

Airfield Lighting Control and Monitoring System



Compliance with Standards

ICAO	<ul style="list-style-type: none"> Annex 14, Volume I, (Aerodromes) current edition Aerodrome Design Manual Part 4, 5 and 9 EASA CS-ADR-CSN ICAO Manual of Surface Movement Guidance and Control System, DOC 9476-AN/927 ICAO Manual of Advanced Surface Movement Guidance and Control System, DOC 9830-AN/452
FAA	<ul style="list-style-type: none"> L-890 AC 150/5345-56 (Current Edition). ETL Certified.
Military	<ul style="list-style-type: none"> UFC 3-353-01 par. 15-3

Solutions

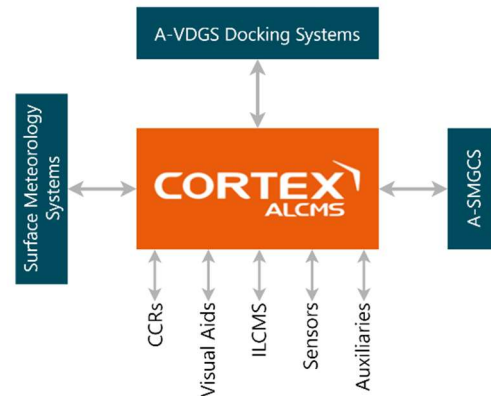
- Airfield Lighting Control and Monitoring System (ALCMS)
- Individual Lamp Control and Monitoring System (ILCMS)
- Advanced Surface Movement Guidance Control System (A-SMGCS)
- Sensor Controlled Incursion Protection System (SCIPS)
- Runway Status Light (RWSL)

Integration with other Airport Systems

- Runway Visual Range System (RVR)
- Automated Weather Observing System (AWOS)
- Docking Guidance System (DGS)
- Deicing Stations
- Instrument Landing System (ILS)
- Multi-Sensor Data Fusion (MSDF)
- Airport Operation Database (AODB)

System Overview

The CORTEX ALCMS enables control and monitoring of airfield ground lighting and other visual aids installed at the airport, providing increased safety of ground operations. The system architecture provides for a wide range of functionalities to support the needs of airport operations and allows for easy integration with the airport systems.

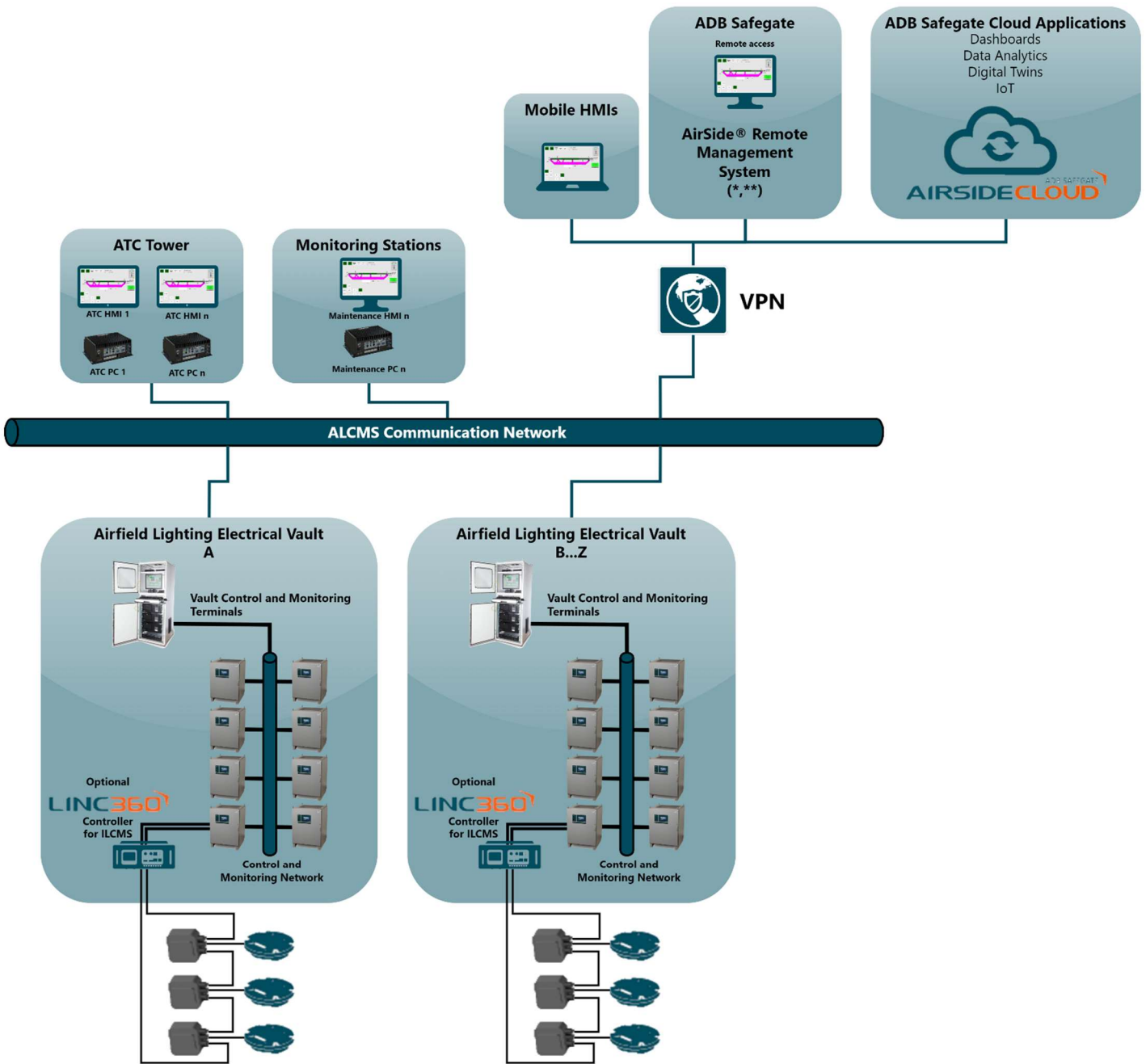


Standard Features

- Provides ALCMS functionality for airports operating from CAT I to III
- Includes more advanced control and monitoring options including ILCMS, sensors and integrations with other airport systems
- Scalable design to support multiple airfield lighting substations with no HMI workstation limitations
- Provides additional operational functions and automations to reduce ATC workload and improve maintenance efficiency

ALCMS Block Diagram

The system architecture will be tailored to fit specific airport requirements.



Airfield Lighting Control

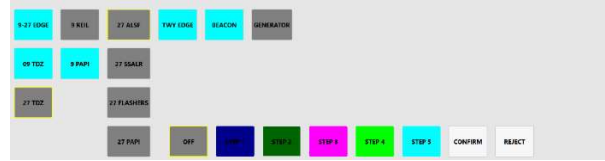
Multiple HMI stations can be integrated within an ALCMS. Each HMI may share control of an airfield or have a specific area of control. Each HMI operates independently of one another and provides complete redundancy for airfield lighting control and monitoring.

- High-definition airfield graphic representation
- High-contrast, anti-glare LCD touchscreen displays



Intuitive User Interface

- Intuitive user interface provides 'pop-up' buttons that lead the air traffic controllers through lighting control tasks
- Highly flexible AGL intensity controls according to weather conditions, runway usage and landing directions
- Activation of general lighting settings using an FAA-compliant preset table per visibility conditions and day, twilight, night parameters

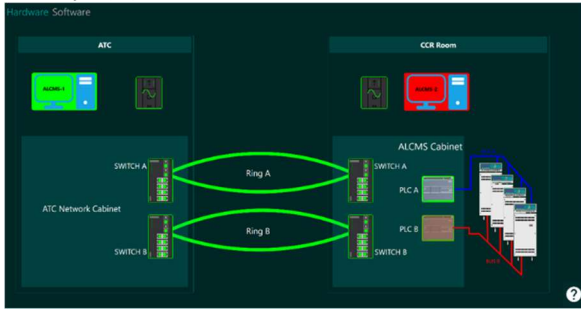


Real-time Status Monitoring

The ALCMS can be enhanced to increase system monitoring and maintenance support by providing detailed real-time status information and alarming from all local or remote workstations. These maintenance options allow for efficient troubleshooting and diagnostics.

System Overview

- Providing status of the ALCMS main components
- Monitoring of computers, backup generators, UPS, and other auxiliary equipment



Equipment Status List

Tabular equipment view providing real-time status of all monitored equipment, including equipment identification, intensity, alarm messaging, equipment monitored values (i.e. voltage, current, lamp fault detection, insulation resistance)

ID	Name	Component	Status	Intensity	AVOL	IOVOLT	PROVOLT	PROVOLT(MHz)
101	LAMP_M0001_1	Lamp	OK	2	340	2000	6000	250
102	L1_S1L_M0001	Relay	OK	2	340	2000	6000	250
103	L1_S1L_M0002	Relay	OK	2	340	2000	6000	250
104	L1_S1L_M0003	Relay	OK	2	340	2000	6000	250
105	L1_S1L_M0004	Relay	OK	2	340	2000	6000	250
106	L1_S1L_M0005	Relay	OK	2	340	2000	6000	250
107	L1_S1L_M0006	Relay	OK	2	340	2000	6000	250
108	L1_S1L_M0007	Relay	OK	2	340	2000	6000	250
109	L1_S1L_M0008	Relay	OK	2	340	2000	6000	250
110	L1_S1L_M0009	Relay	OK	2	340	2000	6000	250
111	L1_S1L_M0010	Relay	OK	2	340	2000	6000	250
112	L1_S1L_M0011	Relay	OK	2	340	2000	6000	250
113	L1_S1L_M0012	Relay	OK	2	340	2000	6000	250
114	L1_S1L_M0013	Relay	OK	2	340	2000	6000	250
115	L1_S1L_M0014	Relay	OK	2	340	2000	6000	250
116	L1_S1L_M0015	Relay	OK	2	340	2000	6000	250
117	L1_S1L_M0016	Relay	OK	2	340	2000	6000	250
118	L1_S1L_M0017	Relay	OK	2	340	2000	6000	250
119	L1_S1L_M0018	Relay	OK	2	340	2000	6000	250
120	L1_S1L_M0019	Relay	OK	2	340	2000	6000	250
121	L1_S1L_M0020	Relay	OK	2	340	2000	6000	250
122	BOC300	Relay	OK	2	340	2000	6000	250

Alarm Log and Reporting

- Operational alarm list providing warning and alarm status of the AGL equipment and system components
- Extensive searching and reporting capabilities
- Alarming tolerances are configurable to adjust sensitivity
- Alarm and event filtering provides flexibility to control which alarms are reported to ATC, maintenance and other users
- Events can be searched and sorted based on date, range of dates, circuit, regulator, reported location and type of alarm
- Information reports can be hard-copy printing or exporting to electronic file

ID	AlarmType	AlarmType	AlarmType	AlarmType	AlarmType	AlarmType	AlarmType	AlarmType	AlarmType	AlarmType	
2022-07-18 09:11:53	Warning	Signal Warning Parity Available	System	Segment	BARA	Segment	BARA	Segment	BARA	Segment	BARA
2022-07-18 09:23:21	Warning	Function Warning Parity OK	System	Function	BARA	Function	BARA	Function	BARA	Function	BARA
2022-07-18 09:23:21	Warning	Function Warning Parity OK	System	Function	BARA	Function	BARA	Function	BARA	Function	BARA
2022-07-18 09:23:21	Warning	CCR in OOD Mode	System	CCR	BARA 14	CCR	BARA 14	CCR	BARA 14	CCR	BARA 14
2022-07-18 09:23:21	Warning	Function Warning Deviation	System	Function	OLEBARA 12	Function	OLEBARA 12	Function	OLEBARA 12	Function	OLEBARA 12
2022-07-18 09:23:21	Warning	Function Warning Deviation	System	Function	OLEBARA 13	Function	OLEBARA 13	Function	OLEBARA 13	Function	OLEBARA 13
2022-07-18 09:23:21	Warning	Function Warning Deviation	System	Function	OLEBARA 14	Function	OLEBARA 14	Function	OLEBARA 14	Function	OLEBARA 14
2022-07-18 09:23:21	Warning	Function Warning Deviation	System	Function	OLEBARA 15	Function	OLEBARA 15	Function	OLEBARA 15	Function	OLEBARA 15
2022-07-18 09:23:21	Warning	Function Warning Deviation	System	Function	OLEBARA 16	Function	OLEBARA 16	Function	OLEBARA 16	Function	OLEBARA 16
2022-07-18 09:23:21	Warning	Function Warning Deviation	System	Function	OLEBARA 17	Function	OLEBARA 17	Function	OLEBARA 17	Function	OLEBARA 17
2022-07-18 09:23:21	Warning	Function Warning Deviation	System	Function	OLEBARA 18	Function	OLEBARA 18	Function	OLEBARA 18	Function	OLEBARA 18
2022-07-18 09:23:21	Warning	Function Warning Deviation	System	Function	OLEBARA 19	Function	OLEBARA 19	Function	OLEBARA 19	Function	OLEBARA 19
2022-07-18 09:23:21	Warning	Function Warning Deviation	System	Function	OLEBARA 20	Function	OLEBARA 20	Function	OLEBARA 20	Function	OLEBARA 20
2022-07-18 09:23:21	Warning	Function Warning Deviation	System	Function	OLEBARA 21	Function	OLEBARA 21	Function	OLEBARA 21	Function	OLEBARA 21
2022-07-18 09:23:21	Warning	Function Warning Deviation	System	Function	OLEBARA 22	Function	OLEBARA 22	Function	OLEBARA 22	Function	OLEBARA 22
2022-07-18 09:23:21	Warning	Function Warning Deviation	System	Function	OLEBARA 23	Function	OLEBARA 23	Function	OLEBARA 23	Function	OLEBARA 23
2022-07-18 09:23:21	Warning	Function Warning Deviation	System	Function	OLEBARA 24	Function	OLEBARA 24	Function	OLEBARA 24	Function	OLEBARA 24
2022-07-18 09:23:21	Warning	Function Warning Deviation	System	Function	OLEBARA 25	Function	OLEBARA 25	Function	OLEBARA 25	Function	OLEBARA 25
2022-07-18 09:23:21	Warning	Function Warning Deviation	System	Function	OLEBARA 26	Function	OLEBARA 26	Function	OLEBARA 26	Function	OLEBARA 26
2022-07-18 09:23:21	Warning	Function Warning Deviation	System	Function	OLEBARA 27	Function	OLEBARA 27	Function	OLEBARA 27	Function	OLEBARA 27
2022-07-18 09:23:21	Warning	Function Warning Deviation	System	Function	OLEBARA 28	Function	OLEBARA 28	Function	OLEBARA 28	Function	OLEBARA 28
2022-07-18 09:23:21	Warning	Function Warning Deviation	System	Function	OLEBARA 29	Function	OLEBARA 29	Function	OLEBARA 29	Function	OLEBARA 29
2022-07-18 09:23:21	Warning	Function Warning Deviation	System	Function	OLEBARA 30	Function	OLEBARA 30	Function	OLEBARA 30	Function	OLEBARA 30

Maintenance & Operations Toolkit Options

Additional maintenance support screens can be designed to provide advanced user-friendly tools for monitoring status of constant current regulators (CCRs), PAPIs and other integrated visual aids. This additional toolkit supports maintenance with corrective and preventative maintenance and detailed fault indication.

Substation Equipment View

- Provides additional information regarding the state of the controlled and monitored AGL equipment using graphical objects and icons
- Enables maintenance to open a detailed object view (pop-up window), by clicking on any of the AGL graphical objects
- Detailed object views contain additional status information about the equipment and a set of tools easing the maintenance activities on the equipment.



Airside Level of Service Dashboard and KPI's

ILCMS monitoring capabilities provide the ability to create 'Level of Service' dashboards to display an airport's entire airside operational status according to current category of operations.

18 - CAT 1	RWY18-36	36 - CAT 2
Approach 18 : On Estimated Service Level: 96 % Lamps Out: 2 of 51	Runway Edge : On Estimated Service Level: 100 % Lamps Out: 0 of 126	Approach 36 : On Estimated Service Level: 100 % Lamps Out: 0 of 166
Runway CL : On Estimated Service Level: 98 % Lamps Out: 3 of 244	Runway End : On Estimated Service Level: 100 % Lamps Out: 0 of 12	Sidewalk 36 : On Estimated Service Level: 98 % Lamps Out: 1 of 62
Threshold 18 : On Estimated Service Level: 100 % Lamps Out: 0 of 16	Stopbars : On Lamps Out: 0 of 40	Runway CL : On Estimated Service Level: 98 % Lamps Out: 3 of 244
	Equipment Status No Server Backup	Threshold 36 : On Estimated Service Level: 100 % Lamps Out: 0 of 26
		TDZ 36 : On Estimated Service Level: 99 % Lamps Out: 1 of 180

ILCMS Integration

The CORTEX ALCMS can optionally be enhanced with our LINC 360 to create an Individual Lighting Control and Monitoring System (ILCMS) that provides the ability for controlling and monitoring individual runway lights, taxiway centerline lights and stop bars. The main LINC 360 components include:

LINC 360 Controller

Located on the output of the CCR, it controls and monitors individual Remotes or Axon EQ fixtures with powerline communications using the existing airfield series circuit cabling (powerline). For more information, see the LINC 360 data sheet on our website product center.



LINC 360 Remote or Axon EQ Fixtures

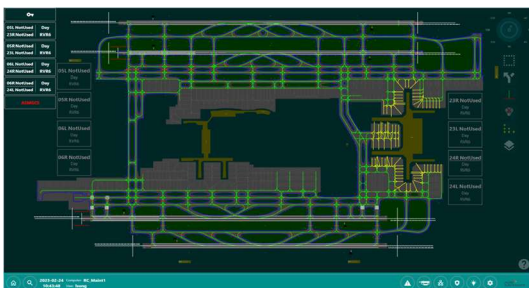
AGL fixtures requiring individual control and monitoring can be connected to a **LINC 360 Remote** or the lights can be pre-equipped with the integrated LINC 360 with the **Axon EQ fixtures**.



A-SMGCS Ready

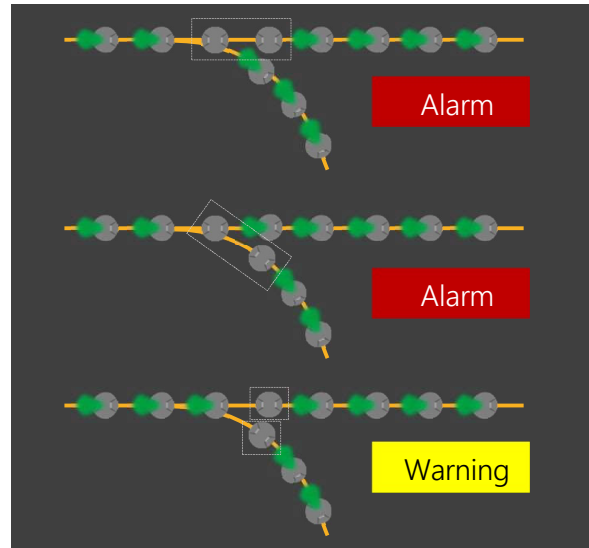
The addition of an ILCMS provides even greater control and monitoring capabilities typically needed as part of an airport's Advanced Surface Movement Guidance and Control System (A-SMGCS). This allows for the design of...

- Dynamic routing and visual guidance along taxiways for automated taxiing procedures, increased safety and throughput
- Stop bar and interlocked taxiway lead-in lighting control with automated stop bar reset via timer, field sensors or surveillance
- Follow-the-Green (FtG) and other advanced operations
- Enhanced operational awareness with the display of track position and flight information labels based on a Multi-Sensor Data Fusion (MSDF) input



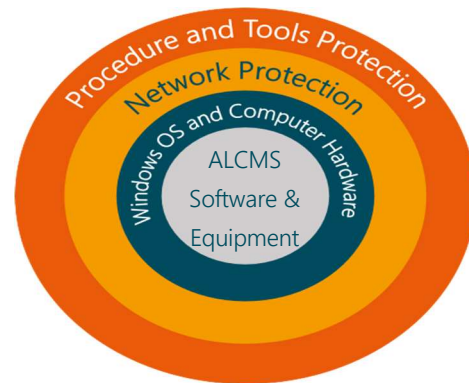
ILCMS Advanced Monitoring

The ILCMS provides advanced individual fixture monitoring allowing airports to comply with all international aerodrome maintenance and monitoring regulations for both fixture serviceability percentage and adjacency monitoring requirements. The system can detect adjacency and critical pattern outages for runway and taxiway circuits that standard lamp fault detection (LFD) monitoring cannot determine.



Cybersecurity

Designed to mitigate cyber threats, proactive measures are taken at all levels of the ALCMS design. Based on an airport's risk assessment, customized cybersecurity solutions can be optionally implemented to protect the ALCMS infrastructure and software against the identified risk.



- **Network Security:** Segmentation, segregation, whitelisting, disabling of unused ports, routers and VPN for external connection,...
- **Hardening of Endpoints:** Firewall, antivirus, blocking of USB, ...
- **User Access Protection:** Login based access, role-based functionalities, event logs, domain controller
- **Data Encryption:** Encryption of communication data, configuration files and more

For more information about the product, please see the Product Center on the ADB SAFEGATE website:
www.adbsafegate.com.

Product specifications may be subject to change, and specifications listed here are not binding. Confirm current specifications at time of order.

Product Part Number Structure

The following Part Number Structure is used to identify Cortex ALCMS products:

ALCMS System-Level Codification:

ALC-XXXXXXXX-Y

- **XXXXXXXX** = Project Number assigned by ADB SG
- **Y** = Compliance with Regulation:
 - **F** = Certified FAA L-890 ALCMS
 - **I** = Compliant with ICAO Publications

ALCMS Nodes Codification:

ALC-XXXXXXXX-ZZZNN

- **XXXXXXXX** = Project Number assigned by ADB SG
- **ZZZ** = Node denominator / location
 - **TWR** = Control Tower
 - **VLT** = Electric Vault
 - **MNT** = Maintenance Center
 - **OPS** = Operations Center
 - **RMT** = Roaming Maintenance
 - **OPT** = Optional
 - **SPR** = Spare Parts Kit
- **NN** = Node designator #