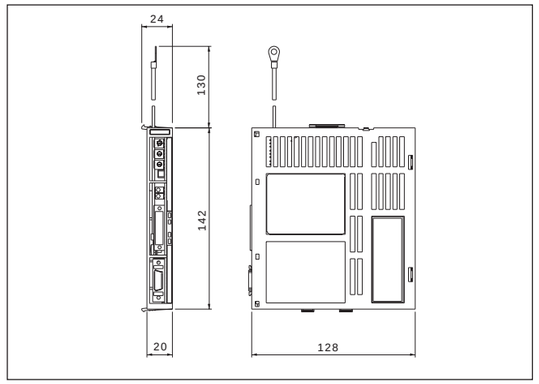
DeviceNet Communications Specifications

Item		Details	
DeviceNet communications	Unit type	Slave Unit	
	Baud rate	125 kbps, 250 kbps, or 500 kbps (selected with rotary switch)	
	Communications functions	Remote I/O communications (operates as slave) and explicit message communications (sends explicit messages)	
	Communications contents	Remote I/O communications	•Move commands for positioning •Origin compensation (when absolute encoder is used) •Reading and writing Servo Driver and DeviceNet Option Unit parameters •Reading monitor items •Present position compensation •Alarm reset
		Explicit message communications	•Setting trace function •Reading trace data •Reading and writing Servo Driver and DeviceNet Option Unit parameters
	Connection format	Combinations of multi-drop method and T-branch method	
	Maximum number of nodes	64 (including Master Unit, Slave Units, and Configurator if connected)	
	Node address settings	Select address between 0 and 63 with rotary switch.	

General Specifications

Item		Details
Applicable Servo Drivers		R88D-WT☐ (software version 14 or later)
Mounting method		Mounted to the side of R88D-WT☐ Servo Drivers
Basic specifications	Power supply voltage	Unit: Supplied from the Servo Driver DeviceNet: 11 to 25-VDC Isolated Power Supply Unit
	Power consumption	1.3 W (current consumption: 250 mA)
	Ambient operating temperature and humidity	0 to 55 C, 90% max. (with no condensation or corrosive gases)
	Ambient storage temperature and humidity	–20 to 85 C, 90% max. (with no corrosive gases)
	Vibration resistance	4.9 m/s²
	External dimensions	20 x 142 x 128 mm (W x H x D)
	Approximate weight	0.2 kg
International standards		EC Directives, UL/cUL

Dimensions (mm)



Available Models

Product name	Model number
DeviceNet Option Unit	R88A-NCW152-DRT
External I/O Connector	R88A-CNU01R
Cable for Setup Tool (IBM PC/AT or compatible: 2 m)	R88A-CCW002P4

Note: Do not use this document to operate the Unit.

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Note: Specifications subject to change without notice.

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1201-0.5M

OMRON

OMNUC W-series AC Servo Drivers
DeviceNet Option Unit

R88A-NCW152-DRT **Positioning Functions** + **DeviceNet Communications**

Simplify Distributed Control and Information Management for Servo Systems

Distributed control with a built-in Single-axis Position Control Unit, information management via DeviceNet, and a failure prediction function for servo systems, can all be added to OMNUC W-series AC Servo Drivers with just one Unit.

Two Roles Performed by One Unit

The Option Unit has both DeviceNet communications functions and the positioning functions of a Position Control Unit. These functions can be added to a W-series AC Servo Driver simply by mounting the Option Unit directly to it. Reduce the load at the PLC by performing servo control from the Servo Driver.

Distributed Control of up to 63 Units

Using Option Units allows up to 63 W-series AC Servo Drivers to be connected as DeviceNet slaves to an open field network with a total network length of 500 m.

Batch Handling of Operating Information for Servo Systems

Information that can be displayed at W-series AC Servo Drivers using monitor display functions (e.g., speed commands and speed feedback) can be read by a PLC using remote I/O functions.

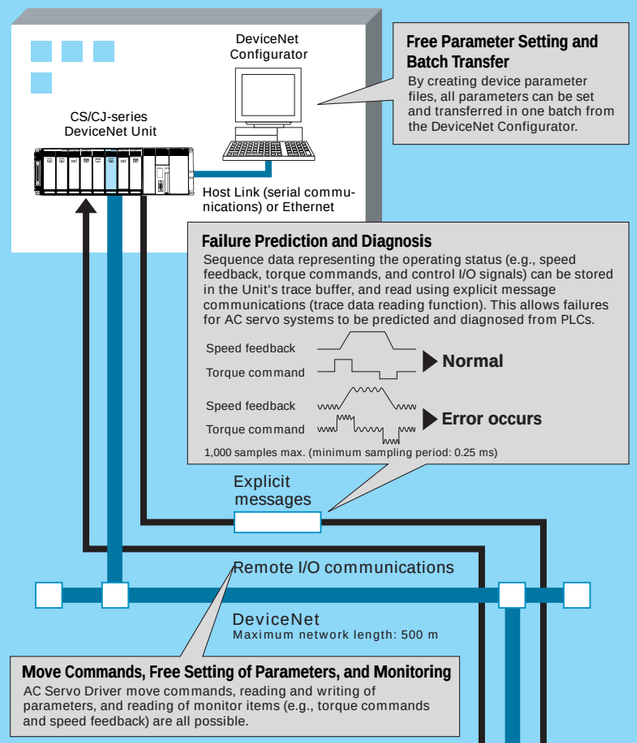
Failure Prediction and Diagnosis

Up to 1,000 samples of sequential data, such as speed feedback and torque commands, can be recorded in units as small as 250 µs. Comparison with data recorded during normal operation allows failure prediction and effective cause analysis for incorrect operation.

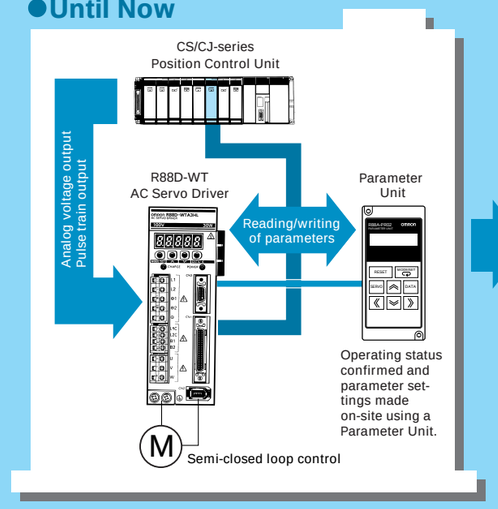
Select the Ideal Motor for the Application

Connect to any Servomotor from the comprehensive W-series lineup — cylinder-style motors, flat-style motors, motors conforming to IP67, motors with absolute encoders, and motors with brakes.

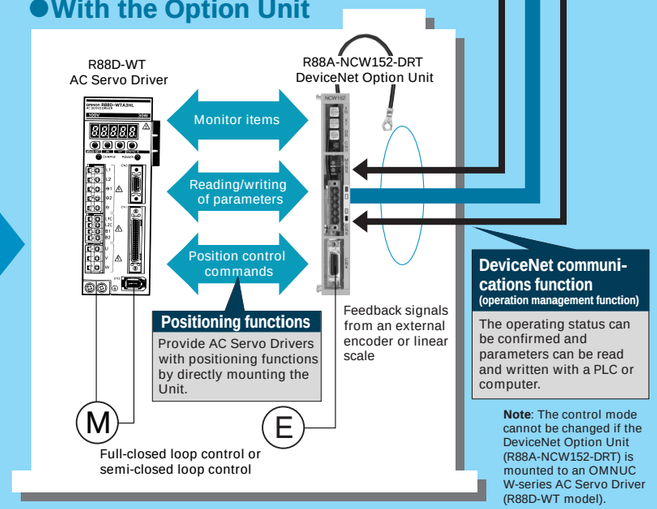
Cylinder-style motors: 1,000 r/min, 300 to 5,500 W
3,000 r/min, 30 to 5,000 W
Flat-style motors: 3,000 r/min, 100 to 1,500 W



●Until Now



●With the Option Unit



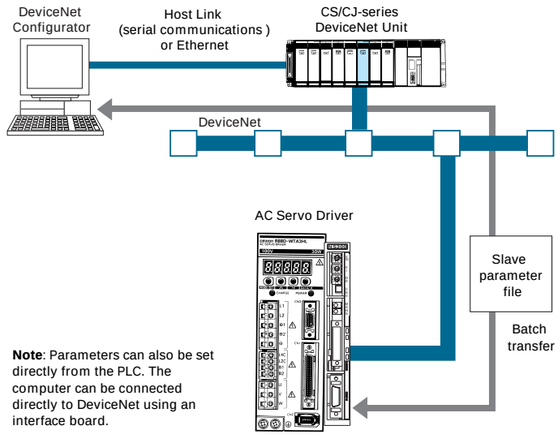
Note: The control mode cannot be changed if the DeviceNet Option Unit (R88A-NCW152-DRT) is mounted to an OMNUC W-series AC Servo Driver (R88D-WT model).

DeviceNet CONFORMANCE TESTED

Parameter Setting Function

Set and transfer parameters in a batch.

Using a DeviceNet Configurator allows AC Servo Driver parameters to be set and transferred in a batch via DeviceNet.

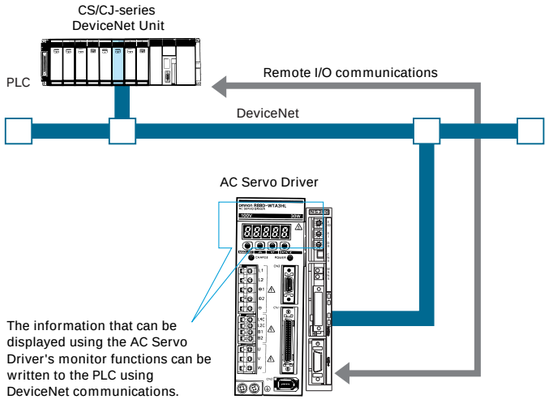


Note: Parameters can also be set directly from the PLC. The computer can be connected directly to DeviceNet using an interface board.

Monitor Item Reading Function

Monitor the AC Servo Driver's operating status from the PLC.

The monitor items that are displayed at the AC Servo Drivers in monitor mode (e.g., speed feedback, torque commands, and position deviation) can be read by a PLC as remote I/O, allowing the operating status of the Servo Driver to be monitored.

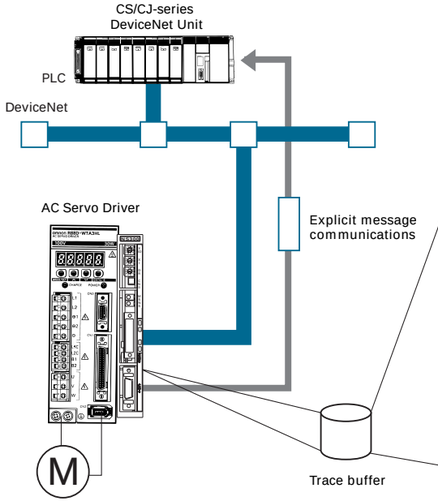


The information that can be displayed using the AC Servo Driver's monitor functions can be written to the PLC using DeviceNet communications.

Trace Function

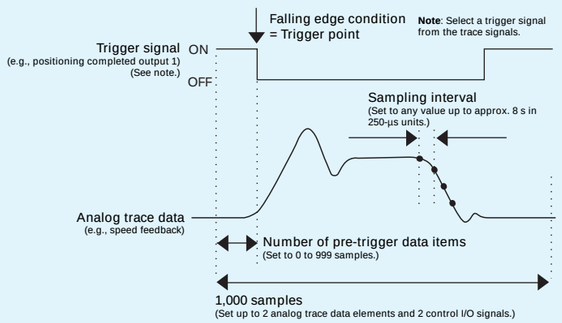
Monitor a specific operation in detail and perform failure prediction and diagnosis.

Sequence data representing the operating status can be stored in the trace buffer. An analog waveform representation of a specific operation can be obtained and, by analysis of this waveform at the PLC or computer, failure prediction and diagnosis can be performed for the servo system.



Trace Data Details

Up to 2 elements of analog data and 2 control I/O signals can be traced (recorded) from the rising edge of the trigger signal (e.g., positioning completed output 1).



Depending on the selection of the trigger signal and the trace data, the responsiveness of the motor with respect to control signals from the AC Servo Driver can be determined.

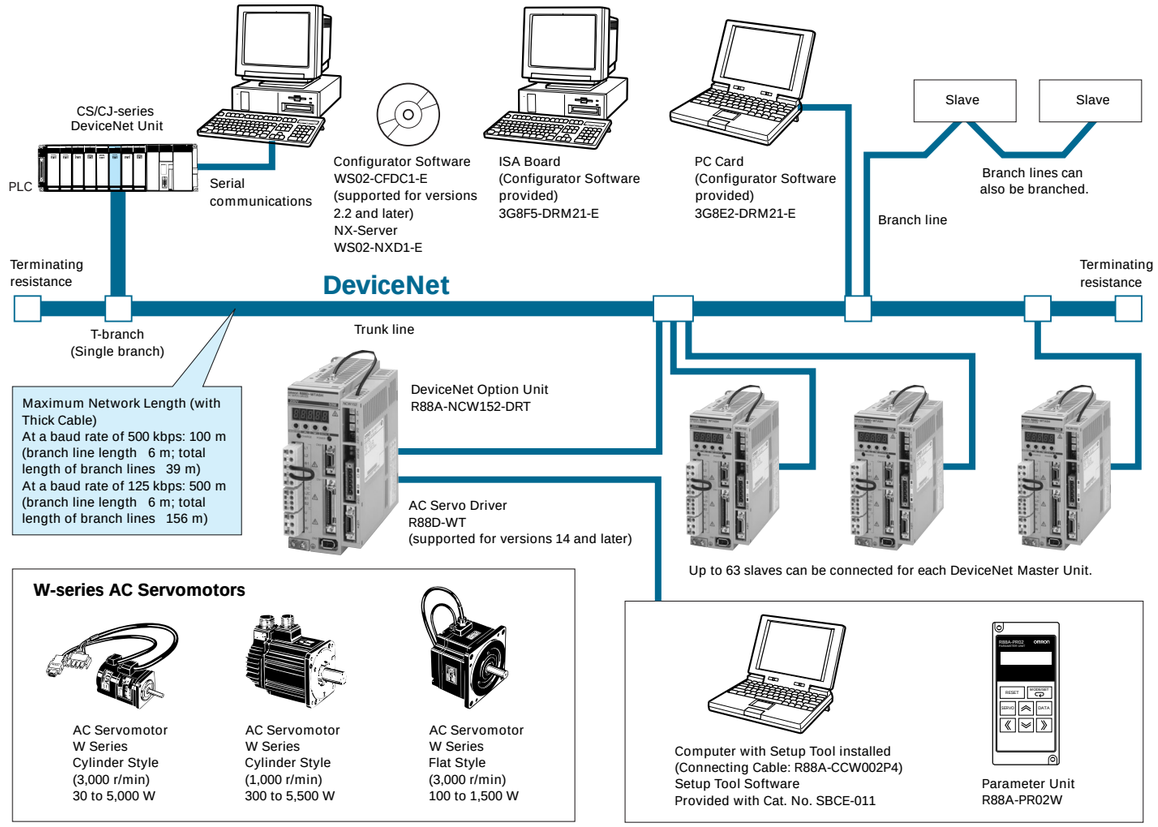
Function Tree

DeviceNet Communications Functions

- Remote I/O communications
  - Move commands
    - Positioning functions
  - Setting/reading commands
    - Parameters
  - Other functions
    - Monitoring
    - Origin compensation
    - PV compensation
    - Alarm reset
- Explicit message communications
  - Setting/reading commands
    - Parameters
  - Trace function
    - Trace function setting
    - Trace data reading

Positioning Functions

- Memory operation
  - Point table operation
  - Step operation
- Direct operation
  - Direct operation
  - Interrupt feeding
  - Notch signal output positioning
  - Multi-speed positioning
- Other functions
  - Indexing operation
  - Jog operation
  - Origin search



Position Control Function Specifications

Item		Specifications	
Number of control axes		1 axis per slave	
Control system		Semi-closed loop/full closed-loop control	
Controlled driver		R88D-WT Servo Drivers	
Positioning unit		User-specified position units (set freely). The amount moved per step can be set as an electronic gear ratio (setting range: 10,000,000 to 0.0000001)	
Operating specifications	Memory operation	Step operation and point table operation	
	Direct operation	Direct operation, interrupt feeding, notch signal output positioning, and multi-speed positioning	
Move command specifications	Type	Incremental (positioning according to relative coordinates) or absolute (positioning according to absolute coordinates)	
	Position commands	Signed, 32-bit data (setting range: -99,999,999 to 99,999,999 steps)	
	Speed commands	Signed, 32-bit data (units: step/min; setting range: 1 to 240,000 steps)	
	Acceleration/ deceleration method	Fixed acceleration/deceleration	Single-step linear acceleration/deceleration, 2-step linear acceleration/deceleration, asymmetric linear acceleration/deceleration, S-curve acceleration/deceleration, asymmetric S-curve acceleration/deceleration
		Fixed acceleration/deceleration time	Exponential acceleration/deceleration, exponential acceleration/deceleration with bias, single-step linear acceleration/deceleration
	Acceleration/deceleration time	1 to 10,000 ms (time taken to reach maximum speed)	
	Coordinate system settings	Set whether to use the AC Servomotor as a linear axis or a rotary axis.	
	Speed changes	The speed can be switched between 16 settings while positioning during multi-speed operation.	
Operation management/ compensation functions	Origin search operation	Without limit reversal	Use the ON/OFF signal of any of the following: Origin proximity signal + origin signal, origin signal, origin proximity signal + phase Z, or phase Z
		With limit reversal	Use the ON/OFF signal of any of the following: Origin proximity signal + origin signal, origin signal, or origin proximity signal + Phase Z
	Backlash compensation	0 to 32,767 steps	
	Jog operation	Based on the origin position when power is turned ON and after origin search	
	Indexing operation	Positioning performed with 1 motor revolution divided equally by a specified number (range: 1 to 32,767).	
	Software limits	Decelerates to a stop at a specified position. (The direction can be specified as either positive or negative in the range -99,999,999 to 99,999,999.)	
	Emergency stop/deceleration stop	Possible via remote I/O communications or using input signal.	
	Present position preset	Possible via remote I/O communications.	
	Trace function	Analog trace data (Select up to 2 elements.)	Command pulse speed (r/min), position deviation (command units), speed feedback (r/min), or torque commands (%)
		ON/OFF trace data (Select up to 2 elements.)	Sensor-ON input, alarm output, positioning completed output 1, speed coincidence output, motor revolution detection output, servo ready output, current limit detection output, speed control detection output, brake interlock output, warning output, positioning completed output 2, alarm code output 1, alarm code output 2, alarm code output 3
		Trigger data	Analog trace data (rising edge, falling edge, or rising/falling edge) ON/OFF trace data (rising edge, falling edge, or rising/falling edge)
		Data sampling	Sampling cycle: Set in 250-µs units (range: 250 to 8,191,750 µs) Number of samples: 1,000 samples (fixed)
	Reading monitor items	Monitor items	Speed feedback (r/min), torque commands (%), number of pulses from phase Z (pulses), electrical angle ( ), input signal monitor (no units), output signal monitor (no units), command pulse speed display (r/min), position deviation (command units), cumulative load rate (%), regenerative load rate (%), dynamic brake resistance load rate (%), input pulse counter (rightmost 16 bits; command units), feedback pulse counter (rightmost 16 bits; pulses)