



Cielo™ ULD Movement Control Module



Manage and control all your ULD movements automatically
in your air cargo terminal.

This module, part of the Cielo™ air cargo software suite, controls ULD movements effortlessly and hassle free. The user loads the ULD and enters the data, after which Cielo coordinates the vehicles and conveyors to ensure the ULD reaches its destination.

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AIR CARGO SYSTEMS SPECIALISTS

Cielo™ ULD Movement Control Specifications

EQUIPMENT

Powered Conveyors
Elevating Transfer Vehicles (ETVs)
Transfer Vehicles (TVs)
Shuttles

COMMUNICATION

CIELO Terminal(s) to CIELO Server

CONTROL

Automated facility

USER INTERFACE SCREENS

ULD Arrival
ULD Retrieval
ULD Retrieve Empty
RFS Graphical Display
CSS Graphical Display

Coordinates and controls all ULD movements

A ULD must be 'Entered' by an operator at a system entry point. Once this is done CIELO then begins to issue commands to move the ULD along the conveyors and through vehicles to get to its destination. All automatic movements are initiated by CIELO. Once the ULD has been 'Entered' the operator's attention is no longer needed and can work on the next ULD. All routing decisions, paths to take, vehicle to use are made by CIELO.

Controls multiple vehicles on the same set of tracks

CIELO coordinates vehicles who service the same area. In order to process multiple commands quickly, CIELO will coordinate vehicle movements between two or more vehicles. Allowing the vehicles to work together and at the same time. For example; one vehicle dropping off a ULD for pick up by a second, or two vehicles moving towards each other each one processing a separate command.

Tracks ULDs through the cargo facility

Whenever a ULD moves onto or off of an automatic piece of equipment, there is a message sent to CIELO. This ensures that all cargo movements are controlled and tracked all of the time.

Changes routing of ULDs in motion in response to cancelled/revised commands

If a ULD is in motion it does not have to arrive to its destination (ie: Storage location) before another command for it can be issued and processed. For example, when a ULD is en route to storage and a request for breakdown is issued. CIELO will reroute the ULD.

Optimizes ULD routing

When CIELO determines a route for a ULD, it assures that it will not block any other ULD. Crossing point decks and vehicles are kept clear and only used for transferring; never for queuing.

Manages redundant paths

Depending on the facility, CIELO can control multiple routes within the cargo building. Availability and load factors will determine which path CIELO selects for a unit. For the case when the primary path is blocked, CIELO would direct units through the secondary or tertiary paths.

Communicates with individual machine-control PLCs and 3rd party controllers

CIELO sends commands and receives conformation messages from the PLCs on the network. Messages are also received from the automatic equipment as to the precise state of the machinery.

Performs a large number of error checking and handshaking with PLCs for alarm and fault messages

An error message is created when the PLC has a problem, the message is sent to CIELO notifying that the PLC is unable to process the command. This would typically be an electro-mechanical fault defined at the PLC level. The purpose of the message is to notify operators of a problem and allow CIELO to stop automatic movement and redirect other ULDs or Roll Boxes around the faulted piece of equipment.

