AiM Infotech

ECU GEMS for Mitsubishi Lancer EVO9 – 1Mhz

Release 1.01

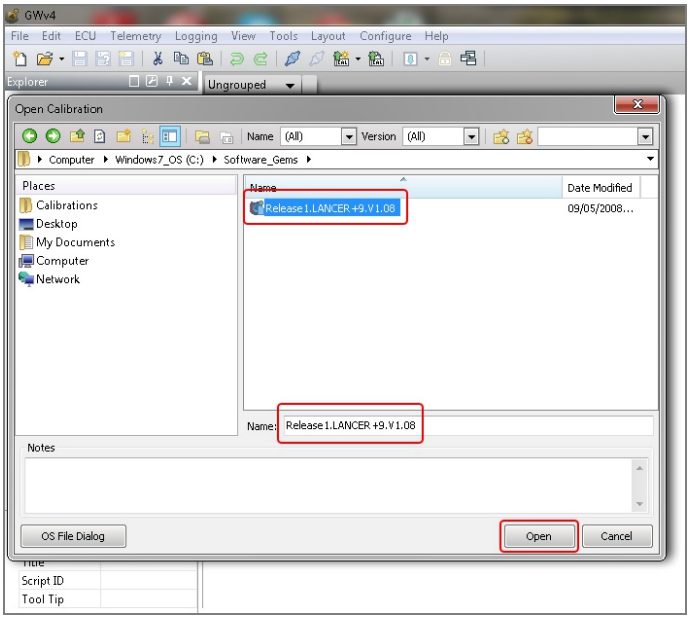
ECU

This tutorial explains how to connect GEMS ECU to Mitsubishi Lancer EVO9. Please refer to GEMS website – www.gems.co.uk – for further information about EVO P&P kits.

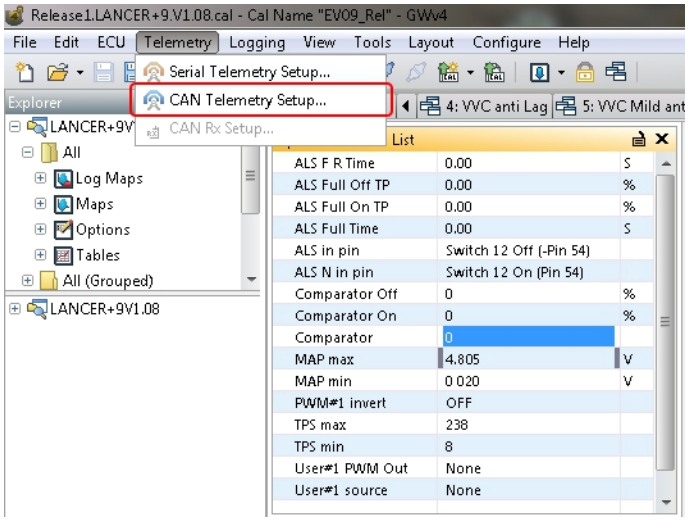
1 Software setting

Gems ECU needs a software set up to correctly communicate with Mitsubishi Lancer EVO9 cars. The software – GWv4 – can be downloaded from GEMS website. To perform the setting follow these steps.

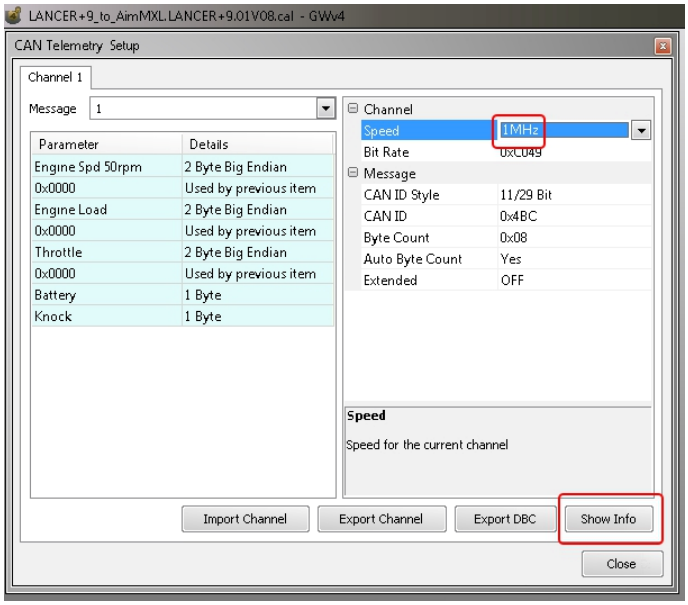
- Run "GWv4" software
- Follow this path: "File –> Open" and import and load the calibration file as showed here on the right.



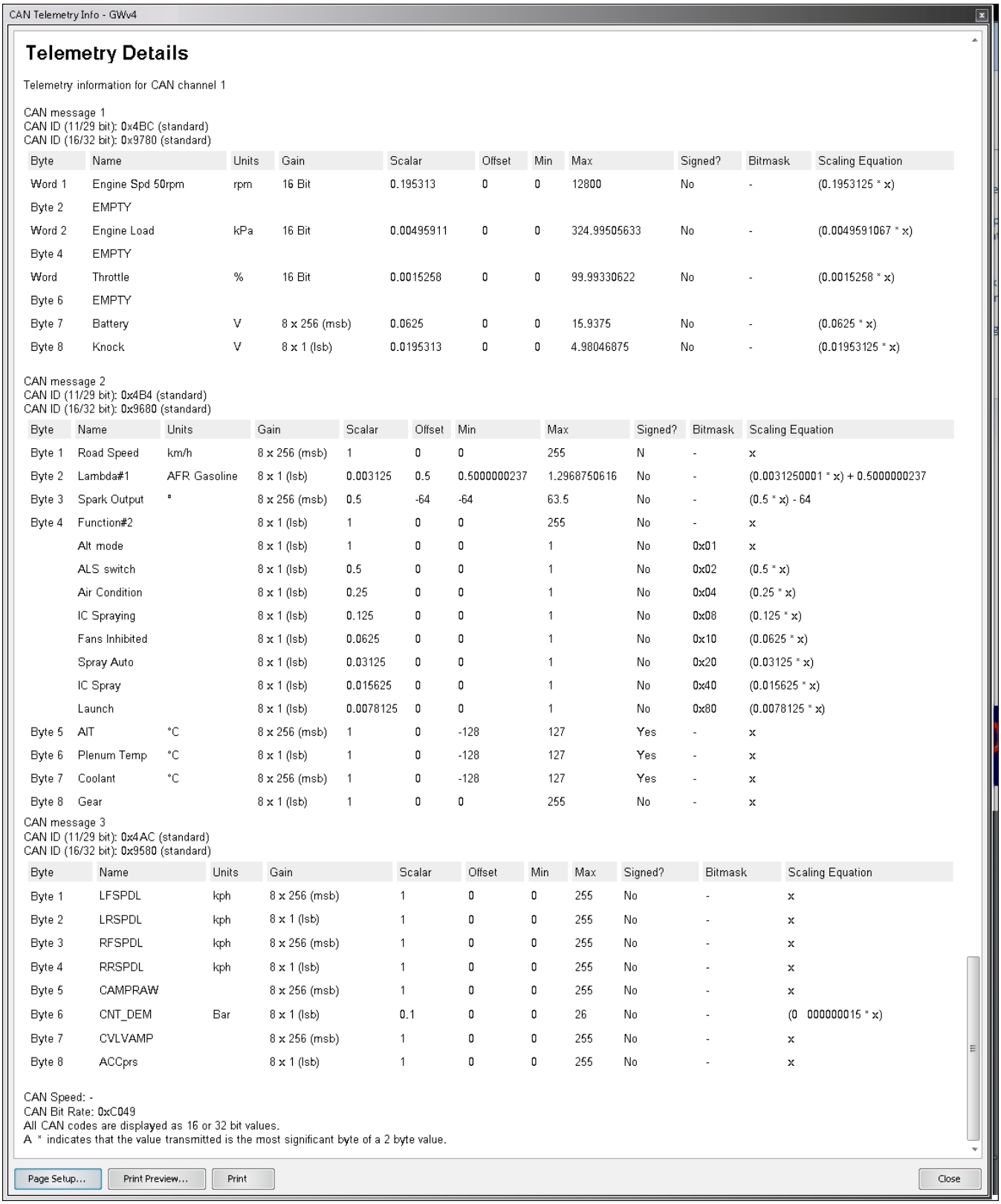
- Follow this path: "Telemetry –>CAN Telemetry Setup..."



- Select CAN speed 1Mhz
- Press "Show Info"



"CAN Telemetry Info" window appears. Check that all values are as shown here below



CAN Telemetry Info - GWv4

Telemetry Details

Telemetry information for CAN channel 1

CAN message 1
CAN ID (11/29 bit): 0x4BC (standard)
CAN ID (16/32 bit): 0x9780 (standard)

Byte	Name	Units	Gain	Scalar	Offset	Min	Max	Signed?	Bitmask	Scaling Equation
Word 1	Engine Spd 50rpm	rpm	16 Bit	0.195313	0	0	12800	No	-	(0.1953125 * x)
Byte 2	EMPTY									
Word 2	Engine Load	kPa	16 Bit	0.00495911	0	0	324.99505633	No	-	(0.0049591067 * x)
Byte 4	EMPTY									
Word	Throttle	%	16 Bit	0.0015258	0	0	99.99330622	No	-	(0.0015258 * x)
Byte 6	EMPTY									
Byte 7	Battery	V	8 x 256 (msb)	0.0625	0	0	15.9375	No	-	(0.0625 * x)
Byte 8	Knock	V	8 x 1 (lsb)	0.0195313	0	0	4.98046875	No	-	(0.01953125 * x)

CAN message 2
CAN ID (11/29 bit): 0x4B4 (standard)
CAN ID (16/32 bit): 0x9680 (standard)

Byte	Name	Units	Gain	Scalar	Offset	Min	Max	Signed?	Bitmask	Scaling Equation
Byte 1	Road Speed	km/h	8 x 256 (msb)	1	0	0	255	N	-	x
Byte 2	Lambda#1	AFR Gasoline	8 x 1 (lsb)	0.003125	0.5	0.5000000237	1.2968750616	No	-	(0.0031250001 * x) + 0.5000000237
Byte 3	Spark Output	°	8 x 256 (msb)	0.5	-64	-64	63.5	No	-	(0.5 * x) - 64
Byte 4	Function#2		8 x 1 (lsb)	1	0	0	255	No	-	x
	Alt mode		8 x 1 (lsb)	1	0	0	1	No	0x01	x
	ALS switch		8 x 1 (lsb)	0.5	0	0	1	No	0x02	(0.5 * x)
	Air Condition		8 x 1 (lsb)	0.25	0	0	1	No	0x04	(0.25 * x)
	IC Spraying		8 x 1 (lsb)	0.125	0	0	1	No	0x08	(0.125 * x)
	Fans Inhibited		8 x 1 (lsb)	0.0625	0	0	1	No	0x10	(0.0625 * x)
	Spray Auto		8 x 1 (lsb)	0.03125	0	0	1	No	0x20	(0.03125 * x)
	IC Spray		8 x 1 (lsb)	0.015625	0	0	1	No	0x40	(0.015625 * x)
	Launch		8 x 1 (lsb)	0.0078125	0	0	1	No	0x80	(0.0078125 * x)
Byte 5	AIT	°C	8 x 256 (msb)	1	0	-128	127	Yes	-	x
Byte 6	Plenum Temp	°C	8 x 1 (lsb)	1	0	-128	127	Yes	-	x
Byte 7	Coolant	°C	8 x 256 (msb)	1	0	-128	127	Yes	-	x
Byte 8	Gear		8 x 1 (lsb)	1	0	0	255	No	-	x

CAN message 3
CAN ID (11/29 bit): 0x4AC (standard)
CAN ID (16/32 bit): 0x9580 (standard)

Byte	Name	Units	Gain	Scalar	Offset	Min	Max	Signed?	Bitmask	Scaling Equation
Byte 1	LFSPDL	kph	8 x 256 (msb)	1	0	0	255	No	-	x
Byte 2	LRSPDL	kph	8 x 1 (lsb)	1	0	0	255	No	-	x
Byte 3	RFSPDL	kph	8 x 256 (msb)	1	0	0	255	No	-	x
Byte 4	RRSPDL	kph	8 x 1 (lsb)	1	0	0	255	No	-	x
Byte 5	CAMPRAW		8 x 256 (msb)	1	0	0	255	No	-	x
Byte 6	CNT_DEM	Bar	8 x 1 (lsb)	0.1	0	0	26	No	-	(0 000000015 * x)
Byte 7	CVLVAMP		8 x 256 (msb)	1	0	0	255	No	-	x
Byte 8	ACCprs		8 x 1 (lsb)	1	0	0	255	No	-	x

CAN Speed: -
CAN Bit Rate: 0xC049
All CAN codes are displayed as 16 or 32 bit values.
A * indicates that the value transmitted is the most significant byte of a 2 byte value.

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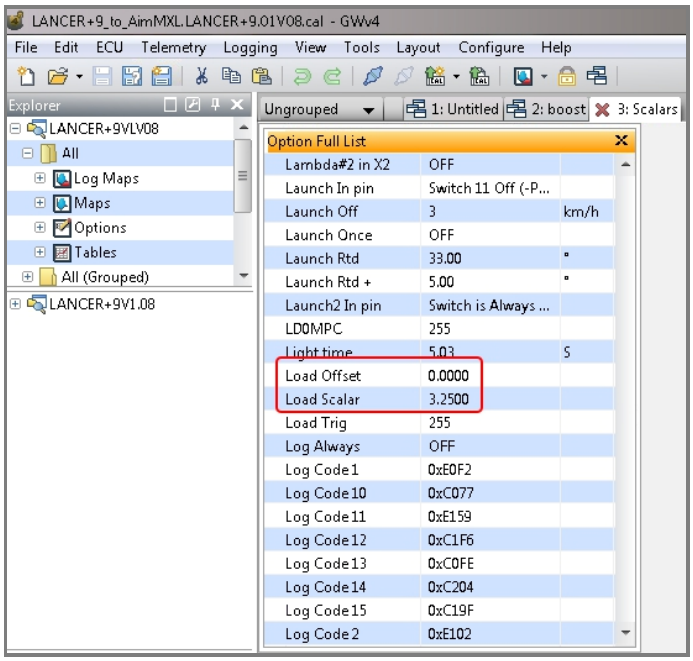
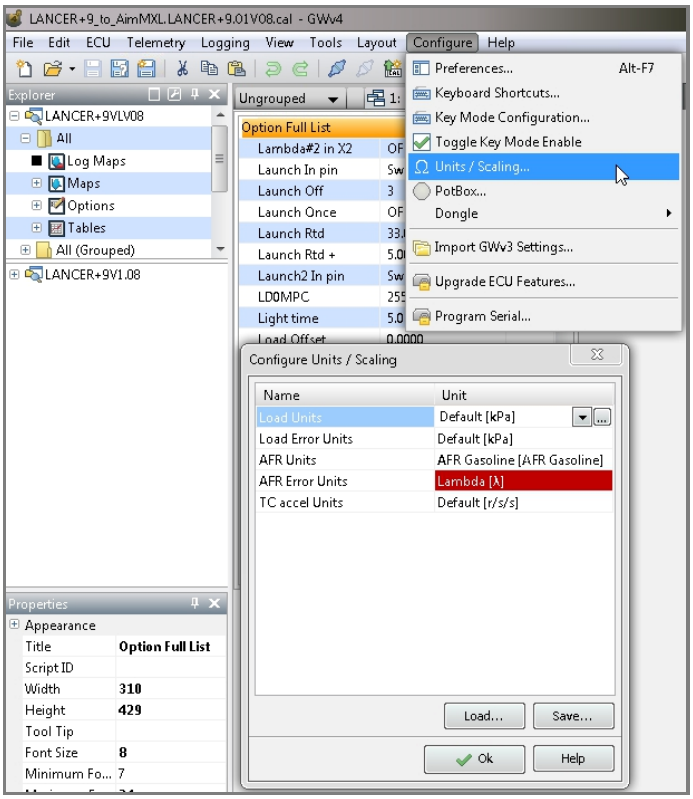
If any "Offset" or "Scalar" value is different it is necessary to set it manually.

- Select "Load Offset" or "Load Scalar" as shown here on the right.

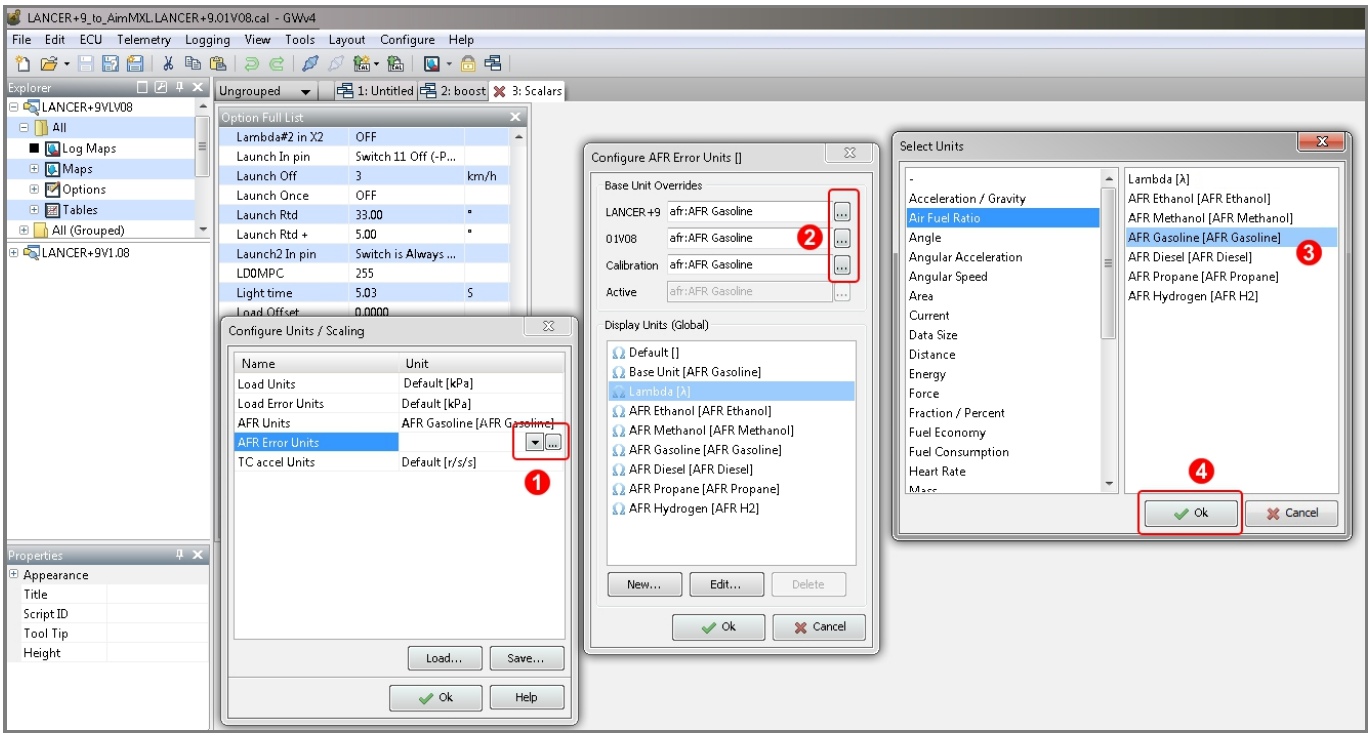


- Follow this path: "Configure –> Units/Scaling..." and select the Name to set



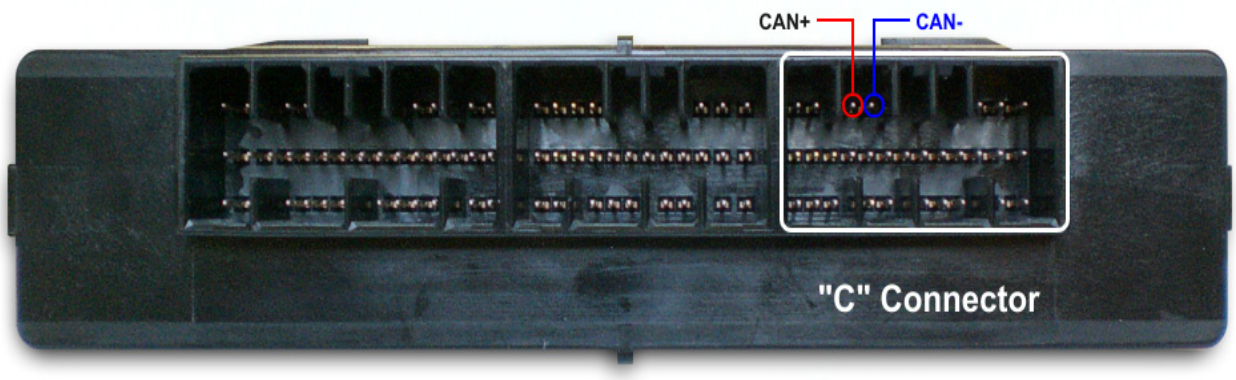
To set the desired Name:

- Activate the dedicated panel (1)
- Set it (2) using the panel that appears (3)
- click "OK" to apply modifications.



2
CAN bus connection

GEMS ECU features a data transmission bus based on CAN on the right front connector. The ECU has three front connectors named "A", "B" and "C". The right one is called "C" Here below you see the connector pinout and connection table.



"C" connector pin	Pin function	AiM cable
C3	CAN+	CAN+
C4	CAN-	CAN-

3
AiM device configuration

Before connecting AiM device to the ECU set it up as follows:

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 “GEMS” and ECU Model “Lancer+9 (CAN 1 Mbit)”
- transmit the configuration to the device pressing “Transmit”.

4
Available channels

Channels received by AiM devices connected to "GEMS" "Lancer+9 1Mbit" protocol are.

ID	CHANNEL NAME	FUNCTION
ECU_1	E9_ENGINE_SPEED	RPM
ECU_2	E9_ROAD_SPEED	Vehicle speed
ECU_3	E9_THROTTLE	Throttle position sensor
ECU_4	E9_ENGINE_LOAD	Engine load
ECU_5	E9_AIT	Pre compressor intake air temperature
ECU_6	E9_COOLANT	Engine coolant temperature
ECU_7	E9_BATTERY	Battery supply
ECU_8	E9_KNOCK	Knock sensor
ECU_9	E9_LAMBDA1	Lambda Value 1
ECU_10	E9_SPARK_OUT	Spark output
ECU_11	E9_FUNCTION2	Function #2
ECU_12	E9_PLENUM_TEMP	Post compressor and post intercooler intake air temperature
ECU_13	E9_CAMPRAW	Raw electrical current in the proportional valve (ACD)
ECU_14	E9_CVLVAMP	Demanded control current in proportional valve (ACD)
ECU_15	E9_GEAR	Engager gear
ECU_16	E9_LFSPDL	Front left wheel speed
ECU_17	E9_LRSPLD	Rear left wheel speed
ECU_18	E9_RFSPDL	Front right wheel speed
ECU_19	E9_RRSPDL	Rear right wheel speed
ECU_20	E9_CNT_DEM	Control demand
ECU_21	E9_ACCPrs	Accumulator pressude (ACD)
ECU_22	E9_LAUNCH	Launch ON/OFF
ECU_23	E9_IC_SPRAY	Intercooler spray
ECU_24	E9_SPRAY_AUTO	IC spray controlled by user defined option and triggered automatically
ECU_25	E9_FANS_INHIB	FANS inhibited ON/OFF
ECU_26	E9_IC_SPRAYING	Intercooler spray is currently active and spraying
ECU_27	E9_ALS_ACT	ALS active ON/OFF
ECU_28	E9_ALT_MODE	ALT mode ON/OFF