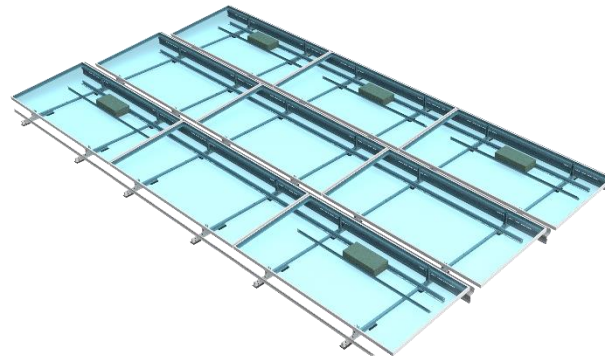


clawFR[®] 5 Degree Design Specifications, Rules and Guidelines





Specifications: clawFR® 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	clawFR can span up to 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 clawFR 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"x16" 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: clawFR® 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: 990-1150 mm, 1270-1310 mm¹

Module Length Range: 1815-2500 mm

Configuration Name	Row-Row Gap	Example clawFR 5 Degree dimensions based on a module width of 1310 mm [51.57 in]				Example clawFR 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
clawFR 5Deg-18 cm (7 in)	6.90 in [175 mm]	3.8	88%	1.99	58.3 in [1481 mm]	4.5	87%	1.99	51.2 in [1301 mm]
clawFR 5Deg-26 cm (11 in)	10.4 in [264 mm]	3.8	83%	3.00	61.8 in [1570 mm]	4.5	81%	3.00	54.7 in [1390 mm]

Repeat E-W dimension is fixed for every configuration as: Module Length + 0.75 in [19mm]

¹At the time of this document's publication, no modules in the US market are in the width range of 1151 mm – 1269 mm. Contact PanelClaw if you're considering a new module in this range.

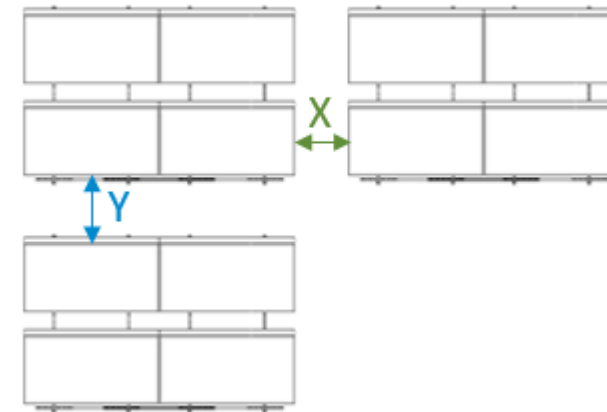


Array Layout Rules: clawFR® 5 Degree

These array layout guidelines were developed to maximize the performance of clawFR 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

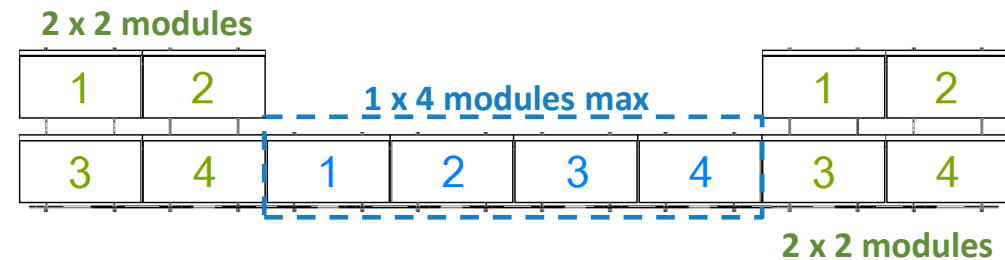
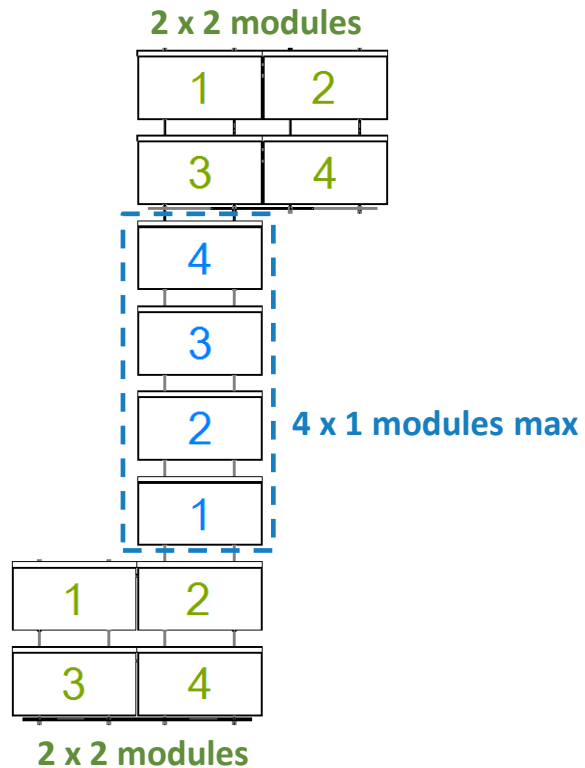


Minimize the Use of Long “Bridges”

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.



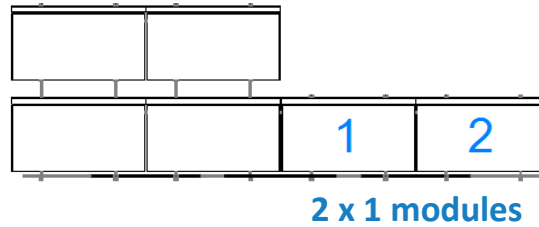
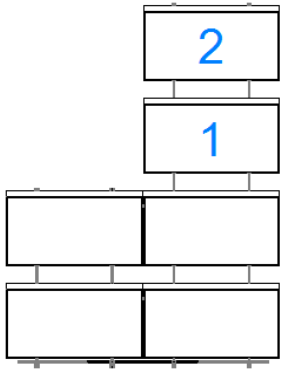


Limit “Peninsulas” to No More Than Two Modules Long

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
