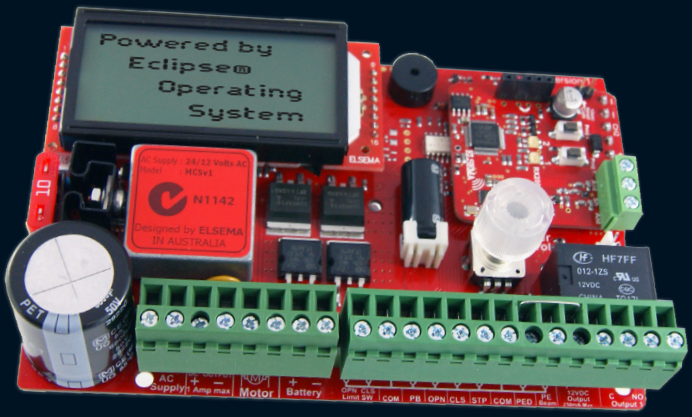
1st Edition

Motor Controller Single Gate

with Eclipse® Operating System (EOS)

Eclipse® MCS



ELSEMA
GATE & DOOR CONTROLS
www.elsema.com

MCS : Motor Controller Single Gates
Setup and Technical Information
Includes latest Intelligent Technology

Important warning and safety instructions

All installations and testing must be done only after reading and understanding all instructions carefully. All wiring should be done only by trained technical personnel. Failing to follow instructions and the safety warnings may result in serious injury and/or damage to property.

Elsema Pty Ltd shall not be liable for any injury, damage, cost, expense or any claim whatsoever to any person or property which may result from improper use or installation of this product.

Risk in the goods purchased shall unless otherwise agreed in written pass to the buyer upon delivery of the goods.

Any figures or estimates given for performance of goods are based upon the company's experience and is what the company obtains on tests. The company will not accept liability for failure to comply with the figures or estimates due to the nature of variable conditions affecting for example Radio Remote Controls.

Please keep this setup instruction for future reference.

Installed by: _____

Service date: _____

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Features

- Lithium-ion and lead acid battery charger
- Suitable for single swing and sliding gates
- Single motor operation
- Eclipse Operating System (EOS)
- Motor soft start and soft stop
- Slow speed and force adjustment
- Large 4-line LCD to indicate controllers status and setup instructions
- 1-Touch control for easy setup
- Various inputs, push button, open only, close only, stop, pedestrian and photoelectric beam
- Supports limit switch inputs or mechanical stops
- Adjustable auto close and pedestrian access
- Adjustable lock and courtesy light outputs
- Variable photoelectric safety beam functions
- 12 Volt DC Output to power accessories
- Service counters, password protection, holiday mode and many more features

Description

The Motor Controller Single (MCS) is not just the next generation but the industry game changer. We wanted to create a controller that is simple to use and does just about any feature required in the gate and door industry. The MCS is not just the next generation but the “Next Transformation” in the gate and door industry creating an Eclipse over previously developed motor controllers.

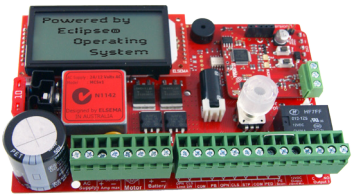
This new intelligent motor controller is the best match for your automatic gate or door motors.

The MCS’s Eclipse® Operating System (EOS) is a user friendly menu driven system that uses the 1-touch button to control, setup and run automatic gates, doors and barriers. It uses a large 4-line LCD screen showing live reading of the motor performance and status of all inputs and outputs.

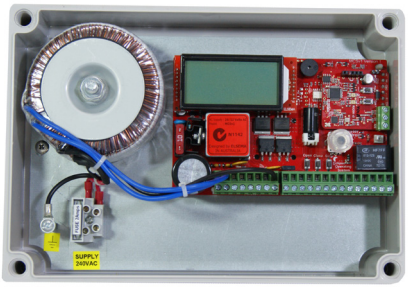
The intelligent controller was built from the ground up, based on customer feedback and using todays technology. With its rich functions, consumer friendly price and with the focus during development being ease of use and setup makes this controller the ultimate board to control your motors.

Elsema’s easy options to add remote controls or any type of photoelectric beams makes for a very user friendly approach, while avoiding the lockdown approach to accessories.

The control cards are available with an IP66 rated plastic enclosure for outdoor installations or the card only.



MCS



MCS24E or MCS12E

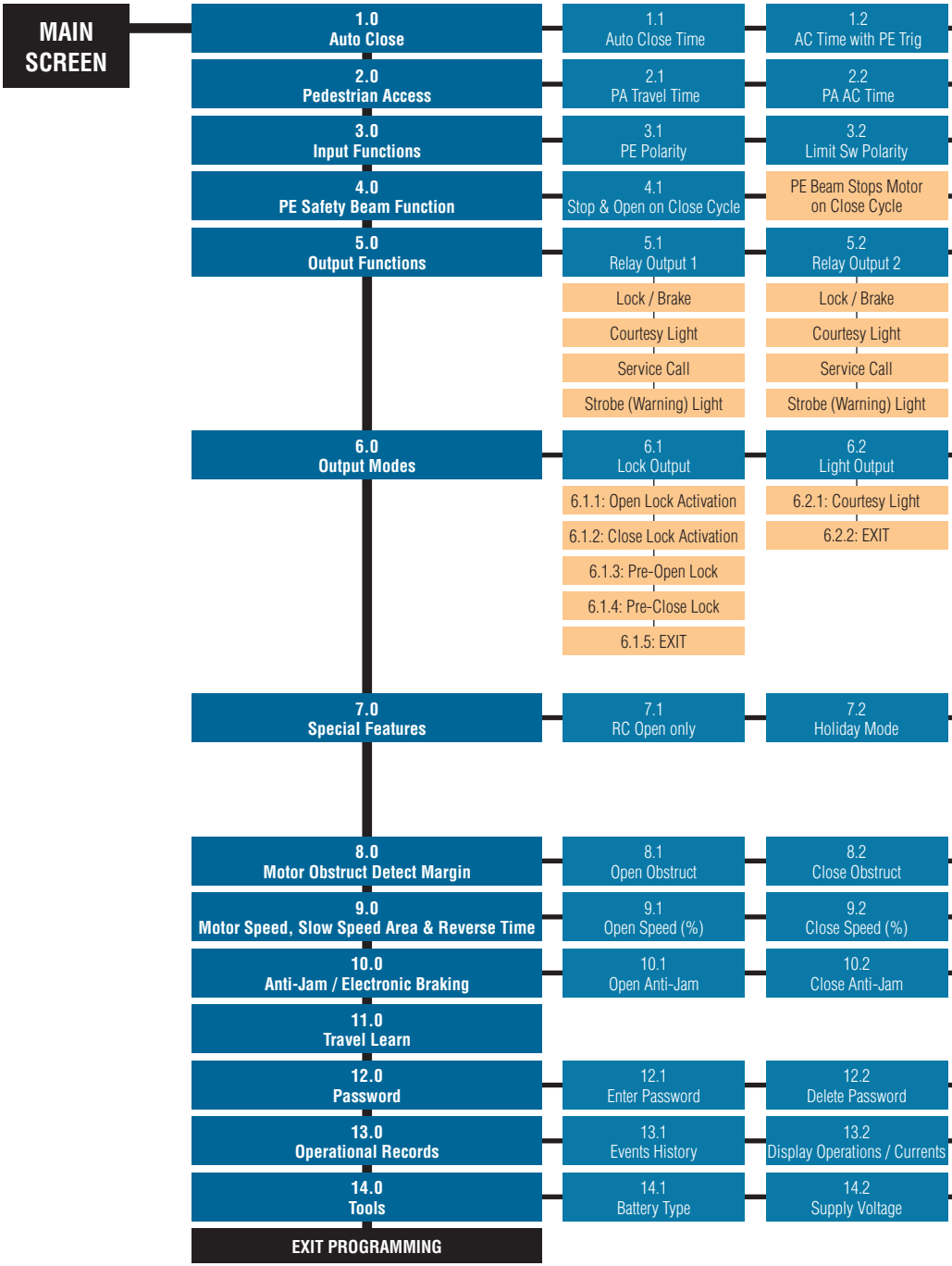
MCS12E7

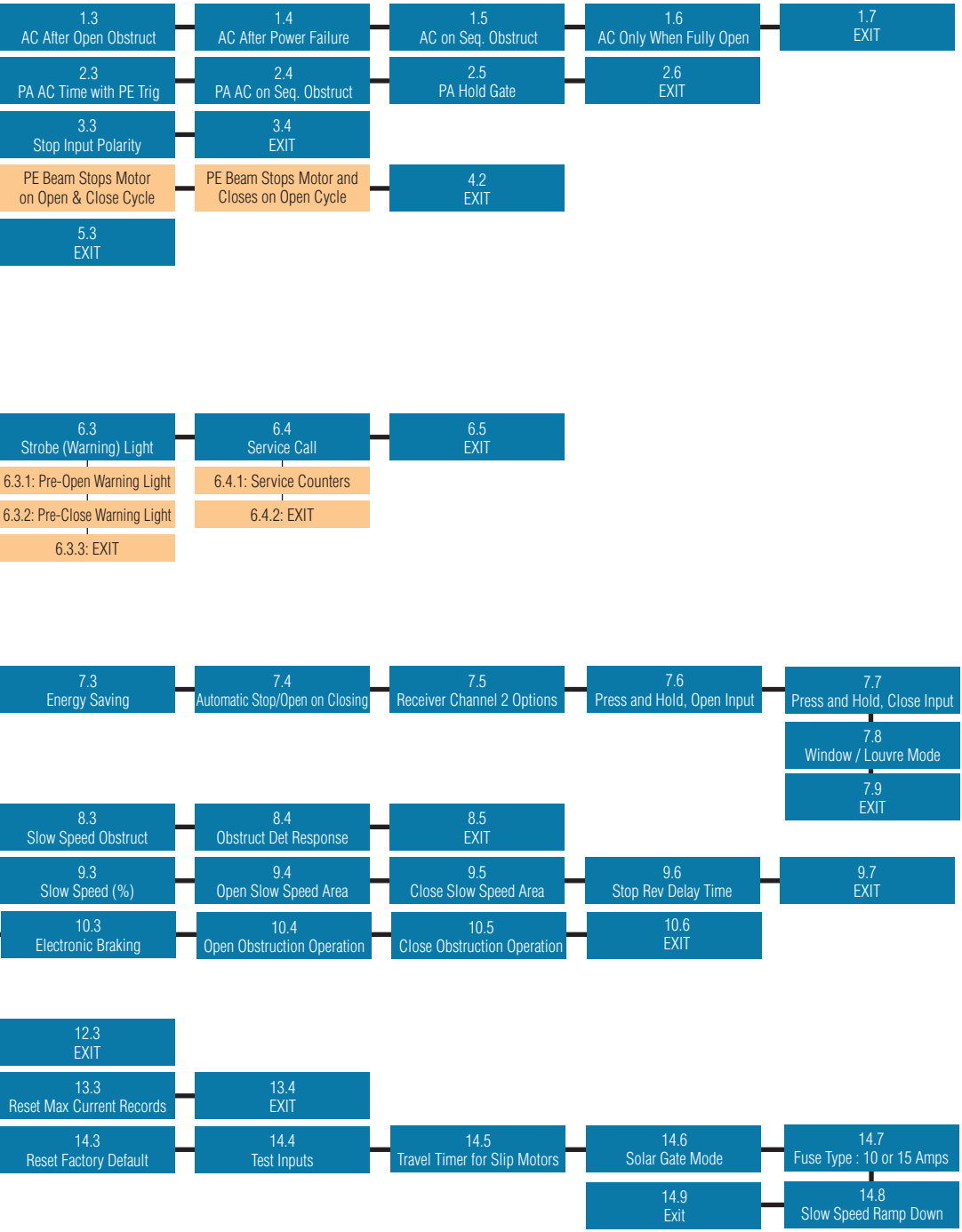
Part Number:

Part No.	Contents	Part No.	Contents
MCS	Single gate and door controller for 24 / 12 Volt motor, card only		
MCS24E	Single controller for 24 Volt motors includes IP66 rated plastic enclosure and transformer	MC1S2E	Single controller for 12 Volt motors includes IP66 rated plastic enclosure and transformer
MCS24E2	Same as MCS24E plus 24 Volt 2.6Ah backup battery	MCS12E2	Same as MCS12E plus 12 Volt 2.6Ah backup battery
MCS24E7	Same as MCS24E plus 24 Volt 7.0Ah backup battery	MCS12E7	Same as MCS12E plus 12 Volt 7.0Ah backup battery
Solar Gates			
Solar24	Solar kit for double or single gates, includes intelligent solar charger & 24 Volt 12.0Ah backup battery	Solar12	Solar kit for double or single gates, includes intelligent solar charger & 12 Volt 12.0Ah backup battery
SP20*	20 Watt solar panel	SP40*	40 Watt solar panel

Menu Structure

Press Master Control for 2 seconds to enter the menu structure




1.3
AC After Open Obstruct
1.4
AC After Power Failure
1.5
AC on Seq. Obstruct
1.6
AC Only When Fully Open
1.7
EXIT
2.3
PA AC Time with PE Trig
2.4
PA AC on Seq. Obstruct
2.5
PA Hold Gate
2.6
EXIT
3.3
Stop Input Polarity
3.4
EXIT
PE Beam Stops Motor on Open & Close Cycle
PE Beam Stops Motor and Closes on Open Cycle
4.2
EXIT
5.3
EXIT
6.3
Strobe (Warning) Light
6.4
Service Call
6.5
EXIT
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6.4.1: Service Counters
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Energy Saving
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Receiver Channel 2 Options
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Press and Hold, Close Input
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Window / Louvre Mode
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EXIT
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Slow Speed Obstruct
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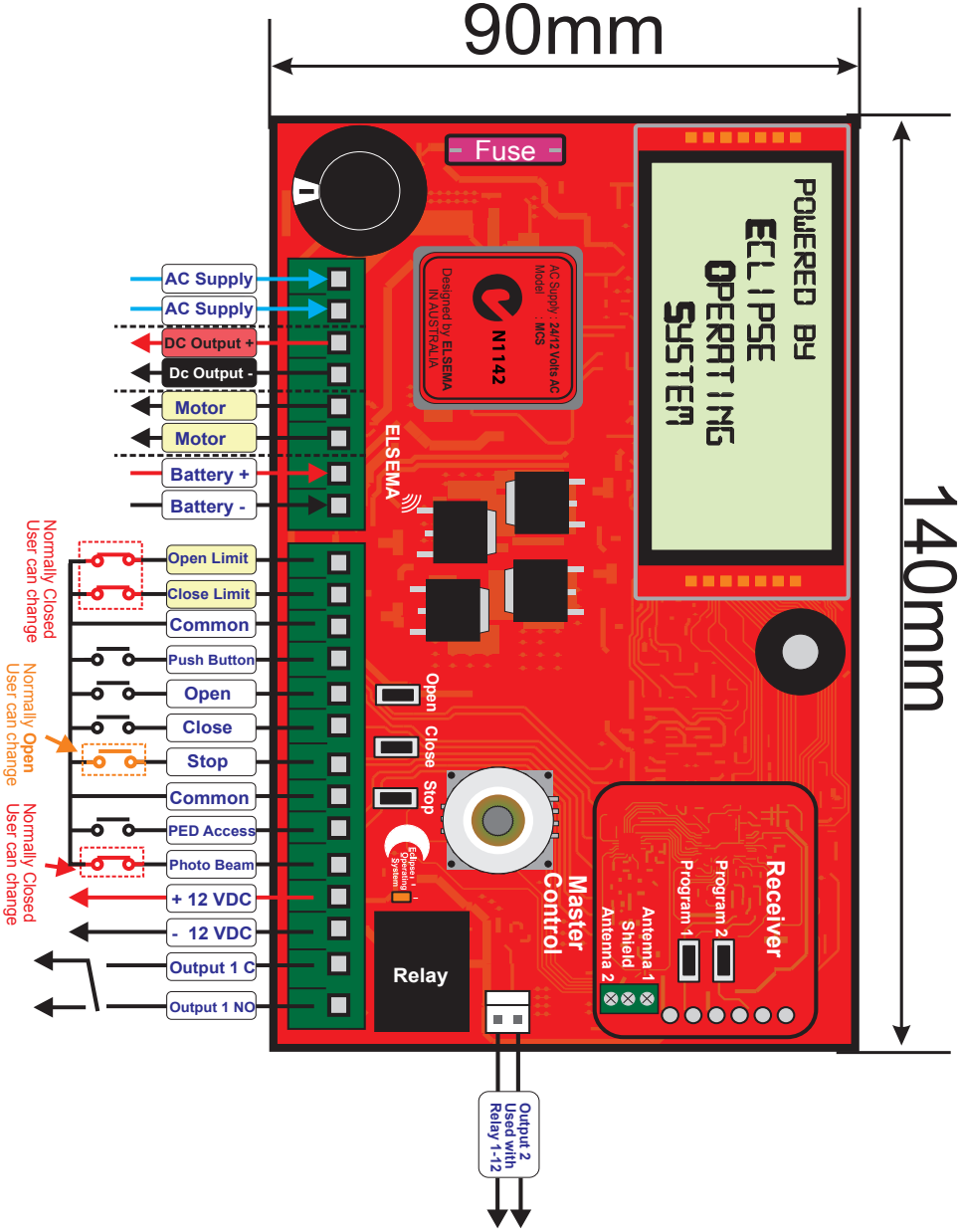
Obstruct Det Response
8.5
EXIT
9.3
Slow Speed (%)
9.4
Open Slow Speed Area
9.5
Close Slow Speed Area
9.6
Stop Rev Delay Time
9.7
EXIT
10.3
Electronic Braking
10.4
Open Obstruction Operation
10.5
Close Obstruction Operation
10.6
EXIT
12.3
EXIT
13.3
Reset Max Current Records
13.4
EXIT
14.3
Reset Factory Default
14.4
Test Inputs
14.5
Travel Timer for Slip Motors
14.6
Solar Gate Mode
14.7
Fuse Type : 10 or 15 Amps
14.9
Exit
14.8
Slow Speed Ramp Down

MCS Connection Diagram



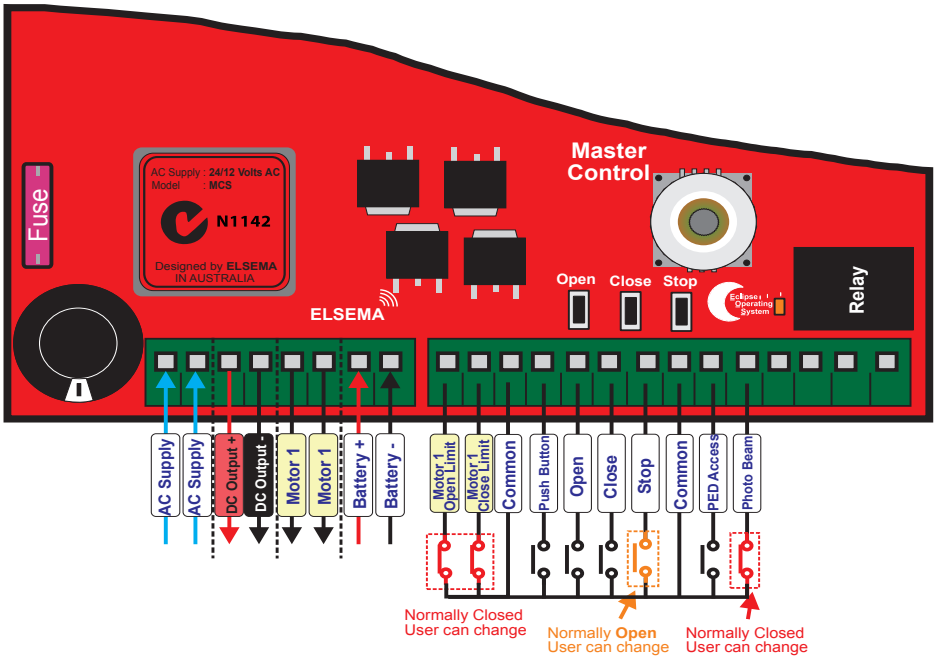
Electrical Wiring - Supply, Motors and Inputs

DANGER
Mains voltage

Always switch off power before doing any wiring.

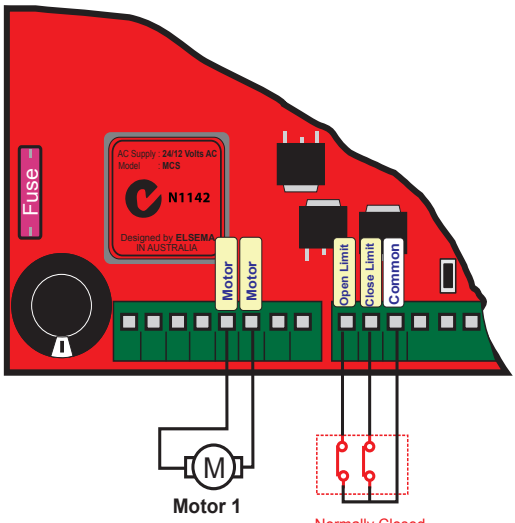
Make sure that all the wiring is completed and that the motor is connected to the control card. **Recommended wire strip length should be 12mm for all connections to the plug in terminal blocks.**

The diagram below shows the supply, motors, and inputs available and the factory default setting for each input.

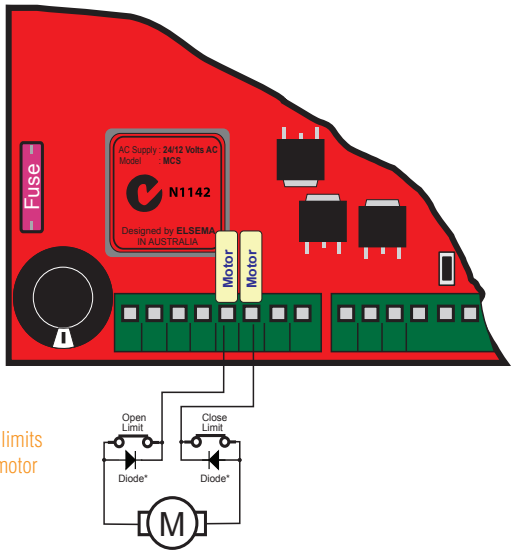


Limit Switches

If you are using limit switches make sure they are connected properly. The control card can operate with either the limit switches connected directly to the cards terminal blocks or in series with the motor. Check diagrams below:



Controller with limits connected



Controller with limits in series with motor

* 6Amps, 50V or better diode

By default the limit switch inputs on the control card are normally closed (NC).

This can be changed to normally open (NO) during the setup steps.

Setup i-Learning Steps:

1. The i-Learning setup can always be interrupted with the stop button or by pressing the Master Control knob.
2. Enter Menu 11 to start i-Learning or new control cards will automatically prompt you to do the i-Learning.
3. Look at the LCD and follow the instructions displayed.
4. Buzzer will indicate learning was successful. If there was no buzzer check all electrical wiring including the power supply then go back to step 1.
5. If you hear the buzzer the gate or door is ready for use.

Menu 1 – Auto Close

Auto close is a feature that automatically closes the gate/door after a preset time has counted down to zero. The control card has a normal auto close and several special auto close features each one having its own countdown timers.

Elsema Pty Ltd recommends a photoelectric beam should be connected to the control card when any of the auto closes options are used.

If the stop button is pressed Auto Close is disabled for that cycle only. Holding the push button, open only or photoelectric beam will not allow the auto close timers to count down.

Menu No.	Auto Close Features	Factory Default	Adjustable
1.1	Normal Auto Close	Off	3 - 600 seconds
1.2	Auto Close with Photoelectric Trigger	Off	1 - 60 seconds
1.3	Auto Close after an Open Obstruction	Off	1 - 60 seconds
1.4	Auto Close after Power Failure is Removed	Off	1 - 60 seconds
1.5	Normal Auto Close on Sequential Obstructions	2	Min = Off, Max = 5
1.6	Auto Close Only when Fully Opened	Off	Off/On
1.7	Exit		

1.1 Normal Auto Close

The gate/door will close after this timer has counted down to zero.

1.2 Auto Close with Photoelectric Trigger

A photoelectric beam needs to be triggered before this auto close starts counting down to close the gate/door. If there is no photoelectric beam trigger the gate/door will not close.

1.3 Auto Close after an Open Obstruction

If the gate/door opens and hits an obstruction normally the gate/door will stop and remain in this position. If this feature is enabled an obstruction will start the timer count down and at zero will close the gate/door.

1.4 Auto Close after Power Failure is Removed

If the gate/door is open in any position and then there is a power failure, when power is reconnected the gate/door will close with this timer.

1.5 Normal Auto Close on Sequential Obstructions

If the normal auto close is set and the gate/door closes onto an object the gate/door will stop and reopen. This setting sets the amount of times the gate/door will try to auto close. After trying for the set limit the gate/door will remain open.

1.6 Auto Close Only when Fully Opened

The auto close timer will not time out unless the gates/doors are fully opened.

Menu 2 – Pedestrian Access

There are several types of Pedestrian access modes. Pedestrian access opens the gate/door for a short time to allow someone to walk through the gate/door but does not allow a vehicle access.

Elsema Pty Ltd recommends a photoelectric beam should be connected to the control card when any of the auto closes options are used.

Menu No.	Pedestrian Access Features	Factory Default	Adjustable
2.1	Pedestrian Access Travel Time	3 seconds	3 - 20 seconds
2.2	Pedestrian Access Auto Close Time	Off	0 - 60 seconds
2.3	Pedestrian Access Auto Close Time with PE trigger	Off	0 - 60 seconds
2.4	Pedestrian Access Auto Close on Sequential Obstructions	2	Min = Off, Max = 5
2.5	Pedestrian Access with Hold Gate	Off	Off/On
2.6	Exit		

2.1 Pedestrian Access Travel Time

This sets the time the gate/door opens when a pedestrian access input is activated.

2.2 Pedestrian Access Auto Close Time

This sets the countdown timer for automatically closing the gate/door when a pedestrian access input is activated.

2.3 Pedestrian Access Auto Close Time with PE Trigger

This sets the countdown timer for automatically closing the gate/door when a photoelectric beam is triggered and pedestrian access input is activated.

2.4 Pedestrian Access Auto Close on Sequential Obstructions

If the pedestrian access auto close is set and the gate/door closes onto an object the gate/door will stop and reopen. This setting sets the amount of times the gate/door will try to auto close. After trying for the set limit the gate/door will remain open.

2.5 Pedestrian Access with Hold Gate

If the pedestrian access hold gate is ON and the Pedestrian access input is permanently activated the gate will remain open in the pedestrian access position. Open input, Close input, Push Button input and remote controls are disable. Used in Fire Exit applications.

Menu 3 – Input Functions

This allows you to change the photoelectric beam and limit switch inputs from normally closed to normally open.

Menu No.	Input Functions	Factory Default	Adjustable
3.1	Photoelectric Beam Polarity	Normally Closed	Normally Closed / Normally Open
3.2	Limit Switch Polarity	Normally Closed	Normally Closed / Normally Open
3.3	Stop Input Polarity	Normally Open	Normally Closed / Normally Open
3.4	Exit		

Menu 4 – Photoelectric Beam

The photoelectric beam is placed across the gate/door and when it is broken it can operate the gate/door to do certain functions.

Menu No.	Photoelectric Beam Feature	Factory Default	Adjustable
4.1	Photoelectric Beam	PE Beam stops and opens gate/door on close cycle	PE Beam stops and opens gate/door on close cycle --- PE Beam stops gate/door on close cycle --- PE Beam stops gate/door on open & close cycle --- PE Beam stops and closes gate/door on open cycle
4.2	Exit		

The factory default for the PE beam input is “normally closed” but this can be changed to normally open. To change it go back to Menu 3.

Elsema Pty Ltd recommends a photoelectric beam should be connected to the control card when any of the auto closes options are used.

Elsema sells several different types of photoelectric beams. We stock Retro-Reflective and Through Beam photoelectric beams.

PE1500
(Polarised Retro-Reflective Type)

PE24
(Through-Beam type)

Menu 5 – Output Functions

The control card has two outputs, Output 1 and Output 2. The user can change the function of these outputs to lock / brake, courtesy light, service call or strobe (Warning) light indicator.

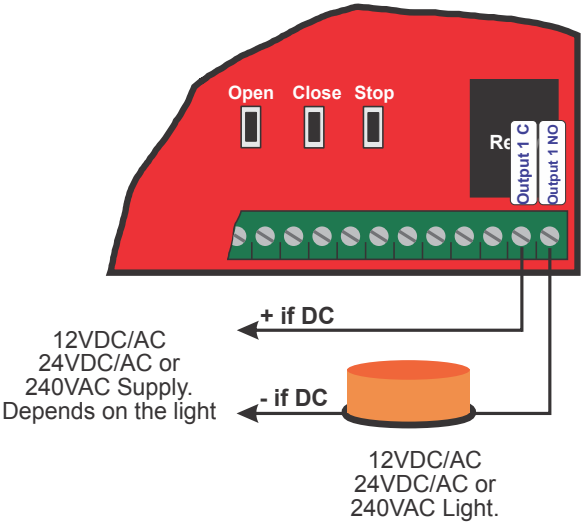
Output 1 is a relay output with common and normally open contacts. Factory default is lock / brake release function.

Output 2 is an open collector output. Factory default is courtesy light function.

Menu No.	Output Function	Factory Default	Adjustable
5.1	Output 1	Lock / Brake	Lock / Brake --- Courtesy Light --- Service Call --- Strobe (Warning) Light
5.2	Output 2	Courtesy Light	Lock / Brake --- Courtesy Light --- Service Call --- Strobe (Warning) Light
5.3	Exit		

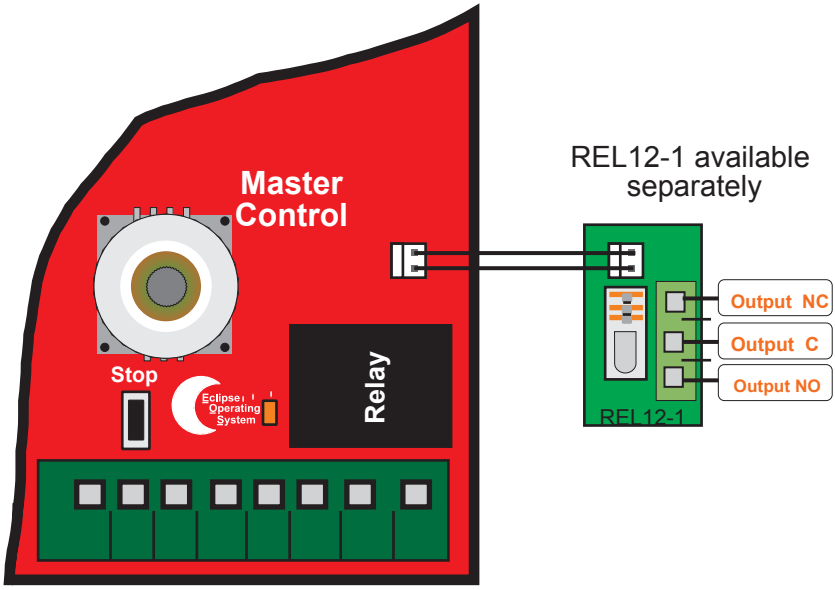
Lock / Brake Output

This output is used to power an electrical lock or a motor brake release. The factory default for the lock/ brake release is on output 1. User can change it to courtesy light, strobe light or service call. Output 1 is a voltage-free relay contact with common and normally open contacts. Having it voltage-free allows you to connect either 12VDC/AC, 24VDC/AC or 240VAC to the common. The normally open contact drives the lock/brake. See diagram below:



Courtesy Light

This output is used to power a courtesy light. The factory default for the courtesy light is on output 2. Output 2 is an open collector output. This output is used to switch an external relay such as Elsema's REL12-1 which can be purchased separately. See diagram on the next page.



Service Call Output

Either output 1 or output 2 can be changed to service call indicator. This will trigger the output when the software service counter is reached. Used to alert installers or owners when the gate/door is to be serviced. Use Elsema's GSM-1000 receiver allows installers or owners to get a SMS message when the service is due.

Strobe (Warning) Light when Opening or Closing

The relay output is activated whenever the gate/door is operating. The factory default is Off. Either output 1 or output 2 can be changed to strobe (Warning) light. See diagram above.

Menu 6.1 – Lock / Brake Output Modes

The relay output in the lock / brake mode can be configured in different ways.

Menu No.	Lock / Brake Modes	Factory Default	Adjustable
6.1.1	Open Lock / Brake Activation	2 seconds	0 – 30 seconds or hold
6.1.2	Close Lock / Brake Activation	Off	0 – 30 seconds or hold
6.1.3	Open Pre-Lock / Brake Activation	Off	0 – 30 seconds
6.1.4	Close Pre-Lock / Brake Activation	Off	0 – 30 seconds
6.1.5	Exit		

6.1.1 Open Lock / Brake Activation

This sets the time the output is activated. Factory default is 2 seconds. Setting it to Hold means the output is activated for the total travel time in the open direction.

6.1.2 Close Lock / Brake Activation

This sets the time the output is activated. Factory default is off. Setting it to Hold means the output is activated for the total travel time in the close direction.

6.1.3 Open Pre-Lock / Brake Activation

This sets the time the output is activated before the motor starts in the open direction. Factory default is Off.

6.1.4 Close Pre-Lock / Brake Activation

This sets the time the output is activated before the motor starts in the close direction. Factory default is Off.

Menu 6.2 – Courtesy Light Output Mode

The relay output in the courtesy mode can be adjusted from 30 seconds to 18 hours. This sets the time the courtesy light is activated. Factory default is 1 minute.

Menu No.	Courtesy Light Mode	Factory Default	Adjustable
6.2.1	Courtesy Light Activation	1 minute	30 seconds to 18 hours
6.2.2	Exit		

Menu 6.3 – Strobe (Warning) Light Output Mode

The relay output in the strobe (Warning) mode can be configured in different ways:

Menu No.	Strobe (Warning) Light Mode	Factory Default	Adjustable
6.3.1	Pre-Open Strobe (Warning) Light Activation	Off	0 – 30 seconds
6.3.2	Pre-Close Strobe (Warning) Light Activation	Off	0 – 30 seconds
6.3.3	Exit		

6.3.1 Pre-Open Strobe Light Activation

This sets the time the strobe light is activated before the gate/door operates in the open direction. Factory default is Off.

6.3.2 Pre-Close Strobe Light Activation

This sets the time the strobe light is activated before the gate/door operates in the close direction. Factory default is Off.

Menu 6.4 – Service Call Output Mode

This sets the number of complete cycles (Open and Close) required before the built-in buzzer is activated. Also the control card outputs can be configured to be activated if the number of cycles is completed. Connecting Elsema's GSM-1000 alert receiver to the output allows owners to get a phone call or SMS message when the service is due.

When "Service Call Due" message shows up on the LCD a service call is required. After service has been done, follow the messages on the LCD.

Menu No.	Secvice Call Mode	Factory Default	Adjustable
6.4.1	Service Counter	Off	Min: 2000 to Max: 50,000
6.4.2	Exit		

Menu 7 – Special Features

The control card has many special features that can all be customised to your specific application.

Menu No.	Special Features	Factory Default	Adjustable
7.1	Remote Control Open Only	Off	Off/On
7.2	Holiday Mode	Off	Off/On
7.3	Energy Saving Mode	Off	Off/On
7.4	Automatic Stop/Open on Closing	On	Off/On
7.5	Receiver Channel 2 Options	Off	Off / Light / Pedestrian Access
7.6	Press and Hold for Open Input	Off	Off/On
7.7	Press and Hold for Close Input	Off	Off/On
7.8	Window / Louvre	Off	Off/On
7.9	Exit		

7.1 Remote Control Open Only

By default the remote control allows the user to open and close the gate/door. In public access areas user should only be able to open the gates/doors and not worry about closing it. Usually the auto close is used to close the gate/door. This mode disables closing for the remote controls.

7.2 Holiday Mode

This feature disables all the remote controls.

7.3 Energy Saving Mode

This puts the control card to very low standby current that reduces your electricity bill while still maintaining normal functions and operations.

7.4 Automatic Stop / Open on Closing

By default if the gate/door is closing and a push button or remote control is activated it will automatically stop and open the gate/door. When this feature is disabled then the gate/door will stop on an activation of the push button or remote control.

7.5 Receiver Channel 2 Options

The receivers 2nd channel can be programmed to control a courtesy light or used for pedestrian access.

7.6 & 7.7 Press and Hold for Open and Close Inputs

If this feature is ON the user must continuously press the open or close input for it to be activated.

7.8 Window or Louvre Mode

This mode optimises the control card for operating electronic windows or louvres.

Menu 8 – Obstruction Detect Margins

This sets the current sensitivity margin above the normal run current to trip the gate/door if an obstruction is detected. Different obstruction margins can be set for the open and close direction. Also the response time is adjustable.

The minimum margin will allow least pressure applied to trip the gate/door if it hits an object. The maximum margin will allow for a large amount of pressure applied to trip the gate/door if it hits an object.

Menu No.	Obstruction Detect Margins and Response Time	Factory Default	Adjustable
8.1	Open Obstruction Margin	1 Amp	0.5 - 6.0 Amps
8.2	Close Obstruction Margin	1 Amp	0.5 - 6.0 Amps
8.3	Open and Close Slow Speed Obstruction Margin	1 Amp	0.5 - 6.0 Amps
8.4	Obstruction Detect Response Time	Medium	Fast, Medium and Slow
8.5	Exit		

Margin Example

Motor is running at 2 Amps and the margin is set to 1.5 Amps, an obstruction detect will occur at 3.5 Amps (Normal Running Current + Margin).

For high margin settings the supply transformer should be large enough to supply the high margin current.

If the gate/door hits an object on closing it will automatically stop and then re-open. If the gate/door hits an object on opening it will automatically stop.

Menu 9 – Motor Speed, Slow Speed Area and Reverse Time

Menu No.	Motor Speed, Slow Speed Area and Reverse Time	Factory Default	Adjustable
9.1	Open Speed	80%	50% to 125%
9.2	Close Speed	70%	50% to 125%
9.3	Open and Close Slow Speed	50%	35% to 65%
9.4	Open Slow Speed Area	4	1 to 12
9.5	Close Slow Speed Area	5	1 to 12
9.6	Stop Reverse Delay	0.4 seconds	0.2 to 2.5 seconds
9.7	Exit		

After changing speed and slow speed, i-Learn has to be done again.

9.1 & 9.2 Open and Close Speed

This sets the speed at which the gate/door will travel. If the gate/door is travelling too fast reduce this value.

9.3 Slow Speed

This sets the speed at which the gate/door will travel in the slow speed region. If the gate/door is travelling too slow increase this value.

9.4 & 9.5 Slow Speed Area

This sets the slow speed travel area. If you want more travel time for the slow speed area increase this value.

9.6 Obstruction Stop Reverse Delay Time

This sets the stop and reverse delay time when the gate/door hits an obstruction.

Menu 10 – Anti-Jam, Electronic Braking and Gate Movement after Obstruction

Menu No.	Anti-Jam or Electronic Braking	Factory Default	Adjustable
10.1	Open Anti-Jam	OFF	0 to 2.0 seconds
10.2	Close Anti-Jam	OFF	0 to 2.0 seconds
10.3	Electronic Braking	OFF	Off/On
10.4	Opening Direction : Gate Movement after Obstruction	Stop	Stop / Reverse for 2 sec / Reverse Fully
10.5	Closing Direction : Gate Movement after Obstruction	Reverse for 2 seconds	Stop / Reverse for 2 sec / Reverse Fully
10.6	Exit		

10.1 and 10.2 Motor Open and Close Anti-Jam

When the gate/door are in the fully open or fully closed position this feature applies a reverse voltage for a very short time. It will prevent the motor from jamming up the gate/door so it is easy to disengage the motors for manual operation.

10.3 Electronic Braking

This will stop the motors with an electronic brake. Brake applies to obstruction and Stop inputs.

10.4 Opening Direction : Gate Movement after Obstruction

After an obstruction has occurred the gate will either stop, reverse for 2 seconds or reverse fully.

10.5 Closing Direction : Gate Movement after Obstruction

After an obstruction has occurred the gate will either stop, reverse for 2 seconds or reverse fully.

Menu 11 – i-Learning

This feature allows you to do the intelligent travel learning of the gates/doors. Follow the messages on the LCD to complete the learning

Menu 12 – Password

This will allow the user to enter a password to prevent unauthorised users from entering the control card settings. User must remember the password. The only way to reset a lost password is to send the control card back to Elsema.

To delete a password select Menu 12.2 and press Master Control.

Menu 13 – Operational Records

This is for information only.

Menu No.	Operational Records
13.1	Event History, up to 100 events are recorded in the memory
13.2	Displays Gates/Doors Operations and Currents Levels
13.3	Reset Maximum Current Records
13.4	Exit

13.1 Event History

The event history will store 100 events. The following events are recorded into the memory: Power On, Low Battery, All Input Activations, Successful Opening, Successful Closing, Obstruction Detected, Unsuccessful i-Learning Attempt and Factory Reset.

13.2 Displays Gates/Doors Operations and Current Levels

This displays the number of open cycles, close cycles, pedestrian cycles, open obstructions, close obstructions and both motor current levels. All maximum current values can be reset by the user from Menu 13.3

Menu 14 – Tools

Menu No.	Tools
14.1	Battery Type : Lithium-ion or Lead Acid battery
14.2	Set the Supply Voltage : 12 or 24 Volts
14.3	Resets Controller to Factory Settings
14.4	Test Inputs
14.5	Travel Timer for Slip Clutch Motors
14.6	Solar Gate Mode : Optimises the Control Card for Solar Applications
14.7	Fuse Type : 10 or 15 Amps Optimises the Control Card for the correct Blade Fuse used
14.8	Slow Speed Ramp Down Time
14.9	Exit

14.1 Battery Type

The MCS can be used with 2 types of backup batteries, Lead Acid & Lithium-ion. **Default setting is Lead Acid. Never connect a lithium battery when lead acid mode is selected. Always select the correct battery type.** Only use Lithium-ion batteries supplied by Elsema.

14.2 Set the Supply Voltage

This allows you to manually set the control card to 12 or 24 Volt supply. The control card will automatically set the correct supply voltage during setup. To use the control card in a solar application you must set the correct voltage in the Tools. This will disable the automatic voltage sensing which could causes problems in solar applications.

14.3 Resets Controller

Reset all settings to factory default. Also removes password.

14.4 Test Inputs

This allows you to test all the external devices connected to the controllers inputs. UPPERCASE means input is activated and lowercase means input is deactivated.

14.5 Travel Timer for Slip Clutch Motors

This allows you to use the controller with travel time. Used for Slip clutch or Hydraulic Motors

14.8 Slow Speed Ramp Down Time

This allows you to change the time it takes the gate/door to change its speed from fast to slow.