Syvecs Limited

Syvecs S6 GP

Pinouts and Wiring Info

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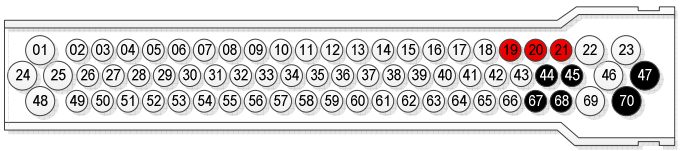
This document intended for use by a technical audience and describes a number of procedures that are potentially hazardous. Installations should be carried out by competent persons only.

Syvecs and the author accept no liability for any damage caused by the incorrect installation or configuration of the equipment.
Please Note that due to frequent firmware changes certain windows might not be the same as the manual illustrates. If so please contact the Syvecs Tech Team for Assistance.

Syvecs S6GP Pinouts



Syvecs Description	Syvecs Pinout	Function	Notes
INJ1 (#1)	1	CYL 1 INJECTOR	
AUX1 (#5)	2	FUEL PUMP	OUTPUT CAN BE USED FOR ANYTHING I.E WATER INJECTION, KNOCK WARNING LIGHT, SHIFT LIGHT ETC... SEE OUTPUT FUNCTIONS IN SCAL
AUX2 (#6)	3	SPARE OUTPUT	
AUX3 (#7)	4	BOOST SOLENOID	
AUX4 (#8)	5	TACHO OUTPUT	
ANGND1	6	TRIGGER GROUND	CRANK AND CAM SENSOR GROUNDS
ANGND1	7	SENSOR GND	TPS, MAP, TEMP SENSORS ETC GROUNDS
ANGND2	8	ABS GROUNDS	
ANGND2	9	CAL SWITCH GROUNDS	
5VOUT1	10	5V OUTPUT FOR SENSORS	5V REFERENCE OUT FOR LIKE MAP SENSOR, TPS ETC
5VOUT2	11	SPARE 5V OUTPUT	
12VOUT	12	SPARE 12V OUTPUT	
AUX5 (#9)	13	IDLE STEPPER	IF NO STEPPER MOTOR IS USED, OUTPUT CAN BE USED FOR ANYTHING I.E WATER INJECTION, KNOCK WARNING LIGHT, SHIFT LIGHT ETC... SEE OUTPUT FUNCTIONS IN SCAL
AUX6 (#10)	14	IDLE STEPPER	
AUX7 (#11)	15	IDLE STEPPER	
AUX8 (#12)	16	IDLE STEPPER	
KNOCK	17	KNOCK SENSOR INPUT	
KNKGND	18	KNOCK SENSOR GROUND	
VBAT	19	12V IGNITION SUPPLY FOR ECU	ALL JOINED ON BOARD SO ONLY ONE INPUT REQUIRED
VBAT	20	12V IGNITION SUPPLY FOR ECU	
VBAT	21	12V IGNITION SUPPLY FOR ECU	
INJ6 (#14)	22	CYL 6 INJECTOR	CAN BE SPARE OUTPUT IF NOT REQUIRED IE 4 CYL ENGINE
INJ8 (#16)	23	CYL 8 INJECTOR	
INJ2 (#2)	24	CYL 2 INJECTOR	
INJ3 (#3)	25	CYL 3 INJECTOR	
IGN1 (#1)	26	CYL 1 IGNITION OUTPUT	
IGN2 (#2)	27	CYL 2 IGNITION OUTPUT	
IGN3 (#3)	28	CYL 3 IGNITION OUTPUT	
IGN4 (#4)	29	CYL 4 IGNITION OUTPUT	
IGN5 (#5)	30	CYL 5 IGNITION OUTPUT	CAN BE SPARE OUTPUT IF NOT REQUIRED IE 4 CYL ENGINE
IGN6 (#6)	31	CYL 6 IGNITION OUTPUT	CAN BE SPARE OUTPUT IF NOT REQUIRED IE 4 CYL ENGINE
COMGND	32	COMMUNICATION GND	
LAMV	33	LAMV	NTK WIDEBAND SENSOR - RED WIRE
LAMGND	34	LAM GND	NTK WIDEBAND SENSOR - BLACK WIRE
AB1 (#1)	35	CAM SENSOR INPUT	OR SPARE BIPOLAR INPUT
AB2 (#2)	36	CRANK SENSOR INPUT	OR SPARE BIPOLAR INPUT
AB3 (#3)	37	FL SPEED INPUT	OR SPARE BIPOLAR INPUT

AB4 (#4)	38	RL SPEED INPUT	OR SPARE BIPOLAR INPUT
THER+	39	EGT +	K - TYPE THERMOCOUPLER +
AV1 (#9)	40	TPS INPUT	IDEAL FOR OIL PRESSURE, FUEL PRESSURE ETC
AV2 (#10)	41	MAP INPUT	IDEAL FOR OIL PRESSURE, FUEL PRESSURE ETC
AV3 (#11)	42	SPARE INPUT	IDEAL FOR OIL PRESSURE, FUEL PRESSURE ETC
AV4 (#12)	43	SPARE INPUT	IDEAL FOR OIL PRESSURE, FUEL PRESSURE ETC
PWRGND	44	ECU GND	ADVISE HOOKING UP ABOUT 3 OF THE PWRGNDS
PWRGND	45	ECU GND	
INJ7 (#15)	46	CYL 7 INJECTOR	CAN BE SPARE OUTPUT IF NOT REQUIRED IE 4 CYL ENGINE
PWRGND	47	ECU GND	
INJ4 (#4)	48	CYL 4 INJECTOR	
LANTX-	49	Cat5 Pin6	Green/White
LANTX+	50	Cat5 Pin3	White/Green
LANRX-	51	Cat5 Pin2	Orange/White
LANRX+	52	Cat5 Pin1	White/Orange
CANH	53	CANH	
CANL	54	CANL	
RS232RX	55	RS232RX	
RS232TX	56	RS232TX	
LAMI	57	LAMI	NTK WIDEBAND SENSOR - WHITE WIRE
AU1 (#5)	58	VEHICLE SPEED INPUT	IDEAL FOR A/C REQUEST OR ANY OTHER 0-5V INPUT
AU2 (#6)	59	SPARE INPUT	IDEAL FOR A/C REQUEST OR ANY OTHER 0-5V INPUT
AU3 (#7)	60	SPARE INPUT	IDEAL FOR A/C REQUEST OR ANY OTHER 0-5V INPUT
AU4 (#8)	61	SPARE INPUT	IDEAL FOR A/C REQUEST OR ANY OTHER 0-5V INPUT
THER-	62	EGT -	K - TYPE THERMOCOUPLER -
AR1 (#13)	63	COOLANT TEMP INPUT	IDEAL FOR OIL TEMP, FUEL TEMP ETC
AR2 (#14)	64	AIR TEMP INPUT	IDEAL FOR OIL TEMP, FUEL TEMP ETC
AR3 (#15)	65	CALIBRATION SWITCH INPUT	IDEAL FOR OIL TEMP, FUEL TEMP ETC
AR4 (#16)	66	SPARE INPUT	IDEAL FOR OIL TEMP, FUEL TEMP ETC
PWRGND	67	PWR GND	
PWRGND	68	PWR GND	
INJ5 (#13)	69	CYL 5 INJECTOR	CAN BE SPARE OUTPUT IF NOT REQUIRED IE 4 CYL ENGINE
PWRGND	70	PWR GND	

General Connections

Connecting Power

The ECU has three power feeds, which can either be used to provide a redundant multiple feeds, or as a way of providing switched power to additional loads through the loom.

Example Schematic

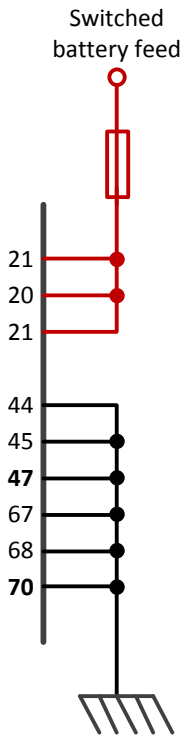


Figure 0-1 - Redundant Power Feeds and a Common grounding point.

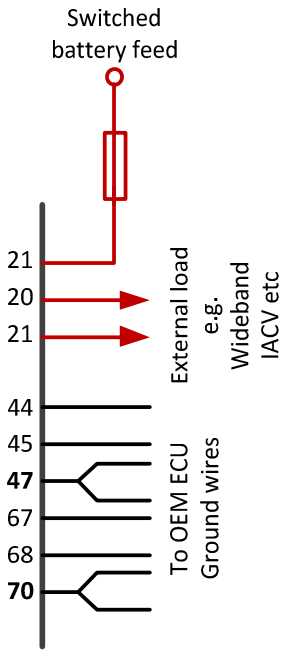
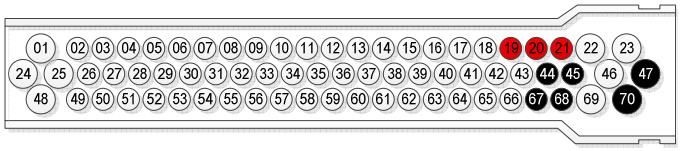


Figure 0-2 – Redundant Power Feeds and OEM ECU grounding.

Pin Schedule



Pin Number	Function	Notes
19	VBAT	Use a fused feed.
20	VBAT	Use a fused feed.
21	VBAT	Use a fused feed.
44	Power Ground	Up to 2 ground wires can be paired to this pin.
45	Power Ground	Up to 2 ground wires can be paired to this pin.
47 (High Current Pin)	Power Ground	Up to 4 ground wires can be connected to this pin.
67	Power Ground	Up to 2 ground wires can be paired to this pin.
68	Power Ground	Up to 2 ground wires can be paired to this pin.
70 (High Current Pin)	Power Ground	Up to 4 ground wires can be connected to this pin.

NOTE! Power Grounds are designed to conduct High Current loads – Do not mix Power Grounds with Analogue (AN) Grounds.

LAN Connection

Connection from the S6 to a Laptop/PC uses a Male RJ45 plug, wired in cross over configuration.

Example Schematic

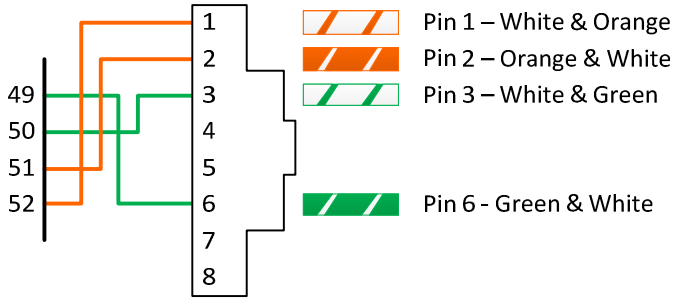
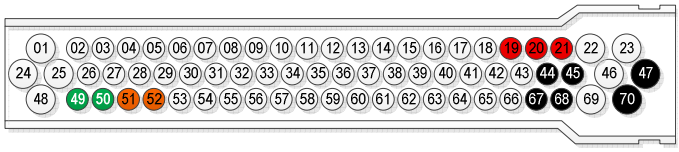


Figure 0-3 RJ45 Wiring

Pin Schedule

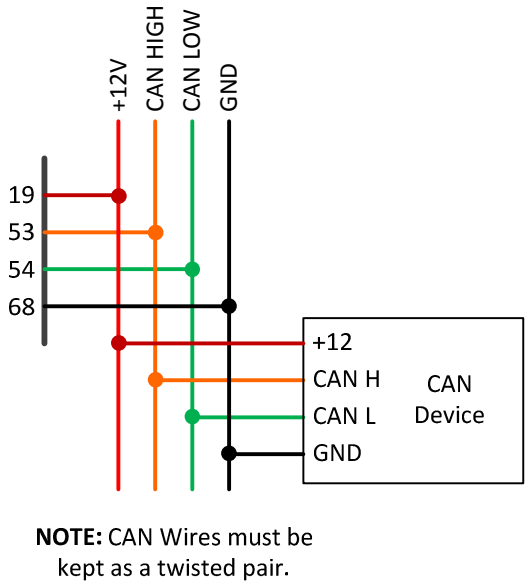


Pin Number	Function	Notes
49	LAN Transmit -	RJ45 Pin 6 – Green & White wire
50	LAN Transmit +	RJ45 Pin 3 – White & Green wire
51	LAN Receive -	RJ45 Pin 2 – Orange & White wire
52	LAN Receive +	RJ45 Pin 1 – White & Orange wire

CAN Bus

Common **A**rea **N**etwork Bus (CAN Bus) is a widely used data interface common used in many cars and aftermarket accessories (such as Stack Data loggers and Dashes). Data is sent using the High and Low wires, which are maintained as a twisted pair.

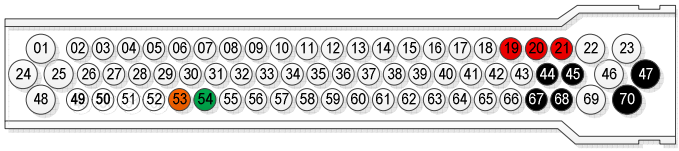
Example Schematic



NOTE: CAN Wires must be kept as a twisted pair.

Figure 0-4 CAN Bus connection

Pin Schedule



Pin Number	Function	Notes
53	CAN HIGH	Check OEM Colour pairing.
54	CAN LOW	Ensure wires are twisted pair.

RS232

Telemetry can data can be provided via RS232.

Example Schematic

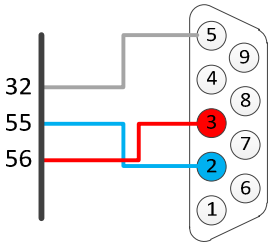
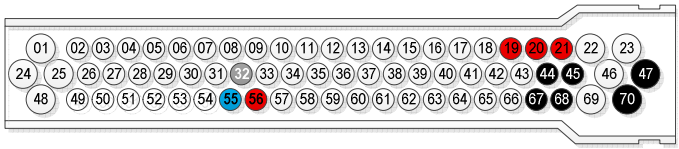


Figure 0-5 RS232 Connection

Pin Schedule



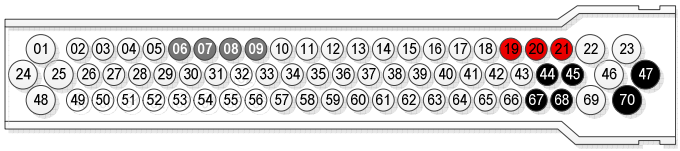
Pin Number	Function	Notes
32	Comm GND	DB-9 pin 5
55	Rx	DB-9 pin 2
56	Tx	DB-9 pin 3

Input Connections

Sensor/ Analogue Grounds (AN Grounds)

Sensors and miscellaneous analogue inputs have their own Ground pins; these grounds must be kept separate from the Power grounds shown in the first section. As there are four ground pins you may have to connect multiple grounds to some of the pins if you have more than four sensors.

Pin Schedule

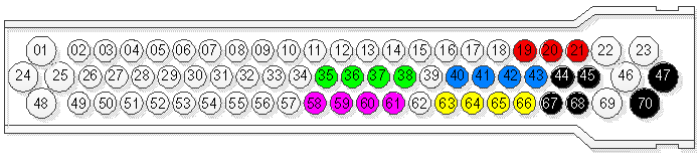


Pin Number	Function	Notes
6	ANGND1	
7	ANGND1	
8	ANGND2	
9	ANGND2	

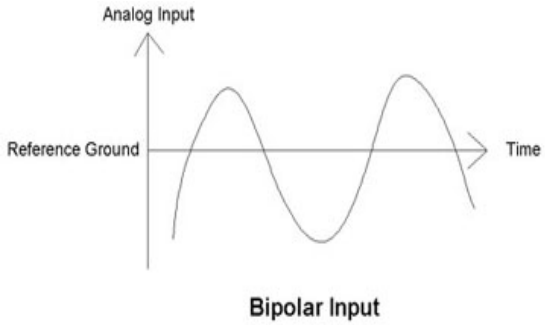
Assigning Inputs

The Syvecs S6GP has 16 programmable inputs available and although they are fully configurable in Scal, they are not all the same type of input which means sensors that for example require a pull up, have to assigned to different types….. Listed below are the 4 types which are available.

Bipolar Inputs – The Bipolar inputs are found on Pins 35,36,37 and 38 as shown below in **Green.**



These Inputs are able to swing above and below the reference ground meaning they can see Positive Voltage as well as Negative.



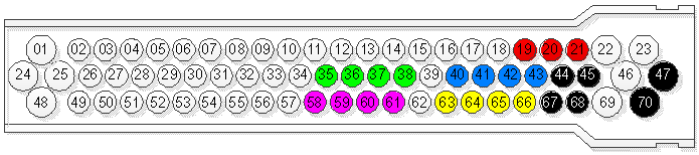
Bipolar Input

Example of sensors normally used on these Inputs are:

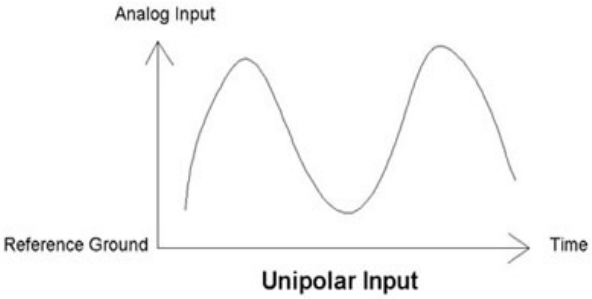
- Reluctor Crank and Cam Sensors
- ABS Sensors for wheel speed

Bipolar inputs are not just limited to the above they can also be used for any sensor that outputs 0-5volts. They are also able to provide a Pull-up through Scal

Unipolar Inputs - The Unipolar inputs are found on Pins 58, 59, 60 and 61 as shown below in **Purple.**



These Inputs are only able to swing above the reference ground meaning they can only see Positive Voltage

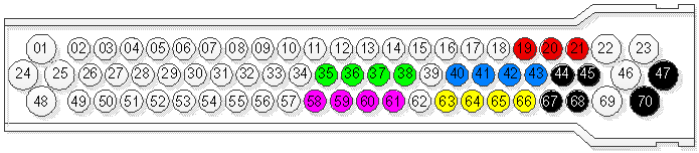


Example of sensors normally used on these Inputs are:

- Hall Effect Crank and Cam Sensors
- Gearbox speed sensors

Unipolar inputs are not just limited to the above they can also be used for any sensors which outputs 0-5volts. They are also able to provide a Pull-up through Scal.

Voltage Inputs – The Voltage inputs are found on Pins 40, 41, 42 and 43 as shown below in Blue.



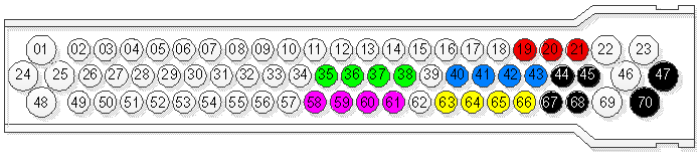
These Inputs are able to sense a Voltage level which is linear and does not swing

Example of sensors normally used on these Inputs are:

- Manifold Pressure sensors
- Throttle Positions
- Oil Pressures

Voltage Inputs are not just limited to the above then can also be used for any sensor which outputs a 0-5volt signal but NOT able to provide a pull up.

Resistive Inputs - The Resistive inputs are found on Pins 63, 64, 65 and 66 as shown below in **Yellow**



These Inputs are the same as voltage inputs in which they can accept a 0-5v but they also allow you to provide a Pullup on the input.

.Example of Sensors normally used on these Inputs are:

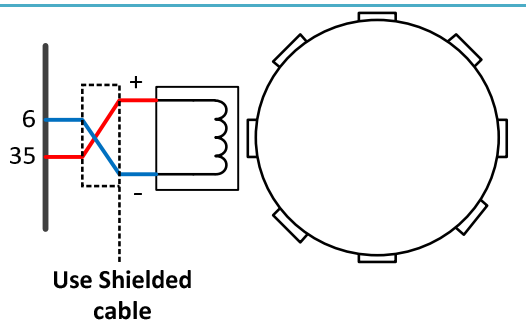
- Temperature sensors
- Calibration switches

Resistive inputs are not just limited to the above then can also be used for any type of 0-5v sensor.

Sensor Schematics - Examples

Crank Sensor – Magnetic Type

Example Schematic

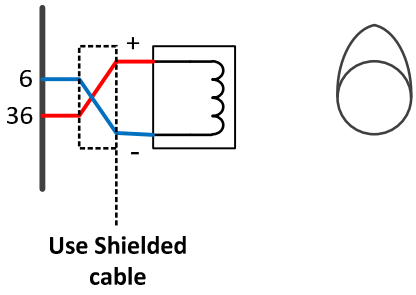


Pin Schedule

Pin Number	Function	Notes
6	ANGND1	Crank Sensor – (Shared with Cam Sensor)
35, 36, 37, 38	Bipolar Input	Crank Sensor+

Cam Sensors – Magnetic Type

Example Schematic

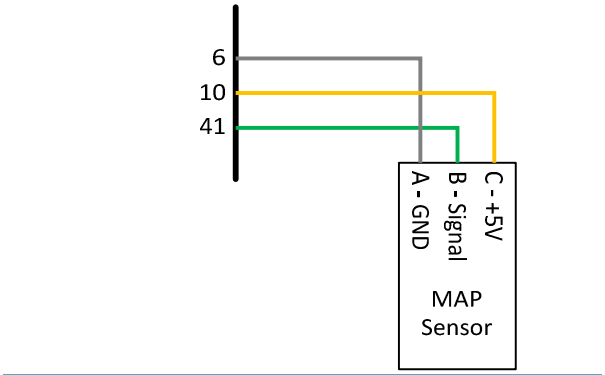


Pin Schedule

Pin Number	Function	Notes
6	ANGND1	Cam Sensor – (Shared with Crank Sensor)
35, 36, 37, 38	Bipolar input	Cam Sensor +

Manifold Pressure Sensor (MAP)

Example Schematic

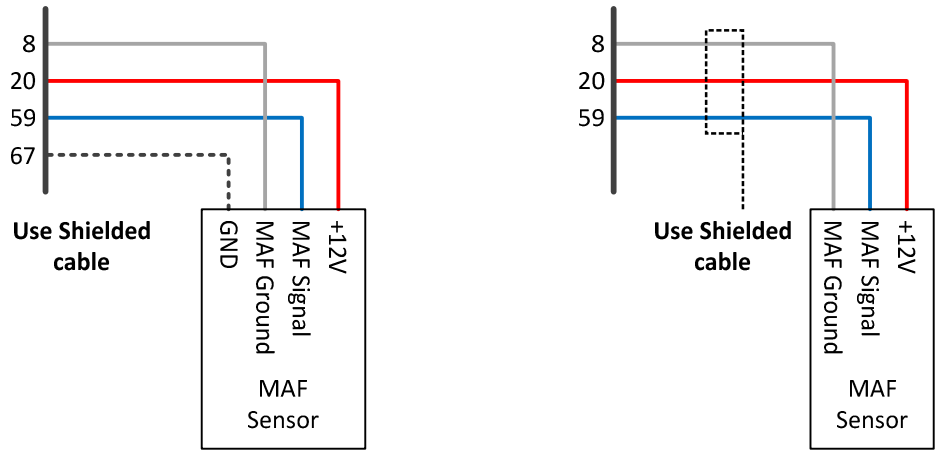


Pin Schedule

Pin Number	Function	Notes
6	ANGND1	May be shared with multiple sensors
10	5VOUT1	Regulated sensor power supply
41	Voltage Input	Can use Bipolar, Unipolar or Voltage inputs

Mass Airflow Sensor (MAF)

Example Schematic

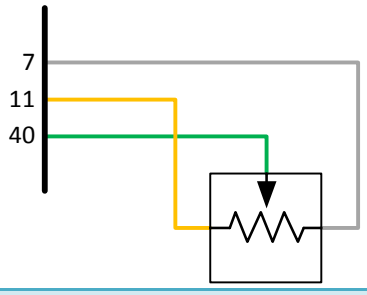


Pin Schedule

Pin Number	Function	Notes
8	ANGND2	May be shared with multiple sensors
20	VBAT	
59	AU2 Unipolar Input #2	Can use Bipolar, Unipolar or Voltage inputs
67	PWRGND	May be shared with multiple grounding points

Throttle Position Sensor (TPS)

Example Schematic

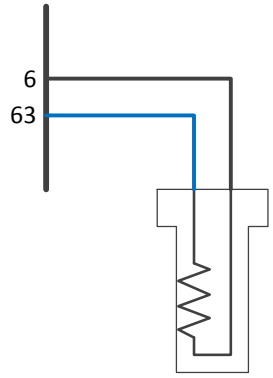


Pin Schedule

Pin Number	Function	Notes
7	ANGND1	May be shared with multiple sensors
11	5VOUT1	Regulated sensor power supply
40	AV1 (#9)	Can use Bipolar, Unipolar or Voltage inputs

Coolant Temperature Sensor (CTS)

Example Schematic

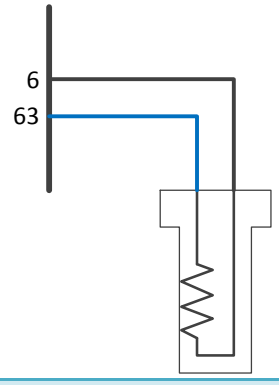


Pin Schedule

Pin Number	Function	Notes
6	ANGND1	May be shared with multiple sensors
63	AR1 Resistive Input #1	Can use Resistive inputs #1 to #4 (pins 63 to 66)

Inlet Air Temperature Sensor (IAT)

Example Schematic

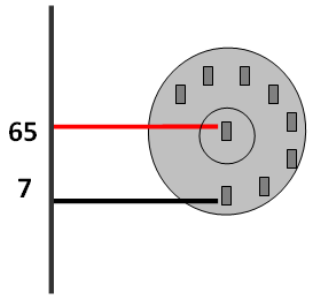


Pin Schedule

Pin Number	Function	Notes
6	ANGND1	May be shared with multiple sensors
64	AR2 Resistive Input #2	Can use Resistive inputs #1 to #4 (pins 63 to 66)

Calibration Switches

Example Schematic

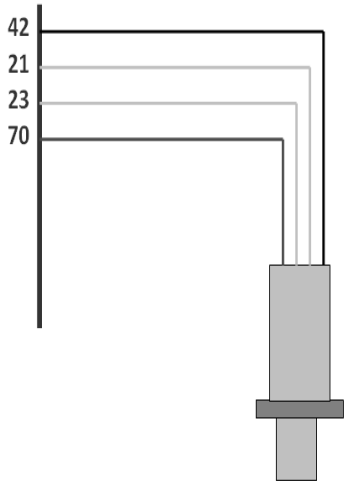


Pin Schedule

Pin Number	Function	Notes
7	ANGND1	May be shared with multiple sensors
64	AR3 Resistive Input #3	Can use Resistive inputs #1 to #4 (pins 63 to 66) Cal Switches Require Pull Up to be On

Narrowband Lambda Sensor

Example Schematic



Pin Schedule

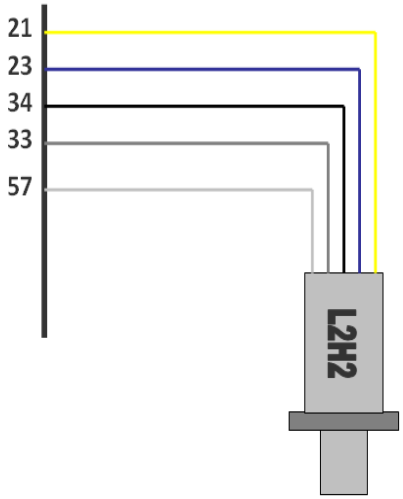
Wire Colour	Function	Pins Usable on S6GP
White	Heater	19, 20, 21 or External 12v Supply
White	Heater Drive	Any Pwm Output or Spare Injector Output – Needs to be assigned in Scal on I/O Configuration
Black	Signal Ground	Power Ground
Grey	Lambda Signal	Can use Bipolar, Unipolar or Voltage inputs

Wideband Lambda Sensor

The Syvecs S6GP has the ability to drive a NTK Wideband sensor directly without the use of external units.

Please note: If you have purchased a Syvecs NTK Sensor it will be an L2H2

Example Schematic



NTK L1H1 Sensor

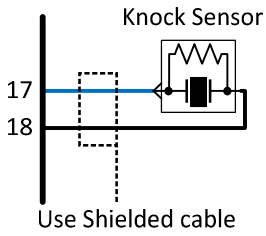
Wire Colour	Function	Pins Usable on S6GP
Yellow	Heater	19, 20, 21 or External 12v Supply
Orange	Heater Drive	Any Pwm Output or Spare Injector Output – Needs to be assigned in Scal on I/O Configuration
Black	Signal Ground	Has to be 34
Red	Nernst Cell Voltage	Has to be 33
White	Ion Pump Current	Has to be 57

NTK L2H2 Sensor

Wire Colour	Function	Pins Usable on S6GP
Yellow	Heater	19, 20, 21 or External 12v Supply
Blue	Heater Drive	Any Pwm Output or Spare Injector Output – Needs to be assigned in Scal on I/O Configuration
Black	Signal Ground	Has to be 34
Grey	Nernst Cell Voltage	Has to be 33
White	Ion Pump Current	Has to be 57

Knock Sensor

SyvecsS6GP has one input for a piezoelectric Example Schematic



Pin Schedule

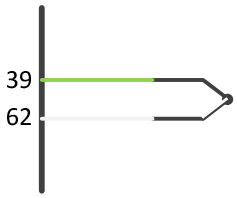
Pin Number	Function	Notes
17	KNOCK	
18	KNKGND	

NOTE: Shield wires should be connected only at one end, common practice is to join shielding wires at the ECU end of the loom and connect them to a Power Ground wire.

EGT/Thermocouple

Syvecs has one K-type thermocouple input.

Example Schematic



Pin Schedule

Pin Number	Function	Notes
39	THER+	Green wire (K-type)
62	THER-	White wire (K-type)

Driven/Output Connections

Ignition

The ignition channels are logic level outputs designed to control ignition coils via an additional igniter (Power transistor). These as standard output a 5V Signal but can be raised to 12v with a Jumper change on board. Speak to Syvecs more about this directly if required.

Pin Schedule

Pin Number	Function	Notes
26	IGN1	Logic Level (5V) output
27	IGN2	Logic Level (5V) output
28	IGN3	Logic Level (5V) output
29	IGN4	Logic Level (5V) output
30	IGN5	Logic Level (5V) output
31	IGN6	Logic Level (5V) output

NOTE: Do not connect IGN pins directly to a coil; the low coil resistance will draw a current that will damage the ECU.

Fuel Outputs

The Injection channels are only able to drive high impendence injectors. The use of Low Impendence injectors with the S6 requires a Ballast pack/resistor pack. For more information on this e-mail ryan@syvecs.co.uk

Pin Schedule

Pin Number	Function	Notes
1	INJ1	High Current (10A)
24	INJ2	High Current (10A)
25	INJ3	High Current (10A)
48	INJ4	High Current (10A)
69	INJ5	High Current (10A)
22	INJ6	High Current (10A)
46	INJ7	High Current (10A)
23	INJ8	High Current (10A)

PWM Auxiliary Outputs

The S6GP has 8 Auxiliary outputs which have full pulse width modulation available. These outputs can be used to drive up to 5A and can only pull to ground.

Spare Injection and Ignition outputs also have full PWM support and can support up to 10A.

Pin Schedule

Pin Number	Function	Notes
2	PWM1	High Current (10A)
3	PWM2	High Current (10A)
4	PWM3	High Current (10A)
5	PWM4	High Current (10A)
13	PWM5	High Current (10A)
14	PWM6	High Current (10A)
15	PWM7	High Current (10A)
16	PWM8	High Current (10A)