XP-ROM Operation Manual (V2. 00)

Table of Contents

Version History
Ver1.01 2002.06.20
Ver1.09 2004.08.25
Ver2.00 2005.05.31

XPROM(Extend Prom Control)

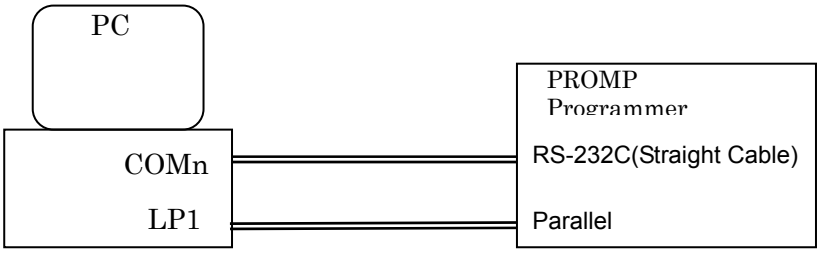
1. Overview

XPROM is remote control software to control PROM Programmer on PC.
Device setting, Master data transfer, device read and program can be accomplished by XPROM. By setting targeted IC, data, programming of the IC can be achieved. After setting up an IC and data, the setting can be stored as a project file.

1,1 Connection between PC and PROM Programmer

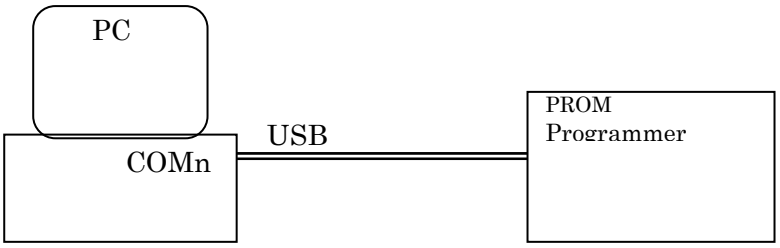
Connection method varies by the model number of the PROM Programmer.

1. Connection of MODEL1893,1930,1931,1940
   RS232C and parallel cable should be connected.



RS232C to control programmer and parallel to transfer data

2. Connection of MODEL1894,1895,1895/2,1896,1950
   USB should be connected



To use USB cable, USB driver must be installed on PC.

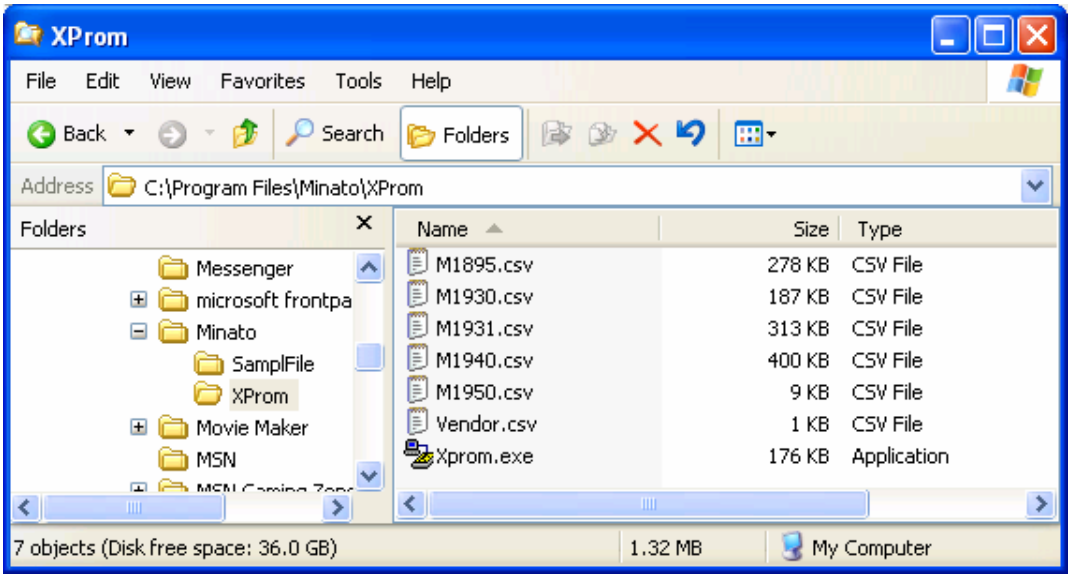
Programmer	USB Driver
M1894 M1895 M1895/2 M1896 M1950	¥Windows¥system32¥drivers¥M1950com.sys ¥Windows¥system32¥drivers¥M1950usb.sys

＊Following USB driver for M1894/95 is automatically removed by installing new USB driver.

¥Windows¥system32¥drivers¥M1894com.sys
¥Windows¥system32¥drivers¥M1894usb.sys

1.2 Installation of XPROM

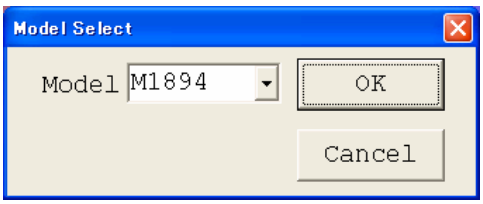
Execute Xprom_setup.exe. Then Minato¥Xprom folder is created in Program File folder. (Make sure to uninstall old version XPROM before installing new version).



M1940.csv file created in Minato¥Xprom¥ is a device data base to select a device through XPROM. The latest csv file (device data base) can be downloaded at the bottom page of http://www.minato.co.jp/products/programmer/programmeritems_e.html
（If the firmware version of programmer is older, by replacing csv to new one does not allow you to program new device. The firmware of the programmer must be also upgraded）

1.3 Start up display

When XPROM is started up, the following message is displayed.



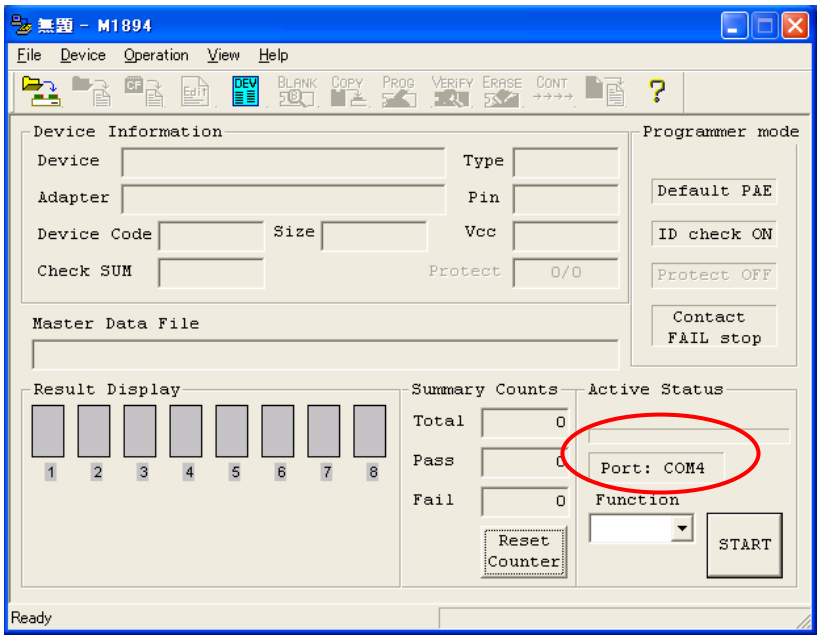
Select targeted model and click Ok

Cancel to close XPROM

When XPROM is started up for the first time, error message is displayed due to unmatched communication setting.

Click several times to go on to the next operation.

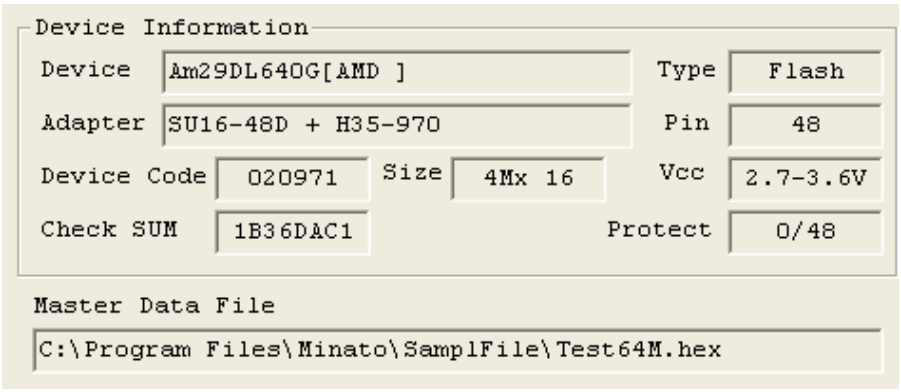
Operation display after start up



Selected port # is displayed

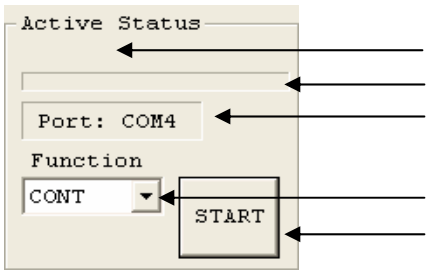
1.4 Explanation of each screen

1. Device Information



Device	:Part number of IC[Supplier's name]
Size	:Address of IC x Formation of data
Type	:type of IC
Pin	:# of pin of IC
VCC	:VCC voltage
Protect	:# of protect
Adapter	:part # of adaptor
Device Code	:Device code
Check SUM	:Check Sum of data
Master Data File	:File name to program into IC

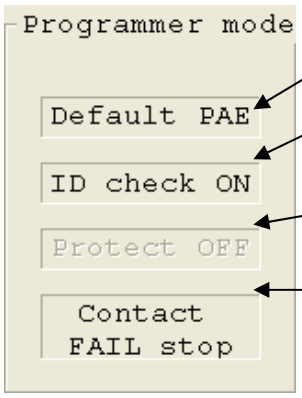
2. Active Status



Area to display active status
Progress bar to indicate file load
Connected port number

Function select
Start button to execute each function

3. Programmer mode



device address mode display
(Specify by Device -> Device Address menu)

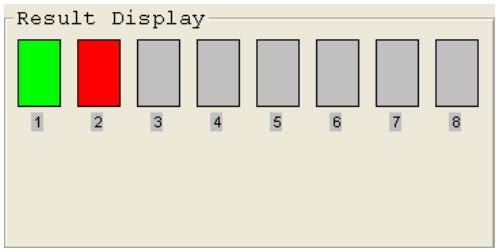
ID check mode display
(Specify by Device -> ID check mode menu)

Protect mode display
(Specify by Device -> Protect mode menu)

Contac check mode display
(Specify by Device -> Contact Stop menu)

4. Result Display

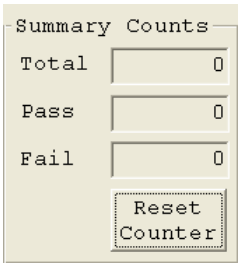
To display the results of Function such as Contact check, ID check



Pass: Green
Fail: Red

5. Summary Counts

To display the number of counts of BLANK,COPY,PROGRAM,VERIFY,ERASE,CONT

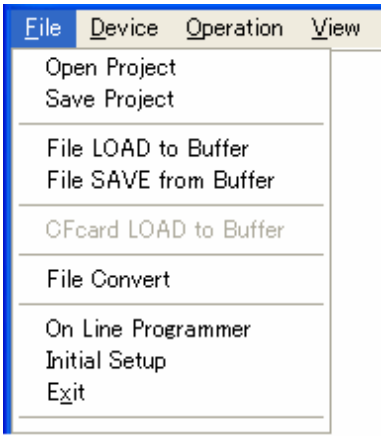


Total : total count
Pass : the # of pass
Fail : the # of fail

Reset Counter button
(the # of clear)

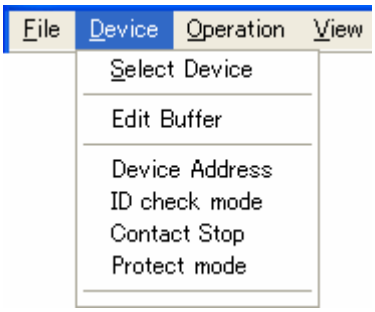
1.5 Menu and Tool

1. File Menu



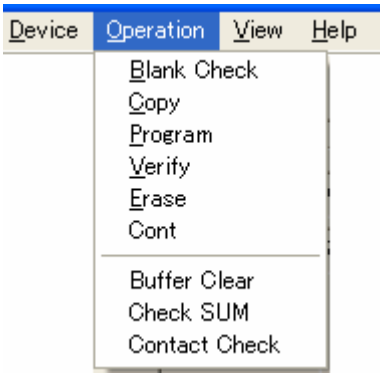
1.Open Project : Open Project File
2. Save Project : Save Project File
3. File LOAD to Buffer : Load Data File in the programmer
4. File SAVE from Buffer : Save data from the buffer of the programmer
5. CFcard LOAD to Buffer :Load data from CF card of the programmer
6. File Convert :Data File conversion
7. On Line Programmer :To make the programmer on line
8. Initial Setup :Initial set-up
9. Exit :Exit

2. Device Menu



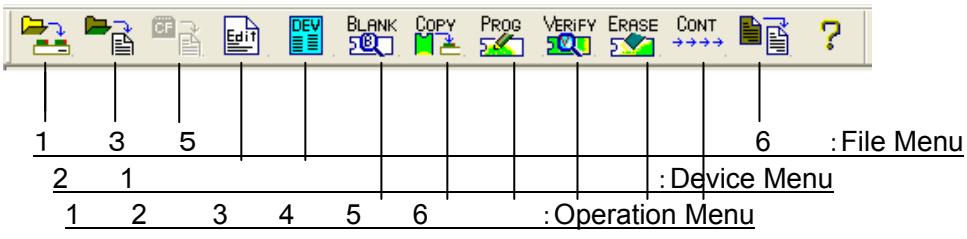
1. Select Device : Select and change device
2. Edit Buffer : Edit buffer memory
3. Device Address : Set address of the device
4. ID check mode : Set device ID check mode
5. Contact Stop : Set contact stop mode
6. Protect mode : Set and edit Protect mode

3. Operation Menu



1. Blank Check : Blank check
2. Copy : Copy
3. Program : Program and verify
4. Verify : Verify
5. Erase : Erase
6. Cont : Continuous (BEPV)
7. Buffer Clear : Clear the buffer memory of the programmer
8. Check SUM : Calculate Check SUM
9. Contact Check : Select contact check

4. Tool Bar (Menu)

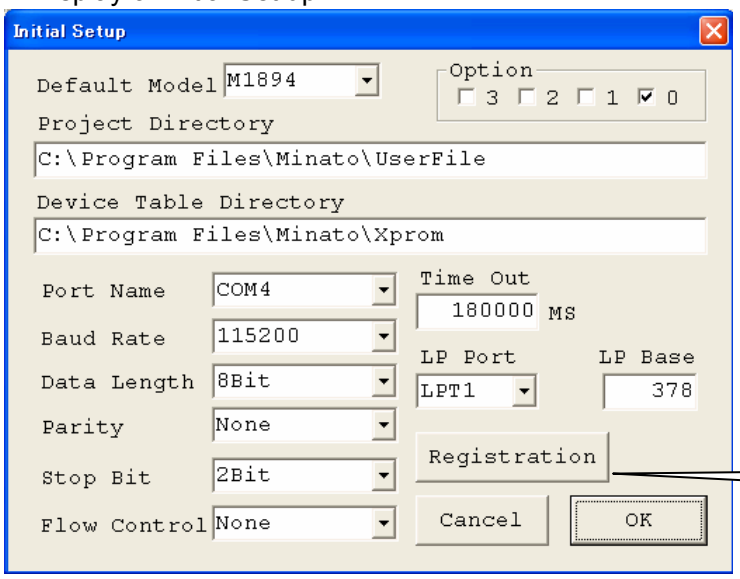


2. Initial set up of XPROM

This operation is to select the model of the programmer and to set file directory and parameters of communication port.

Select File - Initial Setup

Display of Initial Set up



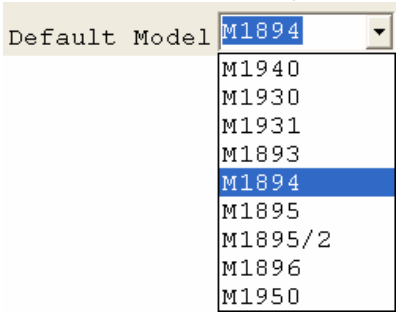
Directory to store Project File

Directory where device data base(csv file) is located

Registration button

When this button is clicked, value becomes effective during the next boot up.

1. Default Model Setting



This operation is to set the model of programmer during boot up.
When it is changed, make sure to click registration to store the setting.

2. Setting of option switch

Option

	Check mark	No check mark
0	Fast USB transfer	Standard USB transfer
1～3	N/A	N/A

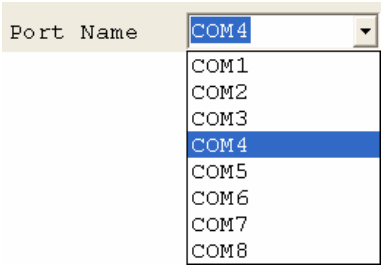
Block data transfer

This option is effective when INTEL.HEX or MOTOROLA data format is selected.

Remarks: When data format error occurred during block transfer, it causes beep sounds due to time lag to stop.

3. Setting communication port

This operation is to set communication port.



Select communication port that is
Assigned by device manager of PC

4. How to check available communication port

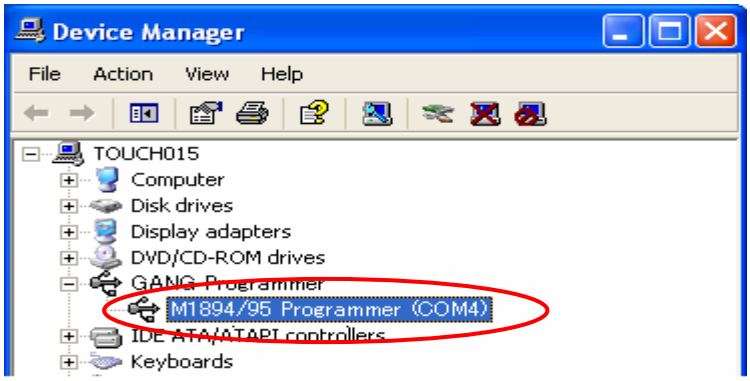
Open following folder on PC

My Computer – Properties - Hard Ware－Device Manager

Select the port number available at
¥Port(COM and LPT)¥M1950 Programmer(COMX) or
¥Port(COM and LPT)¥M1894/95 Programmer(COMX)

After installing new driver, USB driver of M1894/M1895 is not required.
If you have M1894/M1895 driver, please remove it prior to the installation of new driver.
If available, you will find ¥GANG Programmer¥M1894/95 Programmer(COMX)
How to uninstall

Device Manager – Action - Delete



5. Communication setting of XPROM

This operation is to define parameters of communication port of PC.

When USB is used, only COMx is used. However, we suggest to set the parameter as listed below.

When parallel port is used, LP port or LP address must be specified according to the type of OS.

LP Port : Specify printer port number (OS: Windows NT, 2000, XP)

LP Base :Specify IO port base address(OS:Windows95,95,ME)

		Recommended set value			
Model		M1893,M1930 M1931	M1940	M1894,M1895 M1895/2,M1896	M1950
Port / Parameter		RS232C	RS232C	USB	USB
Port Name		COM0,1	COM0,1	COMx	COMx
Baud Rate		19200	115200	(115200)	(115200)
Data Length		8	8	(8)	(8)
Parity		None	None	(None)	(None)
Stop Bit		2	2	(2)	(2)
Flow Control		None	None	(None)	(None)
LP Port		LPT1	LPT1	(LPT1)	(LPT1)
LP Base		(378)	(378)	(378)	(378)
Time Out		Approximately 150% longer time than the estimated longest programming time of the device with highest density			

6. Communication Setting of a programmer

This operation is to define the remote mode setting of the programmer (Please refer to the operation manual of programmer regarding how to set the parameter)

RS Configuration setting		Recommended set value			
Model		M1893,M1930 M1931	M1940	M1894,M1895 M1895/2,M1896	M1950
Port / Parameter		RS232C	RS232C	USB	USB
Port Name		COM0,1	COM0,1	COMx	COMx
Baud Rate		19200	115200	(115200)	(115200)
Data Length		8	8	(8)	(8)
Parity		None	None	(None)	(None)
Stop Bit		2	2	(2)	(2)
Flow Control		None	None	(None)	(None)

Remote Configuration setting

Echo mode	ON	ON	ON	ON
Prompt	#	#	#	#
Time Out	OFF	-N/A	-N/A	-N/A
ACK/NAK	OFF	OFF	OFF	OFF
Command	M1900	-N/A	-N/A	-N/A
Buffer mode	ON	ON	ON	ON
Dummy Read(PD_MODE)	ON	-N/A	-N/A	-N/A

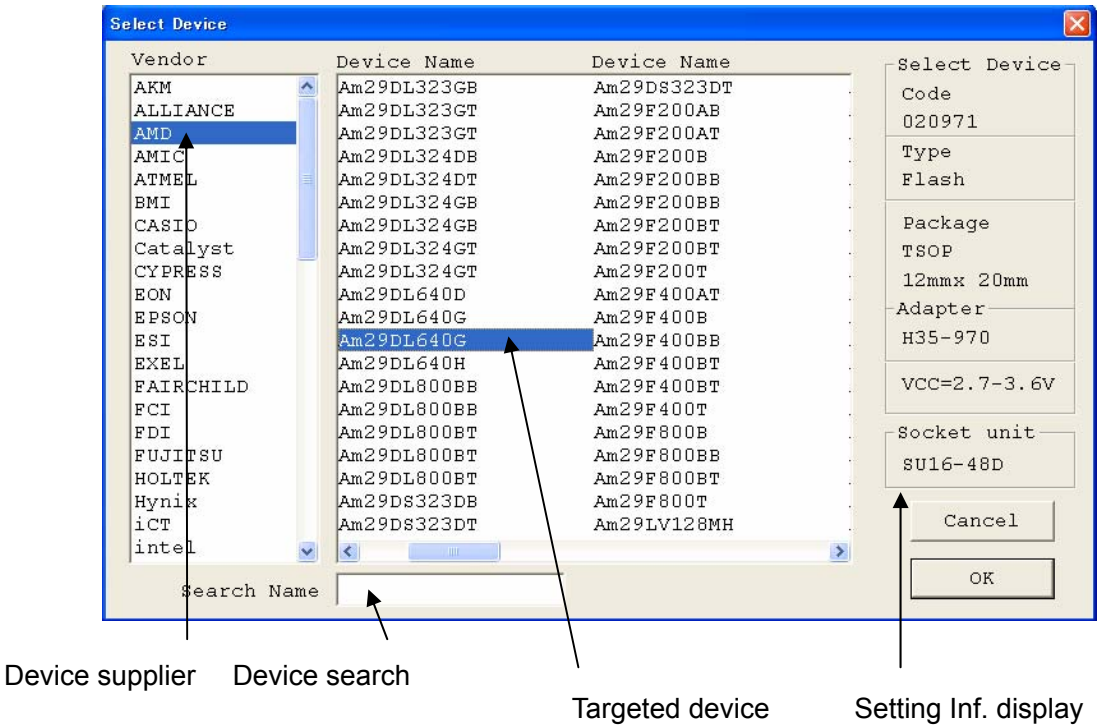
3. XPROM Device Setting and Project File

3.1 Device Select

When Select Device in the menu is clicked, Select Device display is shown up on the screen.

When Vendor(device supplier) is selected, parts number of devices are displayed.
Select a targeted device and click Ok

(1)Select Device Display



Device supplier Device search Targeted device Setting Inf. display

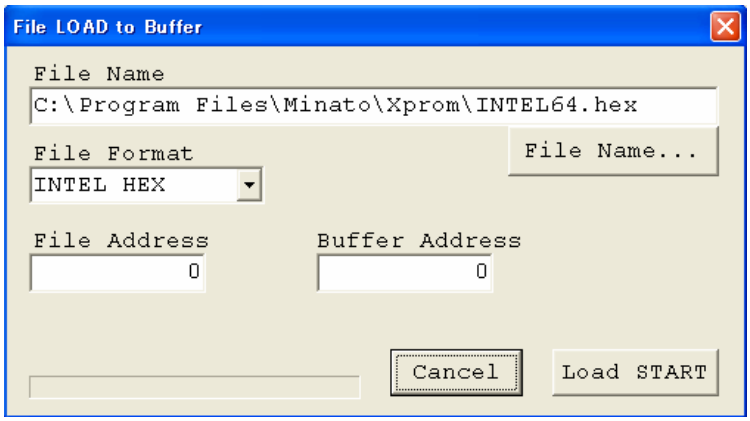
Information of selected device is indicated on the left side at Select Device.
Items are as follows;
Device code, device type, package type, size
Part number of proper adaptor
Part number of socket unit（for M1894,M1895,M1895/2,M1896,M1950）

OK: Selected device code is set in the programmer
Cancel：To cancel the change

3.2 Master Data File LOAD

(1) To LOAD data file that is stored in PC

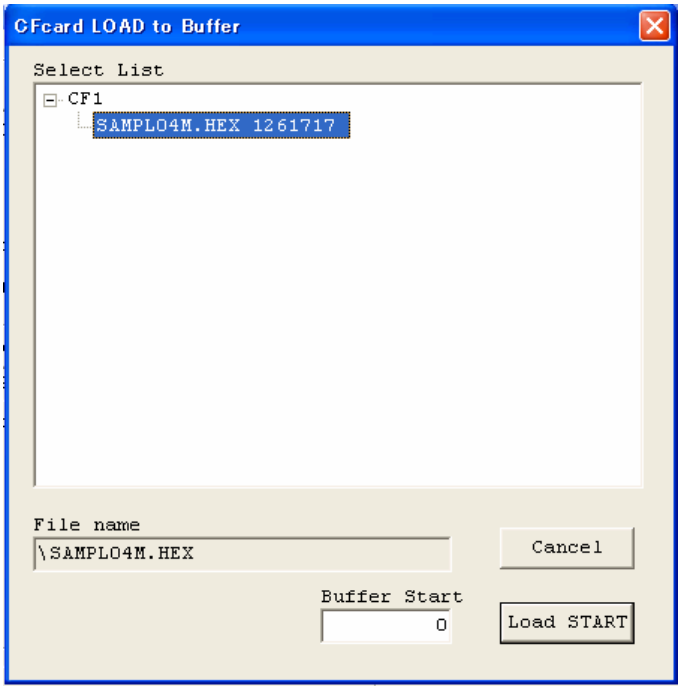
Select the data format of the targeted data to LOAD
After that, select master file to program onto device and click Load START
Then master file data is transferred to the programmer.



(2) To LOAD master file data stored in CF(compact flash card)
（This function is available only for model M1950）

M1950 allow you to LOAD master data from CF card.
Insert CF card into CF card slot and click File¥CFcard LOAD to Buffer on the menu.
Then select master file that is used for programming and click Load START.

Master File Data is transferred to the programmer.



There is no selection of data format.
Other than
file. Hex - INTEL.HEX
file. Mot- MOTOROLA
is shown as
- NO FORMAT LOAD

3.3 Confirmation test of programmer

After transferring master file,　please check check-sum.
Insert device into sockets on the programmer and execute CONT or PROG function.

Then data is programmed in a device.

When program is completed,　Pass/Fail LED is turned on.
Green LED ——　Pass
Red LED ———　Fail

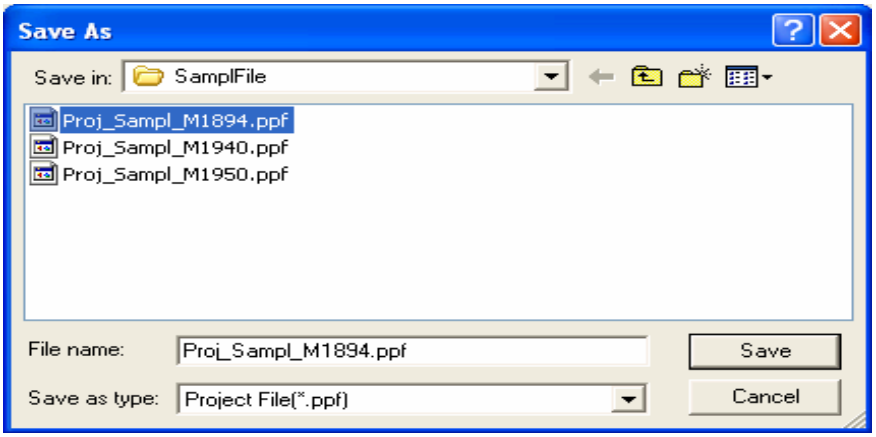
3.4 Project File

When setting of programming device, master data file for transfer are saved as Project File in XPROM, by opening Project File arrow you to automatically set these settings.

(1) Saving Project File
Current setting of XPROM can be stored as Project file.
In the menu, click Save　Project —— input file name to save ——click Save
Setting of programmer is saved as Project File.

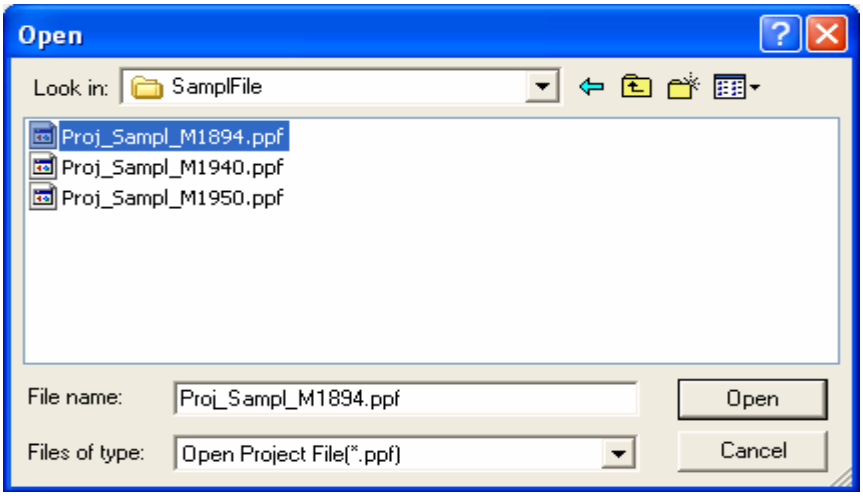
Setting items to be saved as Project File
1　Device part number
2　Master Data File Name
3　Programmer　Operation Mode
4　Device read address / Device program address
5　Setting of sector（block）Protect
6　Setting of Protect mode and Protect data
+ 1 and 2 is essential.
+ 3 to 6 are valid only when a device that has this function are selected.

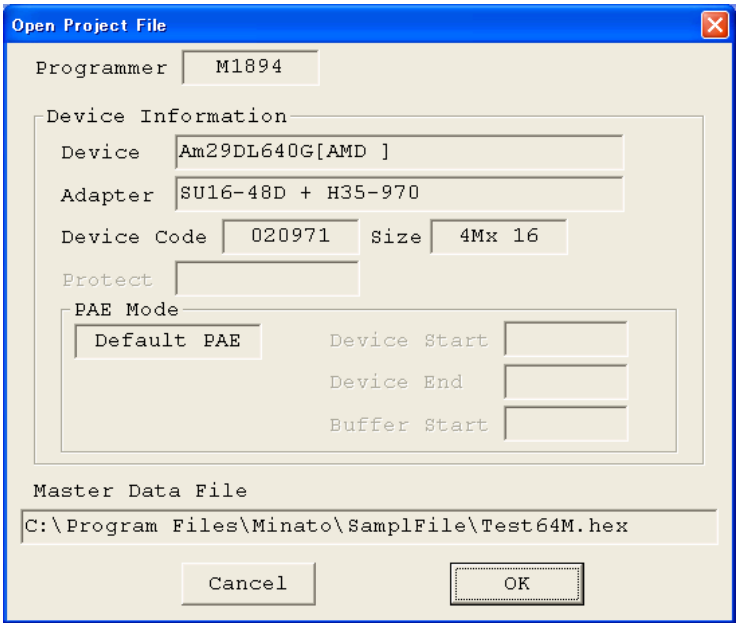
▪
Project file dialog



(2) Opening Project file
Click Load Project in the menu—— specify the file to OPEN—— Click OPEN.

・Project Open file dialog



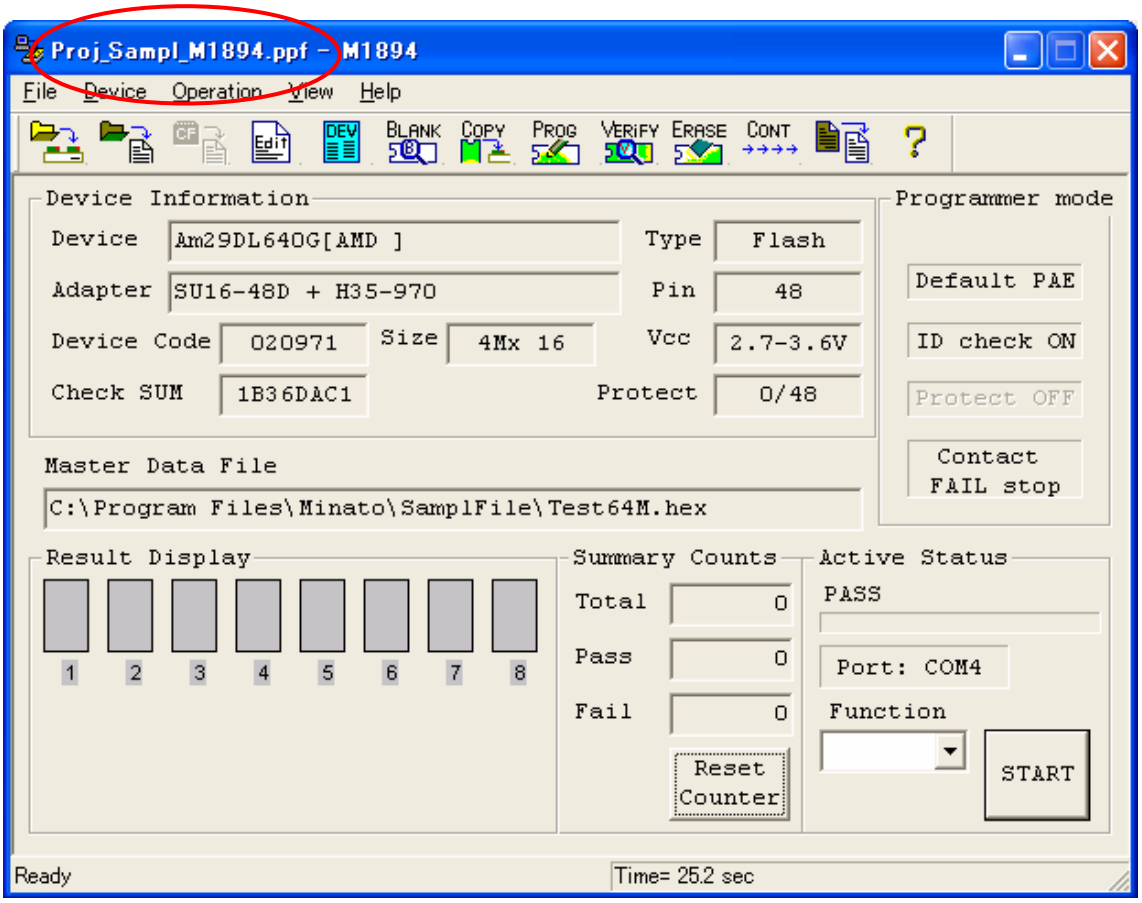


Check the contents and click OK.
Setting items of project file is reflected.

1 Device selection
2 Master data file LOAD
3 Setting Program Operation Mode
4 Setting of device read address/program address
5 Setting of sector (block)Protect
6 Setting of Protect mode and Protect data

After completing the setting of each item, Pass is displayed in Active Status of the main display.

(3) Display after opening a Project
Project file name is displayed in the title bar.



Programmer is automatically set. Insert a IC into socket and click START to execute Programming

One point advice:

When data is copied from master data to the buffer memory of programmer(when master data file is not available), small size dummy master file must be specified in Project File.

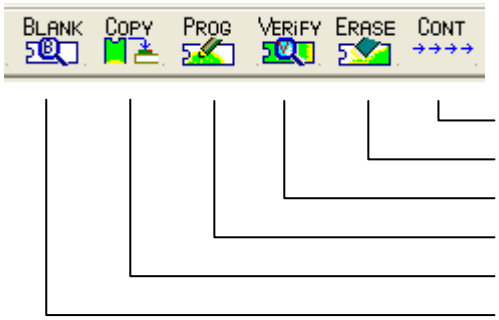
Dummy file can be created by selecting File SAVE from Buffer in the menu and specifying small size data.

Example: Save File name: Dummy01
Buffer Size:1000

4. Device Read / Programming

To Read / Program a device, command must be executed by each tool bar button. Or it can be set as Function and can be executed by clicking Start.

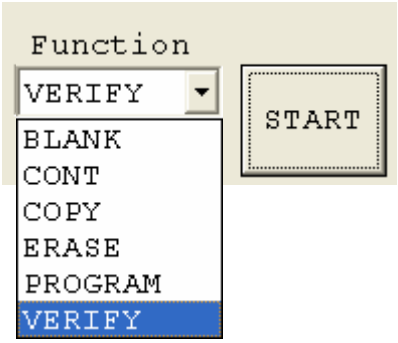
4.1 Too Bar Button



These button to execute each function

Continuous operation
CONT(BLANK-PROGRAM-VERIFY)
ERASE(To erase device)
VERIFY(To verify data in device and buffer)
PROGRAM(To program data in device)
COPY(To Load device data in the programmer)
BLANK(To check if the data in IC is erased)

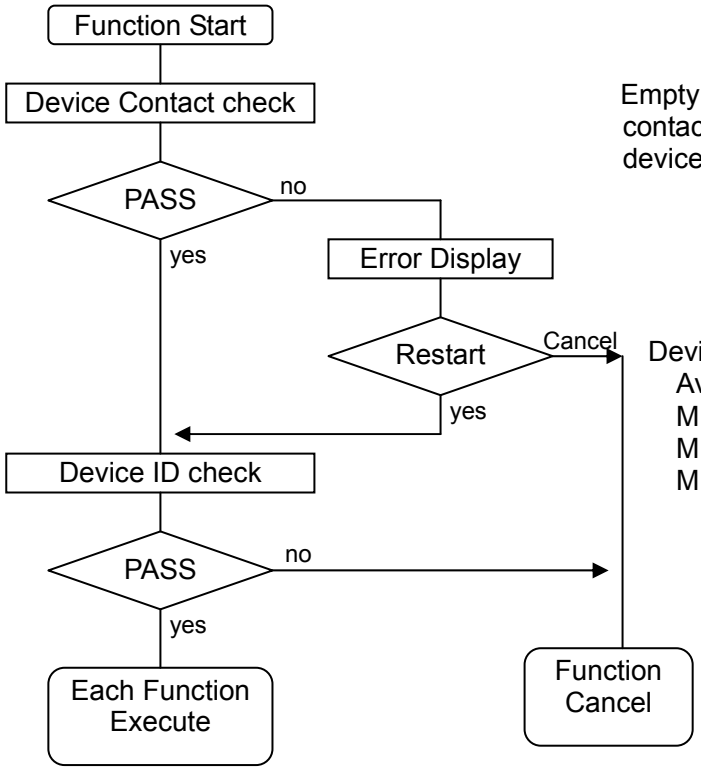
4.2 Function Select



1 Function select
2 After the selection, click Start to execute it.

4.3 Function Flow

Before executing Each Function, programmer checks the following.



Empty socket & contact check between device and socket

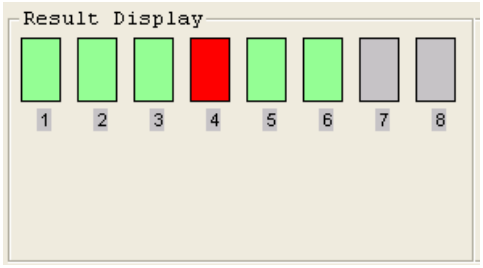
Device ID check Available at M1894, M1896 M1895, M1895/2 M1950

4.4 Device Contact Check

After a Function is started, programmer makes contact check between device and socket. When a socket is empty or bad contact is occurred, programmer stops and displays a error message. After removing IC of bad contact, click OK to move onto IC check.

Display of contact error

OK:ID – Execute a Function
Cancel: To cancel a Function

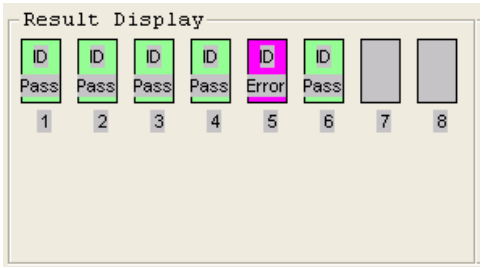


Contact check results display
Light green: Contact check Pass
Red :Contact check Fail
Gray: No socket

When Contact Stop mode is OFF, this is not displayed.

4.5 Device ID Check

After contact check is completed, programmer makes ID check.
ID check is to check whether device code set on the programmer match to actual device on sockets. When no ID error is found, a Function is executed.
When ID check error is occurred, programmer stops. Then remove device from the socket and execute a function.

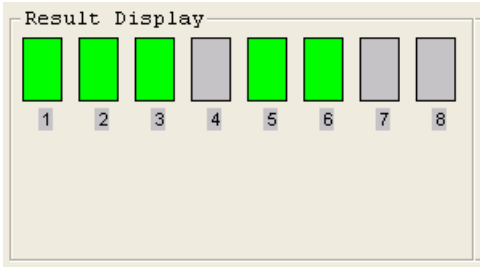


ID check results display
Light green: Contact check Pass
Red : ID check FAIL
Gray: Empty socket

Device ID Check is valid on M1894、M1896M1895、M1895/2M1950.

4.6 Function results

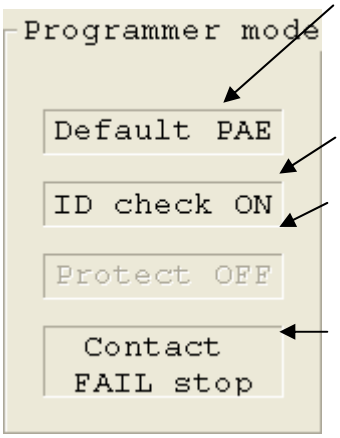
After a function is completed, results are indicated.



Green: Function PASS
Red :Function FAIL
Gray :Empty Socket

Remarks: This result is not applicable for contact check and ID check.

4.7 Programmer mode



Indication of address mode status of device read/write(R/W)
- Default PAE :R/W of every (data) address of a device
- Single PAE :R/W specified address
- Multi PAE :R/W data where data is available

Indication of device ID mode status

Indication of device protect mode status
- Protect OFF(R/W data address of a device)
- UnProt/Prot(R/W data and protect address of a device)
- Protect ON(R/W protect address of a device)

Indication of contact check mode status

Indication of contact mode status shows whether programmer is automatically stopped or not when contact check is occurred. Contact check is executed before a function such as BLANK,COPY,PROGRAM,VERIFY,ERASE,CONT is executed.

4.8 Device address change

Select Menu-Device-Device Address

This function is to specify the address area of deice read / write.

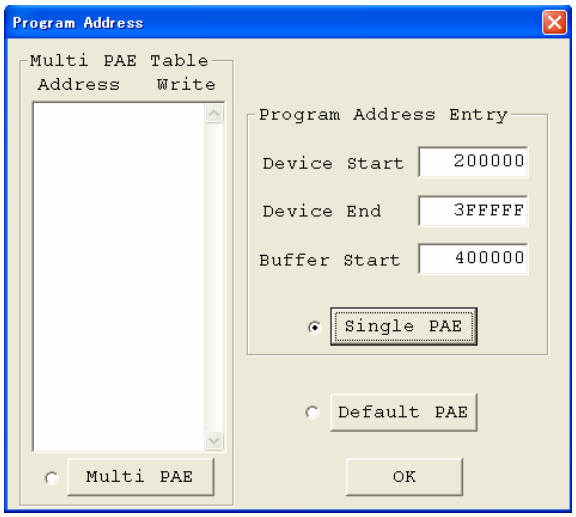
(1) Default PAE

R/W of every (data) address of a device

When a device is set, this mode is set as a default.

(2) Single PAE

Read/Write (R/W) specified address that is set by this Window.



Device Start :R/W start address of a device
The last two digits of the start address must be 00.

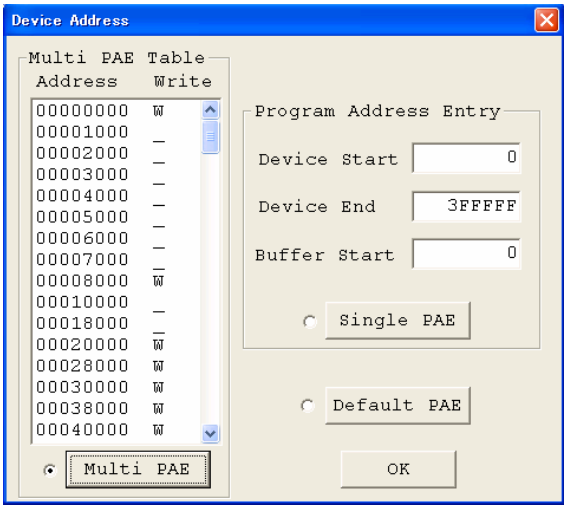
Device End :R/W end address of a device
The last two digits of the end address must be FF.

Buffer Start : Buffer address of programmer for master data
The last two digits of the buffer address should be 00.

When Single PA button is clicked, setting is completed.

(3) Multi PAE (Multiple program address enabled)

Programming occurs only to the block where data is available in the master file. Programming does not occurs to the block where data is not available. A programmer scans multiple blocks to determine the blocks to program and to be skipped.



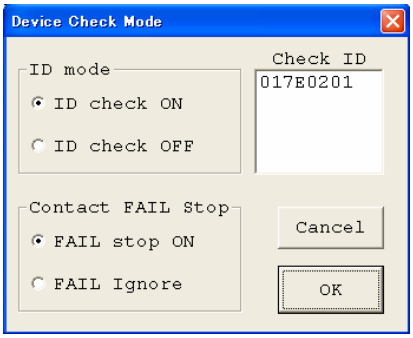
When Multi PAE button is clicked, programmer scan the data from buffer memory address and indicates the results in the multi PAE Window.

xxxxxxx --- Blocks to be skipped

xxxxxxx W Blocks to be programmed

4.9 ID Check On/Off

When menu – Device - ID Check mode is selected, the following dialog is displayed.
You can select whether programmer applies ID check or not for device function.
(This function is not applicable for a programmer which does not support device ID check)

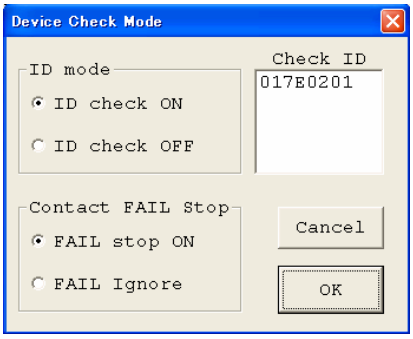


ID check ON : ID check is valid

ID check OFF : ID check is invalid

4.10 Contact Fail Stop/ Ignore

When menu – Device – Contact Stop is selected, the following dialog is displayed.
Before device function is executed, contact check is carried out.
Contact error occurs if there is any socket is empty or contact pin has bad contact. You can select whether you want to stop the device function or not in this dialog when contact fail occurs.



FAIL stop ON : Stop the device function when error occurs

FAIL Ignore : Ignore contact error

4.11 Protect Mode setting

(applicable programmer:M1894,M1895,M1895/2,M1896,M1940,M1950)

Some devices have sector or block protect function to protect programmed data.

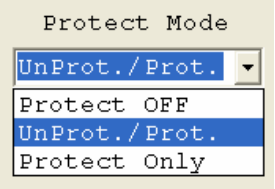
In order to enable protect function by a programmer, you must follow the following setting.

(1) Select a targeting device

When device is selected, protect function is cleared out as default setting.

(2) Execute Edit Protect by Menu – Device – Protect mode

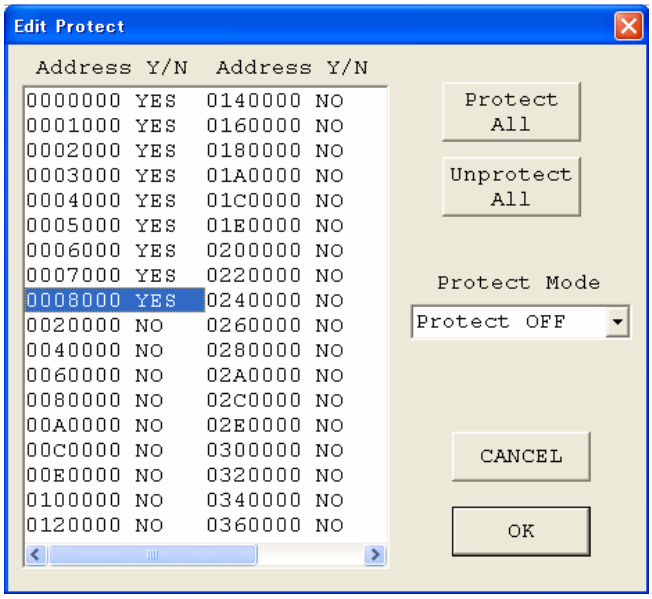
(3) Select Protect mode



Protect OFF : do not access to protect area
UnProt/Prot :access to both data area and protect area
Protect OFF : access only to protect area

(4) Edit protect data

Click address display area and set Yes or No for protect



Address : Protect address
(According to the spec. of a device)
NO(No protect)

Button Protect All : Yes to all
Unprotect All: No to all

Cancel : No change
OK: To set the setting

(5) By clicking OK, protect mode and protect data is set.

5. Data Edit

There are two kinds of data edit.

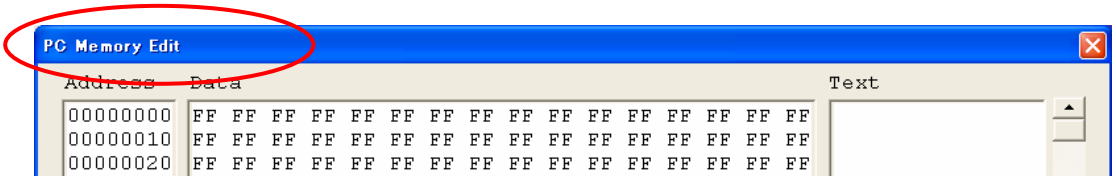
(1) To edit buffer memory of a Programmer
Execute by Edit Buffer command in the menu
In this case, the title of the dialog is Programmer Buffer Edit

(2) To edit virtual memory in a PC (memory size is the same as IC memory size)
Execute by menu – File - File Convert - Memory Edit button
In this case, the title of the dialog is PC Memory Edit

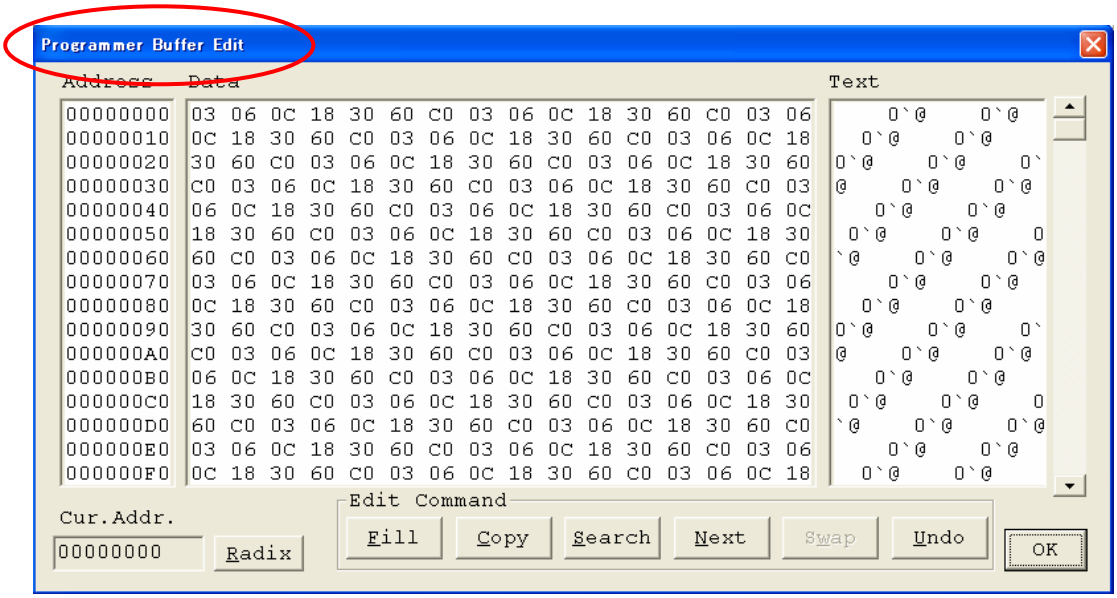
As data edit is accomplished inside of PC, process can be fast.
To program edited data, please send it to the buffer of a programmer by clicking Send Programmer button.

5.1 Edit Display

PC Memory Edit



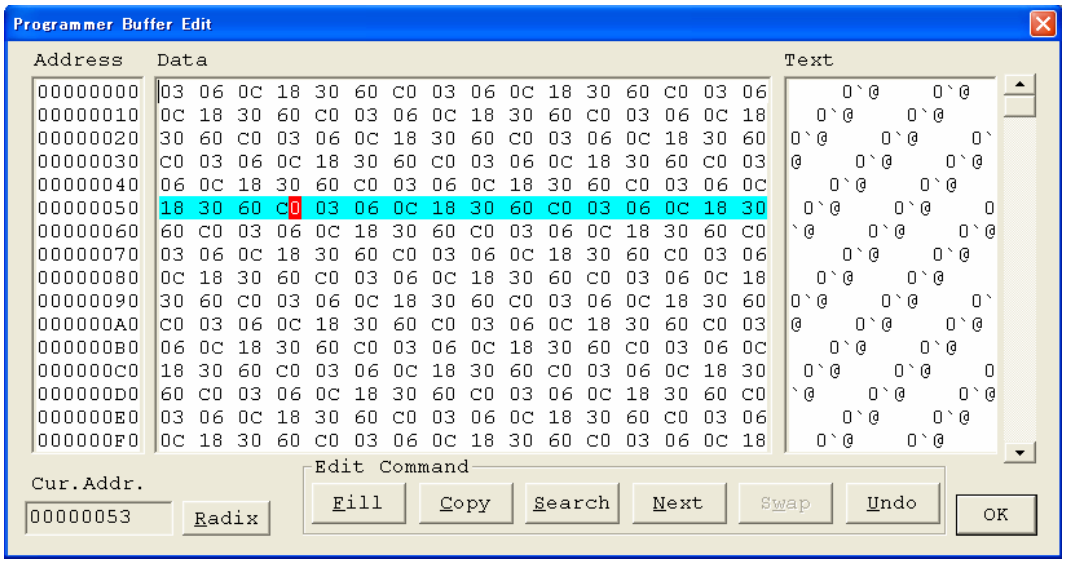
Programmer Buffer Edit



Display	Address	:Address display	
	Data	:Data display(Hex decimal)	Text: test display
	Cur .Addr.	: Current address display	
Button	Radix	:Change between decimal and hex address	
	Fill	:Clear specified area	
	Copy	:Copy data of specified area to other address area	
	Search	:Data search	
	Next	: More Search	
	Swap	:Data swap of Byte、Word、Long data	
	Undo	:To undo the modification of data indicate in blue color	

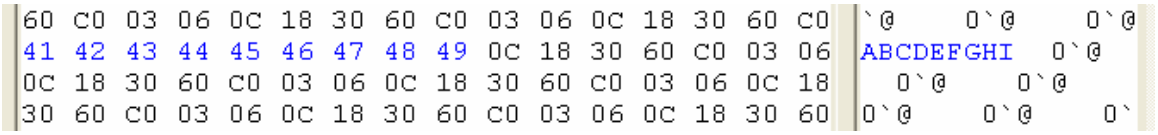
5.2 Change of Address and Data

To change address and data, move and click the cursor to the area to change.
Mover the red cursor the area to change



Arrow key : To change the target for modification
Data input key : Input modified data. Input data is limited according to function of each area.
Address area : Hex input
Data area : Hex input
Text area :ASCII text input

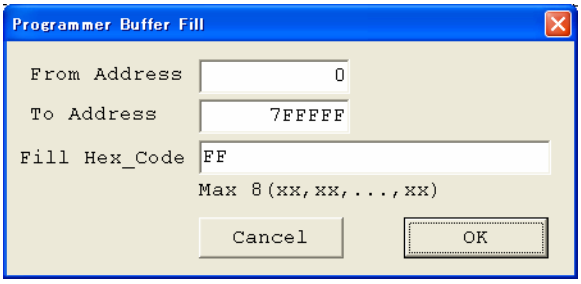
Data in blue text : Modified data is indicated in blue.



Remarks: The modification of address input is valid when it is hex value. If it is decimal value, it can not be changed.

5.3 Fill Command

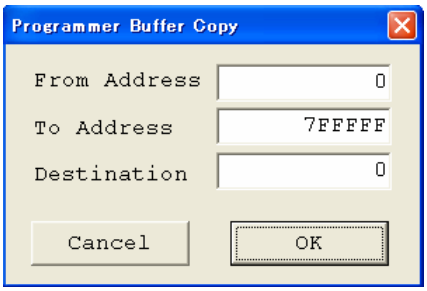
Programmer Buffer Fill: Fill(clear) the buffer of programmer by specified data
PC Memory Fill :Fill(clear) the virtual memory of PC by specified data.



The area of From – To is filled by Hex code.
Clear by Fill Hex Code
Fill data can be specified up to 8 bytes

5.4 Copy Command

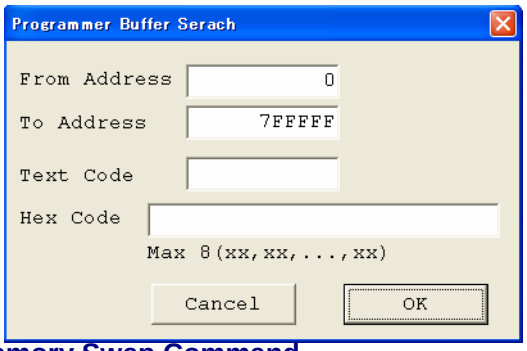
Programmer Buffer Copy: Data in specified address of programmer buffer is copied to other address.
PC Memory Copy :Data in specified address of virtual memory of PC is copied to other address.



Data specified by From – To is copied in destination address.

5.5 Search & Next Command

Programmer Buffer Search: Search data inside of programmer
PC Memory Search: Search data inside of virtual memory of PC

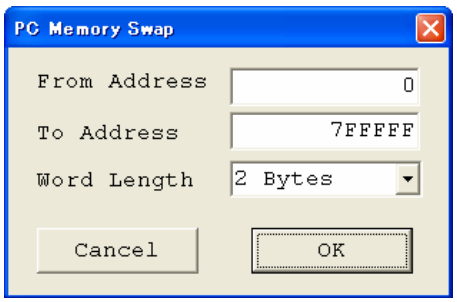


Search: Data search
Search Text or Hex Code data from 0 address

Next: More Search
To do more Search

5.6 Memory Swap Command

PC Memory Swap: Swap data in the virtual memory of PC in Byte, Word, Long.



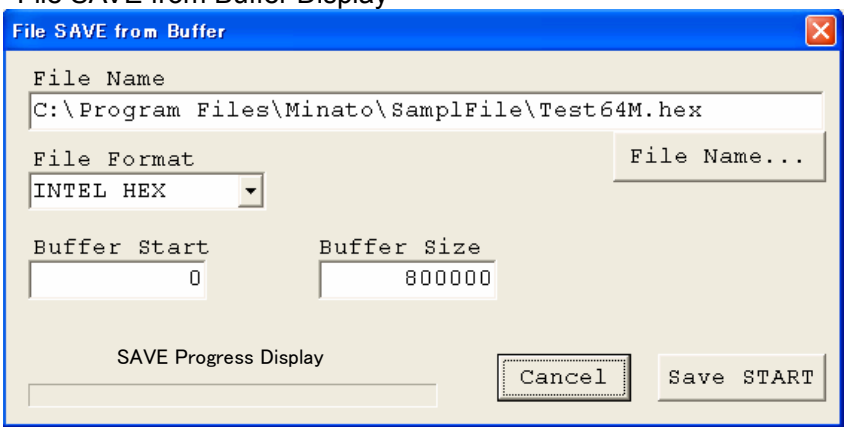
Swap data of From –To address in specified length
Word length=2 Bytes — Byte Swap
4 Bytes – Word(16Bit) Swap
8 Bytes – Long(32Bit) Swap

Remarks: Swap on Programmer is not supported.

6. Buffer Data Save

When copied data from master to programmer buffer is saved in PC, select File SAVE from Buffer in the menu.

File SAVE from Buffer Display



File Name... :Set and select file name
File Format :Select file format to save
*INTEL HEX
*MOTOROLA
*NO FORMAT（Binary）
Buffer Start :Save start address(Default is address0)
Buffer Size :Save size(Default is the size of selected device)
Save START :Start to Save

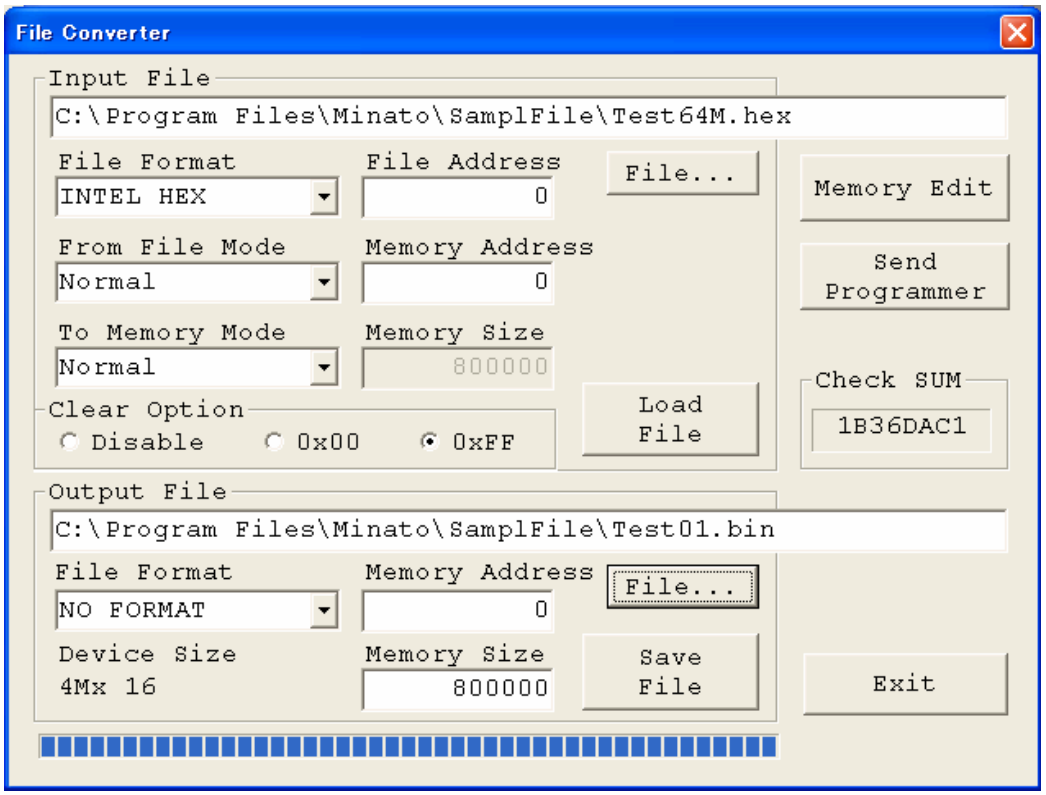
Remarks: Since M1893, M1930, M1931, M1940 use RS232C to save data, it takes some time. Please refer to chapter 10 for the transfer time of each programmer.

7. File Converter

File converter is editing tool to modify data in the virtual memory of PC
Size of virtual memory is the same size as selected device. Several files can be merged into one file. The sequence of Even/Odd of 8 bit data can be swapped. Modified data can be transferred to a programmer.

To execute click File - File Convert in menu

7.1 File Converter Display



Explanation of button

Memory Edit : To execute memory edit dialog

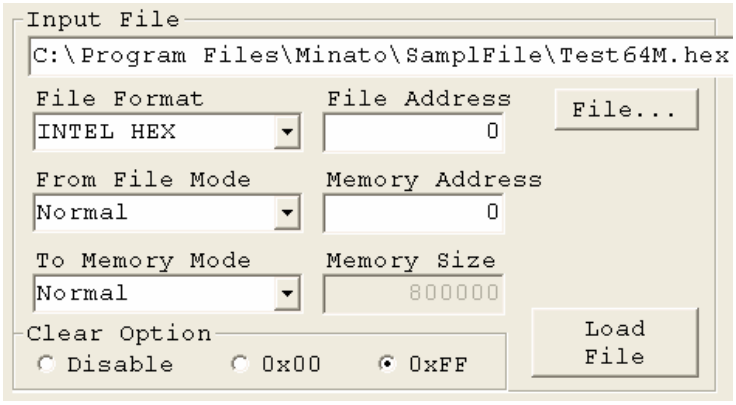
- Fill :to fill specified data
- Copy :To copy data of specified area to other address
- Search :Data Search
- Next :More Search
- Swap :Byte、Word、Long data Swap
- Undo :To undo data modification indicated in blue

Send Programmer :Transfer modified data to programmer
No Format (Binary) transfer shortens the transfer time.
Exit :end

Input File :Input file information area
File… :Select and input file name which is loaded from PC
Load File :To start file load

Output File :Output file information area
File… :Select and input file name which is saved in PC
Load Save: to start file save

7.2 Set Input File and File Conversion Mode

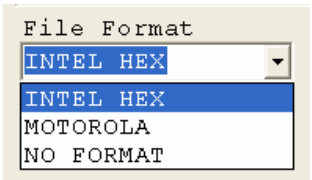


File name display

File…File name selection/input

Load File : To start file load

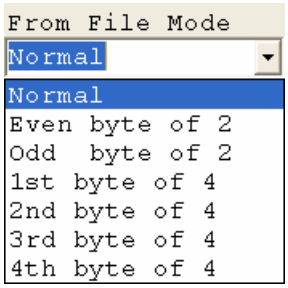
(1) File Format : Specify file format



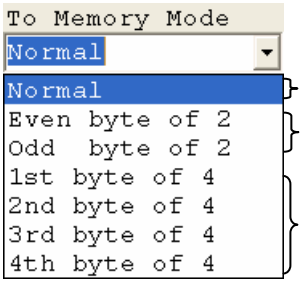
INTEL HEX
MOOROLA
NO FORMAT(Binary)

(2) File convert mode (specify Input output byte conversion)

・From File Mode



・To Memory Mode



Normal: no conversion
1 byte out of 2 byte (Even/Odd)read

1 byte out of 4 byte(#1-#4)read

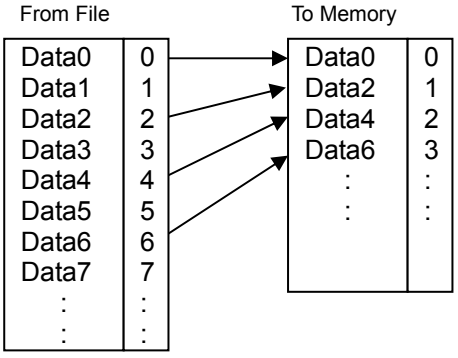
(3) Clear Option

To specify whether virtual memory is cleared or not when file is read.

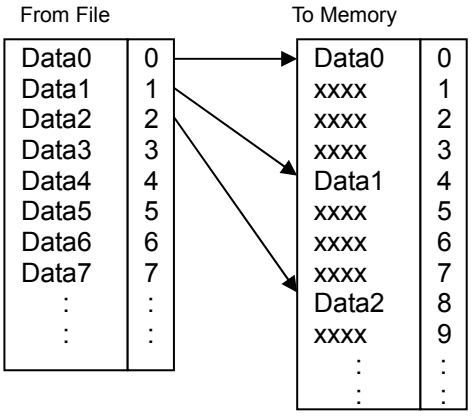
Disable :No to clear(read file is overwritten)
0x00 : Clear to 0
0xFF : Clear to 0xFF

- example of Mode usage -

Even byte of 2 → Normal conversion

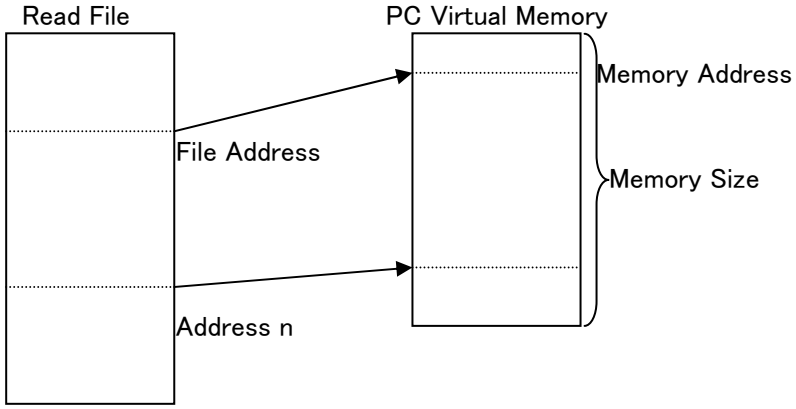


Normal → 1st byte of 4 & Disable set conversion

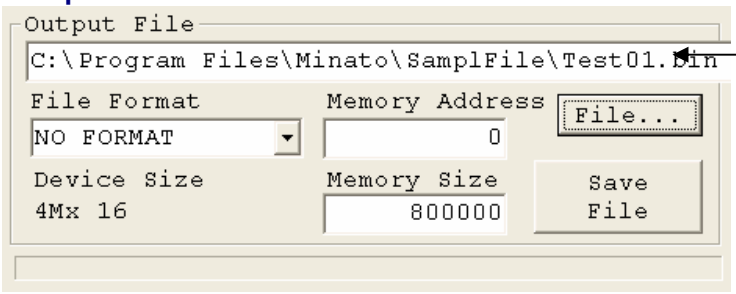


(4) To specify offset address of File Load
*File Address :To specify start address to read
*Memory Address :To specify start address of PC virtual memory in order to save data
*Memory Size :To display virtual memory size

The comparison of specified Address and Memory



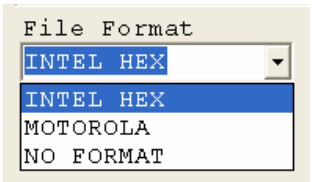
7.3 Set Output File



File…:Select file name/input

Save File: To start file save

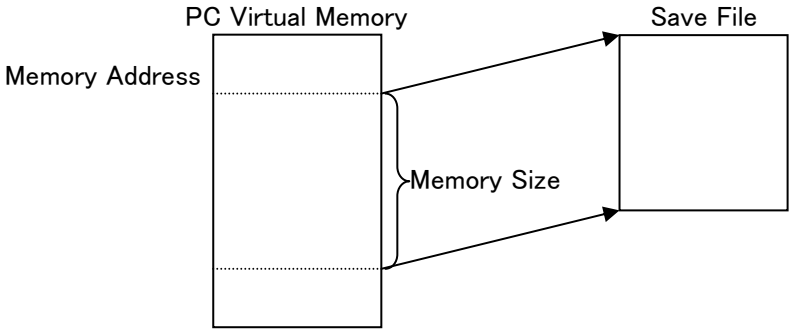
(1) File Format: Specify file format



INTEL HEX
MOOROLA
NO FORMAT(Binary)

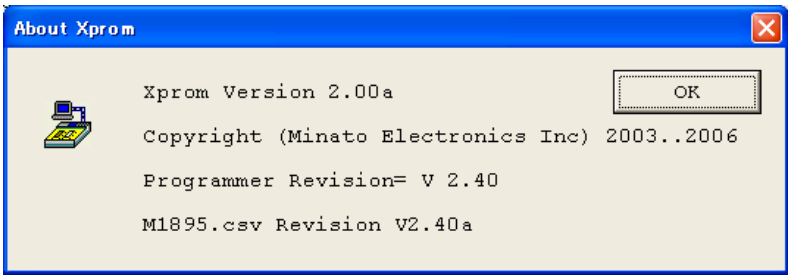
(2) Setting of file save
Memory Address :To specify save start address
Memory Size :To specify memory size to save

The comparison of specified Address and memory



8. Version Display

Click About Xprom for Help menu



Contents of display is as follows;

XPROM Version : version of XPROM
Programmer Revision :version of programmer in use
M1895.csv Revision : Device data base and it's revision in use

The relation of model of programmer and device data base(File.csv)

Programmer	CSV file name	
M1930	M1930.csv	Vendor.csv
M1893	M1931.csv	
M1931		
M1940	M1940.csv	
M1894	M1895.csv	
M1895		
M1895/2		
M1896		
M1950	M1950.csv	

Each CSV file is used to set device in XPROM.
The latest csv file can be downloaded from Minato HP.
（If the version of the programmer is older than the revision of csv file, some device on listed in csv file can not be selected. Please ask contact to our distributor for version up of the programmer

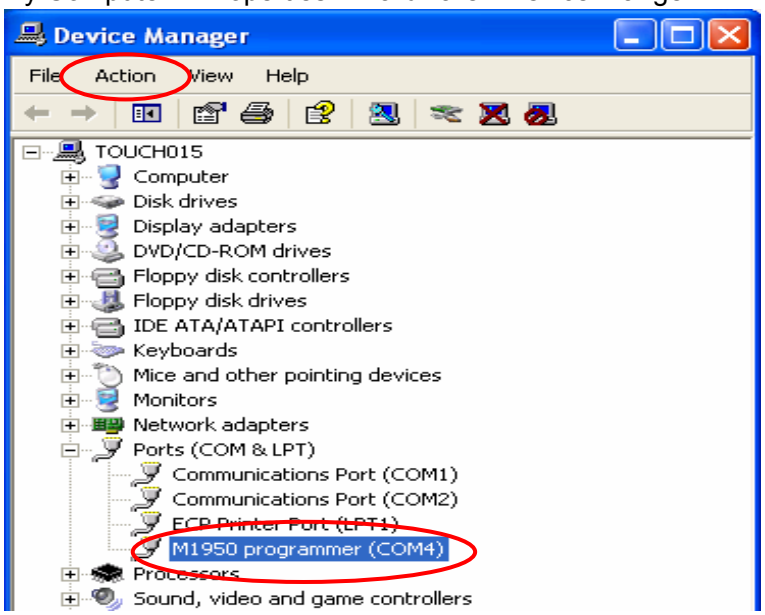
http://www.minato.co.jp/products/programmer/xprom_e.html

9. How to Change USB Port

USB port is automatically assigned by PC. It you feel uncomfortable with the automatically set port, you can change it by device manager.

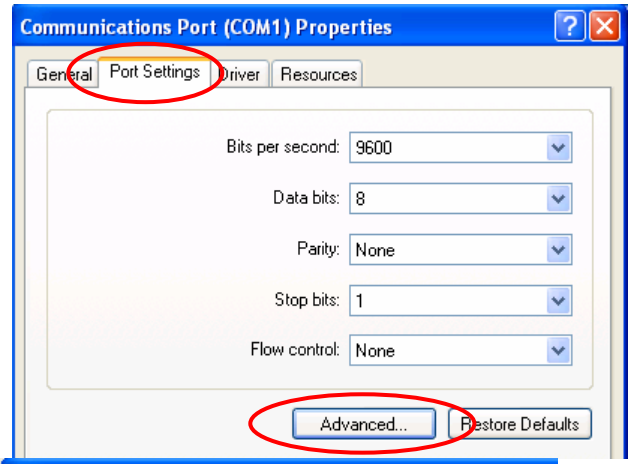
Open the following folder by explore.

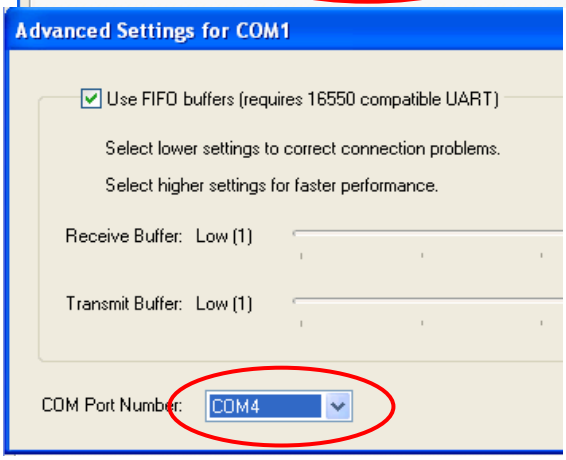
My Computer – Properties – Hardware - Device Manger



Click current setting of M1950Programmer(COM4)

Action – Properties - Port Settings - Advance…





Change port #

10. Data Transfer Time per Programmer

Data transfer time depends on the performance of PC. Please use this data only as a reference.

Reference time of data Load

Device Capacity	Buffer Size	Data Format	Programmer MODEL			
			M1893	M1940	M1894	M1850
			Parallel	Parallel	USB1.2	USB2.0
256Kbit	0x8000	.BIN	3s	2s	2s	2s
		.HEX	9s	3s	2s	2s
1Mbit	0x20000	.BIN	9s	3s	2s	2s
		.HEX	33s	7s	3s	2s
8Mbit	0x100000	.BIN	1’10s	18s	5s	3s
		.HEX	4’10s	48s	15s	8s
64Mbit	0x800000	.BIN	8’30s	2’30s	29s	16s
		.HEX	34’00s	6’30s	1’50s	51s
512Mbit	0x4000000	.BIN	---	19’00s	3’40s	2’00s
		.HEX	---	51’00s	14’00s	6’40s

Reference time of data Save

Device Capacity	Buffer Size	Data Format	Programmer MODEL			
			M1893	M1940	M1894	M1850
			RS232C	RS232C	USB1.2	USB2.0
256Kbit	0x8000	.BIN	20s	4s	2s	2s
		.HEX	47s	10s	3s	3s
1Mbit	0x20000	.BIN	1’20s	14s	2s	2s
		.HEX	3’10s	37s	7s	5s
8Mbit	0x100000	.BIN	10’00s	1’50s	10s	6s
		.HEX	24’30s	4’50s	49s	27s
64Mbit	0x800000	.BIN	---	13’40s	1’10s	35s
		.HEX	---	38’00s	6’30s	3’30s
512Mbit	0x4000000	.BIN	---	---	8’50s	4’30s
		.HEX	---	---	51’00s	28’00s

Gray in color takes more ten minutes
Transfer format is as follows: HEX = INTEL.HEX
BIN=NO FORMAT(Binary)

Port used for Load and Save in each programmer

	LOAD	SAVE
M1893,(M1930,M1931	Parallel	RS232C(19200bps)
M1940	Parallel	RS232C(115200bps)
M1894,(M1895,M1895/2、M1896)	USB1.2	USB1.2
M1950	USB2.0	USB2.0