

**Data Transmission Specifications
Motor Driven Card Reader/Writer
V2BF Series**

Hitachi-Omron Terminal Solutions, Corp.

[Specification History of Modification]

Rev.	Date	Page	Content
A	Jun. 13, 2002	--	
B	Feb.20, 2003	1	The type of V2BF-01JS-AP1 is added to Applicable Card Reader
		4	Correction from "Prohibition on use of FW" to "DL Preparation".
		9	During the download sequence, the time when the DTR signal was turned off was corrected by 3 seconds from 300 ms.
		12-15	Whether or not each command is available is added to the command code lists.
		17-20	The type of detected error is added to the Sorts of Error column in the error code lists.
		101	The PSC Verification command is added to the command parameter of SIEMENS SLE4442.
C	Dec.13, 2007	--	Change the company from OMRON to Hitachi-Omron Terminal Solutions, Corp.
		1	ISO/IEC 7816-3, 7810 and 7811-1 are updated. ISO/IEC 7816-4, 7811-3, 7811-4 and 7811-5 are deleted.
		95,98, 102,103	Supports the ATMEL memory card (AT24C01ASC / AT24C02SC / AT24C16SC / AT24C64SC).
C1	Mar.11.2009	Cover page	Header, footer, corporate logotype change

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1. Introduction

1.1 Introduction

This specification provides the transmission specifications between the V2BF Series Card Reader and the host terminal.

1.2 Applicable Card Reader and CPU / FW

(1) Applicable Card Reader

Module Name	Magnetic write/read				IC card Controller
	ISO Tr 1	ISO Tr 2	ISO Tr 3	JIS 2	
V2BF-01JS	R	R	R	N	Y
V2BF-01S	R	R	R	N	N
V2BF-04JS	N	R	N	N	Y
V2BF-04S	N	R	N	N	N
V2BF-0FJS	R	R	N	R	Y
V2BF-01JS-AP1	R	R	R	N	Y

- *1 R/W : Magnetic reading and writing function
- *2 Y : Provided
- *3 N : No provided

(2) Applicable CPU / FW

	Type	Notes
CPU	HBU-NA092	Not downloadable
FW in Flash memory	HBU-NA128	Downloadable in Flash Memory.

1.3 Normative References

The following standards contain provisions that are referred in this specification.

ISO/IEC 7816-3:2006	Identification cards – Integrated circuit(s) cards with contacts Part 3: Electronic signals and transmission protocols
ISO/IEC 7816-4:2005	Identification cards – Integrated circuit(s) cards with contacts Part 4: Inter-industry commands for interchange
ISO/IEC 7810: 2003-11-1	Identification cards – Physical characteristics
ISO/IEC 7811-1: 2002-09-15	Identification cards – Recording technique Part 1:Embossing
ISO/IEC 7811-2: 2001-02-01	Identification cards – Recording technique Part 2:Magnetic stripe – Low coercivity
ISO/IEC 7811-6: 2001-02-01	Identification cards – Recording technique Part 6:Magnetic stripe – High coercivity
ISO 2111: 1985-02-01	Data communication – Basic mode control procedures -Code independent information transfer
EMV 4.0: December, 2000	EMV2000 Integrated Circuit Card Specification for Payment Systems Book 1 Application Independent ICC to Terminal Interface Requirements
Memory Card	SIEMENS SLE4432/SLE4442 Data Books SIEMENS SLE4418/SLE4428Data Books ATMEL Two-wire Serial EEPROM Smart Card Modules 1K, 2K, 16K, 64K

1.4 Notice for IC card (ICC)

Hitachi-Omron Terminal Solutions, Corp. standard ICC controller and FW (firmware) is not able to execute perfectly all customers ICC(s) because ISO standard and also ICC(s) is modified frequently. Hitachi-Omron Terminal Solutions, Corp. should check your customer's ICC and specification if they are available.

1.5 Definition of Terminology

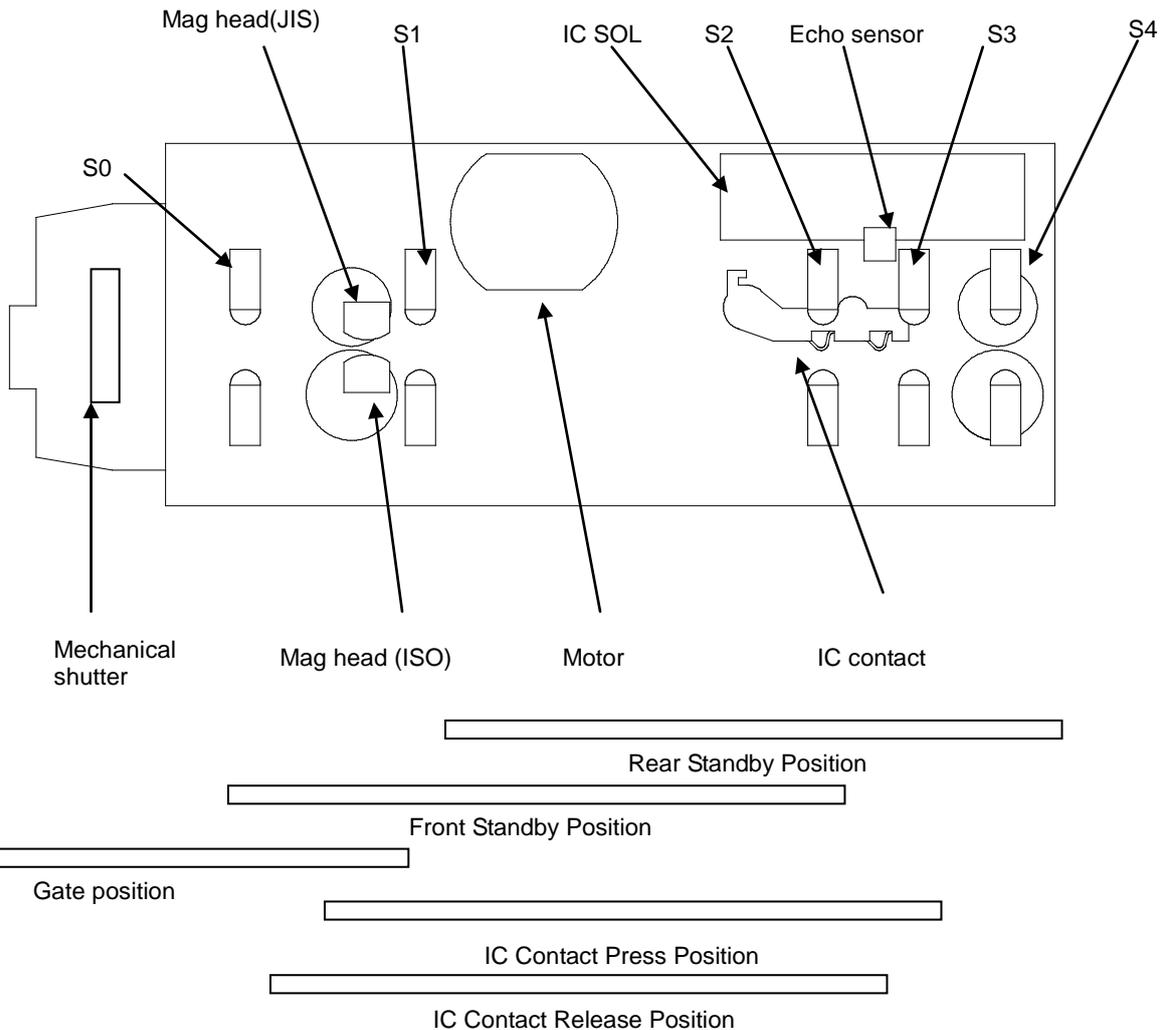
(1) General

C/R	Card Reader / Writer
Default	Value set by the C/R when power is turned on
DL	Program Downloading
FW	Firmware
HOST	HOST Terminal
ICC	Integrated Circuit Card. A card into which one or more integrated circuits are inserted to perform processing and memory functions.
Max.	Maximum
min.	Minimum

(2) Mechanical

Rear Standby Position	Position which the C/R intakes a card from front.
Front Standby Position	Position which the C/R intakes a card from rear.
Gate position	Position which the C/R returns a card to the Gate.
IC Contact Press Position	Position which the C/R can press the IC Contact.
IC Contact Release Position	Position which the C/R releases the IC Contact.

S0: sensor 0	(front)	Echo sensor: IC card contact echo sensor
S1: sensor 1	(second)	
S2: sensor 2	(third)	
S3: sensor 3	(fourth)	
S4: sensor 4	(rear)	



(3) Host Interface

DTR	Data Terminal Ready
CTS	Clear to send

(4) Magnetic Card

SS	Magnetic Data Start Sentinel
ES	Magnetic Data End Sentinel
LRC	Magnetic Data Longitudinal Redundancy Check
VRC	Magnetic Data Vertical Parity

(5) IC Card

APDU	Application Protocol Data Unit
ATR	Answer to Reset
BWI	Block Waiting Time Integer
BWT	Block Waiting Time
CLA	Class Byte of the Command Message
Cold Reset	The reset of the ICC that occurs when the supply voltage (VCC) and other signals to the ICC are raised from the inactive status and the reset (RST) signal is applied.
D	Indicated values of the bit rate adjustment factor
etu	Elementary Time Unit
F	Indicated values of the clock rate conversion factor
IFS	Information Field Size
IFSD	Information field size for the interface device
Lc	Exact Length of Data Sent by Terminal in Response to a Case 3 or 4 Command
Le	Maximum Length of Data Expected by the terminal in Response to a Case 2 or 4 Command
LEN	Length
NAD	Node Address
P1	Parameter 1
P2	Parameter 2
P3	Parameter 3
PCB	Protocol Control Byte
PPS	Protocol and Parameter Selection
SAD	Source Node Address
S-block	Supervisory block
SW1	Status Word One
SW2	Status Word Two
T=0	Character-oriented asynchronous half duplex transmission protocol
T=1	Block-oriented asynchronous half duplex transmission protocol
TCK	Check Character
Warm Reset	The reset that occurs when the reset (RST) signal is applied to the ICC while the clock (CLK) and supply voltage (VCC) lines are maintained in their active status.

(6) Character Code Expression Method

XXH	Shows the HEX Code.
"X"	Shows the ASCII Code.

2. Transmission Specifications

2.1 Basic Transmission Specifications

Item	Content
Electronic Interface	RS232 Interface
Synchronous Method	Start-Stop Synchronization Method
Communication Method	Half-duplex Method
Transmission Speed	1200, 2400, 4800, 9600, 19200, 38400bps Automatic Recognition *1
Character Format	Start Bit: 1 bit
	Data: 8 bit
	Vertical Parity Bit: 1 bit (Even)
	Stop Bit: 1 bit
Character Code	ASCII, Binary
Error Detector	Horizontal Parity Check (BCC): Even
	Vertical Parity Check: Even
Bit Sending Sequence	LSB Priority

*1 After the power is turned on, downloading is successfully completed, or the host receives a response to the command of "d3" (DL Preparation), the host shall confirm the DTR signal of C/R turns on, and shall send an "Initial Reset" command. This "Initial Reset" command determines the transmission speed to be used between the host and the C/R. When the host sends data other than an "Initial Reset" command (e.g. DLE EOT), it shall send an "Initial Reset" command after 15 ms.

2.2 Transmission Control Method

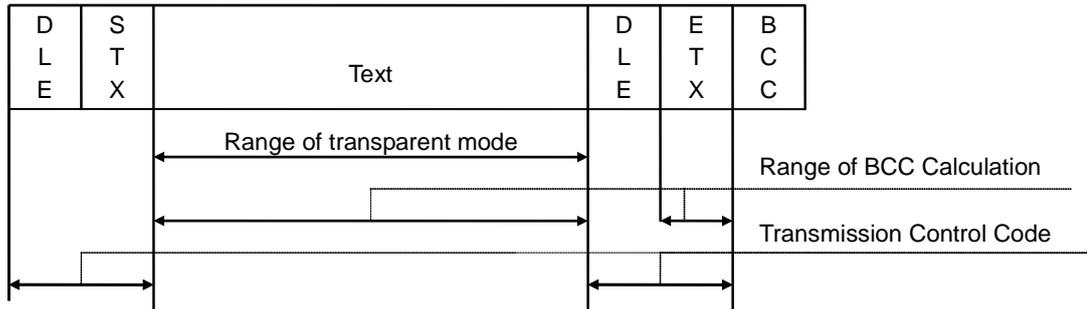
- Command/Response Method
- The C/R executes processes in accordance with commands sent by the host.
- Results obtained from those processes are sent to the host as responses to those commands.

2.3 Transmission Control Codes

Code	Value	Meaning
DLE STX	10H 02H	Representing the start of text in a command or a response.
DLE ETX	10H 03H	Representing the end of text in a command or a response.
DLE ENQ	10H 05H	Requiring the C/R to execute a command or to resend a response
DLE ACK	10H 06H	Positive response from the C/R reporting having successfully received a command sent by the host.
DLE NAK	10H 15H	Negative response from the C/R reporting having failed in receiving a command sent by the host.
DLE EOT	10H 04H	Instructing the C/R to interrupt a transmission or execution of command.
DLE	10H	Representing a control code in text in transparent mode.

2.4 Message Format

2.4.1 Command/Response Format



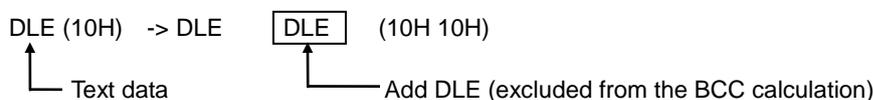
- Each text contains one command or response.
- BCC is obtained by calculating the exclusive OR (XOR) from the beginning of the text (the next character of the STX) to ETX.
- However, the following are excluded from the BCC calculation.
 - DLE (10H) in the transparent mode
 - DLE (10H) in "DLE ETX" of a transmission control code
- The Vertical Parity of BCC is regarded as the BCC Parity.
- The maximum transmission delay between each character from DLE to BCC sent from the host or the C/R is less than 5sec.

2.4.2 Usable Codes in Text

				b8	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	
				b7	0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	
				b6	0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	
				b5	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	
b4	b3	b2	b1		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	0	0	0		DLE*1	S	0	@	P	`	p								
0	0	0	1	1			!	1	A	Q	a	q								
0	0	1	0	2	STX		"	2	B	R	b	r								
0	0	1	1	3	ETX		#	3	C	S	c	s								
0	1	0	0	4	EOT		\$	4	D	T	d	t								
0	1	0	1	5	ENQ	NAK	%	5	E	U	e	u								
0	1	1	0	6	ACK		&	6	F	V	f	v								
0	1	1	1	7			'	7	G	W	g	w								
1	0	0	0	8			(	8	H	X	h	x								
1	0	0	1	9			)	9	I	Y	i	y								
1	0	1	0	A			*	:	J	Z	j	z								
1	0	1	1	B			+	;	K	[	k	{								
1	1	0	0	C			,	<	L	\	l	|								
1	1	0	1	D			~	=	M	]	m	}								
1	1	1	0	E			.	>	N	^	n	~								
1	1	1	1	F			/	?	O	_	o									

*1 [Transparent Mode]

When "DLE (10H)" is used in text as a part of a command or a response, add one more "DLE (10H)" to the text, totaling 2 characters on the transmission line.
 For details, refer to "4. Presentation of data" and "5. Reception of data" in ISO 2111.

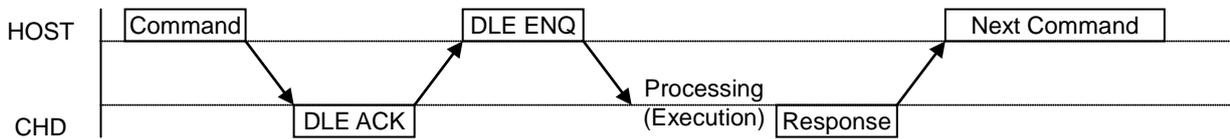


2.5 Transmission Control Procedure

2.5.1 Transmission Start

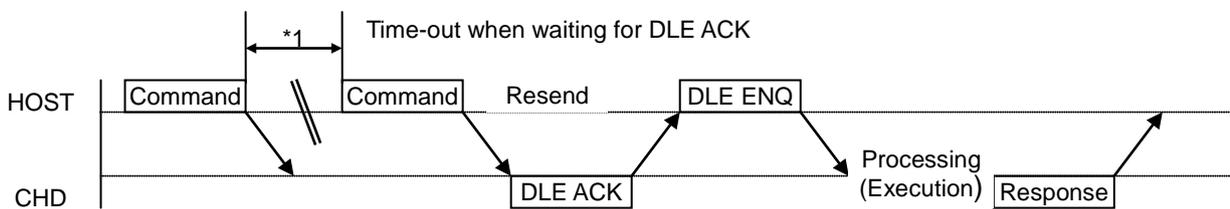
The transmission speed (baud rate) between the C/R and the host is automatically determined by the first "Initial Reset" command from the host. Therefore, the host shall send an "Initial Reset" command as the first command after power is turned on. If the host sends data (e.g. DLE EOT) other than an "Initial Reset" command, it shall send an "Initial Reset" command after 15 ms.

2.5.2 Sequence in Normal Operation



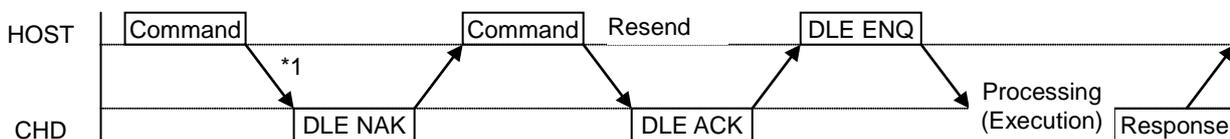
2.5.3 Sequence in Recovery Operation

(1) Monitoring time-out occurs while the host is waiting for ACK from the C/R. (The host resends the command.)



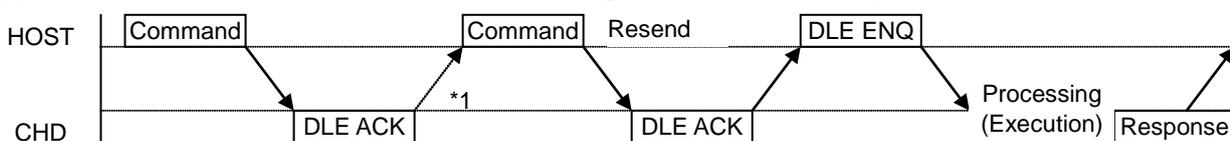
*1: See 1.6 "Transmission Control Matrix"

(2) The host receives NAK from the C/R. (The host resends the command.)



*1: The C/R detected a receiving error.
(Errors include vertical parity, BCC and monitoring time-out between characters.)

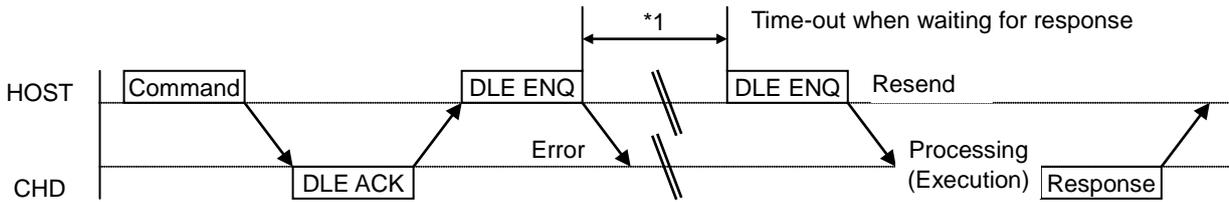
(3) The host detects an error while it is receiving ACK from the C/R. (The host resends the Command.)



*1: The host detected a receiving error.

(4) Monitoring time-out occurs while the host is waiting for a response from the C/R.

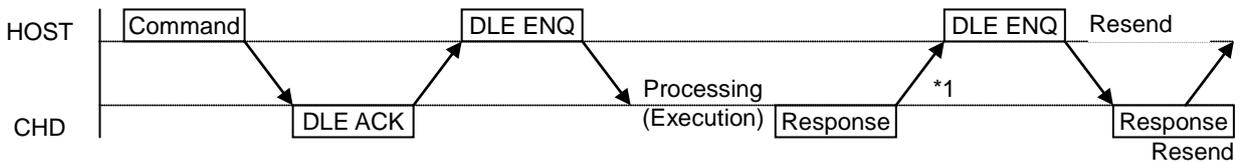
(The host resends ENQ, requesting a response from the C/R.)



*1: See 2.6 "Transmission Control Matrix"

(5) The host detects an error during receiving a response from the C/R.

(The host resends ENQ, requesting the C/R to resend the response.)

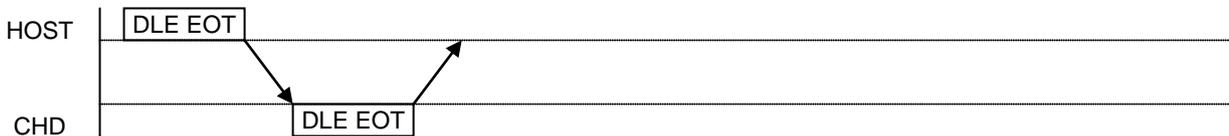


*1: The host detected a receiving error.

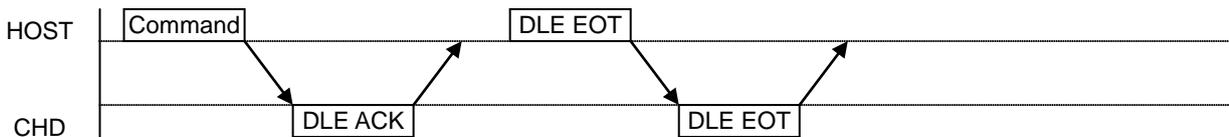
2.5.4 Interruption of Transmission and Command sent by the host to the C/R

By sending "DLE EOT" from the host to the C/R, transmission and execution of a command can be interrupted any time except while downloading is in process. For details, see Annex E.

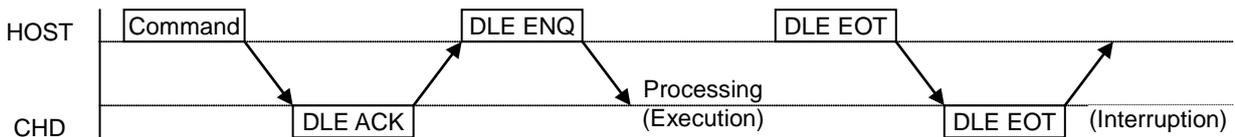
(1) Before the host sends a command (Interrupting transmission from the host to the C/R)



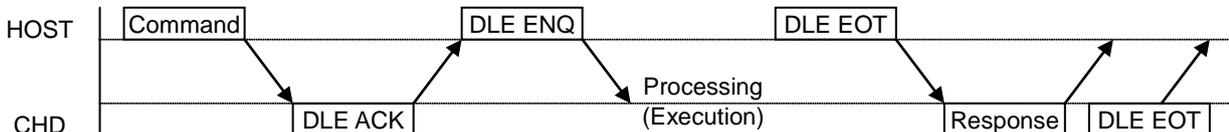
(2) After the host sends a command (Canceling the command from the host to the C/R)



(3) After the host sends ENQ (The host forcefully interrupts the command in process.)



(4) While the C/R is sending a response (The host interrupts the transmission.)



2.6 Transmission Control Matrix

(1) Control by the host (provided for reference)

Code/Event Status of HOST	Codes received from C/R					Reception monitor by HOST	
	DLE ACK	DLE NAK	DLE STX	DLE ETX BCC	Other Codes	Time-out	Monitoring Time
1 Waiting for DLE ACK after sending a command	Sends DLE ENQ -> 2	Resends the command -> 1 *3	Ignores	Ignores	Ignores	Resends the command -> 1 *3	*1
2 Waiting for a response after sending DLE ENQ	Ignores	Ignores	Clears buffer -> 3	Ignores	Ignores	Resends DLE ENQ -> 2 *3	*2
3 Waiting for DLE ETX BCC during receiving a response	Ignores	Ignores	Clears buffer -> 3	Sends the next command when the reception was successful -> 1 Resends DLE ENQ when the reception was failed -> 2 *3	Stores data -> 3	Resends DLE ENQ -> 2 *3	3 seconds *4

*1: Monitoring Time for waiting "DLE ACK" after transmission of a command by the host shall be set to 5.02sec or more. When an Initial Reset Command sent from the host extends the transmission/reception switching time of the C/R side, 5.02 more sec shall be added to this Monitoring Time. (Refer to 7.1 , 7.2 , 7.3 or 7.4)

*2: The monitoring time for which the host waits for a response varies depending on each command. Usually 10 seconds or more is recommended. For responses to commands that require user's operation (e.g., Inserting, taking out), add the operation time to the monitoring time. When the number of retries accompanying mechanical operation (moving) is increased, one second per retry shall be added.

*3: The host side shall define the number of retransmission, and the number shall be one or more. When all the retries end up with failure, the host shall regard it as an error.

*4: This monitoring time varies depending on the transmission speed and the data length of the response. The monitoring time in 9600 bps is 3 sec, but that in 1200 bps is 20 sec.

(2) Control by C/R

Code/Event Status of HOST	Codes received from HOST					Reception monitor by C/R	
	DLE ENQ	DLE STX	DLE EOT	DLE ETX BCC	Other Codes	Time-out	Monitoring Time
1 Idle	Resends the response -> 1	Clears buffer -> 2	Execution Interrupted -> 1	Ignores	Ignores	Ignores	Ignores
2 Waiting for DLE ETX BCC during receiving a command	Ignores	Clears buffer -> 2	Execution Interrupted -> 1	Sends DLE ACK, when the reception is successful -> 3 Sends DLE NAK, when reception was failed -> 1	Stores data -> 2	Sends DLE NAK -> 1	5 sec (Between characters)
3 Waiting for DLE ENQ after sending DLE ACK	Sends a response after executing a command -> 1	Clears buffer -> 2	Execution Interrupted -> 1	Ignores	Ignores	Ignores	Ignores

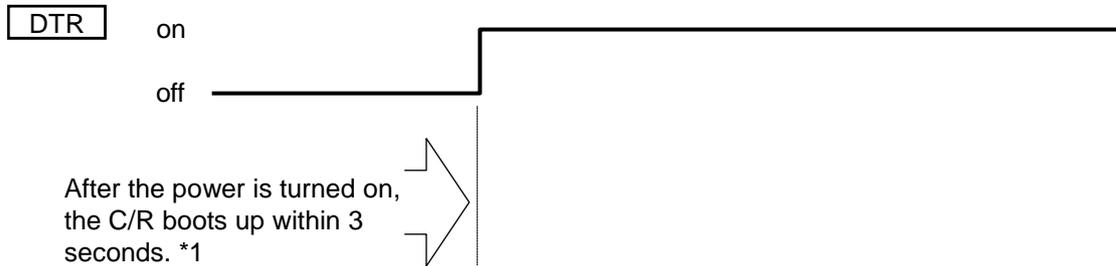
Whenever the C/R is processing a command, except when DL is in process, all characters other than " DLE EOT" from the host are ignored. For details about "DLE EOT" during downloading, see Annex E.

3. Time Chart of Transmission Control Signal Line

The signal names shown below represent the signals on the C/R side.

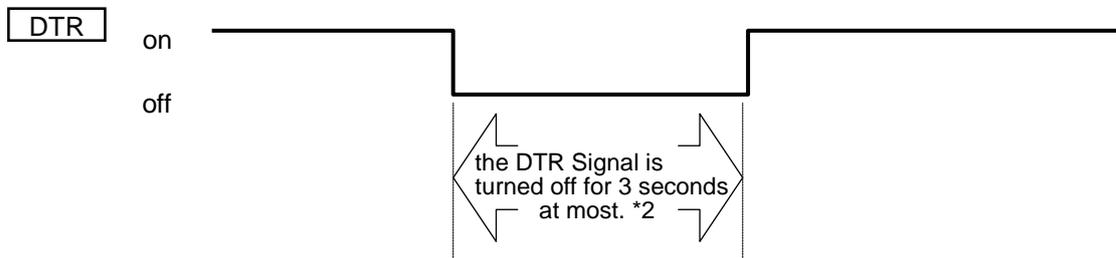
3.1 DTR Signal

3.1.1 After the power is turn ON



*1: The HOST shall send data after the DTR Signal is turned ON

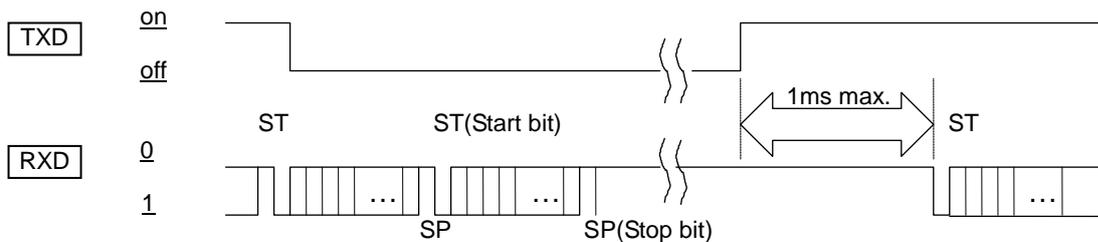
3.1.2 During Download Sequence



*2: After the HOST receives a response of either DL Completion Command or DL Preparation Command, the DTR Signal is turned off for 3 seconds at most. After confirming that the DTR Signal is turned on, the HOST shall send an Initial Reset command.

3.2 Interruption of Transmission by the CTS Signal

The figure shown below represents the case that the CTS Signal from the host is turned off while the C/R is transmitting a response.



- (1) When the CTS Signal from the host is turned OFF during transmission of a response from the C/R, the C/R interrupts the transmission after sending two or less characters.
- (2) The C/R resumes transmission within 1ms after the CTS Signal is turned on.
- (3) If the CTS Signal has been turned off before C/R's transmitting a response, the C/R sends a response after the CTS Signal is turned on.

4. Message Specifications

Each line in the tables specifies as shown below:

- The row of length specifies the byte(s) of each item.
- The row of data specifies the content of each item.

4.1 Command Format (HOST -> C/R)

A Command is the text in which the host instructs the C/R to execute a process.

	IDN	CMD	CMP
Length	1	2	Variable Length (0~512 bytes)
Data	"C"	See 5	For details, see 7

(1) IDN

Specifies its code. The code for commands is "C" (43H).

(2) CMD

Specifies a command. (See 5)

(3) CMP

Command Parameter.

This defines details of a CMD processing. However, some CMDs do not have any command parameter.

4.2 Response Format (C/R -> HOST)

A Response is the text that the C/R sends to the host as a result of a process in response to a command sent by the host.

(1) JDG

The host judges whether the process was normally completed or not by the JDG code in a response message.

- "P" (50H) in JDG specifies a positive response that the process was normally completed.
- "N" (4EH) in JDG specifies a negative response that the process was abnormally completed.

(2) RCM

RCM in a response message is the same code as the command (CMD) to which the response is responding.

4.2.1 Positive Response Format

	JDG	RCM	RES	RDT
Length	1	2	2	Variable Length (0 to 320 bytes)
Data	"P"	See 5	See 6.1	For details, see 7

(1) RES

- Data in RES in a response message usually specifies the position of a card in the C/R.
- When a response responds to the ICC Control Command, the RES specifies the ICC Control Status.
- When a response responds to a DL related command, the RES specifies the DL status.

(2) RDT (Response Data)

- Response data is the data obtained by processing a command.
- Some responses do not have any response data.

4.2.2 Negative Response Format

	JDG	RCM	RES	RDT
Length	1	2	2	Variable Length (0 to 104 bytes)
Data	"N"	See 5	See 6.2	For details, see 7

(1) RES

- RES in a response message is a code indicating an error resulted from the command process.

(2) RDT (Response Data)

- Response data is the data obtained when a command is in process.
- Negative responses except those responded to specific commands do not have any response data.

5. Table of Commands

Each command code and its function are listed below. Also, whether or not the command is available under each type of error condition is described because some commands are unavailable while a specific error is detected. (O: Available, X: Not Available).

All commands are available while the other type of errors other than those described in this section are detected. When any unavailable commands are executed, the detected error code will be returned.

5.1 Card Handling

5.1.1 Initial Reset Commands

Command Name	CMD (ASCII)	Function	C/R abnormality	Power down	Waits initial reset	Waits DL	Length abnormality	Ref
Initial Reset	"00"	Initializes the C/R then returns card to the Gate position if card is in the C/R.	O	O	O	X	O	7.1
	"01"	Initializes the C/R then ejects card through to rear if card is in the C/R.	O	O	O	X	X	7.2
	"02"	Initializes the C/R then holds card at the rear standby position if card is in the C/R.	O	O	O	X	X	7.3
	"03"	Initializes the C/R then ejects card through to front if card in the C/R in order to remove the short card or the long card.	O	O	O	X	O	7.4

5.1.2 Status Sense Commands

Command Name	CMD (ASCII)	Function	C/R abnormality	Power down	Waits initial reset	Waits DL	Length abnormality	Ref
Status Sense	"10"	Reads C/R condition.	O	O	O	O	O	7.5
	"15"	Reads sensors status.	O	X	X	X	O	7.6

5.1.3 Insertion Commands

Command Name	CMD (ASCII)	Function	C/R abnormality	Power down	Waits initial reset	Waits DL	Length abnormality	Ref
Insertion Permission / Denial	":0"	Permits insertion from front and waits infinitely card insertion. Takes in card then transports it to the rear standby position.	X	X	X	X	X	7.67
	":1"	Denies card insertion after interrupting card insertion status by the "Insertion Permission Command" (":0" or ":3").	X	X	X	X	X	7.68
	":3"	Permits insertion from rear waits infinitely card insertion. Takes in card then transports to front standby position.	X	X	X	X	X	7.69

5.1.4 Intake Commands

Command Name	CMD (ASCII)	Function	C/R abnormality	Power down	Waits initial reset	Waits DL	Length abnormality	Ref
Intake	"20"	Permits insertion from the front and waits for card insertion during the monitoring time set by the command "W0". Takes in card then transports it to the rear standby position.	X	X	X	X	X	7.7
	"22"	Permits insertion from rear and waits for card insertion during the monitoring time set by the command "W0". Takes in card then transports to front standby position.	X	X	X	X	X	7.8

5.1.5 Return Commands

Command Name	CMD (ASCII)	Function	C/R abnormality	Power down	Waits initial reset	Waits DL	Length abnormality	Ref
Return	"30"	Returns card to the Gate position.	X	X	X	X	O	7.9
	"31"	Ejects card through to rear.	X	X	X	X	X	7.10
Waiting for Withdrawal	"90"	Waits for card to be withdrawn from the Gate position.	X	X	X	X	X	7.18

5.1.6 Re-intake Commands

Command Name	CMD (ASCII)	Function	C/R abnormality	Power down	Waits initial reset	Waits DL	Length abnormality	Ref
Re-intake	"40"	Re-intakes card from the Gate position to the rear standby position.	X	X	X	X	X	7.11
	"41"	Re-intakes card from the Gate position and ejects it to rear.	X	X	X	X	X	7.12

5.2 Magnetic Read Commands

Command Name	CMD (ASCII)	Function	C/R abnormality	Power down	Waits initial reset	Waits DL	Length abnormality	Ref
Read	"61"	Sends to the host ISO #1 data that C/R has read when the card was taken in	X	X	X	X	O	7.13
	"62"	Sends to the host ISO #2 data that C/R has read when the card was taken in	X	X	X	X	O	7.14
	"63"	Sends to the host ISO #3 data that C/R has read when the card was taken in	X	X	X	X	O	7.15
	"64"	Sends to the host JIS 2 data that C/R has read when the card was taken in	X	X	X	X	O	7.16
	"6a"	Sends to the host data on multiple track that C/R has read when the card was taken in	X	X	X	X	O	7.17

5.3 C/R Setting Commands

Command Name	CMD (ASCII)	Function	C/R abnormality	Power down	Waits initial reset	Waits DL	Length abnormality	Ref
Retry Number Setting	"R3"	Sets the retry number when a return error occurred.	O	X	X	X	O	7.41
	"R5"	Sets the number of retries to be done when an ICC activation error occurs.	O	X	X	X	O	7.42
Monitor Time Setting	"W0"	Sets the monitoring time until card is inserted.	O	X	X	X	O	7.48
	"W1"	Sets the monitoring time until card returned to front is withdrawn.	O	X	X	X	O	7.49
	"W2"	Sets the monitoring time until card is re-intaken to rear.	O	X	X	X	O	7.50

5.4 Card Reject Number

Command Name	CMD (ASCII)	Function	C/R abnormality	Power down	Waits initial reset	Waits DL	Length abnormality	Ref
Card Reject Number	"Q0"	Reads the number of ejected (captured) card to rear.	O	X	X	X	O	7.39
	"Q1"	Resets the number of ejected (captured) card to rear ("000").	O	X	X	X	O	7.40

5.5 FW/HW Identification

Command Name	CMD (ASCII)	Function	C/R abnormality	Power down	Waits initial reset	Waits DL	Length abnormality	Ref
Option Read/Setting	"N0"	Reads information of options installed.	O	X	X	X	O	7.38
Version Read	"V0"	Reads the FW version.	O	X	X	X	O	7.45
	"V1"	Reads the FW version of ICC control part.	O	X	X	X	O	7.46
	"V3"	Reads the version of the memory card control in FW.	O	X	X	X	O	7.47

5.6 Cleaning Commands

Command Name	CMD (ASCII)	Function	C/R abnormality	Power down	Waits initial reset	Waits DL	Length abnormality	Ref
Cleaning	"I0"	Waits for a cleaning card to be inserted and with the card, cleans Mag. head, IC Contact, and roller. Returns the inserted card after cleaning.	X	X	X	X	X	7.34
	"I1"	Cleans Mag. head, IC Contact, and roller with a cleaning card in the C/R. This command does not execute "wait for a cleaning card to be inserted" and "return".	X	X	X	X	X	7.35
Sensor Level Read	"L9"	Reads voltage of sensors.	O	X	X	X	O	7.36
Sensor Warning	"LA"	Checks whether the Photo-sensor requires cleaning or not.	O	X	X	X	O	7.37

5.7 IC Chip Card (ICC) Handling

5.7.1 ICC Activation / Deactivation Commands

Command Name	CMD (ASCII)	Function	C/R abnormality	Power down	Waits initial reset	Waits DL	Length abnormality	Ref
ICC Press	"C0"	Transports ICC to the IC Contact and presses the IC Contact.	X	X	X	X	X	7.19
ICC Release	"C1"	Releases the IC Contact from ICC.	X	X	X	X	X	7.20
ICC Activation	"C2"	Activates (Cold Reset) ICC and sends an ATR.	X	X	X	X	X	7.21
ICC Deactivation	"C3"	Deactivates ICC.	X	X	X	X	X	7.22
ICC Cold Reset	"E0"	Activates (Cold Reset) ICC and sends an ATR. It is possible to specify an automatic execution of the PPS by the C/R.	X	X	X	X	X	7.25
ICC Warm Reset	"E1"	Executes a warm reset to ICC and sends an ATR. It is possible to specify an automatic execution of the PPS by the C/R.	X	X	X	X	X	7.26
ICC Multiple Processing	"C5"	ICC Press ("C0") + ICC Activation ("C2")	X	X	X	X	X	7.23
	"C6"	ICC Deactivation ("C3") + ICC Release ("C1")	X	X	X	X	X	7.24
	"G1"	Press ICC + ICC Cold Reset ("C0"+"E0")	X	X	X	X	X	7.33

5.7.2 ICC Data Transmission Commands

Command Name	CMD (ASCII)	Function	C/R abnormality	Power down	Waits initial reset	Waits DL	Length abnormality	Ref
T=0 Transmission	"F0"	Sends or receives data between the host and ICC using T=0 protocol.	X	X	X	X	X	7.27
T=1 Transmission	"F1"	Sends or receives data between the host and ICC using T=1 protocol.	X	X	X	X	X	7.28
T=1 Continuous Transmission	"F2"	Sends data chained to ICC using T=1 protocol.	X	X	X	X	X	7.29
T=1 Continuous Reception	"F3"	Receives data chained from using T=1 protocol.	X	X	X	X	X	7.30
T=1 interruption Completion	"F4"	Continuous transmission/reception of T=1 protocol is forcedly terminated.	X	X	X	X	X	7.31
PPS Exchange	"F8"	Executes a PPS exchange between the host and ICC.	X	X	X	X	X	7.32

5.7.3 Protocol Handling for ICC

Command Name	CMD (ASCII)	Function	C/R abnormality	Power down	Waits initial reset	Waits DL	Length abnormality	Ref
ICC Control Information	"Y0"	Reads the control information of ICC in Flash Memory.	O	X	X	X	O	7.51
	"Y1"	Sets the reference standard used in commands related to ICC in Flash memory.	O	X	X	X	O	7.52
	"Y2"	Sets the monitoring time for waiting for reception used in commands related to ICC in Flash memory.	O	X	X	X	O	7.53
	"Y3"	Sets the IFSD control method used in commands related to ICC in Flash memory.	O	X	X	X	O	7.54
	"Y4"	Sets the TCK control method used in commands related to ICC in Flash memory.	O	X	X	X	O	7.55

5.8 Memory Card Handling

Command Name	CMD (ASCII)	Function	C/R abnormality	Power down	Waits initial reset	Waits DL	Length abnormality	Ref
Activation	"m2"	Activates memory card.	X	X	X	X	X	7.60
Deactivation	"m3"	Deactivates memory card.	X	X	X	X	X	7.61
Control Information	"m4"	Sets the reception monitoring time used in Memory Card related commands.	O	X	X	X	O	7.62
Multiple processing	"m5"	Card press ("C0") and memory card activation ("m2")	X	X	X	X	X	7.63
	"m6"	Memory card deactivation ("m3") + Card release ("C1")	X	X	X	X	X	7.64
Transmission and Reception	"m7"	Sends and receives data between the host and the memory card.	X	X	X	X	X	7.65
PSC Verification	"m8"	Executes the verification of memory card.	X	X	X	X	X	7.66

5.9 Download Function

Command Name	CMD (ASCII)	Function	C/R abnormality	Power down	Waits initial reset	Waits DL	Length abnormality	Ref
DL Preparation	"d3"	Prepares downloading.	O	X	X	X	X	7.56
DL Start	"d4"	Starts DL procedure.	X	X	X	O	X	7.57
DL Transmission	"d5"	Sends DL Data (FW).	X	X	X	O	X	7.58
DL Completion	"d6"	Completes DL procedure.	X	X	X	O	X	7.59

5.10 Other Command

Command Name	CMD (ASCII)	Function	C/R abnormality	Power down	Waits initial reset	Waits DL	Length abnormality	Ref
User Information	"UA"	Reads user information optionally written by the user.	O	X	X	X	O	7.43
	"UB"	Writes user information optionally written by the user.	O	X	X	X	O	7.44

6. Table of Responses

6.1 Table of Positive Response Status

Response statuses (RES) of Positive Response Format are shown in the table below:

RES (ASCII)	Meaning
"00"	No Card in C/R
"01"	Card at Gate position
"02"	Card in C/R
"10"	IC Contact Press to ICC
"11"	ICC Activation Status
"20"	Transmission with ICC Completion (With/ without Reception Data, with SW1 + SW2)
"21"	In process C/R of Continuous Reception from ICC (With Reception Data, without SW1 + SW2)
"22"	In Process C/R of Continuous Transmission to ICC (Without Reception Data, without SW1 + SW2)
"23"	Abort Completion of ICC Transmission by Forcedly Interruption
"30"	In Process Downloading
"31"	Downloading Normal Completion. Waiting for Initial Reset

6.2 Table of Negative Response Status (Error Code)

Response statuses (RES) of Negative Response Format are shown in the table below:

(1) Error code table A

RES (ASCII)	Sorts of Error		Meaning	Host processing after error
"00"	Reception of Undefined Command	Command Error	-The received command is not included in the specification.	The host must check the content and sequence of the command.
"01"	Command Sequence Error	Command Error	-The received command is not available in the current status.	The host must check the content and sequence of the command.
"02"	Command Parameter Error	Command Error	-The parameter of the received command is not appropriate.	The host must check the content and sequence of the command.

(2) Error code table B

RES (ASCII)	Sorts of Error		Meaning	Host processing after error
"10"	Card Jam *1	C/R abnormality	-The C/R failed to transport a card in the C/R to the correct position. -The C/R failed to return a card to the Gate position because the Gate position was shut. -The C/R failed to transport a card taken in from the Gate position to the correct position.	In case one of these errors occurs, the host shall send one of the initial reset commands ("00" to "03").
"14"	Card Withdrawn	C/R abnormality	-A card in C/R was withdrawn.	In case one of these errors occurs, the host shall send one of the initial reset commands ("00" to "03").
"15"	Card Jam on Reintake	C/R abnormality	-When a card was retaken in from front, the C/R failed to transport it to the rear standby position.	In case one of these errors occurs, the host shall send one of the initial reset commands ("00" to "03").
"16"	Card Jam at the Rear-end	C/R abnormality	-A card was jammed at rear when ejecting a card to rear of the C/R. -A card was jammed at rear when intaking a card from rear of the C/R. -The sensor at rear of the C/R blocked light improperly.	In case one of these errors occurs, the host shall send one of the initial reset commands ("00" to "03").
"18"	Power-down Detection *2 *3	Power down	-Power down was detected while a command (including initial reset command) was being processed or before it is processed.	In case one of these errors occurs, the host shall send one of the initial reset commands ("00" to "03").
"19"	Waiting for Initial Reset *2	Waits initial reset	-The C/R received a command other than the Initial Reset Commands after the power was turned on. -The C/R received a command other than the Initial Reset Commands after the C/R sent the response of Waiting for Initial Reset ("19").	The host shall send one of the initial reset commands ("00" to "03") when 15 ms have passed after the host received the error response.

*1: If a returned card continues being jammed in the C/R, the C/R comes not to return the card automatically. In such a case, the host should send one of the Initial Reset Commands ("00" to "03") to the C/R.

*2: For more details, see Annex G.

*3: This response shall be sent to the host if the power is restored in short time and the CPU memory has memorized the transmission speed. However, this response shall not be sent while an initial reset command is being executed.

(3) Error code table C

RES (ASCII)	Sorts of Error		Meaning	Host processing after error
"20"	Too Long Card	Length abnormality	-A too long card was inserted from front.	In case either error occurs, the host shall send either return command ("30") or initial reset command ("00" or "03"). The Host can send a mag. read command. If a read error is occurred, the C/R sends the read error as a response.
"21"	Too Short Card	Length abnormality	-A too short card or a card with hole(s) was inserted from front.	In case either error occurs, the host shall send either return command ("30") or initial reset command ("00" or "03"). The Host can send a mag. read command. If a read error is occurred, the C/R sends the read error as a response.

(4) Error code table D

RES (ASCII)	Sorts of Error		Meaning	Host processing after error
"32"	Card Position Change	Warning	-The position of a card inserted into the C/R was changed.	The host can send the next command after it receives the error code.
"33"	Data Error in Flash memory	Warning	-The SUM value in data stored in the Flash memory is incorrect. The memory might have been destroyed. -The C/R failed to write correct data on the Flash memory.	The host can send the next command after it receives the error code.

(5) Error code table E

RES (ASCII)	Sorts of Error		Meaning	Host processing after error
"40"	Read Error (SS error)	Card abnormality (Mag)	-The C/R failed to detect the SS code in the read data.	Although the C/R detected the magnetic data error, the host can send the next command.
"41"	Read Error (ES error)	Card abnormality (Mag)	-The C/R failed to detect the ES code after the SS code in the read data.	Although the C/R detected the magnetic data error, the host can send the next command.
"42"	Read Error (VRC error)	Card abnormality (Mag)	-Vertical parity error (VRC error) was detected in the read data (excluding SS and ES codes).	Although the C/R detected the magnetic data error, the host can send the next command.
"43"	Read Error (LRC error)	Card abnormality (Mag)	-The next character of ES in the read data did not agree with the LRC calculation result.	Although the C/R detected the magnetic data error, the host can send the next command.
"44"	Read Error (Not Encoded)	Card abnormality (Mag)	-The read magnetic data was not encoded.	Although the C/R detected the magnetic data error, the host can send the next command.
"45"	Read Error (No Data)	Card abnormality (Mag)	-The next character of SS in the read data was ES, and the next character agreed with the LRC calculation result.	Although the C/R detected the magnetic data error, the host can send the next command.
"46"	Read Error (Jitter Error)	Card abnormality (Mag)	- This error doesn't become above read error ("40"- "45") but there are the bits which is over permission value of Jitter in read data.	Although the C/R detected the magnetic data error, the host can send the next command.
"47"	Card Check Error of banking facilities	Card abnormality (Mag)	-A card of a Japanese banking facility was used. (Only JIS 2 is checked.) -The data will be returned after they are coded.	Although the C/R detected abnormality of the magnetic data, the Host can send the next command.
"49"	Read Track setting Error	Warning	-The specified track has not been read.	Although the C/R detected the magnetic data error, the host can send the next command.
"4A"	Transport failure during mag. reading	Warning	-Transport during reading mag. was failed because of deformation of a card or so, -When a card was inserted, a user held it.	Although the C/R detected the magnetic data error, the host can send the next command.

(6) Error code table F

RES (ASCII)	Sorts of Error		Meaning	Host processing after error
"60"	Incomplete Execution of Re-intake	Warning	-The C/R received the Re-intake command when no card was at the Gate position. -Although the C/R received the Re-intake command when a card was in the Gate position, the card was withdrawn.	The host can send the next command.
"61"	Time-out of Intake Monitoring	Warning	-A card was not taken in the C/R within the intake monitoring time.	The host can send the next command.
"62"	Time-out of Withdrawal Monitoring	Warning	-A card was not withdrawn within the withdrawal monitoring time.	The host can send the next command.
"63"	Time-out of Re-intake Monitoring	Warning	-The C/R did not retake in a card within the re-intake monitoring time.	The host can send the next command.
"64"	Card Keeping	Warning	- During intaking a card from front with the Intake command, it was failed because a card was kept. -Although the C/R received the Initial Reset Command ("01" or "02") or Re-intake Command when a card was at the Gate position, the C/R failed to take it in.	The host can send the next command.

(7) Error code table G

RES (ASCII)	Sorts of Error		Meaning	Host processing after error
"70"	Imperfect Program	Waits DL	-The SUM value in the program stored in the Flash memory is incorrect. The memory might have been destroyed. -The C/R received a command other than DL Command during DL. -The C/R found the downloading of FW unfinished after the power was turned on.	The host shall download the FW, following the downloading sequence.
"71"	Initial Reset waiting after DL completion	Waits initial reset	-The C/R received a command other than the Initial Reset Commands after the downloading was normally completed.	The host shall send an initial reset command ("00" to "03") when 15 ms have passed after the reception of this response.

(8) Error code table H

RES (ASCII)	Sorts of Error		Meaning	Host processing after error
"80"	Reception from ICC Impossible	Card abnormality (ICC)	<ul style="list-style-type: none"> -The data the C/R received from ICC exceeded the C/R's reception buffer size when the C/R executed transmission/reception in T=0 or T=1 Protocol or PPS. -The C/R failed to complete communication with ICC when the C/R executed transmission/reception in T=0 or T=1 Protocol or PPS because the monitoring time set by the host expired. -The C/R aborted ICC process (only when the referred ICC standard is "EMV4.0"). 	ICC shall be deactivated. The host shall release the IC Contacts, and then press them and activate ICC.
"81"	IC Solenoid Error	C/R abnormality	<ul style="list-style-type: none"> -The C/R failed in pressing the IC Contacts. -The C/R failed in releasing the IC Contacts. -When the C/R was pressing the IC Contacts, the echo sensor in the IC unit was turned off. -When the C/R was releasing the IC Contacts, the echo sensor in the IC unit was turned on. 	In case one of these errors occurs, the host shall send one of the initial reset command ("00" to "03").
"82"	ICC Activation Error	Card abnormality (ICC)	<ul style="list-style-type: none"> -When the C/R activated ICC, the C/R detected short circuit on supplying Vcc. -When the C/R activated ICC, time-out or parity error occurred. 	ICC shall be deactivated. The host shall release the IC Contacts, and then press them and activate ICC.
"84"	ICC Communication Error	Card abnormality (ICC)	-Monitoring time-out or parity error occurred during execution of communication in T=0 or T=1 Protocol. Although the C/R executed retry, it failed in recovering.	The host may send the next command after it receives this error code. However, we recommend reactivating ICC after the deactivation.
"85"	Reception of ICC Forceful Termination	Card abnormality (ICC)	-The C/R received forceful termination (S (Abort, req)) on executing in T=1 Protocol.	The host may send the next command after it receives this error code. However, we recommend reactivating ICC after the deactivation.
"86"	ICC Reception Data Error	Card abnormality (ICC)	-The C/R received invalid block or invalid data during execution in T=0 or T=1 Protocol.	The host may send the next command after it receives this error code. However, we recommend reactivating ICC after the deactivation.
"87"	Unsupported ICC	Card abnormality (ICC)	-The C/R received unsupported ATR.	ICC mode may not be set correctly. The host should be deactivated to ICC and re-set to a correct ICC mode.
"88"	ICC movement during pressing IC Contacts	C/R abnormality	-Although the sensor S3 should be interrupted while IC Contacts are being pressed, the status of these sensors were changed.	In case one of these errors occurs, the host shall send one of the initial reset command ("00" to "03").
"89"	Disagreement of Verification Code	Card abnormality (ICC)	-The card failed to be verified because of disagreement of the verification code.	The card has to be checked whether it can be verified.
"8A"	Inappropriate Verification Card	Card abnormality (ICC)	<ul style="list-style-type: none"> -The card rejected verification. -The EC area of the card was 00H, or the protect bit in the EC area was protected. 	The card has to be checked whether it can be verified.

7. Command Specification

Descriptions of Command Specification

7.1 (00) Initial Reset (Return to Front)

(1) Command

IDN (1byte)	CMD (2bytes)		CMP (0~2bytes)	
"C"	"0"	"0"	<1> *1	<2> *1

*1: Omission available.

CMP	Length (Bytes)	Data (ASCII)	Meaning	
<1>	0 or 1	"0"	Less than 10ms *2	Minimum Guaranteed Time for Switching Transmission/Reception *3
		"1"~"9"	10ms~90ms	
<2>	0 or 1	"A"	Hold inside C/R	Card Processing Method After Power Failure
		"B"	Return to Front *2	
		"C"	Eject to Rear	

*2: Specifies the default value.

*3: Minimum Guaranteed Time for Switching Transmission/Reception means the minimum time until the C/R sends a response (DLE ACK or response) after the C/R received a Command or DLE ENQ from the host.

(2) Positive Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"P"	"0"	"0"	See 6.1

(3) Negative Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"N"	"0"	"0"	See 6.2

(4) Detailed Functions

Normal Processing

- Sets the transmission speed between the host and C/R automatically (only when after the power is turned on and after completing download).
- Sets the minimum guaranteed time for switching transmission/reception following the command parameter and the card process procedure when the power is turned off.
- Prohibits an insertion permission status so that a card cannot be inserted. (if an insertion permission status)
- Clears magnetic read data.
- Returns a card to the Gate position when there is a card in the C/R.
- When there is no card in the C/R, the Transport motor is started and stopped. In the case of a type (model) to which IC Contact is installed, confirms the IC Contact behavior.

Retry and Error Processing

- When a card is not returned to the Gate position, sends a Card Jam Error response ("N10").
- When the IC Contact is not pressed or released normally, sends an IC Solenoid Error response ("N81").
- When the SUM value in the data area of Flash memory is not correct, sends a Flash Memory Error response ("N33").
- When this command is executed from the status of all the sensors are transmitted, and the status of light block of one of Sensor S1, S2 and S3 is detected, sends a Too Short Card Error response ("N21")._

(5) Notes

- The host should execute one of Initial Reset Commands immediately after the power is turned on.
- The host should send the Initial Reset command when the C/R initialization and the C/R error.
- The minimum guaranteed time and the card process procedure set by the command parameter are valid until the memorized value in RAM is erased (about more than 2 days after the power off). When the set value is erased, the default value is set.

7.2 (01) Initial Reset (Eject to Rear)

(1) Command

IDN (1byte)	CMD (2bytes)		CMP (0~2bytes)	
"C"	"0"	"1"	<1> *1	<2> *1

*1: Omission available.

CMP	Length (Bytes)	Data (ASCII)	Meaning	
<1>	0 or 1	"0"	Less than 10ms *2	Minimum Guaranteed Time for Switching Transmission/Reception *3
		"1"~"9"	10ms~90ms	
<2>	0 or 1	"A"	Hold inside C/R	Card Processing Method After Power Failure
		"B"	Return to Front *2	
		"C"	Eject to Rear	

*2: Specifies the default value.

*3: Minimum Guaranteed Time for Switching Transmission/Reception means the minimum time until the C/R sends a response (DLE ACK or response) after the C/R received a Command or DLE ENQ from the host.

(2) Positive Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"P"	"0"	"1"	See 6.1

(3) Negative Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"N"	"0"	"1"	See 6.2

(4) Detailed Functions

Normal Processing

- Sets the transmission speed between the host and C/R automatically (only when after the power is turned on and after completing download).
- Sets the minimum guaranteed time for switching transmission/reception following the command parameter and the card process procedure when the power is turned off.
- Prohibits an insertion permission status so that a card cannot be inserted. (if an insertion permission status).
- Clears magnetic read data.
- Ejects a card to rear and counts the number of ejected card when there is a card at the Gate or in the C/R.
- When there is no card at the Gate or in the C/R, the Transport motor is started and stopped. In the case of a type (model) to which IC Contact is installed, confirms the IC Contact behavior.

Retry and Error Processing

- When a card is kept at the Gate position, sends a Card Keeping Error response ("N64").
- When a card is jammed during being ejected, sends a Card Jam at the Rear-end response ("N16").
- When the IC Contact is not pressed or released normally, sends an IC Solenoid Error response ("N81").
- When the SUM value in the data area of Flash memory is not correct, sends a Flash Memory Error response ("N33").
- When the length of re-intaken card is detected as abnormal, sends a Too Long Card Error response ("N20") or Too Short Card Error response ("N21").
- When this command is executed from the status of all the sensors are transmitted, and the status of light block of one of Sensor S1, S2 and S3 is detected, sends a Too Short Card Error response ("N21").

(5) Notes

- The host should execute one of Initial Reset Commands immediately after the power is turned on.
- The host should send the Initial Reset command when the C/R initialization and the C/R error.
- The minimum guaranteed time and the card process procedure set by the command parameter are valid until the memorized value in RAM is erased (about more than 2 days after the power off). When the set value is erased, the default value is set.
- A card at the Gate is intaken to the C/R with this command, then transported to rear.
- When a card at the Gate is withdrawn during re-intaking, this command ends normally. To check a card is captured or not, confirm the number of captured card is renewed or not.
- When a Card Keeping Error response ("N64") occurs, the host can continue a command execution. After re-intaking, card ejection to rear should be executed with the Rear Ejection after Re-intaking Command ("C41") or so.

7.3 (02) Initial Reset (Hold inside C/R)

(1) Command

IDN (1byte)	CMD (2bytes)		CMP (0~2bytes)	
"C"	"0"	"2"	<1> *1	<2> *1

*1: Omission available.

CMP	Length (Bytes)	Data (ASCII)	Meaning	
<1>	0 or 1	"0"	Less than 10ms *2	Minimum Guaranteed Time for Switching Transmission/Reception *3
		"1"~"9"	10ms~90ms	
<2>	0 or 1	"A"	Hold inside C/R	Card Processing Method After Power Failure
		"B"	Return to Front *2	
		"C"	Eject to Rear	

*2: Specifies the default value.

*3: Minimum Guaranteed Time for Switching Transmission/Reception means the minimum time until the C/R sends a response (DLE ACK or response) after the C/R received a Command or DLE ENQ from the host.

(2) Positive Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"P"	"0"	"2"	See 6.1

(3) Negative Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"N"	"0"	"2"	See 6.2

(4) Detailed Functions

Normal Processing

- Sets the transmission speed between the host and C/R automatically (only when after the power is turned on and after completing download).
- Sets the minimum guaranteed time for switching transmission/reception following the command parameter and the card process procedure when the power is turned off.
- Prohibits an insertion permission status so that a card cannot be inserted. (If an insertion permission status)
- Clears magnetic read data.
- Transports a card to the rear standby position when there is a card at the Gate or in the C/R.
- When there is no card at the Gate or in the C/R, the Transport motor is started and stopped. In the case of a type (model) to which IC Contact is installed, confirms the IC Contact behavior.

Retry and Error Processing

- When a card is kept at the Gate position, sends a Card Keeping Error response ("N64").
- When a card is jammed in the C/R, sends a Card Jam Error response ("N10").
- When the IC Contact is not pressed or released normally, sends an IC Solenoid Error response ("N81").
- When the SUM value in the data area of Flash memory is not correct, sends a Flash Memory Error response ("N33").
- When the length of re-intaken card is detected as abnormal, sends a Too Long Card Error response ("N20") or Too Short Card Error response ("N21").
- When this command is executed from the status of all the sensors are transmitted, and the status of light block of one of Sensor S1, S2 and S3 is detected, sends a Too Short Card Error response ("N21").

(5) Notes

- The host should execute one of Initial Reset Commands immediately after the power is turned on.
- The host should send the Initial Reset command when the C/R initialization and the C/R error.
- The minimum guaranteed time and the card process procedure set by the command parameter are valid until the memorized value in RAM is erased (about more than 2 days after the power off). When the set value is erased, the default value is set.
- A card at the Gate is intaken to the C/R with this command.
- When a card at the Gate is withdrawn during re-intaking, this command ends normally. To check a card is captured or not, confirm it with the response status (RES).
- When a Card Keeping Error response ("N64") occurs, the host can continue a command execution. After re-intaking, a card ejection to rear should be executed with the Rear Ejection after Re-intaking Command ("C40") or so.

7.4 (03) Initial Reset (Eject to Front)

(1) Command

IDN (1byte)	CMD (2bytes)		CMP (0~2bytes)	
"C"	"0"	"3"	<1> *1	<2> *1

*1: Omission available.

CMP	Length (Bytes)	Data (ASCII)	Meaning	
<1>	0 or 1	"0"	Less than 10ms *2	Minimum Guaranteed Time for Switching Transmission/Reception *3
		"1"~"9"	10ms~90ms	
<2>	0 or 1	"A"	Hold inside C/R	Card Processing Method After Power Failure
		"B"	Return to Front *2	
		"C"	Eject to Rear	

*2: Specifies the default value.

*3: Minimum Guaranteed Time for Switching Transmission/Reception means the minimum time until the C/R sends a response (DLE ACK or response) after the C/R received a Command or DLE ENQ from the host.

(2) Positive Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"P"	"0"	"3"	See 6.1

(3) Negative Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"N"	"0"	"3"	See 6.2

(4) Detailed Functions

Normal Processing

- Sets the transmission speed between the host and C/R automatically (only when after the power is turned on and after completing download).
- Sets the minimum guaranteed time for switching transmission/reception following the command parameter and the card process procedure when the power is turned off.
- Prohibits an insertion permission status so that a card cannot be inserted. (if an insertion permission status).
- Clears magnetic read data.
- Ejects a card to front when there is a card.
- When there is no card in the C/R, the Transport motor is started and stopped. In the case of a type (model) to which IC Contact is installed, confirms the IC Contact behavior.

Retry and Error Processing

- When a card is not ejected to front, sends a Card Jam Error response ("N10").
- When the IC Contact is not pressed or released normally, sends an IC Solenoid Error response ("N81").
- When the SUM value in the data area of Flash memory is not correct, sends a Flash Memory Error response ("N33").
- When this command is executed from the status of all the sensors are transmitted, and the status of light block of one of Sensor S1, S2 and S3 is detected, sends a Too Short Card Error response ("N21").

(5) Notes

- The host should execute one of Initial Reset Commands immediately after the power is turned on.
- The host should send the Initial Reset command when the C/R initialization and the C/R error.
- The minimum guaranteed time and the card process procedure set by the command parameter are valid until the memorized value in RAM is erased (about more than 2 days after the power off). When the set value is erased, the default value is set.
- The purpose of this command is to eject a too long card or foreign objects from the Gate. Card ejected to front can not be re-intaken since it is departed from Roller.

7.5 (10) Status Sense (C/R Sense)

(1) Command

IDN (1byte)	CMD (2bytes)	
"C"	"1"	"0"

(2) Positive Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"P"	"1"	"0"	See 6.1 .

(3) Negative Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"N"	"1"	"0"	See 6.2

(4) Detailed Functions

Normal Processing

- When the C/R is normal, sends a C/R Status (RES).
- When the C/R becomes the status of some error, sends the error code as the negative response.

Retry and Error Processing

- None

(5) Notes

- None

7.6 (15) Status Sense (Sensor Sense)

(1) Command

IDN (1byte)	CMD (2bytes)	
"C"	"1"	"5"

(2) Positive Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)	RDT (12bytes)			
"P"	"1"	"5"	See 6.1	<1>	~	<9>	<10>

RDT	Length (Bytes)	Data (ASCII)	Meaning		
<1>	1	"0"	No Card In	Sensor S0	Card Position Sensor
		"1"	Card In		
<2>	1	"0"	No Card In	Sensor S1	
		"1"	Card In		
<3>	1	"0"	No Card In	Sensor S2	
		"1"	Card In		
<4>	1	"0"	No Card In	Sensor S3	
		"1"	Card In		
<5>	1	"0"	No Card In	Sensor S4	
		"1"	Card In		
<6>	1	"0"	Fixed	Spare	
<7>	1	"0"	Release IC Contact	IC Contact Echo	
		"1"	Press IC Contact		
<8>	1	"0"	ICC Deactivation	ICC Activation	
		"1"	ICC Activation		
<9>	1	"0"	Stop	Motor Status	
		"1"	Low speed (50mm/sec)		
		"2"	High speed (250mm/sec)		
<10>	7	"0"	Fixed	Spare	

(3) Negative Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"N"	"1"	"5"	See 6.2

(4) Detailed Functions

Normal Processing

- Sends the sensor status.

Retry and Error Processing

- None

(5) Notes

- Confirms the card position during an error by reading the sensor status with this command.

7.7 (20) Intake (from Front)

(1) Command

IDN (1byte)	CMD (2bytes)	
"C"	"2"	"0"

(2) Positive Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"P"	"2"	"0"	See 6.1

(3) Negative Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"N"	"2"	"0"	See 6.2

(4) Detailed Functions

Normal Processing

- Waits a card to be inserted from front.
- Starts intaking behavior by running the Transport motor when the top end of a card reached to Sensor S0.
- Reads the mag. data as transporting the card to the rear standby position.

Retry and Error Processing

- When received this command in the status that there is a card in the C/R, sends a Command Sequence Error response ("N01").
- When this command is received in the status of Insertion Permission Status, sends a Command Sequence Error response ("N01").
- When a card is not intaken within the time set by the Monitoring Timer Setting Command ("CW0"), sends a Monitoring Time-Out Error response ("N61").
- When a card is kept at the Gate position, sends a Card Keeping Error response ("N64").
- When a card is jammed in the C/R, sends a Card Jam Error response ("N10").
- When the length of intaken card is detected as abnormal, sends a Too Long Card Error response ("N20") or Too Short Card Error response ("N21").

(5) Notes

- When there is a returned card at the Gate position, it does not intake another card unless the card has been withdrawn.
- When the C/R received this command, it does not send a response until intaking a card or the monitoring time passed. When aborting waiting for a card insertion, sends a DLE EOT from the host.
- When sending a DLE EOT from the host, in the case where the C/R is under intaking a card already, and the rear end of card has not passed the Sensor S0 yet, the behavior of card intaking is aborted. When the rear end of card has passed the Sensor S0, the behavior of card intaking is not aborted. If the behavior of card intaking is aborted on the way, the card is returned to the Gate position about 1 sec after the C/R sends a DLE EOT.
- The mag. data read during card intaking is not sent as a response with this command. Obtain it with the mag. read command.
- On the mechanical structure of the C/R, card intaking and reading mag. data are executed at the same time. Therefore, if transport is not executed properly during reading mag. data because of a card deformation or keeping a card during intaking, reading mag. data may not be done properly.
- After starting the Transport motor but an intaking card is kept with a hand, depending on the time to keep the card, the card may be transported to the Gate position then intaken.
- If a card is inserted halfway before receiving this command, the card is transported to the Gate position then intaken.

7.8 (22) Intake (from Rear)

(1) Command

IDN (1byte)	CMD (2bytes)	
"C"	"2"	"2"

(2) Positive Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"P"	"2"	"2"	See 6.1

(3) Negative Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"N"	"2"	"2"	See 6.2

(4) Detailed Functions

Normal Processing

- Runs the Transport motor to wait a card to be inserted from rear.
- Intakes a card from rear, and then transports it to the front standby position.

Retry and Error Processing

- When received this command in the status that there is a card in the C/R, sends a Command Sequence Error response ("N01").
- When this command is received in the status of Insertion Permission Status, sends a Command Sequence Error response ("N01").
- When a card is not inserted from rear within the time set by the Monitoring Timer Setting Command ("CW0"), sends a Monitoring Time-Out Error response ("N61").
- When a card is jammed in the C/R, sends a Card Jam Error response ("N10").
- When a card is jammed at rear of the C/R, sends a Card Jam at the Rear-end Error response ("N16").
- When the length of intaken card is detected as abnormal, sends a Too Long Card Error response ("N20") or Too Short Card Error response ("N21").

(5) Notes

- When there is a card at the Gate, the card cannot be intaken until the card is withdrawn. When a card is inserted before a card at the Gate is withdrawn, sends a Card Jam at the Rear-end Error response ("N16").
- When the C/R received this command, it does not send a response until intaking a card or the monitoring time passed. When aborting waiting for a card insertion, sends a DLE EOT from the host.
- When sending a DLE EOT from the host, in the case where the C/R is under intaking a card already, and the rear end of card has not passed the Sensor S3 yet, the behavior of card intaking is aborted. When the rear end of card has passed the Sensor S3, the behavior of card intaking is not aborted. If the behavior of card intaking is aborted on the way, the card is returned to the Gate position about 1 sec after the C/R sends a DLE EOT.
- On the mechanical structure of the C/R, the card intaking from rear and transporting the front standby position doesn't pass the mag. head. Therefore, it doesn't read the mag. data from the card intaking from rear.

7.9 (30) Return (to Front)

(1) Command

IDN (1byte)	CMD (2bytes)	
"C"	"3"	"0"

(2) Positive Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"P"	"3"	"0"	See 6.1

(3) Negative Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"N"	"3"	"0"	See 6.2

(4) Detailed Functions

Normal Processing

- Returns the card to the Gate position.
- Clears magnetic read data.

Retry and Error Processing

- When a card is not returned to the Gate position, sends a Card Jam Error response ("N10").

(5) Notes

- Sends a normal response when there is a card at the Gate position or no card in the C/R at the time this command is received.

7.10 (31) Return (to Rear)

(1) Command

IDN (1byte)	CMD (2bytes)	
"C"	"3"	"1"

(2) Positive Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"P"	"3"	"1"	See 6.1

(3) Negative Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"N"	"3"	"1"	See 6.2

(4) Detailed Functions

Normal Processing

- Ejects a card to rear and counts the number of ejected card.
- Clears magnetic read data.

Retry and Error Processing

- When received this command in the status that there is no card in the C/R, sends a Command Sequence Error response ("N01").
- When a card is jammed during being ejected, sends a Card Jam at the Rear-end Error response ("N16").

(5) Notes

- None

7.11 (40) Re-Intake

(1) Command

IDN (1byte)	CMD (2bytes)	
"C"	"4"	"0"

(2) Positive Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"P"	"4"	"0"	See 6.1

(3) Negative Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"N"	"4"	"0"	See 6.2

(4) Detailed Functions

Normal Processing

- Re-intakes a card at the Gate position and transports it to the rear card standby position. (Before intaking, a card is transported to forward/backward a little)
- Reads the mag. data as transporting the card to the rear standby position.

Retry and Error Processing

- When received this command without a card at the Gate, or card is withdrawn during re-intaking, sends an Incomplete Execution of Re-intake Error response ("N60").
- When a card is not re-intaken within the time set by the Monitoring Timer Setting Command ("CW2"), sends a Monitoring Time-Out Error response ("N63").
- When a card is kept at the Gate position, sends a Card Keeping Error response ("N64").
- When a card is jammed in the C/R, sends a Card Jam when Card Re-intake Error response ("N15").
- When the length of re-intaken card is detected as abnormal, sends a Too Long Card Error response ("N20") or Too Short Card Error response ("N21").

(5) Notes

- Sends a normal response when there is a card in the C/R at the time this command is received.
- The mag. data read during card intaking is not sent as a response with this command. Obtain it with the mag. read command.
- On the mechanical structure of the C/R, a returned card to the Gate does not pass the mag. head completely; the rear edge of card is left on the mag. head. Therefore, the performance of mag. head to re-intaking is not guaranteed.
- The host should treat a returned card to the Gate is withdrawn properly when received an Incomplete Execution of Re-intake Error response ("N60").

7.12 (41) Re-Intake + Reject

(1) Command

IDN (1byte)	CMD (2bytes)	
"C"	"4"	"1"

(2) Positive Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"P"	"4"	"1"	See 6.1

(3) Negative Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"N"	"4"	"1"	See 6.2

(4) Detailed Functions

Normal Processing

- Re-intakes a card at the Gate position, ejects a card to rear and counts the number of ejected card.
- Clears magnetic read data.

Retry and Error Processing

- When received this command in the status that there is no card at the Gate, or a card is withdrawn during re-intaking, sends a Incomplete Execution of Re-intake Error response ("N60").
- When a card is not re-intaken within the time set by the Monitoring Timer Setting Command ("CW2"), sends a Monitoring Time-Out Error response ("N63").
- When a card is kept at the Gate position, sends a Card Keeping Error response ("N64").
- When a card is jammed in the C/R, sends a Card Jam when Card Re-intake Error response ("N15").
- When a card is jammed during being ejected, sends a Card Jam at the Rear-end Error response ("N16").
- When the length of re-intaken card is detected as abnormal, sends a Too Long Card Error response ("N20") or Too Short Card Error response ("N21").

(5) Notes

- The host should treat a returned card to the Gate is withdrawn properly when received an Incomplete Execution of Re-intake Error response ("N60").

7.13 (61) Magnetic Read (ISO#1)

(1) Command

IDN (1byte)	CMD (2bytes)	
"C"	"6"	"1"

(2) Positive Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)	RDT (1~76bytes)
"P"	"6"	"1"	See 6.1 .	<1>

RDT	Length (Bytes)	Data (ASCII)	Meaning
<1>	1~76	Card Data	Magnetic Read Data in ISO #1

(3) Negative Response

(3-1) When an error code is Jitter Error ("46")

JDG (1byte)	RCM (2bytes)		RES (2bytes)		RDT (1~76bytes)
"N"	"6"	"1"	"4"	"6"	<1>

RDT	Length (Bytes)	Data (ASCII)	Meaning
<1>	1~76	Card Data	Magnetic Read Data in ISO #1

(3-2) When an error code is not Jitter Error ("46")

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"N"	"6"	"1"	See 6.2

(4) Detailed Functions

Normal Processing

- Sends the mag. data of ISO#1 track as a response that is read when re-intaking or when intaking a card from front of track.

Retry and Error Processing

- When received this command in the status that there is no card in the C/R, sends a Command Sequence Error response ("N01").
- For the type that the read head of ISO#1 track is not installed, sends a Command Sequence Error response ("N01").
- When a card in the C/R is intaken from rear, or a card that is intaken with an initial reset, sends a Read Track setting Error response ("N49") to this command.

(5) Notes

- On the mechanical structure of the C/R, transport for read retry cannot be done. Therefore, when a read error occurred, sends an error response only, and reading behavior for retry is not executed.
- When an error code is a Jitter Error ("46"), the mag. data is added to the negative response. It is necessary for the host to judge if the mag. data is correct depending on the length of data or content.
- There is a case where a card to which Too Long Card Error("20") or Too Short Card Error("21") occurred but mag. data is normal, so mag. read should be tried before ejecting the card as an abnormal length card.

7.14 (62) Magnetic Read (ISO#2)

(1) Command

IDN (1byte)	CMD (2bytes)	
"C"	"6"	"2"

(2) Positive Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)	RDT (1~37byte)
"P"	"6"	"2"	See 6.1	<1>

RDT	Length (Bytes)	Data (ASCII)	Meaning
<1>	1~37	Card Data	Magnetic Read Data in ISO #2

(3) Negative Response

(3-1) When an error code is Jitter Error ("46")

JDG (1byte)	RCM (2bytes)		RES (2bytes)		RDT (1~37bytes)
"N"	"6"	"2"	"4"	"6"	<1>

RDT	Length (Bytes)	Data (ASCII)	Meaning
<1>	1~37	Card Data	Magnetic Read Data in ISO #2

(3-2) When an error code is not Jitter Error ("46")

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"N"	"6"	"2"	See 6.2

(4) Detailed Functions

Normal Processing

- When intaking a card from front, or the mag. data of ISO#2 track that is read during re-intaking is sent as a response.

Retry and Error Processing

- When received this command in the status that there is no card in the C/R, sends a Command Sequence Error response ("N01").
- When a card in the C/R is intaken from rear or intaken with an initial reset, sends a Read Track setting Error response ("N49") to this command.

(5) Notes

- On the mechanical structure of the C/R, transport for read retry cannot be done. Therefore, when a read error occurred, sends an error response only, and reading behavior for retry is not executed.
- When an error code is a Jitter Error ("46"), the mag. data is added to the negative response. It is necessary for the host to judge if the mag. data is correct depending on the length of data or content.
- There is a case where a card to which Too Long Card Error ("20") or Too Short Card Error ("21") occurred but mag. data is normal, so mag. read should be tried before ejecting the card as an abnormal length card.

7.15 (63) Magnetic Read (ISO#3)

(1) Command

IDN (1byte)	CMD (2bytes)	
"C"	"6"	"3"

(2) Positive Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)	RDT (1~104bytes)
"P"	"6"	"3"	See 6.1	<1>

RDT	Length (Bytes)	Data (ASCII)	Meaning
<1>	1~104	Card Data	Magnetic Read Data in ISO #3

(3) Negative Response

(3-1) When an error code is Jitter Error ("46")

JDG (1byte)	RCM (2bytes)		RES (2bytes)	RDT (1~104bytes)	
"N"	"6"	"3"	"4"	"6"	<1>

RDT	Length (Bytes)	Data (ASCII)	Meaning
<1>	1~104	Card Data	Magnetic Read Data in ISO #3

(3-2) When an error code is not Jitter Error("46")

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"N"	"6"	"3"	See 6.2

(4) Detailed Functions

Normal Processing

- When intaking a card from front, or the mag. data of ISO#3 track that is read during re-intaking is sent as a response.

Retry and Error Processing

- When received this command in the status that there is no card in the C/R, sends a Command Sequence Error response ("N01").
- For the type that the read head of ISO#3 track is not installed, sends a Command Sequence Error response ("N01").
- When a card in the C/R is intaken from rear, or a card that is intaken with an initial reset, sends a Read Track setting Error response ("N49") to this command.

(5) Notes

- On the mechanical structure of the C/R, transport for read retry cannot be done. Therefore, when a read error occurred, sends an error response only, and reading behavior for retry is not executed.
- When an error code is a Jitter Error ("46"), the mag. data is added to the negative response. It is necessary for the host to judge if the mag. data is correct depending on the length of data or content.
- There is a case where a card to which Too Long Card Error ("20") or Too Short Card Error ("21") occurred but mag. data is normal, so mag. read should be tried before ejecting the card as an abnormal length card.

7.16 (64) Magnetic Read (JIS2)

(1) Command

IDN (1byte)	CMD (2bytes)	
"C"	"6"	"4"

(2) Positive Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)	RDT (1~69bytes)
"P"	"6"	"4"	See 6.1	<1>

RDT	Length (Bytes)	Data (ASCII)	Meaning
<1>	1~69	Card Data	Magnetic Read Data in JIS2

(3) Negative Response

(3-1) When an error code is Jitter Error ("46")

JDG (1byte)	RCM (2bytes)		RES (2bytes)	RDT (1~69bytes)	
"N"	"6"	"4"	"4"	"6"	<1>

RDT	Length (Bytes)	Data (ASCII)	Meaning
<1>	1~69	Card Data	Magnetic Read Data in JIS2

(3-2) When an error code is Card Check Error of banking facilities ("47")

JDG (1byte)	RCM (2bytes)		RES (2bytes)	RDT (1~69bytes)	
"N"	"6"	"4"	"4"	"7"	<1>

RDT	Length (Bytes)	Data (ASCII)	Meaning
<1>	1~69	Card Data	Magnetic Read Data in JIS2 (the data are coded)

(3-3) When error code is not Jitter Error ("46") or not Card Check Error of banking facilities ("47")

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"N"	"6"	"4"	See 6.2

(4) Detailed Functions

Normal Processing

-When intaking a card from front, or the mag. data of JIS#2 track that is read during re-intaking is sent as a response.

Retry and Error Processing

-When received this command in the status that there is no card in the C/R, sends a Command Sequence Error response ("N01").

- For the type that the read head of JIS2 track is not installed, sends a Command Sequence Error response ("N01").

- When a card in the C/R is intaken from rear, or a card that is intaken with an initial reset, sends a Read Track setting Error response ("N49") to this command.

-For a type of banking facility to which a card cannot be used, sends a Card Check Error of banking facilities response ("N47") when reading such kind of card.

(5) Notes

- On the mechanical structure of the C/R, transport for read retry cannot be done. Therefore, when a read error occurred, sends an error response only, and reading behavior for retry is not executed.

- When an error code is a Jitter Error ("46"), the mag. data is added to the negative response. It is necessary for the host to judge if the mag. data is correct depending on the length of data or content.

- When an error code is a Card Check Error of banking facilities ("47"), coded mag. data is added to a negative response.

- There is a case where a card to which Too Long Card Error ("20") or Too Short Card Error ("21") occurred but mag. data is normal, so mag. read should be tried before ejecting the card as an abnormal length card.

7.17 (6a) Magnetic Read (Multiple Tracks)

(1) Command

IDN (1byte)	CMD (2bytes)		CMP (2bytes)
"C"	"6"	"a"	<1>

CMP	Length (Byte)	Data (ASCII)	Meaning
<1>	1	"1"	ISO #1
		"2"	ISO #2
		"3"	ISO #3
		"4"	ISO #1 + ISO #2
		"5"	ISO #1 + ISO #3
		"6"	ISO #2 + ISO #3
		"7"	ISO #1 + ISO #2 + ISO #3
		"8"	JIS2
		"9"	JIS2 + ISO #1
		."	JIS2 + ISO #2
		"<"	JIS2 + ISO #1 + ISO #2

(2) Positive Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)	RDT (6~233bytes)			
"P"	"6"	"a"	See 6.1	<1>	<2> ~ <5>	<6> ~ <9>	<10> ~ <13>

RDT	Length (Bytes)	Data (ASCII)	Meaning	
<1>	1	"1"~"9", ".", "<"	Specified track number by command.	
<2>	0 or 2	Result of Reading	ISO #1	None order: none data Magnetic data normality: "00" Magnetic data error: see 6.2
<3>	0 or 2	Result of Reading	ISO #2	
<4>	0 or 2	Result of Reading	ISO #3	
<5>	0 or 2	Result of Reading	JIS2	
<6>	0 or 3	Length	ISO #1	None designating: none data Magnetic data normality: Magnetic Data Length Magnetic data error: "000"
<7>	0 or 3	Length	ISO #2	
<8>	0 or 3	Length	ISO #3	
<9>	0 or 3	Length	JIS2	
<10>	0~76	Card Data	ISO #1	None designating: none data Magnetic data normality: Magnetic data error: No data
<11>	0~37	Card Data	ISO #2	
<12>	0~104	Card Data	ISO #3	
<13>	0~69	Card Data	JIS2	

(3) Negative Response

(3-1) When error code is Read Error ("40"~"47", "49", "4A")

JDG (1byte)	RCM (2bytes)		RES (2bytes)	RDT (6~233bytes)			
"P"	"6"	"a"	See 6.2	<1>	<2> ~ <5>	<6> ~ <9>	<10> ~ <13>

RDT	Length (Bytes)	Data (ASCII)	Meaning	
<1>	1	"1"~"9", ".", "<"	Specified track number by command.	
<2>	0 or 2	Result of Reading	ISO #1	None order: none data Magnetic data normality: "00" Magnetic data error: see 6.2
<3>	0 or 2	Result of Reading	ISO #2	
<4>	0 or 2	Result of Reading	ISO #3	
<5>	0 or 2	Result of Reading	JIS2	None designating: none data Magnetic data normality: Magnetic Data Length Magnetic data error: "000"
<6>	0 or 3	Length	ISO #1	
<7>	0 or 3	Length	ISO #2	
<8>	0 or 3	Length	ISO #3	
<9>	0 or 3	Length	JIS2	None designating: none data Magnetic data normality: Magnetic data error: No data
<10>	0~76	Card Data	ISO #1	
<11>	0~37	Card Data	ISO #2	
<12>	0~104	Card Data	ISO #3	
<13>	0~69	Card Data	JIS2	

(3-2) When error code is not Read Error("40"~"47", "49", "4A")

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"N"	"6"	"a"	See 6.2

(4) Detailed Functions

Normal Processing

- Sends a response when taking a card from front, or the read result (including read errors), read data length and read data of (multiple) tracks that are read during re-intaking.
- Sends a positive response to the (multiple) track(s) specified by a command parameter if there is no less than 1 correctly read track.

Retry and Error Processing

- When received this command in the status that there is no card in the C/R, sends a Command Sequence Error response ("N01").
- When no less than 1 track to which read head is not installed in the (multiple) track(s) specified by a command parameter, sends a Command Parameter Error response ("N02").
- A negative response is sent when all the tracks are read errors on the (multiple) track(s) specified by a command parameter, an error code in this case, is to the highest priority track in the (multiple) track(s) specified by a command parameter. (Priority ISO#1>ISO#2>ISO#3>JIS2)
- When a card in the C/R is intaken from rear or intaken with an initial reset, sends a Read Track setting Error response ("N49") to this command.
- For a type of banking facility to which a card cannot be used, sends a Card Check Error of banking facilities response ("N47") when reading such kind of card.

(5) Notes

- On the mechanical structure of the C/R, transport for read retry cannot be done. Therefore, when a read error occurred, sends an error response only, and reading behavior for retry is not executed.
- When an error code is a Jitter Error ("46"), the mag. data is added to the negative response. It is necessary for the host to judge if the mag. data is correct depending on the length of data or content.
- When JIS2 track is a Card Check Error of banking facilities ("47"), the read result (including read errors), read data length and read data are set to the response data. The read mag. data is coded.
- There is a case where a card to which Too Long Card Error ("20") or Too Short Card Error ("21") occurred but mag. data is normal, so mag. read should be tried before ejecting the card as an abnormal length card.

7.18 (90) Waiting for Withdrawal

(1) Command

IDN (1byte)	CMD (2bytes)	
"C"	"g"	"0"

(2) Positive Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"P"	"g"	"0"	See 6.1

(3) Negative Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"N"	"g"	"0"	See 6.2

(4) Detailed Functions

Normal Processing

- Monitor a card withdrawal at the Gate position.
- Returns a normal response when a card was withdrawn.

Retry and Error Processing

- When received this command in the status that there is a card in the C/R, sends a Command Sequence Error response ("N01").
- When a card is not withdrawn within the time set by the Monitoring Timer Setting Command ("CW1"), sends a Monitoring Time-Out Error response ("N62").

(5) Notes

- When there is no card in the C/R at the time this command is received, sends a normal response of No Card.
- When the C/R received this command, a response is not sent until a card is withdrawn or the monitoring time is passed. When aborting waiting for a card withdrawal, sends a DLE EOT from the host.
- When a card was inserted again during the time between card withdrawal and sending a response, sends a normal response of Card at Gate position.

7.19 (C0) ICC Press

(1) Command

IDN (1byte)	CMD (2bytes)	
"C"	"C"	"0"

(2) Positive Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"P"	"C"	"0"	See 6.1

(3) Negative Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"N"	"C"	"0"	See 6.2

(4) Detailed Functions

Normal Processing

- Transports an IC card to the IC Contact press position then presses the IC Contact.

Retry and Error Processing

- When received this command in the status that there is no card in the C/R, sends a Command Sequence Error response ("N01").
- When a card is not transported to the IC Contact press position, sends a Card Jam Error response ("N10").
- When the IC contact is not pressed, sends an IC Solenoid Error response ("N81").

(5) Notes

- Sends a normal response when received this command in the status that the IC Contact is pressed already.

7.20 (C1) ICC Release

(1) Command

IDN (1byte)	CMD (2bytes)	
"C"	"C"	"1"

(2) Positive Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"P"	"C"	"1"	See 6.1

(3) Negative Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"N"	"C"	"1"	See 6.2

(4) Detailed Functions

Normal Processing

- Release the IC Contact then transports an IC card to the IC Contact release position.

Retry and Error Processing

- When this command is received in the status that the IC card in the C/R is activated, sends a Command Sequence Error response ("N01").
- When a card is not transported to the IC Contact release position, sends a Card Jam Error response ("N10").
- When fails to release the IC Contact, sends an IC Solenoid Error response ("N81").

(5) Notes

- Sends a normal response when there is no card in the C/R at the time this command is received.
- Sends a normal response when received this command in the status that there is a card in the C/R and the IC Contact is released.

7.21 (C2) ICC Activation

(1) Command

IDN (1byte)	CMD (2bytes)		CMP (0 or 2bytes)	
"C"	"C"	"2"	<1>	<2>

CMP	Length (Bytes)	Data (ASCII)		Meaning
		Value	Default value	
<1>	0 or 1	"0"~"7"	"0"	NAD (Node Address) of ICC
<2>	0 or 1	"0"~"7"	"0"	NAD of C/R

For details, see ISO/IEC 7816-3 Amd.1.

(2) Positive Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)	RDT (2~33bytes)				
"P"	"C"	"2"	See 6.1	<1>	<2>	<3>	<4>	<5>

RDT	Length (Bytes)	Data (BIN)	Meaning	
<1>	1	00H~FFH	TS	Initial Character
<2>	1	00H~FFH	T0	Format Character
<3>	0~31	Undefined	00H~FFH	TA1~TDn
<4>		0~15	00H~FFH	T1~Tk
<5>		0 or 1	00H~FFH	TCK	Check Character

For details, see ISO/IEC 7816-3.

(3) Negative Response

(3-1) When an error code is Unsupported ICC Error ("87")

JDG (1byte)	RCM (2bytes)		RES (2bytes)		RDT (2~33bytes)				
"N"	"C"	"2"	"8"	"7"	<2>	<3>	<4>	5>	<6>

RDT	Length (Bytes)	Data (BIN)	Meaning	
<2>	1	00H~FFH	TS	Initial Character
<3>	1	00H~FFH	T0	Format Character
<4>	0~31	Undefined	00H~FFH	TA1~TDn
<5>		0~15	00H~FFH	T1~Tk
<6>		0 or 1	00H~FFH	TCK	Check Character

(3-2) When an error code is not Unsupported ICC Error ("87")

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"N"	"C"	"2"	See 6.2

(4) Detailed Functions

Normal Processing

- Supplies an IC card with electricity and signals then activates the IC card (Cold Reset).
- Sends ATR information after receiving the ATR from the IC card.
- Sets the NAD value that is specified by the command parameter (The NDA only used T=1 protocol).

Retry and Error Processing

- When this command is received in the status that the IC Contact is not pressed, sends a Command Sequence Error response ("N01").
- When this command received in the status that the IC card is already activated, sends a Command Sequence Error response ("N01").
- When an unsupported ATR by the C/R has been received after the IC card activation, sends an ATR with an Unsupported ICC Error response ("N87").
- When an ATR is not received after activating an IC card, retry activation the time specified with the Retry Number Set Command ("CR5"). When still an ATR is not received, sends an Activation Error response ("N82").
- During retry activation, when a card is not transported to the IC Contact press position or the IC Contact release position, sends a Card Jam Error response ("N10").

(5) Notes

- When retry activation, release the IC Contact then transports a card to the IC Contact release position. From the position, transports the card to the IC Contact press position again to press the IC Contact. After that, executes an activation process.
- See Annex D about TA1 (F and D) which C/R supports in case of specific mode.

7.22 (C3) ICC Deactivation

(1) Command

IDN (1byte)	CMD (2bytes)	
"C"	"C"	"3"

(2) Positive Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"P"	"C"	"3"	See 6.1

(3) Negative Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"N"	"C"	"3"	See 6.2

(4) Detailed Functions

Normal Processing

- Turns off the electricity and signals to an IC card to deactivate the IC card.

Retry and Error Processing

- None

(5) Notes

- Sends a normal response when there is no card in the C/R at the time this command is received.
- Sends a normal response when this command is received in the status there is a card in the C/R and the IC Contact is released.
- Sends a normal response when this command is received in the status that the IC Contact is pressed but not activated.

7.23 (C5) ICC Press + Activation

(1) Command

IDN (1byte)	CMD (2bytes)		CMP (0 or 2bytes)	
"C"	"C"	"5"	<1>	<2>

CMP	Length (Bytes)	Data (ASCII)		Meaning
		Value	Default value	
<1>	0 or 1	"0"~"7"	"0"	NAD (Node Address) of ICC
<2>	0 or 1	"0"~"7"	"0"	NAD of C/R

For details, see ISO/IEC 7816-3 Amd.1.

(2) Positive Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)	RDT (2~33bytes)				
"P"	"C"	"5"	See 6.1	<1>	<2>	<3>	<4>	<5>

RDT	Length (Bytes)	Data (BIN)	Meaning		
<1>	1	00H~FFH	TS	Initial Character	
<2>	1	00H~FFH	T0	Format Character	
<3>	0~31	Undefined	00H~FFH	TA1~TDn	Interface Character
<4>		0~15	00H~FFH	T1~Tk	Historical Characters
<5>	0 or 1	00H~FFH	TCK	Check Character	

For details, see ISO/IEC 7816-3.

(3) Negative Response

(3-1) When an error code is Unsupported ICC Error ("87")

JDG (1byte)	RCM (2bytes)		RES (2bytes)		RDT (2~33bytes)				
"N"	"C"	"5"	"8"	"7"	<2>	<3>	<4>	5>	<6>

RDT	Length (Bytes)	Data (BIN)	Meaning		
<2>	1	00H~FFH	TS	Initial Character	
<3>	1	00H~FFH	T0	Format Character	
<4>	0~31	Undefined	00H~FFH	TA1~TDn	Interface Character
<5>		0~15	00H~FFH	T1~Tk	Historical Characters
<6>	0 or 1	00H~FFH	TCK	Check Character	

(3-2) When an error code is not Unsupported ICC Error ("87")

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"N"	"C"	"5"	See 6.2

(4) Detailed Functions

Normal Processing

- Transports an IC card to the IC Contact press position then presses the IC Contact.
- Supplies the IC card with electricity and signals then activate the IC card (Cold Reset).
- Sends ATR information after receiving the ATR from the IC card.
- Sets the NAD value that is specified by the command parameter (The NDA only used T=1 protocol).

Retry and Error Processing

- When received this command in the status that there is no card in the C/R, sends a Command Sequence Error response ("N01").
- When received this command in the status that the IC card is activated already, sends a Command Sequence Error response ("N01").
- When a card is not transported to the IC Contact press position, sends a Card Jam Error response ("N10").
- When the IC Contact is not pressed, sends an IC Solenoid Error response ("N81").
- When an ATR is not received after activating an IC card, retry the time as specified by the Retry Number Set Command ("CR5"). When still an ATR is not received, sends an ICC Activation Error response ("N82").
- During retry activation, when a card is not transported to the IC Contact release position, sends a Card Jam Error response ("N10").
- When an unsupported ATR by the C/R has been received after the IC card activation, sends an ATR with an Unsupported ICC Error response ("N87").

(5) Notes

- When received this command in the status that the IC Contact is pressed, executes activation of IC card only.
- When retry activation, release the IC Contact then transports a card to the IC Contact release position. From the position, transports the card to the IC Contact press position to press the IC Contact. After that, executes an activation process.
- See Annex D about TA1 (F and D) which C/R supports in case of specific mode.

7.24 (C6) ICC Deactivation + Release

(1) Command

IDN (1byte)	CMD (2bytes)	
"C"	"C"	"6"

(2) Positive Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"P"	"C"	"6"	See 6.1

(3) Negative Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"N"	"C"	"6"	See 6.2

(4) Detailed Functions

Normal Processing

- Turns off the electricity and signals to an IC card to deactivate the IC card.
- Release the IC Contact then transports the IC card to the IC Contact release position.

Retry and Error Processing

- When fails to release the IC Contact, sends an IC Solenoid Error response ("N81").
- When a card is not transported to the IC Contact release position, sends a Card Jam Error response ("N10").

(5) Notes

- Sends a normal response when there is no card in the C/R at the time this command is received.
- Sends a normal response when received this command in the status that there is a card in the C/R and the IC Contact is released.
- When received this command in the status that the IC Contact is pressed but not activated, releases the IC Contact only.

7.25 (E0) ICC Cold Reset

(1) Command

IDN (1byte)	CMD (2bytes)		CMP (1 or 3bytes)		
"C"	"E"	"0"	<1>	<2>	<3>

CMP	Length (Bytes)	Data (ASCII)		Meaning
		Value	Default Value	
<1>	1	"0"	--	C/R executes PPS automatically after ATR receiving
		"1"	--	C/R doesn't executes PPS automatically after ATR receiving
<2>	0 or 1	"0"~"7"	"0"	NAD (Node Address) of ICC
<3>	0 or 1	"0"~"7"	"0"	NAD of C/R

For details, see ISO/IEC 7816-3 Amd.1.

(2) Positive Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)	RDT (3~34bytes)					
"P"	"E"	"0"	See 6.1	<1>	<2>	<3>	<4>	<5>	<6>

RDT	Length (Bytes)	Data (BIN)		Meaning	
<1>	1	"0"		Enables to execute protocol type T=0 immediately	
		"1"		Enables to execute protocol type T=1 immediately	
		"P"		Needs to select protocol type by PPS Request Commands	
		"N"		Incompletion of PPS Execution	
		"?"		Command Parameter is " No PPS Execution automatically	
<2>	1	00H~FFH		TS	Initial Character
<3>	1	00H~FFH		T0	Format Character
<4>	0~31	Undefined	00H~FFH	TA1~TDn	Interface Character
<5>		0~15	00H~FFH	T1~Tk	Historical Characters
<6>		0 or 1	00H~FFH	TCK	Check Character

For details, see ISO/IEC 7816-3.

(3) Negative Response

(3-1) When an error code is Unsupported ICC Error ("87")

JDG (1byte)	RCM (2bytes)		RES (2bytes)	RDT (2~33bytes)					
"N"	"E"	"0"	"8"	"7"	<2>	<3>	<4>	5>	<6>

RDT	Length (Bytes)	Data (BIN)		Meaning	
<2>	1	00H~FFH		TS	Initial Character
<3>	1	00H~FFH		T0	Format Character
<4>	0~31	Undefined	00H~FFH	TA1~TDn	Interface Character
<5>		0~15	00H~FFH	T1~Tk	Historical Characters
<6>		0 or 1	00H~FFH	TCK	Check Character

(3-2) When an error code is not Unsupported ICC Error ("87")

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"N"	"E"	"0"	See 6.2

(4) Detailed Functions

Normal Processing

- Supplies an IC card with electricity and signals then activates the IC card (Cold Reset).
- Sends ATR information after receiving the ATR from the IC card.
- If possible, executes the PPS request (Only when it is specified by the command parameter).
- Sets the NAD value that is specified by the command parameter (The NDA only used T=1 protocol).

Retry and Error Processing

- When received this command in the status that the IC Contact is not pressed, sends a Command Sequence Error response ("N01").
- When received this command in the status that an IC card is already activated, sends a Command Sequence Error response ("N01").
- When an ATR is not received after activating an IC card, retry activation the time as specified by the Retry Number Set Command ("CR5"). When still an ATR is not received, sends an ICC Activation Error response ("N82").
- During retry activation, when a card is not transported to the IC Contact press position or the IC Contact release position, sends a Card Jam Error response ("N10").
- When an unsupported ATR by the C/R has been received after the IC card activation, sends an ATR with an Unsupported ICC Error response ("N87").

(5) Notes

- When retry activation, release the IC Contact then transports a card to the IC Contact release position. From the position, transports the card to the IC Contact press position again to press the IC Contact. After that, executes an activation process.
- See Annex D about TA1 (F and D) which C/R supports in case of specific mode.
- See Annex D about TA1 (F and D) which C/R executes PPS request in case of negotiable mode.

7.26 (E1) ICC Warm Reset

(1) Command

IDN (1byte)	CMD (2bytes)		CMP (1 or 3bytes)		
"C"	"E"	"1"	<1>	<2>	<3>

CMP	Length (Bytes)	Data (ASCII)		Meaning
		Value	Default Value	
<1>	1	"0"	--	C/R executes PPS automatically after ATR receiving
		"1"	--	C/R doesn't executes PPS automatically after ATR receiving
<2>	0 or 1	"0"~"7"	"0"	NAD (Node Address) of ICC
<3>	0 or 1	"0"~"7"	"0"	NAD of C/R

For details, see ISO/IEC 7816-3 Amd.1.

(2) Positive Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)	RDT (3~34bytes)					
"P"	"E"	"1"	See 6.1	<1>	<2>	<3>	<4>	<5>	<6>

RDT	Length (Bytes)	Data (BIN)		Meaning	
<1>	1	"0"		Enables to execute protocol type T=0 immediately	
		"1"		Enables to execute protocol type T=1 immediately	
		"P"		Needs to select protocol type by PPS Request Commands	
		"N"		Incompletion of PPS Execution	
		"?"		Command Parameter is " No PPS Execution "	
<2>	1	00H~FFH	TS	Initial Character	
<3>	1	00H~FFH	T0	Format Character	
<4>	0~31	Undefined	00H~FFH	TA1~TDn	Interface Character
<5>		0~15	00H~FFH	T1~Tk	Historical Characters
<6>		0 or 1	00H~FFH	TCK	Check Character

For details, see ISO/IEC 7816-3.

(3) Negative Response

(3-1) When an error code is Unsupported ICC Error ("87")

JDG (1byte)	RCM (2bytes)		RES (2bytes)		RDT (2~33bytes)				
"N"	"E"	"1"	"8"	"7"	<2>	<3>	<4>	5>	<6>

RDT	Length (Bytes)	Data (BIN)		Meaning	
<2>	1	00H~FFH	TS	Initial Character	
<3>	1	00H~FFH	T0	Format Character	
<4>	0~31	Undefined	00H~FFH	TA1~TDn	Interface Character
<5>		0~15	00H~FFH	T1~Tk	Historical Characters
<6>		0 or 1	00H~FFH	TCK	Check Character

(3-2) When an error code is not Unsupported ICC Error ("87")

JDG (1byte)	RCM (2bytes)		RES (2bytes)	
"N"	"E"	"1"	See 6.2	

(4) Detailed Functions

Normal Processing

- Supplies an IC card with electricity and signals then activates the IC card (Warm Reset).
- Sends ATR information after receiving the ATR from the IC card.
- If possible, executes the PPS request (Only when it is specified by the command parameter).
- Sets the NAD value that is specified by the command parameter(The NDA only used T=1 protocol).

Retry and Error Processing

- When received this command in the status that IC card is not activated, sends a Command Sequence Error response ("N01").
- When an ATR is not received after activating an IC card, sends an ICC Activation Error response ("N82") without retrying activation.
- When an unsupported ATR by the C/R has been received after the IC card activation, sends an ATR with an Unsupported ICC Error response ("N87").

(5) Notes

- See Annex D about TA1 (F and D) which C/R supports in case of specific mode.
- See Annex D about TA1 (F and D) which C/R executes PPS request in case of negotiable mode.

7.27 (F0) ICC T=0 Transmission

(1) Command

IDN (1byte)	CMD (2bytes)		CMP (4~261bytes)						
"C"	"F"	"0"	<1>	<2>	<3>	<4>	<5>	<6>	<7>

CMP	Length (Bytes)	Data (BIN)	Meaning	
<1>	1	00H~FEH	CLA	Instruction Class
<2>	1	00H~FFH	INS	Instruction Code
<3>	1	00H~FFH	P1	Instruction Parameter 1
<4>	1	00H~FFH	P2	Instruction Parameter 2
<5>	0 or 1	01H~FFH	Lc field	Number of byte(s) present in the data Field
<6>	Variable = Lc (0~255)	00H~FFH	Data field	String of byte(s) sent in the data field of the command
<7>	0 or 1	00H~FFH	Le field	Maximum Number of byte(s) expected in the data field of the response to the command

For details, see ISO/ICE 7816-4. But following case 1 to case 4 of table below is able to use.

ISO/IEC 7816-4: Annex A Transportation of APDUs by T=0				Remarks
A.1	Case 1			Enable
A.2	Case 2 short	Case 2S.1	Accepted Le	Enable
		Case 2S.2	Definitely not accepted Le	Enable
		Case 2S.3	Not accepted Le, specified La	*1
A.3	Case 3 short			Enable
A.4	Case 4 short	Case 4S.1	Not accepted Command	*1
		Case 4S.2	Accepted Command	*1
		Case 4S.3	Accepted Command with Information Added	*1
A.5	Case 2 Extended			Disable
A.6	Case 3 Extended			Disable
A.7	Case 4 Extended			Disable

*1: It is enabled to use only when ICC reference standard is "EMV4.0".

(2) Positive Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)	RDT (2~258bytes)		
"P"	"F"	"0"	See 6.1	<1>	<2>	<3>

RDT	Length (Bytes)	Data (ASCII)	Meaning	
<1>	0~256	ICC Data	INF	ICC Data (Information Field)
<2>	1	ICC Data	SW1	Status-1
<3>	1	ICC Data	SW2	Status-2

For details, see ISO/IEC 7816-4.

(3) Negative Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"N"	"F"	"0"	See 6.2

(4) Detailed Functions

Normal Processing

- The C/R sends or receives data between the host and ICC using T=0 protocol.

Retry and Error Processing

- When received this command in the status that IC card is not activated, sends a Command Sequence Error response ("N01").
- When the data C/R received from IC card exceeded the C/R's reception buffer size, sends a Reception from ICC Impossible Error response ("N80").
- When the C/R failed to complete communication with IC card within the time set by the Monitoring Timer Setting Command ("CY2"), sends a Reception from ICC Impossible Error response ("N80").
- When Monitoring time-out or parity error occurred during execution of communication with IC card, and the C/R failed in recovering although it executed retry, sends an ICC Communication Error response ("N84").
- When the C/R received invalid block or invalid data during execution of communication with IC card, sends an ICC Reception Data Error response ("N86").

(5) Notes

- For Case 1, the host has to send data to the C/R without Lc=00. The C/R sends the command parameter with Lc=00 to ICC. For details see ISO7816-4 Annex A.
- When a DLE EOT is received during a command execution, the command processing is aborted with the ICC is remained activated.
- When a Reception from ICC Impossible Error ("80") occurred, an IC card is deactivated.

7.28 (F1) ICC T=1 Transmission

(1) Command

(1-1) Normal Transmission (Lc < or = 353)

IDN (1byte)	CMD (2bytes)		CMP (4~360bytes)						
"C"	"F"	"1"	<1>	<2>	<3>	<4>	<5>	<6>	<7>

CMP	Length	Data (BIN)	Meaning	
<1>	1	00H~FEH	CLA	Instruction Class
<2>	1	00H~FFH	INS	Instruction Code
<3>	1	00H~FFH	P1	Instruction Parameter 1
<4>	1	00H~FFH	P2	Instruction Parameter 2
<5>	0, 1 or 3	01H~FFH	Lc field	Number of byte(s) present in the data Field
<6>	Variable = Lc (0~353)	00H~FFH	Data field	String of byte(s) sent in the data field of the command
<7>	0, 1 or 3	00H~FFH	Le field	Maximum Number of byte(s) expected in the data field of the response to the command

For details, see ISO/ICE 7816-4.

(1-2) The Last Block of Continuous Transmission (Lc > 353)

IDN (1byte)	CMD (2bytes)		CMP (0~360bytes)						
"C"	"F"	"1"	<6>						

CMP	Length (Bytes)	Data (BIN)	Meaning	
<6>	0~360	00H~FFH	Data field	String Byte sent in Command Data Field

For details, see ISO/ICE 7816-4.

(2) Positive Response

(2-1) Transmission Completion (RES="20")

JDG (1byte)	RCM (2bytes)		RES (2bytes)		RDT (2~320)			
"P"	"F"	"1"	"2"	"0"	<1>	<2>	<3>	

RDT	Length (Bytes)	Data (ASCII)	Meaning	
<1>	0~318	ICC Data	INF	ICC Data (Information Field)
<2>	1	ICC Data	SW1	Status-1
<3>	1	ICC Data	SW2	Status-2

For details, see ISO/IEC 7816-4.

(2-2) Continuous Reception Status (RES="21")

JDG (1byte)	RCM (2bytes)		RES (2bytes)		RDT (0~320bytes)			
"P"	"F"	"1"	"2"	"1"	<1>	<2>		

RDT	Length (Bytes)	Data (ASCII)	Meaning	
<1>	0~320	ICC Data	INF	ICC Data (Information Field)
<2>	0 or 1	ICC Data	SW1	Status-1

For details, see ISO/IEC 7816-4.

(3) Negative Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"N"	"F"	"1"	See 6.2

(4) Detailed Functions

Normal Processing

- The C/R sends or receives data between the host and ICC using T=1 protocol.
- When the C/R becomes the status of Continuously Receiving after executing a command, a positive response of RES="21" is sent. Otherwise, a positive response of RES="20" is sent.

Retry and Error Processing

- When received this command in the status that IC card is not activated, sends a Command Sequence Error response ("N01").
- When the C/R received this command in the status of Continuously Receiving (RES="21"), sends a Command Sequence Error response ("N01").
- When the data C/R received from IC card exceeded the C/R's reception buffer size, sends a Reception from ICC Impossible Error response ("N80").
- When the C/R failed to complete communication with IC card within the time set by the Monitoring Timer Setting Command ("CY2"), sends a Reception from ICC Impossible Error response ("N80").
- When Monitoring time-out or parity error occurred during execution of communication with IC card, and the C/R failed in recovering although it executed retry, sends an ICC Communication Error response ("N84").
- When the C/R received forceful termination (S (Abort, req)) during execution of communication with IC card, sends a Reception of ICC Forceful Termination Error response ("N85").
- When the C/R received invalid block or invalid data during execution of communication with IC card, sends an ICC Reception Data Error response ("N86").

(5) Notes

- This command should be used for transmission/reception of unchained data or for transmitting the last part of data chained.
- When a DLE EOT is received during a command execution, the command processing is aborted with the ICC is remained activated.
- When a Reception from ICC Impossible Error ("80") occurred, the IC card is deactivated.

7.29 (F2) ICC T=1 Continuous Transmission

(1) Command

(1-1) The first block of continuous transmission (Lc>353)

IDN (1byte)	CMD (2bytes)		CMP (4~360bytes)						
"C"	"F"	"2"	<1>	<2>	<3>	<4>	<5>	<6>	<7>

CMP	Length (Bytes)	Data (BIN)	Meaning	
<1>	1	00H~FEH	CLA	Instruction Class
<2>	1	00H~FFH	INS	Instruction Code
<3>	1	00H~FFH	P1	Instruction Parameter 1
<4>	1	00H~FFH	P2	Instruction Parameter 2
<5>	0, 1 or 3	01H~FFH	Lc field	Number of byte(s) present in the data Field
<6>	Variable = Lc (0~353)	00H~FFH	Data field	String of byte(s) sent in the data field of the command
<7>	0~2 *1	00H~FFH	Le field	Maximum Number of byte(s) expected in the data field of the response to the command

*1 The original length is 0, 1 or 3, but in a continuous transmission, it is from 0 to 2 since it may be divided.

(1-2) The block of continuous transmission except the top and last block (Lc>353)

IDN (1byte)	CMD (2bytes)		CMP (0~360bytes)						
"C"	"F"	"2"	<1>~<2>						

CMP	Length (Bytes)	Data (BIN)	Meaning	
<1>	0~360	00H~FFH	Data field	String Byte sent in Command Data Field
<2>	0~2 *1	00H~FFH	Le Field	Maximum Number of byte(s) expected in Data Field of Response to Command

*1 The original length is 0, 1 or 3, but in a continuous transmission, it is from 0 to 2 since it may be divided.

(2) Positive Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)	
"P"	"F"	"2"	"2"	"2"

(3) Negative Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)	
"N"	"F"	"2"	See 6.2	

(4) Detailed Functions

Normal Processing

- The C/R sends the chained data of T=1 protocol.
- After executing a command, the C/R becomes the status of continuously sending, a positive response of RES="22" is sent.

Retry and Error Processing

- When received this command in the status that an IC card is not activated, sends a Command Sequence Error response ("N01").
- When the C/R received this command in the status of Continuously Receiving (RES="21"), sends a Command Sequence Error response ("N01").
- When the data C/R received from IC card exceeded the C/R's reception buffer size, sends a Reception from ICC Impossible Error response ("N80").
- When the C/R failed to complete communication with IC card within the time set by the Monitoring Timer Setting Command ("CY2"), sends a Reception from ICC Impossible Error response ("N80").
- When Monitoring time-out or parity error occurred during execution of communication with IC card, and the C/R failed in recovering although it executed retry, sends an ICC Communication Error response ("N84").
- When the C/R received forceful termination (S (Abort, req)) during execution of communication with IC card, sends a Reception of ICC Forceful Termination Error response ("N85").
- When the C/R received invalid block or invalid data during execution of communication with IC card, sends an ICC Reception Data Error response ("N86").

(5) Notes

- This command should be used to send data after dividing when the data length to be sent to ICC is longer than the command parameter. But the T=1 Transmission command ("CF1") should be used in case that data length to be sent of the last block is within the command parameter.
- When a DLE EOT is received during a command execution, the command processing is aborted with the ICC is remained activated.
- When a Reception from ICC Impossible Error ("80"), the IC card is deactivated.

7.30 (F3) ICC T=1 Continuous Reception

(1) Command

IDN (1byte)	CMD (2bytes)	
"C"	"F"	"3"

(2) Positive Response

(2-1) Transmission Completion (RES="20")

JDG (1byte)	RCM (2bytes)		RES (2bytes)		RDT (1~320bytes)		
"P"	"F"	"3"	"2"	"0"	<1>	<2>	<3>

RDT	Length (Bytes)	Data (ASCII)	Meaning	
<1>	0~318	ICC Data	INF	ICC Data (Information Field)
<2>	0 or 1	ICC Data	SW1	Status-1
<3>	1	ICC Data	SW2	Status-2

For details, see ISO/IEC 7816-4.

(2-2) Continuous Reception Status (RES="21")

JDG (1byte)	RCM (2bytes)		RES (2bytes)		RDT (320bytes)	
"P"	"F"	"3"	"2"	"1"	<1>	<2>

RDT	Length (Bytes)	Data (ASCII)	Meaning	
<1>	319	ICC Data	INF	ICC Data (Information Field)
<2>	1	ICC Data	SW1	Status-1

For details, see ISO/IEC 7816-4.

(3) Negative Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)	
"N"	"F"	"3"	See 6.2	

(4) Detailed Functions

Normal Processing

- The C/R receives chained data of T=1 protocol.
- Sends a positive response of RES="21", when the C/R remains the status of Continuously Receiving after executing a command. When completing the status of Continuously Receiving of the C/R, sends a positive response of RES="20".

Retry and Error Processing

- When received this command in the status that the C/R is not the status of Continuously Receiving (RES="21"), sends a Command Sequence Error response ("N01").
- When the data C/R received from IC card exceeded the C/R's reception buffer size, sends a Reception from ICC Impossible Error response ("N80").
- When the C/R failed to complete communication with IC card within the time set by the Monitoring Timer Setting Command ("CY2"), sends a Reception from ICC Impossible Error response ("N80").
- When Monitoring time-out or parity error occurred during execution of communication with IC card, and the C/R failed in recovering although it executed retry, sends an ICC Communication Error response ("N84").
- When the C/R received forceful termination (S (Abort, req)) during execution of communication with IC card, sends a Reception of ICC Forceful Termination Error response ("N85").
- When the C/R received invalid block or invalid data during execution of communication with IC card, sends an ICC Reception Data Error response ("N86").

(5) Notes

- This command should be used for continuous data reception status (RES="21").
- When a DLE EOT is received during a command execution, the command processing is aborted with the ICC is remained activated.
- When a Reception from ICC Impossible Error ("80"), the IC card is deactivated.

7.31 (F4) ICC T=1 Interruption Completion

(1) Command

IDN (1byte)	CMD (2bytes)	
"C"	"F"	"4"

(2) Positive Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)	
"P"	"F"	"4"	"2"	"3"

(3) Negative Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)	
"N"	"F"	"4"	See 6.2	

(4) Detailed Functions

Normal Processing

- The C/R forcedly terminates to send or receive the data in T=1 protocol type.
- After executing a command, the C/R becomes the status of forcedly completing, then sends a positive response of RES="23".

Retry and Error Processing

- When the C/R received this command in the status of Continuously Receiving (RES="21"), or not Continuously Sending (RES="22"), sends a Command Sequence Error response ("N01").
- When the data C/R received from IC card exceeded the C/R's reception buffer size, sends a Reception from ICC Impossible Error response ("N80").
- When the C/R failed to complete communication with IC card within the time set by the Monitoring Timer Setting Command ("CY2"), sends a Reception from ICC Impossible Error response ("N80").
- When Monitoring time-out or parity error occurred during execution of communication with IC card, and the C/R failed in recovering although it executed retry, sends an ICC Communication Error response ("N84").
- When the C/R received forceful termination (S (Abort, req)) during execution of communication with IC card, sends a Reception of ICC Forceful Termination Error response ("N85").
- When the C/R received invalid block or invalid data during execution of communication with IC card, sends an ICC Reception Data Error response ("N86").

(5) Notes

- This command should be used for continuous data reception status (RES="21") or continuous data transmission status (RES="22").
- When a DLE EOT is received during a command execution, the command processing is aborted with the ICC is remained activated.
- When a Reception from ICC Impossible Error ("80"), the IC card is deactivated.

7.32 (F8) ICC PPS Exchange

(1) Command

IDN (1byte)	CMD (2bytes)		CMP (0~1byte)
"C"	"F"	"8"	<1>

CMP	Length (Bytes)	Data (ASCII)	Meaning
<1>	0 or 1	"0"	Selection of protocol type T=0.
		"1"	Selection of protocol type T=1.

(2) Positive Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)	RDT (1byte)	
"P"	"F"	"8"	"2"	"0"	<1>

RDT	Length (Bytes)	Data (ASCII)	Meaning
<1>	1	"0"	Enable to execute T=0.
		"1"	Enable to execute T=1.
		"N"	Incompletion PPS Execution

(3) Negative Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"N"	"F"	"8"	See 6.2

(4) Detailed Functions

Normal Processing

- The C/R executes a PPS request between the host and ICC in order to change "F and D" or "Protocol type".

Retry and Error Processing

- When received this command in the status of not after IC card activation (RES="11"), sends a Command Sequence Error response ("N01").
- When the data C/R received from IC card exceeded the C/R's reception buffer size, sends a Reception from ICC Impossible Error response ("N80").
- When the C/R failed to complete communication with IC card within the time set by the Monitoring Timer Setting Command ("CY2"), sends a Reception from ICC Impossible Error response ("N80").

(5) Notes

- Use this command in the status of after activating IC card (RES="11"). After executing receiving/sending T=0, or T=1, this command cannot be used.
- When a DLE EOT is received during a command execution, the IC card is deactivated.
- See Annex D about TA1 (F and D) which C/R executes PPS request in case of negotiable mode.

7.33 (G1) ICC Press + Cold Reset

(1) Command

IDN (1byte)	CMD (2bytes)		CMP (1 or 3bytes)		
"C"	"G"	"1"	<1>	<2>	<3>

CMP	Length (Bytes)	Data (ASCII)		Meaning
		Value	Default Value	
<1>	1	"0"	--	C/R executes PPS automatically after ATR receiving
		"1"	--	C/R doesn't execute PPS automatically after ATR receiving
<2>	0 or 1	"0"~"7"	"0"	NAD (Node Address) of ICC
<3>	0 or 1	"0"~"7"	"0"	NAD of C/R

For details, see ISO/IEC 7816-3 Amd.1.

(2) Positive Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)	RDT (3~34bytes)					
"P"	"G"	"1"	See 6.1	<1>	<2>	<3>	<4>	<5>	<6>

RDT	Length (Bytes)	Data (BIN)		Meaning	
<1>	1	"0"		Enables to execute protocol type T=0 immediately	
		"1"		Enables to execute protocol type T=1 immediately	
		"P"		Needs to select protocol type by PPS Request Commands	
		"N"		Incompletion of PPS Execution	
		"?"		Command Parameter is " No PPS Execution "	
<2>	1	00H~FFH		TS	Initial Character
<3>	1	00H~FFH		T0	Format Character
<4>	0~31	Undefined	00H~FFH	TA1~TDn	Interface Character
<5>		0~15	00H~FFH	T1~Tk	Historical Characters
<6>		0 or 1	00H~FFH	TCK	Check Character

For details, see ISO/IEC 7816-3.

(3) Negative Response

(3-1) When an error code is Unsupported ICC Error ("87")

JDG (1byte)	RCM (2bytes)		RES (2bytes)	RDT (2~33bytes)					
"N"	"G"	"1"	"8"	"7"	<2>	<3>	<4>	<5>	<6>

RDT	Length (Bytes)	Data (BIN)		Meaning	
<2>	1	00H~FFH		TS	Initial Character
<3>	1	00H~FFH		T0	Format Character
<4>	0~31	Undefined	00H~FFH	TA1~TDn	Interface Character
<5>		0~15	00H~FFH	T1~Tk	Historical Characters
<6>		0 or 1	00H~FFH	TCK	Check Character

(3-2) When an error code is not Unsupported ICC Error ("87")

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"N"	"G"	"1"	See 6.2

(4) Detailed Functions

Normal Processing

- Transports an IC card to the IC Contact press position then presses the IC Contact.
- Supplies an IC card with electricity and signals then activates the IC card. (Cold Reset)
- Sends ATR information after receiving the ATR from the IC card.
- If possible, executes the PPS request. (Only when it is specified by the command parameter)
- Sets the NAD value that is used by the T=1 protocol (Only when it is specified by the command parameter).

Retry and Error Processing

- When received this command in the status that there is no card in the C/R, sends a Command Sequence Error response ("N01").
- When received this command in the status that an IC card is already activated, sends a Command Sequence Error response ("N01").
- When a card is not transported to the IC Contact press position, sends a Card Jam Error response ("N10").
- When the IC Contact is not pressed, releases the IC Contact once, then transport it to the IC Contact press position and presses the IC Contact. If still the result is an error, sends an IC Solenoid Error response ("N81").
- When failing activation, retry activation the time specified by the Retry Number Set Command ("CR5"). If still activation is not executed normally, sends an ICC Activation Error response ("N82").
- During retry activation, when a card is not transported to the IC Contact release position, sends a Card Jam Error response ("N10").
- When an unsupported ATR by the C/R has been received after the IC card activation, sends an ATR with an Unsupported ICC Error response ("N87").

(5) Notes

- When received this command in the status that the IC Contact is pressed, executes the IC card and PPS.
- When retrying activation, release the IC Contact to transport a card to the IC Contact release position. From the position, transports the card to the IC Contact press position to press the IC Contact. Then executes activation process.
- See Annex D about TA1 (F and D) which C/R supports in case of specific mode.
- See Annex D about TA1 (F and D) which C/R executes PPS request in case of negotiable mode.

7.34 (I0) Cleaning (Waiting Cleaning Card Insertion + Cleaning + Return)

(1) Command

IDN (1byte)	CMD (2bytes)		CMP (0~1byte)
"C"	"1"	"0"	<1>

CMP	Length (Bytes)	Data (ASCII)	Meaning
<1>	1	"1"	Magnetic head(s), Rollers and Sensors
		"2"	IC Contact

(2) Positive Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"P"	"1"	"0"	See 6.1

(3) Negative Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"N"	"1"	"0"	See 6.2

(4) Detailed Functions

Normal Processing

- Waits a cleaning card to be inserted from front.
- Starts intaking behavior by running the Transport motor when the top end of a card reached to Sensor S0.
- When specified cleaning of the Magnetic head(s), Rollers and Sensors, transports the inserted card between the Gate position and Rear standby position repeatedly.
- When specified cleaning of the IC Contact, with the status that the IC Contact is pressed to the inserted card, transports the card forward/backward. After that, releases the IC Contact.
- After cleaning, returns the card to the Gate position.

Retry and Error Processing

- When received this command in the status that there is a card in the C/R, sends a Command Sequence Error response ("N01").
- When this command is received in the status of Insertion Permission Status sends a Command Sequence Error response ("N01").
- When a card is not intaken within the time set by the Monitoring Timer Setting Command ("CW0"), sends a Monitoring Time-Out Error response ("N61").
- When a card is kept at the Gate position, sends a Card Keeping Error response ("N64").
- When a card is jammed in the C/R, sends a Card Jam Error response ("N10").
- When the length of intaken card is detected as abnormal, sends a Too Long Card Error response ("N20") or Too Short Card Error response ("N21").
- When a card is withdrawn while cleaning the Magnetic head(s), Rollers and Sensors, sends a Card Withdrawn Error response ("N14").
- When a card is not returned to the Gate position, stops the card for a certain time, and then tries to return it again. When still not able to transport the card to the purposed position though repeated a few times, sends a Card Jam Error response ("N10").

(5) Notes

- Use this command before the sensor's becoming dirty and stopping functioning normally.
- When using a different cleaning card per each cleaning part, this command is more convenient than the "C11" command that is only for cleaning.
- After cleaning the sensor, use the Sensor Level Read command ("CL9") to check that the voltage level is normal.

7.35 (I1) Cleaning (Cleaning only)

(1) Command

IDN (1byte)	CMD (2bytes)		CMP (0~1byte)
"C"	"1"	"1"	<1>

CMP	Length (Bytes)	Data (ASCII)	Meaning
<1>	1	"1"	Magnetic head(s), Rollers and Sensors
		"2"	IC Contact

(2) Positive Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"P"	"1"	"1"	See 6.1

(3) Negative Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"N"	"1"	"1"	See 6.2

(4) Detailed Functions

Normal Processing

- When specified cleaning of the Magnetic head(s), Rollers and Sensors, transports the inserted card between the Gate position and Rear standby position repeatedly.
- When specified cleaning of the IC Contact, with the status that the IC Contact is pressed to the inserted card, transports the card forward/backward. After that, releases the IC Contact.

Retry and Error Processing

- When received this command in the status that there is no card in the C/R, sends a Command Sequence Error response ("N01").
- When a card is jammed in the C/R, sends a Card Jam Error response ("N10").
- When a card is withdrawn while cleaning the Magnetic head(s), Rollers and Sensors, sends a Card Withdrawn Error response ("N14").

(5) Notes

- Use this command before the sensor's becoming dirty and stopping functioning normally.
- Before executing this command, a cleaning card has to be intaken beforehand with an Intake Command ("C20") or so. After completing cleaning, it is necessary to return a cleaning card with a Return Command ("C30") or so.
- When continuously using one cleaning card for more that one cleaning part, this command is more convenient than the "C10" Command that executes intaking/returning a cleaning card.
- After cleaning the sensor, use the Sensor Level Read command ("CL9") to check that the voltage level is normal.

7.36 (L9) Sensor Level Read

(1) Command

IDN (1byte)	CMD (2bytes)	
"C"	"L"	"g"

(2) Positive Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)	RDT (10bytes)				
"P"	"L"	"g"	See 6.1	<1>	<2>	<3>	<4>	<5>

RDT	Length (Bytes)	Data (ASCII)		Meaning	
<1>	2	"00"~"50"	0.0~5.0V	Sensor S0	Sensor Voltage
<2>	2	"00"~"50"	0.0~5.0V	Sensor S1	
<3>	2	"00"~"50"	0.0~5.0V	Sensor S2	
<4>	2	"00"~"50"	0.0~5.0V	Sensor S3	
<5>	2	"00"~"50"	0.0~5.0V	Sensor S4	

(3) Negative Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"N"	"L"	"g"	See 6.2

(4) Detailed Functions

Normal Processing

- Reads the voltage of the each sensor in the C/R.

Retry and Error Processing

- None

(5) Notes

- After cleaning the sensor, use this command to check that the voltage level is normal.

7.37 (LA) Sensor Warning Read

(1) Command

IDN (1byte)	CMD (2bytes)	
"C"	"L"	"A"

(2) Positive Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)	RDT (5bytes)				
"P"	"L"	"A"	See 6.1	<1>	<2>	<3>	<4>	<5>

RDT	Length (Bytes)	Data (ASCII)	Meaning
<1>	1	"0"	Output level of Sensor S0 is normal
		"1"	Output level of Sensor S0 is lowered
<2>	1	"0"	Output level of Sensor S1 is normal
		"1"	Output level of Sensor S1 is lowered
<3>	1	"0"	Output level of Sensor S2 is normal
		"1"	Output level of Sensor S3 is lowered
<4>	1	"0"	Output level of Sensor S3 is normal
		"1"	Output level of Sensor S3 is lowered
<5>	1	"0"	Output level of Sensor S4 is normal
		"1"	Output level of Sensor S5 is lowered

(3) Negative Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"N"	"L"	"A"	See 6.2

(4) Detailed Functions

Normal Processing

- Reads if it is a status in which the output level of photo sensor is lowered (warning status).

Retry and Error Processing

- None

(5) Notes

- The output level of photo sensor is checked when taking in a card and returning a card. And it will become a warning status when the status in which the output level is lowered is repeated more than the regulated times.
- A warning status is stored in the RAM, and valid until the power is turned off.

7.38 (N0) Option Read

(1) Command

IDN (1byte)	CMD (2bytes)	
"C"	"N"	"0"

(2) Positive Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)	RDT (32bytes)						
"P"	"N"	"0"	See 6.1	<1>	<2>	<3>	<4>	...	<7>	

RDT	Length (Bytes)	Data (ASCII)	Meaning	
<1>	1	"0"	Without Pin-Shutter	Presence of Pin-Shutter
		"1"	With Pin-Shutter	
<2>	1	"0"	Without IC Contact	Presence of IC Contact
		"1"	With IC Contact	
<3>	1	"0"	No head	ISO #1 head type
		"1"	Read-only	
<4>	1	"0"	No head	ISO #2 head type
		"1"	Read-only	
<5>	1	"0"	No head	ISO #3 head type
		"1"	Read-only	
<6>	1	"0"	No head	JIS 2 head type
		"1"	Read-only	
<7>	26	"0"	Fixed	Spare

(3) Negative Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"N"	"N"	"0"	See 6.2

(4) Detailed Functions

Normal Processing

- The C/R reads the information of the installed options.

Retry and Error Processing

- None

(5) Notes

- None

7.39 (Q0) Reject Number Read

(1) Command

IDN (1byte)	CMD (2bytes)	
"C"	"Q"	"0"

(2) Positive Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)	RDT (3bytes)
"P"	"Q"	"0"	See 6.1	<1>

RDT	Length (Bytes)	Data (ASCII)	Meaning
<1>	3	"000"~"999"	Captured Number of Card

(3) Negative Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"N"	"Q"	"0"	See 6.2

(4) Detailed Functions

Normal Processing

- The C/R reads the number of the ejected (captured) card(s) to rear.

Retry and Error Processing

- None

(5) Notes

- About the captured number of cards, after "999" is "000".

7.40 (Q1) Reset of Reject Number

(1) Command

IDN (1byte)	CMD (2bytes)	
"C"	"Q"	"1"

(2) Positive Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"P"	"Q"	"1"	See 6.1

(3) Negative Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"N"	"Q"	"1"	See 6.2

(4) Detailed Functions

Normal Processing

- The C/R resets the number of the ejected (captured) card(s) to rear ("000").

Retry and Error Processing

- The C/R sends a Command Sequence Error response ("N01") when it receives this command during insertion permission.

(5) Notes

- None

7.41 (R3) Retry Counter Setting (Return Error)

(1) Command

IDN (1byte)	CMD (2bytes)		CMP (2bytes)
"C"	"R"	"3"	<1>

CMP	Length (Bytes)	Data (ASCII)		Meaning
		Value	Default	
<1>	2	"00"~"99"	"03"	Number of times the retries are executed.

(2) Positive Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"P"	"R"	"3"	See 6.1

(3) Negative Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"N"	"R"	"3"	See 6.2

(4) Detailed Functions

Normal Processing

- The C/R sets the retry number when it fails to return to the Gate position.

Retry and Error Processing

- None

(5) Notes

- The retry number is initiated to be the default value when the C/R is turned on.
- This command relates to the Return Command ("C30").

7.42 (R5) Retry Counter Setting (ICC Activation Error)

(1) Command

IDN (1byte)	CMD (2bytes)		CMP (1byte)
"C"	"R"	"5"	<1>

CMP	Length (Bytes)	Data (ASCII)		Meaning
		Value	Default	
<1>	1	"0"~"9"	"1"	Number of times the retries are executed.

(2) Positive Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"P"	"R"	"5"	See 6.1

(3) Negative Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"N"	"R"	"5"	See 6.2

(4) Detailed Functions

Normal Processing

- The C/R sets the retry number when it fails to activate an ICC.

Retry and Error Processing

- None

(5) Notes

- The retry number is initiated to be the default value when the C/R is turned on.
- This command relates to the activation or cold reset commands ("CC2", "CE0", "CC5", "CG1", "Cm2" and "Cm5").

7.43 (UA) User Information Read

(1) Command

IDN (1byte)	CMD (2bytes)		CMP (3bytes)
"C"	"U"	"A"	<1>

CMP	Length (Bytes)	Data (ASCII)	Meaning
<1>	3	"001"~"256"	Size of the User Information to be read. (Specified by the user)

(2) Positive Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)	RDT (1~256bytes)
"P"	"U"	"A"	See 6.1	<1>

RDT	Length (Bytes)	Data (HEX)	Meaning
<1>	1~256	Variable	User Information *1

*1 When User Information is not written, respond "_" s (20 H) of the designated length.

(3) Negative Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"N"	"U"	"A"	See 6.2

(4) Detailed Functions

Normal Processing

- Sends the User Information from the top that is the length specified by the command parameter.

Retry and Error Processing

- None

(5) Notes

- The read information is the one that is written by the User Information Write Command ("CUB") from the host.

7.44 (UB) User Information Write

(1) Command

IND (1byte)	CMD (2bytes)		CMP (1~256bytes)
"C"	"U"	"B"	<1>

CMP	Length (Bytes)	Data (HEX)	Meaning
<1>	1~256	Variable	User Information

(2) Positive Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"P"	"U"	"B"	See 6.1

(3) Negative Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"N"	"U"	"B"	See 6.2

(4) Detailed Functions

Normal Processing

- Writes the user information specified by the command parameter.

Retry and Error Processing

- None

(5) Notes

- Content for writing is optional
- The written user information cannot be deleted since it is stored in the Flash memory.

7.45 (V0) FW Version Read (ROM and Total FW)

(1) Command

IDN (1byte)	CMD (2bytes)	
"C"	"V"	"0"

(2) Positive Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)	RDT (62bytes)			
"P"	"V"	"0"	See 6.1	<1>	<2>	...	<9>

RDT	Length (Bytes)	Data (ASCII)	Meaning
<1>	12	"AAAAAAAAAAAA"	FW Type in CPU ROM
<2>	2	"AA"	FW Version in CPU ROM
<3>	6	"000000"~"FFFFFF"	SUM Value of FW in CPU ROM
<4>	12	"_____"	Spare
<5>	2	"_ "	Spare
<6>	6	"_____"	Spare
<7>	12	"AAAAAAAAAAAA"	Total FW Type in Flash Memory
<8>	2	"AA"	Total FW Version in Flash Memory
<9>	8	"00000000"~"FFFFFFF"	SUM Value of Total FW in Flash Memory

(3) Negative Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"N"	"V"	"0"	See 6.2

(4) Detailed Functions

Normal Processing

- The C/R reads the Total FW information (Type, Version and Sum value) in the CPU ROM and the Flash memory.

Retry and Error Processing

- None

(5) Notes

- When the FW is not downloaded in the Flash memory, "_" is specified in the FW type and version. ("_" Denotes 20H of HEX code.)
- When the FW is not downloaded in the Flash memory, "0" is specified in the SUM value.

7.46 (V1) FW Version Read (ICC FW)

(1) Command

IDN (1byte)	CMD (2bytes)	
"C"	"V"	"1"

(2) Positive Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)	RDT (22bytes)		
"P"	"V"	"1"	See 6.1	<1>	<2>	<3>

RDT	Length (Bytes)	Data (ASCII)	Meaning
<1>	12	"AAAAAAAAAAAA"	ICC FW type in Flash Memory
<2>	2	"AA"	ICC FW Version in Flash Memory
<3>	8	"00000000"~"FFFFFFF"	SUM Value of ICC FW in Flash Memory

(3) Negative Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"N"	"V"	"1"	See 6.2

(4) Detailed Functions

Normal Processing

- The C/R reads the ICC FW information (Type, Version and Sum value) in the Flash memory.

Retry and Error Processing

- None

(5) Notes

- When the FW is not downloaded in the Flash memory, sends a Stored Program in Flash Memory Imperfection Error response ("N70").

7.47 (V3) FW Version Read (Memory Card FW)

(1) Command

IDN (1byte)	CMD (2bytes)	
"C"	"V"	"3"

(2) Positive Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)	RDT (22bytes)		
"P"	"V"	"2"	See 6.1	<1>	<2>	<3>

RDT	Length (Bytes)	Data (ASCII)	Meaning
<1>	12	"AAAAAAAAAAAA"	Memory Card FW type in Flash Memory
<2>	2	"AA"	Memory Card FW Version in Flash Memory
<3>	8	"00000000"~"FFFFFFF"	SUM Value of Memory Card FW in Flash Memory

(3) Negative Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"N"	"V"	"3"	See 6.2

(4) Detailed Functions

Normal Processing

- The C/R reads the memory card FW information (Type, Version and Sum value) in the Flash memory.

Retry and Error Processing

- None

(5) Notes

- When the FW is not downloaded in the Flash memory, sends a Stored Program in Flash Memory Imperfection Error response ("N70").

7.48 (W0) Monitoring Time Setting (for In-take)

(1) Command

IDN (1byte)	CMD (2bytes)		CMP (2bytes)
"C"	"W"	"0"	<1>

CMP	Length (Bytes)	Data (ASCII)			Meaning
		Value	Unit	Default	
<1>	2	"00"~"99"	Seconds	"30"	Monitoring Time ("00": Waits infinitely)

(2) Positive Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"P"	"W"	"0"	See 6.1

(3) Negative Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"N"	"W"	"0"	See 6.2

(4) Detailed Functions

Normal Processing

- The C/R sets the monitoring time until the Card Inserted from front or rear.

Retry and Error Processing

- None

(5) Notes

- The monitoring time is initiated to be the default value when the C/R is turned on.
- This command relates to the intake command ("C20", "C22").

7.49 (W1) Monitoring Time Setting (for Withdrawal)

(1) Command

IDN (1byte)	CMD (2bytes)		CMP (2bytes)
"C"	"W"	"1"	<1>

CMP	Length (Bytes)	Data (ASCII)			Meaning
		Value	Unit	Default	
<1>	2	"00"~"99"	Seconds	"30"	Monitoring Time ("00": Waits infinitely)

(2) Positive Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"P"	"W"	"1"	See 6.1

(3) Negative Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"N"	"W"	"1"	See 6.2

(4) Detailed Functions

Normal Processing

- The C/R sets the monitoring time until the card is withdrawn from the Gate position.

Retry and Error Processing

- None

(5) Notes

- The monitoring time is initiated to be the default value when the C/R is turn on.
- This command relates to the waiting for removal command ("C90").

7.50 (W2) Monitoring Time Setting (for Re-intake)

(1) Command

IDN (1byte)	CMD (2bytes)		CMP (2bytes)
"C"	"W"	"2"	<1>

CMP	Length (Bytes)	Data (ASCII)			Meaning
		Value	Unit	Default	
<1>	2	"00"~"99"	Seconds	"10"	Monitoring Time ("00": Waits infinitely)

(2) Positive Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"P"	"W"	"2"	See 6.1

(3) Negative Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"N"	"W"	"2"	See 6.2

(4) Detailed Functions

Normal Processing

- The C/R sets the monitoring time until the card at the Gate position is re-intaken into the C/R.

Retry and Error Processing

- None

(5) Notes

- The monitoring time is initiated to be the default value when the C/R is turned on.
- This command relates to the re-intake command ("C40").

7.51 (Y0) ICC Control Information Read

(1) Command

IDN (1byte)	CMD (2bytes)	
"C"	"Y"	"0"

(2) Positive Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)	RDT (16bytes)				
"P"	"Y"	"0"	See 6.1	<1>	<2>	<3>	<4>	<5>

RDT	Length (Bytes)	Data (ASCII)	Meaning
<1>	2	"00"	ISO 7816-3 (Default)
		"05"	EMV4.0
<2>	2	"06"~"99"	Monitoring time for waiting for reception from ICC (Default ="10"(10sec))
<3>	1	"0"	Automatic IFSD Request (Default)
		"1"	No IFSD Request
<4>	1	"0"	TCK Check (Default)
		"1"	No TCK Check
<5>	10	"0"	Spare (Fixed to "0")

(3) Negative Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"N"	"Y"	"0"	See 6.2

(4) Detailed Functions

Normal Processing

- Reads the control information for handling IC card.

Retry and Error Processing

- None

(5) Notes

- None

7.52 (Y1) ICC Control Information Setting (ICC Mode)

(1) Command

IDN (1byte)	CMD (2bytes)		CMP (2bytes)
"C"	"Y"	"1"	<1>

CMP	Length (Bytes)	Data (ASCII)	Meaning
<1>	2	"00"	ISO7816 (Default)
		"05"	EMV4.0

(2) Positive Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"P"	"Y"	"1"	See 6.1

(3) Negative Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"N"	"Y"	"1"	See 6.2

(4) Detailed Functions

Normal Processing

- The C/R sets control mode for handling IC card.

Retry and Error Processing

- When this command is received during insertion permission, the C/R sends a Command Sequence Error response ("N01").
- When this command is received during ICC activation, the C/R sends a Command Sequence Error response ("N01").

(5) Notes

- This setting is remained even though the power of C/R is turned off.

7.53 (Y2) ICC Control Information Setting (Monitoring time for reception)

(1) Command

IDN (1byte)	CMD (2bytes)		CMP (2bytes)
"C"	"Y"	"2"	<1>

CMP	Length (Bytes)	Data (ASCII)	Meaning
1	2	"06"~"99"	Monitoring time for reception from ICC (Default ="10"(10sec))

(2) Positive Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"P"	"Y"	"2"	See 6.1

(3) Negative Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"N"	"Y"	"2"	See 6.2

(4) Detailed Functions

Normal Processing

- The C/R sets the monitoring time for reception from IC card.

Retry and Error Processing

- When this command is received during insertion permission, the C/R sends a Command Sequence Error response ("N01").
- When this command is received during ICC activation, the C/R sends a Command Sequence Error response ("N01").

(5) Notes

- This setting is remained even though the power of C/R is turned off.

7.54 (Y3) ICC Control Information Setting (IFSD Control Method)

(1) Command

IDN (1byte)	CMD (2bytes)		CMP (1byte)
"C"	"Y"	"3"	<1>

CMP	Length (Byte)	Data (ASCII)	Meaning
<1>	1	"0"	Automatic IFSD Request (Default)
		"1"	No IFSD Request

(2) Positive Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"P"	"Y"	"3"	See 6.1

(3) Negative Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"N"	"Y"	"3"	See 6.2

(4) Detailed Functions

Normal Processing

- The C/R sets the IFSD control method when it sends the data to IC card using T=1 protocol.

Retry and Error Processing

- When this command is received during insertion permission, the C/R sends a Command Sequence Error response ("N01").
- When this command is received during ICC activation, the C/R sends a Command Sequence Error response ("N01").

(5) Notes

- This setting is remained even though the power of C/R is turned off.

7.55 (Y4) ICC Control Information Setting (TCK Control Method)

(1) Command

IDN (1byte)	CMD (2bytes)		CMP (1byte)
"C"	"Y"	"4"	<1>

CMP	Length (Byte)	Data (ASCII)	Meaning
<1>	1	"0"	TCK Checks (Default)
		"1"	No TCK Check

(2) Positive Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"P"	"Y"	"4"	See 6.1

(3) Negative Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"N"	"Y"	"4"	See 6.2

(4) Detailed Functions

Normal Processing

- The C/R sets the TCK control method when it activates IC card.

Retry and Error Processing

- When this command is received during insertion permission, the C/R sends a Command Sequence Error response ("N01").
- When this command is received during ICC activation, the C/R sends a Command Sequence Error response ("N01").

(5) Notes

- This setting is remained even though the power of C/R is turned off.

7.56 (d3) DL Preparation

(1) Command

IDN (1byte)	CMD (2bytes)		CMP (22bytes)		
"C"	"d"	"3"	<1>	<2>	<3>

CMP	Length (Bytes)	Data (ASCII)	Meaning
1	12	"AAAAAAAAAAAA"	Total FW type in Flash Memory
2	2	"AA"	Total FW Version in Flash Memory
3	8	"00000000"~"FFFFFFF"	SUM Value of Total FW in Flash Memory

(2) Positive Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"P"	"d"	"3"	See 6.1

(3) Negative Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"N"	"d"	"3"	See 6.2 .

(4) Detailed Functions

Normal Processing

- Sends a normal response and turns the DTR signal off.
- Runs the program in CPU ROM and turns the DTR signal on.
- Has the C/R be downloadable and waits for the DL Start Command ("Cd4").

Retry and Error Processing

- When the Total FW information (Type and Version) specified by a command parameter does not accord the FW in the Flash memory, sends a Command Parameter Error response ("N02").
- When there is a card in the C/R, sends a Command Sequence Error response ("N01")

(5) Notes

- The host should send an initial reset command after turning on the DTR signal, and send the DL Start Command ("Cd4").
- This command is used for the C/R to start downloading FW from a normal status. When starting downloading FW in the status that a Stored Program in Flash Memory Imperfection Error response ("N70") is occurred, this command is not necessary to execute. Executes the DL Start Command ("Cd4") immediately.

7.57 (d4) DL Start

(1) Command

IDN (1byte)	CMD (2bytes)		CMP (26~226bytes)				
"C"	"d"	"4"	<1>	<2>	<3>	<4>	<5>

CMP	Length (Bytes)	Data (ASCII)	Meaning
<1>	12	"AAAAAAAAAAAA"	FW Type in CPU ROM
<2>	2	"AA"	FW Version in CPU ROM
<3>	6	"00000"~"FFFFFF"	SUM Value of FW in CPU ROM
<4>	4	"0012"~"0512"	One Block Size of Download Firmware
<5>	4	"0001"~"9999"	Total Block Number of Download Firmware

(2) Positive Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"P"	"d"	"4"	See 6.1

(3) Negative Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"N"	"d"	"4"	See 6.2

(4) Detailed Functions

Normal Processing

- Confirms if the firmware is downloadable.
- Erases all FW in the Flash memory.

Retry and Error Processing

- When the FW information (Type and Version) specified by a command parameter does not accord the FW in the CPU ROM, sends a Command Parameter Error response ("N02").

(5) Notes

- After executing this command, since the FW in the Flash Memory is deleted, when downloading FW is aborted, it becomes the status that the Stored Program in Flash Memory Imperfection Error response ("N70") is occurred. In this case, re-start downloading FW.

7.58 (d5) DL Transmission

(1) Command

IDN (1byte)	CMD (2bytes)		CMP (12~512bytes)
"C"	"d"	"5"	<1>

CMP	Length (Byte)	Data (BIN)	Meaning
<1>	12~512	Variable	Data of Download Firmware

(2) Positive Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"P"	"d"	"5"	See 6.1

(3) Negative Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"N"	"d"	"5"	See 6.2

(4) Detailed Functions

Normal Processing

- Stores the download firmware data into Flash memory.

Retry and Error Processing

- When a download data is not correct, sends a Command Parameter Error response ("N02")

(5) Notes

- Hitachi-Omron Terminal Solutions, Corp. supplies a download data.
- For downloading FW, all the FWs in the Flash Memory are done together. It is not possible to download the ICC FW or the Memory Card FW separately.

7.59 (d6) DL Completion

(1) Command

IDN (1byte)	CMD (2bytes)	
"C"	"d"	"6"

(2) Positive Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)	RDT (20 or 22bytes)		
"P"	"d"	"6"	See 6.1	<1>	<2>	<3>

RDT	Length (Bytes)	Data (ASCII)	Meaning
<1>	12	"AAAAAAAAAAAA"	Downloaded Total FW type
<2>	2	"AA"	Downloaded Total FW Version
<3>	8	"00000000"~"FFFFFFF"	SUM Value of Downloaded Total FW

(3) Negative Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"N"	"d"	"6"	See 6.2

(4) Detailed Functions

Normal Processing

- Completes writing to the Flash memory and confirms if the writing was normal. Sends a DL Completion Response (RES="31").
- Turns off the DTR signal and the new program downloaded in the Flash memory runs.
- Turns on the DTR signal and waits for an initial reset command.

Retry and Error Processing

- None

(5) Notes

- The host has to send an initial reset command after turning on the DTR signal if it receives a DL Completion Response (RES="31") to the DL Completion Command ("Cd6").
- When the FW is not downloaded in the Flash memory, "_" is specified in the FW type and version. ("_" Denotes 20H of HEX code.)
- When the FW is not downloaded in the Flash memory, "0" is specified in the SUM value.

7.60 (m2) Memory Card Activation

(1) Command

IDN (1byte)	CMD (2bytes)		CMP (1byte)
"C"	"m"	"2"	<1>

CMP	Length (Byte)	Data (ASCII)	Meaning
<1>	1	"0"	SLE 4442
		"1"	SLE 4432
		"2"	SLE 4428
		"4"	AT24C01ASC/ AT24C02SC / AT24C16SC
		"5"	AT24C64SC

(2) Positive Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)	RDT (0 or 4bytes)
"P"	"m"	"2"	See 6.1	<1>

RDT	Length (Bytes)	Data (HEX)	Meaning
<1>	1	00H~FFH	ATR Data 1
<2>	1	00H~FFH	ATR Data 2
<3>	1	00H~FFH	ATR Data 3
<4>	1	00H~FFH	ATR Data 4

(3) Negative Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"N"	"m"	"2"	See 6.2

(4) Detailed Functions

Normal Processing

- Supplies a memory card with electricity and signals then activates the memory card.
- Sends an ATR received from the card (4bytes) in the case of SLE4442/4432/4428.

Retry and Error Processing

- When this command is received in the status that the IC Contact is not pressed, sends a Command Sequence Error response ("N01").
- When this command is received in the status that the memory card is already activated, sends a Command Sequence Error response ("N01").
- When all the data in ATR are 00H or FFH, the C/R deactivates a memory card and sends an ICC Activation Error response ("N82").
- When an ATR is not received after activating a memory card, retry activation the time specified by the Retry Number Set Command ("CR5") When still an ATR is not received, sends an ICC Activation Error response ("N82").
- During retry activation, when a card is not transported to the IC Contact press position or the IC Contact release position, sends a Card Jam Error response ("N10").

(5) Notes

- When retrying activation, release the IC Contact to transport a card to the IC Contact release position. From the position, transports the card to the IC Contact press position to press the IC Contact. Then executes activation process.

7.61 (m3) Memory Card Deactivation

(1) Command

IDN (1byte)	CMD (2bytes)	
"C"	"m"	"3"

(2) Positive Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"P"	"m"	"3"	See 6.1

(3) Negative Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"N"	"m"	"3"	See 6.2

(4) Detailed Functions

Normal Processing

- Turns off the electricity and signals to a memory card to deactivate the memory card.

Retry and Error Processing

- None

(5) Notes

- Sends a normal response when there is no card in the C/R at the time this command is received.
- Sends a normal response when this command is received in the status that there is a card in the C/R and the IC Contact is released.
- Sends a normal response when this command is received in the status that the IC Contact is pressed but activation is not done.

7.62 (m4) Memory Card Control Information Setting (Monitoring time for reception)

(1) Command

IDN (1byte)	CMD (2bytes)		CMP (2bytes)
"C"	"m"	"4"	<1>

CMP	Length (Bytes)	Data (ASCII)	Meaning
1	2	"06"~"99"	Monitoring time for reception from memory card (Default ="10"(10sec))

(2) Positive Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"P"	"m"	"4"	See 6.1

(3) Negative Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"N"	"m"	"4"	See 6.2

(4) Detailed Functions

Normal Processing

- The C/R sets the monitoring time for waiting for reception from memory card.

Retry and Error Processing

- When this command is received during insertion permission, the C/R sends a Command Sequence Error response ("N01").
- When this command is received during memory card activation, the C/R sends a Command Sequence Error response ("N01").

(5) Notes

- This setting is remained even though the power of C/R is turned off.

7.63 (m5) Memory Card Press + Activation

(1) Command

IDN (1byte)	CMD (2bytes)		CMP (1byte)
"C"	"m"	"5"	<1>

CMP	Length (Byte)	Data (ASCII)	Meaning
<1>	1	"0"	SLE 4442
		"1"	SLE 4432
		"2"	SLE 4428
		"4"	AT24C01ASC/ AT24C02SC / AT24C16SC
		"5"	AT24C64SC

(2) Positive Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)	RDT (0 or 4bytes)
"P"	"m"	"5"	See 6.1	<1>

RDT	Length (Bytes)	Data (HEX)	Meaning
<1>	1	00H~FFH	ATR Data 1
<2>	1	00H~FFH	ATR Data 2
<3>	1	00H~FFH	ATR Data 3
<4>	1	00H~FFH	ATR Data 4

(3) Negative Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"N"	"m"	"5"	See 6.2

(4) Detailed Functions

Normal Processing

- Transports a memory card to the IC Contact press position to press the IC Contact.
- Supplies the memory card with electricity and signals then activates the memory card.
- Sends an ATR received from the card (4bytes) in the case of SLE4442/4432/4428.

Retry and Error Processing

- When received this command in the status that there is no card in the C/R, sends a Command Sequence Error response ("N01").
- When this command is received in the status that the memory card is already activated, sends a Command Sequence Error response ("N01").
- When a card is not transported to the IC Contact press position, sends a Card Jam Error response ("N10").
- When the IC Contact is not pressed, sends an IC Solenoid Error response ("N81").
- When all the data in ATR are 00H or FFH, the C/R deactivates a memory card and sends an ICC Activation Error response ("N82").
- During retry activation, when a card is not transported to the IC Contact release position, sends a Card Jam Error response ("N10").
- When an ATR is not received after activating a memory card, retry activation the time as specified by the Retry Number Set Command ("CR5"). When still an ATR is not received, sends an ICC Activation Error response ("N82").

(5) Notes

- When this command is received in the status that the IC Contact is pressed, executes activating a memory card only.
- When retrying activation, release the IC Contact to transport a card to the IC Contact release position. From the position, transports the card to the IC Contact press position to press the IC Contact. Then executes activation process.

7.64 (m6) Memory Card Deactivation + Release

(1) Command

IDN (1byte)	CMD (2bytes)	
"C"	"m"	"6"

(2) Positive Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"P"	"m"	"6"	See 6.1

(3) Negative Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"N"	"m"	"6"	See 6.2

(4) Detailed Functions

Normal Processing

- Turns off the electricity and signals to a memory card to deactivate the memory card.
- Release the IC Contact then transports the memory card to the IC Contact release position.

Retry and Error Processing

- When fails to release the IC Contact, sends an IC Solenoid Error response ("N81").
- When a card is not transported to the IC Contact release position, sends a Card Jam Error response ("N10").

(5) Notes

- Sends a normal response when there is no card in the C/R at the time this command is received.
- Sends a normal response when received this command in the status that there is a card in the C/R and the IC Contact is released.
- When received this command in the status that the IC Contact is pressed but not activated, releases the IC Contact only.

7.65 (m7) Memory Card Transmission

(1) Command

IDN (1byte)	CMD (2bytes)		CMP (5~260bytes)						
"C"	"m"	"7"	<1>	<2>	<3>	<4>	<5>	<6>	<7>

CMP	Length (Byte)	Data (BIN)	Meaning		
<1>	1	00H~FFH	CLA	Class	Card Type
<2>	1	00H~FFH	INS	Instruction	Command Code
<3>	1	00H~FFH	P1	Parameter 1	Address (High)
<4>	1	00H~FFH	P2	Parameter 2	Address (Low)
<5>	0 or 1	00H~FFH	Lc field	Length	Number of byte(s) present in the data Field
<6>	Variable = Lc	Variable	Data field	Data	String of byte(s) sent in the data field of the command
<7>	0 or 1	00H~FFH	Le field	Length	Maximum Number of byte(s) expected in the data field of the response to the command

Command Parameter for SIEMENS SLE4442

The format of the command parameter for SIEMENS SLE4442 is shown below.

The card type for SIEMENS SLE4442 is "0"(30H). Therefore, CLA of every command is fixed to 30H.

Memory Card Command	CLA	INS	P1	P2	P3	DATA
Read Main Memory	30H	30H	00H	Start address (00H~FFH)	Read data length (00H~FFH) *1	Not provided
Update Main Memory *3	30H	38H	00H	Start address (00H~FFH)	Write data length (01H~FFH)	Write data
Read Protection Memory	30H	34H	FFH	FFH	04H *2	Not provided
Write Protection Memory	30H	3CH	00H	Start address (00H~1FH)	Write data length (01H~20H)	Write data *6
Read Security Memory	30H	31H	FFH	FFH	04H *2	Not provided
Update Security Memory *4	30H	39H	00H	Start address (00h) (01H~03H)	Write data length (01H) (01H~03H)	Write data
Compare Verification Data	30H	33H	00H	01H~03H	01H03H	Compare data
PSC Verification *5	30H	FFH	00H	00H	03H	PSC Code (00H~FFH)

*1: When "00h" is specified for P2, the length of the read data is 256 bytes.

*2: Since the length of the read data is 4 bytes, the value of P3 is fixed to 04H.

*3: Although the locked data fails to be written, the C/R sends a positive response to the host.

*4: When P2 is 00h, P3 is fixed to 01h. When P2 is between 01H to 03H, P3 is also between 01H to 03H.

*5: The C/R automatically sends the seven commands required for PSC Verification.

*6: Write data is sent to a memory card along with the Write Protection Memory Command.

The memory card compares its storing memory with the write data in order to decide whether to protect the data or not.

Command Parameter for SIEMENS SLE4432

The format of command parameter for SIEMENS SLE4432 is shown below.

The card type for SIEMENS SLE4432 is "1"(31H). Therefore, CLA of every command is fixed to 31H.

Memory Card Command	CLA	INS	P1	P2	P3	DATA
Read Main Memory	31H	30H	00H	Start address (00H~FFH)	Read data length (00H~FFH) *1	Not provided
Update Main Memory *3	31H	38H	00H	Start address (00H~FFH)	Write data length (01H~FFH)	Write data
Read Protection Memory	31H	34H	FFH	FFH	04H *2	Not provided
Write Protection Memory	31H	3CH	00H	Start address (00H~FFH)	Write data length (01H~20H)	Write data

*1: When "00h" is specified for P2, the length of the read data is 256 bytes.

*2: Since the length of the read data is 4 bytes, P3 is fixed to 04H.

*3: Although the locked data fails to be written, the C/R sends a positive response to the host.

Command Parameter for SIEMENS SLE4428

The format of command parameter for SIEMENS SLE4428 is shown below.

The card type for SIEMENS SLE4428 is "2"(32H). Therefore, CLA of every command is fixed to 32H.

Memory Card Command	CLA	INS	P1	P2	P3	DATA
Write and erase with Protect bit *2	32H	31H		Start address (0000H~03FFH)	Write data length (01H~FFH)	Write data
Write and erase without Protect bit *2	32H	33H		Start address (0000H~03FFH)	Write data length (01H~FFH)	Write data
Write protect bit with data Comparison (verification) *2	32H	30H		Start address (0000H~03FFH)	Write data length (01H~FFH)	Write data
Read 9 bits, data with Protect bit *3	32H	0CH		Start address (0000H~03FFH)	Read data length (00H~FFH) *1	Not provided
Read 8 bits, data without Protect bit	32H	0EH		Start address (0000H~03FFH)	Read data length (00H~FFH) *1	Not provided
Write error counter	32H	32H		Start address (03FDH)	01H	00H~FFH
Verify PCB byte(s)	32H	0DH		Start address (0000H~03FFH)	01H~02H	Compare data (00H~FFH)

*1: When "00h" is specified for P2, the length of the read data is 256 bytes.

*2: Although the locked data fails to be written, the C/R sends a positive response to the host. Users shall take the responsibility of protection in the EC and PSC areas.

*3: When data is sent from a memory card to C/R, PB (protection bits) is added to 8-bit data. Therefore, data sent from C/R to the host is twice as much as the data sent from the card to C/R. However, the valid value is only the one in bit 0, and the values from bit 7 to bit 1 are fixed to 0.

Command Parameter for AT24C01ASC / AT24C02SC / AT24C16SC

The format of the command parameter for AT24C01ASC / AT24C02SC / AT24C16SC is shown below.

The card type for AT24C01ASC / AT24C02SC / AT24C16SC is "4"(34H).

Therefore, CLA of every command is fixed to 34H.

Memory Card Command	CLA	INS	P1	P2	P3	DATA
Write Memory	34H	A0H		Start address (0000H~07FFH) *1 *2	Write data length (01H~FFH) *2	Write data
Read Memory	34H	A1H		Start address (0000H~07FFH)	Read data length (00H~FFH) *3	Not provided

*1: The valid address of AT24C01ASC is to 007FH and AT24C02SC is to 00FFH.

*2: When the address + the data length exceeds 07FFH, the C/R sends "**Parameter Error**"("N02").

*3: When "00h" is specified for P3, the length of the read data is 256 bytes.

Command Parameter for AT24C64SC

The format of the command parameter for AT24C64SC is shown below.

The card type for AT24C64SC is "5"(35H). Therefore, CLA of every command is fixed to 35H.

Memory Card Command	CLA	INS	P1	P2	P3	DATA
Write Memory	35H	A0H		Start address (0000H~1FFFH) *1	Write data length (01H~FFH) *1	Write data
Read Memory	35H	A1H		Start address (0000H~1FFFH)	Read data length (00H~FFH) *2	Not provided

*1: When the address + the data length exceeds 1FFFH, the C/R sends "**Parameter Error**"("N02").

*2: When "00h" is specified for P3, the length of the read data is 256 bytes.

(2) Positive Response

JDG (1byte)	RCM (2bytes)	RES (2bytes)		
"P"	"m"	"7"	See 6.1	<1>

RDT	Length (Byte)	Data (BIN)	Meaning
<1>	0~512	Variable	Reception Data from Memory Card

(3) Negative Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"N"	"m"	"7"	See 6.2

(4) Detailed Functions

Normal Processing

- The C/R sends and receives data between the host and the memory card.

Retry and Error Processing

- When the parameters specified by the Memory Card Transmission Command ("Cm7") differ from the card type specified by the Memory Card Activation Command, sends a Command Sequence Error response ("N01").

(5) Notes

- Don't specify the address that is out of maximum address of each memory card in the case of AT24C01ASC/ AT24C02SC / AT24C16SC/ AT24C64SC.

7.66 (m8) Memory Card PSC Certification

(1) Command

IDN (1byte)	CMD (2bytes)		CMP (5~260bytes)						
"C"	"m"	"8"	<1>	<2>	<3>	<4>	<5>	<6>	<7>

CMP	Length (Byte)	Data (BIN)	Meaning		
<1>	1	00H~FFH	CLA	Class	Card Type
<2>	1	00H~FFH	INS	Instruction	Command Code
<3>	1	00H~FFH	P1	Parameter 1	Address (High)
<4>	1	00H~FFH	P2	Parameter 2	Address (Low)
<5>	0 or 1	00H~FFH	Lc field	Length	Number of Byte Present in Command Data Field
<6>	Variable = Lc	Variable	Data field	Data	String of Byte sent in Command Data Field
<7>	0 or 1	00H~FFH	Le field	Length	Maximum Number of Byte expected in Data Field of Response to Command

Command Parameter for SIEMENS SLE4442

Memory Card Command	CLA	INS	P1	P2	P3	DATA
PSC Verification	30H	FFH	00H	00H	03H	PSC Code (00H~FFH)

Command Parameter for SIEMENS SLE4428

Memory Card Command	CLA	INS	P1	P2	P3	DATA
PSC Verification	32H	FFH	00H	00H	02H	PSC Code (00H~FFH)

(2) Positive Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"P"	"m"	"8"	See 6.1

(3) Negative Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"N"	"m"	"8"	See 6.2

(4) Detailed Functions

Normal Processing

- The C/R automatically sends a memory card the commands necessary for verification. (See SIEMENS SLE4442 Data Book or SIEMENS SLE4428 Data Book.)

Retry and Error Processing

- When the host sends the Memory Card Verification Command ("Cm8") to a card not supporting the PSC verification, sends a Command Sequence Error response ("N01").
- If the PSC code specified by the command parameter is not correct, it fails PSC verification, then sends a Disagreement of Verification code response ("N89").
- When a memory card failed to execute the PSC verification successively, and the EC of memory card that has protected the PSC verification is 00h, sends an Inappropriate Verification Code response ("N8A").

(5) Notes

- None

7.67 (:0) Insertion Permission (from Front)

(1) Command

IDN (1byte)	CMD (2bytes)	
"C"	“.”	“0”

(2) Positive Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"P"	“.”	“0”	See 6.1

(3) Negative Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"N"	“.”	“0”	See 6.2

(4) Detailed Functions

Normal Processing

- Without the intake monitoring time, permits intaking a card from front, then sends a normal response. This status is Insertion Permission Status (from Front).
- Starts intaking behavior by running the Transport motor when the top end of a card reached to Sensor S0.
- Reads the mag. data as transporting the card to the rear standby position.

Retry and Error Processing

- When received this command in the status that there is a card in the C/R, sends a Command Sequence Error response ("N01").
- When this command is received in the status of Insertion Permission Status sends a Command Sequence Error response ("N01").
- When a card is kept at the Gate position, until completing intaking a card continues intaking behavior.
- When a card is jammed in the C/R, it becomes the status of the Card Jam Error ("10").
- When the length of intaken card is detected as abnormal, it becomes the status of the Too Long Card Error ("20") or Too Short Card Error ("21").

(5) Notes

- When the C/R received this command, sends a response before intaking a card. The host confirms if a card has been intaken or an error occurred during intaking a card by the Status Sense Command ("C10" or "C15").
- When intaking a card, "Insertion Permission Status" is cancelled. Before intaking a card, when canceling the Insertion Permission Status, sends an Insertion Denial Command ("C:1") or a DLE EOT from the host.
- When an Insertion Denial Command ("C:1") or a DLE EOT is sent from the host, and the C/R is already on the way to intaking a card, and the read edge of the card has not passed the Sensor S0, the intaking behavior of card is aborted. When the rear edge of the card has passed the Sensor S0 already, the card intaking behavior is not cancelled. When an intaking behavior is aborted, the card is returned to the Gate position after 1 sec that the C/R sends a response to an Insertion Denial Command ("C:1") , or a DLE EOT.
- Obtain the mag. data that is read during card intaking with a mag. read command.
- When there is a returned card at the Gate position, it does not intake another card unless the card has been withdrawn.
- On the mechanical structure of the C/R, card intaking and reading mag. data are executed at the same time. Therefore, if transport is not executed properly during reading mag. data because of a card deformation or keeping a card during intaking, reading mag. data may not be done properly.
- After starting the Transport motor but an intaking card is kept with a hand, depending on the time to keep the card, the card may be transported to the Gate position then in taken.
- If a card is inserted halfway before receiving this command, the card is transported to the Gate position then intaken.

7.68 (:1) Insertion Denial

(1) Command

IDN (1byte)	CMD (2bytes)	
"C"	“.”	“1”

(2) Positive Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"P"	“.”	“1”	See 6.1

(3) Negative Response

JDG (1byte)	RCM (2bytes)		RES (2bytes)
"N"	“.”	“1”	See 6.2

(4) Detailed Functions

Normal Processing

- Prohibits an Insertion Permission Status so that a card cannot be inserted.

Retry and Error Processing

- None

(5) Notes

- Sends a normal response when received this command in the status that is not the Insertion Permission Status.

7.69 (:3) Insertion Permission (from Rear)

(1) Command

IDN (1byte)	CMD (2bytes)	
"C"	“.”	“3”

(2) Positive Response

JDG (1byte)	RCM (2bytes)	RES (2bytes)
"P"	“.” “3”	See 6.1

(3) Negative Response

JDG (1byte)	RCM (2bytes)	RES (2bytes)
"N"	“.” “3”	See 6.2

(4) Detailed Functions

Normal Processing

- Without the intake monitoring time, permits intaking a card from rear, then sends a normal response. This status is Insertion Permission Status (from Rear).
- Runs the Transport motor to wait a card to be inserted from rear.
- Intakes a card from rear, and then transports it to the front standby position.

Retry and Error Processing

- When received this command in the status that there is a card in the C/R, sends Command Sequence Error response ("N01").
- When received this command in the status of "Insertion Permission Status", sends a Command Sequence Error response ("N01").
- When there is a card at the gate, intaking a card from rear is not possible until the card is withdrawn. When a card is inserted from rear before a card at the gate is withdrawn, it becomes the status of the Card Jam at the Rear-end Error ("16").
- When a card is not intaken from rear, it becomes the status of the Card Jam Error ("10").
- When the length of intaken card is detected as abnormal, it becomes the status of the Too Long Card Error ("20") or Too Short Card Error ("21").

(5) Notes

- When the C/R received this command, sends a response before intaking a card. The host confirms if a card was intaken or an error occurred by the Status Sense Command ("C10" or "C15").
- When a card is intaken, the "Insertion Permission Status" is cancelled. When cancelled the Insertion Permission Status before intaking a card, sends an Insertion Denial Command ("C:1") or a DLE EOT.
- When the host sent an Insertion Denial Command ("C:1") or a DLE EOT, and the C/R already on the way to intake a card from rear, the top edge of a card before reaching the Sensor S3, the card intaking behavior is cancelled. When the top edge of a card has passed the Sensor S3 already, the intaking behavior from rear is not cancelled. And when the intaking behavior is cancelled on the way, the card has not been transported to the purposed position yet, but it is treated that it is intaken from rear normally.
- On the mechanical structure of the C/R, a card is not passed the mag. head even though a card is intaken from rear and transported to the front stand-by position. Therefore, the card intaken from rear cannot read the mag. data.