

DOOR CONTROL DRIVE

DOORLINK100



USER MANUAL



“ INDEX ”

Preface

Thank you for choosing **ELEVANTIS's high-performance DOORLINK-100 Series**. The **DOORLINK-100 Series** is manufactured with high-quality components and materials and incorporate the latest microprocessor technology available.

This manual is to be used for the installation, parameter setting, troubleshooting, and daily maintenance of the AC motor drive. To guarantee safe operation of the equipment, read the following safety guidelines before connecting power to the AC motor drive. Keep this operating manual at hand and distribute to all users for reference.

To ensure the safety of operators and equipment, only qualified personnel familiar with AC motor drive are to do installation, start-up and maintenance. Always read this manual thoroughly before using DOORLINK-100 series AC Motor Drive, especially the WARNING, DANGER and CAUTION notes. Failure to comply may result in personal injury and equipment damage. If you have any questions, please contact your dealer.

Publication History

Please include the Issue Edition and the Firmware Version, both shown below, when contacting technical support regarding this publication.

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1. Safety Information and Precautions



- AC input power must be disconnected before any wiring to the AC motor drive is made.
- A charge may still remain in the DC-link capacitors with hazardous voltages, when the power is turned off.
- There are highly sensitive CMOS IC components on the printed circuit boards. These components are especially sensitive to static electricity. To prevent damage to these components, do not touch these components or the circuit boards with metal objects or your bare hands.
- Ground the DOORLINK-100 drive using the ground terminal. The grounding method must comply with the local standard of the country which the drive is installed.
- **DOORLINK-100 series can only be used for variable speed control of 3-phase induction motors, it should NOT be applied to 1-phase motors or other purpose.**
- DOORLINK-100 series is a specific drive for elevator door and other automatic door control. It should not be installed in a location that may cause personal injury.
- To prevent personal injury, please keep children and unqualified people away from the equipments.



- Do NOT connect AC main power directly to the drive's output terminals U/T1, V/T2 and W/T3.
- DO NOT use Hi-pot test for internal components. The semi-conductor used in the AC motor drive is easily damaged by high-pressure.
- A charge may still remain in the main circuit terminals with hazardous voltages, even when motor has come to stop.
- Only the qualified technicians are allowed to install, wire and maintain AC motor drive.
- Be aware of the motor that it may rotates as soon as the RUN key is pressed using an external ALTO smartphone app, DO NOT stand next to the motor.



- DO NOT install the AC motor drive in a place subjected to high temperature, direct sunlight, high humidity, excessive vibration, corrosive gases or liquids, or airborne dust or metallic particles.
- Follow the installation instructions when installing the AC motor drive. Failure to comply may result in fire, explosion or electric shock.
- When the motor cable between the AC motor drive and motor is too long, the layer insulation of the motor may be damaged.
- The rated voltage for the AC motor drive must be $\leq 240V$ and the mains supply current capacity must be $\leq 5000A$ RMS.
- If the AC motor drive is stored in no charge condition for more than 3 months, the ambient temperature should not be higher than 30 °C. Storage longer than one year is not recommended, it could result in the degradation of the electrolytic capacitors.
- Pay attention to the following when transporting and installing this package (including wooden crate, wood stave and carton box)
 1. If you need to sterilize, deworm the wooden crate or carton box, please do not use steamed smoking sterilization or you will damage the VFD.
 2. Please use other ways to sterilize or deworm.
 3. You may use high temperature to sterilize or deworm. Leave the packaging materials in an environment of over 56 for 30 minutes.
 4. It is strictly forbidden to use steamed smoking sterilization. The warranty does not covered VFD damaged by steamed smoking sterilization.

1.1 Environmental Protection



Reuse

- Some components of the product can be reused due to high metal content. Dismantle the product into individual components to improve the metal recycling efficiency. Electrical and electronic components contain metal materials that can also be recycled through a specific separation process.



Disposal

- Discard components that cannot be degraded and recycled as industrial wastes according to local regulations.

2. Product Information

2.1 Receiving and Inspection

The AC motor drive should be kept in the shipping carton or crate before installation. In order to retain the warranty coverage, the AC motor drive should be stored properly when it is not to be used for an extended period of time. Storage conditions are:



- Store in a clean and dry location free from direct sunlight or corrosive fumes.
- Store within an ambient temperature range of -20 °C to +60 °C.
- Store within a relative humidity range of 0% to 90% and non-condensing environment.
- Store within an air pressure range of 86 kPA to 106kPA.
- DO NOT place on the ground directly. It should be stored properly. Moreover, if the surrounding environment is humid, you should put exsiccator in the package.
- DO NOT store in an area with rapid changes in temperature. It may cause condensation and frost.
- If the AC motor drive is stored for more than 3 months, the temperature should not be higher than 30 °C. Storage longer than one year is not recommended, it could result in the degradation of the electrolytic capacitors.
- When the AC motor drive is not used for longer time after installation on building sites or places with humidity and dust, it's best to move the AC motor drive to an environment as stated above
- This DOORLINK motor drive has gone through rigorous quality control tests at the factory before shipment. After receiving the AC motor drive, please check for the following:
 - Check to make sure that the package includes an AC motor drive, the User Manual/Quick Start.
 - Inspect the unit to assure it was not damaged during shipment.
 - Make sure that the part number indicated on the nameplate corresponds with the part number of your order.

NOTE: If the nameplate information does not correspond with your purchase order or if there are any problems, please contact your local distributor.

ESEMPIO DI TARGHETTA

ESEMPIO DI CODICE PARLANTE

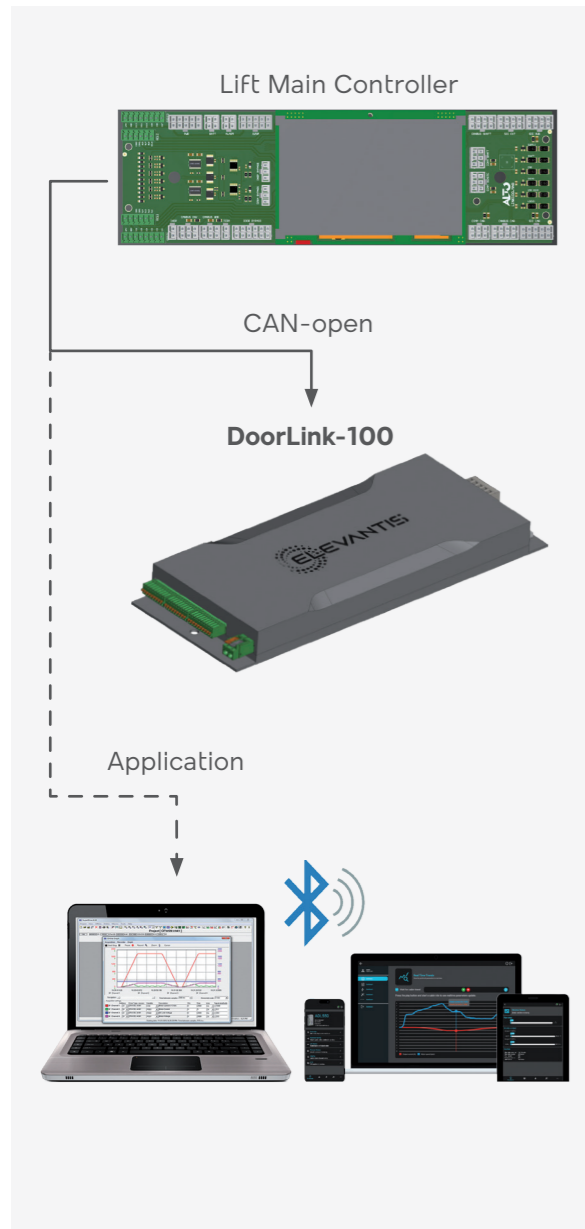
2.2 Features

ELEVANTIS DoorLink-100 series elevator door control drive is an intelligent drive with key features including modular design for easy removal and installation of terminal blocks, BUILT-IN SAFETY and a built-in mobile app that provides quick control of operations and commissioning. This drive offers sophisticated door control modes for opening and closing doors. Distance control is commanded by a proprietary encoder to obtain accurate position and speed. ELEVANTIS DoorLink-100 series elevator door control drives are a complete solution integrating modern and innovative algorithm and hardware solutions.

- The door width is automatically determined and recorded in the elevator related parameters.
- Continuous door reopening curve reduces vibration.
- Block detection, even if the safety device fails, Door-Link can reopen the doors based on the current detection.
- Precise torque detection, keeps the door open/closed; when the door open/close time exceeds the warning time, it forces the door to open.
- Motor type: PM with proprietary encoder and interface protocol. New motor PM 10 ELEVANTIS-SICOR.
- Supports IM asynchronous motors.
- Motor control: FOC-CL for PM and V/F + slip compensation for IM .
- Communication interfaces: CAN-OPEN / BLE Bluetooth / Digital I/O / SmartPhone App

2. Product Information

2.3 Components



GENERAL SPECIFICATIONS	
AC voltage range	1:ø85 + 254 Vac
Frequency supply	50/60Hz
Stand by power	tbd
Nominal power (PM motor)	1.2Arms 160W
Carrier frequency	10 KHz
Frequency range	0,5...100Hz
Size	280 x 125 x 40
Overload capacity	150% @60sec. / 200% @10sec.
3ø PM MOTOR	
Control mode	FOC + PG
Voltage supply	110V
Nominal power	96 W
Nominal torque	1.5N-m
3ø INDUCTION MOTOR	
Control mode	VIF + slip compensation
Voltage supply	230V
Power	150 W
Nominal torque	1.57N-m
INPUTS	
Multi - Function (Input Signal)	8 + (1)
Voltage	15Vdc to 48Vdc (230Vac)
INPUTS	
Multi - Function (Input Signal)	8 + (1)
Voltage	15Vdc to 48Vdc (230Vac)
OUTPUTS	
Multi - Function (Output Signal)	6(NC/NO)
Voltage	Up to 250Vdc, 250mA / 7Ω solid state relays
Enclosure rating	1P20
Operative range	-10°C + 45°C
Environment sensing & protection	Temperature Pressure
Certification	UL, CE
PERFORMANCE	
Open Speed	200...700 mm/s
Close speed	150...400 mm/s
Safety force	60...150N adjustable

Functions

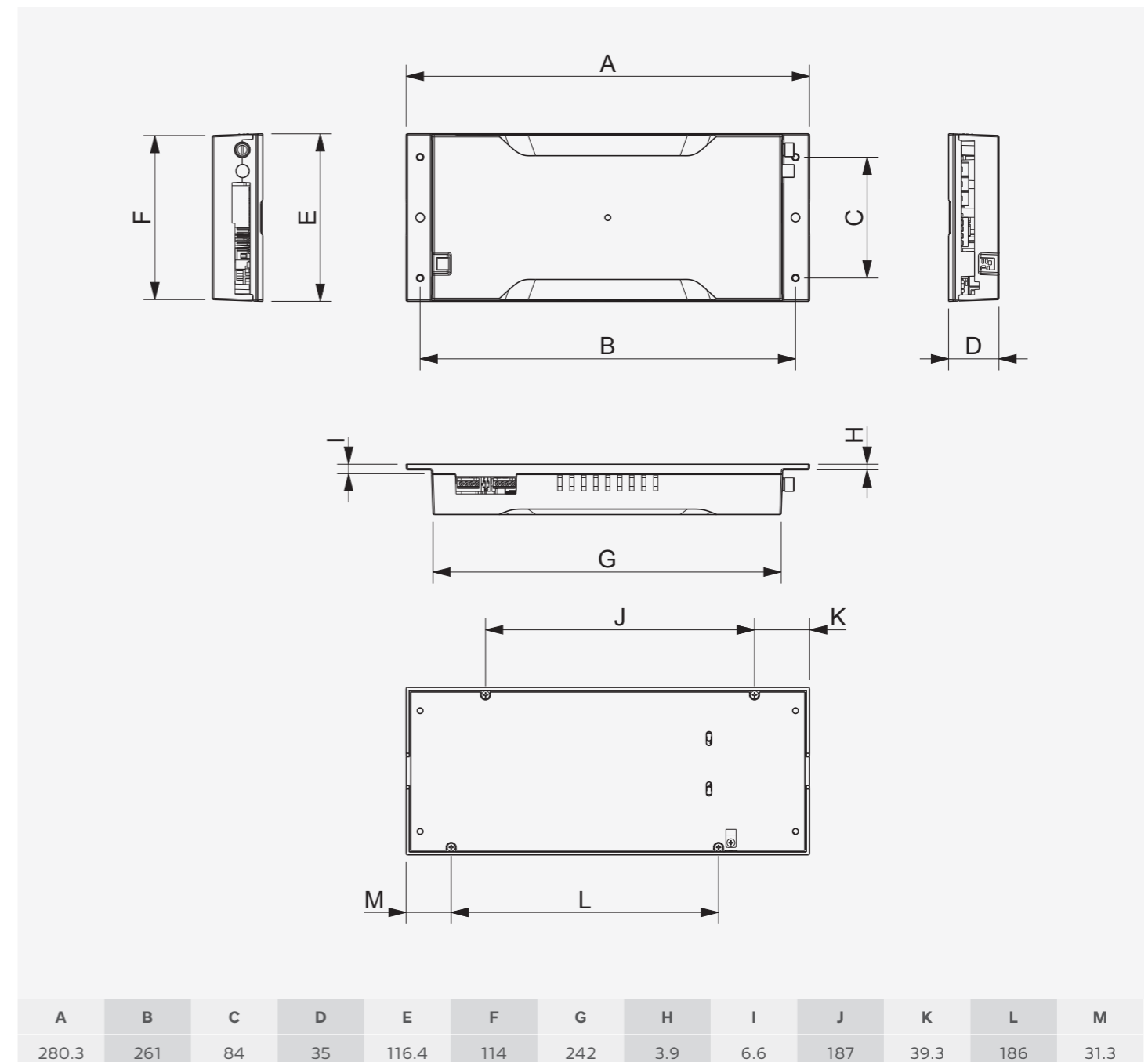
- Open/close with speed/ramp selection/adjust
- S-shape position profile
- Starting/Final speed adjustable
- Permanent torque adjustable: during full open and closed separately
- Moving-mass estimation
- Motor temperator estimation
- Enviromental condition: temperature/floor level
- Self-adjustment - door learning
- Rotation selection
- Memory & alarms
- Motor set-up: Phasing - Identification

3. Mechanical Installation

3.1 Installation Environment

Item	Requirements
Temperature	- 10 to +40 Derated by 1.5 % for each additional 1 °C higher if the temperature is above 40 °C; maximum 40 °C
Altitude	Below 2000 m, up to 1000 m. For altitude above 1000 m, derate 1% for every additional 100 m.
Humidity	Less than 95 % RH, non-condensing
Vibration	Less than 5.9 m/s ² (0.6 g)
Heat dissipation	--
Protection	Avoid places with direct sunlight exposure, moisture, and water drop Avoid places with corrosive, combustibile, or explosive gas Free from greasy dirt and dust

3.2 Diagram of Installation Dimensions (unit: cm)



4. Electrical Installation

Warning



- Do not power on the device before wiring is completed. Failure to comply may result in electrical shock.
- Never connect the controller output terminals U, V, and W to a three-phase power supply. Failure to comply may result in physical injury or fire.
- Never connect the motor terminals U, V, and W to a mains power supply. Failure to comply may result in physical injury or fire.



- Wiring must be carried out by electrical engineering specialists only.
- Ensure that the input voltage of the controller is within the allowable range. Failure to comply may result in product faults.
- Connect an electromagnetic contactor between the input power supply and the main circuit of the controller, to form a structure that can cut off the power supply on the power side of the controller. Otherwise, continuous large current upon controller faults may cause fire.
- Insulate the connection part of power supply terminals during wiring of the power supply and main circuit. Failure to comply may result in electric shock.
- Ground the entire system. Failure to comply may result in injury or accidents.
- After power-off, wait at least 15 minutes before further wiring operations because residual voltage exists after power-off. Failure to comply may result in electric shock.

Caution

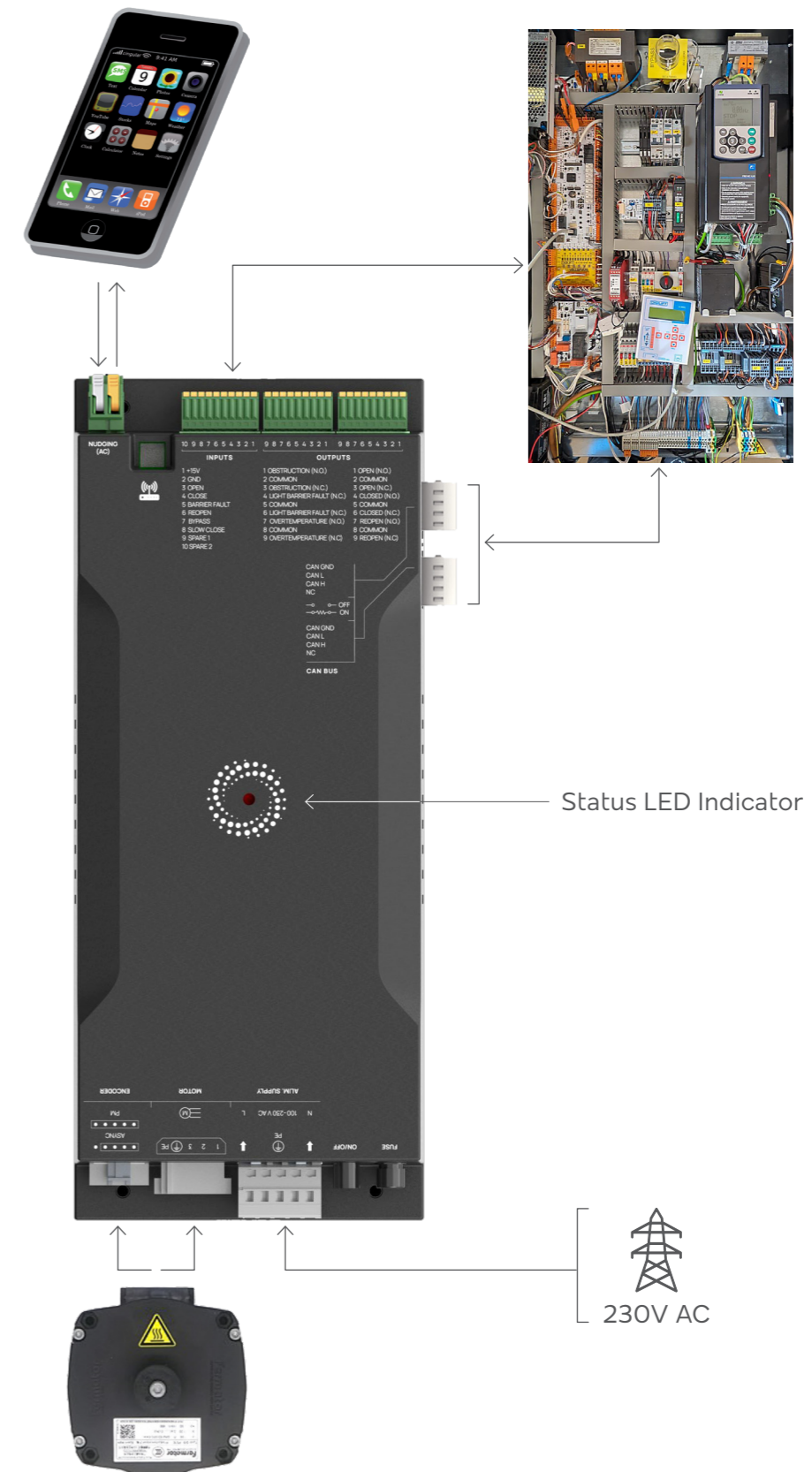


- Never place cables under heavy objects or drag cables vigorously. Failure to comply may result in cable damage and electric shock.
- Never allow metal debris, screws, or liquid enter the controller during wiring. Failure to comply will result in insulation failure or short circuit.



- Protect external wiring, branches, and short circuits according to local regulations.
- Ensure compliance with cable diameter and withstand voltage requirements of the power cable and control power incoming line.
- Strictly follow the specified torque when installing the screws.
- For each peripheral device, read its user guide, fully observe its precautions, and use it properly.
- Wire devices properly. Improper wiring may cause damage to the controller and motor.

4. Electrical Installation



4. Electrical Installation

Category	Terminal Definition	Terminal Name	Terminal Description
Digital Input The circuit can work with external voltage inputs or internal voltage input (voltage free contact).	J19-1	+15V	Isolated 15 Volts output available to control the door through a voltage free contact. Features are: a) This supply must only be used for this purpose. b) This contact must be isolated from any other power supply.
	J19-2	GND	Is the reference used for the opening and closing signal.
	J19-3	OPEN	Is a signal that orders the door to open. With an external voltage input the tension to apply could be from 12 V DC to 60 V DC between this input and common. With an internal voltage input the tension applied is 12 V DC between this input and Out +12 V.
	J19-4	CLOSE	This signal is used for ordering to close the door. With an external voltage input the tension to apply could be from 12 V DC to 60 V DC between this input and common. With an internal voltage input the tension applied is 12 V DC between this input and Out +12 V.
	J19-5	BARRIER FAULT	?????"???
	J19-6	REOPEN	This signal is used for installing the cabin door switch, an external barrier or other devices. In order to active this signal, connect the re-open input with the +12 V. Use voltage free contacts. The reopening signal has priority over the closing signal.
	J19-7	BYPASS	This signal is used to connect an external security switch to detect door closed position.
	J19-8	SLOW CLOSE	This signal is used for ordering to close the door slowly. The slow signal has priority over the control signals and the photocell. It's created for working with fire fighting systems.
	J19-9	SPARE 1	For future uses.
	J19-20	SPARE 2	For future uses.
Outputs Output relays have been provided to give continuous information to the main lift controller concerning the status of the doors.	J10-1	OPENED (N.O.)	This event is present when the doors are fully open.
	J10-2	COMMON	
	J10-3	OPENEN (N.C.)	
	J10-4	CLOSED (N.O.)	This event is present when the doors are fully closed and locked.
	J10-5	COMMON	
	J10-6	CLOSED (N.C.)	
	J10-7	REOPEN (N.O.)	This event is present when the doors are fully reopen.
	J10-8	COMMON	
	J10-9	REOPEN (N.C.)	
	J13-1	1 OBSTRUCTION (N.O.)	This event is present when an obstacle is detected that stops the doors from closing. The signal will reset when the doors reach the opened or closed position.
	J13-2	2 COMMON	
	J13-3	3 OBSTRUCTION (N.C.)	
	J13-4	4 LIGHT BARRIER FAULT (N.O.)	relay activated when a failure occurs on the light curtain.
J13-5	5 COMMON		
J13-6	6 LIGHT BARRIER FAULT (N.C.)		
J13-7	7 OVERTEMPERATURE (N.O.)	This event is present when the VF temperature or motor temperature exceeds the safety limit. When this output is activated the maneuver must give the order to the cabin to go to the next floor, open the door to let out the passengers and stop applying tension to the motor.	
J13-8	8 COMMON		
J13-9	9 OVERTEMPERATURE (N.C.)		
Power Supply	J1-1	N 100-230 VAC	Main supply of 230 V AC.
	J1-2	GROUND	
	J1-3	I 100-230 VAC	
Communication	J5-1	CAN GROUNG	Isolated type Communication baud rate: 50 kbps. This allow the communication with the Lift Main Controller.
	J5-2	CAN-L	
	J5-3	CAN-H	
	J5-4	NC	
	J6-1	CAN GROUNG	
	J6-2	CAN-L	
	J6-3	CAN-H	
J6-4	NC		
Motor	J4-1	Phase 1	Output to the 3 phase motor varying the voltage and frequency to control speed and torque.
	J4-2	Phase 2	
	J4-3	Phase 3	
	J4-4	GROUND	
Encoder	J11	PM/ASINC	An integral quadrature pulse encoder is connected to this input. The purpose of the encoder, which is situated inside the motor, is to inform the control of the exact position and speed of doors.

Mettiamo anche una tabella dei connettori?
- Signal terminal selection

Type	Wire Diameter (mm²)	Socket Model	Plug Model	Pin Model
Signal terminal(2Pin)	0.3	WF3001-2WR01BT1	WF3001-2H01B01	WF3001-TPSN01
Signal terminal(24pin)	0.3	WF3001-2WR12BT1	WF3001-2H12B01	WF3001-TPSN01

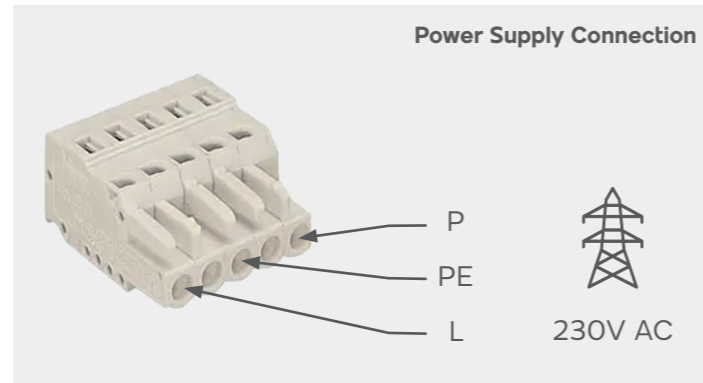
4. Electrical Installation

4.1 Power Supply

The circuit has been designed to operate with a main supply of 230 V AC (+10%, -15%, 50 or 60 Hz).

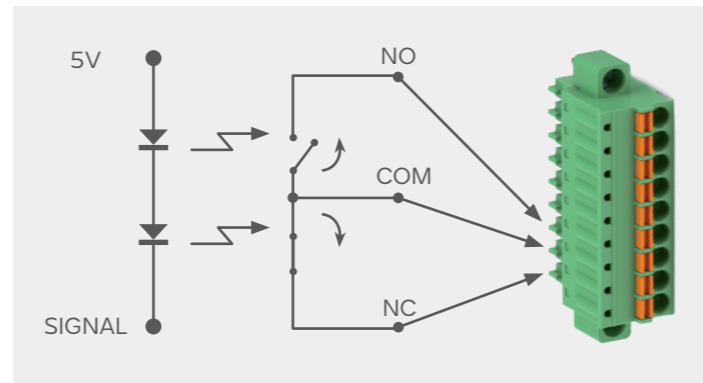
DoorLink-100 incorporates a soft-start system to control the bulk capacitors charge and prevent short circuits.

Note: It is important that the Door Operator Module has a good earth connection



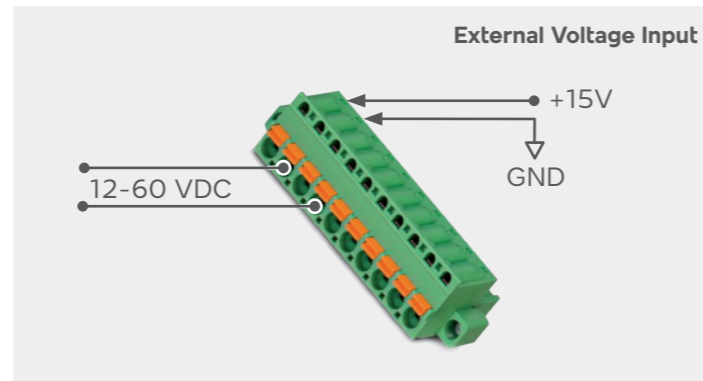
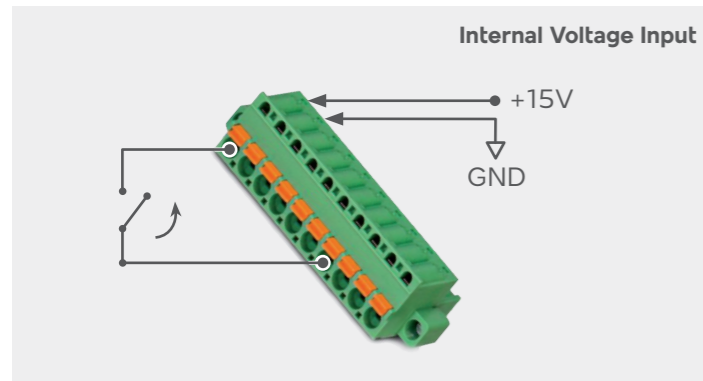
4.2 Outputs

Output relays have been provided to give continuous information to the main lift controller concerning the status of the doors.



4.3 Inputs

The circuit can work with external voltage inputs or internal voltage input (voltage free contact).



4.4 Status Led Indicator

Indicator	State	description
	Steady on white	Waiting for commands
	Steady on blue	In communication with a smartphone app
	Steady on red	In a fault status

Indicator	State	description
	Steady on green	Pending
	off	off

6. Parameters

The DoorLink-100 controller is configurable through a set of parameters, most of which are accessible from the mobile application. The following table lists all the configurable parameters, with a brief description.

6.1 Commands

N°	Range	Type	Default	Name	Unit	Description
1	0~3	ENUM	0	Door Command		Through this parameter is possible to set commands to the door. In particular: 0: OFF 1: OPEN 2: CLOSE 3: STOP
2	0~1	ENUM	0	Self Learning		1: Self Learning

6.2 Door Configuration

N°	Range	Type	Default	Name	Unit	Description
3	0~2	ENUM	0	Open Direction		Open Direction: 0: LEFT 1: RIGHT 2: CENTER
4	1~8	Unit16	2	Number of panels		Number of panels
5	1~105	Float	70	Door Mass	[kg]	Door Mass
6	1~105	Float	10	Clutch Force	[nm]	Clutch Force
7	0.001~1000	Float	1	Gear Ratio		Gear Ratio

6.3 Profile Configuration

N°	Range	Type	Default	Name	Unit	Description
100	0.01~900	Float	40	Open Initial Speed	[m/s]	
101	1~8	Unit16	40	Close Initial Speed	[m/s]	
102	0.01~900	Float	40	Open Proximity Speed	[m/s]	
103	0.01~900	Float	40	Close Proximity Speed	[m/s]	
104	0.01~900	Float	40	Open Clutch Speed	[m/s]	
105	0.01~900	Float	40	Close Clutch Speed	[m/s]	
106	0.01~900	Float	120	Open Limit Speed	[m/s]	
107	0.01~900	Float	120	Close Limit Speed	[m/s]	
108	0.001~1000	Float	0,05	Open Acceleration	[m/s ²]	
109	0.001~1000	Float	0,05	Close Acceleration	[m/s ²]	
110	0.001~1000	Float	0,05	Open Deceleration	[m/s ²]	
111	0.001~1000	Float	0,05	Close Deceleration	[m/s ²]	
112	0.001~1000	Float	0,01	Open Length	[mm]	
113	0~105	Float	20	Open Initial	[mm]	
114	0~105	Float	20	Close Initial	[mm]	
115	0~105	Float	20	Open Proximity	[mm]	
116	0~105	Float	20	Close Proximity	[mm]	
117	0~105	Float	20	Clutch Length	[mm]	
118	0.01~3	Float	0,4	Max Open Torque	[Nm]	
119	0.01~3	Float	0,3	Max Close Torque	[Nm]	
120	0.01~3	Float	0,3	Hold Torque	[Nm]	
121	0.01~3	Float	0,3	Opened Torque	[Nm]	
122	0.01~3	Float	0,3	Closed Torque	[Nm]	

6. Parameters

6.4 Hardware Configuration

N°	Range	Type	Default	Name	Unit	Description
200	0~6	enum	0	Input Config 1		
201	0~6	enum	1	Input Config 2		
202	0~6	enum	2	Input Config 3		
203	0~6	enum	3	Input Config 4		
204	0~6	enum	4	Input Config 5		
205	0~6	enum	5	Input Config 6		
206	0~6	enum	6	Input Config 7		
207	0~5	enum	0	Relay Config 1		
208	0~5	enum	1	Relay Config 2		
209	0~5	enum	2	Relay Config 3		
210	0~5	enum	3	Relay Config 4		
211	0~5	enum	4	Relay Config 5		
212	0~5	enum	5	Relay Config 6		
213	0~63	uint16	0	Relays Setup		

6.5 Functions

N°	Range	Type	Default	Name	Unit	Description
300	0~1	uint16	0	Input Mode		
301	0~1	enum	0	Priority		
302	0~1	uint16	0	First Open Slave		
303	0~1	enum	0	Slow Close		
304	0~1	uint16	0	Unlock Standby		
305	0~1	uint16	0	Close Anticipated		
306	0~1	uint16	0	Close Is Bypass		
307	0~1	uint16	0	First Close Bypass		
308	0~1	uint16	0	Light Barrier Fault Close		
309	0~1	uint16	0	DPM System		
310	0~1	uint16	0	Eco Mode		
311	0~1	uint16	0	CDL Electronic		
312	0~1	uint16	0	Disable Doorlink Overtemp		
313	0~1	uint16	0	Disable Motor Overtemp		

6.6 Informations

N°	Range	Type	Default	Name	Unit	Description
400	0~4.2959	uint32	0	Serial Number		
401	0~105	float	0,2	Software Version		
402	0~105	float	0,2	BLE Version		
403	0~105	float	0,1	Hardware Version		
404	0~1	uint16	0	Access Level		
405	0~4.2959	uint32	0	Password		

6. Parameters

6.7 Door Status

N°	Range	Type	Default	Name	Unit	Description
500	0~4095	enum	0	Door Status		
501	0~105	int16	0	Position	[mm]	
502	-1000~102	float	0	Speed	[m/s]	
503	0~105	float	0	Torque	[Nm]	
504	0~105	float	0	Power In	[W]	
505	0~105	float	0	Power Out	[W]	
506	0~400	float	230	Input Voltage	[Vac]	
507	0~105	float	0	Friction		
508	0~1,52	float	0	Doorlink Temp[°C]		
509	0~1,52	float	0	Motor Temp[°C]		
510	0~4.2959	uint32	0	Active Alarms e warnings (in genere anomalie)		
511	0~500	float	0	DCLink voltage	[Vdc]	
512	0~4.2959	uint32	0	Current Time	[s]	
513	0~127	uint16	0	Input Status		
514	0~63	uint16	0	Output Status		

6.8 Counters

N°	Range	Type	Default	Name	Unit	Description
601	0~108	float	0	Working Hours	[hh]	
602	0~108	float	0	Total Cycles		
603	0~108	float	0	Powerups		
604	0~108	float	0	Learning cycles		
605	0~108	float	0	Reopenings		
606	0~108	float	0	Short-circuits		
607	0~108	float	0	Overcurrents		
608	0~108	float	0	Undervoltages		
609	0~108	float	0	Light curtain faults		
610	0~108	float	0	Doorlink overtemps		
611	0~108	float	0	Motor overtemps		
612	0~108	float	0	Opening Obstructions		
613	0~108	float	0	Closing Obstructions		

6.9 Advanced Configuration

N°	Range	Type	Default	Name	Unit	Description
800	0~1	uint16	0	Save Config		
801	125~1000	uint16	125	CAN Baudrate	[kbps]	
802	1~255	uint16	10	CAN NodeId		
803	0~4.2959	char	Doorlink100	BLE Name		

6.10 Motor Control

N°	Range	Type	Default	Name	Unit	Description

6.11 Graph Data

N°	Range	Type	Default	Name	Unit	Description



by
SICOR ITALY
AN  **ELEVANTIS COMPANY**

Sicor Italy S.R.L.

Viale Caproni, 32 Rovereto (TN) - Italy · Tel: +39 0464 484 111 · info@sicoritaly.com

www.sicoritaly.com