

To our customers,

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April 1<sup>st</sup>, 2010  
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# F-ZTAT™ Microcomputer On-Board Programming Adapter Board

## HS0008EASF2H User's Manual

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- READ this user's manual before using this adapter board.
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Do not attempt to use the adapter board until you fully understand its mechanism.

### Adapter Board:

Throughout this document, the term "adapter board" shall be defined as the main adapter board and attached cables manufactured by Hitachi, Ltd.

The user system or a host computer is not included in this definition.

### Purpose of the Adapter Board:

The adapter board, which is connected between a host computer and the user system, has a function that can write/erase user application programs on the flash memory incorporated in the F-ZTAT microcomputer on the user system (on-board) when it is used with the on-board programming tool.

Therefore, the burden on the peripheral circuit required during on-board programming can be minimized. This board can be used for all F-ZTAT microcomputers incorporating a flash memory.

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**Figures:**

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Hitachi cannot anticipate every possible circumstance that might involve a potential hazard. The warnings in this user's manual and on the adapter board are therefore not all inclusive. Therefore, you must use the adapter board safely at your own risk.

# SAFETY PAGE

## READ FIRST

- READ this user's manual before using this adapter board.
- KEEP the user's manual handy for future reference.

Do not attempt to use the adapter board until you fully understand its mechanism.

## DEFINITION OF SIGNAL WORDS

**DANGER** indicates an **imminently** hazardous situation which, **if not avoided**, will result in **DEATH** or **SERIOUS INJURY** to you or other people.

**WARNING** indicates a **potentially** hazardous situation which, **if not avoided**, could result in **DEATH** or **SERIOUS INJURY** to you or other people.

**CAUTION** indicates a hazardous situation which, **if not avoided**, may result in **minor or moderate injury** to you or other people, or may result in **damage to the machine** or **loss of the user program**. It may also be used to alert against unsafe usage.

**NOTE** emphasizes essential information.



## WARNING

Observe the precautions listed below. Failure to do so will result in a FIRE HAZARD and will damage the user system and the adapter board or will result in PERSONAL INJURY. The USER PROGRAM will be LOST.

1. Always switch OFF the adapter board and the user system before connecting or disconnecting any CABLES.
2. When connecting the adapter board to the user system, ensure that pin 1 of the user system interface cable of the adapter board and pin 1 of the user system socket on the user system are correctly aligned.
3. The adapter board can be used for F-ZTAT microcomputers in which 12 V is applied to both the Vpp pin and MD pin. The adapter board cannot be used for F-ZTAT microcomputers to which 3 V to 5 V is supplied from a single power source.

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## Section 1 Overview

The adapter board HS0008EASF2H, connected between a host computer and the user system, can write/erase user application programs on the flash memory incorporated in the F-ZTAT<sup>®</sup> microcomputer on the user system (on-board) when it is used with the on-board programming tool HS6400FWTW1SF. Therefore, the burden on the peripheral circuit required during on-board programming can be reduced.

A system configuration of the adapter board is shown in figure 1.1. This board can be used for all 12-V F-ZTAT microcomputers incorporating a flash memory.

Note: F-ZTAT (Flexible-Zero Turn Around Time) is a registered trademark of Hitachi, Ltd.

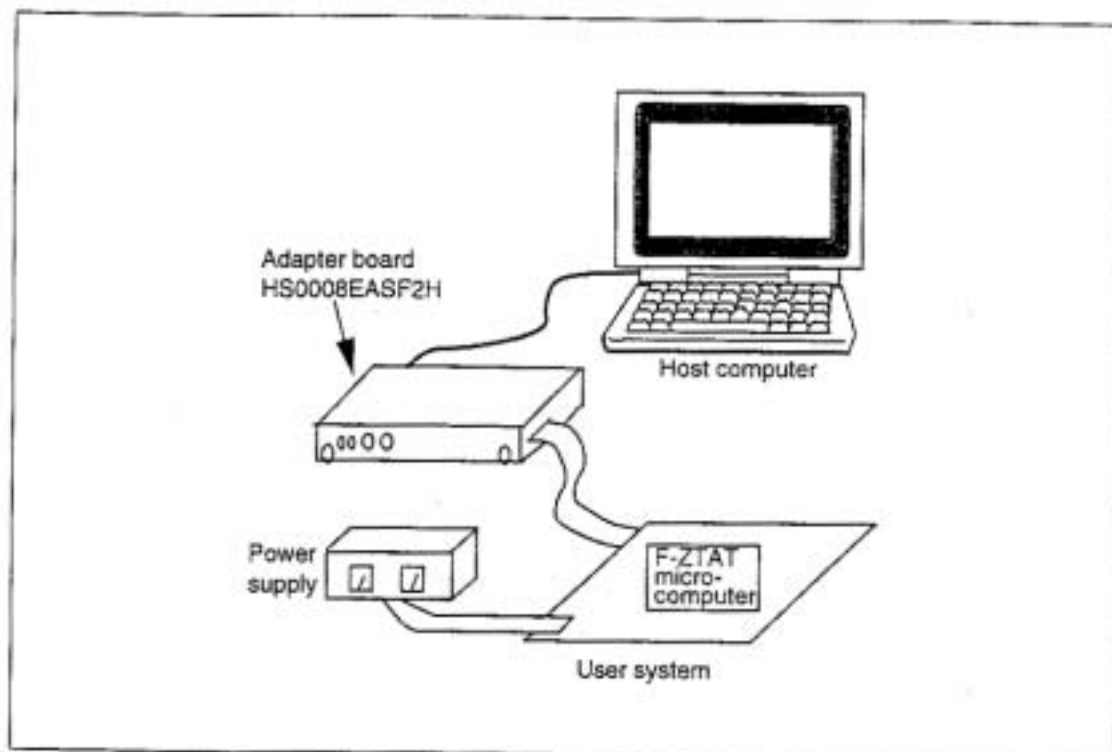


Figure 1.1 System Configuration of Adapter Board

## Section 2 Configuration

The configuration and components of the adapter board are shown in figure 2.1 and table 2.1, respectively.

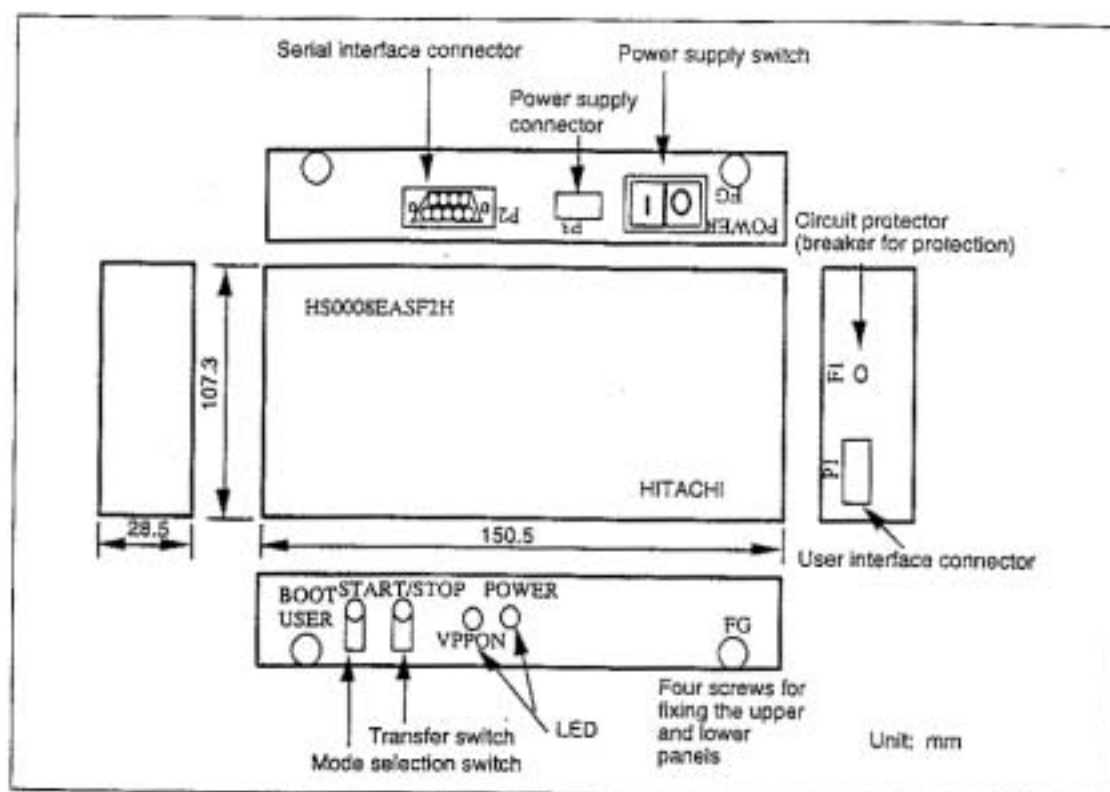


Figure 2.1 Adapter Board

Table 2.1 Components

Item Name	Description	Quantity
Adapter board	Main unit	1
Serial interface cable	Connection between main unit and host computer	1
User system interface cable	Connection between main unit and user system	1
User system interface cable connector	Connection between main unit and user system	1
Adapter board power cable	Adapter board power supply	1

## Section 3 Connectors, Switches, and LEDs

### 3.1 Connectors

This adapter board has connectors P1, P2, and P3.

#### 3.1.1 User Interface Connector (P1)



### WARNING

Observe the precautions listed below. Failure to do so will result in a **FIRE HAZARD** and will damage the user system and the adapter board or will result in **PERSONAL INJURY**.

1. Always switch **OFF** the adapter board and the user system before connecting or disconnecting the **USER SYSTEM INTERFACE CABLES** of the **ADAPTER BOARD** or the **USER SYSTEM**.
2. While connecting cables, pay particular attention to the polarity of pin 1 (marked at the P1 connector) and signal names.
3. When disconnecting cables, take care not to put excessive stress on the cables.

The signals required for writing to flash memory are shown in figure 3.1. Connect the adapter board and the user system using the user system interface cable provided (with an eight-pole connector on both ends) and a user system interface cable connector (used for connecting the cable to the user system). The user system interface cable provided cross-matches the pins in the adapter board to those in the user system, as shown in figure 3.1.

IL-S-8P-S2L2-EF (manufactured by Japan Aviation Electronics Industry, Ltd.) is used as a user system interface cable connector.



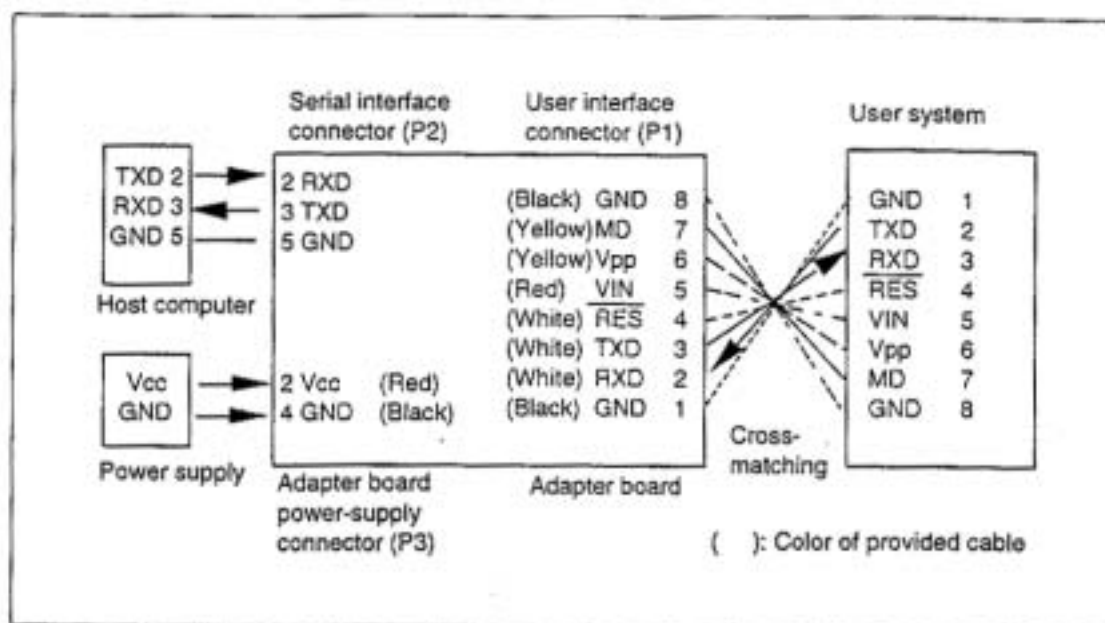


Figure 3.1 Connector Pin Location

### 3.1.2 Serial Interface Connector (P2)

Connect the adapter board and host computer using the serial interface cable provided.

### 3.1.3 Adapter Board Power-Supply Connector (P3)

Supply power to the adapter board from the user system power supply (Vcc 2.7 V to 5.5 V) via the VIN pin of the user system interface cable. (The consumption current is 200 mA maximum at Vcc 5 V.)

If the current supply capability of the user system power supply is insufficient, power (Vcc 5 V  $\pm$  5%) can be supplied using a separate power supply from this connector to the adapter board.

## 3.2 Switches

### 3.2.1 Mode Switch (BOOT/USER)

The mode switch is shown in figure 3.2.

- Lever up: Boot mode
- Lever down: User program mode

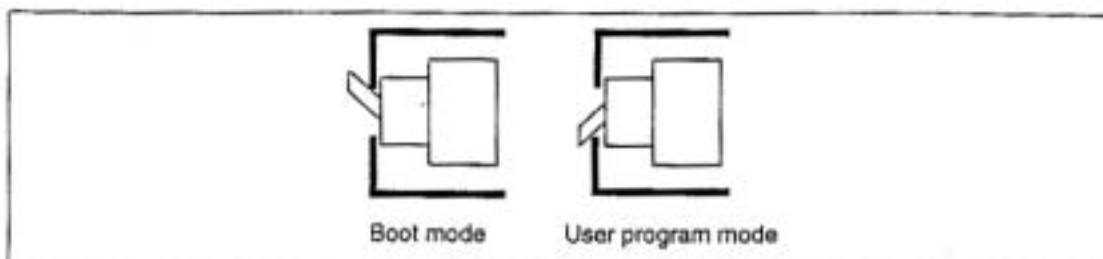


Figure 3.2 Mode Switch (BOOT/USER)

### 3.2.2 Transfer Switch (START/STOP)

When this switch is pressed once, a programming control is initiated. In this case, the VPPON LED (red) turns on. When this switch is pressed again after program transfer, the programming control is terminated. At this time, the VPPON LED (red) is turned off.

#### CAUTION

After program transfer, press the transfer switch (START/STOP) and confirm that the VPPON LED (red) is turned off. If the user system power supply VIN (Vcc 2.7 V to 5.5 V) is turned off while the VPPON LED is lit, the user system will be damaged.

For details on activating the on-board programming tool, refer to the On-Board Programming Tool User's Manual HS6400FWTW1SE.

Activate the on-board programming tool HS6400FWTW1SF, and select the boot mode or user program mode displayed on the host computer. The hardware setting sequence is displayed. Then press the transfer switch. The VPPON LED (red) is lit and a programming control is initiated.

After programming the flash memory in each mode, confirm the end message, press the transfer switch again, and complete the programming control. At this time, the VPPON LED turns off.

### 3.2.3 Power-Supply Switch (POWER)

The following two power-supply methods are available for this adapter board.

- Power is supplied from the user system power supply via the user system interface cable and connector (VIN pin). (Power supply voltage must be Vcc 2.7 V to 5.5 V. A maximum consumption current is 200 mA at Vcc 5 V.)
- As a countermeasure against insufficient current supply capability, power is supplied through the power-supply connector (P3) by method (1) above. In this case, the user must prepare a separate power supply.

Vcc 5 V  $\pm$  5% is supplied to the power-supply connector (P3) of the adapter board. This switch is activated as the power-supply switch (on and off) of the adapter board only when power is supplied from the power-supply connector (P3) of the adapter board. (Refer to figure 3.3.) In this case, power needs to be supplied to the VIN pin of the user system interface cable and the connector.

When power is supplied to the adapter board only from the user system power supply, this power-supply switch does not work. In this case, the power-supply switch on the user system is used as the power-supply switch for the adapter board.

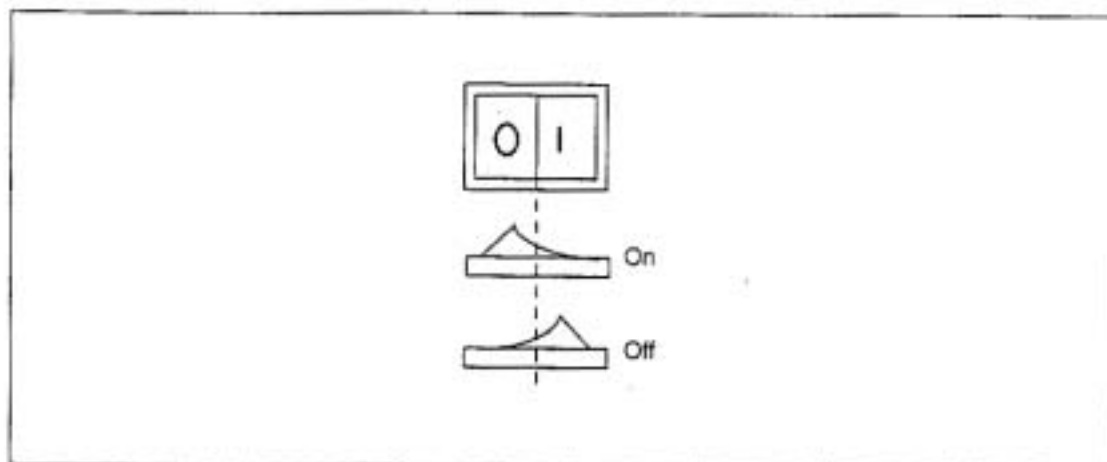


Figure 3.3 Power-Supply Switch (POWER)

#### 3.2.4 Jumper Terminals for Power-Supply Switch (JP1)

### CAUTION

Do not insert jumpers concurrently (1 - 2, and 3 - 4) into the jumper terminals. Concurrent dual connection will damage the system.

The jumper terminals are inside the chassis. Open the upper panel by removing a screw in each corner attaching the upper and lower panels. After jumper setting, close the chassis by fixing the screws.

The following two methods are available for supplying power to the adapter board. Switching is required from these jumper terminals.

- To supply power from the user system via the user system interface cable and connector (VIN pin), insert a jumper into 3 and 4.
- To supply power from power-supply connector (P3), prepare a power supply for the adapter board. Insert a jumper into 1 and 2 (default setting at shipment).

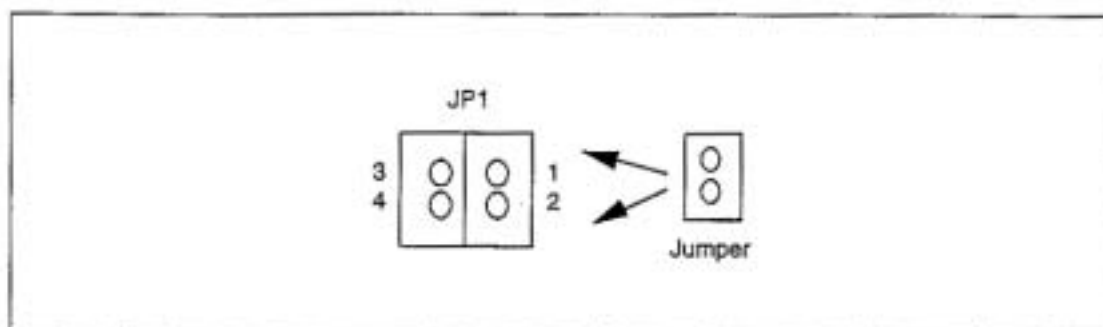


Figure 3.4 Jumper Terminals for Power-Supply Switch (JP1)

#### 3.2.5 Circuit Protector (F1)

This adapter board is provided with a resumable circuit protector on the input section of the user system power supply to prevent damage to the system. If the circuit protector is turned off due to erroneous power-supply connection or excessive current (1 A or more), check the system, then return the circuit protector to the original state by pressing the switch in the hole with a thin pin or wire to activate the circuit protector (figure 3.5).

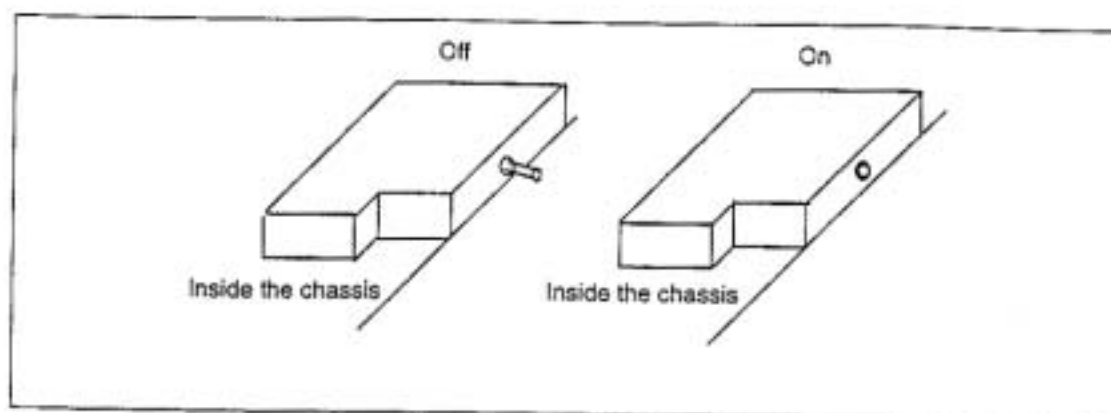


Figure 3.5 Circuit Protector Setting

### 3.3 LEDs

#### 3.3.1 12-V LED (VPPON: Red)

During programming control, 12 V is automatically generated at the adapter board. When this voltage is applied to the Vpp pin, this LED turns on.

#### 3.3.2 Power LED (POWER: Green)

This LED turns on while the user system power supply VIN (2.7 V to 5.5 V) or the power supply Vcc (5 V  $\pm$  5%) dedicated to the adapter board is supplied.

## Section 4 Notes On Use

1. The  $\overline{\text{RES}}$  pin of the adapter board is an open-collector output. Pull up the  $\overline{\text{RES}}$  pin on the user system using a 1-k $\Omega$  resistor.
2. After program transfer, press the transfer switch (START/STOP) again. In this case, check that the VPPON LED (red) is turned off. If the user system power supply VIN ( $V_{cc}$  2.7 V to 5.5 V) is turned off while the VPPON LED is lit, the user system will be damaged.
3. For the host computer connected to the adapter board, only the IBM PC<sup>®</sup> can be used.
4. Vpp and MD pins, to which 12 V is applied, may be damaged due to overshooting depending on the user system configuration. Take preventive measures against such damage beforehand by, for example, inserting a 1- $\mu\text{F}$  capacitor between each pin and GND. For details, refer to each microcomputer hardware manual.

Note: IBM PC is a registered trademark of International Business Machines Corporation.

## Section 5 Specifications

### 5.1 Input Voltage and Consumption Current

- Power-supply input (VIN) from the user interface connector: 2.7 to 5.5 V.
- Power-supply input (Vcc) from the P3 connector of the adapter board: 5 V  $\pm$  5%. Here, consumption current is 200 mA maximum at Vcc 5 V (depends on the user system to be connected).

### 5.2 Write Processing

- (1) When the transfer switch is pressed, the  $\overline{\text{RES}}$  signal is held to the low level for 500 ms.
- (2) After 10 ms of the falling edge of the  $\overline{\text{RES}}$  signal, 12-V application to the Vpp and mode pins starts or stops.
- (3) Mode pin: 12 V is applied to the mode 2 pin (MD2) for the H8/538F and H8/3048F, and 12 V is applied to the mode 1 pin (MD1) for the H8/3437F and H8/3337YF. (Refer to figure 5.1, Reset Signal, 12-V Application, and Stop Timing.)

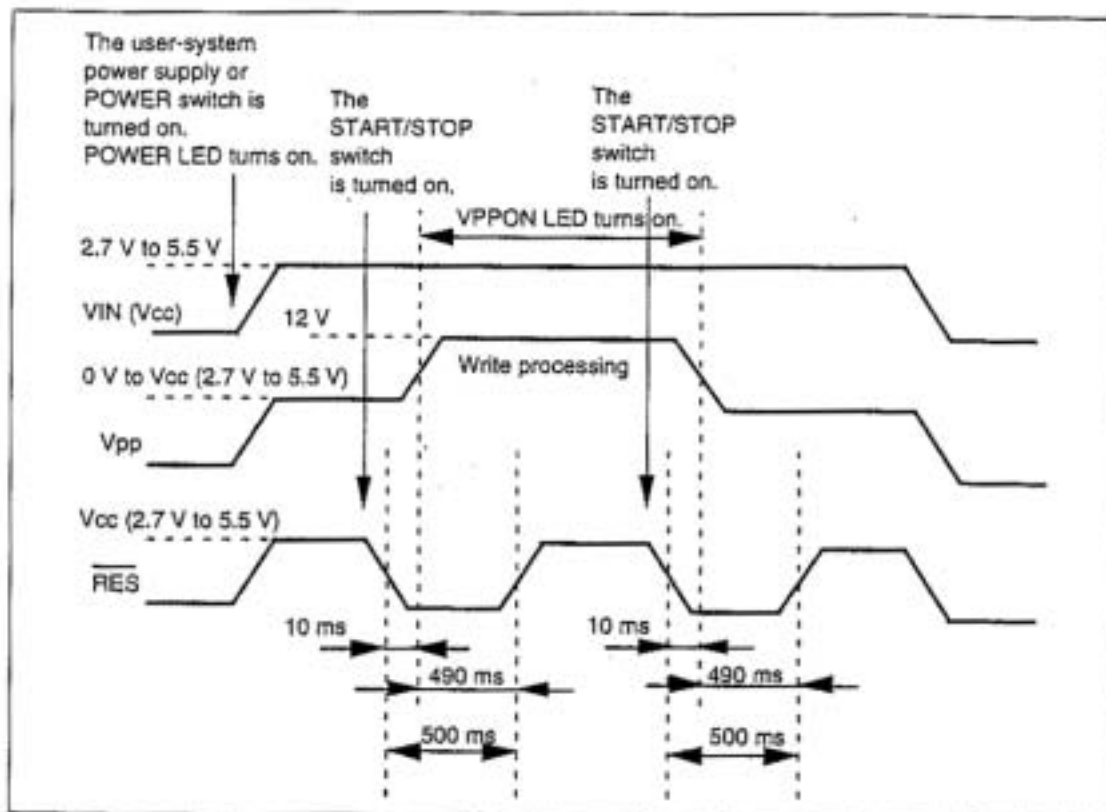


Figure 5.1 Reset Signal, 12-V Application, and Stop Timing