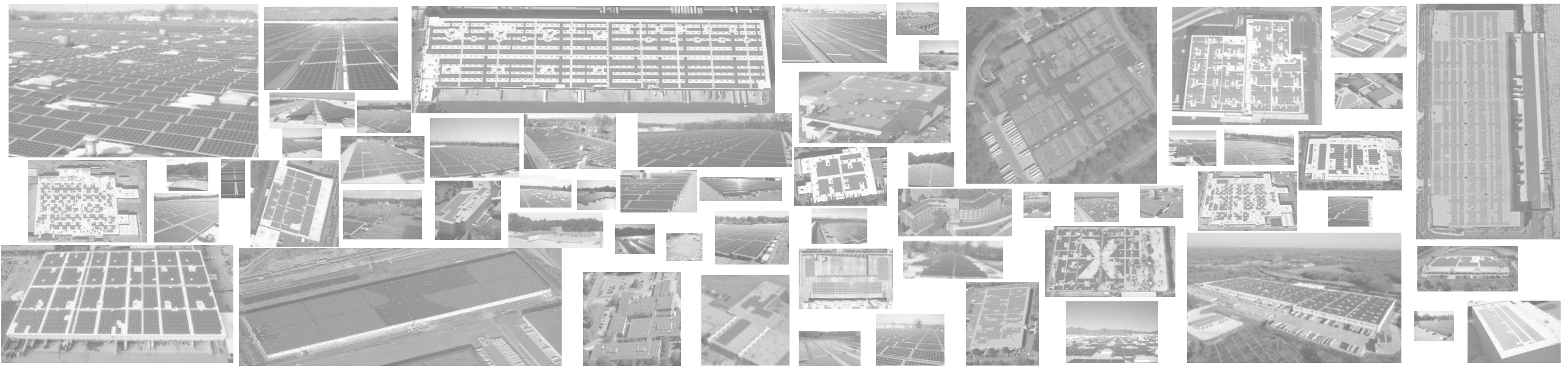

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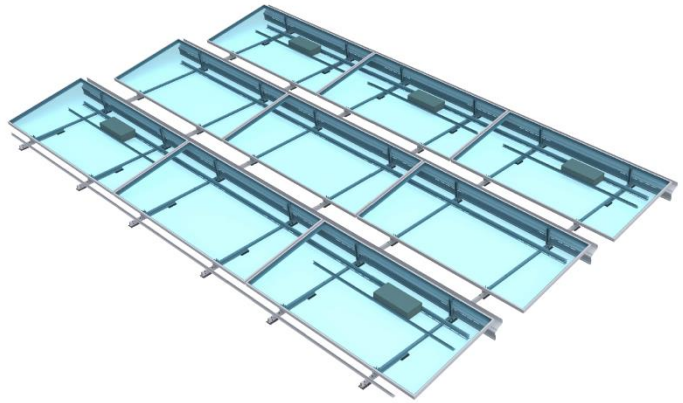
clawFRplus™ 10 Degree Design Specifications, Rules and Guidelines



Specifications: clawFRplus™ 10 Degree

Roof Loading	2 psf to 12 psf (9.75 kg/m^2 to 58.6 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 3° in undulation in any two directions This system is not designed to go over roof cricketing
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™ 10 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: 990-1157 mm, 1277-1317 mm[1]

Module Length Range: 1815-2500 mm

Configuration Name	Row-Row Gap	Example clawFRplus 10 Degree dimensions based on a module width of 1310 mm [51.57 in]				Example clawFRplus 10 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 10Deg-29 cm (11 in)	11.4 in [288 mm]	7.8	83%	1.55	61.9 in [1572 mm]	9.0	80%	1.57	54.9 in [1394 mm]
clawFRplus 10Deg-35 cm (14 in)	13.9 in [354 mm]	7.8	80%	1.92	64.5 in [1638 mm]	9.0	77%	1.94	57.5 in [1460 mm]
clawFRplus 10Deg-44 cm (17 in)	17.4 in [443 mm]	7.8	76%	2.42	68.0 in [1726 mm]	9.0	72%	2.44	61.0 in [1549 mm]

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

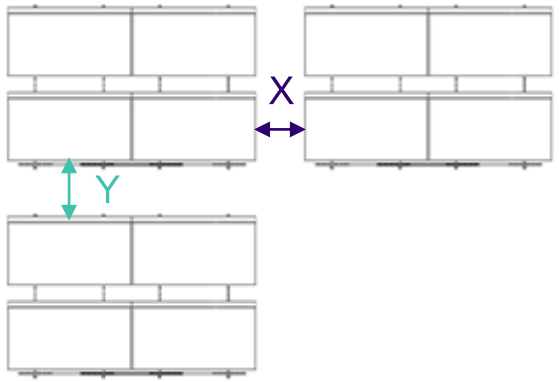
[1] At the time of this document's publication, no modules in the US market are in the width range of 1158 mm – 1276 mm. Contact PanelClaw if you're considering a new module in this range.

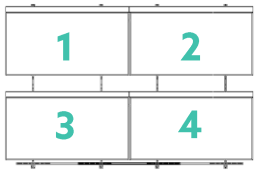
Array Layout Rules: clawFRplus™ 10 Degree

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 obstructions[2]: 6 in (153 mm)**
- **Minimum module-to-module clearance between sub arrays[2]:**
  - **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
11 in [29 cm]	8 in [203 mm]	16.5 in [419 mm]
14 in [35 cm]	8 in [203 mm]	16.5 in [419 mm]
17 in [44 cm]	8 in [203 mm]	20 in [508 mm]

[1] Adjacent subarrays can be grouped with minimum module-to-module clearances as long as the group of subarrays does not exceed 150′ x 150′ IBC fire code requirements

[2] Unless otherwise specified in DMPV analysis for unattached designs

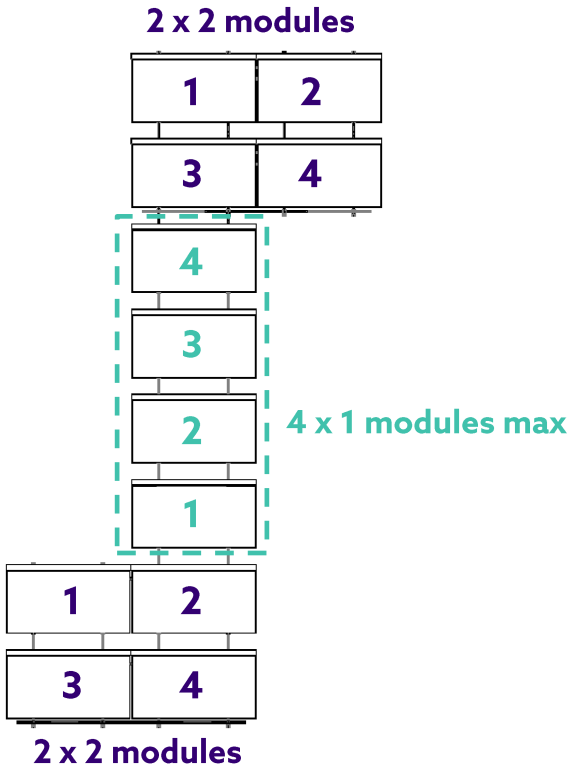
Layout Recommendations for Reducing Weight and/or Mechanical Attachment Counts

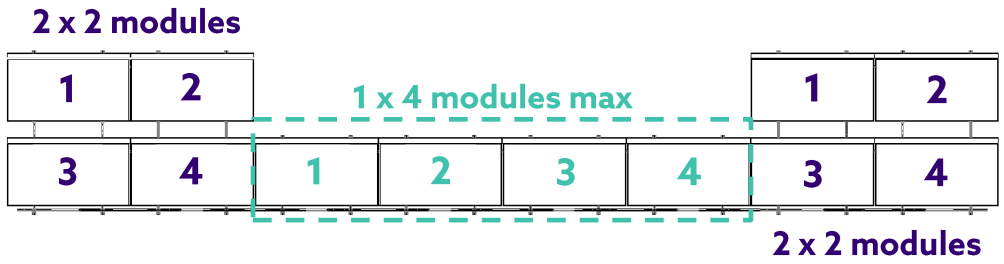
Minimize the Use of Long "Bridges"

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.



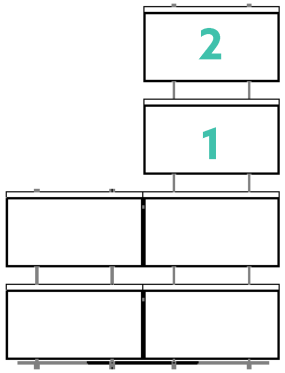


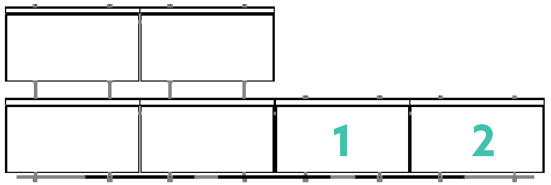
Limit “Peninsulas” to No More Than Two Modules Long

Keep “peninsulas” to no more than 1 x 2 modules or 2 x 1 modules.

“Peninsulas” that are more than 2 modules long will require additional ballast and/or mechanical attachments.

1 x 2 modules





2 x 1 modules

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