

# ECU Serial Interface

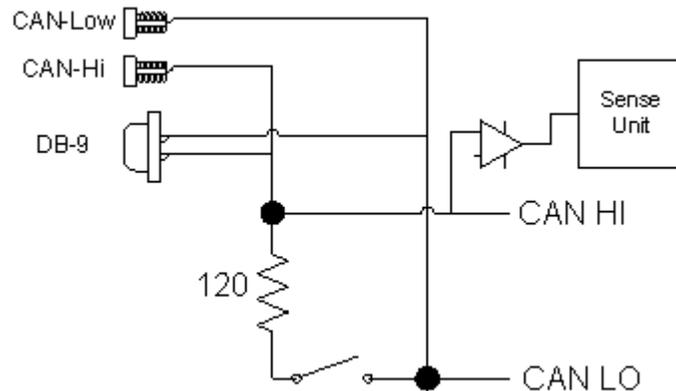
- [Sensing unit measurements](#)
- [CAN Termination](#)

This feature allows the operator to monitor five channels of serial communication protocols typically available on ECUs: CAN (two channels), and J1850 / K-Line / Low-Speed CAN (LS-CAN) (one channel of each). The lines monitored are: [Primary J1850](#), [K-line](#), [CAN1 High](#), [CAN2 High](#), [LS-CAN](#).

The signals are routed on the base module card, from the rear ELCO-56 harness connector to the three 9-pin D-Sub connectors mounted on the front panel of the module. They are also made available on female banana-jacks on this same front panel. Refer to the [Base module front plate](#) description for pin assignment information.

The inputs are operating voltage tolerant and have an input impedance greater than 100 k. The state of the input is monitored over a one-second window sampled at 1 kHz.

The figure below shows the monitoring and termination circuit for the CAN channels. The circuit for LS-CAN, J1850 and K-line are similar, except for specific grounding and termination values (see [CAN Termination](#) section below).



## Sensing unit measurements

The sensing unit measures three values for each signal: the digital current state, the analog current state and the transition count :

- The analog state is the 8-bit value (0-255) of the voltage value of the line.
- The digital state is the high/low state of the serial line captured at the beginning of the calculation step.
- The transition count is the number of transitions that occurred on the serial line during the previous calculation step. It is limited to 255.

For K-Line, CAN 1- HI, CAN 2-HI and LS CAN input lines, the sensing unit indicates a high when the input voltage is above 3.0 V and a low when the input is below 2.8 V. For the J1850 line, the sensing unit indicates a high when the input voltage is above 4.1 V and a low when the input is below 3.8 V.

**User interface information:** These values are displayed in the [Base Module run-time panel](#). For the transition count, by default, the reference model returns the number of transitions per second instead of the transition count per calculation step.

**Model information:** The values are returned at the following outputs of the *OpCtrl Module* Simulink block: *ECU Serial Line Analog States*, *ECU Serial Line Digital States*, *ECU Serial Line Transitions*. In these three vectors, the values are returned in the following order: J1850, K-line, CAN-1, CAN-2, LS-CAN.

## CAN Termination

The board implements a termination resistor circuit for each of the three CAN channels (CAN1, CAN2, and LS-CAN). For CAN1 and CAN2, the termination resistor is 120 , between the High and Low signals. For LS-CAN termination resistor is 2.2 k, between LS-CAN and ground.

**User interface information:** These controls are made available to the operator in the [Base Module configuration panel](#).

**Model information:** The termination is enabled or disabled at run-time by setting the values of the *CAN Termination* parameter of the *OpCtrl Base Module* Simulink block to 1 (enabled) or 0 (disabled). The CAN termination vector values must be submitted in the following order: CAN1, CAN2, LS-CAN