

# FLUSH MOUNT PROLINE

INSTALLATION MANUAL V2.3

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## 1.0 Introduction

### 1.1 Short Description of the system

Schletter Australia offers a wide array of solutions for flush mount photovoltaic (PV) applications suitable for nearly any environmental condition. The solar mounting systems are designed for strength and ease of installation using high quality products to meet or exceed applicable local and international standards.

The system consists of fasteners securing Proline rails which support PV modules. The pre-assembled components, slide in rail joiners without the use of screws and click in module clamps accounts for the industry leading installation times and ease of installation.

The components are made from Aluminium and High-Grade Steel allowing durability in adverse site conditions. The system comes with a 25-year warranty that is compliant with Australian Standards: AS/NZS 1170.2:2021 for wind actions, AS/NZS 1170.1:2002 (R2016) for imposed loadings, and AS/NZS 1170.0:2002 for general principles.

### 1.2 Scope of the Installation Manual

The manual aims to provide information on safety warnings, mounting system setup and components for installation of PV modules in pitched metal roofs.

Section 1 and 2 focuses on introduction and an overall overview of the mounting system. Section 3 and 4 focuses on installation instructions on the appropriate methods for assembling the mounting system.

Please refer to the installation manual and bill of materials carefully before commencing any installation or maintenance work. All necessary information regarding installation and maintenance should be provided. For further questions, please contact Schletter Australia.

The content of this manual should be followed to comply with product warranty.

### 1.3 Appropriate Use/Warnings

The mounting system acts as a support structure for the installation of photovoltaic modules. Any other and/or additional use or incorrect assembly (for example: use of third-party components) or non-observance of tolerance specifications are considered as improper use and exclude any liability of the manufacturer. Any use under conditions other than those assumed in the planning is also considered as improper use and leads to the loss of any liability claims against the manufacturer.

This applies if the system is used under other load, climatic and/or corrosion conditions than originally assumed. Schletter Australia is in no case responsible for damages to the product itself or consequential damages caused by the product which are the result of an inappropriate handling of the product.

Schletter Australia is not responsible for outages or faults resulting from modifications made by the customer or other individuals. There is no entitlement to the availability of previous versions or to the re-fitting of delivered components to the current series status.

## 1.4 Safety Instructions

Read and understand these safety instructions carefully before starting the assembly and keep them safely at hand. Comply with all regional and national valid standards, building regulations and accident prevention regulations.



Break hazard! PV modules may be damaged if stepped on.



Planning, installation and commissioning of the solar power system must only be performed by qualified technical personnel. Improper execution can result in damage to the system and endanger individuals.



Electrical current hazard! Installation and maintenance of the PV modules must only be performed by qualified technical personnel. Observe the safety instructions issued by the PV module manufacturer!



Falling hazard! Working on the roof as well as ascending and descending poses a risk of falling. It is vital to observe accident prevention regulations and use appropriate fall protection equipment. PV mounting systems are not suitable as climbing aids or fall protection.



Injury hazard! Falling objects pose a risk of injury to people. Prior to installation, set up barriers in the hazard area to warn people nearby.



It is the obligation of the operator to ensure that all parts of the mounting instructions are kept within easy reach on the PV-plant for the fitters at any time.



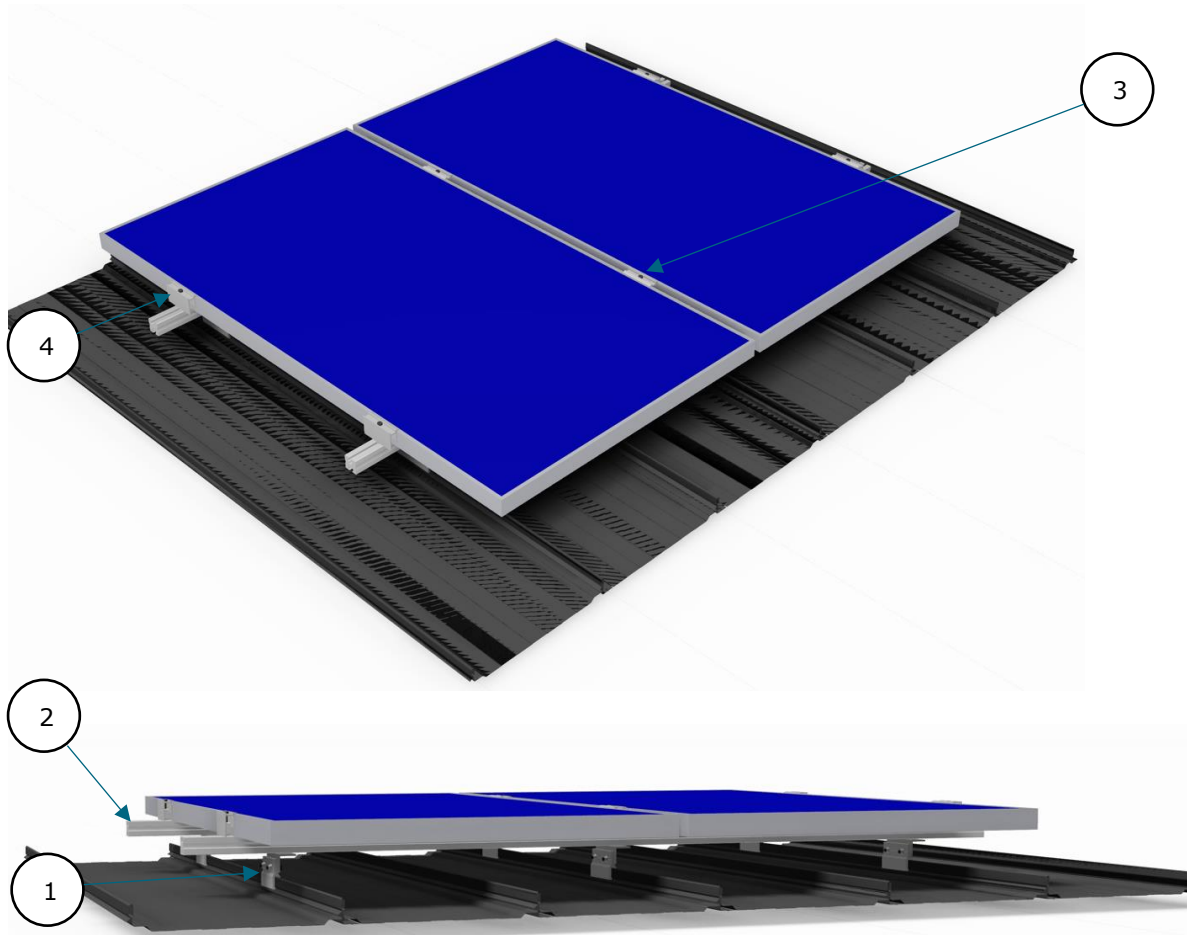
As personnel, only persons who can be expected to carry out their work reliably can be admitted. Persons whose responsiveness is affected, e.g., by narcotics, alcohol, or medication, are NOT permitted.







## 2.0 System Overview

### 2.1 System Setup

An overview of the roof-top parallel system as shown in figure below, subject to changes based on project specific requirements.



#### Key Components

- |  |  |   |
|--|--|---|
|  Fasteners  |  PRO Line Rails |  Middle Clamps |
|  End Clamps |  |   |

#### Accessories

- Rail Connector
- Rail Caps
- Cable Clips
- Earth Lugs



## 2.2 Components Details

ITEM CODE	ITEM DESCRIPTION	PU	IMAGE	
120020-04400	Rail Pro35 4400mm	200		RAILS
120020-94400	Rail Pro35 4400mm - Black	200		
120021-04400	Rail Pro50 4400mm	150		
100001-002	Roof Hook Universal Proline	24		ROOF HOOKS
108000-000	Roof Hook Standard Proline	24		
119026-102	Rapid2+ Pro SML	168		TIN - DIRECT TO PURLIN
119026-902	Rapid2+ Pro SML Black	168		
112012-117	KlipLok Classic EMU	66		KLIPLOCK CLAMPS
112012-127	KlipLok High Strength EMU	66		



131020-001	Mid Clamp 30-47mm Proline	100	
131020-000	End Clamp 30-47mm Proline	50	
131020-901	Mid Clamp 30-47mm Proline Black	100	
131020-900	End Clamp 30-47mm Proline Black	50	

MODULE CLAMPS

900000-080	Universal Screw, Purlin	250	
900000-360	Screw, Direct to Sheet	500	
129065-009	Module Cable Clip	100	
129065-001	Rail Cable Clip	100	
129200-010	Plastic End Cap Proline	100	
129200-910	Plastic End Cap Proline Black	100	
135003-002P	Earthing Clamp Proline	100	
135004-002P	Earthing Shim Proline	100	
149120-004P	Micro/Optimiser Kit Proline	100	

ACCESSORIES





### 3.0 Installation Tools



**Tape Measure**



**Chalk Line**



**Marker**



**Pliers**



**Angle Grinder**



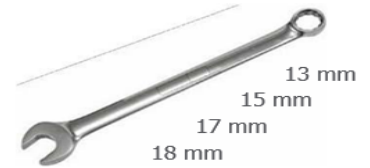
**Carpenter's Square**



**Rubber Mallet**



**Torque Wrench**



**Wrench**



**Rechargeable Power Drill**



**Torx® bit (TX 40)**



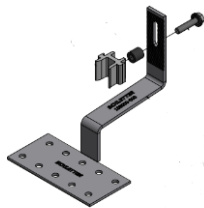
## 4.0 Mounting Instructions

### 4.1 Mount Fasteners

#### 4.1.1 Roof Hooks – Tile Roofs

##### Choice of Roof Hook

The choice of roof hook proline generally depends on the height and length of the horizontal arm of the bracket from the rafter fixing point. Proline roof hook ranges as follows:



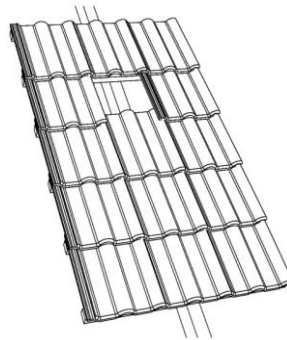
Standard Roof Hook Proline



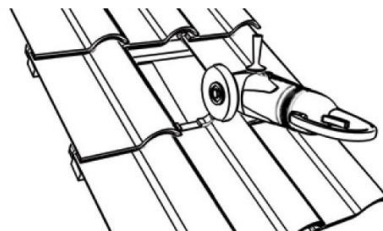
Universal Roof Hook Proline

##### Position Roof Hook

- I. Select the mounting position along the existing rafters. Remove the roof tile.



- II. Grind the bottom tile, if necessary, to remove any raised edges, that allow the roof hook to be correctly oriented maintaining a minimum distance between hook and bottom tile. Use an angle grinder with a diamond wheel for this.



Only remove the raised edge to the extent that the minimum distance between hook and bottom tile is maintained. This is recommended to be 5mm to account for hook elasticity under load conditions.

## Fix Roof Hook to Substructure

- I. Screw on the base plate of the roof hooks using 2 of 6.2mm x 80mm, with minimum 36mm embedment into the wooden rafters. The base plate should have one screw in the upper row of holes and another in the bottom.

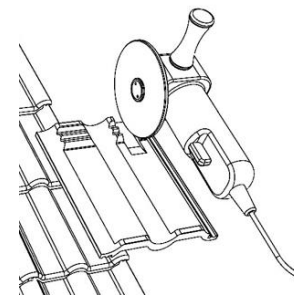


When ordering the roof hook, make sure the height of the horizontal arm of the bracket has been chosen correctly in relation to the batten height and tile thickness. This is to ensure the minimum distance of 5mm mentioned earlier is achieved.

If the necessary height cannot be reached, use a spacer. The height packed by the spacer is limited by the length of screws thread available after 36mm minimum embedment into the rafters.

## Cover Tiles

- I. Turn over the removed tile. Use an angle grinder with a diamond wheel to grind the raised edge section which is in line with the roof hook arm. Do not grind any deeper.
- II. Cover the tiles. Tiles should ultimately lie down as their natural ingress, to prevent any leakage of rainwater into the roof structure.



## 4.1.2 Rapid<sup>2+</sup> Pro SML – Trapezoidal and Corrugated Roofs

I. The Rapid<sup>2+</sup> Pro SMLs are positioned on the roof ridges, using string lines for alignment.



Fig 4.1.2A: Rapid<sup>2+</sup> Pro SMLs aligned on top of roof

II. Fix the fastener to the roof purlin via the supplied self-drilling universal screws, 6.2mm x 80mm. Ensure that the screw drilling line of axis is perpendicular to the roofing sheet.

The universal screw works with both timber and steel substructures if the screw embedment requirements are met:

Substructure	Embedment (mm)
F7 Pine Softwood	36mm
1.5 BMT Steel	Complete Penetration - For steel purlins > 1.9mm, pre-drilled hole of 4.5mm in diameter is recommended

The fasteners must be securely connected to the substructure without deforming the roof ridge.

The tightening torque must be limited (15Nm) to prevent this deformation and to ensure thermal expansion is not impeded.

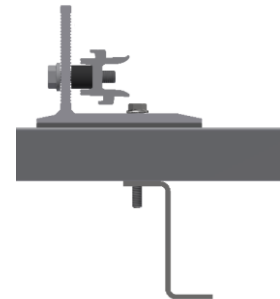


Fig 4.1.2B: Rapid<sup>2+</sup> Pro SMLs being attached using universal screw

### Schletter Advantage

- In comparison to other mounting systems, this fastener has the advantage that it uses a long base to distribute further the applied load on the roof sheet. This minimizes the stress on the roof sheet and guarantees optimized stability. The fastener can be used for both metal and timber substructures.
- The height adjustable multi-adaptor allows for rail adjustment across uneven roofs. It also helps to achieve good clearance between panels and roof sheets for heat dissipation.
- The UV resistant EPDM rubber inlay on the bottom of the fastener guarantees water tightness.

## 4.1.3 Standing Seam Clamp – Standing Seam and Kliplok Roofs

### Choice of Seam Clamps

The choice of seam clamp depends on the correct identification of the Kliplok roofing sheet at site. Based on the roofing sheet the following clamps can be used:



Kliplok Classic



Kliplok High Strength

### Connect Standing Seam Clamp

- I. Once the appropriate seam clamp is selected, position the seam clamps on the roof as per the rail installation plan.
- II. Secure the seam clamps to the roof by tightening the single M8 bolt (14Nm), as shown in Fig 4.1.3A.

Please limit tightening torque to recommended settings to avoid deformation of the standing seams and to ensure that thermal expansion of the metal sheets is not impeded.

Roofing sheet manufacturers recommend to avoid fixing fasteners on lapjoints.



Fig 4.1.3A: Securing seam clamp to roofing sheet

### Schletter Advantage

- The single bolt tightening combined with pre-assembled EMU adaptor makes the system fast and easy to install.
- The seam clamps can be adjusted for either Lysaght Classic or High Strength roof applications.
- The seam clamps come pre-assembled fit for the roofing sheet at site: Classic or High-Strength.
- The multi adaptor can be easily adjusted to run rails parallel and perpendicular to the standing seam of the roofing sheet, as shown below:



Multi adapter orientation for running rail perpendicular to standing seam



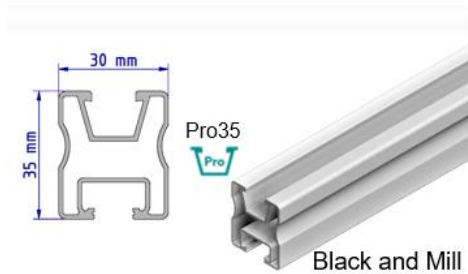
Multi adapter orientation for running rail parallel to standing seam

## 4.2 Rail Installation

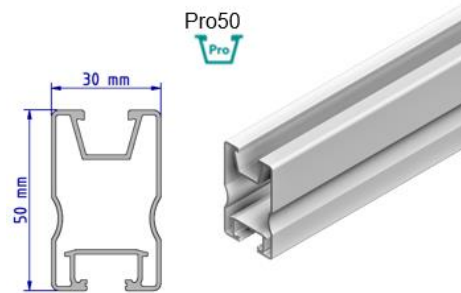
### 4.2.1 Choice of rail

The Proline rails come in standard sizes of 4400mm.

Based on required spans and site conditions, the rails come in the following dimensions:



**Pro35**



**Pro50**

### 4.2.2 Add Rail Splice

- I. To increase the array length, rails can be spliced together using rail joiners [Fig 4.2.1A].
- II. Insert half of internal splice into first rail, push until it reaches midpoint where the stop tab is located under the splice [Fig 4.2.2B].
- III. Add second rail to opposite end until it fully reaches the middle stop plate. This should lock both rails together forming a longer array [Fig 4.2.2C].

No screws are required, saving installation time.

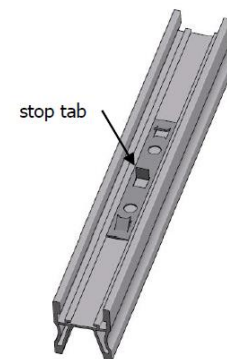



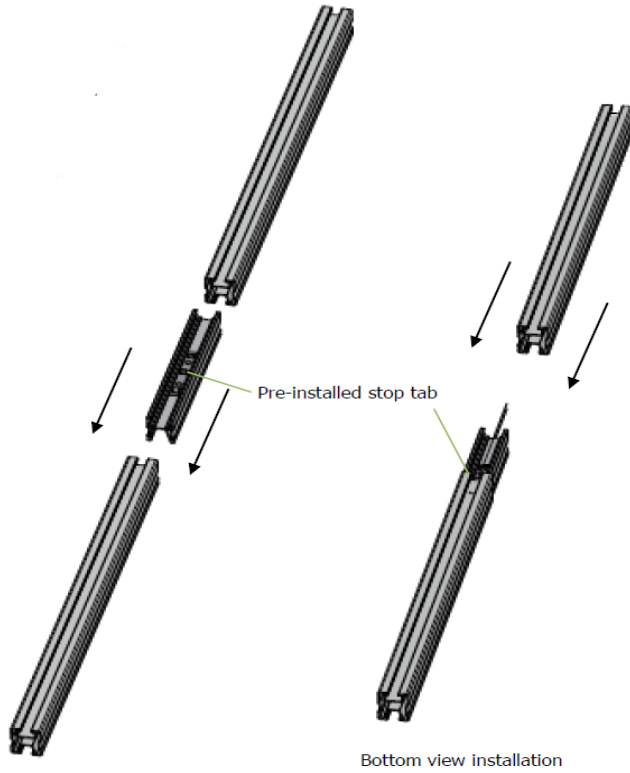


Fig 4.2.1A: Rail Joiner

 It is recommended to limit array lengths to a maximum of 20m, due to thermal expansion limitations, for fixing to substructure.

 However, this should be limited to 10m for fixing in roofing sheets (for example: Kliplok clamps).

 The rail joiners are for single use application only.



*Fig 4.2.2B: Joiner connecting Proline rails*



*Fig 4.2.2C: Rails secured together via Proline joiner*



## 4.2.3 Add Rail to Fastener

- I. Position the bottom (rectangular channel) of Proline rails on top of the multi adaptor hook fit for Proline rails, as shows in Fig 4.2.3A.
- II. Push down the length of rail spliced together on the EMU Proline hooks. so that the hook clips into the bottom channel of the rail.

### **Notes:**

Please note that, the multi adaptor hook should be oriented as shown in Fig 4.2.3A i.e. the hook that is closer to the wall, is fit for Proline rails.

The multi adaptor comes pre-assembled with Rapid<sup>2+</sup> Pro SML, roof hooks and seam clamps. This means one fastening method can be used across all the flush mount fasteners.

If necessary, adjust the rails to the desired height to compensate for roof unevenness before tightening the bolt.

- III. Do not tighten until the rail has been positioned to rest correctly on top of the fastener hook, as shown in Fig 4.2.3B.
- IV. Secure by tightening the bolt on the fasteners using recommended torques (14Nm).

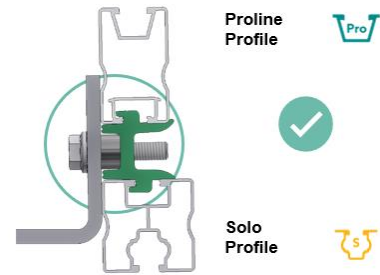


Fig 4.2.3A: Multi Adaptor fixing rail to fastener



Fig 4.2.3B: Rail attachment to fasteners



### 4.3 Module Mounting

#### 4.3.1 Position Modules

I. Position end clamps on rail approximately 20mm from end of rail, do not tighten [Fig 4.3.1A].

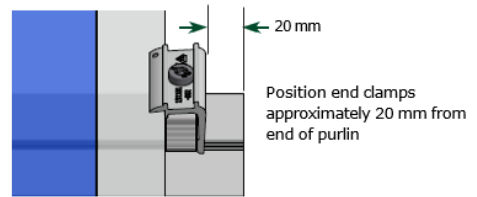


Fig 4.3.1A: Positioning end clamp

II. Position first module and secure using pre-positioned end clamps, do not tighten [Fig 4.3.1B].

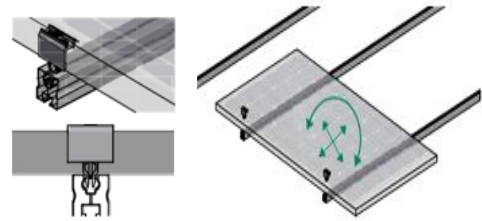


Fig 4.3.1B Positioning first module

III. Attach middle clamps to rail on the exposed side of the first module [Fig 4.3.1C].

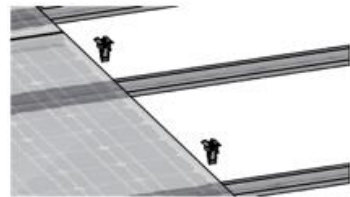


Fig 4.3.1C Positioning middle clamps

IV. Place second module next to first module and secure using middle clamp, do not tighten [Fig 4.3.1D].

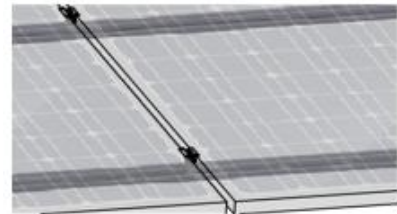


Fig 4.3.1D Positioning second module

V. Repeat until end of row.



### 4.3.2 Secure Modules

I. Verify that the module clamp is fully engaged on the rail and 1.5 mm maximum middle clamp to module offset is aligned with the module frame [Fig 4.3.2A].

II. Secure all clamps [middle and end] to recommended torque settings [15Nm].

When mounting modules, please observe the clamping points specified by the module manufacturers.

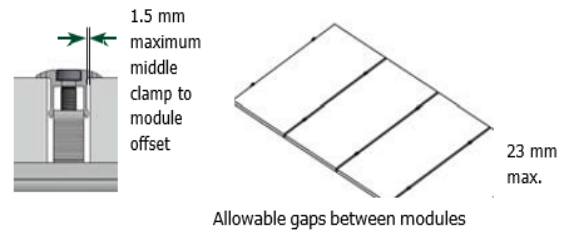


Fig 4.3.2A: Securing middle clamp and PV modules

III. Please observe 30mm gap between module rows for better heat dissipation [Fig 4.3.2B].

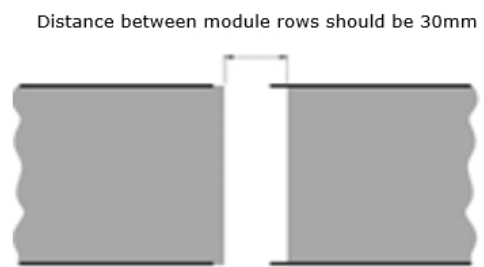


Fig 4.3.2B: Gap between PV Module rows

## 4.4 Accessories

### 4.4.1 Micro/Optimiser Kit Proline

The optimiser kits enable mounting of optimisers and micro-inverters on top of the Proline Rails.

- I. Loosely connect the bolts and washer to the mounting holes of the micro-inverter.
- II. Slide in or simply insert the hammerhead nut from above.
- III. Secure the bolt using recommended torque settings [14Nm].



### 4.4.2 Earthing Lug

The earthing lug can be used as a potential equalization within the mounting racks.

- I. The lug can be positioned by top entry or sliding in top of the rail [V-channel] using the hammerhead nuts.
- II. Place the earthing wires inside the lug chamber.
- III. Secure the bolt using recommended torque settings [14Nm].
- IV. Clamp distance to the edge: 8-10 mm.
- V. Connection (single/multi-wired): 4-50 mm<sup>2</sup>.



## 4.4.3 Rail Cable Clip

The Proklip-Multi 10 allows quick rail cable clip installation without the use of any nuts and bolts.

- Position the clip (A) of the rail cable clip underneath the bottom (rectangular) channel (B) of the Proline rails.
- Insert cable clip by pushing firmly into the channel, until it snaps in, as shown in Fig 4.4.3A.
- The cables are then run through the retainer and the clip can be closed by pressing it in.

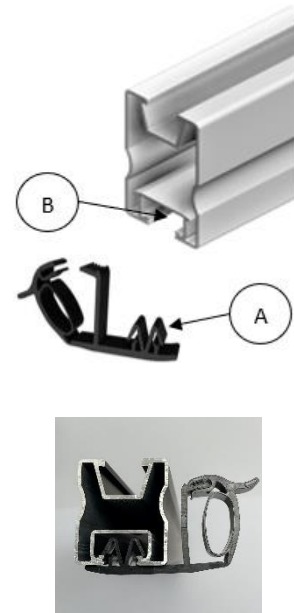


Fig 4.4.3A: Rail cable clip attached to Proline rail



#### 4.5 Torque Specifications and Tolerances

The various bolt sizes of the mounting system and their recommended torques in the mounting system is listed in Table 6.5:

<b>Bolt Size</b>	<b>Recommended Torques</b>
Torx Bolt for RapidPro Module Clamps	15 N-M
M6 and 1/4" Bolt	6 N-M
M8 and 5/16" Bolt	14 N-M
M10 and 3/8" Bolt	30 N-M
M12 and 1/2" Bolt	50 N-M
M16 and 5/8" Bolt	121 N-M
M20 and 3/4" Bolt	244 N-M
<b>Note:</b> Recommended speed for installation of self-drilling 1/4" diameter is 1200-1800 RPMS	

*Table 4.5: Size of bolt and recommended torques*

For project specific system design, please refer to project specific drawings for recommended torque for each size of bolt used in the system and allowable tolerances. In the event of deviation from approved drawings, contact Schletter Australia immediately.

#### 4.6 Maintenance

In general, once correctly assembled, the roof-top systems should operate reliably with minimal maintenance. However, Schletter Australia recommends yearly inspection of system should be conducted to maintain optimal performance. This ensures the system's long-term durability and reliability.

The following best practises and inspection guidelines are advised for roof-top mounting systems:

- I. Prior to installation, it is advisable to store products free from contamination by contact with items that may contain rust, dirt and chemicals. If contamination occurs, affected products have to be cleaned using appropriate methods such as using galvanised zinc spray on affected areas.
- II. Clean any visible contamination from soil, and other particles.  
Further guidelines on this can be found in:

Standards	Material	Country
Standards Association of Australia	Aluminium	Australia
Galvanizers Association of Australia (GAA)	Steel	Australia
Galvanizers Association of New Zealand (GANZ)	Steel	New Zealand

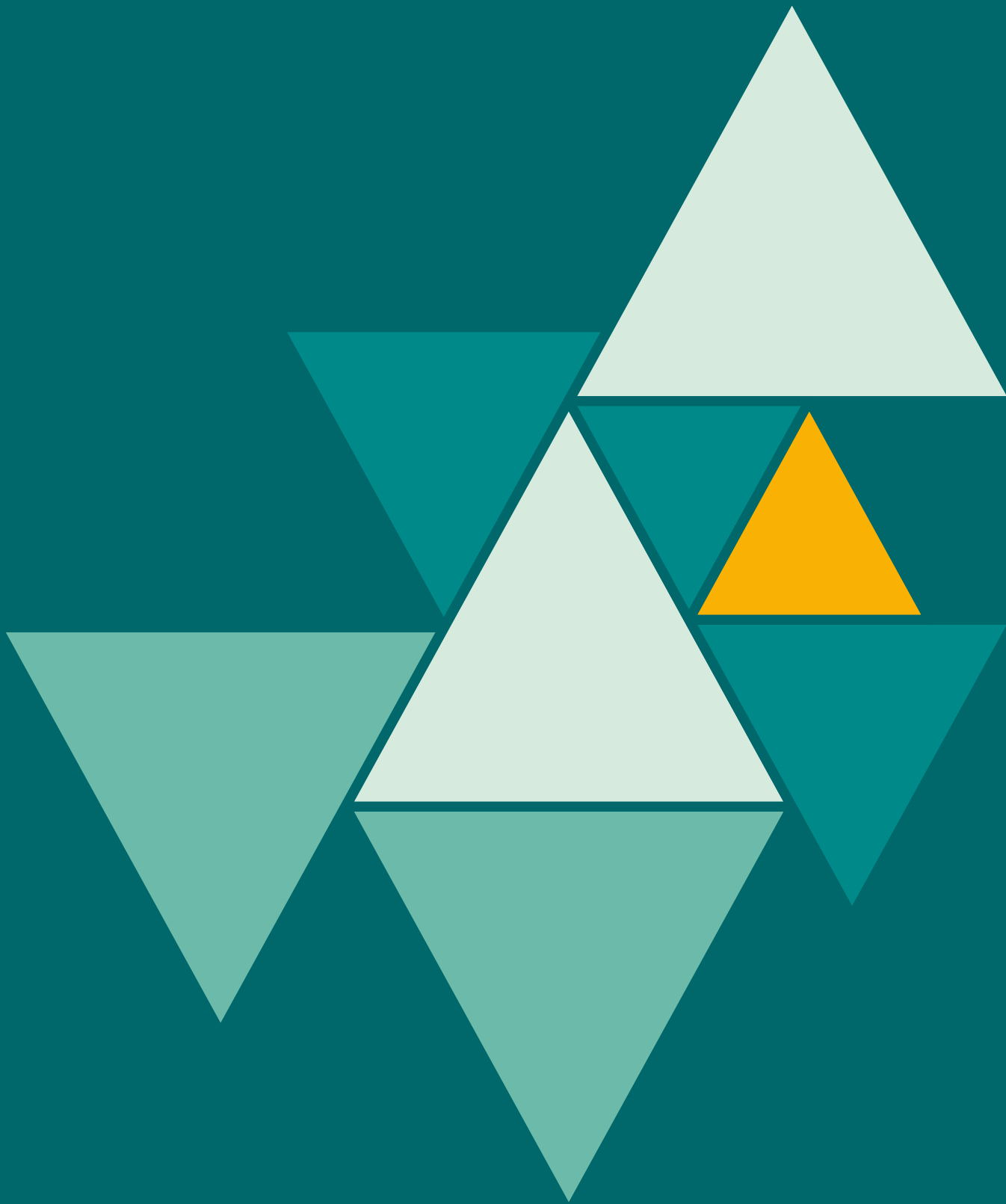
- III. Visually inspect for signs of damage, wear, corrosion, or movement.  
Replace any affected components immediately.



Aluminium components may undergo surface oxidation, forming a thin and hard film of Aluminium oxide which looks like powdery white or dull grey finish. This is standard ageing process for Aluminium and is beneficial for long-term durability of the product. The oxide layer acts as a barrier against atmospheric corrosion.

- IV. Check torque values of fastening bolts in the structure as per recommended torques in section 6.5. The following inspection process can be followed:
  - a) At least 2% of bolted connections must be checked using a calibrated torque wrench. The torque wrench must have a display or be a click type torque wrench.
  - b) Torque wrench should be set at 50% of intended tightening torque. Check is successful if the bolt cannot be loosened.
  - c) If more than 10% of checked bolted connections are loose, a re-check has to be done. The re-check should be increased to 10% of all bolted connections.
  - d) If more than 10% of connections are still loose, all bolted connections must be checked.
  - e) Tighten all non-conforming bolts to specified torques as per section 6.5.
- V. Check for loose wiring.

The maintenance guidelines above apply only to the components of the mounting structure that are manufactured from Schletter. For external components, maintenance should be carried out respective to the relevant manufacturer's guidelines.



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