

Remote-controlled "arm" fits on the armrest of most tractors and can remote control functions like start, stop, throttle and pto.



Wireless Tractor Control Simplifies Grain Handling

"I got fed up with all the extra steps I was taking every day during grain bagging; jumping in and out of my tractor to start and stop it, engage the pto and move hydraulic levers," says Alberta, Canada, farmer Vince Pawluski. "One day I had an 'aha' moment and decided to build a device that would use actuators to handle some of those functions."

Pawluski built and tested a prototype and now has a patent pending device he calls the RCFarmArm. It's an easy-to-install set of mechanical actuators that fits on the armrest of most modern tractors, allowing the operator to use a hand-held remote to start and stop a tractor engine, control the throttle, engage and disengage the pto, and

regulate 2 hydraulic levers. The shifting lever isn't affected so the tractor can still be driven.

"In the summer, during harvest, I can operate my grain bagger without getting in and out of the tractor," Pawluski says. "In the winter, when I'm extracting grain from those bags and the ground is covered with ice or snow, I don't have to worry about slipping and sliding on my way to the tractor because I can operate it with the remote. One big benefit is that the device is mechanical and doesn't tap into a tractor's CAN bus electrical system, affecting the tractor's warranty."

The RCFarmArm is powered from the tractor's standard accessory point and backed up by an internal 12-volt battery. Pawluski says the actuators work just like a person's hand to move the tractor controls. He used his natural ingenuity and life experiences to design, build and apply for the RCFarmArm patent.

"As a kid I enjoyed building and modifying RC model tractors and after high school I became a journeyman millwright. During the 2020 harvest I was using a grease pencil to draw ideas on the windows of my combine cab," he says with a laugh. "After harvest I put them into drawings and designed the actual system."

He taught himself CAD design and used

a 3D printer to make some of the parts. He found others on the internet.

"It's a simple idea with one set of actuators controlling 2 hydraulic levers, the throttle and pto, while a second module turns the switch on and starts the tractor. An emergency shutoff inside the tractor and on the remote shuts the tractor off and sets the actuators back to neutral.

Pawluski built his prototype for a Deere 8220 tractor. He's now taking orders for Deere 8000 and 9000 series models along with 7000 series models if they have fingertip hydraulic controls. A version for the R series armrest is available and additional models are being developed. The system also fits Case IH Magnum, Quadtrac/Steiger and Puma models built from 2011 through 2020. Pricing on pre-order units in fall 2021 is \$4,950 CAN, with shipping included. Modules for older Deere 4000, 5000 and 6000 series tractors without hydraulic actuators will be \$3,950 CAN. "We are fully supporting each system for two harvest seasons to ensure reliability and quality," Pawluski says.

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Cheap Way To Automate Bin Fans

With a couple of temperature and humidity monitoring switches, along with a smartphone app, Adam Ehlers automatically controls fans in each of his 10 grain bins. Total cost for the equipment was \$100 - much better than the \$8,000/bin estimate he was given by a commercial producer says the Presho, S.D., grain farmer.

With the help of Equilibrium Moisture Content charts (available on the internet) he knows the optimum temperatures and humidity levels to turn the fan on and off to remove or add moisture.

The problem was shutting the fans off manually every time it rained or weather conditions changed.

The solution was inspired by a friend who had a system to control the humidity in his home to protect his wooden floor.

In a YouTube video, Ehlers shares the items needed - a \$24 Sonoff TH16 Wi-Fi smart temperature and humidity monitoring

switch, and \$6 Sonoff Wi-Fi switches for each bin. They are wired into the fan controller and activated through the phone app eWeLink.

"I put the switches inside the control box for the fan and taped a magnet to the temperature/humidity sensor and put it under the control box out of the rain. You need Wi-Fi at the bins. It has to be 2.4 GHz, not 5 GHz," he emphasizes, adding that farmers may need to work with someone who is tech savvy to set up the system, with the help of the YouTube video Ehlers made. If the bins are out of range of Wi-Fi coverage, a stronger router or an old cell phone used as a mobile hotspot may be needed.

By setting up the temperature and humidity parameters on the app for the desired moisture content, the fans will turn on and off in each bin. With a setting called "inching" the system will also regularly check the parameters to see if the fan needs to turn off. "This is just optimizing your electric

usage," Ehlers says.

He has used the system since 2019 and noted that other than a lightning strike that knocked out the smart switches, the system has worked well. He can hear the fans run from his home, but if producers aren't near their bins, he notes that they can plug a camera into the Sonoff system.

Ehlers created the YouTube video in response to calls after his bin control was featured in an article. It's not an idea he can sell or profit from, but he did include information in the video about something he wants to sell. So, if you are interested in buying a 42-acre mine in Keystone, S.D. - and also want to learn how to control your grain bin fans remotely - go to <https://youtu.e/iOyByxYazNU>.

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Adam Ehlers came up with a way to automate his bin fans for a fraction of the price of a commercial solution.

Sonar Units Control Sprayer Boom Height

For Bill Menkveld and his brother Bert, fulfilling their dream of a weed sprayer automatic boom height controller happened over a period of many years.

Their family company, Greentronics, was started in 1992 and Bert's expertise with early projects led to a first height controller attempt in 1996. After setting the venture aside, they later renewed their efforts and produced a prototype in 2004. With further testing and experimentation, in 2007, they marketed the RiteHeight, a controller that works on either new or used self-propelled or trailed sprayers.

The small family business manufactures and ships the RiteHeight automatic boom controllers from their shop in Elmira, Ontario.

Bill Menkveld says the purpose of auto boom height control is to add more convenience for the user. If farmers rely solely on manual controls, they must slow down and constantly watch the sprayer boom tips, especially in rolling fields. The RiteHeight controller measures the distance between the boom and the target using sonar-based sensors and electrical

connections to solenoid valves that raise and lower the boom as needed.

"It reduces stress when spraying so you don't have to continually watch the boom tips so they don't hit the ground or go too high," says Menkveld. "Chemical ends up where it's supposed to be and doesn't drift away."

The controller kit comes equipped with a display console and keypad, junction box, cables, and sonar-based sensors.

Up to 8 sensors can be mounted on a sprayer although most farmers choose to add 3. Menkveld says those with more challenging conditions often use 4 or 5 sensors. In North America, most sprayers can raise and lower the center boom independently of the outer booms and use a center sensor for reference. The outer booms automatically follow this setting. Desired target height is selected with changes easily possible while spraying.

"The sonar system is very fast in reading the distance to the ground or tops of the crop. The only limit is in the sprayer hydraulic system as it can only lift the boom at a given rate. I tell people to continue using common



A Greentronics sonar unit is used to control boom height on a field sprayer.

sense with ground speed as there are limits to everything."

Menkveld explains that from the beginning they've tried to design a universal application system and 90 percent of the time their RiteHeight will work on a sprayer, providing it has electric-over-hydraulic boom control. Installed equipment can also be easily removed if upgrading to a different type of sprayer.

Farmers can self-install the systems or

dealers will assist.

Costs depend on the number of sensors required. Complete controller kits begin at \$5,000 and sell up to \$7,500. Individual sensors can also be purchased separately for \$750.

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