Nu-Servo®

Fieldbus Interface Drive

EtherCAT.

Motionnet®

TPM Taiwan Pulse Motion
Inspire New Automation

EtherCAT® SEMI E54.20

EtherCAT® stands for "Ethernet for Control Automation Technology" and is an Ethernet-based real-time fieldbus protocol. EtherCAT® is also an ultra high-speed serial communication system widely applied in factory and machinery automation industries.
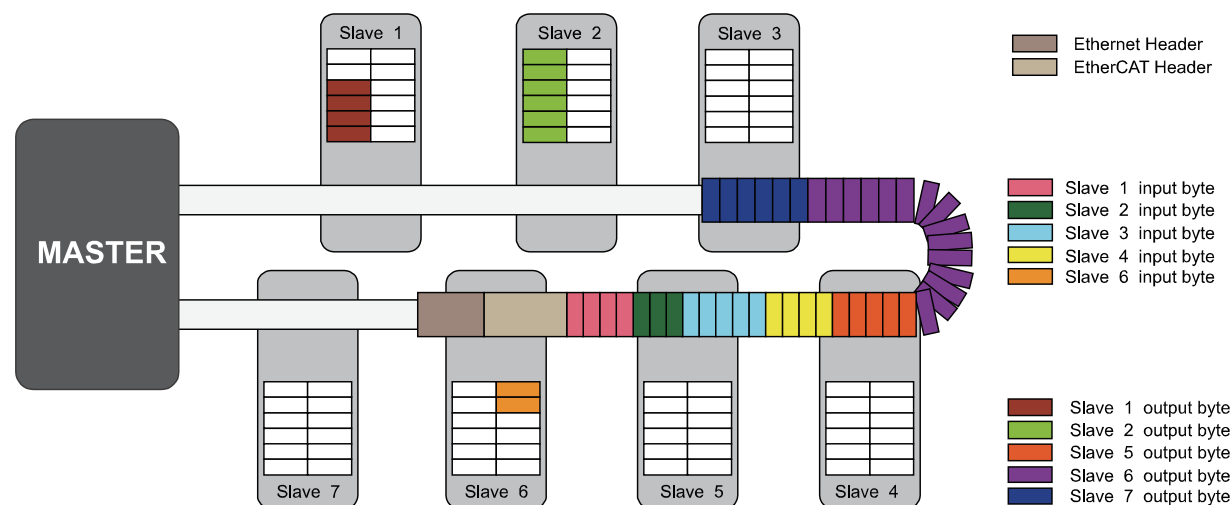
Precise synchronization is one of the features of EtherCAT®. Distributed Clocks (DC) in the EtherCAT® has been introduced to perform synchronization of the master and all slave devices. EtherCAT Distributed Clocks achieves clock synchronization with low jitter less than 1 µs.

EtherCAT® is IEC 61158 and IEC 61784, ISO 13849-1 and SEMI E54.20 communication standard. Its real-time capability and the high transmission rate of up to 100 Mbit/s enables EtherCAT® to operate multiple nodes synchronously and process large quantities of data in a short time.

EtherCAT® uses the CANopen protocol for transfer. The key advantages of standardized CANopen protocol (CiA) is that it can be combined with the high performance of the Ethernet interface.

Advantages:
- Ultra high-speed communication speeds
- Synchronization of multiple units possible
- Real-time capable
- Standardized protocol (CiA)

Ethernet Header
EtherCAT Header

Slave 1 input byte
Slave 2 input byte
Slave 3 input byte
Slave 4 input byte
Slave 6 input byte

Slave 1 output byte
Slave 2 output byte
Slave 5 output byte
Slave 6 output byte
Slave 7 output byte

MASTER

Slave 1 Slave 2 Slave 3
Slave 7 Slave 6 Slave 5 Slave 4

Motionnet® SEMI E54.21

Motionnet® is a high-speed serial communication system with data transfer rate at up to 20 Mbps. This technology is widely applied in factory and machinery automation industries. One Motionnet® master chip supports 64 slave devices including Digital Input/Output, Analog Input/Output, Pulse counter, Temperature and Motion control modules. Through Ethernet cables, slave devices are connected in a linear topology. It reduces a lot of wiring complexity and cable cost. Motionnet® transfers 4 bytes of data in 15.1µsec for cyclic communication. The cyclic communication command is executed every clock cycle processing 4 bytes of the reserved memory spaces for specific commands. Others are transmitted in a communication frame.
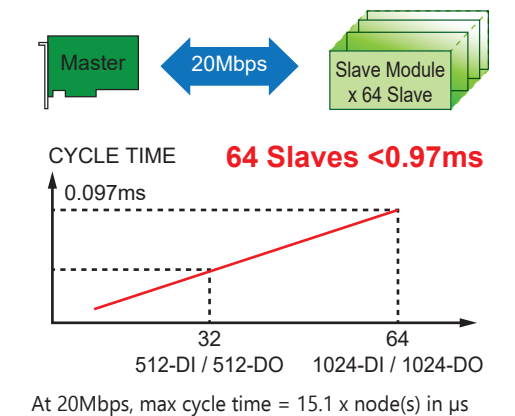
The data change time of a specified module for both types of commands is predictable by a simple formula. With time deterministic feature of Motionnet®, which is a very important issue for real-time application requirements provides a perfect framework for factory and machinery automation systems.
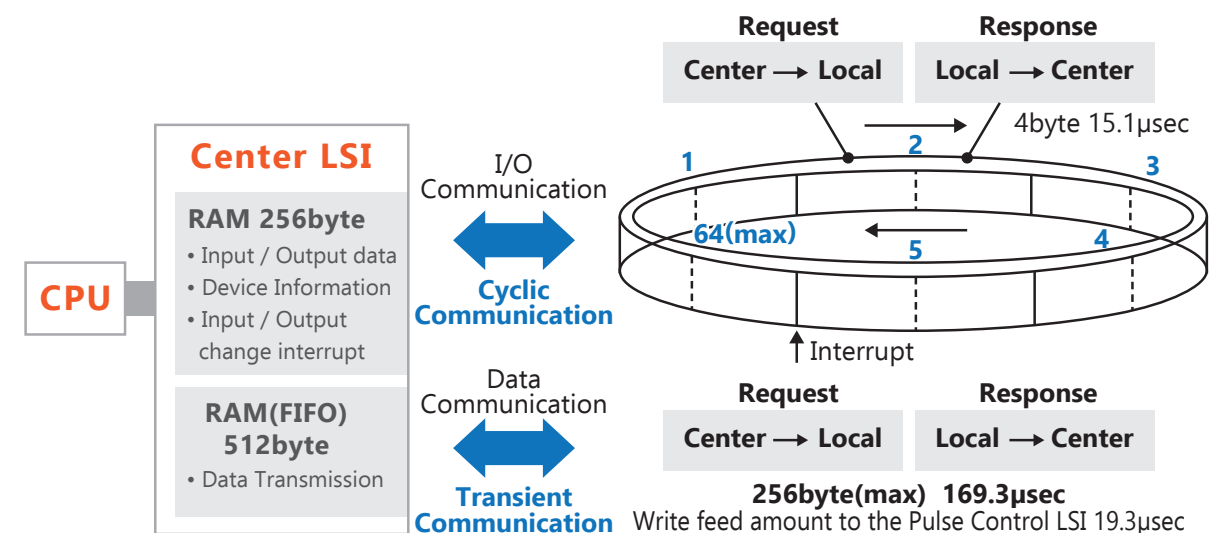
Motionnet Features

WIRE-SAVING / LONG-DISTANCE

HIGH-SPEED / TIME-DETERMINISTIC

Master ⟷ 20Mbps ⟷ Slave Module x 64 Slave

CYCLE TIME **64 Slaves <0.97ms**
0.097ms

32
512-DI / 512-DO

64
1024-DI / 1024-DO

At 20Mbps, max cycle time = 15.1 x node(s) in µs

Motionnet System Configurations

Request
Center → Local

Response
Local → Center

4byte 15.1µsec

Center LSI

I/O Communication

RAM 256byte
- Input / Output data
- Device Information
- Input / Output change interrupt

Cyclic Communication

RAM(FIFO) 512byte
- Data Transmission

Data Communication

Transient Communication

CPU

64 (max)

↑ Interrupt

Request
Center → Local

Response
Local → Center

256byte(max) 169.3µsec
Write feed amount to the Pulse Control LSI 19.3µsec

SVR-K Series Close-Loop Drive

STP-K Series Micro-Step Drive

SVR-K111

Features
- Max. 100Mbps transfer rate
- 1-axis Close-Loop Control
- K111: Current 2.8A
- Bi-polar current driving system
- Resolution: 500~50,000 pulse/revolution
- Encoder feedback
- DIP switch for address setting
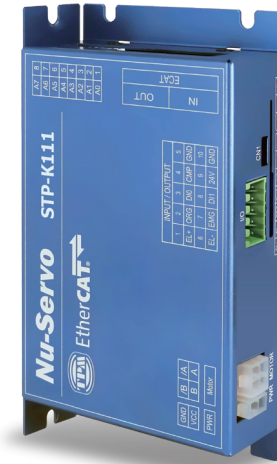- Dimensions: L-74 x W-140 x H-31 mm

STP-K111

Features
- Max. 100Mbps transfer rate
- 1-axis Micro-Step Control
- K111: Current 2.8A
- Bi-polar current driving system
- Resolution: 500~50,000 pulse/revolution
- DIP switch for address setting
- Dimensions: L-74 x W-140 x H-31 mm

SVR-K112

Features
- Max. 100Mbps transfer rate
- 1-axis Close-Loop Control
- K112: Current 4.2A
- Bi-polar current driving system
- Resolution: 500~50,000 pulse/revolution
- Encoder feedback
- DIP switch for address setting
- Dimensions: L-74 x W-140 x H-31 mm

STP-K112

Features
- Max. 100Mbps transfer rate
- 1-axis Micro-Step Control
- K112: Current 4.2A
- Bi-polar current driving system
- Resolution: 500~50,000 pulse/revolution
- DIP switch for address setting
- Dimensions: L-74 x W-140 x H-31 mm

SVR-K221

Features
- Max. 100Mbps transfer rate
- 2-axis Close-Loop Control
- K221: Current 1.8A / axis
- Bi-polar current driving system
- Resolution: 500~50,000 pulse/revolution
- Encoder feedback
- DIP switch for address setting
- Dimensions: L-75 x W-140 x H-47 mm

STP-K221

Features
- Max. 100Mbps transfer rate
- 2-axis Micro-Step Control
- K221: Current 1.8A / axis
- Bi-polar current driving system
- Resolution: 500~50,000 pulse/revolution
- DIP switch for address setting
- Dimensions: L-75 x W-140 x H-47 mm

SVR-M Series Close-Loop Drive

STP-M Series Micro-Step Drive

SVR-M111

Features
- Max. 20Mbps transfer rate
- 1-axis Close-Loop Control
- M111: Current 2.8A
- Bi-polar current driving system
- Resolution: 500~50,000 pulse/revolution
- Encoder feedback
- DIP switch for address setting
- Dimensions: L-74 x W-140 x H-31 mm
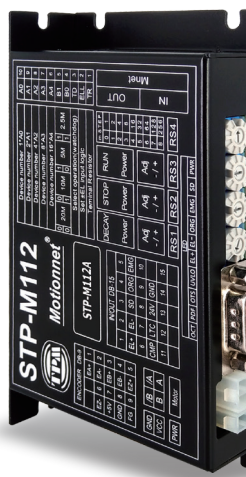
STP-M111A

Features
- Max. 20Mbps transfer rate
- 1-axis Micro-Step Control
- M111A: Current 2.0A
- Bi-polar current driving system
- 1/32 Micro-Step
- Encoder feedback
- Dimension: L-68 x W-125 x H-29mm

SVR-M112

Features
- Max. 20Mbps transfer rate
- 1-axis Close-Loop Control
- M112: Current 4.2A
- Bi-polar current driving system
- Resolution: 500~50,000 pulse/revolution
- Encoder feedback
- DIP switch for address setting
- Dimensions: L-74 x W-140 x H-31 mm

STP-M111G

Features
- Max. 20Mbps transfer rate
- 1-axis Micro-Step Control
- M111G: Current 2.0A
- Bi-polar current driving system
- 1/32 Micro-Step
- Dimension: L-68 x W-125 x H-29mm

SVR-M221

COMING SOON

Features
- Max. 100Mbps transfer rate
- 2-axis Close-Loop Control
- K221: Current 1.8A / axis
- Bi-polar current driving system
- Resolution: 500~50,000 pulse/revolution
- Encoder feedback
- DIP switch for address setting
- Dimensions: L-75 x W-140 x H-47 mm

STP-M112A

Features
- Max. 20Mbps transfer rate
- 1-axis Micro-Step Control
- M112A: Current 4.2A
- Bi-polar current driving system
- 1/256 Micro-Step
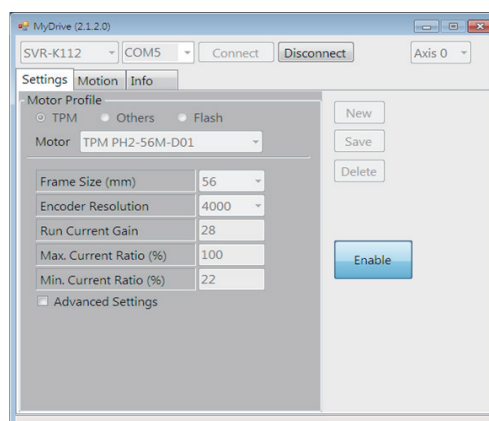- Encoder feedback
- Dimension: L-74 x W-140 x H-29mm

Nu-Servo®

Fieldbus Interface Drive

EtherCAT®

MyDrive
Motor Control Operation System