

UM12336

POLYBESS1500V1 user manual

Rev. 1.0 — 19 December 2024

User manual

Document information

Information	Content
Keywords	Polycarbonate support, demonstrator, HVBMS, high-voltage battery management system, RD-BESS1500BUN
Abstract	This user manual aims to help users build their POLYBESS1500V1 HVBMS polycarbonate support. This platform is used for BESS1500BUN HVBMS hardware reference design.



1 Kit content

The polycarbonate structure POLYBESS1500V1 for RD-BESS1500BUN kit contains:

Table 1. POLYBESS1500V1 kit contents

Item number	Description	Qty
800-10077	Polycarbonate structure combo of 93915 for top and bottom	1
800-10075	Top stand for 800-10077 / 93915, polycarbonate	1
800-10076	Bottom stand for 800-10077 / 93915, polycarbonate	1
800-76228	Side part 800-89269, polycarbonate, 95 mm hinge	2
800-76232	Side part 800-89269, polycarbonate, 145 mm support frame	2
800-76229	Side part 800-89269, polycarbonate, 50 mm hinge	2
901-10100	HW accessory, fastener package for 800-10077 / 91651	1
280-78008	Fastener, screw M3-.5X25 FH SS	12
280-76979	Screw, flat, M3 X 12 mm, stainless	2
280-78015	Fastener, standoff 3.2 mm ID X 10 mm round female 7 mm OD ABS	8
280-76566	Fastener, nut M3-.5 HEX SS machined	8
280-76355	Screw M3X6 flat MS SS DIN965A	4
280-78013	Fastener, screw M4-.7X14 socket head SS	10
280-78014	Fastener, screw M4-.7X20 socket head SS	2
280-78017	Fastener, wingnut, M4-.7, SS	2
280-76689	Feet, bumpon clear, W 0.620" X H 0.400"	6
600-77772	Cable tie, nylon,11.5"L,0.190"W,	2

The tools listed below are required to assemble the structure:

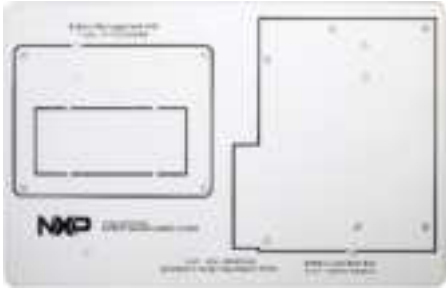
- A Phillips screwdriver
- A 3 mm Allen key
- Pliers
- Cutting pliers

1.1 Content pictures - polycarbonate

Table 2. Polycarbonate structure combo of 93915

800-10077	Polycarbonate structure combo of 93915 for top and bottom	1
800-10075	Top stand for 800-10077 / 93915, polycarbonate	1
800-10076	Bottom stand for 800-10077 / 93915, polycarbonate	1
800-76228	Side part 800-89269, polycarbonate, 95 mm hinge	2
800-76232	Side part 800-89269, polycarbonate, 145 mm support frame	2
800-76229	Side part 800-89269, polycarbonate, 50 mm hinge	2

Table 3. Content pictures

Top plate (800-10075)	Bottom plate (800-10076)
	
Short hinges, 50 mm (800-76229)	Long hinges, 95 mm (800-76228)
	
Supports, 145 mm (800-76232)	
	

1.2 Content pictures - HW accessory

Table 4. Hardware accessory

901-10100	HW accessory, fastener package for 800-10077 / 91651	1
280-78008	Fastener, screw M3-.5X25 FH SS	12
280-76979	Screw, flat, M3 X 12MM, stainless	2
280-78015	Fastener, standoff, 3.2 mm ID X10 mm round female 7 mm OD ABS	8
280-76566	Fastener, nut M3-.5 hex SS machined	8
280-76355	Screw M3X6 flat MS SS DIN965A	4
280-78013	Fastener, screw M4-.7X14 socket head SS	10
280-78014	Fastener, screw M4-.7X20 socket head SS	2
280-78017	Fastener, wingnut, M4-.7, SS	2
280-76689	Feet, bumpon clear, W 0.620" X H 0.400"	6
600-77772	Cable tie, nylon ,11.5" L,0.190" W,	2



2 Guidelines for the construction of the base structure

This section details the steps for the construction of the base structure.

2.1 Required components

For this part of the construction, the required components are:

Table 5. Required components

Item number	Description	Qty
800-10077	Polycarbonate structure combo of 93915 for top and bottom	1
800-10075	Top stand for 800-10077 / 93915, polycarbonate	1
800-10076	Bottom stand for 800-10077 / 93915, polycarbonate	1
800-76228	Side part 800-89269, polycarbonate, 95 mm hinge	2
800-76232	Side part 800-89269, polycarbonate, 145 mm support frame	2
800-76229	Side part 800-89269, polycarbonate, 50 mm hinge	2
901-10100	HW accessory, fastener package for 800-10077 / 91651	1
280-78013	Fastener, screw M4-.7X14 socket head SS	10
280-78014	Fastener, screw M4-.7X20 socket head SS	2
280-78017	Fastener, wingnut, M4-.7, SS	2
280-76689	Feet, bumpon clear, W 0.620" X H 0.400"	6

2.2 Adding hinges and supports to the top plate

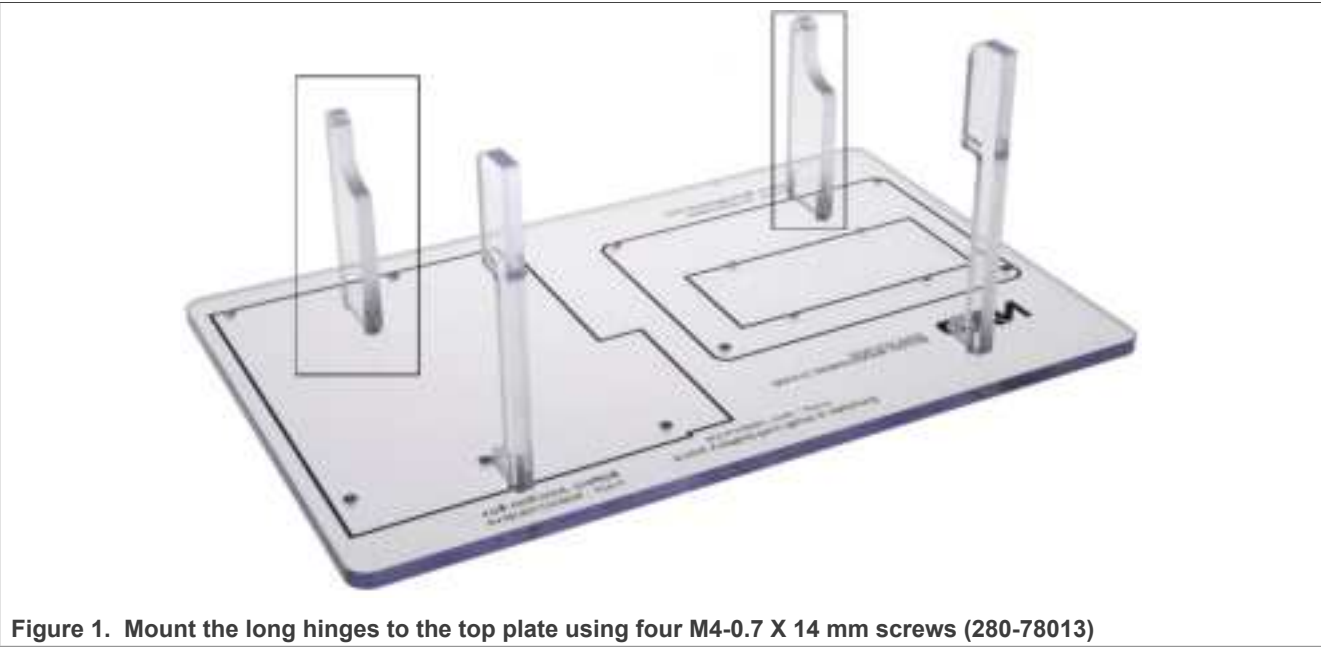


Figure 1. Mount the long hinges to the top plate using four M4-0.7 X 14 mm screws (280-78013)

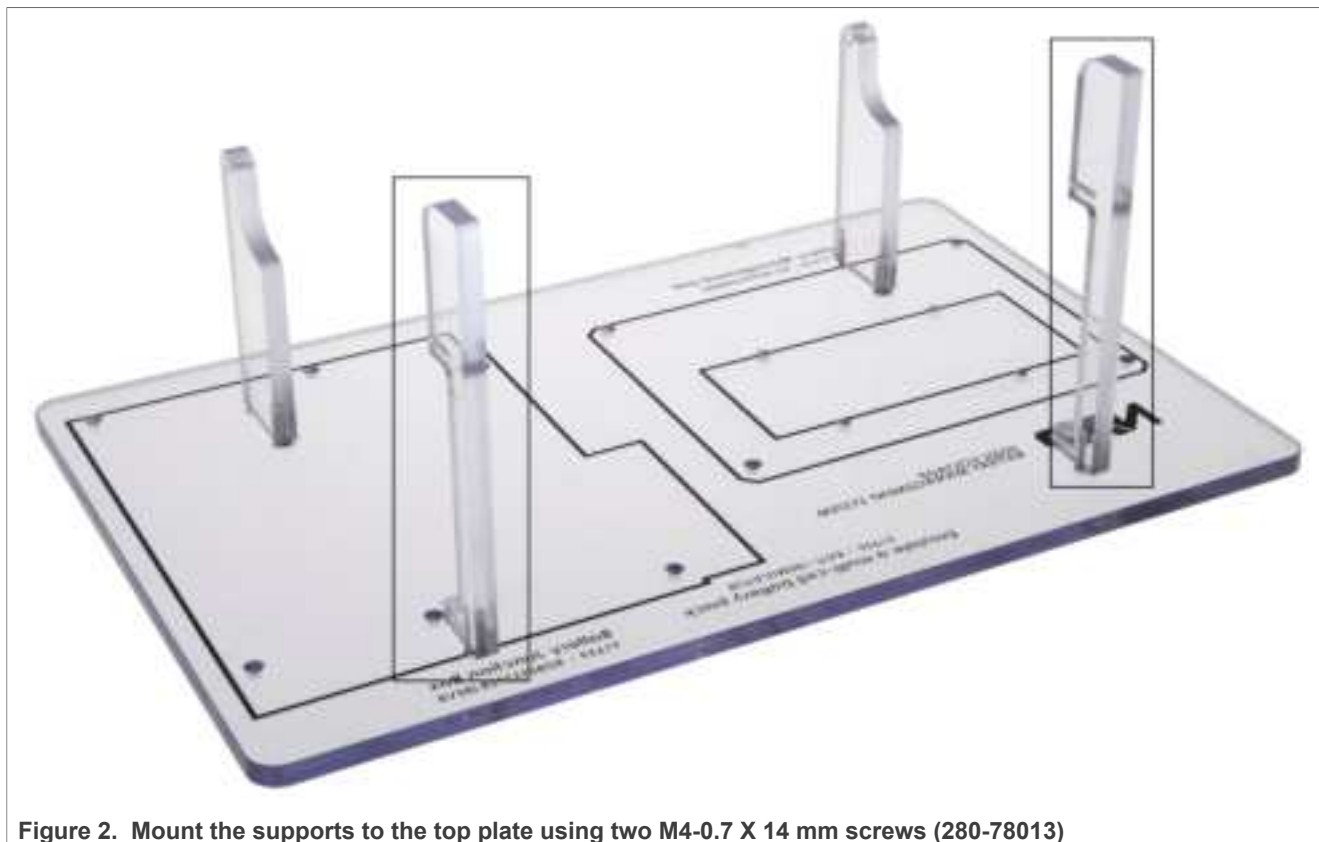


Figure 2. Mount the supports to the top plate using two M4-0.7 X 14 mm screws (280-78013)

2.3 Adding hinges and adhesive feet to the bottom plate



Figure 3. Mount the short hinges to the top plate using four M4-0.7 X 14 mm screws (280-78013)

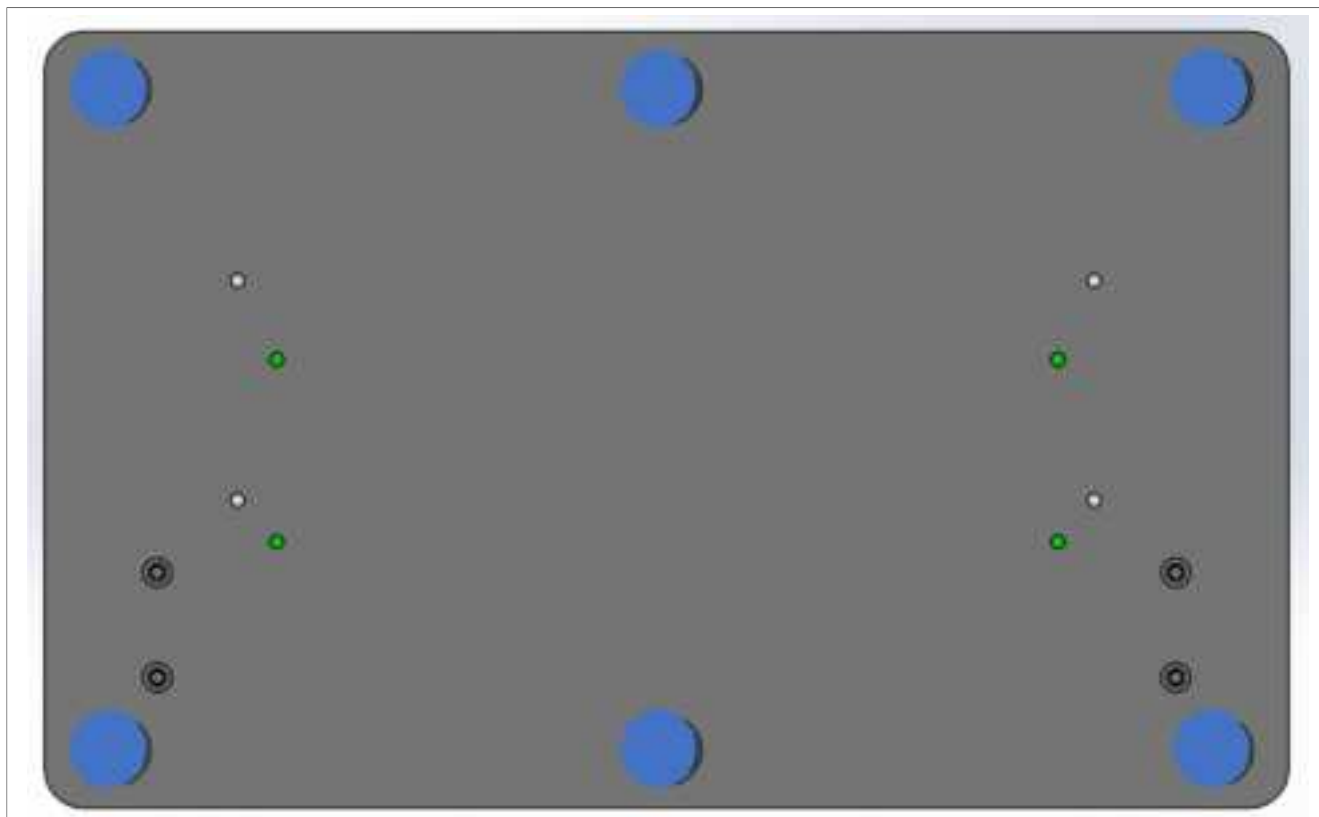


Figure 4. Add the adhesive feet to the bottom plate (280-76689)

2.4 Connecting top and bottom plates



Figure 5. Connect the top and bottom plates using two M4-0.7 X 20 mm screws (280-78014) and two wingnuts (280-78017)

2.5 Completed base structure

The base structure is now complete. To mount the boards on the structure, see [Section 3](#).

3 Guidelines for the specific setup of the RD-BESS1500BUN

This section details the steps for the construction of the specific setup for RD-BESS1500BUN. The RD-BESS1500BUN kit is composed of:

- A RD-BESSK358BMU battery management unit (BMU)
- A RDBESS774A3EVB cell monitoring unit (CMU)
- A RDBESS772BJBEVB battery junction bow (BJB)
- A BATT-18EMULATOR battery emulator
- A 5 V power supply
- A 12 V power supply

Note: One of the two supplies can be fastened to the support.

3.1 Components required

For this part of the construction, the components required are:

1 RD-BESS1500BUN kit

- A RD-BESSK358BMU battery management unit (BMU)
- A RDBESS774A3EVB cell monitoring unit (CMU)
- A RDBESS772BJBEVB battery junction bow (BJB)
- A BATT-18EMULATOR battery emulator
- A 5 V power supply
- A 12V power supply

Table 6. One set of polycarbonate HW accessory

901-10100	HW accessory, fastener package for 800-10077 / 91651	1
280-78008	Fastener, screw M3-.5X25 FH SS	12
280-76979	Screw, flat, M3 X 12 mm, stainless	2
280-78015	Fastener, standoff 3.2 mm ID X 10 mm round female 7 mm OD ABS	8
280-76566	Fastener, nut M3-.5 HEX SS machined	8
280-76355	Screw M3X6 flat MS SS DIN965A	4
280-78013	Fastener, screw M4-.7X14 socket head SS	10
280-78014	Fastener, screw M4-.7X20 socket head SS	2
280-78017	Fastener, wingnut, M4-.7, SS	2
280-76689	Feet, bumpon clear, W 0.620" X H 0.400"	6
600-77772	Cable tie, nylon, 11.5"L, 0.190"W,	2

3.2 Adding support for the battery emulation system

- 1. Mount both 95 mm side parts (800-76228) using two M4-0.7 X 14 mm screws (280-78013) according to [Figure 1](#) and [Figure 2](#).
- 2. Mount both 145 mm supports (800-76232) to the top plate using two M4-0.7 X 14 mm screws (280-78013) according to [Figure 1](#) and [Figure 2](#).

Long hinges, 95 mm (800-76228)	Supports, 145 mm (800-76232)

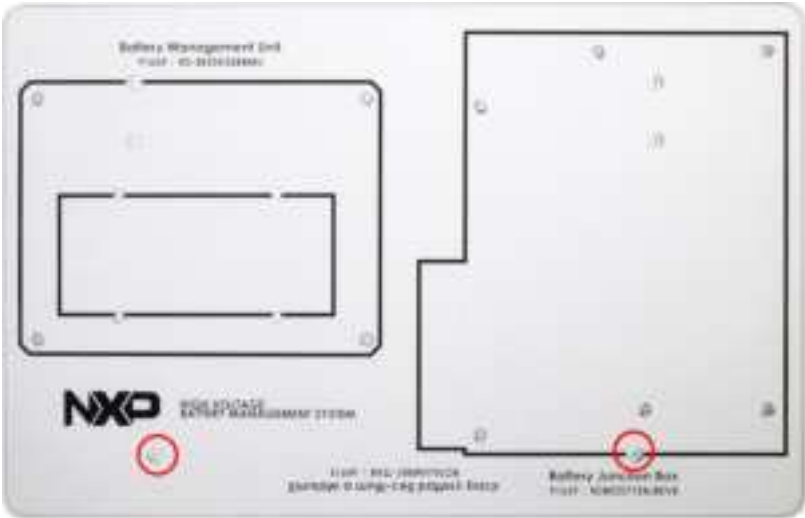


Figure 6. Top plate - BATT-18EMULATOR support mounting holes

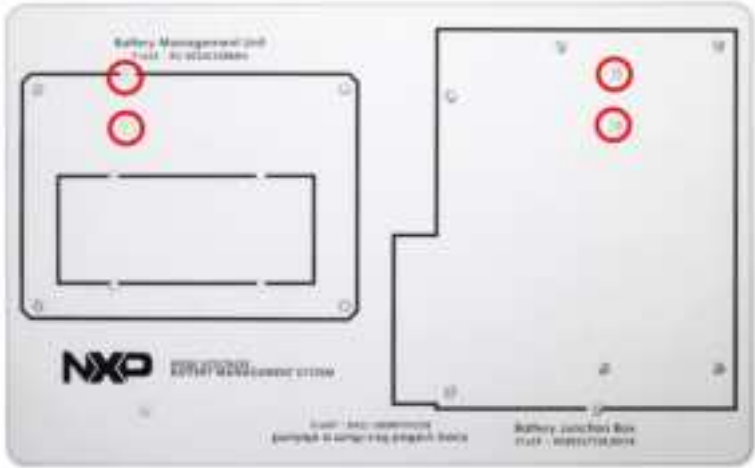
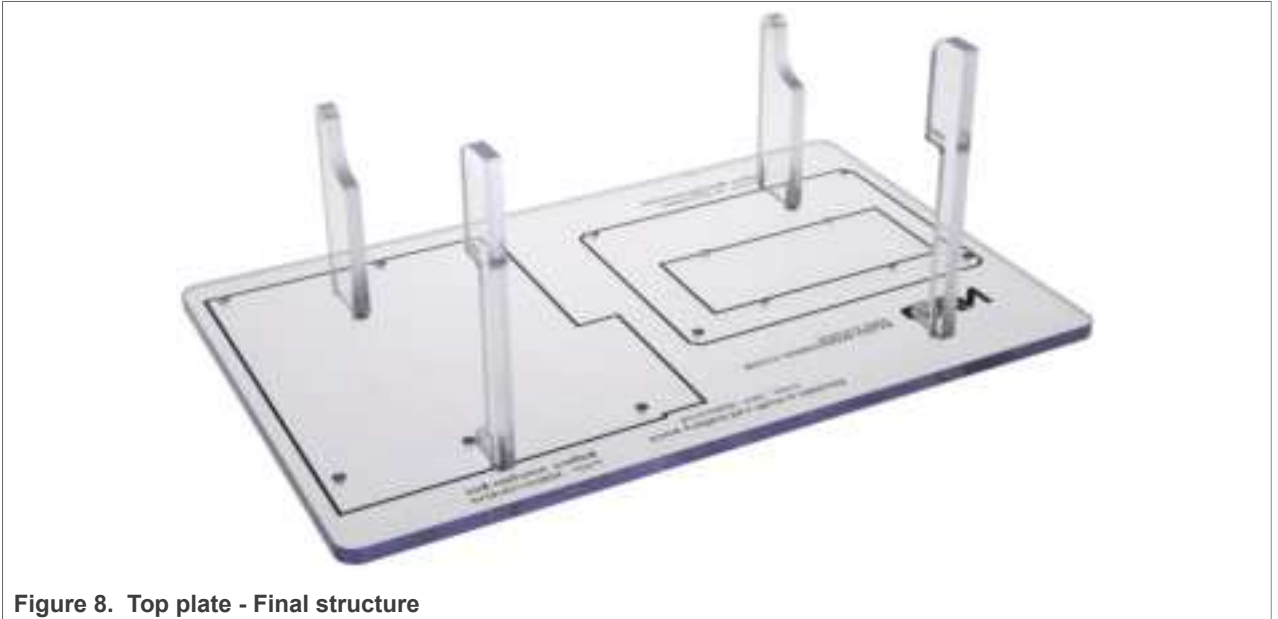
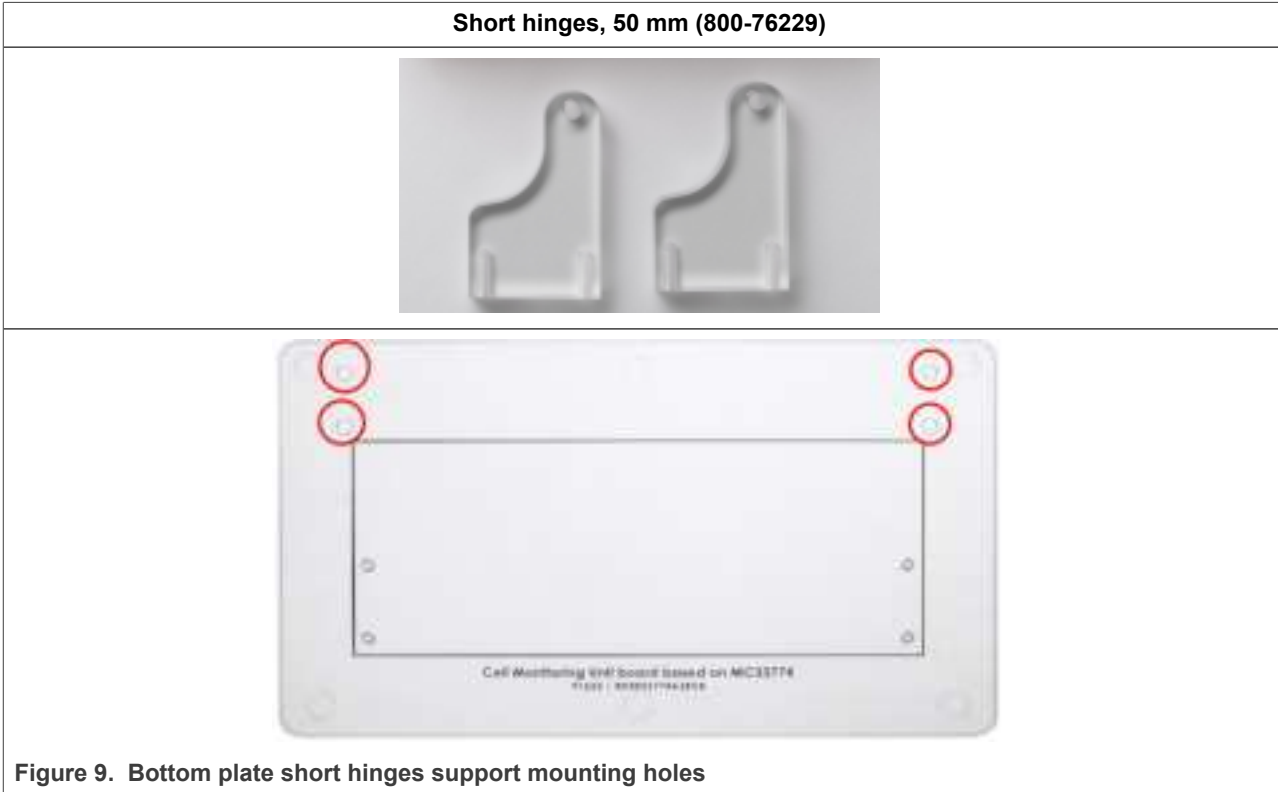


Figure 7. Top plate - BATT-18EMULATOR support mounting holes



3. Mount both 50 mm side parts (800-76229) using two using two M4-0.7 X 14 mm screws (280-78013) according to [Figure 3](#) and [Figure 4](#).



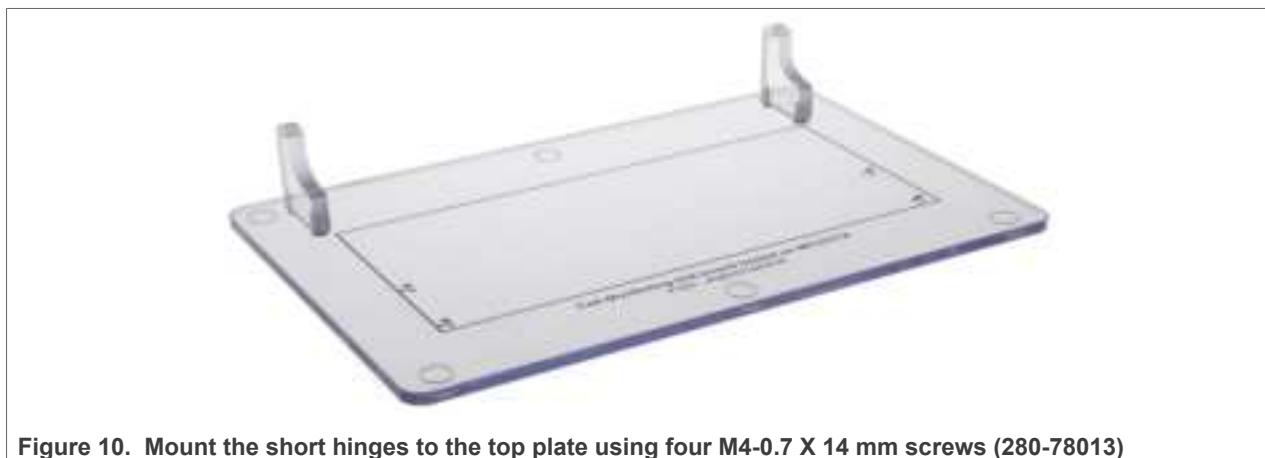


Figure 10. Mount the short hinges to the top plate using four M4-0.7 X 14 mm screws (280-78013)

3.3 Mounting the power supplies (optional)

One of the two power supplies can be fastened on the back of the top plate. The other power supply needs to be placed around the polycarbonate support, but cannot be fastened to it.

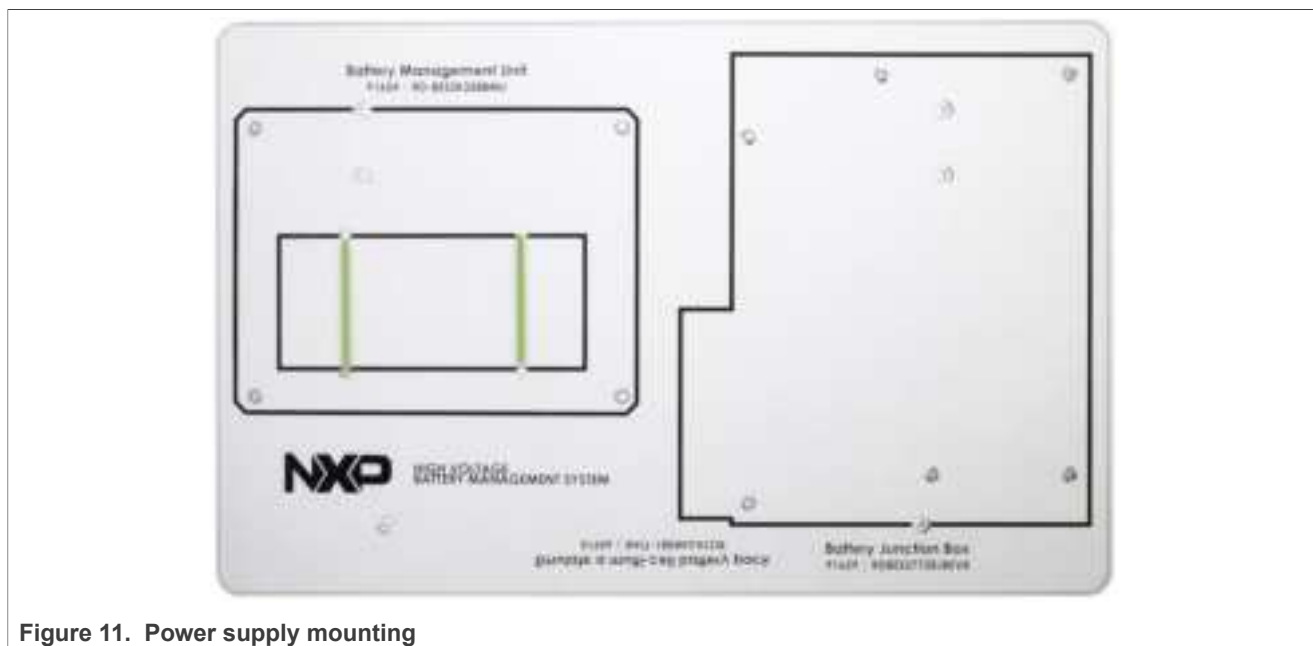


Figure 11. Power supply mounting

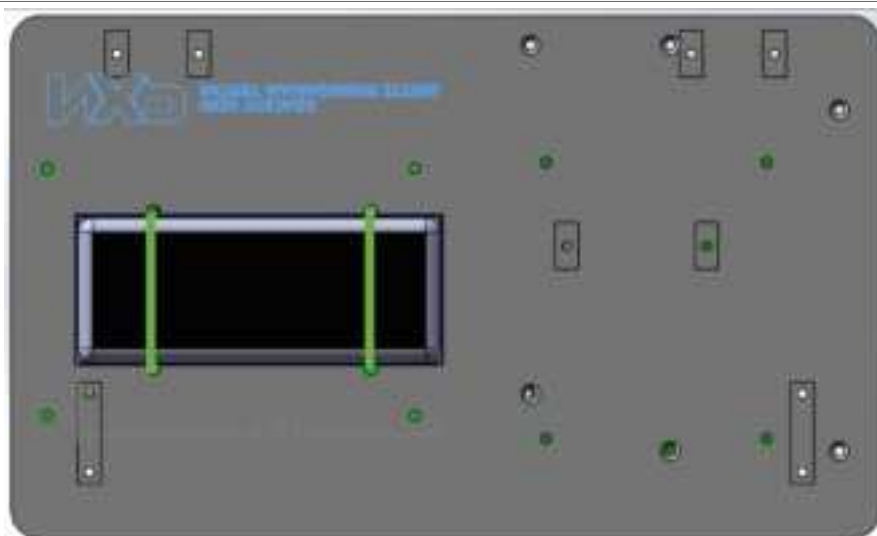


Figure 12. Fastened power supply

Use the two nylon cable ties (600-77772) to fasten one of the power supplies to the top plate according to the highlighted holes. Green marks on [Figure 11](#) and [Figure 12](#).

3.4 Mounting the battery management unit

Mount the BMU to the top plate using four screws (280-78008), four washers (280-78015) and four nuts (280-76566) according to [Figure 13](#).

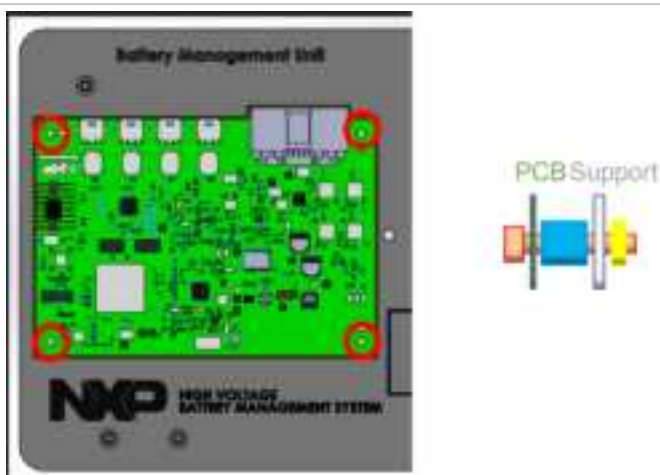


Figure 13. Battery management unit mounting procedure

3.5 Mounting the cell monitoring unit

Mount the CMU to the bottom plate using four screws (280-78008), four washers (280-78015) and four nuts (280-76566) according to [Figure 14](#).

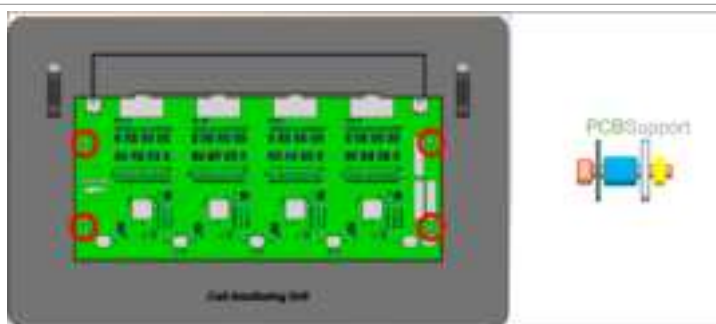


Figure 14. Cell monitoring unit mounting procedure

3.6 Mounting the battery junction box

Mount the BJB to the top plate using four screws (280-78008), four washers (280-78015), and four nuts (280-76566) according to [Figure 15](#) and [Figure 16](#).

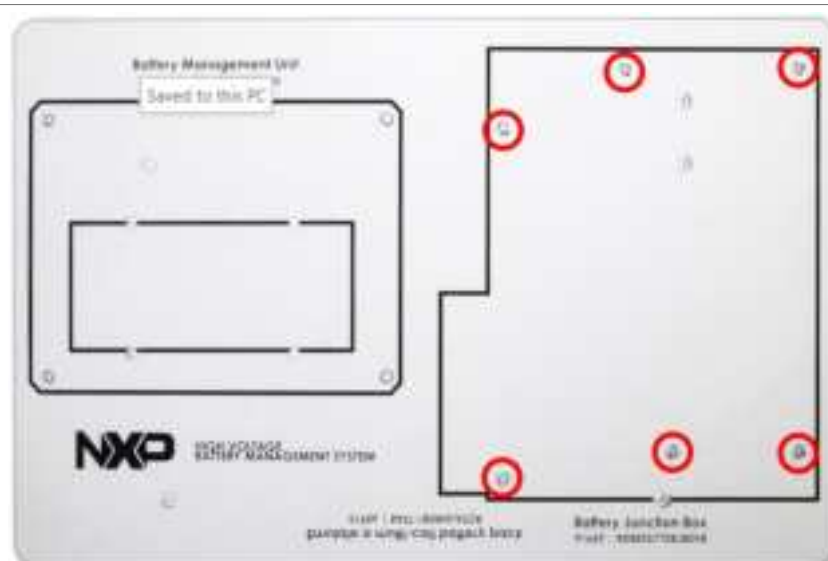


Figure 15. Battery junction box mounting procedure

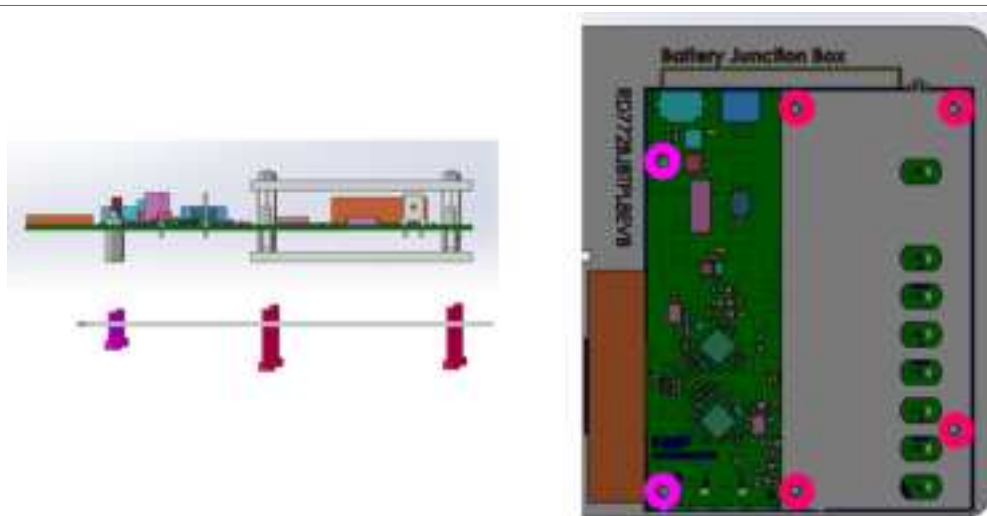


Figure 16. Battery junction box mounting procedure with Plexiglass

3.7 Mounting the battery emulation system

Mount the battery emulator to the 78 mm side parts using four screws (280-76355) according to [Figure 17](#).

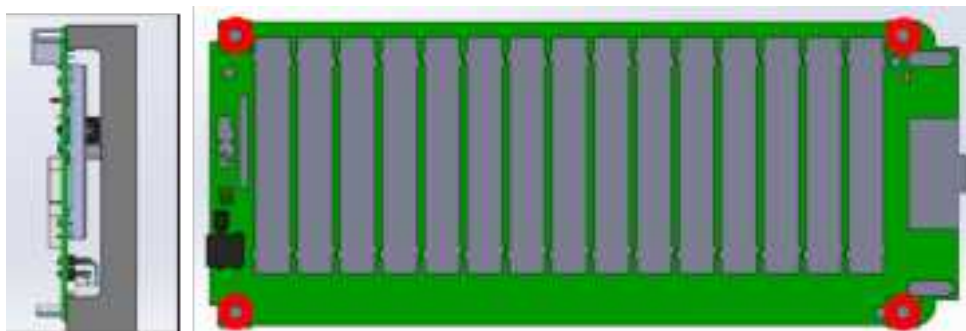


Figure 17. Battery emulator mounting procedure

Note: The J1 connector should face the right side.

3.8 Connect the top and bottom plates

Connect the top and bottom plates using two M4-0.7 X 20 mm screws (280-78014) and two wingnuts (280-78017).



Figure 18. Connect the top and bottom plates

3.9 Completed structure

The RD-BESS1500BUN structure is now complete. To learn how to connect the boards together, refer to the reference design [user manual](#) available on the RD-BESS1500BUN web page.

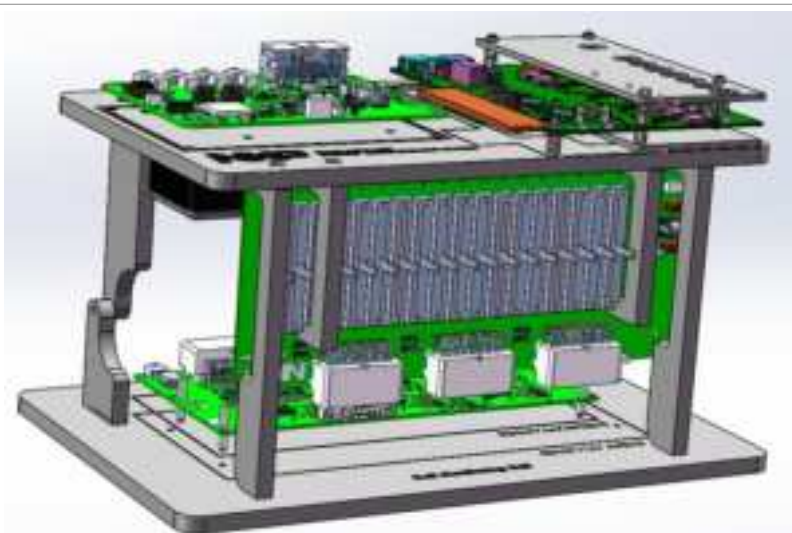


Figure 19. Final structure for RD-BESS1500BUN

4 References

- [1] **RD-BESS1500BUN — 1500 V Battery Energy Storage Reference Design** — detailed information on the RD-BESS1500 BUN, <https://www.nxp.com/part/RD-BESS1500BUN>

5 Revision history

Table 7. Revision history

Document ID	Release date	Description
UM12336 v.1	19 December 2024	Initial version

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