



**FEATURES & CAPABILITIES**



# **AVENGER 2.0**

FEATURES & CAPABILITIES

# AVENGER CORE CAPABILITIES

## PRIMARY FEATURES

- Outstanding capabilities for reach, lift, mobility, and deployment of EOD Tools & CBRN sensors
- Fourteen (14) I/O Ports for cameras, sensors and detection devices
- Wide tracks and stance control feature
- Ascends/descends stairs up to 45°
- Manipulator Arm with 7 Degrees of Freedom
- Standard preset configurations for Manipulator
- Variable speed control for Manipulator Arm with significant lifting capability
- Low profile to reach under vehicles
- Turret and claw rotate 360 degrees in both directions
- Four independent firing circuits
- Four cameras as standard
- Two-way directional audio communications
- Compact storage for transportation
- Two sets of three 12V sealed lead acid (SLA) batteries
- Typical operating time of 4+ hours (dependent upon mission activity)
- Hard-anodized (MIL-A-8625F) aluminum chassis and over-painted in RAL7048.
- Ingress Protection IP66 (ROV), IP65 (Console)
- Ethernet and CANBUS architectures both running through the entire system, for safety critical data streams controlling firing circuits, mobility and redundancy
- Weighs only 112 kg (242.5 lb) (batteries included) for ease of transport in smaller response vehicles

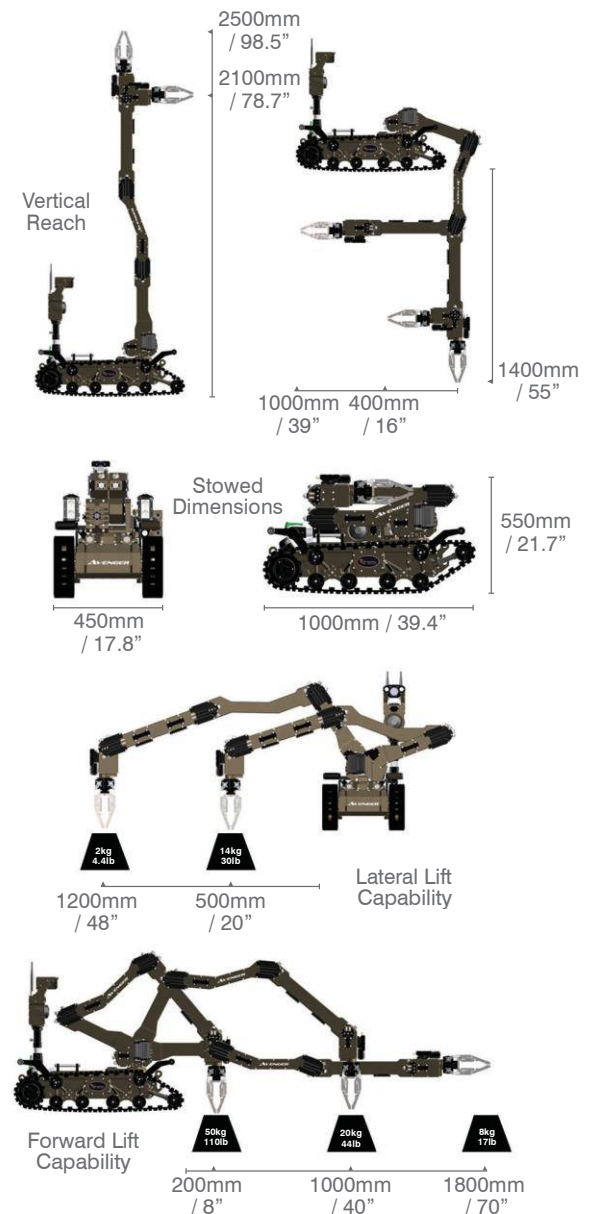
## ROVISS INTEGRATED SENSOR SUITE

Avenger can help manage high risk CBRNE threats by concurrently deploying multiple 3rd party sensors to remotely detect hazardous threats from:

- Explosives
- Radiation
- Chemical and Biological Agents
- Toxic Industrial Chemicals & Materials (TICs & TIMs)
- Meteorological factors

Using optional specialized software, sensor data is fused in the on-board computer then relayed to the Command Post where it is displayed on the X500 Command Console. Software permits real-time accurate mapping, plume prediction, and threat management.

## PHYSICAL PROPERTIES



## MODULAR DESIGN

Avenger uses a modular system architecture for compatibility with future enhancements and for ease of maintenance. Select modules include:

- Vehicle Control Unit
- Embedded PC
- Stalk Communication Mast
- On-Board Cameras
- Claw
- Command Console
- Several Modular Accessories

# AVENGER CORE CAPABILITIES

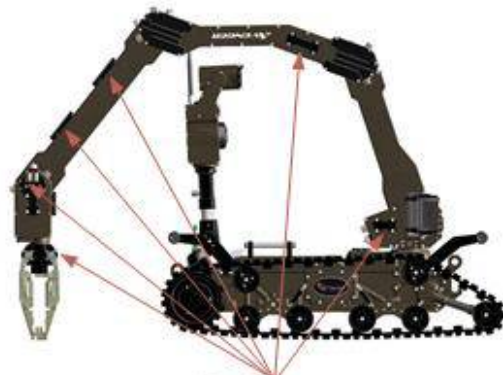
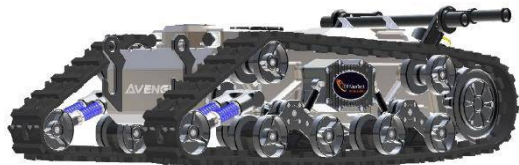
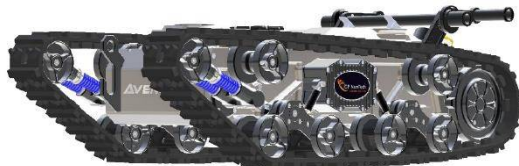
## DRIVE, SPEED & CLIMBING

- Innovative in-line track system to eject debris from the tracks while in motion
- Two high torque BLDC (Brushless Direct Current) motors, with brakes that release only when power is applied
- Variable speed up to 8 km/h (5 mph)
- Drive system incorporates a gas suspension system for reduced vibration
- Low centre of gravity and high-torque motors provide excellent climbing abilities:

## STANCE CONTROL

New variable-position track Stance Control:

- Raised Position for climbing stairs or raised obstacles
- Lowered Position for greater stability when lifting or delivering heavy payloads, and descending stairs
- Driving Position for maximizing track tension
- Maintenance Position for changing tracks
- Tracks can be manually adjusted to any position between 'Raised' and 'Lowered' to aid with mobility



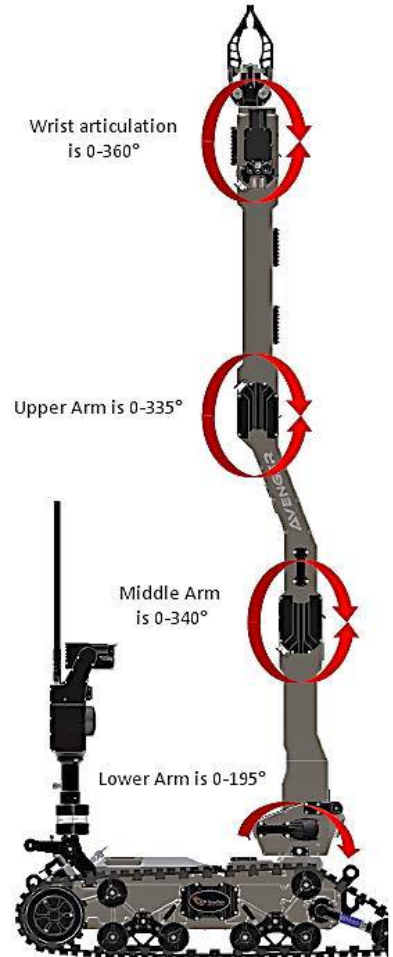
Picatinny Rails



Picatinny Rails

## MANIPULATOR ARM

- Seven (7) degrees of freedom
- Several factory presets assist the end user with rapid positioning of the Manipulator Arm for storage, battery access and weapon loading
- Eleven Picatinny Rails (conforming to MIL-STD-1913) are mounted on the Arm for optional cameras and accessories



# AVENGER CORE CAPABILITIES

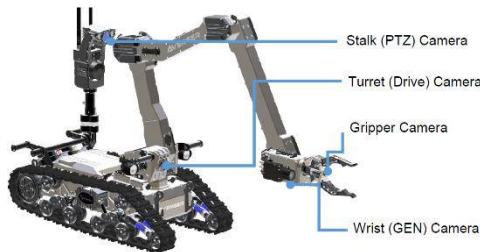
## FIRING CIRCUITS

Four (4) independent firing circuits with safety features to attach four separate electrically initiated payloads:

- Two on the left-hand side of the Upper Arm;
- One on the Wrist; and,
- One in the Claw

## CAMERAS & ILLUMINATION

- 4 cameras included: Turret, Stalk, Wrist, and Gripper; Several optional cameras available
- Turret Camera has 2 LED Clusters controlled independently from other illumination; 2200 Lumens. Turret Camera also includes built-in IR illumination.
- Stalk Camera has 2 high-intensity dimmable LEDs; 500 Lumens; includes IR mode.
- Wrist Camera brings clear vision at night with 0.5 lux performance and day/night mode switching, with viewing distances of up to 5 - 10m. Wrist Camera also includes built-in IR illumination.
- Gripper Camera provides an optimum view of the gripper when conducting manipulation tasks
- Gripper Camera has dedicated LED controlled independent from other illumination.



## CLAW

- Heavy-duty claw with 300mm (12 in) opening optionally includes an integrated wire cutter and belt cutter
- Multi-connector provides Power Over Ethernet (POE), firing port and reversible 24V DC power
- Multi-connector enables connection of selected tools such as disruptors, sensors, and other power tools

## AUXILIARY PORTS

Fourteen (14) Auxiliary Ports on the Chassis and Manipulator Arm, to support CBRNE sensors, additional cameras, EOD tools, and 3rd party equipment

## LASER

Laser Range Finding Camera for accessories such as the Disruptor and Shotgun Mount

## AUDIO SYSTEM

A directional two-way audio (intercom) system for communicating with people near the robot

## GLOBAL NAVIGATION SATELLITE SYSTEM

Displays latitude and longitude on the X500 Command Console. Compatible with GPS, GLONASS, Galileo, and BeiDou

## WIRELESS SYSTEM

- COFDM Point to Multi-Point (PtMP) wireless system capable of operating from 1.427 to 1.447GHz and 2.401 to 2.481GHz, the user can select the frequency to suit the mission as standard
- Line of Sight: Up to 1000m
- Non-line of Sight: Up to 300m



# AVENGER CORE CAPABILITIES

## X500 COMMAND CONSOLE

The X500 Console controls the drive track movement, manipulator arm & claw, cameras and optional devices, as well as firing tools. The X500 Console can view multiple cameras, thermal imagers, X-Ray images, aiming cameras, etc. and display or send data from multiple sensors to a secondary computer system. The X500 Command Console is housed in a ruggedized laptop, weighs only 6kg (13.2 lbs) for ease of mobility, and meets:

- MIL-STD-810G,
- MIL-STD-461F,
- IP65



Secondary Camera Feed

Mimic Display



Drive Control Panel

Primary Camera Feed

Communication Control Panel

## HAND CONTROL

Two game type hand controllers included allowing more natural operation of the ROV drive and manipulator arm

ROV Controller permits direct controller-to-ROV communication for basic ROV positioning

Console Controller permits controller-to-X500 console communication for deployment at up to full wireless range

Weights only 0.28kg (0.62lb)

## X500 FEATURES

- Graphical User Interface (GUI)
- Touch-screen interface
- Screen displays any 2 camera views (primary and secondary) of the 4 standard cameras or optional cameras
- Full screen display (single camera)
- FlyEye software provides an additional FlyEye 4 & FlyEye 7 multiscreen display feature
- Saves captured photos, video and audio files to hard drive for analysis and evidence recovery
- 15.6" TFT LCD with Getac QuadraClear Sunlight Readable Display
- Mimic Display depicts the robot and Arm Assembly joint positions
- Displays status of console battery, RF signal, drive mode and drive current
- Weapons arming and fire control display panel
- Specialized control panels
- Drive control
- Illumination control
- Communication Control Panel
- Accessory control
- Latitude/Longitude Positional Information
- Internal short range antenna and external long range relay station
- Independently tested to military standards for harsh conditions
- Supports Windows 10, and several interface ports: LAN; USB; Serial; external VGA; WLAN and HDMI
- Displays Windows information in any one of 35 languages



# OPTIONS & SUPPORT

## AVENGER ACCESSORIES

### Fibre Optic Spooler

- Permits tethered control of the robot up to 300m (984') from the X500 Command Console
- Cable Management Wand feeds and layers the cable evenly to avoid fouling

### Firing Cable Reel

- Enables deployment of a weapon or explosive charge remotely up to 50m (164') from the robot to avoid physically damaging the robot
- Mounts and Software for Integrating 3rd Party X-Ray and CBRN Sensors

### Disruptor Mounts

- Mounts accommodate most common disruptors and incorporate laser aiming
- Available as a bundle with any of the optional cameras

Universal Disruptor Mount with Range Finder Camera



- Window Breaker
- RF Diversity Station Soft Case
- EOD Multi Tool kit
- Avenger UGV Reusable Transit Case
- Benelli M3 and M4 Shotgun Mounts



M4 Shotgun Mount

## OPTIONAL CAMERAS

### Wrist (GEN) Camera

- A multi-point mounting High Resolution, IP Camera with built-in IR illumination

### Rear Drive Camera

- High Resolution IP camera that can be mounted to the rear of the chassis to enhance situational awareness while driving

### Laser Range Finding Camera

- IP Camera with integrated red dot range finding laser aids end effector placement by permitting accurate gripper-to-target or payload-to-target distance measurement



Range Finding Camera

## TRAINING COURSES

- Operator
- Advanced Operator
- Maintenance
- Refresher
- Train the Trainer
- ROVISS (CBRN Sensor) Operator

## SPARE PARTS

Kit Level 1: Includes the most common items to support 1 year (approx.) of operation and maintenance

Kit Level 2: Includes items to support maintenance over the typical lifetime of the robot

## REFERENCE DOCUMENTS

- User Guide
- Operational Checks & Maintenance
- Repair & Workshop Manual
- Illustrated Parts Catalogue
- Accessory Supplements

For complete Product Specifications, please contact your authorized ICP NewTech representative.