New Edge of Electronic Instruments and Controls

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WE DELIVER EXPERIENCE AND QUALITY SINCE 1990

EMITTER electronics is a technically driven design and manufacturing company dedicated to helping customers to solve their toughest electronics, automation, sensing and measurement problems.

A flexible manufacturing system allows us quick responsiveness as well as efficient handling of large blanket orders. Our products can easily be integrated into already existing systems or can be specially designed for different applications.

Emitter engineering team can help you to design an advanced control system, custom device or modify existing products to save your labour and assembly costs to be more competitive on the market. We have maintained a competitive advantage in this area by being always available to all our customers and potential clients.

Quality, responsibility and innovation have been the fundamental mottos of our operations since the very establishment of the company.

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INTERSCHUTZ

CONTENT

MODULAR MULTIPLEX SYSTEM - MMX

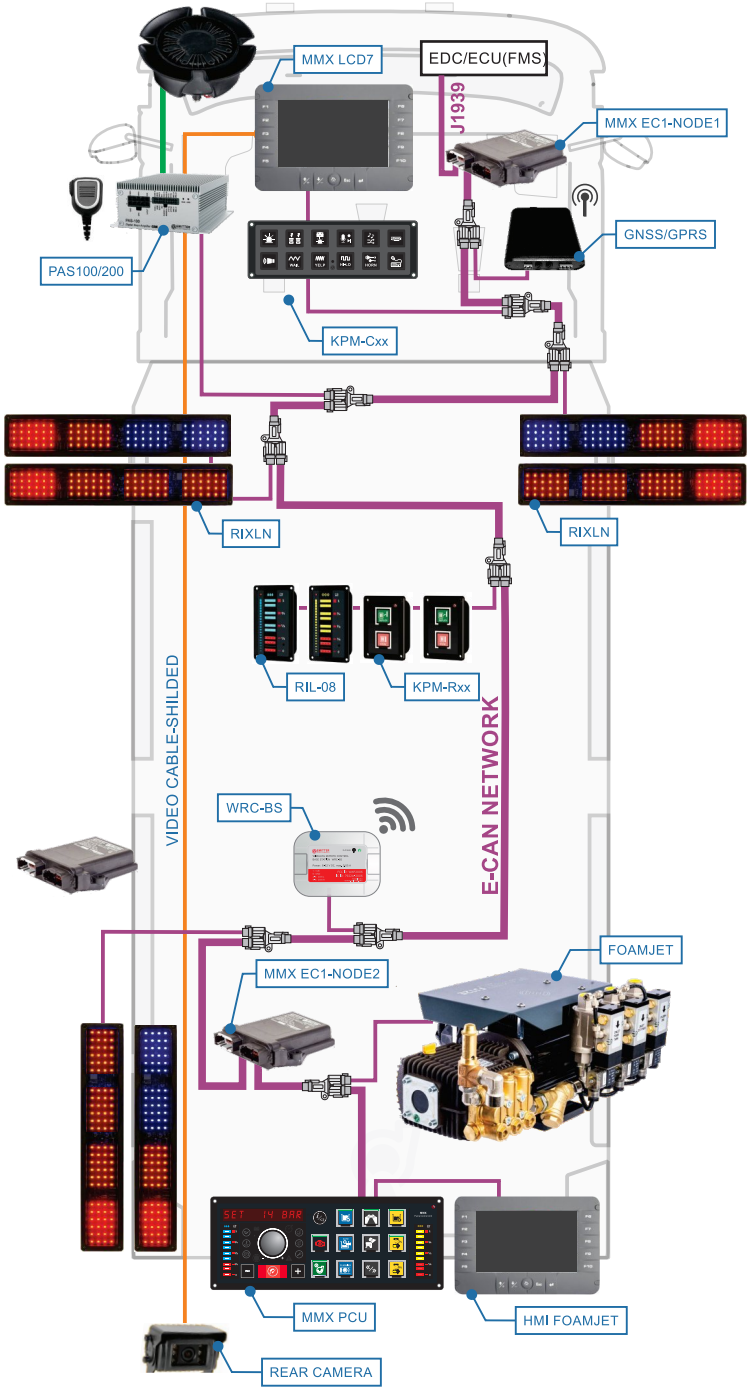
Features and Benefits

1. Simplifies wiring Harness. Reduces the number of wires by more than 40%, that means 40% fewer possible failure points
2. Eliminates most of Fuses & Relays
3. Fewer parts and easy diagnostics resulting in fewer efforts for maintenance time. Because the system is simple, customisation and options can be done in software only, no hardware change needed.
4. Increases Diagnostic capabilities
5. Increases vehicle reliability
6. Integrates electrical & Electronic system

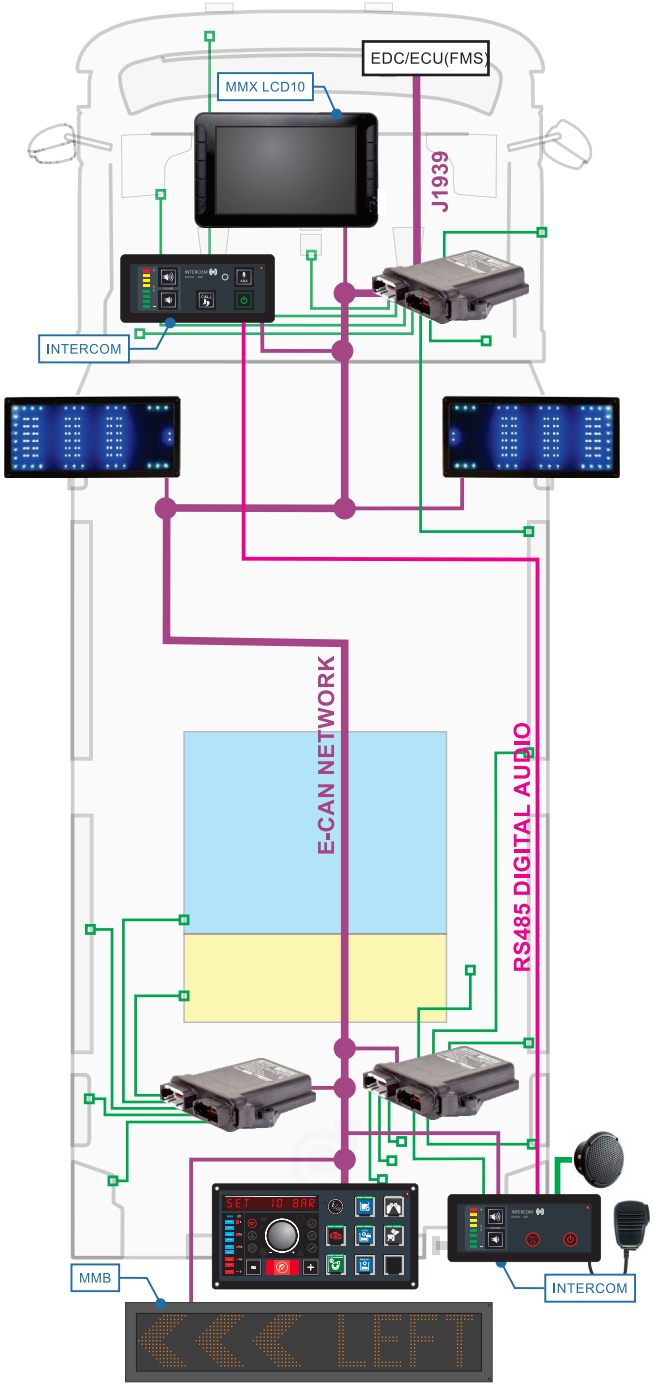
Vehicle wiring networks are rapidly becoming very complex due to increased usage of electronic controls, displays and features. As a result, the vehicle wire harness is growing in size and complexity to the point where multiplexing and data communication links are expected to be required to develop cost efficient and reliable vehicle systems.

Conventional wiring systems use separate wires to control each electrical function. The multiplex wiring system allows multiple electronic messages to travel back and forth through the same datalink wire, just as broadband cable allows telephone, television and Internet connections to travel through the same line.

The MMX IO node controller sends information back and forth, monitoring vehicle components and interpreting messages transmitted through the wires. Because the modules are remotely controlled by signals, rather than by separate wires, fewer relays and connectors are required, reducing possible failure points.



Example 1



Example 2

MMX EC1 G6 CONTROLLER

Features and Benefits

1. **16 Universal Pins**
2. **Digital, Analog, Resistance Or Frequency Inputs**
3. **High Side, Low Side Or PWM Outputs**
4. **Data Logger**
5. **3-axis Accelerometer**
6. **I/O Status LEDs**
7. **Extension Options: H-Bridge, IMU, DAC, RS232/485, Etc.**

The MMX EC1 is a highly configurable controller which is designed for use in various automotive and industrial applications. It provides smart solutions for special vehicles, machinery, industrial automation and enables simple connectivity for sensors, switches, actuators and different CAN devices.

MMX EC1 is a part of Emitter Electronics MMX family products and can be used with other MMX family devices such as LCDs, keypads, pump governors, tank level indicators, etc. For applications requiring high I/O count, several MMX EC1 controllers can be connected over Can bus, CAN SAE J1939, CAN open or free protocol. MMX EC1 controllers are programmable in C/C++ language.

CONNECTIONS

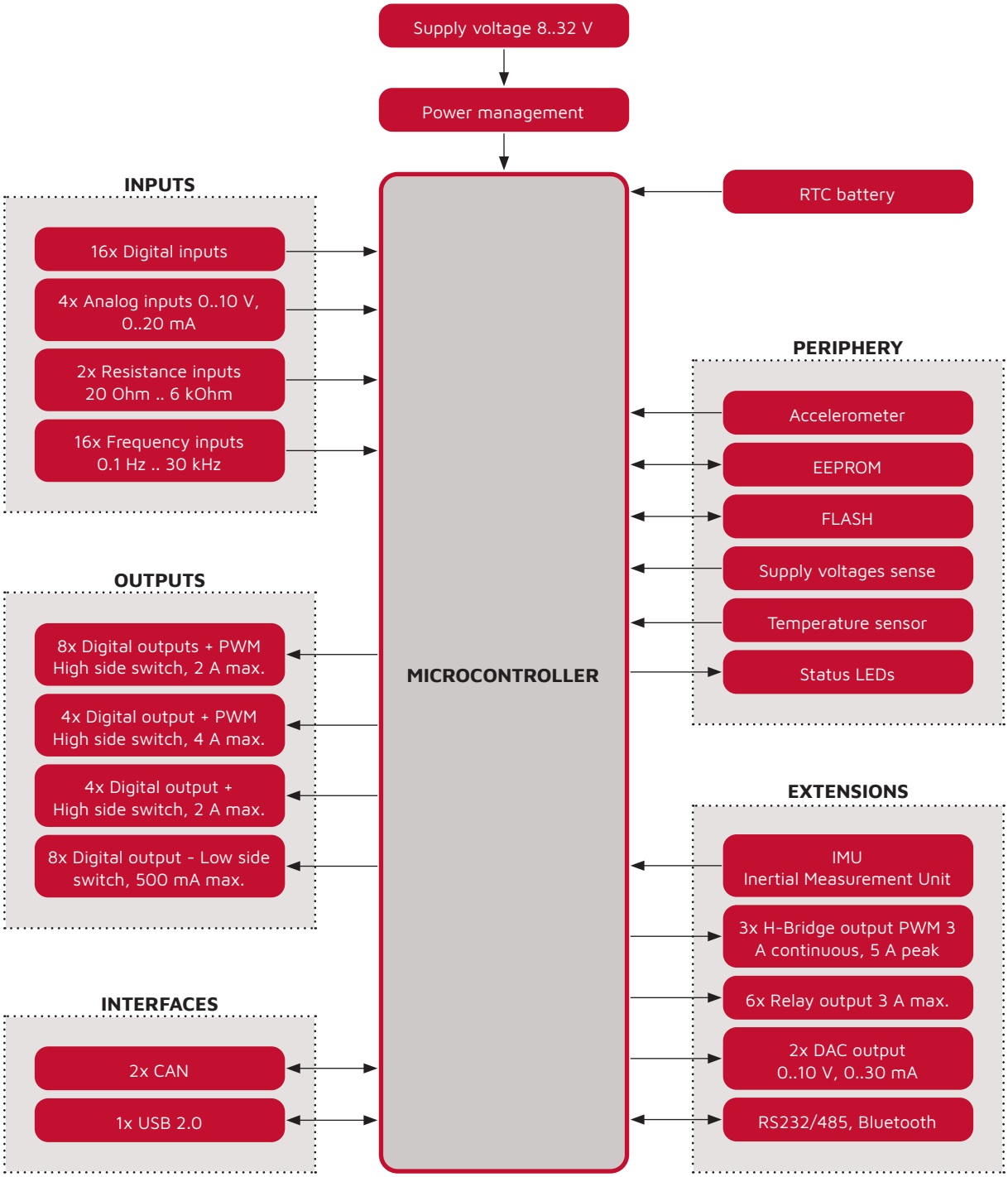
Black Connector: Pin Description

PIN	TYPE	OPTION 1	OPTION 2	OPTION 3	OPTION 4
1	FIXED	BATTERY +	-	-	-
2	FIXED	BATTERY +	-	-	-
3	FIXED	CAN LOW 1	-	-	-
4	CONFIGURABLE	CAN LOW 2 (J1939)	CAN LOW 1	-	-
5	CONFIGURABLE	ANALOG INPUT	DIGITAL INPUT +/-	DIGITAL OUTPUT+	-
6	CONFIGURABLE	ANALOG INPUT	DIGITAL INPUT +/-	DIGITAL OUTPUT+	-
7	CONFIGURABLE	ANALOG INPUT	DIGITAL INPUT +/-	DIGITAL OUTPUT+	RESISTANCE INPUT
8	CONFIGURABLE	ANALOG INPUT	DIGITAL INPUT +/-	DIGITAL OUTPUT+	-
9	CONFIGURABLE	CAN HIGH 2 (J1939)	CAN HIGH 1	-	-
10	FIXED	CAN HIGH 1	-	-	-
11	FIXED	BATTERY -	ANALOG GND	-	-
12	FIXED	BATTERY -	-	-	-

Grey Connector: Pin Description

PIN	TYPE	OPTION 1	OPTION 2	OPTION 3	OPTION 4	EXTENSION BOARD
1	CONFIGURABLE	DIGITAL INPUT +/-	DIGITAL OUTPUT + PWM	-	-	-
2	CONFIGURABLE	DIGITAL INPUT+/-	DIGITAL OUTPUT + PWM	-	-	-
3	CONFIGURABLE	DIGITAL INPUT +/-	DIGITAL OUTPUT + PWM	-	-	-
4	CONFIGURABLE	DIGITAL INPUT +/-	DIGITAL OUTPUT + PWM	-	-	-
5	CONFIGURABLE	DIGITAL INPUT +/-	DIGITAL OUTPUT + PWM	DIGITAL OUTPUT -	-	EXTENSION A
6	CONFIGURABLE	DIGITAL INPUT +/-	DIGITAL OUTPUT + PWM	DIGITAL OUTPUT -	-	EXTENSION A
7	CONFIGURABLE	DIGITAL INPUT +/-	DIGITAL OUTPUT + PWM	DIGITAL OUTPUT -	-	EXTENSION B
8	CONFIGURABLE	DIGITAL INPUT +/-	DIGITAL OUTPUT + PWM	DIGITAL OUTPUT -	RESISTANCE INPUT	EXTENSION B
9	CONFIGURABLE	DIGITAL INPUT +/-	DIGITAL OUTPUT + PWM*	DIGITAL OUTPUT -	-	EXTENSION C
10	CONFIGURABLE	DIGITAL INPUT +/-	DIGITAL OUTPUT + PWM*	DIGITAL OUTPUT -	-	EXTENSION C
11	CONFIGURABLE	DIGITAL INPUT +/-	DIGITAL OUTPUT + PWM*	DIGITAL OUTPUT -	-	-
12	CONFIGURABLE	DIGITAL INPUT +/-	DIGITAL OUTPUT + PWM*	DIGITAL OUTPUT -	-	-

BLOCK DIAGRAM



NOTE: Block diagram shows all available MMX EC1 G6 controller inputs and outputs - 16 of them can be used simultaneously (MMX EC1 G6 controller has 16 configurable IO pins).

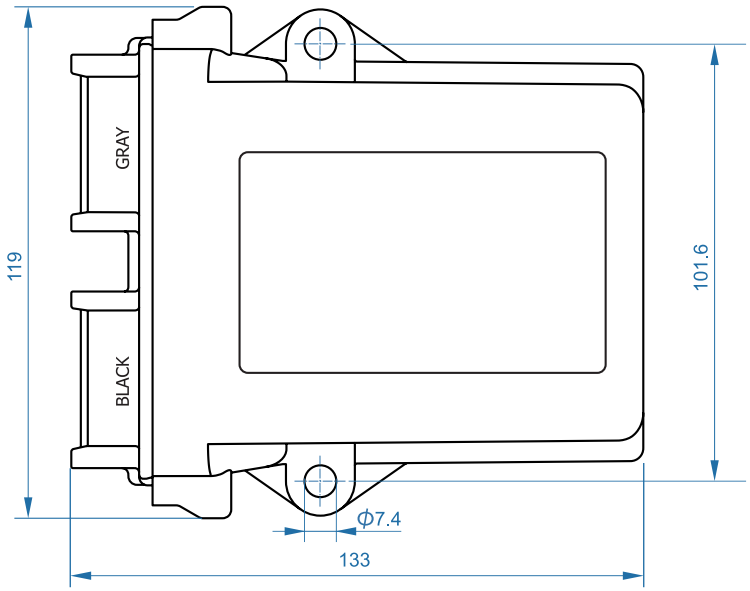
MMX EC1 G6 CONTROLLER

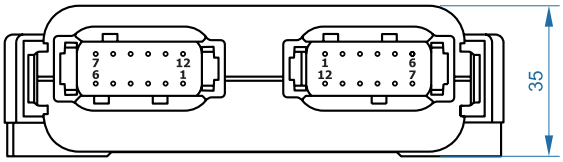
SPECIFICATIONS

KERNEL	
Processor	32-bit ARM Cortex-M4, 168 MHz
Processor flash	1 MByte
Processor RAM	192 kByte
External EEPROM	2 kByte
External flash	64 MByte
I/O PINS	
Total	16x universal pins, individually configurable via software, all I/O pins are protected against short circuit to GND and BAT +, each I/O pin is diagnosable via status LEDs
INPUTS	
Digital input	16x total, configurable integrated pull-up/down resistor and active low/high levels via software, protected
Analog input	4x total, 12-bit resolution, configurable voltage/current input via software, 4 .. 20 mA, 0 .. 10 V, out-of-range detection, protected
Resistance input	2x total, 12-bit resolution, 20 Ohm .. 6 kOhm, Pt1000, Pt100, KTY support, protected
Frequency input	16x total, ≤ 30 kHz, incremental encoder A/B - 8x total, protected
OUTPUTS	
Digital output + PWM	8x total, high side switch, 2 A max., 0 .. 100 %, overload/short circuit protection, overtemperature protection, open load detection
Digital output + PWM (high current)	4x total, high side switch, 4 A max., 0 .. 100 %, overload/short circuit protection, overtemperature protection, open load detection
Digital output +	4x total, high side switch, 2 A max., overload/short circuit protection, overtemperature protection, open load detection
Digital output -	8x total, low side switch, 500 mA max., overload/short circuit protection, overtemperature protection, open load detection
DAC output Voltage DAC Current DAC	2x total, 12-bit resolution, available via extension board 0 .. 10 V (10mA) 0 .. 30 mA
INTERFACES	
CAN	2x CAN, ISO 11898 2.0 A/B up to 1 Mbps, protocols SAE J1939, CANopen, free, etc.
CAN Link	1x T-connection, configurable termination 120 ohm via DIP switch, node ID definition via software
USB	1x USB 2.0, for firmware update
RS232/485, Bluetooth, ...	available via extension boards

OTHER FEATURES	
Accelerometer	integrated 3-axis, MEMS, 12-bit digital accelerometer, +/-2, +/-4, +/-8 g, for inclination/acceleration sensing
IMU	3-axis accelerometer 12-bit, measurement ranges ±2 g, ±4 g, ±8 g, ±16 g, resolution 0.98 mg, 3-axis gyroscope 16-bit, ±125 °/s, ±250 °/s, ±500 °/s, ±1000 °/s, ±2000 °/s, resolution 0.004 °/s, 3-axis magnetometer 16-bit, ±1300 µT (x,y), ±2500 µT (z), resolution 0.3 µT, available via extension board
Data logger	system information/data logging, optional RTC logging with dedicated 1000 mAh onboard battery
Monitoring	internal monitoring of power supply voltage, RTC battery voltage, CPU core temperature and board temperature, over/under supply voltage detection, watchdog functionality
LED diagnostics	dedicated on board status LEDs for I/O pin diagnostics and error indication
Protections	overvoltage, transients , load dump protection, reverse polarity protection by external fuse
ELECTRICAL & ENVIRORMENTAL REQUIREMENTS	
Supply voltage	8 .. 32 V
Peak supply voltage	≤ 36 V for ≤ 5 min, ≤ 40 V for ≤ 2 s
Idle current	30 mA @ 24 V
Max total current	15 A
RTC battery life	min. 10 years
Operating temperature	-40 .. +85 °C (with full load)
ENCLOSURE	
Connector	2x 12 pin Deutch DTM connector, waterproof
Ingress Protection	EN 60529 IP67
Housing material	Nylon 6/6 black glass fibre reinforced, silicone rubber
Housing dimensions	133 x 119 x 35 mm
Weight	250 g
SOFTWARE	
Programming enviroment	C/C++, high level API-library included
STANDARDS	
CE-Mark	2014/30/EU
E-Mark	ECE 10 R-06 noise immunity with 100 V/m
EMC	EN 61000-6-2, noise immunity EN 61000-6-4, radiation of interference
Electrical	ISO 7637-2, pulse immunity, load dump

DIMENSIONS





PRODUCT CODE

Product Code	Total IO	OUT+	OUT+*	OUT-	IN+	IN-	AIN	RIN	F	B	CAN Configuration	EXT1	EXT2	EXT3	Type	Status
MMXEC1-0000-xxxx	16	0	0	0	16	16	4	2	-	-	DIP Switch	-	-	-	TBD	Preview
MMXEC1-0400-xxxx	16	4	0	0	16	12	4	2	-	-	DIP Switch	-	-	-	TBD	Preview
MMXEC1-0500-0001	16	5	2	0	16	11	4	2	-	-	Link Resistors 1,2**	-	-	-	Special	Active
MMXEC1-0600-0002	16	6	2	0	16	10	4	2	-	-	DIP Switch	-	-	-	Standard	Active
MMXEC1-0800-xxxx	16	8	4	0	16	8	4	2	-	-	DIP Switch	-	-	-	TBD	Preview
MMXEC1-1000-xxxx	16	10	2	0	16	6	4	1	-	-	DIP Switch	-	-	-	TBD	Preview
MMXEC1-1200-0003	16	12	4	0	16	4	4	1	-	-	DIP Switch	-	-	-	Standard	Active
MMXEC1-1600-xxxx	16	16	4	0	16	0	0	0	-	-	DIP Switch	-	-	-	TBD	Preview
MMXEC1-1200-0004	16	6	2	6	10	10	4	1	-	-	DIP Switch	-	-	-	Special	Active

*High current outputs
**CAN1 and CAN2 120Ω termination resistors are connected by zero-ohm resistors

OUT - Output, IN - Input, AIN - Analog input, RIN - Resistance input, F - Flash, B - Battery, EXT1 - Extension 1, EXT2 - Extension 2, EXT3 - Extension 3

For other possible IO configurations please contact the supplier.

MATRIX MESSAGE BOARD

MMB-RGB 96X16

Features and Benefits

1. **Full-Matrix RGB LED Display**
2. **96 x 16 Pixels for Clear Message Presentation**
3. **Text, Arrows, Signs, Warnings Patterns**
4. **Long Message presentation - Scroll or Push Transitions**
5. **Unique In-Dash Mounting**
6. **CAN Bus**

The Matrix Message Board **MMB-RGB 96x16** is mainly designed to be mounted on special vehicles to warn or direct traffic, provide information and to secure danger spots on streets or in public areas. The patterns, such as text, arrows and signs are pre-programed according to the customers needs as well as the colour of the pattern itself. Default colour is amber.

The in-dash mounting of the MMB is unique on the market. The board is practically installed flat with the vehicles side to give it a modern look.

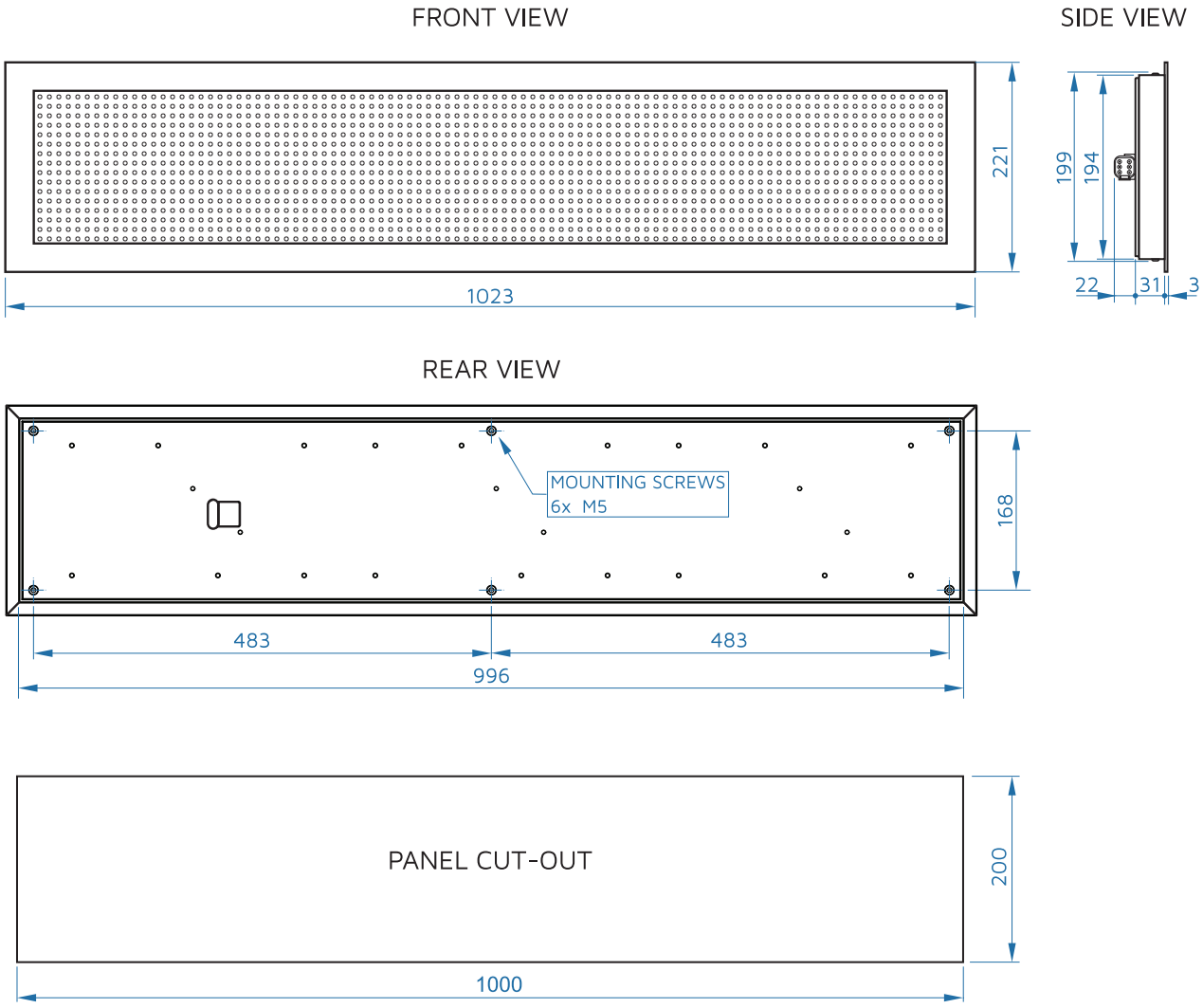
The MMB is a part of Emitter Electronics MMX family products and can be controlled by MMX LCD units, keypads or used together with customers CAN bus system.

Black coated aluminium housing and UV protected polycarbonate front plate are made for long lasting operation and are highly resistant to all weather conditions.

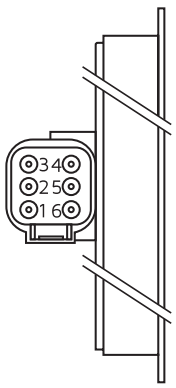
SPECIFICATIONS

POWER	
Unit Supply Voltage	8-32 V DC
Current	max. 0.7 A @ 24 V max. 1.4 A @ 12 V
Electrical Protection	overvoltage, transients, reverse polarity, load dump
INTERFACES	
CAN CAN Termination	1x CAN, ISO 11898 2.0 A/B up to 1 Mbps, protocols SAE J1939, CAN open, free, etc. 120 Ohm, DIP switch
LED MATRIX	
LED	matrix 96x16 RGB super bright SMD LEDs
Message presentation	arrows, text, signs and other patterns
Message animation	steady, scroll, push
Light sensor	optional
ENVIRONMENT	
Temperature range	storage from -40°C to +85°C
Storage Temperature	operation from -40 to +85°C
IP Class (IEC529)	IP65, front panel IP67
EMC	designed to EN 61000-6-2, noise immunity designed to EN 61000-6-4, radiation of interference
ENCLOSURE	
Matting Connector	Deutsch DT06-06S, automotive 6-way connector, waterproof
Housing material	Aluminium housing - black coated, polycarbonate front plate - transparent
Housing dimensions	transparent protection plate, 1023 x 221 x 56 mm
Mounting	in-dash with 6 screws M5 or tapping screws with max. diameter of 5 mm
SIZE AND WEIGHT	
W x H x D	1023 x 221 x 56 (34 without connector)
Weight	4 kg

DIMENSIONS



CONNECTIONS



Deutsch DT06-6S

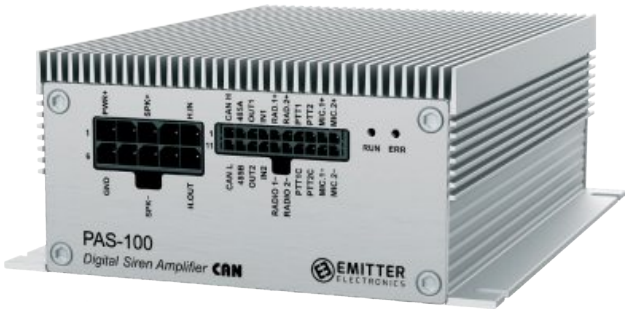
PIN	DESCRIPTION
1	Battery +
2	CAN L
3	CAN L, internal shorted to pin 2
4	CAN H
5	CAN H, internal shorted to pin 4
6	GND (Battery -)

PRODUCT CODE

MMB-RGB 96X16	matrix message board, 96x16 px, RGB, CAN	Standard	Active
For more options please contact the supplier.			

PAS 100 / 200

DIGITAL SIREN AMPLIFIER



Features and Benefits

1. **Power Amplifier with PA system**
2. **True RMS 100 W or 200 W (2x100 W)**
3. **Multi-voltage 8-32 VDC**
4. **Record'n'Play Function, optionally**
5. **Horn Ring Cycler**
6. **Full CAN Bus Control**

The PA electronic Siren Amplifier **PAS-100/200** is designed to be used in Emergency vehicles such as ambulance, firefighting, police or other law enforcement vehicles. The amplifier is available in 100 W and also in 200 W version with two independent channels of 2x 100 W True RMS. It can provide a wide range of pre-programed siren sounds that can be set according to the different country regulations and market needs. Incorporates radio broadcast - two radio inputs and PTT handheld unit with a public access (PA) override function - two mic. inputs.

The siren sound can also be changed with the Ring horn button - Horn Ring Cycler function. It has an integrated OEM Horn Ring transfer Relay and load simulation resistor to avoid problems of displaying errors on vehicle's dashboard when the OEM Horn wire is cut. Optionally it can be supplied with extened memory used for Record'n'Play function. For additional functions, two digital high side outputs and inputs are available.

The PAS100/200 amplifier is a part of Emitter Electronics MMX family products and can be controlled by MMX LCD units, keypads or used together with customers CAN bus system.

As a special function, the Amplifier can transfer the sound via RS485 to other devices E.g. Intercom system etc

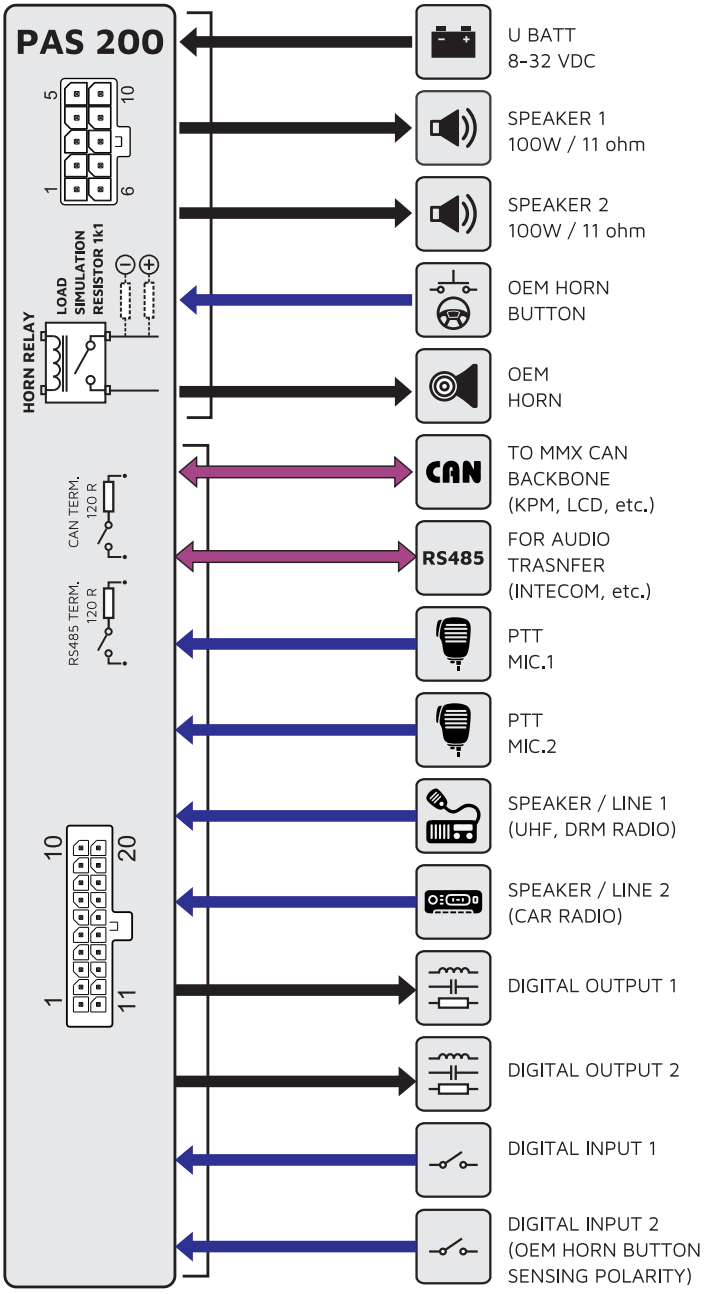
SPECIFICATIONS

POWER	
Supply Voltage	8-32 V DC
Current PAS-100 PAS-200	<50 mA @ IDLE max. 15 A + dig. outputs @ 12 V max. 7.5 A + dig. outputs @ 24 V max. 30 A + dig. outputs @ 12 V max. 15 A + dig. outputs @ 24 V
Electrical Protection	Overvoltage, under-voltage, transients, reverse polarity by breaking external fuse, load dump, over-temperature
INTERFACES	
CAN CAN Termination El. Protection	1x CAN, ISO 11898 2.0 A/B up to 1 Mbps, protocols SAE J1939, CAN open, free, etc. Baud rate 250 kbps (optional ≤ 1 Mbps) 120 Ohm, configurable with internal DIP switch Short to GND or Ub, allowable voltage on pins 0..32V
RS485 RS485 Termination El. Protection	TIA/EIA 485, used for audio transfer, Baud rate ≤ 1 Mbps, optional 120 Ohm, DIP switch Short to GND or Ub, allowable voltage on pins 0..32V
AUDIO I/O	
Inputs Microphone Level Input PTT (Push To Talk) Input Speaker/Line Level Input	 2 x, differential or single ended input, 100 Hz .. 10 kHz @-3dB 2 x, active low logic, integrated pull-up resistor 2 x, differential or single ended input, 100 Hz .. 10 kHz @-3dB
Outputs Speaker Output PAS-100 Speaker Output PAS-200 El. Protection	 1 x, RMS output power 100 W/ch @11 Ω, 100 Hz .. 10 kHz @-3dB 2 x, RMS output power 100 W/ch @11 Ω, 100 Hz .. 10 kHz @-3dB Overload – short between pins, short to GND or Ub, over temperature
DIGITAL I/O	
Inputs El. Protection	2 x, active high logic, integrated pull-down resistor Short to GND or Ub, allowable voltage on pins 0..32V
Outputs El. Protection	2 x, high side switch ≤ 2.2 A Overload – short between pins, short to GND or Ub, over temperature
OEM HORN CONTROL	
Relay	Integrated, normally open contacts, 24 V:I ≤ 15 A, 12 V:I ≤ 30 A
OEM Horn Input	Voltage sensing, pull-down (optional pull-up) load simulation resistor

MISCELLANEOUS	
LED Diagnostics	1x green run LED on front panel, 1x red error LED on front panel
Monitoring	Internal sensing of supply voltages, CPU core and board temperature, watchdog functionality
ENVIRONMENT	
Temperature range	
Storage	From -40°C to +85°C
Operation	Ambient from -40 to +65°C, internal -40 to +105°C (at full load)
IP Class (IEC529)	IP2x
EMC	Designed to EN 61000-6-2, noise immunity Designed to EN 61000-6-4, radiation of interference Designed to ISO 7637-2 pulse immunity, load dump Designed to ECE-R10.5 noise immunity

ENCLOSURE	
Matting Connector	
Power Connector	Mega Fit 10-way dual row for cables 2.5 mm² (14 AWG)
Signal Connector	WR-MPC3 20-way dual row for cables 0.5 mm² (24-20 AWG)
Housing material	Aluminium housing - anodised
Mounting	4 screws M4 or tapping screws with max. diameter of 4.5 mm
SIZE AND WEIGHT	
Housing dimensions	W x H x D
PAS-100	105 x 48 x 160 mm
PAS-200	105 x 48 x 220 mm
Weight	
PAS-100	0,8 kg
PAS-200	1,1 kg

Block Diagram of all available amplifier functions:



POWER CONNECTOR Mega-Fit 2x5

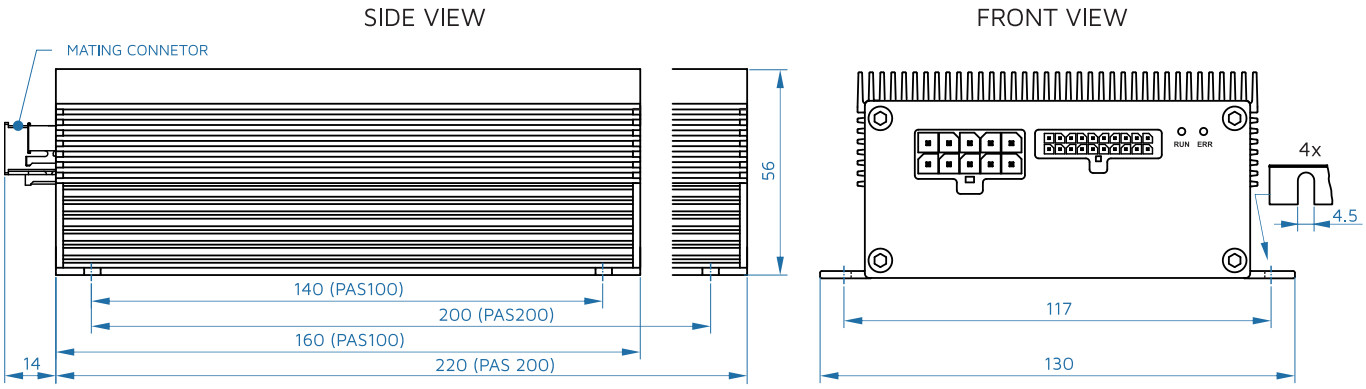
PIN	DESCRIPTION
1	Battery +
2	GND (Battery -)
3	Speaker 1 Out +
4	Speaker 2 Out +
5	OEM Horn In
6	Battery +
7	GND (Battery -)
8	Speaker 1 Out -
9	Speaker 2 Out -
10	OEM Horn Out

SIGNAL CONNECTOR WR-MPC 2x10

PIN	DESCRIPTION
1	CAN H
2	RS485 A
3	Digital Output 1
4	Digital Input 1
5	Speaker/Line Input 1 +
6	Speaker/Line Input 2 +
7	Microphone PTT 1 Input
8	Microphone PTT 2 Input
9	Microphone Input 1 +
10	Microphone Input 2 +
11	CAN L
12	RS485 B
13	Digital Output 2
14	Digital Input 1
15	Speaker/Line Input 1 -
16	Speaker/Line Input 2 -
17	Microphone PTT 1 GND
18	Microphone PTT 2 GND
19	Microphone Input 1 -
20	Microphone Input 2 -

PAS 100 / 200 DIGITAL SIREN AMPLIFIER

DIMENSIONS



HANDHELD MIC UNITS

Product Code	Description	Picture	Status
HH-MIC1E-XLR-01	Handheld mic., electret condenser, PU coiled cable 0.5m, 5x0.8 mm² with XLR connector		Standard
HH-MIC2-01	Handheld dynamic mic., Coiled cable 1.1m (max 1.6m)		TBA

PRODUCT CODE

Product Code	Description	Status
PAS-100S	PA Siren Amplifier, Power 100W/11 ohm, CAN, 8-32 VDC, Standard version	Active
PAS-100F	PA Siren Amplifier, Power 100W/11 ohm, CAN, 8-32 VDC, Full version (record'n'play, RS485)	TBD
PAS-200S	PA Siren Amplifier, Hi-Power 200W/11 ohm, CAN, 8-32 VDC, Standard version	Active
PAS-200F	PA Siren Amplifier, Hi-Power 200W/11 ohm, CAN, 8-32 VDC, Full version (record'n'play, RS485)	TBD
For more options please contact the supplier.		

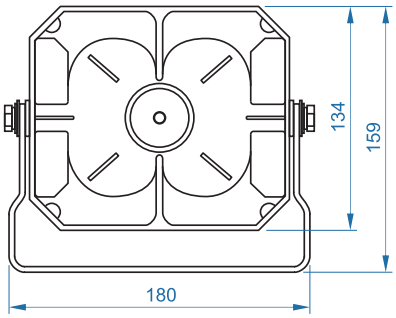
SIREN SPEAKERS

Available are three types of powerful, heavy duty speakers, designed to withstand all weather conditions and to reproduce a clear voice. The Speakers are compatible with Emitter Electronics Sirens.

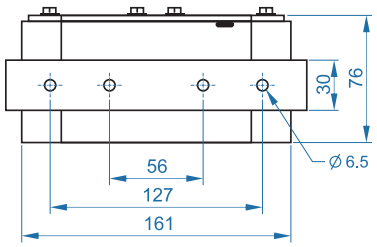
SPK –R100W11 and SPK-C100W11S speakers are super-thin and can be mounted on various mounting locations, as well as under the hood. On the contrary, the SPK-H100W11 speakers use a big horn and can be mounted in the bumper area, on the roof, near the light bar area, etc.

SPK-R100W11

FRONT VIEW

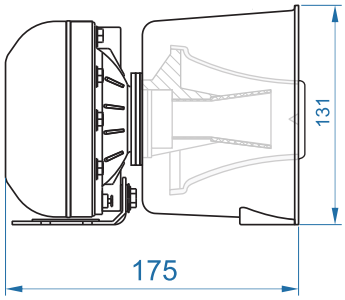


MOUNTING HOLES

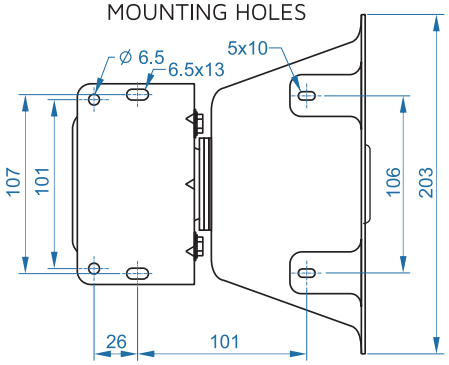


SPK-H100W11

SIDE VIEW

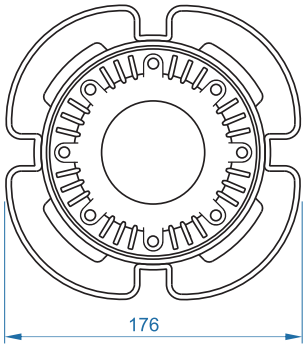


MOUNTING HOLES

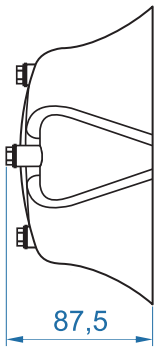


SPK-C100W11

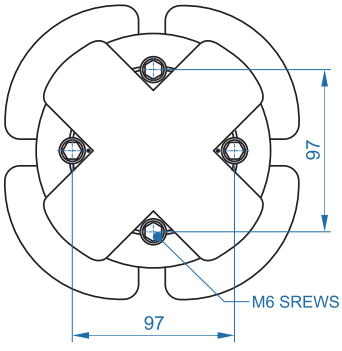
FRONT VIEW



SIDE VIEW



MOUNTING SCREWS



SPECIFICATIONS

Speaker Specifications	All types
Power	100 W
Impedance	11 Ohm
Sound frequency range	200-5.000 Hz
Sound compression level	>118 dB
Weight	Approx. 3 kg

PRODUCT CODE

Product Code	Description
SPK-R100W11	Speaker PA Super Thin, 100 W, 11 Ohm, >118 dB
SPK-C100W11	Speaker PA Circular, 100 W, 11 Ohm, >118 dB
SPK-H100W11	Speaker PA Horn, 100 W, 11 Ohm, >118 dB
For more options please contact the supplier.	

MMX GNSS/GPRS MODEM

Features and Benefits

1. **Worldwide access to your vehicles or machines CAN data via the internet**
2. **Global navigation satellite system and cellular network for telemetrics services**
3. **Enables online access using any screen**
4. **Robust CAN hardware**
5. **Cloud-based and modern design Data Platform for powerful fleet management**
6. **Improves safety, efficiency and increases fleet visibility**

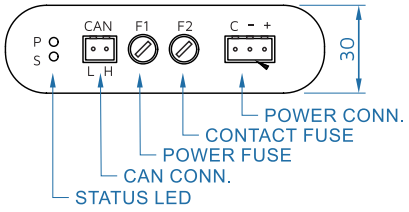
The Emitter telemetric system consists of one or several CAN IO controllers (nodes) which collect telematic data from chassis and superstructure such as system and diagnostics data, vehicle CAN data etc, a GNSS/GPRS modem with integrated eSIM for tracking and sending the data to the cloud, cloud platform to store data for years, and a responsive web portal to visualize and act on the insights.

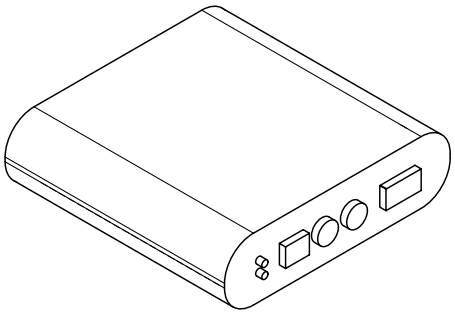
All sensors and actuators are connected to MMXEC1 I/O node. The I/O node communicates with GNSS modem via CAN bus.

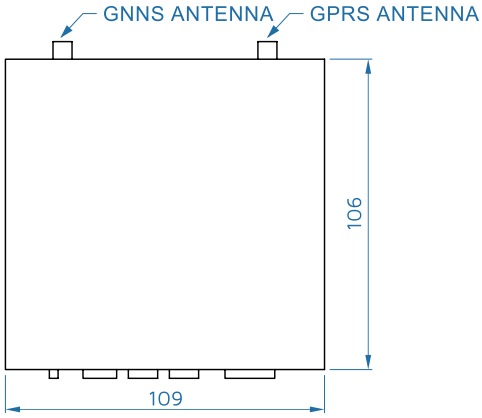
SPECIFICATIONS

POWER	
Supply Voltage	8-30 V DC
Current	1 A maximum
Current average at 24 V	< 100 mA
Electrical Protection	overvoltage, transients, reverse polarity via internal fuse
INTERFACES	
CAN	1 x CAN
CAN termination	no, use external resistor, CKIT DTM YT or similar
GNSS	Professional Global navigation satellite system module, GPS, GLONASS, Galileo, BeiDou
GPRS	HSPA/GSM 3G module, 3G bands 900/2100 Mhz and 2G bands 900/1800 Mhz
ENCLOSURE	
Housing modem	Aluminium
Mounting	Inside the vehicle with cable ties
Mounting GNSS antenna	Antenna has magnetic surface
Connector power supply	Terminal block 2way
Connector CAN	Terminal block 3way
Connector GNSS/ GPRS	SMA connector type
ENVIRONMENT	
IP Class (IEC529)	IP4x
EMC Conformity	EN61000-6-2 noise immunity EN61000-6·4 radiation of interference
Temperature Range	storage -40° to +85°C (-40°F to 185°F) operating -40° to +85°C (-40°F to 185°F)
MISCELLANEOUS	
LED indicator	2x red/green for GNSS, CAN and Contact signal and server connection
Connectors	Power and CAN: Terminal block 2way, 3way, GNSS and GPRS antenna: SMA connector
SIZE AND WEIGHT	
W x H X D [mm]	109 x 106 x 30
Weight	0.3 kg with GNSS and GPRS antenna

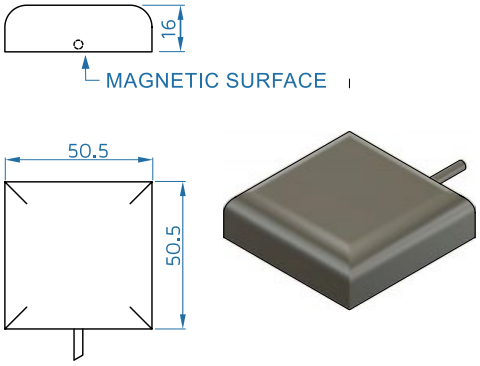
GNSS/GPRS MODEM







GNSS ANTENNA



Real-time map

Scalable cloud-based platform collects and analyses data from connected vehicles and allows generating detailed and customized reports, actions, triggers and events to keep full control over your fleet. The interactive map is scalable and can be accessed from any device, such as PCs, notebooks, tablets, smartphones etc. View the current state of your engine and deep-dive into its historical data. Telematics data are based on a so-called "trip", a complete log from the moment a vehicle is turned ON until it's turned OFF again.

A log of records usually consists of:

GPS timestamp and location, GPS speed, GPS direction, vehicle status (ignition ON/OFF), vehicle voltage, driving and total working time, distance travelled, water and foam tank level, fuel level as well as digital or analogue IO status, RPM, Harsh acceleration, braking and cornering, etc. This offers you also a total control over the maintenance process of your fleet.

PRODUCT CODE

MMXGNSS	GNSS/GSM modem with GPS and GSM antennas
For more options please contact the supplier.	

INTERCOM

Features and Benefits

1. **Digital audio processing and transmission**
2. **Automatic gain control (AGC)**
3. **Integrated microphone**
4. **RGB LED illuminated heavy-duty buttons, suitable for operation with protective gloves**
5. **Automatic Key brightness**
6. **Quick installation and setup**
7. **Robust e-coated aluminium enclosure**

Supreme audio quality, Digital processing

Emitter Vehicle Intercom System is engineered to solve the problem of communication in high-noise environments such as in Fire and Rescue vehicles, mobile machines, ambulances, etc. The supreme audio quality is achieved with digital audio transmission which is much more immune to electrical noise and other disturbances than analogue transmission. Digital audio processing, automatic gain control (AGC), gate functionality and digital filtering improve sound quality on all levels.

INTERCOM consists of two main units and supporting components. Up to three slave units can be connected optionally. Regarding mounting location, one unit, usually mounted in the cabin, is marked as the "indoor/master unit" and the other one as the "outdoor/slave unit". Each unit has its own specific supporting components. The indoor/master unit has an integrated microphone, optional external gooseneck microphone and external 15 W speaker. The outdoor/slave unit has an external handheld unit with an integrated microphone and speaker, external 15 W speaker and 1 A output for external ring indication lamp or a buzzer.

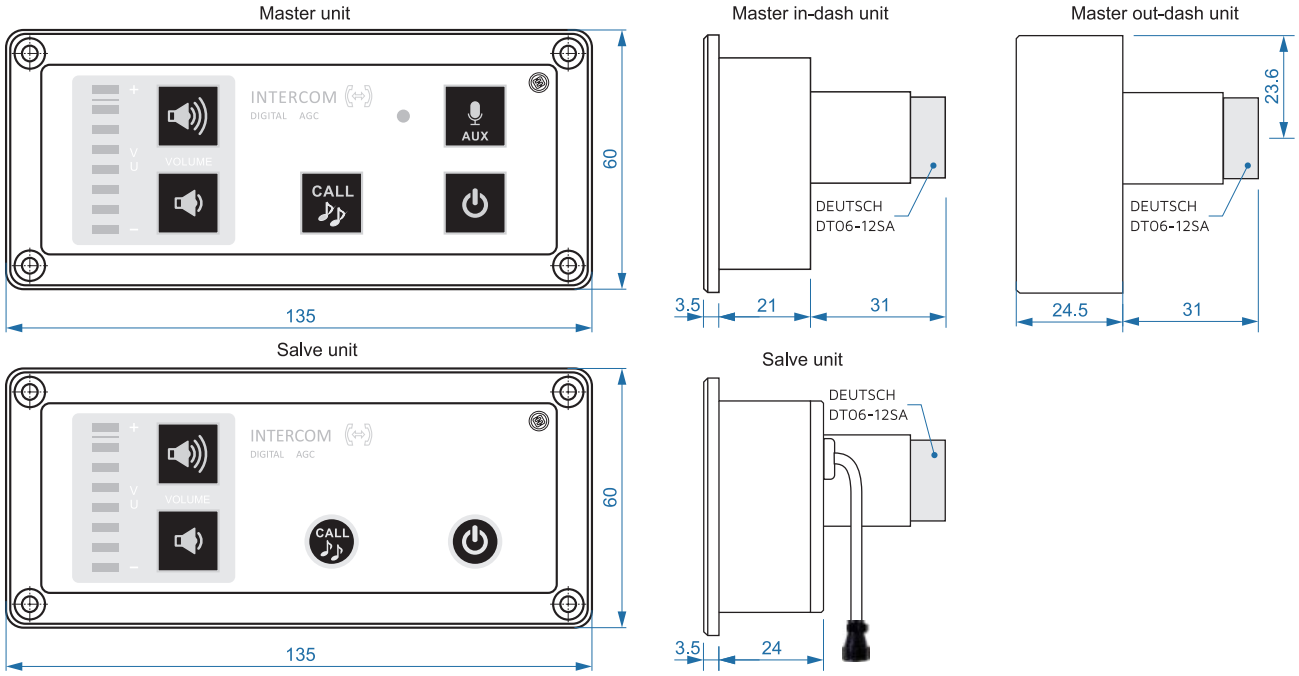
SPECIFICATIONS

POWER	
Supply Voltage	24 V version: 20-32 V DC 12 V version: 8-16 V DC
Current Consump.	24 V version: max. 1.5 A/unit 12 V version: max. 3.75 A/unit
Electrical Protection	overvoltage, transients, reverse polarity, load dump
I/O AND INTERFACES	
Output	1 x Current Sink Output, max. 1 A on outdoor/slave unit
Interfaces	1 x CAN, 1 x RS-485
Speaker	1 x RMS/PEAK power max. 15/25 W, 4 Ω
ENVIRONMENT	
IP Class (IEC259)	Indoor/MasterUnit IP53 Outdoor/Slave Unit IP67
Temperature Range	Indoor/MasterUnit -20°C to +70°C Outdoor/Slave Unit -40°C to +80°C
ENCLOSURE	
Housing Material	Aluminium
Mounting	In-dash or out-dash with 4 screws M3 or 2.9 mm tapping screws
Matting connector	Deutsch DT06-12S
Unit Weight	0.35 kg

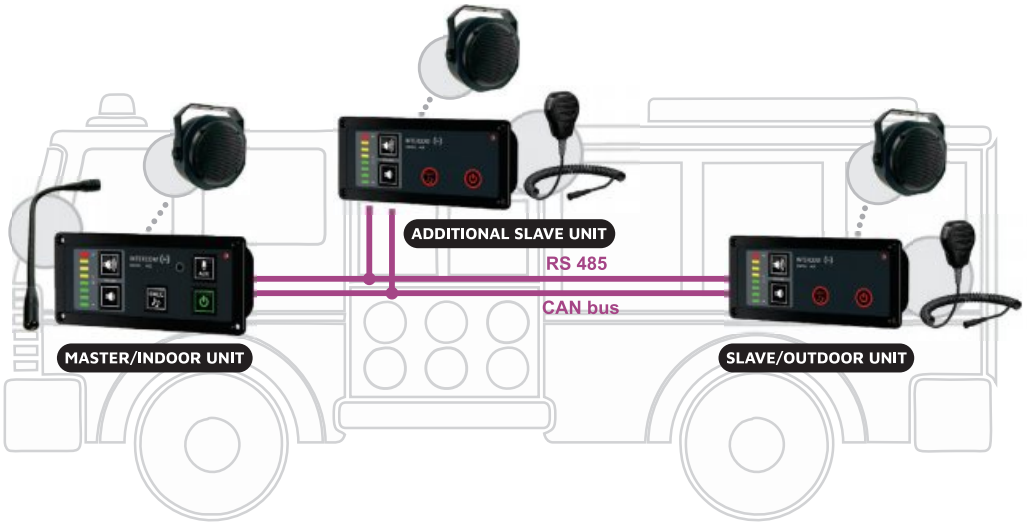
PRODUCT CODE

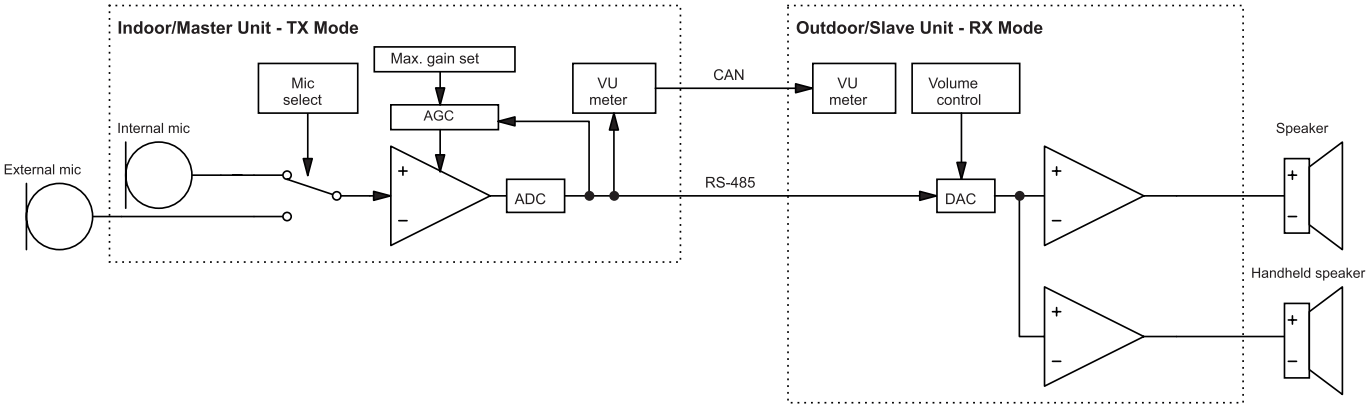
INTMI-24-IM	Intercom Master Cabin/Indoor Unit, In-dash mount, 24V, integrated mic.
INTMI-24-HM	Intercom Master Cabin/Indoor Unit, In-dash mount, 24V, handheld mic.
INTMO-24-HH	Intercom Master Cabin/Indoor Unit, Out-dash mount, 24V, handheld mic.
INTMI-24-IM	Intercom Salve 1 Unit, 24V,integrated mic.
INTS1-24-HH	Intercom Salve 1 Unit, 24V, handheld mic.
INTS2-24-HH	Intercom Salve 2 Unit, 24V, handheld mic.
INTS3-24-HH	Intercom Salve 3 Unit, 24V, handheld mic.
SPK-C15W4	Speaker 15/25W, 4 Ohm with housing
SPK-15W4	Speaker 15/25W, 4 Ohm W/O housing
*if 12V version intecom is needed use 12 in the code instead of 24	

DIMENSIONS



TOPOLOGY AND INTERNAL STRUCTURE





MMX PCU-WPG

Icons shown on this keypad are for visual demonstration only.

Features and Benefits

1. **Pressure Governor With Cavitation Warning**
2. **Alphanumeric Super Bright Led Display**
3. **Integrated Water Tank Level Gauge**
4. **Integrated Keypad - 12 Keys**
5. **Integrated 10 Warning Lights**
6. **Selection of Pressure by Rotary Knob - Encoder**
7. **Acoustic Signal - Integrated Buzzer**

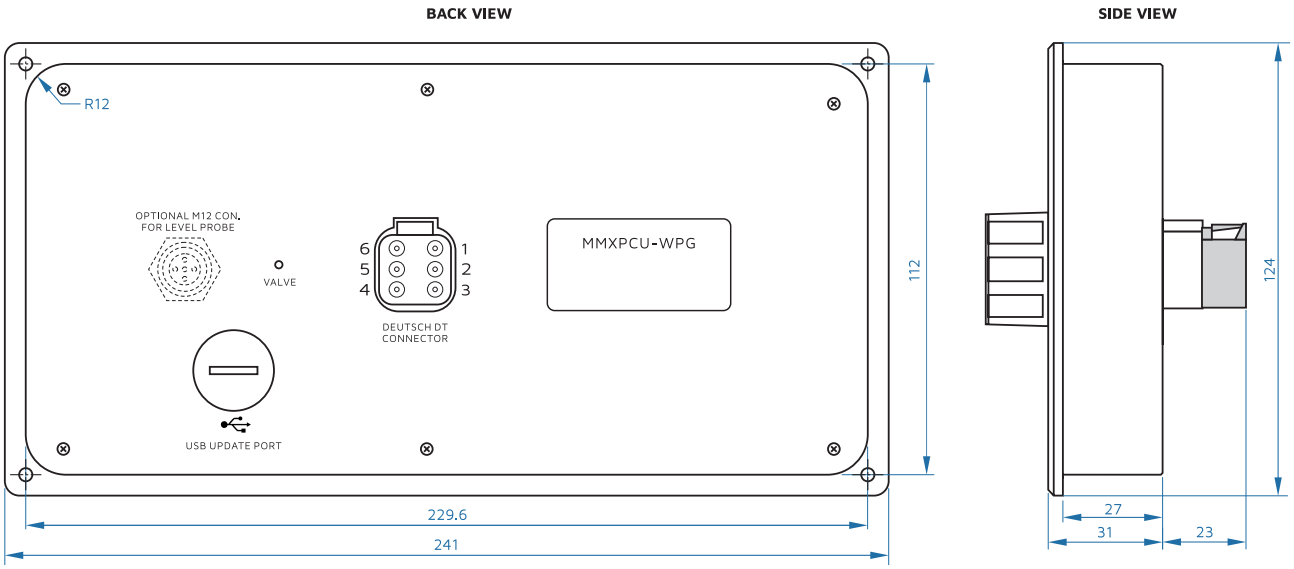
The **MMX PCU-WPG** is an electronic Pump Control Unit with an integrated pressure governor, water tank level gauge, keypad, warning lights and super bright alphanumeric LED display. It can also be used to control other vehicle systems such as valves, lighting, display engine data and water pump data, display pump warning messages as cavitation temperature, etc. The main function of PCU is Pressure Governor which allows automated regulation of the engine RPMs according to the pressure fluctuations in the pump. The automatic pressure regulation is turned ON by turning the rotation switch - encoder.

The integrated keypad is programmable. Each key can be configured to operate as a switch, push button or both as a special feature. Key label graphics are customizable and coloured according to function groups for easy recognition. Unused keys can be screened off with a dark label.

SPECIFICATIONS

POWER	
Supply Voltage	8-32 V DC
Current	1 A maximum
Electrical Protection	overvoltage, transients, reverse polarity, load dump
INTERFACES	
CAN	1 x CAN
CAN termination	120 ohm, DIP switch
USB	1x USB 2.0, for firmware update
FEATURES	
Pressure governor	automatic pressure regulation with cavitation warning
Display	alphanumeric super bright LED display, 11 digit
Warning lights	4 red, 4 amber, 2 green, total 10 LEDs
Tank Level Gauge	1x, blue/red LED
Indicator increments	1/8
Keypad	8 soft keys (programmable) + 4 hard keys (pre-defined)
Signal Indicator	super bright green LED bar
Icons	freely selectable icons
Key Design	RIM-embossed keys with tactile feedback, operating force 8N, white backlit icons
Operating Life	>250.000 cycles
KEY dimension	23 x 23 mm
Rotary Knob	Encoder 16 pos. / 360° with push button
Day/Night operation	automatic – integrated light sensor
Acoustic Signal	Integrated Buzzer 100 dB
ENVIRONMENT	
IP Class (IEC529)	IP67
EMC Conformity	EN61000-6-2 noise immunity EN61000-6-4 radiation of interference
Temperature Range	storage -40° to +85°C (-40° to 185°F) operating -40° to +85°C (-40° to 185°F)
ENCLOSURE	
Housing Material	Aluminium
Mounting	in-dash with 4 screws M3 or 2.9 mm tapping screws
Matting Connector	Deutsch DT06-06S
SIZE AND WEIGHT	
W x H X D	241 x 123 x 38, without matting connector
Weight	1 kg

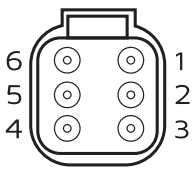
DIMENSIONS



CONNECTIONS

CONNECTION Deutsch DT06-6S

PIN	DESCRIPTION
1	BATTERY + ("15")
2	CAN L
3	CAN L, int. shorted to PIN 2
4	CAN H
5	CAN H, int. shorted to PIN 4
6	BATTERY -



DEUTSCH DT CONNECTOR

PRODUCT CODE

MMPCU-WPG	Pump control unit with pressure governor, water tank level gauge, keypad, warning lights
MMXPCU-W	Pump control unit with water tank level gauge, keypad, warning lights
For more options please contact the supplier.	

MMX PCU-WFPG

Icons shown on this keypad are for visual demonstration only.

Features and Benefits

1. **Pressure Governor With Cavitation Warning**
2. **Alphanumeric Super Bright Led Display**
3. **Integrated Water And Foam Tank Level Gauge**
4. **Integrated Keypad - 15 Keys**
5. **Integrated 10 Warning Lights**
6. **Selection of Pressure by Rotary Knob - Encoder**
7. **Acoustic Signal - Integrated Buzzert**

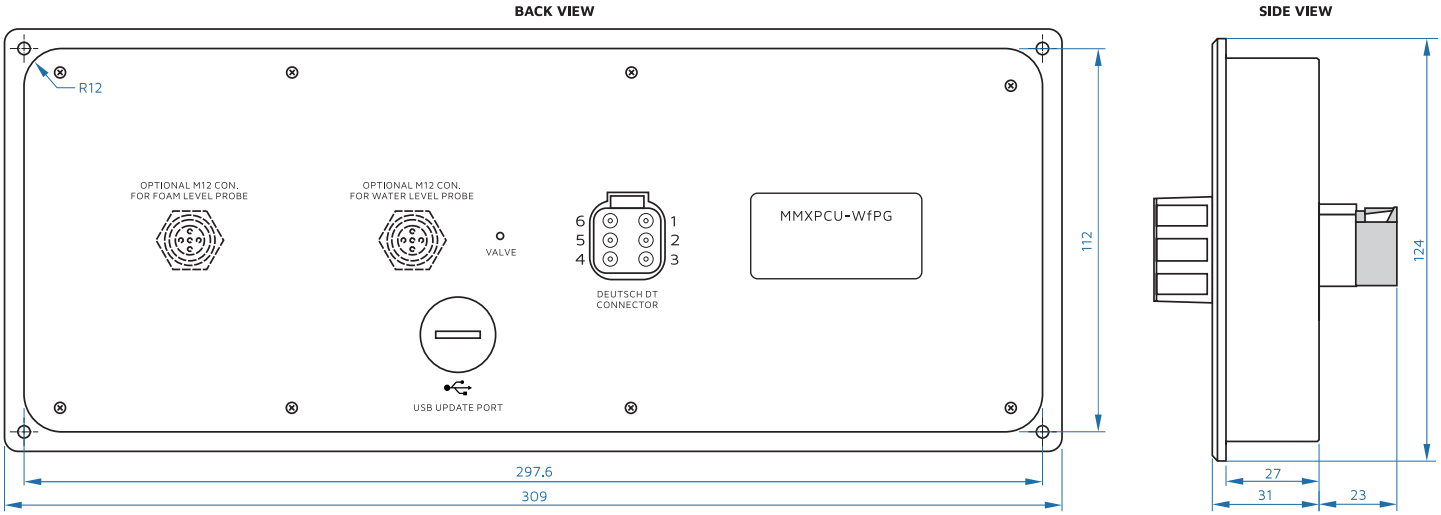
The **MMX PCU-WFPG** is an electronic Pump Control Unit with an integrated pressure governor, water and foam tank level gauge, keypad, warning lights and super bright alphanumeric LED display. It can also be used to control other vehicle systems such as valves, lighting, display engine data and water pump data, display pump warning messages as cavitation temperature, etc. The main function of PCU is Pressure Governor which allows automated regulation of the engine RPMs according to the pressure fluctuations in the pump. The automatic pressure regulation is turned ON by turning the rotation switch - encoder.

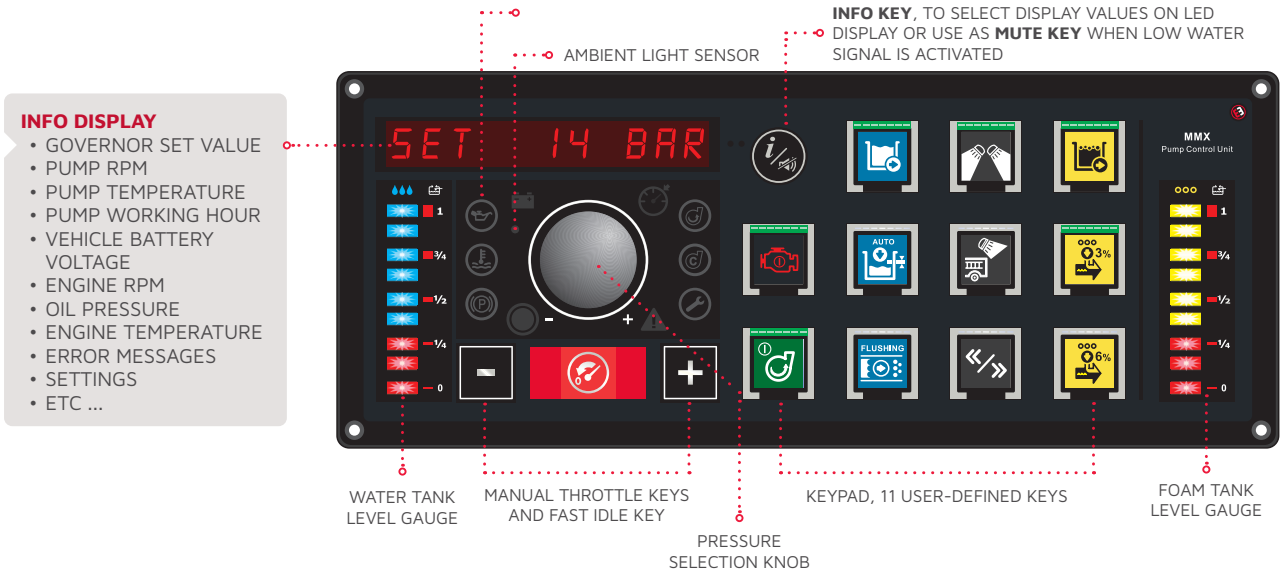
The integrated keypad is programmable. Each key can be configured to operate as a switch, push button or both as a special feature. Key label graphics are customizable and coloured according to function groups for easy recognition. Unused keys can be screened off with a dark label.

SPECIFICATIONS

POWER	
Supply Voltage	8-32 V DC
Current	1.2 A maximum
Electrical Protection	overvoltage, transients, reverse polarity, load dump
INTERFACES	
CAN	1 x CAN
CAN termination	120 ohm, DIP switch
USB	1x USB 2.0, for firmware update
FEATURES	
Pressure governor	automatic pressure regulation with cavitation warning
Display	alphanumeric super bright LED display, 11 digit
Warning lights	4 red, 4 amber, 2 green, total 10 LEDs
Tank Level Gauge	1x, blue/red LED, 1x yellow/red LEDs
Indicator increments	1/8
Keypad	11 soft keys (programmable) + 4 hard keys (pre-defined)
Signal Indicator	super bright green LED bar
Icons	freely selectable icons
Key Design	RIM-embossed keys with tactile feedback, operating force 8N, white backlit icons
Operating Life	>250.000 cycles
KEY dimension	23 x 23 mm
Rotary Knob	Encoder 16 pos. / 360° with push button
Day/Night operation	automatic – integrated light sensor
Acoustic Signal	Integrated Buzzer 100 dB
ENVIRONMENT	
IP Class (IEC529)	IP67
EMC Conformity	EN61000-6-2 noise immunity EN61000-6-4 radiation of interference
Temperature Range	storage -40° to +85°C (-40° to 185°F) operating -40° to +85°C (-40° to 185°F)
ENCLOSURE	
Housing Material	Aluminium
Mounting	in-dash with 4 screws M3 or 2.9 mm tapping screws
Matting Connector	Deutsch DT06-06S
SIZE AND WEIGHT	
W x H X D	309 x 123 x 38, without matting connector
Weight	1.2 kg

DIMENSIONS

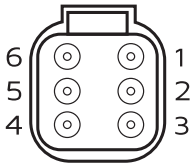




CONNECTIONS

CONNECTION Deutsch DT06-6S

PIN	DESCRIPTION
1	BATTERY + (“15”)
2	CAN L
3	CAN L, int. shorted to PIN 2
4	CAN H
5	CAN H, int. shorted to PIN 4
6	BATTERY -



DEUTSCH DT CONNECTOR

PRODUCT CODE

MMPCU-WFPG	Pump control unit with pressure governor, water tank level gauge, keypad, warning lights
MMXPCU-WF	Pump control unit with water tank level gauge, keypad, warning lights
For more options please contact the supplier.	

MMX PCU-WKPG

Icons shown on this keypad are for visual demonstration only.

Features and Benefits

1. **Pressure Governor With Cavitation Warning**
2. **Alphanumeric Super Bright Led Display**
3. **Integrated Water Tank Level Gauge**
4. **Integrated Keypad - 18 Keys**
5. **Integrated 10 Warning Lights**
6. **Selection of Pressure by Rotary Knob - Encoder**
7. **Acoustic Signal - Integrated Buzzer**

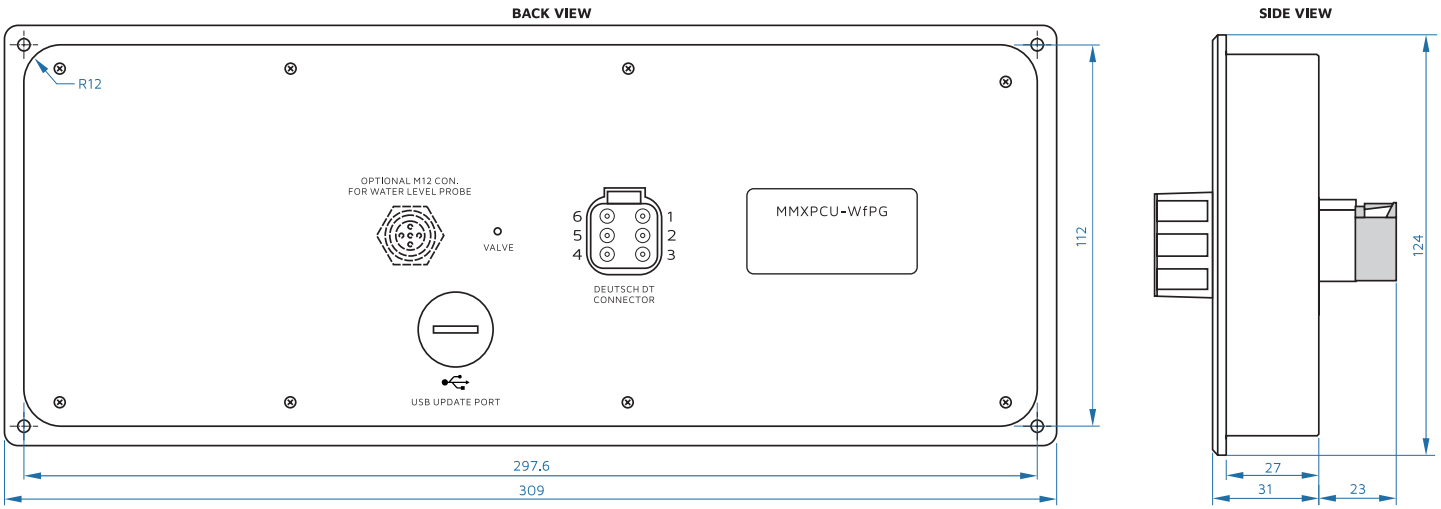
The **MMX PCU-WKPG** is an electronic Pump Control Unit with an integrated pressure governor, water tank level gauge, keypad, warning lights and super bright alphanumeric LED display. It can also be used to control other vehicle systems such as valves, lighting, display engine data and water pump data, display pump warning messages as cavitation temperature, etc. The main function of PCU is Pressure Governor which allows automated regulation of the engine RPMs according to the pressure fluctuations in the pump. The automatic pressure regulation is turned ON by turning the rotation switch - encoder.

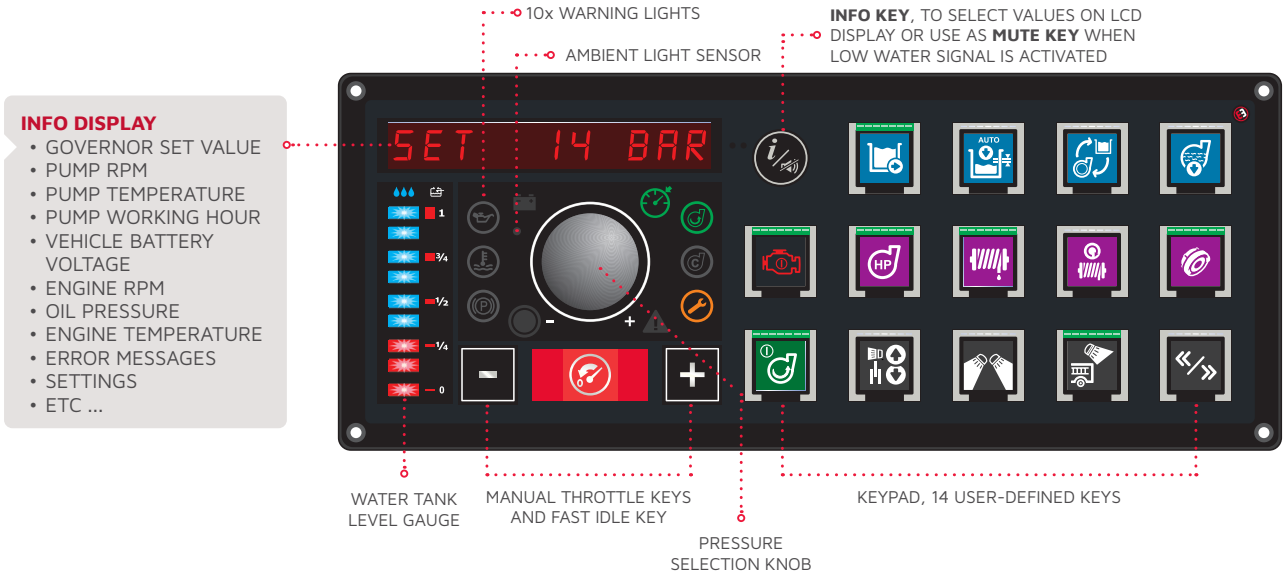
The integrated keypad is programmable. Each key can be configured to operate as a switch, push button or both as a special feature. Key label graphics are customizable and coloured according to function groups for easy recognition. Unused keys can be screened off with a dark label.

SPECIFICATIONS

POWER	
Supply Voltage	8-32 V DC
Current	1.2 A maximum
Electrical Protection	overvoltage, transients, reverse polarity, load dump
INTERFACES	
CAN	1 x CAN
CAN termination	120 ohm, DIP switch
USB	1x USB 2.0, for firmware update
FEATURES	
Pressure governor	automatic pressure regulation with cavitation warning
Display	alphanumeric super bright LED display, 11 digit
Warning lights	4 red, 4 amber, 2 green, total 10 LEDs
Tank Level Gauge	1x, blue/red LED
Indicator increments	1/8
Keypad	14 soft keys (programmable) + 4 hard keys (pre-defined)
Signal Indicator	super bright green LED bar
Icons	freely selectable icons
Key Design	RIM-embossed keys with tactile feedback, operating force 8N, white backlit icons
Operating Life	>250.000 cycles
KEY dimension	23 x 23 mm
Rotary Knob	Encoder 16 pos. / 360° with push button
Day/Night operation	automatic – integrated light sensor
Acoustic Signal	Integrated Buzzer 100 dB
ENVIRONMENT	
IP Class (IEC529)	IP67
EMC Conformity	EN61000-6-2 noise immunity EN61000-6-4 radiation of interference
Temperature Range	storage -40° to +85°C (-40° to 185°F) operating -40° to +85°C (-40° to 185°F)
ENCLOSURE	
Housing Material	Aluminium
Mounting	in-dash with 4 screws M3 or 2.9 mm tapping screws
Matting Connector	Deutsch DT06-06S
SIZE AND WEIGHT	
W x H X D	309 x 123 x 38, without matting connector
Weight	1.2 kg

DIMENSIONS

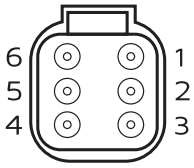




CONNECTIONS

CONNECTION Deutsch DT06-6S

PIN	DESCRIPTION
1	BATTERY + ("15")
2	CAN L
3	CAN L, int. shorted to PIN 2
4	CAN H
5	CAN H, int. shorted to PIN 4
6	BATTERY -



DEUTSCH DT CONNECTOR

PRODUCT CODE

MMPCU-WKPG	Pump control unit with pressure governor, water tank level gauge, keypad, warning lights
MMXPCU-WK	Pump control unit with water tank level gauge, keypad, warning lights
For more options please contact the supplier.	

KEYPAD MODULE

KPM-G21

Icons shown on this keypad are for visual demonstration only.

Features and Benefits

1. **White Backlit With Green Led Signal Indicator**
2. **Freely Selectable Icons**
3. **Can Bus Datalink**
4. **Super Bright Leds, Wide Viewing Angle**
5. **Integrated I/O Driver – Optional**
6. **Washable, Waterproof Alu. Housing**

Keypad module KPM-G21 uses two distinct keys, it is highly resistant to weather conditions and can survive extreme environments, what makes it perfect for installation outside or inside driver cabin. The keys are large, well-spaced and embossed, allowing a reliable pressure sensation with a tactile feedback even when wearing protective gloves. Each key has a large green LED signal indicator above the icon.

Type KPM-G21O has an integrated I/O controller with two low side power outputs and two inputs that can be useful if the keypad is used as a stand-alone device, not connected to the MMX system.

Keypad is programmable. Each key can be configured to operate as a switch or push button. Key label graphics are customizable, white backlit and coloured according to function groups for easy recognition. Unused keys can be screened off with a dark label.

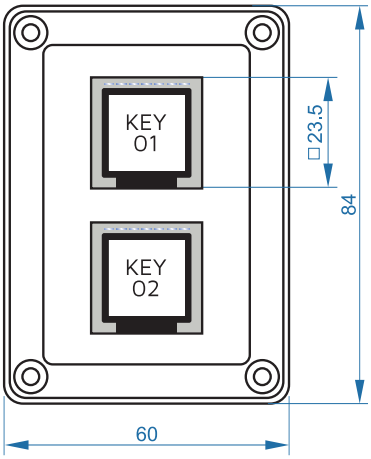
Labels are inserted at the inner side of the front panel of the keypad. Several keypads located on different places can be connected over CAN BUS to collaborate. Keypad modules series KPM-G are a perfect solution in automotive, nautical, agriculture, utility vehicles and industrial sectors.

SPECIFICATIONS

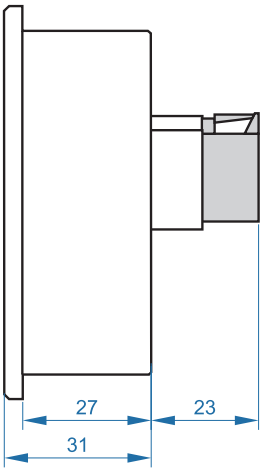
POWER	
Supply Voltage	8-32 V DC
Current	0.1 A maximum, no outputs active
Electrical Protection	overvoltage, transients, reverse polarity, load dump
INTERFACES	
CAN	1 x CAN (only type without I/O driver)
CAN termination	120 ohm, DIP switch
ENVIRONMENT	
IP Class (IEC529)	IP67, waterproof
EMC Conformity	EN61000-6-2 noise immunity EN61000-6·4 radiation of interference
Temperature Range	storage -40° to +85°C (-40° to 185°F) operating -40° to +85°C (-40° to 185°F)
KEYS	
Key LED	white backlit
Signal Indicator	super bright green LED bar
Icons	freely selectable icons
Key Design	embossed keys with tactile feedback, operating force 8N
Operating Life	>250.000 cycles
KEY dimension	23.5 x 23.5 mm
ENCLOSURE	
Housing Material	Aluminium
Mounting	in-dash, with 4 screws M3 or 3.5 mm (#8) tapping screws
Connector	Deutsch DT06-06S
I/O - Only version with integrated IO driver	
Digital Input	2 x active low level
Digital Output	2 x negative switching (low-side), max. 2 A
Loads	inductive, resistive
Miscellaneous	outputs not protected
SIZE AND WEIGHT	
W x H X D	60 x 84 x 33 mm without connector
Weight	0.21 kg

DIMENSIONS

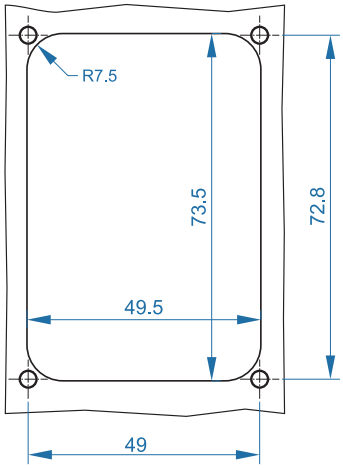
FRONT VIEW



SIDE VIEW



PANEL CUT-OUT



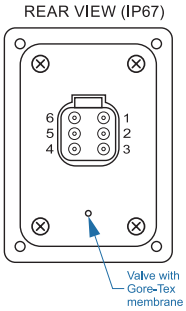
CONNECTIONS

CAN BUS MODULE

CONNECTION Deutsch DT06-6S

PIN	DESCRIPTION
1	BATTERY + (“15”)
2	CAN L
3	CAN L, int. shorted to PIN 2
4	CAN H
5	CAN H, int. shorted to PIN 4
6	BATTERY -

REAR VIEW (IP67)



STAND-ALONE MODULE WITH I/O

CONNECTION Deutsch DT06-6S

PIN	DESCRIPTION
1	BATTERY + (“15”)
2	INPUT 1
3	OUTPUT 1
4	OUTPUT 2
5	INPUT 2
6	BATTERY -

PRODUCT CODE

KPM-G21	Keypad module, 2 keys (2 rows x 1 column), white backlit with green signal indicator, CAN BUS datalink
KPM-G21O	Keypad module, 2 keys (2 rows x 1 column), white backlit with green signal indicator, integrated I/O driver, no CAN BUS datalink
For more options please contact the supplier.	

KEYPAD MODULE

KPM-GC26

Icons shown on this keypad are for visual demonstration only.

Features and Benefits

1. **White And RGB Backlit With Green LED Signal Indicator**
2. **Used Also As Warning Lights (RGB LEDs Inside)**
3. **Freely Selectable Icons**
4. **CAN Bus Datalink**
5. **Super Bright LEDs, Sunlight Readable**
6. **Washable, Waterproof Alu. Housing**

Keypad module KPM-GC26 uses twelve distinct keys, it is highly resistant to weather conditions and can survive extreme environments, what makes it perfect for installation outside or inside driver cabin.

The keys are large, well-spaced and embossed, allowing a reliable pressure sensation with a tactile feedback even when wearing protective gloves. Each key has a large green LED signal indicator above the icon. Since the KEY backlit LED are white and RGB (colour) the keypad can be used as a combination of buttons and warning light indicators.

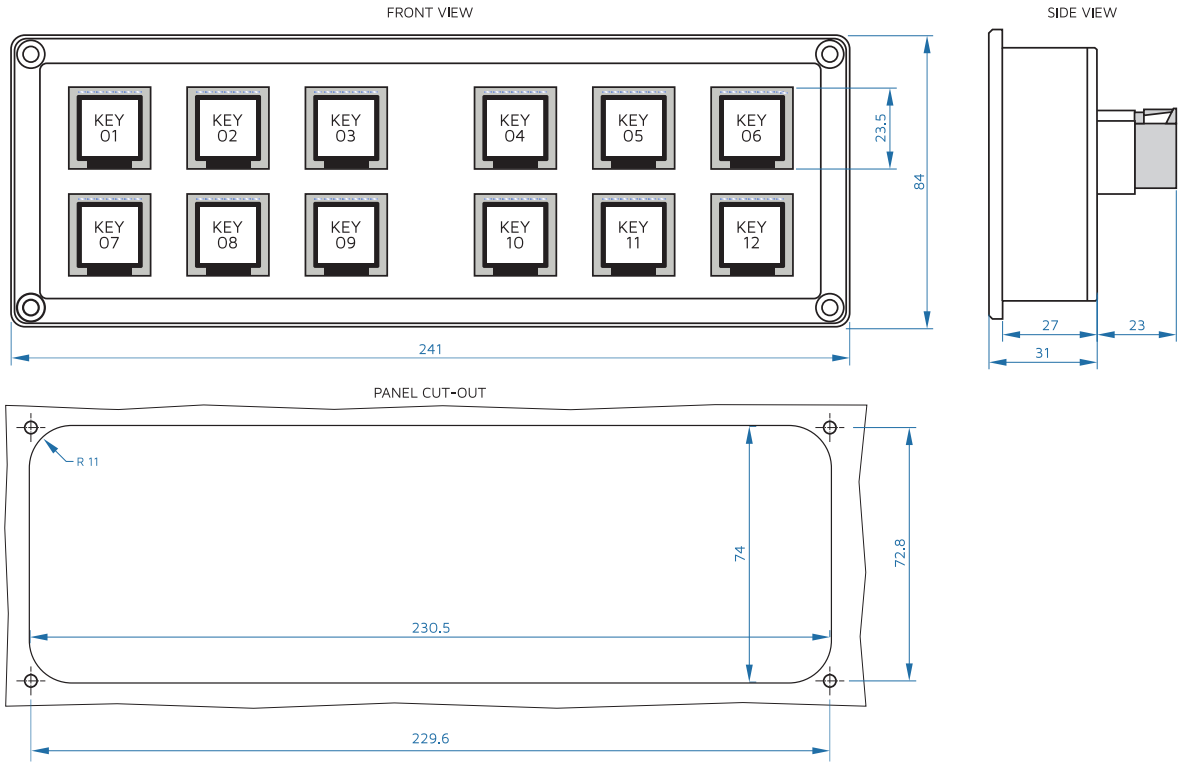
Keypad is programmable. Each key can be configured to operate as a switch or push button. Key label graphics are customizable, white backlit and coloured according to function groups for easy recognition. Unused keys can be screened off with a dark label. Labels are inserted at the inner side of the front panel of the keypad. Several keypads located on different places can be connected over CAN BUS to collaborate.

Keypad modules series KPM-GC are a perfect solution in automotive, nautical, agriculture, utility vehicles and industrial sectors.

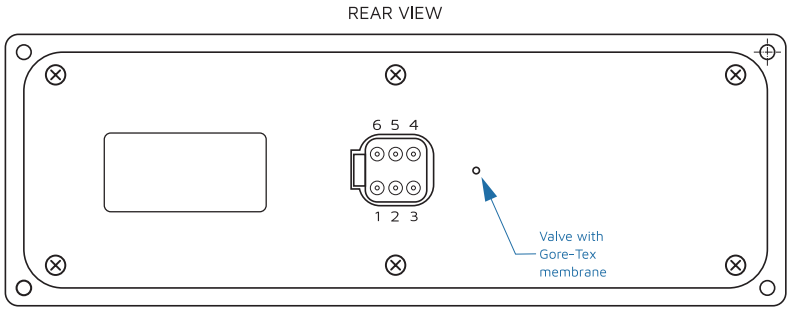
SPECIFICATIONS

POWER	
Supply Voltage	8-32 V DC
Current	0.5 A maximum, no outputs active
Electrical Protection	overvoltage, transients, reverse polarity, load dump
INTERFACES	
CAN	1 x CAN (only type without I/O driver)
CAN termination	configurable termination 120 ohm via DIP switch
CAN Link	T-connection, node ID definition via software
ENVIRONMENT	
IP Class	IP67, waterproof
EMC Conformity	EN61000-6-2 noise immunity EN61000-6-4 radiation of interference
Temperature Range	storage -40° to +85°C (-40° to 185°F) operating -40° to +85°C (-40° to 185°F)
KEYS	
Key LED	first row RGB and white backlit, second row white backlit
Signal Indicator	Super bright green LED bar
Icons	freely selectable icons
Key Design	embossed keys with tactile feedback, operating force 8N
Operating Life	>250.000 cycles
KEY dimension	23.5 x 23.5 mm
ENCLOSURE	
Housing Material	Aluminium
Mounting	in-dash, with 4 screws M4 or 3.5 mm (#8) tapping screws
Connectors	Deutsch DT06-06S
SIZE AND WEIGHT	
W x H X D	241 x 84 x 33 mm without connector
Weight	0.70 kg

DIMENSIONS



CONNECTIONS



CONNECTION Deutsch DT06-6S	
PIN	DESCRIPTION
1	BATTERY + (“15”)
2	CAN L
3	CAN L - shorted to PIN 2
4	CAN H
5	CAN H - shorted to PIN 4
6	BATTERY -

PRODUCT CODE

KPM-GC26	Keypad module, 12 keys (2 rows x 6 columns), white and RGB backlit with green signal indicator
For more options please contact the supplier.	

KEYPAD MODULE

KPM-GC4J2

Icons shown on this keypad are for visual demonstration only.

Features and Benefits

1. **Integrated 2 Joysticks - 4 Way with Limiter**
2. **White and RGB Backlit Keys with Green LED Signal Indicator**
3. **Freely Selectable Icons**
4. **CAN Bus Datalink**
5. **Super Bright LEDs, Sunlight Readable**
6. **Washable, Waterproof Aluminium Housing**

Keypad module KPM-GC4J2 uses two 4-way Joysticks specifically engineered for demanding vehicle applications and 4 distinct keys. It is highly resistant to weather conditions and can survive extreme environments, what makes it perfect for installation outside or inside driver cabin. The keys are large, well-spaced and embossed, allowing a reliable pressure sensation with a tactile feedback even when wearing protective gloves. Each key has a large green LED signal indicator above the icon. Since the KEY backlit LED are white and RGB (colour) the keypad can be used as combination of buttons and warning light indicators.

Keypad is programmable. Each key can be configured to operate as a switch or a push button. Key label graphics are customizable, white backlit and coloured according to function groups for easy recognition. Unused keys can be screened off with a dark label. Labels are inserted at the inner side of the front panel of the keypad. Several keypads located on different places can be connected over CAN BUS to collaborate.

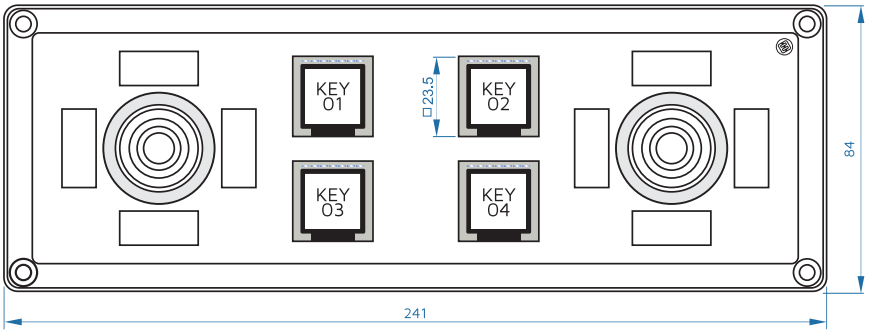
Keypad modules series KPM-GC42J are a perfect solution for agriculture and municipal vehicles as well as in industrial sectors.

SPECIFICATIONS

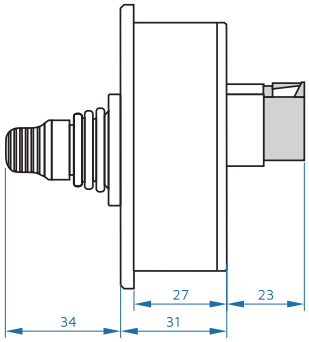
POWER	
Supply Voltage	8-32 V DC
Current	0.5 A maximum, no outputs active
Electrical Protection	overvoltage, transients, reverse polarity, load dump
INTERFACES	
CAN	1 x CAN
CAN termination	configurable termination 120 ohm via DIP switch
CAN Link	T-connection, node ID definition via software
ENVIRONMENT	
IP Class	IP67, waterproof
EMC Conformity	EN61000-6-2 noise immunity EN61000-6-4 radiation of interference
Temperature Range	storage -40° to +85°C (-40° to 185°F) operating -40° to +85°C (-40° to 185°F)
KEYS	
Key LED	first row RGB and white backlit, second row white backlit
Signal Indicator	Super bright green LED bar
Icons	freely selectable icons
Key Design	embossed keys with tactile feedback, operating force 8N
Operating Life	>250.000 cycles
KEY dimension	23.5 x 23.5 mm
JOYSTICS	
Level Action	4-way with 4-way Limiter, spring centering
Operating Force	5 N +/- 1N
Max. Load	Vertical 200 N, Horizontal 150 N
Angle of Movement	+/- 15°
Operating Life	>300.000 cycles
ENCLOSURE	
Housing Material	Aluminium, Joystick - Silicone
Mounting	in-dash, with 4 screws M4 or 3.5 mm (#8) tapping screws
Connectors	Deutsch DT06-06S
SIZE AND WEIGHT	
W x H X D	241 x 84 x 33 mm without connector
Weight	0.75 kg

DIMENSIONS

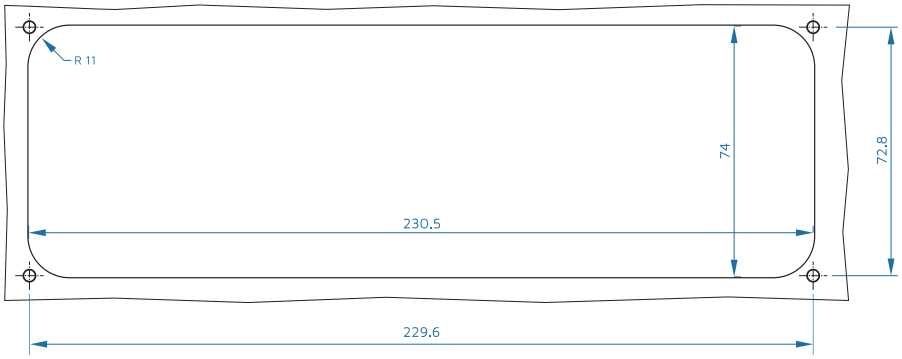
FRONT VIEW



SIDE VIEW

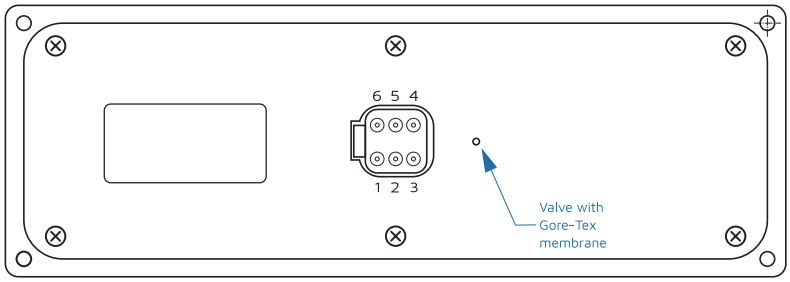


PANEL CUT-OUT



CONNECTIONS

REAR VIEW



CONNECTION Deutsch DT06-6S	
PIN	DESCRIPTION
1	BATTERY + (“15”)
2	CAN L
3	CAN L - shorted to PIN 2
4	CAN H
5	CAN H - shorted to PIN 4
6	BATTERY -

PRODUCT CODE

KPM-GC4J2	Keypad module, 2 Joysticks, 4 keys, white and RGB backlit with green signal indicator
For more options please contact the supplier.	

KEYPAD MODULE

KPM-C22

Icons shown on this keypad are for visual demonstration only.

Features and Benefits

1. **RGB Backlit, Freely Selectable Icons**
2. **Light Sensor**
3. **Individually Adjustable Key Luminous Intensity**
4. **Low Installation Depth**
5. **"RIM" Embossing Keys**
6. **Washable, Waterproof Alu. Housing**

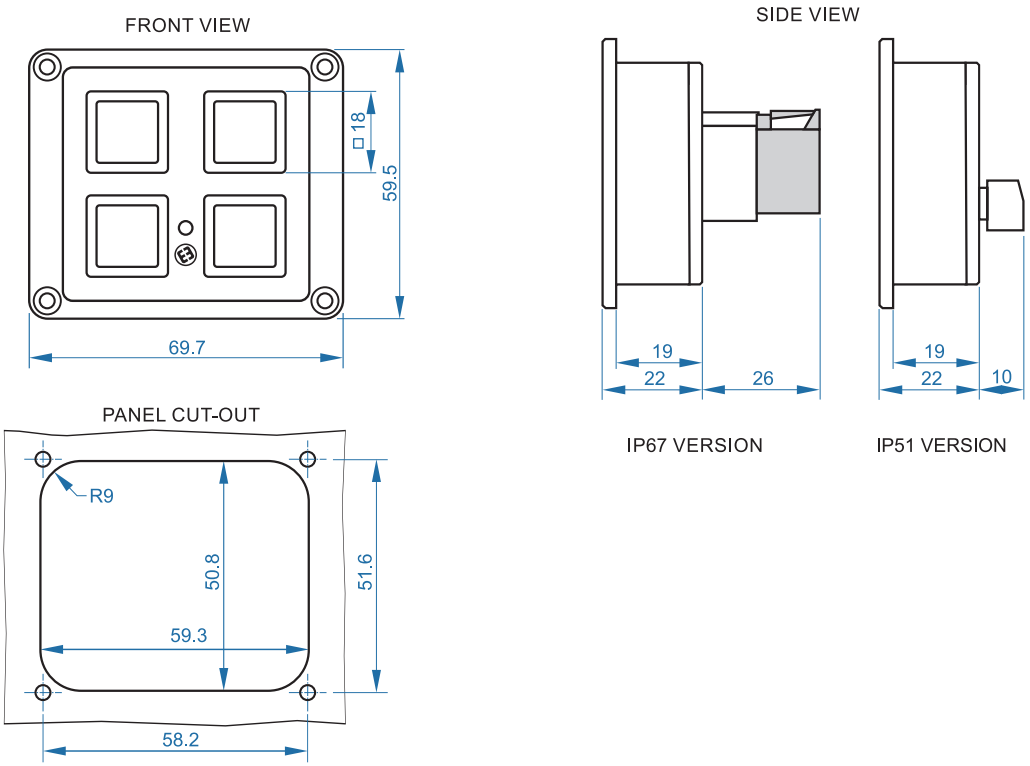
Keypad module KPM-C22 uses four distinct keys, it is highly resistant to weather conditions and can survive extreme environments, what makes it perfect for installation outside or inside driver cabin. The keys are large, well-spaced and "RIM" embossed, allowing a reliable pressure sensation with a tactile feedback even when wearing protective gloves. The keys can also be used in combination as warning lights.

Keypad is programmable. Each key can be configured to operate as a switch or push button. Corresponding key LED indicators are fully configurable, colour and luminance are adjustable. Key label graphics are customizable and backlit coloured according to function groups for easy recognition. Unused keys can be screened off with a dark label. Labels are inserted at the inner side of the front panel of the keypad. Several keypads located on different places can be connected over CAN BUS to collaborate. Keypad modules series KPM-C are a perfect solution in automotive, nautical, agriculture, utility vehicles and industrial sectors.

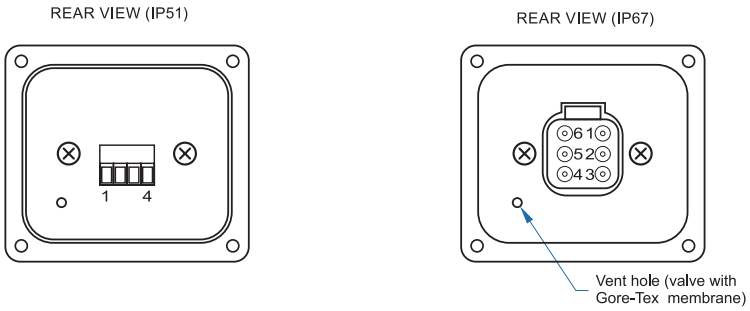
SPECIFICATIONS

POWER	
Supply Voltage	8-32 V DC
Current	60 mA maximum
Electrical Protection	overvoltage, transients, reverse polarity, load dump
INTERFACES	
CAN	1 x CAN (only type without I/O driver)
CAN termination	120 ohm, DIP switch
ENVIRONMENT	
IP Class with terminal block connection with Deutsch DT06-6S connector	 front panel - IP67, back - IP51 complete IP67
EMC Conformity	EN61000-6-2 noise immunity EN61000-6·4 radiation of interference
Temperature Range	storage -40° to +85°C (-40° to 185°F) operating -40° to +85°C (-40° to 185°F)
KEYS	
Key LED	RGB backlit icons
Icons	freely selectable icons
Brightness	individually adjustable key luminous intensity, dimmable - light sensor
Key Design	RIM-embossed keys with tactile feedback, operating force 8N
Operating Life	>250.000 cycles
KEY dimension	18 x 18 mm
ENCLOSURE	
Housing Material	Aluminium
Mounting	in-dash with 4 screws M3 or 2.9 mm tapping screws
Connector	4 way Terminal Block or Automotive - Deutsch DT06-6
SIZE AND WEIGHT	
W x H X D	69.7 x 59.8 x 19 without connector
Weight	0.12 kg (IP51), 0.14 kg (IP67)

DIMENSIONS



CONNECTIONS



CONNECTION Terminal Block 4 way

PIN	DESCRIPTION
1	CAN H
2	BATTERY -
3	BATTERY + ("15")
4	CAN L

CONNECTION Deutsch DT06-6S

PIN	DESCRIPTION
1	BATTERY + ("15")
2	CAN L
3	N/A
4	N/A
5	CAN H
6	BATTERY -

PRODUCT CODE

KPM-C22	Keypad module, 4 colour RGB backlit keys, (2 rows x 2 columns), IP51 connector

For more options please contact the supplier.

KEYPAD MODULE

KPM-C24

Icons shown on this keypad are for visual demonstration only.

Features and Benefits

1. **RGB Backlit, Freely Selectable Icons**
2. **Integrated I/O Driver - Optional**
3. **Light Sensor, Buzzer**
4. **Adjustable Key Luminous Intensity**
5. **Low Installation Depth**
6. **"RIM" Embossing Keys**
7. **Washable, Waterproof Alu. Housing**

Keypad module KPM-C24 uses eight distinct keys, it is highly resistant to weather conditions and can survive extreme environments, what makes it perfect for installation outside or inside driver cabin. The keys are large, well-spaced and "RIM" embossed, allowing a reliable pressure sensation with a tactile feedback even when wearing protective gloves. The keys can also be used in combination as warning lights.

Type KPM-C24O has an integrated I/O controller with high side power outputs and several inputs that can be useful if the keypad is used as a stand-alone device or as an extension of IO ports for controllers used in the MMX system.

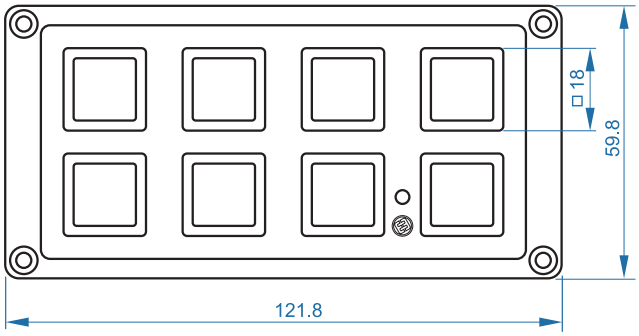
Keypad is programmable. Each key can be configured to operate as a switch or push button. Corresponding key LED indicators are fully configurable, colour and luminance are adjustable. Key label graphics are customizable and backlit coloured according to function groups for easy recognition. Unused keys can be screened off with a dark label. Labels are inserted at the inner side of the front panel of the keypad. Several keypads located on different places can be connected over CAN BUS to collaborate. Keypad modules series KPM-C are a perfect solution in automotive, nautical, agriculture, utility vehicles and industrial sectors.

SPECIFICATIONS

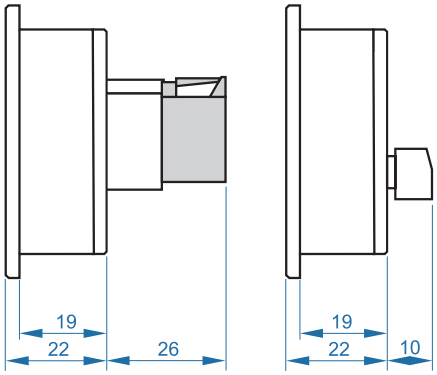
POWER	
Supply Voltage	8-32 V DC
Current	100 mA maximum
Electrical Protection	overvoltage, transients, reverse polarity, load dump
INTERFACES	
CAN	1 x CAN (only type without I/O driver)
CAN termination	120 ohm, DIP switch
ENVIRONMENT	
IP Class with terminal block with Deutsch DT06	 front panel - IP67, back - IP51 complete IP67
EMC Conformity	EN61000-6-2, EN61000-6-4
Temperature Range	storage -40° to +85°C (-40° to 185°F) operating -40° to +85°C (-40° to 185°F)
KEYS	
Key LED	RGB backlit icons
Icons	freely selectable icons
Brightness	individually adjustable key luminous intensity, dimmable - light sensor
Key Design	RIM-embossed keys with tactile feedback, operating force 8N
Operating Life	>250.000 cycles
KEY dimension	18 x 18 mm
ENCLOSURE	
Housing Material	Aluminium
Mounting	in-dash with 4 screws M3 or 2.9 mm tapping screws
Connectors Power Supply/Can I/O	 4 way terminal block or Automotive - Deutsch DT06-6 14 way Terminal Block
I/O - Only version with integrated IO driver	
Digital Inputs	1x configurable active low/high levels via software, 0 .. Ub, integrated pull-up/down resistor, protected 3 x positive – active high, 0..Ub, switch on level >4.6V,integrated pull-down resistor
Digital Outputs	8x positive switching (high-side), max. 1.5 A, total output from the unit may not exceed 8 A
Loads	inductive, capacitive, resistive
Miscellaneous	protection from short circuit and overload
SIZE AND WEIGHT	
W x H X D	121.8 x 59.8 x 19 without connector
Weight	0.18 kg (IP51), 0.22 kg (IP67)

DIMENSIONS

FRONT VIEW

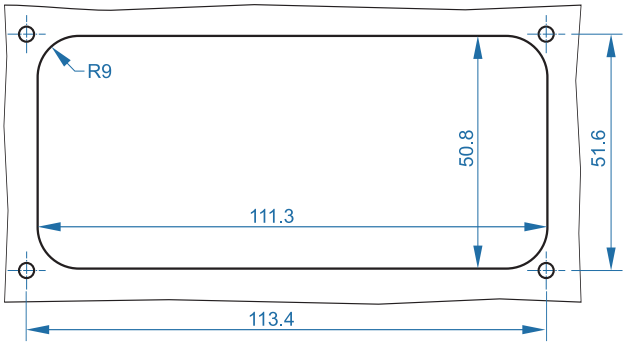


SIDE VIEW



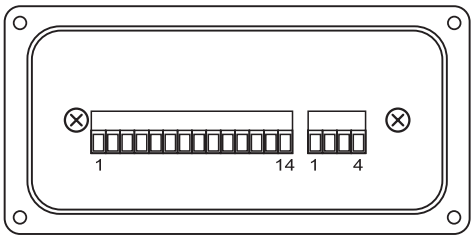
IP67 VERSION IP51 VERSION

PANEL CUT-OUT

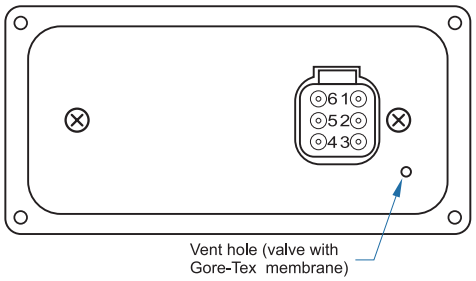


CONNECTIONS

REAR VIEW (IP51) WITH I/O CONNECTOR



REAR VIEW (IP67)



CONNECTION Terminal Block 14 way

PIN	DESCRIPTION
1-8	HIGH-SIDE OUTPUT
9	INPUT - CONFIGURABLE
10-12	INPUT - POSITIVE
13-14	N/A

CONNECTION Terminal Block 4 way

PIN	DESCRIPTION
1	CAN H
2	BATTERY -
3	BATTERY + ("15")
4	CAN L

CONNECTION Deutsch DT06-6S

PIN	DESCRIPTION
1	BATTERY + ("15")
2	CAN L
3	N/A
4	N/A
5	CAN H
6	BATTERY -

PRODUCT CODE

KPM-C24	Keypad module, 8 colour-RGB backlit keys, (2 rows x 4 columns), IP51 connector
KPM-C24O	Keypad module, 8 colour-RGB backlit keys, (2 rows x 4 columns) with integrated IO driver, IP51 connector
For more options please contact the supplier.	

KEYPAD MODULE

KPM-C26

Icons shown on this keypad are for visual demonstration only.

Features and Benefits

1. **RGB Backlit, Freely Selectable Icons**
2. **Integrated I/O Driver - Optional**
3. **Light Sensor, Buzzer**
4. **Adjustable Key Luminous Intensity**
5. **Low Installation Depth**
6. **"RIM" Embossing Keys**
7. **Washable, Waterproof Alu. Housing**

Keypad module KPM-C26 uses twelve distinct keys, it is highly resistant to weather conditions and can survive extreme environments, what makes it perfect for installation outside or inside driver cabin. The keys are large, well-spaced and "RIM" embossed, allowing a reliable pressure sensation with a tactile feedback even when wearing protective gloves. The keys can also be used in combination as warning lights.

Type KPM-C26O has an integrated I/O controller with high side power outputs and several inputs that can be useful if the keypad is used as a stand-alone device or as an extension of IO ports for controllers used in the MMX system.

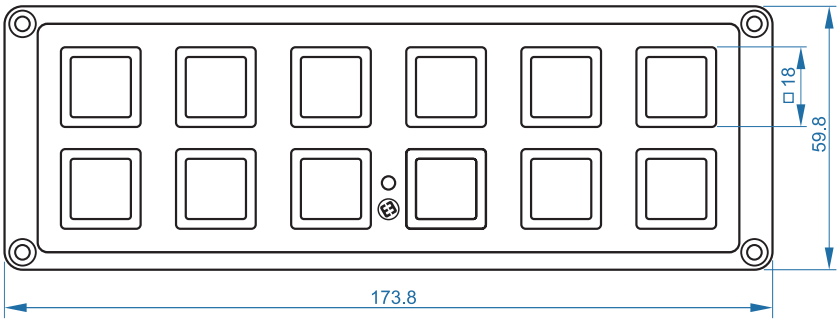
Keypad is programmable. Each key can be configured to operate as a switch or push button. Corresponding key LED indicators are fully configurable, colour and luminance are adjustable. Key label graphics are customizable and backlit coloured according to function groups for easy recognition. Unused keys can be screened off with a dark label. Labels are inserted at the inner side of the front panel of the keypad. Several keypads located on different places can be connected over CAN BUS to collaborate. Keypad modules series KPM-C are a perfect solution in automotive, nautical, agriculture, utility vehicles and industrial sectors.

SPECIFICATIONS

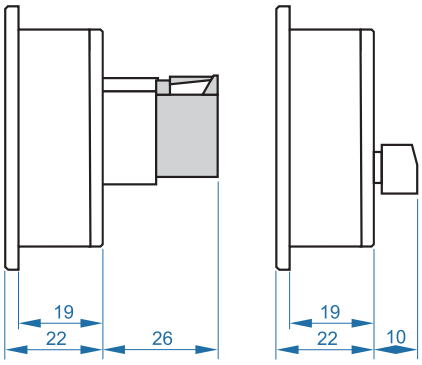
POWER	
Supply Voltage	8-32 V DC
Current	130 mA maximum
Electrical Protection	overvoltage, transients, reverse polarity, load dump
INTERFACES	
CAN	1 x CAN (only type without I/O driver)
CAN termination	120 ohm, DIP switch
ENVIRONMENT	
IP Class with terminal block with Deutsch DT06	 front panel - IP67, back - IP51 complete IP67
EMC Conformity	EN61000-6-2 noise immunity EN61000-6-4 radiation of interference
Temperature Range	storage -40° to +85°C (-40° to 185°F) operating -40° to +85°C (-40° to 185°F)
KEYS	
Key LED	RGB backlit icons
Icons	freely selectable icons
Brightness	individually adjustable key luminous intensity, dimmable - light sensor
Key Design	RIM-embossed keys with tactile feedback, operating force 8N
Operating Life	>250.000 cycles
KEY dimension	18 x 18 mm
ENCLOSURE	
Housing Material	Aluminium
Mounting	in-dash with 4 screws M3 or 2.9 mm tapping screws
Connectors Power Supply/Can I/O	 4 way terminal block or Automotive - Deutsch DT06-6 14 way Terminal Block
I/O - Only version with integrated IO driver	
Digital Inputs	6x configurable active low/high levels via software, 0 .. Ub, switch on level >4.6V, switch off level <2V, integrated pull-up/down resistor, protected
Digital Outputs	12 x positive switching (high-side), max. 1.5 A, total output from the unit may not exceed 8 A
Loads	inductive, capacitive, resistive
Miscellaneous	protection from short circuit and overload
SIZE AND WEIGHT	
W x H X D	173.8 x 59.8 x 19 without connector
Weight	0.23 kg (IP51), 0.3 kg (IP67)

DIMENSIONS

FRONT VIEW

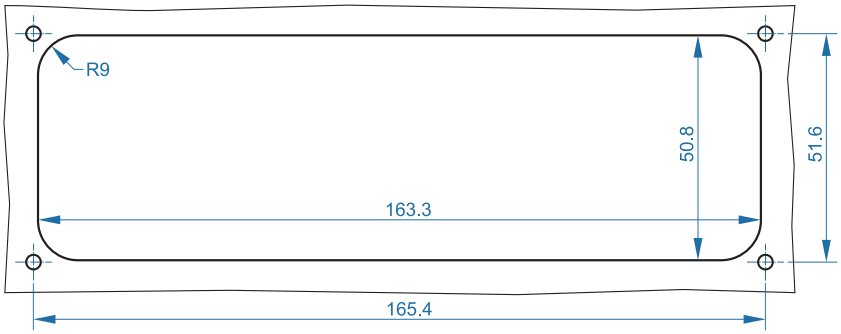


SIDE VIEW



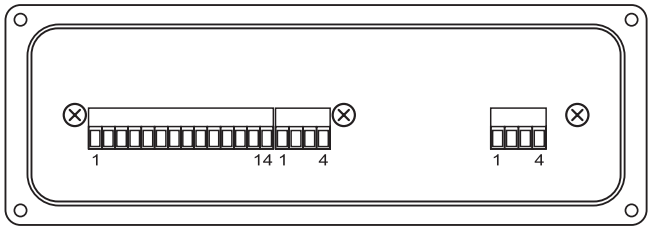
IP67 VERSION IP51 VERSION

PANEL CUT-OUT

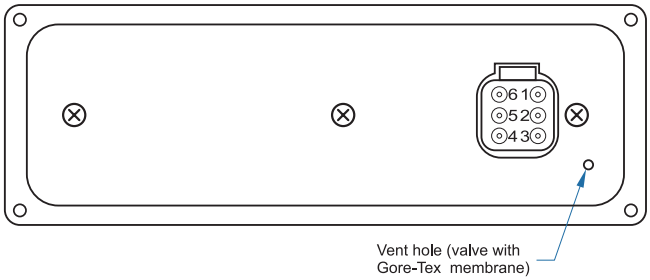


CONNECTIONS

REAR VIEW (IP51) WITH I/O CONNECTOR



REAR VIEW (IP67)



CONNECTION Terminal Block 14 way +4way

PIN	DESCRIPTION
1-12	HIGH-SIDE OUTPUT
13-14	INPUT - CONFIGURABLE
1-4	INPUT - POSITIVE

CONNECTION Terminal Block 4 way

PIN	DESCRIPTION
1	CAN H
2	BATTERY -
3	BATTERY + ("15")
4	CAN L

CONNECTION Deutsch DT06-6S

PIN	DESCRIPTION
1	BATTERY + ("15")
2	CAN L
3	N/A
4	N/A
5	CAN H
6	BATTERY -

PRODUCT CODE

KPM-C26	Keypad module, 12 colour-RGB backlit keys, (2 rows x 6 columns), IP51 connector
KPM-C26O	Keypad module, 12 colour RGB backlit keys, (2 rows x 6 columns) with integrated IO driver, IP51 connector
For more options please contact the supplier.	

MMX LCD4K5

Optional Accessories

Features and Benefits

1. **Sunlight Readable**
2. **Anti-Reflective Glass**
3. **5 Soft Keys**
4. **Video Input**
5. **Cabin Or Panel Mount**

MMX LCD4 Display unit is very modern looking, cost-efficient, rugged 4.3" operator control panel for use on heavy-duty vehicles and work machines that must operate outdoor in harsh conditions. It is fully equipped with five soft-function keys, integrated buzzer, CAN bus and video inputs.

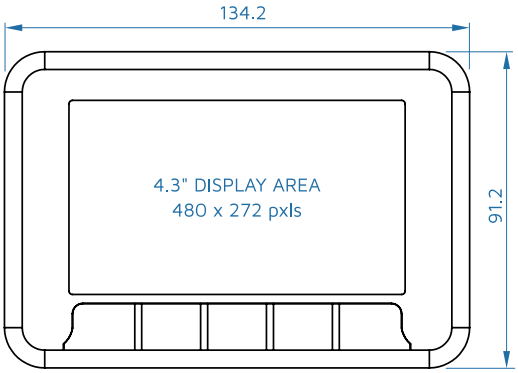
The display can be installed in-dash or out-dash with its specific articulated support.

SPECIFICATIONS

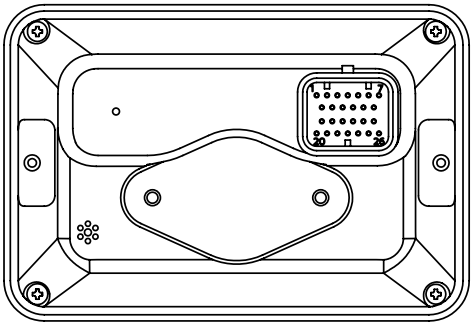
POWER	
Supply Voltage	8-32 V DC
Current	500 mA maximum, no outputs active
Electrical Protection	overvoltage, transients, reverse polarity
INTERFACES	
CAN	2 x CAN BUS ISO 11898, 2.0B high speed
Video	1 x PAL/NTSC
USB	1x USB 2.0, for firmware update
DISPLAY	
Display type	Active matrix colour TFT LCD 4.3 inch, 16.2M colours, sunlight-readable, anti-reflective glass
Resolution	480 x 272 pixels, dot pitch 0.198,16:9
Viewing angle	80°
Luminance	800 cdm
Contrast ratio	600:1
Boot time	< 3 sec.
MISCELLANEOUS	
Keys	5 soft keys, backlit
Touch	resistive - optional
Acoustic signal output	integrated buzzer max 85 dB
Inputs	2 Software configurable
Outputs	4 digital high side, 2 A max, optional
Operating system	Linux embedded
Kernel	ARM 32-bit uP, 2 MB Flash memory, 16 MB serial Flash
ENVIRONMENT	
IP Class (IEC529)	IP65
EMC Conformity	EN61000-6-2 noise immunity EN61000-6-4 radiation of interference
Temperature Range	storage -40° to +85°C (-40° to 185°F) operating -40° to +85°C (-40° to 185°F)
ENCLOSURE	
Housing Material	black rubber housing
Mounting	in-dash with springs or out-dash with articulated support
Matting Connector	Tyco-AMP Ampseal 1437288-6, 26 way
SIZE AND WEIGHT	
W x H X D	134 x 91 x 33, without matting connector
Weight	250 g

DIMENSIONS

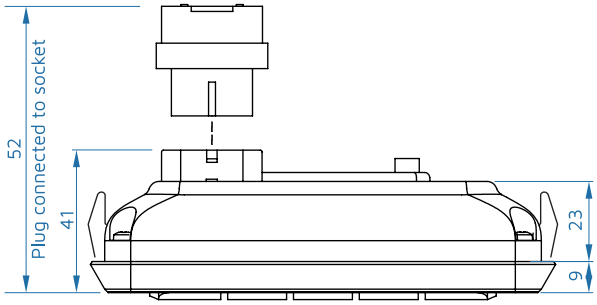
FRONT VIEW



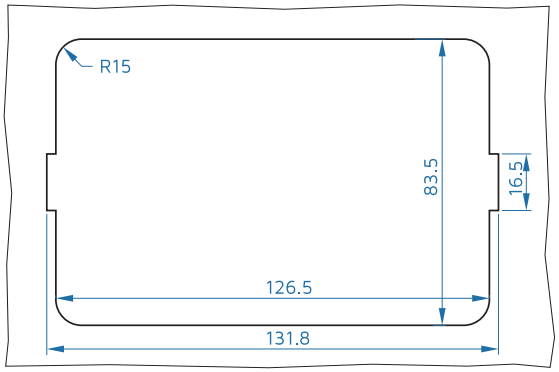
BACK VIEW



SIDE VIEW

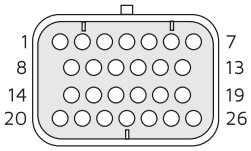


PANEL CUT-OUT



CONNECTIONS

PIN	Description / wire colour
1	U BATT + (Ignition)
2	U BATT - „31" (GND)
3	U BATT + „15" (Ignition)
4	Shorted to PIN 3 - Camera Supply+ (Red)
5	CAN H line 1
6	CAN L line 1
7	Ground signal
8	CAN H line 2
9	CAN L line 2
10	Ground signal
11	Input 1
12	Input 2
13	Ground signal



PIN	Description / wire colour
14	Video Input (Yellow)
15	Video Camera GND (Black + Shield)
16	UART TX
17	UART RX
18	Ground signal
19	Output 1, optional
20	Output 2, optional
21	Output 3, optional
22	Output 4, optional
23	USB V Bus
24	USB Data - line
25	USB Data + line
26	USB Ground

PRODUCT CODE

MMXLCD4K5	4.3" LCD Control panel with 5 Keys, no touch
For more options please contact the supplier.	

MMX LCD7

Optional Accessories

Features and Benefits

1. **Sunlight Readable**
2. **Anti-Reflective Glass**
3. **10 Soft Keys**
4. **5 Pre-Defined Hard Keys**
5. **Video Input**
6. **Cabin Or Panel Mount**

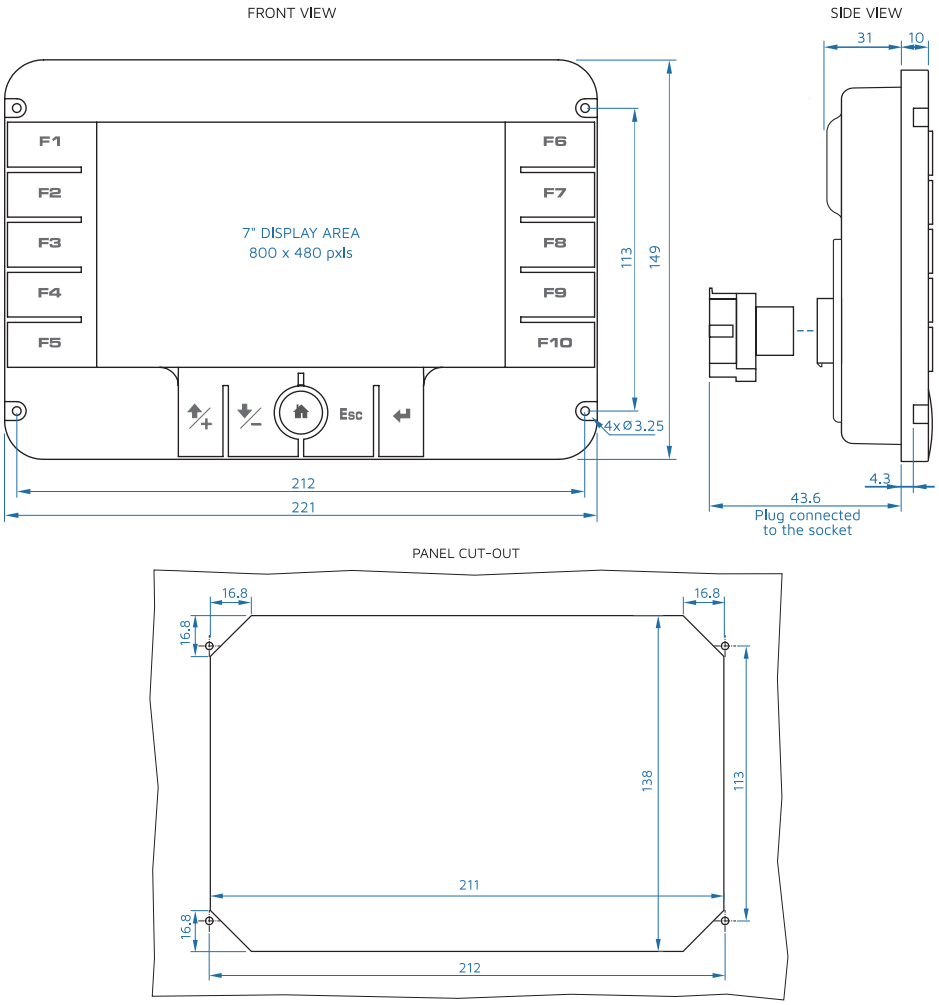
MMX LCD7 Display unit is cost-efficient, rugged operator control panel for use on heavy-duty vehicles and work machines that must operate outdoor in harsh conditions. It is fully equipped with five hard and ten soft-function keys, integrated buzzer, CAN bus and video inputs.

The display can be installed in-dash or out-dash with its specific articulated support.

SPECIFICATIONS

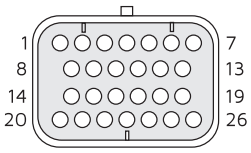
POWER	
Supply Voltage	8-32 V DC
Current	1.2 A maximum
Electrical Protection	overvoltage, transients, reverse polarity, load dump
INTERFACES	
CAN	2 x CAN BUS ISO 11898, 2.0B high speed
Video	1 x PAL/NTSC
USB	1x USB 2.0, for firmware update
DISPLAY	
Display type	Active matrix colour TFT LCD 7 inch, 16.2M colours, sunlight-readable, anti-reflective glass
Resolution	800 x 480 pixels, dot pitch 0.1905 mm, 16:9
Viewing angle	Horizontal 130°, Vertical 110°
Luminance	500 cdm
Contrast ratio	600:1
MISCELLANEOUS	
Keys	10 soft keys and 5 hard keys, backlit
Touch	resistive - optional
Acoustic signal output	integrated buzzer max 85 dB
Digital Output	Low side, 0.7 A max, optional
Operating system	Linux embedded
Kernel	ARM 32-bit uP, 256 MB Flash memory
ENVIRONMENT	
IP Class (IEC529)	IP65
EMC Conformity	EN61000-6-2 noise immunity EN61000-6·4 radiation of interference
Temperature Range	storage -40° to +85°C (-40° to 185°F) operating -40° to +85°C (-40° to 185°F)
ENCLOSURE	
Housing Material	grey rubber housing
Mounting	in-dash with 4 screws M3 or 2.9 mm tapping screws or out-dash with articulated support
Matting Connector	Tyco-AMP Ampseal 1437288-6, 26 way
SIZE AND WEIGHT	
W x H X D	221 x 149 x 32, without matting connector
Weight	650 g

DIMENSIONS



CONNECTIONS

PIN	Description / wire colour
1	U BATT - „31" (GND)
2	J1939 CAN L
3	J1939 CAN H
4	E-CAN1 L
5	E-CAN1 H
6	USB_D+ (Green)
7	USB_D+ (White)
8	-
9	-
10	-
11	-
12	USB_VCC (Red)
13	USB_GND (Grey)



PIN	Description / wire colour
14	-
15	-
16	-
17	Video Camera 2 GND (Black + Shield)
18	Video Input 2 (Yellow)
19	Video Input 1 (Yellow)
20	Video Camera 1 GND (Black + Shield)
21	Digital Output 1 (Optional)
22	Output - Shorted to PIN 21
23	U BATT + „15", optional „30"
24	Shorted to PIN 23 - Camera Supply+ (Red)
25	U BATT + „15" (Ignition)
26	Shorted to PIN 25 - Camera Supply+ (Red)

PRODUCT CODE

MMXLCD7	7" TFT LCD Control panel, antifog, no touch
For more options please contact the supplier.	

MMX LCD10

Optional Accessories

Features and Benefits

1. **Wide Viewing Angle 170° (IPS)**
2. **Sunlight Readable, Anti-Reflective Glass**
3. **9 Soft Keys**
4. **Capacitive Multitouch Screen**
5. **Two Video Input, optinal four**
6. **Cabin Or Panel Mount**
7. **Acoustic Signal-Integrated Buzzer**

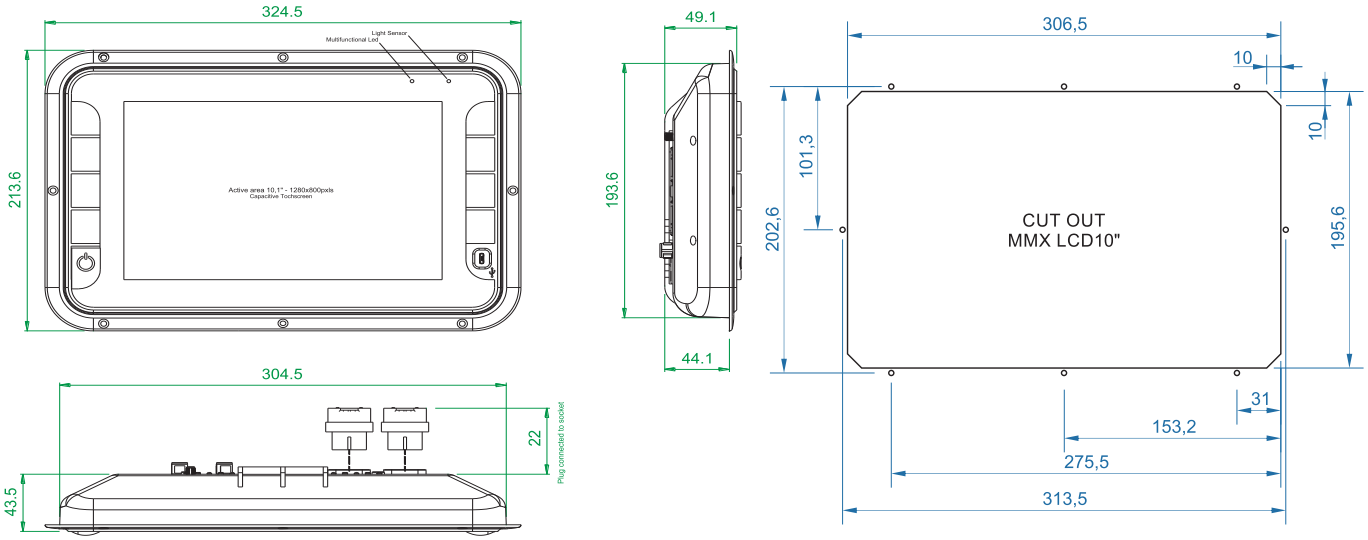
MMX LCD10 is a high-end display solution, a rugged operator control panel for use on heavy-duty vehicles and work machines that must operate outdoor in harsh conditions. It is fully equipped with touch screen and nine soft-function keys, integrated buzzer, CAN bus and video inputs. It is a perfect solution for pump control outside the vehicle or for superstructure control from the cabin.

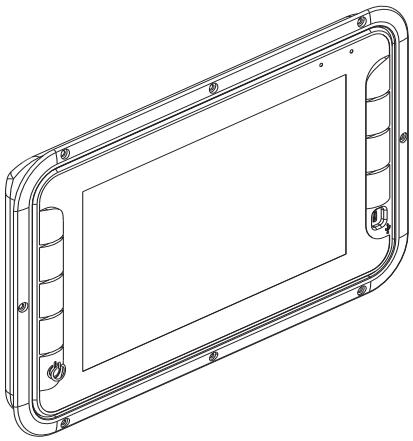
The display can be installed both in-dash or out-dash with its specific articulated support.

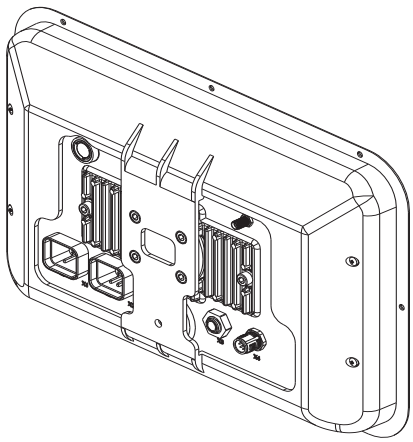
SPECIFICATIONS

POWER	
Supply Voltage	8-32 V DC
Current	1.5 A maximum
Electrical Protection	overvoltage, transients, reverse polarity, load dump
INTERFACES	
CAN	2 x CAN BUS ISO 11898, 2.0B high speed
Video	4 x PAL/NTSC simultaneous
USB	1x USB 2.0, for firmware update
DISPLAY	
Display type	active matrix colour TFT LCD 10 inch, 16.2M colours, sunlight-readable, anti-reflective glass
Resolution	1280 x 800 pixels, dot pitch 0.1695 mm, 16:10
Viewing angle	horizontal 170°, Vertical 170° (IPS)
Luminance	850 cdm
Contrast ratio	800:01:00
MISCELLANEOUS	
Keys	9 soft keys, backlit
Touch	integrated buzzer max 93 dB
Acoustic signal output	detect the intensity of the light in the environment
Digital Output	Low side, 0.7 A max, optional
Operating system	Linux embedded
Kernel	dual ARM Cortex A9, 32-bit uP, 8 GB Flash memory eMMC
ENVIRONMENT	
IP Class (IEC529)	IP65
EMC Conformity	EN61000-6-2 noise immunity EN61000-6-4 radiation of interference
Temperature Range	storage -40° to +85°C (-40° to 185°F) operating -30° to +70°C (-40° to 185°F)
ENCLOSURE	
Mounting	in-dash with 8 screws M3 or 2.9 mm tapping screws or out-dash with articulated support
Matting Connector	Tyco-AMP Ampseal 1437288-6, 26 way M12 8-way for two video cameras
SIZE AND WEIGHT	
W x H X D	324 x 213 x 43, without matting connector
Weight	1500 g

DIMENSIONS



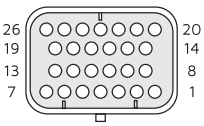




CONNECTIONS

Connector X1	
PIN	Description / wire colour
1	U BATT + (Ignition-15, optionally 30)
10	CAN1 H
11	CAN1 L
14	CAN2 H
20	CAN2 L
21	U batt – (GND-31)
22	U batt+ (Ignition -15)

CONNECTOR X1



View from rear side of the LCD

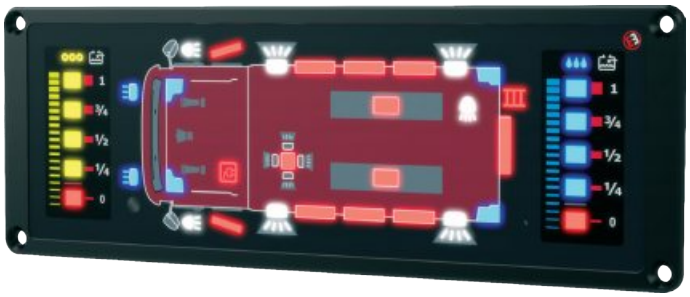
CONNECTOR M12-8way

Connector M12 A-Coding male 8-way	
PIN	Description / wire colour
1	U batt +, positive power supply for external camera (Ignition "15")
2	U batt -, negative power supply for external camera (GND "31")
3	VIDEO IN1, PAL/NTSC video input
4	VIDEO GND, ground signal
5	U batt +, positive power supply for external camera (Ignition-15)
6	U batt -, negative power supply for external camera (GND-31)
7	VIDEO IN2, PAL/NTSC video input
8	VIDEO GND, ground signal

PRODUCT CODE

MMXLCD10	10" TFT LCD Control panel, 9 soft keys + touch
For more options please contact the supplier.	

S&L MONITOR G2



Features and Benefits

1. **22 Digital Inputs, positive or negative**
2. **Photo sensor**
3. **Colour LEDs**
4. **Integrated Warning Buzzer - Optional**
5. **Integrated Remote Indicator for Water and Foam Tank Level**

The S&L Monitor is designed to monitor open side lockers (roller shutters), roof boxes, ladder and displays the status of different kinds of emergency and other lights on special vehicles.

Key advantage: Integrated Water and Foam remote level indicator as optional feature. State of monitored devices will be indicated with LED warning lights in different colours.

Integrated buzzer can signalize raised light mast, open roof boxes and open ladder to draw special attention to the driver at the moment that the parking brake has been released.

Monitoring is provided through 22 digital inputs. Digital inputs are connected via uP to altogether 37 LED lights. Digital inputs can be connected to GND or +UBatt signal, to detect the status of connected lamps, shutters or other equipment. An integrated photo sensor detects the ambient light and automatically adjusts the LED intensity for day or night operation.

SPECIFICATIONS

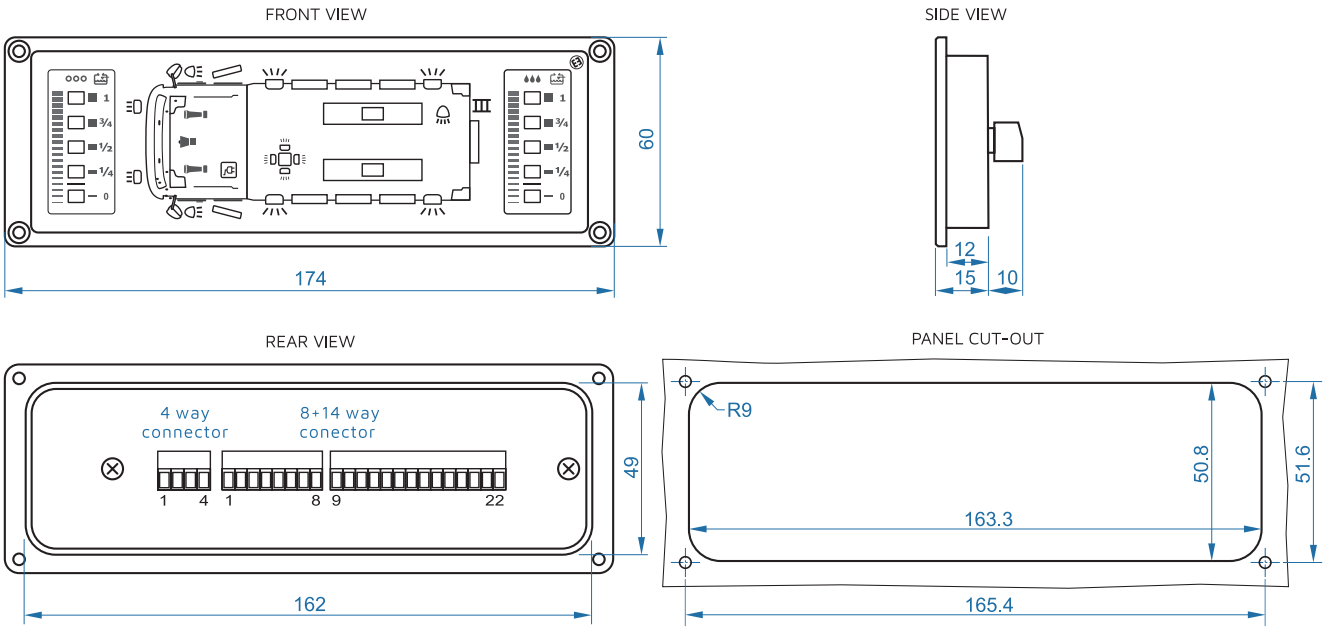
POWER	
Supply Voltage	8-30 V DC
Current	0.2 A maximum, no outputs active
Electrical Protection	overvoltage, reverse polarity
INTERFACES	
CAN	1 x CAN
CAN termination	configurable termination 120 ohm via DIP switch
ENVIRONMENT	
IP Class (IEC529)	front panel – IP65
Temperature Range	storage -40° to +85°C (-40°F to 185°F) operating -40° to +85°C (-40°F to 185°F)
INPUTS	
Digital Input	22 configurable-active low/high, levels 0 .. Ub
ENCLOSURE	
Housing Material	aluminium-black coated
Mounting	in-dash, with 4 screws M3 or 2.9 tapping screws
Connector	Terminal block 4 way, 8 way and 14 way connector, 0,5 to 1,5 mm2 (AWG 28-16)
MISCELLANEOUS	
Level Indication	Water and Foam level optional, remote type
Indicator increments	1/4
Day/Night operation	automatic – integrated light sensor
LED indication	colour LED (white, blue, red, yellow)
SIZE AND WEIGHT	
W x H X D [mm]	174 x 60 x 15 mm without connector
Weight	0.2 kg

How to order (use characters in **bold** to create order code)

Remote Indicator - Small Ordering code example:

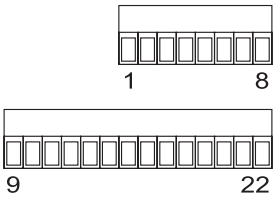
S	L	M	-	7	S	-	W	F
				3S: 3 SHUTTERS (2+1) **5S:** 5 SHUTTERS (2+2+1) **7S:** 7 SHUTTERS (3+3+1) **9S:** 10 SHUTTERS (4+4)			**W**: INTEGARTED WATER LEVEL INDICATOR	**F**: INTEGARTED FOAM LEVEL INDICATOR

DIMENSIONS



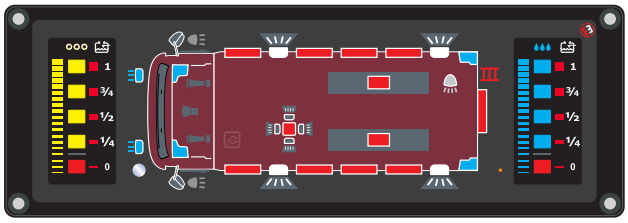
CONNECTIONS

CONNECTION Terminal Block 4 way	
PIN	DESCRIPTION
1	BATTERY +
2	BATTERY -
3	CAN L
4	CAN H

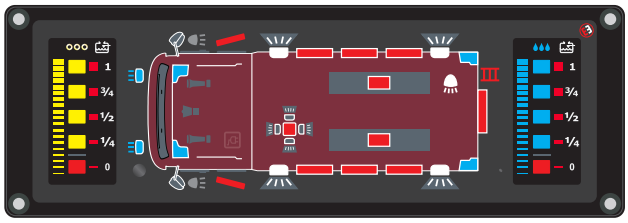


CONNECTION Terminal Block 8 way + 14 way	
PIN	DESCRIPTION
1-22	INPUT (configurable)

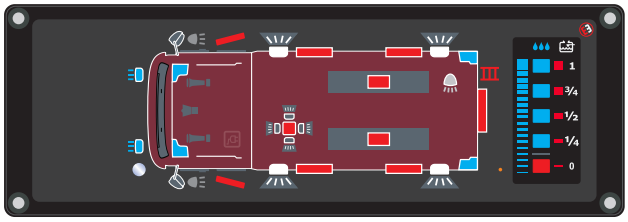
EXAMPLE OF DESIGN OPTIONS



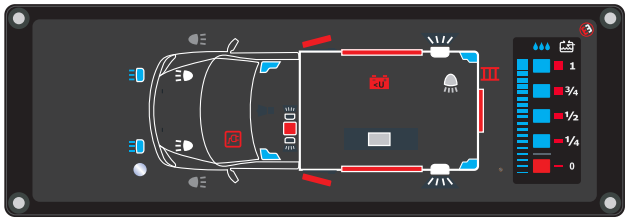
SLM-9S-WF



SLM-7S-WF



SLM-5S-W



SLM-3S-W

TANK LEVEL GAUGE

INS-04/RIS-04/RTSS-04

Features and Benefits

1. **180° Viewing Angle**
2. **I/O Driver For Low Water Warning, Autofill-Hysteresis, Mute input, Etc.**
3. **CAN Bus Interface**
4. **Super Bright LEDs**
5. **Dimmable-Light Sensor, Backlit**
6. **Low Installation Depth**
7. **Conductive Probe Input**

INS-04 types of Tank Level Gauges are designed to display liquid's volume at an accuracy of 1/4 of the tank level using 5 ultra-bright LEDs. The gauge operates on basis of the conductance of the measured liquid using the conductive probe. The electrodes are placed at each quarter length of the probe.

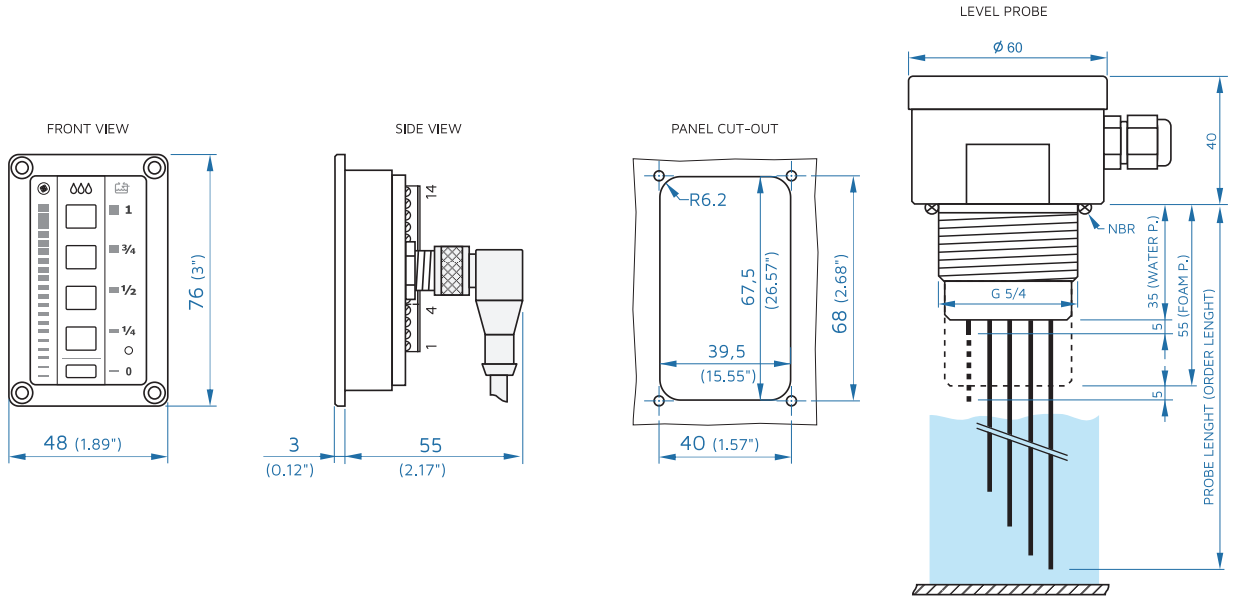
Optional I/O driver can be integrated for low level warning output, autofill-hysteresis output, mute input, etc.

The Tank Level Gauge can be used as a stand-alone system or as a part of MMX system connected via CAN bus to IO Controller. Several slave indicators (small remote - RIS) can be connected to a master indicator INS to show the same value on different locations or in combination with a XL remote indicator (RIXL) for the vehicle sides.

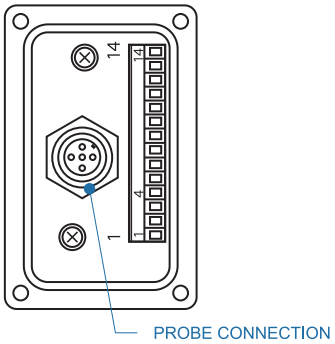
SPECIFICATIONS

POWER	
Supply Voltage	8-32 V DC
Current	0.5 A maximum, no outputs active
Electrical Protection	overvoltage, transients, reverse polarity
INTERFACES	
CAN	1 x CAN
CAN termination	120 ohm
I/O	
Probe input	Conductive probe with max. 5 rods
Digital Input IN1 IN2	 configurable active low/high levels 0..Ub with solder pad on PCB, protected active low level, config. input
Digital Output OUT1 OUT2 OUT3-OUT4 OUT5	**Only version with integrated I/O driver* positive switching (high-side), max. 2 A (Low water warning) positive switching (high-side), max. 2 A (Autofill-Hysteresis) positive switching (high-side), max. 2 A negative switching (low-side), max. 0.5 A
Loads	Inductive, capacitive, resistive
PROBE-OEM	
Detection method	conductive
Probe length	250-2000 mm
Probe material	rods in stainless steel 316 (1.4305)
ENVIRONMENT	
IP Class (IEC529)	front panel IP67, back IP20, probe IP67
EMC Conformity	EN61000-6-2 noise immunity EN61000-6-4 radiation of interference
Temperature Range	storage -40° to +85°C (-40° to 185°F) operating -40° to +85°C (-40° to 185°F)
ENCLOSURE	
Housing Material	aluminium
Mounting	in-dash, with 4 screws M3 or 3.5 mm (#8) tapping screws
Connector	terminal block 4 or 14-way depending of options selected, probe connector M12
MISCELLANEOUS	
Indicator increments	1/4
Day/Night operation	automatic – integrated light sensor
Front panel	backlit, colour coded for water and foam
Detectable substances	water, fire-smothering foam, gasoline, etc
SIZE AND WEIGHT	
W x H X D	48 x 76 x 26 mm with connector
Weight	0.1 kg

DIMENSIONS



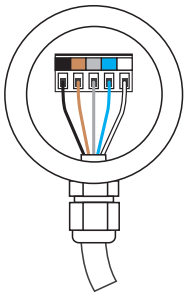
CONNECTIONS



CONNECTION
Terminal Block 4 or 14-way

PIN	DESCRIPTION
1	BATTERY + ("15")
2	BATTERY - / GND
3	CAN L
4	CAN H
5	SENSOR [V]/[MA] VCC+
6	SENSOR [V]/[MA] SIGNAL
7	SENSOR [V] GND
8	DIGITAL IN1
9	OUT1 HIGH SIDE 2 A (LOW W/F)
10	OUT2 HIGH SIDE 2 A (HYST.)
11	OUT3 HIGH SIDE 2 A
12	OUT4 HIGH SIDE 2 A
13	OUT5 LOW SIDE 0.5 A
14	DIGITAL IN2 NEG. (CONFIG.)

PROBE CONNECTION



HOW TO ORDER (use characters in **bold** to create order code)

SET of master indicator small INS, conductive probe, sensor cabl

Ordering code example:

R	T	S	S	-	0	4	W	-	0	5	R	H	L	M
					04 DISPLAY INCREM. 1/4		**W**: WATER **F**: FOAM		CABLE LENGTH, METERS (INCH) **05**: 5 M (20") **10**: 10 M (40") **15**: 15 M (60")		OUT1 **R**: LOW LEVEL WARNING	OUT2 **H**: AUTOFILL HYST. xx/xx % **R**: ADD. OUTPUT	OUT3 - OUT6 **L**: LLD5 DRIVER OUTPUTS	INPUT IN1 **M**: MUTE OUT1

Remote Indicator - Small

Ordering code example:

R	I	S	-	0	4	W	O	-	R	H		M
				04 DISPLAY INCREM. 1/4		**W**: WATER **F**: FOAM	LED BRIGHTNESS **I**: INSIDE **O**: OUTSIDE		OUT1 **R**: LOW LEVEL WARNING	OUT2 **H**: AUTOFILL HYST. xx/xx % **R**: ADD. OUTPUT	OUT3 - OUT6 **L**: LLD5 DRIVER OUTPUTS	INPUT IN1 **M**: MUTE OUT1

Master Indicator - Small

Ordering code example:

I	N	S	-	0	4	W	P	R	R	H	L	M
				04 DISPLAY INCREM. 1/4		**W**: WATER **F**: FOAM	LEVEL PROBE INPUT **PR**: CONDUCTIVE PROBE		OUT1 **R**: LOW LEVEL WARNING	OUT2 **H**: AUTOFILL HYST. xx/xx % **R**: ADD. OUTPUT	OUT3 - OUT6 **L**: LLD5 DRIVER OUTPUTS	INPUT IN1 **M**: MUTE OUT1

TANK LEVEL GAUGE

INS-08/RIS-08/TLGS-08

Features and Benefits

1. **180° Viewing Angle**
2. **I/O Driver For Low Water Warning, Autofill-Hysteresis, Mute Input, Etc.**
3. **CAN Bus Interface**
4. **Super Bright LEDs**
5. **Dimmable-Light Sensor, Backlit**
6. **Low Installation Depth**
7. **Multiple sensor input**

INS-08 types of Tank Level Gauges are designed to display liquid's volume at an accuracy of 1/8 of the tank level using ultra-bright LEDs. The transducer measures the column of the liquid in the tank above the sensor process input and provides a signal that is proportional to the tank high. The unit standardly uses a pressure transducer with output 0.5-4.5 V. The sensor input is widely configurable and it can also be used for 0-10 V transducers, 4-20 mA transmitters or even resistive probe.

Optional I/O driver can be integrated for low level warning output, autofill-hysteresis output, mute input, etc.

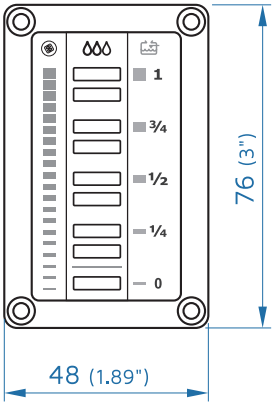
The Tank Level Gauge can be used as a stand-alone system or as a part of MMX system connected via CAN bus to IO Controller. Several slave indicators (small remote - RIS) can be connected to a master indicator INS to show the same value on different locations or in combination with a XL remote indicator (RIXL) for the vehicle sides.

SPECIFICATIONS

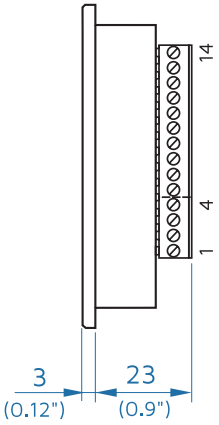
POWER	
Supply Voltage	8-32 V DC
Current	0.5 A maximum, no outputs active
Electrical Protection	overvoltage, transients, reverse polarity, load dump
INTERFACES	
CAN	1 x CAN
CAN termination	120 ohm, DIP switch
I/O	
Sensor input	0.5-4.5 V, 0-5V, 0-10V, 4-20 mA, resistive probe
Digital Input IN1 IN2	 configurable active low/high levels 0..Ub with solder pad on PCB, protected active low level, config. input
Digital Output OUT1 OUT2 OUT3-OUT4 OUT5	**Only version with integrated I/O driver* positive switching (high-side), max. 2 A (Low water warning) positive switching (high-side), max. 2 A (Autofill-Hysteresis xx/xx%) positive switching (high-side), max. 2 A negative switching (low-side), max. 0.5 A
Loads	inductive, capacitive, resistive
ENVIRONMENT	
IP Class (IEC529)	front panel IP67, back IP20
EMC Conformity	EN61000-6-2 noise immunity EN61000-6-4 radiation of interference
Temperature Range	storage -40° to +85°C (-40° to 185°F) operating -40° to +85°C (-40° to 185°F)
ENCLOSURE	
Housing Material	aluminum
Mounting	in-dash, with 4 screws M3 or 3.5 mm (#8) tapping screws
Connector	terminal block 4 or 14-way depending of options selected
MISCELLANEOUS	
Indicator increments	1/8 Standardly, 1/4 Optional
Day/Night operation	automatic – integrated light sensor
Front panel	backlit, colour coded for water and foam
Detectable substances	water, fire-smothering foam, gasoline, etc
SIZE AND WEIGHT	
W x H X D	48 x 76 x 26 mm (1.9" x 3" x 1") with connector
Weight	0.10 kg (0.55 lbs)

DIMENSIONS

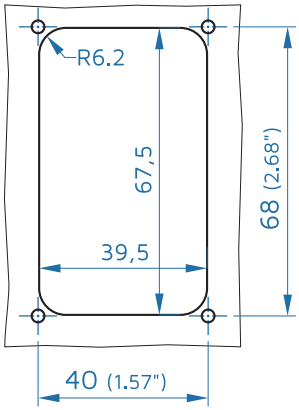
FRONT VIEW



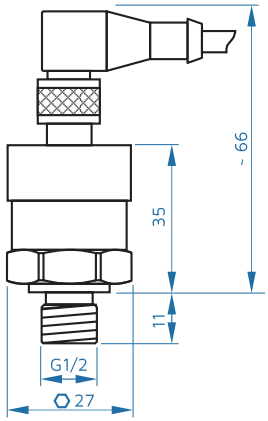
SIDE VIEW



PANEL CUT-OUT

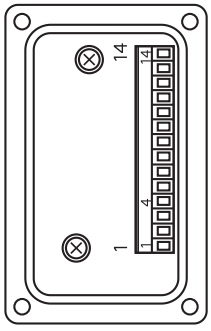


PRESSURE SENSOR
S-PT06



CONNECTIONS

REAR VIEW



CONNECTION
Terminal Block 4 or 14-way

PIN	DESCRIPTION
1	BATTERY + (“15”)
2	BATTERY - / GND
3	CAN L
4	CAN H
5	SENSOR [V]/[MA] VCC+
6	SENSOR [V]/[MA] SIGNAL
7	SENSOR [V] GND
8	DIGITAL IN1
9	OUT1 HIGH SIDE 2 A (LOW W/F)
10	OUT2 HIGH SIDE 2 A (HYST.)
11	OUT3 HIGH SIDE 2 A
12	OUT4 HIGH SIDE 2 A
13	OUT5 LOW SIDE 0.5 A
14	DIGITAL IN2 NEG. (CONFIG.)

TRANSDUCER OEM

SPECIFICATION AND CONNECTION	
Pressure Range	0-600 mbar (0 - 6 m tank height)
Signal Output	0.5-4.5 V
IP Class (IEC529)	IP67
Transducer Material	Stainless steel 316L
Pressure Port	1/4”
Transducer Cable	3 x 0.35 mm2 with M12 connector
M12 Connection	1:Ub, 3:GND, 4:Signal+

HOW TO ORDER (use characters in **bold** to create order code)

SET of master indicator small INS, sensor PT06-U4, sensor cable

Ordering code example:

T	L	G	S	-	0	8	W	-	0	5	R	H	L	M
					08 DISPLAY INCREM.1/8 **04** DISPLAY INCREM.1/4		**W**: WATER **F**: FOAM		CABLE LENGTH, METERS (INCH) **05**: 5 M (20”) **10**: 10 M (40”) **15**: 15 M (60”)		OUT1 **R**: LOW LEVEL WARNING	OUT2 **H**: AUTOFILL HYST. xx/xx % **R**: ADD. OUTPUT	OUT3 - OUT6 **L**: LLD5 DRIVER OUTPUTS	INPUT IN1 **M**: MUTE OUT1

Remote Indicator - Small

Ordering code example:

R	I	S	-	0	8	W	O	-	R	H	L	M
				08 DISPLAY INCREM.1/8 **04** DISPLAY INCREM.1/4		**W**: WATER **F**: FOAM	LED BRIGHTNESS **I**: INSIDE **O**: OUTSIDE		OUT1 **R**: LOW LEVEL WARNING	OUT2 **H**: AUTOFILL HYST. xx/xx % **R**: ADD. OUTPUT	OUT3 - OUT6 **L**: LLD5 DRIVER OUTPUTS	INPUT IN1 **M**: MUTE OUT1

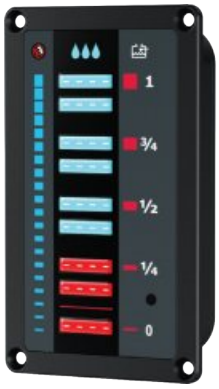
Master Indicator - Small

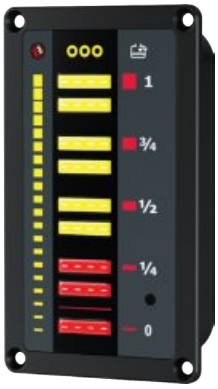
Ordering code example:

I	N	S	-	0	8	W	U	4	R	H	L	M
				08 DISPLAY INCREM.1/8 **04** DISPLAY INCREM.1/4		**W**: WATER **F**: FOAM	SENSOR INPUT / PROBE **U4**: 0,5-4,5V **U1**: 0-10 V **I2**: 4-20 MA		OUT1 **R**: LOW LEVEL WARNING	OUT2 **H**: AUTOFILL HYST. xx/xx % **R**: ADD. OUTPUT	OUT3 - OUT6 **L**: LLD5 DRIVER OUTPUTS	INPUT IN1 **M**: MUTE OUT1

TANK LEVEL GAUGE

INL-08 / RIL-08 / TLGL-08





Features and Benefits

1. **180° Viewing Angle**
2. **I/O Driver For Low Water Warning, Autofill-Hysteresis, Mute Input, Etc.**
3. **Can Bus Interface**
4. **Super Bright Leds**
5. **Dimmable-Light Sensor**
6. **Low Installation Depth**
7. **Washable, Waterproof Aluminium Housing**

INL-08 types of Tank Level Gauges are designed to display liquid's volume at an accuracy of 1/8 of the tank level using ultra-bright LEDs. The transducer measures the column of the liquid in the tank above the sensor process input and provides a signal that is proportional to the tank high. The unit standardly uses a pressure transducer with output 0.5-4.5 V.

The sensor input is widely configurable and it can also be used for 0.5-4.5 V, 0-10 V, 4-20 mA sensors and conductive or resistive probes.

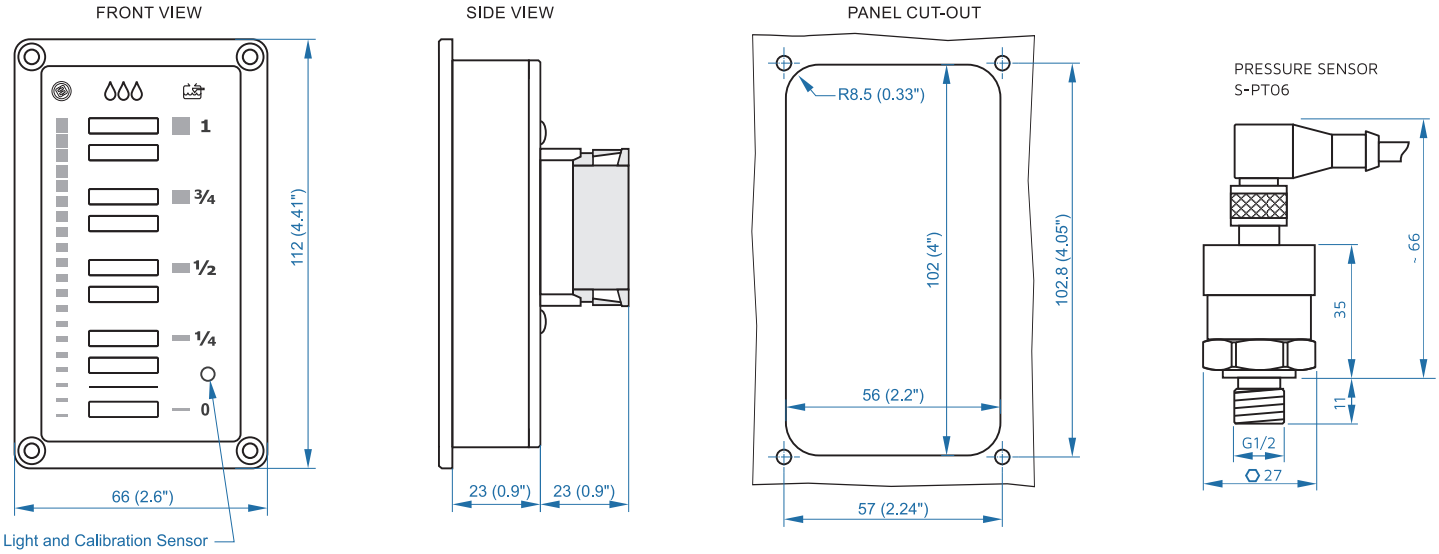
Optional I/O driver can be integrated for low level warning output, autofill-hysteresis output, mute input, etc.

The Tank Level Gauge can be used as a stand-alone system or as a part of MMX system connected via CAN bus to IO Controller. Several slave indicators (large remote - RIL) can be connected to a master indicator INL to show the same value on different locations or in combination with a small remote indicator (RIS) for the cabin and XL remote indicator (RIXL) for the vehicle sides.

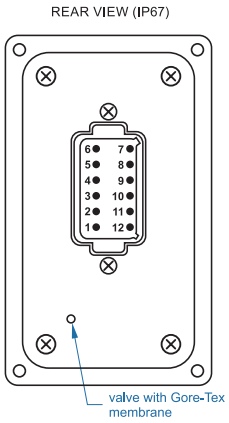
SPECIFICATIONS

POWER	
Supply Voltage	8-32 V DC
Current	0.5 A maximum, no outputs active
Electrical Protection	overvoltage, transients, reverse polarity, load dump
INTERFACES	
CAN	1 x CAN
CAN termination	120 ohm, DIP switch
I/O	
Sensor input	0.5-4.5 V, 0-5V, 0-10V, 4-20 mA, resistive probe, conductive probe throught extra M12 connector
Digital Input	configurable active low/high levels 0..Ub, protected
Digital Output	**Only version with integrated I/O driver*
OUT1	positive switching (high-side), max. 3 A (Low water warning)
OUT2	positive switching (high-side), max. 1.5 A (Autofill-Hysteresis xx/xx%)
OUT3	positive switching (high-side), max. 1.5 A
OUT4	negative switching (low-side), max. 0.5 A
Loads	inductive, capacitive, resistive
Miscellaneous	protection from short circuit and overload
ENVIRONMENT	
IP Class (IEC529)	IP67, waterproof
EMC Conformity	EN61000-6-2 noise immunity EN61000-6·4 radiation of interference
Temperature Range	storage -40° to +85°C (-40° to 185°F) operating -40° to +85°C (-40° to 185°F)
ENCLOSURE	
Housing Material	Aluminium
Mounting	in-dash, with 4 screws M3 or 3.5 mm (#8) tapping screws
Matting Connector	Deutsch DT06-12S
MISCELLANEOUS	
Indicator increments	1/8
Day/Night operation	automatic – integrated light sensor
Front panel	backlit, colour coded for water and foam
Detectable substances	water, fire-smothering foam, gasoline, etc
SIZE AND WEIGHT	
W x H X D	66 x 112 x 23 mm (2.6"x4.41"x0.9") without connector
Weight	0.25 kg (0.55 lbs)

DIMENSIONS



CONNECTIONS



CONNECTION Deutsch DT06-6S	
PIN	DESCRIPTION
1	BATTERY + ("15")
2	CAN L
3	CAN H
4	SENSOR [V] OR [mA] VCC+
5	SENSOR [V] GND
6	SENSOR [V] OR [mA] SIGNAL
7	OUT1 (OPTIONAL), e.g. LOW WATER
8	OUT2 (OPTIONAL), e.g. AUTOFILL
9	OUT3 (OPTIONAL)
10	OUT4 (OPTIONAL)
11	INPUT (OPTIONAL
12	BATTERY -

TRANSDUCER OEM

SPECIFICATION AND CONNECTION	
Pressure Range	0-600 mbar (0 - 6 m tank height)
Signal Output	0.5-4.5 V
IP Class (IEC529)	IP67
Transducer Material	Stainless steel 316L
Pressure Port	1/4"
Transducer Cable	3 x 0.35 mm2 with M12 connector
M12 Connection	1:Ub, 3:GND, 4:Signal+

HOW TO ORDER (use characters in **bold** to create order code)

SET of Master Indicator - Large INL, Sensor PT06-U4, Sensor cable — Ordering code example:

T	L	G	L	-	0	8	W	-	0	5	R	H		
						08 DISPLAY INCREM. 1/8	**W**: WATER **F**: FOAM		CABLE LENGTH, METERS (INCH) **05**: 5 M (20") **10**: 10 M (40") **15**: 15 M (60")	OUT1 **R**: LOW LEVEL WARNING	OUT2 **H**: AUTOFILL HYST. xx/xx % **R**: ADD. OUTPUT	OUT3, OUT4 **O**: 1X 1.5A POSITIVE 1X 0.5A NEGATIVE	INPUT NEGATIVE **M**: MUTE OUT1	

Remote Indicator - Large — Ordering code example:

R	I	L	-	0	8	W	O	-	R	H		
				08 DISPLAY INCREM. 1/8	**W**: WATER **F**: FOAM	LED BRIGHTNESS **I**: INSIDE **O**: OUTSIDE		OUT1 **R**: LOW LEVEL WARNING	OUT2 **H**: AUTOFILL HYST. xx/xx % **R**: ADD. OUTPUT	OUT3, OUT4 **O**: 1X 1.5A POSITIVE 1X 0.5A NEGATIVE	INPUT NEGATIVE **M**: MUTE OUT1	

Master Indicator - Large — Ordering code example:

I	N	L	-	0	8	W	U	4	R	H		
				08 DISPLAY INCREM. 1/8	**W**: WATER **F**: FOAM	SENSOR INPUT / PROBE **U4**: 0,5-4,5V **U1**: 0-10 V **I2**: 4-20 MA **R0**: RESISTIVE IN		OUT1 **R**: LOW LEVEL WARNING	OUT2 **H**: AUTOFILL HYST. xx/xx % **R**: ADD. OUTPUT	OUT3, OUT4 **O**: 1X 1.5A POSITIVE 1X 0.5A NEGATIVE	INPUT NEGATIVE **M**: MUTE OUT1	

TANK LEVEL GAUGE

INS-20/RIS-20/TLGS-20

Features and Benefits

1. **160° Viewing Angle**
2. **I/O Driver For Low Water Warning, Autofill-Hysteresis, Mute Input, Large Light Driver, Etc.**
3. **CAN Bus Or 1 Wire Datalink**
4. **Super Bright LEDs**
5. **Dimmable-Light Sensor, Backlit**
6. **Multiple Sensor input**

INS-20 types of Tank Level Gauges are designed to display liquid's volume at an accuracy of 1/20 (5%) of the tank level using ultra-bright LEDs. The transducer measures the column of the liquid in the tank above the sensor process input and provides a signal that is proportional to the tank height. The unit standardly uses a pressure transducer with output 0.5-4.5 V by which we can detect also broken sensor cable. The sensor input is widely configurable and it can also be used for 0-10 V transducers or 4-20 mA transmitters.

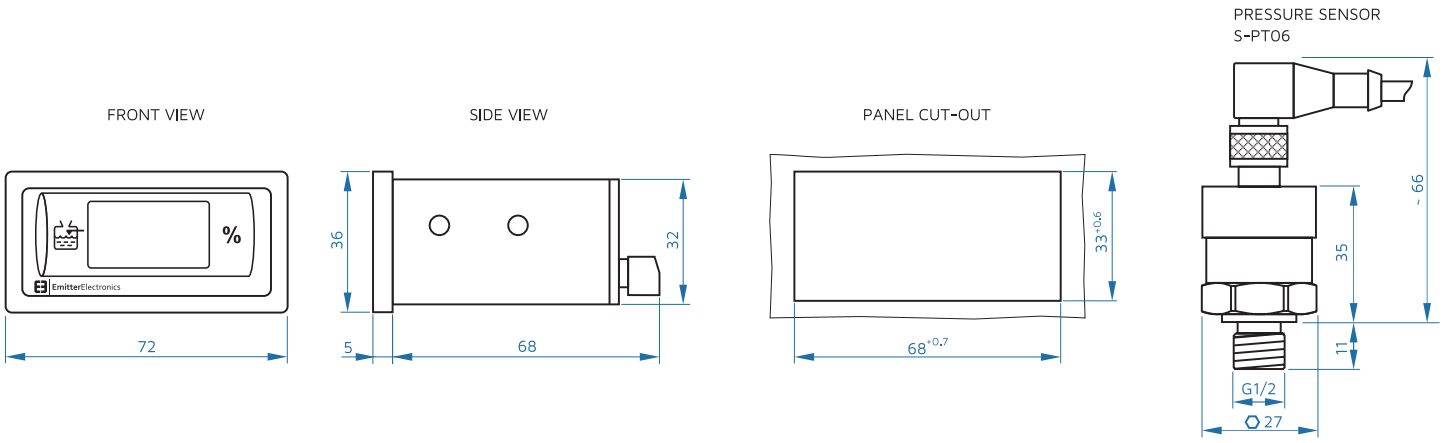
Optional I/O driver can be integrated for low level warning output, autofill-hysteresis output, mute input, etc.

The Tank Level Gauge can be used as a stand-alone system or as a part of MMX system connected via CAN bus to IO Controller. Several slave indicators (small remote - RIS) can be connected to a master indicator INS to show the same value on different locations or in combination with a XL remote indicator (RIXL) for the vehicle sides.

SPECIFICATIONS

POWER	
Supply Voltage	9-30 V DC
Current	0.5 A maximum, no outputs active
Electrical Protection	overvoltage, transients, reverse polarity
INTERFACES	
CAN	1 x CAN, optional
CAN termination	120 ohm, solder pad on PCB
Serial communication	1 x T (1 Wire), optional
I/O	
Sensor input	0.5-4.5 V Standardly, 0-5V, 0-10V, 4-20 mA
Digital Input	GND, only with CAN bus device
Digital Output OUT1 OUT2 OUT3-OUT7	**Only version with integrated I/O driver* positive switching (relay), max. 6 A (Low water warning) positive switching (relay), max. 1.5 A (Autofill-Hysteresis) negative switching (low-side), max. 1.8 A (large light driver)
Loads	inductive, resistive
ENVIRONMENT	
IP Class (IEC529)	front panel IP67, back IP20
EMC Conformity	EN61000-6-2 noise immunity EN61000-6-4 radiation of interference
Temperature Range	storage -40° to +85°C (-40° to 185°F) operating -40° to +85°C (-40° to 185°F)
ENCLOSURE	
Housing Material	NORYL with glass-fibre reinforcement
Mounting	in-dash, with clips or springs
Connector	Terminal block 4, 8 or 13 way depending on selected options
MISCELLANEOUS	
Indicator increments	1/20 (5%)
Day/Night operation	automatic – integrated light sensor
Front panel	backlit, colour coded for water and foam
Detectable substances	water, fire-smothering foam, gasoline, etc
SIZE AND WEIGHT	
W x H X D	36 x 72 x 68 mm with connector
Weight	0.1 kg

DIMENSIONS



CONNECTIONS

CONNECTION standard device

PIN	DESCRIPTION
1	BATTERY + (“15”)
2	BATTERY -
3	OUT1 (OPTIONAL)
4	T-COMMUNICATION
5	SENSOR [V] GND
6	SENSOR [V]/[mA] SIGNAL
7	SENSOR [V]/[mA] VCC+
8	OUT2 (OPTIONAL)
9	OUT3 (OPTIONAL)
10	OUT4 (OPTIONAL)
11	OUT5 (OPTIONAL)
12	OUT6 (OPTIONAL)
13	OUT7 (OPTIONAL)

CONNECTION CAN bus device

PIN	DESCRIPTION
1	BATTERY + (“15”) / SENSOR SUPPLY (OPTIONAL)
2	BATTERY - / SENSOR GND (OPTIONAL)
3	OUT1 (OPTIONAL)
4	T-COMMUNICATION / OUT3 (OPTIONAL)
5	IN1
6	SENSOR [V]/[mA] SIGNAL
7	OUT2 (OPTIONAL)
8	SENSOR [V]/[mA] VCC+ / OUT4 (OPTIONAL)
9	OUT5 (OPTIONAL)
10	SENSOR [V] GND / OUT6 (OPTIONAL)
11	OUT7 (OPTIONAL)
12	CAN L
13	CAN H

TRANSDUCER OEM

SPECIFICATION AND CONNECTION	
Pressure Range	0-600 mbar (0 - 6 m tank height)
Signal Output	0.5-4.5 V
IP Class (IEC529)	IP67
Transducer Material	Stainless steel 316L
Pressure Port	1/4”
Transducer Cable	3 x 0.35 mm2 with M12 connector
M12 Connection	1:Ub, 3:GND, 4:Signal+

How to order (use characters in **bold** to create order code)

SET of master indicator small INS, sensor PT06-U4, sensor cable

Ordering code example:

T	L	G	S	-	2	0	W	T	-	0	5	R	H	L	

20 DISPLAY INCREM. 1/20 (5%)	**W**: WATER **F**: FOAM	**T**: 1 WIRE **C**: CAN BUS		CABLE LENGTH, METERS (INCH) **05**: 5 M (20”) **10**: 10 M (40”) **15**: 15 M (60”)	OUT1 **R**: LOW LEVEL WARNING	OUT2 **H**: AUTOFILL HYST. xx/xx % **R**: ADD. OUTPUT	OUT3, OUT4 **L**: LLD5 DRIVER 5X1.8A GND OUTPUTS	IN1 NEGATIVE **M**: MUTE OUT1 (only CAN device)

Remote Indicator - Small

Ordering code example:

R	I	S	-	2	0	W	T	O	-	R	H		

20 DISPLAY INCREM. 1/20 (5%)	**W**: WATER **F**: FOAM	**T**: 1 WIRE **C**: CAN BUS	LED BRIGHTNESS **I**: INSIDE **O**: OUTSIDE		OUT1 **R**: LOW LEVEL WARNING	OUT2 **H**: AUTOFILL HYST. xx/xx % **R**: ADD. OUTPUT	OUT3, OUT4 **L**: LLD5 DRIVER 5X1.8A GND OUTPUTS	IN1 NEGATIVE **M**: MUTE OUT1 (only CAN device)

Master Indicator - Small

Ordering code example:

I	N	S	-	2	0	W	T	U	4	R	H	L	M

20 DISPLAY INCREM. 1/20 (5%)	**W**: WATER **F**: FOAM	**T**: 1 WIRE **C**: CAN BUS	SENSOR INPUT / PROBE **U4**: 0,5-4,5V **U1**: 0-10 V **I2**: 4-20 MA	OUT1 **R**: LOW LEVEL WARNING	OUT2 **H**: AUTOFILL HYST. xx/xx % **R**: ADD. OUTPUT	OUT3, OUT4 **L**: LLD5 DRIVER 5X1.8A GND OUTPUTS	IN1 NEGATIVE **M**: MUTE OUT1 (only CAN device)

REMOTE INDICATOR XL-NARROW

RIXLN

Features and Benefits

1. **Powerful Luminous Flux**
2. **Colour-Coded Led For Water And Foam Display**
3. **Five Different Level Patterns**
4. **Can Bus Or "T" Datalink**
5. **Low Installation Depth**
6. **Waterproof Aluminium Housing**

The XL Remote Tank Indicator RIXLN types are designed to display water or foam tank level, possible to be seen from a long distance. Blue, yellow and red LEDs are used for displaying water level and amber, yellow and red LEDs for foam. When the tank level is critical (liquid level less than 1/4) both indicators signalize the level with red colour LEDs, when the liquid level is less than 1/8 lights are running from top to bottom to signalize an empty tank.

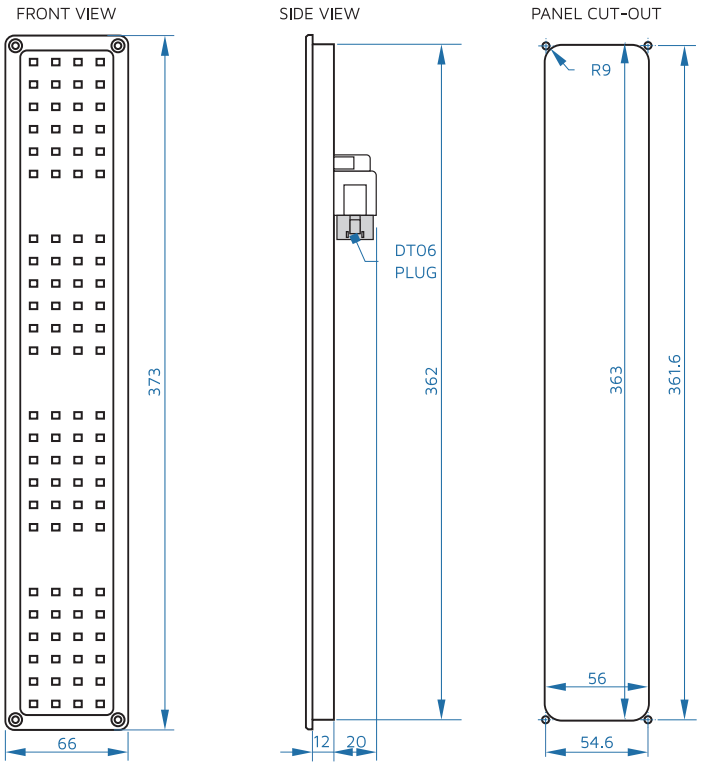
The RIXLN needs to be connected either to a master indicator or to an IO node/controller when used in MMX configuration. Large tank indicator is a slave device. Several slave indicators can be connected over Can bus or "T"- one wire datalink to show the same value on different locations.

Housing is made of Aluminium, highly resistant to weather conditions (IP67) and can survive extreme environments, what makes it perfect for installation outside the vehicles. The level bars are large and well-spaced, allowing a reliable reading of level in bright viewing angle and direct sunlight.

SPECIFICATIONS

POWER	
Supply Voltage	10-30 V DC
Current	1.5 A maximum
Power	16 W maximum
Electrical Protection	overvoltage, transients, reverse polarity, load dump
INTERFACES	
CAN	1 x CAN
T – one wire	1 x serial communication - optional
ENVIRONMENT	
IP Class (IEC529)	IP67, waterproof
EMC Conformity	EN61000-6-2 noise immunity EN61000-6-4 radiation of interference
Temperature Range	storage -40° to +85°C (-40°F to 185°F) operating -40° to +85°C (-40°F to 185°F)
ENCLOSURE	
Housing Material	Aluminium, glass
Mounting	in-dash, with 4 screws M3 or 3.5 mm tapping screws
Connector	Deutsch DT06-6S
MISCELLANEOUS	
Indicator increments	0, 1/4, 1/2, 3/4, Full
LEDs colour water type	24 red, 24 yellow and 48 blue
LEDs colour foam type	24 red, 24 yellow and 48 amber
SIZE AND WEIGHT	
W x H X D [mm]	66 x 373 x 15 without connector
Weight	0.6 kg

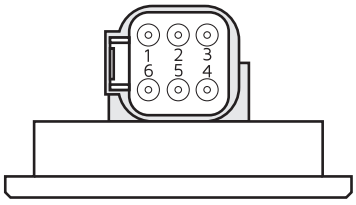
DIMENSIONS



CONNECTIONS

TYPE WITH "T" one wire
Connection Deutsch DT06-6S

PIN	DESCRIPTION
1	BATTERY + ("15")
2	T one wire datalink
3	T one wire datalink, int. shorted to PIN 2
4	N/A
5	N/A
6	BATTERY -



TYPE WITH Can BUS
Connection Deutsch DT06-6S

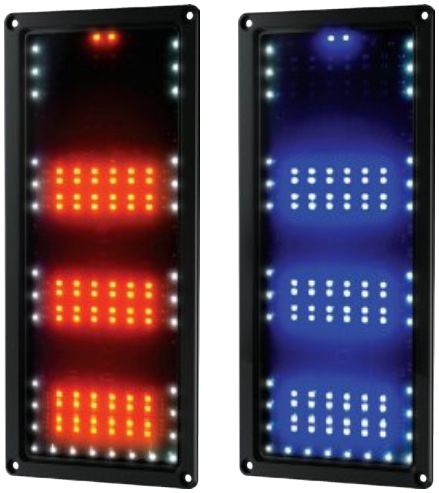
PIN	DESCRIPTION
1	BATTERY + ("15")
2	CAN L
3	CAN L, int. shorted to PIN 2
4	CAN H
5	CAN H, int. shorted to PIN 4
6	BATTERY -

PRODUCT CODE

RIXLN-WRYBB-C	XL remote indicator narrow, for water, red, yellow, blue LEDs Can-bus datalink
RIXLN-FRYYY-C	XL remote indicator narrow, for foam, red, yellow LEDs, Can-bus datalink
For more options please contact the supplier.	

REMOTE INDICATOR XL-WIDE

RIXLW



Features and Benefits

1. **Powerful Luminous Flux**
2. **Colour-Coded Led For Water And Foam Display**
3. **Six Different Level Patterns**
4. **Can Bus Or "T" Datalink**
5. **Low Installation Depth**
6. **Waterproof Aluminium Housing**

The XL Remote Tank Indicator RIXLW types are designed to display water or foam tank level, possible to be seen from a long distance. Blue LEDs are used for displaying water level and yellow LEDs for foam. When the tank level is critical (liquid level less than 1/4) both indicators signalize the level with red colour LEDs, when the liquid level is less than 1/8 lights are running from top to bottom to signalize an empty tank.

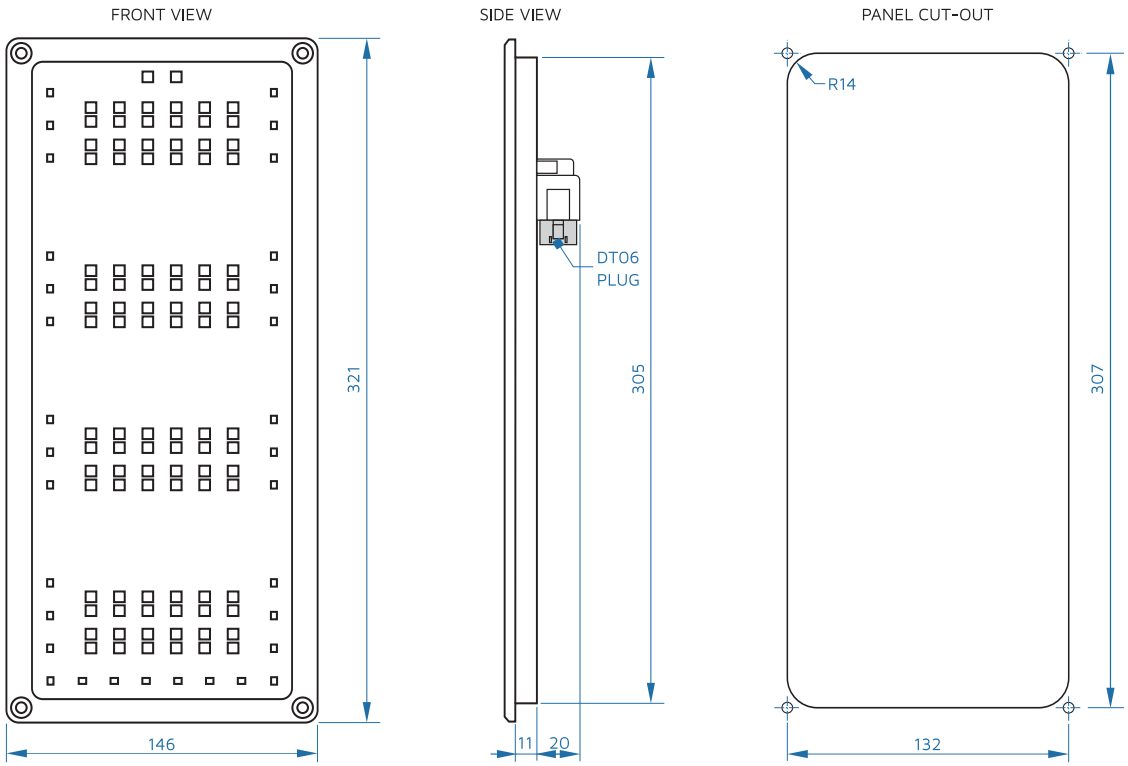
The RIXLW needs to be connected either to a master indicator or to an IO node/controller when used in MMX configuration. Large tank indicator is a slave device. Several slave indicators can be connected over Can bus or "T"- one wire datalink to show the same value on different locations.

Housing is made of Aluminium, highly resistant to weather conditions (IP67) and can survive extreme environments, what makes it perfect for installation outside the vehicles. The level bars are large and well-spaced, allowing a reliable reading of level in bright viewing angle and direct sunlight.

SPECIFICATIONS

POWER	
Supply Voltage	10-30 V DC
Current	1.5 A maximum
Power	16 W maximum
Electrical Protection	overvoltage, transients, reverse polarity, load dump
INTERFACES	
CAN	1 x CAN
T – one wire	1 x serial communication - optional
ENVIRONMENT	
IP Class (IEC529)	IP67, waterproof
EMC Conformity	EN61000-6-2 noise immunity EN61000-6-4 radiation of interference
Temperature Range	storage -40° to +85°C (-40°F to 185°F) operating -40° to +85°C (-40°F to 185°F)
ENCLOSURE	
Housing Material	Aluminium, glass
Mounting	in-dash, with 4 screws M5 or 4.8 mm tapping screws
Connector	Deutsch DT06-6S
MISCELLANEOUS	
Indicator increments	0, 1/8, 1/4, 1/2, 3/4, Full
LEDs colour water type	96 blue, 24 red and 32 white for surround
LEDs colour foam type	96 yellow, 24 red and 32 white for surround
SIZE AND WEIGHT	
W x H X D [mm]	146 x 321 x 15 without connector
Weight	1 kg

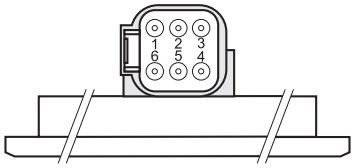
DIMENSIONS



CONNECTIONS

TYPE WITH "T" one wire
Connection Deutsch DT06-6S

PIN	DESCRIPTION
1	BATTERY + ("15")
2	T one wire datalink
3	T one wire datalink, int. shorted to PIN 2
4	N/A
5	N/A
6	BATTERY -



TYPE WITH Can BUS
Connection Deutsch DT06-6S

PIN	DESCRIPTION
1	BATTERY + ("15")
2	CAN L
3	CAN L, int. shorted to PIN 2
4	CAN H
5	CAN H, int. shorted to PIN 4
6	BATTERY -

PRODUCT CODE

RIXLW-WBR-C	XL remote indicator wide, for water, blue/red LEDs, Can-bus datalink
RIXLW-FYR-C	XL remote indicator wide, for foam, yellow/red LEDs, Can-bus datalink
For more options please contact the supplier.	

DIGITAL PRESSURE INDICATOR

DPI-XXXX / RPI / DPG-XXXX

Features and Benefits

1. **Vacuum. Low and High Pressure Indication**
2. **3-Digit [BAR] or 4-Digit [kPa] Display Version**
3. **I/O Driver integrated for Alarms, Regulation, Etc. - Optional**
4. **CAN Bus Or One Wire Datalink**
5. **Super Bright LED Display**
6. **Multiple Sensor input**

DPI types of Digital Pressure Indicators are designed to display system pressure using 3 or 4-digit ultra-bright LED display where multiple pressure sensors can be connected. The unit standardly uses a -1..24 bar, 0..25 bar and 0..60 bar pressure sensors. The sensor input is widely configurable and it can be used for 0.5-4.5 V and 0-10 V transducers or 4-20 mA transmitters.

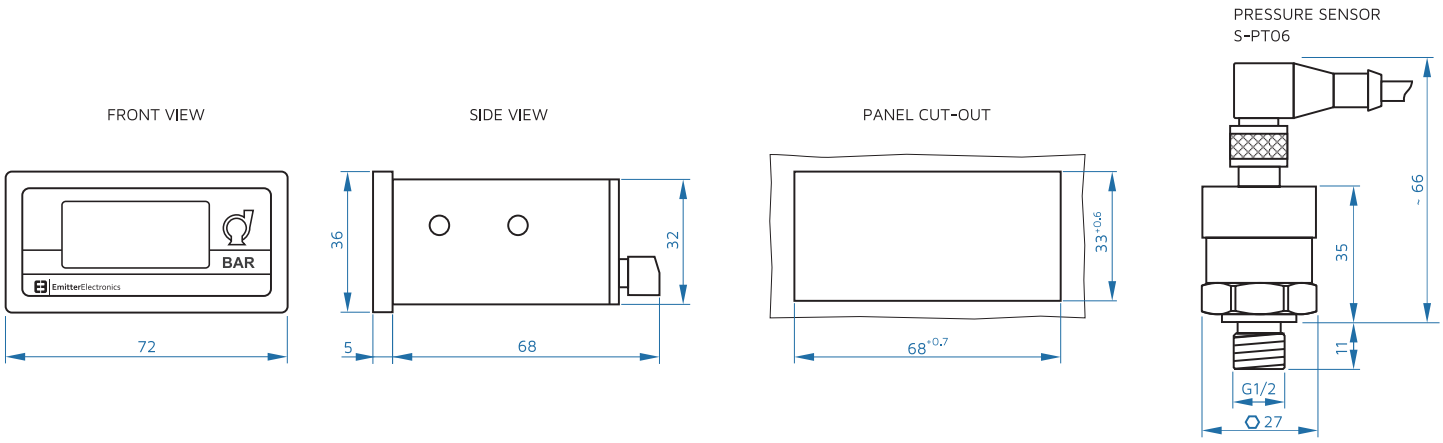
Optional I/O driver can be integrated for activating warning output, regulating the system pressure, etc.

The Digital Pressure Indicator can be used as a stand-alone system or as a part of MMX system connected via CAN bus to IO Controller. Several slave-remote pressure indicators (RPI) can be connected to a master indicator DPI to show the same value on different locations.

SPECIFICATIONS

POWER	
Supply Voltage	9-30 V DC
Current	0.5 A maximum, no outputs active
Electrical Protection	overvoltage, transients, reverse polarity
INTERFACES	
CAN	1 x CAN, optional
CAN termination	120 ohm, solder pad on PCB
Serial communication	1 x T (1 Wire), optional
I/O	
Sensor input	0.5-4.5 V Standardly, 0-5V, 0-10V, 4-20 mA
Digital Input	GND, only with CAN bus device
Digital Output	**Only version with integrated I/O driver*
OUT1	positive switching (relay), max. 6 A (Low water warning)
OUT2	positive switching (relay), max. 1.5 A (Autofill-Hysteresis)
OUT3-OUT7	negative switching (low-side), max. 1.8 A (large light driver)
Loads	inductive, resistive
ENVIRONMENT	
IP Class (IEC529)	front panel IP67, back IP20
EMC Conformity	EN61000-6-2 noise immunity EN61000-6-4 radiation of interference
Temperature Range	storage -40° to +85°C (-40° to 185°F) operating -40° to +85°C (-40° to 185°F)
ENCLOSURE	
Housing Material	NORYL with glass-fibre reinforcement
Mounting	in-dash, with clips or springs
Connector	Terminal block 4, 8 or 13 way depending on selected options
MISCELLANEOUS	
LED display	3 digit (bar) or 4 digit (kPa)
Reading resolution	@P<30 bar: 0.1 bar (10 kPa), @P>30 bar: 1 bar
SIZE AND WEIGHT	
W x H X D	36 x 72 x 68 mm with connector
Weight	0.1 kg

DIMENSIONS



CONNECTIONS

CONNECTION standard device

PIN	DESCRIPTION
1	BATTERY + (“15”)
2	BATTERY -
3	OUT1 (OPTIONAL)
4	T-COMMUNICATION
5	SENSOR [V] GND
6	SENSOR [V]/[mA] SIGNAL
7	SENSOR [V]/[mA] VCC+
8	OUT2 (OPTIONAL)
9	OUT3 (OPTIONAL)
10	OUT4 (OPTIONAL)
11	OUT5 (OPTIONAL)
12	OUT6 (OPTIONAL)
13	OUT7 (OPTIONAL)

CONNECTION CAN bus device

PIN	DESCRIPTION
1	BATTERY + (“15”) / SENSOR SUPPLY (OPTIONAL)
2	BATTERY - / SENSOR GND (OPTIONAL)
3	OUT1 (OPTIONAL)
4	T-COMMUNICATION / OUT3 (OPTIONAL)
5	IN1
6	SENSOR [V]/[mA] SIGNAL
7	OUT2 (OPTIONAL)
8	SENSOR [V]/[mA] VCC+ / OUT4 (OPTIONAL)
9	OUT5 (OPTIONAL)
10	SENSOR [V] GND / OUT6 (OPTIONAL)
11	OUT7 (OPTIONAL)
12	CAN L
13	CAN H

TRANSDUCER OEM

SPECIFICATION AND CONNECTION	
Pressure Range	Vacuum -1..24 bar, Low 0..25 bar, High 0..60 bar
Signal Output	0.5-4.5 V or 4-20 mA
IP Class (IEC529)	IP67
Transducer Material	Stainless steel 316L
Pressure Port	1/4”
Transducer Cable	3 x 0.35 mm2 with M12 connector
M12 Connection	1:Ub, 3:GND, 4:Signal+

How to order (use characters in **bold** to create order code)

SET of DPI - master Indicator, pressure sensor, sensor cable — Ordering code example:

D	P	G	-	0	0	2	5	T	-	0	5	R	R	

MEASURING RANGE **0024**: -1 .. 24 BARS **0025**: 0 .. 25 BARS **0060**: 0 .. 60 BARS **2200**: 0 .. 2200 KPA	**T**: 1 WIRE **C**: CAN BUS		CABLE LENGTH, METERS (INCH) **05**: 5 M (20”) **10**: 10 M (40”) **15**: 15 M (60”)	OUT1 **R**: OUTPUT 1	OUT2 **H**: HYSTERESIS **R**: ADD. OUTPUT	SPECIAL MODIFICATION

Remote Indicator — Ordering code example:

R	P	I	-	B	T	I	R	R	

UNITS: **B**: BAR **P**: KPA	**T**: 1 WIRE **C**: CAN BUS	LED BRIGHTNESS **I**: INSIDE **O**: OUTSIDE	OUT1 **R**: OUTPUT 1	OUT2 **H**: HYSTERESIS **R**: ADD. OUTPUT

Master Indicator — Ordering code example:

D	P	I	-	0	0	2	5	I	2	T	R	R	

MEASURING RANGE **0024**: -1 .. 24 BARS **0025**: 0 .. 25 BARS **0060**: 0 .. 60 BARS **2200**: 0 .. 2200 KPA	SENSOR INPUT / PROBE **U4**: 0,5-4,5V **U1**: 0-10 V **I2**: 4-20 MA	**T**: 1 WIRE **C**: CAN BUS	OUT1 **R**: OUTPUT 1	OUT2 **H**: HYSTERESIS **R**: ADD. OUTPUT	SPECIAL MODIFICATION

FLASHER

Features and Benefits

1. **2 Channels**
2. **High Current Low Side Mosfet Outputs**
3. **Powered by either 12 or 24V**
4. **Factory Programmable**
5. **Ready for Immediate Operation**

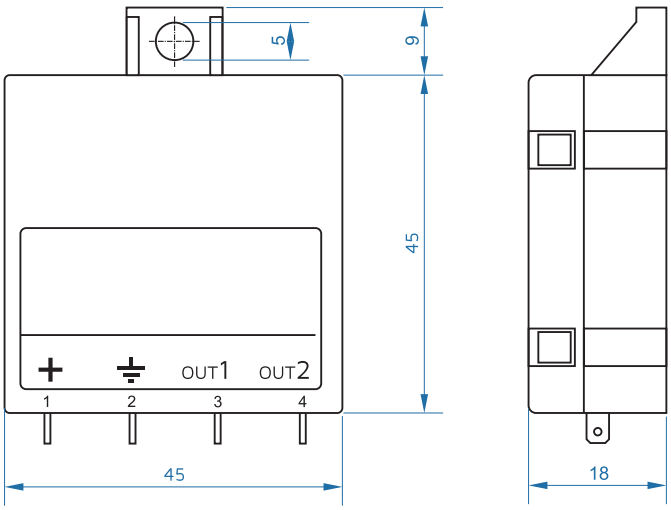
Flasher is an electronic device with two independent low side output signals which can control for e.g flash lamps mounted on the front, rear or on the vehicle sides, warning for open steps etc.

The flasher can be programmed to different flashing user patterns.

SPECIFICATIONS

POWER	
Supply Voltage	8-30 V DC
Current	0.1 A maximum, no outputs active
Electrical Protection	reverse polarity
I/O AND INTERFACES	
Digital Output	
OUT1	negative switching (low-side), max. 2 A
OUT1	negative switching (low-side), max. 2 A
Loads	inductive, resistive
ENVIRONMENT	
IP Class (IEC259)	IP20
Temperature Range	storage from -40° to +85°C operating from -40° to +85°C
ENCLOSURE	
Housing Material	ABS
Mounting	with 1 screw
Connector	faston 2.8 x 0.8
SIZE AND WEIGHT	
W x H x D	45 x45 x 18 mm without connector
Weight	0.1 kg

DIMENSIONS



PRODUCT CODE

FLASHER 2N	Flasher 2x Output GND, 1A, 10-30V DC, fact. programmable

PTO TIMER

Features and Benefits

1. **2 Channels– Clutch and PTO control**
2. **Positive or Negative Relay Outputs**
3. **Pulse or Permanent PTO engagement procedure**
4. **Powered by either 12 or 24V**
5. **Factory Programmable**
6. **Ready for Immediate Operation**

The vehicle PTO engagement and disengagement action uses the main transmission clutch and a control mechanism which physically engage the PTO itself. Typically, an air valve is used to engage the PTO. There are a number of different types of PTO and different engagement procedures.

The PTO TIMER is designed to manage the properly engagement of PTO with two control signals, one for clutch and another for PTO valve. It is factory programmed to specific chassis brands and types. The control and activation signal can be permanent or pulse and positive or negative.

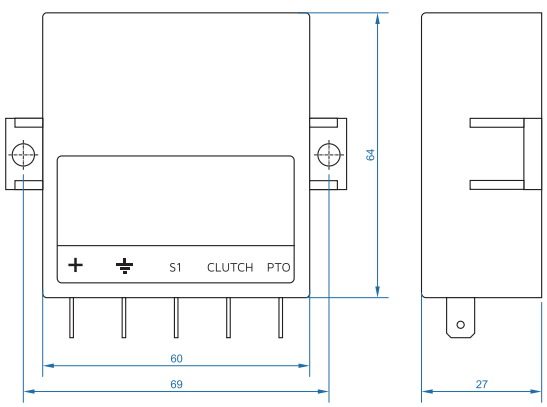
SPECIFICATIONS

POWER	
Supply Voltage	8-30 V DC
Current	0.2 A maximum, no outputs active
Electrical Protection	reverse polarity, overvoltage
I/O AND INTERFACES	
Relay Output	
OUT1	negative or positive switching, max. 1 A
OUT1	negative or positive switching, max. 1 A
Loads	inductive, resistive
ENVIRONMENT	
IP Class (IEC259)	IP20
Temperature Range	storage from -40° to +85°C operating from -40° to +85°C
ENCLOSURE	
Housing Material	ABS
Mounting	with 2 screw
Connector	faston 6.3 x 0.8
SIZE AND WEIGHT	
W x H x D	60 x 60 x 27 mm without connector
Weight	0.1 kg

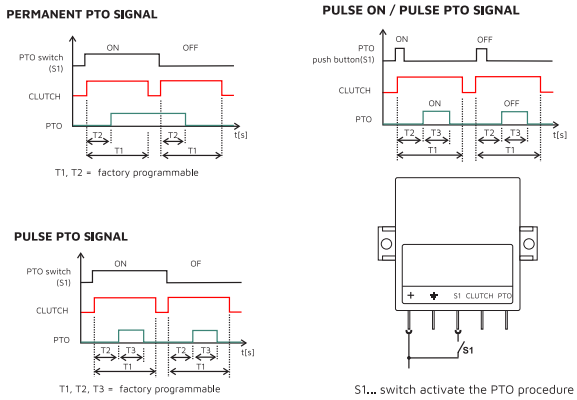
PRODUCT CODE

PTO24VI+-I	PTO-TIMER-24-I-8+/3/4-, clutch +, pto -(pulse), switch input-permanent, Renault
PTO24VP+-	PTO-TIMER-24-P-5+/3, clutch +, pto -, Scania/Iveco
PTO24VP++	PTO-TIMER-24-P-5+/3, clutch +, pto +, MAN/Mercedes

DIMENSIONS



CONNECTIONS



PRESSURE SENSORS

Features and Benefits

1. **Signal output 4...20 mA, 0.5...4.5 V or 0...10 V**
2. **Nonlinearity 0.25%**
3. **Pressure connection G1/4**
4. **Pressure ranges 600 mbar to 600 bar**

Pressure Transmitters/Transducers are engineered and manufactured to fit many industrial and OEM pressure measurement applications. Rugged design provides resistance to vibrations, shock, wide temperature variations, RFI and other extreme environmental conditions that are typical for industrial and OEM applications.

Performance and reliability are enhanced by stainless steel welded measuring cell that eliminates the need for soft sealing materials that may deteriorate over time. The state-of-the-art manufacturing and assembly process increase the long-term reliability.

The PT can be used for a multitude of functions across many different applications. Exceptionally simple installation, set-up and operation with an excellent price/performance ratio set this highly-reliable product apart from alternatives.

SPECIFICATIONS

Specifications	Model PT								
Pressure ranges	bar	0,6	1	1.6	2,5	4	6	10	16
Over pressure safety	bar	1,2	2	3.2	5	8	12	20	32
Burst pressure	bar	3	5	10	10	17	34	34	100
Pressure ranges	bar	25	40	60	100	160	250	400	600
Over pressure safety	bar	50	80	120	200	320	500	800	1200
Burst pressure	bar	100	400	550	800	1000	1200	1700	2400

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