



THE WORLD'S **MOST ADVANCED** DE-ICING SYSTEM BUILT WITH **CEDD®** AIRFIELD GROUND LIGHTING

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MEMPHIS INTERNATIONAL AIRPORT

- Fedex Express global hub (Superhub)
- The Memphis hub is the largest sort facility in the FedEx Express network;
 - 47% of all FedEx volume
 - 69% of U.S. and domestic volume
- Imagine the impact if this process is delayed due to the need for de-icing



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At this moment **commissioning** started for the new **Memphis DE-ICING facility** to be ready for the coming winter





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OPTIMIZING DE-ICING ACTIVITIES (JCAI & TKH)

- Preventing delays in ground traffic: Individual light control for smart guidance to de-icing station ('**Follow-the-Greens**')
- Minimising de-icing time: centralized **de-icing management** (Icelink®) & **control** (Smartpad®)
- Delivering straightforward information to the pilot on the de-icing process: **Electronic Message Boards**





AIRFIELD GROUND LIGHTING REQUIREMENTS

- Fast & reliable control & monitoring (84 sections)
- High availability (minimal failure probability)
- Fast installation
- Energy & CO2 savings
- Safe & easy maintenance





CEDD[®] **AIRFIELD GROUND** **LIGHTING**



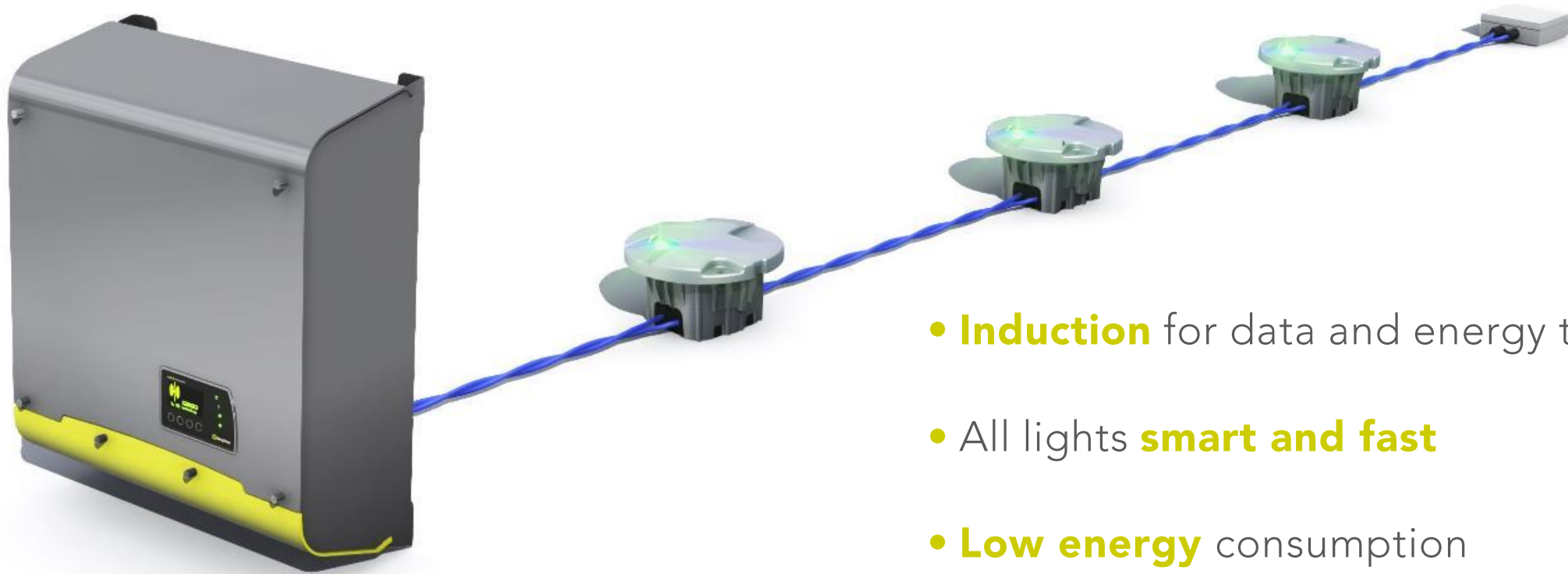


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- Founded in 1930
- **Euronext Stock Exchange**
- € 1.5B turnover / 6,000 employees
- Mission: To create **best-in-class** technologies in the field of Smart Vision, Smart Manufacturing and **Smart Connectivity systems**

- Full range of LED AGL
- CEDD® AGL technology & 6.6 A LED
- Active in AGL since 1969, LED since 2009
- > 150 airports served

CEDD[®] AIRFIELD GROUND LIGHTING SYSTEM



- **Induction** for data and energy transfer
- All lights **smart and fast**
- **Low energy** consumption
(> 40% less compared to 6.6 A LED AGL)
- **Low voltage** (750 V)

CEDD® LIGHTS AND FIXTURES

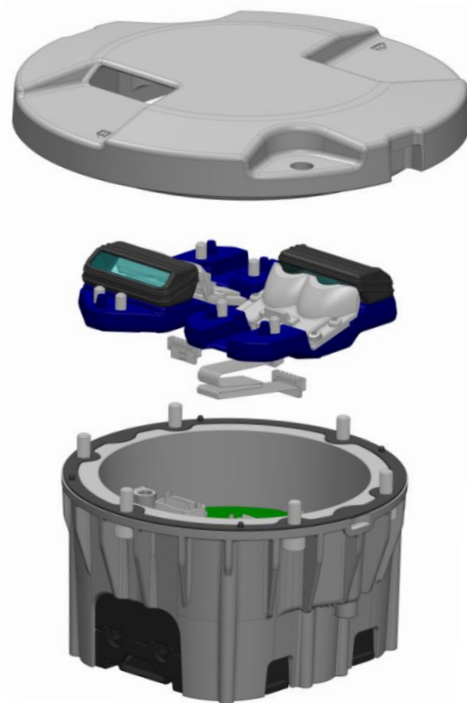
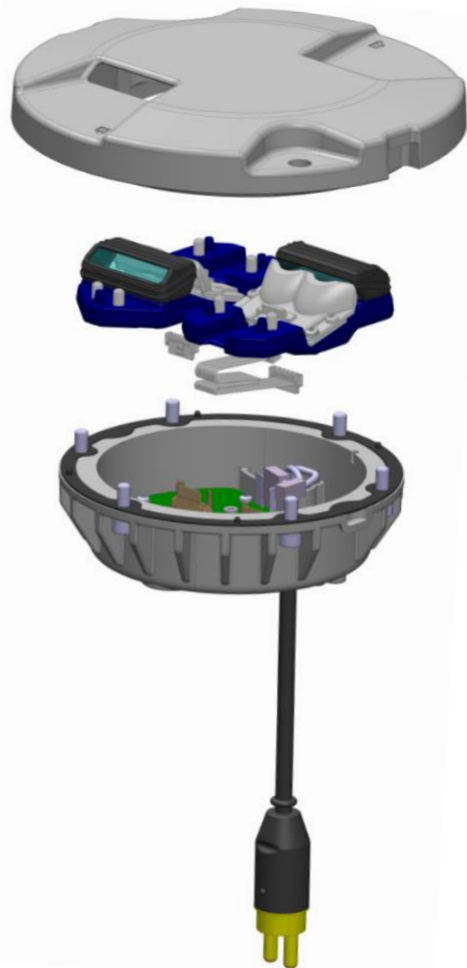


- ✓ **Full portfolio** for runways and taxiways
- ✓ **Rugged** bi-directional communication
- ✓ **Individual** intensity control via commands
- ✓ **Parallel feedback** of fixture status:
<500ms feedback



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CEDD® FIXTURES

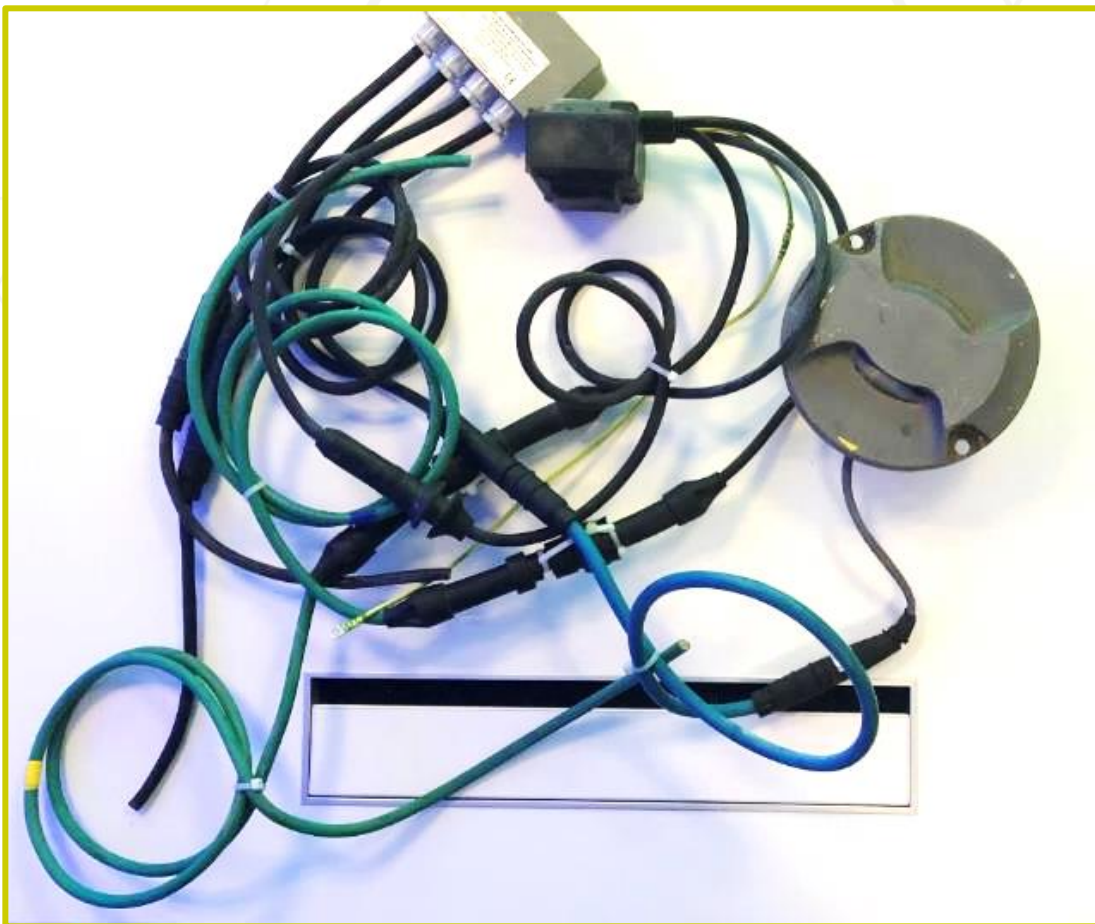


- **Modular** concept, interchangeable parts
- Top part similar to a 6.6 A LED fixture
- **No connectors** : no connector failures
- **No transformers** : no deep cans, no transformer losses
- **No separate ILCMS units**



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LESS COMPLEXITY - **LESS FAILURES** MORE FUNCTIONALITY



- ✓ Powers up to 40 fixtures: **2.3kW**
- ✓ 750 V, 20 kHz out: **low voltage**
- ✓ Redundant **IP Network link** for communication
- ✓ **Built-in web interface** for detailed monitoring

CEDD® **HPS BASESTATION**

Provides power to the CEDD® fixtures and communicates bi-directionally through the CEDD® cable





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- ✓ Reduced EMC interference due to twisted pair configuration
- ✓ Resistant to airport environment
- ✓ Suitable for **sawcut** or **conduit** installation
- ✓ Direct buried variant to save on conduits

CEDD[®] TWISTED PAIR **CABLE**





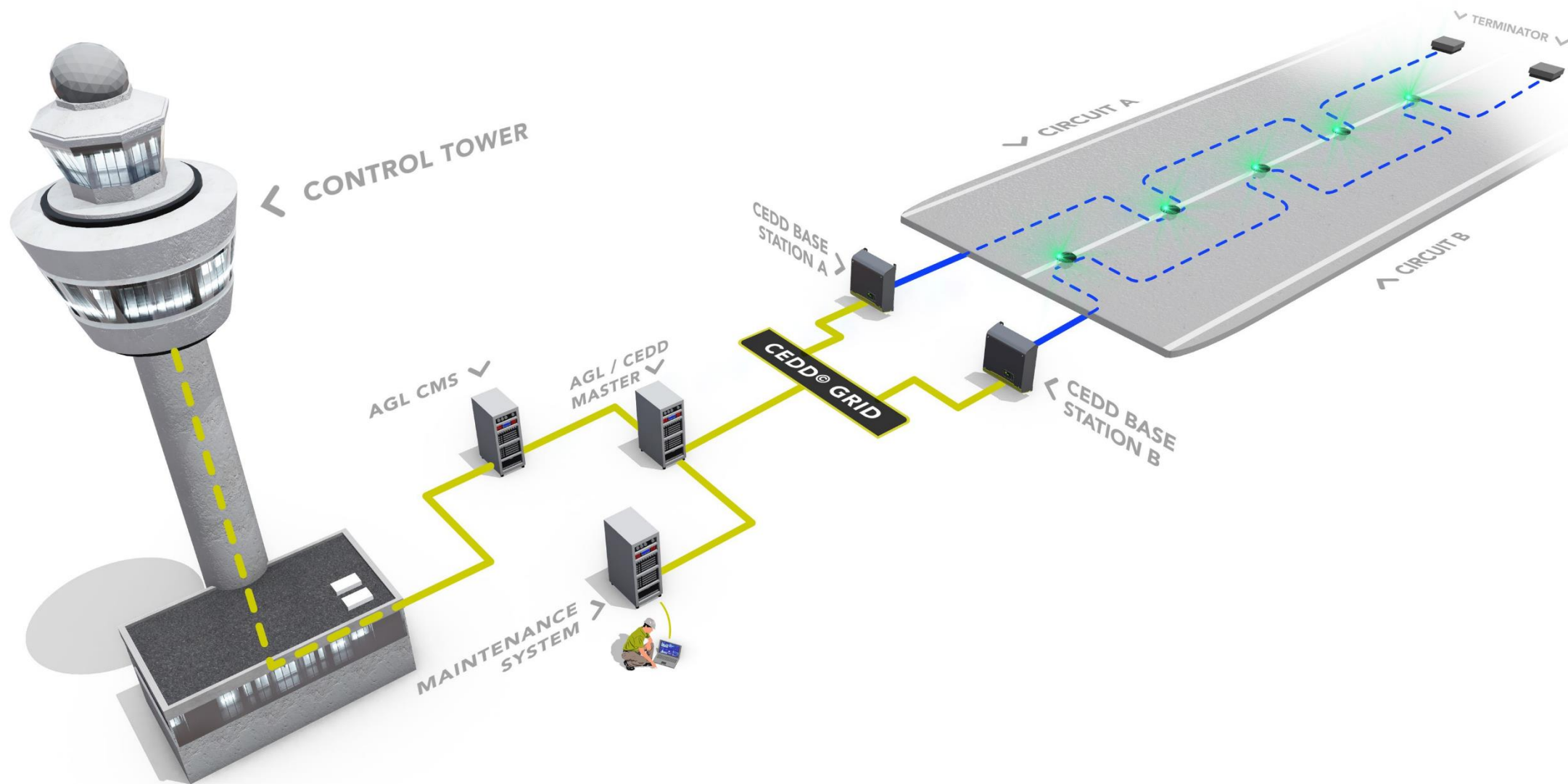
CEDD® **SYSTEM SETUP & INSTALLATION**





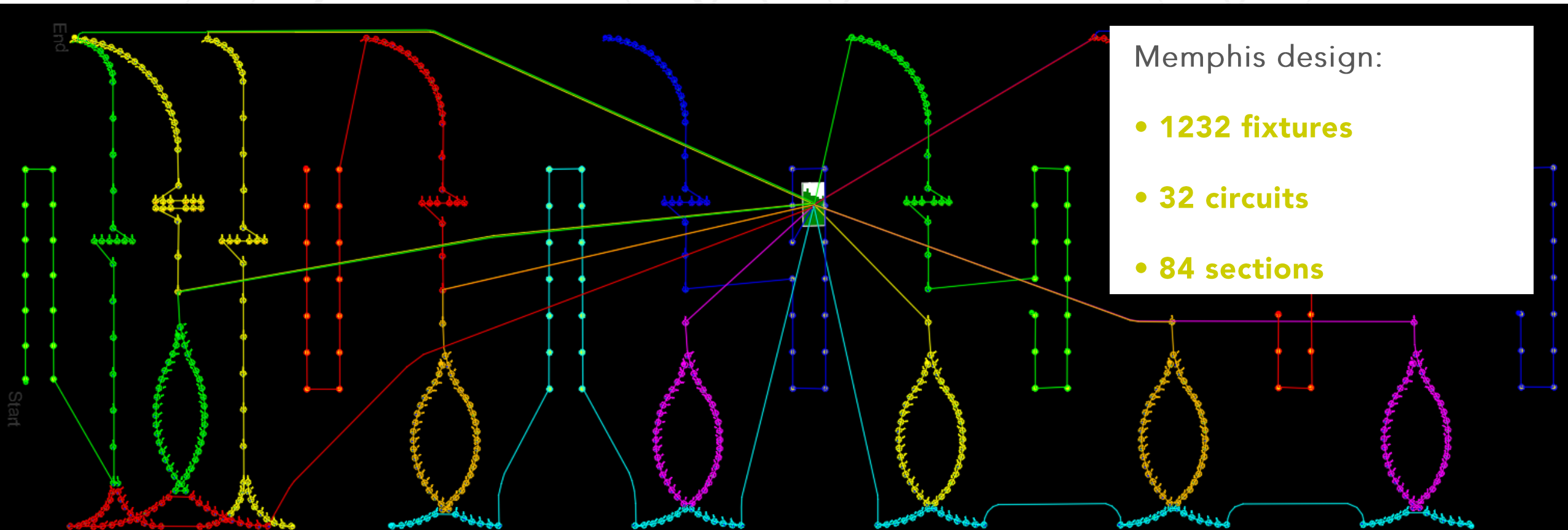
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CEDD® SYSTEM SETUP



CEDD® CIRCUIT DESIGN

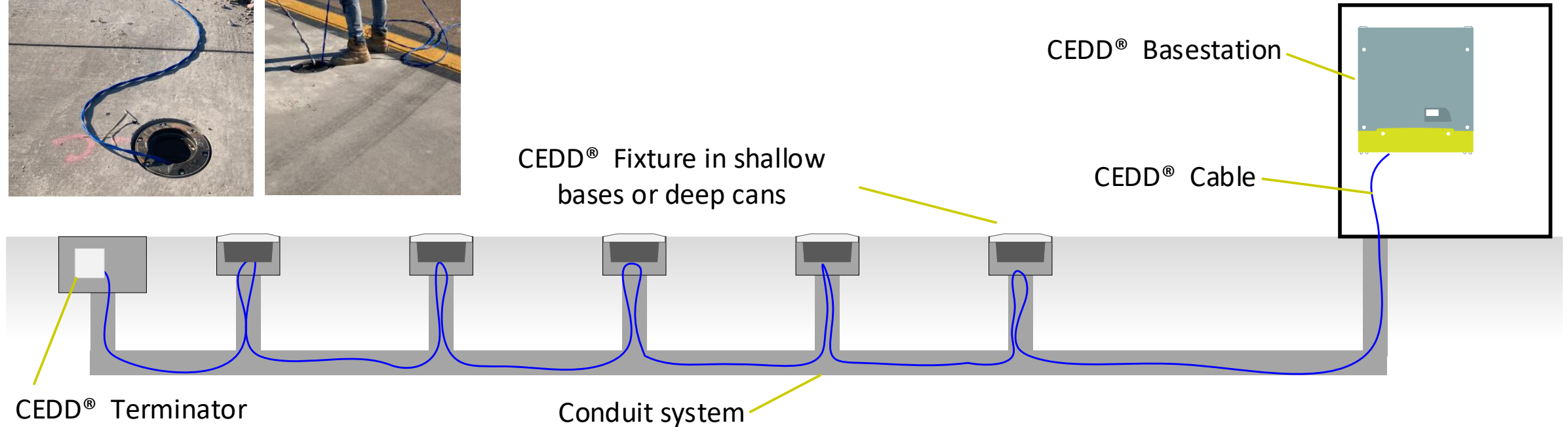
From aeronautical design to CEDD® circuits



CEDD® CABLE INSTALLATION



- **Conduit** installation
- Opportunity to use **shallow bases** instead of deep cans





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CEDD® CABLE INSTALLATION SAWCUT ALTERNATIVE

- **Shallow bases** instead of deep cans
- **No Earthing** required



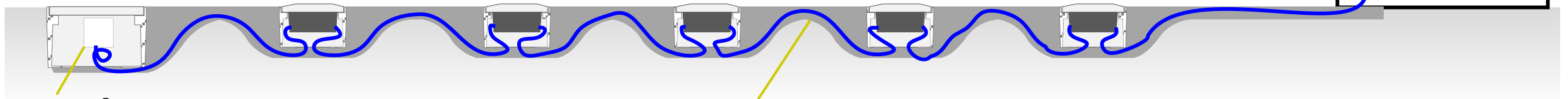
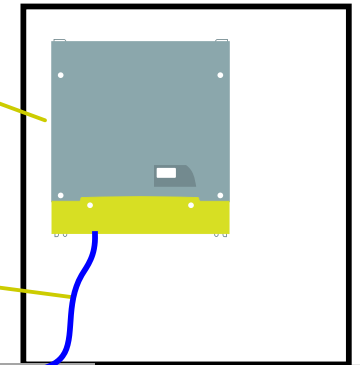
CEDD® Fixture in shallow bases

CEDD® Basestation

CEDD® Cable

CEDD® Terminator
In 12" shallow base

Sawcut in 1st or 2nd layer





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CEDD® FIXTURES

Installation 10x faster than a traditional system



1. Insert cable



2. Connect



3. Go

CEDD® SYSTEM INFRASTRUCTURE

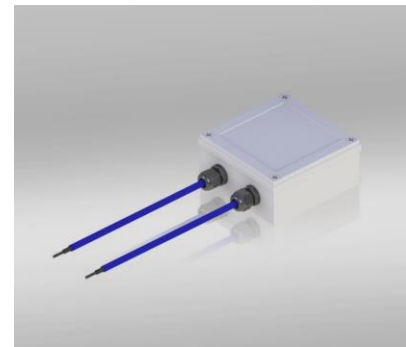
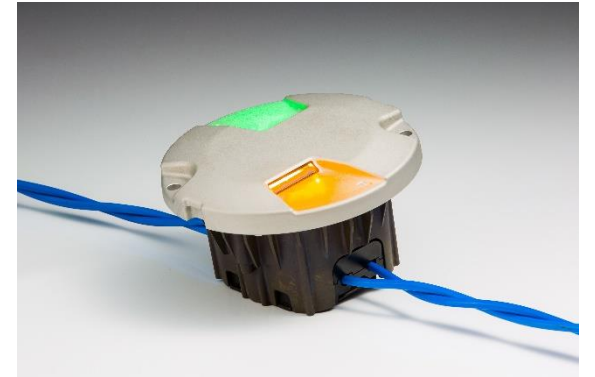
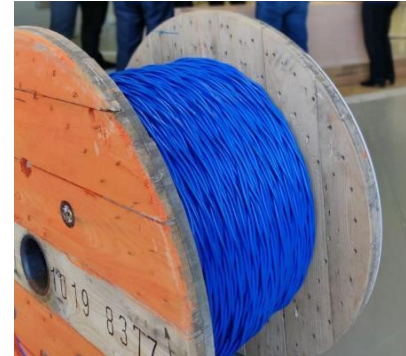
- **Small sized** distribution points closer to the field
- Housing the CEDD® Basestations, network switches, small UPS and airconditioning
- Connected to the main equipment in the tower with an **optical fiber** network



CEDD® ASSETMANAGEMENT

How the CEDD® system will help you to optimize availability

- **Regular maintenance** is similar to conventional AGL, but less components
- **Real time monitoring**
 - Faults in individual fixtures will be real time noticed by the Basestation and reported to ALCMS
 - Faults in Basestations will be real time noticed and reported
- **Assetdata** is gathered from the system to enable preventive maintenance

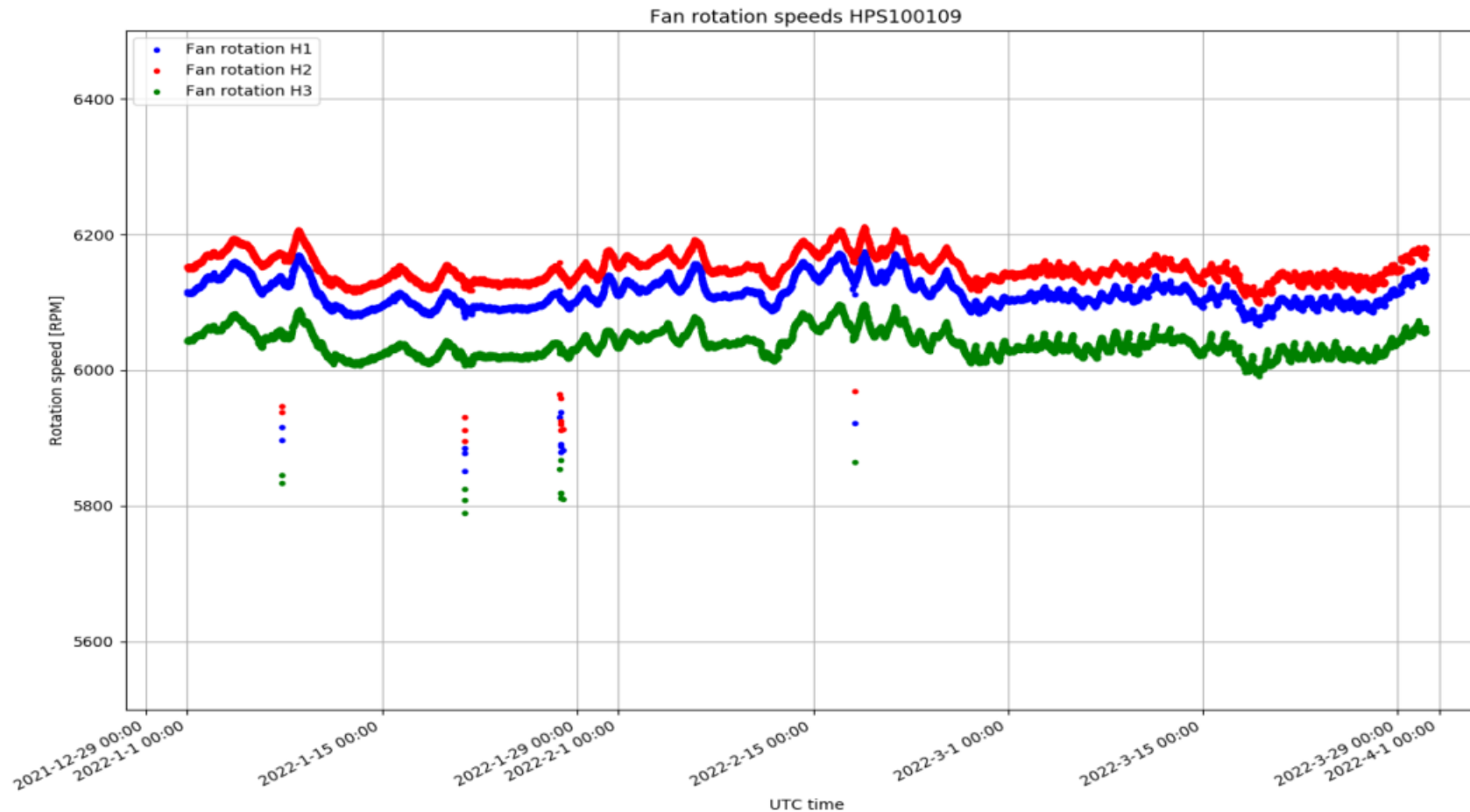




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CEDD[®] ASSETMANAGEMENT

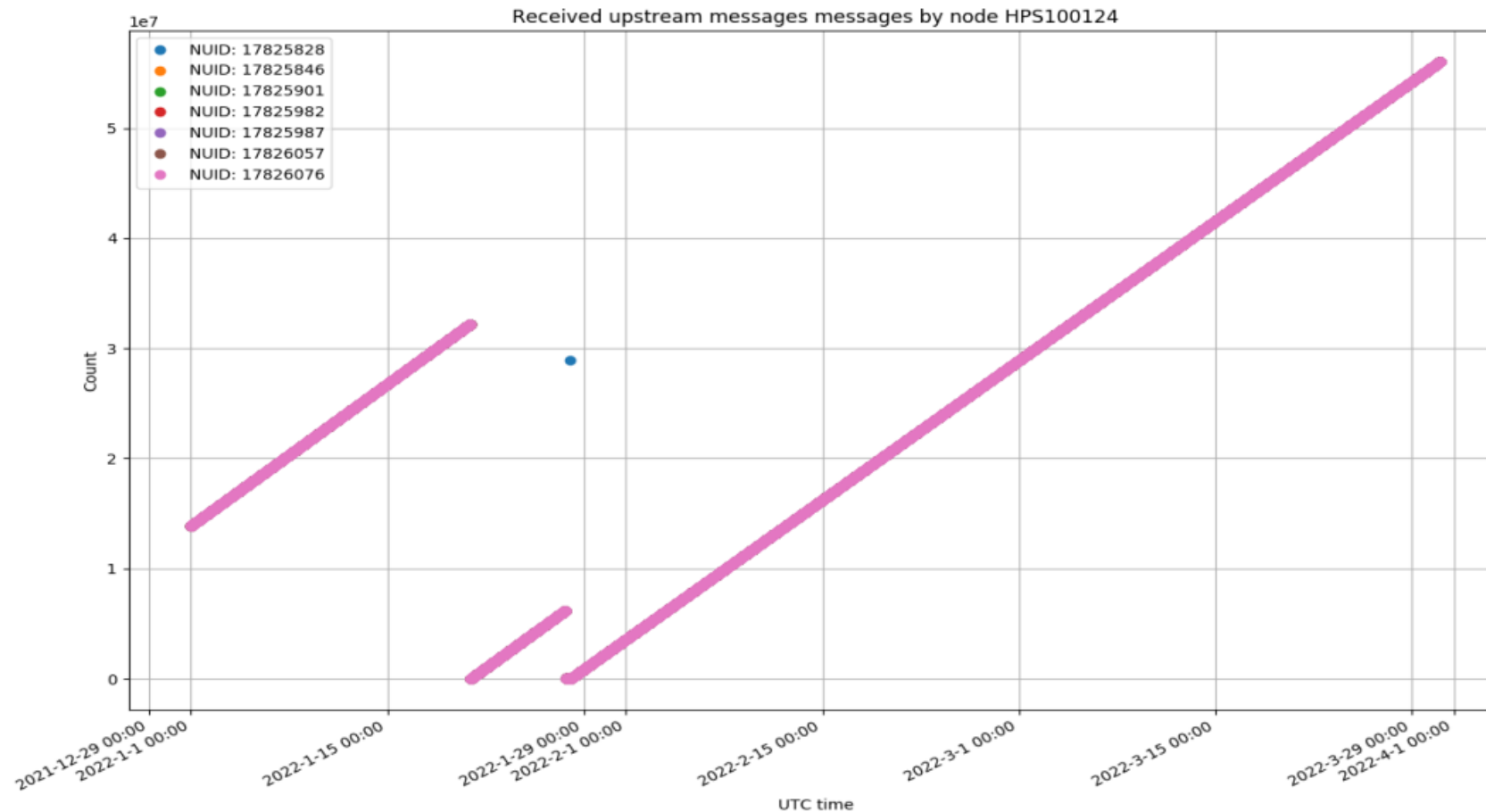
How the CEDD[®] system will help you to optimize availability



- **Fan rotation speeds** indication for fan replacement
- Speed follows **outside air pressure** changes

CEDD[®] ASSETMANAGEMENT

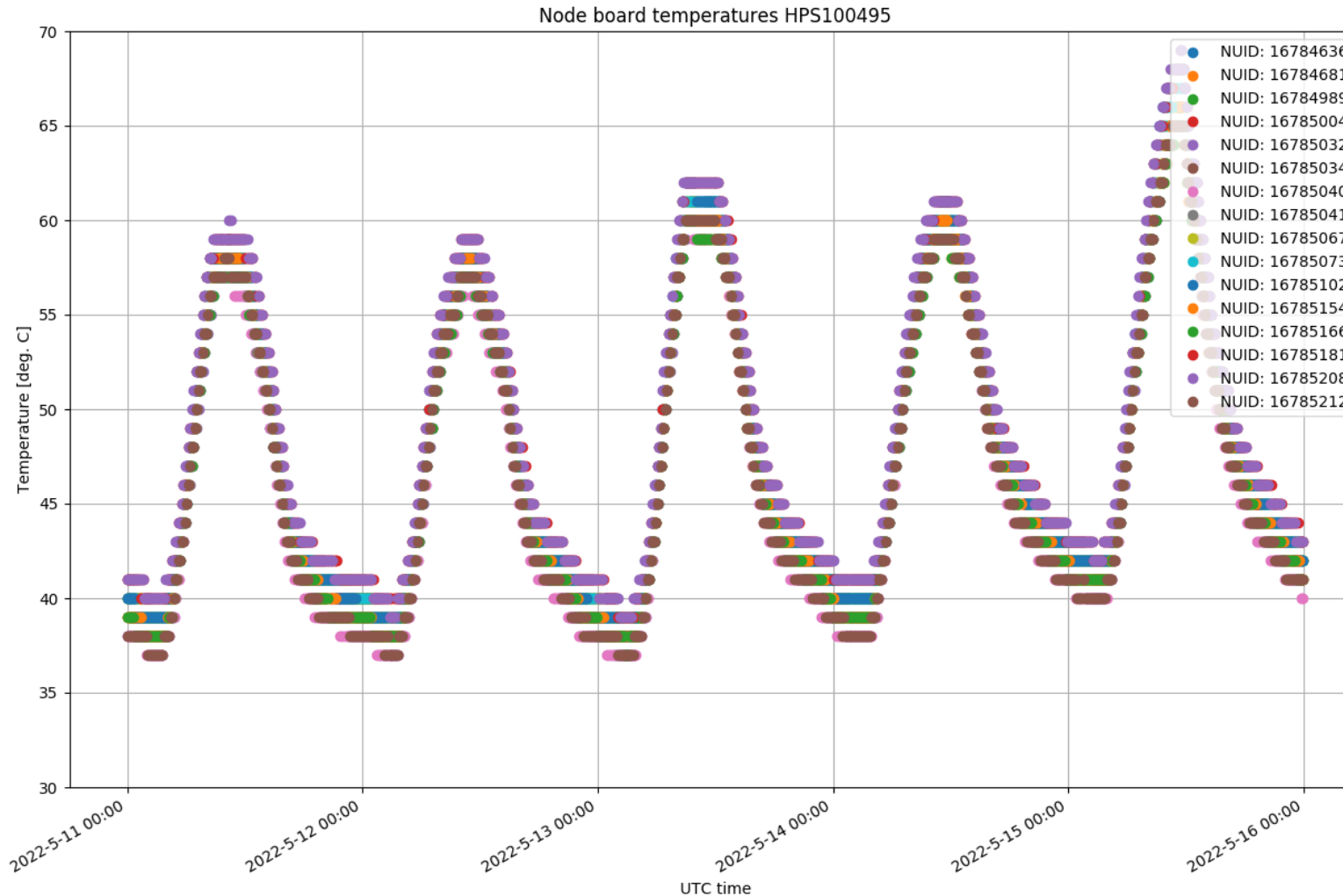
How the CEDD[®] system will help you to optimize availability



- **Received upstream messages**
indication for communication
quality

CEDD[®] ASSETMANAGEMENT

How the CEDD[®] system will help you to optimize availability



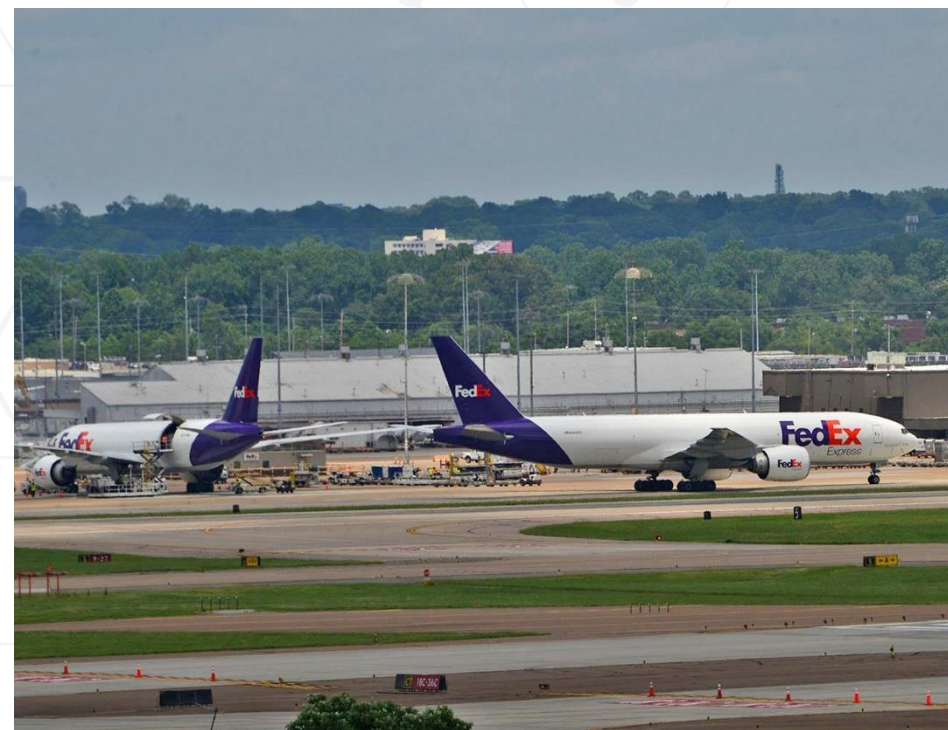
- **Node board temperature** indication for failing fixture electronics
- Temperature follows **outside temperature** (this situation up to 120 degrees Fahrenheit)



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RESULTS FOR MEMPHIS AIRPORT & FEDEX

- ✓ Lower **waiting times** for aircraft
- ✓ **High availability system** with a minimum of maintenance effort
- ✓ Reduced **CO₂ and No_x** emissions
- ✓ **40% lower energy** consumption compared to regular 6.6 A LED lights







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INSTALLED BASE



CEDD INSTALLATIONS

-  Operational
-  Project in progress



QUESTIONS?





THANK YOU FOR YOUR ATTENTION!

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