



สถาบันเทคโนโลยีอวกาศนานาชาติเพื่อการพัฒนาเศรษฐกิจ (สทอช.)

INSTED

International Institute of Space Technology for Economic Development

N3SPACE



KNACKSAT-2

Multi-Payload CubeSat Platform for Rideshare Missions

Phongsatorn Saisutjarit

King Mongkut's University of Technology North Bangkok

“One Satellite Multi-Payload”



Bus System

- Communication
- OBC
- EPS
- Payload Controller

Multi-Payload (up to 10 Slots)

- Designed and developed by users

Ride-Sharing Concept

Shared Launch and Testing Fees
Among Riders

Fully Supports on
License and Safety Review

Focused on Payload Development
Not Satellite Bus Development

Space-Proven Parts

3U Cubesat Multi-Payload Platform
Designed and Developed by



INSTED

N3SPACE





“Songthaew”

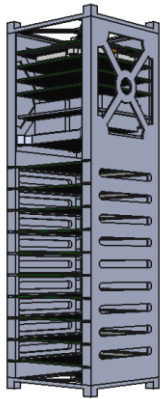
Joining Organizations



- *KMUTNB Pre-Engineering School*
- *KMUTNB Rail Systems Cluster*
- *NARIT (National Astronomical Research Institute of Thailand)*
- *UiTM , Malaysia*
- *UPHSD, Philippines*
- *AIS (Advanced Info Service Public Company Limited)*

*To be launched
in Q3 2025*

Collaborative Platform Development



Satellite Design

- Preliminary Design
- Detailed Design
- Multi-Payload Design



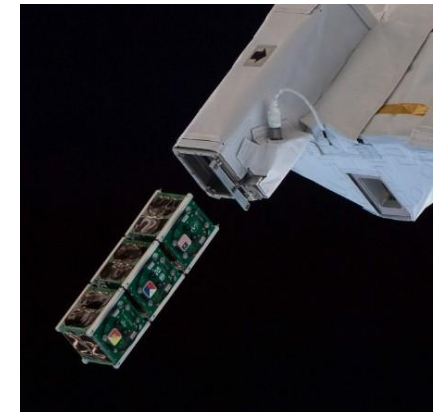
Satellite Fabrication

- Fabrication & Verification
- System Integration Test
- Engineering Model
- Flight Model
- Payload Integration Test



Environment Testing

- Environment Test
- Safety Review
- Launch Readiness Review

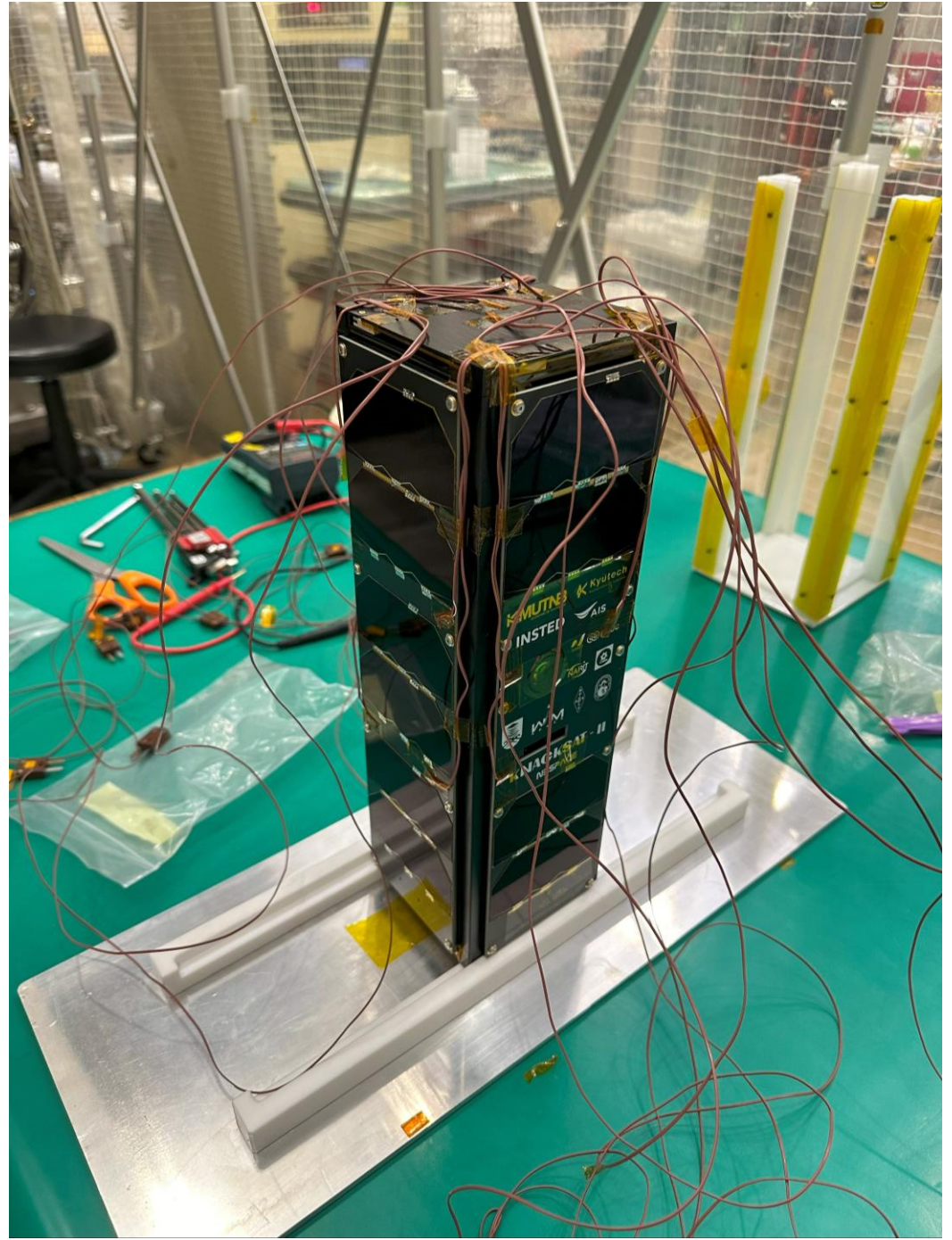


Satellite Launch

- Satellite Deployment

Technical Information

Orbital Altitude:	400 km
Inclination:	ISS Orbit ($\pm 51.6^\circ$)
Payload (P/L):	<u>Multi-Payload</u>
CMD/TLM Transmission Rate:	9600 bps
Data Downlink:	500,000 Byte/Day (Maximum)
Time Resolution:	5 Pass/Day (6-8 Minute/Pass)
Electrical Power:	5V, 3.3V limited to 1A
Battery:	Limited to 7.4V
Data Interface:	CSP (I2C, CAN, UART, SPI)
Main Communication:	Telecommand 400MHz, Downlink 460 MHz
Lifetime:	18 Months (ISS Orbit)

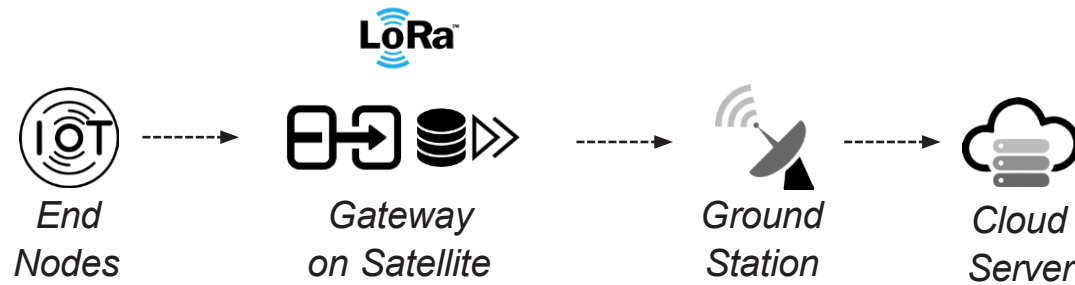




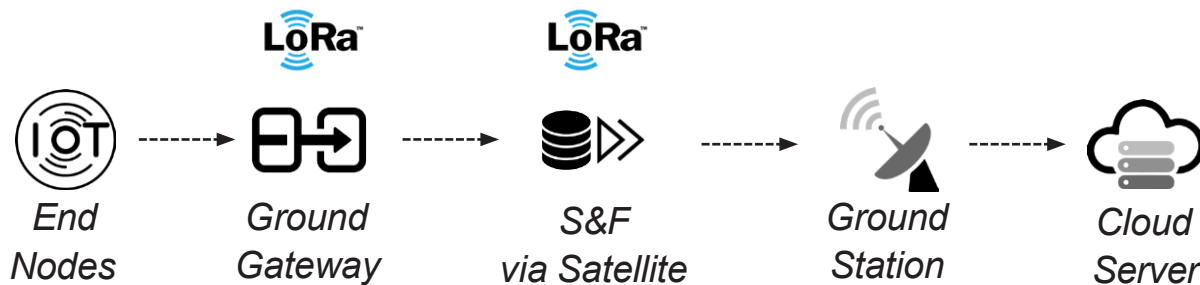
ส่งมอบดาวเทียม KNACKSAT-2 ให้กับ Kyushu Institute of Technology ในวันที่ 26 ตุลาคม 2566

Space-based Internet-of-Things (IoT)

Gateway on Satellite Method

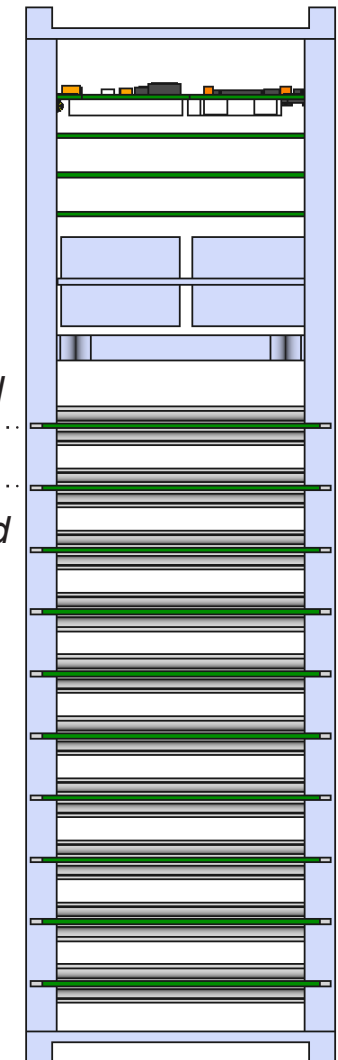


Gateway on Ground Method

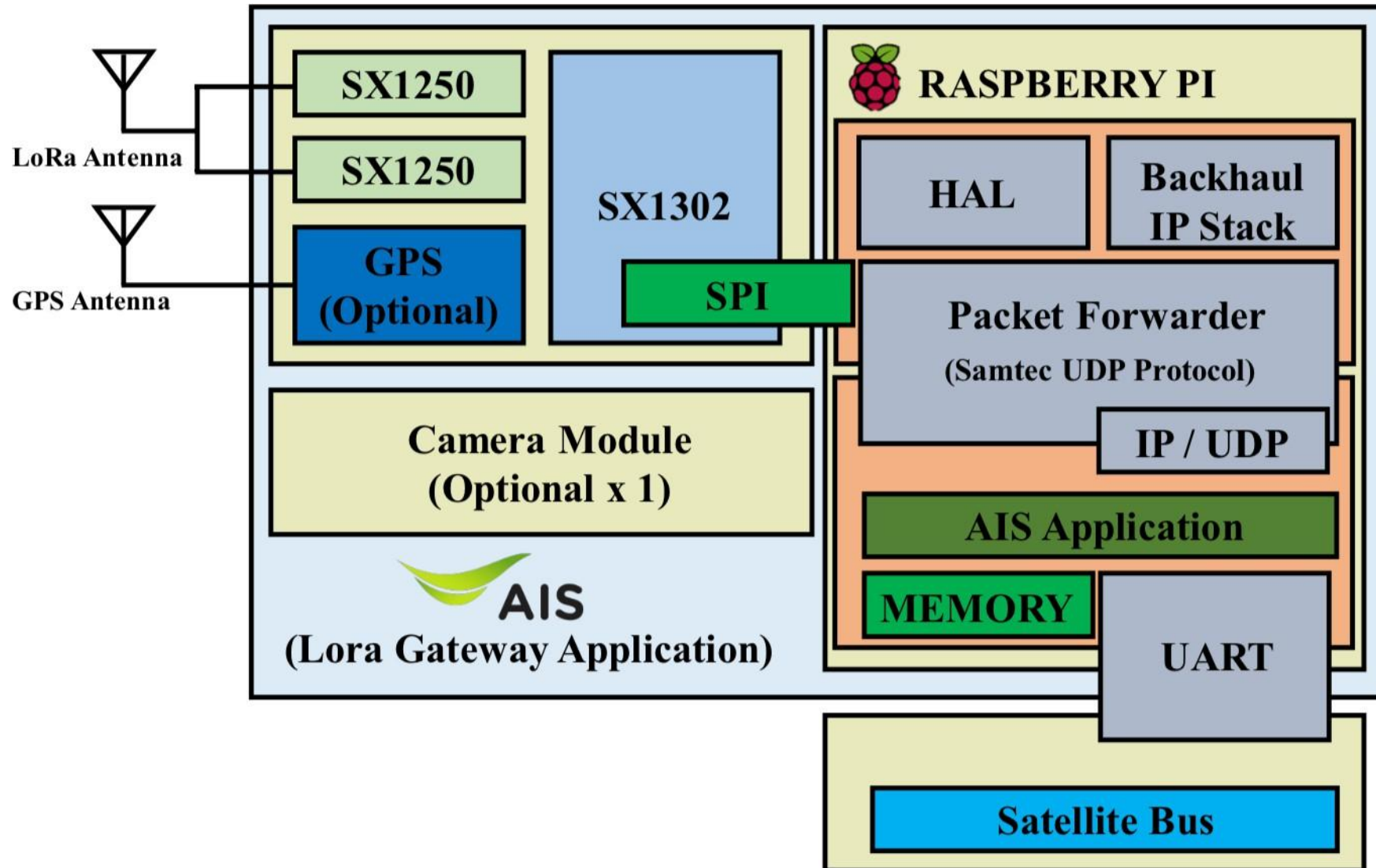


MPCP

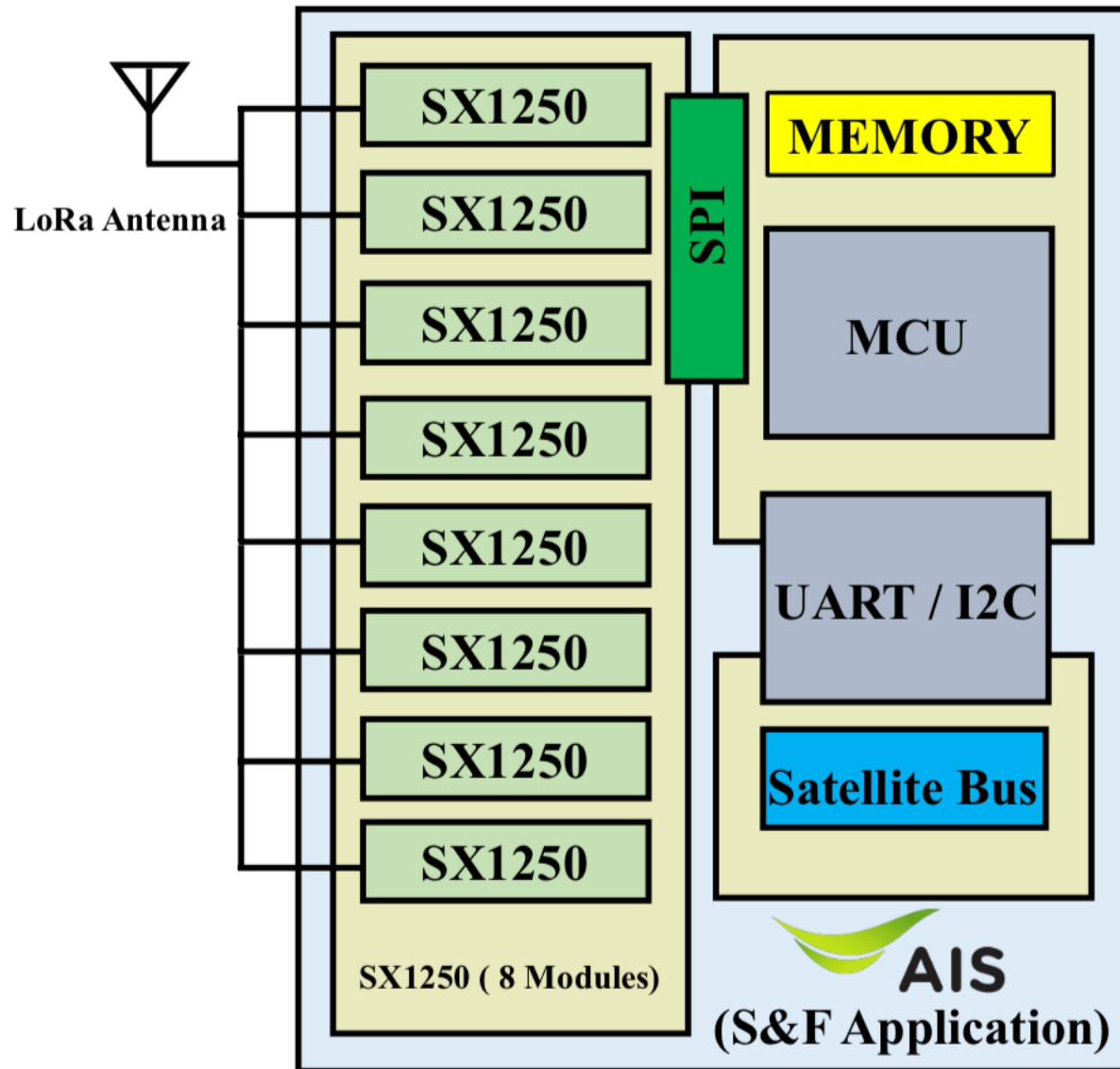
(3U Cubesat by
INSTED, KMUTNB)



Gateway on Satellite Payload



Gateway on Satellite Payload

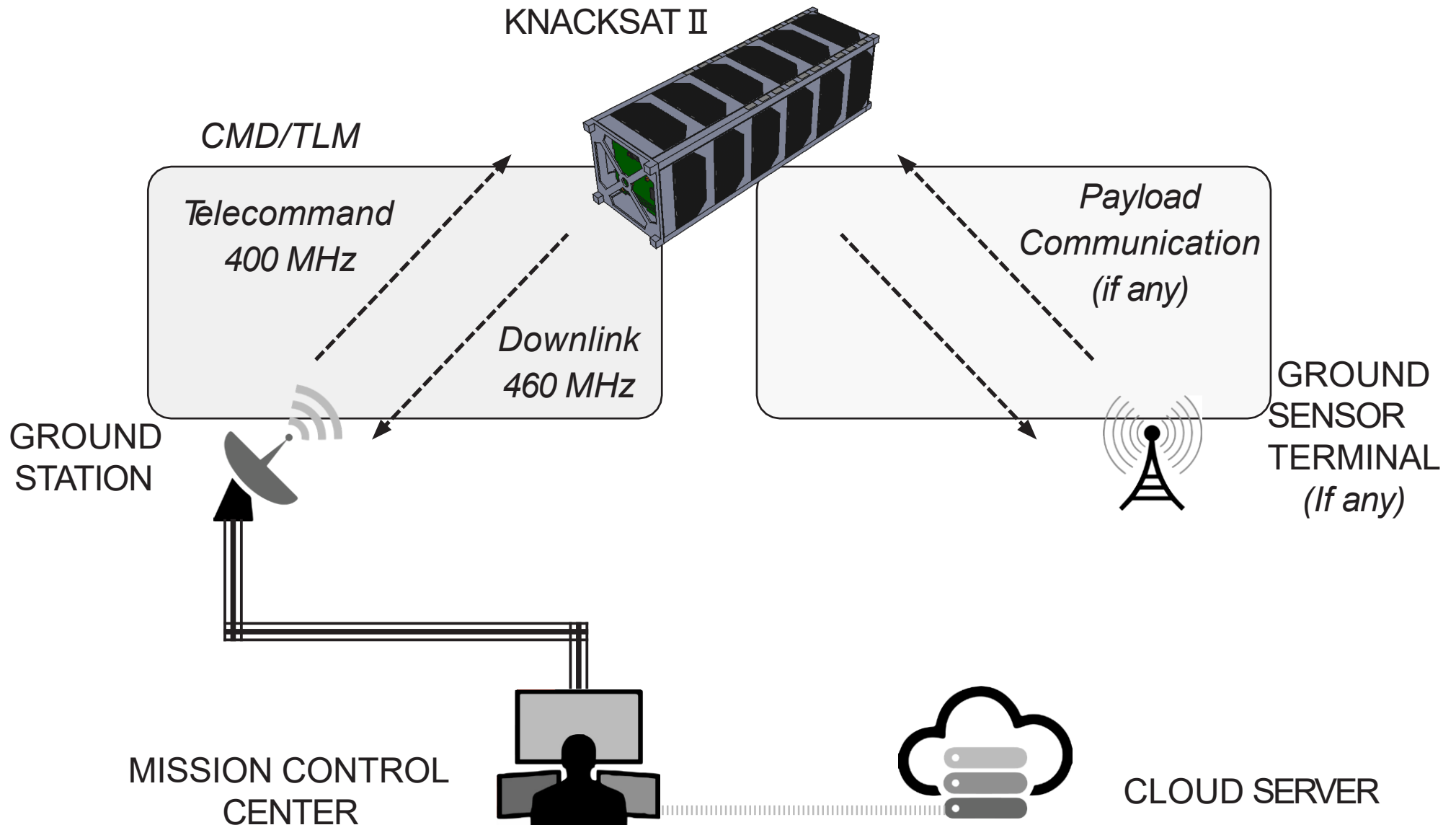


Postman Payload (store & forward)



Chef Payload

Concept of Operation



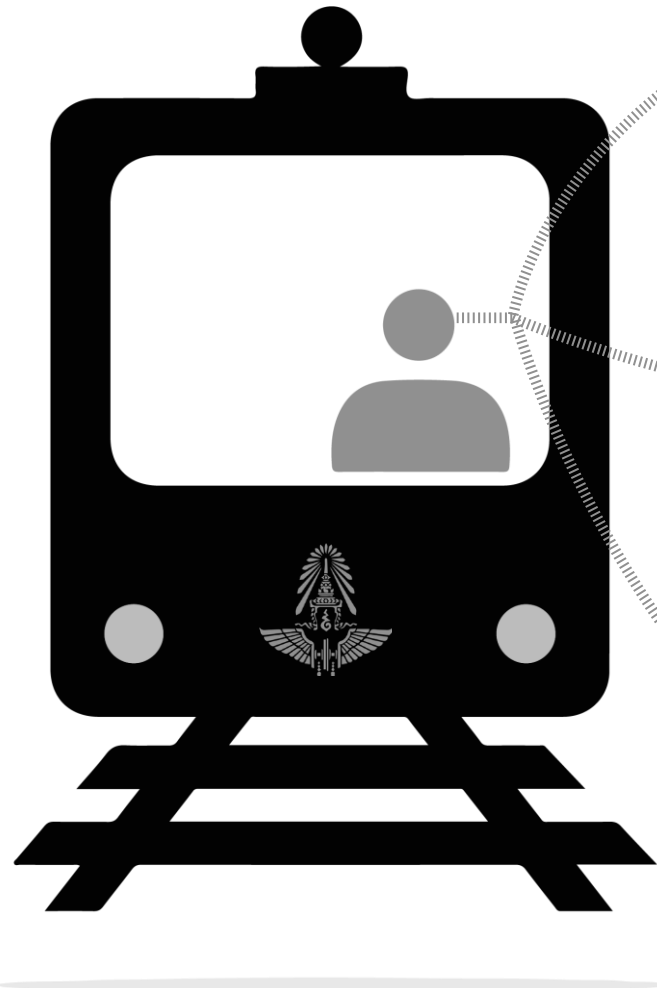
Automatic Packet Reporting System (APRS)

VISUAL INSPECTION

Limited Ranges
(2-3 km)

Inaccurate Speed
(No measurement)

High Risks
*(Dependency on
Driver's Experience)*

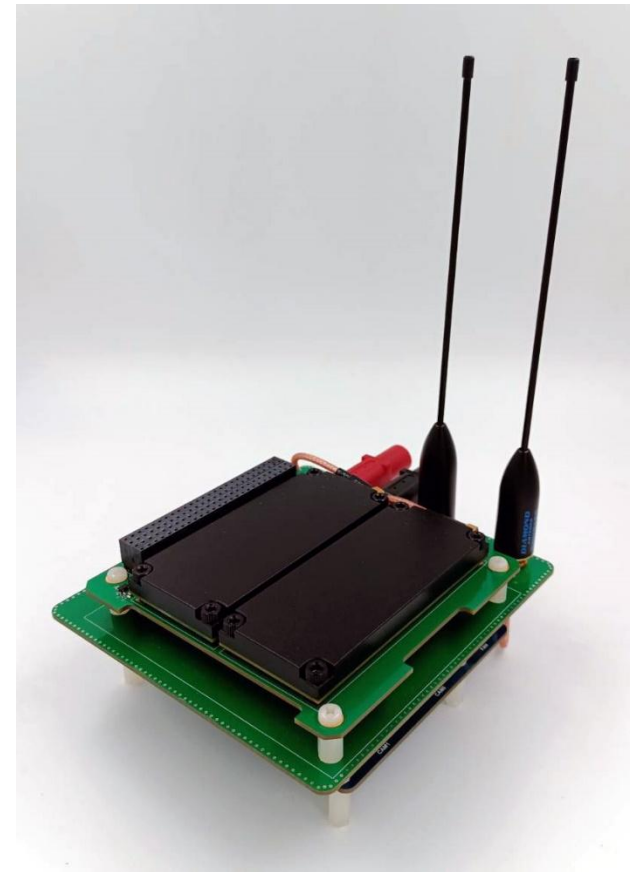




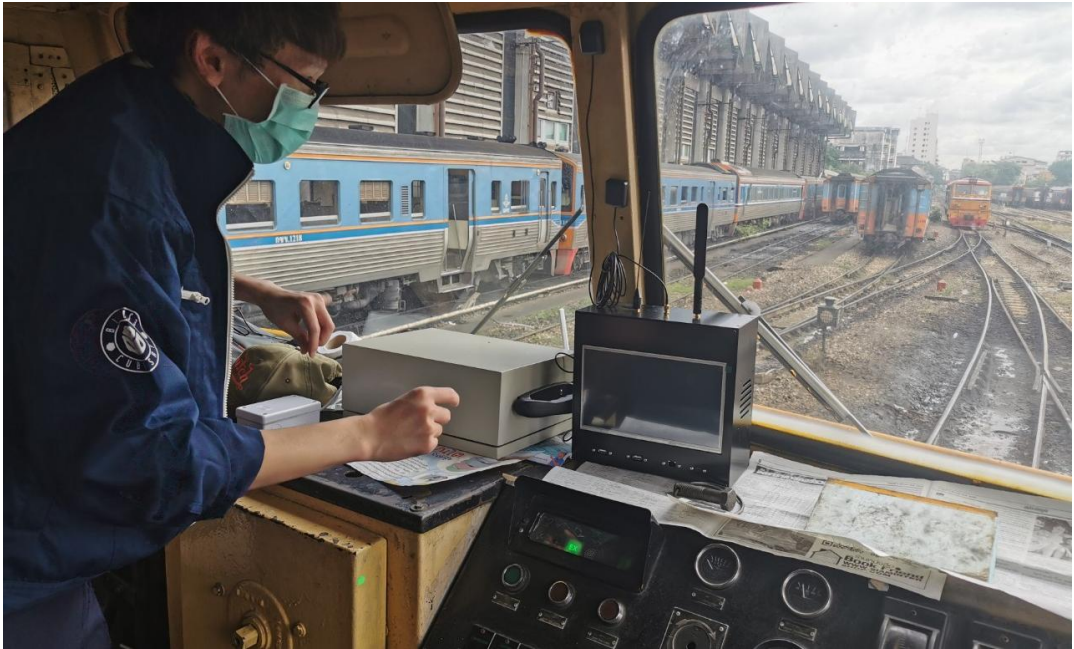
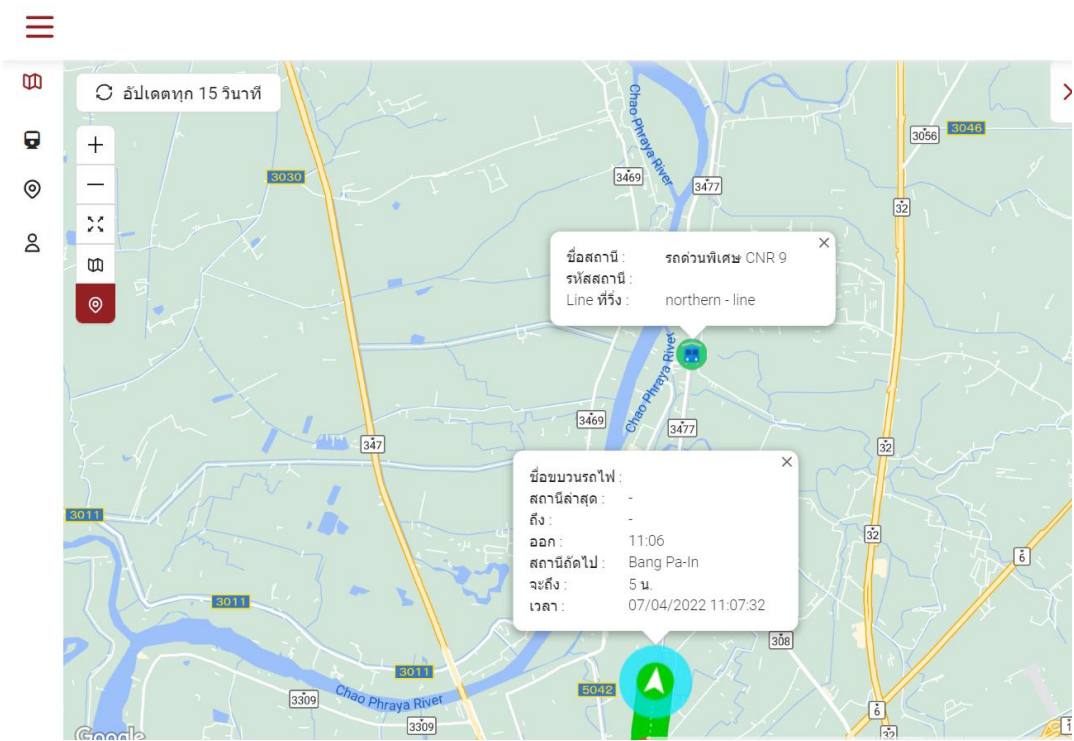
APRS Gateway Station

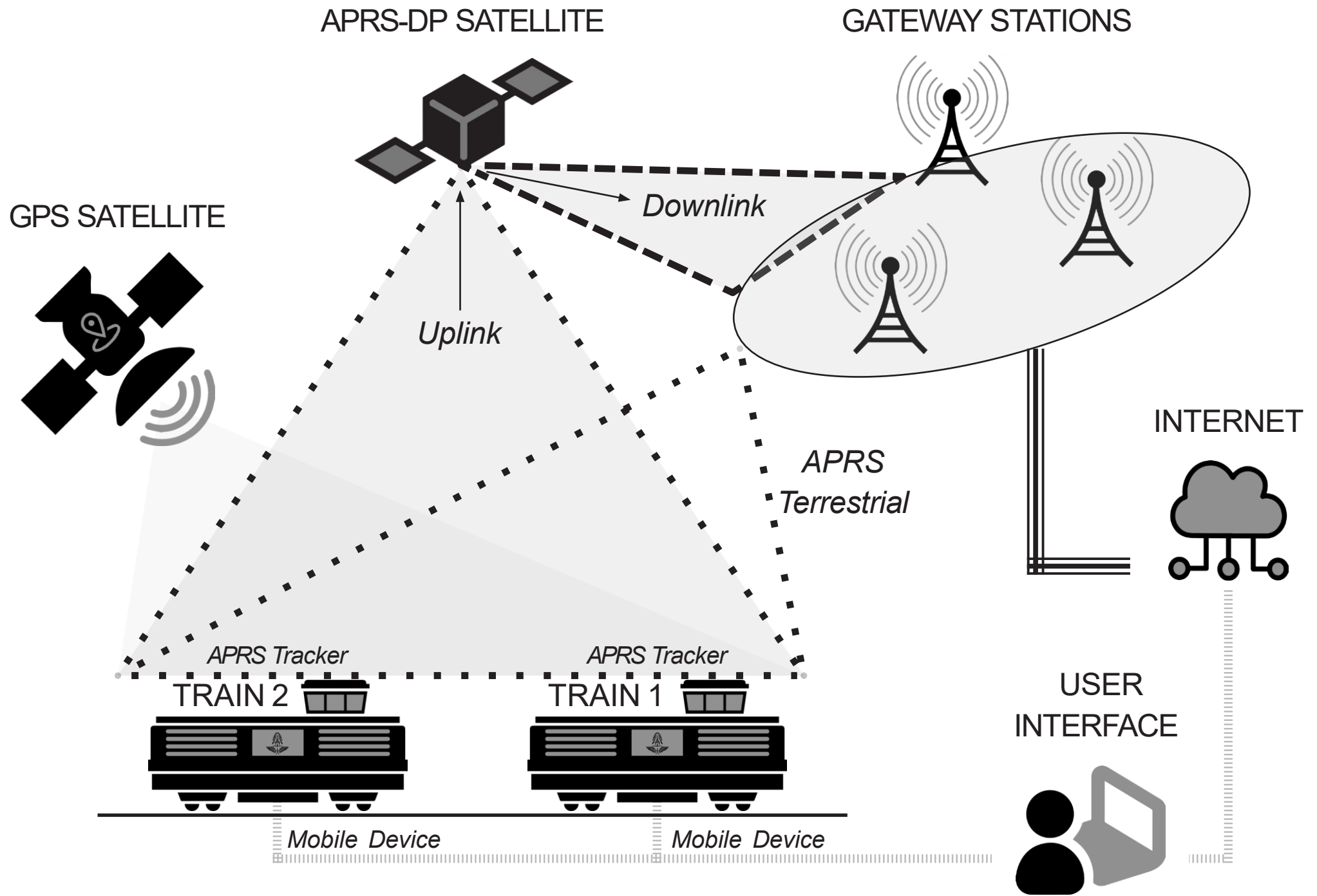


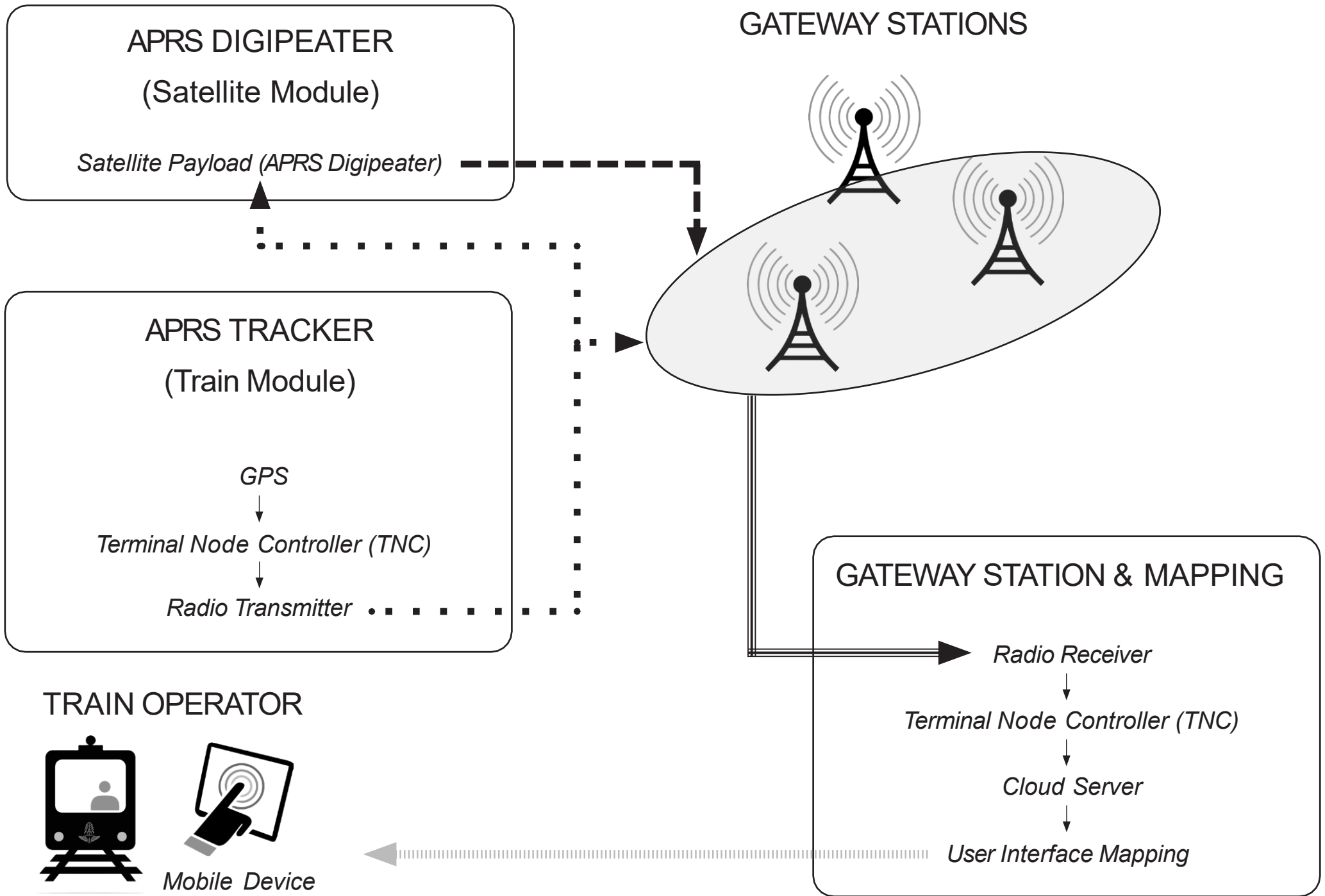
APRS Tracker Module



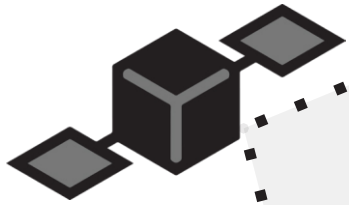
APRS-DP Module



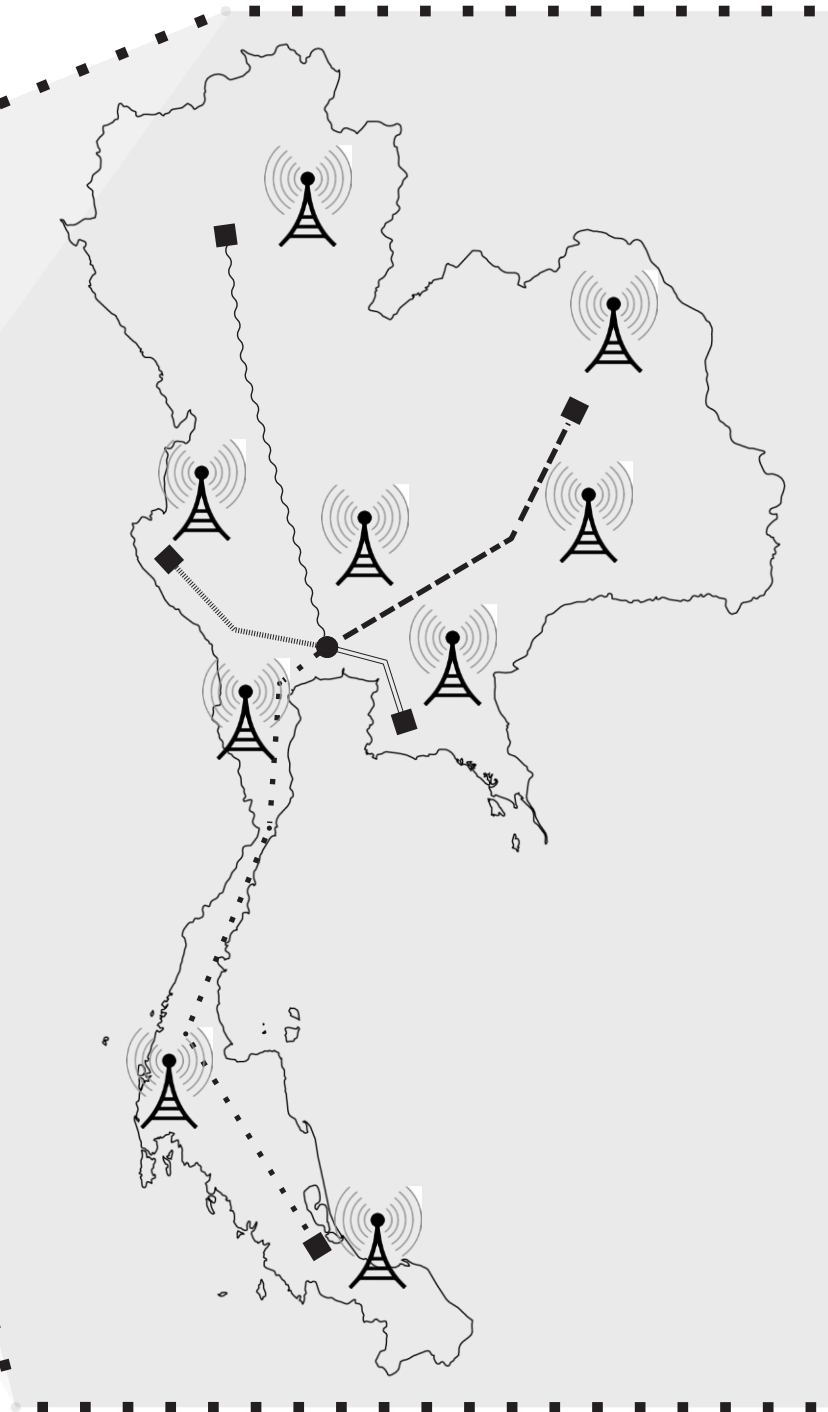




APRS-DP SATELLITE



GPS SATELLITE



ROUTE 1: NORTH
Bangkok - Chiangmai



ROUTE 2: NORTHEAST
Bangkok - Khon Kaen



ROUTE 3: EAST
Bangkok - Rayong



ROUTE 4: WEST
Bangkok - Kanchanaburi



ROUTE 5: SOUTH
Bangkok - Songkhla



สถาบันเทคโนโลยีอวกาศนานาชาติเพื่อการพัฒนาเศรษฐกิจ (สทอศ.)

INSTED

International Institute of Space Technology for Economic Development

Dr. Phongsatorn Saisutjarit **Acting Director**

King Mongkut's University of Technology North Bangkok
1518 Pracharat 1 Rd., Wongsawang, Bangsue
Bangkok 10800 THAILAND
Tel. +66-2555-2000 Ext. 2077
Fax. +66-2587-4350
Email. phongsatorn.s@eng.kmutnb.ac.th