

AiM User Manual

Channel Expansion connection and configuration for AiM loggers

Release 1.01



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Introduction

Channel Expansion is an external expansion module that allows to increase the range of data available for analysis reducing moreover the requested vehicle wiring. Its part number is: **X08CHEXR1**.

Channel Expansion permits the connection of four sensors:

- CH1: analog 0-5V: pressure sensors, potentiometers, thermo-resistors or digital: speed sensor
- CH2: analog 0-5V: pressure sensors, potentiometers, thermo-resistors or digital: speed sensor
- CH3: analog 0-5V: pressure sensors, potentiometers, thermo-resistors
- CH4: analog 0-5V: pressure sensors, potentiometers, thermo-resistors

Please note: if CH1/CH2 is set digital, also CH2/CH1 has to be configured as digital

N.B.: **thermocouples** are not supported.

More Channel Expansions can be connected to create a network. AiM network can support up to 16 expansion modules like GPS Module, Channel Expansion, TC Hub etc.

If the network includes SmartyCam an additional power source for the network is needed and this can be provided by a 2 or 4 ways Data Hub; this last one needs an external power cable whose part number is: **V02557020**. LCU One CAN can work as additional power supply to the network.

AiM recommends to always install Channel Expansion far from heat sources and from source of electromagnetic interference.

2 Configuration

Before using Channel Expansion load it in the configuration of the AiM logger it is connected to and then configure it.

To load Channel Expansion in AiM logger configuration:

- run Race Studio 3
- click on the configuration "Channel Expansion" is to be added to or create a new one
- select "CAN Expansions" layer
- if the selected configuration has no loaded expansions "Expansions" panel shows up and you can select "Channel Expansion"; if the configuration already features one or more expansions press "New expansion" and select "Channel Expansion"
- fill in Expansion name – 6 characters max; the name you fill in is by default added to the four channels name
- press "Get S.N. from a connected expansion" or fill in the serial number you find on the device side as shown here below and press "OK"

Expansion Name (6 characters max.)

Expansion Serial Number (S.N.)

Get S.N. from a connected Expansion

ID	<input checked="" type="checkbox"/>	Name	Function	Sensor	Unit	Freq
C01	<input checked="" type="checkbox"/>	FrontL__Channel01	Voltage	Generic 0-5 V	mV	20 Hz
C02	<input checked="" type="checkbox"/>	FrontL__Channel02	Voltage	Generic 0-5 V	mV	20 Hz
C03	<input checked="" type="checkbox"/>	FrontL__Channel03	Voltage	Generic 0-5 V	mV	20 Hz
C04	<input checked="" type="checkbox"/>	FrontL__Channel04	Voltage	Generic 0-5 V	mV	20 Hz

Close

To set up Channel Expansion:

- click the corresponding row of "Sensor type" column
- channels setting panel show up; set:
 - name
 - function
 - sensor
 - sampling frequency
 - unit of measure

Channel Expansion channels are enabled by default.

To set channel 1 and 2 as speed inputs:

- click the corresponding row of "Sensor type" column
- "Channels setting" panel show up: select "Speed" option as function and choose between vehicle speed and wheel speed
 - **vehicle speed:** set sampling frequency, unit of measure, display precision and fill in wheel circumference and pulses for wheel revolution;
 - **wheel speed:** set position, sampling frequency, unit of measure, display precision and fill in wheel circumference and pulses for wheel revolution;
- both channels are automatically set as speed input.

When channels configuration is over you need to **calibrate/auto-calibrate** sensors that need it, to say:

- **calibrate:** gear sensor, zero based and mid zero potentiometer
- **auto-calibrate:** accelerometer, gyroscope and distance potentiometer.

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Connecting the sensors

AiM sensors are all cabled with plastic Binder connector while Channel Expansion is equipped with metallic Binder; this is why extension cables – commonly referred to as XG extension cables – are mandatory. Available extension cables are ranging from 50 to 300 cm but custom length can be ordered. Ready to ship extension cables part numbers are:

- **V02PCB05BTXG:** 50 cm (19.68 inches)
- **V02PCB10BTXG:** 100 cm (39.37 inches)
- **V02PCB15BTXG:** 150 cm (59.05 inches)
- **V02PCB20BTXG:** 200 cm (78.74 inches)
- **V02PCB25BTXG:** 250 cm (98.42 inches)
- **V02PCB30BTXG:** 300 cm (118.11 inches)



3.1

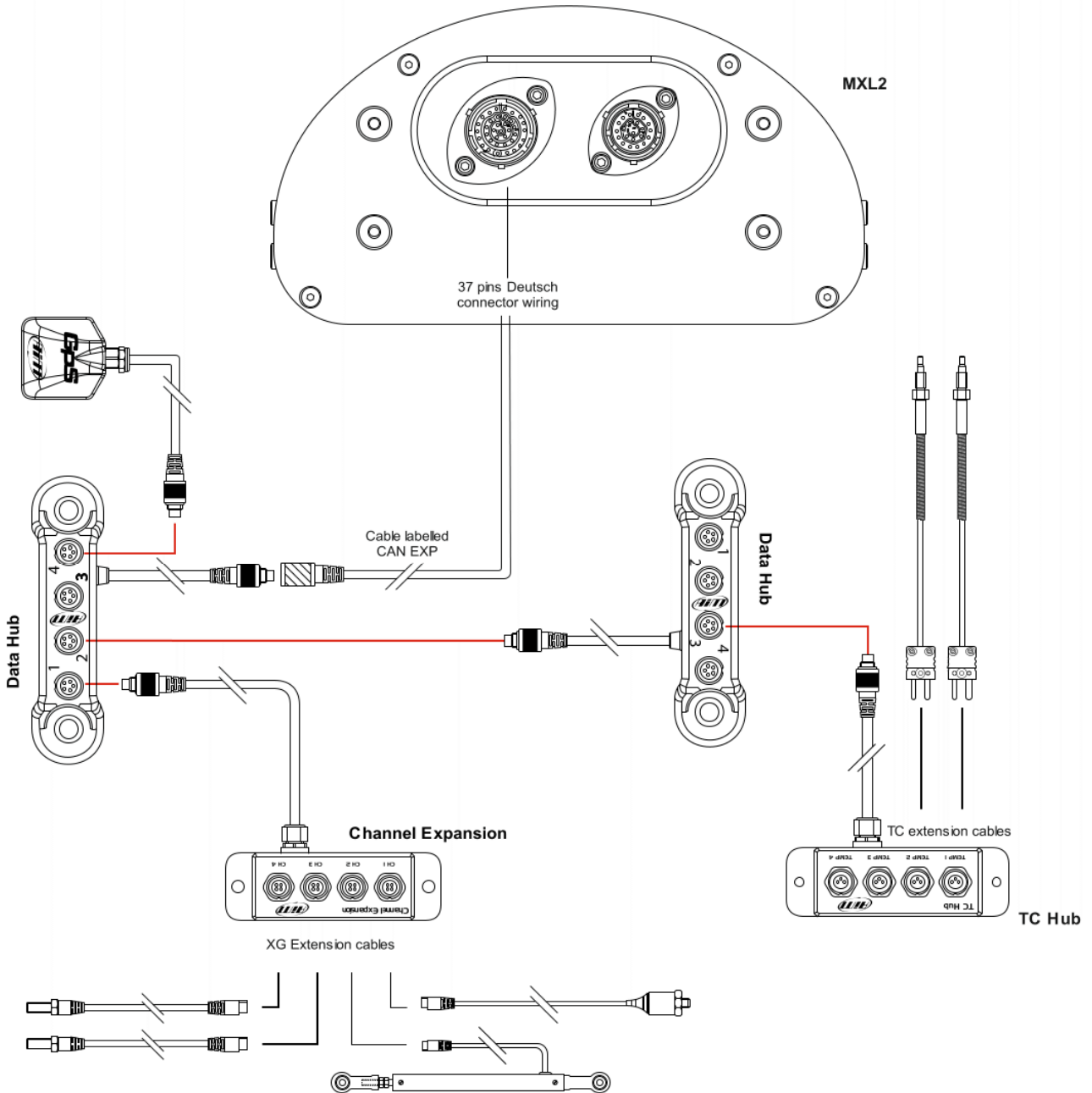
Connecting Channel Expansion to AiM logger

To connect it to AiM loggers you need a CAN extension cable. Available extension cables are ranging from 50 to 350 cm but custom length can be ordered. The most used extension cables part numbers are:

- **V02552700:** 100 cm (39.37 inches)
- **V02552710:** 150 cm (59.05 inches)
- **V02552720:** 200 cm (78.74 inches)

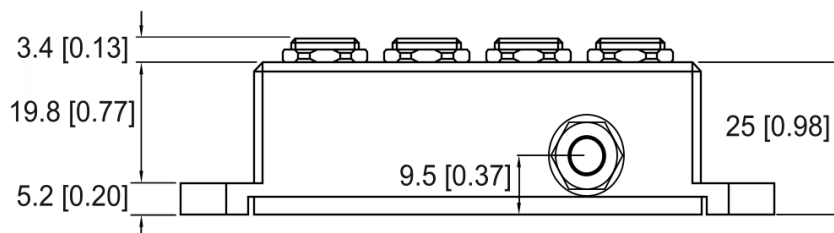
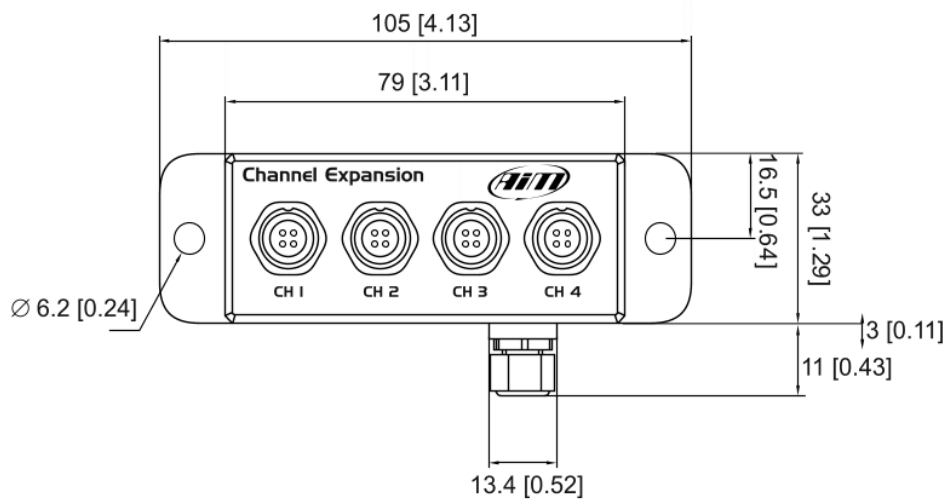
To connect Channel Expansion to AiM use cable labelled "CAN EXP" of 37 pins Deutsch connector wiring of AiM loggers

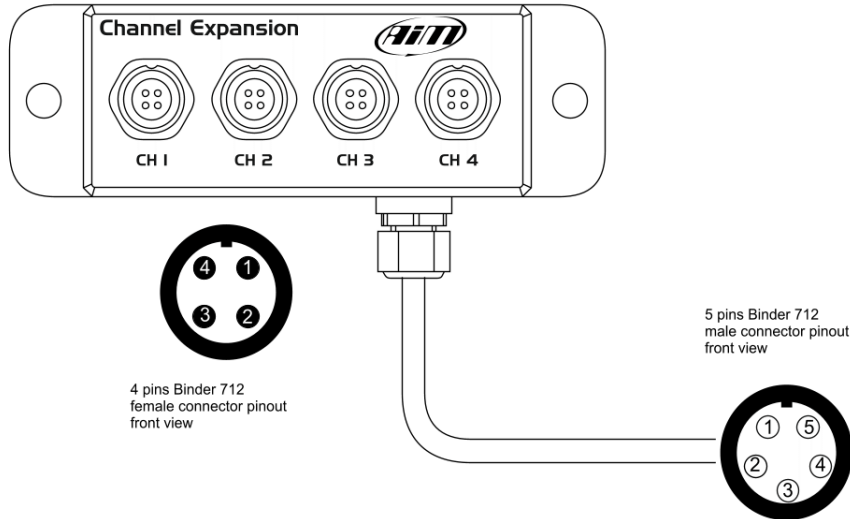
The image below shows an example of AiM network featuring an AiM logger and different external expansion modules with the related sensors.



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Dimensions, pinout and technical characteristics





**4 pins Binder 712 female connector pinout
(CH 1, CH 2, CH 3, CH 4)**

Pin	Function
1	Analog input (1-4)
2	GND
3	+VB
4	+VRef

5 pins Binder 712 male connector pinout

Pin	Function
1	CAN+
2	GND
3	+VB
4	CAN-
5	+Vbext

Here below is a table showing the max supplied current for each Channel Expansion Vref

Vref =5V		Max supplied current in mA
Vref1	Channel 1	50
	Channel 2	
Vref2	Channel 3	50
	Channel 4	

Channel Expansion is waterproof **IP65**.
Channel Expansion cable length: 150 cm (5.90 inches).