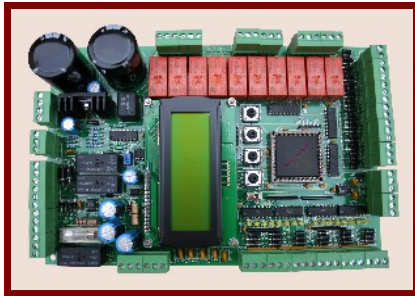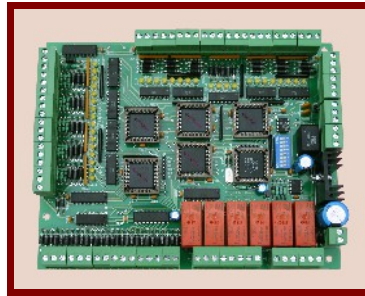# ELEVATION DISTRIBUTED LIFT CONTROL SYSTEM

ElevationBase Unit

ElevationCar Unit

ElevationFloor Unit

The Elevation lift control system consists of a number of distributed board-level units which are organized in a EIA(RS)485 multidrop network and process the lift installation inputs in controlling the overall lift operation. It consists of the following units:
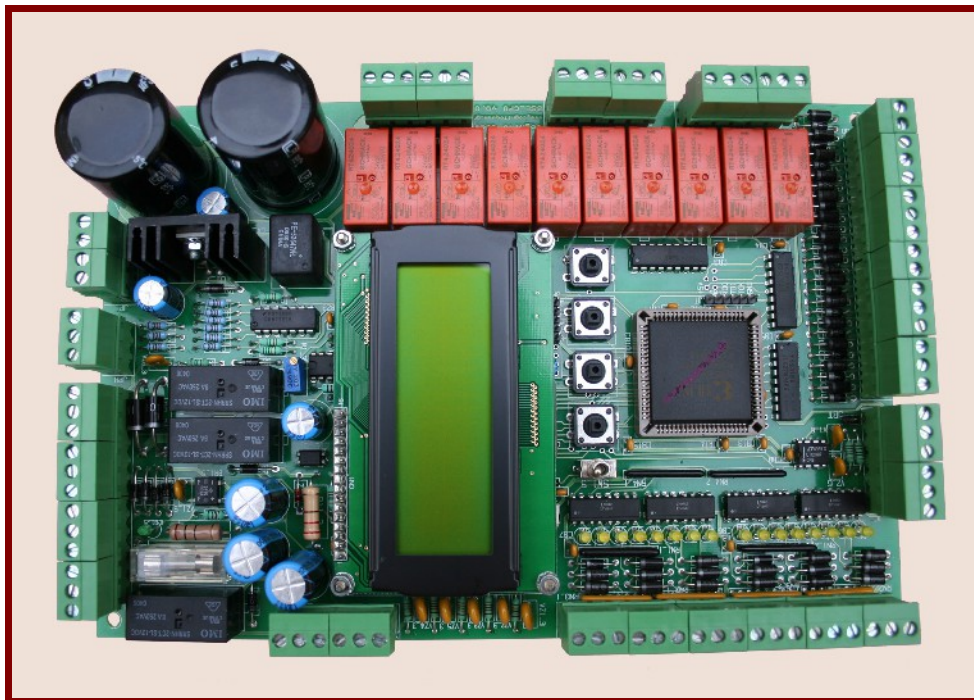
- The machine room unit (ElevationBase) which handles safety and local automation in controlling lift motion and car door operation. In addition it controls system back-up and car evacuation operations in the absence of line power.

- The car unit (ElevationCar) which processes and communicates all car signals and transport demands to the ElevationBase unit and controls car door, fan and light activity.

- The floor unit (ElevationFloor) which processes and communicates all floor level signals and transport demands to the ElevationBase unit and controls the floor level indication and call activity.

All system inputs are fully protected against overvoltages and reverse polarity connection. Each input signal is processed by a noise rejecting DSP filter and its logic state (positive/negative logic) is specified at the unit operation parameters.

All 24 VDC outputs are protected against overvoltages, reverse polarity connection, reverse load current and inductive spikes.

System Attributes	
Car location	The car position is determined after decoding the 4 predefined inputs at either the ElevationBase or the ElevationCar unit. The decoding is performed under various protocols which are selectable from the operation parameters. Car position at start-up is initialized as a homing manouvre at the upper or lower travel ends as specified by the operation parameters.
Call management	System call management is fully parametric and programmable. The call service policy and the sound and visual floor announcements are set from the operation parameters. The current version (v0.r0) features the following call service policies: • Floor to floor, bidirectional call and service, no intermediate stops. • Floor to floor, bidirectional call and service, with intermediate stops. • Floor to direction service, bidirectional call, no intermediate stops. • Floor to direction service, bidirectional call, with intermediate stops. • Ascending service only. • Descending service only. The serviced floors and call sources are specified and activated by the operation parameters.
Motion control	The motion characteristics and the car speed command are specified for each floor for both lift types (mechanical/hydraulic). In addition, the approach and decelaration speed is specified for each floor as well as the number of floors required to stop the car. A post-stop hydraulic pressure release delay is also programmable via the parameters.
Maximum number of floors, future additions	The maximum number of managed floors is 63. Current development work is addressing the coordinated operation of mechanically independent lifts and car location with position encoders.

The ElevationBase machine room unit

The ElevationBase machine room unit

The ElevationBase machine room unit consists of the following subsystems:

- 5 110 VAC safety signal inputs: end travel, shaft emergency stop, floor doors, car door and door latch. The signals are processed by the DSP noise filter and checked for logic integrity.

- 16 24 VDC NPN (active low) predefined inputs: car location, maintainance manouvres, motor thermal protection, external events (earthquake, fire alarm), car full-load and overload condition and, correct motion contactor operation. Each input state is indicated by a dedicated LED.

- Line undervoltage and phase integrity/sequence monitor.

- 10 NO ("Normally Open") 12 A predefined contact outputs: door latch, general motion, motion up, motion down and 4 speed types. Depending on the lift type the 4 speed types are decoded as mechanical ¨slow¨, ¨fast¨, ¨other¨ and ¨maintaince¨ speeds or hydraulic ¨up slow¨, ¨down slow¨, ¨up fast¨ and ¨down fast¨ types.

- 14 predefined 24 VDC, 0,5 A peak, PNP, active high outputs: 6bit position, ascend, descend, alarm, sound gong, fault, ready condition and spare.

- Unregulated 24 VDC power supply, with up to 10 A available for external 24 VDC loads.

- Internal 5 VDC switching power supply, back-up and car evacuation battery charger and battery commutation and car evacuation control in the absence of line power.

- Microprocessor based controller featuring system parameter memory, real time clock, event log, 4x20 character LCD display, operator input with 4 tactile switches and one enabling lever switch and EIA(RS)485 serial communication port.

The ElevationBase unit communicates with the ElevationCar and ElevationFloor units and performs the lift manouvres as required by the received calls, the selected call service policy, the various installation devices state and the activation of external event alarms.

Connections to the unit are made with removable terminal blocks.

The ElevationCar unit

The ElevationCar unit processes the locally available car signals, communicates them to the ElevationBase unit and controls the overall operation of up to two car doors.

Car call management is performed locally under the supervision of the ElevationBase unit. The number of managed calls is expandable with additional ElevationCar units.
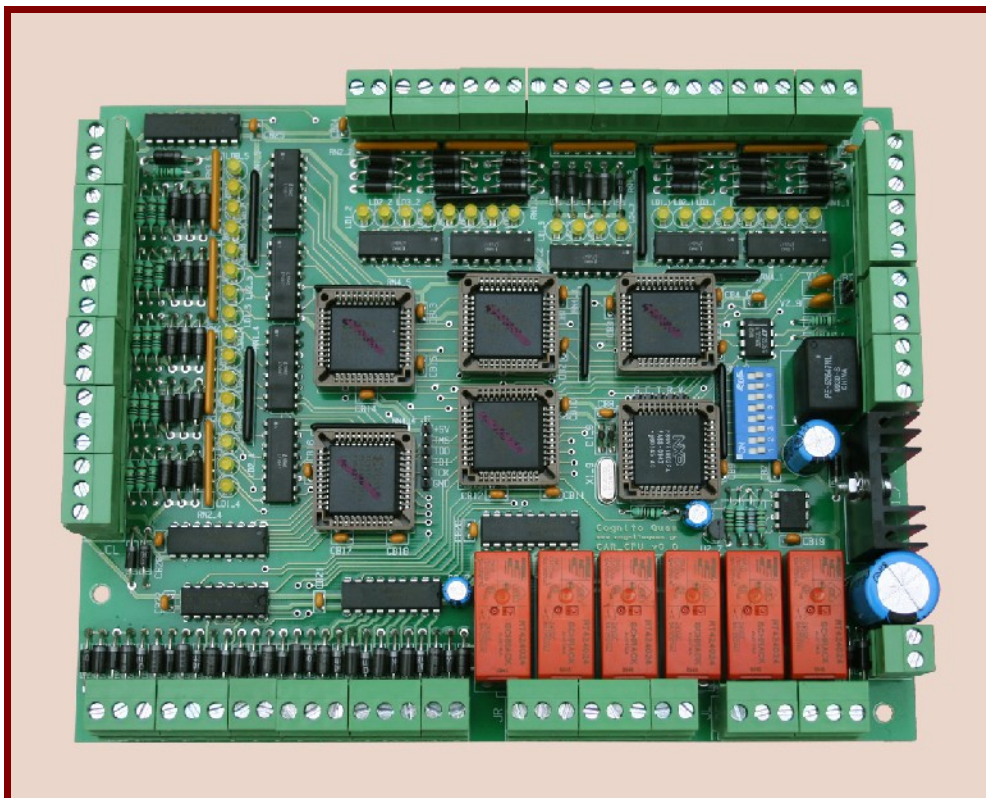
The ElevationCar unit

The ElevationCar unit features the following subsystems:

- 20 predefined 24 VDC NPN (active low) inputs: location sense, maintainance manouvres, door light beams, door terminal switches, internal operation (door open, door close, express call, car full and car overload and manual/automatic fan and light operation). Each input state is indicated by a dedicated LED.

- 16 24 VDC NPN (active low) call inputs with call source latch. The state of each call input is shown by an individual LED. Each call is parametrically characterized as ¨common internal¨, ¨common external¨, ¨external up¨ or ¨external down¨.

- 4 predefined NO ("Normally Open") 12 A contact outputs to control the opening and closing of up two doors.

- 2 predefined CT ("Normally Open" and "Normally Closed") 8 A contact outputs to drive the car fan and lights.

- 14 predefined 24 VDC, 0,5 A peak, PNP, active high outputs: 6bit position, ascend, descend, full load, oveload, sound gong, fault, alarm condition and spare.

- Car evacuation circuit which complements the ElevationBase evacuation circuits.

- Internal 5 VDC switching power supply.

- Microprocessor based controller with local operation parameter memory, EIA(RS)485 serial communication port and 8 position DIP switch.

The operation parameters are specified and loaded by the ElevationBase unit while the DIP switch sets the unit network address and the local/remote car position location.

Connections to the unit are made with removable terminal blocks.

The ElevationFloor unit

The ElevationFloor unit features the following subsystems:

The ElevationFloor unit
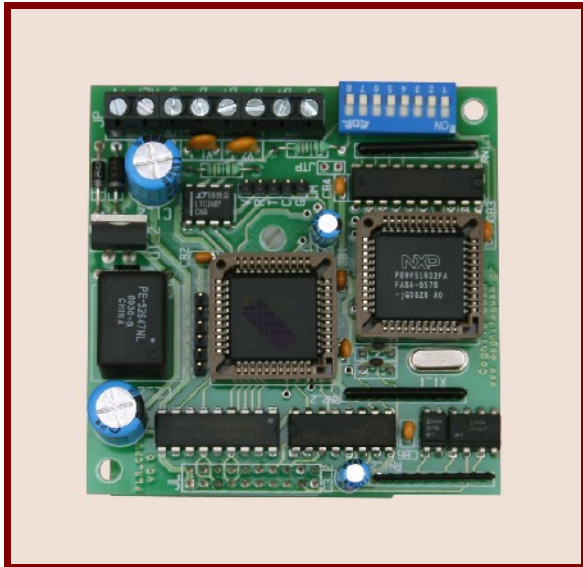
- 1 predefined 24 VDC NPN (active low) input for fire alarm.

- 2 24 VDC NPN (active low) call inputs with call source latch: ¨ascend call¨ and ¨descend call¨.

- 8 24 VDC, 0,5 A peak, PNP, active high outputs: 6bit position, ¨ascend¨ and ¨descend¨.

- 2 call LED 24 VDC NPN (active low) outputs.

- 1 predefined 24 VDC NPN (active low) sound gong output.

- Microprocessor based controller with local operation parameter memory, EIA(RS)485 serial communication port and 8 position DIP switch.

The unit processes and communicates the locally available inputs to the ElevationBase unit and manages the local calls under the supervision of the ElevationBase unit.

The operation parameters are specified and loaded by the ElevationBase unit while the DIP switch sets the unit network address, the common use of the ascend and descend calls and the communication port termination.

Connections to the unit are made with fixed terminal blocks.

Ordering Information	
Model	**Description**
ELVB	ElevationBase lift control unit
ELVC	ElevationCar lift control unit
ELVF	ElevationFloor lift control unit

Cognito Quam Profile

Cognito Quam Electrotechnologies Ltd. (established in 1990) is a privately held engineering and commercial company specializing in industrial electronics and their application. The company expertise covers all aspects of applications for the factory environment namely measurement (transducers and sensors), data processing and communication, control and actuation, automation and robotics and power and energy electronics.

Cognito Quam has contributed and been involved in the design and development of the following technologies, machinery and devices:

- Power factor controllers,
- Motor voltage and frequency inverters and converters,
- Thermal load control and management,
- Robotic interfaces and protocol converters,
- Adaptive panel controllers,
- Robotics controllers,
- Variable speed drives,
- Olive oil processing rejects control equipment (FAIR contract),
- Low Voltage and EMC CE marking compliance devices and equipment for production lines,
- Portable dioxine-furan instrumentation (SMT contract),
- Three-phase programmable soft-starters,
- Hard real time job scheduling systems,
- Hard real time industrial distributed data systems (Brite-EuRam subcontract),
- Calibration rig and supplies for power meters,
- Electrical utility Hall effect energy and power meters,
- Industrial data networks,
- Battery chargers and UPS inverters,
- Solar power air conditioning telemetry and control systems (Thermie subcontract)
- Small switching power supplies,
- Multi-port communication PC cards,
- Ship oily water separators, and
- Modem controllers.

Cognito Quam also offers its research and development services in integrating its products in larger industrial systems products as well as in the design of new and challenging devices and equipment. As such the company cooperates closely and supports its customers in their efforts for a better product.