

# MODEL-1940

## GANG PROGRAMMER OPERATION MANUAL



# For Safe Operation



---

## Precaution for Safety

This operation manual includes safety precautions so that you can operate M1940 safely and correctly. For safe and correct operation of M1940 and also to prevent you, other operators or workers from injury and property from damage, the following pictographs are used to explain these safety precautions.

Before reading this manual, fully understand these pictographs and the meanings. Keep this manual at hand and refer to its as occasion arises.

### Explanation of Pictographs

 <b>WARNING</b>	Indicates a potential hazardous situation in which the operator would be killed or seriously injured unless this precaution is observed.
 <b>CAUTION</b>	Indicates a potential situation in which the operator would be injured or property would be damaged unless this precaution is observed.



## WARNING



COMPULSION

When operating this unit, be sure to follow warnings and cautionary instructions given by Minato Electronics Inc.



Do Not  
Disassemble

Do not disassemble or modify this unit. A fire may start or you may get an electric shock.



Unplug  
Power Cord

When finding a smoke, feeling an abnormal smell or hearing an abnormal sound pull out the power plug immediately from the AC plug receptacle.

If Keep operating, a fire may start or you may get an electric shock owing to short-circuit.

Consult with Minato or Minato distributor.



Unplug  
Power Cord

If dropped this unit or given a strong shock to the unit, pull out the power plug immediately from the AC plug receptacle.

If keep operating, a fire may start or you may get an electric shock owing to short-circuit.

Consult with Minato or Minato distributor.



Unplug  
Power Cord

If any liquid or foreign matter enters this unit, pull out the power plug immediately from the AC plug receptacle.

If keep operating, a fire may start or you may get an electric shock owing to short-circuit.

Consult with Minato or Minato distributor.



CAUTION



Compulsion

An operator who has fully understood the operation manual of M1940 shall operate this unit.

Miss operation may damage this unit and other devices.



Compulsion

Before touching this unit, be sure to touch a nearby large metal and remove static electricity from your body so that this unit is not damaged by static electricity.

Static electricity may damage this unit and other devices.



Compulsion

Clean the unit surfaces, the device socket and the air filter.

Operation without removing dusts may cause a fire.

Clean them periodically.

# CONTENT

---

<b>FOR SAFE OPERATION</b> .....	<b>I</b>
PRECAUTION FOR SAFETY .....	I
Explanation of Pictographs .....	i
<b>CONTENT</b> .....	<b>IV</b>
<b>BEFORE OPERATION</b> .....	<b>1</b>
FOR USERS .....	1
CONFIRMATION OF ACCESSORIES .....	1
M1940 BUFFER MEMORY .....	2
NAMES OF PARTS AND FUNCTION .....	3
Display Panel.....	4
Key Switch.....	5
Device Socket.....	8
Rear Panel .....	9
<b>OVERVIEW</b> .....	<b>10</b>
PRODUCT OVERVIEW.....	10
SPECIFICATIONS .....	11
<b>BASIC OPERATION</b> .....	<b>12</b>
INSTALLATION AND TURNING POWER ON .....	13
<b>DEVICE</b> TO SELECT APPLICABLE DEVICES.....	14
<b>COPY</b> TO READ DATA FROM THE MASTER DEVICE .....	16
<b>ERASE</b> TO ERASE DATA PROGRAMMED IN A DEVICE.....	18
<b>BLANK</b> TO CHECK THE ERASED STATE OF A DEVICE.....	20
<b>VERIFY</b> TO VERIFY DEVICE DATA .....	22
<b>PROGRAM</b> TO WRITE DATA IN A DEVICE .....	24
<b>CONTINUOUS</b> CONTINUOUS OPERATION .....	26
<b>ADVANCE OPERATION</b> .....	<b>29</b>
PAE MODE    SETTING OF OPERATION RANGE.....	30
READ VCC    CHANGE OF SUPPLY VOLTAGE DURING OPERATION .....	36
VERIFY PATTERN SELECTION OF VERIFY PATTERN.....	38
REPEAT MODE   FUNCTION OF REPETITIVE EXECUTION.....	40
PROTECT MODE   DEVICE PROTECT INFORMATION .....	41
PROTECT SETTING CHANGE OF PROTECT INFORMATION .....	43
CHECK SUM    CALCULATION OF CHECKSUM AND EXCLUSIVE OR .....	44
BUFFER INIT   BUFFER MEMORY INITIALIZATION.....	46
BUFFER DUMP/EDIT   DISPLAY AND EDIT OF BUFFER DATA.....	48
BYTE SWAP    BUFFER MEMORY BYTE SWAP .....	50
WORD SWAP    BUFFER MEMORY WORD SWAP .....	51
DEVICE CHECK/ BUZZER/ LED SETTING OF DEVICE-CHECK, BUZZER AND LED .....	52
SELFCHECK SETTING .....	54
SYSTEM UPDATE    FIRMWARE VERSION UPGRADE.....	56

<b>CONNECTION TO EXTERNAL EQUIPMENT .....</b>	<b>57</b>
DATA TRANSFER.....	57
Data format Transfer format.....	58
Data format Operation Procedures.....	59
Setting interface .....	60
Interface Condition Setting .....	61
DATA TRANSFER COMMANDS.....	62
Data Transfer/ Protect Information Command Operation Procedures .....	63
Data Serial IN Command of setting and execution ( Data Transfer ) .....	64
Data Serial OUT Command of setting and execution ( Data Transfer ) .....	65
Data Parallel IN command of setting & execution ( Data Transfer ) .....	66
Protect Serial IN Command of setting and execution ( Protect inf. transfer ) .....	67
Protect Serial OUT Command of setting and execution ( Protect inf. transfer ) .....	68
Protect Parallel IN Command of setting and execution ( Protect inf. transfer ) .....	69
<b>CONTROLLING M1940 IN REMOTE .....</b>	<b>70</b>
Remote Mode Condition setting.....	71
Special Characters.....	73
Remote Mode Start up.....	74
Remote Mode Command Instruction Format .....	76
Remote mode command format .....	76
How to omit a parameter.....	76
Codes used in this text (Remote Mode) .....	77
Execution result display .....	78
<b>REMOTE MODE COMMANDS .....</b>	<b>79</b>
List of Commands Used in the Remote Mode.....	79
RMD Remote Mode Condition Setting .....	80
E, BY Remote Mode End.....	81
Ctrl+D Break Command.....	82
BREAK Code Break Command .....	82
H Help Message Listing .....	83
N, DV Device Selection Command .....	84
OP, CP COPY Mode Execution.....	85
Z, ER ERASE Mode Execution .....	86
B, BL BLANK Mode Execution .....	87
W, PG PROGRAM Mode Execution .....	88
V, VF VERIFY Mode Execution .....	89
OT, CT CONTINUOUS Mode Execution.....	90
CK Precheck Command.....	91
MD, PAE Operation of address Range Setting Command .....	92
MD, PAE Command to set targeted address area ( Expanded / Multi PAE ) .....	94
S, DF Data Transfer Format Setting .....	96
BS Buffer Memory Size Output.....	98
REV Firmware version output.....	98
L, LS Buffer Memory Data Display .....	99
BO, CS Checksum Display ( 4-Digit ) .....	100
BO8, CS8 Checksum Display ( 8 Digit ) .....	101
F, INI Buffer Memory Initialization.....	102
SCH Data Search Command ( Matching ) .....	103
UNS Data Search Command ( Mismatching ) .....	104

T	Data Transfer Command .....	105
P, PL, WD	Serial I/F Data Output.....	106
RL	Serial I/F Data Input.....	108
RD	Serial I/F Data Input.....	109
RH	Parallel I/F Data Input .....	110
PCH	Protection Mode Change .....	111
WP	Protection Data Serial I/F Out put.....	112
RP	Protection Data Serial I/F Output .....	113
RPP	Protection Data Parallel I/F Input.....	114
<b>LIST OF ERROR MESSAGES.....</b>		<b>115</b>
	Errors at M1940 Self-check .....	115
	Errors during operation.....	116
	Remote Mode Errors.....	117
<b>APPENDIX .....</b>		<b>118</b>
	PIN Arrangement of RS232C Connector .....	118
	PIN Arrangement of Parallel Connector .....	119
	Contacting address of HQ of Minato Electronics Inc.....	121

# Before Operation

---

## For Users

We thank you for your purchase of **MODEL-I940**.

The warranty period of this unit is one year after delivery to you. Even during the warranty period, we exclude damages as a result of natural disaster, miss-operation, modification or changes of the unit by user and wear of the socket adapter from the warranty.

Also, please note that we are not obliged to refund for damaged P-ROM when this unit gets out of order.

If anything is unclear to you, please contact to Minato or Minato distributor in your region.

## Confirmation of Accessories

When unpacking the package received from us, check if the following items are enclosed.

■ M1940 main unit	1
■ Power Code	1
■ Power adapter	1
■ Operation manual	1
■ Device Code list	1

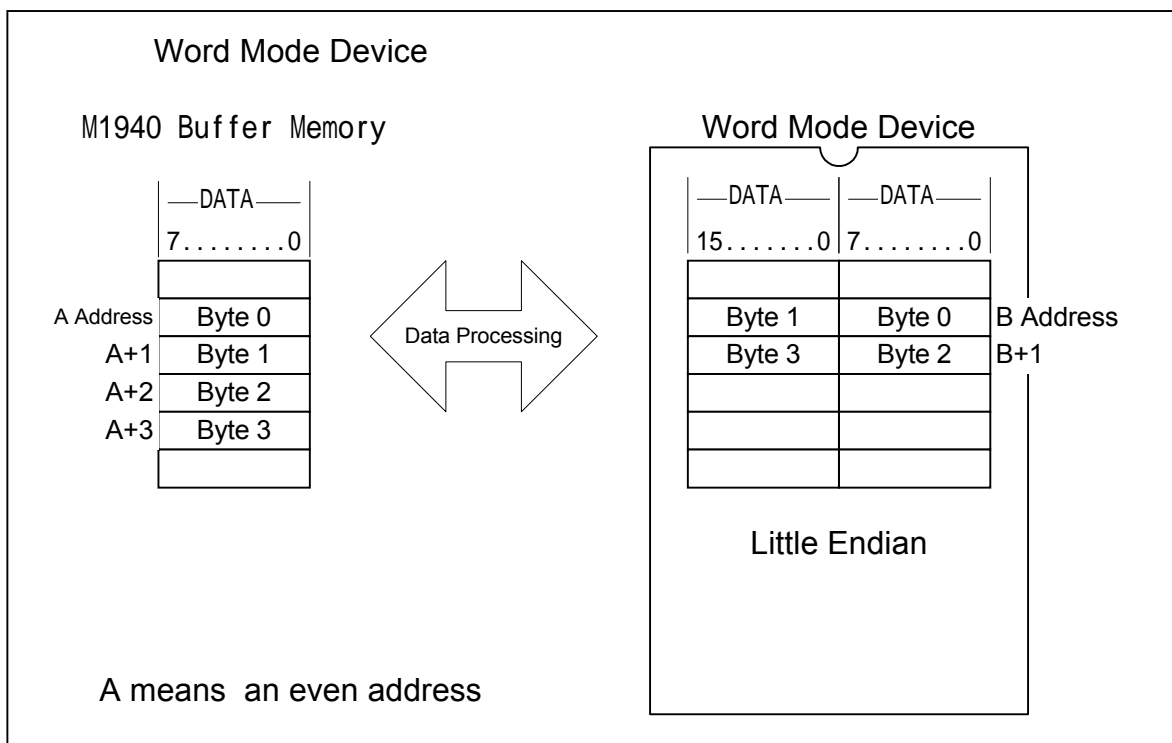
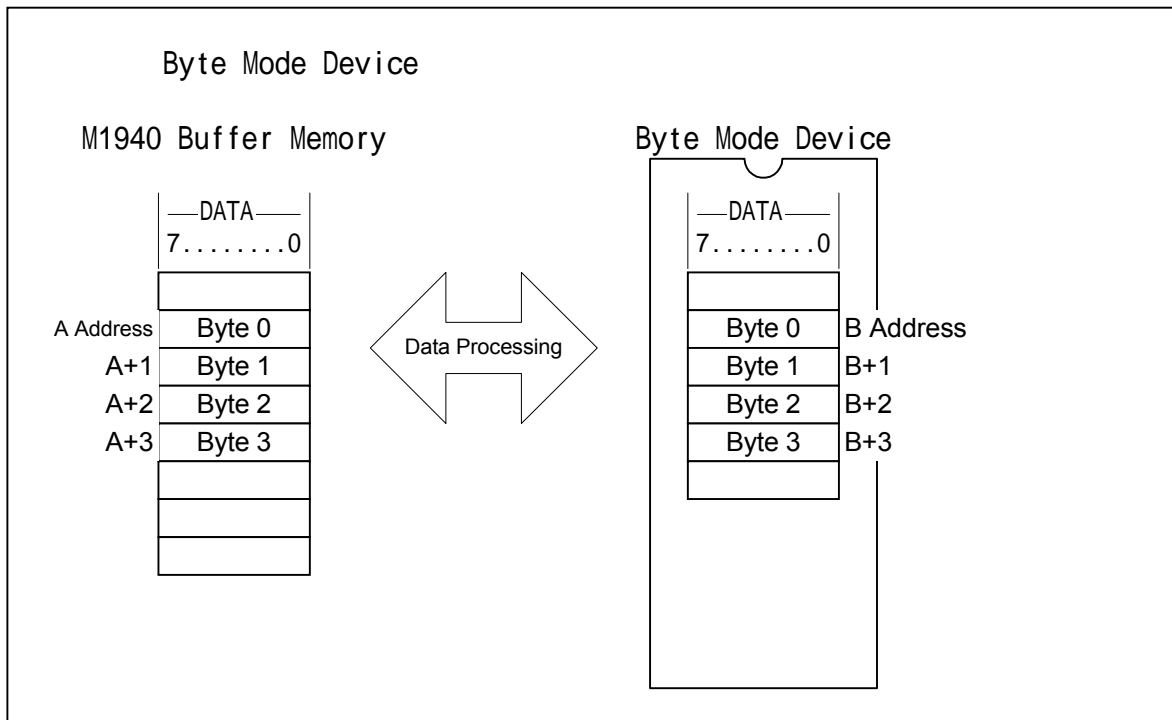
If any item is missing or damaged, please contact to Minato or Minato distributor in your region immediately.

We recommend you to keep the corrugated cardboard box and the packing material for transportation in the future.

# M1940 Buffer Memory

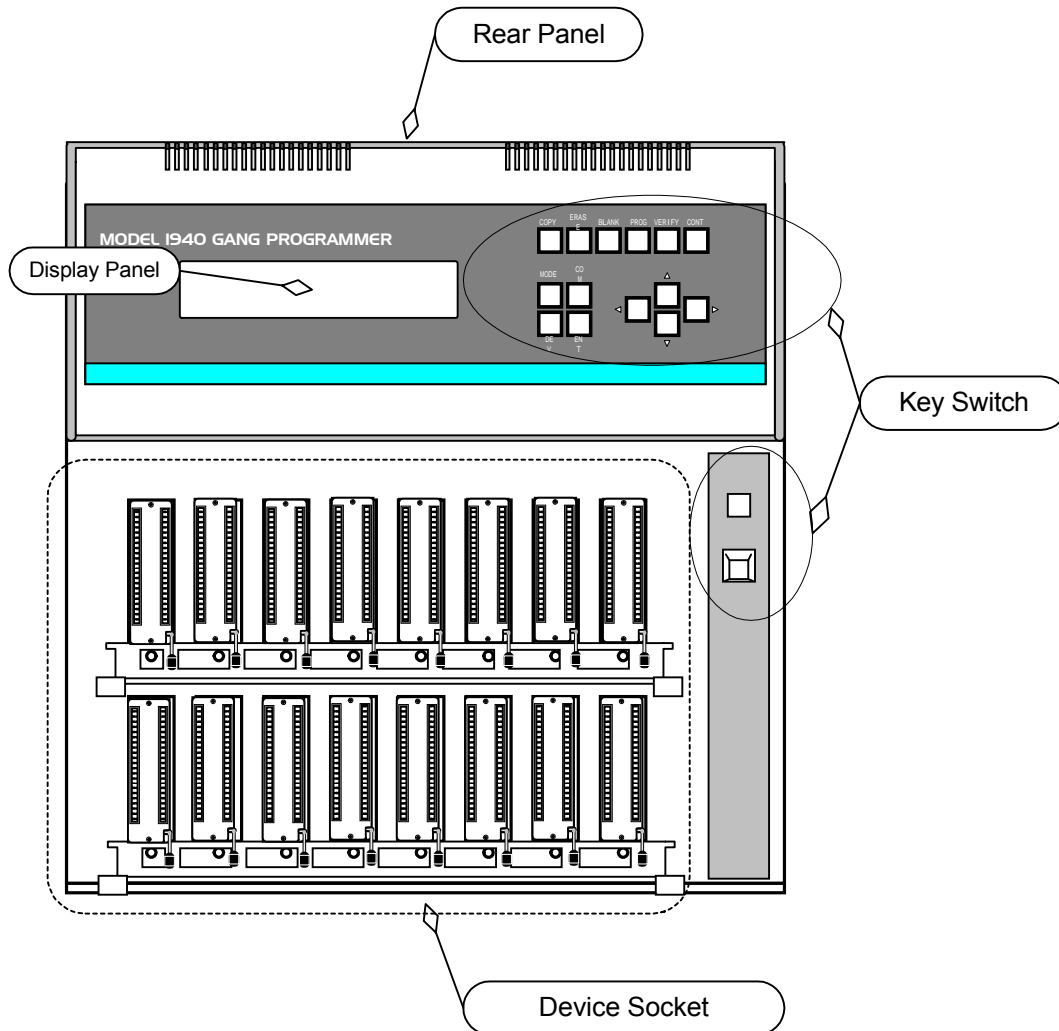
M1940 operates its buffer memory in various ways in the 8-bit-one byte mode.

When handling buffer data stored in the 8-bit-one byte mode on a 16-bit word mode device, M1940 applies little endian mode. Buffer data has to be edited as occasion arise.



## Names of Parts and Function

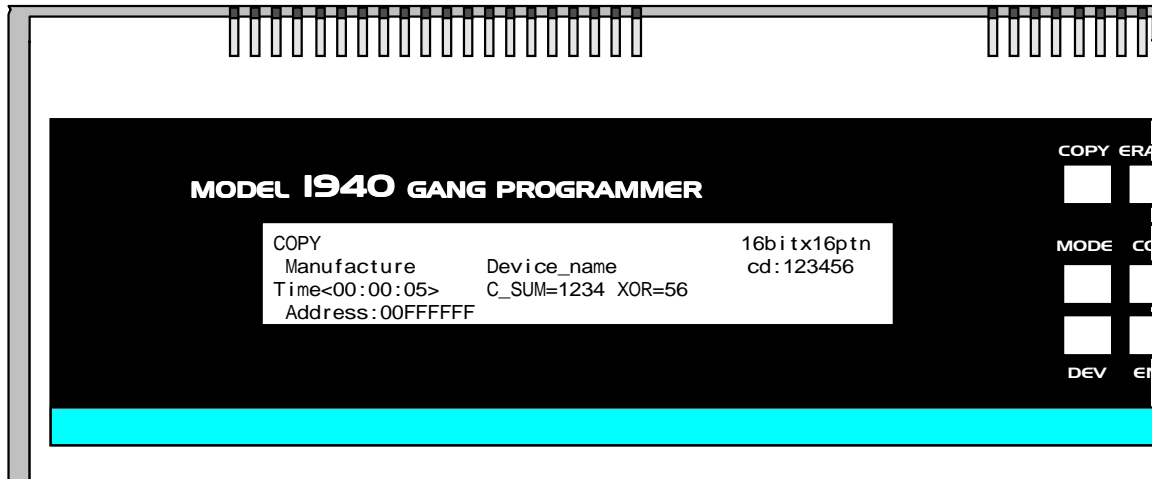
Before explaining the operation, this section explains names of parts & outlines of functions so that you can get ready to operate M1940 .Detailed explanation will be made in each section



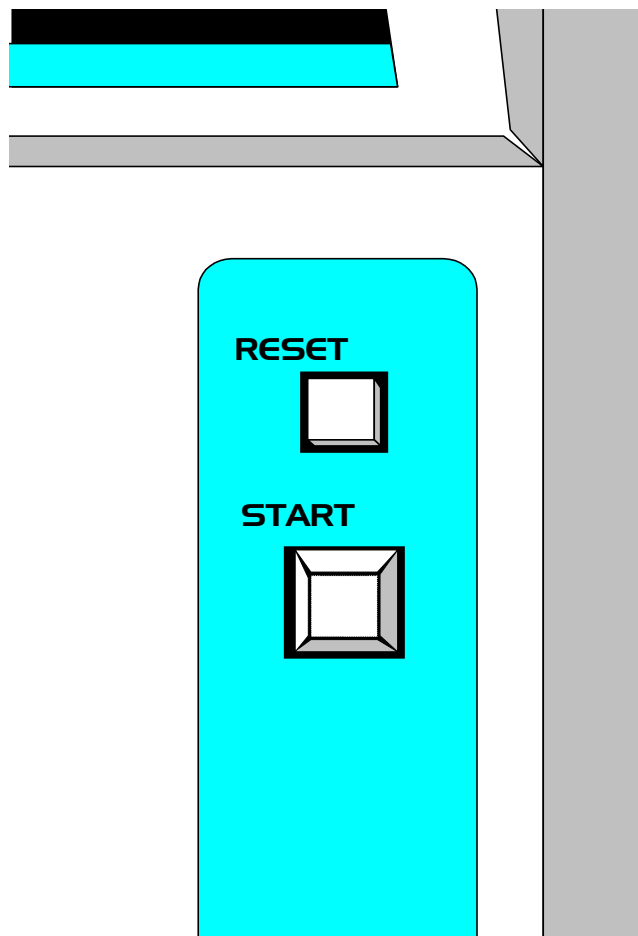
## Display Panel

This panel is for the LCD display of 40 characters x 4 lines.

At the times of operation setting and execution, information is displayed on this LCD.



## Key Switch

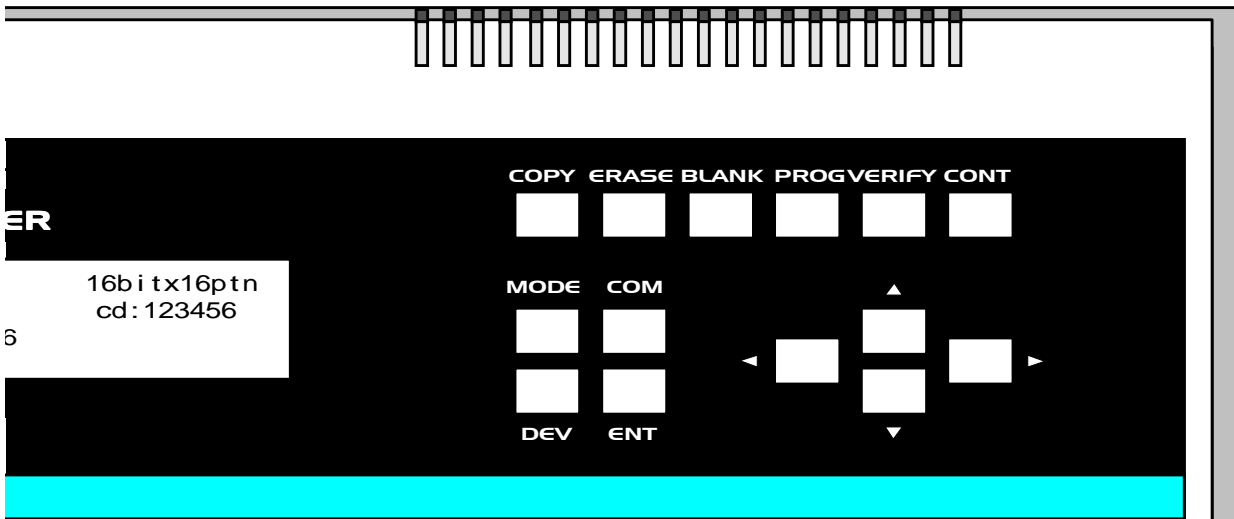


**START** Start Switch

When this switch is pressed, a selected operation will be executed.

**RESET** Reset switch

Press this switch to stop an operation being executed.



**COPY** COPY key

Select this key when transferring data from the device set to Device Socket #1 to the M1940 buffer memory. No operation will start when only the COPY key is press.

**ERASE** ERASE key

Select this key when erasing data written in electrically erasable devices (EE-PROM type and FLASH type) set to the device sockets #1-#16. No operation will start when only the ERASE key is pressed.

**BLANK** BLANK key

Select this key when checking if data have been stored in the devices set to the device sockets #1-#16. No operation will start when only BLANK is pressed.

**PROG** PROGRAM key

Select this key when checking if data have been stored in the devices set to the device sockets #1-#16. No operation will start when only the PROGRAM key is pressed.

**VERIFY** VERIFY key

Select this key when collating the contents in the devices set to the device sockets #1-#16 and the content in the M1940 buffer memory. No operation will start when only VERIFY key is pressed.

**CONT** CONTINUOUS key

Select this key when making continuous operation for the device set to the device socket #1-#16. No operation will start when only CONINUE key is pressed.

**MODE** MODE key

Select this key when operating M1940 in any mode other than the basic mode like dumping the buffer memory, editing, etc.

**COM** COMMAND key

Select this key when operating M1940 after interfacing to external equipment.

**DEV** Device key

Use this key when selecting a device to be used.

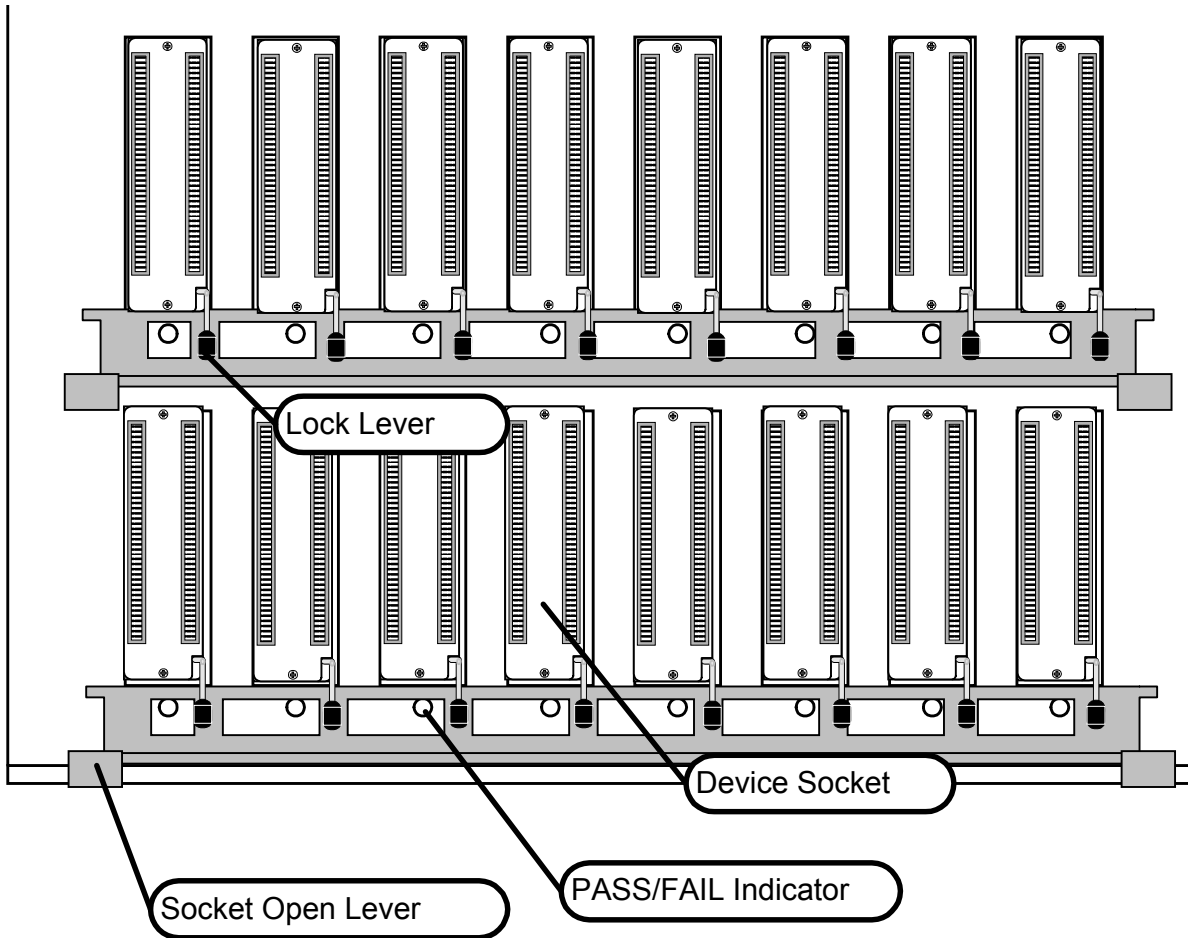
**ENT** ENT key

Use this key when executing a selected operation.

 DIRECTION key

Use these keys when moving the cursor in each selected screen. The cursor moves up, down, left and right. The up and down keys are used to select values in each menu.

# Device Socket



## Device Socket

Each target device is set independently in each device socket.

## Lock Lever

This lever is lowered to fix a target device in a device socket.

## Socket Open Lever

Raising this lever release 8 lock levers at a time.

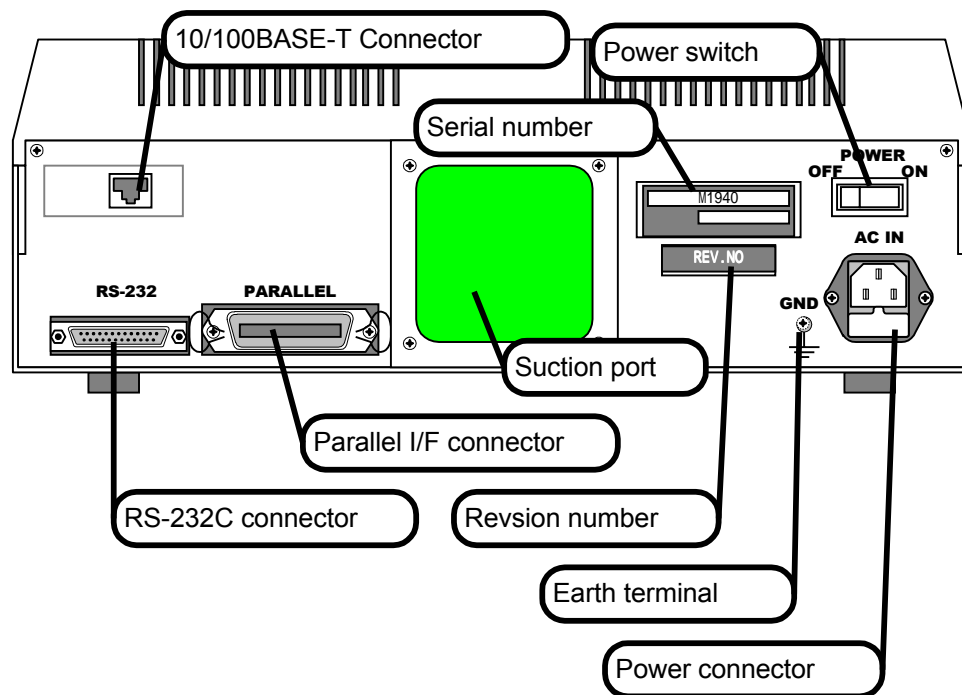
## PASS/FAIL Indicator

Operation result is indicated with LED for each device socket.

In case of PASS : Green light

In case of FAIL : Red light

## Rear Panel



**! CAUTION**  
Use the accessory power code for the supply voltage less than AC125.

**! CAUTION**  
Keep the suction port open

### Power Connector

An AC power input connector with built-in fuse (3A)

### Power Switch

A power switch for turning power on and off.

### Parallel I/F Connector

A parallel interface connector

### RS-232C Connector

A serial interface connector (RS232C)

### 10/100BASE-T Connector (Option)

Ethernet Terminal

### Earth Terminal

A grounding terminal

### Suction Port

For cooling the inside of the M1940 main unit

### Serial Number

A label indicating the serial number of the main unit is affixed. You may be asked to check the number when making some inquiry.

### Revision Number

This label is for revision control of the hardware. You may be asked to check the number when making some inquiry.

# Overview

---

## Product Overview

The M1940 Gang Programmer can flexibly adapt to the latest high-density PROM devices. It utilizes a standard 32M bytes (256M bits) buffer memory. M1940 is so powerful as to allow programming 16 devices at the same time.

M1940 can be connected personal computers and other equipment using various external interfaces as RS232C, parallel interface or Ethernet (option). M1940 can offer high volume production.

Also, M1940 carry out various checking that can not be expected from its fast programming speed. M1940 maximizes the use of devices.

### Features

- The operating speed has greatly improved.
- The standard 256Mbits buffer memory can be upgraded up to 1Gbits.
  
- Applicable to various devices

## Specifications

### Gang programming

The maximum of 16 devices can be programmed at the same time.

### Display

Liquid crystal display panel of 40 character x 4 lines  
2-color LED light for each socket

### Buffer Memory

Standard 256Mbit (Maximum 1Gbits)

### External Interface

Parallel interface: Conforming to Centronics

Serial interface : RS-232C (standard) or Optional Ethernet (10BASE-T or 100 BASE-T) When Ethernet is used, RS-232C can not be used.

### Operating Temperature

5-35 [ C ]

### Power Supply

AC100-120 / AC200-240 [ V ]  
50-60 [ Hz ]

### Power Consumption

200 [ VA ] Max

### Fuse

3 [ A ]

### Dimensions

Width : 380 [mm]  
Depth : 392 [mm]  
Height : 138 [mm]

### Weight

7 [kg]

# Basic Operation

---

This section explains how to use basic functions required for the PROM programmer.

This section explains the following operations.

■ Installation and truing power ON

■ **DEVICE**

To select applicable devices

■ **COPY**

To read data from the master device

■ **ERASE**

To erase data programmed in a device

■ **BLANK**

To check the erased state of a device

■ **VERIFY**

To verify the data in the buffer and the device

■ **PROGRAM**

To program data in a device

■ **CONTINUOUS**

Continuos operation

Since special keys are provided to M1940 to use the above function, operations with the key switches can be minimized.

For the detailed explanation of these operations, please refer to the next section.

## Installation and Turning Power ON

### ! CAUTION

Caution at turning on power

Remove the device and the conversion adapter from device socket, but they may be damaged.

This section explains the installation environment of M1940 and the procedures required until the power is turned on.

- Make sure that there are no equipment with power motor and electric welder that generate electric noises.
- Install M1940 level on a ground free from shake and vibration
- Connect the AC power cable to the special plug receptacle and avoid a starburst connection. A 3P-plug receptacle with grounding cable is recommended. In case of 2P-plug receptacle, be sure to use the accessory adapter to ground the plug receptacle.
- Make sure that the power switch of M1940 is set to OFF, and insert the AC power cable into the power-input connector on the rear panel of M1940.
- Make sure that nothing is inserted in any socket device, and set the power switch on the rear panel to the ON side.
- When the following display appears, M1940 is in order.

```

<M1940 GANG PROGRAMMER SELF CHECK END >
<< SELF CHECK ALL PASS >>

Time<xx:xx:xx>
```

- The version display screen will appear in seconds.
- The device code that had been selected before truing off will be called, and the basic screen will appear.

```

M1940      Ver 1.00                NOV-1999
32M byte memory
MINATO ELECTRONICS INC.
```

Operatoion Mode Display Area

```

COPY ██████████ 8bit x 1ptn
Manufacture Device_name Cd:012345
```

## DEVICE

### To select applicable devices

This operation is to select applicable target devices. We call this operation Device Code Setting. Device codes for M1940 are unique to respective devices. These codes are original to us and are not applicable to any device manufacture and any other programmers of other manufactures.

M1940 does not support the automatic setting function of devices applicable of other Minato programmers.

Select a target device, which you would like to operate, according to the menu shown on the display. Select the device from the select screen of M1940 in the following order: the manufacture of the device, it's capacity and part number of the device.

## Operation Procedures

- Press the DEV key, and the display panel will change to the Manufacture Select Screen.

```

Manufacture select                cd:09----
ALLIANCE    AMD                ASAHIKASE I
ATMEL       Catalyst           CYPRESS
EXEL        FAIRCHILD [ FUJITSU ]
  
```

- Bring the cursor [ ] to the maker name of the target device using any direction key and press the ENT key. And the display panel will change to the Capacity Select screen

```

Capacity select                cd:0908--
256K  512K  1M    2M    4M
8M    16M  [ 32M ] 64M   128M
256M  other
  
```

- Bring the cursor [ ] to the density of the target device by using any direction key and press the ENT key. And the display panel will change to the Device Select screen.
- Bring the cursor [ ] to the part number of the target device by using any direction key and press the ENT key.

```

Device select                cd:090870
[MBM29DL32X*T    ] MBM29DL32X*B
MB84VD2218X      MB84VD2219X
  
```

- The screen shows the contents of the above settings. Make sure that the target device to be operated has been correctly set.

```

Selected device
  Manufacture      Cd:123456
  Device_name     32M
  OK -> [START] key
  
```

- When the device has been set correctly, press the **START** key. This is the end of device code setting.

```

                NO  16bitx 1ptn
Manufacture    Device_name  Cd:??????
  
```

!

To return to the setting screen, press the DEVICE key.

# COPY

## To read data from the master device

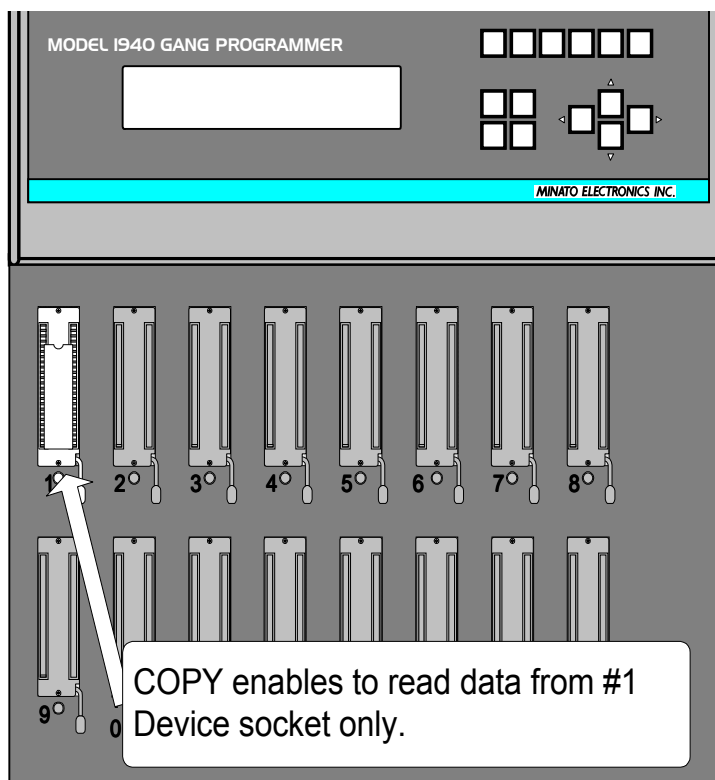
When data to be handled are stored in a device, use the COPY key. This section explains how to load data from the device (master device) to the buffer memory in M1940

### COPY Mode Operation Procedures

- Set the device code.
- Insert the master device in Device socket #1
- Set the device code of the master device.
- Lower the lock lever of the device socket.
- Press the COPY key
- Press the **START** key.
- Check the checksums of both the LED and the display panel.

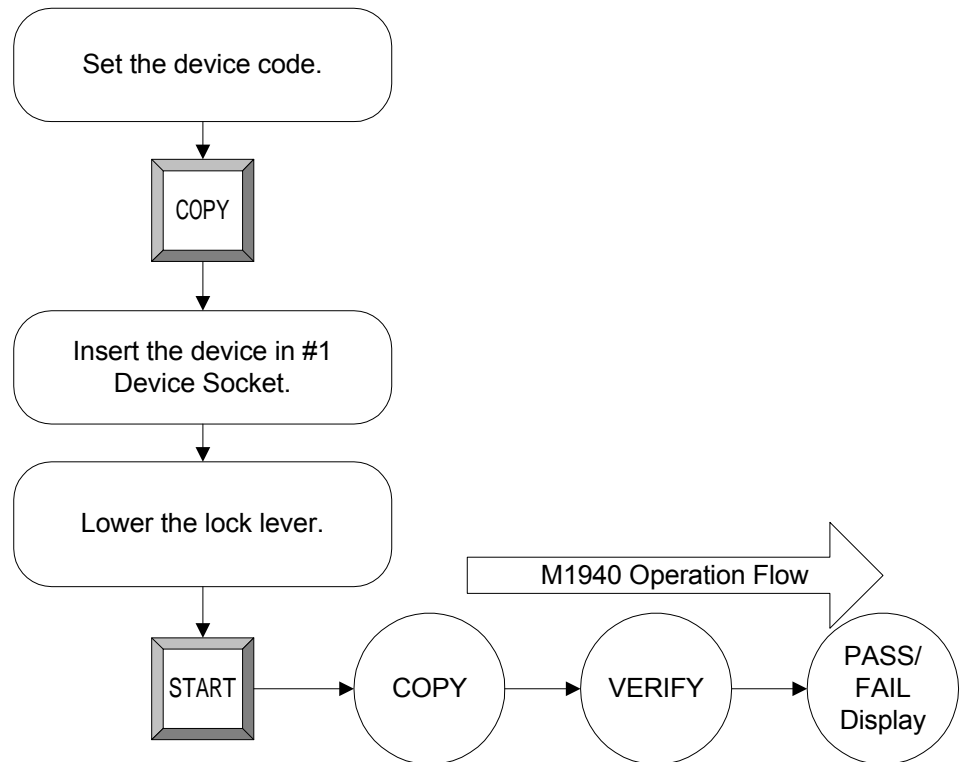
!

Check the checksum of the master device beforehand.



## COPY Mode Operation Flow

The operation flow of M1940 is as described below.



# ERASE

## To erase data programmed in a device

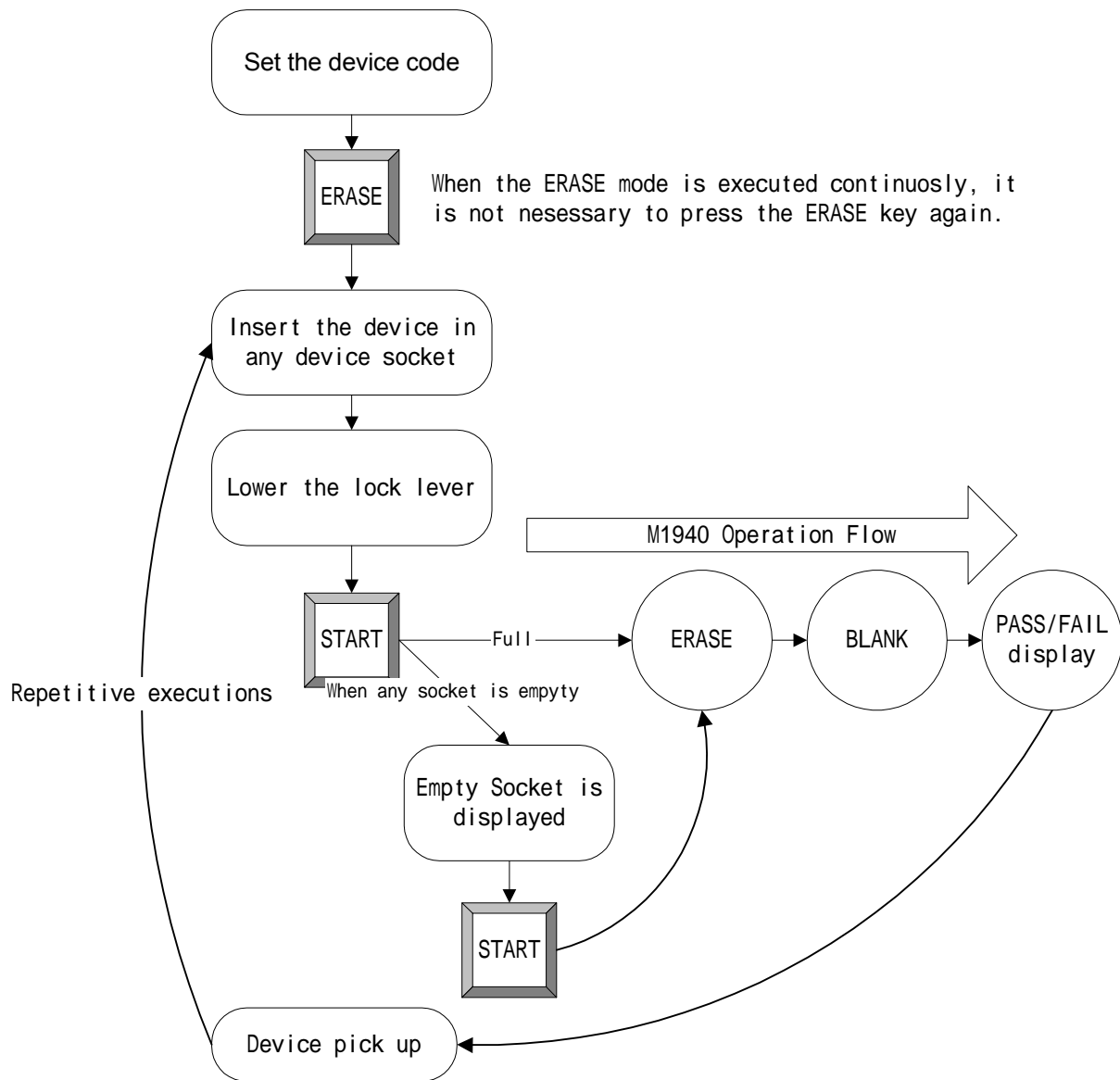
When erasing data programmed in an electrically erasable device (EE-PROM type, FLASH type), use the ERASE key.

### ERASE Mode Operation Procedures

- Set the device code
- Press the ERASE key.
- Inset the device containing the data to be erased in any device socket (#1-#16)
- Lower the lock lever of the device socket.
- Press the **START** key, and the Erase is executed.  
When any of the 16 device sockets is empty without device, “**Empty Socket**” will be displayed on the display panel and the red LED will turn on at the empty device socket. Then, the operation will be stop. To continue, press the **START** key again.
- Check PASS/FAIL observing the LED and the display panel.
- Remove the device from the device socket.

## ERASE Mode Operation Flow

The operation flow in M1940 is as described below.



# BLANK

To check the erased state of a device

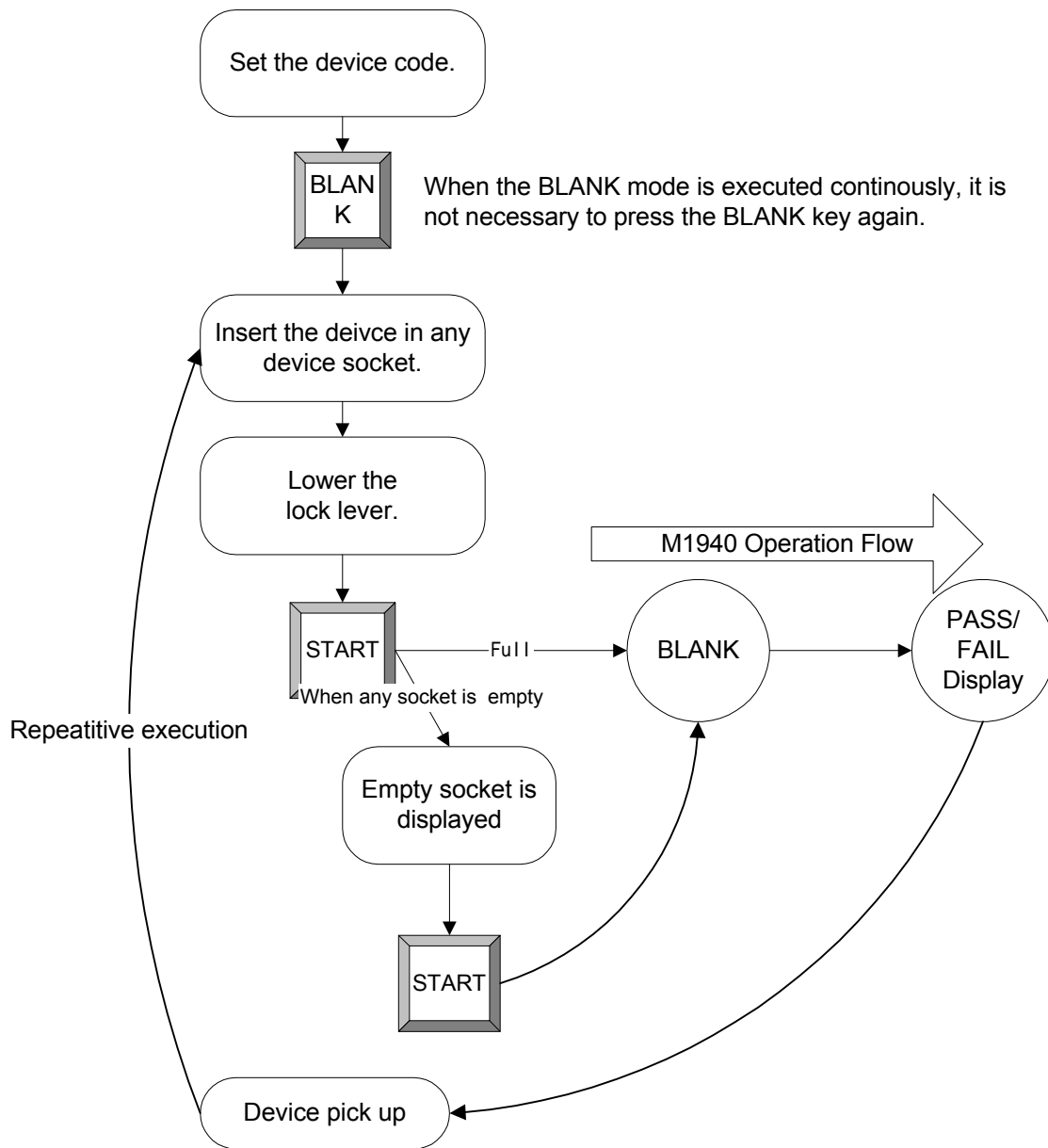
When checking if the device is in the erased state, use the BLANK key.

## BLANK Mode Operation Processors

- Set the device code.
- Insert the device to check the erased state in any device socket (#1-#16).
- Lower the lock lever of the device socket.
- Press the BLANK key
- Press the **START** key  
When any of the 16 device sockets is empty without device, “**Empty Socket**” will be displayed on the display panel and the red LCD will turn on at the empty device socket. Then the operation will be stopped. To continue, press the **START** key again.
- Check PASS/FAIL observing the LED and the display panel.
- Remove the device from the device socket.

BLANK Mode Operation Flow

The operation flow in M1940 is as shown below.



# VERIFY

## To verify device data

The content of data programmed in a device is verified with the content of the buffer memory in M1940. The condition for reading from a device at the time of verifies is changed to collate them in several patterns. Four types of Verifies are summarized as follows:

	Supply voltage	Load on data line
VERIFY1	VccL(Verify_L)	Pull-up to Vcc
VERIFY2	VccL(Verify_L)	Pull-down to GND
VERIFY3	VccH(Verify_H)	Pull-up to Vcc
VERIFY4	VccH(Verify_H)	Pull-down to GND

VccH : supply voltage maximum value ( on data sheet )

VccL : supply voltage minimum value ( on data sheet )

The pattern of execution varies with device type. Basically, the following two types are available.

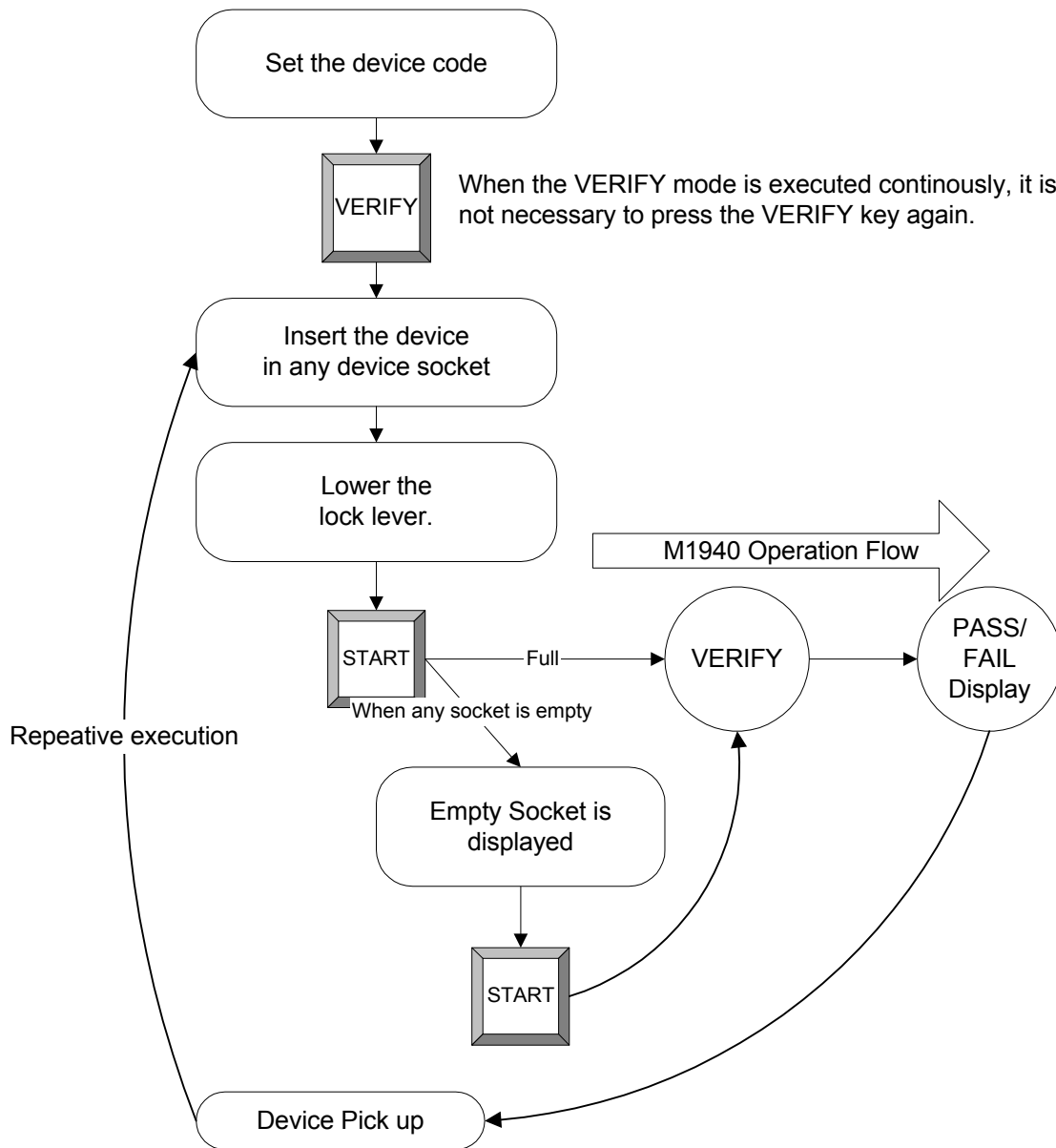
TYPE	VERIFY Pattern			
FLASH		VERIFY2	VERIFY3	
EP-ROM/ EE-PROM	VERIFY1	VERIFY2	VERIFY3	VERIFY4

### VERIFY Mode Operation Procedures

- Set the device code.
- Press the VERIFY key.
- Insert the device, the data of which is collated, in any device socket (#1-#16)
- Lower the lock lever of the device socket.
- Press the **START** key.  
When any of the 16 device sockets is empty without device, “**Empty Socket**” will be displayed on the display panel and the red LED will turn on at the empty device socket. Then, the operation will be stop. To continue the execution, press the **START** key again.
- Check `PASS/FAIL observing the checksums of both the LED and the display panel.

VERIFY MODE Operation Flow

The operation flow of M1940 is as described blow.



# PROGRAM

## To write data in a device

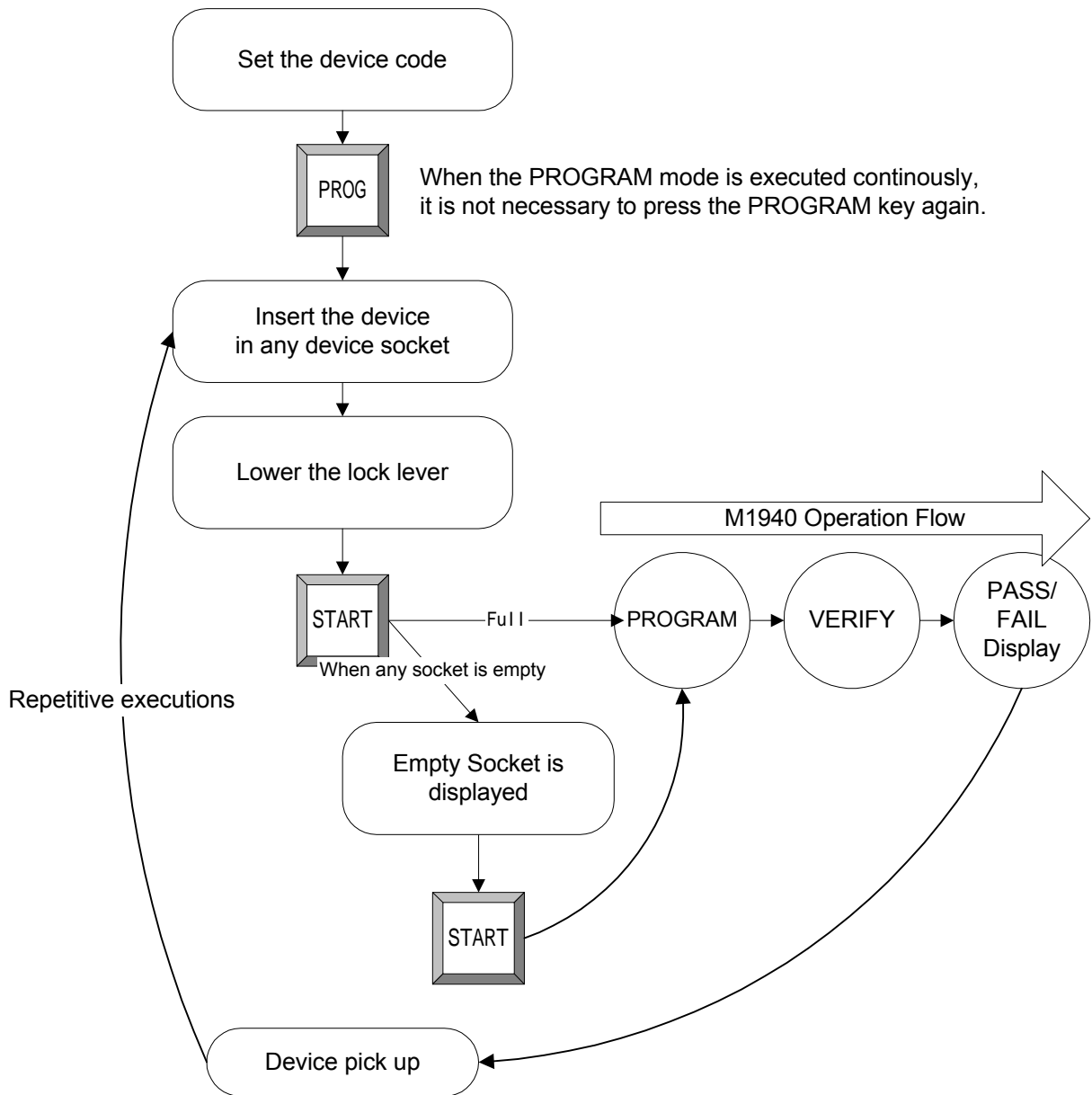
When programming the content of the buffer memory in M1940, use the PROGRAM key.

### Procedure of PROGRAM

- Set the device code.
- Press the PROGRAM key
- Insert the device, in which the memory content is programmed, in any device socket (#1-#16).
- Lower the lock lever of the device socket.
- Press the **START** key  
When any of the 16-device sockets is empty without device, “**Empty Socket**” will be displayed on the display panel and the red LED will turn on at the empty socket. Then, the operation will be stop. To continue the execution, press the **START** key again.
- Check PASS/FAIL observing the checksums of both the LED and the display panel.
- Remove the device from the device socket.

PROGRAM Mode Operation Flow

The operation flow of M1940 is described as below.



# CONTINUOUS

## Continuous Operation

This mode is for automatic and continuous execution of our recommended procedures to program the content of the buffer memory of M1940 in the device. The operation procedures vary with device types, namely, the FLASH/EE-PROM type that supports the electric erase (the ERASE mode of M1940) and the EP-ROM type that does not support it.

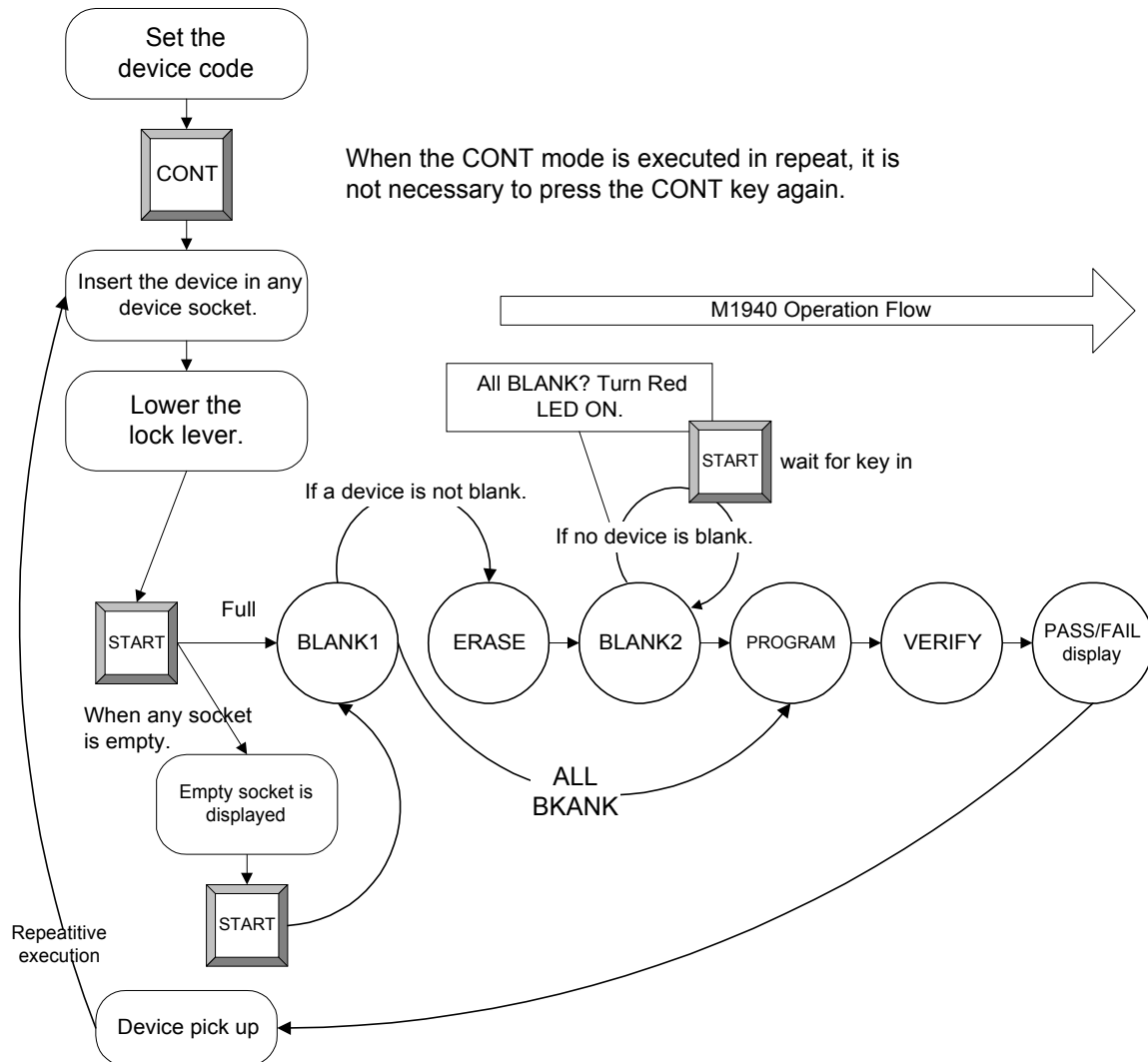
### CONTINUOUS Mode

- Set the device code.
- Press the CONT key.
- Insert the device, in which the memory is programmed, in any device socket (#1-#16)
- Lower the lock lever of the device socket
- Press the **START** key.  
When any of the 16 device sockets is empty without device, “**Empty Socket**” will be displayed on the display panel and the red LED will turn on at the empty device socket. Then, the operation will be stopped. To continue the execution, press the **START** key again
- Check PASS/FAIL observing the checksums of both the LED and the display panel.
- Remove the device from the device socket.

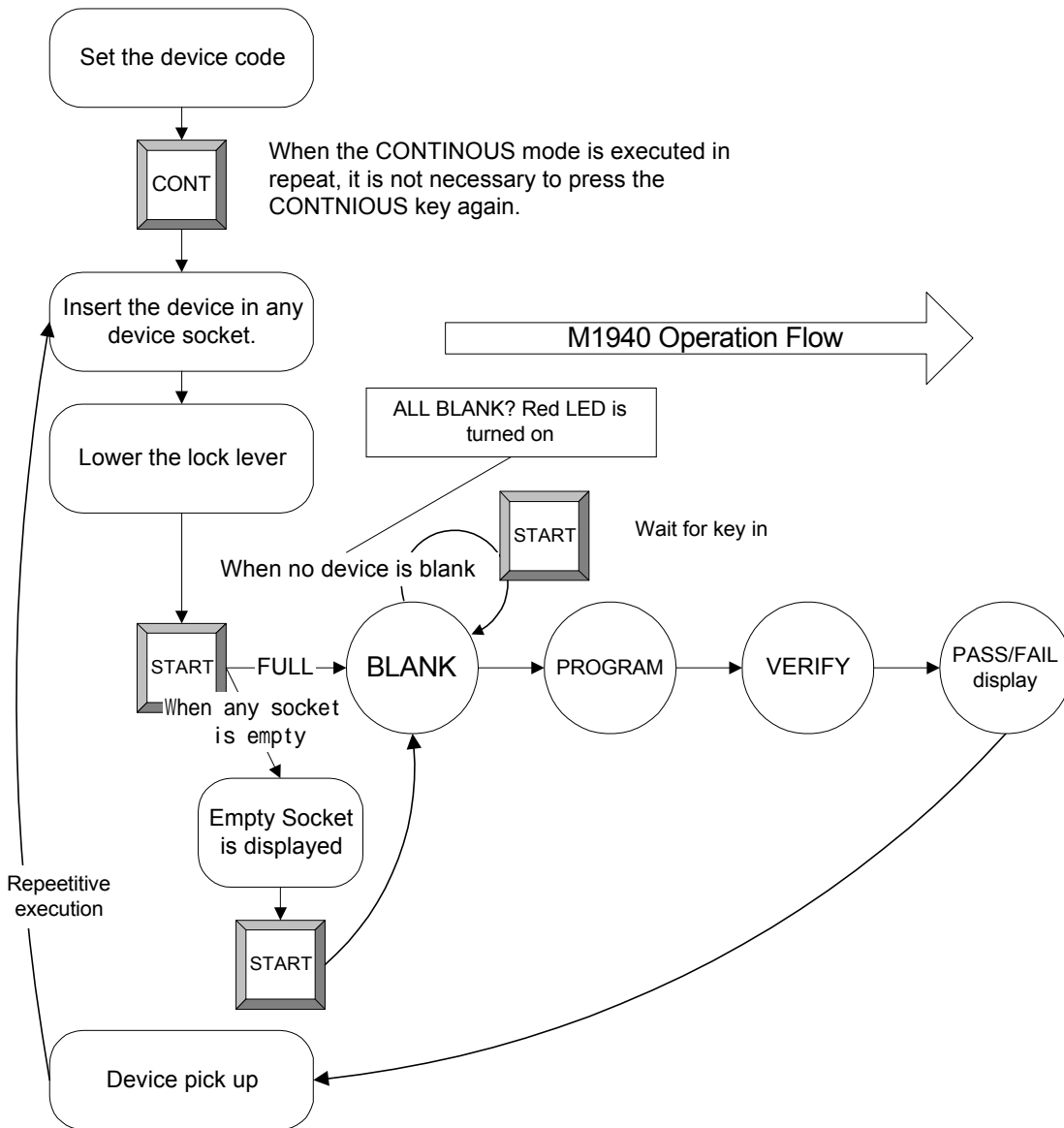
CONTINUOUS Mode Operation Flow-1

(In case the device is FLASH/ EE-PROM)

The operation flow is as described below.



## CONTINUOUS Mode Operation Flow - 2 (In case the device is EP-ROM)



# Advance Operation

---

You can use most features of the PROM programmer M1940 with above-mentioned basic operations. You may also apply the following advance operation to fully utilize the programmer.

【New】Multi PAE  
Version 1.50 & higher

In this section, the following operation is explained.

- |  |                       |
|--|-----------------------|
| ■ Setting of operation range                     | PAE mode<br>Multi PAE |
| ■ Change of supply voltage during Read operation | Read VCC              |
| ■ Selection of Verify Pattern                    | Verify pattern        |
| ■ Function of repetitive execution               | Repeat mode           |
| ■ Device protect information                     | Protect mode          |
| ■ Changes of protect information                 | Protect setting       |
| ■ Calculation of checksum and Exclusive OR       | Check sum             |
| ■ Buffer memory initialize                       | Buffer init           |
| ■ Display and edit of buffer data                | Buffer DUMP/EDIT      |
| ■ Buffer data swaps                              | Byte swap             |
| ■ Buffer data word swap                          | Word swap             |
| ■ Setting of device-check, Buzzer & LED          | Devchk/BZ/LED         |
| ■ Selfcheck setting                              | Selfchek mode         |
| ■ System update                                  | System update         |

!  
Press **MODE** key

Press **MODE** key to use these functions. The details are described as following pages.

## PAE mode      Setting of operation range

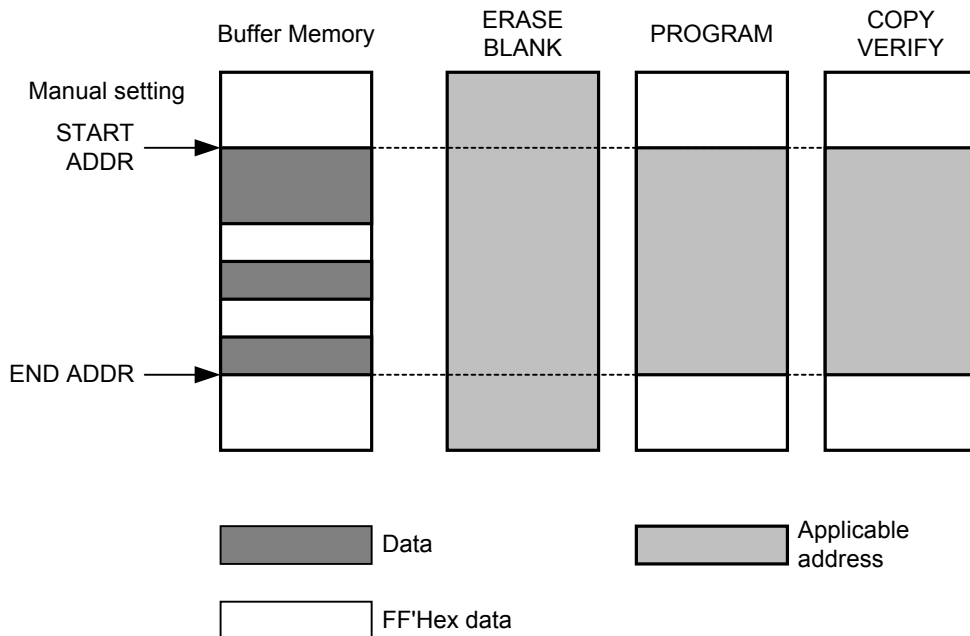
In general, M1940 executes each operation for all addresses of the memory address of a selected device. When an operation range is set, each basic operation can be executed for part of the memory address of a device.

For the version V1.50 or higher, the following Single PAE and Multi PAE can specify operating address.

### Single PAE

One start address and one end address can be manually set.

The setting address depends on the operation. One of the following three is automatically selected by the system of M1940



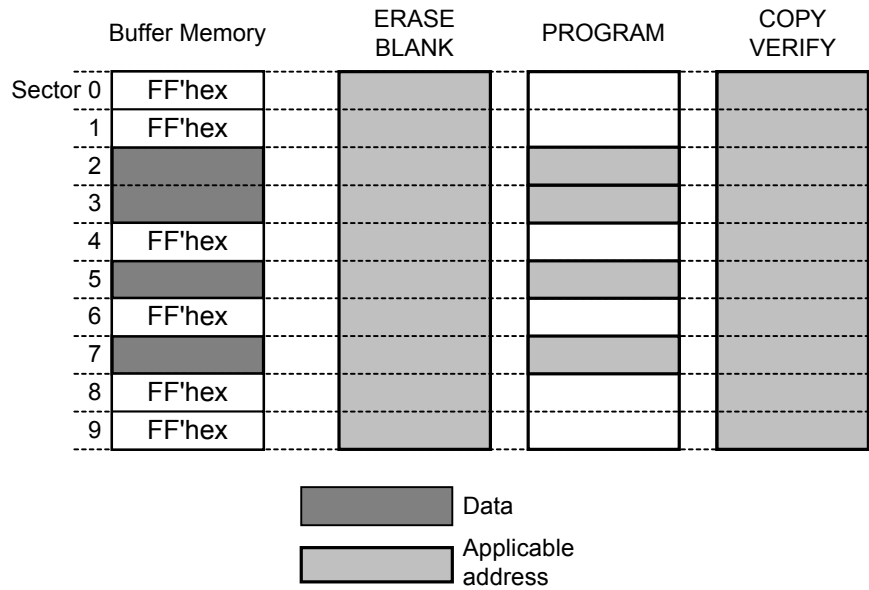
	Device start Address	Device end Address	Buffer start Address
Byte programming	Every 1 Address	Every 1 Address	Every 1 Address
Word programming	Every 1 Address	Every 1 Address	Every Even Address
Multi Bytes/Multi Word Programming	Every Address with lower 2 digits of 00	Every Address with lowe 2 digits of FF	Every Address with lower 2 digits of 00

Multi PAE

Flash memory manages the memory area by many sectors. In Multi PAE mode, you can set start and end address in each sector. Unlike single PAE of which start and end address are manually set, M1940 can automatically set Multi PAE by using sector information of the device and the data in the buffer.

M1940 automatically detects FF'hex data to be skipped. When any data other than FF'hex is found in a sector, PROGRAM becomes applicable to that sector. When all data is FF'hex in a sector, M1940 skips that sector for programming.

Skip is applied only to PROGRAM. Other function such as COPY, ERASE, BLANK, VERIFY are applied to all address.



## Single PAE Operation Procedures

### Device func

### PAE mode

### Single PAE mode

- Press the **MODE** key.

!  
To return to the previous screen, press **DEVICE**

```

Mode menu
Device func          Buffer operation
I/O command         System config
Remote mode
    
```

- Bring [ ] to Device function with direction key. Press **ENT** key. Then Device function menu is appearing on LCD.

```

Device function
Address mode      PAE mode
Read VCC          VERIFY pattern
Protect mode      Repeat mode
    
```

- Bring [ ] to PAE mode and press **ENT** key to display PAE mode menu

```

PAE mode menu
Clear PAE mode    Single PAE mode
Multi PAE mode
    
```

!  
To end the setting, press **START** key

- Bring [ ] to Single PAE mode and press **ENT** key.

```

PAE mode      OK -> [START] key
Device start address = [000000 0]
Device end address = 7FFFFFFF
Buffer start address = 0000000
    
```

ENT

- Move the cursor to the targeted address.
- Address changes by up/down direction key
- The item in [ ] can be changed
- Press **START** to fix the setting
- When the check buzzer sounds and 'PA' meaning the completion of operation range setting appears on the LCD, the setting is completed

!  
When a device code is set or the power is turned off, the setting will be cleared.

Indication When PAE is set.

```

          PA      NO 8bit x 1ptn
FUJITSU  MBM29F033C  Cd:??????
*** SET END ***
    
```

The Operation procedure of Multi PAE mode

**Device func**      **PAE mode**      **Multi PAE mode**

- Press **MODE** key once

!  
To go back to previous screen, press **DEV** key

Mode menu	
Device func	Buffer operation
I/O command	System config
Remote mode	

- Select Device function by moving [ ] with the direction key. Press **ENT** key to display Device function menu.

Device function	
Address mode	PAE mode
Read VCC	VERIFY pattern
Protect mode	Repeat mode

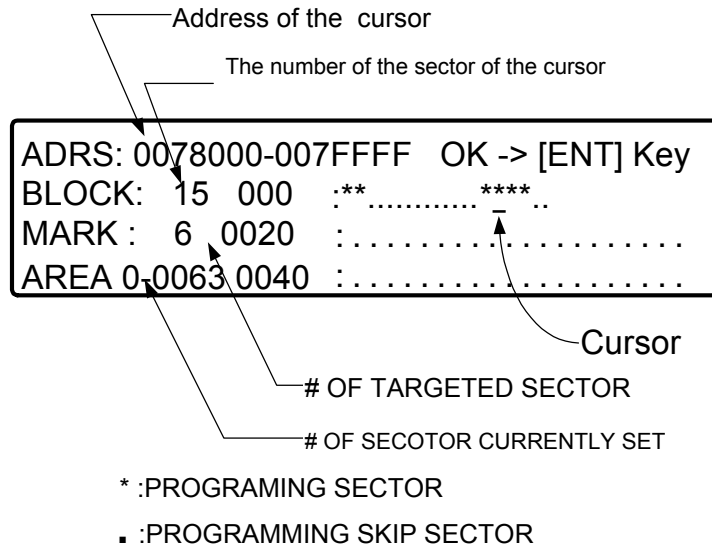
- Select PAE mode by moving [ ] with the direction key and press **ENT** key to display PAE mode menu.

PAE mode menu	
Clear PAE mode	Single PAE mode
Multi PAE mode	

- Select Multi PAE mode by moving [ ] with the direction key and press **ENT** key to search applicable sectors in the buffer.
- Press **START** key to set and end the operation.

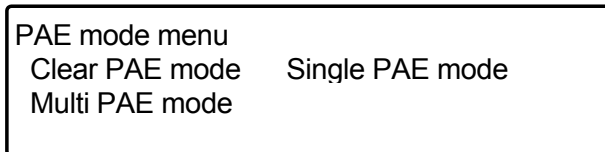
! **COM** key for detail.  
**START** key to end the setting.

### Previous screen of Multi PAE mode

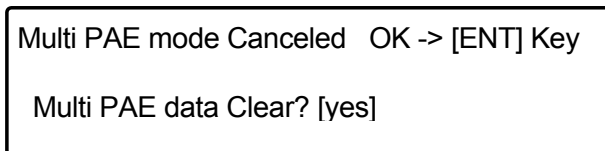


### Multi PAE mode Clear

- To have PAE mode men displayed and selects Clear PAE mode.



- When Multi PAE mode is set, confirmation message is displayed.



- **ENT** key to clear.



# Read VCC Change of supply voltage during operation

You can change the voltages to be supplied to devices during read operation. When reading data from devices, M1940 operates for different mode such as COPY, BLANK and VERIFY.

The supply voltage that can be changed is the voltage to be supplied to each device during BLANK and VERIFY operations. The voltage during COPY operation can not be changed.

Only one supply voltage is used for BLANK check.

At the time of VERIFY, the maximum and the minimum values of the supply voltage are set. Verify\_H is for setting the maximum value of the voltage to be supplied to a device. Verify\_L is for setting the minimum value. When a value is not manually set in this operation, default value of Verify\_H and Verify\_L on each device is applied.

Verify\_H = Max value

Verify\_L = Min. value

Read VCC Operation Procedures

**Device func**

**Read VCC**

- Press **MODE** key

! To go back to previous display, press **DEV** key

Mode menu	Buffer operation
Device func	System config
I/O command	
Remote mode	

- Bring [ ] to Device function with any direction key. Press **ENT** key, and Device function menu will appear on the display menu.
- Bring [ ] to Read Vcc with any direction key.

! To end setting, press **START**

Device function	PAE mode
Address mode	VERIFY pattern
Read VCC	Repeat mode
Protect mode	

- Press the **ENT** key, and READ VCC screen will appear on the display panel.
- Voltage value in [ ] can be changed with the up/down direction key.

Read VCC COPY : 3.30V	OK -> [START]key
BLANK:[ 3.30V ]	
Verify_L : 3.00V	
Verify_H : 3.60V	

!  
By setting a device code and/or power is turned off, this setting is cleared.

- The item in [ ] moves as the **ENT** key is pressed.
- After the setting, press the **START** key.
- When the check buzzer sounds and VC meaning the completion of supply voltage at reading time appears on the basic screen, the setting is completed.

Indication when read VCC is set

VC	8bit x 1ptn
Manufacture Devicename	Cd:???????
*** SET END ***	

# Verify pattern Selection of Verify Pattern

## VERIFY Pattern

You can select VERIFY pattern in the VERIFY operation execution mode. Three kinds of patterns, namely 4-pattern, 2-pattern, 1-pattern, can be selected.

When no pattern is set, the following VERIFY patterns will be executed depending on EP-ROM/EE-PROM type and Flash type.

For the detail of VERIFY pattern, see VERIFY in the basic operation section.

■ EP-ROM/EE-PROM type

When no pattern has been set, the 4-pattern VERIFY operation will be executed.

VERIFY1 VERIFY2 VERIFY3 VERIFY4

■ FLASH type

When no pattern has been set, the 2-pattern VERIFY operation will be executed.

VERIFY2 VERIFY3

Even if 4-pattern is selected here for FLASH type, the above 2-pattern VERIFY operation will be executed. The relations between set patterns and execution patterns are as follows.

Type	4 -pattern	2-pattern	1-pattern
EE/EP-ROM	VERIFY1 2 3 4	VERIFY2 3	VERIFY3
FLASH	VERIFY2 3	VERIFY2 3	VERIFY3

VERIFY Pattern Operation Procedures

**Device func**

**Verify pattern**

! To go back to previous screen, press **DEV** key.

- Press **MODE** key

Mode menu	Buffer operation
Device func	System config
I/O command	
Remote mode	

- Bring [ ] to Device function with any direction key. Press **ENT** key, and Device function menu will appear on the display panel.
- Bring [ ] to VERIFY pattern with any direction key.

! To end the setting, press **START** key

Device function	
Address mode	PAE mode
Read VCC	VERIFY pattern
Protect mode	Repeat mode

- Press **NT** keys and VERIFY pattern select screen appears on the display panel.
- Each time when up/down key is press, Default 2 Times 1 Time will change in this order.

!  
When a device code is set or the power is turned off, the setting will be cleared.

VERIFY count select	OK -> [START] key
VERIFY count :	[ Default ]

- Press **ENT** key, and [ ] will disappear to end the setting.
- Press **START** key, the VF mark meaning the completion of the change of the VERIFY patter will appear on the basic screen.

Indicatin when Verify pattern is changed

PA	VF	NO	8bit x 1ptn
FUJITSU	MBM29F033C		Cd:???????
*** SET END ***			

# Repeat mode

## Function of repetitive execution

Each basic operation is executed repeatedly until an error occurs (FAIL STOP). Use this mode for device continuous test, etc.

### REPEAT Mode setting Procedures

#### Device func

#### Repeat mode

- Press **MODE** key

! To go back to previous display, press DEV key.

Mode menu	Buffer operation
Device func	System config
I/O command	
Remote mode	

- Bring [ ] to Device function with any direction key. Press **ENT** key, and Device function menu will appear on the display panel.
- Bring [ ] to Repeat mode with any direction key.

Device function	
Address mode	PAE mode
Read VCC	VERIFY pattern
Protect mode	Repeat mode

- Press **ENT** key, and Repeat mode menu screen will appear.
- Each time when up/down key is press, the change between Off Fail stop will occur.
- Press **ENT** key, and [ ] will disappear.

!  
When a device code is set or the power is turned off, the setting will be cleared.

Repeat mode menu	OK -> [START] key
Repeat mode :[OFF ]	

- To end the setting, press **START** key. The indicator to show the REPEAT mode has been set will not appear.

## Protect mode    Device protect information

Some FLASH type devices have the protect function for protecting data. The protect information is generally stored as data in an area different from the device data area. M1940 has three kinds of modes for operation of device protects information.

### No Operation

Usually, M1940 operates in this mode. In this mode, M1940 does not access to the device protect information area during the basic operation (**COPY, BLANK, PROGRAM** and **VERIFY**). When this mode has been selected, 'NO' mark displayed in the center of the first line on the basic screen.

### Protect only

M1940 accesses only to the device protect information area. Note that it does not access to the device data area. When this mode has been selected, 'PO' mark is displayed in the center of the first line of the basic screen.

### Unprotect/Protect

M1940 erases the device protect information first and programs protect information to be set to M1940. When this mode has been selected, 'UP' mark is displayed in the center of the first line on the basic screen..

## PROTECT Mode Setting Procedures

### Device func

### Protect mode

- Press **MODE** key.

Mode menu	
Device func	Buffer operation
I/O command	System config
Remote mode	

- Bring [ ] to Device func with direction key.
- Press **ENT** key, and Device function menu will appear on the display panel.

Device function	
Address mode	PAE mode
Read VCC	VERIFY pattern
Protect mode	Repeat mode

- Bring [ ] to Protect mode with direction key.
- Press **ENT** key, and Protect menu will appear on the display panel.

Protect mode menu
Protect mode : [Protect only]

- Select any mode with up/down key.  
Each time when up/down key is pressed, the mode in [ ] will be changed in the following sequence.
- No operation    Protect only    Unprotect/Protect
- Press **ENT** key, and the mode will be selected and [ ] will disappear.
- Press **START** key, the mark indicating that M1940 operates in each mode will appear on the basic screen and the operation will end.

! When device code is set or the power is turned off, the setting will be cleared.

Indicating protect mode  
NO:No operation  
PO:Protect only  
UP:Unprotect/Protect

NO	8bit x 1ptn
Manufacture	Devicename    Cd:???????
*** Complete ***	

## Protect setting      Change of protect information

Protect setting of each block can be set by this operation.  
All sectors is 'Unprotect' at default setting

### Procedures to change protect information

#### Buffer operation

#### Protect setting

- Press **MODE** key

Mode menu	
Device func	Buffer operation
I/O command	System config
Remote mode	

! To go back to previous display, press **DEV** key.

- Bring [ ] to Buffer operation with any direction key.  
Press **ENT** key, and Buffer set menu will appear on the display panel.

Buffer set menu	
Buffer init	Buffer DUMP/EDIT
Byte swap	Word swap
Check sum	Protect setting

! To end the setting, press **START** key

- Bring [ ] to Protect setting with any direction key.  
Press **ENT** key, and Protect setting screen will appear.

Protect setting	
00: [Protect ]	01: Unprotect
02: Unprotect	03: Unprotect
04: Unprotect	05: Unprotect

! When device code is set or the power is turned off, the setting will be changed.

- Bring [ ] to the sector number to be changed with **ENT** key and press up/down key. Each time up/down key is pressed, display is changed to Protect    Unprotect
- To end the setting, press the **START** key.

## Check sum

## Calculation of checksum and exclusive OR

This function is for calculating the data sum and exclusive OR stored in the buffer memory of M1940. Even if this function is not used, Check sum and EXOR are displayed on the screen during the basic operation.

The respective calculation methods are as follows:

Check Sum :

Bit width	8Bit fixed
# of digits	8 digits Hex display
Over flow	discarding the 9 <sup>th</sup> digit

EXOR ( Exclusive OR ) :

Bit width	8Bit fixed
# of digits	2 digits Hex display

Calculation example

Data [Hex]	Check Sum [Hex]	EXOR[Hex]
AA	0000AA	AA
55	0000FF	FF
AA	0001A9	55
55	0001FE	00
AA	0002A8	AA
55	0002FD	FF
AA	0003A7	55

Check sum of former Minato programmer is displayed in 4 digit and 5<sup>th</sup> digits are discarded. The sum of former unit is the same as the last 4 digits of M1940. The check sum and EXOR of M1940 is supported in 8-digit display.

Check sum Operation Procedure

**Buffer operation**

**Check sum**

- Press **MODE** key

Mode menu	Buffer operation
Device func	System config
I/O command	
Remote mode	

! To go back to previous display, press DEV key.

- Bring [ ] to Buffer operation with any direction key. Press **ENT** key, and Buffer set menu will appear on the display panel.
- Bring [ ] to Check sum with any direction key. Press **ENT** key, and the Calculate check sum screen will appear on the display panel.

Buffer set menu	
Buffer init	Buffer DUMP/EDIT
Byte swap	Word swap
Check sum	Protect setting

! To end the setting, press **START** key.

- The start address and the end address are displayed. These addresses are the same as the ones of the M1940 buffer memory being used by the currently selected device. When the operation areas has been specified in the PAE mode, the set point will be reflected here. These addresses can not be specified here.
- Press **START** key, and the calculation result will be displayed.

Calculate check sum	OK -> [START] key
Start adress	0000000
End address	00FFFFFF

## Buffer init

### Buffer memory initialization

The M1940 buffer memory is filled with specific data. The buffer memory is initialized by **FF** hex right after power is turned on. M1940 offers four kinds of initialize patterns as follows.

- All FFH  
Initialize with FF (hex)
- All 00H  
Initialize with 00(hex)
- Test Pattern A  
Initialize with "03, 06, 0C, 18, 30, 60, C0"(hex) 7 byte repeat pattern
- Test Pattern B  
Initialize with "00, 00, FF, FF, 00, 00, FF"(hex) 7 byte repeat pattern.

Buffer initialize operation procedures

**Buffer operation**

**Buffer init**

- Press **MODE** key

```
Mode menu
Device func          Buffer operation
I/O command         System config
Remote mode
```

- Bring [ ] to Buffer operation with any direction key. Press **ENT** key and Buffer set menu will appear on the display panel.

```
Buffer set menu
Buffer init      Buffer DUMP/EDIT
Byte swap       Word swap
Check sum       Protect setting
```

- The start address is displayed in [ ]. To change the address, bring the cursor\_ to the digit to be changed and press the up/down key.
- To change the end address, change it in the same as the start address.

```
Buffer initialize data select
START Adr[0000000]  END Adr 4000000
```

- Press **ENT** key, and the data pattern can be selected.
- Bring [ ] to the data pattern to be initialized and press **ENT** key.

! To end the setting, press the **START** key.

```
Buffer initialize
START Adr 0000000  END Adr 4000000
ALL FF hex       Test patternA
[ALL 00 hex     ] Test patternB
```

- Message asking to press **START** is appeared on the upper right. By pressing **START** key, the buffer memory initialization is executed.
- When the first page is appeared on LCD, the initialization is completed.

```
*** Now Buffer initializeing ***
Start address 0000000
Eed address 4000000
Pattern = FF
```

## Buffer DUMP/EDIT

Display and edit of buffer data

Data loaded in the buffer memory can be displayed and edited on M1940. Data conversion in the EDIT mode immediately rewrites the M1940 buffer memory.

Buffer DUMP/EDIT operation procedure

**Buffer operation**

**Buffer DUMP/EDIT**

- Press **MODE** key

Mode menu	
Device func	Buffer operation
I/O command	System config
Remote mode	

- Bring [ ] to Buffer operation with any direction key. Press **ENT** key, and Buffer set menu will appear on the display panel.
- Bring [ ] to Buffer DUMP/EDIT with any direction key. Press EN key, and the Buffer DUMP screen appears on the

Buffer set menu	
Buffer init	Buffer DUMP/EDIT
Byte swap	Word swap
Check sum	Protect setting

display pane.

- Change the Address with any direction key and display your desired address. This screen displays only the content of M1940 buffers memory. The DUMP field can not be changed.
- To change any data, press the COM key and select the EDIT mode.
- Move the cursor [ ] with right/left key and convert data with the up/down key.
- The DUMP mode and the EDIT mode can be selected with the COM key.

!  
DAMP      EDIT  
**COM** key

! CAUTION  
DATA conversion in the EDIT mode rewrites the M1940 buffer memory in real time.

Address	000000	0	← Cursor	DUMP	DUMP Mode display				
	0000000	FF	FF	FF	FF	FF	FF	FF	FF
	0000008	FF	FF	FF	FF	FF	FF	FF	FF
	0000010	FF	FF	FF	FF	FF	FF	FF	FF

DUMP Field

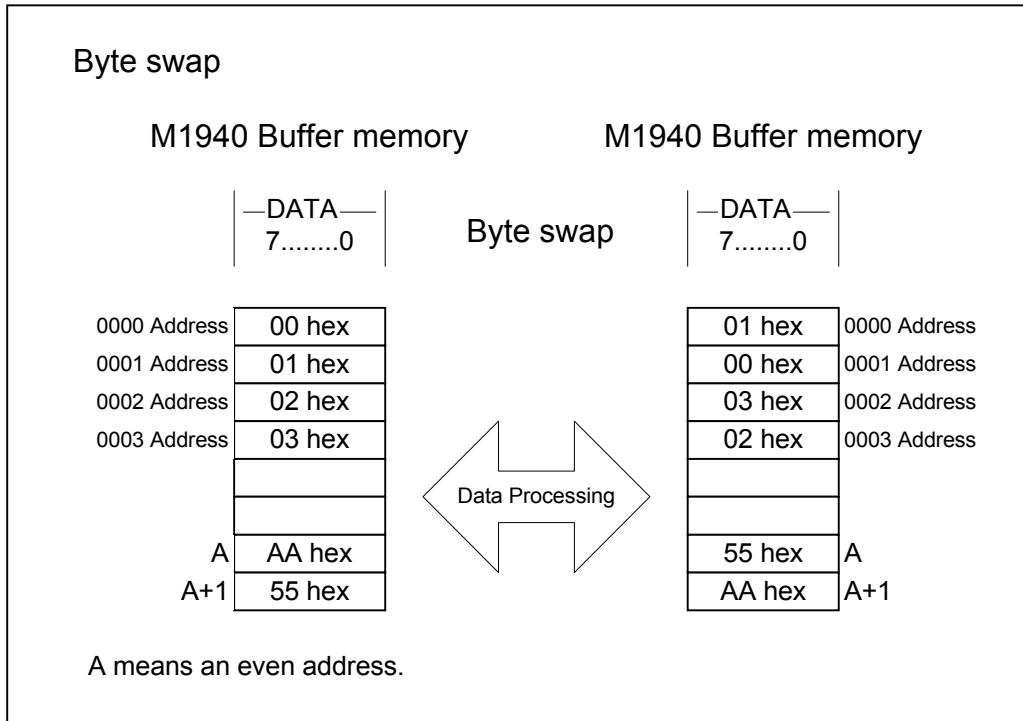
- To end the procedure, select the DUMP mode and press **MODE** key. You can not end the procedure directly in EDIT mode.

Address	000000	0	EDIT	Edit mode display					
	0000000	FF	FF	FF	FF	FF	FF	FF	FF
	0000008	FF	FF	FF	FF	FF	FF	FF	FF
	0000010	FF	FF	[FA]	FF	FF	FF	FF	FF

Cursor      Edit field

# Byte swap Buffer memory byte swap

This operation is to relocate the content of M1940 buffer data in byte unit.



## Byte swap operation procedures

### **Buffer operation**      **Byte swap**

- Press **MODE** key

Mode menu	Buffer operation
Device func	System config
I/O command	
Remote mode	

- Bring [ ] to Buffer operation with direction key. Press **ENT** key, and Buffer set menu will appear on the display panel.
- Bring [ ] to Byte swap with direction key, and press **ENT** key.

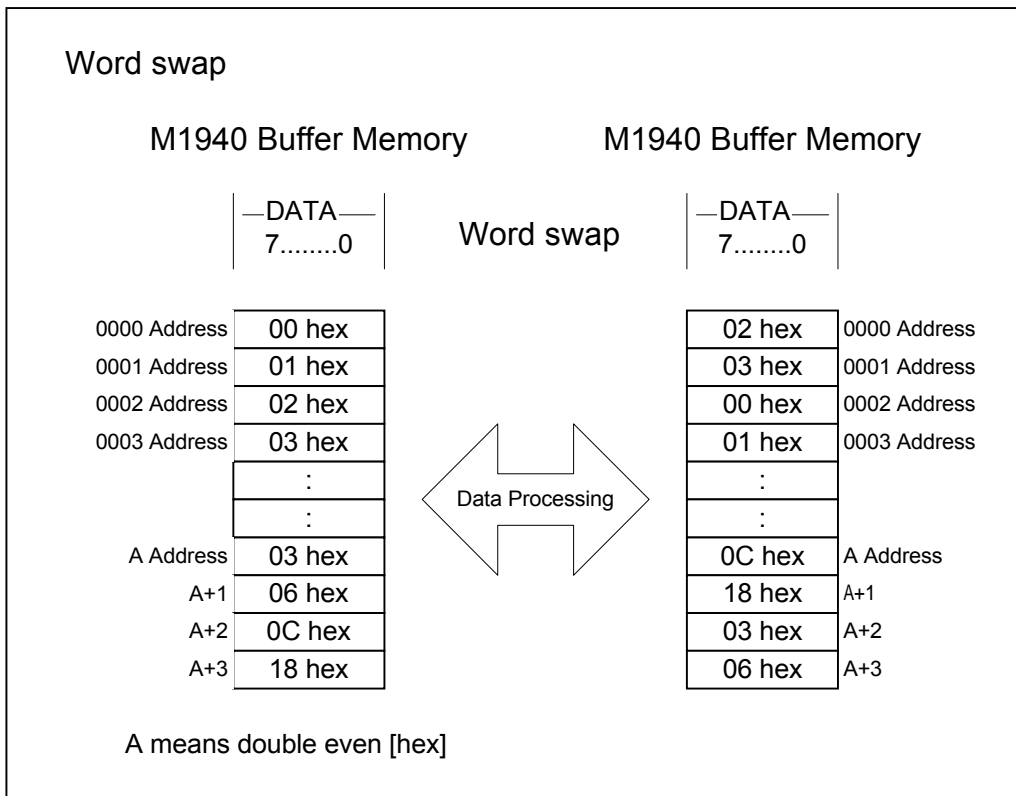
Buffer set menu	
Buffer init	Buffer DUMP/EDIT
Byte swap	Word swap
Check sum	Protect setting

- Press **START** key to execute.

! Execution happens by pressing **START** key. Re-execution will bring the content of the buffer to the original.

# Word swap Buffer Memory Word Swap

This operation is to relocate the content of M1940 data buffer in word unit.



## Word swap Operation Procedure

### **Buffer operation**      **Word swap**

- Press **MODE** key

Mode menu	Buffer operation
Device func	System config
I/O command	
Remote mode	

- Bring [ ] to Buffer operation with any direction key. Press **ENT** key and Buffer set menu will appear on the display panel

! Start the execution with **ENT** key. RE-execution will bring the buffer content to the original

Buffer set menu	Buffer DUMP/EDIT
Buffer init	Word swap
Byte swap	Protect setting
Check sum	

- Bring [ ] to Word swap with any direction key, and press **NT** key.
- Press **START** key to start the execution.

## Device check/ Buzzer/ LED Setting of Device-check, Buzzer and LED

### Device check ON/OFF

The device check is to find a device not placed correctly in a device socket due to incorrect insertion and to find a device not working correctly. In case of recent diversified devices, especially microcomputers with built-in memory, device check often do not agree with judgment value. In case of these devices, the device check has to be set to OFF.

### Buzzer ON/OFF

M1940 has a function to buzzer at the end of operation. The buzzer is generally set to ON to generate the sound. If the buzzer is not required, you can set it OFF.

### LED

At the end of operation, M1940 indicates the judgement result, PASS/FAIL, by lighting the LED of each device socket in proper color. When no device is set in a socket, the LED of the socket ( EMPTY SOCKET ) is lit in red meaning FAIL. You can change the setting so that the LED of an EMPTY SOCKET is not lit without displaying the judgement result, PASS/FAIL.

Device check/Buzzer/LED Operation Procedures

**System config**

**Devchk/BZ/LED**

- Press **MODE** key

Mode menu	
Device func	Buffer operation
I/O command	System config
Remote mode	

- Bring [ ] to System configuration with any direction key.
- Press ENT key, and the System configuration menu will appear on the display panel.

System configuration menu	
I/F config	Data format
Devchk/BZ/LED	Version display
Selfcheck mode	System update

- Bring [ ] to Devchk/Buzzer/LED with any direction key.
- Press ENT key, and the Devchk/Buzzer/LED setting screen will appear on the display panel.
- Bring [ ] to any item to be changed with **ENT** key.
- Each time the up/down key is pressed, the selected item changes to ON and OFF.
- To end the setting, press **START** key.

Devchk/BZ/LED setting OK -> [START] key	
Buzzer mode	= ON
Device check	=[ON ]
Empty LED	= ON

# Selfcheck Setting

## Selfcheck Skip / No skip

M1940 carry out self-diagnosis test right after truing on the power. This function does not work if a device is inserted in a device socket. It may even damage the device.

Due to the restriction of workflow, you may not be able to remove the socket adapter from the programmer. In such case, you can tentatively disable self-diagnosis function.

However, do not disable this function for a long period of time. Self-diagnosis test must be performed periodically.

No skip : All Selfcheck execution (default)

Skip : Disable self-diagnosis test on device socket.

Selfcheck Setting

**System config**

**Selfcheck mode**

- Press **MODE** key

Mode menu	Buffer operation
Device func	System config
I/O command	
Remote mode	

- Bring [ ] to System configuration with any direction key
- Press **ENT** key and System configuration menu will appear on the display panel.

System configuration menu	
I/F config	Data format
Devchk/BZ/LED	Version display
Selfcheck mode	System update

- Bring [ ] to Selfcheck mode with direction key.
- Press **ENT** key and then Selfcheck skip mode screen will appear on the display panel.

Selfcheck mode OK -> [START] key
Selfcheck mode =[No skip]

- Each time the up/down key is press, the selected item changes between No Skip and Skip.
- To end the setting, press **START** key.

# System update      Firmware version upgrade

In order to add device algorithm for newly supported device, new software can be stored in M1940 for version up. We recommend you to have Minato or Minato distributor to carry out the version up. Failure of version up procedure may damage the programmer.

## Operation Procedure

- Initialize the memory of M1940 with FF hex.
- Load version up software from the buffer memory 00000.
- Press **MODE** key.

Mode menu	Buffer operation
Device func	System config
I/O command	
Remote mode	

- Bring [ ] to System configuration with any directions key.
- Press **ENT** key. Then System configuration menu will appear on the display panel.

System configuration menu	
I/F config	Data format
Devchk/BZ/LED	Version display
Selfcheck mode	System update

- Bring [ ] to System update with any direction key and press **ENT** key.
- Press **START** key.

*** Now update system ***
!! Don't touch any key !!

- After above message is displaying, LED starts flashing.
- The color of LED will change to green starting from socket #1 sequentially.
- When all LED is changed to green, that is the end of version up even with above message on the screen.
- Reset and turn off/on the power.

! Any mistake on this operation may damage the programmer. Please consult with Minato or Minato distributor for version up.

# Connection to External Equipment

---

## Data Transfer

M1940 has equipped with the RS-232C and parallel (standard) or Ethernet (factory option) as an interface.

When connected to external equipment for data transfer, M1940 provides the following function.

- RS232C interface (send and receive)
- Parallel interface (receive)  
Please prepare cables accordingly.
- 
- This section explains the following operation.
- Data format: Transfer format
- Interface setting
- Data transfer command

Data Serial IN

Data Serial OUT

Data Parallel IN

Protect Data Serial IN

Protect Data Serial OUT

Protect Data Parallel IN

## Data format Transfer format

Before transferring, data, you are requested to set the format of the data for the transfer. Set the format in M1940 according to the data to be transferred. The following formats can be set in M1940.

Format	Data	Sum	Address	END
MINATO Hex	ASCII	Available	Available	Available
Intel Hex	ASCII	Available	Available	Available
MOTOROLA S	ASCII	Available	Available	Available
HP6400 ABS	Binary	Available	Available	Available
No Format	Binary	None	None	None

**Data format Operation Procedures**

**System config**

**Data format**

- Press **MODE** key

Mode menu	Buffer operation
Device func	System config
I/O command	
Remote mode	

- Bring [ ] to System config with any direction key.
- Press **ENT** key, and System configuration menu will appear on the display panel.

System configuration menu	
I/F config	Data format
Devchk/BZ/LED	Version display
Selfcheck mode	System update

- Bring [ ] to Data format with any direction key.
- Press **ENT** key and Data format menu screen will appear on the display panel.
- The currently set format is displayed in the area enclosed with [ ].

Format Select	OK -> [START] key
Transfer format = [MINATO hex ]	

- When the up/down key is pressed, the display in [ ] is changed in the following order.  
MINATO hex - Intel hex - Motorola S - HP64000ABS - No format
- Press **ENT** key and then [ ] will disappear. Then the format is selected.
- Press **START** to fix the format. This setting is valid even if the power is turned off/on.

!

This setting is valid even if the power is turned off. If the system version is upgraded reset the system.

## Setting interface

### RS232C Communication setting

When connecting to external equipment with RS-232C interface, the communication conditions have to be adjusted accordingly.

Available communication setting is as follows.

Items to be set	Parameter
Baud rate	9600, 19200, 38400, 57600, 115200 [bps]
Character length	7, 8 [bit]
Stop bit	1, 2 [bit]
Parity	None, ODD, EVEN
Control method	XON/XOFF, RTS/CTS, None

### Ethernet communication setting

Please refer to attached sheet

### Parallel I/F communication setting

No initial setting is required for parallel I/F. Connect the unit to external equipment with a parallel cable. Then the unit becomes ready for communication.

Interface Condition Setting

**System config**

**I/F config**

- Press **MODE** key.

Mode menu	Buffer operation
Device func	System config
I/O command	
Remote mode	

- Bring [ ] to System configuration with any direction key.
- Press **ENT** key. Then System configuration menu will appear on the display panel.

System configuration menu	
I/F config	Data format
Devchk/BZ/LED	Version display
Selfcheck mode	System update

- Press **ENT** key. Then I/F config screen will appear on the display panel.
- Bring [ ] to I/F config with any direction key.
- Bring [ ] to any item to be changed with **ENT** key.

I/F Config	Push [START] key		
I/F	RS232C	PARITY	None
BAUD RATE	115000	STOP BIT	2bit
CHARACTER	8bit	CONTROL	XON/XOFF

- When **ENT** key is pressed, the item changes as the following order.

I/F	RS232C - 10BASE-T - 100BASE-TX
BAUD RATE	9600 - 19200 - 38400 - 57600 - 115200
CHARACTER	7 - 8
PARITY	None - ODD - EVEN
STOP BIT	1 - 2

When 10 BASE-T or 100 BASE-TX is selected, this setting is not effective.

- The changed communication condition is stored by pressing **START** key. This setting is valid even if the power is turned off.

# Data transfer commands

The following commands are used for data transfer.

## Data Transfer Command

- Data Serial IN **(Data SR In)**  
This command is for inputting data through Serial I/F( RS232C or Ethernet )  
Make M1940 ready for Serial I/F in and load the input data in to the buffer according to specified data format.
- Data Serial OUT **(Data SR Out)**  
This command is for outputting data through Serial I/F with the specified data format (RS232C or Ethernet).
- Data Parallel IN **(Data PR In)**  
This command is for inputting data through Parallel I/F.
- Make M1940 Parallel I/F ready for Parallel in and load the input data in the buffer according to specified data format.

## Protect Information Transfer Command

Designated area is preparing other than the standard buffer memory to store protects information.

- Protect Data Serial IN **(Protect SR In)**  
This command is for inputting data of protect information through Serial I/F.
- Protect Data Serial OUT **(Protect SR Out)**  
This command is for outputting data of protect information through Serial I/F.  
It outputs protect information of the M1940 through Serial I/F according to the setting of Data format.
- Protect Data Parallel IN **(Protect PR In)**  
This command is for inputting data of protect information through parallel I/F.  
Make M1940 parallel I/F ready to load the protect information and load input data in the buffer according to specified data format.

**Data Transfer/ Protect Information Command Operation Procedures**

- Press **MODE** key

Mode menu	
Device func	Buffer operation
I/O command	System config
Remote mode	

- Bring [ ] to I/O command with direction key.
- Press **ENT** key, and I/O command menu will appear on the display panel.
- Bring [ ] to a command with any direction key.
- Press **ENT** key. Then respective command setting screens will appears described in the following.

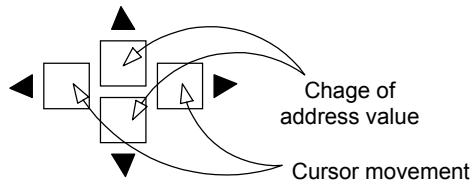
I/O command menu	
[Data SR In ]	Protect SR In
Data SR Out	Protect SR Out
Data PR In	Protect PR In

**I/O command****Data SR In**

- Select Serial IN from the I/O command menu.
- For buffer store address, set the start address of M1940 buffer memory of the transferred data. Move the cursor `_` with the right/left direction key and change the address value with up/down direction key.

```

Data Transfer      OK -> [START]key
Serial Input       Intel hex
Data start address =[0000000]
Buffer store address = 0000000
  
```



- Press **ENT** key. Then [ ] will move.
- Set the start address of the M1940 buffer memory in which transferred data are stored to buffer store address. Move the cursor `_` with right/left direction key and change the address value with the up/down direction key.
- Press **START** key. Then Serial I/F will become ready for input.
- Transfer data from external equipment.

```

Data Transfer
Serial input                               Intel hex
*** COMPLETE ***
  
```

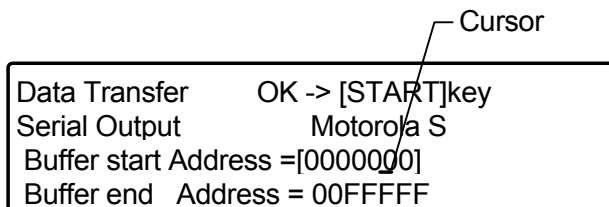
- When above message appears on the screen, the transfer is completed.

Data Serial OUT Command of setting and execution ( Data Transfer )

I/O command

Data SR Out

- Select SR OUT from I/O command menu.
- For buffer start address, set the start address of the buffer memory of the data to be transferred from M1940? Move the cursor\_ with the right/left direction key and change the address value with the up/down direction key.



A screenshot of a menu titled "Data Transfer" with the following text: "Data Transfer OK -> [START]key", "Serial Output Motorola S", "Buffer start Address =[0000000]", and "Buffer end Address = 00FFFFFF". A line labeled "Cursor" points to the digit "0" in the Buffer start Address field.

- For buffer end address, set the buffer memory end address of the data to be transferred from M1940. Set the end address of the Buffer memory of the data to be transferred from end Address. Move the cursor\_ with the right/left direction key and change the address value with up/down direction key.
- Press **START** key. Then data will be output from the Serial I/F.



A screenshot of the "Data Transfer" menu showing the completion message: "Data Transfer", "Serial output Motorola S", and "\*\*\* COMPLETE \*\*\*".

- When this message appears on the screen, the transfer is completed.

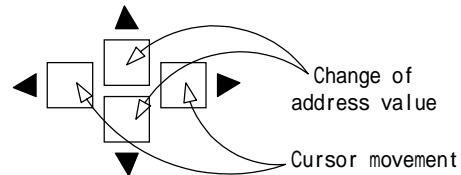
I/O command

Data PR In

- Select Data Parallel In from the I/O command menu.

```

Data Transfer      OK -> [START]key
Parallel input     Motorola S
Data start Address = [0000000]
Buffer store Address = 0000000
    
```



- For data start address, set the start address of the data to be transferred. Move the cursor \_ with the right/left direction key and change the address value with the up/down direction key.
- For buffer store address, set the start address of M1940 buffer memory of the transferred data. Move the cursor \_ with the right/left direction key and change the address value with up/down direction key.
- Press **START** key. Then data will be output from the Parallel I/F.
- Transfer data from external equipment.

```

Data Transfer
Parallel input           Motorola S
*** COMPLETE ***
    
```

- When this message appears on the screen, the transfer is completed.

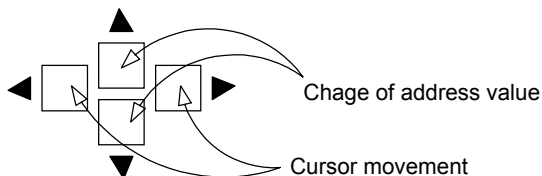
**Protect Serial IN Command of setting and execution ( Protect inf. transfer )**

**I/O command**

**Protect SR In**

- Select Protect SR IN from the I/O command menu.

```
Protect Transfer      OK -> [START]key
Serial Input          Intel hex
Protect start address =[0000000]
```



- For protect start address, set the address according to the data of the transfer.  
Move the cursor\_ with the right/left direction key and change the address value with up/down direction key.
- Press **START** key. Then data will be output form the Serial I/F.
- Transfer data from external equipment

```
Protect Transfer
Serial Input          Intel hex
*** COMPLETE ***
```

- When above message appears, the transfer is completed.

!  
When the device code is set or the power is turned off, this setting is cleared.

## Protect Serial OUT Command of setting and execution ( Protect inf. transfer )

### I/O command

### Protect SR Out

- Select Protect SR Out from the I/O command.

```
Protect Transfer    OK -> [START]key
Serial Output      Motorola S
Protect start address    =0000000
Protect end address     = 0000006
```

- The protects area of the device selected in M1940 is displayed. It can not be changed
- Press **START** key. Then protect data is output from Serial I/F.

```
Protect Transfer
Serial Output      Motorola S
*** COMPLETE ***
```

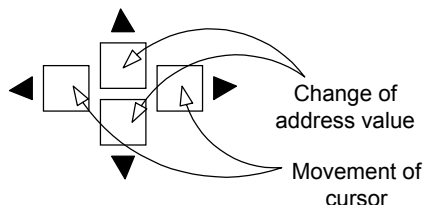
- When above message appears on the screen, the transfer is completed.

**Protect Parallel IN Command of setting and execution ( Protect inf. transfer )**

**I/O command      Protect PR In**

- Select Protect PR In from the I/O command menu.

```
Protect Transfer    OK -> [START]key
Parallel Input                    Motorola S
Protect start address =[0000000]
```



- For protect start address, set an address within the transferred protect data in the format. Move the cursor\_ with the right/left direction key and change the address value with up/down direction key.
- Press **START** key. Then Parallel I/F becomes ready for input.
- Transfer data from external equipment.

```
Protect Transfer
Parallel Input                    Motorola S
*** COMPLETE ***
```

!

When the device code is set or the power is turned off, this setting is cleared.

- When above message appears on the screen, the transfer is completed.

## Controlling M1940 in remote

---

The M1940, in addition to the panel operation from the main unit key switch described in the previous section, enables the remote operation which directly operates the functions of the M1940 from an external terminal by connecting the external device to the terminal via serial I/F (in case of XP-ROM remote control software, data will be sent through parallel)

This operation mode is called remote mode of M1940.

Minato offers two types of mode, m1890 mode and M1900 mode. M1940 supports M1900 mode.

To use the M1940 in the remote control mode, the serial I/F needs to be present. Refer to the connection with the external device.

## Remote Mode Condition setting

There are the functions, which can select conditions in the remote mode between M1940 and an external terminal.

This setting consists of how to set the condition by the main panel operation and how to set the conditions in the remote mode. The contents of the setting are as follows.

### ■ Echo back

Echo back select whether or not M1940 returns a code sent from an external terminal. If the special characters described later can be found in input characters, simple echo back executes each processing without performing the selection even when echo back is set on.

### ■ Prompt

M1940 outputs a prompt to an external terminal when the preparation of the next command input is enabled after command processing has been terminated. The character output as a prompt can be selected from the following three types of symbols.

- |   |   |
|---|---|
| 1 | #   |
| 2 | # <span style="border: 1px solid black; padding: 0 2px;">CR</span> <span style="border: 1px solid black; padding: 0 2px;">LF</span> |
| 3 | None  |

### ■ Timeout

This function halts processing as a timeout if there is no input from the corresponding interface for a fixed time at data input command execution.

■ For M1940, the timeout setting is fixed to none.

### ■ ACK/NAK

M1940 is provided with the function of returning ACK when a command sent from an external terminal was received or NAK when an error was detected. Whether or not this function is used can be selected.

ACK : (41h)

NAK : (4Eh)

### ■ Command type

Minato offers the following two remote mode. It differs depending on the model of the programmer.

- |   |            |   |            |
|---|------------|---|------------|
| 1 | m1890 mode | 2 | m1900 mode |
|---|------------|---|------------|

In case of M1940, m1900 mode is supported.

### ■ Buzzer

M1940 produces a buzzer sound in accordance with the result of the remote command at remote mode execution. This function can select whether or not this buzzer sound is produced. Regardless of the setting of buzzer, execution of M1940 basic function (COPY, PROGRAM, etc) will sound the buzzer with PASS/FAIL result. In M1940, dummy read is fixed to ON.

## How to Set Remote Mode Condition

M1940 has the following two methods of setting remote mode condition.

1. By panel operation
2. By changing from an external terminal by a command  
(Refer to RMD )

The method by the panel operation of (1) is described here. For the method of (2), refer to the RMD command decied in later section.

### Remote mode

### Remote config

- Press MODE key.

Mode menu	Buffer operation
Device func	System config
I/O command	
Remote mode	

- Use the direction key to set [ ] to Remote mode.
- When pressing **ENT** key, the display panel displays the Remote mode menu.
- Use direction key to set [ ] to Remote config.
- When pressing **ENT** key, the display panel displays the Remote config menu.

Remote mode menu	Remote config
Remote	

- Set value can be changed using the up/down key.
- Use **ENT** key to move [ ] of a setting item.

Remote mode config.	OK -> [START] key
ECHO [ ON ]	BZ MODE ON
PROMPT #CRLF	
ACK/NAK OFF	

The value enclosed [ ] can be changed using the up/down key.

- The setting changed is stored by pressing the **START** key. This setting is valid even if the power is turned off.

!

This setting is valid even if the power is turned off. If the system version is upgraded reset the system.

**Special Characters**

The following codes in the remote mode input command are handled as special codes. Accordingly, even in the echo back ON state, simple echo back is not performed.

Character Hex Code	Process of M1940	Character Hex Code	Process of M1940
NUL 00	Ignored	DLE 10	Ignored
SOH 01	Ignored	DC1 11	XON processing
STX 02	Ignored	DC2 12	Ignored
ETX 03	Ignored	DC3 13	XOFF processing
EOT 04	Break command	DC4 14	Ignored
ENQ 05	Ignored	NAK 15	Ignored
ACK 06	Ignored	SYN 16	Ignored
BEL 07	Ignored	ETB 17	Ignored
BS 08	Backspace	CAN 18	Ignored
HT 09	Ignored	EM 19	Ignored
LF 0A	Ignored	SUB 1A	Ignored
VT 0B	Ignored	ESC 1B	Ignored
FF 0C	Ignored	FS 1C	Ignored
CR 0D	Command terminator	GS 1D	Ignored
SO 0E	Ignored	RS 1E	Ignored
SI 0F	Ignored	US 1F	Ignored
		DEL 7F	Back Space

## Remote Mode Start up

To operate M1940 in remote mode, it must be in set in remote mode.

### How to start up in remove mode

To start up M1940 in remote mode, there are two methods.

1. By panel operation
2. From an external terminal by a command

### Start up by the panel operation

#### Remote mode

#### Remote config

- Press **MODE** key

Mode menu	Buffer operation
Device func	System config
I/O command	
Remote mode	

- Use the direction key to [ ] to Remote mode.
- When pressing **ENT** key, the display panel displays the Remote mode menu.
- Use the direction key to set [ ] to Remote.

Remote mode menu	
Remote	Remote config

- When pressing **ENT** key, M1940 enter into the remove mode and the display panel appears as shown below.

Remote mode
-------------

## How to change from an External Terminal by a Command.

- Enter a control code from the external device connected to Serial I/F

Keyboard operation      ASCII (Hex Code)

Ctrl+E    Ctrl+E              ENQ(05h) ENQ(05h)

- M1940 may not be started up well according to the current operation mode.

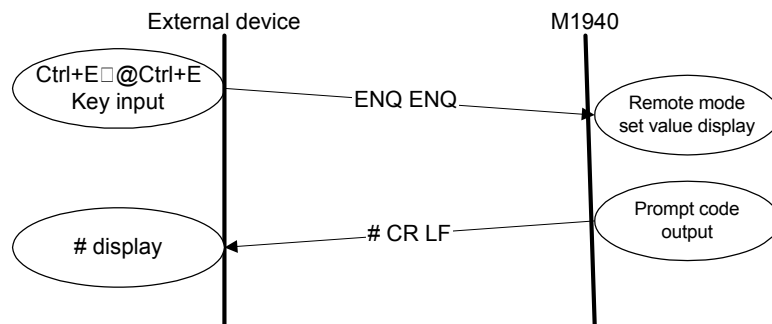
In this case, press the RESET key of the main unit key switch to reset the current operation mode, then reenter a control code.

- When M1940 receives a control code, it displays the following and return a prompt code [# code].



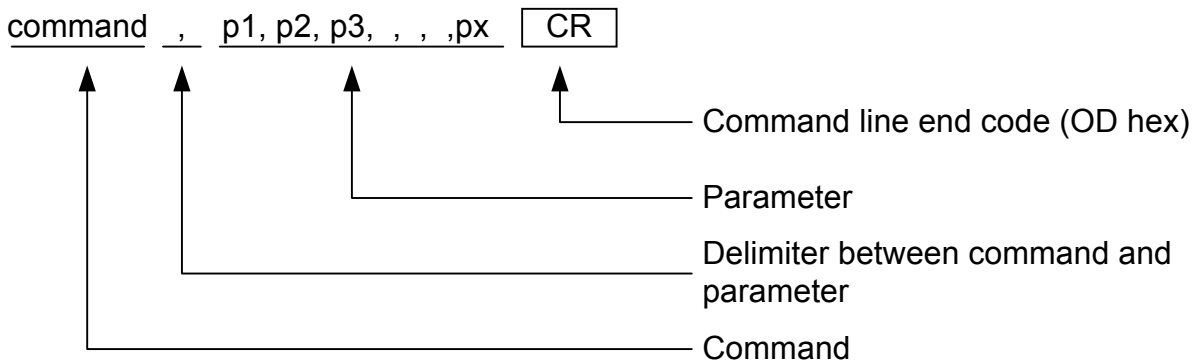
- The contents displayed on the upper right of the display panel are the set value of the current remote control mode.

- Then M1940 becomes wait status if incorrect characters are generated at this stage, check I/F conditions and cables. (It can not be identified if no prompt setting in the remove command condition).



## Remote Mode Command Instruction Format

### Remote mode command format



This command is valid only for all uppercase letters

The delimiter between parameters is a comma ( , )

### How to omit a parameter

Parameter can also be omitted. When there is no parameter and there is a parameter, there is some command which differs in operation can be found every command. Refer to the details of the command described later. How to omit a part of commands having more than one parameter is described here.

Basic format	command ,p1,p2,p3	CR
When only p1 is desired to be changed	command ,p1	CR
When only p3 is desired to be changed.	command , , ,p3	CR

**Codes used in this text (Remote Mode)**

The codes used for inputting instructions are defined as follows.

[n] Output from an external terminal, no echo back from a programmer present

n Output from an external terminal, echo back from a programmer present  
(Echo back ON/OFF can be set )

(LF) Output from a programmer  
( Output for echo back ON/not output for OFF )

n Output from a programmer

SP Space code

CR Carriage return

LF Line feed

D1 XON

D3 XOFF

## Execution result display

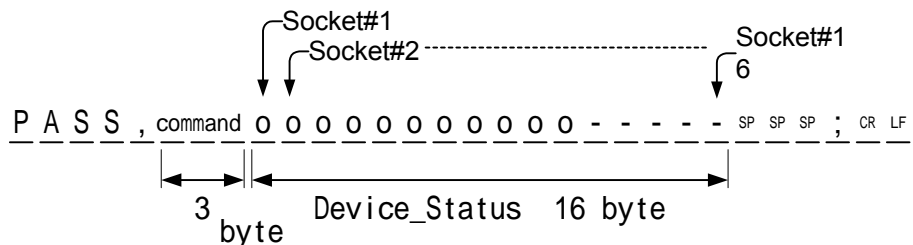
In the remote mode, the execution result of each command is output to an external terminal regardless of a response of the command itself. The basic output format is divided into two types according to the type of the command.

	Command
Execution command for device	OP, CP, Z, ER, B, BL, V, VF, W, PG, OT, CT, CK
Others	

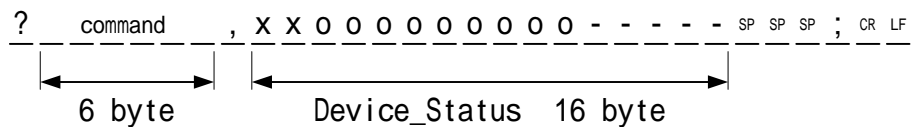
A device status that corresponds to each device socket number of M1940 is returned to an external terminal as the execution result of the device execution command.

### Device execution command output format

#### Output format at normal termination

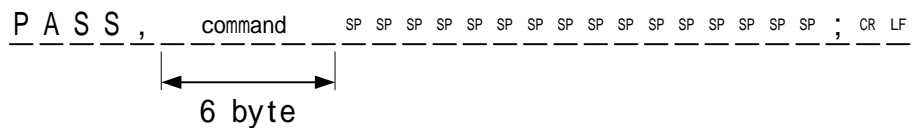


#### Output format at abnormal termination

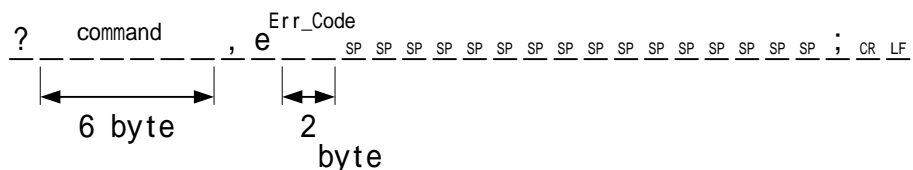


### Other command output format

#### Output format at normal termination



#### Output format at abnormal termination



# Remote Mode Commands

## List of Commands Used in the Remote Mode

Command	Description of operation	Parameter	Page
Ctrl+E	Remote Mode Startup		75
RMD	Remote Mode Condition Setting	p1, p2, p3, p4, p5, p6, p7, p8	80
E, BY	Remote Mode End		81
Ctrl+D	Break Command		82
H	Help Message Listing		83
N, DV	Device Selection Command	p1	84
OP, CP	Copy Mode Execution		85
Z, ER	ERASE Mode Execution		86
B, BL	BLANK Mode Execution		87
W, PG	PROGRAM Mode Execution		88
V, VF	VERIFY Mode Execution		89
OT, CT	CONTINUOUS Mode Execution		90
CK	Precheck Command		91
MD, PAE	Operation Address Range Setting Command	p1, p2, p3	92
S, DF	Data Transfer Format Setting	p1	94
BS	Programmer Memory Size Display		98
REV	Firmware version Output		98
L, LS	Buffer Memory Data Display	p1, p2	99
BO, CS	Checksum Display (4-Digit)		100
BO8,CS8	Checksum Display (8-Digit)		101
F, INI	Buffer Memory Initialization	p1,p2,p3,p4,p5,p6 p7,p8,p9,p10	102
SCH	Data Search Command (Matching)	p1,p2,p3,p4,p5,p6,p7,p8,p9,p10	103
UNS	Data Search Command (Mismatching)	p1, p2, p3	104
T	Data Transfer Command	p1, p2, p3	105
P, PL, WD	Serial I/F Data Output	p1, p2	106
RL	Serial I/F Data Input	p1, p2, p3	108
RD	Serial I/F Data Input	p1, p2	109
RH	Parallel I/F Data Input	p1, p2, p3	110
PCH	Protection Mode Change	p1	111
WP	Protection Data Serial I/F Output		112
RP	Protection Data Serial I/f Input	p1, p2	113
RPP	Protection Data Parallel I/F Input	p1, p2	114

## RMD Remote Mode Condition Setting

The setting of remote mode condition can be changed or checked.

Item can be set:

### Command format

```
RMD, p1, p2, p3, p4, p5, p6, p7
```

#### Parameters

p1	: Echo back	0 : ON	1 : OFF
p2	: Prompt	0 : #	1 : # CR LF    2 : None
p3	: Timeout	0 : None	1 ~ FF : ---
p4	: ACK/NAK	0 : OFF	1 : ON
p5	: Command type	0 : ---	1 : m1900
p6	: Buzzer	0 : ON	1 : OFF
p7	: Dummy read	0 : ---	1 : ON

!

This setting is valid even if the power is turned off. If the system version is upgraded reset the system.

### Confirmaton for the condition

```
RMD CR (LF)
```

```
SP 0 SP SP SP ECHO SP ON SP SP SP SP CR LF
```

```
SP 0 SP SP SP # SP SP SP SP SP SP SP SP SP CR LF
```

```
SP 0 SP SP SP TMO SP OFF SP SP SP SP CR LF
```

```
SP 0 SP SP SP ACK / NAK SP OFF CR LF
```

```
SP 1 SP SP SP M1900 SP mode SP CR LF
```

```
SP 1 SP SP SP BUZZER SP OFF SP CR LF
```

```
SP 1 SP SP SP PDM SP ON SP SP SP SP SP CR LF
```

```
PASS , RMD SP SP SP SP SP SP SP SP SP SP SP SP SP SP SP SP SP SP SP ; CR LF
```

### Chage of the condition

```
RMD , p1 , p2 , p3 p3 , p4 , p5 , p6 , p7 CR (LF)
```

```
PASS , RMD SP SP SP SP SP SP SP SP SP SP SP SP SP SP SP SP SP SP SP ; CR LF
```

E, BY

**Remote Mode End**

The remote mode is terminated

Command format

E

BY

Parameter : None

E CR (LF)

BY CR (LF)

**Ctrl+D**

**Break Command**

**BREAK Code**

**Break Command**

Halts the processing that is currently being executed and returns to the command wait state.

Command format

Ctrl+D

or

BREAK code

Parameters : None

## H Help Message Listing

This instruction outputs a list of remote command

Command format

H

Parameter : none

H CR (LF)

<<< Example of output >>>

```
*****
*      M1894 remote command      *
*****
*** remote mode control ***
E,BY      : remote mode end      RMD      : remote config.
REV       : prom version display H      : help message display
BS        : buffer size display  ^D      : cancel command
break    : cancel command        ^E^E    : remote start
*** data in/out command ***
S,DF      : transfer format set  F,INI    : buffer mem initialize
P,PL,WD   : serial output        RL,RD    : serial input
WP        : protect serial output RP      : protect serial input
*** unit execute command ***
OP,CP     : copy command         OT,CT    : cont command
B,BL      : blank command        V,VF     : verify command
W,PG      : program command      Z,ER     : EEPROM erase command
CK        : contact check command
*** other command ***
BO,CS     : check sum (4 figures) B08,CS8  : check sum (8 figures)
N,DV      : device select        PCH      : protect mode change
L,LS      : buffer mem display   T        : buffer mem transfer
SCH       : buffer mem search    UNS      : buffer mem un_search
```

P A S S , H SP ; CR LF

## N, DV

## Device Selection Command

This command selects or checks a target device to be operated. Select a Device Code of a target device from the attached device code list and set it.

The device code that is currently being set is output with no parameter.

### Command format

N, p1

DV, p1

Parameter

p1 : Device Code ( hex )

!  
The automatic setting  
function is not  
supported for M1940.

### Confirmation

N CR (LF)

0 9 0 2 0 1 CR LF

P A S S , N SP ; CR LF

DV CR (LF)

0 2 0 1 0 1 CR LF

P A S S , D V SP ; CR LF

### 設定

N, p1 p1 p1 p1 p1 p1 p1 CR (LF)

P A S S , N SP ; CR LF

DV, p1 p1 p1 p1 p1 p1 p1 CR (LF)

P A S S , D V SP ; CR LF

**OP, CP**

**COPY Mode Execution**

This command transfer data from the device set in device socket #1 to M1940 buffer memory.

Command format

OP

CP

Parameter	:	none
Status	:	
		o (6Fh)      Normal termination
		x (78h)      Abnormal termination
		- (2Dh)      Not connected

**OP**<sub>CR</sub> (LF)

P A S S , O P <sup>SP</sup> o - - - - - SP SP SP ; CR LF

**CP**<sub>CR</sub> (LF)

P A S S , C P <sup>SP</sup> o - - - - - SP SP SP ; CR LF

## Z, ER

### ERASE Mode Execution

This command detects programmed data from electrically erasable devices (EE-PROM type and Flash type) set in device sockets #1 to #16.

#### Command format

Z

ER

Parameter : none

Status :

o (6Fh) Normal termination

x (78h) Abnormal termination

- (2Dh) Not connected

Z CR (LF)

P A S S , Z SP SP 0 0 0 0 0 0 0 0 0 0 0 0 0 0 - - - - - SP SP SP ; CR LF

E R CR (LF)

P A S S , E R SP 0 0 0 0 0 0 0 0 0 0 0 0 0 0 - - - - - SP SP SP ; CR LF

**B, BL BLANK Mode Execution**

This command checks whether or not data is contained in the device set in device sockets #1 to #16.

Command format

B

BL

Parameter : none

Status :

- o (6Fh) Normal termination
- x (78h) Abnormal termination
- (2Dh) Not connected

B CR (LF)

P A S S , B SP SP 0 0 0 0 0 0 0 0 0 0 0 0 0 0 - - - - - SP SP SP ; CR LF

BL CR (LF)

P A S S , B L SP 0 0 0 0 0 0 0 0 0 0 0 0 0 0 - - - - - SP SP SP ; CR LF

# W, PG

## PROGRAM Mode Execution

This command programs the contents of M1940 buffer memory to the device set to device sockets #1 to 16.

### Command format

W

PG

Parameter : none

Status :

- o (6Fh) Normal termination
- x (78h) Abnormal termination
- (2Dh) Not connected

W CR (LF)

P A S S , W SP SP 0 0 0 0 0 0 0 0 0 0 0 0 0 0 - - - - - SP SP SP ; CR LF

P G CR (LF)

P A S S , P G SP 0 0 0 0 0 0 0 0 0 0 0 0 0 0 - - - - - SP SP SP ; CR LF

**V, VF**

**VERIFY Mode Execution**

This command compare the device set to device sockets #1 to #16 and the contents of M1940 buffer memory.

Command format

V

VF

Parameter : None

Status :

- o (6Fh) Normal termination
- x (78h) Abnormal termination
- (2Dh) Not connected

V CR (LF)

P A S S , V SP SP 0 0 0 0 0 0 0 0 0 0 0 0 0 0 - - - - - SP SP SP ; CR LF

V F CR (LF)

P A S S , V F SP 0 0 0 0 0 0 0 0 0 0 0 0 0 0 - - - - - SP SP SP ; CR LF

## OT, CT

### CONTINUOUS Mode Execution

This command automatically and sequentially executes the operation sequence into a device recommended by our company when the contents of M1940 buffer memory are desired to be programmed to the device. The operation procedure and internal flow differ in the FLASJ/EE-PROM type in which a device type supports electrical erase (M1940 ERASE mode) and the EP=ROM type in which it does not support electrical erase. For detail, refer to CONTINUOUS of the basic operation

#### Command format

OT

CT

Parameter : None

Status :

o (6Fh)	Normal termination
x (78h)	Abnormal termination
- (2Dh)	Not connected

OT<sub>CR</sub> (LF)

P A S S , O T <sub>SP</sub> 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 - - - - - <sub>SP SP SP</sub> ; CR LF

CT<sub>CR</sub> (LF)

P A S S , C T <sub>SP</sub> 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 - - - - - <sub>SP SP SP</sub> ; CR LF

**CK Precheck Command**

This command checks the connection status between a device and a device socket.

Command format

CK

Parameter : None

Status :  
o (6Fh) Normal termination  
x (78h) Abnormal termination  
- (2Dh) Not connected

CK (LF)

PASS, CK SP 0 0 0 0 0 0 0 0 0 0 0 0 - - - - - SP SP SP ; CR LF

CK (LF)

?CK SP SP SP SP , OXXX - - - - - SP SP SP ; CR LF

**Operation of address Range Setting Command**

This command sets an operation range of the basic operation.  
According to parameter, device starts address, end address and buffer memory start address can be specified.

The address can be set depends on the method to program the device For detail, refer to the PAE mode of the applicable operation.

The current setting is output with no parameter.

By using expanded command format, multi PAE mode and be set and disabled. You can also check the status of PAE mode.

**Command format**

MD, p1, p2, p3
----------------

PAE, p1, p2, p3
-----------------

Parameter :

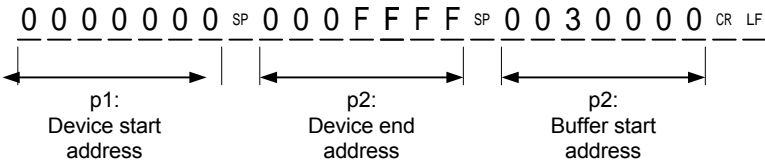
- p1 : Device start address ( hex )  
" - " Default value = 00
- p2 : Device end address ( hex )  
" - " Default value : Buffer end address
- p3 : Buffer start address ( hex )  
" - " Default value = 00

!

For detail, please refer to PAE mode.  
(Advance operation)

Confirmation

M D CR (LF)



P A S S , M D SP ; CR LF

P A E CR (LF)

0 0 0 0 0 0 SP 0 0 0 F F F F SP 0 0 3 0 0 0 0 CR LF

P A S S , P A E SP ; CR LF

Setting

M D , p1 --- p1 , p2 --- p2 , p3 --- p3 CR (LF)

P A S S , M D SP ; CR LF

P A E , p1 --- p1 , p2 --- p2 , p3 --- p3 CR (LF)

P A S S , P A E SP ; CR LF

## MD, PAE

### Command to set targeted address area ( Expanded/ Multi PAE)

MD, PAE command has extension command. By having extensions, Multi PAE mode can be set, disabled, checked.

【Expanded command】

**DIS** To disable Multi PAE

**MLT** Multi PAE mode setting

**MOD** Display of the status of PAE mode

Format of expended command

Disable multi PAE ( default setting )

MD, DIS

PAE,DIS

Multi PAE mode setting

MD, MLT

MD, MLT

Display the status of PAE mode

MD, MOD

PAE, MOD

[Response]

DIS : Multi PAE is not effective

ENB : Single PAE mode

MLT 2 : Multi PAE mode

Disable

DIS

**M D , D I S** CR (LF)

P A S S , M D SP ; CR LF

**P A E , D I S** CR (LF)

P A S S , P A E SP ; CR LF

Multi PAE setting

MLT

**M D , M L T** CR (LF)

P A S S , M D SP ; CR LF

**P A E , M L T** CR (LF)

P A S S , P A E SP ; CR LF

Dispaly of PAE status 【 MOD 】

**M D , M O D** CR (LF)

D I S CR LF

P A S S , M D SP ; CR LF

**P A E , M O D** CR (LF)

M L T SP 2 CR LF

P A S S , P A E SP ; CR LF

## S, DF

### Data Transfer Format Setting

This command can change or check the setting of a data transfer format

Command format

S, p1

DF, p1

Parameter :

p1 : Data format number  
0 : MINATO HEX  
1 :  
2 : INTEL HEX  
3 : HP64000 ABS  
4 :  
5 : MOTOROLA S  
6 :  
7 :  
9 :  
10 :  
11 :  
12 :  
13 :  
14 : No Format

Check

S CR (LF)

SP 0 2 SP SP SP I N T E L SP SP H e x CR LF

P A S S , S SP ; CR LF

D F CR (LF)

SP 0 5 SP SP SP M O T O R O L A SP S CR LF

P A S S , D F SP ; CR LF

Setting

S , p1 p1 CR (LF)

P A S S , S SP ; CR LF

D F , p1 p1 CR (LF)

P A S S , D F SP ; CR LF

## BS

### Buffer Memory Size Output

This command outputs a size of the buffer memory installed in M1940.

Command format

BS

Parameter : None

BS CR (LF)

1 0 2 4 M SP b i t SP b u f f e r CR LF

P A S S , B S SP ; CR LF

## REV

### Firmware version output

This command outputs a firmware version of M1940.

Command format

REV

REV CR (LF)

SP V SP 1 . 3 0 SP SP SP SP SP SP SP SP SP SP CR LF

P A S S , R E V SP ; CR LF

Parameter : none

**L, LS Buffer Memory Data Display**

This command output buffer memory data.  
According to a parameter, the start address and end address of a buffer memory to be displayed can be specified.

Command format

L, p1, p2

LS, p1, p2

Parameter:

- p1 : Start address ( hex )  
Default value = 00
- p2 : End address ( hex )  
Default value = Buffer end address

L,0,2F CR (LF)

Example p1:0000;p2:002F

```

0 0 0 0 0 0 0 SP 0 3 SP 0 6 SP 0 C SP 1 8 SP 3 0 SP 6 0 SP C 0 ----- SP 0 6 CR LF
0 0 0 0 0 1 0 SP 0 C SP 1 8 SP 3 0 SP 6 0 SP C 0 SP 0 3 SP 0 6 ----- SP 1 8 CR LF
0 0 0 0 0 2 0 SP 3 0 SP 6 0 SP C 0 SP 0 3 SP 0 6 SP 0 C SP 1 8 ----- SP 6 0 CR LF
P A S S , L SP SP SP SP SP SP SP SP SP SP SP SP SP SP SP SP SP SP SP SP SP ; CR LF

```

LS,0,FF CR (LF)

Example p1:0000;p2:00FF

```

0 0 0 0 0 0 0 SP 0 3 SP 0 6 SP 0 C SP 1 8 SP 3 0 SP 6 0 SP C 0 ----- SP 0 6 CR LF
0 0 0 0 0 1 0 SP 0 C SP 1 8 SP 3 0 SP 6 0 SP C 0 SP 0 3 SP 0 6 ----- SP 1 8 CR LF
0 0 0 0 0 2 0 SP 3 0 SP 6 0 SP C 0 SP 0 3 SP 0 6 SP 0 C SP 1 8 ----- SP 6 0 CR LF
      |           |           |           |
0 0 0 0 0 F 0 SP 0 C SP 1 8 SP 3 0 SP 6 0 SP C 0 SP 0 3 SP 0 6 ----- SP 1 8 CR LF
P A S S , L S SP SP SP SP SP SP SP SP SP SP SP SP SP SP SP SP SP SP SP SP ; CR LF

```

# BO, CS

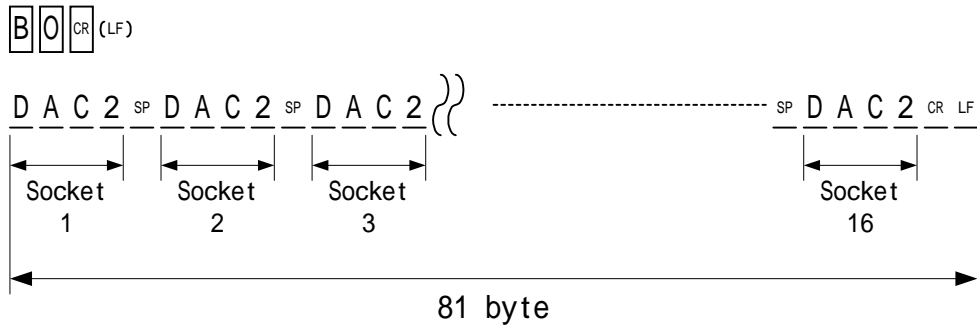
## Checksum Display ( 4-Digit )

This command calculates and outputs a checksum of the buffer memory within the execution range. The checksum display is performed in four digits.

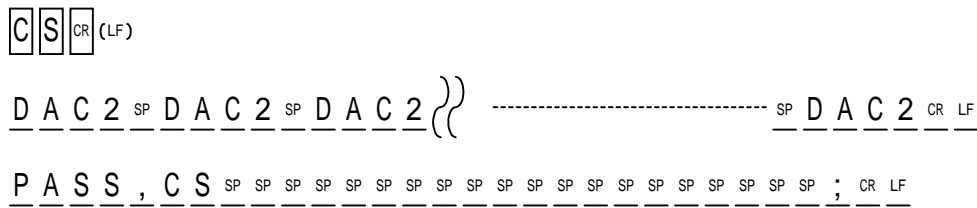
### Command format

BO
CS

Parameter : none



P A S S , B O SP ; CR LF



**BO8, CS8**

**Checksum Display ( 8 Digit )**

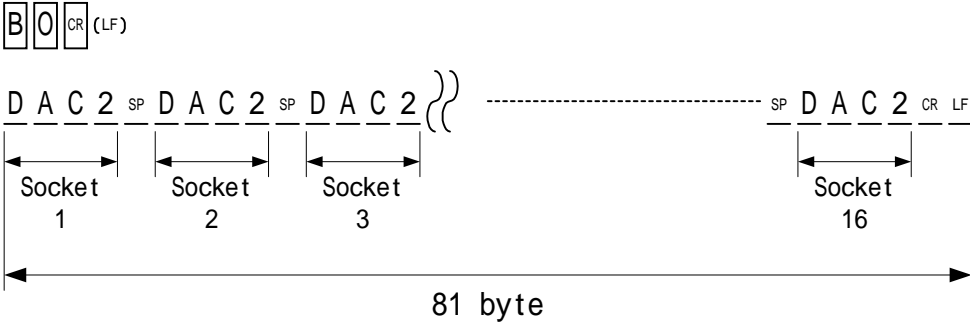
This command calculates and outputs a checksum of the buffer memory within the execution range. The checksum display is performed in eight digits.

Command format

BO8

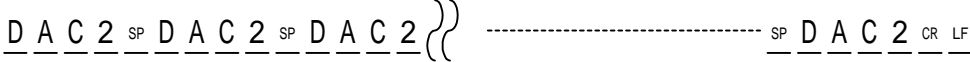
CS8

Parameter : none



P A S S , B O SP ; CR LF

CS CR (LF)



P A S S , C S SP ; CR LF

## F, INI Buffer Memory Initialization

This command rewrites M1940 buffer memory in an optional data string.

According to a parameter, the buffer memory is initialized in up to an 8-byte data string from an optional start address to the end address.

### Command format

```
F, p1, p2, p3, p4, p5, p6, p7, p8, p9, p10
```

```
INI, p1, p2, p3, p4, p5, p6, p7, p8, p9, p10
```

Parameter :

p1 : Start address ( hex )  
Default value = 00

p2 : End address ( hex )  
Default value = Buffer end address

p3 ~ p10 : initialization data ( hex )  
Default value = FF

```
F, p1 -- p1, p2 -- p2, p3 p3, p4 p4, p5 p5, p6 p6, p7 p7, p8 p8, p9 p9, p10 p10 CR (LF)
```

```
P A S S , F SP SP SP SP SP SP SP SP SP SP SP SP SP SP SP SP SP SP SP SP SP SP SP SP ; CR LF
```

```
I N I, p1 -- p1, p2 -- p2, p3 p3, p4 p4, p5 p5, p6 p6, p7 p7, p8 p8, p9 p9, p10 p10 CR (LF)
```

```
P A S S , I N I SP SP SP SP SP SP SP SP SP SP SP SP SP SP SP SP SP SP SP SP SP SP SP SP ; CR LF
```

**SCH Data Search Command ( Matching )**

This command can search matching of an optional data string (up to eight bytes) on the buffer memory. If the specified data string and buffer data match, the address (final address) is displayed. Further, if there is no matching buffer data, the address next to the end address is displayed and processing is terminated.

According to a parameter, the start address, end address and search data (up to eight bytes) can be specified.

**Command format**

SCH, p1, p2, p3, p4, p5, p6, p7, p8, p9, p10
--

Parameter :

p1 : Start address ( hex )  
Default value = 00

p2 : End address ( hex )  
Default value = Buffer end address

p3 - p10 : Search data ( hex )  
Default value = FF

S C H , p1 --- p1 , p2 --- p2 , p3 p3 , p4 p4 , p5 p5 , p6 p6 , p7 p7 , p8 p8 , p9 p9 , p10 p10 CR (LF)

A D D R SP = SP 0 0 0 0 A 6 C CR LF

P A S S , S C H SP SP SP SP SP SP SP SP SP SP SP SP SP SP SP SP SP SP SP ; CR LF

## UNS Data Search Command ( Mismatching )

This command can search mismatching of an optional data string (up to eight bytes) on the buffer memory.

If there is a difference in the specified data string and buffer data, the address (final address) is displayed. If there is no difference, the address next to the end address is displayed and processing is terminated.

According to a parameter, the start address, end address and search data(one byte) can be specified.

### Command format

UNS, p1, p2, p3
-----------------

Parameter:

p1 : Start address(hex)

Default value = 00

p2 : End address(hex)

Default value = Buffer end address

p3 : Search data(hex)

Default value = FF

U N S , p1 --- p1 , p2 --- p2 , p3 p3 CR (LF)

A D D R SP = SP 0 0 0 1 0 6 C CR LF

P A S S , U N S SP ; CR LF

**T Data Transfer Command**

This command can move data (copy operation) on the buffer memory.

According to a parameter, the start address and end address of the data to be moved and the start address(destination address) of a move destination can be specified.

**Command format**

```
T, p1, p2, p3
```

**Parameters :**

- p1 : start address (hex)  
Default value = 00
- p2 : end address(hex)  
Default value = buffer end address
- p3 : destination address (hex)  
Default value = 00

```
T, p1, p2, p3 CR (LF)
```

```
P A S S , T SP SP SP SP SP SP SP SP SP SP SP SP SP SP SP SP SP SP SP SP SP ; CR LF
```

## P, PL, WD

### Serial I/F Data Output

This command is the data output command for the serial I/f (RS232C)

The data of M1940 buffer memory is output from the serial I/F in accordance with the setting (S or DF command) of Data Format.

#### Command format

P, p1, p2
-----------

PL, p1, p2
------------

WD, p1, p2
------------

#### Parameters :

p1 : buffer memory output start address (hex)  
Default value = 00

p2 : buffer memory output end address (hex)  
Default value = buffer end address

When Format=INTEL hex, p1=0, p2=F

**P** **[** **p1** **,** **p1** **---** **p1** **,** **p2** **---** **p2** **CR** (LF)

: 1 0 0 0 0 0 0 0 0 3 0 6 0 C 1 8 3 0 6 0 C 0 0 3 ----- 0 3 0 6 E D CR LF

: 0 0 0 0 0 0 0 1 F F CR LF

P A S S , P SP ; CR LF

When Format=MOTOROLA S, p1=0, p2=F

**P** **[** **L** **,** **p1** **---** **p1** **,** **p2** **---** **p2** **CR** (LF)

S 0 0 9 0 0 0 0 4 D 4 9 4 E 4 1 5 4 4 F 2 E CR LF

S 1 1 3 0 0 0 0 0 3 0 6 0 C 1 8 3 0 6 0 C 0 0 3 ----- 0 3 0 6 E 9 CR LF

S 9 0 3 0 0 0 0 F C CR LF

P A S S , P L SP ; CR LF

When Format=MINATO HEX, p1=0, p2=F

**W** **[** **D** **,** **p1** **---** **p1** **,** **p2** **---** **p2** **CR** (LF)

[ CR LF

# 0 0 0 0 SP 0 3 SP 0 6 SP 0 C SP 1 8 SP 3 0 SP 6 0 ----- 0 3 SP 0 6 CR LF

] CR LF

P A S S , W D SP ; CR LF

## RL

### Serial I/F Data Input

This command is the data input command for the serial I/F. M1940 serial I/F enters the input wait state. Subsequently, the data input from the serial I/F is loaded into the buffer memory in accordance with the setting of Data Format.

According to a parameter, the format start address of the data to be input and the start address of the buffer which specifies and stores the end address can be set.

#### Command format

RL, p1, p2, p3

#### Parameter :

- p1 : format start address (hex)  
Default value = 00
- p2 : format end address (hex)  
Default value = buffer end address
- p3 : buffer address(hex)  
Default value = 00

R L , p1 , p2 , p3 CR (LF)

Use the serial I/F to transfer format data from the external device to M1940

P A S S , R L SP ; CR LF

**RD Serial I/F Data Input**

This command is the data input command for Serial I/F. M1940 serial I/F enters the input wait state. Subsequently, the data input from the serial I/F is loaded into the buffer memory in accordance with the setting of data format. According to a parameter, the format start address of the data to be input and the start address of the buffer which specifies and stores the end address can be set.

Command format

RD, p1, p2

Parameter :

- p1 : format start address (hex)  
Default value = 00
- p2 : buffer address(hex)  
Default value = 00

R D , p1 , p2 CR (LF)

Use the serial I/F to transfer format data from the external device to the M1940.

P A S S , R D SP ; CR LF



**PCH**

**Protection Mode Change**

M1940 has three types of protection modes as the operation to the data protection area. According to a parameter, each protection mode can be changed. For detail, refer to Protect Mode (protection mode) of the advance operation).

The protection mode that is currently set is output with no parameter.

**Command format**

PCH, p1

Parameter:

P1: protection mode

- 0 : No Operation
- 1 : protect / Protect
- 2 : Protect Only

**Confirmation**

PCH CR (LF)

0 SP SP SP No SP O p e r a t i o n CR LF

P A S S , P C H SP ; CR LF

**Setting**

PCH, p1 CR (LF)

P A S S , P C H SP ; CR LF

! When the device code is set or the power is turned off, this setting is cleared.



**RP Protection Data Serial I/F Output**

This command is the protection data output of the Serial I/F (RS-232C).

M1940 serial I/F enters the input wait state. Subsequently, the data input from the serial I/F is loaded into the buffer memory in accordance with the setting of Data format.

According to a parameter, the settings of the format start address and end address of the data to be input can be set.

**Command format**

RP, p1, p2

**Parameter:**

p1 : format start address(hex)  
Default value = 00

p2 : format end address (hex)  
Default value = protection end address

R P , p1 --- p1 , p2 --- p2 CR (LF)

Use the serial I/F to transfer format data from the external device to M1940

P A S S , R P SP ; CR LF

!  
When the device code is set or the power is turned off, this setting is cleared.

## RPP Protection Data Parallel I/F Input

This command is the protection data input command of the parallel I/F.

M1940 parallel enters the input wait state. Subsequently, the data input from the serial I/F is loaded into the buffer memory in accordance with the setting of data format.

According to a parameter, the setting of the format start address and end address of the data to be input can be set.

### Command format

RPP, p1, p2

Parameter :

p1 : format start address(hex)  
Default value = 00

p2 : format end address (hex)  
Default value = protect end address

R P P , p1 --- p1 , p2 --- p2 CR (LF)

◀ Use the serial I/F to transfer format data from the external device to M1940. ▶

P A S S , R P P SP ; CR LF

!

When the device code is set or the power is turned off, this setting is cleared.

### M1940 Protection Data

M1940 represents continuous data using one byte of the protection information from the lowest level address side in a unit of protection every protection units.

00(hex) : no protection

01(hex) : protection

Ex) Example of a device protected every sector

Protect : Sector[0], Sector[1]

No Protection : Sector[2], Sector[3], Sector[4], Sector[5], Sector[6]

Protection data **01010000000000**

## List of Error Messages

---

### Errors at M1940 Self-check

Error indication	Outline of error	Corrective action
!! FPGA Config Error !!	Main unit error	
!!UNIT_CONT Error FPGA !!		
!! Driver Error !!		Check the socket adapter
!! Driver SW Error !!		Check the socket adapter
Relay ON/OFF Error !!		Check the socket adapter
!! VCC SW Error !!		Check the socket adapter
!! VPP SW Error !!		Check the socket adapter
!! VHH SW Error !!		Check the socket adapter
!! DATA Compa Error		Check the socket adapter
!! FPGA Verify Error !!		Check the socket adapter
!! SUM/XOR Function Error !!		
!! MEMORY Check Error !!		

When any of the above error occurred, make sure that no foreign material (including socket adapter) is placed on the device sockets.

Press the RESET key to execute the self-check again from the beginning.

If errors occur continuously, you cannot operate M1940 unit it is repaired.

Please contact to your service window.

## Errors during operation

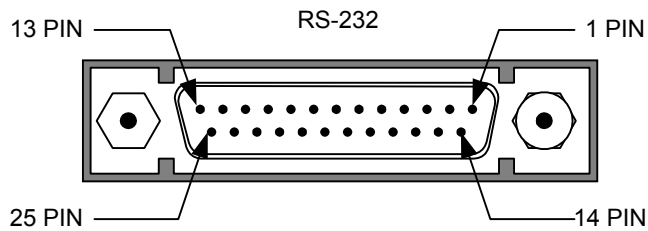
Error indication	Outline of error	Corrective action
!! Check Error!!	An imperfect contact was detected between a device socket and the device.	Insert the device again.
!!Bad Insertion!!	A device is not correctly inserted in a device socket.	Insert the device correctly
!!Over current!!	Over current is applied to the device lcc.	Remove the device from the device sockets with LED lit red.
* Empty Socket *	There is any device socket in which a device has not been set.	Check the device socket with LED lit red.

**Remote Mode Errors**

Error code (External terminal)	Contents of error	Outline of error
00	I/F Parity Error	A parity error occurred during serial communication
01	I/F Overrun Error	A overrun occurred during serial communication
02	I/F buffer Over Error	A buffer overrun occurred during serial communication
03	I/F Framing Error	A framing error occurred during serial communication
90	Format Read · Check Sum Error	A check sum error occurred in an I/F during transfer
91	Format Read · Format Error	A format error occurred in an I/F during data transfer
92	Format Read · Verify Error	A verify error occurred in an I/F during data transfer.
96	Buffer Over Error	M1940 buffer was exceeded in an I/F during data transfer.
F0	Illegal Command	An illegal command was issued.
F1	Parameter Error	An error occurred in a parameter.
F2	Invalid Function	No command function is provided.

# Appendix

## PIN Arrangement of RS232C Connector

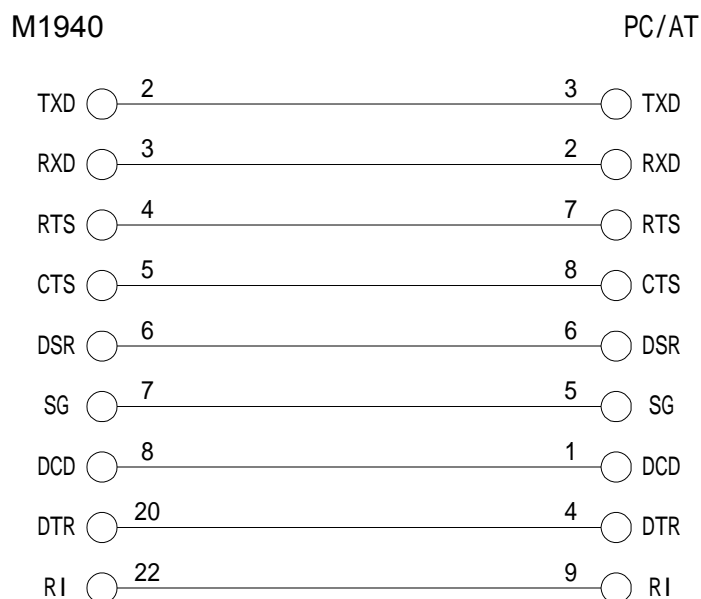


Connector  
Dsub25-Socket  
M1940 : DBLC-J25SAF-23L9F (JAE)

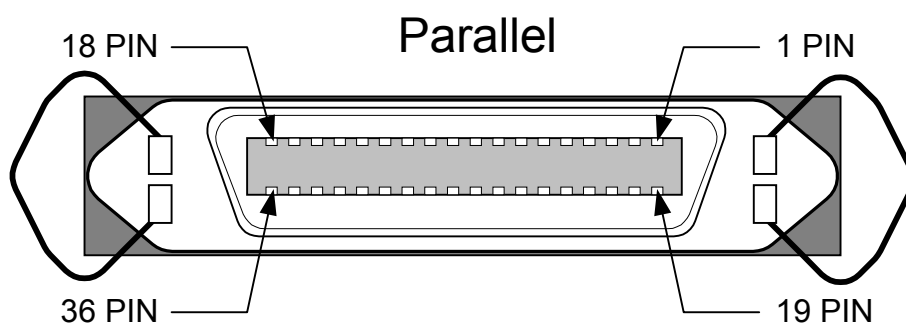
## PIN Assignment of RS232C Connector ( DCE )

Pin #	Code	Direction	Function
1	FG	-	Frame ground
2	TXD	External → M1940	Receive data in M1940 from external unit
3	RXD	External ← M1940	Send data from external unit to M1940
4	RTS	External → M1940	M1940 requests to send data to external unit
5	CTS	External ← M1940	M1940 announces to external unit that it is ready to send data.
6	DSR	External ← M1940	M1940 announces to external unit that it is ready to receive data.
7	SG	-	Signal ground
8	CD	External ← M1940	M1940 announces to external unit that it detected a carrier.
20	DTR	External → M1940	External unit announces to M1940 that it is ready to send data.
22	RI	External ← M1940	M1940 announces to external unit that power is on.

Example : Connection to Host Computer



## PIN Arrangement of Parallel Connector



Connector  
Anphenol 36 - Socket  
M1940 : RC10F-36R-LW (HIROSE)

## PIN Assignment of Parallel Connector

Pin number	Code	Pin number	Code
1	#STROBE	19	GND
2	Data1	20	GND
3	Data2	21	GND
4	Data3	22	GND
5	Data4	23	GND
6	Data5	24	GND
7	Data6	25	GND
8	Data7	26	GND
9	Data8	27	GND
10	#ACK	28	GND
11	BUSY	29	GND
12	PERROR	30	GND
13	SELECT	31	#INIT
14	#AUTOFEED	32	#FAULT
15		33	
16	GND	34	
17	FG	35	
18	Peripheral Logic High	36	SELECTIN



**Contacting address of HQ of Minato Electronics Inc.**

Minato Electronics Inc.

HQ: 4105 Minami Yamada cho Tsuzuki-ku  
Yokohama Kanagawa Japan 224-0026

TEL: +81-3-592-5549

FAX: +81-3-592-2854