ECUMASTER ADU

Application Note

ECUMASTER EMU CLASSIC with CAN MODULE

Revision 1.01

1. Copyright and trademarks

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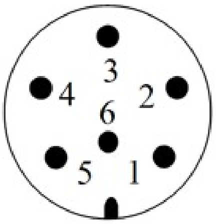
2. Introduction

This application note explains how to connect and configure the ADU with an ECUMASTER EMU CLASSIC using the CAN BUS module and CAN BUS communication.

3. Electrical connection

The ECUMASTER EMU is able to send standard log stream over the CAN BUS. However, CAN BUS support is possible only with the external CAN BUS module.
The CAN BUS module has 2 circular connectors. The 5 way connector is used to connect to the EMU extension port. The 6 way circular connector has two terminals for CAN bus, as well as 4 extra analog inputs

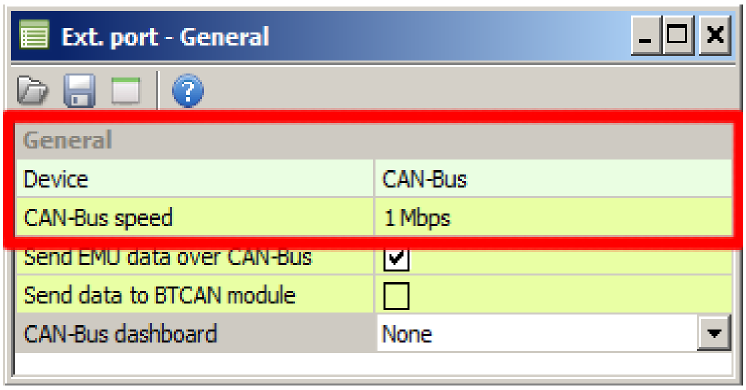
	1 - **CAN L**
	2 - Extra analog in #1
	3 - Extra analog in #2
	4 - Extra analog in #3
	5 – **CAN H**
	6 - Extra analog in #4

There are two options for connection. If the EMU CAN bus speed is set to 1Mbps then you may use ADU CAN1 or CAN2. If the EMU CAN bus speed is set to 500kbps then you may only use ADU CAN2.

CAN BUS module	ADU CAN1	ADU CAN2	Comment
1	4	6	CAN L
5	3	5	CAN H

Twisted pair cable is required for any CAN BUS connection.
Ensure that the CAN BUS is properly terminated.

4. ADU and EMU CLASSIC configuration



Ext. port - General

General	
Device	CAN-Bus
CAN-Bus speed	1 Mbps
Send EMU data over CAN-Bus	☑
Send data to BTCAN module	☐
CAN-Bus dashboard	None

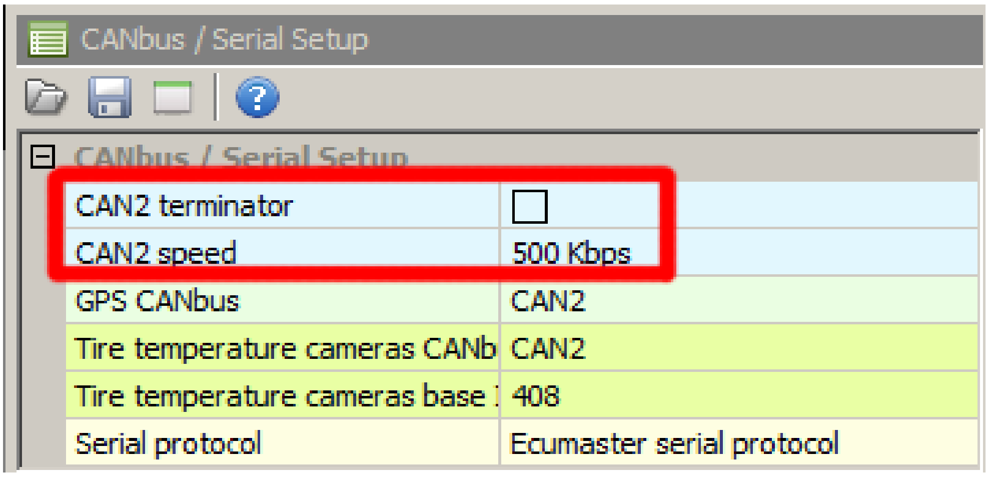
The first step is to enable the EMU standard output stream over CAN Bus. This option can be found under "Ext. port / *General",* accessible via the task bar on the left side of the software.

It is important to select the proper CAN BUS speed. If you choose to connect the ECU to ADU CAN1 or CAN2 at 1Mbps then you need to select 1Mbit speed. If you choose to connect to CAN2 with 500kbps speed, you must select 500kbit.

Additionally, *Send emu stream over CAN-Bus* check should be selected.

If you plan to use ADU CAN1, there is a fixed speed of 1Mbps and no CAN configuration is required. If you plan to connect the EMU CLASSIC to ADU CAN2, you need to set the proper CAN BUS speed and termination in ADU configuration.

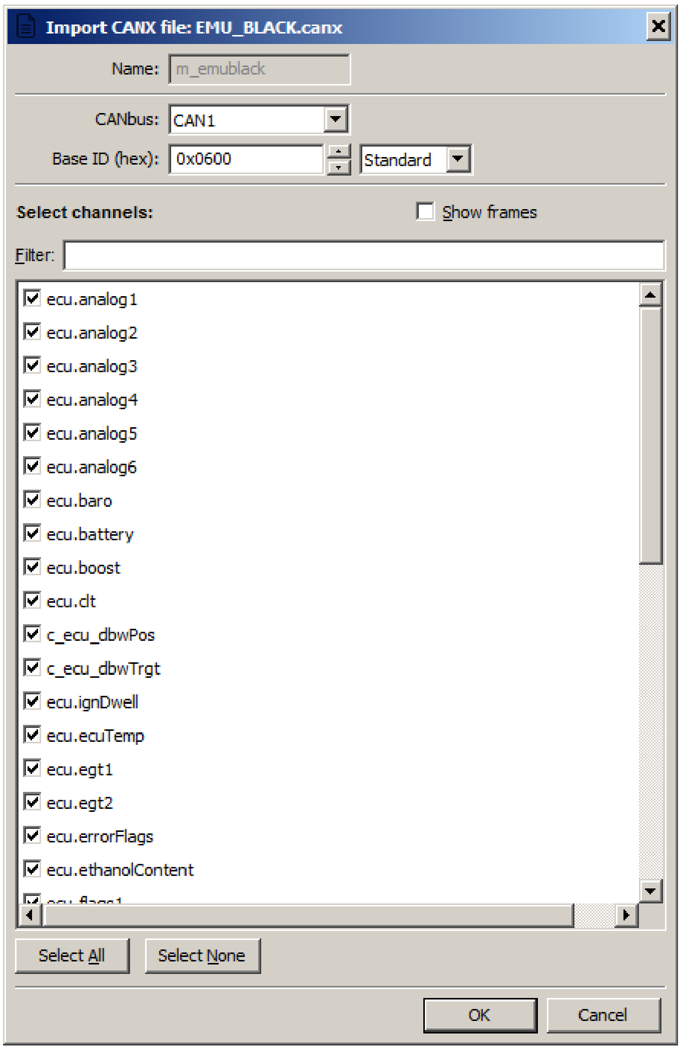
To open the CAN2 configuration, press F9 to show pane selector. Then open "*General / CAN BUS Serial setup".* Select the appropriate CAN2 speed and termination.



CANbus / Serial Setup

CANbus / Serial Setup	
CAN2 terminator	☐
CAN2 speed	500 Kbps
GPS CANbus	CAN2
Tire temperature cameras CANb	CAN2
Tire temperature cameras base	408
Serial protocol	Ecumaster serial protocol

The next important step is loading proper CANX file with EMU standard stream channels definition. On the Project tree press Add button and select Import .CANX file. When the file dialog opens, select "*emu_black.canx"* file. The following dialog appears:



Import CANX file: EMU_BLACK.canx

Name: m_emublack

CANbus: CAN1

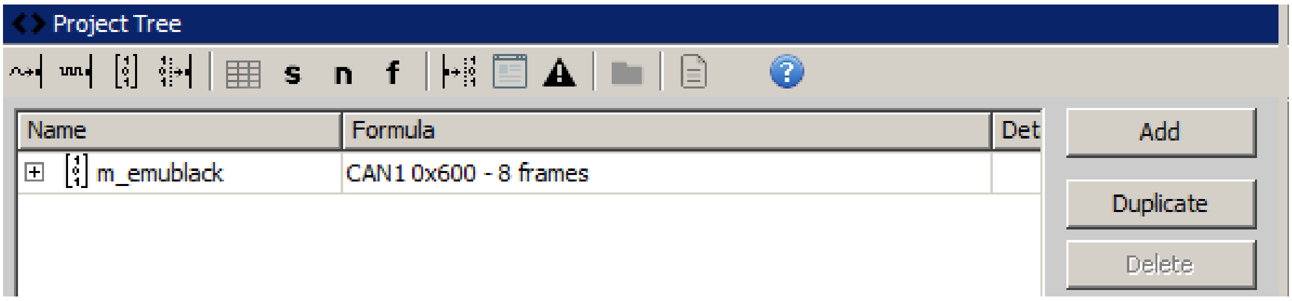
Base ID (hex): 0x0600 Standard

Select channels: □ Show frames

Filter:

- ☑ ecu.analog1
- ☑ ecu.analog2
- ☑ ecu.analog3
- ☑ ecu.analog4
- ☑ ecu.analog5
- ☑ ecu.analog6
- ☑ ecu.baro
- ☑ ecu.battery
- ☑ ecu.boost
- ☑ ecu.clt
- ☑ c_ecu_dbwPos
- ☑ c_ecu_dbwTrgt
- ☑ ecu.ignDwell
- ☑ ecu.ecuTemp
- ☑ ecu.egt1
- ☑ ecu.egt2
- ☑ ecu.errorFlags
- ☑ ecu.ethanolContent
- ☑ ecu.flags1

In this menu you should select the CAN BUS network that will be used for communication (CAN1 or CAN2) and which channels you want to read. In most situations all channels should be loaded (Select All). The project tree should look like the following:



Project Tree

Name	Formula	Det
m_emublack	CAN1 0x600 - 8 frames	

If you open "*m_emublack* mob", all available CAN inputs should be visible.

5. Supported channels

ADU channel	Description
ecu.analog1	Analog input #1
ecu.analog2	Analog input #2
ecu.analog3	Analog input #3
ecu.analog4	Analog input #4
ecu.baro	Barometric pressure
ecu.battery	Battery voltage
ecu.boost	Boost level
ecu.clt	Engine coolant temperature
ecu.ecuTemp	ECU internal temperature
ecu.egt1	Exhaust gas temperature 1
ecu.egt2	Exhaust gas temperature 2
ecu.errorFlags	The following flags are available: - cltSensor error - iatSensor error - mapSensor error - wboSensor error - egt1Sensor error - egt2Sensor error - egtAlarm error - knocking - ffSensor error - dbwFailure error
ecu.ethanolContent	Fuel ethanol content
ecu.flags1	The following flags are available: - gearCut active - ALS active - launch control active - idle state - current table set - TC intervention - pit limiter active
ecu.flags2	The following flags are available:

	- parametricOutput#1 state - parametricOutput#2 state - parametricOutput#3 state - virtualOutput#1 state - virtualOutput#2 state
ecu.flags3	The following flags are available: - canSwitch#1 state - canSwitch#2 state - canSwitch#3 state - canSwitch#4 state - canSwitch#5 state - canSwitch#6 state - canSwitch#7 state - canSwitch#8 state
ecu.flags4	The following flags are available: - Mux switch #1 state - Mux switch #2 state - Mux switch #3 state
ecu.flags5	The following flags are available: - fuel pump state - radiator fan state - AC clutch state - AC fan state - nitrous state
ecu.fuelPress	Fuel pressure
ecu.gear	Current gear
ecu.iat	Intake manifold temperature
ecu.ignAngle	Ignition advance
ecu.ignDwell	Ignition dwell
ecu.injDC	Injector duty cycle
ecu.injPW	Injector pulsewidth
ecu.lambda1	Lambda from oxygen sensor #1
ecu.lambda1Trim	Current lambda #1 fuel trim
ecu.map	Manifold absolute pressure
ecu.oilPress	Engine oil pressure
ecu.oilTemp	Engine oil temperature

ecu.rpm	Engine RPM
ecu.speed	Vehicle speed
ecu.tps	Throttle position sensor
c_ecu_dbwPos	Actual electronic throttle position
c_ecu_dbwTrgt	Electronic throttle target
c_ecu_pitLTrqRdc	Pit limiter torque reduction
c_ecu_tcDrpm	Traction control delta RPM
c_ecu_tcDrpmRaw	Traction control delta RPM raw
c_ecu_tcTrqRdc	Traction control torque reduction

6. Revision log

1.01

- ADU CAN terminals description fixed