

MOTION IMPOSSIBLE



# AGITO

MODULAR DOLLY SYSTEM

## User Manual

AGITO OS 5.2 Nova

July 2022 (rev: 1)

## » DOCUMENT REVISION HISTORY

REVISION:	DATE:	DESCRIPTION:
1.0	July 2019	Initial Document Release – Firmware Release r3.0
1.1	September 2019	Updated for AGITO Tower – Firmware Release r3.2 Minor revisions and corrections
1.2	October 2019	Updated for AGITO Trax – Firmware Release r4.0.4
1.2rev1	October 2019	Minor corrections and inclusion of tower maintenance
1.3	March 2020	Updated for AGITO Tower – Firmware Release r4.13 Update to Trax & Tower Controls, RF Module settings, inclusion of Troubleshooting guide.
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2.1	September 2021	Updated for Firmware Release AGITO OS 5.1 Nova
2.1rev1	September 2021	Updated system specifications and minor corrections
2.2	July 2022	Update for Firmware Release AGITO OS 5.2 Nova, addition of MagTrax. Updated battery safety information. Various minor corrections throughout document.

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## » INTRODUCTION

This document provides information to assist with the setup, installation and safe operation of MOTION IMPOSSIBLE'S AGITO Modular Dolly System.

IMPORTANT:

Please read this disclaimer and warning carefully and review the AGITO user manual prior to use.

If you have any questions, please contact [support@motion-impossible.com](mailto:support@motion-impossible.com) before operating.

□ **Current version of this user manual:** [www.motion-impossible.com/downloads](http://www.motion-impossible.com/downloads)



## » DISCLAIMER

Motion Impossible Limited reserves the right to revise this user manual and make changes from time to time without obligation to notify any persons of such revisions or changes. In no event shall Motion Impossible Limited, its employees or authorised agents be liable for any damages or losses, direct or indirect, arising from the use of any technical or operational information contained in this document. Every precaution has been taken in the preparation of this manual. Nevertheless, Motion Impossible Limited assumes no responsibility for errors or omissions or any damages resulting from the use of the information contained herein.

## » WARNINGS

Throughout this manual important safety notices are highlighted, as follows:

**This is a General Notice:**

Highlighting important information relating to the system, legal requirements or other details.

**THIS IS A GENERAL WARNING:**

**NOT FOLLOWING THIS INSTRUCTION COULD CAUSE DAMAGE TO THE SYSTEM OR OTHER EQUIPMENT ATTACHED TO IT**

**THIS IS A HEALTH & SAFETY WARNING:**

**NOT FOLLOWING THIS INSTRUCTION COULD CAUSE HARM TO THE OPERATOR OR SOMEBODY IN CLOSE PROXIMITY TO THE SYSTEM**

## » GENERAL SAFETY

AGITO is only to be used by operators with extensive prior knowledge of remote-controlled systems, they must have undergone special training approved by Motion Impossible, see "AGITO Academy" on page 63.

- It is your responsibility to learn how to safely operate AGITO.
- It is your responsibility to perform a full system check of AGITO prior to every use.
- The operator must have control of all people, animals, vehicles, vessels and structures in close proximity of the AGITO when in use.
- The operator must have completed a suitable risk assessment prior to operating the AGITO and be confident that all operations can be completed safely.
- AGITO is a tuned system with custom components. Modification, removal, or substitution of AGITO components will void the warranty and any form of regulatory conformity.
- ALWAYS use factory specified replacement parts and accessories, if in doubt contact support.
- Do not disable any safety features on the system.
- Whilst the AGITO is designed to operate in various environments, the system is NOT weather Ingress Protection (IP) rated. Operating AGITO, its component parts and accessories in damp or wet environmental conditions is entirely at the operator's risk.

By using AGITO, you acknowledge that you have read, understand, and agree to this disclaimer. You agree that you are solely responsible for your conduct while using AGITO and for any direct or indirect consequences that may result from its use.

**AGITO IS A BATTERY POWERED DEVICE, OPERATED AT 48VDC  
DO NOT OPEN ANY WARRANTY SEALED COMPARTMENTS**

## » BATTERIES

You must read these safety instructions and warnings carefully before charging or using your AGITO Battery Pack. Improper use may result in damage to the batteries, severe personal injury, and even fire. By purchasing an AGITO Battery Pack, the buyer agrees to bear all responsibilities of the risks and not hold Motion Impossible Ltd, its owners and employees, its distributors, and/or its retailers responsible for any accidents, injury to persons, and property damage. If you do not agree to these conditions, please return the AGITO Battery Pack to the place of purchase in a new and unused condition.

- Do not allow the batteries to come into contact with any kind of liquid. Do not leave batteries out in the rain or near a source of moisture. Do not drop the battery into water. If the inside of the battery comes into contact with water, chemical decomposition may occur, potentially resulting in the battery catching on fire, and may even lead to an explosion.
- If the battery falls into water by accident, put it in a safe and open area immediately. Maintain a safe distance from the battery until it is completely dry. Never use the battery again, and dispose of the battery properly as described in the Battery Disposal section below.
- Put out any battery fire using water, sand, fire blanket or a dry powder fire extinguisher.
- Never use or charge swollen, leaky, or damaged batteries. If your batteries are abnormal, contact Motion Impossible or an authorised dealer for further assistance.
- The battery should be used in temperatures from 0 to +50°C Use of the battery in environments above 50°C can lead to a fire or explosion. Use of battery below -10°C can lead to permanent damage.
- Do not use the battery in strong electrostatic or electromagnetic environments. Otherwise, the battery may malfunction.
- Never disassemble or pierce the battery in any way or the battery may leak, catch fire, or explode.
- Do not drop or strike batteries. Do not place heavy objects on the batteries or charger.
- Electrolytes in the battery are highly corrosive. If any electrolytes make contact with your skin or eyes, immediately wash the affected area with fresh running water for at least 15 minutes, and then seek medical attention immediately.
- Do not use the battery if it received impact from a fall or other accidents.
- Do not heat batteries. Do not put batteries in a microwave oven or in a pressurized container.
- Do not manually short-circuit the battery. Do not store batteries with any conductive objects that could cause short circuiting.
- Only transport batteries in an approved carrying case.
- Do not put batteries in your pocket without a proper carrying case.
- Clean battery terminals with a clean, dry cloth only.
- Never remove the protective wrap of the batteries.
- When a battery's capacity is diminished with use it must be recycled according to your local by-laws.
- If a battery pack becomes or appears damaged STOP using it immediately.



- Never disassemble, modify, puncture, shock, crash, short circuit, and/or expose Battery Packs to a flame. Leakage, smoke emission, ignition, explosion or fire can occur, which may result in personal injury or property damage.

## » BATTERY CHARGING

- Do not leave AGITO Battery Packs and charger unattended when in use.
- Do not attach the batteries to wall outlets or car charger sockets directly.
- Motion Impossible takes no responsibility if the battery is charged using a non-Motion Impossible charger.
- Do not charge the battery near flammable materials or on flammable surfaces such as carpet or wood.
- Do not charge the battery immediately after use, because the battery temperature may be too high.
- Do not charge the battery until it cools down to near room temperature.
- Charging the battery outside of the temperature range of 14-40°C may lead to leakage, overheating, or battery damage.
- Disconnect the charger or charger cable when not in use. Examine the charger, adapter and cable regularly for damage to the cord, plug, enclosure, or other parts. Do not clean the charger with denatured alcohol or other flammable solvents.
- Never use a damaged charger or cable.

## » BATTERY STORAGE

- Keep batteries out of the reach of children and pets.
- Do not leave the battery near heat sources such as a furnace or heater.
- Do not leave the batteries inside of a vehicle on hot days, the ideal storage temperature is between 22-28°C (71-82°F).
- Always keep the battery in a dry place.
- Do not store the battery fully discharged for long periods of time, otherwise it will over discharge and lead to permanent damage.

**RECOMMENDED:** Batteries must remain at a charge level of between 90-50% when in storage, batteries left for more than one month must be charged for a minimum of 30mins (or longer if fully discharged) once a month. Do not leave batteries uncharged, or at a charge level of less than 50%, doing so may damage the battery cells, resulting in reduced life span or in extreme circumstances failure to hold a charge.

## » BATTERY DISPOSAL

Dispose of AGITO batteries in specific recycling boxes only after a complete discharge.

**DO NOT PLACE THE BATTERY IN REGULAR TRASH CONTAINERS. STRICTLY FOLLOW YOUR LOCAL REGULATIONS REGARDING THE DISPOSAL AND RECYCLING OF BATTERIES.**

## » WARRANTY & SERVICE

AGITO comes with a return-to-base 12-month Warranty from the original date of shipment.

Please note that opening any compartment or casing of the AGITO CORE, MASTER, RF Modules, Drive-end, Tower, or any other component or official accessory is not permitted. Bypassing control features or interrupting the control protocol is not permitted.

All Servicing, beyond the basic maintenance outlined in this manual must be undertaken by an officially authorised technician at a Motion Impossible certified service centre.

**There are no user repairable parts, beyond those outlined in this manual. Attempting to undertake any repair, modification or attaching any non-authorized mechanical, electrical or electronic component to the system will void your warranty and may remove conformity.**

## » GENERAL SPECIFICATIONS

<b>Model</b>	<b>AGITO CORE V1.1 (DIODE BOARD ENABLED)</b>
<b>System Voltage</b>	48v DC
<b>Current (AGITO Sports)</b>	20A (typical) at 20Kg payload (40A Peak)
<b>Run-time</b>	30-240+ mins, depending upon operation.
<b>Charging Time</b>	45 mins approx.
<b>Data Type / Baud Rate</b>	RS-232 / 115200
<b>Sound Level</b>	Less than 70dba
<b>Model</b>	<b>AGITO MASTER V1.0</b>
<b>Power Range</b>	12-30v DC
<b>Run-time</b>	8+ hrs, depending upon operational settings and batteries used
<b>Data Type / Baud Rate</b>	RS-232 / 115200
<b>Model</b>	<b>BATTERY V1.0</b>
<b>Chemistry</b>	Lithium-Ion
<b>Voltage / Capacity</b>	48v DC / 99.9Wh
<b>Charging Voltage</b>	50.4v DC
<b>Operational Ambient Temp. Range</b>	0 - +50 °C
<b>Storage Temperature Range</b>	-20 - +50 °C (Ideal 22-28 °C)
<b>Model</b>	<b>AGITO TOWER V1.0</b>
<b>Power Range</b>	12-24v DC
<b>Model</b>	<b>AGITO RF MODULE ENCLOSURE V1.0</b>
<b>Power Range</b>	12v DC
<b>Model</b>	<b>AGITO HUBBOX V1.0</b>
<b>Power Range</b>	7-9v DC
<b>Model</b>	<b>AGITO MAINS PSU V2.0</b>
<b>Input Voltage</b>	110 - 264Vac (47-63Hz)
<b>Primary Output Voltage</b>	48Vdc
<b>Secondary Output Voltages</b>	12Vdc and 24Vdc
<b>Efficiency</b>	95%
<b>Setup Rise Time</b>	1800ms, 60ms at full load
<b>Output Hold up Time</b>	10ms (typical) at full load
<b>Internal Fan - activation temp</b>	30 °C
<b>Inrush Current</b>	60A @ 230Vac (typical cold start)

Module specific specifications are located in the relevant sections of this manual. Details quoted are for the most recent variant of the module, E&OE.

## » RF SPECIFICATIONS

**IT IS THE OPERATORS RESPONSIBILITY TO ENSURE THAT THE RF SETTINGS ARE CORRECT FOR THE TERRITORY OF OPERATION**

AGITO uses RF modules that can be user configured. It is the owner's responsibility to ensure that the correct settings are used for the territory that the RF system is being used in. By using AGITO, you acknowledge that you have read, understand, and agree to this disclaimer. You agree that you are solely responsible for your conduct while using AGITO and for any direct or indirect consequences that may result from its use.

Motion Impossible supply the system by default with the following settings:

Region	Global	EU	North America
Frequency	2.4 GHz	869 MHz	900 MHz
Power	100mW	100mW	100mW

For users in different territories, please consult your local regulatory agency.

When using a third-party RF solution, such as Silvus TriCaster or DTC NetNode/Solo, it is the owner's responsibility to ensure the settings used are legal for the territory of operation and that full control of the AGITO is maintained at all times.

## » TRAINING AND FURTHER ASSISTANCE

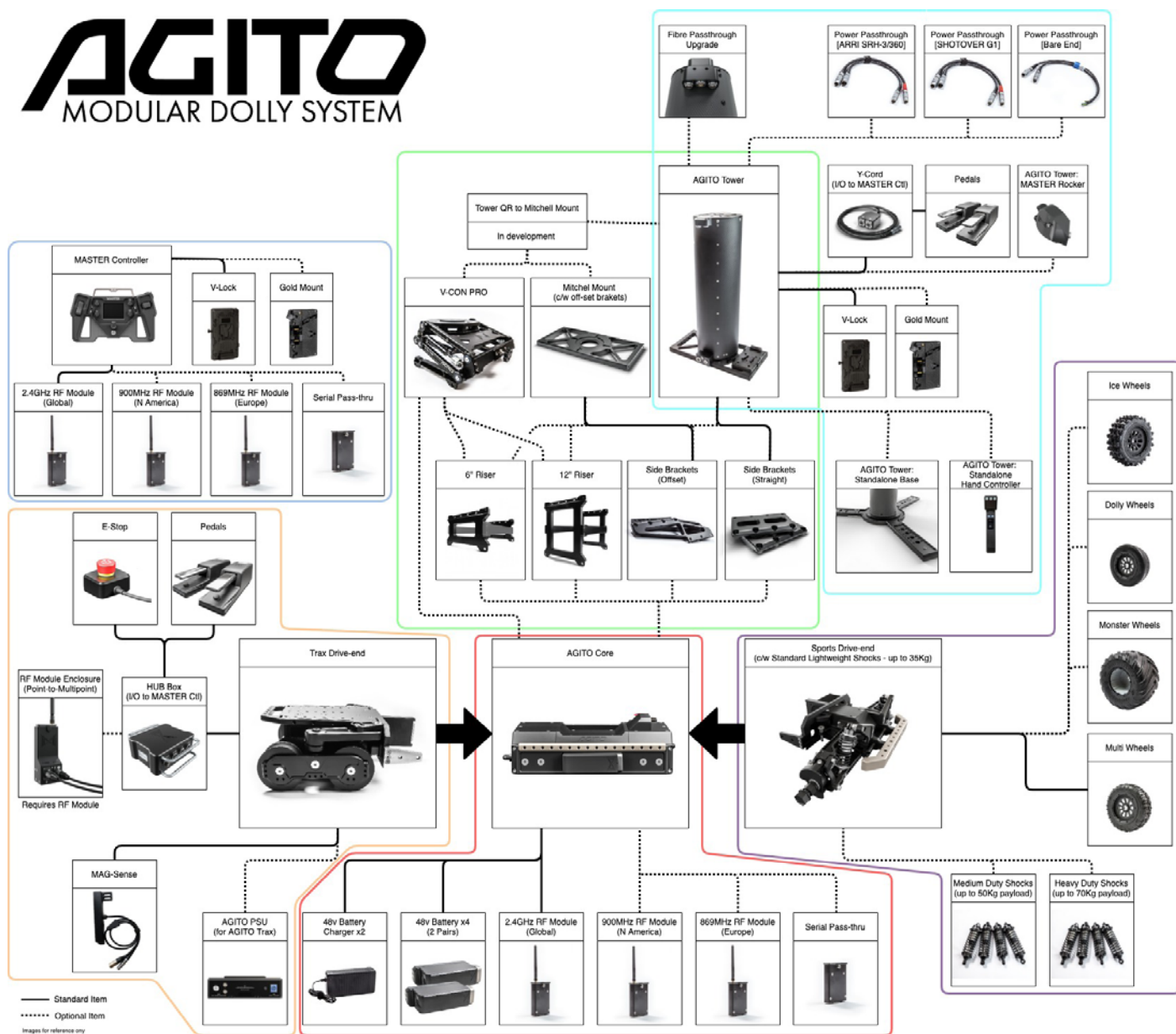
AGITO Academy offers a full range of training for the AGITO Modular Dolly System, online through video guides and our support website as well as face-to-face training, see "AGITO Academy" on page 63.

Throughout this manual, web links to online training, our support website and knowledge base are show as follows:

- <https://motion-impossible.com/support/support-portal/>
- <https://motion-impossible.com/how-to-videos/>

## » AGITO PRODUCT FAMILY

Details correct as of August 2021

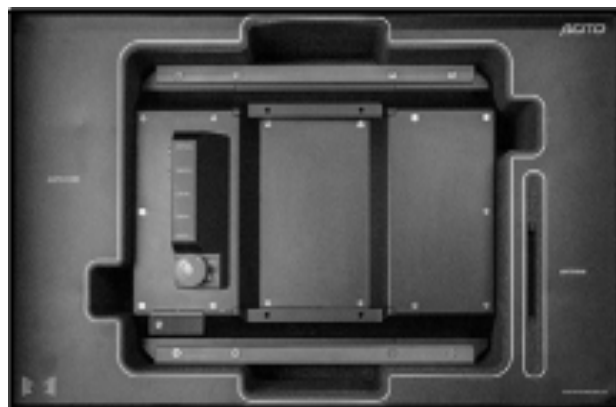


## » CASE CONTENTS, DIMENSIONS & WEIGHTS

### » CORE & MASTER

Case ID:	Dimension (HxWxD)	Shipped Weight:
Core and Master	550 x 820 x 430 mm 21.5 x 32 x 17 inches	32 Kg 70.5 lbs

Item:	Part Name:
1	AGITO Core
2	RF Antenna



Item:	Part Name:
3	AGITO Battery Chargers
4	AGITO 99Wh Batteries
5	Master Controller
6	Toolkit
7	Fixings
8	RF Antenna
9	Firmware Update Cable



### » SPORTS DRIVE-ENDS

Case ID:	Dimension (HxWxD)	Shipped Weight:
Sports Drive-ends	550 x 820 x 430 mm 21.5 x 32 x 17 inches	32 Kg 70.5 lbs

Item:	Part Name:
1	2x AGITO Sports Drive-ends
2	4x Wheel Nuts
3	Wheel Nut Spanner
4	4x Suspension Lock-out Bars

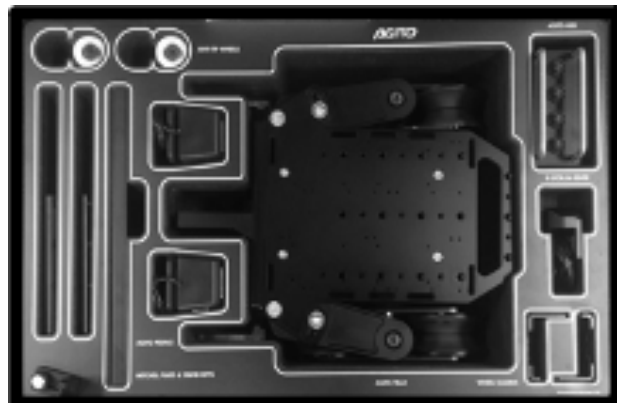


## » TRAX DRIVE-ENDS

Case ID:	Dimension (HxWxD)	Shipped Weight:
Trax Drive-ends (2 Cases)	310x820x430 mm / 12x32x17 inches	32 Kg (x2) / 70.5 lbs (x2)

Item:	Part Name:
1	2x AGITO Trax Drive-ends (1 per case)
2	Mag-Sense / E-Stop *
3	2x Jockey Wheels / Magnets *
4	AGITO Hub / Cable Set *
5	Mitchell Mount *
6	Pedals *

\* exact case content subject to ordered specification, items split between the two cases

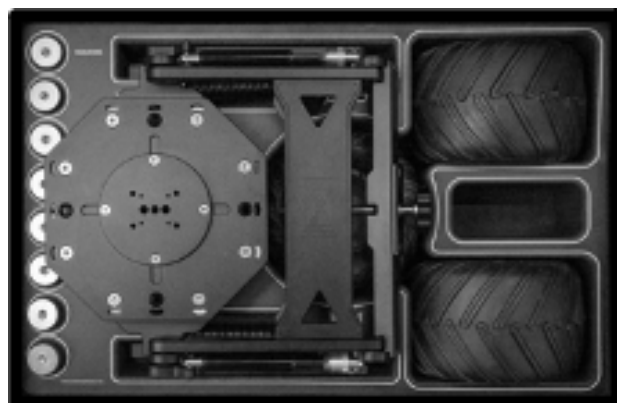


## » V-CON PRO

Case ID:	Dimension (HxWxD)	Shipped Weight:
V-Con Pro	310x820x430 mm / 12x32x17 inches	25 Kg / 55 lbs

Item:	Part Name:
1	V-Con Pro Isolator
2	Gimbal Adaptor Plate
3	8x ISO Dampeners
4	Space for wheels (pitted with Monsters)

**THE V-CON PRO MUST BE FULLY LOWERED USING THE PAYLOAD ADJUSTER KNOB BEFORE PLACING INTO THE CASE.**



## » TOWER

Case ID:	Dimension (HxWxD)	Shipped Weight:
Tower	550x820x430 mm / 21.5x32x17 inches	32 Kg / 70.5 lbs

Item:	Part Name:
1	AGITO Tower with QR Plate
2	Mounting Stand-offs
3	AGITO Hub / Splitter Cable *
4	Power Pass-through Cable Set / Fibre Optic Tails *
5	Pedals *
6	Gas-Struts (under tower)

**TOWER MUST BE FULLY LOWERED AND THE GAS-STRUT REMOVED PRIOR TO PACKING.**



\* exact case content subject to ordered specification



## » MAGTRAX SENSOR BARS

Case ID:	Dimension (HxWxD)	Shipped Weight:
MagTrax	310x820x430 mm / 12x32x17 inches	28Kg / 55lbs

Item:	Part Name:
1	AGITO MagTrax Front Sensor Bar
2	AGITO MagTrax Rear Sensor Bar
3	MagTrax Cable Loom
4	15m Flexible MagStrip Cord 5mm x 5mm
5	40m Adhesive MagStrip
6	AGITO Hub / Cable Set*
7	Pedals*
8	Sports Hard/Medium Shocks*

**THIS CASE CONTAINS MAGNETIC MATERIAL SO SHOULD NOT BE STORED NEAR SENSITIVE EQUIPMENT**



\* exact case content subject to ordered specification.

## » PSU (MAINS POWER SUPPLY UNIT)

Case ID:	Dimension (HxWxD)	Shipped Weight:
PSU	170x460x350mm / 7x18x14 inches	10.5Kg / 23lbs

Item:	Part Name:
1	AGITO PSU
2	Battery Module
3	Battery Module - PSU Cable (under PSU in case)



## » SYSTEM OVERVIEW: AGITO CORE

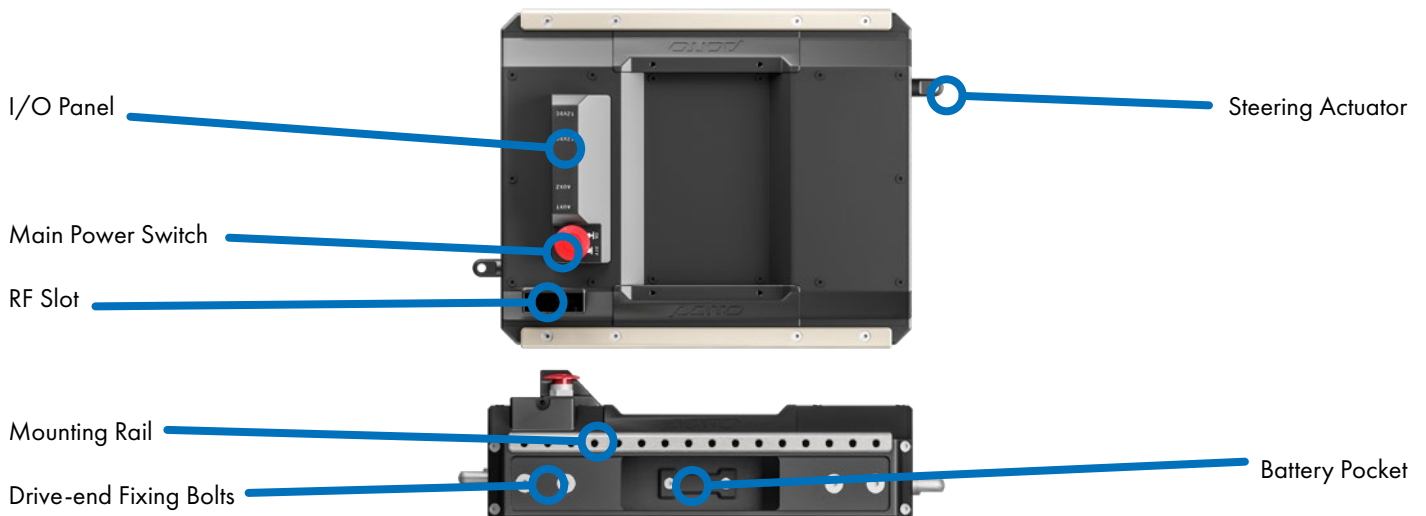
### » INTRODUCTION

The Core is the heart of your AGITO Modular Dolly System, within this module is contained all of the power management, RF / Communications and Steering drivers.

### » DIMENSIONS

See "Technical Drawings" on page 78

### » KEY FEATURES



### » BATTERY POCKETS

**ONLY MOTION IMPOSSIBLE APPROVED BATTERY PACKS SHOULD BE USED TO PREVENT DAMAGE TO THE SYSTEM.**

**ALWAYS OPERATE WITH AT LEAST 1 BATTERY FITTED TO THE AGITO CORE WHEN USING EXTERNAL POWER SUPPLIES.**

**BATTERIES CAN BE HOT SWAPPED. ALWAYS USE BATTERIES OF THE SAME CHARGE LEVEL DURING OPERATION.**

### » MAIN POWER SWITCH

Powers the CORE and attached accessories, the switch will illuminate when turned on. (Solid Red = Connected to MASTER Controller; Slow Flash = Searching for MASTER Controller; Fast Flash = System Error.)

### » RF MODULE SLOT

See "RF Module & Communications settings" on page 60.

### » I/O PORTS

- 2x 12v DC Outputs – 4 Pin XLR connectors with a shared 2A load
- USB Connector – Not in Use (for future expansion).
- 2x AUX Ports – for connection to AGITO Accessories, including Tower, MAG-Stop, MagTrax and for Firmware updates

### » PAYLOAD MOUNTING RAIL

Payload mounting is provided via the 2 mounting rails on each side of the chassis. See "Attaching Camera Mounts" on page 43



## » SYSTEM OVERVIEW: DRIVE MODES

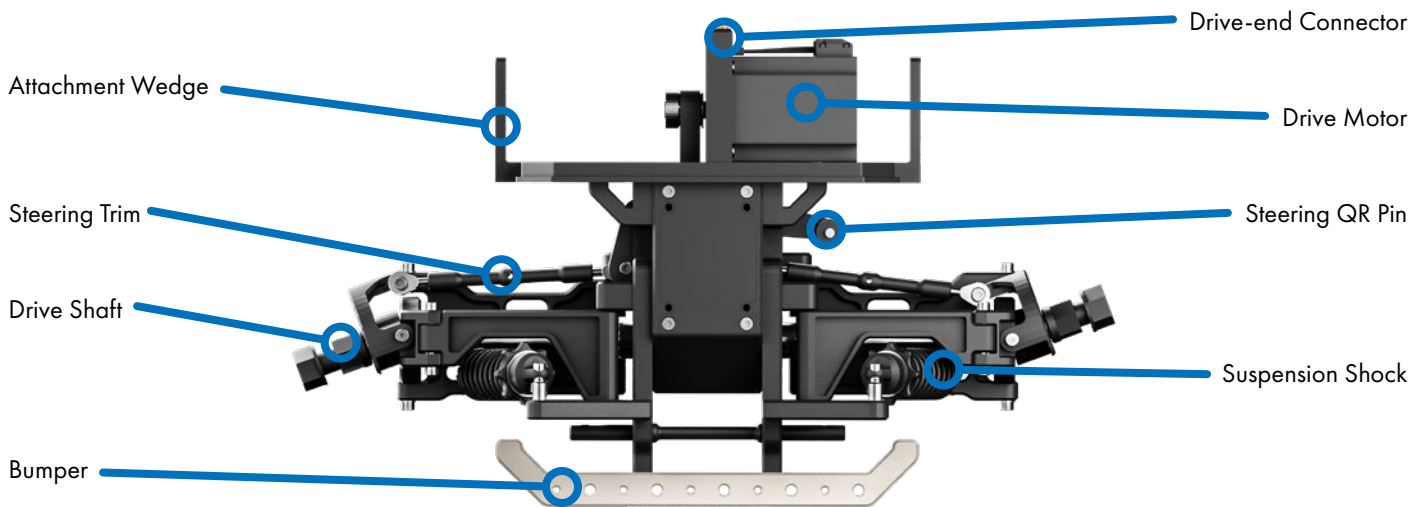
### » SPORTS DRIVE-ENDS

AGITO Sports Drive-ends are our free-roaming drive module, with multiple wheel-type options. Designed for speeds of upto 27mph in Advanced Operator Mode. AGITO Sports will operate at 5.8 m/s (12.1mph) with Dolly Wheels in Standard Operator Mode (SOM). See "Specifications" on page 76





### » DIMENSIONS

See "Technical Drawings" on page 78

### » KEY FEATURES



### » WHEEL OPTIONS

	Dolly Wheel	Multi-terrain Wheel	Monster Wheel	Ice Wheel
<b>Radius</b>	185mm	185mm	225mm	185mm
<b>Recommended for</b>	Studio Floors / Roads	General purpose	Grass, off-road	Ice and packed snow
Images for reference only				

### » SUSPENSION / SHOCK OPTIONS

Mount:	Soft Shock / Standard	Medium Shock	Heavy Shock
<b>V-Con Pro</b>	5-32Kg (11-70lbs)	5-32Kg (11-70lbs)	5-32Kg (11-70lbs)
<b>Mitchell Mount</b>	10-40Kg (22.88lbs)	20-50Kg (44-110lbs)	30-60Kg (66-132lbs)
<b>Tower</b>	7-13Kg (15-28lbs)	7-22Kg (15-48lbs)	16-22Kg (35-48lbs)

**THE SPECIFIED PAYLOAD RANGE ABOVE EXCLUDES THE WEIGHT OF THE MOUNT, NEVER OVERLOAD A CAMERA MOUNT. WHEN USING AGITO TOWER, MEDIUM SHOCKS SHOULD BE CONSIDERED THE DEFAULT OPTION.**

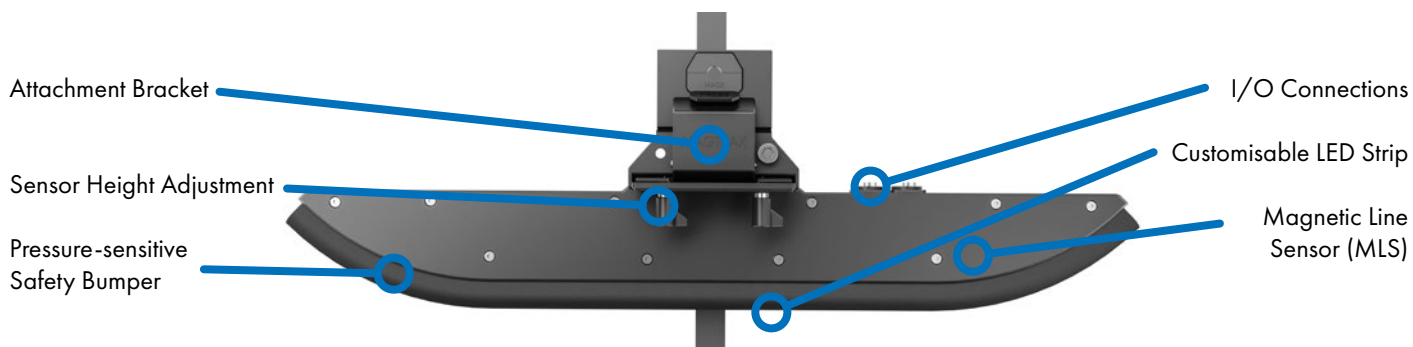
## » MAGTRAX SENSOR BARS

AGITO MagTrax is a revolutionary new way to move cameras along a fixed path, these sensors attach directly to the AGITO Sports Drive ends and allow the system to reliably follow a magnetic strip that can be quickly and discreetly layed in a variety of different shapes.

## » DIMENSIONS

See "Technical Drawings" on page 78

## » KEY FEATURES



## » MAGSTRIP TYPES

	Adhesive Strip	Flexible Strip
<b>Cross-Section Size</b>	25.4mm x 1.1mm (1" x 0.045")	5mm x 5mm (0.197" x 0.197")
<b>Reel Length</b>	45.7m (150')	15.2m (50')
<b>Recommended for</b>	Straight Track, Gentle Curves, Permanent Installations, Under-Surface / Hidden Track.	Tight corners, Quick-lay track, routed grooves
<b>Images for reference only</b>		

## » SUSPENSION / SHOCK REQUIREMENTS

MagTrax requires a more rigid base than normal Sports operation, because of this at least medium shocks or harder are recommended

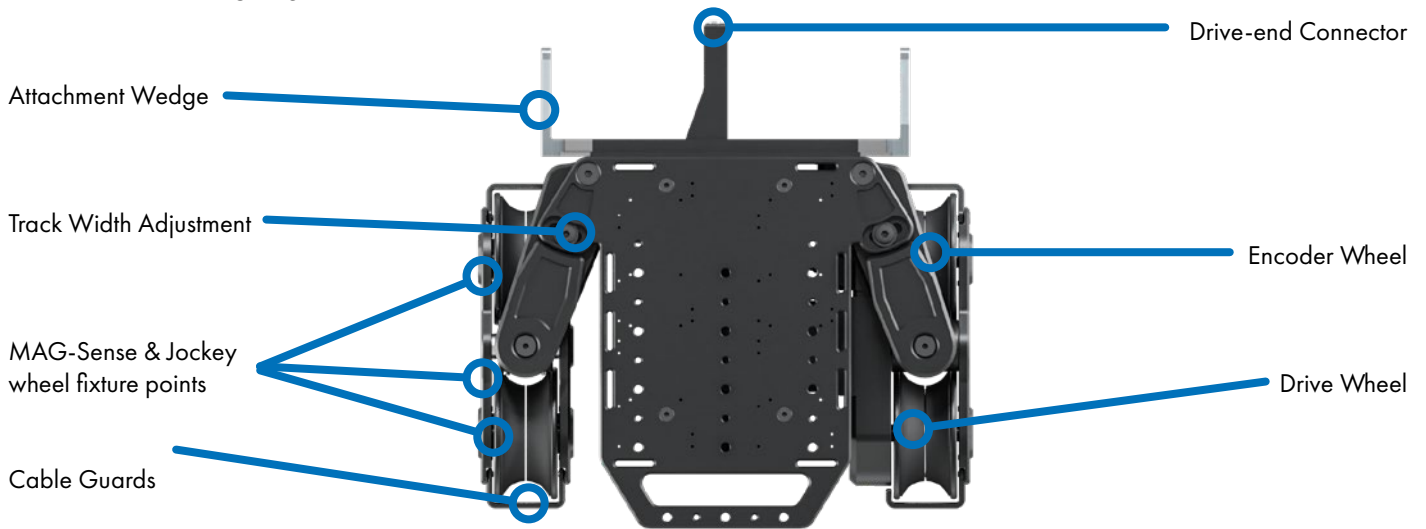
## » TRAX DRIVE-ENDS

AGITO Trax Drive-ends are designed to enable the use of 300-409mm (12 – 16 inch) dolly track with the AGITO system. AGITO Trax will operate at 3.1 m/s (7mph), see “Specifications” on page 76

## » DIMENSIONS

See “Technical Drawings” on page 78

## » KEY FEATURES



## » COMPATIBLE TRACK OPTIONS

AGITO Trax is compatible with many types of dolly track, Motion Impossible have tested and verified:

- AGITO Track
- Egriment 400mm gauge dolly track
- Ronford-Baker narrow gauge dolly track (12")
- Solid Grip Scissor Track
- Panther Scissor / Bar Track
- Ross Video Furio Track

**RUBBER TRACK IS NOT RECOMMENDED FOR USE WITH AGITO TRAX**

## » SYSTEM OVERVIEW: MOUNTING OPTIONS

### » V-CON PRO



V-Con Pro is our low-level isolation mount, with a combination of vertical dampening and vibration isolation. V-Con Pro keeps the camera low to the ground and is ideal for high speed, dynamic moves when a low lens height and low centre of gravity are important

#### » KEY FEATURES

Designed for camera/gimbal packages of up to 32Kg (70.5lbs).

### » TOWER



AGITO Tower is our remote pedestal column, which enables on-shot height adjustment.

A Quick Release plate is included with the Tower which has mounting points for all major remote heads (ARRI SRH-3, Shotover G1, Newton, Freefly Movi, DJI Ronin)

The device is powered via a V-lock battery plate located on the base plate. It is also possible to operate AGITO Tower as a stand-alone unit, when paired with the AGITO Hub using an optional upgrade.

#### » KEY FEATURES

The pedestal column has 700mm (27.5 inches) of travel from a starting height of approximately 750mm (29.5 inches) subject to Drive-end (see "Specifications" on page 76). It has been designed for camera/gimbal packages of up to 22Kg (48.5lbs).

### » MITCHELL MOUNT



Provided as part of the Trax bundle, Tower package or available as an optional extra the Mitchell Mount is a non-isolated fixture.

#### » KEY FEATURES

Designed for camera/gimbal packages of up to 40Kg (88lbs).

### » STACKING RISERS



Provided in two versions, 6 & 12" (150 & 300mm) these risers are compatible with all AGITO mounting options.

## » SYSTEM OVERVIEW: MASTER CONTROLLER

### » INTRODUCTION

The Master Controller is the manual input device for your AGITO Modular Dolly System.

### » OPERATIONAL LAYOUT



### » CONTROL FUNCTIONS

#### » THROTTLE INPUT

##### SPORTS, MAGTRAX & TRAX MODE

Gives forward, reverse & brake in one control. When applying brake, i.e. opposite throttle to the direction you are currently moving, you are forcing the chassis to stop with 100% deceleration. When released the deceleration rate value is used as a coasting brake.

##### MENU NAVIGATION

The throttle functions as an up/down control.

#### » SPEED LIMIT

##### SPORTS, MAGTRAX & TRAX MODE

Maximum speed limit: This control is located on the top left corner and can be operated during a movement. The throttle input and chassis speed cannot exceed the value set by this control. The current maximum speed setting is displayed on the LCD. When in the menus it also functions as a value control. Behind this control on the rear of the Master is a button to make a menu selection.

##### MENU NAVIGATION

Moves up and down through the menu options

## » REAR OPTION BUTTON

### MENU NAVIGATION

Located on the rear of the Master Controller, this button acts as an "Enter" function.

## » ACC - ACCELERATION LIMIT

### SPORTS, MAGTRAX & TRAX MODE

Sets the maximum rate of acceleration you can achieve with a full throttle input. A higher value allows a faster acceleration rate.

### MENU NAVIGATION

Jumps menu pages up on press.

## » DEC - DECELERATION RATE CONTROL

### SPORTS, MAGTRAX & TRAX MODE

Adjusts the coasting brake (when the throttle control is released to neutral while moving). A higher value increases the rate of deceleration and is recommended for beginners, a lower value decreases the rate of deceleration resulting in smoother speed control. When applying the brake, i.e. opposite throttle to the direction you are currently moving, you are forcing the chassis to stop with 100% deceleration, no matter what figure is shown as the DEC value.

### MAGTRAX MODE ONLY

Press to cycle view between Magnetic Strength & Markers

### MENU NAVIGATION

Jumps menu pages down

## » FUNCTION SWITCH

### SPORTS , MAGTRAX & TRAX MODE

This switch is set to Emergency Brake, switching this during operation will command the AGITO to stop as quickly as possible and hold the AGITO in position. There are two modes of operation, UP & DOWN, these are explained later in the manual, see "E-Stop" on page 62.

## » STEERING INPUT

### SPORTS & MAGTRAX MODE

Turns the chassis according to the steering mode selected

### TRAX MODE

Controls Tower movement

### MENU NAVIGATION

The steering input also functions as a left/right control.

## » "2-4-C" - STEERING MODE

This switch can also be assigned to provide multiple functions, to change the function see "Control Mapping" on page 20

### SPORTS & MAGTRAX MODE

Control switches between 3 steering modes:

- 2-wheel steering: front wheel pair steers
- 4-wheel steering: front and rear wheel turn in opposite directions reducing the turning circle and pivots the chassis around the middle during a turn.
- Crab steer: front and rear wheels turn the same way resulting a sideways sliding movement instead of a turn.

## TRAX MODE

Activates and Deactivates MAG-Stop sensor, see "Mag-Stop override" on page 55.

### » STEER LIMIT - STEERING ANGLE LIMIT

## SPORTS & MAGTRAX MODE

Sets the maximum steering angle possible with a full left or right steering input. Good for accurate curves and reducing total travel during high-speed movement.

When Tower is enabled: Press down to cycle between Steer Limit, Tower Speed, Tower Acceleration & Tower Deceleration

## TRAX MODE

Press down to cycle between Tower Speed, Tower Acceleration & Tower Deceleration

### » STEER RATE - STEERING SPEED CONTROL

## SPORTS & MAGTRAX MODE

Adjusts the response of the steering actuators, three options are available: Fast (100%), Medium (50%) and Slow (30%). Steer Rate must be enabled in the menu for this function to work. Does not affect steering speed in MagSteer.

Press down to cycle between Steer Rate/Tower Position, Tower Top Limit & Tower Bottom Limit.

## TRAX MODE

Press down to cycle between Tower Position, Tower Top Limit & Tower Bottom Limit.

### » MODE SWITCH

This switch can also be assigned to provide multiple functions, to change the function see "Control Mapping" on page 20

## FILM & FREE MODE (SPORTS & TRAX)

This switch is designed to allow you to setup and quickly swap between 2 types of movement behaviour, it is in essence two memories. For example, a slow and very controlled camera movement on "Film" mode, and a faster manoeuvring mode in "free" mode. The system automatically remembers the last settings being used before the modes are changed.

## STEERING HOLD (SPORTS)

This feature enables the operator to lock the steering angle to maintain a fixed curve, see "Sports Mode: Steering Hold" on page 51.

## MagTrax ENABLE (MagTrax

In MagTrax mode this switch enables and disables mag steering. Allowing you to lock on and lock off of magnetic tracks quickly.

### » MENU

## MENU NAVIGATION

Short Press to enter the menu options: Rotate and Press to select the desired function.

Long Press to enter the Home menu options: Rotate and Press to select the desired function.

### » MASTER I/O CONNECTIONS

- AUX PORTS: On the Rear of the Master are two auxiliary LEMO connectors:
- AUX 1: Expansion port for accessories, such as Pedal control
- AUX 2: Reserved for Firmware Updates only (see Firmware update section of this manual)

### » POWER

Turns the Master Controller On and Off

## » AGITO OS MENU STRUCTURE

New firmware will be made available periodically to keep the system running alongside our latest developments and improvements. Whilst the basic layout of functions will remain, some differences may occur, it is recommended to check this whenever undertaking a firmware update.

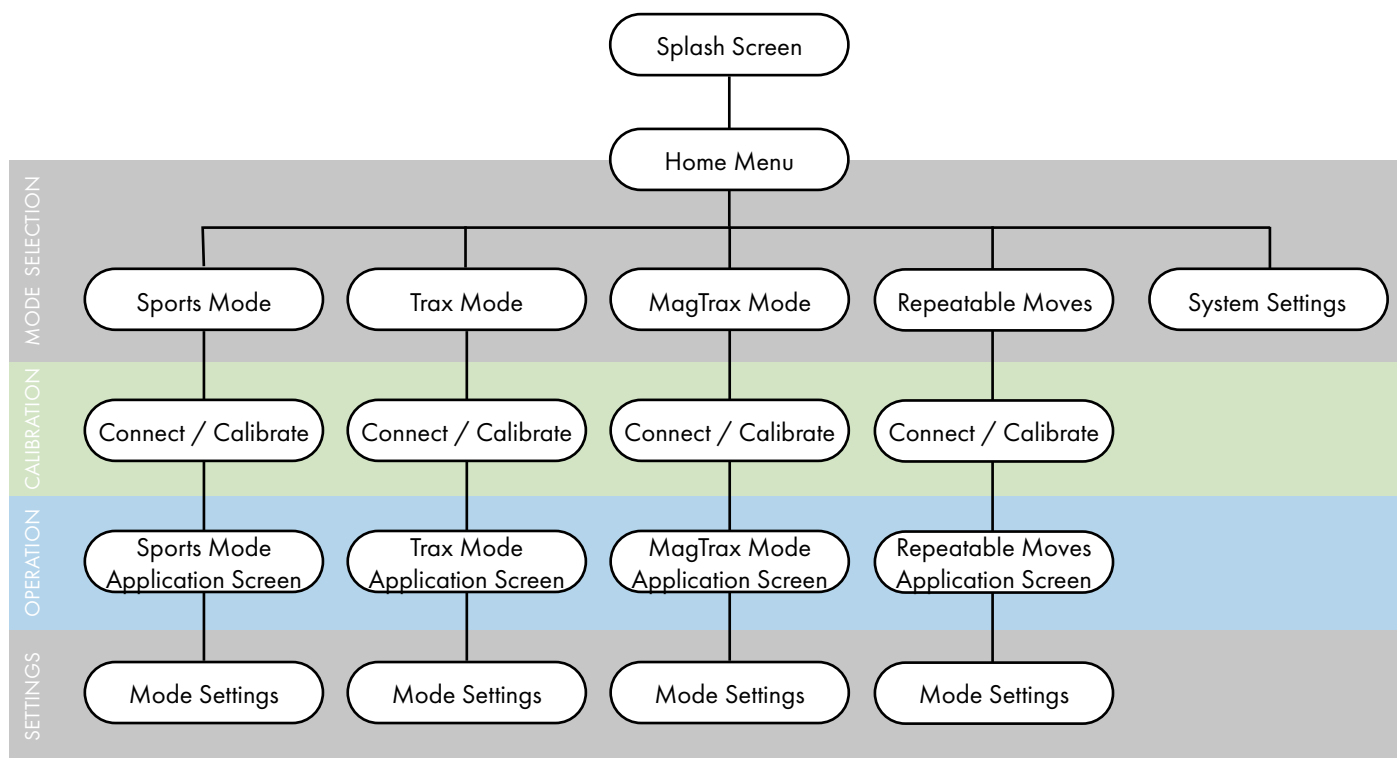
Always run the latest version of firmware

**WHEN ACCESSING MENUS, AGITO CONTROL IS DISABLED.  
ALWAYS ENSURE THAT AGITO IS STATIONARY AND SAFELY POSITIONED PRIOR TO USING MENUS.**

**OPERATING AGITO WITH EITHER A RED RF SIGNAL STRENGTH OR BATTERY INDICATOR IS NOT RECOMMENDED. ALWAYS RESOLVE THE ISSUE BEFORE CONTINUING WITH THE USE OF AGITO.**

### » OVERVIEW

Navigation of the AGITO OS is based on a simple menu structure: Home Menu, Connection Screen, Application Screen, and Settings, as outlined below. As new features become available, additional screens will be activated.



### » MENU NAVIGATION

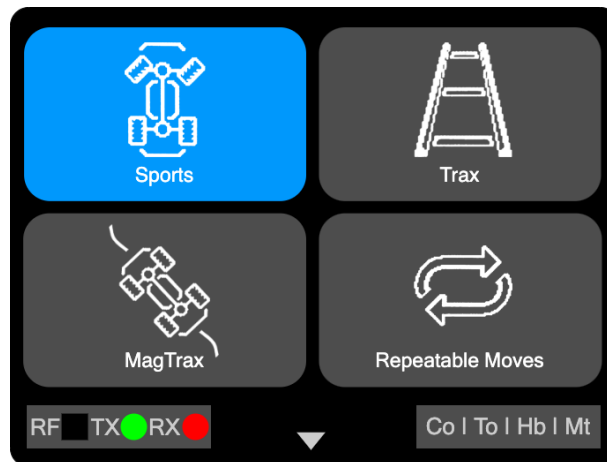
To navigate the menus and functions, you can use:

- Throttle, Steering Rocker, Speed Dial and Menu Dial to roll through options
- Rear Option Button and Menu Button to make a selection

Pressing and holding of the MENU Button will return you to the HOME Menu from anywhere within the system



## » HOME MENU



After the splash screen, which displays OS version number and the Master Controller serial number, the Home menu will be displayed. This screen enables the user to select the operational mode that the AGITO should start up in, this menu consists of multiple modes:

Sports - see "Sports Mode" on page 24

Trax - see "Trax Mode" on page 27

MagTrax - see "MagTrax Mode" on page 30

REPEATABLE MOVES - see "Repeatable Moves" on page 34

In addition the Home menu also allows access to the SYSTEM SETTINGS, which effects the system wide setup and function of the Master Controller, details below. This menu also enables the user to activate Advanced Operator Mode (AOM), see "Advanced Operator Mode (AOM)" on page 63.

**Pressing and holding the MENU Button will return you to the Home menu from anywhere within the system**

## » SYSTEM SETTINGS

The system settings screen provides the user with the ability to change the following general configuration / user settings:

## CONTROL MAPPING

This menu enables the operator to configure switch functions on the Master Controller.



ITEM	DESCRIPTION (* denotes default setting)
AUX2 GPIO Mode:	<p>This options enables the Master Controller AUX 2 port to provide two GPIO options:</p> <p><b>None*</b></p> <p><b>E-Stop:</b> Provides a method of attaching an external E-stop input.</p> <p><b>Trigger:</b> Enables "trigger pulses" to be provided to external devices during repeatable moves.</p>
Function Switch	<p>This option enables user defined functions for the FUNCTION SWITCH during drive operation.</p> <p><b>E-Stop: UP*</b> setting, the chassis will be in an Emergency Stop while the switch is in the up position and will only drive when it is changed down.</p> <p><b>E-Stop: DOWN</b> setting, Emergency Stop will be in operation while the switch is in the down position.</p> <p><b>E-Stop: Auto</b> setting, Emergency Stop will be in operation when the switch moves in either direction. The system will automatically revert out of E-Stop once the chassis has stopped moving.</p>
Free/Film Switch (Sp)	<p>This option enables user defined functions for the FREE / FILM SWITCH during Sports Mode operation.</p> <p><b>Standard*</b> switches between settings memories</p> <p><b>Steering Hold</b>, see "Sports Mode: Steering Hold" on page 51</p>
Steer Mode Switch (Tr)	<p>This option enables user defined functions for the STEER MODE SWITCH during Trax Mode operation.</p> <p><b>Standard*</b> setting maintains Steer Mode Selection in Sports mode and no function in Trax mode</p> <p><b>MAG-Stop Override</b> setting enables the operator to override safety limits when in Trax mode, by switching to the CRAB position. This setting has no effect in Sports mode.</p>
Pedals Calibrate	Proceed to calibrate pedal dead-band, this is used if motion drift occurs.
Restore Defaults	Resets this menu page to default settings

## MEASUREMENT SETTINGS

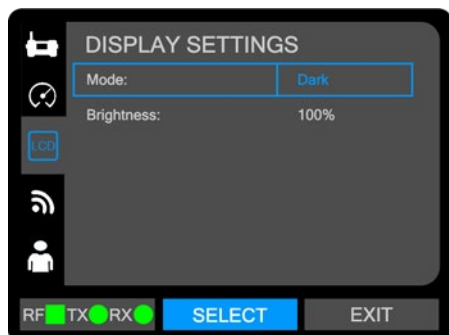
This menu enables the operator to set the displayed measurement units on the Master Controller and other devices.



ITEM	DESCRIPTION (* denotes default setting)
Speeds	<p>This option enables user defined displayed units of speed.</p> <p><b>KPH*</b>: Kilometres per hour</p> <p><b>MPH</b>: Miles per hour</p> <p><b>RPM</b>: Revolutions per minuet</p> <p><b>M/S</b>: Meters per second</p> <p><b>F/S</b>: Feet per second</p>
Distances	<p>This option enables user defined displayed units of measurement, e.g. Length of track.</p> <p><b>Meters*</b></p> <p><b>Cementers</b></p> <p><b>Feet</b></p> <p><b>Inches</b></p>
Heights	<p>This option enables user defined displayed units of measurement, e.g. Height of Tower.</p> <p><b>Meters*</b></p> <p><b>Cementers</b></p> <p><b>Feet</b></p> <p><b>Inches</b></p>
Tower Lens Height	<p>This features enables the user to manually offset the tower height display to account for the remote head.</p> <p><b>+/- units</b></p>
Restore Defaults	Resets this menu page to default settings

## DISPLAY SETTINGS

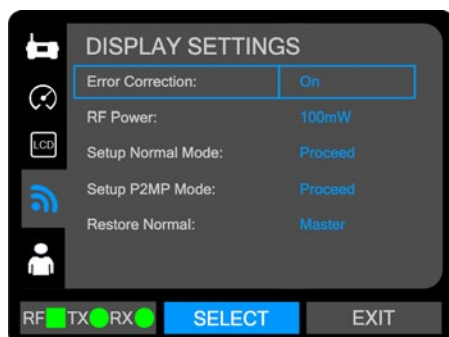
This menu enables the LCD display settings to be changed



ITEM	DESCRIPTION (* denotes default setting)
Mode	Selects the screen mode:  <b>Dark*</b> : Is the default setting and shown throughout this manual <b>Light</b> : Inverts the colours for use in bright daylight
Display Brightness	100% is currently the only option
Restore Defaults	Resets this menu page to default settings

## RADIO COMMUNICATIONS (RF) SETTINGS

This menu enables the configuration of the AGITO RF modules and other data communications settings



ITEM	DESCRIPTION (* denotes default setting)
Error Compensation	This setting enables a mode called Forward Error Correction which can improve signal quality in "congested RF environments". When activated control latency may be slightly increased.  <b>OFF</b> <b>ON*</b>
RF Power	This setting allows the RF power to be adjusted. <b>Always ensure that this power setting is legal for the territory of operation, check with your local regulatory authority before use.</b>  100mW* 200mW 500mW 1000mW
Setup Normal Mode	Proceed will program the RF Modules for Standard use
Setup P2MP Mode	Proceed will program the RF Modules for P2MP use
Restore Normal	Resets the module inserted in the Master to the defaults for either Master or Core Settings & ID.

## USER PROFILE

This menu enables the operator to save user defined settings in one of three files.



ITEM	DESCRIPTION (* denotes default setting)
Current Profile	This option enables the operator to select the User Profile they wish to use  <b>User 1*</b> User 2 User 3 User 4
Rename User	This options enables each of the User Profile memories to be renamed with a title of up to 8 characters.
Copy Settings to User	This options enables the current Top-level settings of the Master and all settings within the three drive modes (Sports, Trax and Repeatable Moves) to be stored to the chosen User Profile memory.  Saving to a memory slot can also be PIN protected to stop inadvertent over-right of settings
Reset User Profile	Resets the selected user to default settings

## SYSTEM INFO

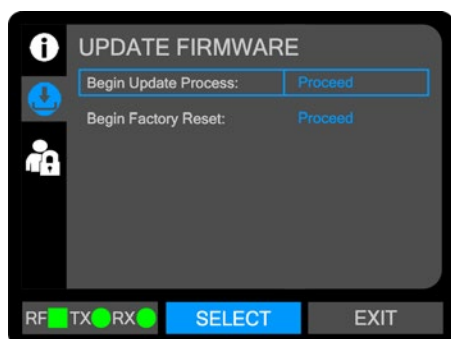
This menu gives conformation of key system information



ITEM	DESCRIPTION
Master Serial Number	Master Controller Serial Number
Master OS Build	Master Controller current OS build number
Master Product Code	Master Controller Hardware ID
Core Serial Number	AGITO Core Serial Number
Core OS Build	AGITO Core current OS build number
Core Product Code	AGITO Core Hardware ID

## UPDATE FIRMWARE

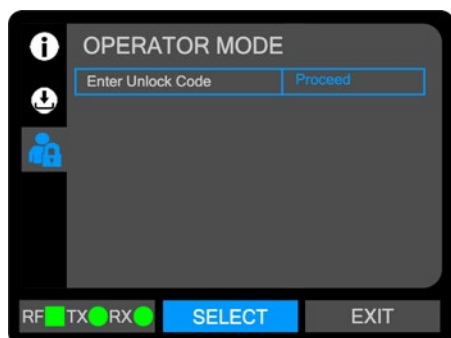
This menu allows the operator to perform Firmware updates



ITEM	DESCRIPTION
Begin Update Process	Selecting Proceed will activate the Master Controller Boot-loader program. See "Firmware updates" on page 69
Begin Factory Reset	This will return all settings back to the original factory defaults

## OPERATOR MODE - STANDARD OPERATOR MODE

This menu allows the operator to change Operational Modes (Standard / Advanced Operator Mode), accessed via PIN Code.



ITEM	DESCRIPTION
Enter Unlock Code	Enter "Advanced Operator Mode" PIN Code here to gain access of advanced features.

## OPERATOR MODE - ADVANCED OPERATOR MODE

This menu allows the operator to change Operational Modes (Standard / Advanced Operator Mode), accessed via a user specific PIN Code, issued once Advanced training has been completed. See "Operator Modes" on page 63



Selecting proceed will open the PIN Code entry screen:

Use the "throttle" control to select the character and "steering" control to move right across the six windows, once the code has been entered use the Menu button to select "ENTER". If the PIN code is correctly entered, the Advanced User will be taken to the full Operator Mode screen.

Once the correct AOM code has been entered, the user will access the Advanced Operator Mode Screen:



ITEM	DESCRIPTION (* denotes default setting)
Training Level	This option selects the active operation mode. Use this to revert back to standard operator mode  Standard Advanced
Unlock Duration	Once Advanced mode has been activated the operator will be able to select the run-time duration of the unlock.  3 Hours* 6 Hours 12 Hours
Time Remaining	Displays the remaining run-time duration

## » SPORTS MODE

Entering this mode will start the connection process with the AGITO Core and configure the system to operate in Sports Mode (Sports Application)

### » CONNECT / CALIBRATION SCREEN (SPORTS MODE)

The purpose of this screen is to ensure that the AGITO system is correctly configured for Sports Mode operation. The system status window (centre of display) will display battery telemetry and confirm serial number of the core you are connecting to. It will also confirm the application mode, i.e. Sports.

The system will then confirm system identification, configuration and calibration. If one of these steps requires action, e.g. steering calibration, then the user will be prompted to perform this process. Once each step has been completed, the screen will display "Done" and move on to the next step.

See section "Sports Mode: Start up Connection & Calibration" on page 47

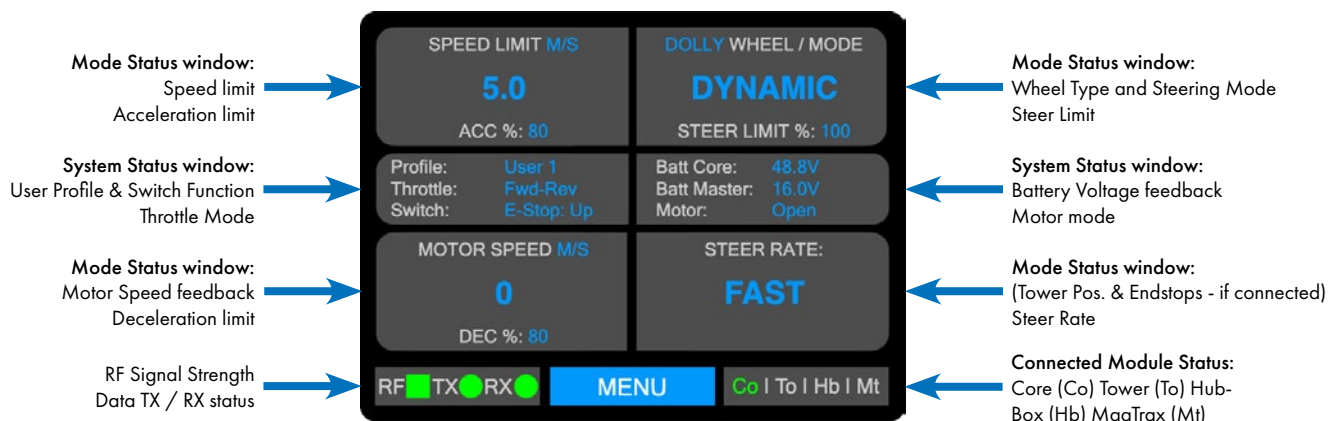
If a core is not connected, the system will time-out and enter the Sports Mode application.



The display will also show RF signal strength, RX / TX status as well as confirmation of attached modules: Core (Co), Tower (To), Hub-Box (Hb), MagTrax (Mt). When a module is attached the relevant initials will turn from grey to green.

### » APPLICATION SCREEN (SPORTS MODE)

When calibrated, the screen will switch to the application screen. This screen is the normal operating status display for the AGITO system, it is divided in to three distinct zones to help the operator quickly navigate information when in use, this screen will also display system warnings. When using Tower, a position bar will be displayed on the right hand side of the screen.

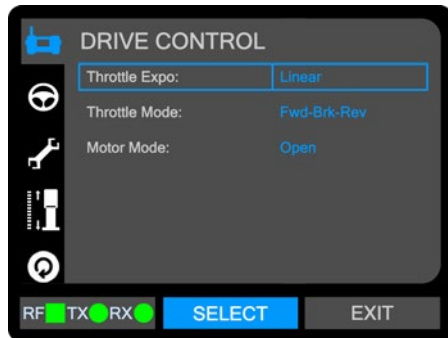


## » MODE SETTINGS (SPORTS MODE)

The mode settings screen provides the user with the ability to change the following mode specific configuration / user settings:

### DRIVE CONTROL

This menu allows the operator to adjust controls related to the driving style of Sports



ITEM	DESCRIPTION (* denotes default setting)
Throttle Expo	Adjusts the Throttle control response curve. At 0% Expo the rate is linear, as you increase Expo the sensitivity around "mid-stick" is reduced. This results in a harder ramp of Throttle in the top end of the control curve.  Linear* Curve 1 Curve 2
Throttle Mode	Defines throttle change behaviour.  FORWARD-BRAKE-REVERSE* defines a rapid change of Throttle Input direction as a brake. To start moving in the opposite direction, the user must first release the throttle before driving. FORWARD-REVERSE mode, the chassis will slow to a stop on a throttle direction change, and then begin to accelerate in the opposite direction.
Motor Mode	Change the mode of the Motor.  AUTO Motor Mode switches the mode depending on the Speed Limit (0-500 rpm is in Encoded mode, and upward values are in Open mode and are indicated by red text). ENCODED speed limit values range from 0-500 rpm. This mode provides a more stable, consistent and controllable movement, but is less responsive. OPEN* speed values are from 0-2500 rpm, this mode provides more responsive movement, but is less consistent across different terrain.

### STEERING CONTROL

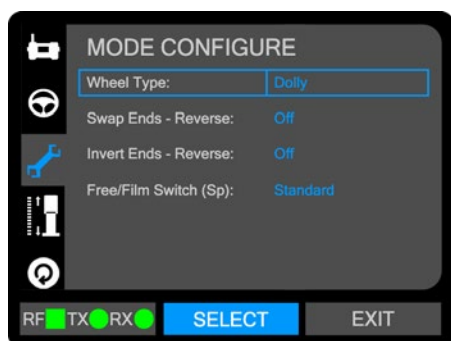
This menu allows the operator to adjust controls related to the steering of Sports drive-ends



ITEM	DESCRIPTION (* denotes default setting)
Steering Rate	Activates Steering Rate Control  IMPORTANT: Use of this mode changes the steering dynamics, ensure that the operator is practiced in this mode.  Disabled* Enabled
Dynamic Steering	Activates Dynamic Steering mode, see "Sports Mode: Dynamic Steering" on page 51  IMPORTANT: Use of this mode changes the steering dynamics, ensure that the operator is practiced in this mode.  Disabled* Enabled
Steering Expo	Adjusts the Steering control response curve.  Linear* Curve 1 Curve 2
Steering Trim - Front / Rear	Set the steering trim for the front or rear of the chassis. The default value is 0. Negative values (-1 to -50) steer towards the left, positive values (1 to 50) steer towards the right.
Steering Calibrate	Request a steering calibration.

## MODE CONFIGURE

This menu allows the operator to adjust controls related to the operation of Sports mode



ITEM	DESCRIPTION (* denotes default setting)
Wheel Type	Select which wheels are attached to the Sports ends on the chassis. The speed limits indicated on the application screen are calculated according to the wheel size selected. This does not affect actual system speeds, only the information on the display.  <b>Dolly*</b> <b>Multi-terrain</b> <b>Monster</b>
Swap Ends - Reverse	Control which end of the chassis drives the steering during reverse.  <b>OFF*</b> stops the steering from switching ends. Maintaining the front end at all times. <b>ON</b> enables the steering end of the AGITO to swap depending to the direction of movement
Invert Ends - Reverse	Control the steering direction behaviours when the chassis is reversing.  <b>OFF*</b> the chassis will continue to steer in the same direction during reverse. <b>ON</b> the steering will invert while the chassis reverses.
Free/Film Switch (Sp)	Change the function of the Free/Film switch.  <b>Standard*</b> switches between settings memories <b>Steering Lock</b> , see "Sports Mode: Steering Hold" on page 51

## TOWER CONTROLS

This menu allows the operator to adjust controls related to the operation of the Tower when in Sports mode



ITEM	DESCRIPTION (* denotes default setting)
Tower Enabled	Enables or disables an attached AGITO Tower
Input Expo	Adjusts the response curve of the input signal  <b>Linear*</b> <b>Curve 1</b> <b>Curve 2</b>
Invert Input	Reverses the direction of travel
Tower Lens Height	Enables the operator to apply an off-set value to the Tower Height readout, e.g. to take in to account the height of the remote head & chassis.
Limits Clear	Resets Tower movement limits to zero (default)

## MODE RESET

This menu allows the operator to apply default resets



ITEM	DESCRIPTION
Reset FREE	Resets the values stored in the FREE memory to default
Reset FILM	Resets the values stored in the FILM memory to default
Reset Sports	Resets all Sports Mode settings



## » TRAX MODE

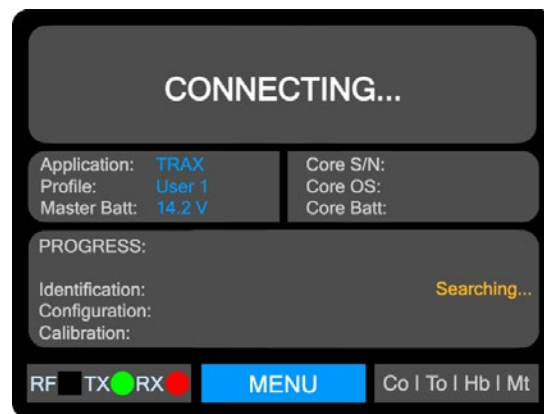
### » CONNECT / CALIBRATION SCREEN (TRAX MODE)

The purpose of this screen is to ensure that the AGITO system is correctly configured for Trax Mode operation. The system status window (centre of display) will display battery telemetry and confirm serial number of the core you are connecting to. It will also confirm the application mode, i.e. Trax.

The system will then confirm system identification, Configuration and Calibration. If one of these steps requires action, e.g. Track Calibration, then the user will be prompted to perform this process. Once each step has been completed, the screen will display "Done" and move on to the next step.

See section "Trax Mode: Start up Connection & Calibration" on page 53

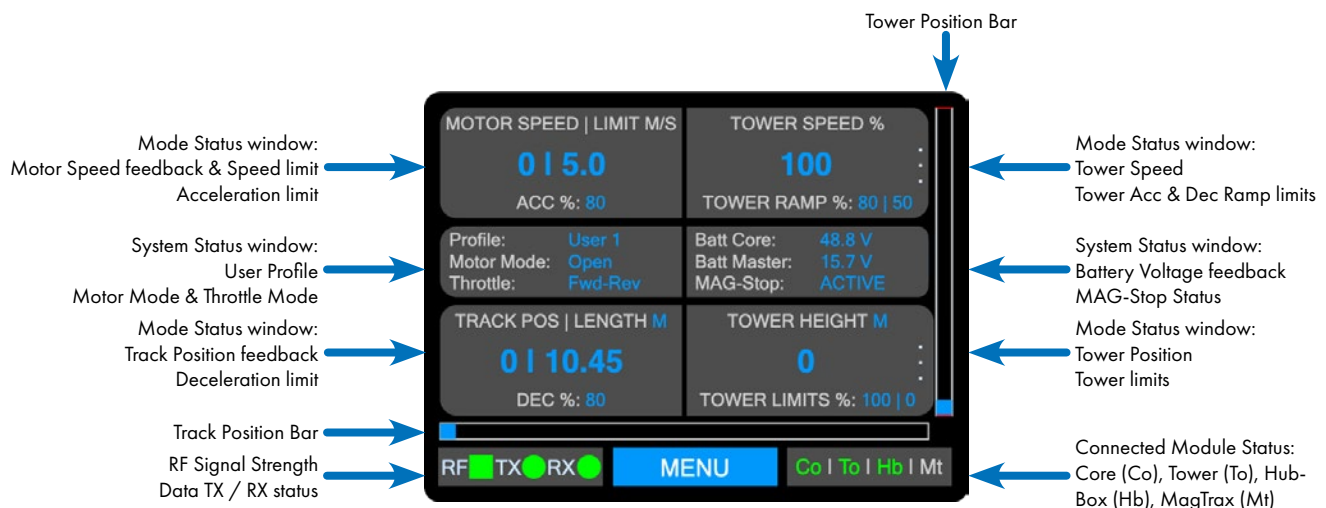
If a core is not connected, the system will time-out and enter the Trax Mode application.



The display will also show RF signal strength, RX / TX status as well as confirmation of attached modules: Core (Co), Tower (To), Hub-Box (Hb), MagTrax (Mt). When a module is attached the relevant initials will turn from grey to green.

### » APPLICATION SCREEN (TRAX MODE)

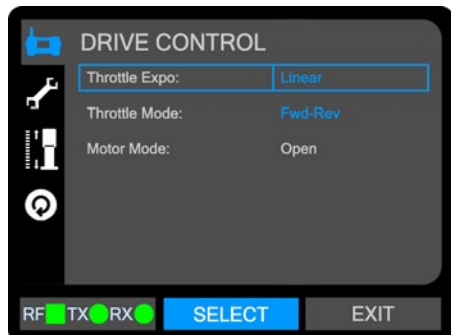
When calibrated, the screen will switch to the application screen. This screen is the normal operating status display for the AGITO system, it is divided in to three distinct zones to help the operator quickly navigate information when in use, this screen will also display system warnings.



## » MODE SETTINGS (TRAX MODE)

### DRIVE CONTROL

This menu allows the operator to adjust controls related to the driving style of trax mode



ITEM	DESCRIPTION (* denotes default setting)
Throttle Expo	Adjusts the Throttle control response curve. At 0% Expo the rate is linear, as you increase Expo the sensitivity around "mid-stick" is reduced. This results in a harder ramp of Throttle in the top end of the control curve.  <b>Linear*</b> <b>Curve 1</b> <b>Curve 2</b>
Throttle Mode	Defines throttle change behaviour.  <b>FORWARD-BRAKE-REVERSE</b> defines a rapid change of Throttle Input direction as a brake. To start moving in the opposite direction, the user must first release the throttle before driving. <b>FORWARD-REVERSE*</b> mode, the chassis will slow to a stop on a throttle direction change, and then begin to accelerate in the opposite direction.
Motor Mode	Change the mode of the Motor. Trax currently only supports Open Motor Mode.

### MODE CONFIGURE

This menu allows the operator to adjust controls related to the operation of trax mode



ITEM	DESCRIPTION (* denotes default setting)
Track Learn	<b>Proceed</b> to activate Track Learning
Drive End Type	Select which version of Trax Drive End is attached. If the wrong Drive End is selected then track distance measurements will be out by a factor of 2.  <b>Version 1.0</b> (pre Nov 2019) <b>Version 1.1*</b>
Swap Inputs	Change the controller mapping.  <b>OFF*</b> Throttle and Tower (Steering) MASTER Controller inputs are in standard positions. <b>ON</b> Tower and Throttle controls are swapped, making the "Throttle" input control tower and "Steering" input control throttle.
Invert Direction	Inverts the direction of the throttle controls
MAG-Stop Override	Fully disable MAG-Stop function  <b>Disabled*</b> MAG-Stop is active <b>Enabled</b> override is active (use caution)

### TOWER CONTROLS

This menu allows the operator to adjust controls related to the operation of the Tower when in trax mode



ITEM	DESCRIPTION (* denotes default setting)
Tower Enabled	Enables or disables an attached AGITO Tower
Input Expo	Adjusts the response curve of the input signal  <b>Linear*</b> <b>Curve 1</b> <b>Curve 2</b>
Invert Input	Reverses the direction of travel
Tower Lens Height	Enables the operator to apply an off-set value to the Tower Height readout, e.g. to take in to account the height of the remote head & chassis.
Limits Clear	Resets Tower movement limits to zero (default)

## MODE RESET

This menu allows the operator to apply default resets



ITEM	DESCRIPTION (* denotes default setting)
Reset FREE	Resets the values stored in the FREE memory to default
Reset FILM	Resets the values stored in the FILM memory to default
Reset Trax	Resets all Trax Mode settings

## » MAGTRAX MODE

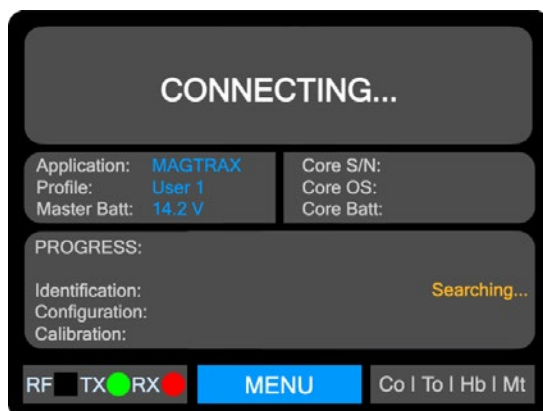
### » CONNECT / CALIBRATION SCREEN (MAGTRAX MODE)

The purpose of this screen is to ensure that the AGITO system is correctly configured for MagTrax Mode operation. The system status window (centre of display) will display battery telemetry and confirm serial number of the core you are connecting to. It will also confirm the application mode, i.e. MagTrax.

The system will then confirm system identification, Configuration and Calibration. If one of these steps requires action, e.g. Calibration, then the user will be prompted to perform this process. Once each step has been completed, the screen will display "Done" and move on to the next step.

See section "Sports Mode: Start up Connection & Calibration" on page 47

If a core is not connected, the system will time-out and enter the MagTrax Mode application.



The display will also show RF signal strength, RX / TX status as well as confirmation of attached modules: Core (Co), Tower (To), Hub-Box (Hb) MagTrax (Mt). When a module is attached the relevant initials will turn from grey to green.

### » APPLICATION SCREEN (MAGTRAX MODE)

When calibrated, the screen will switch to the application screen. This screen is the normal operating status display for the AGITO system, it is divided in to three distinct zones to help the operator quickly navigate information when in use, this screen will also display system warnings.



\*Visible when Tower is enabled

## » MODE SETTINGS (MAGTRAX MODE)

The mode settings screen provides the user with the ability to change the following mode specific configuration / user settings:

### DRIVE CONTROL

This menu allows the operator to adjust controls related to the driving style of the Sports drive-ends.



ITEM	DESCRIPTION (* denotes default setting)
Throttle Expo	Adjusts the Throttle control response curve. At 0% Expo the rate is linear, as you increase Expo the sensitivity around “mid-stick” is reduced. This results in a harder ramp of Throttle in the top end of the control curve.  <b>Linear*</b> <b>Curve 1</b> <b>Curve 2</b>
Throttle Mode	Defines throttle change behaviour.  <b>FORWARD-BRAKE-REVERSE*</b> defines a rapid change of Throttle Input direction as a brake. To start moving in the opposite direction, the user must first release the throttle before driving. <b>FORWARD-REVERSE</b> mode, the chassis will slow to a stop on a throttle direction change, and then begin to accelerate in the opposite direction.
Motor Mode	Change the mode of the Motor.  <b>AUTO</b> Motor Mode switches the mode depending on the Speed Limit (0-500 rpm is in Encoded mode, and upward values are in Open mode and are indicated by red text). <b>ENCODED</b> speed limit values range from 0-500 rpm. This mode provides a more stable, consistent and controllable movement, but is less responsive. <b>OPEN*</b> speed values are from 0-2500 rpm, this mode provides more responsive movement, but is less consistent across different terrain.

### STEERING CONTROL

This menu allows the operator to adjust controls related to the steering of Sports drive-ends.



ITEM	DESCRIPTION (* denotes default setting)
Steering Rate	Activates Steering Rate Control  <b>IMPORTANT: Use of this mode changes the steering dynamics, ensure that the operator is practiced in this mode.</b>  <b>Disabled*</b> <b>Enabled</b>
Dynamic Steering	Activates Dynamic Steering mode, see “Sports Mode: Dynamic Steering” on page 51  <b>IMPORTANT: Use of this mode changes the steering dynamics, ensure that the operator is practiced in this mode.</b>  <b>Disabled*</b> <b>Enabled</b>
Steering Expo	Adjusts the Steering control response curve.  <b>Linear*</b> <b>Curve 1</b> <b>Curve 2</b>
Steering Trim - Front	Set the steering trim for the front of the chassis. The default value is 0. Negative values (-1 to -50) steer towards the left, positive values (1 to 50) steer towards the right.
Steering Trim - Rear	Set the steering trim for the rear of the chassis. The default value is 0. Negative values (-1 to -50) steer towards the left, positive values (1 to 50) steer towards the right.
Steering Calibrate	Request a steering calibration.

## MODE CONFIGURE

This menu allows the operator to adjust controls related to the operation of MagTrax mode.



ITEM	DESCRIPTION (* denotes default setting)
MagStrip Polarity	Determines the magnetic polarity the sensors are looking for with a strip. With the adhesive strip is adhesive down, with the flexible strip it is line face down
Wheel Type	Select which wheels are attached to the Sports ends on the chassis. The speed limits indicated on the application screen are calculated according to the wheel size selected.  Dolly* Multi-terrain Monster
Swap Ends - Reverse	Control which end of the chassis drives the steering during reverse.  OFF* stops the steering from switching ends. Maintaining the front end at all times. ON enables the steering end of the AGITO to swap depending to the direction of movement
Invert Ends - Reverse	Control the steering direction behaviours when the chassis is reversing.  OFF* the chassis will continue to steer in the same direction during reverse. ON the steering will invert while the chassis reverses.
Bump-Stop Override	This function disables the touch sensitive safety bumpers.

## TOWER CONTROLS

This menu allows the operator to adjust controls related to the operation of the Tower when in MagTrax mode.



ITEM	DESCRIPTION (* denotes default setting)
Tower Enabled	Force the system to enable or disable and attached AGITO Tower
Input Expo	Adjusts the response curve of the input signal  Linear* Curve 1 Curve 2
Invert Input	Reverses the direction of travel
Tower Lens Height	Enables the operator to apply an off-set value to the Tower Height readout, e.g. to take in to account the height of the remote head.
Limits Clear	Resets Tower movement limits to zero (default)

## LIGHTING CONTROLS

This menu allows the operator to adjust the behaviour of the LED strip on the MagTrax Sensor Bars.



ITEM	DESCRIPTION (* denotes default setting)
Lighting Mode	Choose which lighting preset to display  Off* Setup - Shows area of magnet detection, strength & markers Operation - Green = Safe   Orange = Live   Orange Pulse = Moving Automotive - White = Forwards   Red = Backwards Custom Colour - Custom colour depending on RGB Values set Rainbow - Embrace your inner unicorn
Brightness	Brightness of the LED strip.
RGB Value	Displays RGB Value of Custom Colour
Red/Green/Blue	Value of each R G B channel for Custom Colour

## MODE RESET

This menu allows the operator to apply default resets



ITEM	DESCRIPTION (* denotes default setting)
Reset FREE	Resets the values stored in the FREE memory to default
Reset FILM	Resets the values stored in the FILM memory to default
Reset MagTrax	Resets all MagTrax Mode settings

## » REPEATABLE MOVES

### » CONNECT / CALIBRATION SCREEN (REPEATABLE MOVES)

Repeatable Moves is a hybrid mode that provides basic record and playback of AGITO movement. It is recommended that initial setup is done within either Sports or Trax mode dependant upon the drive-ends in use. Once configured / calibrated, the user can then access Repeatable Moves

If a core is not connected, the system will time-out and enter the Repeatable Moves Mode application.

The display will also show RF signal strength, RX / TX status as well as confirmation of attached modules: Core (Co), Tower (To), Hub-Box (Hb), MagTrax(Mt). When a module is attached the relevant initials will turn from grey to green.

### » APPLICATION SCREENS (REPEATABLE MOVES MODE)

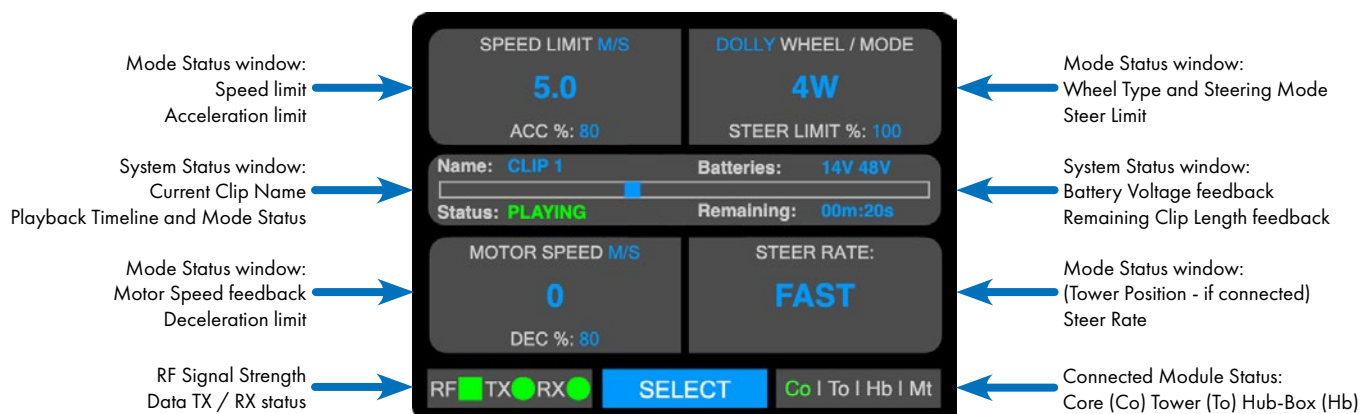
#### RECORDING SCREEN

When calibrated, and a clip has been created the screen will switch to the application screen. This screen is the normal standby and recording display for the AGITO system, it is divided in to three distinct zones to help the operator quickly navigate information when in use, this screen will also display system warnings as it does in Sports and Trax modes.



#### PLAYBACK SCREEN

Once a recording has been created, or when a previous clip is loaded, the Playback Screen will be displayed.





## » MODE SETTINGS (REPEATABLE MOVES)

### REPEATABLE MOVES MENU



ITEM	DESCRIPTION (* denotes default setting)
Selected Clip	Displays the name of the currently selected clip
Drive Mode	Displays the Drive-end associated with the currently selected clip
Rename Clip	Option to rename the current clip

### EXTERNAL TRIGGERS MENU



ITEM	DESCRIPTION (* denotes default setting)
Start Duration	Select the duration of the Trigger pulse 10ms*
Start Pin	Select which devices output the trigger signal on start None Master Core Hub All Devices*
End Duration	Select the duration of the Trigger pulse 10ms*
End Pin	Select which devices output the trigger signal on finish None Master Core Hub All Devices*

## » SETTING UP AGITO

AGITO is supplied with a tool kit which includes all of the necessary tools to perform all of the set-up's and basic maintenance as outlined in this manual. Should any of these tools need replacing please see our recommendations below:

Metric Hex Keys: 2.5mm, 3mm, 4mm, 5mm, 6mm; Imperial Hex Keys: 7/32", 5/16"; AGITO Wheel Nut tool

**PLEASE ENSURE YOU USE THE CORRECT TOOLS TO AVOID DAMAGE TO SCREW HEADS.**

□ <https://motion-impossible.com/how-to-videos/>

### » INSERTING RF MODULES



Attach the antennas to the modules. Ensure you are using the correct antenna for the module's frequency



Insert the module marked "AGITO" into the Core RF socket



Screw in bolt to secure.



Insert the "Master" module into the Master Controller's RF Socket

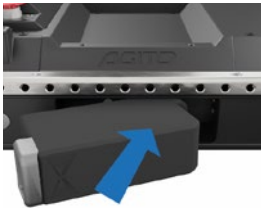


Screw in bolt to secure.

**DO NOT OVER TIGHTEN SCREW-HEADS**

**ENSURE THAT THE CORRECT RF MODULE IS INSERTED IN TO THE CORRECT SOCKET.  
FAILURE TO DO SO MAY RESULT IN RF LINK ISSUES.**

## » INSERTING BATTERIES TO THE CORE



Insert the battery at an angle with the contacts facing forwards.



Push the battery firmly into the slot.

You will hear an audible CLICK from the locking mechanism on the back of the battery when it is in place.

**ALWAYS RUN AGITO WITH TWO BATTERIES THAT ARE OF EQUAL CHARGE TO ENSURE OPTIMUM RUN-TIMES**

## » REMOVING BATTERIES FROM THE CORE



To remove the battery first pull back on the silver locking mechanism



Then pull the battery towards the back of the chassis until it releases.

## » INSERTING DRIVE-ENDS

□ <https://motion-impossible.com/how-to-videos/>



Make sure the fixing bolts are removed then insert the drive end into the chassis. You may need to push firmly for it to slot in.



Screw in tight the two fixing bolts on either side, be careful not to cross-thread. Where applicable insert the steering pin by pressing down the blue button and fitting through the holes.

**WHEN INSERTING THE DRIVE-END, TAKE CARE OF THE STEERING MECHANISM. ENSURE THE STEERING PIN IS SECURELY LOCKED IN PLACE BEFORE OPERATION.**

## » SETTING UP DRIVE-ENDS

Each Drive-end has its own specific characteristics and set-up process, this section is intended as an installation guide. Please see later sections of this manual for full configuration, calibration and operational details.

### » SPORTS DRIVE-END: ATTACHING WHEELS

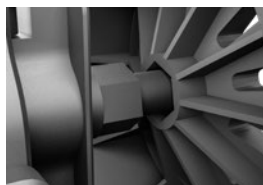
□ <https://motion-impossible.com/how-to-videos/>



Remove the Wheel nut from the shaft



Slide the wheel onto the shaft



Align the hexagons on the wheel and the shaft and slide in



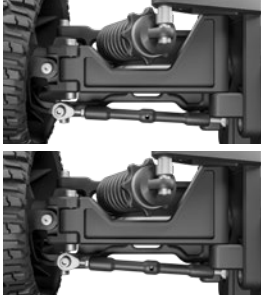
Using the supplied AGITO Wheel Nut Tool to screw on the wheel nut.

Make sure it is tight (but take care not to damage the thread or nut) to prevent it coming loose whilst in motion.

**ALWAYS ENSURE WHEEL NUTS ARE SECURE, CHECK REGULARLY.**

## » SPORTS DRIVE-END: WHEEL TRACKING

□ <https://motion-impossible.com/how-to-videos/>



Once the payload has been mounted to the system and the steering has been calibrated, it is advised to check the wheel tracking. If the wheels are not straight to the chassis, then use the tracking adjustment rod to straighten the wheel.

Loosen the locking nuts at each end of the tracking rod  
Rotate the rod until the wheels align.

Do this to all four wheels, remember to re-tighten the locking nuts.

**ALWAYS ENSURE WHEELS AND TRACKING RODS ARE PROPERLY AND SECURELY LOCKED AND FIXED TO THE AGITO DRIVE-ENDS.**

## » SPORTS DRIVE-END: ADJUSTING SUSPENSION

□ <https://motion-impossible.com/how-to-videos/>



It is very important to adjust your suspension according to the system total weight. Incorrectly setup suspension can cause handling problems and stability issues.

To adjust the suspension you twist the pre-load, moving it up or down depending on weight. Up for lighter loads and down for heavier loads until the lower wishbones are horizontal, as shown below.

**WHILE TWISTING THE PRE-LOAD MAKE SURE YOU DON'T UNSCREW THE SHOCK CAP FROM THE MAIN SHOCK BODY.**



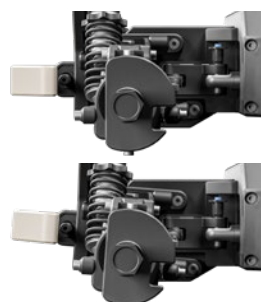
TOO HIGH

CORRECT

TOO LOW

## » SPORTS DRIVE-END: ADJUSTING KICK-UP

□ <https://motion-impossible.com/how-to-videos/>

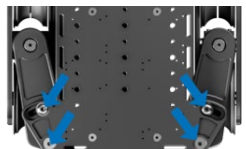


As standard the Drive-ends sit flat

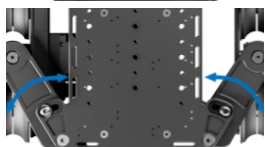
Remove the four Kick-up adjustment screws and rotate the Drive-end as required. Always ensure the screws are tight.

## » TRAX DRIVE-END: ALIGNING TRAX WHEELS TO TRACK

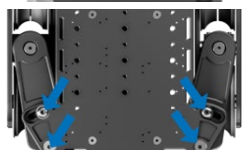
□ <https://motion-impossible.com/how-to-videos/>



Release the four screw heads on both Trax Drive-ends, 1 turn



Place the AGITO with Trax Drive-ends on to your choice of Track, run the system a short distance to align the wheels with the Track Gauge



Tighten the M10 screw head on both Trax Drive-ends, 1 turn or until tight

## » TRAX DRIVE-END: ATTACHING GUIDE WHEEL



Attach the four Track Guide Wheels to the Trax wheel assemblies.  
Use two M6 bolts as provided for each Guide Wheel.

Ensure that the Guide Wheel engages with the Track

## » TRAX DRIVE-END: ATTACHING MAG-STOP

**ALWAYS ENSURE AGITO IS POWERED OFF WHEN ATTACHING ACCESSORIES.**



On the inside edge of the Trax wheel assembly mount the MAG-Stop unit using two M6 bolts as provided.  
Use a 4mm "L" shaped Allen key to fix to position  
Set the MAG-Stop sensor so that it will have 20-60mm separation from the Magnet when they pass



Carefully run the cable from the MAG-Stop to the AGITO Core I/O panel. Attach the 12vdc power 4-pin XLR to a free power outlet and the Data Comms Lemo to AUX 1

## » TRAX DRIVE-END: SETTING MAG-STOP MAGNETS



Place the Magnets securely at each end of the Track  
Ensure the AGITO is positioned in the CENTRE of the Track.  
See "Trax Mode: Start up Connection & Calibration" on page 53 for more information.



Place the Magnets securely at each end of the Track  
Since the MAG-STOP is off-set on the AGITO, it is important to correctly position the magnets so that there will be 20-60mm separation from the Magnet and Sensor when they pass.

## » HUB BOX: CONNECTING PEDALS TO MASTER CONTROLLER

□ <https://motion-impossible.com/how-to-videos/>

**ALWAYS ENSURE MASTER CONTROLLER IS POWERED DOWN WHEN ATTACHING ACCESSORIES.**



Attach Hub Cable to AUX 1 of the MASTER Controller

Plug the other end in to the Hub-Box I/O and attach the E-Stop button

Plug the required pedals in to the Hub-box.  
4x Pedals (Trax & Tower Control)  
2x Pedals (Sports - Tower Control)

## » Y-CORD PEDAL SPLITTER: TOWER ONLY CONTROL (SPORTS)

**ALWAYS ENSURE MASTER CONTROLLER IS POWERED DOWN WHEN ATTACHING ACCESSORIES.**



Attach the Y-Cord Pedal splitter box to AUX 1 of the MASTER Controller

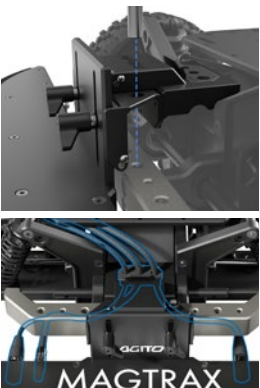
Plug in the two pedals

## » ATTACHING MAGTRAX

### » MAGTRAX: ATTACHING TO AGITO

□ <https://motion-impossible.com/how-to-videos/>

**MAGTRAX WORKS BEST WHEN USING MEDIUM OR HARD SHOCKS.**



Attach the front MagTrax sensor bar to the front Sports Drive end bumper, and attach the rear sensor bar to the rear Sports end bumper. Secure in place with a 3/8" CAP bolt or 1/4" bolt.

Feed the end of the MagTrax Cable Loom with the 3x Connectors of the same length through the cable routing hole on the rear sensor bar and connect into the correct sockets on the MagTrax sensor bar.



Run the MAG-X Cable alongside the core to the front MagTrax Sensor Bar through the cable routing hole and connect to the MAG-X Port on the bar.

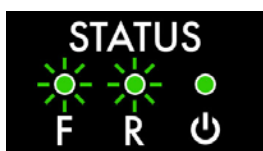


Connect the Lemo to AUX 1 and the 4-Pin XLR to either 12V DC Out on the Core

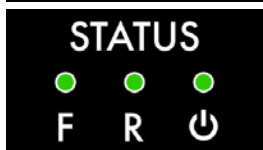
Power the core on and check the 3x LEDs on the back of the Rear Sensor Bar to confirm the system is working correctly. See the LED Status Indicators below for more information.

## » MAGTRAX: STATUS LEDS

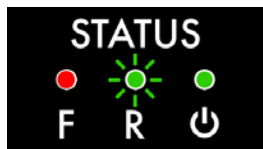
On the inside face of the Rear MagTrax Sensor Bar are 3x LEDs that show the status of the MagTrax System. One for power, one for Front Sensor Bar status (F) and one for Rear Sensor Bar status (R).



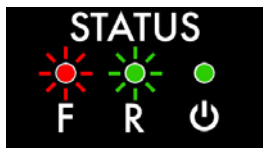
**Two Flashing Green, One Solid Green**  
System is working correctly but is not detecting a MagStrip on either Sensor Bar.



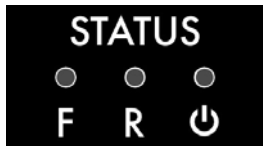
**Three Solid Green**  
System is working correctly and detecting a MagStrip on both Sensor Bars.



**One Solid Red, One Solid or Flashing Green, One Solid Green**  
Rear Sensor Bar is working, Front Sensor Bar is not detected or safety bumper is triggered.



**One Flashing Red, One Solid or Flashing Green, One Solid Green**  
Rear Sensor Bar is working, Front Sensor Bar has a fault with the MLS. Contact Motion Impossible Support.



**No LEDs**  
System is not powered



## » ATTACHING CAMERA MOUNTS

### » V-CON PRO: ATTACHING TO AGITO

□ <https://motion-impossible.com/how-to-videos/>



Place the payload on the rails and align the holes on the sides of the Core

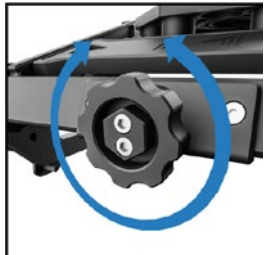
Screw in two 3/8th inch bolts on to either side of the Core using the payload mounting holes as shown. Make sure these are tight and do not come loose

**ALWAYS ENSURE THE PAYLOAD IS PROPERLY AND SECURELY FIXED TO THE AGITO CORE, USE A MINIMUM OF FOUR FIXTURE POINTS.**

**ALWAYS TRY TO KEEP THE PAYLOAD OVER THE CENTRE OF THE CHASSIS, ESPECIALLY WHEN OPERATING AT HIGH SPEEDS. AN ILL-BALANCED LOAD CAN AFFECT HANDLING AND PERFORMANCE.**

### » V-CON PRO: ADJUSTMENT AND TUNING

□ <https://motion-impossible.com/how-to-videos/>



Turn the payload adjustment knob on the front of the V-Con Pro to adjust the preload on the springs. The amount of preload you give depends on the weight of the payload.

Ensure it rests in the middle of the travel. Giving it room to move up and down, as shown below.



Adjust the dampener ring to change the responsiveness of the return movement. Rougher surfaces generally require a softer return.



TOO HIGH



CORRECT



TOO LOW

## » MITCHELL MOUNT



Attach the two side plates to the Core

Inset and tighten the four 3/8th inch bolts

Place the Mitchell Mount on to the side plates

Inset and tighten the four bolts

## » STACKING RISERS



Join the two sides of the Stacking Riser together with a pair of Crossbars  
(note: 150mm (6") risers do not require crossbars)

Now attach to the Core with four 3/8th inch bolts and place either the V-Con Pro, Mitchell Mount or another set of Risers to the top mounting points with four 3/8th inch bolts

**ALWAYS ENSURE THE PAYLOAD IS PROPERLY AND SECURELY FIXED TO THE AGITO CORE, USE A MINIMUM OF FOUR FIXTURE POINTS**

## » TOWER: INSERTING GAS-STRUTS



Remove AGITO Tower from Case.  
Attach battery and carefully invert the Tower (Red light indicates power).

Remove the dust cover and insert your chosen Gas-Strut, see Chart below.

Using the manual adjustment buttons, carefully fully extend the tower.

Ensure that the Gas-Strut remains aligned





When the Green Light Illuminates the Tower is fully extended

Rotate the keyway by 45 degrees to lock the Gas-strut into place

Using the manual adjustment buttons, carefully fully contract the tower, now replace the dust cover.  
The Tower is now ready to mount to the AGITO.

**DO NOT RUN THE TOWER WITHOUT A PAYLOAD, AS THIS MAY DAMAGE THE INTERNAL MECHANISM.  
REMOVE GAS-STRUT WHEN STORING THE TOWER, TO AVOID DAMAGE.**

## » TOWER: PAYLOAD CHART

This chart shows which Gas-Strut to use dependant upon the tower payload:

**BLUE** 7-13Kg / 15-28lbs

**GOLD** 12-18Kg / 26-39lbs

**RED** 17-22Kg / 37-48lbs

**ENSURE THAT THE CORRECT GAS-STRUT IS USED FOR YOUR PAYLOAD.  
DO NOT OVERLOAD OR OFF-SET PAYLOAD**

## » TOWER: ATTACHING TO AGITO



Attach the two side plates to the Core

Inset and tighten the four 3/8th inch bolts

Place the Tower on to the side plates

Inset and tighten the four bolts

Attach Tower Control Cable to the Tower CTL port on the Tower I/O (4-pin Lemo).  
(The smaller of the two connections)

Attach Tower Control Cable to the AUX Port 2 port on the Core I/O).

Attach Battery to activate tower

## » TOWER: ATTACHING CAMERA SYSTEM

**ALWAYS ENSURE THE PAYLOAD IS PROPERLY AND SECURELY FIXED TO THE AGITO TOWER, USE A MINIMUM OF FOUR FIXTURE POINTS.**



Remove the Quick Release Plate from the Tower

Loosen the 3/8th inch lock and lift out plate



Align the Quick Release Plate with the holes on the Remote Head  
Inset and tighten the four bolts, **be careful to use the correct length bolts**



Locate the Quick Release Plate back into the top of the Tower  
Ensure the Plate is located correctly, tighten the 3/8th Locking Bolt

When using the Power and the optional Fibre Optic pass-through, please refer to "Tower: Power & Fibre pass-through" on page 65.

## » ATTACHING DUAL CAMERA MOUNTS (TRAX)

**ALWAYS ENSURE THAT THE MAXIMUM CHASSIS PAYLOAD IS NOT OVERLOADED.  
ALWAYS ENSURE THE PAYLOAD IS PROPERLY AND SECURELY FIXED TO THE AGITO TOWER, USE A MINIMUM OF FOUR FIXTURE POINTS.**



### **TOWER & MITCHELL MOUNT**

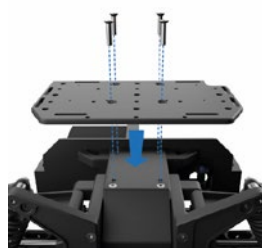
Using the optional offset mounting brackets, it is possible to position two camera mounts on the Chassis.



### **2x MITCHELL MOUNT**

Using the optional offset mounting brackets, it is possible to position two camera mounts on the Chassis.

## » ATTACHING CHEESE PLATE (SPORTS)



Align the Cheese Plate to the 4 fixing holes on the top of the Sports Drive-end

Insert and tighten the 4 hex counter sunk screws

## » OFFSET MOUNTING BRACKETS

Using the optional offset mounting brackets, it is possible to off-set mounts over the drive-ends.  
(Note: this will restrict the mounting of accessories such as PSU)

## » OPERATION AND CONFIGURATION

### » INTRODUCTION TO: SPORTS MODE

#### » SPORTS MODE: TURNING ON

With your batteries installed, it is good practice to first turn on your MASTER Controller. Now on the chassis pull up the red E-Stop button on the top of the CORE. Once the desired operation mode has been selected on the MASTER Controller, the start-up initialisation sequence will begin. For more details see "AGITO OS Menu Structure" on page 18. The CORE Power button will flash if it is unable to connect.

**IF THE AGITO IS FULLY LADEN ITS GOOD PRACTICE TO SLIGHTLY LIFT THE AGITO WHILE IT PERFORMS THIS CALIBRATION. THIS WILL REDUCE UNNECESSARY THE WEAR OF THE STEERING ACTUATORS AND TYRES.**

**WHEN TURNING ON THE MASTER CONTROLLER BE CAREFUL NOT TO PRESS ANY BUTTON OTHER THAN THE POWER SWITCH, SPECIFICALLY THE THROTTLE INPUT / PEDALS. ON START-UP THE CONTROLLER RUNS THROUGH A CALIBRATION PROCESS, IF THE THROTTLE INPUT IS NOT CENTRED THEN THE AGITO MAY ACCELERATE UNEXPECTEDLY. THE CALIBRATION PROCESS FINISHES WHEN THE MAIN MENU SCREEN APPEARS.**

#### » SPORTS MODE: START UP CONNECTION & CALIBRATION

Once Sports Mode has been selected from the Home menu, the MASTER will display the Connect / Calibrate screen. During the connection process the system will check the calibration status of the drive-end, if required the screen will give the operator the chance to proceed or skip steering calibration.

Once Connection and Calibration is complete and the MASTER displays the Mode Operation screen, check that the 'Wheels' type is shown correctly on the MASTER Controller screen. If this is not shown as expected, change these in the Menu, "Mode Settings (Sports Mode)" on page 25



#### » SPORTS MODE: DRIVING

AGITO has 2 key control modes of operation, these are set in the 'Motor Mode' and 'Throttle Mode' settings on the MASTER Controller.

##### MOTOR MODE

Motor Mode controls whether or not AGITO runs in open or encoded modes of operation. It is important to recognise the differences that these modes have on the operational characteristics and available features whilst driving AGITO.



- 'Encoded' this is the most accurate mode and if very slow speeds are required. However, the Maximum Speed is capped. The turning in this mode is "softer" than open mode
- 'Open' allows you to travel at higher speeds and gives a more responsive feel to throttle inputs, but is less accurate at maintaining a specific speed
- 'Automatic' switches between the modes depending on your speed setting.

The system cannot switch from encoded to non-encoded mode during operation, so check that the correct mode is selected at the beginning of the move.

The Maximum Speed dial can be adjusted whilst AGITO is in motion, however if operating in 'Encoded' mode, the Maximum Speed will be capped at 500 rpm/ 2.20 mps / 6.0 kmh / 4.5 mph.

The maximum speed setting on the MASTER GUI will display in:

BLUE if you are in 'Encoded' mode (for slow controlled and repeatable movement)

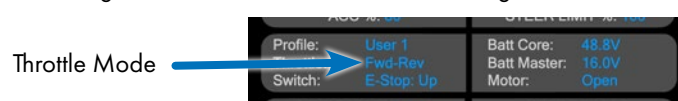
BLUE if you are in 'Open' mode (for fast movement)

RED if you are in 'Automatic' mode and the motors are running in Open as above the speed limit outlined earlier.

We are constantly working on new tuning settings for these modes, and you can expect to receive firmware updates that increase the range of the encoded mode as we develop improved algorithms. Please ensure that you update and review the latest Owner's Manual when you upgrade firmware.

## THROTTLE MODE

There are two 'Throttle Modes' which change the deceleration and direction change characteristics of AGITO:



- 'Forward – Brake – Reverse': When changing direction, the AGITO must come to a complete stop. The throttle must then be released (left in neutral) briefly and reapplied to change direction. This allows the logic in the control system to differentiate between a brake command and a change of direction.
- 'Forward – Reverse': The AGITO will change direction as quickly as possible, without pausing. However, if your intention is to stop without changing direction this mode may make the AGITO bounce in to reverse momentarily, rather coming to a full stop.

**PREPARE AND PLAN YOUR MOVES, FAMILIARISE YOURSELF WITH THE SURROUNDINGS AND ANY POTENTIAL HAZARDS. IT IS THE OPERATOR'S RESPONSIBILITY TO ENSURE YOU ARE WORKING WITHIN THE SAFE LIMITS OF THE SYSTEM AT ALL TIMES.**

### » SPORTS MODE: BRAKING AND EMERGENCY STOP

AGITO Sports uses motor braking rather than mechanical braking. Its important to note that the stopping distances will vary dependant upon the surface being driven on and the speed at which braking is applied.

Higher initial speeds have more kinetic energy available to be converted in to regenerative braking, therefore at slower speeds less energy is available. The effect is that braking at slower speeds can be less efficient, in other words will appear to be less responsive than at higher speeds. See "E-Stop" on page 62

### » SPORTS MODE: STEERING MODES

This feature enables three options Two / Four-wheel steer and Crab mode:

- 2-wheel steering: front wheel pair steers, and the front pair changes to suit the direction you are moving
- 4-wheel steering: front and rear wheel turn in opposite directions reducing the turning circle and pivots the chassis around the middle during a turn.
- Crab steer: front and rear wheels turn the same way resulting a sideways sliding movement instead of a turn
- Dynamic Steering: In this mode the chassis will automatically switch between 2-wheel, 4-wheel and Crab modes dependent upon the speed. As speed increases this switching will improve system stability. See "Sports Mode: Dynamic Steering" on page 51

### » SPORTS MODE: STEERING RATE

Steering Rate control, is now active from AGITO OS 5.1 onwards, it enables the operator to change the speed at which the Steering Actuators respond. There are now three modes: FAST, MEDIUM and SLOW.

FAST mode is the default and allows the actuator to travel at 100% of normal speed, this is exactly as the AGITO operates as standard prior to this option being activated. MEDIUM is 50% of the standard speed and SLOW is 30% of the full speed.

Steering Rate does not limit the travel of the Actuator, only the speed at which it travels.

**STEERING RATE CHANGES THE REACTIVE NATURE OF AGITO.  
OPERATORS MUST PRACTICE DRIVING IN THIS MODE TO FEEL CONFIDENT AND  
UNDERSTAND HOW AND WHEN THE STEERING MODES WILL CHANGE .**

## » SPORTS MODE: USING AGITO TOWER

When operating Tower in Sports mode it is possible to control its operation by using the Master Tower Controller Add-on Module or with Pedals connected via the Y-Cord cable or AGITO Hub. See "Hub Box: Connecting Pedals to Master Controller" on page 41

**When using tower in Sports mode you will need to activate the tower within the  
Sports mode tower menu, see "Tower Controls" on page 26**

To control the operational characteristics of the Tower STEER LIMIT and STEER RATE dials have secondary functionality. To access these functions, press the dial to change the function mode.

STEER LIMIT enables TOWER LIMITS (Top and Bottom)

It is possible to set range limits on the Tower, once the Tower Limit – Top or Bottom has been selected the percentage will switch to show the range. 0% bottom, 100% top.

STEER RATE enables TOWER SPEED

Once STEER RATE has been pressed to enable TOWER SPEED control, the Master display will show tPos (Tower Position), press the STEER RATE button a second time to return the display to Steer Rate.

## » DRIVE DYNAMICS: SPORTS MODE

Setting up the AGITO to best suit your driving style and the requirements of the shot is essential. There are many user configurable software options, that when combined with the hardware set-up will vary the drive dynamics / responsiveness, see "Mode Settings (Sports Mode)" on page 25



## » SPORTS MODE: FIRST USE

**WHEN YOU USE THE SYSTEM FOR THE FIRST TIME, IT IS HIGHLY RECOMMENDED THAT  
THE OPERATOR UNDERSTANDS THIS MANUAL AND HAS TIME TO EXPERIMENT AND  
FAMILIARISE THEMSELVES WITH DIFFERENT CONFIGURATIONS. FINDING THE SET-UP WHICH  
MAKES THE OPERATOR FEEL MOST "CONNECTED" TO AGITO IS ESSENTIAL.**

AGITO is shipped in a standard configuration, and this is how we generally teach operators who attend our training. Firmware settings can be returned to default using the RESET command in the SYSTEM menu. Ensuring that the hardware is in a neutral state is also extremely important when setting up the AGITO.





Always ensure:

- Tracking / wheel alignment is straight
- Suspension is neutral
- Kick-up is neutral

## » SPORTS MODE: WHEEL TRACKING

Once the system has calibrated, we recommend checking that the chassis drives in a straight line.

**ALWAYS ENSURE THAT THE SUSPENSION HAS BEEN CORRECTLY SET PRIOR TO ADJUSTING WHEEL TRACKING**

First check that "Swap Ends on Reverse" and "Invert Steering on Reverse" are both set to Default (No). Set the steering mode to "2-wheel". This means that the chassis will essentially drive like a regular car and maintains the "front end"

Driving the AGITO along a 5-meter line will confirm that the alignment is correct, if the system does not follow the line check the mechanical tracking of the "front end". Now reverse the AGITO back along the line, if the chassis does not follow the line accurately then double check the mechanical tracking, take note of the tracking of the "rear end".

**Note:** It is important that the steering rack is tight, any "slop" within the steering will result in drift. A hard impact to one of the wheels can cause "slop" – if your system has excessive movement within the steering rack then we suggest that you contact Customer Support and book the AGITO Drive-ends in for a full service.

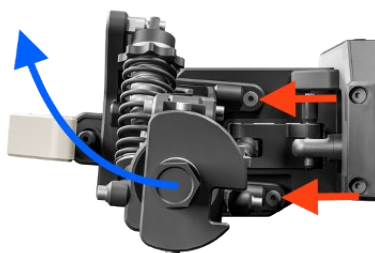
If you need to adjust wheel alignment and tracking, see "Sports Drive-end: Wheel Tracking" on page 39

## » SPORTS MODE: DIGITAL WHEEL TRACKING

Via the menu, it is possible to electronically adjust tracking (as wheel pairs). This is only intended as a temporary adjustment and does not replace the need for the mechanical adjustment as described above.

## » SPORTS MODE: KICK-UP

Kick-up is a method of adjusting suspension behaviour and handling on rough terrain by adjusting the suspension angle of the drive-end. More kick-up at the front will make the AGITO run better over bumps, it also reduces steering response, calming the AGITO, and making its movement smoother. The AGITO will transfer more weight, as the front will rise when accelerating and lower under braking. Less kick-up makes the AGITO more responsive, good for smooth hard surfaces and lower intensity turns, due to less weight transfer. As standard we supply AGITO without any Kick-up in a flat neutral position.





If operating AGITO without a dedicated "front" it is recommended to keep the Drive-ends in a neutral position. It is also recommended that Drive-ends are reset to neutral after use.

## » SPORTS MODE: STEERING HOLD

This feature enables the steering angle to be held in a constant position without needing to maintain pressure on the Steering input control.

To activate this function see "Control Mapping" on page 20, once enabled the Free / Film Switch will lock the current steering angle when the switch position moves from Free to Film. The Steer Limit control can be used to finely adjust the position, switching back to "Free" will return the steering angle back to the Steering input control.

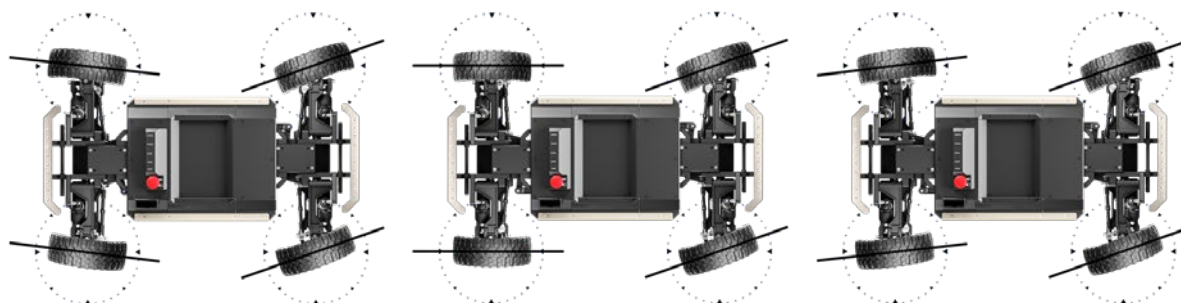
**IF E-STOP IS ACTIVATED WHILST IN STEERING HOLD, THE STEERING WILL REMAIN LOCKED**

## » SPORTS MODE: DYNAMIC STEERING

This option is found in the Sports Steering Menu, once enabled it replaces "CRAB" mode on the steering mode control dial. When enabled and the steering mode switch is set to "C", the chassis will automatically transition between 2-wheel, 4-wheel and Rear Wheel Assist (Crab) mode whilst in motion.

If the operator switches in to Dynamic mode whilst the chassis is traveling at 400rpm or above, the mode will be pending until the AGITO slows to below this speed.

Slow Speeds (short wheel base) > Medium Speeds (standard wheel base) > High Speeds (extended wheel base)



Once active, Dynamic Steering will function in 4-wheel steering whilst at slow speeds, it will then automatically transition to 2-wheel steer and remain in this mode until the chassis reaches a speed of 1400rpm or more (Advanced Operator Mode). Above 1400rpm the chassis will automatically transition to rear wheel assist / crab steering using all four wheels.

**DYNAMIC STEERING MODE CHANGES THE REACTIVE NATURE OF AGITO. OPERATORS MUST PRACTICE DRIVING IN THIS MODE TO FEEL CONFIDENT AND UNDERSTAND HOW AND WHEN THE STEERING MODES WILL CHANGE .**

Transitions	RPM	MPH*	KMH*	M/S*
4 wheel	0 - 600	0-5.2	0-8.4	0-2.3
Transition from 4 to 2 wheel	600 - 1100	5.2 - 9.5	8.4 - 15.3	2.3 - 4.3
2 wheel	1100 - 1400	9.5 - 12.1	15.3 - 19.5	4.3 - 5.4
Transition from 2 wheel to RWA	1400 - 2300	12.1 - 19.9	19.5 - 32.1	5.4 - 8.9
Rear Wheel Assist (crab)	2300 and above	19.9 and above	32.1 and above	8.9 and above

\* Figures for Dolly / Multi-terrain wheels

## » INTRODUCTION TO: MAGTRAX MODE

### » MAGTRAX MODE: TURNING ON

With your batteries installed, it is good practice to first turn on your MASTER Controller. Now on the chassis pull up the red power button on the top of the CORE. Select MagTrax Mode from the Home menu, once the desired operation mode has been selected on the MASTER Controller, the start-up initialisation sequence will begin. The CORE power button will flash if it is unable to connect.

### » MAGTRAX MODE: START UP CONNECTION & CALIBRATION

The MASTER will enter the connection screen and will ask the user to calibrate the Sports Steering (see "Sports Mode: Start up Connection & Calibration" on page 47), At the end of this sequence the CORE is fully powered on and ready to go. The MASTER will show the main MagTrax Mode application screen.

### MAGTRAX SETUP

To correctly set the MagTrax sensor Bars and MagStrip correctly follow these steps.

First lay down the Magnetic Strip along the required path.

The Adhesive strip should be laid adhesive face down.

The flexible strip it should have the face with the line on face down ensuring there is no twist. To help prevent twist, the strip retention brackets can be used at several intervals along the strip length or use a routed groove.



Next ensure that Magsteering is not enabled (Switch in the 'Free' position) and drive the AGITO over the strip. Go into the drive-end menu and enable the 'Setup' mode in the lighting controls. The LEDs should illuminate over the strip.



Loosen the two thumb screws and set the height of the sensor bars to just below the point the colour turns to green. Repeat for both sensor bars. The strength feedback on the Master Controller can also be used (7 is max)



Switch to the 'Film' position to enable mag steering and the AGITO will be able to run up and down the track with no steering input.

If you wish to use end-stop markers, lay down a piece around 6" long of the flat adhesive tape upside down (Adhesive up).

When placed under the sensor in setup lighting mode the strip will turn white when it has picked up the marker and will turn blue when the marker is the correct distance from the strip to register as an enstop. Fix the strip down roughly in the middle of the blue zone. The marker feedback on the Master can also be used, Marker 4 is Endstop.

Once the AGITO drives both sensors over the magnet it will come to a stop and allow you to drive back out of the end zone.

## » INTRODUCTION TO: TRAX MODE

### » TRAX MODE: TURNING ON

With your batteries installed, it is good practice to first turn on your MASTER Controller. Now on the chassis pull up the red Master power button on the top of the CORE. Select Trax Mode from the Home menu, once the desired operation mode has been selected on the MASTER Controller, the start-up initialisation sequence will begin. The CORE power button will flash if it is unable to connect.

### » TRAX MODE: START UP CONNECTION & CALIBRATION

The MASTER will enter the connection screen and will ask the user to calibrate the Trax System, once this is selected the Menu will display the calibration sequence. At the end of this sequence the CORE is fully powered on and ready to go. The MASTER will show the main Trax Mode Operation screen. See "Trax Mode: Mag-Stop" on page 55.

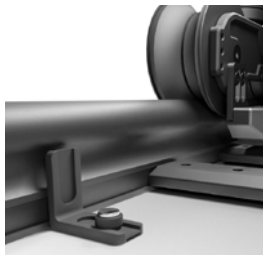
## TRACK CALIBRATION

To correctly calibrate the AGITO Trax system follow these steps



Make sure the MAG-STOP module is correctly fitted to the Trax Drive-End, we normally place this as shown below at the Front / Left side of the AGITO. Positioned on the far side from the Operator for continuity.

Ensure the AGITO is positioned in the  
CENTRE of the Track.



Place the Magnets securely at each end of the Track

Since the MAG-STOP is off-set on the AGITO, it is important to correctly position the magnets. Ensure magnets have **between 20-60mm** separation from the MAG-STOP Sensor when they pass.

At the Front / Left end of the Track (closest to the MAG-STOP) position the Magnet 25cm from the end of the track. At the Rear / Right end of the Track (furthest from the MAG-STOP) position the Magnet 1.25m from the end of the track.



Check that all Pedals and E-Stop are correctly connected to the AGITO Hub.

Turn on the AGITO, make sure that the E-Stop is disabled, ie. AGITO Trax is active.



From the Trax Calibration screen, select Calibrate when prompted.

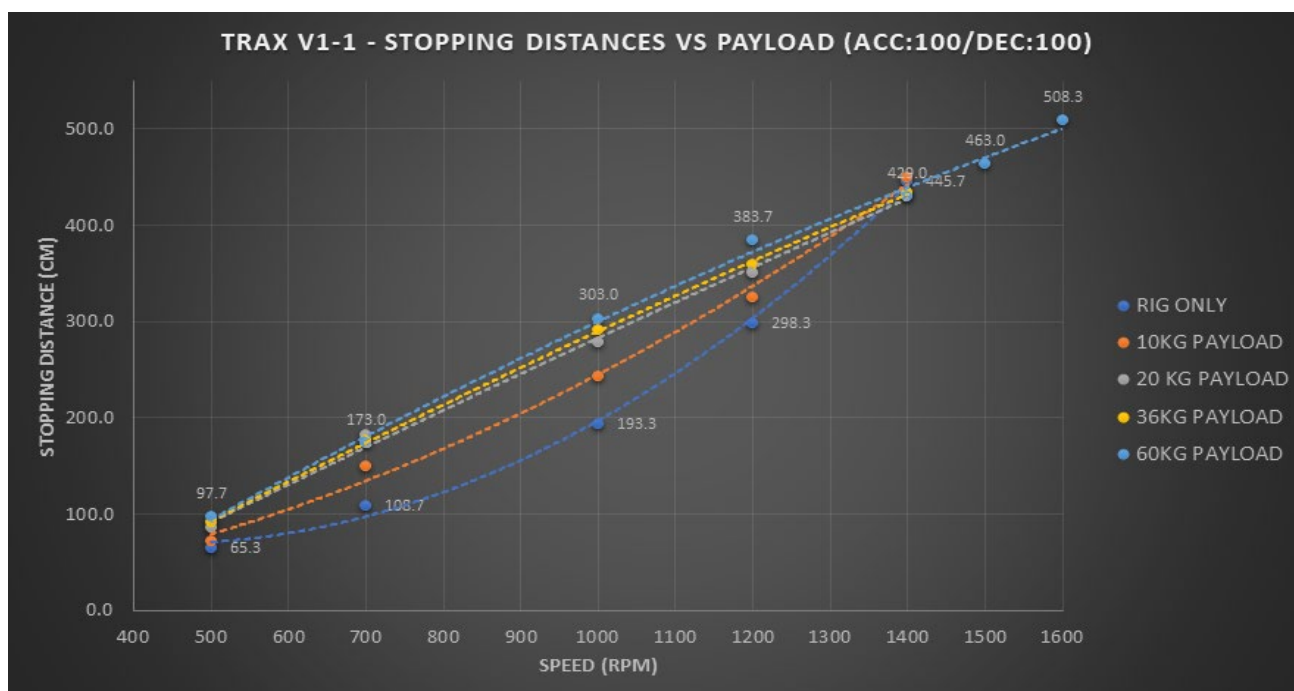
The system will now perform the Calibration process, the AGITO will slowly travel the length of the track confirming the MAG-Stop's. Once completed the MASTER will show the calibrated track length.

If the system does not pick up the first magnet within 15m the track learn with timeout. It is best to start the track learn with the system already close to the front endstop.

### » TRAX MODE: STOPPING DISTANCES

**SHOWN STOPPING DISTANCES ARE A RECOMMENDATION ONLY AND MUST BE TESTED PRIOR TO USE. THE EXACT DISTANCE IS SUBJECT TO VARIATION DUE TO TOTAL PAYLOAD OF THE COMPLETE SYSTEM, ENVIRONMENTAL CONDITIONS (RAIN, DUST, ETC) AND ANY GRADIENT OF THE TRACK.**

After completing the Trax configuration, please move the magnets to the minimum operational position as shown below. Always test the



stopping distance prior to use.

It is recommended that if full-speed (1400 rpm) operation is required that a minimum of 4.5m of track is reserved at each end of the track. Until Dynamic Breaking is introduced this will limit the amount of track available for use at slower speeds.

**WHEN POSITIONING THE MAG-STOP MAGNETS REMEMBER TO COMPENSATE FOR THE LENGTH OF THE AGITO SYSTEM, I.E. QUOTED STOPPING DISTANCES WILL BE +1M FROM THE NON-MAG-SENSE END OF THE AGITO.**

## » TRAX MODE: USING TOWER

When operating Tower in Trax mode it is possible to limit the range of movement. To access this function, press the dial to change the function mode.

STEER LIMIT enables TOWER LIMITS (Top and Bottom)

It is possible to set range limits on the Tower, once the Tower Limit – Top or Bottom has been selected the percentage will switch to show the range. 0% bottom, 100% top. When the relevant limit is selected the display will turn green whilst it is adjustable.

STEER RATE enables TOWER SPEED

Once STEER RATE now adjusts TOWER SPEED control, the Master display will show Tower Position.



## » DRIVE DYNAMICS: TRAX MODE

With your batteries installed, Hub Box and Pedals connected, it is good practice to first turn on your MASTER Controller. Now on the chassis pull up the red power button on the top of the CORE. Select Trax Mode from the home menu, the connection screen will now be displayed and the start-up initialisation sequence will begin, see "Connect / Calibration Screen (Trax Mode)" on page 27. The MASTER will ask the user to initiate a Track Learn, once this is selected the Menu will display the learning sequence. At the end of this sequence the CORE is fully powered on and ready to go. The MASTER will show the main Trax Mode Application screen, see "Application

Screen (Trax Mode)" on page 27

**BEFORE THE TRAX CALIBRATION HAS BEEN COMPLETED,  
IT IS POSSIBLE TO RUN BEYOND THE PHYSICAL ENDS OF THE TRACK.**

**WHEN TURNING ON THE MASTER CONTROLLER BE CAREFUL NOT TO PRESS ANY BUTTON  
OTHER THAN THE POWER SWITCH, SPECIFICALLY THE THROTTLE INPUT / PEDALS.**

Setting up the AGITO to best suit your driving style and the requirements of the shot is essential. There are many user configurable software options, that when combined with the hardware set-up will vary the drive dynamics / responsiveness. "Mode Settings (Trax Mode)" on page 28

## » TRAX MODE: FIRST USE

When you use the system for the first time, it is highly recommended that the operator understands this manual and has time to experiment and familiarise themselves with different configurations. Finding the set-up which makes the operator feel most "connected" to AGITO is essential.

AGITO is shipped in a standard configuration, and this is how we generally teach operators who attend our training. Firmware settings can be returned to default using the RESET command in the SYSTEM menu, "Mode Reset" on page 29. Ensuring that the hardware is in a neutral state is also extremely important when setting up system.

Always ensure:

- MAG-Stop is correctly calibrated
- Stopping Distances have been tested
- Maximum speed is restricted to match the payload and any track curves in use
- Use Guide Wheels to ensure the system is safely attached to the track
- E-STOP is connected and close to the operator at ALL TIMES

## » TRAX MODE: MAG-STOP

MAG-Stop is an automatic feature designed to provide known stopping positions on track. When the MAG-Sense is fitted to the AGITO and the Track Learn calibration has been completed (see "Trax Mode: Start up Connection & Calibration" on page 53), whenever the MAG-sense passes over a MAG-Stop magnet the AGITO will automatically apply braking.

### MAG-STOP OVERRIDE

If enabled within the menu, see "Control Mapping" on page 20, then switching the Steering Mode switch to the CRAB position, far right clockwise, the AGITO will ignore the MAG-Stop feature until this switch is rotated anti-clockwise back to either 2-Wheel or 4-Wheel.

The MAG-STOP feature can also be fully disabled in the Trax Mode menu, see "Control Mapping" on page 20



## » INTRODUCTION TO: REPEATABLE MOVES MODE

### » REPEATABLE MOVES MODE: TURNING ON

Repeatable Moves is a hybrid mode that provides basic record and playback of AGITO movement. It is recommended that initial setup is done within either Sports or Trax mode dependant upon the drive-ends in use. Once configured / calibrated, the user can then access Repeatable Moves.

### » REPEATABLE MOVES: FIRST USE

#### SELECTING A CLIP

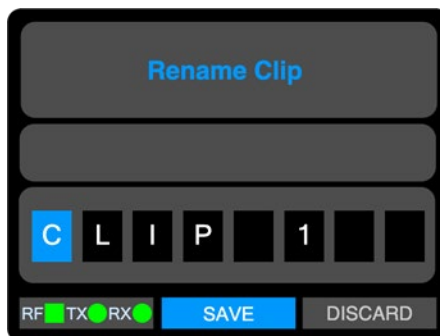
When using Repeatable Moves you will initially need to either select an empty clip or over-right a pre-existing clip. The system will automatically prompt the user to make this decision.



Once selected the user will be prompted to keep the default (previous name) or rename the clip.

#### RENAMING A CLIP

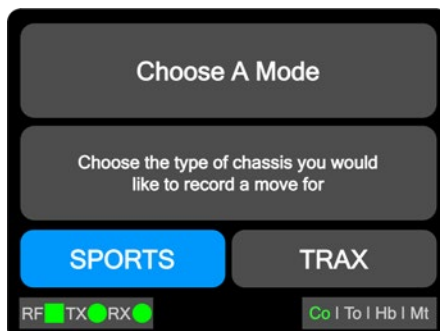
If the user decides to rename the clip, they will be able to enter a 8 character name



#### SELECTING A MODE

Once the Clip name has been chosen, the user will need to manually select the Drive-end currently attached to the AGITO.

**ALWAYS ENSURE THE CORRECT DRIVE-END IS SELECTED, FAILURE TO DO SO MAY RESULT IN DAMAGE TO THE SYSTEM**





## » REPEATABLE MOVES: RECORDING YOUR FIRST CLIP

Once in the Recording / Standby screen, the user will be able to use the Menu Button to select the Repeatable Moves drop-down function menu.



### RECORDING

Once Record has been selected, the AGITO Master Controller will begin recording the clip, the display will display "RECORDING" in the mode status.



Pressing the MENU or REAR OPTION Button will stop the recording, and put the system in a "paused" state.

### PAUSED RECORDING

When a recording has been paused, pressing the MENU or REAR OPTION button will open the Repeatable Moves drop-down function menu.



At this point the recording can either be restarted, by selecting "Record" or saved and prepared for playback.

If during the recording a warning state is displayed, i.e. Low Battery the message will need to be cleared before being able to Pause. Track Position warnings will clear automatically once the Trax has been brought back in to the usable area of track.

## » PLAYING BACK A CLIP

### SELECTING / LOADING A CLIP

When entering playback mode, or selecting a pre-recorded clip on entry to Repeatable Moves mode, the display will show the characteristics of the clip, specifically the drive-end used to create the clip and the duration of the recording. Enter the Repeatable Moves drop-down menu and select Load Clip



### PLAYING A SELECTED CLIP

Once the Playback Screen is displayed, to playback the Clip, use the MENU or REAR OPTION button to enter the Repeatable Moves drop-down menu and select playback.



### POSITION BIAS DURING PLAYBACK

During playback it is possible to use the throttle and steering inputs to make minor adjustments to the movement of the AGITO. These "bias" controls will not be recorded within the clip, but allow for the operator to adjust the position of the system in real-time.

This feature is intended to allow for course errors to be correct, e.g. driving through a narrow gap, or adjusting the AGITO's movement to keep in line with an Actor or the action being recorded.

### REWINDING A CLIP AFTER PLAYBACK

After the clip has been played. The AGITO will need to be reset to its start position. This can be done manually in a Sports Mode clip or by using the Rewind feature in a Trax Mode clip. Once the rewind has been completed the system will return to the Standby state, it can be manually adjusted or playback can be selected.

**ALWAYS ENSURE THE TOWER HAS RETURNED TO THE CORRECT STARTING POSITION BEFORE PLAYING A CLIP**





## » DELETING A CLIP

To delete a clip, access the Select a Clip screen, highlight the clip that will be deleted. Use the MENU or REAR OPTION button to enter the Repeatable Moves drop-down menu and select Clear Clip.



## » TRIGGERS

Triggers enables operators to provide start / stop flags to 3rd party systems or wire a “Bloop” light to the AGITO system. Triggers are accessed from the AUX ports as outlined below.

Located with in the Repeatable Moves menu, if the trigger pulse is required via the MASTER Controller AUX 2 port, then this will also need to be activated from the System Control Mapping menu, see “Control Mapping” on page 20.

The duration of the trigger is selectable from the Repeatable Moves menu “External Triggers Menu” on page 35, the default (and minimum) is 10ms, but this can be increased by the operator as required. It is possible to set triggers to occur at the start, end or both and have different durations of pulse.

### TRIGGER TECHNICAL SPECIFICATIONS

- Triggers are 3.3Vdc logic level and have a low current draw of 20mA.
- Triggers can be activated from:
  - MASTER Controller AUX 2 (Lemo Pin 7)
  - CORE AUX 1 (Lemo Pin 6)
  - HUB Box\*

\* Activating triggers via the Hub box will require a simple modification of the electrical wiring, please contact support for details

## » RF MODULE & COMMUNICATIONS SETTINGS

**ALWAYS ENSURE THAT THE POWER SETTINGS ARE LEGAL IN THE TERRITORY OF OPERATION.**

**AS WITH ALL RF SYSTEMS, LINE OF SIGHT BETWEEN TRANSMITTER AND RECEIVER IS ESSENTIAL. ALWAYS ENSURE THAT THE ANTENNAS ARE FREE FROM OBSTRUCTIONS.**

The system comes with a 2.4 GHz (100mW) module as standard. The RF module is fixed in place using a single locking screw, simply unscrew this to remove the RF and swap for other RF modules (sold separately) when required. Always check that factory paired modules are used.

### » CHANGING SETTINGS

□ <https://motion-impossible.com/how-to-videos/>

**ALWAYS ENSURE FRESH BATTERIES ARE INSTALLED AND NEVER TURN OFF THE AGITO MASTER CONTROLLER AND/OR CORE WHILST CHANGING RF SETTINGS, DOING SO MAY REQUIRE THE RF MODULES BEING RETURNED TO A SERVICE CENTRE TO BE RESET.**

To change the settings of the AGITO RF modules, navigate to the Home Menu by turning on the MASTER Controller or applying a long press to the MENU button. Scroll down and select SYSTEM MENU, then navigate to the RF COMMS menu, see "" on page 21.

The AGITO system will push settings changes from the MASTER Controller to the CORE, once a setting has been selected and mode change transmitted, the RF connection will shut down for up to 3 seconds whilst the modules are configured. The RF system will then automatically restart and check that communication has been re-established. If an error occurs and the MASTER Controller is unable to connect to the CORE then the modules will revert to the previous setting after 10 seconds.

If the CORE is unable to connect to the MASTER Controller, the main power button will flash slowly.

### » RF POWER

By default the system is set to 100mW, this is the legal limit in most countries and territories around the world. It is vital that the owner of the system ensures that all operators know the legal power limits for the area of operation. This menu can then be used to adjust the Transmission Power of the modules to ensure it remains at or below the legal limit.

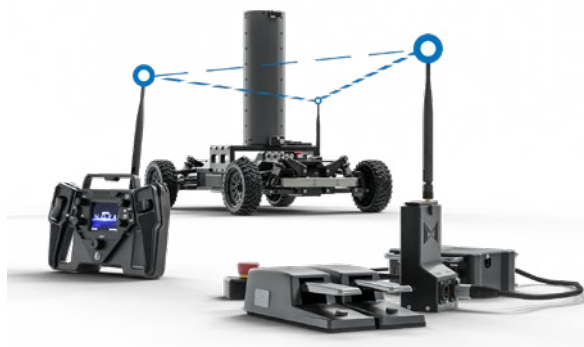
### » RF FORWARD ERROR CORRECTION (FEC)

This feature enables a technique for controlling errors in data transmission in noisy communication environments without the need for multiple retransmissions.

If you are experiencing data-loss or restricted range, ensure that FEC is enabled and that you are using the maximum power that is legal in your territory of operation.

### » POINT-TO-MULTIPOINT (P2MP) MODE

This new feature requires additional hardware, please contact your sales representative for pricing and availability.



Point-to-Multipoint mode enables three RF Modules to be operated simultaneously, to operate in this mode the RF modules will need to be correctly configured.



Insert RF Module in to RF Module Enclosure

Plug DATA cable in to RF Module Enclosure

Plug DATA cable in to HUB Box DATA Port

Attach 12Vdc power to both the RF Module Enclosure  
Attach 7-9Vdc power supply to the Hub-box.

**DO NOT EXCEED 9VDC WHEN POWERING THE HUB-BOX**

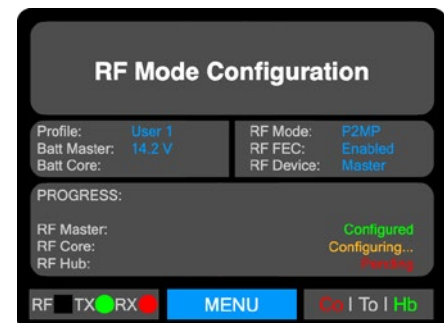
On first use, the HUB Box will need to be connected to the MASTER Controller, then turn on all system components (MASTER, CORE, HUB and RF MODULE ENCLOSURE).

Open the SYSTEM Menu and select "RF Comms" menu. Scroll down to "Setup P2MP Mode" and select Proceed, the system will show progress on the Configuration screen. Once complete the HUB box can be unplugged from the MASTER Controller. If an error message is displayed please contact Support for assistance.

Once set-up the Hub-box can be powered directly using a 7-9Vdc power supply, via 3-pin XLR, see "AGITO Hubbox I/O Connections" on page 90.

## REVERTING TO NORMAL RF MODE

To revert back to normal operation, open the SYSTEM Menu and select "RF Comms" menu. Scroll down to Setup Normal RF Mode and select Proceed.



## » 3RD PARTY RF OPTIONS

Using the Data Pass-through module it is possible to use 3rd Party RF solutions including Silvus TriCaster or DTC NetNode/Solo. Please contact support for more information.

## » WIRED CONTROL

AGITO can be controlled via serial RS232 data using the optional Data Pass-through modules. Serial data has a limited range, therefore for longer cable runs or more complex installations MI recommend LANTRONIX Serial to IP converters which can be purchased separately. Please contact support for more information

## » E-STOP

### » INTRODUCTION TO E-STOP

As a safety precaution AGITO is equipped with an Electronic Stop function, known as E-Stop. This is different to the main power switch (emergency stop) that is present on the AGITO Core. There are several methods of applying the E-Stop:

- Switching the "Function Switch" on the MASTER Controller (when enabled)
- Pressing the HUB E-Stop button when using Pedals
- Using an external input device connected to MASTER Aux 2 port (see pin-outs)

**THE E-STOP FUNCTION IS PROGRAMMED TO APPLY BRAKING AS QUICKLY AND SAFELY AS POSSIBLE WITH A HEAVY PAYLOAD ATTACHED WITHOUT A DANGEROUS LOSS OF CONTROL THAT COULD RESULT IN MORE UNPREDICTABLE RESULTS**

Generally braking is activated whenever the throttle is applied in the opposite direction to your direction of movement. Alternatively using the DEC rate control dial, you can also adjust the behaviour of how the AGITO drifts to a stop when the throttle is released entirely.

**IT IS CRITICAL THAT ALL OPERATORS UNDERSTAND THE BRAKING DYNAMICS OF AGITO. ALWAYS TEST HOW CHANGES TO MODE SETTINGS AFFECT THESE DYNAMICS AND ALWAYS ENSURE THAT AGITO IS OPERATED IN A CONTROLLED ENVIRONMENT.**

### » E-STOP: MASTER CONTROLLER FUNCTION SWITCH

Using the Drive Control menu, it is possible to assign E-Stop to the MASTER Controller "Function Switch". When in Sports mode this feature is displayed, when assigned, on the main screen.

Activation of the E-Stop function is then made by moving the switch either up or down, see "Control Mapping" on page 20.



### » E-STOP: EXTERNAL BUTTON VIA HUB-BOX

When using the AGITO Hub, the E-Stop button must always be connected. Activation of this button will activate E-Stop no matter how the Function Switch menu has been set within the MASTER Controller.



### » E-STOP: EXTERNAL INPUT VIA 3RD PARTY DEVICES

If required, it is possible to create your own switch. A simple closed circuit between pins 7 & 10 of the MASTER Controller AUX 2 port will activate E-Stop. See the pin-out diagrams for full details and "Control Mapping" on page 20 for correct configuration.

**ALWAYS TEST THE FUNCTION OF THE E-STOP PRIOR TO OPERATION**

### » GENERAL SAFETY FEATURES

- Powering off the Master results in the chassis coming to a controlled stop on level ground.
- Loss of RF signal results in chassis coming to a controlled stop on level ground.
- Entering the MENU will also stop the chassis and lock its movement until exiting.

## » OPERATOR MODES

AGITO Sports, as standard is provided to all new customers with a firmware limited speed of 1400rpm (15mph, 24km/h), this is the limit for all operators who have completed "Standard Operator Training". More experienced operators will be able to attend "Advanced Operator Training" (for an additional cost) which will provide attendees with a User PIN that will unlock the firmware to 2500rpm (26mph, 42km/h),

### » STANDARD OPERATOR MODE (SOM)

All users of the AGITO system can access Standard Operator Mode, also referred to as "SOM". Basic operational training is supplied when a system is purchased or by attending an AGITO Academy certified course. In this mode, the advanced features of the AGITO system are restricted in the interests of safety.

The System is limited to the following speeds:

Set-up:	RPM Limit	MPH Limit	Km/h Limit	M/s Limit
Sports	1400	12.1	19.5	5.4
Sports + Monster Wheels	1400	14.8	23.8	6.6
Sports + Tower	800	6.9	11.2	3.1
Sports + Tower + Monster Wheels	800	8.4	13.6	3.8
Trax* + Tower	1400	7.0	11.3	3.1

\* Speeds quoted for Trax drive-ends version v1.1

### » ADVANCED OPERATOR MODE (AOM)

**THE USE OF ADVANCED OPERATOR MODE IS RESERVED FOR EXPERIENCED OPERATORS WHO HAVE UNDERGONE ADDITIONAL TRAINING.**

Only users who have attended advanced training can access Advanced Operator Mode, also referred to as "AOM", using their own individual PIN code. The purpose of this training is to give operators a greater understanding of the system and to ensure they have received a controlled introduction to the high speed operation of the AGITO system.

Enhanced operational training is available by attending an AGITO Academy certified course. In this mode, the full features of the AGITO system are available. The System no longer limited, allowing the operator to achieve the following speeds:

Set-up:	RPM Limit	MPH Limit	Km/h Limit	M/s Limit
Sports	2500	21.7	34.9	9.7
Sports + Monster Wheels	2500	26.4	42.4	11.8
Sports + Tower	800 (default)	6.9 (default)	11.2 (default)	3.1 (default)
Sports + Tower + Monster Wheels	800 (default)	8.4 (default)	13.6 (default)	3.8 (default)
Trax + Tower	1400	7.0	11.3	3.1

### » AGITO ACADEMY

AGITO Academy is our bespoke training programme run globally, please contact your sales rep for more information, or visit the website.

□ [www.motion-impossible.com/academy](http://www.motion-impossible.com/academy)

## » TOWER: MASTER CONTROLLER ADD-ON

### » OVERVIEW

The AGITO Tower Master Controller Add-on unit is designed to enable wireless control of the Tower, specifically when in Sports Mode, without the need for pedals.

### » CONNECTION TO MASTER

The Add-on unit mounts directly to the rear of the Master Controller.



Align the LEMO fixings and push on to the rear of the MASTER Controller

Tighten the fixing screw to attach securely to the rear of the MASTER Controller

### » ADJUSTING ROCKER SWITCH POSITION

The position of the rocker switch is adjustable by exchanging one of three lids, pictured below, giving a low (1), medium (2) and high (3) angle.



Remove the two fixing screws



Remove the Cover



Adjust the angle of the Rocker Switch



Replace with the matching Cover (three covers are provided with the kit) and fix in place with the two screws removed in step one.

## » TOWER: POWER & FIBRE PASS-THROUGH

### » OVERVIEW

The AGITO Tower is supplied with power pass-through and optionally with a dual single-mode Fibre Optic upgrade.

### » POWER PASS-THROUGH

The Tower is equipped internally with a 3-core power line. This can be used when combined with one of three cable sets to allow up to two different voltages to be passed from the base of the tower to the top. Shown as the "A" connectors in the two images below.



#### ARRI SRH-3 & SRH-360

The MI SRH cable set (AG-TO-801) is wired to provide both 12Vdc and 24Vdc circuits from the standard ARRI High Capacity cables commonly supplied. The Arri manual provides details of recommended batteries, power solutions and wiring requirements.

The following cable is required when using the AGITO Mains PSU:

- SRH High Capacity Battery Power Cable 12V/24V, 0.5m/1.64ft (K2.0019306)

#### SHOTOVER G1

The MI G1 cable set (AG-TO-802) is wired to provide a 48Vdc circuit from the standard SHOTOVER G1 Lemo Power Cable. The Shotover manual provides details of recommended batteries, power solutions and wiring requirements.

#### OTHER REMOTE HEADS

If you intend to use another remote head, the MI Bare-ends cable set (AG-TO-809) provides bare-ends for custom configurations. The internal wiring uses standard 1.5mm<sup>2</sup> cores.

### » OPTIONAL SINGLE-MODE FIBRE OPTIC UPGRADE

The optional Fibre Optic tower is supplied with two single-mode fibre optic cores, terminated to custom LEMO connectors. Each tower is supplied with 4x Lemo - ST tails, additional or replacement cables are available, please contact your local sales rep for pricing. ST connectors are industry standard and can be used to connect to any number of accessories.

Off-the-shelf fibre optic converters are available from: AJA, Bluebell Opticom, Moxa, StarTech,, lindy and even Amazon.

## » TOWER: STANDALONE OPERATION

### » OVERVIEW

Using the Tower Spreader Base and Hand Controller, it is possible to operate the AGITO Tower as a standalone device. Details of how to fit the Spreader Base and use of the Hand Controller follow.

## » TOWER: SPREADER BASE

### » OVERVIEW

The AGITO Tower is supplied with power pass-through and optionally with a dual single-mode Fibre Optic upgrade.

### » TOWER SPREADER BASE ASSEMBLY



If fitted, remove the AGITO Tower base plate, to do this the DUST COVER will need to be removed first

Align and fit the Spreader Base Plate  
Reattach the right angle lemo power connector

Attach the three Legs using the supplied screws

Adjust the swivel leg as needed

Adjust the levelling feet as needed

Attach power to the Tower via the 4-pin XLR connector

### POWER SUPPLY

A 12v power source with 4-pin XLR is required for standalone tower operation, the Tower Spreader Base has fixture points for V-lock and Gold-mount battery plates manufactured by Hawk-Woods. Alternatively a commonly available 12Vdc mains power supply can be used (not supplied).



## » TOWER: HAND CONTROLLER

### » OVERVIEW

The AGITO Tower Hand Controller is a stand alone unit designed to enable wired control of the Tower without the need of an AGITO Core and Master Controller.



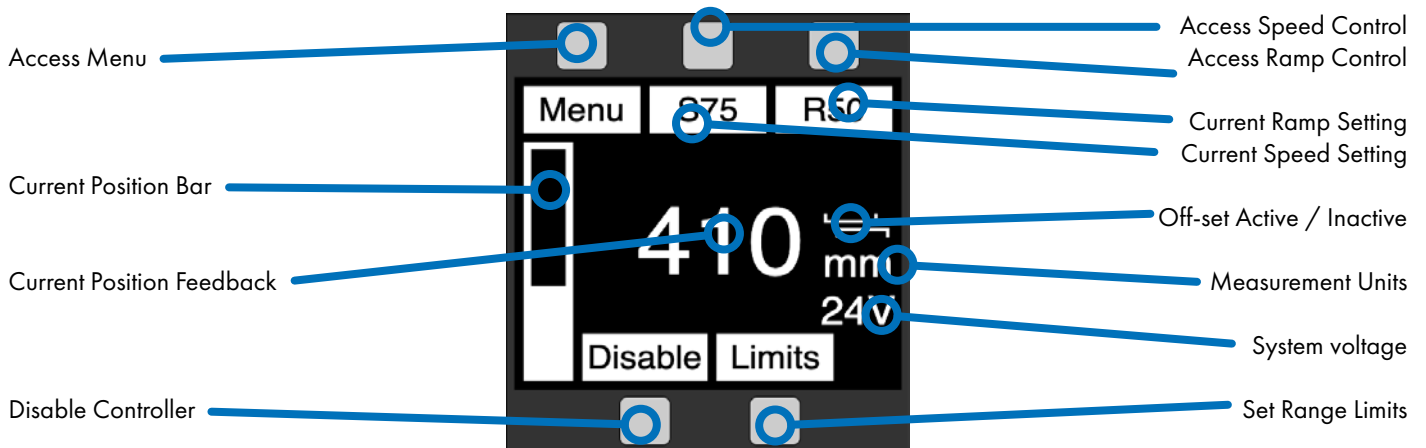
### » CONNECTION TO TOWER

The AGITO Tower Hand Controller plugs directly to the "Tower CTL" connection on the Tower I/O panel. By default the system is supplied with a 12m / 40ft cable. It is possible to run potentially run in excess of 750m / 41,000ft but to do this the baud rate will need to be adjusted, this feature is accessed from the Menu option.

### » DISPLAY AND CONTROLS

The Menus of the Hand Controller can be accessed by the 5 Soft-keys and the Rocker. The actual functions of the 5 Soft-keys are shown on the top and bottom of the Display border.

### » OPERATIONAL LAYOUT



### MENU

Inside the Menus, use the Rocker to move up and down or change values. The following functions are accessible within the Menu: Offset, System Info, Baud rate and Units

### SPEED CONTROL / SPEED RAMP CONTROL

To change maximum Speed or Ramping, press and hold the relevant Button and push the Rocker to increase or decrease the value.

### DISABLE

You can disable the system to prevent unintended movement. Just press the Disable Button (left button on the Main Control) To re-enable the system press the button again.

### RANGE LIMITS

Move the Arm to the required position and select LIMITS from the Menu. Now you can select with the Rocker which Limit to be set or reset. With SET you can set the limit to the current position. RESET will set the Limit back to the mechanical top or bottom limit.

## » MAINS POWER SUPPLY UNIT (PSU)

### » OVERVIEW

The AGITO Mains Power Supply unit is designed specifically for the AGITO Modular Dolly System. It comes primarily as a 48Vdc power supply, providing two unregulated outputs. See the chart below for more details.

#### REQUIRED BEFORE USE

Please note that the AGITO MAINS PSU does not come with a pre-made mains input power cable. The unit is shipped with a NEUTRIK NAC3FCA connector ready to be fitted to a suitable length of mains cable by the user.

*Why doesn't the unit come with a supplied mains cable?* The simple answer is that we don't know how long you want the cable to be, for your application. We have supplied the required NEUTRIK NAC3FCA connector so it will be very easy for a suitably qualified technician to fit this to your own cable. Please follow these instructions for assembly: "[AGITO PSU: Assembling Neutrik powerCON Connector](#)"

### » I/O PORTS AND CURRENT LIMITS

Output	Qty	Recommended Combined Peak Current limit per voltage		Combined Peak Limit All outputs		Connector Type
		110-120Vac	200-240Vac	10-120Vac	200-240Vac	
48Vdc	2	16A	28A			Lemo 2B 2-pin
24Vdc	2	6A	12A	26A	52A	Neutrik XLR 3-pin
12Vdc	2	6A	12A			Neutrik XLR 4-pin
110-240Vac	1	Pass-through		13A recommended peak		Neutrik PowerCON

**SWITCH ON THE MAINS PSU BEFORE TURNING ON ATTACHED DEVICES, AS THE COMBINED CURRENT LOAD MAY ACTIVATE THE SAFETY CUT OFF**

### » BATTERY ATTACHMENT

The AGITO MAINS PSU connects to the AGITO Core using a specially designed Battery Module, connected via an 2-pin Lemo cable (supplied).

**IT IS VITAL THAT WHEN USING THE AGITO MAINS PSU THAT A STANDARD 48V AGITO BATTERY IS ALSO USED TO ENABLE REGENERATIVE BREAKING TO OCCUR.**

### » ATTACHING PSU TO TRAX DRIVE-END

**PLEASE ENSURE YOU USE THE CORRECT TOOL TO AVOID DAMAGE TO SCREWHEADS. USE METRIC TOOLS FOR THE CHASSIS AND IMPERIAL TOOLS FOR DRIVE-ENDS AND CAMERA MOUNT (3/8TH INCH).**



Attach the two Mounting Brackets to each side of the PSU using 4x M5 bolts (provided)

Lower the PSU onto the Trax Drive-End, align the 3/8th inch hole within the Mounting Bracket with the corresponding hole on the Drive-End

Screw in bolt to secure. Do not overtighten

Insert AGITO MAINS PSU Battery Module into the closest Battery Pocket

Connect Battery Module to AGITO MAINS PSU using supplied interconnection cable

ALWAYS insert a Standard AGITO Battery into the remaining Battery Pocket

## » FIRMWARE UPDATES

New firmware will be made available periodically to keep the system running alongside our latest developments and improvements. This includes separate software for the AGITO CORE and MASTER Controller.

Notification of new firmware updates will be normally be emailed to your chosen contact email address and can be downloaded from the Motion Impossible website.

Firmware is installed via a small application that manages the update process, both Windows and MacOS versions of the installer are available from the website.

**DO NOT UNPLUG THE MASTER OR CORE FROM THE PC OR ALLOW THE BATTERY TO FAIL DURING THE UPDATE PROCESS. DOING SO MAY RENDER THE PRODUCT UNUSABLE AND WILL REQUIRE A RETURN TO AN AUTHORIZED SERVICE CENTER TO BE FIXED.**

Always remove the RF module from the Core and Master Controller before attempting an update.

### » HOW TO UPDATE FIRMWARE:

□ <https://motion-impossible.com/how-to-videos/>

To update your AGITO CORE and MASTER Controller you will need to download the latest 'MI Programmer' application from [www.motion-impossible.com/downloads](http://www.motion-impossible.com/downloads)

Before you run the MI-Programmer.exe (Windows) / MI-Programmer.app (MacOS) file make sure you have plugged in the USB update cable as that will install all the necessary drivers, the program may not run without this step. You only need to do this the first time you update from a new computer:



CORE Firmware Update:  
Connect the programming USB cable to AUX 1 Port on the Core



MASTER Controller Firmware Update:  
Connect the programming USB cable to the AUX 2 Port on the Master

- 1) Plug USB update cable on its own to your computer.
- 2) Allow windows to detect the device and automatically install driver.
- 3) Unplug update cable.

After the USB driver is installed and for future Firmware Updates:

- 1) Ensure MASTER/CORE is turned off, and no cables are plugged in.
- 2) Have your update cable (LEMO to USB cable provided) ready, but DO NOT plug it in.
- 2) Unzip all files on to your computer
- 3) Browse to the extracted files
- 4) Run "MI - Programmer.exe"
- 5) Follow on screen instructions

To enter firmware update mode on the Master Controller, when instructed, see "Update Firmware" on page 22.

## » MAINTENANCE

There are very few user-serviceable items on the chassis. However, keeping the AGITO clean using a dry cloth, brush and air duster before and after use is highly recommended. Applying 3-in-1 lubricant is recommended especially if the unit gets wet, be careful to clean away grit/sand/debris before applying

### » SPORTS DRIVE-END

It is recommended that shocks are cleaned at regular intervals and always after use in gravel, mud, sand, sea-water.

#### » SPORTS DRIVE-END: STEERING LINKAGE

Over time the bolts holding the steering linkage together can come loose and cause unwanted 'slop' in the steering. It is good to check these regularly. There are 10 bolts in total to check.

You will need the following to perform the service:



The first six can be found on the steering hubs. Ensure the three bolts on each hub are tight, one is found on the top, another on the bottom and the last is on the steering arm.



Turn the drive-end upside down and move the steering to one limit, this exposes a bolt that is part of the link between the two sides. Ensure that this is tight. Then turn the steering to the other limit and repeat on the other side.



Turn the drive ends the right way up again and tighten the exposed bolt, move the steering to the other limit and repeat on the other side.

#### » SPORTS DRIVE-END: SHOCK SERVICE

The AGITO Shocks can become dirty over time, getting sand & grit on the main shaft, damaging the O-Rings causing them to leak. We recommend servicing the shocks regularly and replacing the O-Rings at first sign of any leakage. Servicing the shock will involve cleaning it, replacing the oil, and replacing the O-Rings.

You will need the following to perform the service:

AGITO Shock Service Kit (With the correct grade oil for the shock, see below:)

Soft Shocks (Standard) – 900CST / Medium Shocks – 1500CST / Hard Shocks – 2000CST

1 mm Hex Allen Key  
2mm Hex Allen Key  
Xmm Hex Socket Driver  
Small Pick or Screwdriver  
Adjustable Spanner/Wrench  
Can of Brake Cleaner  
Clean rags

**SERVICING SHOCKS REQUIRES A SPRING COMPRESS TOOL.  
DO NOT ATTEMPT DISASSEMBLY WITHOUT AS IT COULD CAUSE INJURY.**

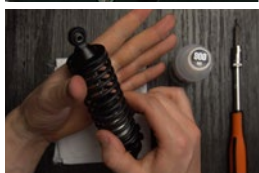
## DISASSEMBLY AND CLEANING



1. To remove the Shock from the Drive-End:  
First attach a 10mm Spanner to the notch at the top of the Shock, then  
use a 4mm Hex T-Bar to remove the Button screw.

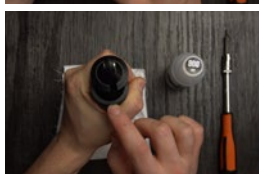


2. Using the 4mm Hex T-Bar remove the lower Cap screw.

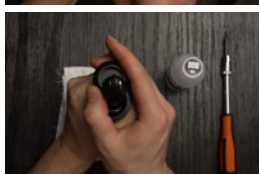


3. To disassemble the shock you must put the shock on a hard surface and grasp the spring with one hand.

**For MEDIUM and HEAVY Springs - ALWAYS use a suitable spring compressor**



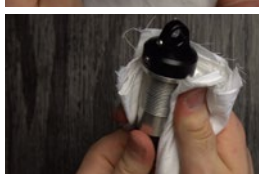
4. Push the spring down and make sure the small ring is still fitted to the spring not the top cup.



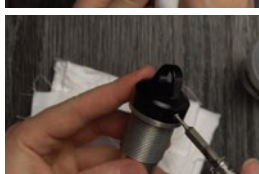
5. The cup should now be loose and slide out of the assembly. Once it  
is clear you can release the spring and it will come loose.



6. Now fully unscrew the pre-load nut



7. Clean the outside with some brake cleaner and a rag, getting rid  
of any grime & dirt from the thread and the shaft.



8. Use the 2mm hex driver to remove the two grub screws in the top cap,  
make sure to store them in a safe place so they are not lost.



9. Get a piece of packing foam or something that you can use to hold the shock upright.



10. Cover a screwdriver with a soft cloth and insert it into the hole at the top of the cap, then with the adjustable spanner hold the shock body at the notches show. Then carefully twist the shock cap free. Once loosened you can remove by hand.



11. Put the cap aside and empty the oil contents into a container for disposal.



12. Compress the shock to push out any remaining oil.



13. Remove the nut at the top of the central shaft using a Xmm hex socket driver.



14. Remove the plastic plate & two washers and store them safely to the side, then remove the central shaft from the assembly



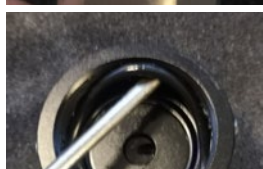
15. Unscrew the plastic cover at the base of the body, this cover will then split into two pieces, store these safely to the side.



16. Remove the inner two O-Rings and Plastic spacer.



17. Remove the outer O-Ring with a pick or small screwdriver



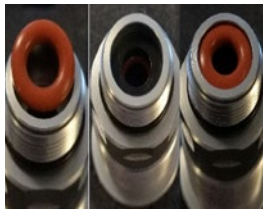
18. Take the Shock Cap and remove the O-Ring seated inside with a pick or small screwdriver.



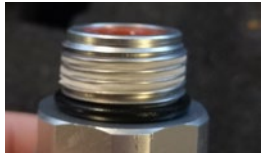
19. Give everything a clean with a rag and brake cleaner to remove any oil residue. Make sure to also clean all the small components.



## REPLACING O-RINGS & REASSEMBLY OF THE SHAFT



1. Take the shock body and insert a fresh O-Ring (small & thick) into the base, then insert a fresh plastic spacer and then a second fresh O-Ring.



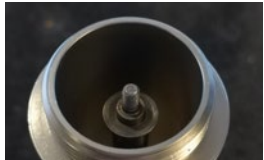
2. Replace the O-Ring on the side of the base with a fresh one (middle size) and wrap a small amount of PTFE thread/tape around the base thread.



3. Fit the two plastic cap pieces together and screw it into place on the shock body, making sure it screws all the way down and compresses the O-ring.



4. Re-insert the central shaft being careful not to damage the new O-Rings on the top thread.



5. Place the larger washer on the top of the shaft, making sure it lies flat.



6. Place the plastic plate onto the shaft, with the smaller diameter indent facing towards the bottom.



7. Place the small black washer on the top and fasten with the nylock nut.



8. Take the shock cap and insert the largest O-Ring.



9. Wrap some PTFE thread/tape onto the top thread of the shock body.

## REFILLING OIL & BLEEDING



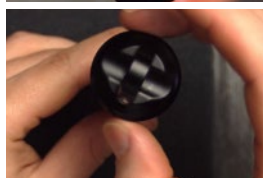
1. Extend the shock to full extension then place it into your holder. Then carefully pour the new oil into the shock body until just above top of the casing. You will see the surface tension curve just above the top of the thread.



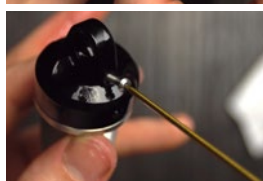
2. Push up on the shock slightly to get oil right at the base. Then Leave the shock to settle for 10-15 minutes for all of the air bubbles to leave. Higher grade oil might take longer. Once there are no bubbles you can continue.



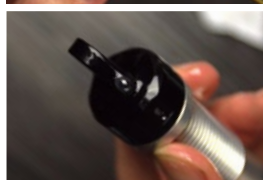
3. Unscrew the bleed screw from the top of the shock cap. Making sure you don't lose the tiny washer. Store this to the side for safe keeping.



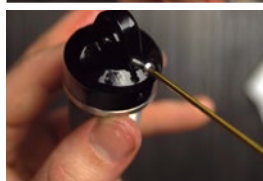
4. Carefully screw the shock cap onto the top of the shock body. If a little bit of oil squeezes out of the bleed hole that is okay. Wipe away any excess oil



5. Replace the bleed screw and tighten.



6. Give the shock several pumps, compressing in and out. If the shock is feeling springy and doesn't stay compressed then there is too much oil. If there is a small amount of free movement before becoming thick, then there is not enough oil and you will have to open up and add more.

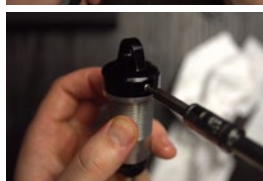


7. To release some of the oil, extend the shock to full and unscrew the bleed screw. Then slowly compress the shock until some oil comes out of the bleed screw, it should be pretty bubbly, keep on compressing until most of the big bubbles have come out.

8. Then replace the bleed screw and repeat steps 6 & 7. If its not feeling springy and there's no free movement you can proceed to reassembling the shock.



9. Make sure the shock cap is fully tightened



10. Then replace the two grub screws.



## FINAL REASSEMBLY



1. Replace the Preload nut onto the shock body.



2. Insert the spring. Making sure the end with the ring insert is at the base.



3. Carefully compress the spring and insert the cup into place.

Your shock has now been serviced, please repeat the process for the rest of the shocks in the kit. You should always service your shocks in drive-end pairs.

**LEAVE THE SHOCKS FOR 24HRS TO CHECK THAT THE SEALS ARE CORRECTLY SEATED,  
MONITOR FOR ANY LEAKS AND TEST WITH A FULL PAYLOAD BEFORE USE**

## » TOWER » CLEANING GAS-STRUT

Always ensure the Gas-Struts are in a clean condition, when new and overtime carbon dust and residue may build up on the shaft.



When using a Strut for the first time, or after a period of storage a small amount of residue may leak from the seal.  
This can cause noise when the Tower column is in operation.



Using a clean cloth simply wipe the strut clean, removing any residue



Make sure that the seal is also clean and clear of residue

If you notice any leaks, please contact the Support Team

## » SPECIFICATIONS

### » PAYLOAD & OPERATIONAL SPECIFICATIONS

#### » AGITO SPORTS (V1.0)

Drive End		Sports (v1.0)		
Mount		V-Con Pro		
Wheel Type		Dolly	Multi-terrain	Monster
Max Speed – Standard (1400rpm)		5.8m/s / 12.1mph	5.8m/s / 12.1mph	6.6m/s / 14.8mph
Max Speed – Advanced* (2500rpm)		9.7m/s / 21.7mph	9.7m/s / 21.7mph	11.8m/s / 26.4mph
Mount Height		350mm / 13.7"	350mm / 13.7"	380mm / 14.9"
Lens Height Comp.	Shotover G1		+400mm / 15.7"	
	Arri SRH-3		+450mm / 17.7"	
	IA Newton		+400mm / 15.7"	
Overall Width		625mm / 24.6"	625mm / 24.6"	766mm / 30.1"
Overall Length		952mm / 37.5"	952mm / 37.5"	952mm / 37.5"
Weight (excluding Payload)		43.6Kg / 96.1lbs	43.6Kg / 96.1lbs	44.9Kg / 99lbs
Max Payload (Standard Shocks)			32Kg / 70.5lbs	

Drive End		Sports (v1.0)		
Mount		Tower		
Wheel Type		Dolly	Standard	Monster
Max Speed – Standard (800rpm)		3.1m/s / 6.9mph	3.1m/s / 6.9mph	3.8m/s / 8.4mph
Max Speed – Advanced* (2500rpm)		9.7m/s / 21.7mph	9.7m/s / 21.7mph	11.8m/s / 26.4mph
Mount Height		750-1440mm / 29.5-56.7"	750-1440mm / 29.5-56.7"	770-1460mm / 30.3-57.5"
Lens Height Comp.	Shotover G1		+400mm / 15.7"	
	Arri SRH-3/360		+450mm / 17.7"	
	IA Newton		+400mm / 15.7"	
Overall Width		625mm / 24.6"	625mm / 24.6"	766mm / 30.1"
Overall Length		952mm / 37.5"	952mm / 37.5"	952mm / 37.5"
Weight (excluding Payload)		47.5Kg / 104.7lbs	47.5Kg / 104.7lbs	48.8Kg / 107.5lbs
Max Payload (Medium Shocks)			22Kg / 48.5lbs	

\* The operator will need to have completed Advanced Operator Mode training to enable access to this mode

## » AGITO TRAX (V1.1)

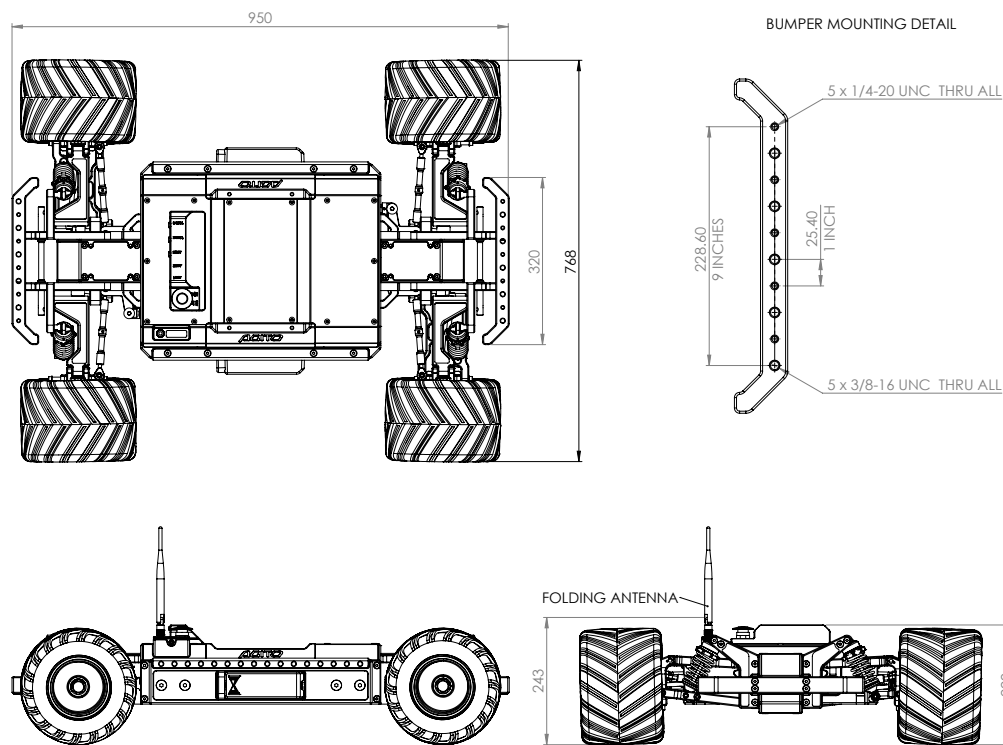
Drive End		Trax (v1.1)		
Number of Mounts		Single		
Type of Mount		V-Con Pro	Mitchell Mount	Tower
Max Speed* – Standard (1200rpm)		3.1m/s / 7mph	3.1m/s / 7mph	3.1m/s / 7mph
Mount Height		350mm / 13.7"	223mm / 8.7"	770mm-1460 / 30.3-57.5"
Lens Height Comp.	Shotover G1		+400mm / 15.7"	
	Arri SRH-3/360		+450mm / 17.7"	
	IA Newton		+400mm / 15.7"	
Overall Width		420mm / 16.5"	420mm / 16.5"	420mm / 16.5"
Overall Length		1110mm / 43.7"	1110mm / 43.7"	1110mm / 43.7"
Weight (excluding Payload)		43.6Kg / 96.1lbs	43.6Kg / 96.1lbs	44.9Kg / 99lbs
Max Payload (Standard Shocks)			32Kg / 70.5lbs	

Drive End		Trax (v1.1)		
Number of Mounts		Twin		
Type of Mount		Mitchell + Mitchell	Mitchell + Tower	Tower + Tower
Max Speed* – Standard (1200rpm)		3.1m/s / 7mph	3.1m/s / 7mph	3.1m/s / 7mph
Mount Height		350mm / 13.7"	223mm / 8.7"	770mm-1460 / 30.3-57.5"
Lens Height Comp.	Shotover G1		+400mm / 15.7"	
	Arri SRH-3/360		+450mm / 17.7"	
	IA Newton		+400mm / 15.7"	
Overall Width		420mm / 16.5"	420mm / 16.5"	420mm / 16.5"
Overall Length		1110mm / 43.7"	1110mm / 43.7"	1110mm / 43.7"
Weight (excluding Payload)		56Kg / 123lbs	63Kg / 139lbs	67Kg / 148lbs
Max Payload (per mount)		45 + 45Kg 99lbs + 99lbs	45 + 22Kg 99lbs + 48.5lbs	22 + 22Kg 48.5 + 48.5lbs

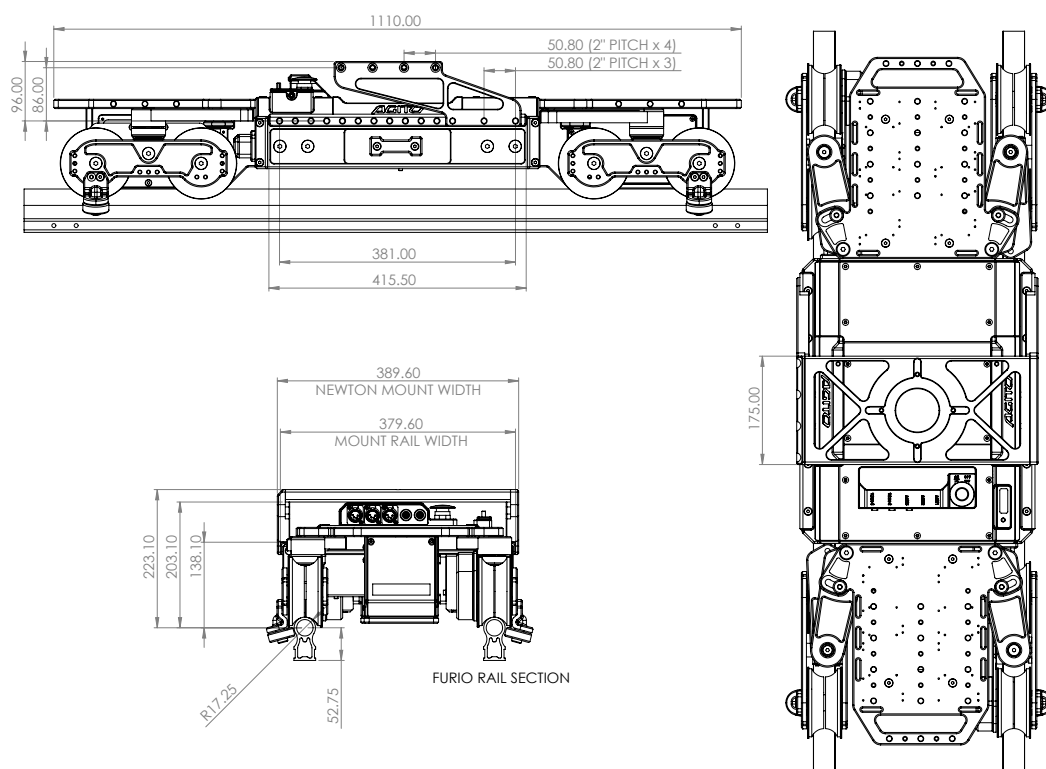
\* Max Speed figures quoted for Trax Drive-end v1.1

» TECHNICAL DRAWINGS

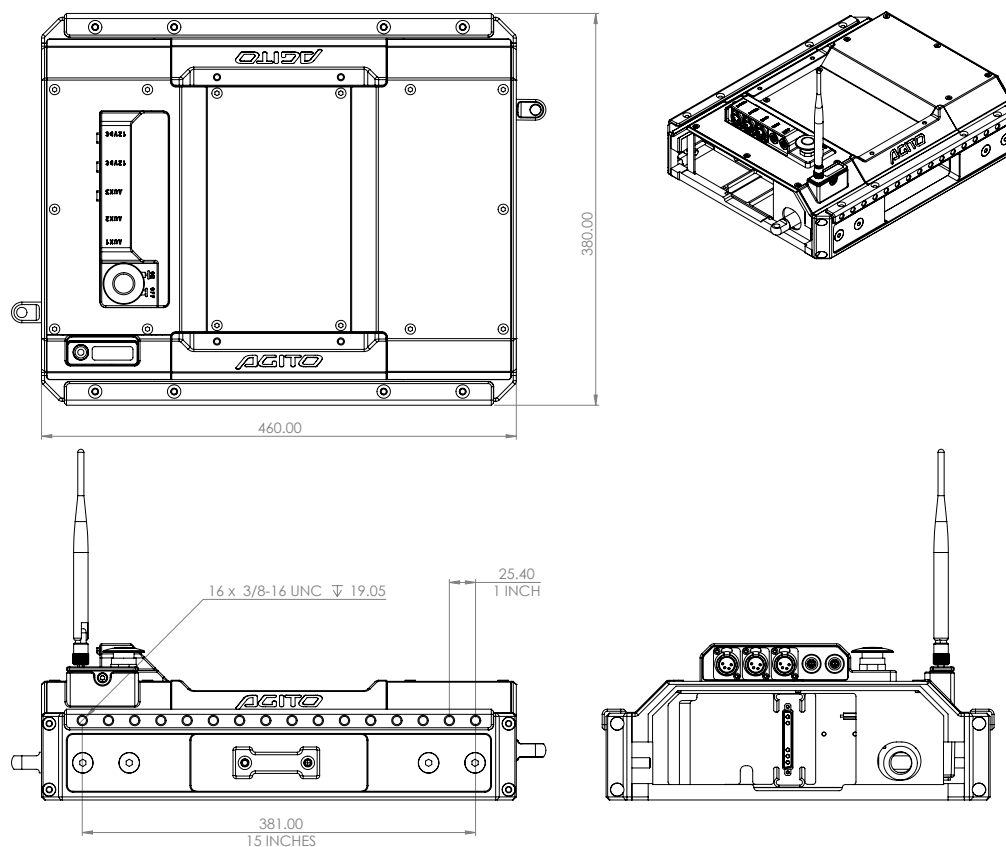
» AGITO SPORTS



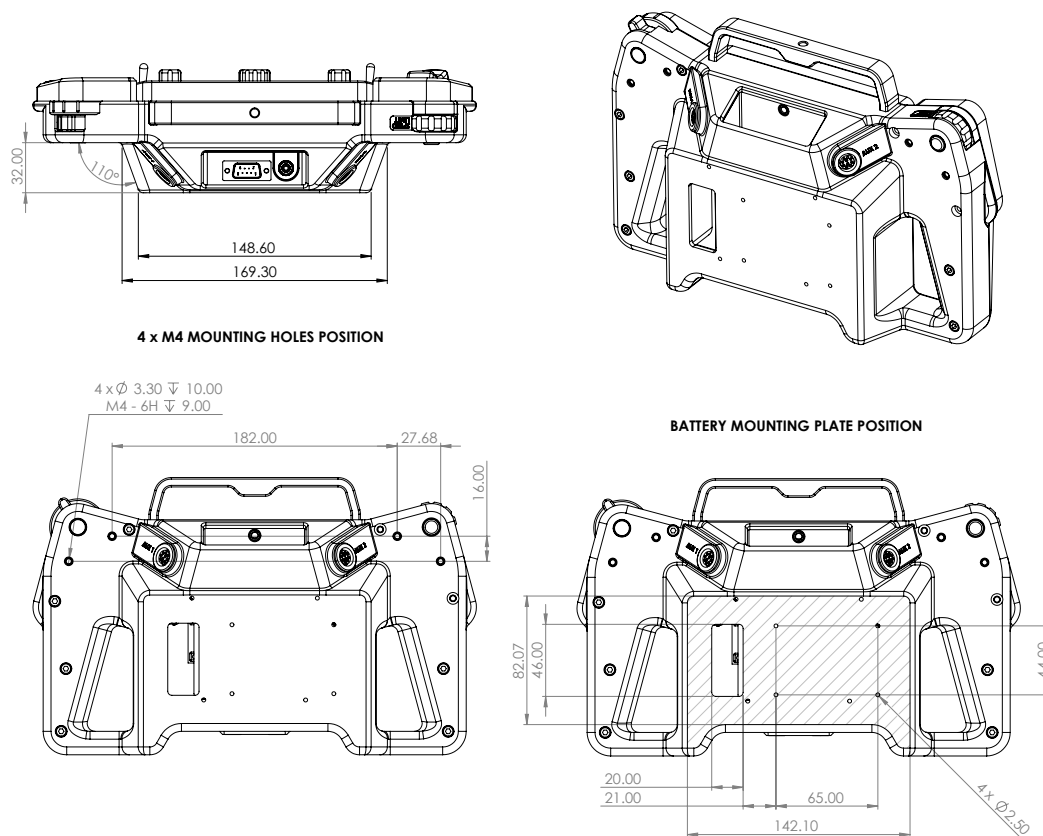
» AGITO TRAX



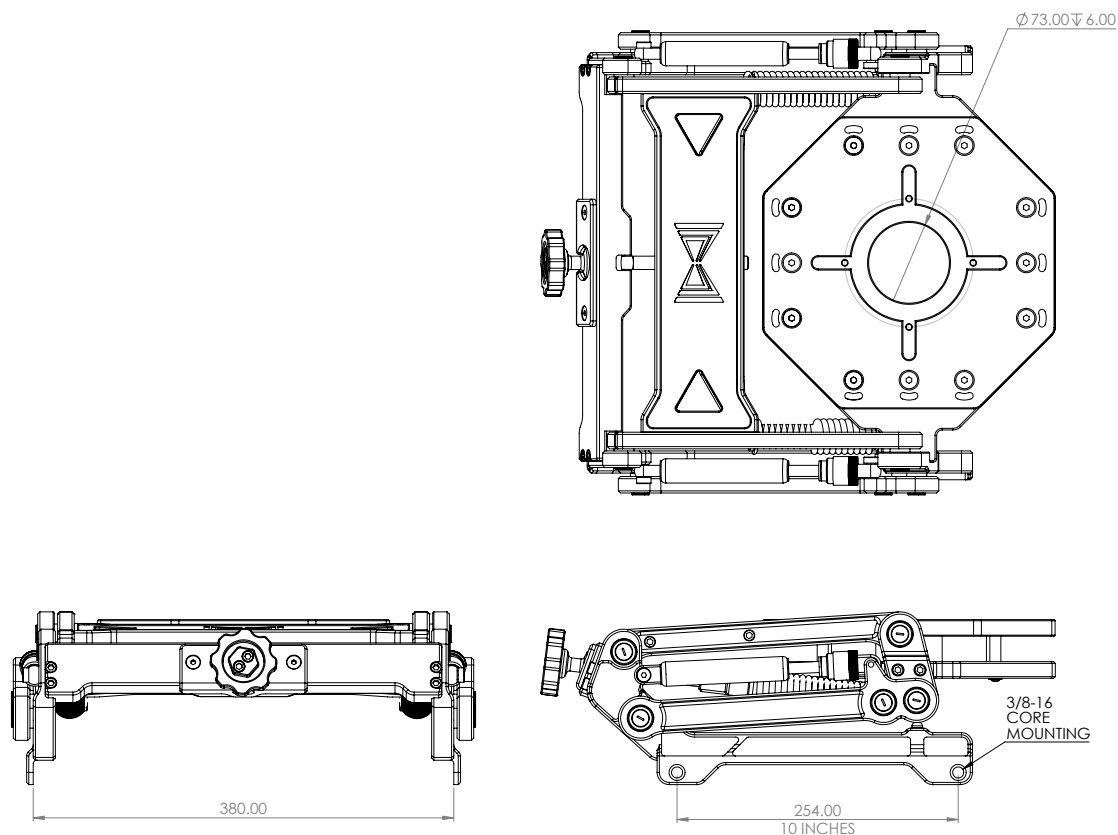
## » AGITO CORE



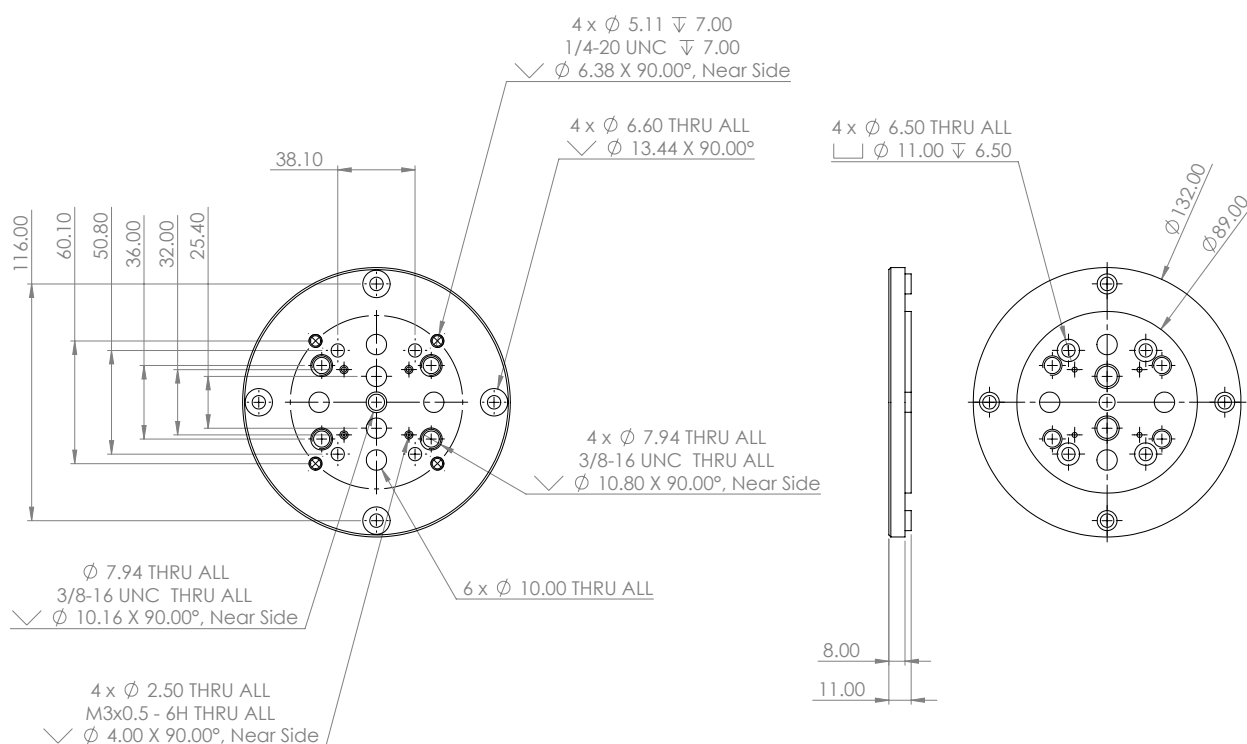
## » AGITO MASTER CONTROLLER



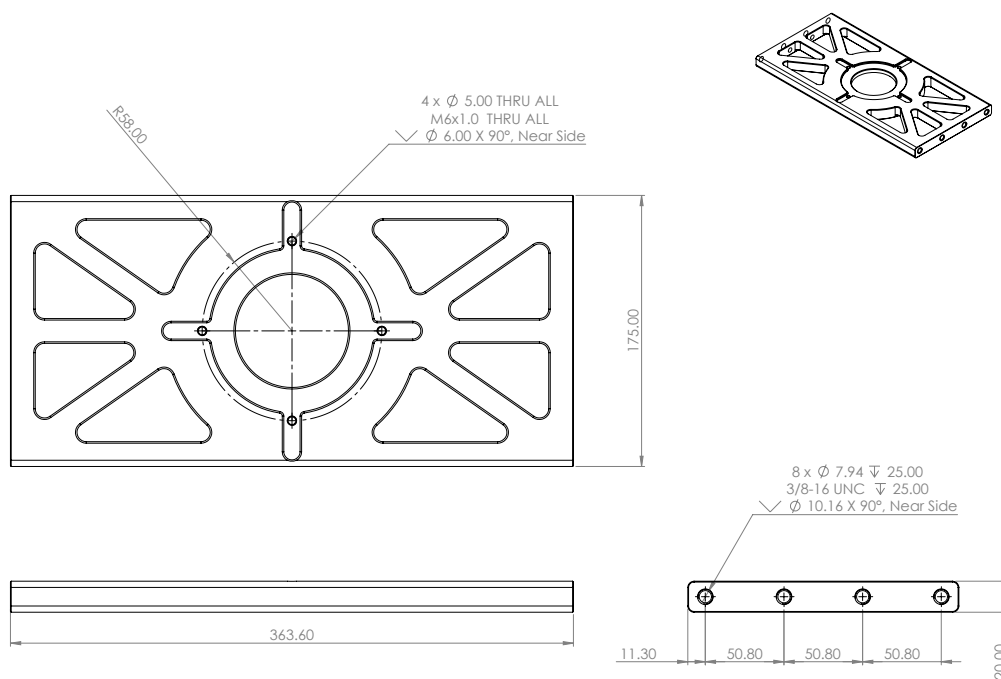
» V-CON PRO



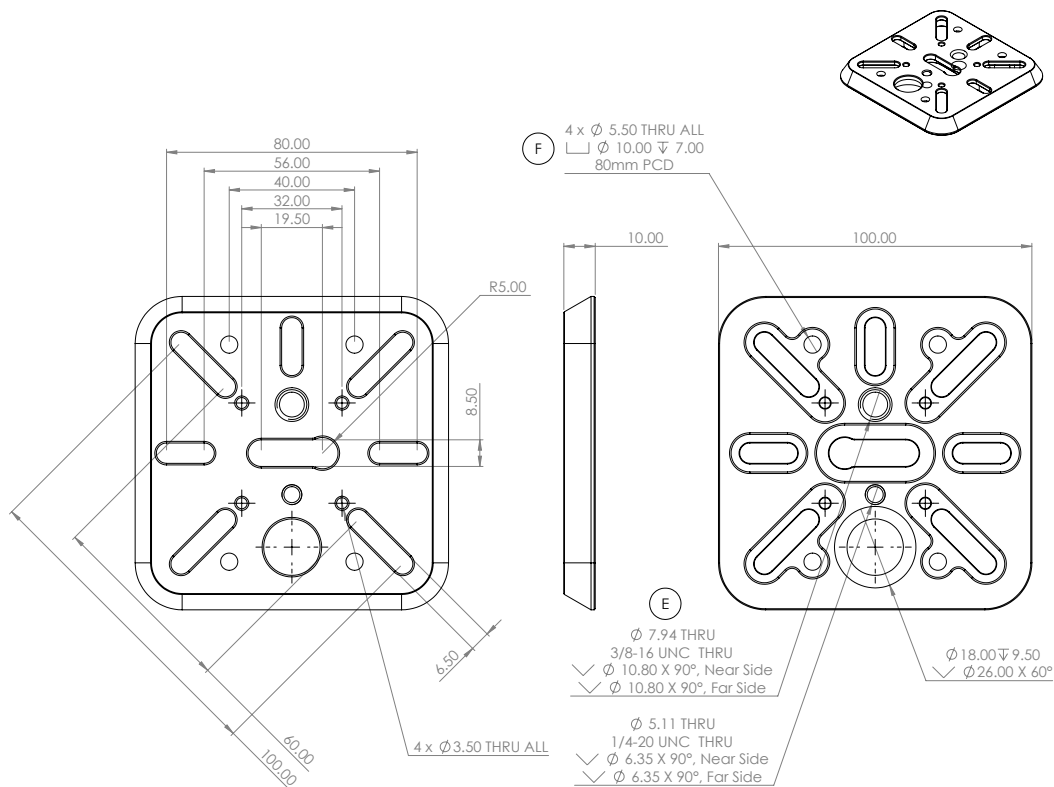
» GIMBAL MOUNTING PLATE



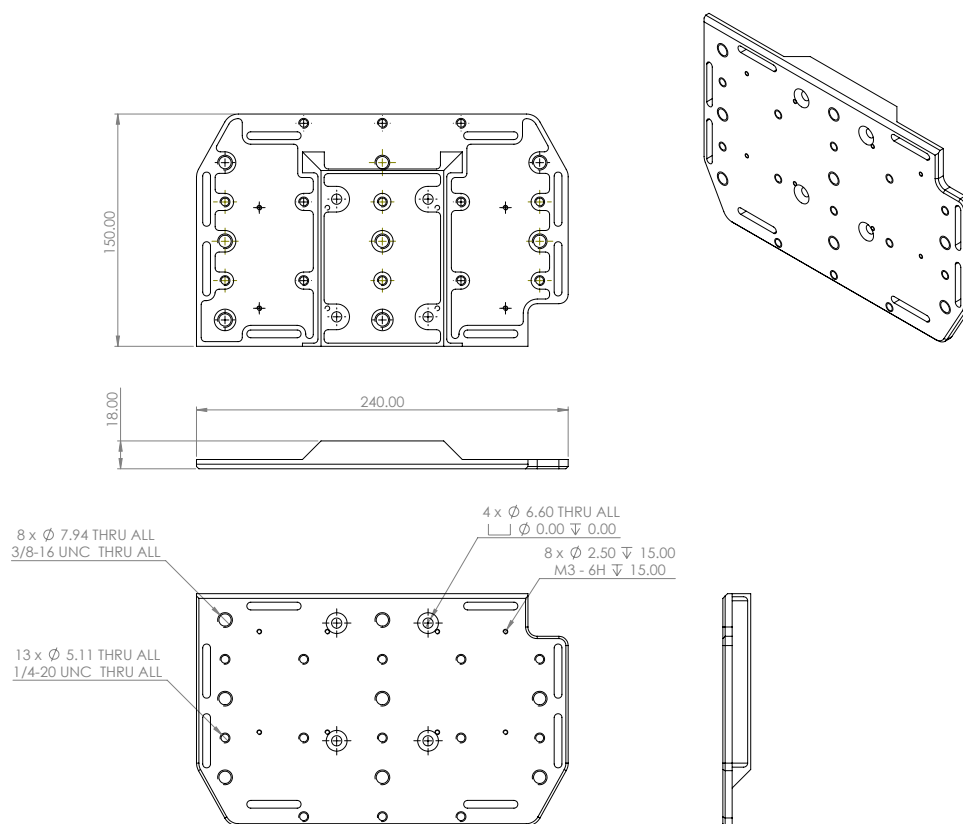
## » MITCHELL MOUNT / TOWER MOUNT



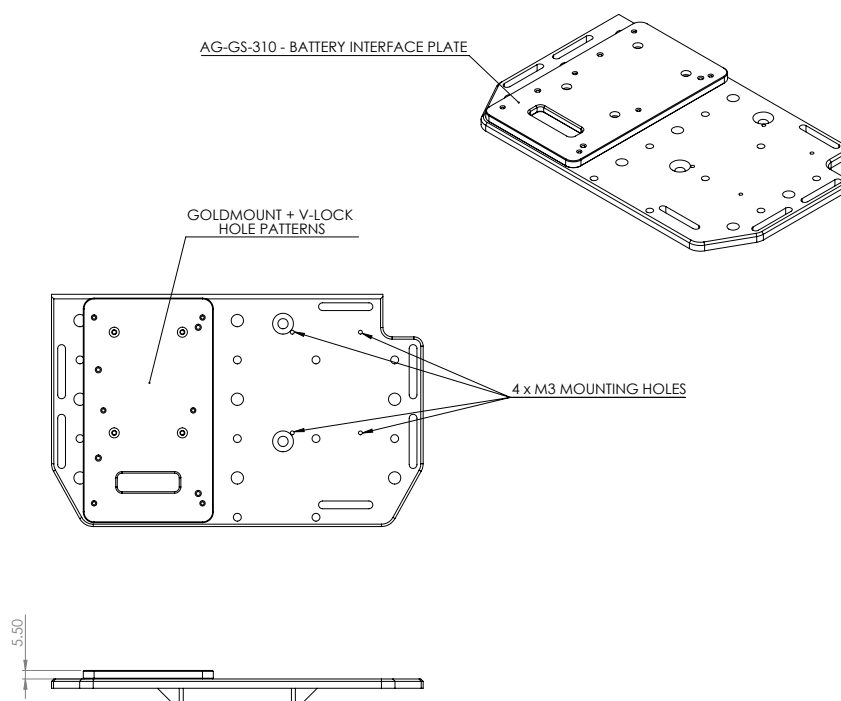
## » TOWER QR PLATE



» CHEESE PLATE (SPORTS DRIVE-END)

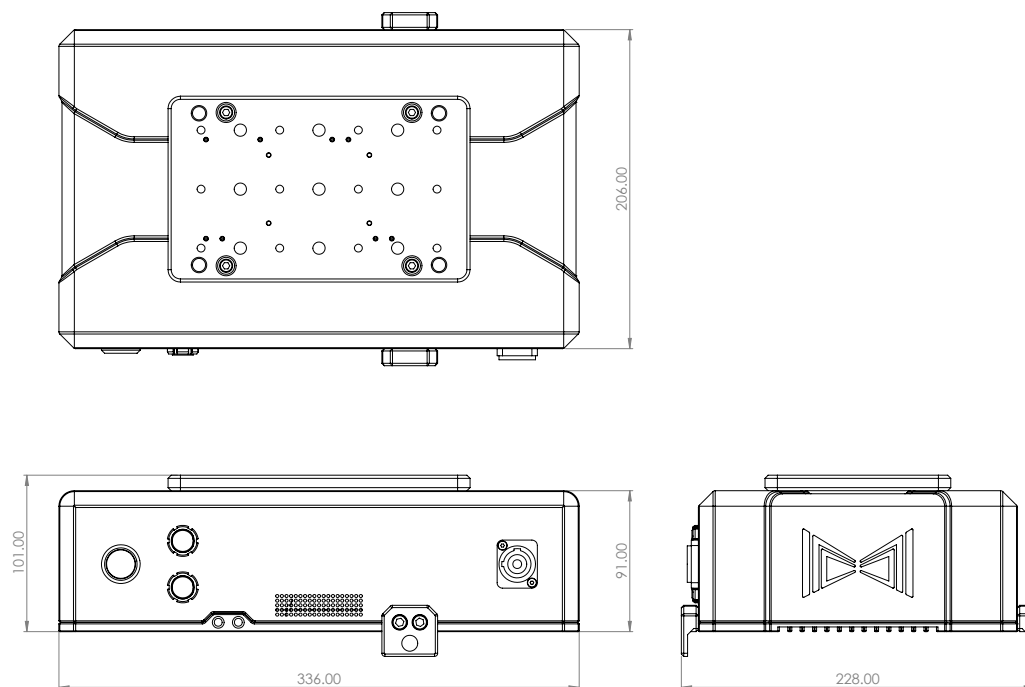


» BATTERY INTERFACE PLATE (SPORTS DRIVE-END)

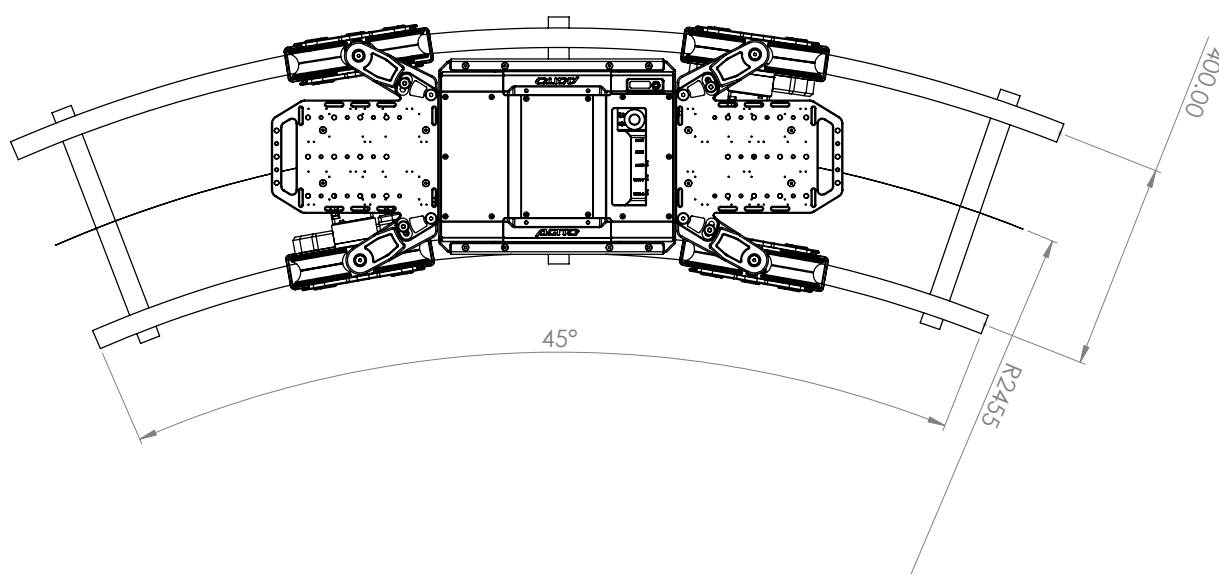




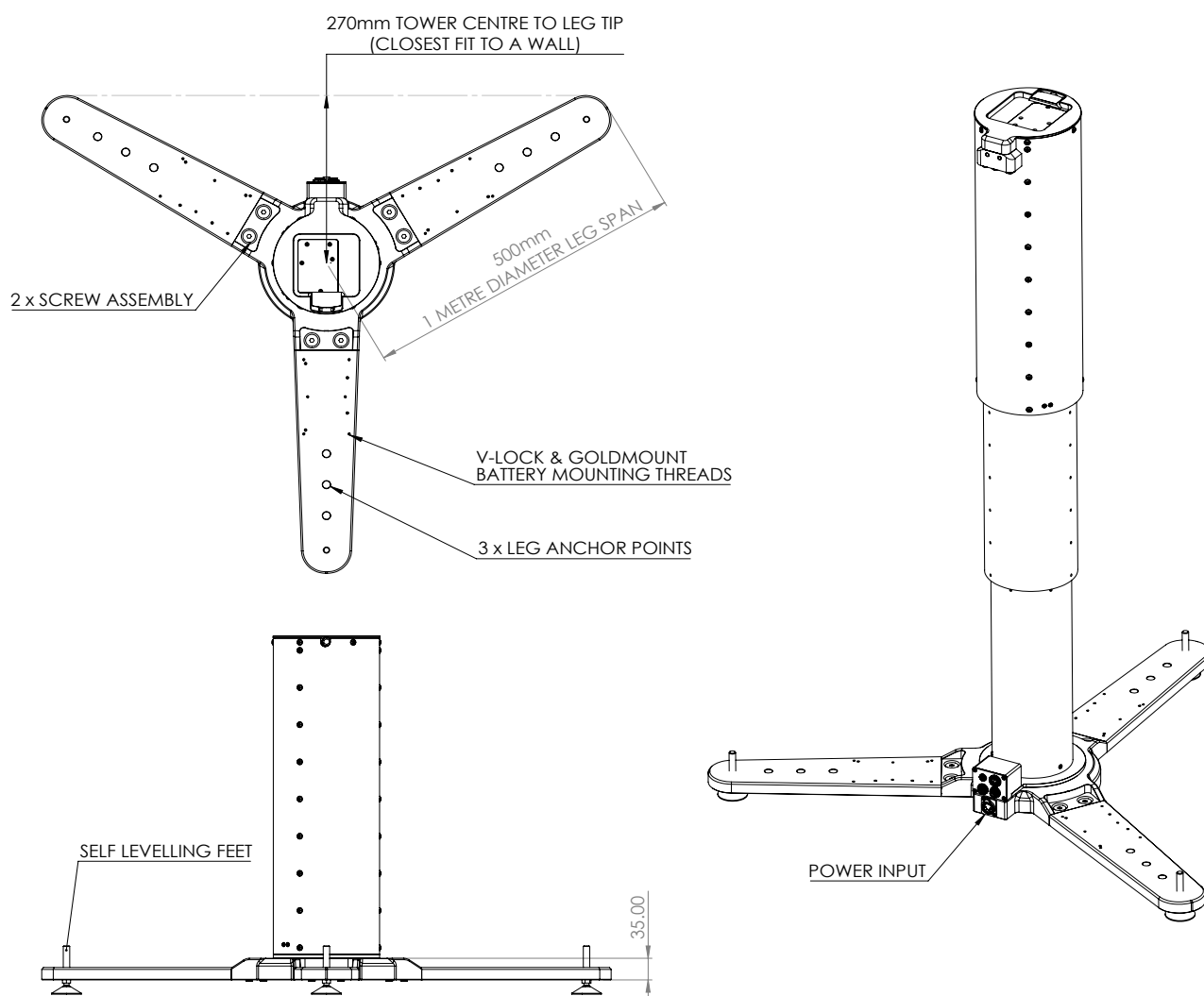
## » PSU (MAINS POWER SUPPLY)



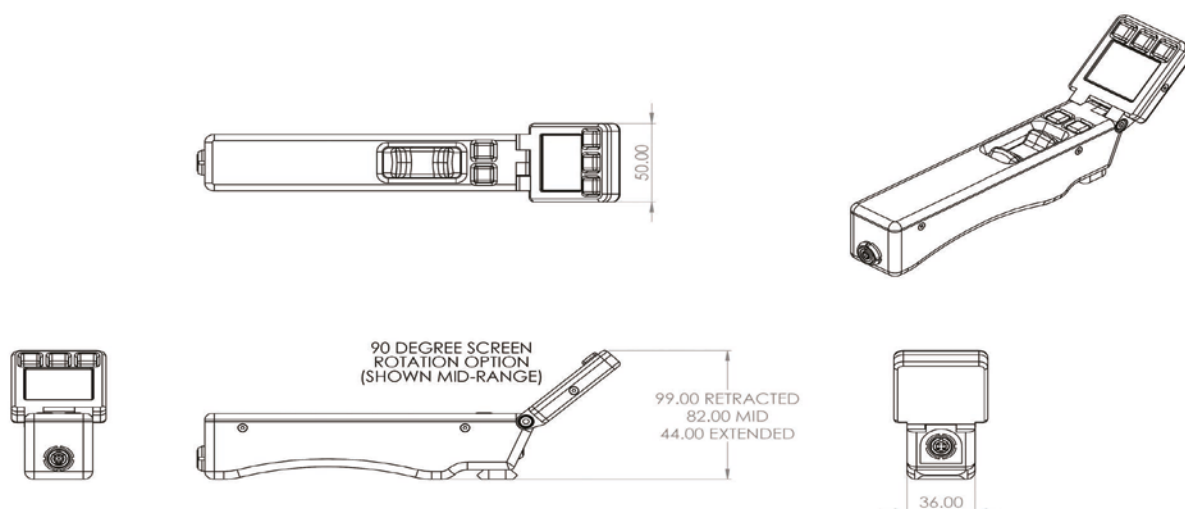
## » AGITO TRAX ON CURVED TRACK



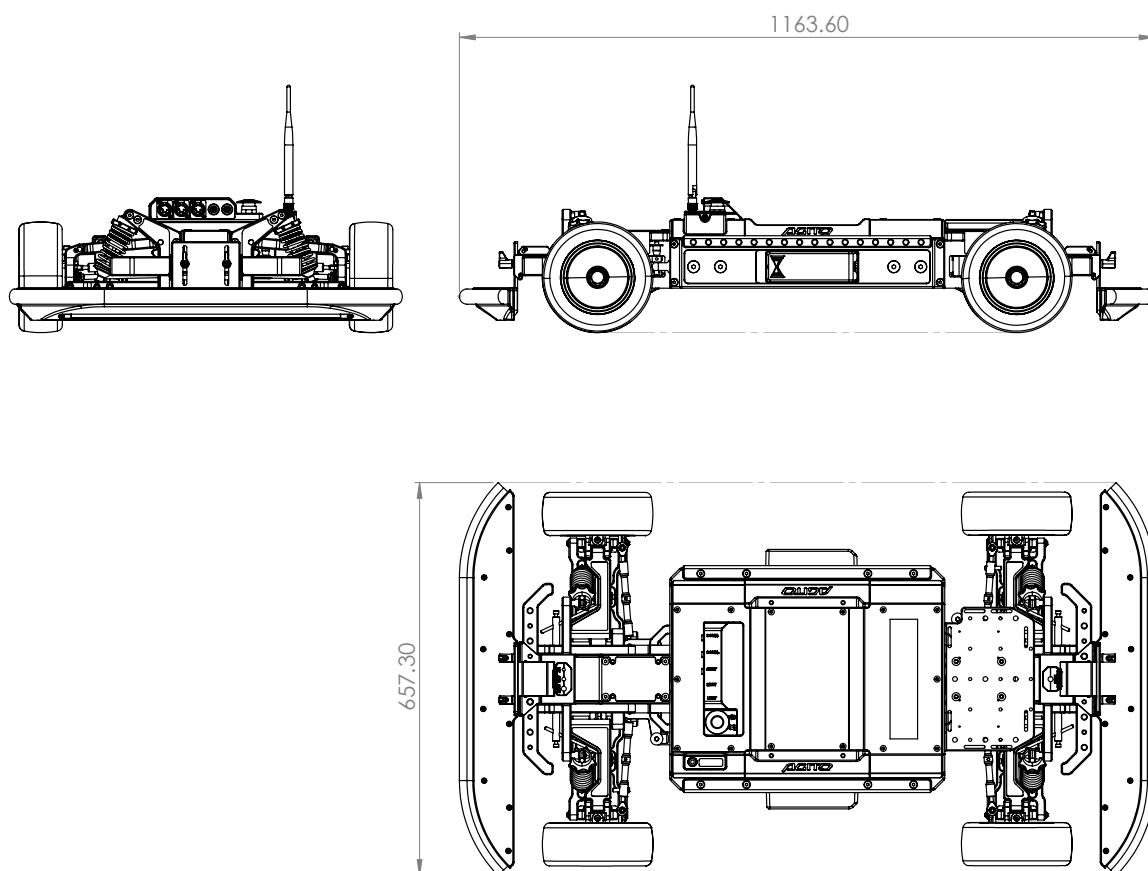
## » AGITO TOWER SPREADER BASE



## » AGITO TOWER STANDALONE HAND CONTROLLER


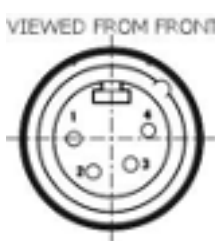


» AGITO MAGTRAX ASSEMBLED PLATFORM



» **PIN-OUTS**


» **CORE INTERFACE I/O CONNECTORS**

Connector Label	Connector P/N	Pin	Description	Mating Connector P/N
12v	Neutrik-NC4FD-L-1	1	GND	Neutrik - NC4MXX
		2	n/c	
		3	n/c	
		4	+12Vdc (2A max combined)	


Connector Label	Connector P/N	Pin	Description AUX1	Description AUX2	Mating Connector P/N
AUX 1	LEMO-EGG.2T.310.CLL	1	GND	GND	LEMO-FGG.2T.310.CLAD72
AUX 2	LEMO-EGG.2T.310.CLL	2	BOOT0	n/c	LEMO-FGG.2T.310.CLAD72
		3	UART1_RX	UART4_RX	
		4	UART1_TX	UART4_TX	
		5	GPIO	n/c	
		6	GPIO	n/c	
		7	GPIO	+3Vdc (Reserved)	
		8	n/c	I2C_CLK	
		9	n/c	I2C_DAT	
		10	GND	GND	


Connector Label	Connector P/N	Pin	Description	Mating Connector P/N
USB	RS 862-1573		Future Use - not connected	USB 2.0 Type B Plug

## » MASTER CONTROLLER I/O CONNECTORS

Connector Label	Connector P/N	Pin	Description AUX1	Description AUX2	Mating Connector P/N
AUX 1	LEMO-EGG.2T.310.CLL	1	GND	GND	LEMO-FGG.2T.310.CLAD72
AUX 2	LEMO-EGG.2T.310.CLL	2	+5Vdc (Reserved)	BOOT0	LEMO-FGG.2T.310.CLAD72
		3	UART2_RX	UART3_RX	
		4	UART2_TX	UART3_TX	
		5	ADC1_IN0	ADC1_IN0	
		6	ADC1_IN3	ADC1_IN3	
		7	GPIO	GPIO	
		8	I2C_CLK	CAN_H	
		9	I2C_DAT	CAN_L	
		10	GND	GND	

## » RF MODULE PASS-THROUGH BOX

Connector Label	Connector P/N	Pin	Description	Mating Connector P/N
Data	LEMO-EGG.0B.304.CLL	1	GND	LEMO-FGG.0B.304.CLAD52
		2	TX RS-232 Data	
		3	RX RS-232 Data	
		4	n/c	

Connector Label	Connector P/N	Pin	Description	Mating Connector P/N
Power	LEMO-EGG.0B.302.CLL	1	GND	LEMO-FGG.0B.302.CLAD52
		2	+12Vdc (1A max)	

## » AGITO TOWER I/O CONNECTIONS

Connector Label	Connector P/N	Pin	Description AUX1	Description AUX2	Mating Connector P/N
Power Tower	PFJ.1B.302.CYCD72	1	GND	GND	ECJ.1B.302.CYC
	LEMO-EGG.2T.310.CLL	2	+12Vdc		

Connector Label	Connector P/N	Pin	Description	Mating Connector P/N
Power pass-through (lower)	EGG.0B.304.CLL	1	GND	FGG.0B.304.CLAD52
Power pass-through (upper)	ECG.2B.303.CYM	2	+12VDC (Arri SRH-3) +48VDC (Shotover G1)	FGG.2B.303.CYCD92ZN
		3	+24VDC (Arri SRH-3) n/c (Shotover G1)	

Connector Label	Connector P/N	Pin	Description	Mating Connector P/N
Tower CTL	ECG.0B.305.CYM	1	GND	FGG.0B.305.CYCD52ZN
		2	CAN L	
		3	CAN H	
		4	+12VDC	
		5	Analog In	

Connector Label	Connector P/N	Pin	Description	Mating Connector P/N
Fibre Optic 1		1	Single Mode Fibre Channel	
Fibre Optic 2				


## » TOWER HAND CONTROLLER


Connector Label	Connector P/N	Pin	Description	Mating Connector P/N
CAN		1	GND	FGA.1B.304.CLAD
		2	CAN -	
		3	CAN +	
		4	+7-37VDC	


## » TOWER SPREADER BASE


Connector Label	Connector P/N	Pin	Description	Mating Connector P/N
Power Input	Neutrik NC4MD-LX-B	1	GND	Neutrik NC4FX
		2	N/c	
		3	N/c	
		4	+12VDC	

## » AGITO PSU I/O CONNECTIONS

Connector Label	Connector P/N	Pin	Description AUX1	Mating Connector P/N
Power Input (BLUE)	Neutrik NAC3MPA-1	E	GND	Neutrik NAC3FCA
		L	Live	
		N	Neutral	

Connector Label	Connector P/N	Pin	Description	Mating Connector P/N
Cable Input (BLUE)	Neutrik NAC3FCA	E	GND	Neutrik NAC3MPA-1
		L	Live	
		N	Neutral	

Connector Label	Connector P/N	Pin	Description	Mating Connector P/N
Power Input (GREY)	Neutrik NAC3MPB-1	E	GND	Neutrik NAC3FCB
		L	Live	
		N	Neutral	


Connector Label	Connector P/N	Pin	Description	Mating Connector P/N
Power Output (GREY)	Neutrik NAC3FCB	E	GND	Neutrik NAC3MPB-1
		L	Live	
		N	Neutral	


Power-in (blue) and power-out (grey) versions with different keying to avoid the possibility of inter-mating.

□ **For assembly instructions please visit:** <http://www.neutrik.co.uk/media/10217/download/BDA%20452%20V4%20-%20powerCON%20-%20NAC3FCA%20%2B%20NAC3FCB.pdf?v=5>

Connector Label	Connector P/N	Pin	Description	Mating Connector P/N
48Vdc	ECJ.2B.302.CYC	1	+48Vdc	FGJ.2B.302.CYMD72
		2	GND	


**UNLIKE OTHER CABLES WITHIN THE AGITO SYSTEM PIN 1 IS POSITIVE  
ALWAYS USE THE CORRECTLY SPECIFIED CABLE, THE OUTPUT OF THIS PSU  
DELIBERATELY MATCHES THE 2-PIN LEMO USED WITH SHOTOVER SYSTEMS**

Connector Label	Connector P/N	Pin	Description	Mating Connector P/N
24Vdc	Neutrik NC3FD	1	GND	Neutrik NC3MX
		2	+24Vdc	
		3	n/c	

Connector Label	Connector P/N	Pin	Description	Mating Connector P/N
12Vdc	Neutrik NC4FD	1	GND	Neutrik NC4MX
		2	n/c	
		3	n/c	
		4	+12Vdc	

## » AGITO HUBBOX I/O CONNECTIONS

**DO NOT EXCEED 12.0VDC WHEN POWERING THE HUBBOX**

Connector Label	Connector P/N	Pin	Description	Mating Connector P/N
DC Input	Neutrik NC3MX	1	n/c	Neutrik NC3FD
		2	+7-12Vdc <b>DO NOT EXCEED 12Vdc</b>	
		3	GND	



## » SUPPORT

### » TROUBLESHOOTING

- **More information and the latest updates are available on the Motion Impossible Knowledge Base:**
- <https://motion-impossible.com/support/support-portal/>

ISSUE	SOLUTION
<b>Master Display Freezes (pre Version 5)</b>	This is a known bug, pressing the Menu button should restart the display driver
<b>No RF link (all versions)</b>	<p>Check to see if RF indicator lights are active on the Master Screen.</p> <p>Check to see if the CORE power button is solid Red.</p> <p>Check that the RF modules have been correctly fitted in the correct slots and that line of sight is maintained between antennas.</p> <p>Check the condition of the RF antennas, a broken antenna can make a massive difference in RF range.</p> <p>Check that you are using a matched pair of RF Modules, the network ID printed on the label must be the same. The modules are created as a matched pair, it is not possible for the user to change this setting.</p> <p>Try turning Forward Error Correction (FEC) on or off.</p> <p>Try changing the power setting to default for both modules (100w non-FEC)</p>
<b>CORE Power Button is Flashing Slowly</b>	This indicates that the CORE is searching for the MASTER Controller, see no RF Link above
<b>MASTER Controller RF indicator is Blue</b>	This indicates that the MASTER Controller is searching for the CORE, see no RF Link above
<b>Limited Steering (AGITO Sports)</b>	<p>Recalibrate the steering, ensure that the wheels can move freely during the calibration.</p> <p>When using Monster Wheels on high grip surfaces (tarmac) it is advised that the user lifts the front and rear of the AGITO during calibration.</p>
<b>Sloppy Steering (AGITO Sports)</b>	<p>Check that the grey plastic inserts (top and bottom) are still glued into the Actuator Pin channel and the steering linkage is correctly set.</p> <p>Check for loose bolts in the steering rack (see maintenance section)</p>
<b>Pedals not working (AGITO Trax, via AGITO Hub)</b>	<p>Check that the Pedals are call correctly connected and that the E-STOP button is both plugged in and in its deactivated state (black line is visible). The E-STOP on the MASTER must also be deactivated.</p> <p>Check that the AGITO Hub is plugged in the correct AUX port on the Master (AUX 1) and that the Hb icon is green</p>
<b>Pedals not working (AGITO Sports, via Pedal Y-Cord)</b>	<p>Check that the Pedals are call correctly connected and that the AGITO HUB is plugged in the correct AUX port on the Master (AUX 1).</p> <p>Check that the E-STOP on the MASTER is not active.</p>
<b>Pedal Drift (all versions)</b>	<p>Occasionally the AGITO or attached accessories may "drift" when no input is applied to the pedals.</p> <p>In this instant try either restarting the Master Controller or apply the Pedal Calibration menu option, see "Control Mapping" on page 20.</p>
<b>MAG-Stop not working (AGITO Trax)</b>	<p>Check the position of the MAG-Stop magnets, they should be positioned between 20-60mm from the MAG-Stop Sensor. If they are outside of this range then it is possible that they will not be read correctly.</p> <p>Check that the MAG-Stop is powered and connected to the correct AUX port on the CORE (AUX 1).</p> <p>Always check the position of the Magnets and ensure they are securely fitted to the track.</p>
<b>PSU Overheat</b>	<p>On reaching over-temp, PSU automatically shuts down outputs</p> <p>Recovers automatically after temperature goes down.</p>

<b>PSU Overload</b>	At 112% rated output power, current limiting with delay shut down after 5 seconds Manual recovery by re-powering PSU using main on/off switch
<b>Tower has limited range (all versions)</b>	Ensure that Top and Bottom limits are deactivated.
<b>Tower not responding (Sports)</b>	Check that the "To" icon is green on the Master Controller screen  Ensure the Tower is "ACTIVATED" within the Sports Menu, see "Tower Controls" on page 26.  Check that the battery/power is correctly mounted, and the tower indicator RED light is NOT illuminated (under the dust cover). If illuminated, then check the Tower Comms Cable.  Check that the Tower Comm's Cable is connected to the correct AUX port on the CORE (Aux 2).  Check that all E-STOP's are in the deactivated position.
<b>Tower not responding (Trax)</b>	Check that the "To" icon is green on the Master Controller screen  Ensure the Tower is "ACTIVATED" within the Trax Menu, see "Tower Controls" on page 28.  Check that the battery/power is correctly mounted, and the tower indicator RED light is NOT illuminated (under the dust cover). If illuminated, then check the Tower Comms Cable.  Check that the Tower Comm's Cable is connected to the correct AUX port on the CORE (Aux 2).  Check that all E-STOP's are in the deactivated position.
<b>Track Distance feedback is wrong</b>	There are two versions of AGITO Trax Drive-ends which have different encoder capabilities.  If your readout is more than the distance actually travelled, then you are likely to have a v1.0 generation drive-end but are running the v1.1 conversion.  If your readout is less than the distance actually travelled, then you are likely to have a v1.1 generation drive-end but are running the v1.0 conversion.  Correct this by changing the setting "Trax Drive End Version", within Trax "Drive Control" on page 28.
<b>Speed Limit (target speed) is not reached</b>	It is common that the target speed set by the Speed Limit dial will not be reached, there are numerous factors which impact the speed of AGITO.  For example, in Sports mode, target speed does not take in to account the physical ground surface, slope/camber and the impact of the wheels rolling resistance.
<b>Chassis does not drive in one direction (MagTrax)</b>	One MagTrax sensor bar is has not been detected or has a triggered Safety Bumper. Check Status LEDs on Rear Sensor Bar.
<b>Forwards &amp; reverse movement is very lurchy (MagTrax)</b>	MagTrax sensors are mounted too high from the magnetic strip, as the suspension moves one sensor lifts up and moves out of magnetic range causing the system to slow. Ensure correct sensor height is set, or switch to a stiffer suspension setup (Hard Shocks/Lock-Out Bars)
<b>MagSteering stays straight then overcorrects back onto the track. (MagTrax)</b>	This can happen when using a flexible MagStrip that is twisted, confusing the sensor. Ensure the cord does not have any twist.
<b>MagSteering oscillates after entering a straight after a corner at high speed. (MagTrax)</b>	Entry and exits of sharp corners work best with a gradual increase in curve sharpness to allow time for the steering to move to the correct position. If the change from corner to straight (or vise-versa) is too sudden the chassis can enter an over-correction oscillation or disconnect from the track.
<b>Touch-Sensitive Bumper is stuck engaged (MagTrax)</b>	Contact Motion Impossible Support. To disable the Bump-stop function, go into the drive end settings and choose "Override Bump-Stop", this is a temporary override and will need to be disabled again on restart.

## » FURTHER SUPPORT

- **For technical documents, spares and assistance please visit:**
- <https://motion-impossible.com/support/support-portal/>

- **For training videos please visit:**
- <https://motion-impossible.com/how-to-videos/>

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