# **ATmega Flashing**

Please follow steps to flash ATmega with current CPM ATmega Firmware.

- Current Firmware: https://github.com/embedded-software-laboratory/cpm\_lab/tree/master/low\_level\_controller
- For questions, please contact Patrick Scheffe

Steps require Main Vehicle PCB to be connected to vehicle to provide power

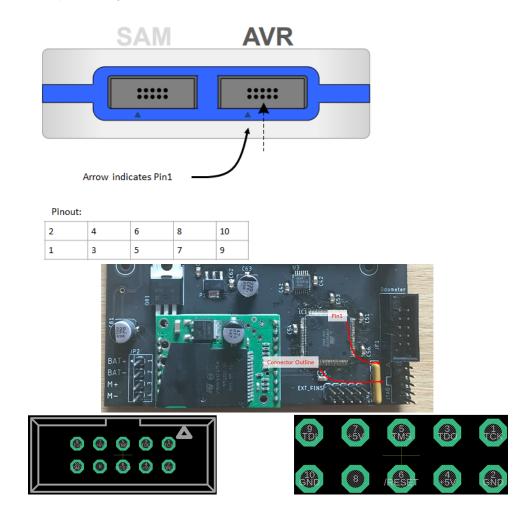
#### 1. Atmel Studio 7.0

- 1. Start Atmel Studio 7.0
- 2. Load current vehicle firmware solution "vehicle\_atmega2560\_firmware.atsln"

## 2. ICE Programmer

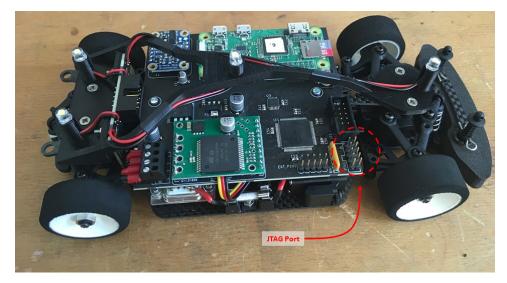
Make sure vehicle is powered off before connecting the programmer!

1. Check pinout of Programmer, Vehicle and Connector Cable:



2. With vehicle power OFF, connect ICE programmer AVR Port to JTAG header.

3. Connect ICE programmer with USB cable to PC.



## 3. Fuses

- Turn ON vehicle
   Connect to ATmega Chip with *ToolsDevice Programming* 
   a. Click *Apply* b. Click *Read* 

   Set the correct fuses (see table and screenshot below)
   Click *Program*

Fuse	Correct Setting
HIGH.SPIEN	Unchecked
HIGH.EESAVE	Optional i.e. checked or unchecked
LOW.CKDIV8	Unchecked
LOW.SUT_CKSEL	Ext. Crystal Osc. 8.0- MHz; Start-up time: 16 CK + 65ms

JTAGICE3 (J3	30200031963) - [	Device Programming						?	×	
Tool	Device	Interface	Device signature	Target Voltage						
JTAGICE3	<ul> <li>ATmega25</li> </ul>	60 • JTAG · Apply	0x1E9801 Read	5.0 V Read	Ŷ					
Interface settings Tool information		Fuse Name Value								
		EXTENDED.BODLEVEL     Brown-out detection disabled								
Device info	ormation	HIGH.OCDEN	]							
Oscillator calibration		WHIGHJTAGEN         Image: Constraint of the second se								
Memories		WHIGH.WDTON								
Fuses		WHIGH.EESAVE								
Lock bits		Autou 000707	Boot Flash size=4096 words	start address = \$15000	v					
Production	n file	HIGH.BOOTRST		start address=\$11000						
		CONCKDIV8								
	CONSUT_CKSEL Ext. Crystal Osc. 8.0- MHz; Start-up time: 16K CK + 65 ms									
				start-up time. Tok ek	+ 03 m3					
		Fuse Register Value								
		EXTENDED 0xFF								
		HIGH 0xB1								
		LOW 0xFF								
✓ Auto		✓ Auto read				_		Copy to clip	board	
		<ul> <li>Verify after programming</li> </ul>				L	Program	Verify I	Read	
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(i) If vehicle is behaving irregularly i.e. servo steering is acting erratic, LEDs timing appears off, this is most likely due to an issue with the clock.

- 1. Check the above settings again.
- 2. Check external crystal oscillator on bottom side of board using oscilloscope (should be 16MHz)

## 4. Flash ATmega

1. Flash chip using Start without Debugging



- 2. Turn OFF vehicle
- 3. Disconnect programmer

## 5. Tests

By setting a jumper, a test mode is activated. This allows testing the inputs and outputs without the MLC.

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