april systems design Ltd

www.aprilsystems.co.uk

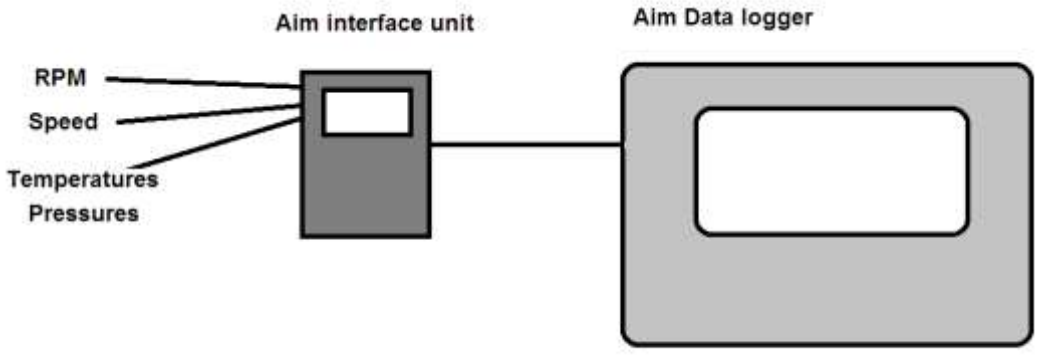
Aim interface unit instructions

Variant 1 = no-RPM power-off , Variant2 = always on

Version V1.3 oct 16

The Aim interface unit allows the connection of non CAN bus or AIM compatible ECU's to be connected to a AIM unit

The Aim interface unit directly connects to the wiring on the vehicle or motorcycle and produces an AIM compatible communication and provides the power to the Aim unit



Variant 1 The unit's power is switched on by the presence of RPM. With no RPM the unit down powers after 10 minutes

Variant 2 The unit is always on

Technical

Set the Aim unit protocol to : AIM UART RS232 Serial Protocol - 19200,n,8,1

The system has 9 channels running at 10Hz
On power up the unit will stream the data using the AIM UART protocol at 19200 baud

With the programming lead and software the unit can be switched into configuration programing mode where the scaling settings can be altered

Wiring and channels

RPM chan(1) pin 12 White wire
Square wave nominal 12V
Falling edge triggered
Trigger voltage high >6V, trigger voltage low <4V
Voltage level of rpm signal required to start 6V
Configuration adjustable scaling for number of pulses per rev
RPM calculation 32bit, RPM = Configuration value /4uS time = RPM

Speed chan(5) pin 5 Yellow wire
Square wave nominal 12V
Falling edge triggered
Trigger voltage high >6V, trigger voltage low <4V
Voltage level of rpm signal required to start 6V
Configuration adjustable scale for tyre size and number of pulses per rev
Speed calculation 32bit, Speed = Configuration value /4uS time

TPS chan(45) pin 11 Blue wire
Fixed scale 0->5V = 0->1000count = 0->100%

Brake/Fuel P chan(21) pin 1 Yellow/Red wire
Configuration adjustable scale
0-5V configuration=10 0->999 * configuration, ie configuration=10 -> 0->10bar
Can be disabled and configured as a change light output (see below)
A configuration of 40 will not provide a full scale of 40 (40,000 value) as the AIM system is limited at 32767

Oil P chan(9) pin 4 Grey/Blue wire
Configuration adjustable scale
0-5V configuration=10 0->999 * configuration, ie configuration=10 -> 0->10bar
A configuration of 40 will not provide a full scale of 40 (40,000 value) as the AIM system is limited at 32767

Water temp chan(17) pin 8 Pink Wire
2K internal – only PT100 sensor to gnd required- USE GOOD EARTH directly back to Interface unit
Fixed scale
PT100 non-linear compensation in software
-50degC to 250DegC

Power Supply **pin 15 Red wire**
12V nominal 7v to 25V
Supply max 30mA , typical 15mA, <0.2uA in closedown mode

0V/Gnd **pin 16,10,2,6 Green wire**
Shielded wire shield

Power output **pin 9,3** **Orange wire / shielded wire red**
Switched from Power Supply line
On when RPM or speed,
Held on for 5 minutes after no speed or RPM
(AIM unit may stay on for 10min longer after the supply closed down)
Max 1A switch

+5V output **pin 7 Purple wire**
Sensor supply , max supply 10mA, current limited.
Load less than 2mA for >4.9V (0.1V drop)
ie use no more than 4off 10K sensors, or 2off 5K sensor, or 1off 2.5K sensor.

RS232 **pin 14**
Pin 13 Yellow wire / shielded wire black
AIM UART RS232 Serial Protocol - 19200,n,8,1
Pin14 RX to interface unit = configuration communication to the interface unit
Pin13 TX from interface unit =stream data from interface to AIM unit

LED
Slow flash = rpm or speed detected
Two short flashes and longer gap = no rpm or speed – 5 minute delay before closedown
No led = closedown mode

Gear Calc **chan(113)**
A derived channel from RPM divided by speed
Five configuration thresholds select the value that the gear channel swaps from one gear to another.
Use the gear ratio channel to view the values.
Select a threshold between the values seen ie a stable ratio of 120 in 1st and 138 in 2nd select 119 as the 1-2 threshold

Gear ratio **chan(33- battery voltage)**
Configuration selectable to be included or excluded in the channel list streamed
A calculated channel of RPM/speed
Ensure RPM and speed values are correct before using

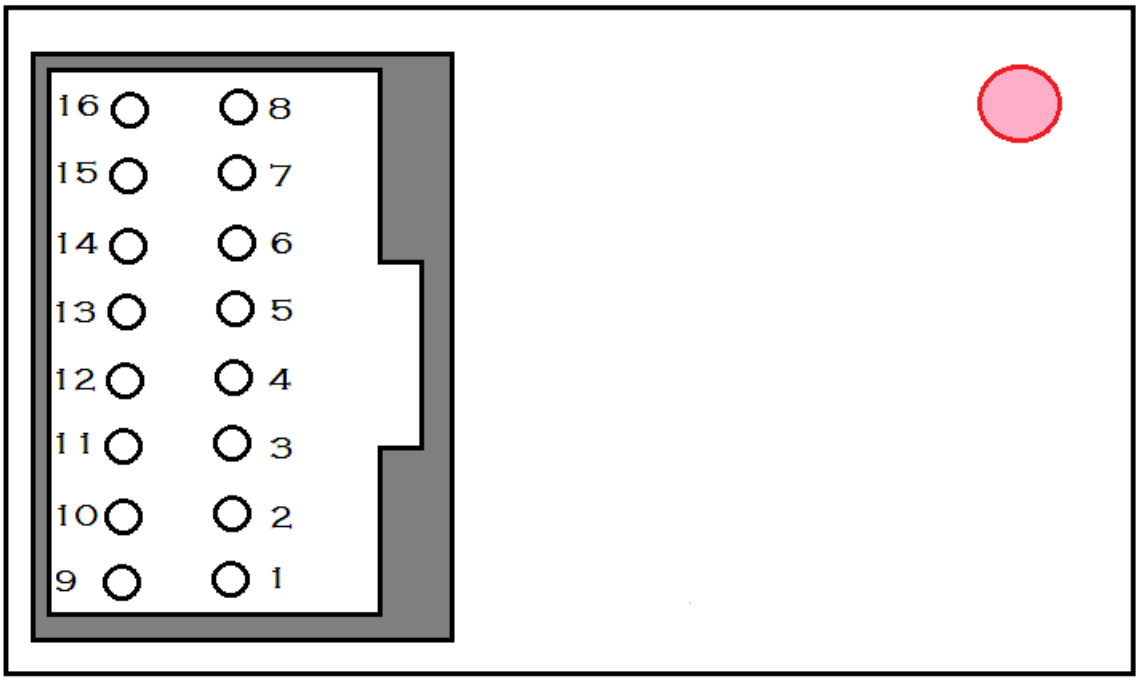
Change light **pin 14**
This is shared with the comms connection
Change light only becomes active 10seconds after RPM has been detected.
Use configuration to select an RPM above which the output goes high
Change light pin14 is active low. Provide the positive connection from pin 9 or pin 3

Notes :
Values over 32767 are limited at 32767 as over this the AIM system shows the value correctly on the 'online' but causes random data on the logged file.
Aim interface unit pin out

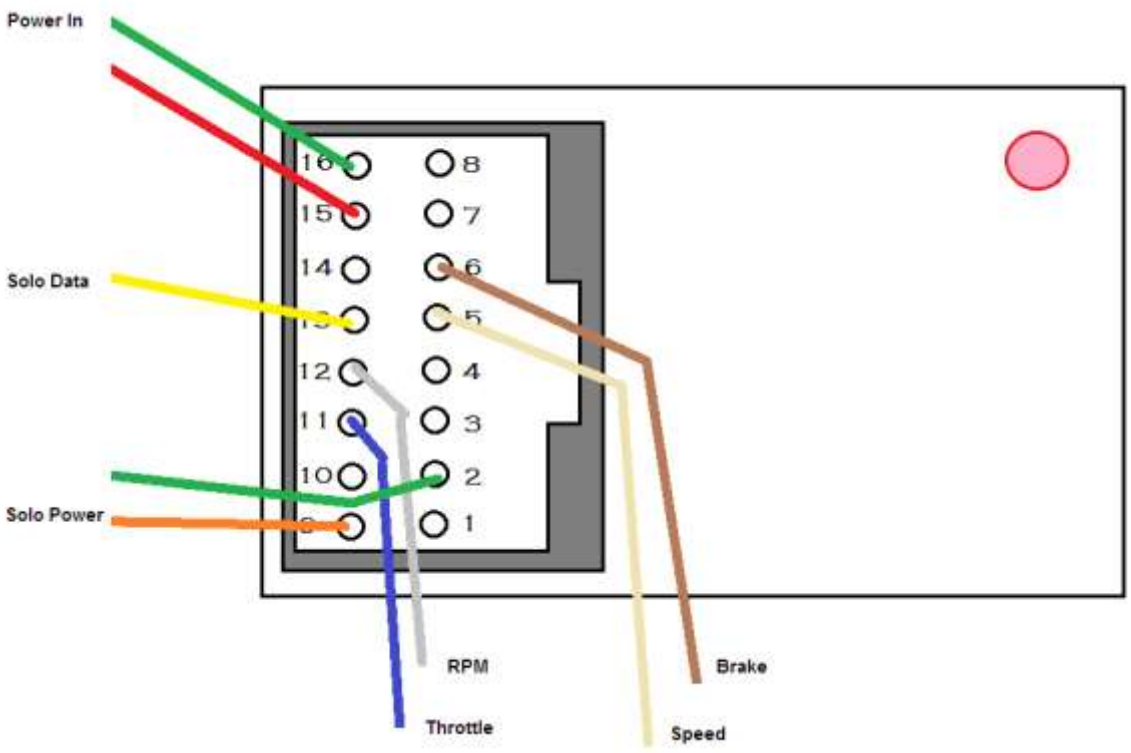
Alternate version unit AIM-Interface-B has pin 6 as a 12V digital input Digital input chan(69) pin 6 Trigger voltage high >6V, trigger voltage low <4V 1K pull-up to internal supply voltage Low = active

AIM solo setup
Always select the finer 'measurement unit' as this gives a better resolution; i.e. choose 0.01bar rather than 0.1bar the display will show for example 2.34bar rather than 2.3bar

Location of pins and led indicator



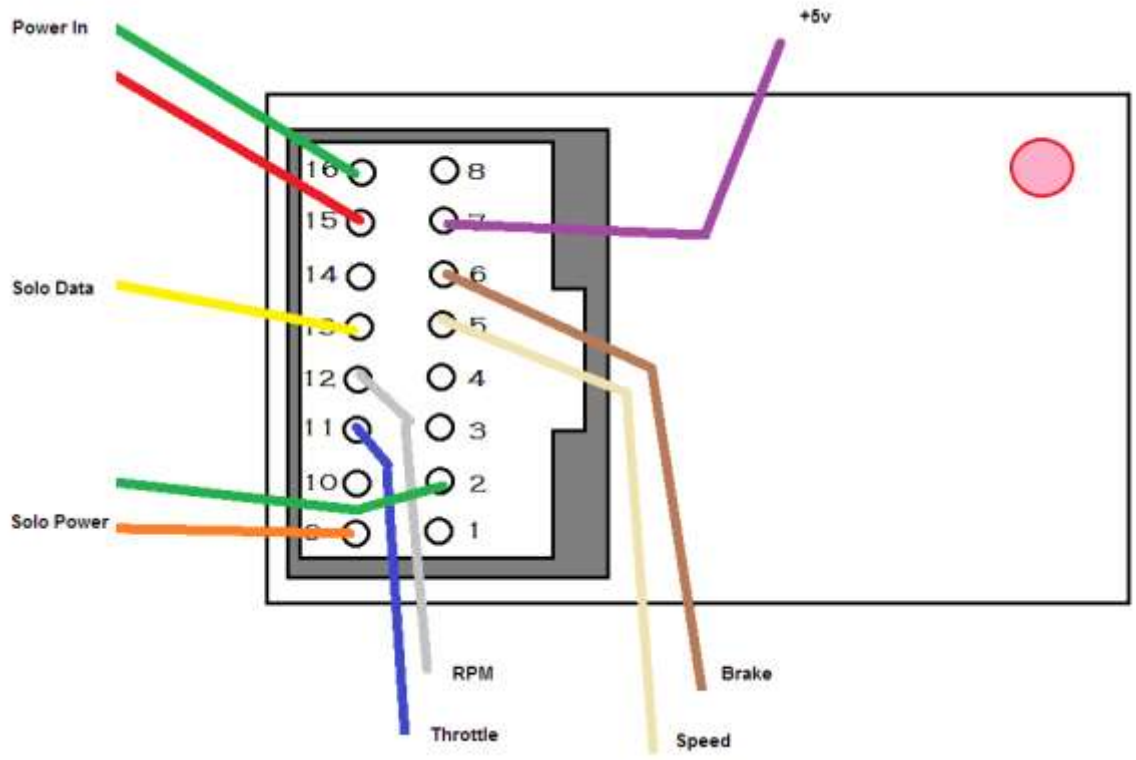
Typical Wiring for Honda Fireblade / 600 Applications.



Ron Haslam Race school wiring

Amp connector - Male	Wire colour	Action	Voltage	Interface pin	Notes
1	Red	Power	12V	15	
2	White	RPM	0-12V	12	
3	Blue	Throttle	0-5V	11	
4	Yellow	Speed	0-5V	5	
5	Brown	F brake	012V	6	1K pull up on PCB
6	Black	Gnd	0V	16	

Typical Wiring for Standard Application



Standard wiring

Wire colour		Action	Voltage	Interface pin	Notes
Red		Power	12V	15	
Green	0V	Chassis 0V	0V	16	
White	Input	RPM	0-12V	12	
Blue	Input	Throttle	0-5V	11	
Purple	Output	Throttle +5v	5V output	7	
Brown	Input	F brake	0-12V	6	
Yellow	Input	Speed	0-12V	5	

Wire colour		Action	Voltage	Interface pin	Notes
Orange	Output	Aim Power	12V	9	
Green	0V	Chassis 0V	0V	2	
Yellow	Output	Aim Comms		5	

Change Light Wiring

Wiring:

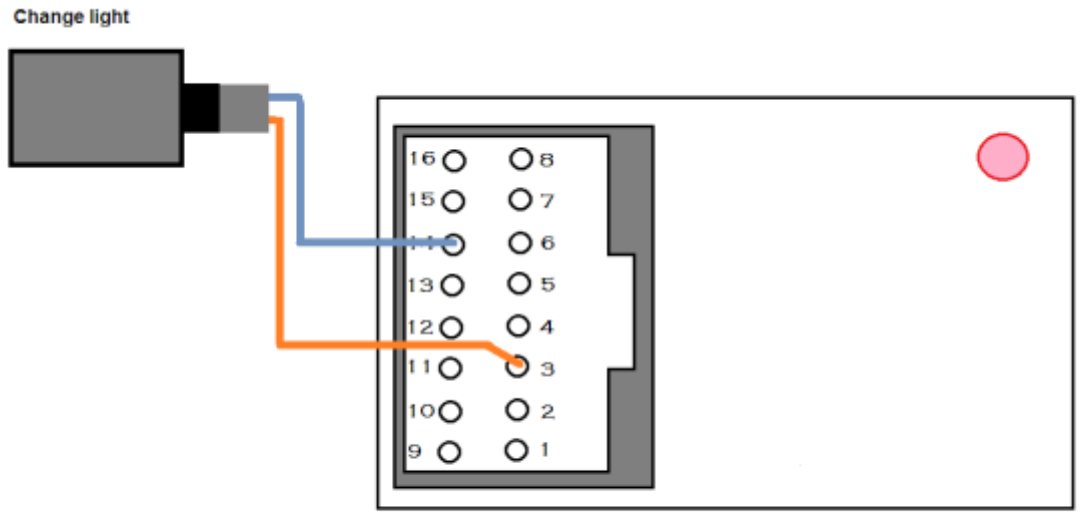
Pin14 (switched to 0v/comms) = -ve cluster

pin 9 or 3 (switched positive) = + ve cluster

Change light is a 12V supply device – don't use a bare wire cluster device

Change light is only active 10 seconds after RPM is detected, this allows the shared comms line time to detect the programming lead and PC program.

When the change light is off, a small amount of current is flowing due to the internal comms function, this may make the cluster glow dimly (the green is more sensitive to this)



Programming lead

The lead connects the ECU-AIM unit RS232 to the PC RS232

The lead feeds a fake RPM from the PC and holds the Speed high and the throttle at full scale
The battery is only in-use when the programming connector is plugged into the ECU-AIM interface
Rs232 extension leads can be used but must be fully wired (ie full RTS/CTS DTE/DTR = 9 wires)
To program the configuration the PC program sends a code word to the interface unit via the Rs232

Programming Software

The software feeds the fake rpm to the unit to maintain the power-on mode
The ECU-AIM interface unit will power up and stream the protocol data

Comm port
Select the correct comm port for communication
Comm Port - > comm 1….12
The selected comm port will be retained next time the program is run

Streaming
The left screen area shows the data being streamed and has a blue surround.

RPM = the PC rpm rate – this is not accurate or constant but will be scaled by the configuration
Speed = 0 as the comms lead is holding the line high
WaterT = 3090 as held up by internal 2K resistor
Throttle = 1023 as comms lead is holding the line high
The channels shown will be the ones enabled

If deselecting any channels in the configuration the channel will stay on the list until refreshed – press the stream tool-bar button to refresh the list

Configuration data
File -> Open / Save
Opens and Saves the configuration files to your PC
The installer will have delivered two example configuration files
Below the open / save selections the last files opened or save are listed, clicking one of these will load it

Sending or reading unit configuration data
Unit -> read configuration / Write configuration
The unit is taken out of streaming mode and the configuration data transfered

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Director: Michael Sharpe, Beng Msc Msc AMIEE
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