

## AUTOMOTIVE TELEMATICS

# Successfully deploying a cost-effective digital control unit (DCU) with cellular and GNSS connectivity



## OVERVIEW

CONNECTM manufactures **Digital Control Units (DCU)**, a flagship product that merges vehicle control, telematics, and in-vehicle display into one compact platform. Acting as the vehicle's digital brain, it connects two and three-wheelers and light commercial vehicles to the cloud, mobile apps, and dashboards, giving drivers, fleet managers, and OEMs tailored control and visibility.

## THE CHALLENGE

ConnectM needed a **solution with 2G and 4G cellular and GNSS connectivity, integrated into a compact PCB (145x82mm)** with minimal ground clearance to fit a Vehicle Control Unit, Telematics, and Instrument Cluster in one device.

Reliable GPS performance that could latch in 30 seconds or less at cold-start, even with nearby material layers like casing, display, and other telematics, was crucial to ensure **accurate navigation, a smooth user experience, and a cost-effective solution** for the highly price-sensitive Indian market.

**"ConnectM turned to Ignion for an antenna solution that could fit into our ultra-compact architecture without compromising on performance."**

**Anish Kumar**  
Head of IoT Solutions  
ConnectM Technologies Solution Pvt Ltd

## THE SOLUTION

### Ignion's solution included:

- **RUN mXTEND™** antenna booster (NN02-224, dimensions: 12.0 x 3.0 x 2.4 mm) for the cellular bands in India (824-960 MHz & 1710-2690 MHz).
- **DUO mXTEND™** antenna booster (NN03-320, dimensions: 7.0 x 3.0 x 2.0 mm) for the GNSS (1560-1610 MHz) requirements.
- Engineering support including:
  - Guidance on antenna booster placement, clearance area and matching network topology for tailored tuning.
  - Cellular verification of the total radiated power (TRP) ensuring meeting the network operator certification targets.
  - GNSS: recommendations on the Low Noise Amplifier (LNA).
  - Guidance on expected total efficiency.
  - Design file review (Gerber file) before prototype run.

**"Ignion's antenna technology delivers robust GNSS and cellular connectivity even when embedded beneath layers of plastic, metal, and PCB, enabling precise vehicle tracking, real-time data sync, and over-the-air software updates."**

**Anish Kumar**  
Head of IoT Solutions  
ConnectM Technologies Solution Pvt Ltd

## THE BENEFITS

**Reliable connectivity** was achieved despite the different internal layers — including Telematics, which often poses a challenge — and the plastic cover, which is crucial for the device to transmit and receive data to and from the app and software of the ConnectM overall solution.

The compact, patent-pending DCU, which combines three devices that were previously sold separately, now provides ConnectM **a strong market advantage** with the help of Ignion's flexible antenna boosters that are so small, they can be easily integrated into any device.

The device's **competitive pricing** may be partly attributed to the more cost-optimized options presented by Ignion that successfully met the bandwidth and GNSS signal reception requirements.

**New business opportunities** have been opened in other markets where the device is already being tested. Ignion's flexible Virtual Antenna® technology also future-proofs the device design making it ready for updates and upgrades.

**"The result is a product that helps OEMs go to market with vehicles that aren't just electric but intelligent and cloud-connected."**

**Anish Kumar**  
Head of IoT Solutions  
ConnectM Technologies Solution Pvt Ltd

## ABOUT CONNECTM

ConnectM is a constellation of companies driving the next generation of electrified equipment, mobility, and distributed energy—enabling a faster, smarter transition to a modern energy economy. In mobility, ConnectM is a leading provider of intelligent solutions for OEMs, specializing in software-defined vehicle architecture, vehicle control units, telematics, connected mobility, Instrument Cluster and Energy Management. By optimizing vehicle performance and efficiency, ConnectM empowers OEMs and enterprises to lower energy costs and reduce carbon emissions globally.



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#### Barcelona

Av. Alcalde Barnils, 64-68  
Modul C, 3a pl. Sant Cugat del Vallés 08174  
Barcelona Spain

[+34 935 66 07 10](tel:+34935660710)

#### Tampa

8875 Hidden River Parkway Suite 300,  
Tampa, FL 33602  
USA

[+1 888 726 8366](tel:+18887268366)

#### Shenzhen

Keyan Road 9, Nanshan District  
BAK Science and Technology  
Building, Room 1301E,  
Shenzhen, GD 518057 - China

[+86 138 2653 8470](tel:+8613826538470)