SAFETY & AUTOMATION MADE EASY

- Safety Monitors for Speed, Standstill and Direction of Rotation
- Level Converters, Splitters and Switches and Signal Converters for Sensors and Encoders
- Autonomous Motion Controllers
- Electronic Counters, Frequency Meters, Process Displays and Timers
Safety Devices

The motrona range of SIL3 / PLe certified safety devices are intended to detect and monitor machine movements. The purpose is to protect the operator and machine by analyzing speed-, direction-, standstill and position and comparing with pre-selected limits.

For the requirements of increased security criteria according to DIN 61508 or EN ISO 13849 our SIL3 / PLe certified DS series offer maximum reliability and safety.

With an integrated analog output an additional signal is supplied that can be used as feedback for motion controllers.

All these devices and monitors are developed for an easy installation in control cabinets and by the flexible design they are suitable for retrofitting or inclusion in the existing design of an OEM equipment.
Safety Motion Monitor

**DS230:** Multi-functional inputs, signal splitter function  
**DS236:** Multi-functional inputs

The DS series is suitable for safety-related monitor tasks, e.g. overspeed, underspeed, standstill or rotative direction for complex machine applications.

- SIL3 / PLe certification
- Safety functions equivalent to EN 61800-5-2
- 2 encoder inputs with format SIN+, SIN-, COS+, COS-[1 Vss]
- 2 pulse inputs with format A, /A, B, /B [RS422]
- 2 pulse- or control inputs with format A, B, 90° [HTL / PNP] (for rotary encoder, proximity switches or commands)
- Input frequency up to 500 kHz
- Forced-guided redundant output relay (NO)
- 4 control outputs with push-pull characteristic, short-circuit-proof, [HTL], each inverse and redundant
- Safety related 14 bit analog output for 4...20 mA (scalable)
- Power supply 18...30 V
- Compact housing for 35 mm mounting top hat rail (according to EN 60715)
- Setup via USB port by operator software or plug-in display and programming unit BG230 (accessories)

**DS240:** Input for certified SinCos encoders, signal splitter  
**DS246:** Input for certified SinCos encoders

Performance as DS230 or DS236, but with different input configuration.

- 1 encoder input with format SIN+, SIN-, COS+, COS-[1 Vss]
- 2 control inputs [HTL / PNP]

**BG230**

Plug-In Display and Programming Unit (Optional)

For simple parameterization of Motrona safety devices.

- Editing, saving and loading of parameters
- Individual scalable process or speed indicator as well as dual channel frequency indicator for visualization of the encoder frequency
- 1.54" OLED touchscreen with intuitive navigation
- Setup via USB port by operator software
**Safety - Monitors for Speed, Direction of Rotation & Standstill**

**DZ260 - 269**

*Speed Monitors for Incremental Encoders and Sensors*

**DZ260:** 3 output relays and 1 analog output  
**DZ266:** 1 analog output  
**DZ267:** 3 output relays

Fast response speed monitoring device with a wide range of programmable monitoring functions, e.g. overspeed, underspeed (incl. start-up suppression), standstill or rotative direction.

- Pulse input with format A, B, 90° [HTL] or A, /A, B, /B [RS422], also possible for single channel  
- Input frequency up to 1 MHz  
- Power supply 17 ... 30 Vdc  
- Snap-on housing for top hat rail (according to EN 60715)  
- LCD display, backlit  
- Setup via keys or via PC by serial RS232 interface

**DZ210**

*Direction and Standstill Monitor*

Fast, reliable standstill and speed monitor with variable settings, a high input frequency range and a very fast response time (< 1 ms at f > 1 kHz).

- Pulse input with format A, B, 90° [HTL] or A, /A, B, /B [RS422], also possible for single channel  
- Input frequency up to 500 kHz  
- 2 output relays with potential-free change-over contact (forward, reward and zero motion)  
- Power supply 17 ... 30 Vdc  
- Snap-on housing for top hat rail (according to EN 60715)  
- DIL switch for setup of input characteristic and definition of standstill
The MS640 motion monitor has been designed for monitoring and control of admissible and impermissible operating conditions on machinery systems. Additionally to its speed monitoring functions, the unit provides comparison between peripheral motion, motor motion and actual operator commands. The control functions include all actual values of two independent encoders (speeds, directions of rotation, standstill, positions and differential positions between both encoders).

- High level of external safety (Recognition of electrical or mechanical errors in the machinery / sensor systems / wirings etc.)
- High level of internal safety (detection of internal errors and failures of the device components)
- Pulse input with format A, B, 90° [HTL] or A, A, B, /B [RS422]
- 4 control inputs for PNP / NPN / Namur signals [10 ... 30 Vdc]
- 6 logical inputs for PNP signals [10 ... 30 Vdc]
- 4 fast transistor outputs with push-pull characteristic, short-circuit-proof [5 ... 30 Vdc]
- 4 forced-guided redundant output relays with potential free change-over contact
- Serial interface RS232 and RS485
- Power supply 24 Vac and 17 ... 40 Vdc
- Compact norm panel housing
- 6 digits LED display with 15 mm height
- Display range -199999 ... 999999
- Setup by keys or PC via serial RS232 interface
Achieved by Signals

Signal Converters

Our signal converters are characterized by a fast conversion time, a wide bandwidth and maximum flexibility classed among the world’s best in industrial automation.

For requirements demanding safe processing and reliable transmission of encoder and sensor signals our frequency dividers, frequency multipliers, pulse dividers and level converters have no peers.

Converters from Motrona convince by easy handling and simple set-up of parameters whereby scaling is performed by DIL switches or TEACH buttons.

Programmable linearization, digital filters or window functions are further features of our complex modules.
Isolated Universal Level Changer

This converter allows the conversion of incremental signals into pulse signals with a static direction output and vice versa, as well as a potential separation of input and output. An external supplied DC voltage determines the level of the output signals.

- 1 pulse input with format A, B, Z [HTL] or A, /A, B, /B, Z, /Z [RS422]
- Input frequency up to 500 kHz
- 1 pulse output with format A, /A, B, /B, Z, /Z [RS422, HTL]
- Power supply 5 … 30 Vdc
- Snap-on housing for top hat rail (according to EN 60715)

Level Changer and Encoder Splitter

Universal encoder interface for level conversion, distribution and electronic switching of incremental encoder signals.

- 2 pulse inputs with format A, B, Z [HTL] or A, /A, B, /B, Z, /Z [RS422]
- Input frequency up to 250 kHz for asymmetrical and up to 1 MHz for symmetric signals
- 2 control inputs for HTL / PNP signals [10 … 30 Vdc]
- 2 output channels with format A, B, Z [HTL] or A, /A, B, /B, Z, /Z [RS422], each output adjustable separately
- Power supply 12 … 30 Vdc
- Snap-on housing for top hat rail (according to EN 60715)
Encoder Splitters with 4 or 8 Outputs

**GV460**: 8 outputs, extended temperature range -20°C ... +60°C
**GV470**: 8 outputs, industrial temperature range 0°C ... +50°C
**GV480**: 8 outputs, extended temperature range -20°C ... +60°C and full electrical isolation of all channels and power supply
**GV461, GV471, GV481**: Performance as above, but with 4 outputs each

Very compact and extremely versatile distributor for incremental encoder signals and measurement systems. Available with 4 or 8 outputs. The outputs can be cascaded to n x 4 resp. n x 8 outputs (without loss of a regular encoder output).

- 2 pulse inputs with format A, B, Z [HTL] or A, /A, B, /B, Z, /Z [RS422]
- Select input for PNP signals [10 ... 30 Vdc]
- Input frequency up to 200 kHz for HTL or 500 kHz for RS422 / TTL
- 4 or 8 push-pull outputs, formats corresponds to the input signals, but with individual assignment for each output
- Power supply 10 ... 30 Vdc
- Snap-on housing for top hat rail (according to EN 60715)
- LEDs for indication of the input pulses

Encoder Splitters with 4 or 8 Outputs

**SV210**: 2 SinCos outputs and 2 RS422 / TTL / HTL outputs

The signal distributors SV210 and SV211 distribute sinusoidal signals from SinCos encoders error-free to several devices.

- 1 encoder input with format SIN+, SIN-, COS+, COS-, REF+, REF- [1 Vss]
- Maximum sinus input frequency 500 kHz with max. 200 ns conversion time
- 4 / 2 signal outputs with format SIN+, SIN-, COS+, COS-, REF+, REF- [1 Vss]
- 2 pulse outputs with format A, /A, B, /B, Z, /Z [RS422, TTL, HTL] (for SV210)
- Power supply 17 ... 30 Vdc
- Snap-on housing for top hat rail (according to EN 60715)
**Programmable Encoder Frequency Divider**

Dual channel frequency divider, programmable for error-free division of sensor signals in the format A, B, 90° with ratios from 1:1 up to 1:4096. A programmable direction format and a separate adjustable marker pulse divider are also included.

- Pulse input with format A, /A, B, /B, Z, /Z (RS422)
- Pulse input with format A, B, Z [HTL]
- 4 control inputs for PNP signals [10 ... 30 Vdc]
- Pulse output with format A, /A, B, /B, Z, /Z [RS422]
- Pulse output with format A, B, 90° [HTL]
- Power supply 18 ... 30 Vdc
- Snap-on housing for top hat rail (according to EN 60715)
- Setup by DIL-switches

**Encoder Pulse and Frequency Multiplier**

Multiplies incoming signals from incremental encoders and measuring systems with a proportional and a reciprocal factor (each adjustable from 0.0001 ... 9.9999). Accurate pulse multiplication taking into account the direction of rotation, therefore no cumulative pulse errors can occur. Further features are available, e.g. programmable marker pulse distance.

- Pulse input with format A, B, 90° [HTL] or A, /A, B, /B, Z, /Z [RS422]
- 4 control inputs for PNP signals [10 ... 30 Vdc]
- Pulse output with format A, /A, B, /B, Z, /Z and push-pull characteristic, [5 ... 30 Vdc]
- Input and output frequency up to 1 MHz
- Power supply 11 ... 30 Vdc
- Snap-on housing for top hat rail (according to EN 60715)
- LCD display, backlit
- Setup via keys, RS232 or USB-Port

**Speed Monitors for Incremental Encoders and Sensors**

**DZ260**: 3 output relays and 1 analog output
**DZ266**: 1 analog output
**DZ267**: 3 output relays

Fast response speed monitoring device with a wide range of programmable monitoring functions, e.g. overspeed, underspeed (incl. start-up suppression), standstill or rotative direction.

- Pulse input with format A, B, 90° [HTL] or A, /A, B, /B [RS422], also possible for single channel
- Input frequency up to 1 MHz
- Power supply 17 ... 30 Vdc
- Snap-on housing for top hat rail (according to EN 60715)
- LCD display, backlit
- Setup via keys or via PC by serial RS232 interface
Interface - Encoder Signal Converters

**Signal Converter: Frequency - Analog / Serial**

- Converts a single frequency, as well as a sum, difference, product or ratio of two frequencies into an analog and a serial format. Unsteady input frequencies can be smoothed by activating a selectable average filter.
- Pulse inputs with format A, B, 2 x 90° [HTL] or A/, A, B/, B [TTL / RS422]
- Input frequency up to 1 MHz [RS422] or 200 kHz [HTL]
- Scalable 14 bit analog output for ±10 V or 0/4 ... 20 mA
- Output polarity ± follows rotation direction (phasing A / B)
- Power supply 18 ... 30 Vdc
- Snap-on housing for top hat rail (according to EN 60715)
- Serial RS232 / RS485 interface

**Signal Converter: Incremental Counter - Analog / Serial**

- Suitable to convert counting process of an incremental counter to an analog output and also converts sum A + B and difference A - B.
- Pulse inputs with format A, B, 2 x 90° [HTL] or A/, A, B/, B [TTL / RS422]
- Input frequency up to 1 MHz [RS422] or 200 kHz [HTL]
- Scalable 14 bit analog output for ±10 V or 0/4 ... 20 mA
- Output polarity ± follows rotation direction (phasing A / B)
- Power supply 18 ... 30 Vdc
- Snap-on housing for top hat rail (according to EN 60715)
- Serial RS232 / RS485 interface

**Signal Converter: SSI - Analog / Serial**

- Suitable for sensors and absolute encoders with SSI interface 6 ... 25 bit, binary or Gray code. Selectable SSI master or slave mode and programmable concentricity functions, bit blanking and many more.
- SSI input with format DATA+, DATA-, CLOCK+, CLOCK- up to 25 bit
- Clock frequency 100 Hz ... 1 MHz
- Scalable 14 bit analog output for ±10 V or 0/4 ... 20 mA
- Output polarity ± follows rotation direction
- Power supply 18 ... 30 Vdc
- Snap-on housing for top hat rail (according to EN 60715)
- Setup via teach function and operator software
- Serial RS232 / RS485 interface

**FU252**

![FU252 Image]

W x H x D = 40 x 80 x 90 mm

**ZU252**

![ZU252 Image]

W x H x D = 40 x 80 x 90 mm

**IV251**

![IV251 Image]

W x H x D = 40 x 80 x 90 mm
**Signal Converter: SSI / RS232 - Parallel**

Suitable for conversion of SSI data or serial RS232 data into a parallel data format (BCD, binary or Gray). Programmable concentricity functions, bit rate, bit blanking and other useful additional functions. Master or slave operation possible.

- SSI input with format DATA+, DATA-, CLOCK+, CLOCK- up to 25 Bit
- Clock frequency up to 1 MHz
- Control input (hold) for PNP signals [10 ... 30 Vdc]
- 25 bit parallel output with push-pull characteristic with format BCD, binary or Gray-Code
- Power supply 18 ... 30 Vdc
- Snap-on housing for top hat rail (according to EN 60715)
- Serial RS232 input

**Signal Converter: Analog - Digital / Serial / SSI**

The UZ210 unit converts analog signals into a frequency or a position as incremental signal or absolute SSI value. Essential features are a variety of functions, a free programmable U / f characteristic, ability to generate repeating frequency processes, motor potentiometer function, programmable zero pulse and more.

- Scalable 14 bit analog input for ±10 V or 0/4 ... 20 mA
- 4 control inputs for PNP signals [10 ... 30 Vdc]
- Pulse output with format A, B, 90° [HTL] or A, /A, B, /B, Z, /Z [RS422]
- SSI output with format DATA+, DATA-, CLOCK+, CLOCK- up to 25 bit
- Power supply 12 ... 30 Vdc
- Snap-on housing for top hat rail (according to EN 60715)
### Signal Converter: Sincos - Incremental

Suitable for converting sinusoidal encoder signals into incremental output pulses. Further features e.g. adjustable multiplier, interpolation factor, divider and glitch filter are available.

- Encoder input with format SIN+, SIN-, COS+, COS-, REF+, REF-, [1 Vss]
- Control input „Error Release“ for PNP signals [10 ... 30 Vdc]
- Input frequency up to 400 kHz
- Pulse output with format A, /A, B, /B, Z, /Z [RS422]
- Pulse output with format A, B, 90° [HTL]
- Output frequency up to 100 kHz [HTL], up to 4 MHz [RS422]
- Control output „Error“ with push-pull characteristic, short-circuit-proof, [5 ... 30 Vdc]
- Power supply 18 ... 30 Vdc
- Snap-on housing for top hat rail (according to EN 60715)

### Signal Converter: Parallel - Serial

Converts parallel BCD, binary or Gray code data into serial RS232 / RS485 formats. The converter also has 3 selection inputs for serial transmission up to 8 different target units.

- 20 bit parallel input with format BCD, binary or Gray-Code
- Input frequency: fast encoder 5 kHz, auto-transmit / data logging 0.5 kHz
- 4 status outputs, with push-pull characteristic, short-circuit-proof [5 ... 30 Vdc]
- Power supply 10 ... 30 Vdc
- Snap-on housing for top hat rail (according to EN 60715)
- Serial RS232 / RS485 interface
Innovative Optical Fiber Modules

- LW213 / LW214: Send-/receive module for RS422 / HTL signals (up to 3000 m)
- LW215 / LW216: Send-/receive module for RS422 / HTL signals (up to 2000 m)
- LW217 / LW218: Send-/receive module for SSI absolute encoder (up to 2000 m)

The fiber optic modules can transmit encoder signals reliably over long distances. The transmission via fiber optic cable is resistant to extremely strong electromagnetic fields and interferences.

Depending on the version the following signal formats are available:

- 4 independent input channels with format A, B, C, D [HTL] or A, /A, B, /B, C, /C, D, /D [RS422], also possible for single channel
- 4 output channels with format A, B, C, D [HTL] or A, /A, B, /B, C, /C, D, /D [RS422]
- 1 SSI input / output channel [RS422] with format DATA+, DATA-, CLOCK+, CLOCK-
- 1 Error input (LW217) or 1 open-drain-output in SSI version (LW218)
- Power supply 10 ... 30 Vdc
- Snap-on housing for top hat rail (according to EN 60715)

Profibus Gateway

Universal gateway for connecting Motrona devices to a Profibus DP-V1. Allows easily the PROFIBUS connection of all Motrona counters, indicators, converters and motion controllers that are equipped with a serial interface (DRIVECOM protocol).

- Power supply 10 ... 30 Vdc
- Snap-on housing for top hat rail (according to EN 60715)
Precision Movements

Motion Control

Our Motion Controllers are implemented in numerous applications in the field of modern drive technology.

The firmware library includes optimized routines for applications such as drive synchronization, index or intermitted printing, label-printing, rotary cutters, flying shears and eccentric scissors.

As other Motrona products, the set-up procedures are simple and intuitive. The highly integrated Motion Controllers feature by a very high cut-off frequency up to 2 MHz, a very flexible bus architecture as well as a variable input configuration of encoders and sensors.

A unique feature of the MC800 drive controller is the integrated tandem drive controller which enables achieving the acceleration requirement of a slave axis by distributing the power on two independent drives.
High-Performance Synchronizers for One Slave Axis

**BY340**: Speed ratio adjustable by keypad
**BY641**: Speed ratio adjustable by thumbwheel switch on front. 4 Relay outputs with potential free change-over contacts

These single-axis controllers with excellent control characteristics are suitable for use in smaller systems with tight cost specifications. Applications are variable speed drives with an analog set point input.

Essential features of the wide function range are an absolute angle and position synchronization as well as a speed synchronization with adjustable ratios and phase angles. The trim and index functions allow the adjustment of the relative position between the axes.

- 2 pulse inputs with format A, B, 90° [HTL] or A, /A, B, /B [RS422]
- 4 control inputs for PNP / NPN / Namur signals [10 ... 30 Vdc]
- Input frequency up to 300 kHz
- 4 fast transistor outputs, with push-pull characteristic, short-circuit-proof [5 ... 30 Vdc]
- Scalable 14 bit analog output for ±10 V or 0/4 ... 20 mA
- Loop time approx. 250 µs
- Power supply 24 VAC and 17 ... 40 Vdc
- Compact norm panel housing
- Top hat rail mounting by using SM300 support brackets (option)
- Setup via keys or via PC by serial RS232 interface
- PROFIBUS connection via Motrona gateway PB251

**BY340 / BY641**

W x H x D = 96 x 48 x 140 mm

Variant 641 with thumbwheel switches
W x H x D = 96 x 96 x 140 mm

Synchronizers for One Slave Axis

**Motion - Synchronizers**
**Stand-Alone Single Axis Controller**

**PS340:** Incremental position adjustable by keypad  
**PS641:** Incremental position adjustable by thumbwheel switch on front. 4 Relay outputs with potential free change-over contacts

The position controller of the series PS340 and PS641 are stand-alone solutions for smaller machines and offer an excellent price-performance ratio. A very short position loop time and intelligent calculation algorithms ensure the best precision for uniaxial applications with electric or hydraulic 4-Q drives, equipped with a ±10V set point input.

An extremely smooth motion with minimum stress for all mechanical parts due to the self-optimized polynomial motion profile and different operation modes, e.g. absolute and relative (incremental) positions or loop mode are further features of these devices.

- 2 pulse inputs with format A, B, 90° [HTL] or A, /A, B, /B [RS422]  
- 4 control inputs for PNP / NPN / Namur signal [10 ... 30 Vdc]  
- Input frequency up to 300 kHz  
- 4 fast transistor outputs, with push-pull characteristic, short-circuit-proof [5 ... 30 Vdc]  
- Scalable 14 bit analog output for ±10V or 0/4 ... 20 mA  
- Loop time approx. 250 μs  
- Power supply 24 Vac and 17 ... 40 Vdc  
- Compact norm panel housing  
- Top hat rail mounting by using SM300 support brackets (option)  
- Setup via keys or via PC by serial RS232 interface  
- PROFIBUS connection via Motrona gateway PB251

**Variant 641 with thumbwheel switches**  
W x H x D = 96 x 96 x 140 mm

**Single Axis Controllers**
Dedicated Controller for Flying Saws and Shears

**FS340:** Cutting length adjustable by keypad
**FS641:** Cutting length adjustable by thumbwheel switch on front. 4 Relay outputs with potential free change-over contacts

These units are specifically matched to the requirements of flying saws and shears and provide maximum cutting performance and precision combined with high protection for the mechanical parts. A short position control cycle and intelligent calculation algorithms ensure maximum precision.

These controllers are used to cut endless material, which cannot be stopped during the cutting operation.

- 2 pulse inputs with format A, B, 90° [HTL] or A, /A, B, /B [RS422]
- 4 control inputs for PNP / NPN / Namur signal [10 ... 30 Vdc]
- Input frequency up to 300 kHz
- 4 fast transistor outputs, with push-pull characteristic, short-circuit-proof [5 ... 30 Vdc]
- Scalable 14 bit analog output for ±10 V or 0/4 ... 20 mA
- Loop time approx. 250 μs
- Power supply 24 VAC and 17 ... 40 Vdc
- Compact norm panel housing
- Top hat rail mounting by using SM300 support brackets (option)
- Setup via keys or via PC by serial RS232 interface
- PROFIBUS connection via Motrona gateway PB251
**Dedicated Controller for Rotary Cutters and Printing Rolls**

**CT340**: Cutting length adjustable by keypad

**CT641**: Cutting length adjustable by thumbwheel switch on front. 4 Relay outputs with potential free change-over contacts

The precision controller series CT340 and CT641 are suitable for application such as rotation cutters and rotating printing, stamping or sealing rollers. These units are used to cut or attend endless materials, which cannot be stopped during the operation processes.

The short control response ensures a high dynamic performance and precise cutting even during speed changes. A high protection for the mechanical parts, as well as a short position loop time and intelligent calculation algorithms are further advantages of the CT series.

- 2 pulse inputs with format A, B, 90° [HTL] or A, /A, B, /B [RS422]
- 4 control inputs for PNP / NPN / Namur signal [10 ... 30 Vdc]
- Input frequency up to 300 kHz
- 4 fast transistor outputs, with push-pull characteristic, short-circuit-proof [5 ... 30 Vdc]
- Scalable 14 bit analog output for ±10 V or 0/4 ... 20 mA
- Loop time approx. 250 μs
- Power supply 24 Vac and 17 ... 40 Vdc
- Compact norm panel housing
- Top hat rail mounting by using SM300 support brackets (option)
- Setup via keys or via PC by serial RS232 interface
- PROFIBUS connection via Motrona gateway PB251

**CT340**: Cutting length adjustable by keypad

**CT641**: Cutting length adjustable by thumbwheel switch on front. 4 Relay outputs with potential free change-over contacts

The precision controller series CT340 and CT641 are suitable for application such as rotation cutters and rotating printing, stamping or sealing rollers. These units are used to cut or attend endless materials, which cannot be stopped during the operation processes.

The short control response ensures a high dynamic performance and precise cutting even during speed changes. A high protection for the mechanical parts, as well as a short position loop time and intelligent calculation algorithms are further advantages of the CT series.

- 2 pulse inputs with format A, B, 90° [HTL] or A, /A, B, /B [RS422]
- 4 control inputs for PNP / NPN / Namur signal [10 ... 30 Vdc]
- Input frequency up to 300 kHz
- 4 fast transistor outputs, with push-pull characteristic, short-circuit-proof [5 ... 30 Vdc]
- Scalable 14 bit analog output for ±10 V or 0/4 ... 20 mA
- Loop time approx. 250 μs
- Power supply 24 Vac and 17 ... 40 Vdc
- Compact norm panel housing
- Top hat rail mounting by using SM300 support brackets (option)
- Setup via keys or via PC by serial RS232 interface
- PROFIBUS connection via Motrona gateway PB251
MC700 is a universal and proven 1 to 4 axes motion controller, which can be cascaded for additional axes. The actual function of this controller-hardware is assigned by loading a specific firmware. Corresponding application firmware is available on our product CD respectively on the Motrona homepage for download. Mathematically optimized motion profiles and extremely short position control cycles guarantee highest accuracy and maximum speed.

In addition to the standard application as a multi-axis synchronizer, this controller is suitable especially for control tasks of motion profiles with flying material processing and for numerous movements of printing machines, packaging machines and winding equipment.

- 4 pulse inputs with format A, /A, B, /B [RS422]
- 4 scalable 12 bit analog inputs for ±10 V or 0/4 ... 20 mA
- 8 control inputs for PNP signals [10 ... 30 Vdc]
- 4 scalable 12 bit analog outputs for ±10 V or 0/4 ... 20 mA
- Short loop time (depending on application)
- Power supply 18 ... 35 Vdc
- Snap-on housing for top hat rail (according to EN 60715)
- Setup via windows operator software (free of charge)
- On-board interfaces: RS232 and CANopen

**Standard Firmware and Available Applications**

**BY701**  
**Firmware for Synchronization of Drives**  
With the use of BY701 firmware, the MC700 controller provides excellent solutions with all kinds of multi-axes synchronizing applications. Numerous possibilities for control of relative phase, position, index and print mark evaluation are available.

**FS701**  
**Firmware for Flying Saws, Shears, Punchers, Etc.**  
With the use of FS701 firmware, the MC700 controller provides excellent solutions with all kinds of flying cut-to-length systems as well as with applications like labeling, printing punching, sealing, etc.

**CT703**  
**Firmware for Rotating Cross Cutters**  
Rotary cutters and other rotary applications require high dynamics, precise cuts and short position control cycles. These requirements will be fulfilled by using the CT703 firmware and the MC700 motion controller.

Typical applications are intermittent or rotary operations like cutting, perforating, printing, sealing, adhesion, applying, labeling and many more.

**CT701**  
**Firmware for Eccentric Material Processing**  
The Firmware CT701, in combination with the controller MC700 offers maximum processing performance with guillotines or eccentric shears in cut-to-length-lines.

**TB701**  
**Firmware for Tubular Bag Packing Machine**  
Due to highly dynamic motion profiles, the combination of firmware TB701 and MC700 controller works with a high level of precision and is optimized for tubular bag packaging machines (e.g. "pillow packaging").
MC800

The MC800 is a universal motion controller, which serves for sophisticated control tasks in today’s machine engineering and drive technology. This motion controller can cover a wide application range due to the function features and settings of the equipped control firmware.

Typical control applications are e. g. drive synchronization of a master and slave axis, index and print mark evaluation, rotating cross cutters, flying and eccentric shears, label printing machines and many more. The unique feature of the MC800 is the integrated tandem drive controller. This enables the reach of the acceleration requirements on heavy loads by splitting the necessary power to two independent drives.

Further features are the flexible and combinable input configuration for different types of encoders, measuring systems and sensors, the high frequency range up to 2 MHz and the adaptive interface architecture.

Due to an extremely short position loop time of 250 μs, a self-optimizing polynomial motion profile, an excellent accuracy - even at high line speeds, the MC800 ensures a very smooth motion with maximum protection of the mechanical parts.

Standard Firmware and Available Applications

BY801  
**Firmware for Synchronization of Drives**
With the use of BY701 firmware, the MC800 controller provides excellent solutions with all kinds of multi-axes synchronizing applications. Numerous possibilities for control of relative phase, position, index and print mark evaluation are available.

Compared to the BY701 firmware, a significantly higher dynamism is achieved by using the combination BY801 firmware with MC800. In addition, processing to various sensor systems and fieldbus architectures is possible.

FS801  
**Firmware for Flying Saws, Shears, Punchers, Etc.**
By using this application firmware, the MC800 controller is equipped for motion control tasks with typical “on-the-fly-processing” machines (e. g. sawing, cutting, punching, drilling, etc.).

Compared to the FS701 firmware, a significantly higher dynamism is achieved by using the combination FS801 firmware with MC800. In addition, processing to various sensor systems and fieldbus architectures is possible.

CT801  
**Firmware for Rotating Cross Cutters**
Rotary cutters and other rotary applications require high dynamic, precise cuts and short position loop time. These requirements will be complied by using the CT801 firmware and the MC800 motion controller.

Typical applications are intermittent or rotary operations like cutting, perforating, printing, sealing, adhesion, labeling and many more.

Compared to the CT703 firmware, a significantly higher dynamism is achieved by using the combination CT801 firmware with MC800 hardware. In addition, an adaptation to a variety of sensor systems and fieldbus architectures is possible.

Special highlight of this firmware is the integrated tandem drive controller which enables achieving the acceleration requirement of a slave axis by distributing the power on two independent drives.
Precise Indication of Linear and Rotating Processes

Digital Indicators

Our display and evaluation systems ensure a precise monitoring of analog, pulse and absolute value information. The significant parameters for rotating and linear processes are precisely monitored, evaluated and displayed.

The electronic and pulse counters, process and position indicators distinguish themselves by offering a high dynamic range, short response times and an input frequency up to 1 MHZ.

Our display devices are able to perform complex data manipulation such as summing, difference, filtering, linearization and totalization and comparison between input variables.

Additionally, the digital displays provide up to four preset values for relay and transistor outputs.

The set-up procedures are straightforward, using an intuitive menu system for entry and adjustment of parameters. Display devices equipped with a serial interface also allow operation and configuration using our OS user software.
Small-Sized Position or Event Counter

Multi-functional counter in a compact design. Including programmable pulse factor, power down memory, as well as numerous programmable operating modes, e.g. position counter, event counter or sum / differential counter.

- Pulse input with format A, B, 90° [HTL]
- Static input for Set / Reset [HTL]
- Input frequency up to 20 kHz
- Power supply 24Vdc
- Miniature norm panel housing
- 6 digits LED display with 8 mm height
- Display range -199999 ... 999999

Small-Sized Tachometer for Diverse Measurement Tasks

Programmable indicator for reliable measurement of RPM, speed and frequency.

- Single channel pulse input [HTL]
- Input frequency up to 20 kHz
- Programmable input filter for mechanical input contacts
- Power supply 24Vdc
- Miniature norm panel housing
- 6 digits LED display with 8 mm height
- Display range -199999 ... 999999

Frequency Counter, Tachometer and Speed Indicator with Touchscreen and Graphic Display

DX350: Basic unit with HTL inputs (A, B), 3 control inputs
Option AO350: 16 bit analog output, 4 control outputs, serial RS232 interface

- Multifunctional unit with several operating modes, e. g. speed or position indicator, process meter, counter, timer or stopwatch
- Universal HTL inputs for encoders / sensors with NPN / PNP / NAMUR characteristic
- Bright and high-contrast display with event-dependent color variations
- Emulation of a 7-segment display inclusively icons and units
- Intuitive and easy parameterization by plain text and touchscreen
- 24V auxiliary output for encoder supply
- Input frequencies up to 250 kHz
- Linearization with 24 control points
- Numerous features, e. g. scaling, filtering, start-up suppression
- 3.78 x 1.89 inch norm panel housing and IP65 protection
High-Performance Counter Units

Fast counter unit with a wide range of functions and operating modes (e.g. single counter, sum and differential counter, measurement of actual cutting lengths and more. Programmable linearization for each encoder channel. Different versions with relay outputs and thumbwheel switches are available.

- 2 scalable inputs with format A, /A, B, /B [HTL / TTL / RS422, single channel, dual channel, symmetric or asymmetric]
- 4 control inputs for PNP / NPN / Namur signals [10 ... 30 Vdc]
- Input frequency up to 1 MHz
- 4 fast transistor outputs with push-pull characteristic, short-circuit-proof
- [5 ... 30 Vdc]
- 4 programmable preset values
- Power supply 24 Vac and 17 ... 40 Vdc
- Compact norm panel housing
- LED display either 6 digits with 15 mm or 8 digits with 10 mm height
- Display range -199999 ... 999999 (6 digits) or -19999999 ... 99999999 (8 digits)
- Serial RS232 interface

Cut-to-Length Control / Counter

Monitor for Slip, Torsion, Skew and Shaft Fracture
Small-Sized Process Indicator with Analog Input

Small-sized process indicator for analog norm signals.

- Scalable 14 bit analog input für 0 ... 10 V or 0/4 ... 20 mA
- Power supply 24 Vdc
- Miniature norm panel housing
- 5 digits LED display with 8 mm height
- Display range -19999 ... 99999

Process Indicator with Two 16 Bit Analog Inputs, Touchscreen and Graphic Display

AX350: Basic unit with 2 analog inputs (16 Bit), 3 control inputs
Option AO350: 16 bit analog output, 4 control outputs, serial RS232 interface

- Operating modes for visualization of channel A, channel B or combinations of A + B, A - B, A x B and A : B
- Two universal 16 bit analog inputs for -10 ... +10 V / 0 ... 10 V / 0 ... 20 mA / 4 ... 20 mA
- High accuracy reference output 10 V for potentiometers > 1 kOhm
- Bright and high-contrast display with event-dependent color variations
- Emulation of a 7-segment display inclusively icons and units
- Intuitive and easy parameterization by plain text and touchscreen
- 24 V auxiliary output for encoder supply
- Linearization with 24 control points
- Numerous features, e.g. Tara, filters, averaging
- 3.78 x 1.89 inch norm panel housing and IP65 protection

SSI Indicator for Absolute Encoders, with Touchscreen and Graphic Display

IX350: Basic unit with SSI interface, 3 control inputs
Option AO350: 16 bit analog output, 4 control outputs, serial RS232 interface

All options can be combined

- Master or Slave operation with clock frequencies up to 1 MHz
- For single turn and multi turn encoders with SSI formats from 13 ... 32 Bit
- Bright and high-contrast display with event-dependent color variations
- Emulation of a 7-segment display inclusively icons and units
- Intuitive and easy parameterization by plain text and touchscreen
- 24 V auxiliary output for encoder supply
- Linearization with 24 control points
- Numerous features, e.g. scaling, filtering, bit blanking etc.
- 3.78 x 1.89 inch norm panel housing and IP65 protection