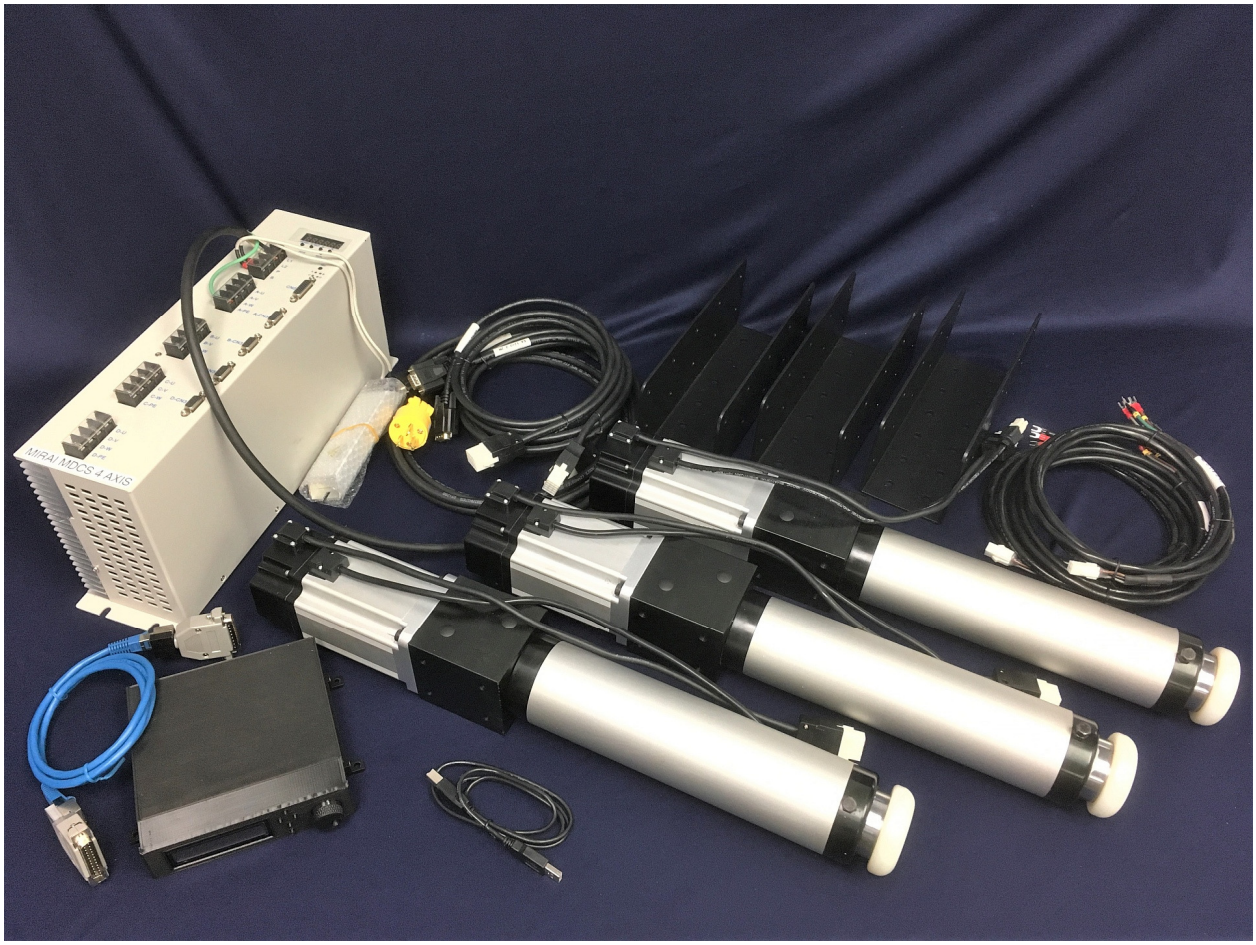
AMC-MDCS controller Manual

for 3DOF or 4DOF Servo Kit



Interface for connection to Simtools or other motion software

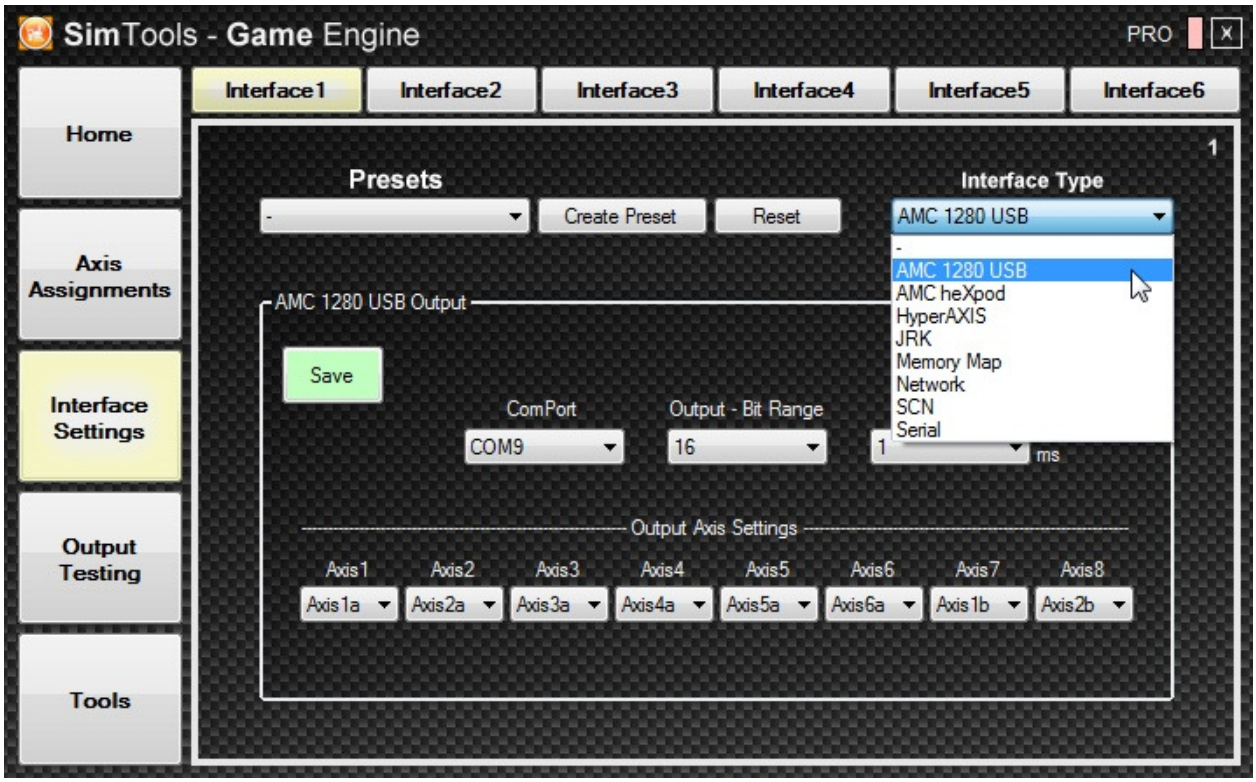
The AMC-MDCS controller allows seamless and fast interface between the PC and the MDCS servo drives. Using the AMC-MDCS controller you can interface your linear servomotors to Simtools, X-sim and Ian's 6DOF BFF motion software. The connection to PC is a simple USB connection and the connection to the MDCS is via RJ45 to 44pin cable that carries the control signals with zero latency.

There are no settings needed for the AMC-MDCS controller unit, comes fully setup. The four button on the panel can be used to manually move the actuators to 15% and 85% for testing when the controller is not receiving motion data from the PC.

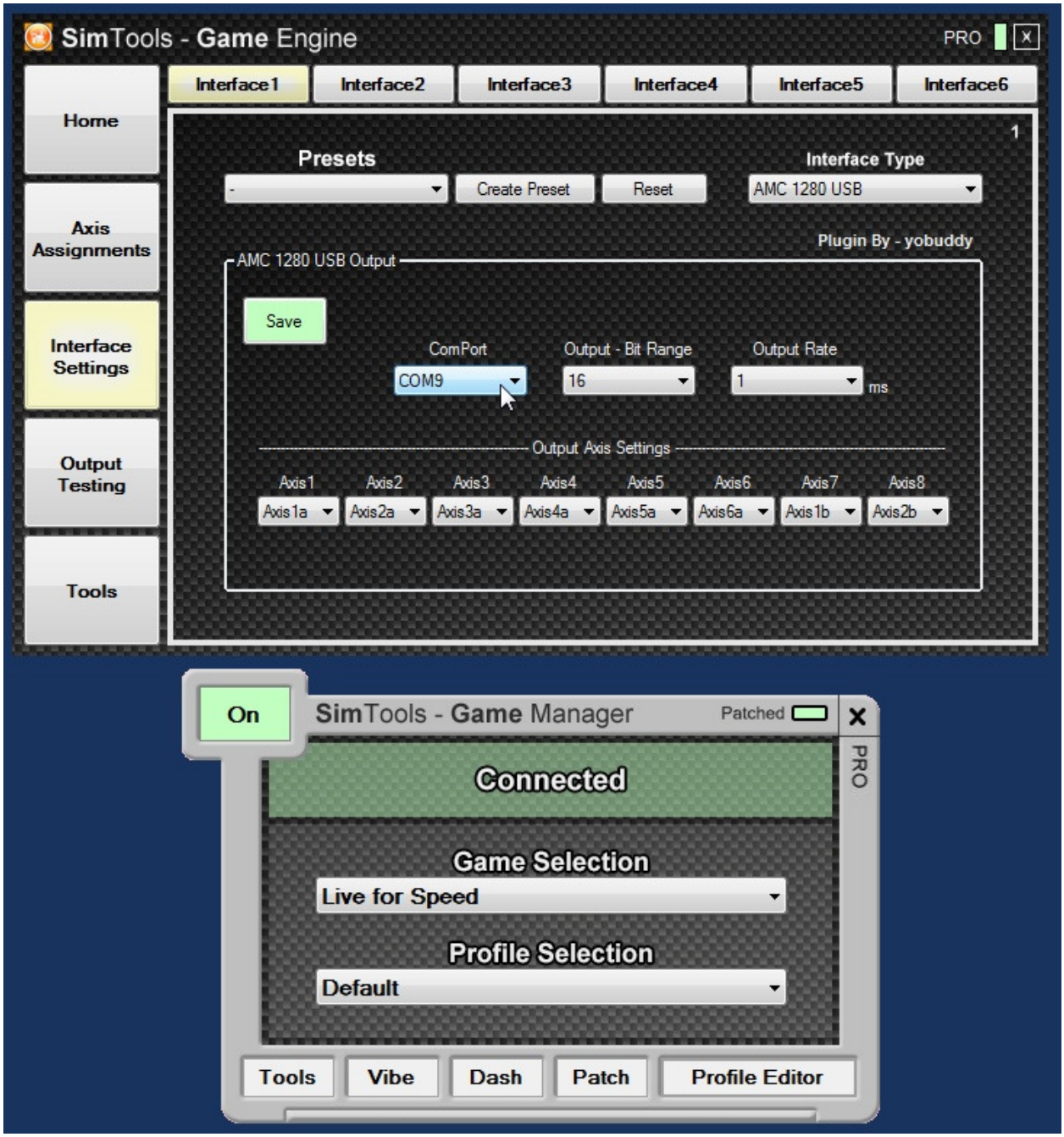
The AMC-MDCS controller is powered from the USB cable. All signal voltages to control the Servos are internally, no external PSU connection is necessary.

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-MDCS.

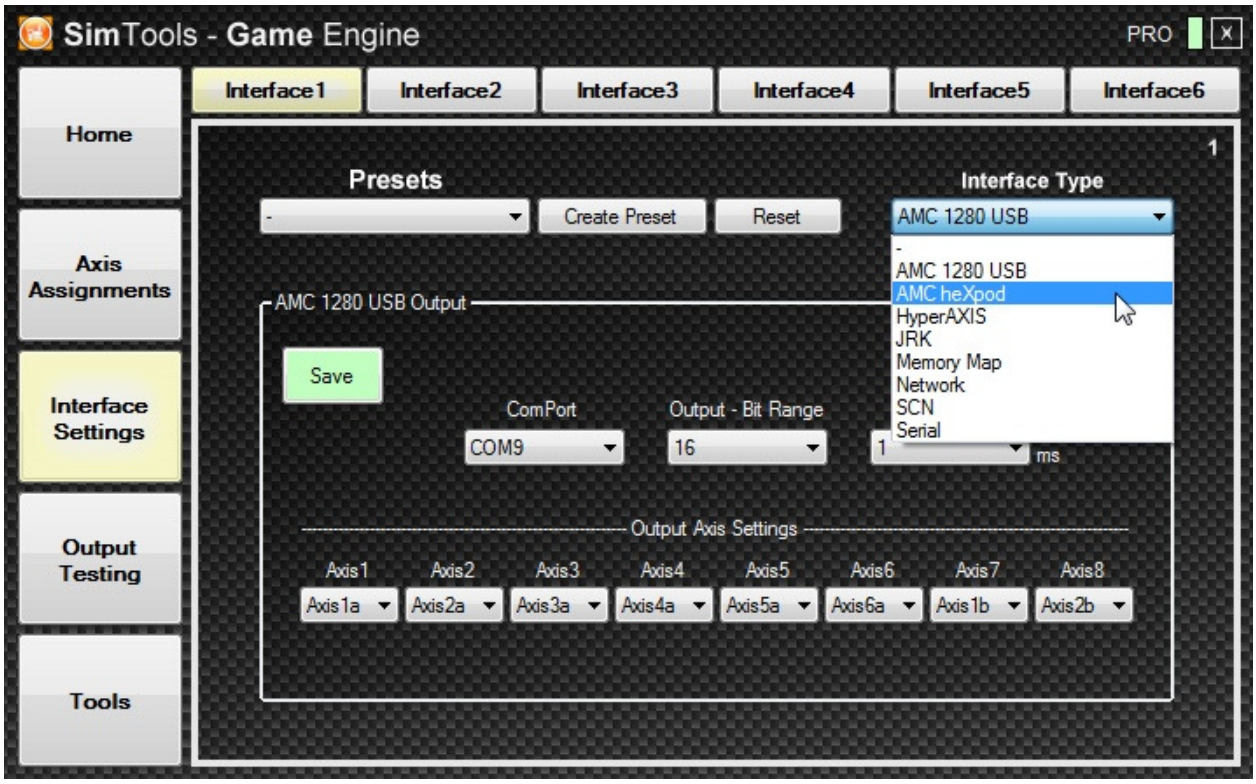


Interfacing the Simtools with direct axis is simple as seen on the below capture. It only requires selecting the AMC1280USB interface and selecting the COM Port that is assigned to the AMC-MDCS in the PC device manager.



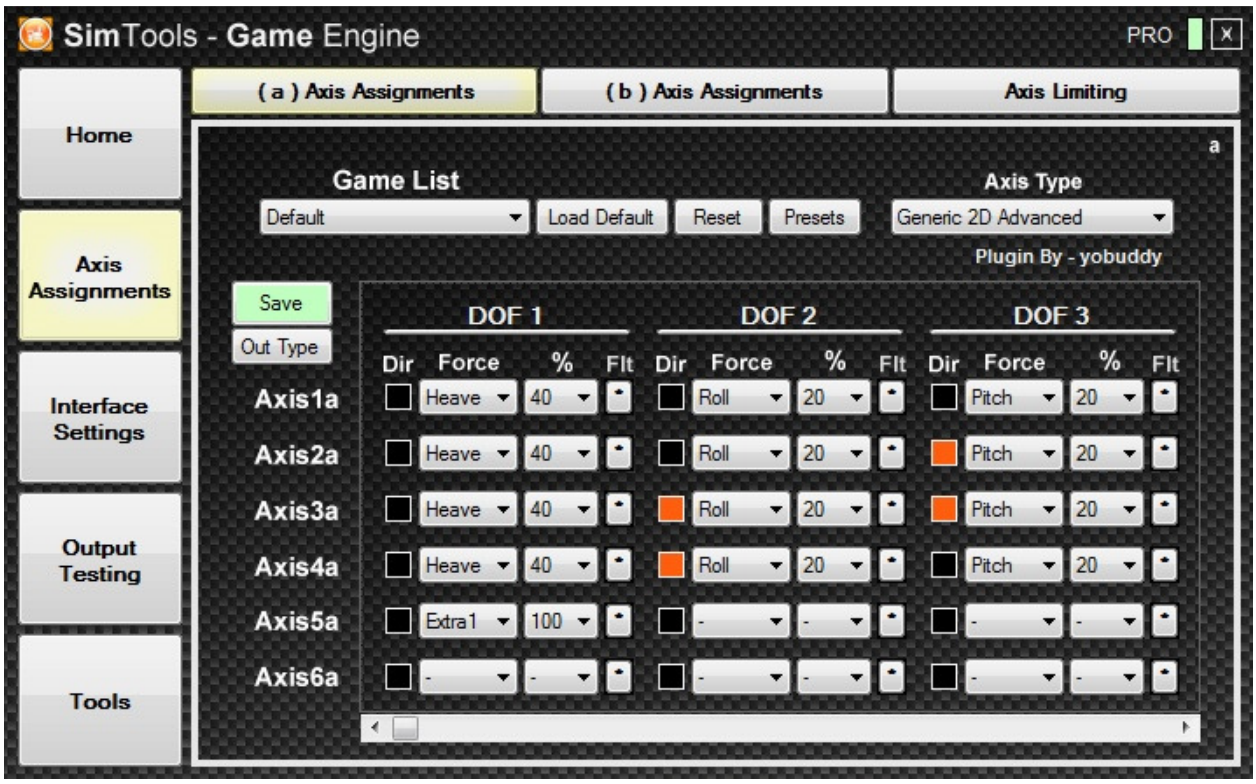
The axis assignments for each DOF provided is up to the use to mix and use as needed. The AMC-MDCS can be configured to use any of the 8axis available or be reconfigured for 2axis, 3axis or 4axis output.

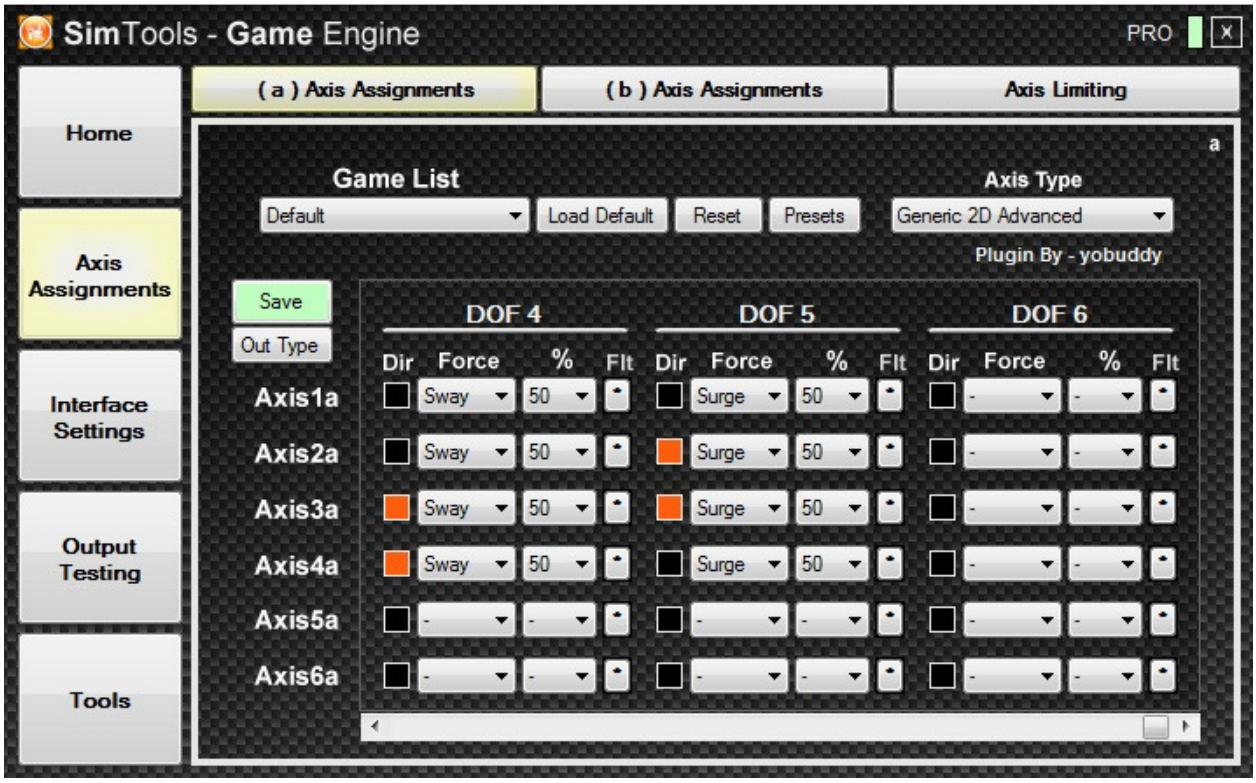
Simtools now supports the AMC-MDCS for use in 6DOF Stewart platforms as well using the Hexpod Driver interface. Complete control panel is available to define the 6DOF dimensions as well intensities and range of motion. The two additional axis7 and axis8 can be also available as pass-through and need to be configured in Simtools as separate axis.



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:





Physically you will need to arrange the order of connection of each actuator to the MDCS controller to correspond to correct order described to the Axis assignments of Simtools. For 4DOF platform the order of connection of each actuator 1-4 is:

Rear left axis 1 of MDCS Servo Power Unit

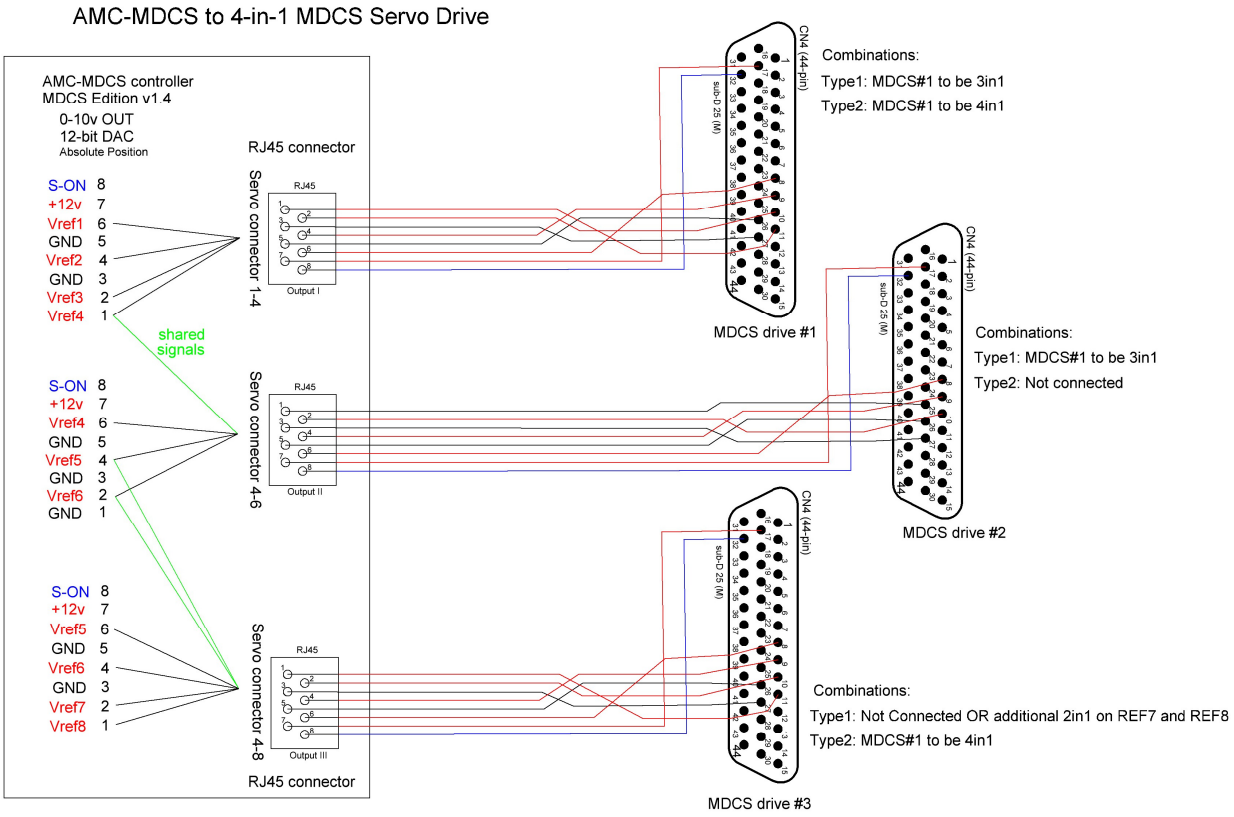
Front left axis 2 of MDCS Servo Power Unit

Front right axis 3 of MDCS Servo Power Unit

Rear right axis 4 of MDCS Servo Power Unit

The AMC-MDCS controller has total of 8 outputs that are arranged between three RJ45 output connectors as:
RJ45 Output1 – Axis 1,2,3,4: MDCS 3-in-1 (3 actuators) or MDCS 4-in1 (4 actuators)
RJ45 Output2 – Axis 4,5,6: MDCS 3-in-1 (3 actuators)
RJ45 Output3 – Axis 5,6,7,8: MDCS 4-in1 (4 actuators)
Combinations of the above can be used as long axis outputs do not overlap.

The connections between the AMC-MDCS controller and the MDCS 4-in-1 or 3-in1- Servo drives as detailed in the following connection schematic:



The controller cables that allow connection to the MDCS come in two versions of the cable with only difference the 4-in-1 version has an additional signal for the extra axis in the on the connector. Combinations allow interfacing of up to two 4-in-1 MDCS servo drives for total 8DOF.

The cables used are CAT7 SSTP patch cables with provided adapters from RJ45 to 44pin. Lengths is the CAT7 SSTP cables can be 6 feet or less to avoid signal quality loss.

The MDCS Servo Power Unit needs the following parameters to be set in its control panel before it can communicate correctly with the AMC-MDCS controller. Some parameters are not effective on MDCS servo drives that have less axis. Using the panel of the MDCS you can navigate to the FNxxx functions and change them to:

Fn 008=3721	Password (Power cycle to take effect)
Fn 009=-1	Enable only 1 Servo Motor
Fn 009=-2	Enable only 2 Servo Motors
Fn 009=-3	Enable only 3 Servo Motors
Fn 009=-4	Enable all 4 Servo Motors
Fn 0FF=0	No Filtering inputs
Fn 100=10	Sampling timing
Fn OC2=10	mm Lead Screw Calc
Fn 00D=5	Initial position after calibration

Actuator Stroke depended parameters

For 150mm stroke actuators only:

Fn 101=0	Offset	150mm stroke
Fn 102=0	Offset	150mm stroke
Fn 103=0	Offset	150mm stroke
Fn 104=0	Offset	150mm stroke
Fn 107=140	Pulse/rev	150mm stroke
Fn 108=140	Pulse/rev	150mm stroke
Fn 109=140	Pulse/rev	150mm stroke
Fn 10A=140	Pulse/rev	150mm stroke

Change S-ON (servo ON) input behavior		
Fn 090	-1	S-on enable
Fn 091	1	stop behavior
Fn 09D	1	Inversion of S-on

To correct extension direction of the actuator for 1000W MDCS model:
On the MDCS servo driver panel use the button “SEL” on each A/B/C/D-->

Fn1 004=1	Change Direction
Fn2 004=1	Change Direction
Fn3 004=1	Change Direction
Fn4 004=1	Change Direction

Some of the parameters need power off and back on again to save.

https://miraiintertech.com/e-store/products/MDCS-F.html