MATILDA PRODUCTS
LIMITED

Cable Gate
Installation Manual

CABLE GATE SERIAL NUMBERS 03360119 ONWARDS

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Introduction

This manual is intended for authorised Cable Gate installation teams. The manual contains the following sections:

Section 1: Preparation for Installation– collecting information about the site and making arrangements for the installation.

*Section 2:*Tools and Equipment – Lists of tools and equipment required for Day One and Day Two.

*Section 3:*Cable Gate Installation Procedure – How to install the Cable Gate and associated operating systems.

Section 4:Access Control Equipment - Outlines the functionality of common Access Control devices and their typical connections into the cable gate control module.

*Section 5:*System Wiring And EMC Issues – Placement of ferrites to meet C-Tick radiated emissions requirements

*Section 6:*Control Module Configurable Parameters – How to configure the operation of the Cable Gate.

Section 7:Engineering Drawings / Data -

In this manual, the words WARNING and CAUTION are used to mean the following:

WARNING

This heading means that the information that follows is provided to protect people from injury.

CAUTION

This heading means that the information that follows is provided to protect equipment or property from damage.

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Section 1: Preparation for Installation

1.1 Required Installation Information

The person completing the installation quotation on the Cable Gate should pass the following information to the installer:

- Business name of customer
- Contact name within the customer's organisation
- Telephone number of contact person
- Fax number of contact person
- Name of person who provided the quotation
- Contact phone number of the person who provided the quotation
- Installation site address
- Details of the required Cable Gate specification:
    - Spacing between the post centres
    - Required powder coat colour for the posts
    - Access control systems required to interface with the Cable Gate
    - Any other specific customer requirements regarding the gate specification
- Detailed access control system specifications:
    - Precise details of the selected access control systems including proposed locations relative to the Cable Gate.
    - Number of key fobs, proximity cards, and other access control "keys" required by the customer.
    - Manufacturers documentation on the selected access control systems detailing interface requirements to other equipment.
- A detailed site plan showing the following details:
    - Precise location of the Cable Gate relative to other fixed landmarks such as buildings, roads, etc.
    - Precise location of the access control system reader posts (if required).
    - Preferred excavation paths for the conduit trenches (if required)
    - Precise location (including height above ground level) for any "gate switching box" that may be required for manual switching of the gate state.
    - Location of GPO's (power points) and water connections available for the installers use.
    - Details of the soil type and condition to permit the installer to select the most appropriate excavation method ahead of the installation date.
- Personal Protective Equipment (PPE) requirements for customer's site. Note also that permissions may have to be obtained for entry onto secure sites.
- Any other customer specific instructions that are relevant to the installation at hand.

1.2 Other Arrangements

The installer should also make the following arrangements before starting the installation:

- A site plan of underground services in the location should be obtained. This can be obtained by phoning 1100 for 'Dial before you Dig' or through the Internet on www.dialbeforeyoudig.com.au.
- Order rubbish skip bin - if this is required.
- Assign additional labourer – if this is required.
- Order concrete for delivery when the footing formwork is likely to be in place (if ready-mixed concrete is readily available). The required concrete strength specification is 20 MPa.
- Notify customer contact of arrival time on site (if the installer is responsible for this function).

1.3 The 7-Step Cable Gate Installation Procedure

This manual describes in detail the procedure for Cable Gate Installation. Before proceeding further, it is worth considering the general installation steps for the Cable Gate product:

Step 1 – Layout the installation location on-site.

Mark out the footing locations.

Mark out the access control system locations.

Mark out the cable routing paths.

Step 2 – Lay the Gate footings.

Run conduits or chase cable runs as required.

Pour the concrete footings or chemical anchor installation.

Step 3 – Pull cables for the gate and access control systems.

Step 4 - Mount the Gate Posts, Reader Post (Optional), and Solar Panel pole (Optional).

Step 5 – Install and Commission access control systems (Optional).

Step 6 – Install the Main Cable and Cable Sheathing.

Step 7 – Commissioning.

Complete gate electrical wiring.

Complete commissioning testing and handover to customer.

1.4 Review of Site Layout

There are a number of layout conditions that can lead to operational problems with the Cable Gate. Before proceeding to the installation phase, check the site layout for any of the following conditions:

1.4.1 Differences in Post Footing Levels

The cable gate is designed to operate optimally on a flat, level road surface. In this instance the foundations for both posts would be at the same reference level. In cases where there is a significant difference in the reference level between the post footings the following can occur:

- The photoelectric (PE) beam may not operate correctly, and may fall out of the range of adjustment provided.
- The Main Cable and Main Cable Protective Sheathing may not fall to the road surface correctly leading to issues of poor gate appearance and unacceptable Counterweight function.
- The load on the drive motor may increase causing the motor to overload. In this instance protection circuitry has been provided to protect the motor by shutting off power to the motor. In this instance the gate will require frequent clearing of faults at the Main Control Board, and will not operate reliably.

The following table shows the maximum acceptable variation in the height of the post foundations:

Post Centre Distance "Y"	Maximum Allowable Post Height Difference "X"	Nominal Road Angle "Z"
4.0 to 5.5 metres	80 mm	1 Deg.
5.5 to 7.0 metres	110 mm	1 Deg.
7.0 to 8.0 metres	140 mm	1 Deg.

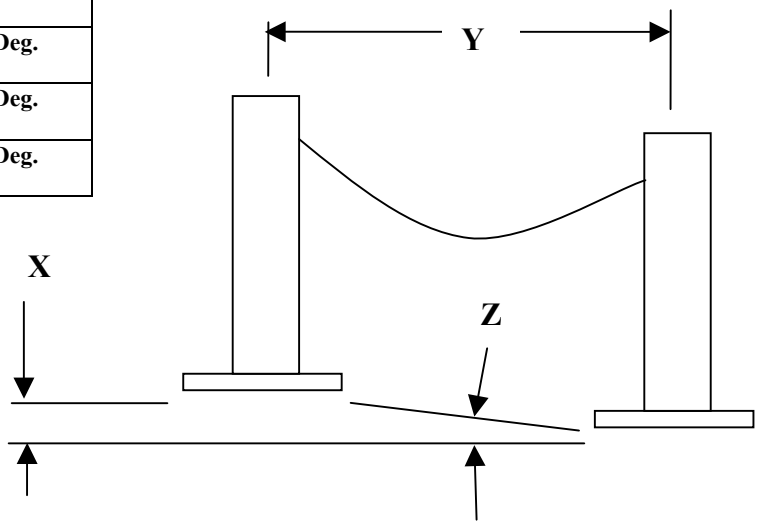


Figure 1-1: Maximum Allowable Post Height Difference

1.4.2 Slope in the Footing Installations

The Cable Gate is tolerant of the post footings being set at a slight angle relative to the horizontal. However, if this angle to the horizontal is too great the main cable will not fall to the road surface in the manner intended.

The following diagram shows the maximum allowable angle of the Cable Gate footings:

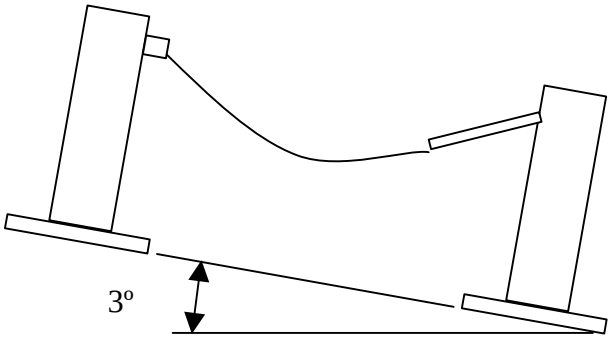


Figure 1-2- Maximum Permissible Gate Installation Angle

Note that the gate should only be installed on an angle if no other installation options are available. In the event that this form of installation is required, the installer should take care to always install the passive post on the low side of the roadway.

1.4.3 Distance from the Road to the Posts

If the Gate is installed too close to the road traffic surface there exists a risk that the cable end may be run over by passing traffic, which can cause damage to the road surface if in a high traffic location. Similarly, positioning the passive post too close to the traffic lane can lead to damage to the gate. The gate should be installed as per the recommendations outlined in the sketch below.

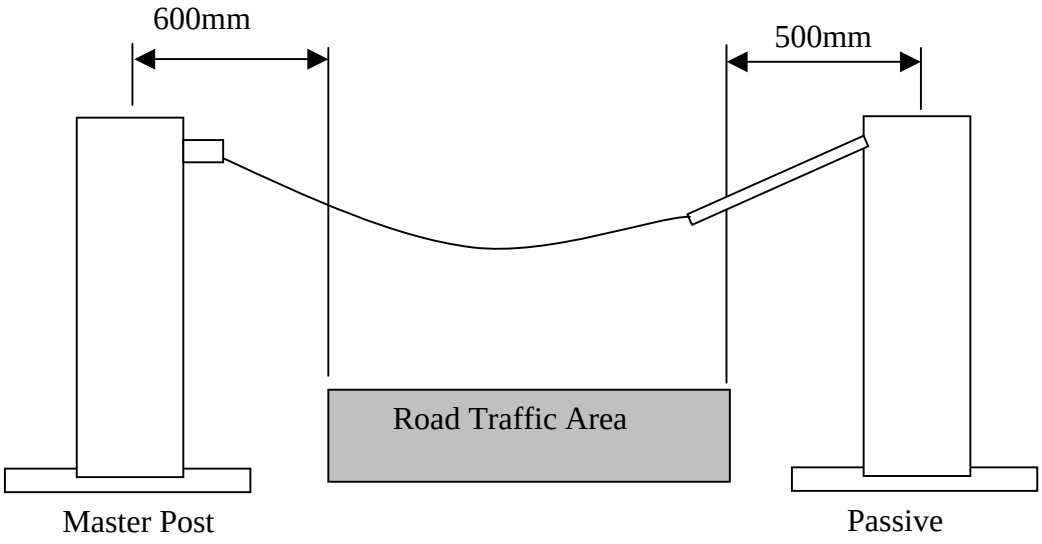


Figure 1-3: Diagram Showing the Minimum Distance that must be maintained from the Cable Gate Posts to the Road Traffic Area.

1.4.4 Fall in the Road Surface

Care should be taken to ensure that the road surface **at no point** falls to more than 100 mm below the level of the post base plates as defined in section 1.4.1 above. The figure below illustrates the allowable local fall in the road surface.

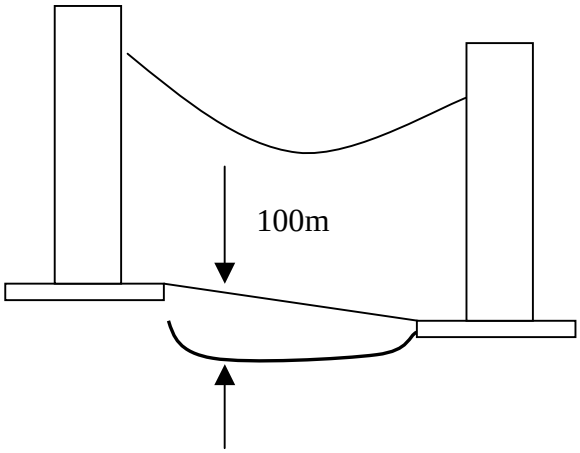


Figure 1-4: Allowable Fall in the Road Surface with Respect to line between post base plates.

1.4.5 Installation Close to Road Junctions

Care should be taken in installing the gate close to a T-Junction to prevent damage to either the Gate Posts or the Main Cable. The following plan view shows the minimum distance that the gate should be installed from a T-Junction or 90 degree corner.

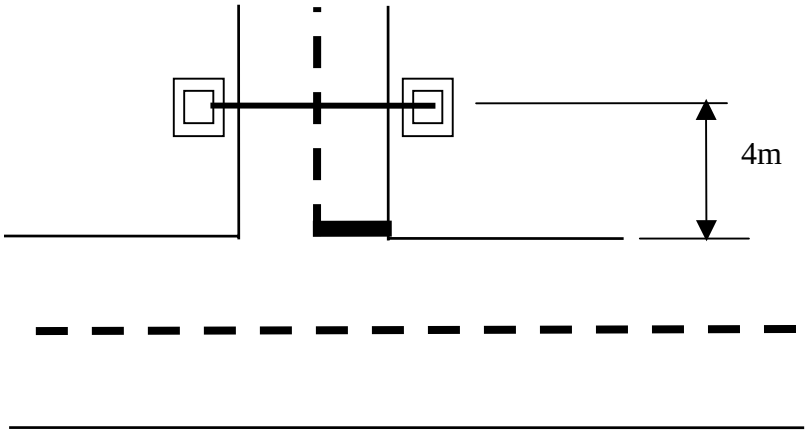


Figure 1-5: Minimum Distance between the Cable Gate and a 90 Degree Bend or T-Junction.

Section 2: Tools and Equipment

2.1 Overview of Required Tools and Equipment

This section lists the tools, equipment and consumables required to install Cable Gate. Installation is done in two sessions. On Day 1, the bolt cages are concreted into the ground and electrical cable conduits are laid. On Day 2, (two days later, when the concrete has cured) electrical cables are run through the conduits, access control systems, and solar panel (if required) are installed and connected, electrical connections made and the Cable Gate is installed and tested.

Where non-Matilda Products part numbers are shown in the lists, like tools and consumables from other manufacturers may be substituted.

2.2 Day 1 – Tools

Table 2-1: Day 1 Tools

Item	Description/Use	Part #	Qty
Broom			1
Burner, propane gas	For bending PVC conduit		1
Crowbar	1500 mm		1
Cutter, tube	For cutting PVC conduit	Rigid Part # 0006 9972	1
Defenders, ear	To national safety standard		1 pr per person
Drill, cordless	14.4 V – with spare battery		1
Drill, percussion	Heavy duty Hilti or similar		1
Drill, percussion	General purpose – for drill bits up to 10 mm		1
Float, timber	For working concrete		1
Formwork Timber	For master, passive and solar panel pads		1 set per pad
Self Tapping Screws	For timber formwork		1 set per pad
Goggles, safety	To national safety standard		1 pr per person
Hammer, club	1.25 kg		1
Hammer, demolition, electric	For digging post holes	Kango Part # 0912 8310	1
Hose, water	Including adaptors to fit water supply taps		As req.
Ladder, extension	5 m to 9 m		1
Lead, extension			As req.
Rake, lawn			1
Saw, diamond (and fuel)	Cutting concrete and bitumen	Honda Gx270 9.0	1
Saw, general purpose	For formwork		1
Shovel, long handle	For hole digging		1
Shovel, trenching	For conduit trench digging		1
Spade, short handle	For conduit trench cutting		1
Strippers, wire	Adjustable		1 pr
Tape, measuring	10 m		
Template, hole marking 700 mm X 700 mm	For master, passive and solar panel post holes	TBD	1
Template, hole marking 250 mm X 250 mm	For reader post holes	TBD	1
Trowel, plasterers	For smoothing concrete		1
Wheelbarrow, builders			1

2.3 Day 1 – Cable Gate and Installation Equipment

Items marked with an asterisk ✸ are used in all Cable Gate installations. Items not marked with an asterisk are optional, depending upon the site requirements.

Table 2-2: Day 1 Cable Gate and Installation Equipment

Item	Description	Part #	Qty
Adaptors, conduit ✸	A selection of elbows, junction boxes and joiners		As reqd
Cages, bolt ✸	For solar panel pads	13-65-00	1
Cages, bolt ✸	For reader pads	13-65-00	1 per pad
Cages, bolt ✸	For master and passive pads	13-65-00	2
Clamps, conduit	P-saddle type clamps for conduit hold-down		As reqd
Conduit, PVC ✸	20HD		As reqd
Cones, warning ✸	For cordoning off the work area around the gate installation		As reqd
Nuts, post, base ✸	M20 galvanised For master, passive and solar panel posts		8 per post
Nuts, post, base	M12 galvanised For reader posts		8 per post
Pickets, star	For supporting warning tape		As reqd
Tape, warning	For cordoning off the work area around the gate installation		As reqd

2.4 Day 1 – Consumables

Table 2-3: Day 1 Consumables

Item	Description	Part #	Qty
Adhesive, PVC for conduit			As reqd
Cold mix bitumen	For repairing bitumen surfaces, alternatively, use contractor		As reqd
Paint, spot marking	Aerosol can – for marking out required post locations		1

2.5 Day 2 – Tools

Table 2-4: Day 2 Tools

Item	Description/Use	Part #	Qty
Bits, drill, masonry	5 mm -10 mm		1 Set
Bits, drill, metal	1 mm to 13 mm		1 Set
Broom			1
Burner, gas	For bending PVC conduit		1
Chisel, masonry, 10 mm	For opening up channel in bitumen or concrete		1
Cutter, tube	For cutting PVC conduit	Rigid Part # 0006 9972	1
Cutters, wire	Cutting Main Cable		1 pair
Defenders, ear	To national safety standard		1 p/p
Drill, cordless	14.4 V – Spare battery reqd		1
Drill, percussion	Heavy duty, Hilti		1
Drill, percussion	General purpose – ≤10 mm		1
Dustpan and brush			1
Goggles, safety	To national safety standard		1 p/p
Hacksaw (& spare blades)	300 mm		1
Hammer, club	1.25 kg		1
Handle, ratchet	1/2 in square drive		1
Hose, water	Including adaptors for taps		As reqd
Keys, Allen	Metric 3,4 & 5 mm		1 set
Ladder, extension	5 m to 9 m		1
Lead, extension			As reqd
Spirit level, post			1
Mallet, rubber	For replacing pavers		1
Pliers, needle nosed	Pull-in cable		1 pr
Pull through, spring	30 m		As reqd
Saw, diamond (and petrol)	Cutting concrete and bitumen	Honda Gx270 9.0 or equivalent	1
Saw, general purpose	For formwork		1
Screwdriver	For system zero™ tamper-proof screws	TBD	1
Screwdrivers		Stanley Part # 65.750 (T186)	Set
Screwdriver, small flat	Screw terminals		1
Screwdrivers, posi-drive	No 1 & No 2		
Spanner, open/closed ended	10 mm for PE unit adjustment		1
Spanner, socket	18 mm – ½" Drive (Reader post nuts)		1
Spanner, socket	30 mm – ½" Drive (Cable Gate Post nuts)		1
Spanner, socket	34 mm – ½" Drive (Heave Cable Gate Post nuts)		
String and chalk line	For line marking		As reqd
Strippers, wire	Adjustable		1 pr
Tool, crimping		Altronics Part # T1570	1

2.6 Day 2 - Cable Gate and Installation Equipment

Items marked with an asterisk ✸ are used in all Cable Gate installations. Items not marked with an asterisk are optional.

Table 2-5: Day 2 Cable Gate and Installation Equipment

Item	Description	Part #	Qty
Cable, 6-core cat 5	For access control systems		As reqd
Cable, main ✸	Supplied with the Cable Gate	13-41-00	1
Cable, road loop	Single core 17 gauge, insulated		As reqd
Cable, pull-in ✸		13-43-00	1
Cap, post ✸	Supplied with the Cable Gate	13-30-28	2
Caps, base nuts ✸	All posts	TBD	4/post
Cards, proximity		94-64-10	As reqd
Clamps, conduit	P-saddle type conduit clamps		As reqd
Connectors, electrical	For joining cables		As reqd
Fobs, key		94-64-04	As reqd
Plug pack ✸	24 V, 1 A	94-23-01	As reqd
Plugs, wall	For brick or stone walls		As reqd
Post, reader	With blanks, if required	TBD	As reqd

2.7 Day 2 – Consumables

Table 2-6: Day 2 Consumables

Item	Description	Part #	Qty
Adhesive, PVC			As reqd
Butyl Mastic	Colour to match area to be repaired		As reqd
Cold mix	For bitumen repair or use contractor		As reqd
Grout, patching	For kerb repair		As reqd
Cable Butter	For running cables through conduits		As reqd

Section 3: Cable Gate Installation Procedure

This section describes the procedure for installing the Cable Gate, access control system reader post(s) if required, and a solar panel if required.

3.1 General Introduction to Access Control System Requirements

Prior to installing the Cable Gate, planning should be completed regarding the required access control system connections that will also be required.

The following is a summary of some of the more common access control system connections to the Cable Gate. All of these systems ultimately are connected to the Cable Gate Main Control Board. However, it is sometimes more convenient to install access control system components in either a reader post (available through Matilda Products as an optional accessory), or in a remote gate control box (not supplied by Matilda Products):

Table 3-1: Preferred Access Control System Mounting Locations

Access Control System	Remote Gate Control Box – Not supplied by Matilda Products	Reader Post – Optional Accessory	Cable Gate Master Post
Radio receiver (for key fob)	✗Not possible to install in this location	✗Not possible to install in this location	✓Preferred – Direct fit onto the Cable Gate Main Control Board
Key pad	✗Possible, but generally no reason to install here	✓Preferred - Run wires to the Cable Gate Main Control Board	✗Possible, but generally inconvenient to install here
Proximity card reader module	✗Possible, but installation in reader post is more convenient	✓Preferred - Run wires to the Cable Gate Main Control Board	✗Possible, but generally inconvenient to install here
Road loop	✗Possible, but generally no reason to install here	✗Possible, but generally no reason to install here	✓Preferred – Provision is made on the Spine Bracket for direct fitment (optional road loop controller housing)
Intercom – Relay only	✓Preferred	✗Possible, but generally no reason to install here	✗Not possible to install in master post
Timer	✓Preferred	✗Not possible to install in reader post	✗Not possible to install in master post

3.2 Cable Gate Installation Procedure - Day 1

3.2.1 General Considerations

WARNING

Fluorescent/reflective vests are to be worn when installing within 3 m of a public road.

1. Collect tools, equipment to be installed and consumables for Day 1.
2. At the site, meet the customer's contact and describe the installation.
3. Complete the customer's site induction course, if this is required.
4. Using spot marker paint or string and chalk, mark the positions and outlines of all posts and all conduit trenches, as shown on the site sketch. Endeavour to position the posts so that it is difficult to drive close to the master post, and thus risk damaging the pull-in cable or entry mouth.

CAUTION

As a general guideline, the Cable Gate must be installed such that no part of its footings comes closer than 1 m to an existing building or other fixed structure. If closer proximity is required a structural engineer should be consulted.

5. Check that the proposed layout is acceptable to the customer.

3.2.2 Mounting on a Suspended Concrete Slab

If the Cable Gate is to be mounted on a suspended concrete slab, follow this procedure:

1. Use a cover meter to determine the location of reinforcing bars before drilling for hold-down bolts. Every effort should be made to position the gate so as to avoid drilling through reinforcing bars.
2. Install **Hilti HAS-E M20X170/48** (or equivalent) Chemical Anchor hold-down bolts in accordance with the manufacturer's instructions. These fasteners require a 24mm hole drilled to a depth of 175 mm.

CAUTION

The specified chemical anchor system requires a minimum slab thickness of 220 mm. If drilling indicates the slab thickness is less than this value, the slab should be cut, and a separate footing poured.

3. Check that the Chemical Anchor bolts are installed so that 50 mm of thread is revealed above the level of the suspended slab.

3.2.3 Cable Gate Footings and Conduits – Road Base or Soil Installation

If the Cable Gate posts are to be installed in either road base (bitumen or asphalt surface), or soil then follow this procedure

The required dimensions for the concrete foundations are as follows:

- Width - 700 mm
- Breadth - 700 mm
- Depth - 700 mm

CAUTION

The footing dimensions presented here are adequate for most installation situations, but it should be noted that they represent a minimal compromise between required strength and installation cost. If the Cable Gate posts receive a direct vehicle impact when installed in sandy soils, the foundation dimensions shown may not be adequate to prevent movement of the foundations. To ensure that the foundations do not move when impacted the foundation size should be increased to 1100 wide x 1100 breadth x 700 deep. If foundation strength is critical in a given installation the installer should obtain independent advice from a consulting engineer.

1. Mark out the location of the footings using construction crayon (if an asphalt surface), or spot marking paint and a string line if installing on a soft surface.
2. Cut the footing outlines and remove the top surface.
3. Dig the footing holes to the required depth.
4. Install formwork at the tops of the footing holes, if necessary, to form a level concrete pad.

Figure 3-1: Formwork for the Gate Post Footings

5. Dig a conduit trench (100 mm wide and 200 mm deep) between:
   - The master post hole and the entry point of the place where the access control system(s) are to be installed (if required)
   - AND/OR, the master post hole and location for the solar panel pole (if required)
   - AND/OR, the master post hole and the location of the external power supply plug pack (if required)

   Note that in installations into asphalt or a concrete slab, the conduit may be replaced with a slot cut in the pavement surface. In this instance, the electrical cables can be held in place with mastic after being installed.

6. Using a gas burner to soften the PVC conduit, make a right-angled bend 500 mm from the end of a length of conduit.
7. Place this conduit in the trench to correspond with the slot in the master post baseplate. Note that when the master post is viewed from the front, the cables should enter the post 80 mm to the right of the post centreline. Wedge the conduit in place so that the 500 mm straight section is pointing directly upward.

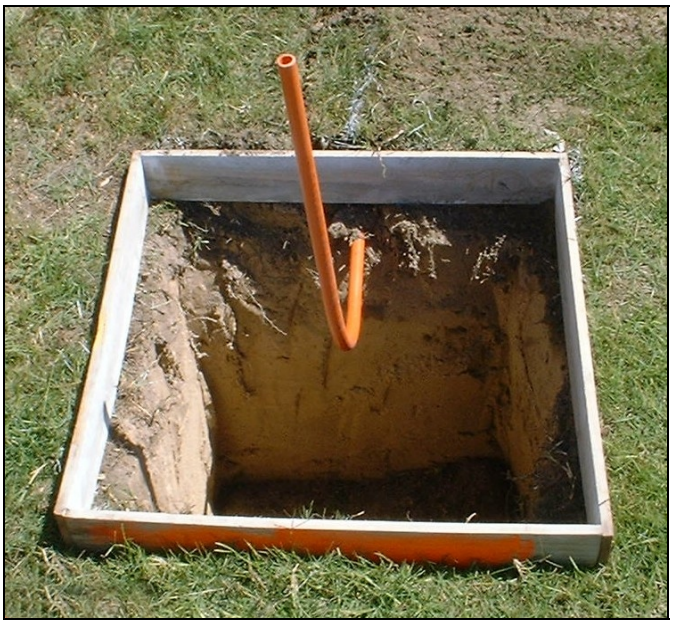


Figure 3-2: Conduit in Post Hole

8. Run a string line through all the conduit to be laid.
9. Using PVC adhesive, attach the required conduit, along the trench to the entry point or weatherproof gate control box.
10. Place four M20 nuts on the master post bolt cage, one to each threaded section. Screw these nuts down until about 50 mm of thread is showing on each section.
11. Place a bolt cage levelling board over the threads and place another nut on each thread. Screw these nuts down until the top of each nut is 5 mm below the top of the threaded section.

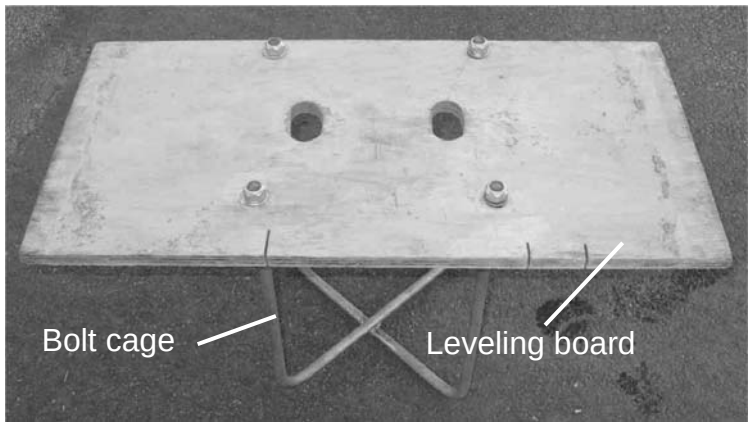


Figure 3-3: Bolt Cage and Levelling Board

12. Turn the bolt cage and board on the side.
13. Screw the nuts first attached down to the levelling board (finger-tight).

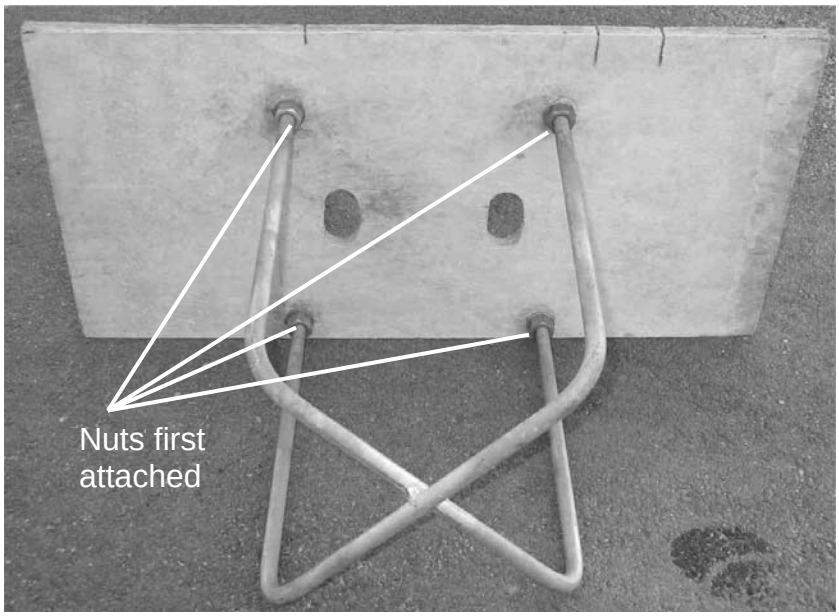


Figure 3-4: Levelling the Board on the Bolt Cage

14. Repeat the procedure for the passive post bolt cage.
15. Pour 0.34 m^3 of concrete into the master post footing hole and level using a timber float.
16. Smooth the surface with a wet steel trowel.
17. Ensuring that the upward pointing conduits pass through the levelling board, press the bolt cage and levelling board into the concrete in the post hole until the levelling board sits on the wet concrete.
18. Repeat the above procedure for the passive post footing.
19. Check that the bolt cages are parallel to the roadway, parallel to each other, and at the correct height using a tape measure and a string line as required. Make any adjustments to the bolt cage location as required.
20. Replace material in the conduit trenches and repair the surface.
21. Smooth the exposed concrete surface again with a wet trowel, if necessary, and allow the concrete to cure.

22. Place warning cones and/or warning tape around the wet concrete areas while the concrete is curing.

3.3 Cable Gate Installation Procedure - Day 2

Collect tools, equipment to be installed and consumables for Day 2.

1. Remove the levelling boards from the concrete pads.
2. Cut the conduit protruding from the concrete footings to a level of 50 mm above the footing.
3. Using a spring pull through and/or cable lubricant run the required cables through the conduits. ***Refer to Appendix C of this manual for guidelines on the appropriate cabling to use in conjunction with the Cable Gate product.***
4. Crimp the required connectors onto the electrical cable ends in accordance with the manufacturers instructions. Ensure that all wires to be fitted into the cable gate Main Control Board Terminal Block are fitted with the appropriate size bootlace ferrules.

- Screw the bolt cage nuts up and down two or three turns to ensure they are free to move and not stuck in the concrete. A die nut may be used if the nuts to not move freely.

3.3.1 Passive Post Installation

1. Locate the passive post on the bolt cage, ensuring that a 20 mm galvanised washer is installed on each leg of the bolt cage.
2. Using a post level, set the post vertical by adjusting the nuts under the post. Ensure that each corner of the post is taking the load of the post. Be sure to adjust the nuts under the base plate to achieve a minimal distance between the base plate and the foundation.

Figure 3-5: Setting the Post Vertical

3. Attach the M20 (with washers) base nuts to the bolt cage and tighten to 150 Nm. If chemical anchors are being used the correct tightening torque is 200 Nm.

3.3.1.1 Counterweight Bar Addition (Optional)

For Cable Gates longer than 6m an additional mass will need to be added to the counterweight bar to ensure that the bar falls to a vertical position when the gate is opened.

Figure 3-6: Extra Mass to be fitted to Counterweight Bar

In order to add the additional mass the following procedure should be followed:

1. Remove the counterweight bar from the passive post by undoing the screw that holds the pin in place inside the passive post.
2. Remove the clamp plate from the spreader bar, by removing all the screws that hold it to the rest of the counterweight bar.
3. Using a Ø7mm drill, drill out the two holes in the counterweight bar, as shown in the figure below.

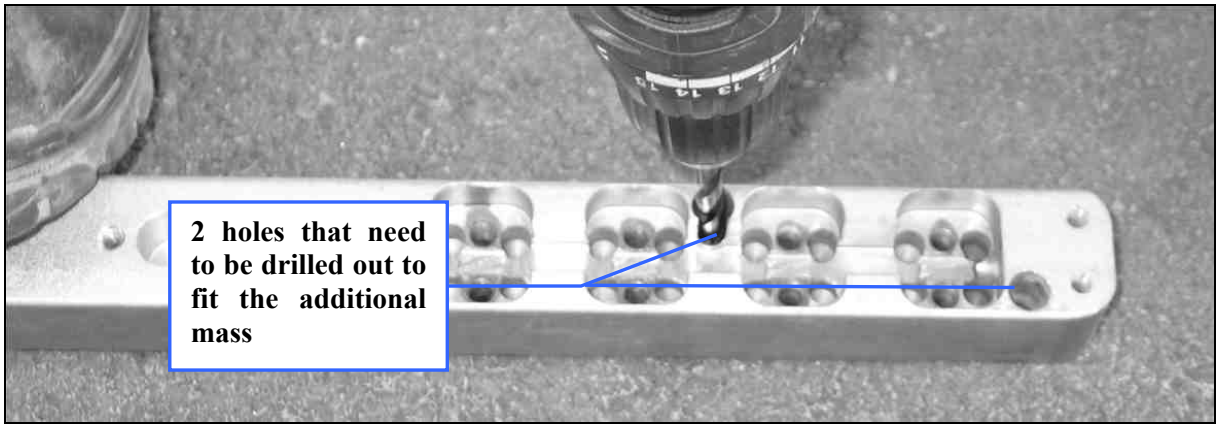


Figure 3-7: Drilling out holes to fit extra mass to counterweight bar

4. Using M6x16 socket head cap screws (2x) attach the extra mass to the top of the counterweight bar.
5. Reattach the clamping plate to the rest of the counterweight bar with all twelve screws, as shown in the Figure below.

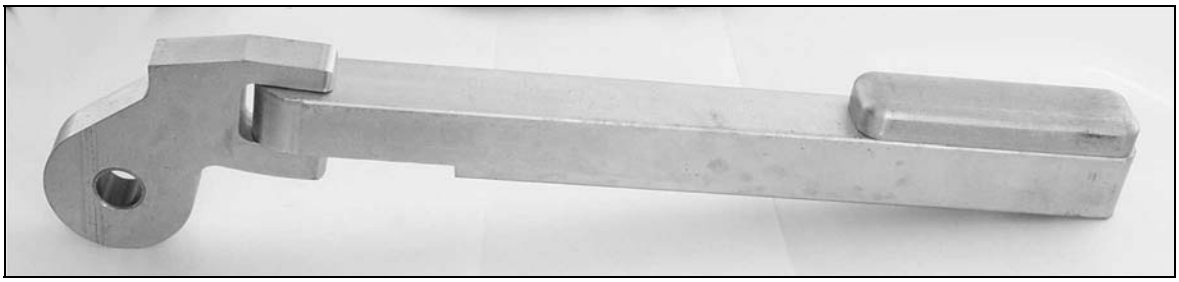


Figure 3-8: Complete counterweight bar with added mass on top

6. Reattach the counterweight bar to the passive post.

3.3.2 Master Post Installation

1. Ensure that the conduit does not protrude more than 150 mm from the footing. Cut down to 150 mm if required.
2. Generally, the procedure for passive post installation should be repeated for the master post. Once both the master and passive posts have been tightened down it is advisable to once again check the alignment of the posts/bolt cages with a string line between the posts to ensure correct alignment. Once the post alignment has been completed, complete the following additional items, which are specific to the master post.

3.3.3 Main Cable Fitment

The installer should note that the main cable is supplied over-length, and is to be cut to length on site. There is therefore no need to control the post centre distance prior to this stage of the installation procedure – provided the post centre distance is less than the specified 8 metre maximum length.

1. Insert the small ball on the pull-in cable into the slanted hole on the shaft of the cable end and push it so that it pokes out the front of the cable end, as shown in Figure 3-9 below.

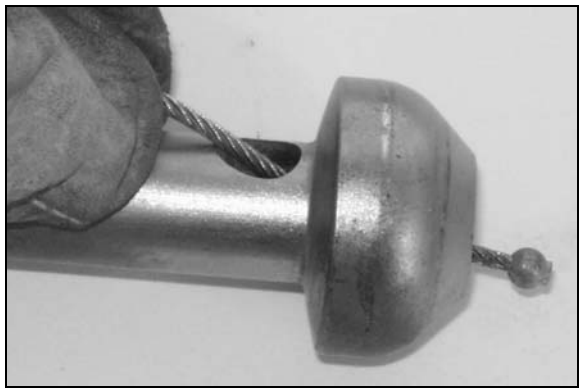


Figure 3-9: Pull-in Cable inserted into Cable End

2. Pull the pull-in cable through the cable end until the large ball on the pull-in cable seats inside the cable end, as shown in Figure 3-10 below.

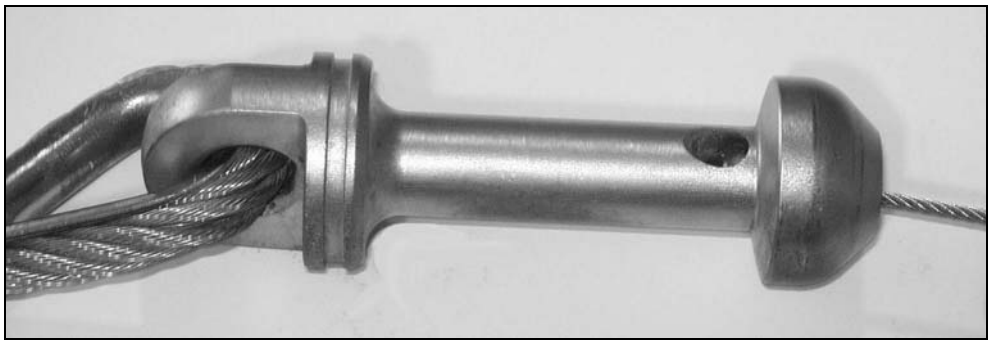
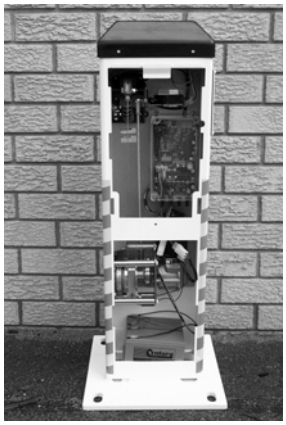
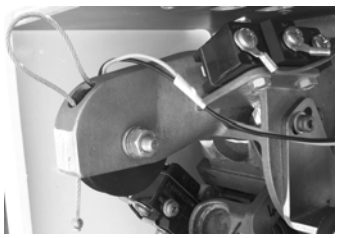


Figure 3-10: Pull-in Cable Fitted to Cable End

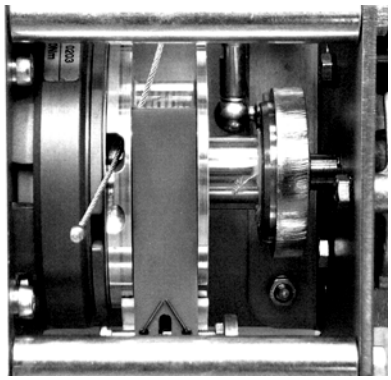
3. Insert the small ball end of the Pull-in Cable through the hole at the back of the entry mouth.

4. Feed the Pull-in Cable down through the hole on the top of the guide pulley and attach to the winch drum.

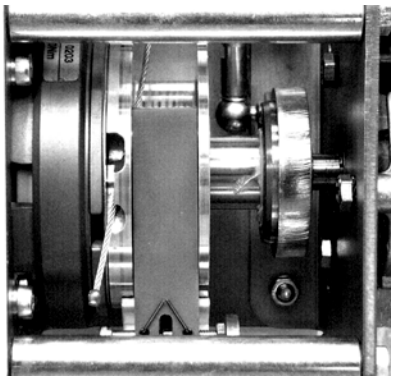




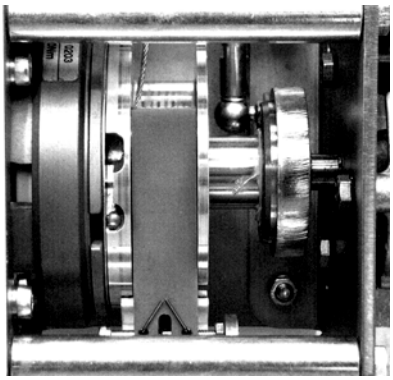
(i) Feed ball end down through hole in Guide Pulley Cover



(ii) Feed Cable through hole



(iii) Push down into groove



(iv) Pull back to lock in place and rotate drum to take up slack in pull-in cable

-
- Install the Cable Gate batteries into the Battery Tray located in the base of the Master Post (if these are not already fitted). Connect the Battery Cables as indicated in the Figure below. At this point the gate will complete a Power-On Self Test (POST) procedure, involving flashing beacons (if fitted) and flashing LED display panel.

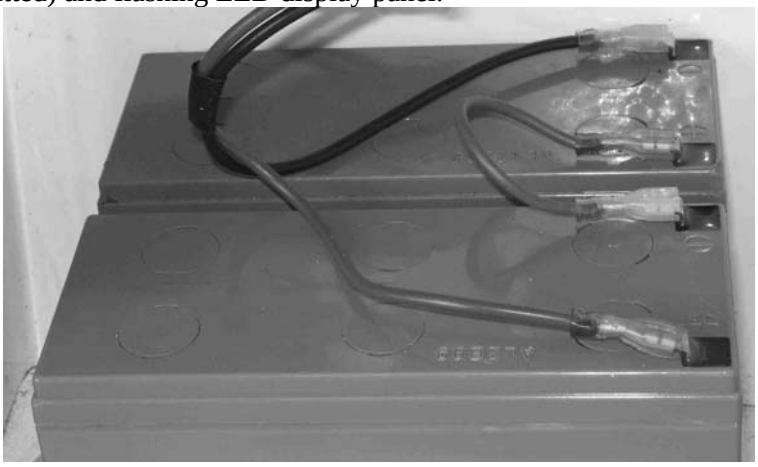


Figure 3-11: Battery Installation and Wiring Connections

5. Disconnect the PE Beam connector adjacent to the PE Unit. Disconnection of the connector will ensure that the gate will draw home to permit the main cable height to be set.
6. Press the button marked “F1” on the Main Control Board to activate the gate. At this point the Latch should pull down, and the gate will remain open for the user defined “Gate Open” period (25 seconds by default). Be sure to keep hands away from the Latch mechanism during this procedure. After the “Gate Open” period has elapsed the motor should commence pulling in the Main Cable until it latches in the home position.
7. Pull the main cable taut such that there is approximately 500 mm sag in the middle of the main cable, while simultaneously holding the main cable adjacent to the counterweight bar to mark the cutting position on the main cable. The allowable tolerance on the Main Cable sag in +/- 25 mm.

Figure 3-12: Marking the Main Cable to Length for cutting

8. Using a friction disk cut the main cable to the marked length. Be sure to wrap tape around the main cable at the cutting location to ensure that the cable strands do not fray as the cable is being cut (as shown in the Figure below). Ensure that all tape is removed from the main cable after cutting is complete.

Figure 3-13: Cutting the Main Cable to Length

9. Attach the ferrule to the main cable by hammering it into place. The ferrule prevents the Cable Sheathing from sliding too far on the main cable. For the correct position of the ferrule, refer to the Table below.

Table 3-2: Length of sheathing and positioning of ferrule on main cable

Post Centre Distance	**≤ 5m**	**5m to 7m**	**> 7m**
Distance from cable end to ferrule	0.5m	0.8m	1m
Length of sheathing	Post centre distance minus 1.5m	Post centre distance minus 2m	Leave sheathing at supplied length of 5m.

10. Cut the Cable Sheathing for the main cable to length. The correct length for the Cable Sheathing is shown in the Table above. The Cable Sheathing is most conveniently cut

using a Stanley™ Knife, or a set of tin snips. Slide the main cable into the Cable Sheathing up to the ferrule. The Main Cable can be guided through the Cable Sheathing using 20mm electrical conduit if required.

Figure 3-14: Inserting the Main Cable into the Cable Sheathing

11. Pop rivet the supplied Sheathing Crimp to the Cable Sheathing at the master post end of the cable. Note that a suitable size hole must be drilled through the Cable Sheathing before riveting is completed. Note that the main cable may need to be released at this point from the latch to permit easy fitment into the counterweight bar.
12. Insert the cut main cable into the counterweight bar slot, ensuring that the hold-down screws are loosened to permit easy sliding of the main cable into the counterweight bar.

Figure 3-15: Inserting the Main Cable into the Counterweight Bar Slot

13. Tighten the two front most counterweight bar screws to finger tightness to secure the main cable in place for final checking.
14. Ensure that with no support, the Main Cable sag at the centre is 500 +/- 25 mm. If the sag is too low at this point, remove the Main Cable again and cut a little extra from the end to achieve the correct sag. If the sag is too high, pull the Main Cable out a little until the correct sag is achieved. Note that the height of the road surface at the Main

Cable measurement point may not be in line with the bottom of the post base plates. Where this is the case, a string line may be run between the base plates for the purpose of checking the Main Cable height. Alternatively, a string line may be run across the top of the Gate Posts. In this instance the main cable should sag to 340 +/- 25 mm beneath the top of the Gate Posts.

CAUTION

Cutting 1 mm from the main cable end will reduce the Cable sag by approximately 10 mm. Cut the main cable in small increments to ensure that an excessive amount is not removed from the main cable.

15. Ensure that after the correct sag is achieved there is no more than 20 mm distance between the cut end of the Main Cable and the end of the slot in the Counterweight Bar.

WARNING

It is imperative that as much of the counterweight slot as possible is filled with the main cable. Failure to do so may result in the main cable becoming dislodged from the counterweight bar in the event of vehicle impact to the main cable.

16. Tighten all of the supplied screws to the underside of the Counterweight Bar to a torque of 16 Nm, working from the front of the Counterweight Bar back toward the passive post in a zigzag fashion. Repeat this tightening procedure 3-4 times as the tightening of each screw will loosen the other screws around it. If a torque wrench is not available the screws should be tightened as firmly as possible with a long handled Allen Key.

3.3.4 Photoelectric (PE) Beam Alignment Procedure

Accurate alignment of the PE unit is essential to correct operation of the Cable Gate. A PE unit that is not exactly aligned will fail to perform in bad weather or dusty situations. In order to exactly align the PE unit with the reflectors in the passive post the following procedure should be followed:

1. Remove the Side Cover on the Master Post to provide access to the PE Beam Bracket.

Figure 3-16: Master Post Side Cover

2. Open the Cable Gate using the "F1" button on the Main Control Board, and move the office box over ride switch (if fitted) to the down position. If the override switch is not fitted, black off the PE Beam by placing paper or cloth over the PE reflector Grille on the Passive Post. Note that, depending on the long safety cut response mode set in section 6.3.10 below, the gate may still close while the PE beam is cut. If this occurs, and no office box over ride switch is fitted, then wire pins 6 and 9 together on the 12-way X2 connector on the control board (refer to Table 5-1). The Cable Gate needs to be open for power to be supplied to the PE unit.
3. Rotate the PE unit until the beam is made and nip the horizontal adjustment screws tight. This shows the PE unit is close to the correct alignment. The adjustment screws are shown in the figure below.

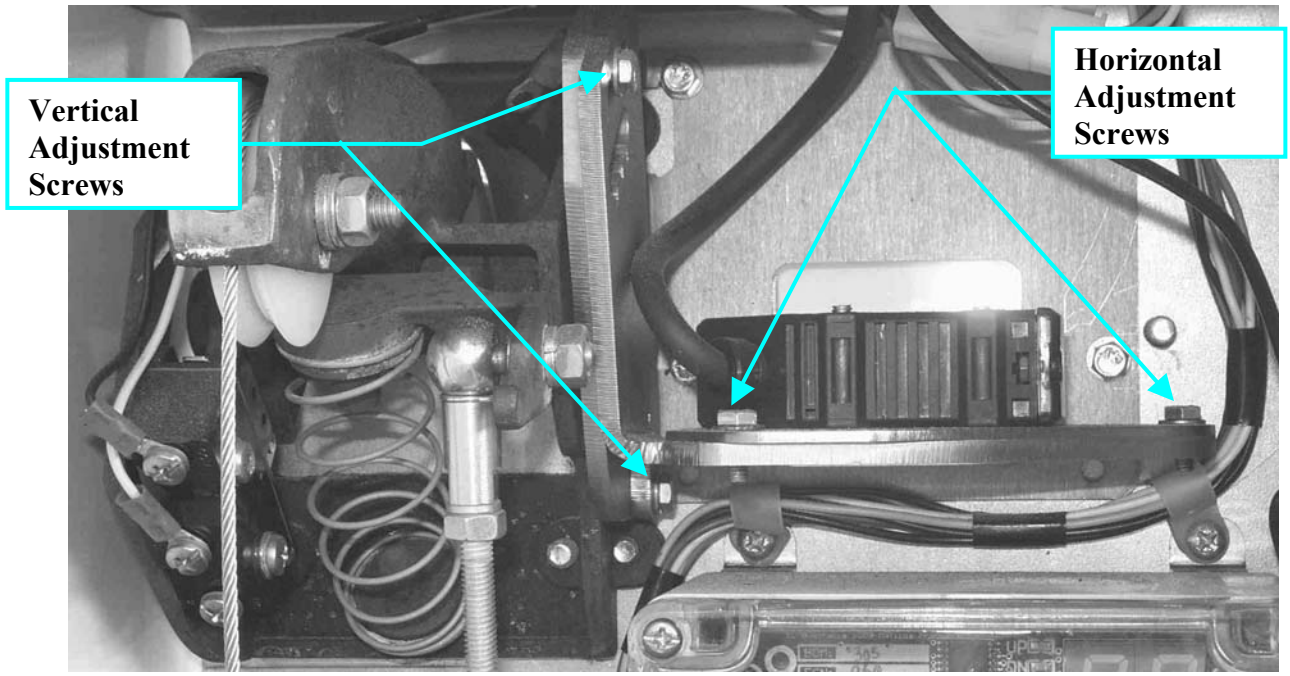


Figure 3-17: PE Beam Adjustment Screw Locations

4. There are a number of ways to determine if the beam is made or broken, such as:
    a. If the override switch is in the "down" position and beacons are fitted, the beacons will flash green when the beam is made and red when the beam is broken.
    b. If the Cable Gate is open, the LED on the control board marked "PE" will be blank if the beam is made and illuminated when the beam is broken. Note that the LED is set-up so that it will always illuminate for at least 0.5 seconds even if the beam is only momentarily broken.
    c. On the side of the PE unit are two LEDs. These can be seen through the access panel in the side of the master post. The orange LED indicates when the PE beam is made or broken and the green LED indicates whether the stability of the beam. When the PE beam is made, the green stability LED should be on and the orange output LED should be off. When the PE beam is broken the green stability LED should be on and the orange output LED should be on. If the beam is on the border between being made and broken the green stability LED will flicker. Note that this is the preferred set-up method for inexperienced installers.
5. Cover the reflectors in the passive post so they are not visible from the PE unit.
6. Taking a hand held reflector and standing at the passive post, move the reflector left and right in front of the post to determine the vertical centreline of the PE beam. Unless the Gate is fitted with beacons and an over ride switch, two people will be needed to undertake this operation. To find the centreline first move the reflector leftwards until the beam is broken (note the position of the reflector), then move the reflector rightwards back through the beam until the beam is broken again (note the position of the reflector). The midpoint between the two noted positions is the centre of the beam.
7. Very carefully loosen the horizontal adjustment screws and adjust the angle of the PE unit before tightening the screws. Repeat the previous step until the centre of the beam is within ±40mm of the centre of the reflectors on the passive post.

8. Check the vertical alignment of the PE unit, using the procedure specified above, by moving the hand held reflector up and down with the passive post reflector covered. Adjust the vertical angle of the PE unit if required.
9. Restore the over ride switch to the neutral/auto position and check the Cable Gate operates correctly.
10. Refit the rear door and side cover on the master post.

3.3.5 Gate Testing and Commissioning

1. Insert the supplied AC Plug Pack into the selected mains GPO (power point) to commence charging the gate Batteries. Confirm that the LED labelled "ES" illuminates on the Cable Gate control board to confirm that the External Supply is available at the Main Control Board.
2. Test the normal opening and closing operation using the supplied operating systems.
3. Test the operation of the Entry Mouth Safety Trigger by lifting it while the gate is closing. The gate should immediately re-open.

Figure 3-18: Demonstration of the Safety Trigger Operation

4. Test the operation of the PE Beam by interrupting it while the gate is closing. The gate should immediately re-open.
5. Test the operation of the opening overload function by manually holding up the Main Cable while sending a correct opening command (see the Figure below). In this instance the gate should not open. The gate should re-try opening every 2 seconds until one of the following occurs:
   - The Main Cable is no longer held up. If this happens the gate opens.
   - The number of re-tries exceeds the programmed number (typically 5). If this happens the gate stays closed and enters lockout mode, with a corresponding error code (13) displayed on the 2-digit, 7-segment LED display on the Main Control Board. This display is viewable through the Perspex window in the rear of the master post door. In this instance the gate will not respond to any further inputs until the Clear Faults ("CF") button on the Main Control Board is pressed.

Figure 3-19: Testing the Operation of the "Opening Overload" Function

6. Test the operation of the closing overload function by manually holding down the Main Cable while the Cable Gate closes (See the Figure below). In this instance the gate should not close. The gate should re-try closing every 2 seconds until one of the following occurs:
   - The Main Cable is no longer held down. If this happens the gate closes.
   - The number of re-tries exceeds the programmed number. If this happens the gate stays open and enters lockout mode, with a corresponding error code (20) displayed on the 2-digit, 7-segment LED display on the Main Control Board. The gate will not respond to any inputs until the Clear Faults ("CF") button on the Main Control Board is pressed.

Figure 3-20: Testing the Operation of the "Closing Overload" Function

7. Ensure that hold-down nuts to the Master Post and Passive Posts are tightened to 150 Nm (or 200 Nm for chemical anchors).
8. Explain the operation of the Cable Gate to the customer. Use the section headings in the *Cable Gate Operators Manual* as a guide to ensure that none of the Cable Gate's operating features are omitted during the explanation.

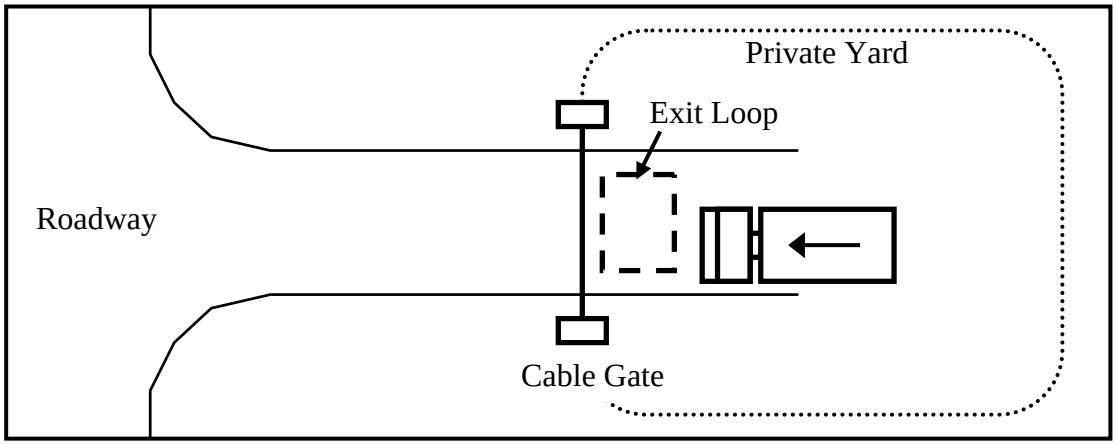
Section 4: Access Control Equipment

This section outlines the functionality of common Access Control devices and their typical connections into the cable gate control module.

4.1 Exit Road Loop

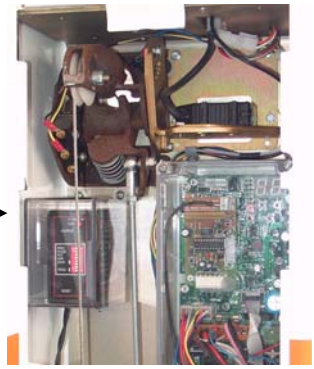
The Exit Road Loop is used to provide unchecked exits from an area.

4.1.1 Site Layout



4.1.2 Equipment Type

Cable Gate recommends the Nortech PD134D – Single Channel Vehicle Detector

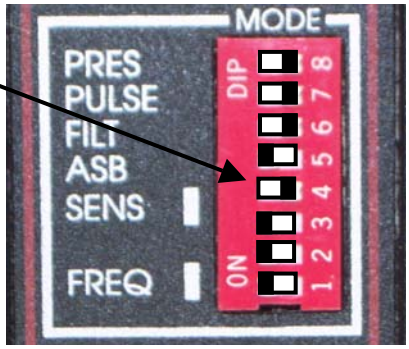


4.1.3 Equipment Mounting

The unit is typically mounted in the Master post onto a rail mounted 11-pin socket base with a water droplet guard cover as shown: -

4.1.4 Equipment Settings

The typical settings on the unit are as shown: -



4.1.5 Connections

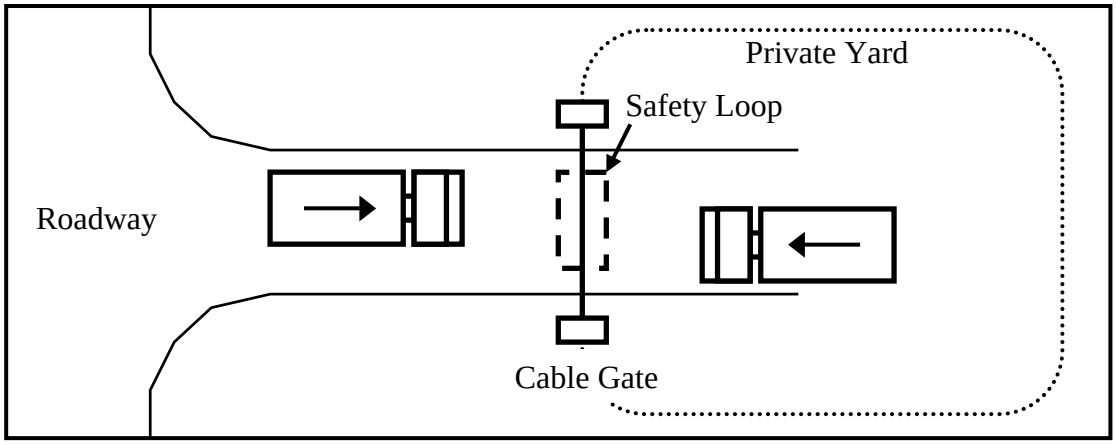
X2 Pin (Refer section 5.2)	11 Way Road Loop Base Pin	Description
8	1	Power
9	2	Ground
7	5	N.O. contact
9	6	Ground
	7	Road loop twisted
	8	Road loop twisted

Note! The N.O. contact must go to X2 pin 7 for exit loops.

4.2 Safety Road Loop

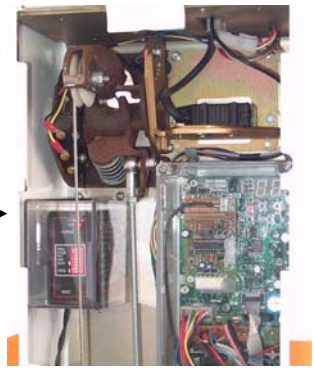
The Safety Road Loop is used to provide an additional safety signal for vehicles that are too high to break the PE Beam i.e. trucks and semi-trailers.

4.2.1 Site Layout



4.2.2 Equipment Type

Cable Gate recommends the Nortech PD134D – Single Channel Vehicle Detector

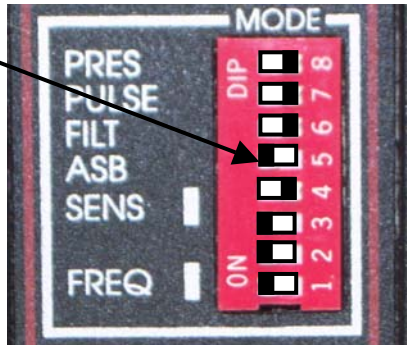


4.2.3 Equipment Mounting

The unit is typically mounted in the Master post onto a rail mounted 11-pin socket base with a water droplet guard cover as shown: -

4.2.4 Equipment Settings

The typical settings on the unit are as shown: -



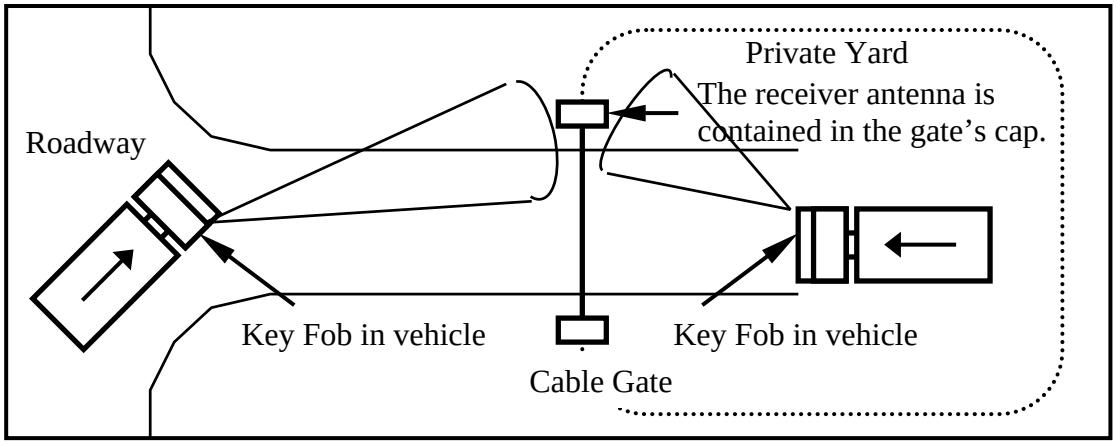
4.2.5 Connections

Pin (Refer section 5.2)	11 Way Road Loop Base Pin	Description
Connector X2, Pin 8	1	Power
Connector X2, Pin 9	2	Ground
Connector X3, Pin 5	5	N.O. contact
Connector X3, Pin 2	6	Ground
	7	Road loop twisted
	8	Road loop twisted

4.3 Remote Key Fob Access Control Device

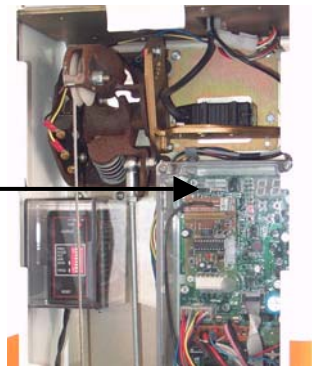
The Key Fob access control device permits entry and exit by remote radio link.

4.3.1 Site Layout



4.3.2 Equipment Type

Cable Gate recommends the Neatrol 433.92MHz Airkey Transmitter/Receiver system.



4.3.3 Equipment Mounting

The receiver unit is mounted inside the controller box as shown: -

4.3.4 Equipment Settings

There are no settings as such, rather every transmitter must be learnt into the receiver's list of valid users.

4.3.5 Connections

X6 Pin	Receiver Pin	Description
1	1	Ground
2	2	Ground
3	3	FOB1
4	4	N.C.
5	5	+12V
6	6	FOB2

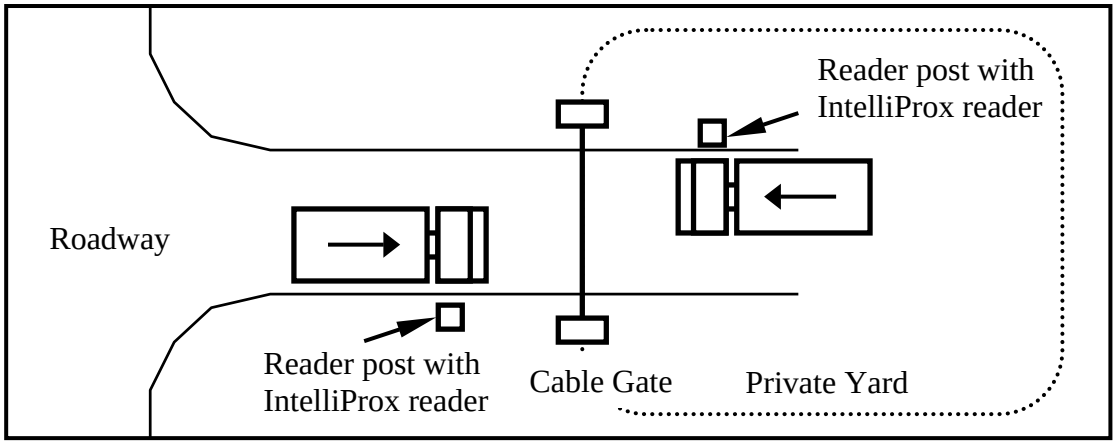
Key Fob Transmitter.

Note: The above connections are made when the receiver is plugged in.

4.4 Proximity Card Access Control Device

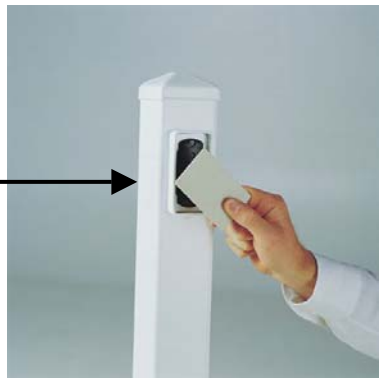
The proximity card access control device permits entry or exit by contact-less, smart card.

4.4.1 Site Layout



4.4.2 Equipment Type

Cable Gate recommends the Keri Microstar reader with IntelliProx SM2000 controller



4.4.3 Equipment Mounting

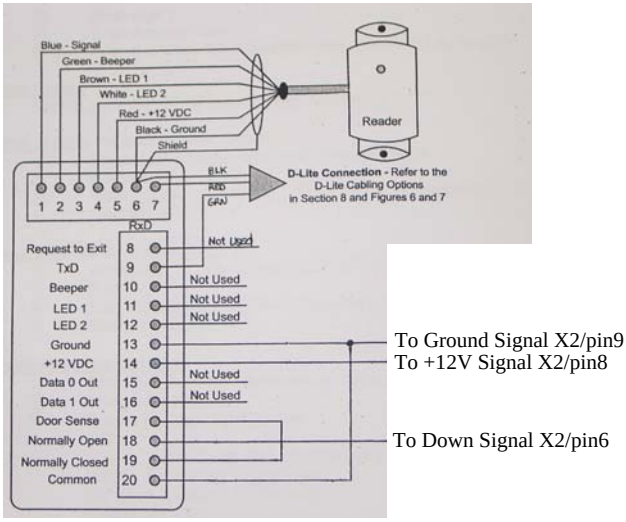
The IntelliProx Reader is mounted on a standard Cable Gate reader post. The prox controller can be mounted inside the reader post or in a separate enclosure.

4.4.4 Equipment Settings

There are no settings as such, rather every smart card must be programmed into the card reader's list of valid cards.

4.4.5 Connections

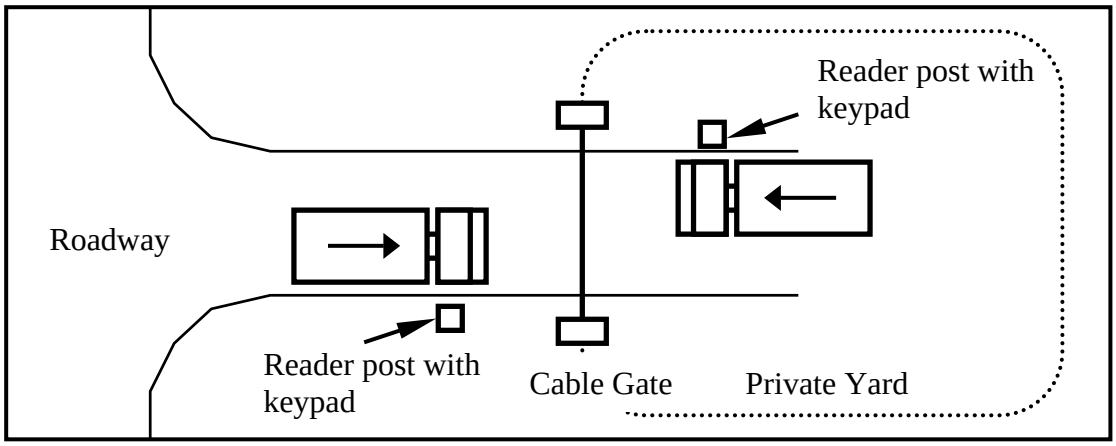
Refer to section 5.2.



4.5 Keypad Access Control Device

The keypad access control device permits entry or exit by PIN number entry.

4.5.1 Site Layout



4.5.2 Equipment Type

Cable Gate recommends the Neatrol KP2 Keypad: -

4.5.3 Equipment Mounting

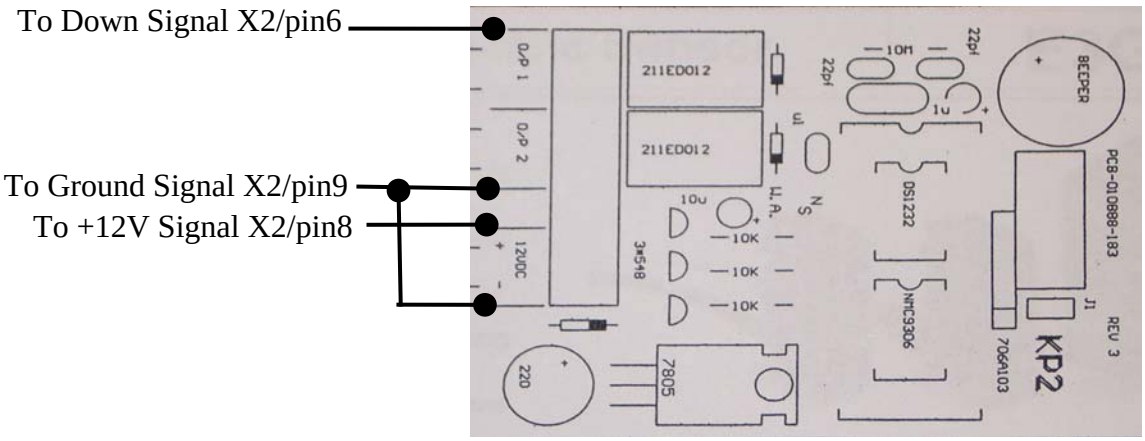
The KP2 Keypad is mounted on a standard Cable Gate reader post:

4.5.4 Equipment Settings

There are no settings as such, rather every PIN number is programmed into the keypad's list of valid PIN numbers.

4.5.5 Connections

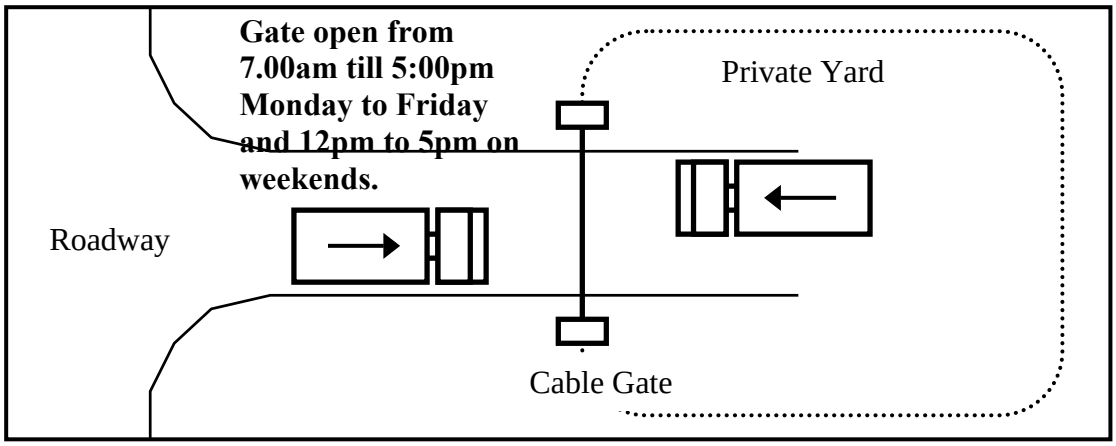
Refer to section 5.2.



4.6 Timer Access Control Device

The timer access control device permits entry during programmable times of the day.

4.6.1 Site Layout



4.6.2 Equipment Type

Cable Gate recommends the Frontier Digital Timer: -

4.6.3 Equipment Mounting

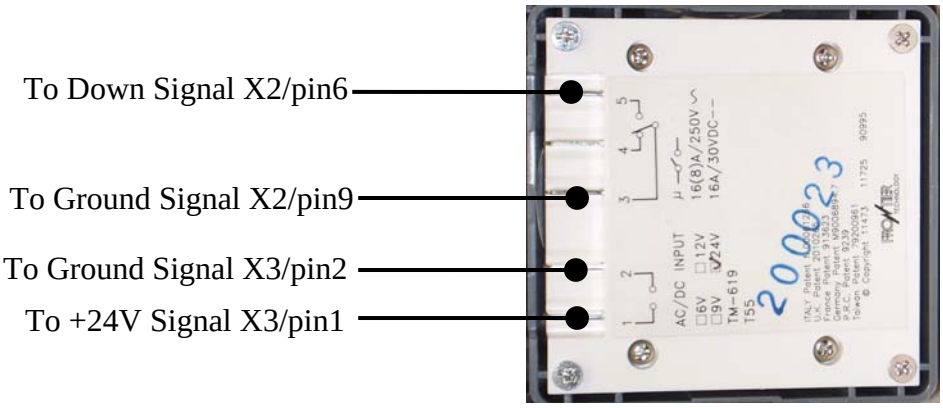
The timer can be mounted in the post or with the Office Box: -

4.6.4 Equipment Settings

Up to eight periods can be programmed independently by setting a start time and a stop time. It can also be programmed to be every day, every other day, weekdays only, weekends only as well as other options.

4.6.5 Connections

Refer to section 5.2.



4.7 Combinations Of Access Control Devices

Access devices generally have floating relay contacts as outputs. By placing these contacts in series or parallel can permit many different combinations of access control. For example, by placing a timer contact in series with a prox. card device, prox card access would be permitted only at certain times of the day. Alternatively, if the contacts were wired in parallel, every one could have access during working hours, but only prox. card access would be permitted after working hours.

Section 5: System Wiring And EMC Issues

5.1 Placement of EMC Ferrite Components

The Cable Gate has passed conducted and radiated emissions tests (to international standards CISPR 11 Class B), which in Australia, is referred to as C-Tick compliance. One of the main contributing factors in achieving this standard is the way in which the wiring is laid out within the master post and the location of the suppression ferrites thereon.

The initial choice of cable size should be determined from the guide provided in Appendix C of this manual. Once the choice has been made and the cables run, there remains the issue of the placement of the suppression components prior to cable termination within the master post.

The suppression parts shown in the following figures are the clamp variety (MPPN 95-46-01), which are used to retrofit onto existing cables. For new installations solid ferrite sleeves (MPPN 95-46-02) are used because of their lower cost. Cables enter the post via conduits in the concrete mounting block. The suppression component(s) must be placed at the point where the cables exit the conduit.

Note (1): The ferrite clamp 95-46-01 or ferrite sleeve 95-46-02 must be placed around **all** cables leaving the base of the gate.

Note (2): The ferrite component must be as close to the bottom of the post as possible.

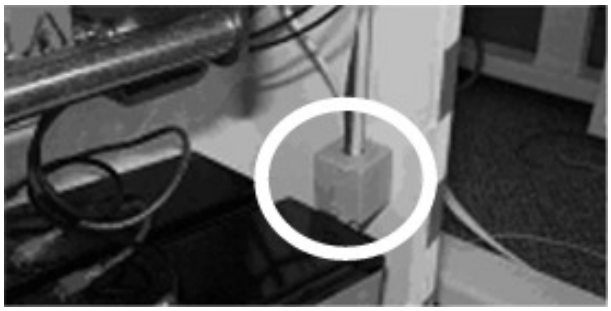


Figure 5-1: Fitting the ferrite component

When a single ferrite is too small to fit around all the cables, use as many ferrites as necessary to surround **all** cables leaving the post as shown.

Figure 5-2: Using more than one ferrite

When cables exit the post through two separate conduits. Place ferrites around cables where the cables enter each of the conduits as shown.

Figure 5-3: Cables exit via two conduits

When a cable leaves the post via the PE beam inspection port, (as is the case of a traffic light installation)
Use a ferrite clamp or sleeve as close as possible to where the cable exits the post. Passing the cable through the ferrite twice fastens the position of the clamp on the cable.

Figure 5-4: Ferrite used at PE inspection plate

Note! Always check that the plastic locking mechanism on the clamp type ferrites are locked into position correctly. If the mechanism springs open, there is no EMC protection!

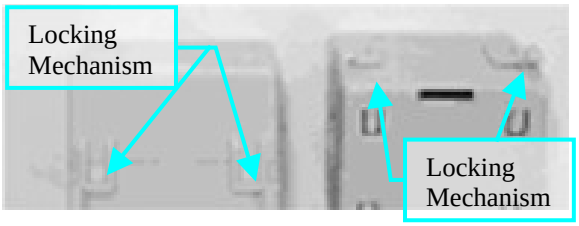


Figure 5-5: Ferrite clamp locking mechanism

5.2 External Wiring Connections

All external wiring is made to connectors X2 and X3 only. All activation device inputs are active low (pull to ground). *Connector pins are numbered from right to left in ascending order when viewed from the rear of the gate as shown below.*

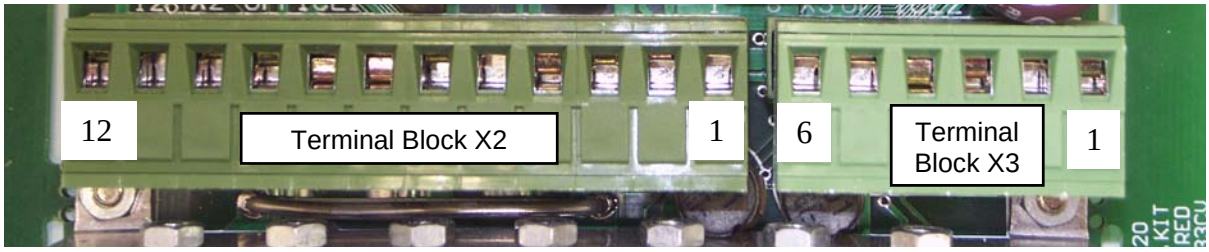


Figure 5-6:Connector Pin Numbering

Table 5-1: Connector Pin Details

Pin X2	In/Out	Type	Description	Max Current /Voltage	4c-cable core colour	6c-cable core colour
1	Input	Power	24 AC+	1 Amp/33V		
2	Input	Power	24 AC-	1 Amp/33V		
3	Input	Power	Solar Positive	1.2 Amp/33V		
4	Input	Power	Solar Negative	1.2 Amp/33V		
5	Input	Signal	Up	20 mA/24V	Red	Red
6	Input	Signal	Down	20 mA/24V	Green	Green
7	Input	Signal	Exit Road loop	20 mA/24V		
8	Output	Power	12 V Access Control Power	500 mA		
9	Output	Power	12 V Access Control Ground	500 mA	Black	Black
10	Input	Signal	Remote Clear Faults	20 mA/24V	Yellow	Yellow
11	Input	Signal	Spare Input (Not used)	20 mA/24V		
12	Output	Power	12 V Access Control Ground	500 mA		
Pin X3	**In/Out**	**Type**	**Description**	**Max Current /Voltage**		
1	Output	Power	24 V DC	1 Amp		
2	Output	Power	Ground	1 Amp		
3	Output	Power	Gate Locked 0	500 mA/33V		Blue
4	Output	Power	Gate Locked 1	500 mA/33V		White
5	Input	Signal	Safety Loop	20 mA/24V		
6	Output	Power	12V Sensor Power	200 mA		

Section 6: Control Module Configurable Parameters

Several gate configuration and operating mode parameters are available for user definition. These configuration parameters are entered through the 16-position rotary switch located on the main control board, as described in the following sections:

6.1 Control Module Access

The control module is housed in a PVC enclosure with a clear acrylic lid, which is fastened with four “quarter-turn” screws. To gain access to the control switches each quarter turn screw must first be pressed in, then rotated one quarter turn anti-clockwise, then released. Fastening the lid is simply the reverse of the removal process, ensuring all sleeved grommets are in their correct place.

6.2 Control Module Switch Locations

There are currently two versions of the control module board, which are not identical in appearance, however, the location of the switch positions and indicator lamps are identical on both boards. With this said, only the latter board layout is shown here.

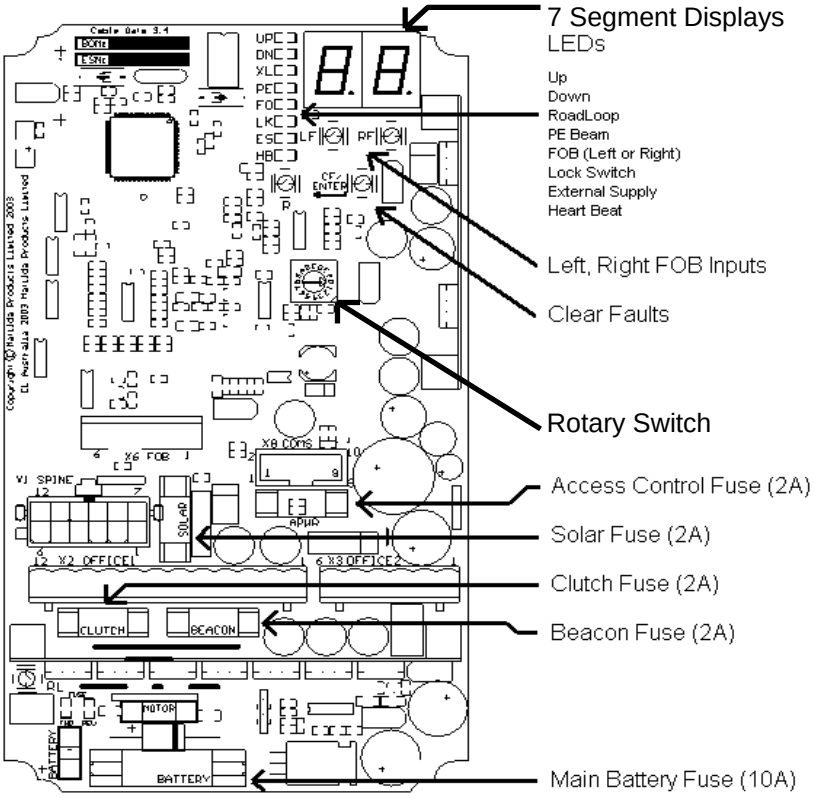


Figure 6-1: Control Board LED and Switch Locations

6.3 Configurable Parameters

6.3.1 General Method for Configuration Mode Selection

The 16-position rotary switch is used to select both the gate operating mode and for entering various calibration modes.

When the rotary switch is set to a certain position, two “alpha” characters are displayed to indicate the mode selection that has been made. For example, the 2-digit, 7-segment display may show the letters “CC” to indicate that the “cycle counter” mode has been selected (switch position 2).

These letters will be displayed until the Clear Faults/ Enter button (Marked CF/Enter) is pressed. Pressing the Clear faults/enter button (Marked CF) brings up the default value of the user-defined parameter associated with the particular operating mode selected.

The parameters are modified by using the left key fob button (Marked F1) and the right key fob button (Marked F2). The left fob button (F1) upwardly increments the parameter value, while the right fob button (F2) downwardly increments the parameter value. The numbers on the display will be flashing at this point to indicate that the display value differs from the parameter value saved in memory.

Once the correct value has been obtained, it is stored in memory through pressing the CF/Enter button. When this button is pressed the display will stop flashing to indicate that the selected parameter has been permanently stored in memory.

At this point the 16-position rotary switch can be set back to the operating mode position (switch position 0).

6.3.2 Run Mode

Position 0 – This position is used to run the gate in whatever mode is selected using position 1.

Gate operation in the selected mode commences immediately upon selecting position 0 (following a brief “debounce” period).

After entering this switch position the 2-digit, 7-segment LED display panel momentarily shows the characters “8.8.” before reverting to displaying the current gate state.

6.3.3 Gate Operation Mode Selection

Position 1 – This switch position is used to select the gate-operating mode to be run in position 0.

Upon entering this switch position the diagnostic display will show the letters "**oP**" to indicate the **op**eration mode selection position has been reached.

The following modes are available and can be selected using the procedure detailed in section 6.3.1:

Mode 0 = Disabled Mode

This is the mode that the gate enters when gate parameters are being modified. In this mode the key fob input is disabled (although F1 and F2 are enabled) to prevent a key fob user from inadvertently changing control parameters from a location adjacent to the gate. This mode setting is of no value to the gate operator and is only every used during shipping or when the gate is left idle for long periods of time.

Mode 1= Up mode.

In this mode the gate will remain locked up regardless on any gate activation signals received. *For this reason caution should be exercised in using this mode*. The gate must already be closed for it to remain up. If the gate is open it will remain open.

While the gate is in up mode the diagnostic display will flash "UP" and the red beacon (if fitted) will flash and the red traffic light will illuminate (if fitted).

Mode 2 = Down mode.

When this mode is selected the cable will drop, and will remain down until a new mode is selected. While in this mode the green beacon and green traffic light (if fitted) will illuminate and the diagnostic display will flash "dn".

In this mode the processor goes to sleep to conserve battery power.

Mode 3 = Automatic mode.

This is the default-operating mode of the gate as supplied. The gate will respond to all gate activation signals in this mode.

Mode 4 = Toggle Mode

In this mode the key fob can be used to toggle the state of the gate. (i.e. depressing the key fob will release the gate, and depressing it again will cause the cable to retract home.)

Mode 5 = Test Cycle mode.

When in this mode the gate will automatically cycle up and down at a fast rate.

If a gate activation signal or safety signal (PE beam break) is received the gate responds respond in the usual manner.

6.3.4 Display of Gate Cycles

The accumulated gate cycles can be displayed at any time on the seven-segment LED display panel.

"Gate cycle display" mode is entered through setting the rotary switch on the Main Control Board to **position 2**.

When this switch position is selected, the 2-digit, 7-segment display will show the letters "CC" to indicate that the "Cycle Count" mode has been selected.

The gate cycle count display is commenced through pressing the CF/Enter button.

If the cycle count was 123 579 cycles, it would be displayed as shown in Figure 6-2.

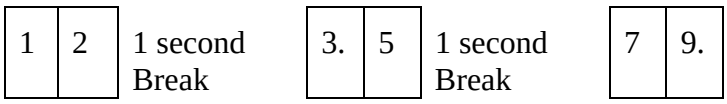


Figure 6-2: Example of cycle count display

The cycle count display sequence can be repeated by repressing the "CF/Enter" button.

Turn the rotary switch back to position 0 to return to normal gate operation.

6.3.5 Gate Status Output Configuration

Position 3 – This switch position is used to configure the behaviour of the two gates status output connections.

Upon selecting this switch position the display will show the letters "ou" (lower case) to confirm that the "**ou**tput select" mode has been entered.

The control system is designed with two outputs for indicating the gate status to remote devices, such as fire alarm mimic panels, security alarms, or programmable logic control systems (PLC's).

The output lines are called "gate locked output 0" and "gate locked output 1". The pins for these outputs are found on the Main Control Board (refer to Section 5.2 above for details).

The following modes are available and can be selected using the procedure detailed in section 6.3.1 above:

Table 6-1: Gate locked output modes

Mode	Description	Gate Locked 0	Gate Locked 1
0	Always off	FLOATING	FLOATING
1	Fault / Open	GROUNDED in Fault	GROUNDED if Open
2	Inverse of mode 1	FLOATING in Fault	FLOATING if Open
3 Default	Fault / Locked	GROUNDED in Fault	GROUNDED if Locked
4	Inverse of mode 3	FLOATING in Fault	FLOATING if Locked
5	Open / Locked	GROUNDED if Open	GROUNDED if Locked
6	Inverse of mode 5	FLOATING if Open	FLOATING if Locked

CAUTION

When the gate is in the fault state it is not possible to determine with certainty whether the gate is locked or not. Therefore, care should be taken in using the open/locked outputs when the gate is in the fault state.

6.3.6 Safety Re-try Time Configuration

Position 4 – This configuration parameter can be used by the service technician to set the period between when a safety signal is re-established and when the gate attempts to close, when in the "open" state.

When this switch position is selected the display shows the letters "**PE**" to indicate that the "photoelectric (**PE**) Beam Safety Time" is being set.

The range of permissible settings is 0 seconds to 65 seconds. Scrolling beyond 65 seconds forces the display back to 0 seconds. The default setting is 2 seconds.

6.3.7 Gate Open Delay Configuration

Position 5 – This position sets the period that the gate remains open for, without the influence of a safety signal or other gate activation signal i.e. the gate open delay period.

When this switch position is selected the display shows the letters "**od**" (lower case) to indicate that the "**o**pen **d**elay" period is being set.

The range of settings is 0 seconds to 65 seconds. Scrolling beyond 65 seconds forces the display back to 0 seconds.

It is possible to configure the safety time for different operating modes; depending on which operating mode the open delay period configuration was entered from. The default values for the open delay time are as follows:

Automatic Mode = 25 Seconds (by default). This value if often set higher if gate users have to make their way back into a car after the gate has been opened.

Toggle Mode = 1 second (by default)

Test Cycle Mode = 1 second (by default)

6.3.8 Power Source and Consumption Configuration

Position 6 – This switch position configures the gate to run from different power sources (and have variable power consumption) as indicated in the table below:

When this switch position is selected the display panel shows the characters “PC” to indicate that the “**P**ower **C**onfiguration” mode has been selected.

The following modes are available and can be selected using the procedure detailed in section 6.3.1 above:

Table 6-2: Power Source Configuration Modes

Power Mode Indicator	*Power Source*
0	No standard power source used
1	AC Plug Pack Used
2	Solar Panel Used

Power Mode 0 should be selected wherever the gate is operated from neither an AC plug pack nor a solar panel assembly, both of which can be supplied by Matilda products. For example, some customers may prefer to run the gate from a 24-volt wet cell, lead-acid battery, with charging not provided by the Cable Gate control system. If Power Mode 0 is selected, the gate controller will not display an error if the anticipated charging current is not observed for an extended period.

6.3.9 Software Version Number Display

Position 7 – This switch position is used by the Service Technician to record the gate operating Software Version Number.

When this mode is selected the display shows the letters “SF” to indicate that the “**S**o**F**tware Version Number” is being selected.

This information is displayed (when the clear faults/enter button is pressed) in the format “x.y” to indicate both the version and sub-version numbers.

This switch position is only used to view the Software Version Number – no editing of the version number is available.

6.3.10 Long Safety Cut Response

Position 8 – This switch position is used to configure how the gate responds when the safety beam is cut for a long period of time.

When this mode is selected the display shows the letters "SC" to indicate that the "**S**afety **C**ut" mode is being selected.

The following modes are available and can be selected using the procedure detailed in section 6.3.1 above:

Table 6-3: Long Safety Cut Response Modes

Long Safety Cut Response Number	***Response***
0	The gate will remain open as long as the safety beam is cut
1	If the safety beam is cut for more than 1 minute, the gate will automatically close (even thought the safety beam remains cut).
2 (Factory default)	If the safety beam was cut on open and remains cut for 1 minute, the gate will automatically close (even though the safety beam remains cut).

Long safety beam cuts can be caused by situations such as:

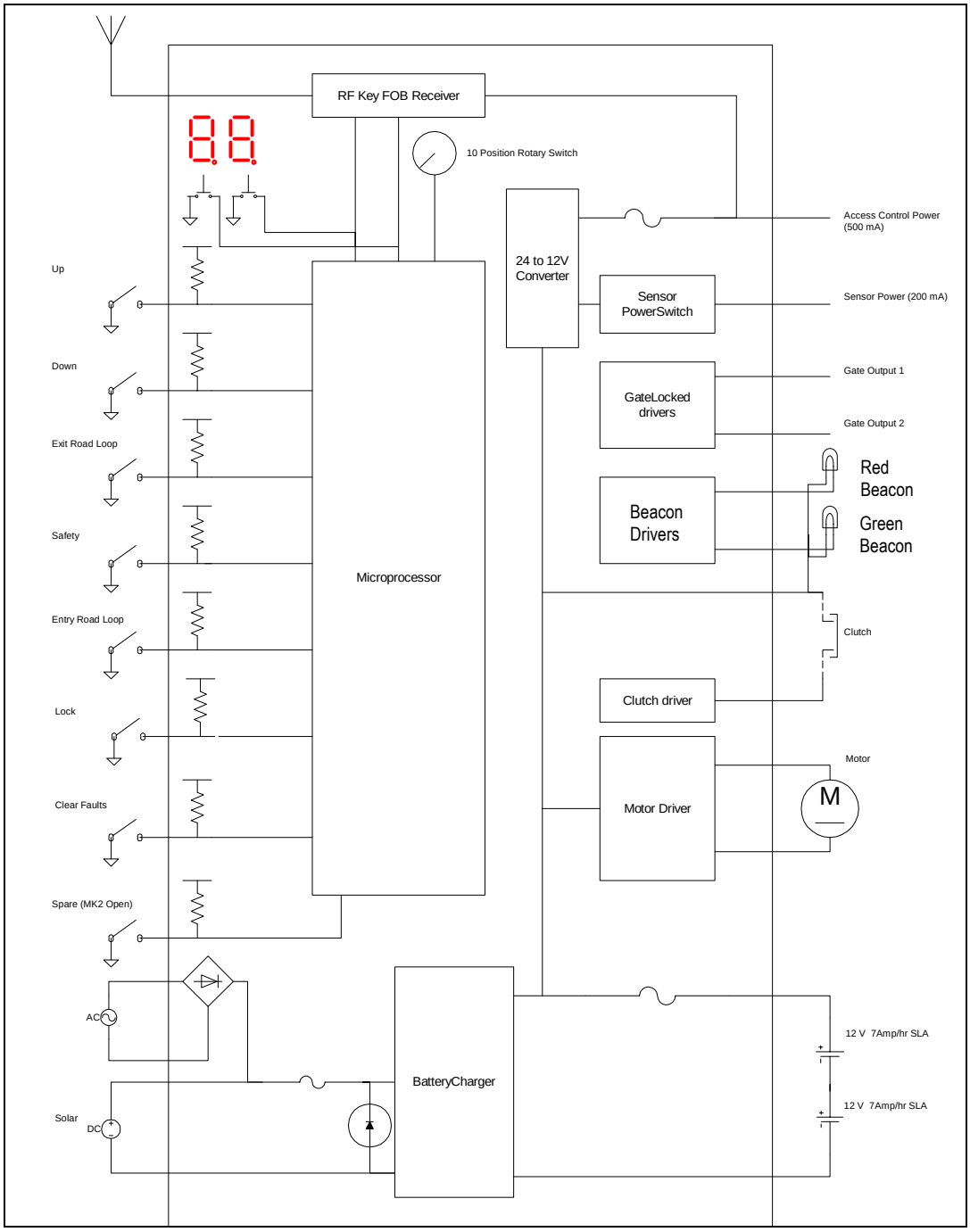
- A car legitimately parked across gate.
- A user blocking the beam to allow non-authorised vehicles to enter.
- Condensation forming on the beam's lens on cold wet mornings.

Thus the "Safety Cut" mode selection is designed to allow the user to decide how they want the gate to behave in these situations.

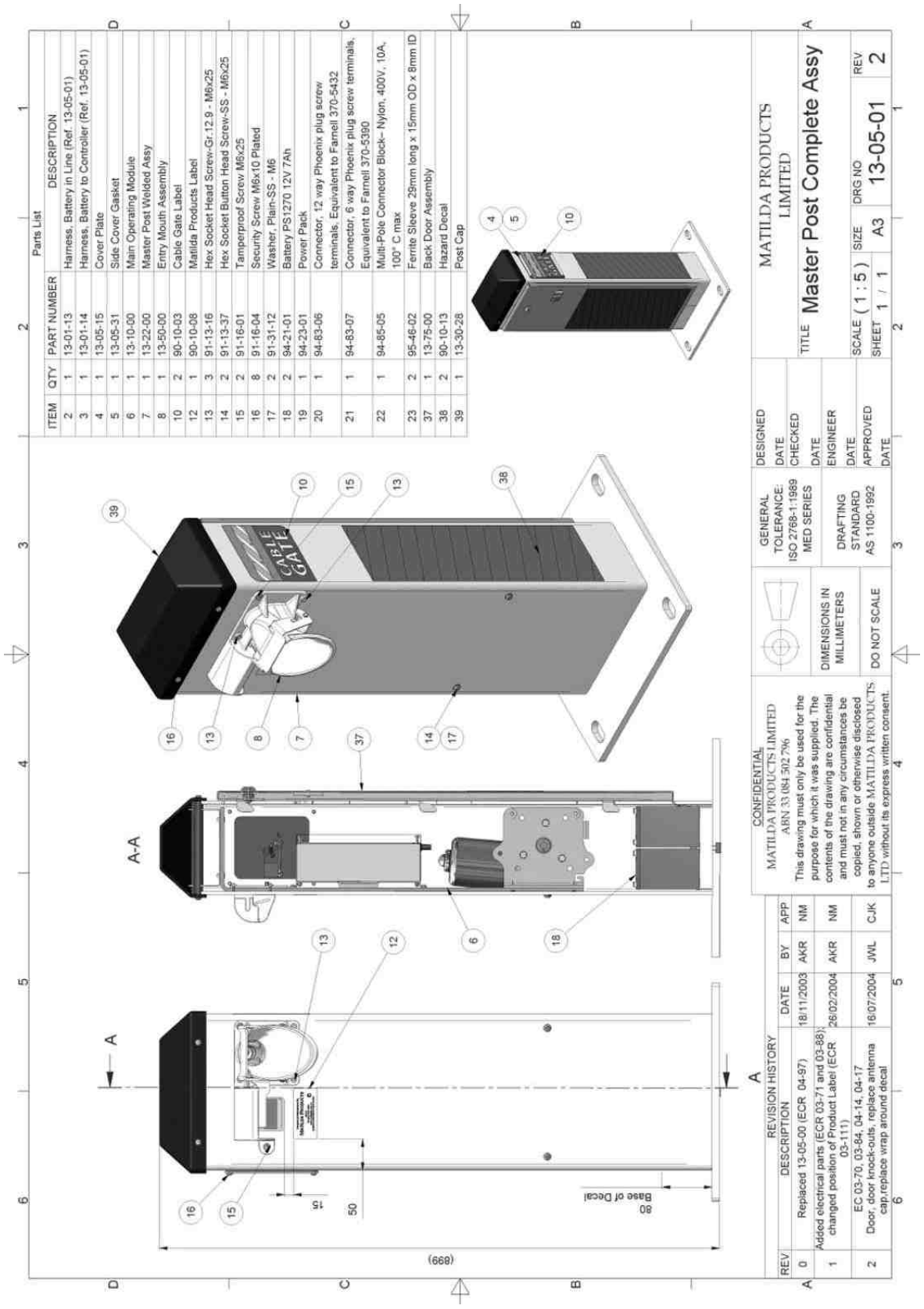
Section 7: Engineering Drawings / Data

7.1 Cable Gate MKIII Controller Block Diagram

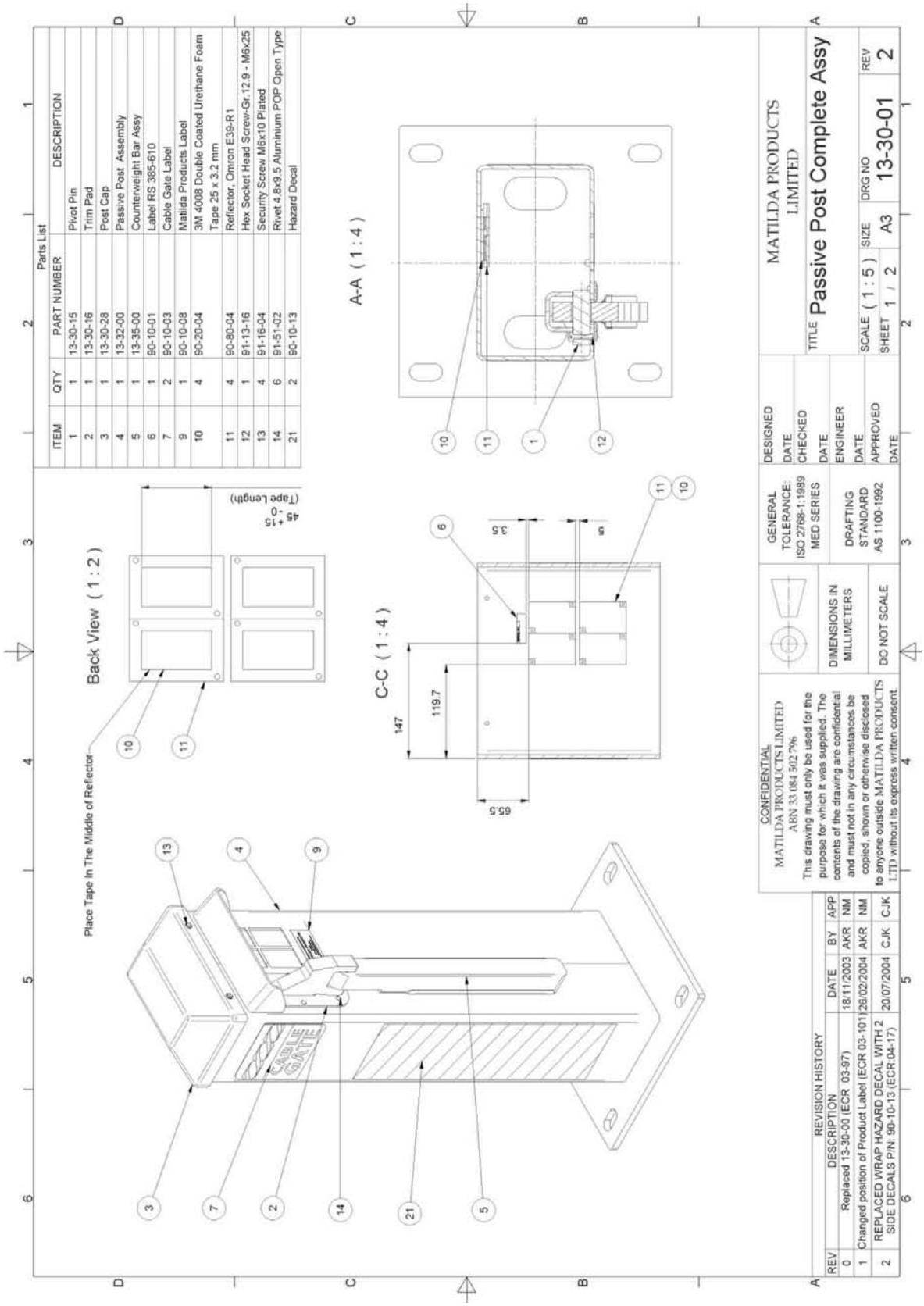
Cable Gate Controller Block Diagram



7.2 Master Post Complete Assembly, Drawing 13-05-01



7.3 Passive Post Complete Assembly, Drawing 13-30-01



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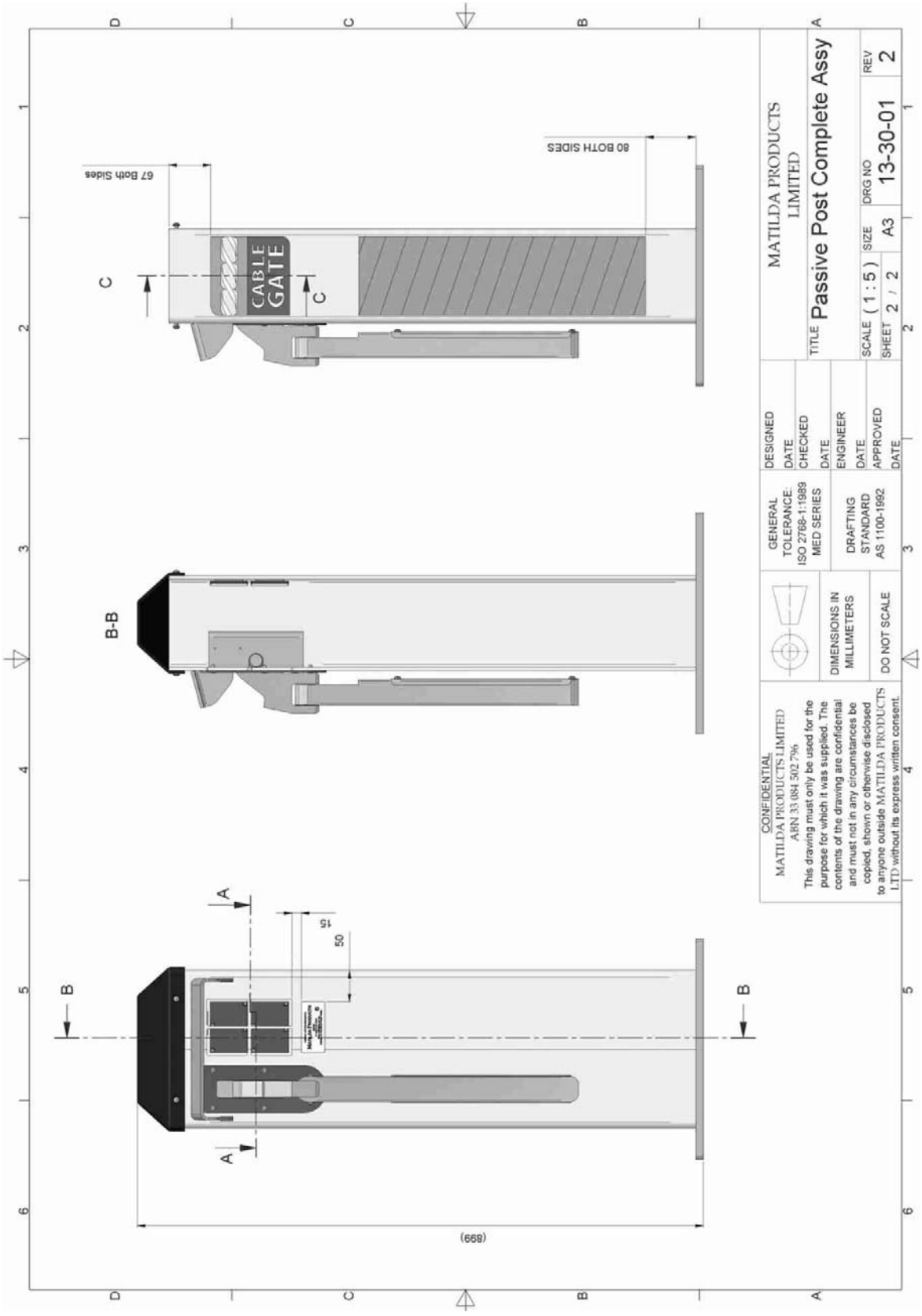
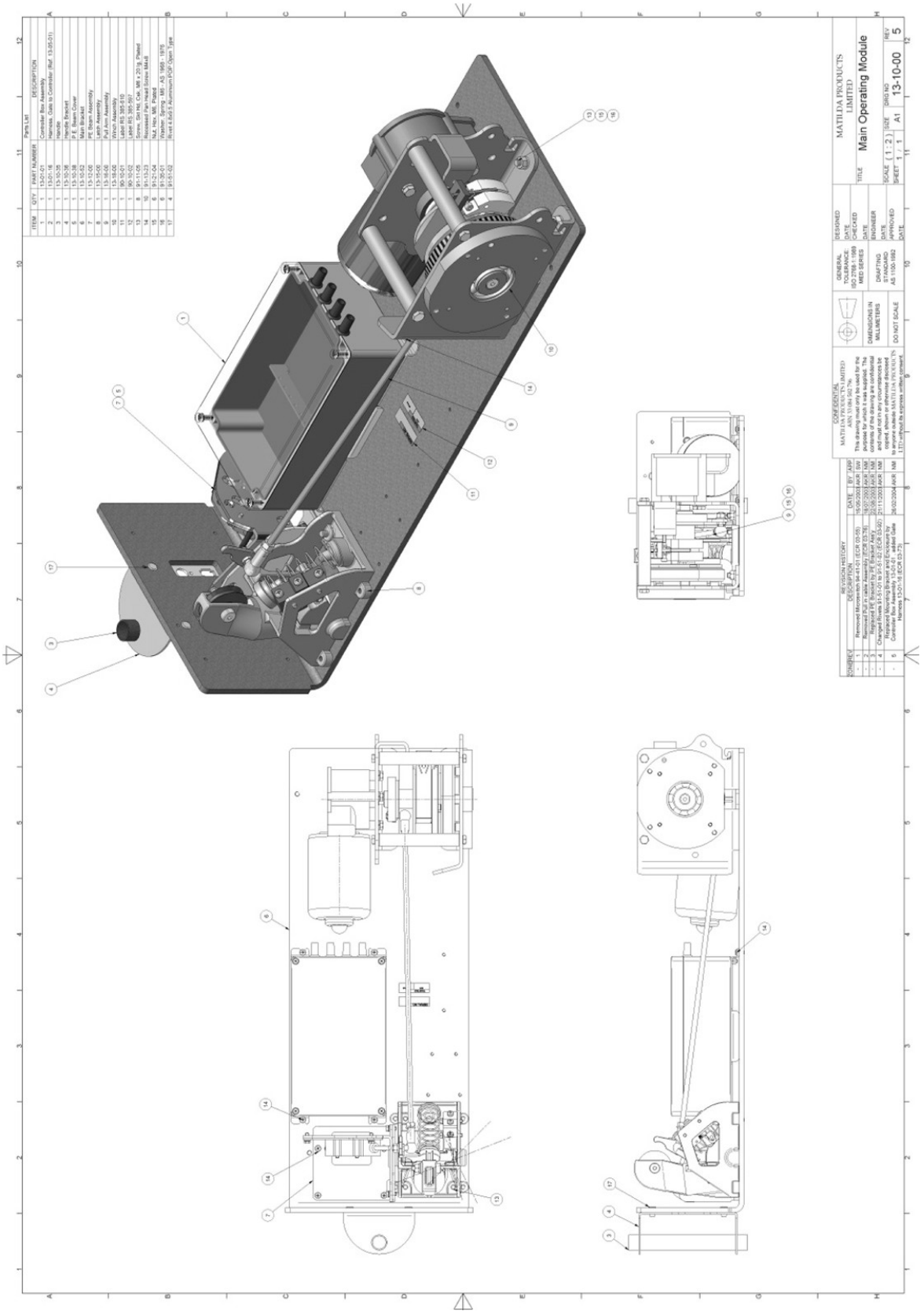
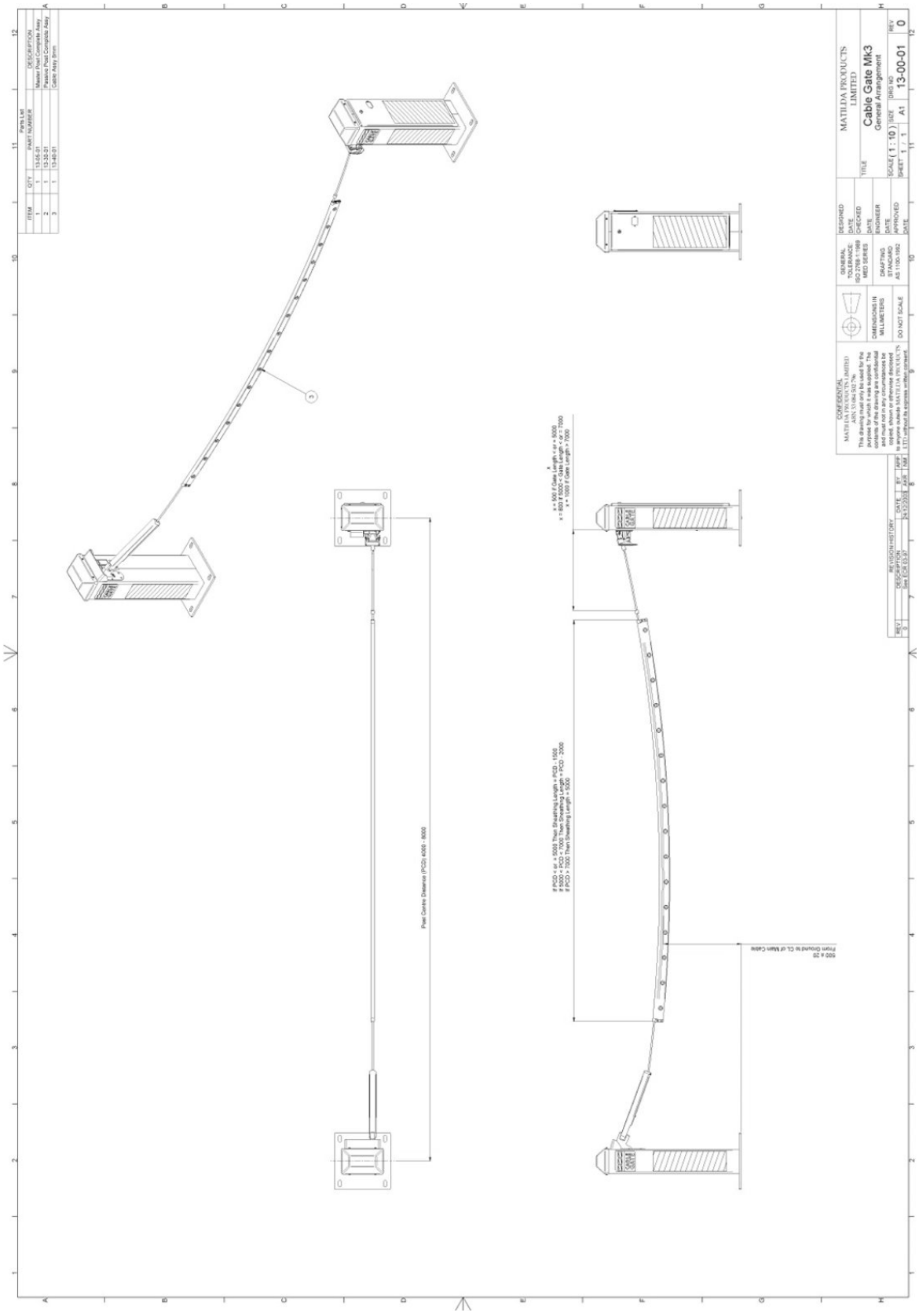


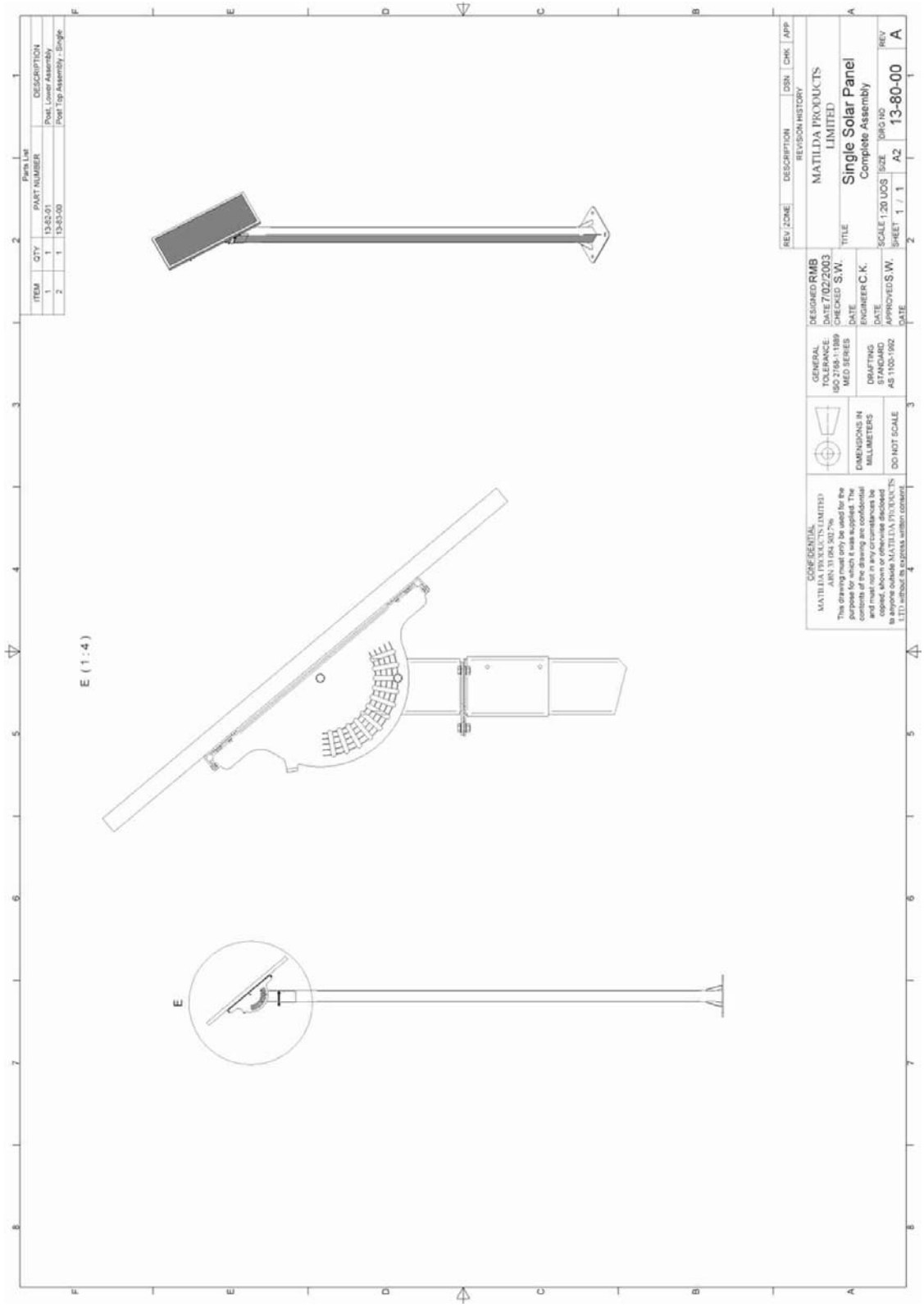
7.4 Main Operating Module, Drawing 13-10-00



7.5 Cable Gate General Arrangement, Drawing 13-00-01



7.6 Single Solar Panel Complete Assembly, Drawing 13-80-00



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Appendix A: Battery Installation, Commissioning and Maintenance Guide

Note: The following information is adapted from the Yuasa manual for NP batteries

Storage

If the batteries are not to be installed immediately, keep them boxed and store in a cool, clean and dry place.

If the batteries are to be stored for six months of more they will need a supplementary charge prior to installation as outlined below.

Unpacking and Inspection

WARNING

Batteries are electrically live at all times. Do not short-circuit the battery terminals.

Inspect the battery consignment for obvious signs of transit damage. Ensure the consignment has all items listed on the advise note or invoice, i.e. batteries, cables, shrouds etc.

Unpack each battery taking care not to drop on the terminals. Inspect each battery for physical damage such as cracks or distortion of the case and terminals.

Measure the battery open circuit terminal voltage, which should be 2.1 volts/cell (12.6 volts for a 6 cell battery). If any batteries are lower they will need a supplementary charge prior to installation.

Supplementary Charge

To ensure maximum service life, a supplementary charge may be required prior to installation. Apply a supplementary charge if:

The batteries have been in storage 6 months of more.

The battery open circuit voltage is under 2.1 volts per cell.

A supplementary charge should be applied in accordance with figures shown in the table below.

Table 7: Supplementary Charge for the Yuasa NP Battery

(can also be used for Century PS batteries)

Storage Period	Charge Voltage (for 12V battery)	Charge Time
Not more than 1 year	13.62V	More than 3 days
1 year	14.1V	2-6 days
1-2 years	13.68V	3-6 days

After the charge period, check that the battery open circuit voltage is above 2.1 volts/cell.

Pre Installation Check List

WARNING

Batteries are electrically live at all times. Do not short-circuit the battery terminals.

Under no circumstances should batteries be charged in a sealed container

The batteries should be installed in a dry and adequately ventilated area with an operational temperature of between 20ºC and 25ºC.

Installation and Connection

A wire brush should be used on all battery terminals to remove any oxidation layers. Application of a non-oxidising grease (such as Vaseline) is not necessary. However, there may be some installations where there are corrosive compounds/elements nearby or in the atmosphere. In these special cases it is recommended that a non-oxidising grease be used.

When installing batteries remove any jewellery and watches.

When installing the batteries, free air space must be provided between each battery. The recommended distance is 10mm minimum.

Since a battery may generate ignitable gases, do not install close to any items that produce sparks.

The battery case is made from ABS resin. Do not, therefore, place in an atmosphere with organic solvents or adhesive material.

Single String Battery Connection

When multiple numbers of batteries are used, make connections as follows:

Positive Termination: Connect the positive terminal (+) of battery No 1 securely to the positive terminal (+) of the charge/load.

Intercell connections: Connect the negative terminal (-) of battery No 1 to the positive terminal (+) of battery No 2.

Negative terminal: Connect the negative terminal (-) of the final battery securely to the negative terminal (-) of the charger or load.

Appendix B: Battery Product Safety Data Sheet

Note: This Product Safety Data Sheet is take from the Yuasa PSDS May 02

Prepared following the Guidelines in Appendix 1 of the HSE publication L62 0 Guidance on regulation 6 of the Chemicals (Hazard Information and Packaging) Regulations 1994

Product Identification

Name: Valve Regulated Lead Acid (VRLA) Battery.

Classification: Batteries, wet, non-spillable, electric storage. Substance identification No.UN 2800

Manufacturer's Name & Address

Century Yuasa Batteries
49-65 Cobalt Street
Carole Park, Qld
PO Box 427
Goodna QLD 4300
Tel: (07) 3361 6161
Fax: (07) 3361 6166

Composition

Component	Approx. by weight or volume	Air Exposure Limits (mg/m^3) O.E.L.
Lead and lead alloy metals	35%	N/A
Lead inorganic compounds	40%	0.15 mg/m^3 as dust in air
Electrolyte – Sulphuric Acid (up to 40% w/w)	15%	1 $mg.m^3$ as mist in air
Separator – Glass Fibre	2%	

Hazards Identification

Sulphuric Acid (up to 40% *wlw)*	Severe IRRITATION and DAMAGE to internal tissues if swallowed, causes IRRITATION of eyes and skin and may cause BURNS and DERMATITIS R35% Causes severe burns (15% & above) No specific antidotal treatment, symptomatic support required. No known delayed effects after single exposure apart from Consequences of local tissue damage.
Lead inorganic compounds	TOXIC by ingestion or inhalation of dust, vapour or fume. R61 May cause harm to the unborn child *R20/22%* Harmful by inhalation and if swallowed R33% Danger of cumulative effects
Glass mat separator	Fibres may cause IRRITATION to skin or eyes upon exposure and to internal tissues if inhaled or swallowed.

First Aid Measures

Inhalation

Sulphuric Acid:	If mist is inhaled, remove from exposure and to fresh air immediately. If there are any breathing difficulties take to hospital.
Lead:	Remove from exposure and wash out mouth.
Glass Fibres:	If fibres have been inhaled, remove to fresh air. If irritation persists take to hospital.

Exposure of Eyes

Sulphuric Acid:	Wash out immediately with copious amounts of water for at least 15 minutes, holding the eye open if necessary. Take to hospital.
Lead Compounds:	Wash out immediately with copious amounts of water for at least 15 minutes holding the eye open if necessary. Take to hospital.

Exposure of Skin

Sulphuric Acid:	Wash off skin immediately with copious amounts of water for at least 15 minutes. Remove all contaminated clothing, which must be washed thoroughly before re-use. Remove and dispose of contaminated footwear.
Lead Compounds:	Wash off skin thoroughly with soap and water.

Fire Fighting Measures

Batteries on charge may emit hydrogen gas that is highly flammable and will form explosive mixtures in air from 4% to 76% concentration. This may be ignited by a spark at any voltage, especially from the batteries themselves.

Batteries on charge must be isolated from power source before attempting to put out a fire. Switch off the power before disconnecting the batteries from the power source.

Batteries in use will be part of an electrical circuit and so water must never be used to put out a fire.

Damaged batteries may expose negative plates (grey) colour that may ignite if allowed to dry out. These plates should be wetted down with water after the battery has been removed from all electrical circuits.

Use extinguisher types:	CO2, Dry Powder
Hazardous decomposition products:	Carbon monoxide, sulphur dioxide, sulphur trioxide, lead fume and vapour, toxic fumes from decomposition of battery case materials.
Special precautions:	Use self-contained breathing apparatus and full acid resistant protective clothing.

Accidental Release Measures

These batteries are designed not to leak under normal conditions. If, however, electrolyte does leak out of any battery for any reason, it should be absorbed onto dry sand, earth or other inert material and must not be allowed to enter any drains. If possible, neutralize any leaked electrolyte using soda ash, sodium bicarbonate, sodium carbonate or calcium carbonate powder and then wash thoroughly with water. Collect absorbed material, and place in an inert sealed container for disposal

Handling and Storage

Store batteries in a cool and dry area with an impervious surface. Store under roof and protect against adverse weather conditions. Protect against physical damage and exposure to organic solvents. Do not allow metal objects to contact both terminals at the same time. This will cause damage, sparking and possible injury.

Large batteries should be handled and moved using mechanical means to prevent risk of injury.

Exposure Controls / Personal Protection

Under normal conditions, where there is no damage and no visible trace of liquid or solid deposit on the batteries, they may be handled without any additional P.P.E. Where there are any signs of damage or liquid or solid deposits, rubber gloves and acid resistant clothing must be worn when handling the batteries and affected packaging to protect against the effects of any acid electrolyte that may be present. If it is suspected that free acid electrolyte is present, then safety glasses must be worn. If large amounts are present, chemical goggles or face shield should be used.

Physical and Chemical Properties

The undamaged product is a manufactured item in an inert plastic case, which will burn if subjected to high temperatures. Some battery types are made in flame retardant plastic, see technical specification.

Batteries on charge may emit hydrogen gas, which is highly flammable and forms explosive mixtures in air.

Electrolyte is a clear liquid with little or no smell. It comprises water and up to 40% sulphuric acid. Leaked electrolyte may dry out to form white patches or patches of other colours, usually green or brown if metals have been attacked, which may be acidic.

In damaged batteries, lead plates can be grey or brown with varying amounts of white. Grey material may ignite if left to dry out.

Stability and Reactivity

The undamaged product is stable up to 60ºC.

Toxicological Information

Sulphuric Acid:	LD50 2140mg/kg oral, rat LC50 0.51 mg/L inh rate
Lead compounds:	No specific data

Ecological Information

Sulphuric Acid:	Toxic to fish and algae. Concentrations of 100% sulphuric acid greater than 1.2mg/L may be lethal to fish. Lowering pH below about 5 would induce fatalities in aquatic life.
Lead compounds:	No specific data.

Disposal Information

UNDAMAGED & DAMAGED BATTERIES	Store in impervious inert container and send to smelter for recycling. Must be treated as special waste, therefore contact supplier for assistance.
ABSORBED SPILLED ELECTROLYTE	Place in sealed inert container. Treat as special waste. Contact supplier for assistance.

Transport Information

VRLA batteries, supplied by Yuasa Battery Sales (UK) Ltd are exempt from requirements of:

Dangerous Goods Regulations, 30th Ed., effective from 01.01.96, because they meet ICAO Special Provision A67 as Class 8., Group111, UN No.2800, Batteries, wet, non-spillable, electric storage.

International Maritime Dangerous Goods (IMDG) Code Amendment 27-94, which incorporates the ICAO special Provision A67, for any special conditions. Other relevant general conditions apply.

European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR).

Regulatory Information

Batteries supplied by Yuasa Battery Sales (UK) Ltd are subject to The Batteries and Accumulators (containing Dangerous Substances) Regulations 1994 and are marked in accordance with the requirements of Regulation 4.

Other Information

To ensure safe use of VRLA batteries by Yuasa Battery Sales (UK) Ltd, the following precaution must be observed:

Never install batteries in a gas-tight enclosure as gases may be generated during use.

Batteries must be charged on a voltage-regulated charging system and adequate ventilation provided to avoid the build-up of ignitable gases. Contact your YUASA battery supplier for advice.

Never short-circuit battery terminals as sparks and arcs produced can injure personnel and are a fire hazard.

Do not charge batteries above +50ºC, or discharge or store above +60ºC.

Under extreme conditions of charging equipment malfunctions and/or battery failure, high voltage and high temperature conditions may occur causing the evolution of Hydrogen Sulphide (H_2S) gas, which is toxic. If detected by its odour of rotten eggs (at extremely low concentrations), switch off the charging equipment, evacuate all personnel from the area and ventilate well. Seek advice before attempting to re-start charging.

MATILDA PRODUCTS
LIMITED

Appendix C: Electrical Cabling Guidelines

Electrical Cable Installation

Cable Gate installations typically require two types of electrical cable to be used. Power cable is used to supply power to and from the gate while signal cable is used to control gate operation. The selection of cable is a function of cable run length and the amount of current flowing through the cable.

Power Cable

WARNING

Note! The term "power cable" in this document refers to a cable carrying power in it's low voltage form, i.e. 24VAC or solar panel voltages. Under no circumstances should 240V mains voltages be run into the Cable Gate post.

The following table shows maximum recommended cable run, length versus cable size for Power cable. Note that Altronics part numbers have been included for ready reference should this prove helpful. However, this inclusion is not intended to be a specific endorsement of Altronics as a preferred supplier of cable for gate installations.

Cable length (meters)	Nominal current rating (Amps)	Approx. Size in AWG	Size in mm2	Altronics Part #
0 to 50	5 Amp	20	0.52	W2110 (200m reel)
50 to 100	7.5 Amp	18	0.82	W2122 (200m reel)
100 to 150	10 Amp	17	1.0	W2136 (100m reel)
100 to 200	15 Amp	15	1.6	Not Available

It is recommended that colour-coded figure 8 cable be used for power installations. This cable is multi-stranded and can be purchased for low cost.

Signal Cable

The signal cable carries very little current and should therefore not be overly affected by cable run length. A multi-core flex such as that used in security alarm installations is preferred.

Signal cable lengths should not be run longer than 500 meters. Typical single conductor size should be 7 strands of 0.2mm or 24 AWG

Often installations will involve using the "gate locked outputs" to drive low current lights, buzzers or access control systems. Where this current is less than 20 mA then Signal cable can be substituted for power cable.

Number conductors	Nominal current rating	Approx Size in AWG	Size in mm2	Altronics Part #
4 core	2.2 Amp	24	0.22	W2356 (200m reel)
6 core	2.2 Amp	24	0.22	W2360 (100m reel)

Typical 4-conductor installation

Conductor	Signal	Notes
Red	Up	Pull to ground input (20 mA)
Green	Down	Pull to ground input (20 mA)
Yellow	Clear Faults	Pull to ground input (20 mA)
Black	Ground	Pull to ground input (20 mA)

Typical 6-conductor installation

If gate locked outputs are used to light low current bulbs then access control power cable must be run as well to provide 12V power.

Conductor	Signal	Notes
Red	Up	Pull to ground input (20 mA)
Green	Down	Pull to ground input (20 mA)
Yellow	Clear Faults	Pull to ground input (20 mA)
Black	Ground	Pull to ground input (20 mA)
Blue	Gate Locked 0	Pull to ground output driver (100 mA for > 100 m)
White	Gate Locked 1	Pull to ground output driver (100 mA for > 100 m)

Appendix D: Cable Gate Specifications

Cable Gate Specifications

The Cable Gate has the following mechanical, installation, and electrical specifications:

Mechanical Specifications:

Master Post:

Material:	250 x 150 x 5mm thick steel RHS
Height:	840mm (overall)
Weight:	58 kg (including Main Operating Module and Batteries)
Base Plate:	350 x 350 x 10mm thick steel plate
Treatment:	Heavy zinc plated, inside and out and powder coated
Colour:	Standard - brilliant white
	Optional – other colours from Colourbond® range

Passive Post:

Material:	As per Master Post
Height:	840mm (overall)
Weight:	38 kg (including Counterweight Bar)
Base Plate:	As per Master Post
Treatment:	As per Master Post
Colour:	As per master post

Main Cable:

Material:	Grade 304 Stainless Steel, 7/19 Lay, 8mm diameter

Drive System:

Motor:	Heavy duty 24-Volt DC, 9 Nm Torque, Sealed Gearbox
Electromagnetic Clutch:	24-Volt DC, 20 Nm maximum torque, Sealed Construction

Operating Specifications:

Opening Time:	Typically 0.5 sec
Closing Time:	Typically 8 sec
Maximum Open Time:	65 secs maximum, 15 secs by default (User Defined)
Safety Closing Time:	65 secs maximum, 2 Seconds by default (User Defined)

Installation Specifications:

Allowable Post Centre Distance:	4.0 metres to 8.0 metres
Allowable Footing Height Difference:	20 mm per metre of post centre distance (See Section 1.4.1)
Maximum allowable installation angle:	3 Degrees (See Section 1.4.2)
Maximum Allowable Operating Temp.:	50 Deg. C
Minimum Allowable Operating Temp.:	-10 Deg. C

Electrical and Control System Specifications:

General:

Gate Control System:	16-Bit microcomputer based control system

Electrical Specifications:

Primary Power Source:	2 x 7Ah 12v rechargeable SLA Battery (Century PS1270)
Maximum Operating Current Draw:	10 Amps at 24-Volts
"Stand-by" Current Draw:	45 mA (no Access Control Systems Fitted)
Battery Charge Current (Mains Variant):	500 mA
Allowable Battery Voltage Range:	16-32 Volts (Nominally 27.6 Volts)
Battery Charging System:	Integrated into the gate control system, Current Limited.
AC Plug Pack:	Batteries float charged from 24-Volt AC Plug Pack, 1 Amp.
Solar Panel Charging (Optional):	21 W 12-Volt Nominal Solar Panel (UniSolar™ US-21)
Max. Beacon Current Draw:	500 mA

Control System Specifications:

Access Control Accessory Voltage:	12-Volts DC nominal
Access Control Max. Current Draw:	1 Amp
Maximum Gate Signal Cable Run:	500 Metres
Available Control Inputs:	Safety, road loop, down, up
Number of Configurable Outputs:	2 Channels (See the *Cable Gate Installation Manual*)

Appendix E: Accessories and Spare Parts

Contact your distributor for information on the access control devices and optional accessories depicted in the following pictures and tables.

 ***Key Fob***	 ***Proximity Card***	 ***Key Pad***
 ***Intercom***	 ***Road Loop***	 ***7-Day Timer***
 ***Office Box***		

Figure E1: Access Control Options

- Pole Mounted Traffic Light (P/N: 99-81-39)
- Master Post Beacon Cap Kit (P/N: 99-81-29)

Combined...

- Post mounted solar pole kit (P/N: 99-81-40)
- Post mounted pole & stop sign (P/N: 99-81-38)

- Solar Panel standalone pole (P/N: 99-81-33)

- Reflective Cable Flags (P/N: 99-81-36)
- 2 way, yellow, raised, glass reflective road markers (P/N: 90-80-03)

Figure E2: Optional Accessories

Table E1: Accessories Part Numbers

Description	Part Number
SOLAR POWER EQUIPMENT:	
Solar Panel 21 Watt	94-22-01
Solar Panel mounting pole & bracket, fixed sun setting	99-81-33
Solar Panel mounting bracket, adjustable sun setting	99-81-34
Bolt Cage 20 mm c/w securing nuts & washers	13-65-00
Weatherproof lockable enclosure, 300 x 250 x 150	91-31-08
Post Mounted Solar Pole Kit, adjustable sun setting*	99-81-40
* **ONLY** suits East-West gate installations	
VISIBILITY AIDS:	
Post Mounted Pole Kit & Traffic Light	99-81-39
Post Mounted Pole Kit & STOP sign (single sided)	99-81-38
Master Post Beacon Cap Kit	99-81-29
Cable Gate Reflective Flag	99-81-36
Hot tape, yellow reflective road striping - 9m roll	90-80-05
2 way, yellow, raised, glass reflective Road Markers	90-80-03
Road Marker adhesive heat pads	90-20-03
OTHER ACCESSORIES:	
Sheathing Assembly - Heavy Duty	99-81-35
Weatherproof lockable enclosure, 300 x 250 x 150	91-31-08
Timer, 7 day	94-64-16
Post mounted pole kit, 65 x 35 section (for your signage)	99-81-37
VEHICLE DETECTION ROAD LOOP:	
Road loop Kit	99-81-26
Road loop Controller, (does not include Base)	94-64-12
RADIO REMOTE KEY FOB:	
Transmitter Key Fob	94-64-04
Transmitter Batteries	94-21-05
Plug-in Receiver Kit (340 keys)	99-81-25
Hand Held Programmer	94-64-05
Hand Held Programmer Chips	94-64-03
PROXIMITY CARD:	
"IntelliProx" Smart Module and Microstar Reader	94-64-08
Smart Module (processor)	94-64-06
Microstar Reader	94-64-07
Hand Held Remote Programmer	94-64-09
Proximity Cards	94-64-10
Mounting Post, 1.3 m High	13-90-00
Mounting Post, 2.1 m High - Truck Height	13-90-01
Bolt Cage 12 mm c/w securing nuts & washers	13-66-00

Description	Part Number
ELECTRONIC KEYPAD:	
Electronic key pad (non illuminated)	94-64-17
Electronic key pad (illuminated)	94-64-18
Mounting Post, 1.3 m High	13-90-00
Mounting Post, 2.1 m High - Truck Height	13-90-01
Bolt Cage 12 mm c/w securing nuts & washers	13-66-00
INTERCOM SYSTEM:	
3 Station Intercom + 2 Speakers	99-81-27
1 Station Intercom + 1 Speaker	99-81-28
Mounting post-1 Station, 1300 x 100 x 100mm	99-81-31
Mounting post-3 Station, 2100 x 100 x 100mm	99-81-30
Bolt Cage 12 mm c/w securing nuts & washers	13-66-00
OFFICE BOX CONTROL:	
Office Box, (Down, Auto Mode Switch)	13-01-03

Table E2: Installation Equipment and Spare Parts Part Numbers

Description	Part Number
INSTALLATION EQUIPMENT:	
Bolt Cage 20 mm c/w nuts & washers	13-65-00
Bolt Cage Setting-Float Board	90-40-03
Security Nut 20 mm - Shear	13-65-13
Chemical Stud Kit, 16 mm, inc 8 studs, adhesive, spacers	99-81-41
Chemical Anchor Adhesive Applicator Gun	90-40-02
Service Tool Kit	90-40-03
Power Cable, 100m roll	94-74-04
Signal Cable, 200m roll	94-74-06
PE Beam Reflector (double panel)	90-80-01
CONSUMABLE SPARES:	
Main Cable Assembly	13-41-00
Sheathing Assembly - Normal Duty	13-42-00
Sheathing Assembly - Heavy Duty	99-81-35
Cable Gate Reflective Flag	99-81-36
Pull in Cable - Grubscrew Type	13-17-00
Pull in Cable - Ball to Ball	13-43-00
12v, 7ah, SLA Rechargeable Battery (2 per gate)	94-21-01
Electrical Plug Pack - 24v, 1amp	94-23-01