Human Machine Interfaces

OMRON

Introduction to OMRON HMI

HMIs for essentially any purpose

						
Model	**NS12**	**NS10**	**NS8**	**NS5-T**	**NS5-S / NSH5-S**	**NS5-M**
Type of display	TFT 12 inch colour display	TFT 10 inch colour display	TFT 8 inch colour display	TFT 5.7 inch colour display	STN 5.7 inch colour display	STN 5.7 inch mono-chrome display
Size in mm (HxWxD mm)	241x215x48.5		177x232x48.5	142x195x54 NSH5 176x223x70.5 (depth excl. emergency button)		
Effective display area	246x184.5 mm (800 x 600 pixels)	215.2x162.4 mm (640 x 480 pixels)	170.9x128.2 (640 x 480 pixels)	117.2x88.4 mm (320 x 240 pixels)		
Display colour	256 colours Image data: 32,768 colours				256 colours Image data: 4,096 colours	16 grey scales
Power supply	24 V DC ±15%					
Touch panel	38 vertical x 50 horizontal	30 vertical x 40 horizontal	24 vertical x 32 horizontal	15 vertical x 20 horizontal		
Obtained standards	UL 1604 C1D2, cUL, EC Directives, 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)	60 MB			20 MB		
Memory card interface	ATA compact flash card interface, 1 slot					
Internal memory	Bit memory: 32,767 bits, Word memory: 32,767 words, Retentative memory: 8,192 bits and 8,192 words.					
Printer connection	Supported			---	---	
Backlight life	50,000 hours minimum		40,000 hours minimum	75,000 hours minimum		50,000 hours minimum
Multivendor support	Supported for most third-party PLCs. Please contact your local OMRON distributor for more information.					
Video board (composite / RGB)	Supported			---	---	

	
Model	**NSJ5**
Features	A combination of a fast and powerful CJ1 PLC, a 5.7" NS series touchscreen and open network connections. With the NSJ5 you are able to configure, commission, operate and maintain your complete automation solution. Ideal for applications that require visualisation, control and open network connection with little space. Panelless automation by making use of remote I/O terminals and intelligent devices. - 5.7“ colour touchscreen, 4096 colours (images), 20 MB screen data memory - 20 k Steps PLC program memory - 32 K Words PLC data memory - DeviceNet or CAN interface - Ethernet interface - Compact Flash card interface

Select the HMI that suits your application best

				
Model	**NT21S-ST121(B)**[1]	**NT11–SF121(B)**[1.]	**NT2S-SF12□B-E(V2)**	**NT3S-ST12□B-E**
Size in mm (HxWxD)	110x190x58	113x218x38.2	60x108x43	77x140x35
Effective display area	117x63 mm (260x140 dots)	160x64 mm	56x11 mm	98x35 mm (192 x 64 pixels, 4.1 inch)
Type with ethernet	24 VDC +10%/-15%	24 VDC ±15%	24 VDC ±10% (when applicable)	24 VDC ±15%
I/O Function keys	-	22 keys	6 to 20 keys depending on model	-
I/O Touch panel	7 vertical x 13 horizontal	---	---	Analog Resistive
Obtained standards	UL, CSA, EC Directives,NEMA equivalent	CE, cULus	CE, cULus	CE, cULus
Display graphics	Straight lines, rectangles, polygons, circles, ovals, sector, bitmaps			Rectangle, rounded rectangle, circle, oval, line, bitmaps
No. of display characters (standard characters)	16 characters x 8 lines	20 characters x 4 lines	16 characters x 2 lines	32 characters x 8 lines
No. of registered screens	3,999 screens max. (depending on screen contents)	250	250	65,000 max. (limited by memory capacity)
Screen data capacity (standard)	512 KB	32 KB	24 KB	120 KB
Expansion memory	---	---	---	---
Memory card interface	NT-MF261 memory unit for screen transfer can be used.	---	---	---
Expansion interface	---	---	---	---
Ethernet	---	---	---	---
Internal memory	Numeral memory table: 2,000 entries max., Character memory table: 2,000 entries max.	-	1 kWords data, 1 kWords retentative memory	1 kWords data, 1 kWords retentative, 64 words system memory
Ladder monitor	---	---	---	---
Programming Console function	Supported	---	---	---
Device monitor	---	---	---	---
Barcode reader connection	Supported	---	---	---
Printer connection	---	Supported	Supported	Supported
Multivendor support	Supports most third party PLCs. [2.]	---	Supports most third party PLCs [2]	Supports most third party PLCs [2.]
Backlight life	50,000 hours average	50,000 hours average	LED, min. 50,000 hours	LED, min. 50,000 hours

1. Model numbers with 'B' have a black frame and without a beige frame.
2. Please contact your local OMRON representative for a list of available drivers.

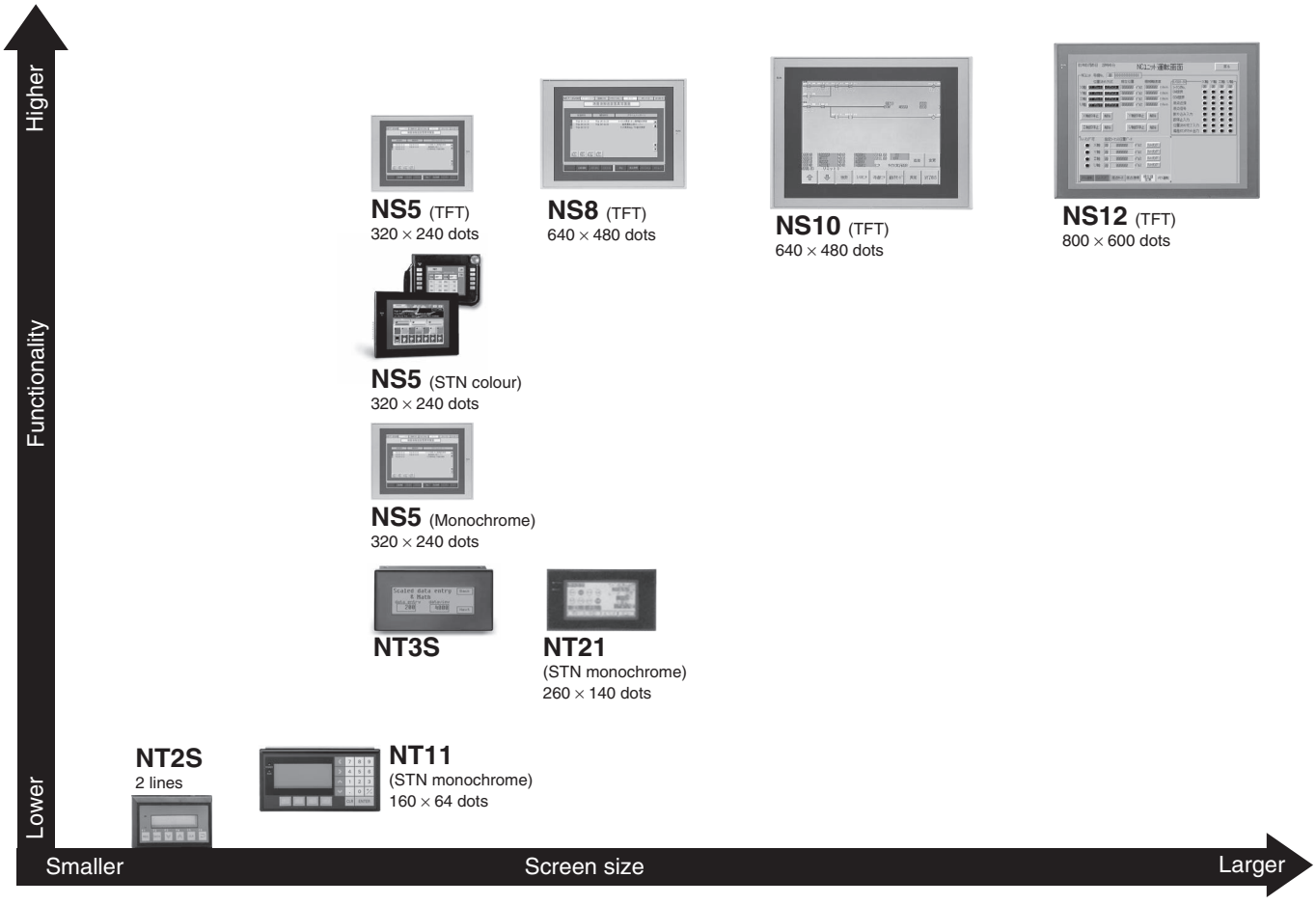
HMI Overview

As a 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 range of NT- and NS-series HMIs suits most applications.



NS5, NS8, NS10, NS12

NS series Advanced Touch Screens

Design Software

The CX-Designer is used to create screen data for NS-series Programmable Terminals. The CX-Designer can also be used to test the operation of the created screen data on the computer.

Screen Creation

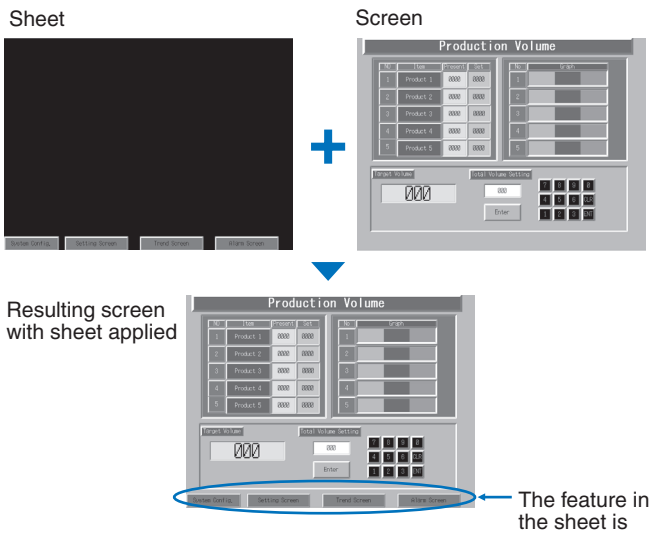
Develop Screens More Efficiently with Easy-to-use Support Software. The CX-Designer has about 1,000 standard functional objects with associated graphics and advanced functions, so even first-time users can create screens easily just by arranging functional objects in a screen.

The CX-Designer is also equipped with a variety of functions that make it easy to create screens for common applications. Screen development is very efficient with the CX-Designer.

Screen templates

Make one common screen (sheet) that overlaps other screens (to save having to recreate the same part, such as a menu, in every screen).

A feature that is common to several screens can be registered in 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.)

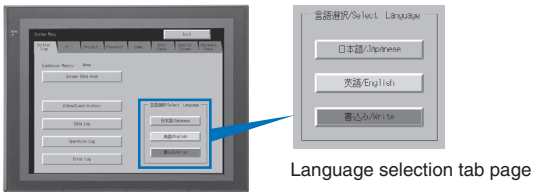


Multiple language support

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.

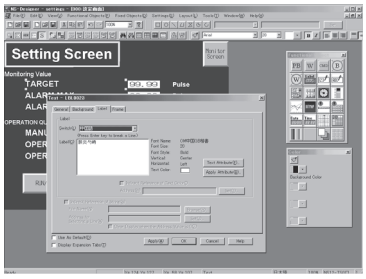


Language selection tab page

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.

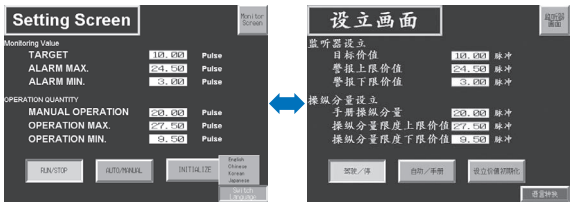


Making multiple language versions with a single screen data file

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.

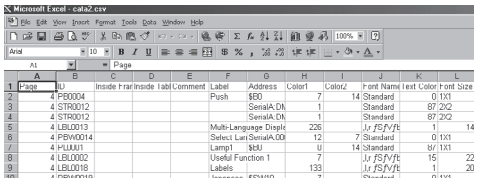


Example: The label switch function can be used to switch between English and Simplified Chinese.

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.



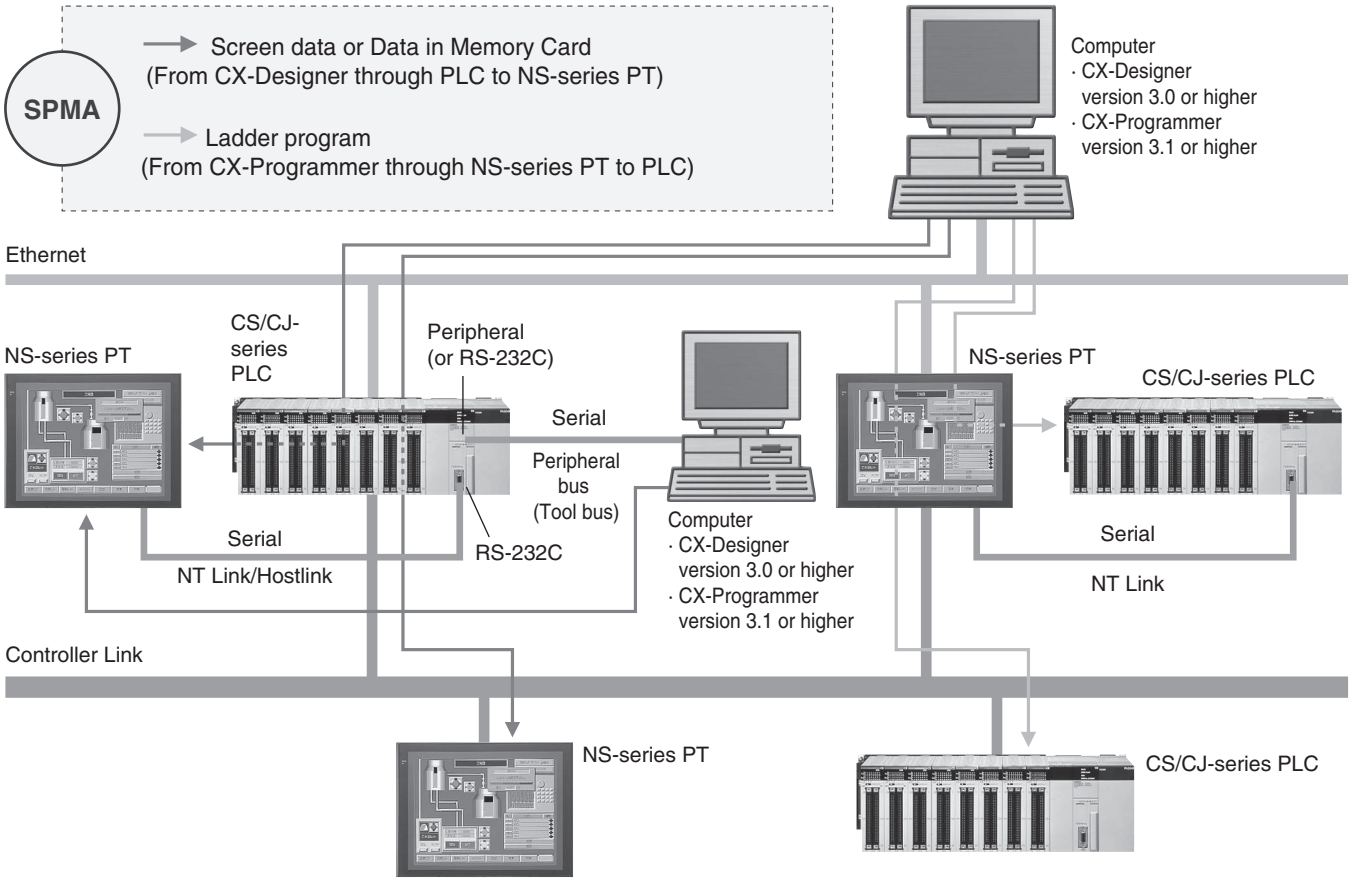
Transferring Screen Data

Data Transfer by Passing Through a PLC or PT!

SPMA (Single Port Multi Access) Function

When transferring screen data from the CX-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
- CX-Designer: Version 3.0 or higher
- CX-Programmer: Version 3.1 or higher
- PLC: Lot No. 030201 and later

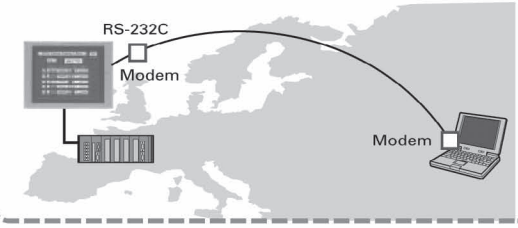
Easy screen data transfer at high speed

Screen transfer through modems is now possible.

- Even a single screen change in a shipped machine involves a risk, because a screen sent by e-mail needs to be transferred to a person familiar with operation. Training workers to understand operation is a hard job. Or service personnel need to visit the site to change screens.

Solution

The screens can be transferred from a computer in an office through modems. The maintenance of the screens is possible without touching the device. Therefore, no training or engineer visits are required.

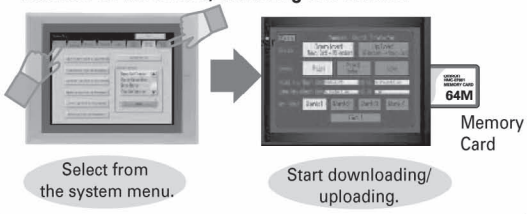


Screen transfers using Memory Cards are possible from the maintenance menu.

- It is very convenient to make backups without using a computer. It is, however, troublesome to operate a DIP switch on the back of the PT each time backups are required.
- You may want to make backups periodically, but worry because the DIP switch pins may break.

Solution

Screen transfers using Memory Cards are possible from the maintenance menu. No physical switch operations are required on the rear panel. Furthermore, easy operation is ensured with no wear and tear of hardware, including the switch.

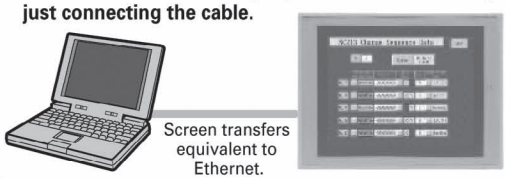


High-speed screen transfer through USB.

- Most computers now have an USB port, and no serial RS-232C ports are provided.
- You may want to transfer screens more easily at higher speeds.

Solution

Data can be transferred over USB through a single cable between the computer and PT. No devices for serial RS-232C and USB conversion are required. Moreover, USB allows high-speed screen transfer by just connecting the cable.



Note: The screen transfer function through the USB will be supported in the near future.

Creating Windows-style screens

Making buttons pop-up with a single property setting

Easily creating pop-up menus

You can easily create your own pop-up menu using the standard command button. 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

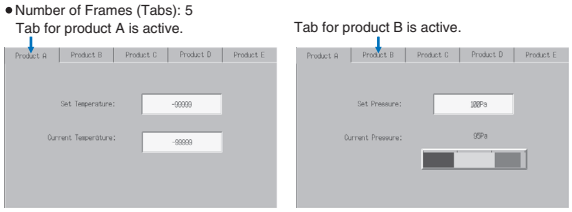
The character strings in the specified PLC addresses or text file are displayed so that the user can select from the list. When a line is selected, the corresponding line number or character string can be written to the PLC. It is possible to display up to 1,024 lines with up to 256 characters in each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

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 one 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.

Using general software

Editing text and bitmap file with your favorite text editor

Editor specifying function

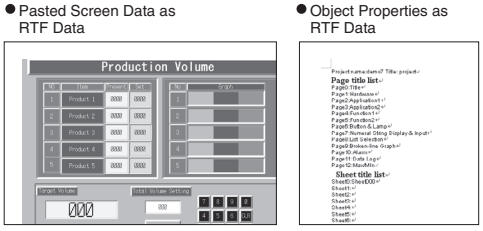
The user can select the editor when editing text or bitmap files.

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.

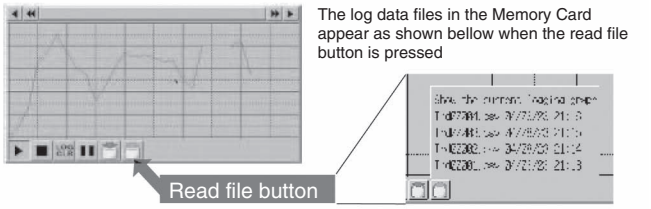
Example of an RTF File Read into Word Processor



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

Log Data in a Memory Card can be read on the screen with the read file button. A list fo files with time stamps will appear on the screen. By selecting the desired file, the past log in the Memory Card ban be read.



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.

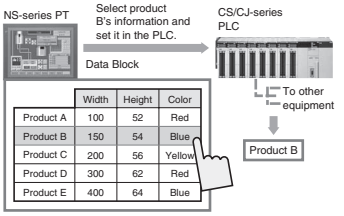
- Alarm/Event History (Alarm/ Event history data)
- Operation Log (Screen operation history data)
- Error Log (Error log data recorded during macro program execution)

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.

Hide or disable objects on a screen with a single bit to prohibit operation

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.

This can be useful when you want to change data from a PLC without the user noticing this. It can also guide the user to perform actions step by step.

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.

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.

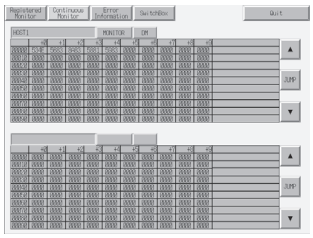
Terminal Software

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 or debugging of the application 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.

Memory Card: Upload/Download Function

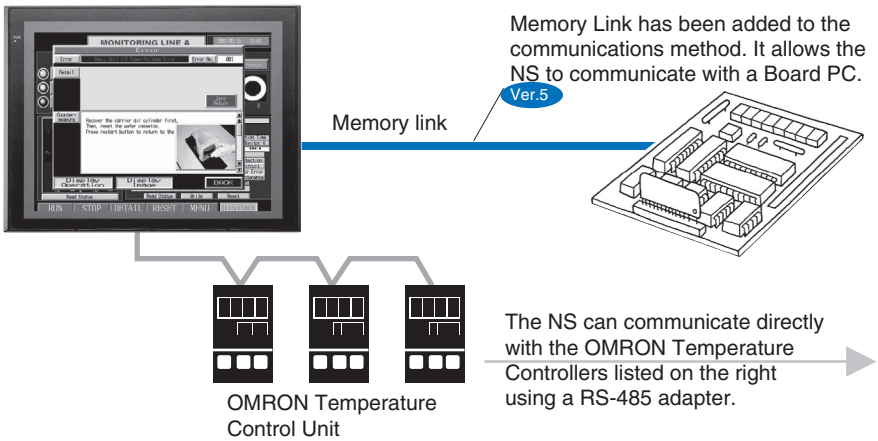
It is possible to download the screen data and system program to Memory Card and upload the same data from the Memory Card. It is also possible to automatically upload the data from the Memory Card to CX-Designer or automatically download the data from Memory Card to PT when the power of PT is turned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

You can partially replace text and pictures from your computer.

FTP (File Transfer Protocol) has been added!

Texts, lists, and recipes can be replaced with the put/get command from your computer! You can even replace BMP files online from your computer easily.

The NS can be connected to a Board PC. The NS can also be directly connected to an OMRON Temperature Controller.



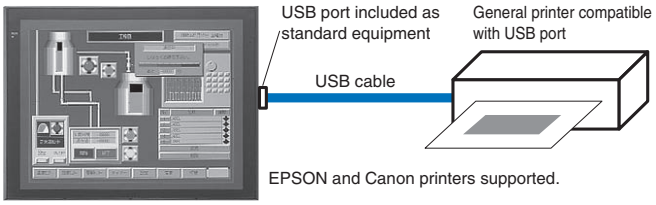
The following models, which have an RS-485 communications port and support CompoWay/F communications, can be connected to the NS.

Unit	Series	Model
Modular Temperature Controllers	E5ZN	E5ZN-SCT24S-500 (terminal unit)
Digital Temperature Controllers	E5AN	E5AN-□□M□-500 + E53-AK03
	E5EN	E5EN-□□M□-500 + E53-AK03
	E5CN	E5CN-□□M□-500 + E53-CNH03 or E53-CN03
	E5GN	E5GN-□□□03□-FLK
Digital Controllers	E5AR	E5AR-QC43DB-FLK
		E5AR-QQ43DW-FLK
		E5AR-CC43DWW-FLK
	E5ER	E5ER-QC43B-FLK
		E5ER-PRQ43F-FLK
		E5ER-QT3DW-FLK
		E5ER-CT3DW-FLK

Printer Support

USB port compatibility with commercially available printers

Hard copies of screens can be printed out in color by USB-compatible printers or to the flash card.



NS5	NS8	NS10	NS12
-	Supported	Supported	Supported

Supported Printers

Manufacturer	Model	NS system version
EPSON	Stylus Photo 830U	v5
	Stylus Photo 870U	v5
	Stylus Photo 900	v5
	Stylus Photo 925	v5
	Stylus Photo 720	v5
	Stylus C62	v5
CANON	PIXMA iP90	v6.20
	PIXMA iP2000	v6.20
	PIXMA iP3000	v6.20
	PIXMA iP4000	v6.20
	PIXMA iP4000R	v6.20
	BJ i80	v5
	BJ i70	v5
	BJC-85	v5

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.

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

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.

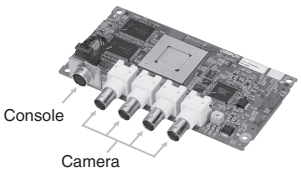
Hardware

Using Video Inputs

Capturing Moving Images from a Video Camera and Image Outputs from a Vision Sensor

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.

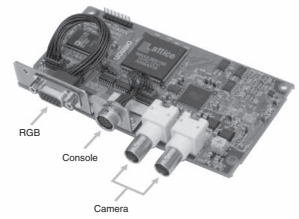


Display PC Screens with the NS-CA002

NS-CA002 RGB/Video Input Unit

(Supported by the NS12-V1/ NS10-V1/NS8-V1)

An analog RGB input terminal is provided in addition to two video input interface terminals. A single video or analog RGB display is possible in user-defined positions and sizes. Touch switches and parts, such as lamps, can be overlapped on the video display. The display of parts will not disappear.



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 a personal computer via Ethernet or Serial connection. It is also possible to display the saved image on the NS screen again, so that you can compare two or more captured images immediately.

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.

Image capture data read function

BMP data captured and saved in a Memory Card can be read on the PT. BMP data displayed in thumbnails can be selected and displayed on the captured data display screen that will appear for the command button. If any error occurs, the image when the error accurred can be displayed on the NS screen. This is useful for on-site error analysis.

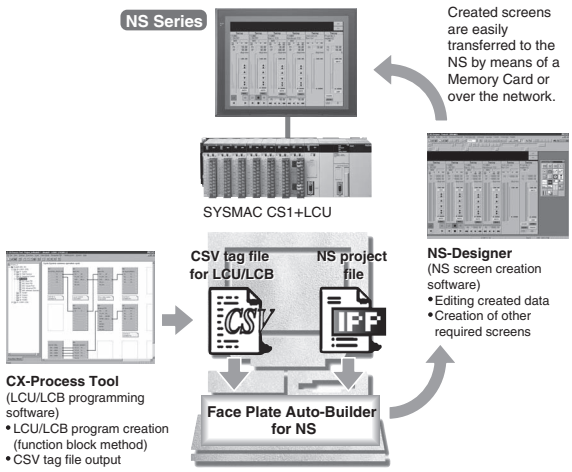
Using for Process Control

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.

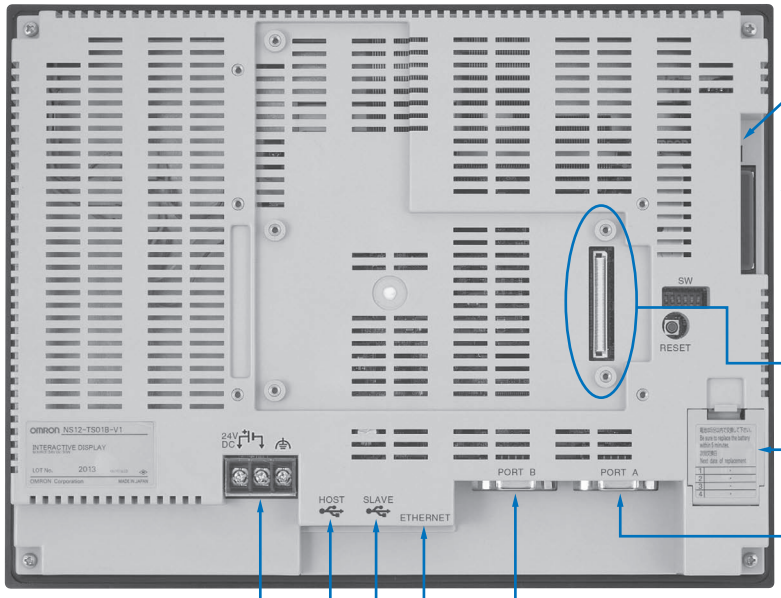
- Automatic generation of control screens and tuning screens. Automatic generation of NS screen data by the software from tag information created with the CX-Process Tool.
- NS communications address allocation, ladder programs, etc., are completely unnecessary.
- Data that has been generated can be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



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

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

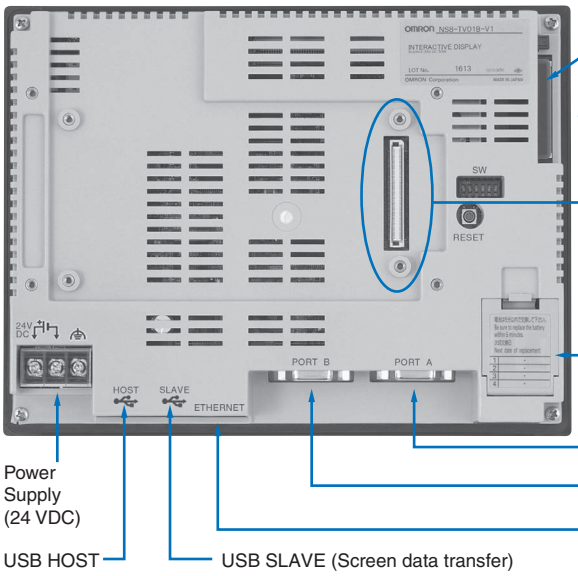
NS12, NS10



Memory Card

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

NS8

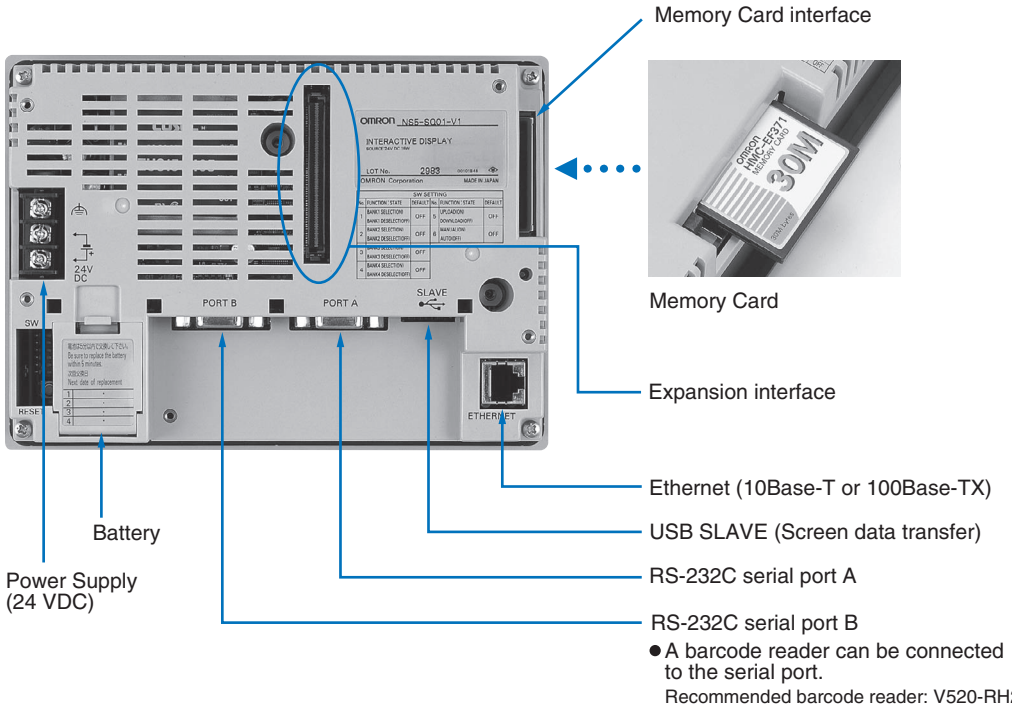


Memory Card

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

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

NS5



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).

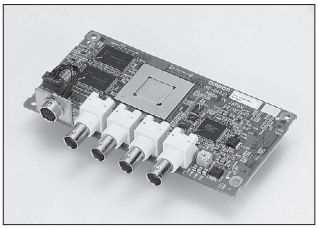
NS-series PTs have backlights with the longest life expectancy in the industry.

At room temperature, the average life expectancy is 50,000 hours min. for the NS12, NS10, NS5 and 40,000 hours min. for the NS8.

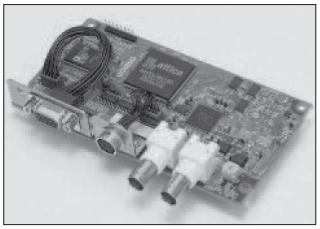
Optional Products

Ladder Monitor program

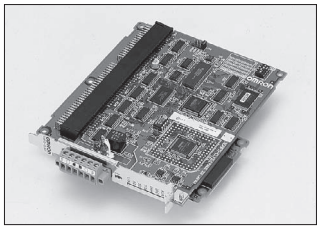
Video Input Unit (with Cover)



RGB/Video Input Unit (with Cover)



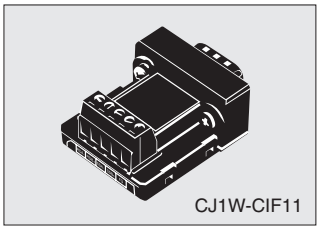
Controller Link Interface Unit (with Cover)



Memory Card

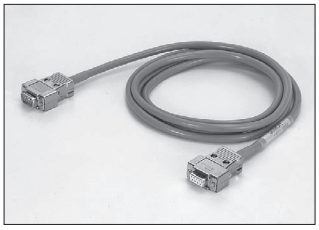
Memory Card Adapter

RS-422A Adapter

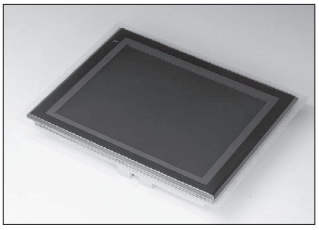


RS-232/RS-422A Conversion Unit

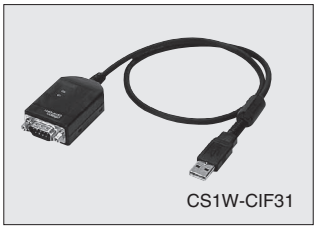
Communications Cable



Protective Cover/Anti-reflection Sheet for NS-series PT



USB Serial Conversion Cable

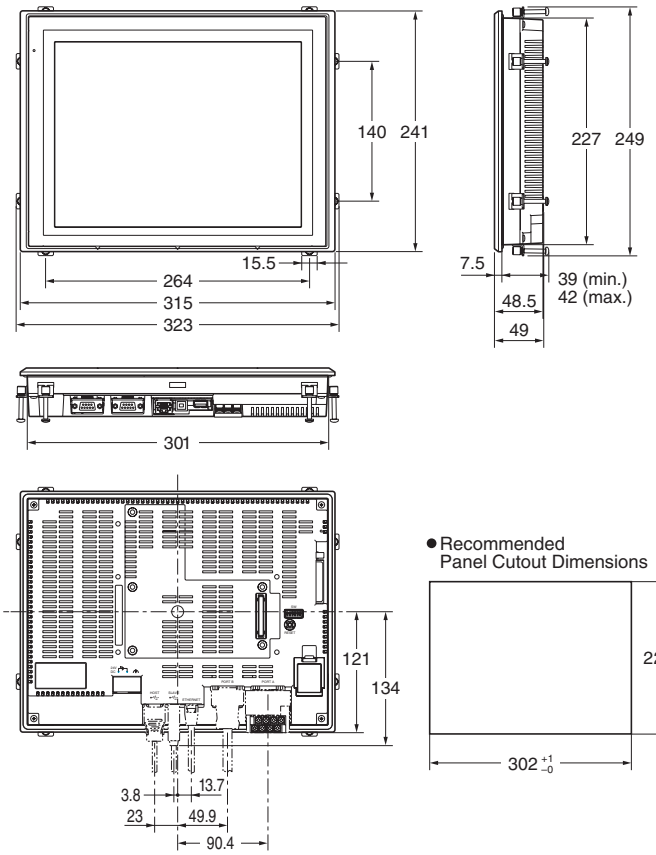


Note: Colors shown in photographs and product names may differ from actual colors and names.

Dimensions

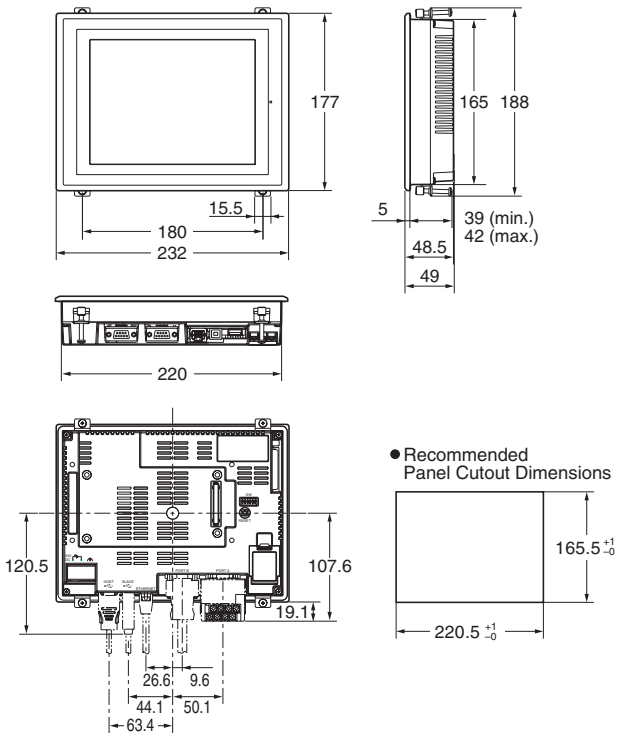
NS12/10

Units: mm



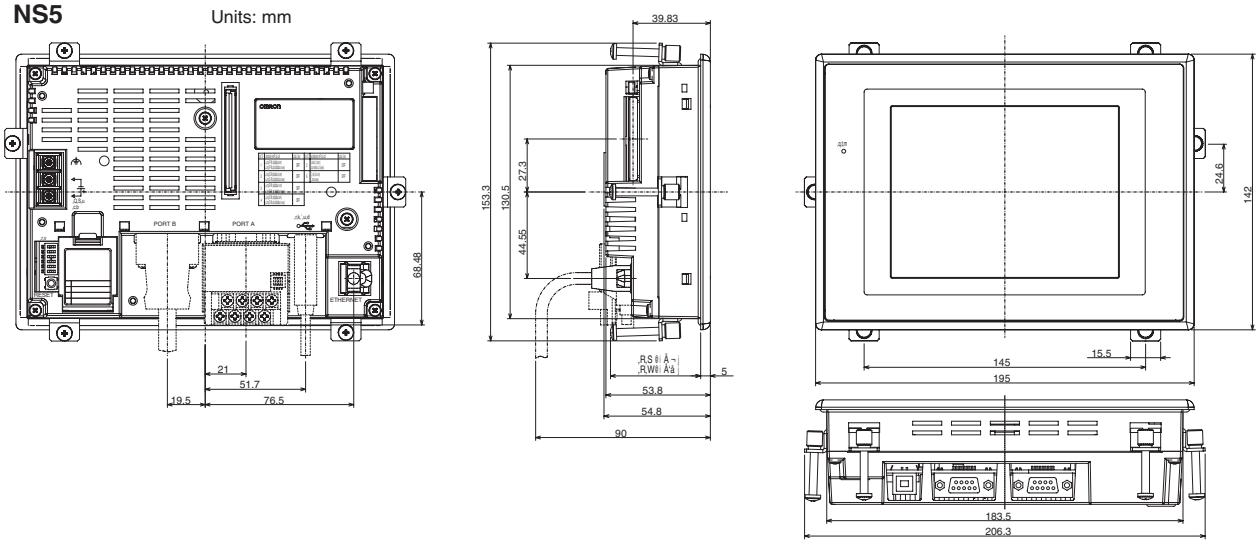
NS8

Units: mm

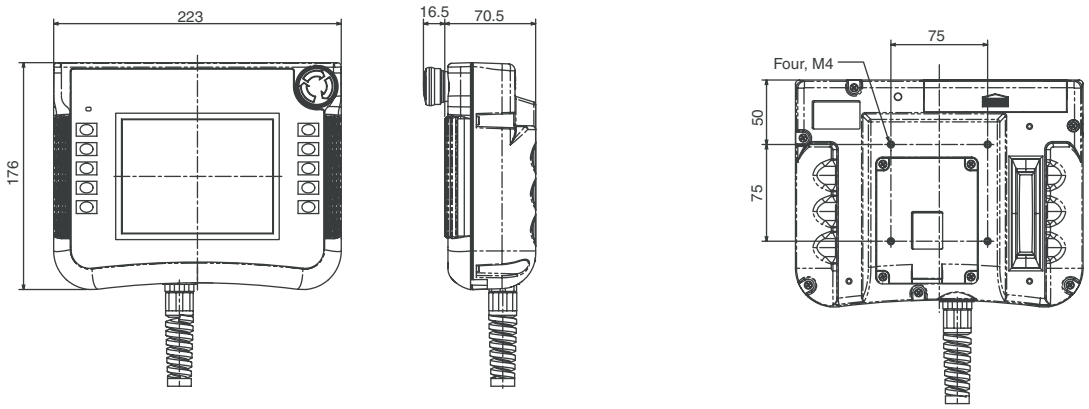


NS5

Units: mm

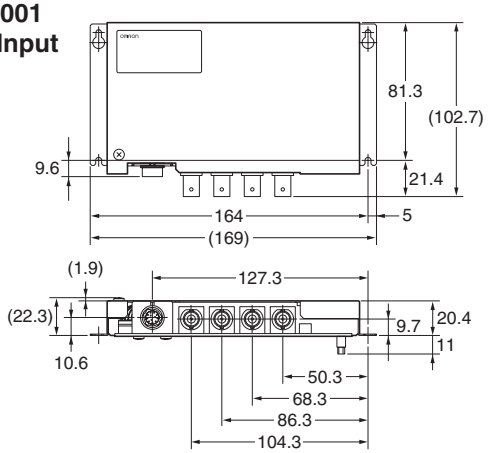


NS5 (STN color Handheld)



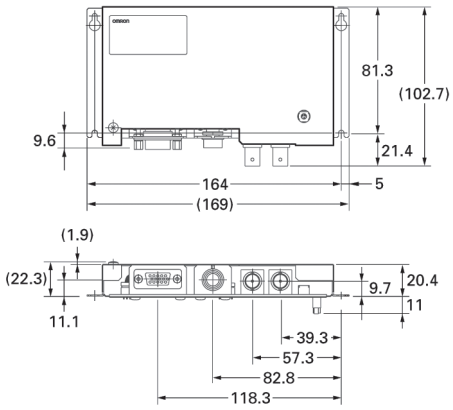
NS-CA001 Video Input Unit

Units: mm



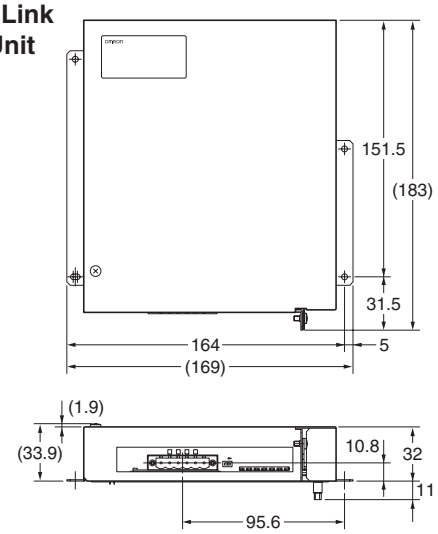
NS-CA002 Video Input Unit

Units: mm



NS-CLK21 Controller Link Interface Unit

Units: mm



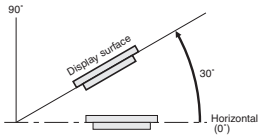
Performance/Specifications

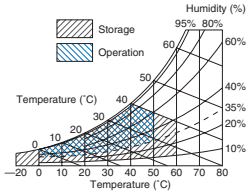
General specifications

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, 55°C for NS5 (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.; NS5: 1.0 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. • Without any Expansion Unit Installed
- NS12-V1/NS10-V1/NS8-V1
Mounting angle of 0° to less than 30° to the horizontal:
Operating temperature range of 0 to 45°C
Mounting angle of 30° to 90° or less to the horizontal:
Operating temperature range of 0 to 50°C
- NS5 -V2
Mounting angle of 0° to 90° or less to the horizontal:
Operating temperature range of 0 to 55°C

• With an Expansion Unit (Video Input Unit or Controller Link Unit) Installed
- NS12-V1/NS10-V1
Mounting angle of 0° to less than 30° to the horizontal:
Operating temperature range of 0 to 35°C
Mounting angle of 30° to 90° or less to the horizontal:
Operating temperature range of 0 to 50°C
- NS8-V1
Mounting angle of 0° to less than 30° to the horizontal:
Operating temperature range of 0 to 35°C
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-V2	NS10-V2	NS8-V2	NS5T*-V2	NS5S*-V2	NS5-M*-V2
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					Sixteen shades of gray
	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 117.2 mm x height 88.4 mm (5.7 inches)		
	Field of view	Left/right ±60°, Top 45°, bottom 55°	Left/right ±60°, Top 35°, bottom 65°	Left/right ±60°, Top 50°, bottom 60°	Left/right ±70°, Top 70°, bottom 50°	Left/right ±60°, Top 30°, bottom 60°	
Backlight (See note 4.)	Service life	50,000 hours min. (See note 1.)		40,000 hours min. (See note 1.)	75,000 hours min. (see note1.)		50,000 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.

Operating specifications

Item		NS12-V2	NS10-V2	NS8-V2	NS5-T*-V2	NS5-S*-V2	NS5-M*-V2
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	300 (20 horizontal × 15 vertical) 16 × 16 dots for each switch		
	Input	Pressure sensitive					
	Service life	1,000,000 touch operations					
Standard screen data capacity		60 MB			20 MB		

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	NS-CA001	NS-CA002
Resolution	320 x 240, 640 x 480, or 800 x 600 dots	Composite, user definable RGB, only full screen
Input signal	composite video NTSC or PAL	2 x composite video NTSC or PAL, 1 x RGB
Number of Camera's	4 max.	3 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			Displayable characters	Base size	
		Font name	Rough	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
			Standard	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
			Fine	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 CX-Designer. Font, style, and size can be specified		
Text attributes	Color			256 colors (NS5 Monochrome 16 shades of gray)		
	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				5000 max. (with system version 6)		
Display colors				256 colors max. (NS12/10/8 shows BMP in 32,768 colors, NS5 in 4,096 colors, NS5 Monochrome in 16 shades of gray)		

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-CPU11/CPU12/CPU13/CPU21/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

Name	Specifications			Model
NS12	TFT, 12", 800 x 600 pixels	Without ethernet	Frame color: Beige	NS12-TS00-V2
			Frame color: Black	NS12-TS00B-V2
		With ethernet	Frame color: Beige	NS12-TS01-V2
			Frame color: Black	NS12-TS01B-V2
NS10	TFT, 10", 640 x 480 pixels	Without ethernet	Frame color: Beige	NS10-TV00-V2
			Frame color: Black	NS10-TV00B-V2
		With ethernet	Frame color: Beige	NS10-TV01-V2
			Frame color: Black	NS10-TV01B-V2
NS8	TFT, 8.4", 640 x 480 pixels	Without ethernet	Frame color: Beige	NS8-TV00-V2
			Frame color: Black	NS8-TV00B-V2
		With ethernet	Frame color: Beige	NS8-TV01-V2
			Frame color: Black	NS8-TV01B-V2
NS5-T	TFT, 5.7", 320 x 240 pixels	Without ethernet	Frame color: Beige	NS5-TQ00-V2
			Frame color: Black	NS5-TQ00B-V2
		With ethernet	Frame color: Beige	NS5-TQ01-V2
			Frame color: Black	NS5-TQ01B-V2
NS5-S	STN color, 5.7", 320 x 240 pixels	Without ethernet	Frame color: Beige	NS5-SQ00-V2
			Frame color: Black	NS5-SQ00B-V2
		With ethernet	Frame color: Beige	NS5-SQ01-V2
			Frame color: Black	NS5-SQ01B-V2
NS5-M	STN monochrome, 5.7", 320 x 240 pixels	Without ethernet	Frame color: Beige	NS5-MQ00-V2
			Frame color: Black	NS5-MQ00B-V2
		With ethernet	Frame color: Beige	NS5-MQ01-V2
			Frame color: Black	NS5-MQ01B-V2
NSH5	STN color, 5.7", 320 x 240 pixels	Without Ethernet	Frame color: Black	NSH5-SQR00B-V2

Software

Name	Specifications	Model
NS-series screen design software for windows	For NS-series Windows 95, 98, Me, 2000, XP, NT 4.0 or XP	CX-Designer, included in CX-ONE

Note: For further information please contact your OMRON representative.

NS series accessories

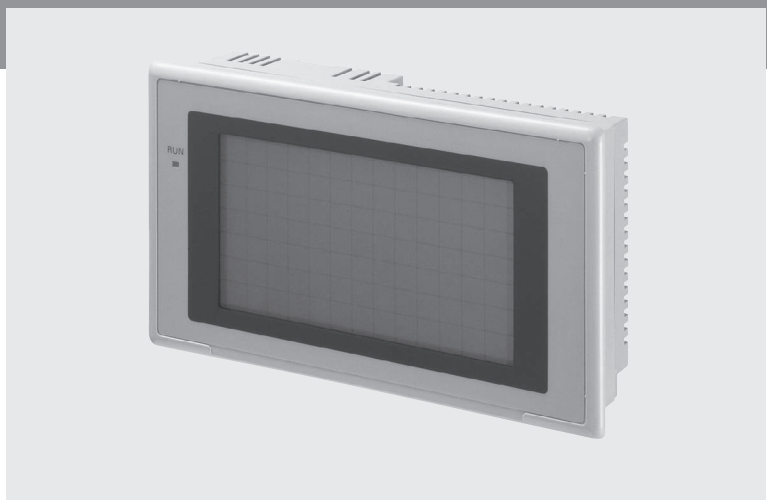
	Specifications		Model
Cable [1]	Screen transfer cable for DOS/V		XW2Z-S002
	USB Host Cable, cable length: 5 m		NS-US52 (5 m)
	USB Host Cable, cable length: 2 m		NS-US22 (2 m)
PT-to-PLC Connecting Cable	PT connection: 9 pins PLC connection:9 pins	Length: 2 m	XW2Z-200T
		Length: 5 m	XW2Z-500T
Accessories	Video input	Inputs: 4 channels NTSC / PAL	NS-CA001
		Inputs: 2 channels NTSC b/ PAL, 1 channel RGB	NS-CA002
	Special cable for the console		F150-VKP (2 m)
			F150-VKP (5 m)
	Controller link interface unit		NS-CLK21
	RS-422A adapter (50 m)		CJ1W-CIF11
	RS-422A adapter (500 m)		NS-AL002
	Anti-reflection sheets (5 surface sheets)	NS12/10	NS12-KBA04
		NS8	NS7-KBA04
		NS5	NT30-KBA04
	Protective anti-reflection covers (5 pack)	NS12/10	NS12-KBA05
		NS8	NS7-KBA05
		NS5	NT31C-KBA05
	Transparent protective covers (5 pack)	NS12/10	NS12-KBA05N
		NS8	NS7-KBA05N
		NS5	NT31C-KBA05N
	Chemical-resistant cover (1 cover)	NS5	NT30-KBA01
	Memory card	15 MB	HMC-EF172
		30 MB	HMC-EF372
		64 MB	HMC-EF672
	Attachment adapter	(NT625C/631/631C series to NS12 series)	NS12-ATT01
		(NT625C/631/631C series to NS12 series)	NS12-ATT01B
		(NT620S/620C/600S series to NS8 series)	NS8-ATT01
		(NT600M/600G/610G/612G series to NS8 series)	NS8-ATT02
	Memory card adapter for pc		HMC-AP001
	Battery		CJ1W-BAT01
	Barcode 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.

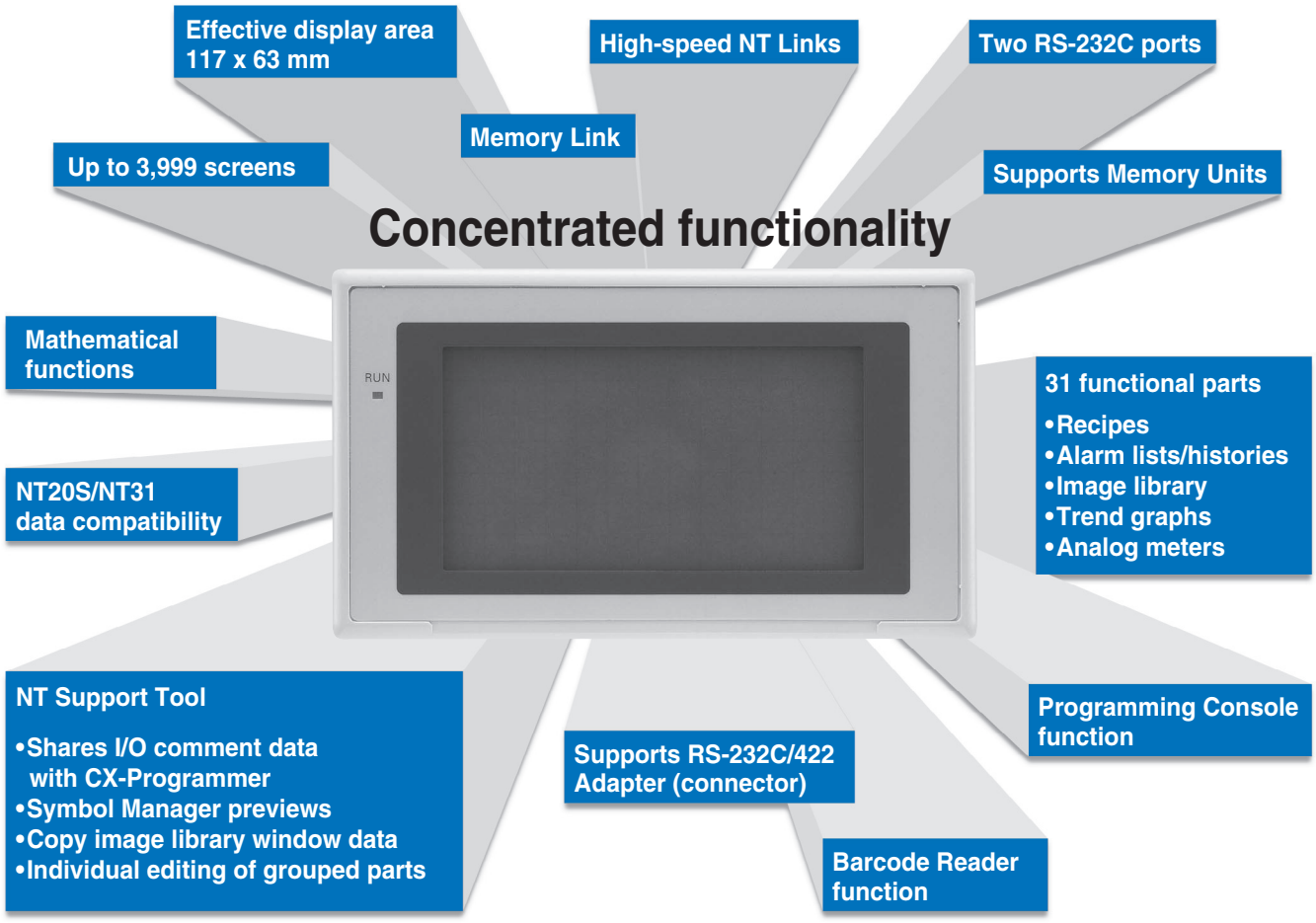
NT21

NT series Touch Screen

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 ±15%
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.

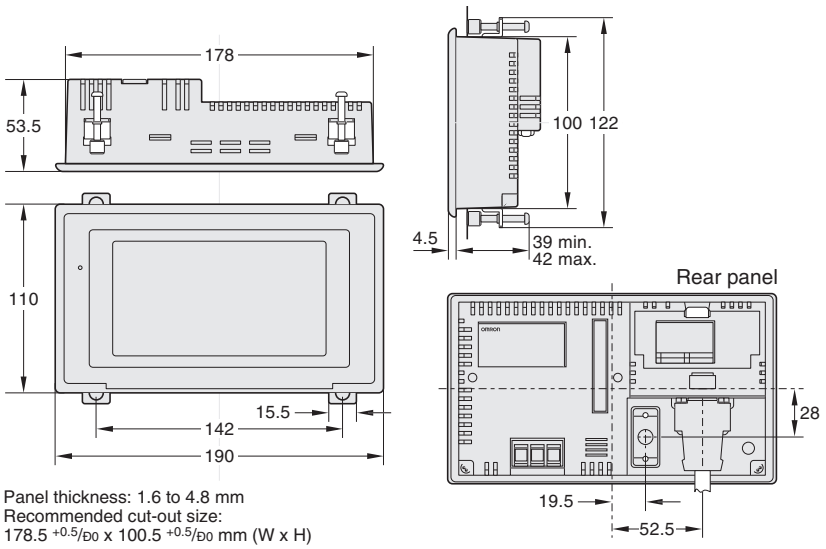
External Interface Specifications

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, 2000 and XP (Pro)		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-200T
			Cable length: 5 m	XW2Z-500T
		PT: 9-pin PLC: Mini-peripheral	Cable length: 2 m	NT-CN221
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)

NT11

NT series Function Key screens

The NT11, 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" (high/low speed), 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.

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 NT11 body, placing orders is a simple matter.

The front panel is available in beige or black

Long–life 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 ±15%
Allowable power supply voltage range	20.4 to 27.8 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 57 Hz with 0.75 mm double amplitude and 57 to 150 Hz with 1G acceleration for a total of 30min. 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
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 x 40 mm - Life expectancy: 50,000 hours minimum - View angle (left/right direction): ±20°	Backlight - LED - Life expectancy: 50,000 hours minimum - 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)

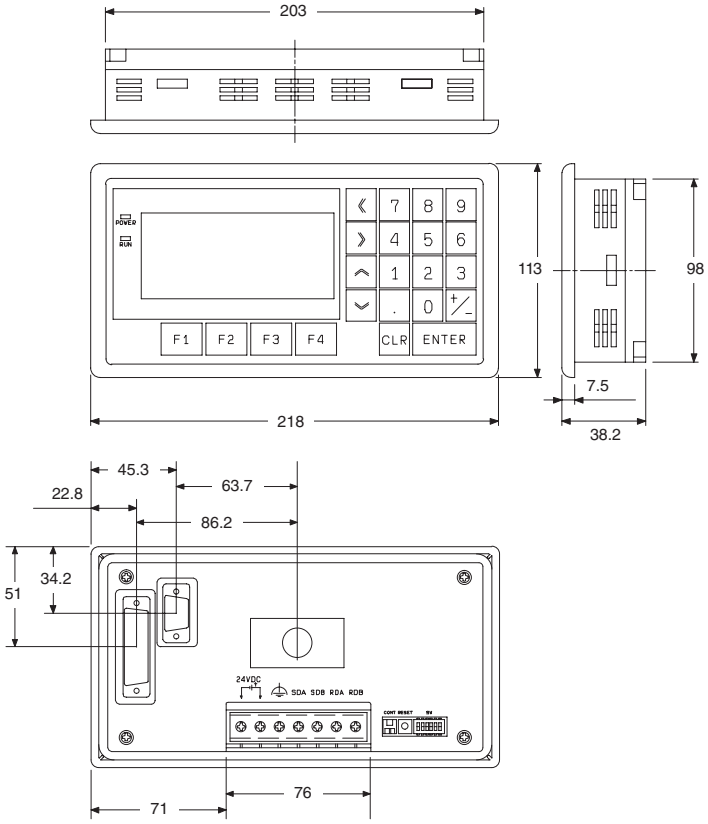
Special Features

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)	NT11–SF121-EV1
		Ten–key type (frame color: black)	NT11–SF121B-EV1
Support Software		3.5” FD (for IBM PC/AT)	NT–ZJCAT1-EV4

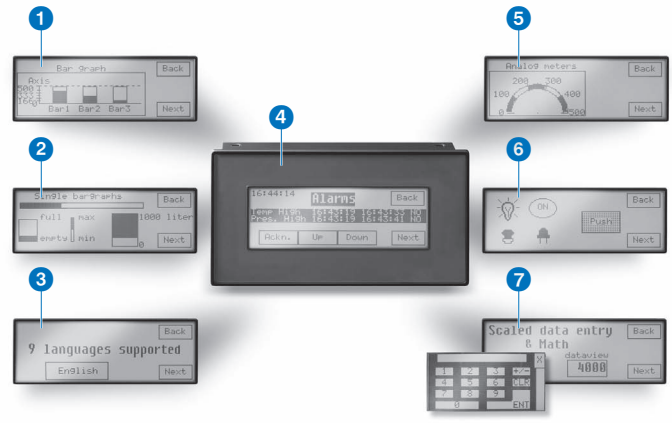
Dimensions


203
POWER
RUN
7
8
9
4
5
6
1
2
3
0
+/-
F1
F2
F3
F4
CLR
ENTER
113
98
7.5
38.2
218
45.3
22.8
63.7
86.2
51
34.2
24VDC
SDA SDB RDA RDB
76
71

NT3S

NT-XS series Touch Screen

- 4.1“ monochrome STN LCD with LED backlight (long lifetime)
- Maximum of two universal (RS232/485/422) serial ports to connect multiple devices with different protocols at the same time
- Drivers for most PLCs, Inverters and Servo Controllers
- Multiple data entry objects per screen with individual limit setting and math operations
- Support for floating point data
- Wizards for rapid application development of standard bitmapped objects
- Real-time and historical alarms (historical alarms in RTC models only)
- Trend graph for defined tags (RTC models only)
- Saves recipes data in non-volatile memory
- Windows® based programming software NT-XS for free!
- IP65 design, CE / cULus Class 1Div. 2 certification



1 2 On the NT3S you can show different kind of bar graphs. Single bar graphs can be filled in different directions and multiple bar graphs with legend can easily be created with a simple wizard.

3 Up to nine languages can be used in the NT3S. This means you can for instance make the text buttons variable. This way you can design one project with different languages so you can use it in different countries.

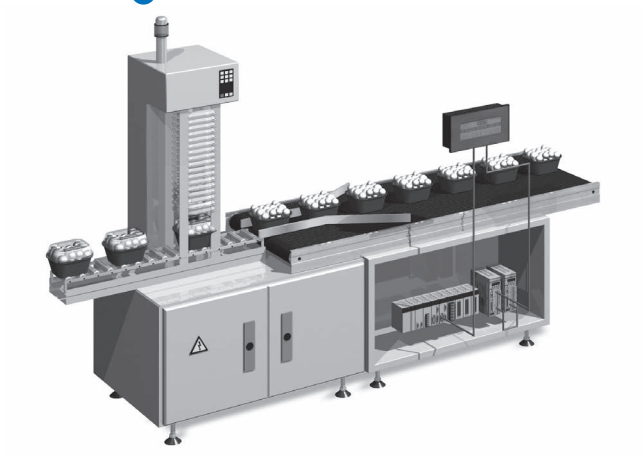
4 You can monitor up to 256 alarms in 16 different groups with the NT3S. Alarms can be shown with text, time, date and status. Acknowledgement can be prohibited by password.

5 Analogue meters can also monitor values of connected devices. You can set the range, angle, and “colours” to your wish.

6 You can create your own buttons and lamps by making use of bitmaps or by choosing one from the library. You can set the “colour”, filling and label.

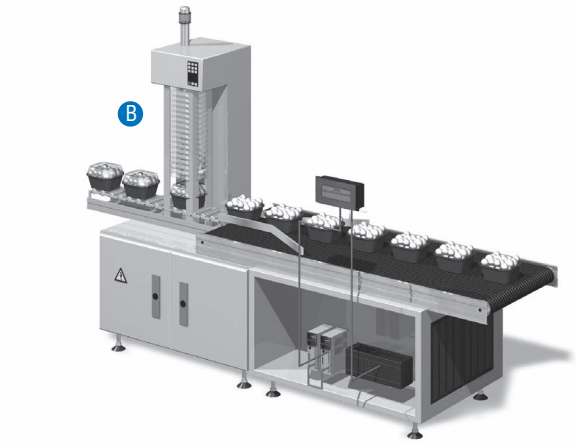
7 Showing and entering data is easy with the NT3S. Data can be shown in the desired format (HEX, BCD etc.). Entering data is performed with a pop-up keypad.

A



A typical application for the NT3S is a machine where an Omron PLC and Intelligent Servo Drives are used. The NT3S can be used to communicate with both the PLC and the Servo Drives. This means setting parameters, reading and writing variables like speed, torque, distance and actual position. It is also possible to move data from the PLC to the Servo Drive (e.g. to change acceleration times). The NT3S gives you the advantage of being able to communicate with the drives without using a bus-system, so a smaller and less expensive PLC can be used.

B



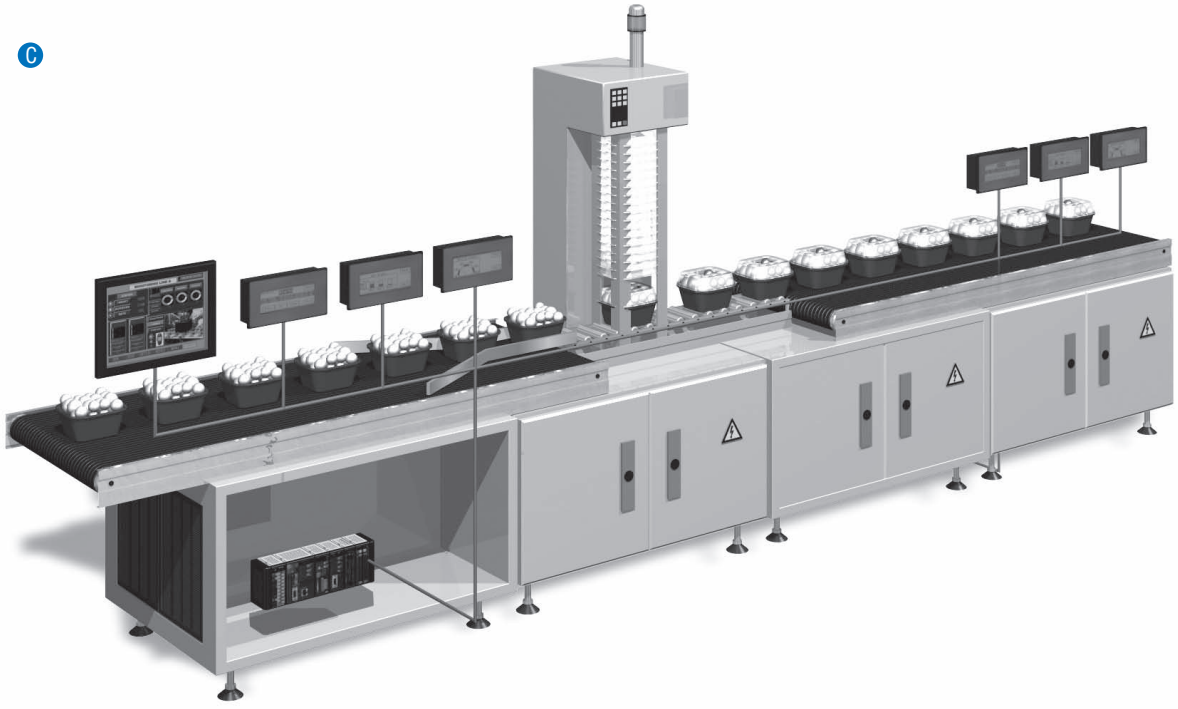
You can also use the NT3S to connect Omron Inverters to another PLC brand. In this solution the NT3S can communicate with the third party PLC* and at the same time the NT3S can change data in the Omron Inverters. Inverter settings can be changed directly from the screen but also from the PLC program. The NT3S acts as a gateway between the different protocols. This way you can save a lot of time developing the communication between the PLC and the Omron Drives.

C

Connecting multiple NT3S terminals to one Omron PLC is a good solution for long machine lines where local setting or monitoring is needed. You can connect a maximum of 8 screens to one PLC. By using the multiple NT3S terminals next to one more advanced HMI like the Omron NS series, you can have a high functional solution with local operation possibility against few extra costs.

* Please contact your local Omron representative for a list of available drivers

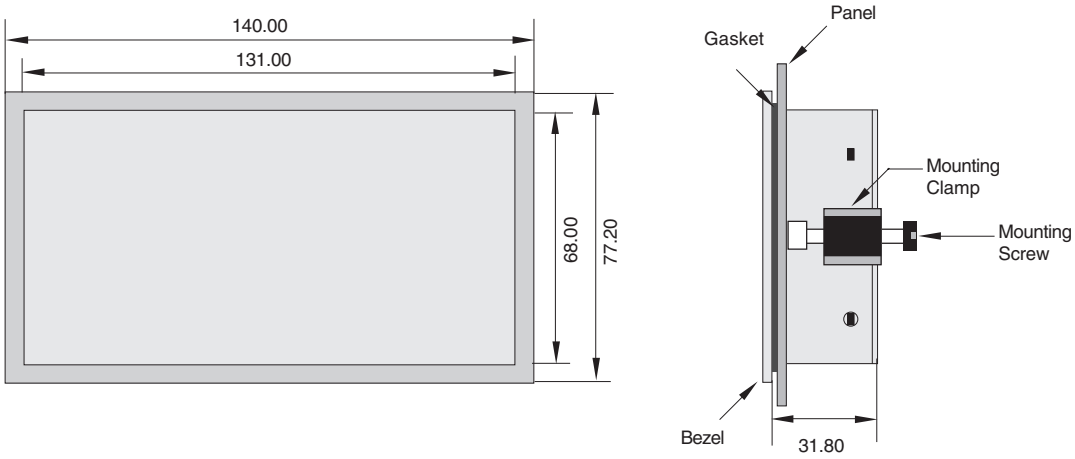
C



Specifications

Model	NT3S-ST126B-E	NT3S-ST124B-E	NT3S-ST123B-E	NT3S-ST121B-E
Type of display	LCD 4.1 inch, STN, Monochrome display			
Dimensions (W x H x D, mm)	140 X 77 X 35			
Effective display area	98 X 35 mm (4.1 inch)			
Display colour	Green LCD, Monochrome			
Communication	2x RS232	1x RS2321x RS485/422/232		2x RS485/422/232
RTC	-		Supported	
Power supply	24V DC +/-15%			
Touch panel	Analog Resistive			
Obtained standards	CE, cULus			
Display graphics	Rectangle, Rounded Rectangle, Circle, Oval, Line, Bitmaps			
No. of display characters (standard characters)	32 characters x 8 lines			
No. of registered screens	65000 max. (limited by memory capacity)			
Screen data capacity (standard)	120 Kb			
Internal memory	1 kWords data memory, 1 kWords retentive, 64 words system memory			
Printer connection	Supported			
Backlight life	LED, min 50.000 hours			
Multi-vendor support	Supports most third party PLCs			

Dimensions (mm)



Software

Name	Specifications	Model
NT2S and NT3S support software for windows	For all models of these NT-XS series	NT-XS (free downloadable from our website)

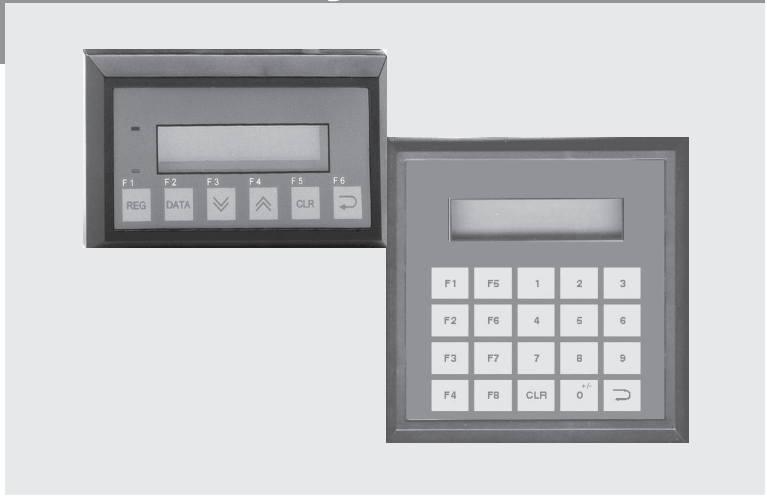
Note: For further information please contact your OMRON representative.

NTXS accesories

Cables for	Specification	Model
NT2S-SF121/125 and NT3S	peripheral port CPM series except CPM2C, 2 m	NT2S-CN212-V1
NT2S-SF121/125 and NT3S	peripheral port CPM series except CPM2C, 5 m	NT2S-CN215-V1
NT2S-SF122/SF123/SF126/SF127	peripheral port CPM series except CPM2C, 2 m	NT2S-CN222-V1
NT2S-SF122/SF123/SF126/SF127	peripheral port CPM series except CPM2C, 5 m	NT2S-CN225-V2
NT2S-SF121/125 and NT3S	mini-peripheral port CJ1/CS1 and CPM2C series, 2 m	NT2S-CN223-V2
NT2S-SF122/SF123/SF126/SF127	mini-peripheral port CJ1/CS1 and CPM2C series, 2 m	NT2S-CN224-V1
NT2S-SF121/125 and NT3S	Serial Port PLC and NT2S/NT3S,2M	NT2S-CN232-V1
NT2S-SF121/125 and NT3S	Serial Port PLC and NT2S/NT3S,5M	NT2S-CN235-V1
NT2S-SF122/SF126	Serial Port PLC and NT2S/NT3S,2M	NT2S-CN242-V1

NT2S

NT-XS series Function Key Screens



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

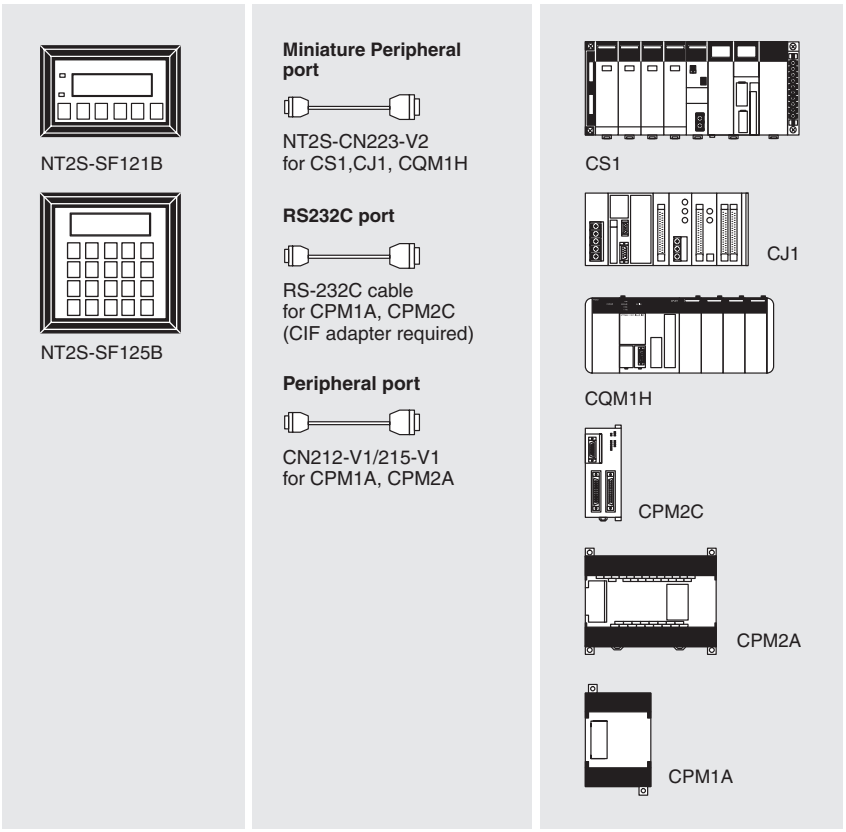
Host Link

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

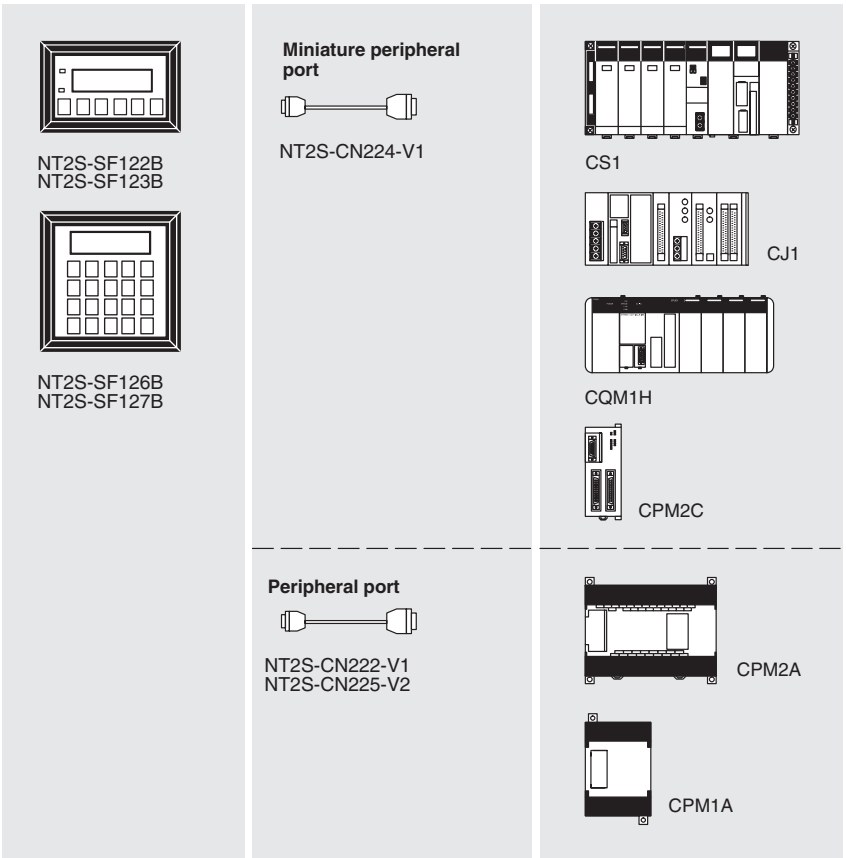
The RS-232C communication method can be used.

The following OMRON PLC systems feature the Host Link protocol:

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



Power supply: 24 VDC, external



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	24 V DC ± 10%		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, cULus Class 1 Div. 2					
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

Software

Name	Specifications	Model
NT2S and NT3S support software for windows	For all models of these NT-XS series	NT-XS (free downloadable from our website)

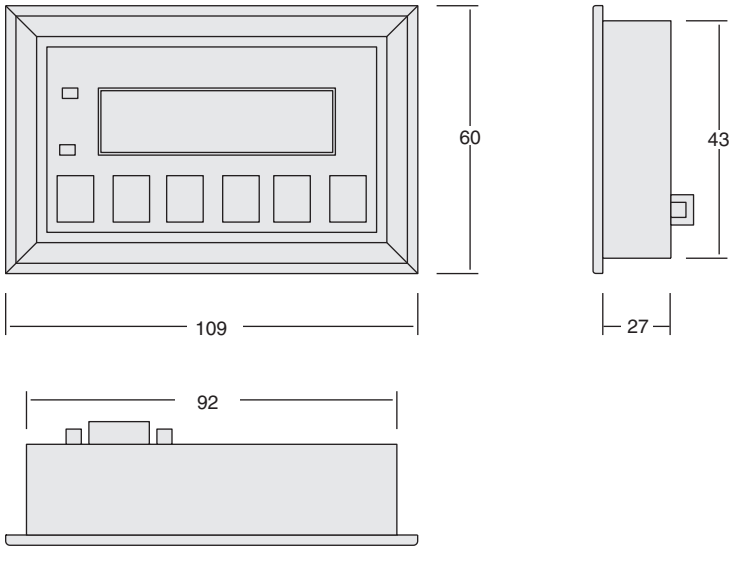
Note: For further information please contact your OMRON representative.

NTXS accesories

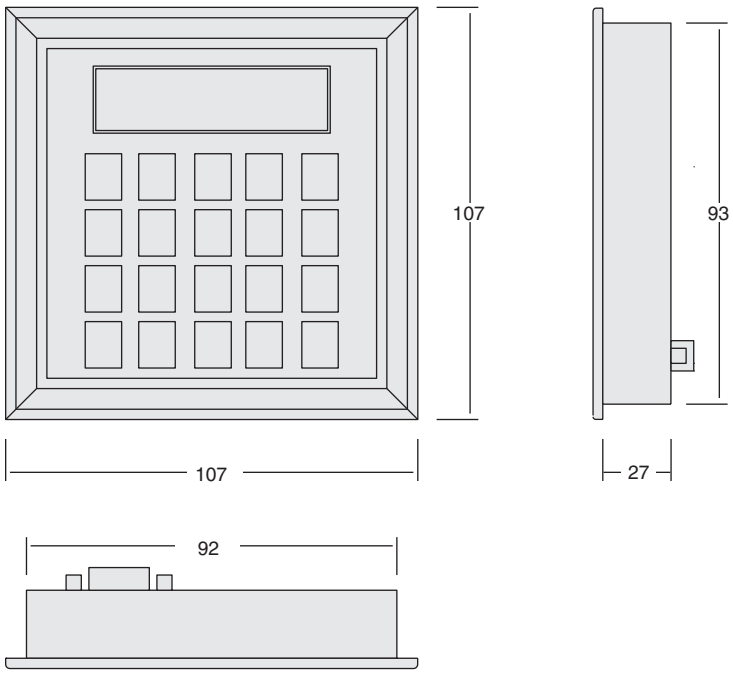
Cables for	Specification	Model
NT2S-SF121/125 and NT3S	peripheral port CPM series except CPM2C, 2 m	NT2S-CN212-V1
NT2S-SF121/125 and NT3S	peripheral port CPM series except CPM2C, 5 m	NT2S-CN215-V1
NT2S-SF122/SF123/SF126/SF127	peripheral port CPM series except CPM2C, 2 m	NT2S-CN222-V1
NT2S-SF122/SF123/SF126/SF127	peripheral port CPM series except CPM2C, 5 m	NT2S-CN225-V2
NT2S-SF121/125 and NT3S	mini-peripheral port CJ1/CS1 and CPM2C series, 2 m	NT2S-CN223-V2
NT2S-SF122/SF123/SF126/SF127	mini-peripheral port CJ1/CS1 and CPM2C series, 2 m	NT2S-CN224-V1
NT2S-SF121/125 and NT3S	Serial Port PLC and NT2S/NT3S,2M	NT2S-CN232-V1
NT2S-SF121/125 and NT3S	Serial Port PLC and NT2S/NT3S,5M	NT2S-CN235-V1
NT2S-SF122/SF126	Serial Port PLC and NT2S/NT3S,2M	NT2S-CN242-V1

Dimensions (mm)

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



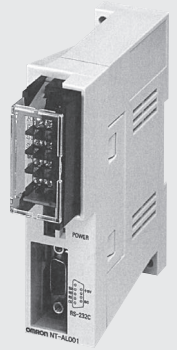
NT2S-SF125B-E
NT2S-SF126B-E
NT2S-SF127B-E



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

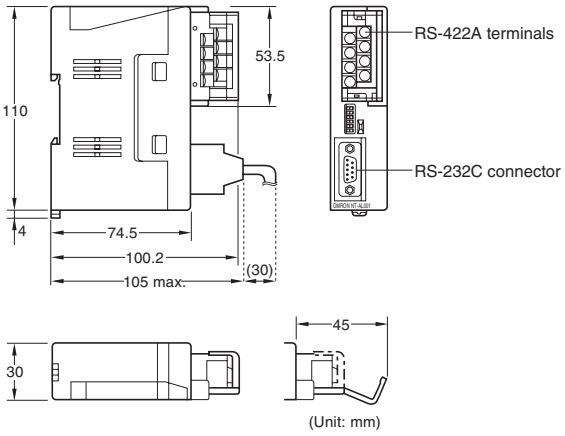
RS-232C Interface

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



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

HMI

NS series

Name	Specifications			Model
NS12	TFT, 12", 800 x 600 pixels	Without ethernet	Frame color: Beige	NS12-TS00-V2
			Frame color: Black	NS12-TS00B-V2
		With ethernet	Frame color: Beige	NS12-TS01-V2
			Frame color: Black	NS12-TS01B-V2
NS10	TFT, 10", 640 x 480 pixels	Without ethernet	Frame color: Beige	NS10-TV00-V2
			Frame color: Black	NS10-TV00B-V2
		With ethernet	Frame color: Beige	NS10-TV01-V2
			Frame color: Black	NS10-TV01B-V2
NS8	TFT, 8.4", 640 x 480 pixels	Without ethernet	Frame color: Beige	NS8-TV00-V2
			Frame color: Black	NS8-TV00B-V2
		With ethernet	Frame color: Beige	NS8-TV01-V2
			Frame color: Black	NS8-TV01B-V2
NS5-T	TFT, 5.7", 320 x 240 pixels	Without ethernet	Frame color: Beige	NS5-TQ00-V2
			Frame color: Black	NS5-TQ00B-V2
		With ethernet	Frame color: Beige	NS5-TQ01-V2
			Frame color: Black	NS5-TQ01B-V2
NS5-S	STN color, 5.7", 320 x 240 pixels	Without ethernet	Frame color: Beige	NS5-SQ00-V2
			Frame color: Black	NS5-SQ00B-V2
		With ethernet	Frame color: Beige	NS5-SQ01-V2
			Frame color: Black	NS5-SQ01B-V2
NS5-M	STN monochrome, 5.7", 320 x 240 pixels	Without ethernet	Frame color: Beige	NS5-MQ00-V2
			Frame color: Black	NS5-MQ00B-V2
		With ethernet	Frame color: Beige	NS5-MQ01-V2
			Frame color: Black	NS5-MQ01B-V2
NSH5	STN color, 5.7", 320 x 240 pixels	Without Ethernet	Frame color: Black	NSH5-SQR00B-V2

NT series

Name	Specifications			Model
NT21	STN monochrome	Frame color: Beige		NT21-ST121-E
		Frame color: Black		NT21-ST121B-E
NT11	STN monochrome	Ten-key type	Frame color: Beige	NT11–SF121-EV1
			Frame color: Black	NT11–SF121B-EV1

NT-XS series

Name	Specifications			Model
NT2S	STN monochrome	Programmable	6-key type, Frame color: Black	NT2S-SF121B-EV2
				NT2S-SF122B-EV2
		PLC controlled		NT2S-SF123B-EV2
		Programmable	20-key type, Frame color: Black	NT2S-SF125B-E
				NT2S-SF126B-E
		PLC controlled		NT2S-SF127B-E
NT3S	STN monochrome	Programmable	2 x RS-232/CMOS, No RTC, No RS485	NT3S-ST126B-E
			RS-232/CMOS on one port, RS-232/CMOS/485/422 on second port, No RTC	NT3S-ST124B-E
			RS-232/CMOS on one port, RS-232/CMOS/485/422 on second port with RTC	NT3S-ST123B-E
			RS-232/CMOS/485/422 on both ports with RTC	NT3S-ST121B-E

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, NT 4.0 or XP	NS-NSDC1 included in CX-One
Cable to transfer screens	IBM PC/AT or compatible	XW2Z-S002

NT(-XS) 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
NT2S and NT3S support software for Windows	For all models of these NT-XS series	NT-XS (free downloadable from our website)

Options

NS series accessories

	Specifications		Model
Cable [1]	Screen transfer cable for DOS/V		XW2Z-S002
	USB Host Cable, cable length: 5 m		NS-US52 (5 m)
	USB Host Cable, cable length: 2 m		NS-US22 (2 m)
PT-to-PLC Connecting Cable	PT connection: 9 pins PLC connection:9 pins	Length: 2 m	XW2Z-200T
		Length: 5 m	XW2Z-500T
Accessories	Video input	Inputs: 4 channels NTSC / PAL	NS-CA001
		Inputs: 2 channels NTSC b/ PAL, 1 channel RGB	NS-CA002
	Special cable for the console		F150-VKP (2 m)
			F150-VKP (5 m)
	Controller link interface unit		NS-CLK21
	RS-422A adapter (50 m)		CJ1W-CIF11
	RS-422A adapter (500 m)		NS-AL002
	Anti-reflection sheets (5 surface sheets)	NS12/10	NS12-KBA04
		NS8	NS7-KBA04
		NS5	NT30-KBA04
	Protective anti-reflection covers (5 pack)	NS12/10	NS12-KBA05
		NS8	NS7-KBA05
		NS5	NT31C-KBA05
	Transparent protective covers (5 pack)	NS12/10	NS12-KBA05N
		NS8	NS7-KBA05N
		NS5	NT31C-KBA05N
	Chemical-resistant cover (1 cover)	NS5	NT30-KBA01
	Memory card	15 MB	HMC-EF172
		30 MB	HMC-EF372
		64 MB	HMC-EF672
	Attachment adapter	(NT625C/631/631C series to NS12 series)	NS12-ATT01
		(NT625C/631/631C series to NS12 series)	NS12-ATT01B
		(NT620S/620C/600S series to NS8 series)	NS8-ATT01
		(NT600M/600G/610G/612G series to NS8 series)	NS8-ATT02
	Memory card adapter for pc		HMC-AP001
	Battery		CJ1W-BAT01
	Barcode 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.

NT series accessories

Product	Specification			Model number
Cables	For screen transfer			XW2Z-S002
	For PLC connection	PT: 9-pin PLC: 9-pin	Cable length: 2 m	XW2Z-200T
			Cable length: 5 m	XW2Z-500T
		PT: 9-pin PLC: Mini-peripheral	Cable length: 2 m	NT-CN221
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

NTXS accesories

Cables for	Specification	Model
NT2S-SF121/125 and NT3S	peripheral port CPM series except CPM2C, 2 m	NT2S-CN212-V1
NT2S-SF121/125 and NT3S	peripheral port CPM series except CPM2C, 5 m	NT2S-CN215-V1
NT2S-SF122/SF123/SF126/SF127	peripheral port CPM series except CPM2C, 2 m	NT2S-CN222-V1
NT2S-SF122/SF123/SF126/SF127	peripheral port CPM series except CPM2C, 5 m	NT2S-CN225-V2
NT2S-SF121/125 and NT3S	mini-peripheral port CJ1/CS1 and CPM2C series, 2 m	NT2S-CN223-V2
NT2S-SF122/SF123/SF126/SF127	mini-peripheral port CJ1/CS1 and CPM2C series, 2 m	NT2S-CN224-V1
NT2S-SF121/125 and NT3S	Serial Port PLC and NT2S/NT3S,2M	NT2S-CN232-V1
NT2S-SF121/125 and NT3S	Serial Port PLC and NT2S/NT3S,5M	NT2S-CN235-V1
NT2S-SF122/SF126	Serial Port PLC and NT2S/NT3S,2M	NT2S-CN242-V1

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

Cat. No. V04E-EN-03A