

# PowerBox PBX 190



The PowerBox is an intelligent control and distribution unit for the electric grid in a modern racing car, which is seamlessly integrated into the Bosch Motorsport system architecture. It is capable to replace all conventional relays, fuses and circuit breakers, simplifies wiring harnesses and provides diagnostic capabilities. The integrated PBX-software guarantees an easy programming of complex functions by intuitive handling.

## Technical Specifications

### Mechanical Data

Size	245 x 183 x 37 mm
Weight	1,270 g
Protection Classification	IP67
Internal G-sensors	
Temp. range (at internal sensors)	-20 to 85°C
Max. vibration	Vibration profile 1 (see <a href="http://www.bosch-motorsport.com">www.bosch-motorsport.com</a> )

### Electrical Data

Supply voltage range	5 to 16 V
Current consumption	<1 A continuously
Maximum recommended output current	250 A continuously; >310 A peak current (2 s)

### Inputs

18 analogue inputs (16 bit resolution) switchable pull-up resistors
10 digital inputs switchable pull-up/pull-down resistors

- ▶ 250 A continuous current
- ▶ 52 outputs, 48 V high side switches
- ▶ Ethernet, CAN and LIN communication
- ▶ Precision current measurement
- ▶ Easy programming of complex functions

### Outputs

4 high power channels up to 40 A (parallel up to 80 A)
10 high power channels up to 25 A
26 high power channels up to 15 A
4 high side channels up to 25 A, up to 48 V
8 multi-purpose outputs up to 15 A (low side, high side, push-pull, PWM; two output stages can be combined to form an H-bridge)
2 sensor supplies 5 V with individual ground pin

### Software

Function development and calibration tool	Bosch Motorsport PBX Suite
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### Pin Configuration

Connector X1: 37 Pins / 8STA62437SA

Pin	Signal	Cont. [A]	Peak [A]
A	HS_15A X1_A	15	100
B	HS_15A X1_B	15	100
C	HS_15A X1_C	15	100
D	HS_15A X1_D	15	100
E	HS_15A X1_E	15	100
F	HS_15A X1_F	15	100
G	HS_15A X1_G	15	100
H	HS_15A X1_H	15	100
J	HS_15A X1_J	15	100
K	HS_15A X1_K	15	100
L	HS_15A X1_L	15	100
M	HS_15A X1_M	15	100
N	HS_15A X1_N	15	100

Connector X1: 37 Pins / 8STA62437SA			
P	PWM_15A X1_P	15	60
R	PWM_15A X1_R	15	60
S	PWM_15A X1_S	15	60
T	PWM_15A X1_T	15	60
U	HS_15A X1_U	15	100
V	HS_15A X1_V	15	100
W	HS_15A X1_W	15	100
X	HS_15A X1_X	15	100
Y	HS_15A X1_Y	15	100
Z	HS_15A X1_Z	15	100
a	HS_15A X1_a	15	100
b	HS_15A X1_b	15	100
c	PWM_15A X1_c	15	60
d	PWM_15A X1_d	15	60
e	PWM_15A X1_e	15	60
f	PWM_15A X1_f	15	60
g	HS_15A X1_g	15	100
h	HS_15A X1_h	15	100
k	HS_15A X1_k	15	100
m	HS_15A X1_m	15	100
n	HS_15A X1_n	15	100
p	Power KL31	15	-
q	Power KL31	15	-
r	Power KL31	15	-

Connector X2: 1 Pin / 8STA61201BN261			
Pin	Signal	Cont. [A]	Peak [A]
1	Power Supply 12 V	200	240

Connector X3: 19 Pins / 8STA62419SN			
Pin	Signal	Cont. [A]	Peak [A]
A	HS_25A X3_A	25	150
B	HS_25A X3_B	25	150
C	HS_25A X3_C	25	150
D	HS_25A X3_D	25	150
E	HS_25A X3_E	25	150
F	HS_25A X3_F	25	150
G + H	HS_40A X3_G_H	40	150
J + T	HS_40A X3_J_T	40	150
K + U	HS_40A X3_K_U	40	150
L + N	HS_40A X3_L_N	40	150
M	HS_25A X3_M	25	150
P	HS_25A X3_P	25	150
R	HS_25A X3_R	25	150
S	HS_25A X3_S	25	150
V	Power KL31	25	-

Connector X4: 6 Pins / 8STA61606SA			
Pin	Signal	Cont. [A]	Peak [A]
A	HS48V_25A X4_A	25	100
B	HS48V_25A X4_B	25	100
C	HS48V_25A X4_C	25	100
D	HS48V_25A X4_D	25	100
E	Supply up to 48 V for X4	25	35
F	Supply up to 48 V for X4	25	35

Connector X5: 66 Pins / 8STA6-18-35SN			
Pin	Signal		
1	Analog Input X5_01	0 to 5 V, Pull-up	
2	Analog Input X5_02	0 to 5 V, Pull-up	
3	Analog Input X5_03	0 to 5 V, Pull-up	
4	Analog Input X5_04	0 to 5 V, Pull-up	
5	Analog Input X5_05	0 to 5 V, Pull-up	
6	Analog Input X5_06	0 to 5 V, Pull-up	
7	Analog Input X5_07	0 to 5 V, Pull-up	
8	Analog Input X5_08	0 to 5 V, Pull-up	
9	CAN 3 Interface Low-Level	Max. 1 Mbaud	
10	Analog Input X5_10	0 to 5 V, Pull-up	
11	Analog Input X5_11	0 to 5 V, Pull-up	
12	Analog Input X5_12	0 to 5 V, Pull-up	
13	Digital Input X5_13	0 to 12 V, Pull-up, Pull-down	
14	Digital Input X5_14	0 to 12 V, Pull-up, Pull-down	
15	CAN 3 Interface High-Level	Max. 1 Mbaud	
16	LIN	Control of Bosch Motorsport LIN devices included. Support of other devices on request.	
17	Analog Input X5_17	0 to 5 V, Pull-up	
18	Analog Input X5_18	0 to 5 V, Pull-up	
19	DGND-fused	5 A	
20	DGND-fused	5 A	
21	Digital Input X5_21	0 to 12 V, Pull-up, Pull-down	
22	Digital Input X5_22	0 to 12 V, Pull-up, Pull-down	
23	SERCOS1 TXP		
24	SERCOS1 TXN		
25	do not connect (use for internal debugging)		
26	do not connect (use for internal debugging)		
27	Analog Input X5_27	0 to 5 V, Pull-up	
28	Digital Input X5_28	0 to 12 V, Pull-up, Pull-down	

Connector X5: 66 Pins / 8STA6-18-35SN		
29	Digital Input X5_29	0 to 12 V, Pull-up, Pull-down
30	Analog Input X5_30	0 to 5 V, Pull-up
31	KL31-fused	
32	SERCOS1 RXP	
33	SERCOS1 RXN	
34	do not connect (use for internal debugging)	
35	do not connect (use for internal debugging)	
36	Digital Input X5_36	0 to 12 V, Pull-up, Pull-down
37	Digital Input X5_37	0 to 12 V, Pull-up, Pull-down
38	Analog_Screen	
39	Analog Input X5_39	0 to 5 V, Pull-up
40	KL31-fused	
41	SERCOS2 RXP	
42	SERCOS2 RXN	
43	Digital Input X5_43	0 to 12 V, Pull-up, Pull-down
44	Digital Input X5_44	0 to 12 V, Pull-up, Pull-down
45	Sensor GND for X5_51	5 A
46	Timesync	
47	COM_Screen	
48	CAN 1 Interface High-Level	Max. 1 Mbaud
49	SERCOS2 TXP	
50	SERCOS2_TXN	
51	Powersupply_5V X5_51	400 mA
52	Sensor GND for X5_58	5 A
53	ETHERNET1 RXN	10/100 Mbps
54	ETHERNET0 RXN	10/100 Mbps
55	CAN 2 Interface Low-Level	Max. 1 Mbaud
56	CAN 1 Interface Low-Level	Max. 1 Mbaud
57	Analog Input X5_57	0 to 5 V, Pull-up
58	Powersupply_5V X5_58	400 mA
59	ETHERNET1 RXP	10/100 Mbps
60	ETHERNET1 TXN	10/100 Mbps
61	ETHERNET0 TXN	10/100 Mbps
62	CAN 2 Interface High-Level	Max. 1 Mbaud
63	Analog Input X5_63	0 to 5 V, Pull-up

Connector X5: 66 Pins / 8STA6-18-35SN		
64	ETHERNET1 TXP	10/100 Mbps
65	ETHERNET0 RXP	10/100 Mbps
66	ETHERNET0 TXP	10/100 Mbps

### Communication

CAN	3
Ethernet	2
LIN	1
	Control of Bosch Motorsport LIN devices included. Support of other devices on request.
Real time ethernet Sercos (optional)	2

### Installation Notes

Inspection services recommended after 220 h or 2 years, no components to replace.

### Ordering Information

#### PowerBox PBX 190

Order number **F02U.V02.626-02**

#### CAN Keypad CK-M12

Order number **F02U.V0U.328-02**

#### Accessories

##### Mating Connector X1

Order number **F02U.004.387-01**

##### Mating Connector X2

Socket 25 mm<sup>2</sup>  
Order number **F02U.B01.044-01**

##### Mating Connector X2

Socket 35 mm<sup>2</sup>  
Order number **F02U.B01.045-01**

##### Mating Connector X3

Order number **F02U.004.386-01**

##### Mating Connector X4

Order number **F02U.004.388-01**

##### Mating Connector X5

Order number **F02U.000.472-02**

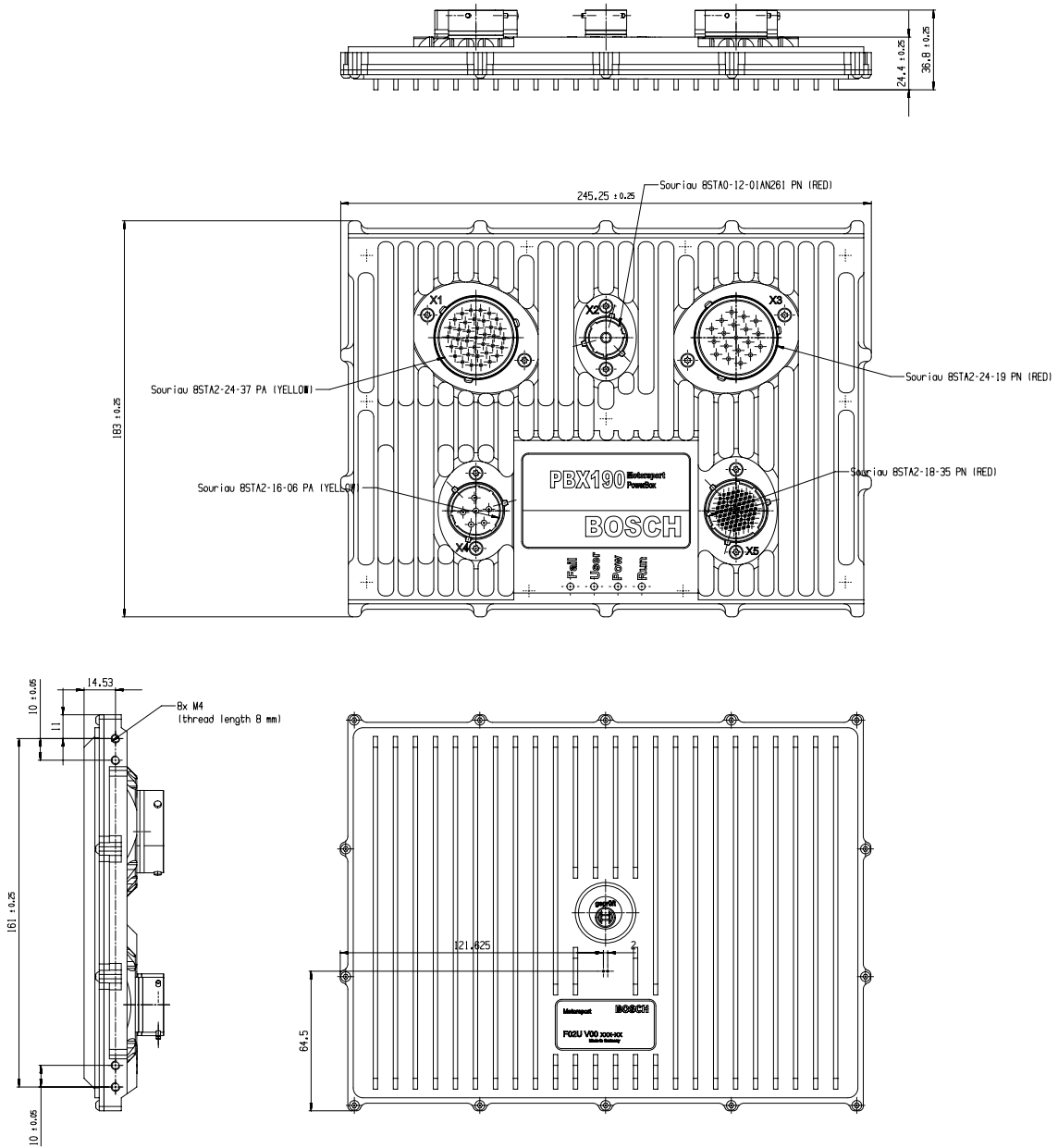
##### Connector Opening Tool for Shellsize 24

Order number **F02U.V02.434-01**

##### Breakout Box

Order number **F02U.V02.523-01**

Dimensions



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