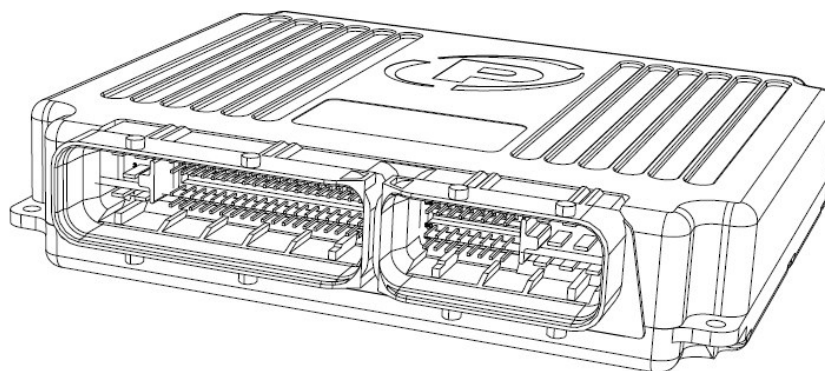




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## Pectel Direct Injection ECU – SQ7Di



### Introduction

The SQ7Di is an integrated ECU and direct injection driver box for use with up to 6 cylinder Gasoline Direct Injection (GDI) Engines.

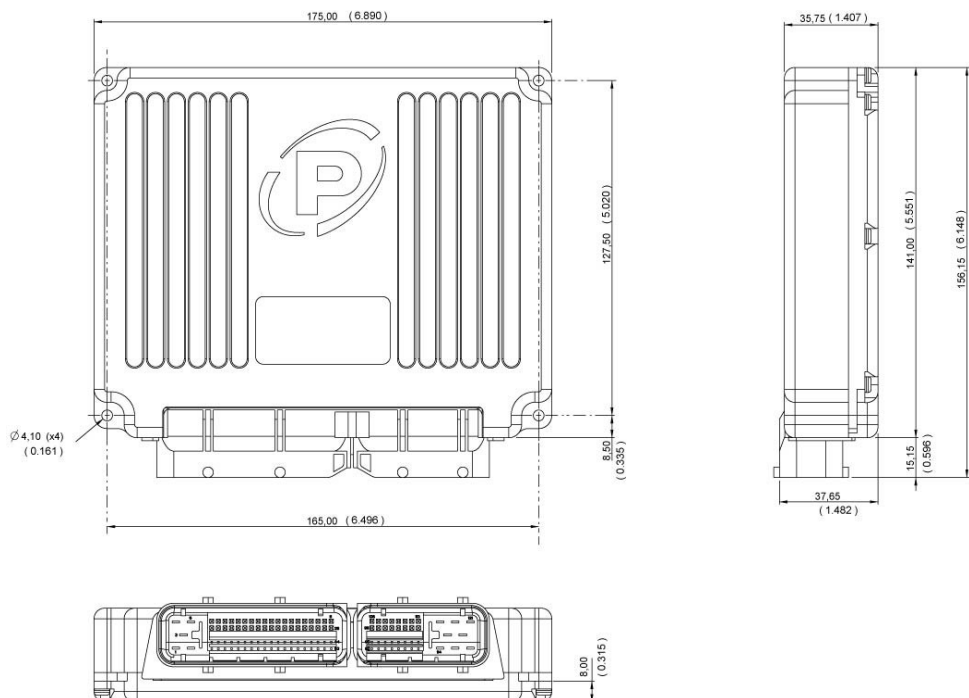
The SQ7Di has been designed to run the Bosch HDEV5 direct injectors and the HDP5 mechanical fuel pump with MSV valve.

In the documentation below recommended wire gauges are stipulated to ensure there is no significant voltage drop to the injectors from the driver box. It is recommended that the length of loom from the driver box to the injectors does not exceed 2m in length.

The firing order of the GDI injectors must use an odd-even-odd-even sequence, using the injector drive numbers that are indicated in the pinout details.



## Dimensions



## Specifications

Description	Value
Engine Configuration	Up to 6 cylinders Direct injection Turbo/NA
Supply Voltage	8V to 18V reverse battery, over-voltage and load dump protection
Communication	1 RS232 3 CAN 2.0B (with 120 ohm termination) 1 Ethernet (10MBit)
Internal Sensors	ECU Internal Temperature x 4 Battery Voltage
Case Operating Temp.	-40°C to +70°C
Environmental	IP67
Vibration	DV-V(a) DV-V(b) DV-V(c) DV-V(c+)
Weight	906g

Description	Value
Injector Drivers	6 off with a boosted voltage to drive GDI injectors. 12 A peak current
Low side injector drivers	2 off. 8 A peak

## Ordering Information

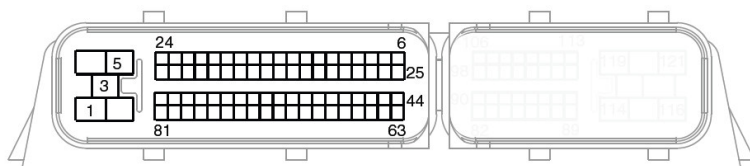
Product	Part Number
Pectel SQ7Di	01E-501070



## Connector Details

ECU Connector	Mating Connectors
Tyco 1241434-3	Tyco 1355171-1 Tyco 1355172-1

## Connector part A Pinout Details



Pin	Signal Name	Recommended Wire Size	Signal Description
1.	ENG GND	14AWG	Power Supply Negative
2.	ENG GND	14AWG	
3.	ENG GND	14AWG	
4.	BATPOS	14AWG	Power Supply Positive
5.	BATPOS	14AWG	
6.	INJLS7	22AWG	GDI Pump Demand Valve (INJ7 Low-Side Driver)
7.	INJLS8	22AWG	INJ8 Low-Side Driver
8.	PWM 1	22AWG	Low side PWM outputs
9.	PWM 2	22AWG	
10.	PWM 3	22AWG	
11.	PWM 4	22AWG	
12.	PWM 5	22AWG	
13.	PWM 6	22AWG	
14.	PWM 7	22AWG	
15.	PWM 8	22AWG	
16.	PWM 9	22AWG	
17.	PWM 10	22AWG	
18.	HB1A	22AWG	Two H-Bridge drives. Can be combined to create a single stepper motor control output, four independent half-bridge outputs, high or low side drive. 5A peak, 2A continuous
19.	HB1B	22AWG	
20.	HB2A	22AWG	
21.	HB2B	22AWG	
22.	AIN1	24AWG	0 to +5V Analogue Inputs, which have software enabled 3k and 33k pull-up resistors to +5V
23.	AIN2	24AWG	
24.	AIN3	24AWG	
25.	INJLS7	22AWG	GDI Pump Demand Valve (INJ7 Low-Side Driver)
26.	INJLS8	22AWG	INJ8 Low-Side Driver
27.	PWM 1	22AWG	Low side PWM outputs
28.	PWM 2	22AWG	
29.	PWM 3	22AWG	
30.	PWM 4	22AWG	
31.	PWM 5	22AWG	



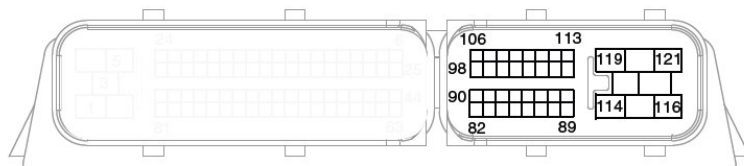
Pin	Signal Name	Recommended Wire Size	Signal Description
32.	PWM 6	22AWG	Low side PWM outputs
33.	PWM 7	22AWG	
34.	PWM 8	22AWG	
35.	AIN KNOCK2	24AWG	Knock Inputs with software configurable gain stage (1x or 30x).
36.	AIN KNOCK1	24AWG	
37.	HB1A	22AWG	Two H-Bridge drives. Can be combined to create a single stepper motor control output, four independent half-bridge outputs, high or low side drive. 5A peak, 2A continuous
38.	HB1B	22AWG	
39.	HB2A	22AWG	
40.	HB2B	22AWG	
41.	AIN 4	24AWG	0 to +5V Analogue Inputs, which have software enabled 3k and 33k pull-up resistors to +5V
42.	AIN 5	24AWG	
43.	AIN 6	24AWG	
44.	DIN1	24AWG	Digital Input
45.	DIN2	24AWG	Digital Input
46.	DIN3	24AWG	Digital Input
47.	DIN4	24AWG	Digital Input
48-49.	N/C	--	Do not Connect
50.	DIN9	24AWG	Digital Switch Inputs
51.	DIN8	24AWG	Digital Switch Inputs
52.	CANHC	24AWG	CAN Port C
53.	CANLC	24AWG	
54.	CANHC	24AWG	
55.	CANLC	24AWG	
56.	ENG GND	--	Power Supply Negative (attach screens)
57-58.	N/C	--	Do not Connect
59.	DIN5	24AWG	Digital Input
60.	DIN6	24AWG	Digital Input
61.	DIN7	24AWG	Digital Input
62.	DIN10	24AWG	Digital Input
63.	CRANK1	24AWG	Dual Crank input, Hall effect or Inductive
64.	CAM	24AWG	Dedicated CAM Input, Hall effect or inductive
65.	CRANK2	24AWG	Dual Crank input, Hall effect or Inductive
66.	AIN 7	24AWG	0 to +5V Analogue Inputs, which have software enabled 3k and 33k pull-up resistors to +5V
67.	AIN 8	24AWG	
68.	AIN 9	24AWG	0 to +5V Analogue Inputs, which have software enabled 3k and 240R pull-up resistors to +5V
69.	AIN 10	24AWG	
70.	AIN 11	24AWG	
71.	EXTGND 4	22AWG	Protected External Ground (Knock)
72.	LAMBDA-VS2	24AWG	Lambda Inputs NTK/Bosch wide-band or narrow-band sensors
73.	LAMBDA-VS1	24AWG	
74.	LAMBDA-IP2	24AWG	
75.	LAMBDA-IP1	24AWG	
76-77.	N/C	--	Do not Connect
78.	EXTGND1	24AWG	Protected External Ground (Digital)



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Pin	Signal Name	Recommended Wire Size	Signal Description
79.	EXTGND2	24AWG	Protected External Ground (Analogue)
80.	EXTGND3	24AWG	Protected External Ground (Comms)
81.	AIN12	24AWG	0 to +5V Analogue Input, which has software enabled 3k and 240R pull-up resistors to +5V

## Connector part B Pinout Details



Pin	Signal Name	Recommended Wire Size	Signal Description
82.	CDI8	24AWG	Ignition outputs (0 to +5V)
83.	CDI7	24AWG	
84.	CDI6	24AWG	
85.	CDI5	24AWG	
86.	CDI4	24AWG	
87.	CDI3	24AWG	
88.	CDI2	24AWG	
89.	CDI1	24AWG	
90.	INJLS3	22AWG	GDI Low-Side Injector Driver
91.	INJLS3	22AWG	
92.	INJLS6	22AWG	
93.	INJLS6	22AWG	
94.	INJHS6	22AWG	GDI High-Side Injector Driver
95.	INJHS6	22AWG	
96.	INJHS3	22AWG	
97.	INJHS3	22AWG	
98.	ETHER-TX -	CAT5e	10 Base-T Ethernet Port (IDU Comms)
99.	CANHA	24AWG	CAN Port A
100.	ETHER-RX -	CAT5e	10 Base-T Ethernet Port (IDU Comms)
101.	COMMS SCR	--	
102.	RS232-TX	24AWG	RS232 Serial Port (IDU Comms)
103.	CANHB	24AWG	CAN Port B
104.	EXTPSU1	22AWG	Sensor Supplies. Individually protected, switchable (+5V @ 50mA) or (+12V @ 1A)
105.	EXTPSU2	22AWG	
106.	ETHER-TX +	CAT5e	10 Base-T Ethernet Port (IDU Comms)
107.	CANLA	24AWG	CAN Port A
108.	ETHER-RX +	CAT5e	10 Base-T Ethernet Port (IDU Comms)
109.	COMMS GND	24AWG	
110.	RS232-RX	24AWG	RS232 Serial Port (IDU Comms)
111.	CANLB	24AWG	CAN Port B
112.	TC1POS	24AWG	Thermocouple K-type inputs
113.	TC1NEG	24AWG	
114.	INJLS1	14AWG	GDI Low-Side Injector Driver
115.	INJLS4	14AWG	
116.	INJHS5	14AWG	GDI High-Side Injector Driver
117.	INJLS2	14AWG	GDI Low-Side Injector Driver



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Pin	Signal Name	Recommended Wire Size	Signal Description
118.	INJHS4	14AWG	GDI High-Side Injector Driver
119.	INJLS5	14AWG	GDI Low-Side Injector Driver
120.	INJHS1	14AWG	GDI High-Side Injector Driver
121.	INJHS2	14AWG	GDI High-Side Injector Driver



## Recycling and Environmental Protection

Cosworth Electronics is committed to conducting its business in an environmentally responsible manner and to strive for high environmental standards.

### **Manufacture**

Cosworth products comply with the appropriate requirements of the Restriction of Hazardous Substances (RoHS) directive (where applicable).

### **Disposal**

Electronic equipment should be disposed of in accordance with regulations in force and in particular in accordance with the Waste in Electrical and Electronic Equipment directive. (WEEE).

### **Battery**

This equipment contains a battery. (Lithium Thionylchloride)

The equipment may be returned to Cosworth Electronics for a replacement battery. (A charge may be made for this service)

Removal of the battery by the user may void any warranty on the equipment.

To remove the battery for recycling:

Remove the case cover(s).

Remove the printed circuit boards from the case.

Remove the battery from the printed circuit board.

Dispose of the battery in accordance with regulations in force.

The content of this document is proprietary and confidential

## Declaration of Conformity

We, the undersigned,

Cosworth Electronics Limited  
Brookfield Technology Centre,  
Cottenham,  
Cambridgeshire, CB24 8PS  
United Kingdom

Certify and declare under our sole responsibility that the following equipment:

Pectel SQ7Di – 01E-501070

An ECU for use only in motorsport applications

Conforms to the following EC directives including applicable amendments:

EMC Directive 89/336/EEC, 72/245/EEC (last amended 2004/104/EC)

The following standards have been applied:

2004/104/EC

Cottenham, 07 Sep. 10

Martin Tolliday : General Manager - Sports