Smooth movement is achieved by greatly improving motion functions

As a new servo motion engine is incorporated, various operations can be merged. Use of a newly developed algorithm achieves shortening of the positioning time and improvement of the tracking accuracy.

**Expansion of CONT option function**

Different type operations, such as PTP, interpolation operation, and conveyor tracking, etc. are merged to improve the speed.

**Improvement of operation speed**

All operations can be merged as much as possible using the merge PTP. As even operations with different acceleration or deceleration time are merged at maximum level with priority put on the operation time, the movement time is shortened greatly.

**Proper use according to application**

When performing the continuous operation, an optimal operation can be selected according the application, like traditional PATH is used for constant-speed operation, such as sealing and merge PTP is used for operation with priority put on the movement time.

**Conventional method**

Programs are set for each controller. Operation is performed while synchronizing the robots through I/O.

**RCX340**

- Up to four robots or 16 axes can be managed with one master RCX340.
- Simultaneous start and arrival of each robot can be controlled freely.

Connectable using LAN cable. YC-Link/E Controllers without program settings

**Up to four robots or 16 axes can be managed with one master RCX340.**

**Simultaneous start and arrival of each robot can be controlled freely.**

**PATH**

Interpolation operation to the final target position is performed at a specified speed.

**Merge PTP operation**

- The PTP1/PTP2 operation pattern is calculated as the merge is preconditioned.
- Maximum merge can be made regardless of operation types to be merged. So, the merge effect is large.

**Note. It is necessary to upgrade the firmware to its latest version.**
## Arch motion can be specified more intuitively

As the arch motion route designation method is changed and the designation method is simplified, the arch motion can be specified more intuitively.

**Conventional method**
- All axes need to specify parameters.
- Route is difficult to adjust.

**RCX340**
- Only the arch axis needs to specify parameters.
- Route adjustment is easy.

### Specify using parameters
- 1st operation (Z)
- 2nd operation (X&Y)
- 3rd operation (Z)

### Obstruction
- 1st operation (Z)
- 2nd operation (X&Y)
- 3rd operation (Z)

---

## Free axis configuration is applicable to a wide variety of applications

**Example: Interpolation operation in dual-lane**

Use of multi-coordinate axis setting and CP command applicable to the axis designation makes it possible to perform the interpolation operation in the dual-lane. The cycle time of the robot with multiple axes having the same coordinate attribute can be shortened.

**Conventional method**
- Sealing by specifying A1/A2/A3
- Operation is impossible during A3 sealing. A3/A4 is swapped after completion of sealing.

**RCX340**
- A4 sealing starts immediately after completion of movement to the A1/A2 sealing position.
- A4 moves to the sealing position in task 2.
- A3 moves to the workpiece setting position in task 2.

- Only the target axis is specified for the sealing.
- Other axes can be execute another operation in parallel in other task.

---

## Improvement of tracking accuracy

Use of visualization with servo analyze function and high responsiveness with new servo function makes it possible to increase the follow-up ability and improve the tracking accuracy when compared to the conventional models.

**RCX240**
- 15 mm/sec.
- 500 mm/sec.

**RCX340**
- 15 mm/sec.
- 500 mm/sec.

Tracking deviation is reduced greatly.
** POINT 2 **

**Improved basic performance**

Functions, such as robot language, multi-task, sequence function, communication, and field bus are improved and made easier to use.

**Motion optimization**

The optimization of the motion to meet the operation pattern is further strengthened to bring out the robot performance at its maximum level. Higher quality robot operations, such as shortening of the operation time and suppression of vibrations during stopping are achieved.

- **Optimal acceleration/deceleration motion**
  
  Acceleration/deceleration motion is generated that can perform the high-speed operation while suppressing vibrations.

**Compact design**

The outside dimensions are approximately 355 mm (W) × 195 mm (H) × 130 mm (D). The volume ratio is reduced to approximately 85% and the body size is made compact when compared to the conventional 4-axis controllers so as to make the installation inside the control panel easy.

**Data table is added.**

**Optimal acceleration/deceleration motion**

**Improvement of cycle time**

The speed-up of the YK-XG series is achieved.

**Example: YK400XG**

- Standard cycle time operation
  
  0.49 sec → 0.45 sec

**User memory capacity increase**

- Number of points is greatly increased.
  
  RCX240
  
  10,000 points
  
  RCX340
  
  30,000 points

- Total capacity of program and point
  
  RCX240
  
  364 KB
  
  RCX340
  
  2.1 MB

**Built-in regenerative unit**

As the regenerative unit (equivalent to RGU3) is built-in, no additional regenerative unit is needed when connecting to the existing robot.

**Support tool with visibility and operability improved New support software RCX-Studio**

The program debug function is strengthened to support the multi-task. Use of convenient operability and program input support function makes it possible to perform the quick setup.

- Program debugging function enhancement and applicable to multi tasks
  
  Various monitor panel layout changes or floating displays are possible.

- Program input support function
  
  Candidates after commanding and how to use are displayed.

**New programing box PBX**

This programming box is applicable to three languages, "Japanese", "English", and "Chinese". Use of a color display makes it possible to improve the visibility.

Work to add or edit functions becomes easy, allowing even personnel without programming skill to operate this programming box.

A function to save the controller data into the USB memory is incorporated.
POINTER 3

Enhanced expandability

RS-232C and Ethernet ports are provided as standard equipment. A wide variety of high-speed and large capacity field networks, such as CC-Link, DeviceNet™, and EtherNet/IP™ are supported as options. Connections with general-purpose servo amplifier or other company’s VISION are easy. So, the RCX340 is called "connectable controller".

<table>
<thead>
<tr>
<th>Communication between controllers</th>
<th>Up to four RCX340 controllers (up to 16 controllable axes) can be connected.</th>
</tr>
</thead>
<tbody>
<tr>
<td>YC-Link/E</td>
<td>More flexible robot configuration</td>
</tr>
<tr>
<td></td>
<td>Easy programming</td>
</tr>
</tbody>
</table>

Applicable to various field buses/centralized control of robots through connections of up to four controllers

RS-232C and Ethernet ports are provided as standard equipment. Additionally, fulfilling field buses, such as CC-Link, EtherNet/IP™, DeviceNet™, PROFIBUS, and PROFINET can be supported to connect and control a wide variety of devices. For 5 or more axes, use of YC-Link/E makes it possible to connect up to four RCX340 controllers so as to perform the centralized control of multiple robots. Additionally, when using YC-Link/E Note 1, multiple robots can be handled as if they are operated using one controller. This ensures very easy robot programming and management.

Therefore, this robot controller contributes to reduction of unseen costs, such as labor cost necessary for the setup work.

Note 1. When ordering YC-Link/E, please specify what robot is connected to what number controller.

More flexible robot configuration is also possible by connecting other company’s servo amplifier

The RX340 can be operated as robot axis by connecting a servo amplifier to it. The RCX340 controller can set the coordinate attribute freely to support various robot configurations.

Note 1. For detail about applicable models, please consult YAMAHA.
Next generation controller, all functions of which were reviewed to further improve the functions of conventional controllers. This controller provides the features to achieve the high functionalities that can construct the equipment at high level.

**Features**

1. **Simultaneous operations of multiple robots can be performed.**
   Simultaneous operations of multiple robots can be performed by strengthening the high-speed communication and collision prevention function.

2. **Multiple robots can also be managed only with one master controller.**
   Control of up to four robots and 16 axes can be managed with one master RCX340 controller. Simultaneous start and arrive of each robot can be made freely.

3. **Motion function is improved greatly to ensure smooth movement.**
   New servo and motion engine is incorporated to merge various operations. As a result, it is achieved to shorten the positioning time and improve the tracking accuracy.

4. **More intuitive arch motion designation is possible.**
   Conventionally, all axes parameters needed to be specified. The RCX340 needs to specify only the arch axis. More intuitive designation becomes possible.

5. **Tracking accuracy is improved.**
   Use of a new servo function makes it possible to ensure the high response and improve the follow-up ability. The tracking accuracy is improved when compared to the conventional model.

6. **Motion is optimized.**
   To draw out the robot performance at its maximum level, the optimization of the motion corresponding to the operation pattern is further strengthened.

7. **Connection function is improved.**
   RC-232C and Ethernet ports are provided as standard functions. The controller is applicable to substantial field networks, such as CC-Link, EtherNet/IP™, and DeviceNet™.

**Ordering method**

- **RCX340**
  - Controller
  - Controller option A (OP.A)
  - Controller option B (OP.B)
  - Controller option C (OP.C)
  - Controller option D (OP.D)
  - Controller option E (OP.E)
- **Controller option board position**
  - OP.A
  - OP.B
  - OP.D
  - OP.E
  - Controller board (controller board)

**Note:**
- [STD.DIO] Parallel I/O board standard specifications
- [EXP.DIO] Parallel I/O board expansion specifications
- General-purpose input 24 points, general-purpose output 16 points
- Do not mix with field bus (CC/DN/PB/PN).
- Select only one master or slave board for YC-Link/E.
- Only one tracking board can be selected.
- Be careful not to mix field networks (CC/DN/EPP/PB/PN).
- Tracking + +VY: For available timing, please consult YAMAHA.
### Basic specifications

<table>
<thead>
<tr>
<th>Item</th>
<th>RCX340</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Applicable robots</strong></td>
<td>YAMAHA single-axis robots, linear single-axis robots, Cartesian robots, SCARA robots (except for YK120X and YK150X), &amp; P&amp;P robots</td>
</tr>
<tr>
<td><strong>Connected motor capacity</strong></td>
<td>1600W or less (in total for 4 axes)</td>
</tr>
<tr>
<td><strong>Power capacity</strong></td>
<td>2500VA</td>
</tr>
<tr>
<td><strong>Dimensions</strong></td>
<td>W355 × H195 × D130mm (main unit only)</td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td>5.2kg (main unit only)</td>
</tr>
<tr>
<td><strong>Power supply voltage</strong></td>
<td>Single-phase 200 to 230V AC +/-10% maximum, 50/60Hz</td>
</tr>
<tr>
<td><strong>No. of controllable axes</strong></td>
<td>Max. 4 axes (simultaneous control: 6 axes) Expandable to up to 16 axes (4 robots) using YC-Link/E.</td>
</tr>
<tr>
<td><strong>Drive method</strong></td>
<td>AC full digital servo</td>
</tr>
<tr>
<td><strong>Position detection method</strong></td>
<td>Resolver or magnetic linear scale</td>
</tr>
<tr>
<td><strong>Control method</strong></td>
<td>PTP motion (point to point), ARCH motion, linear interpolation, circular interpolation</td>
</tr>
<tr>
<td><strong>Coordinate systems</strong></td>
<td>Joint coordinates, Cartesian coordinates</td>
</tr>
<tr>
<td><strong>Position display units</strong></td>
<td>Pules, mm (1/1000 steps), degree (1/1000 steps)</td>
</tr>
<tr>
<td><strong>Speed setting</strong></td>
<td>1 to 100% (1% steps, This setting can be made even by programming.)</td>
</tr>
<tr>
<td><strong>Acceleration/deceleration setting</strong></td>
<td>Automatic acceleration setting by robot model and tip weight parameter Setting by acceleration coefficient and deceleration rate parameters (1% steps) Zone control (Only the SCARA robot can set an optimum speed corresponding to the arm position.)</td>
</tr>
<tr>
<td><strong>Program language</strong></td>
<td>YAMAHA BASIC II conforming to JIS B8439 (SLIM language)</td>
</tr>
<tr>
<td><strong>Multi-task</strong></td>
<td>Max. 16 tasks</td>
</tr>
<tr>
<td><strong>Sequence program</strong></td>
<td>1 program</td>
</tr>
<tr>
<td><strong>Memory capacity</strong></td>
<td>2.1MB (Total of program and point data) (Available capacity for program when the maximum number of points is used: 300KB)</td>
</tr>
<tr>
<td><strong>Program</strong></td>
<td>100 programs (maximum number of programs) 9999 lines (maximum number of lines per program)</td>
</tr>
<tr>
<td><strong>Point</strong></td>
<td>30000 points (maximum number of points)</td>
</tr>
<tr>
<td><strong>Point teaching method</strong></td>
<td>MDI (coordinate data input), direct teaching, teaching playback, offline teaching (data input from external unit)</td>
</tr>
<tr>
<td><strong>System backup</strong> (Internal memory backup)</td>
<td>Lithium battery (service life about 4 years at 0 to 40°C)</td>
</tr>
<tr>
<td><strong>External I/O</strong></td>
<td>Emergency stop ready input, 2 systems Auto mode input, 2 systems (Enabled only when the global specifications are used.)</td>
</tr>
<tr>
<td></td>
<td>Emergency stop contact output, 2 systems Enable contact output, 2 systems (Enabled only when the PBX-E is used.) Motor power ready output, 2 systems</td>
</tr>
<tr>
<td><strong>External communications</strong></td>
<td>RS-232C: 1CH (D-SUB 9-pin (female)) Ethernet: 1CH (In conformity with IEEE802.3u/IEEE802.3) 100Mbps/10Mbps (100BASE-TX/10BASE-T) Applicable to Auto Negotiation USB: 1CH (B type) RS-422: 1CH (Dedicated to PBX)</td>
</tr>
<tr>
<td><strong>Operating temperature</strong></td>
<td>0 to 40°C</td>
</tr>
<tr>
<td><strong>Storage temperature</strong></td>
<td>-10 to 65°C</td>
</tr>
<tr>
<td><strong>Operating humidity</strong></td>
<td>35 to 85% RH (no condensation)</td>
</tr>
<tr>
<td><strong>Noise immunity</strong></td>
<td>Conforms to IEC61000-4-4 Level 3</td>
</tr>
<tr>
<td><strong>Protective structure</strong></td>
<td>IP20</td>
</tr>
</tbody>
</table>

### Options

<table>
<thead>
<tr>
<th>Option</th>
<th>Parallel I/O board</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Parallel I/O board</strong></td>
<td>Standard specifications NPN/PNP specifications are selected. Expansion specifications NPN/PNP specifications are selected. (Max. 4 slots)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Option</th>
<th>Serial I/O</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Serial I/O</strong></td>
<td>CC-Link Remote device station, 4 stations are occupied. Ver.1.1/2.0</td>
</tr>
<tr>
<td></td>
<td>DeviceNet™ Slave</td>
</tr>
<tr>
<td></td>
<td>EtherNet/IP™ Adapter, 2 ports</td>
</tr>
<tr>
<td></td>
<td>PROFIBUS DP-V1 slave</td>
</tr>
<tr>
<td></td>
<td>PROFINET I/O device, 2 ports, Conformance class B, Ver. 2.2</td>
</tr>
</tbody>
</table>

### Programming box

| Programming box | PBX, PBX-E Cable length 5 m / 12m Available languages: Japanese / English / Chinese |

### Support software for personal computer

| Support software for personal computer | RCX-Studio |

### Absolute battery

| Absolute battery | 3.6V 2750mAH / axis Backup retention time: About 1 year |