

AWM ROBOT FREQUENTLY ASKED QUESTIONS

Has the robot been used in an operational environment?

Yes, the AWM robot was developed over a number of years as a joint project between Innova AS and Statnett in Norway. The robot was fully operational and used in production jobs for the marker installation program in 2018 and has been used to install almost 500 markers on the Norwegian grid.

Does the robot install markers on the shield wire or the conductor?

To date, the robot has performed installs on shield wires only; however the robot and marker design allow for future installation directly on the bundle if desired.

Can the AWM Robot remove markers?

Currently, the AWM Robot is for installation of markers only. However, the markers have been designed to allow for future removal by machine, and Innova Aerial plans to develop a removal machine as part of our medium-term technical roadmap, which would be in service by the time markers installed today are due for replacement.

How much does the robot cost?

Please contact us with information about your requirements and we will be happy to provide you a quote for sales or lease of a robot system.

Does the robot work on energized lines?

Yes, the robot successfully completed energized testing Norway in 2019.

How is the robot controlled and powered?

The robot is completely autonomous – once the pilot has placed it in the correct spot and let the weight off the longline, the robot begins an autonomous installation sequence. It is powered by an onboard battery and has no power connection to the helicopter.

How does the pilot know what the robot is doing?

The robot has bright LED lights which flash according to the status of the robot. The pilot knows the status at all times based on these lights.

How much does the robot weigh?

The robot weighs approximately 360 lbs (160 kg).

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COMPATIBLE MARKERS – FAQ



What sizes of markers are available?

Currently the AWM Robot is built to work with 24" (60 cm) spherical markers, which is a standard in many regions of the world. However, the system is scalable and with customer demand we could create a robot for larger markers such as 36" (91 cm).

How much do the markers weigh?

The standard fibreglass composite markers currently weigh approximately 31 lbs (14 kg); lighter versions are possible if necessary.

How much do the markers cost?

Marker cost is affected by factors such as colour, reflective finish, quantity, etc. Please contact us for a quote specific to your requirements.

Will the robot work with any markers?

No, the robot uses markers specifically built to interface with the robot. There are currently two versions available, which are both high quality and designed for harsh environments.

Where can I buy the markers?

Customers can purchase markers through Innova Aerial.

Where are the markers manufactured?

Multiple versions of markers are available, and they are built by leading European manufacturers of powerline equipment specially for the AWM Robot.

What type of qualification testing has been done on the markers?

The markers have been qualified through extensive environmental testing, including vibration testing and slip testing.

How does the marker interface with the wire?

The markers are installed with 4 bolts which clamp together halves of a metal flange. In this flange is a rubber insert sized to fit the diameter of the wire on which it is to be installed. The rubber is the only part of the marker which contacts the wire and has been tested for durability over millions of vibration cycles.

Do the markers require armor rod to be installed on the wire?

No, the markers are made to be installed without requiring armor rod.



ROBOT OPERATIONS – FAQ

How many markers can be installed in a day?

With the AWM Robot, the time spent actually installing the marker is not the limiting factor, as it only takes approximately one minute to install once on site. Factors such as flight time from the staging area and ground crew efficiency become much more important in a fast job. With proper planning and pre-staging of markers and resources, dozens of installations per day are possible.

What is the maximum angle of operation?

Currently the AWM Robot is qualified to install markers at angles up to 30 degrees.

How many crew are required on board the helicopter?

The robot is designed to be used with only a pilot on board the helicopter.

How many ground crew are required?

Two ground crew are needed to load the markers and ensure the robot is armed for each installation.

Does the helicopter require any special equipment?

No, the helicopter only requires a standard belly cargo hook for external load work. For additional security, an approved dual hook system may be used.

What skills does the pilot require?

At a minimum, the pilot should be trained in flying in the wire environment, external load operations, and vertical reference flying.

Do you provide training?

Yes, a comprehensive training course will be provided as part of any robot sale or rental package.