

Programmable Terminal

NB Series

The future-proof, compact HMI



- Pleasant to program
- Appealing to see
- Enjoyable to use

The future-proof, compact HMI

Give more value to your machines with Omron's NB Series: compact range application HMI.

Enjoy his the aesthetic sense and excellent visibility.

Our expertise in Factory automation give you warranty of quality and a total freedom to build up optimal applications.

Newly added remote control features help to reduce the time and work involved in maintenance.

Enjoyable to use

Global support from local site

- Flexible remote access function
- Powerful remote operation
- On/off-line simulation
- USB memory stick support



Easily create intuitive operator screens

- Flexible window handling
- Easy animation
- Extensive language support
- Powerful macros
- Portrait or landscape display





Pleasant to program

Ready to use functions for your machine

- Always informed about alarms
- Easy data presentation
- Multiple security options

The perfect partner for Omron devices

- Serial and Ethernet connectivity
- Connection to Omron and non-Omron devices

Appealing to see in a wide product range

- Screen size from 3.5 to 10.1 inch
- LED backlit TFT LCD
- Wide viewing angle
- More than 65,000 display colors
- High brilliance



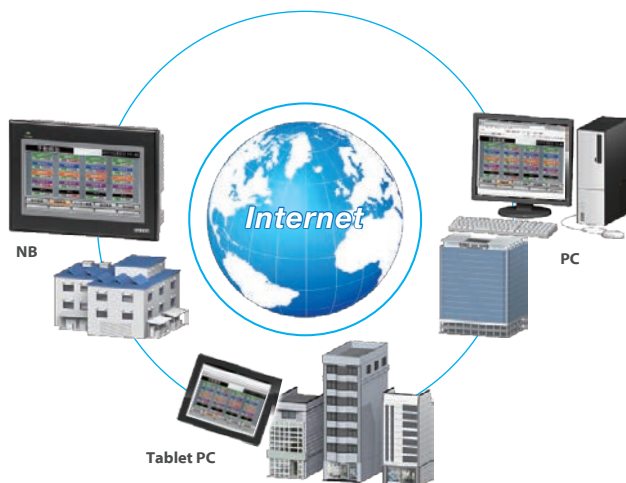
Enjoyable to use

The newly added remote control features significantly save you time, and the flexible design features make screen creation easier. All these features greatly contribute to your global scale business.

Global support from local site

Flexible remote access function

Besides conventional web browsers, now NB Series supports faster and secure Virtual network computing (VNC), providing flexible remote access.



Web browser

Support OS	Support web browser
Windows iOS 6	Internet Explorer 8/9, Google Chrome 32.0., Firefox 27.0 Safari

Monitoring and operating screens via various PC web browsers.

VNC Server - BYOD (Bring Your Own Device)

The VNC client application "HMI Remote Viewer", which is already used for NA Series, can also be used for NB Series.

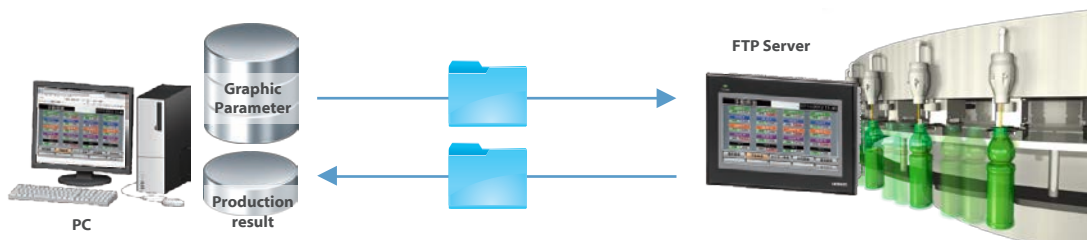


Search by "HMI Remote Viewer" for free download.

Powerful remote operation

With the newly added features such as FTP Server and CSV data-copying features, you can change machine parameters from remote locations or host PC, and collect production data.

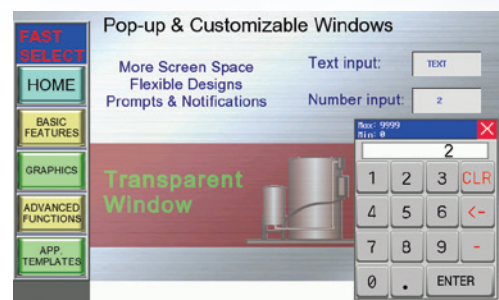
Now graphics can be updated even during the operation, and visual can be changed without stopping the HMI following changes in machines and recipes.



Easily create intuitive operator screens

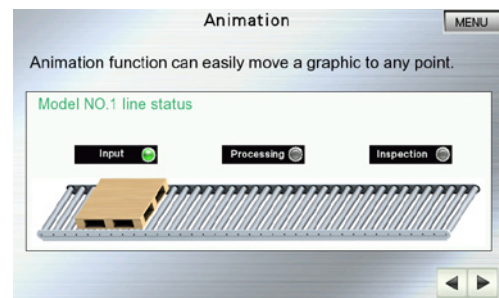
Flexible window handling

NB Series easily creates screens for your project. Besides the standard window, you can also create 'window-in window'. Furthermore, it also supports bottom windows and transparency for pop-up windows.



Easy animation

Animations can be created easily. For example, you can show a different status with text and graphics, or move the components while changing them. This easy animation feature makes the operation easier to understand and eliminates the need for expertise.



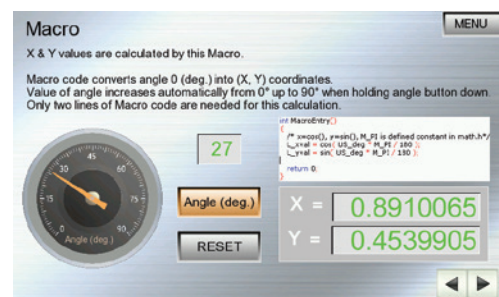
Extensive language support

Thanks to the supported 32 languages and Text Library function, you will find it easy to manage texts in multi-language. This allows users to operate the HMI in the language they choose.



Powerful macros

Thanks to its powerful macros, you can perform calculations and comparisons or iterations, and mathematical functions. It also enables you to do even more.



Pleasant to program

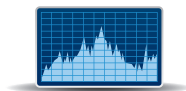
Ready to use functions for your machine

The feature-rich NB series has everything you will need for creating applications for a wide range machines and in many industries, for example, packaging, food, plastics and textiles. From a simple lid placing or loading/unloading machine right up to an in-line filling or sealing /labeling packaging machine. Download free of charge NB-Designer software from Omron web site.



Always informed about alarms

Event monitoring (alarming) is both flexible and easy to use. Not only do you have the possibility to enter bit and word alarms for on/off or on-condition triggering, there is also the possibility to use different fonts and color to indicate varying degrees of status and priorities. Specific alarms are indicated with an audible buzzer sound, as well as by an accompanying text message, and you can even create pop-up alarms for situations where immediate action has to be taken.



Easy data presentation

Graphical representation of real-time and historical data is easy with the NB series. As well as display of time sampling and trending data, you have the option to save sampling data (max. 16 consecutive words) of basic real-time trending data. And you can plot using x/y coordinates, in which case sampling can be done via single or multiple points and with historical data. Furthermore, data can be presented in a variety of ways, such as sampling points using x and y components.



Multiple security options

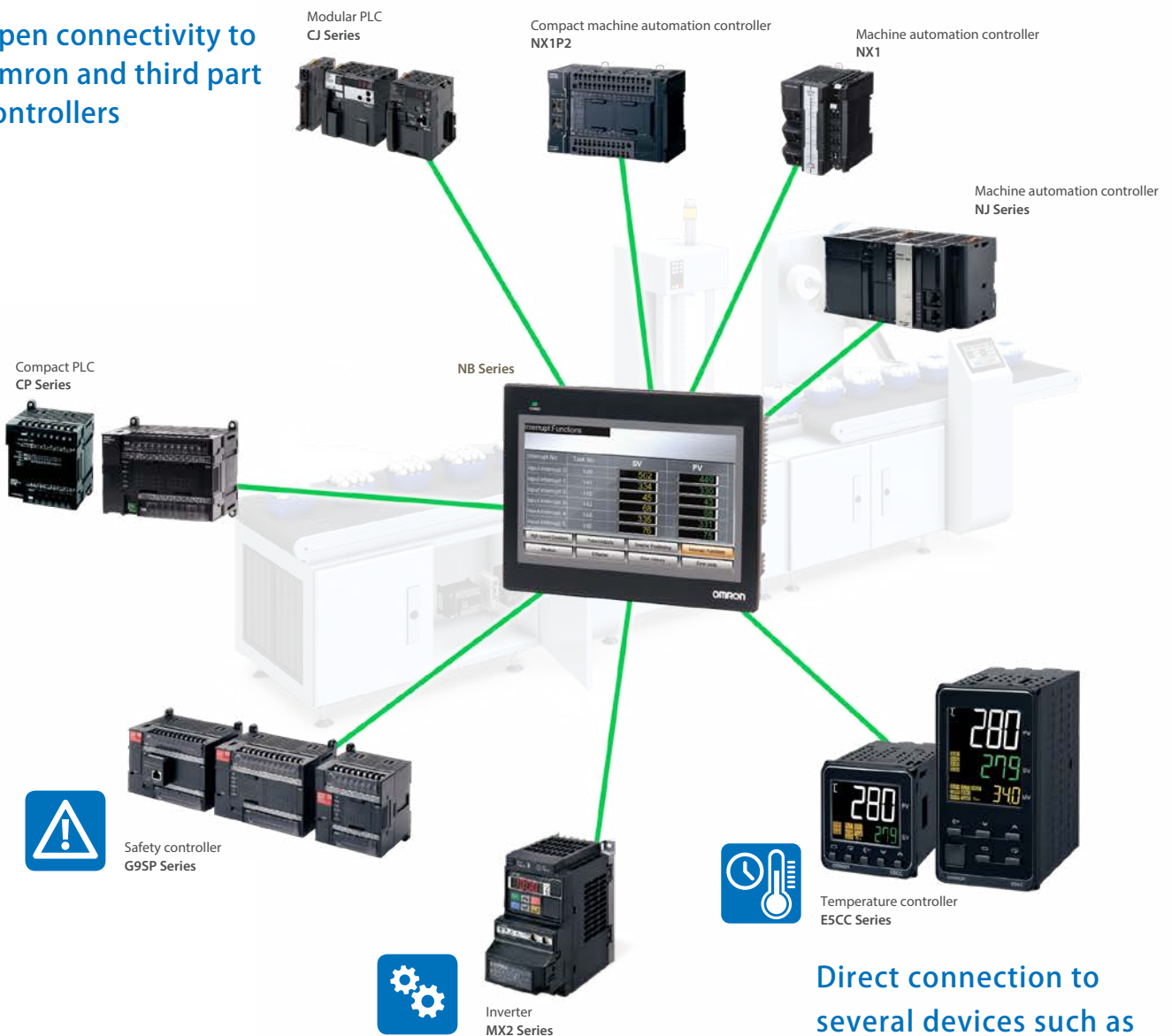
Protecting your developed project with a password using the NB series is both a simple and secure matter. Among the comprehensive security options is the possibility to define up to 16 minimum security levels on screens, buttons and inputs, and you can set up to 32 specific permission controls for each operator. There is also a register condition (bit/word) control for a check of actual condition against a predefined value, and a standard operator confirmation check to confirm that critical actions have been performed by the operator.

The perfect partner for Omron devices

Omron Compact controllers perfectly match your specific automation requirement and connection to the NB series is possible via Serial or Ethernet.

Ethernet protocols, FTP or VNC make easy remote access for maintenance or data gathering and allows digitalisation of your machine.

Open connectivity to Omron and third part controllers



Direct connection to several devices such as safety controller, inverter and temperature controller...

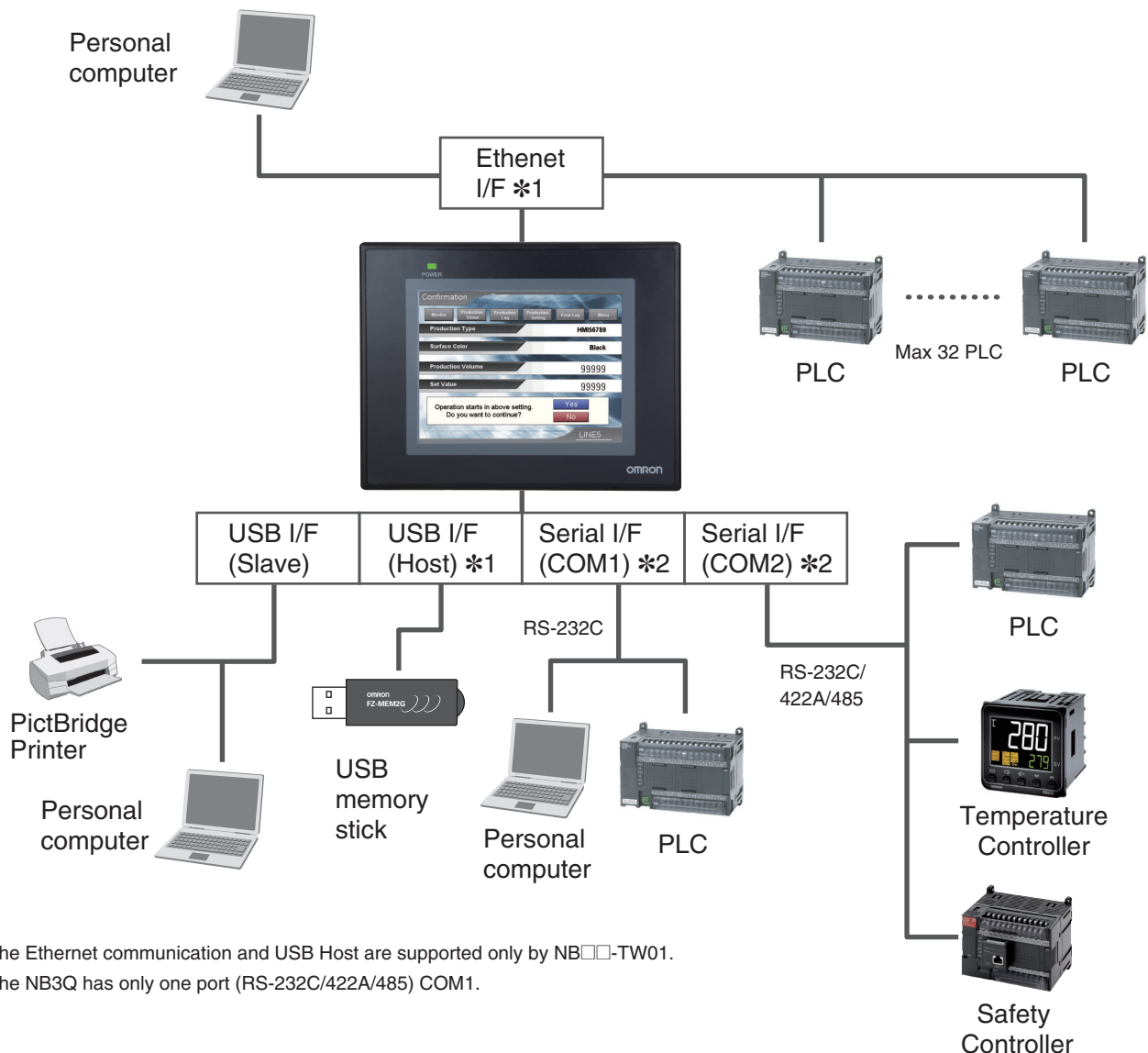
Programmable Terminals NB series

The feature-rich, economic programmable terminal

- More than 65,000 display colors TFT, color touch-screen for all models
- Available in sizes ranging from 3 to 10 inches
- Long-life LED backlight
- Serial, USB or Ethernet communication
- USB memory stick support



System Configuration



Windows is registered trademarks of Microsoft Corporation in the USA and other countries.

Microsoft product screen shot(s) reprinted with permission from Microsoft Corporation.

Apple and Apple logo are registered trademarks of Apple Inc. in the USA and other countries. App Store is a service mark of Apple Inc.

Google Play and the Google Play logo are trademarks of Google LLC.

Safari is trademark of Apple Inc., registered in the U.S. and other countries.

Other company names and product names in this document are the trademarks or registered trademarks of their respective companies.

The product photographs and figures that are used in this catalog may vary somewhat from the actual products.

Ordering Information

Programmable Terminals

Product name	Specifications	Model
NB3Q	3.5 inch, TFT LCD, Color, 320 × 240 dots	NB3Q-TW00B
	3.5 inch, TFT LCD, Color, 320 × 240 dots, USB Host, Ethernet	NB3Q-TW01B
NB5Q	5.6 inch, TFT LCD, Color, 320 × 234 dots	NB5Q-TW00B
	5.6 inch, TFT LCD, Color, 320 × 234 dots, USB Host, Ethernet	NB5Q-TW01B
NB7W	7 inch, TFT LCD, Color, 800 × 480 dots	NB7W-TW00B
	7 inch, TFT LCD, Color, 800 × 480 dots, USB Host, Ethernet	NB7W-TW01B
NB10W	10.1 inch, TFT LCD, Color, 800 × 480 dots, USB Host, Ethernet	NB10W-TW01B

Options

Product name	Specifications	Model
Software	Supported Operating Systems: Windows 10, Windows 8.1, Windows 8, Windows 7, Windows Vista®, Windows XP (SP3 or higher). Note: Except for Windows XP 64-bit version Download from Omron's regional websites.	NB-Designer *
NB-to-PLC Connecting cable	For NB to PLC via RS-232C (CP/CJ/CS), 2 m	XW2Z-200T
	For NB to PLC via RS-232C (CP/CJ/CS), 5 m	XW2Z-500T
	For NB to PLC via RS-422A/485, 2 m	NB-RSEXT-2M
Display protective sheets	For the NB3Q contains 5 sheets	NB3Q-KBA04
	For the NB5Q contains 5 sheets	NB5Q-KBA04
	For the NB7W contains 5 sheets	NB7W-KBA04
	For the NB10W contains 5 sheets	NB10W-KBA04
Attachment	Mounting bracket for NT31/NT31C series to NB5Q series	NB5Q-ATT01

Note: Use a standard USB cable (Type A male to Type B male) or standard Ethernet cable (10 BASE-T/100 BASE-TX twisted-pair cable) to connect the NB series to software (personal computer).
Use a standard Ethernet cable (10 BASE-T/100 BASE-TX twisted-pair cable) to connect the NB series to a PLC. For detail, refer to the NB Series Setup Manual (Cat. No. V107).

- * The NB5Q-TW01B and NB7W-TW01B are supported by NB-Designer version 1.10 or higher.
- * The NB3Q-TW01B and NB10W-TW01B are supported by NB-Designer version 1.20 or higher.

System Configuration

Items	Minimum Configurations
Operating System (OS)	Microsoft Windows XP (SP3 or higher) Microsoft Windows Vista (32-bit or 64-bit edition) Microsoft Windows 7 (32-bit or 64-bit edition) Microsoft Windows 8 (32-bit or 64-bit edition) Microsoft Windows 8.1 (32-bit or 64-bit edition) Microsoft Windows 10 (32-bit or 64-bit edition)
CPU	Windows computers with CPU recommended for OS
Memory	512 MB or more
Hard Disk	2.5 GB or more, with the disk space more than 800 MB at least
Display	Supports the display with resolution of 800 × 600 and 16-bit high color (1024 × 768 and 32-bit true color are recommended.) .
Communication ports	RS-232C Port, USB Port, Ethernet Port

Recommended USB Memory

Product name	Specifications	Model
USB memory stick	Capacity: 2 GB	FZ-MEM2G
	Capacity: 8 GB	FZ-MEM8G

NB Series

Specifications

HMI

Specifications	NB3Q		NB5Q		NB7W		NB10W
	TW00B	TW01B	TW00B	TW01B	TW00B	TW01B	TW01B
Display type	3.5" TFT LCD		5.6" TFT LCD		7" TFT LCD		10.1" TFT LCD
Display resolution (H × V)	320 × 240		320 × 234		800 × 480		800 × 480
Number of colors	65,536						
Backlight	LED						
Backlight lifetime	50,000 hours of operating time at the normal temperature (25°C)*						
Touch panel	Analog resistive membrane type, resolution 1024 × 1024, life: 1 million touch operations						
Dimensions in mm (H × W × D)	103.8 × 129.8 × 52.8		142 × 184 × 46		148 × 202 × 46		210.8 × 268.8 × 54.0
Weight	300 g max.	305 g max.	620 g max.	627 g max.	710 g max.	715 g max.	1525 g max.

* This is the estimated time when the luminous intensity is decreased by 50% per LED at room temperature and humidity. It is a typical value.

Functionality

Specifications	NB3Q		NB5Q		NB7W		NB10W
	TW00B	TW01B	TW00B	TW01B	TW00B	TW01B	TW01B
Internal memory	128 MB (including system area)						
Memory interface	---	USB Memory	---	USB Memory	---	USB Memory	USB Memory
Serial (COM1)	RS-232C/422A/485 (not isolated), Transmission distance: 15 m Max. (RS-232C), 500 m Max. (RS-422A/485), Connector: D-Sub 9-pin		RS-232C, Transmission distance: 15 m Max., Connector: D-Sub 9-pin				
Serial (COM2)	---		RS-232C/422A/485 (not isolated), Transmission distance: 15 m Max. (RS-232C), 500 m Max. (RS-422A/485), Connector: D-Sub 9-pin				
USB Host	Equivalent to USB 2.0 full speed, type A, Output power 5 V, 150 mA						
USB Slave	Equivalent to USB 2.0 full speed, type B, Transmission distance: 5 m						
Printer connection	PictBridge support						
Ethernet	---	10/100 base-T	---	10/100 base-T	---	10/100 base-T	10/100 base-T

General

Specifications	NB3Q		NB5Q		NB7W		NB10W
	TW00B	TW01B	TW00B	TW01B	TW00B	TW01B	TW01B
Line voltage	20.4 to 27.6 VDC (24 VDC -15 to 15%)						
Power consumption	5 W	9 W	6 W	10 W	7 W	11 W	14 W
Battery lifetime	5 years (at 25°C) *						
Enclosure rating (front side)	Front operation part: IP65 (Dust proof and drip proof only from the front of the panel)						
Obtained standards	EC Directives, KC, cUL508						
Operating environment	No corrosive gases.						
Noise immunity	Compliant with IEC61000-4-4, 2 KV (Power cable)						
Ambient operating temperature	0 to 50°C						
Ambient operating humidity	10% to 90% RH (without condensation)						

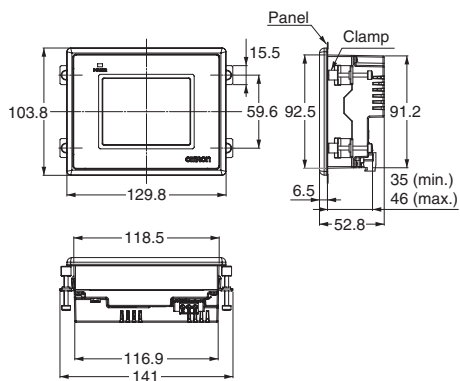
Note: Flash memory can be written to up 100,000 times.

* OMRON accepts NB unit including the display device for repair and analysis within five years of the manufacture date.

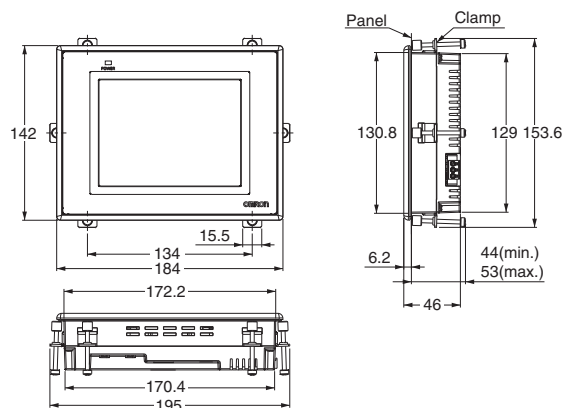
Dimensions

(Units: mm)

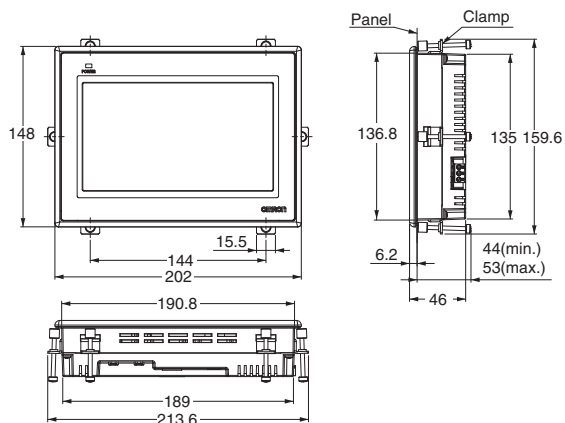
NB3Q



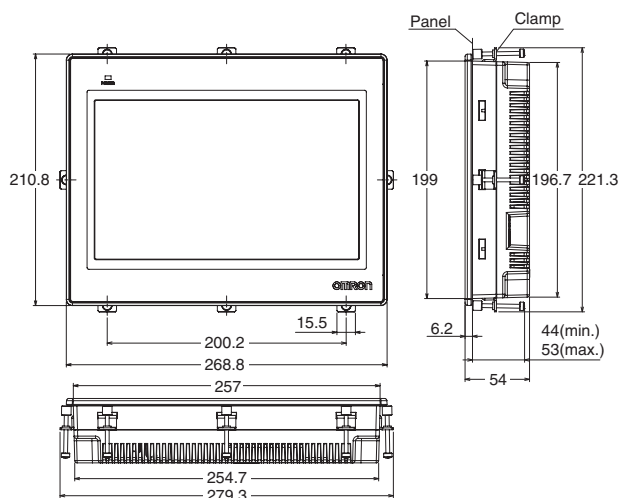
NB5Q



NB7W



NB10W



Model	Panel cutout (H × V mm)
NB3Q	119.0 (+0.5/-0) × 93.0 (+0.5/-0)
NB5Q	172.4 (+0.5/-0) × 131.0 (+0.5/-0)
NB7W	191.0 (+0.5/-0) × 137.0 (+0.5/-0)
NB10W	258.0 (+0.5/-0) × 200.0 (+0.5/-0)

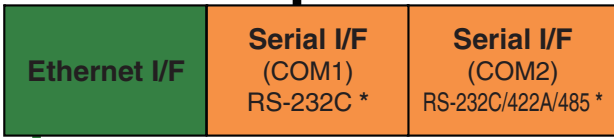
Applicable panel thickness: 1.6 to 4.8 mm

Related Manuals

Cat. No	Model	Name
V106	NB-Designer	NB Series NB-Designer Operation Manual
V107	NB3Q, NB5Q, NB7W, NB10W	NB Series Setup Manual
V108	NB3Q, NB5Q, NB7W, NB10W	NB Series Host Connection Manual
V109	NB3Q, NB5Q, NB7W, NB10W	NB Series Startup Guide

NB Series

NB3Q/NB5Q/NB7W/NB10W



* The NB3Q has one serial port COM1 (RS-232C/422A/485) only.

[Ethernet Communications]

OMRON

- CP Series
- CJ/CJ2/CS/NJ/NX1/NX1P Series

Mitsubishi

- L Series (CPU Ethernet port)
- QnU Series (CPU Ethernet port)
- QnUDV Series (CPU Ethernet port)
- Q Series/L Series (Ethernet Communication Unit)
- FX Series (Communication expansion board)

KEYENCE

- KV Series (KV-5000)

Siemens

- S7-200 (Smart) Series
- S7-300 Series
- S7-1200 Series

Allen-Bradley (Rockwell)

- MicroLogix Series

Modbus

- Modbus TCP Slave

[Serial Communications]

OMRON

- CP Series
- CJ/CJ2/CS/NJ/NX1P Series
- C Series
- G9SP Series

Mitsubishi

- FX Series (CPU)
- FX Series (Communication expansion board)
- Q Series (CPU)
- QnU Series (CPU)
- Q Series/L Series (Serial Communication Unit)

KEYENCE

- KV Series (KV-3000)

Panasonic

- FP Series

Siemens

- S7-200 Series
- S7-300/400 Series

Allen-Bradley (Rockwell)

- SLC500/MicroLogix Series
- CompactLogix/ControlLogix Series

Schneider

- TSX-Micro/Premium/Nano Series
- Twido Series

GE Fanuc

- Series 90-30
- VersaMax/VersaMax Micro & Nano Series

Delta

- DVP Series

LG (LS)

- Master-K Series
- XGT Series

Modbus

- Modbus ASCII
- Modbus RTU
- Modbus RTU Slave
- Modbus RTU Extend
- OMRON: Temperature Controller E5CC/E5EC, Inverter 3G3MX2-V1 or later

Company	Series	Model	
		Ethernet communication	Serial communication
OMRON	CP Series	CP1L-EL/-EM, CP2E-N (Built-in Ethernet port) CP1H-X/-XA/-Y, CP1L-L/-M, CP1E-N-N□□S/-NA (Option Board required)	CP1E-N-N□□S/-NA, CP2E-S/-E (Built-in serial port) CP1L-EL/-EM/-L/-M, CP1H-X/-XA/-Y, CP2E-N (Option Board required)
	CJ/CJ2/CS/NJ/NX1/NX1P Series	CJ1W-ETN21/EIP21 CS1W-ETN21/EIP21 CJ2H-□□□-EIP, CJ2M-CPU3□ NJ□01 NX102-□□□□ NX1P2-□□□□	CJ1□, CJ2□, CS1□ NJ□01 (Serial communication unit required) NX1P2-□□□□ (Option Board required)
	C Series	---	C200HX/HG/HE(-Z) CQM1H CPM1□/2□
	G9SP Series	---	G9SP-N□□□ (CP1W-CIF01 Option Board required)
	* For connectable OMRON PLC models, refer to the <i>Appendices</i> in the <i>NB Series NB-Designer Operation Manual</i> (Cat. No. V106).		
Mitsubishi	FX Series (Port built into CPU)	---	FX1N/1NC/2N/2NC/3G/3GC FX1S FX3U/3UC/3S
	FX Series (Communication expansion board)	FX3U-ENET-L	FX-485ADP/485BD/232BD
	Q Series (Port built into CPU)	---	Q00, Q00J, Q01, Q02, Q02H, Q06H, Q12H, Q25H
	QnU Series (Port built into CPU)	Q03UDE, Q04UDEH, Q06UDEH, Q10UDEH, Q13UDEH, Q20UDEH, Q26UDEH, Q50UDEH, Q100UDEH	Q00UCPU, Q01UCPU, Q02UCPU, Q03UD, Q04UDH, Q06UDH
	QnUDV Series (Port built into CPU)	Q26UDV	---
	Q Series (Communication Unit)	QJ71E71-100	QJ71C24/-R2 QJ71C24N/-R2/-R4
	L Series (Port built into CPU)	L02CPU/-P, L06CPU/-P, L26CPU/-P/-BT/-PBT	---
	L Series (Communication Unit)	LJ71E71-100	LJ71C24/-R2
KEYENCE	KV Series (Port built into CPU)	KV-5000	KV-3000
Panasonic	FP Series	---	FP, FP0, FP1, FP2, FP3, FP2SH, FP10S/SH, FP-M, FP-e, FP-X
Siemens	S7-200 Series	CP243-1, CP243-1 IT, SMART CPU CR40, SMART CPU SR20	CPU212/214/215/216 CPU221/222/224/226
	S7-300/400 Series	CP343-1, CP343-1 IT, CPU315-2 PN/DP, CPU317-2 PN/DP, CPU319-3 PN/DP	CPU312/313/314/315/316/318 CPU412/413/414/416/417
	S7-1200 Series	CPU1211C, CPU1214C	---
Allen-Bradley (Rockwell)	SLC500/MicroLogix Series	MicroLogix 1100/1400 (Built-in Ethernet port), MicroLogix 1000/1200/ 1400/1500 (1761-NET-ENI Unit)	MicroLogix1000/1200/1400/1500 SLC 5
	CompactLogix/ControlLogix Series	---	1756-L61/63 1769-L20/30/31/32E/35E
Schneider	TSX-Micro/Premium/Nano Series	---	TSX 37/P57/07
	Twido Series	---	TWD LCAA/LMDA
GE Fanuc	Series 90-30	---	IC693CPU/CSE
	VersaMax/ VersaMax Micro & Nano Series	---	CPU001/002/005/E05 IC200UAL/UDD/UDR/UAA/UAR
Delta	DVP Series	---	DVP-□□ES/EX/SS DVP-□□SA/SX/SC DVP-□□EH/EH2/SV
LG (LS)	Master-K Series	---	K120s, K200s
	XGT Series	---	XGB
Modbus	Modbus	Modbus TCP Slave	Modbus ASCII Modbus RTU Modbus RTU Slave Modbus RTU Extend --- OMRON: Temperature Controller etc.

Note: 1. OMRON does not guarantee the normal operation of all PLCs in each series. The NB series can be connected to temperature controllers, inverters, and other devices. For details, refer to the *NB Series Host Connection Manual* (Cat.No V108).

2. Including models whose production were discontinued.

Terms and Conditions Agreement

Read and understand this catalog.

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

Warranties.

(a) Exclusive Warranty. Omron's exclusive warranty is that the Products will be free from defects in materials and workmanship for a period of twelve months from the date of sale by Omron (or such other period expressed in writing by Omron). Omron disclaims all other warranties, express or implied.

(b) Limitations. OMRON MAKES NO WARRANTY OR REPRESENTATION, EXPRESS OR IMPLIED, ABOUT NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OF THE PRODUCTS. BUYER ACKNOWLEDGES THAT IT ALONE HAS DETERMINED THAT THE PRODUCTS WILL SUITABLY MEET THE REQUIREMENTS OF THEIR INTENDED USE.

Omron further disclaims all warranties and responsibility of any type for claims or expenses based on infringement by the Products or otherwise of any intellectual property right. (c) Buyer Remedy. Omron's sole obligation hereunder shall be, at Omron's election, to (i) replace (in the form originally shipped with Buyer responsible for labor charges for removal or replacement thereof) the non-complying Product, (ii) repair the non-complying Product, or (iii) repay or credit Buyer an amount equal to the purchase price of the non-complying Product; provided that in no event shall Omron be responsible for warranty, repair, indemnity or any other claims or expenses regarding the Products unless Omron's analysis confirms that the Products were properly handled, stored, installed and maintained and not subject to contamination, abuse, misuse or inappropriate modification. Return of any Products by Buyer must be approved in writing by Omron before shipment. Omron Companies shall not be liable for the suitability or unsuitability or the results from the use of Products in combination with any electrical or electronic components, circuits, system assemblies or any other materials or substances or environments. Any advice, recommendations or information given orally or in writing, are not to be construed as an amendment or addition to the above warranty.

See <http://www.omron.com/global/> or contact your Omron representative for published information.

Limitation on Liability; Etc.

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

Further, in no event shall liability of Omron Companies exceed the individual price of the Product on which liability is asserted.

Suitability of Use.

Omron Companies shall not be responsible for conformity with any standards, codes or regulations which apply to the combination of the Product in the Buyer's application or use of the Product. At Buyer's request, Omron will provide applicable third party certification documents identifying ratings and limitations of use which apply to the Product. This information by itself is not sufficient for a complete determination of the suitability of the Product in combination with the end product, machine, system, or other application or use. Buyer shall be solely responsible for determining appropriateness of the particular Product with respect to Buyer's application, product or system. Buyer shall take application responsibility in all cases.

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

Programmable Products.

Omron Companies shall not be responsible for the user's programming of a programmable Product, or any consequence thereof.

Performance Data.

Data presented in Omron Company websites, catalogs and other materials is provided as a guide for the user in determining suitability and does not constitute a warranty. It may represent the result of Omron's test conditions, and the user must correlate it to actual application requirements. Actual performance is subject to the Omron's Warranty and Limitations of Liability.

Change in Specifications.

Product specifications and accessories may be changed at any time based on improvements and other reasons. It is our practice to change part numbers when published ratings or features are changed, or when significant construction changes are made. However, some specifications of the Product may be changed without any notice. When in doubt, special part numbers may be assigned to fix or establish key specifications for your application. Please consult with your Omron's representative at any time to confirm actual specifications of purchased Product.

Errors and Omissions.

Information presented by Omron Companies has been checked and is believed to be accurate; however, no responsibility is assumed for clerical, typographical or proofreading errors or omissions.

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

OMRON Corporation Industrial Automation Company
Kyoto, JAPAN

Contact: www.ia.omron.com

Regional Headquarters

OMRON EUROPE B.V.

Wegalaan 67-69, 2132 JD Hoofddorp
The Netherlands
Tel: (31)2356-81-300/Fax: (31)2356-81-388

OMRON ELECTRONICS LLC

2895 Greenspoint Parkway, Suite 200
Hoffman Estates, IL 60169 U.S.A.
Tel: (1) 847-843-7900/Fax: (1) 847-843-7787

OMRON ASIA PACIFIC PTE. LTD.

No. 438A Alexandra Road # 05-05/08 (Lobby 2),
Alexandra Technopark,
Singapore 119967
Tel: (65) 6835-3011/Fax: (65) 6835-2711

OMRON (CHINA) CO., LTD.

Room 2211, Bank of China Tower,
200 Yin Cheng Zhong Road,
PuDong New Area, Shanghai, 200120, China
Tel: (86) 21-5037-2222/Fax: (86) 21-5037-2200

Authorized Distributor:

© OMRON Corporation 2011-2020 All Rights Reserved.
In the interest of product improvement,
specifications are subject to change without notice.

CSM_11_4
Cat. No. V412-E1-11

0520(1211)