



SL Series ECU Specification



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1.0 General

Power Supply

- Operating Voltage: 6.0 to 22.0 Volts DC
- Operating Current: 290mA at 14.0V (excluding sensor and load currents)
- Reverse Battery Protection via External Fuse

Operating Temperature

- ECU Internal Temperature Operating Range: -30 to 110°C (-22 to 230°F)

Physical

- Enclosure Size 120 mm x 130 mm x 27 mm
- Weight SL Series: 470g
- Connector system: Super Seal waterproof connector with gold plated contacts.
 - 1 x 34 pin Key 1
 - 1 x 34 pin Key 2

Internal

- Dual 100MHz Processors
- 500Mb DDR RAM (0.5Gb)
- 16MB ECU logging Memory
- x4 channel Oscilloscope function
 - Sampling at 500k samples/second
 - Includes Crank and Cam sensors inputs
 - Includes Digital Inputs 1-2
- On-Board Barometric Pressure Sensor.
 - Range 40 - 115.0 kPa

Communications

- Ethernet 100Mbps. High Speed communications channels used for tuning and uploading ECU log files.
- Up to 2x CAN nodes/ 6 Channels per node

2.0 Injection

Saturated - Up to 8x channels

The ECU runs the injector in Saturated Mode Only. This requires the injector resistance is greater than 5 Ohms.

- 6A Continuous , 10A Limit.
- Flyback Voltage Clamp: 70V.

Protection

- Over current / Short to Battery protection (10A)
- Electrostatic discharge (ESD) protection

Auxiliary Fuel Mode

Unassigned Fuel channels can be used to switch or modulate resistive and inductive loads.

- Sink continuous current 6A, current limit 10A.
- Flyback voltage clamp: 70V.
- Maximum Frequency: 5kHz

Protection

- Over current / Short to Battery protection
- Electrostatic discharge (ESD) protection

3.0 Ignition

Ignition Control - Up to 8x channels

- Up to 8 Channels Sequential/Wasted Ignition or 4 Leading/4 Trailing Ignition.
- Adjustable source current; 35mA at 5V or 70mA at 8.2V for high current mode.

Auxiliary Ignition Mode

Unassigned Ignition channels can be used to switch or modulate resistive and inductive loads.

- Sink continuous current 1A, current limit 3.0A.
- Flyback voltage clamp: 40V.
- Maximum Frequency: 5kHz

Protection

- Over current / Short to Battery protection
- Electrostatic discharge (ESD) protection

4.0 Digital Input

Digital Inputs Overview - 8 channels

Application: Switch to 0V, Switch to VBatt, logic signal, Magnetic or Hall effect frequency based signals.

- Input Analog Voltage Range: 0 -20.0V
- Input Frequency Range: 0 - 30kHz (Available on DI 1- 8)
- Filter time constant = 12us
- Input Impedance.
 - DI 1- 8: 39k Ohms to ground.
- Switchable Pull-up resistor on all channels
 - 4k7 to 9.0V.
- “True” Zero crossing detection on magnetic based signals
- Independent programmable arming thresholds from 0.1V to 15.0V on frequency based inputs. Resolution = 0.1V.
- Programmable trigger edge(s).
- Maximum input signal amplitude +/-100V.

Analog Voltage Input Mode

When not used as frequency or switched inputs these channels can be used to measure analog signals. All Channels have over voltage protection.

DI 1- 8

- Input Analog Voltage Range: 0 - 20.0V
- 4.88mV resolution (10 bit effective resolution)
- Maximum usable Analog Input Voltage: 20.0V
- Input Impedance = 39k Ohms to ground.

5.0 Auxiliary Outputs

The ECU contains 3 different types of auxiliary outputs. These drives are suitable for controlling relays, resistive and inductive loads, stepper motors, DC servo motors and electronic throttles. Auxiliary channels 1-8 can be selected as Low or High Side Control on most models. Auxiliary channels 9-16 are Half Bridge Drivers.

Low Side Driver - 10 Channels

- Auxiliary 1-4:
 - Continuous current 3A
 - Modulated peak current 5A
 - 8A Limit
- Auxiliary 5-8:
 - Continuous current 2A
 - Modulated peak current 3.5A
 - 5A Limit
- Auxiliary 9-10: Half bride (see below)
- Maximum Frequency: 15kHz

Protection

- Over current / Short to Battery/Thermal overload protection
- Electrostatic discharge (ESD) protection
- Reverse Battery Protection
- Flyback Voltage Clamp Aux 1-8: ECU Supply Pin B1.
- Flyback Voltage Clamp Aux 9-10: Aux9-10 Supply Pin A34.

High Side Driver - Up to 4 Channels

- Auxiliary 5-8: Source Continuous current 2.5A, 5A Limit
- Maximum Frequency: 15kHz

Protection

- Over current / Short to Battery protection/Thermal overload protection
- Electrostatic discharge (ESD) protection
- Reverse Battery Protection
- Flyback Voltage Clamp: ECU Supply Pin B1.

Half Bridge Driver - 2x Channels (Aux 9 - 10)

- Sink or Source Continuous current 5A, 8A Limit.
- Maximum Frequency: 15kHz

Protection

- Over current / Short to Battery protection Thermal overload protection
- Electrostatic discharge (ESD) protection
- Reverse Battery Protection
- Flyback Voltage Clamp. Aux 9-10 Supply pin A34.

6.0 Analog Inputs

All analog inputs are sampled using 12bit ADCs. They are suitable for sensors that have an output voltage, potentiometers and temperature sensors. All analog inputs can also be used as switched inputs with ON/OFF levels programmable from 0.0 - 5.0V.

Analog Voltage Inputs - 10 Channels

- Input Analog Voltage Range: 0.0 -5.0V
- 100k ohms input resistance to ground
- 1st order 100Hz Low pass filter.
- 1.22 mV resolution

Analog Temperature Inputs - Available on 4 channels

- Configurable pull-up control on Analog Channels 7 -10
- Input Analog Voltage Range: 0.0 -5.0V
- 1.0k ohm input resistance to 5.0V and 100k Ohms to 0.0V
- 1st order 100Hz Low pass filter.
- 1.22 mV resolution

7.0 Crank and Sync Sensor Inputs

- Two Independent channels with Magnetic, Hall effect and Logic options
- Maximum signal amplitude +/-100V
- Input Resistance = 39k Ohms to ground
- Switchable Pull-up resistor = 4k7 Ohm to 5.0 V
- "True" Zero crossing detection on magnetic based signals
- Programmable Independent arming thresholds from 0.1V to 15.0V on all signals. 12 Bit Solution.

8.0 Knock Control

Knock Inputs - up to 2x Channels

- 2 Independent channels.
- Using Bosch, Digital Knock Integrated Circuit Technology
- Selectable Frequency from 5 - 15kHz
- Selectable Bandwidth from 300Hz - 5kHz
- Programmable digital filter coefficients.
- Selectable gain control.
- Selectable Filter Window (Hamming, Blackman)
- Bank selectable Knock Control.

9.0 Voltage Supply Outputs

5V Engine Supply

- Continuous current: 0.25 Amps
- Accuracy: +/- 0.5% at 20 °C
- Short circuit, Thermal overload protection.

8V CAS

- Continuous current: 0.4 Amps
- Accuracy: +/- 0.5% at 20 °C
- Short circuit, Thermal overload protection.

10.0 Voltage Supply Inputs

ECU Supply

- Main ECU Power Supply
- Power Supply for Auxiliary Channels 1- 8 High Side Drivers
- Operating Range 6.0V - 22.0V

Aux 9-10 Supply

- Power Supply for Auxiliary 9-10 Half Bridge Drivers
 - Connect to ECU Power Supply in non DBW application
 - Connect to DBW Relay output in DBW application

Flyback Supply

- ECU supply for Auxiliary Channels 1-8
- Aux 9-10 supply for Auxiliary Channels 9-10

11.0 Dedicated Functions

Dedicated EFI Relay Control

- Provides a relay ground, 100mA Limit
- Short circuit, Thermal overload protection.

Dedicated Ignition Switch

- Used to control Main EFI Relay circuit.
- Input Analog Voltage Range: 0 - 20.0V
- 100k ohms input resistance to ground
- Adjustable ON/OFF thresholds. Resolution = 0.1V.