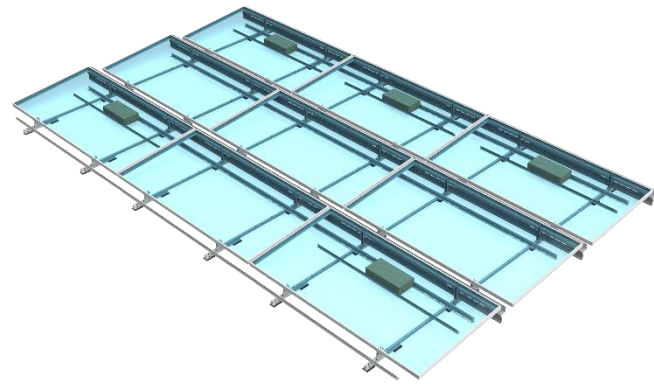




clawFRplus™ 5 Degree Design Specifications, Rules and Guidelines





Specifications: clawFRplus™ 5 Degree

Roof Loading	2.3 psf to 8.0 psf (11.2 kg/m ² to 39.1 kg/m ²) including racking, modules and ballast
Roof Slope	5° max slope (1/12 pitch) in all directions Up to 7° (1.5 / 12 pitch) possible with engineering review
Wavy Roofs	clawFRplus can span up to to 3° in undulation in any two directions This system is not designed to go over roof crickets
Wind Speed	190 mph (306 km/h) – 3 second gust per ASCE 7-16 (150 mph per ASCE 7-05) Higher wind speeds require PanelClaw engineering review
Exposures	ASCE wind exposure categories B, C and D
Seismic Design Category	USGS seismic design category A, B, C, D Seismic zones beyond D can also be evaluated upon request
Maximum Building Height	No Limitations
Roof Material	EPDM, TPO, PVC, Mod Bitumen, Asphalt, Coal Tar, Foam, Concrete, and Gravel Loose gravel and/or river rock must be cleared out from under clawFRplus bases
UL/ANSI 2703-2015 Grounding & Bonding	UL LISTED – Will accommodate max module fuse rating of 40 amps. Typical module fuse rating is ~15 amps
UL/ANSI 2703-2015 Mechanical Load	UL LISTED – Racking components meet electrical and mechanical requirements of standard System load rating is always module dependent (module allowable loads are typically the limiting factor)
UL/ANSI 2703-2015 Fire Listing	System Fire Rating Class A with Type 1, 2, 16, 19, 22, 25, 29, and 30 modules No additional components required for compliance for these module types
Ballast Block Size	Nominal 2" x 8" x 16", 3" x 8" x 16", or 4" x 8" x 16" blocks Actual dimensions: 1 5/8" or 2 5/8" or 3 5/8" x 7 5/8" x 15 5/8" with +/- 1/8" tolerance



Row Spacing and Roof Coverage Ratios: clawFRplus™ 5 Degree

Dimensions shown below vary by module except the Row-Row Gap, which is fixed.

Dynamic AutoCAD building blocks are available for any framed module within the range of dimensions below:

Module Width Range: 997-1157 mm, 1277-1317 mm¹

Module Length Range: 1815-2500 mm

Configuration Name	Row-Row Gap	Example clawFRplus 5 Degree dimensions based on a module width of 1310 mm [51.57 in]				Example clawFRplus 5 Degree dimensions based on a module width of 1130 mm [44.49 in]			
		Tilt Angle [degrees]	Roof Coverage Ratio	Shading Ratio [H:V]	N-S Repeat	Tilt Angle [degrees]	Roof Coverage Ratio	Shading Ratio [H:V]	N-S Repeat
clawFRplus 5Deg-18 cm (7 in)	6.90 in [175 mm]	4.4	89%	1.67	58.0 in [1474 mm]	5.1	87%	1.67	50.9 in [1294 mm]
clawFRplus 5Deg-26 cm (11 in)	10.4 in [264 mm]	4.4	84%	2.54	61.5 in [1563 mm]	5.1	82%	2.55	54.4 in [1384 mm]

Repeat E-W dimension is fixed for every configuration as: Module Length + 0.71 in [18mm]

¹At the time of this document's publication, no modules in the US market are in the width range of 1158 mm – 1276 mm. Contact PanelClaw if you're considering a new module in this range.

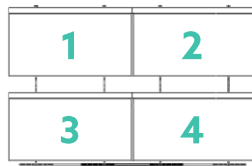
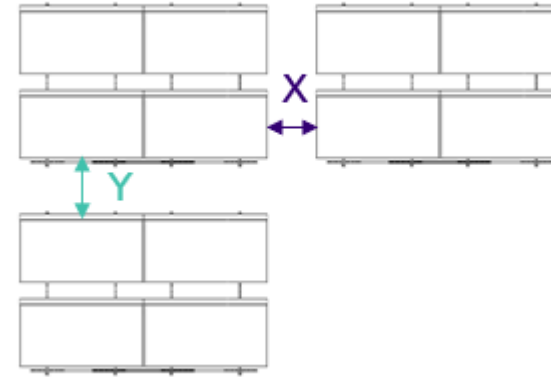


Array Layout Rules: clawFRplus™ 5 Degree

These array layout guidelines were developed to maximize the performance of clawFRplus over its 25+ year lifespan.

Nonconforming arrays may require layout modifications, may not be ballast-able, or may require mechanical attachments.

- ▶ **Minimum setback from roof edges - 4 ft (1.2 m)**
- ▶ **Maximum array row/column length:**
 - ▶ **For Roof Slope > 2 degrees: 80 ft (24.4 m)¹**
 - ▶ **For Roof Slope ≤ 2 degrees: 150 ft (45.7 m)**
- ▶ **Minimum clearance from obstructions²: 6 in (153 mm)**
- ▶ **Minimum module-to-module clearance between sub arrays²:**
 - ▶ **See Table**
- ▶ **Avoid going over existing pipes, lighting rods/cables or vents on the roof**
- ▶ **Minimum array size 2 x 2 modules**



Row Spacing	X, Min. Module-to-Module Clearance	Y, Min. Module-to-Module Clearance
7 in [18 cm]	8 in [203 mm]	15.5 in [394 mm]
11 in [26 cm]	8 in [203 mm]	16.5 in [419 mm]

¹ Adjacent subarrays can be grouped with a minimum module-to-module clearances as long as those groups of subarrays do not exceed 150' x 150' IBC fire code requirements

² Unless otherwise specified in DMPV analysis for unattached designs



Layout Recommendations for Reducing Weight and/or Mechanical Attachment Counts

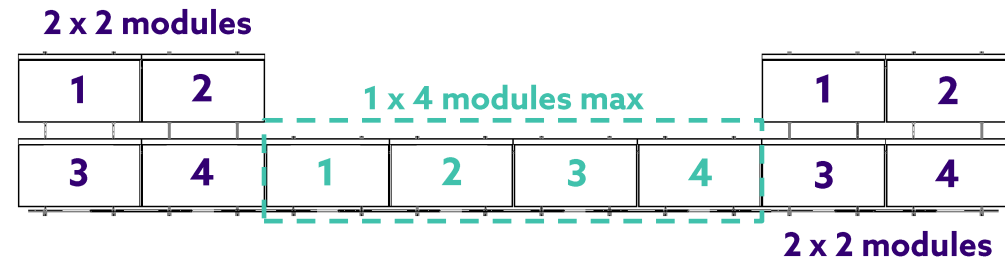
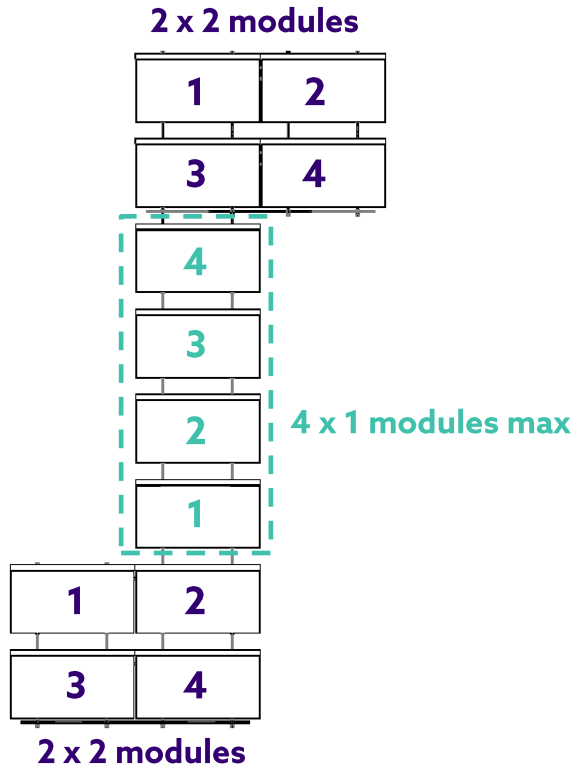


Minimize the Use of Long “Bridges”

Keep the single module wide “bridges” to no more than **1 x 4 modules** or **4 x 1 modules**.

“Bridges” more than 4 single modules long will require additional ballast and/or mechanical attachments.

If “bridge ends” that are at least **2 x 2 modules** on both ends are not present it may result in additional ballast and/or mechanical attachments.



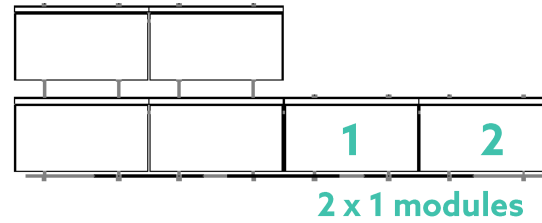
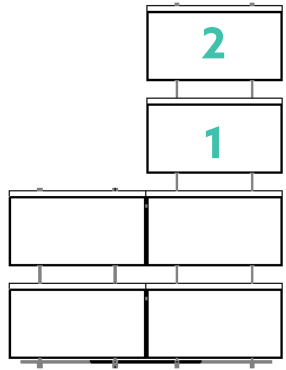


Limit "Peninsulas" to No More Than Two Modules Long

Keep "peninsulas" to no more than **1 x 2 modules** or **2 x 1 modules**.

"Peninsulas" that are more than 2 module long will require additional ballast and/or mechanical attachments.

1 x 2 modules





For Questions or Feedback Contact sales@panelclaw.com or call us at (978) 688-4900
