MPK411
The Next Generation
Lift Control System
Multifunctional with high performance

Optimal functionality through consequent innovation was the motto for the development of the new MPK control system generation 411. The objective was to develop a multifunctional control processor with universal interfaces and a very broad spectrum of applications. The MPK 411 control concept covers nearly the entire scope, including complex elevator facilities of up to 10 units serving maximally 100 floors and high travelling speeds of up to 8 m/sec.

Universal interface design

The concept is based on a high-performance 1GHz Cortex A8 processor with 2000 MIPS. Particular attention was paid to the universal interface design. The frequency converters are actuated serially via the DCP 3 or DCP 4 protocols through plug-in cables. Actuation via CANopen is available as an alternative. Both incremental DSK systems and absolute value transmitting systems can be used as copying systems. Car electronics and floor signals are connected via CANopen. Moreover, the processor has a USB interface for program updates and parameter downloads. Remote monitoring and integration in building management systems is done using the standard TCP/IP interface.

Browser based user interface

The Control Hand Terminal CHT is available as an operating unit for diagnosis and configuration tasks. It is connected to the control system via Ethernet cable. The CHT is browser-based. Its menu structure and the navigation have been fully redesigned. It is controlled using the 4.3 inch CHT touchscreen, and the design is intuitive so that new users will get along very quickly. The highly compact dimensions of the MPK 411 processor of 230 x 87.5 x 45.9 mm (L x W x H) allow for a broad spectrum of applications, especially in the MRL area, from door frame control up to destination call control units. The MPK 411 has 16 flexible inputs and outputs for freely assignable special functions with 2 of the inputs being adjustable to an input current of up to 35 mA and all outputs being monitored by the software. The integrated wide-range safety circuit enquiry ranges from 48 V up to 230 V AC with 2 additional wide-range inputs being available for contactor and synchronisation monitoring. The MPK Green energy saving functions, the MPK IQ self-optimisation functions as well as numerous other setting assistants and forecasting functions, e.g. for shaft copying, are only a few of the features that make operating the control system much easier and ensure optimal elevator operation.
Smartphone - access via WLAN

Connection to building management systems or Kollmorgen’s VisualLift remote monitoring and maintenance system is made via Ethernet or modem. As an alternative, WLAN or GSM modems are available from the product portfolio when using the corresponding terminal equipment.

Also the components of floor and car electronics were fully redesigned in the course of processor development. Particular attention was paid to compact design and innovative technologies here as well. Communication with the floors and the elevator car is realised using the standardised CANopen bus commonly used throughout the elevator industry.

Compatibility with the peripheral components such as frequency control units, drives, hydraulic aggregates, door control units etc. has been enhanced. Nearly all of the cabling is of the plug-in type. The control system is delivered pre-parameterised so that commissioning can normally be done on a plug-and-go basis. The modular concept and the above-average range of applications predestine the MPK 411 for the OEM sector. All components of the control system are available ex stock from the Kollmorgen OEM product program.
## Technical performance data

<table>
<thead>
<tr>
<th><strong>Field of application</strong></th>
<th>Passenger and goods elevators</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Stops</strong></td>
<td>Up to 100 stops</td>
</tr>
</tbody>
</table>
| **Operating mode**       | • Controlled/uncontrolled cable elevators  
                          | • Hydraulic elevators         |
| **Actuation**            | • Single-rotation drives, pole-changing, frequency-controlled cable elevators  
                          | • Controlled cable elevators  
                          | • Star-delta starting, direct starting, soft starting  
                          | • Controlled and uncontrolled hydraulic aggregates  
                          | • Controlled DC drives         |
| **Control type**         | • Self-propelled unit         
                          | • 1 KS independent of/d dependent on direction, 2 KS collective  
                          | • First in - first out        
                          | • Destination call            
                          | • Group control for up to 10 elevators |
| **Travelling speed**     | Max. 8 m/sec                  |
| **Shaft connection**     | Serial via Ethernet/CAN bus/parallel in the shaft (modernisation) |
| **Door control**         | • Actuation of three controlled/uncontrolled  
                          | • Door drives: with opposite entrances / selectivity or sluice function |
| **Signals**              | Actuation of floor indicators with analogue/digital/Gray/inv. Gray output, internal and external direction indicator, travel continuation indicator, gong, busy lamp, out-of-order indicator, full load, excessive load |
| **Copying system**       | Digital shaft copying (DSK or APS) |
Hardware

- 1 GHz Cortex A8 processor with 2000 MIPS
- Ethernet interfaces for group communication, Visual Lift (remote diagnosis and monitoring), handheld terminal and connection with car
- 2 CAN interfaces for shaft and external components, both terminable via software
- USB interface for WiFi, GSM, data logging and parameterisation
- Permanent operating status indication, additional status information via LED displays
- Switch for "Maintenance - close doors" and "Disable calls"
- Thermistor monitoring facility
- 16 flexible inputs and outputs, freely assignable for special functions with 2 of the inputs being adjustable to an input current of up to 35 mA, all outputs monitored
- Wide-range safety circuit enquiry for 48 V up to 230 V AC
- 2 wide-range inputs for contactor and synchronisation monitoring from 24 V DC up to 230 V AC
- Connector for return control unit
- Interface for absolute value, incremental or CAN transmitter
- Connector for external temperature sensor
- DSK ZONE
- Actuation of converters via DCP3 or DCP4+
- Micro SD card slot for long-term data logging, updates

Software

- Event memory: Plain text display showing date/ time/ floor/ statistics/ maintenance intervals/ trip and operating hour counter
- Language settings including German, English, Dutch, Swedish, Polish
- Freely assignable inputs and outputs
- Over 1700 adjustable parameters
- Compatible with Visual Lift remote transmission software/ MPK-Easy parameterising software
- Integrated elevator technician service, emergency call misuse recognition
- Adaptive, intelligent group algorithm
- Processor support during service and maintenance work, intelligent service interval indication
- Actuation of a landing chair
- Traffic registration and automatic tendency recognition
- Dynamic and adjustable parking levels/zones
- MPK IQ self-optimisation functions
- MPK Green energy saving modus
- Serial controller actuation via DCP 3 / DCP 4 (based on the distance to go)
Product Examples

MPK411 MRL controlled

MPK411 Rope controlled

MPK411 Hydraulic
### Summary of MPK 411 modules

<table>
<thead>
<tr>
<th>Module Control system</th>
<th>Product name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Processor</td>
<td>MPK 411</td>
<td>Micro Processor Kollmorgen</td>
</tr>
<tr>
<td>Handheld control</td>
<td>CHT</td>
<td>Control Hand Terminal</td>
</tr>
<tr>
<td>Servo control</td>
<td>R-IM</td>
<td>Relay Interface Module</td>
</tr>
<tr>
<td>Safety circuit</td>
<td>SM</td>
<td>Safety Module</td>
</tr>
<tr>
<td>MMaster I/O extension 16</td>
<td>M-IO/16</td>
<td>Master In Out 16</td>
</tr>
<tr>
<td>Slave I/O extension 16</td>
<td>S-IO/16</td>
<td>Slave In Out 16</td>
</tr>
<tr>
<td><strong>Car</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Car electronics</td>
<td>C-IM/8</td>
<td>Car Interface Module up to max. 8 stops</td>
</tr>
<tr>
<td>Car electronics</td>
<td>C-IM/32</td>
<td>Car Interface Module up to max. 32 stops</td>
</tr>
<tr>
<td>Car electronics</td>
<td>C-IM extension board</td>
<td>Car Interface Module extension board for C-IM/8</td>
</tr>
<tr>
<td><strong>Floor</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Floor module</td>
<td>F-IM</td>
<td>Floor Interface Module</td>
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</tbody>
</table>

**Relay Interface Module R-IM**
The Relay Interface Module R-IM is utilised to control the motor and brake contactors of the lift. The R-IM module is connected via a 10 pole IDC connector to the processor unit of the MPK 411. Beside the four designated relays for the motor control circuit the module offers two additional relays for multi purposes. The status of the relays is displayed via LEDs.

**CAN I/O extension module M-IO/16**
The CAN I/O extension module M-IO/16 serves for the extension of the digital inputs and outputs of the MPK 411 central unit via the CANopen interface. Up to 64 M-IO/16 modules can be connected to the MPK 411 central unit using the CANopen bus.

**I/O extension module S-IO/16**
The I/O extension module serves for the extension of the digital inputs and outputs of the MPK 411 central unit via the I2C interface. Up to eight S-IO/16 modules can be connected to the MPK 411 central unit using the I2C bus.

**Car Interface Module C-IM/8/32**
The Car Interface Module C-IM/8 respectively 32 connects and communicates the car relevant signals to the processor module of the MPK 411 via its CANopen Interface. The C-IM/8/32 module is designed to connect up to eight respectively thirty-two floors via the IDC connector as a pluggable interface. Furthermore the module provides 6 free programmable relays for the control of up to 3 door operators, cabin light switching, car fan, or similar devices.

**Floor Interface module F-IM**
The Floor Interface Module F-IM is used for the connection of the floor/display signals to the processor unit of MPK 411 via the CANopen interface.