Data Transmission Specifications
3S4YR-MVFW(DL)-0** Series
Hybrid Card Reader/Writer

Rev. A0	Jun. 6, 1997
Rev. A1	Aug. 28, 1997
Rev. A2	Jul. 8, 1998
Rev. A3	Jun. 7, 1999
Rev. A4	Oct. 8, 1999

Card Business Promotion Division

O M R O N

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[Specification History of Modification]

Rev.	Date	Page	Content
A0	Jun. 6, 97	--	Draft
A1	Aug. 28, 97	I	Adds Applicable Card Reader/Writer
		3-3	Adds notice of *6 ("90")
		3-4	Changes "P0" to deactivate and "P1" to activation.
		4-6	Erases default value of 4.20 (PTS/NAD setting).
		E-1	Adds using restriction of DL matrix.
		H-1	Adds Annex H (The Commands Which Can be Transmitted When Incomplete Program)
A2	Jul. 8, 98	1,A	Changes character waiting timer from 15ms to 100ms.
A3	Jun. 7, 99	I	Adds the applicable CPU and FW.
		II	Adds EMV 3.0, Errata 1.0 and EMV 3.1.1 in reference standards table.
		3-4,4-8, 5-5	Adds requirement of various ICC standard. (Adds ICC Control Information and Version read of ICC control part commands.)
		3-4	Delete "after the time-out." in the explanation of "C40", "C41" and "C42".
		3-4	Changes the positions of *1 to "Q1","N1","N2","N3" and "NA".
		3-5	Changes the function of "6L" from "to Front" to "to Rear End".
		3-6,4-5 C-1	Deletes ICC setting commands("CB") and command parameters.
		3-12	Changes Error code table(8/8).
		4-2	Changes Return Retry Number from 4 times to 3 times.
		4-8,5-5	Adds "Europay" in ICC reference standard
		5-1	Adds "3" in the parameter of Operating Status of Motor.
A4	Oct. 8, 99	1-1,1-3, A-3	Changes Waiting time to re-sending Initial Reset Commands from 100 to 15 ms when FW in memory is not imperfect.
		1-2,1-5 A-1,A-5	Changes character waiting timer from 100 ms to 5 sec.
		1-5,A-5	Changes monitoring time from 3 sec to 20 sec and adds *4.

I. Introduction

This specification shows the transmission specifications between the IC and magnetic card reader/writer [3S4YR-MVF(DL) Series] with RS232 and the HOST terminal.

II. Applicable Card Reader / Writer

	Track 1	Track 2	Track 3	IC card controller	Module name	Option
A	R/W	R/W	R/W *1	Y *2	3S4YR-MVFW1JD-051	
B	R/W	R/W	R/W	N *3	3S4YR-MVFW1D-052*4	
C	R/W	R/W	R/W *1	Y	3S4YR-MVFR7D-051L	

*1 R/W: Magnetic reading and writing function
*2 Y   : Provided
*3 N   : No provided
*4 In case of this module, this specification should be read except Track 1 read / write and ICC function.

III. Applicable CPU / FW

	Type	Version	Notes
CPU	HBU-NA053	E	
FW in nonvolatile memory	HBU-NA073	D	

IV. Reference Standards

- ISO/IEC 7816-3:1989
  Identification cards - Integrated circuit(s) cards with contacts
  - Part 3 : Electronic signals and transmission protocols
- ISO/IEC 7816-3/Amd.1:1992
  Identification cards - Integrated circuit(s) cards with contacts
  - Part 3 : Electronic signals and transmission protocols
  Amendment 1 : Protocol type T=1,asynchronous half duplex block transmission protocol
- ISO/IEC 7816-3/Amd.2:1994
  Identification cards - Integrated circuit(s) cards with contacts
  - Part 3 : Electronic signals and transmission protocols
  Amendment 2 : Revision of protocol type selection
- ISO/IEC 7816-4:1995
  Identification cards - Integrated circuit(s) cards with contacts
  - Part 4 : Inter-industry commands for interchange

- ISO/IEC 7810: 1995-08-15
  Identification cards - Physical characteristics
- ISO/IEC 7811-1: 1995-08-15
  Identification cards - Recording technique
  Part 1:Embossing
- ISO/IEC 7811-2: 1995-08-15
  Identification cards - Recording technique
  Part 2:Magnetic stripe
- ISO/IEC 7811-3: 1995-08-15
  Identification cards - Recording technique
  Part 3:Location of embossed characters on ID-1 cards
- ISO/IEC 7811-4: 1995-08-15
  Identification cards - Recording technique
  Part 4:Location of read-only magnetic tracks - Tracks 1 and 2.
- ISO/IEC 7811-5: 1995-08-15
  Identification cards - Recording technique
  Part 5:Location of read-only magnetic tracks - Tracks 3

- ISO 2111: 1985-02-01
  Data communication -Basic mode control procedures -
  Code independent information transfer

- EMV 3.0: June 30 '96
  EMV '96 Integrated Circuit Card Specification for Payment Systems
  Part I - Electromechanical Characteristics, Logical Interface, and Transmission Protocols

- Errata 1.0: Jan 31 '98
  EMV '96: ICC Specifications for Payment Systems

- EMV 3.1.1: May 31 '98
  EMV '96 Integrated Circuit Card Specification for Payment Systems
  Part I - Electromechanical Characteristics, Logical Interface, and Transmission Protocols

V. Notice for IC card (ICC)

  OMRON standard ICC controller and FW (firm ware) can't almost execute perfectly all customers ICC(s) because ISO standard and also ICC(s) is modified frequently. OMRON should check your customer's ICC if you can get it and it's specification.

VI. Character Code Expression Method

-XXH   shows the HEX Code.
"X"   shows the ASCII Code.

VII. Definition of Terminology

- HOST   HOST Terminal
- C/R   Card Reader
- Default   Set value on the C/R side when power is turned ON.
- SS   Magnetic Data Start Sentinel
- ES   Magnetic Data End Sentinel
- LRC   Magnetic Data Longitudinal Redundancy Check
- VRC   Magnetic Data Vertical Parity
- ICC   Integrated Circuit Card
- ATR   Answer to Reset
- PTS   Protocol type selection
- APDU   Application Protocol Data Unit
- TCK   Check Character
- IFS   maximum information field size
- IFDS   IFS for the interface device
- F   Indicated values of the clock rate conversion factor
- D   Indicated values of the bit rate adjustment factor
- DL   Program Down Loading
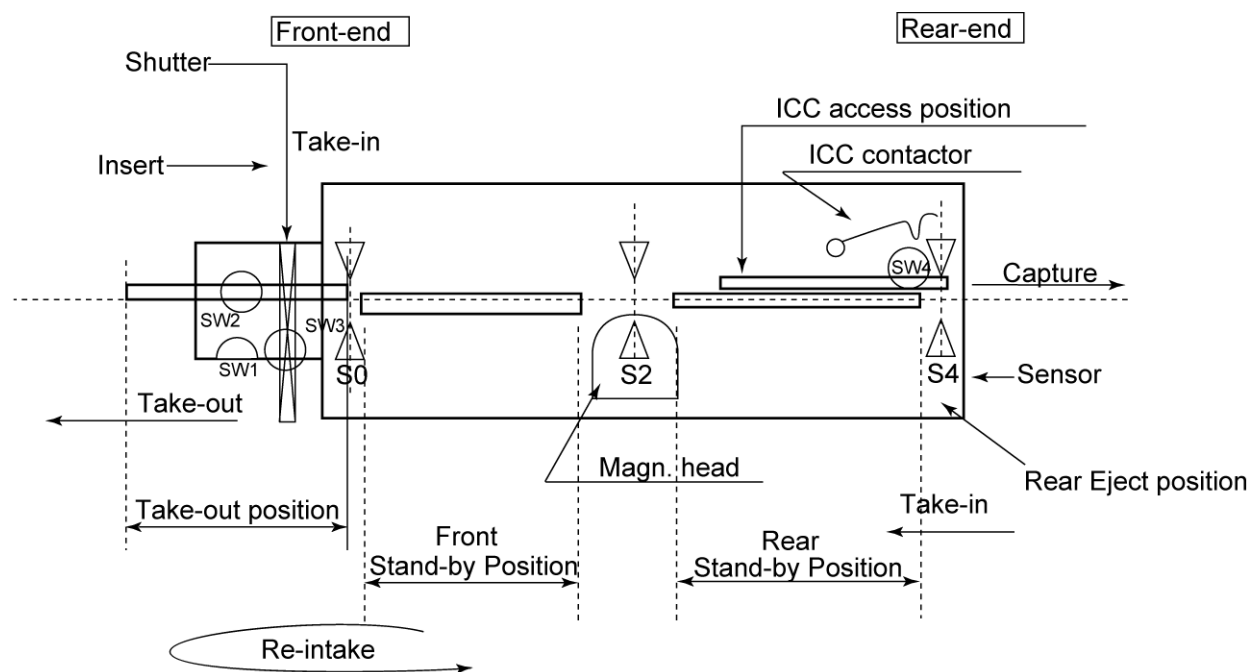
S0:   Front end sensor
S2:   Mid-position sensor
S4:   Rear-end sensor
SW1:   Magnetic stripe detection head
SW2:   Card width detection switch
SW3:   Shutter echo sensor

SW4:   ICC contact echo sensor

1 Transmission Specifications

1.1 Basic Transmission Specifications

Item	Contents
Electronic Interface	RS232 Interface
Synchronous Method	Start-Stop Synchronization Method
Communication Method	Half-duplex Method
Transmission Speed	1200, 2400, 4800, 9600, 19200 bps
	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 The HOST should sent one of " Initial Reset " command for transmission speed
setting between the HOST and the C/R right after power turns on or down loading
processing completed correctly. If the HOST has sent a data except "Initial Reset" command(ex.
DLE-EOT), it should send "Initial Reset" command after 15 ms.

1.2 Transmission Control Method
- Command Response Method
- The C/R executes the designated processing corresponding to the command received from the HOST.
- The results are sent to the HOST as a response.

1.3 Transmission Control Codes

Code	Value	Meaning
DLE STX	10H 02H	Characters showing the start of text for the Command or Response.
DLE ETX	10H 03H	Characters showing the end of text for the Command or Response.
DLE ENQ	10H 05H	Characters showing Command Execution Designation or Request for Response Retransmission.
DLE ACK	10H 06H	Positive Response Characters showing that the Command sent from the HOST has been received normally.
DLE NAK	10H 15H	Negative Response Characters showing the Command sent from the HOST has been received abnormally.
DLE EOT	10H 04H	Characters showing Transmission Interruption or Command Execution Interruption.
DLE	10H	Transparent Mode control code in text

1.4 Message Format

1) Command/Response Format
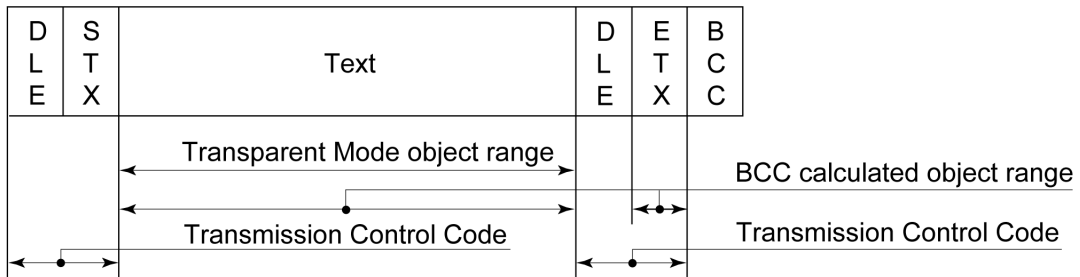
- Only one Command or Response is in the Text.
- BCC is calculation result by an exclusive logic (XOR) from the Text beginning (after STX) to ETX.
- However, the following are excluded from BCC calculation.
  - DLE (10H) added by the Transparent Mode
  - DLE (10H) of the Transmission Control Code " DLE ETX "
- The BCC Vertical Parity is regarded as the BCC Parity.
- The maximum transmission delay between each characters from the DLE to ETX, BCC of the HOST or the C/R is within **5 sec**.

2) Useable codes in the Text

b8				0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
b7				0	0	0	0	1	1	1	1	0	0	0	0	1	1	1	1
b6				0	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1
b5				0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1
b4	b3	b2	b1	column/row	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	0	0	0	0		DLE*1	SP	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]

If "DLE(10H)" character is used in of the text as a part of command or response, double DLE(10H) must be transmitted as below for transmission.
For details, see ISO 2111 "4. Presentation of data" and "5. Reception of data" .

DLE (10H)   -> |DLE| DLE (10H 10H)

└─Text data   └───── Added DLE (exclude BCC calculation)
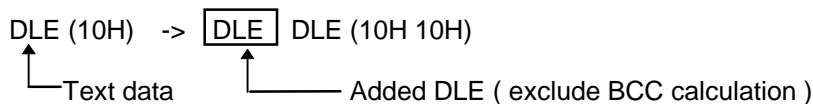
1.5 Transmission Control Procedure

1.5.1 Transmission beginning
Automatic recognition of Transmission speed (baud rate) between the C/R and the HOST is done by one of the " Initial Reset " command from the HOST. Therefor , first of all, the HOST should send one of the " Initial Reset " command after power turns on. If the HOST has sent the data except "Initial Reset" command(ex. DLE-EOT), it should send "Initial Reset" command after 15 ms.

1.5.2 Normal Operation Sequence
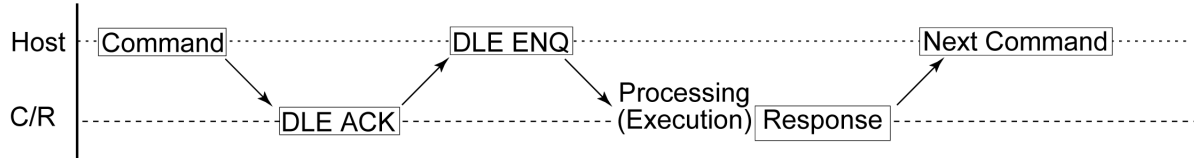
1.5.3 Recovery Operation Sequence
1) Monitoring time-out happens while the HOST is waiting for ACK from the C/R.
   (The HOST re-sends the Command.)
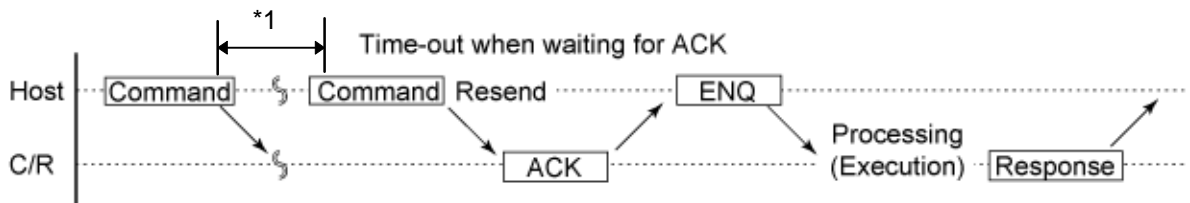
   *1: See 1.6Transmission Control Matrix.

2) When the HOST Receives NAK from the C/R. (Command is resent from the HOST)
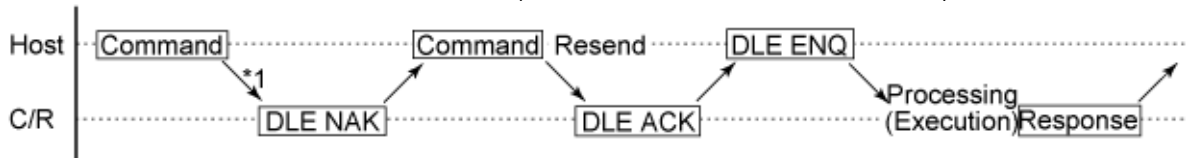
   *1: The C/R detects Receiving Error.
         (Vertical Party, BCC and monitoring time-out happens Between Characters)

3) When the HOST detects an error during receiving of ACK from the C/R.
   (The HOST re-sends the Command.)
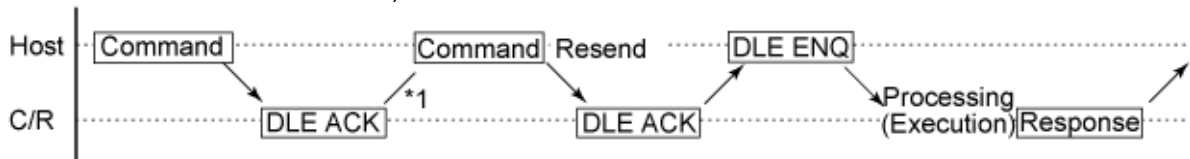
   *1: The HOST detects Receiving Error.

4) When monitoring time-out happens while the HOST is waiting for Response from the C/R.
   (The HOST re-sends ENQ and requests a Response from the C/R.)
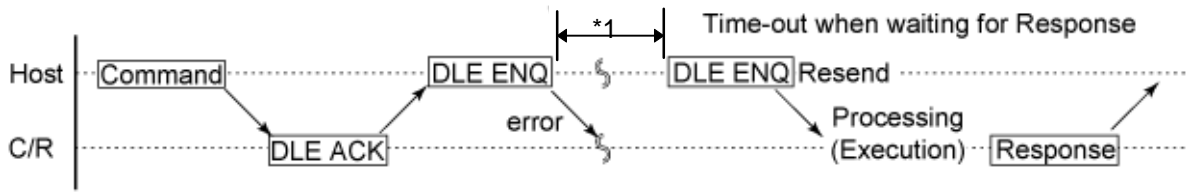
*1: See 1.6Transmission Control Matrix.

5) When the HOST detects an error during receiving of Response from the C/R.
   (The HOST re-sends ENQ and requests resending of the response from the C/R.)
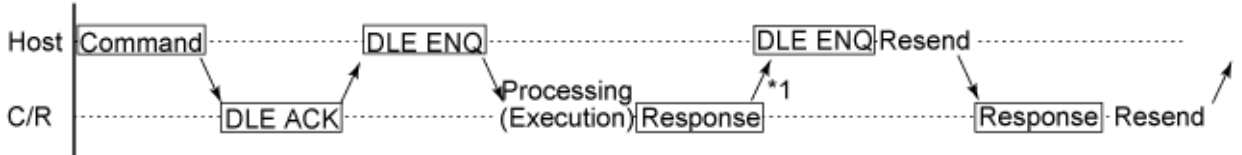
*1: The HOST detects Receiving Error.

1.5.4 Interruption of Transmission and Command to the C/R from the HOST.

By sending "DLE EOT" from the HOST, interruption of transmission or processing command can be specified to the C/R. But interruption of transmission disables in down loading. For more detail, see Annex. E.

1) Before the HOST Sends the Command (Interruption of Transmission from the HOST)

2) After the HOST Sent the Command (Command canceled from the HOST)
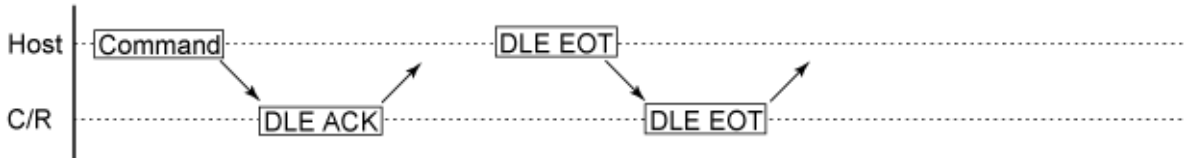
3) After the HOST sent ENQ (Forced interruption of the processing command from the HOST)
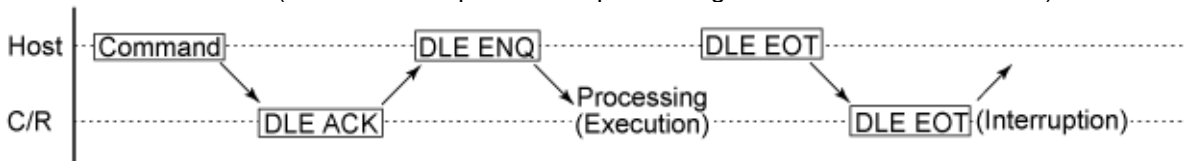
4) While the C/R sends the Response (Transmission Interruption from the HOST)
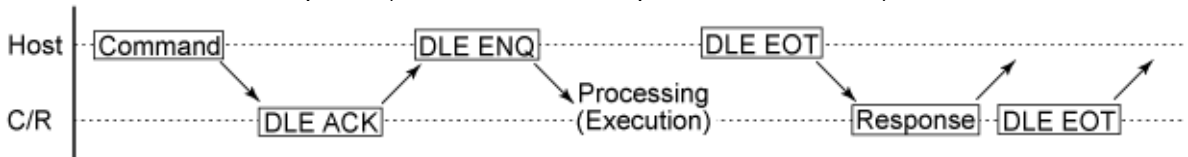
1.6 Transmission Control Matrix

1) HOST Control (for reference)

		Receiving Codes from C/R					HOST Receiving Monitoring	
		DLE ACK	DLE NAK	DLE STX	DLE ETX BCC	Other Codes	Time-out	Monitoring Time
1	Waiting for DLE ACK after sent command	DLE ENQ Sends -> goes to status 2	Re-sends Command -> remain in status 1 *3	Ignores	Ignores	Ignores	Re-sends Command -> remains in status 1 *3	*1
2	Waiting for Response Receiving after sent DLE ENQ	Ignores	Ignores	Clears Buffer -> goes to status 3	Ignores	Ignores	Re-sends DLE ENQ -> remains in status 2 *3	*2
3	Waiting for DLE ETX BCC in Response receiving	Ignores	Ignores	Clears Buffer -> remains in status 3	Sends the next command when the receiving is normal -> goes to status 1 Re-sends DLE ENQ when receiving is abnormal. -> goes to status 2 *3	Stores Data -> remains in status 3	Re-sends DLE ENQ -> goes to status 2 *3	20 seconds *4

*1 : Monitoring Time for waiting "DLE ACK" after the HOST had sent the command should be **5.02sec** or more.

When Sending/Receiving Switching-over Time of C/R is extended by the Initial Reset Command from the HOST, the HOST should be monitored the time which is this value plus **5.02sec**. (Refer to 4.1)

*2 : Monitoring Time of waiting Response of the HOST is different to each command. Usually 10 seconds or more is recommended. For commands which is accompanied human operation (e.g., Insertion, takeout), this human operation time should be added to monitoring time of response, Also, when the number of retries accompanying mechanical operation (moving) increases, one second per re-trying should be added.

*3 : The number of re-transmission is decided by the HOST and should be decided more than one time. The HOST should execute the Error Processing when the number of trying exceeded.

*4: A value of the monitoring time is different by the transmission speed and the response length. 20 seconds is the value of the monitoring time which the transmission speed is 1200 bps. The value of it is 3 seconds by 9600 bps.

2) C/R Control

		Receiving Codes from HOST					C/R Receiving Monitoring	
		DLE ENQ	DLE STX	DLE EOT	DLE ETX BCC	Other Codes	Time-out	Monitoring Time
1	Idle	Re-sends Response -> remains status 1	Clears Buffer -> goes to status 2	Execution Interruption ->remains in status 1	Ignores	Ignores	Ignores	Ignores
2	Waiting for DLE ETX BCC in Command Receiving	Ignores	Clears Buffer -> remain in Status 2	Execution Interruption -> goes to status 1	When receiving is normal, sends DLE ACK -> goes to status 3 When receiving is abnormal, sends DLE NAK -> goes to status 1	Data Store -> remains in status 2	DLE NAK Sends -> goes to status 1	**5sec** (Between characters)
3	Waiting for DLE ENQ after sent DLE ACK	Sends response after command execution -> goes to status 1	Clears Buffer -> goes to status 2	Execution Interruption -> goes to status 1	Ignores	Ignores	Ignores	Ignores

While the C/R is processing a command except DL processing, all characters except " DLE EOT" from HOST are ignored. Also, see Annex E about "DLE EOT" in DL processing.

2   Time Chart of Transmission Control Signal Line

The signal name is shown on the C/R side.

2.1 DTR Signal
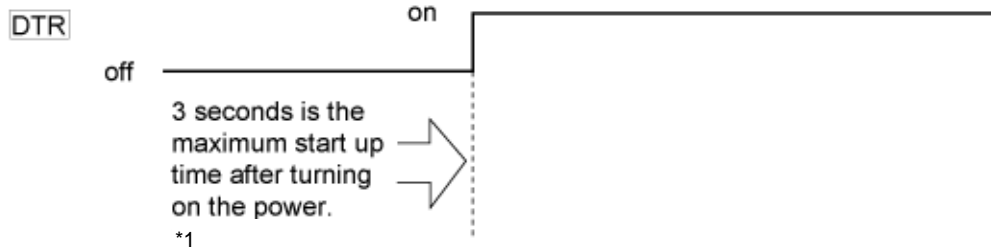
*1:HOST should be transmitted data after DTR Signal turns ON.
   DTR Signal break continues the interval of max. 300ms after DL completion response is sent. After confirmed the DTR Signal rise, HOST should send an initial reset command.

2.2 Transmission Interruption by the CTS Signal

The figure below shows CTS Signal from the HOST turns OFF during Response Transmission by the C/R.
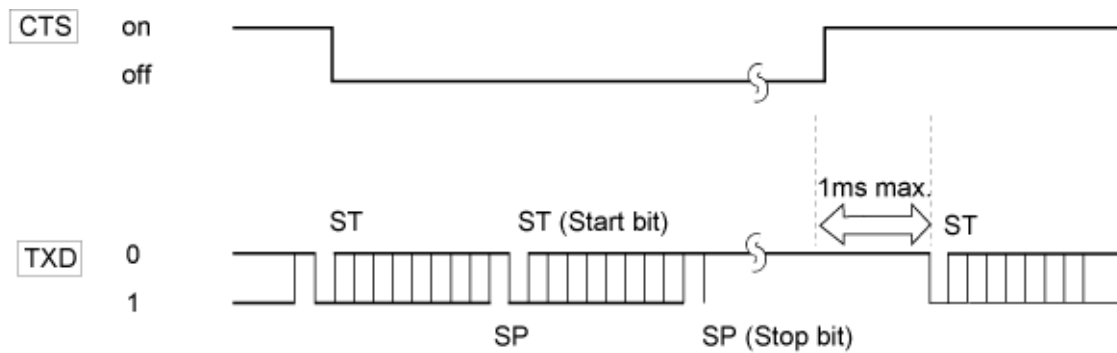
(1)   When the CTS Signal from the HOST is turned OFF during Response Transmission from the C/R, the C/R interrupts the transmission after maximum characters of two was sent.
(2)   The C/R reopens the transmission within maximum delay of 1ms after turning ON the CTS Signal from the HOST.

3   Message Specifications

Explanation of each column in the tables below.
- Column of Length shows the number of byte(s) for each item.
- Column of Data shows the contents of each item.

3.1   Command Format (HOST -> C/R)

A Command is the text which indicates execution processing to the C/R from the HOST.

	IDN	CMD	Command Parameter
Length	1	2	Variable Length (0-2054 bytes)
Data	"C"	See 3.3	For details , see 4

IDN: Indicates code of the command. The code is "C" (43H).
CMD: Indicates the command. (See 3.3)
Command Parameter: This is defined as the details of CMD processing. However, there is also CMD
without Command Parameter.

3.2   Response Format (C/R -> HOST)

A Response is the text which is transmitted from the C/R to the HOST. It is as the processing results for
the command text which was sent from the HOST to the C/R.
(1) JDG
- The HOST should judge the processing results by the JDG Code in the Response Message.
- "P" (50H) indicates a positive response which the processing had been completed normally.
- "N" (4EH) indicates a negative response which the processing had been completed abnormally.
(2) RCM
RCM in the Response Message is the same code as the command (CMD) which had been defined
processing.

3.2.1 Positive Response Format

	JDG	RCM	RES	Response data
Length	1	2	2	Variable Length (0-320 bytes)
Data	"P"	See 3.3	See 3.4.1	For details , see 5

(1) RES
- RES in the Response Message usually indicates the position data of the card in the C/R. (See
3.4.1)
- For the ICC Control Commands, the ICC Control Status is also indicated. (See 3.4.1)
- For the DL relation commands, DL status is also indicated. (See 3.4.1)
(2) Response Data
- Response data is indicated the data due to the processed commands from the HOST. (See 3.3)
- However, there are also no response data due to the command.

3.2.2 Negative Response Format

	JDG	RCM	RES	Response data
Length	1	2	2	Variable Length (0-62 bytes)
Data	"N"	See 3.3	See 3.4.2	For details , see 3.3

(1) RES
RES in the Response Message indicates the Error Code due to the processed commands from the
HOST (See 3.4.2)
(2) Response data
- Response data is only added as a response when an error occurred and the command is defined
which is requested Error Track Number(s) or ATR.   (See 3.3)
- Response data is only added as a response when a command is defined which is requested
response data when DL processing is executing or new FW loading hasn't yet completed in DL
processing. (See 3.3 Annex E)

3.3 Table of Commands

Definition of Terminology

Track A	: Multi-track Numbers
Track B	: Single-track Number
Mag. Data A	: Write Magnetic Data
Mag. Data B	: Single-Track Number + Write Magnetic Data
Mag. Data C	: Multi-track Number + Write Magnetic Data
Mag. Data D	: Read Magnetic Data
Mag. Data E	: Multi-track Number + Read Magnetic Data
Mag. Data F	: Reads Magnetic Data (Multi-track / All tracks)

3.3.1 Card Reader Control Commands (RCC)

(1) Table of Basic Commands(1/3)

Command Name	CMD (ASCII)	Function	Command Parameters	Ref.	Response Data	Ref.
Initial Reset *1	"00"	Initializes the C/R then returns card to takeout position if card is in the C/R.	Initial Set Data	4.1	None	-
	"01"	Initializes the C/R then ejects card through to rear-end if card is in the C/R.	Initial Set Data	4.1	None	-
	"02"	Initializes the C/R then holds card in standby position if card is in the C/R.	Initial Set Data	4.1	None	-
	"04"	Initializes the C/R then returns card to takeout position if card is in the C/R (No shutter control when no card is in).	Initial Set Data	4.1	None	-
	"05"	Initializes the C/R then ejects card through to rear-end if card is in the C/R (No shutter control).	Initial Set Data	4.1	None	-
	"06"	Initializes the C/R then holds card in standby position if card is in the C/R (No shutter control).	Initial Set Data	4.1	None	-
Status Sense	"10"	Reads the C/R condition.	None	-	None	-
	"11"	Reads sensors status. *2	None	-	Sensor info.	5.1
Insertion Permission /Denial	":0"	Permits insertion from front and waits infinitely card (w/o mag. Stripe) insertion. Takes in card then transports to rear standby position. *3	None	-	None	-
	":1"	Denies card insertion after interrupted card insertion state by ":0", ":2" or ":3".	None	-	None	-
	":2"	Permits insertion with mag. Stripe card from front and waits infinitely card insertion. Takes in card then transports to rear standby position. *3	None	-	None	-
	":3"	Permits insertion from rear waits infinitely card (w/o mag. stripe) insertion. Takes in card then transports to front standby position. *3 *5	None	-	None	-
Intake *3 *4	"20"	Permits insertion w/o mag. stripe from front and waits. Takes in card then transports to rear standby position.	None	-	None	-
	"21"	Permits insertion with mag. stripe from front and waits. Takes in card then transports to rear standby position.	None	-	None	-
	"22"	Permits insertion w/o mag. stripe from rear and waits. Takes in card then transports to front standby position. *5	None	-	None	-
	"23"	Permits insertion w/o mag. stripe from front and waits. Takes in card, then return to take out position temporary and take in card immediately and transports to rear standby position.	None	-	None	-
	"24"	Permits insertion with mag. stripe from front and waits. Takes in card, then return to take out position temporary and take in card immediately, and transports to rear standby position.	None	-	None	-

*1: First of all, the HOST has to send one of these "Initial Reset" command for automatic recognition of transmission speed and setting of transmission format (see 1.4 and annex A) between the HOST to the C/R. These setting is only valid by one of initial reset command sending from the HOST after power turned on.

And also these command is used confirmation of movement of shutter, solenoids and motor.

After that, card is returned, ejected or held if card exists inside.

*2: The HOST can get the sensor information, e.g. output status of position sensor after card was took in.

*3: All tracks read data is implicitly stored in memory after in-take. Then Read data is transmitted after processed it by a Read command.

*4 Monitoring time for Card insertion is specified by "W0" .

*5: The HOST should send the command after it confirms the card have been taken out.

(1) Table of Basic Commands (2/3)

Command Name	CMD (ASCII)	Function	Command Parameters	Ref.	Response Data	Ref.
Return	"30"	Transports card to Takeout position of front.	None	-	None	-
	"31"	Ejects card through to rear end.	None	-	None	-
	"32"	Transports the MM-sensor card to read start position.	None	-	None	-
Waiting for Removal *6	"90"	Waits for card to be taken out from front taken-out position while is specified the monitoring time by "W1".	None	-	None	-
Re-intake *1	"40"	Re-intakes card to rear standby position from front takeout position.	None	-	None	-
	"41"	Re-intakes card from front takeout position and ejects to Rear.	None	-	None	-
	"42"	Re-intakes card to rear standby position from front takeout position. And sends read data of a lowest track number that was able to read correctly during intake.	Track A	4.2	Mag. Data E	5.3
Read	"60"	No read operation (only transportation).	None	-	None	-
	"61"	Reads ISO #1 and sends data. *2	None	-	Mag. Data D	5.2
	"62"	Reads ISO #2 and sends data. *2	None	-	Mag. Data D	5.2
	"63"	Reads ISO #3 and sends data. *2	None	-	Mag. Data D	5.2
	"68"	Reads multiple magnetic tracks and sends the read data of the lowest track number which was read correctly. *2 *3 *4	Track A	4.2	Mag. Data E	5.3
	"69"	Sends the read data in memory by this command. *4	Track B	4.3	Mag. Data D	5.2
	"6A"	Sends multi-tracks data in the memory by this command and parameter. *2 *4	Track A	4.2	Mag. Data F	5.4
Write	"71"	Writes magnetic data onto ISO #1 track.	Mag. Data A	4.4	None	-
	"72"	Writes magnetic data onto ISO #2 track.	Mag. Data A	4.4	None	-
	"73"	Writes magnetic data onto ISO #3 track.	Mag. Data A	4.4	None	-
	"78"	Sets write data in memory track by track for Multiple Magnetic tracks (No Write processing).	Mag. Data B	4.5	None	-
	"79"	Writes data of Multiple-Magnetic tracks at one time.	Mag. Data C	4.6	Error track *5	5.5

*1: Monitoring time is specified by "W2".

*2: In case that read data was memorized in C/R, the HOST can get immediately the read data without card transporting. The other hand, in case of no memory of read data , C/R executes re-read according to the setting retry number. In case that the retry number was set zero or error is continuing after retry was done, the error response is sent.

*3: The HOST can get only single track data even if multi-track is read by "68" command. Therefore the HOST should use together with "69" or "6A" command in case of the other track(s) data reading.
   For detail of response, see 5.3.

*4: Multi-read data in memory is transmitted at one time by related command.

*5: Error Track Number is transmitted to the HOST only when an error occurs.

*6: RES of positive response is transmitted the "card position" when the response was prepared.

(1) Table of Basic Commands (3/3)

Command Name	CMD (ASCII)	Function	Command Parameters	Ref.	Response Data	Ref.
Number of Cards Captured	"Q0"	Reads the number of ejected (captured) card(s) to rear.	None	-	Captured No.	5.6
	"Q1"	Initialized number of ejected (captured) card(s) to rear ("000"). (*1)	None	-	None	-
Cleaning	"I0"	Cleans head and or sensors with a Cleaning card (back and forth motion is done 3rd. times.)	None	-	None	-
Sensor Level Read	"L0"	Reads voltage of the C/R sensors.	None	-	Level Info.	5.7
Retry Number Setting	"R0"	Sets the retry number when read error occurred.	Retry No.	4.7	None	-
	"R1"	Sets the retry number when write error occurred.	Retry No.	4.7	None	-
	"R3"	Sets the retry number when return error occurred.	Retry No.	4.8	None	-
Monitor Time Setting	"W0"	Sets the monitoring time till card is inserted (Relating "20","21" and "22").	Monitor Time	4.9	None	-
	"W1"	Sets the monitoring time till card returned to Front is removed (Relating "90").	Monitor Time	4.9	None	-
	"W2"	Sets the monitoring time till card is re-in-taken to Rear (Relating "40","41" and "42").	Monitor Time	4.9	None	-
Option Device Read/ Setting	"N0"	Reads information of options installed .	None	-	Option Info.	5.8
	"N1"	Sets existence of P/F condenser. *1	P/F Condenser Existence	4.10	None	-
	"N2"	Sets one of magnetic head type within "No Head", "Read-only", and "Read/Write". *1	Mag. Head Type	4.11	None	-
	"N3"	Sets using of I/O port. *1	I/O Port using	4.12	None	-
	"NA"	Erases Version Information in memory and the data of Option Information is changed to "No setting". *1	None	-	None	-
Version Read	"V0"	Reads FW version.	None	-	Version Info.	5.9
	"V1"	Reads FW version of ICC control part.	None	-	Nonvolatile Memory FW Version Info.	5.18
I/O Port *2	"P0"	Sets deactivation of output port(s).	Output Port	4.25	None	-
	"P1"	Sets activation of output port(s).	Output Port	4.25	None	-
	"P2"	Sets deactivation of designated output port(s) during the specified time.	Output Port	4.25	None	-
	"P3"	Sets activation of designated output port(s) during the specified time.	Output Port	4.25	None	-
	"P4"	Repeats activation and deactivation of designated output port(s) according to the specified time.	Output Port	4.25	None	-
	"P5"	Reads status of input port(s).	None	-	Input Port	5.17
I/O Port Time Setting	"T0"	Deactivation time of output port(s) is set (Relating "P2").	Output Port Setting Time	4.27	None	-
	"T1"	Activation time of output port(s) is set (Relating "P3").	Output Port Setting Time	4.27	None	-
	"T2"	Deactivation time of output port(s) is set when activation and deactivation is repeated (Relating "P4").	Output Port Setting Time	4.27	None	-
	"T3"	Activation time of output port(s) is set when activation and deactivation is repeated (Relating "P4").	Output Port Setting Time	4.27	None	-
ICC Control Information	"Y0"	Reads control information of ICC.	None	-	ICC Control Info.	5.19
	"Y1"	Sets the reference standard used in commands related to ICC. *1	ICC Reference Standard	4.28	None	-
	"Y2"	Sets the monitoring time for waiting for reception used in commands related to ICC. *1	Timer Value for Waiting for Reception	4.29	None	-
	"Y3"	Sets IFSD control method used in commands related to ICC. *1	IFSD Control Method	4.30	None	-
	"Y4"	Sets TCK control method used in commands related to ICC. *1	TCK Control Method	4.31	None	-

*1 These commands can't execute under "Insertion permission" (until the card is taken in after "Insertion permission" command was sent.)   In that case, C/R sends the response of sequence error ("Nxx01").
*2 All I/O ports is de-active state after power turns on.

(2) Table of Extended Commands

Command Name	CMD (ASCII)	Function	Command Parameters	Ref.	Response Data	Ref
Read	"6B"	Intakes w/o stripe card from front + Reads *3	Track A	4.2	Mag. Data E	5.3
	"6C"	Intakes w/o stripe card from front + Reads + Returns to Front *3	Track A	4.2	Mag. Data E	5.3
	"6D"	Intakes w/o stripe card from front + Reads + Ejects to Rear end *3	Track A	4.2	Mag. Data E	5.3
	"6E"	Intakes with Mag. Stripe card from front + Reads *3	Track A	4.2	Mag. Data E	5.3
	"6F"	Intakes with Mag. Stripe card from front + Reads + Front Return *3	Track A	4.2	Mag. Data E	5.3
	"6G"	Intakes with Mag. Stripe card from front + Reads + Ejects to Rear end *3	Track A	4.2	Mag. Data E	5.3
	"6H"	Intakes from Rear + Reads *3 *4	Track A	4.2	Mag. Data E	5.3
	"6I"	Intakes from Rear + Reads + Returns to Front *3 *4	Track A	4.2	Mag. Data E	5.3
	"6K"	Reads + Returns to Front	Track A	4.2	Mag. Data E	5.3
	"6L"	Reads + Ejects to Rear end	Track A	4.2	Mag. Data E	5.3
Write	"7B"	Intakes w/o stripe card from front + Writes *3	Mag. Data C	4.6	Err. Track No.*1	5.5
	"7C"	Intakes w/o stripe card from front + Writes + Returns to Front *3	Mag. Data C	4.6	Err. Track No.*1	5.5
	"7D"	Intakes w/o stripe card from front + Writes + Ejects to Front *3	Mag. Data C	4.6	Err. Track No.*1	5.5
	"7E"	Intakes with Mag. Stripe card from front + Writes *3	Mag. Data C	4.6	Err. Track No.*1	5.5
	"7F"	Intakes with Mag. Stripe card from front + Writes + Returns to Front *3	Mag. Data C	4.6	Err. Track No.*1	5.5
	"7G"	Intakes with Mag. Stripe card from front + Writes + Ejects to Front *3	Mag. Data C	4.6	Err. Track No.*1	5.5
	"7H"	Intakes from Rear + Writes *3 *4	Mag. Data C	4.6	Err. Track No.*1	5.5
	"7I"	Intakes from Rear + Writes + Returns to Front *3 *4	Mag. Data C	4.6	Err. Track No.*1	5.5
	"7K"	Writes + Returns to Front	Mag. Data C	4.6	Err. Track No.*1	5.5
	"7L"	Writes + Ejects to Rear end	Mag. Data C	4.6	Err. Track No.*1	5.5
Return Conditions Parameters *2	"D0"	Designates Front Return when Read is Normal	Execution Desig. Data	4.13	None	-
	"D1"	Designates Front Return when Read is Error	Execution Desig. Data	4.13	None	-
	"D2"	Designates Front Return when Write is Normal	Execution Desig. Data	4.13	None	-
	"D3"	Designates Front Return when Write is Error	Execution Desig. Data	4.13	None	-
	"D4"	Designates Rear Eject when Read is Normal	Execution Desig. Data	4.13	None	-
	"D5"	Designates Rear Eject when Read is Error	Execution Desig. Data	4.13	None	-
	"D6"	Designates Rear Eject when Write is Normal	Execution Desig. Data	4.13	None	-
	"D7"	Designates Rear Eject when Write is Error	Execution Desig. Data	4.13	None	-
Magnetic Format Change Setting	"S0"	Sets Transmission Format Change of Magnetic Data	Transmission Format	4.14	None	-
	"S1"	Sets Format Change of Magnetic Data	Mag. Format	4.15	None	-
	"S2"	Sets Start Position Change of Write for Start Sentinel (SS)	Position Data	4.16	None	-

*1 Error Track Number is transmitted only when an error occurred.
*2 The return condition parameters are only effective when the extended commands, read or write ,was used.
*3 Monitoring time for Card insertion is specified by "W0" .
*4 The HOST should send the command after it confirms the card have been taken out.

3.3.2 ICC Control Commands (ICC)

(1) Table of Basic Commands

Command Name	CMD (ASCII)	Function	Command Parameters	Ref.	Response Data	Ref.
ICC Press	"C0"	Transports to ICC access position and presses ICC contact.	None	-	None	-
ICC Release	"C1"	Releases ICC contact from ICC.	None	-	None	-
ICC Activation	"C2"	Activates (Cold Reset) ICC and sends ATR. It is impossible to designate the automatic execution of PTS by the C/R.	Node address	4.17	ATR Info.*1	5.10
ICC Deactivation	"C3"	Deactivates ICC.	None	-	None	-
ICC Control Information *2	"C4"	Sets the monitoring time for waiting for reception used in commands related to ICC.	ICC Control Setting	4.32	None	-
ICC Cold Reset	"E0"	Activates to ICC. It is possible to set the execution of PTS independently.	ATR/NAD setting	4.18	ATR/PTS Inf. *1	5.11
ICC Warm Reset	"E1"	Executes warm reset to ICC. It is possible to set the execution of PTS independently.	ATR/NAD setting	4.18	ATR/PTS Inf. *1	5.11

*1 ATR information ("C2","E0" and "E1") is transmitted to the HOST only when the ATR information from the ICC was read correctly. For IC Commands usage, see Annex C and D.

*2 This command can be used to make compatible with the present version.
If ICC control information setting command ("C4") was used, please change the command code from "C4" to "Y1".

(2) Table of Extended Commands

Command Name	CMD (ASCII)	Function	Command Parameters	Ref.	Response Data	Ref.
ICC Multiple processing	"C5"	ICC Press ("C0")+ ICC Activation ("C2")	NAD setting	4.17	ATR Info.*1	5.10
	"C6"	ICC Deactivation ("C3")+ ICC Release ("C1")	None	-	None	-
ICC Cold Reset	"G1"	Press ICC + ICC Cold Reset ("C0"+"E0")	ATRNAD setting	4.18	ATR/PTS Inf. *1	5.11

*1 ATR information ("C5" and "G1") is transmitted to the HOST only when the ATR information from the ICC was read correctly. For ICC Commands usage, see Annex C and D.

(3) IC Card Direct Control Commands (IDC)

Command Name	CMD (ASCII)	Function	Command Parameters	Ref.	Response Data	Ref.
T=0 Transmission	"F0"	Sends or receives data between the HOST and the ICC using Protocol Type T=0.	T=0 Sending Data	4.19	T=0 Receiving Data	5.12
T=1 Transmission	"F1"	Sends or receives data between the HOST and the ICC using Protocol Type T=1. This command should be used for sending/receiving of data unchained or for transmitting the last part of data chained.	T=1 Sending Data	4.20	T=1 Receiving Data	5.13
T=1 Continuous Transmission	"F2"	Sends data chained of Protocol Type T=1. This command should be used to send after divided the data when the data length to be send is longer than the command parameter. "F1" should be used in case that sending data length of the last block is within command parameter.	T=1 Sending Data	4.20	T=1 Receiving Data	5.13
T=1 Continuous Receiving	"F3"	Receives data chained of Protocol Type T=1. This command should be used for continuous receiving of data when response status from the C/R is "21".	None	-	T=1 Receiving Data	5.13
T=1 interruption Completion	"F4"	Continuous sending/receiving of Protocol Type T=1 is forcedly terminated.	None	-	None	-
T=1 Extended Transmission	"F6"	Sends or receives data between the HOST and the ICC using Protocol type T=1. This command should be used for sending/ receiving of unchained or chained data which is the last block. The command APDU is copied onto the information field of an I-block without any change.	T=1 Extended Sending Date	4.21	T=1 Receiving Data	5.13
T=1 Extended Continuous Transmission	"F7"	Sends data chained of Protocol Type T=1. This command should be used to send after divided the data when the data to be sent is longer than the command parameter. "F6" should be used in case that sending data length of the last block is within command parameter. The Command APDU is copied onto the information field of an I-block without any change	T=1 Extended Sending Date	4.21	T=1 Receiving Data	5.13
PTS Request	"F8"	Sends or receives PTS request between the HOST and the ICC.	Protocol Type	4.22	PTS information	5.14

Note: For ICC Commands usage, see Annex C and D.

3.3.3 Table of Command related Down Load (DLC)

Command Name	CMD (ASCII)	Function	Command Parameters	Ref.	Response Data	Ref.
DL Start	"d0"	Designates DL start .	No. of DL Block	4.23	None	-
DL Transmission	"d1"	Sends DL Data (FW) .	DL Data	4.24	None	-
DL Completion	"d2"	Sends DL completion.	None	-	Ver. Info. in Memory	5.15
Memory Check	"c0"	Checks SUM and reads FW version in memory.	None	-	Ver. Info. in Memory	5.15
USER Info. Read	"u0"	Reads the user information in memory.	USER info. length	4.26	USER Info. Data	5.16

Note: For DLC commands usage, see Annex E.

3.4 Table of Responses

3.4.1 Status Table of Positive Response
Response status (RES) of Positive Response Format shows the table below.

RES (ASCII)	Meaning
"00"	No card is in the C/R.
"01"	A card is in the Takeout Position.
"02"	A card is in the C/R.
"04"	A card is in Read Start Position of the MM Sensor
"10"	IC Contact is pressed to the ICC.
"11"	ICC is in the Activation Status.
"20"	Transmission to the ICC is completed. (with/ without Receiving Data, with SW1 + SW2)
"21"	Continuous receiving Status from the ICC. (with Receiving Data, without SW1 + SW2)
"22"	Continuous sending Status to the ICC. (without Receiving Data, without SW1 + SW2)
"23"	Ends the Completion of ICC Transmission by forcedly interruption.
"30"	In Down loading.
"31"	Normal Completion of Down loading, Status of Initial Reset Waiting.

3.4.2 Status Table of Negative Response (Error Code)
Response status (RES) of Negative Response Format shows the table below.

(1) Error code table (1/8)

RES (ASCII)	Sorts of Error		Meaning
"00"	Undefined Command Receipt	--	- The HOST used a unwritten Command in specification.
"01"	Command Sequence Error	--	- The HOST sent a disable command in the present state.
"02"	Command Data Error	--	- The HOST sent a wrong data of command parameter.
"03"	Write Track setting Error	--	- The HOST designated write for track(s) without write data.

Note: Host should be checked the content of command and sequence.

(2) Error code table (2/8)

RES (ASCII)	Sorts of Error		Meaning
"10"	Card Jam	C/R abnormality *1	- The C/R couldn't carry the card in the C/R to the correct position. - The C/R couldn't return the card to the take out position due to the shutting of insertion mouth. - The C/R couldn't carry the card in-taken from front to the correct position.
"11"	Shutter Abnormality	C/R abnormality *1	- The C/R couldn't open the shutter. - The C/R couldn't detect the shutter opening due to the trouble of shutter echo sensor. - All condition was to be closed the shutter , but the C/R couldn't close it. - The shutter is forcibly closed when shutter is opening by "32" (MM card return) or "23","24"(intake). Or the C/R couldn't detect closing condition of shutter due to the trouble of shutter echo sensor.
"12"	Sensor Abnormality	C/R abnormality *1	- Sensor S0 and S4 is shaded when taken in the card was carried.
"13"	Motor Abnormality	C/R abnormality *1	- The C/R rotated motor, but the C/R couldn't detect pulse of 210 bpi encoder to be connected the motor due to the encoder trouble. - The C/R rotated motor , but Motor didn't rotate.
"14"	Card Drawn Out	C/R abnormality *1	- All sensor (S0, S2 and S4) was lighted after card had in-taken. - The card may be drawn out while waiting to be processed.
"15"	Card Jam in Re-intake	C/R abnormality *1	- The C/R couldn't carry the card from the front to the standby position by "40" and "41" (re-intake). - The C/R couldn't carry the card from the front to the standby position by "23" and "24" (intake).
"16"	Card Jam at the Rear-end	C/R abnormality *1	- S4 sensor at the rear is shading after card had ejected.
"17"	75 bpi encoder abnormality	C/R abnormality *1	- The C/R rotated motor and 210bpi pulse was normality, but the C/R couldn't detect pulse of 75 bpi encoder to be connected the motor due to the encoder trouble.
"18"	Power Down Detection *2 *3 *4	C/R abnormality *1	- Power Down is detected during command processing or before processing (include initial reset command) .
"19"	Waiting Initial Reset *3 *4	Waits initial reset *1	- The C/R received a command exclude Initial Reset command after power turned on. - The C/R received a command exclude Initial Reset command after the C/R sent the response of Power Down Detection("19").

Note:
*1: The C/R waits "initial reset "("00", "01", "02", "04" ,"05" and "06") command when the HOST received the error code.
*2: When a command is executing exclude initial reset, the response is sent in case that power is restored in short time and transmission speed etc. in memory of CPU was memorized.
*3: For more detail , see Annex G.
*4: The Host sends "initial reset" ("00", "01", "02", "04" ,"05" and "06") command after waiting for 15ms from error response reception.

(3) Error code table (3/8)

RES (ASCII)	Sorts of Error		Meaning
"20"	Too Long Card	Card abnormality *1	- Longer card is inserted from front and the C/R detect state that card width switch is ON , sensor S0 and S2 is shared. - Longer card is inserted from rear and the C/R detect state that sensor S0, S2 and S4 is shared.
"21"	Too Short Card	Card abnormality *1	- Shorter or with hole(s) card is inserted from front and the C/R detect state that sensor S0 and S2 is lighted. - Shorter or with hole(s) card is inserted from rear and the C/R detect state that sensor S2 and S4 is lighted.

Notes:

*1: The C/R waits "return"("30") and "initial reset "("00" and "04") command after the HOST received the error code.

(4) Error code table (4/8)

RES (ASCII)	Sorts of Error		Meaning
"32"	Card Position Change	Warning *1	- Card position which is taken in moves.
"33"	Memory Information Abnormality	Warning *1 *2	- The SUM value of in memory. (the number of captured card, magnetic head type and existence of P/F condenser) is incorrect. So the information will be destroyed. - Host couldn't set Option Information by "N1", "N2", or "N3".

Notes:

*1: The HOST can sent a next command after the HOST received the error code.

*2: In case of this error, HOST should erase Option Information by "NA" command and set all Option Information again by "N1", "N2", or "N3".

(5) Error code table (5/8)

RES (ASCII)	Sorts of Error		Meaning
"40"	Read Error (SS error)	Card abnormality *1	- The C/R couldn't detect SS-code in read data.
"41"	Read Error (ES error)	Card abnormality *1	- The C/R couldn't detect ES-code after SS-code in read data.
"42"	Read Error (VRC error)	Card abnormality *1	- The C/R detects that SS code and VRC of next character is correct in read data. But VRC of following characters is detected Vertical parity error (VRC error).
"43"	Read Error (LRC error)	Card abnormality *1	- The C/R detects that the character after ES in read data doesn't coincide with result of LRC calculation.
"44"	Read Error (No Encode)	Card abnormality *1	- Total bits to be read magnetic data is less than 20. - No of bits to be read of ISO #1 is less than 10. - No of bits to be read of ISO #2 or #3 is less than 8.
"45"	Read Error (No Data)	Card abnormality *1	- The C/R detects that the character after ES is SS and then the next character coincide with result of LRC calculation in read data. (No data besides SS-ES-LRC)
"46"	Read Error (Jitter Error)	Card abnormality *1	- This error doesn't become above read error ("40"-"45") but there are more than 10bits which is over permission value of Jitter in read data.
"49"	Read Track setting Error	--	- Specified track isn't read .
"50"	Write Error (SS error)	Card abnormality *1	- The C/R couldn't detect SS code in verification after write.
"51"	Write Error (ES error)	Card abnormality *1	- The C/R couldn't detect ES code after SS code in verification after write.
"52"	Write Error (VRC error)	Card abnormality *1	- The C/R detects that SS code and VRC of next character is correct in verification. But VRC of following characters is detected Vertical parity error (VRC error).
"53"	Write Error (LRC error)	Card abnormality *1	- The C/R detects that the character after ES in verification doesn't coincide with result of LRC calculation.
"54"	Write Error (No Encode)	Card abnormality *1	- Total bits to be read is less than 20 in verification. - No of bits to be read of ISO #1 is less than 10. - No of bits to be read of ISO #2 or #3 is less than 8.
"55"	Write Error (Data discordance)	Card abnormality *1	- The C/R detects that SS, ES VRC and LRC is correct. But the write data doesn't coincide with read data.
"56"	Write Error (Jitter error)	Card abnormality *1	- This error doesn't become above write error ("50"-"55") but there are more than 10bits which is over permission value of Jitter in read data.

Notes:
*1: Abnormality of magnetic data is detected. The HOST can sent next command continuously after the HOST received the error code.

(6) Error code table (6/8)

RES (ASCII)	Sorts of Error		Meaning
"60"	Card Taken Out When Re-intake	Warning *1	- The HOST sends Re-intake command ("40", "41" and "42") when no card is in mouth of insertion. - The card is taken out from mouth of insertion when the card is in mouth of insertion and Re-intake command is sent. - The card is taken out or held from / in mouth of insertion when the card returned and re-intake by intake command ("23","24")
"61"	Insertion monitoring Time is up	Warning *1	- No card in-takes by intake command during Insertion monitoring Time.
"62"	Take-out monitoring Time is up	Warning *1	- A card isn't took out from the takeout position during take-out monitoring Time.
"63"	Re-intake monitoring Time is up	Warning *1	- Card isn't re-took in by Re-intake command during Re-intake monitoring Time.
"64"	Card was held at takeout position during initial reset	Warning *1	- When the card was in mouth of insertion the HOST sent initial reset command (ejects rear or keeps inside). But the card isn't took in (e.g. hold by hand)

Notes:
*1: The HOST can sends next command continuously after the HOST received the error code.

(7) Error code table (7/8)

RES (ASCII)	Sorts of Error		Meaning
"70"	FW Imperfection	Waits for DL *1	- The C/R detects SUM value error in memory after power turned on. - The C/R receives a command in DL exclude "d0" , "d1" and " d2". - FW imperfection is detected in memory after power turns on.
"71"	Initial CMD waiting after FW loading completion *2	Waits for initial reset *3	- The HOST sends a command exclude initial reset command after the HOST received "31"(response of normal DL completion).

Notes:

*1: The HOST should send "d0","d1" and "d2" according to DL sequence and should execute FW down loading.

*2:The Host sends "initial reset" ("00", "01", "02", "04" ,"05" and "06") command after waiting for 15ms from error response reception.

*3: The C/R waits "initial reset "("00", "01", "02", "04" ,"05" and "06") command after the HOST received the error code.

(8) Error code table (8/8)

RES (ASCII)	Sorts of Error		Meaning
"80"	Receiving from ICC is Impossibility	ICC abnormality *1	- The C/R detects that receiving data from the ICC is over buffer size of the C/R in execution of T=0,T=1 protocol and PTS. - The C/R can't complete sending and receiving in execution of T=0,T=1 protocol and PTS when monitoring time was up. - The C/R aborted ICC process (ICC reference standard is "EMV3.0 Errata 1.0".)
"81"	ICC Solenoid Abnormality	C/R abnormality *2	- Impossible to press the contact. - impossible to release the contact. - Echo sensor of contact unit under pressing is detected OFF. - Echo sensor of contact unit under releasing is detected ON.
"82"	ICC Activation Abnormality	ICC abnormality *1	- The C/R detects short circuit when Vcc is supplied in activation processing. - The C/R detects that monitoring time was up or parity error occurred in processing.
"84"	ICC Communication Abnormality	ICC abnormality *3	- Monitoring time was up or parity error occurred in T=0 and T=1protocal execution, and the C/R can't recovers after retry execution.
"85"	ICC Compulsory Abort Reception	ICC abnormality *3	- The C/R receives forced Interruption (S block: abort request) in T=0 and T=1protocal execution.
"86"	ICC Reception Data Abnormality	ICC abnormality *3	- The C/R receives invalid block or data in T=0 and T=1protocal execution.
"87"	Unsupported ICC	ICC abnormality *4	- The C/R receives unsupported ATR.
"88"	ICC movement in press	C/R abnormality *2	- Sensor changes different status from S0&S2 was lighted and S4 was shared.

Notes:

*1: C/R deactivates automatically. HOST should releases contact and tries again to activate after press contact after HOST received the error code.

*2: The C/R waits "initial reset "("00", "01", "02", "04" ,"05" and "06") command after the HOST received the error code.

*3: HOST can sent a next command after HOST received the error code. But the HOST shall activate ICC after deactivation.

*4: If ICC reference standard is "ISO", C/R doesn't deactivate automatically. HOST should execute deactivate or warm reset after HOST received the error code.
   If ICC reference standard is "EMV3.0 Errata 1.0" or "Europay", C/R deactivates automatically. HOST should tries again to activate after HOST received the error code.

4 Command Parameters

4.1 Initial Setting Data (0~2 bytes)

The data items (order) for 1 and 2 can be omitted.

Order	Length (Bytes)	Data (ASCII)		Meaning
1	0-1	"0"	10ms *1	Minimum Guaranteed Time of switching between sending and receiving *2
		"2"~"9"	20ms~90ms	
2	0-1	"A"	Hold inside the C/R	Card Processing Method After Power Failure
		"B"	Return to front *1	
		"C"	Eject to Rear	

*1: Indicates the default value.

*2: Minimum Guaranteed Time of switching between sending and receiving means minimum time until the C/R send the Response (DEL-ACK or response) after the C/R received a Command or DEL-ENQ from the HOST.

4.2 Track Number A (1 byte)

Order	Length (Bytes)	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	

Note: Designation of Multiple Track can be performed.

4.3 Track Number B (1 byte)

Order	Length (Bytes)	Data (ASCII)		Meaning
1	1	"1"	ISO #1	
		"2"	ISO #2	
		"3"	ISO #3	

Note: Designation of Multiple Track can't be performed.

4.4 Magnetic data A (1~104 bytes)

Order	Length (Bytes)	Data (ASCII)		Meaning
1	1-76	Card Data	ISO #1	Magnetic Data
	1-37	Card Data	ISO #2	
	1-104	Card Data	ISO #3	See Annex B

4.5 Magnetic Data B (2~105 bytes)

Order	Length (Bytes)	Data (ASCII)		Meaning
1	1	"1"	ISO #1	Track No.
		"2"	ISO #2	
		"3"	ISO #3	
2	1-76	Card Data	ISO #1	Magnetic Data
	1-37	Card Data	ISO #2	
	1-104	Card Data	ISO #3	See Annex B

4.6 Magnetic Data C (2~105 bytes)

Magnetic data C is made up track number to be specified and magnetic data to be write.

When multiple tracks are specified (in case "4","5","6" and "7" of data) , card data corresponded the track of [ ] should be set. And magnetic data of other track(s) should be set by Command ("78") in advance. But, magnetic data is able to omit in case that write all track(s) data had already been set.

Order	Length (Bytes)	Data (ASCII)		Meaning
1	1	"1"	ISO #1	Track No.
		"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	
2	1-76	Card Data	ISO #1	Magnetic Data
	1-37	Card Data	ISO #2	
	1-104	Card Data	ISO #3	See Annex B

4.7 Retry Number (1 byte)

Order	Length (Bytes)	Data (ASCII)				Meaning
		Value	unit	Default value by command		
				"R0"	"R1"	← Command "Code"
1	1	"0"-"9"	No.	"1"	"1"	Retry no.

4.8 Return Retry Number (2 bytes)

Order	Length (Bytes)	Data (ASCII)			Meaning
		Value	unit	Default value	← Command "Code"
1	2	"00"-"99"	No.	"03"	Retry no.

4.9 Monitoring Time Data (2 bytes)

Order	Length (Bytes)	Data (ASCII)					Meaning
		Value	unit	Default value by command			
				"W0"	"W1"	"W2"	← Command "Code"
1	2	"00"-"99"	Seconds	"30"	"30"	"10"	Monitoring Time ("00": Waits infinitely)

Note: For Command details, see 3.3.1 -(1).

4.10 P/F Condenser Existence (1 byte)

Designates attaching of the P/F condenser.

Order	Length (Bytes)	Data (ASCII)	Meaning
1	1	"0" *1	Without P/F condenser
		"1"	With P/F condenser

*1: Shows the default value.

4.11 Magnetic head type (3 bytes)

Order	Length (Bytes)	Data (ASCII)			Meaning
1	1	"0"	"1"	"2"	ISO #1 head type
		Without ISO #1	With ISO #1 read	With ISO #1 read/write	
2	1	"0"	"1"	"2"	ISO #2 head type
		Without ISO #2	With ISO #2 read	With ISO #2 read/write	
3	1	"0"	"1"	"2"	ISO #3 head type
		Without ISO #3	With ISO #3 read	With ISO #3 read/write	

4.12 I/O ports using (1 byte)

Designates using of the I/O port.

Order	Length (Bytes)	Data (ASCII)	Meaning
1	1	"0"	No using I/O port
		"1" *1	Using I/O port

*1: Indicates default setting.

4.13 Execution Designation Data (1 byte)

Order	Length (Bytes)	Data (ASCII)									Meaning
		Value	Default value by command								←Command "Code"
			"D0"	"D1"	"D2"	"D3"	"D4"	"D5"	"D6"	"D7"	
1	1	"0"	--	*1	--	*1	--	*1	--	*1	Doesn't execute
		"1"	*1	--	*1	--	*1	--	*1	--	Executes

*1: It shows the setting as default value for each command.

4.14 Transmission Format of Magnetic Data (1 byte)

The HOST designates Magnetic Data Format of the Sending and Receiving with the Command or Response. The Default value is set in case of no designation.

Order	Length (Bytes)	Data (ASCII)	Meaning
1	1	"0" *1	Only Data
		"1"	SS, Data, ES
		"2"	SS, Data, ES, LRC

*1   Indicates default value

The HOST can select the format based on Processing Method of the Magnetic Data by application of the HOST. The Parameters (Write Data) of Write Command and the responses of Read Commands (Read Data) are shown in the table below.

Format designation	"0" (default)		"1"		"2"	
	Only Data		SS, Data, ES		SS, Data, ES, LRC	
Data length Track	Minimum Length (bytes)	Maximum Length (bytes)	Minimum Length (bytes)	Maximum Length (bytes)	Minimum Length (bytes)	Maximum Length (bytes)
ISO #1	1	76	3	78	4	79
ISO #2	1	37	3	39	4	40
ISO #3	1	104	3	106	4	107

4.15 Magnetic Format (7 bytes)

Commands is used for Read or Write of Magnetic Data Formats outside of the standard. After setting, set format of Read or Write is executed until this command is set again by another data or the C/R power is turned OFF-ON.

Order	Length (Bytes)	Data (ASCII)				Meaning	
			Default value (Standard value)				
			ISO #1	ISO #2	ISO #3		
1	1	"1"	--	--	--	ISO #1	Track No.
		"2"	--	--	--	ISO #2	
		"3"	--	--	--	ISO #3	
2	1	"5"	--	*1	*1	5 bits	Character Length
		"6"	--	--	--	6 bits	
		"7"	*1	--	--	7 bits	
		"8"	--	--	--	8 bits	
3	1	"E"	--	--	--	Even Parity	Vertical Parity Calculation Method
		"O"	*1	*1	*1	Odd Parity	
		"N"	--	--	--	Without Parity	
4	1	"0"	*1	*1	*1	Even LRC	Longitudinal Calculation Method *2
		"1"	--	--	--	Even LRC-2	
		"2"	--	--	--	Odd LRC	
		"3"	--	--	--	CRC	
		"4"	--	--	--	CRC-2	
		"5"	--	--	--	CRC-3	
		"6"	--	--	--	CRC-4	
5	1	ASCII	"sp"	"0"	"0"	Top Character	
6	1	ASCII	"%"	","	","	SS Character	
7	1	ASCII	"?"	"?"	"?"	ES Character	

*1: Indicates default value
*2: LRC/CRC Calculation Method is shown below.

No.	Name	Check Range	Storage Position	Check Code	Remarks
"0"	Even LRC	SS~ES	After ES	1 Character	--
"1"	Even LRC-2	After SS~ES	After ES	1 Character	--
"2"	Odd LRC	SS~ES	After ES	1 Character	--
"3"	CRC	SS~ES	After ES	2 Character	$X^{16}+X^{12}+X^5+X^1$
"4"	CRC-2	After SS~ES	After ES	2 Character	$X^{16}+X^{12}+X^5+X^1$
"5"	CRC-3	SS~ES	After ES	2 Character	$X^{16}+X^{15}+X^2+X^1$
"6"	CRC-4	After SS~ES	After ES	2 Character	$X^{16}+X^{15}+X^2+X^1$

Combinations of Character Length, Vertical Parity Calculation, and Longitudinal Parity Calculation are shown in table below.
("O" shows Enabling and "X" shows disabling)

Character Length	Vertical Parity Calculation Method	Longitudinal Calculation Method						
		Even LRC	Even LRC-2	Odd LRC	CRC	CRC-2	CRC-3	CRC-4
8	Without Parity	X	X	X	O	O	O	O
7	Odd Parity	O	O	O	X	X	X	X
	Even Parity	O	O	O	X	X	X	X
6	Odd Parity	O	O	O	X	X	X	X
	Even Parity	O	O	O	X	X	X	X
5	Odd Parity	O	O	O	X	X	X	X
	Even Parity	O	O	O	X	X	X	X

4.16 Start Sentinel (SS) Positioning Data (3 bytes)

Order	Length (Bytes)	Data (ASCII)			Meaning		
		Value	Unit	Default value			
1	1	"1"	--	--	ISO #1	Track No.	
		"2"	--	--	ISO #2		
		"3"	--	--	ISO #3		
2	2	"-5"-"22"	mm	"00"	*1		

*1: The standard value (default value) of supplementary Data for Write Start Position of the Start Sentinel is 7.4mm.   For example, in the case of "05", 5mm + 7.4mm = 12.4mm.

4.17 Node Address (0 or 2 byte)

Order	Length (Bytes)	Data (ASCII)		Meaning
		Value	Default value	
1	0-1	"0"-"7"	"0"	NAD (Node Address) of ICC
	0-1	"0"-"7"	"0"	NAD of C/R

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

4.18 PTS/NAD setting (1 or 3 bytes)

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

4.19 T=0 (Character Transmission Type) Transmission Data (4-261 bytes)

Order	Code	Name	Length	Description	Remarks
1	CLA	Class	1	Class of instruction	
2	INS	Instruction	1	Instruction code	
3	P1	Parameter 1	1	Instruction parameter 1	--
4	P2	Parameter 2	1	Instruction parameter 2	
5	Lc field	Length	variable =3	Number of byte(s) present in the data field of the command	Executes only in case of Length =< 1
6	Data field	Data	variable = Lc	String of byte(s) is sent in the data field of the command	--
7	Le field	Length	variable =< 3	Maximum number of byte(s) expected in the data field of the response to the command	Executes only in case of Length =< 1

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, indicated 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 only "EMV3.0".

4.20 T=1(Block Transmission Type) Transmission Data (4~360 bytes)

Only Information Field(INF: order 1-7) should be set in the Transmission Data as T=1 Protocol Prologue Field(NAD, PCB, LEN) and Epilogue Field(EDC) are automatically added in the C/R side.

Order	Code	Name	Length	Description	Remarks
1	CLA	Class	1	Class of instruction	
2	INS	Instruction	1	Instruction code	
3	P1	Parameter 1	1	Instruction parameter 1	
4	P2	Parameter 2	1	Instruction parameter 2	
5	Lc field	Length	variable =3	Number of byte(s) presents in the data field of the command	*1
6	Data field	Data	variable = Lc	String of byte(s) is sent in the data field of the command	
7	Le field	Length	variable =< 3	Maximum number of byte(s) expected in the data field of the response to the command	

*1: The data length is either 0, 1 or 3.
For details, see ISO/ICE 7816-4 Annex B Transportation of APDUs by T=1.

4.21 T=1(Block Transmission Type) Extended Transmission Data (5~360 bytes)

Only Information Field(INF: order 1-5) should be set in the Transmission Data as T=1 Protocol Prologue Field(NAD, PCB, LEN) and Epilogue Field(EDC) are automatically added in the C/R side.

ISO/IEC 7816-4:1995 Table 6 Command APDU contents					Remarks
Order	Code	Name	Length	Description	
1	CLA	Class	1	Class of instruction	
2	INS	Instruction	1	Instruction code	
3	P1	Parameter 1	1	Instruction parameter 1	
4	P2	Parameter 2	1	Instruction parameter 2	
5	Data field	Data	1~356	String of byte(s) sent in the data field of the command	

4.22 Protocol type of PTS (1 byte)

Order	Length (Bytes)	Data (ASCII)	Meaning
1	1	"0"	Selection of protocol type T=0.
		"1"	Selection of protocol type T=1.

For details, see ISO/IEC 7816-3.4.9.

4.23 The Number of Down load Block (23 bytes)

Order	Length (Bytes)	Data (ASCII)	Meaning
1	12	"AAAAAAAAAAAA"	Type of CPU
2	2	"AA"	Firm Ware version of CPU
3	6	"000000" ~ "FFFFFF"	SUM Value of CPU ROM
4	3	"001"~"192"	Block no. to be down loaded

4.24 Down load Data (2054 bytes)

Order	Length (Bytes)	Data			Meaning
1	1	'0'	'1'	'2'	Block Identification Code
		Start Block	Data Block(s)	End Block	
2	1	BIN			Block Number
3	2048	BIN			Data
4	4	BIN			Data SUM Value

Note: This table shows Data construction when new FW is offered, and shows only information for customer as no data processing by the HOST.

4.25 Output port setting (2~16 bytes)

Order	Length (Bytes)	Data (ASCII)	Meaning
1	2~16	"01"	Port No.1
		"02"	Port No.2
		"03"	Port No.3
		"04"	Port No.4
		"05"	Port No.5
		"06"	Port No.6
		"07"	Port No.7
		"08"	Port No.8

Note: Data except "01"-"08" is ignored.

4.26 Memory size of "USER" information (3 bytes)

Order	Length (Bytes)	Data(ASCII)		Meaning
		Value	unit	
1	3	"001"~"256"	Bytes	Size of "USER" information. (size of Response)

4.27 Output port setting time (4~30 bytes)

The designated I/O port number and time should be set as pair. The order of I/O port number isn't required.

The error of setting time is +0 ms to -10 ms.

Order	Length (Bytes)	Data(ASCII)				Meaning
		Value	Unit	Default value by command		
				"T0" or "T1"	"T2" or "T3"	
1	2	"0x" *1	--	---	--	I/O port number
2	2	"01"~"99"	100ms	"10"	"05"	Time
3	2	"0x" *1	--	---	--	I/O port number
4	2	"01"~"99"	100ms	"10"	"05"	Time
:	:	:	:	:	:	:
15	2	"0x" *1	--	---	--	I/O port number
16	2	"01"~"99"	100ms	"10"	"05"	Time

*1: Data except "1"-"8" is ignored.

4.28 ICC Reference Standard(2 bytes)

Order	Length (Bytes)	Data (ASCII)	Meaning
1	2	"00"	ISO (default)
		"01"	EMV 3.0 Errata 1.0
		"05"	Europay (EMV 3.1.1)

4.29 Timer Value for Waiting for Reception (2 bytes)

Order	Length (Bytes)	Data(ASCII)			Meaning
		Value	Default value	Unit	
1	2	"06" - "99"	"10"	Seconds	Timer value of waiting for reception from ICC

4.30 IFSD Control Method(1 byte)

Order	Length (Bytes)	Data (ASCII)	Meaning
1	1	"0"	Requests IFSD automatically.(default)
		"1"	Not request IFSD.

4.31 TCK Control Method(1 byte)

Order	Length (Bytes)	Data (ASCII)	Meaning
1	1	"0"	Checks TCK.(default)
		"1"	Not check TCK.

4.32 ICC Control Setting (8 bytes)

Order	Length (Bytes)	Data(ASCII)			Meaning
		Value	Default value	Unit	
1	2	"06" - "99"	"10"	Seconds	Timer value of waiting for reception from ICC
2	2	"00"	--	--	Spare
3	2	"00"	--	--	Spare
4	2	"00"	--	--	Spare

5 Response Data

5.1 Sensor Information (12 bytes)

Order	Length (Bytes)	Data(ASCII)				Meaning	
		"0"	"1"	"2"	"3"		
1	1	No Card is in	Card is in	-	-	Sensor S0	Card Position Sensor
2	1	Spare	-	-	-	Extra	
3	1	No Card is in	Card is in	-	-	Sensor S2	
4	1	Spare	-	-	-	Extra	
5	1	No Card is in	Card is in	-	-	Sensor S4	
6	1	Shutter Closed	Shutter Opened	-	-	Shutter Echo	
7	1	Without Stripe	With Stripe	-	-	Magnetic Stripe Detection	
8	1	No Card is in	Card is in	-	-	Width Detection	
9	1	Release IC Contact	IC Contact	-	-	IC Contact Echo	
10	1	ICC Deactivation	Pressed	-	-	ICC Activation	
11	1	Stop	1st speed	2nd speed	3rd speed	Status of Motor	
12	1	Spare	-	-	-	Extra	

5.2 Magnetic Data D (1~104 bytes)

Order	Length (Bytes)	Data (ASCII)		Meaning
1	1~76	Card Data	ISO #1	Magnetic Data
	1~37	Card Data	ISO #2	See Annex B
	1~104	Card Data	ISO #3	

5.3 Magnetic Data E (2~105 bytes)

Magnetic Data E is consisted of those read Track(s) No. and Magnetic Data which was read correctly. The HOST can find the Track Number which was read correctly by checking Data (as shown in order 1). Magnetic Data in order 2 is the read data of the lowest track among the Track Number which was read correctly in case of Multiple Tracks Read. And the read data of the other tracks should be read by using of command "69".

Order	Length (Bytes)	Data (ASCII)		Meaning
1	1	"1"	ISO #1	Read Track Number
		"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	
2	1~76	Card Data	ISO #1	Magnetic Data
	1~37	Card Data	ISO #2	
	1~104	Card Data	ISO #3	See Annex B

5.4 Magnetic data F (6 ~233 bytes)
Magnetic data F is consisted of Track no.(Order 1), Result of read (Order 2-4), Length of Magnetic Data (Order 5-7) and Magnetic Data (Order 8-10) by designated read command "6A".

(1) The data of track that doesn't be designated by the command doesn't contain .
(2) Result of read by designated command is set "00" in case the track(s) data is normality, and is set error code "4x", in chapter 3.4.2 , in case the data is abnormality.

Order	Length (Bytes)	Data (ASCII)		Meaning	
1	1	"1"~"7"		Designated track number by command. Refer to 4.2.	
2	0 or 2	result of reading	ISO #1	None order : none data	
3	0 or 2	result of reading	ISO #2	Magnetic data normality : "00"	
4	0 or 2	result of reading	ISO #3	Magnetic data abnormality : see 3.4.2	
5	0 or 3	Length	ISO #1	None designating : none data	
6	0 or 3	Length	ISO #2	Magnetic data normality : Magnetic Data Length	
7	0 or 3	Length	ISO #3	Magnetic data abnormality : "000"	
8	0~76	Card Data	ISO #1	None designating : none data	
9	0~37	Card Data	ISO #2	Magnetic data normality : See Annex B	
10	0~104	Card Data	ISO #3	Magnetic data abnormality : No data	

5.5 Error Track Number (0~1 byte)
The Error track Number is only sent to the HOST when an error occurred by Write Command.

Order	Length (Bytes)	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

5.6 Captured Number of Card(s) (3 bytes)

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

5.7 Sensor voltage Information (16 bytes)
Sensor voltage is transmitted as a numerical value data in units of 0.1 V from "00"~"50" for the Sensor voltage level.
(Example) 4.8V -> "48"

Order	Length (Bytes)	Data (ASCII)		Meaning	
1	2	"00"~"50"	0.0~5.0V	Sensor S0	Sensor Voltage
2	2	Spare	-	Extra	
3	2	"00"~"50"	0.0~5.0V	Sensor S2	
4	2	Spare	-	Extra	
5	2	"00"~"50"	0.0~5.0V	Sensor S4	
6	2	Spare	-	Extra	
7	2	Spare	-	Extra	
8	2	Spare	-	Extra	

5.8 Option Information (16 bytes)

Order	Length (Bytes)	Data(ASCII) "0"	"1"	"2"	"?"	Meaning
1	1	Without shutter	With shutter	-	-	Shutter existence
2	1	Without IC Contact	With IC Contact	-	-	IC contact existence
3	1	Spare	-	-	-	Spare
4	1	Without ISO #1	With ISO #1 read	With ISO #1 read/write	No setting	ISO #1 head specs.
5	1	Without ISO #2	With ISO #2 read	With ISO #2 read/write	No setting	ISO #2 head specs.
6	1	Without ISO #3	With ISO #3 read	With ISO #3 read/write	No setting	ISO #3 head specs.
7	1	Without P/F condenser	With P/F condenser	-	No setting	P/F condenser existence
8	1	Without extended ROM	Spare	-	-	Spare
9	1	Spare	With Memory	-	-	Memory existence
10	1	No using I/O ports	Using I/O ports	-	No setting	I/O port(s) using
11~16	6	spare	-	-	No setting	Spare

5.9 Version Information (40 bytes)

Order	Length (Bytes)	Data (ASCII)	Meaning
1	12	"AAAAAAAAAAAA"	CPU FW type
2	2	"AA"	CPU FW Version
3	6	"000000"~"FFFFFF"	CPU ROM SUM Value
4	12	Spare	Spare
5	2	Spare	Spare
6	6	Spare	Spare
7	12	"AAAAAAAAAAAA"	FW type in Memory
8	2	"AA"	FW Version in Memory
9	8	"00000000"~"FFFFFFFF"	SUM Value in Memory

5.10 ATR (Answer to Reset) Information (2~33 bytes)

Order	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		0~1	00H-FFH	TCK	Check Character

For details, see ISO/IEC 7816-3.

5.11 ATR/PTS Information(3~34 bytes)

Order	Length (Bytes)		Data		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 PTS Request Commands.
			"N"		Incompletion of PTS Execution
			"?"		Command Parameter is " No PTS 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		0~1	00H-FFH	TCK	Check Character

5.12 T=0 (Character Transmission Type) Reception Data (2~258 bytes)

Order	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.

5.13 T=1 (Block Transmission Type) Reception Data (2~320 bytes)

Only Information Field (INF) is returned as the received data after T=I Protocol Prologue Field (NAD, PCB, LEN) and Epilogue Field (EDC) was deleted in the C/R side.

Order	Length (Bytes)	Data (ASCII)		Meaning
1	0~318	ICC Data	INF	IC Card Data (Information Field)
2	1	ICC Data	SW1	Status-1
3	1	ICC Data	SW2	Status-2

For details, see ISO/IEC 7816-4.

5.14 PTS Information (1 byte)

Order	Length (Bytes)	Data (ASCII)	Meaning
1	1	"0"	Enable to execute T=0.
		"1"	Enable to execute T=1.
		"N"	Incompletion PTS Execution.

5.15 Memory Version Information (22 bytes)

Order	Length (Bytes)	Data (ASCII)	Meaning
1	12	"AAAAAAAAAAAA"	FW type in Memory
2	2	"AA"	FW Version in Memory
3	8	"00000000"~"FFFFFFFF"	SUM Value in Memory

5.16 USER Information in memory (1~256 bytes)

C/R sends response data of length specified by the command parameter.

Order	Length (Bytes)	Data (ASCII)	Meaning
1	1-256	ASCII	Read data in USER memory

5.17 Input port Information (4bytes)

Order	Length (Bytes)	Data (ASCII)	Meaning
1	1	"0"	Input Port No.1 is OFF.
		"1"	Input Port No.1 is ON.
2	1	"0"	Input Port No.2 is OFF.
		"1"	Input Port No.2 is ON.
3	1	"0"	Input Port No.3 is OFF.
		"1"	Input Port No.3 is ON.
4	1	"0"	Input Port No.4 is OFF.
		"1"	Input Port No.4 is ON.

5.18 FW Version Information of Nonvolatile Memory(22 bytes)

Order	Length (Bytes)	Data (ASCII)	Meaning
1	12	"AAAAAAAAAAAA" *1	FW type of nonvolatile memory
2	2	"AA" *1	FW version of nonvolatile memory
3	8	"000000"~"FFFFFF" *2	FW SUM value of nonvolatile memory

*1 In case of incomplete program, "_" is indicated.   "_" denotes 20H of HEX code.
*2 In case of incomplete program, "0" is indicated.

5.19 ICC Control Information(16 bytes)

Order	Length (Bytes)	Data (ASCII)	Meaning
1	2	"00"	ISO (default)
		"01"	EMV 3.0 Errata 1.0
		"05"	Europay (EMV 3.1.1)
2	2	"06" - "99"	Timer value of waiting for reception from ICC (Unit: seconds)
3	1	"0"	Requests IFSD automatically.
		"1"	Not request IFSD.
4	1	"0"	Checks TCK.
		"1"	Not check TCK.
5	10	"0"	Spare