Upon receipt of the product and prior to initial operation, read these instructions thoroughly, and retain for future reference.

MOTOMAN INSTRUCTIONS
- MOTOMAN--□□□ INSTRUCTIONS
- FS100 INSTRUCTIONS
- FS100 OPERATOR'S MANUAL
- FS100 MAINTENANCE MANUAL

Part Number: 159657-1CD
Revision: 0
MANDATORY

- This manual explains the password protection function of the FS100 system. Read this manual carefully and be sure to understand its contents before handling the FS100.
- General items related to safety are listed in Chapter 1: Safety of the FS100 Instructions. To ensure correct and safe operation, carefully read the FS100 Instructions before reading this manual.

CAUTION

- Some drawings in this manual are shown with the protective covers or shields removed for clarity. Be sure all covers and shields are replaced before operating this product.
- The drawings and photos in this manual are representative examples and differences may exist between them and the delivered product.
- YASKAWA may modify this model without notice when necessary due to product improvements, modifications, or changes in specifications.
- If such modification is made, the manual number will also be revised.
- If your copy of the manual is damaged or lost, contact a YASKAWA representative to order a new copy. The representatives are listed on the back cover. Be sure to tell the representative the manual number listed on the front cover.
- YASKAWA is not responsible for incidents arising from unauthorized modification of its products. Unauthorized modification voids your product's warranty.
Notes for Safe Operation

Read this manual carefully before installation, operation, maintenance, or inspection of the FS100.

In this manual, the Notes for Safe Operation are classified as "WARNING", "CAUTION", "MANDATORY", or "PROHIBITED".

**WARNING**
Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury to personnel.

**CAUTION**
Indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury to personnel and damage to equipment. It may also be used to alert against unsafe practices.

**MANDATORY**
Always be sure to follow explicitly the items listed under this heading.

**PROHIBITED**
Must never be performed.

Even items described as "CAUTION" may result in a serious accident in some situations.

At any rate, be sure to follow these important items.

**NOTE**
To ensure safe and efficient operation at all times, be sure to follow all instructions, even if not designated as "CAUTION" and "WARNING".
WARNING

- Before operating the manipulator, check that servo power is turned OFF when the emergency stop button on the programming pendant is pressed.
  When the servo power is turned OFF, the SERVO ON LED on the programing pendant is turned OFF.

Injury or damage to machinery may result if the emergency stop circuit cannot stop the manipulator during an emergency. The manipulator should not be used if the emergency stop button does not function.

Fig. : Emergency Stop Button

- In the case of not using the programming pendant, be sure to supply the emergency stop button on the equipment. Then before operating the manipulator, check to be sure that the servo power is turned OFF by pressing the emergency stop button.
  Connect the external emergency stop button to the 5-6 pin and 16-17 pin of the robot system signal connector (CN2).

- Upon shipment of the FS100, this signal is connected by a jumper cable in the dummy connector. To use the signal, make sure to supply a new connector, and then input it.
  If the signal is input with the jumper cable connected, it does not function, which may result in personal injury or equipment damage.

- Once the emergency stop button is released, clear the cell of all items which could interfere with the operation of the manipulator.
  Then turn the servo power ON.

Injury may result from unintentional or unexpected manipulator motion.

Fig. : Release of Emergency Stop Button

- Observe the following precautions when performing teaching operations within the manipulator’s operating range:
  – View the manipulator from the front whenever possible.
  – Always follow the predetermined operating procedure.
  – Ensure that you have a safe place to retreat in case of emergency.

Improper or unintended manipulator operation may result in injury.
Definition of Terms Used Often in This Manual

The MOTOMAN is the YASKAWA industrial robot product.

The MOTOMAN usually consists of the manipulator, the FS100 controller, manipulator cables, the FS100 programming pendant (optional), and the FS100 programming pendant dummy connector (optional).

In this manual, the equipment is designated as follows:

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Manual Designation</th>
</tr>
</thead>
<tbody>
<tr>
<td>FS100 controller</td>
<td>FS100</td>
</tr>
<tr>
<td>FS100 programming pendant</td>
<td>Programming pendant</td>
</tr>
<tr>
<td>Cable between the manipulator and the controller</td>
<td>Manipulator Cable</td>
</tr>
<tr>
<td>FS100 programming pendant dummy connector</td>
<td>Programming pendant dummy connector</td>
</tr>
</tbody>
</table>
Descriptions of the programming pendant, buttons, and displays are shown as follows:

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Manual Designation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Programming Pendant</td>
<td></td>
</tr>
<tr>
<td>Character Keys</td>
<td>The keys which have characters printed on them are denoted with [ ].</td>
</tr>
<tr>
<td></td>
<td>ex. [ENTER]</td>
</tr>
<tr>
<td>Symbol Keys</td>
<td>The keys which have a symbol printed on them are not denoted with [ ] but depicted</td>
</tr>
<tr>
<td></td>
<td>with a small picture.</td>
</tr>
<tr>
<td></td>
<td>ex. PAGE key</td>
</tr>
<tr>
<td></td>
<td>The Cursor is an exception, and a picture is not shown.</td>
</tr>
<tr>
<td>Axis Keys</td>
<td>&quot;Axis Keys&quot; and &quot;Numeric Keys&quot; are generic names for the keys for axis operation and</td>
</tr>
<tr>
<td>Numeric Keys</td>
<td>number input.</td>
</tr>
<tr>
<td>Keys pressed simultaneously</td>
<td>When two keys are to be pressed simultaneously, the keys are shown with a &quot;+&quot; sign</td>
</tr>
<tr>
<td></td>
<td>between them,</td>
</tr>
<tr>
<td></td>
<td>ex. SHIFT key +COORD key</td>
</tr>
<tr>
<td>Mode Key</td>
<td>Three kinds of modes that can be selected by the mode key are denoted as follows:</td>
</tr>
<tr>
<td></td>
<td>REMOTE, PLAY, or TEACH</td>
</tr>
<tr>
<td>Button</td>
<td>Three buttons on the upper side of the programming pendant are denoted as follows:</td>
</tr>
<tr>
<td></td>
<td>HOLD button</td>
</tr>
<tr>
<td></td>
<td>START button</td>
</tr>
<tr>
<td></td>
<td>EMERGENCY STOP button</td>
</tr>
<tr>
<td>Displays</td>
<td>The menu displayed in the programming pendant is denoted with { }.</td>
</tr>
<tr>
<td></td>
<td>ex. {JOB}</td>
</tr>
<tr>
<td>PC Keyboard</td>
<td>The name of the key is denoted</td>
</tr>
<tr>
<td></td>
<td>ex. Ctrl key on the keyboard</td>
</tr>
</tbody>
</table>

**Description of the Operation Procedure**

In the explanation of the operation procedure, the expression “Select • • •” means that the Cursor is moved to the object item and the SELECT key is pressed, or that the item is directly selected by touching the screen.

**Registered Trademark**

In this manual, names of companies, corporations, or products are trademarks, registered trademarks, or brand names for each company or corporation. The indications of (R) and TM are omitted.
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1 Password Protection Function

The password protection function helps assure system safety by requiring each user to have a personal authorization registered to access the controller so as to control what operations may be performed by the users. The system administrator authorizes each user by assigning a login name and password, a security level and a timeout setting, thereby allowing a specific level of controller access.

The administrator can register up to 100 user accounts. The user account information can be stored in a file (USRINFO.DAT). Only the system administrator can change registered user account information.

The password protection function also enables to find out, by tracing the alarm history, which user has been logged in at the time of a particular alarm.
2 Logon

A “Logon” window will be displayed immediately after power-on. To operate with the pendant or the controller, it is necessary to log on using a registered user account.

After logging on, operation will be allowed for the level of access registered to the user account.

To log on again after logging off, select {SYSTEM INFO} → {LOGON} under the main menu, and operate the LOGON window (for logon details, refer to chapter 5.1 “Logon As an Administrator” at page 5-1 and chapter 6.1 “Logon As a User” at page 6-1).
3 Logoff

Logoff can be performed either manually or automatically.

3.1 Manual Logoff

To log off manually, select {SYSTEM INFO} → {LOGOFF} under the main menu, and operate the LOGOFF window (for manual logoff details, refer to chapter 5.2 “Logoff As an Administrator” at page 5-2 and chapter 6.2 “Logoff As a User” at page 6-2).

3.2 Auto Logoff

After logging on, an automatic logoff will occur when the Timeout time registered to the currently logged-on user account expires.

The timeout time can be registered from the “USER PASSWORD EDIT (REGISTER/MODIFY)” window. The timeout setting range for a user account is 0 to 43,200 minutes (30 days). If the timeout time is set to “***” (= 0), the automatic logoff function will be disabled.

An automatic logoff will also occur when user registration information (USRINFO.DAT) has been loaded from an external memory.
4 Account

The password protection function provides two types of accounts, “account for administrators” and “user account”, to be used for controller access.

4.1 Account for Administrators

The account for administrators can be used for password protection setup. The account for administrators can also be used to generate new user accounts.

- The account for administrators allows full access to all the controller functions as well as to setup for all the user accounts. The name and password for account for administrators should be carefully controlled by the administrator person.
- The account for administrators should be controlled very carefully, separate from all the other user accounts. Otherwise, it may become impossible to log in to the system as a system administrator.

4.2 User Account

The password protection function allows using up to 100 user accounts. The administrator can generate new user accounts. To each user account, a login name, a password, a security level, a comment and an automatic logout timer can be registered.

The user access levels are defined as follows:

MANAGEMENT MODE:

In the management mode, system setup and maintenance operations can be performed (e.g. parameter changes, special system settings, User Account information changes).

EDITING MODE:

In the editing mode, teaching and job data edit, and various settings can also be performed.

OPERATION MODE:

In the operation mode, basic operations required to control a robot on the production line can be performed (e.g. start, stop).
5 Control As an Administrator

5.1 Logon As an Administrator

Described below is the procedure to log on to the controller as a system administrator.

1. Select {SYSTEM INFO} → {LOGON} under the main menu.

2. The LOGON window appears. Enter the administrator name into the “USER NAME” field.

3. Enter the administrator password into the “PASSWORD” field.

4. Press [ENTER] to log on to the controller.
5.2 Logoff As an Administrator

Described below is the procedure to log off from the controller as a system administrator.

1. Select (SYSTEM INFO) → (LOGOFF) under the main menu.

2. The LOGOFF screen appears. Press [ENTER] or select (EXECUTE).

3. The Administrator will be logged off from the controller.
5.3 New Registration of User Accounts

Described below is the procedure to set up a user account.

1. Log on to the system as a system administrator (for the logon procedure, refer to chapter 5.1 “Logon As an Administrator” at page 5-1).

2. Select \{SYSTEM INFO\} → \{USER PASSWORD\} under the main menu.

3. The USER PASSWORD LIST window appears. Move the Cursor to “USER NAME” and press [SELECT].

4. The selection dialog appears. Move the Cursor to “REGISTER” and press [SELECT].
5. The USER PASSWORD EDIT (REGISTER/MODIFY) window appears. Set up the user account as follows:

**USER NAME:**
One to sixteen alphabetical and numeric characters can be used to create a user name.

**PASSWORD:**
Four to eight numeric characters can be used to create a password.

**PASSWORD (AGAIN):**
Enter the same password again for confirmation.

**MODE:**
Select the access level to be allowed for this user (OPERATION MODE/EDITING MODE/MANAGEMENT MODE).

**COMMENT:**
Enter any required comment. Up to thirty two characters can be entered.

**TIMEOUT:**
Enter the time at which this user should be logged off automatically after logging on. The unit of measure is minute. The time can be set in the range of 0 to 43,200 minutes. If it is set to "*" (=0), timeout will not occur.
6. Press [ENTER] or select (EXECUTE).

7. The entered user account information will be registered.
5.4 Modification of User Accounts

Described below is the procedure to change user account information.

1. Log on to the system as a system administrator (for the logon procedure, refer to chapter 5.1 “Logon As an Administrator” at page 5-1).

2. Select {SYSTEM INFO} → {USER PASSWORD} under the main menu.

3. Move the Cursor to the USER NAME to be modified and press [SELECT].

4. The selection dialog appears. Move the Cursor to “MODIFY” and press [SELECT].
5. The USER PASSWORD EDIT (REGISTER/MODIFY) window appears. Modify the user account as follows:

**PASSWORD:**
Four to eight numeric characters can be used to create a password.

**PASSWORD(AGAIN):**
Enter the same password again for confirmation.

**MODE:**
Select the access level to be allowed for this user (OPERATION MODE/EDITING MODE/MANAGEMENT MODE).

**COMMENT:**
Enter any required comment. Up to thirty two characters can be entered.

**TIMEOUT:**
Enter the time at which This user should be logged off automatically after logging on. The unit of measure is minute. The time can be set in the range of 0 to 43,200 minutes. If it is set to "*" (=0), timeout will not occur.
6. Press [ENTER] or select {EXECUTE}.

7. The user account is modified to the set contents.
5.5 Deletion of User Accounts

Described below is the procedure to delete a user account.

1. Log on to the system as a system administrator (for the logon procedure, refer to chapter 5.1 “Logon As an Administrator” at page 5-1).

2. Select {SYSTEM INFO} → {USER PASSWORD} under the main menu.

3. Move the Cursor to the USER NAME to be deleted and press [SELECT].

4. The selection dialog appears. Move the Cursor to “DELETE” and press [SELECT].
5. The confirmation dialog box, “Delete?” is displayed. Select {YES}.

6. The user account will be deleted.
5.6 Deletion of All the User Accounts

Described below is the procedure to delete all the User Accounts registered.

1. Log on to the system as a system administrator (for the logon procedure, refer to chapter 5.1 “Logon As an Administrator” at page 5-1).

2. Select \{SYSTEM INFO\} → \{USER PASSWORD\} under the main menu.

3. Move the Cursor to the USER NAME and press [SELECT].

4. The selection dialog appears. Move the Cursor to “DELETE ALL” and press [SELECT].
5. The confirmation dialog box, “Delete?” is displayed. Select {YES}.
5.7 Modification of Administrator Account

Described below is the procedure to change the administrator account information.

1. Log on to the system as a system administrator (for the logon procedure, refer to "Logon As an Administrator" at page 5-1).

2. Select {SYSTEM INFO} → {USER PASSWORD} under the main menu.

3. Move the Cursor to “Administrator” and press [SELECT].
4. The selection dialog appears. Move the Cursor to “MODIFY” and press [SELECT].

5. The USER PASSWORD EDIT (REGISTER/MODIFY) window appears. Modify the User Account as follows: Of the administrator account information registered, only the PASSWORD and the TIMEOUT setting can be modified.
5 Control As an Administrator

5.7 Modification of Administrator Account

**PASSWORD:**

Four to eight numeric characters can be used to create a password.

**PASSWORD(AGAIN):**

Enter the same password again for confirmation.

**TIMEOUT:**

Enter the time at which This user should be logged off automatically after logging on. The unit of measure is minute. The time can be set in the range of 0 to 43,200 minutes. If it is set to "*" (=0), timeout will not occur.

6. Press [ENTER] or select {EXECUTE}.

7. The administrator account is modified to the set contents.

**NOTE**

Before deleting all the User Accounts, check to make sure that it will still be possible to log in to the controller afterward. Also, be very careful when changing the information about the Account for Administrators.
5.8 Saving/Loading Registered Account Information

The administrator and the user account information can be saved to an external memory. The file name is "USRINFO.DAT". The saved file can be loaded. When USRINFO.DATA loading is completed, the current User will be automatically logged off from the system.

5.8.1 Save

1. Log on to the system as a system administrator (for the logon procedure, refer to chapter 5.1 "Logon As an Administrator" at page 5-1).

2. Select {EX. MEMORY} \(\rightarrow\) {SAVE} under the main menu.

3. The external memory saving window appears. Select {SYSTEM DATA} \(\rightarrow\) {USER INFORMATION}.

4. Press [ENTER]. The confirmation dialog box, “Save?” is displayed. Select {YES}. 
5.8.2 Load

1. Log on to the system as a system administrator (for the logon procedure, refer to chapter 5.1 “Logon As an Administrator” at page 5-1).

2. Select {EX. MEMORY} → {LOAD} under the main menu.

3. The external memory loading window appears. Select {SYSTEM DATA} → {USER INFORMATION}.
4. Press [ENTER]. The confirmation dialog box, “Load?” is displayed. Select {YES}.

5. When loading is completed, the current user will be automatically logged off.
6 Control As a User

6.1 Logon As a User

Described below is the procedure to log on to the controller as a user.

1. Select {SYSTEM INFO} → {LOGON} under the main menu.

2. The LOGON window appears. In the “USER NAME” field, input the user name that has been assigned by the system administrator.

3. In the “PASSWORD” field, enter the password that has been assigned by the system administrator.

4. Press [ENTER].

5. The current user will be logged on to the controller.
6.2 Logoff As a User

Described below is the procedure to log off from the controller as a user.

1. Select \( \text{(SYSTEM INFO)} \rightarrow \text{(LOGOFF)} \) under the main menu.

2. The LOGOFF window appears. Press [ENTER] or select \( \text{(EXECUTE)} \).

3. The current user will be logged off from the controller.
The “LOGOFF OPERATION MODE” setting can be entered from the LOGON SETTING Window.

Described below is the procedure to specify the degree of operation restriction for logged-off users.

1. Log on to the system as a system administrator (for the logon procedure, refer to chapter 5.1 “Logon As an Administrator” at page 5-1).

2. Select (SYSTEM INFO) → (USER PASSWORD) under the main menu.

3. The USER PASSWORD LIST window appears. Select (UTILITY) → (LOGON SETTING) under the menu.
4. The LOGON SETTING window appears. Press [SELECT].

5. The selection dialog appears. Select either “PROHIBITED” or “RESTRICTED”. Depending on the selection, the degree of operation restriction for logged-off users will be different. For more details, refer to chapter 8.2 “Operation During Logging Off” at page 8-1.
8 Logoff Operation Mode

8.1 Window Display After Logging Off

After the last user logs off from the system, a LOGON window will be shown on the display.

Even if the user has logged off in a multiple-window display mode, the multiple-window display will be cancelled upon logging off, and the LOGON window will be shown in a single-window status.

8.2 Operation During Logging Off

The range of operations allowed during logging off depends on the type of operation restriction selected by the "LOGOFF OPERATION MODE" setting on the LOGON SETTING window.

8.2.1 Prohibited Operation

It will be impossible to go to any window other than the LOGON window shown. The following operations are prohibited. All the other operations can be performed in the same way as by a normal operation-level user.

- Jog operation
- FWD/BWD/TEST RUN operation(s)
- Moving the Destination (for position check etc.)
- Turning the servo on from the pendant (both the [Servo On Ready] key and Enable switch)
- Starting from the pendant (Hold and emergency stop are enabled)
- Control group / Speed / Axis selection
- Function key
- Touch-panel and key operations related to areas other than general-purpose display or dialogue areas

Operations using external signal input (e.g. external servo-on, programmed start) will remain enabled.

The window will not switch to the alarm window even if an alarm occurs. However, the display will show the alarm window if the system has been in an alarm status at the time of logon completion.

8.2.2 Restricted Operation

The following operations will be prohibited. All the other operations can be performed in the same way as by a normal operation-level user.

- Jog operation
- FWD/BWD/TEST RUN operation(s)
- Moving the Destination (for position check etc.)

Operations using external signal input (e.g. external servo-on, programmed start) will remain enabled.

The window will immediately switch to the alarm window when an alarm occurs. It will also be possible to operate the menu to go to windows other than the LOGON window.
The each specific output for security levels is defined as follows:

**OPERATION MODE** setting: #50690  
**EDITING MODE** setting: #50691  
**MANAGEMENT MODE** setting: #50692

The specific output for security levels will change as follows depending on whether any user is logged on or not and what mode is selected for the currently logged-on user.

<table>
<thead>
<tr>
<th>Status</th>
<th>Account ID</th>
<th>Mode setting</th>
<th>#50690</th>
<th>#50691</th>
<th>#50692</th>
</tr>
</thead>
<tbody>
<tr>
<td>Logoff</td>
<td>-</td>
<td>-</td>
<td>ON</td>
<td>OFF</td>
<td>OFF</td>
</tr>
<tr>
<td>Logon</td>
<td>Account for Administrators</td>
<td>-</td>
<td>OFF</td>
<td>OFF</td>
<td>ON</td>
</tr>
<tr>
<td></td>
<td>User Account</td>
<td>OPERATION MODE</td>
<td>ON</td>
<td>OFF</td>
<td>OFF</td>
</tr>
<tr>
<td></td>
<td></td>
<td>EDITING MODE</td>
<td>OFF</td>
<td>ON</td>
<td>OFF</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MANAGEMENT MODE</td>
<td>OFF</td>
<td>OFF</td>
<td>ON</td>
</tr>
</tbody>
</table>
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Specifications are subject to change without notice for ongoing product modifications and improvements.

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