Ingeniería Electrónica

SMART IDENT

CIM-6000

CARD ISSUING MACHINE

MAGNETIC, IC CARD AND RF

Specifications

User Manual

CIM6000.UM.G.EN.doc

REVISION HISTORY

No	DATE	DESCRIPTION	REV	PAGE	F/W Name
1	2005.02.	Preliminary Version	X1	45	
2	2005.04	Revision A	A	49	
3	2006.07	Add Mag and IC function	B	63	
4	2006.10	Modified the model name information in the SPEC	C	63	
5	2007.04	SPEC about Side door type is added	D	67	
6	2007.09	Secret key change commands are changed	E	69	
7	2011.03	Model Name Information table is modified	F	68	
8	2012.03	SAM function and “I23” command is added	G	70	

MODEL NAME INFORMATION

Interface	Function	Type	Track	Option I
T: RS-232C	6: Dual Cartridge	0: -	0: Without Magnetic	0: Without Bezel
		1: MS Only	1: ISO 1 Track	1: Lo-co Short Bezel
		2: MS + IC	2: ISO 2 Track	2: Hi-co Short Bezel
		3: MS + RF	3: ISO 3 Track	3: Lo-co & Shutter
		4: MS + IC + RF	4: ISO 1,2 Tracks	4: Hi-co & Shutter
		5: IC Only	5: ISO 1,3 Tracks	5: Shutter
		6: RF Only	6: ISO 2,3 Tracks	6: Short Bezel
		7: IC + RF	7: ISO 1,2,3, Tracks	7: Lo-co without Bezel
		8: MS Read Only		8. Hi-co without Bezel

Capacity			Option II	Option III
A: 0.2T	G: 0.2T	M: 0.2T	0: -	0: -
B: 0.38T	H: 0.38T	N: 0.38T	A: Card Drop (without Bezel) + Hi-co/Lo-co Selector	1: Side Door + Capture Error Bin
C: 0.5T	I: 0.5T	O: 0.5T		2: Side Door + Capture Slide Drop
D: 0.76T	J: 0.76T	P: 0.76T		B: Capture Error Bin
E: 0.84T	K: 0.84T	Q: 0.84T		D: Capture Slide Drop
F: 1.0T	L: 1.0T	R: 1.0T	D: Card Drop without Bezel	S: Side Door
600 PCS	1000 PCS	400 PCS	H: Hi-co/Lo-co Selector	

C O N T E N T S

OVERVIEW

CIM6XXX Series is a set of card issuing machine for the magnetic, IC, and RF card in conjunction with the KYT2600 and KYT3000 series and KYX-1000 series. This model can be used for magnetic card conforming to the ISO7816-2 standard and most of the IC cards conforming with the ISO7816-4 T=0,T=1. Additionally, this model also can be used for the RF card conforming to the ISO 14443 MIFARE.

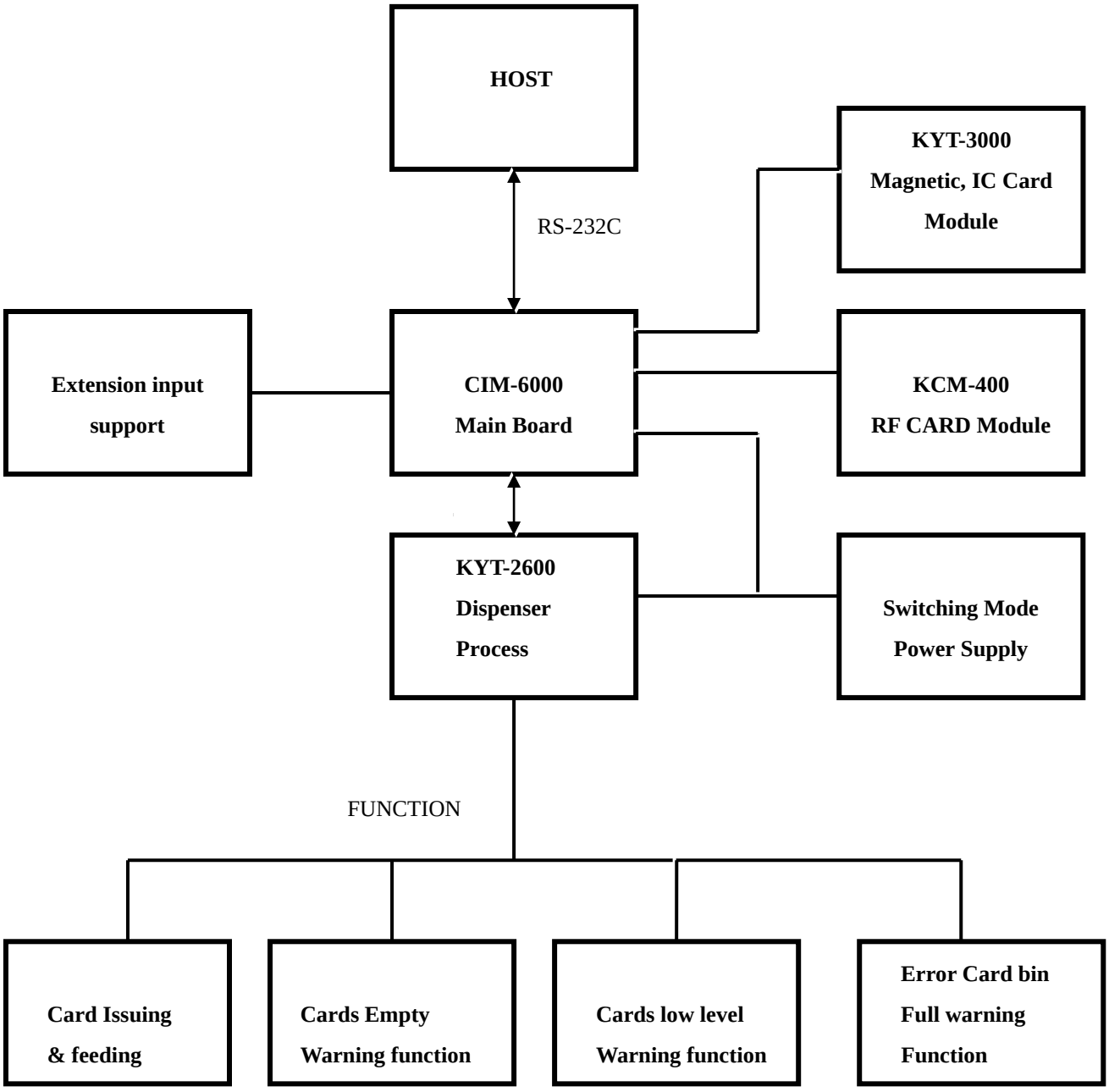
This model simplified the command for magnetic card, minimize the delay time occurs in the communication data processing, and improved the speed due to function to issue the all tracks at a time.

This model has the following advantages:

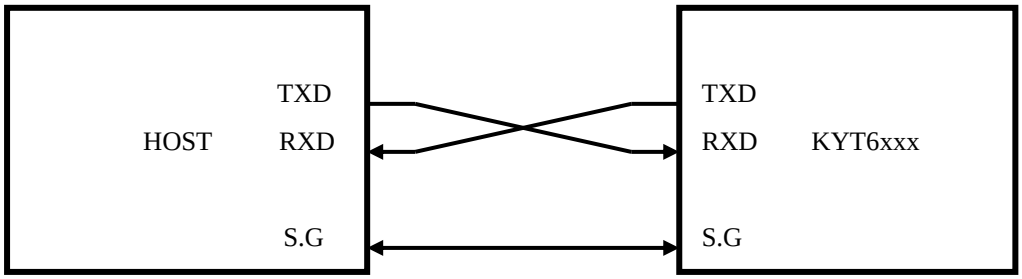
1) Remove the latency due to the user-based card exchange, by loading 1,000 PCS(0.76 mm card) at a time.
2) Use the different type of card using two stackers.

As an automatic issuing machine, this model can be used in issuing most types of credit card and debit card in financial area.

SYSTEM BLOCK DIAGRAM



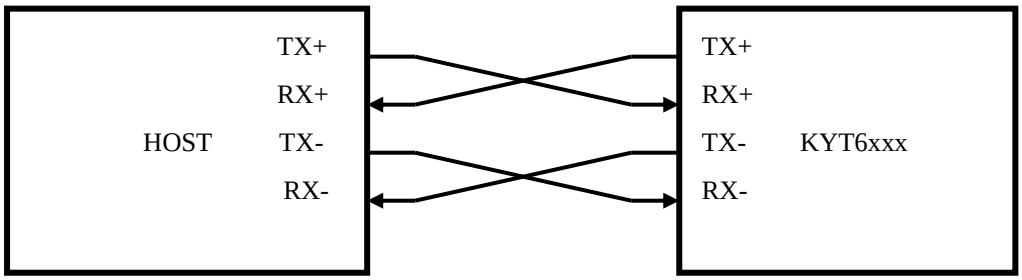
♦ *RS – 232 Connection*



CASE 1) Part Number : RED-9S-LNA(HIROSE)

Pin No	INDEX	Remark
2	RXD	Receive
3	TXD	Transmit
5	S.G	Signal Ground

♦ *RS422 Connection*



CASE 1) Part Number : RED-9S-LNA(HIROSE)

Pin No	INDEX	Remark
1	TX+	
4	RX+	
6	TX-	
8	RX-	

SPECIFICATIONS

♦ *basic functions*

	Spec	Remark
Input power	AC 110 ~ AC 220V Free valtage	
Card Feeding Speed	510 mm/Sec ±10%	

♦ *Environment Requirements*

Operating Locus : in door use Only

Ambient Temperature

Storage : -20 °C to 70 °C(No functional error to be found in 12 hours after returning to normal environment)

Operating : 5 °C to 50°C (In 0°C to +5°C range, all specifications but 'Warped card' to be satisfied)

Ambient Relative Humidity

Storage : 0% to 95% RH(No functional error to be found in 12 hours after returning to normal environment)

Operating : 5 % 90% RH(No Condensation)

Vibration

: Amplitude 2mm, 10 to 50 Hz in X, Y, Z directions for 30min, 2G or less

Shock Endurance

: 30G, 11ms

♦ *Controller Environment*

Communication

: RS422 OR RS232C Interface

: Baud Rate – 9600 BPS

– 19200 BPS

– 38400BPS(Default)

– 57600BPS

: 8Data bit, 1 Start bit, None Parity bit, 1 Stop Bit

MAGNETIC CARD PROCESS

♦ *Total processing time*

: Less than 1.2 Sec

♦ *Life and Reliability*

Life of Head : Minimum 500,000 passes

(One pass is for forward and backward movement)

Error Rate : 5/1000 cycle

♦ *Reference Standards*

: ISO 7811-1,2,3,4,5 : identification cards – Recording technique

♦ *Recording*

	ISO Track 1	ISO Track 2	ISO Track 3
BPI	210	75	210
Capacity	Max 79	Max 40	Max 107
Reading Methods	F2F		
Length	Variable		
Card thickness	Plastic : 0.76 ±0.08mm		

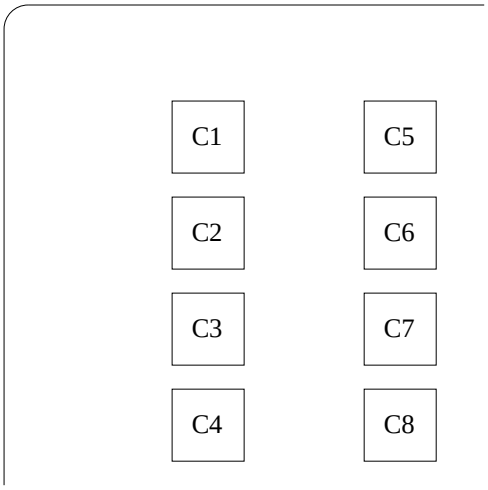
IC CARD PROCESS

This model provides most type of IC card compliant to ISO7816 T=0,T=1 .

♦ *Processing time* : Less than 1 Sec

♦ *Number and Location of the contacts on IC Card*

: Number and location of the contacts on IC Card is specified in ISO 7816-2 figure 2



C1 : VCC(Supply voltage)
C2 : RST(Reset signal)
C3 : CLK(Clock signal)
C4 : Reserved to ISO/IEC JTC 1/SC 17 for future use
C5 : GND(Ground)
C6 : VPP(Programming voltage)
C7 : I/O(Data inut/output)
C8 : Reserved to ISO/IEC JTC 1/SC 17 for future use

♦ *Life and Reliability*

IC Contact : Approximately 1,000,000 passes
Error Rate : 5/1000 cycle

RF CARD PROCESS

The RF module supports most of RF cards conforming with the ISO14443-3 Type A (MIFARE Card) with 8 Kbits memory.

♦ *Processing time* : Once Block

Command	Parameter	Time (mSec)		Note
		Type	Max	
Card Read	1 Block	50		Without card moving
Card Write	1 Block	50		Without card moving, With Verify
Card Decrement	1 Block	80		Without card moving
Card Increment	1 Block	80		Without Card moving

♦ *Operating Frequency*

Operating Frequency : 13.56 MHz

Data Transfer Baud : Baud rate 106Kbaud

COMMUNICATION INTERFACE

♦ *Communication Method*

Asynchronous, Half duplex.

Baud Rate : 9600 – 57600Bps , Default : 38400Bps

Start Bit : 1Bit

Data Length : 8Bit

Parity : None

Stop Bit : 1Bit

♦ *Communication Protocol Format*

1 Command Frame Format.

SOH	Null	Length	STX	CMD	DATA	ETX	BCC
1 byte	1 byte	2 byte	1 byte	3 byte	N byte	1 byte	1 byte

(N byte: Variable length)

2 Positive Response Frame Format

SOH	Null	Length	STX	CMD	GOOD	0x01	DATA	ETX	BCC
1 byte	1 byte	2 byte	1 byte	3 byte	2 byte	1 byte	N byte	1 byte	1 byte

3 Negative Response Frame Format

SOH	Null	Length	STX	CMD	E-Code	0x00	ETX	BCC
1 byte	1 byte	2 byte	1 byte	3 byte	2 byte	1 byte	1 byte	1 byte

4 BCC (Check Sum)

SOH	Null	Length	STX	CMD	DATA	ETX	BCC

BCC (Check Sum)

Command Frame BCC = Null ^ Length ^ STX ^ CMD ^ DATA ^ ETX.

Positive Response BCC = Null ^ Length ^ STX ^ CMD ^ GOOD ^ 0x01 ^ DATA ^ ETX.

Negative Response BCC = Null ^ Length ^ STX ^ CMD ^ E-Code ^ ETX.

5. Explanatory note of technical words

Name	Detail
Null	Reserved. Always 0x00.
Length	Data Length from the CMD to DATA.
CMD	Instruction Code (3 Bytes)
GOOD	Normal Execution : 0x0000 (2 Bytes)
E-Code	Command Failed: Refer to “Error Code” (2 Bytes)
BCC	Check Sum.

<Length>, <E-Code>

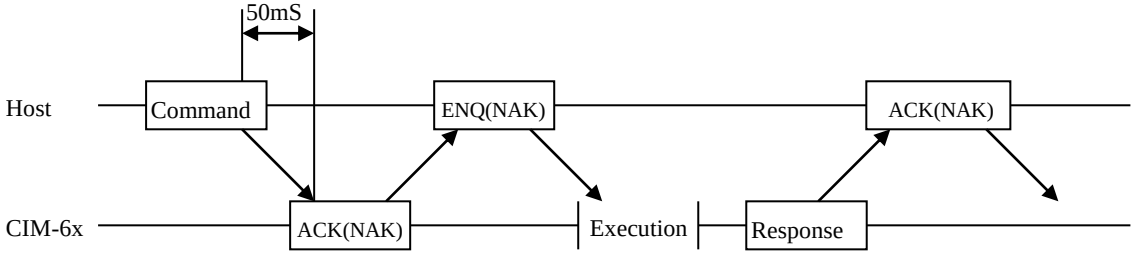
High Byte	Low Byte

6. Control Characters

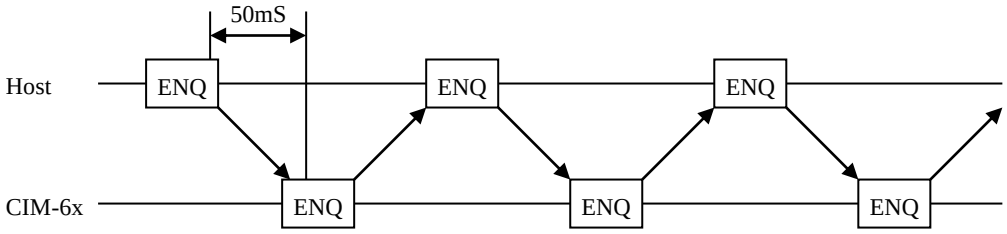
Name	Hex Value	Detail
SOH	0x01	Start of Header
STX	0x02	Start of Text
ETX	0x03	End of Text
ENQ	0x05	Enquiry
ACK	0x06	Positive Acknowledge
NAK	0x15	Negative Acknowledge
CAN	0x18	Cancel

7 COMMUNICATION SEQUENCE / TIMING

7.1 Command

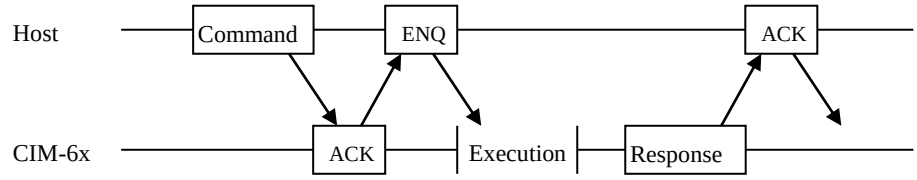


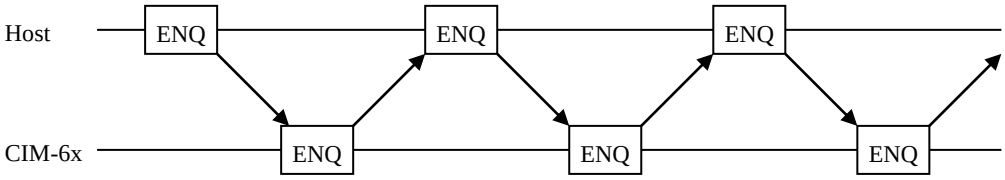
7.2 Inquiry



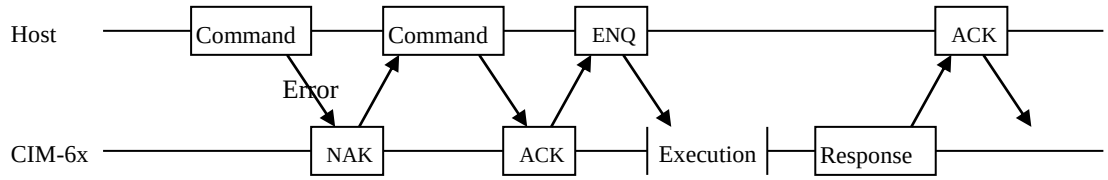
7.3 Sequence

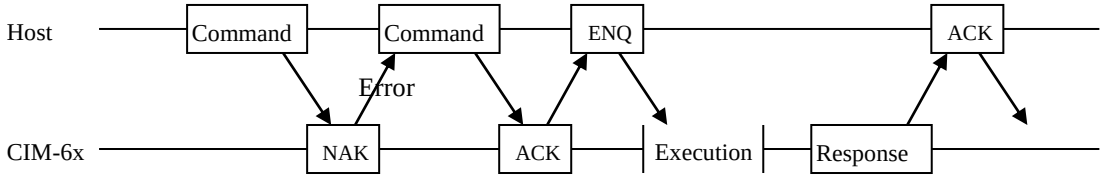
7.3.1 General

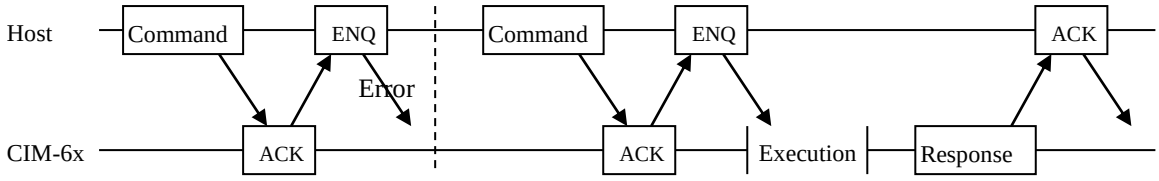


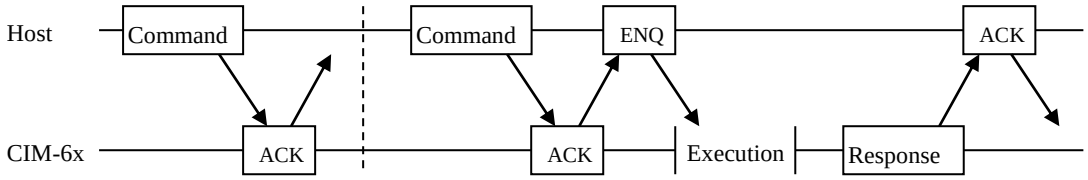


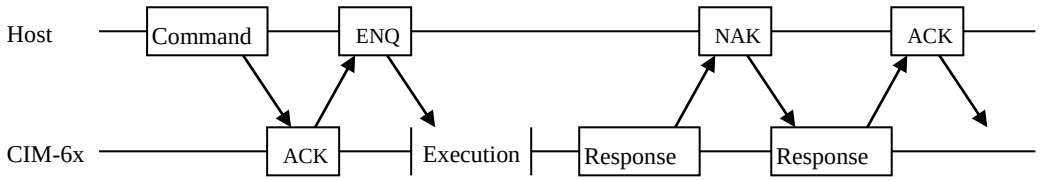
7.3.2 Event

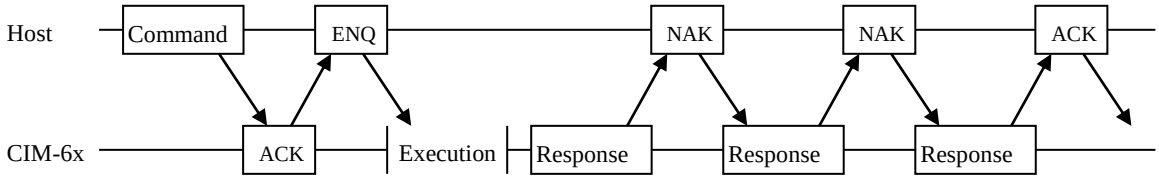

Host
Command
Command
ENQ
ACK
Error
CIM-6x
NAK
ACK
Execution
Response

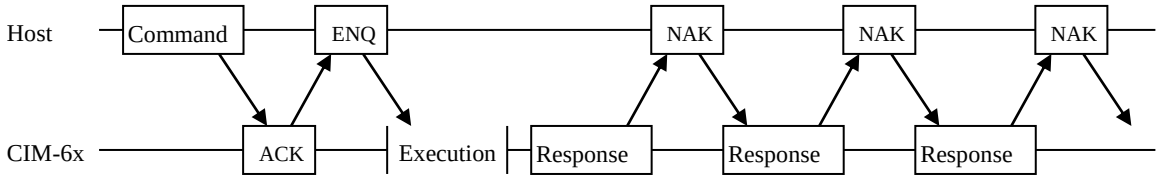

Host
Command
Command
ENQ
ACK
Error
CIM-6x
NAK
ACK
Execution
Response

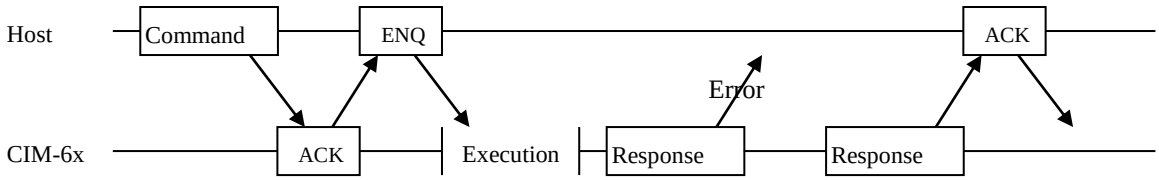

Host
Command
ENQ
Command
ENQ
ACK
Error
CIM-6x
ACK
ACK
Execution
Response

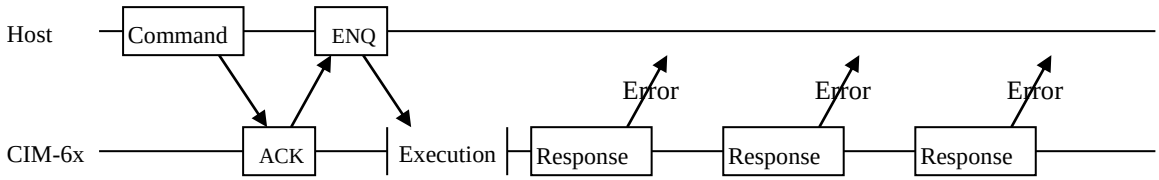

Host
Command
Command
ENQ
ACK
CIM-6x
ACK
ACK
Execution
Response

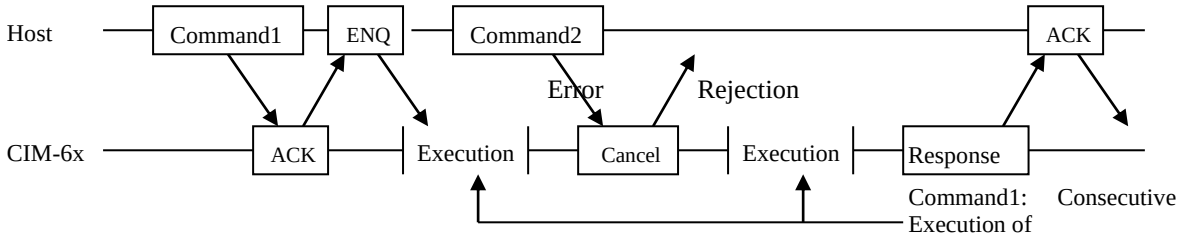

Host
Command
ENQ
NAK
ACK
CIM-6x
ACK
Execution
Response
Response

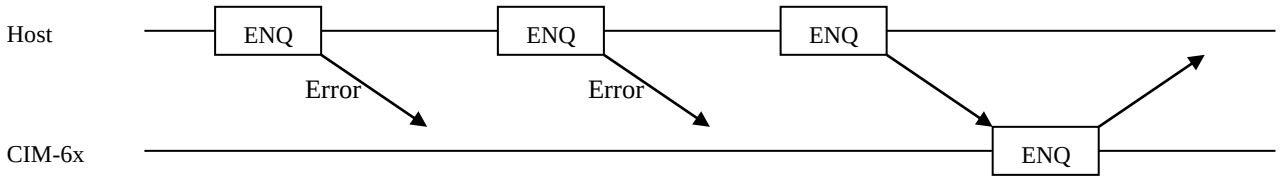

Host
Command
ENQ
NAK
NAK
ACK
CIM-6x
ACK
Execution
Response
Response
Response


Host
Command
ENQ
NAK
NAK
NAK
CIM-6x
ACK
Execution
Response
Response
Response

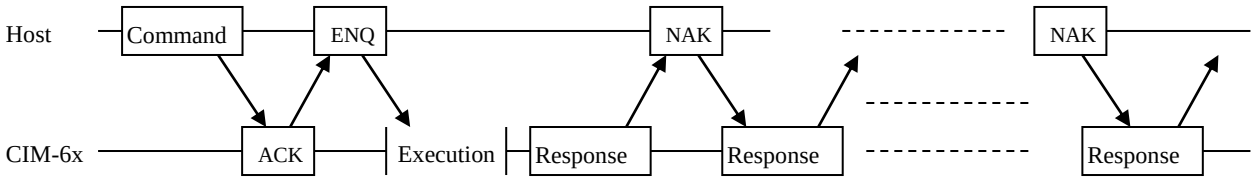

Host
Command
ENQ
ACK
Error
CIM-6x
ACK
Execution
Response
Response


Host
Command
ENQ
Error
Error
Error
CIM-6x
ACK
Execution
Response
Response
Response


Host
Command1
ENQ
Command2
ACK
Error
Rejection
CIM-6x
ACK
Execution
Cancel
Execution
Response
Command1: Consecutive
Execution of

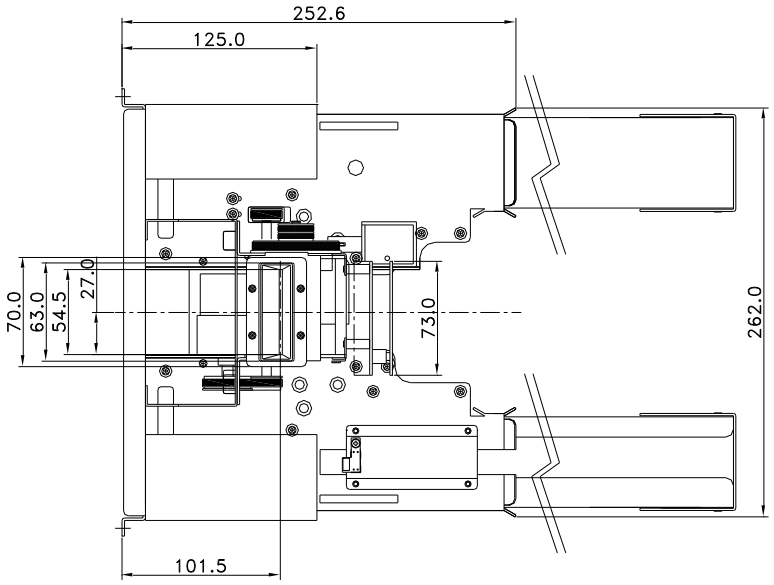


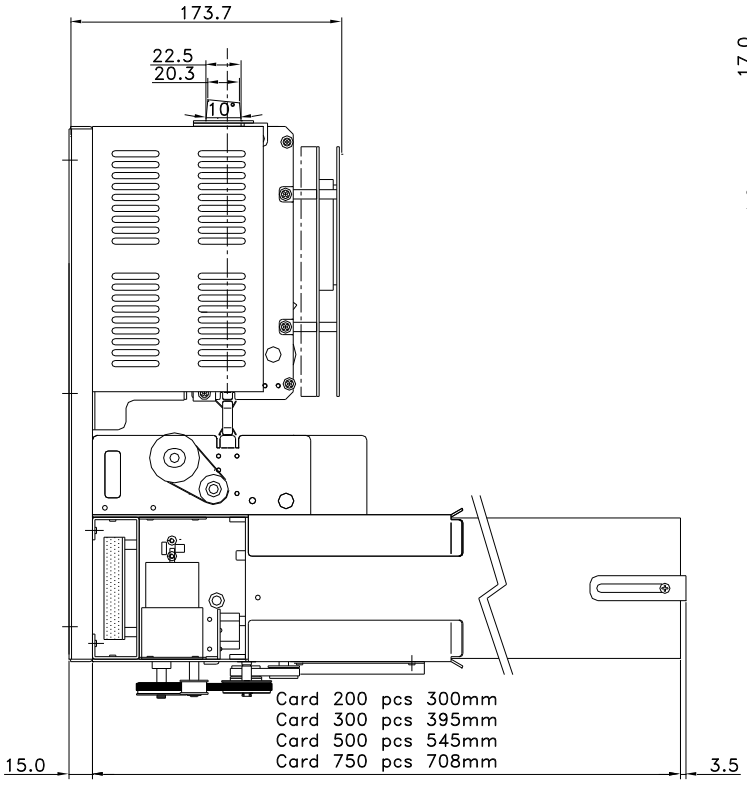
- When received the NAK packet consecutively.

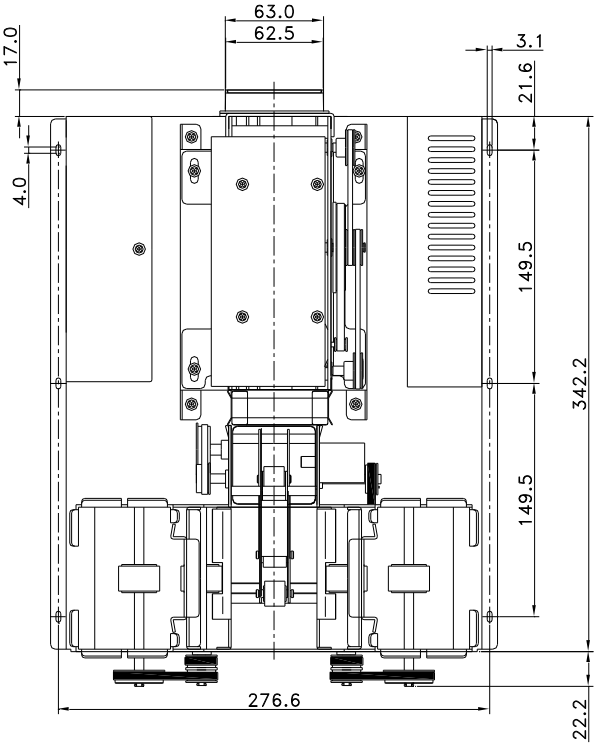


TECHNICAL DRAWING

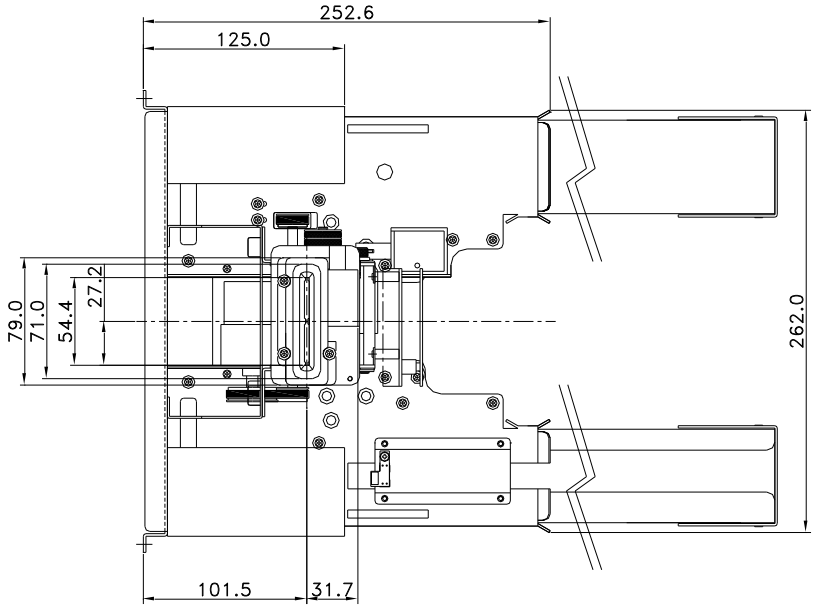
MODEL NAME : CIM61XX, CIM62XX, CIM63XX, CIM64XX, CIM65XX, CIM67XX, CIM68XX,(BEZEL TYPE)

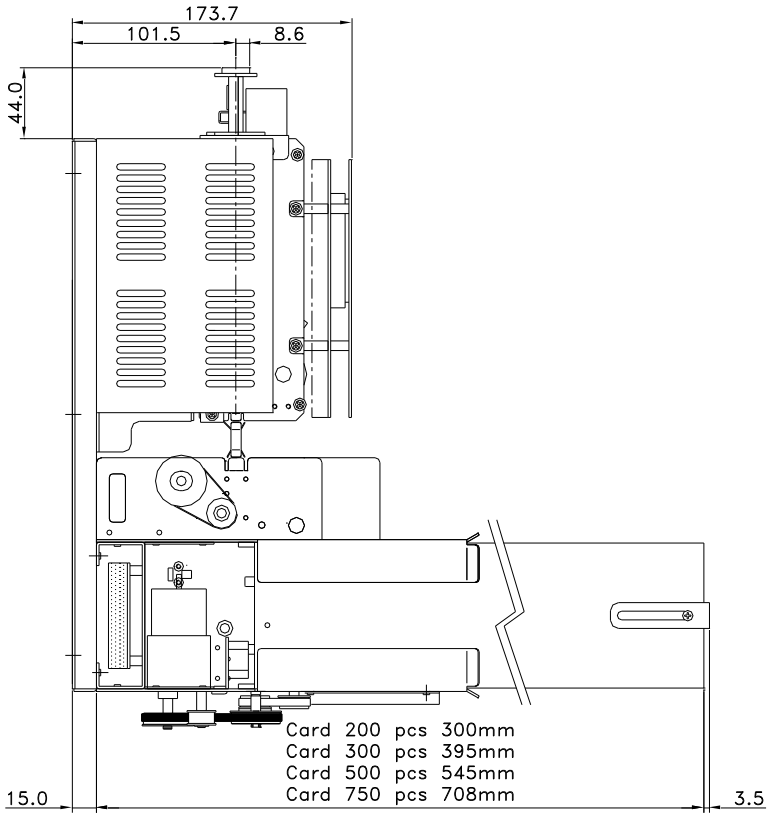


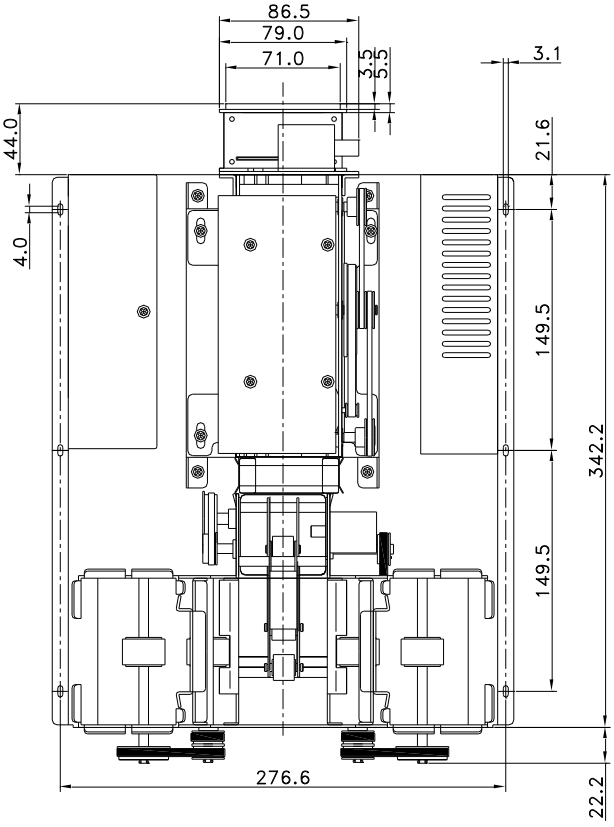




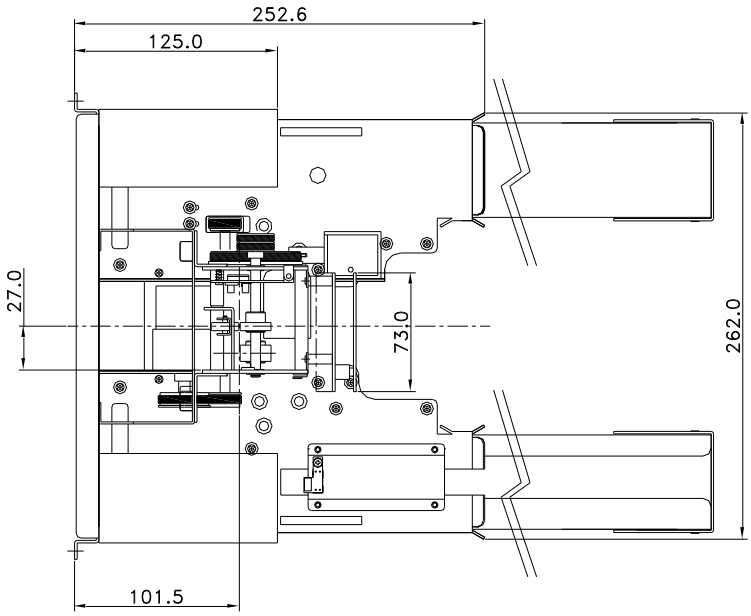
MODEL NAME : CIM61XX, CIM62XX, CIM63XX, CIM64XX, CIM65XX, CIM67XX, CIM68XX,(SHUTTER TYPE)

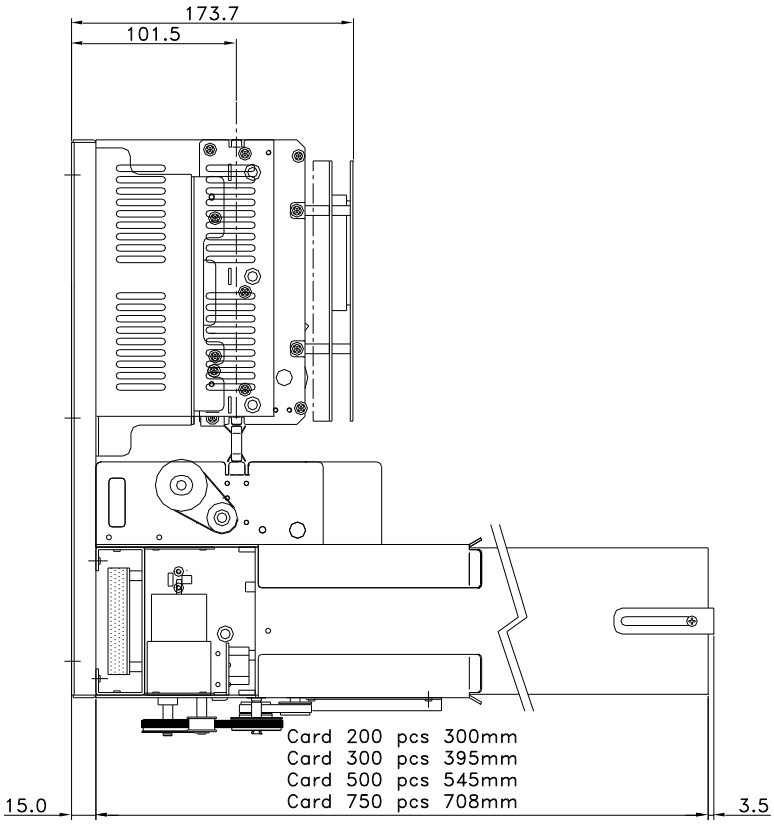


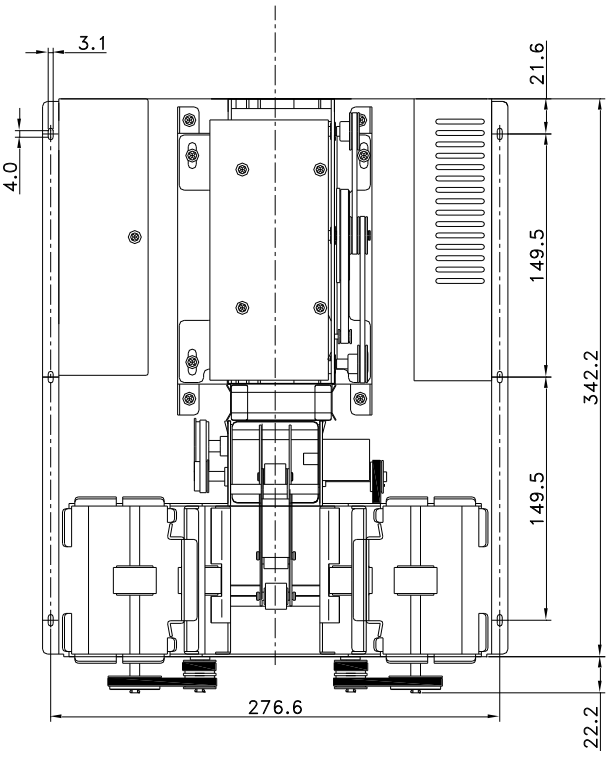




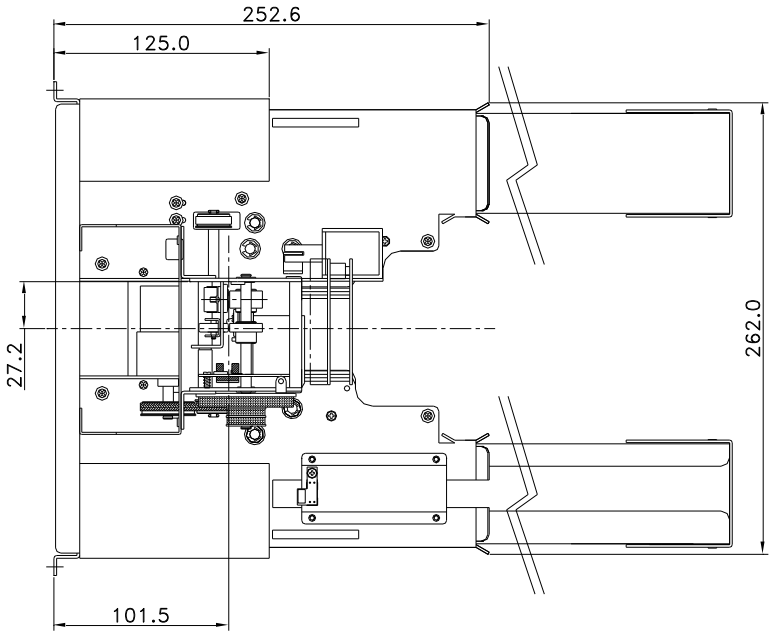
MODEL NAME : CIM61XX, CIM62XX, CIM63XX, CIM64XX, CIM65XX, CIM67XX, CIM68XX,(WITHOUT BEZEL)

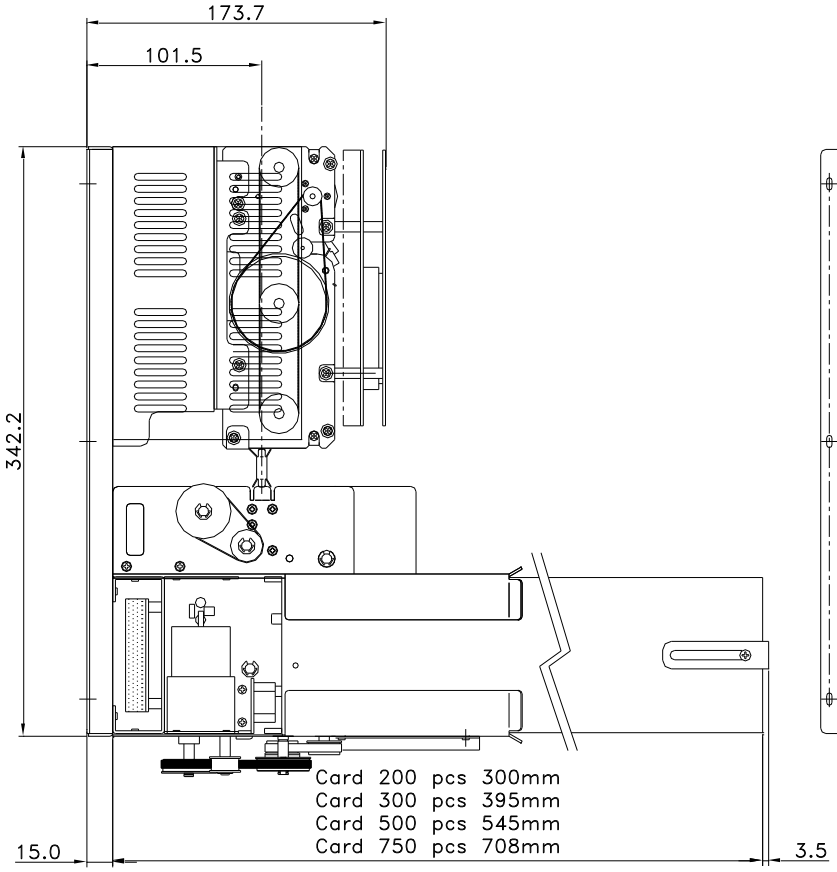


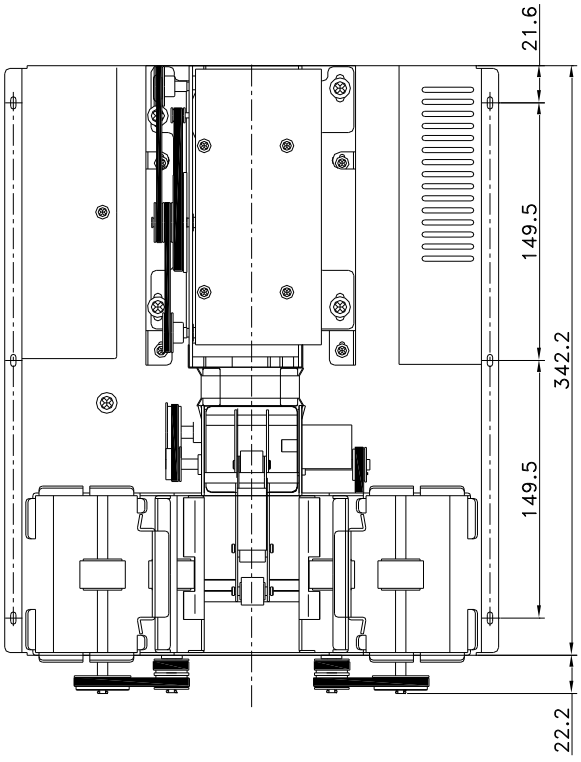




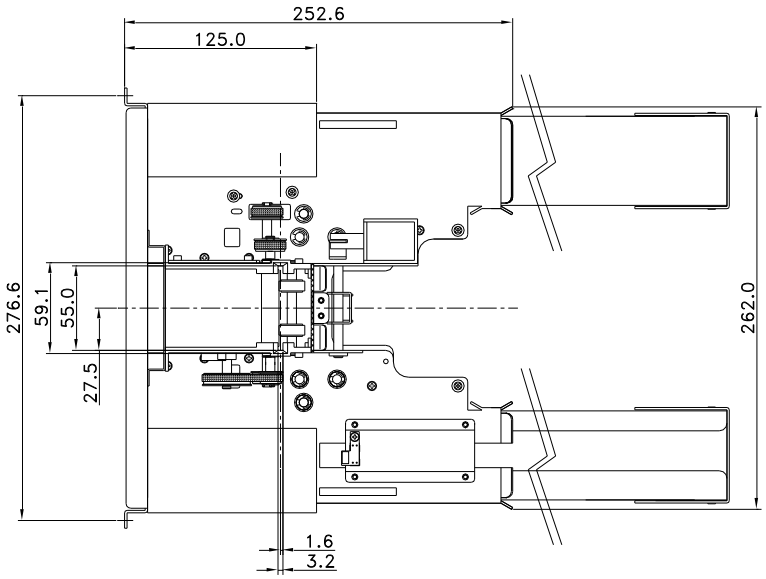
MODEL NAME : CIM61XX, CIM62XX, CIM63XX, CIM64XX, CIM65XX, CIM67XX, CIM68XX,(DROP-TYPE)

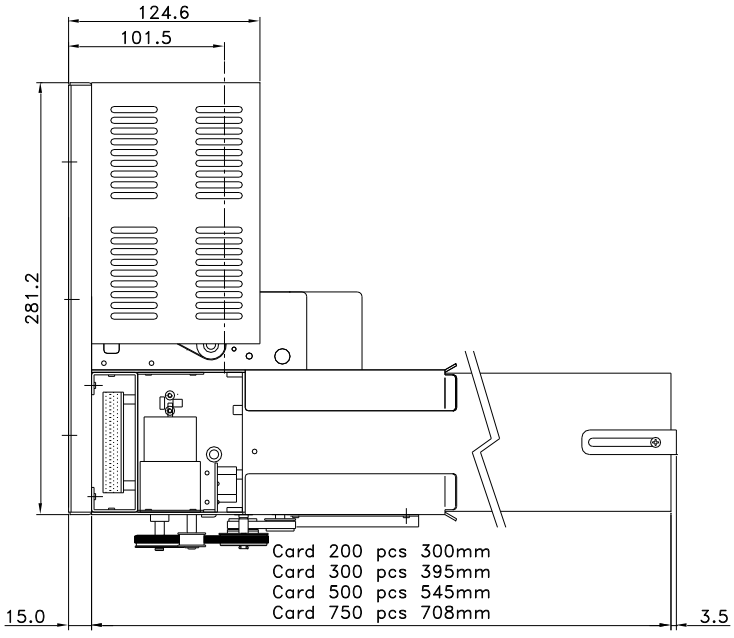


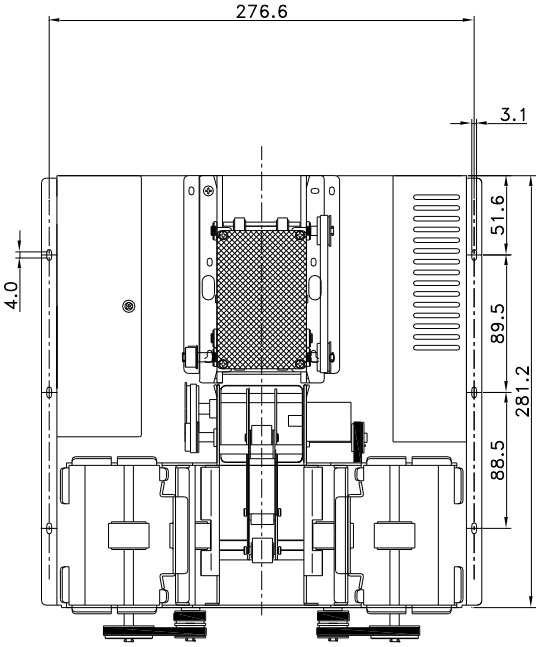




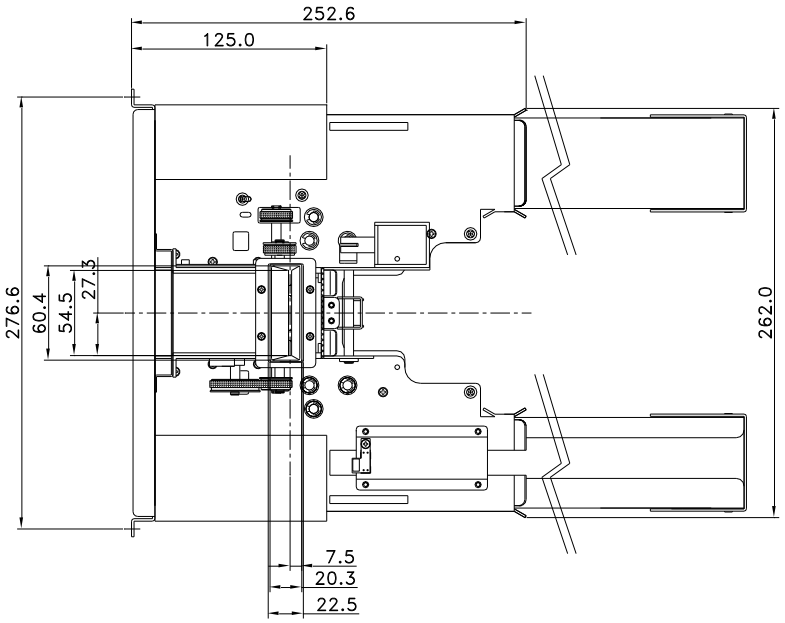
MODEL NAME : CIM66XX(WITHOUT BEZEL)

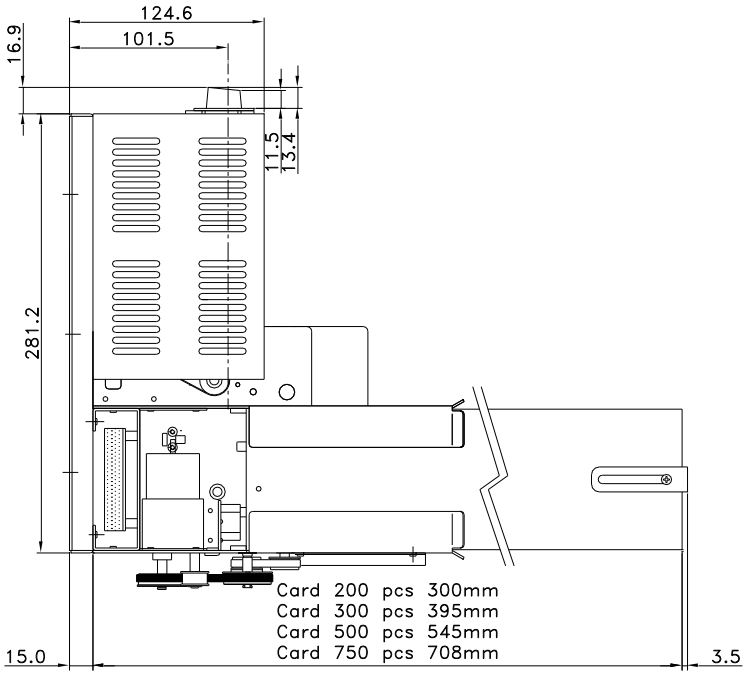


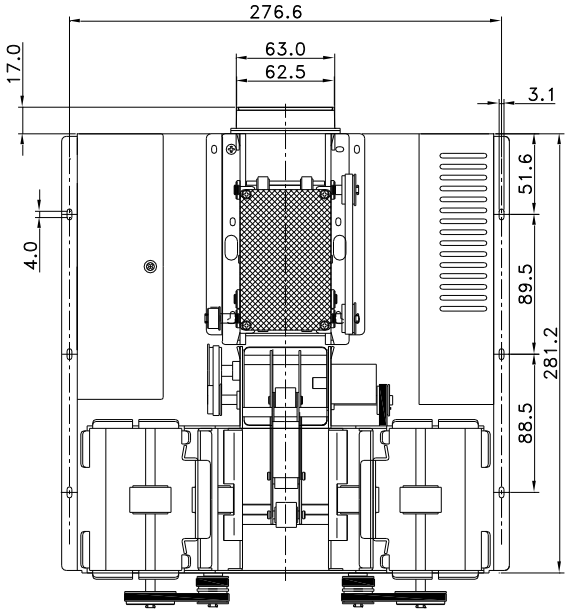




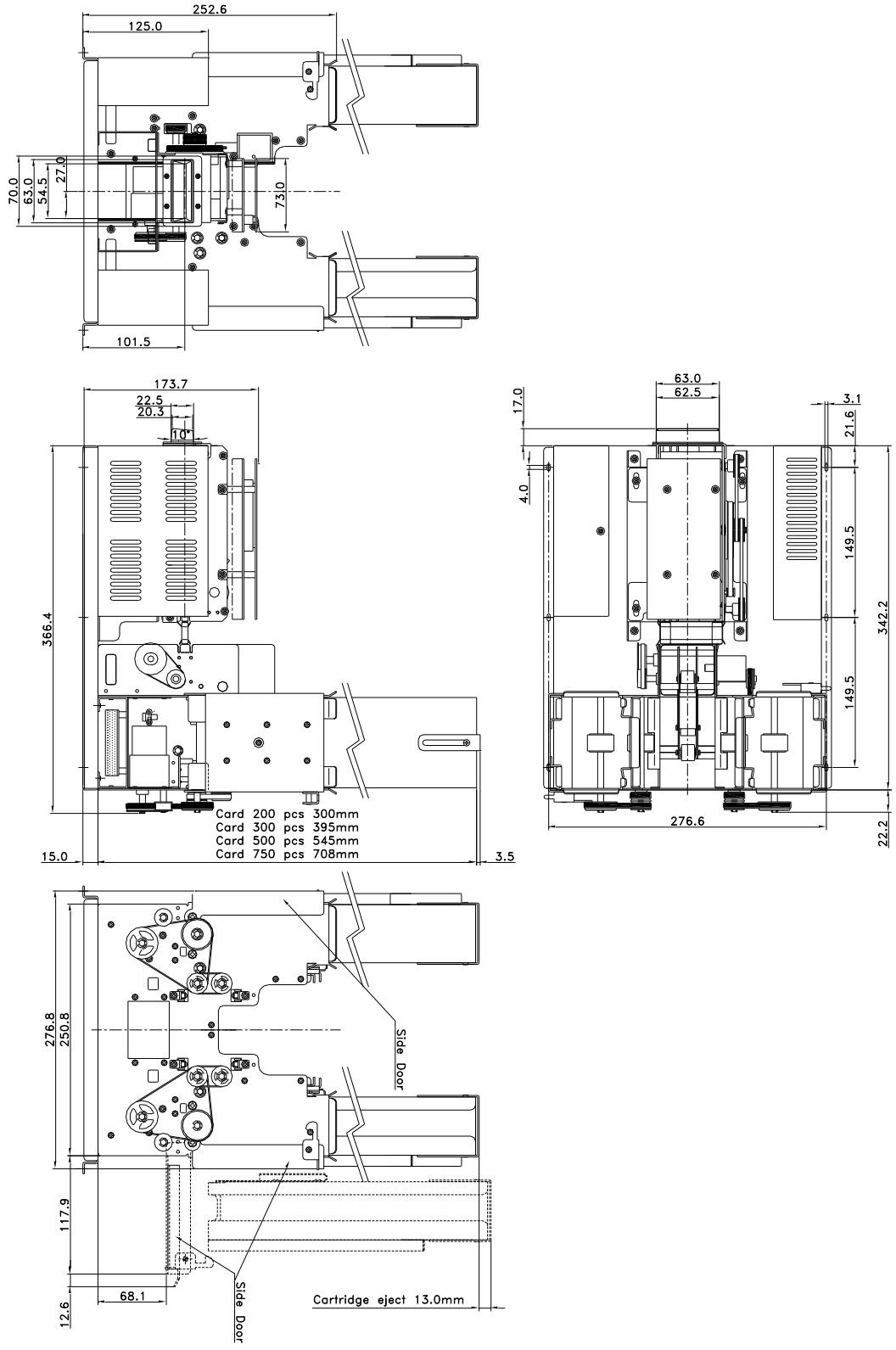
MODEL NAME : CIM66XX(BEZEL TYPE)



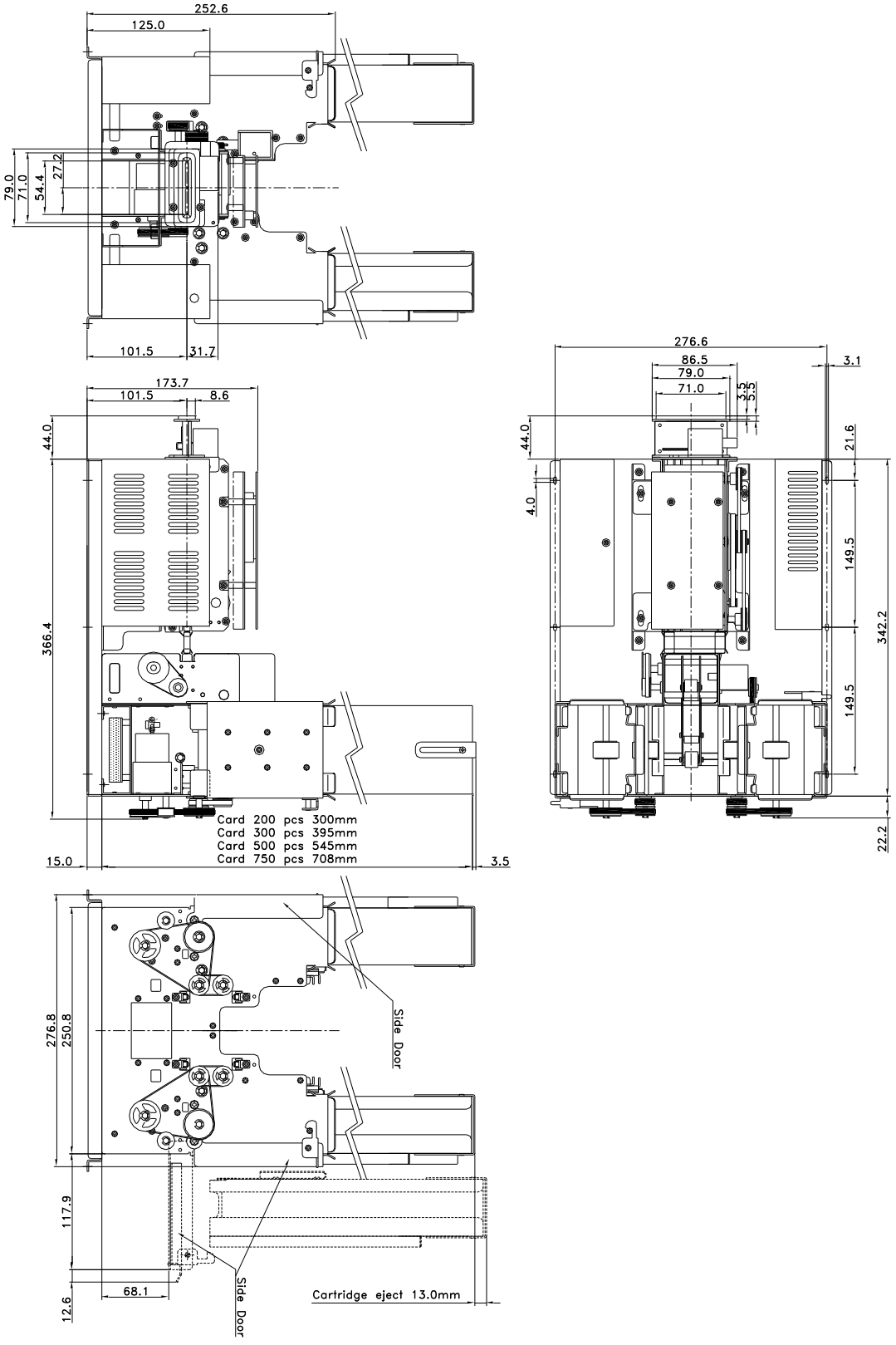




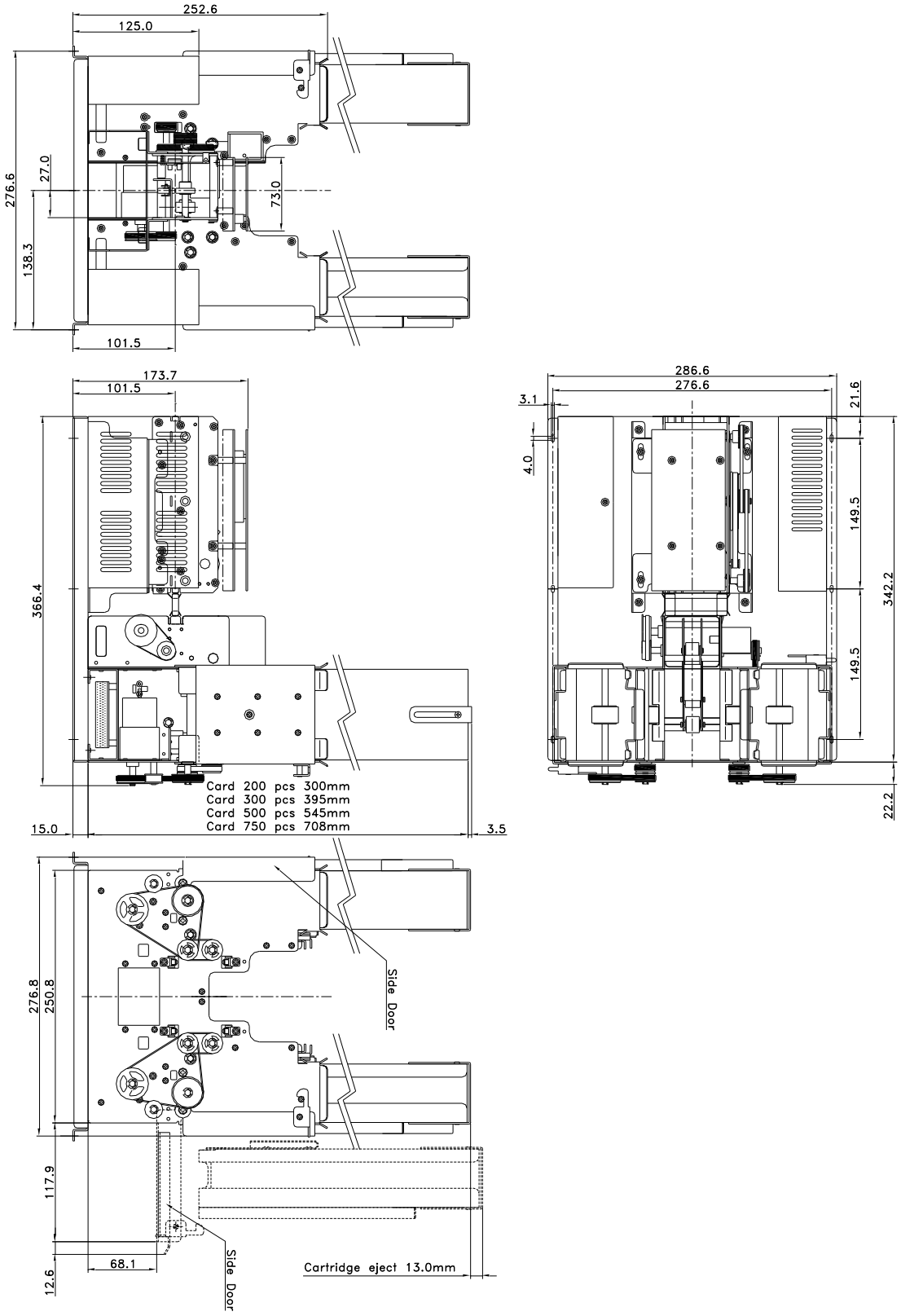
MODEL NAME : CIM61XX, CIM62XX, CIM63XX, CIM64XX, CIM65XX, CIM67XX, CIM68XX,(BEZEL and SIDE DOOR type)



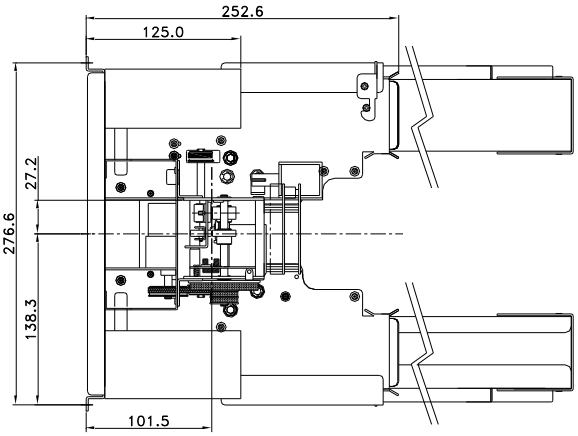
MODEL NAME : CIM61XX, CIM62XX, CIM63XX, CIM64XX, CIM65XX, CIM67XX, CIM68XX,(SHUTTER and SIDE DOOR type)

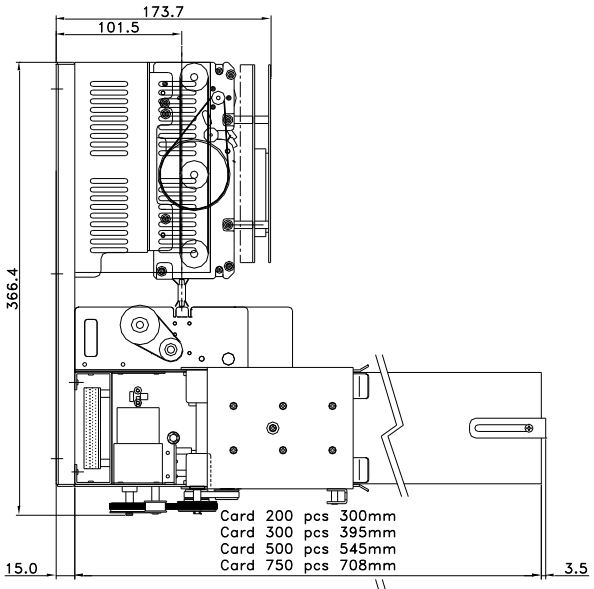


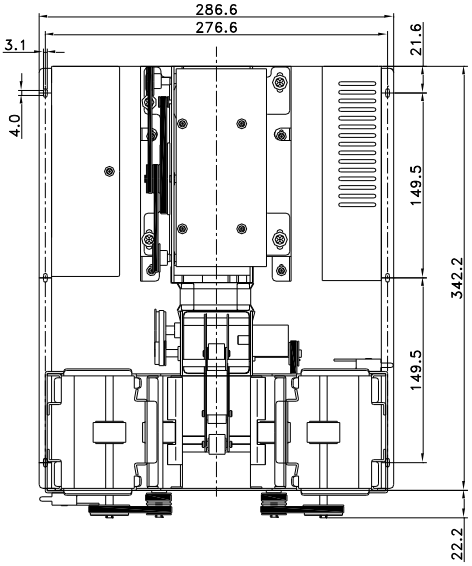
MODEL NAME : CIM61XX, CIM62XX, CIM63XX, CIM64XX, CIM65XX, CIM67XX, CIM68XX,(WITHOUT BEZEL and SIDE DOOR type)

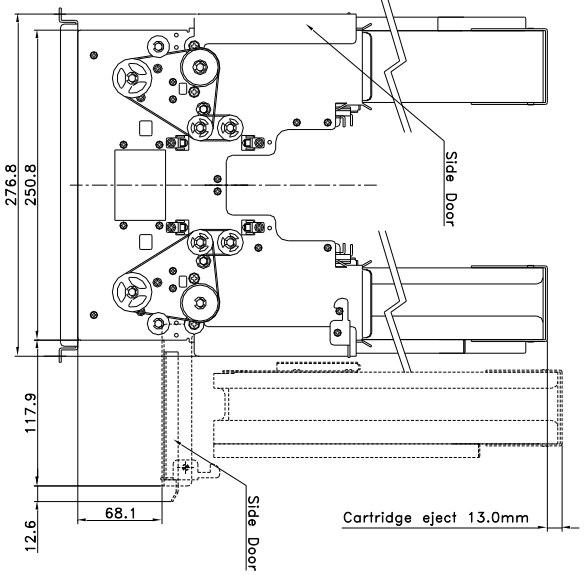


MODEL NAME : CIM61XX, CIM62XX, CIM63XX, CIM64XX, CIM65XX, CIM67XX, CIM68XX,(SIDE DOOR and DROP type)

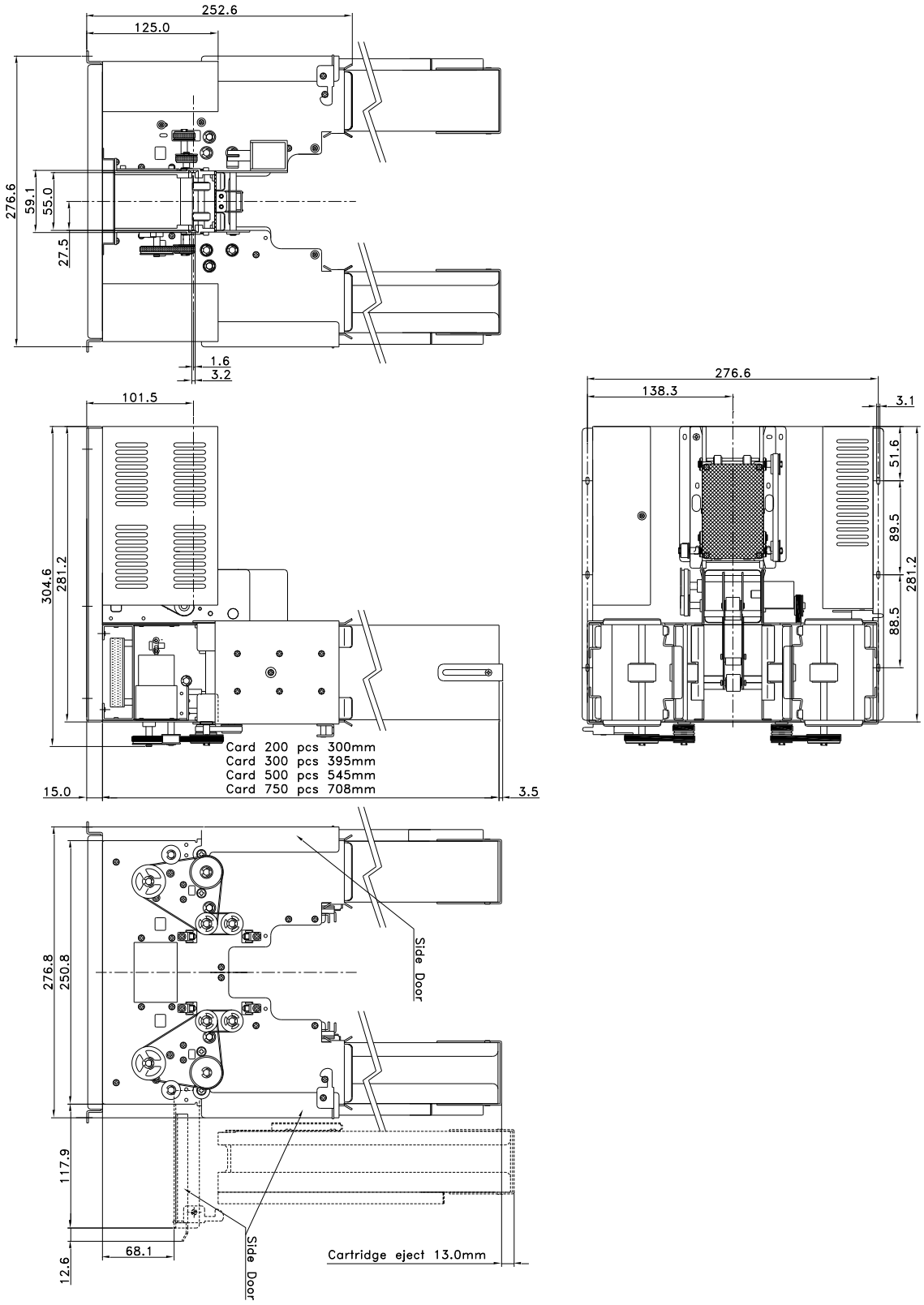




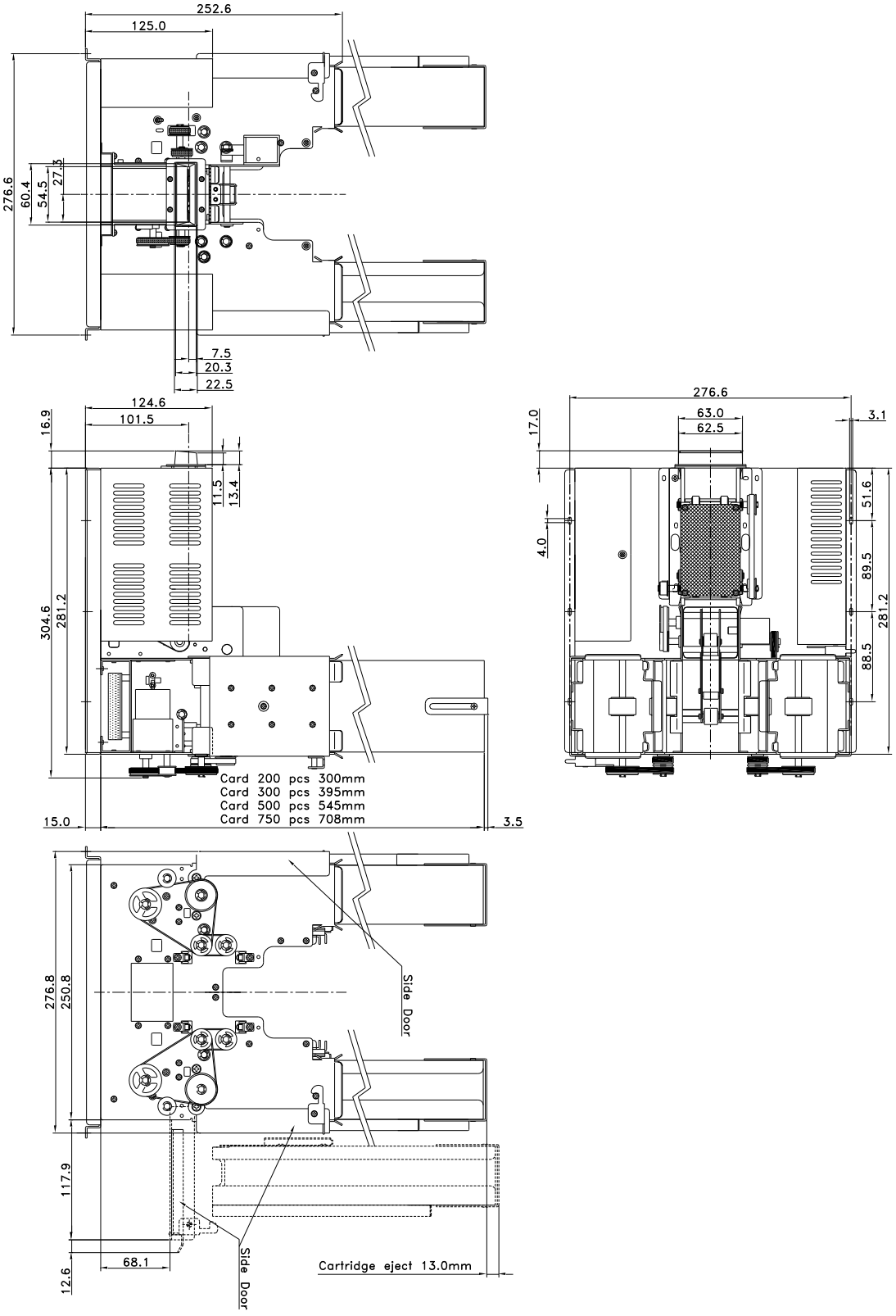




MODEL NAME : CIM66XX(WITHOUT BEZEL and SIDE DOOR type)



MODEL NAME : CIM66XX(SIDE DOOR and BEZEL type)



COMMAND DETAIL

♦ *Command List*

	Item	Cm0	Cm1	Cm2	Detail	Note
COMMON	STATUS	'C'	'1'	'1'	Get Model	
		'C'	'1'	'2'	Get Firmware Version	
		'C'	'1'	'3'	Get Stacker	
		'C'	'1'	'4'	Get Status List	
		'C'	'1'	'5'	Get Error List	
		'C'	'1'	'6'	Get Card Position	
	SETTING_1	'C'	'2'	'1'	Set RTC IC	Check
		'C'	'2'	'4'	Set Retry Count	Check
		'C'	'2'	'5'	Set Buzz On/Off Cont.	Check
		'C'	'2'	'6'	Set Baud Rate	Check
	MOVE	'C'	'3'	'1'	Card Move From Stacker	
		'C'	'3'	'2'	Card Move To …	
		'C'	'3'	'4'	Card Capture	Backward
		'C'	'3'	'6'	Card Eject (Drop Mode)	Forward
		'C'	'3'	'7'	Card Eject (Hold Mode)	Forward
	SETTING_2	C	'4'	'2'	Software Reset	
MAGNETIC CARD	MAGNETIC READ / WRITE	'M'	'3'	'1'	Magnetic Card Read	
		'M'	'3'	'3'	Magnetic Card Write	Verify**
		'M'	'3'	'4'	Magnetic Card Write From Stacker	Verify**
		'M'	'3'	'5'	Magnetic Card All Track Read	
	CLEANING	'M'	'5'	'1'	MSRW Header Cleaning	
IC CARD	IC CONTROL	'I'	'2'	'1'	IC Card Reset	
		'I'	'2'	'2'	IC Card Direct Control	
		'I'	'2'	'3'	Selects IC card or Sam card	
RF CARD	RF READ / WRITE	'R'	'3'	'1'	RF Card Read in Block Range	
		'R'	'3'	'2'	RF Card Write in Block Range	
		'R'	'3'	'6'	Read RF card data in sector range	
		'R'	'3'	'7'	Write RF card data in sector range	
	BALANCE	'R'	'4'	'1'	Increases balance in RF card	
		'R'	'4'	'2'	Decreases balance in RF card	
	SECRET KEY CHANGE	'R'	'5'	'1'	Change 'Secret Key' to other Key	
		'R'	'5'	'2'	Change 'Secret Key' to all the same Key value	
		'R'	'5'	'3'	Selects 'Secret Key Index'	
		'R'	'5'	'4'	Change RF Card 'Secret Key' to other key	
		'R'	'5'	'5'	Key Set and Change 'Secret Key' to other Key	
		'R'	'5'	'6'	Key Set and Change 'Secret Key' to all the same Key value	
	RF DETECT	'R'	'6'	'1'	Check RF card in antenna area	
Ultra Mifare	Read	'U'	'3'	'1'	Reads data on Mifare Ultra Light card.	
	Write	'U'	'3'	'2'	Writes data on Mifare Ultra Light card.	
	UID	'U'	'4'	'1'	Reads UID (Serial Number) on Mifare Ultra Light card.	

♦ *Common*

These are the command set that all the CIM-6000 Series use. These commands include the terminal setting and the card movement related commands.

The 'STATUS' commands provide the function to check the current terminal status and the errors occurred during the command execution.

The 'SETTING' commands consist of commands for setting the terminal and these commands is easy to use because the same command can use for both setting and checking the terminal.

The 'MOVE' commands consist of commands used commonly like the card eject and capture command.

Commands Set:

	Item	Cm0	Cm1	Cm2	Detail	Note
COMMON	STATUS	'C'	'1'	'1'	Get Model	
		'C'	'1'	'2'	Get Firmware Version	
		'C'	'1'	'3'	Get Stacker	
		'C'	'1'	'4'	Get Status List	
		'C'	'1'	'5'	Get Error List	
		'C'	'1'	'6'	Get Card Position	
	SETTING_1	'C'	'2'	'1'	Set RTC IC	Check
		'C'	'2'	'3'	Set Capture Time	Check
		'C'	'2'	'4'	Set Retry Count	Check
		'C'	'2'	'5'	Set Buzz On/Off Cont.	Check
		'C'	'2'	'6'	Set Baud Rate	Check
	MOVE	'C'	'3'	'1'	Card Move From Stacker	
		'C'	'3'	'2'	Card Move To …	
		'C'	'3'	'4'	Card Capture	Backward
		'C'	'3'	'6'	Card Eject (Drop Mode)	Forward
		'C'	'3'	'7'	Card Eject (Hold Mode)	Forward
	SETTING_2	C	'4'	'2'	Software Reset	

1 STATUS / SETTING

1.1 “C11” : Checks out Model number of CIM-6000.

☞ Command Format

SOH	Null	Length	STX	“C11”	ETX	Bcc

☞ Positive Response Format

SOH	Null	Length	STX	“C11”	GOOD	0x01	DATA	ETX	Bcc

☞ Negative Response Format

SOH	Null	Length	STX	“C11”	E-Code	0x00	ETX	Bcc

☞ Response Data Structure

Model No
30 Byte (ASCII)

1.2 “C12” : Checks out Firmware Version of CIM-6000

☞ Command Format

SOH	Null	Length	STX	“C12”	ETX	Bcc

☞ Positive Response Format

SOH	Null	Length	STX	“C12”	GOOD	0x01	DATA	ETX	Bcc

☞ Negative Response Format

SOH	Null	Length	STX	“C12”	E-Code	0x00	ETX	Bcc

☞ Response Data Structure

VERSION
30 Byte (ASCII)

1.3 "C13" : Checks out status of Stacker of CIM-6000

☞ Command Format

SOH	Null	Length	STX	"C13"	ETX	Bcc

☞ Positive Response Format

SOH	Null	Length	STX	"C13"	GOOD	0x01	DATA	ETX	Bcc

☞ Negative Response Format

SOH	Null	Length	STX	"C13"	E-Code	0x00	ETX	Bcc

☞ Response Data Structure

Stacker 1	Stacker 2
1Byte (Hex)	1Byte (Hex)

☞ Data Variable

<Stacker1>

Code	Status
0x01	Stacker #1 Good
0x02	Stacker #1 Warning
0x03	Stacker #1 Empty

<Stacker2>

Code	Status
0x01	Stacker #2 Good
0x02	Stacker #2 Warning
0x03	Stacker #2 Empty

☞ Note

Stacker Status	Detail
'Stacker Good'	Too many cards loading [1)]
'Stacker Warning'	Too few cards loading [1)]
'Stacker Empty'	No cards in stacker

1) The stacker status is detected by the sensor behind the stacker. The number of cards can be changed.

1.4 "C14" : Checks out current Status of CIM-6000

☞ Command Format

SOH	Null	Length	STX	"C14"	ETX	Bcc

☞ Positive Response Format

SOH	Null	HL	Length	"C14"	GOOD	0x01	DATA	ETX	Bcc

☞ Negative Response Format

SOH	Null	Length	STX	"C14"	E-Code	0x00	ETX	Bcc

☞ Response Data Structure

Error Code (1)	---	Error Code (N)

High Byte	Low Byte
2Byte	

☞ Note

You can identify the stacker status, motor status, card status (jamming) and communication status through the Error Code in the response data structure.

1.5 “C15” : Checks out error while Command is being executed.

☞ Command Format

SOH	Null	Length	STX	“C15”	ETX	Bcc

☞ Positive Response Format

SOH	Null	Length	STX	“C15”	GOOD	0x01	DATA	ETX	Bcc

☞ Negative Response Format

SOH	Null	Length	STX	“C15”	E-Code	0x00	ETX	Bcc

☞ Response Data Structure

Error Time (1)	Error Code (1)	---	Error Time (N)	Error Code (N)
7Byte (BCD)	2Byte (Hex)	---	7Byte (BCD)	2Byte (Hex)

High Year	Low Year	Month	Day	Hour	Minute	Second
1Byte	1Byte	1Byte	1Byte	1Byte	1Byte	1Byte

High Byte	Low Byte
1Byte	1Byte

☞ Note

This command is only correspond to the error occurred during command execution. The time when an error is occurred is represented to the BCD, while the error code to the HEX.

1.5 “C16” : Checks out current card position of CIM-6000

☞ Command Format

SOH	Null	Length	STX	“C16”	ETX	Bcc

☞ Positive Response Format

SOH	Null	Length	STX	“C16”	GOOD	0x01	DATA	ETX	Bcc

☞ Negative Response Format

SOH	Null	Length	STX	“C16”	E-Code	0x00	ETX	Bcc

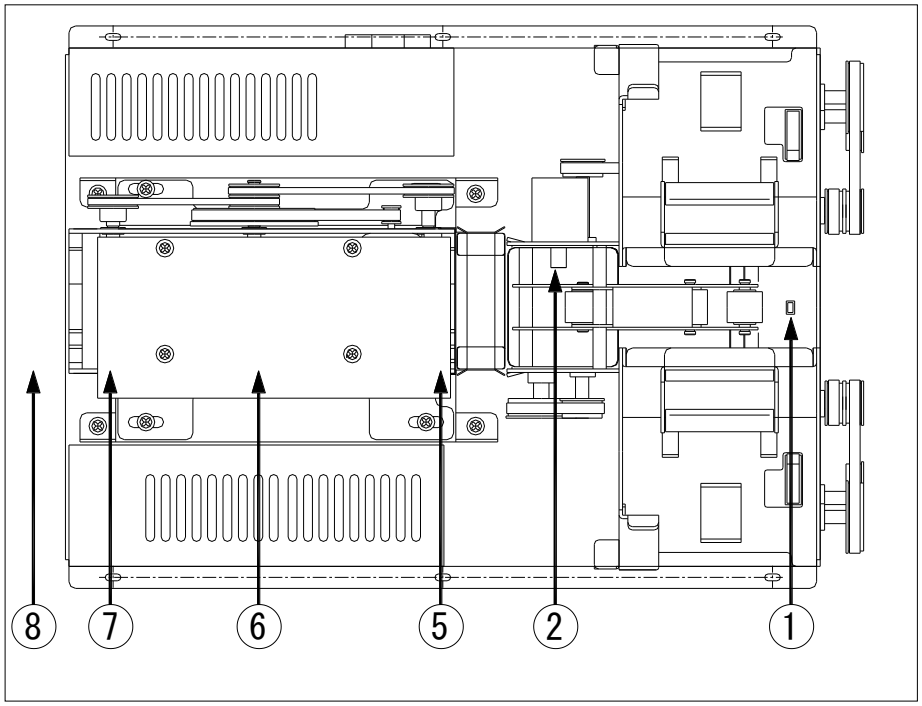
☞ Response Data Structure

Card Position
1Byte (Hex)

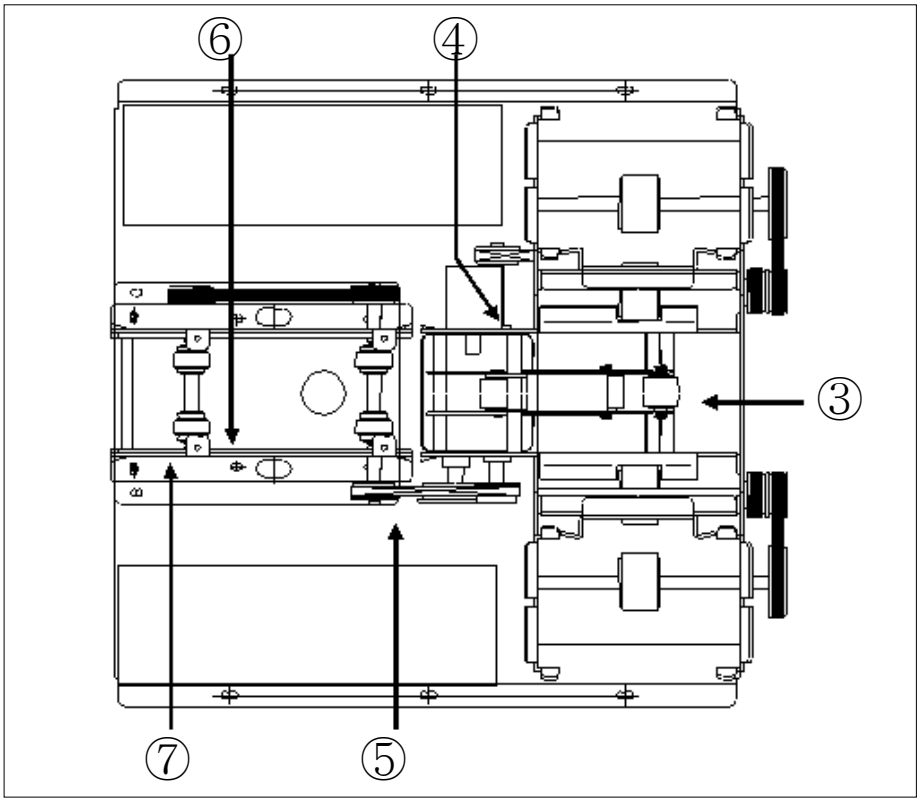
<Card Position> Refer to next page.

Number	Code	Sensor
1	0x01	SEN1
2	0x02	SEN2
3	0x04	SEN3
4	0x08	SEN4
5	0x10	SEN5
6	0x20	SEN6
7	0x40	SEN7
8	0x80	SEN8

<CIM-61XX, CIM-62XX, CIM-63XX, CIM-64XX, CIM-65XX, CIM-67XX, CIM-68XX>



<CIM-66XX>



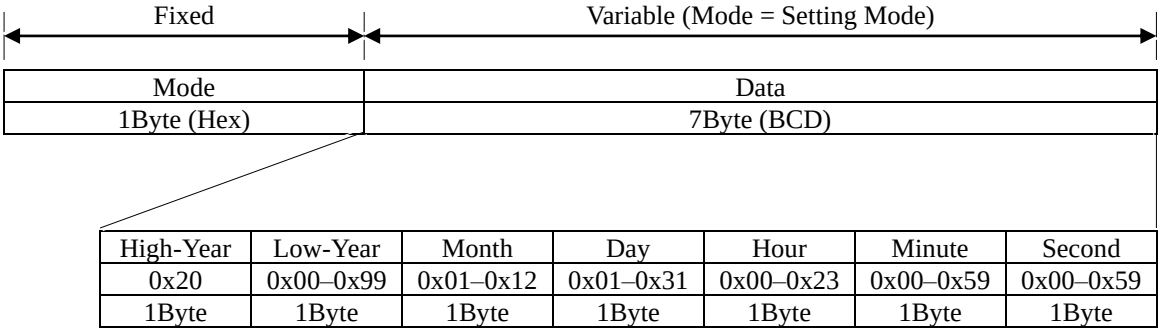
2 SETTING

2.1 “C21” : Sets or to check ‘RTC IC’.

☞ Command Format

SOH	Null	Length	STX	“C21”	DATA	ETX	Bcc

☞ Command Data Structure



High-Year	Low-Year	Month	Day	Hour	Minute	Second
0x20	0x00–0x99	0x01–0x12	0x01–0x31	0x00–0x23	0x00–0x59	0x00–0x59
1Byte	1Byte	1Byte	1Byte	1Byte	1Byte	1Byte

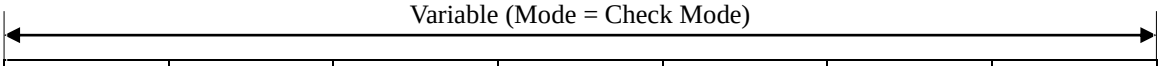
☞ Positive Response Format

SOH	Null	Length	STX	“C21”	GOOD	0x01	DATA	ETX	Bcc

☞ Negative Response Format

SOH	Null	Length	STX	“C21”	E-Code	0x00	ETX	Bcc

☞ Response Data Structure



High-Year	Low-Year	Month	Day	Hour	Minute	Second
0x20	0x00–0x99	0x01–0x12	0x01–0x31	0x00–0x23	0x00–0x59	0x00–0x59
1Byte	1Byte	1Byte	1Byte	1Byte	1Byte	1Byte
BCD						

☞ Data Variable

<Mode>

Code	Mode	Detail
0x01	‘Setting Mode’	Set ‘RTC IC’
0x02	‘Check Mode’	Check ‘RTC IC’

☞ Note

‘Day’ is changeable due to the value of ‘Month’.

2.3 “C24” : Sets or to check ‘Retry Count’.

☞ Command Format

SOH	Null	Length	STX	“C24”	DATA	ETX	Bcc

☞ Command Data Structure

Fixed	Variable (Mode = Setting Mode)
Mode	Retry Count
1Byte (Hex)	1Byte (Hex)

☞ Positive Response Format

SOH	Null	Length	STX	“C24”	GOOD	0x01	DATA	ETX	Bcc

☞ Negative Response Format

SOH	Null	Length	STX	“C24”	E-Code	0x00	ETX	Bcc

☞ Response Data Structure

Variable (Mode = Check Mode)
Retry Count
1Byte (Hex)

☞ Data Variable

<Mode>

Code	Mode	Detail
0x01	‘Setting Mode’	Set ‘Retry Count’
0x02	‘Check Mode’	Check ‘Retry Count’

<Retry Count>

Code	Setting	Detail	Note
0x00	NON	Do not retry	
0x01	Once	Execute the instruction again.	
0x02	Twice	Retry it twice	
0x03	Three times	Retry it three times	Default

2.4 “C25” : Sets or to check ‘Buzz Control’.

☞ Command Format

SOH	Null	Length	STX	“C25”	DATA	ETX	Bcc

☞ Command Data Structure

Fixed	Variable (Mode = Setting Mode)
Mode	Buzz Status
1Byte (Hex)	1Byte (Hex)

☞ Positive Response Format

SOH	Null	Length	STX	“C25”	GOOD	0x01	DATA	ETX	Bcc

☞ Negative Response Format

SOH	Null	Length	STX	“C25”	E-Code	0x00	ETX	Bcc

☞ Response Data Structure

Variable (Mode = Check Mode)
Buzz Status
1Byte (Hex)

☞ Data Variable

<Mode>

Code	Mode	Detail
0x01	‘Setting Mode’	Set ‘Buzz Control’
0x02	‘Check Mode’	Check ‘Buzz Control’

<Buzz Status>

Code	Setting	Detail	Note
0x01	Buzz Off	Buzz Off	
0x02	Buzz On	Buzz On	Default

☞ Note

2.6 "C26" : Changes 'Baud Rate'.

☞ Command Format

SOH	Null	Length	STX	"C26"	DATA	ETX	Bcc

☞ Command Data Structure

Baud Rate
1Byte (Hex)

☞ Positive Response Format

SOH	Null	Length	STX	"C26"	GOOD	0x01	ETX	Bcc

☞ Negative Response Format

SOH	Null	Length	STX	"C26"	E-Code	0x00	ETX	Bcc

☞ Response Data Structure

☞ Data Variable

<Baud Rate>

Code	Setting	Detail	Note
0x01	9600Bps	Set Baud Rate to be 9600Bps	
0x02	19200Bps	Set Baud Rate to be 19200Bps	
0x03	RFU		
0x04	38400Bps	Set Baud Rate to be 38400Bps	Default
0x05	57600Bps	Set Baud Rate to be 57600Bps	

2.5 "C42" : Software RESET for Main Board

☞ Command Format

SOH	Null	Length	STX	"C42"	ETX	Bcc

☞ Positive Response Format

SOH	Null	Length	STX	"C42"	GOOD	0x01	ETX	Bcc

☞ Negative Response Format

SOH	Null	Length	STX	"C42"	E-Code	0x00	ETX	Bcc

☞ Note

This "C42" Software RESET command is effective for CIM6000 MAIN BOARD only.

Card Dispenser and Card Reader is not RESETed.

With this software RESET, all the data setted at CIM-6000 return to DEFAULT value.

After "RESET", minimum 5 seconds is required before running to get secure operation.

3 MOVE

3.1 "C31" : Takes a card from Stacker and to move it to Card Reader / Writer Module.

☞ Command Format

SOH	Null	Length	STX	"C31"	DATA	ETX	Bcc

☞ Command Data Structure

Stacker	Module
1Byte (Hex)	1Byte (Hex)

☞ Positive Response Format

SOH	Null	Length	STX	"C31"	GOOD	0x01	ETX	Bcc

☞ Negative Response Format

SOH	Null	Length	STX	"C31"	E-Code	0x00	ETX	Bcc

☞ Data Variable

<Stacker>

Code	Setting	Detail
0x01	Stacker 1	Select Stacker 1
0x02	Stacker 2	Select Stacker 2
0x03	Auto	Select Stacker automatically

<Module>

Code	Setting	Detail
0x01	MSRW	Card transport to MSRW Module
0x02	IC	Card transport to IC Module
0x03	RF	Card transport to RF Module

3.2 "C32" : Takes card to the Reader / Writer Module

☞ Command Format

SOH	Null	Length	STX	"C32"	DATA	ETX	Bcc

☞ Command Data Structure

Module
1Byte (Hex)

☞ Positive Response Format

SOH	Null	Length	STX	"C32"	GOOD	0x01	DATA	ETX	Bcc

☞ Negative Response Format

SOH	Null	Length	STX	"C32"	E-Code	0x00	ETX	Bcc

☞ Data Variable

<Module>

Code	Setting	Detail
0x01	MSRW	Card is transported to MSRW Module
0x02	IC	Card is transported to IC Module
0x03	RF	Card is transported to RF Module

3.3 “C34” : It takes card to Bin Box (Capture)

☞ Command Format

SOH	Null	Length	STX	“C34”	ETX	Bcc

☞ Positive Response Format

SOH	Null	Length	STX	“C34”	GOOD	0x01	ETX	Bcc

☞ Negative Response Format

SOH	Null	Length	STX	“C34”	E-Code	0x00	ETX	Bcc

☞ Details

Capture card is stored in Bin Box in the back of CIM-6X0. If the Box is full, it causes an error.

3.4 “C36” : Dispense the card to front and Drop it out of the unit.

☞ Command Format

SOH	Null	Length	STX	“C36”	ETX	Bcc

☞ Positive Response Format

SOH	Null	Length	STX	“C36”	GOOD	0x01	ETX	Bcc

☞ Negative Response Format

SOH	Null	Length	STX	“C36”	E-Code	0x00	ETX	Bcc

☞ Note

The CIM-6xxx model with bezel or shutter can not use “C36” command.

3.5 “C37” : Dispense the card to front and hold it at the exit roller of the unit.

☞ Command Format

SOH	Null	Length	STX	“C37”	ETX	Bcc

☞ Positive Response Format

SOH	Null	Length	STX	“C37”	GOOD	0x01	ETX	Bcc

☞ Negative Response Format

SOH	Null	Length	STX	“C37”	E-Code	0x00	ETX	Bcc

♦ *MAGNETIC CARD*

This section describes the commands that can use at the magnetic card.

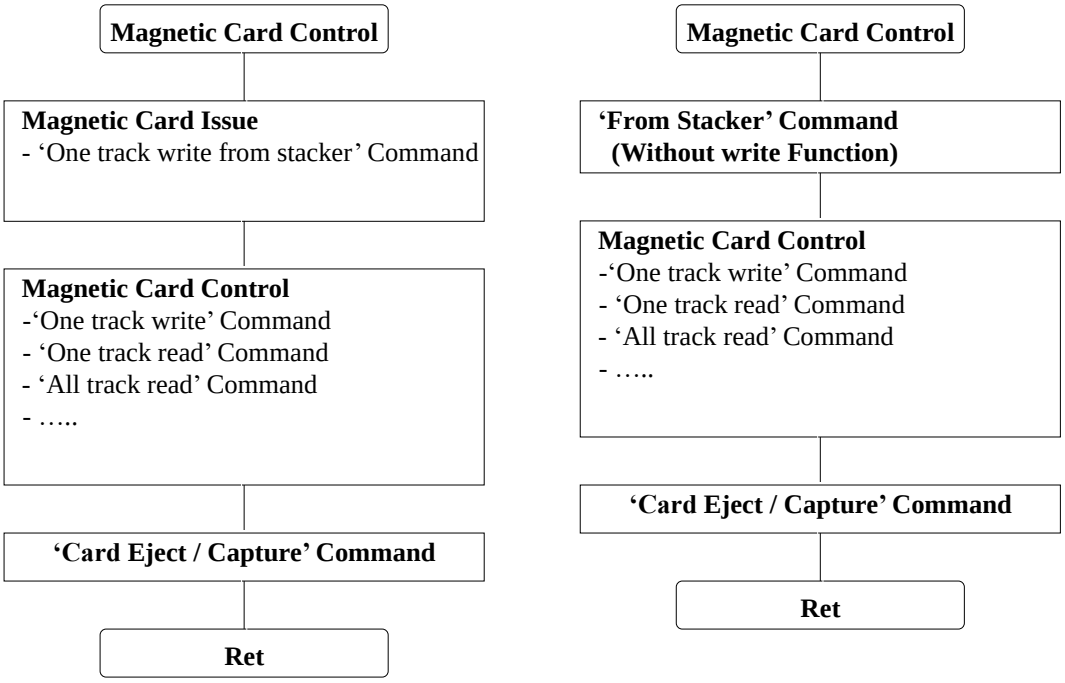
The data to be written in every track should be conformed to the ISO7816-2 standard. The available character is as follows. For more information about Magnetic card, refer to the ISO7816-2 standard.

Track	Available Character Set	Maximum characters	비 고
Track #1	Character, Numbers	76	Except for the special character
Track #2	Numbers	37	
Track #3	Number	104	

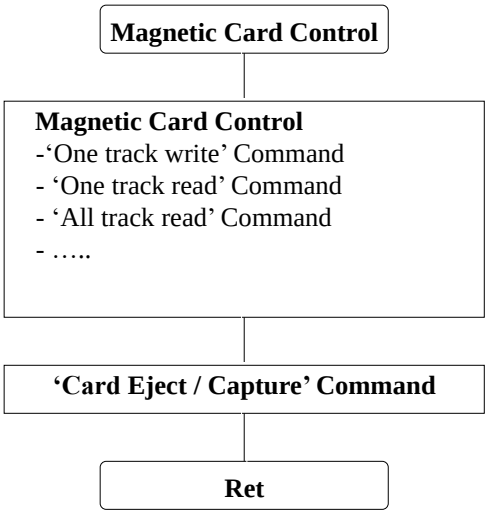
The CIM-1000 provides two features for speedy processing. The first is to provide the command combined with 'FromStacker' and 'Magnetic Write' command. This feature enables to write on card in the dispenser stacker at a command.

The second is to lessen the processing time for the 'magnetic read' command repeated after latching the data read from card. To latch data occurs at a point of time when verify in the magnetic write command and execute the magnetic read command. However, the latched data is erased when the card is off from the terminal.

Basic Magnetic Card Operations:



Magnetic Card Operations in the stacker



Magnetic Card Operations in the terminal

1 MAGNETIC READ / WRITE

1.1 "M31" : Reads data on track chosen.

☞ Command Format

SOH	Null	Length	STX	"M31"	DATA	ETX	Bcc

☞ Command Data Structure

Track (1Byte)

☞ Positive Response Format

SOH	Null	Length	STX	"M31"	GOOD	0x01	DATA	ETX	Bcc

☞ Negative Response Format

SOH	Null	Length	STX	"M31"	E-Code	0x00	ETX	Bcc

☞ Response Data Structure

Read Data (ASCII Code)

☞ Data Variable

<Track>

Code	Setting	Detail
0x01	Track 1	Read data on Track 1
0x02	Track 2	Read data on Track 2
0x03	Track 3	Read data on Track 3

☞ Note

If the 'Magnetic Read' command is executed normally, the read data is latched.

1.2 "M33" : Writes data on track chosen.

☞ Command Format

SOH	Null	Length	STX	"M33"	DATA	ETX	Bcc

☞ Command Data Structure

Track	Write Data
1Byte (Hex)	(ASCII Code)

☞ Positive Response Format

SOH	Null	Length	STX	"M33"	GOOD	0x01	ETX	Bcc

☞ Negative Response Format

SOH	Null	Length	STX	"M33"	E-Code	0x00	ETX	Bcc

☞ Data Variable

<Track>

Code	Setting	Detail
0x01	Track 1	Write data to Track 1
0x02	Track 2	Write data to Track 2
0x03	Track 3	Write data to Track 3

☞ Note

If the 'Magnetic Write' command is executed normally, the written data is latched. This command has the 'Verify' feature.

1.3 "M34" : Takes a card from Stacker and to write data to a selected track.

☞ Command Format

SOH	Null	Length	STX	"M34"	DATA	ETX	Bcc

☞ Command Data Structure

0x00	Track	Write Data
1Byte (Hex)	1Byte (Hex)	(ASCII Code)

☞ Positive Response Format

SOH	Null	Length	STX	"M34"	GOOD	0x01	ETX	Bcc

☞ Negative Response Format

SOH	Null	Length	STX	"M34"	E-Code	0x00	ETX	Bcc

☞ Data Variable

<Track>

Code	Setting	Detail
0x01	Track 1	Write data to Track 1
0x02	Track 2	Write data to Track 2
0x03	Track 3	Write data to Track 3

☞ Note

This command has the Data 'Latch 'and 'Verify' features.

1.4 "M35" : Reads data from all three tracks.

☞ Command Format

SOH	Null	Length	STX	"M35"	ETX	Bcc

☞ Positive Response Format

SOH	Null	Length	STX	"M35"	GOOD	0x01	DATA	ETX	Bcc

☞ Negative Response Format

SOH	Null	Length	STX	"M35"	E-Code	0x00	ETX	Bcc

☞ Response Data Structure

Track1 Data	0x00	Track2 Data	0x00	Track3 Data
(ASCII)	1Byte (Hex)	(ASCII)	1Byte (Hex)	(ASCII)

☞ Note

If the 'Magnetic Read' command is executed normally, the read data is latched.

2 CLEANING

2.1 "M51" : Cleans Magnetic Head mounted inside MSRW.

☞ Command Format

SOH	Null	Length	STX	"M51"	ETX	Bcc

☞ Positive Response Format

SOH	Null	Length	STX	"M51"	GOOD	0x01	ETX	Bcc

☞ Negative Response Format

SOH	Null	Length	STX	"M51"	E-Code	0x00	ETX	Bcc

♦ *IC CARD*

This section describes the commands that can use at the IC card and Memory card.

The IC card should conform to the ISO7816-4 T=0 and T=1 , these cards is available

The applicable models in the CIM6000 Series are the CIM620, CIM640, CIM650, CIM670, and the available commands are as follows.

Item	Cm0	Cm1	Cm2	Detail	Note
IC CONTROL	'I'	'2'	'1'	IC Card Reset	
	'I'	'2'	'2'	IC Card Direct Control	
	'I'	'2'	'3'	Selects IC card or Sam card	

1 IC CONTROL

1.1 "I21" : Reset the IC card and receive the ATR from card.

☞ Command Format

SOH	Null	Length	STX	"I21"	ETX	Bcc

☞ Positive Response Format

SOH	Null	Length	STX	"I21"	GOOD	0x01	DATA	ETX	Bcc

☞ Negative Response Format

SOH	Null	Length	STX	"I21"	E-Code	0x00	ETX	Bcc

☞ Response Data Structure

Length _ High	Length _ Low	ATR (Answer To Request)
2Byte		N Byte

Length

☞ Example

SAMSUNG SCOS ATR

High 8Byte	0x3B	0x6B	0x00	0x00	0x80	0x31	0x80	0x63
Low 7Byte	0x53	0x46	0x01	0x83	0x03	0x90	0x00	

1.2 "I22" : Control the card conforming to the ISO 7816 T = 0 and T =1 , ISO 7816 – 4 standard directly.

☞ Command Format

SOH	Null	Length	STX	"I22"	DATA	ETX	Bcc

☞ Command Data Structure

Length _ High	Length _ Low	IC Command & IC Data
2Byte		N Byte

Length

☞ Positive Response Format

SOH	Null	Length	STX	"I22"	GOOD	0x01	DATA	ETX	Bcc

☞ Negative Response Format

SOH	Null	Length	STX	"I22"	E-Code	0x00	ETX	Bcc

☞ Response Data Structure

Length _ High	Length _ Low	IC Data (or Result)
2Byte		N Byte

Length

☞ IC Command & IC Data Structure

Basic format of Packet of T = 0 command

Length	CLA	INS	P1	P2	Lc	Data	Le
2Byte	1Byte	1Byte	1Byte	1Byte	1Byte	Lc Byte	1Byte

Fixed | Variable

Length

Length _ High	Length _ Low
1Byte	1Byte

CLA	Class	Note
INS	Instruction	
P1	Offset(High Value)	
P2	Offset(Low Value)	
Lc	A number of data to transfer	Max Value : 255
Data	Data to Transfer	
Le	A number of data to receive	

☞ Format of T = 0 Command

Command	INS Code (Hex Value)
Read Binary Command	B0
Write Binary Command	D0
Update Binary Command	D6
Erase Binary Command	0E
Read Record(s) Command	B2
Write Record Command	D2
Append Record Command	E2
Update Record Command	DC
Get Data Command	CA
Put Data Command	DA
Select File Command	A4
Verify Command	20
Internal Authenticate Command	88
External Authenticate Command	82
Get Challenge Command	84
Manage Channel Command	70

For more information, refer to the ISO 7816 – 4 standard.

1.3 "I23" : Selects IC card or Sam card.

☞ Command Format

SOH	Null	Length	STX	"I23"	ETX	Bcc

☞ Positive Response Format

SOH	Null	Length	STX	"I23"	GOOD	0x01	DATA	ETX	Bcc

☞ Negative Response Format

SOH	Null	Length	STX	"I23"	E-Code	0x00	ETX	Bcc

☞ Response Data Structure

Mode
1 Byte

☞ Data Variable

<Mode>

Code	Detail
0x30	Selects IC card as the target of control
0x31	Selects SAM card as the target of control

☞ Note

Reset value of Mode is 0x30.

♦ *RF CARD*

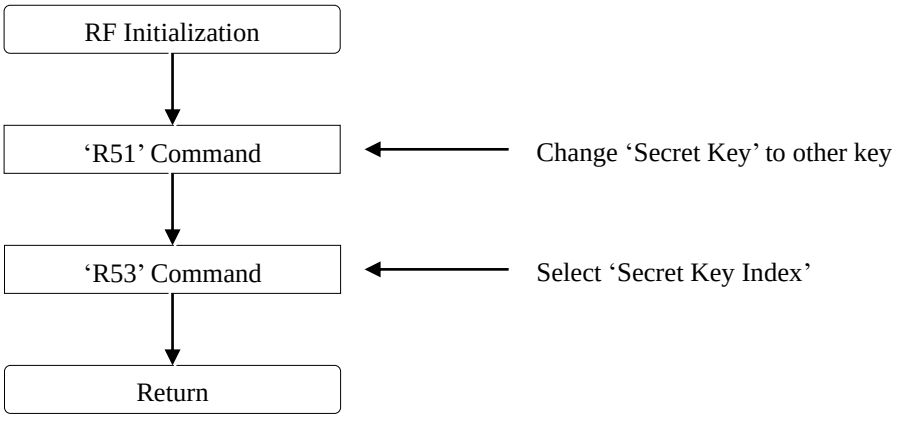
This section describes the commands that can use at the 'RF CARD'.

The RF Module of his model supports only the MIFARE card.

Item	Cm0	Cm1	Cm2	Detail	Note
RF READ / WRITE	'R'	'3'	'1'	RF Card Read in Block Range	
	'R'	'3'	'2'	RF Card Write in Block Range	
	'R'	'3'	'6'	Read RF card data in sector range	
	'R'	'3'	'7'	Write RF card data in sector range	
	'U'	'3'	'1'	Reads data on Mifare Ultra Light card.	
	'U'	'3'	'2'	Writes data on Mifare Ultra Light card.	
BALANCE	'R'	'4'	'1'	Increases balance in RF card	
	'R'	'4'	'2'	Decreases balance in RF card	
SECRET KEY CHANGE	'R'	'5'	'1'	Change 'Secret Key' to other Key	
	'R'	'5'	'2'	Change 'Secret Key' to all the same Key value	
	'R'	'5'	'3'	Select 'Secret Key Index'	
	'R'	'5'	'4'	Change RF Card 'Secret Key' to other key	
	'R'	'5'	'5'	Key Set and Change 'Secret Key' to other Key	
	'R'	'5'	'6'	Key Set and Change 'Secret Key' to all the same Key value	
RF DETECT	'R'	'6'	'1'	Check RF card in antenna area	
UID	'U'	'4'	'1'	Reads UID (Serial Number) on Mifare Ultra Light card.	

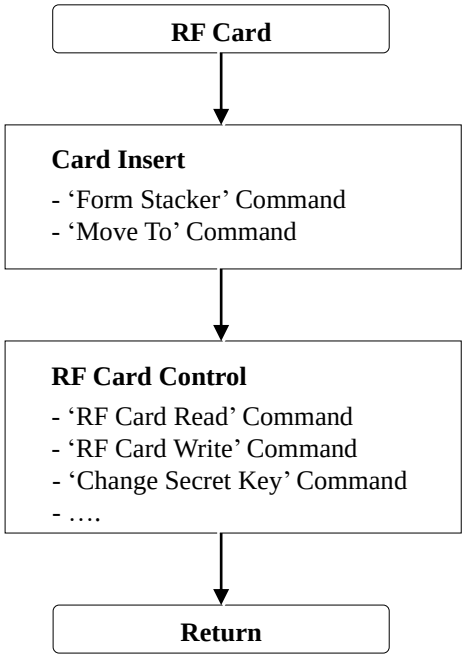
To use the RF card, you need to initialize at first.

- Setting and updating of the secret key and secret key index.



RF Module Initialization

Basic Operating Procedure of the RF card:



RF Card Basic Operating Procedures

Memory Architecture (map) of the RF card: 8Kbit

Sector	Block	Size	Detail	Note
Sector 0	Block 0	16Byte	RF Card Information	Can't use
	Block 1	16Byte		
	Block 2	16Byte		
	Block 3	16Byte	'Sector Key'	Can't use
Sector 1	Block 0	16Byte	User Available Memory	
	Block 1	16Byte		
	Block 2	16Byte		
	Block 3	16Byte	'Sector Key'	Can't use
Sector 2	Block 0	16Byte	User Available Memory	
	Block 1	16Byte		
	Block 2	16Byte		
	Block 3	16Byte	'Sector Key'	Can't use
---	---	---	---	---
Sector 15	Block 0	16Byte	User Available Memory	
	Block 1	16Byte		
	Block 2	16Byte		
	Block 3	16Byte	'Sector Key'	Can't use

1 RF CARD READ / WRITE

1.1 “R31” : Read RF card data & Secret Key in block range

☞ Command Format

SOH	Null	Length	STX	“R31”	DATA	ETX	Bcc

☞ Command Data Structure

Sector	Block
0x00 – 0x0f	0x00 – 0x03
1Byte (Hex)	1Byte (Hex)

☞ Positive Response Format

SOH	Null	Length	STX	“R31”	GOOD	0x01	DATA	ETX	Bcc

☞ Negative Response Format

SOH	Null	Length	STX	“R31”	E-Code	0x00	ETX	Bcc

☞ Response Data Structure

Sector	Block	Read Data
1Byte (Hex)	1Byte (Hex)	16 Byte (Hex)

D0	D1	D2	---	D14	D15
1Byte	1Byte	1Byte	---	1Byte	1Byte

1.2 “R32” : Write RF card data in block range

☞ Command Format

SOH	Null	Length	STX	“R32”	DATA	ETX	Bcc

☞ Command Data Structure

Sector	Block	Write Data
0x00 – 0x0f	0x00 – 0x02	0x00 – 0xff
1Byte (Hex)	1Byte (Hex)	16Byte (Hex)

D0	D1	D2	---	D14	D15
1Byte	1Byte	1Byte	---	1Byte	1Byte

☞ Positive Response Format

SOH	Null	Length	STX	“R32”	GOOD	0x01	ETX	Bcc

☞ Negative Response Format

SOH	Null	Length	STX	“R32”	E-Code	0x00	ETX	Bcc

1.5 “R36” : Read RF card data in sector range

☞ Command Format

SOH	Null	Length	STX	“R36”	DATA	ETX	Bcc

☞ Command Data Structure

Sector
0x00 – 0x0f
1Byte (Hex)

☞ Positive Response Format

SOH	Null	Length	STX	“R36”	GOOD	0x01	DATA	ETX	Bcc

☞ Negative Response Format

SOH	Null	Length	STX	“R36”	E-Code	0x00	ETX	Bcc

☞ Response Data Structure

Sector	0x00	Read Data (Block#0)	0x01	Read Data (Block#1)	0x02	Read Data (Block#2)
1Byte (Hex)	1Byte (Hex)	16Byte	1Byte (Hex)	16Byte	1Byte (Hex)	16Byte

D0	D1	D2	---	D14	D15
1Byte	1Byte	1Byte	---	1Byte	1Byte

1.6 “R37” : Write RF card data in sector range (except Sector 0)

☞ Command Format

SOH	Null	Length	STX	“R37”	DATA	ETX	Bcc

☞ Command Data Structure

Sector	Write Data
0x01 – 0x0f	0x00 – 0xff
1Byte (Hex)	51Byte (Hex)

0x00	Write Data (Block#0)	0x01	Write Data (Block#1)	0x02	Write Data (Block#2)
1Byte (Hex)	16Byte (Hex)	1Byte (Hex)	16Byte (Hex)	1Byte (Hex)	16Byte (Hex)

D0	D1	D2	---	D14	D15
1Byte	1Byte	1Byte	---	1Byte	1Byte

☞ Positive Response Format

SOH	Null	Length	STX	“R37”	GOOD	0x01	ETX	Bcc

☞ Negative Response Format

SOH	Null	Length	STX	“R37”	E-Code	0x00	ETX	Bcc

2 BALANCE

2.1 “R41” : Increment the balance of card to the specified amount.

☞ Command Format

SOH	Null	Length	STX	“R41”	DATA	ETX	Bcc

☞ Command Data Structure

Sector	Block	Index Value
0x00 – 0x0f	0x00 – 0x02	0x00000000 – 0xffffffff
1Byte (Hex)	1Byte (Hex)	4Byte (Hex)

V0	V1	V2	V3
0x00-0xff	0x00-0xff	0x00-0xff	0x00-0xff
1Byte(Hex, LSB)	1Byte(Hex)	1Byte(Hex)	1Byte(Hex, MSB)

☞ Positive Response Format

SOH	Null	Length	STX	“R41”	GOOD	0x01	ETX	Bcc

☞ Negative Response Format

SOH	Null	Length	STX	“R41”	E-Code	0x00	ETX	Bcc

☞ Note

The balance should be written in the Electronic Purse format in the card.

2.1 “R42” : Decrement the balance of card to the specified amount..

☞ Command Format

SOH	Null	Length	STX	“R42”	DATA	ETX	Bcc

☞ Command Data Structure

Sector	Block	Index Value
0x00 – 0x0f	0x00 – 0x02	0x00000000 – 0xffffffff
1Byte (Hex)	1Byte (Hex)	4Byte (Hex)

V0	V1	V2	V3
0x00-0xff	0x00-0xff	0x00-0xff	0x00-0xff
1Byte(Hex, LSB)	1Byte(Hex)	1Byte(Hex)	1Byte(Hex, MSB)

☞ Positive Response Format

SOH	Null	Length	STX	“R42”	GOOD	0x01	ETX	Bcc

☞ Negative Response Format

SOH	Null	Length	STX	“R42”	E-Code	0x00	ETX	Bcc

☞ Note

The balance should be written in the Electronic Purse format in the card.

3 SECRET KEY

3.1 “R51” : Change ‘Secret Key’ to a new key

☞ Command Format

SOH	Null	Length	STX	“R51”	DATA	ETX	Bcc

☞ Command Data Structure

Sector	KEY A	KEY B
0x00 – 0x0f	0x00 – 0xff	0x00 – 0xff
1Byte (Hex)	6Byte (Hex)	6Byte (Hex)

☞ Positive Response Format

SOH	Null	Length	STX	“R51”	GOOD	0x01	ETX	Bcc

☞ Negative Response Format

SOH	Null	Length	STX	“R51”	E-Code	0x00	ETX	Bcc

☞ Note

KEY A : FFFFFFFFFFFF

KEY B : FFFFFFFFFFFF

3.2 “R52” : Change ‘Secret Key’ to all the same key value

☞ Command Format

SOH	Null	Length	STX	“R52”	DATA	ETX	Bcc

☞ Command Data Structure

KEY A	KEY B
0x00 – 0xff	0x00 – 0xff
6Byte (Hex)	6Byte (Hex)

☞ Positive Response Format

SOH	Null	Length	STX	“R52”	GOOD	0x01	ETX	Bcc

☞ Negative Response Format

SOH	Null	Length	STX	“R52”	E-Code	0x00	ETX	Bcc

☞ Note

KEY A : FFFFFFFFFFFF

KEY B : FFFFFFFFFFFF

3.3 “R53” : Select ‘Secret Key Index’

☞ Command Format

SOH	Null	Length	STX	“R53”	DATA	ETX	Bcc

☞ Command Data Structure

Index
0x01 – 0x02
1Byte (Hex)

☞ Positive Response Format

SOH	Null	Length	STX	“R53”	GOOD	0x01	ETX	Bcc

☞ Negative Response Format

SOH	Null	Length	STX	“R53”	E-Code	0x00	ETX	Bcc

☞ Data Variable

<Index>

Code	Setting	Detail
0x01	KEY A	Select ‘Secret Key A’
0x02	KEY B	Select ‘Secret Key B’

3.4 “R54” : Change RF card ‘Secret Key’ to other key

☞ Command Format

SOH	Null	Length	STX	“R54”	DATA	ETX	Bcc

☞ Command Data Structure

Sector	KEY A	Access	KEY B
0x00 – 0x0f	0x00 – 0xff	0x00 – 0xff	0x00 – 0xff
1Byte (Hex)	6Byte (Hex)	4Byte (Hex)	6Byte (Hex)

☞ Positive Response Format

SOH	Null	Length	STX	“R54”	GOOD	0x01	ETX	Bcc

☞ Negative Response Format

SOH	Null	Length	STX	“R54”	E-Code	0x00	ETX	Bcc

☞ Warning

If you use this command incorrectly, it couldn’t be authenticated from the card.

3.5 “R55” : Change ‘Secret Key’ to a new key from Key Set Number.

☞ Command Format

SOH	Null	Length	STX	“R55”	DATA	ETX	Bcc

☞ Command Data Structure

Key Set	Sector	KEY A	KEY B
0x00 – 0x02	0x00 – 0x0f	0x00 – 0xff	0x00 – 0xff
1 Byte(Hex)	1Byte (Hex)	6Byte (Hex)	6Byte (Hex)

☞ Positive Response Format

SOH	Null	Length	STX	“R55”	GOOD	0x01	ETX	Bcc

☞ Negative Response Format

SOH	Null	Length	STX	“R55”	E-Code	0x00	ETX	Bcc

☞ Note

Key Set <Index>

Code	Detail
0x00	Key Set 0
0x01	Key Set 1
0x02	Key Set 2

3.6 “R56” : Change ‘Secret Key’ to all the same key value from Key Set Number.

☞ Command Format

SOH	Null	Length	STX	“R56”	DATA	ETX	Bcc

☞ Command Data Structure

Key Set	KEY A	KEY B
0x00 – 0x02	0x00 – 0xff	0x00 – 0xff
1 Byte(Hex)	6Byte (Hex)	6Byte (Hex)

☞ Positive Response Format

SOH	Null	Length	STX	“R56”	GOOD	0x01	ETX	Bcc

☞ Negative Response Format

SOH	Null	Length	STX	“R56”	E-Code	0x00	ETX	Bcc

☞ Note

Key Set <Index>

Code	Detail
0x00	Key Set 0
0x01	Key Set 1
0x02	Key Set 2

4 RF DETECT

4.1 “R61” : RF card detect in antenna area

☞ Command Format

SOH	Null	Length	STX	“R61”	ETX	Bcc

☞ Positive Response Format

SOH	Null	Length	STX	“R61”	GOOD	DATA	0x01	ETX	Bcc

☞ Negative Response Format

SOH	Null	Length	STX	“R61”	E-Code	0x00	ETX	Bcc

☞ Response Data Structure

Serial Number
Hex Code
4Byte

☞ Note

If the RF card is detected, this command send the serial number to host. But, it doesn’t authenticate the Secret Key of the RF card.

♦ *MIFARE ULTRA LIGHT CARD*

- Memory Organisation

The 512Bit EEPROM Memory is organized in 16 pages with 4 bytes each.

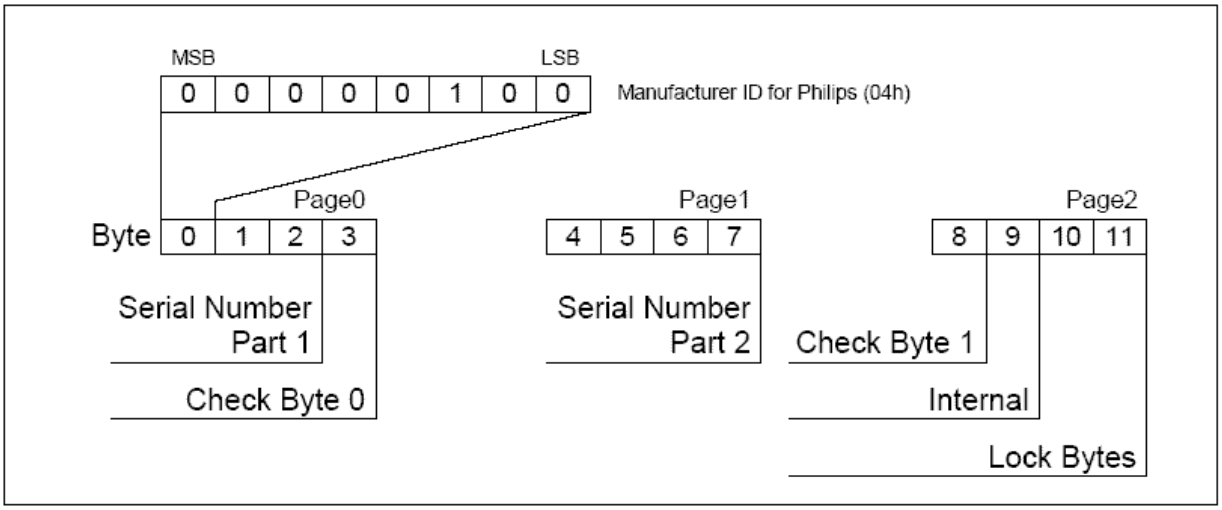
In the erased state the EEPROM cells are read as a logic “0”, in the written state as a logical “1”

Byte Number	0	1	2	3	Page
Serial Number	SN0	SN1	SN2	BCC0	0
Serial Number	SN3	SN4	SN5	SN6	1
Internal / Lock	BCC1	Internal	Lock0	Lock1	2
OTP	OTP0	OTP1	OTP2	OTP3	3
Data read/write	Data0	Data1	Data2	Data3	4
Data read/write	Data4	Data5	Data6	Data7	5
Data read/write	Data8	Data9	Data10	Data11	6
Data read/write	Data12	Data13	Data14	Data15	7
Data read/write	Data16	Data17	Data18	Data19	8
Data read/write	Data20	Data21	Data22	Data23	9
Data read/write	Data24	Data25	Data26	Data27	10
Data read/write	Data28	Data29	Data30	Data31	11
Data read/write	Data32	Data33	Data34	Data35	12
Data read/write	Data36	Data37	Data38	Data39	13
Data read/write	Data40	Data41	Data42	Data43	14
Data read/write	Data44	Data45	Data46	Data47	15

Note: Bold frame indicates user area

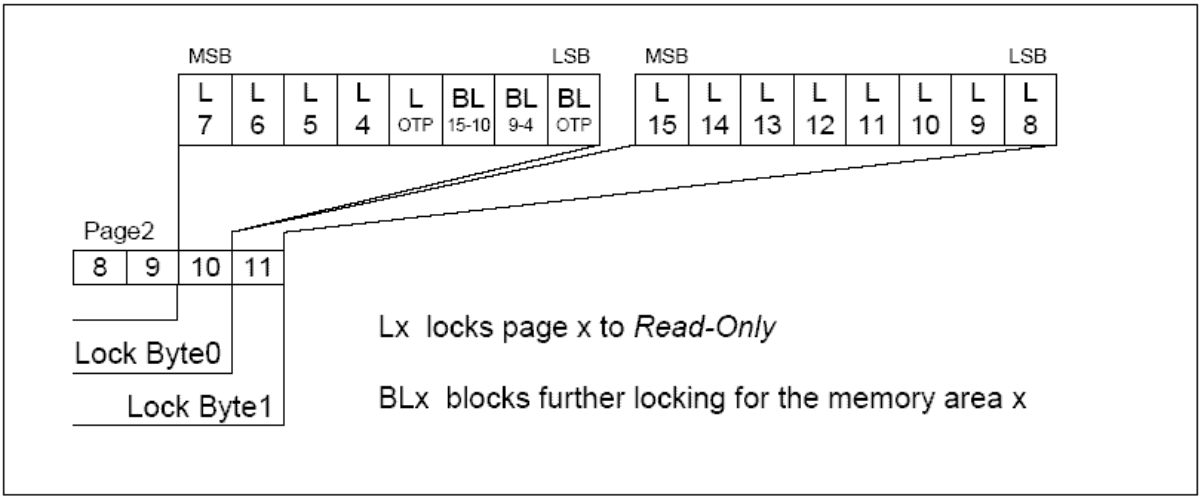
- UID / SERIAL NUMBER

The unigue 7 byte serial number (UID) and its two Check Bytes are programmed into the first 9 bytes of the memory. It therefore covers page 0, page 1 and the first byte of page 2. The second byte of page2 is reserved for internal data. Due to security and system requirements these bytes are write-protected after having been programmed by the IC manufacturer after production



- LOCK BYTES

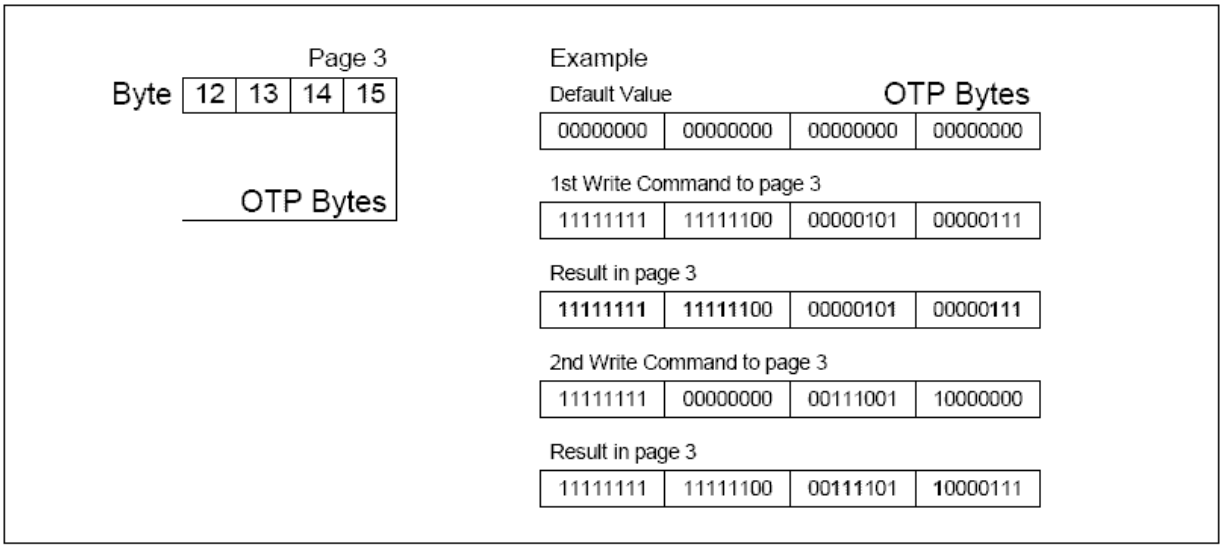
The bits of Byte 2 and 3 of page 2 represent the field-programmable read-only locking mechanism. Each Page x from 3 (OTP) to 15 may be locked individually to prevent further write access by setting the corresponding locking bit Lx to 1. After locking the page is read-only memory.



The 3 least significant bits of lock byte 0 are the block-locking bits. Bit 2 handles pages 15 to 10, bit 1 pages 9 to 4 and bit 0 page 3 (OTP). Once the block-locking bits are set the locking configuration for the corresponding memory area is frozen

- OTP BYTES

Page 3 is the OTP page. It is pre-set to all “0” after production. These bytes may be bit-wise modified by a write command.



The bytes of the write command and the current contents of the OTP bytes are bit-wise “or-ed” and the result becomes the new contents of the OTP bytes. This process is irreversible. If a bit is set to “1”, it cannot be changed back to “0” again.

Note : This memory area may be used as a 32 ticks one-time counter.

- DATA PAGES

Pages 4 to 15 constitute the user read/write area. After production the data pages are initialized to all “0”.

1 MIFARE ULTRA LIGHT CONTROL

1.1 "U31" : Reads data on Mifare Ultra Light card.

☞ Command Format

SOH	Null	Length	STX	"U31"	DATA	ETX	Bcc

☞ Command Data Structure

Page (1Byte)

☞ Positive Response Format

SOH	Null	Length	STX	"U31"	GOOD	0x01	DATA	ETX	Bcc

☞ Negative Response Format

SOH	Null	Length	STX	"U31"	E-Code	0x00	ETX	Bcc

☞ Response Data Structure

Page	Read Data
1 Byte (Hex)	16 Bytes (Hex)

1.2 "U32" : Writes data on Mifare Ultra Light card.

☞ Command Format

SOH	Null	Length	STX	"U32"	DATA	ETX	Bcc

☞ Command Data Structure

Page	Write Data
1Byte (Hex)	4 Bytes (Hex)

☞ Positive Response Format

SOH	Null	Length	STX	"U32"	GOOD	0x01	ETX	Bcc

☞ Negative Response Format

SOH	Null	Length	STX	"U32"	E-Code	0x00	ETX	Bcc

1.3 "U41" : Reads UID (Serial Number) on Mifare Ultra Light card.

☞ Command Format

SOH	Null	Length	STX	"U41"	ETX	Bcc

☞ Positive Response Format

SOH	Null	Length	STX	"U41"	GOOD	DATA	0x01	ETX	Bcc

☞ Negative Response Format

SOH	Null	Length	STX	"U41"	E-Code	0x00	ETX	Bcc

☞ Response Data Structure

UID (Serial Number)
7 Bytes (Hex)

ERROR DETAIL

<GOOD>

Code : 0x0000

Description: Normal Execution

Procedures: None

<NOT_DEFINE_COMMAND>

Code : 0x2001

Description : Using the command that does not defined in this model.

Action : Use the valid command in this model.

<NOT_USE_COMMAND>

Code : 0x2002

Description : Not available command in this model.

Action : Use the valid command in this model.

<COMM_FRAME_ERROR>

Code : 0x2003

Description : Sending the command that has the invalid communication frame.

Action : Check the data format and the corresponding module specification.

<CARD_JAM>

Code : 0x2004

Description : When the card is jammed.

Action : Remove the jammed card.

<NO_CARD>

Code : 0x2005

Description : No cards.

Action : Insert the card.

<CARD_PRESENT>

Code : 0x2006

Description : When the card exists already in the terminal.

Action : Eject the card.

<BUSY>

Code : 0x2007

Description : When the terminal is running or busy.

Action : Wait until the previous operation is completed.

<DISPENSER_ERROR>

Code : 0x2100

Desctiption : Not Applicable Dispenser.

Action : Reset the terminal and exchange the dispenser..

<DISPENSER_COMM_ERROR>

Code : 0x2101

Description : Dispenser communication error

Action : Check the communication line and reset the terminal.

<STACKER1_ERROR>

Code : 0x2102

Description : The first STACKER ERROR

Action : Be sure that the card is loaded at the first stacker.

<STACKER2_ERROR>

Code : 0x2103

Description: The second STACKER ERROR

Action : Be sure that the card is loaded at the second stacker.

<ALL_EMPTY>

Code : 0x2104

Description : No cards at both the first and second stacker.

Action : Load the card in the stacker.

<STACKER1_EMPTY>

Code : 0x2105

Description : No card at the first stacker.

Action : Load the card at the first stacker.

<STACKER2_EMPTY>

Code : 0x2106

Description : No card at the second stacker.

Action : Load the card at the second stacker.

<STACKER1_WARNING>

Code : 0x2107

Description : Too few cards in the first stacker.

Action : Load the card at the first stacker.

<STACKER2_WARNING>

Code : 0x2108

Description : Too few cards in the second stacker.

Action : Load the card at the second stacker.

<ERROR_BIN_FULL>

Code : 0x2109

Description : Too many cards in the ‘CAPTURE BOX’.

Action : Keep the capture box empty.

<MSRW_ERROR>

Code : 0x2200

Description : The MS Reader/Writer that cannot use in this model.

Action : Change the MS Reader/Writer.

<MSRW_COMM_ERROR>

Code : 0x2201

Description : The MS Reader/Writer communication error.

Action : Check the communication line and reset the terminal.

<MSRW_WRITE_ERROR>

Code : 0x2202

Description : Error when the MS Reader/Writer is writing on the card.

Action : Clean the header and check the card.

<MSRW_READ_ERROR>

Code : 0x2203

Description : Error when the MS Reader/Writer is reading on the card.

Action : Clean the header and check the card.

<IC_CONTACT_ERROR>

Code : 0x2204

Description : Error while the terminal contacts the IC card.

Action : Be sure that the current card is an IC card.

<IC_CONTROL_ERROR>

Code : 0x2205

Description : Error while the terminal executes the IC card command.

Action : Check if the command is able to use in the contacted card.

<RF_ERROR>

Code : 0x2300

Description : Unavailable RF module.

Action : Change the RF MODULE

<RF_COMM_ERROR>

Code : 0x2301

Description : Communication error at the RF Module.

Action : Check the connection socket

<RF_AUTHEN_ERROR>

Code : 0x2302

Description : Authentication Error at the RF Module.

Action : Change the 'SECRET KEY'

<RF_WRITE_ERROR>

Code : 0x2303

Description : Error while the terminal writes at the RF Card.

Action : Be sure that the card exists in the detection range.

<RF_READ_ERROR>

Code : 0x2304

Description : Error while the terminal reads at the RF Card.

Action: Be sure that the card exists in the detection range.

<RF_DETECT_ERROR>

Error Code : 0x2305

Description : No RF Card.

Action : Insert the RF Card into the terminal.

<RF_AMOUNT_ERROR>

Error Code : 0x2306

Description : Error while the terminal increases(or decreases) the balance at the RF card.

Action : Tune the RF module.

PRECAUTIONS

1. Check if the card exists in stacker. Otherwise, it may not issue the card.

2. Check the communication line

    1) Communication Port, Baud, Parity, and Data Bit, etc.

3. Check the ‘CAPTURE BOX’.

    The ‘BIN FULL’ error might be caused, if you turn on the power in condition that the card exists in the ‘ CAPTURE BOX’ behind the terminal.