CC-Link*IE TSN*
Development Guide

CLPA
CC-Link PARTNER ASSOCIATION
OPEN AUTOMATION NETWORKS

CC-Link*IE TSN*

Make your products ready for the future of manufacturing with CC-Link IE TSN

The only open industrial Ethernet to combine gigabit bandwidth with TSN

The CC-Link Partner Association introduces CC-Link IE TSN. CC-Link IE TSN builds on our successful pedigree of open automation networks by combining the bandwidth of open gigabit Ethernet with the future proof technology of Time-Sensitive Networking (TSN). Get your products ready for the future of manufacturing by incorporating this groundbreaking new technology into your development roadmap.

Industry standard development solutions

The CLPA has worked with its industry leading partners to assemble a wide portfolio of different CC-Link IE TSN development options. The aim is to address different development needs with industry standard solutions.

PROCESS FLOW

DEVELOPMENT CONSIDERATION

Market/customer demand is requiring you to offer a product that supports TSN and gigabit /100Mbit bandwidth. Create the business case for development.

JOIN THE CLPA

First step of development is to join the CLPA in order to get access to the range of technical specifications (if required) and receive development support where necessary. Contact us at:

PARTNERS@EU.CC-LINK.ORG

DEVELOPMENT/ EVALUATION

Decide how to develop a device, based on which solutions are the closest fit to your established engineering processes.

CONFORMANCE TEST

Successfully complete product development, then work with the CLPA to pass a conformance test. This guarantees that your device will correctly communicate with other compatible devices.

MARKETING & SALES

After successful certification, work with us to promote your product via the CLPA's global marketing activities. A comprehensive variety of options are available to Regular members.

● PERFORMANCE

Highest productivity Industry 4.0 solution combines gigabit Ethernet with TSN

● CONNECTIVITY

Open technology provides freedom of choice for end users, OEMs and device vendors

● INTELLIGENCE

A wealth of intelligent features reduce time to market and downtime while increasing productivity

CC-Link IE TSN can benefit your market sector

CC-Link IE TSN is designed to bring benefits to a wide range of different industries. No matter what sectors you supply now, CC-Link IE TSN will help you to offer market leading products to address the needs of Industry 4.0.

Automative
Semiconductor
Consumer Electronics

Machine Tools
Food & Beverage
Converting

DEVELOPMENT STEPS

1 SELECTING A STATION TYPE

Determine what kind of device you would like to develop - a remote station (field devices such as I/O, valve blocks, robots, HMI, inverters, servos, etc.), a local station (usually a PLC or IPC) or a master station (a PLC or IPC that manages the network).

2 CERTIFICATION CLASS SELECTION

Choose Class A or Class B. Class B supports the full range of CC-Link IE TSN functions and provides greater application flexibility. Class A is a selection of functions for lower specification devices.

3 DEVELOPMENT METHOD SELECTION

Decide if you will develop a device from scratch using CLPA protocol documents, or use the development solutions offered by other CLPA partners as described in this brochure.

4 DEVELOPMENT LOCATION

Choose in-house development if sufficient technical resources are available, or outsource.

CC-Link IE TSN Development Partners

These CLPA partners offer a variety of industry standard development options to match your needs

CC-Link IE TSN for embedded designs

- CC-Link IE TSN solution for Gigabit Ethernet and Fast Ethernet
- Based on the forthcoming netX chip generation for TSN
- Seamless integration in the complete Hilscher product portfolio
- Existing netX support for CC-Link IE, CC-Link IE Field Basic & CC-Link

www.hilscher.com

Anybus for CC-Link IE TSN

- Future proof connectivity – always up to date
- Simple design-in with expert support
- Cost-effective flexibility
- Existing Anybus support for CC-Link IE & CC-Link

www.anybus.com

CC-Link IE TSN/CC-Link IE Safety based Industrial Communication

- Client-specific product development
- Hardware and Software developments to IEC 61508 (SIL2/SIL3) / EN ISO 13849
- Modular concepts for Safety related Industrial Ethernet interfaces, Multi-protocol support
- Utilise MESCO Safety Design Packages for reduced development risk

www.mesco-engineering.com

Seamless implementation of CC-Link IE TSN technology

- Open integrated networking across the manufacturing enterprise
- Mitsubishi Electric is supplying both S/W and H/W development kits
- Simple realization of 100Mbit and gigabit communication
- Existing support for CC-Link IE & CC-Link

eu3a.mitsubishielectric.com

CC-Link IE TSN device development options

No.	Device development options			CC-Link IE TSN	CC-Link IE / CC-Link IE Field Basic
	Communication speed	Master	Slave		
1	1 Gbps	Hardware	Hardware	Supported	Supported
2		Software			Not supported
3		Hardware	Software		
4		Software			
5	100 Mbps	Hardware	Hardware		
6		Software			
7		Hardware	Software		
8		Software			Supported

"Hardware": implemented by dedicated ASIC or FPGA.
"Software": implemented by software stack running on standard Ethernet platforms.

Technical specifications

No.	Items	CC-Link IE TSN	CC-Link IE Field	CC-Link IE Field Basic
1	Baud rate	1Gbps/100Mbps	1Gbps	100Mbps
2	Maximum input/output size per master	4G Octet(Byte)	36K Octet(Byte)	9K Octet(Byte)
3	Transient transmission	Supported	Supported	Supported
4	Communication method	Time sharing	Token passing	Broadcast polling
5	Synchronization method	Time synchronization	Frame reception timing/transmission path delay measurement	–
6	Maximum station No. per network	64,770 stations (Master: m stations, Slave: 64,770-m stations)	254 stations (Master: m stations, Slave:254-m stations)	65 stations (Master:1 station, Slave: 64 stations)
7	Topology	Line, Star, Ring, Line + Star, Line + Ring, Ring + Star, Mesh	Line, Star, Ring, Line + Star	Line, Star
8	Cable specification	IEEE 802.3 1000BASE-T (Category 5e or above)/100BASE-TX (Category 5 or above) compatible cable.* Shielded or double shielded cable recommended.		
9	Connector specification	RJ-45 connector (1Gbps/100Mbps) ANSI/TIA/EIA-568-B compliant. 8 pin shielded connector recommended.* M12 connector (1Gbps/100Mbps) IEC61076-2-109 compliant. 8 pin connector recommended.* M12 connector (100Mbps) IEC61076-2-101 compliant. 4 pin connector recommended.*		

*100Mbps compatible cable / connector cannot be used for CC-Link IE Field.

CLPA board members

3M

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