SANYO DENKI

SANMOTION C S200

Motion controller

Ver.1
English

SANMOTION C
MOTION CONTROLLER

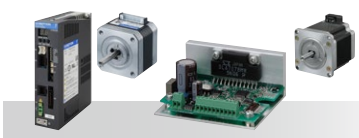
High-Precision Motion Controller for Enhancing Productivity and Quality

Motion Controller Lineup

Series		SANMOTION C S200		SANMOTION C S100		SANMOTION C S500		
Model no.		SMC200-A	SMC200-B	SMC100-A	SMC100-B	SMC505	SMC507	SMC520
								
CPU		1.0 GHz				1.75 GHz	1.91 GHz	2 GHz
Memory		1 GB				2 GB		4 GB
Max. no. of controllable axes		8				64		
Communication cycle		2 ms or more				1 ms or more		
Supported control types		Position control, speed control, torque control	—	Position control, speed control, torque control	—	Position control, speed control, torque control		
Robot control	Supported robots	Cartesian robots, SCARA robots, parallel link robots (only with CNC function)	—	Cartesian robots, SCARA robots, parallel link robots	—	Cartesian robots, SCARA robots, parallel link robots, palletizing robots, 6-/7-axis articulated robots		
	Communication cycle	8 ms or more	—	8 ms or more	—	4 ms or more	2 ms or more	1 ms or more
Input voltage	Main circuit power supply	Rated voltage: 24 VDC (voltage range: 19.2 to 30 V)						
	I/O power supply	Rated voltage: 24 VDC (voltage range: 19.2 to 30 V)				—		
Built-in interface specifications	EtherCAT	100 Mbps (master function), FoE-compatible				100 Mbps (master function)		
	Ethernet	10/100/1000 Mbps, 1 port				10/100/1000 Mbps, 2 ports		
	Serial	RS-485				RS-232C/RS-422/RS-485 selectable in software, 1 port		—
	USB port	USB 2.0 Type A × 1				USB 3.0 Type A × 1		USB 2.0 Type A × 1, USB 3.0 Type A × 1
		Memory storage, wireless adapter (Model no.: SMC-USBW-01), webcam		Memory storage, wireless adapter (Model no.: SMC-USBW-01)		Memory storage		
	microSD card	Up to 32 GB		—		2 GB for runtime software		—
	CFast card	—				—		4 GB (type 1)
	1-Wire®	15400 bps, half-duplex bidirectional communication		—		—		
General-purpose digital input	Number of circuits	16				Scalable with modules		
	Input type	Positive/Negative common, rated input voltage of 24 VDC						
General-purpose digital output	Number of circuits	8						
	Output type	Sinking output (Rated load voltage: 24 VDC; maximum load current: 0.5 A/output)						
General-purpose analog output	Number of circuits	2		—				
	Output type	Current output						
	Output signal range	4 to 20 mA						
	Resolution	4000						
	Accuracy	±0.5% of FSR (full-scale range)						
Catalog		Listed in this catalog.		Catalogs available from our website.				

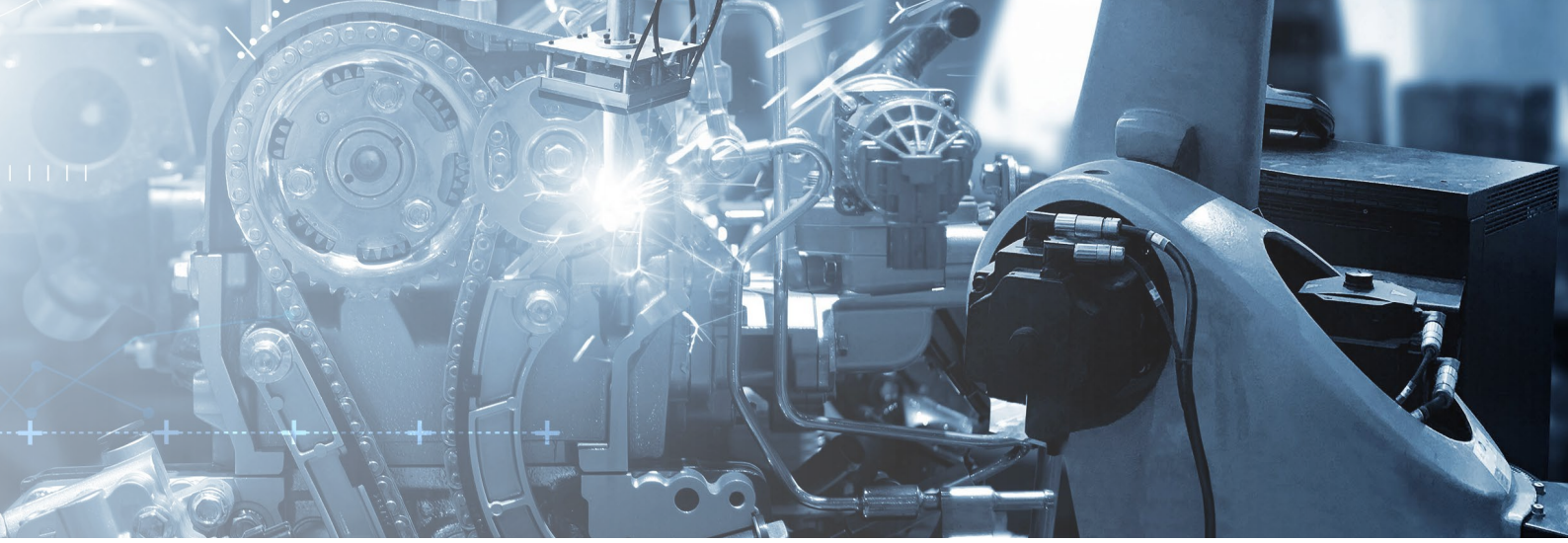
SANMOTION is a brand name for SANYO DENKI's Servo Systems products, such as servo motors, servo amplifiers, and stepping motors.

AC Servo Systems
SANMOTION G
SANMOTION R



Stepping Systems
SANMOTION F2 (2-Phase)
SANMOTION F3 (3-Phase)
SANMOTION F5 (5-Phase)

Closed Loop Stepping Systems
SANMOTION Model No.PB



SANMOTION C S200

EtherCAT®

Compact

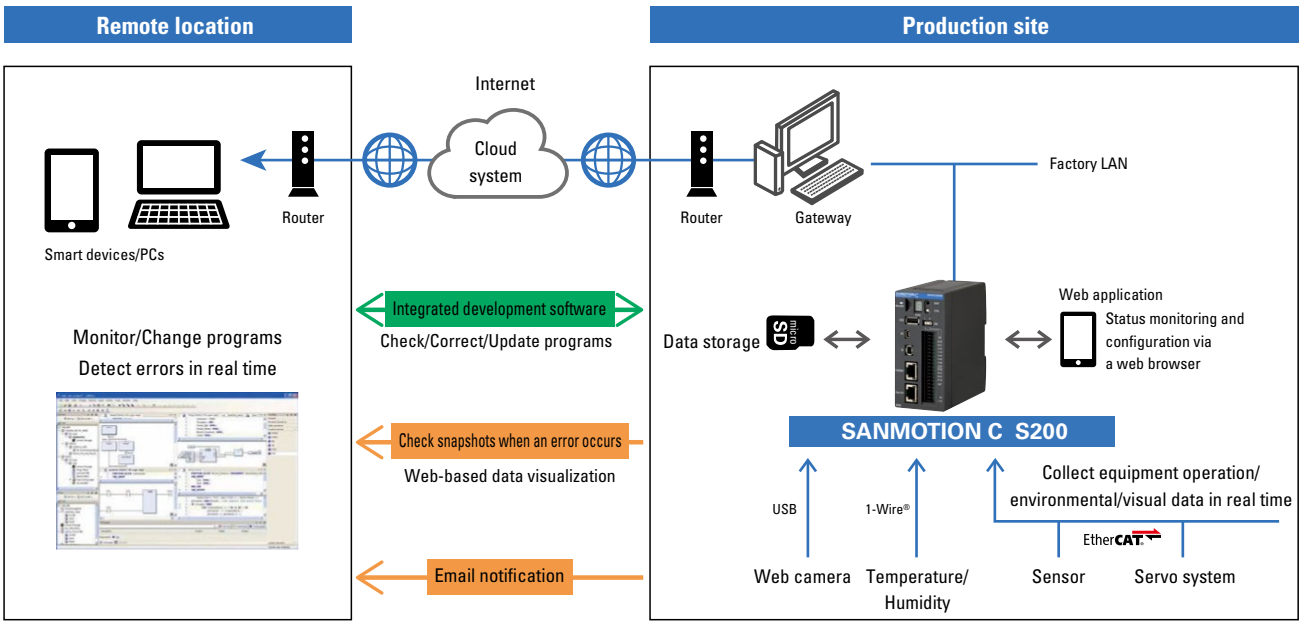
This is a compact motion controller featuring high-speed EtherCAT fieldbus.

Collects Equipment Operating Data for Improved Productivity

The controller can collect and store the operating status of a servo system and various sensor information in real time.
In addition, by connecting a webcam to the USB port, on-site images can be easily captured.
Leveraging the stored data contributes to improving equipment productivity.
Equipment can be monitored and operated remotely, improving the maintainability.

Improved System Maintainability

When equipment malfunctions, users will be notified via email. Also, the controller can be accessed remotely to check errors and equipment status, and change programs.
This contributes to minimizing equipment downtime and reducing maintenance costs.



SANMOTION C S200 Motion Controller for IoT-Based Remote Monitoring and Maintenance of Equipment

Reduce system wiring

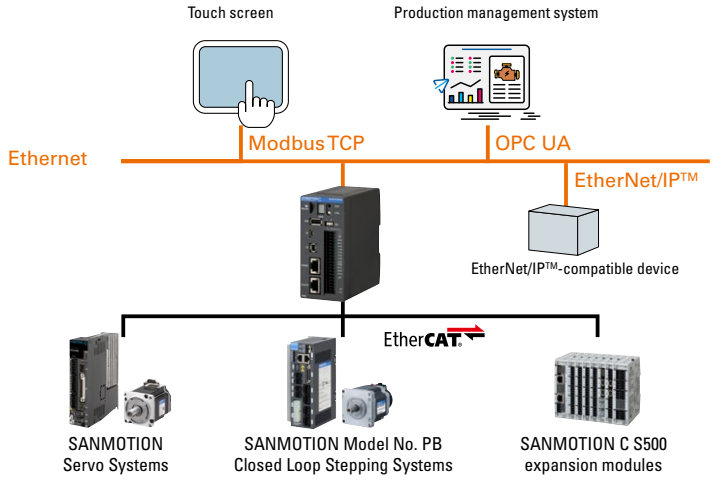
EtherCAT communication supported

EtherCAT connectivity reduces wiring, **contributing to reducing system costs**. We offer various EtherCAT-compatible products, including the SANMOTION G and SANMOTION R AC servo systems and the SANMOTION Model No. PB closed-loop stepping systems, providing selection options for your system needs.

Make your system IoT-ready

Supports various networks for sharing information

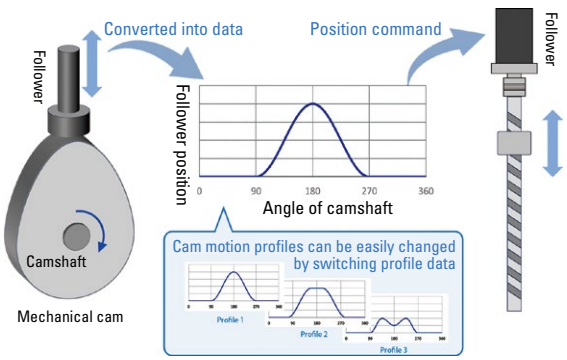
With a variety of open networks supported, including EtherCAT®, EtherNet/IP™, Modbus TCP, and OPC UA, it can contribute to **making factories automated and IoT-ready** by enabling information sharing between devices in real time.



Reduce engineering costs

Electronic cam

The controller is equipped with an electronic cam function that realizes mechanical cam motions through software. The function creates mechanical cam motion digitally by programming the camshaft position data and the corresponding follower position data.
With the electronic cam function replacing conventional mechanical cams, the **cost of engineering mechanical cams can be reduced**.



Capitalize on robots

Robot control using CNC function

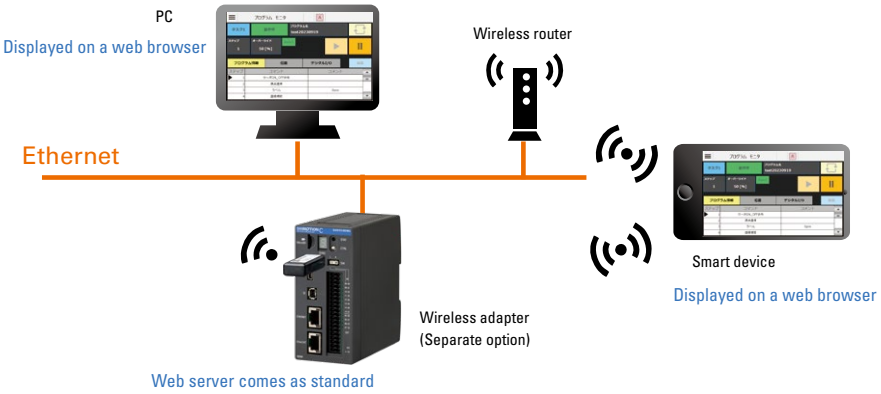
G-code (DIN 66025 compliant) enables control of various robot mechanisms such as cartesian, SCARA, and delta robots.

Cartesian robot　SCARA robot　Parallel link robot

View operation screen without special equipment

Access as HMI from a web browser

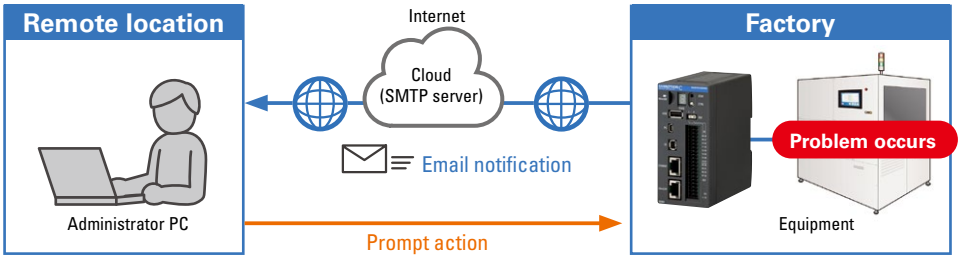
The controller features a web-based data visualization function for creating HMI screens by placing graphical elements such as buttons and lamp components and assigning program variables. HMI screens can be displayed from a web browser, with the controller acting as a web server.



Address abnormalities immediately

Real-time email notification of equipment status changes

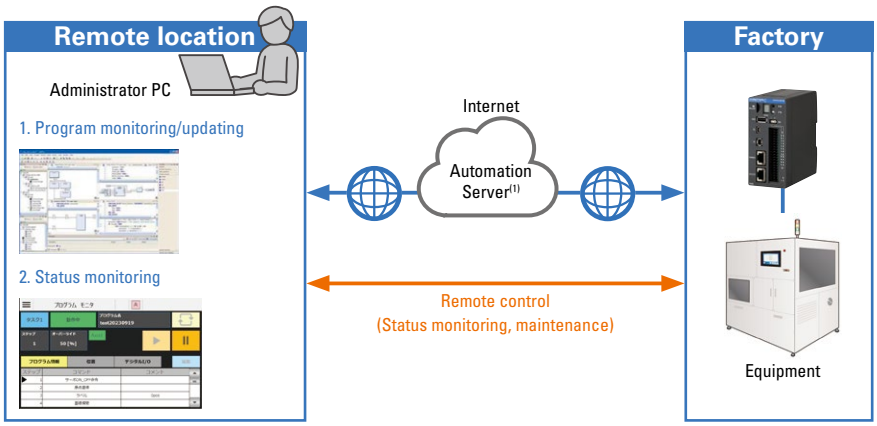
A remote administrator will be immediately notified upon detection of a malfunction.
This enables swift responses to abnormalities, **minimizing equipment downtime**.
Email notifications are triggered by a program command and sent to a predefined email address.



Remote control of motion controller

With the controller's Ethernet port connected to the internet, program updating and status monitoring can be done remotely.
Equipment can be monitored and maintained without having to visit the site.

Perform maintenance remotely

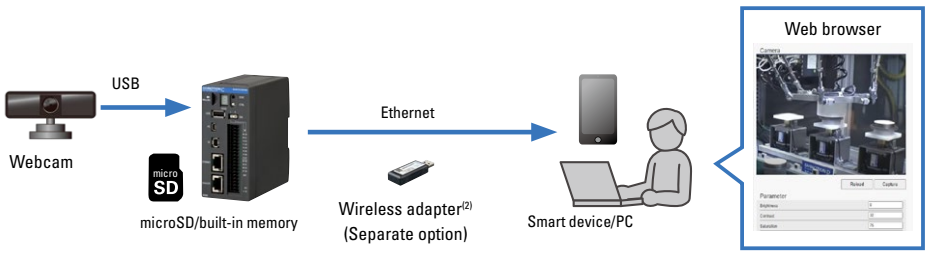


(1) Automation Server is a cloud service provided by CODESYS.
To use this service on a free trial, you need to agree to the Terms of Use and apply for an account with SANYO DENKI. For an extended paid service, you need to create an account with CODESYS.

Easy connection to webcam

With a UVC (USB Video Class) webcam connected to the controller's USB port (Type A), **the equipment environment can be video-monitored from a web browser**. In addition, snapshots can be captured in the built-in memory or microSD card with a program command.

Monitor equipment with video and snapshots

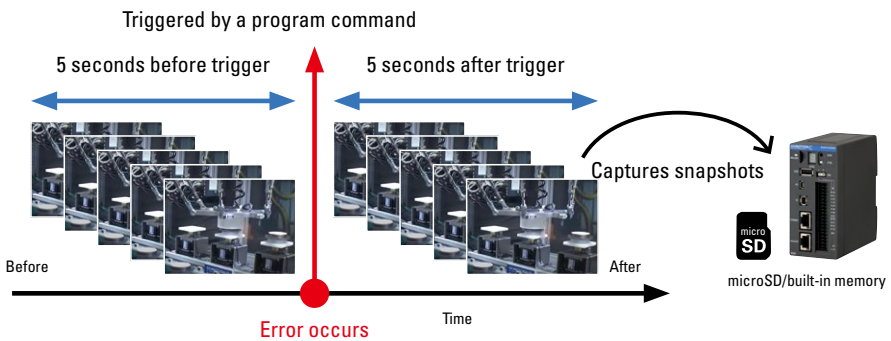


(2) To use a webcam and wireless adapter in combination, a commercially available USB hub (self-powered) is required.

Snapshot capturing

With a program command, snapshots of 100-ms intervals can be captured and saved in the built-in memory or microSD card for **up to 5 seconds before and after** or up to 10 seconds before a trigger. For example, with a program command using an error event as a trigger, the controller can capture snapshots of the **5 seconds before and after** the trigger.

Check how an error occurred

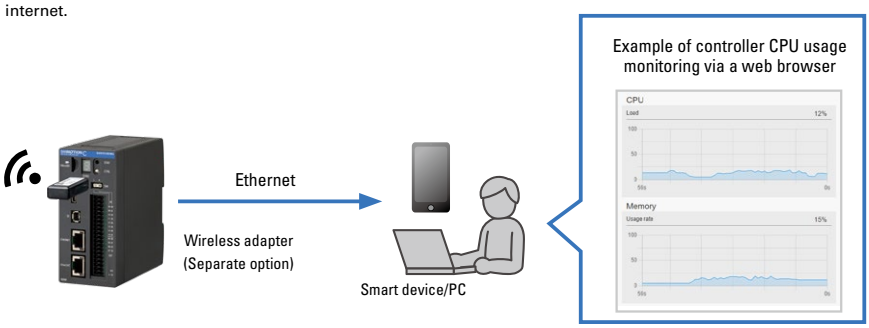


Set up without dedicated software

Browser-based settings and status display

The controller features a web application(3) for configuring the controller's IP address and monitoring the digital I/O status directly from a web browser. **No dedicated software is required.** Controller settings and status monitoring can be done with ease.

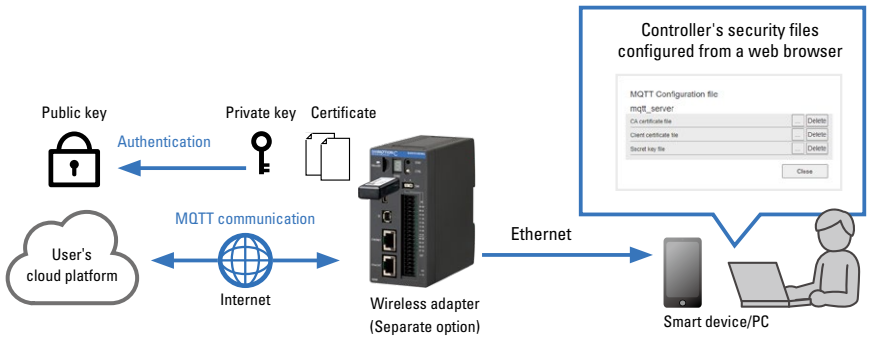
(3) Operable from a web browser on a device within the same network; however, it cannot be accessed via the internet.



Connect to cloud platforms easily

Connecting to cloud platforms

For users to connect to their cloud platforms, the controller supports the MQTT communication protocol with authentication features. Security certificates and private key files can be configured using a web browser, enabling **quick connection to cloud platforms**.

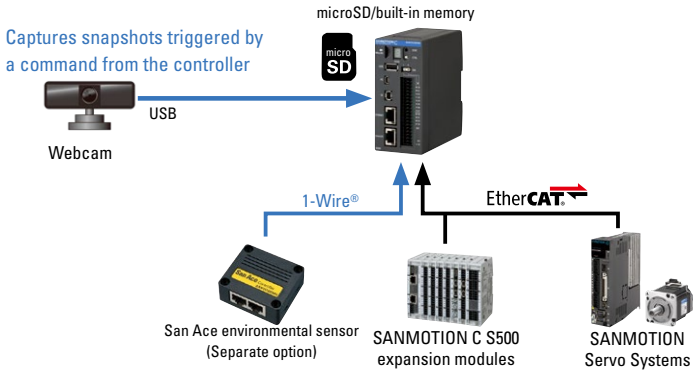


Better analyze the root cause

Time-series data logging

Environmental (temperature/humidity) data of a servo system can be logged chronologically in the built-in memory or microSD card (up to 32 GB) with a program command. **Data can be logged at a minimum interval of 2 ms and stored in a CSV format file.** Additionally, snapshots of an error event, for up to 5 seconds before and after, can be captured to help analyze the root cause.

Environmental (temperature/humidity) data can be acquired from San Ace environmental sensors or SANMOTION C S500 expansion modules.

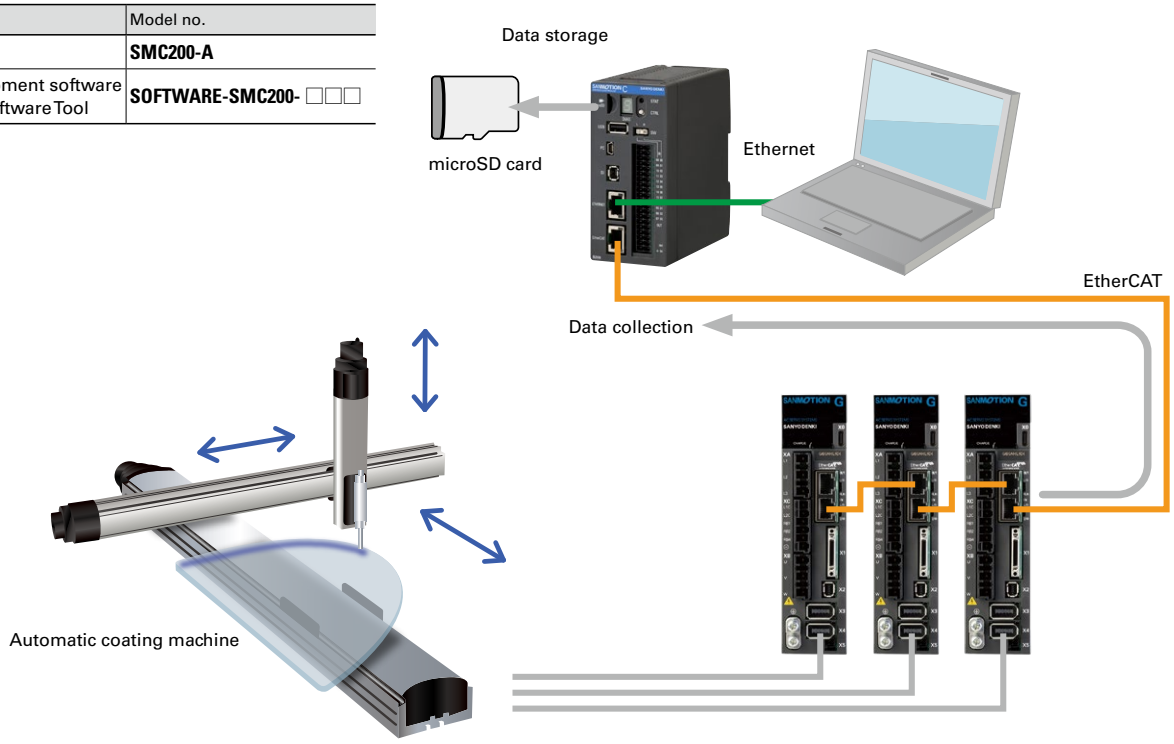


System Configurations

Automatic coating machine

Interpolation control

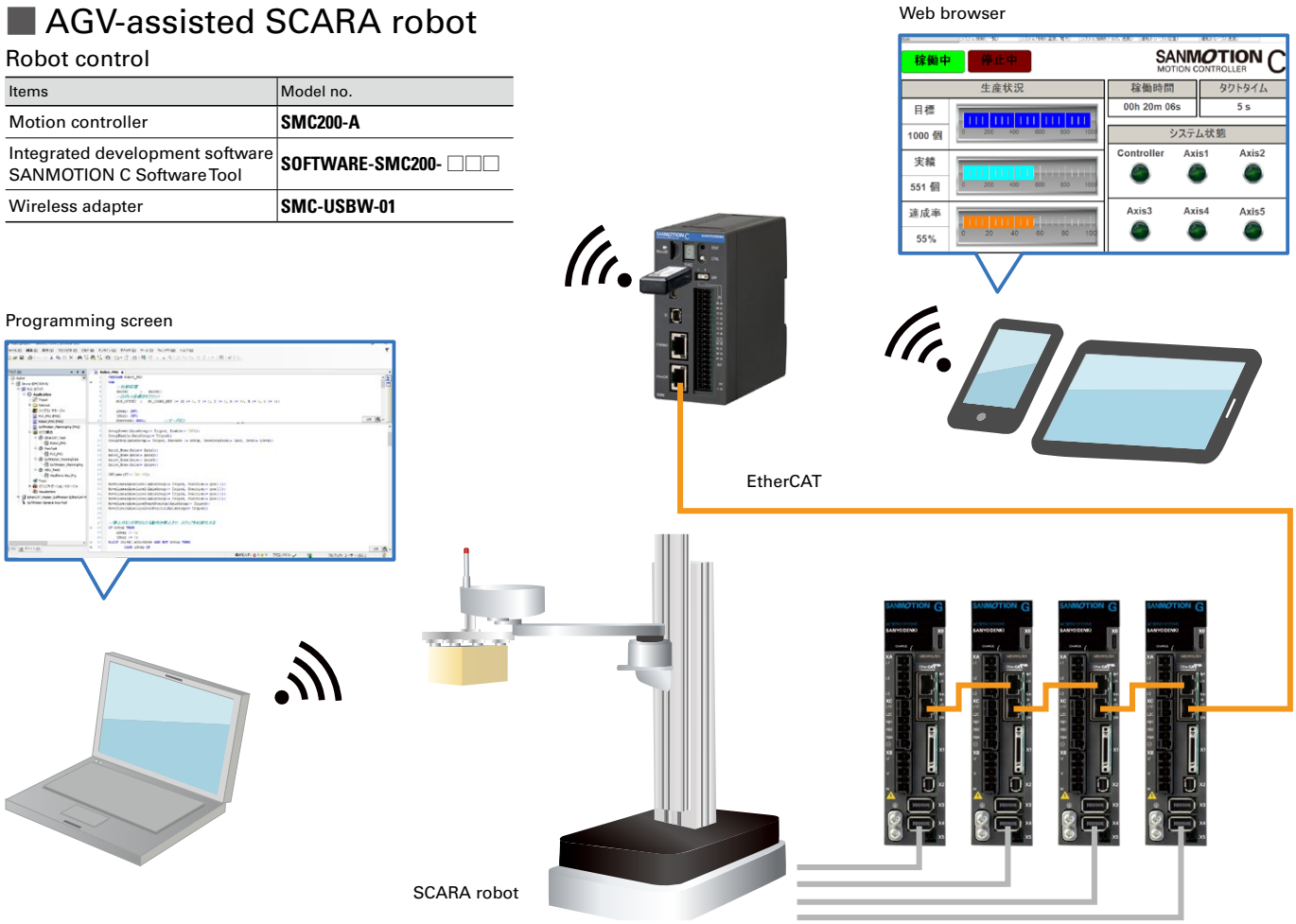
Items	Model no.
Motion controller	**SMC200-A**
Integrated development software SANMOTION C Software Tool	**SOFTWARE-SMC200-** □□□



AGV-assisted SCARA robot

Robot control

Items	Model no.
Motion controller	**SMC200-A**
Integrated development software SANMOTION C Software Tool	**SOFTWARE-SMC200-** □□□
Wireless adapter	**SMC-USBW-01**

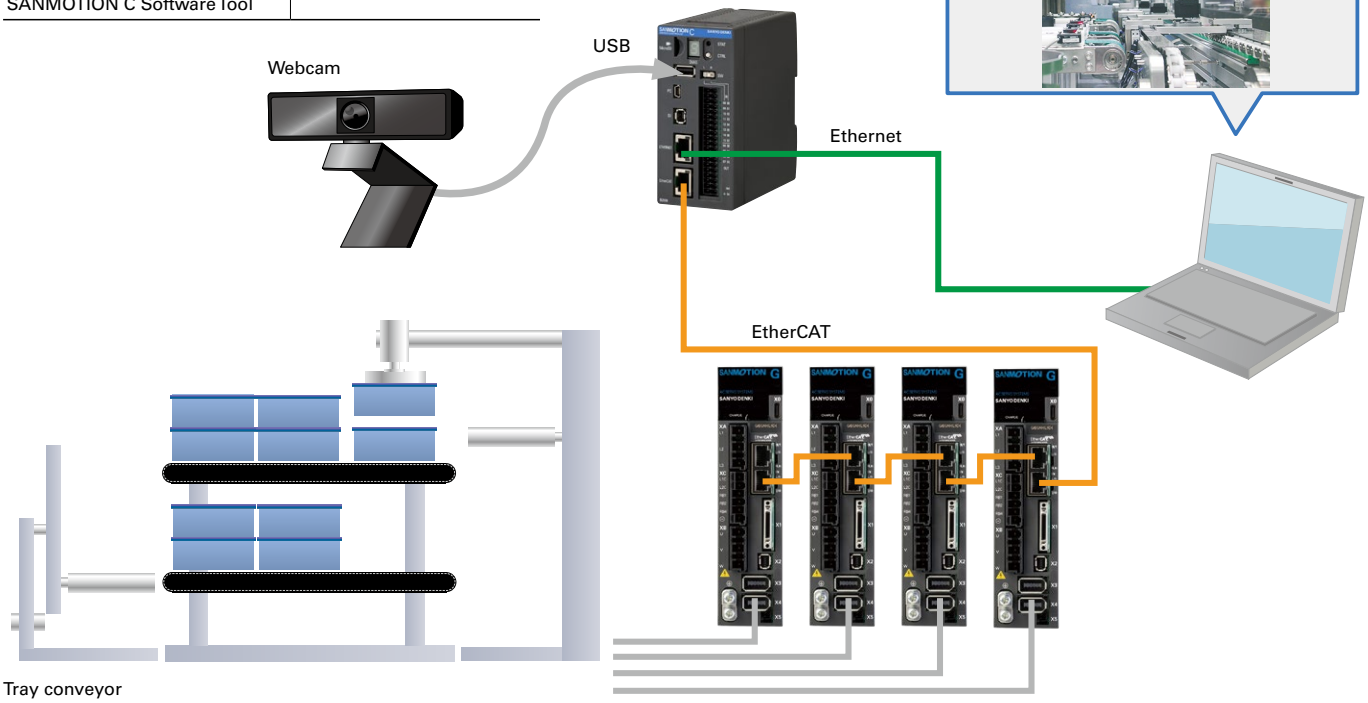


Tray conveyor

PTP motion control

Items	Model no.
Motion controller	**SMC200-B**
Integrated development software SANMOTION C Software Tool	**SOFTWARE-SMC200-** □□□

On-site video

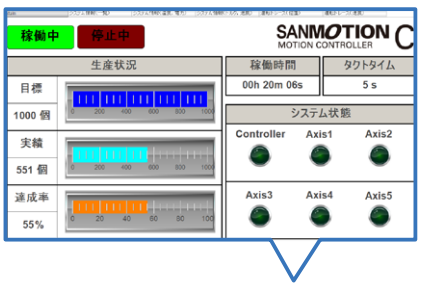


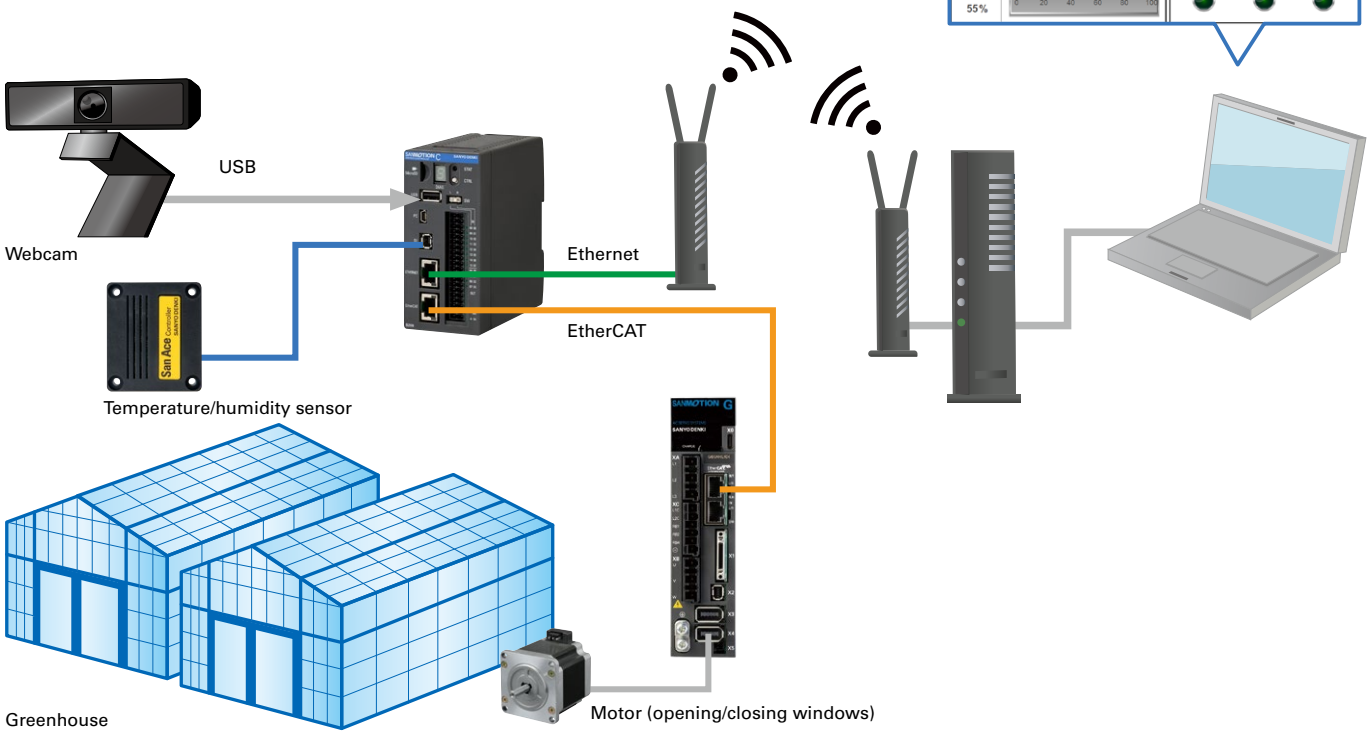
Greenhouse temperature management

Remote monitoring, motion control

Items	Model no.
Motion controller	**SMC200-A**
Integrated development software SANMOTION C Software Tool	**SOFTWARE-SMC200-** □□□
Temperature/humidity sensor	**9CT1-T**

Remote monitoring



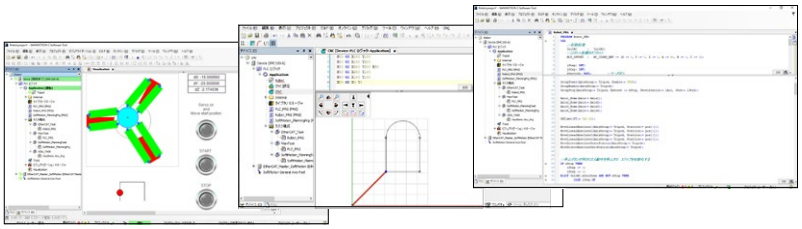


Software and Peripherals

Integrated development software SANMOTION C Software Tool 2.0.0

This software features various functions for system development.

- Programming tool
- Electronic cam editor
- Configuration tool
- Simple HMI (human machine interface) tool
- Analysis and diagnostic tool



Wireless Adapter for enabling wireless communication for motion controllers

- SANMOTION products can be diagnosed and configured using smart devices.
- Wireless LAN network can be enabled by simply connecting the adapter to the controller's USB port.
- Configurable with the controller for use in various countries.

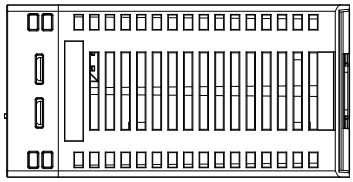
Specifications

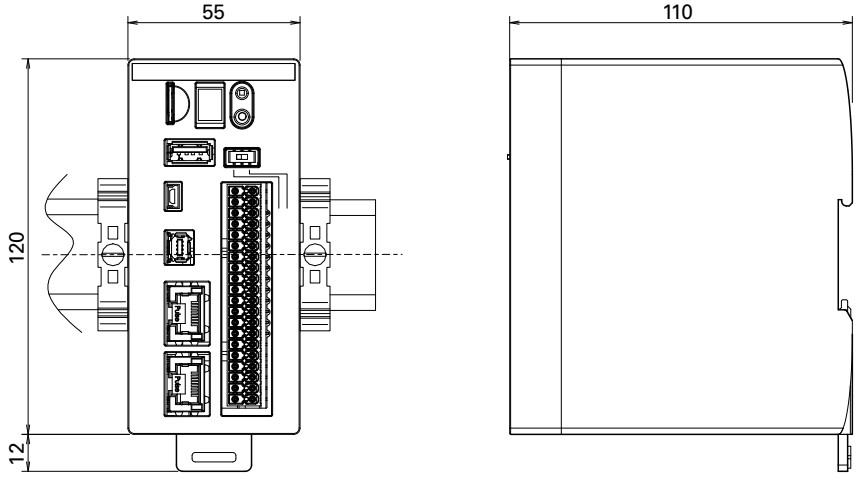
Model no.		SMC200-A	SMC200-B
Interface		EtherCAT® (100 Mbps) master function, FoE-compatible	
		Ethernet (10/100/1000 Mbps), other supported protocols: Modbus TCP, OPC UA, Ethernet/IP™	
		RS-485 (9600 to 115200 bps)	
		1-Wire® (15400 bps, half-duplex bidirectional communication)	
		USB 2.0 Type A (memory storage, wireless adapter (Model no.: SMC-USBW-01), webcam)	
		MicroSD card slot (up to 32 GB)	
General-purpose digital input	Number of circuits	16	
	Input type	Positive/Negative common, rated input voltage of 24 VDC	
General-purpose digital output	Number of circuits	8	
	Output type	Sinking output (Rated load voltage: 24 VDC; maximum load current: 0.5 A/output)	
General-purpose analog output	Number of circuits	2	
	Output type	Current output	
	Output signal range	4 to 20 mA	
	Resolution	4000	
	Accuracy	±0.5% of FSR (full-scale range)	
Input voltage	Main circuit power supply	Rated voltage: 24 VDC, voltage range: 19.2 to 30 VDC, rated current: 0.9 A	
	I/O power supply	Rated voltage: 24 VDC, voltage range: 19.2 to 30 VDC, rated current: 125 mA	
Power consumption		22 W	
Cooling method		Natural air cooling	
Dimensions		55 (W) × 120 (H) × 110 (D) mm	
Mass		300 g	
Control functions		Sequence control Motion control (Electronic cam, electronic gear, linear interpolation, circular interpolation) Robot control: Using CNC function (Cartesian coordinate, SCARA, parallel link)	Sequence control Motion control (PTP control)
Control language		IEC 61131-3 standard programming languages	
		G-code (complies with DIN 66025)	—
Network functions		Web-based data visualization	
		MQTT communication	
		SMTP communication	
		Web application	
Operating ambient temperature		0 to +55°C	
Storage ambient temperature		-40 to 70°C	
Operating/storage humidity		10 to 95% (non-condensing)	
Vibration resistance		Constant amplitude: 3.5 mm (5 to 8.4 Hz) conforming to JIS B 3502:2011 Constant acceleration: 10 m/s² (8.4 to 150 Hz) conforming to JIS B 3502:2011	
Shock resistance		Peak acceleration: 147 m/s², duration 11 ms conforming to JIS B 35:02:2011	
Operating altitude		2000 m max.	
Installation location		In control panel	
Overvoltage category		II or lower	
Degree of pollution		2 or lower	

Dimensions [Unit: mm]

Motion Controller

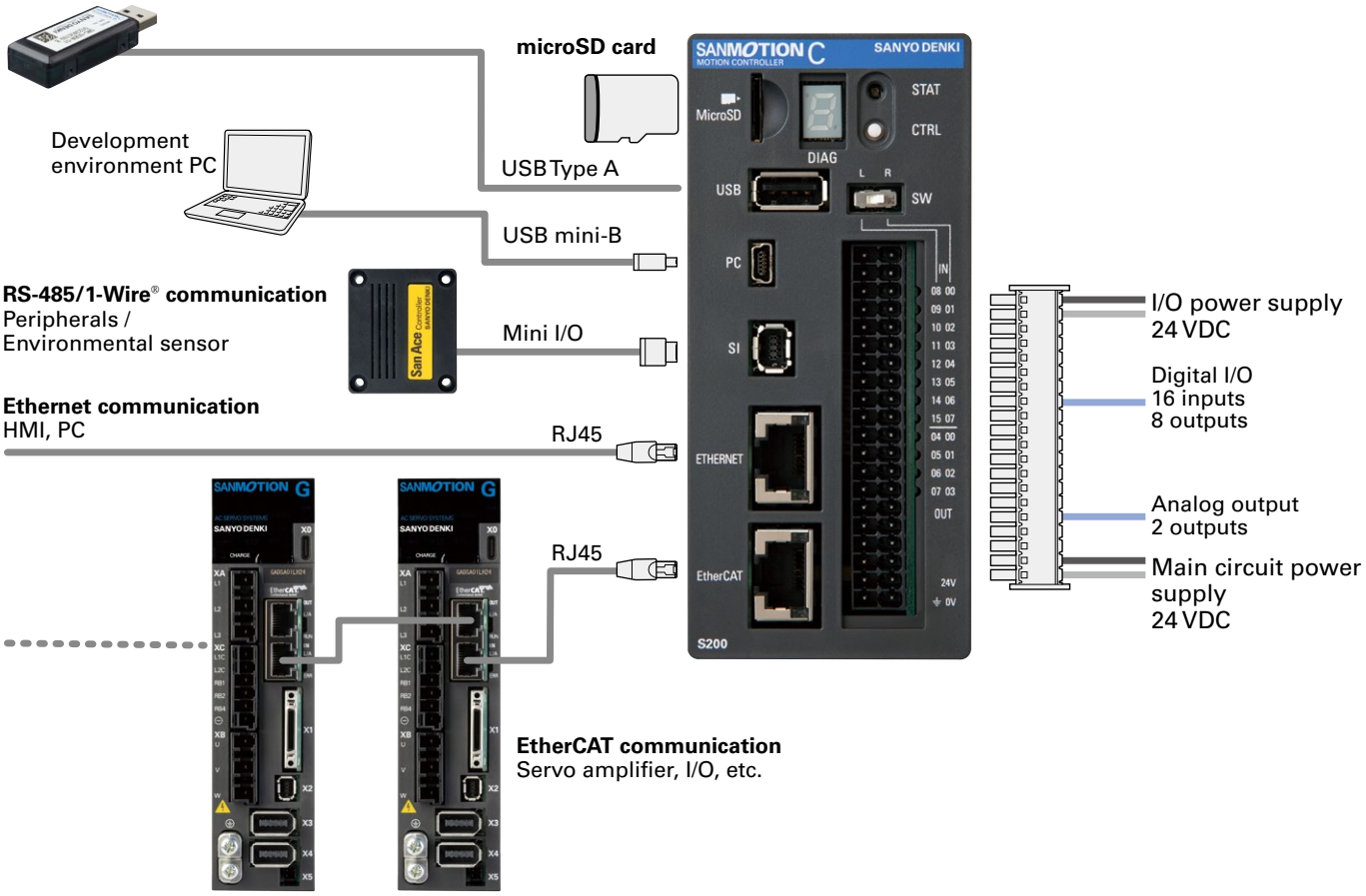
Model: SMC200-A, SMC200-B





System Configuration Diagram

USB host function
Wireless adapter / memory storage / webcam
Note: A commercially available USB hub (self-powered) is required for combination use.



Motion control functions

Number of controllable axes	8
Communication cycle	2 to 16 ms
Supported control types	Position control, speed control, torque control
Acceleration/deceleration profile	Trapezoidal, sine squared, and trapezoidal with jerk limit
Unit for positioning control	Arbitrary (pulse, mm, inch, degree)
Programming language	IEC 61131-3 standard languages: IL (instruction list), ST (structured text), LD (ladder diagram), FBD (function block diagram), SFC (sequential function chart), CFC (continuous function chart)
Function blocks	Homing, incremental mode, absolute mode, constant speed mode
	Model SMC200-A only: Electronic cam, electronic gear

Robot control functions (Model SMC200-A only)

No. of controllable axes	Robot: 4 axes max.
Communication cycle	8 to 16 ms
Supported control types	PTP motion, 3D linear interpolation, 3D circular interpolation
Teaching method	Numeric input
Unit for positioning control	Arbitrary (pulse, mm, inch, degree)
Programming language	G-code
Supported robots	Cartesian coordinate (3 axes), SCARA (4 axes), parallel link (4 axes)

EtherNet/IP™ general specifications

Common	Interface	Ethernet (10/100 Mbps) Note: Can be combined with Modbus TCP, etc.
	Communication role	Scanner function: Network master Adapter function: Network slave Note: Cannot be used at the same time.
	Node distance	100 m or less
	Topology	Star
	Communication cable	Shielded twisted pair cable, category 5/5e or higher recommended
Scanner	Maximum no. of connectable units	4
	Minimum communication cycle	50 ms
Adapter	Device type	12
	Maximum data length	Output: 508 bytes, input: 504 bytes (Recommended output: 128 bytes, input: 128 bytes)
	Minimum communication cycle	50 ms
	Supported data types	BYTE (1 byte) WORD (2 bytes) DWORD (4 bytes) REAL (4 bytes) Big (A collection of byte-type data with the maximum data length)

1-Wire® general specifications

Communication role	Master
Maximum no. of connectable units	7
Communication speed	15400 bps
Communication system	Half-duplex bidirectional communication
Communication range	Max. 200 m
Topology	Multi-drop

Software

■ Integrated development software - SANMOTION C Software Tool 2.0.0

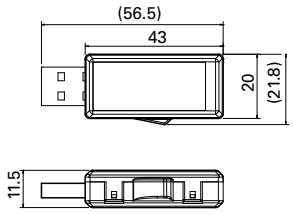
Model no.	Use
SOFTWARE-SMC200- □□□	Integrated development software for sequence/motion/robot control

Peripherals

■ Wireless adapter

Model no.			**SMC-USBW-01**
General specifications	Dimensions		21.8 (W) × 11.5 (H) × 56.5 (D) mm
	Mass		Approx. 10 g
	Rated voltage		5 VDC
	Interface		USB 2.0 Type A
	Use with		SANMOTION C S100 and S200 motion controllers only
	Operating environment	Temperature	0 to +55°C
		Humidity	10 to 95% (non-condensing)
Functions	Wireless standard		Compliant with IEEE802.11b / IEEE802.11g / IEEE802.11n
	Operating frequency band		2.4 GHz band
	Channels		1 to 13
	Maximum data transfer rate		72.2 Mbps
	Wireless LAN mode		Access point mode (Acting as a master network station)
			Station mode (Acting as a slave network station)
	Maximum no. of connectable units		3 (in access point mode)
	Security		WPA2-PSK (AES)
Usable in	Japan		Technical Standard Conformity Certification, VCCI
	Europe		CE (RE Directive, RoHS2)
	North America		FCC, ISED
	China		SRRC
	Taiwan		NCC

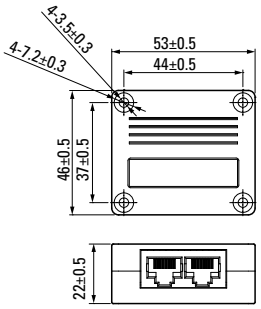
Dimensions (Unit: mm)



■ Environmental sensor module

Sensor type	Temperature/humidity sensor	Barometer
Model no.	**9CT1-T**	**9CT1-P**
Measurement range	Temperature: -20 to +70°C Humidity: 20 to 85% RH (non-condensing)	Barometric pressure: 800 to 1100 hPa
Operating temperature range	-20 to +70°C	
Operating humidity range	20 to 85% RH (non-condensing)	
Dimensions	53 (W) × 46 (D) × 22 (H) mm	
Mass	35 g	
Material	Case: Plastic	

Dimensions (Unit: mm)



Options

■ Connector sets

Model no.	Use	Manufacturer part no.
AL-01174555-01	Power-I/O connector	Phoenix Contact K.K. DFMC 1,5/20-ST-3,5
AL-01139898-03	RS-485/1-Wire® connector	TE Connectivity 2040008-2

■ USB communication cables

Model no.	Cable length	Use
AL-00896515-01	1 m	USB communication cable
AL-00896515-02	2 m	

■ EtherCAT® cables with RJ45 plug

Model no.	Cable length	Specifications	Manufacturer
AL-01109322-R50	0.5 m	Plug: RJ45 (TM21P-88P), on both ends Boot color: black Cable: 20276 ESVP AWG#24X4P, CAT5e	Plug: Hirose Electric Co., Ltd. Cable: Bando Densen Co., Ltd.
AL-01109322-01	1 m		
AL-01109322-03	3 m		
AL-01109322-05	5 m		
AL-01109322-10	10 m		

■ Ethernet cables with RJ45 plug

Model no.	Cable length	Specifications	Manufacturer
AL-01111556-01	1 m	Plug: RJ45 (TM21P-88P), on both ends Boot color: yellow Cable: 20276 ESVP AWG#24X4P, CAT5e	Plug: Hirose Electric Co., Ltd. Cable: Bando Densen Co., Ltd.
AL-01111556-03	3 m		
AL-01111556-05	5 m		
AL-01111556-10	10 m		

■ RS-485/1-Wire® cables with Industrial Mini I/O plug

Model no.	Cable length	Specifications	Manufacturer
AL-01119298-03	3 m	Plug: Industrial Mini I/O connector type II	Plug: TE Connectivity Cable: Bando Densen Co., Ltd.
AL-01119298-05	5 m		
AL-01119298-10	10 m		

ECO PRODUCTS

■ ECO PRODUCTS

ECO PRODUCTS are designed to reduce the environmental impacts throughout the product's life cycle. Ranging from design to manufacturing stages, the environmental impact of a product and its packaging materials is assessed against the eco-design requirements. Those products that satisfy the requirements are accredited as ECO PRODUCTS.

Notes Before Purchase

- Read the accompanying Instruction Manual carefully prior to using the product.
- Do not use this product in an environment where vibration is present, such as in moving vehicles or shipping vessels.
- Do not modify or alter the product in any way.

Please contact us beforehand if you intend to use this product in the following applications.

- Medical equipment that may have an effect on human life
- Systems or equipment that may have a major impact on society or on the public.
- Special applications related to aviation and space, nuclear power, electric power, submarine repeaters, etc.

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