

# SIEMENS



EXTRA LOW-VOLTAGE MOTION APPLICATIONS

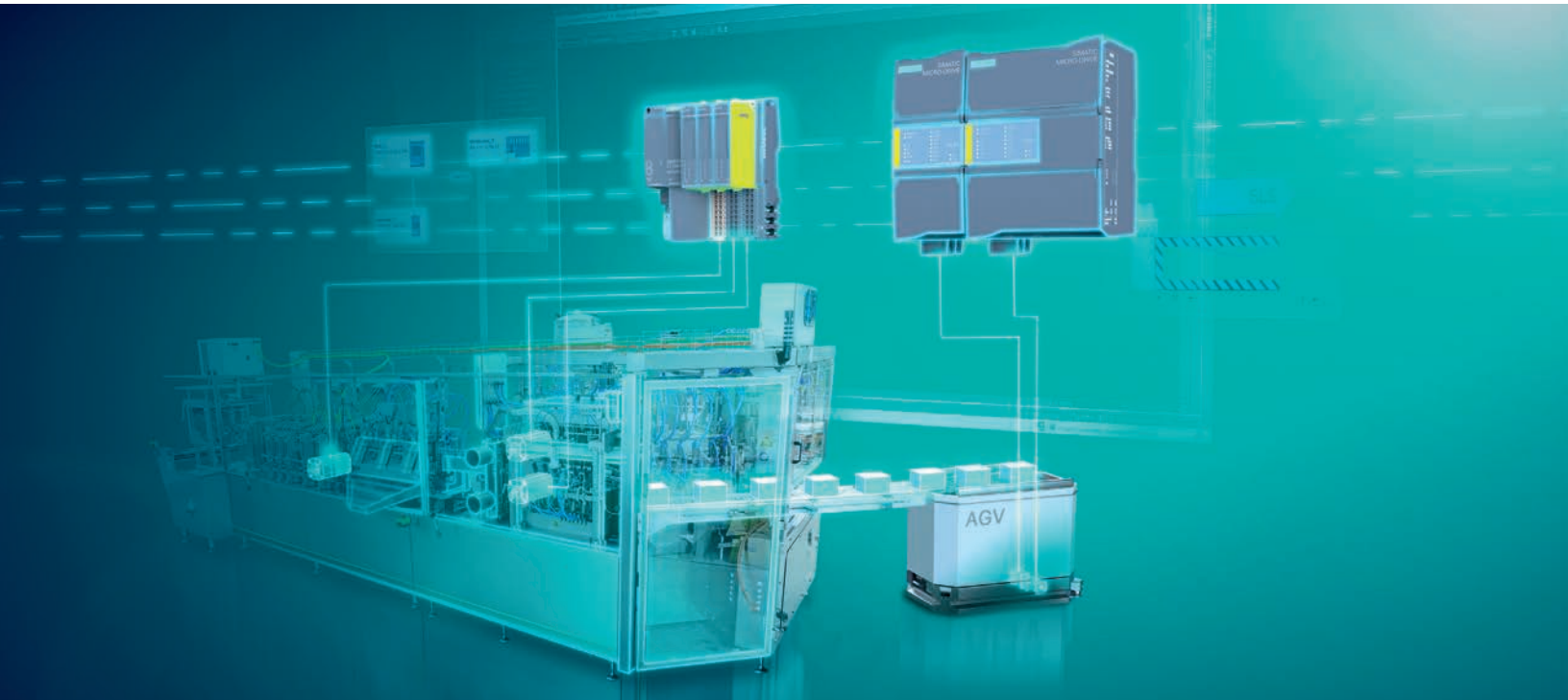
## SIMATIC MICRO-DRIVE

Versatile. Seamless. Safety Integrated.

[usa.siemens.com/micro-drive](http://usa.siemens.com/micro-drive)

# The first class servo-drive for extra low-voltage motion control applications

The requirements needed for motion control tasks in today's manufacturing are continuously increasing and becoming more diverse and complex. Thanks to digitalization, new and innovative solutions are being created—no matter the industry or application.

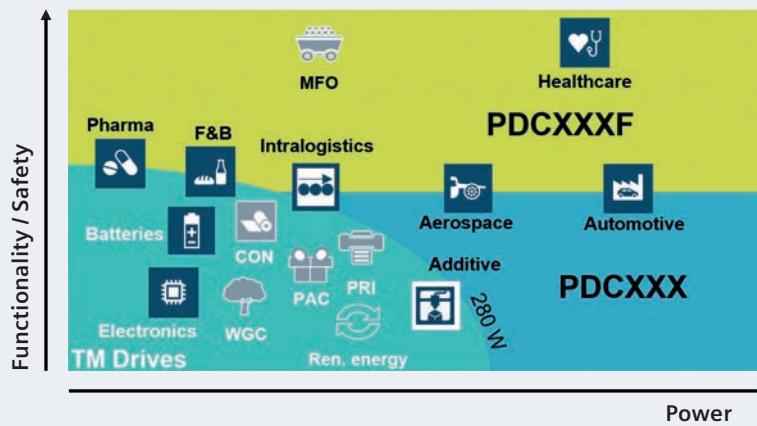


## Fit for digitalization with SIMATIC MICRO-DRIVE

The SIMATIC MICRO-DRIVE drive system allows you to make the perfect entrance into the world of digitalization. Based upon Totally Integrated Automation (TIA), drives and motors are completely integrated into the Siemens automation environment, and can be selected and configured quickly and easily using the TIA Selection Tool and the TIA Portal. A wide range of tools for the complete machine building cycle ensures efficient engineering and fast commissioning. Machine data is made available through MindSphere, the cloud-based, open IoT operating system from Siemens.

## Well-conceived, flexible and fit for the future

The SIMATIC MICRO-DRIVE servo-drive system is compatible with individual and supplementary motors (Dunkermotoren, ebm-papst) and plug-in cables (Harting, KnorrTec) from well-established Siemens product partners. It's also compatible with third-party company motors and cables.



**TM Drives** are designed for basic performances in industries with focus on compactness and simple safety requirements.

**PDC** is a PROFINET participant with a focus on higher performance and extended safety functionalities (e.g. SS1 and SLT\*).

**SIMATIC MICRO-DRIVE TM (Technology Module) drives** feature the new integrated drive controller modules for SIMATIC ET 200SP, a compact design with easy wiring and installation to ensure top performance, while Safety Integrated provides proven safety. The new F-TM Step-Drive ST technology module for the SIMATIC ET 200SP now makes it possible to control stepper motors with or without incremental encoders.

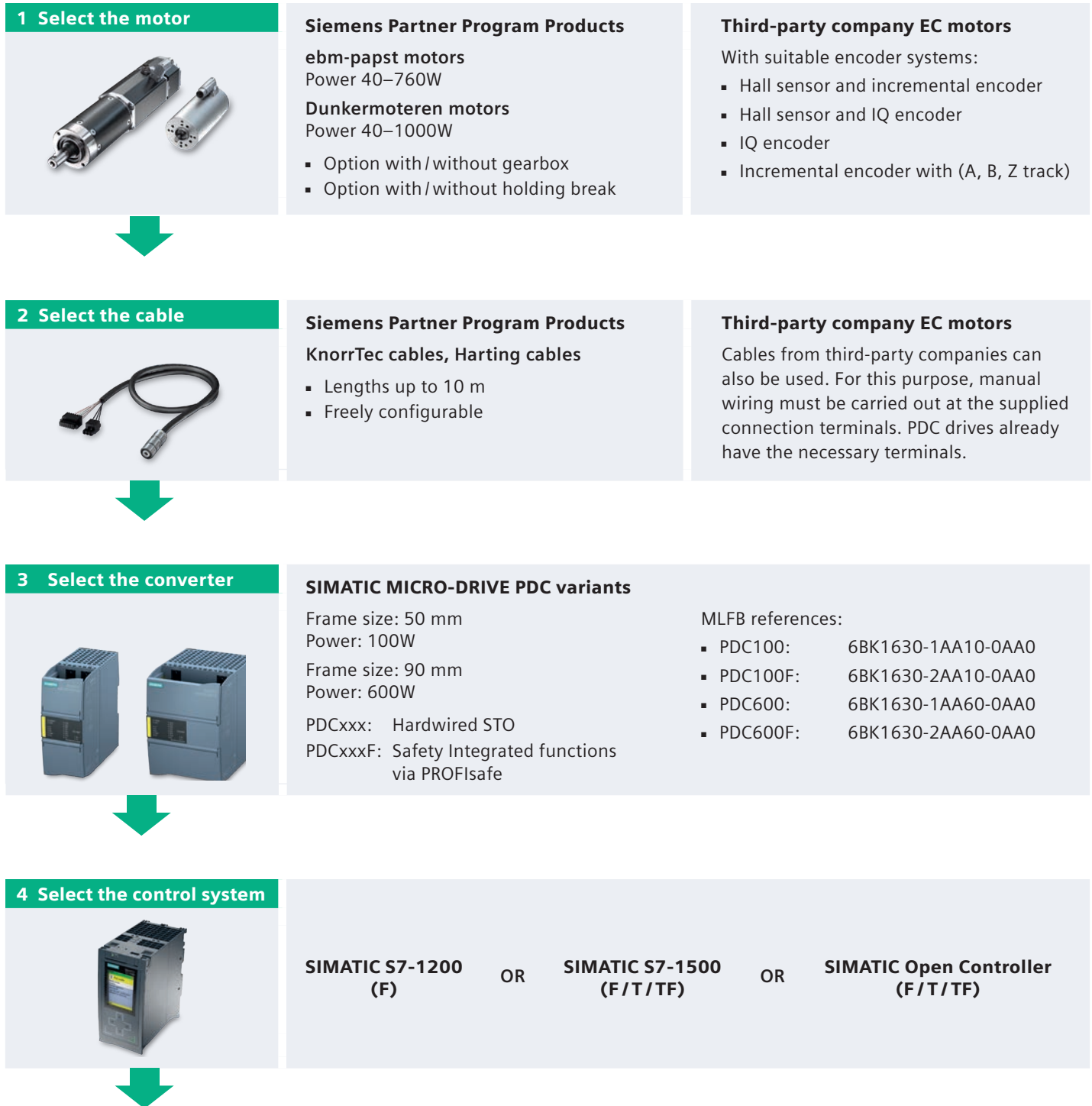
**The SIMATIC MICRO-DRIVE PDC (ProfiDrive-Control) stand-alone servo-drive system** is versatile, seamless and safe for applications in the extra-low-voltage range. It covers a wide variety of applications including precise positioning, shuttles for storage and retrieval machines and storage systems, automated guided vehicles (AGVs) and medical technology.

\*for PDC F-variant

# One system, many possibilities

## SIMATIC MICRO-DRIVE PDC

The SIMATIC MICRO-DRIVE PDC drive system can be easily combined with several components to create a customized solution. The TIA Selection Tool helps you to make the ideal selection. Just point your web browser to: [www.siemens.com/tst](http://www.siemens.com/tst)



**You're done! It's that quick and easy to configure the ideal SIMATIC MICRO-DRIVE servo-drive solution.**

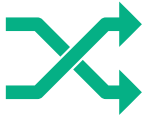
## Technical data

# SIMATIC MICRO-DRIVE PDC

<b>Type</b>	Servo-drive system for extra-low-voltage applications
<b>Applications</b>	AGVs, shuttles, conveyor belts, actuator drives, medical systems
<b>Power range</b>	100W and 600W
<b>Motor supply voltage</b>	24–48V DC
<b>Communication</b>	PROFINET with PROFIdrive and PROFIsafe
<b>Safety functions<sup>1)</sup></b>	STO, SS1, SLT <sup>2)</sup> , SBC, SLS, SSM
<b>Application</b>	TIA Selection Tool
<b>Engineering</b>	TIA Portal with HSP for SIMATIC MICRO-DRIVE
<b>Update</b>	Siemens Automation Tool (SAT)
<b>EMC filter</b>	<ul style="list-style-type: none"> <li>▪ Integrated</li> <li>▪ EN 61800-3:C1 = EN 55011:B1 (residential areas)</li> <li>▪ EN 61800-3:C2 = EN 55011:A1 (residential/industrial areas)</li> </ul>
<b>Standards</b>	<p>CE / UL-certified / RoHS, KC, EAC, RCM</p> <p><b>Performance Level:</b> PL d according to IEC ISO 13849-1</p> <p><b>Safety Integrity Level:</b> SIL2 according to IEC 61508-1</p> <p><b>Safety Category:</b> Cat. 3 according to IEC ISO 13849-1</p>
<b>Motor connection system</b>	<ul style="list-style-type: none"> <li>▪ M12 connector—encoder signals and power cable connected in one plug-in cable up to 200W (Dunkermotoren)</li> <li>▪ Bayonet connector—encoder signals and power cable in one plug-in cable up to 400W (ebm-papst)</li> </ul>
<b>Typical controllers</b>	SIMATIC S7-1200 (F), S7-1500 (F/T/TF), SIMATIC Open Controller (F/T/TF)
<b>Construction</b>	IP20 housing, no fan, convection cooling, mounted on 35 mm DIN rails in accordance with DIN EN 60715
<b>Motor versions</b>	<p>EC motors with suitable encoder system</p> <ul style="list-style-type: none"> <li>▪ Supported encoder systems <ul style="list-style-type: none"> <li>- Hall sensor and incremental encoder</li> <li>- Hall sensor and IQ encoder</li> <li>- IQ encoder</li> <li>- Incremental encoder with (A, B, Z track)</li> </ul> </li> <li>▪ Optional as planetary gearbox or with holding brake</li> <li>▪ Additional gearbox types and connection systems are available in the product partner portfolio</li> </ul>

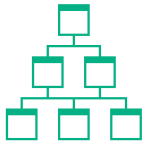
<sup>1)</sup>for PDC F-variant    <sup>2)</sup>valid for PDC100F

# Leverage the benefits SIMATIC MICRO-DRIVE PDC



## Versatile

- Flexible system components that can be combined
- Wide range of certificates (UL, CE, etc.) for use globally
- The servo-drive system can be easily commissioned as a result of IQ encoder technology
- PDC braking chopper can be deactivated, allowing energy recovery for battery operation
- Planning and direct transfer of all operating modes to the SIMATIC control system so that data can be sent to cloud platforms via MindConnect



## Seamless

- For motor power ratings up to 600W
- Motor supply voltage in the protective extra-low-voltage range from 24–48V DC
- Operates perfectly with SIMATIC controllers
- Fast and secure communication via PROFINET IRT with PROFIdrive and PROFIsafe
- Seamless range of tools based upon Totally Integrated Automation (TIA)—from selection and dimensioning using the TIA Selection Tool up to commissioning and service in the TIA Portal



## Integrated safety

- Higher-level, standard safety concepts can be created with maximum safety for your people and your machines
- PDC: Safety Integrated functions STO, SS1, SLT\* SLS, SBC, SSM
- PDC: New SLT\* function (Safely Limited Torque), which monitors the motor current and motor torque in operation
- All Safety Integrated functions are easily commissioned using the TIA Portal and control using a SIMATIC controller via PROFIsafe

*\*for PDC100F*

## SIMATIC MICRO-DRIVE PDC is perfect for every application



### Moving

Energy-efficient and rugged solutions for basic conveyor technology with roller or chain conveyors, for hoisting gear and shuttles, as well as for storage and retrieval machines that demand a high dynamic performance—and always with Safety Integrated on-board.



### Processing

The ideal solution for continuous processes that demand high-speed and torque precision such as packaging, 3D printing and all types of production machines—motion control, isochronous communication and Safety Integrated.



### Positioning

When high dynamic performance and precision are required—the precise positioning of individual axes allows several axes to be interpolated in a coordinated fashion as required in complex robotic applications.



# Integrated Drive system

## SIMATIC MICRO-DRIVE TM

TM Drives are a technology module for the SIMATIC ET 200SP and can be controlled from a SIMATIC S7-1500/1200 PLC via technology objects (TO). In distributed system concepts, TM Drives can be used together with a distributed controller or the SIMATIC ET 200SP Open Controller.

### 1 Choose the right motor for your application

**Stepper motor**—simple application, very compact, high torque at low speed, encoderless positioning

**Servomotors with incremental encoder**—extremely efficient, high-speed axis, high position accuracy

**Servomotors with absolute encoder**—high-performance positioning with high overload

### 2 Select the converter



#### F-TM Step-Drive ST (6BK1136-6SB00-0BU0)

- Drive for bi-polar stepper motors up to 48V, 5/10A
- STO (SIL3)
- Without encoder or with incremental encoder
- Motor holding brake logic
- DI for reference

#### F-TM Servo-Drive ST (6BK1136-6AB00-0BU0)

- Drive for EC motors up to 48V, 5/10A
- STO (SIL2)
- With incremental encoder
- Brake chopper
- Motor holding brake logic
- DI for reference

#### F-TM Servo-Drive HF (6BK1136-6AB00-0CU0)

- Drive for EC motors and stepper motors up to 48V, 5/15A
- STO (SIL3)
- With absolute multi-turn encoder (Biss-C) or incremental encoder
- Encoderless with stepper motor possible
- Motor holding brake logic
- DI for reference

### 3 Select SIMATIC components

#### Interface module



Open controller

OR



ET 200SP



#### Bus adapter

IM155-ST up to 32 modules

OR

IM155-HF up to 64 modules

OR

IM155-MF-HF up to 64 modules



#### Base unit



#### Bright Base Unit (6ES7193-6BP00-0DU0)

For starting of potential group

- Up to 10A

OR



#### Dark Base Unit (6ES7193-6BP00-0BU0)

For extension of potential group

### 4 Select a SIMATIC controller



S7- 1500

OR

S7-1500F

OR

S7-1200

OR

S7-1200F



# Technical data

## TM Drives

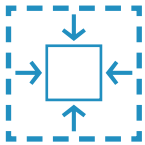
<b>Type</b>	Servo-drive system for extra-low-voltage applications
<b>Applications</b>	Assembly machines, 3D printing machines, labeling machines, powered rollers
<b>Power range</b>	Up to 280W
<b>Output current</b>	$I_{nom}$ : 5 A, $I_{max}$ : 10A, 15A <sup>1)</sup>
<b>Motor supply voltage</b>	24–48V DC
<b>Communication</b>	PROFINET with PROFIdrive
<b>Safety functions</b>	Safety function STO hard-wired
<b>Application</b>	TIA Selection Tool
<b>Engineering</b>	TIA Portal with HSP for SIMATIC MICRO-DRIVE
<b>Update</b>	Siemens Automation Tool (SAT)
<b>EMV</b>	<ul style="list-style-type: none"> <li>▪ According to EN 61800-3 Category C2</li> <li>▪ EN 61800-3:C2 = EN 55011:A1 (residential/industrial areas)</li> </ul>
<b>Standards</b>	<p>CE / UL-certified / RoHS, KC, EAC, RCM</p> <p><b>Performance level:</b> PL d according to IEC ISO 13849-1</p> <p><b>Safety integrity level:</b> SIL3 according to IEC 61508-1<sup>2)</sup></p> <p><b>Safety category:</b> Cat. 3 according to IEC ISO 13849-1</p>
<b>Typical controllers</b>	SIMATIC S7-1200 (F), S7-1500 (F / T / TF), SIMATIC Open Controller (F / T / TF)
<b>Motor versions</b>	<p>EC motors and bi-polar stepper motors are supported</p> <ul style="list-style-type: none"> <li>▪ EC motors with suitable encoder system: <ul style="list-style-type: none"> <li>- IQ encoder</li> <li>- Incremental encoder with (A, B, Z track)</li> <li>- Absolute multi-turn encoder with (Biss-C)<sup>1)</sup></li> </ul> </li> <li>▪ Optional as planetary gearbox or with holding brake<sup>3)</sup></li> <li>▪ Stepper motors: <ul style="list-style-type: none"> <li>- Encoderless operation</li> <li>- Incremental encoder with (A, B, Z track)</li> </ul> </li> </ul>

<sup>1)</sup>F-TM Servo-Drive HF only

<sup>2)</sup>F-TM Servo-Drives ST has safety level SIL2

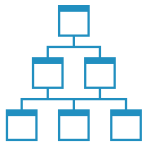
<sup>3)</sup>for TM Servo-Drives, additional gearbox types and connection systems are available in the product partner portfolio

## Leverage the benefits SIMATIC MICRO-DRIVE TM



### Compact

- With SIMATIC ET 200SP TM drives, you can optimally use the space in your control cabinet—the system is about 50% narrower than comparable distributed peripherals
- Output current 5A-rated with 20 mm width
- Expandability of the station to 64 modules
- Compact dimensions, suitable for 80 mm standard control boxes



### Seamless

- Operates perfectly with SIMATIC ET200SP controllers
- SIMATIC ET 200SP adapts to your communication standard—support of Ethernet-based field buses thanks to the MultiFieldbus Interface Module
- Seamless range of tools based upon Totally Integrated Automation (TIA)—from selection and dimensioning using the TIA Selection Tool up to commissioning and service in the TIA Portal



### Easy-to-use

- User-friendly with TO and SINASPEED function with TIA portal
- No tools needed for wiring thanks to push-in technology
- Motor supply voltage in the protective extra-low-voltage range from 24–48V DC
- Extremely efficient, no fan required (-30° C ... +60° C)

## SIMATIC MICRO-DRIVE TM is perfect for every application



### Moving

Energy-efficient and rugged solutions for basic conveyor technology with roller or chain conveyors, for hoisting gear and diverters, as well as for storage and retrieval machines that demand a high dynamic performance—and always with Safety Integrated on-board.



### Processing

The ideal solution for continuous processes that demand high-speed and torque precision such as packaging, 3D printing and all types of production machines—motion control, isochronous communication and Safety Integrated.



### Positioning

When high dynamic performance and precision are required—the precise positioning of individual axes allows several axes to be interpolated in a coordinated fashion as required in complex robotic applications.

# SIMATIC MICRO-DRIVE

## Starter kit and demo case

Starter Kit for the F-TM Servo-Drive ST system

Item number: 6BK1637-6AB00-0BU0



Special price  
with savings up to 64%

The F-TM Servo-Drive Starter Kit is a value package that includes the F-TM Servo-Drive and additional components for fast commissioning and efficient operation.

- F-TM Servo-Drive ST
- SIMATIC ET 200SP Interface Module IM 155-6PN ST
- SIMATIC ET 200SP base unit
- Motor: ebm-papst ECI42.20 24V
- Cable: KnorrTec

SIMATIC MICRO-DRIVE demo case

Item number: 6AG1067-2AA00-0AEO

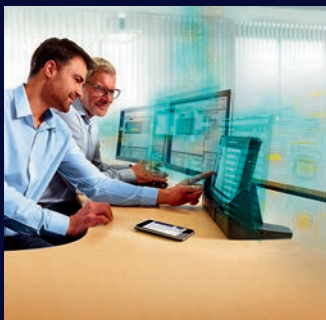


The demo case includes SIMATIC MICRO-DRIVE PDC100F, F-TM Servo-Drive ST and ebm-papst EC motor.

- PDC100F and F-TM Servo-Drive ST
- Motor: ebm-papst ECI42.20 24V with angle disc
- Cable: KnorrTec AiO2 plug-in cable
- Built into the carrier case

TIA Selection Tool—quick, easy and smart configuration

[Click here](#) > Start TIA Selection Tool



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The TIA Selection Tool is available for download as a free desktop version or as a cloud-based system.

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