000
	(Event: BLE_EVENT_LE_GAP_SCAN_RESPONSE)

1.5.31.5. BLEGetAddress

Command:	[2504]
Response:	[00][Bool: *Result*][Byte Array(6): *DeviceAddress*][Byte Array(6): *RemoteAddress*][Byte Array(1): *RemoteType*]
Example	
Command:	2504
Response:	000149D702570B009872F9F36D4601
	(Result: true, DeviceAddress: 49D702570B00, RemoteAddress: 9872F9F36D46, RemoteType: 01)

1.5.31.6. BLEGetVersion

Command:	[2505]
Response:	[00][Bool: *Result*][Byte Array(16): *HWVersion*][Byte Array(12): *BootString*]
Example	
Command:	2505
Response:	000156312E30342C32382E30362E323031370200040000018090000-0101
	(Result: true, HWVersion: 56312E30342C32382E30362E32303137, BootString: 020004000000180900000101)

1.5.31.7. BLEGetEnvironment

Command:	[2506]
Response:	[00][Bool: *Result*][Byte Array(1): *DeviceRole*][Byte Array(1): *SecurityMode*][Byte Array(1): *Rssi*]
Example	
Command:	2506
Response:	0001000000
	(Result: true, DeviceRole: 00, SecurityMode: 00, Rssi: 00)

1.5.31.8. BLEGetGattServerAttributeValue

Command:	[2507][UInt16: *AttrHandle*][Byte: *MaxLen*]
Response:	[00][Bool: *Result*][Byte Array(Var): *Data*]
Example	
Command:	2507120014
	(AttrHandle: 1200, MaxLen: 14)
Response:	0001104254312E3035454C2020202020202020
	(Result: true, Data: 4254312E3035454C2020202020202020)

1.5.31.9. BLESetGattServerAttributeValue

Command:	[2508][UInt16: *AttrHandle*][UInt16: *Offset*][Byte Array(Var): *Data*]
Response:	[00][Bool: *Result*]
Example	
Command:	250815000000050000000000
	(AttrHandle: 1500, Offset: 0000, Data: 0000000000)
Response:	0001
	(Result: true)

1.5.31.10. BLERequestRssi

Command:	[2509]
Response:	[00][Bool: *Result*]
Example	
Command:	2509
Response:	0001
	(Result: true)

1.5.31.11. BLERequestEndpointClose

Command:	[250A]
Response:	[00][Bool: *Result*]
Example	
Command:	250A
Response:	0001
	(Result: true)

1.5.31.12. BLEGetGattServerCharacteristicStatus

Command:	[250B]
Response:	[00][Bool: *Result*][UInt16: *AttrHandle*][Byte: *AttrStatusFlag*][UInt16: *AttrConfigFlag*]
Example	
Command:	250B
Response:	00010000000000
	(Result: true, AttrHandle: 0, AttrStatusFlag: 0, AttrConfigFlag: 0)

1.5.31.13. BLEFindGattServerAttribute

Command:	[250C][Byte Array(Var): *UUID*]
Response:	[00][Bool: *Result*][UInt16: *AttrHandle*]
Example	
Command:	250C02262A
	(UUID: 262A)
Response:	00011200
	(Result: true, AttrHandle: 18)

1.5.31.14. BLEDiscover

Command:	[250D][Byte: *DiscoverMode*][UInt32: *GattHandle*][Byte Array(17): *BLEUUID*]
Response:	[00][Bool: *Result*]
Example	
Command:	250D00FFFF280010FA349B5F80000080001000001DB80000
	(DiscoverMode: 00, GattHandle: FFFF2800, BLEUUID: 10FA349B5F80000080001000001DB80000)
Response:	0001
	(Result: true)

1.5.31.15. BLECheckDiscoveredString

Command:	[250E][Byte: *CheckMode*][Byte Array(Var): *CompareString*]
Response:	[00][Bool: *Result*]
Example	
Command:	250E0006454C41544543
	(CheckMode: 00, CompareString: 454C41544543)
Response:	0001
	(Result: true)

1.5.31.16. BLEConnectToDevice

Command:	[250F][Byte Array(6): *Address*][Byte: *AddressType*]
Response:	[00][Bool: *Result*]
Example	
Command:	250F9872F9F36D4601
	(Address: 9872F9F36D46, AddressType: 01)
Response:	0001
	(Result: true)

1.5.31.17. BLEDisconnectFromDevice

Command:	[2510]
Response:	[00][Bool: *Result*]
Example	
Command:	2510
Response:	0001
	(Result: true)

1.5.31.18. BLEGattGetAttribute

Command:	[2511]
Response:	[00][Bool: *Result*][Byte Array(17): *BLEUUID*][UInt32: *GattHandle*]
Example	
Command:	2511
Response:	000100574E340042312E30382F4E4346332E3100000000
	(Result: true, BLEUUID: 00574E340042312E30382F4E4346332E31, GattHandle: 0)

1.5.31.19. BLEGattGetValue

Command:	[2512][Byte: *ReadMode*][UInt32: *GattHandle*][Byte Array(17): *BLEUUID*][Byte: *MaxLen*]
Response:	[00][Bool: *Result*][Byte: *AttrOpcode*][Byte Array(Var): *Data*]
Example	
Command:	2512002A00000010FA349B5F80000080001000001DB8000010
	(ReadMode: 00, GattHandle: 2A000000, BLEUUID: 10FA349B5F80000080001000001DB80000, MaxLen: 10)
Response:	00010B10CD7CBE4FB6264731587303F12FB369FE
	(Result: true, AttrOpcode: gatt_read_response, Data: CD7CBE4FB6264731587303F12FB369FE)

1.5.31.20. BLEGattSetValue

Command:	[2513][Byte: *WriteMode*][UInt32: *GattHandle*][UInt16: *Offset*][Byte Array(Var): *Data*]
Response:	[00][Bool: *Result*]
Example Command:	2513002C00000000000F010203040506070 8090A0B0C0D0E0F (WriteMode: 00, GattHandle: 2C000000, Offset: 0000, Data: 0102030405060708090A0B0C0D0E0F)
Response:	0001 (Result: true)

1.5.31.21. BLECommand

Command:	[2514][Byte: *ConnMode*][UInt32: *Parameter*]
Response:	[00][UInt16: *Status*]
Example Command:	251400FA000000 (ConnMode: 00, Parameter: FA000000)
Response:	0001000000 (Status: 1)

1.5.31.22. BLESecurity

Command:	[2515][Byte: *SMMode*][UInt32: *Flag1*][UInt32: *Flag2*]
Response:	[00][Bool: *Result*]
Example Command:	25150B40E2010000000000 (SMMode: 0B, Flag1: 40E20100, Flag2: 00000000)
Response:	0001 (Result: true)

1.5.31.23. BLESecuritySetOob

Command:	[2516][Byte: *SMOOBMode*][Byte Array(Var): *OobData*]
Response:	[00][Bool: *Result*]
Example	
Command:	251700100001020304050607 08090A0B0C0D0E0F
	(SMOOBMode: 00, OobData: 000102030405060708090A0B0C0D0E0F)
Response:	0001
	(Result: true)

1.5.31.24. BLESecurityUseScOob

Command:	[2517][Byte: *Enable*][Byte: *MaxLength*]
Response:	[00][Bool: *Result*][Byte Array(Var): *OobData*]
Example	
Command:	25180120
	(Enable: 01, MaxLength: 20)
Response:	000120209678F5BF6EE4EA4F49FA2D22163C57B9A87F40D20183C187-7A93B010A6F2F5
	(Result: true, OobData: 209678F5BF6EE4EA4F49FA2D22163C57B9A87F40D20183C1877A93B010A6F2F5)

1.5.31.25. BLESetStreamingUUID

Command:	[2518][Byte Array(Var): *ServiceUUID*][Byte Array(Var): *CharacUUID*]
Response:	[00][Bool: *Result*]
Example	
Command:	2518108EDFAE3D9BCD0E887442124104C0445A1052C79E169D4822AA-434C0A2FDF9EC243
	(ServiceUUID: 8EDFAE3D9BCD0E887442124104C0445A, CharacUUID: 52C79E169D4822AA434C0A2FDF9EC243)
Response:	0001
	(Result: true)

1.5.31.26. BLESetStreamingMode

Command:	[2519][Byte: *ConnMode*][Byte: *GattMode*][Byte: *TransferMode*]
Response:	[00][Bool: *Result*]
Example	
Command:	2519010000
	(ConnMode: 01, GattMode: 00, TransferMode: 00)
Response:	0001
	(Result: true)

1.5.31.27. BLEGetDiscoveredData

Command:	[251A][Byte: *MaxLen*]
Response:	[00][Bool: *Result*][Byte Array(Var): *Data*]
Example	
Command:	251A40
	(MaxLen: 40)
Response:	00011F02011A03036FFD17166FFD2EACD0A563838173CB517FFD702A-C8D6B68B7AAD
	(Result: true, Data:
	02011A03036FFD17166FFD2EACD0A563838173CB517FFD702AC8D6B68B7AAD)

1.5.32. API I2CCARD

1.5.32.1. I2CCard_Read

Command:	[2800][Byte: *Channel*][UInt16: *Addr*][Byte: *ByteCnt*]
Response:	[00][Bool: *Result*][Byte Array(Var): *Data*]
Example	
Command:	28002800000A
	(Channel: 28, Addr: 0000, ByteCnt: 0A)
Response:	00010A001122849A2789DFD54342
	(Result: true, Data: 001122849A2789DFD543)

1.5.32.2. I2CCard_Write

Command:	[2801][Byte: *Channel*][UInt16: *Addr*][Byte Array(Var): *Data*]
Response:	[00][Bool: *Result*]
Example	
Command:	28012800000401020304
	(Channel: 28, Addr: 0000, Data: 01020304)
Response:	0001
	(Result: true)

1.5.33. API TOPAZ

1.5.33.1. TopazRID

Command:	[2900]
Response:	[00][Bool: *Result*][Byte: *HR0*][Byte: *HR1*][Byte Array(4): *UID*]
Example	
Command:	2900
Response:	0001124CA9747300
	(Result: true, HR0: 18, HR1: 76, UID: A9747300)

1.5.33.2. TopazReadByte

Command:	[2901][Byte Array(4): *UID*][Byte: *ADD*]
Response:	[00][Bool: *Result*][Byte: *Data*]
Example	
Command:	2901A97473000A
	(UID: A9747300, ADD: 0A)
Response:	000133
	(Result: true, Data: 51)

1.5.33.3. TopazReadAllBlocks

Command:	[2902][Byte Array(4): *UID*]
Response:	[00][Bool: *Result*][Byte: *HR0*][Byte: *HR1*][Byte Array(120): *Data*]
Example	
Command:	2902A9747300
	(UID: A9747300)
Response:	0001124CA974730000102500E11033000103F230330203F002030319-D1011555036A7562617465632E65752F6E66632D746167732F2D7461-67732F00AB0011000000000000000000000000000000000000000000-0000000000000000000000000000000000000000000000005555AAAA-124C060001E0000000000000
	(Result: true, HR0: 18, HR1: 76, Data:
	A974730000102500E11033000103F230330203F002030319D101155-5036A7562617465632E65752F6E66632D746167732F2D746167732F-00AB0011000000000000000000000000000000000000000000000000-0000000000000000000000000000000000000000000005555AAAA124C-060001E0000000000000)

1.5.33.4. TopazWriteByteWithErase

Command:	[2903][Byte Array(4): *UID*][Byte: *ADD*][Byte: *Data*]
Response:	[00][Bool: *Result*]
Example	
Command:	2903A97473000A11
	(UID: A9747300, ADD: 0A, Data: 11)
Response:	0001
	(Result: true)

1.5.33.5. TopazWriteByteNoErase

Command:	[2904][Byte Array(4): *UID*][Byte: *ADD*][Byte: *Data*]
Response:	[00][Bool: *Result*]
Example	
Command:	2904A97473000A22
	(UID: A9747300, ADD: 0A, Data: 22)
Response:	0001
	(Result: true)

1.5.34. API CTS

1.5.34.1. CTS_ReadBlock

Command:	[2A00][Byte: *Block*]
Response:	[00][Bool: *Result*][Byte Array(2): *Data*]
Example Command:	2A0000
	(Block: 00)
Response:	00016002
	(Result: true, Data: 6002)

1.5.34.2. CTS_WriteBlock

Command:	[2A01][Byte: *Block*][Byte Array(2): *Data*]
Response:	[00][Bool: *Result*]
Example Command:	2A01000000
	(Block: 00, Data: 0000)
Response:	0001
	(Result: true)

1.5.34.3. CTS_UpdateBlock

Command:	[2A02][Byte: *Block*][Byte Array(2): *Data*]
Response:	[00][Bool: *Result*]
Example Command:	2A02000000
	(Block: 00, Data: 0000)
Response:	0001
	(Result: true)

1.5.35. API EM4305

1.5.35.1. EM4305_Begin

Command:	[2F00]
Response:	[00]
Example Command:	2F00
Response:	00

1.5.35.2. EM4305_Read

Command:	[2F01][Byte: *Address*]
Response:	[00][Bool: *Result*][Byte Array(4): *Data*]
Example Command:	2F0100
	(Address: 00)
Response:	000100000001
	(Result: true, Data: 00000001)

1.5.35.3. EM4305_Write

Command:	[2F02][Byte: *Address*][Byte Array(4): *Data*]
Response:	[00][Bool: *Result*]
Example Command:	2F0205003A36BA
	(Address: 05, Data: 003A36BA)
Response:	0001
	(Result: true)

1.5.35.4. EM4305_Login

Command:	[2F03][Byte Array(4): *Password*]
Response:	[00][Bool: *Result*]
Example Command:	2F0300000000
	(Password: 00000000)
Response:	0001
	(Result: true)

1.5.35.5. EM4305_Protect

Command:	[2F04][Byte Array(4): *Data*]
Response:	[00][Bool: *Result*]
Example	
Command:	2F0400000000
	(Data: 00000000)
Response:	0001
	(Result: true)

1.5.35.6. EM4305_Disable

Command:	[2F05]
Response:	[00][Bool: *Result*]
Example	
Command:	2F05
Response:	0001
	(Result: true)

A. How to Set Specific Tags in Simple Protocol

The firmware function SetTagTypes() enables you to set specific transponder types to search for these types only. To set a specific transponder type, you need the definition for this type, which can be found in the table below.

A.1. Example with Enabling Only MIFARE

For a MIFARE transponder, the definition is as following:

HFTAG_MIFARE	0x80

With the TAGMASK definition (1 « (Tagtype & 0x1F)) we can calculate:

```
1 << (0x80 & 0x1F)
```

Result from (0x80 & 0x1F) is 0, so we shift 1 to the left for 0 places and we get 00000001 in binary, which is 00000001h.
Now we take this result and put it in SetTagTypes command from Simple Protocol.

```
[0502] [UInt32: TagTypesLF] [UInt32: TagTypesHF]
```

In this command it is stated that HFTagTypes is UInt32. Simple Protocol works with little endian, so instead of 00000001h it needs to be 01000000h.
Therefore to enable only Mifare following command should be sent (without the spaces):

0502 0000000000 01000000

where
0502 - command code
00000000 - means that none low frequency technology is enabled
01000000 - means that only Mifare from high frequency technologies is enabled

A.2. Example with Felica and HID Prox Only

Felica and HID Prox have the following definitions:

HFTAG_FELICA	0x85
LFTAG_HIDPROX	0x49

High Frequency:

With the TAGMASK definition (1 « (Tagtype & 0x1F)) we can calculate:

```
1 << (0x85 & 0x1F)
```

Result from (0x85 & 0x1F) is 5, so we shift 1 to the left for 5 places and we get 00100000 in binary, which is 00000020h.
HFTagTypes [UInt32] in little endian is now 20000000.

Low Frequency:
With the TAGMASK definition (1 « (Tagtype & 0x1F)) we can calculate:

```
1 << (0x49 & 0x1F)
```

Result from (0x85 & 0x1F) is 9, so we shift 1 to the left for 9 places and we get 0000001000000000 in binary, which is 00000200h.
LFTagTypes [UInt32] in little endian is now 00020000.

Correct command is (without the spaces):

0502 00020000 20000000

The following definitions can also be found in twn4.sys.h, which is part of the TWN4 Development Pack.

Technology	Definition	Tagtype
LF	LFTAG_EM4102	0x40
	LFTAG_HITAG1S	0x41
	LFTAG_HITAG2	0x42
	LFTAG_EM4150	0x43
	LFTAG_AT5555	0x44
	LFTAG_ISOFDX	0x45
	LFTAG_EM4026	0x46
	LFTAG_HITAGU	0x47
	LFTAG_EM4305	0x48
	LFTAG_HIDPROX	0x49
	LFTAG_TIRIS	0x4A
	LFTAG_COTAG	0x4B
	LFTAG_IOPROX	0x4C
	LFTAG_INDITAG	0x4D
	LFTAG_HONEYTAG	0x4E
	LFTAG_AWID	0x4F
	LFTAG_GPROX	0x50
	LFTAG_PYRAMID	0x51
	LFTAG_KERI	0x52
	LFTAG_DEISTER	0x53
	LFTAG_CARDAX	0x54
	LFTAG_NEDAP	0x55
	LFTAG_PAC	0x56
	LFTAG_IDTECK	0x57
	LFTAG_ULTRAPROX	0x58
	LFTAG_ICT	0x59
	LFTAG_ISONAS	0x5A
HF	HFTAG_MIFARE	0x80
	HFTAG_ISO14443B	0x81
	HFTAG_ISO15693	0x82
	HFTAG_LEGIC	0x83
	HFTAG_HIDICLASS	0x84
	HFTAG_FELICA	0x85
	HFTAG_SRX	0x86
	HFTAG_NFCP2P	0x87
	HFTAG_BLE	0x88
	HFTAG_TOPAZ	0x89
	HFTAG_CTS	0x8A
	HFTAG_BLELC	0x8B

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