JANOME DESKTOP ROBOT

JR2000N/JR-V2000 Series

JANOME CARTESIAN ROBOT

JC Series

Operation Manual

Teaching Pendant Operation

Thank you for purchasing this Janome Robot.

- **Before using your robot, please read this manual thoroughly and always make sure you use the robot correctly. In particular, be sure to thoroughly read "For Your Safety" as it contains important safety information.**

- **After reading this manual, store in a safe place that can be easily accessed at any time by the operator.**

- **This manual is written according to IEC 62079.**

JANOME

PREFACE

The Janome Desktop Robot JR2000N Series, JR-V2000 Series and Cartesian Robot JC Series are new low-cost, high-performance robots. With these robots we succeeded in reducing the price while maintaining functionality. The combined use of stepping motors and specialized micro step driving circuits saves both energy and installation space.

The descriptions within this manual are based on standard specifications. The menu item names etc. may vary depending on the model type.

There are several manuals pertaining to these robots.

JR2000N Series

Setup	Explains how to set up the robot. ■ Make sure you read this manual ■ NOTE: This manual is designed for people who have received safety and installation training regarding the robot.
Maintenance	Explains maintenance procedures for the robot. ■ Make sure you read this manual ■ NOTE: This manual is designed for people who have received safety and maintenance training regarding the robot.
Basic Instructions	Provides part names, data configurations, and the basic knowledge necessary to operate the robot.
Quick Start	Explains the actual operation of the robot by creating and running simple programs.
Teaching Pendant Operation	Explains how to operate the robot via the teaching pendant.
PC Operation	Explains how to use the PC software, JR C-Points.
Functions I	Explains point teaching.
Functions II	Explains commands, variables, and functions.
Functions III	Explains functions such as Run Mode parameters and sequencer programs.
Functions IV	Explains functions in Customizing Mode.
External Control I (I/O-SYS)	Explains I/O-SYS communication control.
External Control II (COM Communication)	Explains COM1 – COM3 communication control.
Camera/Sensor	Explains the functions of the attachable camera and Z position sensor.
Specifications	Outlines general specifications such as the robot's operating range, weight, etc.
Application Specifications	Explains the specialized functions of the various application specifications.

Note: Product specifications are regularly updated; therefore the content of this manual may differ from the robot in your possession.

JR-V2000 Series

JR-V2000 Setup and Maintenance	Explains about installation and maintenance for this robot. ■ Make sure you read this manual ■ NOTE: This manual is designed for people who have received safety, installation and maintenance training regarding the robot.
Basic Instructions	Provides part names, data configurations, and the basic knowledge necessary to operate the robot.
Quick Start	Explains the actual operation of the robot by creating and running simple programs.
Teaching Pendant Operation	Explains how to operate the robot via the teaching pendant.
PC Operation	Explains how to use the PC software, JR C-Points.
Functions I	Explains point teaching.
Functions II	Explains commands, variables, and functions.
Functions III	Explains functions such as Run Mode parameters and sequencer programs.
Functions IV	Explains functions in Customizing Mode.
External Control II (COM Communication)	Explains how to use COM for interfacing. (There is no External Control I Manual for the JR-V2000 series. Please refer to the JR-V2000 manual regarding robot control via IO.)
JR-V2000	Explains specifically about the JR-V2000 Series.

Note: Product specifications are regularly updated; therefore the content of this manual may differ from the robot in your possession.

JC Series

JC Setup and Maintenance	Explains about installation and maintenance for this robot. ■ Make sure you read this manual ■ NOTE: This manual is designed for people who have received safety, installation and maintenance training regarding the robot.
Basic Instructions	Provides part names, data configurations, and the basic knowledge necessary to operate the robot.
Quick Start	Explains the actual operation of the robot by creating and running simple programs.
Teaching Pendant Operation	Explains how to operate the robot via the teaching pendant.
PC Operation	Explains how to use the PC software, JR C-Points.
Functions I	Explains point teaching.
Functions II	Explains commands, variables, and functions.
Functions III	Explains functions such as Run Mode parameters and sequencer programs.
Functions IV	Explains functions in Customizing Mode.
External Control II (COM Communication)	Explains how to use COM for interfacing. (There is no External Control I for the JC Series. Please refer to the application specification manual regarding robot control via IO.)
Application Specifications	Explains the functions of each of the application specifications.

Note: Product specifications are regularly updated; therefore the content of this manual may differ from the robot in your possession.

Attention

To make full use of the machine's functions and capabilities, make sure that you use the robot according to the correct handling/operation procedures that are written in this manual. Do not handle or operate the robot in ways not covered in this manual.

Attention

If you turn OFF the power after making changes to robot's settings or data without saving, these changes are lost and the robot will revert to its original settings. Make sure that you save any changes to data and/or settings.

Attention

When using this robot for the first time, make sure you back up and create an individual configuration information file. When replacing the internal circuit boards of the robot, you will need this individual configuration information.

⚠ Warning

Make sure that the **machine is grounded and do not use the machine if it is not grounded**. Make sure that the **ground resistance of the robot power supply is 100Ω or less**.
Using the machine without sufficient grounding can cause electric shock, fire, accidental operation and machine breakdown.

⚠ Warning

Make sure that the machine power supply is OFF before connecting the power cord.
Failure to do so could cause electric shock and/or injury.

Note: The operation methods described in this manual are indicated as follows:

TP Operation via the teaching pendant

PC Operation via PC (JR C-Points)

CONTENTS

FOR YOUR SAFETY

The safety notes outlined below are provided in order to ensure safe and correct usage of the product in addition to preventing injury to the operator, other people and damage to property as well.

・・・・・Be sure to follow the safety guidelines detailed here・・・・・

Symbols are also listed alongside the safety note explanations. Please refer to the list below for an explanation of these symbols.

■ Symbols that indicate the level of danger and/or damage.

The level of danger or damage that could occur as a result of ignoring these safety guidelines and misusing the robot are classified by the following symbols.

Danger	This symbol indicates an imminent risk of serious injury or death.
Warning	This symbol indicates a risk of serious injury or death.
Caution	This symbol indicates the possibility of serious injury or damage to property.

■ The following symbols list the nature of the danger and any necessary safety methods to be taken.

	Indicates caution must be taken
	Take Caution (General Precaution)
	Indicates a forbidden action
	Never do this (General Precaution)
	Do not disassemble, modify or repair.
	Do not touch (Contact Prohibition)
	Indicates a required action
	Be sure to follow instructions (General Requirement)
	Be sure to unplug the power supply cord
	Make sure the machine is grounded

FOR YOUR SAFETY

Danger

Do not use where flammable or corrosive gas is present.
Leaked gas accumulating around the unit can cause fire or an explosion.

Warning

Make sure that you securely install the unit in a place that can withstand both the mass of the machine and the usage conditions.
In addition, **for JR2000N and JR-V2000 series units with a cooling fan on the back, allow for 30cm or more clearance between the back of the unit and the wall. For the JC series, allow a clearance of approximately 30cm from the top of the control box. Also, do not block the air-intake for robots with ventilation on the bottom of the robot/control box.**
If installation is inadequate, the unit may drop or fall over causing injury and/or unit breakdown.

Make sure to power the unit within its rated current range.
Failure to do so may cause electric shock, fire, or unit malfunction.

Plug the power cord into the wall outlet firmly.
Failure to do so may cause the plug to heat up and may result in fire.

Be sure to use the unit within its indicated voltage range.
Failure to do so may cause fire or unit malfunction.

When inspecting or lubricating the unit, unplug the power cord from the wall outlet, then remove the cord from the main unit and make sure there is no electrical current. Also, **do not touch any of the power inlet pins within 5 seconds of removing the power cord.** Failure to follow these steps causes electric shock or injury.

FOR YOUR SAFETY

⚠ Warning	
	Always **make sure the unit is grounded to avoid possible electrical shocks. Do not use when the unit is not grounded.** Improper grounding may cause electric shock or fire.
	**Wipe the power plug with a clean, dry cloth periodically to eliminate dust.** Dust accumulation may deteriorate the electrical insulation and cause fire.
	**Be sure to unplug the power cord from the power outlet when the unit is not in use for long periods of time.** Dust accumulation may cause fire.
	**Be sure to turn OFF the unit before inserting or removing cords and cables such as the teaching pendant cable.** Failure to do so may result in electric shock, fire, data loss, or unit malfunction.
	**Do not attempt to disassemble or modify the unit.** Disassembly or modification may cause electric shocks or unit malfunction.
	**Do not allow water or oil to come in contact with the unit, control box or the power cord.** Contact with water or oil may cause electric shock, fire, or unit malfunction. IP Protection Rating: IP30 (CE specifications : IP40)
	**If anything unusual occurs, such as a burning smell or unusual sound, stop operation and unplug the power cord immediately. Contact the dealer from whom you purchased the robot or the office listed on the last page of this manual.** Continuing to use the robot without addressing the problem may cause electric shock, fire, or unit breakdown.

FOR YOUR SAFETY

Caution	
	**Do not drop or jar the unit during transport and/or installation.** This could cause injuries or damage the unit.
	**Before performing any operation, ensure there is no imminent danger to any of the operators**. Failure to do so may result in injury.
	**Use the unit in an environment between 0 and 40°C, with a humidity level of 20 – 90%, and without condensation.** Use outside of these conditions may result in unit malfunction or breakdown. IP Protection Rating: IP30 (CE specifications: IP40)
	**Use the unit in an environment where no electrical noise is present.** Failure to do so may result in unit malfunction or breakdown.
	**For models with IO-S circuits, when installing the unit, take safety measures such as setting up area sensors and an enclosure.** If there are no safety measures in place and someone enters the area of operation when the robot is running, they may be injured.
	**Keep the emergency stop switch within reach of the operator when running or operating the robot.** If the robot is operated when the emergency switch is not within reach, it may not be possible to stop the robot immediately and safely. This is potentially dangerous.
	**Make sure that you regularly perform a function check for the emergency stop switch. Also, for models with IO-S circuits, regularly perform an IO-S circuit function check.** If you perform work without making a circuit check, you or the operator will not be able to immediately and safely stop the robot in an emergency. This is potentially dangerous.

FOR YOUR SAFETY

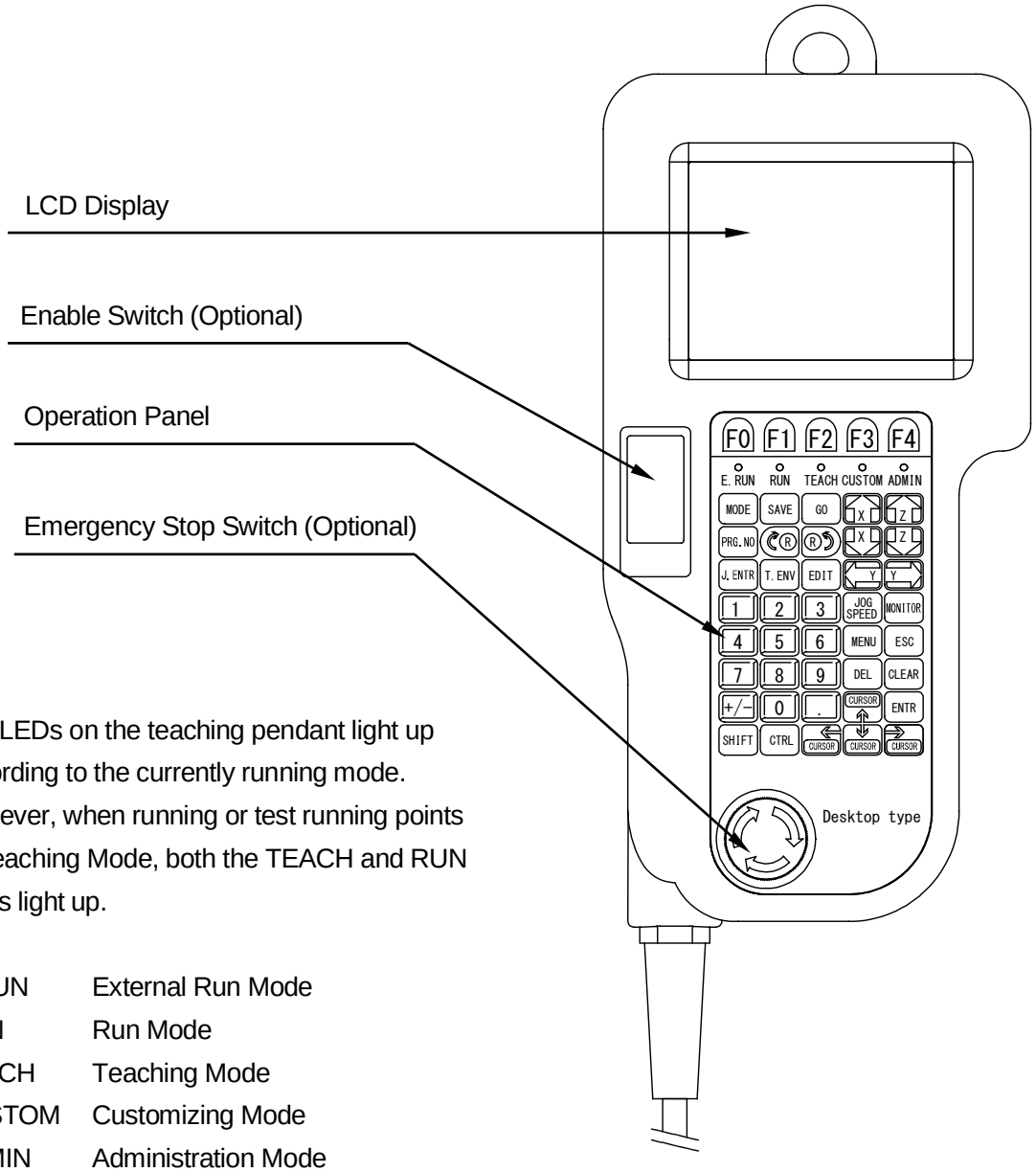
Caution	
	**When attaching tools (such as a screwdriver etc.), make sure they are securely fitted before running the robot.** Failure to do so causes injury or breakdown.
	**When using the machine for extended periods of time, check and make sure none of the main unit's mounting screws are loose, and perform a routine inspection every 3 months.** Failure to do so causes injury or breakdown.
	**Be sure to check the connections of the cords and cables to the main unit and control box.** Improper wiring may result in unit malfunction or breakdown.
	**Be sure to secure the movable parts of the unit before transportation.** Failure to do so may result in injury or breakdown.
	**Use the unit in an environment that is not exposed to direct sunlight.** Direct sunlight may cause unit malfunction or breakdown.

1. TEACHING PENDANT

NOTE

If you are using the JR-V2000 Series, refer to “2. Unit Part Names” in the operation manual *JR-V2000* and if using the JC Series refer to “2. Part Names” in *Setup and Maintenance*.

1.1 Part Names



The LEDs on the teaching pendant light up according to the currently running mode. However, when running or test running points in Teaching Mode, both the TEACH and RUN LEDs light up.

E.RUN	External Run Mode
RUN	Run Mode
TEACH	Teaching Mode
CUSTOM	Customizing Mode
ADMIN	Administration Mode

Attention

Be sure to turn off the robot before removing or inserting the teaching pendant cable. Failure to do so may cause breakdown malfunction. Also, only connect teaching pendants with/without options to compatible robots. Failure to do so may cause unit breakdown.

NOTE

- If you are using a teaching pendant with an enable switch (optional), you need to hold down the enable switch to move the robot axes in Teaching Mode.
  The enable switch has three stages: release, press and press-in. **To move each axis using the JOG keys, keep the enable switch at the "press" stage.**
  Additionally, you need to keep the enable switch pressed when moving the axes.
  If the enable switch is released or pressed-in, the robot stops for your safety.

- A stop made by the enable switch is a Category 2 Stop.
  (Category 2 Stop: A controlled stop, where power is still supplied to the machine.)

- The JR-V2000 Series is not equipped with an enable switch (optional), or an emergency switch (optional).

- The JC Series is not equipped with an enable switch (optional)

- For the JC Series, an emergency stop switch (optional) is equipped by standard.

1.2 Teaching Pendant Operation Panel Keys

F0 ·····Function 0 Key

F1 ·····Function 1 Key

F2 ·····Function 2 Key

F3 ·····Function 3 Key

F4 ·····Function 4 Key

MODE ·····Mode Key

SAVE ·····Save Key

GO ·····Go Key

PRG.NO ·····Program No. Key

J.ENTR ·····J. Enter Key

T.ENV ·····T. ENV Key *1

EDIT ·····Edit Key

SHIFT ·····Shift Key

CTRL ·····Control Key

0 – 9 ·····Numeric Key

± ·····Plus Minus Key

. ·····Decimal Point Key

Numerical Keys

↑X ····· X Plus Key*3

X↑ ····· X Minus Key*3

←Y ····· Y Minus Key

Y→ ····· Y Plus Key

Z↑ ····· Z Up Key

Z↓ ····· Z Down Key

R ····· R Plus Key*2

R ····· R Minus Key*2

JOG Key

CURSOR← ····· Cursor Left Key

CURSOR→ ····· Cursor Right Key

CURSOR↑ ····· Cursor Up Key

CURSOR↓ ····· Cursor Down Key

JOG SPEED ····· JOG Speed Key

MONITOR ····· Monitor Key

MENU ····· Menu Key

ESC ····· Escape Key

DEL ····· Delete Key

CLEAR ····· Clear Key

ENTR ····· Enter Key

*1 Teaching Environment.

*2 The JR-V2000 Series is not equipped with the R R keys.
The R R keys do not work with the JC Series.

*3 With the JC Series the ↑X is the X minus key and the X ↓ is the X plus key.

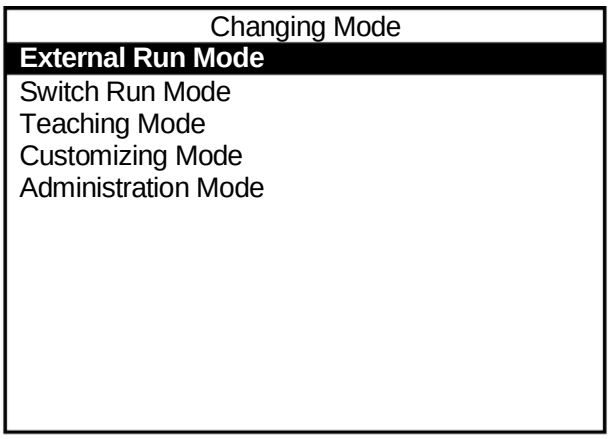
2. CHANGING MODE (MODE Key)

To change modes, carry out one of the following operations at the base screen of any mode:

MODE key: ····· The mode menu is displayed (diagram below)
Select the mode you want to change to.

SHIFT + MODE keys: ····· Push these keys to switch modes in the following order:
Teaching Mode → Switch Run Mode → External Run Mode → Teaching Mode.

- External Run Mode ····· This mode starts running programs using a signal from I/O-SYS or COM1.
- Switch Run Mode ····· This mode starts running programs by pressing the start switch on the front of the robot, or on the switch box.
- Teaching Mode ····· This mode creates programs
- Customizing Mode ····· This mode creates data for composing programs
- Administration Mode ····· This mode is for administration and maintenance.



Changing Mode Menu

The mode currently in use is indicated by the appropriate LED light on the teaching pendant:

- E.RUN: External Run Mode
- RUN: Switch Run Mode
- TEACH: Teaching Mode
- CUSTOM: Customizing Mode
- ADMIN: Administration Mode

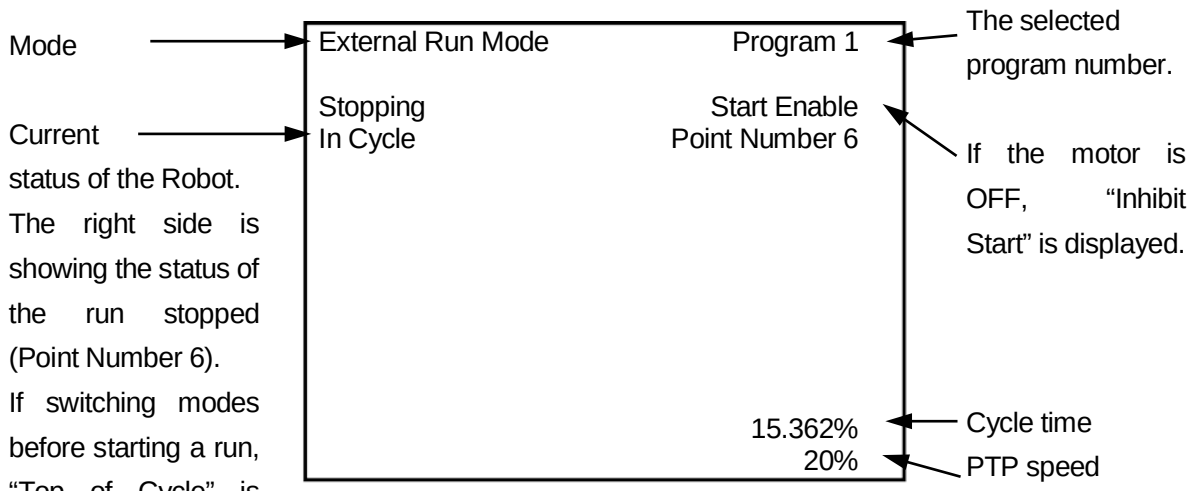
3. BASIC KEY OPERATIONS

This section explains the basic teaching pendant key operations.

3.1 Base Screen

The base screen is the screen which appears immediately after starting up any robot mode (except when there is no teaching data in a program).

3.1.1 Switch Run Mode/External Run Mode



Example of Base Screen: External Run Mode

Cycle time is the time it takes to finish a run of one cycle (units displayed in seconds). If the cycle mode is set to "continuous playback", the time is not updated for each cycle; it displays the total time once the "final work" signal is sent and work is complete. However, if the robot stops running due to an error, the time is not displayed.

The PTP speed override reduces the PTP speed by the percentage displayed (this does not affect the CP speed). Note, this is not displayed when set to 100%.

Operation keys are disabled while the robot is running. Use the keys on the following page when the robot is in the status of "Stopping" or "Top of Cycle".

NOTE

When in Run Mode, the "RUN" LED is lights up on the teaching pendant.

[MODE] ····· Displays the mode selection ([Changing Mode]) menu.

[SHIFT] + [MODE] ····· Push these keys to switch modes in the following order: Teaching Mode → Switch Run Mode → External Run Mode → Teaching Mode

[MENU] ····· Displays the Run Mode menu.

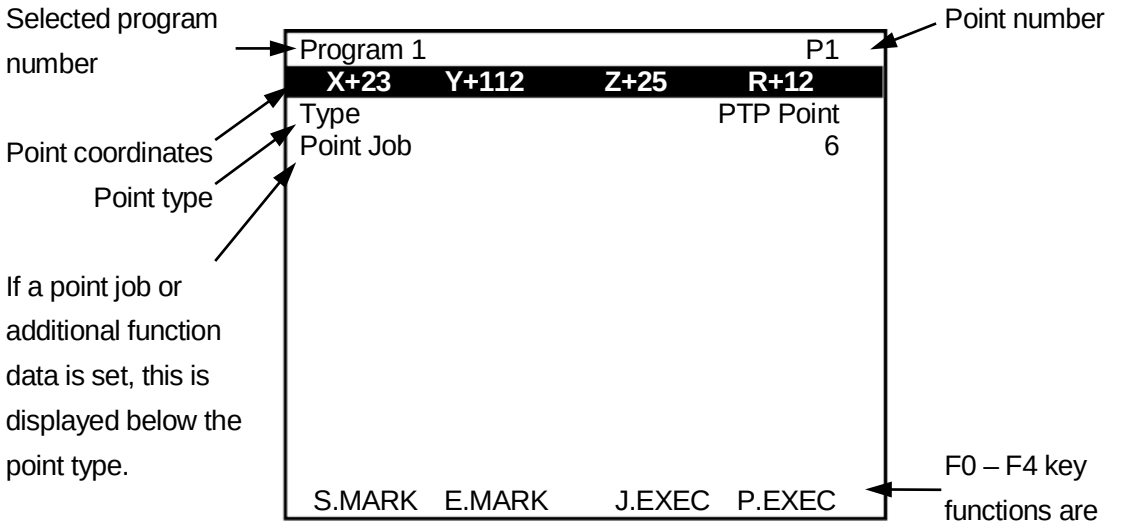
[T.ENV] ····· Displays the Teaching Environment Setting menu.

[CTRL] + [T.ENV] ····· Displays the Display Language menu.

[PRG.NO] ····· Displays the Program Number entry screen.
Here you can change the currently selected program.

[SAVE] ····· Saves C & T (customizing & teaching) data.
Use this key when saving C & T data.

3.1.2 Teaching Mode



Example of base screen: Point Settings Screen

NOTE

- The point settings screen may have multiple pages depending on the point setting and content.
- When in Teaching Mode, the “TEACH” LED lights up on the teaching pendant. When performing a test run or point run, the “TEACH” or “RUN” LED lights up.

[MODE] ……Displays the mode selection menu.

[SHIFT] + [MODE] ……Push these keys to switch modes in the following order: Teaching Mode → Switch Run Mode → External Run Mode → Teaching Mode

[MENU] ……Displays the Teaching Mode menu.

[T.ENV] ……Displays the Teaching Environment Settings menu.

[SHIFT] + [T.ENV] ……Displays the settings screen for the tool during teaching.

[CTRL] + [T.ENV] ……Displays the Display Language menu.

[PRG.NO] ……Displays the Program Number entry screen.
Use this key when changing the currently selected program or registering a new program.

[MONITOR] ……Displays the Test menu.

SAVE ····· Saves C & T (customizing & teaching) data.
Use this key when saving C & T data.

EDIT ····· Displays the point editing screen.
Every point can be edited individually.

GO ····· Moves the robot axes to the displayed coordinates.

⚠ Caution Always pay special attention to the robot's movement when in Teaching Mode.

F0 (S.MARK) ····· Sets the current point number as [Block Start Number] during [Block Editing].

F1 (E.MARK) ····· Sets the current point number as [Block End Number] during [Block Editing].

F3 (J.EXEC) ····· Performs the point job data for the [Point Job Number] set to a given point. Align the cursor up with the point job number and then push this key.

F4 (P.EXEC) ····· Runs the current point, and the screen changes to the settings display for the next point. If the current point is the last point in the program, the work home settings screen appears. However, if the currently displayed point is a CP start point, the robot will run from the CP start point through to the CP end point. Do not run the point if the currently displayed point is a mid CP point (e.g. CP Passing Point).

CURSOR← ····· Displays the settings screen for the previous point. If Point 1 is displayed, the work home settings screen will appear. This key is invalid when the work home settings screen is displayed.

CURSOR→ ····· Displays the settings screen for the next point. If the next point is not entered, the new point entry screen will appear. This key is invalid when the new point entry screen is displayed.

SHIFT + CURSOR← ……Displays the settings screen for the first point (Number 1).

SHIFT + CURSOR→ ……Displays the new point entry screen for the next point after the last registered point.

CURSOR↑ ……The highlighted line shifts one line upward. This key is invalid if the first line of the first page is already highlighted.

CURSOR↓ ……The highlighted line shifts one line downward. If the last line is highlighted, the highlight will shift to the first line of the next page. If the last line of the last page is highlighted, unset but potentially settable point jobs and additional functions for the current point is listed. Select the point job data, or additional function data and enter the number to add the data to the current point. (Number "0" for point job/additional function data means that no point job/additional function data is registered to it).

SHIFT + CURSOR↑ ……This highlights the second line of the first page. This is invalid if the second line on the first page is already highlighted.

SHIFT + CURSOR↓ ……This highlights the item on the bottom of the last page. This is invalid if the item on the bottom of the last page is already highlighted.

ENTR ……Displays the entry or selection screen for the highlighted item.

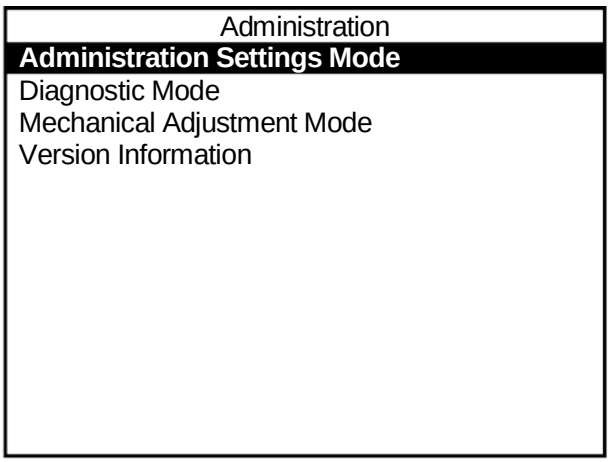
Program numbers or point numbers	The entry screen for the point numbers is displayed. Enter a number here to show the point settings screen for that number.
Coordinates	The coordinate position entry screen is displayed.
Point type	The point type selection screen is displayed.
Point Job Additional function data	The numerical entry screen for registered point job/additional function data is displayed. If you want to change the point job/additional function data type, enter "0" on the currently registered point job/additional function data, and set new point job/additional function data (CURSOR↓ key).

0 – 9 ……Each numeral key executes point job data registered to it (These keys are invalid if there is no set point job data.)

SHIFT + GO ……This executes mechanical initialization.

To select a certain item, highlight it and push the ENTR key.

3.1.3 Administration Mode



← With the JC Series there is no Mechanical Adjustment Mode.

Caution Only maintenance technicians should use Diagnostic Mode and Mechanical Adjustment Mode.

NOTE

When in Administration Mode, the “ADMIN” LED lights up on the teaching pendant.

MODE ····· Displays the mode selection menu.

CTRL + T.ENV ····· Displays the display language menu.

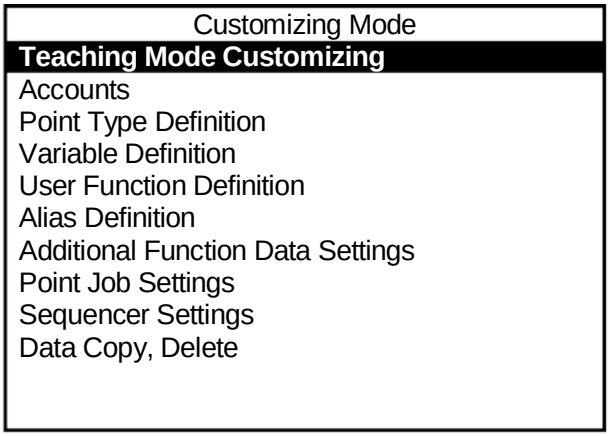
SAVE ····· Saves C & T (customizing & teaching) data.
Use this key when saving C & T data.

CURSOR↑ ····· Shifts the highlighted line one line upward. This key is invalid if the first line of the first page is already highlighted.

CURSOR↓ ····· Shifts the highlighted line one line downward. The highlight bar shifts to the first line of the next page if the last line is highlighted. This key is invalid if the last line of the last page is already highlighted.

ENTR ·····Displays the entry or selection screen for the highlighted item. If [Version Information] is selected, the robot configuration information will appear.

3.1.4 Customizing Mode



Base Screen Example: Customizing Mode

NOTE

The screen shown to the left is the Customizing Mode menu after login.

NOTE

- When in Customizing Mode, the “CUSTOM” LED lights up on the teaching pendant.
- For further details regarding Customizing Mode, refer to *Functions IV*.

MODE ·····Displays the mode selection ([Changing Mode]) menu.

CTRL + T.ENV ·····Displays the Display Language menu.

SAVE ·····Saves C & T (customizing & teaching) data.
Use this key to save C & T data.

CURSOR↑ ·····Shifts the highlighted section one line upward. This key is invalid if the first line of the first page is already highlighted.

CURSOR↓ ·····Shifts the highlighted section one line downward. The highlight bar shifts to the first line of the next page if the last line is highlighted. This key is invalid if the last line of the last page is already highlighted.

ENTR ·····Displays the entry or selection screen for the highlighted item.

3.2 Selection

Screens such as menu and confirmation screens are classified as selection screens. "Select" means to highlight an item and set it (by pressing the ENTR key.)

The selection screen sometimes covers two or more pages. In the diagram to the right, the numbers "1/3" in the upper-right corner of the screen indicate that the current page is page 1 of 3.

IO-SYS Function Assignment	1/3
sysIn1	**Start**
sysIn2	Go Home
sysIn3	Reset
sysIn4	Program Number Load
sysIn5	Program Number 1
sysIn6	Program Number 2
sysIn7	Program Number 4
sysIn8	Program Number 8
sysIn9	Program Number 16
sysIn10	Program Number 32
sysIn11	Program Number 64
sysIn12	Program Number 128

Example of a Selection Screen

[0] – [9] ····· Press the keys to highlight the corresponding line counted from the first line of the first page. Press the [0] key to highlight the tenth line. (Any number larger than the total number of lines is not recognized.)

[CURSOR↑] ····· Shifts the highlighted line one line upward. This key is invalid if the first line of the first page is already highlighted.

[CURSOR↓] ····· Shifts the highlighted line one line downward. The highlight bar shifts to the first line of the next page if the last line is highlighted.
This key is invalid if the last line of the last page is already highlighted.

[SHIFT] + [CURSOR↑] ····· Displays the previous page. (These keys are invalid if there is no previous page.)

[SHIFT] + [CURSOR↓] ····· Displays the next page. (These keys are invalid if there is no next page.)

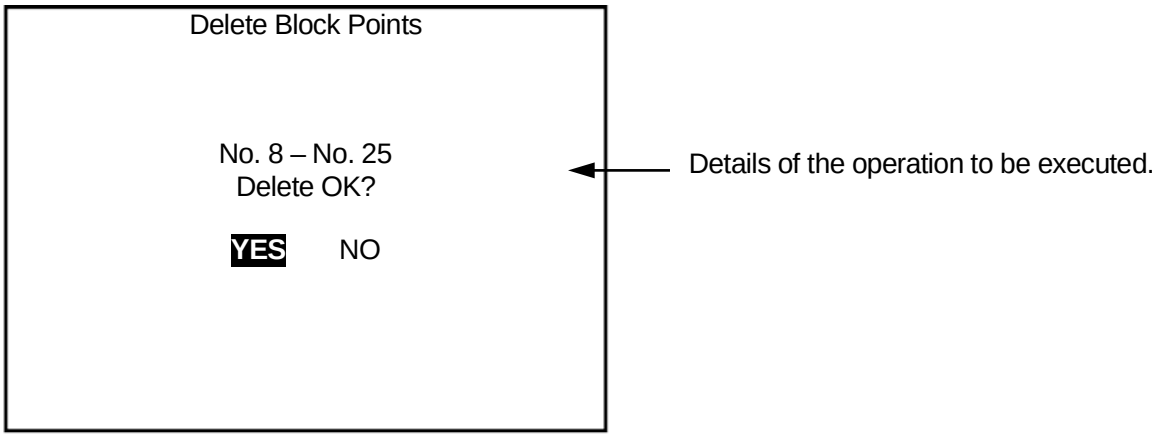
[.] ····· Highlights the last line. (If the menu screen covers multiple pages, the last line of the last page is highlighted.)

ENTR ·····Sets the highlighted item or displays the settings screen or the related menu for that item. If you enter a new point in Teaching Mode, the entry screen or selection screen for the settings of the next item for that point data appears. (For example, if you set the point type to [CP Start Point], the [Line Speed] entry screen will appear next.) If there are no more items to be set, the new position entry screen for the next point appears.

ESC ·····Displays the previous menu or reverts to the base screen. This key is invalid on the Program Number selection screen there are no registered programs.

SHIFT + ESC ·····Reverts to the base screen.
These keys are invalid on the Program Number selection screen if there are no registered programs.

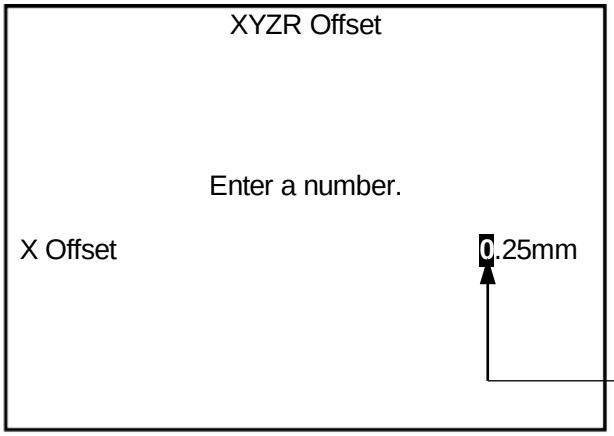
■ Keys valid on a confirmation screen.



Confirmation Screen Example

CURSOR↑, CURSOR↓ CURSOR←, CURSOR→ ·····Moves the highlight bar between YES and NO.

3.3 Entering Numbers



Number Entry Screen Example

The cursor blinks on a character or number.

The following key operations do not apply to the entry of position coordinates using numeric keys. In this situation, refer to MDI Mode in “Position Entry”.

CURSOR↑ ····· Increases the value. If you release this key within 0.5 seconds, the value increases by the minimum increment. If you press this key for more than 0.5 seconds, the value increases every 0.2 seconds.

CURSOR↓ ····· Decreases the value. If you release this key within 0.5 seconds, the value decreases by the minimum increment. If you press this key for more than 0.5 seconds, the value decreases every 0.2 seconds.

SHIFT + CURSOR↑ ····· Increases the value at 10 times the rate of the CURSOR↑ key.

SHIFT + CURSOR↓ ····· Decreases the value at 10 times the rate of the CURSOR↓ key.

CURSOR← ····· Shifts the cursor one digit to the left. This key is invalid if the cursor is on the leftmost digit. If the cursor is hidden, press this key to display the cursor on the bottommost digit.

CURSOR→ ····· Shifts the cursor one digit to the right. If the cursor is on the rightmost digit, pressing this key will hide the cursor. This key is invalid if the cursor is hidden.

[1] – [0] ····· Overwrites the number under the cursor with the number you press. If the cursor is hidden, the digits will shift one place to the left and the number pressed will be entered as the last digit.

[.] ····· Enters a decimal point. This key is invalid if the number contains a decimal point or no decimal fraction is possible.

[±] ····· Reverses plus and minus signs. This key is invalid if no negative (-) number exists.

[CLEAR] ····· Clears the entire value. The value becomes 0.

[DEL] ····· Deletes the number or decimal point at the cursor's current location. The cursor and the number on the left side of the cursor shift one place to the right. However, the decimal point cannot be deleted if the number exceeds the entry range without the decimal point.
If the cursor is hidden, the rightmost figure is deleted and the figures will shift one place to the right.

[ENTR] ····· Sets the number and returns to the previous menu or the base screen. If you enter a new point, the entry or selection screen for the next setting item of the point data will appear. If there is no item to be set next, the new position entry screen for the next point will appear.

[ESC] ····· Returns to the previous menu or the base screen without setting the number.
This key is invalid on the Program Number entry screen if no programs are registered.

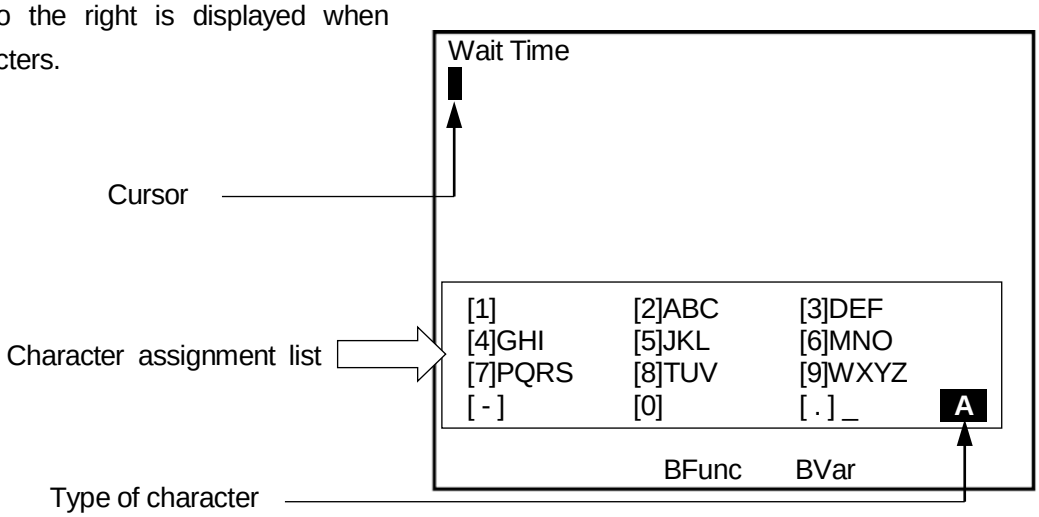
[SHIFT] + [ESC] ····· Returns to the base screen without setting the number.
These keys are invalid on the Program Number entry screen if no program is registered.

[F4](EXP) ····· Switches to the character entry screen. Use this key to enter variables, functions, and formulas. This key is valid when the EXP label is displayed near the bottom right hand side of the screen (above the [F4] key).

3.4 Entering Characters and Formulas

It is possible to attach names to registered programs and point job data. Below are the methods for operating the character entry screen for entering names. These input methods also apply when entering command line formulas for point job data, etc.

The screen to the right is displayed when entering characters.



A: Roman uppercase, a: Roman lowercase, 1: Numbers, C: Operators, *: Symbols

[0] – [9] [+/-] [.] ····· Characters are entered according to the character assignment list on the screen. In the example above, if you press the [2] key once, the letter "A" is entered. If you press it twice, the letter "B" is entered. If you want to enter the letters "AB", enter the letter "A" first and press the [CURSOR→] key to shift the cursor to the right, and then enter "B".
Keys which have no character assigned, such as [1] (above), are invalid.

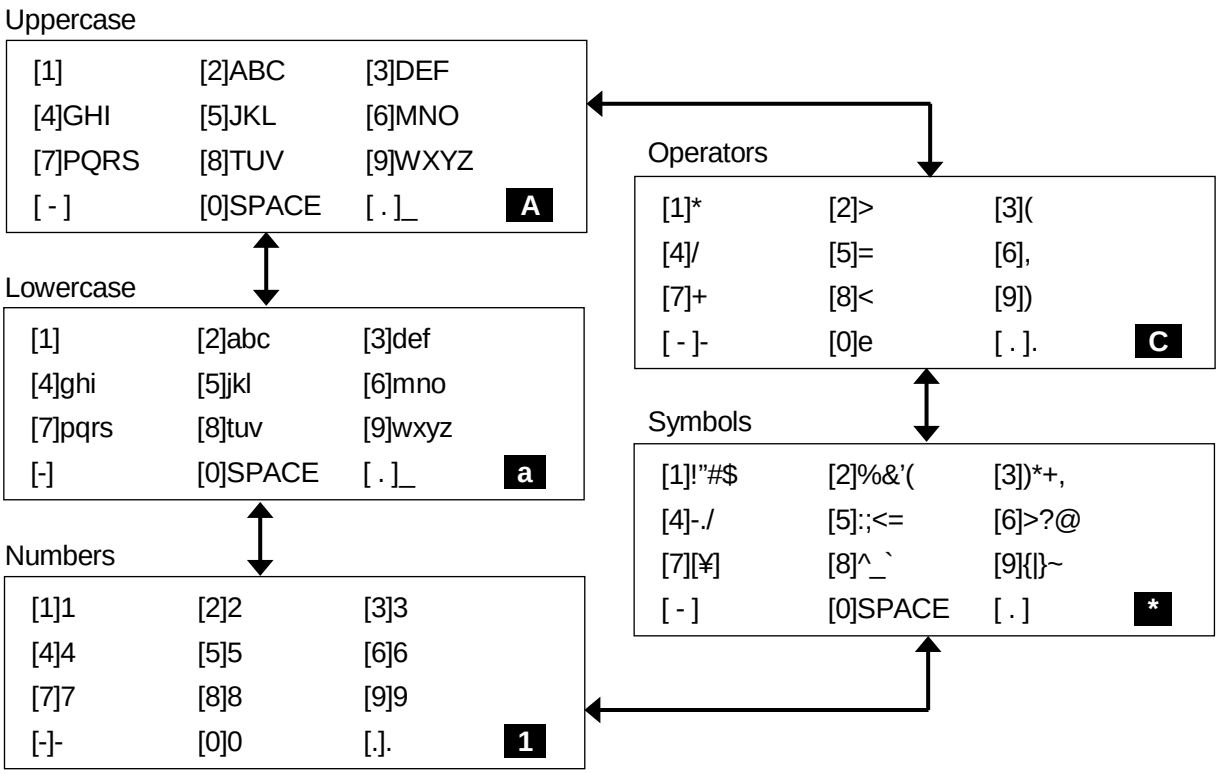
[ESC] ····· Returns to the previous screen (without registering the character string).

[ENTR] ····· This registers the character string and finishes character string entry.
A name cannot be registered if it exceeds the character number limit. Also, you cannot register a name which includes any unusable characters.

F4 ·····Each time this key is pressed, the character type changes in the following order: Roman uppercase → Roman lowercase → numbers → symbols → operators → Roman uppercase
Note, when entering names, the Operators assignment list is not shown, and when entering variables, the Operators and Symbols assignment lists are not shown.

SHIFT + F4 ·····Each time these keys are pressed at the same time, the character type changes in the following order: Roman uppercase → operators → symbols → numbers → Roman lowercase → Roman uppercase.
Note, when entering names, the Operators assignment list will not appear, and when entering variables, the Operators and Symbols assignment lists will not appear.

■ Character Assignment Switching



CURSOR↑ ·····Shifts the cursor upward (in the character string).

CURSOR↓ ·····Shifts the cursor downward (in the character string).

CURSOR← ·····Shifts the cursor to the left (in the character string).

CURSOR→ ·····Shifts the cursor to the right (in the character string).

SHIFT + CURSOR↑ ·····Shifts the cursor to the top line.

SHIFT + CURSOR↓ ·····Shifts the cursor to the bottom line.

SHIFT + CURSOR← ·····Shifts the cursor to the top of the character string.

SHIFT + CURSOR→ ·····Shifts the cursor to the end of the character string.

DEL ·····Deletes the character at the cursor's current location. If the cursor is at the far right of the character string, the last character will be deleted.

CLEAR ·····Clears the entire character string.

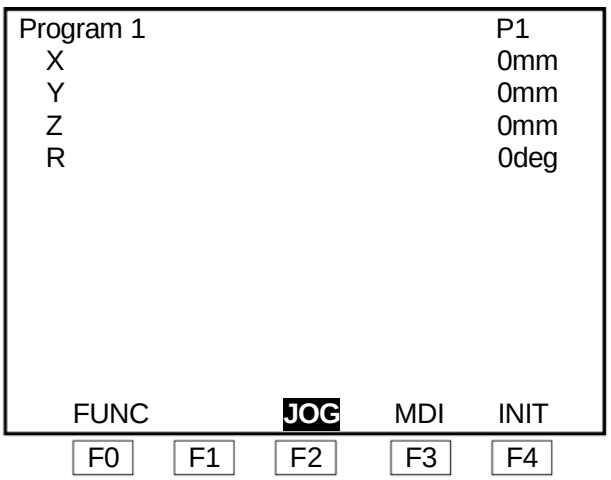
F2 (BFunc)·····Displays the list of built-in functions (functions built into the robot in advance as operating functions). This key is valid when the sign [BFunc] is displayed on the last line of the screen (above the F2 key).

F3 (BVar) ·····Displays the list of built-in variables (variables built into the robot in advance as operating functions). This key is valid when the sign [BVar] is displayed on the last line of the screen (above the F3 key).

If you enter characters, such as the point job command *outCOM*, you can designate the characters using hexadecimal codes after the "¥" code. If you want to use the "¥" as a symbol, enter "¥¥". In this case, the quotation marks ("") which enclose a character string will be entered automatically.

Example: outCOM port2,"¥0D¥0A" Outputs CR LF codes.
outCOM port2,"¥¥300" Outputs ¥300.

3.5 Position Entry



Position Entry Screen Example

Point coordinates
←Only displayed for robots with R axis specs

←The mode currently selected is highlighted.

[F0](FUNC)·····This changes the functions of [F1] – [F4]
(To change the functions a manual job number is required)

[F2](JOG)·····This changes to the JOG Mode. Additionally, the coordinates displayed on the screen switch to the current arm position coordinates.
This is invalid when the robot motor is OFF.
This is the same as when pushing the JOG keys:

JOG keys: [↑X] [↓X] [←Y] [Y→] [↻R] [R↺] [Z↑] [Z↓]

NOTE

- The JR-V2000 Series is not equipped with the [R↺] [↻R] keys.
  The [R↺] [↻R] keys do not work with the JC Series.

[F3](MDI)·····This changes to the MDI Mode. If already in the MDI mode, each time [F3] is pushed, a screen for entering coordinates for each axis is displayed in this order: X → Y → Z → R*1 →X
*1 It only switches to this for models with R axis specifications.

NOTE

- No matter what mode you are using, the following keys are valid while the position entry screen is displayed:
  [SHIFT] + [T.ENV] ·····Displays the settings screen for the tool during teaching.
  [T.ENV] ·····Displays the Teaching Environment Setting menu screen.
  [SHIFT] + [F3]·····Copies the coordinate value for the point of the designated number.

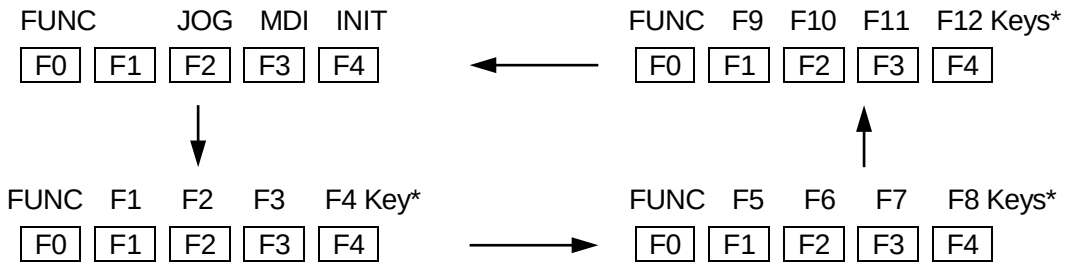
- Be careful when switching from the MDI mode to the JOG mode, as the MDI coordinate values will be replaced with the current positions of the axes.

- If your teaching pendant is equipped with an enable switch (optional), **you must continue pressing the enable switch while operating the teaching pendant keys** to move the robot axes in Teaching Mode.

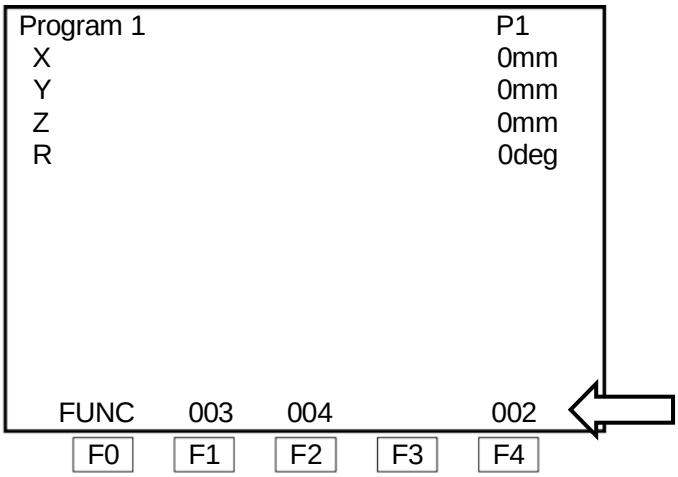
3.5.1 Manual Job

If you set the point job numbers to [F1 Key Job Number] – [F12 Key Job Number], you can perform the designated point job data on the position entry screen in Teaching Mode. Note, however, that [F1 Key Job Number] is not equal to the F1 key.

Each time the F0 (FUNC) key is pressed on the position entry screen, the F1, F2, F3, and F4 key functions change as follows. Note, however, that the function will not change if no point job number is set to [F1 Key Job Number] – [F12 Key Job Number].



*Before using this function, you need to set the point job data to each of the F1, F2, F3, and F4 keys. For details, refer to “4.7 Manual Job Number Setting”.



←Only displayed for robots with R axis specs.

The point job numbers set to each key are displayed on the screen.
(003: Point Job Data 3)
(The lack of a number indicates that there is no point job data set to this key.)

After switching the screen display, press the F1, F2, F3 or F4 key. The robot will perform the point job set to the key.

NOTE

If your teaching pendant is equipped with an enable switch (optional), you must continue pressing the enable switch while operating the teaching pendant keys. If the enable switch is released or pressed-in, the robot stops for your safety.

Caution Always pay special attention to the robot's movement in the Teaching mode.

3.5.2 Copying Point Coordinates

It is possible to copy coordinates of an existing point. This function is convenient in situations such as these:

- When entering [Position Setting] in the [2-Points Position Conversion] menu.
- When entering [Robot Coordinate Position] with camera adjustment calibration.

Press the F3 key while pressing the SHIFT key on the position entry screen. Then enter the point number of the coordinate copy source and set it. The coordinate values of the point number entered will be copied. (You can select points only within the currently selected program.)

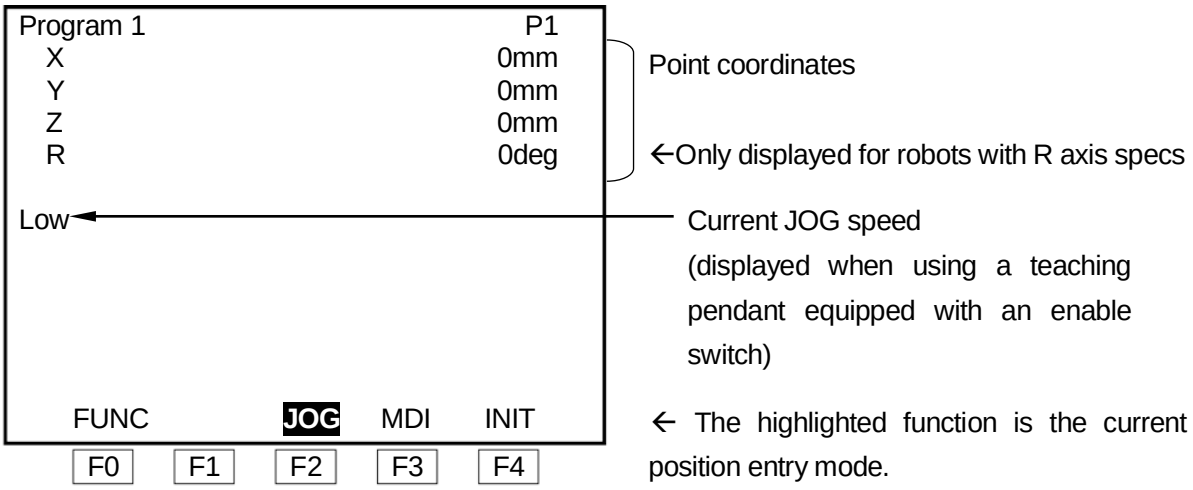
Enter [0] to copy the work home position coordinates.

3.5.3 JOG Mode

> **Caution** Always pay special attention to the robot's movement in the Teaching mode.

In the JOG mode, you move the robot axes to the position you want using the JOG keys on the teaching pendant and enter the position.
The coordinate values of the current position of the axes are displayed on the teaching pendant LCD. Note that the "RUN" LED on the teaching pendant does not light up when the robot axes are moved using the JOG keys.

If you are using a teaching pendant with an enable switch, it is necessary to press the enable switch while operating the robot with the keys.
The enable switch has three stages: release, press and press-in. To move each axis using the JOG keys, keep the enable switch at the "press" stage.
If the enable switch is released or pressed-in, the robot stops for your safety.



X↓ ……Moves the X axis in the –X direction.
Moves the X axis in the +X direction with the JC Series.

X↑ ……Moves the X axis in the +X direction.
Moves the X axis in the -X direction with the JC Series.

[←Y] ·····Moves the Y axis in the –Y direction.

[Y→] ·····Moves the Y-Axis in the +Y direction.

[↑Z] ·····Moves the Z-Axis in the –Z direction.

[↓Z] ·····Moves the Z-Axis in the +Z direction.

[↶R] ·····Rotates the R-Axis in the –R direction. (4-Axis model only)

[R↷] ·····Rotates the R-Axis in the +R direction. (4-Axis model only)

NOTE

- Each of the above keys, [X↓] – [R↷], are called JOG keys. The distance the axes move from one push, and also the speed at which the axes move when holding down a JOG key, can be set using the [JOG SPEED] key, or by setting them in the teaching parameters ([T.ENV] key).
  JR-V2000 Series is not equipped with the [↶R] [R↷] keys
  The [↶R] [R↷] keys do not work with the JC Series.

- Continuously hold down a jog key to move the corresponding axis at low speed. As you continue to hold down the jog key, the axis will gradually increase speed and move at middle speed.
  When pushing a JOG key to move the axis at a low/middle speed, also hold the [SHIFT] key to gradually increase to high speed. When moving the axes by pressing the [SHIFT] + JOG keys, release the [SHIFT] key to gradually reduce the axis to medium speed.
  However, when using a teaching pendant equipped with an enable switch, pressing the [SHIFT] key does not change the axis speed. In this situation, press the [JOG SPEED] key to switch among low → middle → high speed.

- The movement of the axes in the JOG mode is limited by the move area limit. If an axis is not able to go over certain coordinates, check the program data, [Move Area Limit].

[J.ENTR] or [ENTR] ·····This fixes the coordinates and proceeds to the point type selection screen when inputting new positions. Returns to the point setting screen (base screen) when modifying positions.

[ESC] ·····This key is invalid when inputting new positions. Returns you to the point settings screen (base screen) when modifying positions.

JOG SPEED ……This changes the setting values for the moving distance (referred to as a step) and the moving speed for the axes when entering positions using the JOG keys in Teaching Mode. You can also make these settings during teaching using the "Jog movement" parameters (T.ENV key)

NOTE: When using a teaching pendant equipped with an enable switch, you can continuously press the JOG key to switch the arm moving speed from low → middle → high.

F0 (FUNC) ……Changes the F1 – F4 key functions.
(To change the functions, you must set the manual job numbers.)

F3 (MDI) ……Switches to MDI Mode.*

F4 (INIT) ……Performs mechanical initialization and moves all axes to their absolute coordinates (0, 0).*

*If you have changed the functions of the F1 – F4 keys by pressing the F0 key, the point jobs assigned to the keys are performed instead. (Manual job)

SHIFT + T.ENV ……Displays the settings screen for the tool during teaching.

T.ENV ……Displays the teaching environment setting menu.

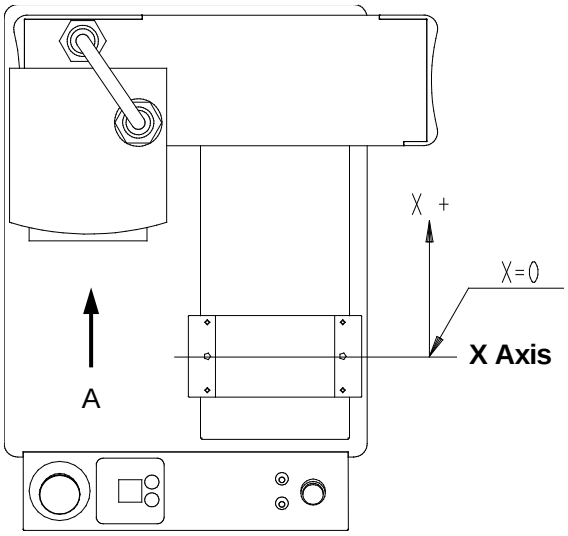
SHIFT + F3 ……Copies the designated point number coordinate values.

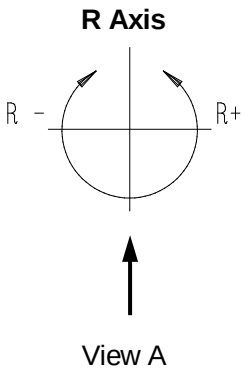
■ Coordinate System

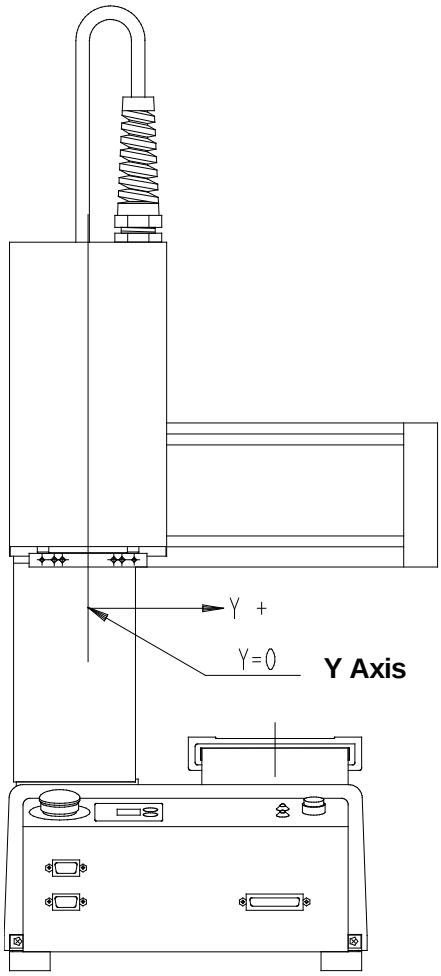
JR2203N Example Diagrams

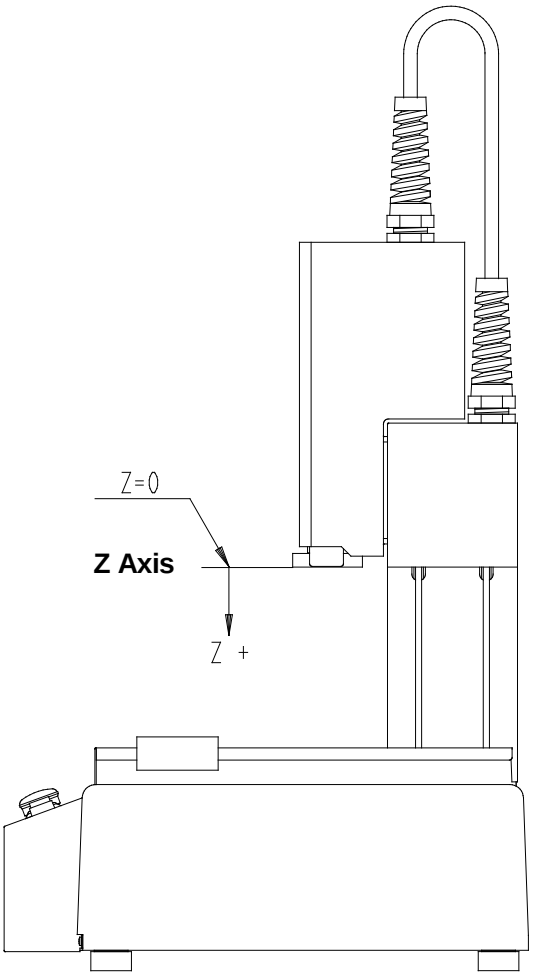
NOTE

If using the JR-V2000 Series, please refer to the operation manual *JR-V2000*.

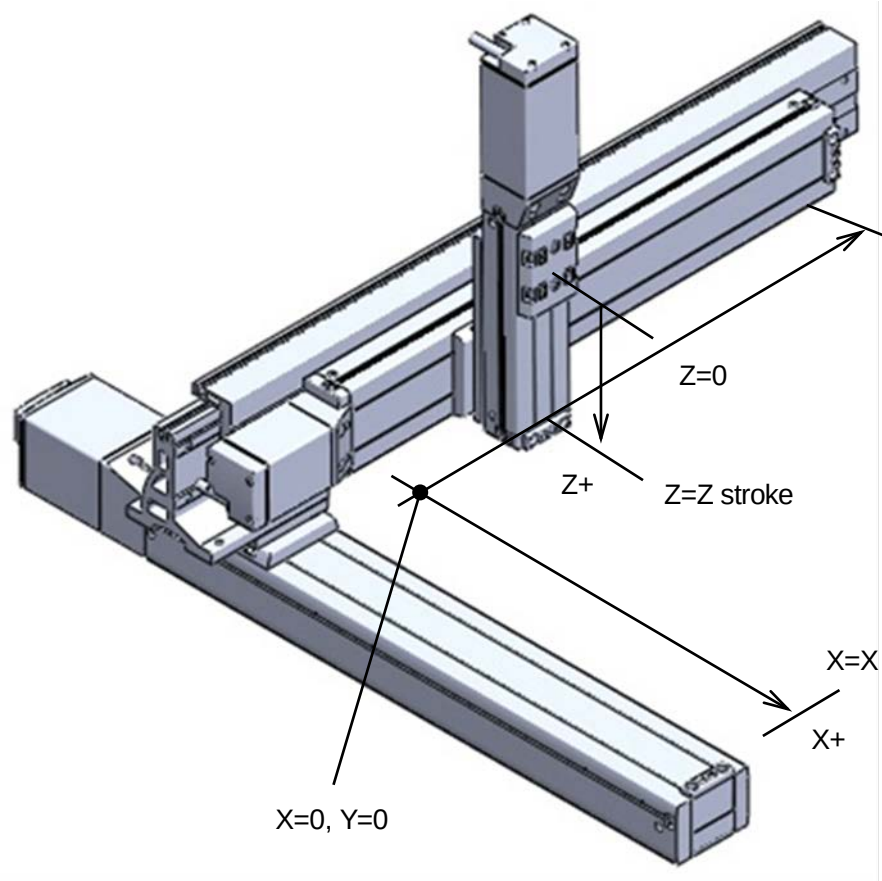








■ JC Coordinate System



JC-2T Example diagram

Unit: mm

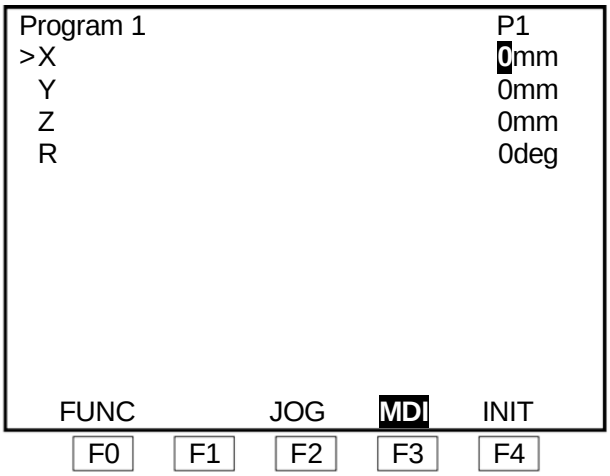
Axis Robot	X stroke	Y stroke	Z stroke
JC-2T (single shaft)	200,300,400,500,600	200, 300	50, 100
JC-2H (double shaft)	300,400,500,600	300, 400, 500	50, 100

NOTE

The stroke length of each axis varies depending on the specifications.

3.5.4 MDI Mode

In MDI Mode, you can enter the coordinate values using the numeric keys. The axes do not move.



← You can enter a value for the item indicated by the ">" symbol on the left side of the screen.
← Only displayed for robots with R axis specs

← The highlighted indicator (JOG or MDI) is the current mode.

[1] – [0] ·····Overwrites the cursor's current location with the numbers you input. If the cursor is hidden, the digits shift one place to the left and the number pressed is entered as the last digit.

[.] ·····Enters a decimal point. This key is invalid if the figure already contains a decimal point or no decimal fraction is possible.

[±] ·····Reverses the plus and minus signs. This key is invalid for items where negative (-) number exists.

NOTE

The above, [1] – [±] keys, are called numeric keys.

[CLEAR] ·····Clears the entire value. The value becomes 0.

[DEL] ·····Deletes the figure or decimal point from the cursor's current location. The cursor and any figures to the left of the cursor shift one place right. However, the decimal point cannot be deleted if the figure exceeds the entry range without the decimal point.

If the cursor is hidden, the lowest figure is deleted and the figures shift one place to the right.

F3 ····· Each time this key is pressed, the cursor line (indicated by ">") switches in the following order: X → Y → Z → R*1 → X.
*1 It only switches to this for models with R axis specifications.

CURSOR← ····· Moves the cursor one place to the left. This key is invalid if the cursor is on the leftmost digit. If the cursor is hidden, press this key to display the cursor on the rightmost digit. When entering new positions, this moves the cursor to the previous point's screen.

CURSOR→ ····· Moves the cursor one place to the right. If the cursor is on the rightmost digit, pressing this key will hide the cursor. This key is invalid if the cursor is hidden.

GO ····· Moves the axes to the coordinates displayed on the LCD. The "RUN" LED on the teaching pendant does not turn on when using the GO key to move the axes.

Caution

Always pay special attention to the robot's movement in Teaching Mode.

J.ENTR or ENTR ····· Fixes the coordinates. The Point Type Selection screen is displayed when entering a new point. The screen returns to the point settings screen (base screen) when a registered point is modified.

ESC ····· This key is invalid when a new position is entered. Returns to the point settings screen (base screen) when a position is modified.

F0 (FUNC) ····· Changes the F1 – F4 key functions.
(To change the functions, you must set the manual job numbers.)

F2 (JOG) ····· Switches to JOG mode. Also, the coordinates displayed on the LCD are replaced with the current axes position coordinates.*

F4 (INIT) ·····Performs mechanical initialization and moves the axes to their absolute coordinates (0, 0).*

*If you have changed the F1 – F4 key functions by pressing the F0 key, the point jobs assigned to the keys are performed instead. (Manual job)

NOTE

If you are using a teaching pendant with an enable switch, you must **press the enable switch while using the operation keys** to move the axes.

The enable switch has three stages: release, press and press-in. To move each axis using the JOG keys, keep the enable switch at the "press" stage. If the enable switch is released or pressed-in, the robot is stopped for your safety.

SHIFT + T.ENV ·····Displays the settings screen for the tool during teaching.

T.ENV ·····Displays the teaching environment settings menu.

SHIFT + F3 ·····Copies the designated point number coordinate values.

NOTE

- Axes movement in MDI Mode is not limited by the move area limit. If a move area limit is required, enter the positions using JOG Mode, or otherwise be careful not to exceed the move area limit.

- If a displayed coordinate value is not the same as the current axes position, the differing coordinate axis (X, Y, Z, or R) is highlighted.

4. TEACHING ENVIRONMENT SETTING (T.ENV Key)

The environment settings include the following parameters. Press the T.ENV key in the Teaching Mode to display the parameters. These three parameters: Brightness Adjustment, Unit of Measure, and Display Language, can also be selected in Run Mode by pressing the T.ENV key.

Parameter	Description
Brightness Adjustment	Adjust the brightness on the teaching pendant LCD.
Unit of Measure	Change the measurement unit from millimeters (mm) to inches (in) and vice versa.
Display Language	Select the LCD display language.
Go Function	Set the robot axes moving conditions for when the GO key is pressed.
JOG Function	Set the robot axes moving conditions for when entering positions using the JOG keys.
Tool for Teaching	Set the tool settings for use only in Teaching Mode.
Manual Job Number Setting	Point jobs set here can be executed in MDI Mode.
Key Click	Select where a sound is emitted when keys on the operation panel are pressed.
Back Light on Teaching	Select [OFF] to disable the teaching pendant LCD backlight in Teaching Mode.
Save on Changing Mode	Select [Valid] (default) to display the confirmation screen for saving C & T data when changing modes.
Coordinates Display	Set this [Detail] to display coordinates down to their decimal values in the point settings screen.

NOTE

You can select the display language by pressing the CTRL + T.ENV keys from any mode.

4.1 Contrast

Here you can adjust the brightness of the teaching pendant LCD.

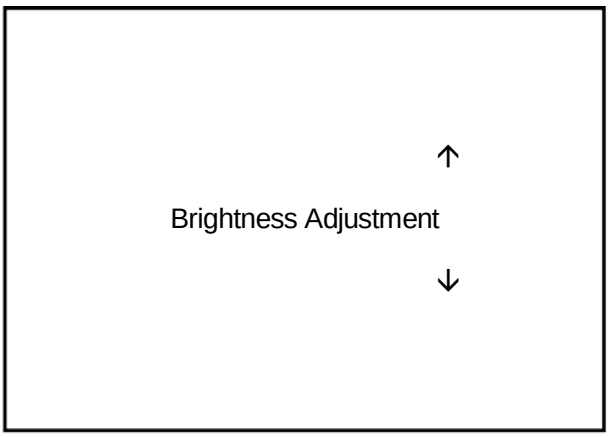
Key and Item Selection

T.ENV

[Brightness Adjustment]

CURSOR↑ key: Darker

CURSOR↓ key: Brighter



4.2 Changing the Unit of Measure

You can select the unit of length displayed on the teaching pendant LCD. Choose either millimeters or inches.

Key and Item Selection

T.ENV

[Unit of Measure]

[Millimeters [MM] [MM/S]]

[Inches [IN] [IN/S]]

4.3 Changing the Display Language

You can select the language displayed on the teaching pendant LCD from among the following:

Key and Item Selection

T.ENV

[Display Language]

[English]

[Japanese]

[German]

[Italian]

[Spanish]

[French]

[Korean]

[Chinese] (Simplified characters only)

[Czech]

[Vietnamese]

NOTE

Vietnamese is not supported with the JR2000N Series when running system software below ver9.57.

4.4 GO Function

The axes will move to the coordinates displayed on the teaching pendant LCD when the GO key is pressed while teaching using MDI Mode. You can set the moving conditions for the axes on this screen. However, you cannot switch to a CP movement.

Key and Item Selection

T.ENV

[GO Function]

[PTP Speed]

[R-Axis Rotate Speed]*

[R-Axis Acceleration]*

[Relative Mode] / [Absolute Mode]

[Z Move Height] / [Horizontal Move Pos'n]

[Z Up Distance] / [Start Horizontal]

[Z Down Distance] / [Start Down Pos'n]

* This is only displayed for robots with R axis specifications.

GO Function	
PTP Speed	**30%**
R-Axis Rotate Speed	15%
R-Axis Acceleration	38%
	Relative Mode
Z Move Height	100mm
Z Up Distance	100mm
Z Down Distance	100mm

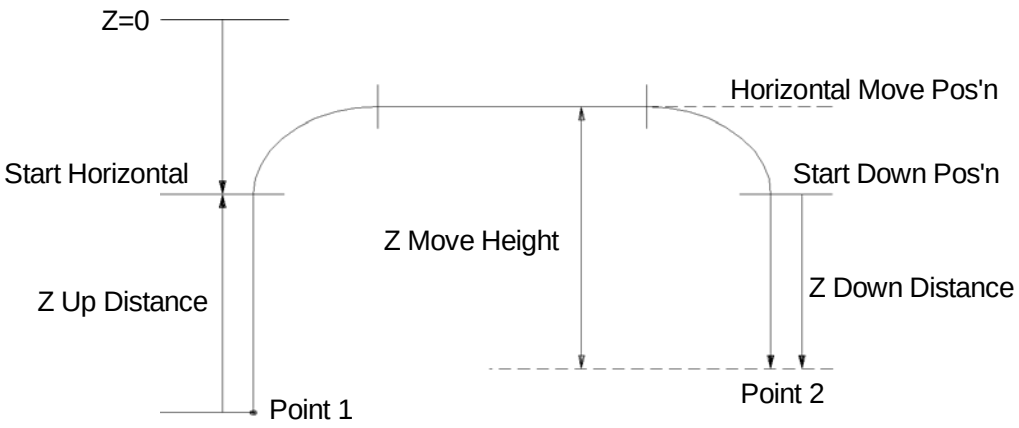
GO Function Selection Screen Example
(When [Relative Mode] is selected)

GO Function	
PTP Speed	**30%**
R-Axis Rotate Speed	15%
R-Axis Acceleration	38%
	Absolute Mode
Horizontal Move Pos'n	30mm
Start Horizontal	5mm
Start Down Pos'n	10mm

GO Function Selection Screen Example
(When [Absolute Mode] is selected)

Select the item that you wish to change and then enter the desired value.

■ GO Function Movement Trajectory



4.5 JOG Function

You can select the distance (step) and speed at which the axes move during teaching in JOG Mode. These settings can also be entered using the JOG SPEED key during teaching in JOG Mode*1.

If you are using a teaching pendant with an enable switch, you can change the axes speed from low speed → middle speed → high speed*2 using the JOG SPEED key when teaching in JOG Mode. You can specify the speed for each stage using numerical input.

*1 The JOG SPEED key is only valid in JOG Mode. You cannot use this key in MDI Mode.
*2 The display on the screen changes Low → Middle → High.

Key and Item Selection

T.ENV

[JOG Function]

Select the item for which you want to specify speed/distance. The number entry screen for the selected item will appear. Enter the speed or distance and set it.

The speed or distance entered here becomes the axes' speed/distance when teaching in JOG Mode.

JOG Function	
Low Speed	**3mm/s**
Middle Speed	10mm/s
High Speed	20mm/s
Low Step	0.05mm
Middle Step	0.2mm
High Step	0.5mm
R-Axis Low Step	0.1deg
R-Axis Middle Step	0.2deg
R-Axis High Step	1deg

4.6 Tool for Teaching

Use this function when teaching points using a tool different from the one being used in Run Mode.
If the [Tool for Teaching] is set to [Valid], the tool data set in the [Setting Tool for Teaching] is enabled only in the Teaching Mode. In the Run Modes, the [Tool Data] set in the [Program Data Settings] is activated.

Key and Item Selection

T.ENV
- [Tool for Teaching]
  - [Tool for Teaching]
    - [Invalid]
    - [Tool #1 Valid]
    - ⋮
    - [Tool #5 Valid]
  - [Setting Tool for Teaching #1]
  - ⋮
  - [Setting Tool for Teaching #5]

4.7 Manual Job Number Setting

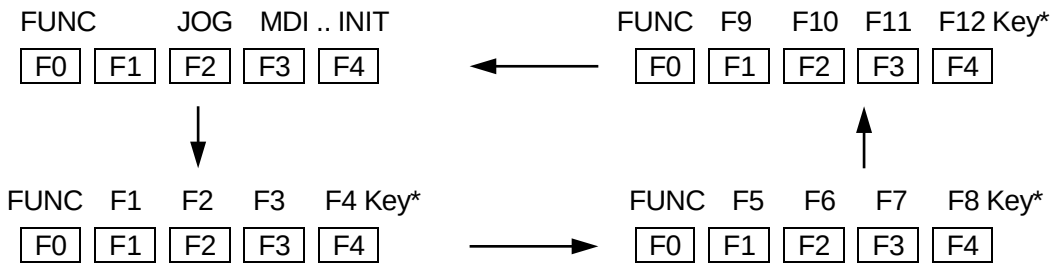
You can set up to 3 point job numbers (12 total) for each of the F1 , F2 , F3 , and F4 keys.
For example, when teaching a program to perform a pick & place operation, if you set a point job number for closing the hand tool to the F1 key, you can check to see if the hand tool can actually pick up the workpiece at the position registered in Teaching Mode.

Key and Item Selection

T.ENV
- [Manual Job Number Setting]
  - [F1 Key Job Number]
  - ⋮
  - [F12 Key Job Number]

Set point job numbers to [F1 Key Job Number] – [F12 Key Job Number] to perform these registered point jobs at the position entry screen in Teaching Mode. Note that the [F1 Key Job Number] is not equal to the F1 key.

Each time the F0 (FUNC) key is pressed on the position entry screen, the F1, F2, F3, and F4 key functions change as follows. However, the function does not change if there is no point job number set to [F1 Key Job Number] – [F12 Key Job Number].



*The screen will indicate the point job numbers set to each key.
Example: 003 = Point job number 3

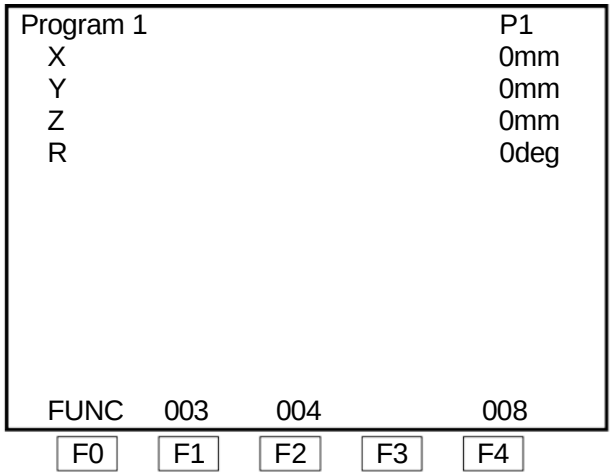
Select the key to which you wish to set point job data.
The Point Job Number entry screen will appear.

Enter the point job number you want and set it.

Manual Job Number Setting	
F1 Key Job Number	**3**
F2 Key Job Number	4
F3 Key Job Number	0
F4 Key Job Number	8
F5 Key Job Number	12
F6 Key Job Number	13
F7 Key Job Number	0
F8 Key Job Number	0
F9 Key Job Number	15
F10 Key Job Number	6
F11 Key Job Number	0
F12 Key Job Number	0

After setting the point job number, press the F0 (FUNC) key on the position entry screen.
The indicators on the last line will change from [FUNC], [JOG], [MDI], and [INIT] to the point job numbers set to the F1, F2, F3, and F4 keys as shown to the right.

Press the F1, F2 , F3 , or F4 key. The robot will perform the point job data set to the corresponding key.



NOTE

- If the point job number 0 (equal to no point job) is set to the keys, it will not appear on the position entry screen.

- The [F0] (FUNC) key is invalid if no point job data is set for any of the [F1 Key Job Number] – [F12 Key Job Number] (or if the point job number 0 is set to the keys).

- If your teaching pendant is equipped with an enable switch, you must continuously press the enable switch while using the operation keys to perform point job data that includes commands that move the robot axes.

Caution Always pay special attention to the robot's movement in Teaching Mode.

4.8 Key Click

Select the location from where the click sound comes when any key on the operation panel is pressed.

Key and Item Selection

[T.ENV]

[Key Click]

[Inside: ON Panel: ON]
[Inside: OFF Panel: ON]
[Inside: ON Panel: OFF]
[Inside: OFF Panel: OFF]

- Inside: ON, Panel: ON Emits sound from both the robot and the teaching pendant
- Inside: OFF, Panel: ON Emits sound only from the teaching pendant
- Inside: ON, Panel: OFF Emits sound only from the robot
- Inside: OFF, Panel: OFF No sound

4.9 Back Light on Teaching

Select [OFF] to disable the teaching pendant LCD backlight in Teaching Mode.

Key and Item Selection

T.ENV

[Back Light on Teaching]

[ON]

[OFF]

NOTE

To turn OFF the LCD backlight during Run Mode refer to ”12. LCD Backlight ON/OFF” .

4.10 Save on Changing Mode

Select [Valid] (default) to display the confirmation screen for saving C & T data (if there are changes) when changing from Teaching Mode to Ext. Run or Switch Run Mode.
Select [YES] to save the data and [NO] to discard the data.

Key and Item Selection

T.ENV

[Save on Changing Mode]

[Valid]

[Invalid]

4.11 Coordinates Display

Select [Detail Display] to change the coordinates display on the point settings screen so that the coordinate values are displayed up to three decimal places per line, one line per axis. Up to two decimal places per line are displayed for the R axis. The default setting is [Normal Display].

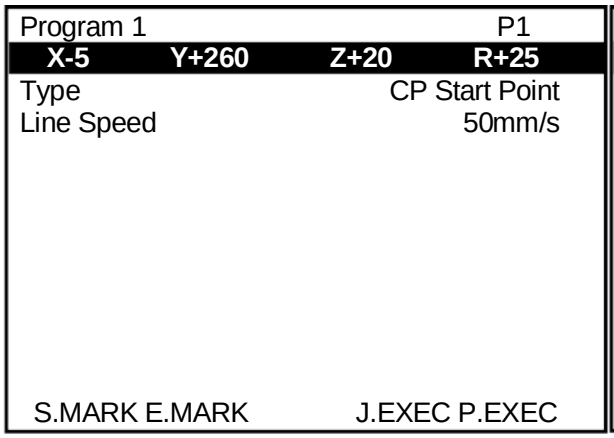
Key and Item Selection

T.ENV

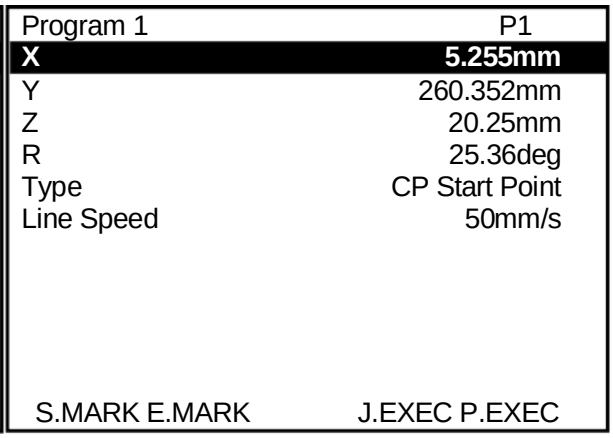
[Coordinates Display]

[Normal Display]

[Detail Display]



Point Settings Screen Example (Normal)

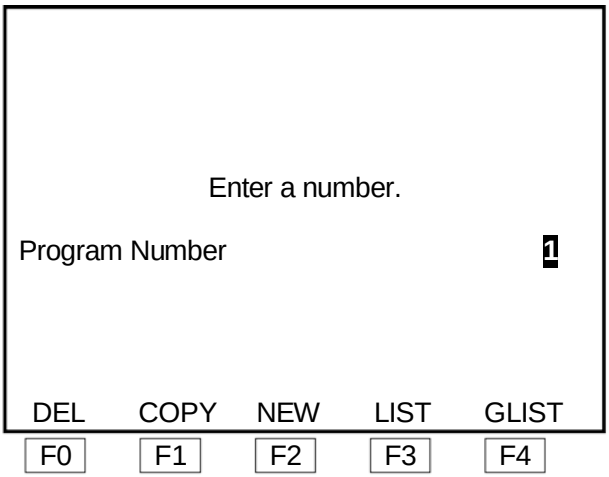


Point Settings Screen Example (Detail)

5. PROGRAM SELECTION (PRG.NO Key)

By calling up and running programs, you can make the robot perform various operations.

Press the PRG.NO key on the base screen either in Teaching, External Run, or Switch Run modes.
The Program Number entry screen (in Teaching Mode, in this example) shown to the right will appear.
Enter a program number to select the program.



NOTE

The F0 (DEL), F1 (COPY), F2 (NEW), and F4 (GLIST) keys are enabled only in Teaching Mode. The F3 (LIST) key is enabled only in External Run and the Switch Run Modes. (LIST cannot be displayed in Run Mode.)

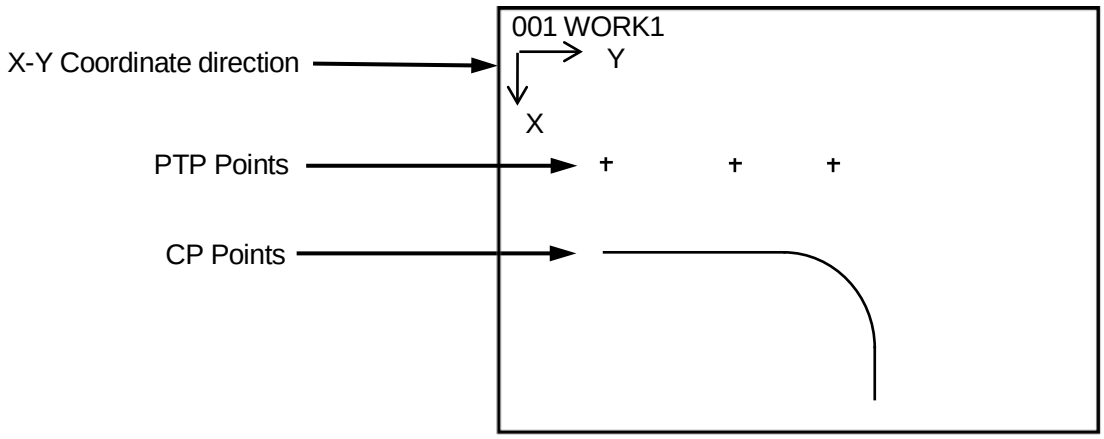
F0 (DEL) key: ····· This displays the Delete Program Number entry screen. Enter the program number that you wish to delete.

F1 (COPY) key: ····· This displays the Source Program Number entry screen. Enter the source program number and then enter the destination program number. The contents of the source program are copied to the destination program.

F2 (NEW) key: ····· This displays the unregistered program number list. Select a number from the list. The new position entry screen for the first point (Point 1) of the selected program appears.

F3 (LIST) key: ····· This displays the registered program number list. Select a number from the list. The settings screen for the first point (Point 1) of the program appears.

F4 (GLIST) key:·····This displays the currently selected program as a graph. These graphs make it easy to differentiate between individual programs.



Graph Display

NOTE

The CP points (from the CP start point to the CP end point) are displayed as a line on the graph. Also note, the JR-V2000 Series displays only the outer circumference of an area which is filled in. For example, if filling in a in a donut shaped area (an empty center), the shape is displayed not as ● or ⊙, but as ○.

■ The following keys are enabled on the graph display screen:

CURSOR↓ ·····The registered program for the program number immediately following the currently displayed program appears. This key is disabled if there are no programs following the current one.

CURSOR↑ ·····The registered program for the program number immediately before the currently displayed program appears. This key is disabled if there are no programs before the current one.

ENTR ·····Displays the point settings screen (base screen) for the currently displayed program.

ESC ·····Returns to the Program Number entry screen.

6. POINT RUN

In Teaching Mode, you can run any individual point. (However, with a CP drive, the robot will run from [CP Start Point] through [CP End Point] as one unit. A [Passing Point] cannot be run individually.) As you can run points at your discretion, you can run a singled point which in the middle of a given program.
The robot will perform operations such as point jobs and additional functions in exactly the same way as in Ext. Run/Switch Run Mode. This function is useful for checking the “Execute Condition” etc., and in some circumstances, points which execute from different programs.

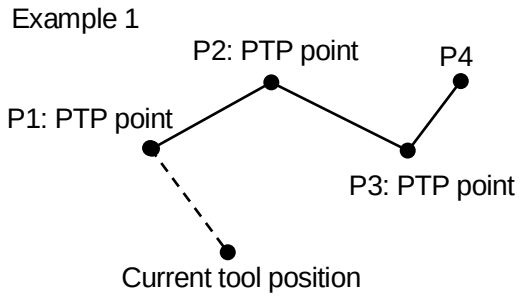
If you set the point job data or sequencer program data to wait for a start signal from I/O-1, etc., the robot will also wait for a start signal when running points in Teaching Mode.

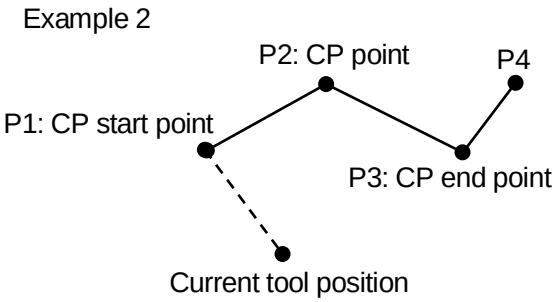
Caution Always pay special attention to the robot’s movement in Teaching Mode.

■ Press the F4 (P.EXEC) key on the point settings screen. The robot will run the currently displayed point and the screen will change to the settings screen for the next point.

NOTE
- Be sure not to perform a test run when the point settings screen displays a CP point from the middle of a CP drive, such as a CP Passing point.
- If you are using a teaching pendant with an enable switch, continuously press the enable switch when you push the F4 (P.EXEC) key. Also press the enable switch while the robot is moving. Releasing/pressing-in the enable switch stops the robot

If the point currently displayed is a CP Start Point, the robot will run the program from the CP Start Point through to the CP End Point without stopping at CP Passing Points or CP Arc Points.
If using programs such as the two examples on the next page, press the F4 (P.EXEC) key on the P1 settings screen once to execute a point run.





Example 1: The robot runs P1 (moves its axes and performs the point job and additional function) and then waits at the P1 position. The screen then changes to the settings screen for P2.

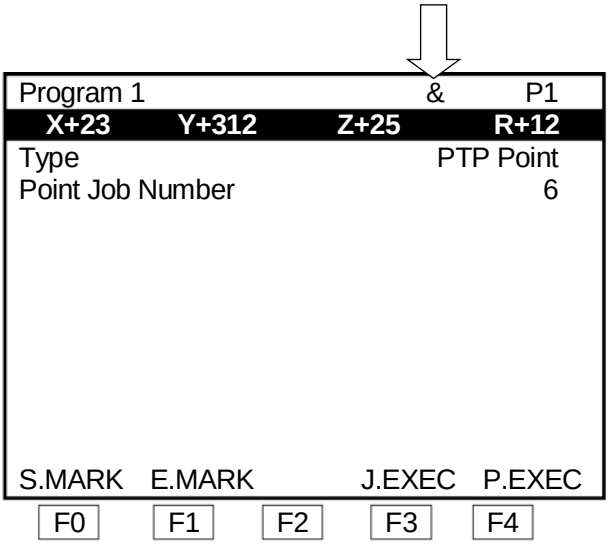
Example 2: The robot runs P1 → P2 → P3 in order (moves its axes and performs the point job and additional function) and then stops at the P3 position. The screen then changes to the settings screen for P4.

■ After running the last point of the program, press the F4 (P.EXEC) key again to run the work home position or the first point. If the [Cycle Mode] setting in the program data is set to [1 Cycle Playback] the robot will run the work home position, if it is set to [Continuous Playback] it will run the first point. However, if the Last Work signal (JR2000N, JC: #sysIn11, JR-V2000: #sysIn7) is ON, the work home position is run, even when [Continuous Playback] is set.

Press the F4 (P.EXEC) key on the point settings screen. The robot runs the currently displayed point and the screen then changes to the settings screen for the next point. At this time, the "&" symbol appears in the first line of the screen.

When the "&" symbol is displayed, press the F4 (P.EXEC) key to continue to the next point, and run it.
If "&" is not displayed, the point for the currently displayed settings is run.

If running a series of points, the additional function set to a point is used in succession when moving to a point following it.



■ Example: [Pallet Routine] is set to point 2.

When running P2, the "&" symbol will appear on the settings screen for P2. Each time the F4 (P.EXEC) key is pressed here, the robot axes move to the next point on the pallet.

NOTE

- The "&" symbol disappears if the MENU, ←CURSOR, CURSOR→, MODE, PRG.NO, MONITOR keys are pressed or when the settings screen for the next point is displayed. Also, the pallet counter is reset if the "&" symbol disappears while running the [Pallet Routine].

- Depending on your settings, the work home position is run when you push F4 (P.EXEC) key again after making a point run on the final point in the program. At this time if the [Job on End of Cycle in P.EXEC] is set to [Valid], the point job registered in [Job on End of Cycle] is executed. If the [Cycle Mode] settings in the program data are set to [Continuous Playback], the point job is executed only when the Last Work signal (JR2000N, JC: #sysIn11, JR-V2000: #sysIn7) is ON.

When [Job on End of Cycle in P.EXEC] is set to [Valid]

Cycle Mode	Destination After Final Point Run	Job on End of Cycle
1 Cycle run	Work home position	Execute
Continuous playback	Point 1 (work home position if Last Work signal is ON)	Do not execute (Execute if Last Work signal is ON)

Key and Item Selection

MENU

[Run Mode Parameter]

[Job and Sequencer on Run Mode]

[Job on End of Cycle]

Key and Item Selection

(Customizing Mode)

MENU [Teaching Mode Customizing]

[Job and Sequencer on Teaching Mode]

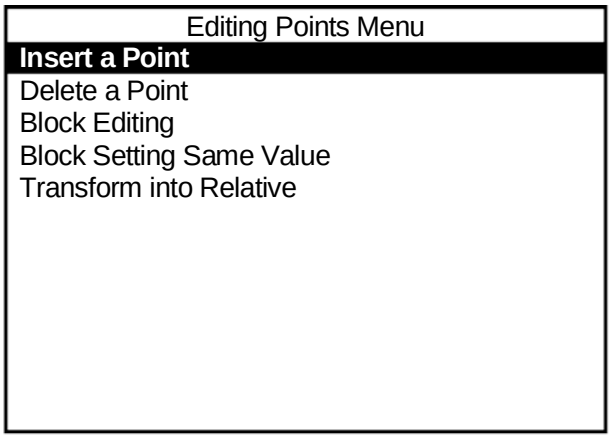
[Job on End of Cycle in P.EXEC]

7. EDITING (EDIT Key)

7.1 Point Data

7.1.1 Inserting a Point

Display the point settings screen for the number you wish to insert.

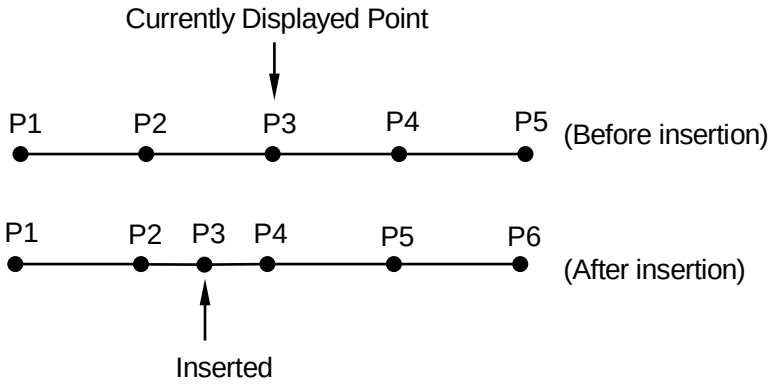


Key and Item Selection

EDIT

[Insert a Point]

When you select [Insert a Point], the new position entry screen will appear. Enter the position for the point you want to insert and select the point type. Each point that comes after the inserted point will shift up by one number.



7.1.2 How to Delete a Point

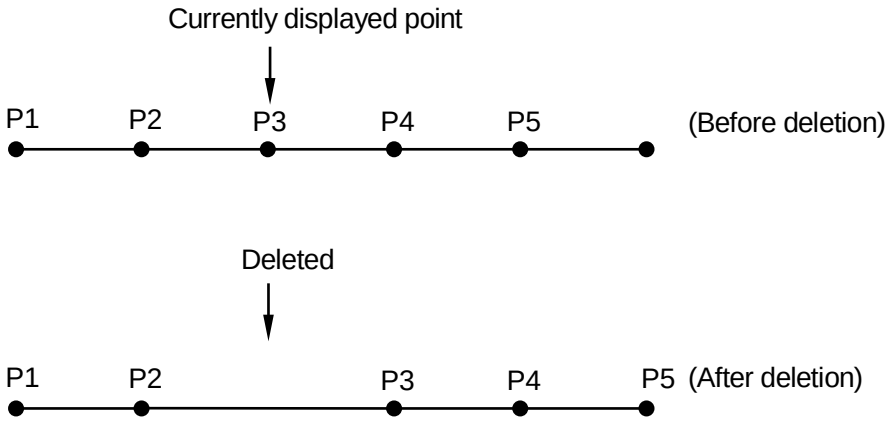
Display the settings screen for the point that you wish to delete.

Key and Item Selection

EDIT

[Delete a Point]

If you select [Delete a Point], the point currently displayed is deleted and the settings screen for the next point appears. Each point that comes after the deleted point shifts down by one number.



7.1.3 Block Editing

You can edit (delete, move, copy, mirror copy, offset, position data rotation) a block of points between given points in a program.

Display the Block Editing Menu using the following procedures:

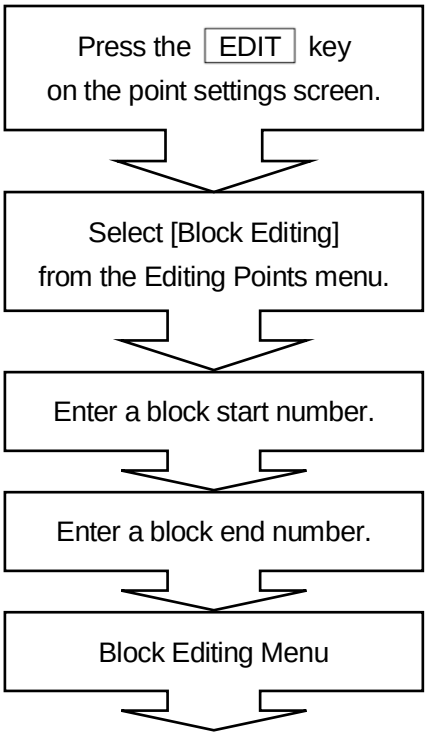
Press the [EDIT] key on the point settings screen. The Editing Points Menu is displayed.

Select [Block Editing] from the menu.

Enter the start number of the points (block start number) and the end number of the points (block end number) that you wish to edit.

The Block Editing Menu shown below will appear.

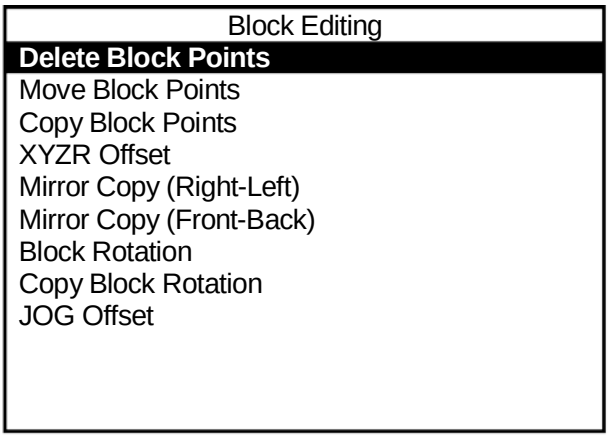
Select the item that you wish to edit from the menu.



NOTE

- Press the [F4] (ALL) key on the Block Start Number entry screen to select all points in the program. (The Block End Number entry screen will not appear.)
  Press the [F4] (LAST) key on the Block End Number entry screen. The last point number in the program will be entered.

- You can set default values for the block start numbers and end numbers in advance.
  Press the [F0] (S.MARK) key on the point settings screen. The current point number is set as the default block start number.
  If you press the [F1] (E.MARK) key, the current point number is set as the default block end number.

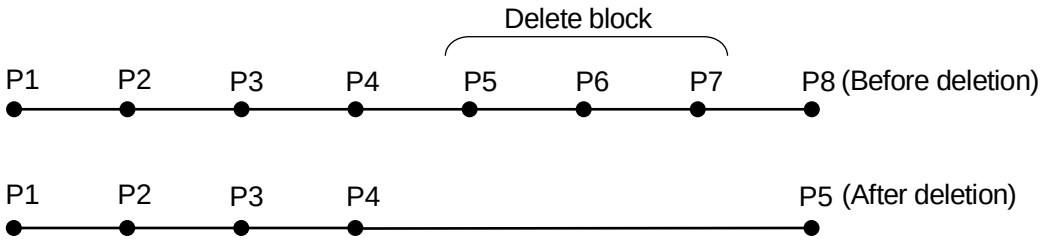


Block Editing Menu

■ Delete Block Points

This deletes a block of points between given points in a program.

Select [Delete Block Points] from the Block Editing Menu. The Delete Block Points confirmation screen will appear. Select [YES].



Each point that comes after the deleted points shifts up.

■ Move Block Points

You can move a block of points between given points in a program. Note that you cannot move the points into other programs.

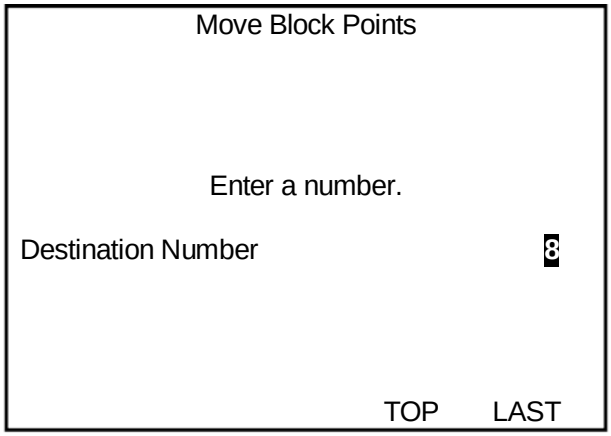
Select [Move Block Points] from the Block Editing Menu. The Destination Number entry screen will appear.

The designated block will move in front of the destination point.

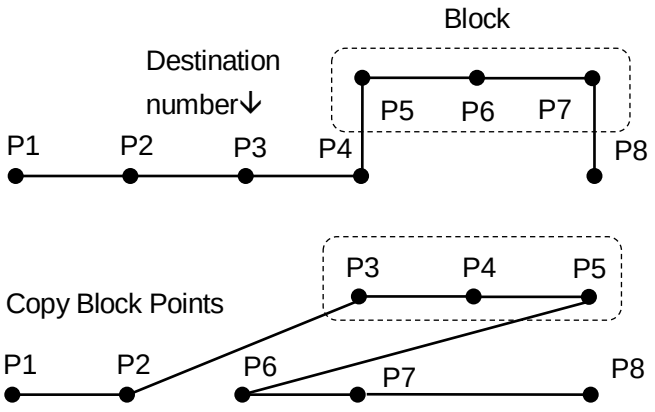
Enter the destination number.

If the F3 (TOP) key is pressed, 1 is entered as the destination number.

If the F4 (LAST) key is pressed, the number equal to the last point number plus 1 is entered as the destination number.



Destination Number Entry Screen



NOTE: you cannot select a destination number within the block you are moving.

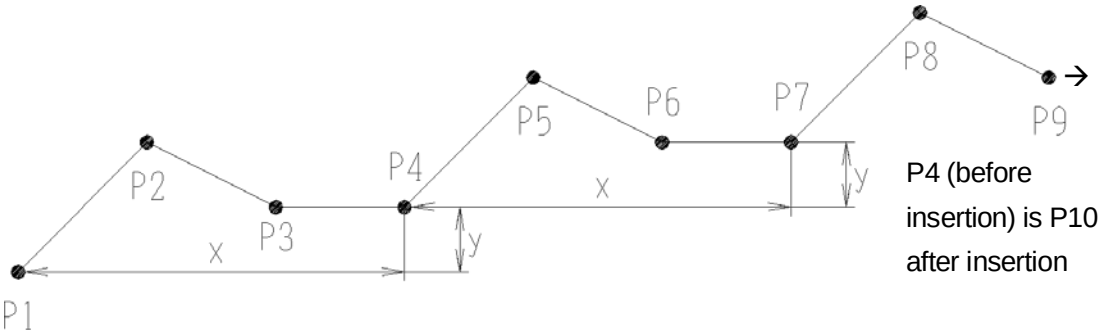
This copies a block of points between given points in a program.
You can designate the copy count and parallel moving distance. However, note that you cannot copy the points into other programs.

Select [Copy Block Points] from the Block Editing Menu. The X Distance entry screen will appear. Enter the parallel moving distance of the copied block (X direction).
After entering the X distance, the Y distance entry screen will appear. Enter the Y direction moving distance of the copied block.
After entering the Y distance, the Copy Times entry screen will appear. Enter the desired number of copies.

After entering the number of copies, the block is copied and the screen returns to the point settings screen. The copied points are inserted just behind the original points.

The copied point coordinates may exceed the operating range of the robot. After copying the block points, be sure to perform [Checking Data] in [Program Test].

The following example shows the point shift when the Point Block P1 – P3 is copied twice.



P4 (before insertion) is P10 after insertion

■ XYZR Offset

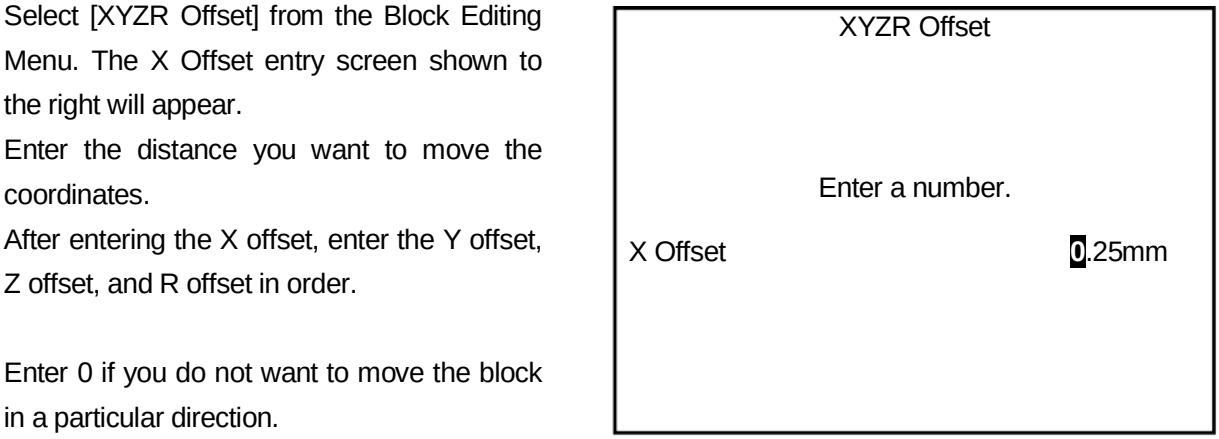
This moves a point coordinate block between certain points in a program.

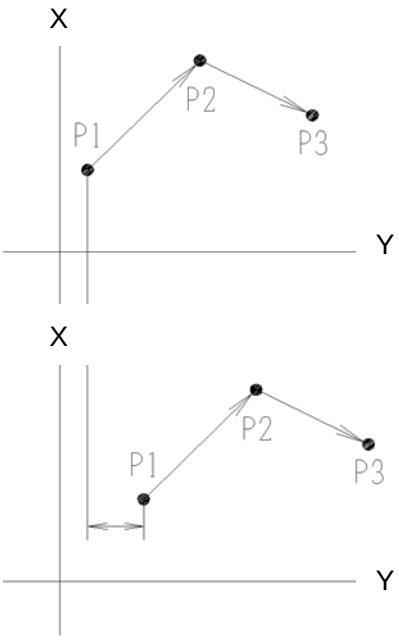
Select [XYZR Offset] from the Block Editing Menu. The X Offset entry screen shown to the right will appear.

Enter the distance you want to move the coordinates.

After entering the X offset, enter the Y offset, Z offset, and R offset in order.

Enter 0 if you do not want to move the block in a particular direction.





An example of entering only a Y offset

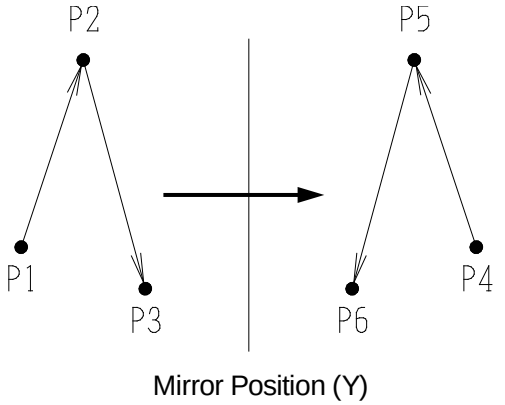
The entered offsets are added to all points in the block and then the screen reverts to the point settings screen.

The offset point coordinates may exceed the operating range of the robot. After editing the offset, be sure to perform [Checking Data] in [Test Program].

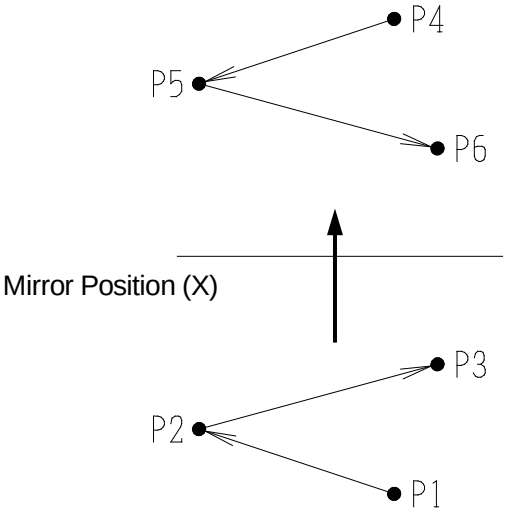
■ Mirror Copy

This makes a mirror copy of a block of points between given points in a program. Note that it is not possible to copy the points into other programs.

Mirror Copy (Right-Left)



Mirror Copy (Front - Back)

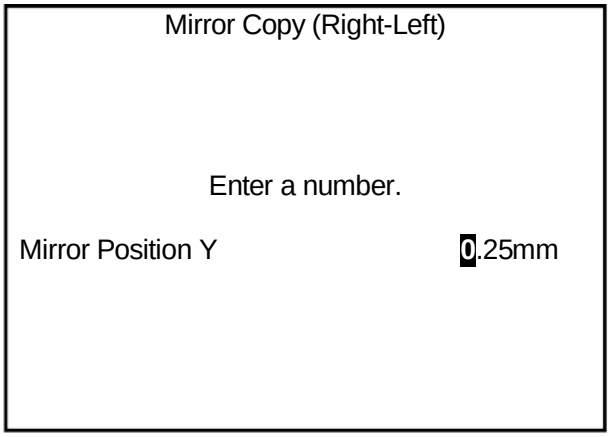


Select [Mirror Copy (Right-Left)] or [Mirror Copy (Front-Back)] from the Block Editing Menu. The Mirror Position X or Y entry screen shown to the right will appear.

Enter the coordinates of the mirror position for X or Y.

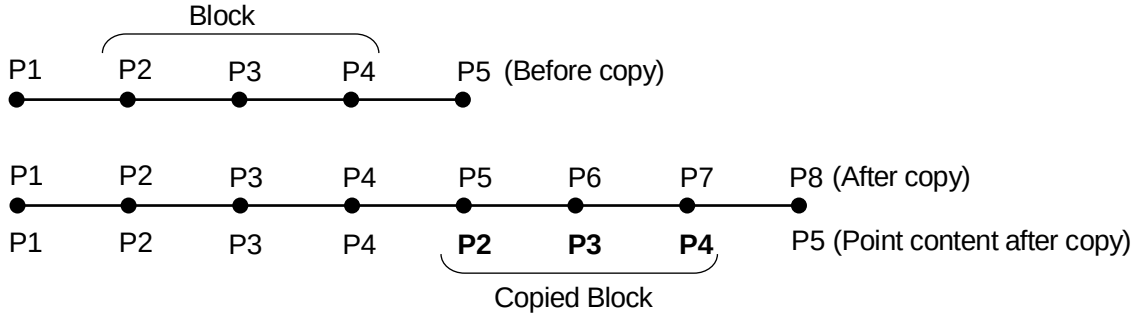
After entering the mirror position for X or Y, a mirror copy is made and the screen reverts to the point settings screen.

The copied points are inserted directly after the original block.



Mirror Position Y Entry Screen Example

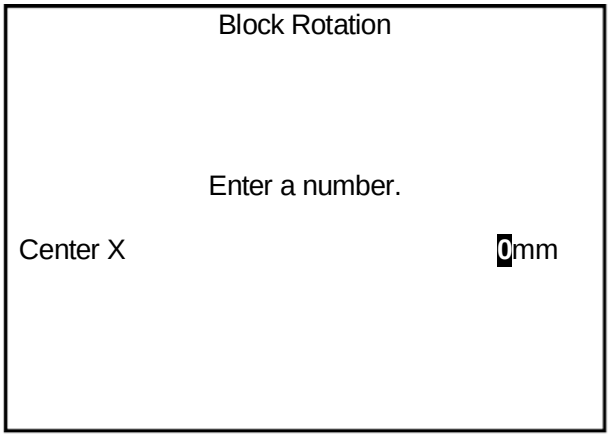
The coordinates of the copied points may exceed the operating range of the robot. After copying the block points, be sure to perform [Checking Data] in [Program Test].



■ Block Rotation

This rotates the coordinates for a point block between given points in a program.

Select [Block Rotation] from the Block Editing Menu.
The Center X entry screen shown to the right will appear.
Enter the X coordinate for the center of rotation.



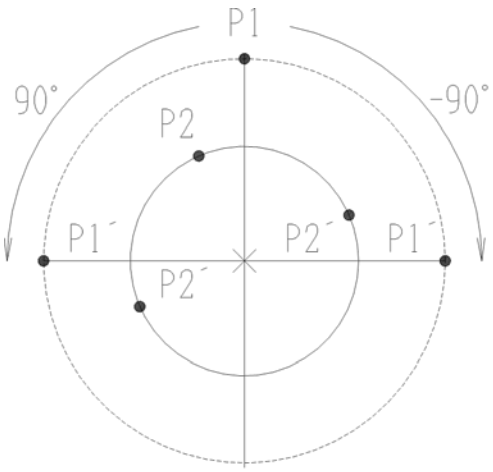
Center X Entry Screen Example

After entering the X coordinate, the Center Y entry screen will appear.
Enter the Y coordinate for the center of rotation.

After entering the Y coordinate, the Rotate Angle entry screen will appear. Enter the rotation angle.

After entering the rotation angle, the block is rotated and the screen reverts to the point settings screen.

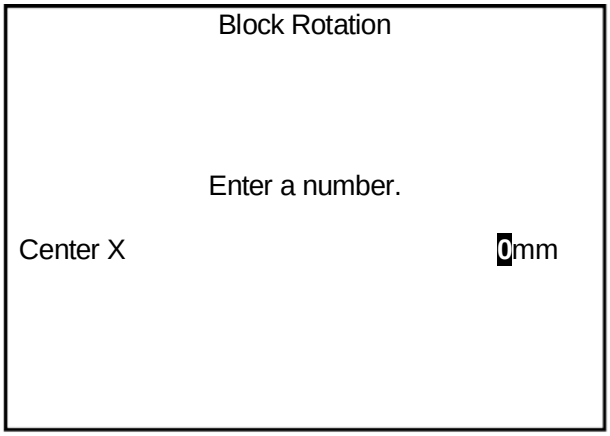
Example:
If you rotate Point 01 (P1) and Point 02 (P2) by +90 or –90 degrees, the destinations are P1' and P2' as shown below.



■ Copy Block Rotation

This rotates the coordinates for a block of points between given points in a program and copies the block. The copied points are placed directly behind the original block.

Select [Block Rotation] from the Block Editing Menu. The Center X entry screen shown to the right appears. Enter the X coordinate for the center of rotation.
After entering the X coordinate, the Center Y entry screen appears. Enter the Y coordinate for the center of rotation.



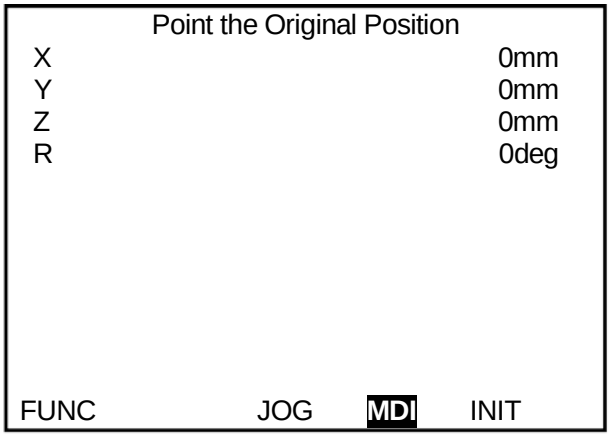
Center X Entry Screen Example

After entering the Y coordinate, the Rotate Angle entry screen appears. Enter the desired rotation angle.
After entering the rotation angle, the block is rotated and copied, and the screen reverts to the point settings screen.

■ JOG Offset

This designates two points and using the difference between them as an offset amount, moves a point coordinate block that amount.

Select [JOG Offset] to display the Point Number entry screen.
After entering a point number, the position entry screen (MDI Mode) where the coordinates for that point number were entered appears.



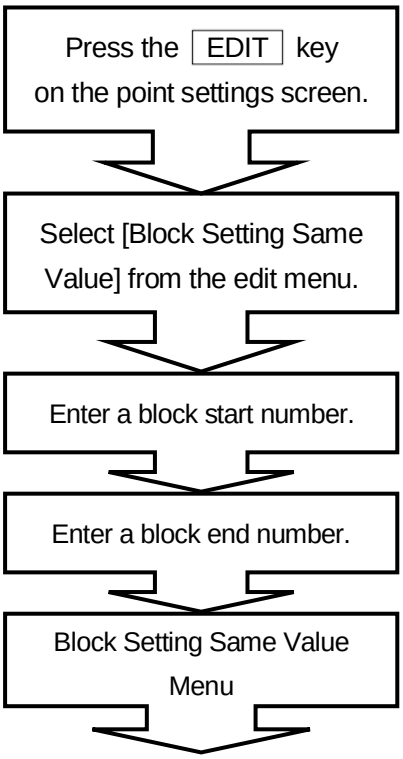
If the entered number has not been registered, the work home position coordinates are displayed on the position entry screen. The coordinates entered here become the “Original Position” (the first point) offset.

Press the ENTR key to display the “shift position” (second point) entry screen. The coordinates of the first point are entered on the entry screen for the second point.
Enter the coordinates for the second point. The point coordinate block is moved by the position difference (X, Y, Z, R) between the two points ([Original Position] and [Shift Position]).
The coordinates with the offset included may exceed the operating limit. Always execute [Checking Data] in [Program Test] after entering an offset.

7.1.4 Block Setting Same Value

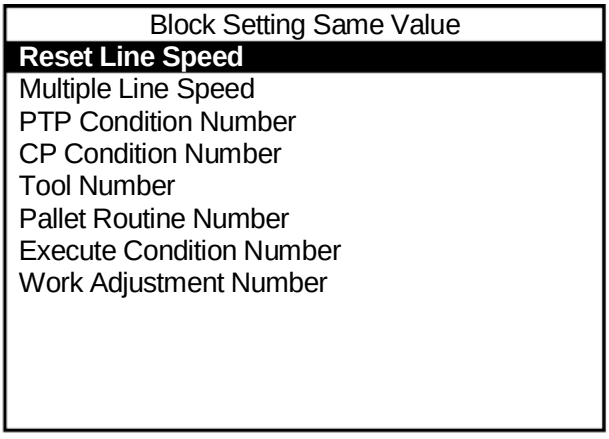
This sets designated additional function numbers to a block of points (between designated points). Any additional functions already set to the points will be replaced by the additional functions that are designated in [Block Setting Same Value]. If the block contains any point that the designated additional function cannot be set to (PTP conditions set for CP points etc.), that point is not affected.

Press the EDIT key on the point settings screen and select [Block Setting Same Value] from the EDIT menu.
Enter the start point number (block start number) and end point number (block end number) for the points to which you wish to set line speed/additional function data.
The Block Setting Same Value Menu will appear.



NOTE

Press the F4 (ALL) key on the Block Start Number entry screen to select all points in the program. (The Block End Number entry screen does not appear.)
Press the F4 (LAST) key on the Block End Number entry screen to enter the last point number in the program.



Block Setting Same Value Menu

■ Reset Line Speed

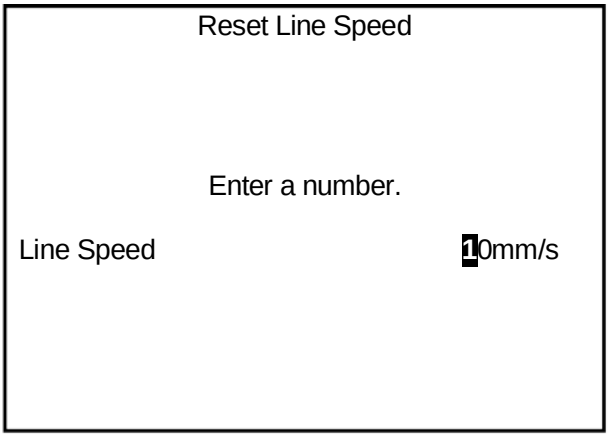
This sets the same line speed between certain points in a program. If the block contains any PTP points, those points are not affected.

If the moving distance is too short, etc. and movement is finished before the robot can reach the registered line speed, a “CP Speed Over” error will occur. In this case please set the line speed slow.

Select [Reset Line Speed] from the Block Setting Same Value Menu and enter the desired speed.

The maximum line speed is 800mm/s.* If a larger number is entered, the speed is set as 800mm/s.

*The maximum line speed for the JR2200N (NE) Series is 700mm/s, JR-V2000 Series is 500mm/s, and JC Series is 600mm/s.

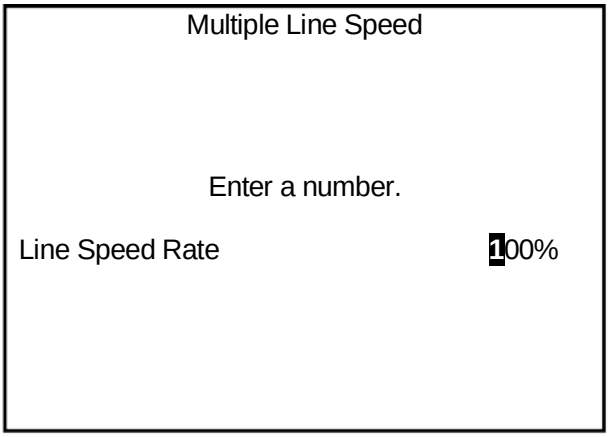


■ Multiple Line Speed

This sets the same line speed rate between certain points (point block) in a program. If the block contains any PTP points, those points are not affected.

Select [Multiple Line Speed] from the Block Setting Same Value menu and enter the desired percentage.

The multiple line speed maximum value is 500%.

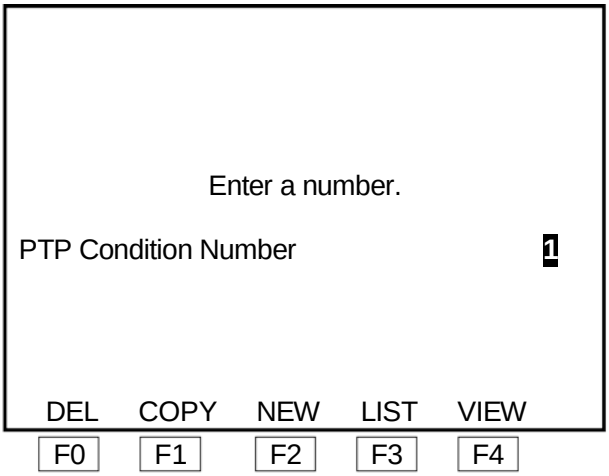


■ Setting Numbers for Additional Function Data

This sets specific numbers for additional function data to a block of points (between given points) in a program.

If any point in the block already has the same additional function data set to it, the additional function data number will be replaced with the number specified in the Block Setting Same Value. If the block contains any point that the specified function cannot be set to, that point is not affected.

From the Block Setting Same Value Menu, select the additional function (data) number (e.g. [PTP Condition Number]) that you wish to set, and enter that number.



F0 (DEL) key: ····· This displays the delete additional function data number entry screen. Enter the number of the point job/additional function data that you wish to delete.

F1 (COPY) key: ····· This displays the source additional function data number entry screen. Enter the source number and destination number. The contents of the source point job/additional function data are copied to the destination number.

F2 (NEW) key: ····· This displays the unregistered additional function number list. Select a number from the list. The new entry or selection screen for the additional function data will appear. Enter the commands or parameters. Press the ESC key to set the entered additional function data to the point and the display returns to the point settings screen.

F3 (LIST) key: ····· This displays the registered additional function number list. Select a number from the list, and selected additional function data is set to the point and the display returns to the point settings screen.

F4 (GLIST) key:·····This displays the settings screen for the currently displayed additional function data number. You can modify the data on this screen.

7.1.5 Transform into Relative

Select [Transform into Relative] to convert all the point coordinates in the currently selected program into relative coordinates.

Specifically, deduct the Point 1 values for the X, Y, Z, and R axes from each of the X, Y, Z and R values of Point 1 – the last point. Set the differences as the relative coordinates for each point. (The coordinates of Point 1 become X: 0, Y: 0, Z: 0, R: 0.)

The coordinates of the work home position and the points that have no number (those included in the program data rather than in the point data) are not converted.

Key and Item Selection

EDIT

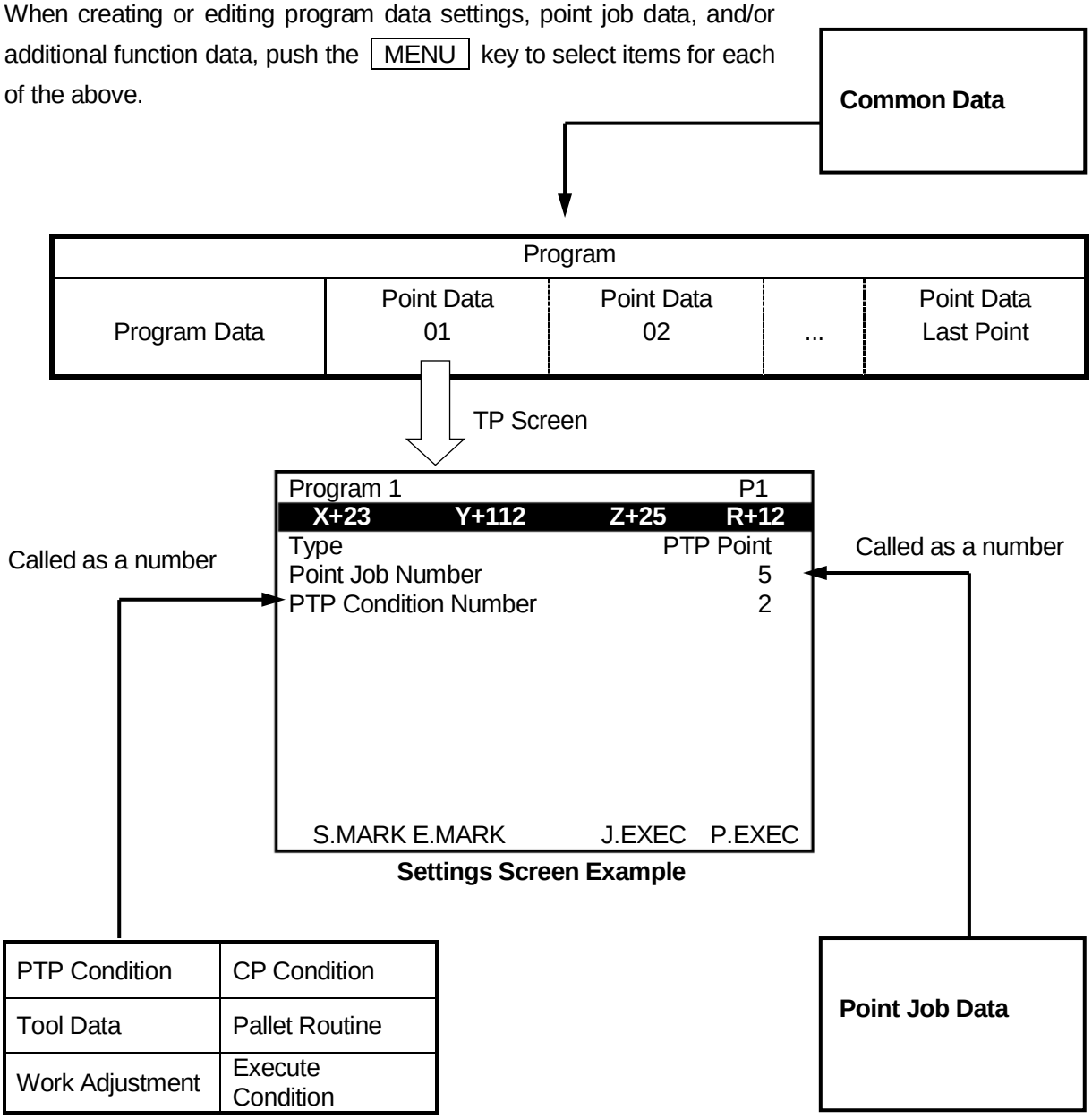
[Transform into Relative]

NOTE

You cannot transform point coordinates from relative to absolute coordinates.

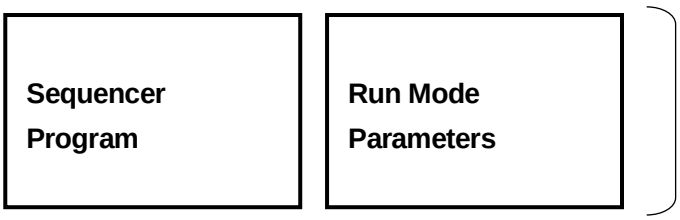
8. MODE MENU (MENU Key)

When creating or editing program data settings, point job data, and/or additional function data, push the MENU key to select items for each of the above.



Settings Screen Example

Additional Function Data



8.1 Program Data

This setting is used to manage program names etc., and the programs themselves. For more details refer to the operation manual *Functions I*.

Key and Item Selection

MENU [Program Data Settings]
- [Program Name]
- [Work Home]
- [Job on Start of Cycle]
- [Cycle Mode]
- [PTP Conditions]
- [CP Conditions]
- [Tool Data]
- [Move Area Limit]
- [Position Data Type]
- [Workpiece Weight]

NOTE

JR2200N, JR-V2000 Series and the JC Series do not have the item [Workpiece Weight]. This setting is fixed at 7kg.

8.2 Common Data

Common Data are settings common to all programs.

The common data items and content vary depending on the specifications of the robot (for example, dispensing specifications have the item “Dispense”). Also refer to the Application Specification operation manuals.

NOTE

The default standard specifications and soldering specifications do not have “Common Data”.

8.3 Additional Function Data

These are used as additional functions called up by number from the point data. When additional function data is called up, its function is set to the point. However, depending on the point type it may not be possible to set the additional function. Additional function data consists of the following 6 items. You can create additional function data numbers 01 – 50 in Teaching Mode. Additional function data numbers 51 – 100 can be created in Customizing Mode. You can also create workpiece adjustment numbers 101 – 255.

1) PTP Condition: ····· The contents are the same as those set in the program data. Use this item to change the settings between designated points only.
2) CP Condition: ····· The contents are the same as those set in the program data. Use this item to change the settings between designated points only.
3) Tool Data: ····· The contents are the same as those set in the program data. Use this item when you wish to use tool data different from that set in the program data, between designated points only.
4) Pallet Routine: ····· The pallet is the offset (including the counter) from the coordinates of the standard point. (For details, refer to the Function operation manuals.)
5) Execute Condition: ····· Use this item to determine whether or not to run the designated point.
   If the point is not run, the robot axes will skip the point and move to the next point.
6) Workpiece Adjustment: ····· You can adjust only the position (coordinates) of a particular point according to the values entered in here.

Method 1

MENU [Additional Function Data Settings]

Set additional function data (e.g. [PTP Condition Settings])

Enter the additional function data number.

Method 2

On the point settings screen:

Enter the additional function data number (e.g. [PTP Condition Settings])

NOTE

If you highlight the last item of the point settings screen and press the CURSOR↓ key, further point job data and additional function data content settable to that point are displayed.

In Method 1, if you enter an additional function number, or select a number from the list, the settings screen of the additional function data for the entered/selected number is displayed.
In Method 2, if you press the F4 (VIEW) key on the Additional Function Number Entry screen, the additional function data settings screen for the currently displayed number appears.

F0 (DEL) key: ····· This displays the Delete Additional Function Data Number entry screen. Enter a number here to delete the additional function data for that number.

F1 (COPY) key: ····· This displays the Source Additional Function Data Number entry screen. Enter the source number and destination number. The contents of the source additional function data are copied to the destination number.

F2 (NEW) key: ····· This displays the unregistered additional function number list. Select a number from the list to display the additional function data settings screen (with no content entered).

F3 (LIST) key: ····· This displays the registered additional function number list. Select a number from the list to display the additional function data settings screen for that number.

F4 (VIEW) key: ····· This displays the settings screen for the currently displayed additional function data number. You can modify the data on this screen. (This key is not available with Method 1.)

NOTE

- Only the additional function data [Execute Condition] are created by entering commands. Methods of inputting, editing, inserting, and deleting commands for [Execute Condition] are exactly the same as for point job data.

- Names can be set to the additional function data [Pallet Routine] and [Workpiece Adjustment]. Press the EDIT key on the additional function data settings screen to display the Name Editing screen.

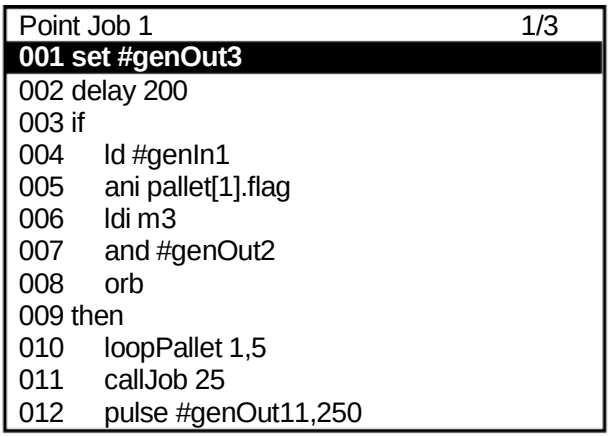
- For more details on additional function data, see the operation manual *Functions I (Point Teaching)*.

8.4 Point Job Data

Point job data are a set of command strings and logic operations performed at job points.
Setting numbers to point data allows you to call on the data and use it. However, note that depending on the point type set to a given point, setting certain numbers may not be possible.
You can create point job data Nos. 01 – 100 in the Teaching Mode. Point job data Nos. 101 – 200 can be created in the Customizing Mode.

Before teaching new point job data or modifying registered point job data, you need to display the settings screen.

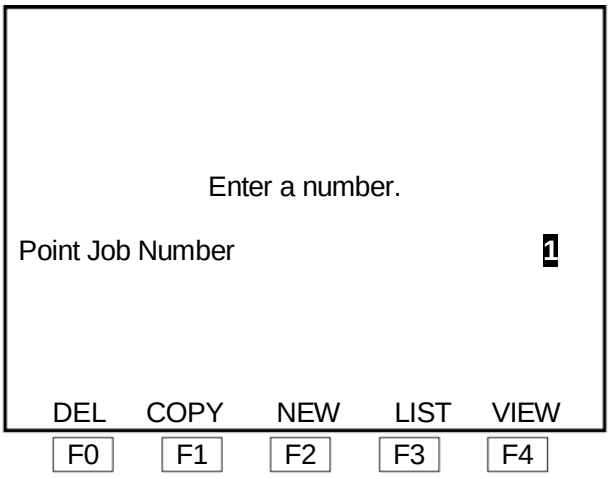
Display the settings screen for the point job data that you wish to modify according to either of the following methods:



Point Job Data Settings Screen Example

Method 1
On the point settings screen:
MENU [Point Job Settings]
Enter the point job number

Method 2
On the point settings screen:
[Job before Moving]
[Job while Moving]
[Point Job Number]
[Job while CP Moving]
Enter the point job number



Point Job Number Entry Screen Example

NOTE

If you highlight the last item of the point settings screen and press the CURSOR↓ key, further point job data and additional function data content settable to that point are displayed.

In Method 1, if you enter a point job number, or select a number from the list, the settings screen of the point job data for the entered/selected number is displayed.
In Method 2, if you press the F4 (VIEW) key on the Point Job Number Entry screen, the point job data settings screen for the currently displayed number appears.

F0 (DEL) key: ····· This displays the Delete Point Job Number entry screen. Enter the point job number that you wish to delete.

F1 (COPY) key: ····· This displays the Source Point Job Number entry screen. Enter the source number and destination number. The contents of the source point job data are copied to the destination number.

F2 (NEW) key: ····· This displays the unregistered point job number list. Select a number from the list. The new entry or selection screen for point job data is displayed. Enter the commands or parameters. Pressing the ESC key sets the entered point job data to that point and the display returns to the point settings screen.

F3 (LIST) key: ····· This displays the registered point job number list. Select a number from the list. The selected point job data is set to that point and the display returns to the point settings screen.

F4 (VIEW) key: ····· This displays the settings screen for the currently displayed point job data number. You can modify the data on this screen. (This key is not available with Method 1.)

NOTE

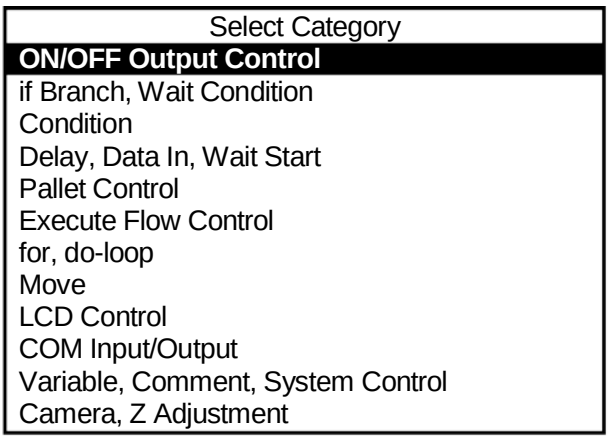
For further details on point job data, refer to the operation manual *Functions I (Point Teaching)*.

8.4.1 Enter Command

Point job data entry is performed by adding commands to the tail end of the command string. Select the last command number (only a number, it contains no command content) on the Point Job Data settings screen.

Select a command number on the Point Job Data settings screen.
The Point Job Command Category selection screen shown to the right is displayed.

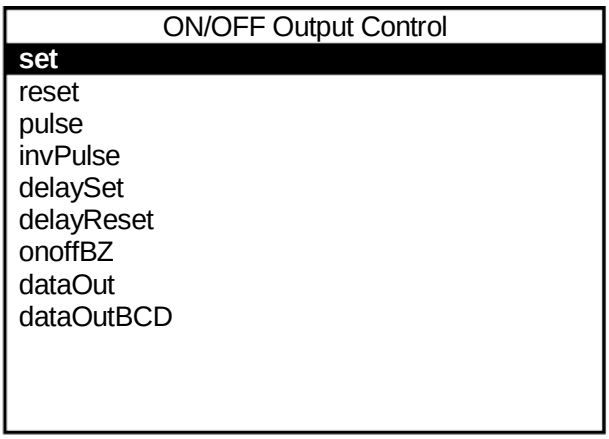
Select the command type (category) that you wish to enter.



Point Job Command Category Selection Screen

Once you select a command category, the selection screen for commands that belong to that category appear, shown to the right.

Select the command that you wish to enter. By selecting a command, you make the Parameter entry or selection screen appear. Depending on the command, either no parameters or multiple parameters need to be entered. Enter or select the required parameter(s).



Command Selection Screen Example

Example: The [set] command requires the [Output Destination] as a parameter.

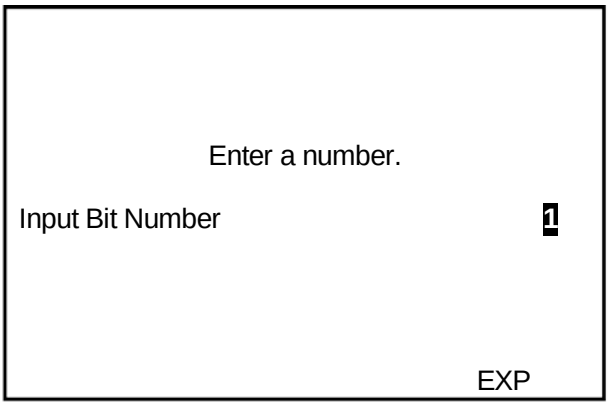
Depending on the commands, you may need to select the entry method for entering parameters.

Example: For the *outLCD* command, select [String] or [Expression] as the entry method.

outLCD 7,4,"PULSE": Displays the string PULSE on the teaching pendant LCD. The *outLCD* command requires three parameters (row, column, and string) for the string and string position (column and row on the LCD). After entering the row and the column, the displayed data input screen appears. Select [String] and enter PULSE. (The quotation marks (“ “) which enclose the string (PULSE in this example) are entered automatically.)

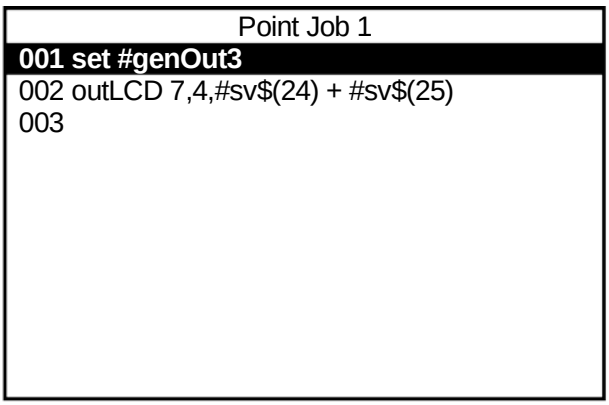
eoutLCD 7,4,#sv(24) & #sv(25): Displays the value of the combined string variables #sv(24) and #sv(25) on the teaching pendant LCD.
The *outLCD* command requires the three parameters (row, column, and string) for the string and string position (column and row on the LCD). After entering the row and the column, the displayed data input screen appears. Select [Expression] and enter "#sv(24) & #sv(25)".

Additionally, when entering a number as a parameter, you can select a variable or an expression instead of a value if "EXP" is displayed at the bottom right of the number entry screen (above the F4 key).
Press the F4 (EXP) key to display the character entry screen, and enter the variable or expression you wish to set.



Number Entry Screen Example

After entering or selecting parameter(s), the registered command is entered for the selected command number and the screen returns to the Point Job Data settings screen shown to the right.
If you want to enter more commands, select the last command number (the line that contains no command; 003 in the example to the right).



Point Job Data Settings Screen Example

When you have finished entering commands, press the ESC key on the Point Job Data settings screen.

8.4.2 Change Command

There are two ways to modify the point job data command: changing the command in the command category ([set] (output command) → [pulse]), and changing the command category (e.g. *set* (output command) → *waitStart* (wait command) etc.).

■ Changing the Command in the Command Category

Select the command that you wish to change on the Point Job Data settings screen. The Command selection screen appears. Select a new command on the selection screen.
The highlighted command is deleted and replaced by the newly selected command.

■ Changing the Command Category

Display the settings screen for the point job data that you wish to modify and highlight the command that you wish to change.
Press the EDIT key and select [Change a Command]. The Command Category selection screen appears. Select the command category and the command that you wish to change, and enter or select the necessary parameter(s).

8.4.3 Insert Command

This inserts a new command in front of the highlighted command. For example, highlight the command number 004 line to insert a new command after command number 003.

Key and Item Selection

EDIT

[Insert a Command]

Select [Insert a Command] to display the Command Category selection screen.
Select the command category and the command that you wish to insert, and enter or select the necessary parameter(s).

8.4.4 Delete Command

This deletes the currently highlighted command. Highlight the command that you wish to delete.

Key and Item Selection

EDIT

[Delete a Command]

Select [Delete a Command]. The highlighted command is deleted and the commands following the deleted command shift upward.

8.4.5 Delete Block (Command)

Key and Item Selection

EDIT

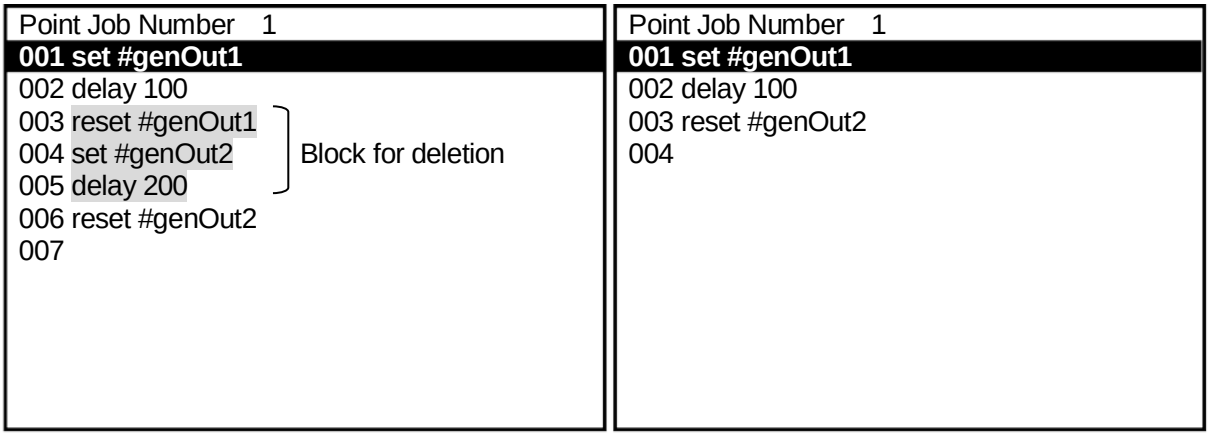
[Edit Block Commands]

[Delete Block Steps]

Select [Delete Block Steps] to display the Block Start Number entry screen. Select the first number for the command block that you wish to delete.

After entering the block start number, the Block End Number entry screen appears. Enter the last number of the command block.

After entering the block end number, the command block is deleted and the screen returns to the settings screen. The commands following the deleted block will shift upward as shown below.



Before Deletion **After Deletion**

8.4.6 Move Block (Command)

Key and Item Selection

EDIT

[Edit Block Commands]

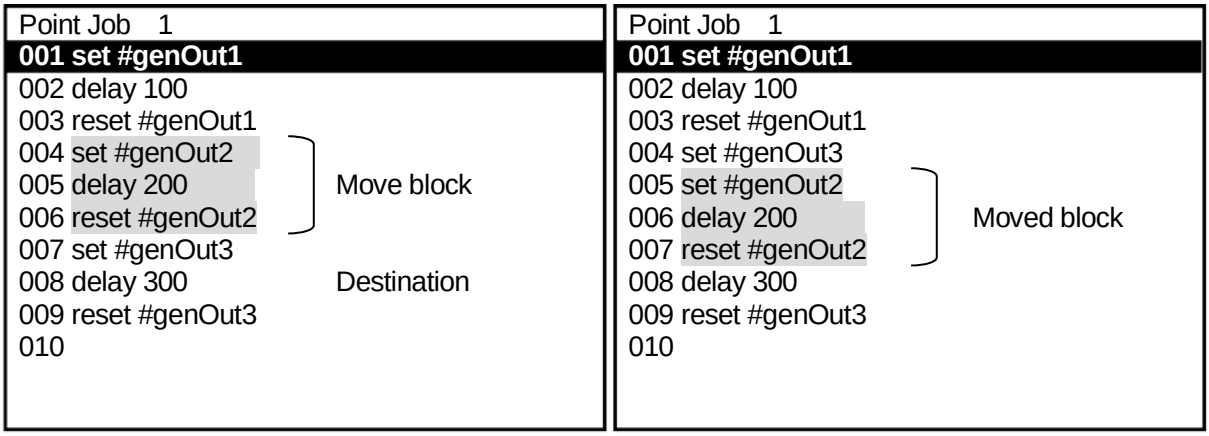
[Move Block Steps]

Select [Move Block Steps] to display the Block Start Number entry screen. Enter the first command number for the block that you wish to move.

After entering the block start number, the Block End Number entry screen appears. Enter the last command number of the command block.

After the block end number is entered, the Destination Number entry screen appears. Enter the destination command number where the command block is to move.

After the destination number is entered, the command block is moved in front of the destination command number and the screen returns to the settings screen.



Before Move **After Move**

8.4.7 Copy Block (Command)

Key and Item Selection

EDIT

[Edit Block Commands]

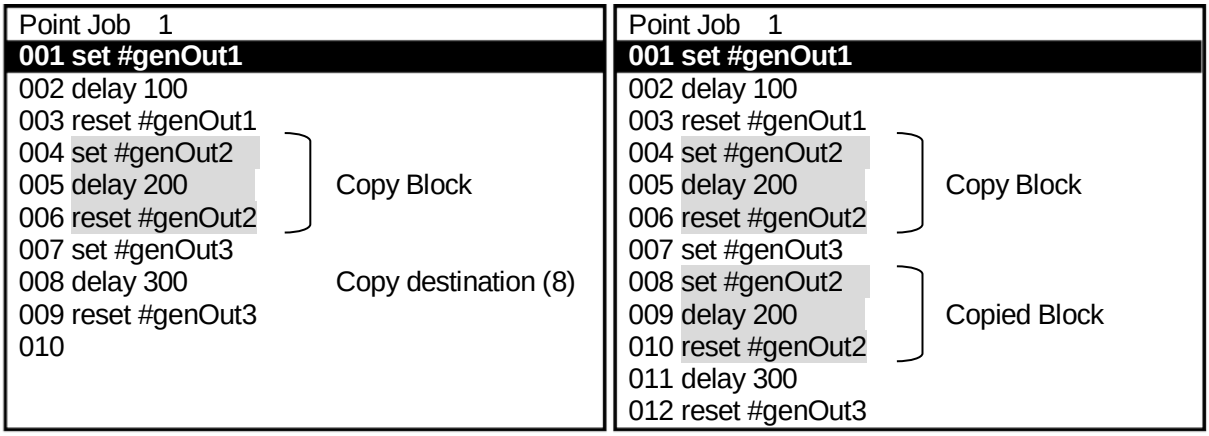
[Copy Block Steps]

Select [Copy Block Steps] to display the Block Start Number entry screen. Enter the first command number for the block that you wish to copy.

After the block start number is entered, the Block End Number entry screen appears. Enter the last command number of the command block.

After the block end number is entered, the Destination Number entry screen appears. Enter the command number where the block is to be copied.

After entering the destination number, the block command is copied in front of the destination command number and the screen returns to the settings screen.



Before Copy **After Copy**

8.4.8 Point Job Name Editing

The following explains how to enter a point job data name.

This process can be used for both entering a new name and also when modifying a registered name.

First, display the point job data settings screen.

Key and Item Selection

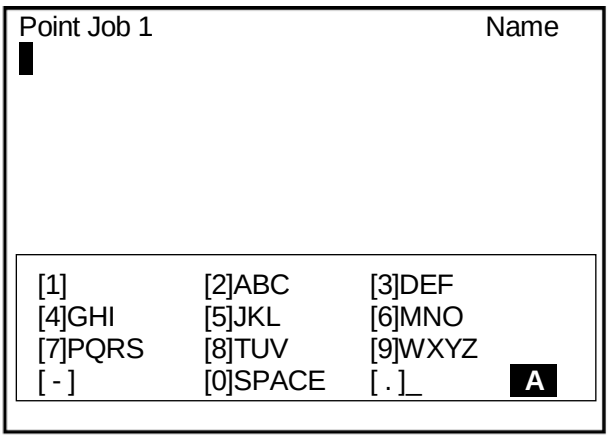
On the Point Job Data settings screen:

EDIT

[Edit Point Job Name]

Select [Edit Point Job Name] from the Edit Menu.

The character entry screen shown to the right will appear.



Character Entry Screen Example

Enter the desired name.

NOTE

Depending on the type of character it is possible to use 40 – 120 characters.

(Up to 120 characters can be entered when using the teaching pendant. When using the PC, the maximum number of characters will be 40 depending on the character type.)

However, up to 36 characters* (the maximum number of characters per line) are displayed on the registered program list. The rest of the characters are omitted.

(*: When characters can be entered using the teaching pendant)

8.4.9 Import Merge

Select [Import Merge] from the Edit Menu to display the Source Point Job Number entry screen.

After entering the number, the contents of the entered point job data are placed behind the last command line of the currently selected point job data.

Key and Item Selection

EDIT

[Import Merge]

8.4.10 Jumping to a Specified Command Number

This displays the command of the number you designate.

Using this function enables you to display the desired command quickly when there are multiple command lines. You do not need to keep pressing the [CURSOR↓] key over and over.

First, display the settings screen for the point job data that includes the desired command.

Key and Item Selection

[EDIT]

[Change Command Number]

Select [Change Command Number] to display the Change Command Number entry screen. Enter the command number that you wish to display.

After you enter the command number, the settings screen including that command number is displayed.

8.5 Sequencer Program

The sequencer program is a set of logical operation commands for controlling I/O signals, etc. It is always activate in Switch Run Mode and External Run Mode. For further details regarding teaching for sequencer programs etc., refer to the operation manual *Functions III (Run Mode Parameter/Sequencer)*.

You can create sequencer program data Nos. 01 – 50 in Teaching Mode.

Use one of the following methods to display the Sequencer Program Setting screen.

Method 1

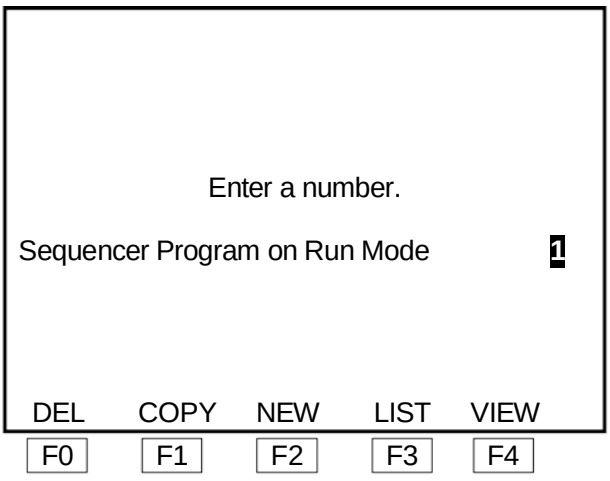
[MENU] [Sequencer Settings]

Enter the sequencer number

Method 2

[MENU] [Run Mode Parameter]

[Job and Sequencer on Run Mode]



Sequencer Number Entry Screen

In Method 1, if you enter a sequencer number, or select the number from the list, the settings screen of the sequencer program for the number entered/selected is displayed.
In Method 2, if you press the F4 (VIEW) key on the Sequencer Number Entry screen, the settings screen of the sequencer program for the currently displayed number appears.

F0 (DEL) key: ·····This displays the Delete (Sequencer Program) Data Number entry screen. Enter the sequencer program number that you wish to delete.

F1 (COPY) key:·····This displays the Source (Sequencer Program) Data Number entry screen. Enter the source number and destination number. The contents of the source sequencer program are copied to the destination number.

F2 (NEW) key: ·····This displays the unregistered sequencer program number list. Select a number from the list. The selected sequencer program data settings screen (content not yet entered) will appear.

F3 (LIST) key:·····This displays the registered sequencer program number list. Select a number from the list. The selected sequencer program data settings screen will appear.

F4 (VIEW) key:·····This displays the settings screen for the currently displayed sequencer program number. You can modify the contents on this screen. (This key cannot be used in Method 1.)

NOTE
The method for entering and editing commands for sequencer programs is exactly the same as it is for point job data. Also, the same as for point job data, names can be set to sequencer programs. Press the EDIT key on the sequencer program data settings screen to display the Name Editing screen.

To execute a registered sequencer program, you need to set the registered sequencer number to [Sequencer Program on Run Mode];

MENU [Run Mode Parameter]
[Job and Sequencer on Run Mode]
[Sequencer Program on Run Mode]
Enter a sequencer number.

NOTE

- By entering 0 you can deactivate (not carry out) the sequencer program.
- The registered sequencer program is activated once you switch to External Run Mode or Switch Run Mode.

8.6 Run Mode Parameters

For details regarding Run Mode parameters refer to the operation manual *Functions III*. For operating methods refer to “3.2 Selection” and “3.3 Entering Numbers” in this manual.

8.7 Teaching Data Copy, Delete, Conversion

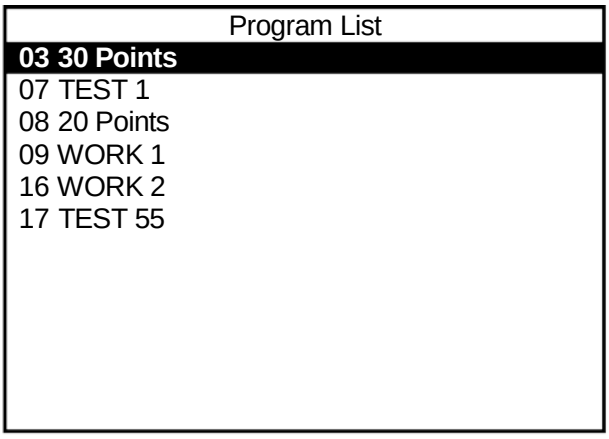
8.7.1 Program List

Use this when you want to check what program number a specific program is registered to.

Key and Item Selection

MENU [Teaching Data Copy, Delete, Conversion]
[Program]
[Program List]

Select [Program List] to display the registered program list.
Unused (unregistered) program numbers will not appear.



Registered Program List Example

NOTE

You can press the PRG.NO key on the base screen and then press the F3 (LIST) key to select a program.

8.7.2 Copy

When you want to create program/point job data/additional function data similar to existing data, making a copy of the data and modifying the copy is convenient.

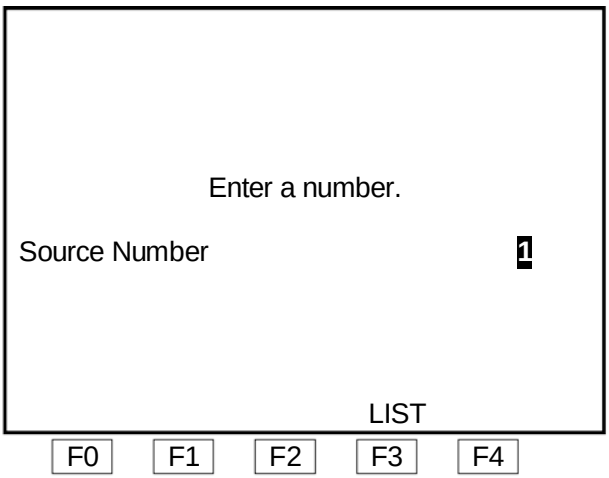
Key and Item Selection

MENU [Teaching Data Copy, Delete, Conversion]

- [Program]
  - [Copy Program]
- [PTP Condition Data]
  - [Copy PTP Condition Data]
- [CP Condition Data]
  - [Copy CP Condition Data]
- [Tool Data]
  - [Copy Tool Data]
- [Pallet Routine Data]
  - [Copy Pallet Routine Data]
- [Workpiece Adjustment Data]
  - [Copy Workpiece Adjustment Data]
- [Execute Condition Data]
  - [Copy Execute Condition Data]
- [Point Job Data]
  - [Copy Point Job Data]
- [Sequencer Data]
  - [Copy Sequencer Data]

Select [Copy xxx] to display the Source Number entry screen, as shown to the right.

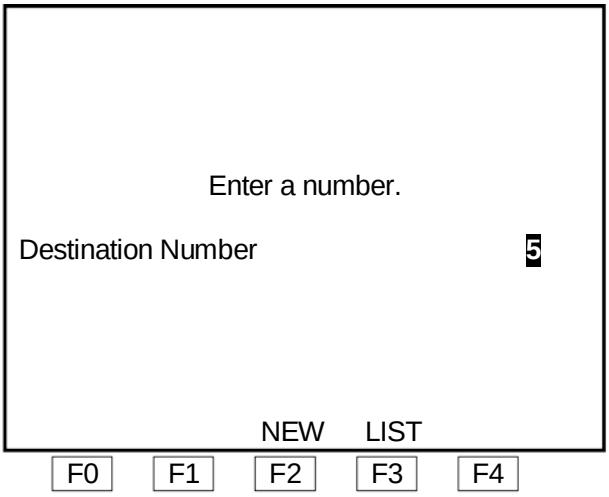
Enter a source number for each data item.



Press the F3 (LIST) key on the Source Number entry screen to display the registered program, point job data, or additional function data list. You can select the program/data you want from the list

After the source number is entered, the Destination Number entry screen appears. Enter a destination number for the copy.

On the Destination Number entry screen, press the F2 (NEW) key to display the unregistered number list.
Press the F3 (LIST) key to display the registered number list. You can also select the program/data you want from this list.



If the destination number already contains data, the Copy Confirmation screen appears.
If you select [YES], the data is overwritten.
If you select [NO], the screen returns to the Source Number entry screen.
To change only the destination number, press the ESC key on the Copy Confirmation screen. The screen will return to the previous screen (Destination Number entry screen).

8.7.3 Delete

This deletes any program, point job data, or additional function data for the specified number.

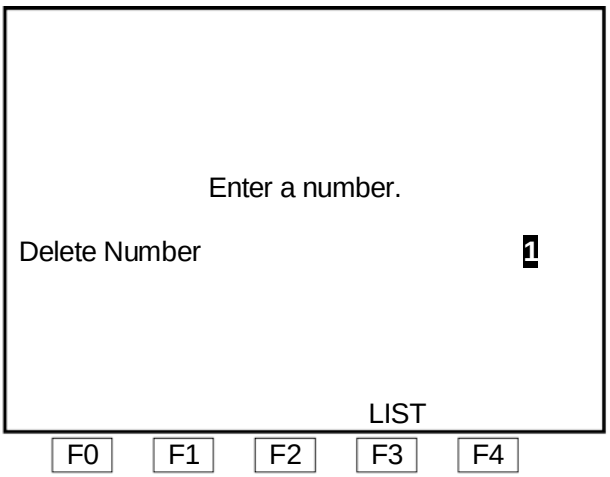
Key and Item Selection

MENU [Teaching Data Copy, Delete, Conversion]

- [Program]
  - [Delete Program]
- [PTP Condition Data]
  - [Delete PTP Condition Data]
- [CP Condition Data]
  - [Delete CP Condition Data]
- [Tool Data]
  - [Delete Tool Data]
- [Pallet Routine Data]
  - [Delete Pallet Routine Data]
- [Workpiece Adjustment Data]
  - [Delete Workpiece Adjustment Data]
- [Execute Condition Data]
  - [Delete Execute Condition Data]
- [Point Job Data]
  - [Delete Point Job Data]
- [Sequencer Data]
  - [Delete Sequencer Data]

Select [Delete xxx] to display the Delete Number entry screen, as shown to the right. Enter the number you want to delete.

After the number to delete is entered, the Delete Confirmation screen appears.
If you select [YES], the program or data is deleted.
If you select [NO], the screen returns to the Delete Number entry screen.



Press the F3 (LIST) key on the Delete Number entry screen to display the registered program, point job data, or additional function data list. You can also select the number you want to delete from this list.

8.7.4 Change Program Number

This changes program numbers.

The procedures described below produce the same result as copying a program, giving it a new name, and then deleting the original program.

Key and Item Selection

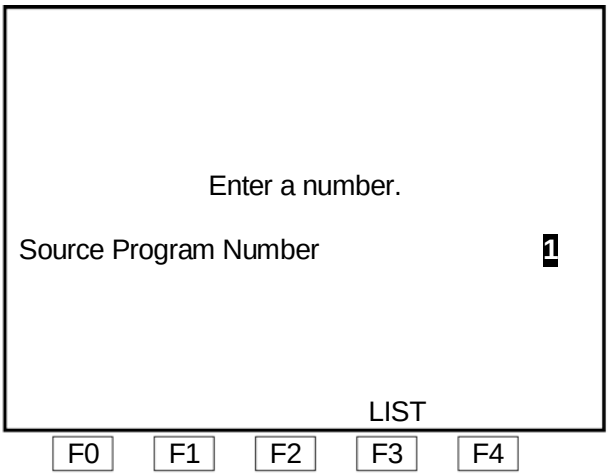
MENU [Teaching Data Copy, Delete, Conversion]

[Program]

[Change Program Number]

Select [Change Program Number] to display the Source Program Number entry screen, as shown to the right.

Enter the program number you want to change.



After a source program number is entered, the Destination Program Number entry screen appears.

Enter the new program number you want to use.

If a program already exists for the selected destination number, the Copy Confirmation screen appears.

If you select [YES], the program is overwritten.

If you select [NO], the screen returns to the Source Program Number entry screen.

If you want to change only the destination program number, press the ESC key on the Copy Confirmation screen. The screen will return to the previous screen (Destination Program Number entry screen).

Press the F3 (LIST) key on the Source Program Number or Destination Program Number entry screen to display the registered program list. To display the unregistered program number list, press the F2 (NEW) key on the Destination Program Number entry screen. You can also select a program number from this list.

8.7.5 Delete All

This deletes all the registered programs, point job data, or additional function data. (Additional function data is deleted by category.)

Key and Item Selection

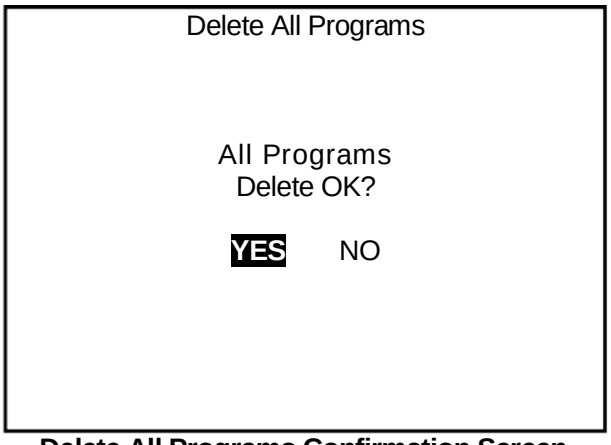
MENU [Teaching Data Copy, Delete, Conversion]

- [Program]
  - [Delete All Programs]
- [PTP Condition Data]
  - [Delete All PTP Condition Data]
- [CP Condition Data]
  - [Delete All CP Condition Data]
- [Tool Data]
  - [Delete All Tool Data]
- [Pallet Routine Data]
  - [Delete All Pallet Routine Data]
- [Workpiece Adjustment Data]
  - [Delete All Workpiece Adjustment]
- [Execute Condition Data]
  - [Delete All Execute Condition]
- [Point Job Data]
  - [Delete All Point Job Data]
- [Sequencer Data]
  - [Delete All Sequencer Data]

Select [Delete All xxx] to display the Delete All Confirmation screen, as shown to the right.
If you select [YES], all of the selected data is deleted.

NOTE

Numbers 101 and above for Point Job Data or 51 and above for Additional Function Data cannot be deleted by this operation because they are included in the Customizing Data.



Delete All Programs Confirmation Screen

8.7.6 Delete All Teaching Data

Executing [Delete All Teaching Data], erases all of the following data:
(Each setting for the common setting data and run mode parameters resets to its default setting.)

- All programs
- Point job data Nos. 1 – 100
- Additional function data Nos. 1 – 50 (all types)
- Sequencer program data Nos. 1 – 50
- Condition data
- Common data
- Run Mode parameter

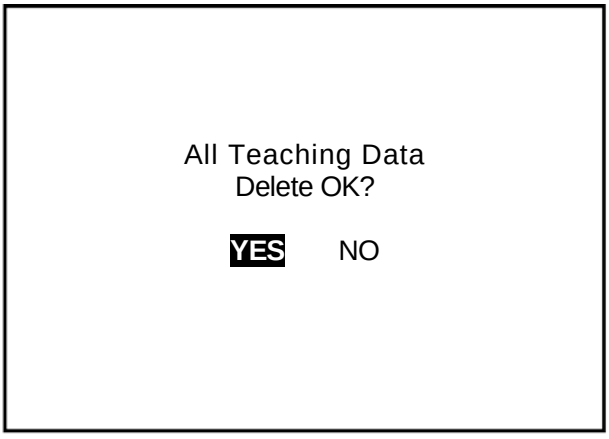
Point job data Nos. 101 – 200, additional function data Nos. 51 – 100 and sequencer program data Nos. 51 – 100 are included in the Customizing Data and therefore cannot be deleted through this operation.

Key and Item Selection

MENU [Teaching Data Copy, Delete, Conversion]
[Delete All Teaching Data]

Select [Delete All Teaching Data] to display the Delete All Teaching Data confirmation screen, as shown to the right.
Select [YES].

NOTE
Executing [Delete All Teaching Data] in the JR-V2000 Series also returns the IO-DSP function assignments to default values. At this time, the I/O-SYS takes on the values settable in Customizing Mode for the [Run Mode Parameter Default Setting], but IO-DSP assignment functions return to the factory settings.



Delete All Teaching Data Confirmation Screen

8.7.7 Reset Run Mode Parameter Values (to default)

Performing the [Reset Run Mode Parameter] operation will reset all the run mode parameter settings to default.

Key and Item Selection

MENU [Teaching Data Copy, Delete, Conversion]
[Reset Run Mode Parameter]
[YES]
[NO]

NOTE

Executing [Reset Run Mode Parameter] in the JR-V2000 Series also returns the IO-DSP function assignment to its default values. At this time, I/O-SYS takes on the values which can be set at your discretion in Customizing Mode for the [Run Mode Parameter Default Setting], but the IO-DSP assignment function returns to the factory settings.

8.7.8 2-Points Position Conversion (Move, Rotate)

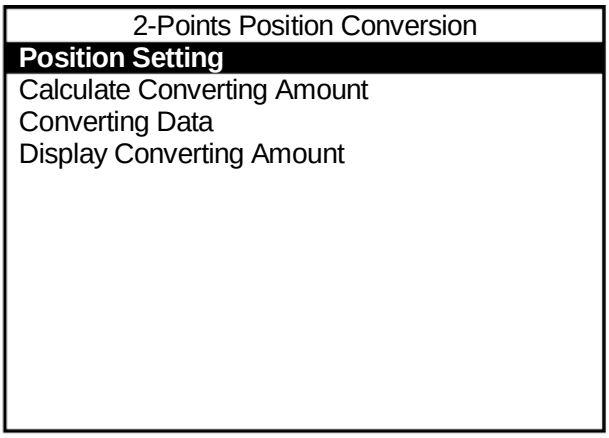
By designating two points at the conversion source (standard) and the corresponding two points at the conversion destination, you can perform parallel and rotational coordinate conversions with the X, Y, and Z axes.

This function is useful for matching coordinates when copying teaching data or when writing CAD data from one robot via a DXF file for uploading to several robots.

Designating two points each for the conversion source and conversion destination allows you to do [offset] and [rotate] for [block edit].

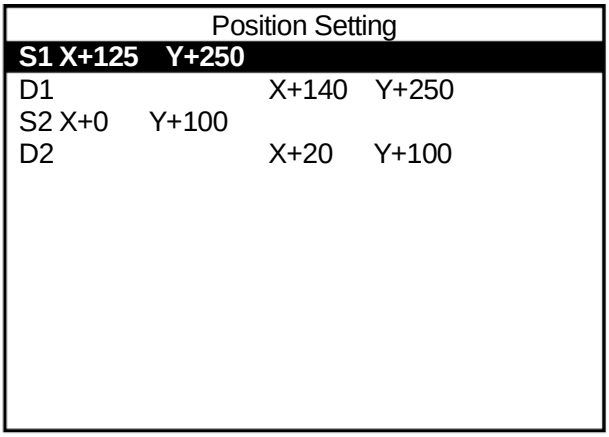
Key and Item Selection

MENU
[Teaching Data Copy, Delete, Conversion]
[2-Points Position Conversion]
[Position Setting]
[Calculate Converting Amount]
[Converting Data]
[Display Converting Amount]



2-Points Position Conversion Menu

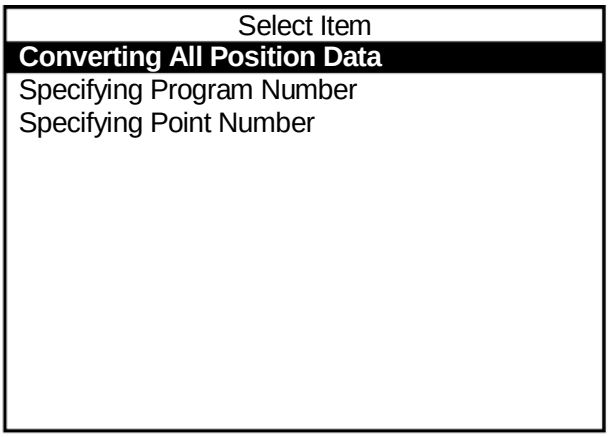
Select [Position Setting] to display the screen on the right.



S1 and S2 are the coordinates of the conversion source. D1 and D2 are the coordinates after conversion.
Select each item and enter the coordinates.
(After an item is selected, the position entry screen appears.)
After inputting each coordinate for S1, S2, D1, D2 (conversion source and after conversion), press the ESC key. The screen reverts to the 2-Points Position Conversion Menu.

Select [Calculate Converting Amount].
Next, select [Display Converting Amount] to check the conversion factor. After confirmation, press the ESC key and return to the 2-Points Position Conversion menu.

Select [Converting Data] from the 2-Points Position Conversion menu.
The screen shown on the right is displayed.



Select the point range that you wish to convert.

■ Selecting [Converting All Position Data], converts the following coordinates:

- Position coordinates from Point 1 to the last point in all programs
  (excluding the [Work Home] position coordinates)
- Position coordinates for common data items which include coordinate values as parameters
- Robot coordinates for camera adjustment calibration
- Standard mark position (robot coordinates) for camera adjustment calibration
- Coordinates of [Standard (p0)], [Row (pa)], [Column (pb)] and [Tier (pc)] for the additional function data, [Pallet Routine]
- Robot coordinates for camera pallet calibration
- The camera pallet standard mark position (robot coordinates)

- If you select [Specifying Program Number], the Program Number entry screen will appear. Enter the program number and the following coordinates are converted:
  - Position coordinates from Point 1 to the last point in the designated program

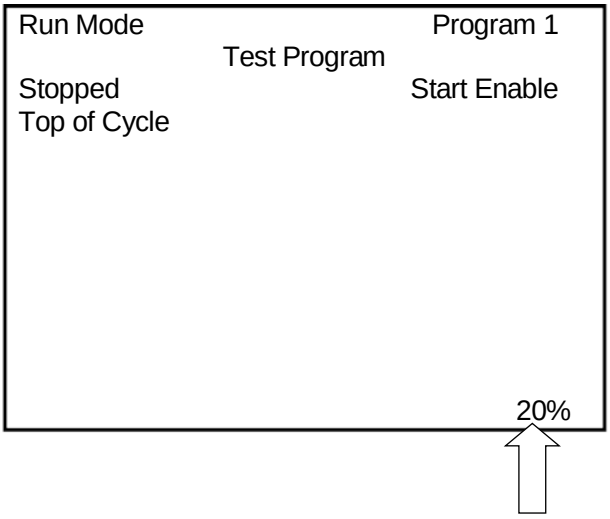
- If you select [Specifying Point Number], the Block Start Number entry screen will appear. Enter the start number, and the Block End Number entry screen appears. Enter the block end numbers in order, and the following coordinates are converted:
  - Point Position coordinates within the designated point block in the currently selected program

8.8 PTP Speed Override

The PTP speed in Run Mode can be reduced by setting a percentage in the [PTP Speed Override] setting (this does not affect the CP speed). Use this when, initially, you want to run a new program at a low speed.

When in Run Mode, press the MENU key and select [PTP Speed Override].
Enter the speed percentage you want to set.

When you want to set a percentage other than 100%, the Run Mode base screen, as shown to the right, appears.



9. PROGRAM TESTING (MONITOR Key)

9.1 Checking Data

When you have registered a new program or modified a registered program, be sure to perform [Checking Data] before running the program.

Key and Item Selection

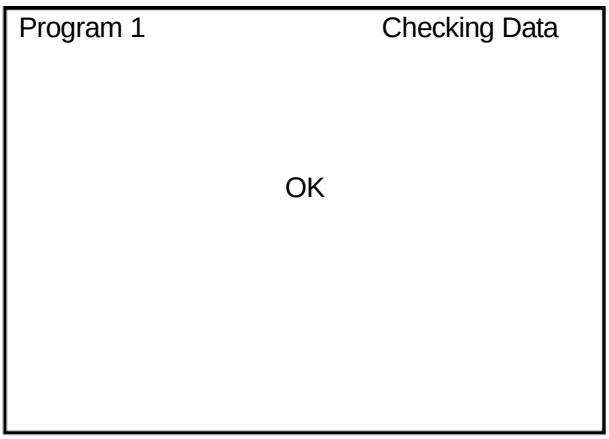
MONITOR

[Checking Data]

Press the MONITOR key to display the Test Menu. Select [Checking Data] from the Test Menu to start the data check for the currently selected program.
Depending on the program, it may take some time to complete the process.

If no error is detected, the screen shown to the right appears.

Press the ENTR or ESC key.



Checking Data Result Screen Example

NOTE

When an error is detected and you are on the data check result screen, if you push any key other than the SHIFT, CTRL, or ESC keys, the result data for the error point following the current error point is displayed. If there are no error points following the current error point, the screen reverts to the Test Menu.
The SHIFT and CTRL keys are invalid. Pushing the ESC key returns you to the Test Menu even if you are not at the end of the result screen.

9.1.1 Point Type Error

If there is a problem in the setting [Type] for the registered point, an error occurs and the message “Point Type Error” is displayed on the screen.

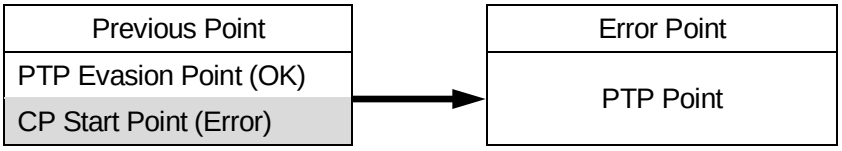
The following describes possible error causes. Check the point types for the points around the error point.

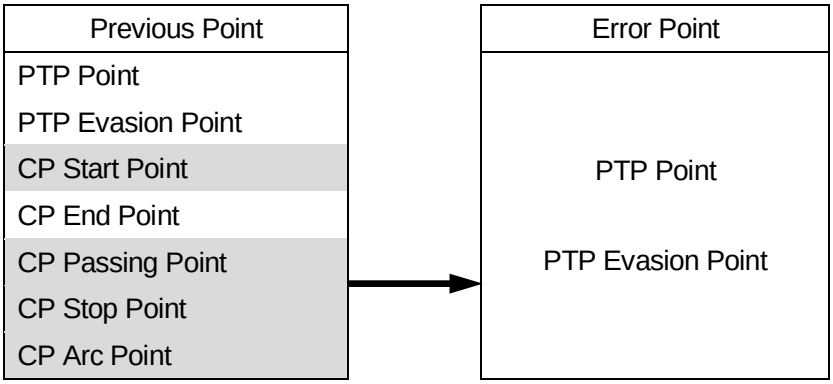
■ Causes of Error

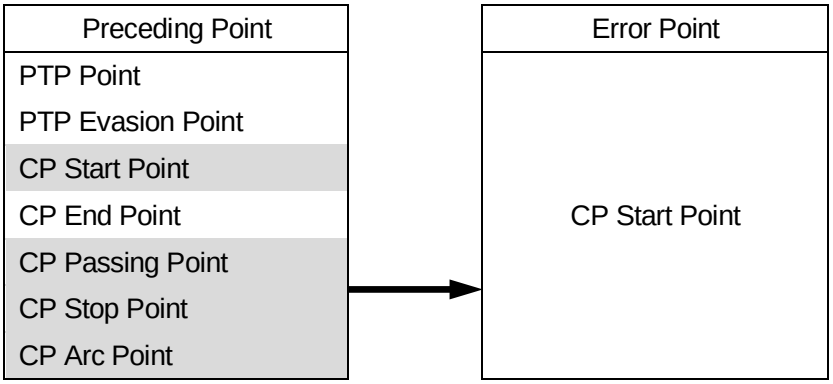
If the points are aligned as shown in the highlighted gray ( ) sections below, an error will occur.

For example, a point type error occurs if a point is set as a PTP point when the previous point is a CP start point. If the previous point is a PTP evasion point, an error will not occur.

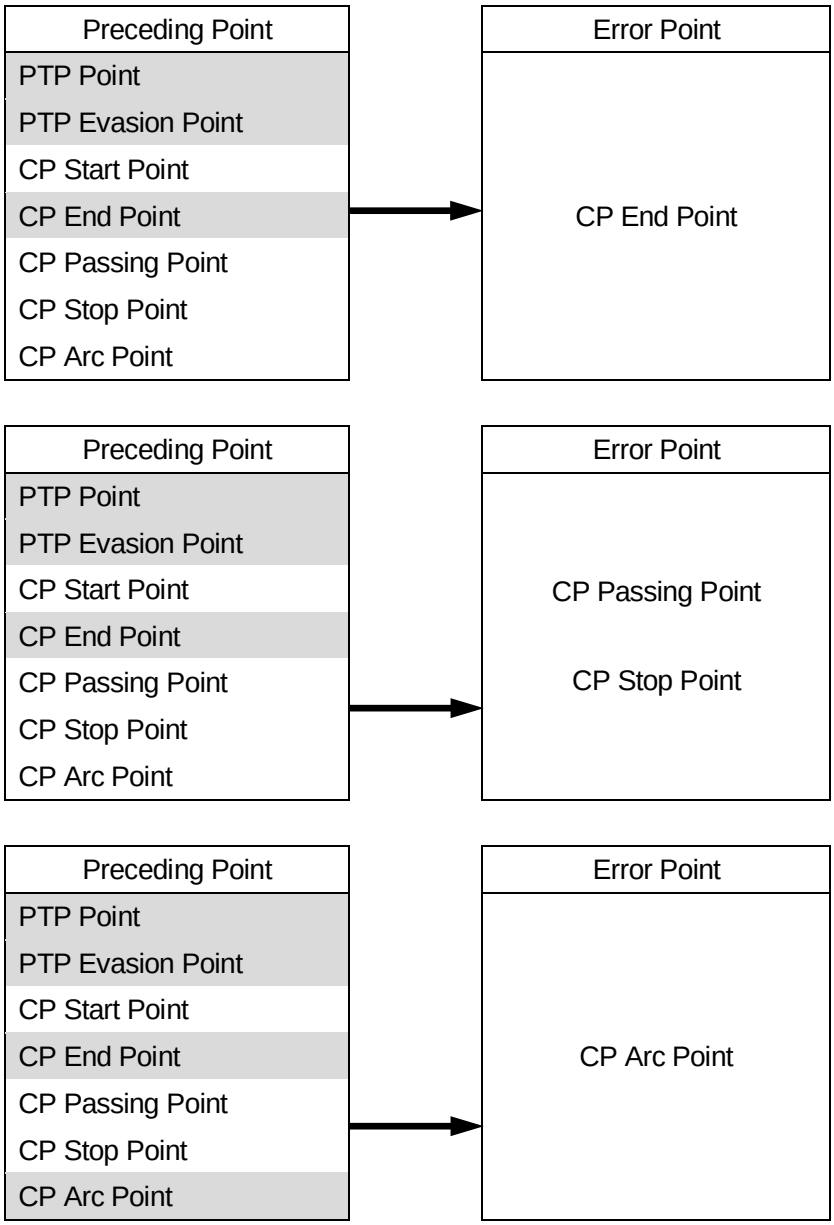
Example







If there is no CP End Point before the end of a program with a CP Start Point, an error occurs.



To correct a point type error, change the point type of the previous point or insert a new point if needed.

9.2 Test Run

Select [Test Run] when you want to check the movement for a newly registered or modified program before performing an actual run.
The test run speed will not exceed 250 mm/s for safety reasons. Other than this, the robot will perform one cycle of a test run (including the point job data and additional function data) the same as with an actual run.
NOTE: If Cycle Mode is set to [Continuous Playback], the robot runs continuously.
Be sure to execute [Checking Data] and then [Test Run] before an actual run when you register a new program or modify a registered program.

Caution Always pay special attention to the robot's movement when in Teaching Mode.

Key and Item Selection

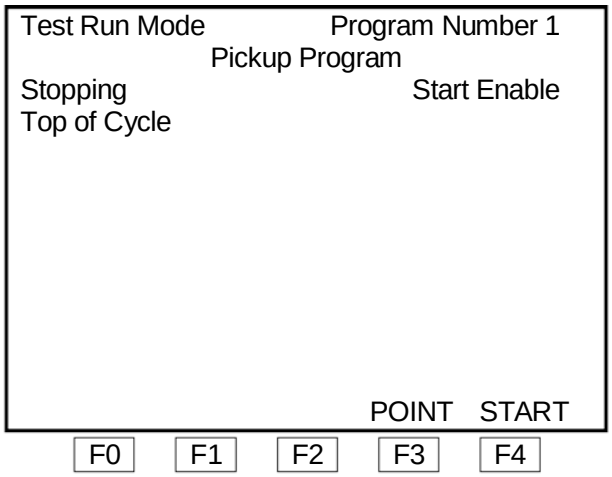
MONITOR

[Test Run]

Select [Test Run] from the Test Menu to display the Test Run standby screen as shown to the right.

Press the F4 (START) key. The test run will start.

Check to see that the program is performed as entered.



Test Run Standby Screen

Press the F3 (POINT) key to perform a point run.
For information on point runs, please refer to "9.4 Point Run" in "9. What you can do in Teaching Mode" in the operation manual *Basic Instructions*.
The PRG.NO and MENU keys can be used in the same way in Switch Run Mode and External Run Mode. Press the PRG.NO key to select the program you want to confirm.
Press the MENU key to set the Run Mode menu.
You can set a PTP speed override in the Run Mode menu. For information on PTP speed override, please refer to "7.5 PTP Speed Override" in "7. What you can do in External Run Mode" or "8.5 PTP Speed Override" in "8. What you can do in Switch Run Mode" in the operation manual *Basic Instructions*.

NOTE

- If [Program Number Changing Way] in the [Run Mode Parameter] menu is set to [Loading at Start], the program number settings in the I/O-SYS activate when the run starts (including test runs). If you have connected a device that can change program numbers on the I/O-SYS, change the program number settings on the device to the program number for which you want to conduct a test run on, before starting the test run.
- If you are using a teaching pendant with an enable switch, keep pressing the enable key when you push the F4 (START) key. Also, keep pressing the enable switch while the robot is moving. Pressing in or releasing the enable switch stops the robot.

9.2.1 Error in Point Position

If the registered position coordinates exceed the operating range or the move area limit of the robot, an error occurs and the message “Position is Out of Range” is displayed when you perform a data check.

Correct the error by using one of the following procedures:

■ Modify the position coordinates

Display the settings screen for the point where the error occurred and select the coordinates display line. Enter the new coordinates.

■ Modify the move area limit (if the point exceeds the move area limit)

1. Press the MENU key on the base screen for the program that you wish to modify. Select [Program Data Settings] from the Menu.
2. Select [Move Area Limit].
3. Enter a new move area limit and set it.

NOTE

You can set the values more than the default values (maximum values).

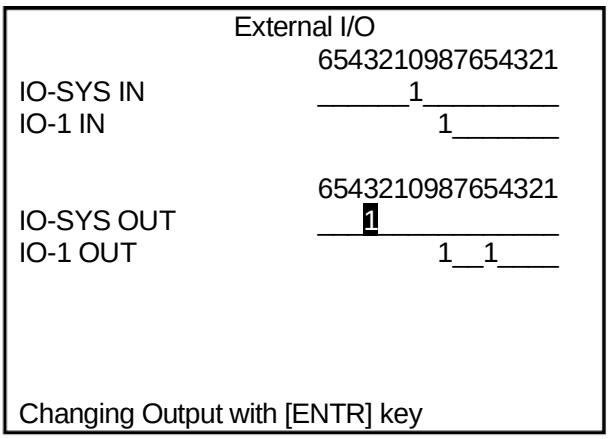
9.3 IO Test

Key and Item Selection

MONITOR

[IO Test]

Select [IO Test] from the Test Menu to display the I/O-SYS and I/O-1 input/output statuses on the LCD.
Check that the input/output statuses are properly displayed.
Pressing the ENTR key switches the output signals the cursor is on, ON/OFF.



Press the ESC key to return to the Test Menu.

NOTE
The I/O-SYS and I/O-DSP statuses are displayed on the LCD in the JR-V2000 Series.

9.4 Test Run (Check IO)

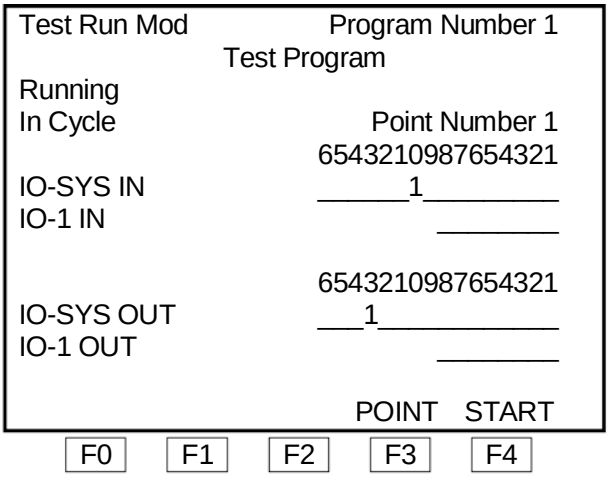
Key and Item Selection

MONITOR

[Test Run (Check IO)]

Select [Test Run (Check IO)] from the Test Menu to display the Test Run (Check IO) standby screen.
Press the F4 (START) key to start the test run.

Selecting [Test Run (Check IO)] displays the test run while also showing the I/O-SYS and I/O-1 input/output statuses on the LCD.



Press the F3 (POINT) key to perform a point run.
For information on point runs, please refer to “9.4 Point Run” in “9. What you can do in Teaching Mode” in the operation manual *Basic Instructions*.

The [PRG.NO] and [MENU] keys can be used in the same way in Switch Run Mode and External Run Mode.

Press the [PRG.NO] key to select the program you want to confirm.

Press the [MENU] key to set the Run Mode menu.

You can set a PTP speed override in the Run Mode menu. For information on PTP speed override, please refer to “7.5 PTP Speed Override” in “7. What you can do in External Run Mode” or “8.5 PTP Speed Override” in “8. What you can do in Switch Run Mode” in the operation manual *Basic Instructions*.

NOTE

- The I/O-SYS and I/O-DSP statuses are displayed on the LCD in the JR-V2000 Series.

- If [Program Number Changing Way] in the [Run Mode Parameter] menu is set to [Loading at Start], the program number settings on the I/O-SYS activate when an operation starts (including the test run). If you have connected a device that can change program numbers on the I/O-SYS, change the program number settings on the device to the desired number before starting the test run.

- If you are using a teaching pendant with an enable switch, keep pressing the enable key when you push the [F4] (START) key. Also, keep pressing the enable switch while the robot is moving. Pressing in or releasing the enable switch stops the robot.

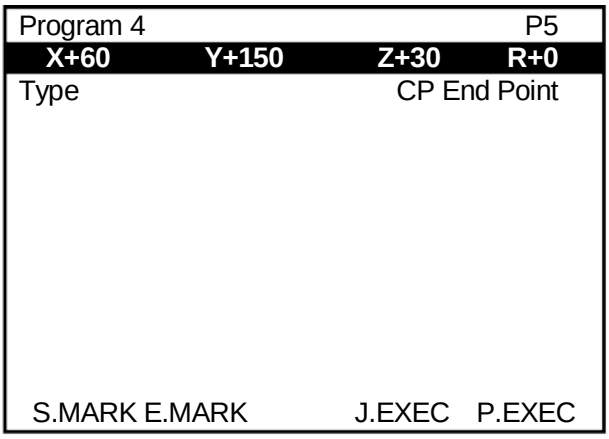
10. SAVING C & T DATA (SAVE Key)

This saves C & T data (customizing data and teaching data).
Any modifications made to the C & T data which is not saved are deleted automatically when the power to the robot is turned OFF. Be sure to save whenever you modify teaching data or customizing data.

Key Selection

SAVE

To save C & T data, press the SAVE key on a base screen, except when in External Run mode and Switch Run Mode.



Example of the Point Settings Screen

(Base Screen in Teaching Mode)

The save operation overwrites the registered data. Note that you cannot restore the overwritten data.

When you want to back up your data, send the C & T data from the robot to a PC using the PC software JR C-Points or JR C-Points Limited Edition and create your backup file.

Attention

Do not turn OFF the robot power during a save operation. The data may be corrupted.

11. DELETE ALL C & T DATA

This deletes all of the C & T data (customizing data and teaching data) on the robot.

Attention

If you are using a model other than a Standard Specifications models, do not perform this operation. Dedicated application data for Screw Tightening, Dispensing etc., is saved as customized data in a specialized account. Performing this operation not only deletes this data, but the robot as a specialized application model, will no longer function normally.
If the specialized application data is deleted by mistake, refer to "3. Downloading the Robot System Software" in the operation manual *Maintenance* and send the system software to the robot.
If using model specifications other than Normal Specifications, use "Delete All Teaching Data" (MENU key).

Key and Item Selection

MODE [Administration]
[Administration Settings Mode]
[Clear All Data]

MENU [Teaching Data Copy, Delete, Conversion]
[Delete All Teaching Data]

Perform [Clear All Data] to delete all the customizing and teaching data.
Once data has been deleted it cannot be restored. Always confirm whether it is okay to erase the data before deletion. We recommend that you backup before deleting data.

12. LCD BACKLIGHT ON/OFF

You can set the backlight of the teaching pendant LCD display ON/OFF when in Run Mode.

■ Tip

The lifespan of the LCD display is dependent upon the lifespan of the backlight. By setting this function, you can extend the life of the LCD display.

Key and Item Selection

MODE [Administration]

[Administration Settings Mode]

[Back Light Auto OFF]

Functions	Details
Auto OFF Invalid	The backlight does not turn OFF (always ON)
ON at Hitting Key or Starting	Pushing a key on the teaching pendant or starting a run turns the backlight ON.
ON at Hitting Key	Pushing a key on the teaching pendant turns the backlight ON.
ON at Starting	Starting a run turns the backlight ON.
Always OFF	The backlight is normally OFF in Run Mode.
Wait Time	The time it takes for the backlight to go from ON to OFF

For example, if you select “ON at Hitting Key”, and set “Wait Time” to 5 seconds, once you switch to Run Mode and no key is pressed for 5 seconds, the backlight goes OFF. If you press a key, the backlight comes ON, and if you don’t press a key for 5 seconds, the backlight goes OFF again.

NOTE

The LCD display can also be set ON/OFF for the Teaching Mode. However, there are only two selections: ON (always ON) / OFF (always OFF).

Key and Item Selection

T.ENV

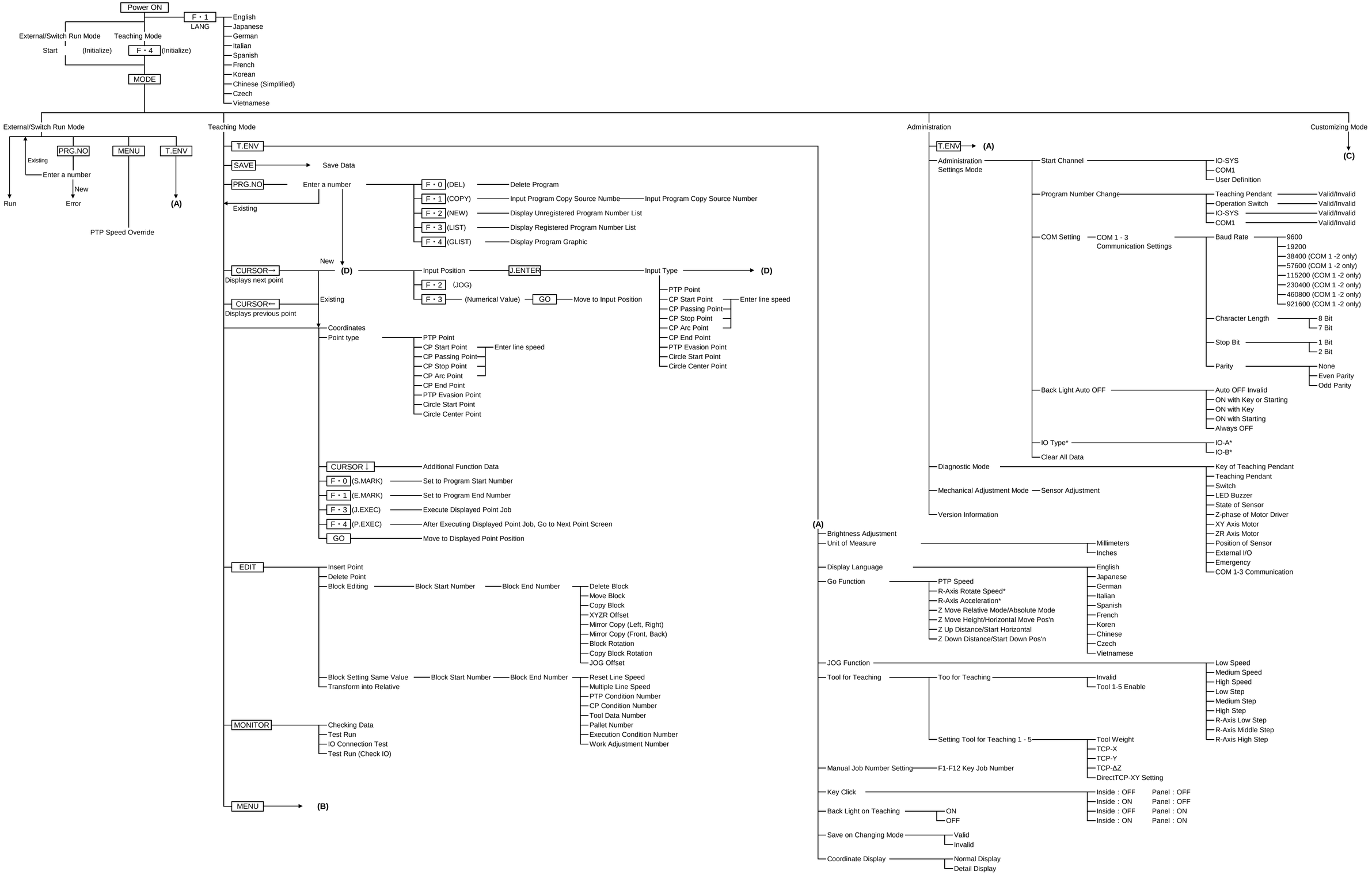
[Back Light on Teaching]

[ON]

[OFF]

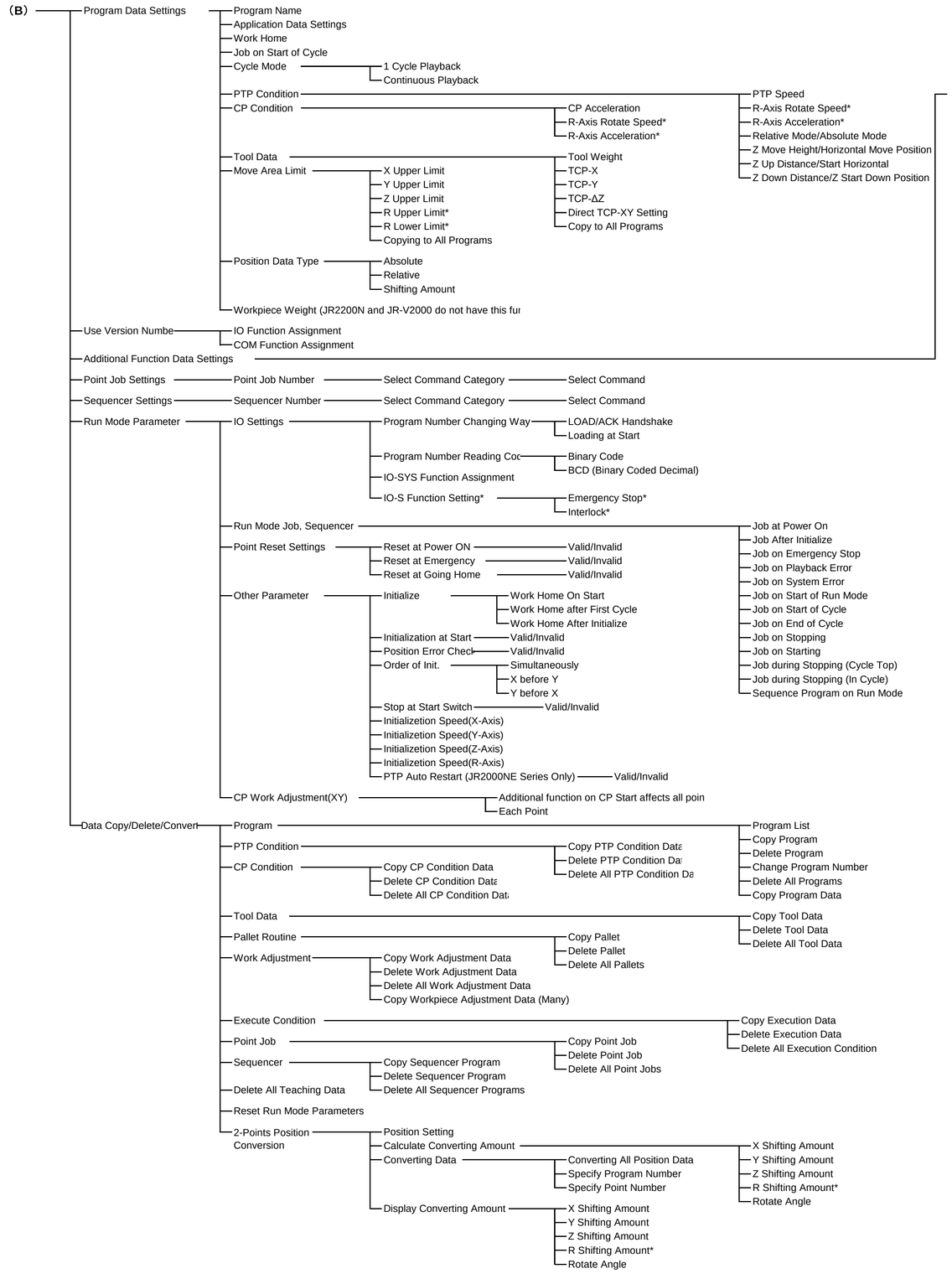
Operation Flowchart (JR2000N/JR-V2000) Ver.10.0x 1/3

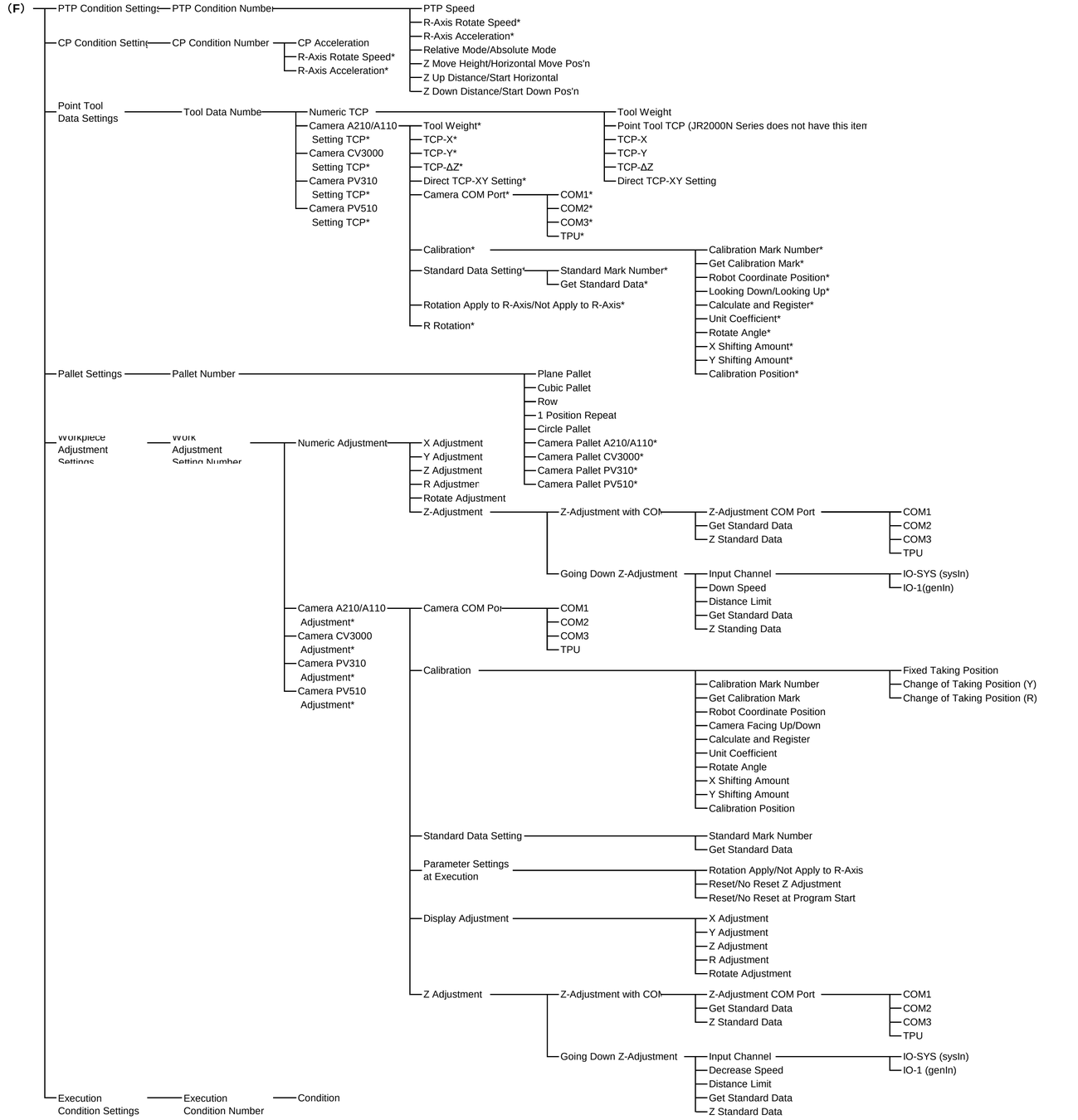
*This asterisk indicates items only displayed for the JR2000N Series



Operation Flowchart (JR2000N/JR-V2000) Ver.10.0x 2/3

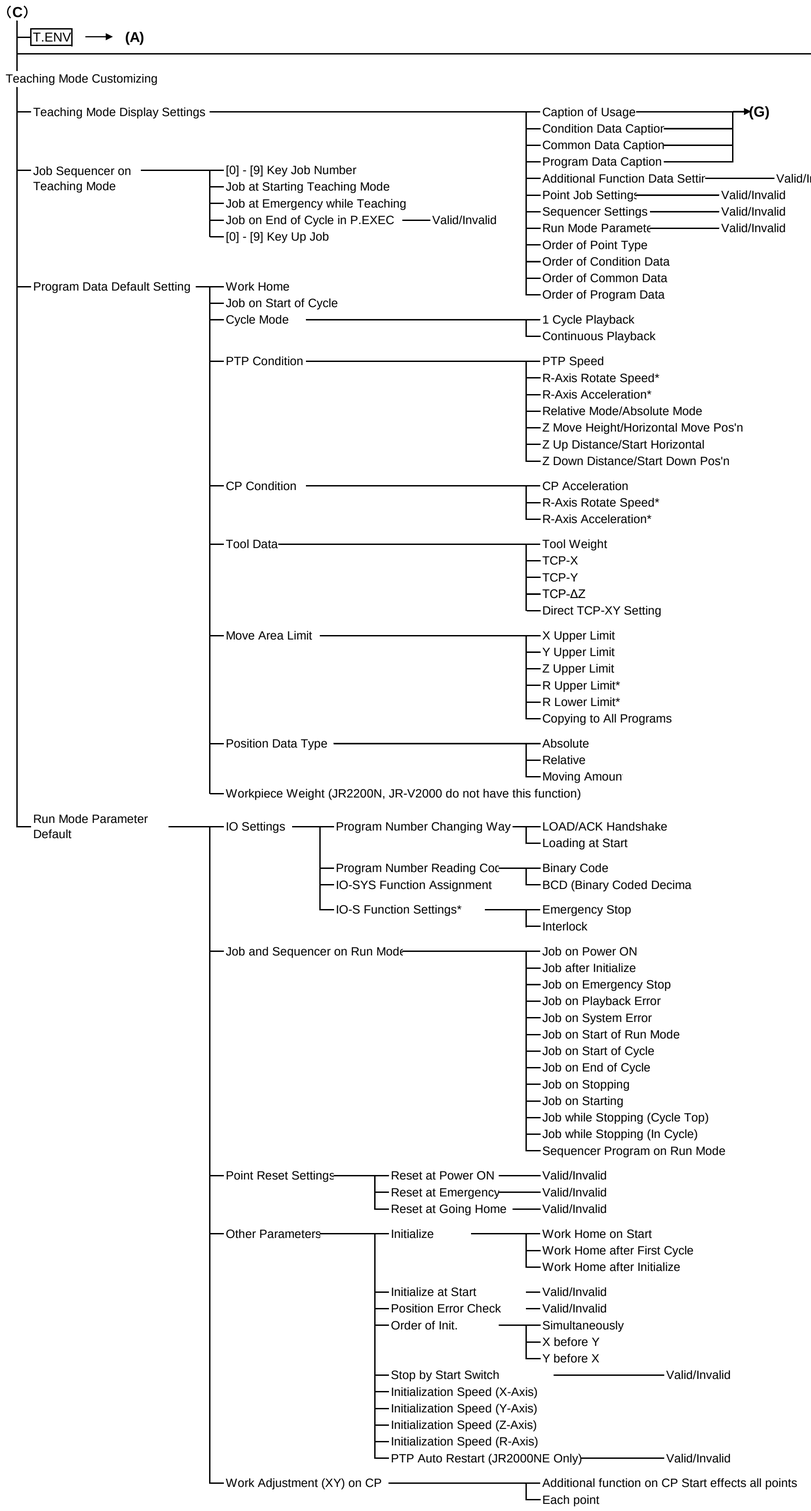
*This asterisk indicates items only displayed for the JR2000N Series

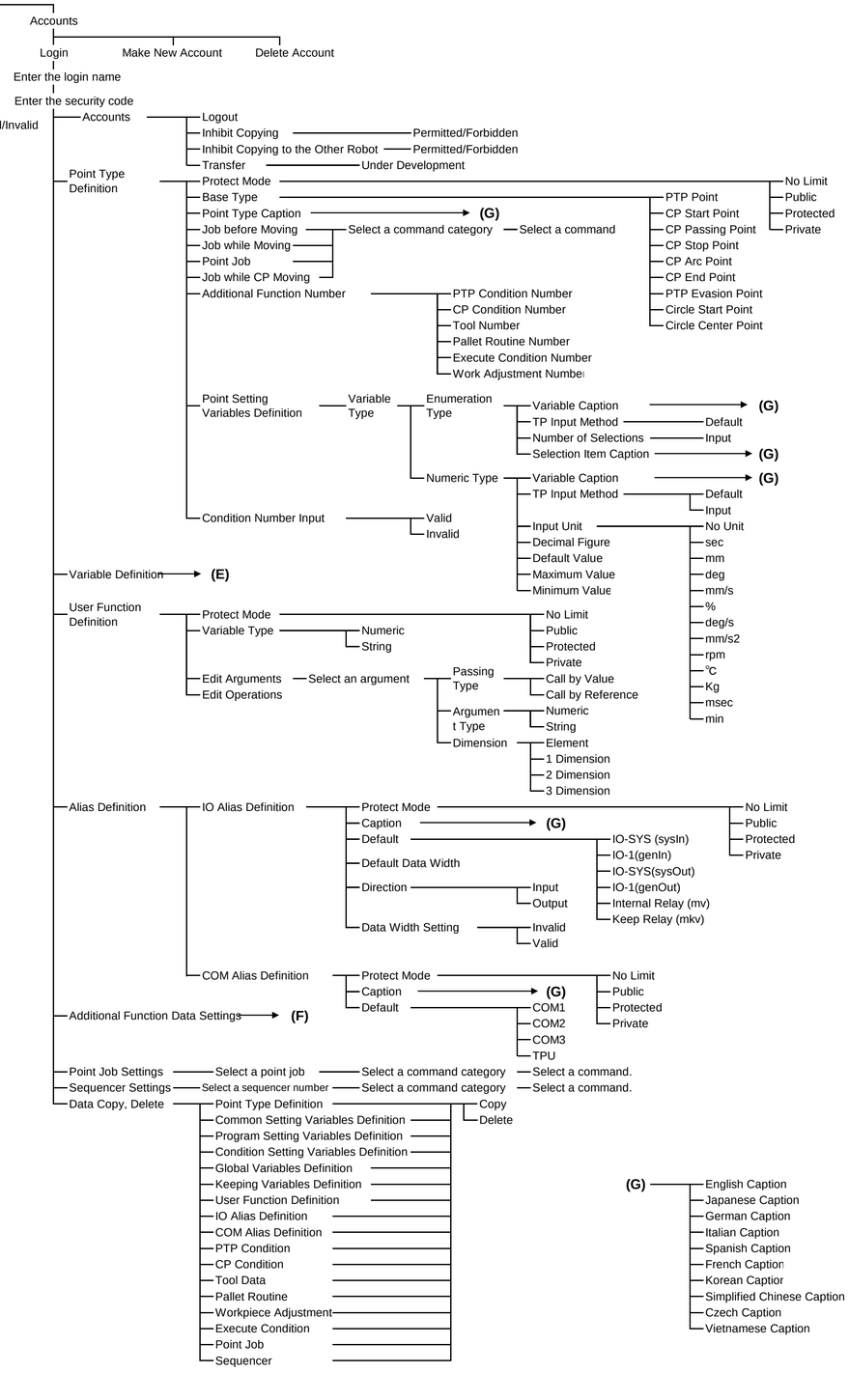


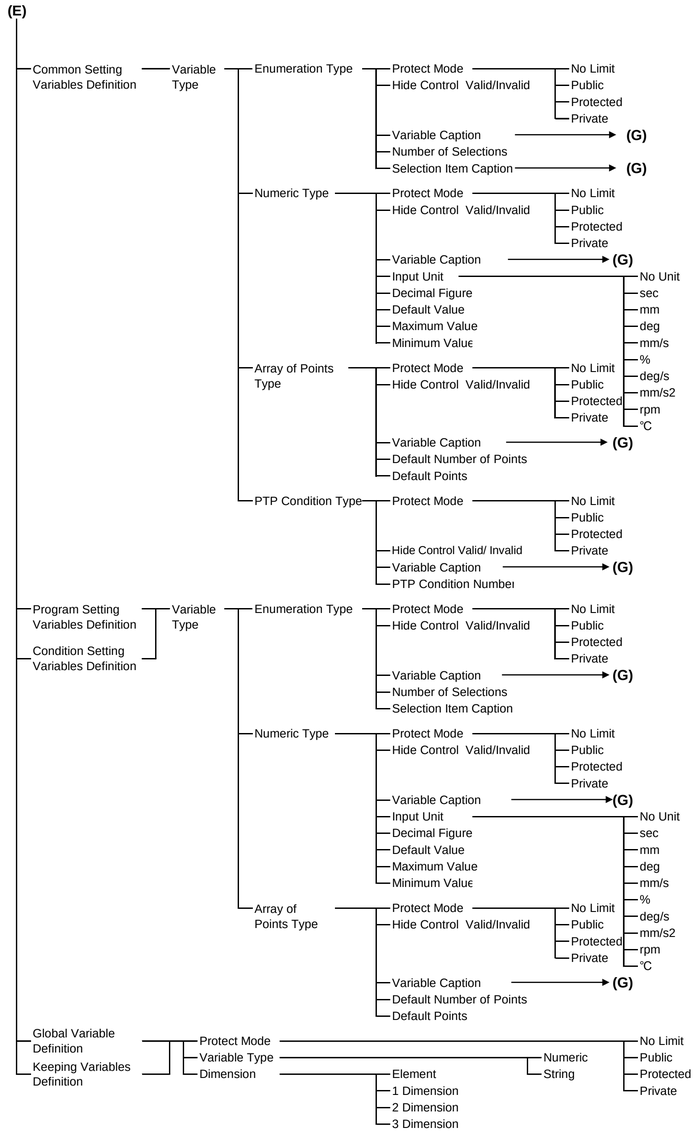


Operation Flowchart (JR2000N/JR-V2000) Ver.10.0x 3/3

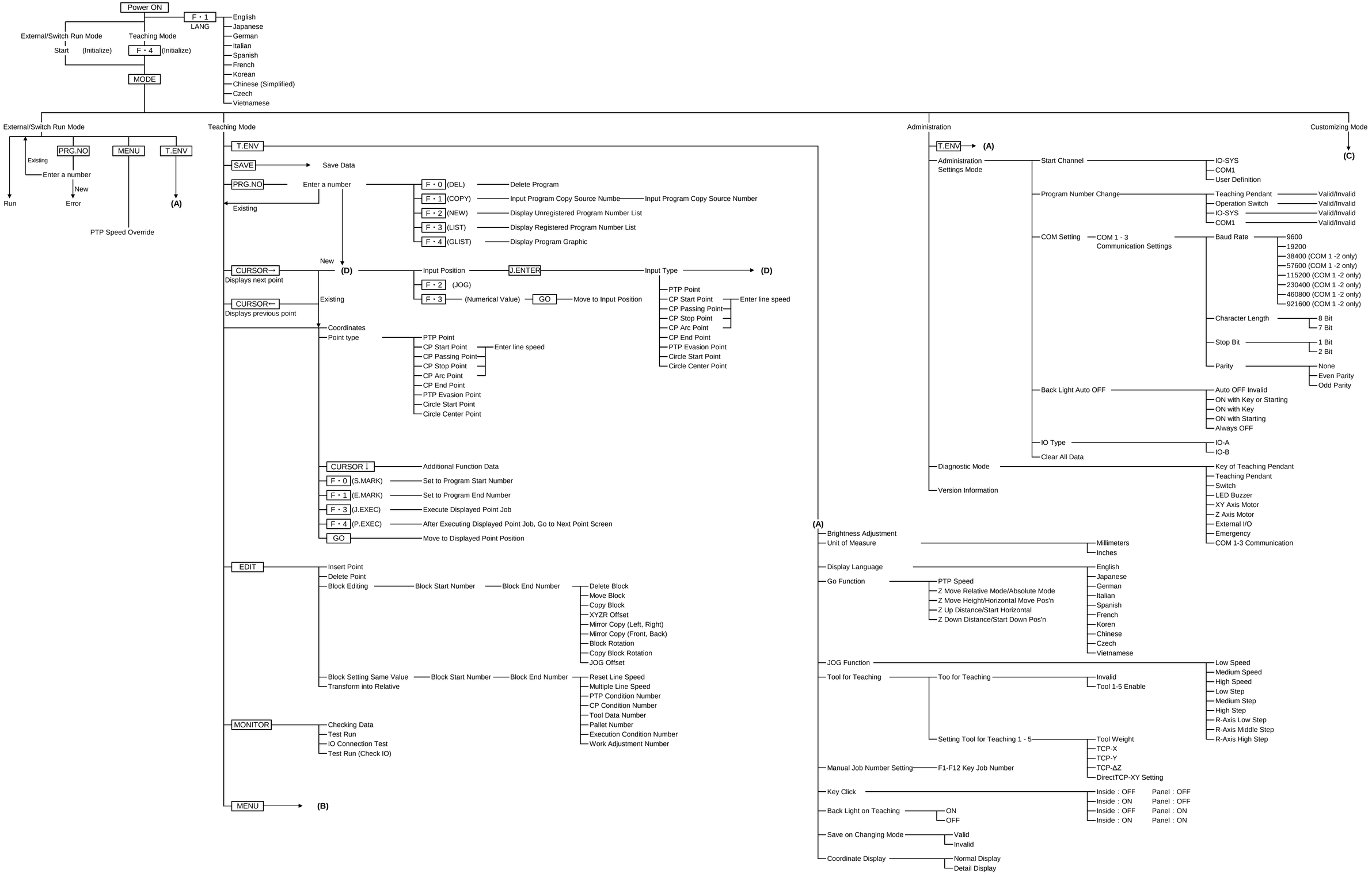
*This asterisk indicates items only displayed for the JR2000N Series



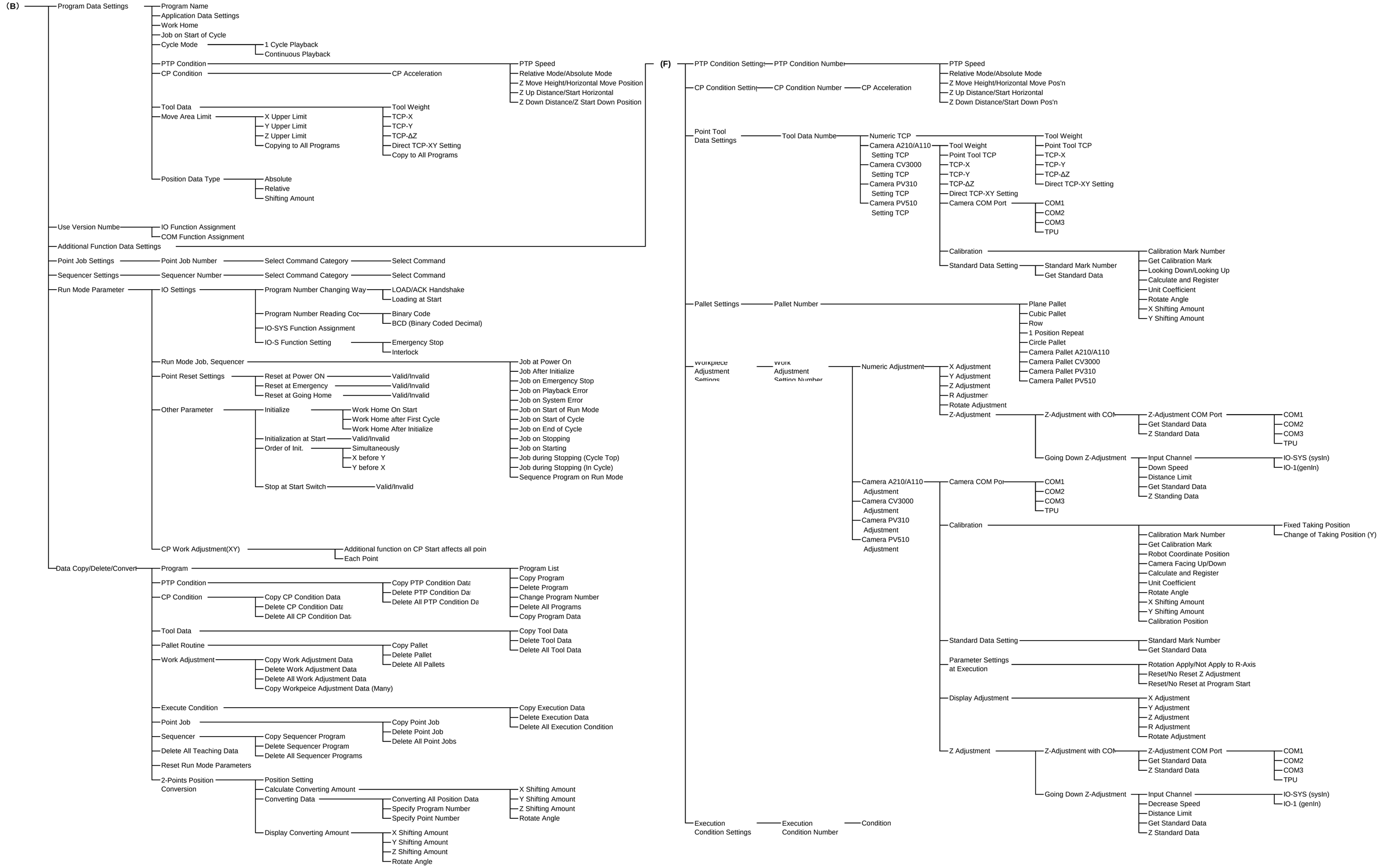




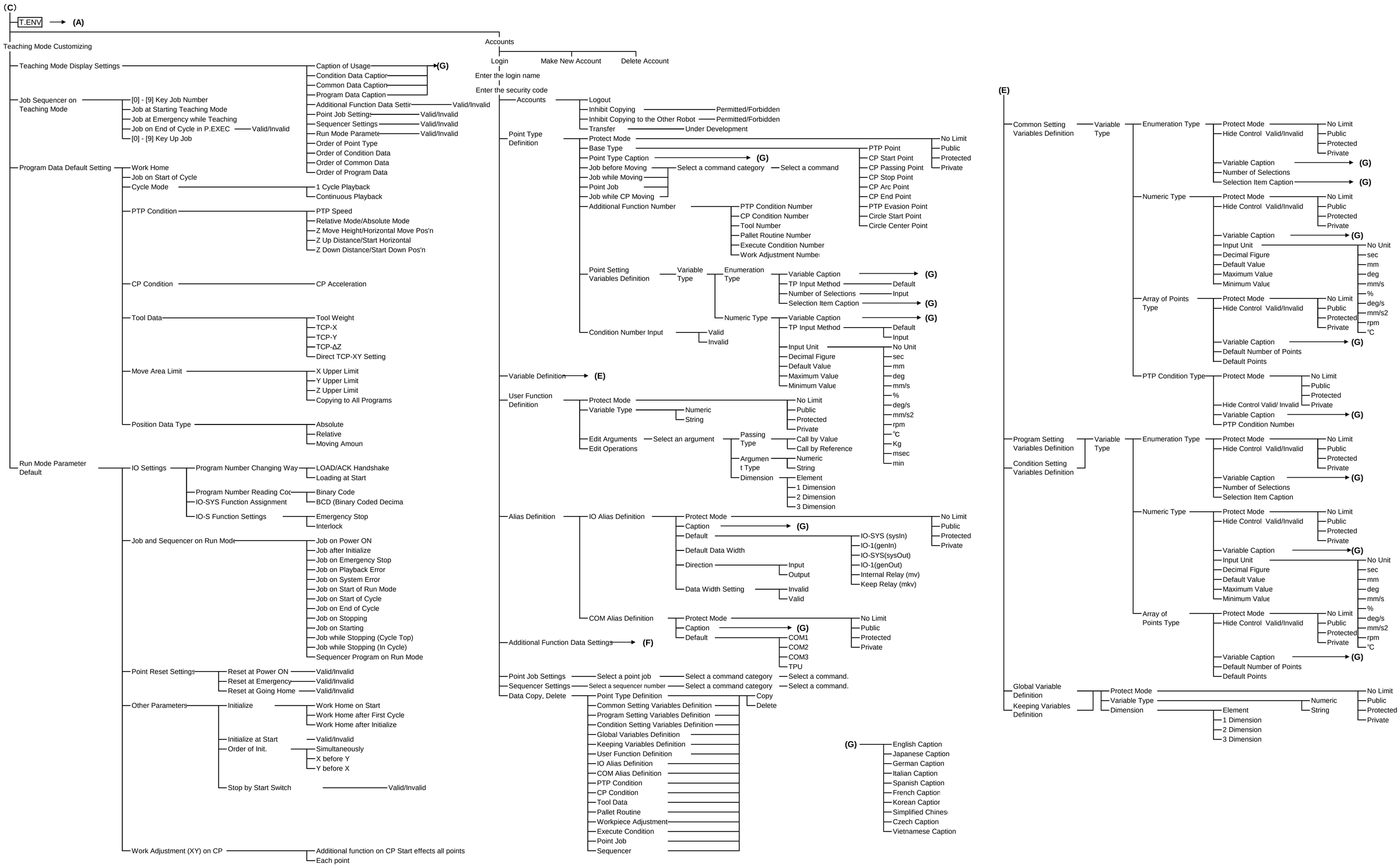
Operation Flowchart (JC) Ver.10.0x 1/3



Operation Flowchart (JC) Ver.10.0x 2/3



Operation Flowchart (JC) Ver.10.0x 3/3



Janome Sewing Machine Co., Ltd.

Industrial Equipment Sales Division

1463 Hazama-machi, Hachioji-shi, Tokyo, Japan, 193-0941

Tel: +81-42-661-6301

Fax: +81-42-661-6302

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