HITACHI

Software Manual

Operation
NXTOOLS For Windows®

510VE

Software Manual

Operation

NXTOOLS For Windows®

510VE

SAFETY PRECAUTIONS

- Read this manual thoroughly and follow all the safety precautions and instructions given in this manual before operations such as system configuration and program creation.
- Keep this manual handy so that you can refer to it any time you want.
- If you have any question concerning any part of this manual, contact your nearest Hitachi branch office or service engineer.
- Hitachi will not be responsible for any accident or failure resulting from your operation in any manner not described in this manual.
- Hitachi will not be responsible for any accident or failure resulting from modification of software provided by Hitachi.
- Hitachi will not be responsible for reliability of software not provided by Hitachi.
- Make it a rule to back up every file. Any trouble on the file unit, power failure during file access or incorrect operation may destroy some of the files you have stored. To prevent data destruction and loss, make file backup a routine task.
- Furnish protective circuits externally and make a system design in a way that ensures safety in system operations and provides adequate safeguards to prevent personal injury and death and serious property damage even if the product should become faulty or malfunction or if an employed program is defective.
- If an emergency stop circuit, interlock circuit, or similar circuit is to be formulated, it must be positioned external to the programmable controller. If you do not observe this precaution, equipment damage or accident may occur when this programmable controller becomes defective.
- Before changing the program, generating a forced output, or performing the RUN, STOP, or like procedure during an operation, thoroughly verify the safety because the use of an incorrect procedure may cause equipment damage or other accident.
- This manual contains information on potential hazards that is intended as a guide for safe use of this product. The potential hazards listed in the manual are divided into four hazard levels of danger, warning, caution, and notice, according to the level of their severity. The following are definitions of the safety labels containing the corresponding signal words DANGER, WARNING, CAUTION, and NOTICE.
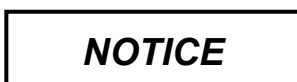
⚠ **DANGER**	: This safety label identifies precautions that, if not heeded, will result in death or serious injury.
⚠**WARNING**	: Identifies precautions that, if not heeded, could result in death or serious injury.
⚠ **CAUTION**	: Identifies precautions that, if not heeded, could result in minor or moderate injury.
NOTICE	: This safety label without a safety alert symbol identifies precautions that, if not heeded, could result in property damage or loss not related to personal injury.

Failure to observe any of the ⚠CAUTION and *NOTICE* statements used in this manual could also lead to a serious consequence, depending on the situation in which this product is used. Therefore, be sure to observe all of those statements without fail.

The following are definitions of the phrases "serious injury," "minor or moderate injury," and "property damage or loss not related to personal injury" used in the above definitions of the safety labels.

Serious injury: Is an injury that requires hospitalization for medical treatment, has aftereffects, and/or requires long-term follow-up care. Examples of serious injuries are as follows: vision loss, burn (caused by dry heat or extreme cold), electric-shock injury, broken bone, poisoning, etc.

Minor or moderate injury: Is an injury that does not require either hospitalization for medical treatment or long-term follow-up care. Examples of minor or moderate injuries are as follows: burn, electric-shock injury, etc.

Property damage or loss not related to personal injury: Is a damage to or loss of personal property. Examples of property damages or losses not related to personal injury are as follows: damage to this product or other equipment or their breakdown, loss of useful data, etc.

The safety precautions stated in this manual are based on the general rules of safety applicable to this product. These safety precautions are a necessary complement to the various safety measures included in this product. Although they have been planned carefully, the safety precautions posted on this product and in the manual do not cover every possible hazard. Common sense and caution must be used when operating this product. For safe operation and maintenance of this product, establish your own safety rules and regulations according to your unique needs.

NOTICE

- This product allows a program or internal register values to be rewritten while running the PCs. Note that the unnecessary rewriting of a program or register values may result in equipment damage or a serious accident. Therefore, before rewriting any program or values, be sure to confirm normal equipment status.

  (See page 1-2.)

- When installing or uninstalling the NXTOOLS system, use an appropriate Administrator account. If you use a standard account, you might not be able to normally install or uninstall the system.
- Before you start installing the NXTOOLS system, be sure to exit or close all Windows®-based programs that are running, including memory-resident programs, such as virus monitoring software. If you attempt to install the system without ending these programs, an error might occur. In such cases, uninstall the tool you are attempting to install, and then end all Windows®-based programs that are running. Then, install the system again. For details on how to uninstall the system, see "4.2　Uninstalling the NXTOOLS System".
- For the installation destination of the NXTOOLS system, do not specify the following folders, which are protected by User Account Control:
  • Program file folders (such as C:\Program Files)
  • System route folders (such as C:\Windows)
  • System drive route folders (such as C:\)
  • Program data folders (such as C:\ProgramData)

  (See page 4-1.)

NOTICE

- The NXTOOLS system cannot be installed on a per-user basis. To install the NXTOOLS system successfully, the user must first log on to the operating system with an appropriate Administrator account, which is the Administrator account that was first created when the computer was in its initial condition. In the following cases, the NXTOOLS system might not be installed properly: 1) the user uses a standard user account and acquires administrator permissions by using User Account Control (*) or 2) the user logs on by using an Administrator account that was created from a standard user account by using User Account Control.
  If you log on by using a user account other than the one you used to install the NXTOOLS system, the installed program might not appear in the program menu. In this case, perform the following steps: 1) log on by using the Administrator account that was first created when the computer was in its initial condition; 2) uninstall the installed program; and 3) install the program again.
  If you want to create a new account, be sure to log on with an Administrator account. Do not use User Account Control when creating a new account.

  (*) User Account Control is a Microsoft Windows feature that temporarily grants administrative rights to standard user accounts.

Revision record

Revision No.	Revision record (revision details and reason for revision)	Month, Year	Remarks
A	First edition	October 2020	

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PREFACE

Thank you for purchasing NXTOOLS SYSTEM/S10VE.

> The NXTOOLS SYSTEM/S10VE system, running on a personal computer, is used to change a variety of set parameters.

This manual describes how to perform operations on the NXTOOLS SYSTEM/S10VE system and how to program by using the NXTOOLS SYSTEM/S10VE system.
It covers the following system versions:

P.P. model	System name and version	Supported OS
S-7898-13	NXTOOLS SYSTEM/S10VE 01-00 and later	Windows® 7/10 (64-bit)

<Related manual>
  S10VE Software Manual Operation NXACP For Windows® (manual number SEE-3-134)

<Trademarks>
  • Microsoft® and Windows® are registered trademarks or trademarks of Microsoft Corporation in the United States and/or other countries.
  • Ethernet® is a registered trademark of Xerox Crop.

<Definitions of terms>
  PCs: Abbreviation for Programmable Controllers.
        Generic term for such PLCs as the S10VE, S10V, S10α, and S10mini series.
  PLC: Abbreviation for Programmable Logic Controller.
        This refers to industrial electronic equipment that performs sequence control by using the stored program system.
        The S10VE, S10V, S10α, and S10mini series are PLCs.
  MCS: Abbreviation for Man-machine Communication System.
        The term "MCS" is a generic name for software functionality that supports read and write of the PCs' memory contents.

<Note for storage capacity calculations>
  ● Memory capacities and requirements, file sizes and storage requirements, etc. must be calculated according to the formula 2^n. The following examples show the results of such calculations by 2^n (to the right of the equals signs).
    1 KB (kilobyte) = 1,024 bytes
    1 MB (megabyte) = 1,048,576 bytes
    1 GB (gigabyte) = 1,073,741,824 bytes
    1 TB (terabyte) = 1,099,511,627,776 bytes
  ● As for disk capacities, they must be calculated using the formula 10^n. Listed below are the results of calculating the above example capacities using 10^n in place of 2^n.
    1 KB (kilobyte) = 1,000 bytes
    1 MB (megabyte) = $1,000^2$ bytes
    1 GB (gigabyte) = $1,000^3$ bytes
    1 TB (terabyte) = $1,000^4$ bytes

CONTENTS

FIGURES

TABLES

CHAPTER 1 GENERAL INFORMATION FOR OPERATING THE SYSTEM

This manual is intended for users who are familiar with programming on Windows®-based personal computers.

1.1 Overview of NXTOOLS SYSTEM/S10VE

NXTOOLS SYSTEM/S10VE (hereinafter referred to as the NXTOOLS system) enables you to perform the following operations: 1) transfer the system program for NXHOST running on S10VE to the target machine and 2) change the set parameters after such a transfer. You can perform these operations as if you were using a common Windows® application.

1.2 Supported Hardware

The NXTOOLS system supports only S10VE-series PCs.

1.3 Required Hardware and Software Items

The NXTOOLS system requires the following hardware and software.
• A personal computer (hereinafter abbreviated to PC) that has a 1-GHz or faster CPU
• A display resolution of 1,366 × 768 (FWXGA) or higher
• 2 GB or more of RAM
• 200 MB or more free space on the hard disk
• CPU, power supply, and backboard for the S10VE series
• Cable for connecting the personal computer to the PCs unit (LAN cable)
• Remote I/O stations, other power supplies and backboards, cards, and wiring as required
• Microsoft® Windows® 7 (64-bit) operating system, or Microsoft® Windows® 10 (64-bit) operating system
• Microsoft Visual C++ 2010 Redistributable Package (x64)
• Microsoft .NET Framework 4

NOTICE

This product allows a program or internal register values to be rewritten while running the PCs. Note that the unnecessary rewriting of a program or register values may result in equipment damage or a serious accident. Therefore, before rewriting any program or values, be sure to confirm normal equipment status.

The user of this product must be knowledgeable about the Windows® environment and user interface. This system conforms to the Windows® standard. This manual is intended for users who are familiar with how to operate Windows®, which is the basis for operating this product.

- When using a PC having a suspend function, turn off the suspend function. Note that operating the suspend function while running the system may inhibit normal system operation.
- Insufficient RAM capacity may cause an application error. Should an application error occur, check the free memory capacity and install additional RAM in case of insufficient free memory capacity.
- For Windows drivers, use those provided by manufacturers. If you use generic drivers for Windows, operations might be slow.

CHAPTER 2   GENERAL DESCRIPTION

2.1   Communications Specifications of NXHOST

The NXTOOLS system, as described in the previous chapter, is a software system that enables you to transfer the system program for NXHOST to the target machine and change the set parameters after such a transfer. You can perform these operations as if you were using a common Windows® application.

The NXHOST, on the other hand, is an autonomous-distribution online package software system that serves as an interface to ladder programs running together with it on the S10VE controller. In functionality, it is equivalent to a combination of the NXACP/S10VE and NXLADDER (system extension arithmetic function programs used by LADDER DIAGRAM SYSTEM/S10VE).

Table 2-1 shows the major communications specifications of the NXHOST.

Table 2-1   Communications Specifications of NXHOST

Item	Specification
Network	Ethernet®
Communication protocol	UDP/IP
Message size (in bytes)	1,408 max.

This product automatically occupies a memory area as shown below, which is used by the NXHOST during data communication. Users are not allowed to use this memory area.

Table 2-2   Exclusively Used Memory Area

Item	Specification
FW registers	FWBFD thru FWBFF (used as error info setting registers)

2.2 Software Configuration

This system is used in the software configuration shown in Figure 2-1. It requires the following software item for its normal operation:

• LADDER DIAGRAM SYSTEM/S10VE

<Development system>   <Execution system>

NXTOOLS system   Applications

Windows®   NXHOST

Personal computer   LADDER DIAGRAM SYSTEM/S10VE

S10VE

Ethernet®
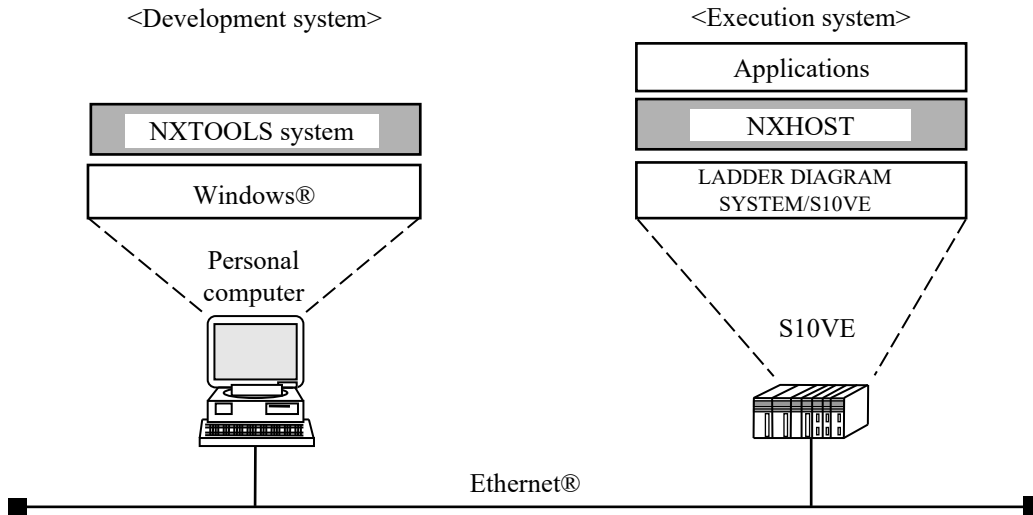
Figure 2-1   Software Configuration

Table 2-3 shows the software systems that are essential to the use of the NXTOOLS system.

Table 2-3   Required Software Systems and Their Versions and Revisions

System name	Version and revision
LADDER DIAGRAM SYSTEM/S10VE	01-01 or later (S-7898-02)
NXTOOLS SYSTEM/S10VE	01-00 or later (S-7898-13)
BASE SYSTEM/S10VE	01-00 or later (S-7898-38)

Note: The NXTOOLS system cannot be used in combination with RPDP/S10VE. For this reason, for S10VE for which CPMS was downloaded, be sure to use a project that was created on BASE SYSTEM/S10VE by specifying the setting to not use C mode.

2.3 Multicast Communication

The NXHOST supports multicast communication that sends and receives TCD-added messages with other nodes in the network by using the NXACP/S10VE from the ladder program interface.

Multicast communication is a mode of communication that constitutes the base of the NX protocol. It has the following characteristics:

• It enables efficient transmissions because it can send the same message to a number of distant nodes in the network simultaneously.

• It is easy to use because inter-communicating nodes have no dependency on each other and no procedure is required for establishing a connection between them.

Multicast group 2

| Node 1 | | Node 2 | Node 3 | Node 4 |

```
DFN=1
MGN=2    User data
TCD=3
```
Message   Data field 1

The received message is discarded because the transaction code in that message is found not registered at the receiving side.

The received message is discarded because the multicast group number in that message is found not registered at the receiving side.
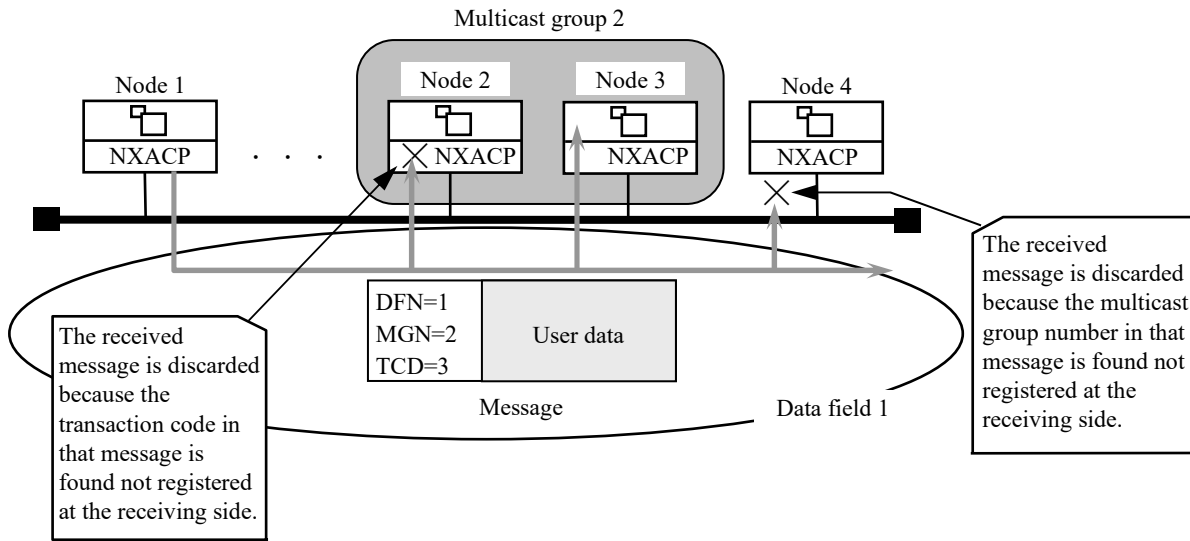
Figure 2-2   A Diagrammatic Representation of Multicast Communication

[Supplementary information]

The sending node sends out messages containing such parameters as the destination data field number, transaction code, etc. and the receiving nodes autonomously take in only messages they need from among the received messages. Thus, none of the nodes have to identify any other communicating party and establish synchronization with it. This enables you to improve the independency of communicating equipment or user programs and, at the same time, increase the extensibility of the entire system.

2.4 Transaction Management

The NXHOST uses transaction management in which sets of one register and one buffer are placed in one-to-one correspondence with transaction codes.

In transaction management, a register serves as a switch to notify of the completion of a data transmission or of an issued data reception request. That is, a register is switched on by the NXHOST system when the system starts a data transmission to satisfy a data transmission (send) request issued by the user, and is switched off when the transmission is completed. When a data message is received from a distant node, another register is switched on by the system when the system has written the received message to the receive buffer. This is illustrated below.
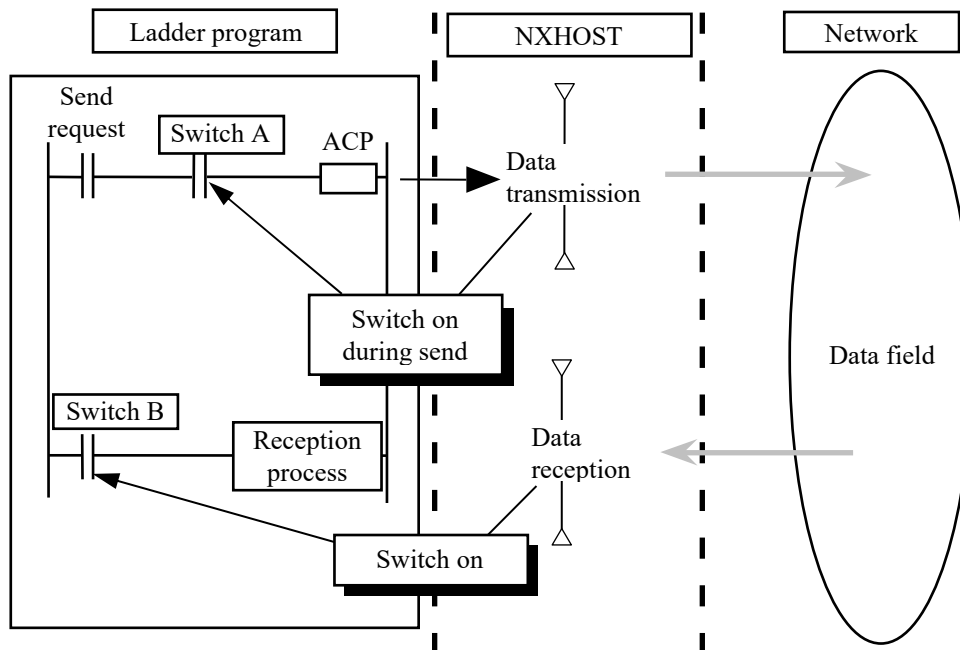
Figure 2-3   A Diagrammatic Representation of Transaction Management

[Supplementary information]
 Register numbers must be set by the user when constructing a ladder interface.

2.5 System Extension Arithmetic Functions

The NXHOST offers the following four system extension arithmetic functions:

(1) sat() function

Performs the initialization process for the NX/HOST-S10V. This function must be executed once at the activation of the ladder.

(2) acp() function

Works as a transmission process to satisfy a send request issued by the user.

(3) sato() function

(Prerequisite: Ver.-Rev. 02-00 and later of NX/HOST-S10V (S-7895-14), Ver.-Rev. 01-00 and later of NX/HOST-S10V (S-7895-66) and Ver.-Rev. 01-16 and later of the S10V Ladder Chart System)

In the ladder chart program of the S10/2α Series or S10mini Series, sato() is the arithmetic function to which the sat() arithmetic function of old NX/Ladder-S10 (Ver.-Rev. 02-00 and earlier) used for NX initialization is converted for S10V. The sato() function works in the same way as for the sat() function in (1) above. However, the parameter specification differs between them.

In a general ladder chart program of S10VE, use sat() in (1) above as the arithmetic function that performs NX initialization.

(4) acpo() function

(Prerequisite: Ver.-Rev. 02-00 and later of NX/HOST-S10V (S-7895-14), Ver.-Rev. 01-00 and later of NX/HOST-S10V (S-7895-66) and Ver.-Rev. 01-16 and later of the S10V Ladder Chart System)

In the ladder chart program of the S10/2α Series or S10mini Series, acpo() is the arithmetic function to which the acp() arithmetic function of old NX/Ladder-S10 (Ver.-Rev. 02-00 and earlier) used for transmission of data requested by a user is converted for S10V. The acpo() function works in the same way as for the acp() function in (2) above. However, the parameter specification and the transmission flag use method differ between them. For details, see "Note: Differences between acp() and acpo()" in the next page.

In a general ladder chart program of S10VE, use acp() in (2) above as the arithmetic function that performs NX transmission.

Note: Differences between acp() and acpo()
  As shown below, acp() and acpo() differ in specifying parameters and in using the during-send register.
  1. The during-send register of acp() is turned on when transmission starts, and is turned off when transmission ends.

Send request | During-send register

User send-data setting process

This register prevents the next ACP call from being issued during the transmission process in progress.

ACP
F | 00100055

8-digit decimal number
○○○○○○○○
DF number | TCD number

MOV
F | 0→Send request
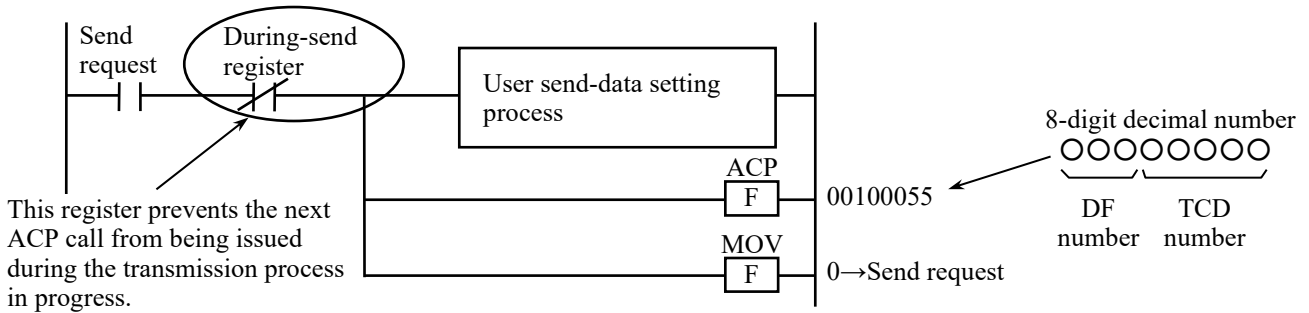
Figure 2-4   Ladder Chart Using acp()

2. The during-send register of acpo() conforms to the old NX/Ladder-S10 specification and is the ON register that is turned on when transmission is complete.
  This register needs to be turned off before the next transmission.

Send request

User send-data setting process

ACPO
F | 00100055

8-digit decimal number
○○○○○○○○
DF number | TCD number

MOV
F | 0→Send request

ON register

MOV
F | 0→ON register

After data transmission, the ON register is turned off (recognition) and then the next data transmission is performed.
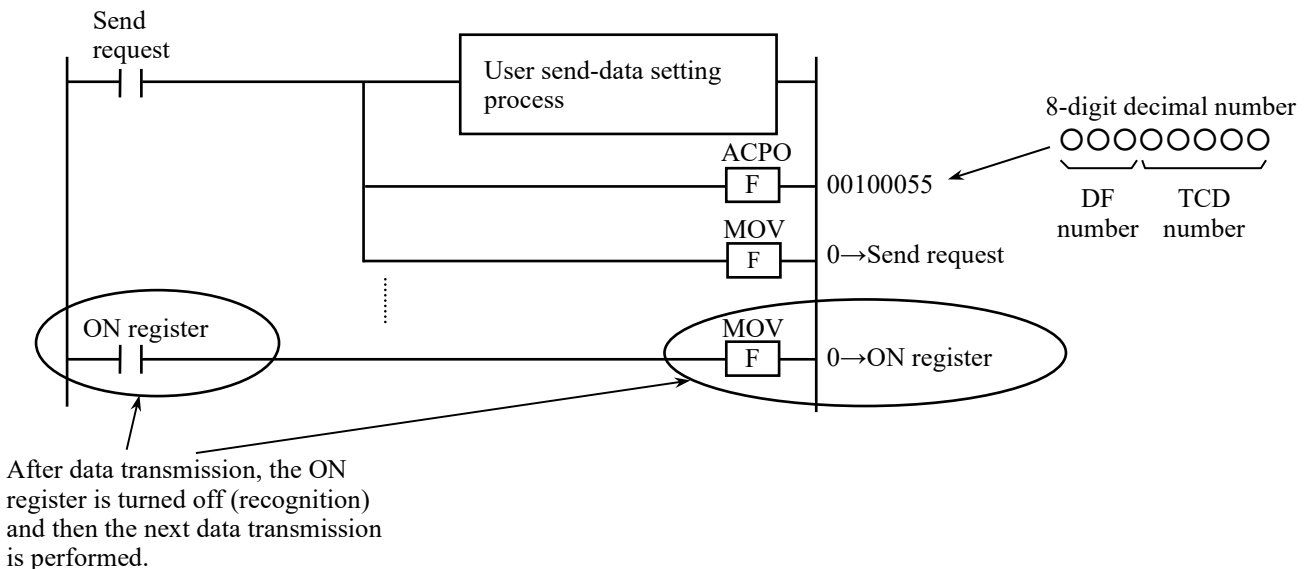
Figure 2-5   Ladder Chart Using acpo()

Note: The ON register registered for the NXTOOLS system is displayed as the "During Send register" on the Local DF screen. However, read that during-send register as the "ON register."

CHAPTER 3   USAGE GUIDE

3.1   Procedure for Creating a Ladder Sequence

To use the NXHOST, perform the procedure shown below that aims at the initialization of the ladder chart system and ladder programs.
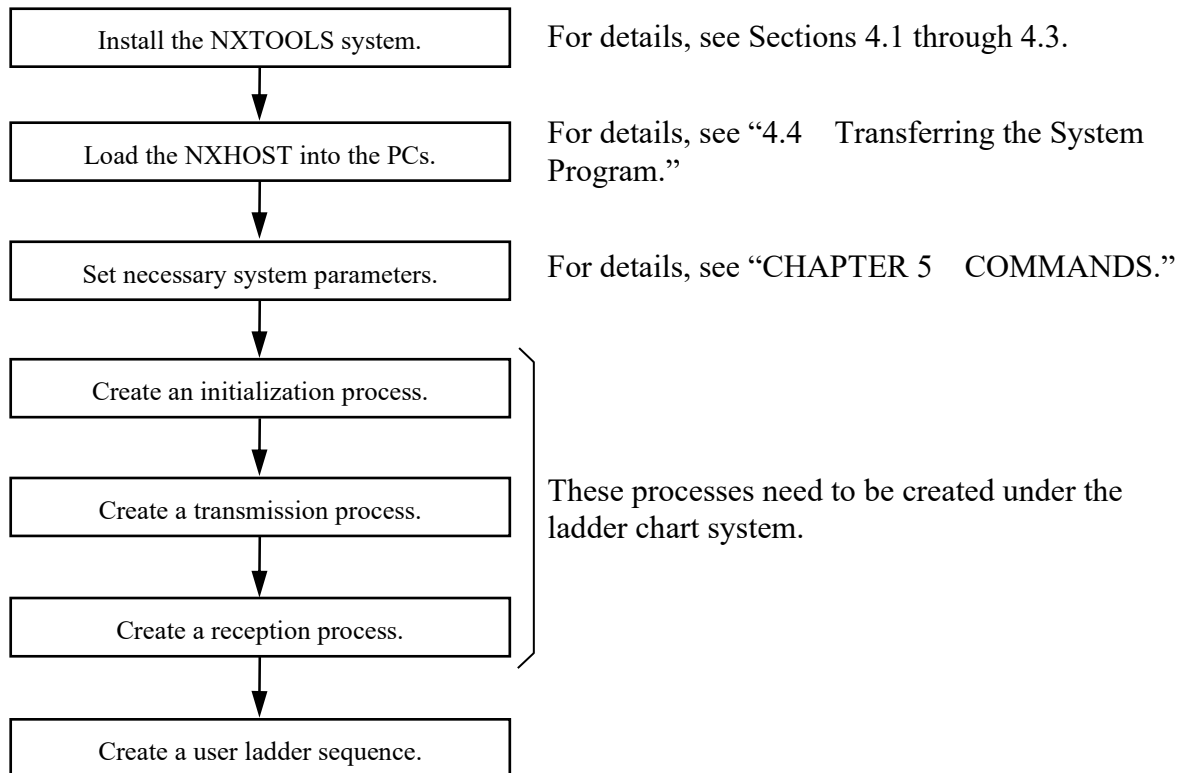
Figure 3-1   Procedure for Creating a Ladder Sequence

3.2   Creating an Initialization Process

The sat() function, available as a system extension arithmetic function, is used to initialize and start the NX. This function needs to be executed only once when the PCs has been powered down and then up again or when it has been reset. The sole parameter to sat() must always be set to 0. Figure 3-2 shows an example of a circuit using this function, where the V-contact is used to limit its execution to only once.
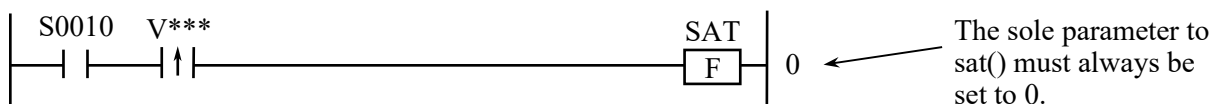
Figure 3-2   A Programming Example of Using the sat() Function

3.3 Creating a Transmission Process

The acp() function, available as a system extension arithmetic function, is used to send as many data bytes as specified by the set send-byte count (set via the TCD setting window shown in CHAPTER 5, "COMMANDS") from the source specified by the set send-address (set via that same window). This function must be called by performing the following steps: 1) set the desired user data to send from the source, 2) ensure that the during-send register is in Off state, and 3) call the acp() function. When this function is called, clear the send request immediately. The parameters to acp() must be specified by an 8-digit decimal number whose low-order five digits represents a TCD number and whose high-order three digits represents a destination DF (data field) number. These two parameters must be assigned the same values as specified as the TCD number and DF number in the DF setup window described in CHAPTER 5, "COMMANDS."
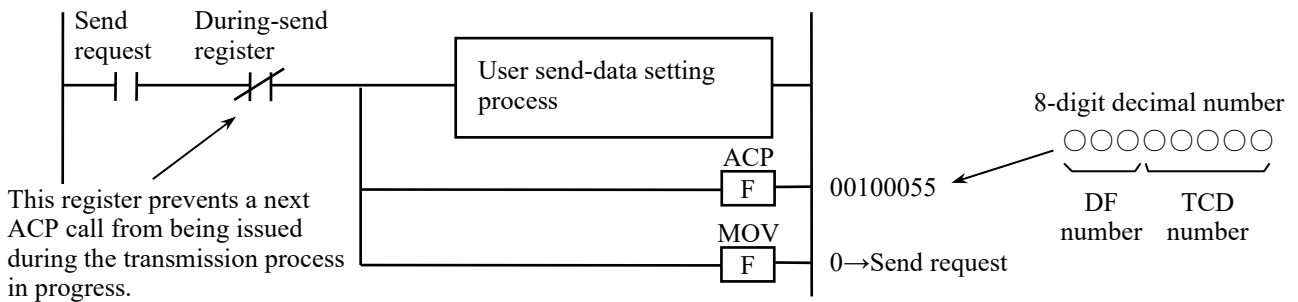
Figure 3-3   A Programming Example of Using the acp() Function

Note 1: The send request must be a contact that has the acp() initiation condition latched by a V-contact. It must be set to 0 upon every issue of an acp() call. If it is not, the send request will be issued repeatedly (see the following example).

Note 2: The during-send register must be one that has been set via the NXTOOLS system. This register prevents a next ACP call from being issued during the transmission process in progress.

Example: Sending a given piece of data once every time X000 becomes ON.
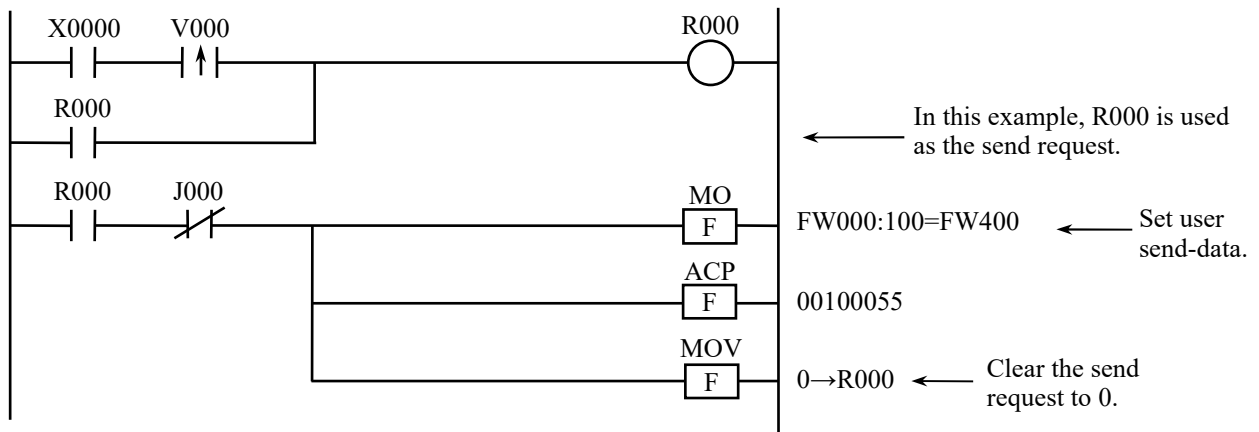
Figure 3-4   A Sending Ladder Circuit

3.4 Creating a Reception Process

Upon reception of a given piece of data, the NX/HOST-S10V transfers as many bytes of the received data as specified by the set receive-byte count (set via the TCD setting window (local DF) shown in Figure 5-4) to the storage location specified by the set receive-address (set via that same window) and then turns on the receive-completion register. If the received data piece contains more bytes than specified by the set receive-byte count, the excess trailing byte(s) will be discarded.

When the receive completion register is ON, you must fetch the user data from the specified storage location and clear the receive completion register.
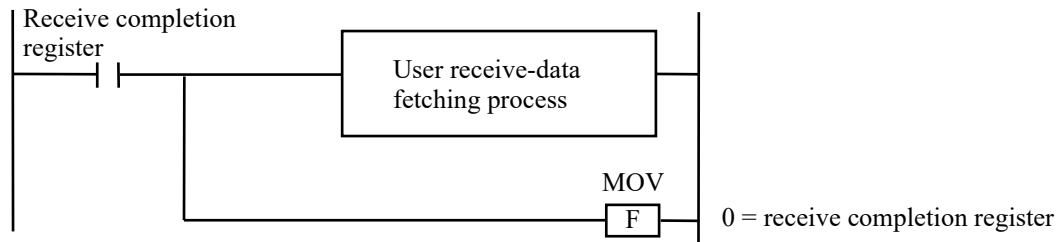
Figure 3-5   A Programming Example of Fetching the Received Data (1)

Note: The receive completion register must be one that has been set as described in CHAPTER 5, "COMMANDS."
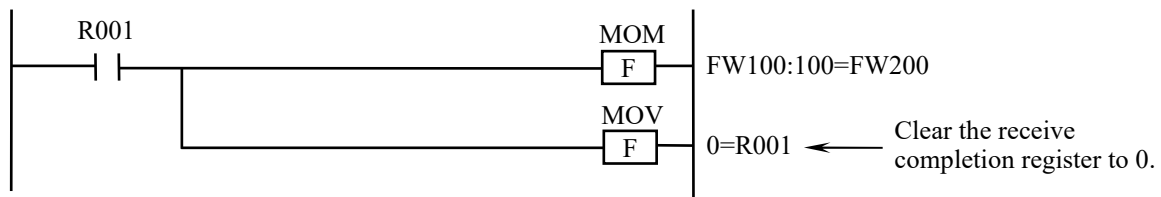
Figure 3-6   A Programming Example of Fetching the Received Data (2)

3.5 Converting the Ladder Chart Program

For details on how to use the S10mini series to convert a ladder chart system that uses a system extension arithmetic function of NXHOST to S10V and details on how to convert the ladder chart system from S10V to S10VE, see the "*User's Manual REPLACEMENT for S10VE* (manual number SEE-1-146)".

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CHAPTER 4   INSTALLING THE SYSTEM

4.1   Installing the NXTOOLS System

First, make sure that your CD-ROM is correct. The NXTOOLS system is compatible with Microsoft® Windows® 7 (64-bit) operating system and Microsoft® Windows® 10 (64-bit) operating system. Operation of the NXTOOLS system is not guaranteed on other operating systems.

4.1.1   Notes on installation

Before installing the NXTOOLS system, make sure that "BASE SYSTEM/S10VE (P.P. model: S-7898-38)" is installed.
For the NXTOOLS system to operate, the following runtime components must be installed. If these runtime components are not installed, install them from the Microsoft Download Center before using the system.
• Microsoft Visual C++ 2010 Redistributable Package (x64)

The NXTOOLS system requires BASE SYSTEM/S10VE for normal operation. If BASE SYSTEM/S10VE is not installed on your machine, you cannot install the NXTOOLS system.

NOTICE

● When installing or uninstalling the NXTOOLS system, use an appropriate Administrator account. If you use a standard account, you might not be able to normally install or uninstall the system.
● Before you start installing the NXTOOLS system, be sure to exit or close all Windows®-based programs that are running, including memory-resident programs, such as virus monitoring software. If you attempt to install the system without ending these programs, an error might occur. In such cases, uninstall the tool you are attempting to install, and then end all Windows®-based programs that are running. Then, install the system again. For details on how to uninstall the system, see "4.2   Uninstalling the NXTOOLS System".
● For the installation destination of the NXTOOLS system, do not specify the following folders, which are protected by User Account Control:
  • Program file folders (such as C:\Program Files)
  • System route folders (such as C:\Windows)
  • System drive route folders (such as C:\)
  • Program data folders (such as C:\ProgramData)

4.1.2   Installation
The following describes how to install the NXTOOLS system.
When installing the system, use an Administrator account to log on to the operating system.
(1) To install the NXTOOLS system, double-click "setup.exe" stored in the "S789813" folder on the CD (NXTOOLS SYSTEM/S10VE) to execute the setup program.
(2) When the "Welcome to the InstallShield Wizard for NXTOOLS SYSTEM/S10VE" window appears, click the [Next] button.
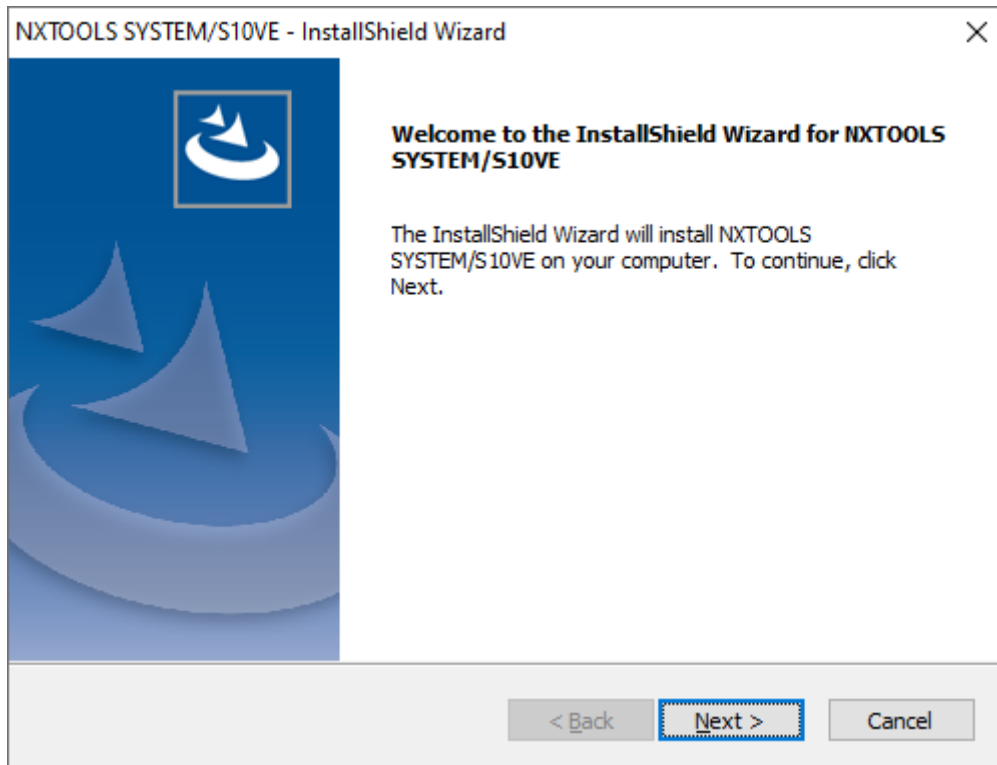
Figure 4-1   NXTOOLS SYSTEM/S10VE Installation Selection Window

If you click the [Cancel] button, the message "Are you sure you want to cancel the setup?" appears. Click the [Yes] or [No] button.
[Yes] button: The installation of the NXTOOLS system is canceled.
              In the "InstallShield Wizard Complete" window, click the [Finish] button.
[No] button: The installation of the NXTOOLS system resumes.
(3) The "Choose Destination Location" window appears. If necessary, change the installation destination folder, and then click the [Next] button.
(4) The "Setup Status" window appears.
(5) When the installation is completed, the "InstallShield Wizard Complete" window appears. Click the [Finish] button.

Notes on installation

When "setup.exe" starts, the following dialog box might appear. If the dialog box appears, click the [Yes] button to execute the setup program.

NOTICE

The NXTOOLS system cannot be installed on a per-user basis. To install the NXTOOLS system successfully, the user must first log on to the operating system with an appropriate Administrator account, which is the Administrator account that was first created when the computer was in its initial condition.
In the following cases, the NXTOOLS system might not be installed properly: 1) the user uses a standard user account and acquires administrator permissions by using User Account Control (*) or 2) the user logs on by using an Administrator account that was created from a standard user account by using User Account Control.
If you log on by using a user account other than the one you used to install the NXTOOLS system, the installed program might not appear in the program menu.
In this case, perform the following steps: 1) log on by using the Administrator account that was first created when the computer was in its initial condition; 2) uninstall the installed program; and 3) install the program again.
If you want to create a new account, be sure to log on with an Administrator account. Do not use User Account Control when creating a new account.

(*) User Account Control is a Microsoft Windows feature that temporarily grants administrative rights to standard user accounts.

4.2 Uninstalling the NXTOOLS System

To uninstall the NXTOOLS system, perform the following procedure.

In addition, when uninstalling the system, use an Administrator account to log on to the operating system.

(1) From the [Start] menu, choose [Control Panel]. From the Control Panel, click [Programs and features]. Then, double-click [NXTOOLS SYSTEM/S10VE].

When the message "Do you want to completely remove the selected application and all of its features?" appears, click the [Yes] button.
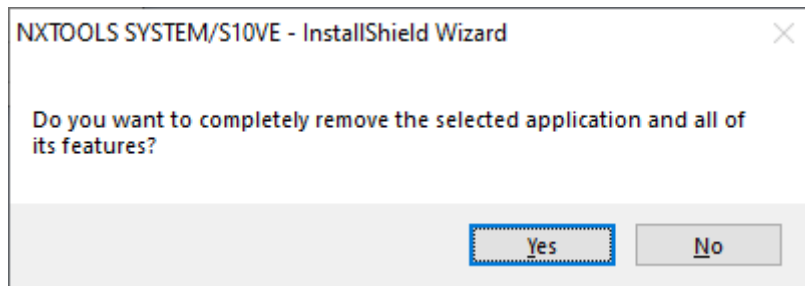
Figure 4-2   The Message "Do you want to completely remove the selected application and all of its features?"

[Yes] button: The application is uninstalled.

[No] button: The uninstallation is canceled.

(2) When the uninstallation is completed, "Uninstall Complete" appears. Click the [Finish] button.

4.3　Starting Up the System

4.3.1　Starting it up in online mode
　　　The NXTOOLS system can be started up in online mode by performing the following
　　　procedure:
　　　(1) Start BASE SYSTEM/S10VE, and then create or select a target project. For details on
　　　　　how to start BASE SYSTEM/S10VE and how to create or select a project, see the
　　　　　"*S10VE User's Manual General Description* (manual number SEE-1-001)".
　　　(2) From the [Program] menu of BASE SYSTEM/S10VE, click [Setting Tool]. The "Setting
　　　　　Tool" window appears as shown in Figure 4-3.

BASE SYSTEM/S10VE - [Setting Tool]			
Project　Online　Program　Setting　RAS　CPMS Debugger			
Name	**Model**	**Version**	
BACKUP RESTORE SYSTEM/S10VE	S-7898-09	01-00-02	Execute
BASE SYSTEM/S10VE	S-7898-38	01-00-04	Save List
CPMS/S10VE	S-7898-05	01-00-04	
LADDER DIAGRAM SYSTEM/S10VE	S-7898-02	01-01-01	
NXTOOLS SYSTEM/S10VE	S-7898-13	01-00-02	Close
RCTLNET/S10VE	S-7898-60	01-00-01	

PCsNo:0100 | Communication kind:Ethernet | 192.192.192.1

Figure 4-3　The "Setting Tool" Window of BASE SYSTEM/S10VE

(3) From the list in the "Setting Tool" window, select [NXTOOLS SYSTEM/S10VE]. Then, click the [Execute] button. The main window of the NXTOOLS system appears as shown in Figure 4-4. At this stage, the system is not connected to the PCs unit yet.
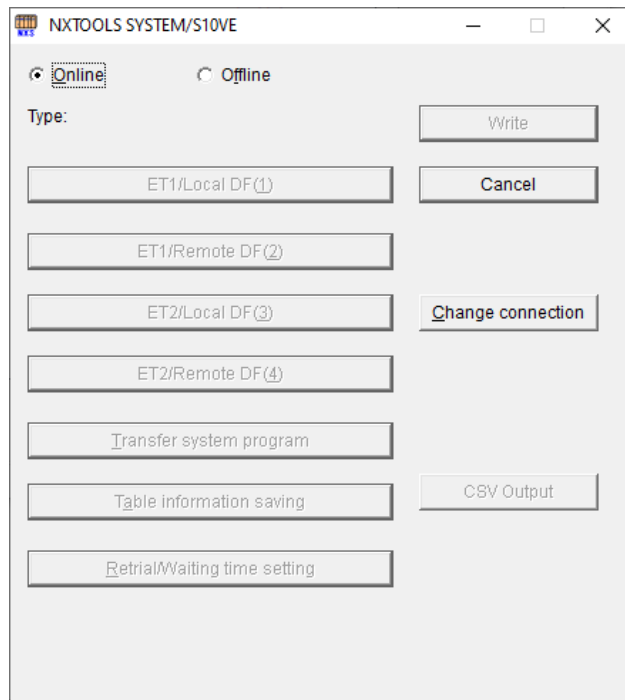
Figure 4-4   The Main Window

(4) In the main window (shown in Figure 4-4), click the [Change connection] button. The "Communication type" window appears as shown in Figure 4-5. In the window, specify the connection destination, and then click the [OK] button. (For details on selecting a communication type, see "5.6   Change Connection".) If you do not need to change the connection destination, click the [Cancel] button.
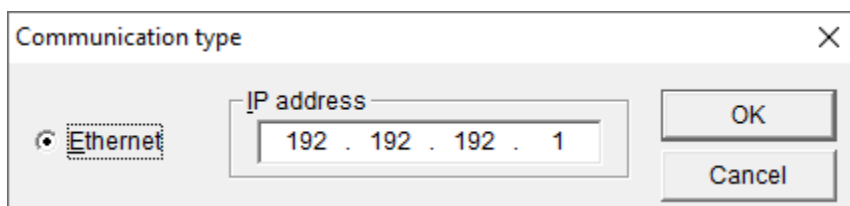
Figure 4-5   The "Communication type" Window

To specify the default IP address, you can use BASE SYSTEM/S10VE (P.P. model: S-7898-38).

(5) One of the windows shown in Figures 4-6 and 4-7 appears, indicating that the NXTOOLS system has started (in online mode). Click the desired command button in the window, except in cases where the necessary system program has not been transferred to the target machine (this condition is indicated by the window shown in Figure 4-6). In such cases, transfer the system program. For details on the system program transfer, see "4.4　Transferring the System Program".
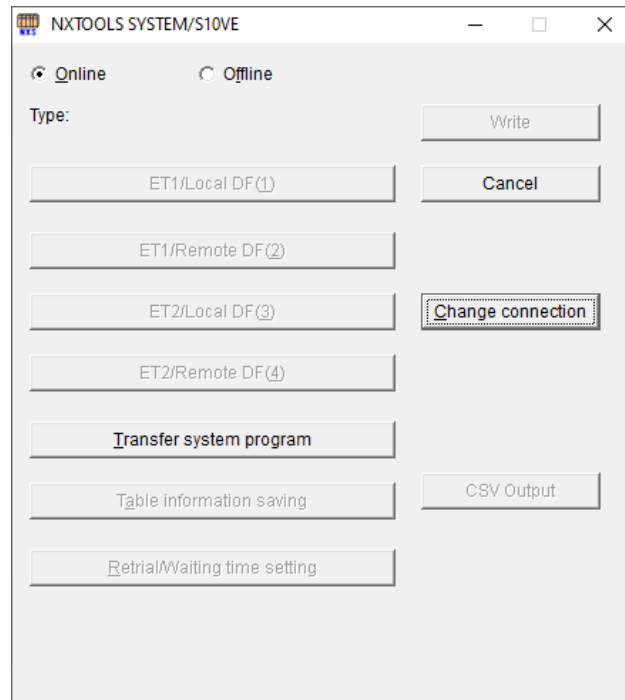
Figure 4-6　The Main Window (if the system program has not been transferred)
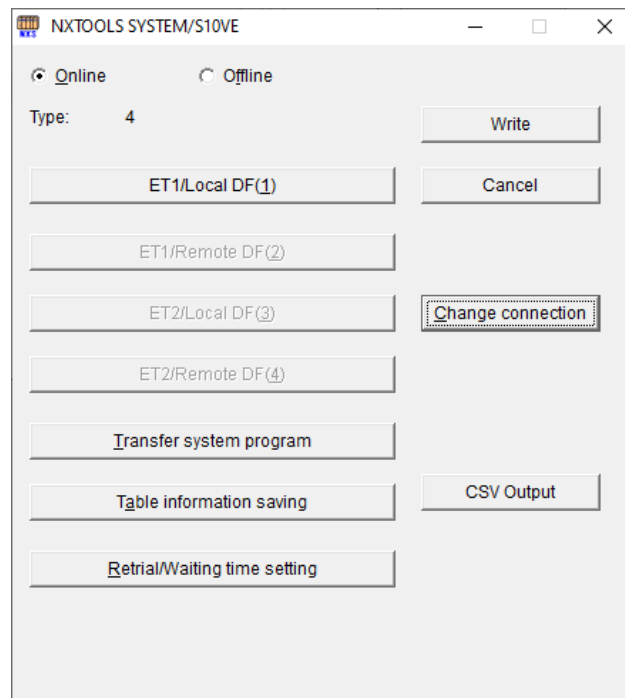
Figure 4-7　The Main Window (if the system program has been transferred)

- In cases where the system program has already been transferred (as shown in Figure 4-7), if the [ET1/Local DF], [ET1/Remote DF], [ET2/Local DF], and [ET2/Remote DF] buttons are not enabled, the default information that is part of the setting information might not have been transferred to the target at the time of the previous system program transfer. In such cases, transfer the system program and the default information. For details on how to perform the transfer, see "4.4   Transferring the System Program".
- If you want to use the remote DF of ET1 but the [ET1/Remote DF] button is not enabled (only the [ET1/Local DF] button is enabled), the system program might have been transferred to the target with "Type 4" specified for the default information. In such cases, transfer the system program with "Type 5" specified for the default information. For details on how to perform the transfer, see "4.4 Transferring the System Program".
- If you want to use ET2 but the [ET2/Local DF] and [ET2/Remote DF] buttons are not enabled, the system program might have been transferred to the target with "Type 4" or "Type 5" specified for the default information. In such cases, transfer the system program with "Type 6" specified for the default information. For details on how to perform the transfer, see "4.4   Transferring the System Program".

4.3.2 Starting it up in offline mode

The NXTOOLS system can be started up in offline mode by performing the following procedure:

(1) Take the same steps as Steps (1) and (2) described under "4.3.1 Starting it up in online mode."

(2) Select the [Offline] radio button, as shown in Figure 4-8.
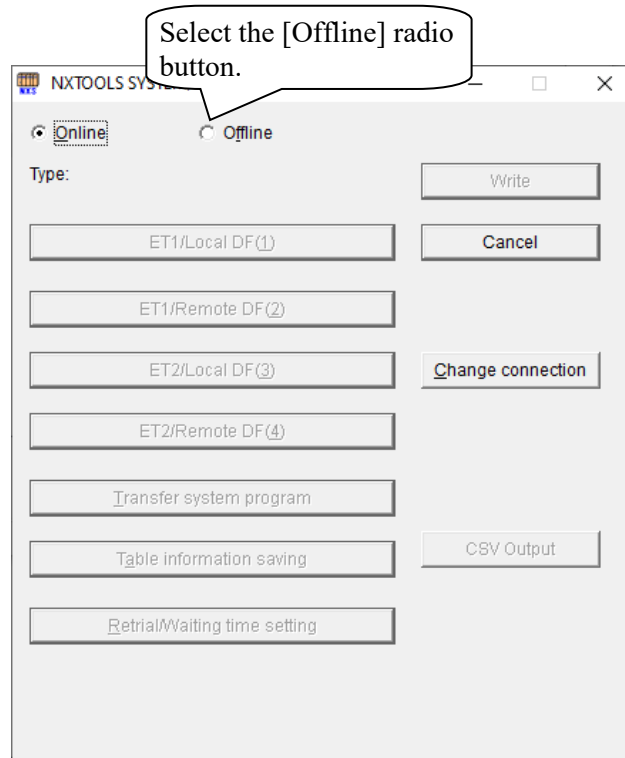
Figure 4-8 Selecting the [Offline] Radio Button

(3) Click the [Edition file select] button as shown in Figure 4-9. The "Open" dialog box appears as shown in Figure 4-10.
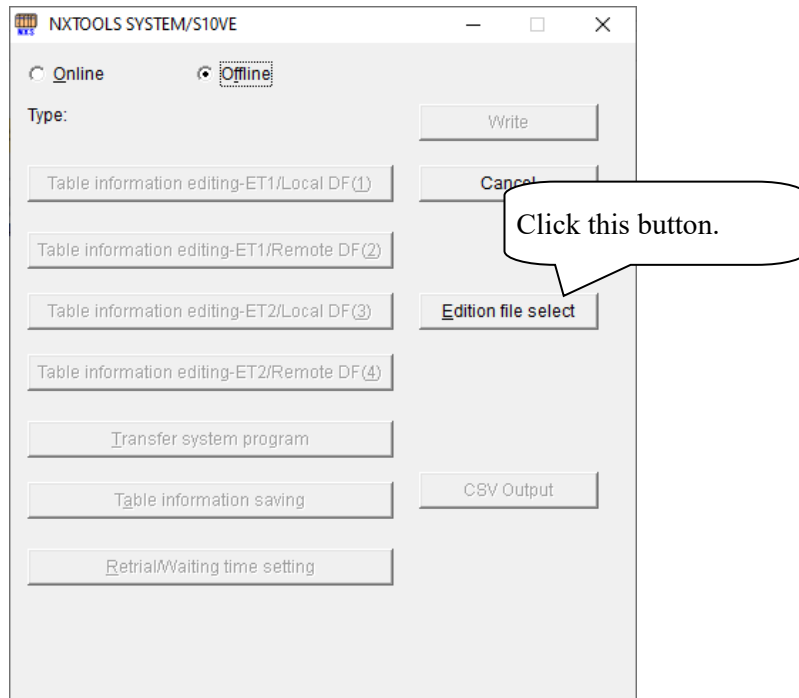
Figure 4-9　The [Edition file select] Button
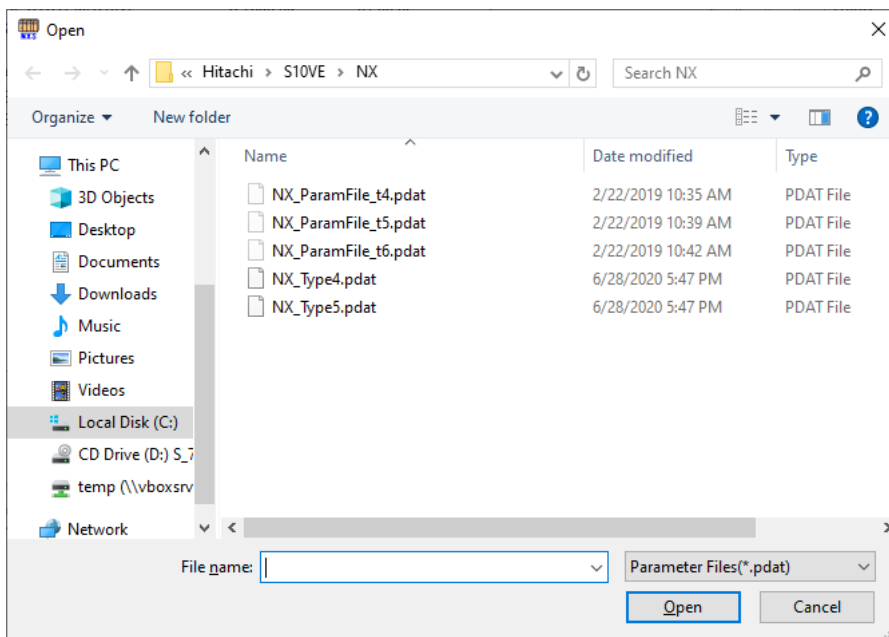
Figure 4-10　The "Open" Dialog Box

(4) Select the NX setup information file you want to edit in offline mode, and then click the [Open] button as shown in Figure 4-11. You can select files in the PDAT format.
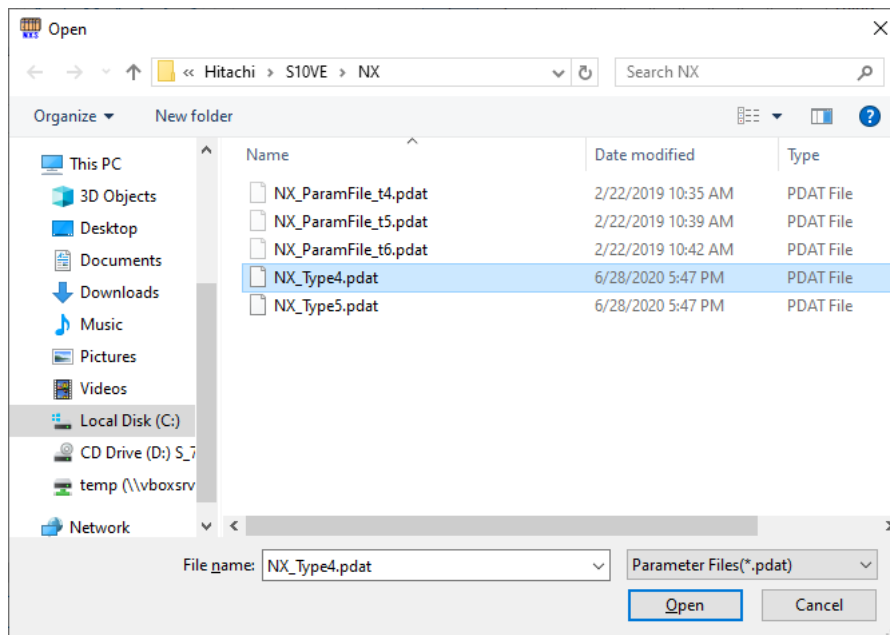
Figure 4-11   The "Open" Dialog Box (file selection)

(5) The "Select File" window appears as shown in Figure 4-12.
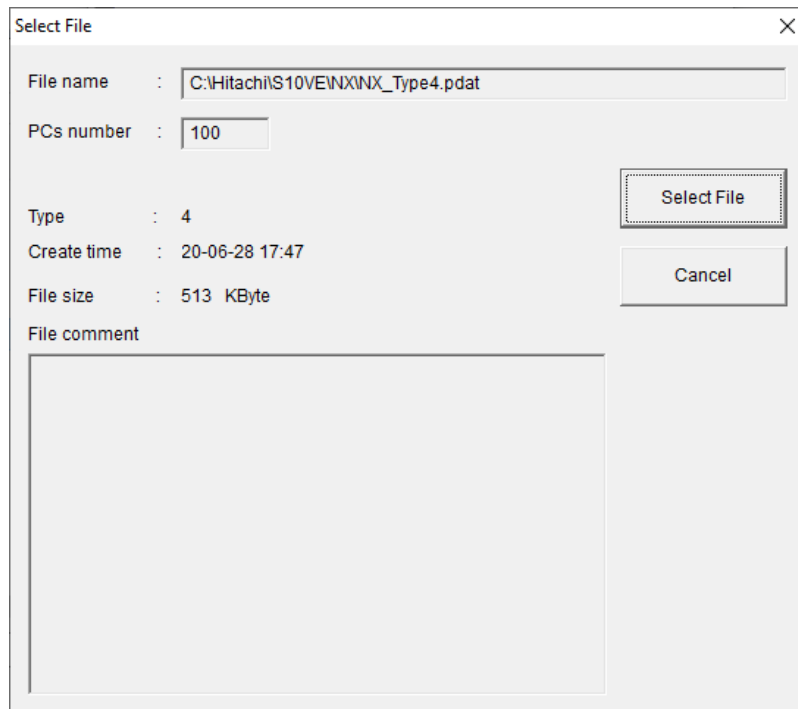
Figure 4-12   The "Select File" Window

    If you want to edit the selected NX setup information file, click the [Select File] button.
If you want to cancel the selection, click the [Cancel] button.

(6) You can now edit the selected NX setup information file. For details on how to edit the NX setup information file in offline mode, see "5.8　Table Information Editing -- Local DF" or "5.9　Table Information Editing -- Remote DF".

4.4 Transferring the System Program

The NXTOOLS system offers an option named "Transfer system program". This option loads to the PCs a set of program modules (tasks, IRSUBs, etc.) and setup information (tables to be referenced or updated by those program modules during their execution) for the system program that are necessary for use in communication with the NX.

You can transfer the system program while a ladder operation is stopped or in progress. If you transfer the system program while a ladder operation is in progress (in LADDER RUN status), the S10VE unit is automatically reset (by remote resetting). So, you must be careful when using this option.

To use this option, click the [Transfer system program] button in the main window. The System program transfer window appears as shown in Figure 4-13.
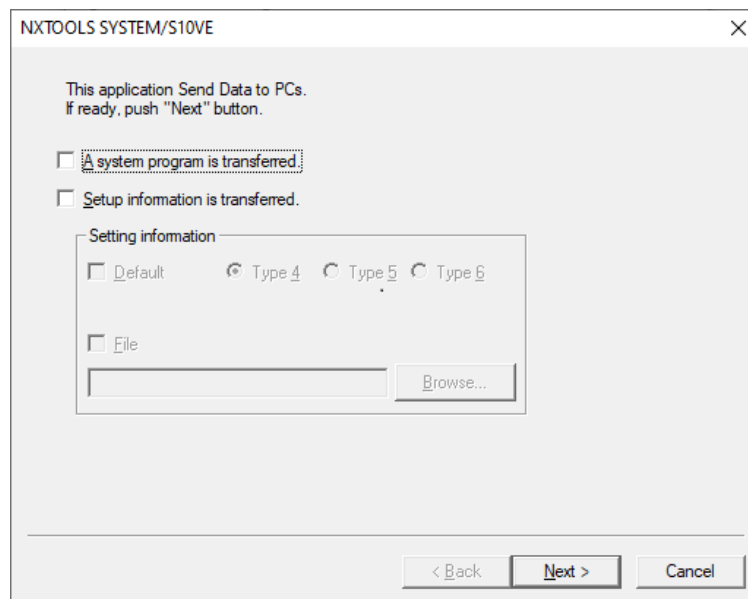
Figure 4-13   The System Program Transfer Window

The above window for system program transfer can be used in the following cases:
● The system program has not been transferred to the target yet.
● The system program needs to be replaced because of, for example, the release of a new version.
● The NX setup information created by offline editing needs to be loaded to the target.
● The NX setup information saved as a file from another PCs unit needs to be loaded to the target.
● The type of the transferred system program needs to be changed.

Note 1: Of the above NX setup information, the retry count/receive-wait time setting information is not loaded to the target. It has to be loaded separately to it according to the instructions given under "5.5   Retrial/Waiting Time Setting."
Note 2: If you send the default information, as with the previous S10V, the NX setup information excluding the registered TCD information edited by the user is initialized. However, after sending the default information and before transferring the system program by using the [Write] button in the main window (in online mode) to register NX setup information or by specifying a file, if you start the ladder program to call the SAT arithmetic function, the TCD information is cleared.

4.4.1 Cases where the system program has not been transferred yet

If the system program has not been transferred to the target yet, you cannot click each DF setting button in the main window. In such cases, transfer the system program by performing the following procedure.

(1) Click the [Transfer system program] button in the main window as shown in Figure 4-14.
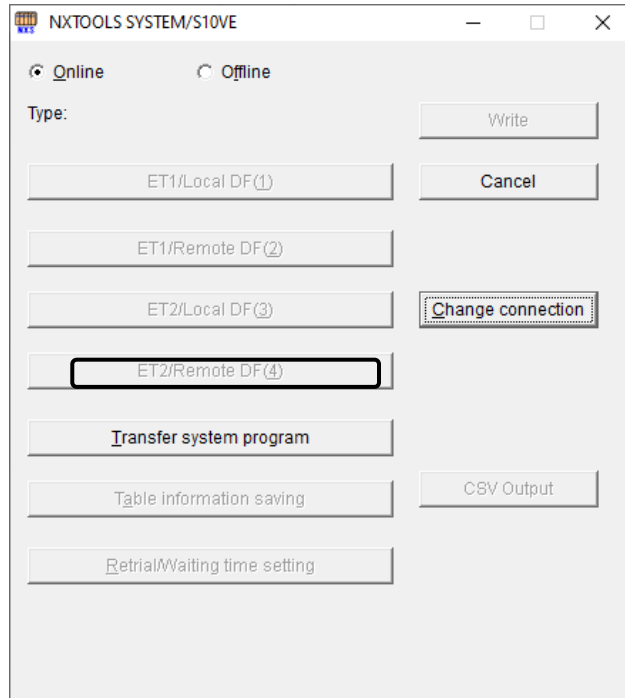
Figure 4-14   The Main Window

The System program transfer window shown in Figure 4-15 will then be displayed.
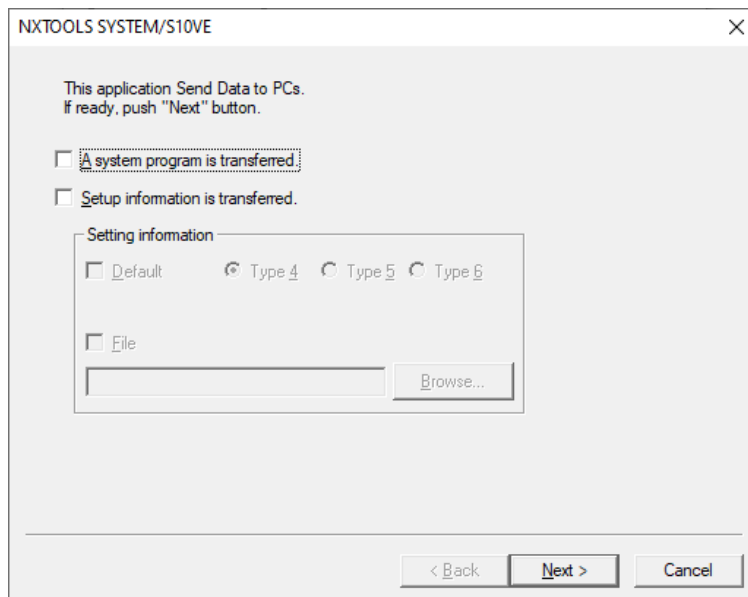
Figure 4-15   The System Program Transfer Window

(2) Check the following check boxes in the System program transfer window shown in Figure 4-16:
   • "A system program is transferred."
   • "Setup information is transferred."
   • "Default" in the "Setting information" group box
   When the "Default" check box is checked, select the type of NX system program you want to use ("Type 4", "Type 5", or "Type 6"). Detailed information on the selectable types of NX system programs is given under the title "<Types and data fields>" in "5.1 Command Repertoire."
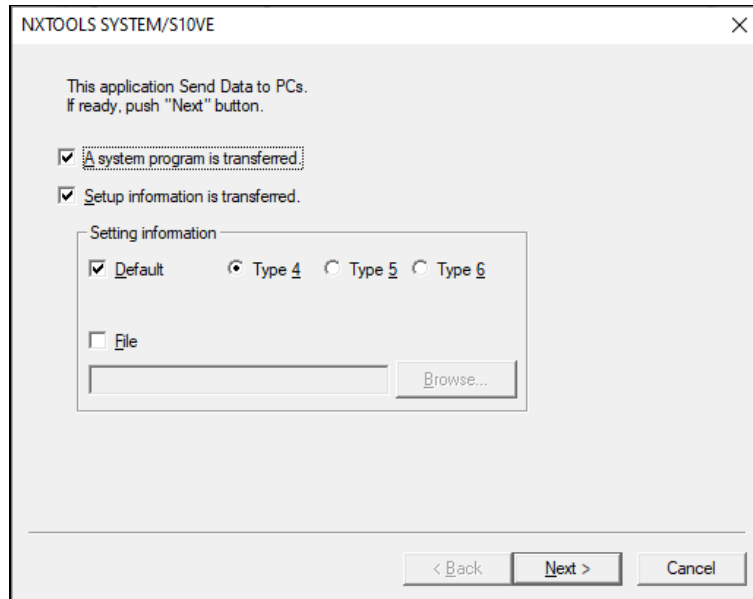
Figure 4-16   The System Program Transfer Window ("Default" selected)

(3) Click the [Next] button in the System program transfer window shown in Figure 4-16.
(4) A confirmation dialog box will appear as shown below to ask whether you are ready to transfer the system program along with the setup information. The message displayed in the dialog box varies depending on the transfer status of the system program at the transfer destination PCs unit (see Figures 4-17 and 4-18).
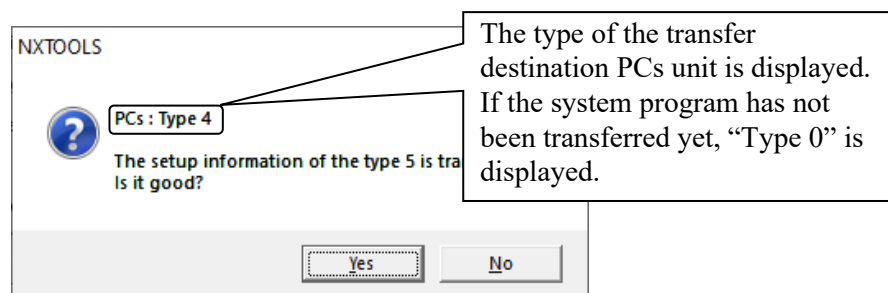
Figure 4-17   A Confirmation Dialog Box for Transferring the Setup Information
              (if the types do not match between the transfer source and target or the system program has not been transferred yet)
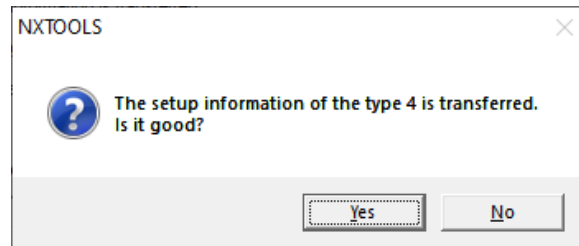
Figure 4-18　A Confirmation Dialog Box for Transferring the Setup Information
(if the types of the transfer source and target match)

If you want to perform the transfer, click the [Yes] button.
If you do not want to perform the transfer, click the [No] button. Then, the System program transfer window will reappear.
(5) A confirmation dialog box asking whether you want to perform remote resetting of the PCs unit will appear as shown in Figure 4-19. If you want to reset the PCs unit, click the [OK] button.
If you do not want to reset the PCs unit, click the [Cancel] button. Then, the System program transfer window will reappear.
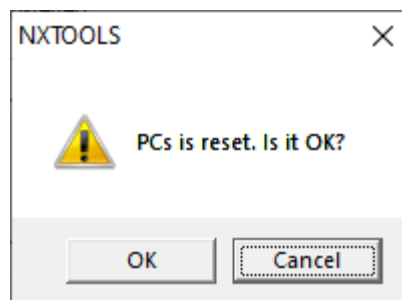
Figure 4-19　A Confirmation Dialog Box for Remote Resetting of the PCs Unit

The S10VE controller, the destination of the requested system program transfer, will then be automatically reset, followed by the start of the requested transfer. During the transfer, a window displaying the progress of the transfer at the destination of the system program transfer will appear as shown in Figure 4-20.
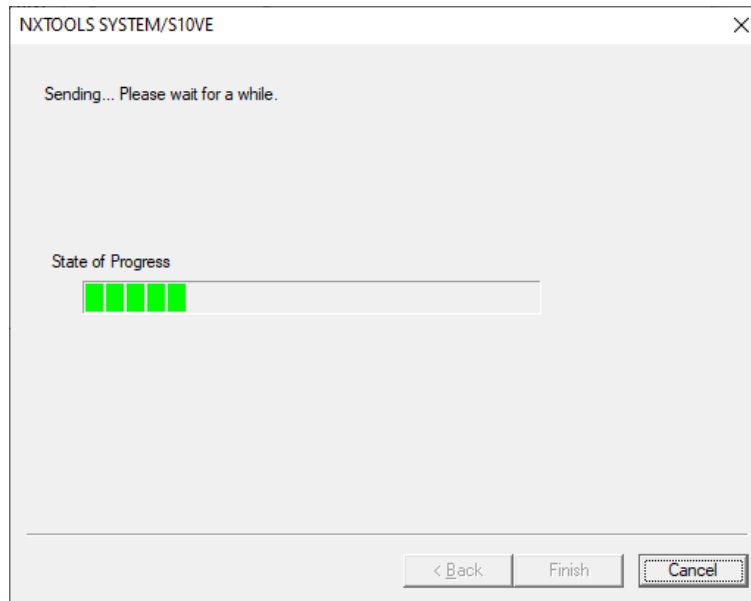
Figure 4-20   The Window Displaying the Progress at the Destination of the System Program
Transfer (showing the progress)

During the transfer, avoid clicking the [Cancel] button as far as possible. If you click the
button during the transfer, the system program thus far transferred will be left incomplete
in the S10VE controller. In this case, you need to redo the transfer.

(6) When the transfer is completed, the message "Processing completed" appears in the
window displaying the progress at the destination of the system program transfer (shown
in Figure 4-21). Click the [Finish] button.
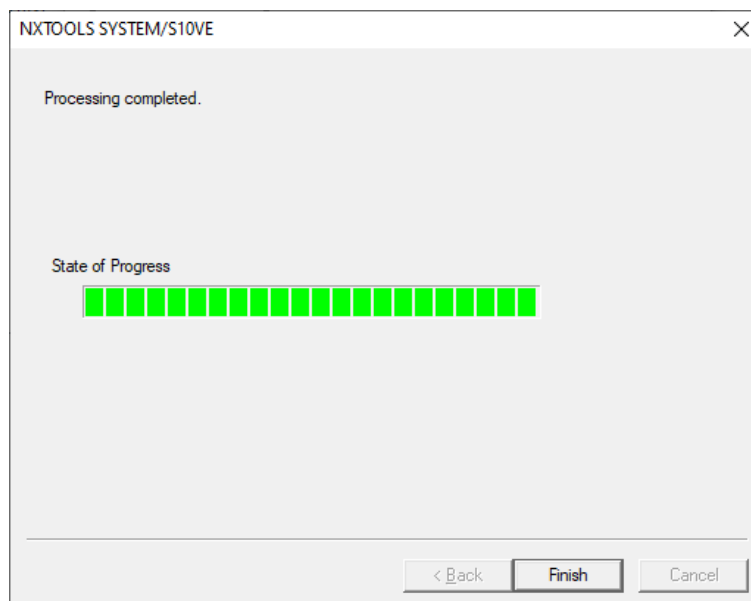
Figure 4-21   The Window Displaying the Progress at the Destination of the System Program
Transfer (transfer complete)

(7) After the system program is transferred, a window displaying the status of receiving data after the system program transfer appears as shown in Figure 4-22. Then, readback of the parameters transferred to the actual controller will be performed.
The file type that is read back is applied to the type of the main window.
After the readback is finished, the main window reappears. Now, the system program transfer is complete.

Receiving... Please wait for a while.
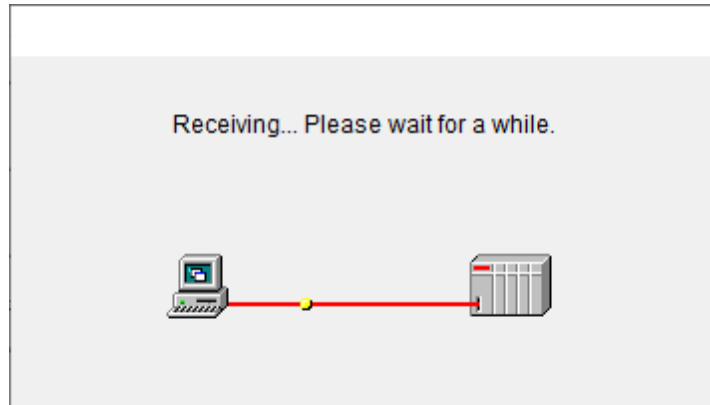
Figure 4-22   The Window Displaying the Status of Receiving Data After the
System Program Transfer

4.4.2   Transferring the NX setup information

In cases where the system program has already been transferred to the PCs unit, you can transfer the NX setup information file that was created through offline editing or by saving table information, to the same PCs unit by performing the following procedure.

(1) In the main window shown in Figure 4-23, click the [Transfer system program] button. The System program transfer window will then appear as shown in Figure 4-24.
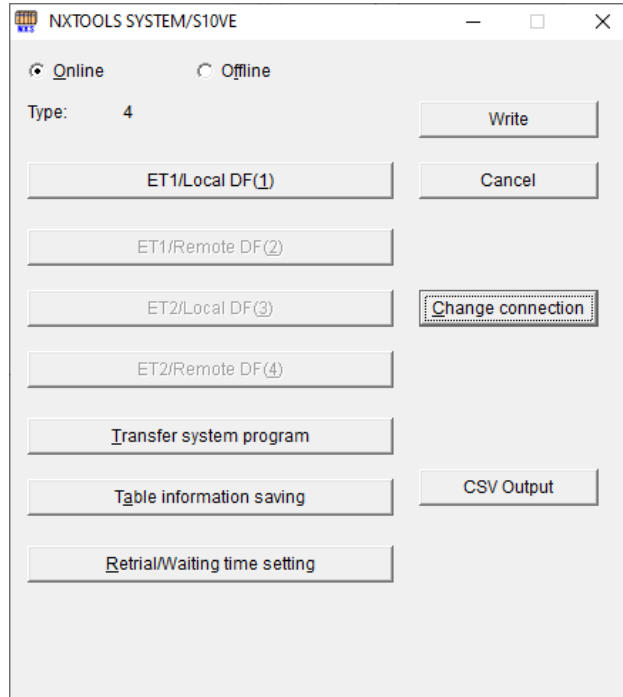
Figure 4-23   The Main Window (Type 4 setup info already transferred)

(2) As shown below, check the "Setup information is transferred." check box in the System program transfer window shown in Figure 4-24 and also check the "File" check box in the "Setting information" group box.
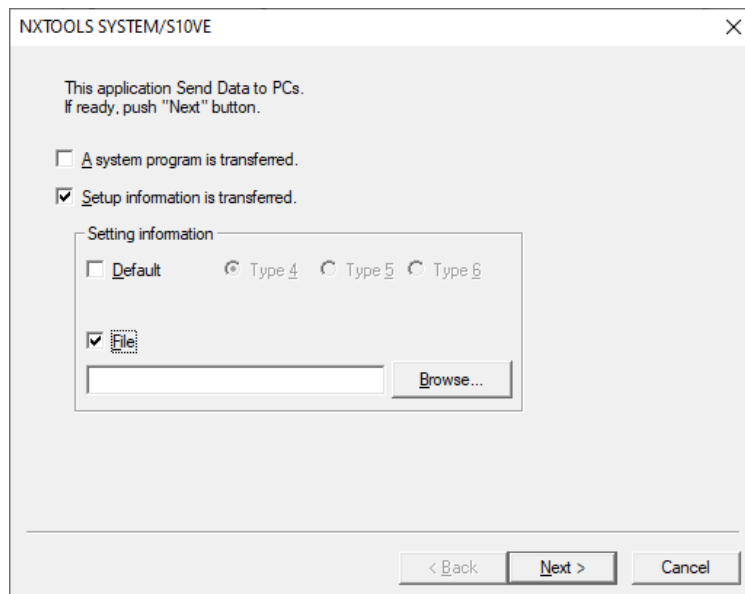
Figure 4-24   The System Program Transfer Window ("File" check box selected)

(3) If you click the [Browse] button in the "Setting information" group box, the "Open" dialog box appears as shown in Figure 4-25. In the dialog box, select the desired NX setup information file you want to transfer to the destination, and then click the [Open] button.
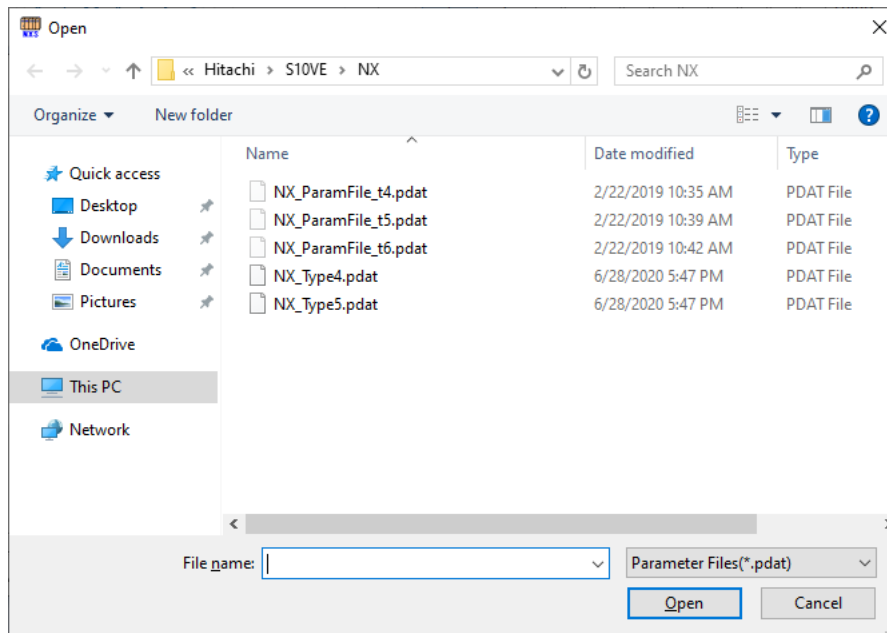
Figure 4-25   The "Open" Dialog Box

(4) The "Select File" window appears as shown in Figure 4-26. Make sure that the type matches that of the transfer destination PCs unit. If you want to transfer a NX setup information file whose type does not match that of the transfer destination PCs unit, transfer the default information with the type corresponding to that of the transfer destination PCs unit so that the types match. For details on how to transfer the default information for a type, see "4.4.1　Cases where the system program has not been transferred yet".

To transfer the selected NX setup information file, click the [Select File] button. To cancel the file, click the [Cancel] button.

The System program transfer window reappears.

Select File	✕
File name　:　C:\Hitachi\S10VE\NX\NX_Type4.pdat	
PCs number　:　100	
	Select File
Type　　　:　4	
Create time　:　20-06-28 17:47	Cancel
File size　　:　513　KByte	
File comment	
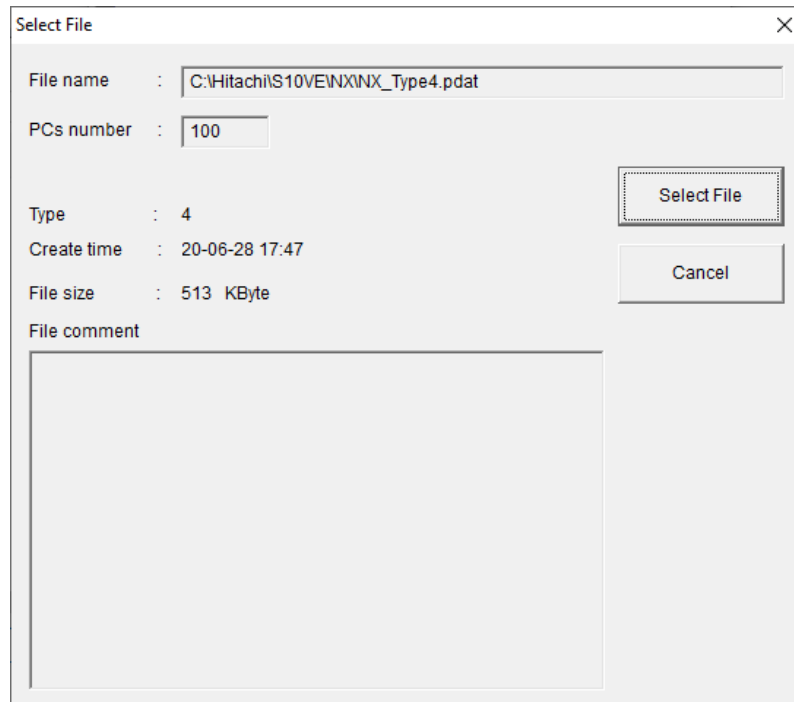
Figure 4-26　The "Select File" Window

(5) If you select the NX setup information file, the specified file name appears in the System program transfer window as shown in Figure 4-27. Click the [Next] button, as shown below.
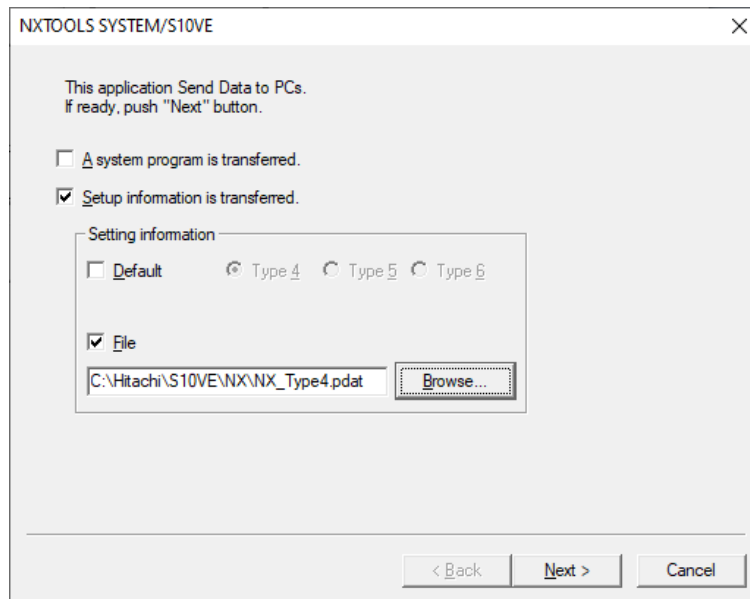
Figure 4-27　The System Program Transfer Window (a file is specified)

(6) A confirmation dialog box will be displayed as shown in Figure 4-28 to ask whether or not you are ready to transfer the setup information.
Make sure that the CPU module's LADDER switch is set in "STOP" position.
If the LADDER switch is set in the other position ("RUN"), the NXTOOLS system is unable to perform such transfer.
If you want to perform the transfer, click the [Yes] button. If you do not want to perform the transfer, click the [No] button. The System program transfer window reappears.
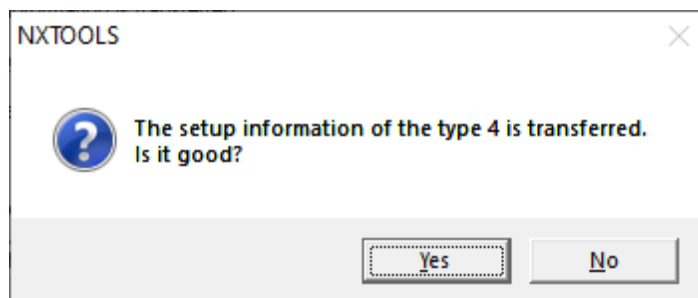
Figure 4-28　A Confirmation Dialog Box for Transferring the Setup Information

(7) The "Option module parameter setup list" window appears as shown in Figure 4-29. Click the number of the module to which you want to write, and then click the [OK] button. If NX setup information is registered for the module you clicked, a confirmation dialog box appears to ask whether you want to overwrite it. If you click the [OK] button, the NX setup information is registered. If you click the [Cancel] button, the NX setup information is not registered. You can register NX setup information for only one case. To cancel writing, click the [Cancel] button in the "Option module parameter setup list" window.

In the "Option module parameter setup list" window, the information set for the CPU appears.

If you register NX setup information, "NX(Type$X$)" appears, where X is a number in the range from 4 to 6, indicating the registered type.

```
Option module parameter setup list                    ×

    No.   Module Name                      OK
    1     NX(Type4)
    2                                    Cancel
    3
    4
    5
    6
    7
    8
    9
    10
```
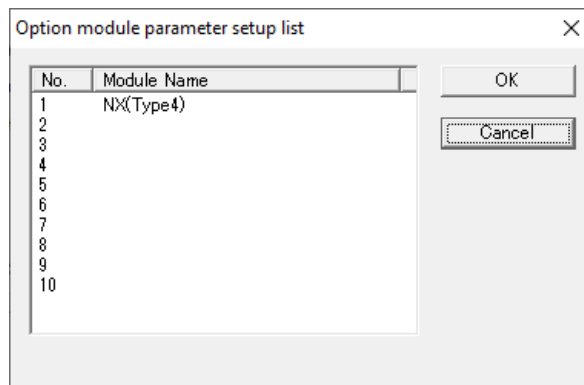
Figure 4-29　The "Option module parameter setup list" Window

(8) A confirmation dialog box will appear as shown in Figure 4-30 to ask whether you want to reset the PCs unit. If you want to reset the PCs unit, click the [OK] button in the dialog box.

If you do not want to reset the PCs unit, click the [Cancel] button. The "Option module parameter setup list" window reappears.

If you do not reset the PCs unit, the parameters are written to the CPU but not applied to communication with NX. If you want to use the set parameters for communication with NX, you need to manually reset the PCs unit or to transfer the NX setup information again.

```
NXTOOLS                        ×

    ⚠   PCs is reset. Is it OK?

        OK            Cancel
```
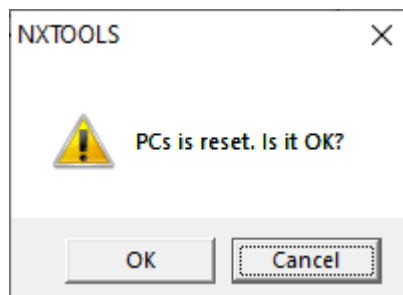
Figure 4-30　A Confirmation Dialog Box for Resetting the PCs Unit

(9) When the PCs unit is successfully reset, a dialog box displaying a message indicating that the PCs unit was successfully reset appears as shown in Figure 4-31. Click the [OK] button.
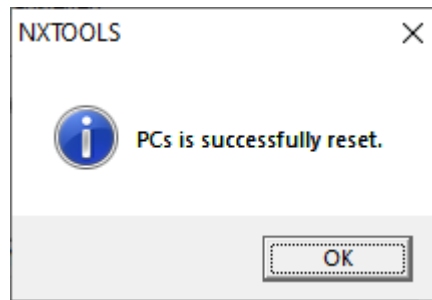
Figure 4-31　A Dialog Box Displaying a Message Indicating That the PCs Unit Was Successfully Reset

(10) The window displaying the status of receiving data after the system program transfer appears as shown in Figure 4-32. Then, readback of the parameters transferred to the actual controller will be performed.
The file type that is read back is applied to the type of the main window.
After the readback is finished, the main window reappears.
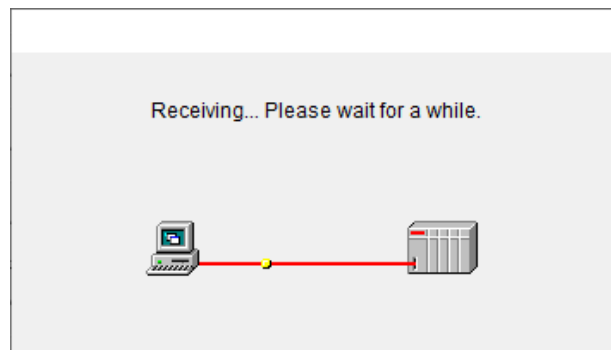
Figure 4-32　The Window Displaying the Status of Data Reception After the System Program Transfer

If you transfer the NX setup information file, the retry count and receive-wait time settings that were edited in online mode will be overwritten by the values saved in the file. For this reason, you must be careful when transferring an NX setup information file. After transferring the file, use the "Retrial number of times/Receiving waiting time" window (shown in Figure 5-15) to check the retry count and receive-wait time settings. If you want to change the retry count and receive-wait time settings, change them by using the "Retrial number of times/Receiving waiting time" window. Then, in the main window, click the [Write] button to write the new settings to the PCs unit. For details on writing to the PCs unit, see "5.7　Write".

4.4.3　Replacing the system program with its updated version
    (1) Save the existing NX setup information from the PCs unit to a file. For information on how to save it, see "5.4　Table Information Saving."
    (2) Transfer the up-to-date version of the system program to the PCs unit. For information on how to transfer it, see "4.4.1　Cases where the system program has not been transferred yet."
    (3) Transfer to the PCs unit the NX setup information that was saved in Step (1). For information on how to transfer it, see "4.4.2　Transferring the NX setup information."

4.4.4　Transferring the NX setup information created through offline editing
    (1) Save the NX setup information that has been created through offline editing to a file. For details on the offline editing, see "5.8　Table Information Editing -- Local DF" or "5.9 Table Information Editing -- Remote DF."
    (2) Transfer the system program to the PCs unit if it has not been transferred yet. For details, see "4.4.1　Cases where the system program has not been transferred yet."
    (3) Transfer to the PCs unit the NX setup information that was saved in Step (1). For information on how to transfer it, see "4.4.2　Transferring the NX setup information."

4.4.5　Transferring the NX setup information saved in a file from a PCs unit
    (1) Transfer the system program to the PCs unit if it has not been transferred yet. For details, see "4.4.1　Cases where the system program has not been transferred yet."
    (2) Transfer to the PCs unit the NX setup information that has been saved in a file from a PCs unit. For information on how to transfer it, see "4.4.2　Transferring the NX setup information."

4.5　Exiting the System

To exit the NXTOOLS system, simply click the [×] or [Cancel] button in the main window (Figure 4-6 or 4-7).

CHAPTER 5   COMMANDS

5.1   Command Repertoire

This section shows the command repertoire of the NXTOOLS system. The individual commands in the command repertoire are classified into two groups: commands used in online mode and commands used in offline mode.

```
Commands ─────┬─── Online ───┬─── ET1/Local DF
              │              ├── ET1/Remote DF
              │              ├── ET2/Local DF
              │              ├── ET2/Remote DF
              │              ├── Transfer system program
              │              ├── Table information saving
              │              ├── Retrial/Waiting time setting
              │              ├── Change connection
              │              ├── Write
              │              └── CSV output
              │
              │
              └─── Offline ──┬─── Table information editing -- ET1/Local DF
                             ├── Table information editing -- ET1/Remote DF
                             ├── Table information editing -- ET2/Local DF
                             ├── Table information editing -- ET2/Remote DF
                             ├── Edition file select
                             ├── Write
                             └── CSV output
```

Of the above commands, some cannot be used depending on the type of the NX system program loaded in the PCs you want to set up. The rest of this section identifies the types of NX system programs supported and shows the relationships between those types and the commands usable with each of the types.

<Types and data fields>
The types of NX system programs supported by the NXTOOLS system are Type 4, Type 5, and Type 6. Each of these two types must be selected in accordance with the network configuration used and the data field you want to access, as shown in Figure 5-1.
If you have used the conventional type (Type 1, Type 2, or Type 3) of NX system program on a S10 series machine, migrate to Type 4, Type 5, or Type 6. Type 4, Type 5, and Type 6 are upgraded versions of Type 1, Type 2, and Type 3, and allow you to define more TCDs than before. These two generations of NX system program types are functionally identical to each other.
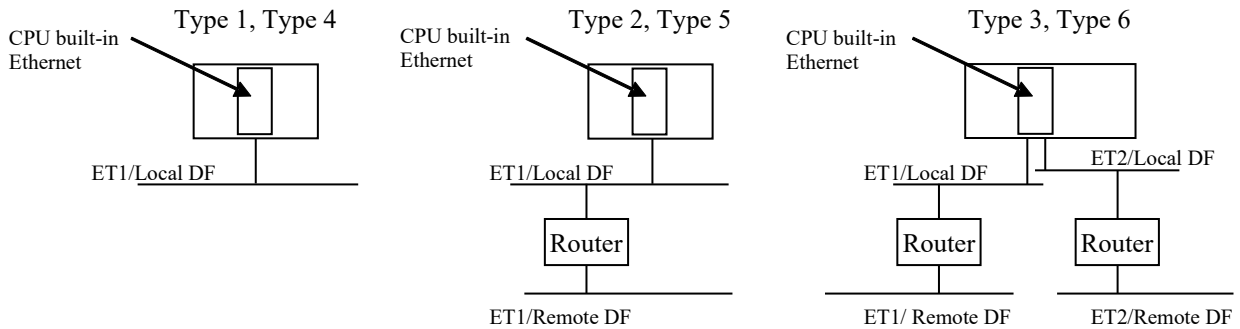
Figure 5-1   Types and Data Fields

The commands that can be used with each selected type are shown in Table 5-1 and Table 5-2.

Table 5-1   Commands Usable with Each Type (in online mode)

Command	Without the system	Type 4	Type 5	Type 6
ET1/Local DF	nu	√	√	√
ET1/Remote DF	nu	nu	√	√
ET2/Local DF	nu	nu	nu	√
ET2/Remote DF	nu	nu	nu	√
Transfer system program	√	√	√	√
Table information saving	nu	√	√	√
Retrial/Waiting time setting	nu	√	√	√
Change connection	√	√	√	√

√: Usable   nu: Not usable

Table 5-2   Commands Usable with Each Type (in offline mode)

Command	Without any file selected	Type 4	Type 5	Type 6
Table information editing -- ET1/Local DF	nu	√	√	√
Table information editing -- ET1/Remote DF	nu	nu	√	√
Table information editing -- ET2/Local DF	nu	nu	nu	√
Table information editing -- ET2/Remote DF	nu	nu	nu	√
Edition file select	√	√	√	√

√: Usable   nu: Not usable

Notes on performing NX communication with a remote DF of other models
If you use a remote DF for NX communication using NXTOOLS between S10VE and other models (such as S10V and S10mini), do not change the default DF numbers and logical node numbers of other models. If you change these settings, the data sent from the remote DF of other devices cannot be received.

5.2 Local DF

Function: Adds changes to the set values for the ET1/local DF (or ET2/local DF) and adds
changes to the set values, sets new parameter values, and deletes existing set values
for the MCGs and TCDs.

Operation: The operating procedure for using this command is described below, along with its
parameters.

(1) Start up the NXTOOLS system. (For information on how to start it up, see "4.3   Starting
Up the System.") Then, click the [Local DF] button in its main window. For Type 6, you
can also use the [ET2/Local DF] button.
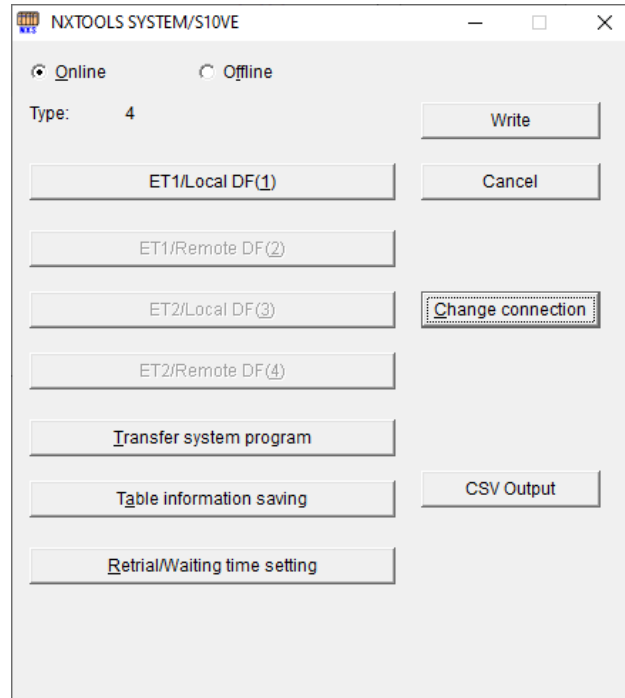
Figure 5-2   The Main Window (in online mode)

- ET1/Local DF
  This data field is directly connected to the CPU module built-in Ethernet (ET1).
- ET1/Remote DF
  This data field is connected to the CPU module built-in Ethernet (ET1) via a router or
  gateway.
- ET2/Local DF
  This data field is directly connected to the CPU module built-in Ethernet (ET2).
- ET2/Remote DF
  This data field is connected to the CPU module built-in Ethernet (ET2) via a router or
  gateway.

(2) Add changes to the set values, set new parameter values, and/or delete existing set values. To accomplish this, first enter values in the "DF Number", "Node Name", "Logical Node Number", "Alive message timeout", "Alive message interval", "Alive port number", and "Send my port number" fields for the local DF you are setting up. Enter send- and receive-MCG numbers and the corresponding port numbers for each MCG, as shown below. Up to five sets of MCG and port information can be registered for the local DF.

Figure 5-3   The "Local DF" Window (DF settings, displayed in online mode)

Description of items:
- DF (data field) Number
  Is the ID number assigned to the data field. This ID number must be specified within the range 1 to 255 and may not be duplicated with the DF number set for the remote DF.
- Node Name
  Is the ID name assigned to the node. This ID name must be specified with a string of up nine ASCII characters.
- Logical Node Number
  Is the ID number assigned to each device in the data field. This ID number is identical to the host number in the IP address and must be specified within the range 1 to 255.
- Alive message timeout
  Is a time period that begins at the detection of an "alive" signal not coming periodically from the source and ends when the continuation of that condition is recognized as a timeout error. This time period must be specified within the range 1 to 43200 (seconds).
- Alive message interval
  Is a time interval at which an "alive" signal is sent out periodically. This time interval must be specified within the range 1 to 3600 (seconds).

● Alive port number
Is the port number of the destination's port to which an "alive" signal is sent. This port number must be specified within the range 1 to 65535.

● Send my port number
Is the port number of the local node's port through which messages are sent out. This port number must be specified within the range 1 to 65535.

● Send MCG (multi-cast group) No.
Identifies the destination's multicast group to which a specified TCD is sent. This ID number may be specified within the range 0 to 255. However, if you need not register it, specify a value of 0 (zero) for it.

● Send Port No.
Is the port number of the sole send port that each node in the data field has for data transmission, and must be specified within the range 1 to 65535. Each specified combination of multicast group number and port number must be used uniquely throughout the data field. Further, the send port number and receive port number must be specified with different values.

● Receive MCG (multi-cast group) No.
Is the ID number of a receive multicast group. This ID number may be specified within the range 0 to 255. However, if you need not register it, specify a value of 0 (zero) for it.

● Receive Port No.
Is the port number of the sole receive port that each node in the data field has for data reception, and must be specified within the range 1 to 65535. Each specified combination of multicast group number and port number must be used uniquely throughout the data field. Further, the send port number and receive port number must be specified with different values.

Notes:
• The port numbers of the above ports must be unique on each node.
• The "Alive message interval" and "Alive message timeout" values specified must satisfy the following condition:
Alive message interval < Alive message timeout

(3) To set TCD information, select the desired TCD number from among those listed in the "TCD Number" column of the TCD settings information list within the "Local DF" window, and then click the [Edit] button or double-click the desired TCD number in the "TCD Number" column.
The "TCD Set" window (Figure 5-4) appears.
If the TCD number you selected is a numerical value, the existing TCD information will be changed. (However, if you select the "Copy" check box, the new values you enter will be added as a new registration entry together with the existing values.) If, instead of a TCD number, you choose the symbol "--" next to the last TCD number displayed in the TCD No. column, the new values you enter will be added as a new registration entry together with the existing values.

Figure 5-4   The "TCD Set" Window (Local DF)

Description of items:
● TCD Number
Is the TCD number of a transaction code (TCD) sent or received. This TCD number may be specified within the range 0 to 59,999. If you do not want to register a TCD, enter a value of 0 (zero).
● Unused
If you select the "Unused" check box, all of the parameter values in the "Send" or "Receive" group box will be disabled. To enable the values, do not select the check box. Even if a valid TCD number (in the range from 0 to 59,999) is specified, if the "Unused" check boxes in the "Send" and "Receive" group boxes are selected, the settings will be disabled (in this case, the selection of those check boxes signifies that the specified TCD number should not be used for data transmission and reception).
● Send-byte number
Is a count of the number of user data bytes sent at a time. This count must be specified with an even number within the range 0 to 1408.
● Send-address
Is the starting address of a buffer that stores the user data to be sent. Table 5-3 lists addresses that can be set. As shown, either a register address or a memory address may be specified as this send-address.

Table 5-3   Setting Ranges of Send-Addresses

No.	Setting range of register addresses	Setting range of memory addresses	Remarks
1	XW0000 to XWFFF0	/414000 to /442FFE	Bit/Word registers
2	JW000 to FF0	/E0200 to /E03FE	Bit/Word registers
3	YW0000 to YWFFF0	/443000 to /444FFE	Bit/Word registers
4	QW000 to FF0	/E0600 to /E07FE	Bit/Word registers
5	GW000 to FF0	/E0800 to /E09FE	Bit/Word registers
6	RW000 to FF0	/E0C00 to /E0DFE	Bit/Word registers
7	MW0000 to MWFFF0	/447000 to /448FFE	Bit/Word registers
8	FW000 to BFC	/E2000 to /E37F8	Word registers
9	DW000 to FFF	/61000 to /62FFE	Word registers
10	LBW0000 to FFF0	/412000 to /413FFE	Bit/Word registers
11	LWW0000 to FFFF	/450000 to /46FFFE	Word registers
12	LXW0000 to 3FFF	/4A0000 to /4A7FFE	Word registers
13	–	/4B2000 to /4CAFFE	PI/O-RAM (battery-backed)
14	–	/414400 to /42D3FE	PI/O-RAM (not battery-backed)
15	–	/1000000 to /10FFFFE	NX user buffers

● Send-register

Is a during-send register. This register is used to notify that a send request to send the user data is issued during a data transmission by NXHOST. When this register is switched on, the ladder sequence can detect a data transmission in progress by checking the register. This register is automatically switched off when the data transmission in progress is completed. If a requested data transmission fails, this register is not switched on, but instead an error code is set in the function work register FWBFF. (For details on the error code, see "APPENDIX A   ERROR CODES.") The FWBFF is overwritten with a new error code every time an error occurs. Therefore, the user has to save the error code in this register to some other place if necessary.

The during-send register must always be specified. If it is omitted, an undefined register may be switched on. Table 5-4 shows the allowable setting ranges of registers that can be used as during-send registers.

Table 5-4   Setting Ranges of During-Send Registers

No.	Setting range of registers	Setting range of addresses	Remarks
1	J000 to FFF	/A2000 to /A3FFE	Bit registers
2	Y0000 to YFFFF	/720000 to /73FFFE	Bit registers
3	Q0000 to QFFFF	/740000 to /75FFFE	Bit registers
4	G000 to FFF	/A8000 to /A9FFE	Bit registers
5	R000 to FFF	/AC000 to /ADFFE	Bit registers
6	M0000 to MFFFF	/760000 to /77FFFE	Bit registers
7	LB0000 to LBFFFF	/220000 to /23FFFE	Bit registers

- MCG

  Is the group number of the send-multicast group. Specify a value in the range from 1 to 255. If a send-multicast group number other than those listed in the Send MCG No. column of the "Local DF" window (Figure 5-3) is specified, no data transmission will be performed for the specified TCD number.

- Receive-byte number

  Is a count of the number of user data bytes received at a time. Specify an even number of bytes in the range from 0 to 1,408. If the data bytes actually received are more than the set value of the receive-byte count, the excess bytes will be discarded.

- Receive-address

  Is the starting address of a storage area that will store the user data received. Any receive-address specified must be within one of the ranges listed in Table 5-3, "Setting Ranges of Send-Addresses."

- Receive-register

  Is a receive-completion register. Specify the bit register to be switched on by the NXHOST when data reception is complete. When this register is switched on, the ladder sequence can detect the end of a data reception by the NXHOST. Upon the completion of a data transmission, this register must be switched off by the user. If the NXHOST receives data during the ON state of a specific receive-completion register (unique for each TCD), it will discard the received data unless a retry count and a receive-wait time are set by the user. For details, see "5.5   Retrial/Waiting Time Setting."

  Any receive-completion register specified must be within one of the setting ranges listed in Table 5-4, "Setting Ranges of During-Send Registers."

- Copy

  If you select the "Copy" check box and click the [OK] button, the new values you enter will be added as a new registration entry, rather than as changes to the existing TCD information. If you want to select this check box, all of the TCD number, register, and address specified must be unique.

(4) To confirm the edited settings, click the [OK] button. The edited settings are checked. If there are no problems, the "TCD Set" window (local DF) closes, and the settings are applied to the "Local DF" window. If there is a problem with the edited settings, an error message is displayed, and the "TCD Set" window (local DF) does not close. If you click the [Cancel] button, the edited settings are discarded, and the "Local DF" window becomes active again.

(5) To delete TCD information, select the desired TCD number from among those listed in the "TCD Number" column of the TCD settings information list in the "Local DF" window, and then click the [Delete] button.

(6) After specifying all necessary settings, click the [OK] button in the "Local DF" window to return to the main window. If you click the [Write] button in the main window, the edited settings are written to the PCs. For details, see "5.7   Write."

5.3 Remote DF

Function: Adds changes to the set values for the ET1/remote DF (or ET2/remote DF) and adds changes to the set values, sets new parameter values, and/or deletes existing set values for the MCGs and TCDs. The use of the ET1/remote DF (or ET2/remote DF) requires the prior setting of route information via the "Set Network" window of BASE SYSTEM/S10VE.

Operation: The operating procedure for using this command is described below.

(1) Start up the NXTOOLS system. (For information on how to start it up, see "4.3   Starting Up the System.") Then, click the [ET1/Remote DF] button in its main window. For Type 6, you can also use the [ET2/Remote DF] button.
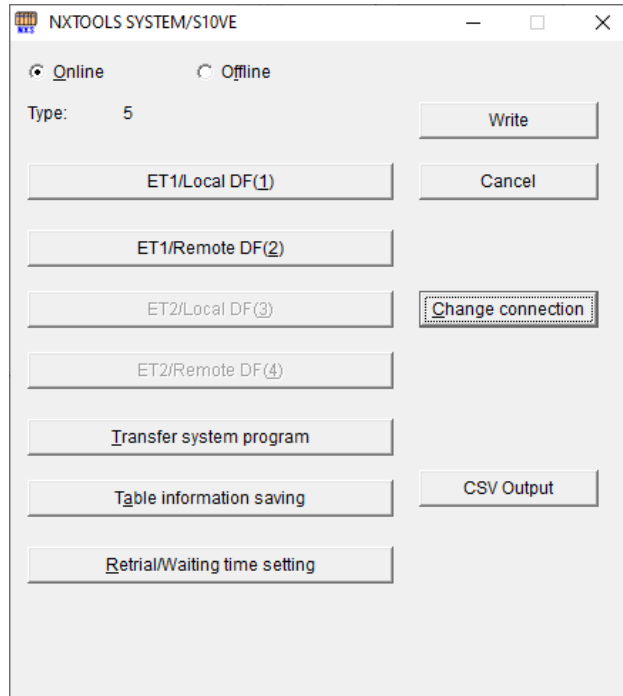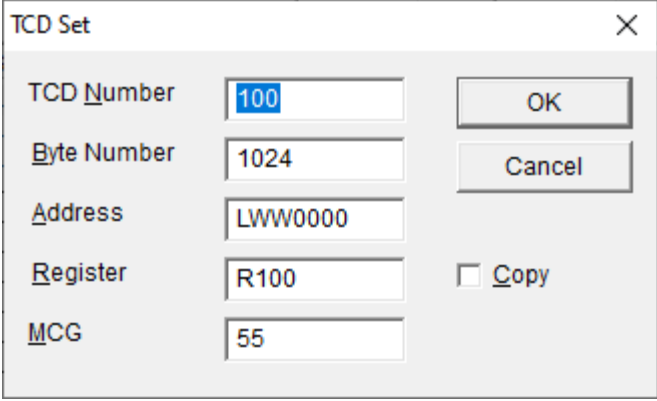
Figure 5-5   The Main Window (in online mode)

(2) Add changes to the set values, set new parameter values, and/or delete existing set values. To do this, first enter values in the "DF Number", "Remote LAN Network Address", and "Remote LAN Network Mask" fields for the remote DF you are setting up. You can register up to five sets of MCG for the local DF. Enter send MCG numbers and the corresponding port numbers for each MCG, as shown below. Up to five sets of MCG and port information can be registered for the remote DF.

Figure 5-6   The "Remote DF" Window (DF settings, displayed in online mode)

● DF (data field) Number
  Is the ID number assigned to the data field. This ID number must be specified within the range 1 to 255 and may not be duplicated with the DF number set for the local DF.
● Remote LAN Network Address
  Is the network address (Class A, Class B, or Class C) at which the communication destination is located in the network.
● Remote LAN Network Mask
  Is the subnet mask for the remote LAN network address.
● Send MCG (multi-cast group) No.
  Identifies the destination's multicast group to which a specified TCD is sent. This ID number may be specified within the range 0 to 255. However, if you do not want to register it, specify a value of 0 (zero) for it.
● Send Port No.
  Is the port number of the sole send port that each node in the data field has for data transmission, and must be specified within the range 1 to 65535. Each specified combination of multicast group number and port number must be used uniquely throughout the data field.

(3) To set TCD information, select the desired TCD number from among those listed in the "TCD Number" column of the TCD settings information list within the "Remote DF" window, and then click the [Edit] button or double-click the desired TCD number in the "TCD Number" column.
The "TCD Set" window (remote DF) appears.
For details on the values to be set for each item in the "TCD Set" window, see the description of Step (3) under "5.2   Local DF."

Figure 5-7   The "TCD Set" Window (Remote DF)

(4) To confirm the edited settings, click the [OK] button. The edited settings are checked. If there are no problems, the "TCD Set" window (remote DF) closes, and the settings are applied to the "Remote DF" window. If there is a problem with the edited settings, an error message is displayed, and the "TCD Set" window (remote DF) does not close. If you click the [Cancel] button, the edited settings are discarded, and the "Remote DF" window becomes active again.
(5) After you specify all necessary settings, click the [OK] button in the "Remote DF" window to return to the main window. If you click the [Write] button in the main window, the edited settings are written to the PCs. For details, see "5.7   Write."

5.4 Table Information Saving

Function: Reads the NX setup information that is currently set for the PCs from the memory
of the CPU module, and saves it to a user-specified file (in binary format).
The files saved by using the "Table information saving" command can be edited in
offline mode.
For details on editing files in offline mode, see "5.8   Table Information Editing --
Local DF" or "5.9   Table Information Editing -- Remote DF."

Operation: The operating procedure for using this command is described below.

(1) Start up the NXTOOLS system. (For information on how to start it up, see "4.3   Starting
Up the System.") Then, click the [Table information saving] button in its main window.
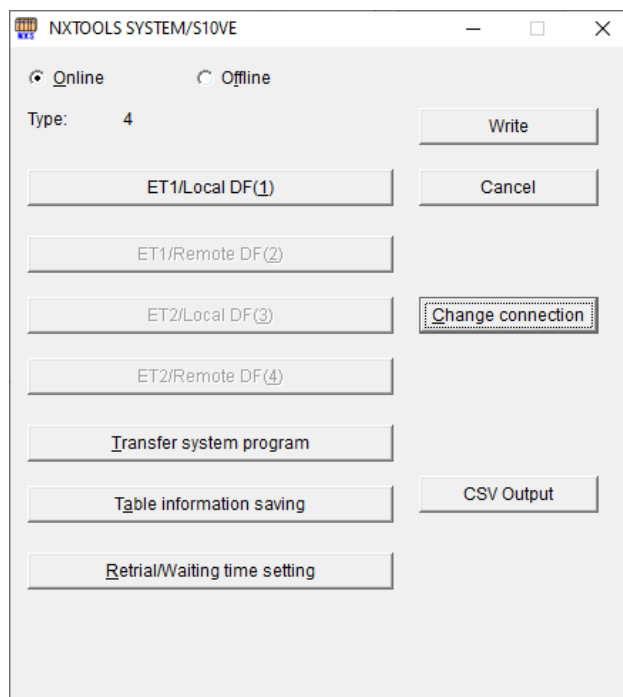
Figure 5-8   The Main Window (in online mode)

(2) The "Save As" window (Figure 5-9) appears. Enter a name for the file to be saved, and then click the [Save] button. Save the file with the file extension ".pdat".
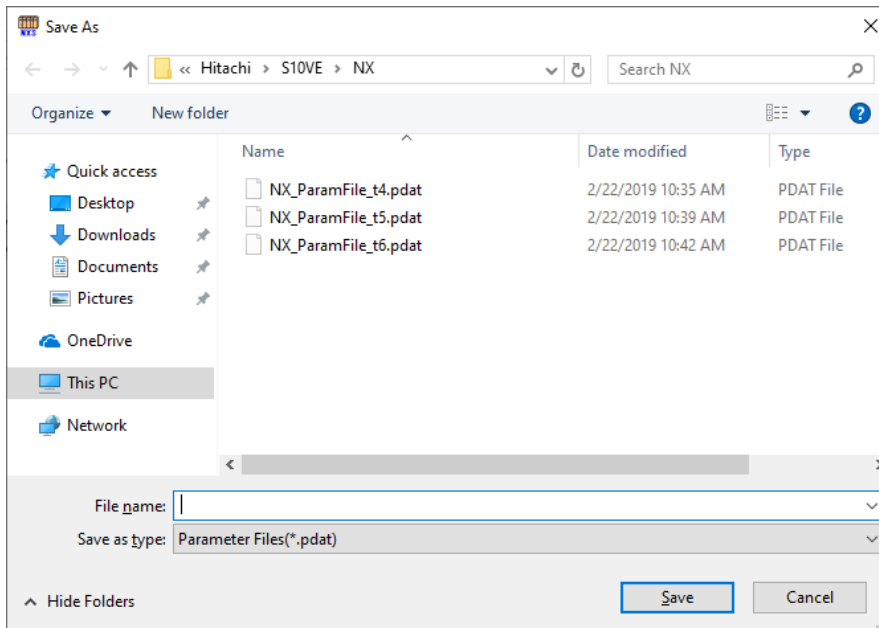
Figure 5-9   The "Save As" Window

(3) The "Save File" window (Figure 5-10) appears.

The PCs number of the connection destination PCs is displayed by default.
Valid setting range: 0 to 9999
Number of characters that can be entered: 4

Entry of a file comment is optional.
By default, this field is blank.
You can enter up to 512 characters.
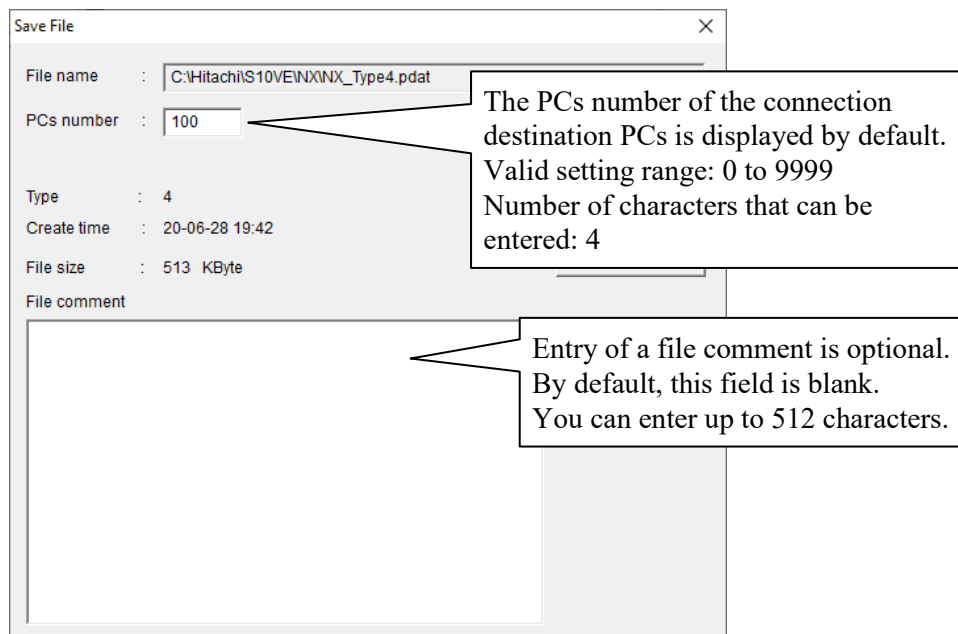
Figure 5-10   The "Save File" Window

(4) Enter a file name. If necessary, change the PCs number and enter a comment for the file, and then click the [Save File] button. The consistency of the range of the entered PCs number is checked. If there is a problem, an error message is output. If there are no problems, the file receive window (showing the progress of file reception) (Figure 5-11) appears.
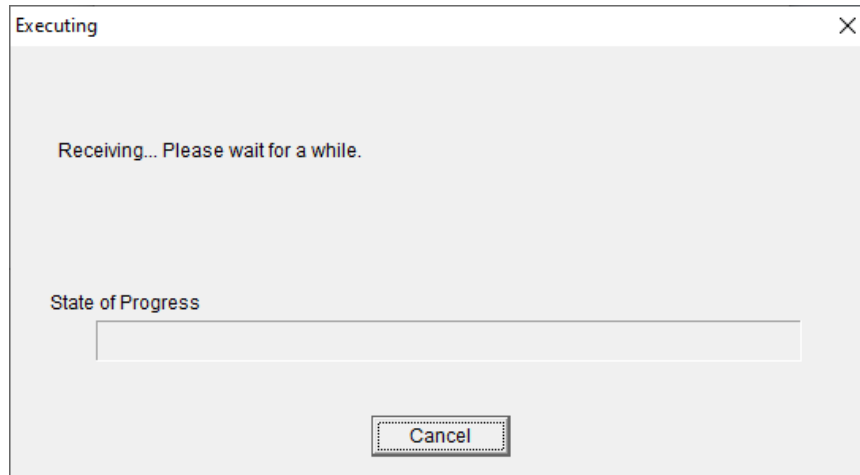
Figure 5-11   The Receive File Window (showing the progress of file reception)

If the file is saved successfully, the Receive File window (showing the successful completion of file reception) (Figure 5-12) appears.
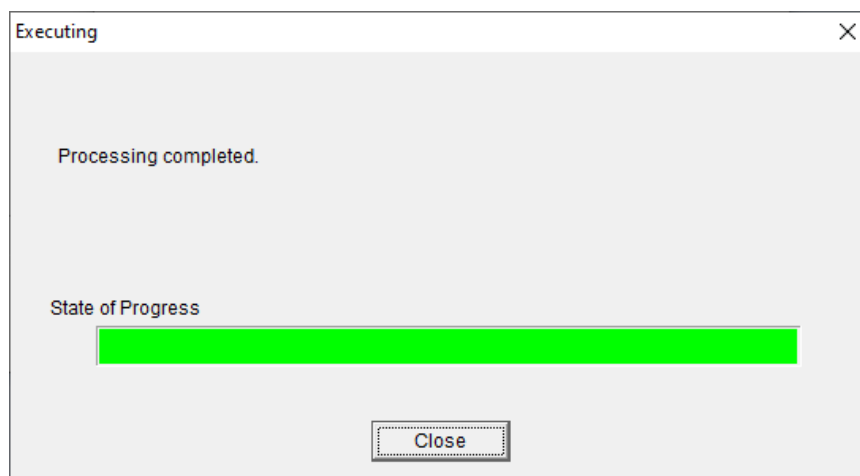
Figure 5-12   The Receive File Window (showing the successful completion of file reception)

If you click the [Cancel] button while the file is being saved, a message dialog box confirming whether you want to cancel the operation (figure 5-13) appears.
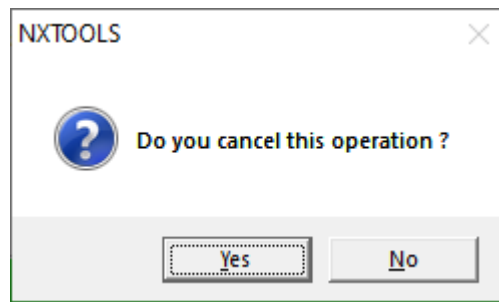
Figure 5-13   A Message Dialog Box Confirming Whether to Cancel the Operation

If you click the [Yes] button, the message dialog box of the Receive File window displays "Processing aborted.". If the data cannot be received or saved, the same message is displayed in the Receive File window, and one of the following error messages is also displayed: "Failed to receive the data." or "Failed to generate file."

5.5 Retrial/Waiting Time Setting

Function: Displays the currently set retry count and retry interval (receive-wait time) that are used in conjunction with a check to see if the receive-completion register is in OFF state. This command also enables you to change those currently set values or enter initially values for those parameters. For information on the receive-completion register, see Figure 5-4, "The 'TCD Set' Window (Local DF)," and the subsequent description of items under "5.2   Local DF."

Operation: The operating procedure for using this command is described below.

(1) Start up the NXTOOLS system. (For information on how to start it up, see "4.3   Starting Up the System.") Then, click the [Retrial/Waiting time setting] button in its main window.
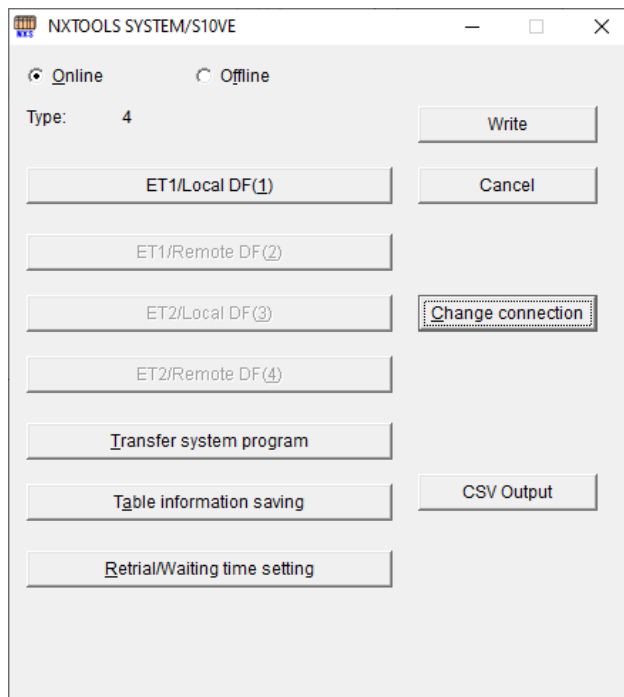
Figure 5-14   The Main Window (in online mode)

(2) The "Retrial number of times/Receiving waiting time" window as shown in Figure 5-15 opens.
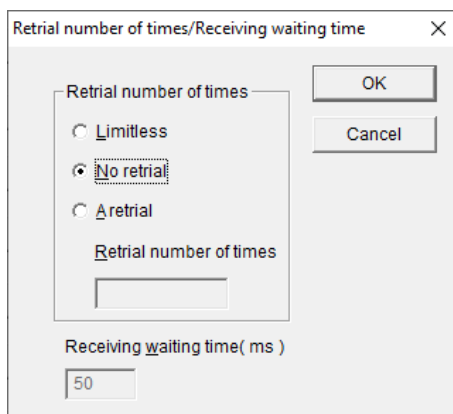
Figure 5-15   The "Retrial number of times/Receiving waiting time" Window

● Retrial number of times
Is a count of the number of times a completion check is retried until the receive-completion register is in OFF state. If the receive-completion register is found to be in OFF state by such a check, the NXHOST will not discard the received data. The modes of check available for this purpose are the following three:
• Limitless
Is selected when you want to retry the check an indefinite number of times.
• No retrial
Is selected when you want to execute the check only once.
• A retrial
When this mode of check is selected, you must specify a retry count in the range 1 to 2,147,483,647.
● Receiving waiting time
Is a receive-wait time and is effective only when "A retrial" is selected as the mode of check. This time interval can be specified in the range 10 to 1000 (milliseconds) and is defaulted to 50.
(3) To add changes to the retry count/receive-wait time information displayed, click the [OK] button. If there are no problems with the settings you edited, the main window will become active again. The retry count/receive-wait time information you edited will be written when you click the [Write] button in the main window. For details, see "5.7 Write."
(4) If you click the [Cancel] button in the "Retrial number of times/Receiving waiting time" window (Figure 5-15), the edited settings are discarded, and the main window becomes active again.

5.6 Change Connection

Function: Allows you to select the desired S10VE unit by specifying the IP address of its
module and makes the selected S10VE unit ready for data communication (online
operation) with the NXTOOLS system.

Operation: The operating procedure for using this command is described below.

(1) Click the [Change connection] button in the main window.

(2) The "Communication type" window (Figure 5-16) appears.

```
Communication type                                      ×
                        ┌IP address──────────┐  ┌──────────┐
  ⦿ Ethernet            │ 192 . 192 . 192 . 1 │  │    OK    │
                        └─────────────────────┘  ├──────────┤
                                                 │  Cancel  │
                                                 └──────────┘
```
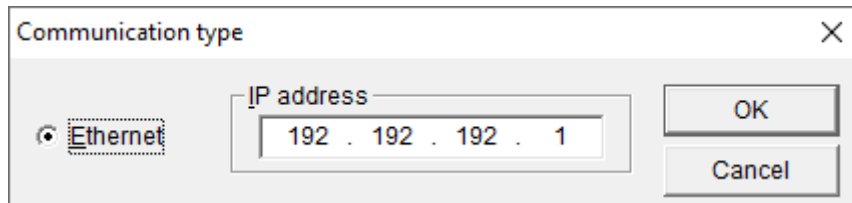
Figure 5-16   The "Communication type" Window

(3) Specify the connection destination, and then click the [OK] button. If you do not want to
change the connection destination setting, click the [Cancel] button.
The default communication type is the one that you set last by using the "Change
connection" command.

5.7 Write

Function: Writes the edited settings (the local DF setting, remote DF setting, retry count setting, and receive-wait time setting) to the PCs or the NX setup information file.

In online mode: The settings are written to the PCs.

In offline mode: The settings are written to the NX setup information file.

Operation: The operating procedure for using this command is described below.

● Writing in online mode (writing to the PCs)

(1) Click the [Write] button in the main window. The "Option module parameter setup list" window (Figure 5-17) appears.
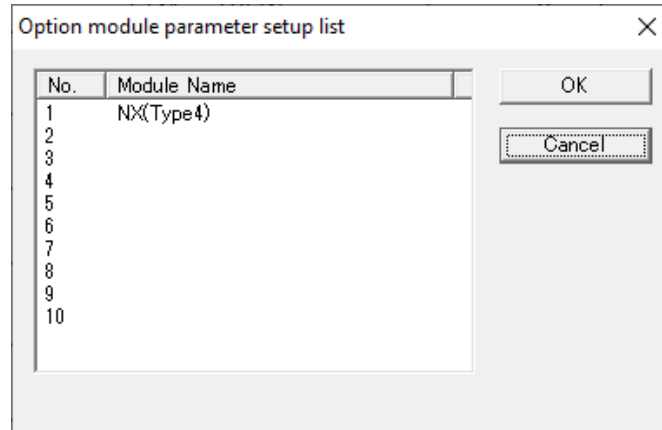
Figure 5-17   The "Option module parameter setup list" Window

If the ladder is in the RUN state, a message dialog box indicating that the PCs is under RUN status (Figure 5-18) appears, and the writing processing is canceled. In this case, place the ladder in the STOP state, and then click the [Write] button again.
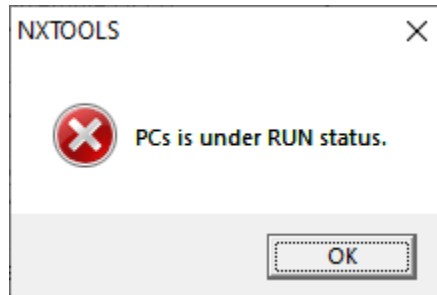
Figure 5-18   A Message Dialog Box Indicating That the PCs Is in the RUN State

(2) Click the number of the module to which you want to write the settings, and then click the [OK] button. Register only one set of NX setup information. To cancel the writing processing, click the [Cancel] button. In the "Option module parameter setup list" window, information that is already set for the CPU module is displayed. If an unknow module is set, "None (the module ID and module number)" is displayed. If the module does not have a module ID, "None (the module ID)" is displayed.

(3) When the processing to write parameters ends, a message dialog box confirming whether you want to reset the PCs (Figure 5-19) is displayed.
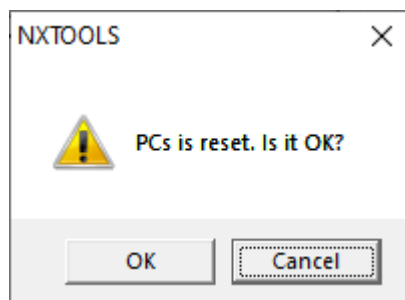
Figure 5-19   A Message Dialog Box Confirming Whether to Reset the PCs

To reset the PCs, click the [OK] button. If you do not want to reset the PCs, click the [Cancel] button. If you click the [Cancel] button, even though the parameters are already written to the CPU, the parameters prior to those that were written will be used for communication until the PCs is reset and the sat() or sato() system extension arithmetic function of the ladder program is executed.

(4) If the PCs is reset successfully, a message dialog box that says "The PCs was successfully reset" is displayed. If the PCs cannot be reset, a message dialog box that says "Failed to reset the PCs" is displayed.

If you perform a system program transfer with a file specified, the retry count and receive-wait time settings saved in the file are transferred. Therefore, after the system program transfer ends, open the "Retrial number of times/Receiving waiting time" window (Figure 5-15) and check the retry count and receive-wait time. To change the retry count and receive-wait time settings, change them in the "Retrial number of times/Receiving waiting time" window, and then click the [Write] button in the main window to write the settings to the PCs.

● Writing in offline mode (writing to a file)

(1) Click the [Write] button in the main window. A message dialog box confirming whether you want to overwrite the settings (Figure 5-20) appears. To save the settings, click the [Yes] button. To cancel the saving, click the [No] button.

Figure 5-20   A Message Dialog Box Confirming Whether to Overwrite Settings

(2) If you click the [Yes] button, a message dialog box indicating the completion of the saving processing (Figure 5-21) appears, and the settings are saved.

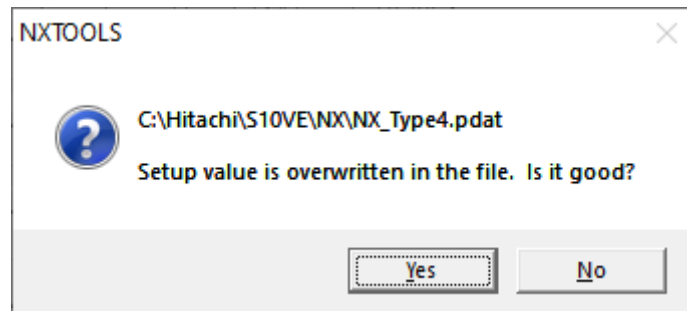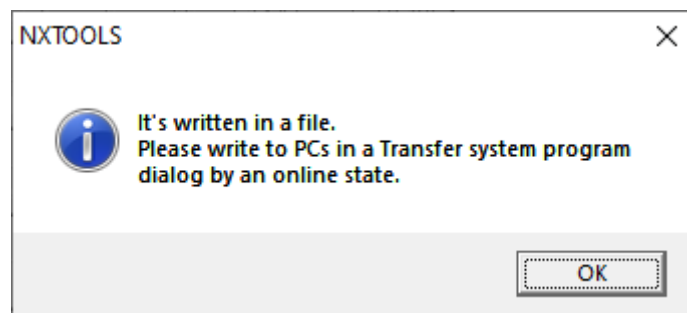Figure 5-21   A Message Dialog Box Indicating the Completion of Saving

5.8 Table Information Editing -- Local DF

Function: Enables you to edit the local DF (ET1/ET2) of the NX setup information in offline
mode.

Operation: The operating procedure for using this command is described below.

(1) Select the [Offline] radio button in the main window (Figure 5-22) if it is deselected.

(2) If an edition file is not selected yet or you want to change the currently selected edition
file, click the [Edition file select] button. If the desired edition file is already selected, skip
this step. For information on how to select an edition file, see "5.10   Edition File Select."

Figure 5-22   The Main Window (in offline mode)

(3) Click the [Table information editing-ET1/Local DF] button in the above main window.
For Type 6, you can also use the [Table information editing-ET2/Local DF] button.
● Table information editing-ET1/Local DF
Click this button to change the NX setup information for the data field directly
connected to the CPU module built-in Ethernet (ET1).
● Table information editing-ET1/Remote DF
Click this button to change the NX setup information for the data field connected to the
CPU module built-in Ethernet (ET1) via a router or gateway.
● Table information editing-ET2/Local DF
Click this button to change the NX setup information for the data field directly
connected to the CPU module built-in Ethernet (ET2).
● Table information editing-ET2/Remote DF
Click this button to change the NX setup information for the data field connected to the
CPU module built-in Ethernet (ET2) via a router or gateway.

(4) The "Local DF" window (DF settings, displayed in offline mode) (Figure 5-23) appears. The items shown in this window are the same as those in the "Local DF" window (DF settings, displayed in online mode) shown in Figure 5-3, except for the file name and file type. For information on how to edit those items, see Figure 5-3 and the subsequent description.

Figure 5-23   The "Local DF" Window (DF settings, displayed in offline mode)

(5) For details on how to edit the TCD information, see Figure 5-4, "The 'TCD Set' Window (Local DF)," and the subsequent description.
(6) Save the edited information by clicking the [Write] button in the main window (in offline mode). Saving is done by overwriting.

5.9   Table Information Editing -- Remote DF

Function: Enables you to edit the remote DF (ET1/ET2) of the NX setup information in offline mode.

Operation: The operating procedure for using this command is described below.

(1) Select the [Offline] radio button in the main window (Figure 5-24) if it is deselected.

(2) If an edition file is not selected yet or you want to change the currently selected edition file, click the [Edition file select] button. If the desired edition file is already selected, skip this step. For information on how to select an edition file, see "5.10   Edition File Select."
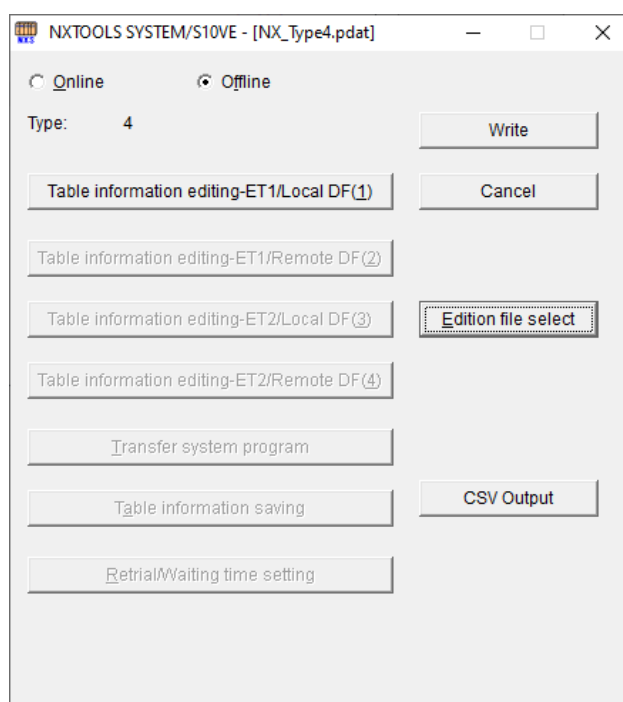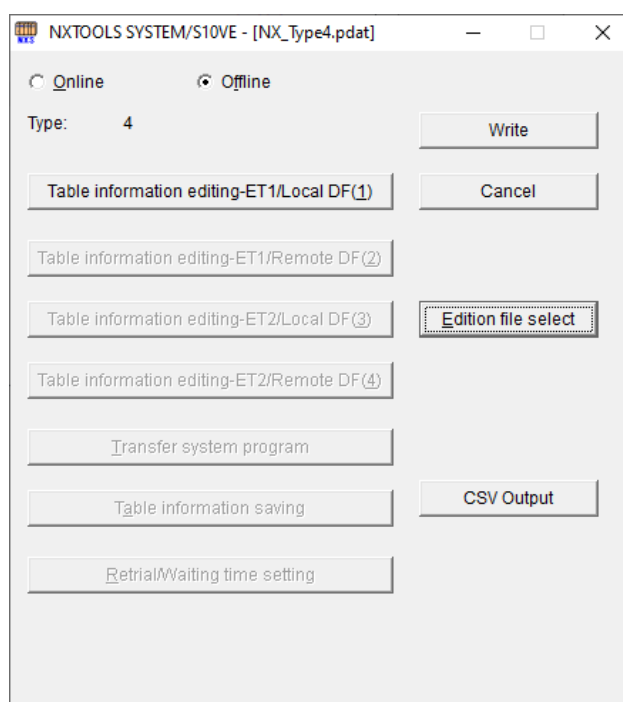

Figure 5-24   The Main Window (in offline mode)

(3) Click the [Table information editing-ET1/Remote DF] button in the above main window. For Type 6, you can also use the [Table information editing-ET2/Remote DF] button.

(4) The "Remote DF" window (DF settings, displayed in offline mode) (Figure 5-25) opens. The items shown in this window are the same as those in the "Remote DF" window (DF settings, displayed in online mode) shown in Figure 5-6, except for the file name and file type. For information on how to edit those items, see Figure 5-6 and the subsequent description.

Figure 5-25   The "Remote DF" Window (DF settings, displayed in offline mode)

(5) For details on how to edit the TCD information, see Figure 5-7, "The 'TCD Set' Window (Remote DF)," and the subsequent description.

5.10 Edition File Select

Function: Selects the file to be edited in offline mode.

Operation: The operating procedure for using this command is described below.

(1) Select the [Offline] radio button in the main window if it is deselected.

(2) If an edition file is not selected yet or you want to change the currently selected edition file, click the [Edition file select] button. The "Open" window as shown in Figure 5-26 will then open.
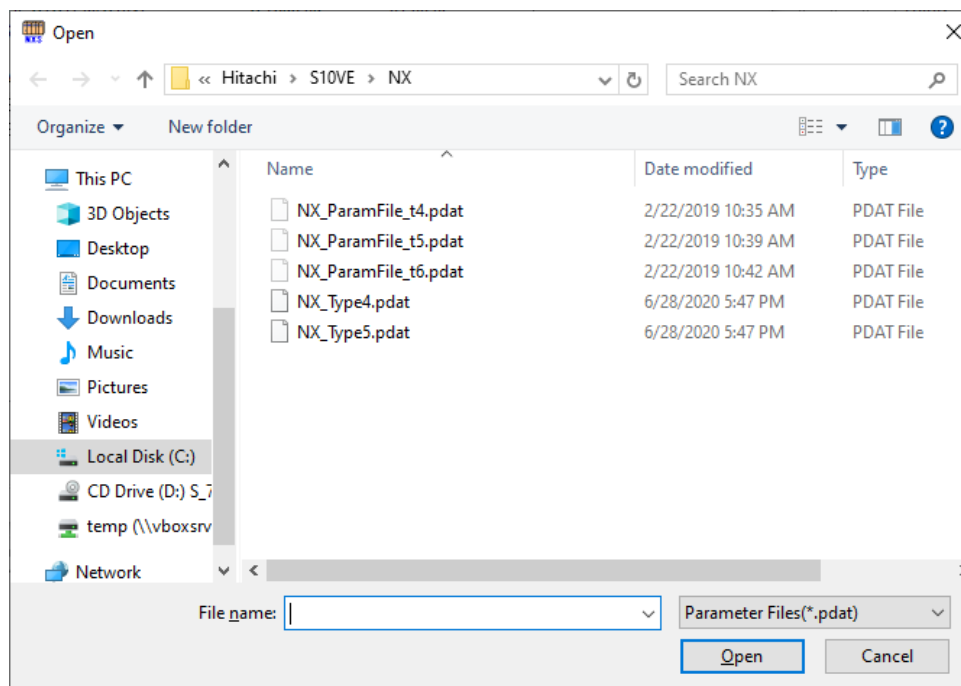
Figure 5-26   The "Open" Window (selecting an existing file)

The type of files that you can select in this window is PDAT files (files that have the file extension ".pdat"). PDAT files are files created in binary format by using the "Table information saving" command of the NXTOOLS system.

5.10.1   Creating a new file
  (1) If you want to create a new NX setup information file and edit its content, enter a new
    file name and then click the [Open] button.
  (2) The "Creation confirmation" window (Figure 5-27) appears. Specify the necessary
    items, and then click the [Save File] button. To cancel the specified settings, click the
    [Cancel] button.
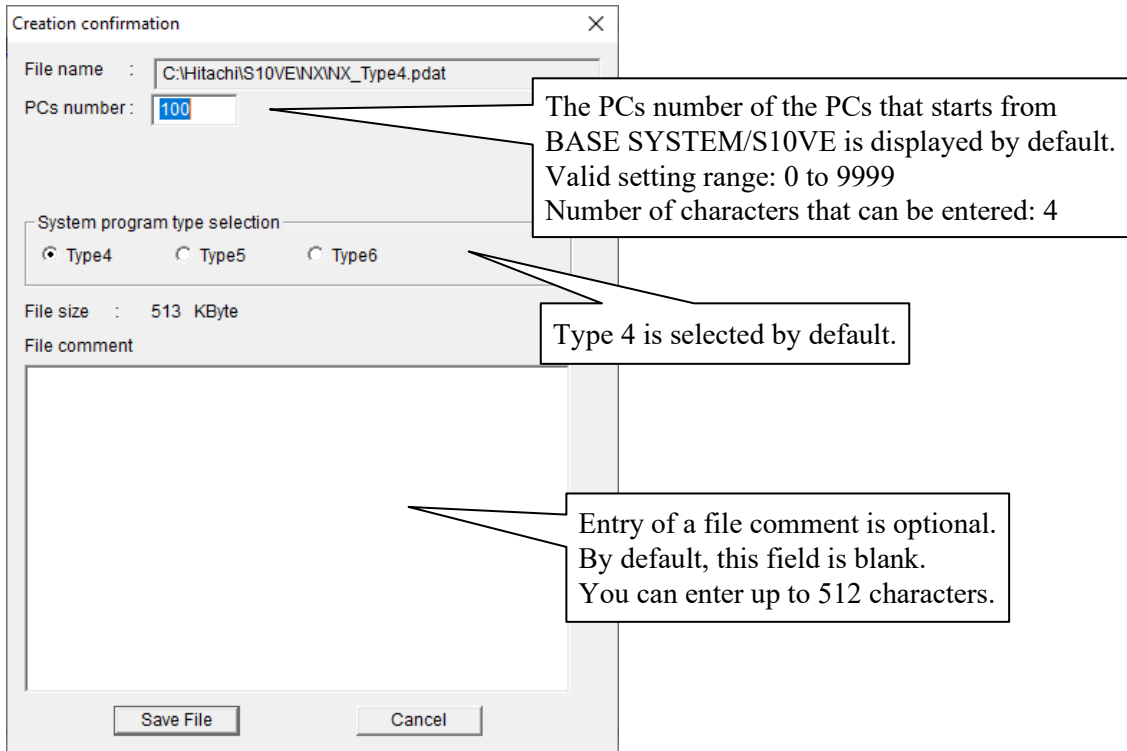
Figure 5-27 The "Creation confirmation" Window

5.10.2   Editing a file that is already created
(1) If you want to edit an existing NX setup information file, select it from among those listed in the "Open" window. You can select a file with the file extension ".pdat".
(2) The "Select File" window (Figure 5-28) appears. The following information for the selected file is displayed: file name, PCs number (in decimal notation), type, creation time, file size (in kilobytes), and file comment. To edit the setup information file you selected, click the [Select File] button. To cancel the selection, click the [Cancel] button.
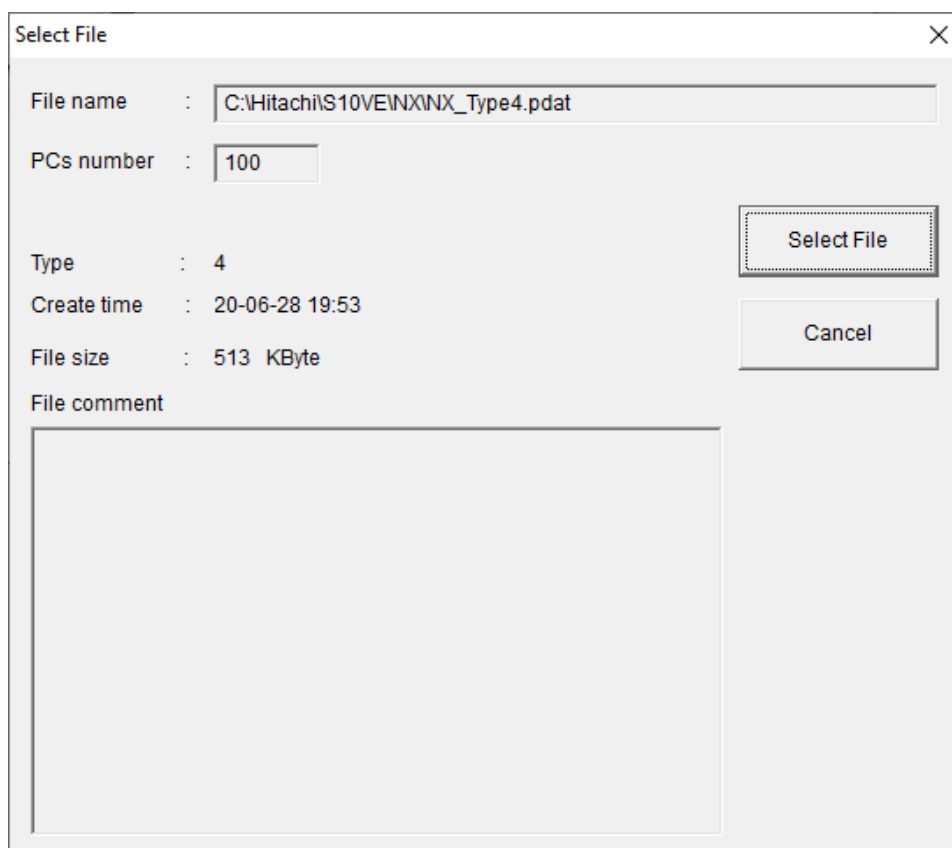
Figure 5-28   The "Select File" Window

(3) If the selected file is a valid NX setup information file, you can view and change the NX setup information by clicking the [Table information editing-ET1/Local DF] button or the [Table information editing-ET1/Remote DF] button in the main window. For Type 6, you can also use the [Table information editing-ET2/Local DF] button or the [Table information editing-ET2/Remote DF] button.

5.11 CSV Output

Function: Outputs the NX setup information that is currently being edited to a file in CSV format.

Operation: The operating procedure for using this command is described below.

(1) If the system is started up in online mode, establish a connection with the PCs (see "5.6 Change Connection"). If it is started up in offline mode, select the desired edition file (see "5.10　Edition File Select").

(2) Click the [CSV Output] button in the main window.

(3) The "Save As" window (Figure 5-29) appears. Specify the desired folder and file, and click the [Save] button. If you do not want to save the file, click the [Cancel] button.
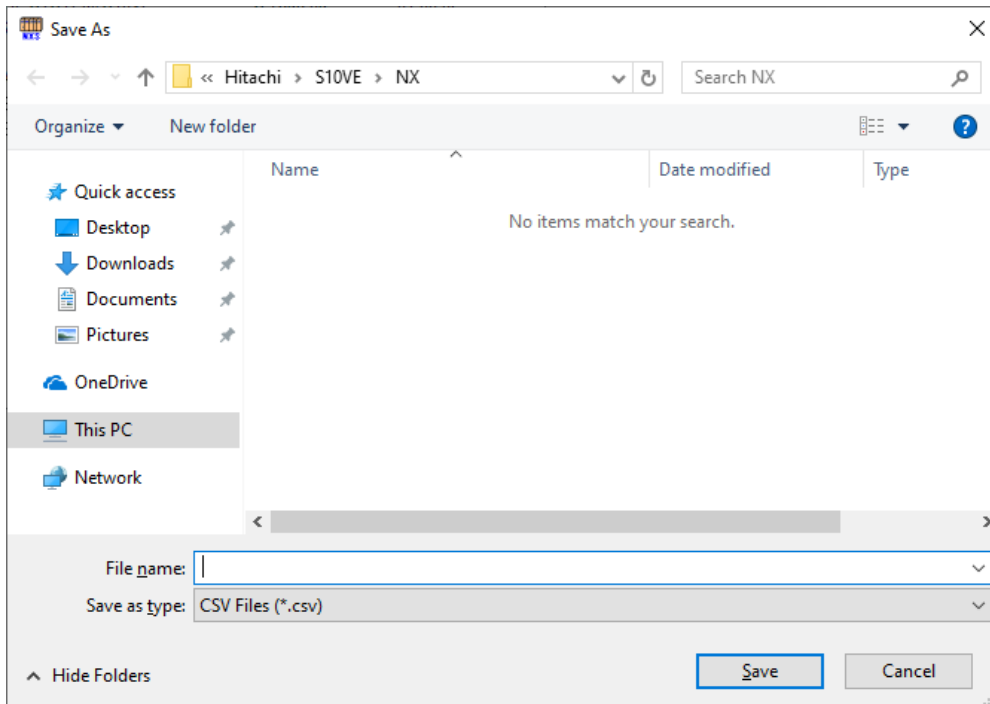
Figure 5-29　The "Save As" Window

\<Sample CSV file output\>

```
NXTOOLS S10VE    2018/10/24    16:24:15
 Ethernet(192.192.192.1)

***** ET1 *****
 Local DF(Type 5),
 DF Number,1
 Node Name,node_100
 Logical Node Number,77
 Alive message timeout,30
 Alive message interval,10
 Alive port number,600
 Send my port number,1025

 Send MCG No.,Send Port No.,Receive MCG No.,Receive Port No.,
 55,10055,77,10077,
 77,10077,0,0,
 0,0,0,0,
 0,0,0,0,
 0,0,0,0,

 TCD No,Send byte num,Send addr,During Send reg,Send MCG,Rcv byte num,Rcv addr,Rcv comp reg,
 2110,--,--,--,--,100,DWDE0,R113,
 2111,--,--,--,--,38,DWF00,R114,
 5101,90,FW27B,R140,5,--,--,--,
 5112,362,DWBEB,R142,5,--,--,--,
 13002,--,--,--,--,100,DWB00,R122,


 Remote DF(Type 5),
 DF Number,2
 Remote LAN Network Address,192.192.194.1
 Remote LAN Network Mask,255.255.255.0
 Send MCG,Receive Port No.,
 55,10055,
 77,10077,
 0,0,
 0,0,
 0,0,

 TCD No,Send byte num,Send addr,During Send reg,Send MCG,
 100,1024,LWW0000,R100,55,
 200,1024,LWW1000,R200,55,
 300,1024,LWW2000,R300,55,
```

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APPENDIX A   ERROR CODES

(1) Error codes from the NXHOST system's internal receiving task
   All error codes in this category are listed in the table below. They are set in the register FWBFF.

Code	Meaning	Required user action
0x831	NX's table is missing.	Download the data for Type 4, Type 5, or Type 6 by using the NXTOOLS system.
0x834	A receive-completion register address is not set for a TCD received by the ET1 local DF.	Set a receive-completion register address by using the NXTOOLS system.
0x835	A message previously received by the ET1 local DF has not been processed yet.	Switch off the receive-completion register.
0x836	A TCD definition has not been made for a TCD received by the ET1 local DF.	Make a TCD definition for the received TCD by using the NXTOOLS system.
0x837	A receive-completion register address is not set for a TCD received by the ET1 remote DF.	Set a receive-completion register address by using the NXTOOLS system.
0x838	A message previously received by the ET1 remote DF has not been processed yet.	Switch off the receive-completion register.
0x839	A TCD definition has not been made for a TCD received by the ET1 remote DF.	Make a TCD definition for the received TCD by using the NXTOOLS system.
0x83a	A receive-completion register address is not set for a TCD received by the ET2 local DF.	Set a receive-completion register address by using the NXTOOLS system.
0x83b	A message previously received by the ET2 local DF has not been processed yet.	Switch off the receive-completion register.
0x83c	A TCD definition has not been made for a TCD received by the ET2 local DF.	Make a TCD definition for the received TCD by using the NXTOOLS system.
0x83d	A receive-completion register address is not set for a TCD received by the ET2 remote DF.	Set a receive-completion register address via the NXTOOLS system.
0x83e	A message previously received by the ET2 remote DF has not been processed yet.	Switch off the receive-completion register.
0x83f	A TCD definition has not been for a TCD received by the ET2 remote DF.	Make a TCD definition for the received TCD by using the NXTOOLS system.
0x843	A receiving DF (remote or local) is not set up.	Set up the local or remote DF again by using the NXTOOLS system.
0xXXX	An error is detected during a reception by the NX. (XXX is a return code from nx_get.)	Troubleshoot the NX from what is reported by the return code.

(2) Error codes from the NXHOST system's internal sending task
　　All error codes in this category are listed in the table below. They are set in the register FWBFE.

Code	Meaning	Required user action
0x821	The NX's table is missing.	Download the data for Type 4, Type 5, or Type 6 by using the NXTOOLS system.
0x823	The NX table for the ET1 local DF is missing.	
0x824	The NX table for the ET1 remote DF is missing.	
0x825	The NX table for the ET2 local DF is missing.	
0x826	The NX table for the ET2 remote DF is missing.	
0xXXX	An error is detected during a transmission by the NX. (XXX is a return code from nx_put.)	Troubleshoot the NX from what is reported by the return code.

(3) Error codes from the NXHOST system's internal sending task -- classified by arithmetic function
　　All error codes in this category are listed in the table below. They are set in the register FWBFE.

• Error codes from sat() and sato()

Code	Meaning	Required user action
0x804	A duplicated DF number is detected, or the two DF numbers specified are both zero.	Set up both the local DF and remote DF again by using the NXTOOLS system. Alternatively, revise the parameters of sat() and sato().
0x805	The number of sets of TCD information specified for a DF exceeds the limit of 95 (cases).	Revise the parameters of sat() and sato(), and the number of the specified sets of TCD information.
0x806 0x807	The NXLADDER initialization task could not run.	Download the system program by using the NXTOOLS system.
0x841 0x843	The NX's table is missing.	Download the data for Type 4, Type 5, or Type 6 by using the NXTOOLS system.
0x844	The NX could not be initialized (due to an ET1 local DF startup error).	Reset S10VE and re-issue sat() or sato().
0x845	The NX could not be initialized (due to an ET1 remote DF startup error).	
0x846	The NX could not be initialized (due to an ET2 local DF startup error).	
0x847	The NX could not be initialized (due to an ET2 remote DF startup error).	

• Error codes (0x811 thru 0x81f) from acp()) and acpo()

Code	Meaning	Required user action
0x813	No TCD definition exists for a specified ET1 local DF.	Make a TCD definition(s) for the specified DF by using the NXTOOLS system.
0x814	A during-send register is not set for a specified ET1 local TCD.	Set a during-send register for the specified TCD by using the NXTOOLS system.
0x815	Data transmission failed due to a previously started ET1 local TCD transmission that is still in progress.	Wait for a while and then try again.
0x816	No TCD definition exists for a specified ET1 remote DF.	Make a TCD definition(s) for the specified DF by using the NTTOOLS system.
0x817	A during-send register is not set for a specified ET1 remote TCD.	Set a during-send register for the specified TCD by using the NXTOOLS system.
0x818	Data transmission failed due to a previously started ET1 remote TCD transmission that is still in progress.	Wait for a while and then try again.
0x819	No TCD definition exists for a specified ET2 local DF.	Make a TCD definition(s) for the specified DF by using the NXTOOLS system.
0x81a	A during-send register is not set for a specified ET2 local TCD.	Set a during-send register for the specified TCD by using the NXTOOLS system.
0x81b	Data transmission failed due to a previously started ET2 local TCD transmission that is still in progress.	Wait for a while and then try again.
0x81c	No TCD definition exists for a specified ET2 remote DF.	Make a TCD definition(s) for the specified DF by using the NTTOOLS system.
0x81d	A during-send register is not set for a specified ET2 remote TCD.	Set a during-send register for the specified TCD by using the NXTOOLS system.
0x81e	Data transmission failed due to a previously started ET2 remote TCD transmission that is still in progress.	Wait for a while and then try again.
0x81f	A specified DF is undefined. (There is a non-matching DF setup between the ladder and NXTOOLS.)	Set up the specified DF by using the NXTOOLS system.

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APPENDIX B   REGISTERS USED BY NXTOOLS

NXHOST uses the following registers during execution:

\<Function work registers\>

	FWBFD	FWBFE	FWBFF	BD000
	Error count (number of TCDs not received)	Error codes from acp(), sat(), and internal sending tasks. (*)	Error codes from internal sending tasks. (*)	

[ ] : These are the information set by NXHOST.

(*) For details on these error codes, see APPENDIX A, "ERROR CODES."

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APPENDIX C　RESOURCES USED BY NXTOOLS

The NXTOOLS system uses the following resources:

Table C-1　Tasks Used by NXTOOLS

No.	Task name	Task number	Level
1	acp_init	103	4
2	tk_acp	104	4
3	mgt	105	4
4	tk_acpo	106	4
5	nx_memac	209	7
6	nx_cycsnd	210	7
7	nx_operation	213	4
8	nx_snd1	214	6
9	nx_snd2	215	6
10	nx_snd3	216	6
11	nx_snd4	217	6
12	nx_snd5	218	6
13	nx_snd6	219	6
14	nx_htim	220	5
15	nx_ltim	221	17
16	nx_upexe	222	6
17	nx_purcv	223	6

Table C-2　IRSUBs Used by NXTOOLS

No.	IRSUB name	IRSUB number
1	nx_init	301
2	nx_quit	302
3	nx_put	303
4	nx_get	304
5	nx_dfup	305
6	nx_dfdwn	306
7	nx_init_tm	307
8	nx_ctl_tm	308
9	nx_get_tm	309
10	nx_write_tm	310
11	nx_read_tm	311
12	nx_trc	312
13	nx_cdoff	313
14	nx_cdon	314
15	nx_puni	315

Table C-3   IRGLBs Used by NXTOOLS

No.	IRGLB name	IRGLB number
1	nx_com	301
2	dfcb	302
3	nxbuf	303
4	tcbcb	304
5	nxtrc	305
6	nxpubuf	313

Table C-4   ULSUBs Used by NXTOOLS

No.	ULSUB name	ULSUB number
1	nx_ins	INS
2	nx_exs	EXS
3	nx_abs	ABS
4	nx_ctl	MODES

Table C-5   GLBs Used by NXTOOLS

No.	Item	Size
1	GLBW space (type 4)	0x00068000
2	GLBW space (type 5)	0x000C3000
3	GLBW space (type 6)	0x00177000