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NS-Series

CX-Designer

Ver. 2.1

NS-CXDC1-V2

USER'S MANUAL

OMRON

CX-Designer
Ver. 2.1
NS-CXDC1-V2


User's Manual


Revised July 2007


Notice:

OMRON products are manufactured for use according to proper procedures by a qualified operator and only for the purposes described in this manual.

The following conventions are used to indicate and classify precautions in this manual. Always heed the information provided with them. Failure to heed precautions can result in injury to people or damage to property.

 **DANGER** Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury. Additionally, there may be severe property damage.

 **WARNING** Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury. Additionally, there may be severe property damage.

 **Caution** Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury, or property damage.

OMRON Product References

All OMRON products are capitalized in this manual. The word “Unit” is also capitalized when it refers to an OMRON product, regardless of whether or not it appears in the proper name of the product.

The abbreviation “Ch,” which appears in some displays and on some OMRON products, often means “word” and is abbreviated “Wd” in documentation in this sense.

The abbreviation “PLC” means Programmable Controller. “PC” is used, however, in some Programming Device displays to mean Programmable Controller.

Visual Aids

The following headings appear in the left column of the manual to help you locate different types of information.

Note Indicates information of particular interest for efficient and convenient operation of the product.

1,2,3... 1. Indicates lists of one sort or another, such as procedures, checklists, etc.

Terminology

NS-series PT	A Programmable Terminal in the NS Series manufactured by OMRON.
PLC	A Programmable Logic Controller manufactured by OMRON.
Host	A PLC, factory computer, personal computer or other controller controlling an NS-series PT.
NS-Designer	The NS-NSDC1-V□ NS-Designer produced by OMRON. The NS-Designer is an applications software package that enables creating screen data for NS-series PTs.
CX-One	The CXONE-AL□□C-E CX-One FA Integrated Tool Package produced by OMRON. This applications software package provides all of the software packages for OMRON PLCs and components.
CX-Designer	The NS-CXDC1-V2 CX-Designer produced by OMRON.
NS-Runtime	The NS-Runtime software runs on Windows XP and provides the same functionality as an NS-series PT.

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About this Manual:

The CX-Designer is a software package that enables creating screens for OMRON Programmable Terminals. Please be sure you understand the functions and performance of the CX-Designer to ensure correct application of the Programmable Terminals.

Please read this manual and related manuals carefully and be sure you understand the information provided before attempting to use the CX-Designer.

Section 1 provides an overview of the CX-Designer and its features and explains basic operating methods.

Section 2 describes how to install and uninstall the CX-Designer.

Section 3 describes the CX-Designer menus and basic procedures.

Section 4 describes convenient functions of the CX-Designer.

The **Appendices** provide a comparison between the CX-Designer and NS-Designer, tables of short-cut keys, and data transfer procedures between different versions of NS-series PT.

Guide to Version Upgrade

From CX-Designer Version 1.0 to Version 2.0

Item	Previous versions	New version
CX-Designer	Version 1.0 (NS-CXDC1-V1)	Version 2.0 (NS-CXDC1-V2)
NS system software	Version 6.2 or 6.5	Version 6.6
Integrated simulation	The only function available was simulated testing of PT screen operations on a personal computer.	Using a personal computer, a virtual PT can be connected to a virtual PLC (CX-Simulator) or to an actual PLC, and the operation of the entire PT-PLC system can be simulated. This makes it possible to reduce the total time involved in debugging.
Symbol programming without addresses	Symbol names, addresses, and comments were entered in symbol tables. Then the required symbols were selected from the symbol tables when creating screens.	Symbol names and comments can be input for symbol tables with no addresses. This allows screens to be created using symbol names without inputting addresses. Entering symbols in screen designs without addresses makes it possible to reduce the total time involved in design.
Multi-vendor connectivity	Not supported.	It is now possible to connect OMRON NS-series PTs to Mitsubishi FX-series PLCs, A-series PLCs, and Siemens S7-series PLCs.
Data security	The following two types of data transfers are possible between CX-Designer (running on a personal computer) and a PT: <ul style="list-style-type: none"> •Data transfers with the PT. •With data transfers using a Memory Card, data can be uploaded and downloaded by any user. 	A password can now be set for creating data. When data with a set password is transferred to a PT, the password is then required in order to upload the data. This prevents users who do not know the password from obtaining that data from the PT. In addition, a password can be required to transfer data to the PT. This prevents data from being accidentally overwritten.
User security	Any of five levels of passwords could be set for each functional object. A dialog box asking for the password was displayed each time an attempt was made to use a functional object for which a password had been set, and the object could not be used unless the password was input.	Once a user inputs the password to use a functional object for which a password has been set, the password does not have to be input again as long as the user continues using only functional objects for which lower level passwords have been set. Functional objects with a higher-level password cannot be manipulated. (A warning message will be displayed if an attempt is made.) This makes it possible to create applications that permit only the necessary operations by users who have entered passwords, and thus helps prevent faulty operations.
Consecutive line drawing	Not available.	Data in memory is treated as X and Y coordinates, and straight lines are drawn between the applicable coordinates to create consecutive line drawing. This makes it possible to handle applications involving the drawing of various graphics in two-dimensional space that could not be drawn using the existing graph components.

Item	Previous versions	New version
Improvements in broken-line graph	Number of monitor points: 256 max.	<ul style="list-style-type: none"> • Number of monitor points: 1,000 max. • Batch reading • Graph overwriting • Indirect specification of starting display position • Indirect specification of displaying/hiding graph lines • Indirect specification of displaying/hiding scale lines
Ladder Monitor	To use the Ladder Monitor it was necessary to copy the Ladder Monitor software from a CD-ROM to a Memory Card and to install the Memory Card in an NS-series PT. In addition, the PT was reset when starting or exiting the Ladder Monitor.	With version-2 NS-series PTs (except for the NS5-V2 and NSJ5), ladder monitoring is built into the PT as a standard feature, so no separate Memory Card is required. (A Memory Card is required for version-1 PTs, however, just as before.) In addition, neither version-1 nor version-2 PTs are reset when starting or ending the Ladder Monitor when Ladder Monitor version 2.8 is used. These improvements make the Ladder Monitor easier to use and reduce operating time.
Symbol table transfers when transferring screen data	Symbol tables set using the CX-Designer could be managed only by the CX-Designer, and symbol data was lost when data was uploaded from an NS-series PT.	When screen data is downloaded from the CX-Designer, the symbol tables are downloaded together with it. Likewise, when screen data is uploaded, the symbol tables are uploaded too.
Holding log and alarm information when transferring screen data	All of the log and alarm information in the PT was initialized when screen data was downloaded.	It is now possible to select whether log and alarm information is to be initialized when screen data is downloaded.
PLC data trace reading	Not supported. (This was a function of the CX-Programmer.)	Trace results from data traces (which is a CPU Unit function) can now be read by the PT and displayed in time chart format. (CSV files cannot be saved.) This makes it possible, using just the PT without CX-Programmer, to isolate the causes of errors that occur on-site.
Addition of European fonts	With the built-in raster fonts in NS-series PTs, Russian and Greek characters were full-width and not all characters were available.	All Russian and Greek characters are now available, and all characters are half-width.
Japanese file names	Two-byte characters could not be used for project file names.	Two-byte characters can now be used for project file names.
Video display mode setting	Image quality could not be adjusted when an NS-CA002 RGB/Video Input Unit was used.	It is now possible to select from three patterns for image quality adjustment. When a visual sensor is connected, even small display characters can be read. It is now also possible to adjust the display position for RGB display.
SAP (Smart Active Parts)	---	SAP has been added for the EJ1 Modular Temperature Controller, G3ZA Multi-channel Power Controller, and Troubleshooters.
Automatic using symbol names and I/O comments as labels and alarm messages	---	Symbol names and I/O comments of the communications addresses can be automatically used as functional object labels and alarm messages.
NS-Runtime	---	Projects can be created for NS-Runtime.

From CX-Designer Version 2.0 to Version 2.1

Item	Previous versions	New version
CX-Designer	Version 2.0	Version 2.1
NS system software	Version 6.6	Version 7.0
Multi-vendor connectivity	---	It is now possible to connect NS-series PTs to the following devices. <ul style="list-style-type: none"> • OMRON Trajexia Motion Controllers • Yaskawa MP-series Machine Controllers • Yaskawa F7-series Varispeed and VS Mini V7-series Machine Controllers • Mitsubishi Q-series PLCs • Yaskawa Eshed Technology XtraDrive Motion Controllers
NT compatibility	---	System memory can now be allocated to PLC memory areas in the same way as for the NT Series, enabling PLC ladder programs to be easily transferred when migrating from the NT Series to the NS Series.
Holding previous system memory values	When an NS-series PT was started, the initial screen set in the System Setup was always opened.	It is now possible to display at the next startup the screen that was being displayed when the program was closed.
Multilingual system capability	The system supported two languages: English and Japanese.	In addition to English and Japanese, the system now also supports German, French, Italian, Spanish, and Chinese (both traditional and simplified).
Multifunction Objects	Macros were required in order to executed multiple processes for a single functional object.	Multifunction Objects have been added to functional objects. With Multifunction Object, multiple processes can be registered and can then be executed with the press of a button. Processes that previously required the creation of macros can now be executed by simply setting properties.
Machine Navigator function	Multiple objects, such as frames, labels, and bitmaps, were used to change displays such as on-screen characters and BMP files. Contents of displays were set individually, which was time-consuming and made maintenance troublesome.	A Machine Navigator function and a functional object contents display function have been added. Machine Navigator provides unified control of text and image files (i.e., "contents") to be displayed, and the new display function displays those contents. Contents requiring association can be managed in ID units, and the display can be easily changed by simply changing the ID specification.
Flicker function	The only flicker method for objects was display color inversion.	The following flicker methods have been added. <ul style="list-style-type: none"> • Display/hide (entire object or label) • Flicker color specification (fill color, character, and line colors)
Improved alarm/event summary and history display	When the history was displayed using the Alarm/event Summary & History command, the same alarm/event was displayed in multiple places for each date of occurrence. This made it difficult to check the frequency of occurrence. In addition, in some cases there were many items to be displayed and not all of them could fit on the screen.	A function has been added to provide a summary of a particular alarm/event on a single line, making it possible to quickly check conditions without unnecessary displays. A horizontal scrolling function has also been added to allow all items to be checked.

Item	Previous versions	New version
Fonts	Raster fonts could be set for objects with changing display character strings, such as numeric displays and inputs. Rounded areas became rough, however, when the font size was increased.	Scalable fonts have been added to enable smooth displays. Gothic numeral and 7-segment displays have also been added to allow more attractive and up-to-date screens to be created.
Improved screen switching function	---	Speed and bitmap performance have been improved for switching screens.
Improved connection operations	When serial ports A and B were both set for use for NT Links, "Connecting" was displayed if either of the hosts was not connected.	Even if one host is not connected, the monitoring results of the connected host can be displayed on the screen without "Connecting" being displayed.
SAP Library allocated unit number and communications setting information display	SAP Library settings could not be checked even by displaying addresses using screen data checking from the System Menu.	The following information can now be displayed. <ul style="list-style-type: none"> • Command destination port names • Destination network addresses • Destination node addresses • Destination unit numbers • DeviceNet Slave Unit address and Inverter node addresses
Programming Console function	To use the Programming Console function with the NS5-V2, it was necessary to copy the program onto a Memory Card and to insert the Memory Card into the NS5-V2.	The Programming Console function is built-in to the NS5-V2, so there is no need for a Memory Card.
Bar codes	The maximum length of data that could be processed by an NS-series PT was 40 bytes.	The maximum data length has been increased to 254 bytes, allowing the data to be processed by two-dimensional bar code readers.
Test screens	---	The following functions have been added to test screens. <ul style="list-style-type: none"> • Zoom • Always displaying on top • Starting test screens in the previous display position and zoom status
DXF files	DXF files could not be accessed.	It is now possible to convert DXF files to graphics and position them with the CX-Designer.
Initialization options for alarm/event history data	When the alarm/event history data was cleared by using \$SB32, all history data was cleared including current alarms or events.	System Memory \$SW40 has been added so that it is now possible to specify initializing cleared or confirmed history data.
Changing host settings with the System Menu	The settings of a host connected by Ethernet or Controller Link could not be checked with the System Menu.	A list of hosts can now be displayed by selecting Communications Settings from the System Menu. It is now also possible to change the host network address, node address, and host type.

Related Manuals:

The manuals related to using the CX-Designer are listed below. Manual suffixes have been omitted. Please be sure you have the most recent version for your area.

Installing the CX-Designer

CX-Designer User's Manual - - - - -V088

This manual describes how to install the CX-Designer and the user interface. It also describes characteristic functions and application methods.

Confirming Functional/Fixed Object Setting Procedures when Using the CX-Designer

CX-Designer Help

The online help feature explains CX-Designer operating methods and settings (including detailed settings for functional and fixed objects).

It also explains how to transfer screen data to the NS-series PT.

Using NS-series PT Functions and Troubleshooting Errors

NS-Series PT Programming Manual - - - - -V073

This manual describes using NS-series PT functions and application methods. It also provides troubleshooting methods in the event that problems occur with the PT.

Checking NS-series PT Functions, Operations, and Restrictions

NS-V1/V2-series PT Setup Manual - - - - -V083

This manual describes installation and connection procedures, general specifications, and other hardware information for NS-V1/V2-series PTs (NS12-V1/V2, NS10-V1/V2, NS8-V1/V2, and NS5-V1/V2).

NS-series PT Setup Manual - - - - -V072

This manual describes installation and connection procedures, general specifications, and other hardware information for NS-series PTs (NS12, NS10, and NS7).

Installing the CX-Designer from the CX-One

CXONE-AL□□C-EV2/AL□□D-EV2 CX-One Ver. 2.1 Setup Manual

- - - - -W463

This manual provides an overview of the CX-One FA Integrated Tool Package and describes installation methods.

Using an NS-series PT for the First Time

CX-Designer Introduction Guide - - - - -V089

This tutorial describes using a NS-series PT for first-time users, from simple screen creation to system operation.

Using NS-series PT Macros

Macro Reference (Installed from CX-Designer CD-ROM.)

The online help for the CX-Designer provides detailed descriptions of the NS-series PT macro function. The same level of detail is also provided in this reference manual, which is installed

on the hard disk as a PDF file when the CX-Designer is installed. Use either the online help or this reference as required.

Checking PLC Functions and Operation

Operation Manuals for the PLC Being Used

For information on PLC operation and functions, refer to the operation manuals for the CPU Unit, Special I/O Units, CPU Bus Units, Communications Units, or other Units that you are using.

Checking NS-Runtime Functions, Operations, and Restrictions

NS-Runtime User's Manual - - - - -V093

This manual describes the special functions of NS-Runtime.

Read and Understand this Manual

Please read and understand this manual before using the product. Please consult your OMRON representative if you have any questions or comments.

Warranty and Limitations of Liability

WARRANTY

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At the customer's request, OMRON will provide applicable third party certification documents identifying ratings and limitations of use that apply to the products. This information by itself is not sufficient for a complete determination of the suitability of the products in combination with the end product, machine, system, or other application or use.

The following are some examples of applications for which particular attention must be given. This is not intended to be an exhaustive list of all possible uses of the products, nor is it intended to imply that the uses listed may be suitable for the products:

- Outdoor use, uses involving potential chemical contamination or electrical interference, or conditions or uses not described in this manual.
- Nuclear energy control systems, combustion systems, railroad systems, aviation systems, medical equipment, amusement machines, vehicles, safety equipment, and installations subject to separate industry or government regulations.
- Systems, machines, and equipment that could present a risk to life or property.

Please know and observe all prohibitions of use applicable to the products.

NEVER USE THE PRODUCTS FOR AN 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.

PROGRAMMABLE PRODUCTS

OMRON shall not be responsible for the user's programming of a programmable product, or any consequence thereof.

Disclaimers

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 model numbers when published ratings or features are changed, or when significant construction changes are made. However, some specifications of the products may be changed without any notice. When in doubt, special model numbers may be assigned to fix or establish key specifications for your application on your request. Please consult with your OMRON representative at any time to confirm actual specifications of purchased products.

DIMENSIONS AND WEIGHTS

Dimensions and weights are nominal and are not to be used for manufacturing purposes, even when tolerances are shown.

PERFORMANCE DATA

Performance data given in this manual 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 users must correlate it to actual application requirements. Actual performance is subject to the OMRON Warranty and Limitations of Liability.

ERRORS AND OMISSIONS

The information in this manual has been carefully checked and is believed to be accurate; however, no responsibility is assumed for clerical, typographical, or proofreading errors, or omissions.

SECTION 1

Overview

This section describes the features of the CX-Designer and the startup procedures for NS-series PTs for first-time users.

1-1	Features of the CX-Designer	2
1-1-1	Features	2
1-2	Basic Operation Procedures	5

1-1 Features of the CX-Designer

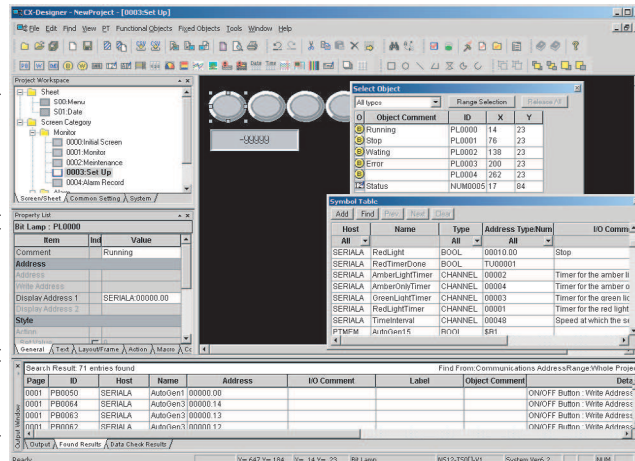
The CX-Designer is software that can be run on Windows 98 SE, NT, Me, 2000, XP, or Vista to create screen data for NS-series Programmable Terminals (PTs).

The CX-Designer has a variety of functions to enable efficient screen creation and debugging.

Project Workspace
The entire project structure can be displayed in a directory tree.

Property List
Functional object property settings can be changed and checked without having to open a properties dialog box.

Output Window
Displays data such as search results and error details.



Edit Screens
Screen data displayed on the PTs can be created for a group of objects.

1-1-1 Features

Screens Can Be Created Using Symbols

Symbols can be used with the CX-Designer. Symbols are addresses to which names have been assigned. In addition to the existing method of directly inputting addresses to be browsed by functional objects, the addresses can also be set by using symbols (names). When the address allocated for a symbol is changed, the address is changed for all objects that access that symbol. This makes it easy to change address allocations and reuse screens. Symbols can also be shared by the CX-Designer and CX-Programmer by copying the symbols from CX-Programmer symbol tables to the CX-Designer.

Refer to *4-1 Creating Screens Using Symbols* for details.

Project Management Using Project Workspace

Screens, alarms, and other common settings can be displayed in a directory tree in the CX-Designer project workspace. Projects are easy to manage because the entire project structure can be checked at a glance.

Screens and settings can be copied between multiple CX-Designer project workspaces. Screens can also be copied within the same project workspace. Refer to *4-2 Using Screens from Other Projects* for details.

Easy Reuse of Screens

Screens and settings can be copied between multiple CX-Designer project workspaces. Screens can also be copied within the same project workspace. The common settings accessed by screens are also copied automatically.

If symbols are used, it also becomes easy to change addresses after screens have been copied. Refer to *4-2 Using Screens from Other Projects* for details.

Screen Classification by Application for Easy Management

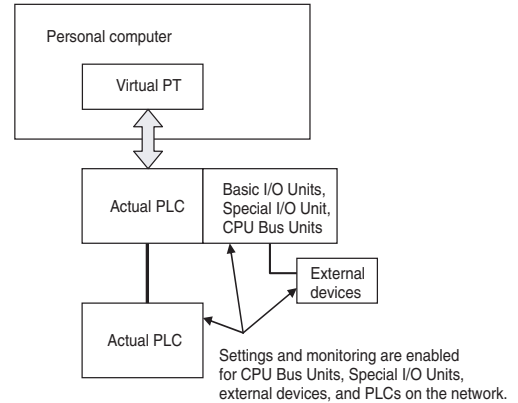
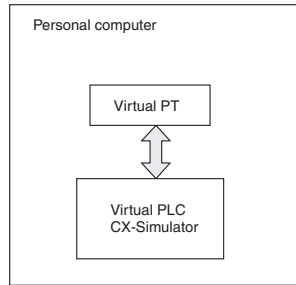
Screens can be classified into any category, e.g., by application, and displayed in a directory tree. When screens are created, consecutive screen numbers are automatically applied to screens in the same category. These numbers can also be changed. This makes screen management even easier.

Refer to *4-3 Classifying Screens by Application* for details.

Functional Object Property Settings Using Property Lists	<p>Functional object settings can be changed and checked without having to open a dialog box.</p> <p>When more than one object is selected, common settings for those objects can be changed in one operation from the property list.</p> <p>Refer to <i>4-4 Checking and Changing Functional Object Properties without Opening Property Setting Dialog Boxes</i>.</p>
Edit Properties from Lists	<p>Properties of objects on the screen can be displayed in table format and the settings changed.</p> <p>Settings for more than one object can be changed at the same time and consecutive addresses can be automatically set.</p> <p>Refer to <i>4-5 Listing and Editing Functional Object Properties</i> for details.</p>
Select and Display Specified Objects	<p>Objects on the screen can be listed and specified objects selected. The screen display can also be limited to specified objects.</p> <p>This makes it easy to check and change the property settings for overlapping objects.</p> <p>Refer to <i>4-6 Editing Overlapping Objects</i> for details.</p>
Find Macros	<p>Embedded macros can be listed.</p> <p>This improves debugging efficiency by no longer requiring individual object property settings to be opened to find objects that use macros.</p> <p>Refer to <i>4-9 Searching for Embedded Macros</i> for details.</p>
Automatic Transfer of Edited Data Only	<p>Once screens have been transferred to the PT, quick transfers of only the changed data can be made automatically. Screens are edited and data transferred many times during debugging, so the quick transfer function greatly reduces transfer time and increases efficiency.</p> <p>Refer to <i>4-10 Transferring Only Edited Data to PT</i> for details.</p>
Easy Document Creation	<p>Common settings and property settings for objects in screens can be output in rich text format (.rtf). The output settings are displayed in a list for easier viewing.</p> <p>Screen images can also be output to bmp and jpg files.</p> <p>Refer to <i>4-11 Creating Documents</i> for details.</p>
Integrated Simulation for Entire PT-PLC System (CX-Designer Version 2.0 and Higher)	<p>The CX-Designer test function can be connected to the CX-Simulator (a virtual PLC). When the CX-Simulator is started, the PLC user program created using the CX-Programmer can be debugged on a personal computer together with screen data.</p>

In addition, the test function can be connected directly to an actual PLC. This enables debugging (including monitoring and settings) using actual I/O, Special I/O Units, and CPU Bus Units connected to the PLCs, as well as data from external devices and PLC data on the network.

1. Integrated operations with screens and user programs can be tested on a personal computer
2. Screen operations can be tested while connected to the actual PLC System (including external devices).



Prevent Unauthorized Uploading of Data from the PT (CX-Designer Version 2.0 and Higher)

To prevent data theft from the PT, a password can be required to upload project data. Data cannot be uploaded from the PT unless the correct password is input. A password can also be required for downloading data to prevent data from being accidentally overwritten.

Note Project data created using the NS-Designer can be used with the CX-Designer. Project data created using the CX-Designer can also be used with the NS-Designer. (Only project data versions supported by NS-Designer, however, can be used.)

1-2 Basic Operation Procedures

This section describes the basic procedures for creating screens using CX-Designer, transferring data to the PT, and displaying screens. Refer to the CX-Designer online help and the *NS Series Setup Manual* and *NS Series Programming Manual* for details.

Creating Projects and Screens on the CX-Designer

