

System use cases for IQ8 Microinverters

Please note: We recently simplified our product and services naming across the Enphase Energy System. For a quick reference chart to map old names to new, please visit [this article](#).

Understanding system use cases for IQ8 series microinverters

The Enphase Energy System, with IQ8 Microinverters, enables many configurations for different customer needs. The system supports four use cases that are described below.

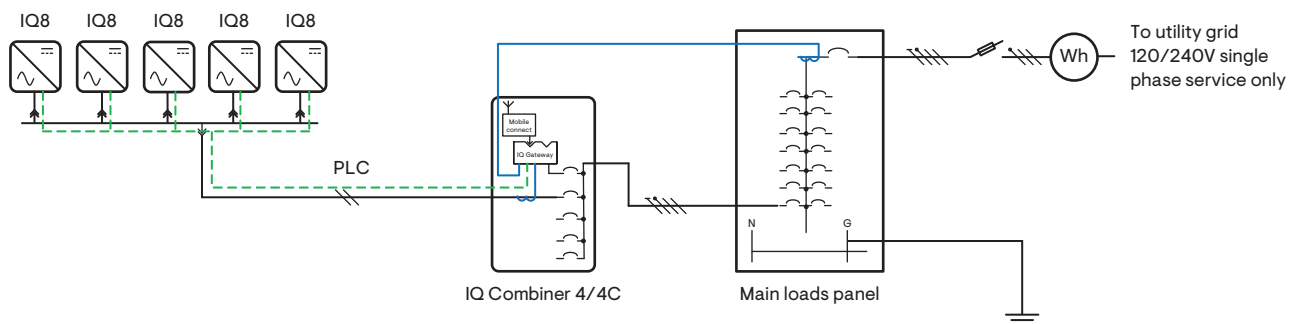
1. **Solar Only:** The system does not provide any backup. It offers economic savings by using the power produced to supply customer loads and exports excess power back to the grid when allowed.
2. **Sunlight Backup:** In addition to the benefits offered by the Solar Only use case, the system provides backup when the sun is shining for up to four essential loads.
3. **Home Essentials Backup:** In addition to the benefits offered by the Sunlight Backup solution, the system provides backup during day or night for essential loads.
4. **Full Energy Independence:** In addition to the benefits offered by the Home Essentials Backup use case, the system provides backup during day or night for the whole home.

Solar Only

In this use case, the IQ8 series microinverters operate in a grid interactive mode. The system does not provide any backup and offers economic savings by using solar power to offset the customer's consumption from the grid. Excess PV power can be exported back to grid when allowed by utilities and local Authorities Having Jurisdiction (AHJs).

The advantage of this use case with IQ8 PV is that the system can be easily upgraded to a Sunlight Backup use case by adding an IQ System Controller 2 and an essential loads solution.

Figure 1: Solar Only single line diagram



Sunlight Backup

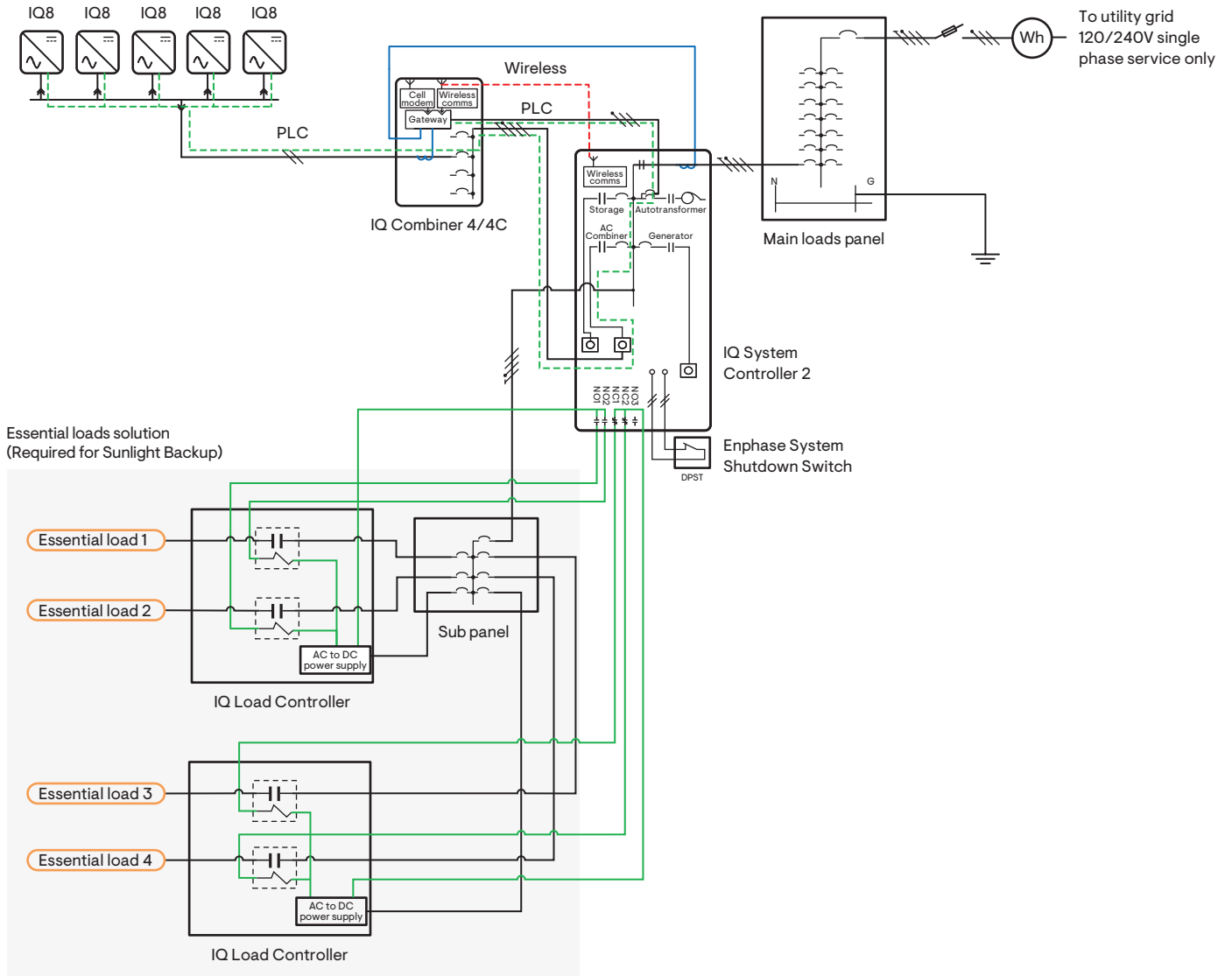
In this use case, the Enphase Energy System provides backup using IQ8 series microinverters when the sun is shining. The system does not include any IQ Batteries. The system can support PV branch circuits rated for up to 64A continuous current output.

IQ System Controller 2 is installed on the load side of an existing main load panel. This configuration must be used with an Essential Loads Solution. An Essential Loads Solution consists of:

- An off-the-shelf panel with a maximum of four pre-selected, essential load circuits that are backed up by the system.
- Two IQ Load Controllers, each enabling fine-grained, circuit-level control for two of the essential load circuits.

Using this configuration for backing up an entire home will lead to a poor customer experience and is not a use case supported by Enphase.

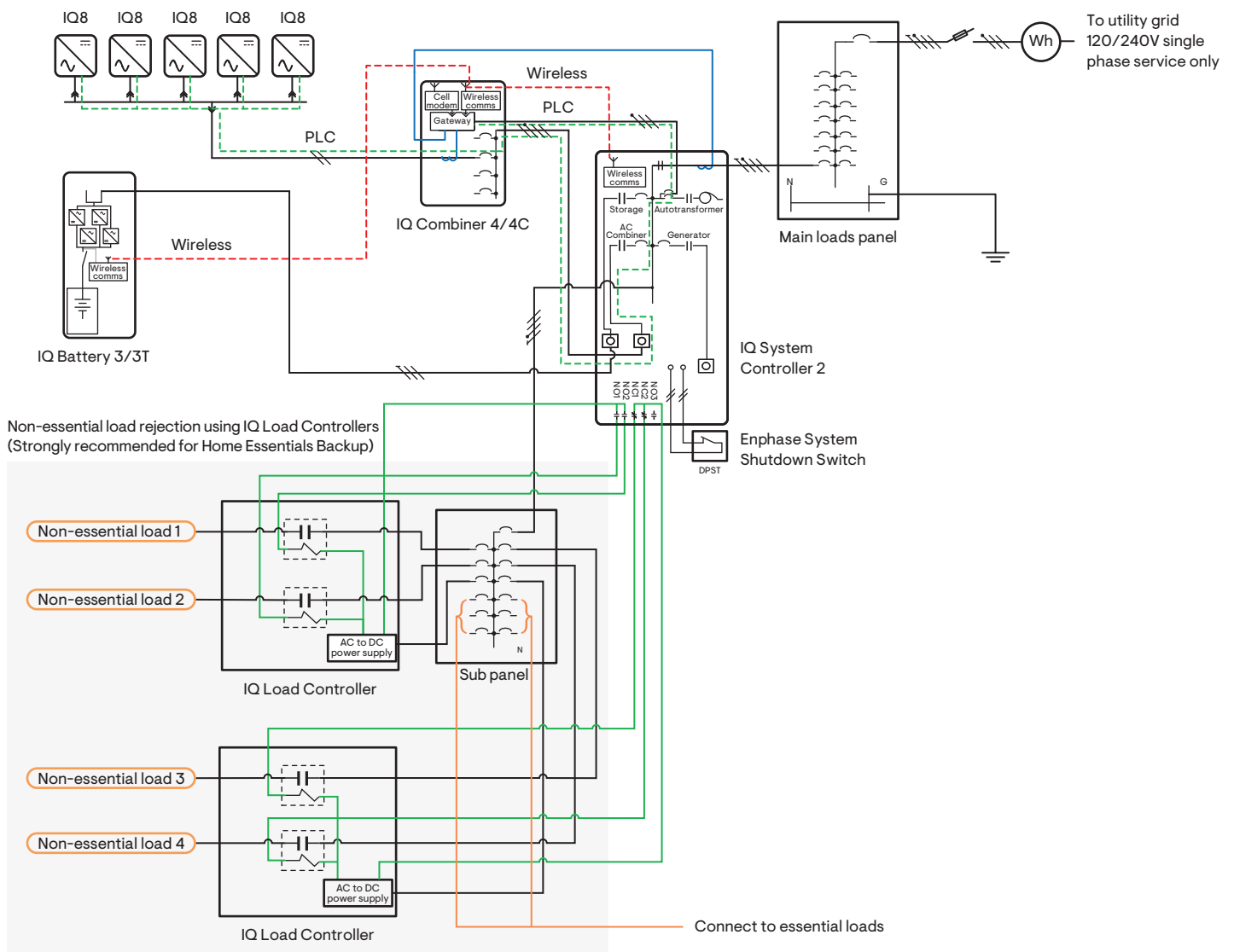
Figure 2: Sunlight Backup single line diagram



Home Essentials Backup

In this use case, the Enphase Energy System provides backup using IQ8 series microinverters and IQ Batteries during day or night for essential loads. The system has at least one IQ Battery 3/3T. IQ System Controller 2 is installed on the load side of an existing main load panel or service equipment. This use case can be used when the Enphase Energy system is configured to provide backup to a few pre-selected, essential load circuits. Up to two IQ Load Controllers are strongly recommended to reject high power loads.

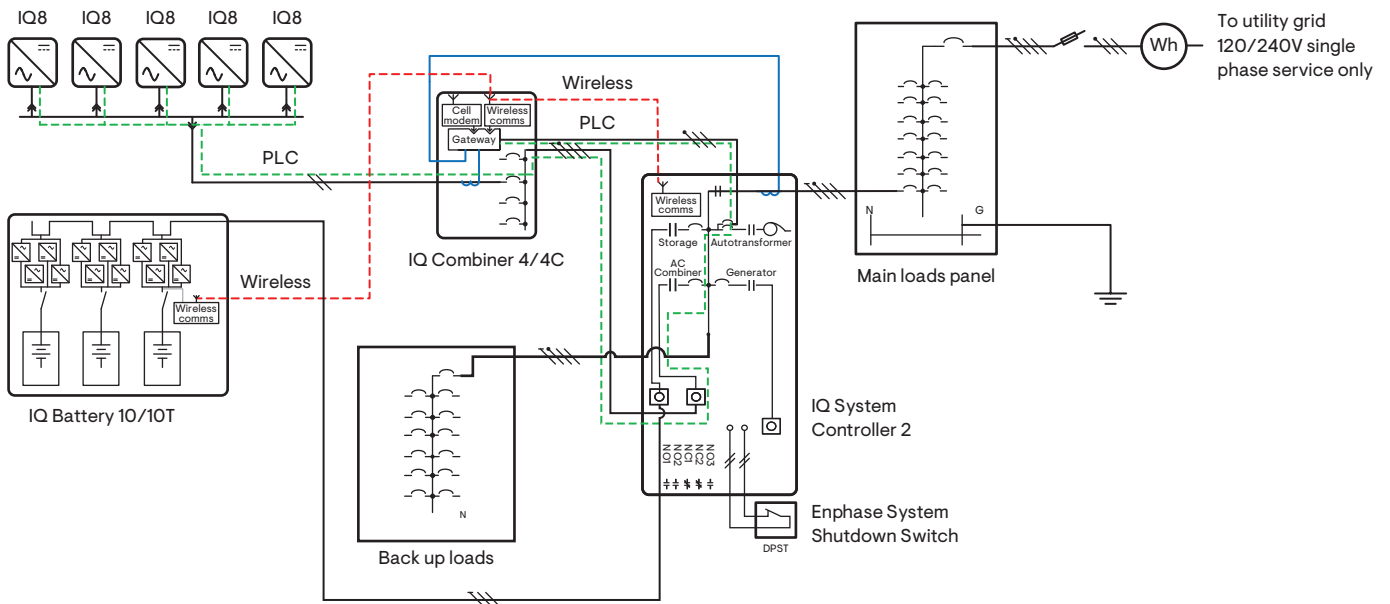
Figure 3: Home Essentials Backup single line diagram



Full Energy Independence

In this use, the Enphase Energy System provides backup using IQ8 series microinverters and IQ Batteries during day or night. The system must have at least 10 kWh of IQ Batteries installed i.e., at least an IQ Battery 10/10T. Depending on the IQ Battery sizing, the system will be able to sustain off grid operation for extended periods of time. This use case supports whole home backup i.e., backing up all the loads in the home. Note that the batteries must be sized correctly to supply the loads. Up to 2 IQ Load Controllers can be used to enable fine-grained control of backed-up loads.

Figure 4: Full Energy Independence single line diagram



COMPONENT TYPE	PRODUCT NAME AND MODEL NUMBER	SOLAR ONLY	SUNLIGHT BACKUP	HOME ESSENTIALS BACKUP	FULL ENERGY INDEPENDENCE
Microgrid-forming microinverters (240V AC)	IQ8 Series IQ8-60-2-US IQ8PLUS-72-2-US IQ8M-72-2-US IQ8A-72-2-US IQ8H-240-72-2-US	As needed per system design	As needed per system design (up to 64A continuous)	As needed per system design (up to 64A continuous)	As needed per system design (up to 64A continuous)
Batteries	IQ Batteries ENCHARGE-3-1P-NA ENCHARGE-10-1P-NA ENCHARGE-3T-1P-NA ENCHARGE-10T-1P-NA	0	0	At least one ENCHARGE-3-1P-NA or ENCHARGE-3T-1P-NA	At least one ENCHARGE-10-1P-NA or ENCHARGE-10T-1P-NA
Combiner	IQ Combiner 4/4C X-IQ-AM1-240-4 OR X-IQ-AM1-240-4C (Includes IQ Gateway and 2 consumption CTs)	1	1	1	1
Gateway	IQ Gateway for IQ Series ENV-IQ-AM1-240	1 (If not using IQ Combiner)	0	0	0
Smart switch with microgrid interconnection device (MID)	IQ System Controller 2 EP200G101-M240US01	0	1	1	1
Load control	IQ Load Controller EP-NA-LK02-040	0	2	0, 1, or 2	0, 1, or 2
Enphase System Shutdown Switch	For use with IQ System Controller 2 for IQ8 PV rapid shutdown and system shutdown EP200G-NA-02-RSD	0	1	1	1
Enphase Energy System communications (between IQ Batteries, IQ System Controller 2, and IQ Gateway)	Enphase Communications Kit COMMS-CELLMODEM-M1-06 (COMMS-KIT-01 and CELLMODEM-M1-06-SP-05) or COMMS-KIT-01 (if system already has cellular modem or if using an IQ Combiner SKU that already has a cellular modem)	0	1	1	1
Mobile Connect	Enphase Mobile Connect CELLMODEM M1 (Support for antenna relocation, AT&T 5yr data plan) CELLMODEM-M1-06-SP-05 ¹ (T-Mobile/Sprint 5yr data plan) CELLMODEM-M1-06-AT-05 (AT&T 5yr data plan)	0 or 1 (If not using an IQ Combiner with cellmodem built-in)	0 (Part of COMMS-CELLMODEM-M1-06)	0 (Part of COMMS-CELLMODEM-M1-06)	0 (Part of COMMS-CELLMODEM-M1-06)
Consumption CTs	Current transformers CT-200-SPLIT	2 (If not using a new IQ Combiner that ships with consumption CTs)	0	0	0

1) CELLMODEM-M1-06-SP-05 is available as part of COMMS-CELLMODEM-M1-06 and X-IQ-AM1-240-4C today. Standalone SKUs, CELLMODEM-M1-06-AT-05 and CELLMODEM-M1-06-SP-05, will be available to order in 2022.

COMPONENT TYPE	PRODUCT NAME AND MODEL NUMBER	SOLAR ONLY	SUNLIGHT BACKUP	HOME ESSENTIALS BACKUP	FULL ENERGY INDEPENDENCE
Main breaker and/or load breaker for IQ System Controller 2	IQ System Controller main breakers BRK-200A-2P-240V (Eaton SKU: CSR2200N) BRK-175A-2P-240V (Eaton SKU: CSR2175N) BRK-150A-2P-240V (Eaton SKU: CSR2150N) BRK-125A-2P-240V (Eaton SKU: CSR2125N) BRK-100A-2P-240V (Eaton SKU: CSR2100)	0	0, 1, or 2	0, 1, or 2	0, 1, or 2
Circuit breakers for IQ8 PV, IQ Battery, and generator circuits in IQ System Controller 2	IQ System Controller 2 circuit breakers BRK-20A-2P-240V-B (Eaton SKU: BR220B) BRK-30A-2P-240V (Eaton SKU: BR230B) BRK-40A-2P-240V (Eaton SKU: BR240B) BRK-60A-2P-240V (Eaton SKU: BR260) BRK-80A-2P-240V (Eaton SKU: BR280)	0	1 or 2 (For PV and generator)	2 or 3 (For PV, batteries, and generator)	2 or 3 (For PV, batteries, and generator)
Circuit breakers for PV in IQ Combiner 4/4C	IQ Combiner 4/4C circuit breakers² BRK-20A-2P-240V-B (Eaton SKU: BR220B) BRK-15A-2P-240V-B (Eaton SKU: BR215B)	1, 2, 3, or 4	1, 2, 3, or 4	1, 2, 3, or 4	1, 2, 3, or 4
Hold down kit for IQ Combiner 4/4C	X-IQ-NA-HD-125A ³ Eaton SKU: BREQS125	0	1 or 2	1 or 2	1 or 2
Hold down kit for IQ System Controller 2	EP200G-NA-HD-200A Eaton SKU: BRHDK125	0	1	2	2
Off-the-shelf panel	For essential loads backup	No	Yes (Up to four essential loads)	Yes	No
PV modules	Any	As needed per system design	As needed per system design	As needed per system design	As needed per system design

2) Enphase recommends using breakers compatible with hold down kits in IQ Combiner 4/4C for IQ8 solar only use case to enable an easy upgrade to a backup use case when the homeowner decides to add backup. However if breakers that support hold down kits are not available then BR220 or BR215 breakers can be used in a IQ Combiner 4/4C for solar Only Use Case. All other use cases require breakers that support hold down kits to comply with 2017 NEC 710.15 (E) or 2020 NEC 710.15(F).

3)X-IQ-NA-HD-125A supports up to 2 PV branch circuits per hold down kit while Eaton BREQS125 supports only one branch circuit per hold down kit.