AMC-AASD15A servo controller Manual

https://www.thanos-motion.com/

This manual is written for firmware **v2.26 fix5**

Follow us on Discord: https://discord.gg/bx4PxYR

AMC-AASD15A Interface information

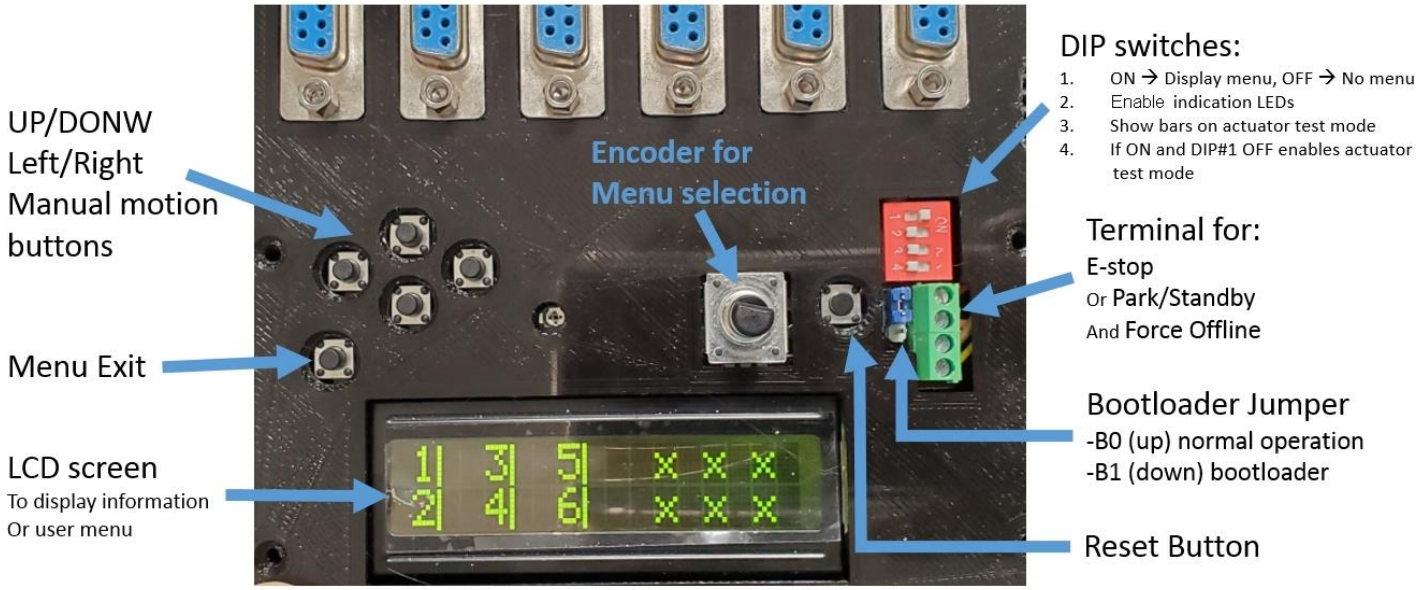
The AMC-AASD15A servo controller allows seamless and fast interface between the PC and the AASD-15A servo drives. Using the AMC-AASD15A controller you can interface your linear servomotors to Sim Racing Studio, Simtools, FlyPT Mover and Ian's 6DOF BFF motion software. The connection to PC is a simple USB connection and the connection to the AASD-15A drives is via straight male-male DB25 cables (1:1 with all 25 wires), one for each drive.

In the LCD menu of the AMC-AASD15A, you can set the following to match your simulator platform (Other settings are not so much important):

- Number of motors → **4act** (for 3DOF using 4 vertical actuators) or **5act or 6act or 7act** (additional actuator for Surge or Front/Back Traction loss)
- Auto-Park function → **4act +TL +Surge** (to disable park on TL axis or other horizontally placed actuators)
- Actuator Stroke → set to **100mm** (for SFX100 DIY actuators) or **150mm** (for PT-ACTUATOR Scorpion or other)
- Lead screw → set to **5mm/rev** for 250mm/s speed with 1605 or 2005 leadscrew (SFX100 and PT-ACTUATOR Scorpion actuators) or 10mm/rev for 500mm/s with 1610 or 2010 leadscrew actuators
- Motor Direction →Set to **Inline** (for SFX100 DIY actuators) or **Foldback** if the motors are mounted via belt.
- Gear reduction ration→Used mostly foldback actuators that may have different ratio belt drive.
- Platform Check →Blocks the use of the platform with motion data if any of the actuators is not in ready state.
- Pulse Frequency→by default is 200kHz, but some servo drives may require less like the Syntron HS that need 100Khz frequency for the pulses.
- Pulse Filter → smooths out high frequency motion data received to create smooth curve pulse signals.
- Spike Filter and Spike Filter TL→ if enabled, it can limit motor speed when new position cues are above the defined stroke distance.
- Automatic turn OFF the backlight of the RGB LCD screen after 10 mins if not used.

Panel and buttons info

For detailed guide on setting up the parameters and options for 4DOF+TL on the AMC-AASD15A controller see this video: https://www.youtube.com/watch?v=RG3atym_lKo



When an AASD-15A servo is connected and powered on the AMC-AASD15A servo controller, it will perform calibration seeking for the home position (usually hard stop against the end of travel of the actuator).

Once the calibration is complete, the motor will head to home position…

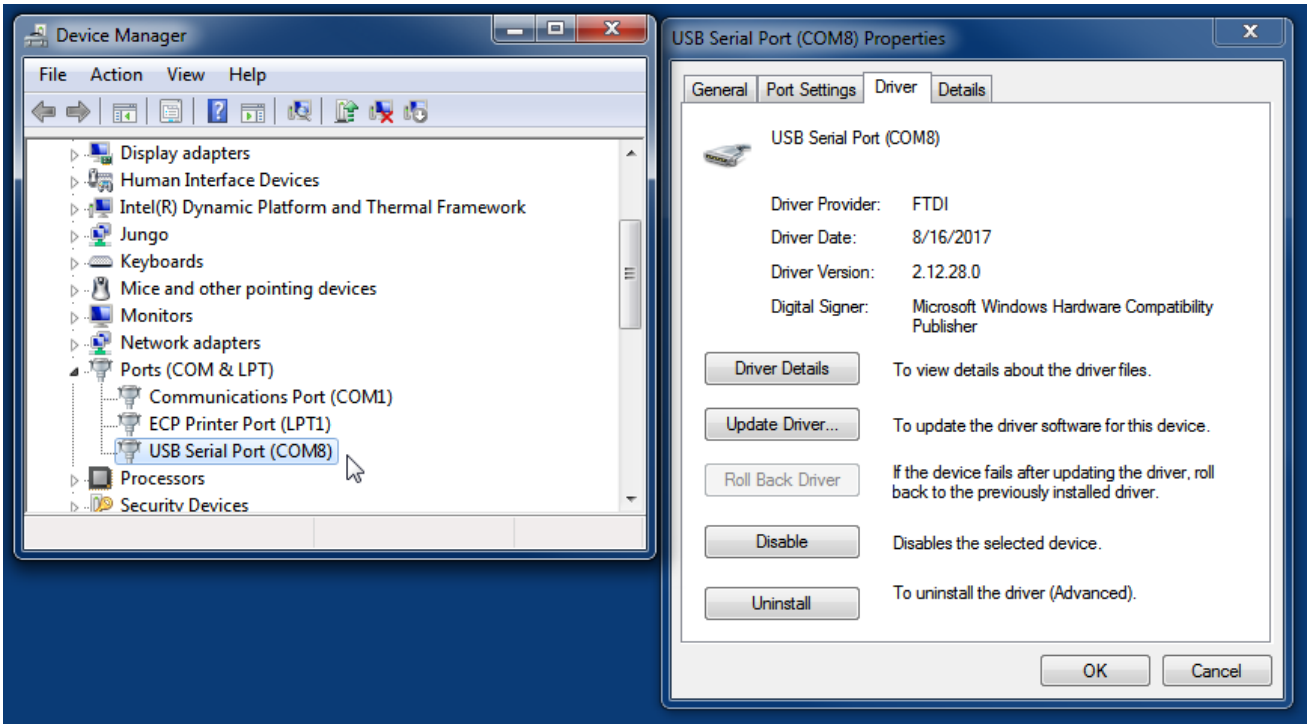
…or standby position if motion data from the PC are already present.

If there is no motion data from the PC, the controller will timeout and automatically park the actuator showing a P symbol for the actuator.

At any point you can **restore default parameters** by holding the "Menu Exit" button and pressing Reset. Keep holding the "Menu Exit" button until you see the message "**Restoring Defaults**" appear on the LCD. Watch this video to see how: https://www.youtube.com/watch?v=g12Grq-1LBQ

The USB Data connection requires FTDI driver that can be downloaded from the FTDI website:
http://www.ftdichip.com/Drivers/VCP.htm

The device appears in the PC Device manager as COM Serial interface device that then can be defined for use with Simtools or any other motion software that provides interface support for the AMC-AASD15A.



If your controller has older firmware you can visit the Github and get the latest firmware to update the controller.

https://github.com/tronicgr/AMC-AASD15A-Firmware

https://github.com/tronicgr/AMC-AASD15A-Firmware/tree/master/Latest_firmware

Make sure to download the bootloader utility that corresponds to your chip version:

https://github.com/tronicgr/AMC-AASD15A-Firmware/blob/master/Latest_firmware/MEGA1280_chip/AVRUBD_%201280_Firmware_bootloader_Utility_52.zip

https://github.com/tronicgr/AMC-AASD15A-Firmware/blob/master/Latest_firmware/MEGA2560_chip/AVRUBD_%202560_Firmware_bootloader_Utility_52.zip

Firmware Update procedure video

1. 1280 chipset https://www.youtube.com/watch?v=WkAm-MI0xbo
2. New 2560 chipset https://www.youtube.com/watch?v=hrNW2Oc2yg8

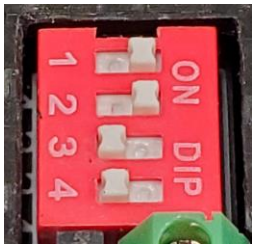
Detailed step by step Guide:
https://www.simracingstudio.com/forum/motion-profiles-actuator/thanos-firmware-update-guide

Quick testing the controller and servos

First download the manual and make sure your servo drives parameters are set as in the page 25 of this manual.

Then set the leadscrew size (usually 5mm for sfx100 or PT-actuator) and the stroke of your actuators (100mm or 150mm respectively).

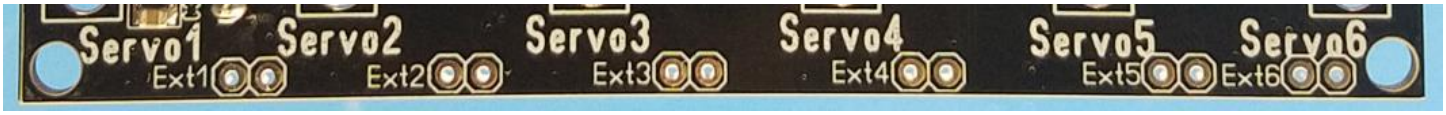
Then on the AMC front panel, on the red DIP Switches, move DIP switch #1 to OFF position and DIP switch #4 to ON position. The actuators should be moving from home position to fully extended slowly. You can adjust speed using the encoder knob on the panel. When done move the DIP switches to their initial positions and press the reset button to re-calibrate home positions.



DIP Switches selection

If you do not have the actuators yet and want to test just the motors, they should rotate slowly when you plug in the DB25 cable showing "C" on the LCD screen for that motor that means its seeking for actuator end-stop to calibrate home position. If you have rotary gearboxes but no hard end-stop, you can wire simple switches or NPN contact less limit switches on the back of the AMC controller on the pads that are labeled as EXT1, EXT2 etc… closing these pairs of contacts together while the motor is calibrating (showing “C” on the LCD) it will bypass the signal from the servo drive that indicates the detection of hard stop. This video shows example of wiring an inductive limit switch on the EXT pins:

https://www.youtube.com/watch?v=nslZmwOgvxw



Or if you want to use the computer to test your actuators, you can use this test script written on Processing that autodetects the AMC-AASD15A controller and allows you to use a single slider to move all the actuators:

https://github.com/tronicgr/AMC-AASD15A-Firmware/tree/master/Thanos-utility/Thanos-motion-test-simple

Filtering

The Pulse Filter smooths out high frequency motion data received to create smooth curve pulse signals for the servomotors. It acts like a high-pass filter which amplitude depends on the frequency, so fast frequency “noise” with high amplitude gets filtered, while lower frequency “noise” will be allowed to pass through.

The Pulse Filter uses a Rolling Average Filter on the servomotor, to decrease the motor step performance, remove small vibrations (noise) that exist from the use of electronic gearing pulse method and add s-curve smoother accelerations and decelerations. On the other side the Spike filter is used to replace any large spikes in motion (non-linear motion cues) with temporary artificial slower motion until the motion levels relax. The Spike Filter is especially useful to protect the motion platform from large amplitude fast vibrations that translate to full speed swings to the expend of the whole stroke, that are usually generated from the motion software in case of a crash (maxing out force levels). It will also slow down the motors speed in case you run off the road to minimize the effects of violent vibration if set to lower level.

The Rolling Average filter is located under the Pulse Frequency submenu. A good value for minimal vibration and good response is “2-Semi-Hard-Filter”. You can disable the Pulse Filter by setting it to “0”.

The Spike filter is in a separate menu, where you can set the Level of the spike parameter (distance between two positions, in the scale of 0-65535 values), the Range parameter, which can increase the selection resolution “step” of the values in lower Spike Level values and the option to Enable-Disable the filter. A good level for the Spike filter for normal racing is around “1800”.

The spike filter level represents a stroke travel. Say you use value 1800... then in mm for 150mm total stroke it would be about 4mm free travel for fast vibrations, if a motion cue instructed the actuator to go instantly to say 5mm it would activate the spike filter...

The calculation is as:
150mm / 65535 = 0.0022888533
1800 * 0.0022888533 = 4.11993594 mm

You can select the TL spike filter setting (for horizontal actuators) using the Left-Right buttons on the AMC Panel. You can define which actuators are horizontal by selecting the **Auto-Park** menu parameter and selecting **4act +TL +Surge** to indicate you have 4 vertical actuators and the rest (5,6 and 7) are horizontal placed.

There are some parameters available to adjust for the recovery of the spike filter: ESC and FINE...

Under Spike Filter speed menu:

ESC sets the "Escape" speed that the actuators move during the spike filter trying to reach the real time target.

FINE sets how close to real time motion data targets the actuators need to be to jump to live data. It defines the smaller distance before that actuator "locks" into the target position and jumps only if ALL the rest axis are also in locked distances...

The servomotor speed is proportional to the rate of the pulses it receives. So the AMC sends the pulses with max rate possible to be able to synchronize the motion to all actuators and keep the positions as close to real time with the game motion cues.

Less pulse rate is used when spike filter is active for example where the controller is not reacting real time but "following" slowly the real time positions, to create artificial motion instead the huge spike jump. But the slower motion is lagging, so its temporary until it catches up with real time positions again.

So anything less than full speed pulses, will be lagging behind in normal use and will clip out vibration details of the road etc... you could use the pulse filter parameter in the AMC, which adds some ramping in the accelerations, to make motion a bit more smooth, but as I said will filter out some of the details.

LCD navigation information

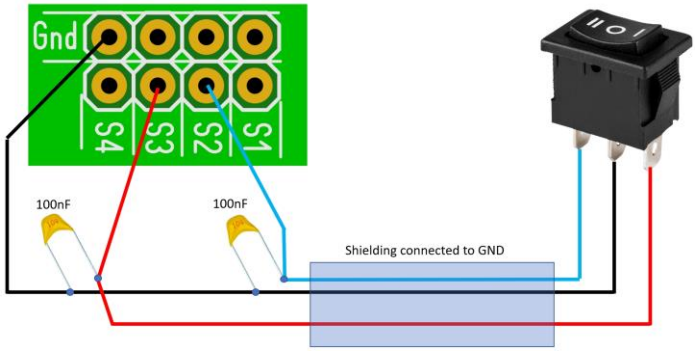
The following menus use the LEFT/RIGHT buttons on the AMC Panel to select values or actuator number on the displayed parameter: **Stroke** Act, **Leadscrew** Act, **Direction** Act, **Ratio** Act, **Spike Filter**, **RGB color** menu.

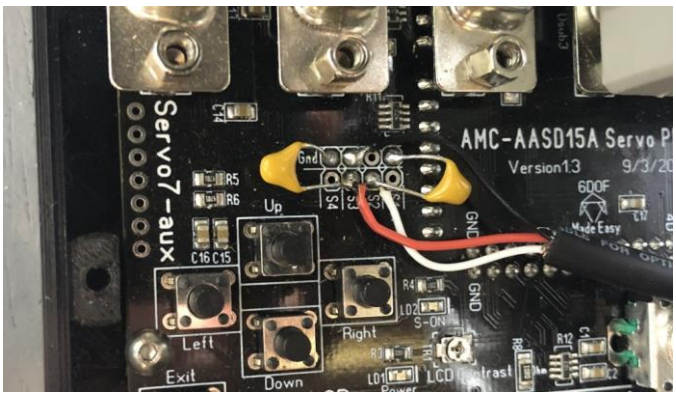
To be able to select actuator number for the above parameters, please adjust one first and when it asks to “Merge Act values” select “No, individual”. The LCD menu parameters displays different values when rotating the encoder knob i.e:

6 axis: 1▮ 3▮ 5▮ x x x 2▮ 4▮ 6▮ x x x 7axis: 1▮ 3▮ 5▮ x x xx 2▮ 4▮ 6▮ x x x▮ **Number of Motors** <1-7axis>: 6axis --> 1 axis --> 2 axis --> 3 axis --> 4 axis --> 5 axis --> 6 axis --> 7 axis	**Actuator Type** --> Linear --> Rotary **Platform Check** OFF – Normal ON – Park all **Park Position** <0-100%>:0/4 Position ___ %0 **Park move speed** Speed ▮__ %4 Park delay: 10:0	**Standby POS/SPD** <0-100%>:50/3 Position ▮▮_ %50 Speed ▮__ %3 Timeout: 10:0sec **Auto-Park Actuat** >All Axis Normal >6act +Rotation >5act +TL +Surge >4act +TL +Surge >3act +TL +Surge >2act +TL +Surge

Belt Tensioner support

Some additional options are now available for belt tensioner to allow trimming of the position of the belt while its used online or offline. The wiring of the trim switch or buttons is simple as seen below. The capacitors and shielded wiring are highly recommended to avoid human body capacitive related false triggering (by body proximity), as well to shield from EMI noise from the environment as the inputs have weak pull ups.





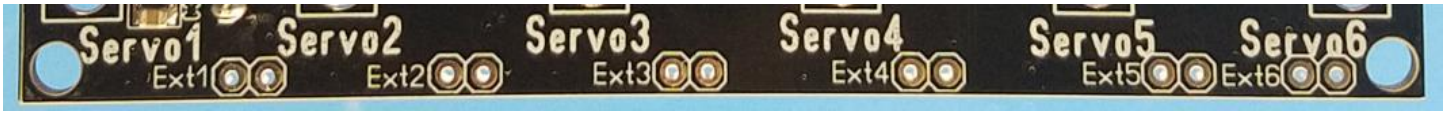
In the LCD menu, a new selection will now appear "**Belt Tensioner**" followed by the standard settings: "**S5 D20 P0**".

"**S**" is the steps parameter that dictates how many steps the motor will execute each time it detects the trim switch is pressed.

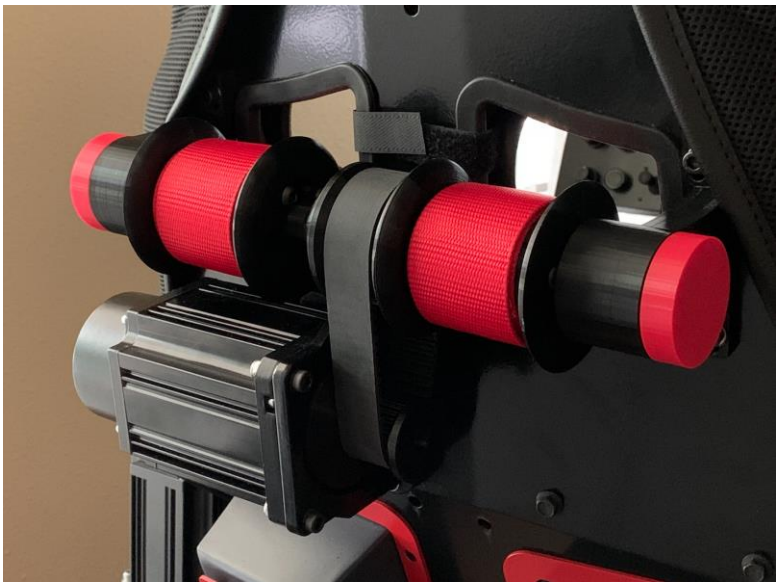
"**D**" is the delay that is used to determine the speed of the motor during the trim switch function, can vary depending the type of the Belt Tensioner (Direct, 2:1 reduction, or leadscrew).

"**P**" is the Port that the trim switch will have effect on, with "0" being turned off, or active on ports 1 to 7.

To calibrate the servomotor immediately on power up for belt tensiomers without hard stop or limit switch, you can short together the two pins on the EXT5, EXT6, EXT7 pins on the according port the belt tensioner is connected on.



Example of the **GS5 compact belt tensioner** with 3D printed parts and 2:1 reduction belt by **FlagGhost** (on my Discord):



Software Setup

SRS – Sim Racing Studio:

https://www.simracingstudio.com/product-page/srs-license-for-bass-shaker-and-pt-actuator-thanos-motion-platform

SRS automatically detects the AMC controller and its ready to use almost immediately. Since SRS handles setting the Spike filter value you need to disable it on the AMC LCD menu or if not sure, just restore defaults on the AMC controller and just set your stroke/leadscrew/Auto-park settings, leaving all else to default values.

Quick start guide for AMC-AASD15A controller setup:
https://bit.ly/3lX6ON5

More links to information setting up for SRS:

https://www.simracingstudio.com/forum/motion-profiles-actuator/actuator-setup-links

The order of connecting the actuators on the platform in a manner that works correct with SRS can be found in the SRS app:

ACTUATOR	PORT	REVERSE
RL	1	
FL	2	
FR	3	
RR	4	
TL Rear	5	Off
Surge	6	Off
TL Front	7	Off

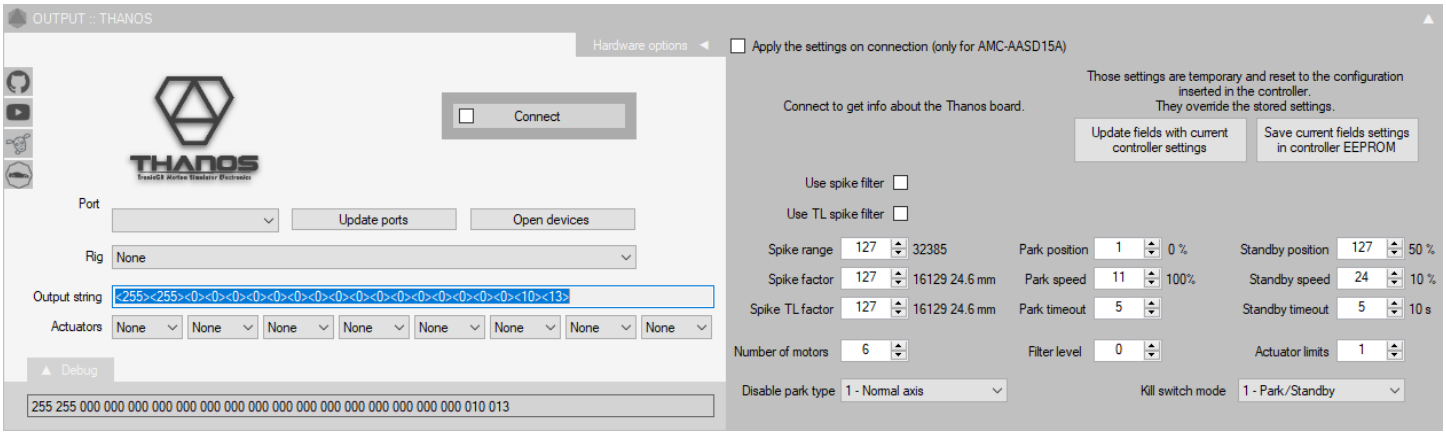
Don't forget to have a look at the Tuning guide:
https://www.simracingstudio.com/forum/motion-profiles/srs-2-0-motion-tuning-guide

FlyPT Mover:

https://www.flyptmover.com/

The FlyPT has output module for the AMC-AASD15A controller to easy setup not only for the basic communication COM port settings but also access to some internal parameters, remotely, like i.e., Spike Filter settings.

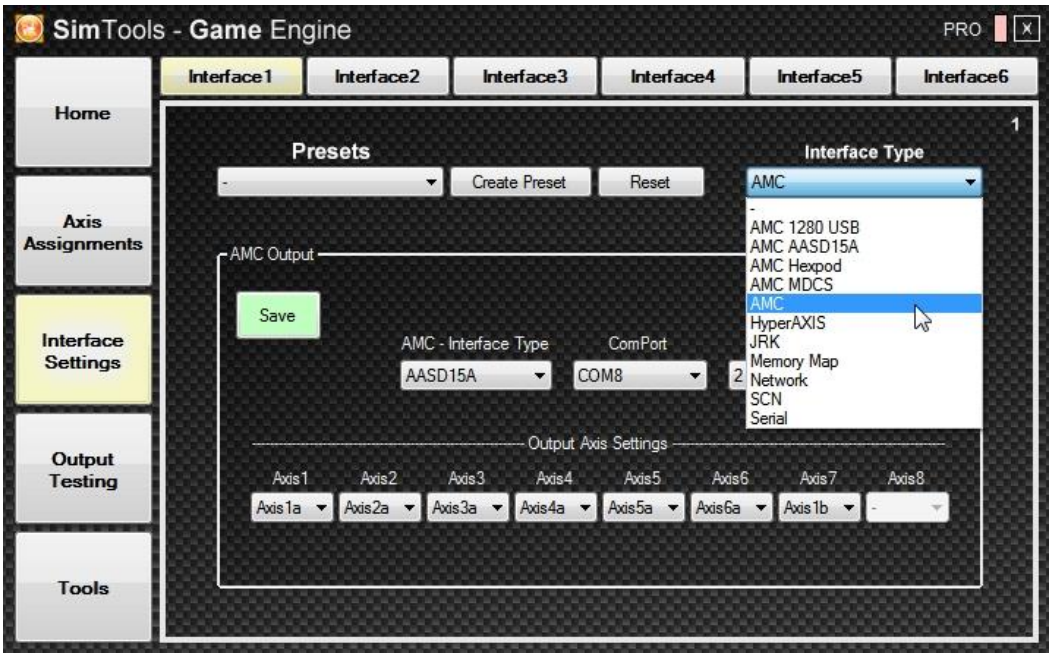
More info about it here: https://www.flyptmover.com/outputs/thanos



Simtools:

The Simtools v2.4 should already include the AMC interface plugin. Start Simtools, you should see 8axis available now for the AMC1280USB interface plugin. You can watch the basics here: https://www.youtube.com/watch?v=RG3atym_lKo

Or you can watch Barry's videos from Sim Racing Garage: https://www.youtube.com/watch?v=-J65OE7cJoM

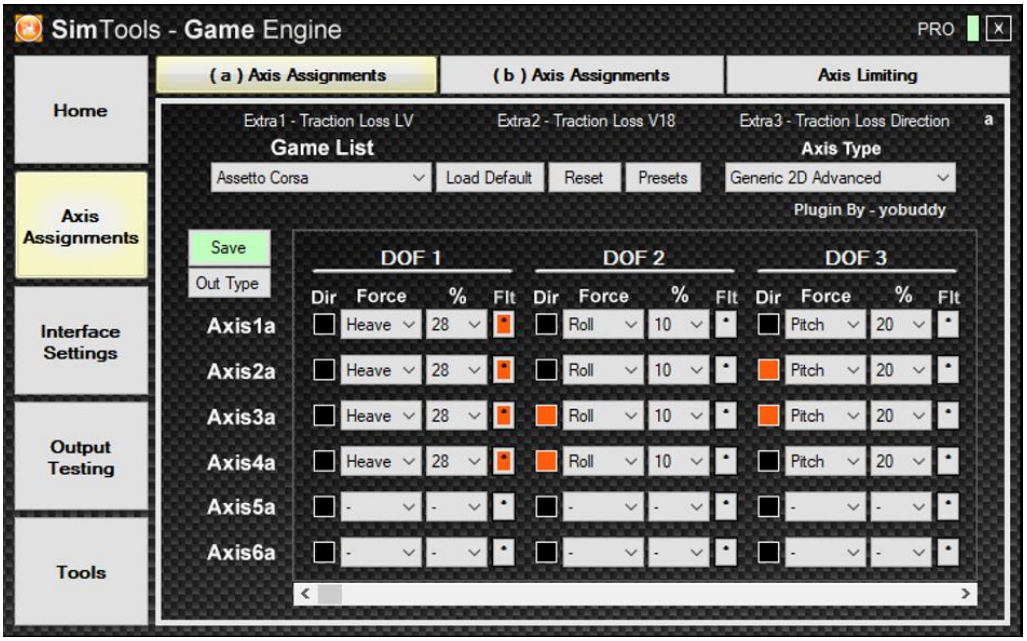


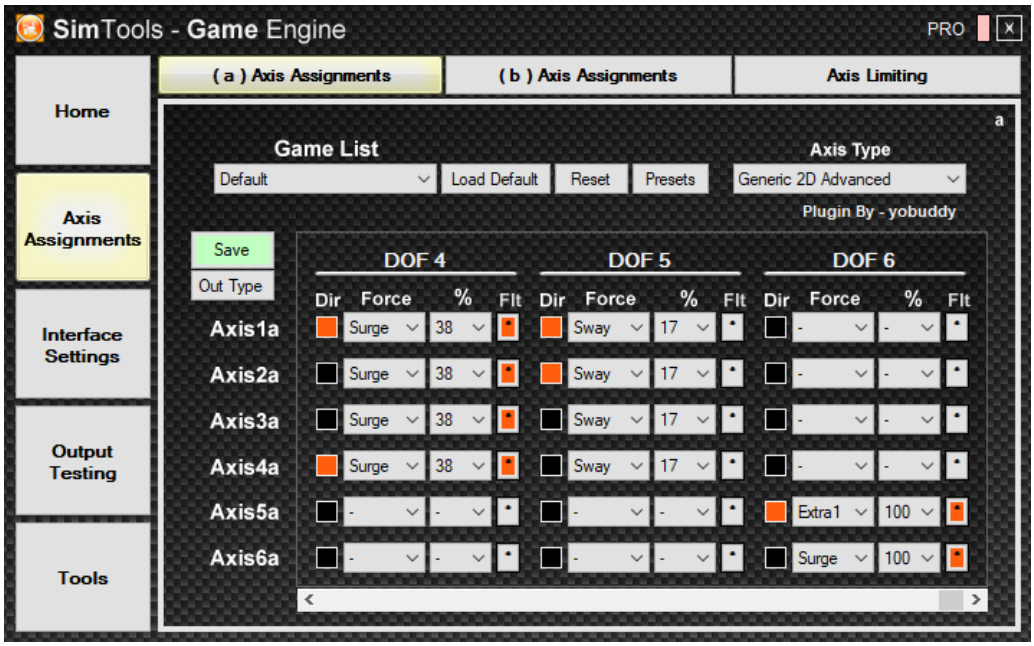
Interfacing the Simtools with direct axis is simple as seen on the below capture. It requires to select the AMC interface plugin, select the AASD15A interface type and select the COM Port that is assigned to the AMC-AASD15A in the PC device manager.

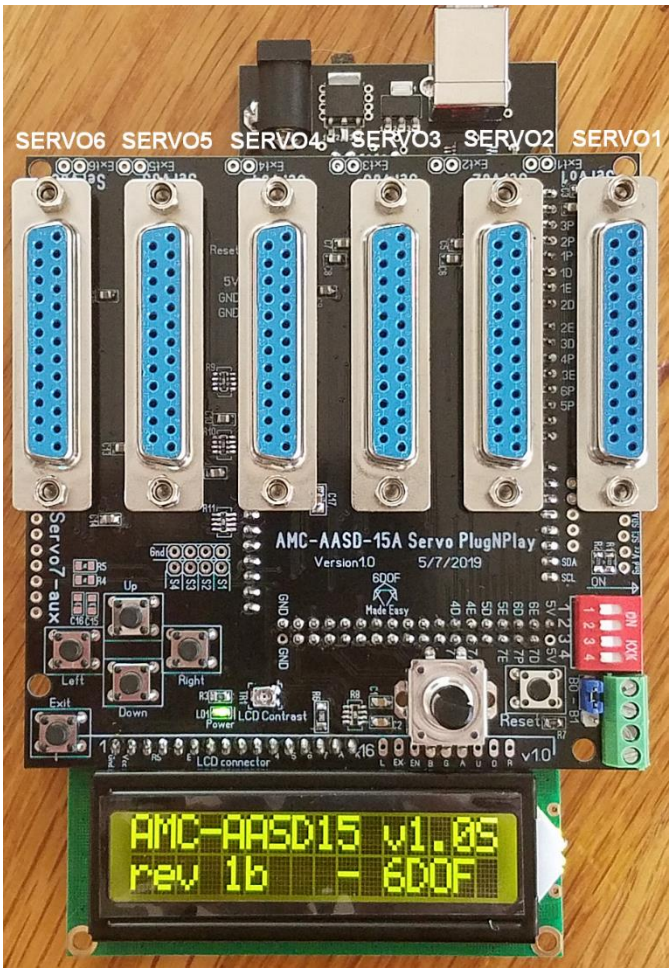
The axis assignments for each DOF provided is up to the use to mix and use as needed. The AMC-AASD15A can be configured to use any of the 3axis, 4axis or 5axis outputs.

To get the desired motion from the computer game to the actuators, you will have to create some profiles that mix the axis information from the game to the axis setup of the actuators. This can be done in the Axis Assignments section of the Game Engine of Simtools. If additional traction loss actuator is used, it can be assigned to Axis5a (extra1 for many games).

Setup example of the Axis assignments with various DOF (degrees of freedom) motion cues data inputs for combined motion. The axis5a on the example uses just the “Extra1” that is traction loss usually and axis6a holds the pure Surge value for the surge actuator:







Physically you will need to arrange the order of connection of each actuator to the AMC-AASD15A controller to correspond to correct order described to the Axis assignments of Simtools. For 5DOF platform the order of connection of each actuator 1-5 is:

Rear left - Servo 1 connector of AMC-AASD15A

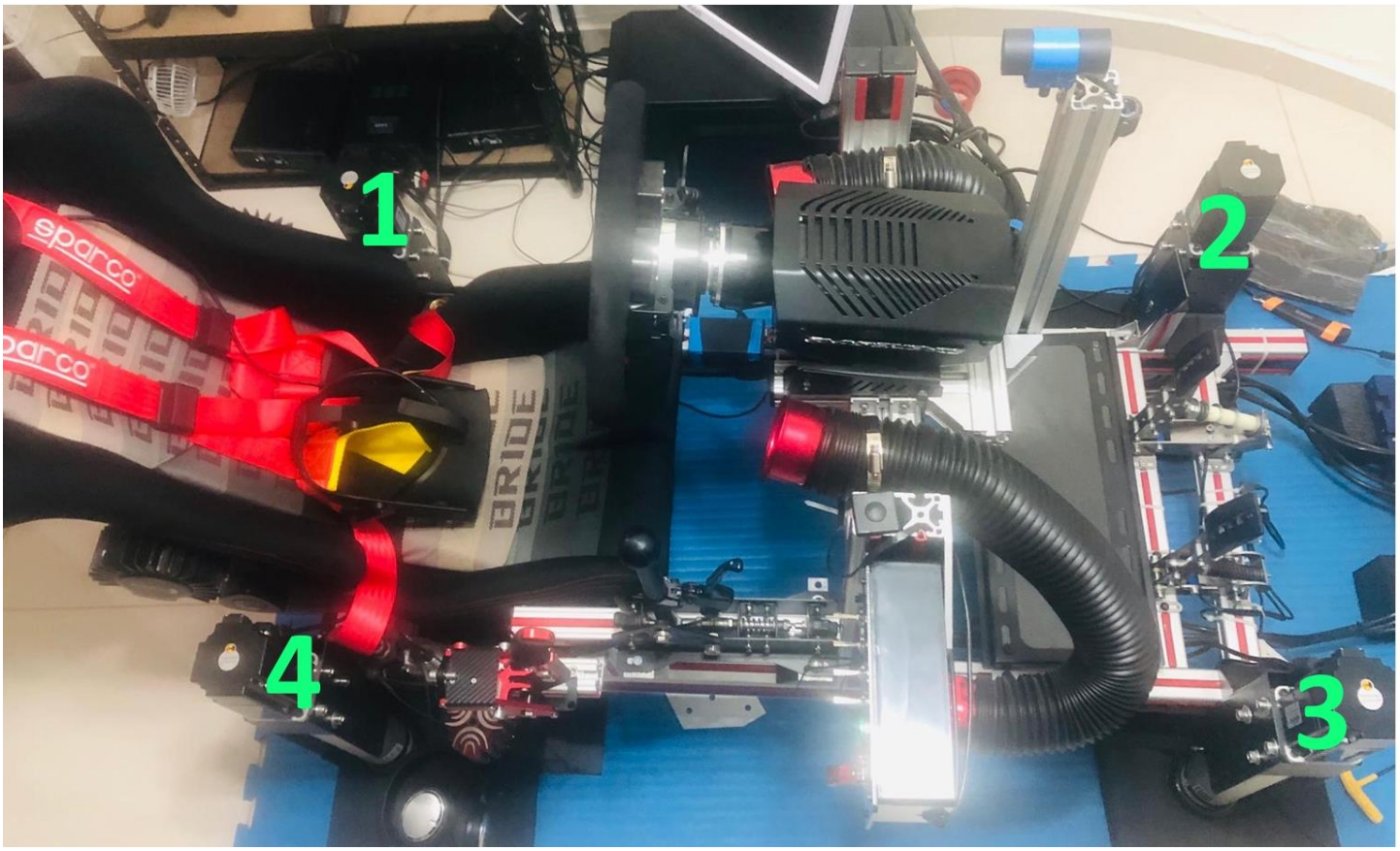
Front left - Servo 2 connector of AMC-AASD15A

Front right - Servo 3 connector of AMC-AASD15A

Rear right - Servo 4 connector of AMC-AASD15A

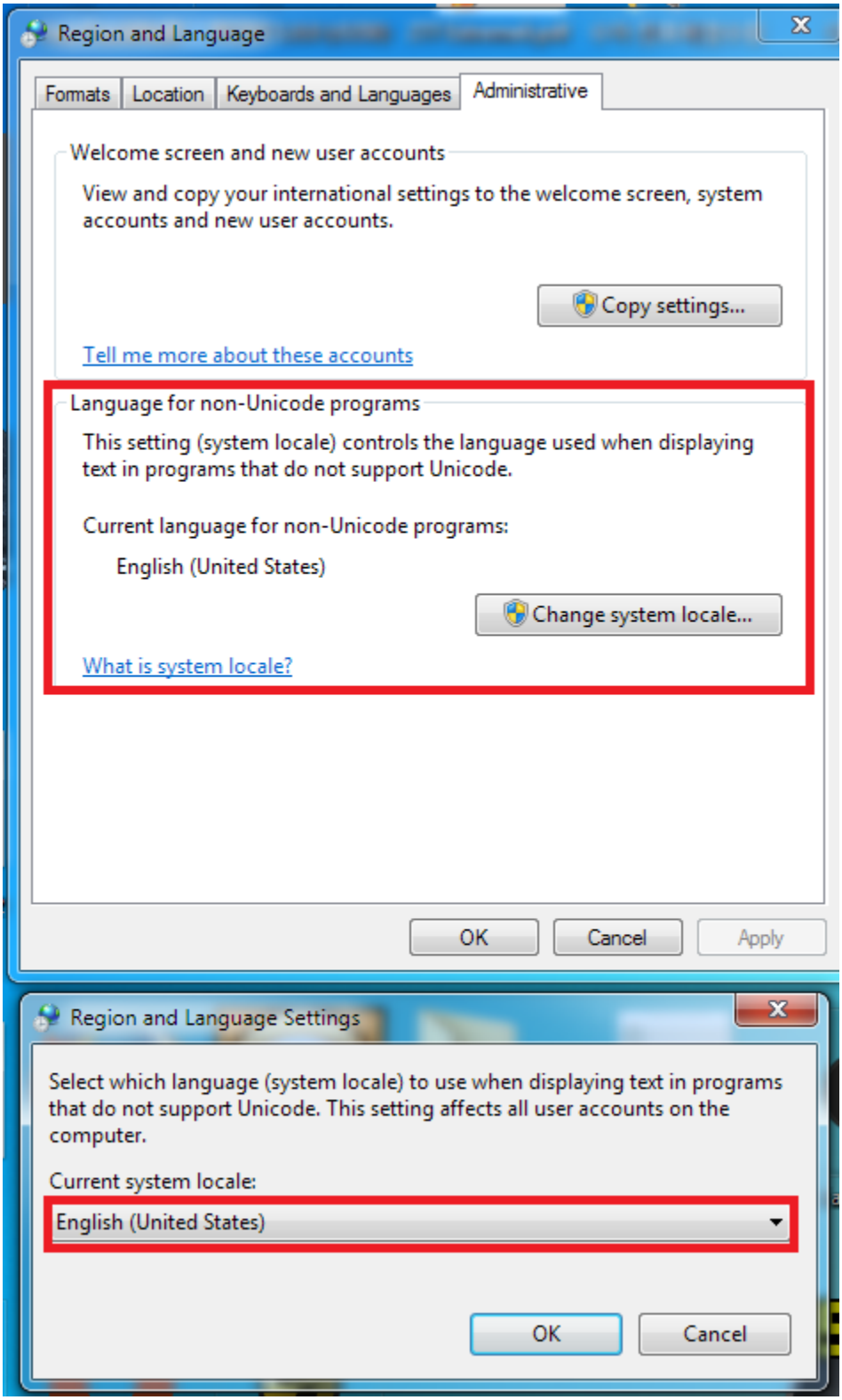
Traction Loss - Servo 5 connector of AMC-AASD15A

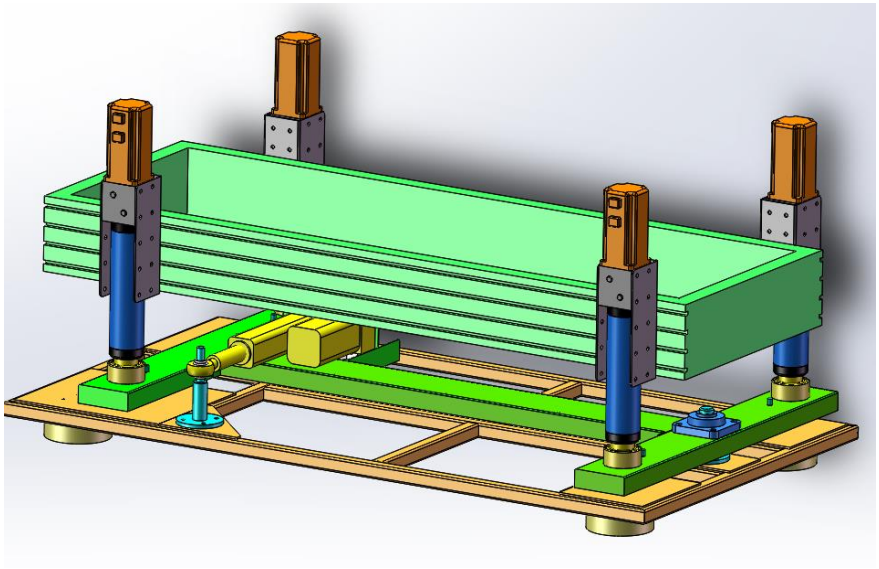
Surge Actuator - Servo 6 connector of AMC-AASD15A



Troubleshooting for Simtools:

If no there is no motion when you test manually the sliders in Simtools, please change the computer Region and Language settings as below:





You can see the four actuators mounted vertically and the traction loss actuator (foldback) mounted horizontally

Example videos from Sim Racing Garage: https://www.youtube.com/watch?v=Os4EiGsz4CM

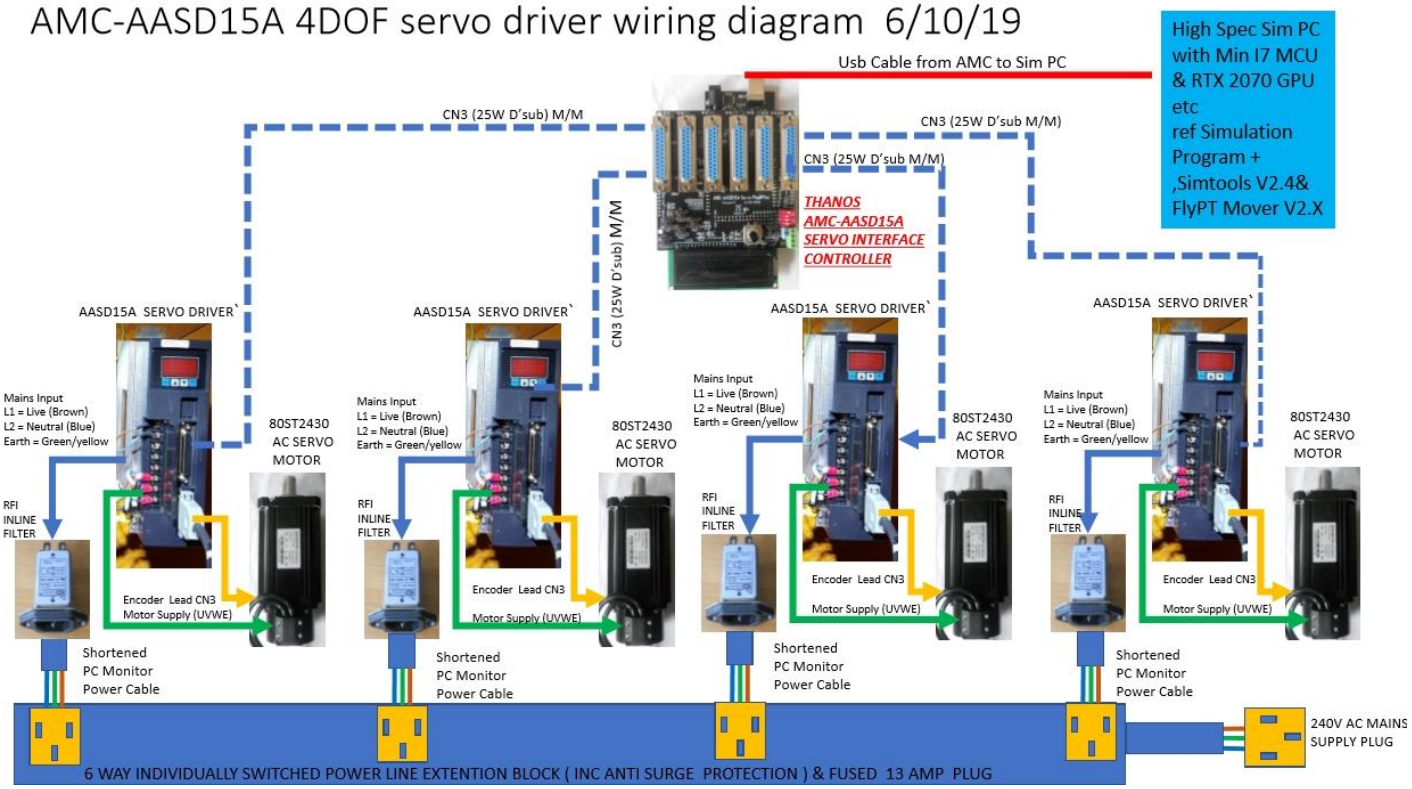
https://www.youtube.com/watch?v=rhXrQlctt_E

Actually this is old example, now most platforms use two inline actuators for Front/Rear Traction loss:

https://www.youtube.com/watch?v=c98oRO2VjOc

The wiring of the servo drives is not too complicated if you do some basic cable managing

AMC-AASD15A 4DOF servo driver wiring diagram 6/10/19

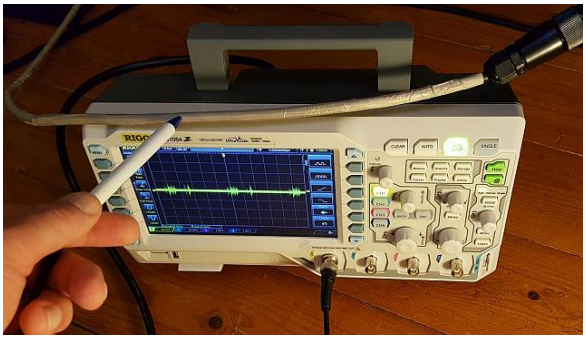


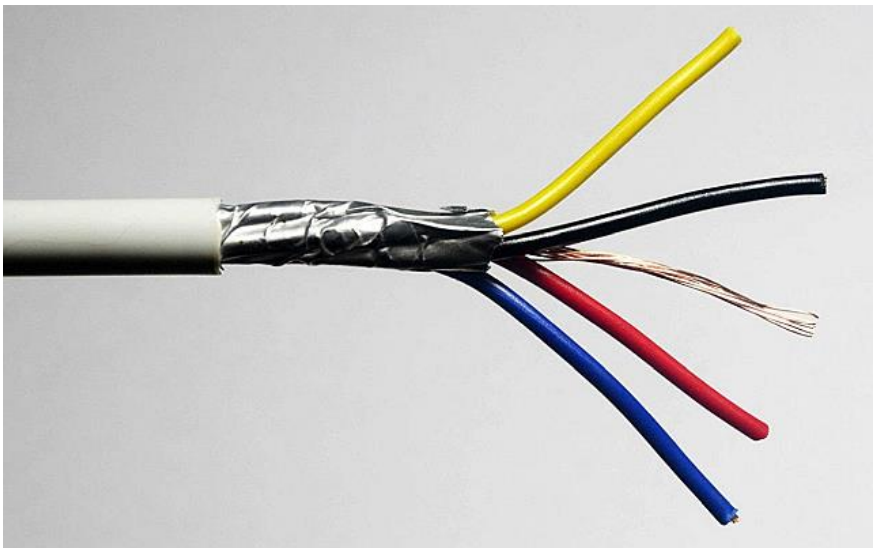
A better way would be using a small rack to enclose the AASD-15 drives and arrange the wiring. Also including some filtered power strips and chokes on each cable. Such racks often have their own fans that allow cooling of the servo drives while on operation and block much of the noise.

Dealing with EMI issues from the motor cables

EMI and EMC considerations

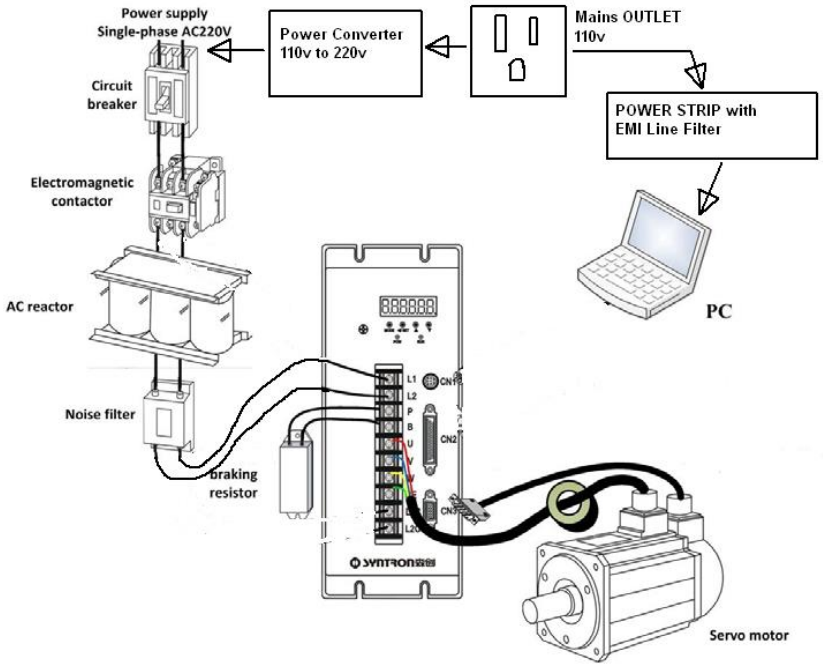
Most of the servomotors are delivered from the factories without proper shielded cable that leaves all other nearby equipment subject to severe EMI interferences. This can be really bad for devices that are really sensitive like many VR equipment that are usually positioned right on top of these interferences. The long unshielded cables of the servomotors can act as antennas for transmitting these EMI interferences several feet away. The source of these is the servo drive itself that generates a 10khz PWM signal (or 16Khz on newer models) on the three phase AC power signals that is used to power and position the servomotors. These signals swing up to 110v in many cases can affect nearby low voltage devices (5v or 3.3v devices). The best way to solve this is to cover these power cables with conductive tape from the servo drive all the way up to the motor. See example capture of the noise on the same cable when it's measured on covered and an uncovered region of the cable:

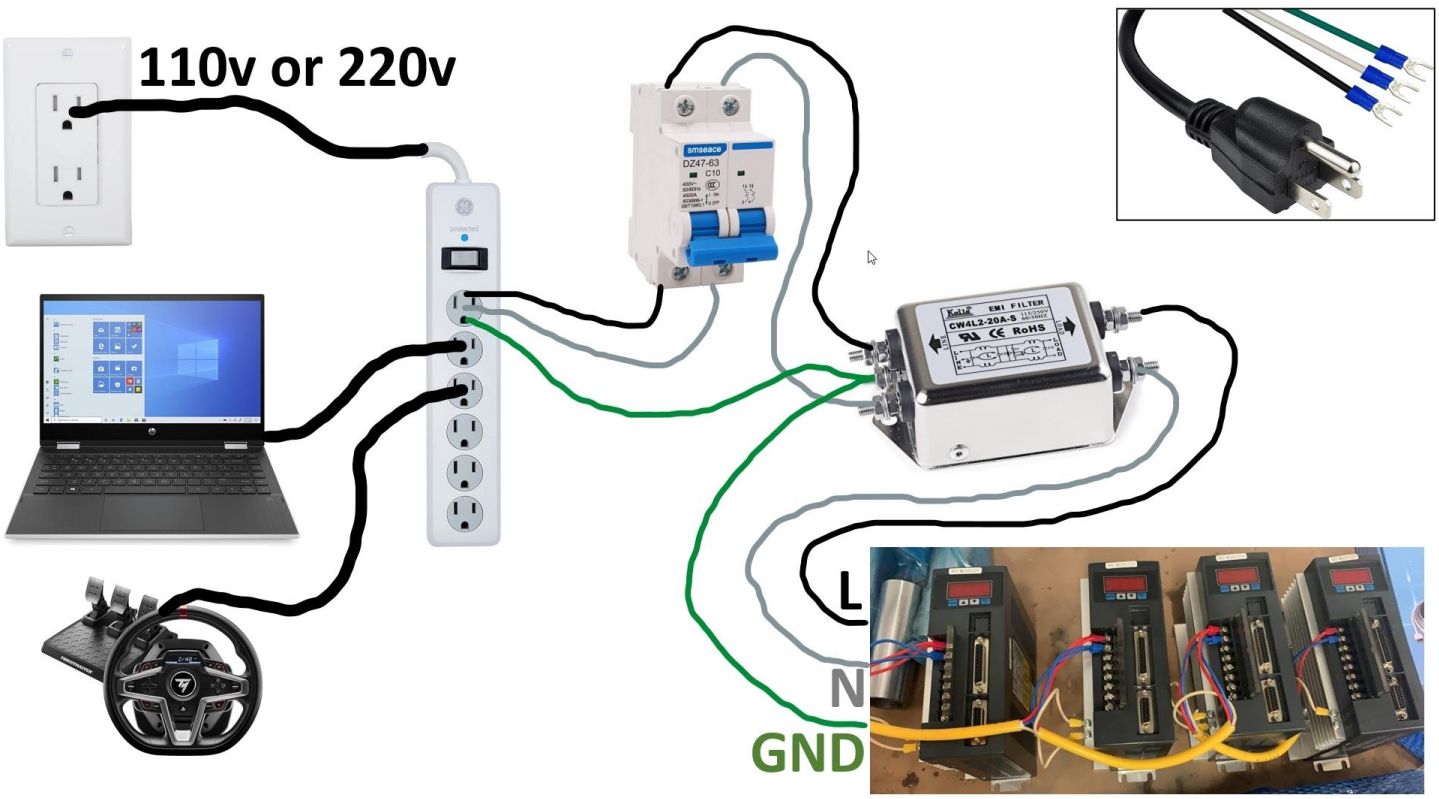




As you can see on the photos above the power cable is not shielded. Next to it, is a shielded cable.

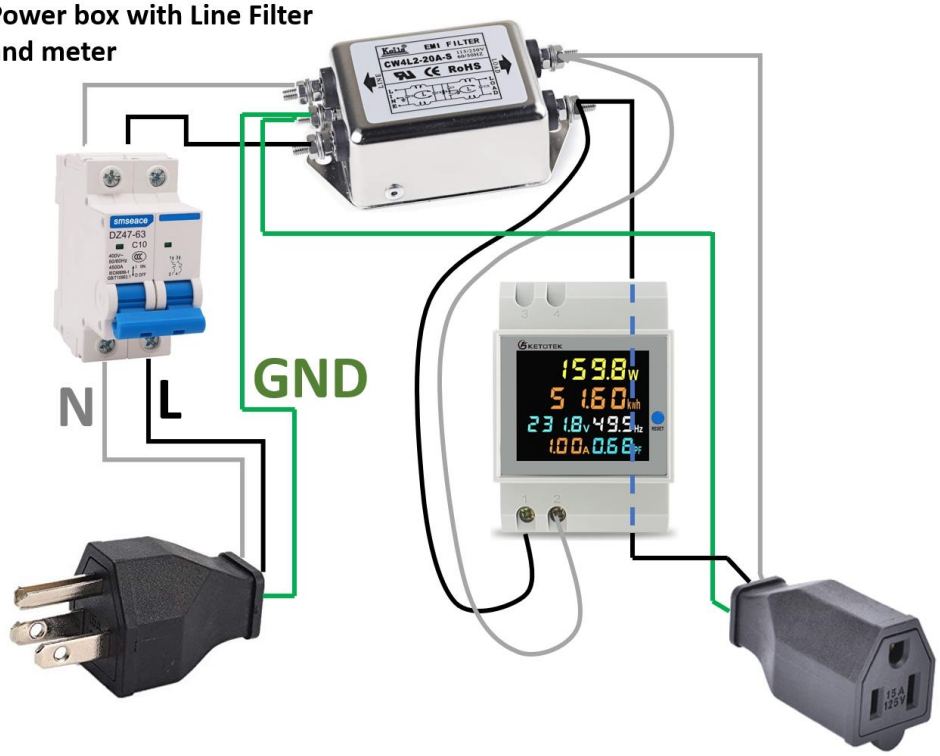
Consider adding a line filter to prevent some of the EMI noise to propagate to other connected devices on same power line like the PC or peripherals. Usually all system must be star connected to a single outlet to avoid ground loops:

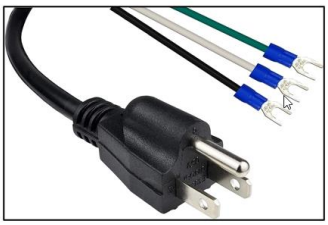




Example of wiring a line filter to prevent EMI polluting other devices connected on same power line.

Power box with Line Filter and meter



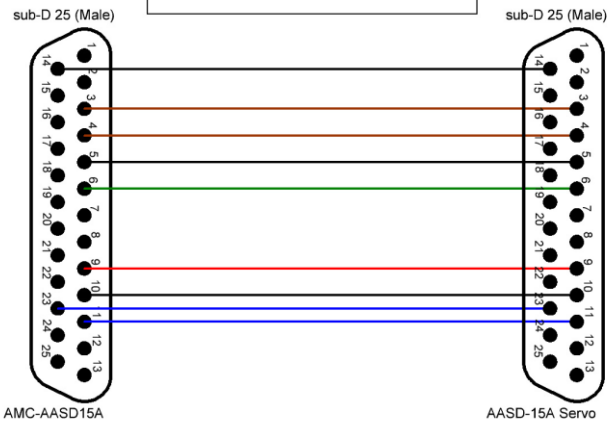


Example of wiring the power fused switch and line filter in combination with a meter

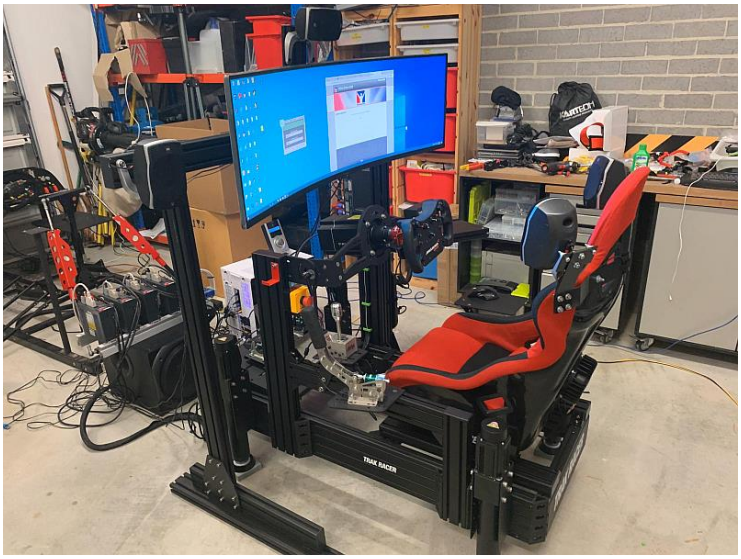
If you want to see which wires are used in the DB25 cable:

AMC-AASD15A pinout
DB25 male-male straight

9	DC 5V
10	COM
6	SigIn1 (S-ON)
11	SigOUT1 (Servo ready)
23	SigOUT2 (Treach)
3	PP+ (STEP)
14	PP-
4	PD+ (DIR)
5	PD-



Here are some examples of platforms for use with the AMC-AASD15A:



Programmer's information:

The data packet string now is 20 bytes long and includes additional spare motion data slots for up to 8axis

The ID is byte values 0xFF + 0xFF
Each Axis is 16bit wide.
LF+CR is required in the end (0x0A + 0x0D)

ID AXIS1 AXIS2 AXIS3 AXIS4 AXIS5 AXIS6 AXIS7 AXIS8 LF/CR

The parameters can be also changed via terminal (250000 bps)

---List of commands---

'---CMD## , spv##$$$, where ##=parameter number and $$$= value 0-255

CMD01 Motornumber:	spv012-spv017	- (6=default)
CMD02 Disable park type:	spv021-spv025	- (1=disabled) *
CMD03 reserved - Pulse_freq in Thano4U		
CMD04 Park Position:	spv04001-spv04254	- (001=default 0%, 1-254 is percentage of the stroke)
CMD05 Park Move Speed:	spv05001-spv05100	- (002=default) -Parkmovespeed
CMD06 Park Move Timeout:	spv0601-spv0690	- (01=default) -Parkmovetimeout
CMD07 Standby Position:	spv07010-spv07254	- (127=default 50%) -6dofstartpos
CMD08 Standby Speed:	spv08000-spv08100	- (005=default) -Startmovestep
CMD09 Standby Timeout:	spv0901-spv0990	- (05=default) -Startmovetimeout
CMD10 Platform_check	spv101-spv102	- (1=default disabled, 2=enabled)
CMD11 reserved - Rotation_offset in Thanos4U		
CMD12 reserved - Buttonspeed in Thanos4U		
CMD13 Estop_mode	spv131-spv132	- (2=default kill power, 1=Servos Hold position powered)
CMD14 Kill switch mode:	spv141-spv142	- (1=default) Klm_mode *
CMD15 Spike Range:	spv15001-spv15254	- (127=default) -Spike_f_range
CMD16 Spike Level:	spv16001-spv16254	- (127=default) -Spike_f_mult1
CMD17 Spike On-Off:	spv171-spv172	- (2=default disabled) -Spike_filter_En
CMD18 TL Spike Level:	spv18001-spv18254	- (127-default) -Spike_f_mult1_tl
CMD19 TL Spike On-Off:	spv191-spv192	- (2=default disabled) -Spike_filter_en_tl
CMD20 Filter Factor 0-5:	spv200-spv205	- (0=default no pulse filter) *

RQM - Displays model, revision and number of motors
Park - Parks the actuators if in standby mode
CMD55 Prints short, delimited parameters values list
spv45 Saves all parameters at once*

```
The CMD$$ displays each parameter, and spv$$### saves each parameter with the value indicated.
To actually store the parameters in the flash memory you need to send "spv45" to save all
parameters at once. The "$$" on the spv is the command number, and the "###" is the value,
Some parameters have single digit value, some two digit value and some 3 digit value.
All values are characters!
```

Some explanation of the parameters with Asterisk *:

CMD02 DisableParktype : spv021-spv026 (1=disabled)

Disableparktype = 1 ">All Axis Normal"
Disableparktype = 2 ">6act +Rotation "
Disableparktype = 3 ">5act +TL +Surge"
Disableparktype = 4 ">4act +TL +Surge"
Disableparktype = 5 ">3act +TL +Surge"
Disableparktype = 6 ">2act +TL +Surge"

CMD13 Estop_mode : spv131-spv132 (2=default kill power, 1=Servos Hold position powered)*

1= Will stop the motors and hold their position powered

2=Will cut the power of the motors, so if the leadscrew allows the actuator will start dropping if loaded

CMD14 Klm_mode : spv141-spv142 (1=default)*

1= will treat the e-stop as monetary button for 1 second to switch between Park and Standby positions

2= will immediately activate the e-stop function

CMD20 Filter_factor : spv201-spv205 (0=default no pulse filter)*

Servo motor pulses smoothing, to reduce vibrations and noise

1= Hard Filter, 2= Semi-Hard Filter, 3= Semi-Soft Filter, 4= Soft-Filter, 5= very soft-molasses

CMD55 Prints short, delimited parameters values list:

> data:v2.26:AASD:6:1:7:5:127:12:5:1:0:1:127:127:2:1:2:0:0:127:2:0:0:0:0:

Here is what each parameter corresponds on the above reading:

"data:" Firmwareversion ":AASD:" Motornumber ":" ; Park_position ":" Parkmovespeed ":" Parkmovetimeout ":" 6dofstartpos ":" Startmovestep ":" Startmovetimeout ":" Disableparktype ":" Limit ":" Klm_mode ":" Spike_f_range ":" Spike_f_mult1 ":" Spike_filter_en ":" Platform_check ":" Estop_mode ":" ":" 0 ":" 0 ":" Spike_f_mult1_tl ":" Spike_filter_en_tl ":" 0 ":" ; 0 ":" 0 ":" Filter_factor

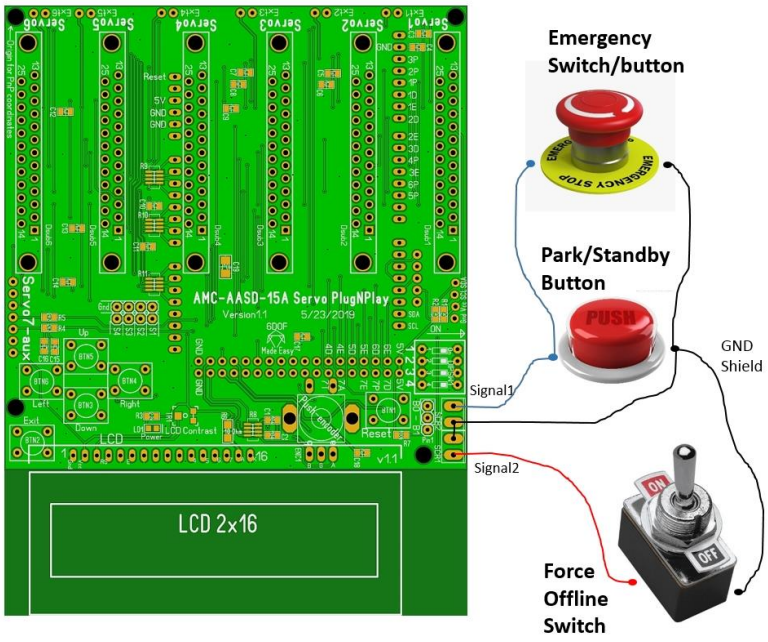
spv45 Saves all parameters at once*

When you save the parameters, only the ones that are different from the existing values in the epprom will be written. This way no unnecessary writes will be performed when you want to permanently same the parameters that are adjusted using the spv commands. Here is an example result:

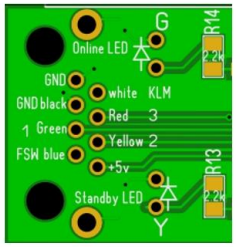
> Saving... 4, 7, 13, 33, :[done] All changed parameters saved successfully:

Wiring Button – E-STOP switch – Force Offline switch

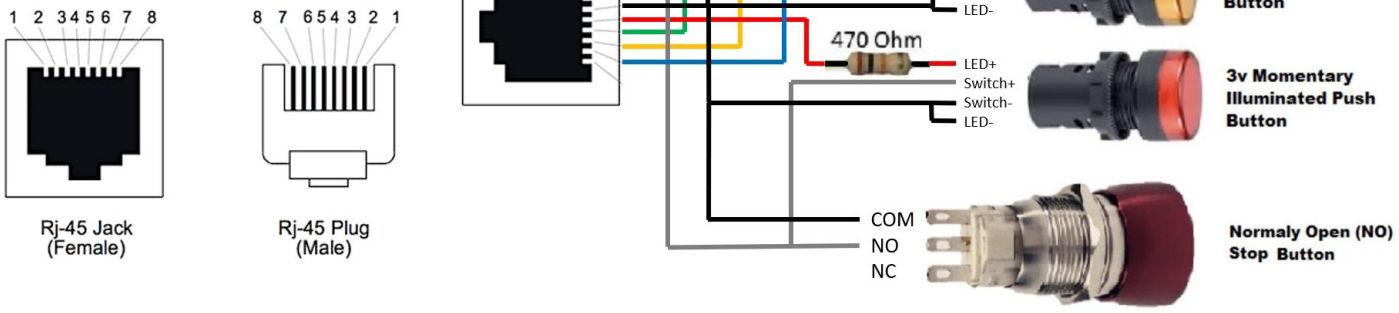
Note that the switches/buttons must be “NO” type (Normally Open)



E-stop button box – RJ45 – AMC-AASD15A v1.4c



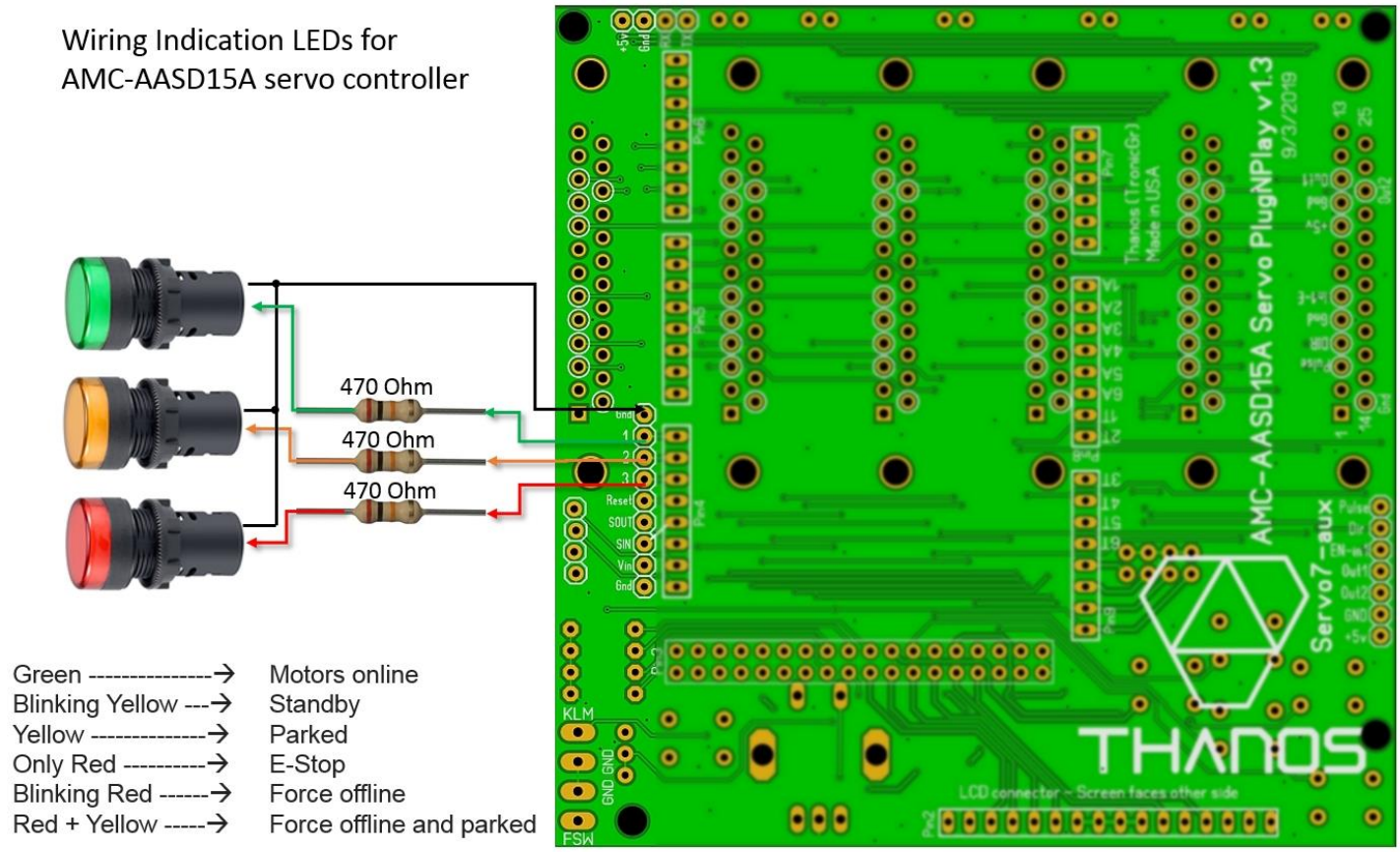
1. Gnd
2. **E-stop** Switch (KLM)
3. **Gnd**
4. RED LED
5. GREEN LED
6. YELLOW LED
7. **Force Offline** Switch (FSW)
8. +5v



Wiring indication LEDs only on AMC-AASD15A

You may need LED indication for the state of the controller from within the cockpit, in that case you can wire some simple LEDs if you don't have access to the LCD display of the controller.

```
Meaning of LED indications depending on the state of the controller:
Green ------------->     Motors online
Blinking Yellow --->     Standby
Yellow ------------>     Parked
Only Red ---------->     E-Stop
Blinking Red ------>     Force offline
Red + Yellow ------>     Force offline and parked
```



Wiring DB25 female connector on Servo7-aux pins

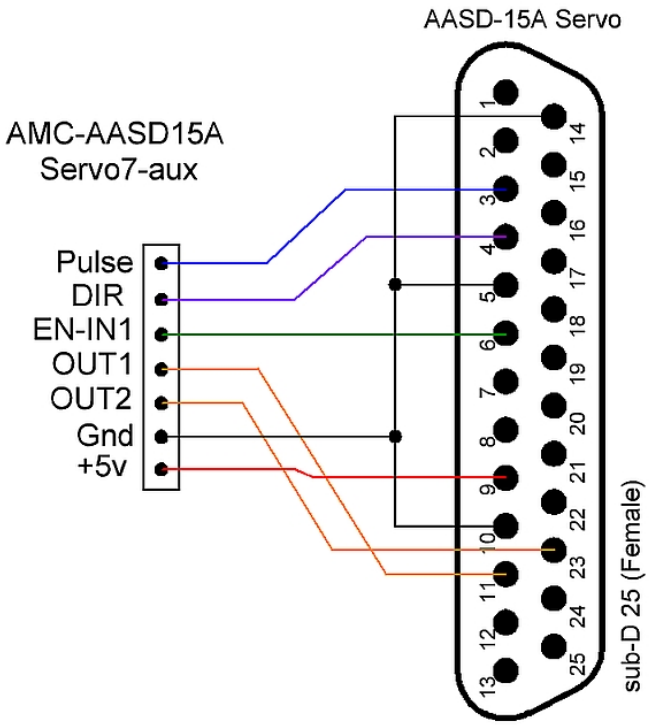
If you need more that 6 axis, you can add a DB25 female connector and plug a 7th servo in the controller. Possible uses are 4DOF+TL+Surge+Belt tension, or 6DOF+rotation axis…

See the videos for details on wiring

https://www.youtube.com/watch?v=CT7M-8LCCwc

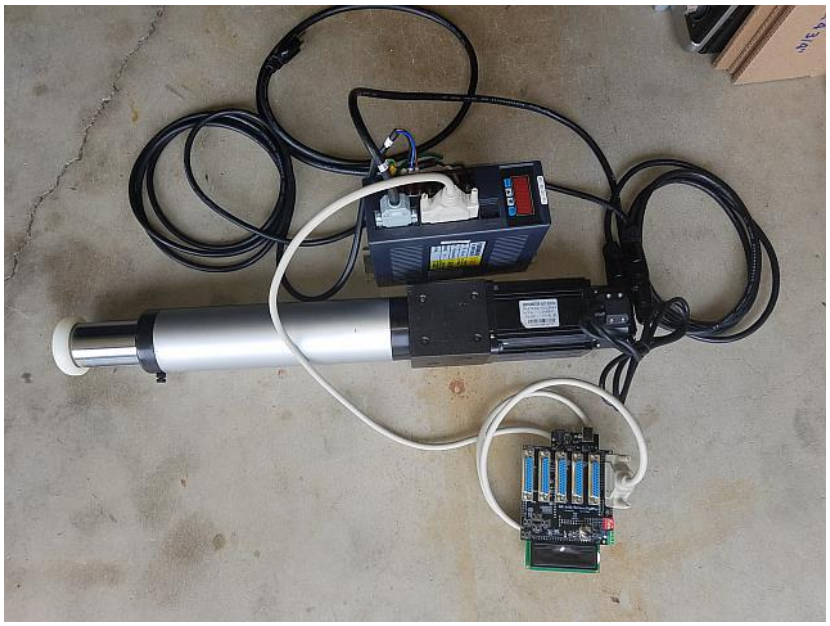
https://www.youtube.com/watch?v=pVbQSvhRTq4

https://www.youtube.com/watch?v=gEhakHadHmc



You can now order that allows easy attachment of the BD25 connector without wiring, just a 2.54mm header (male and female): https://oshpark.com/shared_projects/pSGIJpx4

AASD-15A Servo drives SETUP



The AMC-AASD15A can be interfaced to all models of AASD that have the DB25 connector and are compatible. AASD-15A, AASD-20A, AASD-30A etc. Example servo and drive below.

80ST-M02430 220V 0.75W AC Servo Motor 2.4N.M 3000RPM Servo Motor Single-Phase AC Drive Permanent Magnet Matched Driver AASD-15A
https://www.aliexpress.com/item/80ST-M02430-220V-0-75W-AC-Servo-Motor-2-4N-M-3000RPM-Servo-Motor-Single-Phase/32973113245.html

Or visit PT-Actuator for selection of servos on various actuators that may fit your motion simulator type:
http://www.pt-actuator.com/index.html

The AASD-15A drives need some parameters before they are ready to be used. Most of the parameters are same as SFX100 DIY but some additional parameters are required.

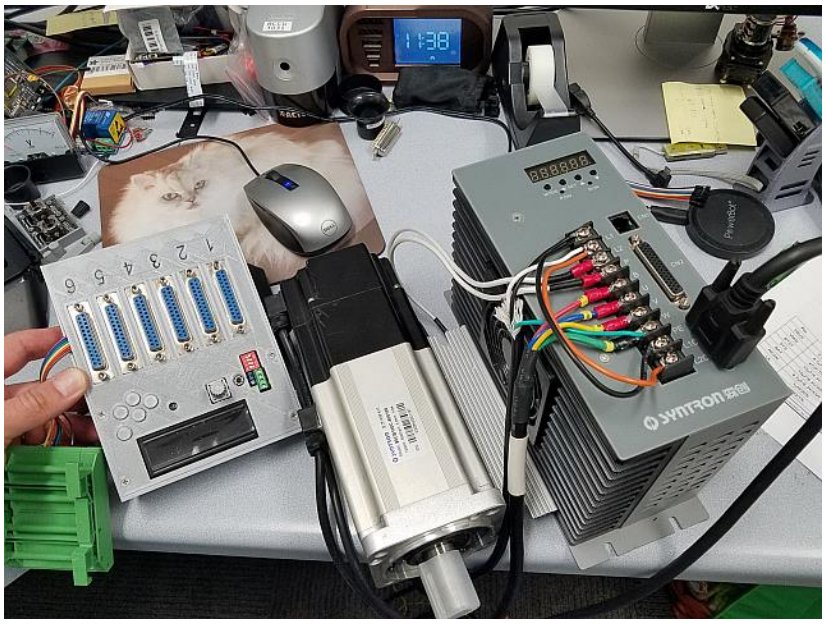
AASD-15A Servo Settings:
Push MOD until you see Pn000. This enters the parameter mode.
Change and check these settings on all motors:

Pn8 = 300 - Max peak torque % CW
Pn9 = -300 - Max peak torque % CCW
Pn51 = 3000 - Max servomotor speed in RPM
Pn98 = 20 - Pulse Multiplier (electronics gear)
Pn109 = 1 - smoothing, (1=fixed smoothing, 2=s-Shaped smoothing)
Pn110 = 30 - Smoothing Filter Time
Pn113 = 20 - Feedforward %
Pn114 = 10 - Feedforward Filter Time (ms)
Pn115 = 100 - Gain %
Pn24 = 100 - Torque level for home calibration
Pn52 = 1
Pn60 = 2
Pn61 = 6

Factory Reset of AASD-15A drive:

Select Fn004, no need to enter a value. Just press/hold the Set button and it displays Pni n, then press/hold Set again.. displays go... done... Remove power and plug back in..

Syntron HS Servo drives SETUP

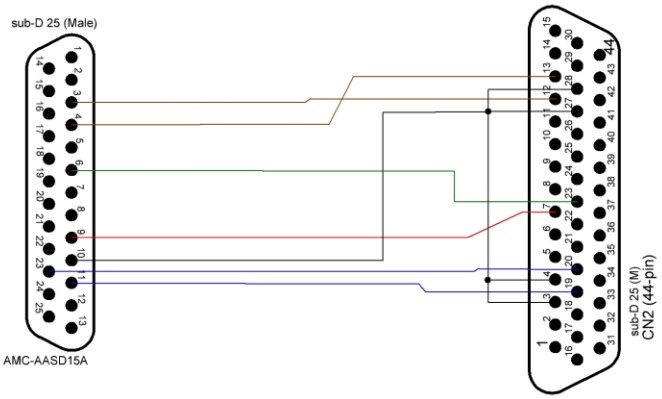


Note: Syntron HS drives **require 101Khz** Pulse Frequency setting on the AMC-AASD15A servo controller

Example cable between AMC-AASD15A and Syntron HS .

AMC-AASD15A pinout	
9	DC 5V
10	COM (GND)
6	SigIn1 (S-ON)
11	SigOUT1 (Servo ready)
23	SigOUT2 (Treach)
3	PP+ (STEP)
14	PP-
4	PD+ (DIR)
5	PD-

Syntron HS CN2 pinout	
7	DC 5V
23	SigIn1 (S-ON)
19	SigOUT1 (Servo ready)
3	Digital Output 1 (-) (GND)
20	SigOUT2 (Treach)
4	Digital Output 2 (-) (GND)
12	PULS+ (STEP)
27	PULS- (GND)
13	SIGN+ (DIR)
28	SIGN- (GND)



Complete list of values to enter in the Syntron HS:

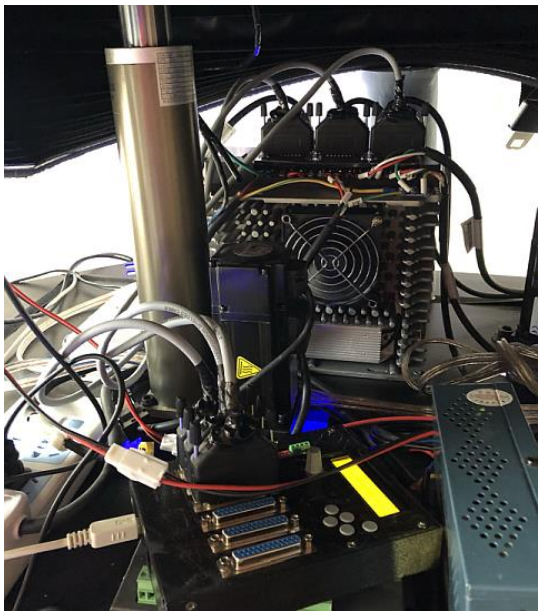
Fn 000 = 1 Hard-wired control port work mode
Fn 001 = 2 External pulse position mode
Fn 010 = -1 Servo Enabling (S-ON)
Fn 030 = -18 Servo Ready (ENA-SRV)
Fn 031 = -6 Target Torque Reached
Fn 038 = 1 Single pulse Positive logic (Pulse/DIR)
Fn 039 = 0 (2.5Mhz filter)
Fn 049 = 100 Torque threshold
Fn 04A = 10 Torque hysteresis
Fn 050 = 20 Electronic gear ratio numerator
Fn 054 = 1 Electronic gear ratio denominator
Fn 004 = 0 Motor direction 0=CCW - 1=CW

Fn 056 = 120 Pulse input command exponent filtering (Acceleration - deceleration)
Fn 057 = 32 Pulse input command moving smoothing filtering
Fn 05A = 0 Position loop speed feed-forward coefficient
Fn 05B = 10 Position-loop speed feedforward low-pass filter's time constant
Fn 05C = 80 Position loop's No.1 proportional gain Kp1
Fn 05D = 80 Position loop's No. 2 proportional gain Kp2
Fn 0DA = 32767 Number of tracking error pulses

Fn 0AC = 3000 (MAX MOTOR RPM)

Monitoning:
DN 00 RPM
DN 01 COMMAND FREQ
DN 02 TORQUE
DN 03 Position Tracking errors
DN 07 Motor speed command value (RPM)

Dorna M1 Servo drives SETUP



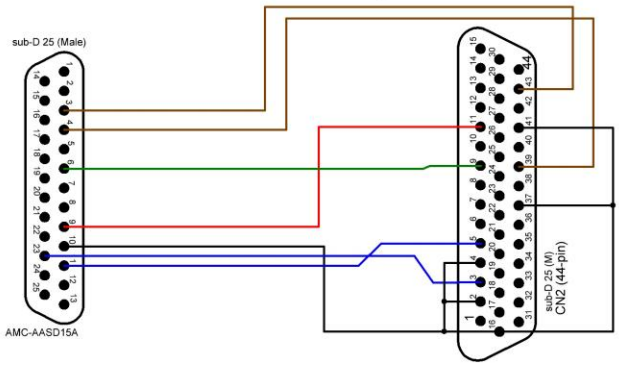
Example cable between AMC-AASD15A and Dorna M1

AMC-AASD15A pinout

9	DC 5V
10	COM
6	SigIn1 (S-ON)
11	SigOUT1 (Servo ready)
23	SigOUT2 (Treach)
3	PP+ (STEP)
14	PP-
4	PD+ (DIR)
5	PD-

Dorna M1 pinout

11	DC 5V
16	COM SG
9	SigIn1 (S-ON)
5	SigOUT2 (Servo ready)
4	Digital Output 2 (-) (GND)
3	SigOUT3 (Treach)
2	Digital Output 3 (-) (GND)
43	PULS+ (STEP)
41	PULS- (GND)
39	SIGN+ (DIR)
37	SIGN- (GND)



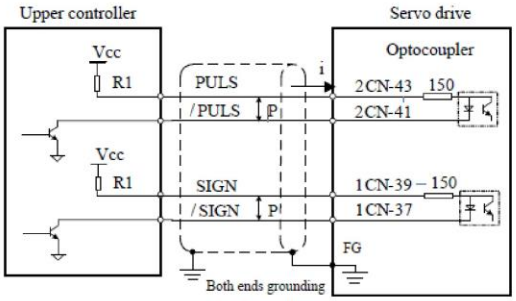
Complete list of values to enter in the Dorna M1:

PA000 = h0000
PA001 = h0000
PA200 = 0000
PA205 = 20
PA206 = 1
PA214 = 5
PA215 = 5
PA216 = 30
PA402 = 120
PA403 = 120
PA404 = 100
PA405 = 100
PA500 = 0
PA508 = b.0000
PA510 = h.0d40
PA511 = b.0000

PA500 = 0 (DEC) (INPUT)
[0] Servo-on (S-ON)

PA510 = 0d40
[4] Servo ready signal (S-RDY): active when servo is in proper status.
[D] Torque Reach signal (Treach): active when load torque reaches PA404/PA405.

- Open collector, option 2 (external 5VDC, 12VDC or 24VDC)



Input current I = 10 ~ 15mA, thus R1 resistance:
If 24VDC, R1=2K Ω;
If 12VDC, R1=510 Ω;
If 5VDC, R1=180 Ω;

Most of these Dorna M1 drives are from recycled arcade platforms, so you may want to restore factory defaults.

HOW TO RESTORE FACTORY DEFAULTS ON DORNA M1

1st - disconnect power and encoder of motors from M1 driver.
2nd - On the M1 driver press Mode button until you find AF 00 .
Set parameter to AF 05.

Follow the manual steps-

Before you plug anything back in, turn power off of everything.
Then plug everything back in, then power back on.

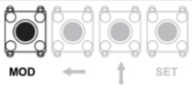
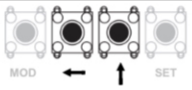
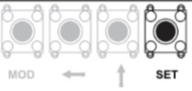
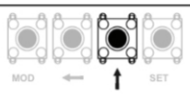
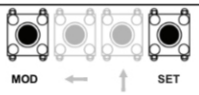
You will have to re-set all the parameters on each axis.

Here is the page from the manual:

6.7 Initialization parameter settings (AF 05)

The parameters for the function used to restore the factory settings. ² parameter settings must be initialized in the servo OFF Execution in the state. In the servo ON It can not be executed in the state. ² to enable the setting, the operator must turn on the power of the servo drive.

Operation step As shown in the following step.

step	Rear panel displaying	Use keys	operating
1			press MOD Key to select the auxiliary functions.
2			Press "↑" button or the "←" key to display " AF005 . "
3			If the servo is not running, press SET Key to display the left.
4			If the servo is running or set the front panel lock (AF 03), Is displayed on the left, that they can not perform this aid operation.
5			Press and hold the "↑" key to display the left.
6			Left until the display indicating that the operation is completed.
7			After displaying the left release buttons.
8			press MOD Key or SET To exit this auxiliary function, return to step 2 Display.
9	Re-power		
10	End		

Contact for inquiries or questions: contact@thanos-motion.com