Program Controller for RoboCylinder RCP5/RCP4/RCP3/RCP2

MSEL-PG

Powerful & Multifunctional

www.robocylinder.de
Introducing the RoboCylinder 4-axis Program Controller
MSEL with High-output Driver (PowerCon)

1 Control Maximum of 4 Axes Available with Pulse Motor Mounted RoboCylinder

Actuators with pulse motor in the past were able to control only up to two axes at maximum with one program controller. By using MSEL, four axes will be available for control. It is also available for interpolation operation, which enhances the ways of use.

Example of Combinations

<table>
<thead>
<tr>
<th>3-axis Cartesian (Pulse Motor)</th>
<th>RCP5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Available to Connect 4 Axes at Maximum</td>
<td></td>
</tr>
</tbody>
</table>

2 Available to Connect RoboCylinders RCP5 and RCP4

By applying to PowerCon, it is now possible to perform interpolation operation with RoboCylinders RCP5 and RCP4, which are applicable for high-output driver, but were not feasible with the program controller PSEL in the past.

3 Greatly Enhanced Programming Feature

The feature has been greatly upgraded with four times as many programs and twenty times as many positions compared to our products (PSEL) in the past.

<table>
<thead>
<tr>
<th></th>
<th>Conventional product</th>
<th>PSEL</th>
<th>New product</th>
<th>MSEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of programs</td>
<td>64</td>
<td>4 times</td>
<td>255</td>
<td></td>
</tr>
<tr>
<td>Number of program steps</td>
<td>2000</td>
<td>5 times</td>
<td>9999</td>
<td></td>
</tr>
<tr>
<td>Number of multi-tasking programs</td>
<td>8</td>
<td>2 times</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>Number of positions</td>
<td>1500</td>
<td>20 times</td>
<td>30000</td>
<td></td>
</tr>
</tbody>
</table>

(*1) Note that the number of points available for backup in system memory is 10000 points.
4 Equipped with Expansion I/O Slot

In addition to the standard I/O (IN 16 points / OUT 16 points), one slot is available as the expansion I/O slot. The expansion I/O is available to select from PIO (IN 16 points / OUT 16 points) and four types of field network.

<table>
<thead>
<tr>
<th>Max. I/O Input and Output Points</th>
<th>Conventional product PSEL</th>
<th>New product MSEL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>24/8</td>
<td>32/32</td>
</tr>
<tr>
<td></td>
<td>Not applicable for expansion</td>
<td>When expansion slot used</td>
</tr>
<tr>
<td>Field Network</td>
<td>3 types</td>
<td>4 types</td>
</tr>
<tr>
<td></td>
<td>(CC-Link, DeviceNet, PROFIBUS-DP)</td>
<td>(CC-Link, DeviceNet, PROFIBUS-DP, EtherNet/IP)</td>
</tr>
<tr>
<td>Other External Connections</td>
<td>RS232C: 1ch</td>
<td>RS232C: 1ch</td>
</tr>
</tbody>
</table>

5 Cable and Cost Reduction

In 4-Axis Controlling of Actuator

- Cable Reduction: Applicable for AC100~230V with built-in power source
- Cost Reduction: Approx. 36% reduced

6 Global Version according to CE Safety Standard

MSEL-PG is applicable for Safety Categories B to 3.
(To apply with Safety Category, it is necessary that the user establish a safety circuit out of the controller.)

7 Applicable for Various Models

It is now compatible with pulse motor type RoboCylinders RCP5 / RCP4 / RCP3 / RCP2.
It is a program controller available for operation of RCP5 / RCP4 / RCP3 / RCP2 series actuator. It is applicable to various types of controls with one unit.

**Model List**

<table>
<thead>
<tr>
<th>Type name</th>
<th>PG</th>
</tr>
</thead>
</table>

**Safety Category type**

<table>
<thead>
<tr>
<th>Maximun number of controlled axes</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of positions</td>
<td>30000</td>
</tr>
<tr>
<td>Power supply</td>
<td>Single-phase AC100~230V</td>
</tr>
<tr>
<td>Safety category (*1)</td>
<td>Can be made compliant with categories B to 3</td>
</tr>
</tbody>
</table>

*1: Meeting this Safety Category requires the customer to install a safety circuit externally to the controller.

**Model**

MSEL Controller

<table>
<thead>
<tr>
<th>Series</th>
<th>Type</th>
<th>Number of connected axes</th>
<th>Motor type</th>
<th>Encoder type</th>
<th>Option</th>
<th>Motor type</th>
<th>Encoder type</th>
<th>Option</th>
<th>Standard I/O type</th>
<th>Expansion I/O type</th>
<th>Type of I/O cable</th>
<th>Power-supply voltage</th>
<th>Simple absolute unit</th>
<th>Actuator mounting specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>PS</td>
<td>Global type</td>
<td>1-axis specification</td>
<td>2-axis specification</td>
<td>3-axis specification</td>
<td>4-axis specification</td>
<td>PS 20P</td>
<td>20 pulse motor (high-thrust specification)</td>
<td>encoder type</td>
<td>Option</td>
<td>NPN specification</td>
<td>NPN specification</td>
<td>AC100~230V</td>
<td>NPN specification</td>
<td>Screw mounting specification</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1-axis specification</td>
<td>2-axis specification</td>
<td>3-axis specification</td>
<td>4-axis specification</td>
<td>PS 20SP</td>
<td>20 pulse motor (high-thrust specification)</td>
<td>encoder type</td>
<td>Option</td>
<td>NPN specification</td>
<td>NPN specification</td>
<td>AC100~230V</td>
<td>NPN specification</td>
<td>Screw mounting specification</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1-axis specification</td>
<td>2-axis specification</td>
<td>3-axis specification</td>
<td>4-axis specification</td>
<td>PS 28P</td>
<td>28 pulse motor (high-thrust specification)</td>
<td>encoder type</td>
<td>Option</td>
<td>NPN specification</td>
<td>NPN specification</td>
<td>AC100~230V</td>
<td>NPN specification</td>
<td>Screw mounting specification</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1-axis specification</td>
<td>2-axis specification</td>
<td>3-axis specification</td>
<td>4-axis specification</td>
<td>PS 35P</td>
<td>35 pulse motor (high-thrust specification)</td>
<td>encoder type</td>
<td>Option</td>
<td>NPN specification</td>
<td>NPN specification</td>
<td>AC100~230V</td>
<td>NPN specification</td>
<td>Screw mounting specification</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1-axis specification</td>
<td>2-axis specification</td>
<td>3-axis specification</td>
<td>4-axis specification</td>
<td>PS 42P</td>
<td>42 pulse motor (high-thrust specification)</td>
<td>encoder type</td>
<td>Option</td>
<td>NPN specification</td>
<td>NPN specification</td>
<td>AC100~230V</td>
<td>NPN specification</td>
<td>Screw mounting specification</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1-axis specification</td>
<td>2-axis specification</td>
<td>3-axis specification</td>
<td>4-axis specification</td>
<td>PS 6SP</td>
<td>6 pulse motor (high-thrust specification)</td>
<td>encoder type</td>
<td>Option</td>
<td>NPN specification</td>
<td>NPN specification</td>
<td>AC100~230V</td>
<td>NPN specification</td>
<td>Screw mounting specification</td>
</tr>
</tbody>
</table>

* PNP specification is coming soon.

**Make sure to select ABB / ABBN when selected Simple Absolute Type "SA".

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* Battery-less absolute and incremental cannot be used together with simple absolute. When using simple absolute, all the axes need to be used in simple absolute.

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* Make sure to select ABB / ABBN when selected Simple Absolute Type "SA".

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* If CC2 or DV2 is selected, a 2-way connector is supplied for branch wiring.
System Configuration

- MSEL Controller
- Emergency stop switch
- Enable switch
- PLC
- Expansion PIOs/various field networks
- PIO Flat Cable (Refer to P.10)
  - Model number: CB-PAC-PIO020
  - Standard: 2m
  - Absolute data backup battery box will be enclosed when selected Simple Absolute Type in the controller type.

<Connectable Actuators>

- Integrated Motor-Encoder Cable (Refer to P.9)
  - Model number: CB-PSEP-MA
  - Standard: 1m / 3m / 5m
  - Supplied with the actuator

- Actuator RCP2 series
- Integrated Motor-Encoder Cable (Refer to P.10)
  - Model number: CB-RPSEP-MA
  - Standard: 1m / 3m / 5m
  - Supplied with the actuator

- Actuator RCP2 small rotary
- Integrated Motor-Encoder Cable (Refer to P.9)
  - Model number: CB-APSEP-MA
  - Standard: 1m / 3m / 5m
  - Supplied with the actuator

- Actuator RCP3 series
- Integrated Motor-Encoder Cable (Refer to P.9)
  - Model number: CB-CA-MA
  - Standard: 1m / 3m / 5m
  - Supplied with the actuator

- Actuator RCP4 series
- Integrated Motor-Encoder Cable (Refer to P.9)
  - Model number: CB-CAN-MA
  - Standard: 1m / 3m / 5m
  - Supplied with the actuator

- Actuator RCP5 series

*(*) TB-01-SJ coming soon with CE conformity. For a safety category compliant system with deadman switch type TB-01-D(R) see TB-01 brochure.

**Standard accessory/option**
- Dummy Plug (Refer to P.8)
- Model number: DP-4S
- (Supplied with the MSEL-PG)

- Connector Conversion Cable (Refer to P.8)
  - Model number: CB-SEL-SJS002
  - (Supplied with the TB-01-SJ/IA-101-X-MW-JS)

- Absolute Data Backup Battery Box (Refer to P.8)
  - Model number: MSEL-ABB
  - Replacement Battery (Refer to P.8)
  - Model number: AB-7

*(**) For a safety category compliant system with safety circuit emergency stop connector type IA-101-XA-MW-JS contact IAI.

- AC100~230V
- Protective grounding

* Wire the emergency stop switch, enable switch, electromagnetic contactor, etc., as necessary. It is also possible to operate with a factory setting (short-circuit bridge).

**Standard accessory**
- Teaching Pendant (Refer to P.8)
  - Model number: TB-01-SJ (*)
  - The MSEL-PG is supported only by Ver. 1.10 or later.

- PC Compatible Software (Refer to P.8)
  - Model number: IA-101-X-MW-JS (**)
  - (RS232C cable + Connector conversion cable)
  - Model number: IA-101-X-USBS

* The MSEL-PG is supported only by Ver. 12.00.01.00 or later.

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# Basic Controller Specifications

<table>
<thead>
<tr>
<th>Specification item</th>
<th>Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power-supply input voltage</td>
<td>Single-phase AC100~230V ±10%</td>
</tr>
<tr>
<td>Power-supply current</td>
<td>2.9A typ. (AC100V), 1.4A typ. (AC200V), 1.2A typ. (AC230V)</td>
</tr>
<tr>
<td>Power-supply frequency range</td>
<td>50/60Hz ±5%</td>
</tr>
<tr>
<td>Motor type</td>
<td>Pulse motor (servo control)</td>
</tr>
<tr>
<td>Supported encoder</td>
<td>Incremental encoder / Battery-less absolute encoder</td>
</tr>
<tr>
<td>Data storage device</td>
<td>FlashROM/FRAM</td>
</tr>
<tr>
<td>Number of program steps</td>
<td>9999</td>
</tr>
<tr>
<td>Number of positions</td>
<td>30000</td>
</tr>
<tr>
<td>Number of programs</td>
<td>255</td>
</tr>
<tr>
<td>Number of multitasks</td>
<td>16</td>
</tr>
<tr>
<td>Operation mode</td>
<td>Serial communications</td>
</tr>
<tr>
<td></td>
<td>Program</td>
</tr>
<tr>
<td>SIO interface</td>
<td>Communication method</td>
</tr>
<tr>
<td></td>
<td>RS232 (asynchronous communications)</td>
</tr>
<tr>
<td>Baud rate</td>
<td>9.6, 19.2, 38.4, 57.6, 76.8, 115.2kbps</td>
</tr>
<tr>
<td>Live wire connection</td>
<td>TP port—</td>
</tr>
<tr>
<td></td>
<td>USB</td>
</tr>
<tr>
<td>Standard PIO interface</td>
<td>Number of input points</td>
</tr>
<tr>
<td></td>
<td>16 points</td>
</tr>
<tr>
<td></td>
<td>Input voltage</td>
</tr>
<tr>
<td></td>
<td>DC24V ±10%</td>
</tr>
<tr>
<td></td>
<td>Input current</td>
</tr>
<tr>
<td></td>
<td>7mA/circuit</td>
</tr>
<tr>
<td></td>
<td>ON voltage</td>
</tr>
<tr>
<td></td>
<td>Min. DC16V</td>
</tr>
<tr>
<td></td>
<td>OFF voltage</td>
</tr>
<tr>
<td></td>
<td>Max. DC5V</td>
</tr>
<tr>
<td></td>
<td>Leak current</td>
</tr>
<tr>
<td></td>
<td>Allowable leak current: 1mA max.</td>
</tr>
<tr>
<td></td>
<td>Insulation method</td>
</tr>
<tr>
<td></td>
<td>Photocoupler insulation</td>
</tr>
<tr>
<td></td>
<td>Number of output points</td>
</tr>
<tr>
<td></td>
<td>16 points</td>
</tr>
<tr>
<td></td>
<td>Load voltage</td>
</tr>
<tr>
<td></td>
<td>DC24V ±10%</td>
</tr>
<tr>
<td></td>
<td>Maximum current</td>
</tr>
<tr>
<td></td>
<td>100mA/point, 400mA/8 points (Note 1)</td>
</tr>
<tr>
<td></td>
<td>Saturated voltage</td>
</tr>
<tr>
<td></td>
<td>Max. 3V</td>
</tr>
<tr>
<td></td>
<td>Leak current</td>
</tr>
<tr>
<td></td>
<td>Max. 0.1mA</td>
</tr>
<tr>
<td></td>
<td>Insulation method</td>
</tr>
<tr>
<td></td>
<td>Photocoupler insulation</td>
</tr>
<tr>
<td>Compliant expansion I/O interface</td>
<td>Expansion PIO NPN specification* (16IN/16OUT) * Coming soon with PNP specification</td>
</tr>
<tr>
<td>Calendar/clock function</td>
<td>Retention time</td>
</tr>
<tr>
<td></td>
<td>Approx. 10 days</td>
</tr>
<tr>
<td></td>
<td>Charge time</td>
</tr>
<tr>
<td></td>
<td>Approx. 100 hours (fully charged)</td>
</tr>
<tr>
<td></td>
<td>* Data can be retained even when the batteries are not fully charged.</td>
</tr>
<tr>
<td>Protective functions</td>
<td>Overcurrent, abnormal temperature, fan speed low monitoring, encoder disconnection, etc.</td>
</tr>
<tr>
<td>Operating temperature range</td>
<td>0~40°C</td>
</tr>
<tr>
<td>Operating humidity range</td>
<td>85% RH max. (non-condensing, non-freezing)</td>
</tr>
<tr>
<td>Installation</td>
<td>Installation direction</td>
</tr>
<tr>
<td></td>
<td>Installed vertically (exhaust side up)</td>
</tr>
<tr>
<td></td>
<td>Installation method</td>
</tr>
<tr>
<td></td>
<td>Mounted with screws or using a DIN rail</td>
</tr>
<tr>
<td>Rush current</td>
<td>15A typ. (AC100V ), 30A typ. (AC200V); 5ms max. (Ambient temperature 25°C/ No cycling of the power)</td>
</tr>
<tr>
<td>Air cooling method</td>
<td>Forced air cooling</td>
</tr>
<tr>
<td>External dimensions</td>
<td>Width 130mm x Height 195mm x Depth 125mm</td>
</tr>
<tr>
<td>Mass</td>
<td>Approx. 1400g</td>
</tr>
</tbody>
</table>

Note 1: The total load current shall be 400mA for every eight points from standard I/O No. 316. (The maximum current per point shall be 100mA.)
### PIO Signal Chart

#### Pin Layouts for Standard PIO Connector/Expansion PIO Connector

<table>
<thead>
<tr>
<th>Pin No.</th>
<th>Category</th>
<th>Assignment</th>
<th>Pin No.</th>
<th>Category</th>
<th>Assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1A</td>
<td>24V</td>
<td>P24</td>
<td>18</td>
<td></td>
<td>OUT0</td>
</tr>
<tr>
<td>2A</td>
<td>24V</td>
<td>P24</td>
<td>2B</td>
<td></td>
<td>OUT1</td>
</tr>
<tr>
<td>3A</td>
<td>—</td>
<td>—</td>
<td>3B</td>
<td></td>
<td>OUT2</td>
</tr>
<tr>
<td>4A</td>
<td>—</td>
<td>—</td>
<td>4B</td>
<td></td>
<td>OUT3</td>
</tr>
<tr>
<td>5A</td>
<td>—</td>
<td>IN0</td>
<td>5B</td>
<td></td>
<td>OUT4</td>
</tr>
<tr>
<td>6A</td>
<td></td>
<td>IN1</td>
<td>6B</td>
<td></td>
<td>OUT5</td>
</tr>
<tr>
<td>7A</td>
<td></td>
<td>IN2</td>
<td>7B</td>
<td></td>
<td>OUT6</td>
</tr>
<tr>
<td>8A</td>
<td></td>
<td>IN3</td>
<td>8B</td>
<td></td>
<td>OUT7</td>
</tr>
<tr>
<td>9A</td>
<td></td>
<td>IN4</td>
<td>9B</td>
<td></td>
<td>OUT8</td>
</tr>
<tr>
<td>10A</td>
<td></td>
<td>IN5</td>
<td>10B</td>
<td></td>
<td>OUT9</td>
</tr>
<tr>
<td>11A</td>
<td></td>
<td>IN6</td>
<td>11B</td>
<td></td>
<td>OUT10</td>
</tr>
<tr>
<td>12A</td>
<td></td>
<td>IN7</td>
<td>12B</td>
<td></td>
<td>OUT11</td>
</tr>
<tr>
<td>13A</td>
<td></td>
<td>IN8</td>
<td>13B</td>
<td></td>
<td>OUT12</td>
</tr>
<tr>
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<td></td>
<td>IN9</td>
<td>14B</td>
<td></td>
<td>OUT13</td>
</tr>
<tr>
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<td></td>
<td>IN10</td>
<td>15B</td>
<td></td>
<td>OUT14</td>
</tr>
<tr>
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<td></td>
<td>IN11</td>
<td>16B</td>
<td></td>
<td>OUT15</td>
</tr>
<tr>
<td>17A</td>
<td></td>
<td>IN12</td>
<td>17B</td>
<td></td>
<td>—</td>
</tr>
<tr>
<td>18A</td>
<td></td>
<td>IN13</td>
<td>18B</td>
<td></td>
<td>—</td>
</tr>
<tr>
<td>19A</td>
<td></td>
<td>IN14</td>
<td>19B</td>
<td>0V</td>
<td>N</td>
</tr>
<tr>
<td>20A</td>
<td></td>
<td>IN15</td>
<td>20B</td>
<td>0V</td>
<td>N</td>
</tr>
</tbody>
</table>

#### Internal Circuits for Standard I/Os (NPN Specifications)

**Input section**
- External input specifications (NPN specifications)
  - Input voltage: DC24V ±10%
  - Input current: 7mA/circuit
  - On/Off voltage:
    - On voltage: Min. DC16.0V, Off voltage: Max. DC5.0V
  - Insulation method: Photocoupler insulation

**Output section**
- External output specifications (NPN specifications)
  - Load voltage: DC24V ±10%
  - Maximum load current: 100mA/point, 400mA/8 points (Note)
  - Leakage current: Max. 0.1mA/point
  - Insulation method: Photocoupler insulation

*The port numbers in the circuit diagram below represent the factory-set port numbers.
*When the input is off, the allowable leak current is 1mA max.

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#### Internal Circuits for Expansion I/Os (NPN Specifications)

**Input section**
- External input specifications
  - Number of input points: 16 points
  - Input voltage: DC24V ±10%
  - Input current: 4mA/circuit
  - On/Off voltage:
    - On voltage: Min. DC18V (3.5mA)
    - Off voltage: Max. DC6V (1mA)
  - Insulation method: Photocoupler insulation

**Output section**
- External output specifications
  - Number of output points: 16 points
  - Rated load current: DC24V ±10%
  - Maximum current: 50mA/circuit
  - Insulation method: Photocoupler insulation

*The expansion I/Os with PNP specifications are coming soon.
**Name of Each Part**

- Mode switch
- Teaching connector
- USB connector
- System I/O connector
- Standard I/O connector (I/O1)
- Expansion I/O connector (I/O2)
- Motor drive power line connector
- Brake release switch
- Motor/encoder connector
- Power connector
- Absolute data backup battery connector

*1: Do not connect a wrong motor to the MPG1, MPG2, MPG3 or MPG4 connector. It may cause malfunction or failure.

**External Dimensions**

**Controller**

**Screw mounting specification**

**DIN rail mounting specification**

**Absolute Data Backup Battery Box**

* Dimensions are given in millimeters (mm) and are approximate. Actual dimensions may vary.

*1: Do not connect a wrong motor to the MPG1, MPG2, MPG3 or MPG4 connector. It may cause malfunction or failure.
**Teaching Pendant**

**Features**
A teaching device offering program/position input, trial operation and monitoring functions.

**Model number TB-01-SJ** (Note 1)

* This model is the standard specification with connector conversion cable. If you are interested in the deadman switch specification, specify the model number of the applicable teaching pendant (TB-01D-N/TB-01DR-N) and that of the cable (CB-TB1-X050-JS).

**Options**

- **3m USB cable**
- **CB-SEL-USB030**
- **Dummy plug**
- **DP-4S**
- **5m**
- **RS232C cable**
- **CB-ST-E1MW050-EB**
- **Connector conversion cable**
- **CB-SEL-SJS002**

**Configuration**

- The teaching pendant is supported by Ver. 1.10 or later.

**Absolute Data Backup Battery Box**

**Features**
If the absolute position encoder specification is selected with code ABB, the absolute data backup battery box is included with the controller. However, if the battery box is ordered as a separate unit, it does not include the battery but just the box itself. If the battery is needed, please purchase it separately. (Model: AB-7)

**Model number MSEL-ABB** (Batteries not included)

**Exterior dimensions** See P.7

* A cable (Model CB-MSEL-ABB005) that connects the absolute data backup battery box to the MSEL is included with the box.

**Replacement Battery**

**Features**
The replacement battery for the absolute data backup battery box.

**Model number AB-7**

* Same quantity of absolute battery units is required as the number of axes.

**PC Compatible Software (Windows Only)**

**Features**
The startup support software provides program/position input, test operation and monitoring functions, among others. With its enhanced functions required for debugging, this software helps shorten the startup time.

**Model number IA-101-X-MW-JS** (RS232C cable + Connector conversion cable) (Note 2)

**Configuration**

- The MSEL-PG is supported by Ver. 1.10 or later.

**Model number IA-101-X-USBS** (USB cable + Dummy plug)

**Configuration**

- The MSEL-PG is supported by Ver. 12.00.01.00 or later.

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**Note 1**
TB-01-SJ is coming soon with CE conformity. For a safety category compliant system with deadman switch type TB-01-D(R) see TB-01 brochure.

**Note 2**
The RS232C standard cable CB-ST-E1MW050-EB cannot be used when “Building an enable system that uses a system I/O connector and external power supply” or “Building a redundant safety circuit.” (The RS232C safety category cable CB-ST-A1MW050-EB must be used instead.) For more details of a safety category compliant system with a safety circuit emergency stop connector kit IA-101-XA-MW-JS contact IAI.
**Service Parts**

**Model number**
- CB-CAN-MPA
- CB-CAN-MPA-RB

**Integrated Motor-Encoder Cable**
- **Model number**
  - CB-APSEP-MPA-LC
  - CB-APSEP-MPA-LC

**Integrated Motor-Encoder Robot Cable**
- **Model number**
  - CB-PSEP-MPA

**for**
- RCP4-SA3/RCA3/RCP5
  - * Please indicate cable length (L) in [mm], maximum 20m. e.g. 080 = 8m
- RCP4 (Excluding the RCP4-SA3/R3)
  - * Please indicate cable length (L) in [mm], maximum 20m. e.g. 080 = 8m
- RCP3/RCA2 and others
  - * Please indicate cable length (L) in [mm], maximum 20m. e.g. 080 = 8m

**Controller side**

**Actuator side**

Minimum bending radius
- 5m or less length: R = 68mm or more (Dynamic bending condition)
- Longer than 5m: R = 73mm or more (Dynamic bending condition)

* The robot cable is designed for flex resistance. Please use the robot cable if the cable has to be installed through a cable track.

(Note 1) If the cable is 5m or longer, ø9.1 cable diameter applies for a non-robot cable and ø10 for a robot cable.

**Integrated Motor-Encoder Cable for**
- Integrated Motor-Encoder Robot Cable
- **Model number**
  - CB-APSEP-MPA-LC
  - CB-APSEP-MPA-LC

**for**
- RCP2
  - * Only robot cable is available for this model
  - * Please indicate cable length (L) in [mm], maximum 20m. e.g. 080 = 8m

**Connector 1st**

Pin No. | Pin No. | Signal name
---|---|---
1 | 1 | 
2 | 2 | 
3 | 3 | 
4 | 4 | 
5 | 5 | 
6 | 6 | 
7 | 7 | 
8 | 8 | 
9 | 9 | 
10 | 10 | 
11 | 11 | 
12 | 12 | 
13 | 13 | 
14 | 14 | 
15 | 15 | 
16 | 16 | 
17 | 17 | 
18 | 18 | 
19 | 19 | 
20 | 20 | 
21 | 21 | 
22 | 22 | 
23 | 23 | 
24 | 24 | 
25 | 25 | 
26 | 26 | 
27 | 27 | 
28 | 28 | 
29 | 29 | 
30 | 30 | 
31 | 31 | 
32 | 32 | 
33 | 33 | 
34 | 34 | 
35 | 35 | 
36 | 36 | 
37 | 37 | 
38 | 38 | 
39 | 39 | 
40 | 40 | 
41 | 41 | 
42 | 42 | 
43 | 43 | 
44 | 44 | 
45 | 45 | 
46 | 46 | 
47 | 47 | 
48 | 48 | 
49 | 49 | 
50 | 50 | 
51 | 51 | 
52 | 52 | 
53 | 53 | 
54 | 54 | 
55 | 55 | 
56 | 56 | 
57 | 57 | 
58 | 58 | 
59 | 59 | 
60 | 60 | 
61 | 61 | 
62 | 62 | 
63 | 63 | 
64 | 64 | 
65 | 65 | 
66 | 66 | 
67 | 67 | 
68 | 68 | 
69 | 69 | 
70 | 70 | 
71 | 71 | 
72 | 72 | 
73 | 73 | 
74 | 74 | 
75 | 75 | 
76 | 76 | 
77 | 77 | 
78 | 78 | 
79 | 79 | 
80 | 80 | 
81 | 81 | 
82 | 82 | 
83 | 83 | 
84 | 84 | 
85 | 85 | 
86 | 86 | 
87 | 87 | 
88 | 88 | 
89 | 89 | 
90 | 90 | 
91 | 91 | 
92 | 92 | 
93 | 93 | 
94 | 94 | 
95 | 95 | 
96 | 96 | 
97 | 97 | 
98 | 98 | 
99 | 99 | 
100 | 100 |
**MSEL Controller**

### Integrated Motor-Encoder Robot Cable

**Model number** CB-RPSEP-MPA

- Integrated Motor-Encoder Robot Cable
- for RCP2-RTBS/RTBSL/RTCS/RTCSL
- Minimum bending radius: $R \geq 68$ mm (Dynamic bending condition)

### PIO Flat Cable

**Model number** CB-PAC-PIO

- PIO Flat Cable
- for MSEL/PCON-CA/MSEP-LC
- Half-pitch MIL socket: HIF6-40D-1.27R (Hirose)

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* Only robot cable is available for this model

* Please indicate cable length ($L$) in $\leq 20$ m.
  e.g.) $080 = 8$ m

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* Please indicate cable length ($L$) in $\leq 10$ m.
  e.g.) $080 = 8$ m

HIF6-40D-1.27R

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* Only robot cable is available for this model
MSEL-PG Series
Catalogue No. 1214-E

The information contained in this catalog is subject to change without notice for the purpose of product improvement.

IAI Industrieroboter GmbH
Ober der Röth 4
D-65824 Schwalbach / Frankfurt
Germany
Tel.:+49-6196-8895-0
Fax:+49-6196-8895-24
E-Mail: info@IAI-GmbH.de
Internet: http://www.eu.IAI-GmbH.de

IAI America, Inc.
2690 W. 237th Street, Torrance, CA 90505, U.S.A
Phone: +1-310-891-6015, Fax: +1-310-891-0815

IAI (Shanghai) Co., Ltd
Shanghai Jiahua Business Centee A8-303.808,
Hongqiao Rd., Shanghai 200030, China
Phone: +86-21-6448-4753, Fax: +86-21-6448-3992

IAI CORPORATION
645-1 Shimizu Hirose, Shizuoka 424-0102, Japan
Phone: +81-543-64-5105, Fax: +81-543-64-5182

IAI Robot (Thailand) Co., Ltd
825 PhairojKijja Tower 12th Floor, Bangna-Trad RD.,
Bangna, Bangna, Bangkok 10260, Thailand
Phone: +66-2-361-4457, Fax: +66-2-361-4456

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