



How Diamond Kinetics Reduced Device Resets by 90% & Fixed Their #1 Bluetooth LE Bug



Every step of the way, the Memfault SDK has been reliable and easy to integrate. I wouldn't go to market on an IoT device without Memfault in place.

Mike Ressler

Chief Technology Officer, Diamond Kinetics



About Diamond Kinetics

Diamond Kinetics is the market leader in mobile motion technology that enables player development, superior equipment fitting, objective scouting and recruiting, and engagement-driven entertainment.

Diamond Kinetics is the creator of the SwingTracker and PitchTracker that provide motion analytics and easy-to-understand metrics along with data and pitching analysis tools previously available only with expensive hardware systems.

Company Profile

- Industry: Athletic Training
- Location: Pittsburgh, PA
- Chipset: Dialog
- Operating System: FreeRTOS
- Connectivity: Bluetooth low Energy

Benefits

- Reduction in resets per device by 90% in six months
- Fixed #1 crash, a connectivity bug in Bluetooth LE chip
- Faster time to market by accelerating the development cycle

Challenge

Diamond Kinetics' smart balls and bats are connected to their mobile application via Bluetooth, transmitting all their data to their cloud. Unfortunately, many baseball and softball facilities don't have great LTE or WiFi coverage.

Diamond Kinetics had no crash logs or stack traces on their older products. When customers submitted support tickets, they gave very little detailed information, making it nearly impossible for Diamond Kinetics to reproduce the issue locally. As a result, they spent countless hours 'psychic debugging', trying to guess what happened and where the fault occurred in the code. Adding to this grueling process, they had to update all devices at once to fix an issue on any device. This "all or nothing" approach greatly enhanced testing requirements and, as you might expect, stress levels. With this cumbersome process, the risk of launching a new product or updating firmware was very high as they did not want their customers experiencing additional crashes and reboots.

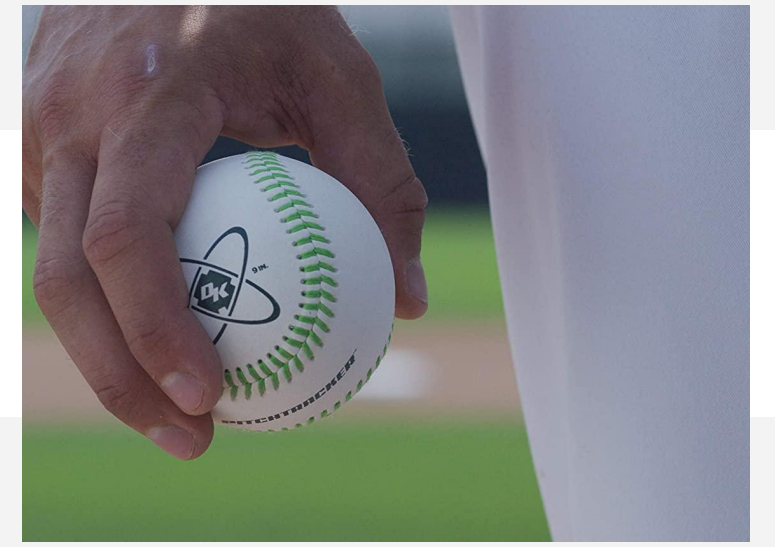
Solution

As Diamond Kinetics worked on their new Generation 3 devices, they used Dialog chips and FreeRTOS, simplifying the initial development process, but they still struggled with observability. They had no analytics into BLE connectivity, battery life, or other metrics. Their over-the-air updates were all custom and one-off with Dialog SUOTA, so they were not confident in shipping new firmware even with all the testing involved.

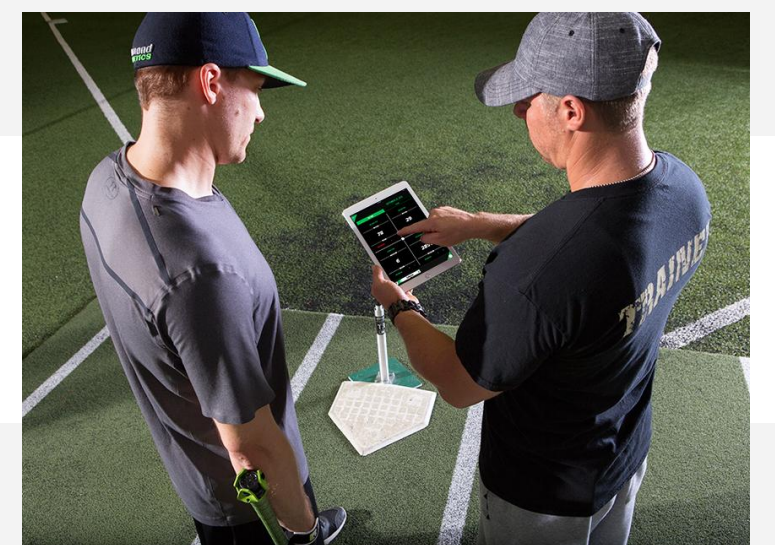
Fortunately, early on in development, they came across Memfault and immediately recognized the value of diagnosing and debugging issues quickly and remotely. With more device observability, they could see detailed information about real-world bugs, create fixes, and improve their devices incrementally.

Diamond Kinetics knew partnering with Memfault would be a seamless process because of their tight OS integration, flexible framework, and agile IoT Development. They quickly integrated Memfault into FreeRTOS on Day 1 and had working development firmware running within two weeks.

And by using Memfault as a data transport layer, Diamond Kinetics had a working data pipeline from the sensor through the app on day one instead of weeks or months.



“ Because of the monitoring and automatic data collection capabilities that Memfault gave us, we were able to go to market faster with more confidence in the success of our launch
Mike Ressler, Chief Technology Officer.



“ With Memfault, we can now service and address issues without needing to “psychic debug” sensors in the wild based on customer reports – we have the stack traces. All this on an embedded sensor with limited resources over a Bluetooth connection to a mobile app.
Mike Ressler, Chief Technology Officer.

Results

Using Memfault, Diamond Kinetics fixed their #1 crash, a connectivity bug in their BLE chip. They caught the issue during development testing but did not delay the launch of their next-generation hardware, thanks to Memfault. Knowing they could diagnose the root cause of the issue with devices in the field and then intelligently roll out firmware fixes, Diamond Kinetics launched their product to market earlier and with more confidence in its eventual success.

Using Memfault's fleet monitoring capabilities, Diamond Kinetics receives real-time alerts with actual data from their devices, helping them remotely resolve device issues in the field. Memfault not only enabled the firmware engineers to work more efficiently as a team, but it helped them work better with the support team, giving them the data they needed to solve customer issues. As a result, the firmware engineers often detect and resolve issues before customer support is alerted. With these firmware crash analytics, Diamond Kinetics reduced the number of resets per device by 90% in just six months.

Memfault enabled Diamond Kinetics to release new firmware to accelerate the development cycle to get their products to market faster. After implementing Memfault, they finally have crash logs and stack traces that help them understand what is happening on all devices throughout development testing, allowing them to see more reboots than they would have noticed previously. Seeing this data and the reboots gives them the confidence to automatically detect, observe, and resolve errors before their users notice them.

You can **learn more** about Diamond Kinetics [here](#).



With Memfault, I get so many stack traces and a more streamlined release cycle that is much more reminiscent of web development than embedded development. And that's fantastic. I can control my launches, I can control my rollouts, and I get telemetry from my entire fleet, which is phenomenal..

Mike Ressler, Chief Technology Officer.