

# AVENGER

FEATURES & CAPABILITIES

**A COMPLETELY NEW  
MID-SIZED ROBOT  
WITH ENHANCED  
EOD CAPABILITIES**



A BRAND OF THE SAFARILAND GROUP

# AVENGER CORE CAPABILITIES

## PRIMARY FEATURES

Outstanding capabilities for reach, lift, mobility, and deployment of EOD Tools & CBRN sensors

Thirteen (13) 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 presets and user-defined preset configurations for Manipulator Arm

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 standard cameras

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, far more resistant to wear than paint

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 (247 lb) (batteries included) for ease of transport in smaller response vehicles

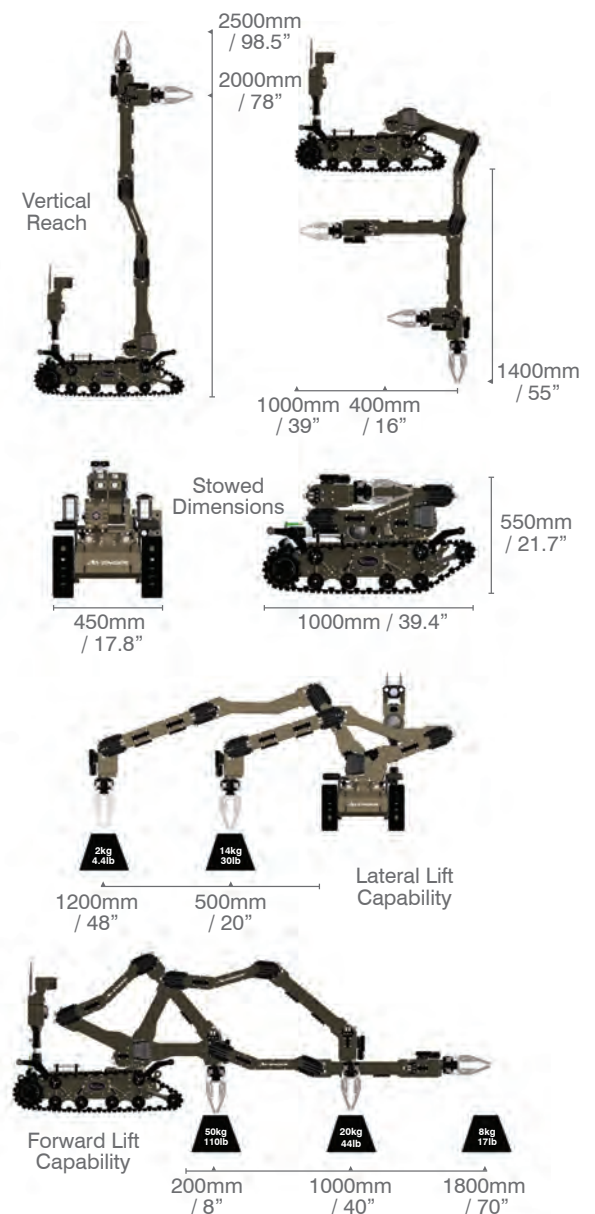
## ROVISS INTEGRATED SENSOR SUITE

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 at least 8 km/h (5 mph)

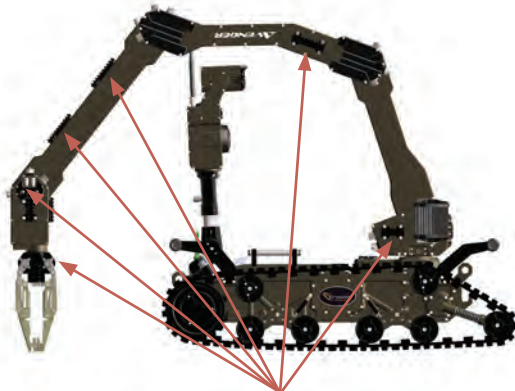
Drive system incorporates a gas suspension system for reduced vibration

Low centre of gravity and high-torque motors provide excellent climbing abilities: ascend and descend inclines greater than 45°

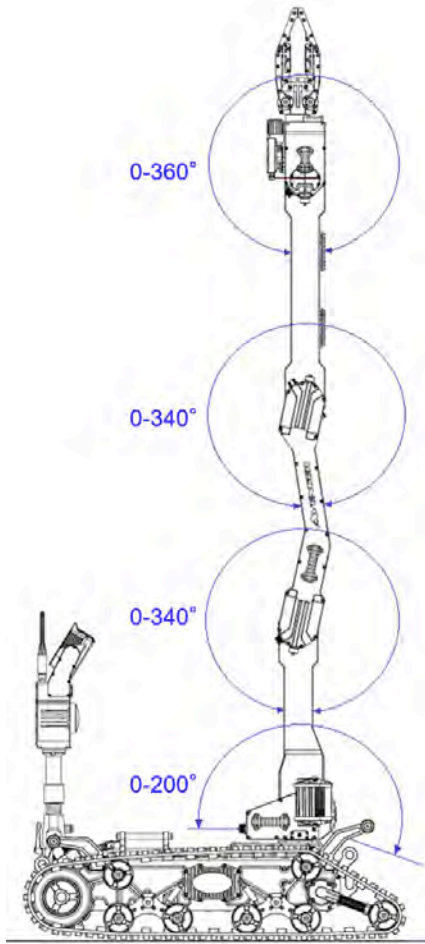
## STANCE CONTROL

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 adjusted to any position between 'Raised' and 'Lowered' to aid with mobility



Picatinny Rails



Picatinny Rails

## MANIPULATOR ASSEMBLY

Seven (7) degrees of freedom

Several factory and user-defined Presets assist the end user with rapid positioning of the Manipulator Assembly for storage, battery access and weapon loading

Eleven Picatinny Rails (conforming to MIL-STD-1913) are mounted on the Arm Assembly, 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

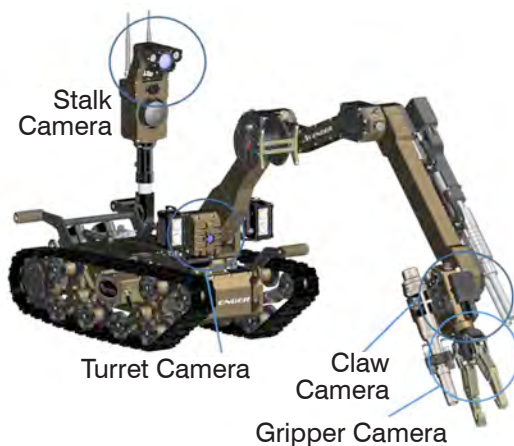
4 cameras included: Turret, Stalk, Wrist, and Gripper; Several optional cameras available

Turret Camera has 2 LED Clusters controlled independently from other illumination; 3600 Lumens. Turret Camera also includes built-in IR illumination.

Stalk Camera has 2 high-intensity LEDs; 500 Lumens

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

Gripper Camera provides an optimum view of the gripper when conducting manipulation tasks



## 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

Thirteen (13) 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

Diversity OFDM operating from 2.412 to 2.472 GHz; automatically selects the optimum channel to use to avoid contention. FCC and IC Certified

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
- ANSI/ISA 12.12.01



## HAND CONTROL

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

Quick Start 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

Weighs only 0.21kg (0.46lb)

## 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)

Digital zoom

Saves captured photos, video and audio files to hard drive for analysis and evidence recovery

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

Lights control

Radio link control

Accessory control

Latitude/Longitude Positional Information

Internal short range antenna and external long range relay station

Multiple built-in safety systems for operator safety

Independently tested to military standards for harsh conditions

Supports Windows® 7, and several interface ports: LAN; USB; Serial; external VGA; WLAN and HDMI

Displays Windows information in any one of 35 languages





## AVENGER OPTIONS

### Boom Mount

- Adds an additional independently controllable section to the Arm Assembly for deploying and maneuvering sensor payloads in the direct vicinity of the Claw without use of the Gripper
- Available as a bundle with a PTZ Camera or as a basic “mount only” version (without camera) for users who wish to only fit 3rd party sensors

### Fibre Optic Spooler

- Permits tethered control of the robot up to 305m (1,000') 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

### Bruhn Newtech SCIM Software for 3rd party CBRN sensor integration

### Disruptor Mounts with dedicated camera and range finding/aiming laser available for most common disruptors

### Window Breaker

### X500 Command Console Hard Case

### RF Diversity Station Soft Case

### Extra Avenger UGV Battery Charger for use as a spare or as an additional charger

### Benelli M3 and M4 Shotgun Mounts

### Avenger UGV Reusable Transit Case

## TRAINING COURSES

Operator

Advanced Operator

Maintenance

Refresher

Train the Trainer

ROVISS (CBRN Sensor) Operator

## OPTIONAL CAMERAS

### Auxiliary Camera

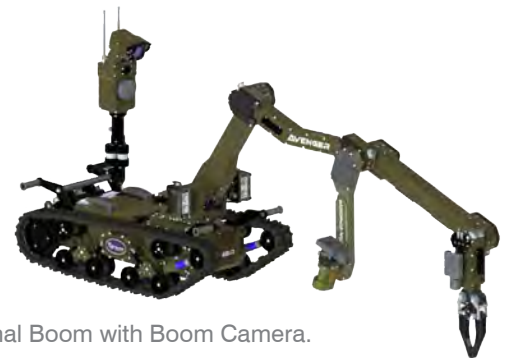
- High Definition, IP Camera with low lux sensor for operating in low light condition

### 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

### Boom Camera

- Fitted to the Boom Mount, the Boom Camera can be maneuvered to provide an optimal view during Claw positioning, tool placement, or when searching



Optional Boom with Boom Camera.

## 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 Schedules

Repair & Workshop Manual

Illustrated Parts Catalogue

Accessory Supplements