S6400 Reference Manual

Guide for System Integrators

RI-H4R-S5H3, RI-H4R-S5H4, RI-H4R-S6H3, RI-H4R-S6H4

Technical Reference

11-06-21-712 8-2003

TI-RFid
A TEXAS INSTRUMENTS TECHNOLOGY

Edition 1 - May 2003

This is the first edition of this manual. It describes the following products:

S6410	RI-H4R-S6H3 RI-H4R-S6H4	Wall Plate Reader
S6420	RI-H4R-S6H3 RI-H4R-S6H4	Mullion Reader

Texas Instruments (TI) reserves the right to make changes to its products or services or to discontinue any product or service at any time without notice. TI provides customer assistance in various technical areas, but does not have full access to data concerning the use and applications of customer's products

Therefore, TI assumes no liability and is not responsible for customer applications or product or software design or performance relating to systems or applications incorporating TI products. In addition, TI assumes no liability and is not responsible for infringement of patents and/or any other intellectual or industrial property rights of third parties, which may result from assistance provided by TI.

TI products are not designed, intended, authorized or warranted to be suitable for life support applications or any other life critical applications which could involve potential risk of death, personal injury or severe property or environmental damage.

Read This First

About This Manual

This reference manual is designed to assist anyone interested in integrating the S6400 series readers into an Access Control System. It includes a basic hardware description, along with a detailed description of the host protocol.

Purpose

For anyone implementing the S6400 series readers into a complete Access Control solution, this manual:

- Describes the S6400 reader hardware, allowing physical implementation of the reader into a complete Access Control system.
- Describes in detail the host protocol commands required to produce software that will interface with the reader and take advantage of the readers' command functions.

Audience

This reference is designed for use by engineers and developers who are integrating the S6400 series readers into a complete system.

Conventions

The following pictograms and designations are used in these operating instructions:

	**WARNING:** **A WARNING IS USED WHERE CARE MUST BE TAKEN, OR A CERTAIN PROCEDURE MUST BE FOLLOWED IN ORDER TO PREVENT INJURY OR HARM TO YOUR HEALTH.**
	**CAUTION:** **This indicates information on conditions which must be met, or a procedure which must be followed, which if not heeded could cause permanent damage to the system.**
	**Note:** Indicates conditions, which must be met, or procedures which must be followed, to ensure proper functioning.
	**Information:** Indicates information which makes usage of the equipment or software easier.

If You Need Assistance

For more information, please contact the sales office or distributor nearest you. This contact information can be found on our web site at:

http://www.ti-rfid.com

Terms and Abbreviations

The terms and abbreviations used in this manual can be found in the Terms and Abbreviations Manual, document number 11-03-21-002. This manual can be found in the document center on our web site at:

http://www.ti-rfid.com

Document Overview

List of Figures

List of Tables

List of Examples

References

ISO/IEC FSID15693-3: 2000(E)/(now ISO released 2001/3/29), Protocol & Anti-collision.
Terms and Abbreviations Manual, document number 11-03-21-002
S6410/S6420 Access Control Reader Installation Guide 11-06-21-713

Chapter 1

Introduction

Topic **Page**

1.1 Introduction

Texas Instruments' RFID line of 13.56 MHz readers provides a new level of performance, speed and accuracy for the access control market. A superior read range and faster data transfer rate make the TI-RFid™ Systems' S6400 family Access Control Reader System ideal for any building or venue where it's vital to ensure safe, fast and secure access.

The S6400 family is based on ISO/IEC 15693 vicinity card standards, which means interoperability across all systems, 2000-bit memory read capacity and multiple badge identification. Up to 10 badges can be read simultaneously by a single reader, creating faster throughput and eliminating read interference common when two or more conventional proximity cards are in the same read field.

Available in either a wall plate or mullion option, the two-piece reader package is easy to install in new or retrofit applications, and its attractive design fits any setting.

TI's 13.56 MHz 2000-bit memory and in-the-field programmability means users can add and update vital information like time stamps or employee authorization codes, certification or emergency medical histories.

Figure 1. S6410 Wall Plate Reader (left) and S6420 Mullion Reader (right)

Chapter 2

Hardware Description

Topic **Page**

2.1 Specifications

Table 1. Specifications.

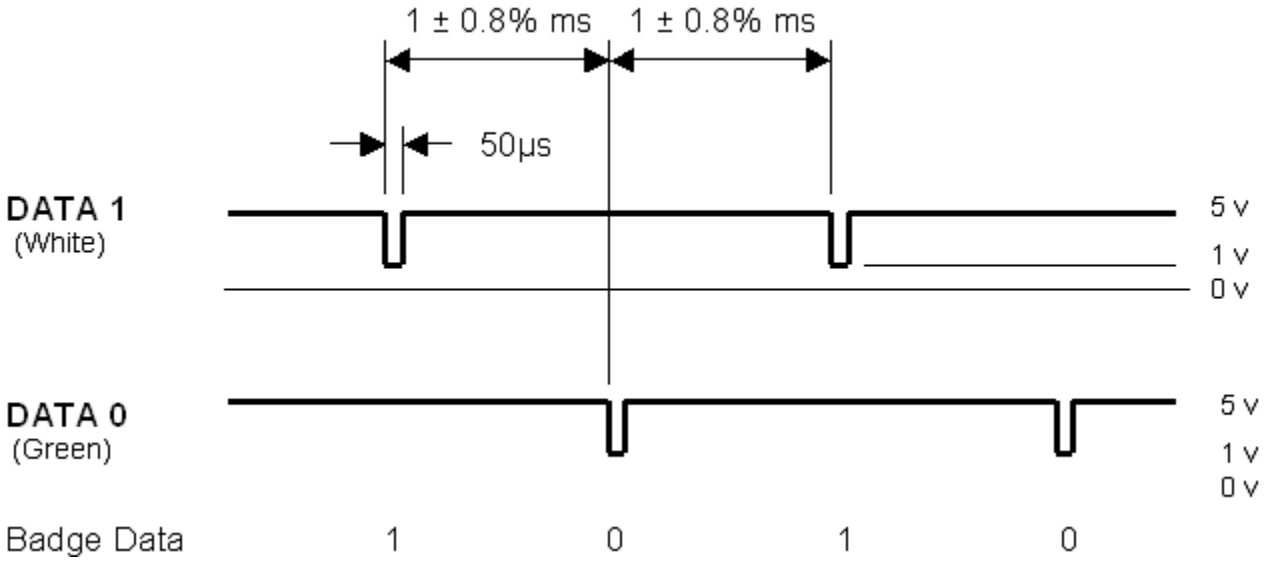
Device name	***S6410 Wall Plate Reader***		***S6420 Mullion Reader***	
Part number	RI-H4R-S6H3	RI-H4R-S6H4	RI-H4R-S5H3	RI-H4R-S5H4
Color	Charcoal Gray	Black	Charcoal Gray	Black
Operating Frequency	13.56 MHz			
Supported Standards	ISO/IEC 15693 (Vicinity)			
Supply Voltage	+9 to +14 V_{DC}, built-in overvoltage and reverse polarity protection, Linear power supply recommended			
Average Current	50 mA Typical (normal), 130 mA Typical (Badge Read)			
RS-485 Baud Rates	9600, 19200, 38400 (Default)			
Supported Protocols	Wiegand 26-64 bit and RS-485 protocol			
Data Integrity	500 ft (152 m) Wiegand, 4000 ft (1219 m) RS-485 (AWG22 wire)			
Data Output Format	DES Encryption Mode (Cipher Text), Wiegand UID Mode, RS-485 Mode			
Read Range*	Up to 8" (~20 cm)		Up to 5" (~13 cm)	
Mount on Metal*	No*		Yes*	
Operating Temperature	-20°C to +70°C			
Storage Temperature	-40°C to +75°C			
Operating Humidity	Up to 90% Relative non-condensing			
Protection Class	IP64, Potted			
Regulatory Approvals	FCC, CE, UL-94 and UL-294 (ETL), MPT (Japan)			
Overall Dimensions	5.0" x 5.0" x 1.0" (12.7 x 12.7 x 2.5 cm)		5.0" x 1.7" x 1.0" (12.7 x 4.3 x 2.5 cm)	
Weight (Includes Packaging)	~10.5 oz (~298 g)		~6.3 oz (~178 g)	

** The S6420 (Mullion) reader has been optimized so that it can be mounted onto a metal surface with only a minor diminishment in read range. The S6410 (Wall Plate) reader should not be mounted on metal*

2.2 Wiegand Circuitry Reference

The diagram in Figure 2 summarizes the basic Wiegand protocol.

Figure 2. Wiegand Circuitry Summary



2.3 Installation

2.3.1 Wiring Guide

Table 2 indicates which wire connections are essential in each operating mode. The optional connections may be used to provide additional functionality and to customize user feedback. See the S6400 User's Guide (11-06-21-711) for more information regarding the use of these wires.

Table 2. Wiring Guide.

Color	*Wiegand*	*RS-485*	*Function*
Black	Essential	Essential	Ground (GND)
Red	Essential	Essential	Power (+9 to +14 V_{DC})
Gray	N/A	Essential	RS-485(A or -)
Violet	N/A	Essential	RS-485(B or +)
Green	Essential	N/A	Wiegand Data(0)
White	Essential	N/A	Wiegand Data(1)
Brown	Optional	Optional	Red LED
Orange	Optional	Optional	Green LED
Yellow	Optional	Optional	Audio
Blue	Optional	Optional	Hold

2.3.2 Mounting

2.3.2.1 Product Selection

The Wall Plate Reader offers the best read range when mounted on a non-metal surface. The lower-profile Mullion Reader is designed to offer acceptable range on either metal or non-metal. If it is necessary to mount the reader on a metal surface, such as a door mullion or metal wall, select the Mullion Reader whenever possible.

Note:

If the Wall Plate Reader must be mounted onto a metal surface, a spacer of no less than 1/4" MUST be placed between the reader and the metal surface for the reader to function. Read range will be diminished.

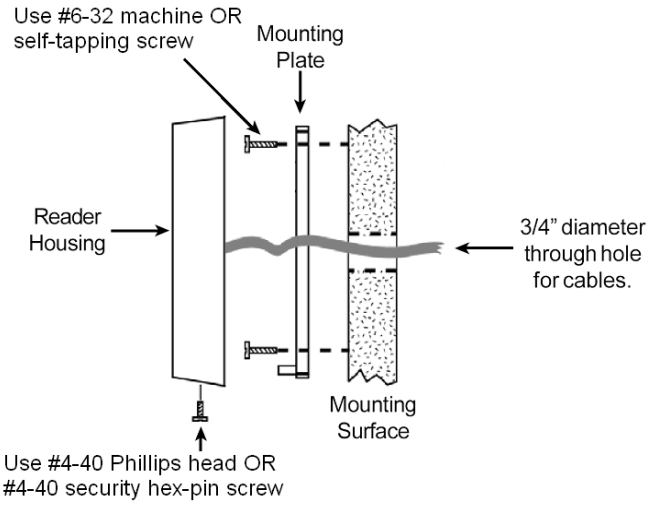
2.3.2.2 Surface preparation

1. If the reader is to be used with an electrical box, surface preparation is unnecessary. (Skip to 2.3.2.2, Typical Installation)
2. Use the appropriate template (from installation Guide, 11-06-21-713) to mark mounting and cable hole locations.
3. The mounting screws provided with the unit will self-tap into soft materials, but pre-drilling may be necessary for hard surfaces such as metal, vinyl, or hardwoods. Pre-drill mounting holes as necessary. If installing on concrete, masonry, or stucco, wall anchors should be used appropriately.
4. The cable through hole must be large enough to accept the cable AND the connectors. If necessary, enlarge the hole to ensure that the cable and connectors will fit through. The hole should not exceed 3/4" (20mm) diameter.

2.3.2.3 Typical Installation

1. Slide mounting plate over wires coming out of wall. Make certain that the flat side of the plate faces the wall, and that the tab is on the bottom. Screw the plate down using the appropriate fasteners. If the unit is being installed into an electrical box, #6-32 machine screws are recommended. Otherwise, self-tapping screws may provide better results.
2. Connect the reader wires to the wires coming out of wall per the wire guide in Table 2. Cap any unused wires to prevent shorting. (Do not cut.)
3. Carefully push wires and connections through hole in mounting plate, and snap housing onto plate by first engaging the upper tab(s), then applying pressure on the bottom.
4. Secure cover with #4-40 Phillips head screw, OR for added security, use #4-40 security hex-pin screw.

Figure 3. Mounting.



Chapter 3

Host Protocol

Topic Page

3.1 Introduction

The purpose of this chapter is to define the host protocol for RS-485 serial communications with the S6400 reader.

3.2 Generic Serial Protocol Definition

The RF Reader accepts and sends data at RS485 levels, 38400 baud, 8 data bits, 1 start bit, 1 stop bit and no parity by default. The mode of transmission is half-duplex and asynchronous.

The data packet from the host to the reader is known as the **request** and the reply from the reader to the host as the **response**. The host is always the primary station and initiates all RS-485 communication sequences. These consist of request/response pairs where the host always waits for a response before continuing.

The 6400 series reader has a Device ID of **10h**. It supports a set of error codes and commands values that may differ from the Generic Application Layer commands that use a Device ID of **04h**.

One major difference between the Generic Application Layer and the Application Specific Layer is the use of the Command 1 field. In the Generic Application the Command 1 field is used to direct the Command 2 request to the proper the library or layer. The Response Packet uses the Command 1 field to show the layer or library that responded to the request. Example: The Command 1 field is set to 01h when sending a request to the Application Layer and the response packet will have a Command 1 field set to 01h to validate that the application Layer responded to the request. The S6400 series readers use the Command 1 field as a status byte for request and response packets.

The packets for Device ID **10h** use the Command 1 field to represent the Request Packet Command Flags in the request packet and the Response Packet Flags in the response packet. Each bit of these bytes represents a specific flag. Each flag is not essential to every command. The Command 1 field is essential to each request and response packet, but there are commands that do not check the setting of every flag in the flag byte.

3.2.1 Request Packet Format (Host to RF Reader)

SOF 01h	Length LSB	Length MSB	Device ID	Cmd1	Cmd2	Data1	...	DataN	LRC/CRC1 (LSB)	LRC/CRC2 (MSB)

Field Name SOF
Field Size 1 byte
Field Value 01_{hex}
Purpose Start of Frame

Field Name Length
Field Size 2 bytes; LSB first
Field Value Packet dependent
Purpose Describes the length of the whole packet including SOF

Device ID Type of Device
Field Size 1 byte
Field Value Fixed value controlled by TI. 10_{hex} is defined for access control
Purpose Identifies the device type for command and data to follow

Field Name Command1 (Cmd1) or Command Flag
Field Size 1 byte
Field Value Flags
Purpose Specifies the action to be taken by the RF Reader

Field Name Command2 (Cmd2)
Field Size 1 byte
Field Value Specific instruction
Purpose Specifies the action to be taken by the RF Reader

Note:

If Command1 and Command2 are combined as 2 bytes, Cmd1 is LSB, Cmd2 is MSB; (LSB first)

Field Name Data
Field Size Command dependent from 0 to 1000 bytes
Field Value Command dependent
Purpose Contains the parameters and data for the command

Field Name LRC/CRC
Field Size 2 bytes
Field Value 16 bit LRC/CRC of the preceding packet including the SOF see section 3.2.4 for further details. LRC/CRC1 is LSB. LRC/CRC2 is MSB.
Purpose Allows the RF Reader to validate the correct reception of the request packet

3.2.1.1 Request Packet Command Flags

Bit #	Flag Description	Bit = 0	Bit = 1	Applicable
7	Request Flag	N/A – Always 1	Packet is Request	Set in all Request Packets
6	Reserved	Default	N/A	Not used
5	Reader Address	No Reader Serial #	Requires Reader Serial #	Reader Request; See note 1
4	Tag Address	UID not Required	UID Required	15693 Request; See note 2
3	Xmit Modulation	FSK Modulation	ASK Modulation	15693 Request
2	Tag Modulation	100 % Modulation	10 % Modulation	15693 Request
1	Data Rate	Slow Read	Fast Read	15693 Request
0	Downlink	Pulse 1/256	Pulse 1/4	15693 Request

Note 1:

If set, the message will include 8 bytes in ASCII (first byte “00 or null” followed by 7 bytes which designate the reader serial number). Only the reader with a matching serial number (enter 7 bytes) will respond.

Note 2:

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

3.2.2 Examples using Inventory Command and Reader Nonaddressed:

Example 1. Non Addressed Inventory Commands.

```
Host Request -> 01 09 00 10 83 01 00 9A 65 where 83 = 10000011 (¼,Fast,100%,FSK) - Default
Host Request -> 01 09 00 10 82 01 00 9B 64 where 82 = 10000010 (1/256,Fast,100%,FSK)
Host Request -> 01 09 00 10 81 01 00 98 67 where 81 = 10000001 (¼, Slow,100%,FSK)
Host Request -> 01 09 00 10 80 01 00 99 66 where 80 = 10000000 (1/256, Slow,100%,FSK)
Host Request -> 01 09 00 10 87 01 00 9E 61 where 87 = 10000111 (1/4,Fast,10%,FSK)
Host Request -> 01 09 00 10 86 01 00 9F 60 where 86 = 10000110 (1/256,Fast,10%,FSK)
Host Request -> 01 09 00 10 84 01 00 9D 62 where 84 = 10000100 (1/256,Slow,10%,FSK)
Host Request -> 01 09 00 10 8F 01 00 96 69 where 8F = 10001111 (¼,Fast,100%,ASK)
Host Request -> 01 09 00 10 8A 01 00 93 6C where 8A = 10001010 (1/256,Fast,100%,ASK)
Host Request -> 01 09 00 10 88 01 00 91 6E where 88 = 10001000 (1/256,Slow,100%,ASK)
Host Request -> 01 09 00 10 89 01 00 90 6F where 89 = 10001001 (¼,Slow,100%,ASK)
Host Request -> 01 09 00 10 8F 01 00 96 69 where 8F = 10001111 (¼,Fast,10%,ASK)
Host Request -> 01 09 00 10 8E 01 00 97 68 where 8E = 10001110 (1/256,Fast,10%,ASK)
Host Request -> 01 09 00 10 8C 01 00 95 6A where 8C = 10001100 (1/256,Slow,10%,ASK)
Host Request -> 01 09 00 10 8D 01 00 94 6B where 8D = 10001101 (¼,Slow,10%,ASK)
```

Example 2. Read Block Commands.

Examples with Read Block Command and tag UID E00700000681AE92 Addressed:

```
Host Request -> 01 11 00 10 93 20 92 AE 81 06 00 00 07 E0 05 EA 15 where 93 = 10010011
(1/4,Fast,100%,FSK)
Host Request -> 01 11 00 10 92 20 92 AE 81 06 00 00 07 E0 05 EB 14 where 92 = 10010010
(1/256,Fast,100%,FSK)
```

Examples with Read Block Command and Reader SN 5175030 and tag UID E00700000681AE92 Addressed:

```
Host Request -> 01 19 00 10 B3 20 35 31 37 35 30 33 30 00 92 AE 81 06 00 00 07 E0 05 F7 08
where B3 = 10110011 (1/4,Fast,100%,FSK)
Host Request -> 01 19 00 10 B2 20 35 31 37 35 30 33 30 00 92 AE 81 06 00 00 07 E0 05 F6 09
where B2 = 10110010 (1/256,Fast,100%,FSK)
```

Example 3. Inventory Commands.

Examples with Inventory Command and Reader SN 5175030 Addressed:

```
Host Request -> 01 11 00 10 A3 01 35 31 37 35 30 33 30 00 00 97 68 where A3 = 10100011
(1/4,Fast,100%,FSK)
Host Request -> 01 11 00 10 A2 01 35 31 37 35 30 33 30 00 00 96 69 where A2 = 10100010
(1/256,Fast,100%,FSK)
```

3.2.3 Response Packet Format (RF Reader to Host)

SOF 01h	Length LSB	Length MSB	Device ID	Cmd1	Cmd2	Data1	...	DataN	LRC/CRC1 (LSB)	LRC/CRC2 (MSB)

Field Name SOF
Field Size 1 byte
Field Value 01_{hex}
Purpose Start of Frame

Field Name Length
Field Size 2 bytes; LSB first
Field Value Packet dependent
Purpose Describes the length of the whole packet including SOF, LRC/CRC1 and LRC/CRC2.

Device ID Type of Device
Field Size 1 byte
Field Value Fixed value controlled by TI. 10_{hex} is defined for access control
Purpose Identifies the device type responding to the command

Field Name Command1 or Response Command Flag
Field Size 1 byte
Field Value Flags (00 hex if command execution successful; else error code)
Purpose Specifies the action taken by the RF Reader.

Field Name Command2
Field Size 1 byte
Field Value Specific instruction
Purpose Contains the execution information for the request just processed

Note:

If Command1 and Command2 are combined as 2 bytes, Cmd1 is LSB, Cmd2 is MSB; (LSB first).

Field Name Data
Field Size Command dependent
Field Value Command dependent
Purpose Contains the parameters and data for the request just processed or error if error

Field Name LRC/CRC
Field Size 2 bytes
Field Value 16 bit LRC/CRC of the preceding packet including the SOF see section 3.2.4 for further details. LRC/CRC1 is LSB, LRC/CRC2 is MSB.
Purpose Allows the host to validate the correct reception of the response packet

3.2.3.1 Response Packet Flags

Bit #	Flag Description	Bit = 0	Bit = 1	Applicable
7	Reserved	N/A – Always 0	N/A	Not used
6	Reserved	N/A – Always 0	N/A	Not used
5	Reserved	N/A – Always 0	N/A	Not used
4	Reserved	N/A – Always 0	N/A	Not used
3	Reserved	N/A – Always 0	N/A	Not used
2	Reserved	N/A – Always 0	N/A	Not used
1	Error Status	No Error	Error detected	15693 Request
0	Error Status	No Error	Error detected	15693 Request

Example 4. Bit 0,1 Examples.

Bit 0,1 Examples:
00 = No Error
01 = Error From Tag
11 = Error from Reader

3.2.4 BCC

A Block Check Character (BCC) is used for error detection and is attached to the end of the packet. The 16-bit BCC is calculated on all the bytes of the packet including the SOF. The BCC consists of two parts; LS byte is a Longitudinal Redundancy Check (LRC) and the MS byte is the ones compliment of the LRC. The LRC is calculated by performing a cumulative Exclusive-OR operation on all the bytes of the packet.

3.2.5 Packet reception and validation

The following sequence is followed within the timeout constraints:

1. BEGIN_RECEIVE: Discard all characters received until SOF is received.
2. SOF_RECEIVED: Receive next two characters. Compute Packet_Length.
3. LEN_RECEIVED: Receive (Packet_Length – 3) more characters.
4. PACKET_VALIDATE: Verify if (LRC1 + LRC2) equals FF hex. Compute LRC as defined in section 3.2.4. Compare computed LRC with LRC1.
5. DeviceID Correct: Verify the DeviceID is correct. If the DeviceID is not correct, the reader should return an error code. Important: The response packet should use the reader's CORRECT DeviceID.
6. VALIDATION_COMPLETE: Strip packet overhead and deliver packet content to calling routine.

3.3 ISO 15693 Commands & Examples

3.3.1 ISO 15693 Command Codes

This section is devoted to functions specifically designed for ISO 15693 badges.

Command Function	*ISO Command Code*
Inventory *(Identify)*	01_{hex}
Stay Quiet *(used as internal command with Inventory)*	02_{hex}
Read Single Block *(View One Block)*	20_{hex}
Write Single Block *(Program One Block)*	21_{hex}
Lock Block	22_{hex}
Read Multiple Blocks *(contiguous up to 32, View Many Blocks)*	23_{hex}
Write AFI *(Program AFI)*	27_{hex}
Lock AFI	28_{hex}
Write DSFID *(Program DSFID)*	29_{hex}
Lock DSFID	$2A_{hex}$
Get System Information *(View Tag Data)*	$2B_{hex}$
Get Multiple Block Security Status	$2C_{hex}$

3.3.2 AFI & DSFID

IC manufacturer code for Texas Instruments is 07_{hex}. Application Family Identifier (AFI) is typically set and locked at "30" for access control. Data Storage Format Identifier (DSFID) is used for revision on functionality features of the firmware.

3.3.3 Basic Command Examples

3.3.3.1 Read Single Block Command (20h):

Example 5. Read block "0" of any 15693 transponder, reader un-addressed.

The UID is sent least significant byte first and the response block data is returned in the same format.

Request Packet: (**01 09 00 10 83 20 00 BB 44**)

Field	Contents	Summary
SOF	01	Start of Frame
Packet Length	09 00	Packet Length 9 bytes
Device ID	10	Terminal is S6400
Command 1	83	Request Command Flag – Request Packet Downlink Pulse – ¼ Fast Read
Command 2	20	Read Single Block Request
Block Number	00	Read Block 0
BCC characters	BB 44	LRC and ~LRC

Response Packet: (**01 0E 00 10 00 20 1C 1C 00 00 00 00 3F C0**)

Field	Contents	Summary
SOF	01	Start of Frame
Packet Length	0E 00	Packet Length 14 bytes
Device ID	10	Terminal is S6400
Command 1	00	Response Packet Flag - Successful
Command 2	20	Read Single Block Request
Block data bytes	1C 1C 00 00	Block 0 data LSB first
	00	Reserved
Block # read	00	Block 0 was read
BCC characters	3F C0	LRC and ~LRC

Example 6. Read block "0" from a specific 15693 transponder, reader un-addressed.

A UID of "E00700000681AFDF" is used. The UID is sent least significant byte first and the response block data is returned in the same format.

Request Packet: (**01 11 00 10 93 20 DF AF 81 06 00 00 07 E0 00 A3 5C**)

Field	Contents	Summary
SOF	01	Start of Frame
Packet Length	11 00	Packet Length 17 bytes
Device ID	10	Terminal is S6400
Command 1	93	Request Command Flag – Request Packet Tag Addressed Downlink Pulse – ¼ Slow Read
Command 2	20	Read Single Block Request
UID number	DF AF 81 06 00 00 07 E0	UID LSB first
Block number	00	Read Block 0
BCC characters	A3 5C	LRC and ~LRC

Response Packet: (**01 0E 00 10 00 20 1C 1C 00 00 00 00 3F C0**)

Field	Contents	Summary
SOF	01	Start of Frame
Packet Length	0E 00	Packet Length 14 bytes
Device ID	10	Terminal is S6400
Command 1	00	Response Packet Flag - Successful
Command 2	20	Read Single Block Request
Block data bytes	1C 1C 00 00	Block 0 data LSB first
	00	Reserved
Block # read	00	Block 0 was read
BCC characters	3F C0	LRC and ~LRC

Example 7. Read block "5" from a specific 15693 transponder, reader addressed.

A transponder UID of "E00700000681AE92" is used and reader serial number "5175030" is addressed.

Request Packet: (**01 19 00 10 B3 20 35 31 37 35 30 33 30 00 92 AE 81 06 00 00 07 E0 05 F7 08**)

Field	Contents	Summary
SOF	01	Start of Frame
Packet Length	19 00	Packet Length 25 bytes
Device ID	10	Terminal is S6400
Command 1	B3	Request Command Flag – Request Packet Reader Addressed Tag Addressed Downlink Pulse – ¼ Fast Read
Command 2	20	Read Single Block Request
Reader number	35 31 37 35 30 33 30 00	Reader # LSB first
UID number	92 AE 81 06 00 00 07 E0	UID # LSB first
Block Number	05	Read Block 5
BCC characters	F7 08	LRC and ~LRC

Response Packet: (**01 0E 00 10 00 20 78 56 34 12 00 05 32 CD**)

Field	Contents	Summary
SOF	01	Start of Frame
Packet Length	0E 00	Packet Length 14 bytes
Device ID	10	Terminal is S6400
Command 1	00	Response Packet Flag - Successful
Command 2	20	Read Single Block Request
Block data bytes	78 56 34 12	Block 5 data LSB first
	00	Reserved
Block # read	05	Block 5 was read
BCC characters	32 CD	LRC and ~LRC

3.3.3.2 Write Single Block (21h):

Example 8. Write block "5" of any 15693 transponder, reader un-addressed.

Write 0x12, 0x34, 0x56, 0x78 to block 5. The Block data is sent least significant byte first.

Request Packet: (**01 0D 00 10 83 21 05 78 56 34 12 B3 4C**)

Field	Contents	Summary
SOF	01	Start of Frame
Packet Length	0D 00	Packet Length 13 bytes
Device ID	10	Terminal is S6400
Command 1	83	Request Command Flag – Request Packet Downlink Pulse – ¼ Fast Read
Command 2	21	Write Single Block Request
Block Number	05	Write Block 5
Block Data	78 56 34 12	Block 5 data – LSB first
BCC characters	B3 4C	LRC and ~LRC

Response Packet: (**01 09 00 10 00 21 00 39 C6**)

Field	Contents	Summary
SOF	01	Start of Frame
Packet Length	09 00	Packet Length 9 bytes
Device ID	10	Terminal is S6400
Command 1	00	Response Packet Flag - Successful
Command 2	21	Write Single Block Request
Status	00	Block was successfully written
BCC characters	39 C6	LRC and ~LRC

Example 9. Write block "5" of a specific 15693 transponder, reader un-addressed.

0x12, 0x34, 0x56, 0x78 will be written to block "5" of transponder with UID "E00700000681AE92." The UID is sent least significant byte first and the response block data is returned in the same format.

Request Packet: (**01 15 00 10 93 21 92 AE 81 06 00 00 07 E0 05 78 56 34 12 E7 18**)

Field	Contents	Summary
SOF	01	Start of Frame
Packet Length	15 00	Packet Length 21 bytes
Device ID	10	Terminal is S6400
Command 1	93	Request Command Flag – Request Packet UID Address Downlink Pulse – ¼ Fast Read
Command 2	21	Write Single Block Request
UID number	92 AE 81 06 00 00 07 E0	UID Number LSB first
Block Number	05	Write Block 5
Block Data	78 56 34 12	Block 5 data – LSB first
BCC characters	E7 18	LRC and ~LRC

Response Packet: (**01 09 00 10 00 21 00 39 C6**)

Field	Contents	Summary
SOF	01	Start of Frame
Packet Length	09 00	Packet Length 9 bytes
Device ID	10	Terminal is S6400
Command 1	00	Response Packet Flag - Successful
Command 2	21	Write Single Block Request
Status	00	Block was successfully written
BCC characters	39 C6	LRC and ~LRC

Example 10. Write block 5 of a specific 15693 transponder, reader addressed.

0x12, 0x34, 0x56, 0x78 will be written to block "5" of the transponder with UID "E00700000681AE92" using reader serial number "5175030." The Block data, reader Serial number and UID are sent least significant byte first.

Request Packet: (**01 1D 00 10 B3 21 35 31 37 35 30 33 30 00 92 AE 81 06 00 00 07 E0 05 78 56 34 12 FA 05**)

Field	Contents	Summary
SOF	01	Start of Frame
Packet Length	1D 00	Packet Length 29 bytes
Device ID	10	Terminal is S6400
Command 1	B3	Request Command Flag – Request Packet UID Addressed Reader Addressed Downlink Pulse – ¼ Fast Read
Command 2	21	Write Single Block Request
Reader number	35 31 37 35 30 33 30 00	Reader # LSB first
UID number	92 AE 81 06 00 00 07 E0	UID Number LSB first
Block Number	05	Write Block 5
Block Data	78 56 34 12	Block 5 data – LSB first
BCC characters	FA 05	LRC and ~LRC

Response Packet: (**01 09 00 10 00 21 00 39 C6**)

Field	Contents	Summary
SOF	01	Start of Frame
Packet Length	09 00	Packet Length 9 bytes
Device ID	10	Terminal is S6400
Command 1	00	Response Packet Flag - Successful
Command 2	21	Write Single Block Request
Status	00	Block was successfully written
BCC characters	39 C6	LRC and ~LRC

3.3.3.3 Lock Single Block Command (22h):

Example 11. Lock block "5" of any 15693 transponder, reader un-addressed.

Request Packet: (**01 09 00 10 83 22 05 BC 43**)

Field	Contents	Summary
SOF	01	Start of Frame
Packet Length	09 00	Packet Length 9 bytes
Device ID	10	Terminal is S6400
Command 1	83	Request Command Flag – Request Packet Downlink Pulse – ¼ Fast Read
Command 2	22	Lock Single Block Request
Block Number	05	Lock Block 5
BCC characters	BC 43	LRC and ~LRC

Note:

It is not possible to write to any block that has been locked. A block cannot be unlocked once it has been locked.

Response Packet: (**01 09 00 10 00 22 00 3A C5**)

Field	Contents	Summary
SOF	01	Start of Frame
Packet Length	09 00	Packet Length 9 bytes
Device ID	10	Terminal is S6400
Command 1	00	Response Packet Flag - Successful
Command 2	22	Lock Single Block Request
Status	00	Block was successfully locked
BCC characters	3A C5	LRC and ~LRC

Note:

The response packet contains a status byte of **00** h when successful and **11** h when the block is already locked.

Example 12. Example of successful/unsuccessful lock.

(block 5):

```
Host Request    -> 01 09 00 10 83 22 05 BC 43
Reader Response -> 01 09 00 10 00 22 00 3A C5
Reader Response -> 01 09 00 10 01 22 11 2A D5 (Error: block already locked)
```

Example 13. Lock block "5" of a specific 15693 transponder, reader un-addressed.

Block "5" of transponder with UID "E00700000681AE92" will be locked.

Request Packet: (**01 11 00 10 93 22 92 AE 81 06 00 00 07 E0 05 E8 17**)

Field	Contents	Summary
SOF	01	Start of Frame
Packet Length	11 00	Packet Length 17 bytes
Device ID	10	Terminal is S6400
Command 1	92	Request Command Flag – Request Packet UID Address Downlink Pulse – ¼ Slow Read
Command 2	22	Lock Single Block Request
UID number	92 AE 81 06 00 00 07 E0	UID Number LSB first
Block Number	05	Write Block 5
BCC characters	E8 17	LRC and ~LRC

Response Packet: (**01 09 00 10 00 22 00 3A C5**)

Field	Contents	Summary
SOF	01	Start of Frame
Packet Length	09 00	Packet Length 9 bytes
Device ID	10	Terminal is S6400
Command 1	00	Response Packet Flag - Successful
Command 2	22	Lock Single Block Request
Status	00	Block was successfully locked
BCC characters	3A C5	LRC and ~LRC

Example 14. Lock block "5" of a specific 15693 transponder, reader addressed.

Transponder UID "E00700000681AE92" and reader serial number "5175030" are used. The Serial number and UID are sent least significant byte first.

Request Packet: (**01 19 00 10 B3 22 35 31 37 35 30 33 30 00 92 AE 81 06 00 00 07 E0 05 F4 0A**)

Field	Contents	Summary
SOF	01	Start of Frame
Packet Length	19 00	Packet Length 25 bytes
Device ID	10	Terminal is S6400
Command 1	B3	Request Command Flag – Request Packet UID Addressed Reader Addressed Downlink Pulse – ¼ Fast Read
Command 2	22	Lock Single Block Request
Reader number	35 31 37 35 30 33 30 00	Reader # LSB first
UID number	92 AE 81 06 00 00 07 E0	UID Number LSB first
Block Number	05	Write Block 5
BCC characters	F4 0A	LRC and ~LRC

Response Packet: (**01 09 00 10 00 22 00 3A C5**)

Field	Contents	Summary
SOF	01	Start of Frame
Packet Length	09 00	Packet Length 9 bytes
Device ID	10	Terminal is S6400
Command 1	00	Response Packet Flag - Successful
Command 2	22	Lock Single Block Request
Status	00	Block was successfully locked
BCC characters	3A C5	LRC and ~LRC

Example 15. Successful/Unsuccessful Lock Single Block with Reader and Tag Addressed.

(block 5 with reader SN 5175030 and UID E00700000681AE92 addressed):

```
Host Request -> 01 19 00 10 B3 22 35 31 37 35 30 33 30 00 92 AE 81 06 00 00 07 E0 05 F4 0A
Reader Response -> 01 09 00 10 00 22 00 3A C5
Reader Response -> 01 09 00 10 01 22 11 2A D5 (Error: block already locked)
```

3.3.3.4 Read Multi-block Command: (23h):

Example 16. Read blocks 5, 6, and 7 of any 15693 transponders, reader un-addressed.

Blocks "5", "6", and "7" will be read from the present transponder. The Block data is returned least significant byte first for each block.

Request Packet: (**01 0A 00 10 83 23 05 03 BD 42**)

Field	Contents	Summary
SOF	01	Start of Frame
Packet Length	0A 00	Packet Length 10 bytes
Device ID	10	Terminal is S6400
Command 1	83	Request Command Flag – Request Packet Downlink Pulse – ¼ Fast Read
Command 2	23	Read Multiple Blocks Request
First Block Number	05	Start Read at Block 5
Number of blocks	03	Read 3 blocks total
BCC characters	BD 42	LRC and ~LRC

Response Packet: (**01 19 00 10 00 23 00 03 05 78 56 34 12 06 44 44 00 00 07 00 00 00 00 24 DB**)

Field	Contents	Summary
SOF	01	Start of Frame
Packet Length	19 00	Packet Length 25 bytes
Device ID	10	Terminal is S6400
Command 1	00	Response Packet Flag - Successful
Command 2	23	Read Multiple Blocks Request
Block number	05	Block 5
Block data bytes	78 56 34 12	Block 5 data LSB first
Block number	06	Block 6
Block data bytes	44 44 00 00	Block 6 data LSB first
Block number	07	Block 7
Block # read	00 00 00 00	Block 7 data LSB first
BCC characters	24 DB	LRC and ~LRC

Example 17. Read blocks 5, 6, and 7 from a specific 15693 transponder, reader un-addressed.

Blocks “5”, “6”, and “7” will be read from transponder with a UID of “E00700000681AE92” from any reader attached to the RS-485 Bus. The UID is sent least significant byte first and the response block data is returned in the same format.

Request Packet: (**01 12 00 10 93 23 92 AE 81 06 00 00 07 E0 05 03 E9 16**)

Field	Contents	Summary
SOF	01	Start of Frame
Packet Length	12 00	Packet Length 18 bytes
Device ID	10	Terminal is S6400
Command 1	92	Request Command Flag – Request Packet Tag Addressed Downlink Pulse – ¼ Slow Read
Command 2	23	Multiple Single Blocks Request
UID number	92 AE 81 06 00 00 07 E0	UID LSB first
Block number	05	Start Read at Block 5
Number of blocks	03	Read 3 blocks total
BCC characters	E9 16	LRC and ~LRC

Response Packet: (**01 19 00 10 00 23 00 03 05 78 56 34 12 06 44 44 00 00 07 00 00 00 00 24 DB**)

Field	Contents	Summary
SOF	01	Start of Frame
Packet Length	19 00	Packet Length 25 bytes
Device ID	10	Terminal is S6400
Command 1	00	Response Packet Flag - Successful
Command 2	23	Read Multiple Blocks Request
Block number	05	Block 5
Block data bytes	78 56 34 12	Block 5 data LSB first
Block number	06	Block 6
Block data bytes	44 44 00 00	Block 6 data LSB first
Block number	07	Block 7
Block # read	00 00 00 00	Block 7 data LSB first
BCC characters	24 DB	LRC and ~LRC

Example 18. Read blocks 5, 6, and 7 from a specific15693 transponder, reader addressed.

Blocks “5”, “6”, and “7” will be read from transponder with a UID of “E00700000681AE92”, from only the reader with serial number “5175030.” The UID is sent least significant byte first and the response block data is returned in the same format.

Request Packet: (**01 1A 00 10 B3 23 35 31 37 35 30 33 30 00 92 AE 81 06 00 00 07 E0 05 03 F4 0B**)

Field	Contents	Summary
SOF	01	Start of Frame
Packet Length	1A 00	Packet Length 26 bytes
Device ID	10	Terminal is S6400
Command 1	B3	Request Command Flag – Request Packet Reader Addressed Tag Addressed Downlink Pulse – ¼ Fast Read
Command 2	23	Read Multiple Blocks Request
Reader number	35 31 37 35 30 33 30 00	Reader # LSB first
UID number	92 AE 81 06 00 00 07 E0	UID # LSB first
Block Number	05	Start Read at Block 5
Number of blocks	03	Read 3 blocks total
BCC characters	F4 0B	LRC and ~LRC

Response Packet: (**01 19 00 10 00 23 00 03 05 78 56 34 12 06 44 44 00 00 07 00 00 00 00 24 DB**)

Field	Contents	Summary
SOF	01	Start of Frame
Packet Length	19 00	Packet Length 25 bytes
Device ID	10	Terminal is S6400
Command 1	00	Response Packet Flag - Successful
Command 2	23	Read Multiple Blocks Request
Block number	05	Block 5
Block data bytes	78 56 34 12	Block 5 data LSB first
Block number	06	Block 6
Block data bytes	44 44 00 00	Block 6 data LSB first
Block number	07	Block 7
Block # read	00 00 00 00	Block 7 data LSB first
BCC characters	24 DB	LRC and ~LRC

3.3.3.5 Write AFI Command (27h):

Example 19. Write an AFI of 30 h to any 15693 transponder, reader un-addressed.

AFI of "30" will be written to present transponder.

Request Packet: (**01 09 00 10 83 27 30 8C 73**)

Field	Contents	Summary
SOF	01	Start of Frame
Packet Length	09 00	Packet Length 9 bytes
Device ID	10	Terminal is S6400
Command 1	83	Request Command Flag – Request Packet Downlink Pulse – ¼ Fast Read
Command 2	27	Write AFI Request
AFI value	30	AFI set to 30 h
BCC characters	8C 73	LRC and ~LRC

Note:

The AFI cannot be programmed on transponders with the AFI already locked. The status byte will be returned as **00** h when the AFI is programmed successfully and **11** h when the AFI is already locked.

Response Packet: (**01 09 00 10 00 27 00 3F C0**)

Field	Contents	Summary
SOF	01	Start of Frame
Packet Length	09 00	Packet Length 9 bytes
Device ID	10	Terminal is S6400
Command 1	00	Response Packet Flag - Successful
Command 2	27	Write AFI Request
Status	00	AFI was successfully programmed
BCC characters	3F C0	LRC and ~LRC

Example 20. Successful/Unsuccessful Write AFI (unaddressed).

(AFI 30):

```
Host Request    -> 01 09 00 10 83 27 30 8C 73
Reader Response -> 01 09 00 10 00 27 00 3F C0
Reader Response -> 01 09 00 10 01 27 11 2F D0 (Error: AFI is already locked)
```

Example 21. Write an AFI of 30 h to a specific transponder, reader unaddressed.

AFI of “30” will be written to transponder with UID “E007000001645C67”.

Request Packet: (**01 11 00 10 93 27 67 5C 64 01 00 00 07 E0 30 3D C2**)

Field	Contents	Summary
SOF	01	Start of Frame
Packet Length	11 00	Packet Length 17 bytes
Device ID	10	Terminal is S6400
Command 1	93	Request Command Flag – Request Packet UID Addressed Downlink Pulse – ¼ Fast Read
Command 2	27	Write AFI Request
UID value	67 5C 64 01 00 00 07 E0	UID – LSB first
AFI value	30	AFI set to 30 h
BCC characters	3D C2	LRC and ~LRC

Response Packet: (**01 09 00 10 00 27 00 3F C0**)

Field	Contents	Summary
SOF	01	Start of Frame
Packet Length	09 00	Packet Length 9 bytes
Device ID	10	Terminal is S6400
Command 1	00	Response Packet Flag - Successful
Command 2	27	Write AFI Request
Status	00	AFI was successfully programmed
BCC characters	3F C0	LRC and ~LRC

Example 22. Successful/Unsuccessful Write AFI (addressed).

(AFI 30 with UID E007000001645C67):

```
Host Request    -> 01 11 00 10 93 27 67 5C 64 01 00 00 07 E0 30 3D C2
Reader Response -> 01 09 00 10 00 27 00 3F C0
Reader Response -> 01 09 00 10 01 27 11 2F D0 (Error: AFI is already locked)
```

Example 23. Write an AFI of 30 h to specific 15693 transponder, reader addressed.

Write AFI of “30” to transponder with UID “E007000001645C67” from only the reader with the Serial Number “5175030.”

Request Packet: (**01 19 00 10 B3 27 35 31 37 35 30 33 30 00 67 5C 64 01 00 00 07 E0 30 20 DF**)

Field	Contents	Summary
SOF	01	Start of Frame
Packet Length	19 00	Packet Length 25 bytes
Device ID	10	Terminal is S6400
Command 1	B3	Request Command Flag – Request Packet Reader Addressed UID Addressed Downlink Pulse – ¼ Fast Read
Command 2	27	Write AFI Request
Reader number	35 31 37 35 30 33 30 00	Reader # LSB first
UID value	67 5C 64 01 00 00 07 E0	UID – LSB first
AFI value	30	AFI set to 30 h
BCC characters	20 DF	LRC and ~LRC

Response Packet: (**01 09 00 10 00 27 00 3F C0**)

Field	Contents	Summary
SOF	01	Start of Frame
Packet Length	09 00	Packet Length 9 bytes
Device ID	10	Terminal is S6400
Command 1	00	Response Packet Flag - Successful
Command 2	27	Write AFI Request
Status	00	AFI was successfully programmed
BCC characters	3F C0	LRC and ~LRC

Example 24. Successful/Unsuccessful Write AFI with Reader and Tag Addressed.

(AFI 30 with reader SN 5175030 and tag UID E007000001645C67 addressed):

```
Host Request -> 01 19 00 10 B3 27 35 31 37 35 30 33 30 00 67 5C 64 01 00 00 07 E0 30 20 DF
Reader Response -> 01 09 00 10 00 27 00 3F C0
Reader Response -> 01 09 00 10 01 27 11 2F D0 (Error: AFI is already locked)
```

3.3.3.6 Lock AFI Command (28h):

The AFI cannot be unlocked on transponders with the AFI locked. The status byte will be returned as **00** h when the AFI is locked successfully and **11** h when the AFI is already locked.

Example 25. Lock the AFI on any 15693 transponder, reader un-addressed.

Request Packet: (**01 08 00 10 83 28 B2 4D**)

Field	Contents	Summary
SOF	01	Start of Frame
Packet Length	08 00	Packet Length 8 bytes
Device ID	10	Terminal is S6400
Command 1	83	Request Command Flag – Request Packet Downlink Pulse – ¼ Fast Read
Command 2	28	Lock AFI Request
BCC characters	B2 4D	LRC and ~LRC

Note:

The AFI cannot be unlocked on transponders with the AFI locked. The status byte will be returned as **00** h when the AFI is locked successfully and **11** h when the AFI is already locked.

Response Packet: (**01 09 00 10 00 28 00 30 CF**)

Field	Contents	Summary
SOF	01	Start of Frame
Packet Length	09 00	Packet Length 9 bytes
Device ID	10	Terminal is S6400
Command 1	00	Response Packet Flag - Successful
Command 2	28	Lock AFI Request
Status	00	AFI was successfully Locked
BCC characters	30 CF	LRC and ~LRC

Example 26. Successful/Unsuccessful Lock AFI (unaddressed).

```
Host Request    -> 01 08 00 10 83 28 B2 4D
Reader Response -> 01 09 00 10 00 28 00 30 CF
Reader Response -> 01 09 00 10 01 28 11 20 DF (Error: AFI is already locked)
```

Example 27. Lock the AFI on a specific 15693 transponder, reader un-addressed.

Lock AFI of 15693 transponder with UID “E007000001645C67” from any reader attached to the RS-485 Bus.

Request Packet: (**01 10 00 10 93 28 67 5C 64 01 00 00 07 E0 03 FC**)

Field	Contents	Summary
SOF	01	Start of Frame
Packet Length	10 00	Packet Length 16 bytes
Device ID	10	Terminal is S6400
Command 1	93	Request Command Flag – Request Packet UID Addressed Downlink Pulse – ¼ Fast Read
Command 2	28	Lock AFI Request
UID value	67 5C 64 01 00 00 07 E0	UID – LSB first
BCC characters	03 FC	LRC and ~LRC

Response Packet: (**01 09 00 10 00 28 00 30 CF**)

Field	Contents	Summary
SOF	01	Start of Frame
Packet Length	09 00	Packet Length 9 bytes
Device ID	10	Terminal is S6400
Command 1	00	Response Packet Flag - Successful
Command 2	28	Lock AFI Request
Status	00	AFI was successfully Locked
BCC characters	30 CF	LRC and ~LRC

Example 28. Successful/Unsuccessful Lock AFI (addressed).

(AFI 30 with UID E007000001645C67):

```
Host Request    -> 01 10 00 10 93 28 67 5C 64 01 00 00 07 E0 03 FC
Reader Response -> 01 09 00 10 00 28 00 30 CF
Reader Response -> 01 09 00 10 01 28 11 20 DF (Error: AFI is already locked)
```

Example 29. Lock the AFI on a specific 15693 transponder, reader addressed.

Lock AFI on 15693 transponder with UID “E007000001645C67” from with reader with the Serial Number “5175030.”

Request Packet: (**01 18 00 10 B3 28 35 31 37 35 30 33 30 00 67 5C 64 01 00 00 07 E0 1E E1**)

Field	Contents	Summary
SOF	01	Start of Frame
Packet Length	18 00	Packet Length 24 bytes
Device ID	10	Terminal is S6400
Command 1	B3	Request Command Flag – Request Packet Reader Addressed UID Addressed Downlink Pulse – ¼ Fast Read
Command 2	28	Lock AFI Request
Reader number	35 31 37 35 30 33 30 00	Reader # LSB first
UID value	67 5C 64 01 00 00 07 E0	UID – LSB first
BCC characters	1E E1	LRC and ~LRC

Response Packet: (**01 09 00 10 00 28 00 30 CF**)

Field	Contents	Summary
SOF	01	Start of Frame
Packet Length	09 00	Packet Length 9 bytes
Device ID	10	Terminal is S6400
Command 1	00	Response Packet Flag - Successful
Command 2	28	Lock AFI Request
Status	00	AFI was successfully Locked
BCC characters	30 CF	LRC and ~LRC

Example 30. Successful/Unsuccessful Lock AFI with Reader and Tag Addressed.

(Reader SN 5175030 and UID E007000001645C67 addressed):

```
Host Request -> 01 18 00 10 B3 28 35 31 37 35 30 33 30 00 67 5C 64 01 00 00 07 E0 1E E1
Reader Response -> 01 09 00 10 00 28 00 30 CF
Reader Response -> 01 09 00 10 01 28 11 20 DF (Error: AFI is already locked)
```

3.3.3.7 Write DSFID Command (29h):

Example 31. Write a DSFID of 00 h to any 15693 transponder, reader un-addressed.

Request Packet: (**01 09 00 10 83 29 00 B2 4D**)

Field	Contents	Summary
SOF	01	Start of Frame
Packet Length	09 00	Packet Length 9 bytes
Device ID	10	Terminal is S6400
Command 1	83	Request Command Flag – Request Packet Downlink Pulse – ¼ Fast Read
Command 2	29	Write DSFID I Request
DSFID value	00	DSFID set to 00 h
BCC characters	B2 4D	LRC and ~LRC

Note:

The DSFID cannot be programmed on transponders with the DSFID already locked. The status byte will be returned as **00** h when the DSFID is programmed successfully and **11** h when the DSFID is already locked.

Response Packet: (**01 09 00 10 00 29 00 31 CE**)

Field	Contents	Summary
SOF	01	Start of Frame
Packet Length	09 00	Packet Length 9 bytes
Device ID	10	Terminal is S6400
Command 1	00	Response Packet Flag - Successful
Command 2	29	Write DSFID Request
Status	00	DSFID was successfully programmed
BCC characters	31 CE	LRC and ~LRC

Example 32. Successful/Unsuccessful Write DSFID (unaddressed).

(DSFID 00):

```
Host Request    -> 01 09 00 10 83 29 00 B2 4D
Reader Response -> 01 09 00 10 00 29 00 31 CE
Reader Response -> 01 09 00 10 01 29 11 21 DE (Error: AFI is already locked)
```

Example 33. Write a DSFID of 00 h to a specific 15693 transponder, reader un-addressed.

Write a DSFID of 00 h to 15693 transponder with UID "E007000001645C67" from any reader attached to the RS-485 Bus.

Request Packet: (**01 11 00 10 93 29 67 5C 64 01 00 00 07 E0 00 03 FC**)

Field	Contents	Summary
SOF	01	Start of Frame
Packet Length	11 00	Packet Length 17 bytes
Device ID	10	Terminal is S6400
Command 1	93	Request Command Flag – Request Packet UID Addressed Downlink Pulse – ¼ Fast Read
Command 2	29	Write DSFID Request
UID value	67 5C 64 01 00 00 07 E0	UID – LSB first
DSFID value	00	DSFID set to 00 h
BCC characters	03 FC	LRC and ~LRC

Response Packet: (**01 09 00 10 00 29 00 31 CE**)

Field	Contents	Summary
SOF	01	Start of Frame
Packet Length	09 00	Packet Length 9 bytes
Device ID	10	Terminal is S6400
Command 1	00	Response Packet Flag - Successful
Command 2	29	Write DSFID Request
Status	00	DSFID was successfully programmed
BCC characters	31 CE	LRC and ~LRC

Example 34. Successful/Unsuccessful Write DSFID (addressed).

(DSFID 00 with UID E007000001645C67):

```
Host Request    -> 01 11 00 10 93 29 67 5C 64 01 00 00 07 E0 00 03 FC
Reader Response -> 01 09 00 10 00 29 00 31 CE
Reader Response -> 01 09 00 10 01 29 11 21 DE (Error: AFI is already locked)
```

Example 35. Write a DSFID of 00 h to specific 15693 transponder, reader addressed.

Write a DSFID of 00 h to 15693 transponder with UID "E007000001645C67" from with reader with the Serial Number "5175030."

Request Packet: (**01 19 00 10 B3 29 35 31 37 35 30 33 30 00 67 5C 64 01 00 00 07 E0 00 1E E1**)

Field	Contents	Summary
SOF	01	Start of Frame
Packet Length	19 00	Packet Length 25 bytes
Device ID	10	Terminal is S6400
Command 1	B3	Request Command Flag – Request Packet Reader Addressed UID Addressed Downlink Pulse – ¼ Fast Read
Command 2	29	Write DSFID Request
Reader number	35 31 37 35 30 33 30 00	Reader # LSB first
UID value	67 5C 64 01 00 00 07 E0	UID – LSB first
DSFID value	00	DSFID set to 00 h
BCC characters	1E E1	LRC and ~LRC

Response Packet: (**01 09 00 10 00 29 00 31 CE**)

Field	Contents	Summary
SOF	01	Start of Frame
Packet Length	09 00	Packet Length 9 bytes
Device ID	10	Terminal is S6400
Command 1	00	Response Packet Flag - Successful
Command 2	29	Write DSFID Request
Status	00	DSFID was successfully programmed
BCC characters	31 CE	LRC and ~LRC

Example 36. Successful/Unsuccessful Write DSFID with Reader and Tag Addressed.

(DSFID 00 with reader SN 5175030 and UID E007000001645C67 addressed):

```
Host Request   -> 01 19 00 10 B3 29 35 31 37 35 30 33 30 00 67 5C 64 01 00 00 07 E0
00 1E E1
Reader Response -> 01 09 00 10 00 29 00 31 CE
Reader Response -> 01 09 00 10 01 29 11 21 DE (Error: AFI is already locked)
```

3.3.3.8 Lock DSFID Command (2Ah):

Example 37. Lock the DSFID on any 15693 transponder, reader un-addressed.

Request Packet: (**01 08 00 10 83 2A B0 4F**)

Field	Contents	Summary
SOF	01	Start of Frame
Packet Length	08 00	Packet Length 8 bytes
Device ID	10	Terminal is S6400
Command 1	83	Request Command Flag – Request Packet Downlink Pulse – ¼ Fast Read
Command 2	2A	Lock DSFID Request
BCC characters	B0 4F	LRC and ~LRC

Note:

The DSFID cannot be locked on transponders with the DSFID already locked. The status byte will be returned as **00** h when the DSFID is programmed successfully and **11** h when the DSFID is already locked.

Response Packet: (**01 09 00 10 00 2A 00 32 CD**)

Field	Contents	Summary
SOF	01	Start of Frame
Packet Length	09 00	Packet Length 9 bytes
Device ID	10	Terminal is S6400
Command 1	00	Response Packet Flag - Successful
Command 2	2A	Lock DSFID Request
Status	00	DSFID was successfully Locked
BCC characters	32 CD	LRC and ~LRC

Example 38. Successful/Unsuccessful Lock DSFID (unaddressed).

```
Host Request    -> 01 08 00 10 83 2A B0 4F
Reader Response -> 01 09 00 10 00 2A 00 32 CD
Reader Response -> 01 09 00 10 01 2A 11 22 DD (Error: AFI is already locked)
```

Example 39. Lock the DSFID on a specific 15693 transponder, reader un-addressed.

Lock DSFID on the 15693 transponder with UID “E007000001645C67” from any reader attached to the RS-485 Bus.

Request Packet: (**01 10 00 10 93 2A 67 5C 64 01 00 00 07 E0 01 FE**)

Field	Contents	Summary
SOF	01	Start of Frame
Packet Length	10 00	Packet Length 16 bytes
Device ID	10	Terminal is S6400
Command 1	93	Request Command Flag – Request Packet UID Addressed Downlink Pulse – ¼ Fast Read
Command 2	2A	Lock DSFID Request
UID value	67 5C 64 01 00 00 07 E0	UID – LSB first
BCC characters	01 FE	LRC and ~LRC

Response Packet: (**01 09 00 10 00 2A 00 32 CD**)

Field	Contents	Summary
SOF	01	Start of Frame
Packet Length	09 00	Packet Length 9 bytes
Device ID	10	Terminal is S6400
Command 1	00	Response Packet Flag - Successful
Command 2	28	Lock DSFID Request
Status	00	DSFID was successfully Locked
BCC characters	32 CD	LRC and ~LRC

Example 40. Successful/Unsuccessful Lock DSFID (addressed).

(UID E007000001645C67 addressed):

```
Host Request    -> 01 10 00 10 93 2A 67 5C 64 01 00 00 07 E0 01 FE
Reader Response -> 01 09 00 10 00 2A 00 32 CD
Reader Response -> 01 09 00 10 01 2A 11 22 DD where AFI is already locked
```

Example 41. Lock the DSFID on a specific 15693 transponder, reader addressed.

Lock DSFID on the 15693 transponder with UID "E007000001645C67" using reader with the Serial Number "5175030."

Request Packet: (**01 18 00 10 B2 2A 35 31 37 35 30 33 30 00 67 5C 64 01 00 00 07 E0 1D E2**)

Field	Contents	Summary
SOF	01	Start of Frame
Packet Length	18 00	Packet Length 24 bytes
Device ID	10	Terminal is S6400
Command 1	B2	Request Command Flag – Request Packet Reader Addressed UID Addressed Downlink Pulse – ¼ Slow Read
Command 2	2A	Lock DSFID Request
Reader number	35 31 37 35 30 33 30 00	Reader # LSB first
UID value	67 5C 64 01 00 00 07 E0	UID – LSB first
BCC characters	1D E2	LRC and ~LRC

Response Packet: (**01 09 00 10 00 2A 00 32 CD**)

Field	Contents	Summary
SOF	01	Start of Frame
Packet Length	09 00	Packet Length 9 bytes
Device ID	10	Terminal is S6400
Command 1	00	Response Packet Flag - Successful
Command 2	28	Lock DSFID Request
Status	00	DSFID was successfully Locked
BCC characters	32 CD	LRC and ~LRC

Example 42. Successful/Unsuccessful Lock DSFID with Reader and Tag Addressed.

(reader SN 5175030 and UID E007000001645C67 addressed):

```
Host Request    -> 01 18 00 10 B2 2A 35 31 37 35 30 33 30 00 67 5C 64 01 00 00 07 E0 1D E2
Reader Response -> 01 09 00 10 00 2A 00 32 CD
Reader Response -> 01 09 00 10 01 2A 11 22 DD where AFI is already locked
```

3.3.3.9 Read Tag Information Command (2Bh):

The UID is an 8-byte Unique Identifier and is read least significant byte first. The AFI is a single byte Application family Identifier and is typically set to 30 h for Access Control applications. The DSFID is the single byte Data Storage Format Identifier.

It is possible to read this information from any 15693 transponders within the read range, as well as specify a specific transponder by its UID value. It is also possible to select a specific reader from which to read this information by addressing the reader by its serial number.

The response packet contains a data flag byte. The bits of this byte represent fields that are present in the response packet. The following table details the bits of the Data Flag byte.

Data Flag Bit #	Bit ON Represents
0	DSFID field present
1	AFI field present
2	VICC Memory size present
3	IC reference present

Example 43. Read the Tag Information from any 15693 transponder, reader un-addressed.

Request Packet: (**01 08 00 10 83 2B B1 4E**)

Field	Contents	Summary
SOF	01	Start of Frame
Packet Length	08 00	Packet Length 8 bytes
Device ID	10	Terminal is S6400
Command 1	83	Request Command Flag – Request Packet Downlink Pulse – ¼ Fast Read
Command 2	2B	Read Tag Information Request
BCC characters	B1 4E	LRC and ~LRC

Response Packet: (**01 16 00 10 00 2B 0F 92 AE 81 06 00 00 07 E0 00 30 3F 03 88 FB 04**)

Field	Contents	Summary
SOF	01	Start of Frame
Packet Length	16 00	Packet Length 22 bytes
Device ID	10	Terminal is S6400
Command 1	00	Response Packet Flag - Successful
Command 2	2B	Read Tag Information Request
Data Flag	0F	
UID value	92 AE 81 06 00 00 07 E0	UID – LSB first - E00700000681AE92
DSFID value	00	DSFID = 00
AFI value	30	AFI = 30
Number of Blocks	3F	64 blocks – (0-63)
Block Size	03	4 bytes each – (0-3)
IC Reference	88	IC Ref. = 88
BCC characters	FB 04	LRC and ~LRC

Example 44. Read the Tag Information from a specific 15693 transponder, reader un-addressed.

Read Tag Information from the15693 transponder with UID value of "E00700000681AE92" from any reader attached to the RS-485 Bus.

Request Packet: (**01 10 00 10 93 2B 92 AE 81 06 00 00 07 E0 E5 1A**)

Field	Contents	Summary
SOF	01	Start of Frame
Packet Length	10 00	Packet Length 16 bytes
Device ID	10	Terminal is S6400
Command 1	93	Request Command Flag – Request Packet UID Addressed Downlink Pulse – ¼ Fast Read
Command 2	2B	Read Tag Information Request
UID value	92 AE 81 06 00 00 07 E0	UID – LSB first - E00700000681AE92
BCC characters	E5 1A	LRC and ~LRC

Response Packet: (**01 16 00 10 00 2B 0F 92 AE 81 06 00 00 07 E0 00 30 3F 03 88 FB 04**)

Field	Contents	Summary
SOF	01	Start of Frame
Packet Length	16 00	Packet Length 22 bytes
Device ID	10	Terminal is S6400
Command 1	00	Response Packet Flag - Successful
Command 2	2B	Read Tag Information Request
Data Flag	0F	
UID value	92 AE 81 06 00 00 07 E0	UID – LSB first - E00700000681AE92
DSFID value	00	DSFID = 00
AFI value	30	AFI = 30
Number of Blocks	3F	64 blocks – (0-63)
Block Size	03	4 bytes each – (0-3)
IC Reference	88	IC Ref. = 88
BCC characters	FB 04	LRC and ~LRC

Example 45. Read the Tag Information from a specific 15693 transponder, reader addressed.

Read Tag Information from the15693 transponder with UID value of "E00700000681AE92" using the reader with serial number "5175030."

Request Packet: (**01 18 00 10 B3 2B 35 31 37 35 30 33 30 00 92 AE 81 06 00 00 07 E0 F8 07**)

Field	Contents	Summary
SOF	01	Start of Frame
Packet Length	18 00	Packet Length 24 bytes
Device ID	10	Terminal is S6400
Command 1	B3	Request Command Flag – Request Packet Reader Addressed UID Addressed Downlink Pulse – ¼ Fast Read
Command 2	2B	Read Tag Information Request
Reader number	35 31 37 35 30 33 30 00	Reader # LSB first - 5175030
UID value	92 AE 81 06 00 00 07 E0	UID – LSB first - E00700000681AE92
BCC characters	F8 07	LRC and ~LRC

Response Packet: (**01 16 00 10 00 2B 0F 92 AE 81 06 00 00 07 E0 00 30 3F 03 88 FB 04**)

Field	Contents	Summary
SOF	01	Start of Frame
Packet Length	16 00	Packet Length 22 bytes
Device ID	10	Terminal is S6400
Command 1	00	Response Packet Flag - Successful
Command 2	2B	Read Tag Information Request
Data Flag	0F	
UID value	92 AE 81 06 00 00 07 E0	UID – LSB first - E00700000681AE92
DSFID value	00	DSFID = 00
AFI value	30	AFI = 30
Number of Blocks	3F	64 blocks – (0-63)
Block Size	03	4 bytes each – (0-3)
IC Reference	88	IC Ref. = 88
BCC characters	FB 04	LRC and ~LRC

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

The address of the first block to check is required along with the number of blocks to check. The response packet shall return a **00** h for each of these blocks that are unlocked and a **01** h for each of these blocks that are locked.

Example 46. Read the Security Status form Information from the blocks "0" – "7" from a 15693 transponder, reader un-addressed.

For this example, block "2" will be locked and the rest will be unlocked.

Request Packet: (**01 0A 00 10 83 2C 00 07 B3 4C**)

Field	Contents	Summary
SOF	01	Start of Frame
Packet Length	0A 00	Packet Length 10 bytes
Device ID	10	Terminal is S6400
Command 1	83	Request Command Flag – Request Packet Downlink Pulse – ¼ Fast Read
Command 2	2C	Read Security Status Request
First Block	00	Block 0 start block
Number of Blocks	07	Read 7 blocks
BCC characters	B3 4C	LRC and ~LRC

Response Packet: (**01 12 00 10 00 2C 00 00 07 00 00 01 00 00 00 00 29 D6**)

Field	Contents	Summary
SOF	01	Start of Frame
Packet Length	12 00	Packet Length 18 bytes
Device ID	10	Terminal is S6400
Command 1	00	Response Packet Flag - Successful
Command 2	2C	Read Security Status Request
Reserved	00	Always 00
First Block	00	Block 0 start block
Number of Blocks	07	Read 7 blocks
Block 0 Status	00	Block 0 is unlocked
Block 1 Status	00	Block 1 is unlocked
Block 2 Status	01	Block 2 is locked
Block 3 Status	00	Block 3 is unlocked
Block 4 Status	00	Block 4 is unlocked
Block 5 Status	00	Block 5 is unlocked
Block 6 Status	00	Block 6 is unlocked
Block 7 Status	00	Block 7 is unlocked
BCC characters	29 D6	LRC and ~LRC

Example 47. Read the Security Status of blocks "5" – "7" from a specific 15693 transponder, reader un-addressed.

Reader Security Status from the 15693 transponder with UID "E00700000681AE92." For this example, block "5" will be locked and the rest will be unlocked.

Request Packet: (**01 12 00 10 93 2C 92 AE 81 06 00 00 07 E0 05 03 E6 19**)

Field	Contents	Summary
SOF	01	Start of Frame
Packet Length	12 00	Packet Length 18 bytes
Device ID	10	Terminal is S6400
Command 1	93	Request Command Flag – Request Packet UID Addressed Downlink Pulse – ¼ Fast Read
Command 2	2C	Read Security Status Request
UID value	92 AE 81 06 00 00 07 E0	UID E00700000681AE92 LSB first
First Block	05	Block 5 start block
Number of Blocks	03	Read 3 blocks
BCC characters	E6 19	LRC and ~LRC

Response Packet: (**01 0E 00 10 00 2C 00 05 03 01 00 00 34 CB**)

Field	Contents	Summary
SOF	01	Start of Frame
Packet Length	0E 00	Packet Length
Device ID	10	Terminal is S6400
Command 1	00	Response Packet Flag - Successful
Command 2	2C	Read Security Status Request
Reserved	00	Always 00
First Block	05	Block 5 start block
Number of Blocks	03	Read 3 blocks
Block 5 Status	01	Block 5 is locked
Block 6 Status	00	Block 6 is unlocked
Block 7 Status	00	Block 7 is unlocked
BCC characters	34 CB	LRC and ~LRC

Example 48. Read the Security Status form Information from the blocks "5" – "7" from a specific 15693 transponder, reader addressed.

Read Security Status from the 15693 transponder with UID "E00700000681AE92" using reader with Serial Number "5175030." For this example, block "5" will be locked and the rest will be unlocked.

Request Packet: (**01 1A 00 10 B3 2C 35 31 37 35 30 33 30 00 92 AE 81 06 00 00 07 E0 05 03 FB 04**)

Field	Contents	Summary
SOF	01	Start of Frame
Packet Length	1A 00	Packet Length 26 bytes
Device ID	10	Terminal is S6400
Command 1	B3	Request Command Flag – Request Packet Reader Serial Number Addressed UID Addressed Downlink Pulse – ¼ Fast Read
Command 2	2C	Read Security Status Request
Reader number	35 31 37 35 30 33 30 00	Reader # LSB first - 5175030
UID value	92 AE 81 06 00 00 07 E0	UID E00700000681AE92 LSB first
First Block	05	Block 5 start block
Number of Blocks	03	Read 3 blocks
BCC characters	FB 04	LRC and ~LRC

Response Packet: (**01 0E 00 10 00 2C 00 05 03 01 00 00 34 CB**)

Field	Contents	Summary
SOF	01	Start of Frame
Packet Length	0E 00	Packet Length
Device ID	10	Terminal is S6400
Command 1	00	Response Packet Flag - Successful
Command 2	2C	Read Security Status Request
Reserved	00	Always 00
First Block	05	Block 5 start block
Number of Blocks	07	Read 3 blocks
Block 5 Status	01	Block 5 is locked
Block 6 Status	00	Block 6 is unlocked
Block 7 Status	00	Block 7 is unlocked
BCC characters	34 CB	LRC and ~LRC

3.3.3.11 Inventory Command (01h):

The Inventory command returns the eight-byte UID for every 15693 transponder in the reader's field. The UID values are returned least significant byte first.

The Inventory request searches for 15693 transponders by their Application Family Identifier (AFI) value. The terminal only returns the UID values of 15693 transponders with AFI values that match the AFI value entered in the request packet. An AFI value of **00** h will return the 15693 UID for any AFI value.

Example 49. Inventory Request with the multiple transponders in the field, reader un-addressed.

Inventory request with the following 15693 transponders present the readers read field: UID - "E00700000681AE92"; UID - "E007000001645C67"; and UID - "E007000001645EEB."

Request Packet: (**01 09 00 10 83 01 00 9A 65**)

Field	Contents	Summary
SOF	01	Start of Frame
Packet Length	09 00	Packet Length 9 bytes
Device ID	10	Terminal is S6400
Command 1	83	Request Command Flag – Request Packet Downlink Pulse – ¼ Fast Read
Command 2	01	Inventory Request
AFI	00	AFI – search for any AFI value
BCC characters	9A 65	LRC and ~LRC

Response Packet: (**01 22 00 10 00 01 00 03 92 AE 81 06 00 00 07 E0 67 5C 64 01 00 00 07 E0 EB 5E 64 01 00 00 07 E0 E3 1C**)

Field	Contents	Summary
SOF	01	Start of Frame
Packet Length	22 00	Packet Length 34 bytes
Device ID	10	Terminal is S6400
Command 1	00	Response Packet Flag - Successful
Command 2	01	Inventory Request
Status byte	00	Successful
Number of Tags	03	3 15693 Tags read
UID #1	92 AE 81 06 00 00 07 E0	UID #1 – LSB first - E00700000681AE92
UID #2	67 5C 64 01 00 00 07 E0	UID #2 – LSB first - E007000001645C67
UID #3	EB 5E 64 01 00 00 07 E0	UID #3 – LSB first - E007000001645EEB
BCC characters	E3 1C	LRC and ~LRC

Example 50. Additional Examples - Inventory (unaddressed).

```
(UIDs E00700000681AE92, E007000001645C67 & E007000001645EEB):
Host Request    -> 01 09 00 10 83 01 00 9A 65
Reader Response -> 01 22 00 10 00 01 00 03 92 AE 81 06 00 00 07 E0 67 5C 64 01 00
00 07 E0 EB 5E 64 01 00 00 07 E0 E3 1C
Reader Response -> 01 0A 00 10 00 01 00 00 1A E5 (No Transponders Found)
```

Example 51. Inventory Request with multiple transponders in the field, reader addressed.

Inventory Request with the following 15693 transponders present the readers read field: UID - "E00700000681AE92"; UID - "E007000001645C67"; and UID - "E007000001645EEB." This request is directed to the reader with Serial Number "5175030."

Request Packet: (**01 11 00 10 A3 01 35 31 37 35 30 33 30 00 00 5F A0**)

Field	Contents	Summary
SOF	01	Start of Frame
Packet Length	11 00	Packet Length 17 bytes
Device ID	10	Terminal is S6400
Command 1	A3	Request Command Flag – Request Packet Reader Addressed Downlink Pulse – ¼ Fast Read
Command 2	01	Inventory Request
Reader number	35 31 37 35 30 33 30 00	Reader # LSB first - 5175030
AFI	00	AFI – search for any AFI value
BCC characters	5F A0	LRC and ~LRC

Response Packet: (**01 22 00 10 00 01 00 03 92 AE 81 06 00 00 07 E0 67 5C 64 01 00 00 07 E0 EB 5E 64 01 00 00 07 E0 E3 1C**)

Field	Contents	Summary
SOF	01	Start of Frame
Packet Length	22 00	Packet Length 34 bytes
Device ID	10	Terminal is S6400
Command 1	00	Response Packet Flag - Successful
Command 2	01	Inventory Request
Status byte	00	Successful
Number of Tags	03	3 15693 Tags read
UID #1	92 AE 81 06 00 00 07 E0	UID #1 – LSB first - E00700000681AE92
UID #2	67 5C 64 01 00 00 07 E0	UID #2 – LSB first - E007000001645C67
UID #3	EB 5E 64 01 00 00 07 E0	UID #3 – LSB first - E007000001645EEB
BCC characters	E3 1C	LRC and ~LRC

3.4 ISO 14443A Commands

3.4.1 View UID (40h):

This request reads the eight-byte UID value from a 14443-A transponder. The eight-byte UID is returned least significant byte first. Anti-collision is not supported. The reader is addressable by the serial number to view a 14443-A transponder UID.

Example 52. View 14443-A UID Request.

View 14443-A UID request is issued while the following 14443-A transponder is present within the readers read field - "71AE2865."

Request Packet: (**01 09 00 10 80 40 00 D8 27**)

Field	Contents	Summary
SOF	01	Start of Frame
Packet Length	09 00	Packet Length 9 bytes
Device ID	10	Terminal is S6400
Command 1	80	Request Command Flag – Request Packet
Command 2	40	View 14443-A UID Request
Reserved	00	Reserved
BCC characters	D8 27	LRC and ~LRC

Response Packet: (**01 0D 00 10 00 40 00 65 28 AE 71 CE 31**)

Field	Contents	Summary
SOF	01	Start of Frame
Packet Length	0D 00	Packet Length 14 bytes
Device ID	10	Terminal is S6400
Command 1	00	Response Packet Flag - Successful
Command 2	40	View 14443-A UID Request
Status byte	00	Successful
UID value	65 28 AE 71	UID – LSB first - 71AE2865
BCC characters	CE 31	LRC and ~LRC

Response Packet Byte

Each Response Packet contains a Response Packet Byte that resides in the Command 2 field of the response packet. This byte reflects whether the request command has been successful or not. No bits set, 00 h, indicates a command was successful. Bit 0 ON and Bit 1 OFF suggest an error from the transponder. Refer to the Transponder Error Table to determine the exact error. When Bit 1 is ON and Bit 0 is OFF, the error is related to the Reader. Refer to the Reader Error Table to determine the error.

Bit 1	Bit 0	Definition
0	0	No Error
0	1	Error From Transponder
1	0	Error From Reader
1	1	Reserved

3.5 Reader Commands

3.5.1 Reader Command Codes

Reader Commands	Codes
Reader Version	E0h
Reader Reset	E5h
Reader Setup	E7h
Reader Information	EBh
Set Custom Key	ECh
Reader Mode	EDh
Active LED	EEh
Active Audio	EFh

3.5.2 Reader Command Examples

3.5.2.1 Reader Version Command (E0h):

This function returns the firmware version for the reader.

The response packet will return the following:

Reader Firmware version – (2 bytes) – LSB first – Stored in hex format.

Reserved – (1 byte) – Always 0x07- Stored in hex format

Product ID – (1 byte) – 02 = 13.56 MHz – Stored in Hex format

Reader Serial # - (7 bytes) – stored in ASCII format

Example 53. Generic get version command, reader un-addressed.

Request Packet: (**01 08 00 10 80 E0 79 86**)

Field	Contents	Summary
SOF	01	Start of Frame
Packet Length	08 00	Packet Length 8 bytes
Device ID	10	Terminal is S6400
Command 1	80	Request Command Flag – Request Packet
Command 2	E0	Reader Version Request
BCC characters	79 86	LRC and ~LRC

Response Packet: (**01 14 00 10 00 E0 01 02 07 02 35 31 37 34 39 39 37 00 D3 2C**)

Field	Contents	Summary
SOF	01	Start of Frame
Packet Length	14 00	Packet Length 20 bytes
Device ID	10	Terminal is S6400
Command 1	00	Response Packet Flag - Successful
Command 2	E0	Reader Version Request
Reader Version	01	Reader Version (LSB) - 01
Reader Version	02	Reader Version (MSB) - 2
Reserved	07	
Product ID	02	Reader 13.56 MHz
Reader Serial #	35 31 37 34 39 39 37	Reader Serial # 5174997
	00	Null
BCC characters	D3 2C	LRC and ~LRC

Example 54. Get version command, reader addressed.

Get version command addressed to reader with serial number “5175030.”

Request Packet: (**01 10 00 10 A0 E0 35 31 37 35 30 33 30 00 74 8B**)

Field	Contents	Summary
SOF	01	Start of Frame
Packet Length	10 00	Packet Length 16 bytes
Device ID	10	Terminal is S6400
Command 1	A0	Request Command Flag – Request Packet, Specific Reader addressed
Command 2	E0	Reader Version Request
Reader Serial #	35 31 37 35 30 33 30 00	Reader Serial Number - 05175030
BCC characters	74 8B	LRC and ~LRC

Response Packet: (**01 14 00 10 00 E0 20 01 07 02 35 31 37 35 30 33 30 00 F4 0B**)

Field	Contents	Summary
SOF	01	Start of Frame
Packet Length	14 00	Packet Length 20 bytes
Device ID	10	Terminal is S6400
Command 1	00	Response Packet Flag - Successful
Command 2	E0	Reader Version Request
Reader Version	20	Reader Version (LSB) - 32
Reader Version	01	Reader Version (MSB) - 1
Reserved	07	
Product ID	02	Reader 13.56 MHz
Reader Serial #	35 31 37 35 30 33 30	Reader Serial # 5175030
	00	Null
BCC characters	F4 0B	LRC and ~LRC

3.5.2.2 Reader Reset Command (E5h):

Example 55. Generic Reader Reset Request.

The reader resets regardless of the Reader Serial Number.

Request Packet: (**01 08 00 10 80 E5 7C 83**)

Field	Contents	Summary
SOF	01	Start of Frame
Packet Length	08 00	Packet Length 8 bytes
Device ID	10	Terminal is S6400
Command 1	80	Request Command Flag – Request Packet
Command 2	E5	Reader Reset Request
BCC characters	7C 83	LRC and ~LRC

Response Packet: (**01 08 00 10 00 E5 FC 03**)

Field	Contents	Summary
SOF	01	Start of Frame
Packet Length	8 00	Packet Length 8 bytes
Device ID	10	Terminal is S6400
Command 1	00	Response Packet Flag - Successful
Command 2	E5	Reader Reset Request
BCC characters	FC 03	LRC and ~LRC

Example 56. A Reader Reset Request to a specific reader.

For this example the Reader Serial number “5175030” is used.

Request Packet: (**01 10 00 10 A0 E5 35 31 37 35 30 33 30 00 71 8E**)

Field	Contents	Summary
SOF	01	Start of Frame
Packet Length	10 00	Packet Length 16 bytes
Device ID	10	Terminal is S6400
Command 1	A0	Request Command Flag – Request Packet, Specific Reader addressed
Command 2	E5	Reader Reset Request
Reader Serial #	35 31 37 35 30 33 30	Reader Serial # 5175030
	00	Null
BCC characters	71 8E	LRC and ~LRC

Response Packet: (**01 08 00 10 00 E5 FC 03**)

Field	Contents	Summary
SOF	01	Start of Frame
Packet Length	08 00	Packet Length 8 bytes
Device ID	10	Terminal is S6400
Command 1	00	Response Packet Flag - Successful
Command 2	E5	Reader Reset Request
BCC characters	FC 03	LRC and ~LRC

3.5.2.3 Reader Set-up Command (E7h):

This command can be used to return the current reader set up. This function will return 5 status bytes. The bits of these five bytes will reflect the set up of the reader being polled. The bytes represent the following:

Mode byte 1	Mode byte 2	Baud Rate byte	Wiegand / AFI byte	Encrypt Mode byte

Note:

Bit 5 must be set to **1** in the Request Command Flag and the 7-digit serial number must be passed in to set up a specific reader.

Mode Byte 1

Bit	Definition
6	Wiegand UID Mode
7	Wiegand Encrypted Data

Note:

This byte is tied to the Mode 2 byte Wiegand options.

Mode Byte 2

Bit	Definition
0	RF On
2	LED w/successful command
3	Audio w/successful command
4	Wiegand ISO 14443A Read
5	Weigand ISO 15693 Read
6	Weigand Tag-it Read

Weigand Application Family Identifier

Byte	Definition
0X	All Families
1X	Transport
2X	Financial
3X	ID / Access Control
4X	Telecommunications
5X	Medical
6X	Multimedia
7X	Gaming
8X	Data Storage
9X	Item Management
AX	Express Parcels
BX	Postal Services
CX	Airline Bags

Note:

The least significant nibble of this byte represents the AFI Sub category.

Baud Rate Byte

Byte	Definition
00	9600 bps
01	19200 bps
02	**38400 bps (default)**

Encryption Mode

Bit	Definition
0	Use Custom Key
1	Plain Text/No Encrypt

Note:

Default Master Key used for DES encryption when Encrypt Mode byte set to **00**h.

Example 57. Generic Reader Set Up Request.

The reader returns the current set up regardless of the Reader Serial Number.

Request Packet: (**01 08 00 10 80 E7 7E 81**)

Field	Contents	Summary
SOF	01	Start of Frame
Packet Length	08 00	Packet Length 8 bytes
Device ID	10	Terminal is S6400
Command 1	80	Request Command Flag – Request Packet
Command 2	E7	Reader Reset Request
BCC characters	7E 81	LRC and ~LRC

Response Packet: (**01 0D 00 10 00 E7 00 29 02 00 00 D0 2F**)

Field	Contents	Summary
SOF	01	Start of Frame
Packet Length	0D 00	Packet Length 14 bytes
Device ID	10	Terminal is S6400
Command 1	00	Response Packet Flag - Successful
Command 2	E7	Reader Set Up Request
Mode 1	00	
Mode 2	29	LED with successful command Audio with successful command Weigand ISO 15693 Read
Baud Rate	02	38400 baud
Wiegand AFI	00	No AFI set
Encryption Mode	00	Default Master Key Encryption
BCC characters	D0 2F	LRC and ~LRC

Example 58. Reader Set Up Request to a specific reader.

The reader returns the current set up only when the Reader Serial Number matches that passed to it. In this example the reader serial number is “5175030.”

Request Packet: (**01 10 00 10 A0 E7 35 31 37 35 30 33 30 00 73 8C**)

Field	Contents	Summary
SOF	01	Start of Frame
Packet Length	10 00	Packet Length 16 bytes
Device ID	10	Terminal is S6400
Command 1	A0	Request Command Flag – Request Packet Specific Reader addressed
Command 2	E7	Reader Reset Request
Reader Serial #	35 31 37 35 30 33 30	Reader Serial # 5175030
BCC characters	73 8C	LRC and ~LRC

Response Packet: (**01 0D 00 10 00 E7 00 29 02 00 00 D0 2F**)

Field	Contents	Summary
SOF	01	Start of Frame
Packet Length	0D 00	Packet Length 14 bytes
Device ID	10	Terminal is S6400
Command 1	00	Response Packet Flag - Successful
Command 2	E7	Reader Set Up Request
Mode 1	00	
Mode 2	29	LED with successful command Audio with successful command Weigand ISO 15693 Read
Baud Rate	02	38400 baud
Wiegand AFI	00	No AFI set
Encryption Mode	00	Default Master Key Encryption
BCC characters	D0 2F	LRC and ~LRC

3.5.2.4 Get Reader Information Command (EBh):

Request Reader Information

SOF	Length	Device ID	CMD Flags	CMD	LRC
01h 1 Byte	08h 2 Bytes	10h 1 Byte	 1 Byte	EBh 1 Byte	 2 Bytes

No examples available.

Request Reader Information with Reader Addressed

SOF	Length	Device ID	CMD Flags	CMD	Address	LRC
01h 1 Byte	10h 2 Bytes	10h 1 Byte	xxh 1 Byte	EBh 1 Byte	Reader 8 Bytes	 2 Bytes

No examples available

Reader Information Response

SOF	Length	Device ID	Resp. Flags	CMD	Serial #	Life (hrs)	Version	LRC
01h 1 Byte	14h 2 Bytes	10h 1 Byte	00h 1 Byte	EBh 1 Byte	 7+1 Bytes	 2 Bytes	 2 Bytes	 2 Bytes

3.5.2.5 Set Custom DES Key (ECh):

Blocks 1 through 4 are written to the transponder in an encrypted format. The data in blocks 1-4 are XORed with the 32 least significant bits of the transponder UID. This modified data is then encrypted using a single DES algorithm and an encryption key. The custom DES key must be 8 bytes. This custom value can then be used to encrypt / decrypt the data in blocks 1 through 4.

The byte order is swapped for the custom encryption key. Byte sent in the packet, as the most significant byte is treated as the least significant byte in the DES computation and vice versa.

Example 59. Request to set a custom DES encryption/decryption key.

For this example the custom DES key shall be antered as "1122334455667788." The algorithm reverses the byte order, so the custom encryption key used to encrypt the data will actually be "8877665544332211."

Request Packet: (**01 11 00 10 80 EC 01 11 22 33 44 55 66 77 88 E5 1A**)

Field	Contents	Summary
SOF	01	Start of Frame
Packet Length	11 00	Packet Length 17 bytes
Device ID	10	Terminal is S6400
Command 1	80	Request Command Flag – Request Packet
Command 2	EC	Set Custom DES Key Request
DES Key	11 22 33 44 55 66 77 88	Custom DES Encryption Key
BCC characters	E5 1A	LRC and ~LRC

Response Packet: (**01 09 00 10 00 EC 00 F4 0B**)

Field	Contents	Summary
SOF	01	Start of Frame
Packet Length	09 00	Packet Length 9 bytes
Device ID	10	Terminal is S6400
Command 1	00	Response Packet Flag - Successful
Command 2	EC	Reader Reset Request
Error Code	00	Error None - Successful
BCC characters	F4 0B	LRC and ~LRC

3.5.2.6 Reader Mode (EDh):

The reader has multiple modes of operation. The Set Reader Mode Request provides the means to change the configuration of the reader. This packet allows control of things such as the RS-232/RS-485 communications, Wiegand tag data, ISO badge format, audio transducer, and LEDs.
The request packet may include the following three bytes to set up the reader:

Mode byte 1	Mode byte 2	Wiegand/ AFI byte

The Mode 2 byte is only required when the Mode 1 byte contains certain values. The Wiegand/AFI byte is also optional and is dependant upon the Mode 1 value. The Wiegand Modes and UID do not apply to the RF transmitter or the LED control, and the first Mode 2 table will not apply in those cases. A second Mode 2 table shows the Mode 2 values that apply when Mode 1 is controlling the LED/Audio options.

Mode 1 Definition

Value	Definition
03	Turn On RF Transmitter
04	Turn Off RF Transmitter
07	Set LED and Audio Options
09	Wiegand Read ISO 14443A Tags
0A	Wiegand Read ISO 15693 Tags
0B	Wiegand Read Tag-it Tags
0C	Wiegand Off
0E	Set Baud Rate 9600 bps
0F	Set Baud Rate 19200 bps
10	Set Baud Rate 38400 bps

Mode 2 Wiegand Modes (Mode 1 = 0A)

Byte	Definition
00	Report ISO 15693 UID 26 bits
01	Report Encrypted Weigand
02	Report ISO 14443A & 15693 UID 32 bits
03	Report ISO 15693 UID 36 bits
04	Report ISO 15693 UID 64 bits

Note:
These values only apply to Mode 1 Wiegand settings.
The AFI byte will be valid when these values used.
An AFI value of 00 – includes report all tags.

Mode 2 LED & Audio (Mode 1 = 07)

Bit	Definition
2	LED On w/successful command
3	Audio On w/successful command

These settings only apply when Mode 1 set to LED/Audio.

The following examples demonstrate various reader set up options. Note that the reader response packet contains the Command 2 value for the Reader Set Up command, not the Set Reader Mode. This reflects the Reader Set up after the Set Reader Mode request has been processed. Refer to the Reader Set Up section for detailed response packet information.

Example 60. Set the reader into the ISO 15693 Card Mode, no AFI selected, reader un-addressed.

No AFI is selected, so the reader will return any 15693 cards it reads, regardless of the AFI value. No particular reader has been addressed in this request.

Request Packet: (**01 0B 00 10 80 ED 0A 01 00 7C 83**)

Field	Contents	Summary
SOF	01	Start of Frame
Packet Length	0B 00	Packet Length 11 bytes
Device ID	10	Terminal is S6400
Command 1	80	Request Command Flag – Request Packet
Command 2	ED	Set Reader Mode Request
Mode 1	0A	Wiegand Read ISO 15693 Tags
Mode 2	01	Report Encrypted Weigand
Wiegand AFI	00	No AFI selected -support all AFI values
BCC characters	7C 83	LRC and ~LRC

Response Packet: (**01 0D 00 10 00 E7 80 24 02 00 00 5D A2**)

Field	Contents	Summary
SOF	01	Start of Frame
Packet Length	0D 00	Packet Length 14 bytes
Device ID	10	Terminal is S6400
Command 1	00	Response Packet Flag - Successful
Command 2	E7	Reader Set Up Request
Mode 1	80	
Mode 2	24	LED with successful command Weigand ISO 15693 Read
Baud Rate	02	38400 baud
Wiegand AFI	00	No AFI set
Encryption Mode	00	Default Master Key Encryption
BCC characters	5D A2	LRC and ~LRC

Example 61. Set the reader into the ISO 15693 UID 36-Bit Mode with an AFI of "30", reader un-addressed.

The AFI "30" is selected so that the reader will return only 15693 cards it reads with an AFI value of "**30**." No particular reader has been addressed in this request.

Request Packet: (**01 0B 00 10 80 ED 0A 03 30 4E B1**)

Field	Contents	Summary
SOF	01	Start of Frame
Packet Length	0B 00	Packet Length 11 bytes
Device ID	10	Terminal is S6400
Command 1	80	Request Command Flag – Request Packet
Command 2	ED	Set Reader Mode Request
Mode 1	0A	Wiegand Read ISO 15693 Tags
Mode 2	03	Report ISO 15693 UID 36 bits
Wiegand AFI	30	AFI **30** selected -support only AFI 30 values
BCC characters	4E B1	LRC and ~LRC

Response Packet: (**01 0D 00 10 00 E7 40 24 02 30 00 AD 52**)

Field	Contents	Summary
SOF	01	Start of Frame
Packet Length	0D 00	Packet Length 14 bytes
Device ID	10	Terminal is S6400
Command 1	00	Response Packet Flag - Successful
Command 2	E7	Reader Set Up Request
Mode 1	40	
Mode 2	24	LED with successful command Weigand ISO 15693 Read
Baud Rate	02	38400 baud
Wiegand AFI	30	AFI 30 set
Encryption Mode	00	Default Master Key Encryption
BCC characters	AD 52	LRC and ~LRC

Example 62. Set the reader communications rate.

The baud rate will be set to “9600” for this example.

Note:

the reader does not send a response packet when setting the readers baud rate.

Note:

The S6400 DLL program issues a Reader Set Up Request after setting the baud rate to verify the new baud rate.

Request Packet: (**01 0A 00 10 80 ED 0E 00 78 87**)

Field	Contents	Summary
SOF	01	Start of Frame
Packet Length	0A 00	Packet Length 10 bytes
Device ID	10	Terminal is S6400
Command 1	80	Request Command Flag – Request Packet
Command 2	ED	Set Reader Mode Request
Mode 1	0E	Set Baud Rate 19200 bps
	00	Purpose Unknown
BCC characters	78 87	LRC and ~LRC

Example 63. Set the reader LED/Audio mode.

The LED and Audio will be turned ON in this example, causing the LED to flash Green and an audio burst to sound following the successful execution of a command.

Request Packet: (**01 0A 00 10 80 ED 07 0C 7D 82**)

Field	Contents	Summary
SOF	01	Start of Frame
Packet Length	0A 00	Packet Length 10 bytes
Device ID	10	Terminal is S6400
Command 1	80	Request Command Flag – Request Packet
Command 2	ED	Set Reader Mode Request
Mode 1	07	Set LED and Audio Options
Mode 2	0C	LED ON, Audio ON
BCC characters	7D 82	LRC and ~LRC

Response Packet: (**01 0D 00 10 00 E7 40 2C 00 30 00 A7 58**)

Field	Contents	Summary
SOF	01	Start of Frame
Packet Length	0D 00	Packet Length 14 bytes
Device ID	10	Terminal is S6400
Command 1	00	Response Packet Flag - Successful
Command 2	E7	Reader Set Up Request
Mode 1	40	
Mode 2	2C	LED & Audio with successful command Weigand ISO 15693 Read
Baud Rate	00	9600 baud
Wiegand AFI	30	AFI 30 set
Encryption Mode	00	Default Master Key Encryption
BCC characters	A7 58	LRC and ~LRC

Additional Examples follow.

Example 64. Set Reader Mode to `Self Run Card Format with AFI 30:`

```
Host Request    -> 01 0B 00 10 80 ED 0A 01 30 4C B3
Reader Response -> 01 0D 00 10 00 E7 80 2C 02 30 00 65 9A
```

Example 65. Set Reader Mode to `Self Run Card Format with AFI 00:`

```
Host Request    -> 01 0B 00 10 80 ED 0A 01 00 7C 83
Reader Response -> 01 0D 00 10 00 E7 80 2C 02 00 00 55 AA
```

Example 66. Set Reader Mode to `Self Run 26 bit UID with AFI 30:`

```
Host Request    -> 01 0B 00 10 80 ED 0A 00 30 4D B2
Reader Response -> 01 0D 00 10 00 E7 40 29 02 30 00 A0 5F
```

Example 67. Set Reader Mode to Self Run 26 bit UID with AFI 30 with Reader serial number "5175030" addressed:

```
Host Request    -> 01 13 00 10 A0 ED 35 31 37 35 30 33 30 00 0A 00 30 40 BF
```

```
Reader Response -> 01 0D 00 10 00 E7 40 2C 02 30 00 A5 5A
```

Example 68. Set Reader Mode to Self Run 32 bit UID with AFI 30:

```
Host Request    -> 01 0B 00 10 80 ED 0A 02 30 4F B0
Reader Response -> 01 0D 00 10 00 E7 40 29 02 30 00 A0 5F
```

Example 69. Set Reader Mode to Self Run 36 bit UID with AFI 30:

```
Host Request    -> 01 0B 00 10 80 ED 0A 03 30 4E B1
Reader Response -> 01 0D 00 10 00 E7 40 29 02 30 00 A0 5F
```

Example 70. Set Reader Mode to Self Run 64 bit UID with AFI 30:

```
Host Request    -> 01 0B 00 10 80 ED 0A 04 30 49 B6
Reader Response -> 01 0D 00 10 00 E7 40 29 02 30 00 A0 5F
```

Example 71. Set Reader Mode to Wiegand Off:

```
Host Request    -> 01 0B 00 10 80 ED 0C 00 00 7B 84
Reader Response -> 01 0D 00 10 00 E7 00 09 02 30 00 C0 3F
```

Example 72. Set Reader Mode to LED Off & Audio On with Reader serial number "5175030" addressed):

```
Host Request    -> 01 12 00 10 A0 ED 35 31 37 35 30 33 30 00 07 08 74 8B
Reader Response -> 01 0D 00 10 00 E7 00 29 02 30 00 E0 1F
```

Example 73. Set Reader Mode to LED On & Audio Off with Reader serial number "5175030" addressed):

```
Host Request    -> 01 12 00 10 A0 ED 35 31 37 35 30 33 30 00 07 04 78 87
Reader Response -> 01 0D 00 10 00 E7 00 25 02 30 00 EC 13
```

Reader Setup / Mode Response

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

*** - Mode Byte 1:**

Bit	Definition
6	Wiegand UID Mode
7	Wiegand Card Encrypted Data

**** - Mode Byte 2:**

Bit	Definition
2	LED w/successful cmd.
3	Audio w/successful cmd

4	Wiegand Read ISO 14443A Read
5	Wiegand Read ISO 15693 Read

Encryption Mode:

Bit	Definition
0	Use Custom Key

Baud Rate: 0 = 9600bps, 1 = 19200bps, **2 = 38400bps (default)**
No response is given when the baud rate is the only change. Command Response E7 was used instead of ED to avoid duplication and decrease code space.

Example 74. Reader Setup / Mode Response.

```
(Setting to 38400):
Host Request     -> 01 0A 00 10 80 ED 10 00 66 99
Host Request     -> 01 08 00 10 80 E7 7E 81
```

3.5.2.7 Activate LED (EEh):

The reader has three distinct color modes. The color mode as well as the duration of illuminatrion can be selected using the following three input parameter bytes:

Input Parameter byte 1:
This parameter is reserved for future functionality. The value is always be 00.

Input Parameter byte 2:
This parameter represents the color of the LED. The color is referred to as Amber when both the Red and Green LEDs are illuminated.

01 - RED
02 - GREEN
03 - AMBER

Input Parameter byte 3:
This parameter is the duration the LED(s) are to be illuminated. This parameter shall represent the number of 5 millisecond intervals.

Example 75. Turn on the RED LED for 100 milliseconds.

Request Packet: (**01 0C 00 10 80 EE 00 01 14 00 66 99**)

Field	Contents	Summary
SOF	01	Start of Frame
Packet Length	0C 00	Packet Length 12 bytes
Device ID	10	Terminal is S6400
Command 1	80	Request Command Flag – Request Packet
Command 2	EE	Activate LED Request
Reserved	00	Reserved
Color	01	Red LED ON
Duration	14	100 milliseconds (20 - 5 millisecond)
BCC characters	66 99	LRC and ~LRC

Response Packet: (01 09 00 10 00 EE 00 F6 09)

Field	Contents	Summary
SOF	01	Start of Frame
Packet Length	09 00	Packet Length 9 bytes
Device ID	10	Terminal is S6400
Command 1	00	Response Packet Flag - Successful
Command 2	EE	Activate LED Request
	00	Success
BCC characters	F6 09	LRC and ~LRC

3.5.2.8 Active Audio (EFh):

The reader accepts a request packet that allows control of the Audio Beep duration. As with the LEDs, this is settable in 5 millisecond intervals.

Example 76. Set the audio duration to 100 milliseconds.

Request Packet: (**01 0B 00 10 80 EF 00 14 00 61 9E**)

Field	Contents	Summary
SOF	01	Start of Frame
Packet Length	0B 00	Packet Length 11 bytes
Device ID	10	Terminal is S6400
Command 1	80	Request Command Flag – Request Packet
Command 2	EF	Activate Audio Request
Reserved	00	Reserved
Duration	14	100 milliseconds (20 - 5 millisecond)
BCC characters	61 9E	LRC and ~LRC

Response Packet: (**01 09 00 10 00 EF 00 F7 08**)

Field	Contents	Summary
SOF	01	Start of Frame
Packet Length	09 00	Packet Length 9 bytes
Device ID	10	Terminal is S6400
Command 1	00	Response Packet Flag - Successful
Command 2	EF	Activate Audio Request
	00	Success
BCC characters	F7 08	LRC and ~LRC

3.5.3 Error Codes

The protocol flags the source of the error. Flag bytes are:

Bit 1	Bit 0	Definition
0	0	No Error
0	1	Error From Tag
1	0	Error From Reader
1	1	Reserved

Example 77. Lock command with No error.

```
Reader Response -> 01 09 00 10 00 28 00 30 CF
```

3.5.3.1 Error Codes from the Transponder

These error codes apply when the response packet has Bit 1 OFF and Bit 0 ON.
This indicates that the error is with the Transponder.

Byte	Description
01	Command not supported
02	Command not recognized
03	Command option not supported
06	Tag CRC
0F	Error with no information given or a specific error code is not supported
10	Specified block not available (does not exist)
11	Specified block already locked, cannot be locked again
12	Specified block locked, contents cannot be changed
13	Specified block was not successfully programmed
14	Specified block was not successfully locked
A0-DF	Custom command error codes

Example 78. Transponder Error Codes.

Reader Response -> 01 09 00 10 02 20 06 3C C3 (Read Single Block, where 06 shows Tag CRC Error)
Reader Response -> 01 09 00 10 01 21 11 29 D6 (Write Single Block, where 11 shows block already locked)
Reader Response -> 01 09 00 10 01 21 10 28 D7 (Write Single Block, where 10 shows specific block not available

3.5.3.2 Error Codes from the Reader

These error codes will apply when the response packet has Bit 1 ON and Bit 0 OFF.
This indicates that the error is with the Reader.

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

Example 79. Error Codes from Reader.

`Reader Response -> 01 0A 00 10 00 01 00 00 1A E5` `(Inventory mode, Transponder(s) Not Found)`

Chapter 4

Regulatory, Safety, & Warranty

Topic **Page**

4.1 Regulatory Notes

An RFID system comprises an RF transmission device, and is therefore subject to national and international regulations.

TI has obtained approvals for this equipment from approval authorities in a number of countries and is continuing to apply for approvals in further countries. Actual status for a given product can be advised by TI-RFid Sales Offices.

A system containing one or more S6400 readers may be operated only under an experimental license or if the required FCC, PTT or relevant government agency approval has been obtained. Sales, lease or operation in some countries may be subject to prior approval by the government or other organization.

4.1.1 FCC Notices (U.S.A.)

The S6400 reader has been tested and certified to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules.

4.1.2 CE Conformity

A CE Declaration of Conformity is available for this system through customer support. Any device or system incorporating the S6400 reader system, in full or in part, in any other than the originally tested configuration needs to be verified against the European EMC directive. The System Integrator or user of such a system prior to marketing and operating it in European Community must issue a separate Declaration of Conformity.

4.2 Warranty and Liability

The "General Conditions of Sale and Delivery" of Texas Instruments Incorporated or a TI subsidiary apply. Warranty and liability claims for defect products, injuries to persons and property damages are void if they are the result of one or more of the following causes:

- Improper use of the reader.
- Unauthorized disassembly, operation and/or improper maintenance of the reader.
- Operation of the reader modules with defective and/or non-functioning equipment.
- Operation of the reader outside of it’s intended purpose or specified environment.
- Improperly conducted repairs.
- Catastrophes caused by foreign bodies and acts of God.