### Basic specifications of linear conveyor module

<table>
<thead>
<tr>
<th>Model</th>
<th>LCM100-4M / 3M / 2MT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drive method</td>
<td>Moving magnet type, Linear motor with flat core</td>
</tr>
<tr>
<td>Pitched positioning accuracy</td>
<td>±0.015 mm (single slider) / ±0.05 mm (mutual difference among all sliders)</td>
</tr>
<tr>
<td>Max. pitch between sliders</td>
<td>420 mm</td>
</tr>
<tr>
<td>Max. number of combined modules</td>
<td>16 (total length: 10240 mm)</td>
</tr>
<tr>
<td>Max. number of sliders</td>
<td>16 (when 16 modules are combined)</td>
</tr>
<tr>
<td>Min. pitch between sliders</td>
<td>420 mm</td>
</tr>
<tr>
<td>Min. height difference between sliders</td>
<td>0.08 mm</td>
</tr>
<tr>
<td>Max. allowed size of body cross-section</td>
<td>W 136.5 mm × H 155 mm (including slider)</td>
</tr>
<tr>
<td>Bearing method</td>
<td>1 guide rail / 2 blocks (with retainer)</td>
</tr>
<tr>
<td>Module weight</td>
<td>12.5 kg (4M) / 9.4 kg (3M) / 7.6 kg (2MT)</td>
</tr>
<tr>
<td>Slider weight</td>
<td>2.4 kg (3M) / 3.4 kg (when the belt module is used)</td>
</tr>
<tr>
<td>Cable length</td>
<td>3 m / 5 m</td>
</tr>
<tr>
<td>Controller</td>
<td>LCC140</td>
</tr>
</tbody>
</table>

#### Notes:
- Note 1: Repeated positioning accuracy when positioning in the same direction (pulsating).
- Note 2: Pulsating accuracy in the pulsating when using the position correction function with the RFID.
- Note 3: Lengths are approximately 5 µm.
- Note 4: When used together with the belt module, the max. payload becomes 14 kg since the parts dedicated to the belt are attached to the slider.

### Basic specifications of belt module

<table>
<thead>
<tr>
<th>Model</th>
<th>LCM100-4B / 3B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drive method</td>
<td>Belt back surface pressing tension drive</td>
</tr>
<tr>
<td>Bearing method</td>
<td>1 guide rail / 2 blocks (with retainer)</td>
</tr>
<tr>
<td>Max. speed</td>
<td>180 mm/sec</td>
</tr>
<tr>
<td>Max. payload</td>
<td>14 kg</td>
</tr>
<tr>
<td>Max. module length</td>
<td>540 mm (4B) / 480 mm (3B)</td>
</tr>
<tr>
<td>Max. number of sliders</td>
<td>1 slider / 1 module</td>
</tr>
<tr>
<td>Max. payload of combined modules</td>
<td>14 kg (including sliders)</td>
</tr>
<tr>
<td>Module weight</td>
<td>13.2 kg (4B) / 10.4 kg (3B)</td>
</tr>
<tr>
<td>Slider weight</td>
<td>2.4 kg (3B) / 3.4 kg (when the belt module is used)</td>
</tr>
<tr>
<td>Cable length</td>
<td>None</td>
</tr>
<tr>
<td>Controller</td>
<td>Dedicated driver (included)</td>
</tr>
<tr>
<td>Power supply</td>
<td>DC 24 V 5A</td>
</tr>
<tr>
<td>Communication I/F</td>
<td>Dedicated input/output 16 points</td>
</tr>
</tbody>
</table>

### Additional Information
- **IM Operations**
  982 Sogo-cho, Naka-ku, Hamamatsu, Shizuoka 435-0054, Japan  
  Tel 81-53-460-6101  Fax 81-53-460-6811  
  E-mail: robotn@yamaha-motor.co.jp

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Feel the action.

From "flow" to "move"

Efficient transfer processes for increased profitability

Connect, expand, and create.

Linear conveyor module

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**Yamaha Robot Official Channel**

Animated video for your better understanding

**LCM 100 Promotion Video**

https://www.youtube.com/watch?v=QLx1Rxuqpm8

Check out the actual move in the video.

**Yamaha PAS Speedometer Assembly Line**

https://www.youtube.com/watch?v=1_-wU6R-JXg

**The slider insertion/ejection function in use**

Examples of using the traverser for transport

https://www.youtube.com/watch?v=09G1eBvGyFO
From "flow" to "move"
Linear Conveyor Module LCM100
Constructing high-speed throughput lines.

In a conventional production line:
- Tact time was close to the limit
- Unit changes were cumbersome
- No work could be performed on the conveyor, so the equipment became larger
- Time was wasted from having to perform operations based on the longest work when conducting a combination of works with different cycles such as screw fastening, sealing, and joining

Comparison between LCM100 and a conventional conveyor

- **Reduced transfer time**
  - Transfer: Linear motor drive for high-speed transfer
  - Deceleration: Optimum acceleration/deceleration ensures smooth deceleration and stop
  - Stop: Slider is "supported directly by a highly rigid guide"
  - Work: Work on the slider is possible

- **Increased yield**
  - Work is performed on the slider, allowing a 30% reduction in tact time.

- **Saves space**
  - Round travel is possible

- **Lower total costs**
  - Removable slider

- **High-speed and high-accuracy transfer**
  - Max. speed: 3000 mm/sec.
  - Max. acceleration: 2G
  - Max. load mass: 15 kg
  - Repeated positioning accuracy: +/-0.015 mm (standalone slider)*

Note: *This is the repeated positioning accuracy for a standalone slider when positioning from one direction (single-side approach).
Note: The positioning accuracy for the single-side approach after correction by RFID is ±1 mm including the mutual difference between sliders.

- **Tact time was close to the limit**
- **Unit changes were cumbersome**
- **No work could be performed on the conveyor, so the equipment became larger**
- **Time was wasted from having to perform operations based on the longest work when conducting a combination of works with different cycles such as screw fastening, sealing, and joining**

- **Slow transport due to frictional resistance**
- **Requires some distance for deceleration**
- **All stop positions require a sensor and stopper**
- **Retrieval retraction is required because the system does not have rigidity**
- **Returned back to the line**
  - Notes: May vary depending on conditions
A modular structure that allows the connection of modules

The length of the transfer line can be adjusted freely by adding modules.

Save equipment space.

- Since the movement direction can be changed, the same processes are made common. This makes the equipment compact and results in cost reduction.
- Forward and backward movement at a high speed can be set freely.
- Flexible actions such as moving only some sliders backward is possible.

Can be moved efficiently between processes with different tacts

- Narrow pitch movement is possible.
- Movement time can be reduced by combining the use of different movements, such as using pitch-feed for the same processes in short-time processes while transferring three workpieces at the same time at a high speed in long-time processes.

Workpieces do not need to be retracted

- As the work moves down, you can assemble and process them on the transfer line.
- Eliminates having to retract the work from the pallet to the work table.
- Reduces costs.

Significant reduction of start-up time

- Just connect modules for easy construction of a transfer line.
- Lifting cylinders, sensors, stoppers, and other complex parts are not necessary.
- Operations can be performed by using only the LCC140 Controller.
- Economical as excess modules can be used for other lines or stored for maintenance.

Construct branching lines, joint lines, and other lines in flexible configurations.

- Example of horizontal circulation
- Example of horizontal branching
- Example of vertical circulation

Module convenient for the circulation are configured.

Note. The customer needs to prepare the return unit and the circulation mechanism.

Note. Numerical values are used for setting transfer distance and stop positions.
An expanding, next-generation transport system

Flexible set-up of the slider’s acceleration/deceleration, forward/backward movement, positioning, and other actions. The variety of possible line structures has been greatly expanded to supersede conventional models.

Genuine new Yamaha belt modules are included in the lineup.

- Low price: Using modules only for return processes and interprocess transfer will help reduce the facility cost.
- Easy control without controllers and no need to create robot programs

**Fast responses and smooth action**

Example of vertical circulation mechanism

- LCM100-2MT, a module for circulation, is available to insert or eject a slider into or out of a line.
- Also can be used for a return mechanism.

We welcome consultations on proposals for customized design, design drawing presentation, etc., to create return units best fitting your request. For details, contact our sales representatives.

**Belt modules can be selected to your needs**

- Greatly decreased design and production labor
  - The guide connections, connection height, and stroke length are completely compatible between belt and linear modules. Reduced design and production labor will help speed up the start-up time.
  - Note 1: The belt module and the linear module have different depths.

Circulation modules are also available

**Benefits of LCM100-2MT**

- Long service life
- Reduced transport line space
- Lower running costs
- Excellent maintainability
- Shorter start-up time
- Increased throughput
- Flexible line configurations
- Improved tact time
- Increased throughput
- Excellent maintainability
- Reduced transport line space
- Improved tact time
- Increased throughput
- Excellent maintainability
- Reduced transport line space

**Optimum line length design**

Stroke variation [640 mm/480 mm]
The optimum design can be achieved by combining multiple modules to reduce line length.

**Easier to design and implement**

Laminated PTFE guide

Use the sensor to check the position of the slider. This prevents collisions between sliders and enables smooth action.

A maximum of three proximity sensors can be used (optional).

**Linear Conveyor Module**

LCM100

- Example of horizontal circulation mechanism

**Linear module**

- B1 
  - KDJ-M2205-L0: Linear module for circulation

**Belt module**

- B3 
  - KDJ-M2205-C0: Belt module for circulation

- B5 
  - KDJ-M2205-R0: Belt module for circulation

**Signal and Role**

- Pin Number | Signal | Role
- A1 | +24V | Power connection
- A2 | GND | DC24V (+/-10%)
- A3 | | 
- A4 | | 
- A5 | | 
- A6 | | 
- A7 | | 
- A8 | | 
- B1 | | 
- B2 | | 
- B3 | | 
- B4 | | 
- B5 | | 
- B6 | | 
- B7 | | 
- B8 | | 

- **Note**: A belt attachment is required.
Create a new transfer environment.

Loss-free transport that was not possible with conventional conveyors can be achieved with LCM100. Reduce losses while increasing profitability.

- Optimal for small batch production of various product types
  - No need for mechanical stoppers or sensors. Change layout easily.
  - Reconstruction can be finished quickly by just changing the program to set a stop position.
  - Frequent unit changes for different models can be handled flexibly.

- Quick recovery by replacing the slider when machine trouble occurs
  - Parts can be replaced easily.
  - Parts can be kept for maintenance as they are standardized.
  - Possible to minimize the downtime of a production line.

- Easy maintenance
  - Motors and scales do not make contact and are free from abrasion.
  - As only the rails are sliding parts, dust generation is low.
  - There are only a few consumable parts, which mean a long service life.

System configuration diagram (when 3 sliders are connected)

<Linear module>

The module is standardized and can also be stored for maintenance.

If a short line is used and modules are in excess, they can be diverted to another line or stored for maintenance.

Standardized slider

The slider is standardized and can be used for any line. It’s also possible to share the slider on multiple lines. Production can be restored immediately by replacing a failed slider if trouble occurs.

Controller is replaceable

The connected controller and module combinations can be changed as needed. Note that initial setting is required when a combination is changed. Replacing just the controller or the module is also possible.

Linear Conveyor Module

LCM100

Improved tact time  Increased throughput  Excellent maintainability  Reduced transport line space

Flexible line configurations  Shorter start-up time  Lower running costs  Long service life

<Linear conveyor module>

Stop positions can be set just by changing the program settings.

Stop position can be changed just by changing the numeric value.

<Linear conveyor module>

Stop positions can be set just by changing the program settings.

Stop position can be changed just by changing the numeric value.

Note. One controller needs to be connected to the PLC.

Robot cable

Insertion/ejection rail

Termination module

RFID antennae

Programming box

HPB

LINK cable

PLC cable (CC-Link network etc.)

PLC cable (parallel I/O)

Power cable

24V power

This interface allows the customer to supply 24V power and select just the necessary signals to use. Note. The customer will need to prepare the wiring on the user side.

Note. One controller is required for every module.

The connected controller and module combinations can be changed as needed. Note that initial setting is required when a combination is changed. Replacing just the controller or the module is also possible.
## Parts for LCM100

### Robot cable for linear module

Robot cable for linear module:

- For LCM100-4M: KDJ-M4710-30 (3m x 2 pcs.)
- KDJ-M4710-50 (5m x 2 pcs.)

### Slider

- For linear module: KDJ-M1610-00
- For belt module: KDJ-M4811-00

### Module connection block (with fastening bolts)

- Model: KDJ-M2021-L0

### Module connection cable

- Model: KDJ-M4811-00

### Parts for LCM100 controller

- Power connector: KDK-M1630-00
- Connection lever: KDK-M1610-00

### Safety connector

- Linear module: KDJ-M1670-00
- Wired plug kit: KDK-M1670-T0

### Parts for LCC140 controller

- Model: KDK-M1600-00
- USB type: KDK-M1300-00

### PC supporting software POPCOM+

- POPCOM+ software model: KB5-M4966-00

### Parts for line configuration

- LINK cable:
  - [Number of modules] - 1) cables per line are required.
- Terminator connector:
  - When connecting modules, 2 connections per line are required.

### Data cables (5m)

- Communication cable for POPCOM+:
  - Select from USB cable or D-sub cable.

### RFID

- Reader/writer cable:
  - KAS-M5380-00
- Antenna amplifier controller cable:
  - D-Sub type: KAS-M538F-00

### Maintenance parts

- Robot cable for LCM100:
  - KDJ-M1751-30 (3m x 1 pc.)
  - KDJ-M1751-50 (5m x 1 pc.)
- Lithium battery for system backup:
  - KDJ-M1785-00
- Replacement filter for LCC140 (3 pcs. in package):
  - KDK-M276-00

### Link

- USB type: KDK-M1300-00

### USB type (5m)

- D-sub type: KDK-M1300-00

### Data cable for communication

- Note: The USB cable supports Windows 2000/XP or later.
- Note: The USB cable is made for USB/USB specifications.
- Note: The USB cable can be downloaded from our website.

### RFID (manufactured by OMRON)

- Whether or not the RFID system can be used may vary depending on the destination place (country).
- Before selecting a RFID system, please contact us.

### References

- Windows is the registered trademark of US Microsoft Corporation in U.S.A. and other countries.
- POPCOM+ environment:
Note. No mechanical stoppers are provided due to product characteristics. When necessary, the customer installs appropriate mechanical stoppers.

Note 1. Use M6 hex socket head bolts to install the main body.

Note 2. For the stop point when the slider enters, specify a point 190mm or more away from the end face of the module on the ejection side. Otherwise, the slider may not be stopped or ejected correctly.

When ejecting the slider, eject the slider after it has been stopped at a point 190mm or more away from the end face of the module.

Note 3. An area of +/-6mm from both ends of each connected module and an area of 150mm from the line end become slider stop inhibited areas.

Note 4. Select an appropriate rail length of the insertion/ejection rail option from the "Insertion/ejection rail length selection table" shown on the left.

Note 5. The LCM100 is installed only in the horizontal direction.

Note 6. Module variations can be combined freely within the same line. (This figure shows that 3M on the left is combined with 4M on the right.)

Note 7. It is recommended to install rail support parts on the insertion/ejection rail.

Details including specifications and restrictions should be consulted before considering specific applications of LCM100. Please contact our sales representatives in advance for consultations concerning the customer’s requests.
### Linear module slider

<table>
<thead>
<tr>
<th>A (mm)</th>
<th>FA (N) Payload</th>
<th>FB (N) Payload</th>
<th>FC (N) Payload</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>2540</td>
<td>1540</td>
<td>1080</td>
</tr>
<tr>
<td>10</td>
<td>1790</td>
<td>1460</td>
<td>1240</td>
</tr>
<tr>
<td>20</td>
<td>1310</td>
<td>1020</td>
<td>620</td>
</tr>
<tr>
<td>30</td>
<td>1130</td>
<td>920</td>
<td>420</td>
</tr>
<tr>
<td>40</td>
<td>900</td>
<td>800</td>
<td>310</td>
</tr>
<tr>
<td>50</td>
<td>720</td>
<td>710</td>
<td>250</td>
</tr>
<tr>
<td>60</td>
<td>601</td>
<td>590</td>
<td>210</td>
</tr>
</tbody>
</table>

Note: The loads shown above are tolerable loads at a position C "mm away from the center of the guide rail."

### Belt module slider

**Static tolerable load of slider**

Static loads shown below are tolerable as references when performing the screw tightening, part assembly, or light press-fitting on the slider.

<table>
<thead>
<tr>
<th>A (mm)</th>
<th>FA (N) Payload</th>
<th>FB (N) Payload</th>
<th>FC (N) Payload</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>2540</td>
<td>1540</td>
<td>1080</td>
</tr>
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<td>10</td>
<td>1790</td>
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</tr>
<tr>
<td>20</td>
<td>1310</td>
<td>1020</td>
<td>620</td>
</tr>
<tr>
<td>30</td>
<td>1130</td>
<td>920</td>
<td>420</td>
</tr>
<tr>
<td>40</td>
<td>900</td>
<td>800</td>
<td>310</td>
</tr>
<tr>
<td>50</td>
<td>720</td>
<td>710</td>
<td>250</td>
</tr>
<tr>
<td>60</td>
<td>601</td>
<td>590</td>
<td>210</td>
</tr>
</tbody>
</table>

Note: The loads shown above are tolerable loads at a position C "mm away from the slider upper surface."

### Ordering method

<table>
<thead>
<tr>
<th>Linear module</th>
<th>LCC140 - 10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Controller</td>
<td>LCC140</td>
</tr>
<tr>
<td>Encoder encoder</td>
<td>LCC140</td>
</tr>
<tr>
<td>Network option</td>
<td>LCC140</td>
</tr>
</tbody>
</table>

The above shows the minimum "one module + one controller" ordering method. When connecting modules, please separately inform the number of necessary modules. Note 1: For 2MT, be sure to select an appropriate network option. Note 2: Please see page 07 for the proximity sensor used for checking the slider position. Note 3: Parts necessary to connect the belt module and linear module. Parts are incorporated into the belt module.

### Linear conveyor module LCM100

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>01</strong> Program operation</td>
<td>The LCC140 controller can perform operations using registered programs and operations using remote commands from the PLC. In addition to the control of input/output signals such as movement or positioning, processes related to the insertion/ejection of sliders can be performed.</td>
</tr>
<tr>
<td><strong>02</strong> SR1 controller base operation system</td>
<td>The same user interface as the SR1 controller is incorporated, and specifications and functions specific to the linear conveyor module have been added based on this user interface. A very user-friendly operation system is provided.</td>
</tr>
<tr>
<td><strong>03</strong> Controller-linking function</td>
<td>You can use the link cables dedicated to LCC140 controllers to connect the controllers when two or more modules are connected. You can handle multiple controllers as if they were one controller.</td>
</tr>
<tr>
<td><strong>04</strong> Position correction function using RFID</td>
<td>When multiple sliders are each stopped at a position of your choice, actual stop positions have an error width (machine difference) of 500 µm. This is because each slider has a different stopping accuracy. Link the RFID unit and LCC140 controller to suppress the machine difference of individual sliders to an error width of approximately 100 µm.</td>
</tr>
</tbody>
</table>

### Basic specifications of LCC140 (Controller for linear module)

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outside dimensions</td>
<td>W 402.5 × H 229 × D 106.5mm</td>
</tr>
<tr>
<td>Main body weight</td>
<td>4.8kg</td>
</tr>
<tr>
<td>Input power voltage</td>
<td>Single-phase AC200 to 230V ±10% or less (50/60Hz)</td>
</tr>
<tr>
<td>Maximum power consumption</td>
<td>350VA (LCM100-4M 1 slider is driven)</td>
</tr>
<tr>
<td>SAFETY</td>
<td></td>
</tr>
<tr>
<td>External input/output</td>
<td>RS-232C (dedicated to RFID)</td>
</tr>
<tr>
<td>CC-Link Ver. 1.10 compatible, RS-232C (for HPB / doubles as POPCOM+)</td>
<td></td>
</tr>
<tr>
<td>EtherNet/IP adapter 2 ports</td>
<td></td>
</tr>
<tr>
<td>Network option</td>
<td>CANopen (for HPB / doubles as POPCOM+)</td>
</tr>
<tr>
<td>EtherNet/IP (via ECI adapter)</td>
<td></td>
</tr>
<tr>
<td>Programming box</td>
<td>HPB, HPB-D (Software version 24.01 or later)</td>
</tr>
</tbody>
</table>

### LCC140 controller

#### Part numbers

- LCM100: Linear conveyor module 4M series
- LCM100-4B: Linear conveyor module 4B series
- LCM100-3B: Linear conveyor module 3B series
- LCM100-2B: Linear conveyor module 2B series
- LCM100-1B: Linear conveyor module 1B series

#### Natural Text

- **Static tolerable load of slider**
- **Ordering method**
- **Linear module slider**
- **Belt module slider**
- **Linear module controller LCC140**
- **Static tolerable load of slider**
- **Ordering method**
- **Linear module slider**
- **Belt module slider**
- **Linear module controller LCC140**