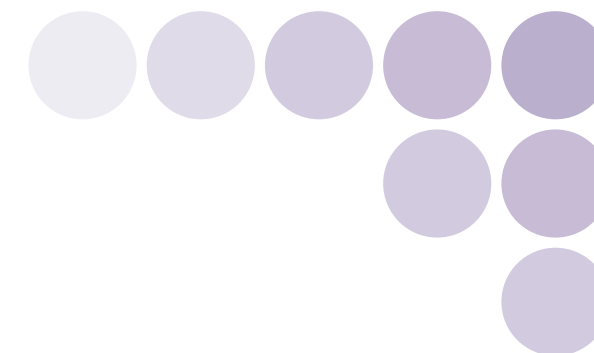


Programmable Terminals NT11/NT21



Warranty and Limitations of Liability

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

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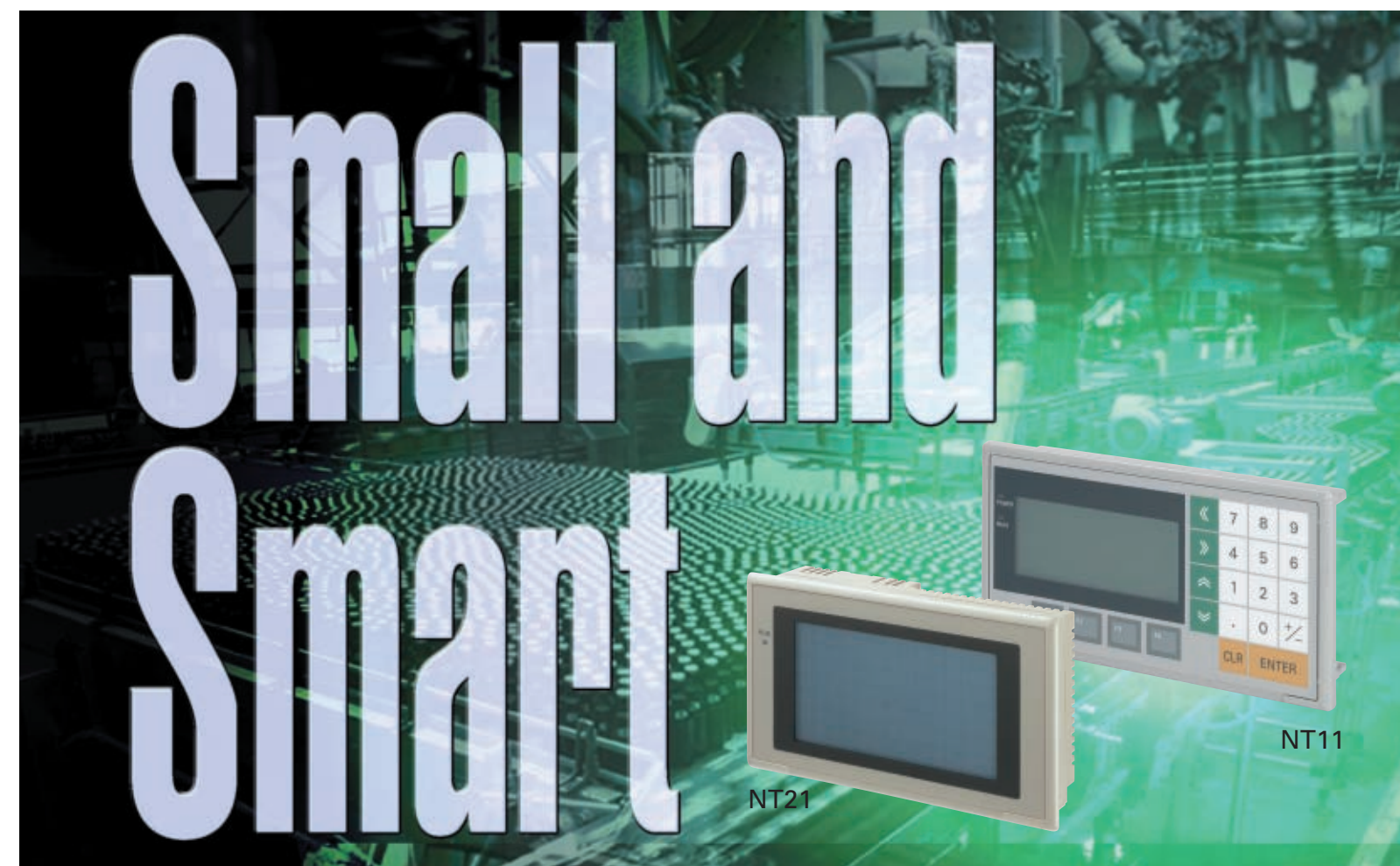
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This catalog mainly provides information that is necessary for selecting suitable models, and does not contain precautions for correct use. Always read the precautions and other required information provided in product operation manuals before using the product.

- The application examples provided in this catalog are for reference only. Check functions and safety of the equipment before use.
- Never use the products for any application requiring special safety requirements, such as nuclear energy control systems, railroad systems, aviation systems, medical equipment, amusement machines, vehicles, safety equipment, or other application involving serious risk to life or property, without ensuring that the system as a whole has been designed to address the risks, and that the OMRON products are properly rated and installed for the intended use within the overall equipment or system.



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

| | | |
|---|--|--|
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|---|--|--|

Note: Specifications subject to change without notice. Cat. No. V071-E1-02
Printed in Japan 1003-0.5M

Versatile I/O and Large-capacity Screen Memory in a Space-saving Size

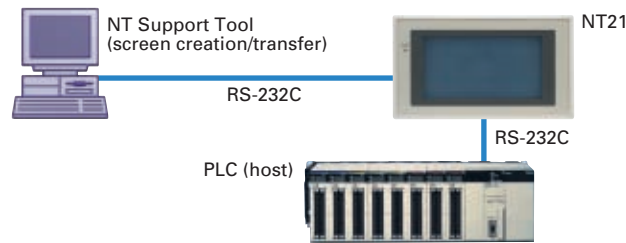
Small Size, Large Screen

The LCD screen is larger than the OMRON NT20S (increased from 256 x 128 dots to 260 x 140 dots), but the external dimensions and panel cut-out size are the same.



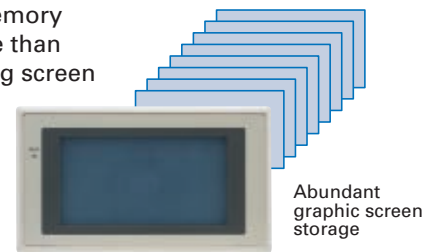
Two RS-232C Ports

Two RS-232C ports in the NT21 (compared with one in the NT20S) enable simultaneous connection of a PLC, Bar Code Reader, and NT Support Tool (connectable to serial port A only).



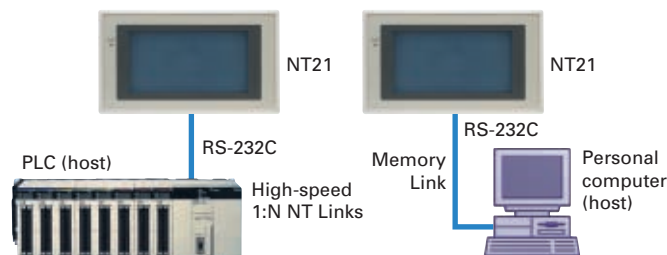
Plenty of Capacity for Saving Graphic Screens

With 512 Kbytes of memory capacity, there is more than ample space for storing screen data.



Versatile Communications

In addition to the Host Link and 1:1 NT Link communications, the NT21 supports high-speed 1:N NT Links and Memory Link communications.



Highly Reliable Hardware

Long, Maintenance-Free Life (50,000 h)

Conforms to International Standards

The NT21 conforms to the EC Directives, as well as UL, cULus (Class 1 Div2), and C-Tick. The front panel has an enclosure rating equivalent to IP65F.

System and screen data can be stored in NT21 Flash Memory.

Function Support Equivalent to That of a Mid-size Operator Interface

Recipe Function

Parts tables on the PT screen can be used to set multiple word data in records, which can then be written to the PLC by a simple PT touch panel operation. For example, the setting parameters for separate models can be edited on the PT, then written to or read from the PLC.

| No. | Cake | Cream | Sugar | Egg |
|-----|--------|-------|-------|-----|
| 1 | Cheese | 1000 | 300 | 20 |
| 2 | Almond | 300 | 200 | 10 |
| 3 | Pound | 1000 | 200 | 10 |
| 4 | Carrot | 800 | 150 | 10 |
| 5 | Apple | 500 | 300 | 5 |

Write Read

Alarm List/History(*)

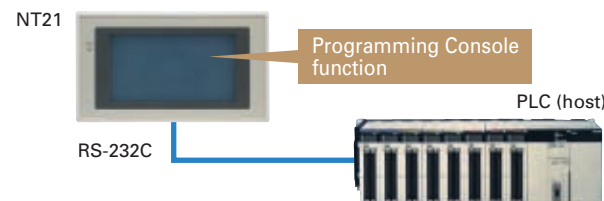
An alarm message can be displayed in response to PLC bit status, and the content and time of the message can be stored as an alarm history.

| Alarm History | Menu |
|------------------------------|-------|
| order of occurrence | Reset |
| Cur. Time 01/09/17 17:24:08 | |
| Battery Error 01/09/17 14:20 | |
| Sensor Error 01/09/14 16:15 | |
| Feed Error 01/09/12 10:05 | |
| Pump Error 01/09/11 11:48 | |

*C500-BAT08 Battery (sold separately) required.

Programming Console Function

The NT21 is equipped with many of the same functions as the SYSMAC PLC Programming Console.



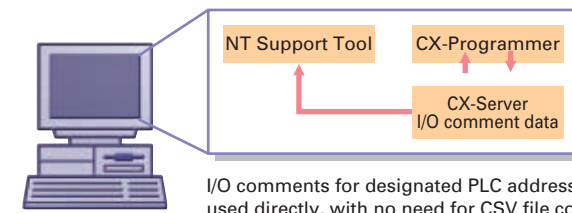
Mathematical Functions

Up to 256 math equations can be stored in the PT processing table to allow automatic PT processing, and the results can be written to the numeral memory table or other destinations. This makes it possible to perform scaling and other mathematical operations automatically in the PT.

Upgraded NT Support Tool Version (-EV4.7)

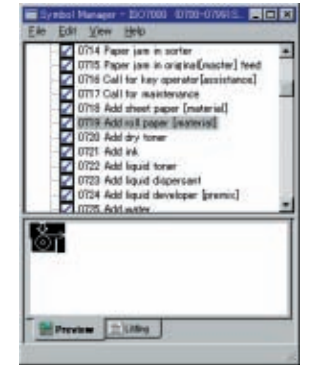
Enhanced Editing Functions

I/O comments in the I/O tables of the CX-Programmer can be used directly.



I/O comments for designated PLC addresses can be used directly, with no need for CSV file conversion.

- Symbol Manager previews are supported. This function makes it possible to preview symbols (parts created from graphics data).
- Parts can be copied by drag & drop operations of image, library, or mark data.
- The properties of grouped parts can be edited without having to ungroup them.
- Because NT20S and NT31 screen data is compatible with the NT21, existing software assets can be utilized to greatly reduce the number of design steps.
- Note:** Some data revisions may be required due to size differences.
- Windows XP supported.



Comparison with the NT11

| | Model | NT11 | NT11S | NT21 | NT20S | | |
|------------------------|-----------------------------------|--|-------------------|------|--|---|----------------------------|
| Basic performance | Dimensions | 218 x 113 x 38.2 mm (H x W x D) | | | 190 x 110 x 53.5 mm (H x W x D) | | |
| | Resolution | 160 x 64 dots (4.24 inches) | | | 260 x 140 dots (5.2 inches) | 256 x 128 dots (4.91 inches) | |
| | Effective display area | 100 x 40 mm | | | 117 x 63 mm | 112 x 56 mm | |
| | Display color | Black & white (with Yellow mode) | | | Black & white (with blue mode) | | |
| | Panel cut-out size (W x H) | 204.2 x 99.8 mm | | | 178.5 x 100.5 mm | | |
| | Max. number of registered screens | 250 | | | 3,999 | 500 | |
| | Screen data capacity | 32 KB | | | 512 KB | 96 KB | |
| | Function keys | 4 | | | None | None | |
| | Other Keys | Numeric Keys, Cursor Keys, Function Keys | | | None | None | |
| | Display elements | Rectangles, polygons, arcs, sectors | None | | | Supported | None |
| Painting out | | None | | | Supported | None | |
| Image/library displays | | None | | | 256 positions per screen | None | |
| Analog meters | | None | | | 50 positions per screen | None | |
| Trend graphs | | None | | | 1 position per screen | None | |
| Broken line graphs | | None | | | 1 position per screen | None | |
| Alarm lists/histories | | None | | | 4 positions per screen | None | |
| Recipes | | None | | | 1 position per screen | None | |
| Interlocks | | None | | | Supported | None | |
| Special functions | | Mathematical Function | None | | | Math equations: Max. 256 (arithmetic functions, logic operations, bit manipulations, comparison operations) | None |
| | Programming Console function | None | | | (Executes functions equivalent to C200H-PR027 and CS1 Programming Consoles.) | None | |
| | High-quality font | None | | | Supported | None | |
| | Memory Unit | None (Emergency transfer mode)* | | | Supported | None | |
| | Backlight service life | 50,000 hours min. | 10,000 hours min. | | 50,000 hours min. | 10,000 hours min. | |
| | Communications | Memory Links | None | | | Supported | Via RS-232C communications |
| | | Bar Code Reader connection | None | | | Supported | None |
| | | Host Link Speed | Up to 115,200 | | 9,600/19,200 | 9,600/19,200 | 9,600/19,200 |

*Emergency transfer mode: When power to the NT11 is turned ON with DIP switch pin 3 turned ON, data transfer mode can be entered directly without any other operation.

■NT11 General Specifications

| Item | Specification |
|--------------------------------------|--|
| Power supply voltage | 24 VDC |
| Allowable power supply voltage range | 20.4 to 27.6 VDC (24 VDC -15%, +15%) |
| Power consumption | 10 W max. |
| Noise resistance | Conforms to IEC61000-4-4, 2K (power lines) |
| Vibration resistance | 10 to 57 Hz with 0.075 mm amplitude and 57 to 150 Hz with 9.8 m/s ² acceleration for 30 min in each of X, Y, and Z directions |
| Shock resistance | 147 m/s ² 3 times in each of 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 gasses. |
| 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.

| Item | Specification |
|----------------|---|
| Display screen | <ul style="list-style-type: none"> Dot matrix of STN liquid crystal display panel Number of dots: 160 x 64 Effective display area: 100 x 40 mm Life expectancy: 50,000 hours minimum View angle (left/right direction): ±20° |
| Indicators | <ul style="list-style-type: none"> POWER indicator (Green LED): Lit while power is being supplied. RUN indicator (Green LED): Lit during operation |
| Switch | <ul style="list-style-type: none"> 22 switches Life expectancy: 1 million operations minimum |

■Display Capacity

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

| Item | Specification | |
|-----------------------------------|--|---|
| Display characters | Normal characters (8 x 16 dots): Alphanumerics and symbols Marks (8 x 16 dots): User-defined, 64 max. | |
| Number of characters displayed | Normal-size: 20 horizontally x 4 lines vertically max. | |
| Enlargement function | Double width | |
| Display elements | Character string displays | 8 positions per screen |
| | Numerical displays | 8 positions per screen |
| | Graph displays | 4 positions per screen |
| Screen attributes | Numerical settings | 8 positions per screen |
| | Display history | Order of frequency, 256 screens |
| Screen types | 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: 32 KB (downloading method) | |

■Special Features

| Item | Specification |
|-----------------------|---|
| Printing function | Printing of display history data Printing of daily reports (printing format registered by the users) |
| Maintenance functions | <ul style="list-style-type: none"> Self-test for memory, switches, etc. Status setting confirmation for communications and other conditions. Simple communications confirmation. |

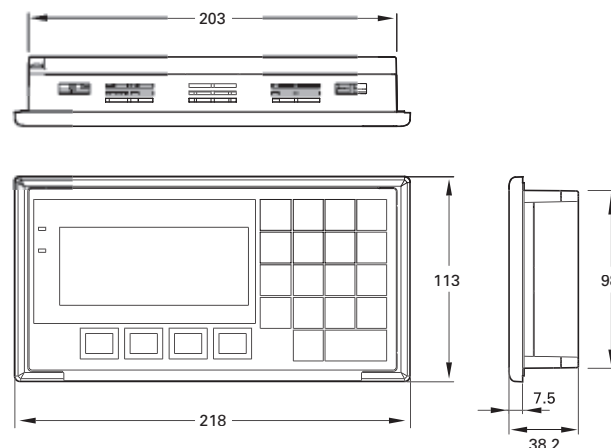
■NT11 Product Configurations

| 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 | CD-ROM (for Windows 95, 98, Me, XP, NT, 2000) | NT-ZJCAT1-EV4 | |
| Function key sheet | 10 sheets for replacement for beige | NT11-CKF01 | |
| | 10 sheets for replacement for black | NT11-CKF01B | |

*The PT body incorporated the communication interface, screen memory, and a flash ROM that downloads the system program.

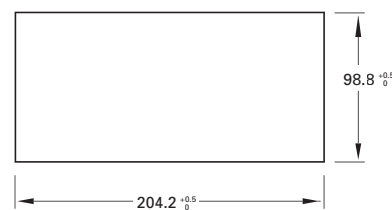
*Connecting cables with the PLC and NTST are the same as those for the NT21. Please refer to the next page.

■Outside Dimensions

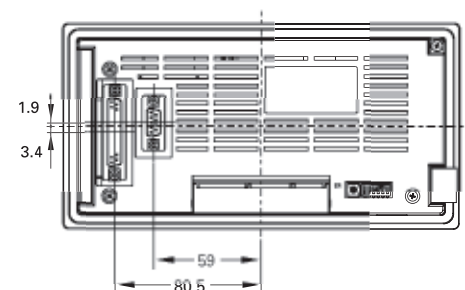


■Panel Plate thickness: 1.6 to 4.8 mm

■Recommended panel cutout:



■Rear face



■NT21 General Specifications

| Item | Specification |
|-------------------------------|--|
| Power supply voltage | 24 VDC ±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) |
| | Fixed character strings | With overlapping screens, the total is 524,280 per screen |
| | Graphics | |
| | Marks | |
| | Numerical displays | 256 positions per screen, max. 10-digit display (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 |
| Screen types | Lamps | 256 positions per screen |
| | Image library images | 256 positions per screen |
| | Touch switches | 256 positions per screen, max. 256 meshes |
| | Numerical settings | 256 positions per screen (numerical key pad) |
| | 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 |
| | Recipes | One position per screen |
| | Normal screens | Displays screens registered as normal |
| Screen attributes | 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 occurrence (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 | <ul style="list-style-type: none"> 0: No display 1 to 3999: User registered screens (normal, overlapping, windows) 9000: System startup screen 9001: Display history screens, order of occurrence 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%) |
| Backlight (white cold cathode tube) | Automatic turn-OFF | Can be set to turn OFF in 1 to 255 min or to remain ON with screen saver |
| | 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

| Communications method | Serial port A | Serial port B |
|-----------------------|--|---------------|
| NT Support Tool | Supported | Not supported |
| PLC | Host Link | Supported |
| | 1:1 NT Link | Supported |
| | 1:N NT Links | Supported |
| | NT Link, PT Programming Console function | Supported |
| SBC/personal computer | Memory Links | Supported |
| Bar Code Reader | | Supported |

*Connection via RS-422A/485 is possible using the NS-AL002 RS-232C/422A Adapter (connector), which can be connected only to serial port B. (RS-485 connections must use 1:N NT Links.)

■NT21 Standard Models

| Product | Specification | Model number | |
|----------------------------|---------------------------------|---|----------------------------------|
| NT21 Programmable Terminal | Monochrome STN | Frame color: beige NT21-ST121-E | |
| | | Frame color: black NT21-ST121B-E | |
| Support Tool | Windows 95, 98, Me, NT, or 2000 | CD-ROM NT-ZJCAT1-EV4 | |
| Cables | For screen transfer | XW2Z-S002 | |
| | For PLC connection | PT: 9-pin PLC: 9-pin | Cable length: 2 m XW2Z-200T |
| | | | Cable length: 5 m XW2Z-500T |
| | | PT: 9-pin PLC: 25-pin | Cable length: 2 m XW2Z-200S |
| | | | Cable length: 5 m XW2Z-500S |
| | | PT: 9-pin PLC: Mini-peripheral | Cable length: 2 m XW2Z-200T-2 |
| | | Cable length: 5 m XW2Z-500T-2 | |
| Options | Reflection Protective Sheets | Display area only (5 sheets) NT20M-KBA04 | |
| | Chemical-resistive Cover | Silicon cover NT20S-KBA01 | |
| | Battery | For alarm lists/histories C500-BAT08 | |
| | Memory Unit | For screen and system data transfer NT-MF161 | |
| | RS-232C/422A Adapter | NS-AL002 | |
| Connector Kit | XM2S-0911-S003 | | |

■Dimensions

