E024 U

Control Board

Intertek

UL325 - UL991

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1. E024U CONTROL BOARD DESCRIPTION & CHARACTERISTICS

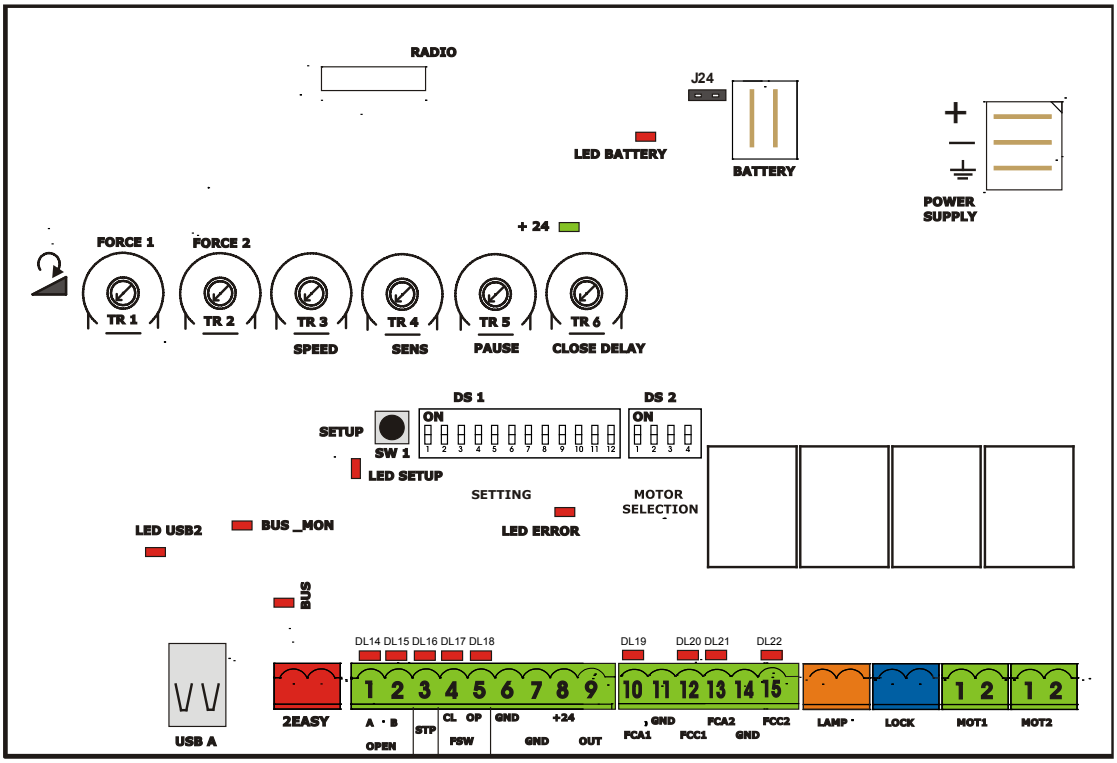


Fig. A1

1.1 TECHNICAL SPECIFICATIONS

Main power supply	115 V~ 60 Hz
Secondary power supply	24 Vdc - 16 A max. (min. 20 Vdc. - max. 36 Vdc.)
Power consumption	stand-by = 4W max. = 400 W
Max load per motor	7 A
Accessory power supply	24 Vdc - 500 mA
Battery charge current	150 mA
Operating temperature	-4 °F +131 °F (-20 °C +55 °C)
Protection fuses	All self-resetting
Main power fuse	6.3 A Timed
Operating Logics	E, A, S, EP, AP, SP, B, C
Operating time out	10 min.
Pause time	Programmable (0 to 4 min) with trimmer
Motor force, speed, obstacle sensitivity, closing delay	Programmable with dedicated trimmer
Connector inputs	Power supply, Battery, Radio receiver, USB
Terminal strip inputs	Encoder, Open A, OpenB, Stop, Open safety fotocell, Closing safety fotocell, Limit switches
Terminal strip outputs	Lamp, Buzzer, Motors, Lock, Programmable OUT, accessory power supply
Programming	With trimmers, dipswitches and pushbutton

1.2 LAYOUT AND COMPONENTS

RADIO	Connector for the radio receiver
BATTERY	Connector for the backup battery
J24	Jumper to disable battery charging (With the jumper present the battery is charged)
POWER SUPPLY	DC Power supply input
TR1 to TR6	Programming Trimmers
+24 LED	DC power indicator
SW1 - SETUP	Pushbutton for automatic setup
DS1 - DS2	Programming dipswitches
LED ERROR	Troubleshooting indicator
USB A	USB connection for software upgrade

1.3 RADIO CONNECTION

On the radio connector it's possible to plug in receivers RP and RP2. With a single channel radio RP it will be possible to activate only the OPEN A input, with a dual channel radio RP2 it will be possible to activate both OPEN A and OPEN B inputs. Plug in the radio board with the component side towards the internal part of the board.

⚠ Make sure you insert or disconnect the board ONLY with the power off.

2. INPUT / OUTPUT DESCRIPTION

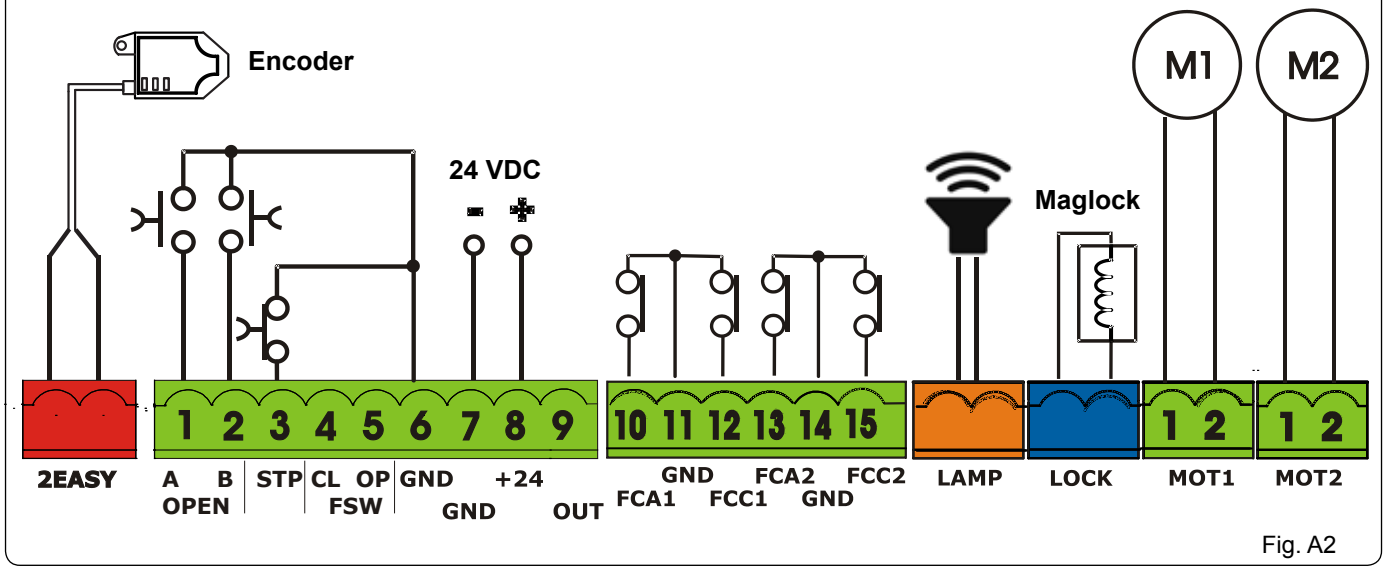


Fig. A2

PIN	LABEL	FUNCTION
2 EASY	2 EASY	2easy BUS input for the encoder
1	OPEN A	N.O. Contact for total opening command
2	OPEN B / CLOSE	OPEN B: N.O. Contact for opening of leaf 1 only (with only one leaf the opening stops at 50% of traveling) CLOSE (LOGIC B-C): N.O. Contact for closing command
3	STOP	N.C. Contact for stop command
4	FSW CL	N.C. Contact for closing safety
5	FSW OP	N.C. Contact for opening safety
6	GND (-)	24 Vdc negative
7	GND (-)	24 Vdc negative
8	+ 24	24 Vdc positive
9	OUT (-)	Programmable output (See: DS1 SW 11-12)
10	FCA 1	Open limit switch Motor 1
11	GND (-)	24 Vdc negative
12	FCC 1	Close limit switch Motor 1
13	FCA 2	Open limit switch Motor 2
14	GND (-)	24 Vdc negative
15	FCC2	Close limit switch Motor 2
LAMP	LAMP	Audio alarm output (DS1 SW11=OFF) Output for flashing light 24Vdc 15W max (DS1 SW11=ON)
LOCK	LOCK	Output for electrical lock, max 5A pulse (DS2 - SW 4=OFF) 12 Vac / 24Vdc Always ON (maglock): max 1 A (DS2 - SW 4=ON) 24 Vdc
MOT1	MOT 1	Motor 1 output (first moving motor)
MOT2	MOT 2	Motor 2 output (second moving motor)
USB A	USB	Firmware upgrade input

3. PHOTOCELLS CONNECTIONS

How to connect Normally Open contacts.
(Connect them in parallel)

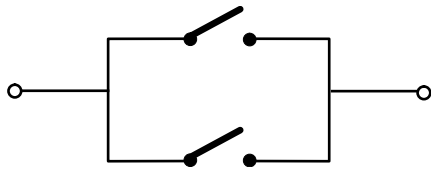


Fig. A3

How to connect Normally Close contacts.
(Connect them in series)

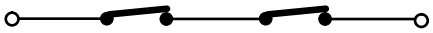


Fig. A4

The E024U board allows the connection of several safety devices (for example photocells). With photocells you can activate the FAILSAFE function, which, before each movement of the operator, tests each fotocells. In case the test fails the movement is inhibited. To activate this function set to ON the dip-switch N. 11 and 12 of DS1, and connect the negative of the transmitter to the OUT pin (No.9).

The photocells must be connected depending on which area they must protect. (See Fig. A5)
Closing Safety D : These photocells protect the area covered by the gate during the closing movement. They have no effect during the opening movement.
Opening Safety B-C : These photocells protect the area covered by the gate during the opening movement. They have no effect during the closing movement.
Opening/Closing Safety A : These photocells protect the area covered by the gate both during the opening and the closing movements.

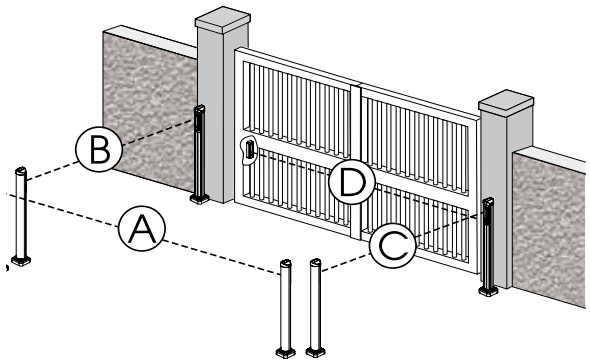
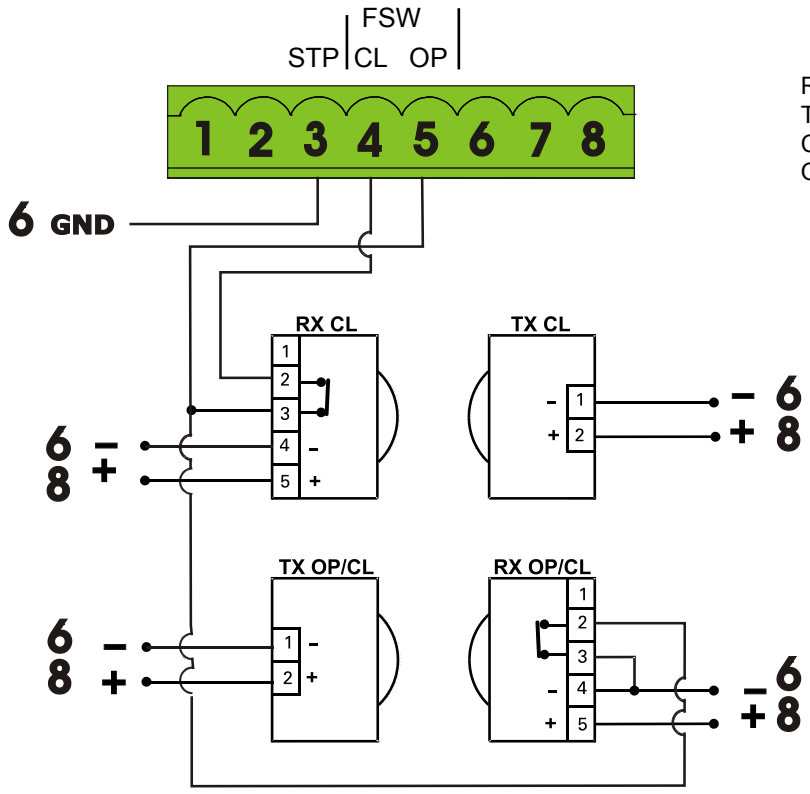


Fig. A5

3.1 CONNECTIONS TO NORMALLY CLOSE (N.C.) PHOTOCELLS

Connection of a pair of closing photocells and a pair of opening/closing photocells

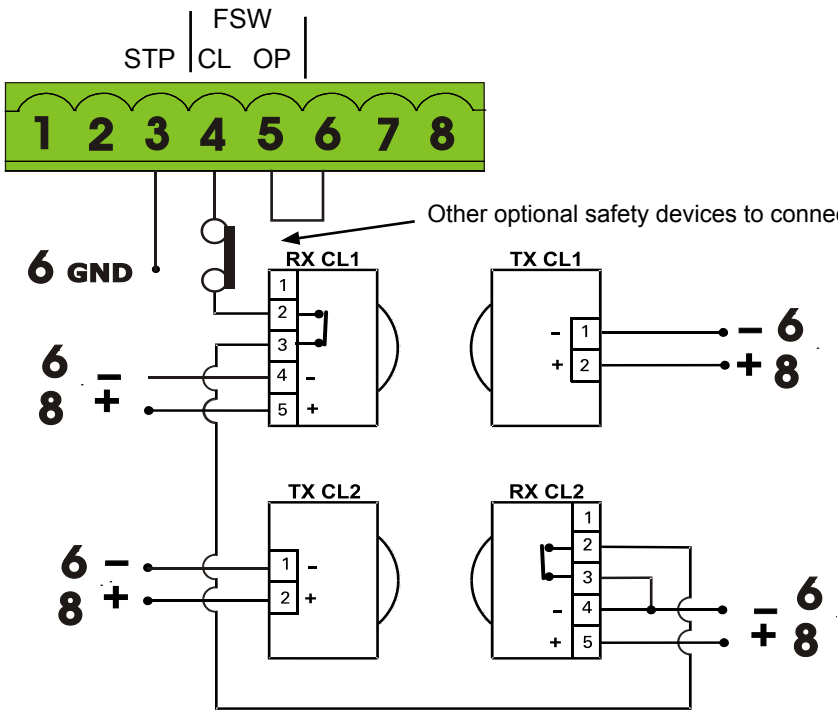


RX= Photocell Receiver
TX= Ptotocell Transmitter
CL= Closing
OP= Opening

To use the FAILSAFE mode connect the negative power supply of the transmitters to OUT (pin 9), and set dip-switch 11 and 12 to ON on DS1

Fig. A6

Connection of two pairs of closing photocells



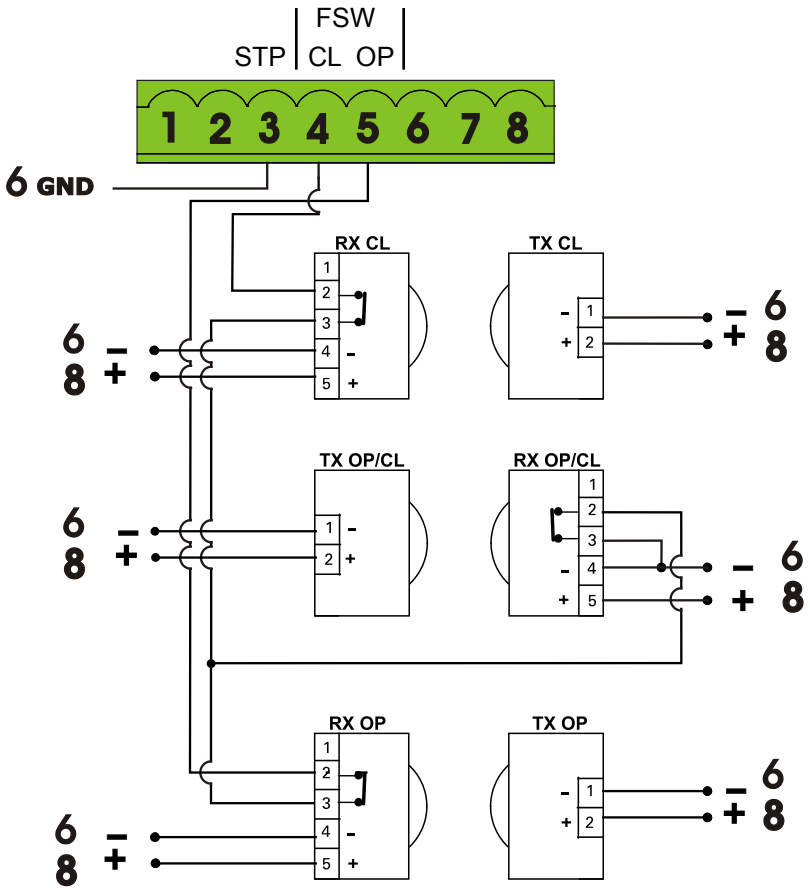
RX= Photocell Receiver
TX= Ptotocell Transmitter
CL= Closing
OP= Opening

To use the FAIL-SAFE mode connect the negative power supply of the transmitters to OUT (pin 9), and set dip-switch 11 and 12 to ON on DS1

When using the FAIL-SAFE mode also the safety inputs not used (FSW CL, FSW OP) must be connected to OUT (pin No. 9)

Fig. A7

Connection of a pair of closing photocells, a pair of opening photcells and a pair of opening/closing photocells

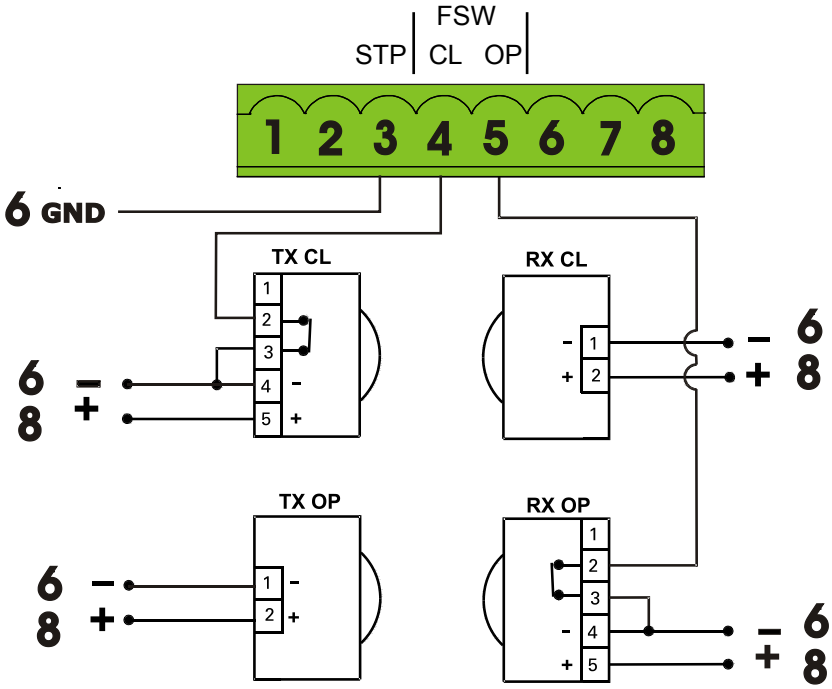


RX= Photocell Receiver
TX= Ptotocell Transmitter
CL= Closing
OP= Opening

To use the FAIL-SAFE mode connect the negative power supply of the transmitters to OUT (pin 9), and set dip-switch 11 and 12 to ON on DS1

Fig. A8

Connection of a pair of closing photocells and a pair of opening photocells



RX= Photocell Receiver
TX= Ptotocell Transmitter
CL= Closing
OP= Opening

To use the FAIL-SAFE mode connect the negative power supply of the transmitters to OUT (pin 9), and set dip-switch 11 and 12 to ON on DS1

Fig. A9

Connection of no safety or stop devices (NOT RECOMMENDED)

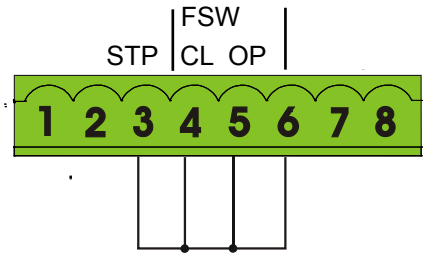


Fig. A10

Connection of a generic closing safety device and a generic open safety device

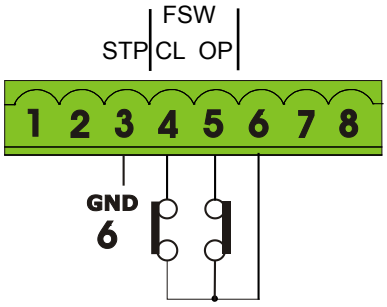
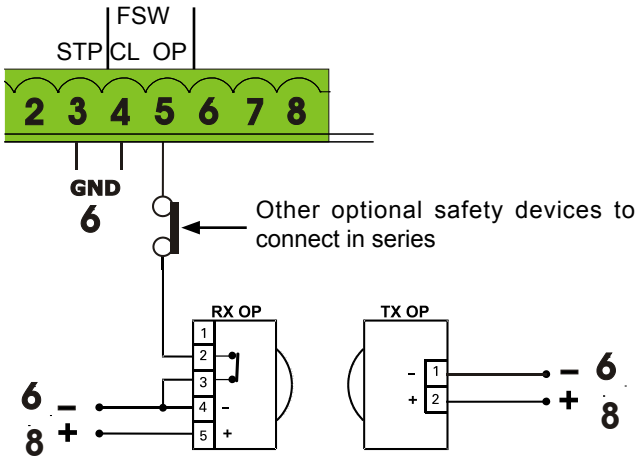


Fig. A11

Connection of one pair of opening photocells



To use the FAIL-SAFE mode connect the negative power supply of the transmitters to OUT (pin 9), and set dip-switch 11 and 12 to ON on DS1

When using the FAIL-SAFE mode also the safety inputs not used (FSW CL , FSW OP) must be connected to OUT (pin No. 9)

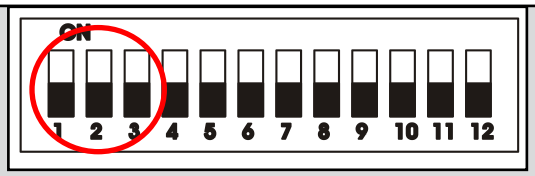
Fig. A12

4. PROGRAMMING

4.1 DIP SWITCH DS1 SETTINGS FOR OPERATING LOGIC

OPERATING LOGIC

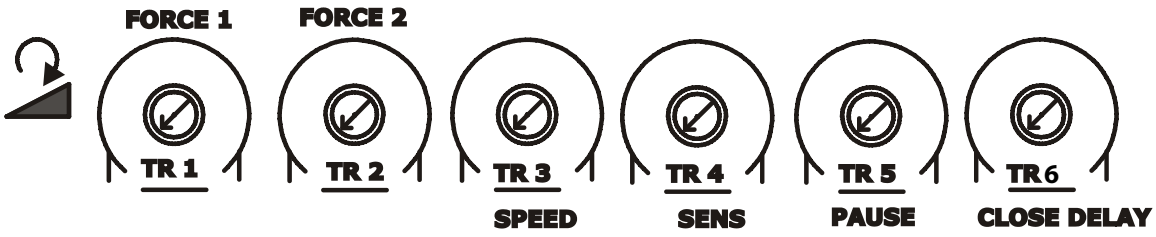
DS 1: SW 1 - SW 2 - SW 3



LOGIC	SW 1	SW 2	SW 3	PAUSE TIME	DESCRIPTION
E (default) Semiautomatic	OFF	OFF	OFF	NO	One command opens, the next one closes. A command during opening stops the gate
A Automatic	ON	ON	ON	0 - 4 min	One command opens, waits for the pause time an then closes automatically
S Security	OFF	OFF	ON	0-4 min	One command opens, waits for the pause time and then closes automatically. If the closing safety is activated or another command is given during the pause time it closes
EP Semiautomatic step by step	OFF	ON	OFF	NO	One command opens, the next one closes. During the movement a command stops the gate
AP Automatic step by step	OFF	ON	ON	0-4 min	One command opens, waits for the pause time and then closes automatically. A command during the pause time holds the gate open
SP Security step by step	ON	OFF	OFF	0-4 min	One command opens, waits for the pause time and then closes automatically. If the closing safety is activated during pause time the gate closes in 5 s. A command during pause time holds open the gate
B Manned Pulsed	ON	OFF	ON	NO	An open A command opens the gate, an open B command closes the gate
C Manned Constant	ON	ON	OFF	NO	Holding open A active opens the gate, holding Open B active closes the gate

For more details on the operating logics please refer to Chapter 12 - Function Logics

4.2 ADJUSTING TRIMMERS



TR1 – FORCE ADJUSTMENT MOTOR 1
Turn clockwise to increase the opening and closing force

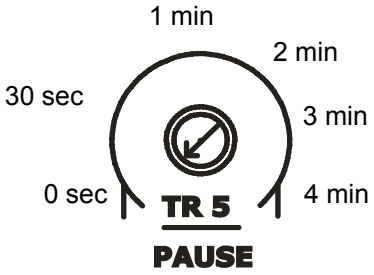
TR 2 – FORCE ADJUSTEMENT MOTOR 2
Turn clockwise to increase the opening and closing force

TR 3 – SPEED ADJUSTMENT FOR MOTOR1 AND MOTOR 2
Turn clockwise to increase the opening and closing speed

TR 4 – SENSITIVITY ADJUSTEMENT FOR OBSTACLE DETECTION FOR MOTOR 1 AND MOTOR 2
Turn clockwise to increase the sensitivity for obstacle detection.

With this trimmer you can adjust the reaction time for the board to invert the motion of the gate in case of obstacle detection, or the complete stop in case the board is in the positive stop detection zone.
If an obstacle is detected during the gate movement the board will invert the motor rotation until the gate goes back to the original starting position. If in the successive movement an obstacle is detected again the board will be put in alarm mode and won't take any more commands until the STOP input is activated (Alarm Reset) or power is cycled

TR 5 – PAUSE TIME ADJUSTMENT (0 - 4 min.)
Turn clockwise to increase the pause time.



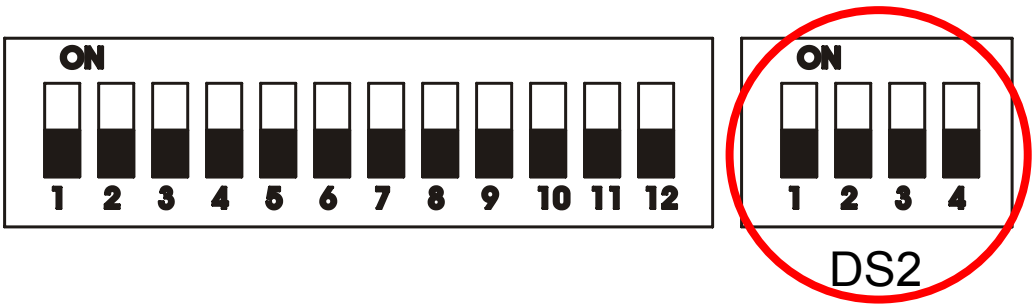
Dip switches DS1: 1 to 3 need to be set for an operating mode with PAUSE time for this adjustment to have any effect

TR6 - CLOSING DELAY OF LEAF 1 OVER LEAF 2 ADJUSTMENT (0 - 15 sec)
Turn clockwise to increase the delay

4.3 DIP SWITCH DS1 SETTINGS FOR BOARD SETUP

BOARD SETUP DS 1: SW 4 to SW 12		
OPENING DELAY	SW 4	The opening of leaf 2 is delayed after the opening of leaf 1. This is to avoid that the gate's leafs interfere with each other during the initial part of the movement. In case there is only one leaf is has no effect.
0 sec (default)	OFF	
2 sec	ON	
REVERSE AND LAST STROKE	SW 5	If active, before opening, while the gate is closed, the motors thrust to close for 2 s to facilitate the release of the electric lock. At closing the motors are activated for a final stroke after slowdown to facilitate locking of the electric lock.
inactive (default)	OFF	
active	ON	
MAX THRUST AT STARTUP	SW 6	With this fuction active the motors work at maximum force at startup (regardless of the force setting) during the initial phase of the movement. Useful for heavy leafs
inactive (default)	OFF	
active for 3 sec	ON	
AUTOMATIC OPENING IN CASE OF POWER FAILURE	SW 7	If active and with the optional backup battery installed, the board will open the gate after one minute from the power failure and keep it open. Within the minute wait it's always possible to open and close the gate with a command. If the logic used has a pause time the board will close the gate when the power comes back.
inactive (default)	OFF	
active	ON	
CLOSING SAFETY LOGIC	SW 8	With this function you can choose the behaviour of the closing safety. With SW8 OFF the gate movement will be reversed as soon as the safety is active, with SW8 ON the gate will stop when the safety is active and it will reverse only when the safety is deactivated again.
immediate reverse (default)	OFF	
reverse when cleared	ON	
PREFLASHING	SW 9	This function activates the flashing lamp for 5s before the movement of the gate
inactive (default)	OFF	
active for 5 sec	ON	
EXTRA SENSITIVITY TO OBSTACLE DETECTION	SW 10	If active this function allows to have an immediate reverse in case the gate hits a rigid obstacle, while keeping the motor active in case of a gradual increment of resistance, like with wind pressure on the gate or increased friction
inactive (default)	OFF	
active	ON	
ORANGE TERMINAL FUNCTION	SW 11	If OFF after the second consecutive obstacle detection this output is activated until the STOP contact is open or the power is cycled if ON the output can be connected to a warning lamp. NOTE: for UL325 compliance this switch must be left OFF
Audio Alarm (default)	OFF	
Warning Lamp	ON	
OUT FUNCTION (pin 9) max 100mA	SW 12	if OFF: use pin 9 as power supply negative for a warning lamp. The lamp will be active during opening, pause and stop. Flashing during close, off when the gate is closed
Lamp	OFF	If ON: use pin 9 as power supply negative for the safety photocells. Before any movement the board will check for the presence of the safety photocells. If the test fails the gate will not move.
Photocells FAIL SAFE active	ON	

4.4 DIP SWITCH DS2 SETTINGS FOR OPERATOR TYPE AND LOCK MODE

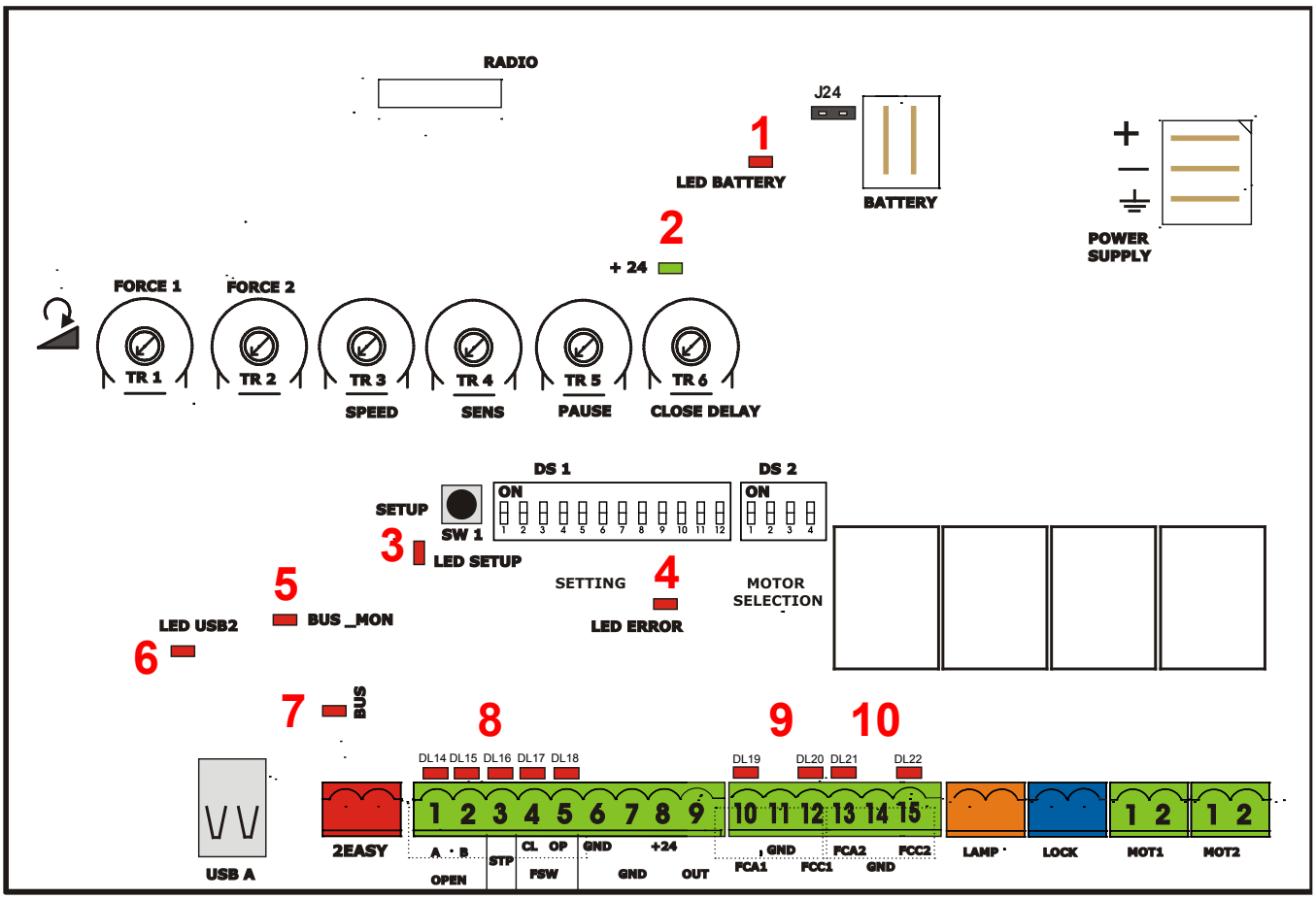


IMPORTANT

DS 2			
OPERATOR SELECTION			
OPERATOR TYPE	SW 1	SW 2	SW 3
S450H, S800H	OFF	OFF	OFF
S418	OFF	OFF	ON
415, 390, 770	ON	OFF	OFF

DS 2	
LOCK OUTPUT MODE	
OUTPUT MODE	SW 4
Active only for 3 sec. after an open impulse (from gate closed)	OFF
Active always except 3 sec. before an opening	ON

5. LED DIAGNOSTICS



LED	DESCRIPTION	LED STATUS In BOLD the normal state with gate closed and working		
		ON STEADY	OFF	BLINKING
1	LED BATTERY	Board working on AC power	Board working on battery power or ext supply	Battery charging
2	LED +24	**Main power present**	Main power OFF	
3	LED SET-UP		**Normal operation**	SLOW BLINK (1 sec. ON - 1 sec. OFF) SET-UP needed
				FAST BLINK (0.5 sec. ON - 0.5 sec OFF) SET UP in in progress
4	LED ERROR	Board mulfunction. See possible causes below	**No errors**	Error conditions. See LED ERROR DISPLAY table
5	LED BUS_MON	**Communication on Bus "2easy" OK**	Communication bus "2Easy" inactive. Verify the bus "2Easy" devices for shorts	Bus 2Easy devices with the Same address. Verify dip switch Setting on photocells or Encoder LEDs
6	LED USB		**Software update done or USB key not present**	USB key inserted and software Update in progress (DON'T Remove the USB key)
7	RESERVED			
8	LED DL 14 OPEN A INPUT (N.O.)	OPEN A active	**OPEN A not active**	
	LED DL 15 OPEN B INPUT (N.O.)	OPEN B active	**OPEN B not active**	
	LED DL 16 STOP INPUT (N.C.)	**STOP non active**	STOP active or wiring error	
	LED DL 17 FSW CL INPUT (N.C.)	**Closing safety devices clear**	Closing safety devices triggered or wiring error	
	LED DL 18 FSW OP INPUT (N.C.)	**Opening safety devices clear**	Opening safety devices triggered or wiring error	
9	LED DL 19 FCA1: OPEN LIMIT SWITCH MOT1 (N.C.)	**Limit switch OFF or not used**	Limit Switch activated	
	LED DL 20 FCC1: CLOSE LIMIT SWITCH MOT1 (N.C.)	Limit switch OFF or not used	**Limit Switch activated**	
10	LED DL 21 FCA2: CLOSE LIMIT SWITCH MOT2 (N.C.)	**Limit switch OFF or not used**	Limit Switch activated	
	LED DL 22 FCC2: CLOSE LIMIT SWITCH MOT2 (N.C.)	Limit switch OFF or not used	**Limit Switch activated**	

BOARD MULFUNCTION ERROR POSSIBLE CAUSES	SOLUTIONS
There were two consecutive obstacle detections (the audio alarm also sould sound)	Remove obstructions
One of the motor driver component has failed	The board needs to be repaired
The idle current in one of the motors is out of range	Check the motors
Both limit switches are active at the same time	Check the limit switches
Input voltage from the power supply out of range	Check DC input voltage

The diagnostic LED shows only one error condition at a time, with the priority of the below table. In case there is more than one error once one is eliminated the LED will show the next

LED ERROR DISPLAY		
NUMBER OF FLASHES	ERROR CONDITION	SOLUTION
1	OBSTACLE DETECTION	Remove the obstacle
2	BOARD IN SLEEP MODE (Slow blinking means that the automatic open in case of power failure function is active)	Verify the presence of AC power
3	MOTOR 1 FAILURE	Replace motor 1
4	MOTOR 2 FAILURE	Replace motor 2
5	ENCODER on motor 1 or motor 2 broken or wiring error	Verify the encoder wiring and LED status. If they are correct replace the encoder
6	FAIL SAFE FAILED	Verify the photocells wiring and alignement
7	BOARD THERMAL PROTECTION ACTIVE	Turn off the board and wait until the components cool down
8	MAX RUN TIME REACHED WITHOUT FINDING THE POSITIVE STOP (10 min.)	- Verify that the operator manual release is not engaged - Verify that the board recognizes the mechanical stop, in case redo the setup procedure

6. TIME LEARNING (SET-UP)

After powering up the board for the first time or when the board will need it the setup LED will blink at a slow frequency to indicate that the setup procedure to learn the running times is needed.

The setup can be redone at any time by pressing and holding the setup button as indicated below.

After the setup first movement, if the leafs are opening instead of closing you need to reverse the wires going to the motor that moves in the wrong direction

6.1 AUTOMATIC TIME LEARNING

WARNING: If the time learning setup is done automatically then the slow down points are set by the board on his own

Move the leafs to the mid position
Very important for a good result

1. Press and hold the SETUP button until the SETUP LED lights up, wait about 3 sec. until it turns off and then release it immediately. NOTE: If you wait too long to release it the manual set-up will start. The LED will blink during the setup procedure
2. Leaf 2 (if present) starts to move slowly in closing direction, stopping when it reaches the mechanical stop or FCC2.
3. Leaf 1 begins to move slowly in closing direction, stopping when it reaches the mechanical stop, or FCC1.
4. Leaf 1 starts to move slowly in opening direction, followed by leaf 2 (if present) still slowly.
5. When they both reach the open mechanical stop or FCA1 and FCA2 they stop and reverse, leaf 2 (if present) automatically starts closing at full speed followed by leaf 1.
6. When they reach the close mechanical stop or FCC1 and FCC2 both leafs stop and leaf 1 restarts automatically opening at full speed followed by leaf 2 (if present).
7. If you selected an automatic logic the board will wait for the pause time and then closes the gate automatically. Otherwise you have to give an OPEN command to close the gate.

6.2 MANUAL TIME LEARNING

WARNING: If the manual time learning setup is done then the slow down points must be set by the installer during the procedure

Move the leafs to the mid position
Very important for a good result

1. Press and hold the SETUP button until the SETUP LED lights up, keep it pressed for about 3 sec. until it turns off and keep it pressed more until the leaf 2 (if present) starts moving slowly. The LED will blink during the setup procedure
2. Leaf 2 will move in closing direction until it reaches the mechanical stop or FCC2
3. Leaf 1 starts moving slowly until it reaches the mechanical stop or FCC1
4. Leaf 1 starts moving in opening direction at the set speed (trimmer speed).
5. At the point where you want the slowdown to start give an OPEN A command with the push button or the remote that is already stored in memory. Leaf 1 starts to slow down and stops when it reaches the mechanical stop or FCA1.
6. Leaf 2 starts moving in opening direction at the set speed (trimmer speed)

7. At the point where you want the slowdown to start give an OPEN A command with the push button or the remote that is already stored in memory. Leaf 2 starts to slow down and stops when it reaches the mechanical stop or FCA2.
8. Leaf 2 starts to close at the set speed (trimmer speed).
9. At the point where you want the slowdown to start give an OPEN A command with the push button or the remote that is already stored in memory. The leaf 2 starts to slow down and stops when it reaches the mechanical stop or FCC2.
10. Leaf 1 starts to close at the set speed (trimmer speed).
11. At the point where you want the slowdown to start give an OPEN A command with the push button or the remote that is already stored in memory. Leaf 1 starts to slow down and stops when it reaches the mechanical stop or FCC1.
12. The manual time learning procedure is complete.

6.3 OBSTACLE DETECTION FUNCTION

The obstacle detection function is achieved by controlling the current absorption and / or through the encoder connected to the motors.

If the gate encounters an obstacle during the movement of opening or closing, the obstacle detection function is activated and the operator reverses the direction of the gate.

In case of a second consecutive obstacle the operator stops the gate right away and any further command is inhibited. To re-enable the automation, you must remove power or open the STOP contact input. The Audio Alarm output will be active until this “reset”.

This is a more detailed description of what happens after an obstacle detection:

Gate opening, obstacle detected:

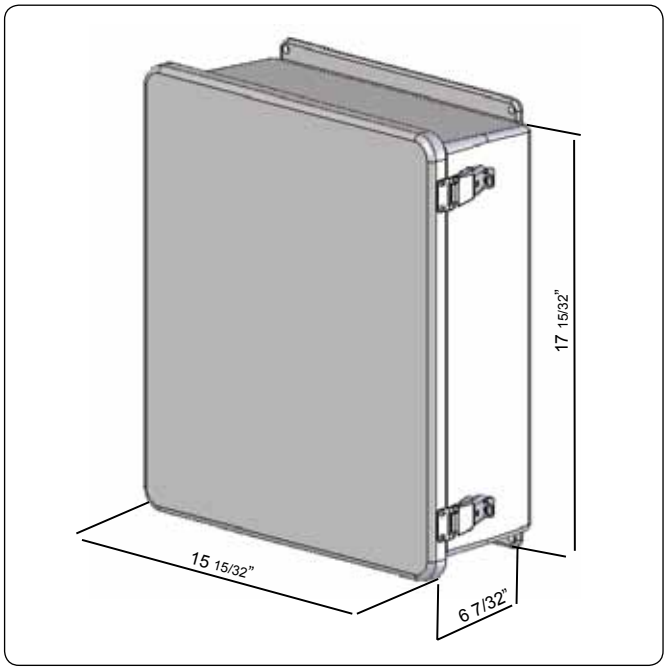
Gate reverses partially (for 3 sec.) and STOPS. After that either the gate is in a halfway position or completely closed
An open_A command is received:
the Gate tries to open from the current position:
If there is another obstacle detection:
complete stop, alarm goes off
If the gate reaches the open position:
reset the obstructions count, normal operations

Gate closing, obstacle detected:

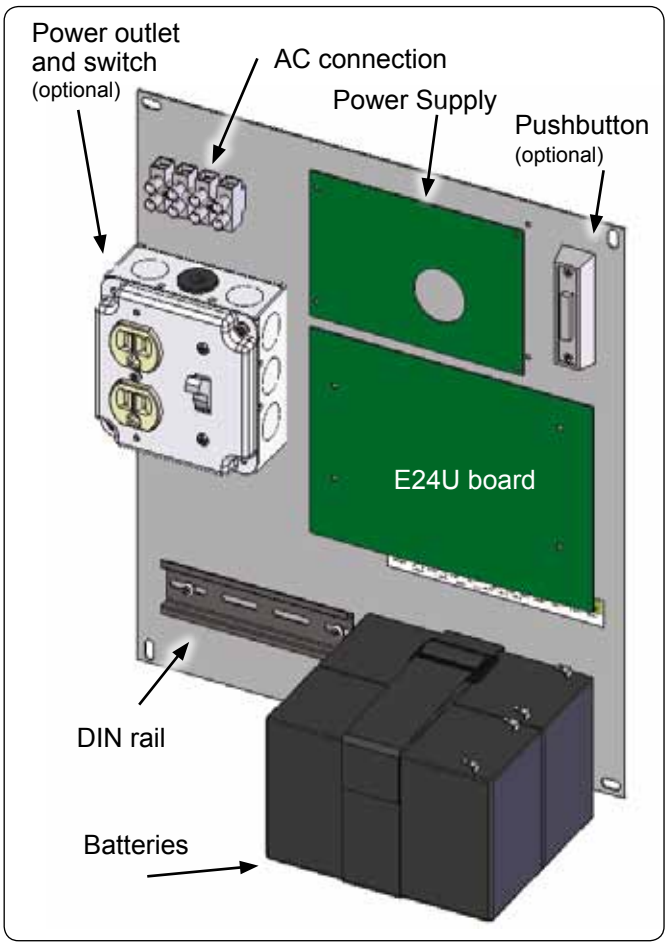
Gate reverses partially (for 3 sec.) and STOPS. After that either the gate is in a halfway position or the gate is completely open
An open_A command is received:
In NON Automatic mode:
if the gate was not completely open:
execute an open
if the gate was completely open:
execute a close
in Automatic mode:
if the gate was not completely open:
execute an open, wait for the pause time and then closes.
if the gate was completely open:
reload the pausetime, and then closes
If there is another obstacle detection:
complete stop, alarm goes off
If the gate reaches the close position:
reset the obstructions count, normal operations

7. ENCLOSURE

The E024U board is supplied on a panel that fits in a 16x14” enclosure.



On the back panel there are: the control board, the power supply and additional accessories.



8. POWER CONNECTION

AC POWER GUIDELINES:

THE E024U control board and power supply uses a single phase AC power line to operate, charge the batteries, and power gate accessories. Use the following guidelines when installing the AC power:

1. Check the local wiring codes in all cases and follow all local building codes. Wiring and hookup should be performed by a qualified electrician/installer only.

2. AC power should be supplied from a circuit breaker panel and must have its own dedicated circuit breaker. This supply must include a green ground conductor.

3. Use copper conductor wires with liquid tight flexible conduit UL listed for electric cable protection

14 AWG, 600V, 80°C
Terminal Block max Torque 2.1 Nm

4. Properly ground the gate operator to minimize or prevent damage from power surges and/or lightning. Use a grounding rod if necessary. A surge suppressor is recommended for additional protection.

AC POWER CONNECTION

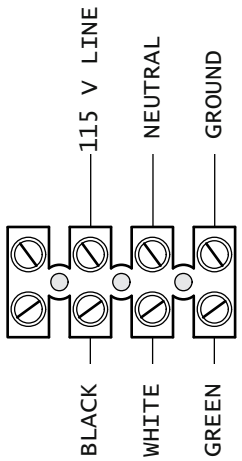
To connect AC power to the controller:

1. Turn the circuit breaker for the AC gate operator power OFF before connecting the AC input wires.

2. Turn OFF the Power Switch located on the left side of enclosure before connecting the AC input wires.

3. Connect the AC input wires to the AC terminal located on the top left of the control box. See diagram below.

4. Batteries must be installed after the AC power is on. See Battery Power Connection.



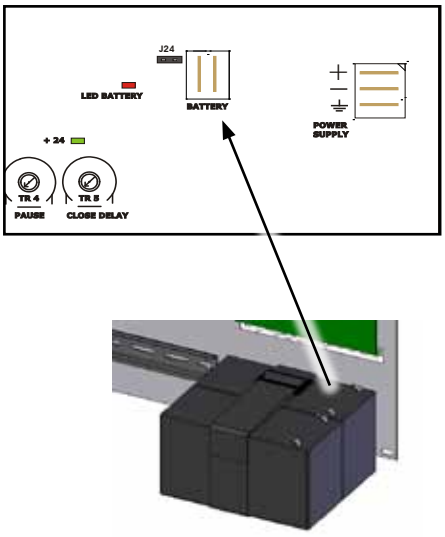
8.1 POWER SUPPLY

The E024U board is powered by a high efficiency switching power supply that takes 115V in input and provides 36VDC to power the board. On the power supply board there is the only repleaceble fuse: **6.3A timed**

9. BACKUP BATTERY

The E024U board allows the connection of a 24V backup battery to provide power to operate the gate during blackouts. For more details about how the boards handles the loss of main power and how to configure its behaviour please see par 4.3 and DS1 switch 7.

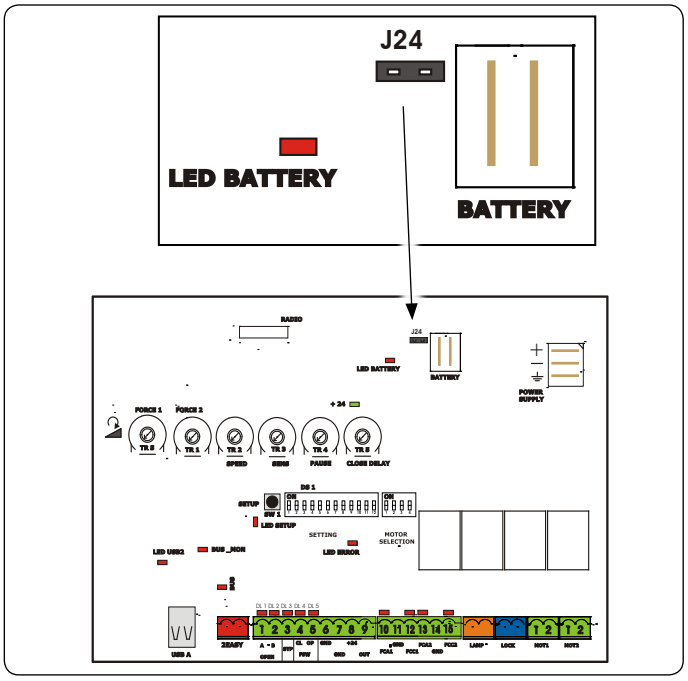
To connect the battery use the provided cable and plug it on the BATTERY connector on the board. Plug the other end of the cable to the batteries, red wire to +24 and black wire to GND.



9.1 DISABLE THE BATTERY CHARGER

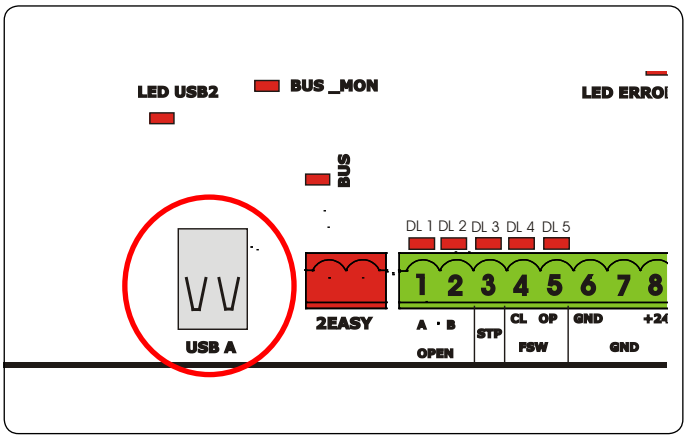
To disable the battery charger unplug jumper J24

J24 PRESENT = BATTERY CHARGING ACTIVE
J24 NOT PRESENT = BATTERY CHARGING NOT ACTIVE



10. FIRMWARE UPGRADE

The E024U board keeps the operating firmware in a field programmable memory, it can be easily upgraded through the on board USB port



For the upgrade you need a USB Flash Drive, where you have to copy the file supplied by FAAC. Then follow these steps:

1. Disconnect the batteries if they are present.
2. Turn the AC power off and insert the Flash Drive into the USB A input on the board
3. Turn the AC power back on. The USB2 LED will start to flash to confirm the beginning of the software update. (WARNING: DON'T TURN THE POWER OFF OR REMOVE THE FLASH DRIVE UNTIL THE USB2 LED TURNS OFF.
4. Wait until the USB 2 LED turns off
5. Remove the USB Flash drive.
6. Cycle power, reconnect the batteries if needed and execute a new SETUP procedure (See chapter 6)

⚠

WARNING: Only upgrade the firmware with the proper file supplied by FAAC. otherwise the board could be damaged

11. FUNCTION LOGICS

LOGIC "E"	PULSES					
SYSTEM STATUS	OPEN A	OPEN B	STOP	FSW OP	FSW CL	FSW CL/OP
CLOSED	opens the leaves	opens leaf 1	no effect (OPEN disabled)	no effect (OPEN disabled)	no effect	no effect (OPEN disabled)
OPENING	stops operation (1)	stops operation	stops operation	immediately reverses at closing	no effect	stops and opens at release (OPEN stops - saves CLOSE)
OPEN	recloses leaves immediately (1)	recloses leaves immediately	no effect (OPEN/CLOSE disabled)	no effect	no effect (CLOSE disabled)	no effect (OPEN/CLOSE disabled)
CLOSING	reopens leaves immediately	reopens leaves immediately	stops operation	no effect	reverses at opening	stops and opens at release (OPEN stops - saves CLOSE)
BLOCKED	closes leaves	closes leaves	no effect (OPEN/CLOSE disabled)	no effect (OPEN disabled)	no effect (CLOSE disabled)	no effect (OPEN stops - saves CLOSE)

(1) if the cycle began with OPEN-B (leaf 1), both leaves are activated at opening

LOGIC "A"	PULSES					
SYSTEM STATUS	OPEN A	OPEN B	STOP	FSW OP	FSW CL	FSW CL/OP
CLOSED	opens and closes after pause time	opens leaf 1 and closes after pause time	no effect (OPEN disabled)	no effect (OPEN disabled)	no effect	no effect (OPEN disabled)
OPENING	no effect (1)	no effect	stops operation	reverses at closing	no effect	stops and opens at release (saves CLOSE)
OPEN IN PAUSE	reloads pause time (1)	reloads pause time of released leaf	stops operation	no effect	recharges pause time (CLOSE disabled)	recharges pause time (CLOSE disabled)
CLOSING	reopens leaves immediately	reopens leaves immediately	stops operation	no effect	reverses at opening	stops and opens at release (saves CLOSE)
BLOCKED	closes leaves	closes leaves	no effect (OPEN/CLOSE disabled)	no effect (OPEN disabled)	no effect (CLOSE disabled)	no effect (OPEN/CLOSE disabled)

(1) if the cycle began with OPEN-B (leaf 1), both leaves are activated at opening

LOGIC "S"	PULSES					
SYSTEM STATUS	OPEN A	OPEN B	STOP	FSW OP	FSW CL	FSW CL/OP
CLOSED	opens and closes after pause time	opens released leaf and closes after pause time	no effect (OPEN disabled)	no effect (OPEN disabled)	no effect	no effect (OPEN disabled)
OPENING	no effect (1)	no effect	stops operation	reverses at closure	continues to open and recloses immediately	stops and opens at release (saves CLOSE)
OPEN IN PAUSE	recloses leaves immediately (1)	recloses leaves immediately	stops operation	no effect	stops and, at release, closes	stops and, at release, closes
CLOSING	reopens leaves immediately	reopens leaves immediately	stops operation	no effect	reverses at opening (see DS1-SW8) and closes immediately at end	stops and opens after release and closes immediately at end
BLOCKED	closes leaves	closes leaves	no effect (OPEN/CLOSE disabled)	no effect (OPEN disabled)	no effect (CLOSE disabled)	no effect (OPEN/CLOSE disabled)

(1) if the cycle began with OPEN-B (leaf 1), both leaves are activated at opening

LOGIC "EP"	PULSES					
SYSTEM STATUS	OPEN A	OPEN B	STOP	FSW OP	FSW CL	FSW CL/OP
CLOSED	opens the leaves	opens leaf 1	no effect (OPEN disabled)	no effect (OPEN disabled)	no effect	no effect (OPEN disabled)
OPENING	stops operation (1)	stops operation	stops operation	immediately reverses at closure	no effect	stops and opens at release (OPEN stops - saves CLOSE)
OPEN	recloses leaves immediately (1)	recloses leaves immediately	no effect (OPEN/CLOSE disabled)	no effect	no effect (CLOSE disabled)	no effect (OPEN/CLOSE disabled)
CLOSING	stops operation	stops operation	stops operation	no effect	reverses at opening	stops and opens at release (OPEN stops - saves CLOSE)
BLOCKED	restarts moving in opposite direction. Always closes after STOP	restarts moving in opposite direction. Always closes after STOP	no effect (OPEN/CLOSE disabled)	no effect (OPEN disabled)	no effect (CLOSE disabled)	no effect (OPEN stops - saves CLOSE)

(1) if the cycle began with OPEN-B (leaf 1), both leaves are activated at opening

LOGIC "AP"	PULSES					
SYSTEM STATUS	OPEN A	OPEN B	STOP	FSW OP	FSW CL	FSW CL/OP
CLOSED	opens and closes after pause time	opens leaf 1 and closes after pause time	no effect (OPEN disabled)	no effect (OPEN disabled)	no effect	no effect (OPEN disabled)
OPENING	stops operation (1)	stops operation	stops operation	reverses at closing (saves OPEN)	no effect	stops and opens at release (OPEN stops - saves CLOSE)
OPEN IN PAUSE	stops operation (1)	stops operation	stops operation	no effect	recharges pause time (CLOSE disabled)	recharges pause time (CLOSE disabled)
CLOSING	reopens leaves immediately	reopens leaves immediately	stops operation	no effect	reverses at opening (see DS1-SW8)	stops and opens at release (OPEN stops - saves CLOSE)
BLOCKED	closes leaves	closes leaves	no effect (OPEN/CLOSE disabled)	no effect (OPEN disabled)	no effect (CLOSE disabled)	no effect (OPEN/CLOSE disabled)

(1) if the cycle began with OPEN-B (leaf 1), both leaves are activated at opening

LOGIC "SP"	PULSES					
SYSTEM STATUS	OPEN A	OPEN B	STOP	FSW OP	FSW CL	FSW CL/OP
CLOSED	opens and closes after pause time	opens leaf 1 and closes after pause time	no effect (OPEN disabled)	no effect (OPEN disabled)	no effect	no effect (OPEN disabled)
OPENING	stops operation (1)	stops operation	stops operation	reverses at closure	continues to open and recloses immediately	stops and opens after release and closes immediately at end (OPEN stops - saves CLOSE)
OPEN IN PAUSE	recloses leaves immediately (1)	recloses leaves immediately	stops operation	no effect	stops and, at release, closes	stops and, at release, closes
CLOSING	stops operation	stops operation	stops operation	no effect	reverses at opening	stops and opens at release (saves CLOSE)
BLOCKED	restarts moving in opposite direction. Always closes after STOP	restarts moving in opposite direction. Always closes after STOP	no effect (OPEN/CLOSE disabled)	no effect (OPEN disabled)	no effect (CLOSE disabled)	no effect (OPEN/CLOSE disabled)

(1) if the cycle began with OPEN-B (leaf 1), both leaves are activated at opening

LOGIC "B"	PULSES					
SYSTEM STATUS	OPEN A	OPEN B	STOP	FSW OP	FSW CL	FSW CL/OP
CLOSED	opens the leaves	no effect	no effect (OPEN disabled)	no effect (OPEN disabled)	no effect	no effect (OPEN disabled)
OPENING	no effect	closes leaves	stops operation	reverses at closure	no effect	stops and, at release, closes (saves OPEN/CLOSE)
OPEN	no effect	closes leaves	no effect (OPEN/CLOSE disabled)	no effect	no effect (CLOSE disabled)	no effect (OPEN/CLOSE disabled)
CLOSING	opens the leaves	no effect	stops operation	no effect	reverses at opening	stops and opens at release (saves OPEN/CLOSE)
BLOCKED	opens the leaves	closes leaves	no effect (OPEN/CLOSE disabled)	no effect (OPEN disabled)	no effect (CLOSE disabled)	no effect (OPEN/CLOSE disabled)

LOGIC "C"	CONTINUOS COMMANDS		PULSES			
SYSTEM STATUS	OPEN A	OPEN B	STOP	FSW OP	FSW CL	FSW CL/OP
CLOSED	opens the leaves	no effect	no effect (OPEN disabled)	no effect (OPEN disabled)	no effect	no effect (OPEN disabled)
OPENING	no effect	closes leaves	stops operation	reverses at closure	no effect	stops and, at release, closes (saves OPEN/CLOSE)
OPEN	no effect	closes leaves	no effect (OPEN/CLOSE disabled)	no effect	no effect (CLOSE disabled)	no effect (OPEN/CLOSE disabled)
CLOSING	opens the leaves	no effect	stops operation	no effect	reverses at opening	stops and opens at release (saves OPEN/CLOSE)
BLOCKED	opens the leaves	closes leaves	no effect (OPEN/CLOSE disabled)	no effect (OPEN disabled)	no effect (CLOSE disabled)	no effect (OPEN/CLOSE disabled)

LIMITED WARRANTY

To the original purchaser only:

FAAC International, Inc., warrants, for twenty-four (24) months from the date of invoice, the gate operator systems and other related systems and equipment manufactured by FAAC S.p.A. and distributed by FAAC International, Inc., to be free from defects in material and workmanship under normal use and service for which it was intended provided it has been properly installed and operated.

FAAC International, Inc.'s obligations under this warranty shall be limited to the repair or exchange of any part of parts manufactured by FAAC S.p.A. and distributed by FAAC International, Inc. Defective products must be returned to FAAC International, Inc., freight prepaid by purchaser, within the warranty period. Items returned will be repaired or replaced, at FAAC International, Inc.'s option, upon an examination of the product by FAAC International, Inc., which discloses, to the satisfaction of FAAC International, Inc., that the item is defective. FAAC International, Inc. will return the warranted item freight prepaid. The products manufactured by FAAC S.p.A. and distributed by FAAC International, Inc., are not warranted to meet the specific requirements, if any, of safety codes of any particular state, municipality, or other jurisdiction, and neither FAAC S.p.A. or FAAC International, Inc., assume any risk or liability whatsoever resulting from the use thereof, whether used singly or in combination with other machines or apparatus.

Any products and parts not manufactured by FAAC S.p.A. and distributed by FAAC International, Inc., will carry only the warranty, if any, of the manufacturer. This warranty shall not apply to any products or parts thereof which have been repaired or altered, without FAAC International, Inc.'s written consent, outside of FAAC International, Inc.'s workshop, or altered in any way so as, in the judgment of FAAC International, Inc., to affect adversely the stability or reliability of the product(s) or has been subject to misuse, negligence, or accident, or has not been operated in accordance with FAAC International, Inc.'s or FAAC S.p.A.'s instructions or has been operated under conditions more severe than, or otherwise exceeding, those set forth in the specifications for such product(s). Neither FAAC S.p.A. nor FAAC International, Inc., shall be liable for any loss or damage whatsoever resulting, directly or indirectly, from the use or loss of use of the product(s). Without limiting the foregoing, this exclusion from liability embraces a purchaser's expenses for downtime or for making up downtime, damages for which the purchaser may be liable to other persons, damages to property, and injury to or death of any persons.

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Consumers must inquire from their selling dealer as to the nature and extent of that dealer's warranty, if any. This warranty is expressly in lieu of all other warranties expressed or implied including the warranties of merchantability and fitness for use. This warranty shall not apply to products or any part thereof which have been subject to accident, negligence, alteration, abuse, or misuse or if damage was due to improper installation or use of improper power source, or if damage was caused by fire, flood, lightning, electrical power surge, explosion, wind storm, hail, aircraft or vehicles, vandalism, riot or civil commotion, or acts of God.