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## “We are here to innovate, collaborate, and build a safer, smarter future together”



After more than a decade I connected with the dynamic **Dasari Ramakrishna, CEO and MD, Efftronics Systems Pvt. Ltd.** Was elated to hear that he and his team will be exhibiting at InnoTrans as I was also invited as media to cover the event. A successful and innovative entrepreneur, he launched Efftronics in 1985. With a strong focus on Research & Development today Efftronics with its Made-in-India products and solutions for Indian Railways, smart signalling, smart cities, smart buildings and other IoT domains has become a strong force to reckon with globally. To get more insights into Efftronics we interacted with Dasari Ramakrishna. **Excerpts**

### Can you provide a brief overview of Efftronics Systems Pvt. Ltd.?

The purpose of any business is to create value for customers and not just making profits. In today's economy, customer value creation is typically based on product and process innovation and on understanding the latent and future requirements of customer and implementing them with speed and precision. There should be always a win-win scenario between customer and manufacturer. With this vision, we have been developing niche products in various domains which create value to our customers.

We launched our company in 1985 with LED display system. It was a new concept at that time as microprocessor technology itself was in its early stages in India. Efftronics sold the display systems with marginal profit. There were no hidden costs and we even agreed to provide after sale services at free of cost. Apart from that, we took the responsibility of failures irrespective of the conditions that caused the failure.

Our vision is simple – “To provide actionable insights in real time for enhancing wealth”. At Efftronics, we always stress for fitting the right technology to the problem rather than using the technology for technology sake. This philosophy made us to pioneer another new product ‘Datalogger’, which shifted the paradigm in railway signaling in India. A datalogger is like a ‘black box’ which enabled railways to find the root cause for failures. While the railway environment is challenging and variant across India, Efftronics succeeded and came with this breakthrough and niche product. This altered the way signaling system is seen in Indian Railways.

After the development of Data logger, we shifted our focus on networking of data loggers. This eliminated person movement to individual stations and railways were able to access all stations information at divisional headquarters. This has paved way for many applications for train tracking, asset monitoring, faults monitoring etc. It has given a fresh lease of efficient working model to railways for effective operation of the trains, discipline adherence of the personnel and maintenance of signaling assets. As of today, we have our datalogger presence in 98% of Indian Rail Network monitoring 10million signaling elements across 9000 locations. This is living up to our vision of wealth creation.

### You spoke about your journey and emphasized on technology development in view of value creation. How you strategize and invest in R&D?

With emergence of datalogger, the business and size of efftronics expanded continuously in last two decades. We firmly believe that growth of organization is solely dependent on continuous R&D activities, and it is quite evident from the beginning itself. Our strength is total solution development under one roof i.e., hardware, embedded software, front application software, mobile apps, mechanical design, and testing etc. We invest around 10% of our annual turnover into R&D. We have developed our own methods, tools and systems that accelerates our R&D efforts and bring in efficiencies into development. We continuously visit international trade fairs, participate in technology symposiums and conferences every year. We also keep constant communication with technology providers to understand how technologies are evolving. We bring those learning into our R&D and implement into our solutions.

We put focus on acquiring domain expertise. Our current focus is on Industry 4.0 solutions which are system of systems in nature, particularly in the areas of railway signaling, water utilities, road traffic management, building management etc. We identify clear value by delving deep into domain challenges using data analytics. We believe listening to our customers sincerely and accepting challenges without hesitation has helped greatly in business. Our approach of extending scope beyond initial boundaries to ensure comprehensive problem-solving clearly differentiates Efftronics. We approach value creation by overseeing the entire product lifecycle—from ideation, creation, development, and manufacturing to deployment, maintenance, and upgrades—offering a seamless, one-roof solution that significantly reduces costs and guarantees reliability and usability, as all our processes are closely knit within Efftronics.

### 1) You recently came up with end-to-end IoT platform which is highly customizable. How do you re-imagine asset maintenance through your IoT platform?

Even though IoT systems generate asset data, the key is to translate data into actions which is possible through data analytics / algorithms. Value from our end-to-end IoT Platform

- Ensure availability of signaling system**
  - **Reduce MTTR** – insights of failures
  - **Increase MTBF** – insights into system through predictive alarms, real time simulation and health reports
- Deskilling** of maintenance activities
- Collaborative** of maintenance activities

4. Reduction of **maintenance effort**
5. Provide **data driven** decisions

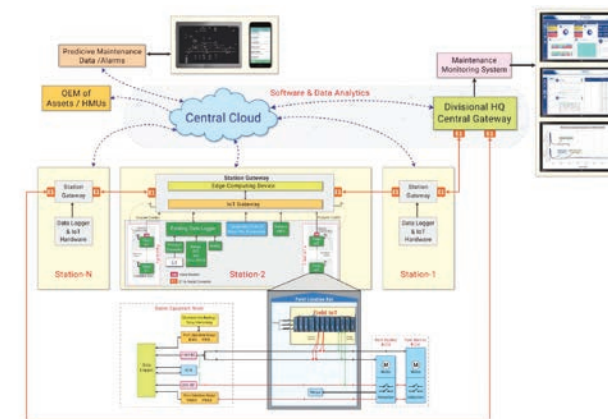


Reference: Analytics Spectrum, Gartner USA

The maintenance process through IoT system

1. Sensing parameters & generation of data
2. Communicating sensed data to central location
3. Applying algorithms to generate actionable decisions by IOT system
4. Assessment of maintenance staff
5. Taking decisions based on human input and output from IOT
6. Implementation of decision

Modern assets have intelligent diagnostics in-built, whereas legacy systems need augmentation of IoT sensors for real time capture of their behavior and health. Thus, Efftronics came up with different IoT devices like intelligent sensors, Edge devices, Processing Units and Gateways which will be deployed for monitoring of existing railway infrastructure making them intelligent and ready for advanced analytics. Based on the operational behavior of these railways assets, data generated will be both continuous time series and irregular and sporadic in nature. Data ingestion, stream processing/event processing and contextual analytical algorithms have been designed in our software platform to handle that event behaviors. Our platform is highly customizable which provides real time alerts and notifications, provides users with real time dashboards and live schematics, provides bi-directional collaborative working through digital forms.



Reference: Efftronics Solution Architecture

### You also have SIL4-certified products like LED signals and block instrument in your portfolio, what makes these products stand out in terms of technology, safety, and reliability?

At Efftronics, our SIL4-certified products, like LED signals and

block instruments, exemplify our dedication to safety, reliability, and cutting-edge technology. Achieving SIL4 certification, the highest safety integrity level, reflects our rigorous R&D processes and our commitment to quality.

Our R&D capabilities are at the core of our innovation. We have a robust and experienced team focused on developing advanced technologies that enhance the safety and efficiency of railway operations. Our LED signals are designed with state-of-the-art components to ensure maximum visibility and reliability, while our block instruments leverage advanced microprocessor technology for precise control and monitoring.

What sets our products apart is the meticulous attention to detail in our design and testing processes. We conduct extensive testing under diverse environmental conditions to ensure our products perform reliably in the field. This is very much critical for Indian Railways network. Our Indian environment conditions are quite extreme as hot summer temperatures will reach up to 50OC. This holistic R&D approach and our continuous improvement mindset enables us to deliver products that are not only technologically superior but also incredibly dependable, making railways safer and more efficient.

### What is Efftronics roadmap particularly in the space of railway signaling, and how does it align with global technological trends?

We are right now focusing on enhancing capabilities of our IoT platform. We are continuously adding more and more asset contextualized algorithms into our solution. In a couple of years, we would like to see our platform become mainstream in Indian Railways for asset maintenance and it seamlessly integrates into railway personnel day-to-day workflows.

One of our prime focus in R&D is to build digital twins for signaling and deepen our existing IoT platform in other railway infrastructure. We are also building algorithms to reduce journey time of trains by identifying bottlenecks in infrastructure, and operations. We are also working on Train Management System (TMS) for improving the train operations.

### Lastly, what message would you like to convey to your current and potential customers, partners and stakeholders attending InnoTrans 2024?

As we showcase our innovations at InnoTrans 2024, I want to extend a heartfelt thank you to our current customers, partners, and stakeholders for their unwavering support and trust in Efftronics Systems Pvt. Ltd. Your belief in our vision and products fuels our commitment to excellence.

To our potential customers and partners, we invite you to join us on this journey of innovation and transformation. At Efftronics, we are dedicated to creating solutions that not only meet the highest standards of safety and reliability but also push the boundaries of what's possible in the railway industry.

Our message is simple: we are here to innovate, collaborate, and build a safer, smarter future together. Whether through our SIL4-certified products or our advanced IoT platform for asset maintenance, we are constantly evolving to meet the changing needs of the industry. We look forward to forging new partnerships and continuing to deliver groundbreaking solutions that drive progress and create lasting value.