AIM Infotech

# ViPec V44-V88 CAN Bus Base and CAN Bus Full protocol

### Release 1.00







This tutorial explains how to connect ViPec V44-V88 to AIM loggers using the CAN Bus. This communication protocol offers two different configurations: a CAN Bus Base (supplied by default) and a CAN Bus Full available downloading a file from AIM website <u>www.aim-sportline.com</u> (See par. 2.2). For any further information concerning ECU firmware / software settings and/or upgrading it is always recommended to address to the ECU dealer.

# 1 Prerequisites

ViPec V44-V88 has a CAN Protocol. For them to correctly communicate with AIM loggers some prerequisites are to be verified:

- ECU Firmware version is to be 4.8.0 or higher;
- ECU serial number is to be 10000 or higher;
- VTS software release is to be 4.8.xxx OR HIGHER.

# 2 Software setup

ViPec V44-V88 ECUs are to be set using VTS software and AIM loggers are to be configured using Race Studio 2 software.

# 2.1 VTS Software setting for CAN Bus Base configuration

To set ViPec V44-V88 ECU CAN Bus Base run the software, load a configuration (File -> open) and follow this path:

ECU Controls -> CAN Configuration as shown here on the right.





"User CAN Setup" panel appears: select Data Rate 1 MBPS.

The panel shows the selected CAN Setup. Press "Load".

Select "Generic Dash.lcc" and press "Open"

CAN Configuration		
CHIN MODULO		
⊙ CAN 1	Data Rate OFF	
(CAN I		
	1 MBP5 500 kBP5	
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	125 kBP5	
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🔤 User CAN Setup		J×
CAN Configuration		-
CAN Module		
O CAN 1	Data Rate 1 MBPS	
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CAN Channels	Channel Data ECU Parameters	
Channel 1 : OFF		
Channel 2 : OFF		
Channel 3 : OFF Channel 4 : OFF	🕀 🔂 Limits	
Channel 5 : OFF	- Auxiliary Outputs	
Channel 6 : OFF	Digital Inputs	
CAN ID	0 -> +++++++++++++++++++++++++++++++++++	
Data Direction	👜 🛅 MotorSport	
	😟 💼 🛅 Electronic Throttle	
<ul> <li>OFF</li> </ul>		
OFF     ECU Transmit	🖬 🔂 Knock Control	
OFF     ECU Transmit     ECU Recieve	Figure 1 - Control     Figure 2 - Control	
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OFF     ECU Transmit     ECU Recieve     Transmit Format     Sequential	B ← Knock Control B ← WT Control B ← EU Logging B ← EU Status	
OFF     CU Transmit     ECU Transmit     ECU Recieve     Transmit Format     Sequential     Compound     CRC32	Move Up Move Down	
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It is now necessary to check the following parameters settings:

- CAN ID: 1000 (1);
- ECU Transmit flag: enabled (2);
- Compound flag: enabled (3).

Once these parameters verified press "Apply" and "OK"  $% \mathcal{O}(\mathcal{O})$ 

The system warns you to check your ECU serial number to verify that it is 10000 or higher. Press "OK" and transmit the configuration to the ECU.

CAN Module	Data Rate 1 MBPS
Data CAN Channels	Channel Data ECU Parameters
Channel 1: OFF Channel 2: OFF Channel 3: OFF Channel 3: OFF Channel 5: OFF Channel 5: OFF Channel 5: OFF CAN ID 1000 Data Direction OFF © ECU Transmit © ECU Transmit © ECU Transmit © ECU Transmit © Compound © Compound © CRC32 Transmit Rate 10 Hz	Ecripie Speed     MaP     MAP     MAP     MAP     MAP     Add      MAP     Add     Add     MAP     Add     Add     MAP     Add     Add     MAP     Add     Add     MAP     Add     Add     MAP     Add     Add     MAP     Add     Add     MAP     Add     Add     Add     MAP     Add     Add     Add     MAP     Add     Add
	Help Apply OK Close
arning	

U.	If this modification is not done the ECU will corrupt signals on the CAN bus. Contact your nearest dealer for further assistance.	
	ОК	

Please note: once "Generic Dash" file loaded, Channels Data" box, highlighted here below, must show exactly the list that follows

CAN Configuration CAN Module	Data Ra	te 1 MBPS
Data CAN Channels	Channel Data	ECU Parameters
Channel 1: Transmit on ID 1000           Channel 2: OFF           Channel 3: OFF           Channel 5: OFF           Channel 6: OFF           Cannel 6: OFF           CAN ID           Data Direction           OFF           ECU Transmit           ECU Transmit           ECU Receive           Transmit Format           Sequential           O Compound           CRC32           Transmit Rate	Horpine Speed     MgP     MgP     BAP     TP (Min)     Tri Duty Cycle     Tri Duty Cycle (Sec)     Tri Duty Cycle (Sec)     Tri Ass Air Flow     Gear     Ini Timina     Move Up     Move Down     Load     Save	Digital Inputs





#### Channel Data list:

Engine speed MAP MGP BAP TP (Main) Inj Duty Cycle Inj Duty Cycle (sec) Inj Actual PW ECT IAT Battery Voltage Mass Air Flow Gear Inj Timing Ign Angle Inlet/LH Posn Inlet/RH Posn Exh/LH Posn Exh/RH Posn WideBand1 WideBand2 Trig1 Err Counter Fault Codes Fuel Pressure Oil Temp Oil Pressure Speed#1 – DI Speed#2 - DI Speed#3 – DI Speed#4 - DI Knk Level Cyl 1 Knk Level Cyl 2 Knk Level Cyl 3 Knk Level Cyl 3 Knk Level Cyl 5 Knk Level Cyl 5 Knk Level Cyl 6 Knk Level Cyl 7 Knk Level Cyl 8 Limits Flags Word

# 2.2 VTS Software setting for CAN Bus Full configuration

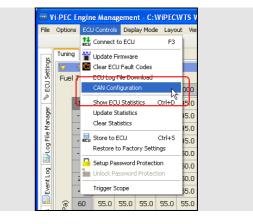
For CAN Bus Full configuration to be correctly loaded through VTS software, a specific file is to be downloaded from AIM website at <u>www.aim-sportline.com</u>, following this path:

• Area download -> ECU connections -> Racing ECU's list-> ViPec.

On bottom of the page – under the list of available ViPec ECU – you find the link to download the configuration file (ViPec\_All\_inputs). Click on it and store the file where you prefer.

Once the file downloaded run VTS software, load a configuration (File -> open) and follow this path:

ECU Controls -> CAN Configuration as shown here on the right.

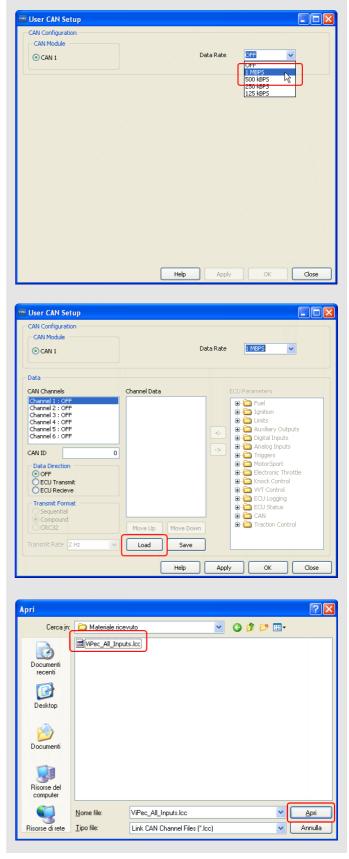




"User CAN Setup" panel appears: select Data Rate 1 MBPS.

The panel shows the selected CAN Setup. Press "Load".

Browse the folders until the one where the file has been stored, select "ViPec\_All\_Inputs.lcc" and press "Open"





It is now necessary to check the following parameters settings:

- CAN ID: 1000 (1);
- ECU Transmit flag: enabled (2);
- Compound flag: enabled (3).

Once these parameters verified press "Apply" and "OK"  $% \mathcal{O}(\mathcal{O})$ 

The system warns you to check your ECU serial number to verify that it is 10000 or higher. Press "OK" and transmit the configuration to the ECU.

Data gine Speed p p (Main) Duty Cycle Duty Cycle (Sec Actual PW T T T tt Voltage ss Air Flow	:)	<. .>	ECU Parameter	on ary Outputs I Inputs Ig Inputs ers	
gine Speed P (Main) Duty Cycle Duty Cycle (Sec Actual PW T T T tt Voltage	:)	<	Fuel     Grintic     Grin	on ary Outputs I Inputs Ig Inputs ers	
			Knock     Knock     Kock     For Current Constraints     For Current Constraints     For Canada Canada     For Canada Canada     For Canada Cana	onic Throttle Control Control Logging Status	
Help		Appl	ly O	к –	Close
	d Sav	d Save	d Save	Up Move Down d Save	Up Move Down d Save

Warning this ECU may not be CAN capable. ECUs before serial number 10000 require a hardware modification to enable CAN. If this modification is not done the ECU will corrupt signals on the CAN bus. Contact your nearest dealer for further assistance.	
ОК	

Please note: once "Generic Dash" file loaded, Channels Data" box, highlighted here below, must show exactly the list that follows

CAN Configuration CAN Module	Data Rate 1 MBP5 💌
Data CAN Channels Channel 1 : Transmit on ID 1000 Channel 2: OFF Channel 4: OFF Channel 5: OFF Channel 6: OFF	Channel Data Engine Speed MAP MGP TP (Main) Inf) Duty Cycle ECU Parameters CU Parameters Cull
CAN ID         1000           Data Direction         OFF           © ECU Transmit         ECU Recieve           Transmit Format         Sequential           © Compound         CRC32	ECT IAT Batt Volkage Gear - Inf Timing - Inf Timing - Inf Timing - Inf Timing - Inf Angle - WideBand 1 - ArR Target - Eul Pressure Move Up Move Down - Inf Timing - Inf Timing - Inf Control - Inf Timing - Inf Control - Inf Timing - Inf Control - Inf Timing - Inf Control - Inf Control - Inf Timing - Inf Control - Inf Control
Transmit Rate 50 Hz	Load Save



#### Channel Data list:

Engine speed
MAP
MGP
TP (Main)
Inj Duty Cycle
ECT
IAT
Battery Voltage
Gear
Inj Timing
Ign Angle
WideBand1

AFR Target Fuel Pressure Oil Temp Oil Pressure Speed#1 – DI Speed#2 - DI Speed#3 – DI Speed#4 - DI AT1 – GP Temp AT2 – GP Temp AT3 – GP Temp AT4 – GT Temp AN Volt 6 AN Volt 7 AN Volt 8 AN Volt 9 AN Volt 10 AN Volt 11 Digital Input 5 Digital Input 5 Digital Input 7 Digital Input 8 Digital Input 9 Digital Input 10

## 2.3 AIM Logger configuration

Once the ECU connected to the logger, this last one is to be configured as connected to the ECU.

Run Race Studio 2 software and follow this path:

- Device Configuration -> Select the device you are using;
- Select the configuration or press "New" to create a new one;
- select ECU manufacturer "ViPec" and ECU Model "CAN\_BUS\_BASE\_LCC" or "CAN\_BUS\_FULL\_LCC" according to the configuration you are using;
- transmit the configuration to the device pressing "Transmit".

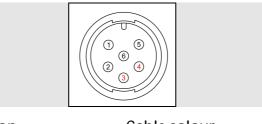


# 3 ECU-AIM devices wiring connection

ViPec V44-V88 ECU CAN Bus is on the bottom right connector shown here below.



On this connector are both CAN and RS232 Protocol. Here below is the connector pinout as well as the connection table.



ECU connector pin	Function	Cable colour	AIM cable
3	CAN High	White	CAN+
4	CAN Low	Green	CAN-



## 4 Available channels

Channels received by AIM loggers connected to ViPec V44-V88 ECU using the CAN bus changes according to the configuration you selected.

Here below are channels available selecting CAN\_Bus\_Base configuration:

ID	CHANNEL NAME	FUNCTION
ECU_1	ECU_RPM	RPM
ECU_2	ECU_SPEED1	Speed 1
ECU_3	ECU_SPEED2	Speed 2
ECU_4	ECU_SPEED3	Speed 3
ECU_5	ECU_SPEED4	Speed 4
ECU_6	ECU_TPS	Throttle Position Sensor
ECU_7	ECU_ECT	Engine coolant temperature
ECU_8	ECU_IAT	Intake air temeprature
ECU_9	ECU_OILT	Oil temperature
ECU_10	ECU_GEAR	Engaged gear
ECU_11	ECU_MAP	Manifold Air pressure
ECU_12	ECU_MGP	Manifold gauge pressure
ECU_13	ECU_BARO	Barometric pressure
ECU_14	ECU_MAF_GR_SEC	Manifold Air flow (g/sec)
ECU_15	ECU_OIL_PRESS	Oil pressure
ECU_16	ECU_FUEL_PRESS	Fuel pressure
ECU_17	ECU_VOLTS	Battery Voltage
ECU_18	ECU_WBO2_LAM1	Lambda 1
ECU_19	ECU_WBO2_LAM2	Lambda 2
ECU_20	ECU_CAM_IN_LF	Camshaft Left inlet position
ECU_21	ECU_CAM_IN_RH	Camshaft Right inlet position
ECU_22	ECU_CAM_EX_LF	Camshaft left exhaust position



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ECU_23	ECU_CAM_EX_RH	Camshaft Right exhaust position
ECU_24	ECU_INJECT_TIM	Injection time
ECU_25	ECU_IGN_TIM	Ignition time
ECU_26	ECU_INJ_DC	Injection dwell counter
ECU_27	ECU_INJ_DC_SEC	Injection dwell counter in seconds
ECU_28	ECU_INJ_PULSE	Injection pulse
ECU_29	ECU_TRIG1_ERR	Trigger 1 error
ECU_30	ECU_FAULT_CODE	Fault code
ECU_31	ECU_KNOCK_LEV1	Knock level 1
ECU_32	ECU_KNOCK_LEV2	Knock level 2
ECU_33	ECU_KNOCK_LEV3	Knock level 3
ECU_34	ECU_KNOCK_LEV4	Knock level 4
ECU_35	ECU_KNOCK_LEV5	Knock level 5
ECU_36	ECU_KNOCK_LEV6	Knock level 6
ECU_37	ECU_KNOCK_LEV7	Knock level 7
ECU_38	ECU_KNOCK_LEV8	Knock level 8
ECU_39	ECU_RPM_LIM	RPM Limiter
ECU_40	ECU_MAP_LIM	Manifold Air pressure limiter
ECU_41	ECU_SPEED_LIM	Speed limiter
ECU_42	ECU_MAX_IGN	Maximum ignition





Here below are channels available selecting CAN\_Bus\_Full configuration:

ID	CHANNEL NAME	FUNCTION
ECU_1	ECU_RPM	RPM
ECU_2	ECU_SPEED1	Speed 1
ECU_3	ECU_SPEED2	Speed 2
ECU_4	ECU_SPEED3	Speed 3
ECU_5	ECU_SPEED4	Speed 4
ECU_6	ECU_TPS	Throttle Position Sensor
ECU_7	ECU_ECT	Engine coolant temperature
ECU_8	ECU_IAT	Intake air temeprature
ECU_9	ECU_OILT	Oil temperature
ECU_10	ECU_GEAR	Engaged gear
ECU_11	ECU_MAP	Manifold Air pressure
ECU_12	ECU_MGP	Manifold gauge pressure
ECU_13	ECU_EGT	Exhaust gas temperature
ECU_14	ECU_ENG_COOL_P	Engine coolant pressure
ECU_15	ECU_OIL_PRESS	Oil pressure
ECU_16	ECU_FUEL_PRESS	Fuel pressure
ECU_17	ECU_BATT_VOLT	Battery Voltage
ECU_18	ECU_WBO2_LAM1	Lambda 1
ECU_19	ECU_AFR_TARGET	Air/Fuel Ratio target
ECU_20	ECU_AT1	GP Temp 1
ECU_21	ECU_AT2	GP Temp 2
ECU_22	ECU_AT3	GP Temp 3
ECU_23	ECU_AT4	GP Temp 4
ECU_24	ECU_INJ_TIM	Ignition time
ECU_25	ECU_IGN_TIM	ECU Ignition time
ECU_26	ECU_INJ_DC	Injection dwell counter
ECU_27	ECU_EXH_BACK_P	exhausted bak pressure
ECU_28	ECU_CRANK_PR	Crank Pressure
ECU_29	ECU_DIFF_TEMP	Differential control temperature



ECU_30	ECU_AN_VOLT11	Analog voltage 11
ECU_31	ECU_DIG_IN5	Digital input 5
ECU_32	ECU_DIG_IN6	Digital input 6
ECU_33	ECU_DIG_IN7	Digital input 7
ECU_34	ECU_DIG_IN8	Digital input 8
ECU_35	ECU_DIG_IN9	Digital input 9
ECU_36	ECU_DIG_IN10	Digital input 10