AiM Infotech

# SCS
# Delta 400, 800, 880
# Delta GDI4, Delta SDI4

Release 1.00

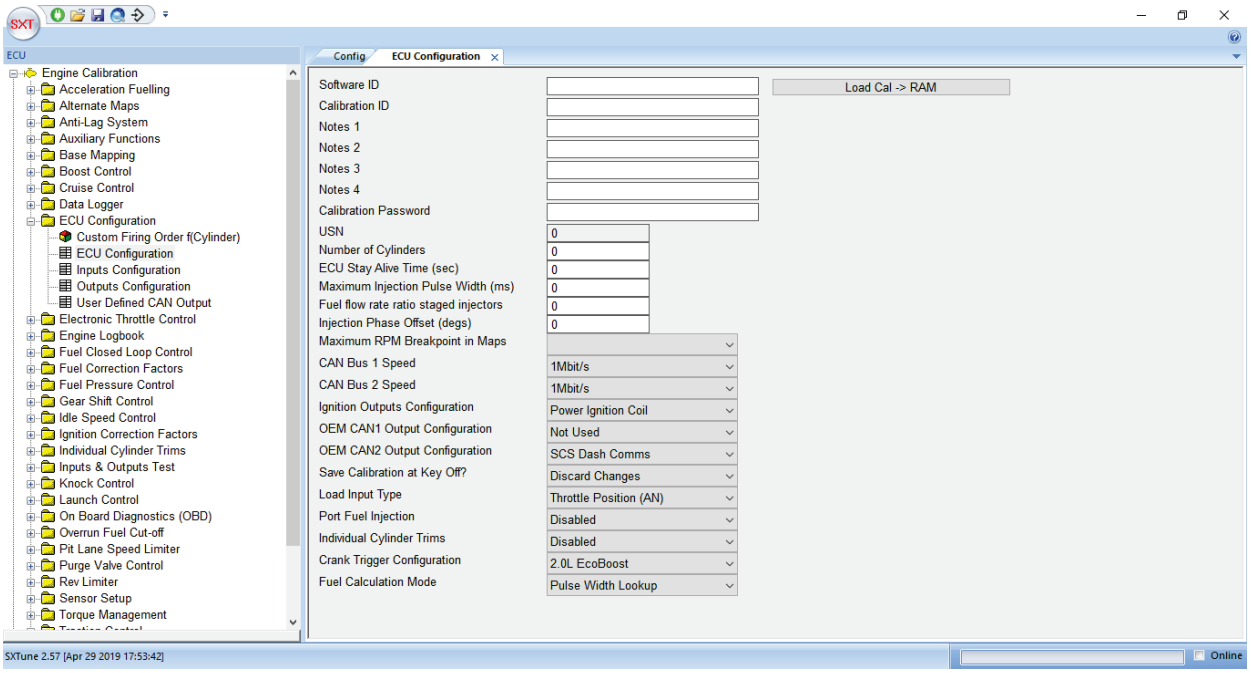
# 1 Models

This document explains how to connect AiM devices to the vehicle Engine Control Unit (ECU) data stream.
Supported models are:

- Current Petro ECUs: Delta 400, 800, 880
- Current GDI ECUs: Delta GDI4
- Current Diesel ECUs: Delta SDI4, Delta 400, 800

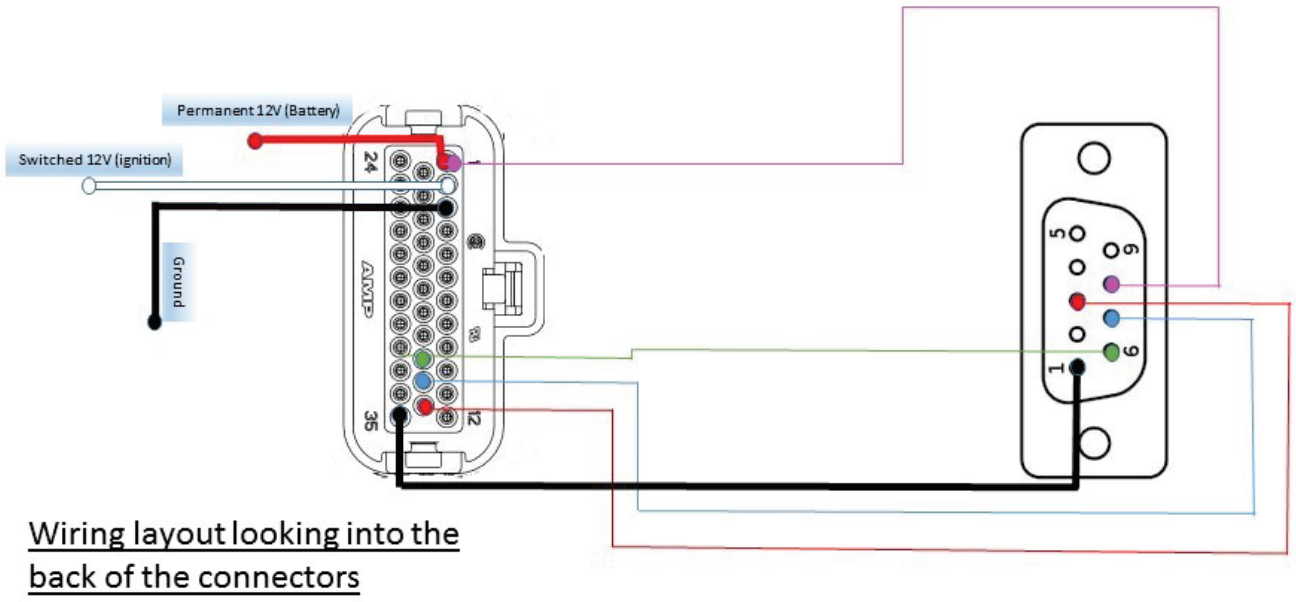
# 2 Software configuration

SCS Delta ECUs always broadcast the proprietary data stream on CAN 1.
ECU's with a second CAN channel need to be set to **SCS Dash Comms** with the SXTune software, if being used.
The CANbus speed for the SCS Dash Comms protocol must be set at **1Mbit/s**.
To do so, open the ECU software SXTune - Engine Calibration - ECU Configuration and set the field CAN Bus 1 Speed: 1Mbit/s



# 3
# Wiring connection

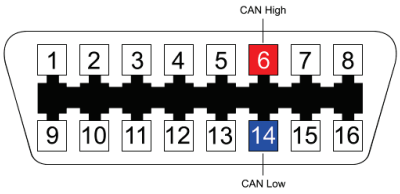
These models feature a bus communication protocol based on CAN, this data stream is generally accessible through the **DB9** plug or, in some applications, through the **OBDII** plug or the **second CAN** bus, for specific ECU models.
For typical installations refer to the following pinout of the ECU harness plug. Here below you find the DB9 and the matching AMP-A connector's pinout (rear view) and connection table.




Wiring layout looking into the back of the connectors

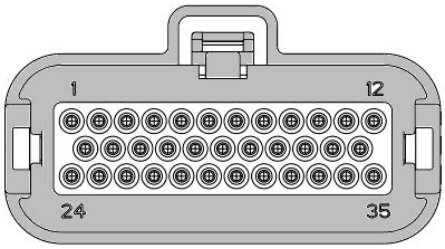
| DB9 connector pin | AMP A connector pin | Function | AiM cable |
|---|---|---|---|
| 6 | A21 | CAN High | CAN + |
| 7 | A22 | CAN Low | CAN - |

Alternatively, OBDII connection can be used on some applications.
Here below you find the vehicle's OBDII connector pinout (female front view) and connection table.




| OBDII connector pin | Function | AiM cable label | AiM color cable |
|---|---|---|---|
| 6 | CAN High | CAN + | White |
| 14 | CAN Low | CAN – | Blue |

With some ECU models there can be the possibility to connect and setup a second CAN line, accessible through the connector B (Blue AMP).
Here below you find the matching connector B pinout (female rear view) and connection table.




| AMP B connector pin | Function | AiM cable label | AiM color cable |
|---|---|---|---|
| B34 | CAN Low | CAN - | White |
| B35 | CAN High | CAN + | Blue |

# 4 Race Studio configuration

Before connecting the ECU to AiM device, set this up using AiM Race Studio software.
The parameters to select in the AiM device configuration are:

- ECU manufacturer: **SCS**
- ECU model:
  - **DELTA_GDI4** for Delta GDI4
  - **DIESEL** for Delta SDI4, Delta 400, 800
  - **PETROL** for Delta 400, 800, 880

# 5 Protocols

Channels received by AiM devices change according to the selected protocol.

## 5.1 "SCS - Delta_GDI4" protocol

Channels received by AiM devices configured with "SCS – Delta_GDI4" protocol are:

| CHANNEL NAME | FUNCTION |
|---|---|
| RPM | Engine speed |
| TPS | Throttle position |
| KFuelMAP | Manifold pressure fuel correction |
| MAP | Manifold air pressure |
| IdleLearn | Idle learn value |
| dThrot | Delta throttle position |
| Lambda2 | Actual measure lambda bank 2 |
| InjHPerc | Percentage staged injection |
| AE | Acceleration enrichment |

| | |
|---|---|
| Iidle | Idle integrator |
| KMH | Wheel speed |
| DCBaseIdle | Base idle duty cycle |
| IdleOut | Final idle duty cycle |
| PercSlip | Traction control actual slip |
| Target Slip | Traction control target slip |
| IVCTAngle | Inlet cam position angle |
| EVCTAngle | Exhaust cam position angle |
| IVCTAngleTarget | Target Inlet cam position |
| EVCTAngleTarget | Target exhaust cam position |
| DBW TPS1 | Drive by wire primary TPS |
| BaseInjPW | Base injection pulse width |
| RunPW1 | Final injection pulse width |
| SABase | Base spark advance |
| SAOut | Final spark advance |
| Lambda1 | Actual measure lambda bank 1 |
| TargetLambda | Target lambda |
| RunPW2 | Final injection pulse width bank 2 |
| CLC1 | Closed loop control value bank 1 |
| CLC2 | Closed loop control value bank 2 |
| Gear | Gear position |
| BaseBoostDC | Base boost duty cycle |
| BoostOut | Final boost duty cycle |
| OilP | Oil pressure |
| FuelP | Fuel pressure |
| IBoost | Integral boost control term |
| TargetBoost | Target boost pressure |
| SAKnockRetard1 | Knock retard cylinder 1 |
| SAKnockRetard2 | Knock retard cylinder 2 |
| SAKnockRetard3 | Knock retard cylinder 3 |
| SAKnockRetard4 | Knock retard cylinder 4 |
| VBatt | Battery voltage |

| | |
|---|---|
| DJVBatt | Injector battery voltage correction |
| Phase | Injector timing phase |
| Dwell | Coil dwell time |
| TPS1I | Raw throttle position 1 voltage |
| PPS1I | Raw pedal position 1 voltage |
| PPS2I | Raw pedal position 2 voltage |
| TPSDrvReq | Throttle position target |
| TPS2I | Raw throttle position sensor |
| TPSPPSFault | Throttle/Pedal fault code |
| PPS | Scaled final pedal position |
| PPS1 | Scaled pedal position 1 |
| PPS2 | Scaled pedal position 2 |
| TPS1 | Scaled throttle position 1 |
| TPS2 | Scaled throttle position 2 |
| TH2O | Coolant temperature |
| TOil | Oil temperature |
| kFuelCrk | Crank fuel correction |
| Tair | Air temperature |
| TH2OI | Raw coolant temp sensor voltage |
| TOilI | Raw oil temp sensor voltage |
| ERunTimer | Engine run timer |
| TairI | Raw air temp sensor voltage |
| LambdaI | Raw lambda sensor voltage |
| kFuelTH2O | Coolant temp fuel correction |
| kFuelTair | Air temp fuel correction |
| CrkCnt | Crank rotation counter |
| kFuelBaro | Barometric pressure fuel correction |
| kFuelP | Fuel pressure fuel correction |
| OSATAir | Air temp spark advance correction |
| RPMTarget | Target idle speed |
| KMH16LR | Left rear wheel speed |
| KMH16RR | Right rear wheel speed |

| | |
|---|---|
| KMH16LF | Left front wheel speed |
| KMH16RF | Right rear wheel speed |
| FuelPTarget | Fuel pressure target |
| FuelLevel | Raw fuel level |
| FuelPCntrlDC | Fuel pressure control duty cycle |
| AuxStat1 | Auxiliary function status 1 |
| AuxStat2 | Auxiliary functions status 2 |

**Technical note**: not all data channels outlined in the ECU template are validated for each manufacturer model or variant; some of the outlined channels are model and year specific, and therefore may not be applicable.

## 5.2 "SCS - DIESEL" protocol

Channels received by AiM devices configured with "SCS – DIESEL" protocol are:

| CHANNEL NAME | FUNCTION |
|---|---|
| RPM | Engine speed |
| TPS1 | Throttle pedal position 1 |
| TPS2 | Throttle pedal position 2 |
| MAP | Manifold air pressure |
| MainA | Main fuel injection timing |
| dThrot | Delta throttle pedal position |
| PilotA | Pilot fuel injection timing |
| MAPI | Raw MAP sensor voltage |
| CrkCnt | Crank counter |
| KMH | Wheel speed |
| Boost PW | Measured boost actuator pulse width |
| BoostFreqIn | Measured boost actuator frequency |
| BoostDCIn | Measured boost actuator duty cycle |

| | |
|---|---|
| FuelPTarget | Common tail fuel pressure target |
| FuelPError | Common rail fuel pressure error |
| FuelPPID | Common rail fuel pressure PID term |
| FuelP | Common rail fuel pressure |
| BaseInjPW | Base main injection pulse width |
| AttInj1 | Final main injection pulse width |
| EGR2 Pos | Final RGR actuator position B2 |
| EGRTarget | Target EGR position |
| EGRBaseDC | EGR control base duty cycle |
| AttInj2 | Final pilot injection pulse width |
| GEAR | Gear position |
| PilotBaseInjPW | Pilot fuel injection pulse width |
| VGT Pos | Measured boost actuator position |
| FuelPBaseDC | Base fuel pressure duty cycle |
| Baro | Barometric pressure |
| BoostOut | Final boost actuator position |
| TargetBoost | Target boost pressure |
| BaseBoostDC | Base boost actuator position |
| FuelVDC | Fuel volume control duty cycle |
| VBattI | Battery voltage |
| EGR Pos | Final EGR actuator position B1 |
| TPS1I | Raw throttle pedal position 1 voltage |
| TPS2I | Raw throttle pedal position 2 voltage |
| IdleOut | Final idle fuel pulse width |
| Pidle | Idle control proportional term |
| Iidle | Idle control integral term |
| IdleLearn | Idle control adaption term |
| TH2o | Coolant temperature |
| TFuel | Fuel temperature |
| EStart | Auto engine start status |
| TAir | Air temperature |
| OilP | Oil pressure |

| | |
|---|---|
| J1939ERunReq | J1939 engine run request |
| ERunTimer | Engine run timer |
| RPMTargetIdle | Target idle speed |
| FuelPI | Raw fuel pressure sensor voltage |
| KFuelTH2o | Coolant temp fuel correction |
| OFuelTH2o | Coolant temp fuel pressure offset |
| TFuelI | Raw fuel temperature voltage |
| TAirI | Raw air temperature voltage |
| TH2oI | Raw coolant temperature voltage |

**Technical note**: not all data channels outlined in the ECU template are validated for each manufacturer model or variant; some of the outlined channels are model and year specific, and therefore may not be applicable.

## 5.3 "SCS - PETROL" protocol

Channels received by AiM devices configured with "SCS – PETROL" protocol are:

| CHANNEL NAME | FUNCTION |
|---|---|
| RPM | Engine RPM |
| TPS | Throttle position sensor |
| KFuelMAP | Manifold pressure fuel correction |
| MAP | Manifold air pressure |
| IdleLearn | Manifold idle value |
| dThrot | Delta throttle position |
| Lambda2 | Actual measure lambda bank 2 |
| InjHPerc | Percentage staged injection |
| AE | Acceleration enrichment |
| DE | Deceleration enrichment |
| KMH | Wheel speed |
| DCBaseIdle | Base idle duty cycle |

| | |
|---|---|
| IdleOut | Final idle duty cycle |
| PercSlip | Traction control actual slip |
| Target Slip | Traction control target slip |
| IVCTAngle | Inlet cam position angle |
| EVCTAngle | Exhaust cam position angle |
| IVCTAngleTarget | Target inlet cam position |
| EVCTAngleTarget | Target exhaust cam position |
| DBW TPS1 | Drive by wire primary TPS |
| BaseInjPW | Base injection pulse width |
| RunPW | Final injection pulse width |
| SABase | Base spark advance |
| SAOut | Final spark advance |
| Lambda1 | Actual measure lambda bank 1 |
| TargetLambda | Target lambda |
| KFuelLearn | Fuel learn value |
| CLC1 | Closed loop control value bank 1 |
| CLC2 | Closed Loop control value bank 2 |
| Gear | Gear position |
| BaseBoostDC | Base boost duty cycle |
| BoostOut | Final boost duty cycle |
| OilP | Oil pressure |
| FuelP | Fuel pressure |
| Baro | Barometric pressure |
| Pboost | Proportional boost control term |
| IBoost | Integral boost control term |
| TargetBoost | Target boost pressure |
| VBatt | Battery voltage |
| DJVBatt | Injector battery voltage correction |
| Phase | Injector timing phase |
| CamCount | Camshaft tooth counter |
| DWell | Coil dwell time |
| TPS1I | Raw throttle position sensor 1 voltage |

| | |
|---|---|
| PPS1I | Raw pedal position sensor 1 voltage |
| PPS2I | Raw pedal position sensor 2 oltage |
| TPSDrvReq | Throttle position sensor target |
| TPS2I | Raw throttle position 2 voltage |
| TPSPPSFault | Throttle/Pedal position sensor fault code |
| PPS | Scaled final pedal position sensor |
| PPS1 | Scaled pedal position sensor 1 |
| PPS2 | Scaled pedal position sensor 2 |
| TPS1 | Scaled throttle position sensor 1 |
| TPS2 | Scaled throttle position sensor 2 |
| TH2O | Coolant temperature |
| TOil | Oil temperature |
| kFuelCrk | Crank fuel correction |
| Tair | Air temperature |
| TH2OI | Raw coolant temp sensor voltage |
| TOilI | Raw oil temp sensor voltage |
| ERunTimer | Engine run timer |
| TairI | Raw air temp sensor voltage |
| LambdaI | Raw lambda sensor voltage |
| kFuelTH2O | Coolant temp fuel correction |
| kFuelTair | Air temp fuel correction |
| CrkCnt | Crank rotation counter |
| kFuelBaro | Barometric pressure fuel correction |
| kFuelP | Fuel pressure fuel correction |
| OSATAir | Air temp spark advance correction |
| RPMTarget | Target idle speed |
| KMH16LR | Left rear wheel speed |
| KMH16RR | Right rear wheel speed |
| KMH16LF | Left front wheel speed |
| KMH16RF | Right front wheel speed |
| kFuelLearn | Fuel learn value |
| FuelLevel | Scaled fuel level |

| | |
|---|---|
| FuelLevelI | Raw fuel level |
| GearRatio | Gear ratio (N/V) |
| AuxSt1 | Auxiliary functions status 1 |
| AuxSt2 | Auxiliary functions status 2 |
| SARetard1 | Spark advance retard 1 |
| SARetard2 | Spark advance retard 2 |
| SARetard3 | Spark advance retard 3 |
| SARetard4 | Spark advance retard 4 |
| SARetard5 | Spark advance retard 5 |
| SARetard6 | Spark advance retard 6 |
| SARetard7 | Spark advance retard 7 |
| SARetard8 | Spark advance retard 8 |

**Technical note**: not all data channels outlined in the ECU template are validated for each manufacturer model or variant; some of the outlined channels are model and year specific, and therefore may not be applicable.