



# Servo Solutions for Continuous and Pulse Duty Applications

Servo drives, servo motors and geared servo motors

Digitax ST | Unidrive M700 | Unimotor fm  
Unimotor hd | Dynabloc fm | Dynabloc hd



**CONTROL TECHNIQUES™**  
**LEROY-SOMER™**

**Nidec**  
All for dreams

# Control Techniques

## Solving your challenges

### Nidec – the world's No.1 comprehensive motor manufacturer

Nidec Corporation was founded in Kyoto, Japan in 1973 by four engineers. Today we have operations in over 40 countries through approximately 300 companies, employing 110,000 people. Our vision has always been to be the world's number 1 for everything that spins and moves. From small precision to supersized motors; we create next-generation drive technology that accommodates the needs of the society.



**110,000**  
EMPLOYEES  
WORLDWIDE



**300**  
COMPANIES  
WORLDWIDE



### Control Techniques – a global leader in motion control technology

Control Techniques have been at the front of customer-focused drive technology for over 40 years. We're dedicated to the advancement of automation. From product development at our headquarters to our 45 automation centers, we provide solutions relevant to the industries in your region. We ensure high performance, reliability and energy efficiency across every application.



## Complete servo solutions for continuous and pulse duty applications

Control Techniques offers a full range of drive and motor solutions that are tailored to work together to deliver maximum performance for both continuous and pulse duty servo applications. The Control Techniques servo solution guarantees high reliability and short lead times thanks to rigorous testing and the ability to offer late customization.

### Pulse duty

The Digitax ST servo drive and the Unimotor hd servo motor make up Control Techniques' complete servo solution for pulse duty applications where high peak torque is required.

Combining low inertia with high current overload, the Digitax ST -Unimotor hd solution delivers high performance with superior motor control, reduced cabinet size through compact yet powerful design, and flexibility via a range of options.

Control Techniques' pulse duty servo solution offers the highest performance for the most demanding applications such as flying shear, pick and place and industrial robotics.

### Continuous duty

The Unidrive M700 servo drive and Unimotor fm servo motor solution is the ideal option for continuous duty applications where continuous torque is required.

The Unidrive M700-Unimotor fm solution brings optimized system performance through an onboard Advanced Motion Controller, maximized throughput with superior motor control, and ultimate flexibility through the option to add significant inertia to the motor.

Control Techniques' continuous duty servo solution delivers high performance for all continuous duty applications such as theatre hoists, printing machines and material handling.

As well as servo control, the Unidrive M700 offers class leading induction motor performance.

### Wide range of complementary products

To complete its servo solution, Control Techniques can supply a variety of geared Dynabloc servo motors, a wide range of optional drive modules and additional equipment such as brakes, encoders and cables.



# Servo drives: Digitax ST - pulse duty

## Digitax ST

From 0.72 Nm to 18.8 Nm (56.4 Nm peak)

Digitax ST is a dedicated servo drive optimized for pulse duty. The drive is designed to meet the demands of modern manufacturers for smaller, more flexible and higher performing machinery.

## Benefits:

### Maximize throughput with superior motor control

- High bandwidth motor control algorithm for servo motors
- Optimum performance for high-dynamic applications with 300% torque overload
- Flexible speed and position feedback interface supports a wide range of feedback technologies from robust resolvers to high resolution encoders
  - Up to two encoder channels simultaneously e.g. 1 feedback encoder and 1 simulated output
  - Quadrature, SinCos (including absolute), SSI, EnDat (up to 4 Mb with EnDat 2.2 and 100 m of cable as line compensation is supported) and resolvers (SM resolver module required)
  - Simulated encoder output can provide position reference for CAMs, digital lock and electronic gearbox applications

### Reduce cabinet size with compact drive design

- Digitax ST is compact and can be flush mounted which at high current ratings can save up to 50% of cabinet space compared to competitor products
- Onboard features such as Safe Torque Off reduce the need for external components

### Flexible machine design with option modules

Digitax ST drives can be tailored for a variety of applications. Two options slots allow increasing capabilities.

- *Communications*: Ethernet, Ethernet/IP, PROFIBUS-DP, DeviceNet, CANopen, INTERbus, CNet, EtherCAT, SERCOS
- *Feedback*: Resolver, Universal Encoder, Incremental Encoder
- *Input and output*: I/O lite, I/O plus, High density I/O, I/O with real-time clock
- *Applications*: Register

### Reduce development time

- Three motion programming options:
  - CTSOft index motion
  - SyPTPro
  - PowerTools Pro
- Servo and fieldbus option modules independently certified for conformity with open standards
- 2D and 3D CAD files to make it easier and quicker to design the drive into your machine

### Quicker installation

- The top or bottom of the drive can be located onto a DIN rail
- The cable mounting system features rigid mounting and grounding brackets
- Pluggable control terminals enable looms to be easily prepared

### Reduce commissioning time

- Digitax ST can be quickly configured using the removable keypad, Smartcard and supplied commissioning software
- Autotune gets the best performance by measuring machine dynamics and automatically optimizing control loop gains
- CTScope – a realtime software oscilloscope – is supplied for tuning and monitoring



### Digitax ST is available in five variants:

- **EtherCAT** - Built-in EtherCAT connectivity
- **Plus** - With on-board APC motion controller
- **EZ Motion** - Easy-to-use motion programming
- **Indexer** - Point-to-point positioning functionality
- **Base** - Digital or analog control



Drive features	EtherCAT	Plus	EZ Motion	Indexer	Base
Two option module slots	✓	✓	✓	✓	✓
Digital and analog I/O	✓	✓	✓	✓	✓
Smartcard	✓	✓	✓	✓	✓
High speed freeze input	✓	✓	✓	✓	✓
Safe Torque Off	✓	✓	✓	✓	✓
DC bus paralleling	✓	✓	✓	✓	✓
CTSoft and CTScope commissioning software	✓	✓		✓	✓
Removable keypad (optional)	✓	✓	✓	✓	✓
RS485 PC programming port	✓	✓	✓	✓	✓
Intellectual property protection		✓		✓	
CTSoft programming		✓		✓	
Program multi-tasking		✓	✓		
PowerTools Pro programming			✓		
SyPT Pro programming with PLCopen		✓			
Drive-to-drive networking		✓			

# Servo drives: Unidrive M700 - continuous duty

## Unidrive M700

**0.7 Nm – 136 Nm (408 Nm peak)**

Unidrive M700 is an AC and servo drive optimized for continuous duty.

Unidrive M700 offers class leading servo and induction motor performance with onboard real-time Ethernet. The drive provides high performance motor control to satisfy the requirements of machine builders and high performance industrial applications.

## Benefits:

### Maximize throughput with superior motor control

- High bandwidth motor control algorithm for open and closed-loop induction, permanent magnet and servo motors
- Flexible speed and position feedback interface supports a wide range of feedback technologies from robust resolvers to high resolution encoders
  - Up to three encoder channels simultaneously e.g. 1 feedback encoder, 1 reference encoder and 1 simulated output
  - Quadrature, SinCos (including absolute), SSI, EnDat (up to 4 Mb with EnDat 2.2 and 100 m of cable as line compensation is supported) and resolvers
  - Simulated encoder output can provide position reference for CAMs, digital lock and electronic gearbox applications



### Optimize system performance with onboard Advanced Motion Controller

- M700 incorporates an Advanced Motion Controller capable of controlling 1.5 axis. The motion functions are carried out 'on the drive' so that system performance is maximized.

### Design flexible centralized and decentralized control systems

- MCI modules can be added to execute larger programs for advanced system control capability
- Machine Control Studio is an industry standard IEC61131-3 programming environment for efficient system design and configuration
- Integrated dual port Ethernet switch provides simple connectivity using standard connections
- Onboard real-time Ethernet (IEEE 1588 V2) uses RTMoE (Real Time Motion over Ethernet) to provide fast communication and accurate axis synchronization
- Three 'SI' ports are available to fit additional fieldbus, position feedback and I/O options

### Flexible machine design with options modules

Unidrive M700 can be tailored for a wide variety of demanding servo and induction applications. The drive has three option slots for System Integration modules, giving maximum flexibility

- Machine control: MCI200, MCI210, SI-Applications Plus
- Communications: SI-Ethernet, SI-PROFINET RT, SI-EtherCAT, SI-CANopen, SI-PROFIBUS, SI-DeviceNet
- Safety: SI-Safety
- Additional I/O: SI-I/O
- Feedback: SI-Encoder, SI-Universal Encoder

### Conform to safety standards, maximize uptime and reduce costs by integrating directly with safety systems

- M700 has an integrated Safe Torque Off input and can accommodate an SI-Safety module for safe motion functions





## Unidrive M700 variants: M701 and M702

### Unidrive M701

Unidrive M701 has 2 x RS485 ports onboard instead of Ethernet. Parameter sets can be ported to Unidrive M using a smartcard or Unidrive M connect. Unidrive M701 is a direct upgrade for Unidrive SP users.

### Unidrive M702 – Enhanced Safety

Unidrive M702 has an additional STO input for applications that require onboard Ethernet and dual STO to comply with SIL 3 PL<sub>e</sub>.

Feature	M700	M701	M702
Open loop v/Hz	✓	✓	✓
Open loop (RFC-A)	✓	✓	✓
Closed loop vector	✓	✓	✓
Active Front End regeneration capability	✓	✓	✓
Servo	✓	✓	✓
Sensorless open loop permanent magnet	✓	✓	✓
DC bus paralleling	✓	✓	✓
Analog inputs/outputs	3/2	3/2	0/0
Digital inputs/ outputs/ bidirectional inputs/ outputs	4/1/3	4/1/3	3/3/0
Relay output	1	1	1
Safe Torque Off	1	1	2
Ethernet	Onboard	SI Option	Onboard

# Servo Motors and gears: Unimotor hd and Dynabloc hd - pulse duty

## Unimotor hd – high dynamic servo motor for pulse duty applications

0.72 Nm to 85.0 Nm (255.0 Nm peak)

Unimotor hd is a high dynamic brushless AC servo motor range designed for use in pulse duty applications where rapid acceleration and deceleration is required.

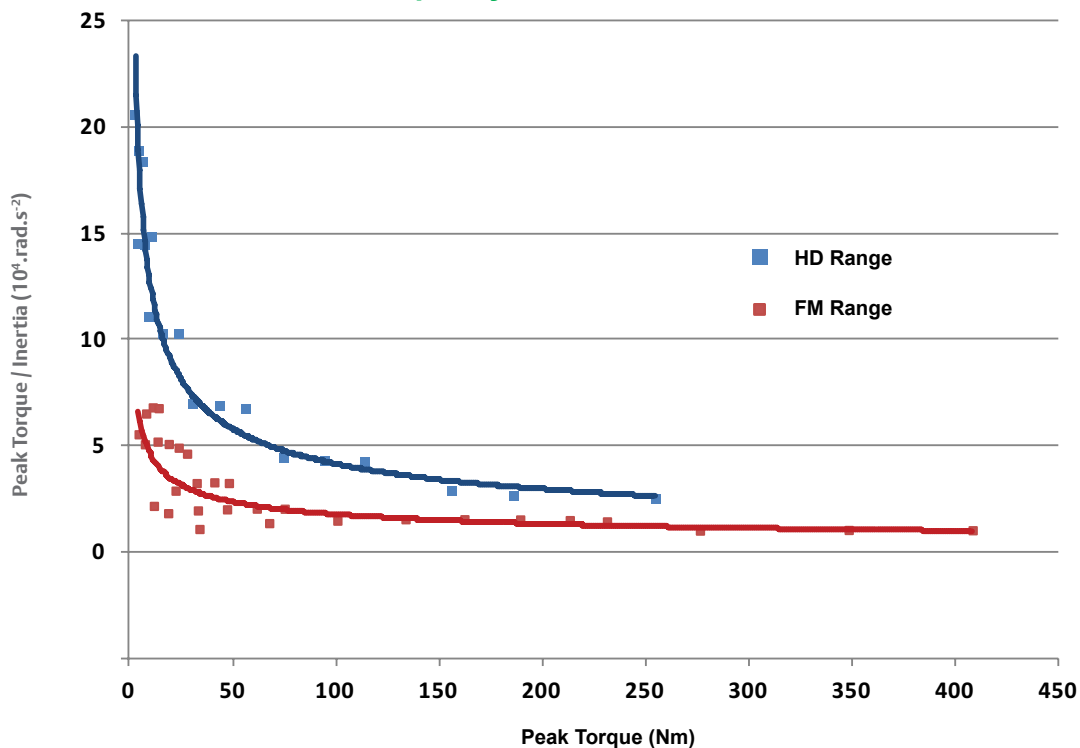
### High power to weight ratio

Unimotor hd has a high power to weight ratio, meaning that it can be easily integrated into the smallest, most demanding applications such as industrial robotics, pick & place and packaging.



The Unimotor hd family ranges from 55 mm to 190 mm

## Capacity of Acceleration







## Key features

- High torque to inertia ratio for high dynamic performance
- Compact but powerful
- High energy dissipation brakes
- IP65 conformance: sealed against water spray and dust when mounted and connected
- Segmented stator design for high power density and compactness
- Supported by rigorous testing for performance and reliability
- Winding to suit 400 V and 220 V
- Rated speeds include 1,000 rpm - 6,000 rpm depending on motor size
- Larger shafts to increase torsional rigidity for stiffer control and higher positioning accuracy

## Dynabloc hd – geared servo hd motor

Planetary or worm gearbox with reduced backlash for high dynamical applications

There are three variants of Dynabloc hd:

- **Dynabloc hd Pje:** cost-effective geared planetary servo motor for inline applications
- **Dynabloc hd Pjr:** high performance geared planetary servo motor with high rigidity and reduced backlash, for inline applications
- **Dynabloc hd Mjd:** high precision and silent worm gearbox solution with high efficiency, for right angle applications



# Servo Motors: Unimotor fm and Dynabloc fm - continuous duty



The Unimotor fm family ranges from 75 mm to 250 mm

## Unimotor fm – high performance servo motor for continuous duty applications

**1.2 Nm to 136 Nm (408 Nm peak)**

Unimotor fm is a high performance brushless AC servo motor range designed for use in demanding continuous duty applications.

### Ultimate flexibility

Unimotor fm has the option to add significant inertia. In many cases the inertia of the rotor can be doubled by adding an inertia wheel. This flexible design is ideal for inertia matching and allows the drive to be adapted to cope with a wide range of systems. It is particularly useful for high inertia loads such as printing cylinders.

### Ideal for retrofit

Unimotor fm is an ideal retrofit choice for your existing servo motor application and the motor has been designed so that users of previous generation Unimotors can easily migrate. All connector interface types and mounting dimensions remain the same within the Unimotor range.

## Key features

- High energy parking brakes
- Numerous connector variants, e.g. vertical, 90° low profile, 90° rotatable and hybrid box on frame size 250
- Variety of flange possibilities (IEC/NEMA)
- Various shaft diameters; keyed or plain
- IP65 conformance; sealed against water spray and dust when mounted and connected
- Additional inertia option available
- Supported by rigorous testing for performance and reliability
- Winding voltages of 400 V and 220 V
- Rated speeds include 1,000 rpm - 6,000 rpm depending on motor size





## Dynabloc fm - geared servo motor for continuous duty applications

Planetary, worm, helical or parallel gearbox with high torque (up to 3,000 Nm), a rugged cast iron design and easy dismantling due to shrink disk for hollow shaft output.

There are four variants of Dynabloc fm:

- **Mub:** compact geared helical servo motor solution with parallel hollow output shaft
- **Cb:** geared helical servo motor with inline output
- **Mb:** cost effective worm geared servo motor with right angle output
- **Ot:** high efficiency bevel geared servo motor with right angle output

Other planetary gearbox solutions are available on request with the fm range.





# Additional Unimotor family benefits

The Unimotor family offers faster commissioning and optimized performance, as well as a range of options for customization to suit your specific application needs.

- Increased lifetime due to a resin encapsulated stator
- Low cogging torque due to an optimized electromagnetic structure
- High overload capacity
- Faster commissioning and optimized performance due to pre-installed parameters when fitted with SinCos or Absolute encoder

## Customized and custom built motors for specific applications

Control Techniques specializes at customizing its existing motor platforms and at custom building specialized servo motors to meet specific application requirements.

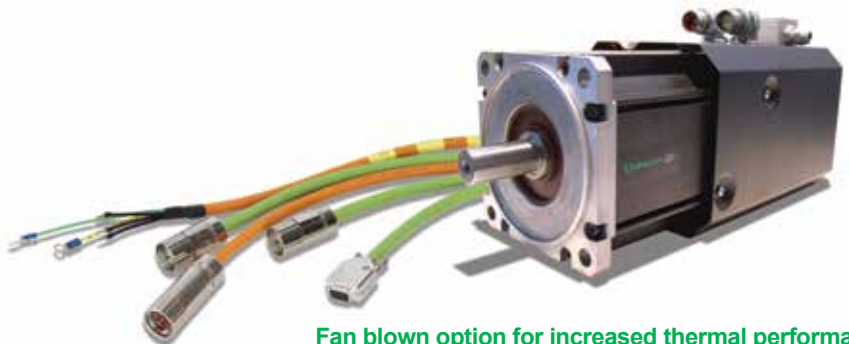
Existing motor platforms can be customized to interface with special mechanical arrangements, to have reduced profiles, or to survive in difficult/sensitive environments, for example in a food application where metal surfaces are not acceptable, the casing of the motor can be replaced with a composite.

Bespoke motors can be direct drive motors of an unusually small size, built to a special mechanical design to allow for physical integration into a machine, or integrated into battery-driven applications.

## Accessories

- Safe encoders with a large choice of feedback types
- Parking brake
- Signal and power cables for static and dynamic applications
- Cable connectors
- Fan boxes

*An example of a customized solution which integrates all functions of a conventional power train, including a high-end electric motor, into a wheel.*



Fan blown option for increased thermal performance

## Typical servo applications

Control Techniques' servo products have been proven in thousands of applications worldwide. The company has a global network of expert servo engineers who specialize in developing solutions tailored to the specific requirements of customers. For new electric control systems or retrofit projects, Control Techniques can provide fully engineered turnkey solutions. By working with a single supplier, Control Techniques acts as a one-stop shop for all your system and support requirements including specification, design, build and commissioning.

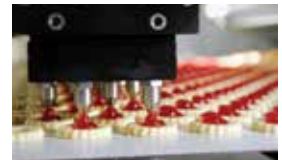
### Automotive

Automotive applications often include industrial robots. Control Techniques' servo solutions meet the needs of industrial robots: high dynamics, high accuracy and a wide power range.



### Food and beverage

Hygiene is vital in the food industry where availability and fast changeovers are key. Control Techniques' servo drive and motor solutions offer the flexibility and reliability to meet the most demanding food applications.



### Packaging and labelling

Packaging and labelling machines achieve fast throughput with highly dynamic cycles. Low inertia motors and high overload drives from Control Techniques deliver the high performance required.



### Printing

Typical servo printing applications include controlling presses and rollers. Control Techniques' high performance servo products have exact positioning control to ensure high print quality.



### Rubber and plastics

Servo motors are widely used in all-electric or hybrid injection molding machines. On all-electric machines each movement is servo driven, this technology offers significant energy savings, increased productivity, reduced noise level, higher precision and lower maintenance requirements compared to hydraulic machines.



### Textiles

Textile machines have multiple axes requiring decentralised control, high dynamics and high accuracy. Control Techniques servo solutions exceed the toughest demands of the textile industry.



### Entertainment

Many entertainment applications, such as theatres, require silent operation and high reliability for safety. The Control Techniques servo solution is in use in theatres and concerts around the world.



# Servo Solutions: global facilities and resources



## Express Availability: Quick reaction to critical customer needs

Our Express Availability service helps customers ensure continuity of production and implement expansion, while minimizing spares and stock requirements onsite. A large range of motors, drives, options and accessories is available to be shipped directly from our regional facilities to customer premises with short lead times, starting from same day availability. Our production and regional distribution centers have been organized to meet critical customer requirements in many countries.



## A strong union that benefits our customers worldwide

Through our integrated organization, we have an enhanced global presence with 5,500 employees. Our combined local support & services provide:

 5,500 employees



### Global network of automation centers and distributors

Providing excellent customer support for any product, automation solutions or service requirements



### 23 Manufacturing sites

Producing a comprehensive range of high quality products, optimized for industry-specific customer requirements



### 8 Engineering and Design facilities

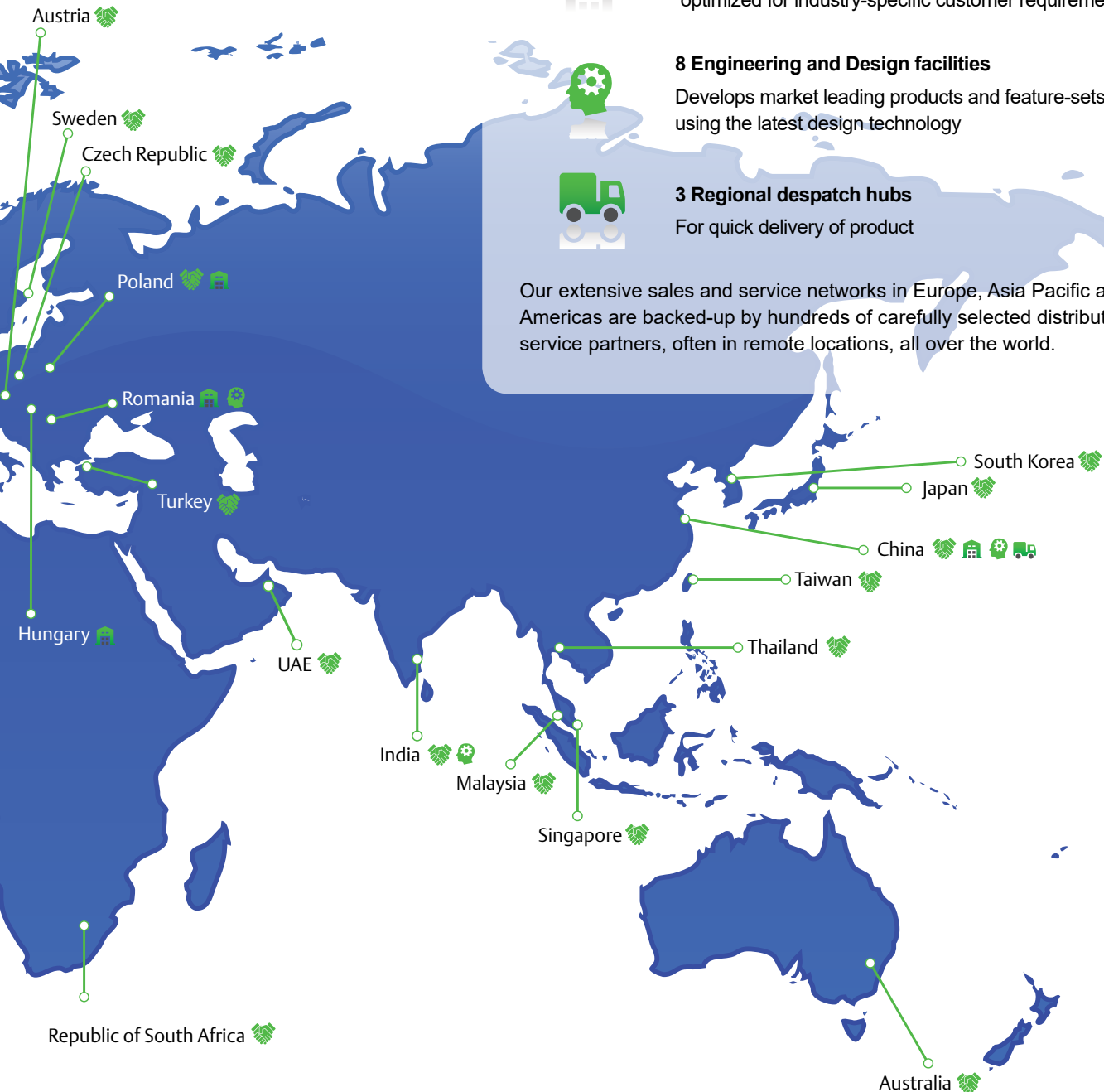
Develops market leading products and feature-sets using the latest design technology



### 3 Regional despatch hubs

For quick delivery of product

Our extensive sales and service networks in Europe, Asia Pacific and the Americas are backed-up by hundreds of carefully selected distributors and service partners, often in remote locations, all over the world.



Note that many countries have more than one of the facilities represented by the icons

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