Mitsubishi Electric Corporation Nagoya Works is a factory certified for ISO14001 (standards for environmental management systems) and ISO9001 (standards for quality assurance management systems).
Evolving Quickly
to New Areas...

to Optics!

Raising the Bar to Reach Higher Performance with High-Speed Synchronous Network SSCNET III!

Mitsubishi has invented an original servo system network <SSCNET> in pursuit of reliability. SSCNET is an optical network that realizes smooth, high-response and high-accuracy operation under all circumstances.

※ SSCNET (Servo System Controller NETwork)

Super High-Resolution Encoder

High-Speed Communication

Improved Synchronization Accuracy

Phase Compensation

Command Synchronization System

Absolute Value System

Large Capacity Data Communication

Noise Resistance

Long-Distance Wiring

Reduced Wiring

Reduced Cable Preparation and Wiring Man-Hours

Parameter Batch Control

Easy Axis Addition

Integrated Development Environment

Multi-Axis Parameter Control

Multi-Axis Monitor

Multi-Axis Graph

SSCNET III

SSCNET
Smooth, High-Speed and High-Accuracy Operation

Servo technology has been remarkably advanced. SSCNET realizes high-performance and high-accuracy devices that could not be attained with conventional pulse train command or analogue command. There were problems with both pulse-train command and analogue command: former had a limited pulse frequency for a high-speed and high-accuracy control, and the latter was vulnerable to the line noise, voltage drop due to the cable length, and temperature drift. SSCNET, however, resolves these problems and realizes smoother operations with high speed and accuracy. The high-speed serial communication system in SSCNET allows the servo motor synchronous control system and absolute-position system to be easily structured, and the one-touch connection with the connector simplifies wiring. SSCNET consists of metal cable SSCNET/SSCNETII and optical fiber cable SSCNETIII.

Network Hierarchy

What is SSCNET?
Advantages of SSCNET

Powerful Device with Synchronous Communication
With the conventional pulse-train command, some operations such as synchronous startup and high-accuracy two-axis interpolation were difficult because the servo amplifier and Motion controller were asynchronously operated. SSCNET realizes powerful functionality of the devices (ex. printing machines, food-processing machines, machine tool, etc.) that require accurate synchronization.

Advantages of Central Control with Network
SSCNET can exchange large volume of data between the controller and servo amplifier in real time. Servo parameters can be set from the personal computer connected to the controller when Motion controller is in use. Motor speed, current position and voltage value of each axis can be monitored with the digital oscilloscope function.

Easy Structure of Absolute System
An I/O module is necessary for sending/receiving the ABS data to structure an absolute system with a pulse-train command, and wiring is also required between the I/O module and servo amplifier. SSCNET does not require any wiring, and structuring an absolute system is very easy. Since home-position return operations are unnecessary, operations can be started up shortly after the power is on even with many axes.

Reduced Wiring
SSCNET can be connected only by inserting the dedicated cable into connectors. No more complicated wiring is necessary.

Improved Reliability
SSCNET offers a high degree of accuracy and communication reliability with its data communication. When an error occurs during communication, the current data is discarded and the following normal data is used.
SSCNETIII Features

Improved Communication Speed and Command Communication Cycle

The command communication cycle (transmission communication cycle) to the servo amplifier is improved (SSCNET: 0.88ms → SSCNETIII: 0.44ms) by increasing the communication speed from 5.6Mbps to 50Mbps. This improvement also allows synchronization accuracy and speed/position accuracy to be enhanced.

![Graph showing improved communication speed](image)

Long-Distance Wiring

The cable length per system can be extended for long-distance wiring with SSCNETIII.

![Diagram showing long-distance wiring](image)

Large devices can be handled if the control panel is placed away from the drive section in a large-scale device or production line. The separable controller section and drive section can shorten the power cable wired between the servo amplifier and servo motor.

![Diagram showing control panel downsizing](image)

SSCNETIII communication cycle differs according to the controller specifications.
High Speed and Accuracy with Synergic Effect with MR-J3

Combined with MR-J3, SSCNET III realizes faster and smoother operations for higher speed (maximum HF-KP motor speed: 6000r/min) and higher accuracy (HF-KP motor resolution: 262144p/rev).

Shorter Adjustment Time with Servo Adjustment and Multiple Monitor

MR Configurator (Setup software) can be used via SSCNET III. Parameters for the amplifier connected to SSCNET III can be set and monitored only connecting a personal computer to the Motion controller.

Improved Noise Resistance

The optical fiber cables used for SSCNET III dramatically improve the resistance against noise which enters from the power cable or external devices.

SSCNET Specifications

<table>
<thead>
<tr>
<th>Item</th>
<th>SSCNET III</th>
<th>SSCNET II</th>
<th>SSCNET</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication Medium</td>
<td>Optical Fiber Cable</td>
<td>Standard Cord for Inside Panel</td>
<td>Metal Cable</td>
</tr>
<tr>
<td>Standard Cable for Outside Panel</td>
<td>Long Distance Cable (Note-1)</td>
<td>Metal Cable</td>
<td></td>
</tr>
<tr>
<td>Communication Speed</td>
<td>5Mbps</td>
<td>5.6Mbps</td>
<td>5.6Mbps</td>
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<tr>
<td>Communication Cycle (Note-2)</td>
<td>0.44ms/0.88ms</td>
<td>0.88ms</td>
<td>0.88ms/1.77ms/3.55ms</td>
</tr>
<tr>
<td>Maximum Control Axes per System</td>
<td>Communication Cycle 0.44ms/8 axes/system</td>
<td>6 axes/system</td>
<td>8 axes/system</td>
</tr>
<tr>
<td>Transmission Distance</td>
<td>Maximum 20m between Stations (20m x 16 axes)</td>
<td>Maximum 50m between Stations (50m x 16 axes)</td>
<td>Overall Distance 30m</td>
</tr>
<tr>
<td>Noise Resistance</td>
<td>☑</td>
<td>☑</td>
<td>☑</td>
</tr>
</tbody>
</table>

(Note-1) : Special-order product.
(Note-2) : Communication cycle differs according to the controller specifications.
For safe use

- To use the products given in this catalog properly, always read the “manuals” before starting to use them.
- These products have been manufactured as a general-purpose part for general industries, and have not been designed or manufactured to be incorporated in a device or system used in purposes related to human life.
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