AutoStore

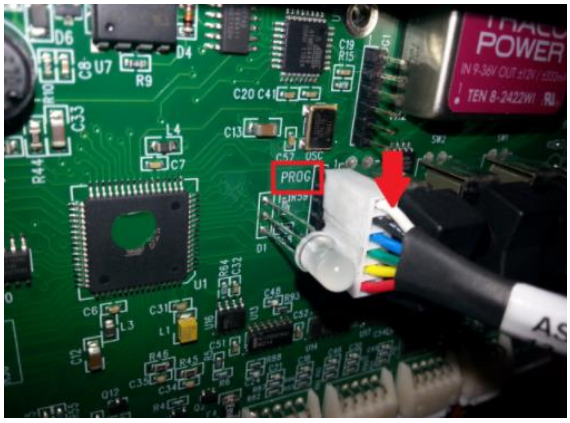
How to upgrade firmware (FW) using the AVR® programmer

IMPORTANT INFO AND EXCEPTIONS

- Each Module/Device has its own fuse settings
  - Fuse documentation is included in the BOOT folder in the module FW(firmware) folder
  - PCBs may have different “Device” signatures; the information (which Device must be chosen) is listed in the "Fuse Settings" document
- Each module has different programming pin connections
  - Example PROG connection locations in *Appendix – Photos of Common Programming Locations*
  - Make sure that the white wire of the AVR programming cable is close to "PROG" sign on the board
- AVR tool will have a green and red LED active when connected to the module
  - Both AVR LEDs will turn green while programming FW
  - If the device does not read or reach the target voltage for operation, please evaluate connections or power distribution to the module.
- **If programming a Robot Radio 2.4GHz, please see information in section *1.4 Programming Robot Radio 2.4GHz before following 1.0 GENERAL PROCEDURE FOR ALL APPLICABLE MODULES***

1.0 GENERAL PROCEDURE FOR ALL APPLICABLE MODULES

- Download FW from the Autostore Download Center in the CRM Service Portal
- Power off the module
- Connect AVR-Programmer from your PC to PROG pins of device

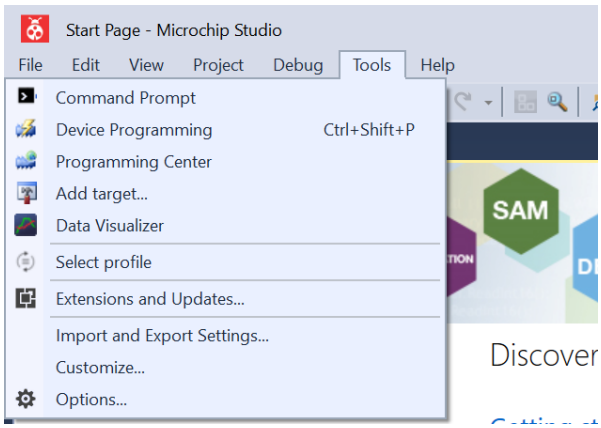


Example PROG pin from R5 CPU board

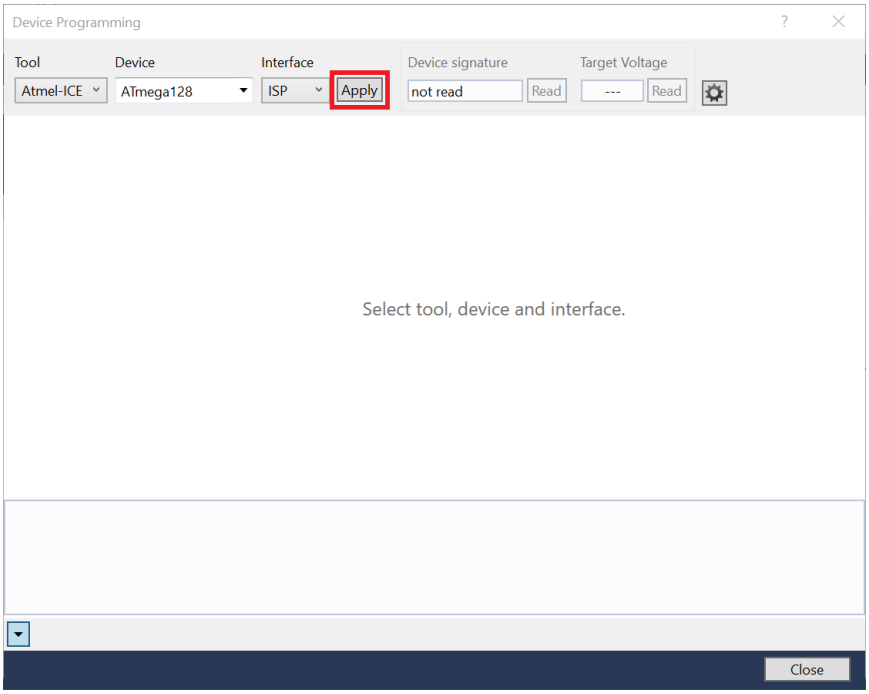
- Power on the module
  - Ensure Safety features aren’t cutting power to the device; Estop, safety hatch, etc.)
- Start the application Microchip Studio for AVR® and SAM Device to program:
  - module main firmware file
  - module boot file located in firmware folder

1.1 Preparing to program using *Microchip Studio for AVR® and SAM Device*

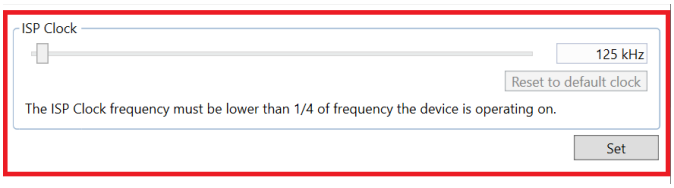
- Start the application ***Microchip Studio for AVR® and SAM Device***
- Start the device programming tool under the tools tab of the start page



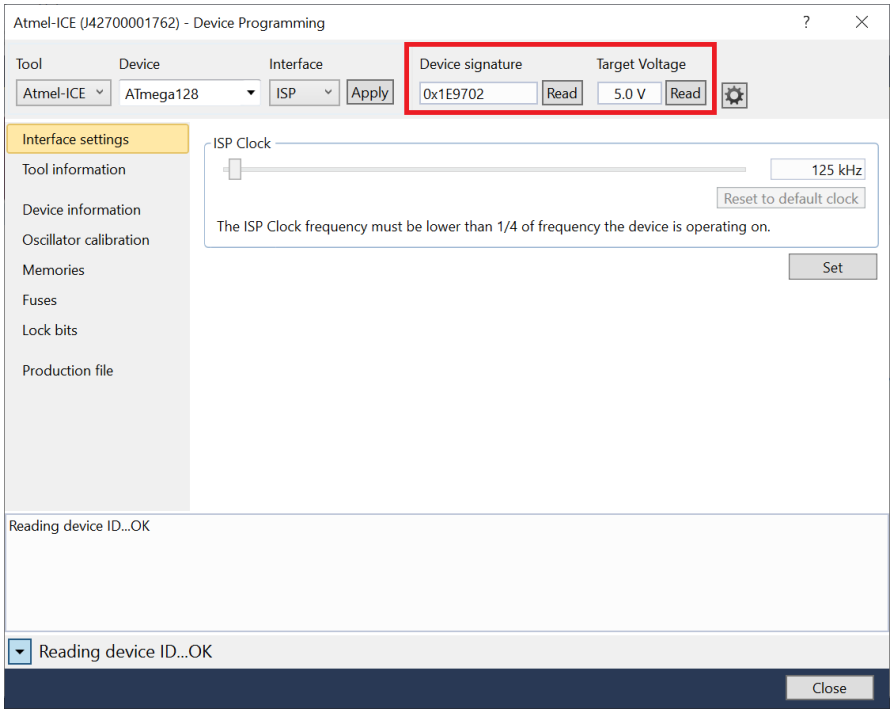
- Select the tool “Atmel-ICE” and the processor name from the "Device" list
  - Use the default “Interface” value
- Click the «Apply» button



- Click “Set” on the default frequency clock



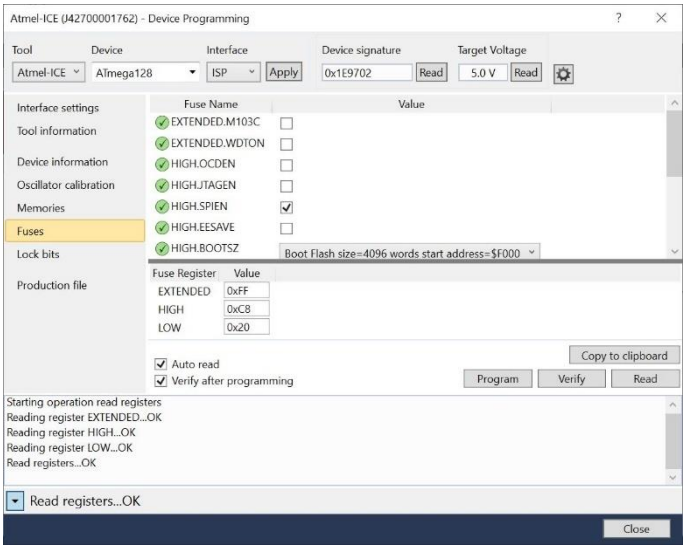
- Click the «Read» button under “Device Signature”



If device error message is displayed, check the following items, and try again:

- AVR programming cable is reversed
- There is no power on programmable module
- Chosen device setting is not correct, check Fuse Settings Document for the correct device

- Make sure “Fuses” settings are the same as in the document provided together with the FW file for the module



AS-90177 FuseSettings STD-V1

Document revision	01
Document change	18.02.2016
Device	ATmega128 (U1)
PCB AS-number	AS-12140

M103C = [ ]
WDTON = [ ]
OCDEN = [ ]
JTAGEN = [ ]
SPIEN = [X]
EESAVE = [X]
BOOTSZ = 4096W_F000
BOOTRST = [X]
CKOPT = [ ]
BODLEVEL = 2V7
BODEN = [X]
SUT_CKSEL = EXTHIFXTALRES_16KCK_64MS

EXTENDED = 0xFF (valid)
HIGH = 0xD0 (valid)
LOW = 0xBF (valid)

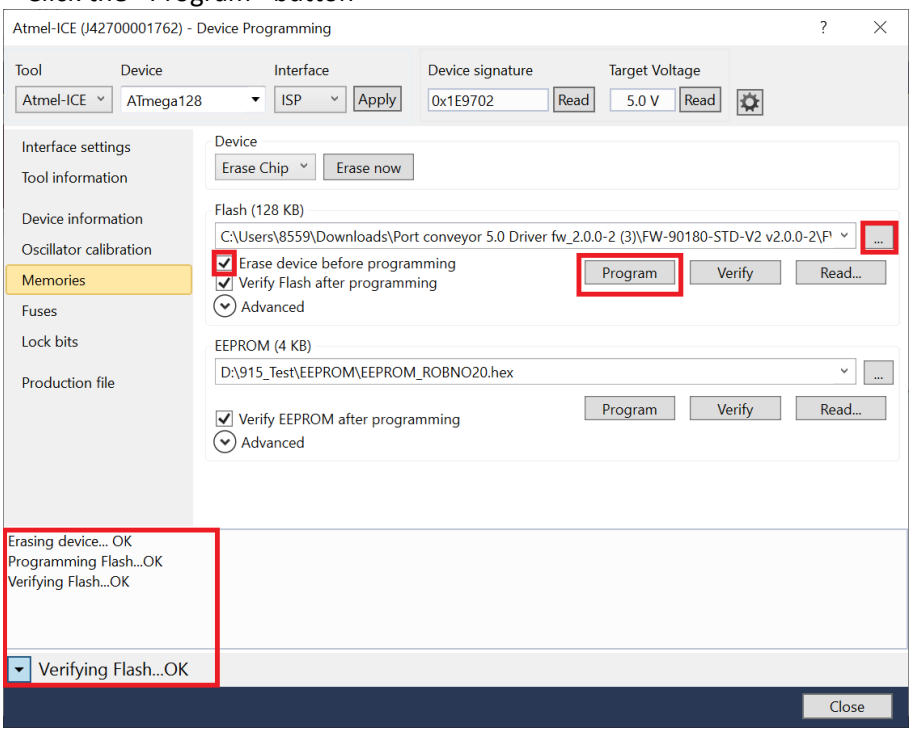
Document change

Rev	Date	Initials	
NA			Fuse Settings AS-90177.pdf
01	2016.02.18	ØG	Split GripperComIC fuse settings to separate document No changes to fuse settings for Main MCU

- Click the «Program» button to save Fuse settings.

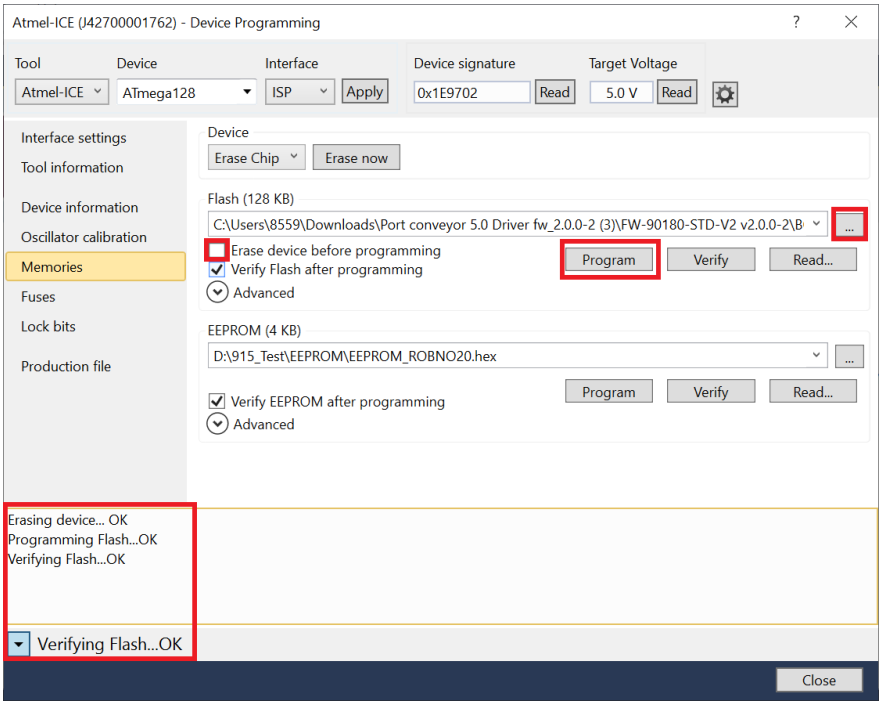
1.2 Programming the main FW file

- Browse and select the main FW-file
- Ensure field “Erase device before programming” is marked
- Click the «Program» button



1.3 Programming the BOOT file

- Ensure field “Erase device before programming” is NOT marked
- Browse and select the boot file
- Click the «Program» button

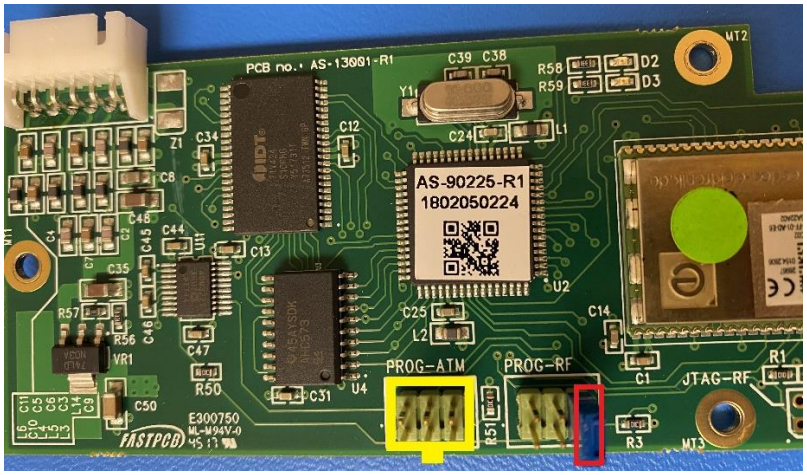


- The module has been upgraded
    - Turn off the module
    - Disconnect the AVR

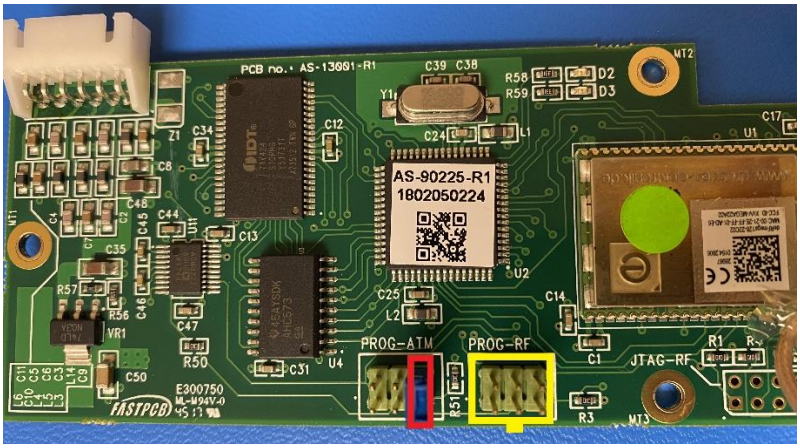
1.4 Programming a Robot Radio 2.4GHz using the AVR

IMPORTANT INFO

- The ATM and RF chips can be programmed in any order. It is important when programming each chip, the main firmware file is flashed before the boot file
- The radio needs to be connected to the robot with the robot powered on for the radio to receive power for programming. Keep the radio connected to the robot at all times
- When programming the ATM chip, the jumper goes on the right-side pins of the “PROG-RF” connection. Please see the photo below.
    - Connect the AVR programmer to the “PROG-ATM” chip pins



- When programming the RF chip, the jumper goes on the right-side pins of the “PROG-ATM” connection. Please see the photo below.
    - Connect the AVR programmer to the “PROG-RF” chip pins
    - "Device" setting needs to be set to ATmega128RFA1 instead of ATmega128A

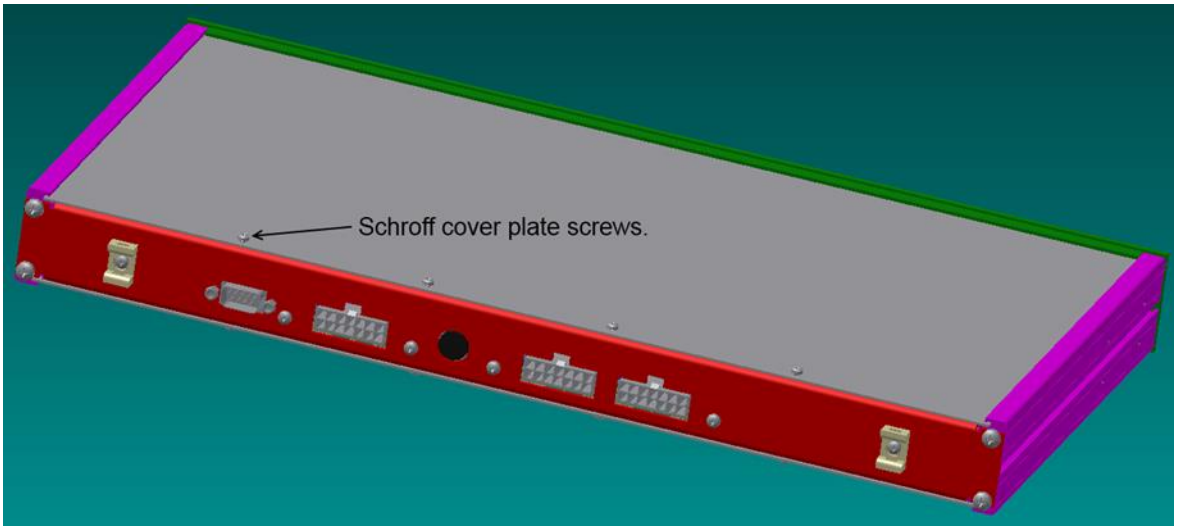


IMPORTANT: Once finished, be sure to place the jumper back on one pin only, so that it is no longer jumping any pins, but will stay with the radio for any future programming attempts.

1.5 Programming an ASIO 2.X series using the AVR

IMPORTANT INFO

- Programming ASIO 2.X series requires removal of Schoff cover plate screws to access internal CPU Board. Image below details location of screws. Photo of CPU board programming location can be found in the Appendix.
- Programming ASIO 2.X series follows standard process *1.0 GENERAL PROCEDURE FOR ALL APPLICABLE MODULES.*



Appendix – Photos of Common Programming Locations

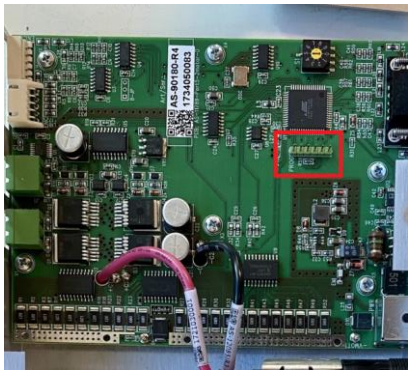
R5 CPU Board

R5 Radio 2.4GHz ATM

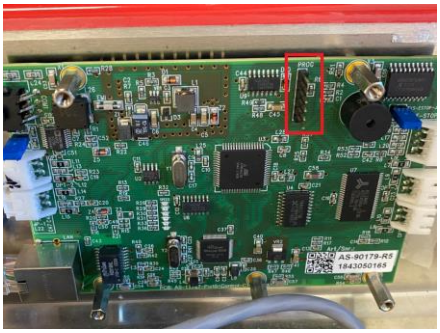
Carousel Port 2.x, 3.x, 4.x Arm Driver Box

R5 Radio 2.4GHz RF

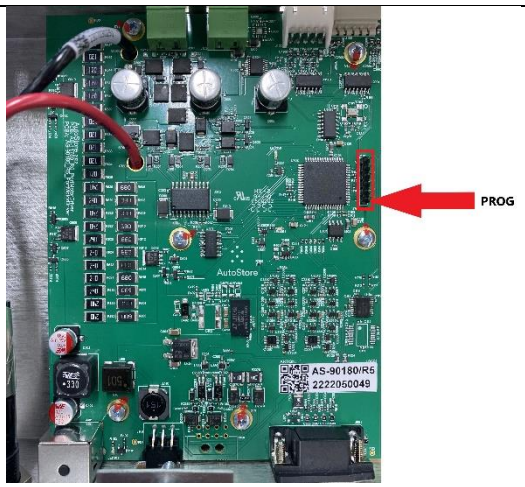
Gripper CPU Board



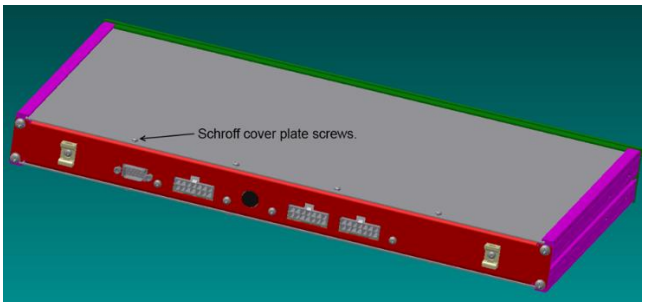
Conveyor Port 5.0/5.1 Motor Driver Box rev-4



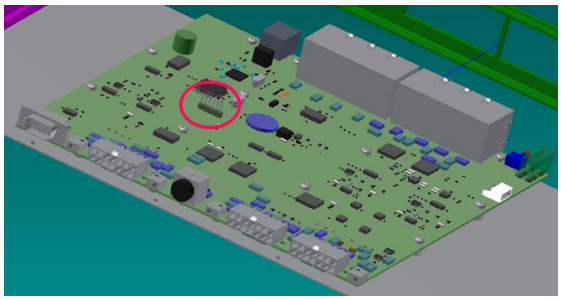
Port Controller CPU Board



Conveyor Port 5.0/5.1 Motor Driver Box rev-5



ASIO 2.X cover plate removal – image 1



ASIO 2.X CPU Board / Internals – image 2