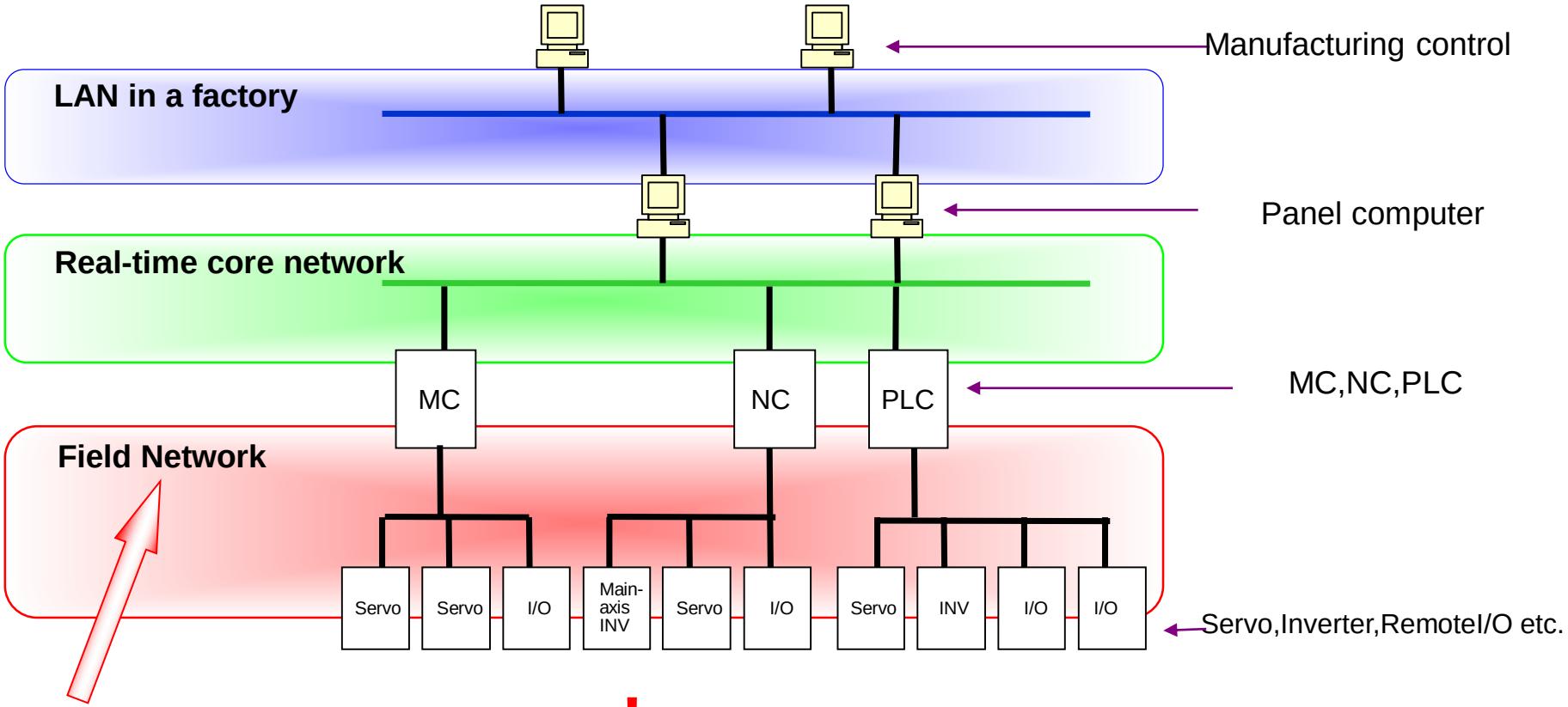
Introduction of MECHATROLINK

MECHATROLINK
Members
Association

June 2015

Position of MECHATROLINK

MECHATROLINK is positioned as a field network. A field network is a network that drives control elements of control system such as I/Os and actuators, and allows devices for input control information to be connected



MECHATROLINK!

MECHATROLINK Specifications

Function Specification	MECHATROLINK-Ⅱ	MECHATROLINK-Ⅲ
Physical Layer	Equivalent to RS-485	Ethernet
Baud Rate	10Mbps	100Mbps
Transmission Cycle Time	250μsec ～ 8msec	31.25μsec ～ 64msec
Data Size	17 bytes or 32 bytes (Both data sizes cannot be used in the same network.)	8/16/32/48/64bytes (Different data sizes can be used in the same network)
Number of Slaves	30 max.	62 max.
Maximum Transmission Distance	50m total(100m with Repeater)	100m between stations 0.5m
Minimum Distance between Stations	0.5m	0.2m
Topology	Bus	Cascade, Star or Point-to-Point
Cyclic/Event-driven Communications	Cyclic Communications possible	Cyclic and event-driven communications supported.
Retry function	Max 7 stations(1 time per 1 station)	Max 62 stations(n time per 1 station)
Message Communications	None	Available
Multi Slave	No	Yes

Name	MECHATROLINK MEMBERS ASSOCIATION (MMA)
Objectives	MMA is a group of MECHATROLINK product developers and users who promote the use of MECHATROLINK, a motion field network. All members support the construction and promotion of a larger MECHATROLINK family.
Main Office	480 Kami-fujisawa, Iruma, Saitama, Japan Telephone: +81-4-2962-7920 Fax: +81-4-2962-5913 e-mail：mma@mechatrolink.org URL：http://www.mechatrolink.org

MECHATROLINK Members Association (MMA)

Chairman

MMA Executive Committee
(・M-System ・Oriental Motor ・Pro-face ・YASKAWA
・YASKAWA Information Systems ・YOKOGAWA)

・Discuss and determine policy and activities
・Discuss and determine management policy and organization
・Discuss and determine technical specifications
・Audit and approve management costs

Sub committee

Marketing sub committee
・Promotion activities
・Event planning
・Preparation of leaflets and other promotional material

PC tech sub committee
・Promotion activities
・Development promotion

Safety sub committee
・Safety protocol developed
・Documentation

MMA Secretariat
（General secretary, Staff in charge of technical activities and public relations)

MMA Global
・MMA Germany ・MMA US ・MMA KOREA ・MMA China
・MMA Taiwan・MMA India

＜Technical Activities＞
・Creates and archives specification
・Settles technical problems
・Prepares and distributes technical documents

＜Vendor Support＞
・Provides support for presentation of products at exhibitions
・Plans and manages seminars
・Distributes information in E-mail and internet
・Creates and distributes catalogs
・Supports development of MECHATROLINK products by MMA members
・Offers testing for compliance and certification
・Registers new members and collects annual fees

＜User Support＞
・Distributes information in E-mail and internet
・Distributes catalog

MMA Members

Membership categories and Privileges

■MECHATROLINK Members Association Membership

Type of Members		Membership Categories				
		Board Members	Executive Members	Regular Members	User Members	Registered Members
Annual fee(April to March)		500,000JPY	200,000JPY	100,000JPY	20,000JPY	Free
Annual fee(October to March)		1/2 of the above annual fee			20,000JPY	Free
Participation in committee and genera meetings		Authorized to participate the executive committee, subcommittee, and general meeting	Authorized to participate the subcomittee and general meeting			Authorized to participate the general meeting
Service	Downloading the technical documents from the website	Free				
	Direct mails from the Association	Free				
	Seminar	Free				
	Product presentation at seminar	Authorized			Not authorized	
	Technical inquiries (by e-mail or telephone)	Free				No authorized
	Development support for vendors	Free(charged for some cases)				No authorized
	Introduction of products on the Association 's website	Free			No authorized	
	Advertisement on the Association's website	Free	Charged		No authorized	
	Compliance certification test	50,000JPY	100,000JPY	200,000JPY		-
Rights of Members	Development of products	Authorized				No authorized
	Sales of products	Authorized			No authorized	
	Participation in formulation of specifications	Authorized	No authorized (Possible to receive the information on experimental specifications.)		No authorized (Possible to read the formulated specifications.)	

Benefits of MMA Membership

- Issue ID and Password for WEB member site
- Getting MECHATROLINK specifications
- Up-to-date with the latest information by mail magazine and News
- Technical support for product development
- Promotion assistance for MECHATROLINK compliant products
- Participation for the MECHATROLINK booth at tradeshows
- Product certification test
- Be able to purchase connector kit and assemble cables
- Participation for the MECHATROLINK meeting (once a year)
- Participation for the MECHATROLINK development seminar

Technical support is available overseas

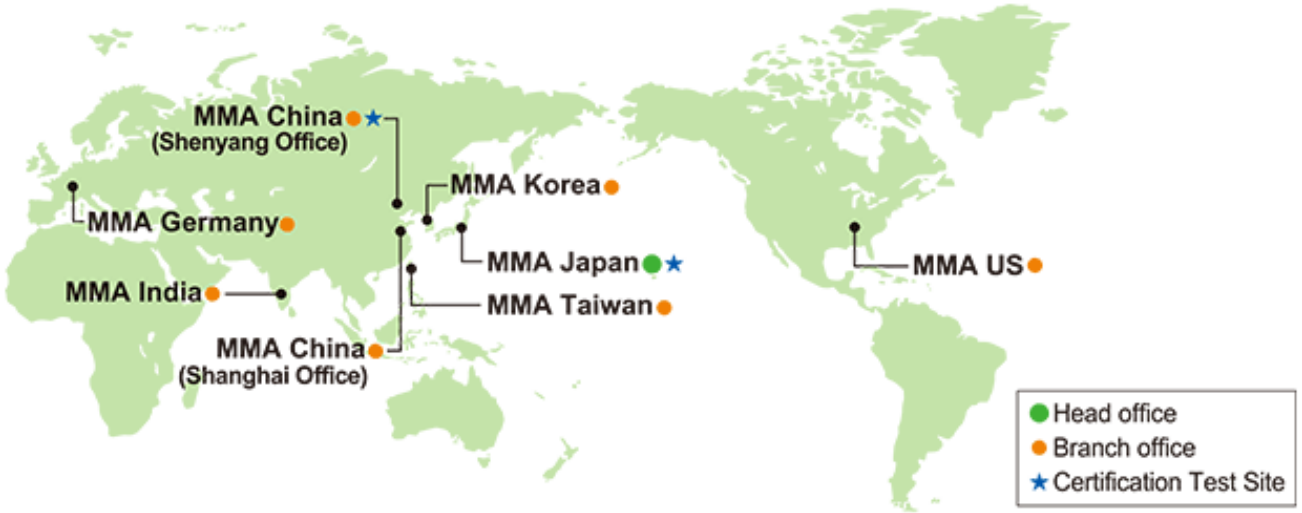
Contact Information

■ MMA Head Office (MMA Japan)
480 Kamifujisawa, Iruma, Saitama,
358-8555, Japan
Tel : +81-4-2962-7920
Fax : +81-4-2962-5913
e-mail : mma@mechatrolink.org」

■ MMA U.S.
2121 Norman Drive South; Waukegan, IL 60085; U.S.A.
Tel : +1-847-887-7231
e-mail : mma-us@mechatrolink.org

■ MMA Germany
Hauptstr. 185
65760 Eschborn Germany
Tel : +49-6196-569420
e-mail : mma@mechatrolink.de

■ MMA Korea
9F Kyobo Securities Bldg., 26-4,
Yeouido-Dong, Yeongdeungpo-gu,
Seoul, KOREA
Tel : +82-2-368-8875
e-mail : mma-kr@mechatrolink.org



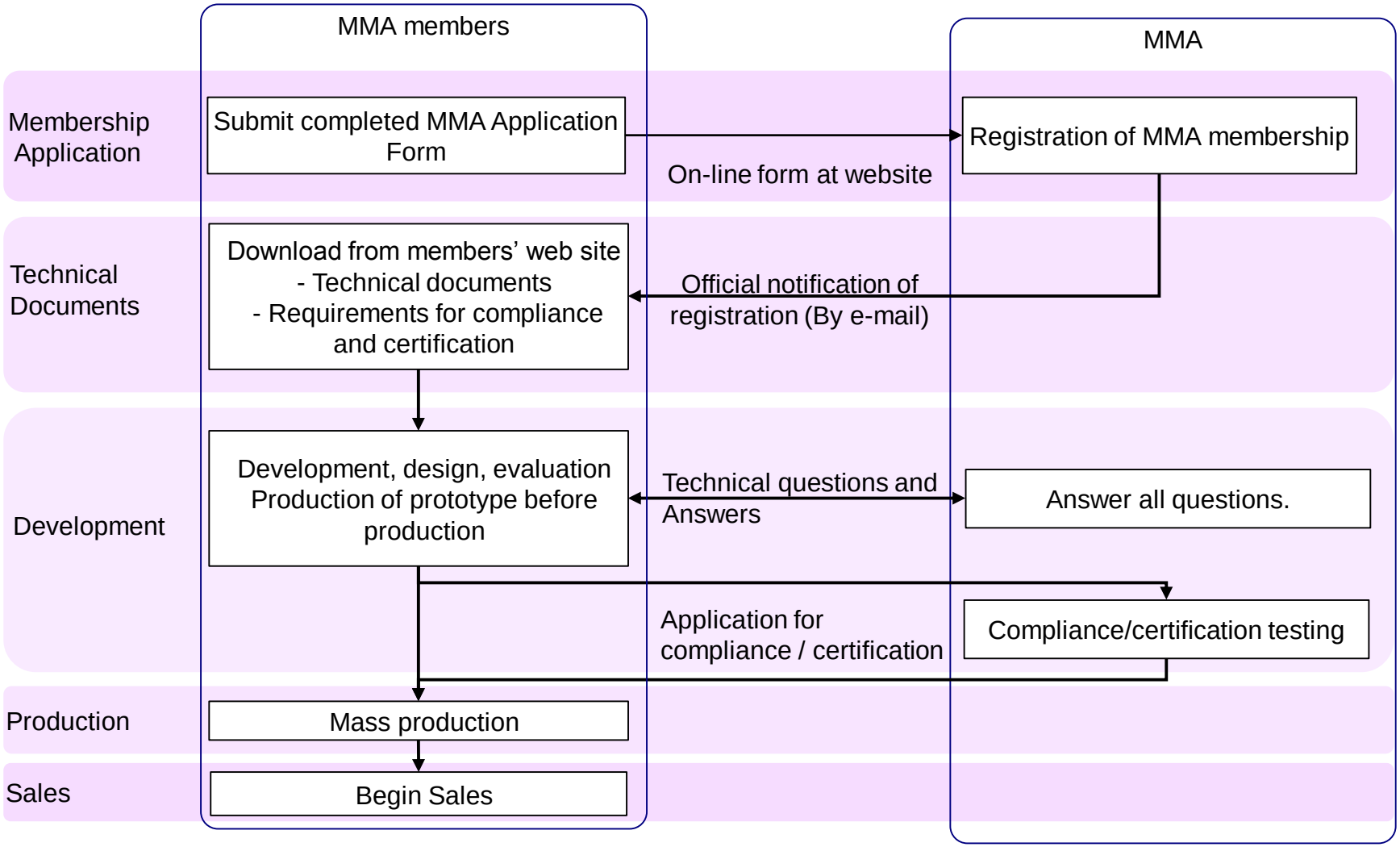
■ MMA China
(Shanghai Office)
22/F One Corporate Avenue No.222 Hubin Road, Huangpu District Shanghai, 200021 CHINA
Tel: +86-21-53852070
e-mail: mma-sh@mechatrolink.org

(Shenyang Office)
No.16, East Nanping Road, Hunnan High-tech. Industrial Development Zone, Shenyang, 110171, P.R. China
Tel : +86-24-24696016
e-mail : mma-cn@mechatrolink.org

■ MMA Taiwan
12F., No.207, Sec. 3, Beixin Rd., Xindian Dist., New Taipei City 231, Taiwan
Tel : +886-2-8913-1778
e-mail : mma-tw@mechatrolink.org

■ MMA India
17/A, 2nd Main, Electronic City, Phase-1, Hosur Road, Bengaluru - 560 100, INDIA
Tel : +91-80-4244-1920
e-mail : mma-in@mechatrolink.org

From Membership to Product Release



Compliance and Certification Testing

- Compliance and certification testing is carried out to see if products meet MECHATROLINK specifications. If test results are satisfactory, the MMA grants the use of the MECHATROLINK logo on the product.

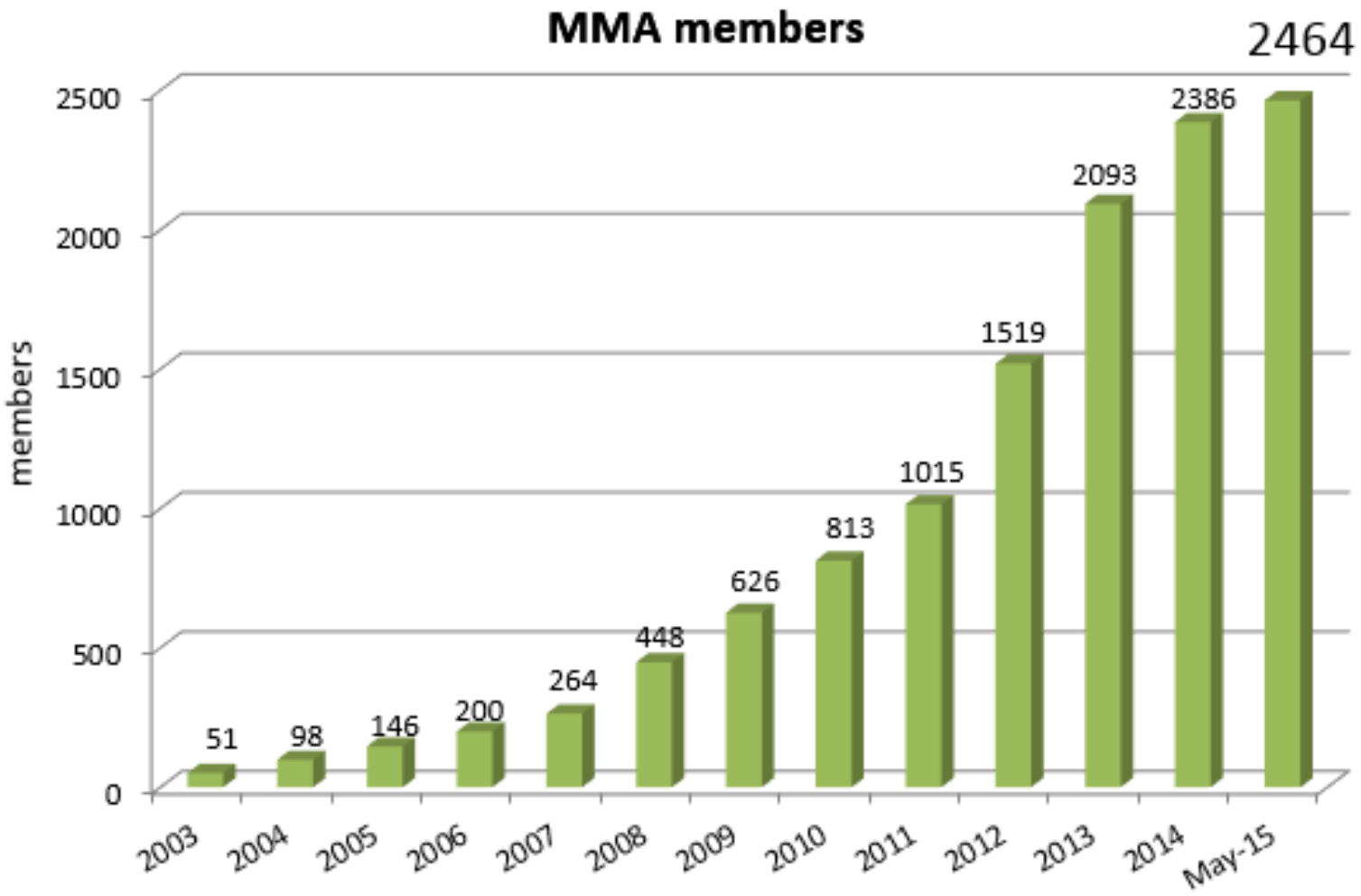
MECHATROLINK

- Cost of testing product is $2,000 (Executive:$1,000, Board: $500).

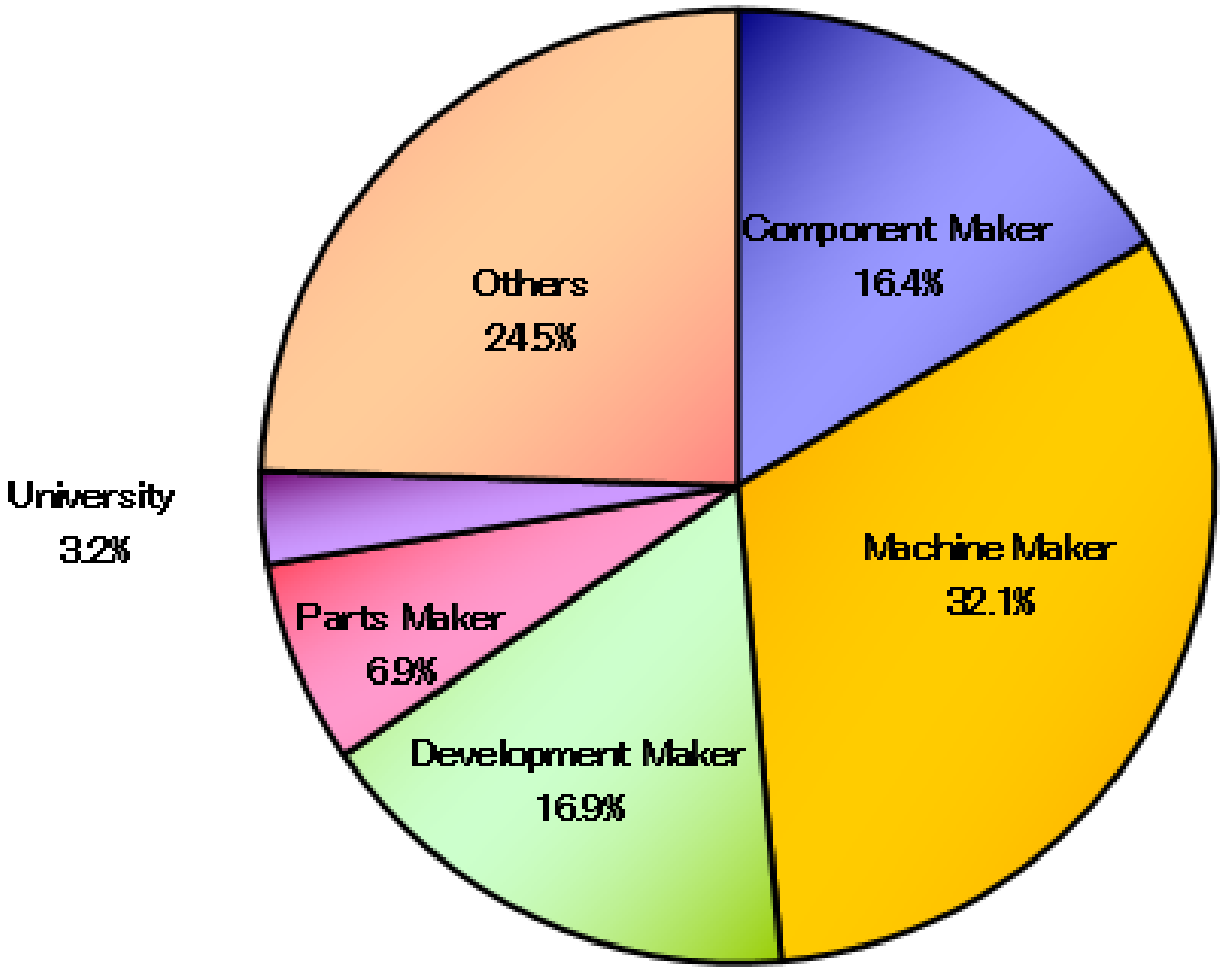
- Time required for testing: Will vary in accordance with the product specifications, such as the number of applicable commands.

  For more information, contact to MMA secretariat.
  Compliance testing is not compulsory,
  but, it is recommended.

2464 members (as of May 2015)

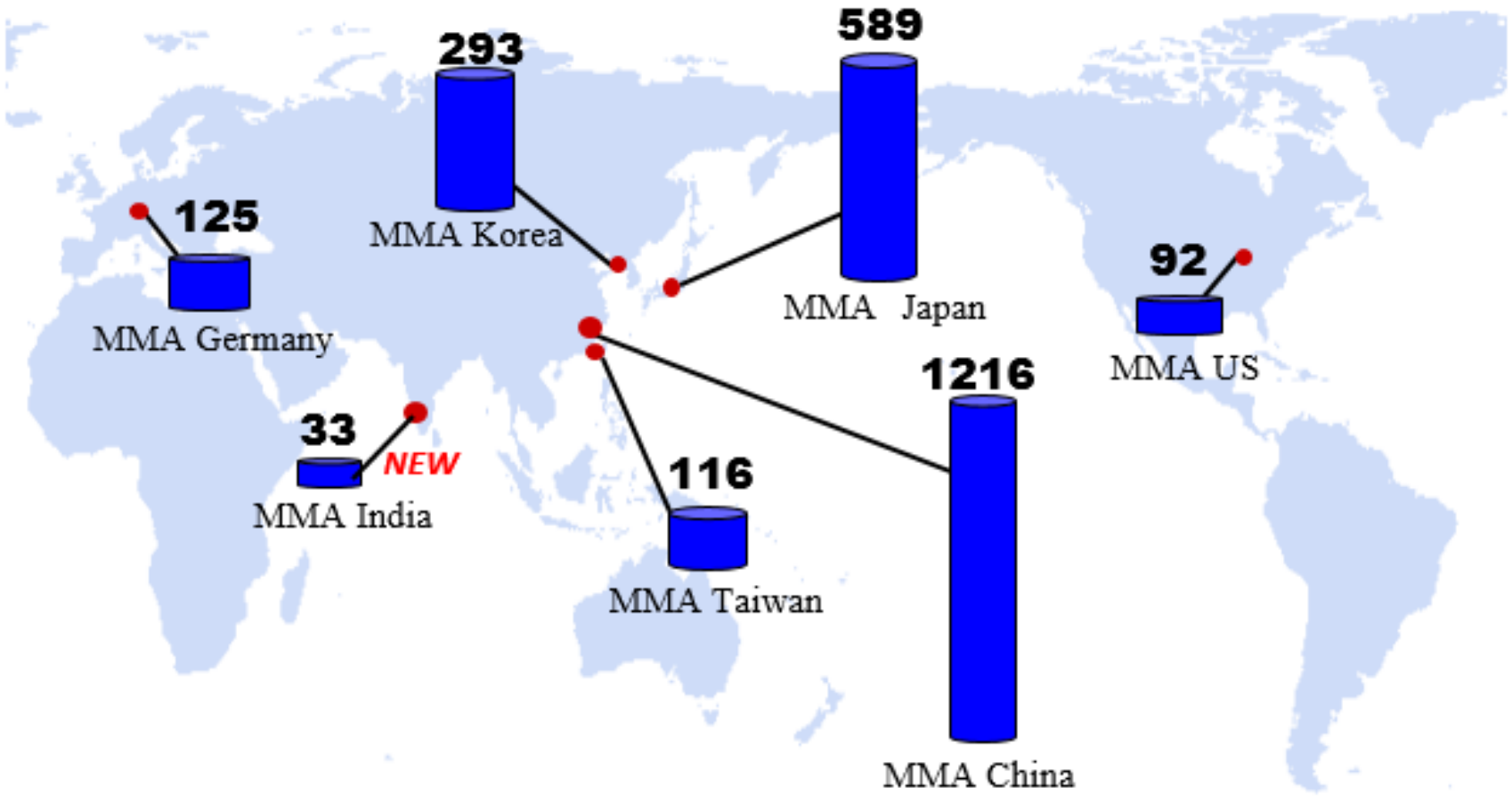


Type of MMA member



(As of May 2015)

MMA Worldwide



*ASEAN area is included in the MMA Japan

(As of May 2015)

Various line-up

Obtaining Information

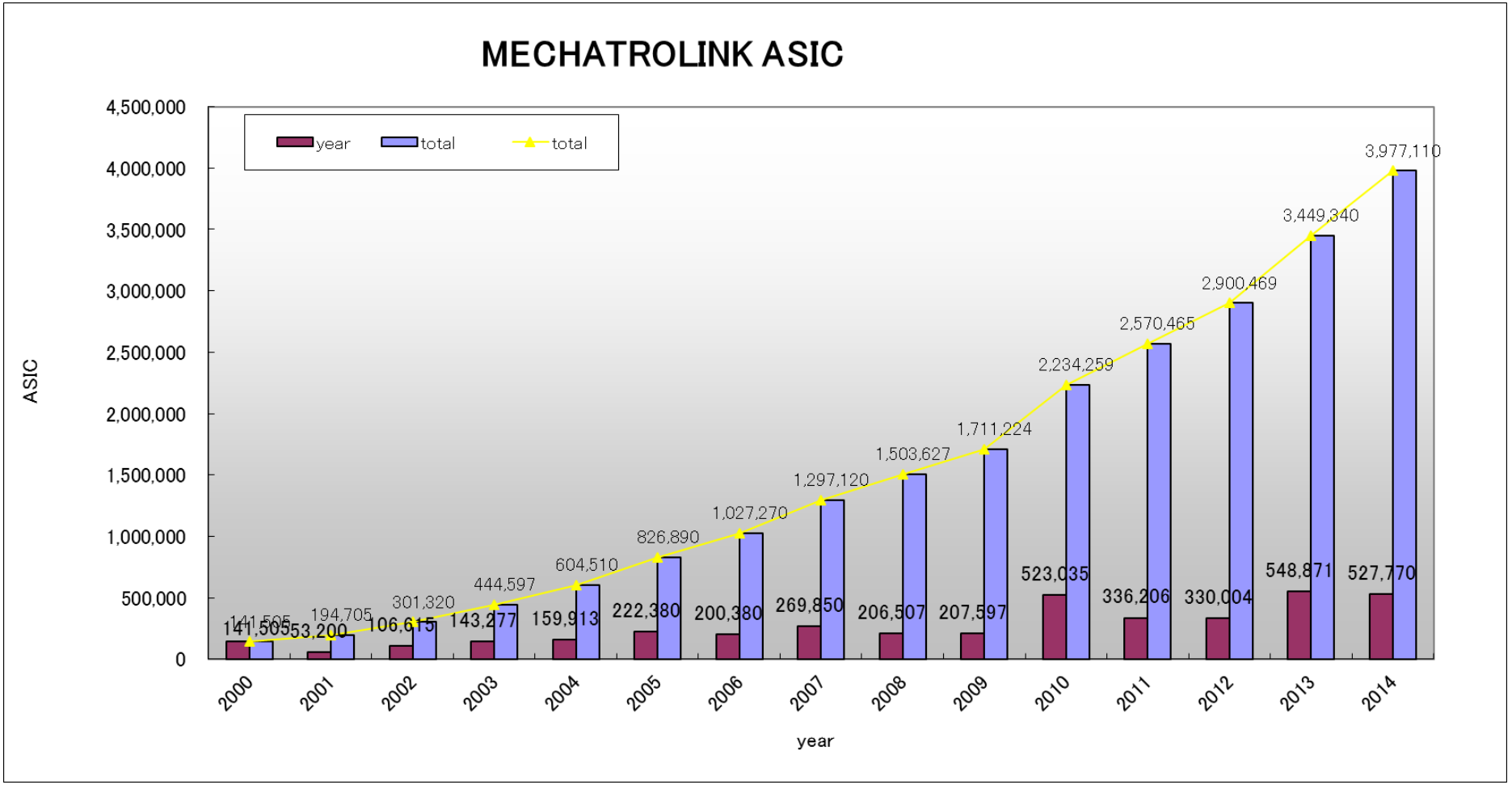
The MMA website provides the following information.

- About MECHATROLINK
- Guide to the MECHATROLINK Members Association
  (Download the membership agreement and the application form.)
- Member List (Includes only members who have given their permission.)
- MECHATROLINK compliant products
- Contract manufactures
- News and Events
- Technical Information (Download the latest technical documents.) *1
- Compliance Certification Test
- MECHATROLINK Products of MMA Members Brochure
- Q & A *2
- Inquiries (on-line form)

http://www.mechatrolink.org

*1 Members ID and password are required for downloading each manual.
*2 Members ID and password are required for access to Product Development Information

MECHATROLINK communication ASIC total shipping nodes **3.97 million**



As of March 2015

Number of MECHATROLINK product is 408

As of March 2015

MECHATROLINK is a network technology ranked by international standards and can be used without any concern since the standards are certified globally.

SEMI Standard

・SEMI E54.19 Standard

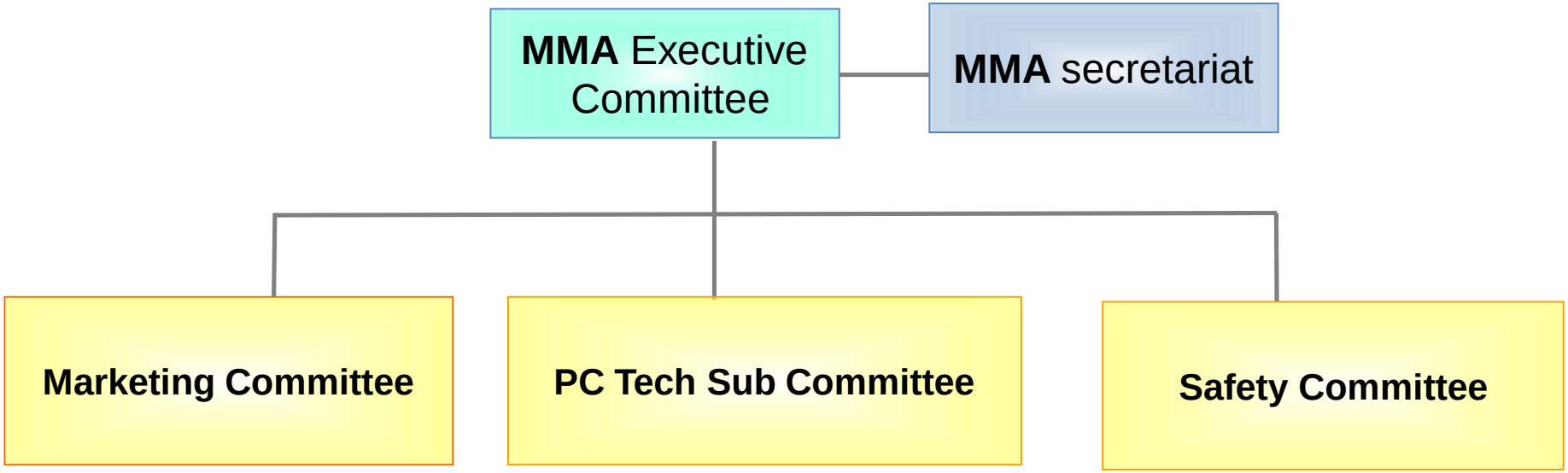
It is much easier to implement on semiconductor/liquid crystal-related devices. MECHATROLINK was certified for E54.19 (sensor/actuator network) on March 2007.

IEC Standard

・MECHATROLINK was certified IEC standard in August 2014.
It is a world standard as an open field network.

Compatible standard: IEC61158 field network protocol and service IEC61784 field network profile

Task force


MMA Executive Committee
MMA secretariat
Marketing Committee
PC Tech Sub Committee
Safety Committee

Promotion Activities

Trade show

Result of 2014

- SEMICON SINGAPORE(Singapore)
- Industrial Open Networks Fair 2014(Japan)
- Techno Frontier2014(Japan)
- Taipei International Automation Technology Exhibition 2014(Taiwan)
- Automation2014(India)
- RS2013(China)
- Asia Manufacturing Forum (Thailand, India, Indonesia, Vietnam)
- SEMICON Korea2015(Korea)
- Automation Components Fair2015(Japan)
- Manufacturing Industry Innovation Forum(Thailand)
- Aimex2014(Korea)







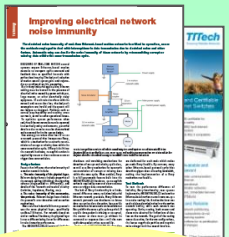

Seminar

Result of 2014

Japan（Tokyo/Aichi）
China(Nanjing)
Taiwan(Taipei)
Thailand(Bangkok)


Promotion


Focus-On


Industrial Ethernet Book


AUTOMATION REVIEW


IPG


MECHATROLINK NEWS


KEISO


NIKKEI Technology

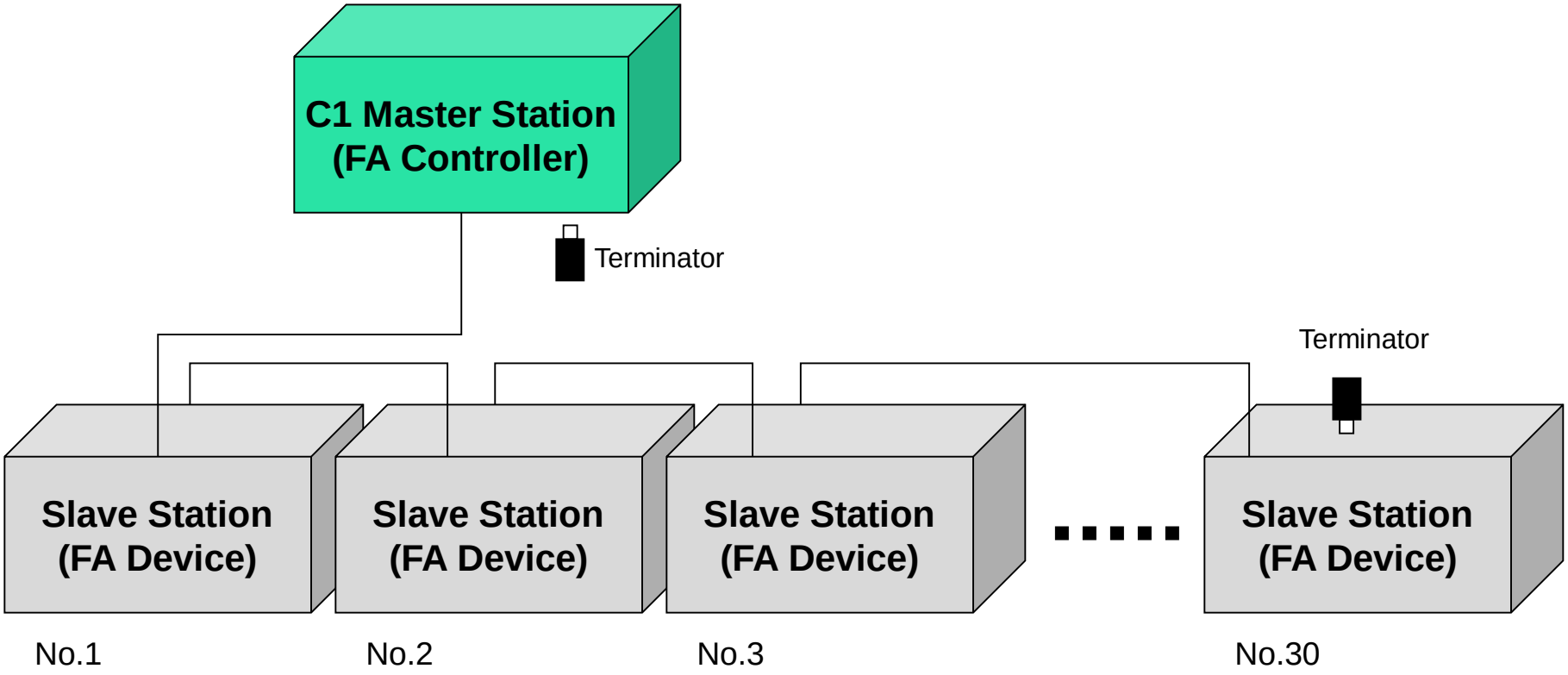
MECHATROLINK-Ⅱ

Slave stations and Transmission cycle

Transmission cycle [msec]	Data size	
	17byte	32byte
0.25	2	1
0.5	7	4
1.0	15	9
1.5	23	15
2.0	30	21
2.5	30	26
3.0	30	30
3.5	30	30
4.0	30	30
4.5	30	30
5.0	30	30
5.5	30	30
6.0	30	30
6.5	30	30
7.0	30	30
7.5	30	30
8.0	30	30

- Condition : C2 master=0, retry=0
- The slave number in the table above is communication specification only. The number of slave that master can control depends on each master controller's specification.
- Which Transmission cycle is supported depends on master and slave's product specification.

System Configuration

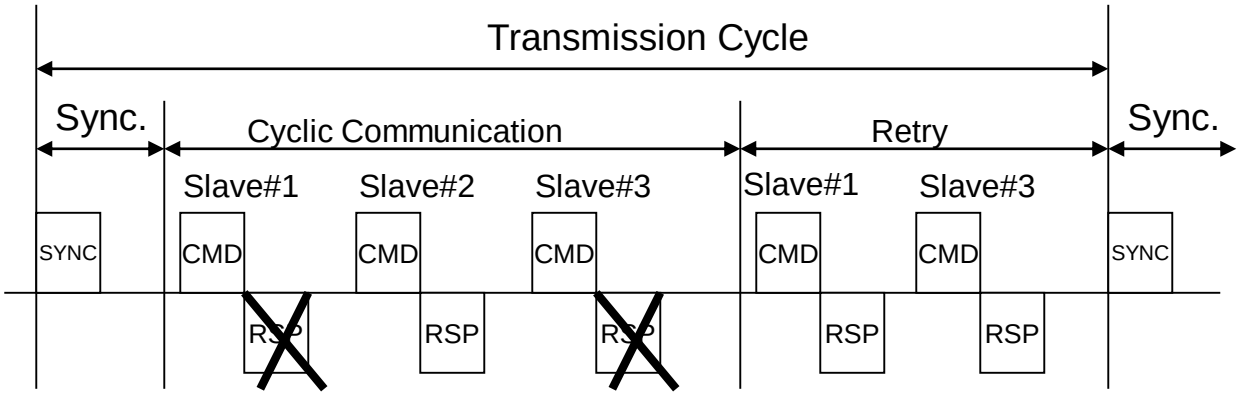


The number of slave node is depending on the master product specification

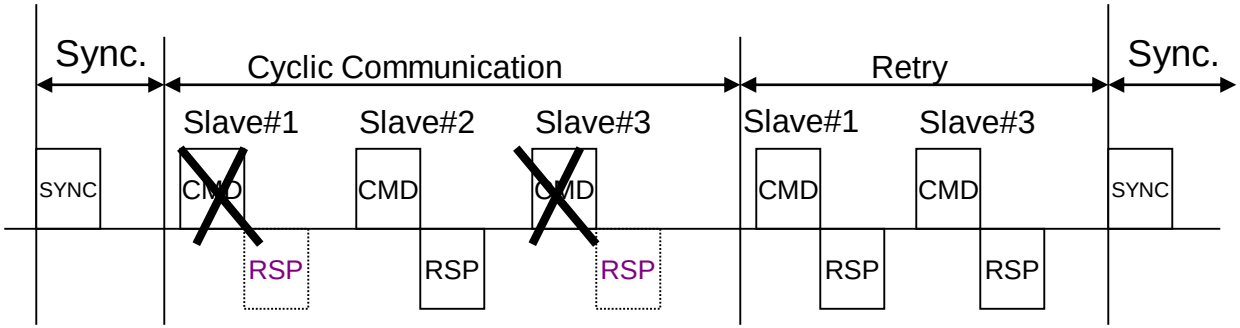
* Terminators are needed at the both ends of the network. (Some products include a built-in terminator.)

- 1 retry for each failed station
  (up to 7 failed stations allowed)
- An automatic retry in a transmission cycle

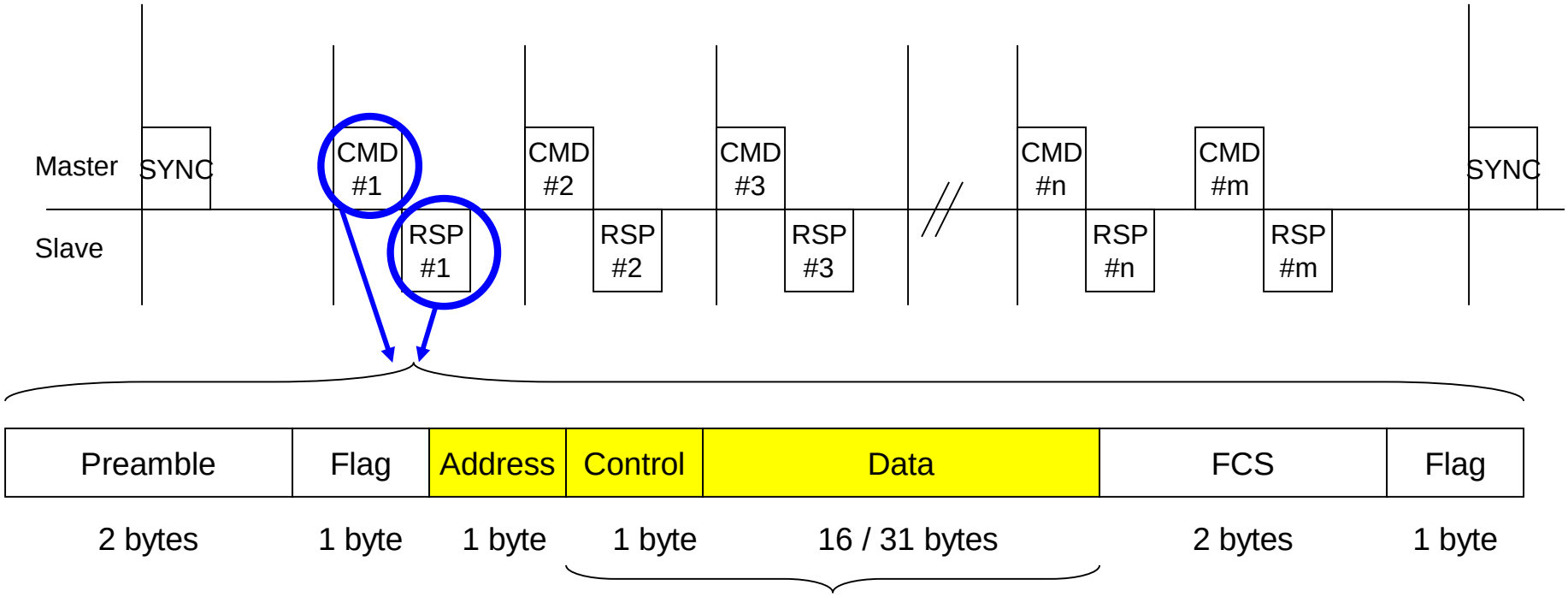
Response data corrupted



Command data corrupted



Frame Format



- 17-byte Mode : Control (1 byte) + Data (16 bytes)
- 32-byte Mode : Control (1 byte) + Data (31 bytes)

Data Format

	byte	Command	Response
Main command	1	CMD	RCMD
	2		
	3		
	4		
	5		
	6		
	7		
	8		
	9		
	10		
	11		
	12		
	13		
	14		
	15		
	16	WDT	RWDT
Sub command	17	SUBCMD	RSUBCMD
	18		SUBSTATUS
	19		
	20		
	21		
	22		
	23		
	24		
	25		
	26		
	27		
	28		
	29		
	30		
	31		

◆17 byte mode

Control (1 byte)

+ Main command (16 bytes)

◆32 bytes mode

Control (1 byte)

+ Main & Sub command (31 bytes)

CONNECT command(0Eh)

Byte	Command	Data (hex)
1	CONNECT	0E
2		00
3		00
4		00
5	VER	21
6	COM_MOD	02
7	COM_TIM	01
8		00
9		00
10		00
11		00
12		00
13		00
14		00
15		00
16	WDT	WDT

CONNECT Command: 0EH

VER: 21H (MECHATROLINK-II)

COM_MOD: 02H (Synchronous mode)

COM_TIM: 01H (communication cycle =01 x transmission cycle)

WDT: Data updates between master and slave when Synchronous mode

* All data must be 0 for 17 to 31 byte when 32 byte communication.

Command Group

CODE [Hex]	Command Group
00 to 1F	Common command group
20 to 2F	Common motion command group
30 to 3F	Standard servo command group
40 to 4F	Standard inverter command group
50 to 5F	Standard I/O command group
60 to 7F	Reserved
80 to 8F	Extended servo command group (For customization)
90 to 9F	Extended inverter command group (For customization)
A0 to AF	Extended I/O command group (For customization)

MECHATROLINK-II Commands

< Main command >

Code (hex)	Command	Function	Subcommand
00	NOP	No Operation Command	Not Available
01	PRM_RD	Read Parameter Command	Not Available
02	PRM_WR	Write Parameter Command	Not Available
03	ID_RD	Read ID Command	Available
04	CONFIG	Setup device Command	Not Available
05	ALM_RD	Read Alarm or Warning Command	Not Available
06	ALM_CLR	Clear Alarm or Warning Command	Not Available
0D	SYNC_SET	Start Synchronous communication Command	Not Available
0E	CONNECT	Eshtablish connection Command	Not Available
0F	DISCONNECT	Release Connection Command	Not Available
1B	PPRM_RD	Read Stored Parameter Command	Not Available
1C	PPRM_WR	Write Stored Parameter Command	Not Available
20	POS_SET	Set coordinates Command	Not Available
21	BRK_ON	Apply Brake Command	Not Available
22	BRK_OFF	Release Brake Command	Not Available
23	SENS_ON	Turn Sensor ON Command	Not Available
24	SENS_OFF	Turn Sensor OFF Command	Not Available
25	HOLD	Stop Motion Command	Available
28	LTMOD_ON	Request Latch Mode Command	Available
29	LTMOD_OFF	Release Latch Mode Command	Available
30	SMON	Servo Status Monitor Command	Available
31	SV_ON	Servo ON Command	Available
32	SV_OFF	Servo OFF Command	Available
34	INTERPOLATE	Interpolation Command	Available
35	POSING	Positioning Command	Available
36	FEED	Feed Command	Available
38	LATCH	Interpolation with Position Latch Function Command	Available
39	EX_POSING	External Signal Input Positioning Command	Available
3A	ZRET	Zero Point Return Command	Available
3C	VELCTRL	Velocity Control Command	Available
3D	TRQCTRL	Torque (Thrust) Control Command	Available
3E	ADJ	Adjusting Command	Not Available
3F	SVCTRL	General-purpose Servo Control Command	Available

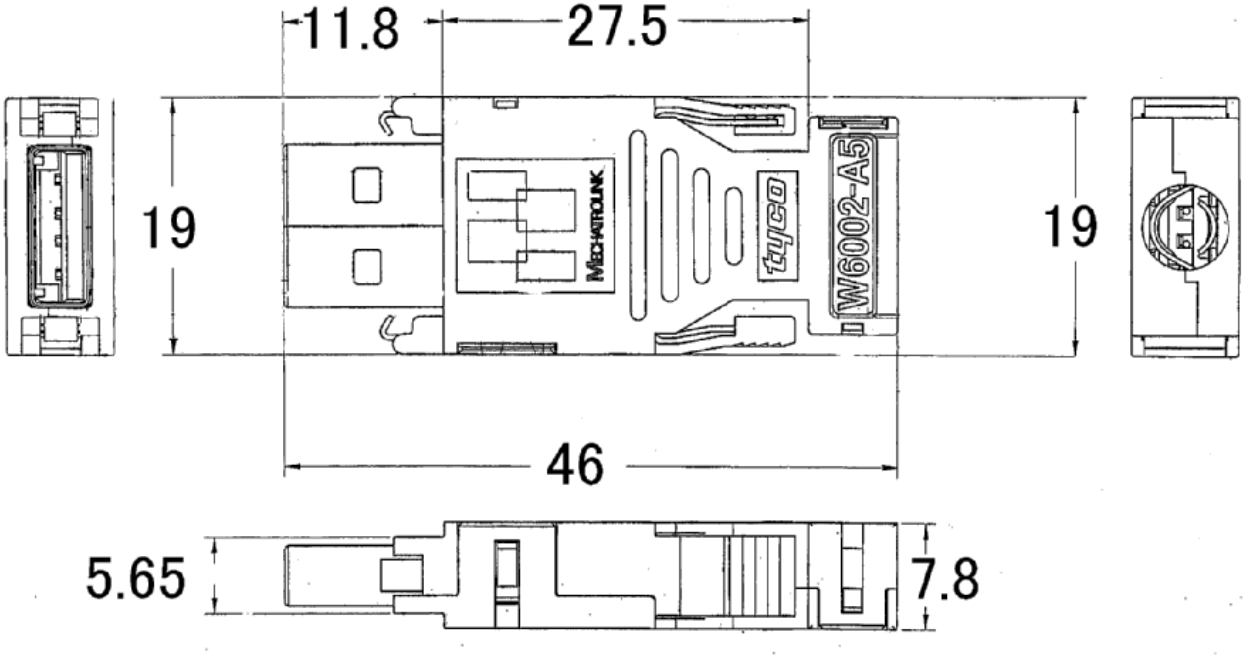
< Sub command >

Code (hex)	Command	Function
00	NOP	No Operation Command
01	PRM_RD	Read Parameter Command
02	PRM_WR	Write Parameter Command
05	ALM_RD	Read Alarm or Warning Command
1C	PPRM_WR	Write Stored Parameter Command
30	SMON	Servo Status Monitor Command

- In order to enable to use Subcommand, set the COM_MOD bit in the CONNECT command even in 32 byte communication.
- Combination of main command and subcommand is different depending on the product specification.

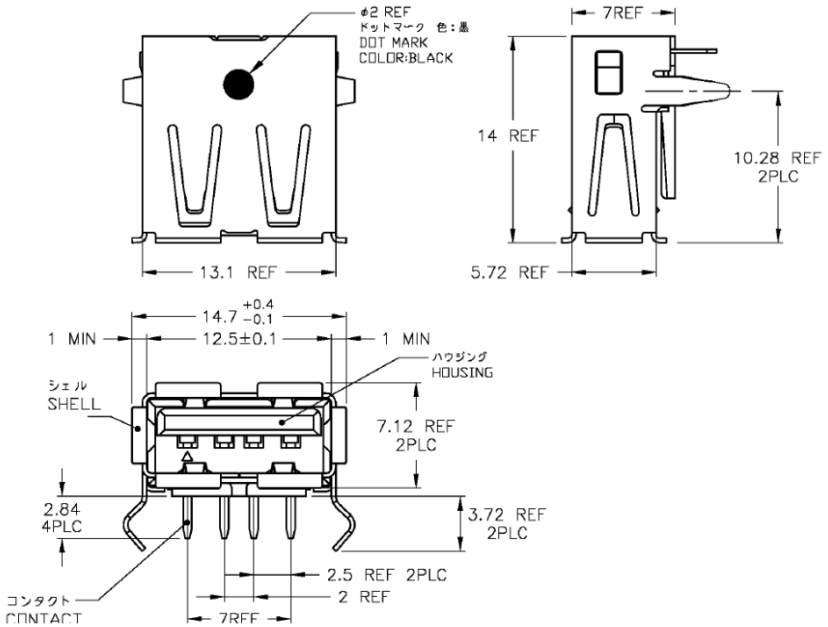
ASIC JL-080B	•Support MECHATROLINK-I/II •For Master/Slave Lot：60piece/Lot, 300/pieceLot	
ASIC JL-098B	•Support MECHATROLINK-I/II •For Master Lot：60piece/Lot, 300piece/Lot	
ASIC JL-052C	•Support MECHATROLINK-I/II •For Slave Lot：90piece/Lot, 450piece/Lot	

Tyco Electronics
MECHATROLINK-II Connector kit
model：1827525-1

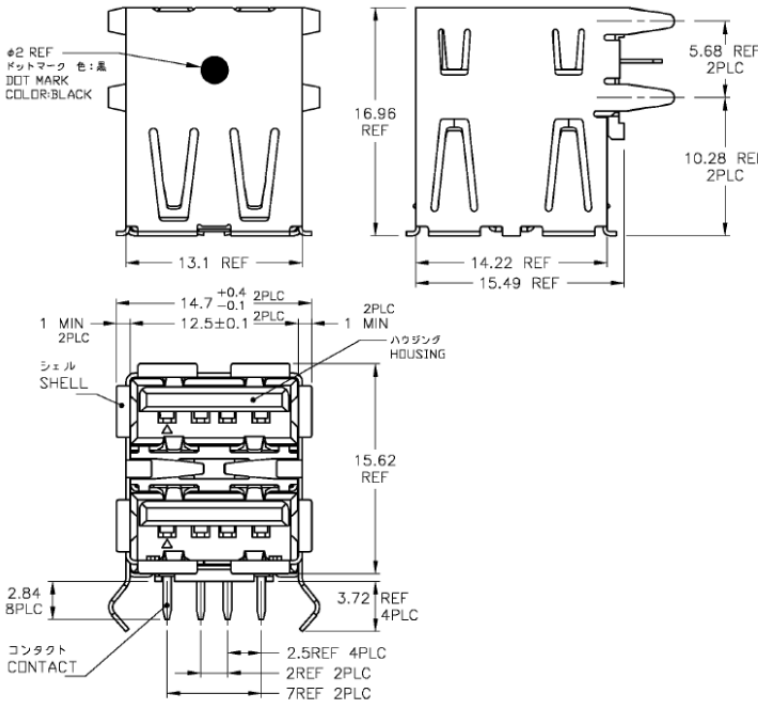


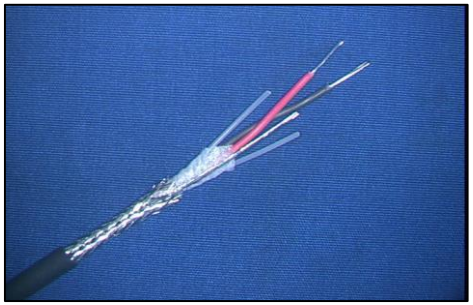
USB typeA

Tyco Electronics
USB connector
model：1903814-1



Tyco Electronics
USB connector（two-tier）
model：1903815-1





Recommended cable :

DYDEN CORPORATION

Cable for MECHATROLINK-Ⅱ

Type : HRZFV-SB AWG25/2C

Item	Specifications
Size	AWG25 × 2 Core
Overall diameter(mm)	4.8 ± 0.2
Characteristic Impedance (Ω)	120 (at 4MHz)

MECHATROLINK-Ⅱ Assembly cable

YASKAWA Control Corporation

Cable Type

- ●Assembly cable without Core: JEPMC-W6002-△△-E
- ●Assembly cable with Core : JEPMC-W6003-△△-E

△△ : Cable length 0.5m～50m.

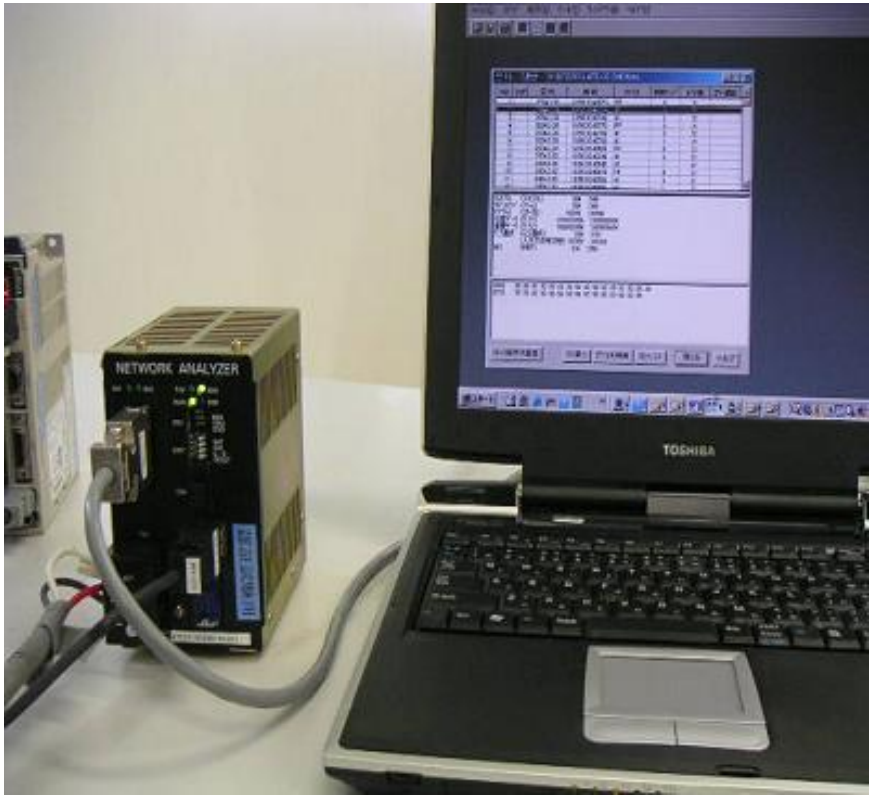
Cable Type (Flexible Type)

- ●Assembly cable without Core: JEPMC-W6005-▲▲-E
- ●Assembly cable with Core : JEPMC-W6006-▲▲-E

▲▲ : Cable length 5, 10, 15m.

MECHATROLINK-Ⅱ　Development tool

Network Analyzer



Name: Network Analyzer

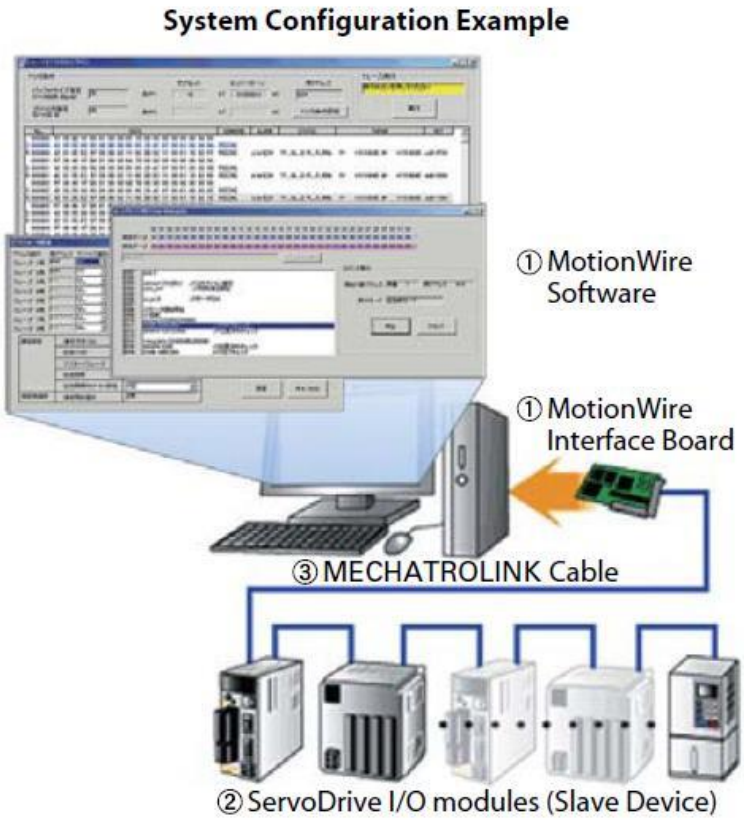
1) Network Analyzer unit
   Part #: 87215-95121-S0103
2) Network Analyzer software
   Part #: JEPMC-NWAN700

Vender : YASKAWA Electric Corporation

MECHATROLINK-II I/F cards

[standard PCI] JAPMC-NT110 [low-profile PCI] JAPMC-NT111	• For Master • Communication I/F card with JL-080B (CPU-less) • Supported OS –RTX 6.0.1 or greater –Windows 2000/XP/Vista/7(32bit) –INtime3.13	

Vender : YASKAWA Electric Corporation



Master station for slave development

Study tool for MECHATROLINK protocol

Name: MotionWire StarterKit

Manufacturer: Yaskawa Information System

Sample Kit

Parts kit for MECHATROLINK standard circuit. Convenient for developer who wants to make MECHATROLINK board.

■JL-080 sample kit
Type: JEPMC-OPM2SK-1-E
Contents: Qty. 5 of five different parts (total of 25 parts)
JL-080B (ASIC)
Pulse transformer
Driver/receiver
Crystal oscillator
USB 2-stage connector

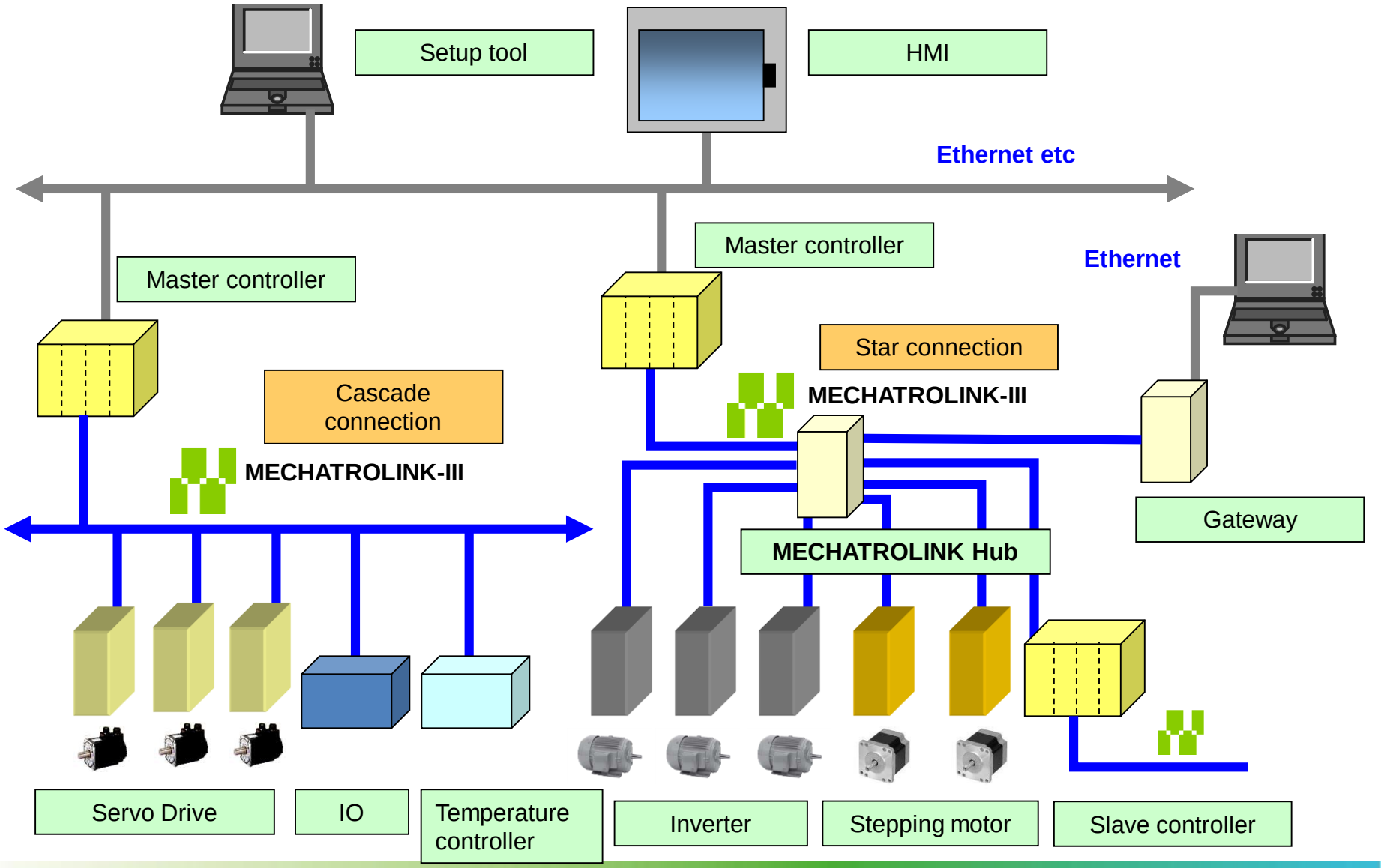
■JL-052 sample kit
Type:JEPMC-OPM2SK-2-E
Contents: Qty. 5 of five different parts (total of 25 parts)
JL-052C (ASIC)
Pulse transformer
Driver/receiver
Crystal oscillator
USB 2-stage connector

■JL-098 sample kit
Type: JAPMC-OPM2SK-3-E
Contents: Qty. 5 of five different parts (total of 25 parts)
JL-098B (ASIC)
Pulse transformer
Driver/receiver
Crystal oscillator)
USB 2-stage connector

Vendor : YASKAWA CONTROLS CO., LTD.

MECHATROLINK-Ⅲ

MECHATROLINK-III system configuration



Cyclic time and # of nodes

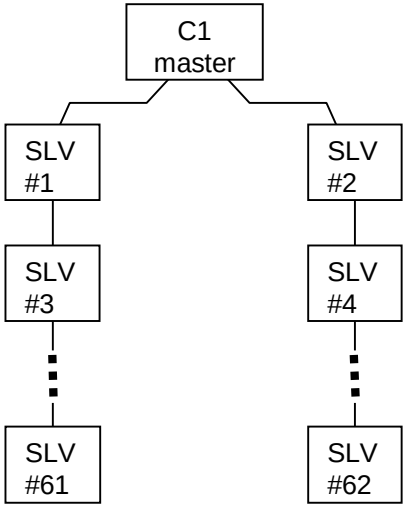
Maximum # of slaves are following tables:

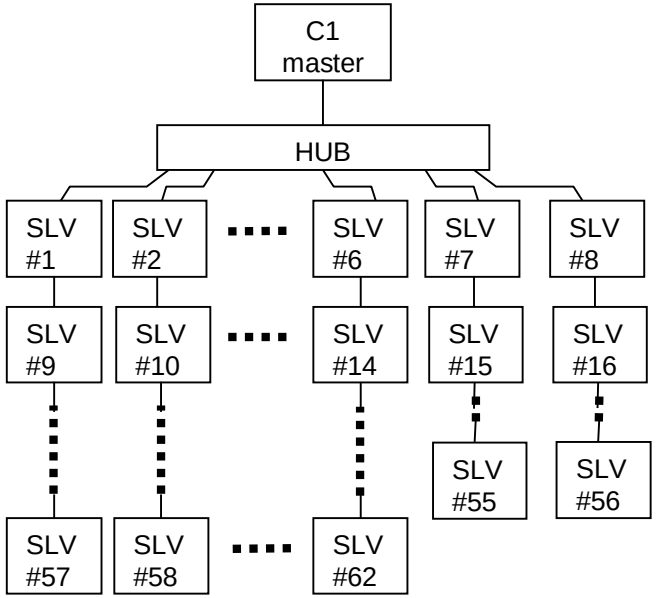
Cyclic time	Data size (byte)			
	16	32	48	64
31.25us	1	1	0	0
62.5us	2	2	2	2
125us	6	6	5	4
250us	11	11	10	9
500us	19	19	18	17
1ms	31	31	29	28
2ms	49	49	47	45
4ms	62	62	62	62
8ms	62	62	62	62

Cascade (C1 master has 2ports, and 0.2m cable each)

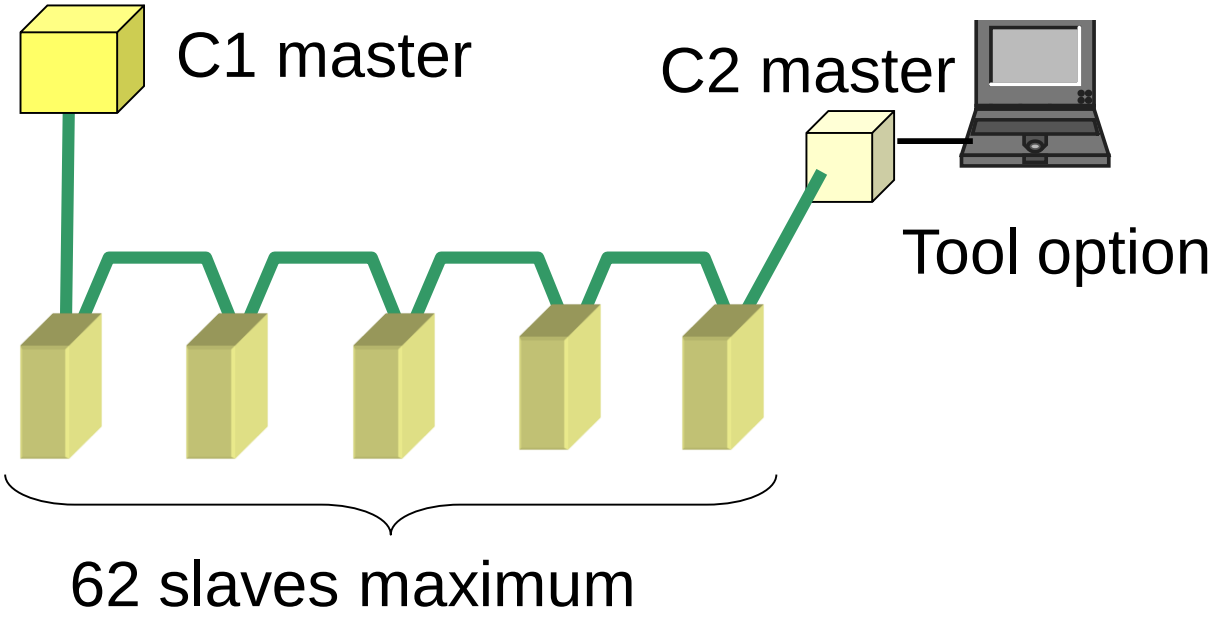
Cyclic time	Data size (byte)			
	16	32	48	64
31.25us	0	0	0	0
62.5us	2	2	2	2
125us	6	6	5	4
250us	12	12	11	10
500us	24	24	21	19
1ms	42	42	39	36
2ms	62	62	62	62
4ms	62	62	62	62
8ms	62	62	62	62

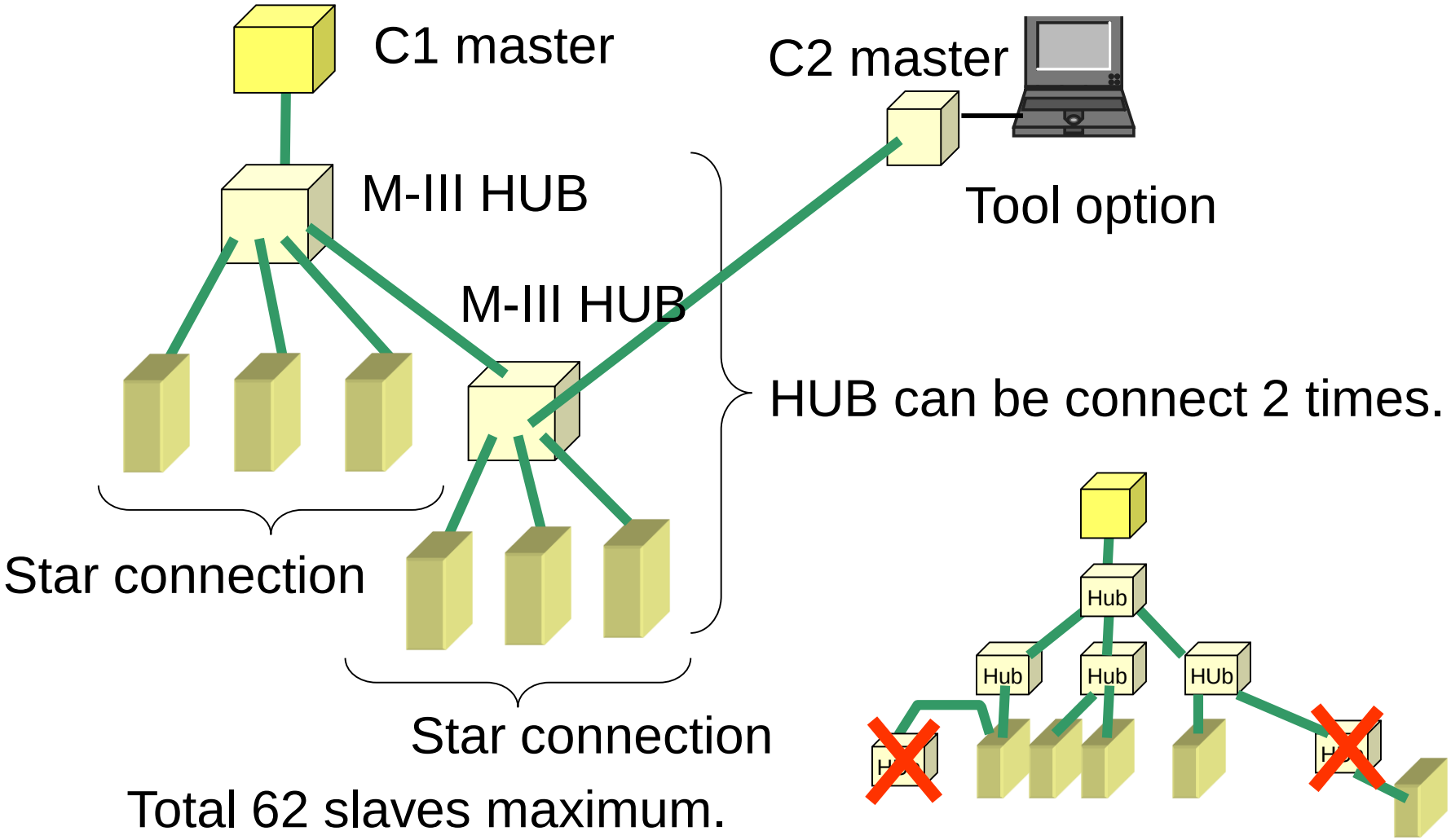
Star (HUB x 1, and 0.2 cable each)





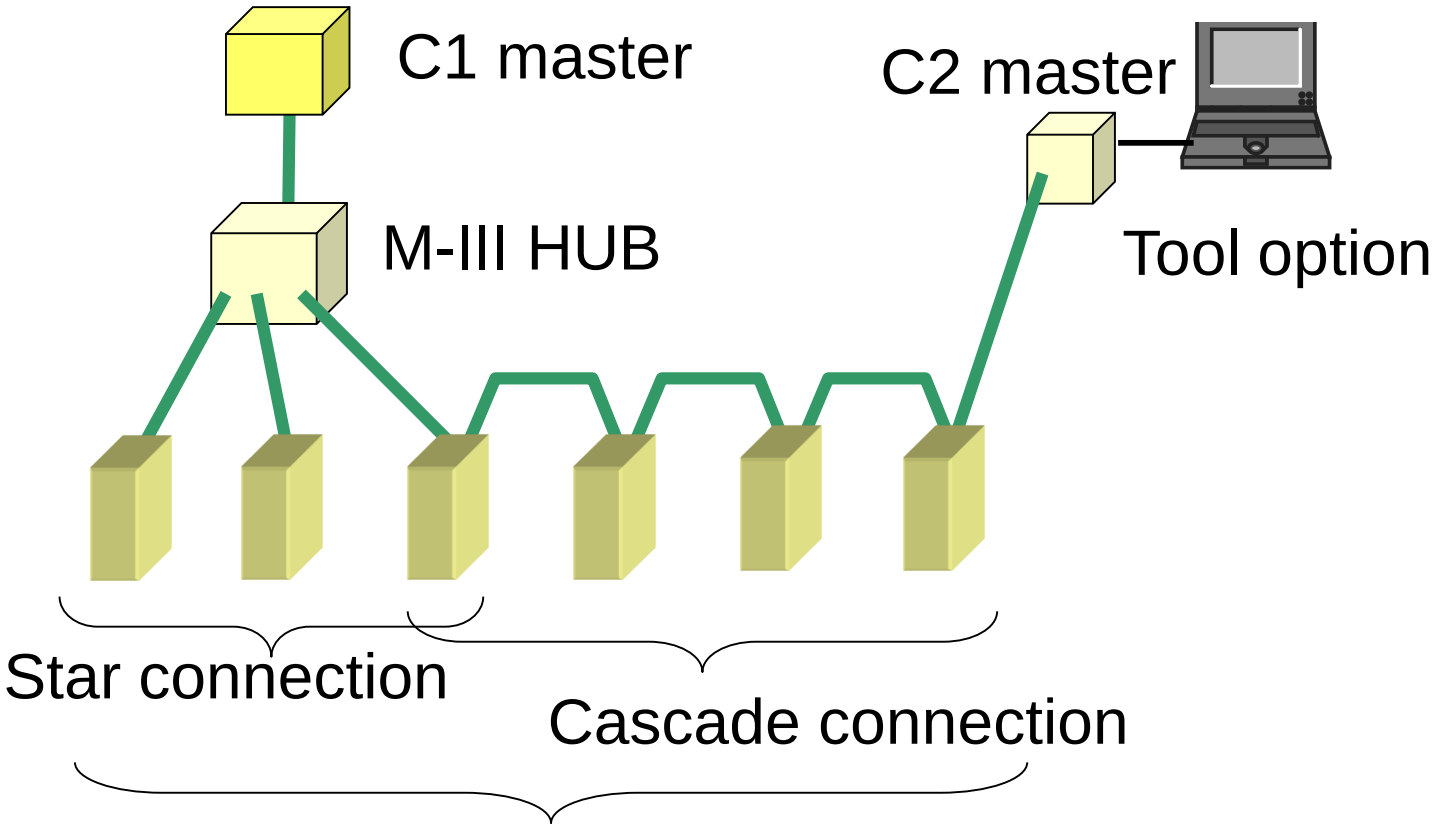
Topology cascade





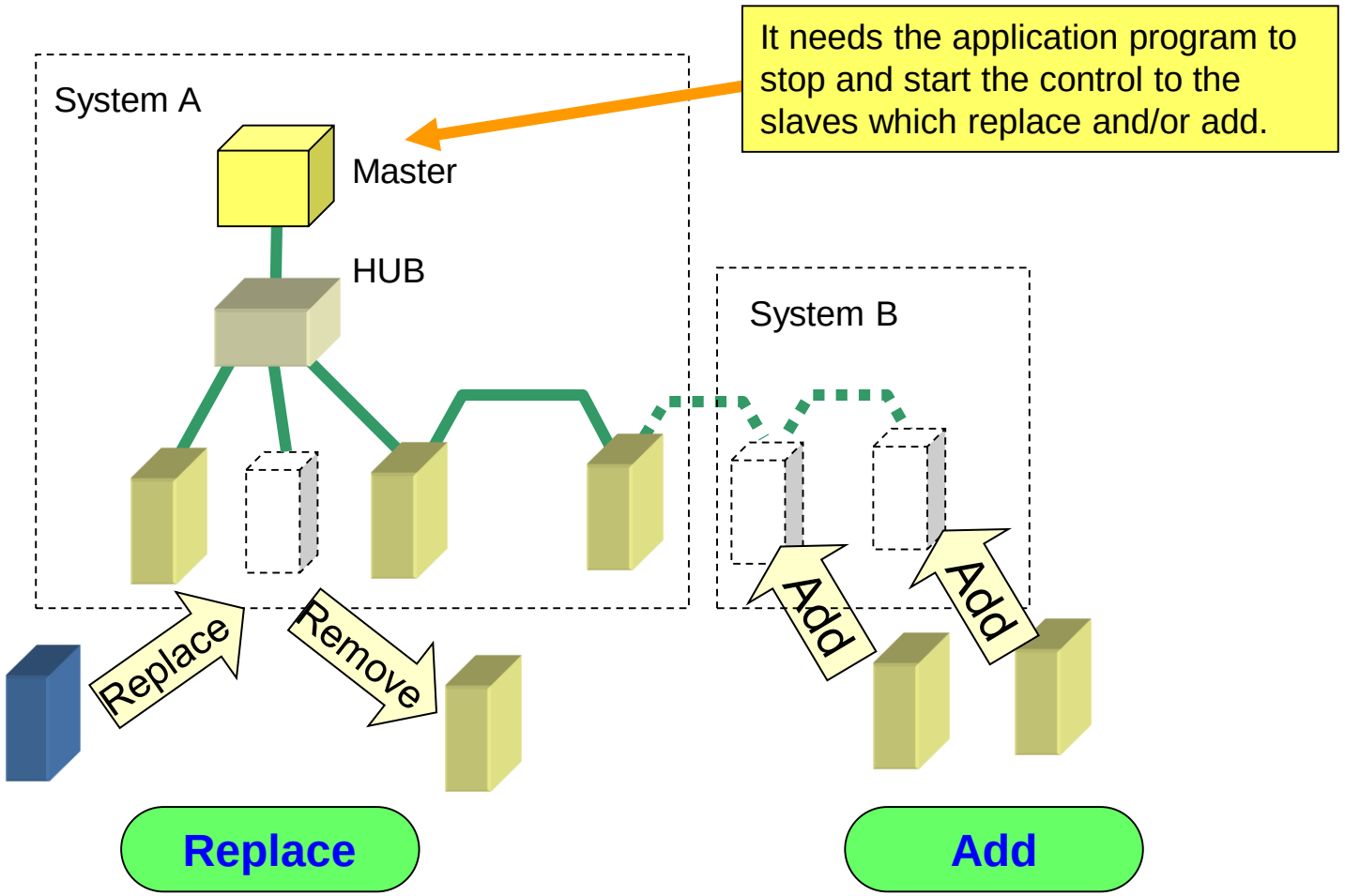
Total 62 slaves maximum.
Terminator is not necessary.

Topology Star & Cascade mix

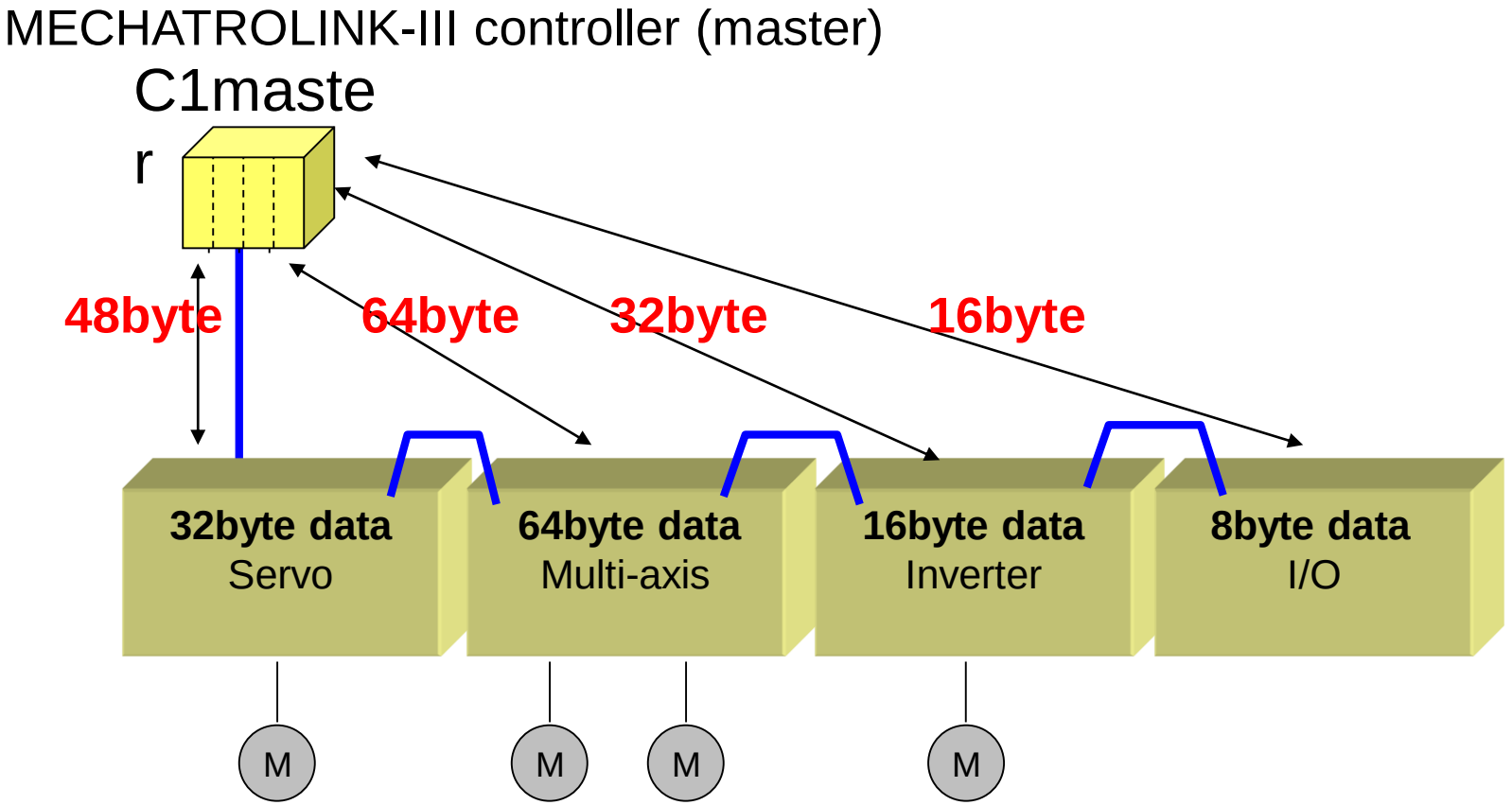


Total 62 slaves maximum.

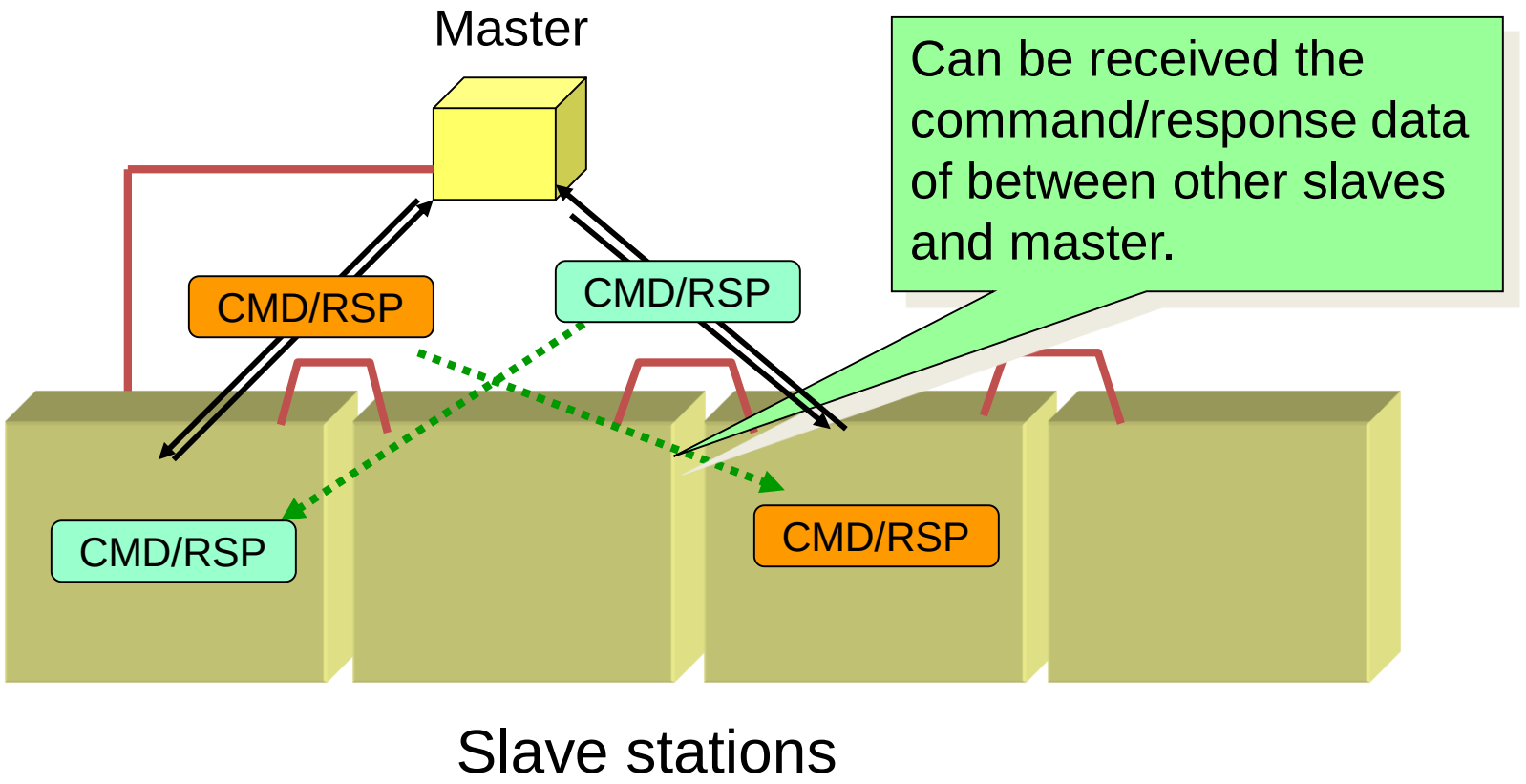
Slaves and C2 master can be connected to the network after cyclic communication started. As a result, it is enable to replace and/or add the slaves while the master controls other slaves.



Different communication data size for each slave node can be mixed. Possible to use the best network corresponding to the system.

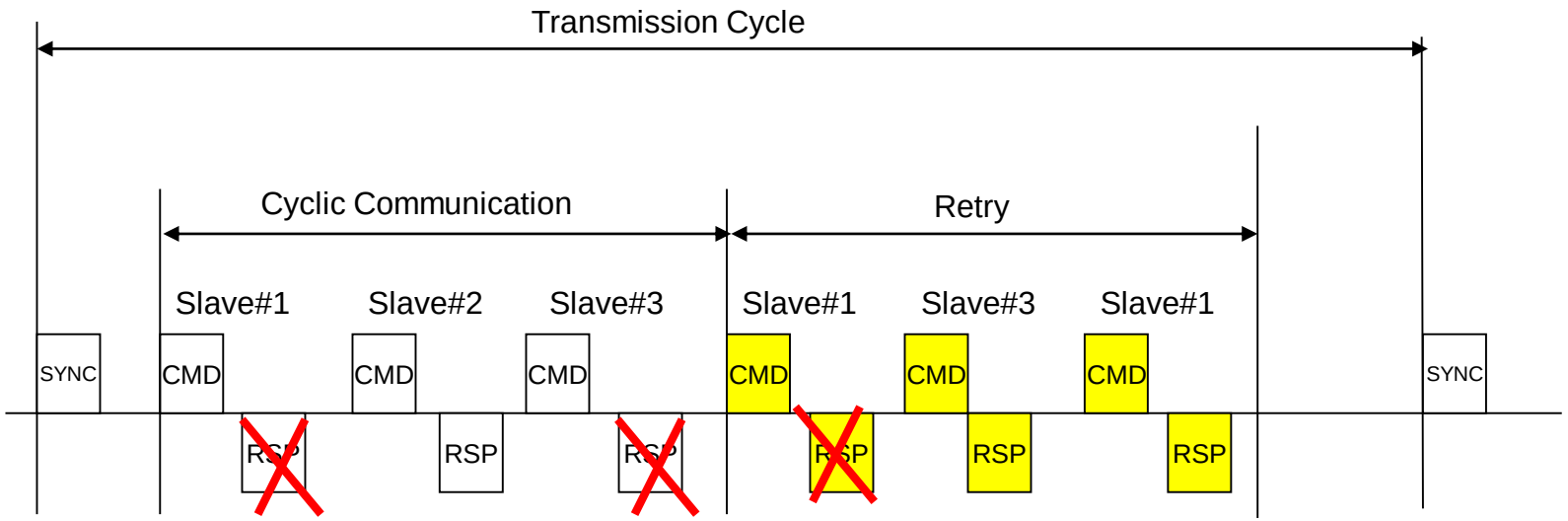


Monitor slave can be received the command/response data of other slave stations and master.



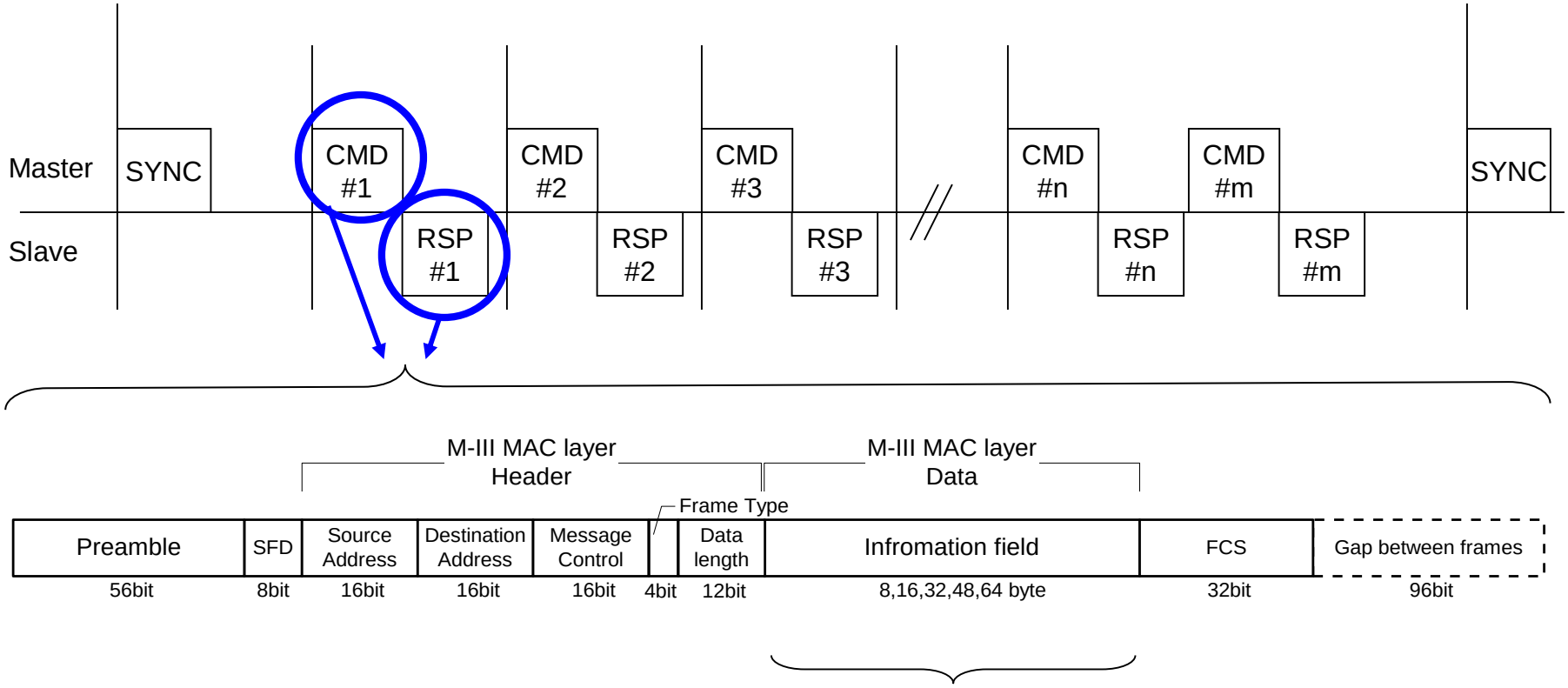
ASIC has a retry function same as MECHATROLINK-II.

- Max. 62 times (can try the retry when retry failed if it is available time to do.)
- ASIC tries the retry communication in same transmission cycle time automatically.



C1 master ASIC tries to send the command as a retry to the slave again if the retry time remains.

Frame format



8 / 16 / 32 / 48 / 64 bytes : Information field

Standard Servo Profile Format

	Byte	Command	Response
Main command	0	CMD	RCMD
	1	WDT	RWDT
	2	CMD_CTRL	CMD_STAT
	3		
	4	CMD_DATA	RSP_DATA
	5		
	6		
	7		
	8		
	:		
	:		
	28		
	29		
	30		
	31		
Sub command	32	SUBCMD	RSUBCMD
	33	SUB_CTRL	SUB_STAT
	34		
	35		
	36	SUB_CMD_DATA	SUB_RSP_DATA
	37		
	38		
	:		
	:		
	45		
	46		
	47		

32 byte mode

Header(4byte) + Data field (28byte)

for Main command

48 byte mode

Header(4byte) + Data field (44byte)

for Main command + Sub command

Profile type

Profiles are subclassified according to the purpose and use. To realize, with MECHATROLINK-III, the high-resolution and long stroke system that the standard servo profile cannot support, for example, add a profile and define the command specifications specific to the function.
The MECHATOLINK Members Association manages the profile types.

Code	Profile	Code		Contents
0x00	MECHATROLINK-II compatible profile	0x00	MECHATROLINK-II compatible profile	The profile that supports the compatibility of the MECHATROLINK-III-compatible devices, enabling them to operate in the MECHATROLINK-II application layer.
0x01		0x01	Acquiring the ID information in event-driven communication	The special profile type used to acquire the ID data, common parameters, and so on by the ID_RD command, the MEM_RD command or other commands in the event-driven communication.
0x02 – 0x0F	Reserve			
0x10 – 0x1F	Servo Profile	0x10	Standard Servo Profile	The profile that the MECHATROLINK-III-compatible servo devices and stepping motor drive devices support.
		:		
		0x1A	Stepping motor drive Profile	
0x20 – 0x2F	Inverter Profile	0x20	Standard Inverter Profile	The profile that the MECHATROLINK-III-compatible inverter devices support.
		:		
0x30 – 0x3F	I/O Profile	0x30	Standard I/O Profile	The profile that the MECHATROLINK-III-compatible I/O devices support.
		:		
0x40 – 0xFF	Reserved			Reserved

* The table above is just an example. Some profiles in the table are not defined at this time.

SV_ON

Byte	Command	Response
0	SV_ON (31H)	SV_ON (31H)
1	WDT	RWDT
2	CMD_CTRL	CMD_STAT
3		
4	SVCMD_CTRL	SVCMD_STAT
5		
6		
7		
8	SVCMD_IO	SVCMD_IO
9		
10		
11		
12	Reserve	CPRM_SEL_MON1
13		
14		
15		
16		CPRM_SEL_MON2
17		
18		
19		
20		MONITOR1
21		
22		
23		
24		MONITOR2
25		
26		
27		
28		MONITOR3
29		
30		
31		

POSING

Byte	Command	Response
0	POSING (35H)	POSING (35H)
1	WDT	RWDT
2	CMD_CTRL	CMD_STAT
3		
4	SVCMD_CTRL	SVCMD_STAT
5		
6		
7		
8	SVCMD_IO	SVCMD_IO
9		
10		
11		
12	TPOS	CPRM_SEL_MON1
13		
14		
15		
16	TSPD	CPRM_SEL_MON2
17		
18		
19		
20	ACCR	MONITOR1
21		
22		
23		
24	DECR	MONITOR2
25		
26		
27		
28	TLIM	MONITOR3
29		
30		
31		

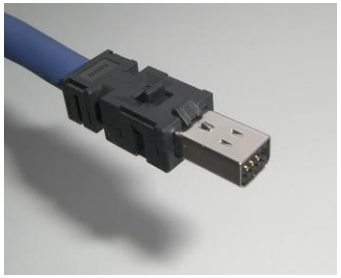
FEED

Byte	Command	Response
0	FEED (36H)	FEED (36H)
1	WDT	RWDT
2	CMD_CTRL	CMD_STAT
3		
4	SVCMD_CTRL	SVCMD_STAT
5		
6		
7		
8	SVCMD_IO	SVCMD_IO
9		
10		
11		
12	Reserve	CPRM_SEL_MON1
13		
14		
15		
16	TSPD	CPRM_SEL_MON2
17		
18		
19		
20	ACCR	MONITOR1
21		
22		
23		
24	DECR	MONITOR2
25		
26		
27		
28	TLIM	MONITOR3
29		
30		
31		

- **MECHATROLINK-III Communication ASIC**
  - Physical layer : 100 base-TX
- **Cable**
  Category 5e / STP (Shielded Twist Pair)
- **Connector**
  RJ-45 or Industrial mini I/O connector

M-III cable


RJ-45


Industrial mini I/O connector

Master/Slave

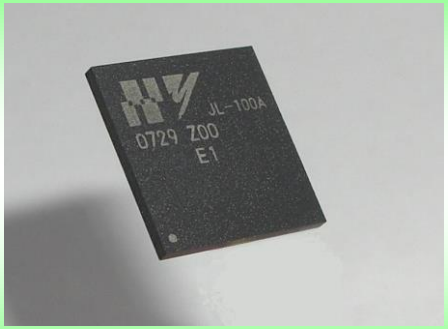
FBGA: JL-100

Size: 12mm × 12mm
Pins: 144 pin
Thermal resistance : 43 C/w
Order No.
76 pieces/304 pieces

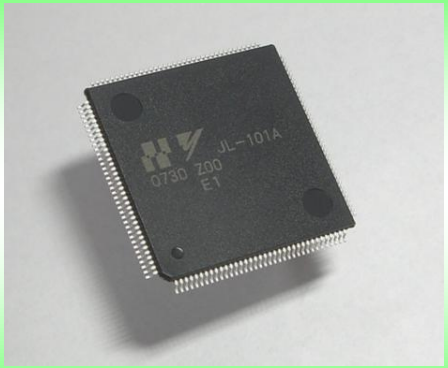
LQFP : JL-101

Size: 20mm × 20mm
Pins: 144 pin
Thermal resistance : 46 C/w
60 pieces/300 pieces

FBGA



LQFP



Slave Only

FBGA: JL-102

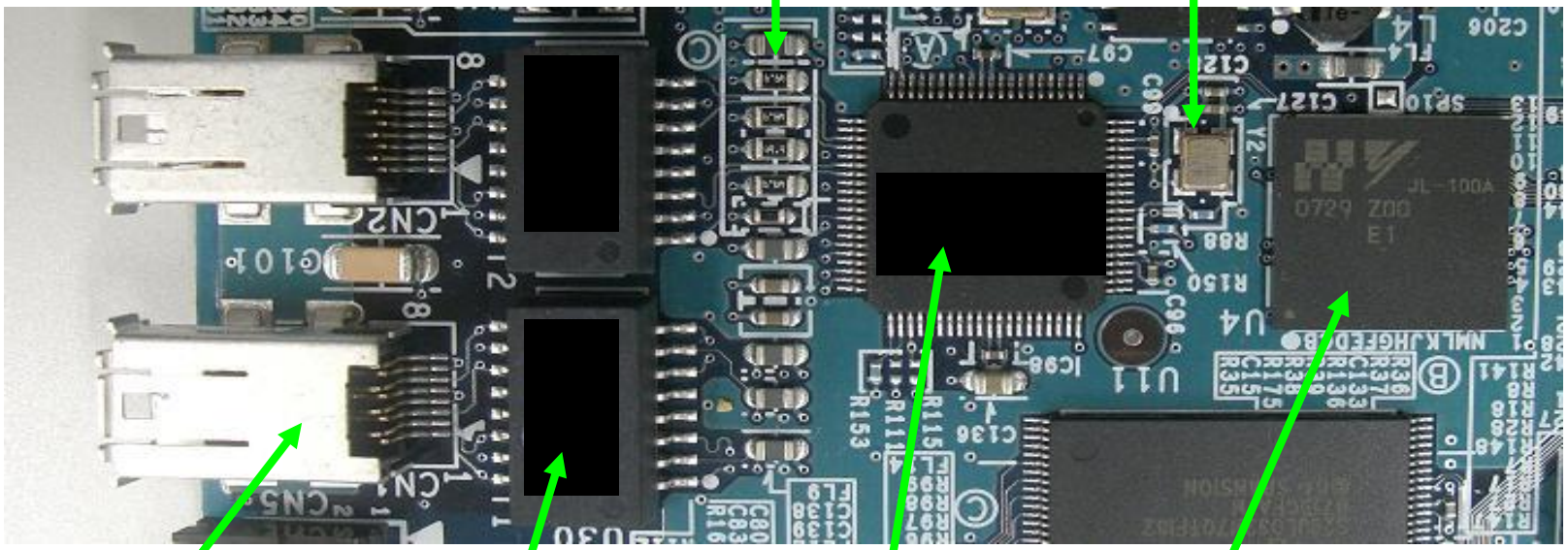
Size: 12mm × 12mm
Pins: 144 pin
Thermal resistance : 43 C/w
Order No.
76 pieces/304 pieces

LQFP : JL-103

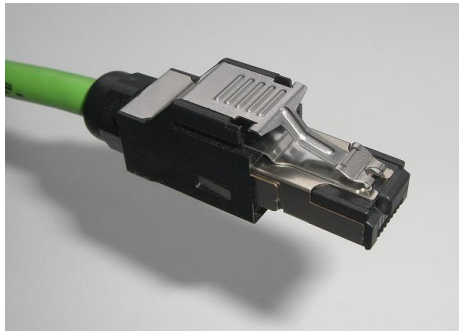
Size: 14mm × 14mm
Pins: 100 pin
Thermal resistance : 46 C/w
90 pieces/450 pieces

<Note>These ASICs have the same functions, but size and thermal resistance are different.

Board figure

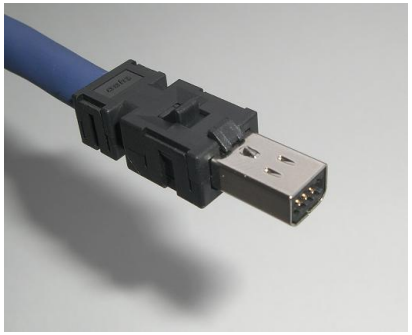


2 types of connector can be use for MECHATROLINK-III.

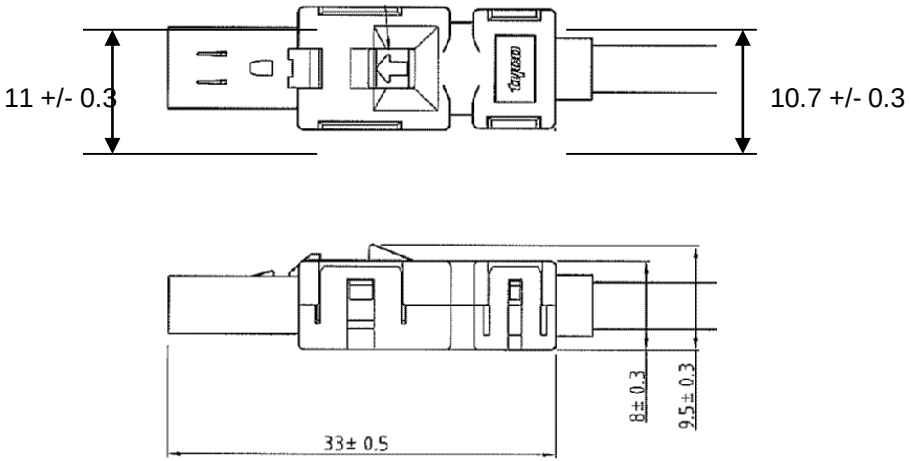


TYCO AMP
FA type RJ-45

Recommended parts No. :
1903526-1

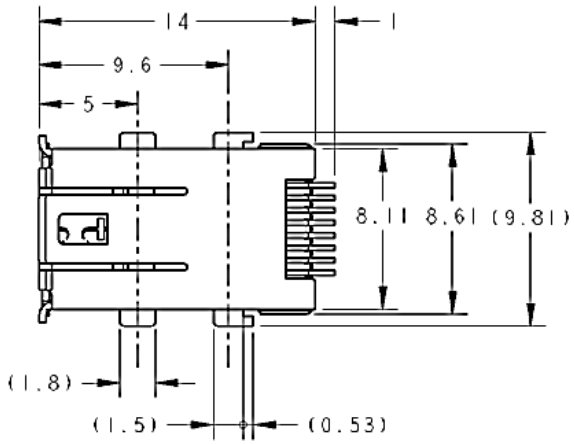


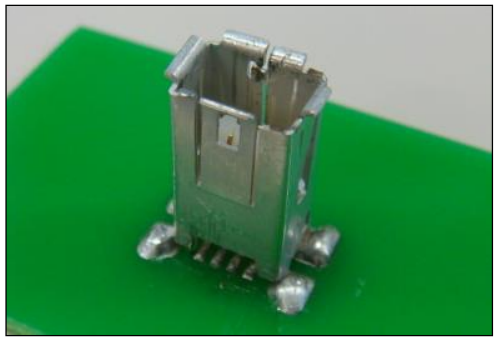
TYCO AMP
IMI connector
Parts No. 2040008-1



Tyco Electronics Japan G.K.
IMI Connector
Angle-Type

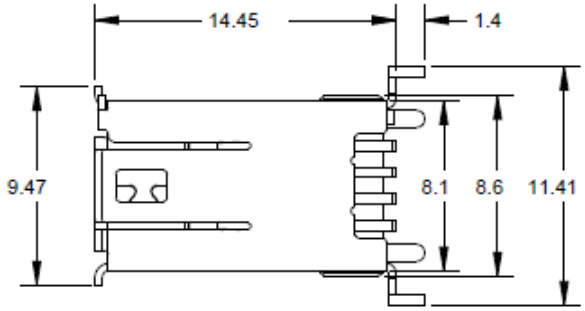
Type : 1981386-1





Tyco Electronics Japan G.K.
IMI Connector
Vertical-Type

Type : 1971885-2



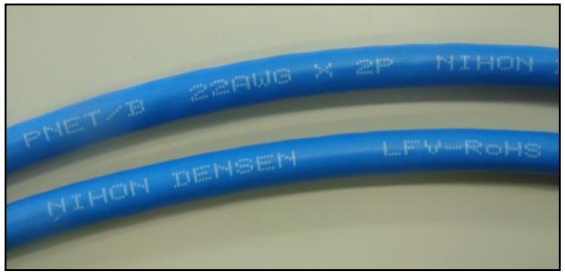
Ethernet cable

Recommended cable(1):

DYDEN CORPORATION

Ethernet cable
Type : RS-MIII(20276)

Item	Specification
Size	AWG22 × 4 Core
Overall diameter (mm)	6.4 (max 6.7)
Characteristic Impedance (Ω)	85～115 (at 1 ～ 100MHz)



Recommended cable(2):

NIHON ELECTRIC WIRE & CABLE CO.,LTD.

Ethernet cable
Type : PNET/B (20276)

Item	Specificatiopn
Size	AWG22 × 4 Core
Overall diameter (mm)	6.5 (TYP)
Characteristic Impedance (Ω)	100±15 (at 1 ～ 100MHz)

Standard Ethernet STP Cat5e cable can be use.

In case of using standard cable from market, make sure the minimum round radius specification of the cable. In case of short cable use such as 20cm.

Also system evaluation is needed in case of using a long distance cable with ferrite core or junction box. Make sure there is no noise effect.

MECHATROLINK-Ⅲ Assembly cable

YASKAWA Control Corporation

Cable Type

- ●Assembly cable without Core: JEPMC-W6012-△△-E
- ●Assembly cable with Core : JEPMC-W6013-△△-E
- ●Assembly cable without Core: JEPMC-W6014-△△-E (one side no connector)

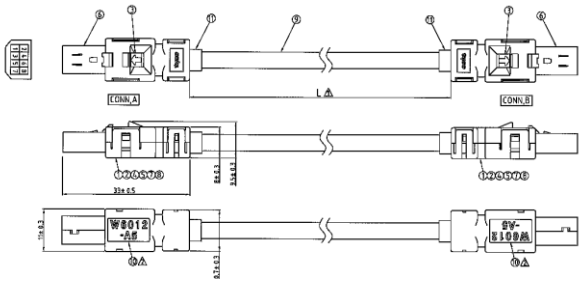
△△ : Cable length 0.2m～75m.

NICHIGOH COMMUNICATION ELECTRIC WIRE CO., LTD.

Cable Type

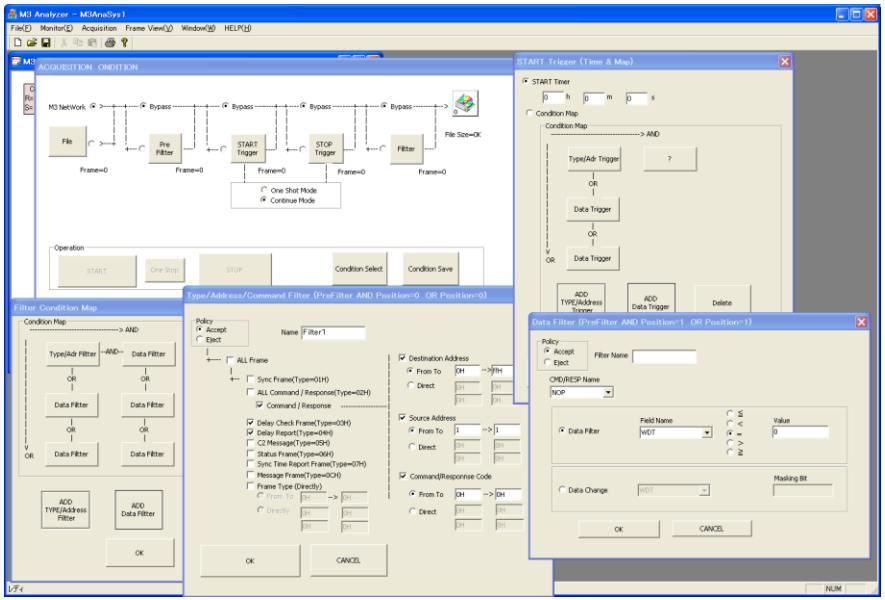
- ●Assembly cable without Core: ML3-C0 □□□

□□□ : Cable length 0.2m～30m.



MECHATROLINK-Ⅲ　Support tools

MECHATROLINK-III Network Analyzer



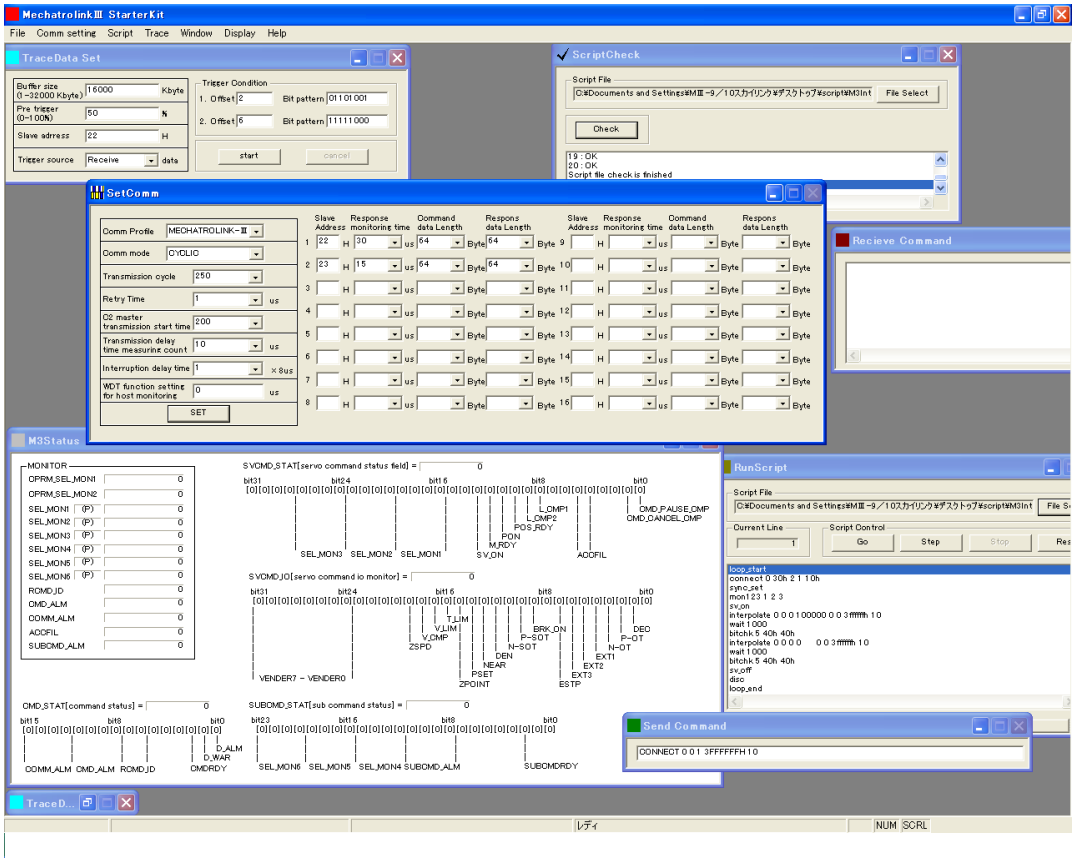
- Two Type of cards are available : PCI card and PCMCIA card
- Features
  - (1) Network monitor function (Online monitor)
  - (2) Data gathering (capture) function
  - (3) Filter function (Pre-trigger, After-trigger function)
  - (4) Trace data display function (Trigger search function, Save to a text file)
- OS : Windows XP

Vendor : Sky Link Corporation

[standard PCI] JAPMC-NT112A-E	• For M-Ⅲ master device • Communication interface card with JL-101 (CPU-less) • OS –RTX6.0.1 or greater –Windows2000/XP/Vista/7(32bit) –INtime3.13	

Vendor : Yaskawa Electric Corporation

MECHATROLINK-III starterkit is for slave device developer. StarterKit is able to send any commands to the MECHATROLINK-III slaves.



Vendor : SKY LINK Corporation

Sample kit for developing prototype

Sample kit includes 5 sets of main parts for prototyping MECHATROLINK-III device (master/slave).

JL-100 sample kit

Product code : JAPMC-OPM3SK-1
Vendor : YASKAWA Control Corporation
Parts list in the sample kit
- JL-100A(ASIC, qty.5)
- H1102(transformer, qty. 10)
- DP83849IVS(PHY 2ch type, qty.5)
- 1981836-1(connector, qty.10)
- BLM21BB201SN1D (Filter, qty.40)

JL-101 sample kit

Product code : JAPMC-OPM3SK-2-E

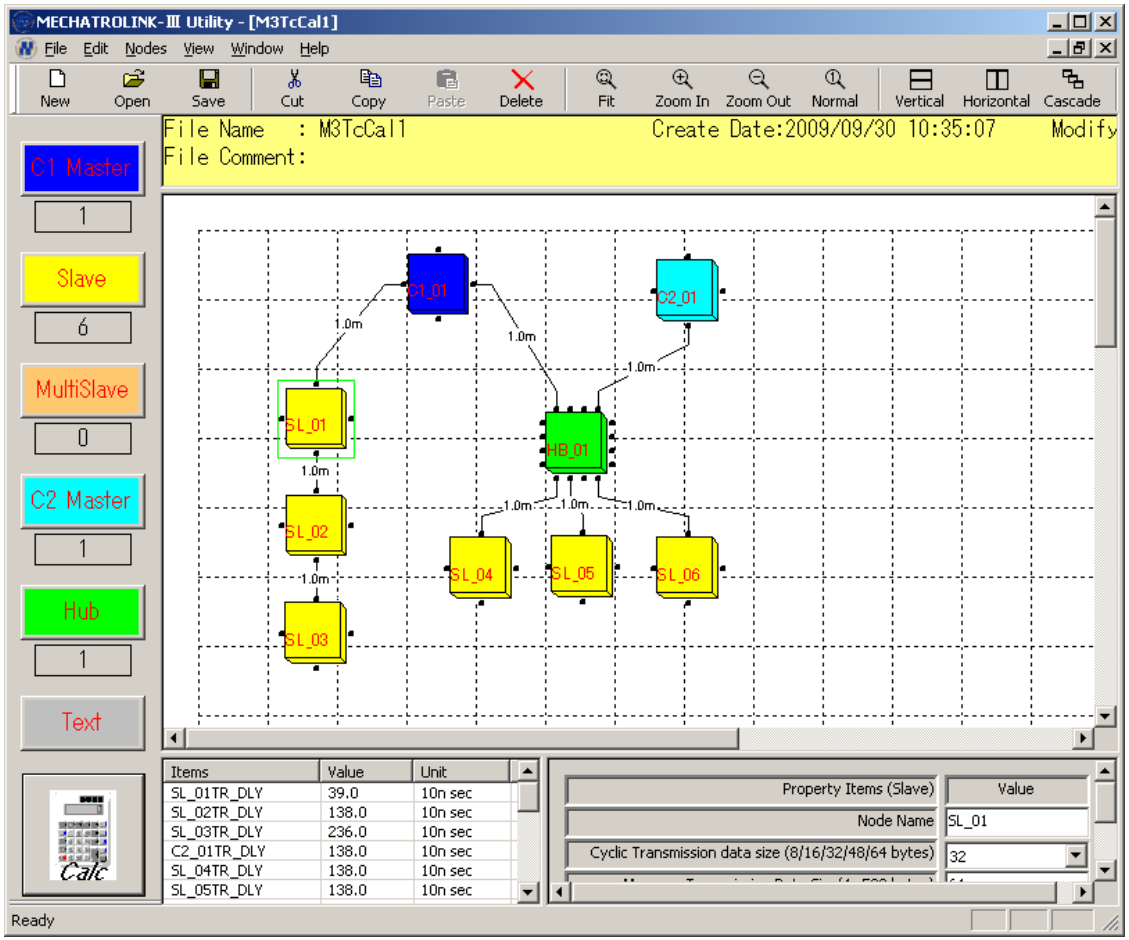
JL-102 sample kit

Product code : :JAPMC-OPM3SK-3-E

JL-103 sample kit

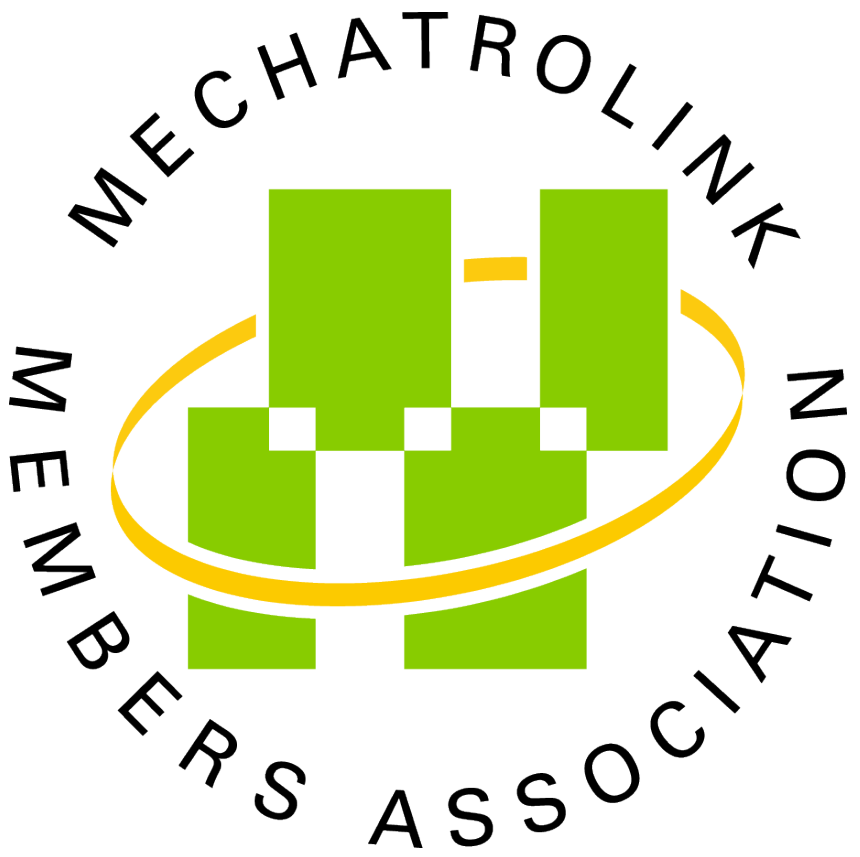
Product code : :JAPMC-OPM3SK-4-E

Vendor : YASKAWA CONTROLS CO., LTD.



System configuration is defined by putting the icons(C1/C2 master, slave, Hub) and connecting them with lines in the canvas and setting the parameters such as communication data size, cable length, retry times, and so on.

This software calculates the minimum transmission cycle time in that system.


MECHATROLINK
MEMBERS ASSOCIATION