

# Selection and application guide



## Siemens Microinverter System

[www.usa.siemens.com/microsolar](http://www.usa.siemens.com/microsolar)

**SIEMENS**



# Siemens Microinverter System

The Siemens Microinverter System is the most advanced, flexible, cost effective solution for residential and commercial photovoltaic (PV) inversion on the market. It can generate up to 20% more energy harvest from the same solar modules than a comparable string inverter. Because nearly all the wiring is AC, it is safer for installers and home owners, and its simple installation requires little up front engineering, simplifying the installation. This Selection and Application guide will help you select the correct components for your solar project



## System Benefits

- No single point of failure
- Compatible with most photovoltaic module manufactures
- Modular design for easy system expansion
- Performance analysis module by module
- Simplified Trunk and Drop cable system for easy installation
- System uptime greater than 99.8%
- Low voltage DC reducing the risk of fire
- Resistant to dust, debris, and shading
- 25 year warranty
- Mounts directly to racking



The Siemens Microinverter mounts directly to the racking in a position within reach of the photovoltaic panel wire connections. The Microinverter wires connect directly to the photovoltaic panel using either MC-4 or Tyco Solarlok connectors which are specified by the photovoltaic panel manufacture. The AC cable then connects to the trunk and drop cable system installed on the racking.

The trunk and drop cable system mounts to the racking using straps or cable holders. The AC output cable from the microinverter connects easily to the trunk cable system for a clean installation. This trunk cable can be cut to length and capped. Additional accessories are provided in the accessory section. Smaller unit lengths of cable come with an installation kit, which is also sold separately



The Envoy communication gateway collects the information from each Microinverter and transmits this data to the Enlighten monitoring service. The Envoy plugs into any standard AC receptacle and is connected to a broadband router.



The Enlighten monitoring service gives users a system to track the power production from the Microinverter system. This system monitors module by module, which string inversion systems cannot achieve. The Web-based output is available from any computer or smart phone to provide access whenever the user desires.



# Siemens Microinverters

## 215W Output

### Standard Features

- 215W @ 120V maximum output power
- Uses the trunk and drop cabling system to reduce installation times and amount of wiring required
- NEMA 6 Enclosure Rating
- Compatible with most 60-cell panels
- 25 year warranty



| Part Number    | Max Power Output | Voltage | Connector Type | Peak Power Efficiency |
|----------------|------------------|---------|----------------|-----------------------|
| SMIINV215R60MC | 215 W            | 120 V   | MC Type        | 96.50%                |
| SMIINV215R60TY | 215 W            | 120 V   | TYCO Type      | 96.50%                |

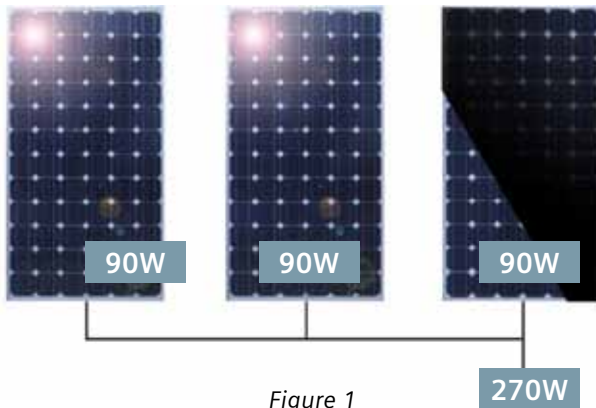


# Siemens Microinverters

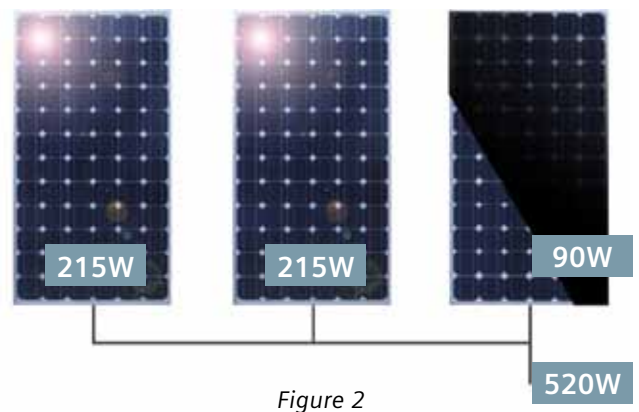
The example below shows the exact same configuration of panels with a traditional string inverter (*Figure 1*) and microinversion technology (*Figure 2*). Shading has covered one of the photovoltaic modules, reducing the amount of power produced by that panel. Notice, in Figure 1, how with a traditional string inverter, each module reflects

the same power production. The entire system is limited by the weakest link. With microinversion this does not occur. As shown in Figure 2, if shading covers part of one module it loses efficiency, but each of the other modules is connected to its own microinverter and functions as a stand-alone power producing unit, increasing the efficiency of the entire system.

## String Inverter System



## Siemens Microinverter System



Siemens Microinverters are designed to work with virtually any 60 cell photo-voltaic module. A detailed list of compatible modules can be found at [www.usa.siemens.com/microsolar](http://www.usa.siemens.com/microsolar). Please note that installers will need to verify the type of connector that a given module uses and purchase the specific part number of microinverter to match.

# Trunk and Drop Cable Systems

## Features

- Available in Portrait or Landscape spacing
- 20A cable can handle up to 17 Modules at 120/240V and 25 Modules at 120/208 V on a single run
- Balance of Systems savings with less wire required

The Trunk and Drop cable system comes in a length of cable with a set number of female connections. This cable can be cut to length required for each installation. A terminator end cap is required for the end of line and any unused female connections must be covered. Please see page 8 for accessories.



## 120/240 Cables

| Part Number | Voltage / Phasing      | Number of Drops | Spacing | Module Orientation |
|-------------|------------------------|-----------------|---------|--------------------|
| ET10240BULK | 120/240 V Single Phase | 240 Drops       | 1.0 m   | Portrait           |
| ET17240BULK | 120/240 V Single Phase | 240 Drops       | 1.7 m   | Landscape          |
| ET1024040   | 120/240 V Single Phase | 40 Drops        | 1.0 m   | Portrait           |
| ET1724040   | 120/240 V Single Phase | 40 Drops        | 1.7 m   | Landscape          |

## 120/208 V Cables

| Part Number | Voltage / Phasing    | Number of Drops | Spacing | Module Orientation |
|-------------|----------------------|-----------------|---------|--------------------|
| ET10208BULK | 120/208V Three Phase | 240 Drops       | 1.0 m   | Portrait           |
| ET17208BULK | 120/208V Three Phase | 240 Drops       | 1.7 m   | Landscape          |
| ET1020830   | 120/208V Three Phase | 30 Drops        | 1.0 m   | Portrait           |
| ET1720830   | 120/208V Three Phase | 30 Drops        | 1.7 m   | Landscape          |

# Envoy

## Communications Gateway

### Standard Features

- Energy Management Interface
- UL 60950 Listed
- Includes lifetime Enlighten subscription for all connected inverters
- Power Line Communication (PLC) from each microinverter
- Plugs into standard 120V, 60Hz outlets to read PLC signal
- Gateway to internet using standard Ethernet cable to broadband router
- Transmits performance data to online analysis software
- Easy to read liquid crystal display to monitor energy production and communication between microinverters
- True plug-and-play installation
- Maximum of 250 Microinverters per Envoy Gateway
- Dimensions (inches) 8.8 x 4.4 x 1.7



### Power line Carrier Ethernet Bridge

- For use when an Ethernet cable connection is not available due to distance or structures

| Part Number | Description   |
|-------------|---|
| IEMU03      | Envoy Communications Gateway with PLC Bridge & Monitoring |
| EPLC01      | Power Line Carrier Ethernet Bridge                        |



# Enlighten

## Monitoring Service

### Features

- 24/7 module by module performance analysis
- Accessible via website or smart phone application
- Detailed information including current and lifetime metrics
- Lifetime subscription included with each microinverter



# Microinverter Accessories

## Installation Kit Part Number: ETINSTL

- 1 Disconnect Tool
- 4 Terminator Caps
- 5 Seal Caps



Terminator Cap

## Terminator Cap Part Number: ETTERM10

- Required for end of each cable run
- Available in bag of 10



Seal Cap

## Seal Cap Part Number: ETSEAL10

- Used to Fill unused Drop Positions on Trunk Cable
- Weather Proof

## Disconnect Tool Part Number: ETDISC05

- Needed to remove Seal Cap
- Available in Packs of 3



Disconnect Tool

## Splice Kit Part Number: ETSPLK05

- Used to splice cables
- Unavailable Late 2011



Splice Kit

## Additional Offerings: Disconnect Switches

- Required by some utilities
- Check local Code Requirements
- Additional Offering in Siemens SpeedFax Catalog

## 30A 2 or 3 Pole, 10k AIC, Non-Fused Part Number: GNFR321R

- Neutral Bar: W410190

## 60A 2 or 3 Pole, 10k AIC, Non-Fused Part Number: GNFR322R

- Neutral Bar: HN612



GNFR321R

# Solar Ready Meter Enclosures

Surface Mount, Meter-Load Center Combination,  
1-Phase, 3-Wire 120/240V AC



- UL Listed
- Line side Connection avoids 20% Rule Restrictions
- Separate solar input does not consume branch circuit positions
- Designed to meet Utility Specifications for common Solar Markets (CO, AZ, CA, WA, OR)

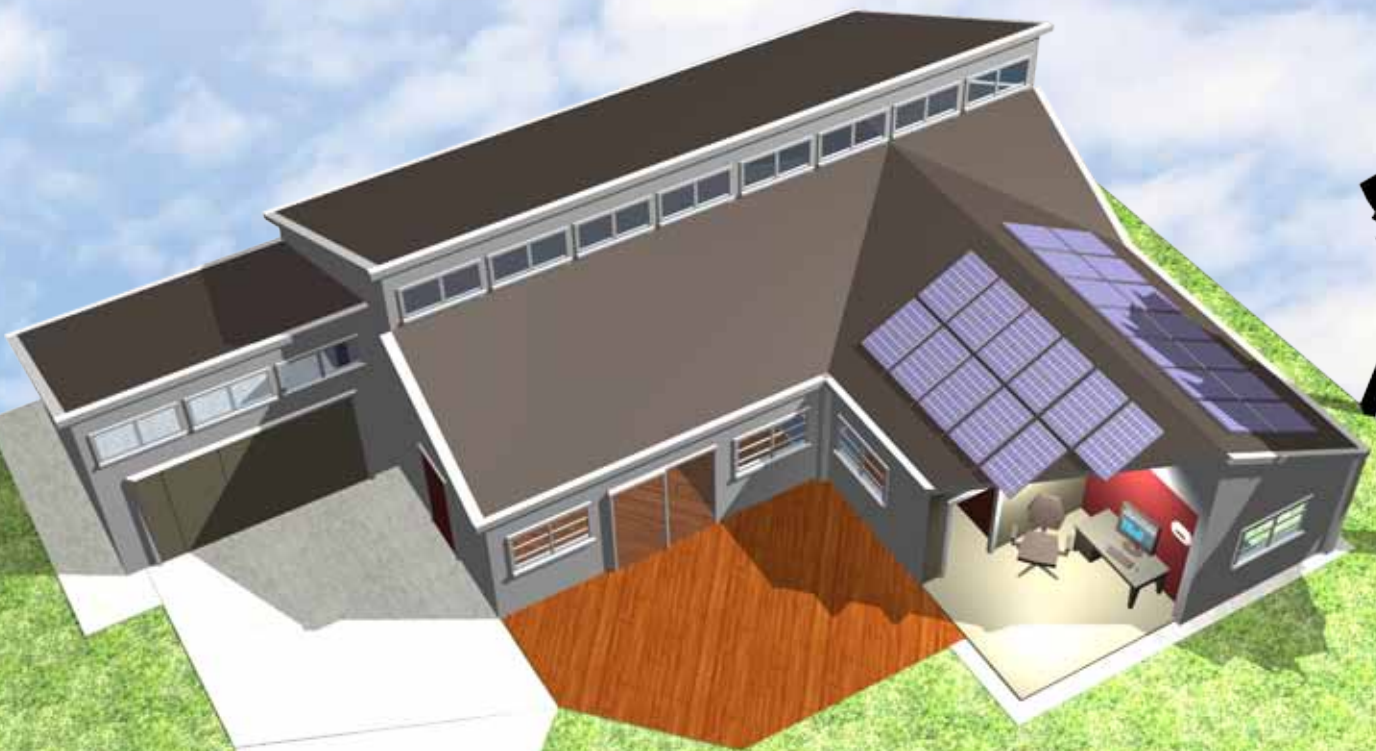
| Catalog #  | Amp Rating (Cont.) | Aux. input max. /Bkr type | Utility Incoming | Bypass Type     | No. of Spaces | No. of Circuits | Dimensions (inches) |       |      | Main Breaker | Short Circuit Rating | Hub Provision  | 5th Jaw   | Cover Type |       |       |      |
|--|--------------------|---------------------------|------------------|-----------------|---------------|-----------------|---------------------|-------|------|--------------|----------------------|----------------|-----------|------------|-------|-------|------|
|  |                    |                           |                  |                 |               |                 | H                   | W     | D    |              |                      |                |           |            |       |       |      |
| <b>EUSERC Compliant Meter-Load Center Combination, 200amp with Alternate Energy Input &amp; Full Load Center Width (Side-by-Side Construction)</b> |                    |                           |                  |                 |               |                 |                     |       |      |              |                      |                |           |            |       |       |      |
| MC3040S1200SC  | 200                | 60A / QP(H) MP-(HT)       | OH/UG            | None            | 30            | 40              | 35.68               | 21.0  | 5.09 | QN2200RH     | 22,000               | RX / HC        | ECMC5J    | Ring       |       |       |      |
| MC4040S1200SC  |                    |                           |                  |                 | 40            | 40              |                     |       |      |              |                      |                |           |            |       |       |      |
| <b>EUSERC Compliant Meter-Load Center Combination, 200amp with Alternate Energy Input, Between Studs Width (Side-by-Side Construction)</b>         |                    |                           |                  |                 |               |                 |                     |       |      |              |                      |                |           |            |       |       |      |
| MC0816S1200SCT   | 200                | 60A / QP(H) MP-(HT)       | OH/UG            | None            | 8             | 16              | 40.81               | 14.61 | 7.04 | EQ9985       | 22,000               | RX / HC        | ECMC5J    | Ring       |       |       |      |
| MC2442S1200SC  |                    |                           |                  |                 | 24            | 42              |                     |       |      |              |                      |                |           |            | 40.66 | 14.34 | 7.04 |
| MC2442S1200FC  |                    |                           |                  |                 |               |                 |                     |       |      |              |                      |                |           |            |       |       |      |
| <b>EUSERC Compliant Meter-Load Center Combination, 200amp with Alternate Energy Input, Overhead Feed Only (Over/Under Construction)</b>            |                    |                           |                  |                 |               |                 |                     |       |      |              |                      |                |           |            |       |       |      |
| MC2040S1200SZ  | 200                | 60A / QP(H) MP-(HT)       | OH               | None            | 20            | 40              | 32.67               | 14.34 | 4.29 | MBK200A      | 22,000               | HC             | EMC5J     | Ring       |       |       |      |
| <b>Meter-Load Center Combination, 200amp, Lever Bypass with Alternate Energy Input (Over/Under Construction)</b>                                   |                    |                           |                  |                 |               |                 |                     |       |      |              |                      |                |           |            |       |       |      |
| MC2040S1200JLC   | 200                | 60A / QP(H) MP-(HT)       | OH/UG            | HQ Lever Bypass | 20            | 40              | 40.06               | 14.32 | 5.15 | 4-Pole       | 22,000               | RX-top, HC-bot | Installed | Ring       |       |       |      |

# Application: Residential Solar

- 120 / 240V system
- Grid tied through Solar Ready Meter Combination
- Utility Requires Disconnect Switch
- 6.4 kW required to offset desired utility consumption

## Example Bill Of Materials:

- 30 Microinverters  
(Part number to match module connector)
- 30 Drops of Trunk Cable (120V / 240V)
  - 1 Installation Kit
- Envoy Communications Gateway
- Solar Ready Meter Combo
- Disconnect Switch (GNF321R + W410190)
- 30 PV Modules (Non-Siemens)
- Racking (Non-Siemens)



# Application: Commercial Solar

- 120 / 208V system
- Grid tied through Back-fed Service Entrance Equip
- Utility Requires Disconnect Switch
- Roof configuration allows for 90 modules

## Example Bill Of Materials:

- 90 Microinverters  
(Part number to match module connector)
- 90 Drops of Trunk Cable (120V / 240V)
  - 3 Installation Kit
- Envoy Communications Gateway
- Proper Lug Kit for Service Entrance Back-feed
- Disconnect Switch GNF323R + HN623
- 90 PV Modules (Non-Siemens)
- Racking (Non-Siemens)



# Application: Campus Solar

- Examples: University campus, Military Base, Corporate Campus, etc.
- Mix of 120 / 240V and 120 / 208V systems
- Desired output of 50 kW

## Example Bill Of Materials:

- Treat each building as separate installation
- Consult Residential and Commercial Application Pages
  - Total of 234 Microinverters
  - Total of 234 Drops of Trunk Cable
  - 1 Envoy Communications gateway per building
  - Combine all on Single Enlighten Account





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