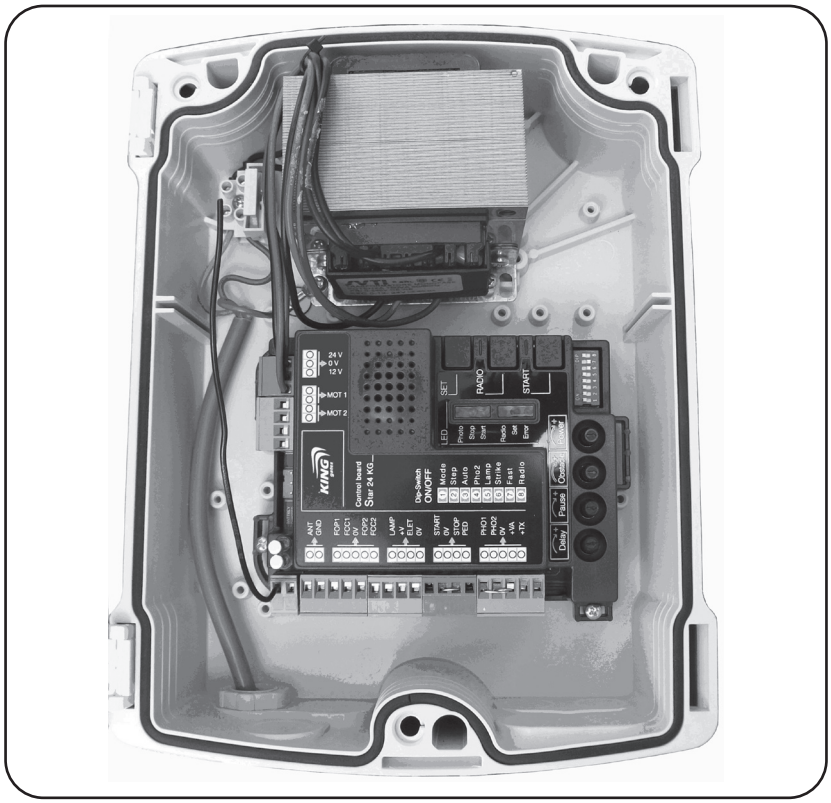
Star 224
Star M 224

SWING GATE CONTROL UNIT VER. AUS 4 – MANUAL

Star 224= Control unit for 1 or 2 24 Vdc Jet motors / Modus motors



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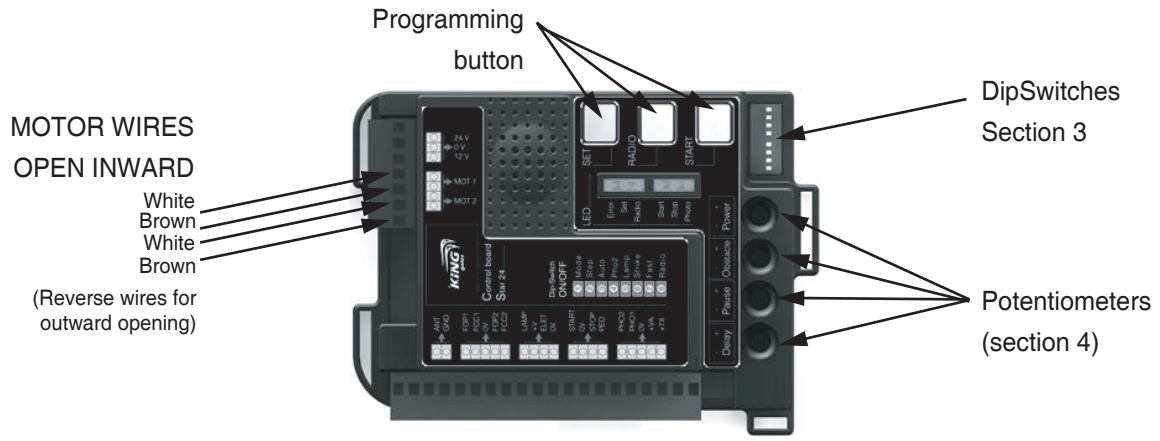
Main Menu



1 - SAFETY NOTICE

- This Instructions Manual (Instructions) contains important information regarding safety
- Read the entire document before you install any of the equipment
- Installation must be carried out by qualified installers
- Installation must be in accordance with all state and federal laws and regulations relating to Electrical Safety in your area
- Make sure that all cabling and wiring are in accordance with Wiring Rules AS 3000:2007
- Do not modify the equipment unless directed to by the Instructions. Modifications may cause irreversible damage to the equipment and result in malfunction. King-Gates and LiteStart disclaim any liability for damage resulting from modified equipment.
- Ensure that no damage will be caused by automating the gate. Pay particular attention to any damage that may be caused by impact, crushing, shearing, dragging, etc. as well as other general dangers.

Before installing any of the equipment ensures that the gate can move freely through its motion and that nothing is blocking or interfering with its path of travel.

- During installation and use, ensure that solid objects or liquids cannot enter the control box.

Before connecting the control box to the mains power

1 - Verify that all wirings done as described in section 2 above

2 - Ensure that the gate can move freely through its motion and that nothing is blocking or interfering with its path of travel

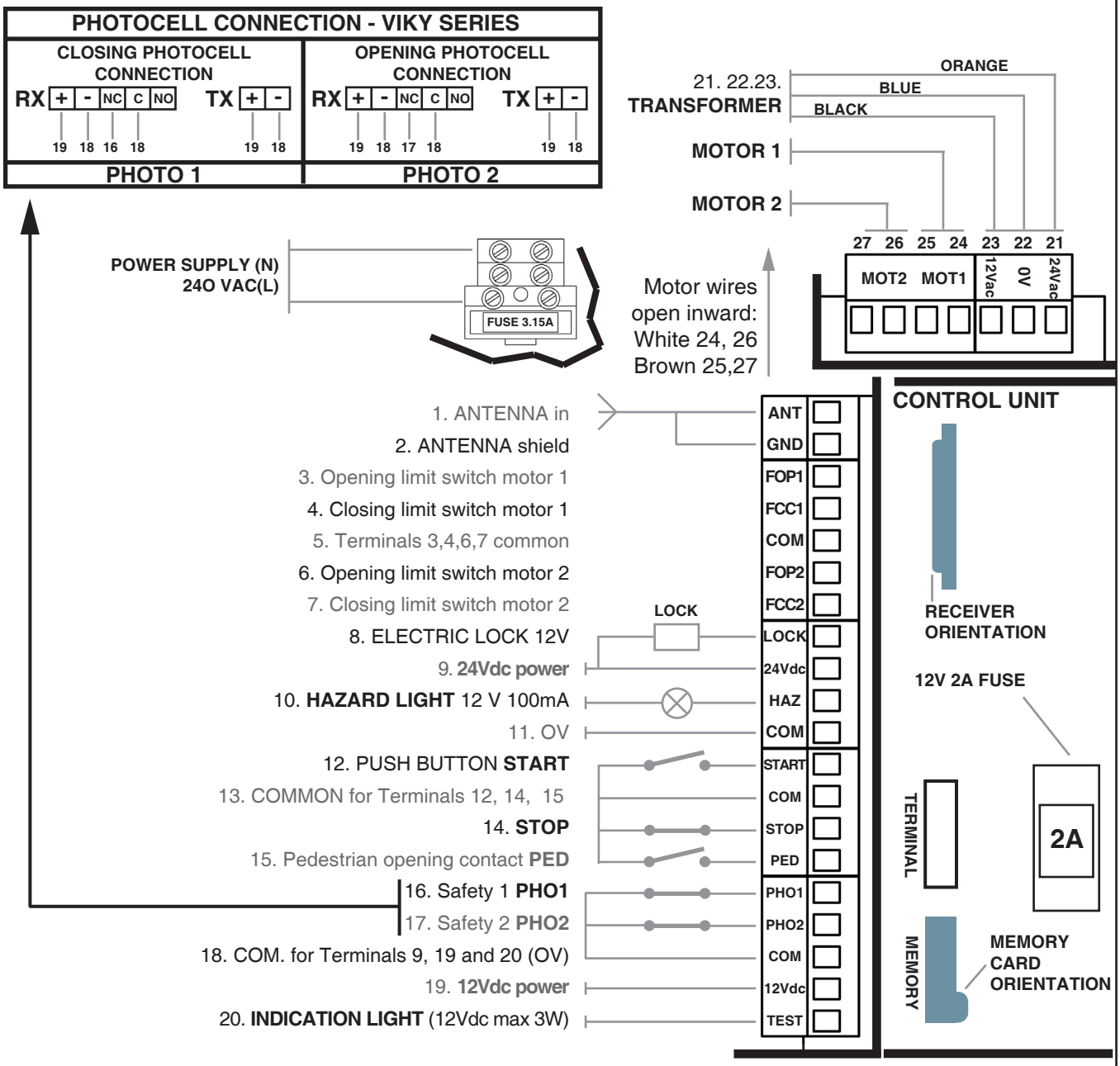
3 - Ensure that no damage will be caused by automating the gate

4 - Motor's terminals MUST be plugged in before powering the box

2 - ELECTRICAL CONNECTIONS

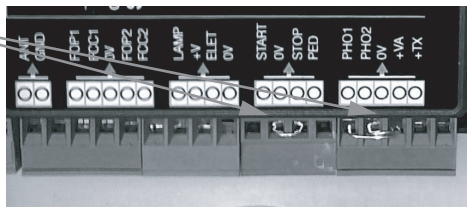
Cable length and cross section

- If the distance between the control unit and the grounding system is more than 30m, then it is necessary to install an electric discharger near the control unit
- Cables used for low-voltage features must be at least 0.25 mm2 for distance up to 30meters
- Use shielded (screened) cables that are at least 0.5mm2 for distance 30 -100meter
- Do not connect cables in underground boxes or inside conduits



NOTE:

- All connections to the board must be voltage free contacts ("dry Contacts")
- For motors without limit switches, terminals 3,4,5,6 and 7 are not used and must not be bridged (linked)
- The unit comes with safety devices' inputs (terminals 16 and 17) and the STOP input (terminal 4) all bridged (linked) to the COM (T13, 18)
- When connecting safety or STOP devices, remove the links from these terminals.
- For single wing gates, use only MOT1. Single / double motor set up done automatically with the gate travel learning



3 - SETTING THE DIPSWITCHES

- DipSwitches settings will only take effect after the system has reached the end of a cycle. i.e. when the gate closed or when the system has been reset (power off, battery and mains)

DIP sw.1 needs to be set BEFORE the gate travel learning

DS-1: Motor	Motor type (to set before gate travel learning)
ON	Folding arm Modus,Minimodus
OFF	Linear, Jet, Couper

DS-2: STEP	DS-3: AUTO	Operation mode setting
ON	ON	Auto-Closing with intervention by remote /command
ON	OFF	Step-by-step: open / stop / close / stop ....
OFF	ON	Fully Automatic, always close, (condominium)
OFF	OFF	Open / close /open (no stop when opening)

DS-4: Photo sensor-2	PHO2 input - terminal 17, setting
ON	Photo-sensor intervenes in opening and closing
OFF	Safety edge operation

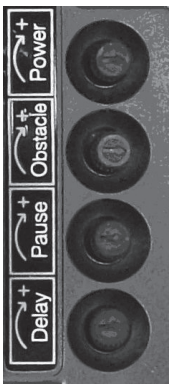
DS-5: Hazard Light	Hazard Light output (terminals 10 & 19) setting
ON	Connected light will flash during the cycle
OFF	Connected light will be steady on during the cycle

DS-6: Kick-back	Kick-back (Water hammer) on start
ON	Before opening, the gate shortly pushes to closing (for lock release).for hydraulic rams
OFF	Kickback is disabled

DS-7: Close After Photo	Close immediately after vehicle clears the photocell
ON	Gate closes immediately once photo-sensor is cleared
OFF	Close after Photo disabled

DS-8: Remote Control Programming	Remote Control Programming setting vehicle / pedestrian access (see sections 5, 6 and 11)
ON	Vehicle (full) opening
OFF	Pedestrian opening

4 - LINEAR POTENTIOMETERS



- Adjustments to the potentiometers will only take effect after the system has reached to the end of a cycle, i.e. when the gate closed or when the system has been reset (power off). Make sure that you let the adjustments take effect before readjusting.
- Adjusting the POWER potentiometers will require repeating the Automatic gate travel learning

POWER AND SPEED potentiometer adjusts the force and speed of the motor(s). Use this to adjust the pushing-force and for fine control over the speed (basic speed is determined by DipSwitch-1). Adjustment range is 30% to 100%. Adjust this potentiometer to have enough power to push against a 15 -35kg object that is 2 meters from the wing's hinges. (If the wing(s) are too sensitive to obstacles increase (+) the OBSTACLE potentiometer slightly)

Typical position - near maximum

Remember: adjusting the power pot. will take effect only after doingthe gate travel learning (sec.9)

OBSTACLE potentiometer is the anti-crush control. This determines the motor's pushing force limit and the time it takes the motor(s) to cut-out after hitting an obstacle. Increase (+) this adjustment when more force is needed. Eg. for gates made of full steel, cast iron, colorbond (sheet metal), and for gates in windy areas. Cut out range time is 0.1 to 3 seconds

- For windy arias, wooden and colorbond gates – increase the obstacle level slightly
- This potentiometer also controls the pressure against the travel stoppers. Check manual override operation after adjusting this potentiometer

Typical position - near maximum

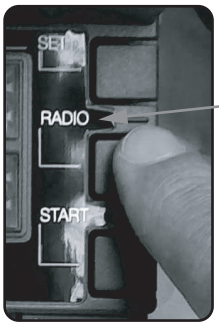
PAUSE potentiometer determines the delay time at the open position before automatically closing. (for auto-closing modes only). The delay range is 1 to 90 seconds.

- Remember: let the cycle finish before readjusting

DELAY between the wings in opening and closing. This potentiometer controls the delay between MOT 1 and MOT 2 (wing 1 and wing 2). Use this delay when wings overlap or when using an electric lock. The delay range is 0 to 15 seconds.

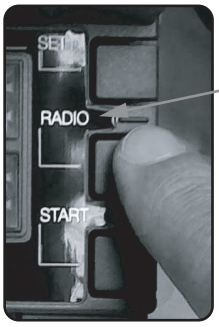
- Remember for single wing gates - this potentiometer should be set to 0 (zero).

5 - PROGRAMMING THE REMOTE CONTROL FOR MAIN VEHICLE ACCESS - FULL OPENING



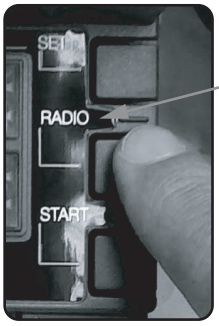
1) Make sure that: A) Power – ON
B) DipSwitch 8 - ON
2) Press the **RADIO** button in the control box for 3 seconds
the RADIO-LED turns on
3) Choose the remote's button you want to use for vehicle access opening
(usually the large one) and press it
The RADIO-LED flashes shortly
For programming more remotes – repeat step 3
4) Press the **RADIO** button again to exit the programming mode
If no key is pressed, programming mode will automatically exit after 10 seconds!

6 - PROGRAMMING REMOTE CONTROL PEDESTRIAN ACCESS



1) Move DipSwitch 8 to OFF
2) Press the RADIO button in the control box for 3 seconds
the RADIO LED turns on
3) Choose the remote's button you want to use for PEDESTRIAN- ACCESS opening (usually the smallest one) and press it
the RADIO LED will flashes shortly
For programming more remotes - repaid this process one after the other
4) Press the RADIO button again to exit the programming mode
If no key is pressed, programming mode will automatically exit after 10 seconds!
5) Move Dip SW 8 to ON (reccomended)

7 - DELETING ALL THE REMOTE CONTROLS FROM THE CONTROL BOX



1) Press the RADIO button for 4 seconds and release
the RADIO-LED starts flashing
2) While it flashes, press the RADIO button again until
the RADIO-LED flashing rapidly
All remotes deleted

8 - HOW TO ADJUST THE OBSTACLE, POWER AND SPEED WITH THE POTENTIOMETERS

1) Make sure that DipSwitch 2 is ON & DipSwitch 3 is OFF - step-by-step mode

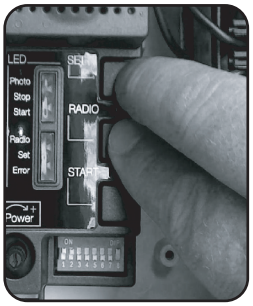
2) Engage (Open) the manual override lever and move the wings to half way, then disengage (close) the manual override

3) Before operating the gate consider all safety requirements (see paragraph 1)

4) Operate the gate with a remote control (or with the START button) and check the force, torque while the wings are moving
- adjust the speed with the POWER potentiometer (Typical position is near maximum)
- Remember; changes will only take effect at the end of the cycle
- High / low BASIC speed is determine by DipSwitch 1

5) Carefully check that the gate has enough power to push against a 15 -35kg object. Adjust it with the OBSTACLE potentiometer
- Measure the force about 2 meters from the wing hinge
- If the motor force is not sufficient, increase the power slightly by adjusting the POWER potentiometers (Typical position is near maximum)
- For windy sites, wooden or colorbond gate – increase the obstacle level slightly (for more details see section 4)

9 - AUTOMATIC GATE TRAVEL LEARNING



Before the Automatic Learning!

- In this process the controller "learns" the gate's travel time and automatically sets the default slowdown points
- During the Automatic Learning safety devices are disabled! Keep the gate travel area clear to prevent any damage that may be caused by crushing into an object, vehicle, person, animals...
- Ensure that the mechanical and or electrical limit switches are in-place and operating
- To stop this programming mode at any time press the SET and RADIO buttons simultaneously.
- For systems with single motor, use MOT1 (terminal 24 and 25) and adjust the DELAY potentiometer to (-) minimum
- For double (twin) wings, connect the motor that opens first to MOT1 (terminal 24 and 25)
- To changing the default slowdown points – see section 10

Automatic Gate Travel Learning procedure

1) Make sure that DipSwitch 2 is ON and DipSwitch 3 is OFF- step-by-step mode
2) Engage (Open) the manual override lever and move the wings to half way, then disengage (close) the manual override
3) Press and hold the SET button for 2 seconds
- the yellow SET LED flashes
4) Immediately press the Set button again for 2 sec - gate start opening , SET LED remain on till the end of learning
5) If the wing(s) begin moving to closing, stop the Automatic Learning process (press the SET and RADIO simultaneously) and reveres (swap) the motor(s) wires.
Automatic Gate Travel Learning done

Advanced Programming

10 - CHANGING THE FACTORY SLOWDOWN POINTS

1) The Automatic Gate Travel Learning should be done first, the default slow down points are set at 15% of full travel
2) You may remove, or set new slowdown points
3) For new slowdown points, mark the points on the driveway
4) Make sure that the operation mode is Step By Step (DipSwitch 2 ON / 3 OFF)
5) Move the wings to half way position
6) Press the **SET** button for 2 seconds >> the **SET LED** flashes for 5 seconds
7) Press the **RADIO** button for 1 second >> the **SET LED** turns steady on and gate starts moving
8) The gate begins to open slowly, then the wings will close one after the other until fully closed
9) Press the **SET** button, or the remote control >> wings begin to open

To remove the slowdown points in opening let the wings open all the way; Or, for new slowdown point(s):

When wing 1 arrives to the new slowdown point >> press the **SET** button, or button 1 of the remote control
When wing 2 arrives to the new slowdown point >> press the **RADIO** button, or button **2** of the remote control

10) Press the **SET** button or the remote control >> wings begins closing

To remove slowdown points in closing let the wings to go the way; **Or, for new slowdown point(s)**:

When wing 1 arrives to the slowdown point >> press the **SET** button, or button 1 of the remote control
When wing 2 arrives to the slowdown point >> press the **RADIO** button, or button 2 of the remote control

11 - ADJUSTING THE PEDESTRIAN ACCESS OPENING GAP

1) Make sure that the remote control(s) is programmed for pedestrian access opening (DipSwitch 8 OFF)
2) Make sure that the gate is in the closed position
3) Press the **SET** button for 2 seconds >> **SET LED** begins to flash
4) Press the **START** button >> **SET LED** turns steady on
5) Press the **START** or remote or push button >> **Wing 1** begins to open
6) When wing 1 arrives at the desired opening point - stop it by pressing **START**, remote , or push button
The new Pedestrian opening gap is set

12 - RESET THE PEDESTRIAN OPENING GAP TO DEFAULT SETTING

1) Make sure that the gate is in the closed position
2) Press the **SET** button for 2 seconds >> **SET LED** begins to flash
3) Press the **START** button >> **SET LED** turns steady on
4) Press the **SET** button >> **SET LED** flashes rapidly and turns off
Pedestrian opening gap reset

13 - DELETING PEDESTRIAN ACCESS BY REMOTE CONTROL

1) Make sure that the gate is in the closed position
2) Press the **SET** button for 2 seconds >> **SET LED** begins to flash
3) Press the **START** button >> **SET LED** turns steady on
4) Press the **SET** button >> **SET LED** flashes rapidly and turns off
Pedestrian access by remote control deleted (push button command terminal 15 still active)

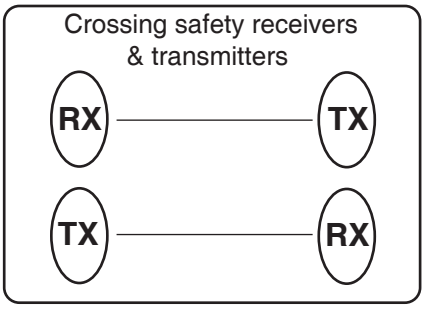
ADVANCE FEATURES

14 - SAFETY DEVICES DETAILED DESCRIPTION

PHO1- SAFETY DEVICES IN CLOSING
Input PHO1 (terminal 16 and 18) is used for connecting photo-sensors as safety devices to intervene during closing.

PHO2: SAFETY DEVICES IN OPENING AND CLOSING
Input PHO2 (terminals 16 and 17) intervene both in closing and in opening
There are two options determined by DipSwitch **4**:
DipSwitch **4 ON**: if trigged by safety device >> gate stops and when path is cleared keeps going
DipSwitch **4 OFF**: (for Safety Edge in Opening):
Trigged in opening >> stops and closes for 2 seconds
Trigged in closing >> no effect

NOTE:
If more than one pair of photo-sensors is used, it is recommended to have the position of the transmitters and receivers alternated between the pair, in order to avoid cross triggering.



SAFETY AUTO TEST
The Auto safety test is recommended in Europe. The control unit has a Safety Device Test mode to check the operation of the devices connected to inputs PHO1 (terminals) and PHO2 (terminals).

ENTER THE SAFETY DEVICE TEST:
1) First connect the Photo-sensor's +VE end to the TX input (terminal 20) instead of the VA input (terminal 19), for which it should be connected during normal operation.
2) Press the **RADIO** button for 2 sec >> RADIO-LED Red turns on
3) Press the **SET** button 4 times >> SET LED Yellow turns on
4) Wait 10 seconds >> SET LED and RADIO LED both turn off
Safety Auto Test is now activated

EXIT THE SAFETY AUTO TEST MODE (if error LED on press the SET button, and wait unit the SET LED turns off) then:
1) Press the **RADIO** button for 2 seconds >>SET LED and red RADIO LED both turn on
2) Press the **START** button once >> SET LED turns off
3) Wait 10 seconds >> RADIO LED turns off
Safety Auto Test is now deactivated

NOTE: Entering the test with the safety devices not properly connected will cause the unit to malfunction.
To determine whether the unit is in the test mode press the RADIO button for 3 seconds: if the RADIO LED turns on then the self-test is disabled. If both the red RADIO led and the yellow SET led turn on then the test is active.

15 - OPTIONAL ACCESSORIES

HAZ – HAZARD LIGHT output: terminals 10, 19; 12 VDC Max 15W. (0.6Amp); for connection of hazard light. Turns on a second before the wings move. DipSwitch-5 setting: ON: Flashing / / OFF: steady on

ANTENNA input : terminals 1,2 - for increasing reception range connect an external antenna (Item code: ANT 433) and remove internal antenna (the wire from the terminal)

TX – MOTION INDICATION LIGHT output: terminal 8, 9 – 12 Vdc Max 3W (0.25W)
Gate opening >> Light flashes // Gate closing >> Fast flashing
Gate open or closed (stand still) >> no output
also used for the Safety Auto Test mode (section 14).

ELECTRIC LATCH LOCK output – terminals 10, 11; 12Vdc MAX 15W (1.25Amp)

BACKUP BATTERY KIT
Backup battery kit available in two options:
2 x 2.3 A/H (Buffer) internal batteries and charger provide emergency power for about 3 hours
2 x 7 A/H batteries and charger provide emergency power for about 8 hours.

COURTESY LIGHT output –optional card connected to HAZ terminals 10,11
Voltage free (dry) contact Max 250Vac 500W ** Time range: (0) to 120 Seconds

16 - STATUS LED'S

SET Yellow LED
FLASHING for 5 seconds when power is turned on.
ON > during Gate Travel Learning
OFF>when unit operates normally

RADIO Red LED
OFF >the control unit is functioning normally
FLASHING briefly when a remote transmits
ON > the unit is ready to store a new remote to memory
FLASHING fast while deleting all remotes from memory
FLASHING continuously fast > memory card is faulty
FLASHES continuously slowly >memory card is full

PH Red LED
ON >photo-sensor connected properly (if safety devices are not connected, the links must be in place, Section 2)
OFF> Safety (photocell) sensor is triggered (or not correctly installed)

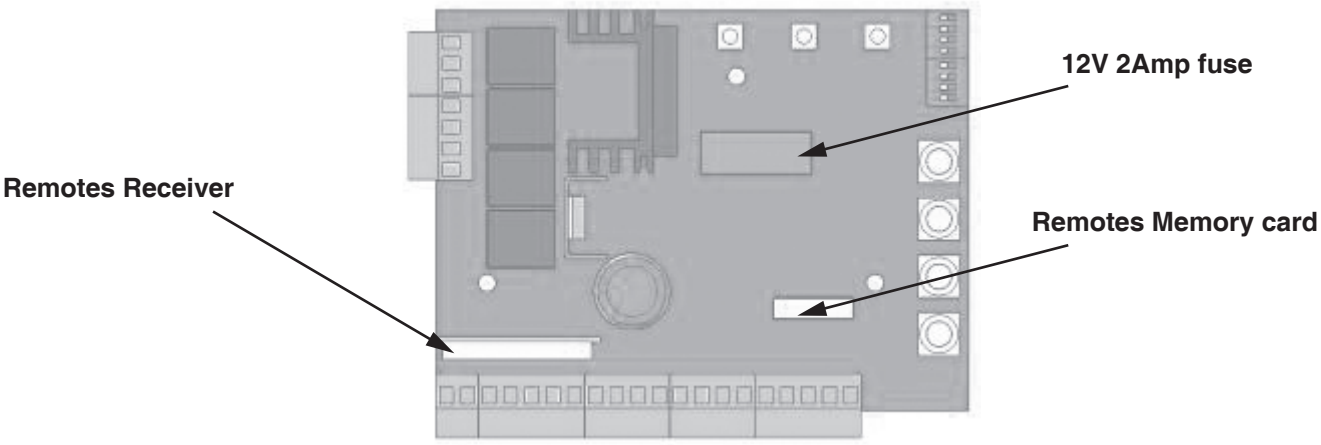
START Green LED
ON >START command received contact close (shorted) terminal 12
OFF> no START command

ST Red LED
ON > the STOP input (terminal 14) is closed (shorted)
OFF> the STOP input (terminal 14) is opened

ER red LED
ON or FLASHING > an error occurs (see Trouble shooting section 18)
ON or FLASHING > Travel learning needs to be done see sec.9
OFF > the control unit is working normally

17 - INSIDE THE CONTROL UNIT (advanced only)

NOTES: opening the board case may cancel the warranty for the board



18 - TROUBLE SHOOTING

THE RED ERROR (ERR) LED TURNS ON, AND THE CONTROL UNIT DOES NOT FUNCTION
- Repeat Automatic Gate Travel Learning – see section 9
-The control unit is in Safety Test mode (section 14) to deactivate:
- Faulty control unit – replace the unit
- Memory hybrid fault - replace the board

GATE DOES NOT MOVE AT ALL
- check that the control box has power.
- Check the main fuse. IMPORTANT: TURN OFF POWER BEFORE CHECKING THIS FUSE
- Verify that the STOP (ST) LED is on. If not check connection on the STOP input (terminal 14). This is a Normally Closed contact.
- Check that the remote control is programmed for the system (Section 5)

GATE OPEN BUT NOT CLOSE
- Check that the photo sensors are properly connected (PHO LED is on). If the LED is off ensure that the photo-sensors are connected properly and that nothing is blocking the beam's path.
- Check that the green START LED is off. If it is on then check connection to the START input (terminal 12). This is a Normally Open contact.
- Check photo red LED to be on, if not check the link (jumper) or the photo 2 connection

THE REMOTE CONTROL DOES NOT WORK
- Check that the LED on the remote is working. If not replace the remote's batteries.
- Check that the red RADIO LED briefly flashes when the remote transmits. If it does not then re-program the remote.

GATE CLOSES BY ITSELF (WITHOUT THE REMOTE BEING PRESSED)
- Check the operation mode – DipSwitches 2 ON , DipSwitch 3 OFF >> Step-By-Step mode
- Check that DipSwitch 7 (Close after Photo) is OFF.

GATE STOPS HALFWAY AND THEN MOVES IN THE OPPOSITE DIRECTION
- The obstacle sensitivity is too low: Increase the Obstacle Sensitivity Potentiometer.
- Check that the gate does not cut the photo sensor beam when moving.
- Open the manual override and check that the gate travels freely all the way.
- repeat Automatic Gate Travel learning (section 9)

GATE STOPS HALFWAY
- Not enough force; Increase the POWER potentiometer. Adjustment to this potentiometer will also change the speed and will require repeating the Automatic Gate Travel Learning (Section 9).
- The gate stops after they reach the slow down point. Manually set (or remove the slow down) points (Section 10).

SHORT RECEPTION RANGE
- The remote control batteries are weak or dead. Replace batteries.
- An external antenna needs to be added to the system.

NOTE: External interferences from power lines and other emitting devices can influence the reception range. Installing an external antenna may improve the reception range.

G**ATE IS NOT TIGHTLY CLOSED WHEN REACHING THE CLOSED POSITION**
- Increase the Obstacle Sensitivity potentiometer so that the wings are pressing harder against the stopper.
- Check that all brackets and hinges are secure and that their bolts are tightened

THE MANUAL RELEASE IS JAMMED
- The override mechanism is too tight. Decrease the Obstacle Sensitivity potentiometer.
- It is recommended to repeat the Automatic Gate Travel Learning after adjustment to this potentiometer

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