

#### Limiter Version (43.33.2105xx.xx):

- **8 Inputs** software configurable as:
  - **On/Off Inputs** (High-side)
  - **Analog Inputs** range **0 ÷ 5 V**, 12-bit resolution
  - **Analog Inputs** range **0 ÷ 20 mA**, 12-bit resolution
- **2 Inputs** software configurable as:
  - **On/Off Inputs** (High-side)
  - **RPM Inputs** (High-side or Low-side)
  - **Analog Inputs** range **0 ÷ 30 V**, 12-bit resolution
- **2 Inputs** software configurable as:
  - **On/Off Inputs** (High-side or Low-side)
  - **RPM Inputs** for Pick-Up sensors (High-side or Low-side)
  - **Analog Inputs** range **0 ÷ 30 V**, 12-bit resolution
- **4 On/Off Inputs** (High-side)
- **4 Outputs** with status feed-back, software configurable as:
  - **On/Off Outputs** (High-side, current 2A, short circuit current 8A)
  - **PWM Outputs** (High-side, current 2A, short circuit current 8A)
  - **PWM Outputs** with current feedback (High-side, current 2A, short circuit current 8A)
- **2 Outputs** with status feed-back, software configurable as:
  - **On/Off Outputs** (High-side, current 2A, short circuit current 8A)
  - **PWM Outputs** (High-side, current 2A, short circuit current 8A)

#### All version:

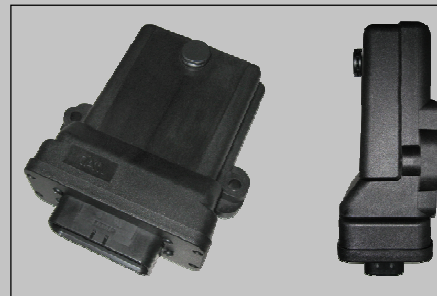
- **1 Stabilized external power supply for sensors: +5V (100mA max)**

## MIDAC PLUS: MASTER OR SLAVE MODULE

3B6®

Master or Slave Module for CAN networks. Based on high speed processor and high number of I/O, it can be used in all automotive application where reliability and functionality is a must.

It is a highly configurable device, it can even manage an internal double axis inclinometer for access platforms or any self levelling applications. It is ready for EN13849 safety standards (safety of machinery).



### TECHNICAL DATA

#### CONTROL SYSTEM:

- Microcontroller Freescale, 16bit, 50 MHz clock
- Flash memory 256 KB (1 MB for limiter version)
- RAM memory 16 KB (64 KB for limiter version)
- EEPROM 4 KB for Parameters Storage
- 2nd microcontroller Freescale, 8bit with 16KB Flash, 1KB RAM, 512B EEPROM for safety critical applications
- Optional Flash memory 256 KB for Data Logging
- Optional Real time clock with 240 byte RAM and rechargeable backup battery
- Optional integrated tilt sensor

#### CONNECTIVITY:

- 2 CAN-BUS 2.0B (11 or 29-bit), ISO 11898-2 compliance, speed up to 1 Mbit/s, safety CAN-OPEN compatible.
- Optional 1 LIN-BUS master 9600 bit/s

#### ELECTRICAL CHARACTERISTICS:

- Main power supply: 8 ÷ 30 Vdc (Operates with vehicle power supply directly)
- Logic power supply (cold cranking): 4 ÷ 30 Vdc
- Load Dump and power supply inversion protection
- Separate power supply for outputs
- Internal safety relay controlled by watchdog, used to disconnect outputs in case of hardware or software malfunctions.
- Maximum current for the outputs: 16 A (external fuse is required)
- Relay status is available as output on connector.

#### CERTIFICATIONS:

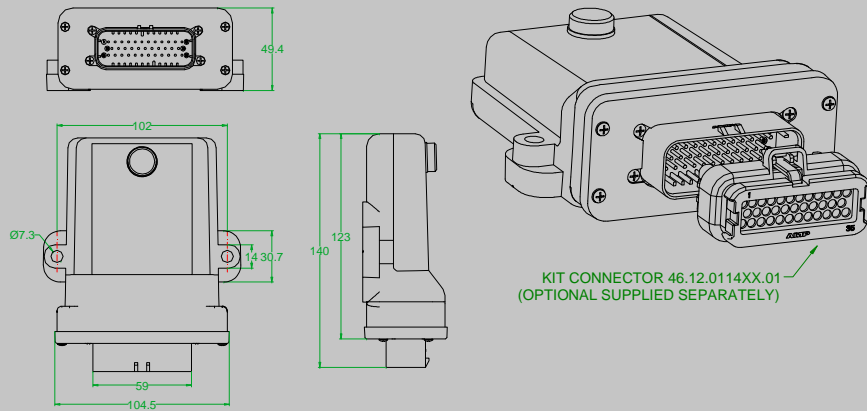
The controller will be certified for following automotive standards required by 89/336 CE:

- 1) EMC standards for emission, immunity for industry (high density industrial environment):
  - Reference standard: EN 61000-6-4
  - Base standard: EN 55011 (RF Emission)
- 2) Electromagnetic immunity, low density environment:
  - Reference standard: EN 61000-6-2
  - Base standard: EN 61000-4-3 (Radio Frequency)
  - EN 61000-4-4 (Burst)
  - EN 61000-4-6 (Conducted disturbance)

#### MECHANICAL AND RATINGS:

- Protection: IP65
- Operating Temperature Range: from -40°C to +80°C (from -40°F to +176°F)
- Storage Temperature Range: from -40°C to +85°C (from -40°F to +185°F)
- Connector: Automotive 35 way
- Housing: PA66 30%

### MECHANICAL DIMENSIONS:



### I/O CONFIGURATION: (all inputs are under and over voltage protected; all outputs are short circuit protected)

#### Digital Version (43.33.2102xx.xx / 43.33.2103xx.xx):

- **4 Inputs** software configurable as:
  - **On/Off Inputs** (High-side or Low-side)
  - **Analog Inputs** range  $0 \div 5 \text{ V}$ , 12-bit resolution
  - **Analog Inputs** range  $0 \div 20 \text{ mA}$ , 12-bit resolution
- **4 Inputs** software configurable as: (with external power supply +15V option these Inputs are only 3)
  - **On/Off Inputs** (High-side)
  - **Analog Inputs** range  $0 \div 5 \text{ V}$ , 12-bit resolution
  - **Analog Inputs** range  $0 \div 30 \text{ V}$ , 12-bit resolution
  - **Analog Inputs** range  $0 \div 5000\Omega$ , 12-bit resolution
  - **Analog Inputs** range  $0 \div 2500\Omega$ , 12-bit resolution
- **2 Inputs** software configurable as:
  - **On/Off Inputs** (High-side or Low-side)
  - **RPM Inputs** (High-side or Low-side)
  - **Analog Inputs** range  $0 \div 30 \text{ V}$ , 12-bit resolution
- **2 Inputs** software configurable as:
  - **On/Off Inputs** (High-side or Low-side)
  - **RPM Inputs** for Pick-Up sensors (High-side or Low-side)
  - **Analog Inputs** range  $0 \div 30 \text{ V}$ , 12-bit resolution
- **4 Outputs** with status feed-back, software configurable as:
  - **On/Off Outputs** (High-side, current 2A, short circuit current 8A)
  - **PWM Outputs** (High-side, current 2A, short circuit current 8A)
  - **PWM Outputs** with current feedback (High-side, current 2A, short circuit current 8A)
- **6 Outputs** with status feed-back, software configurable as:
  - **On/Off Outputs** (High-side, current 2A, short circuit current 8A)
  - **PWM Outputs** (High-side, current 2A, short circuit current 8A)

#### Danfoss Version (43.33.2101xx.xx):

- **4 Inputs** software configurable as:
    - **On/Off Inputs** (High-side or Low-side)
    - **Analog Inputs** range  $0 \div 5 \text{ V}$ , 12-bit resolution
    - **Analog Inputs** range  $0 \div 20 \text{ mA}$ , 12-bit resolution
  - **4 Inputs** software configurable as: (with external power supply +15V option these Inputs are only 3)
    - **On/Off Inputs** (High-side)
    - **Analog Inputs** range  $0 \div 5 \text{ V}$ , 12-bit resolution
    - **Analog Inputs** range  $0 \div 30 \text{ V}$ , 12-bit resolution
    - **Analog Inputs** range  $0 \div 5000\Omega$ , 12-bit resolution
    - **Analog Inputs** range  $0 \div 2500\Omega$ , 12-bit resolution
  - **2 Inputs** software configurable as:
    - **On/Off Inputs** (High-side or Low-side)
    - **RPM Inputs** (High-side or Low-side)
    - **Analog Inputs** range  $0 \div 30 \text{ V}$ , 12-bit resolution
  - **2 Inputs** software configurable as:
    - **On/Off Inputs** (High-side or Low-side)
    - **RPM Inputs** for Pick-Up sensors (High-side or Low-side)
    - **Analog Inputs** range  $0 \div 30 \text{ V}$ , 12-bit resolution
  - **4 Outputs** with status feed-back, software configurable as:
    - **On/Off Outputs** (High-side, current 2A, short circuit current 8A)
    - **PWM Outputs** (High-side, current 2A, short circuit current 8A)
    - **PWM Outputs** with current feedback (High-side, current 2A, short circuit current 8A)
  - **6 Outputs** with status feed-back, software configurable as:
    - **Analog Output**  $0 \div 10\text{V}$  or  $0 \div +\text{VB}$  ratiometric
- #### 4 Digital and 2 Danfoss Version (43.33.2104xx.xx):
- **4 Inputs** software configurable as:
    - **On/Off Inputs** (High-side or Low-side)
    - **Analog Inputs** range  $0 \div 5 \text{ V}$ , 12-bit resolution
    - **Analog Inputs** range  $0 \div 20 \text{ mA}$ , 12-bit resolution
  - **4 Inputs** software configurable as: (with external power supply +15V option these Inputs are only 3)
    - **On/Off Inputs** (High-side)
    - **Analog Inputs** range  $0 \div 5 \text{ V}$ , 12-bit resolution
    - **Analog Inputs** range  $0 \div 30 \text{ V}$ , 12-bit resolution
    - **Analog Inputs** range  $0 \div 5000\Omega$ , 12-bit resolution
    - **Analog Inputs** range  $0 \div 2500\Omega$ , 12-bit resolution
  - **2 Inputs** software configurable as:
    - **On/Off Inputs** (High-side or Low-side)
    - **RPM Inputs** (High-side or Low-side)
    - **Analog Inputs** range  $0 \div 30 \text{ V}$ , 12-bit resolution
  - **2 Inputs** software configurable as:
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  - **4 Outputs** with status feed-back, software configurable as:
    - **On/Off Outputs** (High-side, current 2A, short circuit current 8A)
    - **PWM Outputs** (High-side, current 2A, short circuit current 8A)
    - **PWM Outputs** with current feedback (High-side, current 2A, short circuit current 8A)
  - **4 Outputs** with status feed-back, software configurable as:
    - **On/Off Outputs** (High-side, current 2A, short circuit current 8A)
    - **PWM Outputs** (High-side, current 2A, short circuit current 8A)
  - **2 Outputs** with status feed-back, software configurable as:
    - **Analog Output**  $0 \div 10\text{V}$  or  $0 \div +\text{VB}$  ratiometric