

Multiplex Transmission Device

TOLINE-XM

Support Tool

for master unit (XM-TBM32) of XM series conductor bar
transmission units

Instruction Manual

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[Introduction]

Multiplex transmission device XM series master unit for conductor bar: support tool for XM-TBM32 (“support tool”) is a software product that supports the user in setting up and monitoring this multiplex transmission device (“master unit” or “XM-TBM32”) and configuring the system.

The support tool has the following functions for the Master unit.

◇ Parameter setting

- Master settings/ slave settings
- Ethernet communication parameter setting and allocation of PLC CPU unit (compatible with Mitsubishi, Omron and JTEKT) devices
- Reading and display of current values set for the Master unit
- Reading and setting from CSV files

◇ Monitor

- Master reception data and master transmission data
- Information on slave unit status
- Current error condition and error history

◇ USB communication

- The support tool is connected to XM-TBM32 through USB and transfers data to perform the above functions.

Notes:

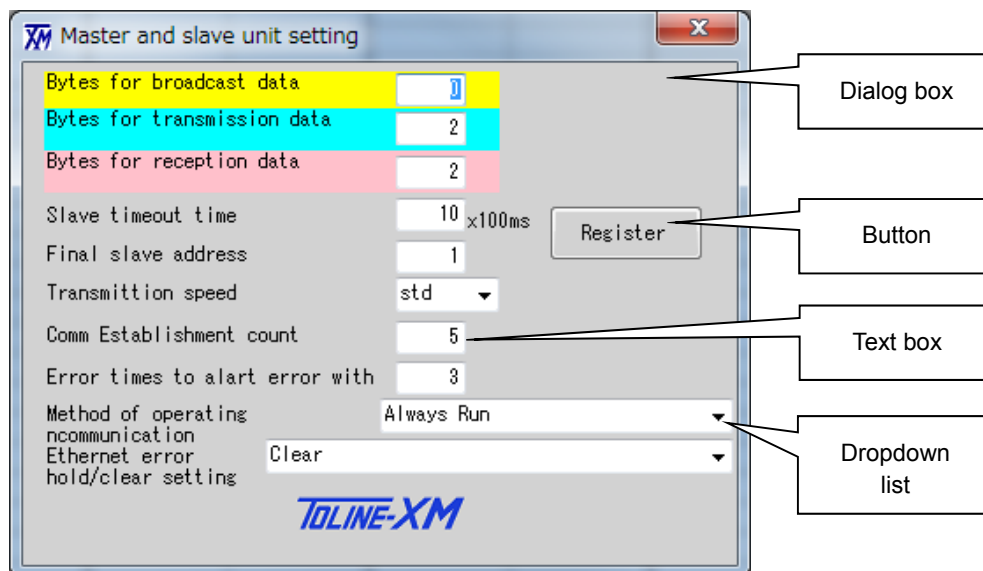
1. This manual applies to the support tool for multiplex transmission device XM series units
2. This manual uses Microsoft Windows 7 as an example to describe the screens and operations. Replace the details according to the operating environment as necessary.
3. This manual is subject to change due to improvements without notice.

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[Terms used in the screen descriptions]

To avoid confusion and misunderstanding regarding the difference in terms this instruction manual standardizes the names of the components of the user interface screen as shown below based on the terms used in general on graphical user interfaces (GUI).

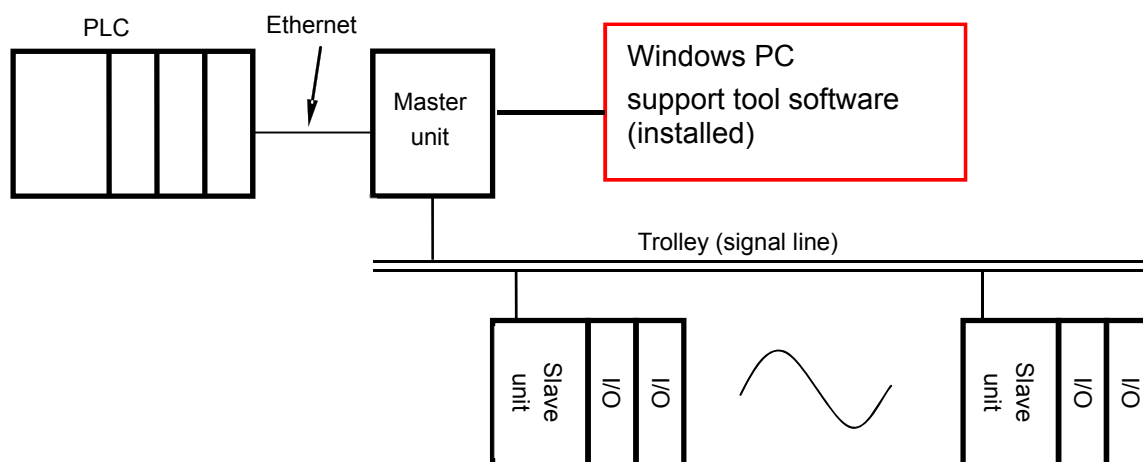


- **Dialog box:** An independent operation screen
- **Button:** Operation or processing starts by clicking this.
- **Text box:** A value is directly entered through keyboard input or a copy-and-paste operation.
- **Dropdown list:** One is selected from the options presented in the box.

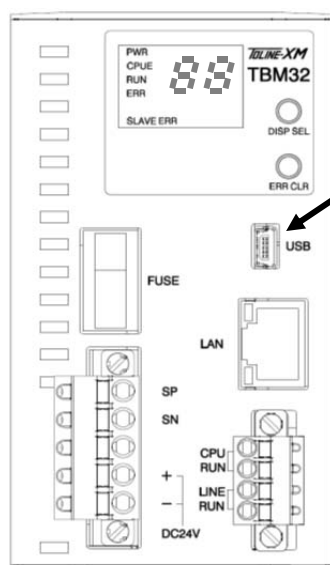
1. Operating environment

1.1 Composition

This support tool operates on a Windows-based PC (“PC”) connected to the master unit of a system shown below, which exchanges signals with multiple slave units mainly through conductor bars.



1.2 Connection



Please connect the USB connector and the PC using a USB cable (USB(A)male-USB(Micro-B)male).

1.3 System requirements

Type of PC	Windows-based PC
CPU	32 bit or 64 bit processor with speed of 1 GHz or higher
Recommended OS	Microsoft Windows 7, 8, or 8.1 (Japanese version)
Memory	1 GB or more
HD free space	30 MB
Interface	USB 2.0 Port x 1 ch.

* Operation in the above environment has been tested under some general or common conditions. However, it does not guarantee proper operation under any combination of the conditions in the above environment.

2. Installation/uninstallation of support tool

2.1 Installation steps

- (1) Step 1: Download and unzip the support tool and USB driver
- (2) Step 2: Install the USB driver
- (3) Step 3: Install the support tool

2.2 Downloading the Support Tool and USB driver

Download the USB driver for support tool and XM-TBM32 support tool software on Toho Technology website and unzip the files.

- * The appearance and composition of the website may change and differ from the following. If this is the case, search the download page and download the files using the following basic flow as a reference.

◇ Download page on the Toho Technology website

- On Toho Technology Corporation website: <http://www.toho-tec.co.jp/>

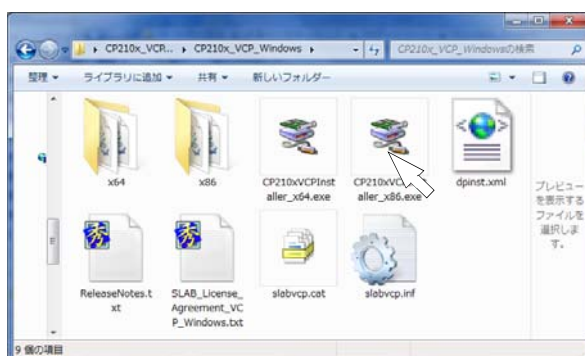
Download the zip or compressed file for TOLINE XM-TB support tool and USB driver from **Product Information > FA-related Devices/Systems, Multiplex Transmission Devices, and Wireless Devices > Multiplex Transmission Devices/Wireless Communication Devices > Multiplex Transmission Devices and Data.**



2.3 File unzip

File “CP210x_VCP_Windows.zip” is downloaded. Double-click to unzip the file. Folder “CP210x_VCP_Windows” is created. Select and double-click a driver for the type of your system and install the driver by following the instructions on the screen.

System type	Driver
32-bit operating system	CP210xVCPInstaller_x86.exe
64-bit operating system	CP210xVCPInstaller_x64.exe



- * The system type is found by clicking **Start > Control Panel > System** (or **System and Security > System** to open the **View basic information about your computer** page.

[Note 1]

Do not use any USB driver not provided by Toho Technology. Using the driver of the other version may interrupt the normal operation of support tool.

[Note 2]

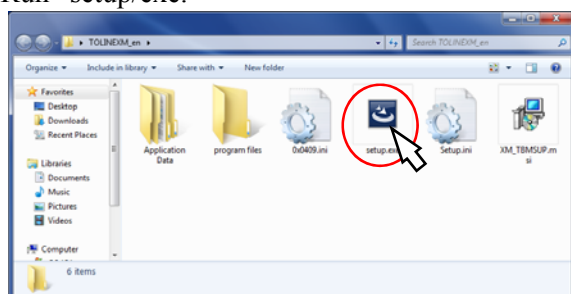
It is generally known that there is compatibility between the USB device itself and a PC and between a device that uses USB serial converter IC and a PC. The support tool may not be installed or properly operate on certain PCs, operating system, settings, peripheral devices, and/or other software products installed. Please note that, if this is the case, you may need to replace your PC.

2.4 Running the Support Tool installer

- ◇ If the former version of XM-TBM32 support tool is installed, uninstall it by following the instructions below before installing the current version.
- ◇ Unzip the support tool software and start the installer.

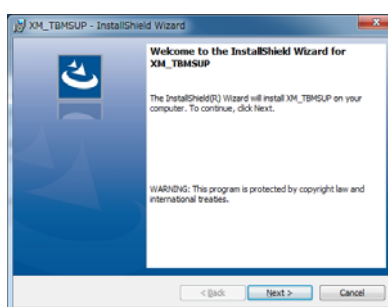
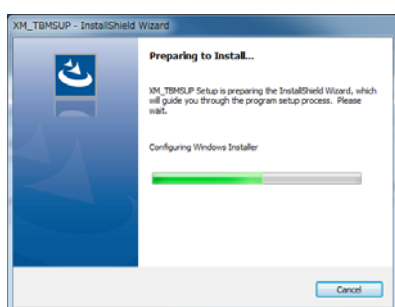
XM_TBM_SUP folder is created when the downloaded zip file is unzipped.

Run “setup.exe.”



- ◇ Running installation

- Setup Wizard appears. Follow the instructions on the screen.




2.5 Uninstallation of Support Tool

- (1) Click **Start > Control Panel** and open **Uninstall a program**.
- (2) Select **XM_TBMSUP** in the list for **Add/Remove Programs or Uninstall a Program** and uninstall the program.

3. Connecting and starting Support Tool

3.1 Connecting to the master units

- (1) Connect the PC in which the support tool is installed and the master unit (XM-TBM32) by using a USB cable.
- (2) Turn on the power of the master unit.
- (3) Start the support tool.
 - Double-click the shortcut icon  on desktop.
 - Or Click **Start > All programs > TohoTec** and click **XM_TBMSUP**.

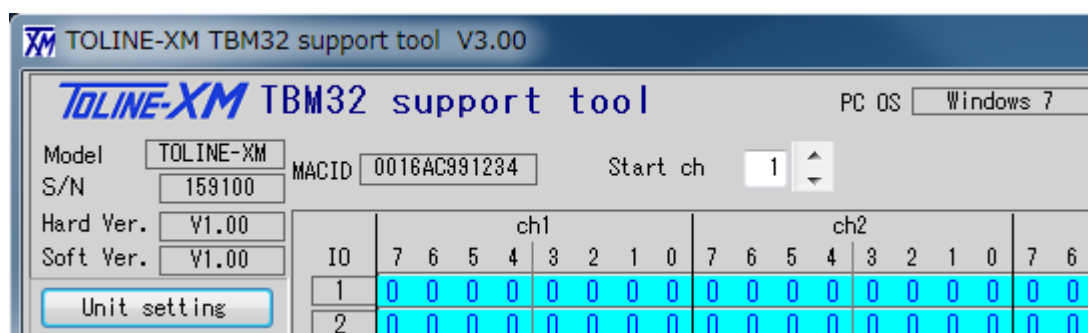
3.2 Starting the Support Tool

3.2.1 Loading initial values

- USB communication (COM) port number: Read automatically from the COMINI.csv file.

3.2.2 Connecting USB communication

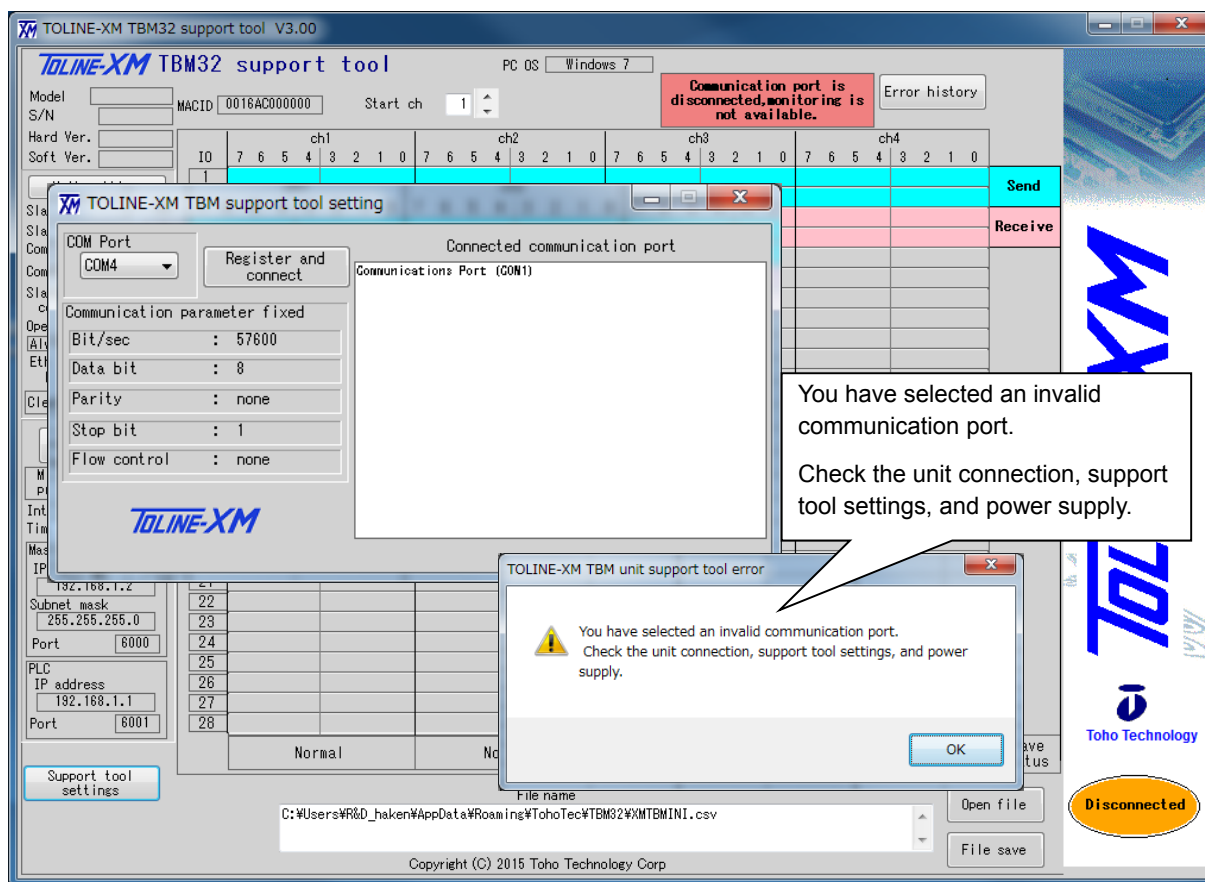
- (1) Try the connection with the master unit using the above COM port number. If successfully connected, obtain the following information from the PC and master unit and display.



- The version of Windows OS on the PC
- The model name of connected unit
- Software version
- Hardware version
- MacID

- (2) Display when connection has failed:

The following error message appears.



* Possible reasons for the connection failure include the followings.

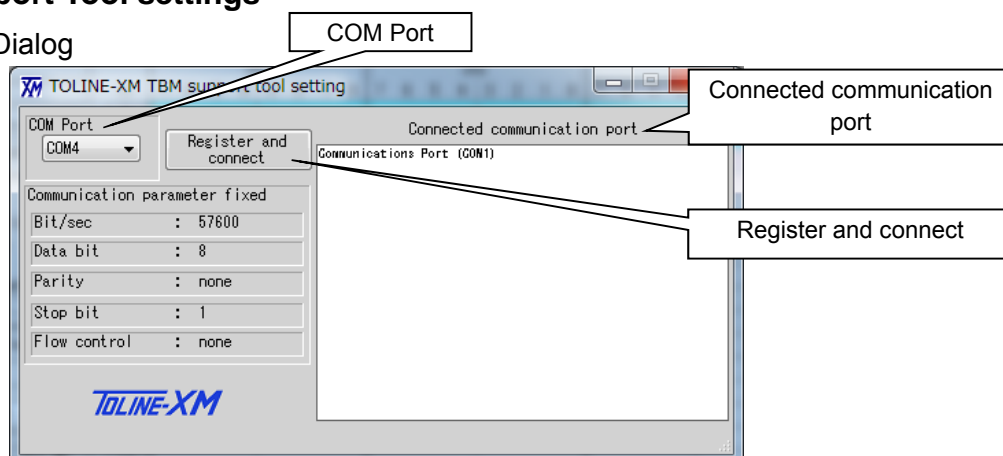
- (1) The power of the master unit is off.
- (2) The USB cable is not connected with the PC and/or the master unit.
- (3) The driver for USB serial converter IC is not installed in the PC.
- (4) COM ports have not been set up, or the settings are not correct.

Follow the section “3.3 support tool setting”.

- (5) Compatibility between USB devices or between the USB serial converter IC and PC is not good.

3.3 Support Tool settings

3.3.1 Dialog



- (1) The COM port status is shown in the “Information on Connected Communication Port” textbox .

Specify the COM port connected to the master unit in the “Communication Port Settings” list box. Select the USB-UART conversion port (COM5 in the above example).

- (2) Communication parameter value

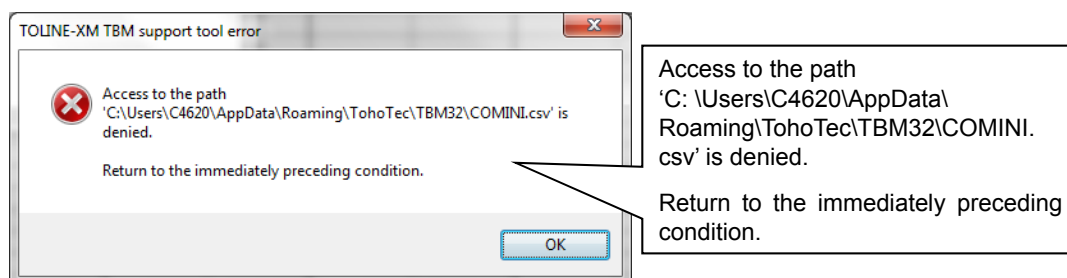
- Parameters other than the COM port number are fixed as described in the dialog box.

- (3) **Register and connect** button

- The COM port settings are registered and automatically saved in a file.

For details, see the section “5.2.3 File types and restrictions”.

* If the following error dialog box appears when saving the file, refer to the final section “support tool errors.”



3.3.2 Setting method

- (1) The COM port information is presented in the “Connected Communication Port” textbox in the “support tool settings” dialog box.

- 1) Correct COM port is detected.

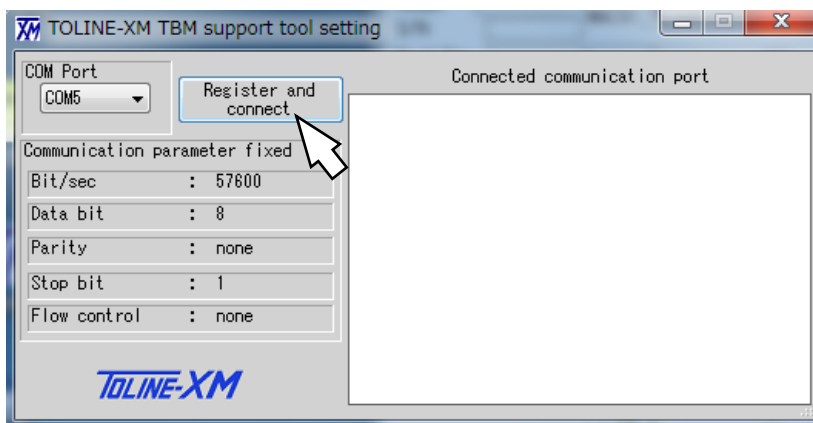
The port numbers contained in the PC are displayed.

If the COM numbers in the Communication Port Settings” list box match, the support tool settings are correct and connected.

Silicon Labs CP210x USB to UART Bridge (COM5)

***** Currently connecting COM5 *****

- 2) COM Port is not detected.



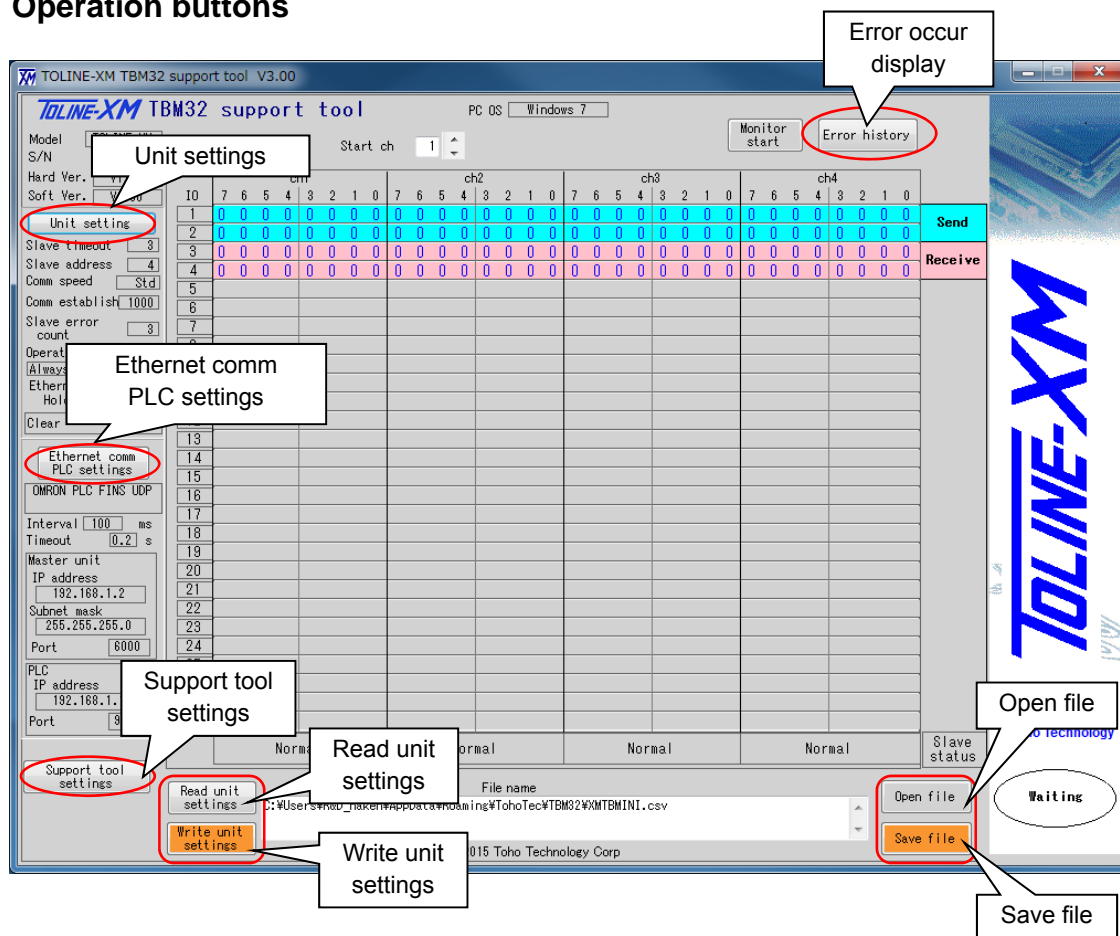
- 3) If the COM port number setting is different, select the existing port numbers in the list box.
- (2) After setting the COM numbers, click the “Register and connect with unit” button to close the support tool setting dialog box and reconnect the USB.

4. Ending support tool setting

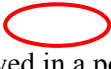
Click the “X” at the upper right side of the main dialog box to end the program.

5. Dialog configuration, display, and operation

5.1 Operation buttons




5.1.1 Sub-dialog display

By clicking the main dialog settings and display buttons (in ovals  the above diagram), dialogs (four types) with the same names as the buttons are displayed in a pop-up window.

Once any one of the dialogs is open, the other dialogs cannot be displayed or operated until the open dialog is closed.





5.1.2 Reading and writing settings

Setting information from the master unit and files can be read and written by clicking the read and write buttons (in round rectangles  in the above diagram) of the main dialog.

5.2 Details of dialog box

5.2.1 Information display

(1) USB communication status

	Displayed when the USB communication is disconnected. This status shows some abnormal conditions such as incorrect settings or cable disconnection. Because connection between the PC and the unit is automatically set up.
	Neither transmission nor reception is performed.
	Transmitting data to the unit
	Receiving data from the unit.

(2) Setting display

* Settings are displayed on the left-hand side of the main dialog box.

- 1) Display of master unit settings / slave unit settings
- 2) Display of Ethernet communication and PLC communication settings

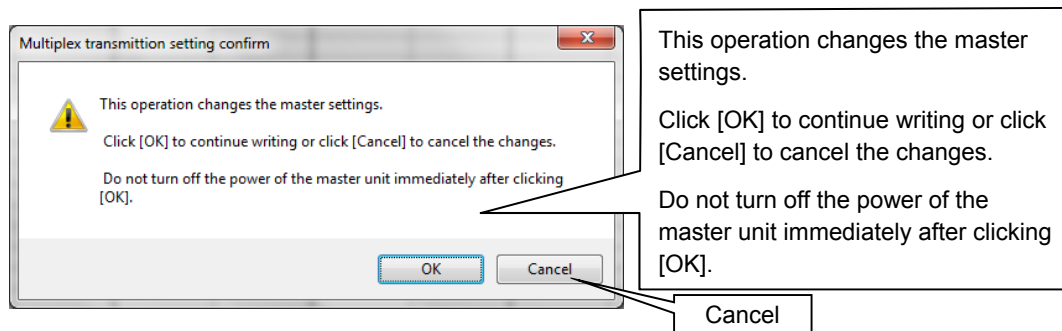
5.2.2 Read unit settings and Write unit settings buttons

(1) Read unit settings button

- The settings when the support tool is started are default and may be different from the master unit settings before these buttons are pressed.
- Click this button to read all settings from the connected master unit.

(2) Write Unit Settings button

- This button displays the following warning dialog box.



- Click the **OK** button to write all settings of the connected master unit.
Do not turn off the power for approximately one second before the writing is complete.
- The settings when the support tool is started correspond to the file and may be different from the master unit settings before writing is performed using this button.

5.2.3 File types and restrictions

This is a CSV file that records the settings of each parameter.

(1) File types

1) USB COM file

- File name: COMINI.csv
This file name is reserved. Do not use the name in other ways or delete it.
- It records the communication port selected in the support tool settings.
- The data are automatically loaded and saved, and the file is not to be accessed by the user.

2) Factory default file

- File name: InitialFile.csv
This file name is reserved. Do not use the name in other ways or delete it.
- > Read the settings in this file when returning the parameters to the factory default values.
This file and read-only files cannot be overwritten.

3) Users specified file

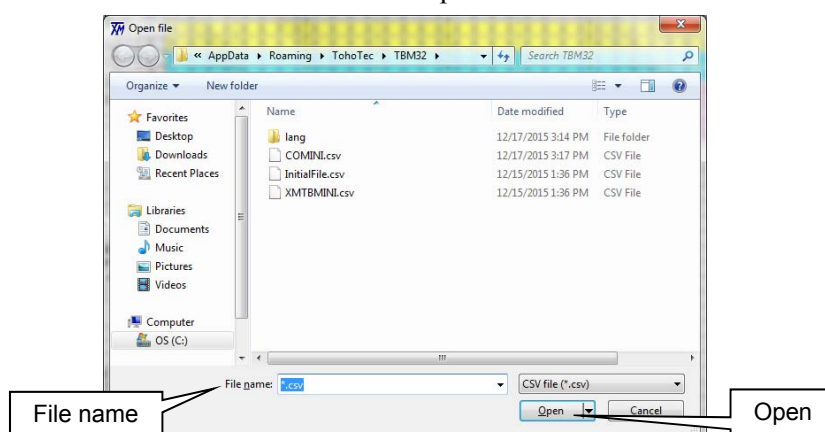
- File name: an arbitrary name given by the user
Names of other files may be given arbitrarily if they have the extension ".csv".

(2) File operation



1) Reading a file

- The **Open File** button opens the same dialog boxes as **File > Open** of Microsoft applications such as Office Word and Excel.
The subsequent steps are the standard procedure of Windows. Follow the instructions on the screen to proceed.

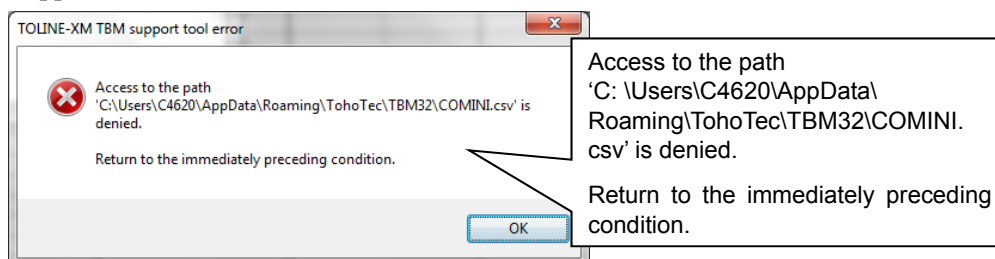


- While the “Open File” operation makes the parameters in the support tool the same as those in the file, the master unit parameters do not change.
Subsequently, clicking the **Write Unit Settings** button makes the parameters for the file, support tool, and master unit consistent.

2) Saving data in a file

- Click the **Save File** button opens the same dialog box as **File > Save As** in Microsoft applications such as Office Word and Excel.
The subsequent steps are the standard procedure of Windows. Follow the instructions on the screen to proceed
- No writing is allowed for read-only files and factory default files (InitialFile.csv).

* If the following error dialog box appears when saving the file, refer to the final section “support tool errors.”



5.2.4 Data set for the Tool, master unit settings, and file transfer

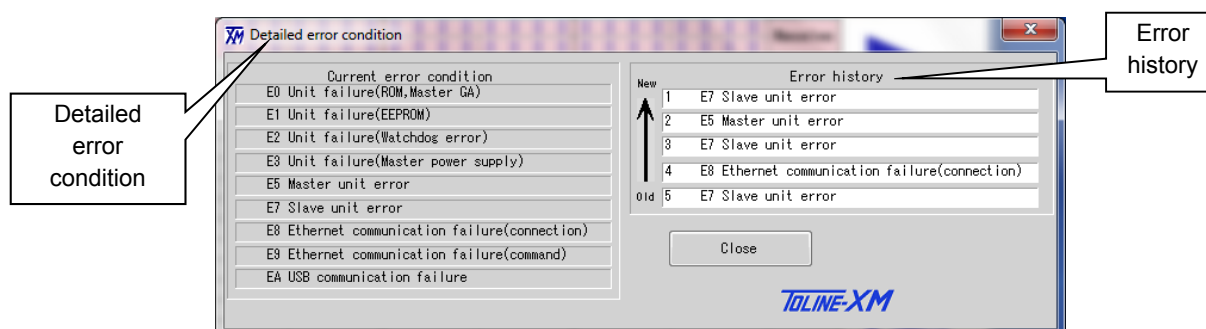
- Registering each setting only changes the settings in the Tool, but not the settings in the multiplex units and file.

Currently, the internal settings of the master units and the Tool settings/displays are inconsistent. The Write Unit Settings button and Write File button turn red to prompt writing each setting. The “Write Unit Settings” button and the “Save File” button are displayed in orange color to indicate that the unit settings have not been written and the file has not been saved.



- These orange buttons return to the normal color after the operation of **Write Unit Settings** button and **Save File** button.

5.2.5 Error condition display

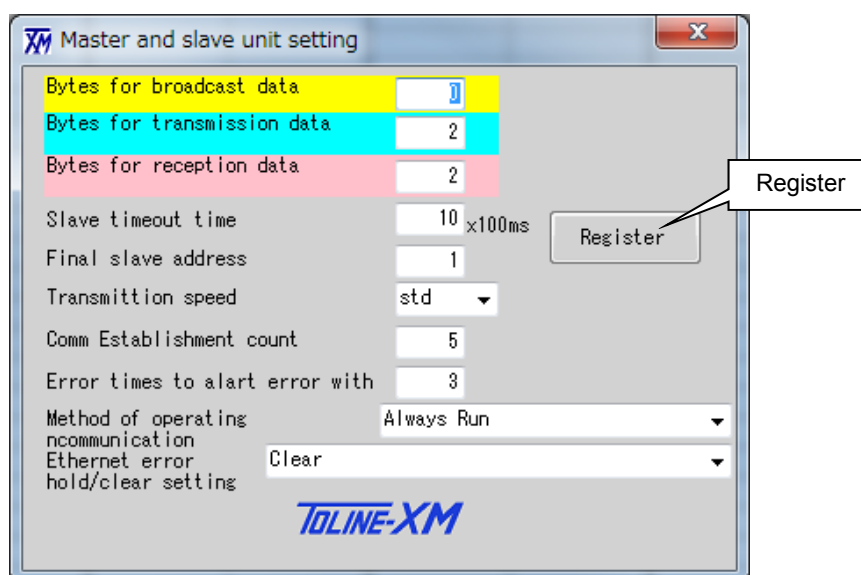


- Current error conditions are displayed on the left-hand side.
- Up to five last error histories are displayed on right-hand-side.

6. Setting

6.1 Master unit settings / slave unit settings

6.1.1 Dialog box



6.1.2 Description of settings

Item	Description	Setting method and remarks
Number of bytes for broadcast data	Allocation of broadcast output unit installation: 0 – 7 bytes	Directly input numbers
Number of bytes for transmission data	Allocation of output unit installation: 1 – 14 bytes	Directly input numbers
Number of bytes for reception data	Allocation of input unit installation: 1 – 14 bytes	Directly input numbers
Slave unit timeout time	Settings for slave stations, slave station multiplex communication timeout time 0 - 255 × 100 ms	Directly input numbers
Final slave unit address	Final address of slave stations: 1 - 32	Directly input numbers
Multiplex transmission speed	1/4x	Select from list box
	1/2x	
	Standard	
	2x	
Setting to establish a remote station circuit	Number of scans to establish slave unit circuit: 0 – 1,000 times	Directly input numbers
Number of times to examine errors with slave unit communication	Master station settings, multiplex transmission failure: 0 – 10 times	Directly input numbers
Method of operating multiplex communication	Continuous operation	Select from list box
	Control using system register	
Ethernet communication failure Retain/clear settings	Clear	Select from list box
	Follow the settings of output-hold switch of I/O unit	

6.1.3 “Register” button

- (1) Error in the upper/lower limit assessment
 - The input value is ignored.
 - (2) Entries are normal.
 - The input values are registered, the dialog box closes, and the screen returns to the main dialog box.
- * Subsequently, the registered data are transferred to the unit with the **Write Unit Settings** button.

6.2 Ethernet communication and PLC communication settings

6.2.1 Ethernet communication and PLC communication settings

- (1) Dialog box
 - Mitsubishi PLC screen

- Omron PLC screen

* The part varies.

- JTEKT PLC screen

Ethernet communication PLC setting

Ethernet communication setting
Protocol: JTEKT PLC(Ethernet computer link)

Master unit
IP address: 192 . 168 . 1 . 2 Port: 6000 (Fixed)
Subnetmask: 255 . 255 . 255 . 0

PLC
IP address: 192 . 168 . 1 . 1 Port: 6001

Interval: 100 ms
Timeout @ 100 x 10ms

Select PLC
Command register: Do not use M is 8 bit unit

	Data register D	Input(DEC,HEX)	Transfer	Setting(DEC)
Status information	Data register D	0	Transfer DEC	Set 0
Received data	Data register D	3E8	Transfer DEC	Set 1000
Transmission data	Data register D	7D0	Transfer DEC	Set 2000
System register	Data register D	BB8	Transfer DEC	Set 3000
Command register	Data register D	C1C	Transfer DEC	Set 3100

Program No. P1 PC10 mode PC10 standard mode

TOLINE-XM

* The part varies.

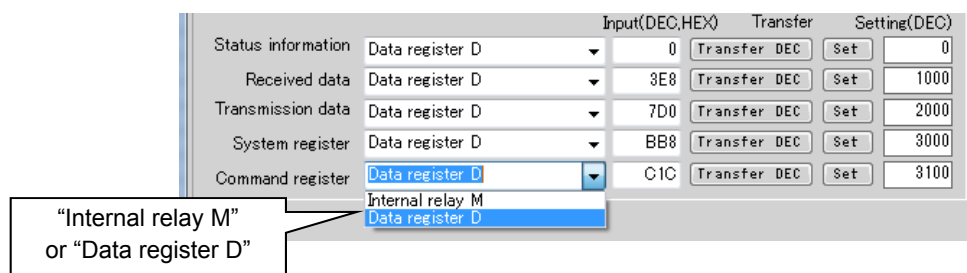
(2) Description of settings

Item		Description	How to make settings and remarks
Ethernet communication setting: protocol selection		Mitsubishi PLC MC protocol 3E frame / Omron PLC FINS UDP / JTEKT PLC (Ethernet computer link)	Select from list box
Ethernet communication transmission interval		10 – 60,000 ms	Directly enter the number in the text box.
Ethernet communication time out		Mitsubishi PLC: 0.25 – 10 s Omron PLC: 0.1 – 10 s JTEKT PLC: 0.2 – 10 s	Directly enter numbers in text box. Mitsubishi PLC: input in terms of $0.25 \text{ s} \times n$. Omron PLC: $0.01 \text{ s} \times n$ JTEKT PLC: $0.01 \text{ s} \times n$
PLC command register		Use	Select “Command Register” in list box.
		Do not use	
PLC CPU device allocation	Status information	Head device value in the sequencer setting	[Device code] Select from list box Mitsubishi PLC <ul style="list-style-type: none"> • Internal Relay M • Data Register D Omron PLC <ul style="list-style-type: none"> • Internal auxiliary relay W • Data memory D JTEKT PLC <ul style="list-style-type: none"> • Internal Relay M • Data Register D [Head device value] Directly enter the number in the text box. • Enter hexadecimal value -> decimal conversion setting or decimal input setting
	Multiplex reception data/error history		
	Transmission data		
	System register		
	Command register		
Master unit: IP address		Decimal 3 digit x 4	Directly enter the numbers in 4 text boxes.
Local station subnet mask		Each 0 – 255	
Local station port number		6,000	Fixed value, setting not possible (monitor)
Counterpart station IP address		Decimal 3 digit x 4 Each 0 – 255	Directly enter the numbers in 4 text boxes.
Counterpart station port number		Decimal 1024 – 65,535	Directly enter the number in the text box.
Number of retries (Omron PLC)		Decimal value 0 – 10	Directly enter numbers in text box.
Local station node number (Omron PLC)		Hexadecimal value 1 – 0xFE	Directly enter numbers in text box.
Counterpart station node number (Omron PLC)		Hexadecimal value 1 – 0xFE	Directly enter numbers in text box.
Program No, (JTEKT PLC)		P1 / P2 / P3	Select from list box
Function mode (JTEKT PLC)		PC10 mode PC10 standard mode	Select the radio button

◇ Method of setting PLC CPU device allocation

(1) Device code dropdown list

- Select Internal Relay M or Data Register D.



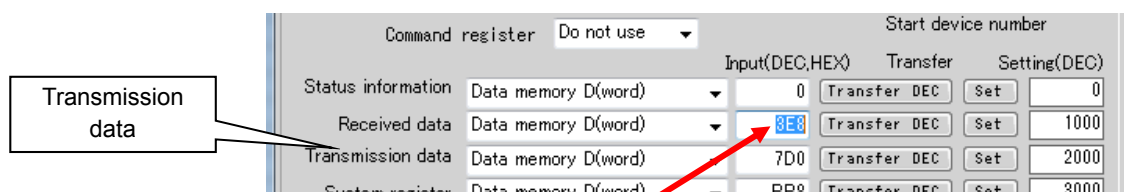
(2) Head device value

The first device value may be described as a decimal or hexadecimal number, which is, therefore, structured in a way that allows hexadecimal and decimal conversion in this dialog box.

[How to enter a value]

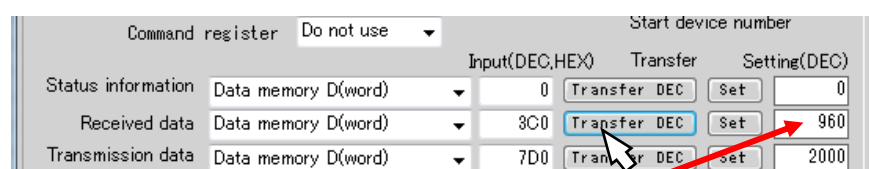
(a) Hexadecimal input

- (i) Enter a hexadecimal number in the Input (decimal/hexadecimal) text box.



Enter hexadecimal “3E8” in Multiplex Transmission Data.

- (ii) Click the **Decimal Conversion Settings** button in “Multiplex Transmission Data”.

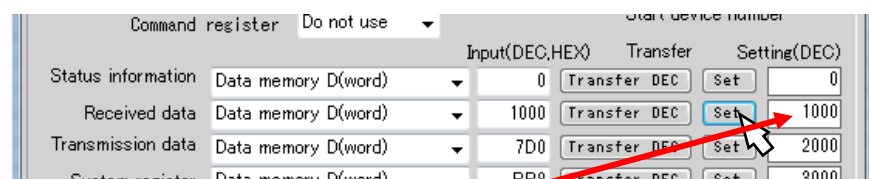


The value “3C0” is converted to a decimal number in “Setting (decimal)” and “960” appears.

Clicking the Register button validates and registers the value indicated in this Setting (decimal).

(b) Decimal input

Enter a decimal number in the Input (decimal/hexadecimal) text box and click the Settings button.



The value 1,000 of “Input (decimal/hexadecimal)” is transferred to “Settings (decimal)” without any change.

- * When selected internal relay M in the case of JTEKT PLC, please enter a multiple of 8.

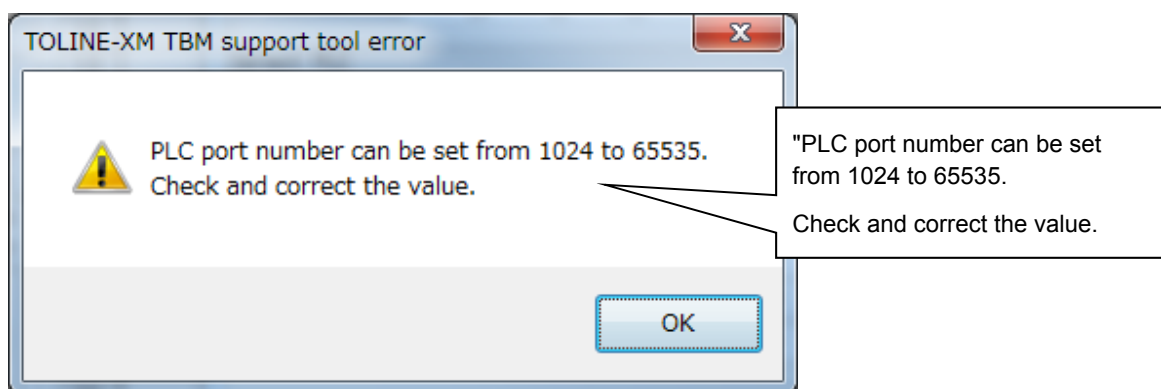
(3) Entries check

By clicking the **Register** button, the entries are checked.

- 1) When the entered value exceeds the upper/lower limits: The input value is ignored.
 - 2) Input value is within the limits: The input values are registered, the dialog box closes, and the screen returns to the main dialog box.
- * Subsequently, the registered data are transferred to the unit with the “Write Unit Settings” button.
 - * It transferred the contents will not be reflected until the power of the unit is turned on again.

6.3 Input error

- If an input is an error in settings, etc., a message box appears. Click the **OK** button after checking the error, and the message box disappears.



7. Monitor mode

7.1 Start/End monitor mode

7.1.1 Start monitor mode

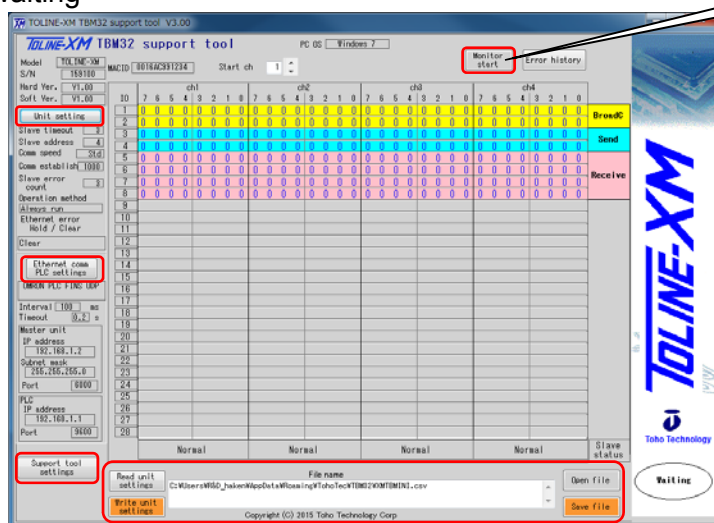
- Clicking the **Monitor** button while **Waiting** (the condition that is not the monitor mode and the setting dialog box is not open) turns on the “Monitoring” mode.

The setting dialog box should be closed.

- Communication is performed once every second to periodically obtain data from the Master unit.

Comparison of the main dialog box (Waiting vs. Monitoring)

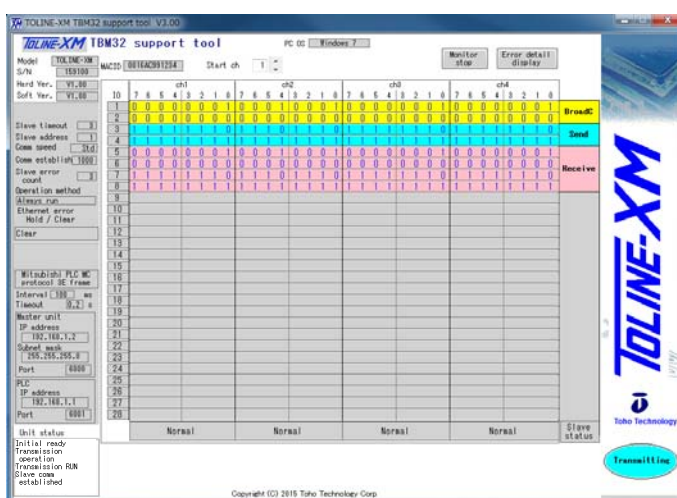
Waiting



Monitor start

Monitor

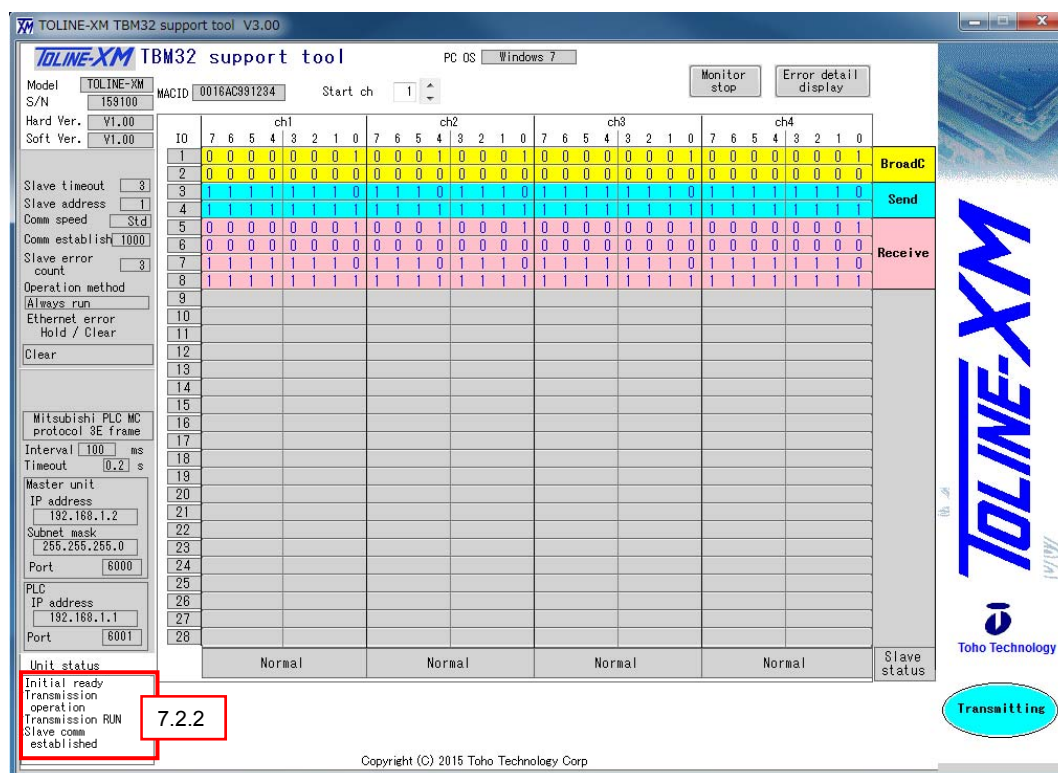
- The setting button is not displayed and setting is prohibited,
- The communication status periodically cycles “transmitting, receiving, and waiting”,
- The Unit Status viewed at the lower left section
- The background color of the slave station port status becomes white (not gray).



7.1.2 End monitor mode

- Clicking the Stop Monitor button returns the status to “Waiting”.

7.2 Monitor display



7.2.1 Display of multiplex transmission and reception data

(1) Description of display

- Horizontal direction: Displays 4 channels out of up to 32 channels of slave units
- Vertical direction: Displays the IO information (up to 28 bytes) of input and output units connected to each slave units

(2) Selection of channels to display (displayed slave station channels)

- When directly entering a number in the text box of the channel to start display or specifying the first channel to display using the up/down button, data for four channels out of the specified channels will be displayed.
- The above diagram shows the example of two to five channels.

7.2.2 Unit status

- Displays the multiplex communication status.

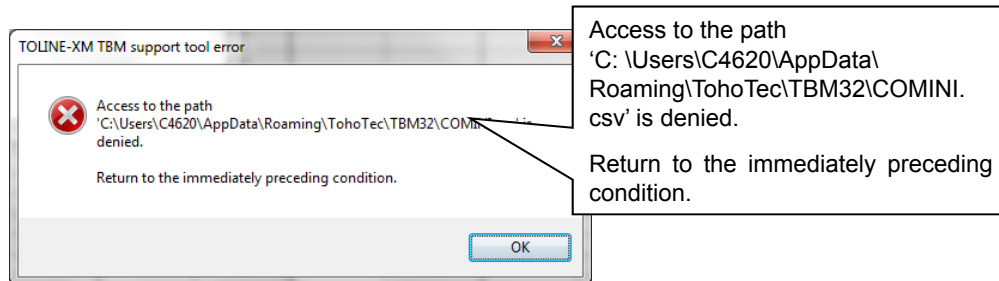
7.2.3 Slave station status

- Displays the state of slave units.

8. Support Tool errors

8.1 Saving a file

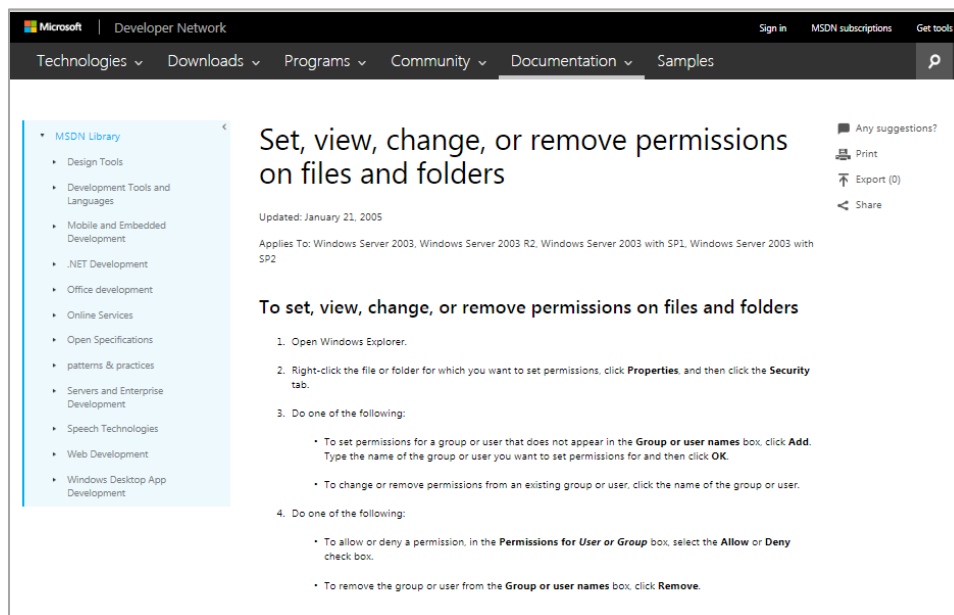
- The following error message that may appear when saving a file means that the file has not been saved.



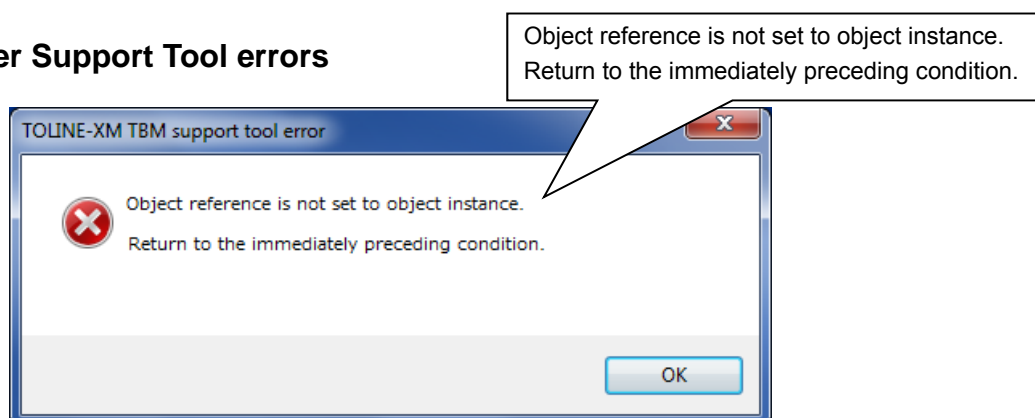
This occurs most often when the file or folder to be saved is “write protected” in the PC’s Windows settings.

- To solve this problem, contact the system administrator or change the settings using the following and other information as a reference.

<https://msdn.microsoft.com/en-au/library/cc780121%28v=ws.10%29.aspx>



8.2 Other Support Tool errors



Such an error is indicated when data outside the range that can be processed is detected due to the effect of input operation, communication, OS, or other applications or an unexpected condition or a situation that cannot be processed by the PC has occurred.

Click **OK** to return to the state before the occurrence of an error, and normally, the operation can continue.

There is no problem if this message appears once in a long while or has appeared only once; however, if it appears when performing a specific operation or often enough to interrupt the use of the system, please contact Toho Technology.

When you contact us, information such as the exact message that appears, the environment in which the system is used, the conditions when the message is displayed, etc. will help us understand the situation better.

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Note:

Information included in this manual is subject to change without notice.



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