

PCI Express Bus NCB Series

HPCIe-NCB674N

HPCIe-NCB674N(1)

**xDA data editing software manual**



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# **1. Please read first**

## **1.1 Extent of Warranty**

1. The product warranty is valid for a period of three years from the date of purchase. If a defect is acknowledged by Hivertec within the period of warranty, Hivertec will repair or replace the product upon return of the product to Hivertec.
2. Hivertec is not responsible beyond the purchase price of the product for any damages or loss of profit, direct, indirect, or secondary, caused by application, delivery, or failure of a Hivertec product either within or outside of the period of warranty.

## **1.2 Limitations to Liability**

1. Hivertec is not responsible for any damages resulting from product installation, connections, settings, or operation that do not follow the contents of this manual.
2. This product uses semiconductor devices manufactured for general electronics equipment, such as machine tools, instrumentation, measurement hardware, FA devices, OA devices, and communications equipment. They are not designed, conceived, approved for, or warranted for application in devices for which faulty operation or failure will have a direct effect on human life or result in personal injury or damage to property, such as medical equipment, traffic equipment, burning appliances, or safety devices.  
The safety, quality, and performance of the products are not guaranteed explicitly or implicitly beyond those given in this manual or related catalogs.
3. Hivertec is not responsible for any damages resulting from modifications or repairs made to the product without the approval of Hivertec either within or outside of the period of warranty.
4. The contents of this manual do not guarantee or grant rights to patents, copyright, trademark rights, or any other rights to the intellectual property of Hivertec or any third party.  
Hivertec is not responsible for any problems that may occur concerning the rights to intellectual property of third parties resulting from the application of information provided in this manual.

### 1.3 Important Safety Instructions

Thank you for choosing this product. This manual contains information that is important for the safe and reliable operation of this product. Read this section and understand the information contained before attempting to use the product.

Furthermore, save this manual and store it in an easily accessible location near the installed product, so that it can be referenced when necessary.

<b>Safety Precautions</b>	
<p>Always read this manual and any attached documents completely before attempting to use this product. Be sure that you understand the information provided and are using the product correctly. Do not use the product before having a complete understanding of the product, product safety information, and precautions. In this manual, safety precautions are classified as either Warnings or Cautions.</p>	
 <b>Warning</b>	Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
 <b>Caution</b>	Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury, or property damage.

#### 1.3.1 Authorized For

 <b>Caution</b>	
	<p>This product and this manual are designed for those with the following knowledge.</p> <ul style="list-style-type: none"><li>• A basic knowledge for installing and wiring expansion boards.</li><li>• A basic knowledge of electronic control devices and personal computers, Windows.</li></ul>

#### 1.3.2 Program Adjustment Made by Users

 <b>Warning</b>	
	<p>Always debug the program thoroughly before using this product to drive devices. Any error in the program may result in unexpected operation leading to death and/or serious injury.</p>

## 2. Introduction

This manual provides operating explanation of the software that is for operation an intelligent 4-axis motion board HPCIe-NCB674 suitable for PCI Express1.0a (x1) or for MDB operation (that is to be performed by loading the pre-4000 lines of data to the board) of HPCIe-NCB674N (1) or for editing the data of CDA operation (that is to load and run one after the other the following operating data for each 2000 lines completed).

Hereafter, HPCIe-NCB674 or HPCIe-NCB674N (1) is described as the "NCB".

For the details of MDA data and CAD data, please refer to the "HPCIe-NCB674N(1) User's Manual <Software>"

Hereafter, MDA data and CAD data are described as "xDA data".

### 2.1 Program type

No.	Software name	Execution file name	Function
1	Intermediate file creation software	ND2xDA.exe	It outputs an intermediate file that is to be converted the source file
2	xDA data editing software	xDAedit.exe	

### 2.2 Operating environment

Windows8, Windows7+.NET Framework4.0, Windows XP SP3+.NET Framework4.0

### 2.3 Data file type

Data files are written in the format of text file.

No.	Name	Contents	Extension	Notes
1	Source file	the original data from 1 to 1,000,000 lines	.csv	Created in the editor such as Excel. Read and converted and output an intermediate file in ND2xDA.
2	Intermediate file	Intermediate data from 3 to 1,000,000 lines	.tmptxt	Output file of ND2xDA Read, edit, and save are possible in xDAedit
3	Execution file	Execution data from 3 to 1,000,000 lines	.txt	Specified at a time of saving in xDAedit. Executed by the MDA in the case of less than 4000 lines Executed by the CDA in the case of 4001 or more lines and inserted TOB data in every 2000 lines.

## 2.4 Intermediate file creation software

Converts the source files (extension .csv) (configured by the text described the amount of interpolation movement of the X ~ U-axis and its velocities) into an intermediate file.

## 2.5 Functions of xDA data editing software

Features of the software are as follows.

- automatically generating the header and footer rows.
- editing the PCL command write data.
- editing the PCL register write data (multiple lines).
- editing the general-purpose output control data.
- editing the general-purpose input-ready data.
- verifying the contents of the data that has been edited.
- specifying the scope and number of repetitions in case the data is repeating the same content.
- inserting the data into any row.
- deleting the data of any row.
- reading and editing an intermediate file.
- saving the edited data as an intermediate file.
- converting the intermediate file to execution file and saving it.

## 2.6 Execution file creation procedure example

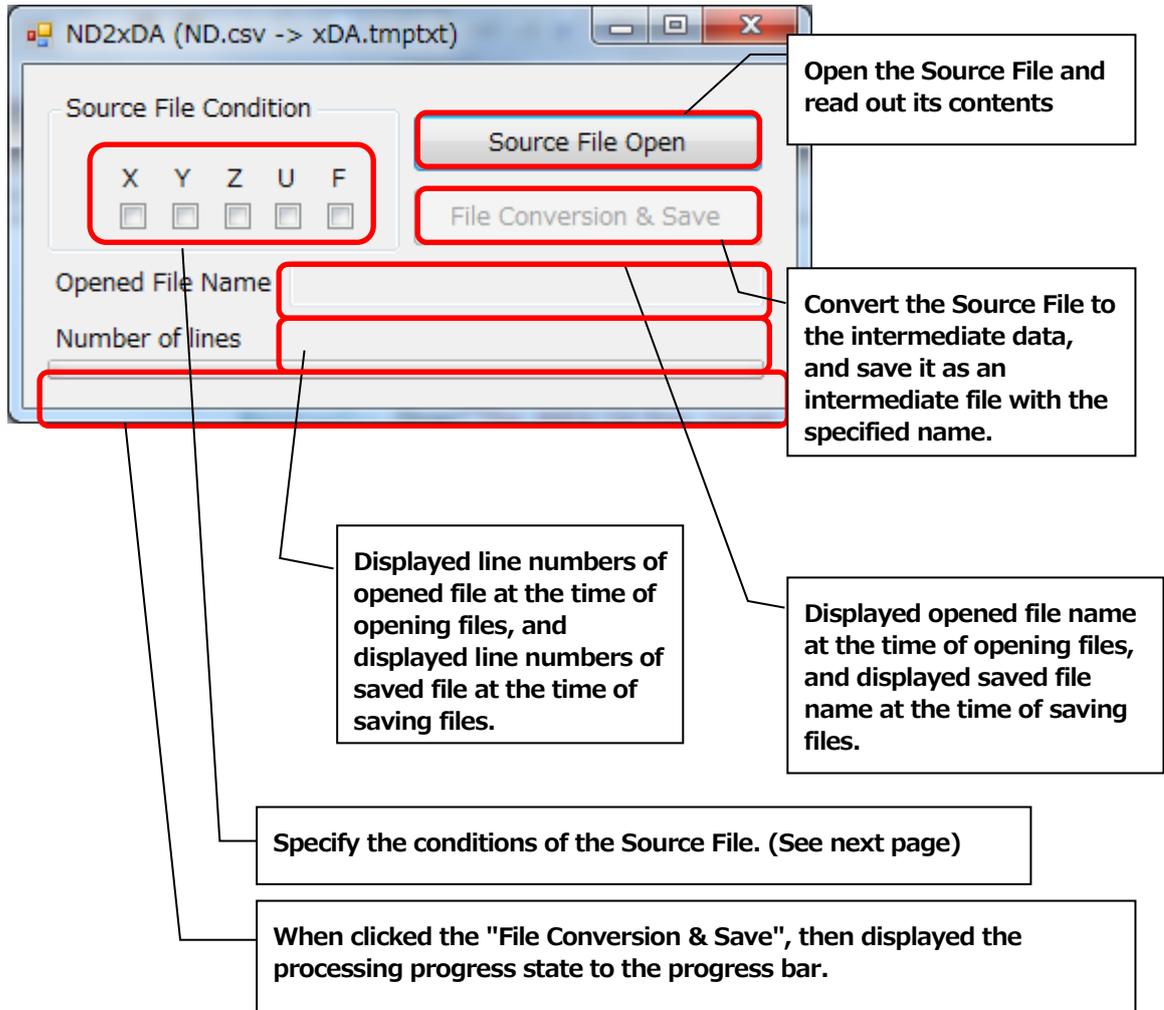
1. Creating a source file in Excel, etc..
2. In the intermediate file creation software, converting a source file into an intermediate file.
3. Adding or editing the data in the intermediate file using xDA data editing software, if necessary.
4. saving an intermediate file that was edited in xDA data editing software as an execution file.

### 3. Operations of intermediate file creation software

To convert the source files into an intermediate file..

#### 3.1 startup screen

The following screen is displayed when you start an intermediate file creation software "ND2xDA.exe".



### 3.2 Conditions of Source File and file format

Specify the axis and its velocity. File extension is to be ".csv".

Example 1. If the X, Y, Z are checked, description of the Source File will be as follows:  
travel distance of X, travel distance of Y, travel distance of Z +CR+LF

Travel distance is a decimal number of text data with a plus or minus sign.

For example, in the case that travel distance of first movement of linear interpolation of each axes are "1000", "-5000", "100", and that the second movement are "2000", "-4000", "70", the description will be as follows.

1000, -5000, 100 (Line break)

2000, -4000, 70 (Line break)

.

.

.

Example 2. If the Y, Z, F are checked, description of the Source File will be as follows:  
travel distance of Y, travel distance of Z, operation speed +CR+LF

Travel distance is a decimal number of text data with a plus or minus sign.

Operating speed is to be corresponding register of value (1 to 65535), and the command speed [pps] is to be multiplied result of the register value (of operation speed) and speed magnification. (See also the item "2.2.5 Speed and acceleration" of "CPD Board Series User's Manual <Operation>")

For example, in the case that travel distance of first movement of linear interpolation of each axes are "100", "-50" and register value (of operation speed) is "10000", and that the second movement are "300", "-100" and register value (of operation speed) is "12000", the description will be as follows.

100, -50, 10000

300, -100, 12000 (Line break)

.

.

.

### **3.3 Intermediate data**

In execution data (4001 or more rows of data) for CDA, it contains the TOB in every 2000 lines, but it is not included in the intermediate data.

In addition, the sequence number has also been added with a few lines incrementally.

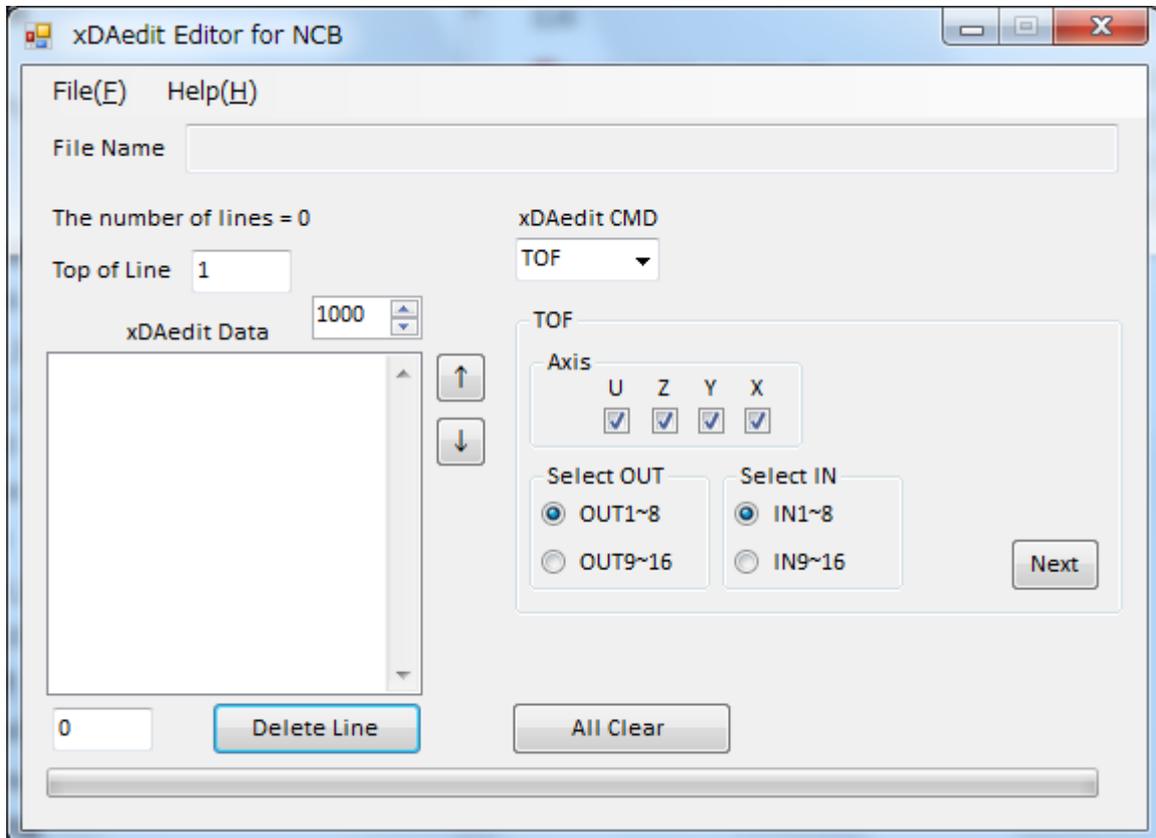
When converting this intermediate data into execution data, use the "xDAedit.exe" that is the xDA data editing software.

## 4. Operations of xDA data editing software

Editing the intermediate data, and saving the edited data as the intermediate data or execution data file. (Up to 1,000,000 rows)

### 4.1 startup screen

When starting "xDAedit.exe" that is xDA data editing software, the following screen will be displayed.



## 4.2 Execution data format

SEQ\_NO is to be decimal string, other data are to be hexadecimal string. Each line is to be always 4 sets of data.

The first line is always to be the Beginning initialization block (header). The last line is always to be the final block (footer).

The format is as follows.

SEQ\_NO, DATA1, DATA2, DATA3 +CR+LF

For more details of DATA1, DATA2, and DATA3, please see the item "5.6 Contents of DATA1(CND/CMD)" and "5.7 Details of MDA Operation Block" of the "HPCIe-NCB674N(1) User's Manual <Software>"

.

<Example>

1,0700,0B49,0003

2,0300,8061,0800

3,0400,8061,0800

4,0000,0387,0000

.

.

2889,0813,0000,0000

The "xDAedit.exe" that is xDA data editing software is a tool to create the execution data described above example.

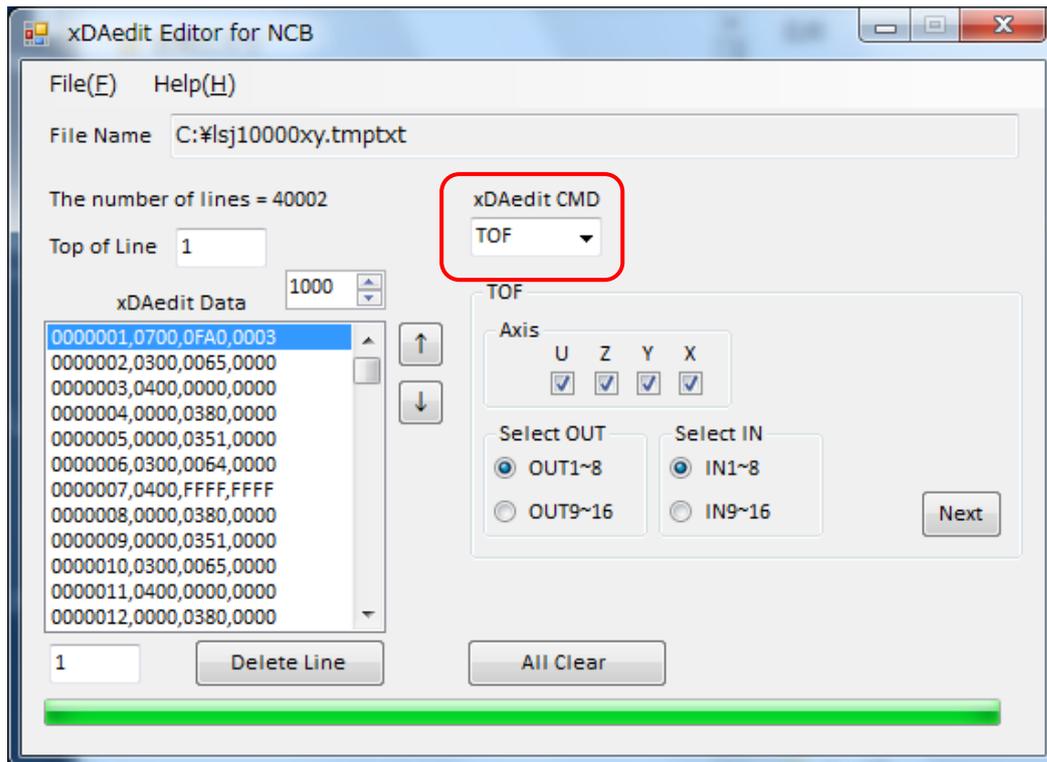
### 4.3 Confirming intermediate data

Intermediate data during editing will be displayed in the **red frame** of the following figure.

The screenshot shows the xDAedit Editor for NCB interface. The title bar reads "xDAedit Editor for NCB". The menu bar includes "File(E)" and "Help(H)". The "File Name" field contains "C:¥lsj10000xy.tmp.txt". Below this, "The number of lines = 40002" is displayed. The "Top of Line" field is set to "1". A scrollable list of data is shown, with the first line "0000001,0700,0FA0,0003" highlighted in blue and enclosed in a red frame. To the right of the list are "UP" and "DOWN" buttons. A "Delete Line" button is at the bottom left. Callout boxes provide the following information:

- The total number of rows of data being edited will be displayed.** (points to the "The number of lines = 40002" text)
- Specified the first line that will be displayed**  
**It will be displayed up to 100 lines from the sequence number that has been entered in this text box** (points to the "Top of Line" field)
- Specifies the number of lines to be moved with clicking the UP/DOWN button.** (points to the "1000" spin box)
- UP button**  
**The displayed first line moves backward as the specified number of rows.** (points to the UP button)
- DOWN button**  
**The displayed first line moves foreword as the specified number of rows.** (points to the DOWN button)

## 4.4 Switching each editing screen



Each edit screen can be switched to with the combo box within the **red frame**.

Select the "**PCL\_CMD**" when editing PCL command write data.

Select the "**WR\_REG**" when editing PCL register write data.

Select the "**OUT**" when editing general-purpose output control data.

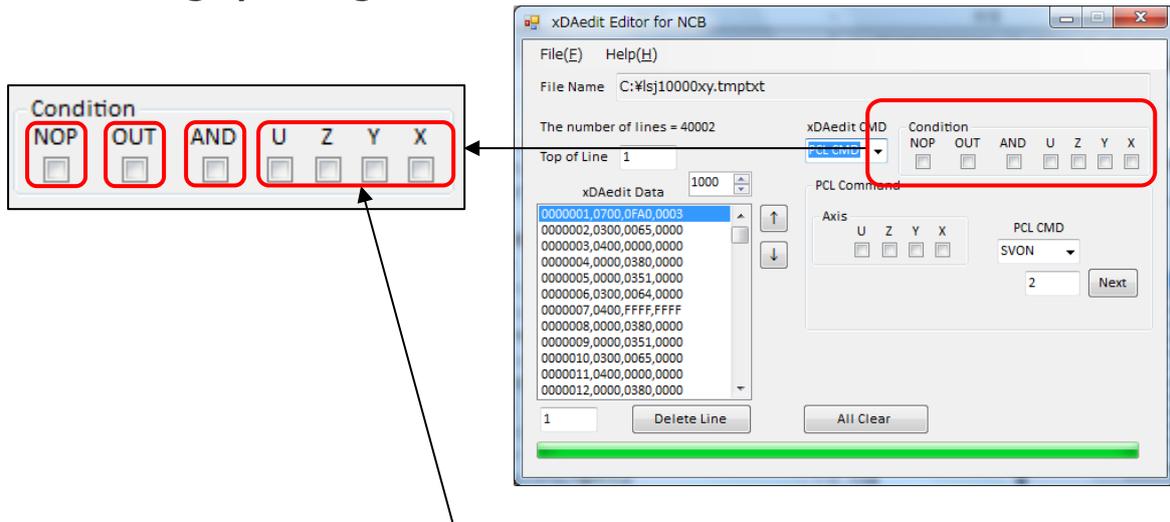
Select the "**WAIT\_IN**" when editing general-purpose input ready data.

Select the "**Multiple**" when editing repeated data.

Select the "**TOF**" when editing TOF data.

Select the "**EOF**" when editing EOF data.

## 4.5 Editing operating condition



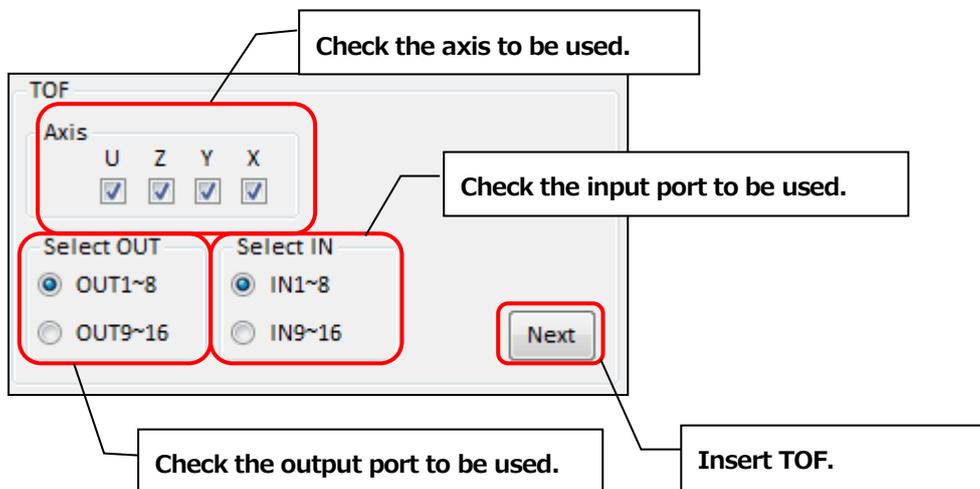
Sets the operating condition of the operating block. When checked, each axes will be waiting for the completion.

When checked the "AND", it will be AND conditions. When removed check, it will be the OR condition.

When checked the "OUT", axes will be waiting and operation will start after the completion of previous operation output pulse.

When checked the "NOP", operation will start regardless of the previous operation.

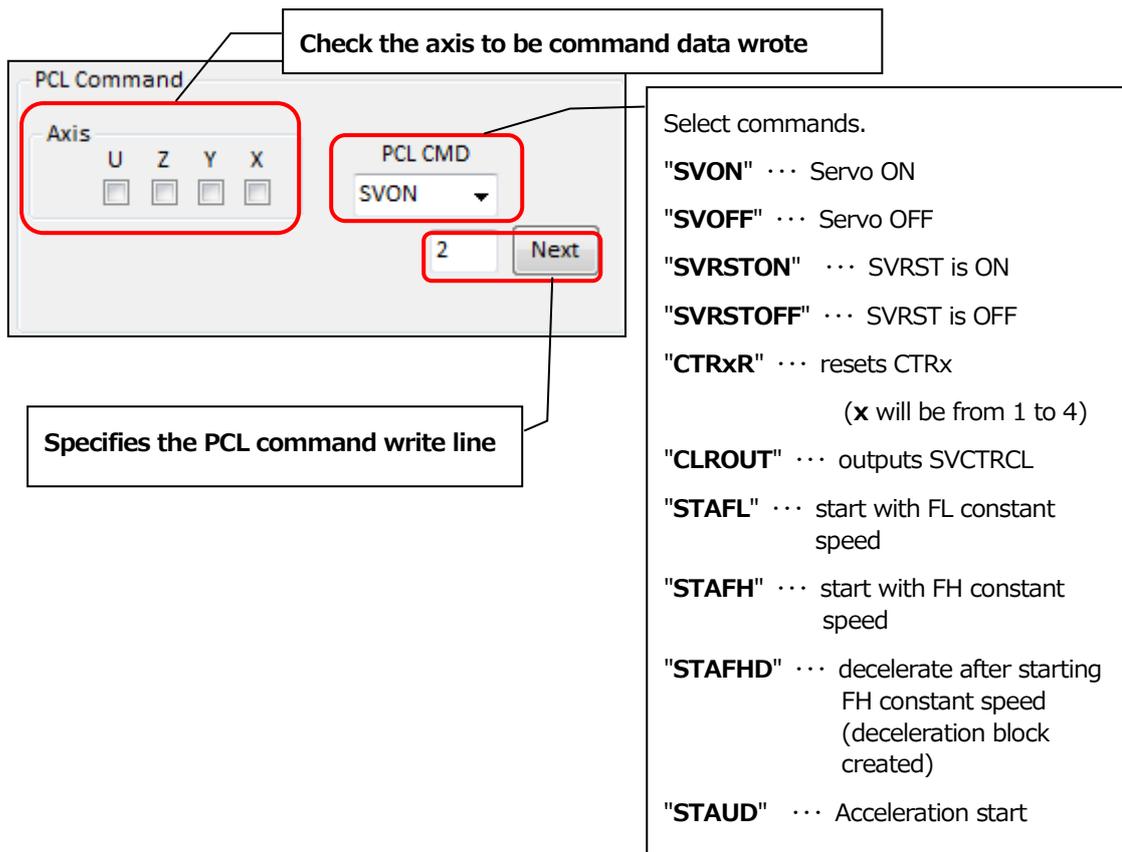
## 4.6 Editing TOF data



If the TOF is already existed in the data, perform this operation after deleting the existing TOF.

The number of data lines will be created automatically calculated at the time of EOF inserted.

## 4.7 Editing PCL command write data



The screenshot shows the "PCL Command" interface. A red box highlights the "Axis" section with checkboxes for U, Z, Y, and X. A callout box points to this section with the text "Check the axis to be command data wrote". Another red box highlights the "PCL CMD" dropdown menu, which is currently set to "SVON". A third red box highlights the "2" input field and the "Next" button. A callout box points to the "2" field with the text "Specifies the PCL command write line".

Select commands.

- "SVON" ... Servo ON
- "SVOFF" ... Servo OFF
- "SVRSTON" ... SVRST is ON
- "SVRSTOFF" ... SVRST is OFF
- "CTR $x$ R" ... resets CTR $x$   
( $x$  will be from 1 to 4)
- "CLR $OUT$ " ... outputs SVCTRCL
- "STAF $L$ " ... start with FL constant speed
- "STAF $H$ " ... start with FH constant speed
- "STAF $HD$ " ... decelerate after starting FH constant speed (deceleration block created)
- "STAUD" ... Acceleration start

## 4.8 Editing PCL register write data

Input of a decimal number when selected "DEC"  
 Input of a hexadecimal number when selected "HEX"  
 Confirm the data by clicking "Enter".

Specifies the line to be inserted the register write line

Check the axis to be command data wrote

Select the register write command.

- "PRMV" (pre-register of travel distance)
- "PRFL" (pre-register of base speed)
- "PRFH" (pre-register of operation speed)
- "PRUR" (pre-register of acceleration rate)
- "PRDR" (pre-register of deceleration rate)
- "PRMG" (pre-register of speed magnification)
- "PRDP" (pre-register of deceleration start point)
- "PRMD" (pre-register of operation mode)
- "PRIP" (pre-register of circular interpolation center position)
- "PRUS" (pre-register of acceleration S-shaped section)
- "PRDS" (pre-register of deceleration S-shaped section)
- "PRCI" (pre-register of stepping digits)
- "RFA" (register of auxiliary speed)
- "RMV" (register of travel distance)
- "RFH" (register of operation speed)
- "RENVx" (register of environment setting, x will be from 1 to 4)
- "RCTRx" (counter, x will be from 1 to 4)

## 4.9 Editing general-purpose output control data

Select the mode of general-purpose output from the level (ON/OFF) and pulse (Positive/Negative).

Specifies the line to be inserted the general-purpose output control data line

Check the bit to perform the operation of the general-purpose output.

When selected pulse, enter the pulse width (msec units).

The screenshot shows the 'Out' window with the following elements:

- Mode:** Radio buttons for Level(ON) (selected), Pulse(Posi), Level(OFF), and Pulse(Nega).
- Select Bit:** A row of checkboxes for bits 7, 6, 5, 4, 3, 2, 1, and 0.
- Pulse Width(msec):** A text input field containing '0'.
- Line Selection:** A text input field containing '2' and a 'Next' button.

## 4.10 Editing general-purpose input ready data

Check the general-purpose input conditions.  
When checked "AND", it will be AND conditions of the selected bit. When removed the "AND", it will be OR conditions of the selected bit.  
When checked "OFF", it will be waiting OFF of the selected bit. When removed the "OFF", it will be waiting ON of the selected bit.

Specifies the line to be inserted the general-purpose input ready data line

Check the bit to make a comparison of the general-purpose input.

Setting the time-out period (msec units).  
When set to "0", it will be forever waiting.

The screenshot shows the 'Wait IN' window with the following elements:

- Mode:** Checkboxes for AND and OFF.
- Select Bit:** A row of checkboxes for bits 7, 6, 5, 4, 3, 2, 1, and 0.
- Time Out(msec):** A text input field containing '0'.
- Line Selection:** A text input field containing '2' and a 'Next' button.

## 4.11 Editing repeated data

Multiple

From	To	Times
2	3	1

2 Next

Specifies the line to be inserted the repeated data line

Input those values.  
The beginning line of already existing data (From)  
The end line (To)  
Number of repetitions (Times)

## 4.12 Deleting the specified line

The line was specified in the **red frame** can be deleted by clicking "Delete Line".

xDAedit Editor for NCB

File(E) Help(H)

File Name C:\%lsj10000xy.tmp.txt

The number of lines = 40002

Top of Line 1

xDAedit Data 1000

0000001,0700,0FA0,0003  
0000002,0300,0065,0000  
0000003,0400,0000,0000  
0000004,0000,0380,0000  
0000005,0000,0351,0000  
0000006,0300,0064,0000  
0000007,0400,FFFF,FFFF  
0000008,0000,0380,0000  
0000009,0000,0351,0000  
0000010,0300,0065,0000  
0000011,0400,0000,0000  
0000012,0000,0380,0000

1

Delete Line

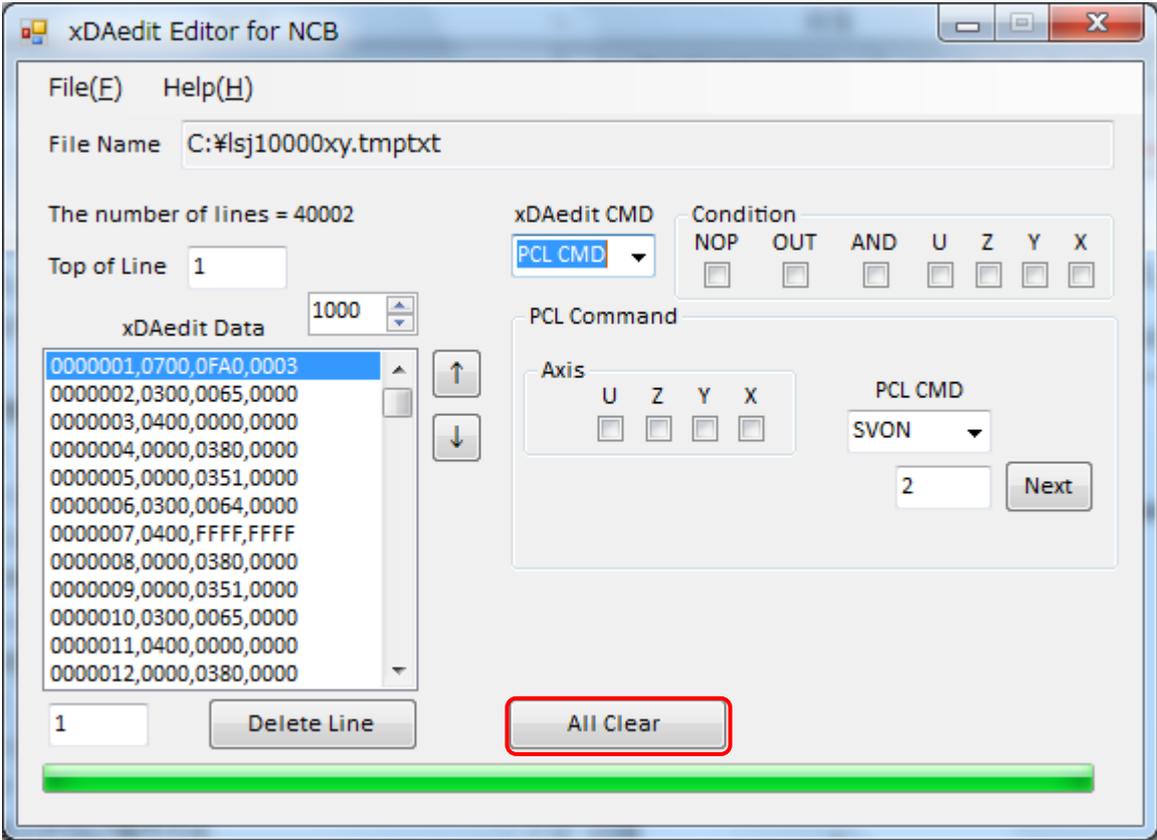
All Clear

xDAedit CMD PCL CMD Condition NOP OUT AND U Z Y X

PCL Command Axis U Z Y X PCL CMD SVON 2 Next

### 4.13 Deleting all lines

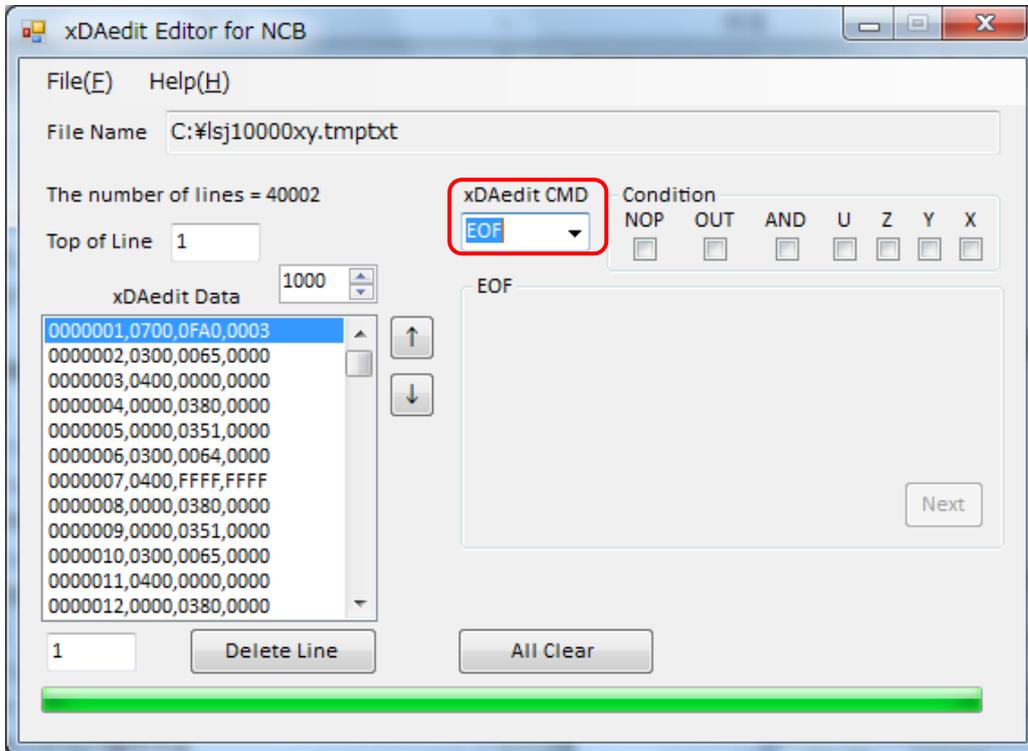
All line can be deleted by clicking "All Clear".



## 4.14 Creating EOF

Select the "EOF" of the combo box within the **red frame**, select the program completion conditions, to create the EOF data.

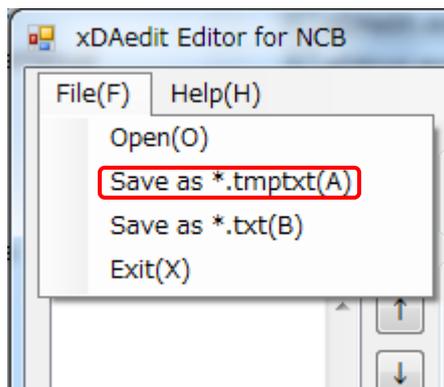
If the EOF is already existed in the data, perform this operation after deleting the existing EOF.



## 4.15 Saving the intermediate data

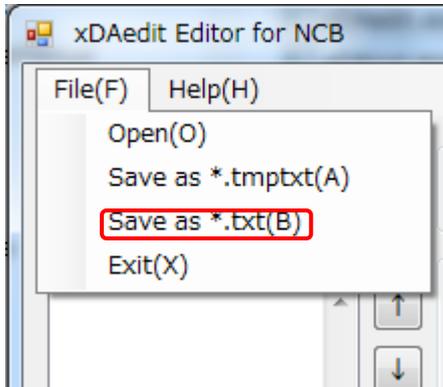
By clicking "File" and "Save as \*.tmp.txt" in the sequent order, the file save dialog is displayed.

With the specified name, the edited data can be saved as an intermediate file.  
(extension is .tmp.txt)



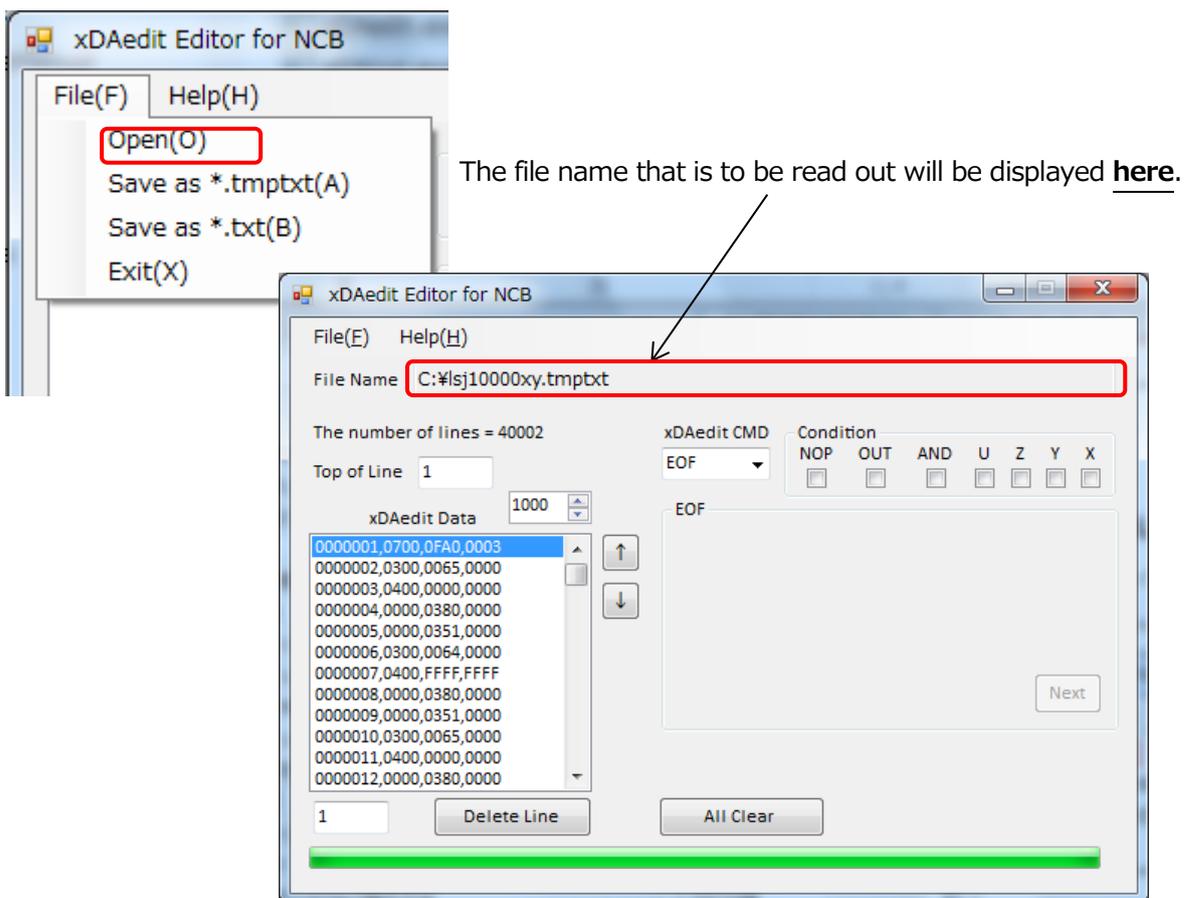
## 4.16 Conversion and saving as execution data

By clicking "File" and " Save as \*.txt " in the sequent order, the file save dialog is displayed. With the specified name, the edited data is converted to execution data, and saved. (extension is .txt)



## 4.17 Reading data

By clicking "File" and " Open " in the sequent order, the file open dialog is displayed. The intermediate file (extension is .tmptxt) of the specified name can be read and edited.



#### **4.18 When adding and editing the intermediate file output by "ND2xDA"**

An intermediate file can be editing in the procedure of "4.17 Reading data".

In the case that TOF is subject to change, remove the TOF, and next, edit the TOF.

Then, adding the execution initial data appropriately. Finally, remove the EOF and perform the procedure described in the "4.14 Creating EOF".

### **5. Confirmation of the execution data that was edited in xDA data**

MDA/CDA execution data verification software "**xDArun**" is provided as a confirmation tool of execution data.

"xDArun" can be confirmed the execution data actually on board.

For the operation of "xDArun", please see the "MDA/CDA execution data verification software xDArun Operation Manual".