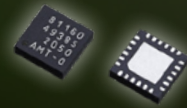


# Melexis

INSPIRED ENGINEERING

MLX81160

## SMART LIN PRE-DRIVER FOR DC MOTORS WITH RELAY (200 W)



The hummingbird's beating wings flap at extremely high frequencies, typically around 50 times per second. This allows it to fly at speeds exceeding 15 m/s, to fly backwards or to seemingly be suspended in the air in perfect balance. What better animal to reflect the motor/control driver and actuator capacities?

## SMALLEST ALL-IN-ONE LIN PRE-DRIVER PROPELS AUTOMOTIVE RELAY WINDOW LIFTERS

### MLX81160

The MLX81160 is a LIN pre-driver IC for relay DC motors offering a combination of high power, compactness and attractive pricing. It complements the gen-3 family of compatible embedded motor drivers. With its 48 KB of memory (16 KB ROM for the included LIN protocol and 32 KB Flash for the application software) in a compact QFN24 package (4 mm x 4 mm) it is suitable for applications like window regulators.

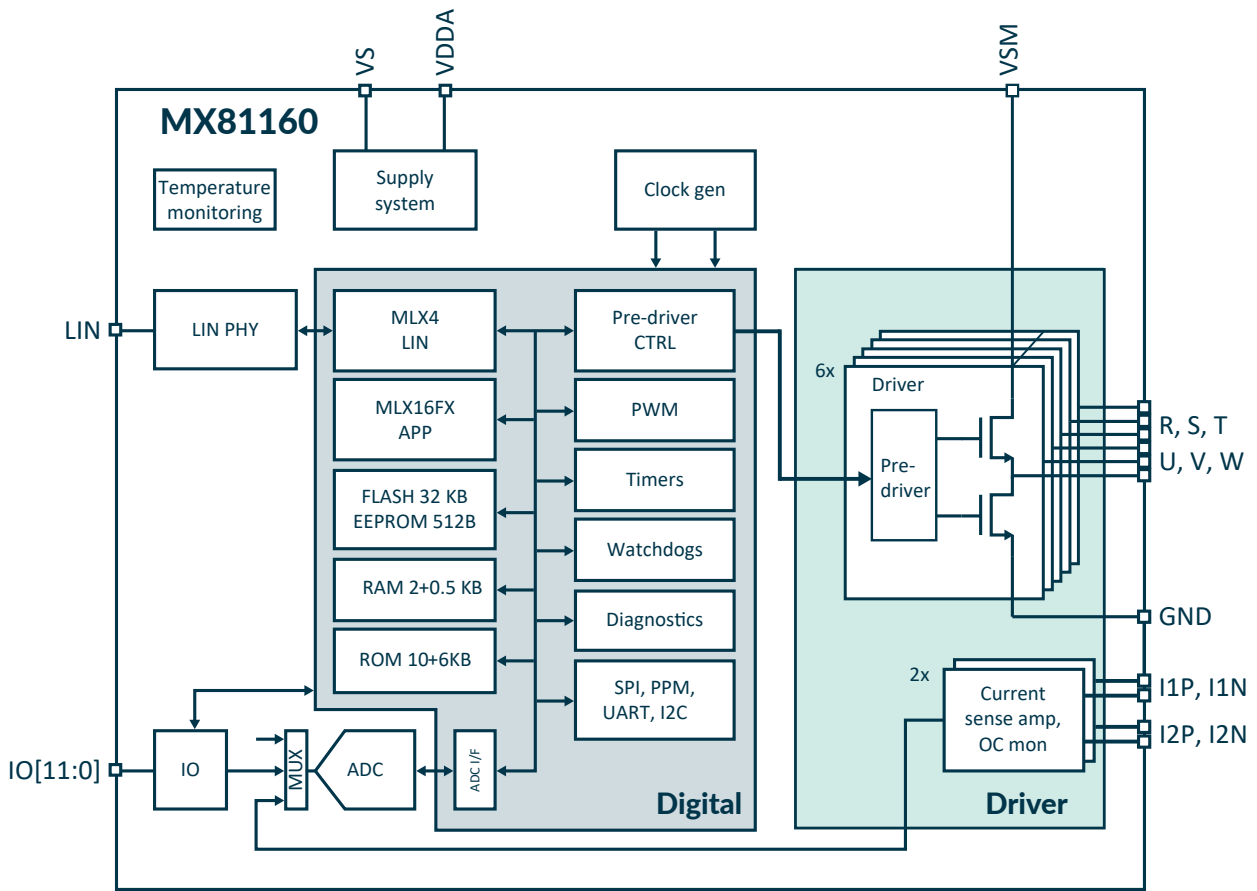
### KEY FEATURES MLX81160

- ✔ **Motor driver**
  - 6x Driver for external relays, or 6x Pre-Driver for external PN-FET half-bridges up to 30nC with 6x PWM
- ✔ **Microcontroller**
  - MLX16-FX, application CPU
  - MLX4, communication CPU
  - Programmable digital watch-dog
  - Interrupt controller
  - Common purpose timer
- ✔ **Memories split per CPU**
  - MLX16-FX memories:
    - 32 KB Flash with ECC
    - 10 KB ROM
    - 2 KB RAM
    - 512 B EEPROM
  - MLX4 memories:
    - 6 KB ROM
    - 512 KB RAM
- ✔ **Fast end-of-line programming via LIN pin** (32 KB Flash in < 2.5sec)
- ✔ **Pin-compatible family in QFN32**
  - MLX81160: 48 KB PN-FET driver
  - MLX81344: 90 KB NN-FET driver
- ✔ **Periphery**
  - Configurable RC-clock 12..32MHz
  - 12x general purpose IO's, up to 9x high-voltage analog inputs, 2x UART, SPI, I<sup>2</sup>C-slave
  - 6x 16-bit motor PWM timers
  - 2x 16-bit timers
  - 12-bit ADC with < 1.2µs conversion time with 32 channels
  - 2x differential current sense amplifier with 8-bit programmable overcurrent
  - Temperature sensor, over-temperature detection
  - Over-current detection, over-voltage and under-voltage protection
- ✔ **Voltage regulators**
  - Internal voltage regulators, directly powered from 12V battery supply
  - IC operating motor voltage VSM = 5.5V to 32V
  - Operating voltage VS = 5.5V to 32V\*
  - Operation down to 3.5V with reduced analog characteristics, down to 3.0V without losing register content, down to 1.6V with intact RAM memory
  - Low standby current consumption of typ 25µA in sleep mode
  - Wake-up possible via LIN, external pins or internal wake-up timer
- ✔ **Bus interface**
  - LIN 2.x/SAE J2602 and ISO17987-4 compliant LIN slave
- ✔ **Automotive AEC-Q100 qualified**
- ✔ **Designed for safety applications according to ASIL B (ISO 26262)**
- ✔ **Maximum IC temperature (with validated mission profile)**  
T<sub>j</sub> = 175°C

FOR MORE INFORMATION: [WWW.MELEXIS.COM/MLX81160](http://WWW.MELEXIS.COM/MLX81160)

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## BLOCK DIAGRAM

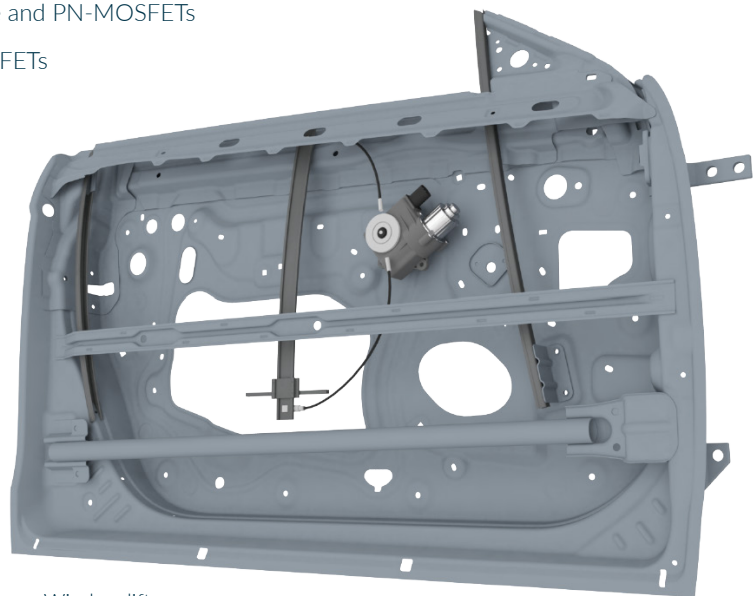


MLX81160 IC Block diagram

## APPLICATION WITH RELAY DC MOTORS (<200 W)

The MLX81160 pre-driver is well suited for

- ✓ DC Window Lift, Sunroof with Relays or PN-MOSFETs
- ✓ DC/BLDC pump or fan with PWM-drive and PN-MOSFETs
- ✓ Multiple small DC motors with PN-MOSFETs



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