

Description

The **PowerPlex®** Compact Module has been designed for the 12 V or 24 V DC-System of recreational vehicles and boats. It offers eight multifunctional inputs, which can be used for measuring current, voltage, temperature and/or liquid levels, as well as 14 load outputs.

PowerPlex® is a modular, CAN bus based control system allowing the realisation of intelligent on-board electrical systems on boats and recreational vehicles. A **PowerPlex®** system connects and controls a wide range of tasks and electrical components in complex on-board electrical systems. All **PowerPlex®** control modules ensure reliable and efficient power supply of all functionally relevant components. The wide range of **PowerPlex®** products offers various possibilities to run processes automatically or to link them with conditions.

By means of the **PowerPlex®** configuration software, the application-specific logics for power distribution, power control and power monitoring will be defined, stored or adjusted. Communication takes place via the **PowerPlex®** CAN, based on SAE J1939.

Typical applications

- Buses, recreational vehicles, mobile homes etc.
- Watercraft, e. g. leisure boats, workboats

Features

- Well-proven CAN technology
- Galvanical isolation of the CAN interface
- Programmable overload protection
- 14 dimmable outputs
- 8 multifunctional inputs digital/analog
- Undervoltage monitoring
- Integrated freewheeling diodes
- 2 H-bridges for motor control
- Flexible system design using configuration software

Part number

PP-M-CM500-000-0-Z-00

Approvals

Authority	Standard	Rated voltage
KBA	ECE regulation No 10 (E1)	DC 12 V DC 24 V



Technical data

Voltage rating	DC 12 V/24 V
Operating voltage	9 ... 32 V DC
Current consumption	typically 63 mA at 12 V typically 44 mA at 24 V
Max. total current per module	60 A
Degree of protection	IP20 when mounted vertically with terminals pointing downwards
Operating temperature range	-30 ... +70 °C (-22 ... +158 °F), with derating above +50 °C (+122 °F)
Storage temperature range	-30 ... +85 °C (-22 ... +185 °F)
Humidity (IEC 60068-2-30, Db)	95 % Rh, 240 hrs
Vibration IEC 60068-2-6, Fc	10 Hz to 57 Hz: ± 0.38 mm 57 Hz to 200 Hz: acceleration 5 g
IEC 60068-2-64, Fh	10 Hz to 2000 Hz: acceleration approx. 2 g _{RMS}
Shock IEC 60068-2-27, Ea	25 g (11 ms)
EMC	CE marking to EN 61000-6-1, EN 61000-6-3
Mass	approx. 410 g

Interfaces:

CAN I*	PowerPlex® CAN, 250 kbit/s, galvanically isolated
CAN II*	CAN II galvanically isolated, protocol upon request
*) The CAN-terminals at each end of a CAN bus require a termination by a 120 Ω resistor.	
LIN	LIN bus interface (CI-BUS) upon request

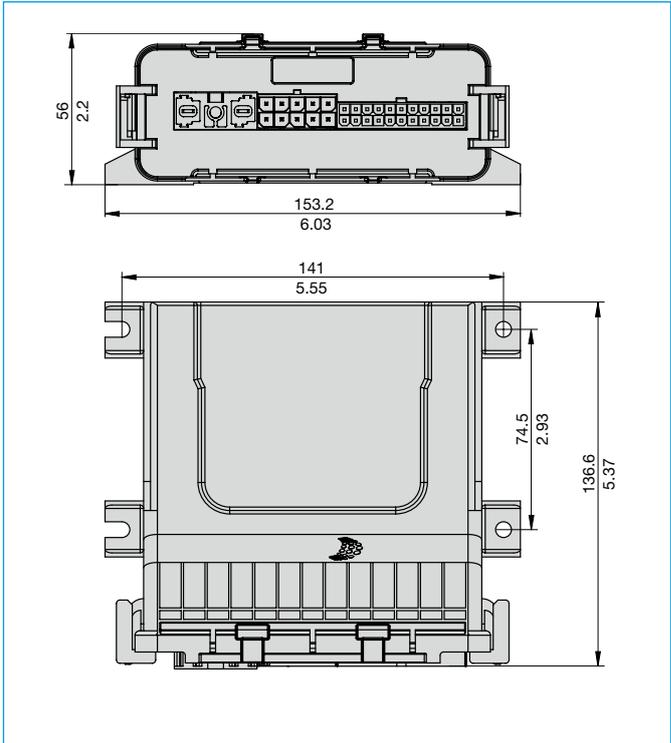
Inputs:

8 multifunctional inputs, configurabel as	I1	I2	I3	I4	I5	I6	I7	I8
digital input:								
0 ... 8 kΩ: ON; > 10 kΩ OFF; plus or minus switching	•	•	•	•	•	•	•	•
analog inputs:								
a) voltage monitoring:								
0 ... 32 V, Rin: 60 kΩ; resolution: 10 Bit	•	•	•	•	•	•	•	•
b) battery monitoring:								
± 60 mV; battery current measurement with external shunt (I3 & I4)			+	-				
c) resistance measurement:								
0 ... 750 Ω; for tank levels and temperature	•	•	•	•	•	•	•	•
d) frequency measurement:								
0 ... 10 kHz (I1 & I2)	•	•						

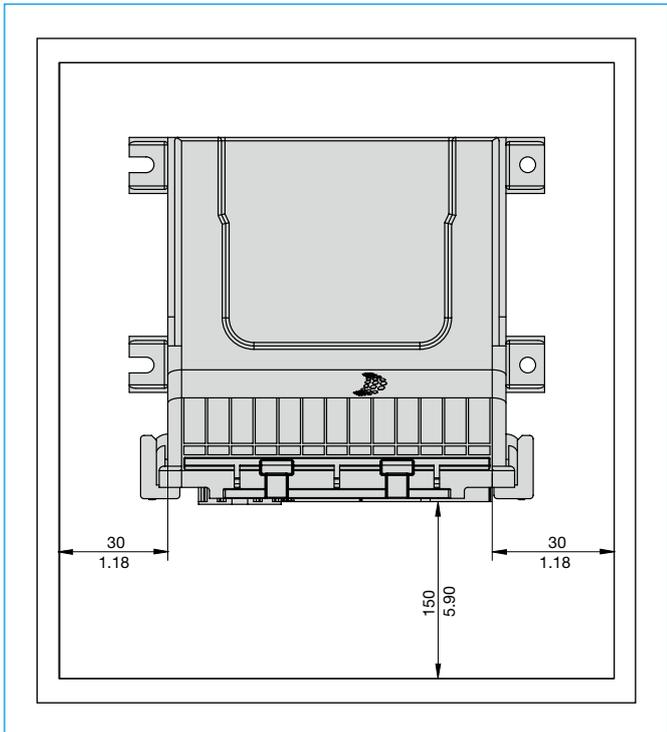
Technical data

Outputs:	
10 outputs with 10 A max. continuous current	
load output:	Power MOSFET, high side switching
max. current rating:	10 A, adjustable in 1 A steps
typical voltage drop U_{ON} at rated current (at 25°C):	60 mV
tripping range at overload:	1.01 ... 1.30 x I_N
trip time:	adjustable from 100 msec to 6 s
outputs are equipped with fail-safe-elements (30 A-SMD-fuse)	
leakage current in OFF condition:	4 μ A
Wire breakage monitoring in ON condition of load:	wire breakage thresholds: I_{Load} typically < 2.5 A
motor function:	switching of 2 H-bridges possible (X2: O1 & O2, X2: O6 & O7)
high current function:	20 A outputs via parallel connection of two load outputs (X2: O1 ... O10)
dimming function:	all outputs are high-frequency dimmable, frequency adjustable
4 outputs with 3 A max. continuous current	
load output:	Power MOSFET, high side switching
max. current rating:	3 A, adjustable in 1 A steps
typical voltage drop U_{ON} at rated current (at 25 °C):	75 mV
tripping range at overload:	1.01 ... 1.30 x I_N
trip time:	typically 180 μ s at 19 A
outputs are equipped with fail-safe-elements (20 A-SMD-fuse)	
leakage current in OFF condition:	2 μ A
Wire breakage monitoring in ON condition of load:	wire breakage thresholds: I_{Load} typically < 2.5 A
dimming function:	all outputs are high-frequency dimmable, frequency adjustable

Dimensions

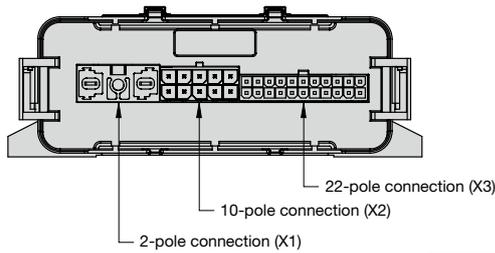


Mounting dimensions

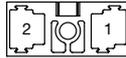


7

Pin assignment

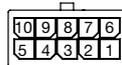


2-pole connection * (X1)



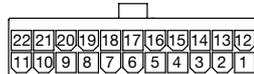
interface	assignment	pin
voltage supply (DC 12 V/24 V; DC 9 ... 32 V)	U _{Batt} +	1.1
	U _{Batt} -	1.2

10-pole connection * (X2)



interface	assignment	pin
10 A outputs, dimmable (motor function [H1/H2]: O1 & O2, O6 & O7; high current function: 20 A via parallel connection; GND _O must be connected externally.)	O1 (H1)	2.1
	O2 (H1)	2.2
	O3	2.3
	O4	2.4
	O5	2.5
	O6 (H2)	2.6
	O7 (H2)	2.7
	O8	2.8
	O9	2.9
	O10	2.10

22-pole connection * (X3)



interface	assignment	pin
CAN I: PowerPlex ® CAN, galvanically isolated	CAN-H	3.1
	CAN-L	3.2
	SHLD	3.3
CAN II, galvanically isolated	CAN-H	3.12
	CAN-L	3.13
	SHLD	3.14
3 A outputs, dimmable (note: parallel connection possible; GND _O must be connected externally.)	O1	3.4
	O2	3.5
	O3	3.15
	O4	3.16
multifunctional inputs (note: when monitoring the battery, it must be ensured that PLUS/ MINUS are correctly connected.)	I1	3.6
	I2	3.7
	I3	3.8
	I4	3.9
	I5	3.17
	I6	3.18
	I7	3.19
	I8	3.20
GND for multifunctional inputs (note: only use GND _I for multifunctional inputs (X3: I1 – I8), not for GND _O of the load outputs (X2: O1 – O10; X3: O1 – O4)	GND _I	3.10
	GND _I	3.21
LIN bus interface	LIN	3.22
	GND _{LIN}	3.11

*) Mating connectors are not included in delivery (see connection and accessories)

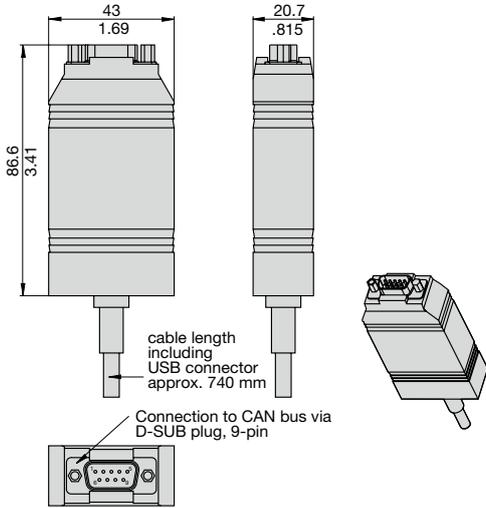
Connection

connector	mating connectors *
X1: 2-pole	Weidmuller-PCB Connector: BUZ 10.16IT/02/180MF AG BK BX Hand-Crimp-Tool: PZ16 Phillips screwdriver (6 mm): SDK PZ2 Optional wire end ferrule with plastic collar: H16.02 / 24D
X2: 10-pole	Molex Mega Fit: 170001-0110 Mega-Fit Female Crimp Terminal, AWG 14-16, reel: 172063-0311 Hand-Crimp-Tool: 63825-7100 Extractor Tool: 63824-0800
X3: 22-pole	Molex Mini-Fit, 0039012220 Mini-Fit Female Crimp-Terminals 18-24 AWG, reel: 39-00-0038 or Mini-Fit Female Crimp-Terminals 16 AWG, reel: 5556T3 Hand-Crimp-Tool: 63819-0900 Extractor Tool: 11030044

*) All required mating connectors and crimp contacts are included in the connector pack.

Accessories

USB/CAN converter: X PP-USBC0
X PP-USBC1 (opto-decoupled)



Pin assignment D-SUB output plug

PIN	assignment
2	CAN-L
7	CAN-H

This is a metric design and millimeter dimensions take precedence. Applicable for nominal dimensions without direct tolerance indication: DIN ISO 286 ± IT 13. Refer to product datasheet for installation and safety instructions.

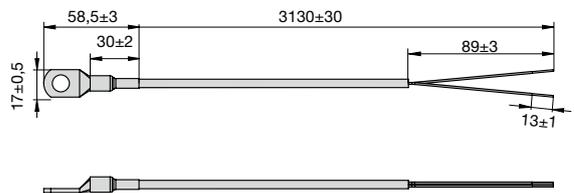
PowerPlex® Configuration Software

Connector package:
(contains a 2-, 10- and 22-pole connector, 10 x crimp contacts 14-16 AWG and 22 x crimp contacts 16 AWG)

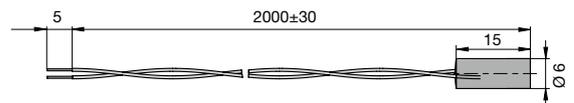
XPP-CP-130

Temperature sensor:

XPP-TS500R-HB
temperature range: -30 ... +100 °C (-22 ... +212 °F)



XPP-TS500R-PH
temperature range: -30 ... +100 °C (-22 ... +212 °F)



All dimensions without tolerances are for reference only. In the interest of improved design, performance and cost effectiveness the right to make changes in these specifications without notice is reserved. Product markings may not be exactly as the ordering codes. Errors and omissions excepted.