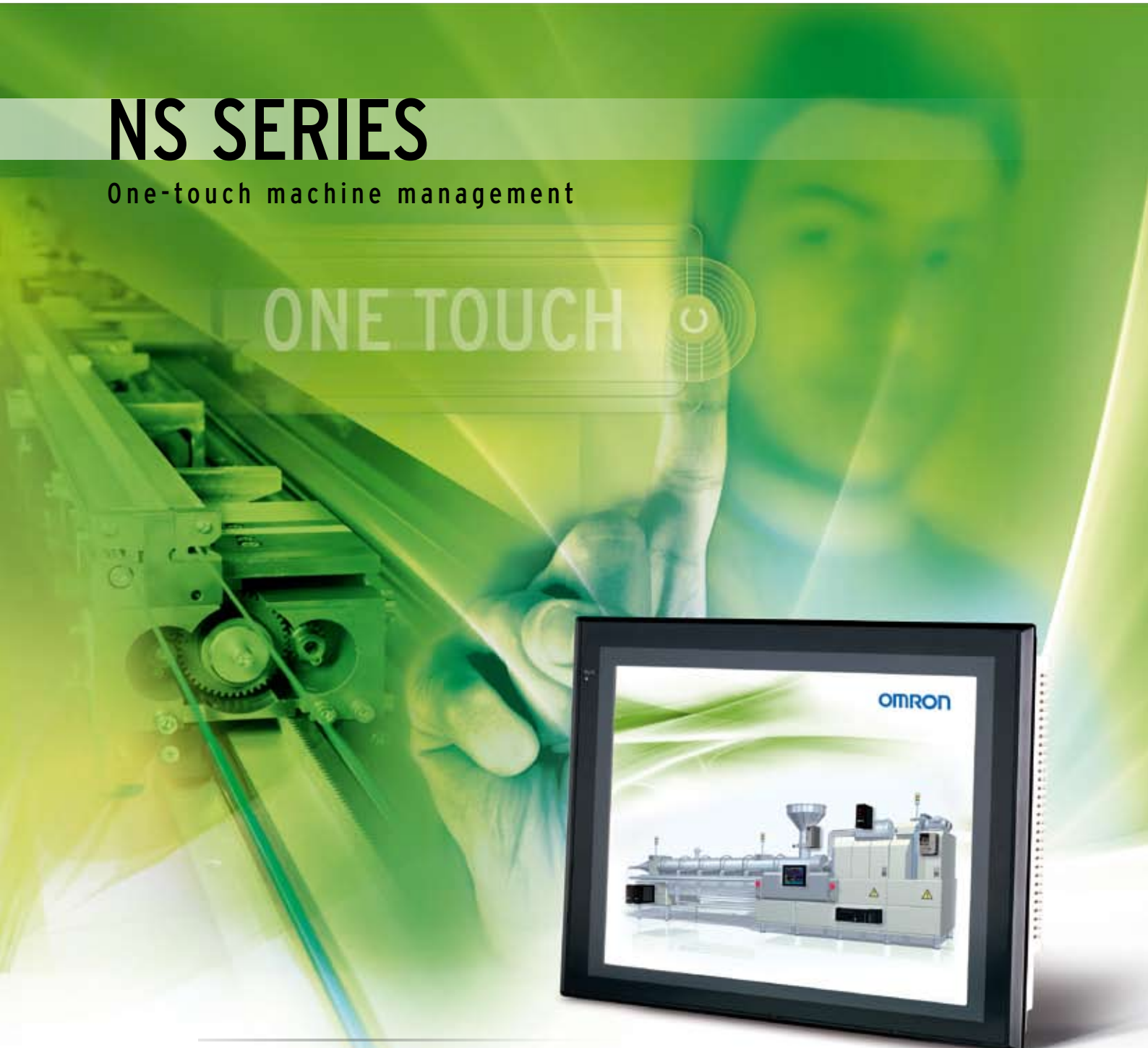
OMRON

NS SERIES

One-touch machine management



» High-quality screen with 3-year warranty

» Connect to any device

» 'Drag & Drop' simplicity of Smart Active Parts

realizing

Total control at your fingertips

Omron's NS series looks like a normal HMI, but it is not. Designed on Smart Platform, the NS series provides enhanced communication even across multiple networks, to manage all devices in a machine for true industrial machine management. We provide functions to let you perform diagnoses and maintenance to make your machine competitive in an easy way. This is why we call it: one touch Machine Management. And that's why it's more than just an HMI terminal!

Outstanding connectivity

Used together with Omron PLCs and other field-programmable devices, such as temperature controllers and inverters, the NS series gives enhanced communication and programming capabilities, even across multiple networks, allowing you to manage all devices in your machine from a single terminal.

A built-in USB connection enables simple and fast connection of peripherals, while a built-in Ethernet interface allows fast connection to multiple PLCs and computers.
The NS series is also capable of connecting to many non-Omron devices to give you total flexibility in managing your machine.

Sysmac One

Machine management tool vs. HMI terminal

The NS HMI has, beside the generic HMI functions, many other functions to be able to use the NS as a real machine management tool. With the NS HMI you can configure, commission, maintain and operate many Omron devices and even third party devices. This means you can simple configure some settings, display errors or statuses, up- and download parameters all with the NS HMI terminal.
The NS HMI allows you to create and use the diagnostics functions for many devices you need to manage your machine. By providing diagnoses and maintenance functions on the NS, Omron allows a full insight into the machine's state and the flexibility to quickly troubleshoot on-site with minimum of work for the machine builder, system integrator or end-user.

Proven reliability

For over a decade Omron has been a global supplier of HMI solutions and high-reliability industrial touch-screen technology. Omron has supplied more than 500,000 pieces of HMI through more than 200 Omron Sales & Support offices world-wide, each offering after-sales support, service and training in local languages.

Integrated Machine Management: Sysmac One series

The Sysmac One series combine an NS touch screen with a powerful CJ1 PLC and the choice of different network interfaces in a compact housing occupying less panel space. Complete transparency enables the PLC, network (including field devices) and HMI to be accessed via a single port – a big advantage when servicing your machine remotely.
With the Sysmac One you get the best of both worlds: One touch Machine Management HMI and the flexible, fast and easiest logic controller in the market.

Smart Platform

Omron's Smart Platform concept enables complete machine and plant automation from one single platform without having to worry about field buses, integration of various software and above all without being locked into one dominant supplier. Smart Platform will minimize the time and effort you spend on automation.

http://smartplatform.info/

NS Series Portfolio

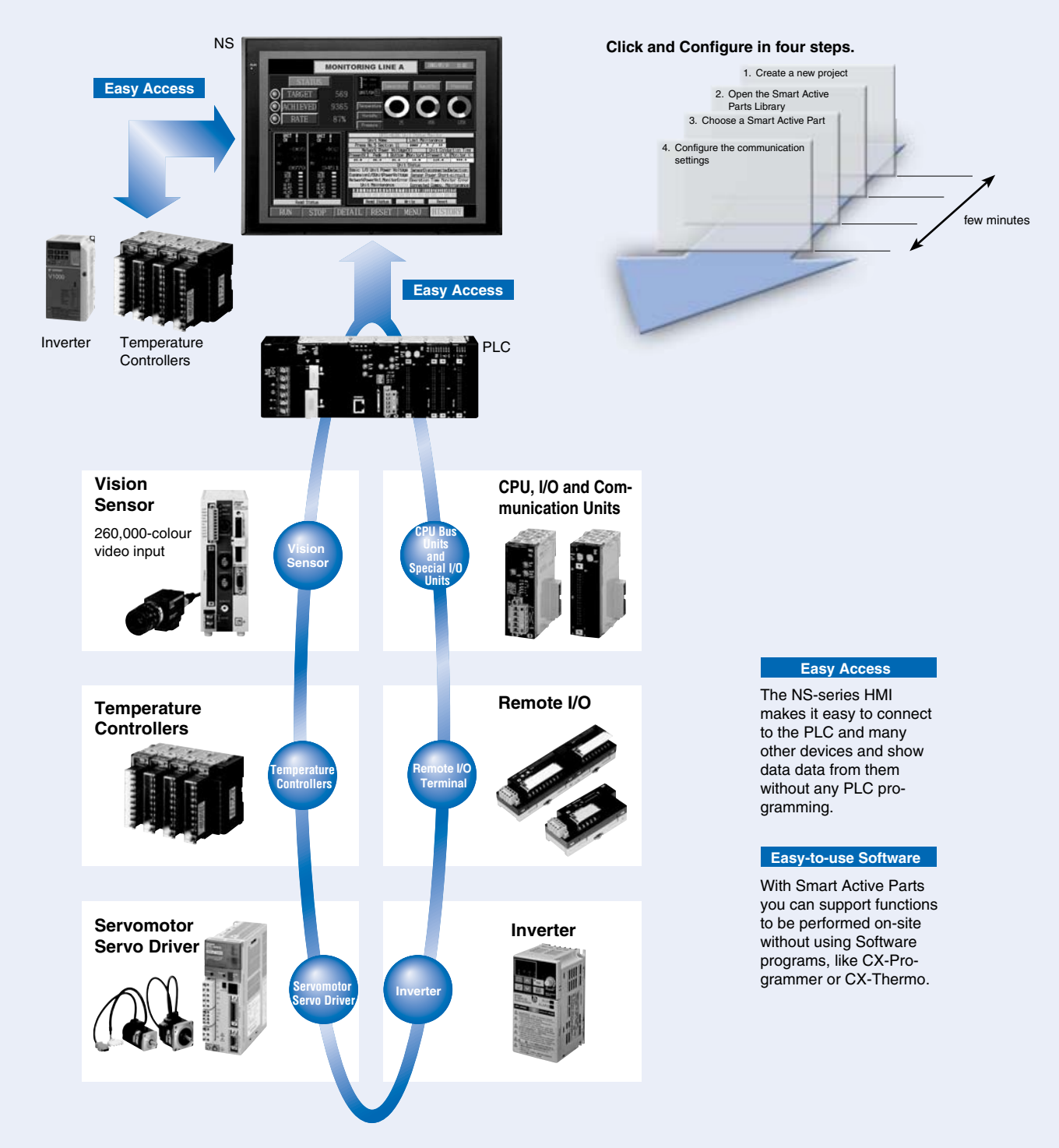
	Advanced HMI – NS				
Model	**NS12**	**NS10**	**NS8**	**NS5**	**NS5 Handheld**
Display	12.1 inch TFT colour	10.4 inch TFT colour	8.4 inch TFT colour	5.7 inch Monochrome or STN/TFT colour	5.7 inch STN colour
Resolution	800×600 pixels	640×480 pixels	640×480 pixels	320×240 pixels	320×240 pixels
Number of colours	256 (32,768 for image data)	256 (32,768 for image data)	256 (32,768 for image data)	Monochrome 16 grey-scales, STN/TFT 256 colours (STN 4096, TFT 32,768 for image data)	256 colours (4096 colours for image data)
Memory Size	60MB screen memory, 32,768 words + 32,768 bits internal memory and 8192 words + 8192 bits retentative memory	60MB screen memory, 32,768 words + 32,768 bits internal memory and 8192 words + 8192 bits retentative memory	60MB screen memory, 32,768 words + 32,768 bits internal memory and 8192 words + 8192 bits retentative memory	60MB screen memory, 32,768 words + 32,768 bits internal memory and 8192 words + 8192 bits retentative memory	60MB screen memory, 32,768 words + 32,768 bits internal memory and 8192 words + 8192 bits retentative memory
Options	Ethernet, Controller Link, Video input board (RGB/Composite)	Ethernet, Controller Link, Video input board (RGB/Composite)	Ethernet, Video input board (RGB/Composite)	Ethernet	RS-232 or RS-422 communication depending on cable
Size in mm (HxWxD)	241×315×48.5	241×315×48.5	177×195×48.5	142×195×54	176×223×70.5 (excl. emergency button)

	HMI & Control – SYSMAC One			
Model	**NSJ12**	**NSJ10**	**NSJ8**	**NSJ5**
Display	12.1 inch colour TFT	10.4 inch colour TFT	8.4 inch colour TFT	5.7 inch colour TFT or STN
Display Size / Resolution	246×184.5 mm (800×600 pixels)	215.5×162.4 mm (640×480 pixels)	170.9×128.2 mm (640×480 pixels)	117.2×88.4 mm (320×240 pixels)
Control	CJ1G-CPU45H; 60k-steps program memory, 128k-words data memory, logic instruction time 0.04 µs	CJ1G-CPU45H; 60k-steps program memory, 128k-words data memory, logic instruction time 0.04 µs	CJ1G-CPU45H; 60k-steps program memory, 128k-words data memory, logic instruction time 0.04 µs CJ1M-CPU13; 20k-steps program memory, 32k-words data memory, logic instruction time 0.04 µs	CJ1G-CPU45H; 60k-steps program memory, 128k-words data memory, logic instruction time 0.04 µs CJ1M-CPU13; 20k-steps program memory, 32k-words data memory, logic instruction time 0.04 µs
Communication	DeviceNet Master/Slave or PROFIBUS Master and optional Ethernet interface	DeviceNet Master/Slave or PROFIBUS Master and optional Ethernet interface	DeviceNet Master/Slave or PROFIBUS Master and optional Ethernet interface	DeviceNet Master/Slave or PROFIBUS Master and optional Ethernet interface
Expansion (1 board max.)	Ethernet, Controller Link, I/O extension	Ethernet, Controller Link, I/O extension	Ethernet, Controller Link, I/O extension	Ethernet, Controller Link, I/O extension
Size in mm (HxWxD)	Without expansion unit 241×315×73.3 With expansion unit 241×315×89.3	Without expansion unit 241×315×73.3 With expansion unit 241×315×89.3	Without expansion unit 177×232×73.3 With expansion unit 177×232×89.3	Without expansion unit 195×142×79 With expansion unit 195×142×95

Outstanding Connectivity

Save time on programming and designing with Smart Active Parts

Unlike conventional visualization objects, Smart Active Parts communicate, across multiple networks, with their corresponding devices. They can be used to configure, commission, operate and maintain these devices, without a single line of code needed to be written in the PLC or the HMI. This allows you to add powerful functionality to your application within minutes.

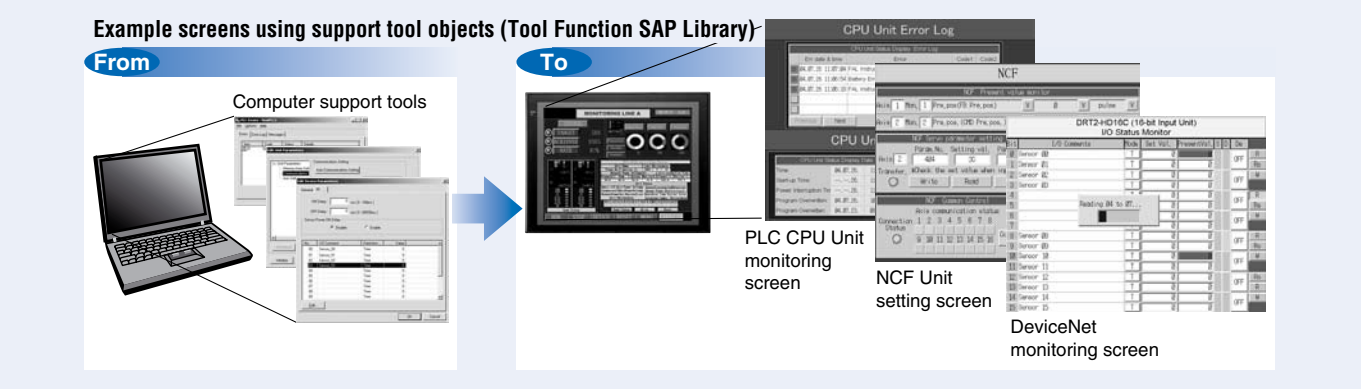


Using Smart Active Parts: just a few simple steps

Dramatically reduces the effort required to create ladder programming and screens.

A library with more than 2,000 Smart Active Parts is available, which can directly access OMRON PLCs and other devices. You can drag & drop Smart Active Parts in an application in just 4 simple steps.

With Smart Active Parts you can for instance monitor device errors in understandable text, donwload parameters to devices and check Network statuses without the need for a computer with software tools.

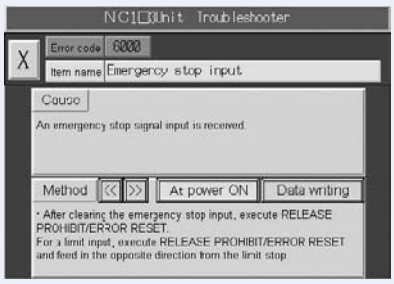


The SAP library also provides PLC I/O Unit Troubleshooter SAPs

Troubleshooter Smart Active Parts are available to troubleshoot specific PLC units. When an error occurs in an unit, the Troubleshooter SAP provides an easy-to-understand explanation of the cause of the error as well as which counter measures to take to resolve the error.

In this way you can quickly resolve errors on-site even without using documentation.

Troubleshooter SAP for a Position Control Unit

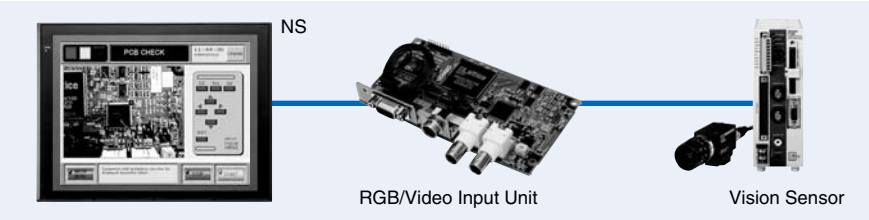


Troubleshooter SAP for Basic I/O Unit

260,000-colour Video Display

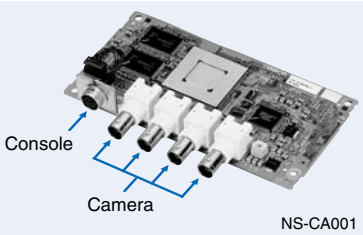
Display the production steps on the HMI via optional video inputs!

Two kinds of video interfaces are available to connect to various applications. Provides compatibility with OMRON Vision Sensors (F150, F160, and F250) in addition to video and CCD camera connections. The NS-series HMI contain some useful functions like capturing and browsing images and operating the Console functions in the vision sensor.



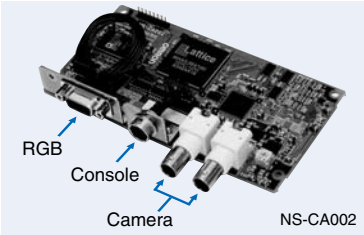
NS-CA001 Video Input Unit

Four video inputs or CCD cameras can be connected and up to four images can be displayed simultaneously if the image size is 320x240 pixels.



NS-CA002 RGB/Video Input Unit

There is an analog RGB input terminal in addition to the two video input terminals. Either the video signals or the analog RGB signal can be displayed on the NS-series HMI.



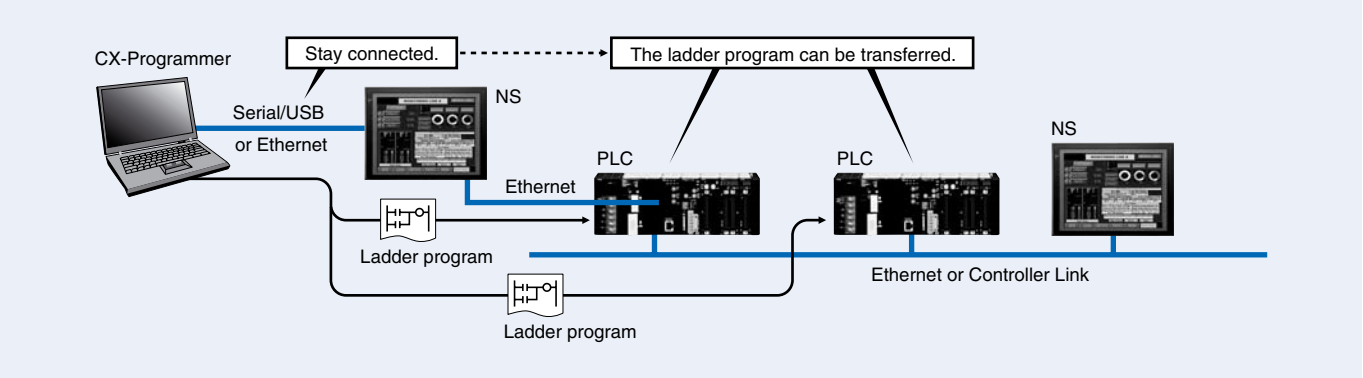
Single Port Multi Access (SPMA)

The PLC program and screen data can be transferred from a single port!

With SPMA you can transfer the PLC program and HMI project data with one cable connection. It does not even matter if you connect first to HMI or PLC, you can always transfer the data and keep on operating the HMI or PLC.

The HMI can transfer data across different network levels.

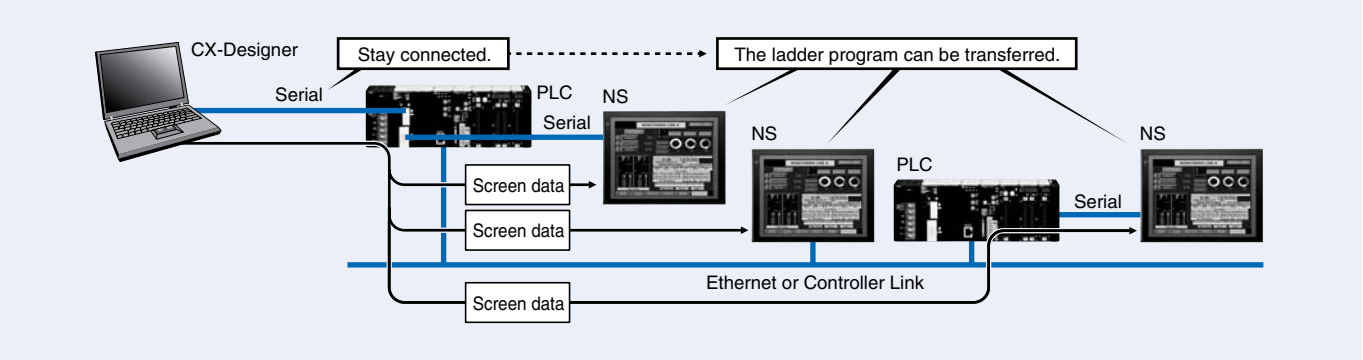
Computer (Serial/USB/Ethernet) → NS-series HMI (Ethernet) → PLC (Ethernet or Controller Link) → PLC



SPMA significantly improves maintenance efficiency when the NS-series HMI and PLC are connected over longer distances.

Computer (Serial/USB/Ethernet) → PLC (Serial, Ethernet or Controller Link) → NS-series HMI

Note: SPMA can be used in CS/CJ-series PLCs with lot number 030201 or later.

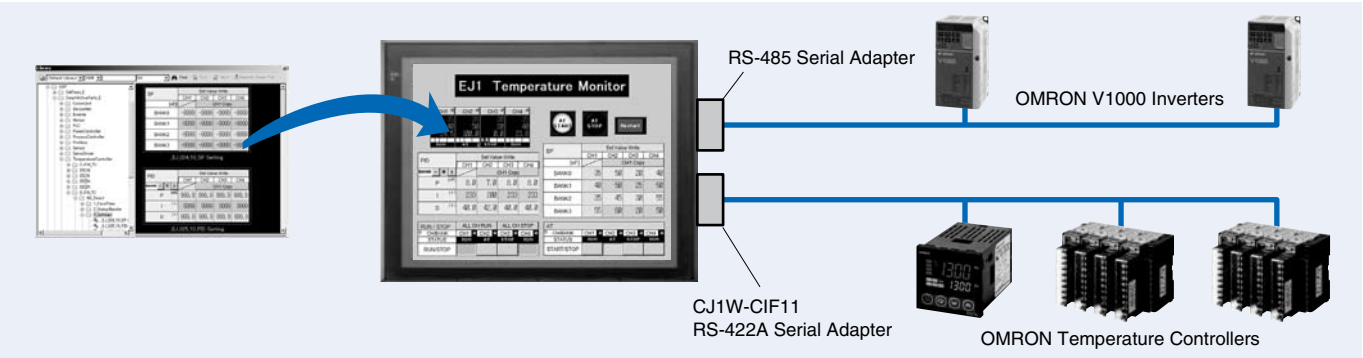


Direct Connection to Temperature Controllers and Inverters

Connect OMRON Temperature Controllers and Inverters to the NS-series HMI.

OMRON Temperature Controllers can be connected directly to the NS-series HMI RS-232C port. Data does not pass through the PLC, so ladder programming is not required. There are many SAPs in the Library for Temperature Controllers. Temperature Controller screens can be created easily just by pasting objects from the SAP Library onto the screens.

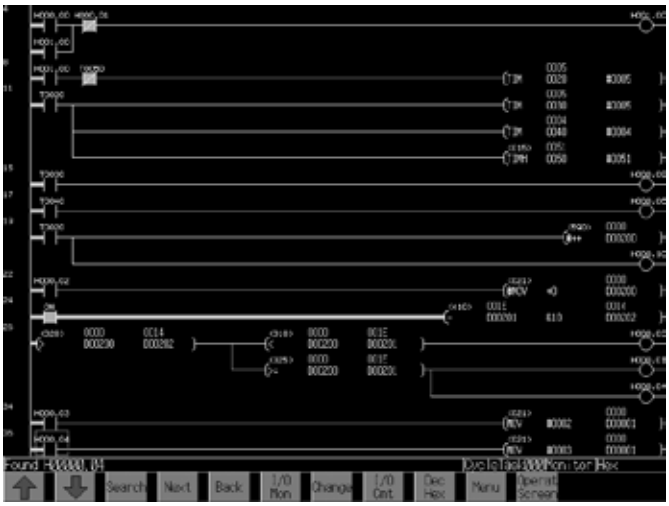
The Omron inverters can also be connected to the NS-series HMI. This makes it easy to read and change parameters for the inverters without any PLC programming.



Exceptional Functionality

Easy maintenance with the Ladder Monitor

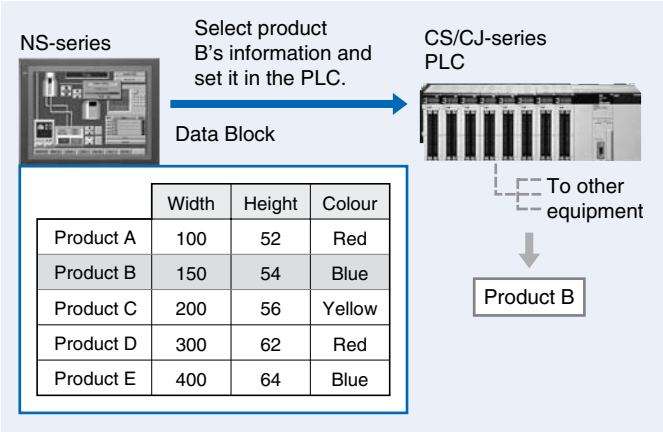
The NS HMI (except for the NS5 series) has a Ladder Monitor built in as a standard feature. A Ladder Monitor is an application that allows you to monitor the ladder program in the CS/CJ series PLC. With the Ladder Monitor you can monitor the execution status of the ladder program in the connected PLC without the need to use software (CX-Programmer). Many useful functions are provided with the Ladder Monitor like viewing I/O comments, monitor and change values, search addresses, easy navigation and capture ladder image.



Easily utilizing advanced functions

Data block (Recipe) function

Data blocks (recipe function) allow several numeric values and/or character strings to be transferred to/from memory areas, such as PLC data areas. Data blocks can be used to change the system's production setup even faster.



	Width	Height	Colour
Product A	100	52	Red
Product B	150	54	Blue
Product C	200	56	Yellow
Product D	300	62	Red
Product E	400	64	Blue

Communication drivers

The NS-series HMI can connect to several non-Omron devices. This means the NS HMI can have communication on one port to an Omron devices and on the second port to a non-Omron device. Contact Omron for up-to-date information on the available communication drivers for the NS HMI series.

Macro functions

The NS provide an extensive set of macro functions that can be used to perform many different operations.

These functions allows the HMI to process screen display actions or calculate some data, which was performed by PLC before. Also the HMI project can be made more interactive using some macro functions in combination with PLC memory.

Macro functions can be used with screen pages, functional objects, like buttons and lamps or on specific timing operation.

In general we provide macro functions to perform the following actions using Conditional and Logical operations:

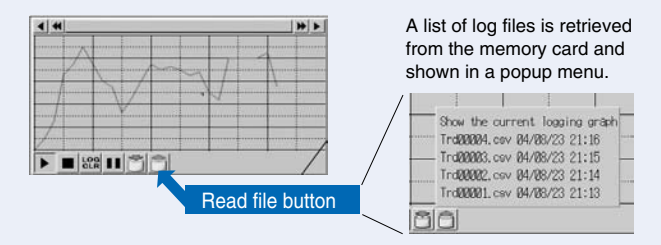
- Convert and manipulate data
- Read/Write data to a device
- Perform string manipulation
- Perform screen/popup operations
- Store/retrieve data from CF
- Set date/time
- Influence Screen navigation
- Perform loop operation

Trend Graphs & Data Logging

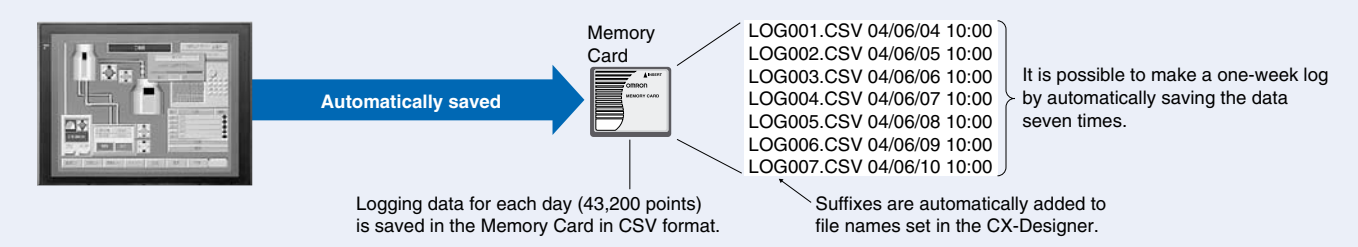
Easily log and display any data over time

A variety of graphing functions are built into the NS-series HMI, such as the trend graph, which can log data over a longer period of time, and the line graph, which can display overlapping graphs.

Logging data is stored as a CSV file in the Memory Card mounted in the NS-series HMI. The data stored in the Memory Card can be read or deleted from the screen.



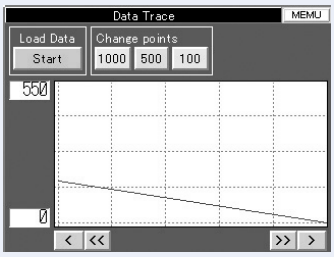
Log files can be saved automatically, just by selecting the Save the data periodically Option in the Data Log Setting Window.



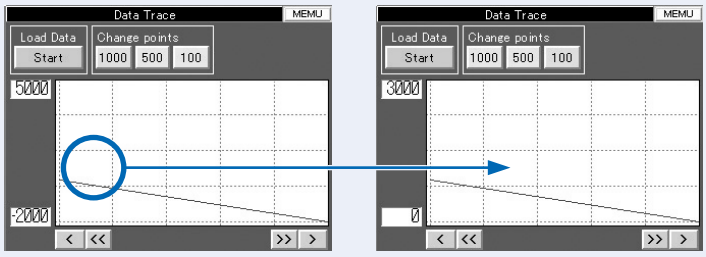
Trend Graph Function

Data stored/logged by the PLC can be displayed in overlapping graphs, so a device's operation can be compared for evaluation and analysis. In addition, up to 1,000 words of consecutive data can be displayed as a line graph, data can be displayed together, and any region can be magnified.

(1) Graphs can be superimposed.

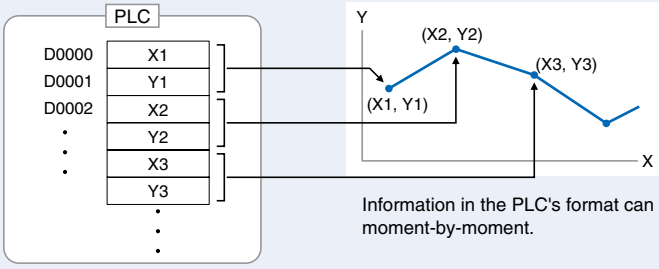


(2) The display can be magnified.



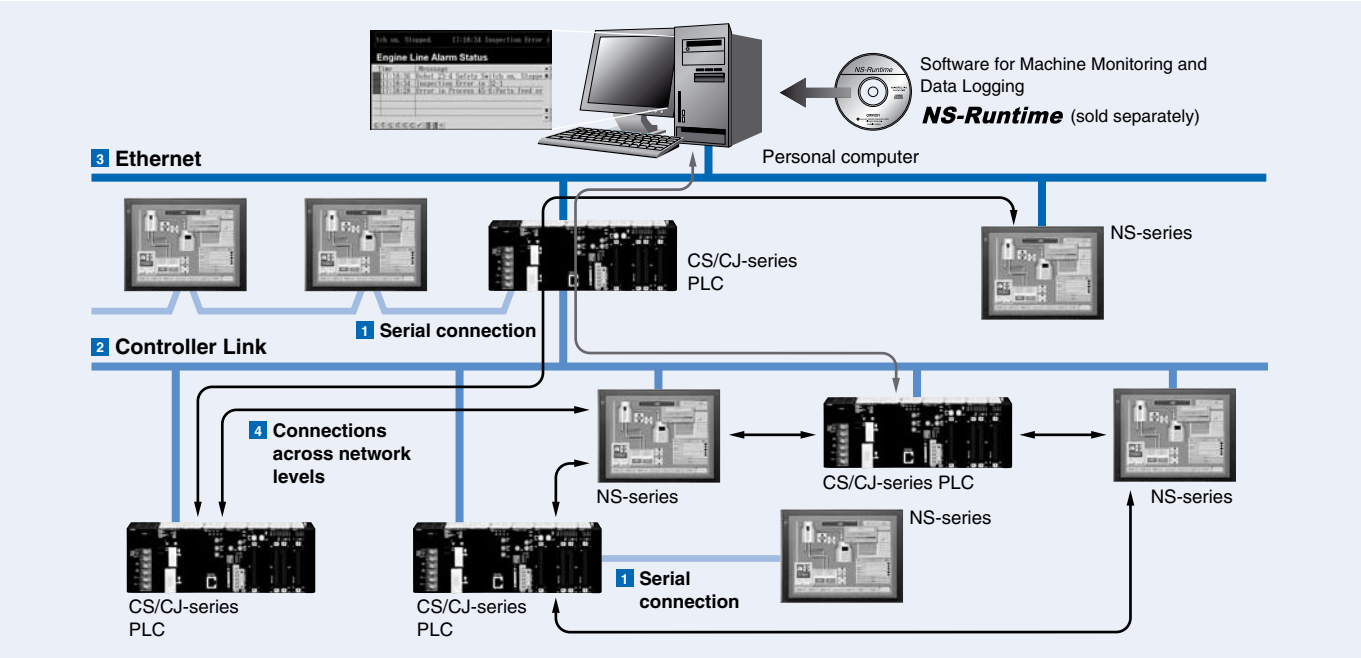
Continuous Line Graph

A graph can be plotted in any position by specifying the X and Y coordinates of the vertices. Also, the graph can be moved on the screen by specifying the movements from the PLC.



Diverse Network possibilities to fit any application

The NS-series provide very strong networking skills. With serial NT-Link communications supporting both 1:1 and 1:N connections you can connect multiple HMI's to the PLC. The NS-series HMI can also support communications with multiple PLCs and multiple HMI's through Controller Link and Ethernet connections, so the network can be configured freely to match the requirements and scale of the application. In addition, using the NS-Runtime makes it possible to monitor machine status and log data from the host.

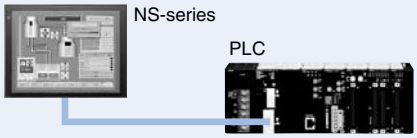


1 Serial connection

1:1 NT Link or Host Link

NS:PLC = 1:1

Connecting with the PLC through port A or port B



NS:PLC = 1:2

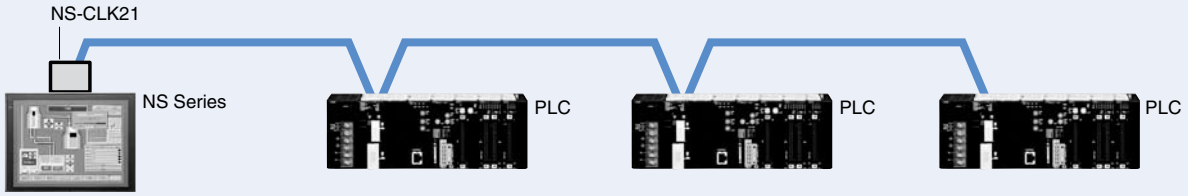
1:N NT Link

NS:PLC ratio = 8:1 max.

Up to 8 NS-series can be connected to each of the PLC's RS-232C/RS-422A ports.

2 Controller Link Connection

The HMI can be connected to an OMRON Controller Link network by mounting a Controller Link Interface Unit.

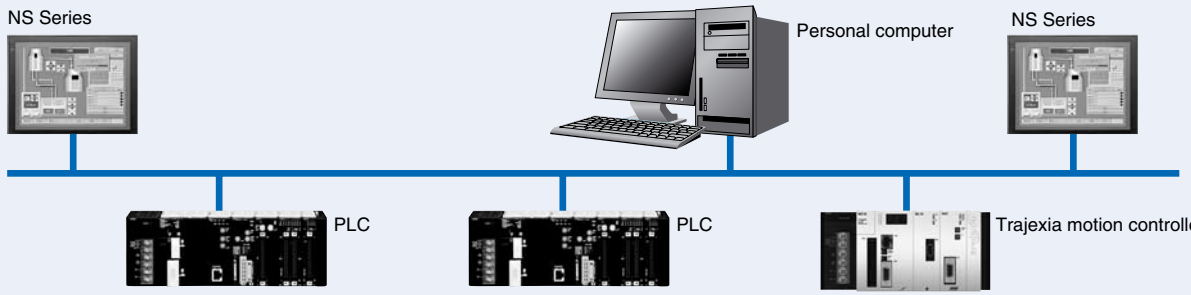


If a Controller Link connection is used, data links can be configured between PLCs and multiple PLCs can be monitored from the NS-series HMI screen.

- Baud rate
  2 Mbps (500 m max.)
  1 Mbps (800 m max.)
  500 kbps (1 km max.)
- Max. number of nodes: 32 nodes

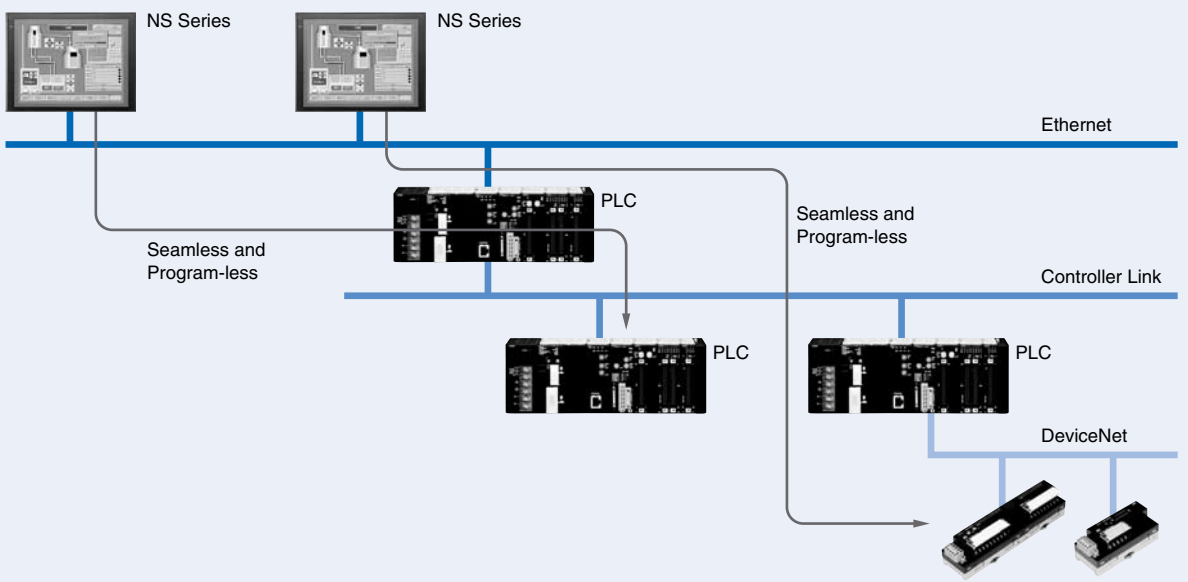
3 Ethernet Connection

When using the NS-series HMI with Ethernet you can connect to any Omron controller with an Ethernet port. Beside this you can also use a FTP client to gather data from the NS and even transfer project data to different NS HMI terminals.



4 Connections across Different Network Levels

The NS-series HMI can connect to a variety of devices in the network, through as many as 3 network levels. For example, if SAP (Smart Active Parts) are being used, an NS-series HMI connected by Ethernet can be used to monitor the information in a PLC connected through Controller Link as well as the information in the DeviceNet Slaves connected to that PLC.

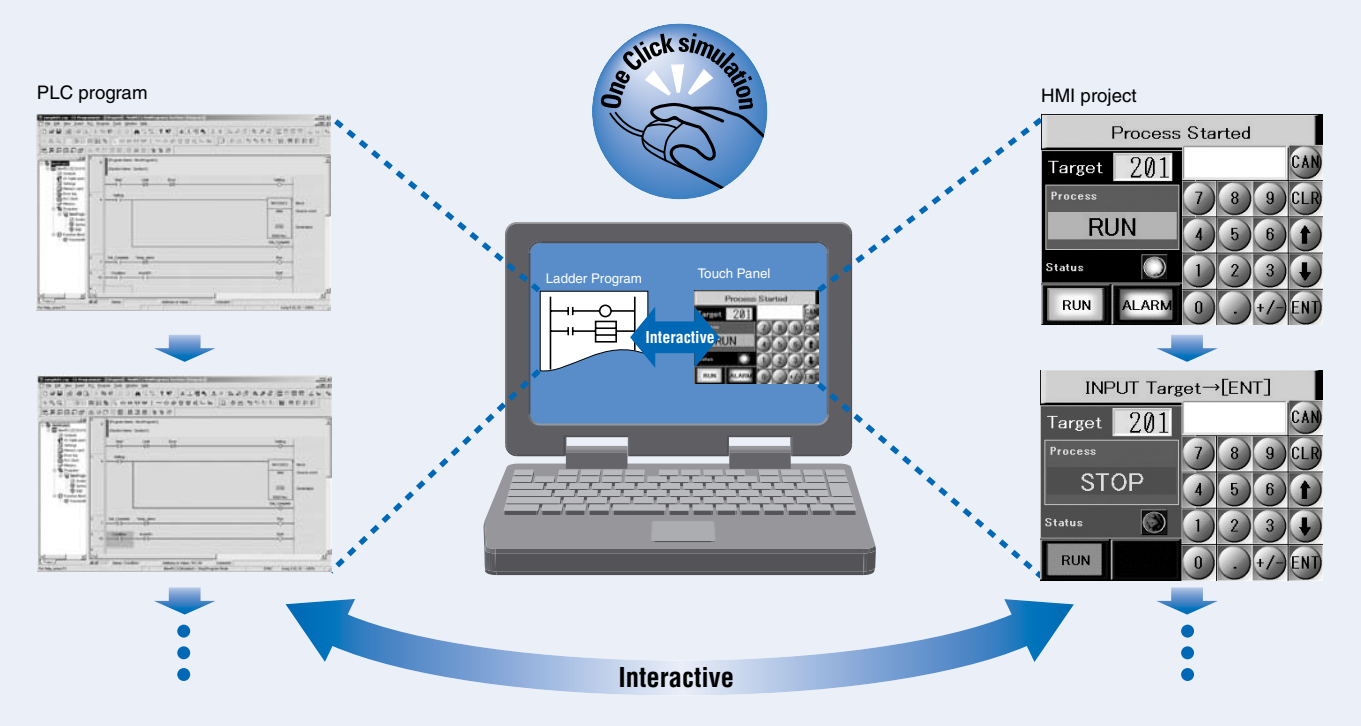


User-Friendly Software

Integrated Simulation

Simulate the HMI program with the PLC program on your PC.

The integrated simulation function allows you to test the ladder program with the HMI progam in an interactive way. You can quickly make changes and test the function to see if it works as desired. Therefore the integrated simulation function significantly increases debugging efficiency.

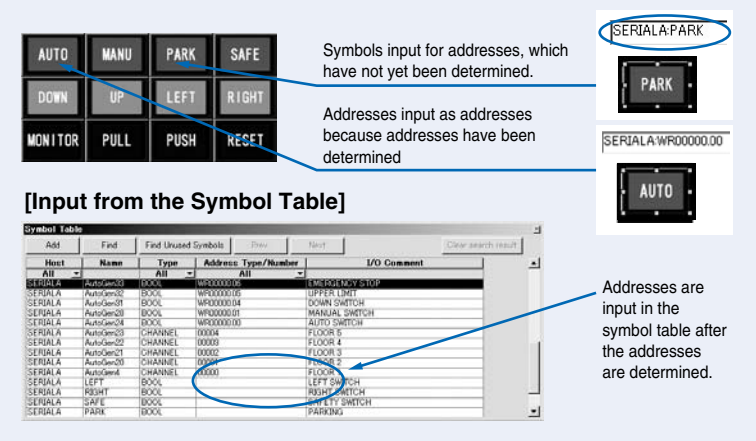


Programming with Symbols

Screens can be created even when addresses are unknown.

Screens can be created even if the addresses have not been determined. Addresses can be input as either names or actual addresses and the addresses can be input from the symbol table after the addresses are determined.

The symbol table created in our PLC programming package, CX-Programmer can be shared with CX-Designer by simply dragging and dropping them in the software.

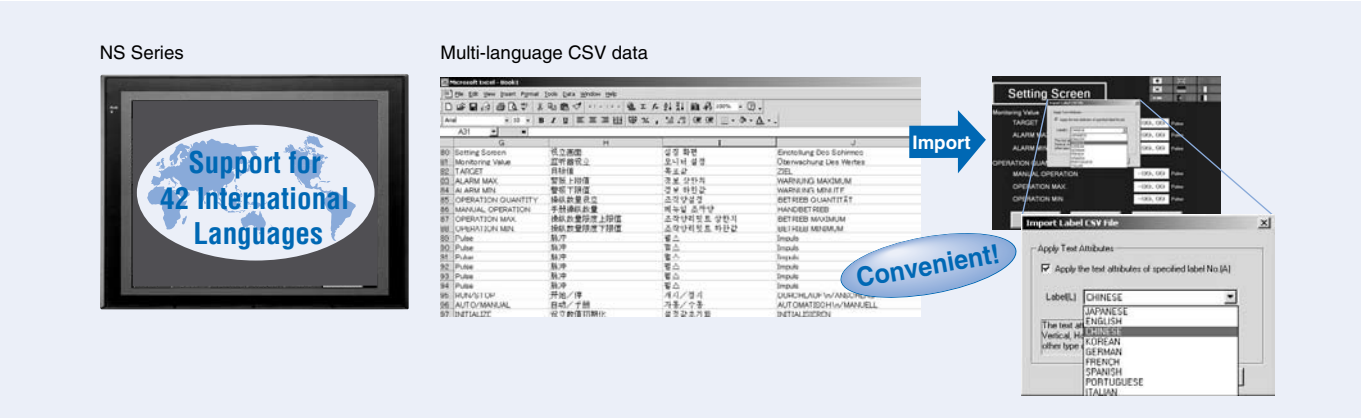


Multi-language Support

Easily export/import text to translate in many different international languages.

As the NS-series HMI support Unicode you can use many different languages from Asia and Europe. In runtime you can switch between 16 languages.

With CX-Designer it is very easy to export and import texts for translation as it is using CSV format. When you import a new language you can even choose to apply the same label properties (e.g. font, colour, etc.) as an existing language.



Advanced functions

Remote machine servicing over the WWW

The NS HMI series have a web-interface built into the HMI terminal. The web-interface function allows you to see the local NS HMI screen, which is also seen by the operator, remotely in any standard web browser without the need to install software on your PC. This makes it very easy to see what is happening at the site where the machine is located. You can see the alarms and actual values and even operate the HMI from your remote location.

The web-interface[1)] can run in a monitor mode, which allows you to only monitor certain screens, or it can run in the operation mode so that you can operate the HMI terminal as if you where located at the machine.

You can also show all the files stored on the local CF card, e.g. log files created by the NS data logger, and open or download these files from your remote location.

1) Web-interface function will be delivered with CX-One v3.1

NS-Runtime

Machine monitoring and reporting at the production site

Machine Viewer

The NS-Runtime software provides functions equivalent to the NS Series, and enables you to display information and perform operations for a complete production line. NS-Runtime will run the NS project, created with CX-Designer, on Windows XP including the DyaloX Series. Beside the existing NS functionality, the NS-Runtime also provides some additional functions explained in more detail below.

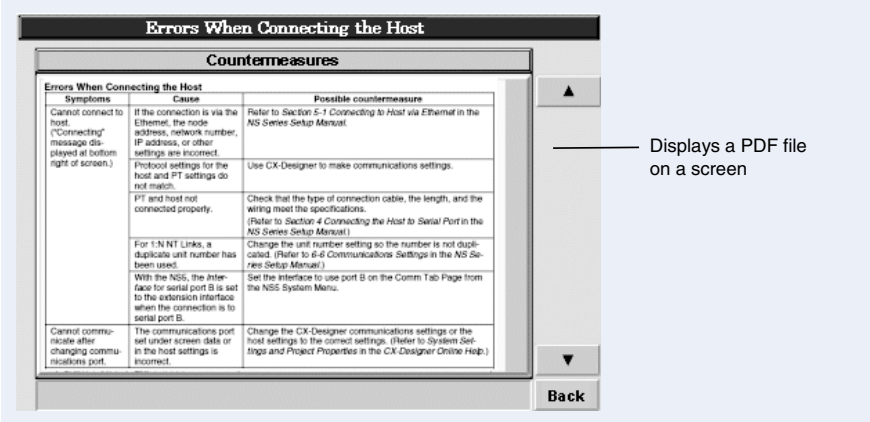
Data Logger

Data can be logged through background processing, with up to 160,000 points stored in one file. The logged data is stored in CSV format, and data can be displayed on data log graphs.

Example: 160,000 Points
Data can be logged for approximately 7.4 days, assuming data is logged every two seconds for 12 hours a day. By using automatic file saving, data logging can be continued even longer than 7.4 days.

Display documents

The display document function in NS-Runtime makes it possible to show documents (e.g. PDF file) in the screen itself. This is useful for maintenance instructions or reporting. You can even show a different document every time an alarm occurs.



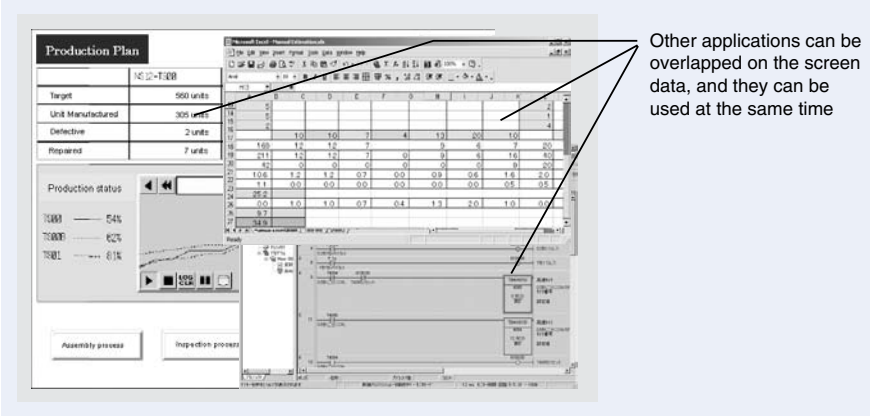
Application Startup Function

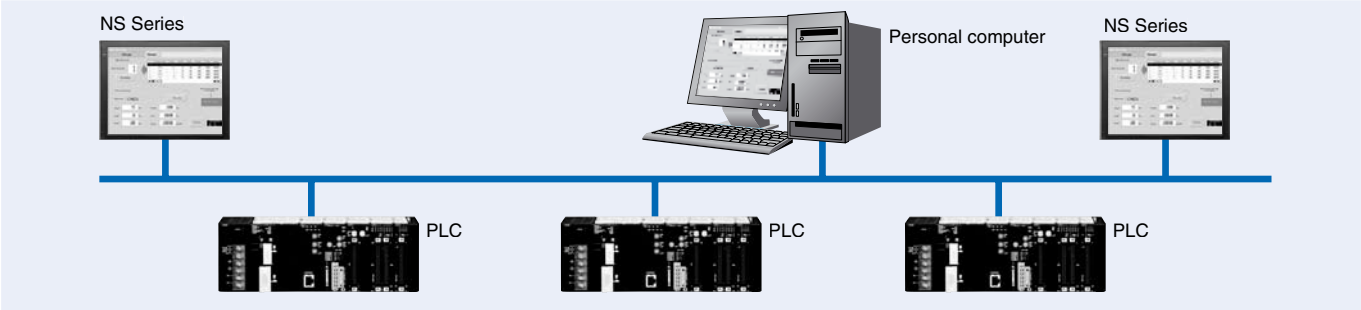
You can start any user application from NS-Runtime by simply clicking a button. This allows you to open documents like Excel or any other software tool you need to use.

Wide Screen

Computer output can be displayed on another wide-screen monitor.

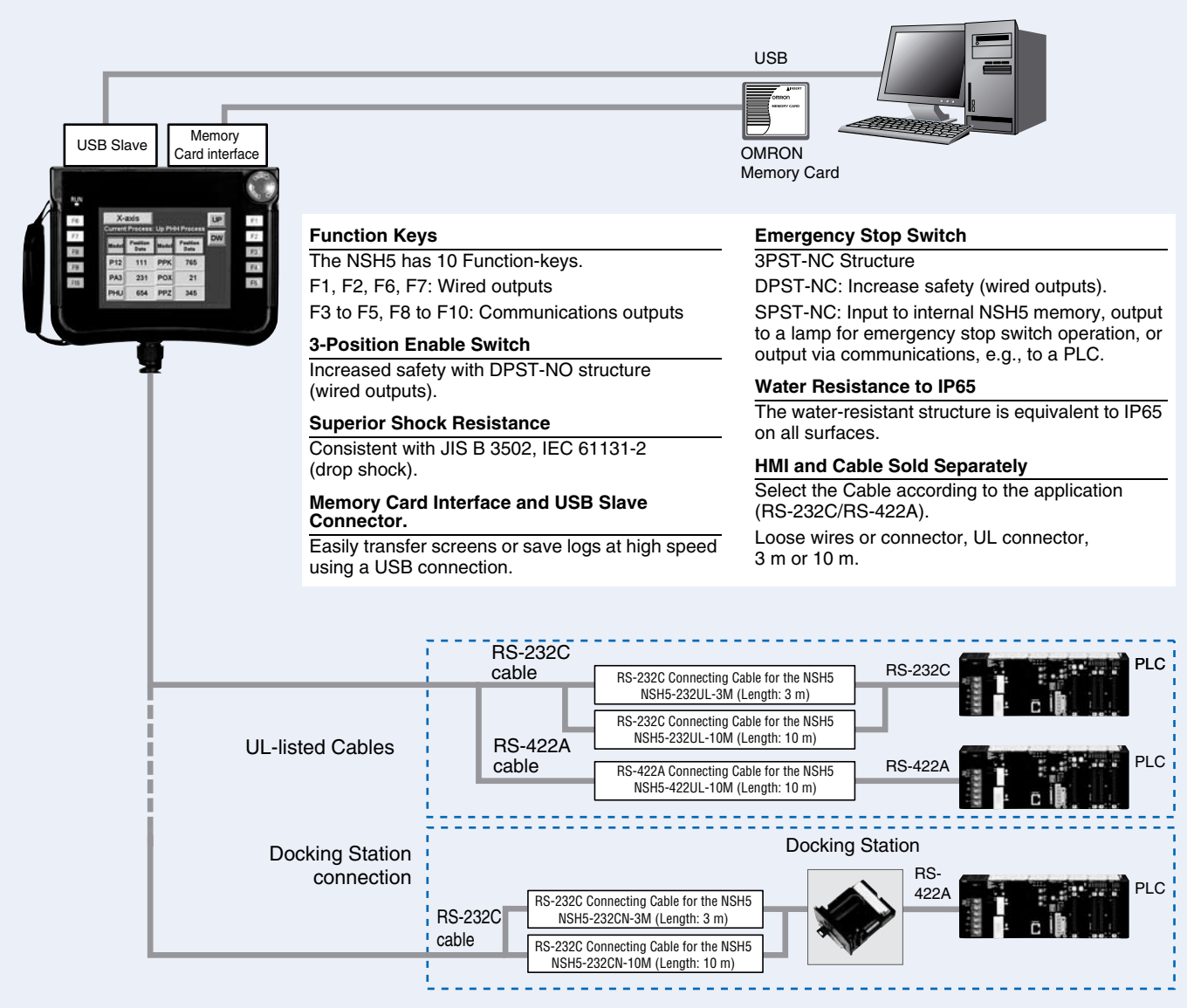
XGA (1,024 x 768 dots) and up to a maximum screen size of 3,840 x 2,400 is supported. Alarms occurring in devices or the line can be monitored.





NSH5 Series

The NSH5 is the mobile version of the NS5 HMI. So it comes with the same strong HMI functions, but allows you to move around the machine with the HMI in your hand. For this we provide the NSH5 with an extremely tough casing that can withstand severe shock and is also completely water resistant.



Function Keys

The NSH5 has 10 Function-keys.

F1, F2, F6, F7: Wired outputs

F3 to F5, F8 to F10: Communications outputs

3-Position Enable Switch

Increased safety with DPST-NO structure (wired outputs).

Superior Shock Resistance

Consistent with JIS B 3502, IEC 61131-2 (drop shock).

Memory Card Interface and USB Slave Connector.

Easily transfer screens or save logs at high speed using a USB connection.

Emergency Stop Switch

3PST-NC Structure

DPST-NC: Increase safety (wired outputs).

SPST-NC: Input to internal NSH5 memory, output to a lamp for emergency stop switch operation, or output via communications, e.g., to a PLC.

Water Resistance to IP65

The water-resistant structure is equivalent to IP65 on all surfaces.

HMI and Cable Sold Separately

Select the Cable according to the application (RS-232C/RS-422A).

Loose wires or connector, UL connector, 3 m or 10 m.

Options

Docking Station

The Docking Station is designed in a way that the emergency stop switch line will not turn OFF to trigger the emergency stop circuit even if the NSH5 is disconnected from the station. This eliminates the need for adding an external circuit. Power is disconnected via a key. You can connect a maximum of 15 Docking Stations to a PLC.

Visor

Installing a visor helps to protect the Emergency Stop Switch and prevents improper operation from occurring inadvertently when the HMI is laid down.

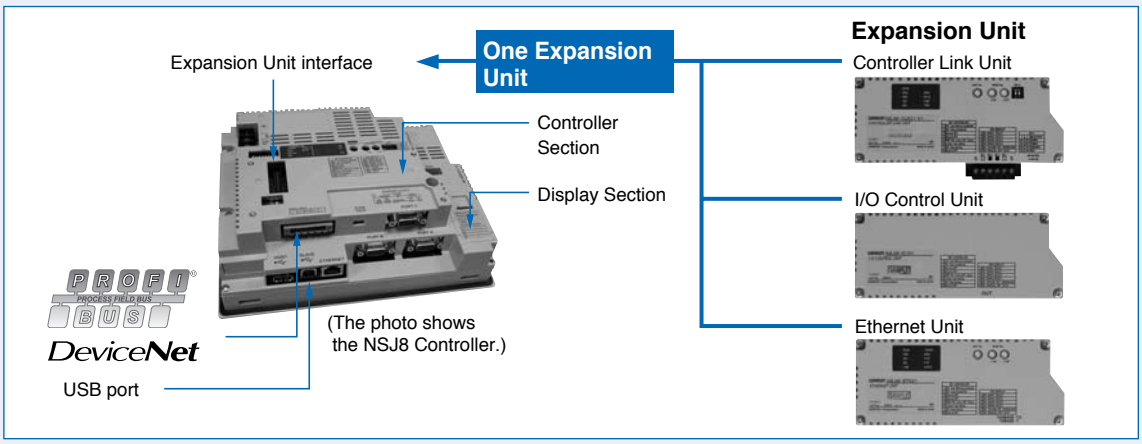
Sysmac One Series

Integrated Machine Management: Sysmac One series

The Sysmac One series combine an NS touch screen with a powerful CJ1 PLC and the choice of different network interfaces in a compact housing occupying less panel space. With the standard USB port you can program both the controller part and the graphical display. The Sysmac One series are available in different screen sizes and two different controller types. The controller is running on a separate CPU so that you have the best performance on both screen and controller. Another benefit of this is that the controller can continue operating even if the screen is accidentally broken.

		Display Section					
		5.7 Inches		8.4 Inches	10.4 Inches	12.1 Inches	Main Differences in Specifications
		Colour STN	Colour TFT				
Controller Section (Designated by model number suffix)	M3x	■	■	■	-	-	• I/O capacity: 640 • User memory: 20 Ksteps • Expanded data memory: None
	G5x	■	■	■	■	■	• I/O capacity: 1,280 • User memory: 60 Ksteps • Expanded data memory: 32 Kwords x 3 banks

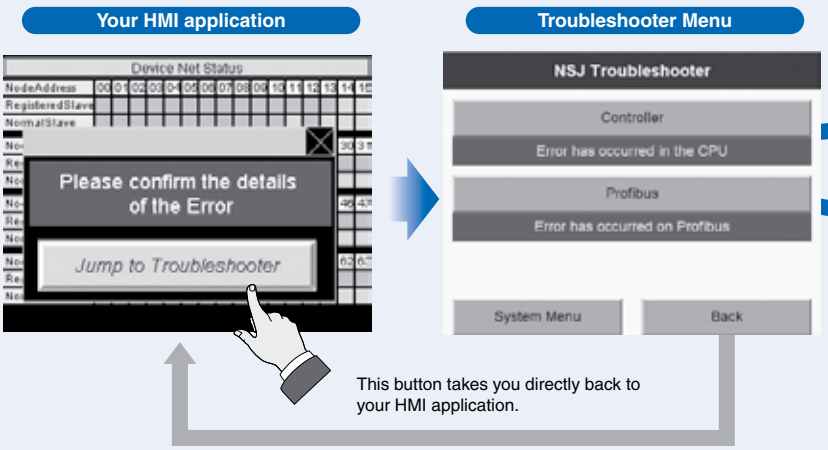
Sysmac One Appearance



Easy Maintenance using Troubleshooter function

Quickly see Errors and Statusses of Controller and Network device

The standard-equipped Troubleshooter contributes to solving problems during device startup and operation. When an error occurs, simply follow the on-screen instructions to confirm the error details and quickly implement counter measures, without referring to the manual.



Expansion Units

For the Sysmac One series we have three different expansion units available. It is only possible to use one expansion unit on a single Sysmac One model. Two expansion units are providing extra network possibilities on Controller Link and Ethernet. The third expansion unit allows you to connect the standard CJ1 units to the Sysmac One model.

Controller Link Unit (NSJW-CLK21-V1)

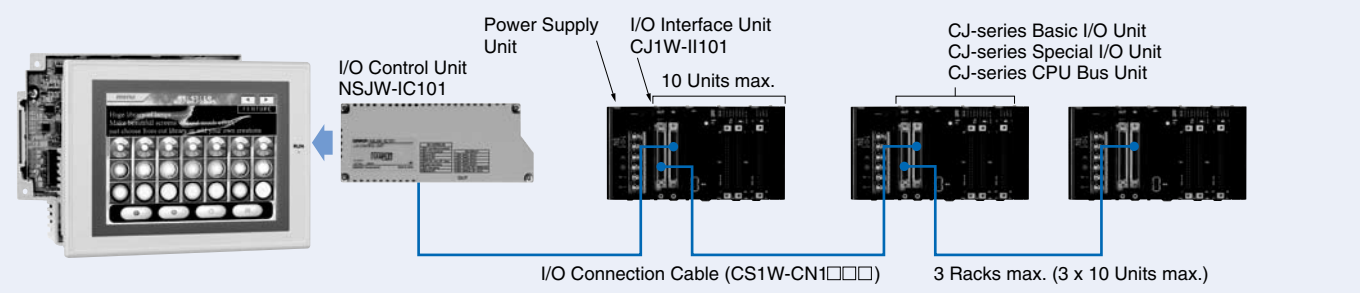
High-speed, large-capacity data link

The PLC data link function can be used to provide a high-speed, large-capacity data link between Controllers over the Controller Link network.

I/O Control Unit (NSJW-IC101)

Easily connect Special I/O Units and CPU Bus Units

Used to mount Motion Control Units and other Special I/O Units or CPU Bus Units to the NSJ-series Controller, for excellent expandability.

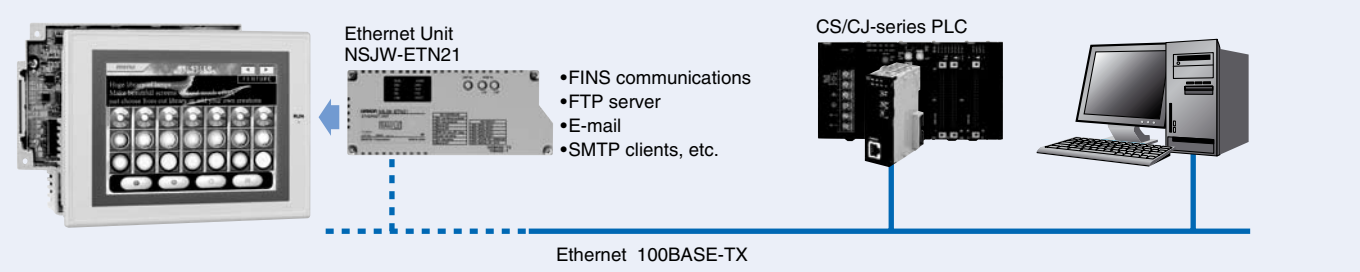


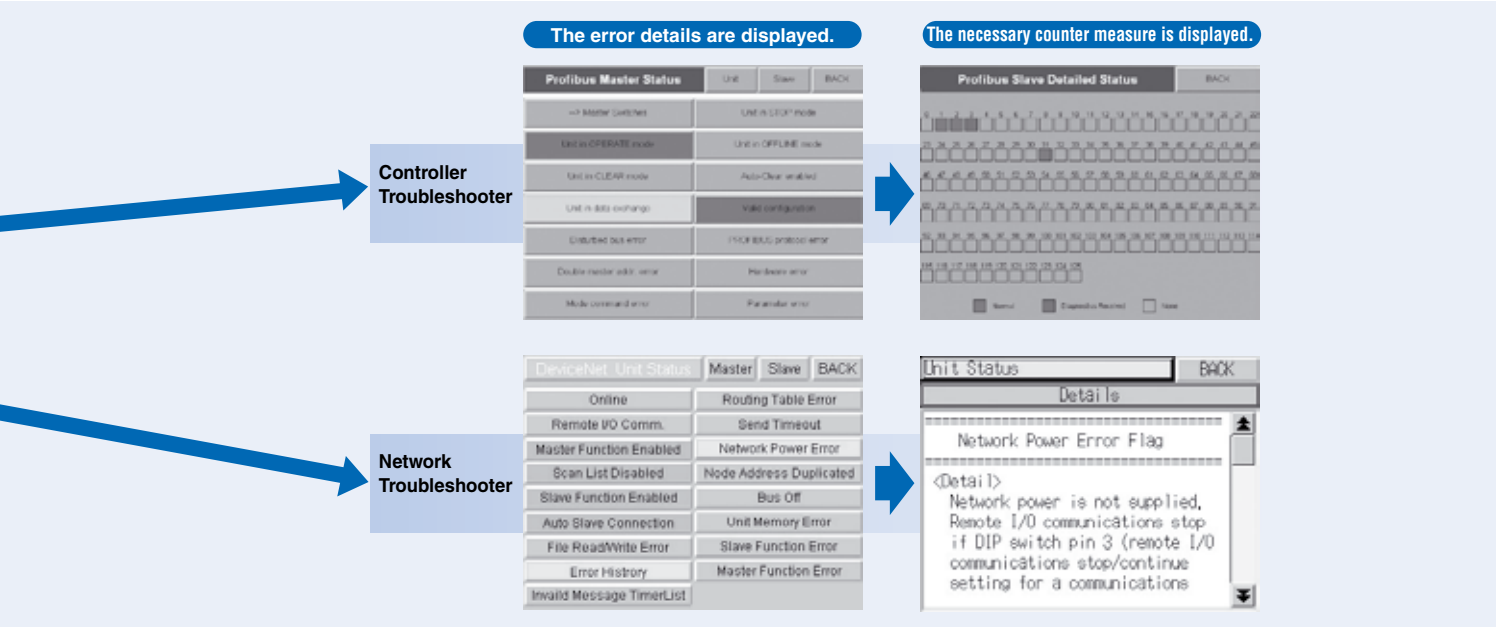
Note: Used to mount Motion Control Units and other Special I/O Units or CPU Bus Units to the NSJ-series Controller, for excellent expandability.

Ethernet Unit (NSJW-ETN21)

Full use of versatile Ethernet functions

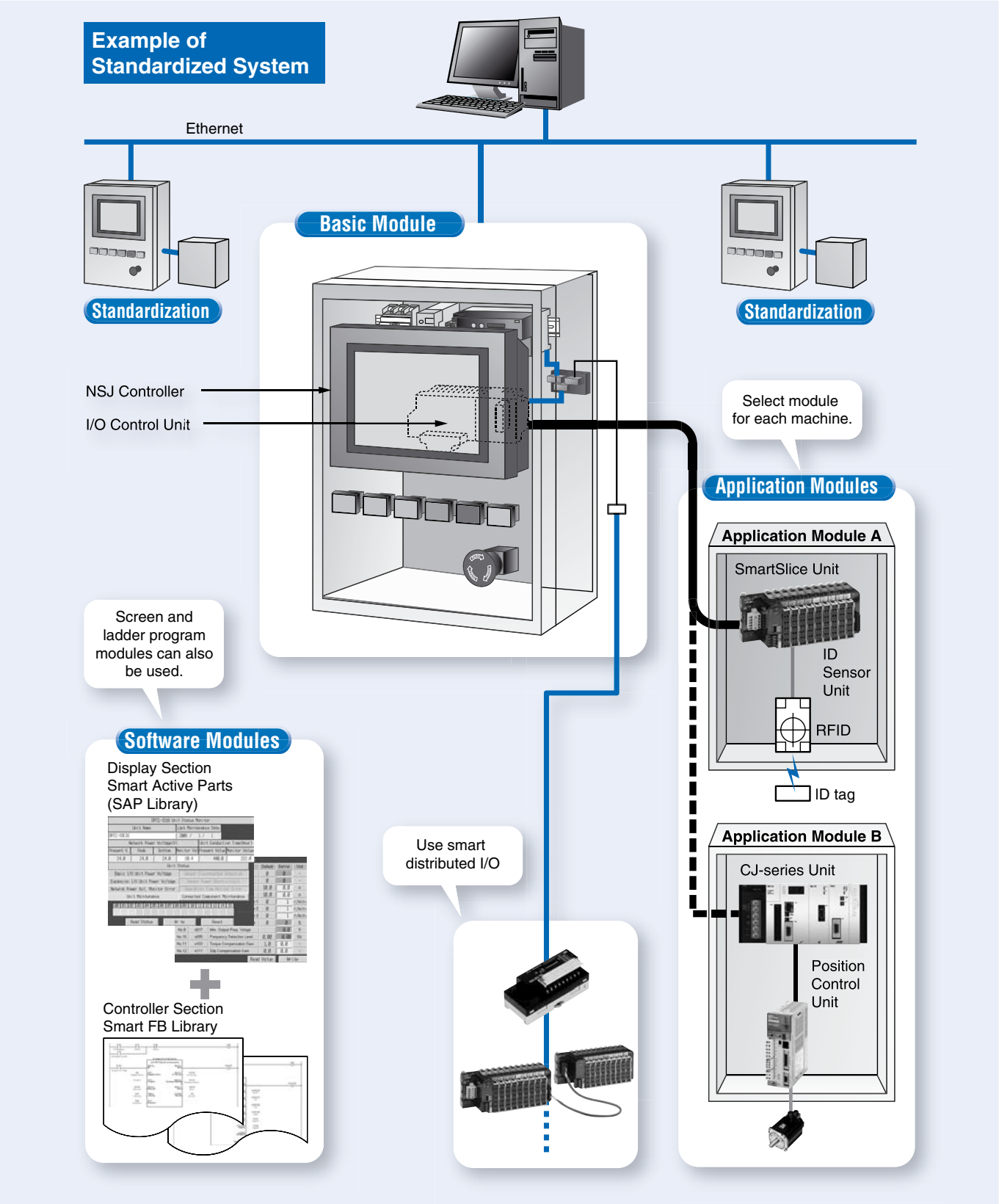
The Ethernet expansion unit provides extra Ethernet functions like sending/receiving messages, using CMND instruction and sending/receiving E-mails.





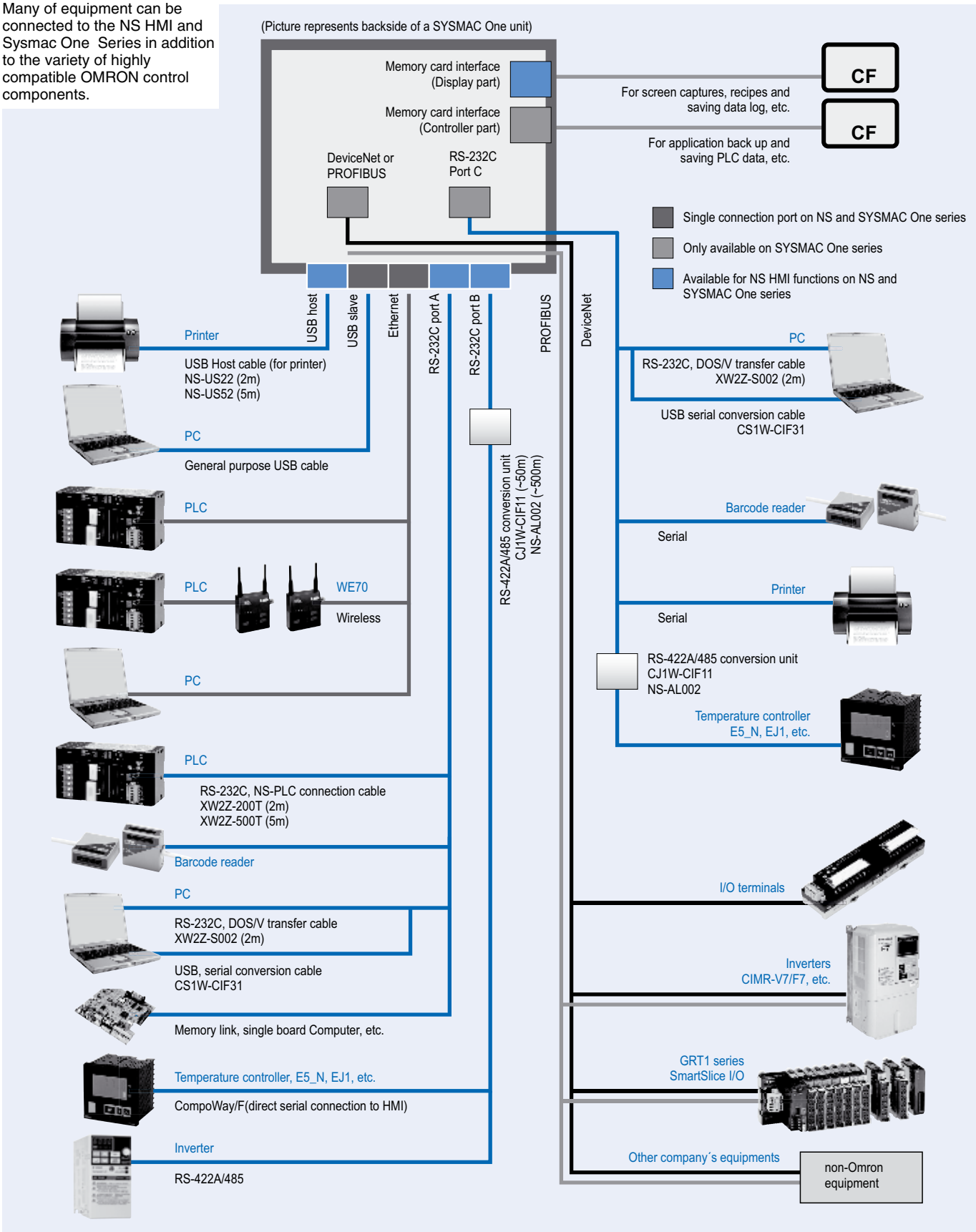
Control Panel Standardization

By standardizing control panels based on SYSMAC One, design steps can be reduced and software assets can be reused to eliminate redundancy and inconsistency all the way from the design stage to system startup.



NS-series HMI: Outstanding connectivity

Many of equipment can be connected to the NS HMI and Sysmac One Series in addition to the variety of highly compatible OMRON control components.



OMRON EUROPE B.V. Wegalaan 67-69, NL-2132 JD, Hoofddorp, The Netherlands. Tel: +31 (0) 23 568 13 00 Fax: +31 (0) 23 568 13 88 www.industrial.omron.eu

Austria
Tel: +43 (0) 2236 377 800
www.industrial.omron.at

Belgium
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South-Africa
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www.industrial.omron.co.za

Spain
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Sweden
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Turkey
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