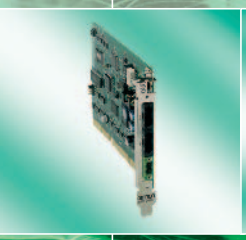
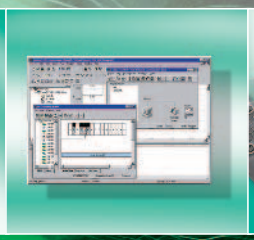
GENERAL CATALOGUE 2004

Automation Systems


- Programmable Controllers
- Wiring Systems
- Industrial Communication
- Remote I/O
- Industrial Information Technology
- Machine Management Tools
- HMI
- Software

Advanced Industrial Automation

Cat. No.Y201-EN2-02 AS

OMRON

Programmable Terminals

Introduction to OMRON PTs

PTs for essentially any purpose

Recommended models				
	TFT 12-inch color display Without Ethernet: **NS12-TS00/00B** With Ethernet: **NS12-TS01/01B** (See note.)	TFT 10-inch color display Without Ethernet: **NS10-TV00/00B** With Ethernet: **NS10-TV01/01B** (See note.)	TFT 8-inch color display Without Ethernet: **NS8-TV00/00B** With Ethernet: **NS8-TV01/01B** (See note.)	STN 5.7-inch color display Without Ethernet: **NS5-SV00(B)-EV1** With Ethernet: **NS5-SV01(B)-EV1** (See note.)
Dimensions (WxHxD, mm)	315 x 241 x 48.5		232 x 177 x 48.5	195 x 142 x 54
Effective display area	246 x 184.5 (12.1-inch)	215.2 x 162.4 (10.4-inch)	160.4 x 121.1 (7.8-inch)	118.2 x 98.4 (5.7-inch)
Power supply	24 V DC ±15%			
I/O Function keys	---	---	---	---
I/O Touch panel	38 vertical x 50 horizontal	30 vertical x 40 horizontal	24 vertical x 32 horizontal	16 vertical x 24 horizontal
Obtained standards	cULus, EC Directives, C1D2, NEMA equivalent			
Display graphics	Rectangle, circle, oval, straight line, polyline, polygon, arc			
No. of display characters (standard characters)	100 characters x 37 lines	80 characters x 30 lines		
No. of registered screens	3,999 screens max. (depending on screen contents)			
Screen data capacity (standard)	20 MB		6 MB	
Memory card interface	ATA compact flash card interface, 1 slot			
Ethernet	TS01(B) only	TV01(B) only	TV01(B) only	SV01(B) only
Internal memory	Bit memory ($B): 32,767 bits, Word memory ($W): 32.767 words			
Ladder monitor	Supported (with NS-EXT01 and Memory Card added)			---
Programming Console function	Supported			
Device monitor	Supported			
Barcode reader connection	Supported			
Screen hardcopy	Supported			Available 2004
Backlight life	50,000 hours		40,000 hours	50,000 hours
Multivendor support	Supported for most third-party PLCs. Please contact your local OMRON distributor for more information.			
See page 637.				

Note: Model numbers with “B” have a black frame and without a beige frame.

Select the best PT to suit the application

Recommended models			
	EL display: **NT631-ST211(B)-V2** TFT color display: **NT631C-ST151(B)-V2** (See note.)	STN monochrome display: **NT31-ST121(B)-V2** STN color display: **NT31C-ST141(B)-V2** (See note.)	Host Link direct access, **NT21S-ST121(B)** (See note.)
Dimensions (WxHxD, mm)	315 x 250 x 54	195 x 142 x 54	190 x 110 x 58
Effective display area	ST211:211 x 158 (640 x 480 dots) ST151:211 x 158 (640 x 480 dots)	118.2 x 98.4 (320 x 240 dots)	117 x 63 (260 x 140 dots)
Power supply	24 V DC +10%/−15%		
I/O Function keys	---		
I/O Touch panel	24 vertical x 32 horizontal	12 vertical x 16 horizontal	7 vertical x 13 horizontal
Obtained standards	UL, CSA, EC Directives, NEMA equivalent		
Display graphics	Straight lines, rectangles, polygons, circles, ovals, sector		
No. of display characters (standard characters)	80 characters x 30 lines	40 characters x 15 lines	16 characters x 8 lines
No. of registered screens	3,999 screens max. (depending on screen contents)		
Screen data capacity (standard)	1 MB		512 KB
Expansion memory	---		
Memory card interface	NT-MF261 Memory Unit for Screen Transfer can be used.		
Expansion interface	Supported		---
Ethernet	---		
Internal memory	Numeral memory table: 2,000 entries max., Character memory table: 2,000 entries max.		
Ladder monitor	---		
Programming Console function	Supported		
Device monitor	Supported		---
Barcode reader connection	Supported		---
Screen hardcopy	Supported		---
Multivendor support	Supported for most third-party PLCs. Please contact your local OMRON distributor for more information.		

Recommended models		
	NT11S–SF121	**NT2S-SF12□B-E(V2)**
Dimensions (WxHxD, mm)	218 x 113 x 38.2	108 x 60 x 43
Effective display area	160 x 64	56 x 11
Power supply		
I/O 13 keys, others: Emergency stop switch	22 keys	6 to 22 keys depending on model
I/O 12 vertical x 16 horizontal	---	---
Obtained standards		
Display graphics		---
No. of display characters (standard characters)	20 characters x 4 lines	16 characters x 2 lines
No. of registered screens	250	250
Screen data capacity (standard)	32 KB	8 KB
Expansion memory	---	
Memory card interface	---	
Expansion interface	---	
Ethernet	---	
Internal memory	---	
Ladder monitor	---	
Programming Console function	---	
Device monitor	---	
Barcode reader connection	---	
Screen hardcopy	---	
Backlight life	30,00 hours average	LED backlight

Note: Model numbers with “B” have a black frame and without a beige frame.

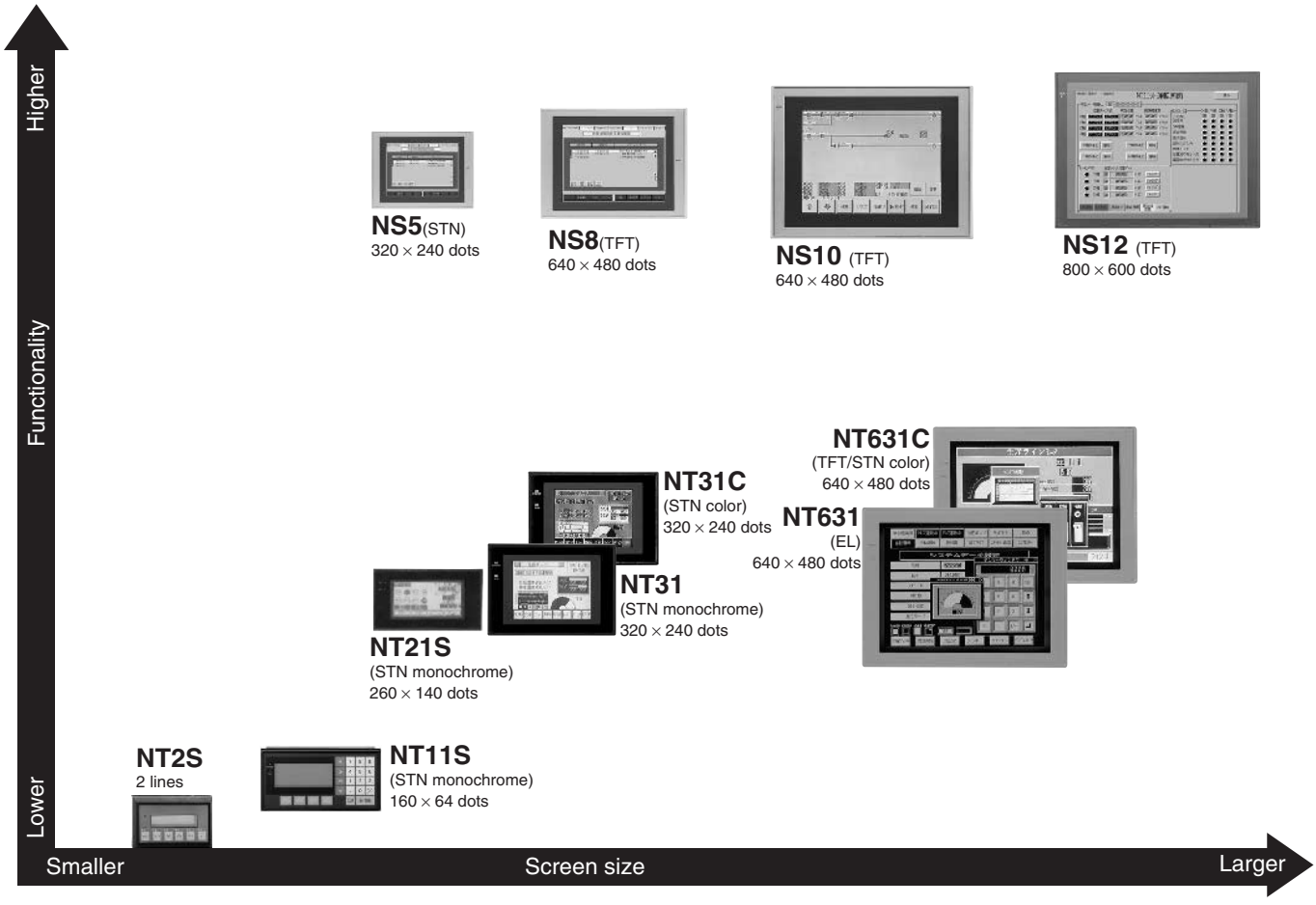
Programmable Terminals

As an machine management tool ... as an information terminal ... as a system component

As a global supplier of HMI solutions and high-reliability industrial touch screen technology for over 12 years, Omron has supplied more than 500,000 pieces of HMI through more than 200 world-wide sales and support offices each offering after-sales support, service and training in the local language.

We also understand the changing needs of our customers. As control systems become more complex the HMI is increasingly being used not only as an operator display and data-setting terminal, but also as a maintenance tool for the complete control system. Many HMI applications now contain 100's of screens of maintenance information for the complete control system and Omron's easy software and hardware integration within the control system can greatly reduce programming time needed and also greatly increase the functionality of the maintenance, therefore dramatically reducing the total cost of ownership.

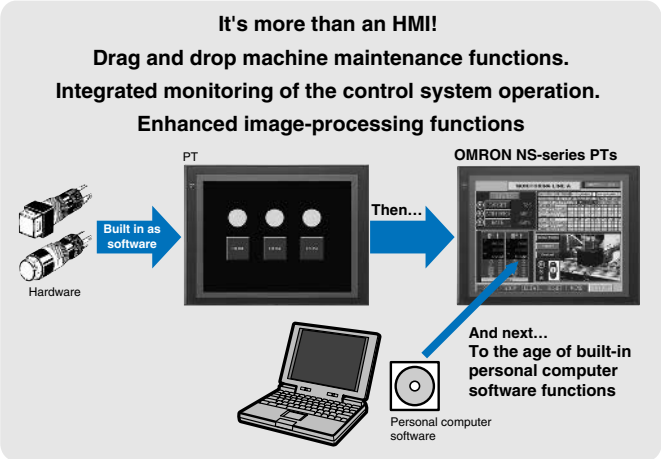
Select by screen size. Select by functions. The wide array of NT- and NS-series PTs suits most applications.



NS5, NS8, NS10, NS12

NS-series Programmable Terminals

Moving to the next generation... This is what the NS Series is doing.



Increased functionality, small size NS range – It's more than an HMI.

The new NS product range now offers greatly increased functionality with several patented features, while also offering faster performance and screen updating. The patented features allow the NS terminals to actually embed pre-tested communications components (Smart Active Parts) into the NS application simply with a drag-and-drop operation. The components are created and tested by skilled Omron engineers and are available to all users free from the Omron website. Once the Smart Active Parts library is downloaded you will be able to create, in minutes, functionality for your machine that previously took skilled programmers hours or even days to create.

This can be combined with the possibility to program the PLC, monitor the existing control program, to reconfigure settings for the complete control system all from the HMI without any PCs or programming software. That's why we call it a Machine Management Tool, and that's why it's more than just an HMI!

Also new is a smaller 5.7" STN model to complement the 8", 10" and 12" TFT screens already available to allow this powerful 'Machine Management' functionality to be used on a wide range of machines and to fully compliment the range of Omron HMI's. The advantage with Omron is that application code written for NS5 will also work on all products in the family allowing a scalable display solution without extra development costs.

NS series lineup

Series	NS12	NS10	NS8	NS5
Appearance				
Dimensions (W x H x D)	315 x 241 x 48.5 mm	315 x 241 x 48.5 mm	232 x 177 x 48.5 mm	195 x 142 x 54 mm
Effective Display area	12.1 inch	10.4 inch	8 inch	5.7 inch
Display device	TFT	TFT	TFT	STN
Number of dots	800 x 600 dots	640 x 480 dots	640 x 480 dots	320 x 240 dots
Display color	256 colors[1] Image data: 32.000 colors	256 colors[1] Image data: 32.000 colors	256 colors[1] Image data: 32.000 colors	256 colors[1] Image data: 32.000 colors
Screen data capacity	20 MBytes	20 MBytes	6 MBytes	6 MBytes
Memory Card	○	○	○	○
Ladder Monitor function	○	○	○	Pro-con function
Video Input Unit support	○	○	○	---
Controller Link Interface Unit Support	○	○	---	---
Multivendor support	Supported for most third-party PLCs. Please contact your local Omron distributor for more information.			

1. When video input is used, 260,000 colors are displayed.

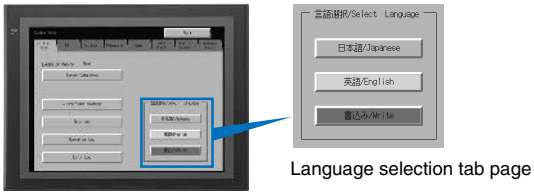
Functions NS series

Multiple language support

Switching error messages between English and Japanese

A Dual-language (English/Japanese) system program

With an NS-series PT, the display language for the system menu and error messages can be switched between English and Japanese with the System Menu's Select Language function. Like the Label Switching function, the Dual-language setting is useful for exported products because the language can be set to English for normal operation and switched to Japanese when Japanese staff need to operate the equipment or perform maintenance.



Language selection tab page

Creating Italian, German, or Other Language Screens in any language version of Windows

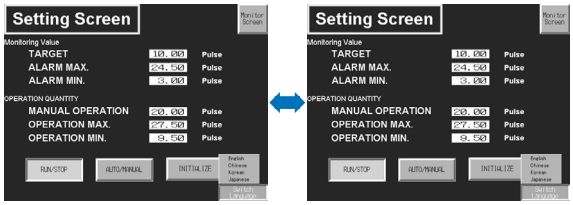
Multi-language Input (When Windows 2000 or XP is Used)

When Windows 2000 or XP is being used, French, German, Spanish, Italian, and other language text can be input in NS-Designer. Select the desired language with regional options to input a different language.

Making multiple language versions with a single screen data file

Label switching function

Up to 16 groups of labels (labels 0 to 15) can be registered for functional objects such as buttons, lamps, labels, and alarm settings. (Each label can correspond to a different language, for example, label 0 = Japanese, label 1 = Simplified Chinese, label 2 = Korean, label 3 = English, etc.) Once all of the labels have been input in each language with the multilingual input function, all of the labels can be switched to a different language at once just by specifying the corresponding label number from the PLC.

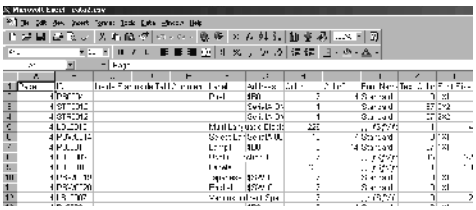


Example: The label switch function can be used to switch between English and Simplified Chinese.

Having a text label converted into multiple languages by a translation company

CSV File Input/Output

The labels for each functional object can be exported in CSV format. The changed labels can be imported again after it has been edited with a program such as Excel.



Creating Windows-style screens

Making buttons pop-up with a single property setting

Easily creating pop-up menus

Register item names (screen numbers for command buttons, optional character strings corresponding to the numeric values for word buttons) for pop-up menus in advance. When the button is pressed, the pop-up menu will be displayed and the corresponding operation (such as switching screens or setting a value in a specified communications address) can be performed by choosing the item name from the pop-up menu.

Inputting character strings by selecting from a list

List selection object

The character strings in the specified PLC addresses or text file are displayed so that the user can select from the list. When a line is selected, the corresponding line number or character string can be written to the PLC. It is possible to display up to 1,024 lines with up to 256 characters in each line.

Making one common screen (sheet) that overlaps other screens

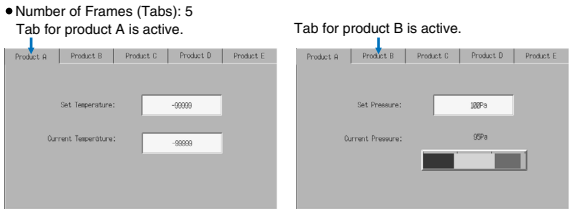
Sheets

A feature that is common to several screens can be registered as a sheet. The common feature can be added to any screen just by applying the corresponding sheet to the screen. (Up to 10 sheets can be created for one project.)

Switching just part of the screen, Like the Pages of a Notebook

Frame function

It is possible to specify an area in the screen (Frame) that will be switched as a page. Up to 10 frames can be set for 1 screen. Up to 256 pages can be switched for one frame.
This function can be used for operations such as switching tabs.



Varying the font size, just as you can in a word processor

Windows fonts function

Windows fonts such as Arial or Century can be used for text objects and the font size can be changed.

Using an image, e.g. a picture taken with a digital camera, for the background

Bitmap displays

It is possible to display BMP and JPG files. The files can be specified directly or indirectly.

Background files

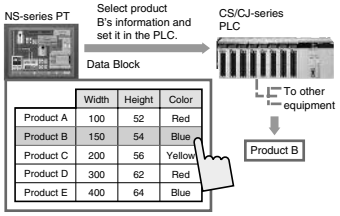
It is also possible to arrange BMP and JPG files for the background of the screen.

Easily utilizing advanced functions

Setting and displaying recipe data from the PT for fast production changeovers

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.



Easily creating screens in table format containing multiple functional objects

Tables

The same kind of functional objects (such as Buttons, Text, or Numeral Display & Input objects) can be created together in a table just by specifying the kind of functional object, number of rows, and number of columns in the table. In addition, the properties for functional objects can all be set together and PLC addresses can be allocated automatically. It is also possible to add headings for each row and column.

Converting the scale for industrial units at the PT

Units setting and scaling function

The display units and scale can be changed Numeral Display & Input objects. Any unit display can be set.

Using a command from the PLC to prohibit operation of push buttons and change the displayed text while operation Is prohibited

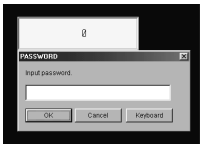
Control flag (Interlock) function

A bit in the PLC can be used as a control bit to control the display of an object (such as a button or numeral input) or disable/enable an operation.

Protecting the system with passwords

Passwords

It is possible to register 5 kinds (levels) of passwords (16 characters max.) for the whole project. Also can set one of 5 passwords for each functional object (which you operate).



Changing the color of an area of the Meter to indicate an error level

Switch display color function

Level Meter and Analogue Meter can be divided into three ranges with a different fill color in each range. It is also possible to indirectly specify each range's color and border values so that the ranges can be changed during operation.

Create customized functionality using script

(Moving functional objects based on the status of PLC bits, performing conditional processing at a given present value, writing to the PLC according to set value arithmetic operations, etc.)

Macro function

Original, user-defined programs (macros) can be added and executed to control projects, screens, and functional objects.

Using general software

Editing text and bitmap file with your favorite text editor

Editor specifying function

The user can select the editor when editing text or bitmap files.

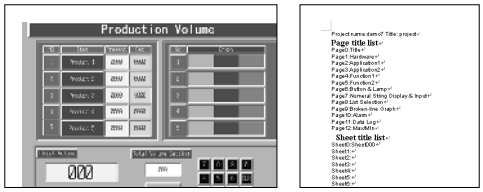
Creating system-related documents

Outputting project information in RTF

Data such as screen information and object information can be output in an RTF file. The RTF file can be read into Word Processor to produce a system manual.

Example of an RTF File Read into Word Processor

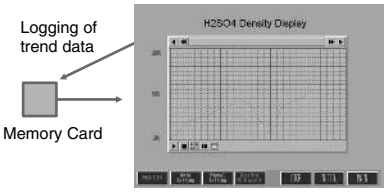
- Pasted Screen Data as RTF Data
- Object Properties as RTF Data



Using Excel to analyze data, such as the Alarm/Event History, Operation Log, and Error Log, and to create Daily Reports

Memory Card: data logging function

Logging data (trend data, up to 1000 points with a sampling cycle of 1 to 86,400 s/group) can be stored in the Memory Card in CSV format.



Using Excel to analyze time-series data and to create daily reports

Memory Card: History Storage Function

The following data can be saved to the Memory Card in CSV format.

- Alarm/Event History (Alarm/ Event history data)
- Operation Log (Screen operation history data)
- Error Log (Error log data recorded during macro program execution)

Exchanging data with a PLC over a network (Multihost)

Communicating with a PLC via NT Link, using Ethernet without special PLC Programming

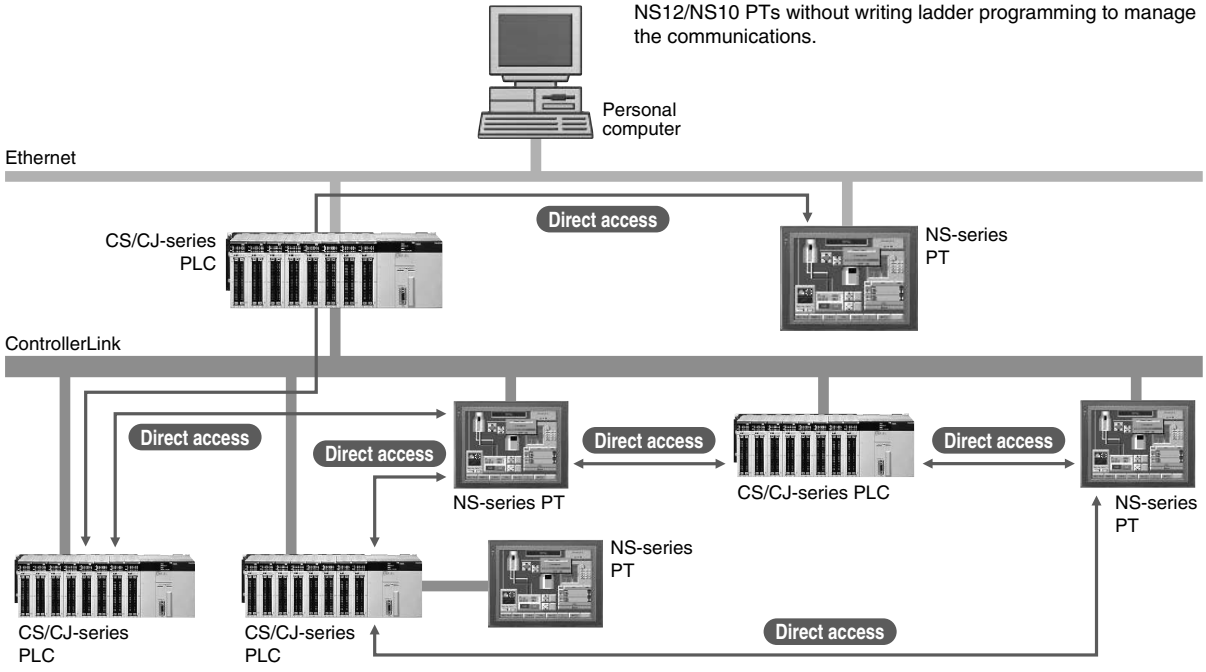
Ethernet communications without programming

NS-series PTs can communicate with a CS/CJ-series PLC (equipped with an Ethernet Unit) through “program-free” communications just like NT Link communications. Data is transferred through Ethernet through a simple PLC address and initial communications setup.

Using data links between the PT and the PLC

Controller Link interface unit

The Controller Link is an FA network that can send and receive large data packets flexibly and easily among OMRON PLCs and IBM PC/AT or compatible computers. The NS12 and NS10 PTs can be connected to the Controller Link network easily via a Controller Link Interface Unit. When a Controller Link network is used, data can be transferred between multiple PLCs and NS12/NS10 PTs without writing ladder programming to manage the communications.

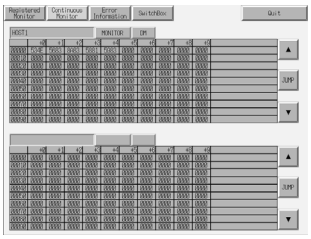


Monitoring and setting PLC data

Monitoring PLC I/O data for the purpose of device debugging and maintenance

Device Monitor Function

The Device Monitor Function is a standard feature in the NS-series Programmable Terminals. Data in the PLC's I/O memory can be accessed directly (read and written.) The Device Monitor provides functions that can significantly reduce the time needed to set up the system, such as displaying a block of consecutive PLC data area addresses and inputting/verifying parameters in CPU Bus Units and Special I/O Units.



Easily Displaying the Status of Particular Bits in Ladder Programs when Errors Occur

Switch Box Function

The Switch Box Function has been added to the NS-series Programmable Terminals. The Switch Box Function can be used to monitor the status of each bit in a word or a combination of user-selected bits organized like a ladder program section. The Switch Box Function makes it possible to perform basic troubleshooting on the factory floor even without a computer.

Monitoring Execution of the PLC's Ladder Program

Ladder Monitor Function

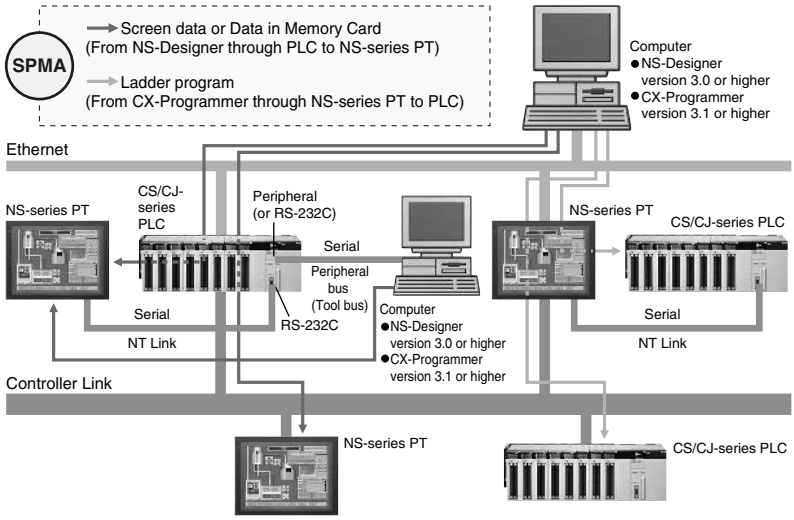
Save the NS-EXT01 Ladder Monitor system program on a Memory Card (the NS-EXT01 is sold separately) and install the Memory Card to enable monitoring of a ladder program (I/O bit status monitor, address/instruction search, multiple I/O bit monitor, etc.) being executed in a CS/CJ-series PLC connected by a serial connection. It is also possible to display I/O comments created with the CX-Programmer.

Transferring Screen Data

Data Transfer by Passing Through a PLC or PT!

SPMA (Single Port Multi Access) Function

When transferring screen data from the NS-Designer to the NS-series PT, the data can be transferred through a PLC as long as the PT is connected to the PLC by a serial connection or network connection. Also, when monitoring/transferring a PLC ladder program from the CX-Programmer, the PLC ladder program can be monitored/transferred through an NS-series PT as long as the PT is connected to the PLC by a serial connection or network connection.



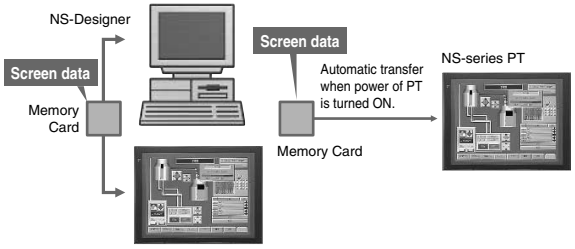
* To use the SPMA function through the PLC, the following software and hardware versions are required.
- NS-series PT: System version 3.0 or higher
- NS-Designer: Version 3.0 or higher
- CX-Programmer: Version 3.1 or higher
- PLC: Lot No. 030201 and later (Refer to the following table.)

PLC series	CPU model	Lot number
CJ Series	CJ1H-CPU65H	030201
	CJ1H-CPU66H	
	CJ1G-CPU42H	
	CJ1G-CPU43H	
	CJ1G-CPU44H	
	CJ1G-CPU45H	
	CJ1M-CPU12	
	CJ1M-CPU13	
	CJ1M-CPU22	
	CJ1M-CPU23	
CS Series	CS1H-CPU63H	030201
	CS1H-CPU64H	
	CS1H-CPU65H	
	CS1H-CPU66H	
	CS1H-CPU67H	
	CS1G-CPU42H	
	CS1G-CPU43H	
	CS1G-CPU44H	
	CS1G-CPU45H	

Transferring Screen Data to the PT On-site from a Memory Card

Memory Card: Upload/Download Function

It is possible to download the screen data and system program to Memory Card and upload the same data from the Memory Card. It is also possible to automatically upload the data from the Memory Card to NS-Designer or automatically download the data from Memory Card to PT when the power of PT is turned ON.

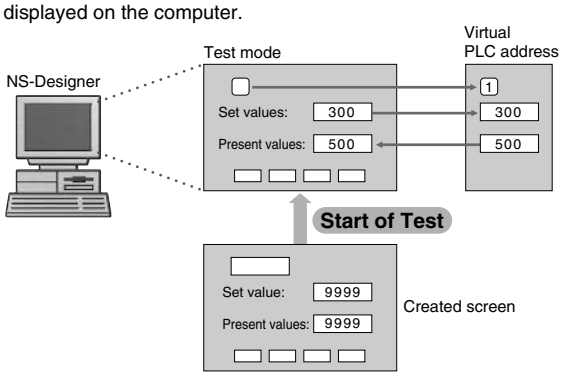


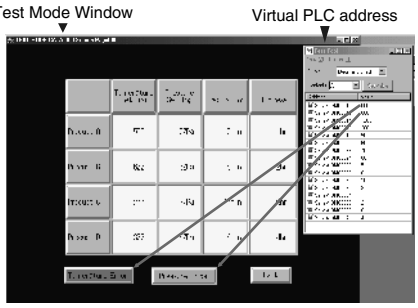
Using a Personal Computer to Check PT Operation

Using a Personal Computer to Check the Operation of Created Functional Objects

Simulation via the "Test Function"

When a test is started, a test screen and virtual PLC will be displayed on the computer.





Operating (clicking with the mouse) the functional objects on the test screen will change the corresponding address in the virtual PLC. Conversely, changing the content of a virtual PLC address will change the corresponding functional objects. It is also possible to confirm pop-up screens. This function can be used to confirm the actual operation of a screen during the editing. The test function enables debugging screens without NS and PLC Hardware.

Sharing Screen Data

Using Image library

Select Shape Function

About 1,000 shapes can be used for ON/OFF buttons, Bit lamps, and Word lamps, including shapes such as 7-Segment digits, rotary switches, limit switches, and motors.

Registering Complex Objects such as Graphics to a Library and Reusing Them

Library Register Function

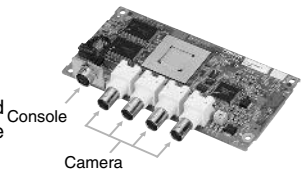
Organize functional objects or fixed objects that you have created and register them in the library so that they can be reused.

Using Video Inputs

Capturing Moving Images from a Video Camera and Image Outputs from a Vision Sensor, and Doing Layout on a PT Screen

Video Input Interface

Four video input interfaces are provided, so four video or CCD cameras can be connected. Up to four images can be displayed simultaneously if the image size is 320x240 pixels.



Saving Displayed Video Images to a Memory Card in BMP Format

Image Capture Function

When necessary, the displayed image can be captured and saved in a Memory Card in BMP format. The saved image can then be uploaded from remote personal computer via Ethernet or Serial connection.

The number of images that can be saved depends on the capacity of Memory Card. As an example, about 50 images from a 640x480 display (about 600 Kbytes each) can be saved in a 30-Mbyte Memory Card.

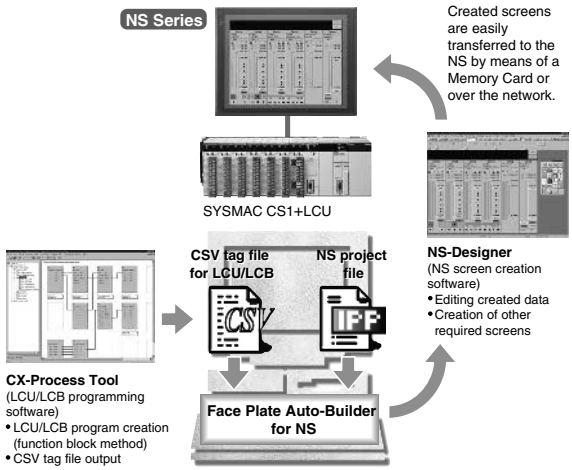
Using for Process Control

Automatically Generating PT Image Data from Tag Information Created with CX-Process

Face Plate Auto-Builder for NS (Sold separately)

Significantly reduces the engineering time required, by combining LCB/LCU and the NS Series.

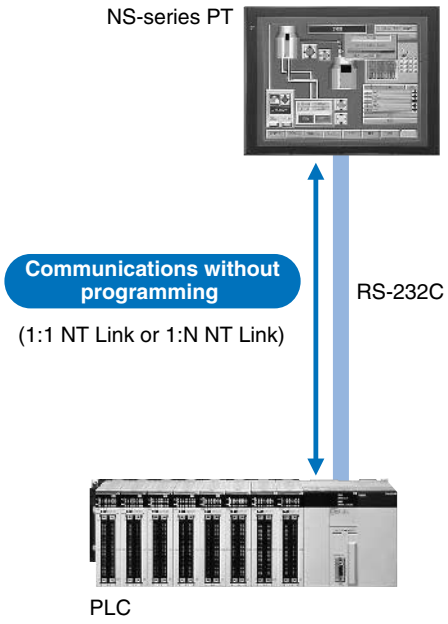
- Automatic generation of control screens and tuning screens. Automatic generation of NS screen data by the software from tag information created with the CX-Process Tool.
- NS communications address allocation, ladder programs, etc., are completely unnecessary.
- Data that has been generated can be freely edited and processed by NS-Designer (NS screen creation software).



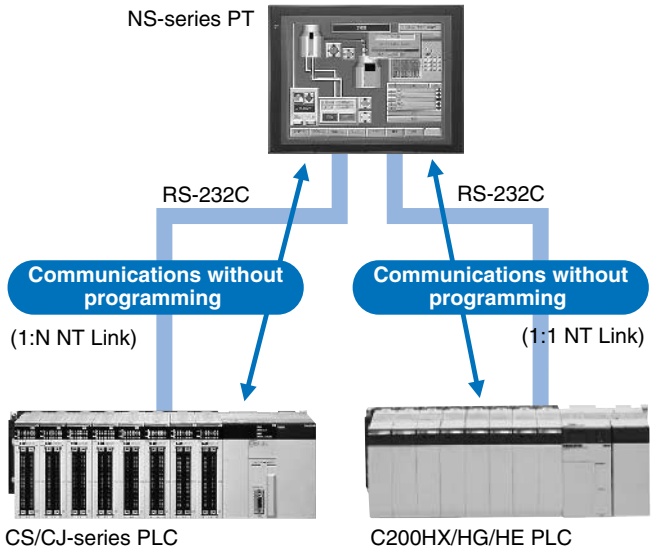
System configurations

Various connections, such as 1:1, 1:2, 1:N, and M:N, are supported with Ethernet or serial connections.

PT:PLC = 1:1

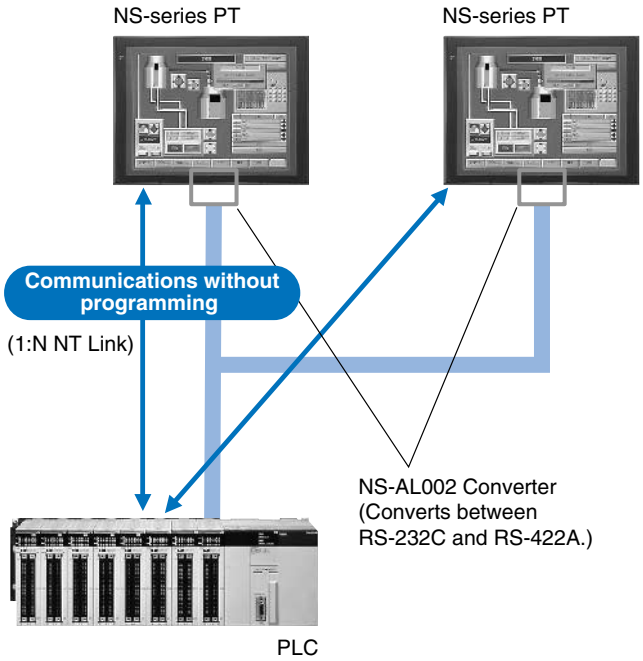


PT:PLC = 1:2

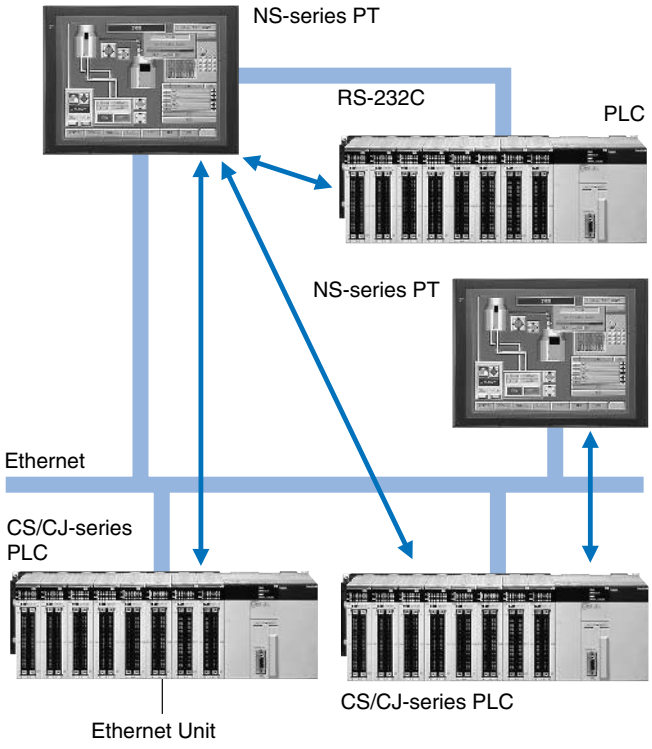


Note: It is possible to make a 1:N NT Link connection to one port and a 1:1 NT Link connection to the other port. It is not possible to make 1:N NT Link connections to both ports. (Consequently, it is not possible to connect CS/CJ-series PLCs to both ports). It is also possible to communicate with a PLC using RS-422A communications through an NS-AL002 Converter connected to either of the ports.

PT:PLC = 1:N



PT:PLC = M:N



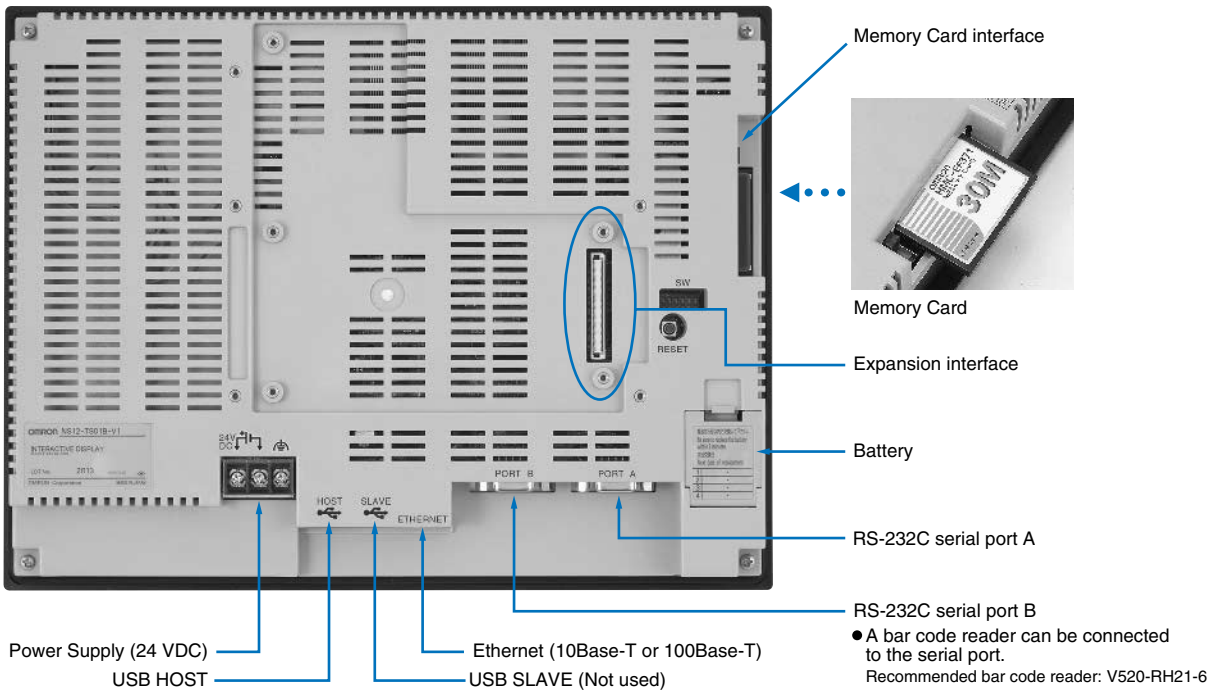
Host registration function
It is possible to register two or more PLCs as hosts and communicate with the PLCs by specifying the host ID and address.

High-reliability and advanced functions in the industry's slimmest PT

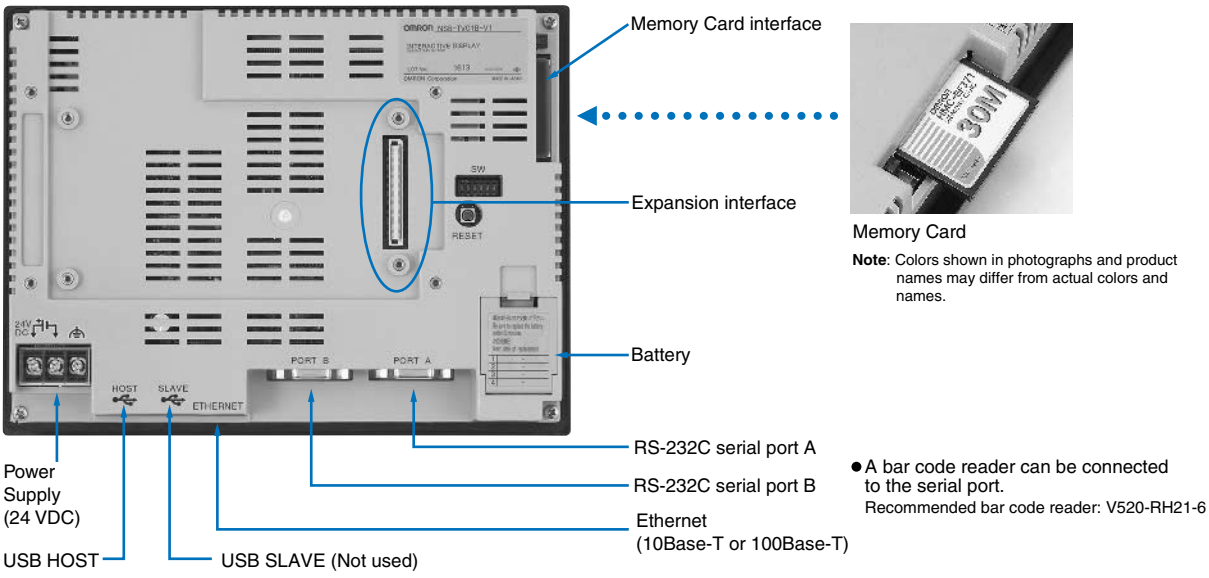
■ Super-thin 48.5-mm Body for a Slimmer Control Panel

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**



● **NS8**



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

■ 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. Be sure to use USB cables made by OMRON (NS-US52/NS-US22).

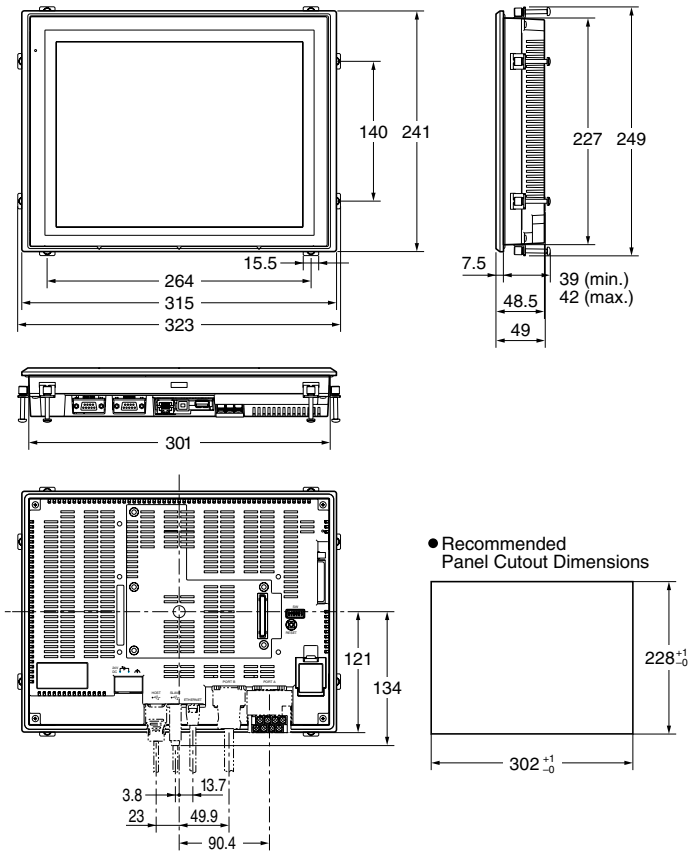
■ NS-series PTs have backlights with the longest life expectancy in the industry.

At room temperature, the average life expectancy is 50,000 hours min. for the NS12 and NS10, 40,000 hours min. for the NS8.

Dimensions

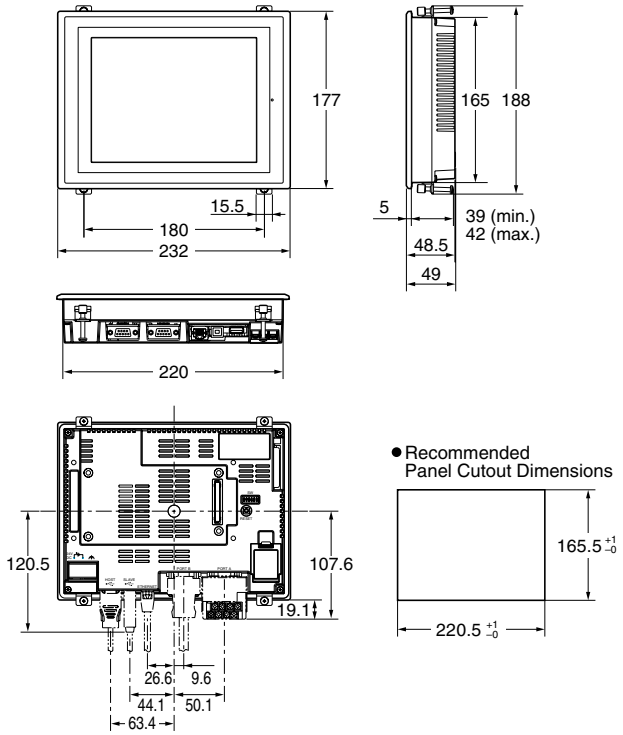
NS12/10 PT

Units: mm



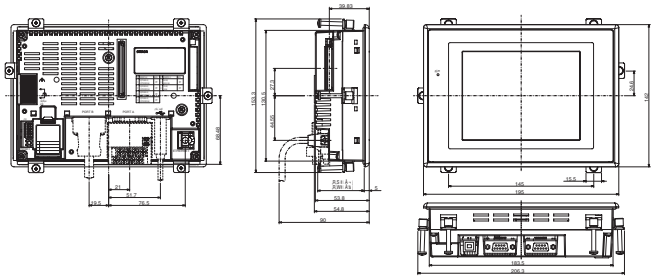
NS8 PT

Units: mm



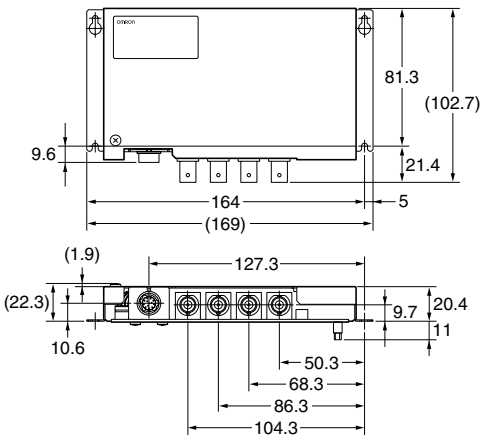
NS5 PT

Units: mm



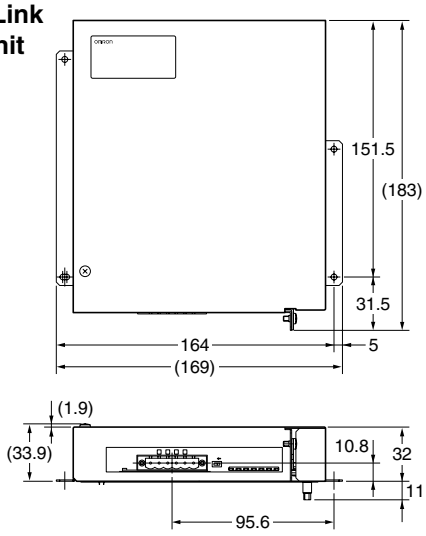
NS-CA001 Video Input Unit

Units: mm



NS-CLK21 Controller Link Interface Unit

Units: mm



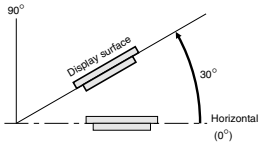
Performance/Specifications

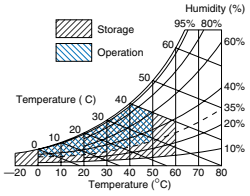
General specifications

Item	Specifications
Rated power supply voltage	24 V DC
Allowable voltage range	20.4 to 27.6 V DC (24 V DC ±15 %)
Power consumption	25 W max.
Ambient operating temperature	0 to 50°C (See notes 1 and 2.)
Storage temperature	-20 to 60°C (See note 2.)
Ambient operating humidity	35% to 85% (0 to 40 °C) with no condensation 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)	Conforms to IEC 60068-2-6, JIS C0040. 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)	Conforms to IEC 60068-2-27, JIS C0041. 147 m/s² 3 times each in direction of X, Y, and Z.
Weight	NS12: 2.5 kg max.; NS10: 2.3 kg max.; NS8: 1.8 kg max.
Enclosure rating	Front operating panel: IP65F and NEMA4 compliant (See note 3.)
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

Note: 1. The operating temperature is subject to the following restrictions according to the mounting angle.
Mounting angle of 0 to 30× 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: See note 4.

2. Operate the PT within the temperature and humidity ranges shown in the following diagram.





3. May not be applicable in locations with long-term exposure to oil.

4. - NS12-V1/NS10-V1
Mounting angle of 30° to 90° or less to the horizontal: Operating temperature range of 0 to 50 °C
- NS8-V1
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

Characteristics

Display specifications

Item		NS12-V1	NS10-V1	NS8-V1	NS5*
Display panel	Display device	High-definition TFT color LCD			STN
	Number of dots	800 dot horizontal x 600 dot vertical	640 dot horizontal x 480 dot vertical		320 dot horizontal x 240 dot vertical
	Display color	256 colors			
	Effective display area	Width 246.0 mm x height 184.5 mm (12.1 inches)	Width 215.2 mm x height 162.4 mm (10.4 inches)	Width 162.2 mm x height 121.7 mm (8 inches)	Width height (5.7 inches)
	Field of vision	Left/right ±60°, Top 45°, bottom 55°	Left/right ±60°, Top 35°, bottom 65°	Left/right ±60°, Top 50°, bottom 60°	Left/right ±60°, Top 45°, bottom 60°
Backlight (See note 4.)	Service life	50,000 hours min. (See note 1.)		40,000 hours min. (See note 1.)	---
	Brightness adjustment	There are 3 levels that can be set with the touch panel. (See note 2.)			
	Backlight error detection	Error is detected automatically, and the RUN indicator flashes green as notification. (See note 3.)			---

Note: 1. 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 drastically 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).

2. The brightness cannot be adjusted much.

3. 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.

4. Contact your nearest OMRON representative to replace the backlight.

* For more information please ask your local representative.

Operating specifications

Item		NS12-V1	NS10-V1	NS8-V1	NS5*
Touch panel (Matrix type)	Method	Resistive membrane			---
	Number of switches	1,900 (50 horizontal x 38 vertical) 16 x 16 dots for each switch	1,200 (40 horizontal x 30 vertical) 16 x 16 dots for each switch	768 (32 horizontal x 24 vertical) 20 x 20 dots for each switch	---
	Input	Pressure sensitive			---
	Service life	1,000,000 touch operations			---
Standard screen data capacity		20 MB		6 MB	6 MB

* For more information please ask your local representative.

External Interface specifications

Item	Specification
Memory card interface	One ATA-Compact Flash interface slot. Used to transfer and store screen data and to store history data.
Expansion interface	For Expansion Interface Units Used to install various Interface Units that are currently in development.

Communication specifications

Serial Communication

Item	Specification
Port A	Conforms to EIA RS-232C. D-Sub female 9-pin connector 5-V output (250 mA max.) through pin 6 (See note.)
Port B	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.

Controller Link (Wired-type) specifications

Item	Specification
Baud rate	2M/1M/500K
Transmission path	Shielded twisted-pair cable (special cable)

Ethernet specifications (NS12-TS01(B) and NS10/8-TV01(B) only

Item	Specification
Conformance standards	Conforms to IEEE 802.3/Ethernet (10Base-T/100Base-T).

Video input specifications

Item	Specification
Resolution	320 x 240, 640 x 480, or 800 x 600 dots
Input signal	NTSC composite video or PAL
Cameras	Number of cameras: 4 max.

USB specification

Item	Specification
USB rating	USB1.1
Connector	Type A (Host), Type B (Slave)

Display element specifications

Item				Specification		
Display text	Raster font	Font name	Rough	Displayable characters	Base size	
			Standard	Alphanumeric characters or Japanese katakana	8 x 8	1 x 1, 1 x 2, 2 x 1, 2 x 2, 3 x 3, 4 x 4, 8 x 8
			Fine	Alphanumeric characters or Japanese, Chinese (Simplified, Traditional) or Korean	8 x 16 16 x 16	1 x 1, 1 x 2, 2 x 1, 2 x 2, 3 x 3, 4 x 4, 8 x 8
				Alphanumeric characters or Japanese katakana Japanese kanji	16 x 32 32 x 32	1 x 1, 1 x 2, 2 x 1, 2 x 2, 3 x 3, 4 x 4, 8 x 8
	Vector font (text objects only)			Can be specified in NS-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 that can 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.		
Alarm/event settings				500 max.		
Display colors				256 colors max.(32,000 colors for BMP)		

CPU Units (1:1 NT Link Connection)

Model number	Specifications	PLC Model name
CQM1-CPU41-V1/CPU42-V1/CPU43-V1/CPU44-V1	With RS-232C connector (9-pin type)	C-series CQM1
CQM1H-CPU21/CPU51/CPU61		C-series CQM1H
CPM1-10/20CDR-□+CPM1-CIF01	Connect to peripheral port.	C-series CPM1
CPM1A-10/20/30/40CD□-□+CPM1-CIF01		C-series CPM1A
CPM2A-30/40/60CD□□-□+CPM1-CIF01	Connect to RS-232C or peripheral port.	C-series CPM2A
CPM2C-10/20□□□□□□-□(See note 1)	With RS-232C connector (9-pin type)	C-series CPM2C
C200HS-CPU21/CPU23/CPU31/CPU33		C-series C200HS
C200HE-CPU32(-Z) (See note 2) /CPU42(-Z)		C-series C200HE (-Z)
C200HG-CPU33(-Z) (See note 2) /CPU43(-Z) /CPU53(-Z) (See note 2) /CPU63(-Z)		C-series C200HG (-Z)
C200HX-CPU34(-Z) (See note 2) /CPU44(-Z) /CPU54(-Z) (See note 2) /CPU64(-Z) /CPU65-Z/CPU85-Z		C-series C200HX (-Z)
CV500/1000/2000-CPU01-V1 CVM1-CPU01-V2/CPU11-V2/CPU21-V2	With RS-232C connector (switching/9-pin type)	CVM1/CV-series CVM1 or CV500/ CV1000/CV2000

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.

CPU Units (1:N NT Link Connection)

Model number	Specifications	PLC Model name
CS1G-CPU42H/CPU43H/CPU44H/CPU45H	With RS-232C connector (9-pin type)	CS-series CS1G
CS1H-CPU63H/CPU64H/CPU65H/CPU66H/CPU67H		CS-series CS1H
CJ1G-CPU42H/CPU43H/CPU44H/CPU45H (See note 1)		CJ-series CJ1G
CJ1H-CPU65H/CPU66H (See note 1)		CJ-series CJ1H
CJ1M-CPU12/CPU13/CPU22/CPU23 (See note 1)		CJ-series CJ1M
CQM1H-CPU61/51 with a CQM1H-SCB41 Serial Communications Board		C-series CQM1H
C200HE-CPU32(-Z) (See note 2) /CPU42(-Z)		C-series C200HE(-Z)
C200HG-CPU33(-Z) (See note 2) /CPU43(-Z) /CPU53(-Z) (See note 2) /CPU63(-Z)		C-series C200HG(-Z)
C200HX-CPU34(-Z) (See note 2) /CPU44(-Z) /CPU54(-Z) (See note 2) /CPU64(-Z) /CPU65-Z/CPU85-Z		C-series C200HX(-Z)

Note: 1. The CJ1W-SCU41 Serial Communications Unit can also be connected.

2. A C200HW-COM02/COM04/COM05/COM06(-V1) Communications Board is required

Standard Models

Model name	Specifications			Model number
		Ethernet	Case color	
NS12 PT	12-inch TFT 800 x 600 dots	No	Ivory	NS12-TS00
			Black	NS12-TS00B
		Yes	Ivory	NS12-TS01
			Black	NS12-TS01B
NS10 PT	10-inch TFT 640 x 480 dots	No	Ivory	NS10-TV00
			Black	NS10-TV00B
		Yes	Ivory	NS10-TV01
			Black	NS10-TV01B
NS8 PT	8-inch TFT 640 x 480 dots	No	Ivory	NS8-TV00
			Black	NS8-TV00B
		Yes	Ivory	NS8-TV01
			Black	NS8-TV01B
NS5 PT	5.7-inch STN 320 x 240 dots	No	Ivory	NS5-SV00
			Black	NS5-SV00B
		Yes	Ivory	NS5-SV01
			Black	NS5-SV01B
NS-Designer Screen design software	Windows version on CD-ROM			NS-NSDC1
Cable[1]	Screen transfer cable for DOS/V			XW2Z-S002
	USB Host Cable, cable length: 5 m			NS-US52 (5 m)[2]
	USB Host Cable, cable length: 2 m			NS-US22 (2 m)[2]
PT-to-PLC Connecting Cable	PT connection: 9 pins PLC connection: 9 pins	Length: 2 m		XW2Z-200T
		Length: 5 m		XW2Z-500T
Accessories	Ladder Monitor Software	One CD-ROM Ladder Monitor application[3] and I/O Comment File Extraction Tool[4]		NS-EXT01-V2
				NS-EXT01-V2L03 (3 licenses)
				NS-EXT01-V2L10 (10 licenses)
				NS-EXT01-V2HMC (with 64-Mbyte Memory Card)
	Video Input Unit	Inputs: 4 channels Signal type: NTSC/PAL		NS-CA001

Model name	Specifications			Model number
	Special Cable for the Console			F150-VKP (2m)
				F150-VKP (5m)
	Controller Link Interface Unit	For Controller Link Communications		NS-CLK21
	RS-422A Adapter			CJ1W-CIF11
	Anti-reflection Sheets (5 surface sheets)		NS12/10	NS12-KBA04
			NS8	NS7-KBA04
	Protective Covers (5 pack)		NS12/10	NS12-KBA05
			NS8	NS7-KBA05
	Memory Card		15 MB	HMC-EF172
			30 MB	HMC-EF372
			64 MB	HMC-EF672
	Memory Card Adapter			HMC-AP001
	Battery			CJ1W-BAT01
	Bar Code Reader (Refer to the Catalog for details.)			V520-RH21-6

1. Be sure to use cables made by OMRON when connecting NS hardware to a printer. No guarantee of proper operation if other cables are used.
2. Available soon.
3. NS-series PT application used to monitor a SYSMAC CS/CJ-series PLC's ladder program from the PT.
4. This tool extracts I/O comment data from the CX-Programmer's CXT file and converts the data to a format that can be used by the Ladder Monitor Software for NS.

NT631/NT31 V2

Touch-screen HMI

Greater Compatibility with SYSMAC PLCs and Easy-to-Use Support Software

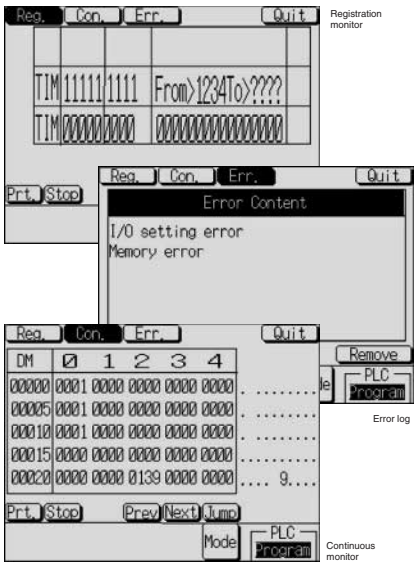
NT631C

NT31C

Features for Users

Device Monitor Function

I/O memory in the PLC can now be directly accessed to read or write data. Continuous portions of PLC areas can be displayed. This greatly increases startup efficiency for setting Special Units or for checking settings. The Device Monitor can be accessed directly from user screens for applications in monitoring and maintenance screens.



Full Area Access and High-speed NT Links with CS Series

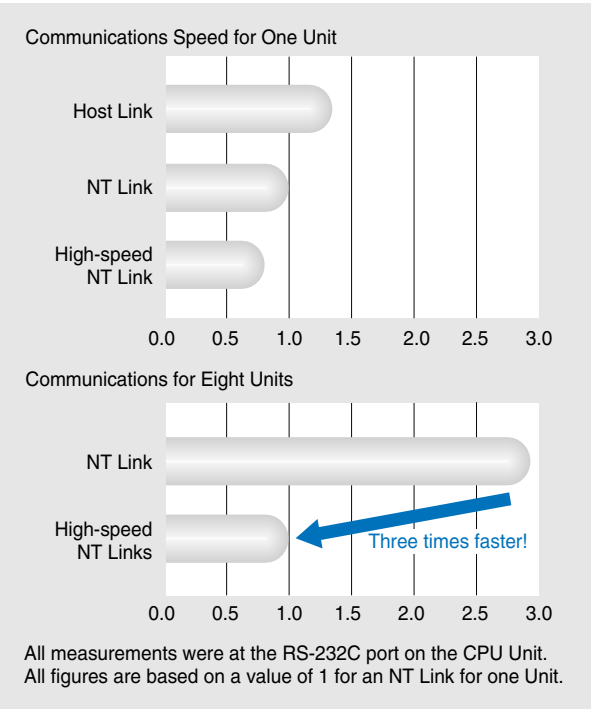
High-speed Links with CS-series PLCs

- Fastest communications in the industry for serial connection.
- Connect up to 8 PTs to a single port.
- Communicate to a maximum of 500 m.
- Connect up to 8 PTs and still get the same communications speed as 1 PT connected in a standard NT Link.

Accessible Areas in CS-series PLCs (for 1:N NT Links)

PLC	CS1G or CS1H
CIO Area	00000 to 06143
HR Area	00000 to 00511
AR Area	00448 to 00959
Timer/Counter present values	00000 to 04095
DM Area	00000 to 32767
EM Area (e.g., current EM bank, EM bank 0, or EM bank C)	00000 to 32767
Work Bit Area	00000 to 00511
Task Flags	00000 to 00031
Timer Completion Flags	00000 to 04095
Counter Completion Flags	00000 to 04095

Faster Access to More Areas (OMRON Comparison)



All measurements were at the RS-232C port on the CPU Unit.
All figures are based on a value of 1 for an NT Link for one Unit.

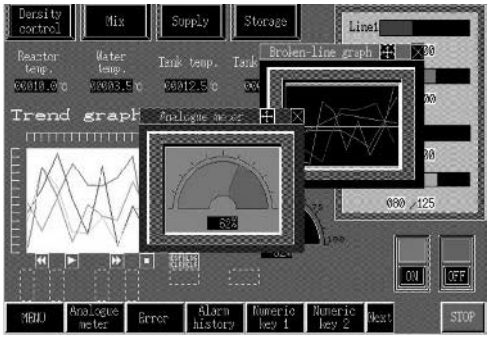
Features

More Processing and Interlock Functions

Numeric processing and interlock features can be built into the screens, greatly reducing the amount of ladder programming required and simplifying program changes, maintenance work, and system upgrading. (The PT now supports up to 5 items of arithmetic and/or logic processing).

Multi-window Display Allows Optimum Screen Application

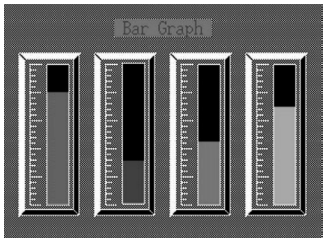
Up to three windows can be displayed simultaneously. A window can be moved with the touch of a finger. Furthermore, windows can be opened and closed from the PLC using operations in the Window Control Area.

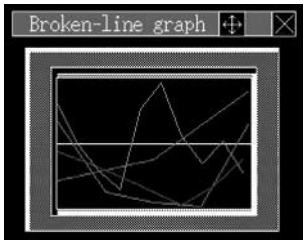


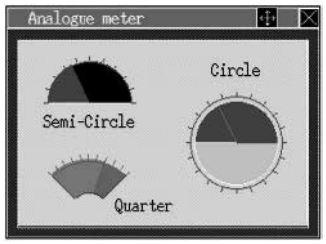
Versatile, Enhanced Display Functions

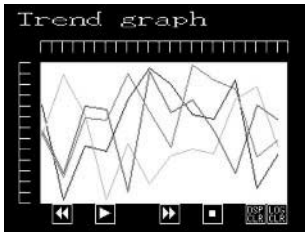
Enhanced Graphs

The enhanced graph function allows precise settings, including indirect settings for analog meters, trend graphs, sequential line graphs, and bar graphs.







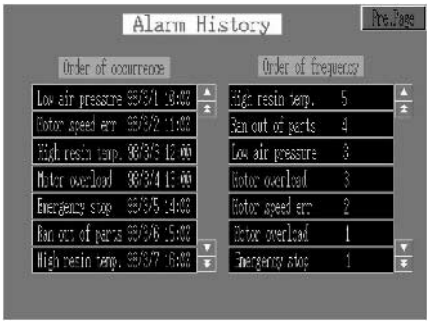


High-definition Fonts

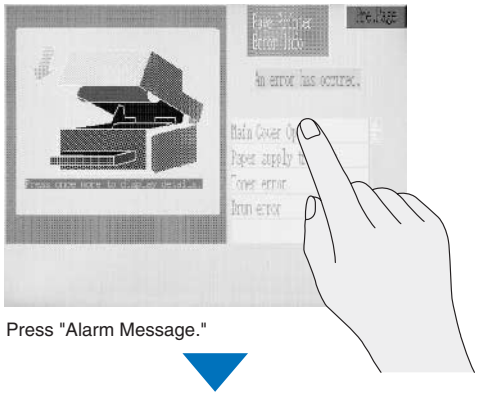
Display text can be set to from 4 to 16 times normal size and still maintain high definition for easy reading.

Alarm History Helps to Improve Equipment

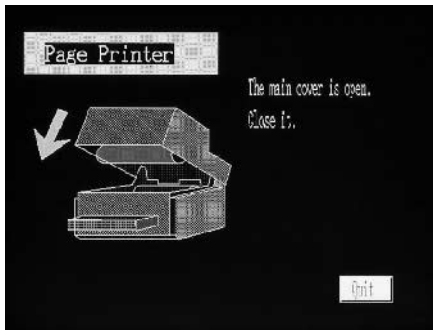
A history of malfunctions displayed on the screen can be arranged in order of occurrence or frequency. The history can be referred to at any time, even during operation, making analyzing machine problems far easier. The history can also be uploaded to the NT Support Software.



Alarm List for Realtime Error Displays



Press "Alarm Message."



A program will start and display the details of the error.

Features for Maintenance

System Program Transfers

Functions and performance can be upgraded without changing hardware simply by loading a new system program.

Screen Transfers via Memory Units

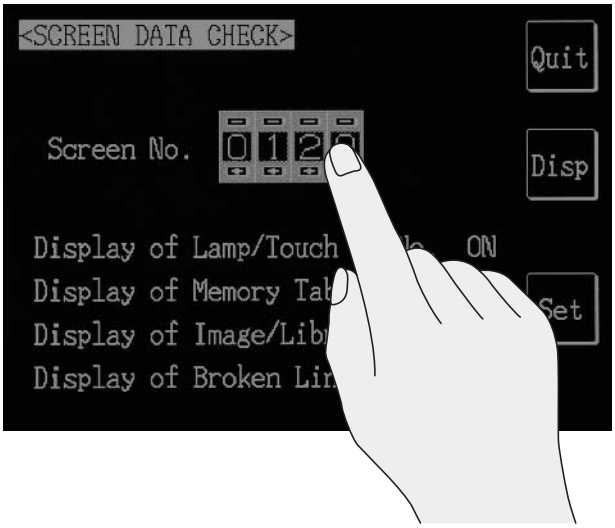
Just save the screens to a Memory Unit and essentially anyone can easily transfer screens. Up to two banks of data can be saved in a Memory Unit, enabling both screen data and the system program to be saved to a single Memory Unit

Special Screen Transfer Utility

Essentially anyone can transfer screen data without using the NT Support Tool. The utility is a separate software package and can be set up separately wherever required.

Screen Verification without PLC Connection

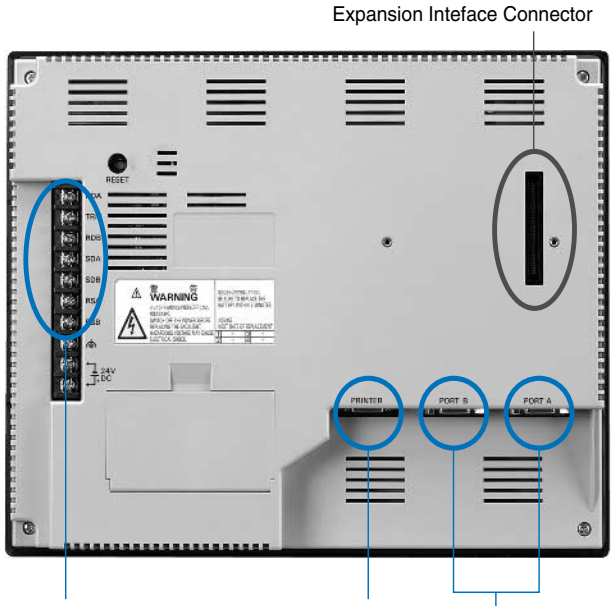
The NT631/NT31 displays screens, such as lamps, touch switches, and memory table numbers, without the PLC connected, to enable efficient debugging.



Other Features

Three Communications Ports for Easier Application

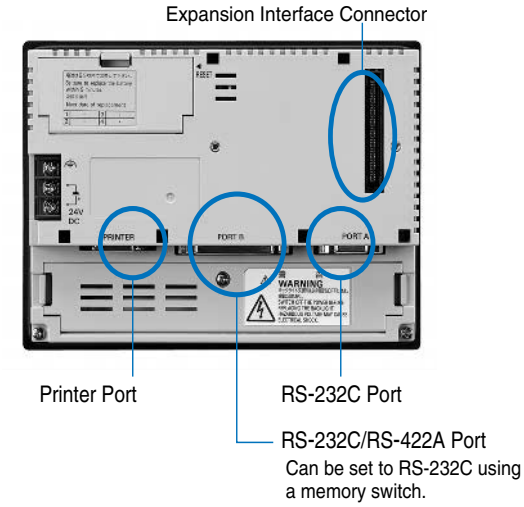
NT631/NT631C



Easily achieve 1:N RS-422A or RS-485 communications. Long-distance communications are also possible.

Two RS-232C ports are a standard feature. Connect directly to a barcode reader to construct a POP system. Or connect one to the Support Software and one to anyother host to make debugging and maintenance more efficient.

NT31/NT31C



Can be set to RS-232C using a memory switch.

Flat, Thin Body

All models are only 54 mm thick with an essentially flat surface. This makes the PTs fit so much more easily into control panels or machines and contributes to down-sizing.

IP65F Environment Resistance

Flush surface construction is used for superior environmental resistance to achieve an enclosure rating for the front of the PT of IP65F.

IP → International Protection

6 → Dust and dirt will not enter interior.
(Enclosure protects against foreign objects.)

5 → There are no adverse effects from a water stream from any direction. (Enclosure protects against water intrusion.)

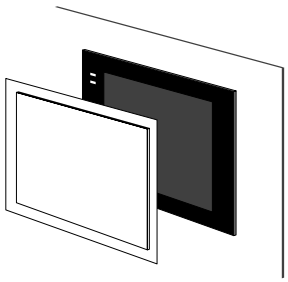
F → There are no harmful effects from oil droplets or spray from any direction. (Enclosure protects against oil intrusion.)

International Standards

EC Directives, UL, and CSA listings/approvals have all been acquired for each shipping anywhere in the world.

NEMA4 (equivalent)

Protective Cover



Model numbers	NT631C-KBA05 (5 Covers)
	NT31C-KBA05 (5 Covers)
Material	Polyethylene film
Mounting method	Double-sided tape

Note: This Protective Cover is designed to protect the screen from the adhesion of oil, dust, finger marks, etc.

Specifications

NT631C/NT631

General Specifications

Item	Specifications	
	NT631C-ST151(B)-EV2	NT631-ST211(B)-EV2
Rated power supply voltage	24 V DC	
Allowable power supply voltage range	20.4 V DC to 26.4 V DC (24 V DC -15% to +10%)	
Power consumption	18 W max.	30 W max.
Operating ambient temperature	0 to 50°C	
Storage ambient temperature	–20 to 60°C35% to 85% (with no condensation)	
Operating ambient humidity		
Operating environment	No corrosive gases	
Noise immunity	Conforms to IEC61000-4-4, 2 kV (power line)	
Vibration resistance (operating)	Conforms to IEC 60068-2-6, JIS C0040. 10 to 57 Hz with 0.075-mm amplitude, 57 to 150 Hz with 1G {9.8 m/s^2} acceleration for 30 minutes in each of X, Y, Z directions	Conforms to IEC 60068-2-6, JIS C0040. 10 to 54.8 Hz with 0.075-mm amplitude for 30 minutes in each of X, Y, Z directions
Shock resistance (operating)	Conforms to IEC 60068-2-27, JIS C0041. 147 m/s^2 {15G} 3 times in each of X, Y, and Z directions	
Weight	2.5 kg max.	
Enclosure ratings	Front panel: Equivalent to IP65F (NEMA4)*	

Note: The NT631/NT631C may not be used at a location where it is exposed to splashing oil for a long period.

Performance Specifications

Display Specifications

Item		Specifications	
		NT631C-ST151(B)-EV2	NT631-ST211(B)-EV2
Display panel	Display device	Color TFT LCD	High-contrast EL
	Number of dots (resolution)	640 dots horizontal × 480 dots vertical	
	Effective display area	211 mm horizontally × 158 mm vertically (10.4")	
	View angle	Up: ±55° Down: 55° Left: 55° Right: 55°	(No restriction)
	Display colors	8 colors (and intermediate colors can be displayed with tiling patterns)	Black, white (2 colors)
	Life expectancy	50,000 hours minimum (until brightness reduced by half)	30,000 hours minimum (until brightness reduced by 30%)
	Automatic turn-off	Can be set to turn off in 1 to 255 minutes, or to remain on	
	Contrast adjustment	(Not provided)	(Not provided)
Backlight (with cold cathode tube)	Life expectancy (at high brightness)	30,000 hours minimum*1	---
	Replacement	Can be replaced from the rear	---
	Brightness adjustment	(Not provided)	---
Indicators	POWER (green LED)	Lit while power is being supplied	
	RUN	Lit green: Running normally, Memory unit automatic transmission done Lit orange: Low battery voltage (during operation) Lit red: Low battery voltage (when NT631/NT631C is stopped)	

Note: 1. Time taken for brightness to reduce to half at normal temperature and humidity

Touch Panel Specifications

Number of switches	768 (32 horizontally × 24 vertically)
Input method	Pressure-sensitive type
Operating force	1 N minimum
Life expectancy	One million operations minimum

External Interface Specifications

Item		Specification
Serial communications	Serial port A	Conforms to EIA RS-232C D-Sub 9-pin connector (female) +5 V (250 mA max.) output at pin No. 6
	Serial port B connector	Switchable between EIA RS-232C and RS-422A/485 (by memory switch setting) RS-232C: D-Sub 9-pin connector (female) RS-422A/485: Terminal block (6 terminals)
Parallel interface		Conforms to Centronics standard, 20-pin half pitch connector
Expansion interface		Dedicated connector

Display Specifications (Same for NT631C/631/31C/31)

Item		Specification
Display elements	Character displays	65,535 per screen (including marks)
	Fixed displays	
	Character string displays	256 per screen (40 bytes (40 characters) per string)
	Numeral displays	256 per screen, max. 10-digit display
	Bar graph displays	50 per screen with percentage and sign displays
	Analogue meters	50 per screen, with percentage and sign displays
	Trend graphs	1 frame per screen, 50 graphs per screen data file (8 graphs per screen data file with data logging)
	Broken line graphs	1 frame per screen, 256 graphs per frame, 512 points per graph
	Lamps	256 per screen
	Image library data	256 per screen
	Touch switches	256 per screen, 256 mesh overlapping
	Numeric key inputs	256 per screen
	Thumbwheel inputs	
	Character string inputs	256 per screen
	Alarm lists	4 groups per screen
	Alarm histories	
Screen types	Normal screen	The normal screen display
	Overlapping screens	A maximum of 8 registered screens can be displayed overlapped with each other.
	Window screens	Up to 3 screens (2 local windows and 1 global window) can be displayed at the same time.
	Display history screens	Order of occurrence (max. 1024 screens), order of frequency (max. 255 times)
Screen attributes		Buzzer, display history, background color, backlight, keyboard screen number
Number of screens	Max. number of registered screens	3,999 screens
	Screen No.	0:No display 1 to 3999:User registered screens 9000:Initializing system screen 9001:Display history (occurrence) screen 9002:Display history (frequency) screen 9020:Programming Console function screen 9021:Registration monitor screen 9022:Continuous monitor screen 9023:Error Log screen 9030:Brightness/contrast adjustment screen 9999:Return to the previous screen
Screen registration method		By transmitting screen data created using the Support Software to the PT
		By transmitting screen data stored in a Memory Unit to the PT (automatic/manual)
Screen saving method (screen data memory)		Flash memory (screen data memory in the PT)

Display Element Specifications

Item	Specification
Display characters	• Half-size characters (8×8 dots): Alphanumerics and symbols • Standard characters (8×16, 16×32 dots): Alphanumerics and symbols • Marks (16×16 dots): User-defined pictographs
Enlargement function	Equal, wide, high, 2×2, 3×3, 4×4, 8×8
Smoothing process	Characters of 2×2 or larger (except marks)
Character display attributes	Standard, flash, inverse flash, transparent
Image data	Variable-size pictographs Size:8×8 dots min., 640×480 dots max. The size can be set as required in 8-dot units. Enlarged display, smoothing processing, and display attributes such as inverse and flash cannot be set.
Library data	Combinations of any graphics Size: 1×1 dots min., 640×480 dots max. Any size can be set within this range. Enlarged display, smoothing processing, and display attributes such as inverse and flash are implemented according to the setting registered.
Graphics	Polyline, circle, arc, sector, rectangle, polygon
Line type	4 types only for polylines (solid line, broken line, alternate long and short dash, long and two short dashes)
Tiling	10 types
Graphic display attributes	Standard, inverse, flash, inverse flash
Display colors	NT31, NT631:Two colors (black, white) NT31C, NT631C: Eight colors (black, blue, red, magenta, green, cyan, yellow, white)

Data Capacities

Data	Capacity
Screen data	1 MB
Numeral memory tables	2 words x 2,000 entries (1,000 entries backed up)
String memory tables	40 characters x 2,000 entries (500 read/write)
Bit memory tables	1 x 1,000 entries
Mark data	224 marks (calculated for 16 x 16-bit marks)
Image data	4,095
Library data	12,288

NT31C/NT31

General Specifications

Item	Specification
Rated power supply voltage	24 V DC
Allowable power supply voltage range	20.4 V DC to 26.4 V DC (24 V DC –15% to +10%)
Power consumption	15 W max.
Operating ambient temperature	0 to 50°C
Storage ambient temperature	–20 to 60°C
Operating ambient humidity	35% to 85% (with no condensation)
Operating environment	No corrosive gases
Noise immunity	Conforms to IEC61000-4-4, 2 kV (power line)
Vibration resistance (operating)	Conforms to IEC 60068-2-6, JIS C0040. 10 to 57 Hz with 0.075-mm amplitude, 57 to 150 Hz with 1G {9.8 m/s^2} acceleration for 60 minutes in each of X, Y, Z directions
Shock resistance (operating)	Conforms to IEC 60068-2-27, JIS C0041. 147 m/s^2 {15G} 3 times in each of X, Y, and Z directions
Weight	1 kg max.
Enclosure ratings	Front panel: Equivalent to IP65F (NEMA4)*

Performance Specifications

Display Specifications

Item		Specifications	
		NT31-ST121(B)-EV2	NT31C-ST141
	Display device	Monochrome STN LCD	Colour STN LCD
	Number of dots (resolution)	320 dots horizontal × 240 dots vertical	
	Effective display area	118.2 mm horizontally × 89.4 mm vertically (5.7 inches)	
	View angle	Up:20° Down:30° Left/right:±30°	
	Display colors	Black, white (2 colors)	8 colors
	Life expectancy	50,000 hours minimum (until brightness reduced by half)	
	Automatic turn-off	Can be set to turn off in 1 to 255 minutes, or to remain on	
	Contrast adjustment	Adjustable in 100 levels by operation at touch panel	
Backlight (white cold cathode tube)	Life expectancy (at high brightness)	25,000 hours minimum (at room temperature, until brightness is reduced to 50%)	
	Replacement	Can be replaced from the rear	
	Brightness adjustment	Adjustable in 3 levels by at touch panel	
Indicators	POWER (green LED)	Lit while power is being supplied	
	RUN	Lit green: Running normally, Memory unit automatic transmission done Lit orange: Low battery voltage (during operation) Lit red: Low battery voltage (when stopped)	

Touch Panel Specifications

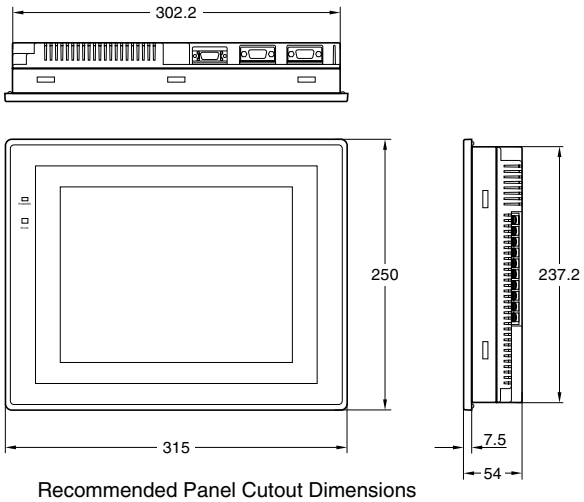
Number of switches	192 (16 horizontally × 12 vertically)
Input method	Pressure-sensitive type
Operating force	1 N minimum
Life expectancy	One million operations minimum

External Interface Specifications

Item		Specification
Serial communications	Serial port A	Conforms to EIA RS-232C D-Sub 9-pin connector (female) +5 V (250 mA max.) output at pin No. 6
	Serial port B	EIA RS-232C or RS-422A/485 (selectable by memory switch setting) D-Sub 25-pin connector (female)
Parallel interface		Conforms to Centronics standard, 20-pin half pitch connector
Expansion interface		Dedicated connector

Dimensions

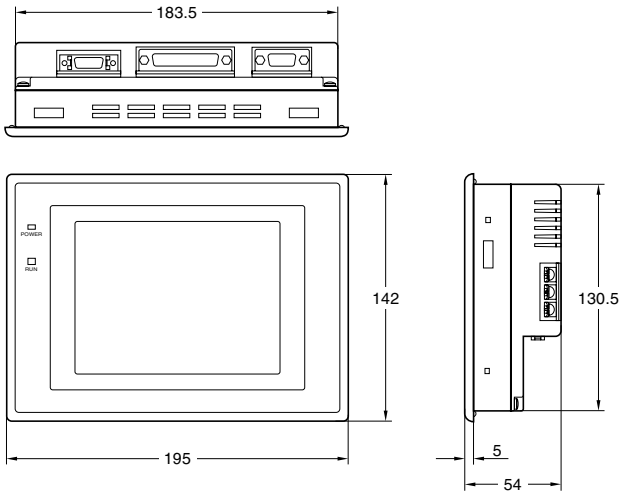
NT631C/NT631



Recommended Panel Cutout Dimensions

$238.0^{+0.5}_{0}$ x $303.0^{+0.5}_{0}$ mm (vertical x horizontal)

NT31C/NT31



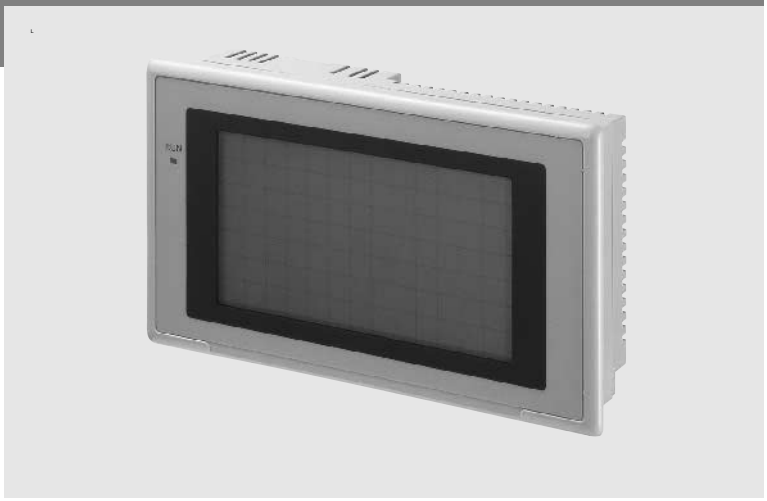
Recommended Panel Cutout Dimensions

$131.0^{+0.5}_{0}$ x $184.0^{+0.5}_{0}$ mm (vertical x horizontal)

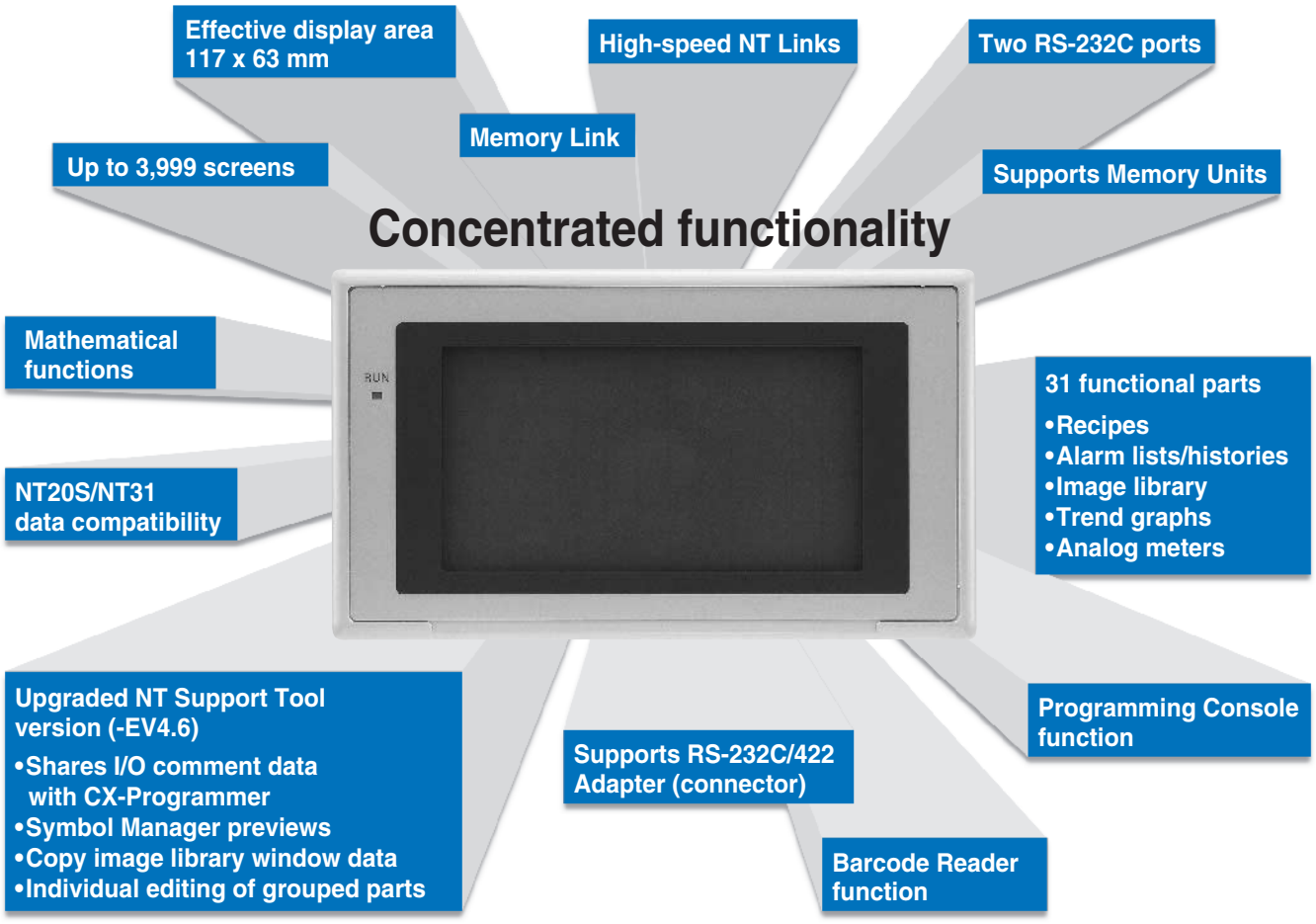
NT21S

Small touch-screen HMI

Cost effective touch screen terminals to replace function key units and increase the flexibility and operation.



Features



Connectable PLCs for Direct Access

Communications method	C200H	C200HS	C200HX/HG/HE(-Z)	C1000H/C2000H	CS1/CJ1	CV/CVM1 V1	CQM1H	CPM1(A)	SRM1	Computer/SBC
Host link (RS-232C)	CU	CU/CPU (Note 1)	CU/CPU (Note 4)	CU	CU/CPU	CU/CPU	CPU (Note 2)	CPU (Note 5)	CPU	---
1:1 NT Link	---	CPU (Note 1)	CPU (Note 4)	---	---	CPU	CPU (Note 3)	CPU (Note 5)	CPU	---
Memory Link (NTH protocol)	---	---	---	---	---	---	---	---	---	CPU

CPU: Connected to built-in CPU Unit port, CU: Connected to Communications Unit.

Note: 1. The built-in port can be used on the following CPU Unit: C200HS-CPU2□/3□.
2. The built-in port can be used on the following CPU Unit: CQM1H-CPU21/4□.
3. The built-in port can be used on the following CPU Unit: CQM1H-CPU4□.
4. Connection is also possible to a Communications Board. Refer to the communications methods for individual models for details.
5. A CPM1-CIF01 RS-232C Adapter must be purchased separately

Specifications

General Specifications

Item	Specification
Power supply voltage	24 V DC
Power consumption	7 W max
Noise resistance	Conforms to IEC61000-4-4, Power supply line 2 kV
Vibration resistance	10 to 57 Hz with 0.075 mm single amplitude, 57 to 150 Hz with 9.8 m/s^2 acceleration, for a total of 60 min. in X, Y, and Z directions.
Shock resistance	Peak acceleration 15 G 3 times each in X, Y, and Z directions
Ambient operating temperature	0 to 50°C (with no icing)
Storage temperature	–20 to 70°C (with no icing)
Ambient operating humidity	35% to 85% (with no condensation)(0 to 40°C) 35% to 55% (with no condensation)(40 to 50°C)
Dimensions	190 x 110 x 53.5 mm (W x H x D) (thickness inside panel: 49.0 mm)
Enclosure ratings	Front panel operating section: Equivalent to IP65F, NEMA 4.*
Weight	0.6 kg max.

* Usage may not be possible in places where the unit would be exposed to oil for long periods.

Display Capacity

Item			Specification	
Display elements	Fixed displays		A total of 65,535 per screen (Graphics: Continuous straight lines, rectangles, circles, polygons, arcs, sectors)	With overlapping screens, the total is 524,280 per screen
		Fixed character strings		
		Graphics		
		Marks		
	Numeral displays		256 positions per screen, max. 10-digit disply (2 words)	
	Character string displays		256 positions per screen max. 1,024 display elements for overlapping screens	
	Graph displays		50 positions per screen, capable of displaying signs and percentages	
	Analog meters		50 positions per screen, capable of displaying signs and percentages	
	Trend graphs		One frame per screen, 50 items per frame (8 items max. for data logging)	
	Broken line graphs		One frame per screen, 256 items per frame, 260 points per item	
	Lamps		256 positions per screen	
	Image library images		256 positions per screen	
	Touch switches		256 positions per screen, max. 256 meshes	
	Numeral settings		256 positions per screen (numerical keypad)	Total of 256 positions for both numerical and thumbwheel settings
	Thumbwheel settings		26 positions per screen	
	Character string settings		256 positions per screen	
	Temporary inputs		One position per screen	
	Alarm lists/histories		Four groups per screen	
Screen types	Recipes		One position per screen	
	Normal screens		Display screens registered as normal	
	Overlapping screens		A maximum of eight screens can be displayed overlapping each other	
	Windows		Up to three window screens can be displayed	
	Display history screens		Order of occurence (1,024 screens max.), order of frequency (255 times max.)	
	System startup screen		Displayed when powering ON (or resetting) the PT, and when switching to RUN mode	
	Programming console screen		Emulates PLC programming Console functions, capable of being called from RUN mode.	
Screen attributes			Buzzer, display history, normal background colors, backlight mode, local windows	
Number of screens	Max. number of registered screens		3,999	
	Screen number		0: No display 1 to 3999: User registered screens (normal, overlapping, windows) 9000: System startup screen 9001: Display history screens, order of occurence 9002: Display history screens, order of frequency 9020: Programming console screen 9021 to 9023, 9030: Reserved 9999: Return to previous screen designation	
Screen registration method			By transferring screen data from the NT Support Tool to the PT via serial communications	
			By mounting the Memory Unit and downloading (automatic/manual transfer) data to the PT	
Saving screen data			Flash memory (PT internal image memory)	

Display Specifications

Item		Specification
Display Panel	Display device	Monochrome STN LCD
	Number of dots (resolution)	260 dots horizontally x 140 dots vertically
	Effective display area	117 mm horizontally x 63 mm vertically
	Viewing angle	Left/right direction: 30°, up/down: 30°
	Display color	Black & white (with blue mode)
	Service life	50,000 hours min. (until contrast reduced to 50%)
	Automatic turn-OFF	Can be set to turn OFF in 1 to 255 min or to remain ON with screen saver
Backlight (white cold cathode tube)	Service life	50,000 hours min. (at room temperature, until brightness is reduced to 50%)
	Replacement	Non-replaceable

Panel Specifications

Item		Specification
Touch panel	Number of switches	91 (13 horizontally x 7 vertically)
	Input	Pressure-sensitive
	Threshold force for operation	1 N max.
	Life expectancy	1 million operations min.

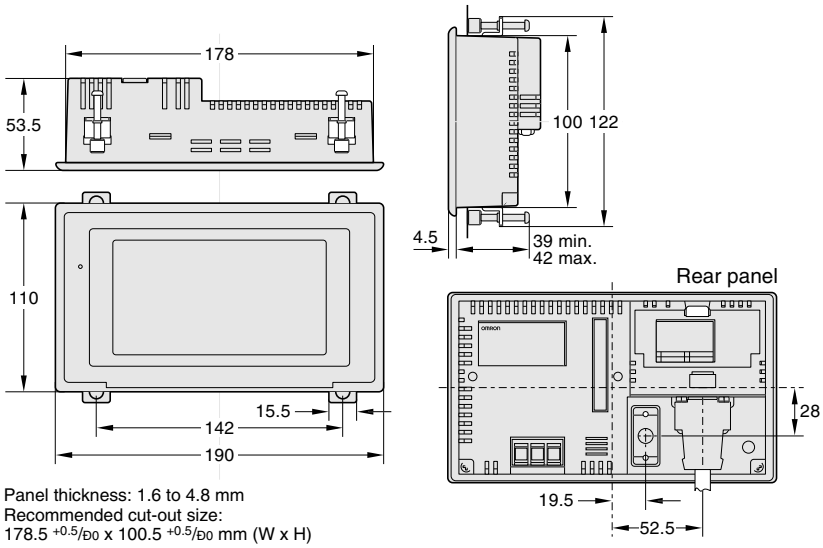
External Interface Specifications

Communication method			Serial port A	Serial port B
NT support Tool			Supported	Not Supported
PLC	Host Link		Supported	Supported
	1:1 NT Link		Supported	Supported
	1:N NT Links		Supported	Supported
	NT Link, PT Programming Console function		Supported	Supported
SBC/personal computer		Memory Links	Supported	Supported
Barcode Reader			Supported	Not Supported

NT21 Standard Models

Product	Specification			Model number
NT21 Programmable Terminal	Monochrome STN	Frame color: beige		NT21-ST121E
		Frame color: black		NT21-ST121B-E
Support Tool	Windows 95, 98, ME, NT, or 2000		CD-ROM	NT-ZJCAT1-EV4
Cables	For screen transfer			XW2Z-S002
	For PLC connection	PT: 9-pin PLC: 9-pin	Cable length: 2 m	XW2Z-S200T
			Cable length: 5 m	XW2Z-S500T
		PT: 9-pin PLC: 25-pin	Cable length: 2 m	XW2Z-S200S
			Cable length: 5 m	XW2Z-S500S
		PT: 9-pin PLC: Mini-peripheral	Cable length: 2 m	XW2Z-S200T-2
			Cable length: 5 m	XW2Z-S500T-2
Options	Reflection Protective Sheets	Display area only (5 sheets)		NT20M-KBA04
	Chemical-resistive Cover	Silicon cover		NT20S-KBA01
	Battery	For alarm lists/histories		C500-BAT08
	Memory Unit	For screen and system data transfer		NT-MF161
	RS-232C/422A Adapter			NS-AL002
	Connector Kit			XM2S-0911-S003

Dimensions



Panel thickness: 1.6 to 4.8 mm
Recommended cut-out size:
178.5 $^{+0.5}/_{0}$ x 100.5 $^{+0.5}/_{0}$ mm (W x H)

NT11S

Function-key HMI terminal

The NT11S, the Slim, Low Cost Operation Terminal that Stands Up Well to Harsh Environments.

- Long-lived Backight
- Simplified Ladder Programming
- Password Screens
- Conforms to NEMA4 and IP65

Main features

Withstands Water and Oil

- Use in many demanding ares even with oil and water

The front panel of the terminal withstands water to NEMA4 and IP65 standards, which means that it can be used even in locations where it may be splashed with water or oil.

Large Keys

- For easy operation by all users

The numeric keys and function keys have been made a generous size for your convenience. They can be operated even when wearing working gloves.

Entry of Numerical Values

The numeric key pad integrated with the display allows the entry of numerical values such as temperatures and production quantities.

Printout of Production Status

Data such as the production status and production results can be printed out, leaving a record on paper which can be used as a daily report.

(The NT11S has a printer port. One screen only is printed.)

"Direct Connection" Communication

- Simplifies Ladder Programming

The NT11S supports two communication methods: the NT link method, which substantially reduces the size of the program at the host side, and the host link direct connection method.

The "NT link" method features a particularly high response speed.

- NT link method

SYSMAC
C200HS–CPU3□/2□
CQM1–CPU4□

- Host link direct connection method

SYSMAC
C200HS–CPU3□/2□
C200H–LK201/–V1
CQM1 (Excludes –CPU11)

Integral Numeric Key Pad

The display, numeric keys, and function keys are all integrated into the front panel, which is convenient for designers. The key layout is ergonomically designed for ease of use.

Password Screens for Security

- To limit access to authorized persons only

Password screens cannot be accessed unless the correct password is entered. This means that the operations that can be performed can be restricted according to the operator.

Key Titles can be Marked on the Function Key Sheet

Key titles can be marked on the function key sheet in accordance with the applications of the keys: the sheet can be taken out from the side face of the terminal. The front panel of the terminal has a water–withstanding construction.

Bar Graphs can be Displayed

Bar graph displays allow the progress of processes to be checked at a glance. (The bars are oriented horizontally.)

Display History Record Helps in Analysis of Machine Faults

When the display history record function is set as a screen attribute, the time, the screen number, and a comment are recorded in the terminal's memory every time the relevant screen is displayed. This display history can be printed by issuing a print instruction from the host, and is useful for machine fault analysis.

Screen Operations are Easy

Using the support software, screens to be displayed by the terminal can be created as easily as if using a word proces-sing program. This software can be run on an IBM PC/AT or compatible. It contains the system program transfer tool that downloads the system program to the flash ROM.

Main functions

- Fixed displays, numeral display, character display
- Character inversion, flashing, double–width. Character copy, move, delete.
- 8 x 16 dot mark registration (max. 64 marks can be registered)
- Horizontal bar graphs
- Numeral setting
- Password

Easy to Order

Since the communication interface, image memory, and flash ROM that downloads the system program are incorporated in the NT11S body, placing orders is a simple matter.

The front panel is available in beige or black

Long–lived Backlight

Since LEDs are used for the backlight, it is very long–lived and rarely needs to be changed.

Specifications

General Specifications

Power supply voltage	24 V DC
Allowable power supply voltage range	20.4 to 26.4 V DC (24 V DC –15 %, +10 %)
Power consumption	15 W max.
Noise resistance	Common mode (between power supply and panel): 1000 Vp–p Normal mode: 300 Vp–p Pulse width: 100 ns to 1 ms Pulse rise time: 1 ns
Vibration resistance	10 to 22 Hz with 1.5 mm double amplitude in X, Y, and Z directions. 22 to 500 Hz with 1.5 G {14.7 m/s 2 } acceleration for a total of 30min. in X, Y, and Z directions.
Shock resistance	20 G {196 m/s 2 } 3 times each in X, Y, and Z directions.
Ambient operating temperature	0 to +50 _C
Ambient operating humidity	35 to 85 % RH (with no condensation)
Operating environment	No corrosive gases.
Storage temperature	–20 to +70 _C (with no freezing)
Enclosure ratings	Front panel: Equivalent to IP65, NEMA4
Weight	1.0 kg max.

Display/Panel Specifications

Note: In order to improve the performance of displays, liquid crystal devices may be changed without notice.

Display screen	Dot matrix of STN liquid crystal display panel - Number of dots: 160x64 - Effective display area: 100 40 mm - Life expectancy: 50,000 hours minimum - View angle (left/right direction): ±20°	Backlight - LED - Life expectancy: 10,000 hours minimum (average: 30,000 hours) - Automatic turn–off: can be set to turn off in 10 minutes or 1 hour, or to remain on.
Indicators	- POWER indicator (Green LED): Lit while power is being supplied. - RUN indicator (Green LED): Lit during operation	
Switch	- 22 switches - Life expectancy: 1 million operations minimum	

Display Capacity

Note: Note: In order to improve the performance of displays, liquid crystal devices may be changed without notice.

Display characters		Normal characters (8 16 dots): Alphanumerics and symbols Marks (8 16 dots): User–defined, 64 max.
Number of characters		displayed Normal–size: 20 horizontally 4 lines vertically max.
Enlargement function		Double width
Display elements	Character string displays	8 positions per screen
	Numeral displays	8 positions per screen
	Graph displays	4 positions per screen
	Numeral settings	8 positions per screen
Screen attributes	Display history	Order of frequency, 256 screens
	Password screen	Ensures security: screens for which this attribute is set can only be displayed if the correct password is input.
	Menu screen	Four items per screen
Screen types		Normal screen: Displays screen registered as normal.
Max. number of registered screens		250
Screen registration method		Transfer screen data created using an IBM PC/AT personal computer to the PT.
Screen saving method		Saved to flash memory: 32KB (downloading method)

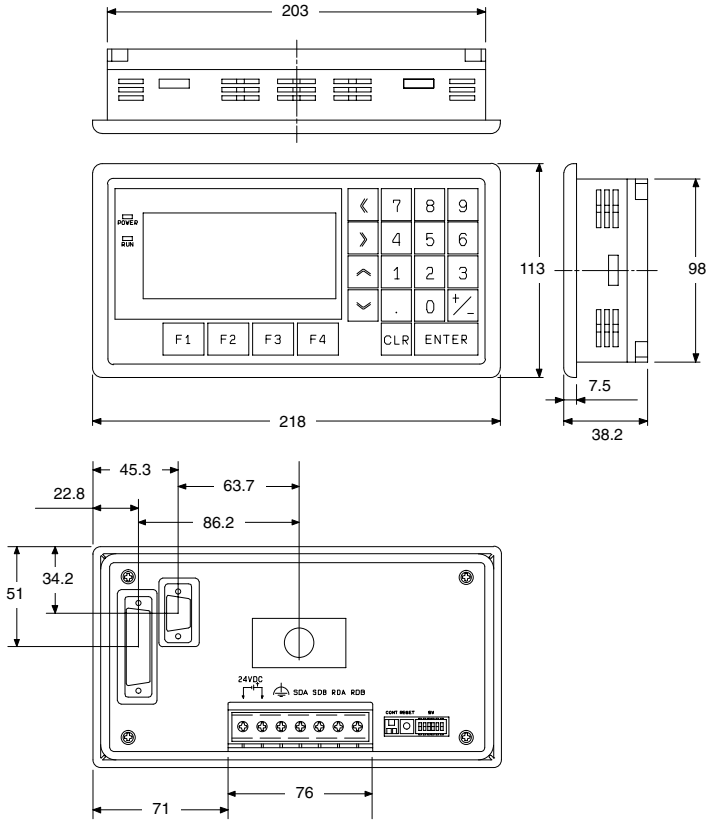
Special Features

Printing function	Printing of display history data Printing of daily reports (printing format registered by the users)
Maintenance functions	Self–test for memory, switches, etc. Status setting confirmation for communications and other conditions. Simple communications confirmation

Ordering Information

Product		Specification	Model
Programmable Terminal	Host link direct connection, NT link method	Ten–key type (frame color: beige)	NT11S–SF121
		Ten–key type (frame color: black)	NT11S–SF121B
Support Software		3.5” FD (for IBM PC/AT)	NT11S–ZA3AT–EV1

Dimensions

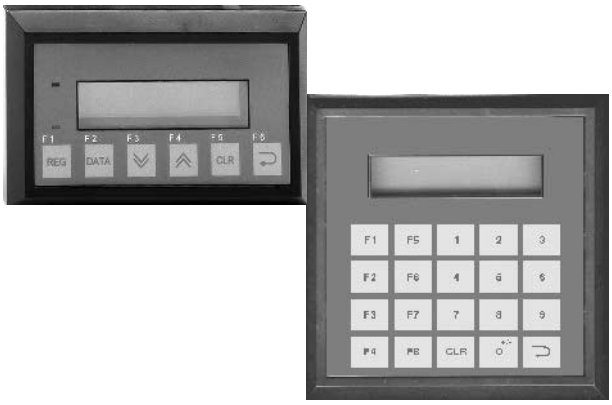

203
113
98
7.5
38.2
218
POWER
RUN
F1
F2
F3
F4
CLR
ENTER
45.3
22.8
63.7
86.2
51
34.2
24VDC
SDA SDB RDA RDB
71
76

NT2S

Small Function Key Terminals

The NT2S series Terminals are designed as a human machine interface for simple control tasks. Their small dimensions and low installation depths ensure that they will fit into any machine.
Of the six NT2S types, four can be connected directly to the peripheral port and two can be connected to OMRON PLCs via an RS-232C port.

- Easy programming
- Small size and installation depth
- IP65 protection
- Real-time clock
- Printer connection
- Excellent value for money



Performance Data (Max. Values)

	NT2S-SF121B-EV2	NT2S-SF125B-E	NT2S-SF122B-EV2	NT2S-SF126B-E	NT2S-SF123B-EV2	NT2S-SF127B-E
Programmable	Yes	Yes	Yes	Yes	No (PLC controlled)	No (PLC controlled)
Terminal size (W,H,D)	109x60x36 mm	107x107x36	109x60x36 mm	107x107x36	109x60x36 mm	107x107x36
Display size	56x11 mm	56x11 mm	56x11 mm	56x11 mm	56x11 mm	56x11 mm
Number of screen pixels	5x7 pixel/character	5x7 pixel/character	5x7 pixel/character	5x7 pixel/character	5x7 pixel/character	5x7 pixel/character
Number of lines/characters	2/16	2/16	2/16	2/16	2/16	2/16
Number of function/control keys	6	20	6	20	6	20
Memory	24 kB for applications	24 kB for applications	24 kB for applications	24 kB for applications	PLC memory is used	PLC memory is used
Max. screen pages	250	250	250	250	Depending on PLC memory	Depending on PLC memory
Number input	Yes	Yes	Yes	Yes	Yes	Yes
Bar graph	Yes	Yes	Yes	Yes	Yes	Yes
Trend/line diagram	-	-	-	-	-	-
Alarm handling	-	-	-	-	-	-
Real-time clock/date	Yes	Yes	-	-	-	-
Printer interface	Yes	Yes	Yes	Yes	-	-

Communication

Host Link	Yes (RS-232C)	Yes (RS-232C)	Yes (peripheral port)	Yes (peripheral port)	Yes (peripheral port)	Yes (peripheral port)
1:1 NT Link	-	-	-	-	-	-
1:n NT Link	-	-	-	-	-	-
ASCII protocol	-	-	-	-	-	-

System Configuration

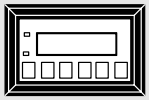
Host Link

Data is exchanged quickly between the Control Terminal and an OMRON PLC using the Host Link protocol.

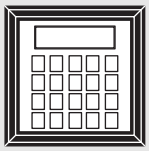
The RS-232C communication method can be used.

The following OMRON PLC systems feature the Host Link protocol:

- CPM1 family
- CPM2 family
- CQM1 family
- CJ1
- CS1



NT2S-SF121B



NT2S-SF125B

Miniature Peripheral port

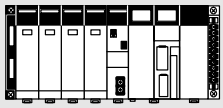
NT2S-CN223-V1
for CS1,CJ1, CQM1H

RS232C port

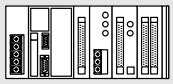
RS-232C cable
for CPM1A, CPM2C
(CIF adapter required)

Peripheral port

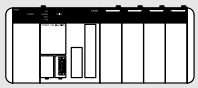
NT2S-CN212/215
for CPM1A, CPM2A



CS1

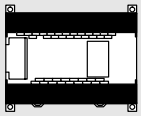


CJ1

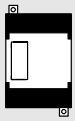


CQM1H

CPM2C

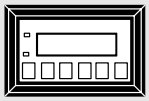


CPM2A

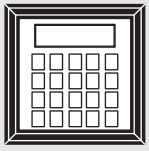


CPM1A

Power supply: 24 VDC, external



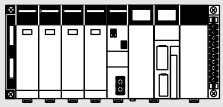
NT2S-SF122B
NT2S-SF123B



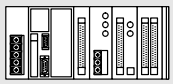
NT2S-SF126B
NT2S-SF127B

Miniature peripheral port

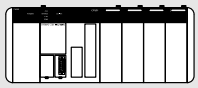
NT2S-CN224-V1



CS1



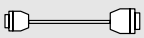
CJ1



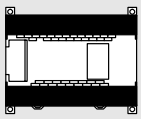
CQM1H

CPM2C

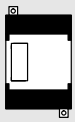
Peripheral port



NT2S-CN222-V1
NT2S-CN225-V1



CPM2A



CPM1A

Power supply: from the PLC, via port connection

Product Overview

Model code	NT2S-SF121B-EV2	NT2S-SF125B-E	NT2S-SF122B-EV2	NT2S-SF126B-E	NT2S-SF123B-EV2	NT2S-SF127B-E
	- Programmable using software - Real-time clock - Printer port - PLC connection via RS-232C port - Supply voltage 24 V		- Programmable using software - Printer port - PLC connection via peripheral port - Supply voltage connection via peripheral port		- Functions are controlled using the PLC - PLC connection via peripheral port - Supply voltage connection via peripheral port	
Display size (WxHxD)	108x60x43 mm	108x108x43 mm	108x60x43 mm	108x108x43 mm	108x60x43 mm	108x108x43 mm
Number of screen pixels	5x7 pixel/character					
Number of lines/characters	2/16	2/16	2/16	2/16	2/16	2/16
Number of function/control keys	6	20	6	20	6	20
Memory	24 kB Flash memory for applications				PLC memory is used	
Supply voltage	24 V DC	24 V DC	---			
Degree of protection	IP65F (front side)					

Specifications

Model code	NT2S-SF121B-EV2	NT2S-SF125B-E	NT2S-SF122B-EV2	NT2S-SF126B-E	NT2S-SF123B-EV2	NT2S-SF127B-E
Function keys						
Key type	Membrane keyboard					
Key function	As well as fixed or system functions, functions can be assigned dynamically using software (Softkeys), while global, i.e. screen-independent, keys can also be defined					
Display elements						
Characters	5x7 pixel/character					
Image colours	Monochrome					
Character display attributes	Normal, flashing (entire screen)					
Display specification						
Display	- LED backlit LCD Module, 2x16 characters, 5x7 pixel/character - Character size 4.35 mm - Extended ASCII character set (semi-graphic)					
Function displays	2 status LEDs[1], programmable via PLC					
Display capacity						
String display	Entire display area can be used					
Numeric display	Entire display area can be used					
Bar graph display	Entire display area can be used					
Character string input	-					
Alarm list	-					
Time display	Either by output from Controller real-time clock or output from Terminal's integrated real-time clock		From Controller			
Screen page						
Number of stored screen pages	Max. 250				-	
Screen page numbers	1..250				-	
Storing of screen pages	Transfer of data from a PC to the Terminal				All programming in the PLC	
General						
Battery backup	Data backup in EEPROM				-	
Supply voltage	10..30 V DC		via PLC			
Power consumption	approx. 1.5 W		-			
Immunity	Between power supply and panel: 1700 Vss Normal: 480 Vss Pilse width 100 ns..1 µs Pulse rise time 1 ns					
Vibration resistance (in operation)	10..61.2 Hz with 0.1 mm amplitude 61.2..150 Hz with an acceleration of 1.5 g in X, Y and Z directions 4 times for 8 minutes each					
Shock resistance (in operation)	147 m/s², 3x in X, Y and Z directions					
Ambient temperature	0 °C..50 °C					
Ambient humidity	35%..85%					
Operating environment	No corrosive gases					
Storage temperature	-20 °C..60 °C					
Degree of protection	Front side: IP65F, Rear side: IP20					
Approvals	CE, c-UL					
Weight	150 g	230 g	135 g	205 g	130 g	200 g
Host Link Direct communication						
Communication method	RS-232C or Peripheral port		Peripheral port			
Communication protocol	C series SYSWAY (1:1)					
Communication settings	Start/stop synchronisation Communication speed: 9600 bps Data length: 7 bits Stop bit: 2 bits Parity: even					
Connection	1 x 9-pin D-Sub female for PLC 1 x 9-pin D-Sub female for PC/Printer, SW download/printer		1 x 9-pin D-Sub male for PLC 1 x 9-pin D-Sub female for PC/Printer		1x9-pin D-sub male for PLC	
Number of devices	1					
Printer						
Communication method	ASCII protocol printer				No	
Connection	Serial RS-232C port				No	

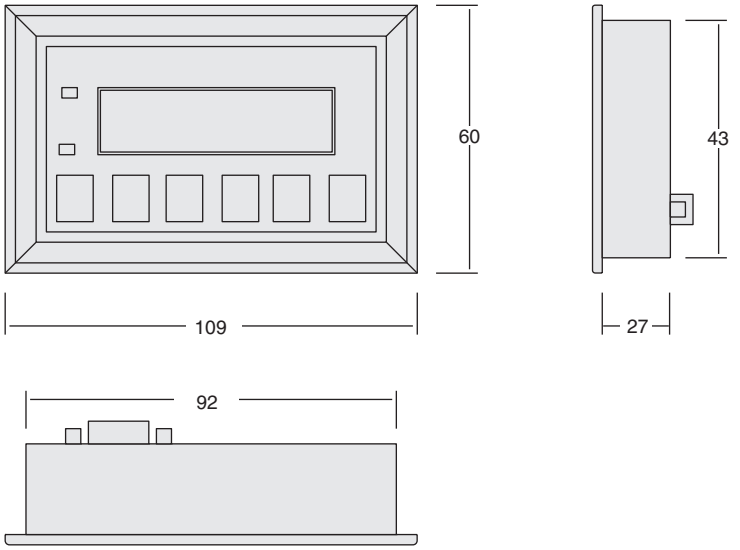
1. The NT2S-SF125/126/127B-E do not have status LEDs

Programming and Accessories

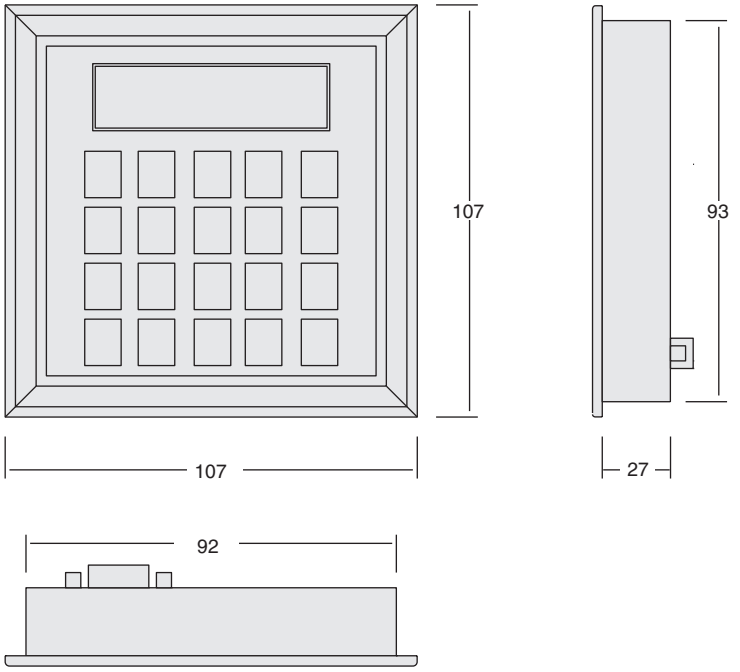
	Description	Cable length	Model code
Programming	NT Shell. Programming software for Control Terminals. For WINDOWS 95/98/ME/2000/NT4.0-SP5 see page 454	-	**NT Shell**
Accessories, cables etc.	Connecting cable, NT2S SF121B / SF125B <-> PLC (peripheral port)	2 m	**NT2S-CN212**
		5 m	**NT2S-CN215**
	Connecting cable, NT2S SF122B / SF123B / SF126B / SF127B <-> PLC (peripheral port)	2 m	**NT2S-CN222-V1**
		5 m	**NT2S-CN225-V1**
	Connecting cable, NT2S-SF121B / SF125B <-> PLC (miniature peripheral port)	2 m	**NT2S-CN223-V1**
	Connecting cable, NT2S-SF122 / SF123B / SF126B / SF127B <-> PLC (miniature peripheral port)	2 m	**NT2S-CN224-V1**
	Adapter cable, miniature peripheral port <-> PLC (peripheral port)	2 m	**CS1W-CN114**

Dimensions (mm)

NT2S-SF121B-EV2
NT2S-SF122B-EV2
NT2S-SF123B-EV2



NT2S-SF125B-E
NT2S-SF126B-E
NT2S-SF127B-E



NT-AL001

RS-232C/RS-422A Adapter

The NT-AL001 converts signals between RS-232C and RS-422A.
Use the NT-AL001 to connect 1:N NT Link communications, to connect to multivendor communications, or anytime signal conversion is required.

Specifications

General Specifications

Item	Specification
Model number	NT-AL001
Ambient operating temperature	0 to 55°C
Ambient operating humidity	10% to 90% (with no condensation)
Rated power supply voltage	+5 V ±10% (supplied from pin 6 of RS-232C connector)
Rated power supply current	150 mA max.
Surge current	0.8 mA max.
Insulation resistance	20 MΩ min. (at 500 V DC) between RS-422A signal lines and functional ground terminal
Dielectric strength	1,500 V AC between RS-422A signal lines and functional ground terminal for 1 min, leakage current: 10 mA max.
Operating environment	No corrosive gases
Ambient storage temperature	−20 to 75°C
Vibration resistance	Conforms to JISC 0911, 80 min each in X, Y, and Z directions
Shock resistance	Conforms to JISC 0912, 15G for 3 times each in X, Y, and Z directions
Weight	200 g

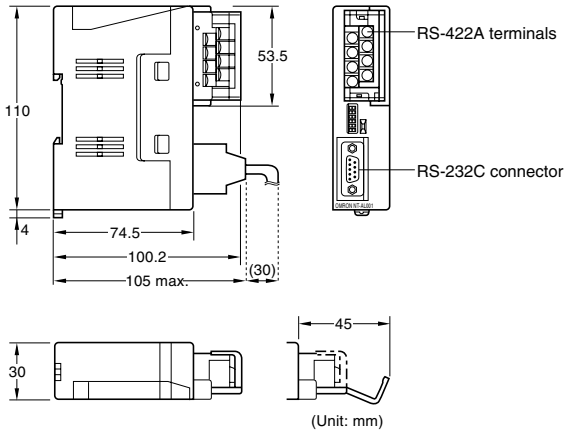
RS-232C Interface

Item	Specification
Baud rate	64 kbps max.
Transmission distance	2 m max.
Connector	D-Sub, 9-pin connector (female)

RS-422A Interface

Item	Specification
Baud rate	64 kbps max. (depends on RS-232C baud rate)
Transmission distance	500 m max.
Terminals	8-terminal removable terminal block, M3.0 terminals

Dimensions



(Unit: mm)

30 x 114 x 100.2 mm (W x H x D) with RS-422A terminal cover removed.
30 x 114 x 119.5 mm (W x H x D) with RS-422A terminal cover in place.

Ordering Information

PTs

NS Series

Name	Specifications			Model
NS12	TFT, 12”, 800 x 600 dots	Without Ethernet	Frame color: Beige	NS12-TS00
			Frame color: Black	NS12-TS00B
		With Ethernet	Frame color: Beige	NS12-TS01
			Frame color: Black	NS12-TS01B
NS10	TFT, 10”, 640 x 480 dots	Without Ethernet	Frame color: Beige	NS10-TV00
			Frame color: Black	NS10-TV00B
		With Ethernet	Frame color: Beige	NS10-TV01
			Frame color: Black	NS10-TV01B
NS8	TFT, 8”, 640 x 480 dots	Without Ethernet	Frame color: Beige	NS8-TV00
			Frame color: Black	NS8-TV00B
		With Ethernet	Frame color: Beige	NS8-TV01
			Frame color: Black	NS8-TV01B
NS5	STN, 5.7“, 320 x 240 dots	Without Ethernet	Frame color: Beige	NS5-SV00
			Frame color: Black	NS5-SV00B
		With Ethernet	Frame color: Beige	NS5-SV01
			Frame color: Black	NS5-SV01B

NT Series

Name	Specifications			Model
NT631	TFT color	Frame color: Beige		NT631C-ST151
		Frame color: Black		NT631C-ST151B
	EL	Frame color: Beige		NT631-ST211
		Frame color: Black		NT631-ST211B
NT31	STN color	Frame color: Beige		NT31C-ST141
		Frame color: Black		NT31C-ST141B
	STN monochrome	Frame color: Beige		NT31-ST121
		Frame color: Black		NT31-ST121B
NT21S	STN monochrome	Frame color: Beige		NT21-ST121E
		Frame color: Black		NT21-ST121B
NT11	STN monochrome	Ten–key type	Frame color: Beige	NT11S–SF121
			Frame color: Black	NT11S–SF121B
NT2S	LCD monochrome	Programmable	6-key type, Frame color: Black	NT2S-SF121B
				NT2S-SF122B
		PLC controlled		NT2S-SF123B
		Programmable	20-key type, Frame color: Black	NT2S-SF125B
				NT2S-SF126B
		PLC controlled		NT2S-SF127B

Support Software

NS-series PTs

Name	Specifications	Model
NS-series Screen Design Software for Windows	For NS-series PTs Windows 95, 98, Me, 2000, XP, or NT 4.0	NS-NSDC1
Cable to transfer screens	IBM PC/AT or compatible	XW2Z-S00S

NT-series PTs

Name	Specifications	Model
NT-series Support Software for Windows	For NT-series PTs Windows 95, 98, Me, 2000 or NT 4.0	NT-Shell
Memory Unit to transfer screens	For NT31, NT31C, NT631, or NT631C	NT-MF261
Printer cable for NT Series	To print hardcopies of screens	NT-CNT121

Options

Name		Specifications		Model
Ladder Monitor Software	1 CD-ROM Ladder Monitor applications (See note 1.) and I/O Comment File Creation Tool (See note 2.)	For NS Series	A Memory Card must be purchased separately to operation on the NS-series PT. A HMC-AP001 Memory Card Adapter is required to write data from the CD-ROM to a Memory Card on a personal computer.	NS-EXT01
				NS-EXT01-L03 (3 licenses)
				NS-EXT01-L10 (10 licenses)
				NS-EXT01-HMC (with 48-MB Memory Card)
RS-232C/RS-422A Adapter		For NS Series		NS-AL002
Reflective Protective Sheets (front only, 5 sheets in a set)		For NS10/NS12		NS12-KBA04
		For NS7		NS7-KBA04
Protective Covers (5 covers in a set)		For NS10/NS12		NS12-KBA05
		For NS7		NS7-KBA05
Memory Cards	8 MB	For NS Series		HMC-EF861
	15 MB			HMC-EF171
	30 MB			HMC-EF371
	48 MB			HMC-EF571
Memory Card Adapter		For NS Series		HMC-AP001
Battery		For NS10/NS12		C500-BAT08
		For NS7		CPM2A-BAT01
DeviceNet Interface Unit		For NT631/NT31		NT-DRT21
Reflective Protective Sheets (front only, 5 sheets in a set)		For NT631C/NT631		NT610C-KBA04
		For NT31C/NT31		NT30-KBA04
		For NT20S		NT20M-KBA04
Protective Covers (5 covers in a set)		For NT631C/NT631		NT631C-KBA05
		For NT31C/NT31		NT31C-KBA05
Chemically Resistive Covers (5 covers in a set)		For NT631C/NT631		NT625-KBA01
		For NT31C/NT31		NT30-KBA01
Replacement Backlights		For NT631C-ST151(B)-EV2		NT631C-CFL01
		For NT631C-ST141(B)-EV2		NT631C-CFL02
		For NT31C/NT31		NT31C-CFL01
		For NT20S		NT20S-CFL01
Barcode Reader		Refer to the Barcode Reader catalog for details.		V520-RH21-6
RS-232C/RS-422A Adapter		For CV-series, C200HS, C1000H, and C500 PLCs		NT-AL001

Note: 1. This application for the NS-series PT enables monitoring ladder programs in SYSMAC CS/CJ-series PLCs on the PT.

2. This software extracts I/O comment data from CXT files from the CX-Programmer and converts them for ladder monitoring.

PT-PLC Connecting Cables

Communications method	Cable	SYSMAC PLC connector	PT connector	Cable length	Model
Host Link, 1:1 NT Link (D-Sub, 9-pin; D-Sub, 25-pin; or peripheral)	Host Link Cable	D-Sub, 9-pin	D-Sub, 9-pin	2 m	XW2Z-200T
				5 m	XW2Z-500T
			D-Sub, 25-pin	2 m	XW2Z-200S
				5 m	XW2Z-500S
		D-Sub, 25-pin	D-Sub, 9-pin	2 m	XW2Z-200P
				5 m	XW2Z-500P
		CS1, CJ1, or CQM1H peripheral port	D-Sub, 9-pin	2 m	XW2Z-200T-2
				5 m	XW2Z-500T-2
1:N NT Link for connection of multiple PTs	NT-A001-to-PT Cable	D-Sub, 9-pin (on NT-AL001)	D-Sub, 9-pin	70 cm	XW2Z-070T-1
				2 m	XW2Z-200T-1
NT2S-SF121 and 125 to CPM1A, CPM2A PLC peripheral port	Host link to NT2 connecting cables	peripheral port	NT2S SF121B / SF125B	2 m	NT2S-CN212
				5 m	NT2S-CN215
NT2S-SF122, 123, 126 and 127 to CPM1A, CPM2A PLC peripheral port.	Host link to NT2 connecting cables	peripheral port	NT2S SF122B / SF123B / SF126B / SF127B	2 m	NT2S-CN222-V1
				5 m	NT2S-CN225-V1
NT2S-SF121 and 125 to CJ1, CS1, CQM1H, PLC peripheral port.	Connecting cable	miniature peripheral port	NT2S-SF121B / SF125B	2 m	NT2S-CN223-V1
NT2S-SF122, 123, 126 and 127 to CJ1, CS1, CQM1H, PLC peripheral port.	Host link to NT2 connecting cables	miniature peripheral port	NT2S-SF122 / SF123B / SF126B / SF127B	2 m	NT2S-CN224-V1
Adapter	Adapter cable	peripheral port	miniature peripheral port	2 m	CS1W-CN114

Note: Refer to the product manuals for cables other than those listed above.