

2020.Jun.



English version

CLPA Guide Book Overview of the CC-Link Partner Association (CLPA)



CC-Link IETSN
Open the Future of Connected Industries



The CC-Link Partner Association (CLPA) is a world leader in developing a truly open industrial network that accelerates the construction of smart factories.

CC-Link Family- the first field network from Japan and Asia.

CLPA has acquired ISO and IEC international standards for its open network family and grown into a global standard in manufacturing.

In order to accelerate the construction of smart factories utilizing IIoT, CLPA has launched the world's first open industrial network "CC-Link IE TSN" using TSN (Time-Sensitive Networking), an expansion of standard Ethernet.

In response to the growing market demand for a wide range of devices in manufacturing sites, high-performance drive equipment, and protocol implementations for various types of equipment and applications, CLPA will provide a variety of development methods and develop truly open industrial networks on a global scale.



Message

Information and communication technology has fundamentally changed our daily lives and industrial activities. Various activities, which used to be performed by human-to-human communication or document sharing, are now performed by digitalized methods and in an automated/autonomous manner. The production process now integrates many different lifecycle tasks. These include direct physical production activities, business processes, supply chains, after sales service and take back/recycling. Key to this integration is information and communication technologies. By flexibly combining complementary activity in related enterprises, new industrial sectors are emerging. With key words such as "Smart manufacturing" or "Cyber-physical production systems", many projects from new industrial revolutions are being promoted in industrially advanced countries. Developing countries are also rapidly catching up on such trends.

One of the important factors for the drastic changes in production is the spread of information and communication infrastructure. This consists of industrial information networks connected to enterprise information networks. Hence the integration and utilization of comprehensive data about production assets is made possible. These assets may include equipment, materials, parts, products, manufacturing technology and environment. Such industrial information networks of production assets become indispensable infrastructure for advanced manufacturing.

To realize such an industrial information network in practical and meaningful scale and cost, it must be an open and standardized network which can be shared and utilized across the boundary of individual enterprises. Versatile functional requirements with respect to communication speed, data volume, network control methods and network complexity, etc. are also desirable. Finally, continuing development works should be performed to seek higher functionalities.

The CLPA has addressed these requirements for an open and standardized industrial network. This was begun with the CC-Link open fieldbus. Ethernet-based CC-Link IE followed, and high-performance CC-Link IE TSN was recently introduced. The CLPA will continue to respond to the ever expanding demands for advanced industrial networks. In this way, the CC-Link Family of open networks will contribute to the development of future advanced manufacturing systems.



The Chairman of CLPA
Fumihiko Kimura
Faculty of Science and Engineering,
Department of Mechanical Engineering
Professor emeritus of Tokyo University,
Doctor of Engineering

CLPA, the organization promoting open networks as well as your business partner.

Support vendors and users in the global promotional activities of the CC-Link Family.

Under the motto "CC-Link, the open field network, will become world's de facto standard", CLPA was established in November 2000. Ever since, the Board of Directors, Marketing Task Force and Technical Task Force have joined forces to help vendors to develop compatible products and users to build open FA systems.

◎ The Board of Directors consisting of nine firms operates the CLPA and decides on major association issues.

◎ Increase partner membership and adoption of the CC-Link Family.

Marketing Task Force

Oversees a wide variety of promotional activities world wide, including fairs, conferences, seminars, advertising programs, social media and other activities.

◎ Focuses on management of related technology and coordinates provision of information to members and outside standard-setting organizations.

Technical Task Force

Develops new specifications for the CC-Link Family, including "CC-Link IE TSN", the first open industrial Ethernet to support TSN technology. Also develops technical materials such as installation manuals as well as conformance test specifications and addresses various technical issues.

Get the membership of CLPA.

The partners can develop business opportunities by receiving services such as support for developing compatible products.

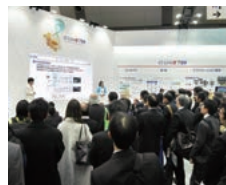
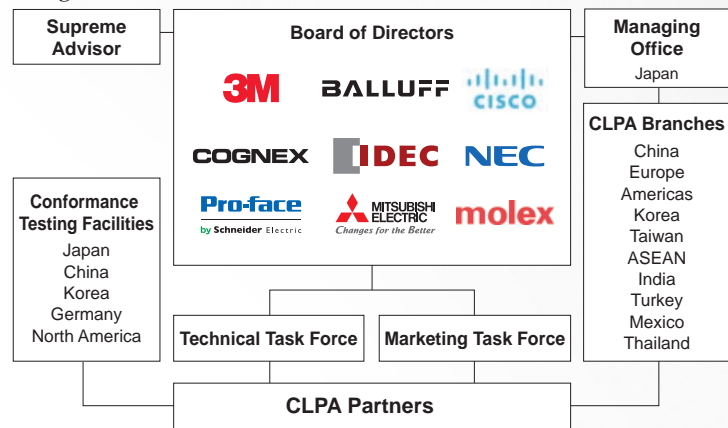
The member firms are entitled to obtain the most up-to-date technical information and CC-Link Family specifications for free. In addition, support for conformance tests that are essential to establishing reliability is available at various stages of developing compatible products.

Free distribution of CC-Link Family specifications

Conducting conformance tests

Technical support

■ Organization Chart for the CC-Link Partner Association



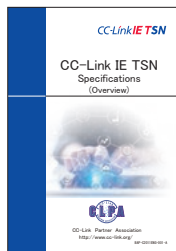
Exhibitions



Seminars



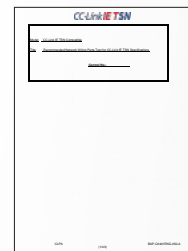
Distributing information



CC-Link IE TSN Specifications



CC-Link Cable Installation Guide



Conformance test specifications

■ CLPA membership categories (price excluding tax)

		Registered member	Regular member	Executive member	Board member
Annual fees () shows monthly fees for intermediate enrollment		—	JPY 100,000 (JPY 9,000)	JPY 200,000 (JPY 18,000)	JPY 1,000,000 (JPY 84,000)
Initiation fee		—	—	—	JPY 1,000,000
Acquisition of product specifications		Provided for free upon membership registration			
License to use CC-Link Family technology		Included			
SLMP** CC-Link Family Specifications (Other than SLMP)		—	Included		
Conformance test fee (per device)	CC-Link IE TSN	—	JPY 100,000*3	JPY 50,000*3	Included in the annual membership fee *Contact your local CLPA office.
	Master, local and intelligent device stations for CC-Link and normal stations of CC-Link IE Control Master and local stations, intelligent device stations, remote device stations of CC-Link IE Field CC-Link IE Safety IESMAP(master) IESSLP(slave)	—	JPY 300,000	JPY 200,000	
	CC-Link remote device and I/O stations, cables and miscellaneous products CC-Link/LT master and slave stations, cables and miscellaneous products	—	JPY 200,000	JPY 100,000	
	CC-Link IE Field Basic*2	—	—	—	
	SLMP** connectable products	—	—	—	
	Recommended network wiring parts for CC-Link IE TSN CC-Link IE Control and CC-Link IE Field	—	JPY 100,000	JPY 50,000	
Use of CC-Link Family logo		—	Included		
Technical support		—	Included		
Publishing products in home page-CLPA Partner Product Search Tool (No charge)		—	Included		
Promotion at fairs		—	Included		
Information about events Posting of company name on CLPA web site		Included			

¹⁾ SLMP: Seamless Message Protocol

²⁾ Download the test tools and conduct a self-test.

³⁾ If you submit the result of a test conducted on behalf of the CC-Link Partner Association at a testing organization recognized by the CC-Link Partner Association, the cost will be as follows.
· Regular : 50,000 yen · Executive: 20,000 yen

Leveraging the forces of partner firms around the world, the CC-Link Family will take another giant step forward.

CC-Link Family...making the next leap forward with CLPA Partners!



3M Company	DAINCUBE Corp.	igus k.k.
3M Korea Ltd.	Datalogic Automation s.r.l.	IHI Corporation
A&D Co., Ltd.	DENSO WAVE INCORPORATED	Industrial Control Communications, Inc
ABB AS, ROBOTICS	Diatrend Corporation	Industrial Software Co.
ABB K.K.	Dyadic Systems Co.,Ltd.	INFOHOBBY.LTD
AC&T System CO.,LTD	DYDEN CORPORATION	International Laboratory Corporation
Adullam Tech.	EAST WEST ELECTRIC WIRE CO.,LTD.	ITOH DENKI CO., LTD.
Advanet Inc.	ELCO (TIANJIN) ELECTRONICS CO., LTD.	JANOME SEWING MACHINE CO., LTD.
Advantech Japan Co., Ltd.	Emerson Industrial Automation - ASCO	Japan Quality Assurance Organization (JQA)
Ailes Electronic Industry CO., LTD	ENDO KOGYO Co.,Ltd.	Japan Telegartner Ltd.
Allied Automation,Inc.	ESPEC TEST SYSTEM CORP.	JEL SYSTEM CO., LTD
Allied Telesis K.K.	ESTIC CORPORATION	JFE Plant Engineering Co., Ltd.
ALPHA SYSTEMS CO.,LTD	FAG Industrial Service GmbH	JISANG ELECTRIC CO., LTD.
Altima Corp.	FANUC LTD	JMACS Japan Co., Ltd.
Analog Devices	FASTECH Co., Ltd.	JTEKT CORPORATION
ANYWIRE CORPORATION	Festo AG & Co. KG	JVCKENWOOD Public & Industrial Systems Corporation
Asahi Enterprise Corporation	Fluidyne Control Systems (P) Ltd.	Kanematsu Communications LTD.
Asahi Glass Co., Ltd.	Fortinet Japan K.K.	Kawasaki Heavy Industries, LTD.
ASKA CORPORATION	Fortive ICG Japan Co., Ltd.	KEYENCE Corporation
ATEQ K.K.	FUJII CONTROLS COMPANY LIMITED	Kistler Lorch GmbH
Atlas Copco Industrial Technique AB	FUJII ELECTRIC CABLE CO.,LTD.	KITAZAWA ELECTRIC WORKS CO., LTD.
Azbil Corporation	Fuji Electric Co., Ltd	KK TFF Fluke Networks
B&PLUS KK	Fuji Electric F-Tech Co., Ltd.	KOGANEI CORPORATION
Balluff GmbH	Fujikin Incorporated	Korea Electronics Technology Institute
Beckhoff Industrie Elektronik	Fukushima SiC Applied Engineering Inc.	KOYOELECTRONICS INDUSTRIES CO.,LTD.
Beijing D&S FieldBus Technology Co., Ltd.	GIKEN INDUSTRIAL CO., LTD.	Kubota Corporation
Belden Electronics Division	HAKARU PLUS CORPORATION	KURAMO ELECTRIC CO., LTD
Belden Hirschmann Industries (Suzhou) Ltd.	Hakko Electronics Co., Ltd	KWANG-IL ELECTRIC WIRE CO., LTD.
Berk-Tek LLC	Hangzhou Hikrobot Technology Co.,Ltd.	KYOEI ELECTRIC CO.,LTD
Bihl+Wiedemann GmbH	Hans Turck GmbH & Co. KG	KYOWA ELECTRONIC INSTRUMENTS CO., LTD.
Binder USA, LP	Harmonic Drive Systems, Inc	L Light
BROTHER INDUSTRIES LTD	HARTING JAPAN	LAUMAS ELETTRONICA SRL
Buerkert Werke GmbH & Co. KG	Helmut Fischer GmbH Institut fuer Elektronik und Messtechnik	LEONI Cable (China) Co., Ltd.
C.D.N CORPORATION	HELUKABEL GmbH	Leoni Special Cables Friesoythe GmbH & Co.KG
CANON ANELVA CORPORATION	HERUTU ELECTRONICS CORPORATION	Long Yang Enterprise Co., Ltd.
CHINO CORPORATION	HIGEN MOTOR CO., LTD	LS Cable&system Ltd.
Chiyoda Co., Ltd	Hilscher GmbH	Lutze Inc.
CHUBU NIHON MARUKO CO., LTD.	Hirata Corporation	M-System Co., Ltd.
CHUO SEISAKUSHO, LTD.	Hirschmann Automation and Control KK.	Magnescale Co., Ltd.
Cisco Systems	Hitachi Industrial Equipment Systems Co., Ltd.	MARS TOHKEN SOLUTION CO. LTD.
CITIZEN FINE DEVICE CO., LTD.	Hitachi Metals, Ltd.	Matrox Electronic Systems Ltd.
CKD Corporation	Hivertec,inc.	Matsusada Precision Inc.
CKD NIKKI DENSO CO., LTD.	HMS INDUSTRIAL NETWORKS	MEIDENSHA CORPORATION
Cobtel Precision Electronics Co., Ltd.	HMS Industrial Networks AB	MELEC Inc.
Cognex Corporation	HOKUYO AUTOMATIC CO., LTD.	METIS CO., LTD.
Conductix Wampfler	HORIBA STEC Co., Ltd.	METTLER TOLEDO
CONTEC CO.,LTD	Hottinger Baldwin Messtechnik GmbH	METTLER TOLEDO AG
CORRENS CORPORATION	HYUNDAI HEAVY INDUSTRIES CO., LTD	MICRO-LOG SYSTEMS
COWIN.FA Co.,Ltd	I Motion Plus Co., Ltd.	Minebea Intec GmbH
CREVIS CO., LTD	IAI Corporation	Minebea Mitsumi Inc.
DAI-ICHI DENTSU, LTD.	IAR Systems AB	MISUMI CORPORATION
DAIICHI ELECTRONICS CO., LTD	IDEC Corporation	MITSUBISHI ELECTRIC CORPORATION

MITSUBISHI ELECTRIC ENGINEERING COMPANY LIMITED
 Mitsubishi Electric FA Industrial Products Corporation
 Mitsubishi Electric Information Network Corporation
 MITSUBISHI ELECTRIC MECHATRONICS SOFTWARE CORPORATION
 MITSUBISHI ELECTRIC MICRO-COMPUTER APPLICATION SOFTWARE COMPANY LIMITED
 MITSUBISHI ELECTRIC SYSTEM & SERVICE CO., LTD.
 Mitsubishi Electric TOKKI Systems Corporation
 Mitsubishi Electric Turkey Elektrik Urunleri A.S.
 Molex Inc.
 MOXA Inc.
 MTT Corporation
 MYUNGBO CABLE CO.,LTD.
 NADA ELECTRONICS, LTD
 NADEX Co., Ltd.
 Nanjing DECOWELL Automation CO. Ltd.
 Nanjing Solidot Electronic Technology Co., Ltd.
 NEC Corporation
 Net One Systems Co., Ltd.
 NICHIDEN SHOKO CO.,LTD.
 Nichigoh communication electric wire co., Ltd.
 NINGBO RONGHE WIRE & CABLE CO.,LTD.
 Nippon Dempa Co., Ltd
 NIPPON DENKI KENKYUSHO CO., LTD.
 Nippon Seisen Cable, Ltd.
 NITTA CORPORATION
 NKE CORPORATION
 Northwire,Inc.
 NSD Corporation
 NSK Ltd.
 NTT Communications Corporation
 O-DEAR INTERNATIONAL CORPORATION
 OFS Fitel LLC
 Okano Electric Wire Co.,Ltd.
 Oki Electric Cable Co., Ltd.
 OMRON Corporation
 ONTEC CO.,LTD.
 OPTEX FA CO.,LTD.
 orientalmotor
 ORing Industrial Networking Corp.
 ORION ELECTRONICS
 Palo Alto Networks k.k
 panasonic Industrial Device SUNX Co
 Panasonic Life Solutions Networks Co., Ltd.
 Panduit, Corp.
 Parker Hannifin
 Pepperl + Fuchs GmbH
 PEPPERL+FUCHS K.K.
 Phoenix Contact GmbH & Co. KG
 Phoenix Contact K.K
 Pilz GmbH &Co
 Pneumax S.P.A.
 PROFICIENT (SHANGHAI) INTERNATIONAL CO.,LTD

Red Lion Controls
 REJ Co., Ltd
 Renesas Electronics Corporation
 RKC INSTRUMENT INC.
 Robostar Co., Ltd
 ROBOTEC Inc.
 SAMWON ACT CO.,LTD.
 SANSHA ELECTRIC MFG. CO.,LTD.
 SANTEST CO., LTD
 Sanwa Engineering Corp
 Sanyo Machine Works. Ltd.
 Sasaki Sekkei Co., Ltd.
 Schneider Electric Japan Holdings Ltd.
 Seidensha Electronics co., ltd.
 SEIKO EPSON CORPORATION
 Sekisui Jushi Cap-Ai System Co.,Ltd.
 Servoland Corporation
 Shanghai Ashiya Trading LTD.
 Shanghai Automation Instrumentation Co., Ltd
 Shanghai Golytec Automation CO.,LTD.
 Shanghai Powerful Automation Technology Development Co., Ltd
 Shanghai SUNCHU Electromechanical Device Co., Ltd.
 Shanghai Suntone Electronic Co., Ltd.
 Sharp Corporation
 SHIMADEN CO., LTD.
 SHINKO TECHNOS CO.,LTD
 SHOEI Electric Co., Ltd.
 SHOSHIN CORPORATION
 Sichuan Odot Automation System Co., Ltd.
 SICK AG
 SILA Embedded Solutions GmbH
 SINKA JAPAN CO.,LTD.
 SINSEONG IDOL
 SMC CORPORATION
 SN-TECH
 Solartron Metrology Ltd
 Spinner GmbH
 SR Technology CO.,Ltd.
 STMicronics K.K.
 Sumitomo Heavy Industries,Ltd.
 SUNHO AUTOMATION
 Surpass Industry Co., Ltd.
 Suzhou Jia Zhan Science and Technology CO., Ltd.
 SWCC SHOWA CABLE SYSTEMS CO., LTD.
 TACHIBANA ELETECH CO., LTD.
 TAIHAN ELECTRIC WIRE CO., LTD.
 TAIYO CABLE (DONGGUAN) CO., LTD.
 TAIYO CABLETEC CORPORATION
 TAIYO ELECTRIC CO.,LTD.
 TAIYO,LTD.
 TAKEBISHI CORPORATION
 Takikawa Engineering Co., Ltd.

TAMADIC Co., Ltd.
 TAMAGAWA SEIKI CO., LTD.
 TATSUTA ELECTRIC WIRE & CABLE CO.,LTD.
 TEAC Corporation
 Technical & Try CO., LTD
 TESSERA TECHNOLOGY INC.
 THK CO.,LTD.
 Thomas Cable Co., Ltd.
 Tianjin Geneuo Technology Co., Ltd.
 Tianjin Sentinel Electronics Co., Ltd.
 TOGAMI ELECTRIC MFG. CO., LTD
 Toho Technology Corporation
 TOSHIBA MACHINE CO., LTD.
 Toshiba Schneider Inverter Corporation
 TOYO ELECTRIC CORPORATION
 TOYO ELECTRIC MFG. CO.,LTD.
 TOYOGIKEN CO., LTD.
 TPC Mechatronics Corp.
 Tyco Electronics Japan G.K.
 U.I. Lapp GmbH
 UNION DENSHI WORKS CO., LTD.
 Unipulse Corporation
 UNITEC Corp.
 UNITED ELECTRIC WIRE (KUNSHAN) CO., LTD.
 Valcom Co.,LTD.
 VAT Vakuumventile AG
 Wago Company of Japan, Ltd.
 Weidmueller Interface GmbH & Co. KG
 WITTENSTEIN ternary Co.,Ltd.
 YAMAHA MOTOR CO., LTD.
 YAMATO SCALE CO., LTD.
 YASKAWA ELECTRIC CORPORATION
 Yokogawa Electric Corporation
 YOSHINOAWA ELECTRICWIRE&CABLE
 YOSIO ELECTRONIC COMPANY
 Zhejiang Wanma Group Special Electronic Cable Co., Ltd.
 Zhejiang Zhaolong Interconnect Technology Co., Ltd.

Alphabetical listing by company name for
 Regular Members and above (as of May 29th, 2020)

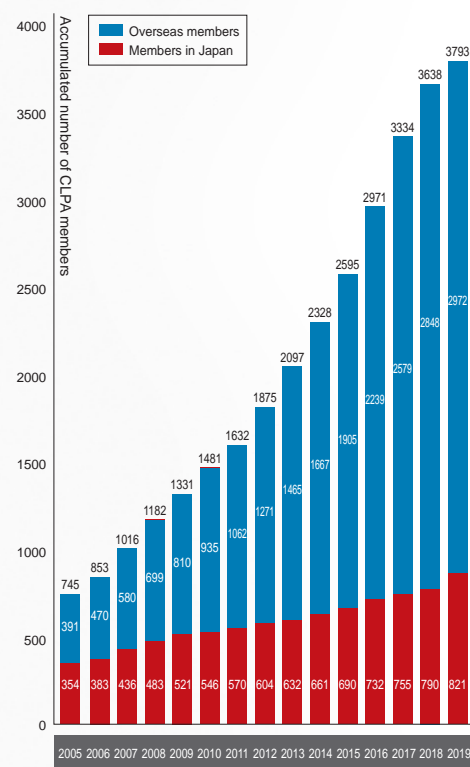
The CLPA's commitment to advancing the CC-Link Family betters manufacturing sites around the world.

These figures are self-explanatory about the development and growth on the global level.

Many member firms come crossing the borders to join the CC-Link Partner Association.

Though starting with only 134 member firms when CLPA was established, it is expected to reach more than 3793 member firms in financial year 2019 (as of the end of March 2019). The overseas firms account for as much as 80 % of the memberships, providing solid evidence that the world has recognized that the CC-Link Family have become true global standards.

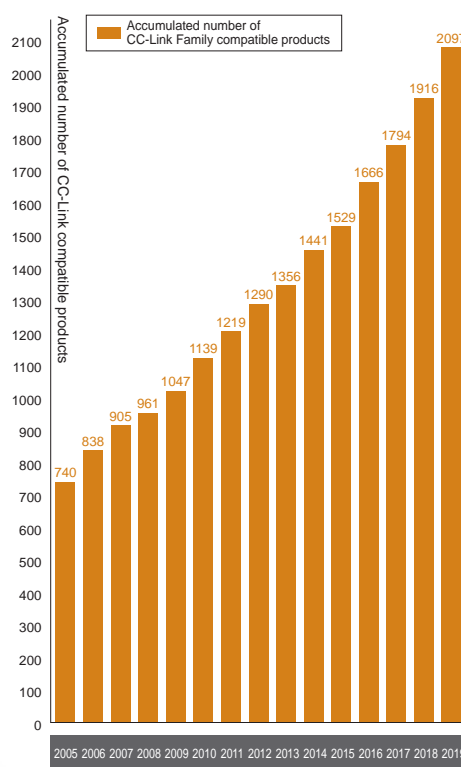
◎Growing CLPA members



A line of diversified CC-Link Family compatible products, as many as the number of user voices.

With the increasing number of vendor firms joining the CC-Link Partner Association, the accumulated number of CC-Link Family compatible products is now over 2000 models. Partner companies also receive the benefit of their products being promoted in various CC-Link Partner Association activities free of charge, including the CLPA Partner Product Search Tool.

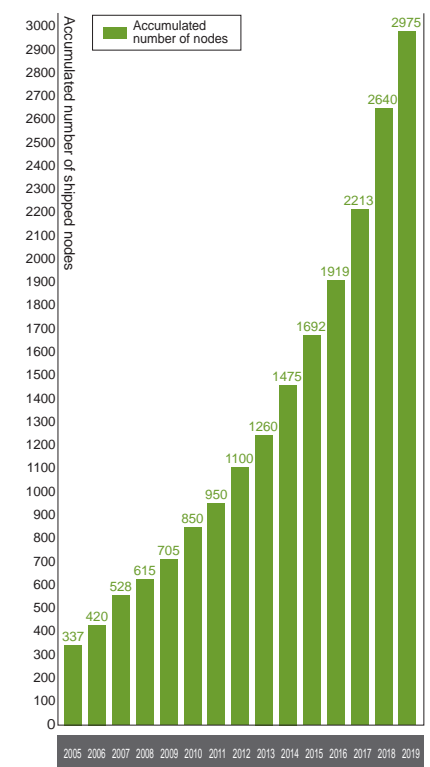
◎Increase in number of CC-Link compatible products



As a sign of our global acceptance, the total number of shipped devices is approx. 30 million.

The growth of the installed base is being driven by the automotive, semiconductor and LCD panel industries. We expect that this growth will continue to accelerate.

◎Increase in number of shipped nodes (Unit: 10000 nodes)



CC-Link, CC-Link Safety and CC-Link IE, ...

The global acceptance of the first open industrial network from Japan continues.

As a key feature of our promotion and the best opportunities to exchange information with more vendors and users, CLPA participates in exhibitions in Japan and overseas. We will continue to actively participate in more trade shows and exhibitions of diversified industries to promote technical understanding of the future of manufacturing, CC-Link IE TSN.



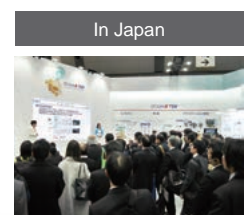
Smart Manufacturing Forum 2019 (Guangzhou)



Smart Factory + Automation World 2019



SPS2019



IIFES2019

CLPA is a global operation with local offices in 11 regions worldwide. Each office works to increase the adoption of CLPA networks by device makers, machine builders and end-users operating in these regions.

CLPA's 11 global offices are located in Japan, China, Europe, North America, Korea, Taiwan, ASEAN, India, Turkey, Mexico and Thailand. These offices promote CC-Link Family technology and provide a wide range of services for CLPA members.



① Headquarters (Japan)

6F Ozone-front Building, 3-15-58, Ozone, Kita-ku, Nagoya 462-0825, Japan
TEL : +81-52-919-1588 FAX : +81-52-916-8655
E-mail : info@cc-link.org
URL : <https://www.cc-link.org/>

② China

Headquarters (Tongji University): School of Electronics and Information Engineering, Jiading Campus, Tongji University, Shanghai, P.R.China
Head Office : 19F No.1386 Hong Qiao Road, Shanghai, P.R.China
TEL : +86-21-64940523 FAX : +86-21-64940525
E-mail : support@cn.cc-link.org
URL : <https://www.cc-linkchina.org.cn/>

③ Europe

Postfach 10 12 17, 40832 Ratingen, Germany
TEL : +49-2102-486-7988 FAX : +49-2102-532-9740
E-mail : partners@eu.cc-link.org
URL : <https://eu.cc-link.org/en/>

④ North America

500 Corporate Woods Parkway, Vernon Hills, IL60061, USA
TEL : +1-847-478-2647 FAX : +1-847-876-6611
E-mail : info@cclinkamerica.org
URL : <http://am.cc-link.org/en/>

⑤ Korea

RM. 711, 7F GANGSEO HANGANG XI-TOWER A, 401 Yangcheon-ro, Gangseo-gu, Seoul 07528 Korea
TEL : +82-2-3663-6178 FAX : +82-2-6224-0158
E-mail : clpakor@meak.co.kr
URL : <http://kr.cc-link.org/ko/>

⑥ Taiwan

No.105, Wugong 3rd Rd., Wugu Dist., New Taipei City 24889, Taiwan (R.O.C.)
TEL : +886-2-8990-1573 FAX : +886-2-8990-1572
E-mail : cclink01@ms63.hinet.net
URL : <https://tw.cc-link.org/zh/>

⑦ ASEAN

307 Alexandra Road #05-01/02 Mitsubishi Electric Building Singapore 159943
TEL : +656-470-2480 FAX : +656-476-7439
E-mail : cclink@asia.meap.com
URL : <http://as.cc-link.org/en/>

⑧ India

Emerald House, EL-3, J Block, M.I.D.C. Bhosari, Pune - 411 026, Maharashtra, INDIA
TEL : +91-20-4624 2100 FAX : +91-20-4624 2200
E-mail : Clpa_India@asia.meap.com
URL : <https://in.cc-link.org/en/>

⑨ Turkey

Serifali Mahallesi Nutuk Sokak.No:5 34775Umraniye-istanbul /Turkey
TEL : +90-216-526-39-90 FAX : +90-216-526-39-95
E-mail : partners@tr.cc-link.org
URL : <https://eu.cc-link.org/en/>

⑩ Mexico

Mariano Escobedo 69, Zona Industrial - Tlalnepantla, 54030, Estado de Mexico, Mexico
TEL : +52-55-3067-7517
E-mail : info@cclinkamerica.org
URL : <http://am.cc-link.org/sp/>

⑪ Thailand

CC-Link Promotion Center - Thailand
101, True Digital Park Office, 5th Floor, Sukhumvit Road, Bangkok, Phra Khanong, Bangkok 10260
TEL : +66(2) 092-8600 Ext. 5506
Fax : +66(2) 043-1231-33
E-mail : info@cclinkthailand.com
URL : <http://th.cc-link.org/th/>

High-level Technology and Ease-of-Use

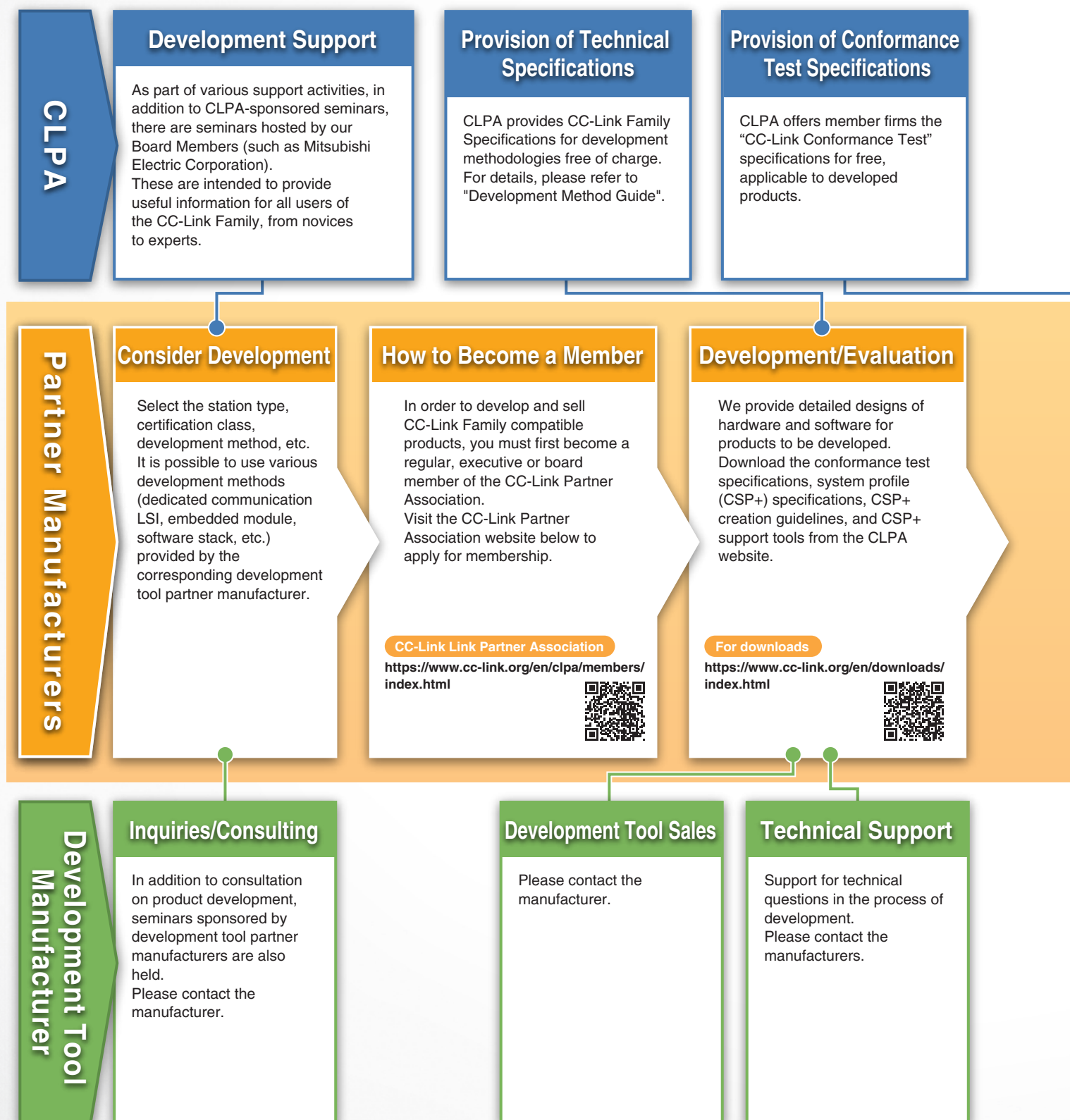
The CC-Link Family has been certified to conform to international standards, IEC Standards and SEMI Standards for the semiconductor and FPD industries, in addition to Japanese Industrial Standards, Chinese National Standards, ISO Standards, Korean National Standards and Taiwanese Standards. An established de facto standard in Japan, now it is now also recognized as a global standard. It meets the conventional requirements for open networks, communication compatibility and a diverse lineup of compatible products. In addition, it can drastically improve the production efficiency of manufacturing systems and applications. Its high technological level and ease of use are internationally appreciated.

From a Japanese defacto standard to a Global Standard

International Standard: ISO	ISO15745-5 : CC-Link published in January 2007
International Standard: IEC	IEC61158, IEC61784-1 : CC-Link published in December 2007 IEC61158, IEC61784-2 : CC-Link IE Field published in August 2014 IEC61784-3-8 : CC-Link Safety published in June 2010 IEC61784-3-8 : CC-Link IE Safety published in August 2016
SEMI Standard	SEMI E54.12 : CC-Link published in July 2001 SEMI E54.23 : CC-Link IE Field published in May 2013 SEMI E54.23 : CC-Link IE TSN published in May 2020 NEW
The National Standards of the People's Republic of China: GB	GB/Z 19760-2005 : CC-Link published in December 2005 GB/T 20299.4-6 Chinese BA (Building Automation) standard : CC-Link published in December 2006 GB/T 19760-2008 : CC-Link published in June 2009 GB/Z 29496.1.2.3-2013 : CC-Link Safety published in June 2013 GB/T 33537.1.2.3-2017 : CC-Link IE published in April 2017 GB/Z 37085-2018 : CC-Link IE Safety published in December 2018
Japanese Industrial Standards: JIS	JIS TR B0031 : CC-Link published in May 2013
Korean National Standards: KS	KSB ISO 15745-5 : CC-Link published in March 2008 KSC IEC 61158/61784 : CC-Link published in December 2011 KSC IEC 61784-5-8 : CC-Link/CC-Link IE published in December 2014 KSC IEC 61784-3-8 : CC-Link IE Safety published in July 2018
Taiwan Standards: CNS	CNS 15252X6068 : CC-Link published in May 2009

Development flow for CC-Link Family compatible products.

The CC-Link Partner Association will support you from development to sales of CC-Link Family compatible products.



Testing Laboratory

CLPA conducts conformance tests. The member firms use the conformance test facilities to test CC-Link Family compatible products in various ways. The noise test, hardware test, software test and combined test among others enable verification of correct performance.



Testing Laboratory

<https://www.cc-link.org/en/support/testlab/index.html>



Promotion①

"CLPA Partner Product Search Tool" is available, fully covering all the CC-Link Family compatible products that the member manufacturers have developed and put on the market. CLPA provides users with diversified solutions.

CLPA Partner Product Search Tool

<https://www.cc-link.org/en/downloads/index.html#section-A>



Promotion②

By registering compatible product information, products can be published on the CLPA website.



Mass Production Planning·Evaluation

Make a prototype based on the design and perform various evaluations.

Do Conformance Tests

Perform conformance tests for each model based on the "Conformance Test Specification". To facilitate the conformance testing process, the CC-Link Partner Association has test centers available in Japan and overseas.

※A certificate will be issued after a conformance test is passed.

Sales

Products that have passed the conformance test can be sold as compatible products. In order to promote products on the CLPA website, the product information must be added by the partner manufacturer.

What is a Conformance Test?

- A conformance test is to be conducted on each model to ensure reliable communication between CC-Link Family compatible products.
- Your products need to be tested to ensure that your products meet the CC-Link Family communication specifications and can be connected to CC-Link networks.
- We offer test tools for CC-Link IE Field Basic, SLMP and open tools for CC-Link IE TSN.

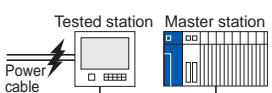
By conducting the conformance test, you can ...

- ensure the communication reliability of your product with the CC-Link Family, and
- easily design system configurations where products of different manufacturers and models are connected.

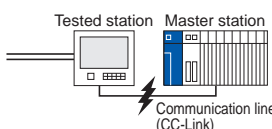
* The conformance test is to ensure that the product meets the common specification of CC-Link Family. The conformance test is not intended to ensure the performance and quality of the product itself.

Test Cases

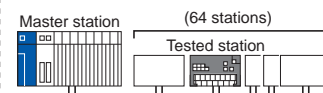
Power supply noise test (AC/DC)



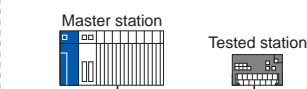
Communication line noise test



Fully loaded network test - 64 stations



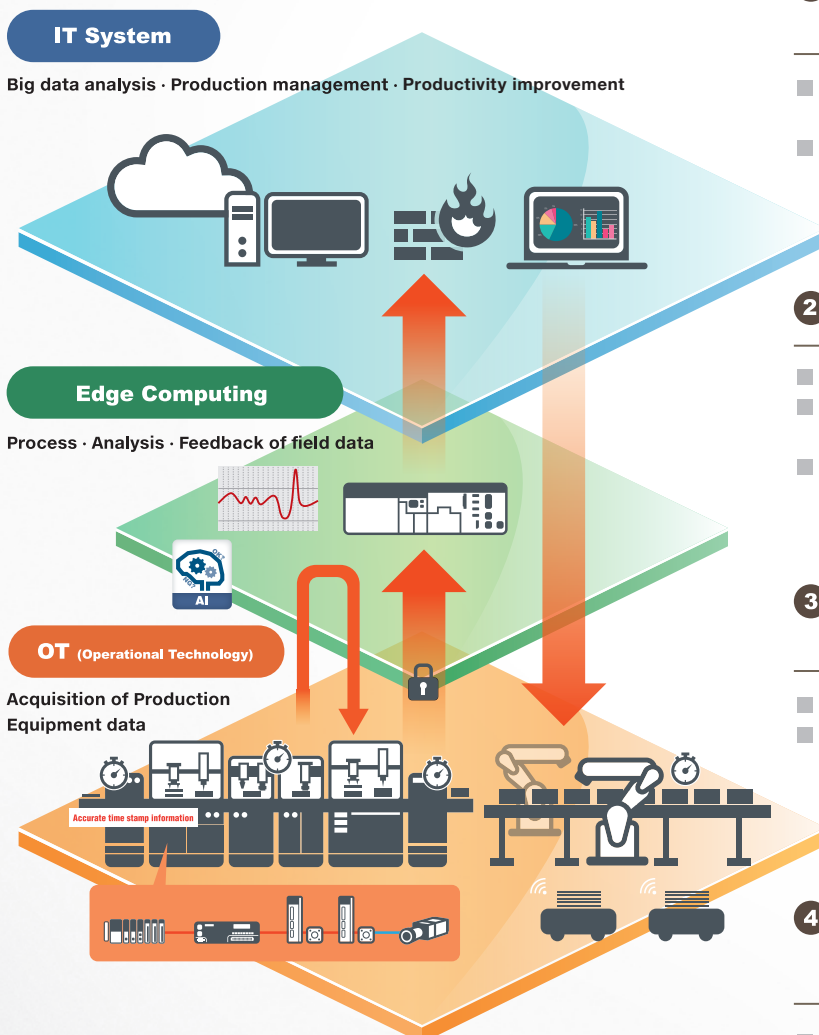
Interoperability test



Accelerate smart factory construction with TSN technology.
The first in the world applying TSN technology to open industrial Ethernet.

CC-Link IE TSN *Open the Future of Connected Industries*

With the adoption of TSN (Time-Sensitive Networking) Ethernet communication technology as a time sharing method to enable flexible IIoT system construction.



① Accurate time stamp information and advanced analysis

- Collection of field data with accurate time stamp information
- Improvement of analysis accuracy by application of AI

② Network integration

- Coexistence of multi-protocols on a single trunk
- Realize simultaneous FA real time control and IT layer seamless communication
- Handle general, motion and safety communication on a single network.

③ Realization of advanced motion control

- Fast and high accuracy synchronization control
- Optimize device performance by combining different communication cycles

④ Utilization of wireless networks and 5G

Future concept

- Construct production lines free of wiring constraints
- Wiring-free system construction

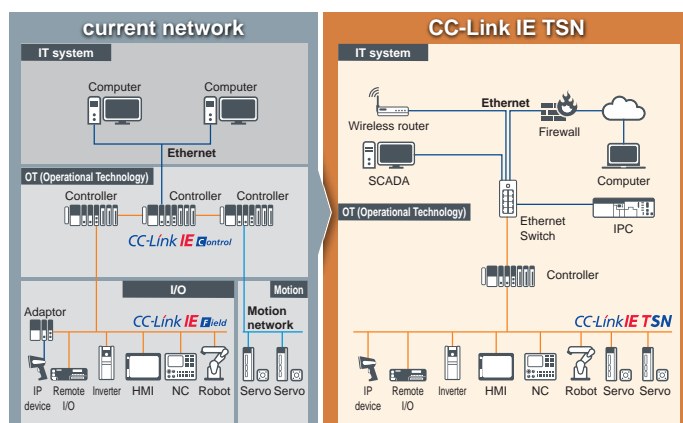
CC-Link IE TSN

Adopts TSN technology, significantly increasing the performance and functions of CC-Link IE

By adopting TSN (Time-Sensitive Networking), which achieves real time communication by time sharing, different networks can coexist on a single cable. Also, this efficient protocol will achieve high speed, accurate control.

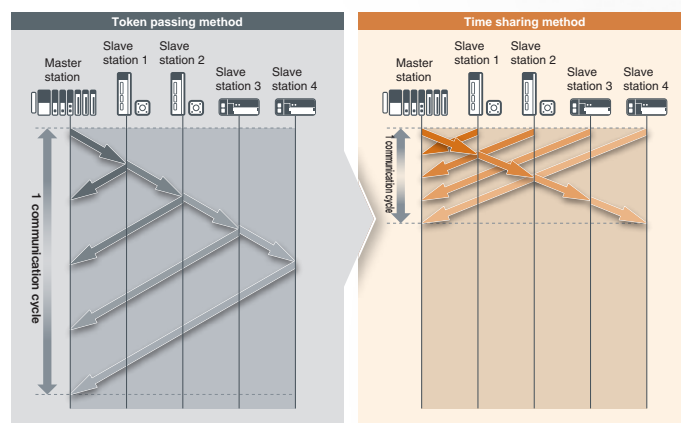
Integration of networks

- ©Integrate multiple OT and IT networks. Increase system structure flexibility and reduce wiring cost.



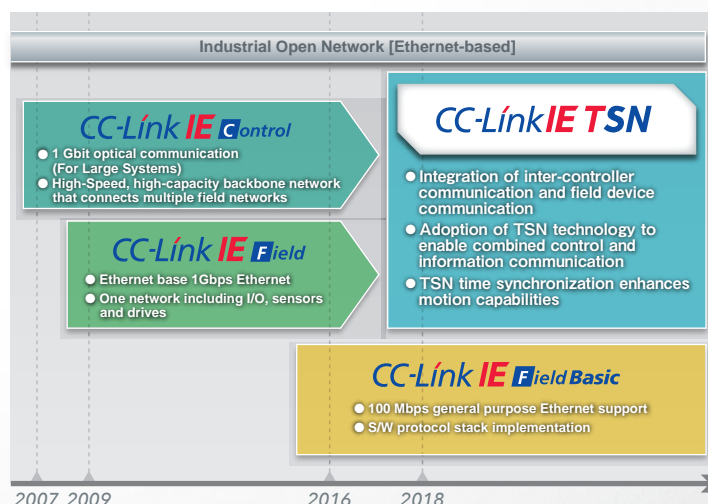
Dramatic reduction of communication cycles

- ©Shorten cyclic data update time with time sharing. This simultaneously transmits and receives input and output communication frames in both directions by using network time synchronization.



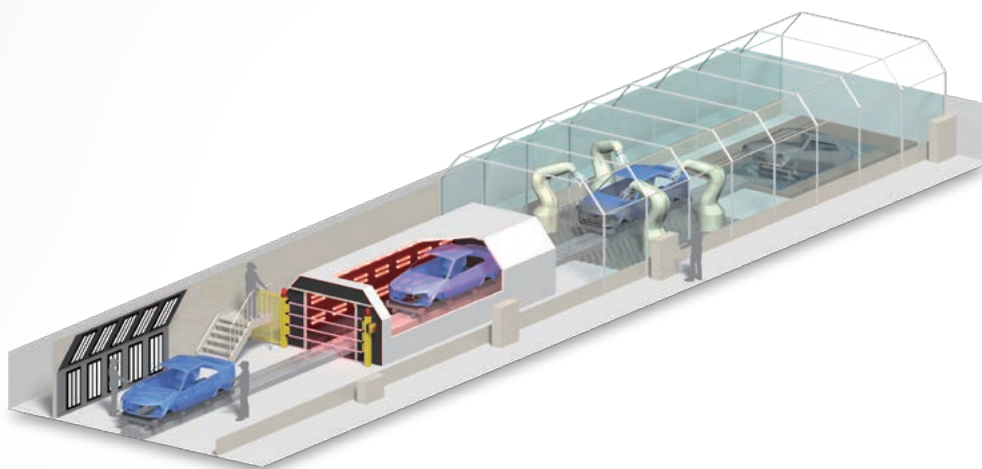
Roadmap

- ©"CC-Link IE TSN" -a new industrial open network that combines traditional open networks (CC-Link IE Control/CC-Link IE Field) with motion control.
- By adopting TSN technology, the network is made more open with enhanced performance and functions.

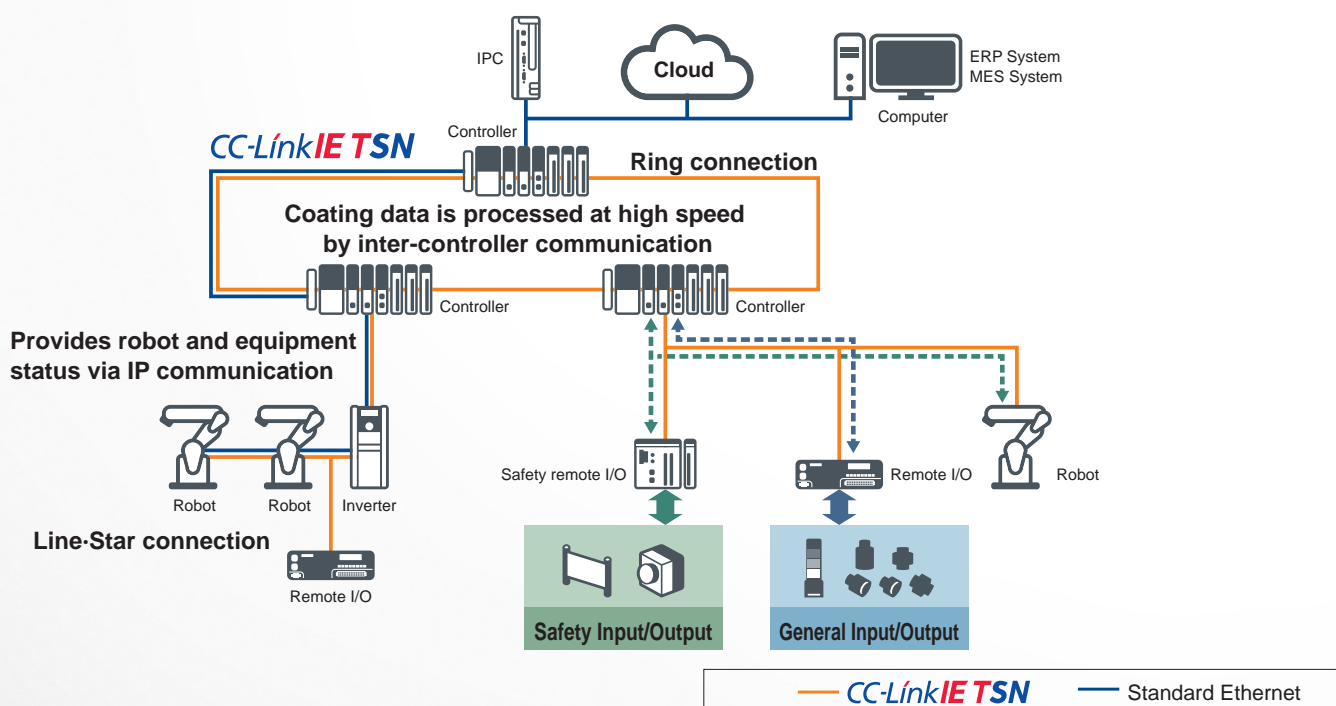


Use cases

CASE 1 Automotive (Paint shop)

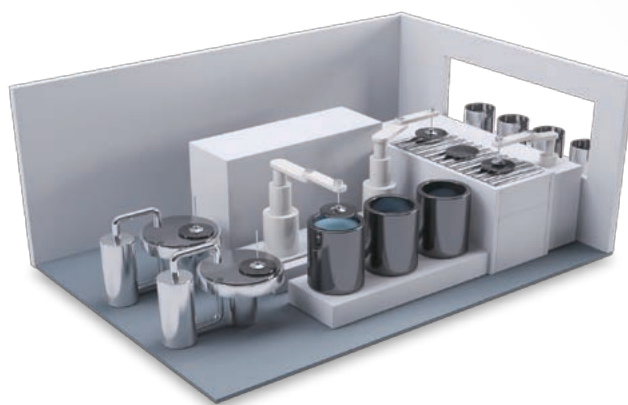


- ◎ Communicates both safety and non-safety communication on a single network
- ◎ Flexible cabling supports line/star/ring topology
- ◎ Supports from controller level downwards, handling large amounts of data for plant monitoring on the same line

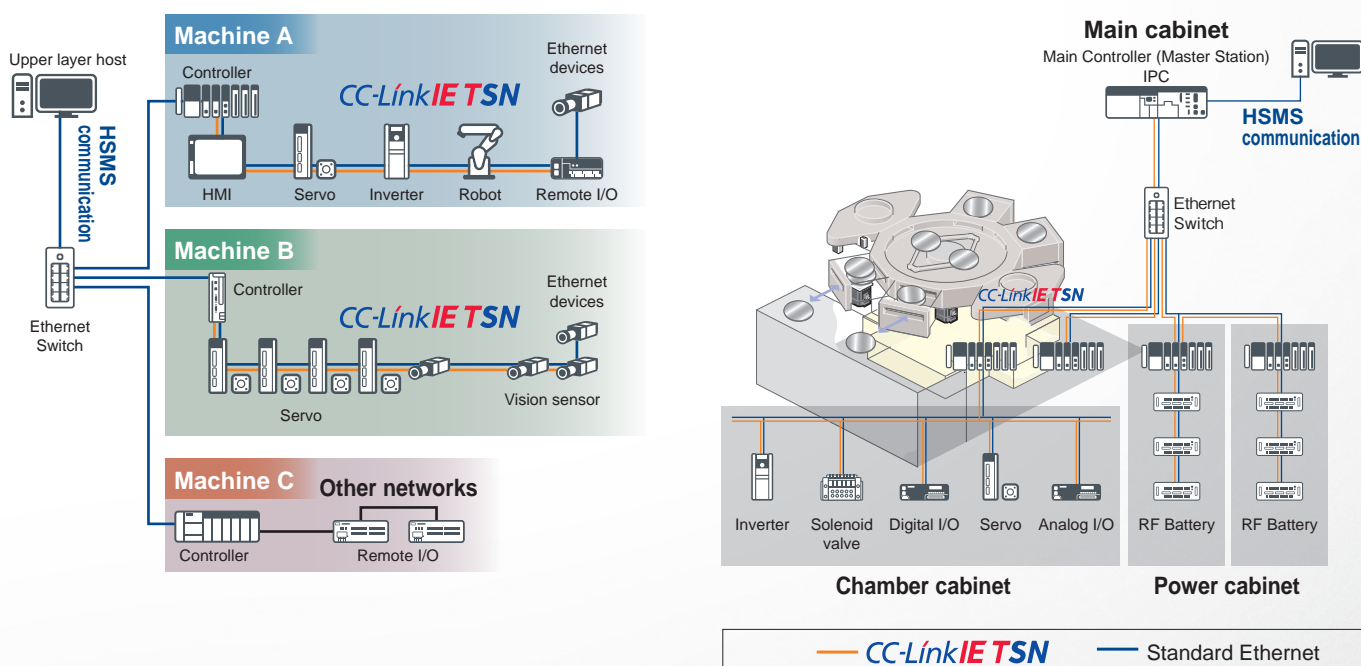


CASE 2

Semiconductor process tool

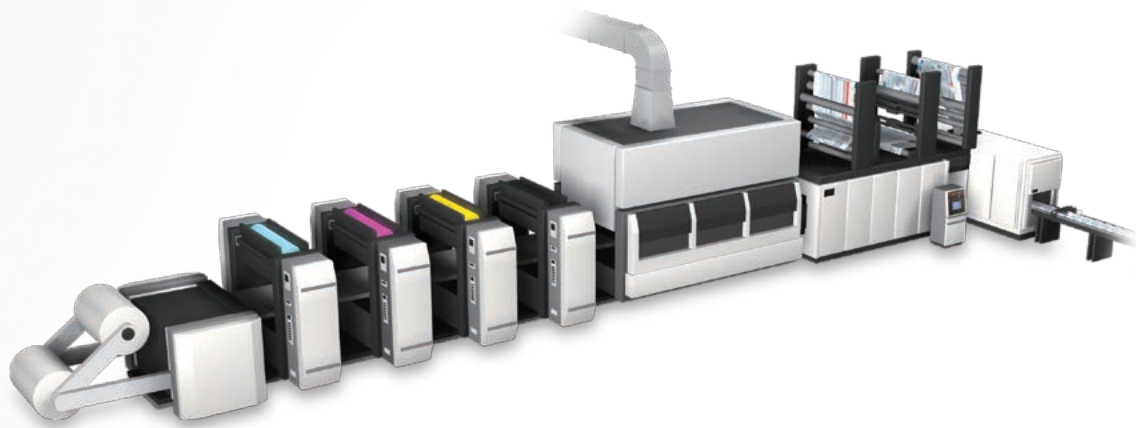


- Provides rapid communications to handle large amounts of recipe and traceability data
- Does not affect operational communication determinism while co-existing with HSMS communication
- Ethernet devices communicate directly with the host on the upper layer
- Use current design assets by implementing a software protocol stack on top of the main controller (Master Station) IPC

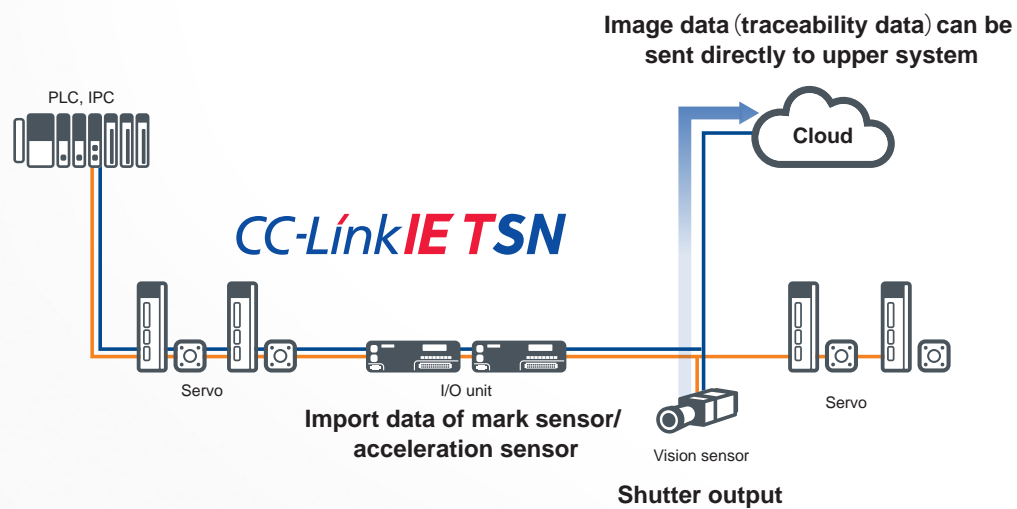


Use cases

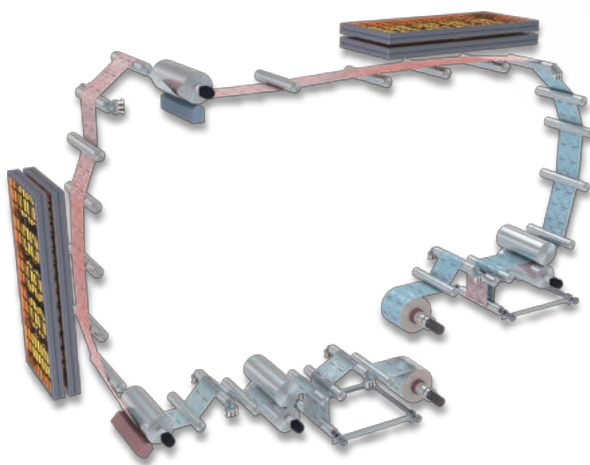
CASE 3 Printing machine



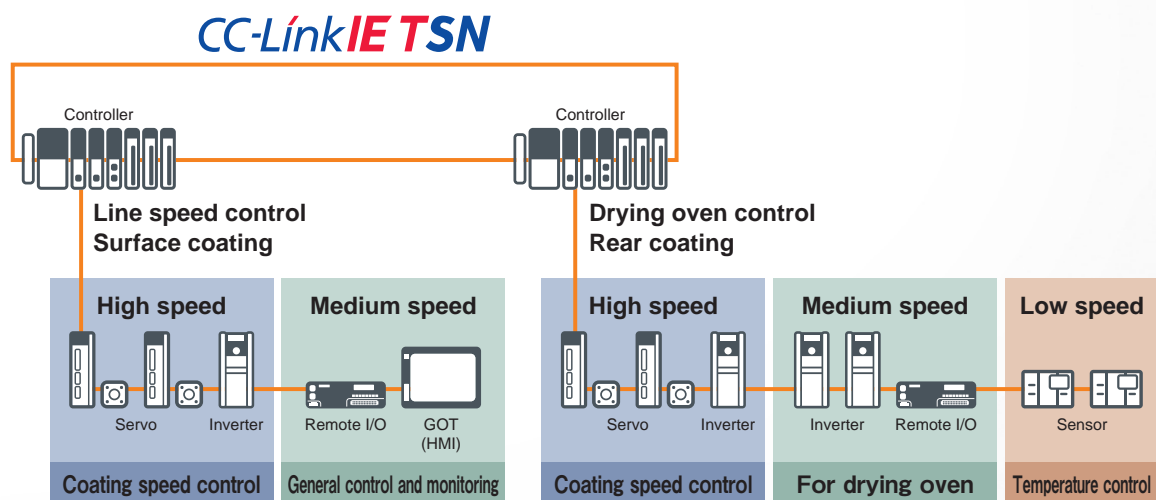
- ◎ Vision system integration. Combine vision system IP traffic on the same network as motion control data while communicating with upper systems.
- ◎ High speed, accurate servo system



CASE 4 Lithium ion battery manufacturing machine



- ◎ High accuracy control synchronization for multiple combined servo and inverter axes.
- ◎ Increase machine performance by combining fast communication cycle devices (e.g. servo) with slower devices (e.g. inverter).



Cyclic communication is enabled by suppressing the effect of each slave station's performance response.

Network List

CC-Link **IE TSN**

TSN technology makes it possible to mix different networks on the same trunk line and provide real-time communication through time synchronization. Thus the motion control capabilities have been significantly enhanced.

CC-Link **IE Field Basic**

CC-Link IE communication using general-purpose Ethernet technology can be easily applied to small-scale equipment not requiring high-speed control. This is easy to use and develop. Cyclic communication on the CC-Link IE Field network can be realized by software implementation alone.

CC-Link **IE Control**

The industrial Ethernet network that realizes high reliability by duplexing the transmission path. The core network that bundles each field or motion network and provides controller-level distributed control with gigabit speed high data capacity.
With the newly added safety communication function, safety data can be shared between controllers.

CC-Link **IE Field**

The new industrial Ethernet field network for intelligent manufacturing systems. Provides real-time integrated distributed control of I/O while also linking numerous networks at gigabit speed.
The safety communication function and motion communication function have been recently added, allowing systems to be configured easily.

CC-Link CC-Link/LT CC-Link Safety

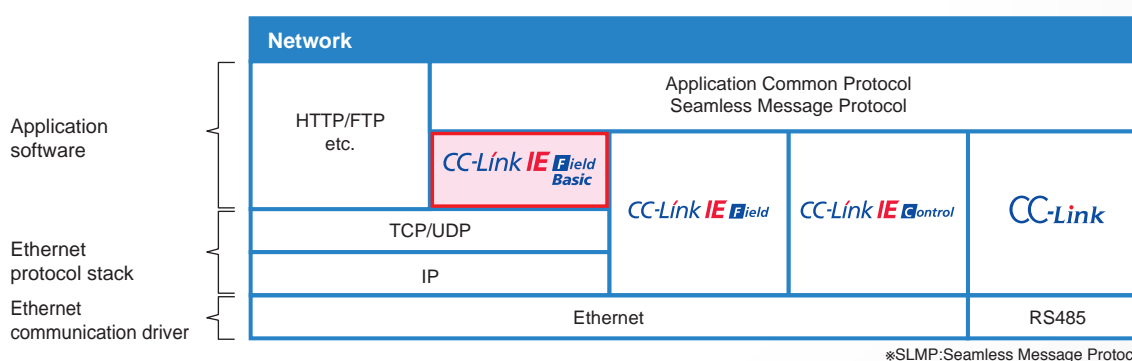
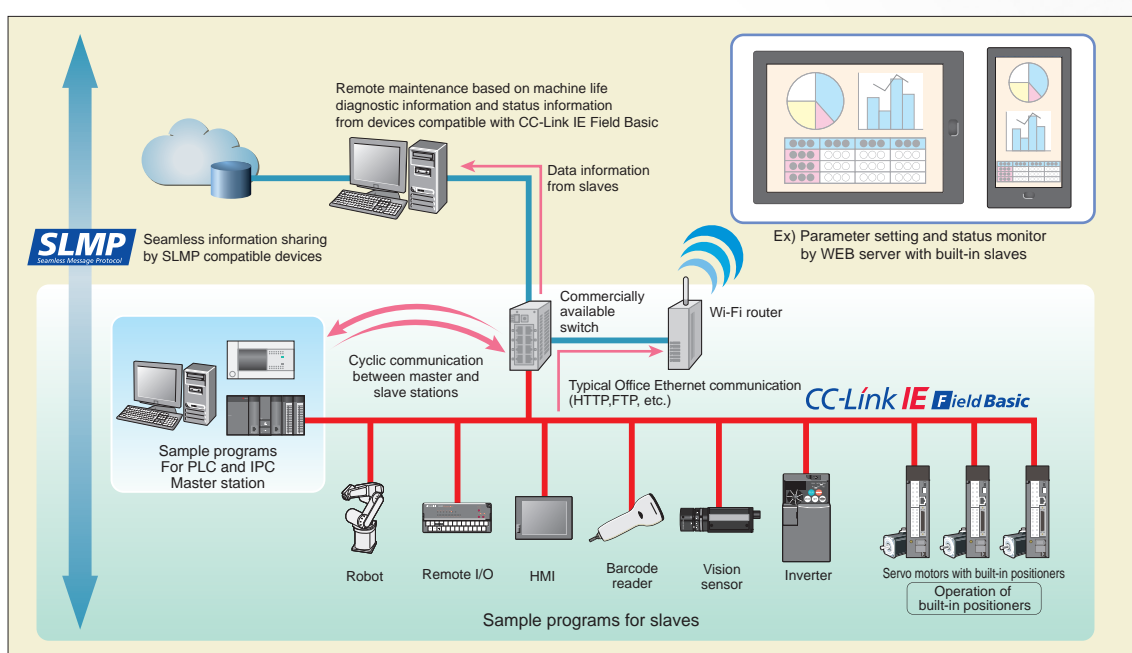
CC-Link is the existing fieldbus network for typical field control applications. CC-Link/LT is a cost saving network for small I/O applications. CC-Link Safety is specialized for use to meet demanding safety network requirements.

SLMP Seamless Message Protocol

The SLMP (Seamless Message Protocol) is a common protocol for realizing system management and operation regardless of the differences between networks. SLMP ensures direct transmission of information between production site and IT systems and facilitates extensive information sharing.

Realizing CC-Link IE communication using general-purpose Ethernet on field networks applicable to small-scale equipment

CC-Link IE communication using general-purpose Ethernet technology. This can easily be applied to small-scale equipment not requiring high-speed control and is easy to use and develop.
Cyclic communication on the CC-Link IE Field network is realized by software.



Cyclic communication on CC-Link IE Field network is realized by software.

◎The system can be developed quickly, and a wide lineup of applicable devices can be developed easily.

The communication can be done simultaneously with standard Ethernet TCP/IP communication (HTTP, FTP, etc.).

◎Wiring for control is not required, and the Ethernet network can be unified.

The master station can be easily realized on an IPC or personal computer.

◎The master station can be realized without a dedicated interface board.

*Cyclic communication is implemented as application software with Ethernet based sample source code.

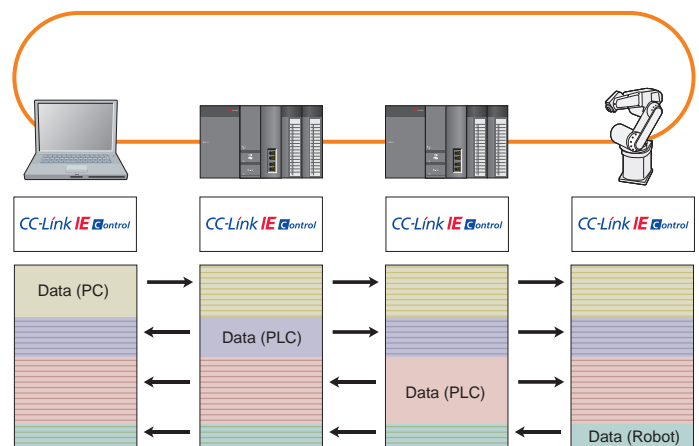
A field network system compatible with standard Ethernet communication can be constructed at low cost.

A wide factory backbone network utilizing gigabit Ethernet technology.

CC-Link IE Control is designed to ensure a highly reliable network through the use of full duplex fiber optic transmission paths, delivering high-speed, high-capacity distributed control. It's the backbone network that provides assured control of each field network.

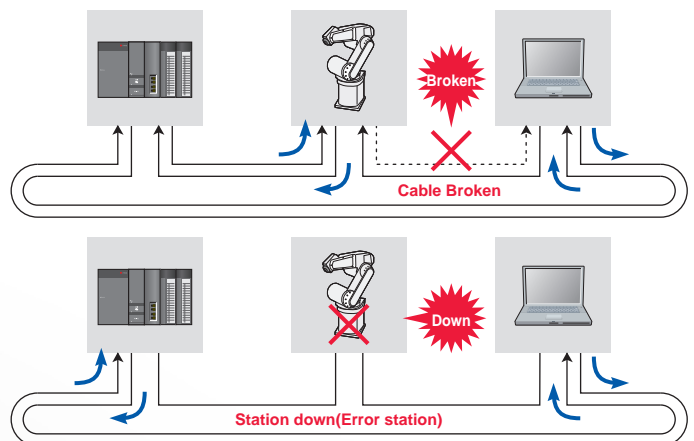
Network shared memory for cyclic communication with ultra high speed & ultra large capacity

- ◎ To achieve stable communication independent of transmission delay, CC-Link IE Control adopts a token passing protocol for data transmission control.
- ◎ Each controller passes data to the network shared memory only when it has the token, ensuring fully deterministic and high speed real-time communication.



High speed & reliability by redundant fiber optic loop technology

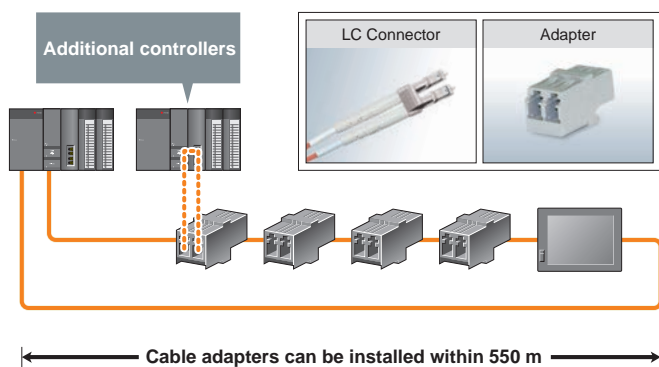
- ◎ By adoption of redundant loop topology, each station continues communication by looping back upon detection of a broken cable or station error.
- ◎ This integrated redundancy is provided without additional equipment and without increasing network cost.



Adoption of standard Ethernet cables, connectors and adapters

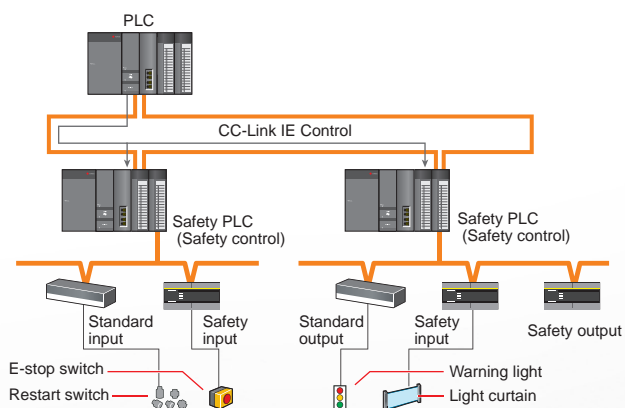
- ◎ Worldwide availability of standard Ethernet cabling and parts by using standard Ethernet technology.
- ◎ By using cable adapters, wiring debugging and installation can be started even if all the equipment in the line has not been fully installed.

- IEEE802.3z (1000BASE-SX)
- LC connector (IEC61754-20)



IEC61508 SIL3 IEC61784-3 (2010) Compliant Safety Communication Function

- ◎ The safety communication function has been added to the CC-Link IE Control network allowing safe communication to be shared between controllers.



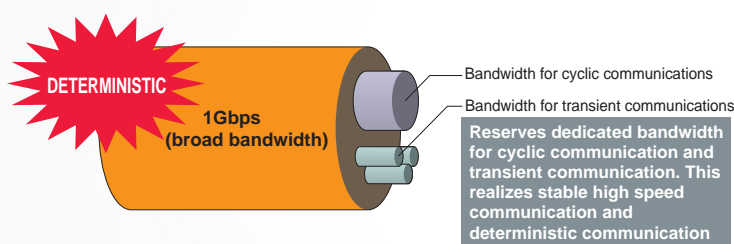
CC-Link **IE** Control

Ultra-high-speed ... supremely useable ... seamless ...
and fully compatible with the Ethernet standards
We've brought the benefits of "Gigabit & Ethernet"
to the field level!

CC-Link IE Field is an ultra high speed & ultra large capacity network, which provides both synchronous deterministic (cyclic) and asynchronous on-demand messaging (transient) communication.
I/O control, motion control and safety functions can be combined seamlessly.

Ultra High Speed

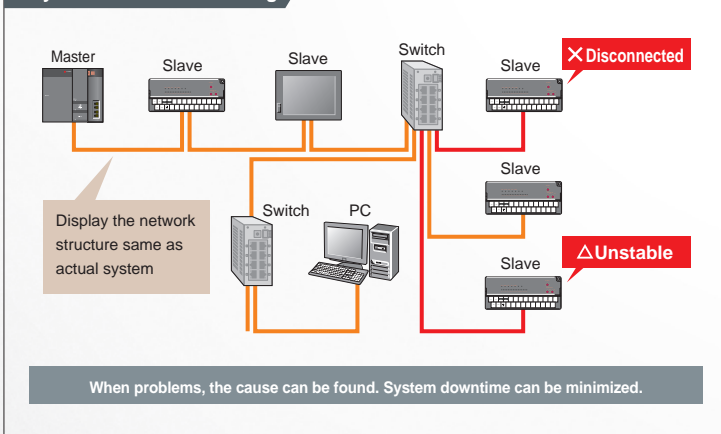
- ◎Gigabit transmission and real-time protocol enables easy and reliable data communication and remote I/O communication independent of transmission delay.
- ◎High-speed communication for management information of devices and trace information as well as the transmission of control data.



Easy Networking

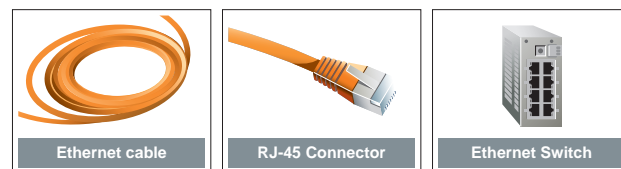
- ◎Flexible network topology (ring, line and star are all possible)
- ◎The network shared memory allows communication among controllers and field devices.
- ◎Easy configuration and network diagnostics enable a total engineering cost reduction from system start-up to maintenance.

Easy network troubleshooting

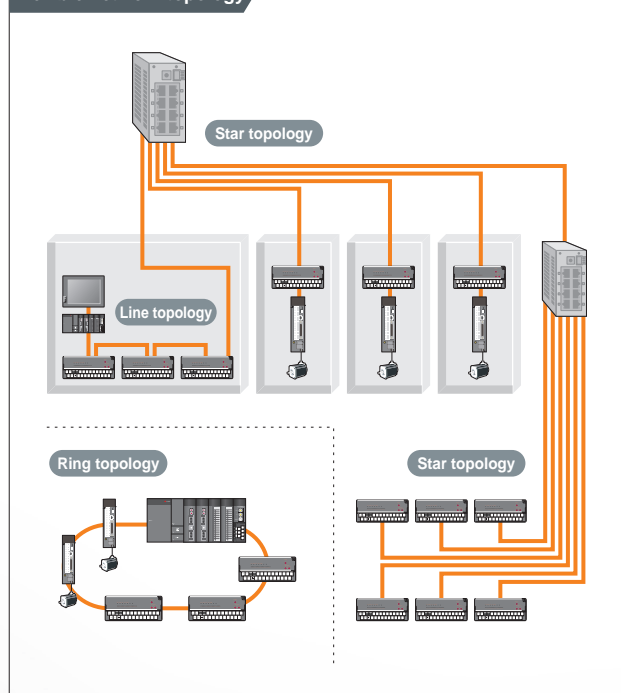


Ethernet Cable and Connector

- ◎Since the physical and data link layers of the CC-Link IE Field network use standard Ethernet technology, conventional cables, switches and hubs can be used.
- ◎The availability of materials and selection of equipment for the network installation and maintenance are enhanced.



Flexible network topology



Seamless Networking

- ◎ CC-Link IE Field can access field devices directly with remote engineering tools across the network hierarchy.
- ◎ Devices can be monitored or configured from anywhere in the network, which increases engineering efficiency with remote management.

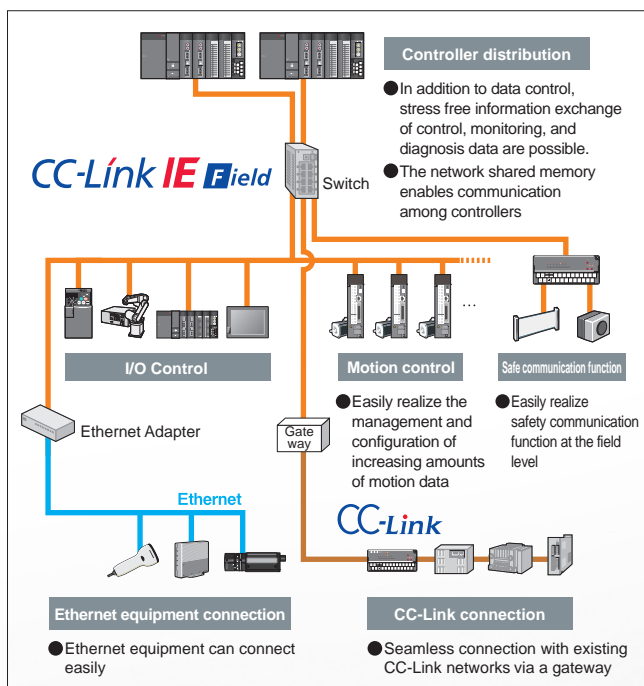
IEC61508 SIL3 IEC61784-3 (2010)

Compliant Safety Communication Function

- ◎ The safety communication function has been added to the CC-Link IE Field network allowing safety communication at the field level.
- ◎ Allows flexible configurations of safety and general PLCs on a single network.

Motion communication function capable of highly accurate synchronous communication

- ◎ Highly accurate synchronization is possible by compensating for the delay time in propagating data from the master station to the slave station.
- ◎ Able to combine not only required device synchronization, but also the information of I/O and sensors for which synchronization is not required, on the same CC-Link IE Field network.



CC-Link IE Field



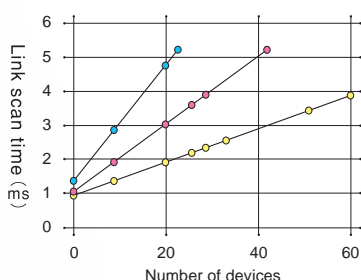
CC-Link obtains SEMI certification. The open field network as a global standard

CC-Link is the high-speed field network able to simultaneously handle both control and information data. With a high communication speed of 10 Mbps, CC-Link can achieve a maximum transmission distance of 100 meters and connect to 64 stations.

High-speed and Highly Deterministic Input-Output Response

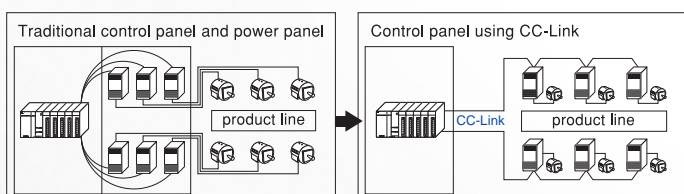
In addition to high speed 10 Mbps operation, CC-Link is extremely deterministic. Being able to rely on a predictable, unvarying I/O response allows system designers to provide reliable, real-time control.

- Link scan time
(at communication speed of 10 Mbps)
- Only remote I/O connected
- Only remote Device connected
(Each occupy one station)
- Only Local/
Intelligent Device connected
(Each occupy one station)



Efficiency through Reduced Wiring

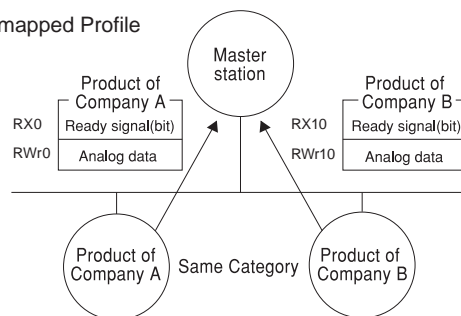
CC-Link significantly reduces the amount of control and power wiring needed in today's complex production lines. It reduces wiring and installation costs, minimizes the work needed to accomplish the wiring and drastically improves maintenance operations.



CC-Link Provides Compatibility between Multiple Vendor Products

CLPA provides a "memory mapped profile" that defines data for each product type. This definition includes the control signal and data layout (addressing). Multiple vendors can develop CC-Link compatible products to match this "profile". Users are then able to easily change from one product brand to another without needing to change connections or control programs.

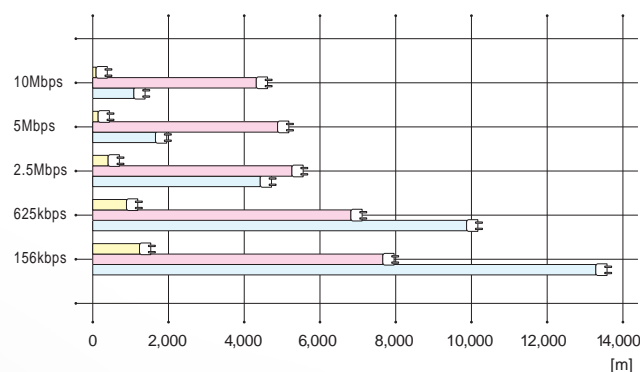
■ Memory mapped Profile



Easy to Extend Transmission Distance

The maximum overall cable length is 100 meters when 10 Mbps is selected. This length can be extended to 1.2 km when the network speed is 156 Kbps. The use of cable repeaters and optical repeaters allows even greater distances to be covered. CC-Link supports large-scale applications and reduces the work needed for wiring and device installation.

■ CC-Link transmission distance

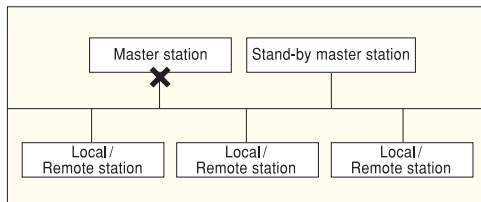


CC-Link Realizes High Reliability with an RAS Function.

The RAS (Reliability, Availability, Serviceability) function is another of CC-Link's features. Functions including stand-by master, detachment of slave stations, automatic return, testing and monitoring provide a high reliability network system and allow the system down time to be minimized.

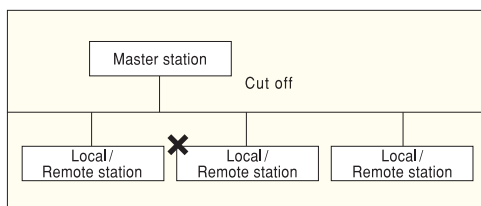
Stand-by Master Function

Using CC-Link, a Stand-by Master station can assume control of network communications in the event that the Primary Master station becomes inoperable.



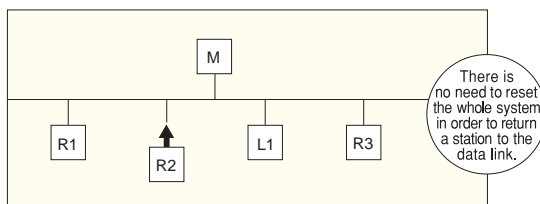
Slave Station Detachment Function

In the event that a slave station stops communicating, CC-Link allows communication to continue with all other stations.



Automatic Return Function

CC-Link automatically returns a detached station to full network operation when the fault is corrected.



Testing and Monitoring Function

This function monitors data link status, and conducts a series of hardware and circuit tests.

CC-Link

CC-Link IE TSN Specification

Item			Specifications
Communication speed			1Gbps/100Mbps
Maximum cyclic size per station			Max. 4G (4,294,967,296) octet in total per station
Transient transmission			With the server function and client function for each station, The transmission capacity is the same as SLMP.
Communication method			Time sharing method
Synchronization function			Compliant with IEEE802.1AS and IEEE1588v2
Number of nodes connected to a single network			64,770 devices (total of master/slave stations) Up to 65535 devices for IP address class A.
Maximum distance between nodes			<ul style="list-style-type: none"> Twisted pair cable (compliant with IEEE 802.3): 100 m Optical fiber (IEEE 802.3 compliant multimode fiber): 550 m Optical fiber (SI-POF): 20m Optical fiber (SI-HPCF):100m
Maximum no. of branches			No upper limit
Topology			Line, star, line/star mixed, ring, ring/star mixed, mesh
Connection specifications	Twisted pair cable specifications	Cable specifications	<ul style="list-style-type: none"> 1 Gbps: IEEE 802.3 1000BASE-T compliant cable ANSI/TIA/EIA-568-B (Category 5e or higher) compliant shielded or double shielded type is recommended. 100 Mbps: IEEE 802.3 100BASE-TX compliant cable ANSI/TIA/EIA-568-B (Category 5 or higher) shielded or double shielded type is recommended. Under noise environment, double shielding is recommended.
		Connector specifications	<ul style="list-style-type: none"> RJ45 connector(1 Gbps): The shielded RJ45 compliant with ANSI/TIA/EIA-568-B 8-pin connectors is recommended. RJ45 connector (100 Mbps): The shielded RJ45 compliant with the ANSI/TIA/EIA-568-B 4-pin or 8-pin connector is recommended. M12 connector (1 Gbps): The X-Coding 8-pin connector compliant with IEC 61076-2-109 is recommended. M12 connector (100 Mbps): The D-Coding 4-pin connector compliant with IEC 61076-2-101 or X-Coding 8-pin connector compliant with IEC 61076-2-109 is recommended.
	Optical fiber cable specifications (1Gbps)	Optical fiber specification	Optical fiber cable compliant with IEEE 802.3 1000BASE-SX (MMF)
		Standard	IEC 60793-2-10 Types A1a.1 (50/125 μm multimode)
		Transmission loss (max)	3.5 (dB/km) or less ($\lambda = 850$ nm)
		Transmission band (min)	500 (MHz/km) or higher ($\lambda = 850$ nm)
		Optical fiber specification	GI type plastic optical fiber cable (GI -POF)
		Standard	Proposing IEC 60793-2-40 (core 55 μm, external diameter 490 μm multimode)
		Transmission loss (max)	100 (dB/km) or less ($\lambda = 850$ nm)
		Transmission band (min)	350 (MHz/km) or higher ($\lambda = 850$ nm)
		Connector specifications	Duplex LC type connector
		Standard	IEC 61754-20: Type LC connector
		Connection loss	0.3 (dB) or less
		Polished surface	PC polishing
	Optical fiber cable specifications (100Mbps)	Optical fiber specification	SI type plastic optical fiber cable (SI-POF)
		Standard	—
		Transmission loss (max)	170 (dB/km) or less ($\lambda = 650$ nm)
		Transmission band (min)	10 (MHz/km) or higher ($\lambda = 650$ nm)
		Optical fiber specification	SI type plastic clad fiber cable (SI-PCF)
		Standard	—
		Transmission loss (max)	19 (dB/km) or less ($\lambda = 650$ nm)
		Transmission band (min)	14 (MHz/km) or higher ($\lambda = 850$ nm)
		Connector specifications	F07 type connector
		Standard	IEC 61754-16: Type PN connector
		Connection loss	0.8 (dB) or less (for master fiber)
		Polished surface	Not defined

*1. For the ring/star mixed and mesh wiring, use switches that can configure each topology.

CC-Link IE Control Network Specifications

Item		Specifications
Communication speed/data link control		1Gbps / Standard Ethernet
Communication control method		Token passing method
Communication control method		Ring
Redundant system function		Redundant data transfer as standard
Number of connected stations per network		Up to 120 stations
Max. number of networks		239
Max. number of groups		32
Optical fiber cable	Optical fiber specification	Optical fiber cable for 1000BASE-SX (MMF)
	Standard	IEC60793-2-10 Types A1a.1 (50/125μm multimode)
	Transmission loss (max)	3.5(dB/km) or less ($\lambda=850\text{nm}$)
	Transmission band (min)	500(MHz-km) or more ($\lambda=850\text{nm}$)
	Total length (total length of optical cable)	66 km (when 120 stations connected)
	Maximum distance between nodes	550 m (core/clad=50/125(μm))
	Connector specifications	Duplex LC connector
	Standard	IEC61754-20:Type LC connector
	Connection loss	0.3(dB) or less
	Polished surface	PC polishing
	Transmission line type	Dual loop
Twisted pair cable	Communication medium	Shielded twisted pair cable (category 5e)
	Connector	RJ45 connector, M12 X-Code connector
	Total length	12,000m
	Distance between stations (max.)	100m
Cyclic communication (Max. number of link points per network)		Control data (Max. number of link points)
		LB : 32768 bits
		LW : 131072 words
		LX : 8192 bits
		LY : 8192 bits

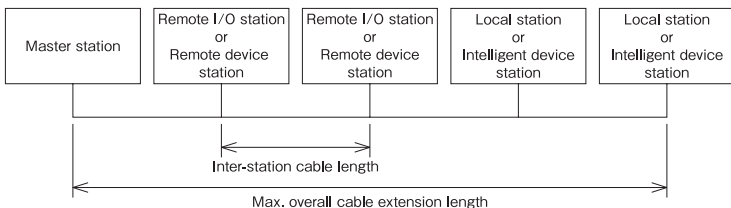
CC-Link IE Field Network Specifications

Item	Specifications
Ethernet Standards	IEEE802.3ab (1000BASE-T) compliant
Communication speed	1Gbps
Communication media	Shielded twisted pair cable (Category 5e), RJ-45 connector
Communication control method	Token passing method
Topology	Line, star, ring
Maximum number of connected units	254 modules (total of master and slave stations)
Maximum station-to-station distance	100m
Cyclic communication (Master slave method)	Control signal (bit data): max. 32768 bits (4096 octets) RX (slave → master): 16384 bits RY (master → slave): 16384 bits Control data (word data): Max. 16384 words (32768 octets) RWr (slave → master): 8192 words RWw (master → slave): 8192 words
Transient communication (message communication)	Message size: Max. 2048 octets

CC-Link IE Field Basic Specifications

Item		Specifications
Communication speed		100Mbps
Implementation method		Software
Connection form		Star (connection with switching hub)
Cable		Ethernet category 5e or higher
Max. number of connected stations per network (open specification)		64
Cyclic communication		Supported
Max. number of link points/network	RX,RY	512 octets each (4K points)
	RWr,RWw	4K octets each (2K points)
Max. number of link points/station (More than one station can be occupied.)	RX,RY	8 octets each (64 points) (fixed)
	RWr,RWw	64 octets each (32 points) (fixed)
Link scan time (16 stations connected)		10ms
Transient transmission		Possible (max. 2K octets)
Mix of communication protocols, TCP and IP		Supported

CC-Link Specification

Item			Specification				
			Ver. 1.10	Ver. 2.00			
Control specification	Maximum number of link points	Remote I/O(RX, RY)	2048 points each	8192 points each			
		Remote register (RWr)	256 words	2048 words (Slave station to Master station)			
		Remote register(RWw)	256 words	2048 words (Master station to Slave station)			
	Extended cyclic setting		—	1 time setting	2 time setting	4 time setting	8 time setting
	Number of link points per unit	1 station occupied	RX, RY	32 points each	32 points each	64 points each	128 points each
			RWr, RWw	4 words each	8 words each	16 words each	32 words each
		2 stations occupied	RX, RY	64 points each	96 points each	192 points each	384 points each
			RWr, RWw	8 words each	16 words each	32 words each	64 words each
		3 stations occupied	RX, RY	96 points each	160 points each	320 points each	640 points each
			RWr, RWw	12 words each	24 words each	48 words each	96 words each
		4 stations occupied	RX, RY	128 points each	224 points each	448 points each	896 points each
			RWr, RWw	16 words each	32 words each	64 words each	128 words each
	Maximum number of occupied stations		4 stations				
Communication speed			10M / 5M / 2.5M / 625k / 156kbps				
Communication system			Broadcast polling system				
Synchronization system			Frame synchronization system				
Encoding system			NRZI				
Transmission path format			Bus format (EIA RS485 conformance)				
Transmission format			HDLC conformance				
Error control system			CRC (X ¹⁶ +X ¹² +X ⁵ +1)				
Max. number of units connected			64 units				
The number of slave station			1-64				
Communication specification	Max. overall cable extension length and inter-station cable length						
			CC-Link Ver. 1.10 compatible cable (Using 110Ω terminators)				
			Communication speed	inter-station cable length	Max. overall cable extension length		
			156Kbps	20 cm or longer	1200m		
			625Kbps		900m		
			2.5Mbps		400m		
			5Mbps		160m		
			10Mbps		100m		
			If a system uses modules compatible with Ver. 1.00, 1.10 and Ver. 2.00, and cables compatible with Ver. 1.00 and 1.10, then follow the Ver. 1.00 specification for maximum overall cable extension length and inter-station cable length.				
Connection cable			CC-Link Ver. 1.10 compatible cable (Shielded, 3-core twisted pair cable) * Mixture of different brand cables is possible only when they are all Ver. 1.10 compatible cables.				

Difference between CC-Link Ver.1.10 and Ver.2.00 in the number of connected units

	Number of units connected
Ver.1.10	<p>Max. 64 stations. It should satisfy the conditions below.</p> <p>1. Number of all stations $a+b \times 2+c \times 3+d \times 4 \leq 64$ a : Number of units that occupies 1 station, b : Number of units that occupies 2 stations c : Number of units that occupies 3 stations, d : Number of units that occupies 4 stations</p> <p>2. Number of units connected $16 \times A+54 \times B+88 \times C \leq 2304$ A : Number of remote I/O station units Max. 64 units B : Number of remote device station units Max. 42 units C : Number of local station, stand by master station and intelligent device station units Max. 26 units</p>
Ver.2.00	<p>Max. 64 stations. It should satisfy the conditions below.</p> <p>1. Number of all stations $(a+a2+a4+a8)+(b+b2+b4+b8) \times 2+(c+c2+c4+c8) \times 3+(d+d2+d4+d8) \times 4 \leq 64$</p> <p>2. Total number of remote I/O points $(a \times 32+a2 \times 32+a4 \times 64+a8 \times 128)+(b \times 64+b2 \times 96+b4 \times 192+b8 \times 384)+$ $+(c \times 96+c2 \times 160+c4 \times 320+c8 \times 640)+(d \times 128+d2 \times 224+d4 \times 448+d8 \times 896) \leq 8192$</p> <p>3. Total number of remote register points $(a \times 4+a2 \times 8+a4 \times 16+a8 \times 32)+(b \times 8+b2 \times 16+b4 \times 32+b8 \times 64)+$ $+(c \times 12+c2 \times 24+c4 \times 48+c8 \times 96)+(d \times 16+d2 \times 32+d4 \times 64+d8 \times 128) \leq 2048$ a : The number of units with 1 station occupied and 1 time setting b : The number of units with 2 stations occupied and 1 time setting c : The number of units with 3 stations occupied and 1 time setting d : The number of units with 4 stations occupied and 1 time setting a2: The number of units with 1 station occupied and 2 times setting b2: The number of units with 2 stations occupied and 2 times setting c2: The number of units with 3 stations occupied and 2 times setting d2: The number of units with 4 stations occupied and 2 times setting a4: The number of units with 1 station occupied and 4 times setting b4: The number of units with 2 stations occupied and 4 times setting c4: The number of units with 3 stations occupied and 4 times setting d4: The number of units with 4 stations occupied and 4 times setting a8: The number of units with 1 station occupied and 8 times setting b8: The number of units with 2 stations occupied and 8 times setting c8: The number of units with 3 stations occupied and 8 times setting d8: The number of units with 4 stations occupied and 8 times setting</p> <p>4. Number of units connected $16 \times A+54 \times B+88 \times C \leq 2304$ A : Number of remote I/O station units Max. 64 units B : Number of remote device station units Max. 42 units C : Number of local station, stand by master station and intelligent device station units Max. 26 units</p> <p>*In the case of units compatible with Ver. 1, the number is calculated with one time setting.</p>

CC-Link Ver. 1.00 model (Differences from Ver. 1.10)

There are two differences in specifications between CC-Link Ver. 1.10 and Ver. 1.00 as shown below.

- Max. overall cable extension length and inter-station cable length
- Connection cable

Item	Specification																									
Max. overall cable extension length and inter-station cable length	<div><div><div>Master station</div><div>Remote I/O station or Remote device station</div><div>Remote I/O station or Remote device station</div><div>Local station or Intelligent device station</div><div>Local station or Intelligent device station</div></div><div><div><div>*2</div><div>*1</div><div>*2</div><div>*2</div></div><div>Max. overall cable extension length</div></div></div>																									
	*1: Inter-station cable length between remote I/O or remote device stations																									
	*2: Inter-station cable length between the master station and a local station or between an intelligent device station and the preceding or following station																									
	CC-Link Ver. 1.10 compatible cable (Using 110Ω terminators)																									
	<table><tr><th rowspan="2">Communication speed</th><th colspan="2">inter-station cable length</th><th rowspan="2">Max. overall cable extension length</th></tr><tr><th>*1</th><th>*2</th></tr><tr><td>156Kbps</td><td rowspan="3">30 cm or over</td><td rowspan="10">1 m or over ^(A) / 2 m or over ^(B)</td><td>1200 m</td></tr><tr><td>625Kbps</td><td>600 m</td></tr><tr><td>2.5Mbps</td><td>200 m</td></tr><tr><td rowspan="2">5Mbps</td><td>30 cm to 59 cm*</td><td>110 m</td></tr><tr><td>60 cm or over</td><td>150 m</td></tr><tr><td rowspan="3">10Mbps</td><td>30 cm to 59 cm*</td><td>50 m</td></tr><tr><td>30 cm to 59 cm*</td><td>80 m</td></tr><tr><td>1 m or over</td><td>100 m</td></tr></table>	Communication speed	inter-station cable length		Max. overall cable extension length	*1	*2	156Kbps	30 cm or over	1 m or over ^(A) / 2 m or over ^(B)	1200 m	625Kbps	600 m	2.5Mbps	200 m	5Mbps	30 cm to 59 cm*	110 m	60 cm or over	150 m	10Mbps	30 cm to 59 cm*	50 m	30 cm to 59 cm*	80 m	1 m or over
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	1 m or over		100 m																							
(A): 1 m or longer: In the case of a system comprising only remote I/O or remote device stations																										
(B): 2 m or longer: In the case of a system comprising local and intelligent device stations																										
*: If even a cable between remote I/O or remote device stations is to be wired within this range, the maximum overall cable length shown above applies.																										
Connection cable	CC-Link Ver. 1.10 compatible cable (Shielded, 3-core twisted pair cable) * Cables of different manufacturers cannot be used together.																									

●How to become a member

Would you like to improve your FA, BA, and PA devices by making them compatible with the CC-Link Family? Are you interested in open FA devices that satisfy international standards? CLPA will support you by promoting related technologies and holding exhibitions and seminars in Japan and overseas.

◎ How to apply for a membership: Please access from our website.

※FA:Factory Automation / BA:Building Automation / PA:Process Automation



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CC-Link Partner Association

6F Ozone-front Building, 3-15-58, Ozone, Kita-ku, Nagoya
462-0825, Japan

TEL: 052-919-1588 FAX: 052-916-8655

<https://www.cc-link.org> E-mail: info@cc-link.org