

SARCTrac Mk3

Satellite Antenna Rotator and TRACker

By: The School Amateur Radio Club Network®

Web: www.sarcnet.org.au E-Mail: info@sarcnet.org

Address: 9 Mead Ct. Oakleigh 3166 Vic. Australia



FCC ID:2AHMR-ESP12S

ISM2.4G 802.11b/g/n

Packaging List

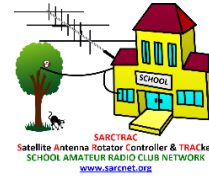
1. SARCTrac Rotator with the following attachments:
 - a. SARCTrac 3D Sensor
 - b. SARCTrac Quick Disconnect Power Cable with Safety Lanyard
2. SARCTrac USB Dongle
3. SARCTrac Accessories Bag:
 - a. 1 -2.5 mm Hex Key
 - b. 2 – 6 mm Shaft Hubs with 2 - M3x4 mm stainless-steel cap screws
 - c. 1 - 6g x 9.5 mm Pan-Head stainless-steel self-tapping screw
 - d. 4 - M3 x 12 mm Countersunk stainless-steel screws
 - e. 8 - M3 x 10 mm Pan-Head stainless-steel screws, washers & hex nuts.
4. 1 - 27-51mm Stainless-Steel Hose Clamp

Regulatory Compliance

- SARCTrac comprises a pair of WiFi microcontroller modules, which have been granted FCC and CE approval: FCC ID: 2AHMR-ESP12S, CE 0890. The regulatory compliance marks are shown in the figure above.
- SARCTrac has a technical folder, which indicates it comprises these WiFi modules, together with additional sensors, drivers and motors, which due to their nature and operating conditions would not affect this base EMI/EMC qualification. Note that the reduction of EMI to nearby receivers and EMC with nearby transmitters, to levels well below international standards, was a key design requirement of this product.
- SARCTrac has been assembled with all lead-free components and solder and complies with Restriction of Hazardous Substances (RoHS) requirements.
- SARCTrac operates on 12 VDC @ 125 mA and complies with Separated Extra Low Voltage (SELV) device requirements.
- SARCTrac introduces safety risks, which have been fully identified below. Operational safety testing has been carried out to qualify these safety risks as minor. The safety risks have been reduced, by design, to as low as is reasonably practicable.

Disclaimer

This is partly a DIY construction project for the experience builder. We are not responsible for your time, costs, tools, availability or substitution of parts. We are not responsible for your lack of adherence to our stated instructions, limitations, cautions, warnings and safety directions. We will replace or refund the price of equipment in the event of a proven manufacturing defect. This is the total limit of our liability.



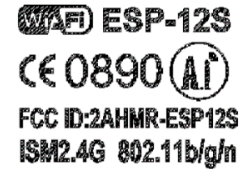
SARCTrac Mk3

Satellite Antenna Rotator and TRACker

By: The School Amateur Radio Club Network®

Web: www.sarcnet.org.au E-Mail: info@sarcnet.org

Address: 9 Mead Ct. Oakleigh 3166 Vic. Australia



FCC ID:2AHMR-ESP12S

ISM2.4G 802.11b/g/n

Packaging List

5. SARCTrac Rotator with the following attachments:
 - a. SARCTrac 3D Sensor
 - b. SARCTrac Quick Disconnect Power Cable with Safety Lanyard
6. SARCTrac WiFi Dongle
7. SARCTrac Accessories Bag:
 - a. 1 -2.5 mm Hex Key
 - b. 2 – 6 mm Shaft Hubs with 2 - M3x4mm stainless-steel cap screws
 - c. 1 - 6g x 9.5 mm Pan-Head stainless-steel self-tapping screw
 - d. 4 - M3 x 12 mm Countersunk stainless-steel screws
 - e. 8 - M3 x 10 mm Pan-Head stainless-steel screws, washers & hex nuts.
8. 1 - 27-51mm Stainless-Steel Hose Clamp

Regulatory Compliance

- SARCTrac comprises a pair of WiFi microcontroller modules, which have been granted FCC and CE approval: FCC ID: 2AHMR-ESP12S, CE 0890. The regulatory compliance marks are shown in the figure above.
- SARCTrac has a technical folder, which indicates it comprises these WiFi modules, together with additional sensors, drivers and motors, which due to their nature and operating conditions would not affect this base EMI/EMC qualification. Note that the reduction of EMI to nearby receivers and EMC with nearby transmitters, to levels well below international standards, was a key design requirement of this product.
- SARCTrac has been assembled with all lead-free components and solder and complies with Restriction of Hazardous Substances (RoHS) requirements.
- SARCTrac operates on 12 VDC @ 125 mA and complies with Separated Extra Low Voltage (SELV) device requirements.
- SARCTrac introduces safety risks, which have been fully identified below. Operational safety testing has been carried out to qualify these safety risks as minor. The safety risks have been reduced, by design, to as low as is reasonably practicable.

Disclaimer

This is partly a DIY construction project for the experience builder. We are not responsible for your time, costs, tools, availability or substitution of parts. We are not responsible for your lack of adherence to our stated instructions, limitations, cautions, warnings and safety directions. We will replace or refund the price of equipment in the event of a proven manufacturing defect. This is the total limit of our liability.

Safety

- SARCTRAC is a portable, power-operated, robotic machine with autonomous behaviour.
- SARCTRAC may move the attached antenna, without warning, in any direction.
- Restricted access and constant supervision are required to prevent injury or damage.
- Installation of appropriate safety guards, signage and a cut-off switch are recommended.
- Immediately disconnect the power to avoid any possible injury or damage.
- Not suitable for unattended operation - Movement may cause injury, cable or antenna damage.
- Not suitable for fixed or permanent outdoor installation - Unit is light-duty.
- Beware of moving parts - Unit may move without warning. Do not stand near operating unit.
- Beware of eye hazards - Moving satellite antennas are prickly. Eye protection is recommended.
- Beware of pinch hazards - Keep fingers away from moving parts.
- Beware of electromagnetic radiation hazards - Do not use with high power (> 10W) transmitters.
- Beware of electrocution hazards - Do not use near power lines.
- Beware of lightning hazards - Do not use in thunderstorms, or in rainy or windy conditions.
- Unit must be fitted and tested with the safety lanyard and quick-disconnect cables provided.
- Read the on-line user manual at <https://www.sarcnet.org/sarctrac.html> before operation.

Limitations

- Only suitable for rotating a single, 2kg, Yagi antenna mounted on a counterbalanced lift-arm.
- Motors are light-duty: Forcing them, dropping or bumping the tripod may strip the metal gears.
- Any magnet brought near the 3D sensor may magnetize it, invalidating the factory calibration.
- Unit will oscillate unless solidly mounted on a rigid stand such as a heavy-duty (speaker) tripod.
- Unit will oscillate unless the 3D sensor is rigidly mounted on the counterbalance Lift-Arm.
- Unit will not track correctly if the 3D sensor is located near any magnetic materials
- Unit will not track correctly if operated within 30 degrees latitude of the North or South poles.
- Unit will not track correctly if operated with high-power transmitters (> 50 W).

Specifications

- Enclosure Size: 145x105x65mm (5.7x4.1x2.2 inch). Operating Temperature: 0-40 Celsius.
- Ingress protection: Enclosure: IP65. 3D sensor: IP68. USB dongle: IP68.
- Anti-Windup safety mechanism: Quick-disconnect power cables with lanyard.
- Sensor cable: 1 m. Power cable: 1 m. USB cable: 150 mm. USB cable type: USB2.0, type A.
- Operating voltage: 12-15 VDC. Current: 125 mA (typical). With reverse polarity protection.
- WiFi mode: 802.11b/g/n. WiFi band: ISM2.4GHz. WiFi range: 30 m (100 ft) typical.
- Sensor type: Absolute position sensing 3D Magnetometer/Accelerometer.
- Control type: Real-time position feedback system with PID motor controller.
- Rotation range: Azimuth +/-360 degrees. Elevation +/-360 degrees.
- Rotation speed: 0.5 RPM (3 degrees per second) azimuth and elevation.
- Rotation torque: 50 kg.cm static, 25 kg.cm dynamic.
- Rotation accuracy: < +/- 5 Degrees (depends on local magnetic environment)
- Rotation mode: Shortest-path with configurable anti-windup algorithm.
- Start-up time: 10 seconds. No shutdown time required.
- Rotator emulation - Serial protocol: AMSAT EasyCommII with position feedback - 9600/N/8/1.

Safety

- SARCTRAC is a portable, power-operated, robotic machine with autonomous behaviour.
- SARCTRAC may move the attached antenna, without warning, in any direction.
- Restricted access and constant supervision are required to prevent injury or damage.
- Installation of appropriate safety guards, signage and a cut-off switch are recommended.
- Immediately disconnect the power to avoid any possible injury or damage.
- Not suitable for unattended operation - Movement may cause injury, cable or antenna damage.
- Not suitable for fixed or permanent outdoor installation - Unit is light-duty.
- Beware of moving parts - Unit may move without warning. Do not stand near operating unit.
- Beware of eye hazards - Moving satellite antennas are prickly. Eye protection is recommended.
- Beware of pinch hazards - Keep fingers away from moving parts.
- Beware of electromagnetic radiation hazards - Do not use with high power (> 10W) transmitters.
- Beware of electrocution hazards - Do not use near power lines.
- Beware of lightning hazards - Do not use in thunderstorms, or in rainy or windy conditions.
- Unit must be fitted and tested with the safety lanyard and quick-disconnect cables provided.
- Read the on-line user manual at <https://www.sarcnet.org/sarctrac.html> before operation.

Limitations

- Only suitable for rotating a single, 2kg, Yagi antenna mounted on a counterbalanced lift-arm.
- Motors are light-duty: Forcing them, dropping or bumping the tripod may strip the metal gears.
- Any magnet brought near the 3D sensor may magnetize it, invalidating the factory calibration.
- Unit will oscillate unless solidly mounted on a rigid stand such as a heavy-duty (speaker) tripod.
- Unit will oscillate unless the 3D sensor is rigidly mounted on the counterbalance Lift-Arm.
- Unit will not track correctly if the 3D sensor is located near any magnetic materials
- Unit will not track correctly if operated within 30 degrees latitude of the North or South poles.
- Unit will not track correctly if operated with high-power transmitters (> 50 W).

Specifications

- Enclosure Size: 145x105x65mm (5.7x4.1x2.2 inch). Operating Temperature: 0-40 Celsius.
- Ingress protection: Enclosure: IP65. 3D sensor: IP68. USB dongle: IP68.
- Anti-Windup safety mechanism: Quick-disconnect power cables with lanyard.
- Sensor cable: 1 m. Power cable: 1 m. USB cable: 150 mm. USB cable type: USB2.0, type A.
- Operating voltage: 12-15 VDC. Current: 125 mA (typical). With reverse polarity protection.
- WiFi mode: 802.11b/g/n. WiFi band: ISM2.4GHz. WiFi range: 30 m (100ft) typical.
- Sensor type: Absolute position sensing 3D Magnetometer/Accelerometer.
- Control type: Real-time position feedback system with PID motor controller.
- Rotation range: Azimuth +/-360 degrees. Elevation +/-360 degrees.
- Rotation speed: 0.5 RPM (3 degrees per second) azimuth and elevation.
- Rotation torque: 50 kg.cm static, 25 kg.cm dynamic.
- Rotation accuracy: < +/- 5 Degrees (depends on local magnetic environment)
- Rotation mode: Shortest-path with configurable anti-windup algorithm.
- Start-up time: 10 seconds. No shutdown time required.
- Rotator emulation - Serial protocol: AMSAT EasyCommII with position feedback - 9600/N/8/1.