OMRON

Real Value and Flexible Application

Provides the Functions Sought in New Displays.
This Powerful Lineup Showcases OMRON's Unique Value.

NS SERIES

realizing

Navigator for System
NS Series

NS-series Value

Perfect Synergy

Best Match

Demonstrates excellent matching with OMRON control devices. Greatly reduces the cost and effort required to connect all kinds of components, such as PLCs. Provides a wide variety of useful functional aspects of the same manufacturer.

Simple Screen Designing

Easy-to-use Software

The CX-Designer is so easy-to-use that anyone can master it, without even designing screens and ladder programs. You can create the desired screens quickly and with OMRON's integrated development environ-ment, you can dramatically reduce the time required to design screens.

Complete Functionality

Plenty of Basic Functions

The basic functions desired in new displays have been greatly improved. In addition to making the displays as easy-to-use as possible, a variety of useful functions that can precisely meet the customers' needs have been built into the displays.

Navigator for System
NS Series

NS Series Lineup

This powerful lineup showcases OMRON's unique value.
Choose from 3 types to match your application and requirements.

NS Series Plentiful screen variations and diverse functions allow use in a wide variety of applications.

Standard Models

5.7 inches

USB Slave | USB Master | Ethernet | RS-232C x 2
Controller Link | Ladder Monitor | Video | Memory Card

NS5-MQ Monochrome STN

- 16 monochrome gradations
- QVGA 320 x 240 pixels
- Screen memory size: 20 MB

NS5-SQ Color STN

- 4,096 colors ● QVGA 320 x 240 pixels
- Screen memory size: 20 MB

NS5-TQ Color TFT

- 32,768 colors ● QVGA 320 x 240 pixels
- Screen memory size: 20 MB

8.4 inches

USB Slave | USB Master | Ethernet | RS-232C x 2
Controller Link | Ladder Monitor | Video | Memory Card

NS8-TV Color TFT

- 32,768 colors ● VGA 640 x 480 pixels
- Screen memory size: 60 MB

10.4 inches

USB Slave | USB Master | Ethernet | RS-232C x 2
Controller Link | Ladder Monitor | Video | Memory Card

NS10-TV Color TFT

- 32,768 colors ● VGA 640 x 480 pixels
- Screen memory size: 60 MB

12.1 inches

USB Slave | USB Master | Ethernet | RS-232C x 2
Controller Link | Ladder Monitor | Video | Memory Card

NS12-TS Color TFT

- 32,768 colors ● SVGA 800 x 600 pixels
- Screen memory size: 60 MB

Optional Products NS-series functions, such as image processing and networking, have been expanded.

Video Input Unit
NS-CA001
- NTSC/PAL video inputs (4 channels)

RGB/Video Input Unit
NS-CA002
- NTSC/PAL (2 channels)
- RGB input (1 channel)

Controller Link Interface Unit
NS-CLK21

RS-232C/RS-422A Conversion Unit
NS-AL002
- Transmission distance: 500 m max.

Communications Cable
XW2Z-S002

NSH Series A hand-held version of the NS5 is now available to perform operations at the production site.

Hand-held Models

5.7 inches

USB Slave | USB Master | Ethernet | RS-232C x 2
Controller Link | Ladder Monitor | Video | Memory Card

NSH5-SQR
Color STN
- Equipped with a red switch for an emergency stop input.
- 4,096 colors
- QVGA 320 x 240 pixels
- Emergency stop (3 inputs)

NSH5-SQG
Color STN
- Equipped with a gray switch for a stop input.
- 4,096 colors
- QVGA 320 x 240 pixels
- Emergency stop (3 inputs)

Hand-held PT Cable

RS-422A | RS-232C

SYSMAC One NSJ Series

PT is unified with the Controller into one package to greatly help standardize equipment and reduce size.

Integrated Controller Models

5.⁷ inches

USB Slave | USB Master | Ethernet | RS-232C x3
Controller Link | Ladder Monitor | Video | Memory Card

NSJ5-TQ☐☐-M3D Color TFT

(Display Section)
- 32,768 colors
- QVGA 320 x 240 pixels
- Screen memory size: 20 MB
(Controller Section)
- I/O points: 640
- Program capacity: 20K steps
- Data Memory: 32K words

NSJ5-SQ☐☐-M3D Color STN

(Display Section)
- 4,096 colors
- QVGA 320 x 240 pixels
- Screen memory size: 20 MB
(Controller Section)
- I/O points: 640
- Program capacity: 20K steps
- Data Memory: 32K words

NSJ5-TQ☐☐-G5D Color TFT

(Display Section)
- 32,768 colors
- QVGA 320 x 240 pixels
- Screen memory size: 20 MB
(Controller Section)
- I/O points: 1,280
- Program capacity: 60K steps
- Data Memory: 128K words

NSJ5-SQ☐☐-G5D Color STN

(Display Section)
- 4,096 colors
- QVGA 320 x 240 pixels
- Screen memory size: 20 MB
(Controller Section)
- I/O points: 1,280
- Program capacity: 60K steps
- Data Memory: 128K words

8.⁴ inches

USB Slave | USB Master | Ethernet | RS-232C x3
Controller Link | Ladder Monitor | Video | Memory Card

NSJ8-TV☐☐-M3D Color TFT

(Display Section)
- 32,768 colors
- VGA 640 x 480 pixels
- Screen memory size: 60 MB
(Controller Section)
- I/O points: 640
- Program capacity: 20K steps
- Data Memory: 32K words

NSJ8-TV☐☐-G5D Color TFT

(Display Section)
- 32,768 colors
- VGA 640 x 480 pixels
- Screen memory size: 60 MB
(Controller Section)
- I/O points: 1,280
- Program capacity: 60K steps
- Data Memory: 128K words

10.⁴ inches

USB Slave | USB Master | Ethernet | RS-232C x3
Controller Link | Ladder Monitor | Video | Memory Card

NSJ10-TV☐☐-G5D Color TFT

(Display Section)
- 32,768 colors
- VGA 640 x 480 pixels
- Screen memory size: 60 MB
(Controller Section)
- I/O points: 1,280
- Program capacity: 60K steps
- Data Memory: 128K words

12.¹ inches

USB Slave | USB Master | Ethernet | RS-232C x3
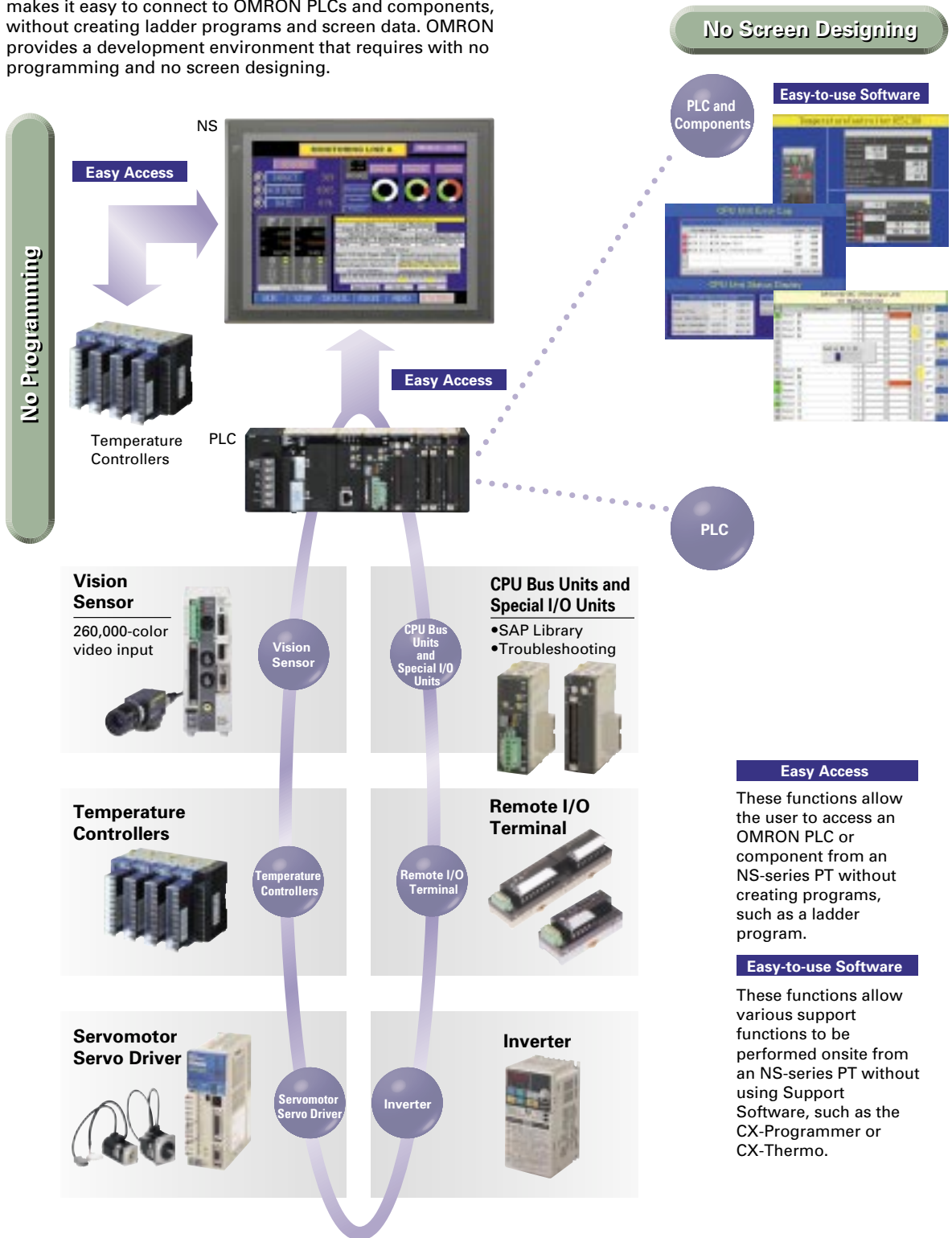Controller Link | Ladder Monitor | Video | Memory Card

NSJ12-TS☐☐-G5D Color TFT

(Display Section)
- 32,768 colors
- SVGA 800 x 600 pixels
- Screen memory size: 60 MB
(Controller Section)
- I/O points: 1,280
- Program capacity: 60K steps
- Data Memory: 128K words

Note: For details on the NSJ-series Controllers, refer to the NSJ-series Programmable Controllers Catalog (Cat. No. V406).

Best Match

Best Match with OMRON Products,
Eliminates Programming and Screen Designing

The Smart Active Parts (SAP Library) for the NS Series makes it easy to connect to OMRON PLCs and components, without creating ladder programs and screen data. OMRON provides a development environment that requires with no programming and no screen designing.

No Screen Designing

PLC and Components

Easy-to-use Software

No Programming

NS

Easy Access

Easy Access

Temperature Controllers

PLC

PLC

Vision Sensor
260,000-color video input

Vision Sensor

CPU Bus Units and Special I/O Units
• SAP Library
• Troubleshooting

CPU Bus Units and Special I/O Units

Temperature Controllers

Temperature Controllers

Remote I/O Terminal

Remote I/O Terminal

Servomotor Servo Driver

Servomotor Servo Driver

Inverter

Inverter

Easy Access

These functions allow the user to access an OMRON PLC or component from an NS-series PT without creating programs, such as a ladder program.

Easy-to-use Software

These functions allow various support functions to be performed onsite from an NS-series PT without using Support Software, such as the CX-Programmer or CX-Thermo.

Smart Active Parts (SAP Library)

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

More than 2,000 Library parts (Smart Active Parts) are available, which can directly access OMRON PLCs and components. The objects can just be pasted from the Smart Active Parts (SAP Library) Library to the screen; it is completely unnecessary to create screens and ladder programming.
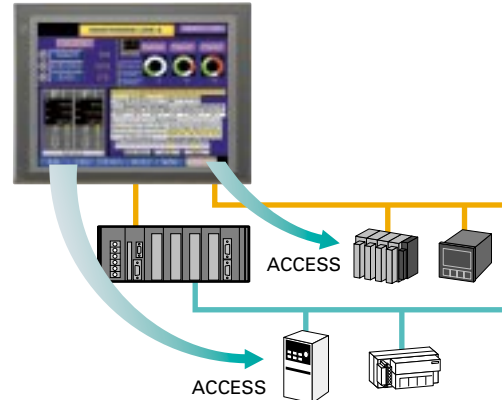
The Temperature Controller's setting and monitor screens are completed in no time.

CX-Designer Screen Design Software

SAP Library, Temperature Controller Parts

ACCESS

ACCESS

Support tool objects can be incorporated to check for errors and make settings, even without a computer.
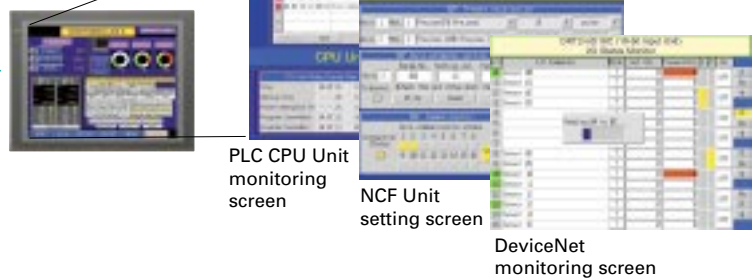
Plenty of support tool objects (the Tool Function SAP Library) are available, which can be easily incorporate support tool functions in the NS-series PT. Just paste the support tool objects in the screen to check for errors and make settings,

Example screens using support tool objects (Tool Function SAP Library)

From

To

Computer support tools

Easy Support Tools

PLC CPU Unit monitoring screen

NCF Unit setting screen

DeviceNet monitoring screen
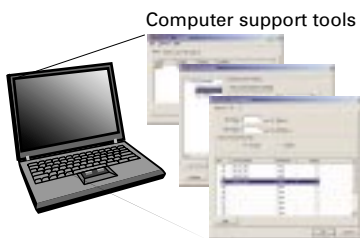
CPU Bus Unit and Special I/O Unit Troubleshooting Can Be Also Performed with the SAP Library.
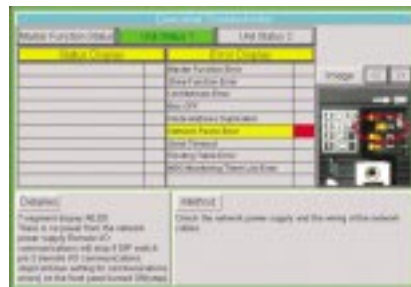
A Troubleshooter SAP Library is available to troubleshoot each Unit in the PLC. When an error occurs in a Unit, the Troubleshooter SAP Library provides an easy-to-understand explanation of the cause of the error as well as the countermeasures.

Troubleshooter SAP for a Position Control Unit
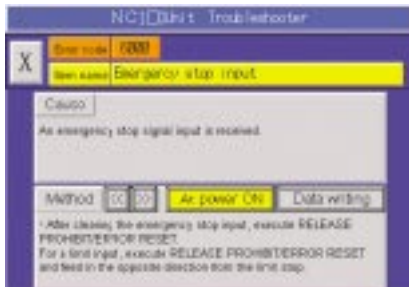
Troubleshooter SAP for a DeviceNet Unit

We plan successive development of the following Troubleshooter SAP Libraries.
New versions of the SAP Libraries for the Analog Input Units, Analog Output Units, Analog I/O Units, ID Sensor Units, Temperature Sensor Units, and Fast Counter Units will be available soon.

Best Match

Single Port Multi Access (SPMA)

**The ladder program and screen data can be transferred from a single port!**
The ladder program can be transferred through the PLC and the PT's screen data can also be transferred, all while the computer remains connected to the PT's port (such as a USB port).

The PT can transfer data over network levels by the following routes.
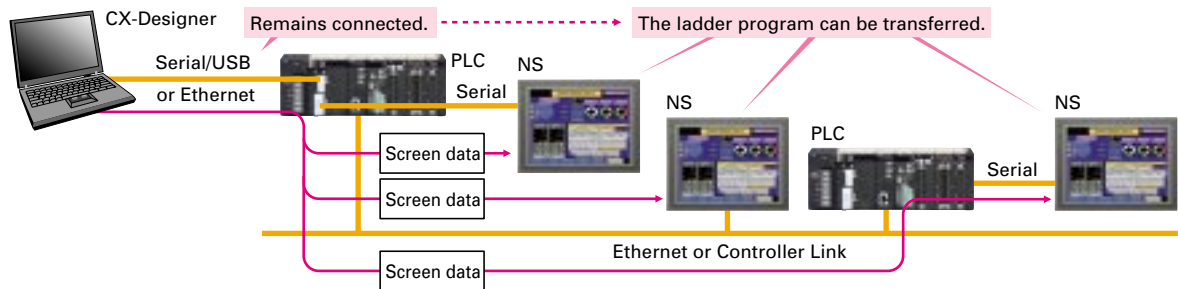Computer (USB)→NS-series PT (Serial)→PLC (Ethernet or Controller Link)→PLC
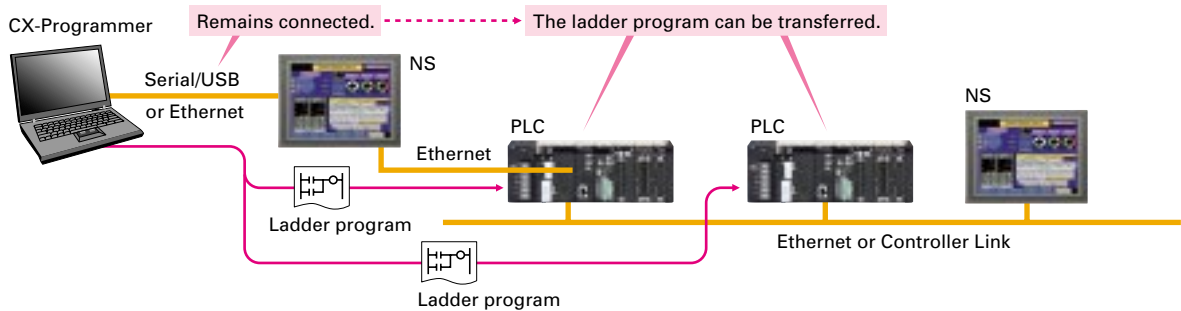
SPMA significantly improves maintenance efficiency when the NS-series PT and PLC are some distance apart.
Computer (USB) → PLC (Serial)→NS-series PT
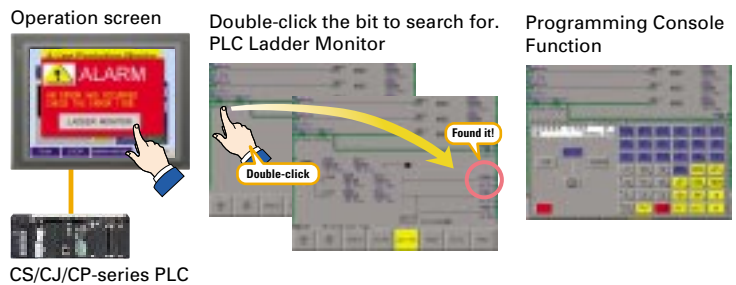**Note**: SPMA can be used in CS/CJ-series PLCs with lot number 030201 or later.

Ladder Monitor

The ladder program can be monitored onsite without a laptop!
Ladder programs with I/O comments can be monitored on the PT's screen and the ladder program can also be edited with the Programming Console function.
Note: The Ladder Monitor function is not supported by the 5.7-inch models, but the Programming Console function can be used if the required software is copied to the Memory Card.

Operation screen

CS/CJ/CP-series PLC

Double-click the bit to search for.
PLC Ladder Monitor

Double-click

Found it!

Programming Console Function

Also meets the requirements of users who need to display devices onsite, instead of the ladder program.

[Switch Box Function]
The operator can check the PLC status by displaying just the I/O comments and status.

[Device Monitor Function]
Displays the device's contents, allowing settings to be input and checked and making startup operations more efficient.

Switch Box Function

Device Monitor Function

PLC Data Trace

The PLC's operation can be checked!

The PLC Data Trace function is built into the PT in addition to the Ladder Monitor and Device Monitor. A bit's status and operation can be viewed in a time chart just by setting the desired PLC bit's address in the PT.

Note: There are differences between this Data Trace function and the CX-Programmer's Data Trace function. Refer to the NS-series Programmable Terminal Programming Manual (Cat. No. V073) for details.
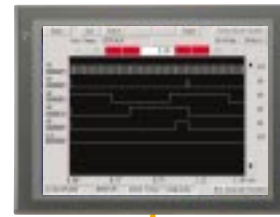
CS/CJ/CP-series PLC

Data Trace

PLC Troubleshooter

Constantly monitors PLC errors.

Automatically detects PLC errors and displays the error details and recovery procedure on the screen. Even if a problem occurs, it can be resolved quickly without referring to the manuals.

Error details are displayed.

Processing procedure is displayed.

CS/CJ/CP-series PLC

Note: A special template is required when using this function. Contact your OMRON representative for details. This function is a standard feature in the NSJ-series PTs.

Direct Connection to Temperature Controllers

Connect OMRON Temperature Controllers directly to the NS-series PT.

OMRON Temperature Controllers can be connected directly to the NS-series PT's RS-232C port. Data does not pass through the PLC, so ladder programming is not required. Also, there are plenty of objects in the SAP Library for Temperature Controllers, and Temperature Controller screens can be created easily just by pasting objects from the SAP Library to the screens.

CJ1W-CIF11
RS-422A Serial Adapter

OMRON Temperature Controllers

Note: An RS-422A Serial Adapter is needed to connect directly to a Temperature Controller. Refer to page 34 for a list of the Temperature Controllers that can be connected.

Best Match

Screens for Loop Controllers can be easily and automatically created.

Compatibility with CX-Process Is Also Outstanding.

WS02-NSFC1-EV3
Face Plate Auto-Builder for NS

Significantly reduces the effort required to combine a Loop Controller with an NS-series PT.

- Easy automatic generation of faceplates, such as faceplates for PV monitoring and SV setting, as well as tuning screens, such as screens to set and autotune PID constants.
- A total of 17 function blocks are supported, with eleven function blocks, such as Ratio Setting and Motor Manipulators newly supported (version 3 of higher).
- Comments are automatically entered for automatically assigned unit and scale settings when a project is generated (version 3 and higher).

Note: Refer to the PLC-based Process Control Catalog (Cat. No. P051) and the Loop-control CPU Unit Catalog (Cat. No. R128) for details on Loop Controllers.

NS Series

Created screens are easily transferred to the NS by using a Memory Card or over the network.

SYSMAC CS/CJ-series Loop Controller

CSV tag file for Loop Controller   NS project file

CX-Designer
(NS screen creation software)
- Editing created data
- Creation of other required screens

CX-Process Tool
(Loop Controller Programming Software)
- Loop Controller program creation (function block method)
- CSV tag file output

Face Plate Auto-Builder for NS
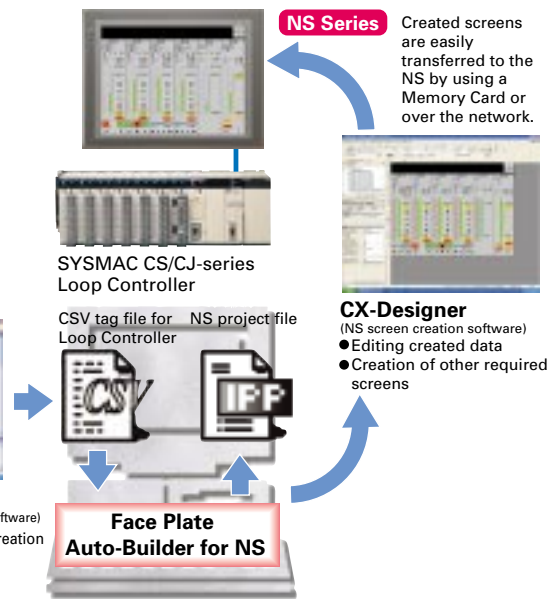
260,000-color Video Display

Equipment and workpiece movements can also be displayed in beautiful video!

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. A Console Unit is not needed to connect, either.

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 of the video signals or the analog RGB signal can be displayed on the NS-series PT.

Note: Some models of Video Input Units and RGB Video Input Units cannot be used. For details, refer to page 4.

Console

Camera

RGB

Console

Camera
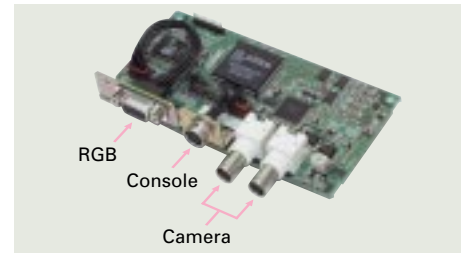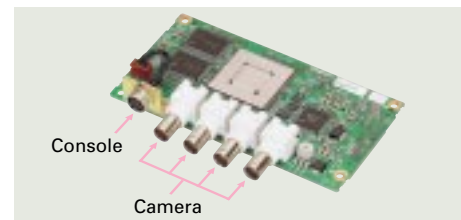
Also Compatible with OMRON Vision Sensors.

NS

RGB/Video Input Unit

Vision Sensor

Easy-to-use Software
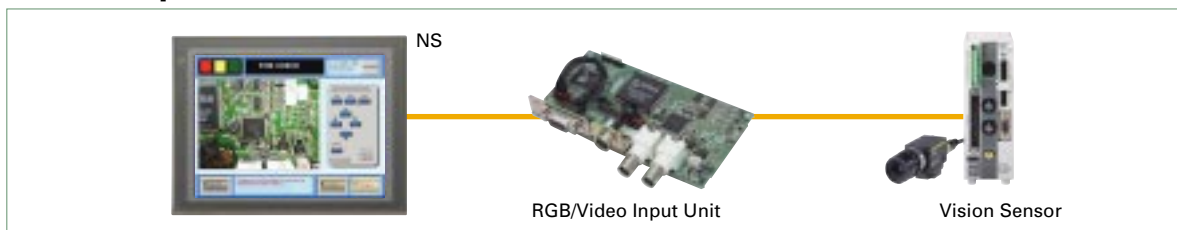
User-friendly Screen Creation

So easy to use, anyone can master it.
Without screen creation and ladder programming, the CX-Designer Screen Design Software is so easy-to-use that anyone can master it.

All addresses and comments can be managed using a single Symbol Table.

Shows a list of addresses, names, and comments used in project screen data. Addresses, names, and I/O comments for the CX-Programmer can also be imported.

Improved Icons and Help

Fijar La Pantalla
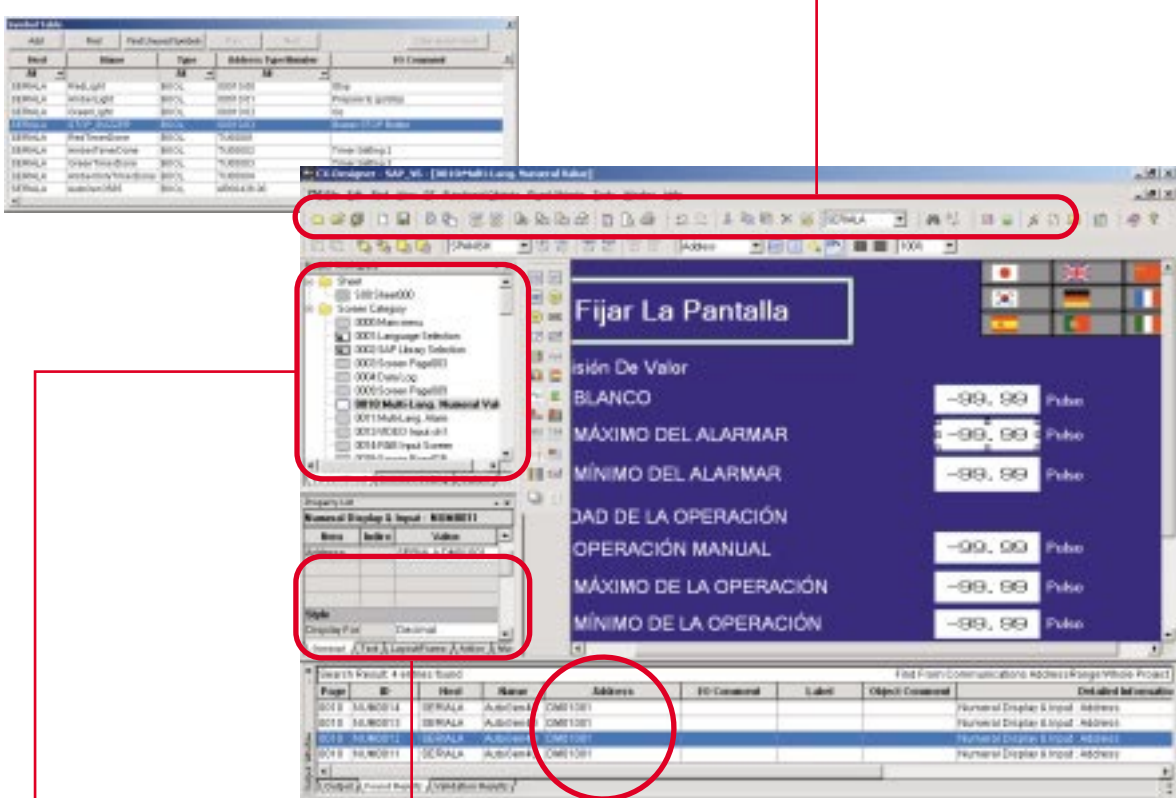
The project Workspace enables the user to look through the entire project.

● Screens you want to edit can be opened right away.
● Perform screen management, such as copying or deleting screens, by simply right-clicking.
● Reusing screens from other projects is easy with the CX-Designer.
● Settings for alarms, data logs, communications, and other functions can be easily accessed.

Drastically reduce the number of clicks in the project.

Just click on the object once to display or change properties. Multiple objects can be selected to display and change shared properties all at once.

The Output Window shows search results.

In addition to addresses and I/O comments used in screen data, labels can also be used as search strings and the results can be displayed.

Easy-to-use Software

Reading the Symbol Table

Dramatically reduces the need to manually input data such as addresses and I/O comments.

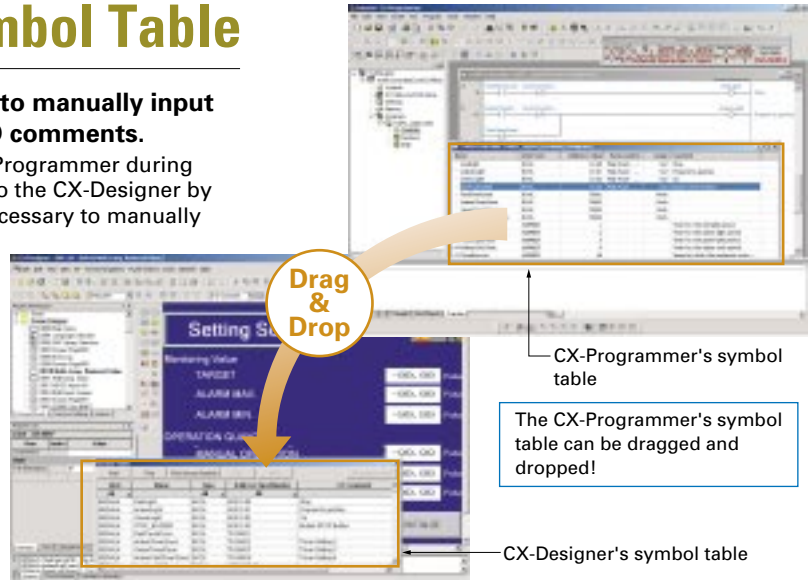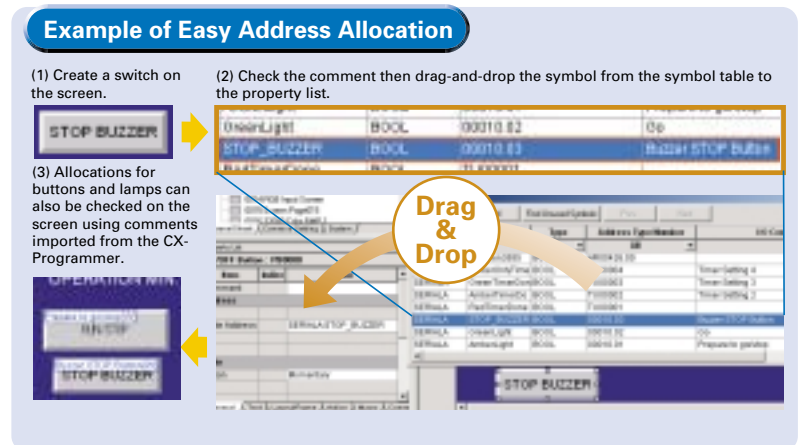The symbol table created in the CX-Programmer during ladder programming can be read into the CX-Designer by dragging and dropping, so it isn't necessary to manually data such as input addresses and I/O comments.

Drag & Drop

CX-Programmer's symbol table

The CX-Programmer's symbol table can be dragged and dropped!

CX-Designer's symbol table

● **Example of Reading the Symbol Table**

The symbol table read from the CX-Programmer can be directly dragged and dropped to the touch switch and lamp.

Example of Easy Address Allocation

(1) Create a switch on the screen.

STOP BUZZER

(2) Check the comment then drag-and-drop the symbol from the symbol table to the property list.

| OnientLight | BOOL | 00010.02 | Ge |
| STOP_BUZZER | BOOL | 00010.03 | Buzzer STOP Button |

(3) Allocations for buttons and lamps can also be checked on the screen using comments imported from the CX-Programmer.

Drag & Drop

STOP BUZZER

● **Example of Reading I/O Comments**

If Use I/O comment is selected in advance for the Use symbol text as label, the I/O comments are automatically used as labels when addresses are dragged and dropped from the symbol table. (If Use symbol names is selected, the symbol names are used as the labels.)

Drag & Drop

PARKING   The I/O comment is used as the label.
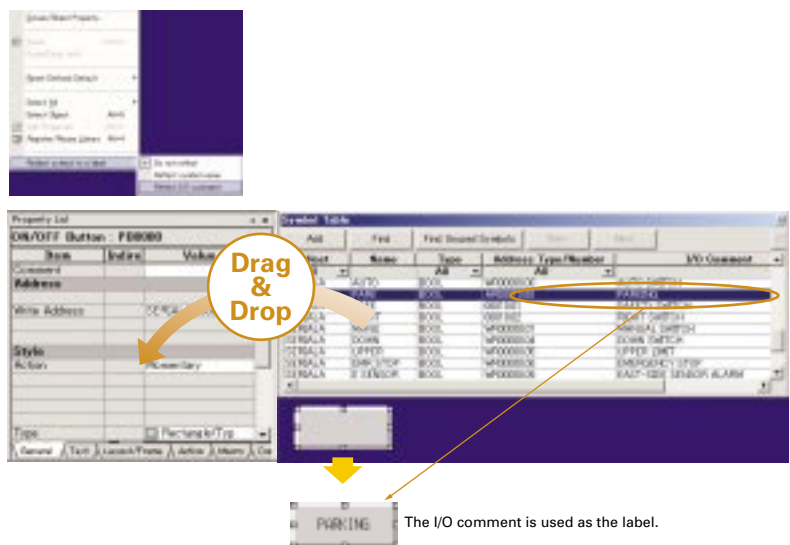
Reading Another Project's Screens and Objects

Easily reuse screen resources by dragging and dropping them.

Resources from another project can be easily reused by just selecting the screen or objects that you want to read and dragging and dropping it, so screens can be created intuitively.

[Example screen 1]

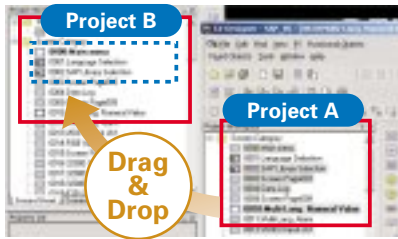Select the screen that you want to read, drag it to the destination, and drop it.

[Example screen 2]
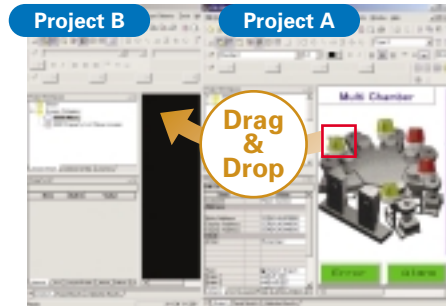
Select the part that you want to read, drag it to the destination, and drop it.

Integrated Simulation with the PLC Ladder Program

The screen data and ladder program can be checked simultaneously in the computer.

The CX-Designer and CX-Programmer interconnects the test functions in the computer through the CX-Simulator. The screens and ladder program checks are performed simultaneously, which significantly increases debugging efficiency.

● Ladder Program Window

● CX-One Version 2.0 on computer

● Touch Panel Screen

Interactive

Easy-to-use Software

Editing of Multiple Objects

Objects can be edited very efficiently in a list!
Addresses and other settings, such as labels and colors, can be set together in a list, making editing operations much more efficient.

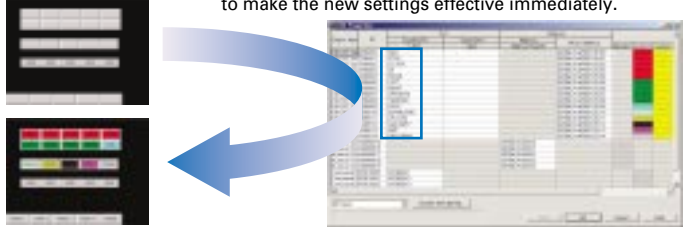### The attributes of multiple parts can be edited together, too.
When the common attributes (such as background color and text color) of multiple parts are being changed, the attributes can be changed together using the property list.

[Example screen 1] After editing the settings in the list, press the OK Button to make the new settings effective immediately.

[Example screen 2] If the background color is changed from white to gray in the property list, the background color is changed for all of the selected objects.
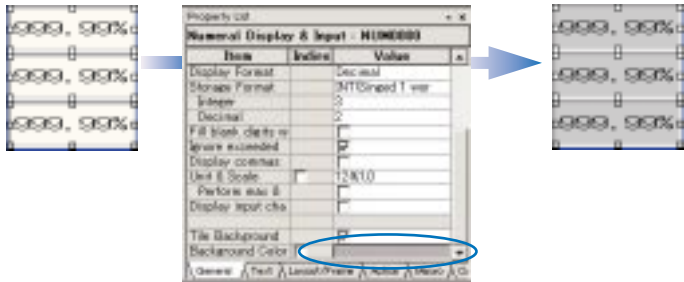
Editing of Overlapping Objects

The Select Object command and filter function are the solution for overlapping objects!
The Select Object command is a powerful tool when you want to edit object hidden by overlapping.
A filter function can also be used to aid editing by displaying only the objects to be edited.

[Object Selection Window]
Right-click and select Select Part to display the objects (all types) on the screen.
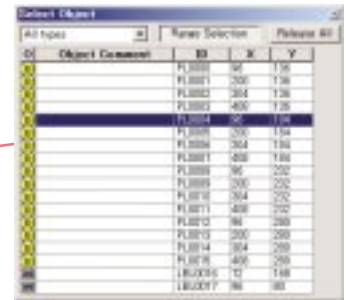
[Filter Function]
Use the Select Part command's filter function to select the objects (ON/OFF Button) that you want to edit.

Only the edited object is displayed and it can be edited easily.

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.

Symbols input for addresses, which have not yet been determined.

Addresses input as addresses because addresses have been determined.

[Inputting from the Symbol Table]

Addresses are input in the symbol table after the addresses are determined.

Plenty of Basic Functions

Multi-language Support

There are 41 languages supported and useful label switch functions are also built into the PT.
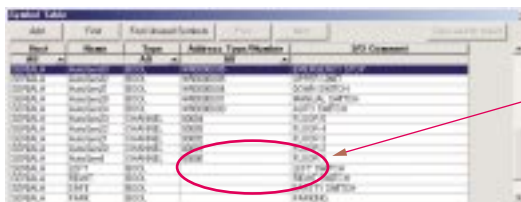Unicode is supported and 41 Asian and European languages can be combined in screens. Also, it is possible to switch between up to 16 labels using the label switching function, so it is possible to support up to 16 languages in a single screen just by specifying the language to be displayed in each label.

NS Series

Support for 41 International Languages

[The labels' text attributes can also be reflected when importing.]
When screen data is imported, text attributes can be applied to the specified labels and attributes such as the font and text color can be reflected to other languages labels.

Multi-language CSV data

Import

Convenient!
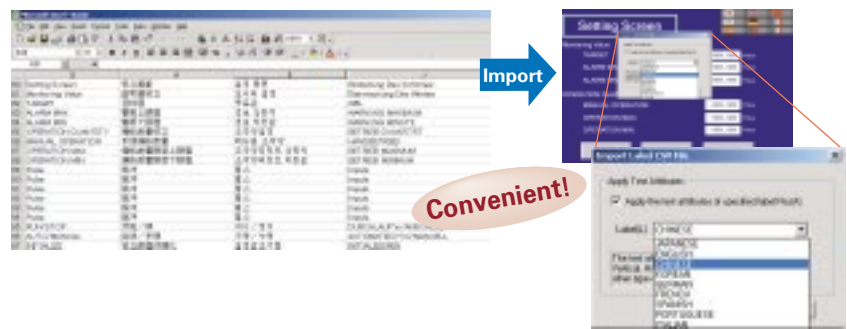
Multi-language conversion has become much easier.
The screen data in the source language is exported to a CSV file and sent to a translation agency by e-mail for translation. Later, the translated CSV file is just imported to easily provide multi-language support.

Language A screen data
NS project

Language A Excel data
CSV

Attachment
CSV

Dual-language input in Excel by translation companies and local companies

Dual-language screen data
NS project

Language A and B Excel data
CSV or Unicode text

CSV Attachment
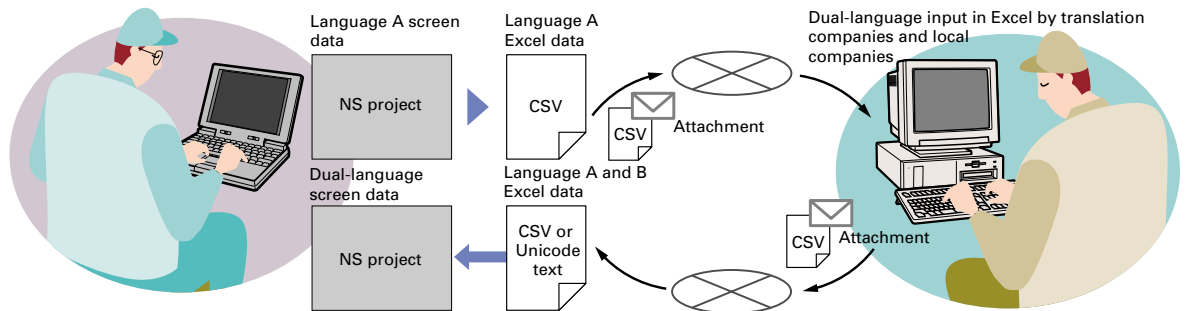
Note: Windows 2000 or XP is required for multi-language support.

FTP Function

You can partially replace text and pictures from your computer.
FTP (File Transfer Protocol) has been added! Texts, lists, and recipes can be replaced with the put/get command from your computer! You can even replace BMP files from your computer easily.

Screens, bitmaps, text, recipe data

If(Date=0526)
FTP 192.xxxx
xxxx
mput * .bmp

Replace the wafer.

Replace the wafer

Handle the wafer with gloves on.
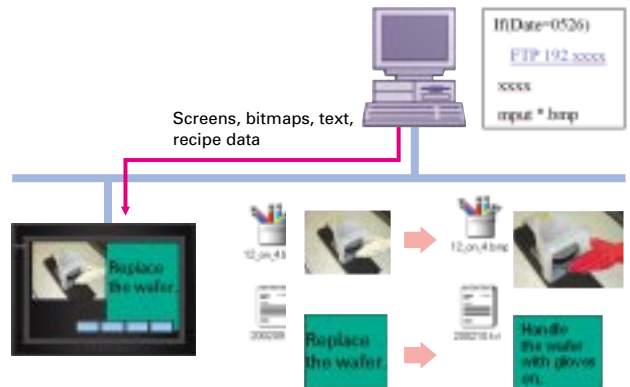
Plentiful Graphing Functions

A device's operation is easier to understand when presented visually.

A variety of graphing functions are built into the PTs, such as the trend graph, which can log data over a long term, and the line graph, which can display overlapping graphs. A device's operation is easier to understand when presented visually.

● **Long-term data logging and storage are also easily achieved.**

[Trend Graph (Data Log) Function]

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

The log data files in the Memory Card appear as shown below when the read file button is pressed.

Read file button

A log can be saved automatically, without any programming, just by selecting the Save the data periodically Option in the Data Log Setting Window.

Memory Card

Auto-matically saved

64M

LOG001.CSV 04/06/04 10:00
LOG002.CSV 04/06/05 10:00
LOG003.CSV 04/06/06 10:00
LOG004.CSV 04/06/07 10:00
LOG005.CSV 04/06/08 10:00
LOG006.CSV 04/06/09 10:00
LOG007.CSV 04/06/10 10:00

It is possible to make a one-week log by automatically saving the data seven times.

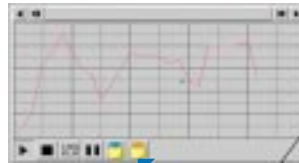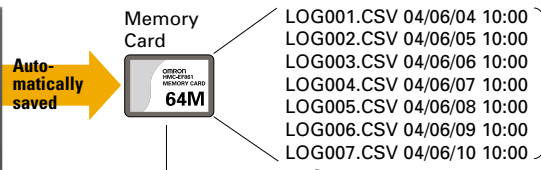Logging data for each day (43,200 points) is saved in the Memory Card in CSV format.

Suffixes are automatically added to file names set in the CX-Designer.

● **The earlier line graph function as been further improved.**

[Line Graph Function]

The data 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.
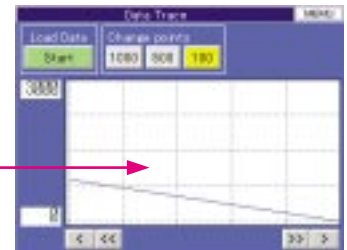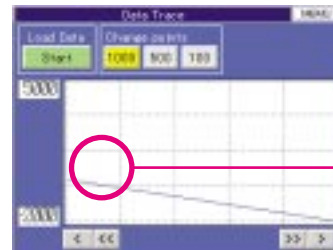
● **Any position from the host (PLC) can be plotted as a graph.**

[Continuous Line Function]

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.

PLC

D0000	X1
D0001	Y1
D0002	X2
•	Y2
•	X3
	Y3

Y

(X2, Y2)

(X3, Y3)

(X1, Y1)

X
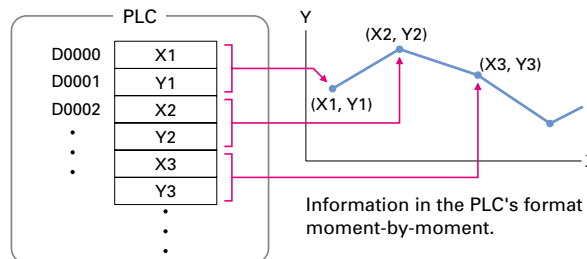
Information in the PLC's format can be plotted moment-by-moment.

Screen Data Security Functions

Protect important screen data with a password.

If password protection is set in the data transfer security settings when the screen data is designed, a password must be entered to download or upload the screen data, so important screen data can be protected.
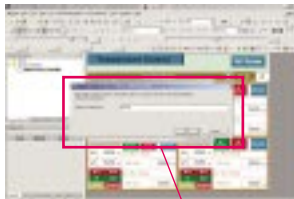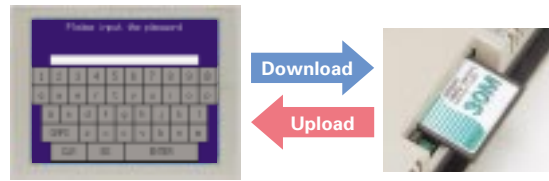
Download
Upload

Download
Upload

A password between 4 and 64 characters long can be set. The download/upload will start if the user inputs the password that was set when the screen was designed. (Password input will be disabled if the wrong password is input 3 times in a row.)

Security password

If a password has been set, the password is required to transfer screen data (download or upload) with the Memory Card.

User Security Functions

Operator access rights and the operating format can be set to one of five password levels.

Each operator can be given one of 5 password levels using the User Security (level authentication) function.
A password level can be set for each object, so various objects can be made inoperable or hidden based on the operator's access level.
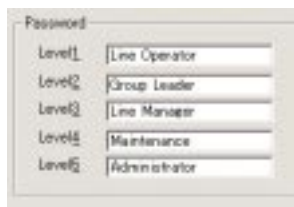
High

Level 5
Level 4
Level 3
Level 2
Level 1

Low

Operator passwords are managed in 5 levels. Passwords can be up to 16 characters long and the access rights increase as the level number increases.

The operator cannot manipulate objects with a password level (authentication level) higher than the operator's login level.

Huge 60-MB Image Memory

Real images can be used liberally, without worrying about memory capacity!

The industry's highest standard image memory: 60 MB. Take full advantage of the 32,768-color palette and spacious memory to design realistic images.

Note: The standard image memory of the 5.7-inch models (NS5, NSH5, and NSJ5) is 20-MB.

When an error occurs, the location of the error can be shown realistically in a picture.

Plenty of Basic Functions

Connect! Expand! Feel the NS Series, the power of networking.

Provides serial NT Link communications supporting both 1:1 and 1:N connections. The NT Link has more efficient communications than Host Link and its capabilities are especially apparent in applications with multiple PTs connect to the PLC. The NS-series PTs can also support communications with multiple PLCs and multiple NS-series PTs through Controller Link and Ethernet connections, so the network can be configured freely to match the requirements and scale of the application.

[Example NS-series Network Configuration]

Personal computer

3 Ethernet

NS-series PT

CS/CJ-series PLC

1 Serial connection

2 Controller Link

4 Connections across network levels

NS-series PT

CS/CJ-series PLC

NS-series PT

NS-series PT

1 Serial connection

CS/CJ-series PLC

CS/CJ-series PLC
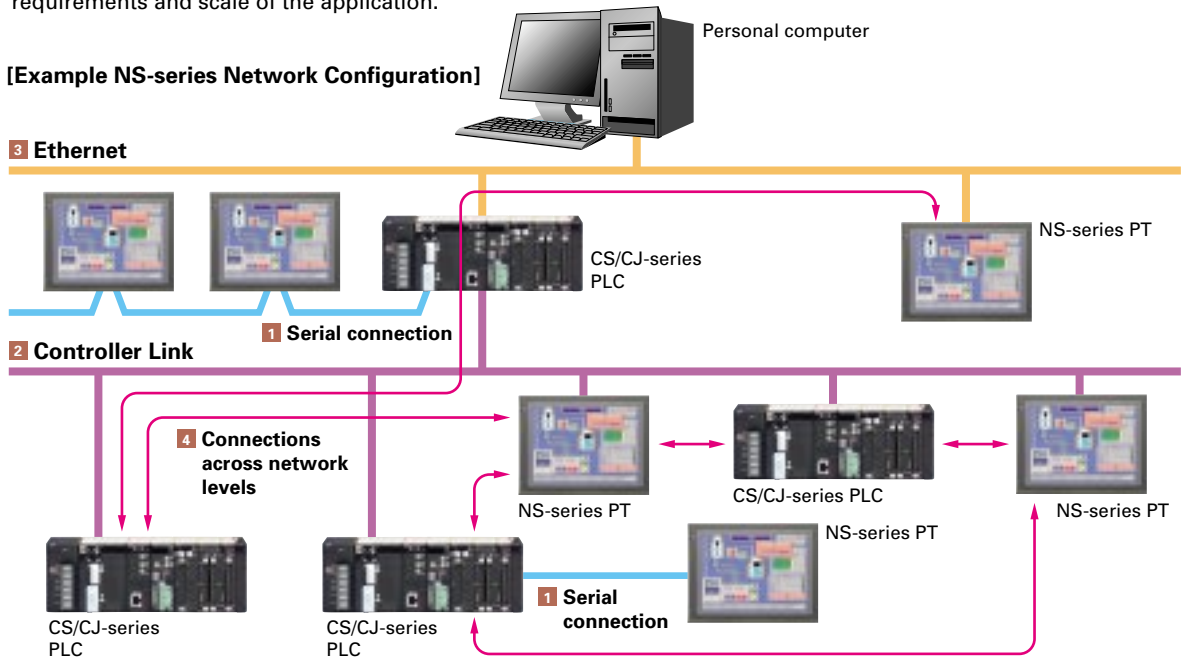
1 Serial connection

■1:1 NT Link or Host Link

● NS:PLC = 1:1
Connecting with the PLC through port A or port B

NS-series PT

PLC

● NS:PLC = 1:2

NS-series PT

PLC

PLC
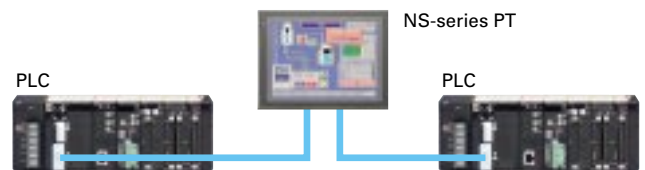
■1:N NT Link

● NS:PLC ratio = 8:1 max. Up to 8 NS-series PTs can be connected to each of the PLC's RS-232C/RS-422A ports.

NS-series PT

NS-series PT

NS-series PT

PLC

NS-AL002 Converter
(Converts between RS-232C and RS-422A.)

NS-series PT

NS-series PT

NS-series PT
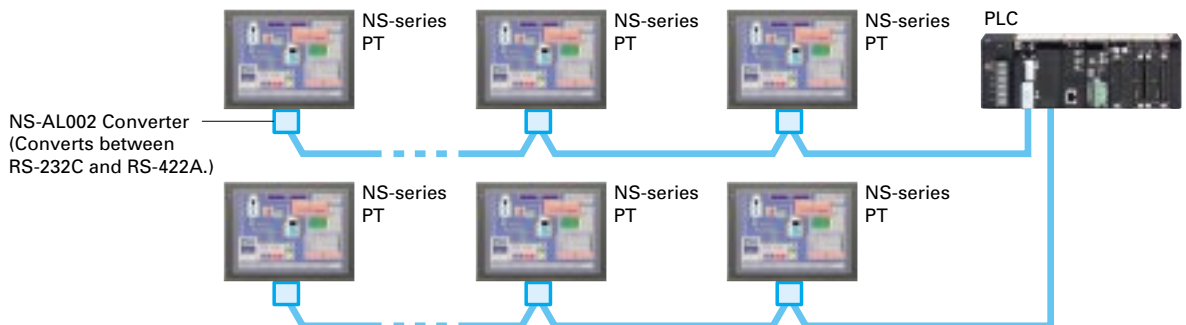
2 Controller Link Connection

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

NS-CLK21

NS Series   PLC   PLC   PLC
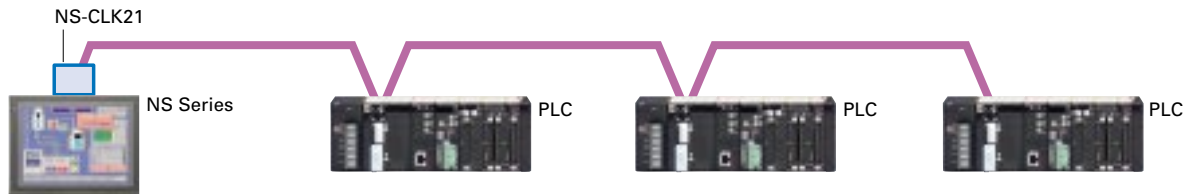
If a Controller Link connection is used, data links can be set between PLCs and multiple PLCs can be monitored/set from the NS-series PT's screen.

- 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

If an Ethernet-compatible NS-series PT is used, the PT can connect to a PLC with an Ethernet Unit and an Option Unit is not needed to connect at the PT.

NS Series   Personal computer   NS Series

PLC   PLC   PLC
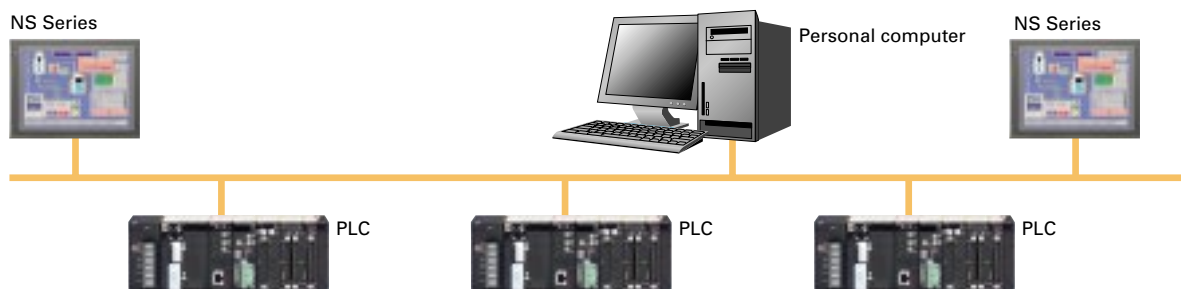
4 Connections Over Network Levels

The NS-series PTs 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 PT 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.

NS Series   NS Series

Ethernet

PLC

Seamless and Program-less

Seamless and Program-less

Controller Link

PLC   PLC

DeviceNet
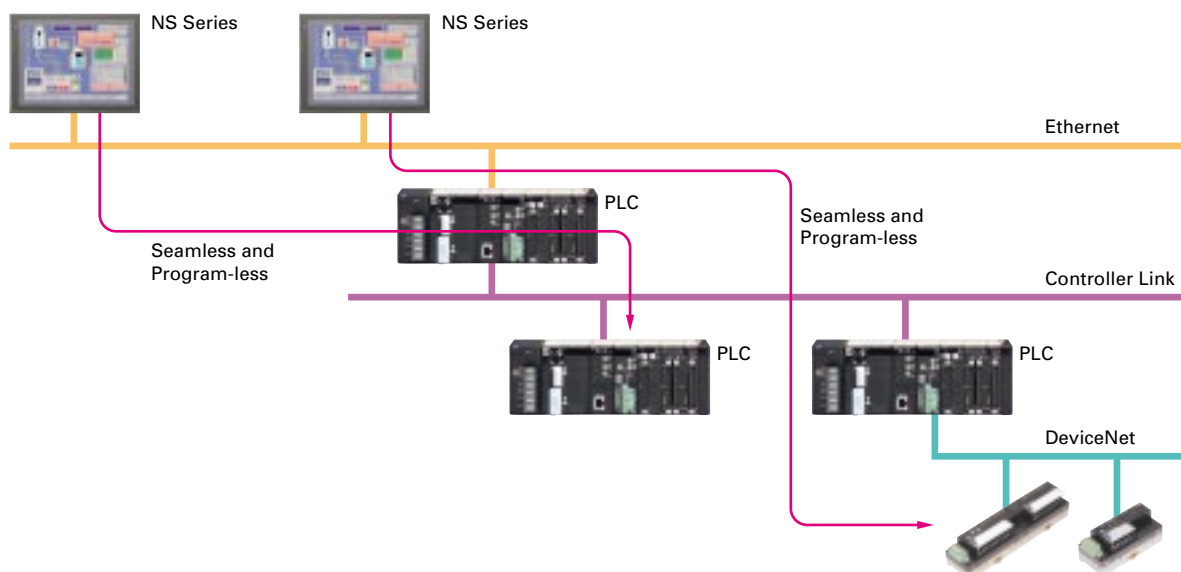
System Configuration

System Configuration Diagram

Memory Card Interface — OMRON Memory Card 64M

RS-422A Conversion Unit
CJ1W-CIF11
NS-AL002

Ethernet port | USB Slave | USB Master | RS-232C port | RS-232C port

PT-to-PLC Connecting Cable
XW2Z-200T (Length: 2 m)
XW2Z-500T (Length: 5 m) — RS-232C — OMRON PLC

Bar Code Reader
Recommended: OMRON
V520-RH21-6

Screen transfer cable
XW2Z-S002 (Length: 2 m) — RS-232C — Personal computer

Screen transfer cable
XW2Z-S002 (Length: 2 m) | USB Serial Conversion Cable
CS1W-CIF31 — USB

Memory link connection — Micro-computer board, personal computer, etc.

CompoWay/F connection — Temperature Controller

RS-422A — OMRON PLC

USB Host Cable for printer
NS-US22 (Length: 2 m)
NS-US52 (Length: 5 m)
Commercially available. — USB

Standard USB cable — USB — Personal computer

Wireless — WE70 ↔ WE70 — Ethernet — OMRON PLC

Ethernet — OMRON PLC

Ethernet — Personal computer

20

System Configuration Diagram (Expansion Bus Interface)

Expansion bus interface

Any one of the following Units can be mounted to the expansion bus interface.

Controller Link Interface Unit NS-CLK21	Controller Link	PLC
Video Input Unit NS-CA001	NTSC/PAL	Vision Sensor
RGB/Video Input Unit NS-CA002	NTSC/PAL	
	RGB output	Personal computer
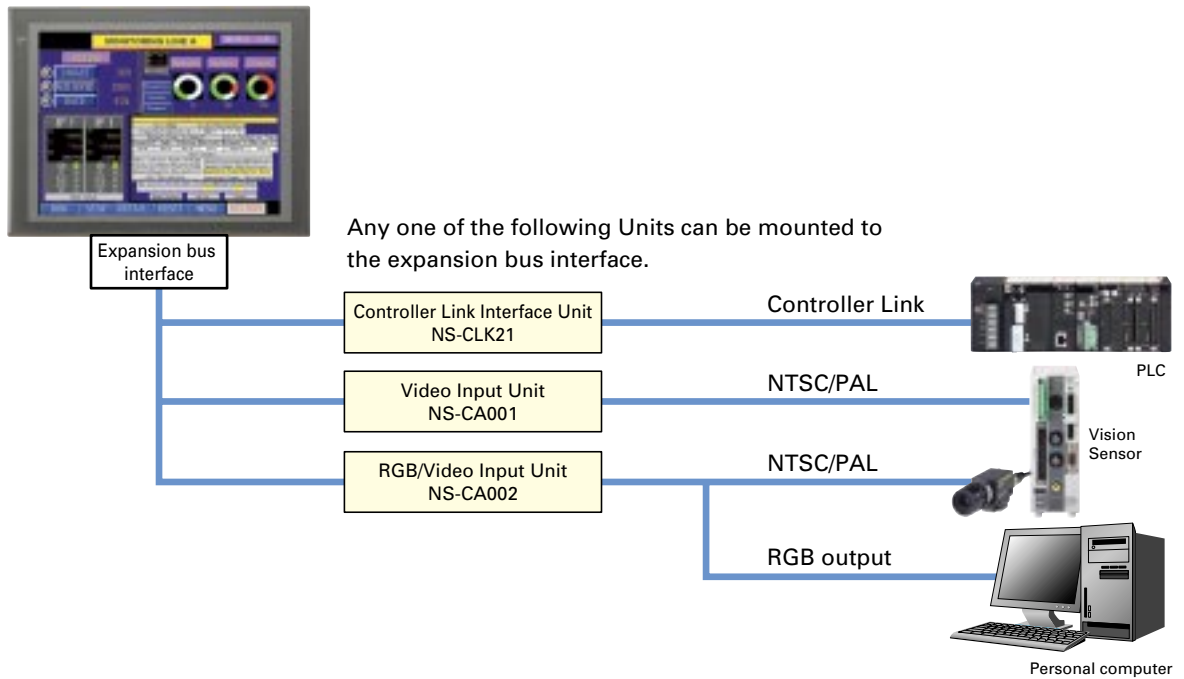
System Configuration Diagram (Multi-vendor)

RS-232C port

RS-232C port

RS-422A Conversion Unit CJ1W-CIF11 NS-AL002

Screen transfer cable for DOS/V XW2Z-S002 (Length: 2 m)

RS-232C — Computer Link Unit — Mitsubishi A-series PLC

— Function Extension Board or Communications Adapter — Mitsubishi FX-series PLC

— SIMATIC S7 HMI Adapter — Siemens S7-3000-series PLC

— Computer Link Unit — Mitsubishi A-series PLC

RS-422A

— Function Extension Board or Communications Adapter — Mitsubishi FX-series PLC

Component Names and Options

High-reliability and Advanced Functions in the Industry's Slimmest PT

Super-thin 48.5-mm Body for a Slimmer Control Panel
This thin-profile model has few protrusions so it can be incorporated easily into a panel or machine.
The PT can help save space when space is at a premium.

■ NS12, NS10

Memory Card interface

Memory Card
Note:
Colors shown in photographs and product names may differ from actual colors and names.

Expansion interface

Battery

RS-232C serial port A

RS-232C serial port B

● A bar code reader can be connected to the serial port.
Recommended bar code reader: V520-RH21-6

Power Supply (24 VDC)

Ethernet (10Base-T or 100Base-TX)

USB SLAVE (For screen data transfer)

USB HOST (for printer)

■ NS8

Memory Card interface

Memory Card
Note:
Colors shown in photographs and product names may differ from actual colors and names.

Expansion interface

Battery

RS-232C serial port A

● A bar code reader can be connected to the serial port.
Recommended bar code reader: V520-RH21-6

RS-232C serial port B

Ethernet (10Base-T or 100Base-TX)

USB SLAVE (For screen data transfer)

USB HOST (for printer)

Power Supply (24 VDC)

● **Built-in Expansion Interface**
The NS-series PTs have a built-in Expansion Interface for future expandability.

● **USB Ports**
A printer can be connected to the USB HOST port.
Refer to *Printer Support* on page 31 for recommended printers.

■ **NS5**

Memory Card interface

Memory Card
Note:
Colors shown in photographs and product names may differ from actual colors and names.

Expansion interface

Ethernet (10Base-T or 100Base-TX)

USB SLAVE (For screen data transfer)

RS-232C serial port A

RS-232C serial port B

Battery

Power Supply (24 VDC)

● A bar code reader can be connected to the serial port.
Recommended bar code reader: V520-RH21-6

Optional Products

Video Input Unit
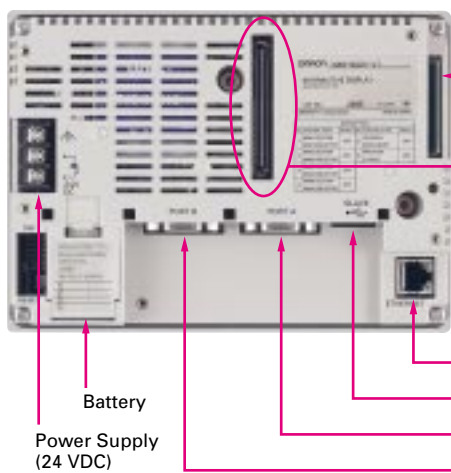NS-CA001(with Cover)

RGB/Video Input Unit
NS-CA002 (with Cover)
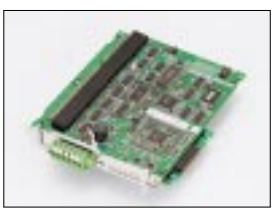
Controller Link Interface Unit
NS-CLK21 (with Cover)
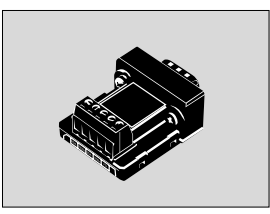
RS-422A Adapter
CJ1W-CIF11

RS-232C/RS-422A Conversion
Unit NS-AL002

Communications Cable
XW2Z-S002

Protective Cover/Anti-reflection
Sheet for NS-series PT
NS□-KBA0□(N)
NT30/NT31C-KBA05(N)

USB Serial Conversion Cable
CS1W-CIF31

Note: Colors shown in photographs and product names may differ from actual colors and names.

NSH5 Series

A hand-held version of the NS5 is now available to perform operations at the production site. The NS-series PT's have a complete set of functions that can be used at the production site, such as the SAP Library, multi-language support, and Programming Console functions.

Function Switches

Use the ten functions switches.
F1, F2, F6, F7: Wired outputs
F3 to F5, F8 to F10: Communications outputs

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.

3-Position Enable Switch

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

Water Resistance to IP65

The water-resistant structure is equivalent to IP65 on all surfaces.
Note: The PT may not be suitable for use in environments with long-term water exposure.

PT and Cable Sold Separately

Select the Cable according to the application (RS-232C/RS-422A).
Connector-loose wires,
UL connector,
3 m or 10 m.

Superior Shock Resistance

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

●Precautions for Emergency Stop Switches

When using a hand-held NSH5 that will be installed and removed from a control panel or Removable Box, always use the specified Stop Switch (Gray/NSH5-SQG00B-V2) to conform to Safety Standards (EN 60204-1).

●Options
■ Visor

Use when the NSH5 is in direct sunlight. Installing a visor also helps protect the Emergency Stop Switch and prevents improper operation from occurring inadvertently when the PT is put down.

■ Mounting Bracket

Use to attach the NSH5 to a control panel.

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System Configuration Diagram (NSH5 Hand-held PT)

Personal computer

USB

Commercially available USB cable.

OMRON
Memory Card

64M

USB Slave

Memory
Card interface

NSH5 PT

X-axis		UP
Current Process: Up PHH Process		
	Position Data		Position Data
IP12	111	PPK	768
PA3	231	PCW	21
PHU	894	PPZ	348

DW

RS-232C cable

RS-232C Connecting Cable for the NSH5
NSH5-232CW-3M (Length: 3 m)

RS-232C

PLC

RS-232C Connecting Cable for the NSH5
NSH5-232CW-10M (Length: 10 m)

RS-422A cable

RS-422A Connecting Cable for the NSH5
NSH5-422CW-10M (Length: 10 m)

RS-422A

PLC

UL-listed Cables

RS-232C cable

RS-232C Connecting Cable for the NSH5
NSH5-232UL-3M (Length: 3 m)

RS-232C

PLC

RS-232C Connecting Cable for the NSH5
NSH5-232UL-10M (Length: 10 m)

RS-422A cable

RS-422A Connecting Cable for the NSH5
NSH5-422UL-10M (Length: 10 m)

RS-422A

PLC

Compatibility

Screen Design Software

Basic Functions

Specifications

25

Standard Models

■ Programmable Terminals

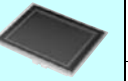| Model name	Specifications				Model number	Standards
	Effective display area	Number of dots	Ethernet	Case color		
NS5-V2	5.7-inch STN monochrome	320 × 240 dots	No	Ivory	NS5-MQ00-V2	CU, CE
				Black	NS5-MQ00B-V2	
			Yes	Ivory	NS5-MQ01-V2	
				Black	NS5-MQ01B-V2	
	5.7-inch STN		No	Ivory	NS5-SQ00-V2	
				Black	NS5-SQ00B-V2	
			Yes	Ivory	NS5-SQ01-V2	
				Black	NS5-SQ01B-V2	
	5.7-inch TFT		No	Ivory	NS5-TQ00-V2	
				Black	NS5-TQ00B-V2	
			Yes	Ivory	NS5-TQ01-V2	
				Black	NS5-TQ01B-V2	
NS8-V2	8.4-inch TFT	640 × 480 dots	No	Ivory	NS8-TV00-V2	
				Black	NS8-TV00B-V2	
			Yes	Ivory	NS8-TV01-V2	
				Black	NS8-TV01B-V2	
NS10-V2	10.4-inch TFT	640 × 480 dots	No	Ivory	NS10-TV00-V2	
				Black	NS10-TV00B-V2	
			Yes	Ivory	NS10-TV01-V2	
				Black	NS10-TV01B-V2	
NS12-V2	12.1-inch TFT	800 × 600 dots	No	Ivory	NS12-TS00-V2	
				Black	NS12-TS00B-V2	
			Yes	Ivory	NS12-TS01-V2	
				Black	NS12-TS01B-V2	
NSH5-V2 Hand-held	5.7-inch STN	320 × 240 dots	No	Black (Emergency stop button: Red)	NSH5-SQR00B-V2	
				Black (Stop button: Gray)	NSH5-SQG00B-V2	

■ Programming Devices
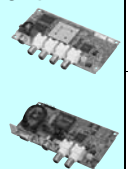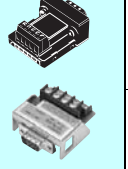
Model name	Specifications		Media	Model number	Standards
CX-One FA Integrated Tool Package Ver. 2.0	The CX-One is an integrated tool package that provides programming and monitoring software for OMRON PLCs and components. The CX-One runs on any of the following operating systems: OS: Windows 98 SE, Me, NT 4.0 (Service Pack 6a), 2000 (Service Pack 3 or higher), or XP. CX-Designer version 2.□ is included in CX-One version 2.0. Refer to the CX-One catalog (Cat. No. R134) for details. Note: Site licenses are also available for users that need to use the CX-One on many computers. Ask your OMRON representative for details.	1 license	CD	CXONE-AL01C-EV2	---
			DVD	CXONE-AL01D-EV2	
		3 licenses	CD	CXONE-AL03C-EV2	
			DVD	CXONE-AL03D-EV2	
		10 licenses	CD	CXONE-AL10C-EV2	
			DVD	CXONE-AL10D-EV2	
		30 licenses	CD	CXONE-AL30C-EV2	
			DVD	CXONE-AL30D-EV2	
		50 licenses	CD	CXONE-AL50C-EV2	
			DVD	CXONE-AL50D-EV2	
CX-Designer Ver.2.□	The CX-Designer can also be ordered individually using the following model number.				
	Screen Designer for NS Series OS: Window 98 SE, Me, NT 4.0 (Service Pack 6a), 2000 (Service Pack 3 or higher), or XP. The Ladder Monitor Software is included with CX-Designer version 2.□. Note: The Ladder Monitor Software is used to monitor CS/CJ-series PLC ladder programs from an NS-series PT. A Memory Card and Memory Card Adapter (both sold separately) are required to use the Ladder Monitor Software with the NS8-V1, NS10-V1, or NS12-V1, or with the NS8-V2, NS10-V2, or NS12-V2 with system program version 6.6 or lower.	1 license		NS-CXDC1-V2	---

Model name	Specifications		Model number	Standards
Cable (See note.)	Screen transfer cable for DOS/V (CX-Designer ↔ PT)	Length: 2 m	XW2Z-S002	---
	USB Host Cable (For a printer)	Length: 5 m	NS-US52	
	USB Host Cable (For a printer)	Length: 2 m	NS-US22	
	USB-Serial Conversion Cable	Length: 0.5 m	CS1W-CIF31	N
NSH5 Cables	RS-422A cable (loose wires)	Length: 10 m	NSH5-422CW-10M	
	RS-232C cable (loose wires)	Length: 3 m	NSH5-232CW-3M	
	RS-232C cable (loose wires)	Length: 10 m	NSH5-232CW-10M	
UL-compliant NSH5 Cable	RS-422A cable (loose wires)	Length: 10 m	NSH5-422UL-10M	
	RS-232C cable (loose wires)	Length: 3 m	NSH5-232UL-3M	
	RS-232C cable (loose wires)	Length: 10 m	NSH5-232UL-10M	
PT-to-PLC Connecting Cable	PT connection: 9 pins PLC connection: 9 pins	Length: 2 m	XW2Z-200T	---
		Length: 5 m	XW2Z-500T	
	PT connection: 9 pins PLC peripheral port	Length: 2 m	XW2Z-200T-2	
		Length: 5 m	XW2Z-500T-2	
NSH5 Wall-mounting Bracket	---		NSH5-ATT02	
NSH5 Visor	---		NSH5-ATT01	

Note: Use an OMRON USB Host Cable to connect an NS-series PT to a printer.

■ Options

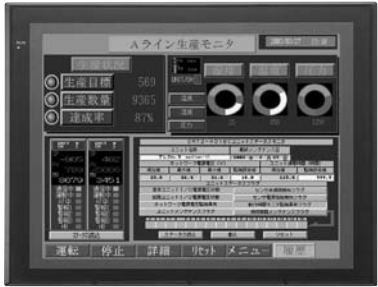| Model name	Specifications		Model number	Standards
Video Input Unit	Inputs: 4 channels Signal type: NTSC/PAL		NS-CA001	CU, CE
	Input channels: 2 video channels and 1 RGB channel (See note 2.) Signal type: NTSC/PAL		NS-CA002	
Special Cable for the Console	Cable length: 2 m		F150-VKP (2 m)	---
	Cable length: 5 m		F150-VKP (5 m)	
Controller Link Interface Unit	For Controller Link Communications		NS-CLK21	CU, CE
RS-422A Adapter	Transmission distance: 500 m total length **Note:** Use this model when connecting PT models without a V□ suffix. **Note:** PT models with the V□ suffix can also be connected.		NS-AL002	---
	Transmission distance: 50 m total length **Note:** Only PT models with a suffix of V□ are connectable. Use the NS-AL002 to connect models without a V□ suffix.		CJ1W-CIF11	CU, N, L, CE
Sheet/Cover (See note 2.)	Anti-reflection Sheets (5 surface sheets)	NS12/10	NS12-KBA04	---
		NS8	NS7-KBA04	
		NS5	NT30-KBA04	
	Protective Covers (5 pack) (anti-reflection coating)	NS12/10	NS12-KBA05	
		NS8	NS7-KBA05	
		NS5	NT31C-KBA05	
	Protective Covers (5 covers included) (Transparent)	NS12/10	NS12-KBA05N	
		NS8	NS7-KBA05N	
		NS5	NT31C-KBA05N	
Attachment	NT625C/631/631C Series to NS12/10 Series		NS12-ATT01	
	NT625C/631/631C Series to NS12/NS10 Series (Black)		NS12-ATT01B	
	NT610C Series to NS12/10 Series		NS12-ATT02	
	NT620S/620C/600S Series to NS8 Series		NS8-ATT01	
	NT600M/600G/610G/612G Series to NS8 Series		NS8-ATT02	
Memory Card	30 MB		HMC-EF372	L, CE
	64 MB		HMC-EF672	
	256 MB		HMC-EF283	
	512 MB		HMC-EF583	
Memory Card Adapter	---		HMC-AP001	CE
Battery	---		CJ1W-BAT01	---
Bar Code Reader	Refer to the Catalog for details.		V520-RH21-6	

Note 1. One screen cannot display two video inputs simultaneously.
    2. A Chemical-resistant Cover (NT30-KBA01) is available only for the NS5.

Performance/Specifications

Series	NS5-V2											
Type	5.7-inch Monochrome STN				5.7-inch Color STN				5.7-inch Color TFT			
Appearance												
Display device	Monochrome LCD				STN color LCD				Color TFT			
Effective display area	Width 117.2 × height 88.4 mm (5.7 inches)											
Case color	Ivory		Black		Ivory		Black		Ivory		Black	
Built-in Ethernet port	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Model number	NS5-MQ00-V2	NS5-MQ01-V2	NS5-MQ00B-V2	NS5-MQ01B-V2	NS5-SQ00-V2	NS5-SQ01-V2	NS5-SQ00B-V2	NS5-SQ01B-V2	NS5-TQ00-V2	NS5-TQ01-V2	NS5-TQ00B-V2	NS5-TQ01B-V2
Display colors	16 gradations				256 colors							
Number of dots	320 dot horizontal × 240 dot vertical											
Field of vision	Left/right: 45°, Top: 20°, Bottom: 40°				Left/right: 50°, Top: 45°, Bottom: 50°				Left/right: 70°, Top: 70°, Bottom: 50°			
Screen data capacity	20 Mbytes											
Image data (BMP or JPG images)	16 gradations				4,096 colors				32,768 colors			
Memory Card	Supported											
Ladder Monitor function	Not supported											
Video Input Unit support	Not supported											
Image displayed via video input	---											
Controller Link Interface Unit (Wired) support	Not supported											

Backlight **Note:** Contact your nearest OMRON representative to replace the backlight.	Service life	50,000 hours min.	75,000 hours min.
		Note: This is the estimated time before brightness is reduced by half at room temperature and humidity. It is not a guaranteed value. The service life will be dramatically shortened if PT is used at low temperatures. For example, using the PT at temperatures of 0°C will reduce the service life to approximately 10,000 hours (reference value).	
	Brightness adjustment	There are 3 levels that can be set with the touch panel. **Note:** The brightness cannot be adjusted much.	
	Backlight error detection	Error is detected automatically, and the RUN indicator flashes green as notification. **Note:** This function does not indicate that the service life has been reached. It detects when the backlight is not lit due to a disconnection or other errors. Backlight error detection indicates that all backlights (2) are OFF.	

Touch panel (Matrix type)	Method	Resistive membrane
	Number of switches	300 (20 horizontal × 15 vertical) 16 × 16 dots for each switch
	Input	Pressure-sensitive
	Service life	1,000,000 touch operations.

Display text	Raster font		Displayable characters, Base size	
	Font name	Rough	Displayable characters: Alphanumeric characters or Japanese katakana, Base size: 8 × 8, Magnification: 1 × 1, 1 × 2, 2 × 1, 2 × 2, 3 × 3, 4 × 4, 8 × 8	
		Standard	Displayable characters: Alphanumeric characters or Japanese, Chinese (Simplified, Traditional) or Korean, Base size: 8 x 16, 16 × 16, Magnification: 1 × 1, 1 × 2, 2 × 1, 2 × 2, 3 × 3, 4 × 4, 8 × 8	
		Fine	Displayable characters: Alphanumeric characters or Japanese katakana, Japanese kanji, Base size: 16 × 32, 32 × 32, Magnification: 1 × 1, 1 × 2, 2 × 1, 2 × 2, 3 × 3, 4 × 4, 8 × 8	
	Vector font (text objects only)		Can be specified in CX-Designer. Font, style, and size can be specified.	

Text attributes	Color	256 colors
	Font style (only when vector font is specified)	Bold or italic
	Vertical alignment	Top, center, or bottom
	Horizontal alignment	Left-justified, centered, or right-justified

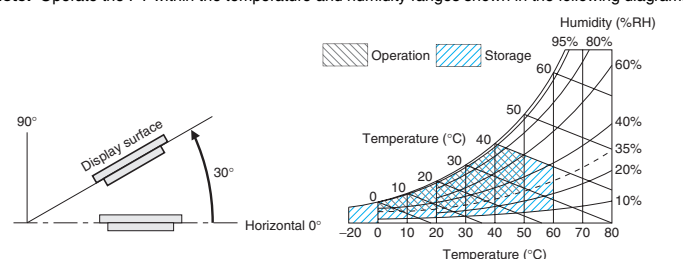| Flicker	Objects supporting flicker	Functional objects: Up to 10 types can be registered. The flicker speed and flicker range can be set. Fixed objects: Select from 3 types. The flicker speed and flicker range are fixed.
	Numeral units and scale settings	1,000 max.

	NS8-V2				NS10-V2				NS12-V2			
	8.4-inch Color TFT				**10.4-inch Color TFT**				**12.1-inch Color TFT**			
	High-definition TFT color LCD				High-definition TFT color LCD				High-definition TFT color LCD			
	Width 170.9 × height 128.2 mm (8.4 inches)				Width 215.2 × height 162.4 mm (10.4 inches)				Width 246.0 × height 184.5 mm (12.1 inches)			
	Ivory		Black		Ivory		Black		Ivory		Black	
	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
	NS8-TV00-V2	NS8-TV01-V2	NS8-TV00B-V2	NS8-TV01B-V2	NS10-TV00-V2	NS10-TV01-V2	NS10-TV00B-V2	NS10-TV01B-V2	NS12-TS00-V2	NS12-TS01-V2	NS12-TS00B-V2	NS12-TS01B-V2
	256 colors				256 colors				256 colors			
	640 dot horizontal × 480 dot vertical				640 dot horizontal × 480 dot vertical				800 dot horizontal × 600 dot vertical			
	Right/left: ±65°, Top: 50°, Bottom: 60°				Right/left: ±60°, Top: 35°, Bottom: 65°				Right/left: ±60°, Top: 45°, Bottom: 75°			
	60 Mbytes				60 Mbytes				60 Mbytes			
	32,768 colors				32,768 colors				32,768 colors			
	Supported				Supported				Supported			
	Supported				Supported				Supported			
	Supported				Supported				Supported			
	260,000 colors				260,000 colors				260,000 colors			
	Not supported				Supported				Supported			
	50,000 hours min.				50,000 hours min.				50,000 hours min.			
	768 (32 horizontal × 24 vertical) 20 × 20 dots for each switch				1,200 (40 horizontal × 30 vertical) 16 × 16 dots for each switch				1,900 (50 horizontal × 38 vertical) 16 × 16 dots for each switch			

Performance/Specifications

Series	NS5-V2			
Type	5.7-inch Monochrome STN	5.7-inch Color STN	5.7-inch Color TFT	
Alarm/event settings	5,000 max.			
Memory Card — Interface	One ATA-Compact Flash interface slot			
Memory Card — Functions	Used to transfer and store screen data, store logging data, and store history data. (Alarm/Event History, Operation Log, and Error Log generated during Macro execution).			
Expansion interface	For Expansion Interface Units			
Serial Communications — Port A — Connector	Conforms to EIA RS-232C. D-Sub female 9-pin connector 5-V output (250 mA max.) through pin 6 (See note.) **Note:** The 5-V outputs of serial ports A and B cannot be used at the same time.			
Serial Communications — Port A — Functions	Host (PLC) access: 1:N NT Links (connections with CS/CJ/CP-series PLCs and C200HX/HG/HE(-Z) PLCs), 1:1 NT Links, or Host Link (connections with C Series or CVM1/CV-series PLCs) Direct access to Temperature Controllers using Smart Active Parts: CompoWay/F and bar code reader connections (Read directly from display.)			
Serial Communications — Port B — Connector	Conforms to EIA RS-232C. D-Sub female 9-pin connector 5-V output (250 mA max.) through pin 6 (See note.) The 5-V outputs of serial ports A and B cannot be used at the same time. **Note:** The 5-V outputs of serial ports A and B cannot be used at the same time.			
Serial Communications — Port B — Functions	Host (PLC) access: 1:N NT Links (connections with CS/CJ/CP-series PLCs and C200HX/HG/HE(-Z) PLCs) or 1:1 NT Links (connections with C Series or CVM1/CV-series PLCs) Direct access to Temperature Controllers using Smart Active Parts: CompoWay/F and bar code reader connections (Read directly from display.)			
USB SLAVE Specifications — USB rating	USB1.1			
USB SLAVE Specifications — Connector	TYPE-B (Slave)			
USB SLAVE Specifications — Functions	Connection with the CX-Designer (for screen data transfers)			
USB HOST Specifications — USB rating	None			
USB HOST Specifications — Connector				
USB HOST Specifications — Functions				
Built-in Ethernet Specifications (NS☐-☐☐01-V2 only) — Conformance standards	Conforms to IEEE 802.3/Ethernet (10Base-T/100Base-TX).			
Built-in Ethernet Specifications (NS☐-☐☐01-V2 only) — Function	Host (PLC) access and connection with the CX-Designer (for screen data transfers)			
Controller Link (Wired-type) Specifications — Baud rate	---			
Controller Link (Wired-type) Specifications — Transmission path	---			
Controller Link (Wired-type) Specifications — Functions	---			
Video Input Specifications — Resolution	---			
Video Input Specifications — Input signal	---			
Video Input Specifications — Cameras	---			

● General Specifications

Rated power supply voltage	24 VDC
Allowable voltage range	20.4 to 27.6 VDC (24 VDC ±15%)
Power consumption	25 W max. (15 W max. for the NS5)
Ambient operating temperature	0 to 50°C **Note:** The operating temperature is subject to the following restrictions according to the mounting angle. • Mounting angle of 0 to 30°C to the horizontal: Operating temperature range of 0 to 45°C When a Video Input Unit or a Controller Link Interface Unit is mounted, the ambient operating temperature is 0 to 35°C. • Mounting angle of 30 to 90° to the horizontal: NS12/NS10/NS5: Operating temperature range of 0 to 50°C NS8: Mounting angle of 30° to less than 90° to the horizontal: Operating temperature range of 0 to 45°C Mounting angle of 90° to the horizontal: Operating temperature range of 0 to 50°C
Storage temperature	−20 to 60°C **Note:** Operate the PT within the temperature and humidity ranges shown in the following diagram.
Ambient operating humidity	35 to 85% (0 to 40°C) 35 to 60% (40 to 50°C) (with no condensation)
Operating environment	No corrosive gases.
Noise immunity	Conforms to IEC61000-4-4, 2 kV (power lines).
Vibration resistance (during operation)	10 to 57 Hz, 0.075 mm amplitude, 57 to 150 Hz, 9.8 m/s² 30 min each in X, Y, and Z directions
Shock resistance (during operation)	147 m/s² 3 times each in direction of X, Y, and Z
Weight	NS5: 1.0 kg max.; NS8: 2.0 kg max.; NS10: 2.3 kg max.; NS12: 2.5 kg max.
Degree of protection	Front operating panel: Equivalent to IP65F and NEMA4. **Note:** May not be applicable in locations with long-term exposure to oil.
Ground	Ground to 100 Ω or less.
Battery life	5 years (at 25°C): Replace battery within 5 days after the battery runs low (indicator lights orange).
Applicable standards	cULus and EC directives

	NS8-V2	NS10-V2	NS12-V2
	8.4-inch Color TFT	10.4-inch Color TFT	12.1-inch Color TFT
	USB1.1		
	TYPE-A (Host)		
	Connection with a printer (for hard copies) • Manufacturer: EPSON or Canon • Recommended models: EPSON: PM-2200C, PM-930C, PM-870C, PM-740C, PM-900C, PM-D600, PM-G720, PM-G730, and PX-A650 Canon: BJ M70, BJ M40, PIXUS 550i, PIXUS 50i, PIXUS 80i, PIXUS iP2000, PIXUS iP3100, PIXUS iP4100, and PIXUS iP4100R		
	---	2 M/1 M/500 K	
	---	Shielded twisted-pair cable (special cable)	
	---	Host (PLC) access and data links	
	NS-CA001: 320 × 240, 640 × 480, 800 × 600 dots	NS-CA002: User-defined size	
	NS-CA001: NTSC composite video or PAL	NS-CA002: NTSC composite video or PAL	
	NS-CA001: Number of cameras: 4 max.	NS-CA002: 2 cameras + RGB	

Performance/Specifications

Series	NSH5-V2
Type	5.7-inch Color STN (Hand-held Version)
Appearance	Emergency stop button (Red) — Stop button (Gray)
Case color	Black
Built-in Ethernet port	No
Model number	NSH5-SQROOB-V2 (Emergency stop button: Red) — NSH5-SQGOOB-V2 (Stop button: Gray)
Rated power supply voltage	24 VDC
Allowable voltage range	20.4 to 27.6VDC (24 VDC ±15%)
Power consumption	10 W max.
Ambient operating temperature	0 to 40°C
Storage temperature	−20 to 60°C
Ambient operating humidity	35% to 85% (0 to 40°C) 35% to 60% (40 to 50°C) with no condensation
Operating environment	No corrosive gases.
Noise immunity	Common mode: 1,000 Vp-p (between power supply terminals and panel) Normal mode: 300 Vp-p Pulse width: 100 ns to 1 μs, Rise time: 1-ns pulse
Vibration resistance (during operation)	10 to 57 Hz, 0.075 mm amplitude, 57 to 150 Hz, 9.8 m/s^2 30 min each in X, Y, and Z directions
Shock resistance (during operation)	147 m/s^2 3 times each in direction of X, Y, and Z
Weight	1 kg max.
Degree of protection	Equivalent to IP65.
Ground	Ground to 100 Ω or less.
Battery life	5 years (at 25°C): Replace battery within 5 days after the battery runs low (indicator lights orange).
Applicable standards	cULus and EC directives Conforms to EN60204-1.

■ Compatible OMRON PLCs

● Link Connection

PLC series	PLC model name	Model number	Specifications
C Series	CQM1	CQM1-CPU☐☐-V1	With RS-232C connector (9-pin type)
	CQM1H	CQM1H-CPU☐☐	
	CPM1	CPM1-☐☐CDR-☐+CPM1-CIF01	Connect to peripheral port.
	CPM1A	CPM1A-☐☐CD☐-☐+CPM1-CIF01	
	CPM2A	CPM2A-☐☐CD☐☐-☐+CPM1-CIF01	Connect to RS-232C or peripheral port.
	CPM2C	CPM2C-10/20☐☐☐☐☐☐-☐ (See note 1.)	With RS-232C connector (9-pin type)
	C200HS	C200HS-CPU☐☐	
	C200HE(-Z)	C200HE-CPU☐☐(-Z) (See note 2.)	
	C200HG(-Z)	C200HG-CPU☐☐(-Z) (See note 2.)	
	C200HX(-Z)	C200HX-CPU☐☐(-Z) (See note 2.)	
CVM1/CV Series	CV500/1000/2000	CV500/1000/2000-CPU☐☐-V1	With RS-232C connector (switching/9-pin type)
	CVM1	CVM1-CPU☐☐-V2	

Note 1. Use an Adapter Cable (CPM2C-CN111 or CS1W-CN114/118), CPM1-CIF01 RS-232C Adapter, or CPM1-CIF11 RS-422A Adapter to connect.
    2. A C200HW-COM02(-V1), C200HW-COM04(-V1), C200HW-COM05(-V1), or C200HW-COM06(-V1) Communications Board is required.

● 1:N NT Link Connection

PLC series	PLC model name	Model number	Specifications
CS series	CS1G	CS1G-CPU☐☐(-V1) (See note 1.)	With RS-232C connector (9-pin type)
		CS1G-CPU☐☐H (See note 1.)	
	CS1H	CS1H-CPU☐☐(-V1) (See note 1.)	
		CS1H-CPU63H/CPU64H/CPU65H/CPU66H/CPU67H (See note 1.)	
	CS1D	CS1D-CPU☐☐H (See note 1.)	
CJ series	CJ1G	CJ1G-CPU☐☐H (See note 2.)	
	Loop-control CPU Unit	CJ1G-CPU☐☐P	
	CJ1H	CJ1H-CPU☐☐H (See note 2.)	
	CJ1M	CJ1M-CPU☐☐ (See note 2.)	
CP series	CP1H	CP1H-☐☐	Connect to the RS-232C connector of a CP1W-CIF01 RS-232C Option Board.
C series	CQM1H	CQM1H-CPU61/51 with a CQM1H-SCB41 Serial Communications Board	With RS-232C connector (9-pin type)
	C200HE(-Z)	C200HE-CPU32(-Z) (See note 3.)/CPU42(-Z)	
	C200HG(-Z)	C200HG-CPU33(-Z) (See note 3.)/CPU43(-Z)/CPU53(-Z) (See note 3.)/CPU63(-Z)	
	C200HX(-Z)	C200HX-CPU34(-Z) (See note 3.)/CPU44(-Z)/CPU54(-Z) (See note 3.)/CPU64(-Z)/CPU65-Z/CPU85-Z	

Note 1. Connection is also possible to a CS1W-SCB☐☐-V1 Serial Communications Board or CS1W-SCU☐☐-V1 Serial Communications Unit.
    2. Connection is also possible to the CJ1W-BCU☐☐-V1 Serial Communications Unit.
    3. A C200HW-COM02/COM04/COM05/COM06(-V1) Communications Board is required.

● Connecting by Host Link

PLC series	PLC model name	Model number	Specifications
C series	CPM1	CPM1-☐☐CDR-☐/CPM1A-☐☐CD☐-☐	RS-232C or RS-422A adapter connected to peripheral port
	CPM2A	CPM2A-☐☐CD☐☐-☐	With RS-232C connector (9-pin type)
	CPM2C	CPM2C-10/20☐☐☐☐☐☐-☐	Communications connectors include both a peripheral port and RS-232C port (branching possible through CPM2C-CN111 Conversion Cable). Used as separate peripheral and RS-232C ports through CS1WCN114/118 Conversion Cable.
	CQM1	CQM1-CPU☐☐-V1	With RS-232C connector (9-pin type)
	CQM1H	CQM1H-CPU☐☐	With RS-232C connector (9-pin type) (CQM1H-CPU11: peripheral port only)
	C200HS	C200HS-CPU☐☐	With RS-232C connector (switching/9-pin type)
	C200HE(-Z)	C200HE-CPU☐☐(-Z) (See note 1.)	
	C200HG(-Z)	C200HG-CPU☐☐(-Z) (See note 1.)	
	C200HX(-Z)	C200HX-CPU34 (-Z) (See note.)/CPU44 (-Z)/CPU54 (-Z) (See note 1.)/CPU64 (-Z)/CPU65-Z/CPU85-Z	
CS series	CS1G	CS1G-CPU☐☐(-V1) (See note 2.)	With RS-232C connector (9-pin type)
		CS1G-CPU☐☐H (See note 2.)	
	CS1H	CS1H-CPU☐☐(-V1) (See note 2.)	
		CS1H-CPU☐☐H (See note 2.)	
CJ series	CJ1G	CJ1G-CPU☐☐H (See note 3.)	
	Loop-control CPU Unit	CJ1G-CPU☐☐P	
	CJ1H	CJ1H-CPU☐☐H (See note 3.)	
	CJ1M	CJ1M-CPU☐☐ (See note 3.)	
CVM1/CV series	CV500/1000/2000	CV500-CPU01-V1/CV1000-CPU01-V1/CV2000-CPU01-V1	With RS-232C connector (switching/9-pin type)
	CVM1	CVM1-CPU☐☐-V2	

Note 1: A C200HW-COM02/COM04/COM05/COM06(-V1) Communications Board is required.
    2: Connection is also possible to a CS1W-SCB☐☐-V1 Serial Communications Board or CS1W-SCU☐☐-V1 Serial Communications Unit.
    3: Connection is also possible to the CJ1W-BCU☐☐-V1 Serial Communications Unit.

Connectable PLCs

PLC series	CPU Unit	SIMATIC S7 HMI Adapter
Siemens S7-300 Series	CPU313 CPU315-2DP CPU317-2PN/DP	6ES7 972-0CAI☐-0XA0

PLC series	CPU Unit	Computer Link Unit
Mitsubishi Electric Corporation, A Series	A1SHCPU A2USHCPU-S1 A2US	AISJ71UC24-R2 AISJ71UC24-R4

PLC series	Basic Unit	Communications Adapter	Function Extension Board
Mitsubishi Electric Corporation, FX Series	FX0N FX1S FX1N FX1NC FX2N FX3UC	FX☐☐(☐)-232ADP FX☐☐(☐)-485ADP	FX☐☐-232-BD FX☐☐-485-BD FX☐☐-422-BD

Connectable Temperature Controllers

■ Compatible Temperature Controllers (Support Direct Connection)

The following Temperature Controllers can be connected directly to an NS-series PT.

Unit name	Series	Model	Remarks
Modular Temperature Controller	EJ1	EJ1-EDU End Unit	SAP screens are available.
Modular Temperature Controller	E5ZN	E5ZN-SCT24S Terminal Unit	
Digital Controller	E5AR	E5AR-☐☐☐☐☐☐☐-FLK	
	E5ER	E5ER-☐☐☐☐☐☐☐☐-FLK	
Digital Temperature Controller	E5CN	E5CN-☐☐M☐-500/E5CN-☐☐☐U+ Option Unit with Communications required.	
	E5AN/E5EN	E5AN-☐☐☐M☐-500/E5EN-☐☐☐M☐-500 Option Unit with Communications required.	
	E5GN	E5GN-☐☐☐TC-FLK Thermocouple Input Type	
		E5GN-☐☐☐P-FLK Platinum Resistance Thermometer Input Type	

■ Transferring Screens (Connecting the CX-Designer and PT)

● Connecting to the Computer's RS-232C Port

Use a XW2Z-S002 Cable for screen transfers.
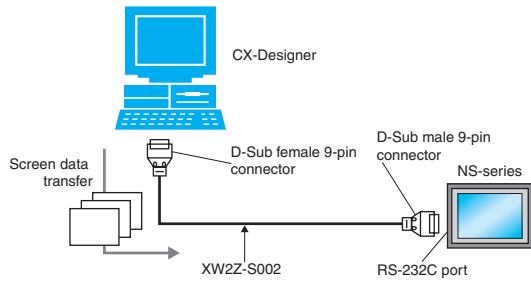
● Connecting to the Computer's USB Port

Use a CS1W-CIF31 USB-Serial Conversion Cable and XW2Z-S002 Cable for screen transfers.
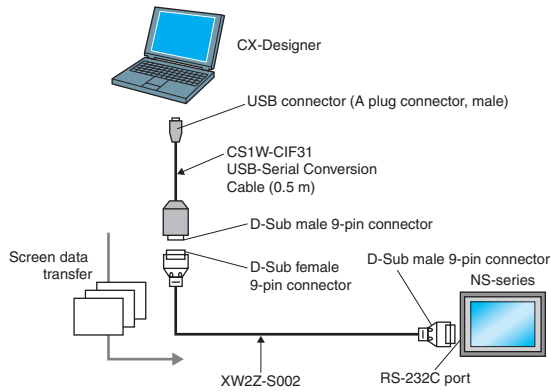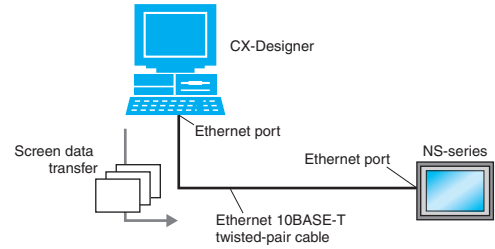

A standard USB cable can be used when connecting the CX-Designer to an NS-series with lot number 0325 (February 3, 2005) or later.
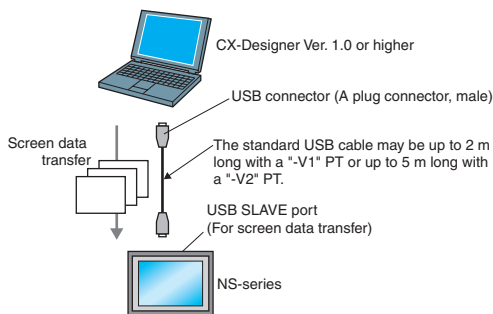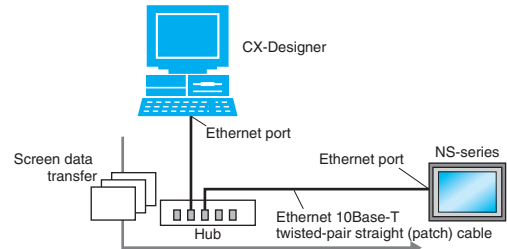

● Connecting to the Computer's LAN (Ethernet) Port

Connecting Directly (1:1) to the Computer

Connecting to the Computer through a Hub

Note: An NS-series PT can also connect to a network configured for 10Base-5 when using a hub and transceiver set for 10Base-5 communications.

● Connecting through a PLC

If the PLC is a CS/CJ-series PLC an its CPU Unit has lot number 030201 or later, screen data can be transferred to an NS-series PT through the PLC.

Using a Serial → Serial Connection
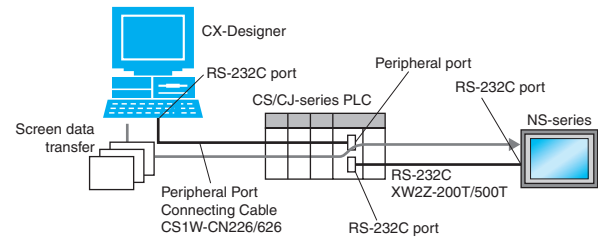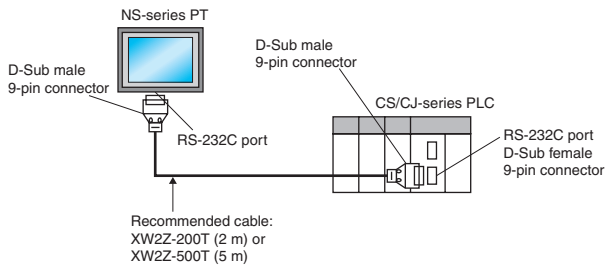

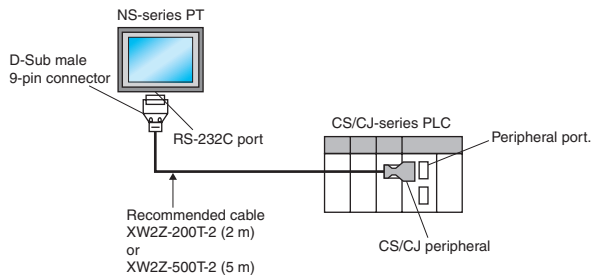Using an Ethernet → Serial Connection
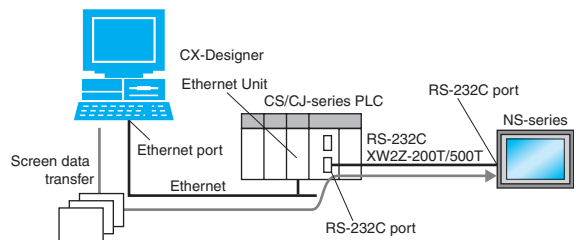
Connection Configurations

■ Operation (Connection between NS-series PT and PLC)

● Using a Serial Connection

When connecting to a CS/CJ-series PLC's RS-232C port, use an XW2Z-200T/500T Cable between the PT and PLC.
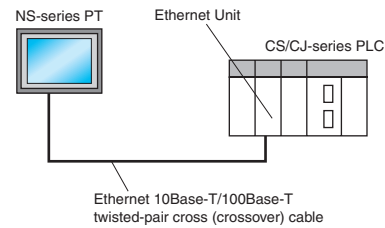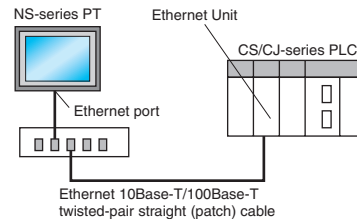

NS-series PT
D-Sub male 9-pin connector
D-Sub male 9-pin connector
RS-232C port
CS/CJ-series PLC
RS-232C port D-Sub female 9-pin connector
Recommended cable: XW2Z-200T (2 m) or XW2Z-500T (5 m)

When connecting to a CS/CJ-series PLC's peripheral port, use an XW2Z-200T-2/500T-2 Cable between the PT and PLC.

NS-series PT
D-Sub male 9-pin connector
RS-232C port
CS/CJ-series PLC
Peripheral port.
Recommended cable XW2Z-200T-2 (2 m) or XW2Z-500T-2 (5 m)
CS/CJ peripheral

● Using an Ethernet Connection

Connecting Directly (1:1) to the Computer

NS-series PT
Ethernet Unit
CS/CJ-series PLC
Ethernet 10Base-T/100Base-T twisted-pair cross (crossover) cable

Connecting to the Computer via a Hub

NS-series PT
Ethernet Unit
CS/CJ-series PLC
Ethernet port
Ethernet 10Base-T/100Base-T twisted-pair straight (patch) cable

Note: An NS-series PT can also connect to a network configured for 10Base-5 when using a hub and transceiver set for 10Base-5 communications.

In addition, the NS-series PT can be connected through Controller Link by mounting an NS-CLK21 Controller Link Interface Unit to the PT.

Smart Active Parts (SAP) Library Contents

The following Smart Active Parts are provided on the CX-One/CX-Designer.

● For CS/CJ CPU Unit
Error Log Monitor, Online Battery Change Button, etc.

● For Serial Communications Boards/Units
Communications Status Displays (Error Monitor), Ports Settings, etc.

● For Ethernet Units/CLK Units
Network Status Displays (Error Monitor and Network Node Status), etc.

● For MC/MCH Unit
JOG Running, Search Zero Position, Program Running, Error Displays, I/O Status Monitor, PV Monitor, etc.

● For NC/NCF Unit
JOG Running, Direct Running, Memory Running (NC Only), Error Displays I/O Status Monitor, PV Monitor, etc.

● For Wireless Terminals for WT30
Monitoring Slave Operating Status in a Wireless Environment

● For Servo (R88D-WT, R7D-AP) (See note.)
PV Monitor, Parameter Settings, Error Displays, Driver Information Displays, I/O Status Monitor, etc.

● For Inverters (See note.)
Rotation Speed/Monitoring Output Frequency, Other Parameter Settings, etc.

● For DeviceNet
DRT2 Maintenance/Status Information, IN/OUT Information, etc.

● For Temperature Controllers (E5□R, E5ZN, E5□N, EJ1 and CJ1W-TC)
Operation Monitor, PID Settings, SP Settings, Alarm Settings, Input Shift Settings, etc.

● For Sensors (E3X-DRT)
Threshold Settings, Monitoring Light Reception Levels, etc.
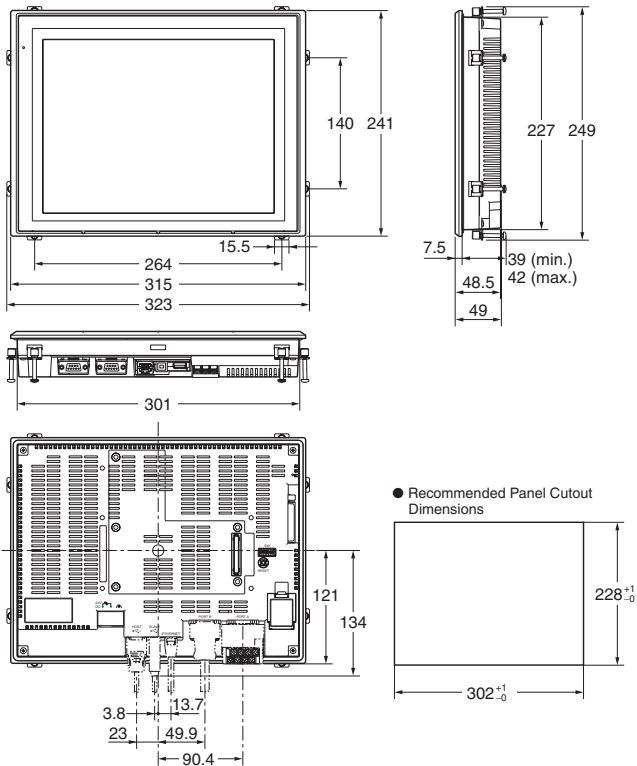
● For the SmartSlice GRT1 Series
Communications Unit Status, Warning/Alarm Flags, Network Joining/Leaving Status

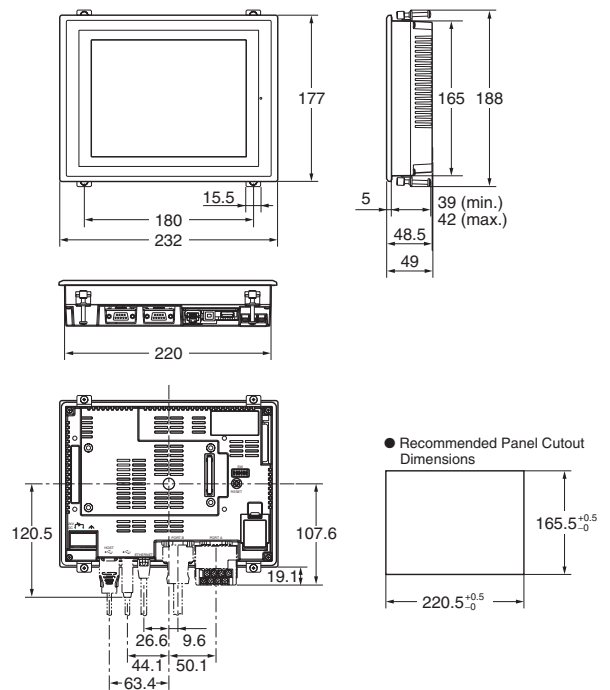**Note:** Smart Active Parts require a Serial Communications Units/Boards (version 1.2 or later).
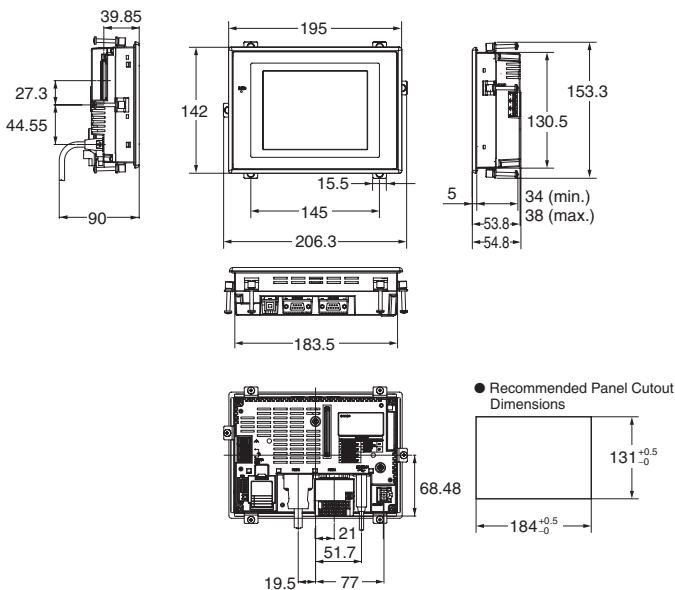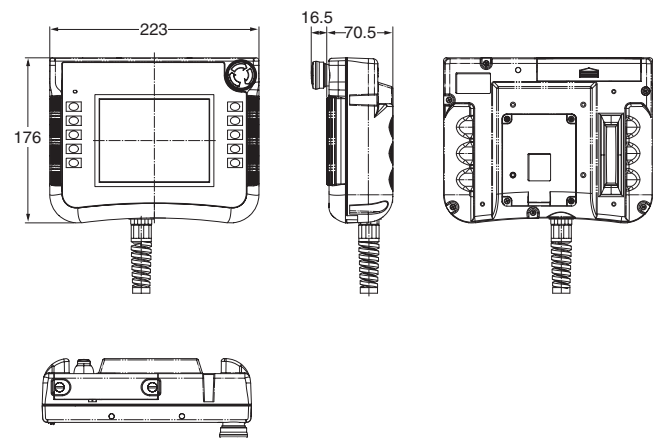
(Units: mm)

NS12/10

140 241
227 249
15.5
7.5
39 (min.) 42 (max.)
264
315
323
48.5
49
301
121
134
● Recommended Panel Cutout Dimensions
228 +1 −0
302 +1 −0
3.8 13.7
23 49.9
90.4

NS8

177
165 188
15.5
5
39 (min.) 42 (max.)
180
232
48.5
49
220
120.5
107.6
19.1
● Recommended Panel Cutout Dimensions
165.5 +0.5 −0
220.5 +0.5 −0
26.6 9.6
44.1 50.1
63.4

NS5

39.85
195
27.3
44.55
142
153.3
130.5
15.5
5
34 (min.) 38 (max.)
90
145
53.8
54.8
206.3
183.5
● Recommended Panel Cutout Dimensions
131 +0.5 −0
184 +0.5 −0
68.48
21
51.7
19.5 77

Hand-held NS5

223
16.5 70.5
176

NS-CA001
Video Input Unit

81.3
(102.7)
9.6
21.4
164
(169)
5
(1.9) 127.3
(22.3)
9.7 20.4
11
10.6
50.3
68.3
86.3
104.3

NS-CA002
Video Input Unit

81.3
(102.7)
9.6
21.4
164
(169)
5
(1.9)
(22.3)
9.7 20.4
11
11.1
39.3
57.3
82.8
118.3

NS-CLK21
Controller Link Interface Unit

151.5
(183)
31.5
164
(169)
5
(1.9)
(33.9)
10.8 32
11
95.6
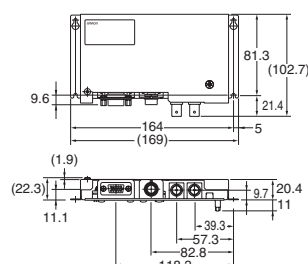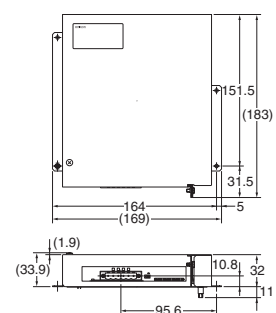
Ordering Information

● International Standards

• The standards indicated in the "Standards" column are those current for UL, CSA, cULus, cUL, NK, and Lloyd standards and EC Directives as of the end of November 2006. The standards are abbreviated as follows: U: UL: U1: UL (Class I Division 2 Product for Hazardous Locations), C: CSA, UC: cULus, UC1: cULus (Class I Division 2 Product for Hazardous Locations), CU: cUL, N: NK, L: Lloyd, CE: EC Directives.

• Ask your OMRON representatives for the conditions under which the standards were met.

● EC Directives

The EC Directives applicable to PLCs include the EMC Directives and the Low Voltage Directive. OMRON complies with these directives as described below.

● EMC Directives

Applicable Standards (See note.) EMI: EN61131-2
EN61000-6-4
EMS: EN61131-2
EN61000-6-2

PLCs are electrical devices that are incorporated in machines and manufacturing installations. OMRON PLCs conform to the related EMC standards so that the devices and machines into which they are built can more easily conform to EMC standards. The actual PLCs have been checked to conformity to EMC standards. Whether these standards are satisfied for the actual system, however, must be checked by the customer.

EMS-related performance will vary depending on the configuration, wiring, and other conditions of the equipment or control panel in which the PLC is installed. The customer must, therefore, perform final checks to confirm that the overall machine or device conforms to EMC standards.

Note: The applicable EMS standards depends on the product.

● Low Voltage Directive

PLC Applicable Standard: EN61131-2

Devices that operate at voltage from 50 to 1,000 VAC or 75 to 150 VDC must satisfy the appropriate safety requirements. With PLCs, this applies to Power Supply Units and I/O Units that operate in these voltage ranges.

These Units have been designed to conform to EN61131-2, which is the applicable standards for PLCs.

Read and Understand this Catalog

Please read and understand this catalog before purchasing the product. Please consult your OMRON representative if you have any questions or comments.

Warranty and Limitations of Liability

WARRANTY

OMRON's exclusive warranty is that the products are free from defects in materials and workmanship for a period of one year (or other period if specified) from date of sale by OMRON.

OMRON MAKES NO WARRANTY OR REPRESENTATION, EXPRESS OR IMPLIED, REGARDING NON-INFRINGEMENT, MERCHANTABILITY, OR FITNESS FOR PARTICULAR PURPOSE OF THE PRODUCTS. ANY BUYER OR USER ACKNOWLEDGES THAT THE BUYER OR USER ALONE HAS DETERMINED THAT THE PRODUCTS WILL SUITABLY MEET THE REQUIREMENTS OF THEIR INTENDED USE. OMRON DISCLAIMS ALL OTHER WARRANTIES, EXPRESS OR IMPLIED.

LIMITATIONS OF LIABILITY

OMRON SHALL NOT BE RESPONSIBLE FOR SPECIAL, INDIRECT, OR CONSEQUENTIAL DAMAGES, LOSS OF PROFITS OR COMMERCIAL LOSS IN ANY WAY CONNECTED WITH THE PRODUCTS, WHETHER SUCH CLAIM IS BASED ON CONTRACT, WARRANTY, NEGLIGENCE, OR STRICT LIABILITY.

In no event shall the responsibility of OMRON for any act exceed the individual price of the product on which liability is asserted.

IN NO EVENT SHALL OMRON BE RESPONSIBLE FOR WARRANTY, REPAIR, OR OTHER CLAIMS REGARDING THE PRODUCTS UNLESS OMRON'S ANALYSIS CONFIRMS THAT THE PRODUCTS WERE PROPERLY HANDLED, STORED, INSTALLED, AND MAINTAINED AND NOT SUBJECT TO CONTAMINATION, ABUSE, MISUSE, OR INAPPROPRIATE MODIFICATION OR REPAIR.

Application Considerations

SUITABILITY FOR USE

OMRON shall not be responsible for conformity with any standards, codes, or regulations that apply to the combination of the product in the customer's application or use of the product.

Take all necessary steps to determine the suitability of the product for the systems, machines, and equipment with which it will be used.

Know and observe all prohibitions of use applicable to this product.

NEVER USE THE PRODUCT FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE OMRON PRODUCT IS PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.

PROGRAMMABLE PRODUCTS

OMRON shall not be responsible for the user's programming of a programmable product, or any consequence thereof.

Disclaimers

CHANGE IN SPECIFICATIONS

Product specifications and accessories may be changed at any time based on improvements and other reasons. Consult with your OMRON representative at any time to confirm actual specifications of purchased product.

DIMENSIONS AND WEIGHTS

Dimensions and weights are nominal and are not to be used for manufacturing purposes, even when tolerances are shown.

PERFORMANCE DATA

Performance data given in this catalog is provided as a guide for the user in determining suitability and does not constitute a warranty. It may represent the result of OMRON's test conditions, and the users must correlate it to actual application requirements. Actual performance is subject to the OMRON Warranty and Limitations of Liability.

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

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In the interest of product improvement, specifications are subject to change without notice.