

OMRON

Better SYSMAC Compatibility and Easier-to-use Support Software

NT631/NT31 Version 2

Series



Feel
the change
more!



PT

Programmable
Terminal

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Providing What's Needed in Programmable Terminals

Feel the change more!

NT-series
Support Software
Version 4.1



SYSMAC PLCs



NT631 Version 2



NT31 Version 2



Improved Functionality Based on Complete Research in Designing, Development, and Production Site Needs

To keep in pace with the progress of information technology on production sites, more advanced and more diversified functions are continuously required from operator interfaces. OMRON continuously researches the use of operator interfaces at all stages of application. OMRON scrutinizes system compatibility, design efficiency, and maintenance, and has now achieved new versions of the NT631/NT31 Programmable Terminals with the functionality required by users. Experience the remarkable progress of new NT631/NT31.

Improved SYSMAC Compatibility

Device monitoring and I/O comment loading functions facilitate system construction.

6

Enhanced Screen Creation and Better Design Efficiency

Greatly enhanced NT Support Software with reusable screen data and powerful simulation on editing screens.

8

Windows "Look and Feel" Environment for Easier Operation

Improved operating procedures for NT Support Software with new functions for easier screen creation.

10

New User-friendly Functions and Enhanced Display Versatility

A new operation/interlock function greatly reduces the size of ladder programs. Furthermore, a new display function provides versatile display features and a "recipe" function has been added to make data easier to handle.

12

Easier On-site System Maintenance







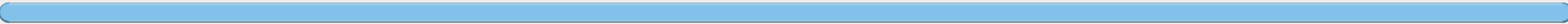
Transfer the system program and screen data to ensure smooth on-site system maintenance and improve the efficiency of on-site work.

14

PT
Programmable Terminal

A Lineup of Models with Versatile Display Features and Easy Operation

Select the most suitable PT according to the display device from three large and two medium-size models. The functions and operability of all models are unified, making replacement with another model easy. Screen data can be used not only from other models, but also from previous models.

		NT631C-ST151(B)-EV2	NT631C-ST141(B)-EV2		NT631-ST211(B)-EV2	NT31C-ST141(B)-EV2	NT31-ST121(B)-EV2
Model							
Display		TFT color display	STN color display		High-contrast EL	STN color display	STN monochrome display
Effective display area		211 x 158 mm	229 x 172 mm		211 x 158 mm	118 x 89 mm	
No. of dots (resolution)		640 x 480 dots			320 x 240 dots		
Max. number of touch switches		32 x 24 switches			16 x 12 switches		
External interface		RS-232C, RS-422A, RS-485, and printer port					
International standards		UL/CSA standards and EC Directives					
Connectable hosts	From OMRON (See note 1.)	1-to-1 NT Link	C200HX(-Z), C200HG(-Z), C200HE(-Z), C200HS-CPU2□, and C200HS-CPU3□		CQM1-CPU4□, CPM1A, CPM2A/C, SRM1, CVM1, CV Series (EV1 or EV2), and C200HX/HG/HE Communications Boards		
		1-to-N NT Link	CS1H, CS1G, C200HX(-Z), C200HG(-Z), C200HE(-Z), and SRM1-EV2		CS1 Communications Unit and CQM1H Communications Board		
		High-speed NT Link			CS1H and CS1G		
		Host Link	CS1H, CS1G, C200HX(-Z), C200HG(-Z), C200HE(-Z), C200HS-CPU2□, C200HS-CPU3□ and CS1 Communications Units		CQM1-CPU4□, CQM1-CPU2□, CPM1A, CPM2A, CPM1C, SRM1, CVM1, CV series (EV1 or EV2), C-series/CV-series/CVM1 Host Link Unit		
		Memory Link			Personal Computer, SBC, and Programmable Controller		
	From Mitsubishi	Mitsubishi FX Series			MELSEC FX1, FX2, FX2C, FXO, and FXON		
		Mitsubishi A-Series Computer Link Unit			AOJ2-C214S1, A1SJ71UC24-R2, A1SJ71UC24-R4, and AJ71UC24		
		Allen Bradley			SLC 5/02, 03, 04, and 05 (see notes 2 and 3.)		
		GE-Fanuc			90-20 and 90-30 Series (see notes 2 and 3.)		
		Siemens			S7-300 and S7-400 Series (see notes 2 and 3.)		
Language	Japanese						
	English						

Note 1: There are some limitations on hosts that can be connected. Refer to the PT manual for details.
 2: The English version of the NT Support Tool must be used.
 3: Connection possible with "-EV1" function only.

Providing What's Needed in Programmable Terminals

Improved SYSMAC Compatibility for Easier System Construction

NEW

Device Monitor Function

The device monitor function makes it possible to read and write I/O memory data and display consecutive sections of PLC data areas. This function greatly improves the efficiency of PLC setup work, including set value input into the Special I/O Units and checks on the settings. Data can be read from I/O memory from a user-created screen to enable application on maintenance screens for monitoring.

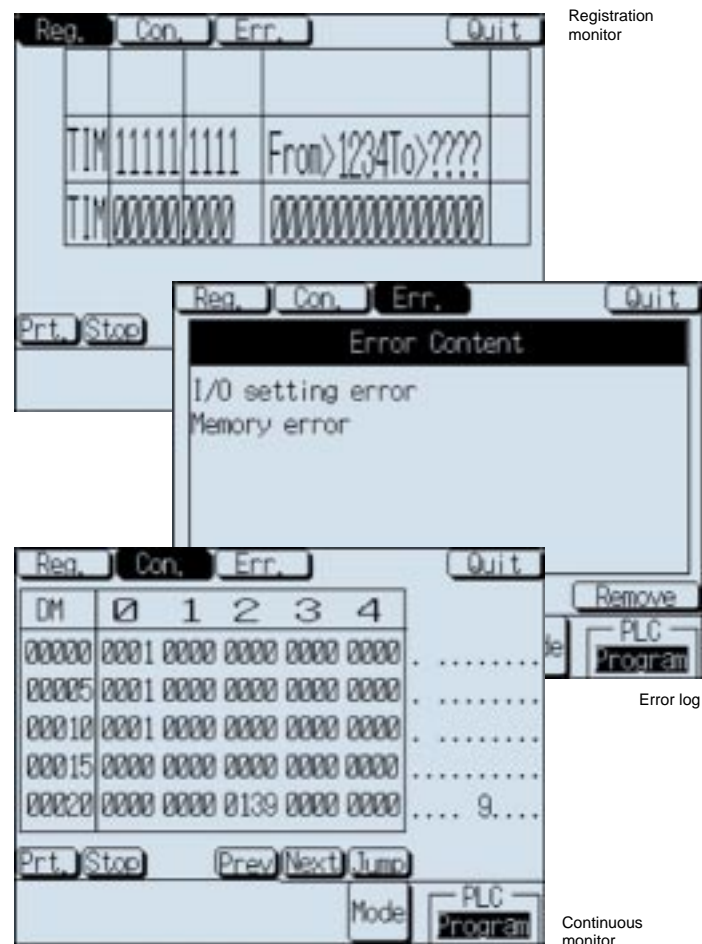


SYSMAC

NT631/NT31

Programming Console Functions

Ladder Programs written in mnemonics can be written and read through the NT631/NT31 screens for easy on-site system maintenance.



Registration monitor

Error log

Continuous monitor

Recipe Function

Using this function, data can be written to and read from the host (PC memory or PT memory) in table format, enabling multiple settings to be transferred between the PT and the host in a single operation.

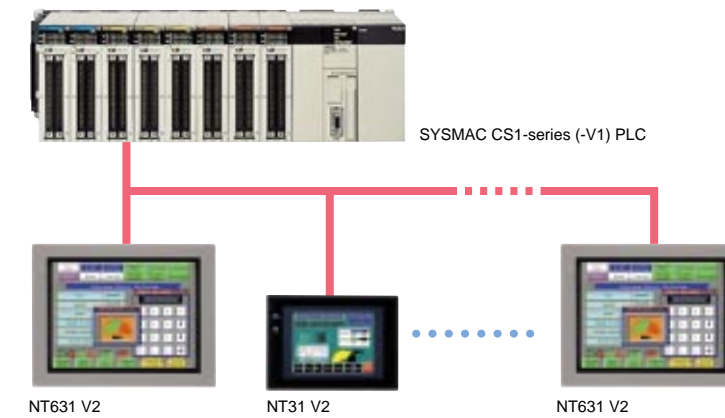
No.	Cake	Cream	Sugar	Egg	Milk
1	Cheese cake	1000	300	20	300
2	Almond cake	300	200	10	250
3	Pound cake	1000	200	10	300
4	Carrot cake	800	150	10	250
5	Butter cake	700	150	20	300
6	Apple cake	500	300	5	200
7	Banana cake	900	300	10	150
8	Layer cake	1000	450	10	300
9	Cream cake	1000	300	15	100
10	Coconut cake	0	0	0	0

NEW

Full-area Access to SYSMAC CS1-series PLCs over High-speed NT Link

Connect to SYSMAC CS1-series PLC over High-speed NT Link

- The industry's highest serial communications speed.
- Up to eight NT631/NT31 Units can be connected to a single port.
- Extends to a maximum of 500 m.
- Essentially the same performance is achieved for NT Links with eight PTs as for an NT Link with a single PT (for refreshing numeric displays).

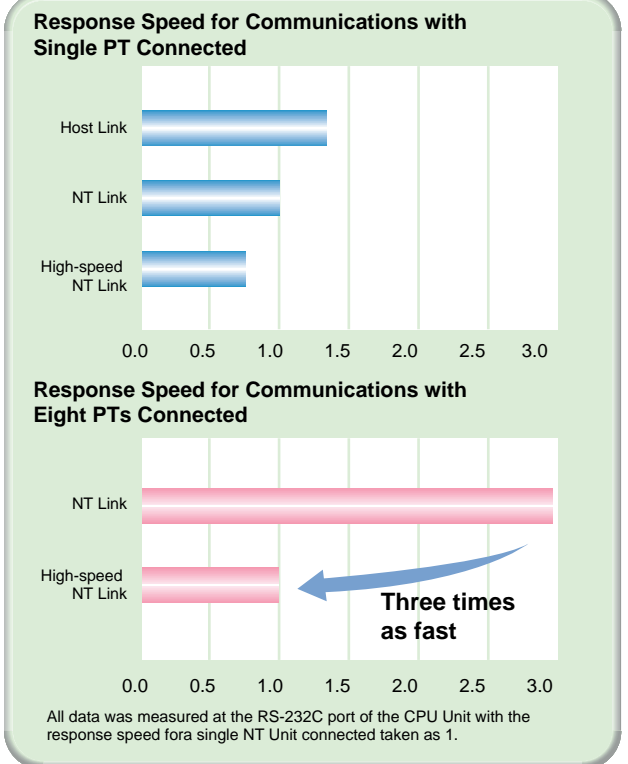


NT631 V2

NT31 V2

NT631 V2

OMRON Data Comparison



Greater Area Access

Addresses Accessible in SYSMAC CS1-series PLCs

For 1-to-N NT Links

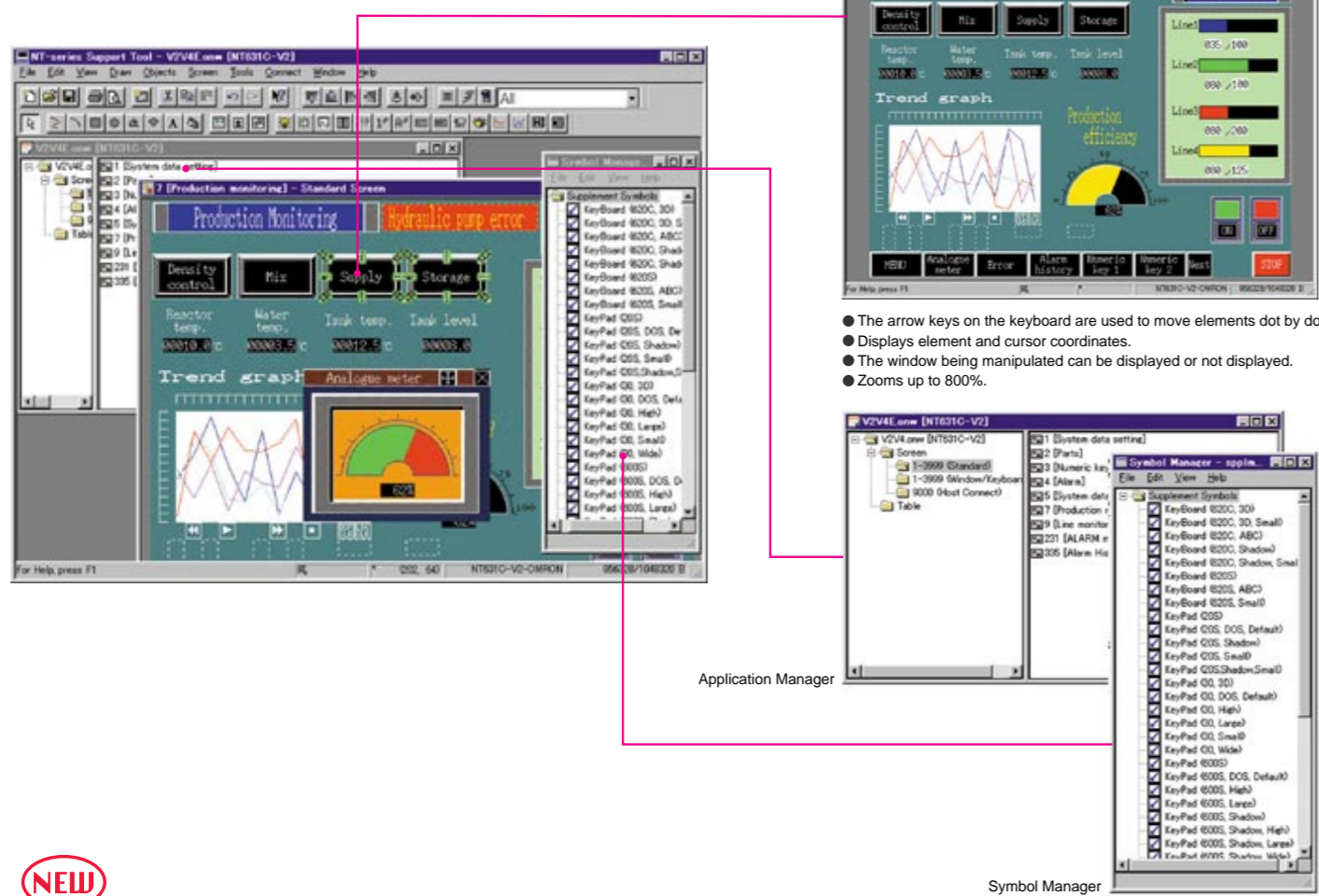
PLC	CIO Area	HR Area	AR Area	Timer/Counter PVs	DM Area	EM Area (EM, EM0, EMC)	WR Area	Task Flag (TK) Area	Timer Completion Flags (TU)	Counter Completion Flags (CU)
CS1G and CS1H	00000 to 06143	00000 to 00511	00448 to 00959	00000 to 04095	00000 to 32767	00000 to 32767	00000 to 00511	00000 to 00031	00000 to 04095	00000 to 04095

Providing What's Needed in Programmable Terminals

Enhanced Screen Creation and Better Design Efficiency with Improved Support Software

Greatly Improved Support Software

Windows Look and Feel environment ensures easy operation, allowing anyone to create screens quickly and easily. The enhanced ON/OFF simulation function of the NT631/NT31 and easy application of existing screen data accelerate product development and designing.



- The arrow keys on the keyboard are used to move elements dot by dot.
- Displays element and cursor coordinates.
- The window being manipulated can be displayed or not displayed.
- Zooms up to 800%.

NEW

Easier Application of Existing Screen Data

It is possible to load screens and tables independently from different screen data files. The NT631/NT31 can now use existing screen data efficiently.

Improved Compatibility with NT30 and NT620 Series

- Image and library data coding.
- Image and library data insertion into character strings.
- The word configuration and functions for the NT631/NT31 status control area and notification area.

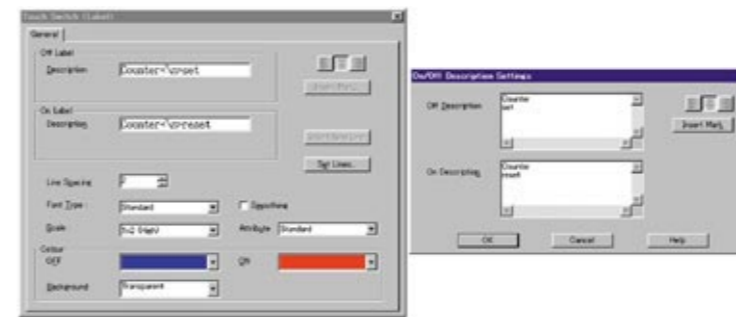


NEW

Complete Display Functionality for Guide Characters and Numeric/Character Strings

Guide Characters

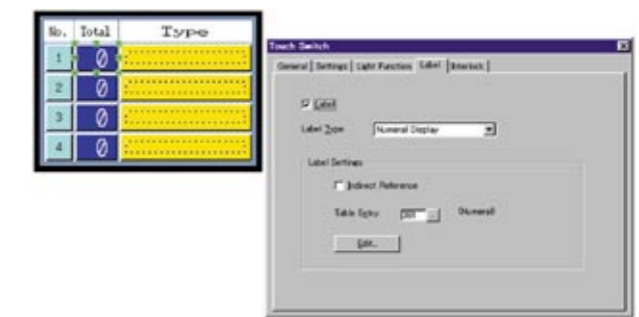
Guide characters for touch switches and lamps can be displayed on multiple lines, can be turned ON and OFF, and can be left-, right-, or center-aligned.



Guide characters on multiple lines

Numeric/Character Strings

A single element makes it possible to create and display a touch switch or lamp, greatly saving the number of steps previously required for image creation.



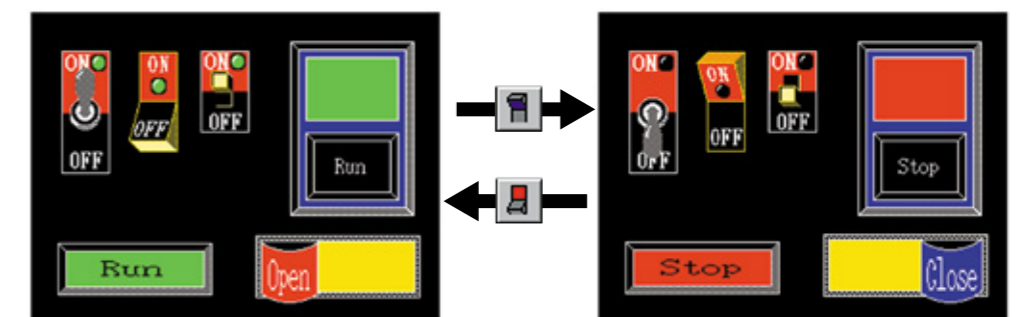
Numeric or Character String TSW

NEW

ON/OFF Simulation on Edit Screen

Easily confirm the ON/OFF status of lamps and touch switches from a personal computer.

A simulated screen with standard elements provided can include touch switches and lamps that are easily registered with the Symbol Manager.



NEW

Many Standard Elements Provided

In addition to ISO symbols, approximately 1,000 lamp and touch switch elements are provided as standard elements. The preview function makes it possible to select and edit these elements with ease. Furthermore, it is possible to copy image tables or library tables independently.

- The image editor makes it possible to enlarge or reduce images.

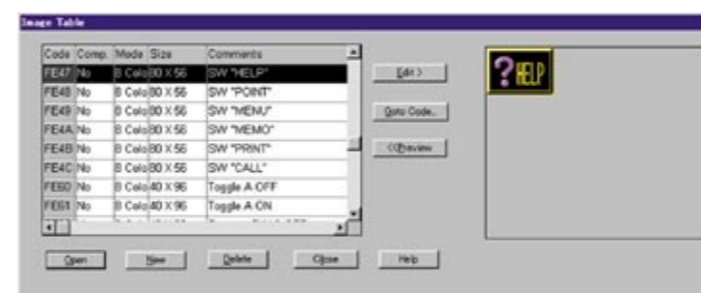
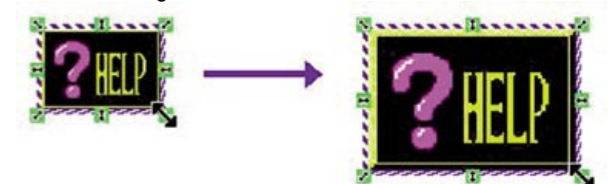


Image table



Color palette

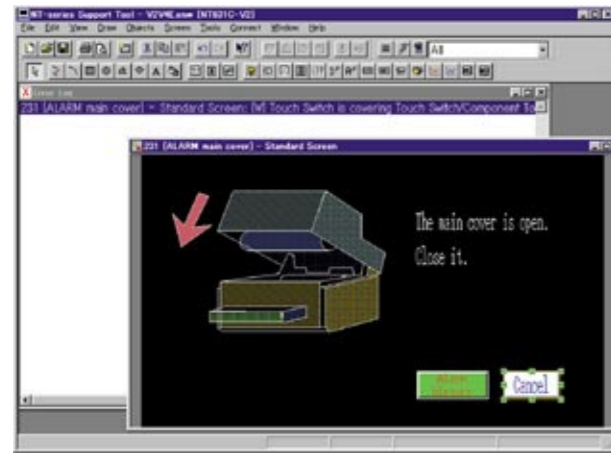


Windows Look and Feel Environment for Easier Operation and Image Creation

Complete Functions in NT Support Software

Error Log Viewer

Double-click the error message to track down the error on the screen.



I/O Comment Table

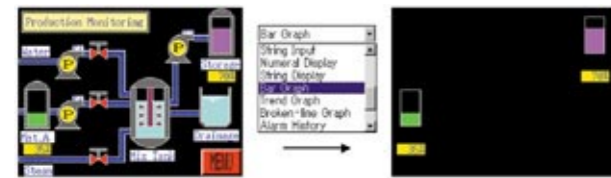
All PLC addresses and I/O comments can be managed together. Addresses that have been allocated are automatically registered in the I/O comment table.

Numeral	String	I/O Comments	Bit Memory
PLC Bit Address	I/O Comment	Ref.	
D0000000	Mtr: Num disp.1	Yes	
D0000100	Mtr: Num disp.2	Yes	
D0000300	Mtr: Trd graph 1	Yes	
D0000400	Mtr: Trd graph 2	Yes	
D0000500	Mtr: Bar graph 1	Yes	
D0000600	Mtr: Bar graph 2	Yes	
D0001000	Set: Num input 1	Yes	
D0001200	Set: Num input 2	Yes	

I/O Comment Table

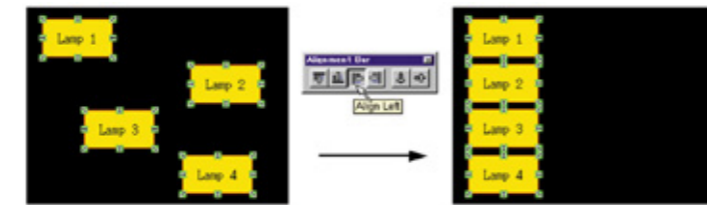
Filter **NEW**

The filter function makes editing easier by displaying only the elements you select for modification.



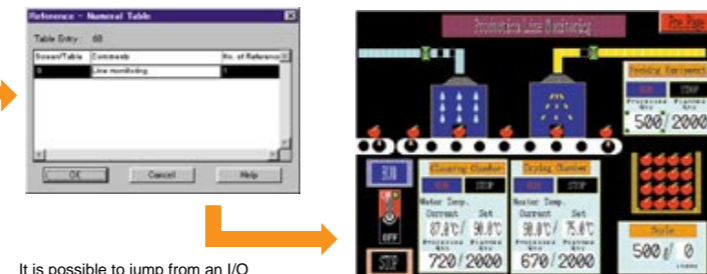
Element Alignment **NEW**

Elements can be top-, bottom-, left-, right-, or center-aligned automatically.



Search Function

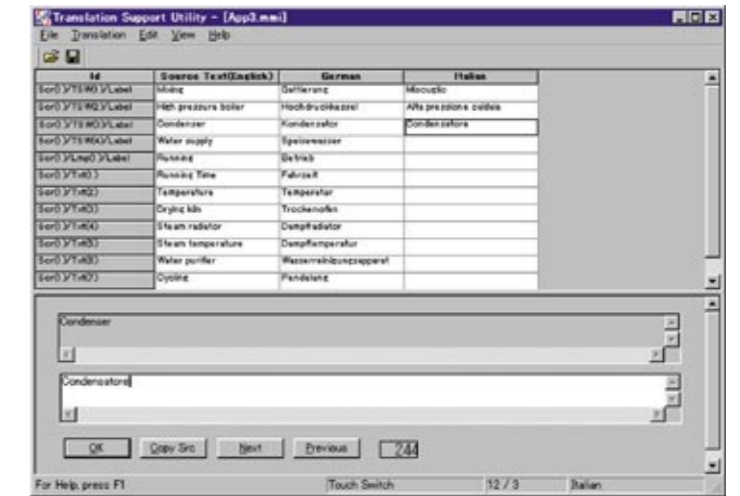
No.	Value	Initial	Storage	Type	Words	PLC Address	I/O Comm.
64	700	<input type="checkbox"/>	System	2	D00064	Heater cui	
65	750	<input type="checkbox"/>	System	2	D00065	Heater set	
66	670	<input type="checkbox"/>	System	2	D00066	Drying chi	
67	2000	<input type="checkbox"/>	System	2	D00067	Drying chi	
68	500	<input type="checkbox"/>	System	2	D00068	Packing p	
69	2000	<input type="checkbox"/>	System	2	D00069	Packing p	
70	500	<input type="checkbox"/>	System	2	D00070	Scale (g)	
71	10	<input type="checkbox"/>	System	2	D00071	Scale item	
72	0	<input type="checkbox"/>	System	2	00244		



It is possible to jump from an I/O comment table address to the screen where the element is located.

Translation Support Utility

Currently, translation for label contents in NTST can only be performed manually by opening and editing individual visible string contents in NTST, before downloading applications to a different language PT. The Translation Support Utility enables you to load the memory map image file (.MMI) for the source language and be able to translate the new string contents of the application and generate independent memory map files (.MMI) for the specified target language.



Better Keyboard Operation

Short-cut Keys

Menu	Function	Key
File	New	Ctrl + N
	Open	Ctrl + O
	Save	Ctrl + S
	Print	Ctrl + P
Editing	Undo	Ctrl + Z
	Redo	Ctrl + Y
	Cut	Ctrl + X
	Copy	Ctrl + C
	Paste	Ctrl + V
	Align top	Ctrl + ↑
	Align bottom	Ctrl + ↓
	Align left	Ctrl + ←
	Align right	Ctrl + →
	Align horizontal center	Ctrl + F9
	Align vertical center	Ctrl + Shift + F9
Delete	Del	
Select all	Ctrl + A	

In the above table, "Ctrl +" means to select the specified key while holding down the Control Key.

Menu	Function	Key
Display	Redraw	F9
	Group	Ctrl + G
Draw	Ungroup	Ctrl + U
	Move to front	Ctrl + F
	Move to back	Ctrl + B
Screen	Center	Ctrl + L
	New	Ctrl + W
	Delete	Ctrl + E
Tool	Memory table	Ctrl + T
	Error check	F12
Connection	Download (all screen data)	Ctrl + Shift + D
	Upload (all screen data)	Ctrl + Shift + U
Non-menu items	Show properties	Alt + Enter
	Select element	Display order: Tab Reverse display order: Shift + Tab
	Element edit mode ON/OFF	Insert
	Element edit mode ON and select element	Ctrl + Shift + Click

System Requirements

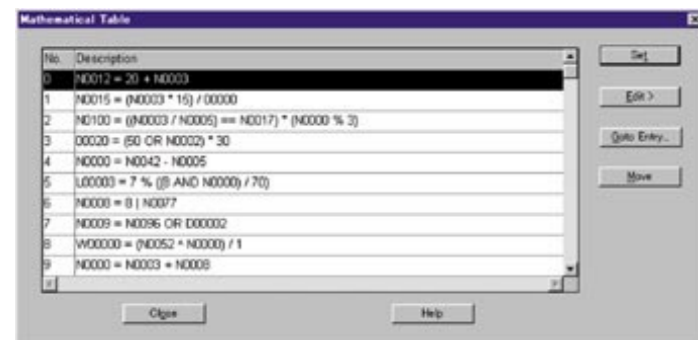
- CPU: Pentium 100 MHz min.
- RAM: 32 MB min.
- Hard disk: Software capacity: 17 MB, Installer: 3 MB, Sample elements: 32 MB
- OS: Windows 95/98 or Windows NT 4.0
- Media: CD-ROM

New User-friendly Functions for Greater Display Versatility

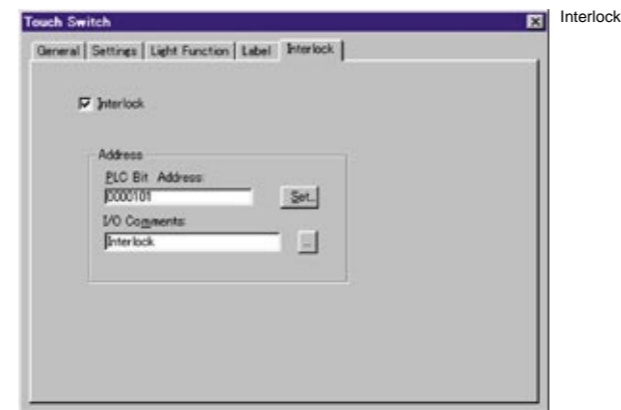
NEW

Mathematical/Interlock Function

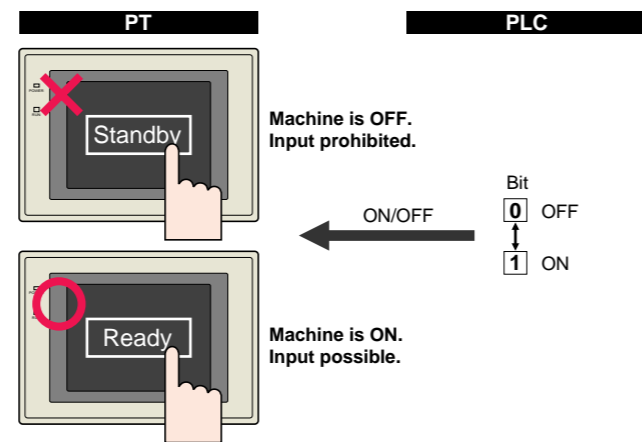
The mathematical/interlock function can be used to create screens, greatly eliminating the size of ladder programs and enabling easier program modifications. This function allows up to five arithmetic operations (i.e., addition, subtraction, multiplication, and division) or boolean operations (e.g., AND and OR) to be used on the NT631/NT31.



Mathematical table



Example: While the machine is not ready to operate, "Standby" will appear on the touch switch prohibiting the operation of the machine. When the machine is ready to operate, "Ready" will appear on the touch switch permitting command inputs.



Multi-window Display Allows Optimum Screen Application

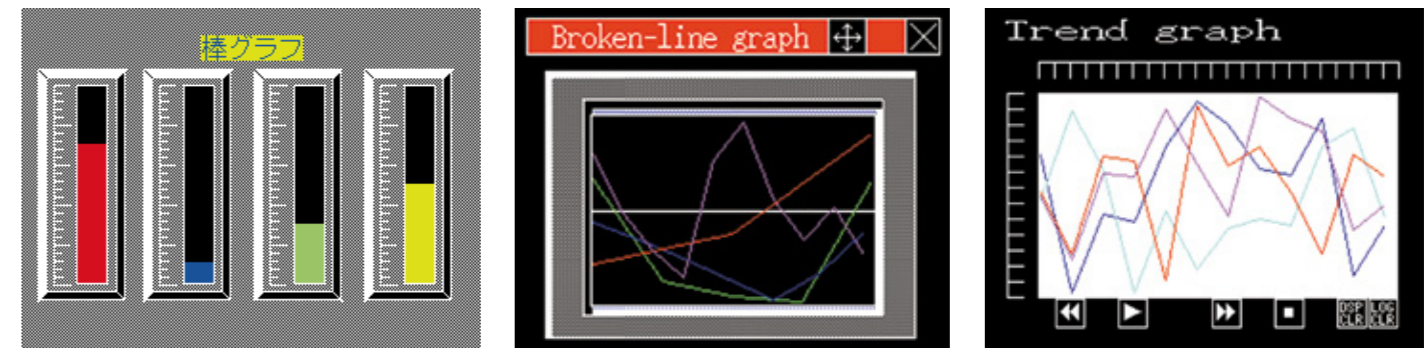
Up to three windows can be displayed simultaneously. A window can be moved with the touch of a finger. Furthermore, windows can be opened and closed from the PLC using operations in the Window Control Area.



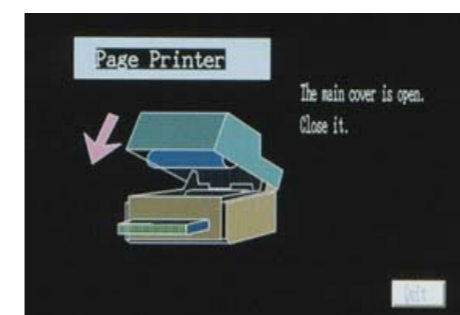
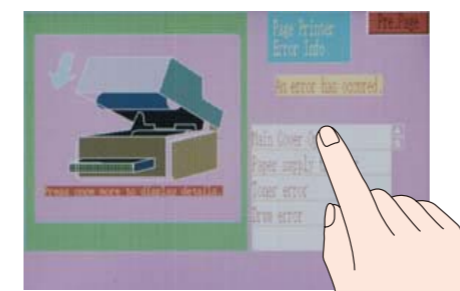
Versatile, Enhanced Display Functions

Enhanced Graphics

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



Alarm List for Real-time Display of Errors



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

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.



Providing What's Needed in Programmable Terminals

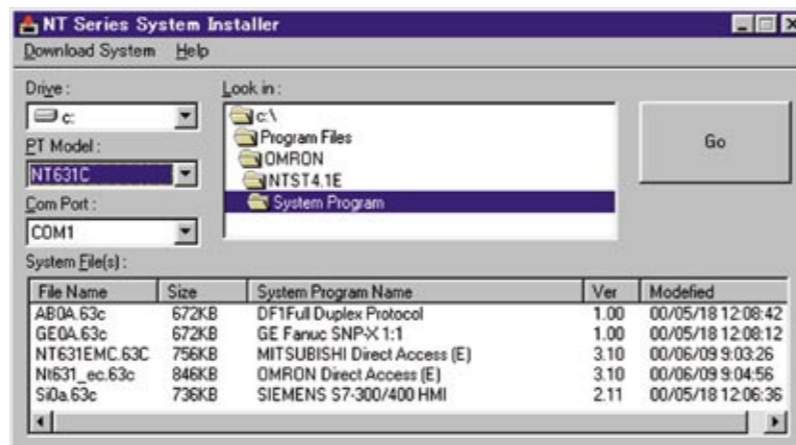
Easier On-site Maintenance

System Program Transfer

By transferring a new system program, functions and performance can be updated without changing hardware.

System Programs Provided

- For NT31/NT631: OMRON version (Memory Link) and Mitsubishi version
- For NT30/NT620: OMRON version, Mitsubishi version, and Memory Link version
- For NT11S



System installer

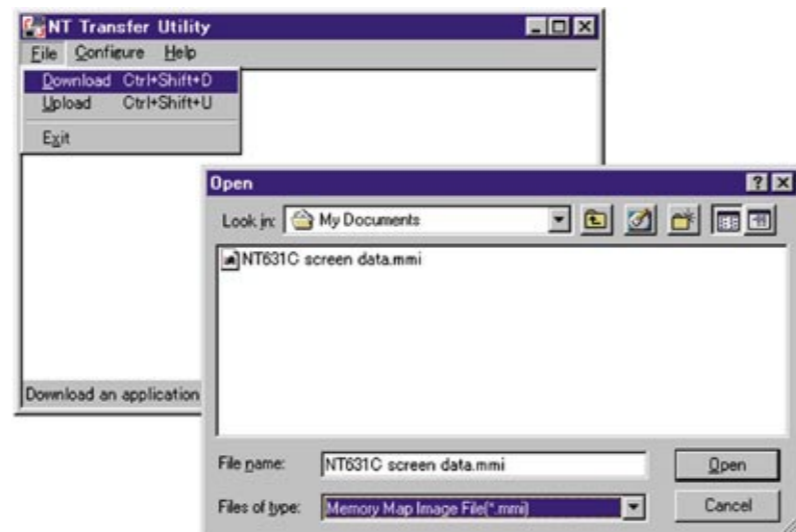
Memory Unit Provides Easy and Immediate Screen Data Transfer

Simply attaching the Memory Unit to the back of the NT631/NT31 allows easy transfer of screens. Up to two banks can be registered and it is possible to transfer both system programs and screen data.



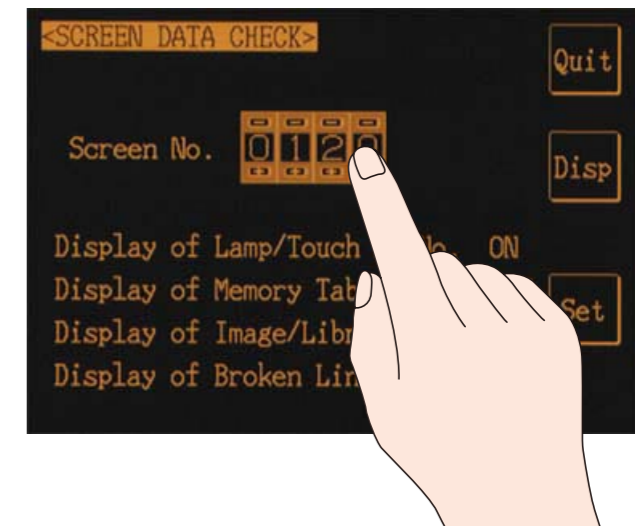
Special Utility to Transfer Screen Data

It is possible to transfer screens by using a special software application instead of the NT Support Software. The software application can be set up separately.



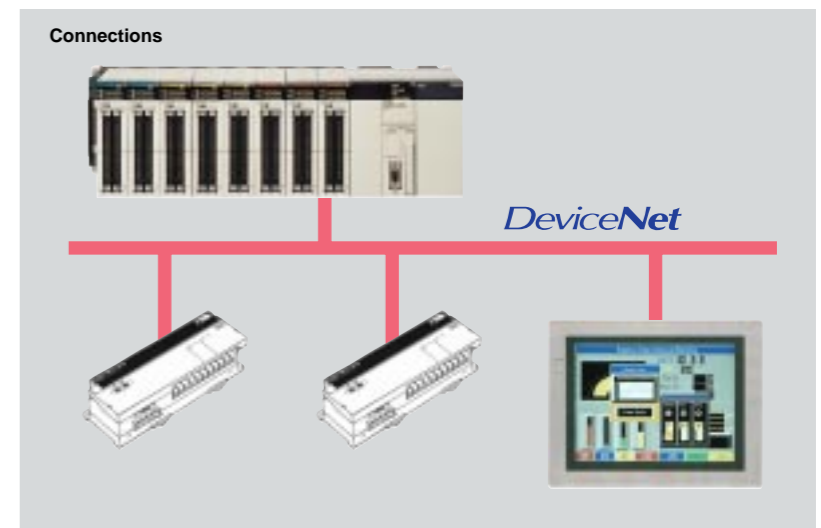
Screen Data Checked without Programmable Controller Connected

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



DeviceNet Compatible

The NT631/NT31 is compatible with DeviceNet for I/O allocations and message communications, promoting further standardization. With the DeviceNet Interface Unit (under development) mounted, version 1 or older versions of NT631/NT31 can also be connected to the DeviceNet.

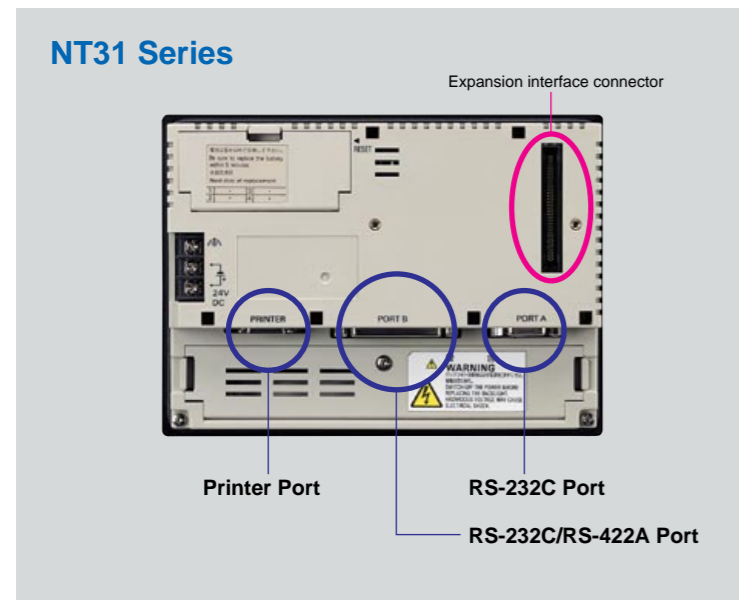
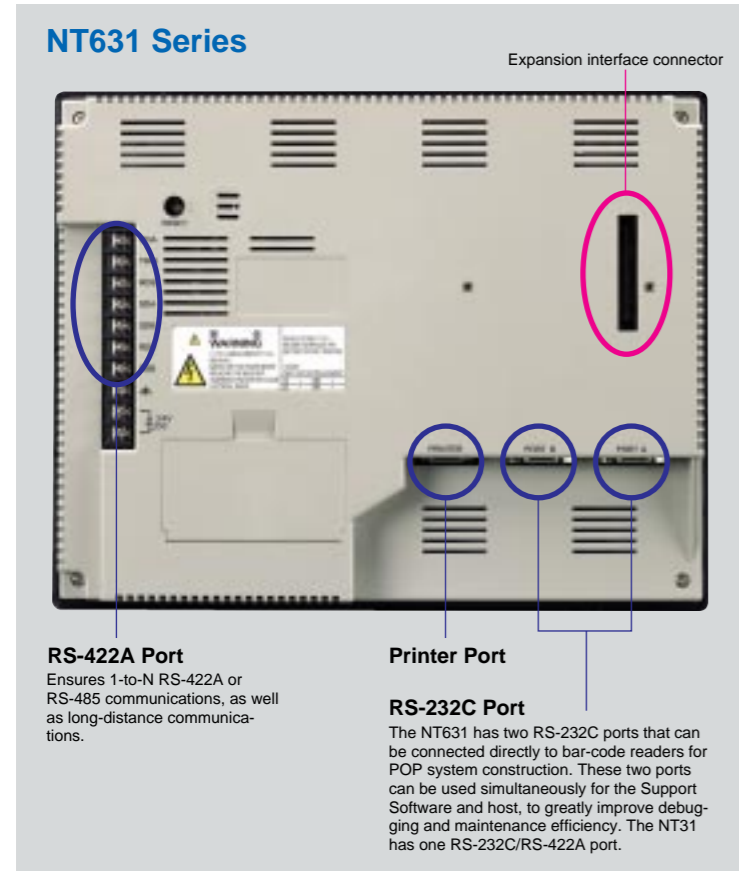


English, European, and Asian Language Support

Both European and English languages are supported by -EV1 models. Furthermore, models supporting Chinese, Taiwanese, and Korean are available. The NT Support Software also supports all of these languages. Contact your OMRON representative for details.

Improved Communications Interface

Three Types of Built-in Communications Ports Enable Easy External Interfaces



Flat, Thin-profile Model Only 54 mm Thick

All models have flat, smooth surfaces and are only 54 mm thick, which is ideal for space-saving designs built into equipment.

Conformance to IP65F Ensures a High Degree of Resistance to the Environment

The NT631/NT31 has a flush-surface construction and is highly resistive to severe operating environments. The front panel conforms to IP65F.

- IP: International Protection
- 6: Resistant to dust (protected from solid objects)
- 5: Resistant to water spray from any direction (protected from water immersion)
- F: Resistant to oil drops or sprayed oil

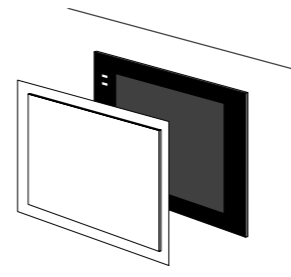
The NT631/NT31 cannot be used in locations where it will be subjected to oil spray over a long period of time.

Conformity to International Standards Ensures Suitability for Exports

The NT631/NT31 conforms to UL/CSA standards and EC Directives.



Protective Cover (Sold Separately)



Material	Polyester film
Mounting method	Double-sided tape
Model numbers	NT31C-KBA05 NT631C-KBA05

The Protective Cover protects the surface of the NT631/NT31 from oil, dust, or fingerprints.

Specifications

NT631C/NT631

General Specifications

Item	NT631C-ST141(B)-EV2	NT631C-ST151(B)-EV2	NT631-ST211(B)-EV2	
Rated 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	18 W max.		30 W max.	
Ambient operating temperature	0° to 40°C	0° to 50°C		
Ambient storage temperature	-20° to 60°C			
Ambient operating humidity	35 to 85 % RH (with no condensation)			
Ambient operating environment	No corrosive gases			
Noise resistance	Common mode	1,000 Vp-p (between the power supply terminals and panel) (see note 2)		
	Normal mode	300 Vp-p (see note 2)		
	Pulse range	100 ns to 1 μs (see note 2)		
	Rise time	1 ns pulse (see note 2)		
Vibration resistance (when operating)	10 to 57 Hz, amplitude of 0.075 mm 57 to 150 Hz, 1 G (9.8 m/s ²) Acceleration in X, Y, and Z directions for 30 min.	10 to 54.8 Hz, amplitude of 0.075 mm Acceleration in X, Y, and Z directions for 30 min.		
	Shock resistance (when operating)	147 m/s ² (15 G), 3 times each in X, Y, and Z directions		
Weight	2.5 kg max.			
Degree of protection (front panel)	Equivalent to IP65F, NEMA 4 (see note 1)			
Applicable EC Directives or Standards	EC Directives	EMC Directives:	89/336/EEC, 92/31/EEC	
		Low Voltage Directives:	73/23/EEC	
		Standards	EMI	EN50081-2: 1993
		EMS	EN61131-2: 1995	
Electrical Safety	EN61131-2: 1995			

Note: 1. The equipment cannot be used for long periods of time in locations which expose the panel to spills of oil.
2. Conforms to IEC61000-4-4 at 2 kV (power supply line)

Display/Panel Specifications

Item	NT631C-ST141(B)-EV2	NT631C-ST151(B)-EV2	NT631-ST211(B)-EV2	
Display	Display	Color STN LCD	Color TFT LCD	
	Number of dots (resolution)	640 dots (horizontal)X480 dots (vertical)		
	Effective display area	229X172 mm (11.3 inches)		
	View angle	Up/Down: ±30° Left: 55° Right: 45°	Up: 40° Left: 55° Down: 55° Right: 55°	No restrictions
	Display color	8 colors (intermediate colors can be displayed in tiling patterns)		Black/White (2 colors)
	Life expectancy	50,000 hours (until contrast is reduced by 50%)		30,000 hours (until brightness is reduced by 30%)
Backlight (cold cathode tube)	Contrast adjustment	100 levels of adjustment possible using the front touch panel	---	
	Life expectancy (when brightness is set to high)	25,000 hours min. (see note 1)	30,000 hours min. (see note 1)	
	Replacement	User replacement possible from rear panel		
LED	Brightness	3 levels of adjustment possible using the front touch panel (see note 2)	---	
	Automatic turn-OFF	1 to 255 minutes/None		
	POWER	Green	Lit while power is being supplied	
	RUN	Green	Lit in green: Running normally, Memory unit automatic transmission done	
Flash in green		Flash in green: Memory unit automatic transmission being executed, memory unit automatic transmission error		
Orange		Lit in orange: Low battery voltage (during operation)		
Red	Flash in red: Low battery voltage (when NT631/NT631C is stopped)			

Note: 1. The time until brightness is reduced by half, under normal temperature and normal humidity.
2. Large changes in brightness adjustment are not possible.

Operation Specifications

Item	NT631C-ST141(B)-EV2/NT631C-ST151(B)-EV2/NT631-ST211(B)-EV2	
Touch panel	Number of switches	768 (32X24)
	Input	Pressure sensitive
	Operating force	1 N (approx. 100 gf) min.
	Life expectancy	1,000,000 operations min.

External I/F Specifications

Item	NT631C-ST141(B)-EV2/NT631C-ST151(B)-EV2/NT631-ST211(B)-EV2	
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, (RS-422A/485 selectable by memory switch setting) D-sub 9-pin connector (female) EIA RS-422A/485, (RS-232C selectable by memory switch setting) Terminal block
Parallel I/F	Conforms to Centronics specifications, 20-pin half-pitch connector	
Expansion I/F	Dedicated connector	

Specifications

NT31C/NT31

■General Specifications

Item		NT31C-ST141(B)-EV2/NT31-ST121(B)-EV2	
Rated 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.	
Ambient operating temperature		0° to 50°C	
Ambient storage temperature		-20° to 60°C	
Ambient operating humidity		35 to 85 % RH (with no condensation)	
Ambient operating environment		No corrosive gases	
Noise resistance	Common mode	1,000 Vp-p (between the power supply terminals and panel) (see note)	
	Normal mode	300 Vp-p (see note)	
	Pulse range	100 ns to 1 μs (see note)	
	Rise time	1 ns pulse (see note)	
Vibration resistance (when operating)		10 to 57 Hz, amplitude of 0.075 mm 57 to 150 Hz, 1 G (9.8 m/s ²) Acceleration in X, Y, and Z directions for 60 min.	
Shock resistance (when operating)		147 m/s ² (15 G), 3 times each in X, Y, and Z directions	
Weight		1 kg max.	
Applicable EC Directives or Standards	EC Directives	EMC Directives: 89/336/EEC, 92/31/EEC	
		Low Voltage Directives: 73/23/EEC	
		Standards EMI	EN 50081-2: 1993
		EMS	EN 61131-2: 1995
Electrical Safety		EN 61131-2: 1995	

Note: Conforms to IEC61000-4-4 at 2 kV (power supply line)

■Display/Panel Specifications

Item		NT31C-ST141(B)-EV2	NT31-ST121(B)-EV2	
Display	Display	Color STN LCD (with backlight)	Monochrome STN LCD (with backlight)	
	Number of dots (resolution)	320 dots (horizontal)X240 dots (vertical)		
	Effective display area	118.2X89.4 mm (5.7 inches)		
	View angle	Up: 45°	Up: 20° Down: 30° Left/Right: ±30°	
		Down: 60° Left/Right: ±50°		
	Display color	8 colors (intermediate colors can be displayed in tiling patterns)	Black/White (2 colors)	
	Life expectancy	50,000 hours (until contrast is reduced by 50%)		
Contrast adjustment	100 levels of adjustment possible using the front touch panel			
Backlight (cold cathode tube)	Life expectancy (low, medium brightness)	At low or medium brightness: 25,000 hours minimum At high brightness: 10,000 hours minimum		
	Replacement	User replacement possible from rear panel		
	Brightness adjustment	3 levels of adjustment possible using the front touch panel		
LED	Automatic turn-OFF	1 to 255 minutes/None		
	POWER RUN	Green	Lit while power is being supplied	
		Green	Lit during operation	
		Orange	Lit when the battery voltage is low (when operating)	
Red		Lit when the battery voltage is low (when stopped)		

■Operation Specifications

Item		NT31C-ST141(B)-EV2/NT31-ST121(B)-EV2
Touch panel	Number of switches	192 (16X12)
	Input	Pressure sensitive
	Operating force	1 N (approx. 100 gf) min.
	Life expectancy	1,000,000 operations min.

■External I/F Specifications

Item		NT31C-ST141(B)-EV2/NT31-ST121(B)-EV2
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 (RS-422A/485 selectable by memory switch setting) D-sub 25-pin connector (female)
Parallel I/F	Conforms to Centronics specifications, 20-pin half-pitch connector	
Expansion I/F	Dedicated connector	

■Display Capacity

Item	NT631C-ST141(B)-EV2/NT631C-ST151(B)-EV2/NT631-ST211(B)-EV2	
Display elements	Character displays (fixed display)	Fixed character data (character strings registered for each screen) Maximum combined total with other fixed display elements of 65,535 per screen (maximum of 524,280 for an overlapping screen)
	Character string displays	Up to 256 per screen (1,024 for an overlapping screen) (40 bytes per string)
	Numerical displays	Up to 256 per screen (1,024 for an overlapping screen), max. 10-digit display
	Bar graph displays	Up to 50 per screen (400 for an overlapping screen*), percentage display and sign display are possible
	Mark displays (fixed display)	Up to 65,535 per screen (52,480 for an overlapping screen*)
	Analogue meter	Up to 50 per screen (400 for an overlapping screen*), percentage display and sign display are possible.
	Trend graphs	One frame per screen (max. of 8 frames on an overlapping screen) Without the data logging function: 50 graphs per screen data file With the data logging function: 8 graphs per screen data file
	Broken line graphs	One frame per screen (max. of 8 frames on an overlapping screen), 256 graphs per frame, 512 points per graph
	Graphic displays (fixed display)	Can be displayed wherever required. Maximum combined total with other fixed display elements of 65,535 per screen (maximum of 524,280 for an overlapping screen)
	Lamps	Up to 256 per screen (1,024 for an overlapping screen)
	Touch switches	Up to 256 per screen
	Image data	Combined total, with library data, of 256 per screen (1,024 for an overlapping screen)
	Library data	Combined total, with image data, of 256 per screen (256 for an overlapping screen also)
	Numerical inputs	Combined total, with thumbwheel switches, of 256 per screen (Can only be registered on one child screen of an overlapping screen.)
	Character string inputs	Up to 256 per screen (Can only be registered on one child screen of an overlapping screen.)
	Alarm lists	Up to 4 groups per screen (32 groups for an overlapping screen)
	Alarm histories	(For alarm histories, 1 group each in occurrence order and frequency order on normal screens/child screens)*2
	Clock display	Time display of the built-in clock using the numeral display function
	Recipes	1 per screen
	Screen types	Normal screen
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. All objects other than thumbwheel type numeric input can be registered.
Display history screens		Order of occurrence (max. 1,024 screens), order of frequency (max. 255 times)
Screen attributes		Buzzer, display history, background color (NT631C only), 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 order) screen 9002: Display history (frequency order) screen 9020: Programming Console function screen 9030: Brightness and contrast adjustment screen (NT631C-ST141(B) only) 9999: Return to the previous screen
Screen registration method		By transmitting screen data created using the Support Tool to the NT631/NT631C By transmitting screen data stored in a memory unit to the NT631/NT631C (automatic/manual)
Screen saving method (screen data memory)		Flash memory (screen data memory in the PT)

*1 Limits on numbers of elements on a window is same as on a standard screen. Therefore, when 3 windows are displayed, the maximum number is increased by 3 screens.

*2 When displaying image/library data, the restrictions on image and library data must be observed.

■Display Element Specifications

Item	NT631C-ST141(B)-EV2	NT631C-ST151(B)-EV2	NT631-ST211(B)-EV2
Display characters	Half-size characters (8X8 dots): Alphanumerics and symbols Normal-size characters (8X16 dots, 16X32 dots*): Alphanumerics and symbols Mark data (16X16 dots): User defined picture characters		
Enlargement function	Normal size, double width, double height, and magnifications of 4X, 9X, 16X, 64X		
Smoothing processing	Available for enlarged characters with magnification of 4X or greater (excluding mark data)		
Character display attribute	Normal, flashing, reverse flashing, transparent		
Image data	Variable-size pictograph Size: Min. 8X8 dots, Max. 640X480 dots The size can be set in 8-dot units. It is not possible to set enlarged display, smoothing processing, or display attributes such as reverse/flashing.		
Library data	Combination of any characters and graphics Size: Min. 1X1 dots, Max. 640X480 dots Any size can be set. Enlarged display, smoothing processing, and display attributes such as reverse/flashing are displayed according to the setting registered.		
Graphics	Polyline, circle, arc, fan, square, polygon		
Line type	4 types only for polyline (solid line, broken line, alternate long and short dash, long and two short dashes)		
Tiling	10 types		
Graphic display attribute	Normal, flashing, reverse, reverse flashing		
Display colors	8 colors (black/blue/red/purple/green/light blue/yellow/white)		2 colors (black/white)
Color specification	Foreground color, background color, boundary color (line color)		

*Usable only when "ISO8859-1" font type is selected at the Support Tool

■Number of Display Items

Item	Model	NT631C-ST141(B)-EV2/NT631C-ST151(B)-EV2/NT631-ST211(B)-EV2
Screen data capacity		1 MB
Numeric memory table		2 words x up to 2,000 (1,000 tables can be backed up with battery)
Character string memory table		40 normal-size characters x up to 2,000 (Data can be written to and read from 500 tables)
Bit memory table		1 bit x 1,000
Mathematical table		256
Recipe table		40 KB
Mark data		224 (16-by-16-dot basis)
Image data		4,095 items
Library data		12,288 items

Dimensions

■ Display Capacity

Item		NT31C-ST141(B)-EV2/NT31-ST121(B)-EV2
Display elements	Character displays (fixed display)	Fixed character data (character strings registered for each screen) Maximum combined total with other fixed display elements of 65,535 per screen (maximum of 524,280 for an overlapping screen)
	Character string displays	Up to 256 per screen (1,024 for an overlapping screen) (40 bytes per string)
	Numerical displays	Up to 256 per screen (1,024 for an overlapping screen), max. 10-digit display
	Bar graph displays	Up to 50 per screen (400 for an overlapping screen*), percentage display and sign display are possible
	Mark displays (fixed display)	Up to 65,535 per screen (52,480 for an overlapping screen*)
	Analogue meter	Up to 50 per screen (400 for an overlapping screen*), percentage display and sign display are possible.
	Trend graphs	One frame per screen (max. of 8 frames on an overlapping screen) Without the data logging function: 50 graphs per screen data file With the data logging function: 8 graphs per screen data file
	Broken line graphs	One frame per screen (max. of 8 frames on an overlapping screen), 256 graphs per frame, 320 points per graph
	Graphic displays (fixed display)	Can be displayed wherever required. Maximum combined total with other fixed display elements of 65,535 per screen (maximum of 524,280 for an overlapping screen)
	Lamps	Up to 256 per screen (1,024 for an overlapping screen)
	Touch switches	Up to 256 per screen (same restriction applies to overlapping screens)
	Image data	Combined total, with library data, of 256 per screen (1,024 for an overlapping screen)
	Library data	Combined total, with image data, of 256 per screen (same restriction applies to overlapping screens)
	Numerical inputs	Numeric key type: Up to 256 per screen (Can only be registered on one child screen of an overlapping screen.) Thumbwheel type: Up to 64 per screen (Can only be registered on one child screen of an overlapping screen.)
	Character string inputs	Up to 256 per screen (Can only be registered on one child screen of an overlapping screen.)
	Alarm lists	Up to 4 groups per screen (32 groups for an overlapping screen)
	Alarm histories	(For alarm histories, 1 group each in occurrence order and frequency order on normal screens/child screens)
Clock display	Time display of the built-in clock using the numeral display function	
Recipes	1 per screen	
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. All objects other than thumbwheel type numeric input can be registered.
	Display history screens	Order of occurrence (max. 1,024 screens), order of frequency (max. 255 times)
Screen attributes		Buzzer, display history, background color (NT31C only), 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 order) screen 9002: Display history (frequency order) screen 9030: Brightness and contrast adjustment screen 9020: Programming Console function screen 9999: Return to the previous screen
Screen registration method		By transmitting screen data created using the Support Tool to the NT31/NT31C By transmitting screen data stored in a memory unit to the NT31/NT31C (automatic/manual)
Screen saving method (screen data memory)		Flash memory (screen data memory in the PT)

*1 Limits on numbers of elements on a window is same as on a standard screen. Therefore, when 3 windows are displayed, the maximum number is increased by 3 screens.

■ Display Element Specifications

Item	NT31C-ST141(B)-EV2	NT31-ST121(B)-EV2
Display characters	Half-size characters (8X8 dots): Alphanumerics and symbols Normal-size characters (8X16 dots*, 16X32 dots*): Alphanumerics and symbols Mark data (16X16 dots): User defined picture characters	
Enlargement function	Normal size, double width, double height, and magnifications of 4X, 9X, 16X, 64X	
Smoothing processing	Available for enlarged characters with magnification of 4X or greater	
Character display attribute	Normal, reverse, flashing, reverse and flashing, transparent	
Image data	Variable-size pictograph Size: Min. 8X8 dots, Max. 320X240 dots The size can be set in 8-dot units. It is not possible to set enlarged display, smoothing processing, or display attributes such as reverse/flashing.	
Library data	Combination of any characters and graphics Size: Min. 1X1 dots, Max. 320X240 dots Any size can be set. Enlarged display, smoothing processing, and display attributes such as reverse/flashing are displayed according to the setting registered.	
Graphics	Polyline, circle, arc, fan, square, polygon	
Line type	4 types only for polyline (solid line, broken line, alternate long and short dash, long and two short dashes)	
Tiling	10 types	
Graphic display attribute	Normal, flashing, reverse, reverse flashing	
Display colors	8 colors (black/blue/red/purple/green/light blue/yellow/white)	
Color specification	Foreground color, background color, boundary color (line color)	2 colors (black/white)

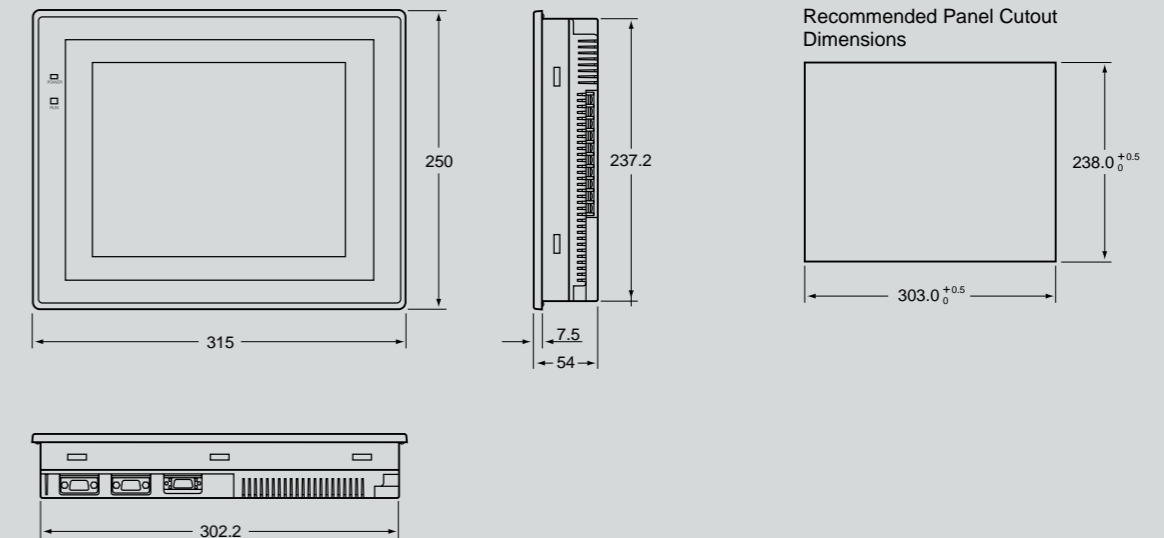
*Usable only when "ISO8859-1" font type is selected at the Support Tool

■ Number of Display Items

Item	Model	NT31C-ST141(B)-EV2/NT31-ST121(B)-EV2
Screen data capacity		1 MB
Numerical memory table		2 words x up to 2,000 (1,000 tables can be backed up with battery)
Character string memory table		40 normal-size characters x up to 2,000 (Data can be written to and read from 500 tables)
Bit memory table		1 bit x 1,000
Mathematical table		256
Recipe table		40 KB
Mark data		224 (16-by-16-dot basis)
Image data		4,095 items
Library data		12,288 items

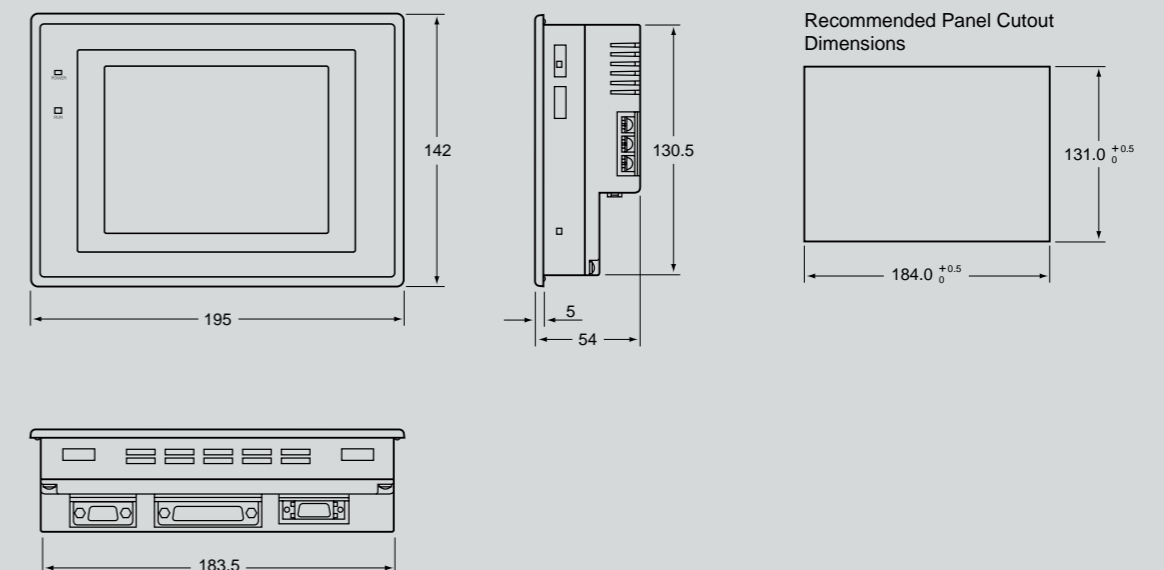
NT631C/NT631

■ Dimensions (Unit: mm)



NT31C/NT31

■ Dimensions (Unit: mm)



Ordering Information

■ NT631/NT31 Standard Models

Item	Specification		Model
NT631	TFT color	Frame color: beige	NT631C-ST151-EV2
		Frame color: black	NT631C-ST151B-EV2
	STN color	Frame color: beige	NT631C-ST141-EV2
		Frame color: black	NT631C-ST141B-EV2
	EL	Frame color: beige	NT631-ST211-EV2
		Frame color: black	NT631-ST211B-EV2
NT31	STN color	Frame color: beige	NT31C-ST141-EV2
		Frame color: black	NT31C-ST141B-EV2
	STN monochrome	Frame color: beige	NT31-ST121-EV2
		Frame color: black	NT31-ST121B-EV2
Support Software	English	Windows 95/98, Windows NT, CD-ROM	NT-ZJCAT1-EV4
Cable	Printer	For hardcopies of screens	NT-CNT121
Option	DeviceNet Interface Unit		NT-DRT21
	Protective sheet	Display section only NT631C/631 (5 sheets)	NT610C-KBA04
		Display section only NT31C/31 (5 sheets)	NT30-KBA04
	Protective Cover	NT631C/NT631 (set of 5 covers)	NT631C-KBA05
		NT31C/NT31 (set of 5 covers)	NT31C-KBA05
	Chemical resistant cover	Silicon cover for NT631C/NT631	NT625-KBA01
		Silicon cover for NT31C/NT31	NT30-KBA01
	Backlight	NT631C-ST151□	NT631C-CFL01
		NT631C-ST141□	NT631C-CFL02
		NT31C/31	NT31C-CFL01
memory unit	NT631□/NT31□ (common)		NT-MF261