Latest News!

MOVIDRIVE® Application Version

Edition

01/2002
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The Product

1.1 The situation so far

Depending on the application, you used to be able to select from different unit types with different technology functions.

For example, a range of application modules was available for the "positioning" field of application, while certain application types of MOVIDRIVE® and MOVIDRIVE® compact could be obtained for the "electronic cam" or "electronic synchronous operation" fields of application.

However, the application versions could only be used for the corresponding function. The figure below shows the situation so far. Various unit types with a range of application assignments.

Application modules

- Table positioning
  - Table positioning with bus control
- Absolute positioning
  - Bus positioning
  - Expanded bus positioning
- Central winder
- Flying saw

Unit versions

- Standard version -00
- Electronic synchronous operation version -06
- Electronic cam version -04

Application

- Positioning
- Winding
- Flying saw
- Electr. synch. op.
- Electronic cam
1.2 The situation now

MOVIDRIVE® and MOVIDRIVE® compact unit series are now available in the new application version. This version offers all technology functions in a standard unit series. The application version covers the entire range of functions of all MOVIDRIVE® and MOVIDRIVE® compact units and can therefore be used as a replacement unit in all applications.
1.3 The functions of the application version

The application modules form a library of programs which turn MOVIDRIVE® and MOVIDRIVE® compact drive inverters of the application version type into

- positioning controls,
- winding controls,
- flying saw controls
or units for other applications.

The application modules offer you the user the following benefits:

- The application modules are covered by the MOVITOOLS user interface. As a result, you have all the programs and, if necessary, you can select the appropriate solution as late as during the startup phase.
- You have the program library of application modules at your disposal. This reduces startup costs because you only have to set parameters, rather than perform programming.
- The MOVIDRIVE® application version can perform all the functions of the standard version as well as all current application modules. As a result, it can be used as a replacement unit for all applications. There is no need for special units for each application.
- The MOVIDRIVE® application version and the application modules mean you can rely on global availability and service for your applications, at the same time as reducing your stock diversity.

1.4 MOVITOOLS version 2.70

You can use the application version from the new MOVITOOLS 2.70 version and later. In addition, MOVITOOLS version 2.70 and later supports the new encoders (HIAPERFACE®) ES1H (single turn) and AS1H (multiturn). As a result, the system is open to unit series MCH40A, MCH41A and MCH42A.
1.5 **Standard and application versions**

The differentiation into standard and application versions runs through the entire unit series of MOVIDRIVE® and MOVIDRIVE® compact.

The table below shows the functional differences between the two versions.

<table>
<thead>
<tr>
<th>Unit / function</th>
<th>Application version</th>
<th>Standard version</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit type&lt;br&gt;MDX60A/MCX40A/MCX41A</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>IPOS® plus® sequence control system</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Operating modes&lt;br&gt;CFC/VFC/VFC&amp;n-Ctrl/Servo</td>
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<td>X</td>
</tr>
<tr>
<td>Fieldbus option card (MDX only)</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>DRS synchronous operation interface&lt;br&gt;(MDX only)</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>DIP absolute encoder interface&lt;br&gt;(MDX only)</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Electronic cam</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Internal synchronous operation</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Application modules</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Automatic anti-slip control in master/slave applications</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>
2 Fields of Application of the Application Version

2.1 Positioning applications

There are application modules for linear and rotary positioning in positioning applications.

The travel records can be processed in the PLC or the drive inverter, depending on your requirements.

The following illustration shows an overview with the various solutions for positioning applications.

Field of application: Positioning

- Linear motion
  - Up to 32 target positions
    - Table positioning
    - Table positioning with bus control

- Variable target positions
  - Absolute positioning
  - Bus positioning
  - Expanded bus positioning

- Rotating / revolving motion
  - Rotary axis
**Example:** “Positioning via bus” technology function

This function is used for applications in which the target positions are processed in the PLC. The movement records consisting of the target position, movement speed and acceleration, are specified as variables in the user travel unit via the fieldbus.

To make startup even more straightforward, we have developed a diagnostic monitor which is especially tailored to the application.

This monitor shows the data traffic between the inverter and the PLC. It makes it possible to control and test the drive unit without a PLC or a running fieldbus.
2.2 Winding applications

SEW provides two application modules for winding applications, namely for endless winders and stop/start winders.

**Endless winders**  
In this case, either the tensile stress or the line speed of the winding material is controlled.

**Stop/start winders**  
In this case, the winding material is controlled by a jockey roll. This jockey roll control means the material is transported smoothly.

**Jockey control**  
A jockey control application module is in preparation.

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**Field of application: Winding**

- **Continuous winding**
  - Determines the tensile stress

- **Clocked winding**
  - Determines the line speed

**Application modules**

- **Central winder**
  - Mode1: F-control
  - Mode2: V-control

- **Winder with jockey control**
Endless material has to be processed in many industries such as the paper, plastics, textile or sheet metal industries. The material is wound, unwound or unwound and rewound. Depending on the application, the winder must provide the specified tensile stress or operate at a specified line speed.

In both cases, the line speed is recorded by a master encoder or an analog setpoint and
• the current diameter is calculated,
• friction factors are compensated for,
• the specified tensile stress is set
• or alternatively the line is operated at the specified speed.

The editor integrated into the user interface enables you to define your own winding profile and therefore run with variable tension values without having to alter the setpoint continuously.

The figure below shows an application in the sheet metal industry. Copper and brass sheets are finished before being delivered to the customer. To do this, the material is pickled in baths and polished by several brushes. The sheets are driven by three stations for this purpose. Unwinding and rewinding takes place with a constant tensile stress and a constant web speed.
2.3 **Electrical synchronous operation application**

**Example:**

_Synchronized processing with the flying saw_

Endless material must be cut to length – it's the classic job of the "flying saw."

Synchronous operation is required in particular in applications which do not allow for stop/start processing of the material. For example, cars are filled with liquids (screen wash, brake fluid and coolant) as they move along the assembly line.

For this purpose, the tool has to be synchronized with the transported material (workpiece) prior to processing, moved at a synchronous angle to the workpiece during processing and then returned to the starting position at the end so it can restart the cycle (see the figure below).

![Diagram](image-url)

There are two ways of generating the start signal for synchronization:

- **Cutting length control**
  Automatic synchronization (engaging) takes place depending on the specified processing length.

- **Cutting mark control**
  In this case, the cut is triggered externally:
  E.g. by fiducials printed on the material or a start pulse generated by a machine control.
2.4 Cyclical processing with the electronic cam

In the past, mechanical cams have always been used for harmonizing complex movement sequences in cyclical machinery. In this method, the synchronous operation of all cams is ensured by means of a centrally driven shaft (vertical shaft). The speed of this vertical shaft could be used for setting the production speed of the machine.

However, this mechanical solution is very inflexible and can no longer cope with the requirements of modern production and processing machines.

As a result, the engineering industry is increasingly replacing mechanical cams with electronically controlled drives.

The following figure shows an application in the beverage industry where bottles are supplied to the bottling station by means of an electronic cam.

![Image of bottles supplied by electronic cam](image)

The startup of the technology functions is assisted by the application wizard so that these applications, with their extremely complicated requirements, can be started up as easily as possible.
3 Application Wizard

3.1 Cam editor application

The MOVITOOLS user interface assists you in programming the "electronic cam" technology function.

The software is adapted to the specifics of your mechanical application. The program editor of the IPOSplus® compiler is started after you have downloaded the data into the drive inverter.

A significant feature of MOVIDRIVE® drive inverters now comes into play, namely the integrated IPOSplus® positioning and sequence control system.

This gives you complete flexibility and you can use a high-level language to write a program which controls the entire sequences of motion directly in the MOVIDRIVE®, right on the plant floor. The programming language is based on ANSI-C and has been expanded with drive-specific functions.

To make it easier for you to develop programs when using technology functions, the Application Wizard makes all the settings for the selected function in advance using a software module. You can now concentrate on developing your application and integrating the technology function flexibly into the IPOSplus® program.

Here too, the process of developing the program is quick and clear. You can copy short sample routines for every command from the online help. You can then test and analyze your program with user-friendly debugging functions.
4 Order Information

Application version units are ordered using the type designation -0T. Refer to the new catalog and system manual versions for the appropriate part numbers for MOVIDRIVE®.

For the moment, please contact us regarding MOVIDRIVE® compact.

Sample order

MDV60A-0015-5A3-4-0T

MOVIDRIVE®

Application version

MCS41A-0015-5A3-4-0T

MOVIDRIVE® compact

Application version

5 Documentation

The latest editions of the catalogs and system manuals with part numbers for the corresponding -0T units are listed below:

<table>
<thead>
<tr>
<th>Name</th>
<th>Publication number</th>
<th>Available as of</th>
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<tbody>
<tr>
<td>Catalog</td>
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<tr>
<td>MOVIDRIVE® MD_60A</td>
<td>1052 4304 DE</td>
<td>09/2001</td>
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<td>02/2002</td>
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<tr>
<td>System Manual</td>
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<tr>
<td>MOVIDRIVE® MD_60A</td>
<td>1052 2204 DE</td>
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<tr>
<td>Catalog</td>
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<tr>
<td>MOVIDRIVE® compact</td>
<td>1053 8305 DE</td>
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<tr>
<td></td>
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<td>04/2002</td>
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<tr>
<td>System Manual</td>
<td></td>
<td></td>
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<tr>
<td>MOVIDRIVE® compact</td>
<td>1053 380x DE</td>
<td>Expected 03/2002</td>
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<tr>
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<td>1053 3818 EN</td>
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