EdgeScout
REMOTE MONITORING

ROTOCHOPPER Inc.

How RRAMAC's EdgeScout Improved Rotochopper's Data Monitoring & Customer Service Capabilities

RRAMAC
CONNECTED SYSTEMS

CASE STUDY OVERVIEW

RRAMAC's EdgeScout & Rotochopper

Challenge and Project Requirements:

Rotochopper wanted a cost-effective remote monitoring system with a centralized database and web displays that would allow their service technicians to access graphical displays for preventative maintenance, predictive maintenance, and alarm history for all of their grinders. In addition, they wanted customers to be able to access the maintenance screens and gather production reports. Rotochopper also needed all of their historical data transferred and accessible within the system. The project timeline was 6-weeks.

Rotochopper's goal was to better serve their customers, provide an enhanced level of troubleshooting, predict maintenance needs, save money and reduce downtime.

Solutions RRAMAC Provided:

- One mutually accessible site for their customers and Rotochopper's internal service team
- Advanced data storage and graphing capabilities
- Bar charts showing maintenance life of individual components, engine data, and predictive maintenance
- Detailed maintenance stats and history, alarm history, performance stats, and historical trends reporting
- Communications configured thru Secomea SiteManager ™ using a custom driver to collect data files from the local operator interface screen. This allowed Rotochopper to use file structures that already exist on machines in the field, so they can add the web displays to existing machines and leverage data that has already been collected.
- "Go Live Link" on Rotolink page that allows the user to go online with web published pages from the onsite Operator Interface Screen
- Configurable email and text message alerts
- Weather status at the machine location using nearest NOAA weather station data

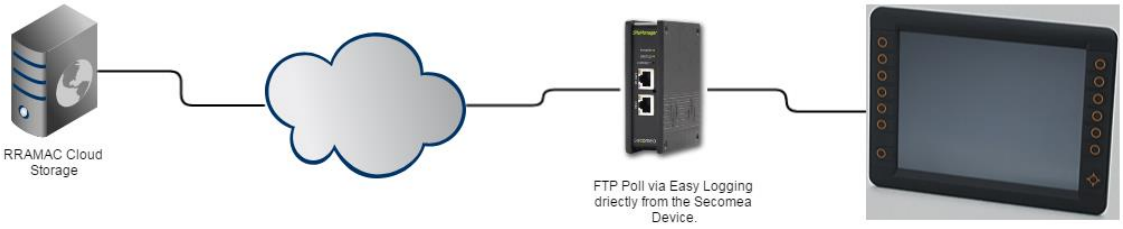
Impact:

- Detailed and historical alerts and reporting that allow for predictive maintenance – resulting in less downtime and money saved
- Corrective maintenance enabled Rotochopper to diagnose a customer's bad valve before it created a bigger maintenance issue
- A live link for service technicians and customers to see the same screen simultaneously
- Alarm notifications alerted Rotochopper to a low voltage on a customer's machine—allowing them to troubleshoot and fix the issue right away
- Enhanced customer service capabilities, increasing their customer satisfaction

Rotochopper's Challenge

Rotochopper specializes in grinding and shredding equipment that transforms waste materials into colored landscape mulch, animal bedding, biomass fuels, and compost with "Perfect in One Pass" simplicity. Rotochopper needed a hosted remote monitoring solution that was able to store a large amount of data and remotely monitor their grinders.

Rotochopper decided they wanted a centralized database and a web displays that would allow service technicians to access graphical displays for preventative maintenance, predictive maintenance, and alarm history for all of their grinders. They also wanted to give customers access to the maintenance screens and production reports for their grinders.



Why Did Rotochopper Come to RRAMAC?

Rotochopper tried hiring an integrator to set up the required database and web pages, but ultimately decided they needed someone with more experience. RRAMAC was recommended by Power/mation who Rotochopper had a previous relationship with through the purchase of the Secomea SiteManager. As a distribution partner of RRAMAC's EdgeScout, Power/mation was intimately familiar with their capabilities and knew that RRMAMAC was the right choice for the job. Tom Craven, VP of Product Strategy, and Justin Chamberlain-Dupree, Software Developer, met with the Rotochopper team to discuss their needs.

"We were looking for a knowledgeable partner who could handle a large amount of data through remote monitoring," said Brian Wenning, Control Systems Engineer at Rotochopper. "It was clear from the first meeting that RRAMAC understood our needs and had the experience to execute the project. It was an easy decision."

The Timeline

RRAMAC started the project on July 31 with a deadline to be fully operational for an important Rotochopper customer event on September 13 called "Demo Days." **The project was completed in approximately 4-weeks**, with some ongoing testing and troubleshooting during the remaining 2-weeks before the customer event.

"It felt like RRAMAC was part of our team – we were all working together on the same project" said Wenning and Doug (Spike) Meyer, Director of Customer Service. "They had quick and definitive responses to all of our questions and a solution for every problem."

“We pushed hard to get the system up and running as quickly as possible to be ready for Demo Days.” said Meyer. “RRAMAC did not release the system until it was ready – it was the right thing to do and they still made sure it was ready in-time for our event.”

Creating a Custom Solution

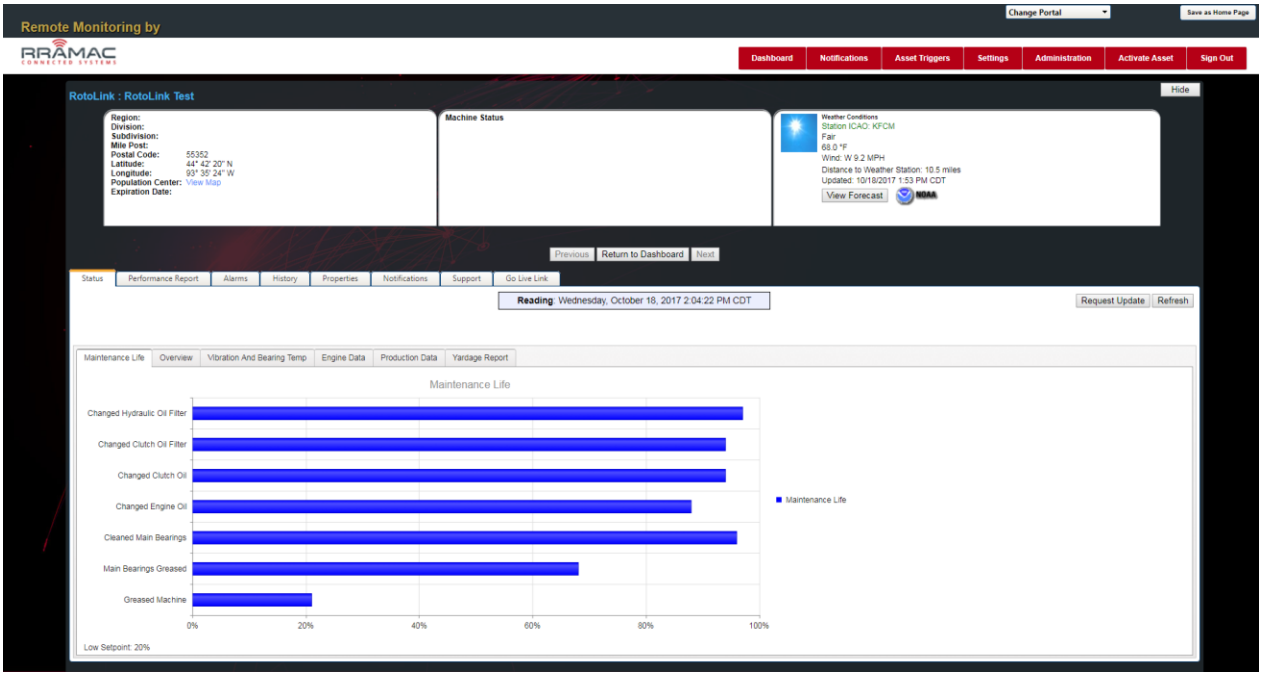
Rotochopper had historical data files at every site that they did not want to lose. All of this needed to be transferred to the EdgeScout system. Nathan Entinger, Chief Technology Officer and Dupree led the project from the RRRMAC side.

RRAMAC was able to take full advantage of the existing control system platform that Rotochopper was already using because of their experience working with the Secomea SiteManager. The data log files that were in use at existing sites were accessed remotely by RRAMAC, making it easy to upgrade existing sites while making use of data that has already been collected.

“RRAMAC worked with us so we did not have to go through the extra work of converting all of our existing data into a different file form,” said Wenning.

RRAMAC created one mutually accessible website for their customers and the internal Rotochopper service team with data storage and advanced graphing capabilities. The Rotochopper grinders connect to the internet via the customer’s local LAN or Wifi. Some sites require a cell modem.

“RRAMAC showed the data storage and graphing capabilities that other companies would have to build from scratch,” said Wenning. **“They brought a new level of knowledge, expertise and experience to the project. They understood what we wanted and created solutions to fulfill our goals.”**



EdgeScout REMOTE MONITORING

The Demo Days Rotolink Launch

Rotochopper unveiled their latest remote monitoring solution from RRAMAC's EdgeScout, called the Rotolink at the Demo Days event. Dupree even drove out to the event to ensure a smooth product launch.

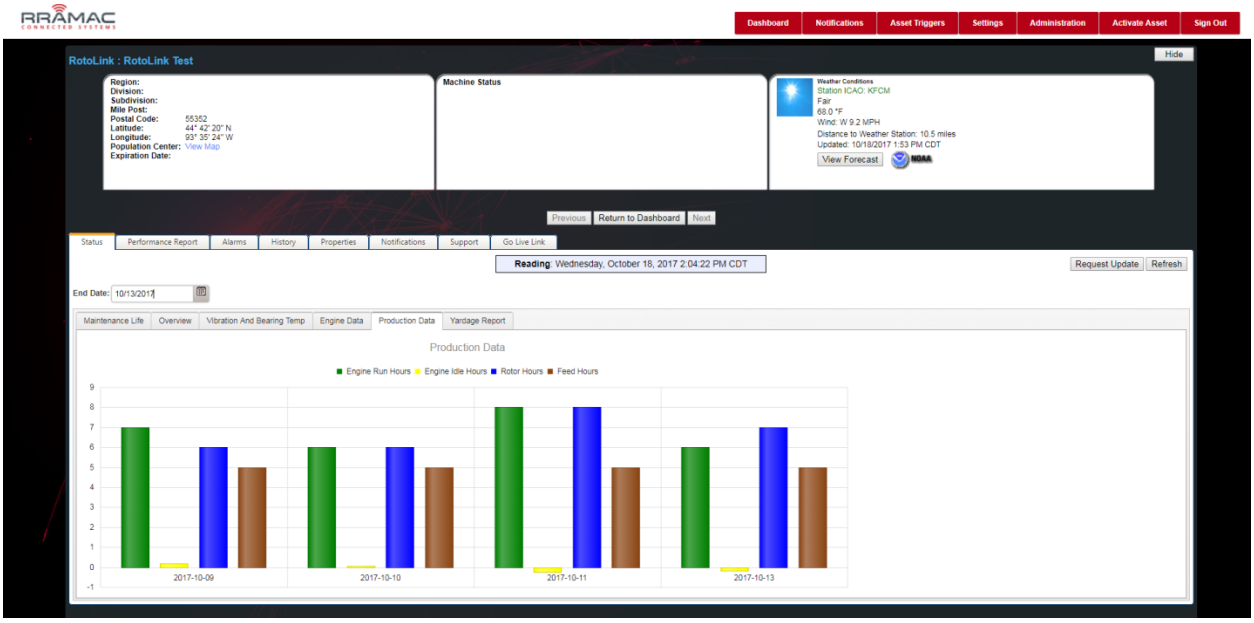
Meyer and Wenning were both very impressed by this, commenting "Justin taking the time to personally drive to Demo Days and demo the system to the customers spoke to the impressive level of customer service that RRAMAC provides."

"The company was exceptionally receptive and welcoming," said Dupree. "Attending Rotochopper's annual customer event was a great first-hand opportunity to see interaction with the system and get important feedback directly from their customers. This was an excellent opportunity to explore some new and interesting functional areas."

How has RRAMAC's EdgeScout Benefitted Rotochopper and their Customers?

"This upgrade has made an impact on the service we provide to our customers," said Meyer. "We can tell ahead of time if a machine needs servicing and save money and downtime in the end. The troubleshooting feature with detailed, non-subjective data is incredibly valuable."

EdgeScout by RRAMAC has enabled Rotochopper to practice corrective maintenance. By means of the production and engine chart data, Rotochopper diagnosed a bad valve and notified the customer before it caused a bigger issue – saving both time and money for Rotochopper and their customer.



The EdgeScout product has proven to be a huge rollout for customers and for the Rotochopper customer service department. With the shared website, data operators are able to consult with Rotochopper customer service to quickly troubleshoot machine failures with the least amount of impact to production uptime. In addition, historical data and machine performance trends are captured for proactive and predictive maintenance on the machine.

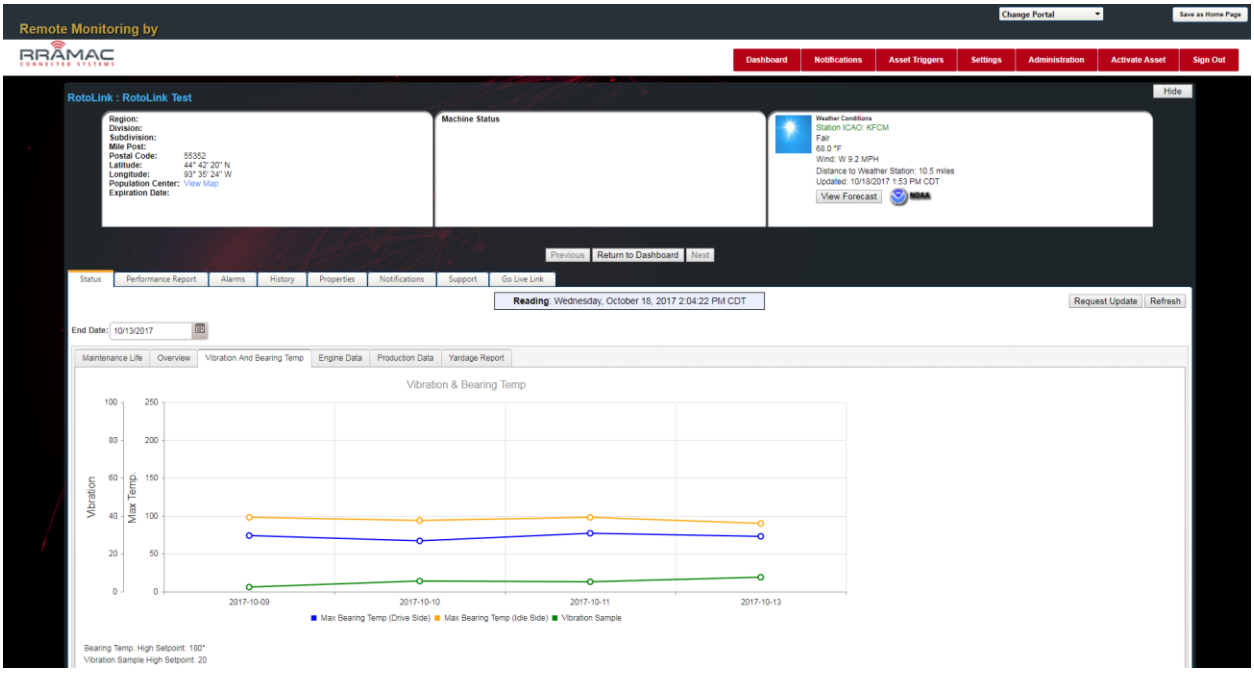
In one instance, Rotochopper received an email notification that alerted them to a low voltage warning on of their customer's machines. They were able to contact their customer right away and provide a solution that fixed the issue right away.

This alarm history report is extremely valuable to Rotochoppers' service group to remotely troubleshoot machines. "The EdgeScout system allows them to get actual time stamped data, instead of relying on anecdotal operator reports and details," said Craven.

The Rotochopper team was very pleased with the result and commended the RRAMAC team saying, "They handled everything very well – their professionalism was outstanding."

"Customers see maintenance as the first thing when they log into the site," said Meyer. "They love the fact that they can see what maintenance needs to be scheduled – just as they do with new vehicles. The

history part is huge – engine data, bearing temp, and the zoom in. The ability for service to have a live link to see exactly what the customer sees is the cherry on top."



The RRAMAC team was greatly appreciative of the level of response, ease, and friendliness of the Rotochopper team. Dupree noted that, "It was great to work with an organization that had a clear sense of vision in terms of what they wanted to accomplish, yet was willing to take guidance on how best to present their vision to customers. Spike and Brian in particular were very receptive and responsive. Their ability to turnaround any requests from our side in a timely manner really helped ease the process and get everything completed on time."

What's next for Rotochopper and RRAMAC's EdgeScout?

RRAMAC is proud to continue working with Rotochopper to develop the same system for their other machinery. "The great thing about our product is that it is reusable across other machines and systems," said Craven. "Only minor tweaks are needed to customize to the specific needs of the machine."

For more information about this case study, please contact Tom Craven, RRAMAC's VP of Product Strategy at tcraven@rramac.com.

About Rotochopper:

Rotochopper designs, builds, and supports a complete line-up of horizontal grinders, wood chip processors, asphalt shingle grinders, and mobile bagging systems from a state-of-the-art manufacturing facility in St. Martin, Minnesota. They are an employee-owned (ESOP) manufacturer committed to our roots as a small Mid-western company. We work directly with customers to develop innovations that create economic opportunities and environmental sustainability. To learn more about Rotochopper, visit rotochopper.com.