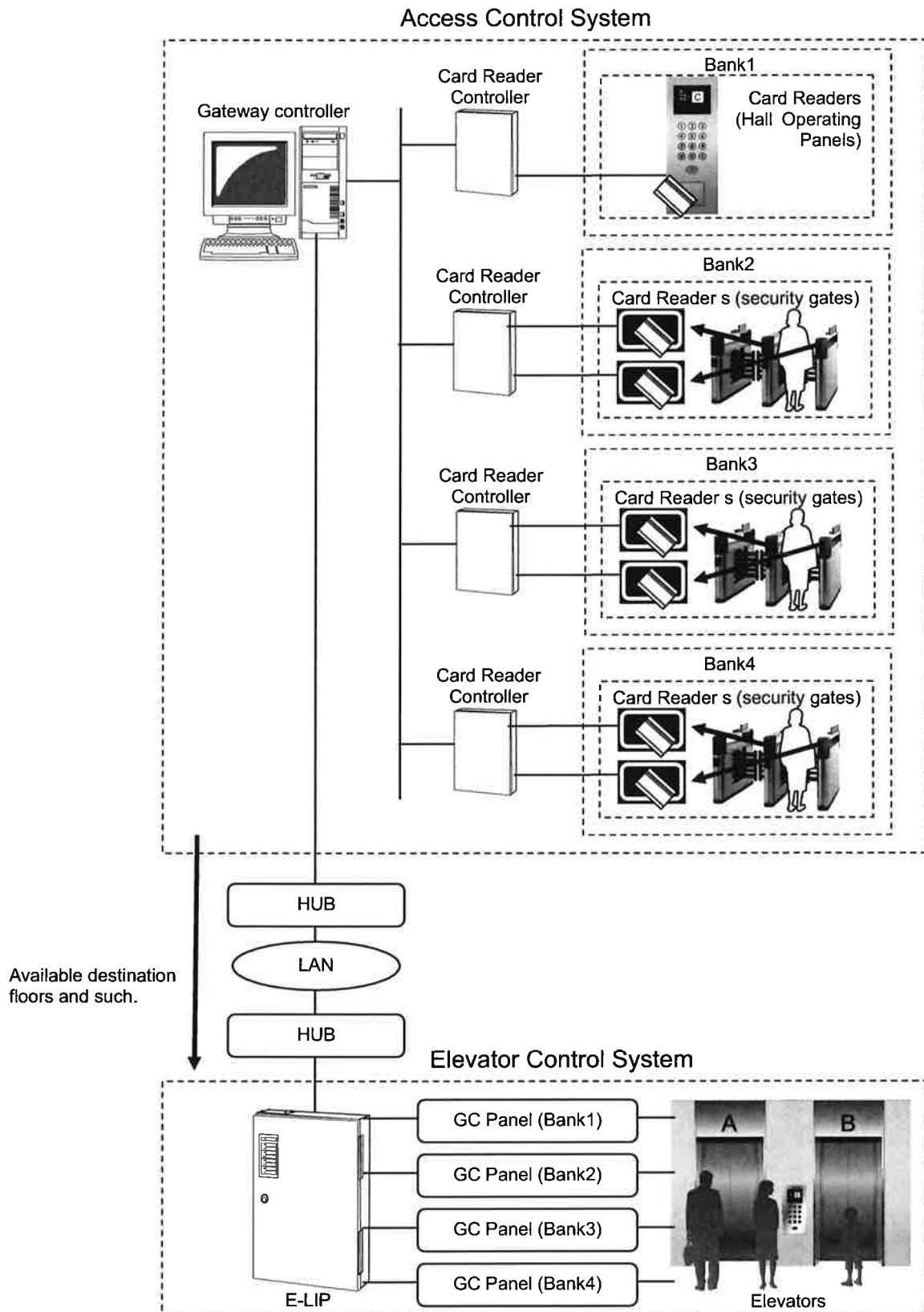# Specification of Communication between E-LIP and Access Control System
(*E-LIP: Elevator Link Interface Processor)

Mitsubishi Electric Corporation

1. Outline

This document describes the communication interface of E-LIP controller (called E-LIP hereinafter) with access control system (by local) in Destination Control System linked with a security system.

Access Control System

Gateway controller

Card Reader Controller

Bank1
Card Readers
(Hall Operating Panels)

Card Reader Controller

Bank2
Card Reader s (security gates)

Card Reader Controller

Bank3
Card Reader s (security gates)

Card Reader Controller

Bank4
Card Reader s (security gates)

HUB

LAN

Available destination floors and such.

HUB

Elevator Control System

E-LIP

GC Panel (Bank1)

GC Panel (Bank2)

GC Panel (Bank3)

GC Panel (Bank4)

Elevators

2

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[Physical layer]
Ethernet
Transmission medium: 100BASE-Tx

[Protocol]
TCP/IP protocol

[Communication activity]
Access control system transmits data, such as available destination floors, to E-LIP.
E-LIP only receives the data and does not transmit response data.
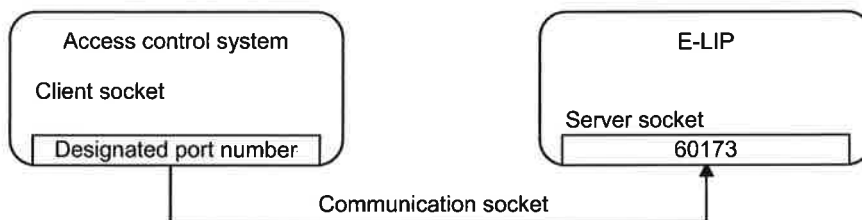If received data is improper, E-LIP discards the data.

2. Communication port

2.1 Socket connection configuration

Server port number (E-LIP) : 60173
Client port number (Access control system) : Port number designated by access control system

Access control system	E-LIP
Client socket	
	Server socket
Designated port number	60173

Communication socket

2.2 Socket connection

(1) Access control system connects a socket when transmitting data.
    When no data is transmitted for 30 minutes, the system disconnects the socket.
    So transmitting the healthy check data (3.4.(2)) is needed for continuing to connect the socket.
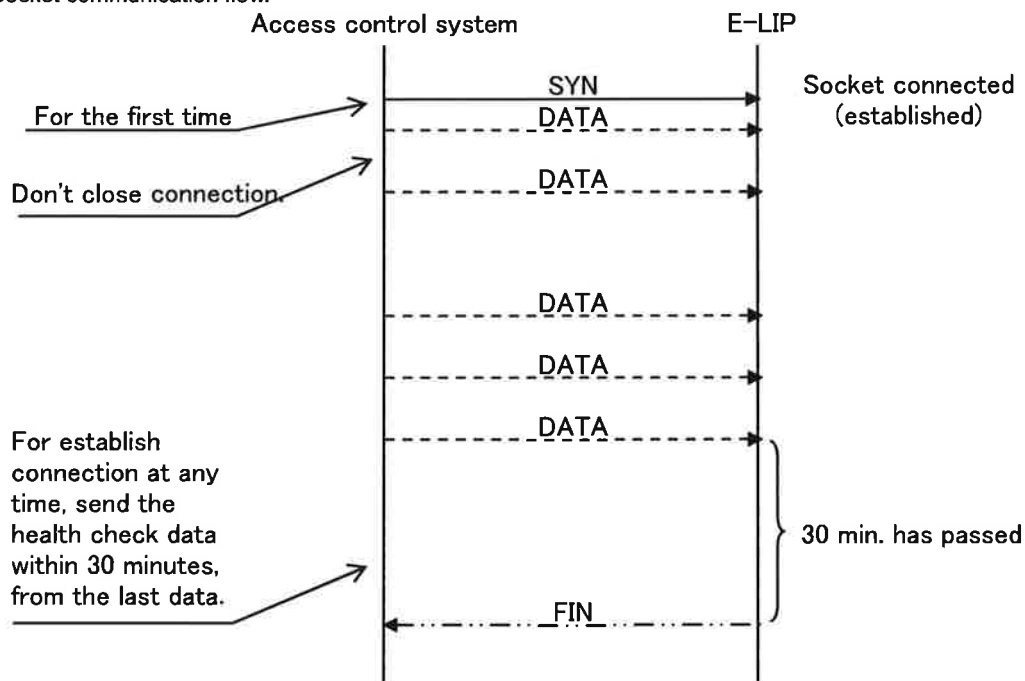   Need to send the healthy check data within 30 minutes, from the last data. *
(2) E-LIP does not support multiple socket connections.
    Mutiple controllers of access control system can not directly connect with E-LIP, so access control system should have
    ONE gateway controller between E-LIP and multiple controllers.
(3) E-LIP does not monitor the connection status of the socket.

*Socket communication flow.

Access control system   E-LIP

                                    SYN
For the first time   Socket connected
                                    DATA   (established)

                                    DATA
Don't close connection

                                    DATA

                                    DATA

                                    DATA
For establish
connection at any
time, send the
health check data   30 min. has passed
within 30 minutes,
from the last data.
                                    FIN

3. Communication format

3.1 Notation rules for data types

Definition of the data types described in this section is as follows.

Data type	Description	Range
CHAR	Character data type	0x00, 0x20 to 0x7F Refer to the "ASCII Code Table" of the end of this document.
BYTE	1-byte numeric value type (unsigned)	0x00 to 0xFF
CHAR(n)	Character string type (fixed length) It means a character string corresponding to designated digits (n).	0x00, 0x20 to 0x7F (Refer to ASCII Code Table) * n Refer to the" ASCII Code Table" of the end of this document.
BYTE(n)	1-byte numeric value type (unsigned) array It means a numeric string corresponding to designated digits (n).	0x00 to 0xFF * n

3.2 Overall structure

The general structure of communication format is divided into the communication header and communication data.

Communication header (4 bytes)	Communication data (4 or 12 bytes)

Item	Data type	Explanation
Communication header	Described later	Header area such as data length
Communication data	Described later	Data area such as destination floors

3.3 Structure of communication header

The structure of the communication header is as follows.

Data length (1 byte)	Version (1 byte)	Reserve (2 bytes)

Item	Data type	Explanation
Data length	BYTE	Byte size of the communication data*
Version	CHAR	"A" (fixed)
Reserve	BYTE (2)	0x00 0x00 (fixed)

* In case of automatic registration, data length is 0x0C.
  In case of manual registration, data length is 0x4C.
  In case of healthy check, data length is 0x04.

3.4 Structure of communication data

The structure of the communication data is as follows.

(1) In case of automatic registration

Command (1 byte)	Swiped card reader number (4 bytes)	Destination floor (3 bytes)	Door Opening (1 byte)

Attribution (1 byte)	Sequence number (1 byte)	Reserve (1 bytes)

Item	Data type	Explanation
Command	BYTE	0x10 (fixed)
Swiped card reader number	CHAR (4)	"0001" to "0255"
Destination floor	CHAR (3)	"001" to "255" (Building Floor Name*)
Door opening	CHAR	"1": Front side, "2": Rear side, "3": Both-side
Attribution	CHAR	"0": General, "1": Handicapped person, "2": VIP
Sequence number	BYTE	0x00 to 0xFF
Reserve	BYTE (1)	0x00 (fixed)

* 'Building floor' may differ from the actual floor name. The bottom floor in a building is always 'Building floor 001'

(2) In case of manual registration

Command (1 byte)	Swiped card reader number (4 bytes)	Accesible Floors (64 bytes)

Accesible Floors

Attribution (1 byte)	Sequence number (1 byte)	Reserve (5 bytes)

Item	Data type	Explanation
Command	BYTE	0x20(fixed)
Swiped card reader number	CHAR(4)	"0001" to"0255"
Accesible Floors	BYTE(64)	Refer to the following Structure of "Accesible Floors" Data.
Attribution	CHAR	"0": General, "1": Handicapped person, "2": VIP
Sequence number	BYTE	0x00 to 0xFF
Reserve	BYTE(5)	0x00(fixed)

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The Structure of "Accesible Floors" Data

NO	D 7	D 6	D 5	D 4	D 3	D 2	D 1	D 0
1	4th Building Floor		3rd Building Floor		2nd Building Floor		1st Building Floor(*)	
2	8th		7th		6th		5th	
3	12th		11th		10th		9th	
4	16th		15th		14th		13th	
⋮	⋮		⋮		⋮		⋮	
6 1	244th		243rd		242nd		241st	
6 2	248th		247th		246th		245th	
6 3	252nd		251st		250th		249th	
6 4	— (00)		255th		254th		253rd	

Building Floor Data

D(High)	D(L)	explanation
O	O	Not accessible
O	1	Accessible to only front side door
1	O	Accessible to only rear side door
1	1	Accessible to both side door

* 'Building floor' may differ from the actual floor name. The bottom floor in a building is always '1st Building floor'

(3) The healthy check data

Command (1 byte)	Reserve (3 bytes)

Item	Data type	Explanation
Command	BYTE	0x11 (fixed)
Reserve	BYTE (3)	0x00 0x00 0x00(fixed)

Need to send the healthy check data within 30 minutes, from the last data.

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SALES DATA
S-8-K4.1-E

CONFIDENTIAL

3.5 Example of packet data

The example of the packet data is as follows.
<Example1> Swiped card reader number : No.3   (0003)
              Accesible floors : 1st Floor, 4th Floor, 8th Floor, 10th Floor (All is only front side.)

<Packet dump> [HEX: 80 bytes]   64 bytes(Accesible Floors)
    Captured data:
        4C 41 00 00 20 30 30 30 33 41 40 04 00 00 ・・・ 00 00 30 00 00 00 00 00 00 00

                                    80 bytes

Communication header:
Data length   BYTE (1): 4C   [76 (0x4C)] ----Byte size of the communication data
Version   CHAR (1): 41   ["A" (0x41) fixed] — Refer to ASCII Code Table
Reserve   BYTE (2): 00 00   [fixed]
Communication data:
Command   BYTE (1): 20   [fixed]
Card reader   CHAR (4): 30 30 30 33   ["0003"] ------------- Refer to ASCII Code Table
Accesible floor: 1st, 4th, 8th, 10th (All is only front side)

        D7 D6 D5 D4 D3 D2 D1 D0
No.1   0 1 0 0 0 0 0 1 → 0x41
No.2   0 1 0 0 0 0 0 0 → 0x40
No.3   0 0 0 0 0 1 0 0 → 0x04
The others are 0x00.

Attribution   CHAR (1): 30   ["0" General] ------- Refer to ASCII Code Table
Seq number   BYTE (1): 00   ["0" 0x00 to 0xFF]Increase per a packet sending
Reserve   BYTE (5): 00 00 00 00 00 00 [(fixed)]

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<Example2> The healthy check

<Packet dump> [HEX: 8 bytes]
    Captured data:
       04 41 00 00 11 00 00 00

Communication header:

Data length	BYTE (1): 04	[4 (0x04)]	--------------Byte size of the communication data
Version	CHAR (1): 41	["A" (0x41) fixed]	———— Refer to ASCII Code Table
Reserve	BYTE (2): 00 00	[fixed]	

Communication data:

Command	BYTE (1): 11	[fixed]
Reserve	BYTE (3): 00 00 00	[fixed]

<ASCII Code Table>

HEX	CHAR	HEX	CHAR	HEX	CHAR	HEX	CHAR	HEX	CHAR	HEX	CHAR	HEX	CHAR	HEX	CHAR
0x00	NUL	0x10	DLE	0x20		0x30	0	0x40	@	0x50	P	0x60	`	0x70	p
0x01	SOH	0x11	DC1	0x21	!	0x31	1	0x41	A	0x51	Q	0x61	a	0x71	q
0x02	STX	0x12	DC2	0x22	"	0x32	2	0x42	B	0x52	R	0x62	b	0x72	r
0x03	ETX	0x13	DC3	0x23	#	0x33	3	0x43	C	0x53	S	0x63	c	0x73	s
0x04	EOT	0x14	DC4	0x24	$	0x34	4	0x44	D	0x54	T	0x64	d	0x74	t
0x05	ENQ	0x15	NAK	0x25	%	0x35	5	0x45	E	0x55	U	0x65	e	0x75	u
0x06	ACK	0x16	SYN	0x26	&	0x36	6	0x46	F	0x56	V	0x66	f	0x76	v
0x07	BEL	0x17	ETB	0x27	'	0x37	7	0x47	G	0x57	W	0x67	g	0x77	w
0x08	BS	0x18	CAN	0x28	(	0x38	8	0x48	H	0x58	x	0x68	h	0x78	x
0x09	HT	0x19	EM	0x29	)	0x39	9	0x49	I	0x59	Y	0x69	i	0x79	y
0x0A	LF	0x1A	SUB	0x2A	*	0x3A	:	0x4A	J	0x5A	Z	0x6A	j	0x7A	z
0x0B	VT	0x1B	ESC	0x2B	+	0x3B	;	0x4B	K	0x5B	[	0x6B	k	0x7B	{
0x0C	FF	0x1C	FS	0x2C	,	0x3C	<	0x4C	L	0x5C	¥	0x6C	l	0x7C		
0x0D	CR	0x1D	GS	0x2D	-	0x3D	=	0x4D	M	0x5D	]	0x6D	m	0x7D	}
0x0E	SO	0x1E	RS	0x2E	.	0x3E	>	0x4E	N	0x5E	^	0x6E	n	0x7E	~
0x0F	SI	0x1F	US	0x2F	/	0x3F	?	0x4F	O	0x5F	_	0x6F	o	0x7F	DEL

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Revision history

A: 2010/7/16 Koba

    P.12   The height size is wrong.

    P.13   Notes for Modernization are added.

B: 12/NOV/2010 S.Yamashita

    P.1   D-C-843 was modified.

    P.2   NEXIEZ was added.

    P.13   VFGLB was deleted.

C: 14/MAY/2011 S.Yamashita

    P.7   Position of car designation indicator was described.

    P.8   URL addresses were deleted.

    P.9   URL addresses were deleted.

    P.11   System configuratin was modified.

    P.12   Item 9 was added.

D: 25/DEC/2012 T.Okunaka

    P.3   Applicable models were added.

    P.3   Maximum number of floors integrated with card reader was modified.

E: 5/JUN/2013 Y.Koba

    P.11   The range of power supply was modifed.

    P.12   The description about NDA was deleted.

    Attachment 1   The transmission specifications to E-LIP were added.

F: 13/NOV/2013 T.Okunaka

    P.3   Application models were modified.

    P.4,5,8   Figures of Hall Operating panel are modified.

    P.6   Remarks was modifed.

    P.11   Note on sales engineering is added.

G: 21/JAN/2014 N.Kurokawa

    All pages   Modified a description of "Integration with card reader".

               1.   Add description of "Automatic call registration".

               2.   Add description of "Specifications of wiring".

               3.   Modified "Layout of components".

H: 25/APR/2014 N.Kurokawa

P.3	"(5) Start of production" was modified.
P.6	Add description of Remarks for card reader.
Attachment 1, P.6	Add Attribution "1": Handicapped person and "2": VIP.

I: 13/NOV/2014 N.Kurokawa

P.3	Change the "Number of C/R per Floor". Add KMEC in (5).
P.4-7	Add description of Override switch.
P.9	Add a table of "Recommend system configurations".
P.10	Change description of (3).
P.13-16	Add description of Override switch.
P.19	Add Q&A No.9.
P.20	Add Appendix.

J: 10/MAR/2015 N.Kurokawa

P.4	Add "(7) How to order" and "(8)How to send technical inquiry or price quotation request".

K: 22/MAY/2015 K.Tsuji, N.Kurokawa

All pages	Full revise

L: 7/AUG/2015 N.Kurokawa

All pages	English descritption are modified with proper word. (Using the word that is familiar with the sales person) e.g. "place a card" → "scan a card"
P1	Clause "4-4","5-2" was added.
P2	1-1 was modified
P6	(5) Applicable models table was modified.
P10	(8), (9) was modified.
P10	"Notes on Override Switch" was modified.
P12	Add refer to Attachment 1.
P13	This page was added.
P15	"No.16 Supervisor card" was added.
P16	The contents of this page were fully modified.
P17	(5) was added.
P19	(5) was added.

Revision history 2