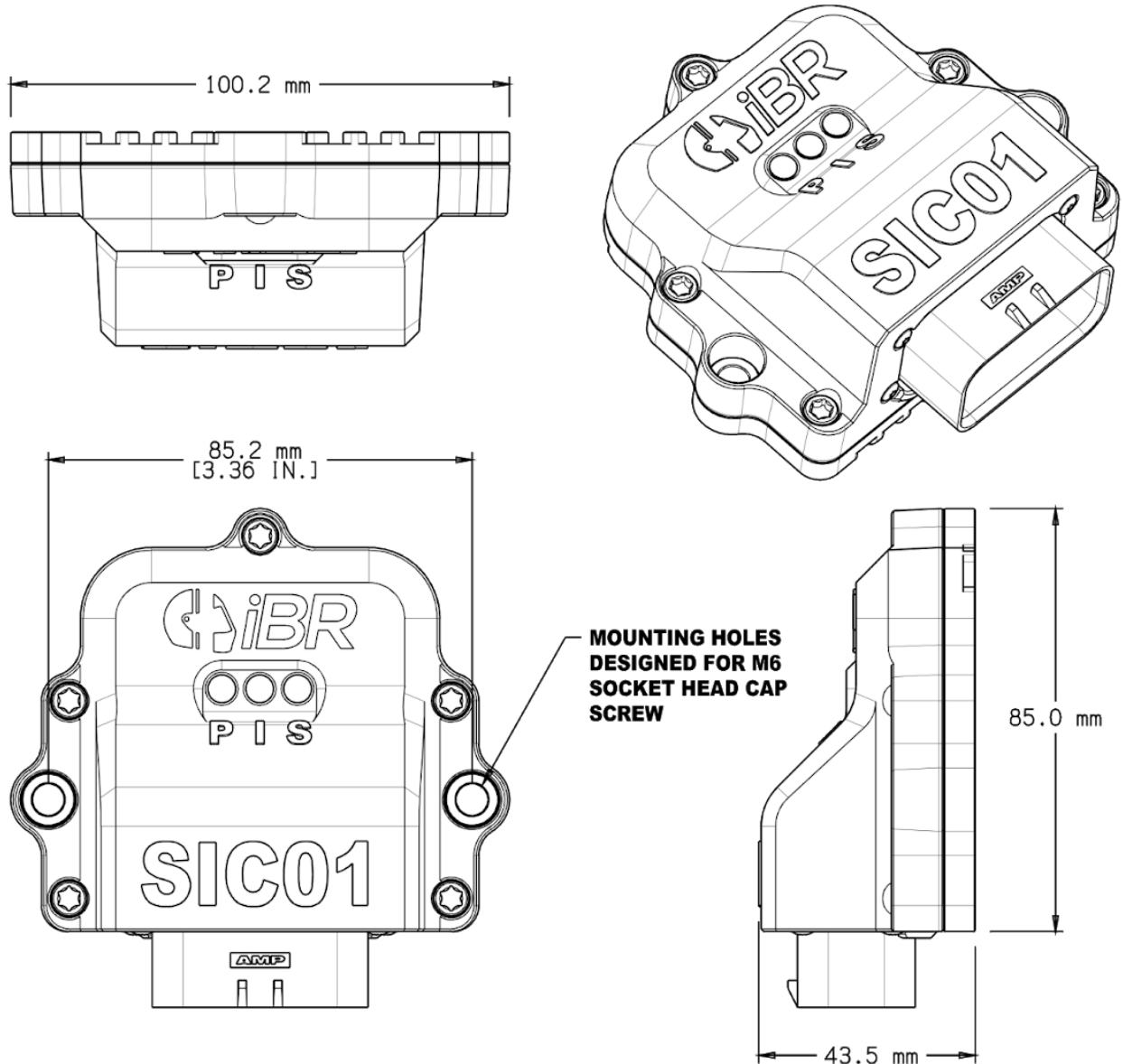
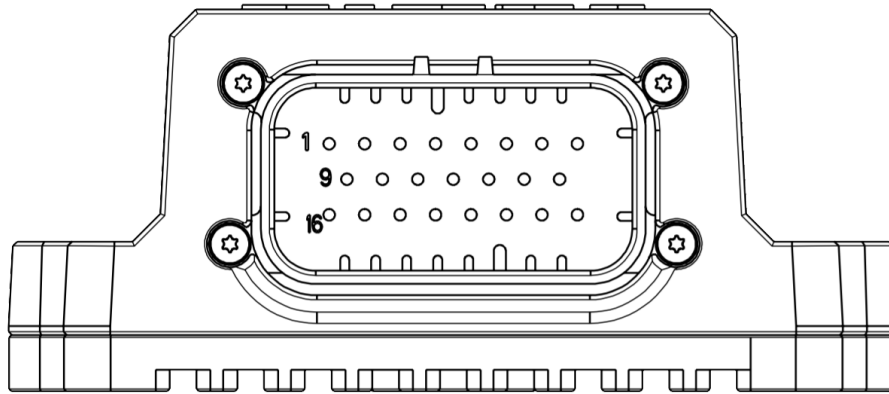


SIC01 - Secondary Injection Controller V1.0

Features:

IBR SIC is a secondary, staged port injection controller for Direct Injected engines. SIC01 will control port injectors based on direct injection duty cycle. iBR have pre-programmed the SIC01 to work with industry standard ID 1050x and ID 1300x injector characterization. Limiting the selection of fuel injectors allows the system to accurately and smoothly transition into Secondary Injection at high loads. The onset and slope of the Secondary Injection curve is designed to be outside of the emissions sensitive and low load drivability zones where the OE DI system is capable of delivering sufficient fuel. iBR has designed the system with the compensation characterisation specifically for ID1050X or ID1300X injectors @50PSI base fuel pressure and referenced to manifold pressure. While other injectors can be driven without issue, there may be low pulse width nonlinearity in the amount of fuel delivered by the secondary injectors.

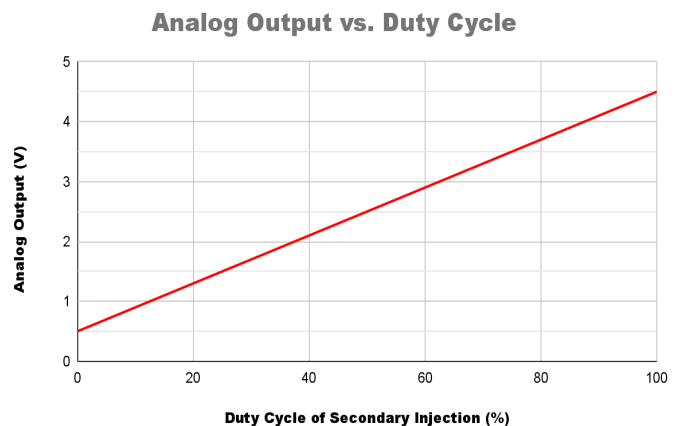




PIN		
NO.	NAME	DESCRIPTION
1	5V +	Input Signal ref and 5V from ECU
2	GND5	Signal GND from ECU
3	DI+	Direct Injection Signal (+)
4	DI-	Direct Injection Signal (-)
5	IDC	Secondary Injector Duty Cycle Analog Out
6	NC	No Connect
7	NC	No Connect
8	NC	No Connect
9	GND12	Chassis GND, Injector Power Ground
10	INJ -	Injector Pulsed Ground
11	INJ -	Injector Pulsed Ground
12	NC	No Connect

PIN		
NO.	NAME	DESCRIPTION
13	INJ +	Injector Switched 12V
14	INJ +	Injector Switched 12V
15	12V +	Battery 12V (+), Injector Power
16	INJ -	Injector Pulsed Ground
17	INJ -	Injector Pulsed Ground
18	INJ -	Injector Pulsed Ground
19	INJ -	Injector Pulsed Ground
20	INJ +	Injector Switched 12V
21	INJ +	Injector Switched 12V
22	INJ +	Injector Switched 12V
23	INJ +	Injector Switched 12V

Functional Limits			
Parameter	Min	Nominal	Max
Input Voltage Pin 1 (ECU Logic)	4.5V	5.0V	5.5V
Current Draw Logic Level (5V Pin 1)		28mA	45mA
Input Voltage Pin 15 (Battery)	10.0V	12.5V	16.0V
Current Draw Pin 15		4.5A	10A
RPM	500		12,500
Temperature	-40 °C		125 °C
Number of Injectors	1		6
Injector Impedance	11kOhm	12.5kOhm	14kOhm
DI Injection angle for active secondary injection	170°		420°



Error Reporting:

SIC01 has two ways to deliver errors: three onboard RGB LEDs and through the Analog Out in reserved areas above and below the nominal 0.5 to 4.5v linear output of the duty cycle. The analog output can be used to verify the function of the SIC01 as well as troubleshooting other fuel related issues.

Error	P	I	S	AnalogOut	Description
No Power, all LEDs off	●	●	●	0V	No 5V Power Connected, check wires that lead to 5V Reference Power. This could be in the TGV plug on a Subaru specific harness or the orange (+) and gray (-) wire if a universal harness was used. 5V connection should be switched power so that the module turns off with vehicle power.
5V Power Applied	●				5V switch power applied to the unit. System on.
Battery Power Low	●			0.4 V	Battery power above 9.0 Volts and below 11.5 Volts. Verify battery connections, fuse and wires between SIC and battery.
Battery Power Outside of Range	●			0.3 V	Battery power below 9.0 Volts or above 16 Volts. Internal electronic fuse will cut power during an over voltage or over current situation. Internal fuse will automatically reset when power is cycled.
DI Signal Nominal		●		0.5 → 4.5V	DI signal is being sensed, no action needed.
Waiting for DI Signal		●		0.5 V	SIC has not sensed any Direct Injection signal since power up or the signal has timed out due to inactivity. This is expected prior to start of the engine, during a decel event with no fueling and after the engine has been turned off but power on the car is still on. If idle RPM dips to a low value this LED may blink between amber and green due to a longer duration between pulses.
Reversed DI Signal Wires		●		0.2 V	SIC has sensed that the DI Signal Wires are reversed. This will cause the system to turn off any fueling as it cannot accurately supply fuel. Check the wires going to the OEM Direct Injector and reverse the pin orientation. Verify that the correct pin orientation is carried through the iBR harness between the OEM harness and the factory Direct Injector.
Nominal Condition			●		No other errors
Over 85% Duty Cycle Detected			●		Since last power up the SIC has sensed a situation where over 85% Duty Cycle was output to the Secondary Fuel Injectors. This is a warning but consider going to a larger fuel injector or consult your tuner. It is important to know that injector latency is factored into this calculation and can account for a significant amount of time at high RPMs.
Over 95% Duty Cycle Detected			●	4.7V	Since last power up the SIC has sensed a situation where over 95% Duty Cycle was output to the Secondary Fuel Injectors. Above 95% Duty Cycle the Secondary Fuel System can become non-linear. Consider changing to a larger fuel injector and consult your tuner.
Over 11,000 RPM Detected			●	4.8V	This is a warning, this could also show a possible instability in the signal. Check connections between the factory Direct Injector and the SIC01. If you are approaching this RPM on a custom application this is a warning that the controller will become unstable, cease to function or function erratically above 12.5k RPM.