



More Energy

Active Management

Enhanced Safety



# THE TIGO ENERGY® MAXIMIZER™ SOLUTION

## The Tigo Energy® Maximizer™ System

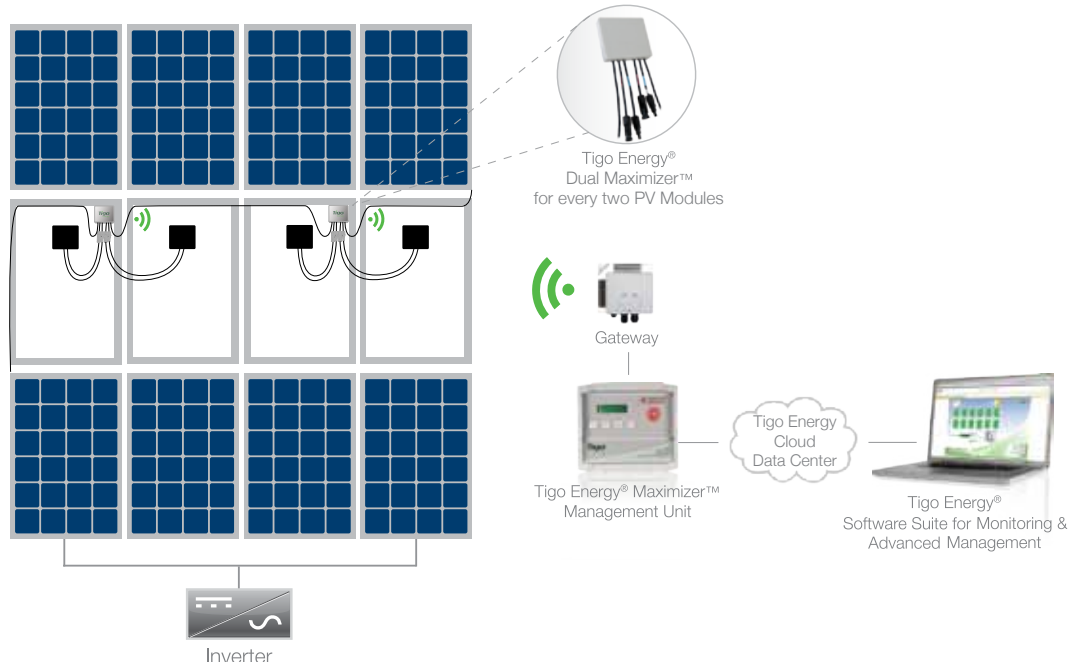
The Tigo Energy Maximizer System provides more energy, active management, and enhanced safety for utility, commercial and residential solar arrays. Tigo Energy's innovative combination of hardware and software increases the output of solar arrays by up to 20 percent, enables module-level monitoring and alerts, and improves safety with module-level deactivation – all provided by a system with industry-leading cost, efficiency, and reliability. The versatile architecture works seamlessly with all standard photovoltaic modules and inverters.

### More Energy

The Tigo Energy Maximizer Solution implements Maximum Power Point Control at the module level, eliminating the impact of underperforming modules on the stronger modules. Even “perfectly” architected, unshaded systems are subject to mismatch from soiling, clouds, thermal mismatch, and long-term material degradation, and therefore can benefit from module-level power control. Many arrays are also subject to partial shading. Tigo Energy can deliver up to 20% more energy from these arrays. Tigo Energy uses a patented impedance-matching technology, rather than a buck-boost circuit. This gives the Tigo Energy Maximizer Solution an industry-best 99.5% efficiency, which allows system owners to harvest the maximum potential energy out of their arrays.



## Tigo Energy Maximizer System



### Active Management

The Tigo Energy Module Maximizers send performance data each second to the Tigo Energy® Maximizer™ Management Unit. Tigo Energy's software enables web-based advanced analytics which look for anomalies, degradation patterns, and regularly occurring issues at the module or system level. With the Tigo Energy MaxiManager software suite, solar projects can be kept at peak operation throughout their life cycle. By understanding the performance of each system component, maintenance can be quickly and effectively performed. On-demand maintenance reports help crews directly target problem areas, streamlining trips and reducing O&M costs. Crews arrive at the site with exactly the right replacement components and tools to get the job done quickly.

### Enhanced Safety

The Tigo Energy Maximizer Solution improves the safety of arrays through its patent-pending PV-Safe™ technology. When activated, the PV-Safe function deactivates the system at the module level, eliminating high voltage for emergency or maintenance teams. This can be initiated from the management software, or on-site by pressing the PV-Safe button on the Maximizer Management Unit. This mechanism is also triggered automatically if an emergency crew shuts off the AC circuit breaker. The Maximizer solution also has an optional theft prevention solution which alerts the system owner if modules are unexpectedly disconnected from the system at night.

## Tigo Energy® Module Maximizer™-ES

① The Tigo Energy Module Maximizer-ES (MM-ES) corrects for module mismatch that drags down the energy output of arrays. The MM-ES mounts quickly and easily to each PV module and provides an industry-leading 99.5% average conversion efficiency, the smallest electronics footprint of its kind, and a polycarbonate enclosure which eliminates the need for extra grounding. The MM-ES will enhance the performance and improve the payback of both shaded and unshaded arrays.



### Tigo Energy® Module Maximizer™ (MM-ES)

	MM-ES50	MM-ES75	MM-ES110	MM-ES170	MM-2ES (per Input)
<b>Input Data</b>					
Maximum power	300W	350W	300W	300W	300W
Maximum input DC voltage (Voc)	52V	75V	110V	170V	52V
Recommended Vmp range *	16-48V	30-65V	30-89V	30-140V	16-48V
Maximum continuous current (Imp)	9.5A	6.5A	4.7A	2.6A	9.5A
Maximum input current (Isc)	10A	7.5A	5A	3A	10A

\* Vmp = Voltage at maximum power = Maximum power voltage.

	MM-ES50	MM-ES75	MM-ES110	MM-ES170	MM-2ES (per Input)
<b>Output Data</b>					
Maximum output power	300W	350W	300W	300W	300W
Maximum continuous current	9.5A	6.5A	4.7A	2.6A	9.5A
Nominal voltage / range	0-Voc	0-Voc	0-Voc	0-Voc	0-Voc

<b>Mechanical Specifications</b>	
Operating temperature range	-30°C to +70°C
Cooling	Natural Convection
Enclosure environmental rating	NEMA3R
Dimensions (LxWxH)	120x104x25mm (165x140x28mm with a bracket)
Weight (with a bracket)	680gm

### Tigo Energy® Maximizer™ Management Unit (MMU) and Gateway

#### Configuration

Single Gateway communicates with up to 120 modules  
 Single MMU controls up to 7 Gateways  
 Single MMU connects up to 360 modules

#### Mechanical Specifications

<b>MMU:</b>	
Dimensions (LxWxH)	245x150x80mm
Weight	1000gm
Operating Temperature	0°C to +70°C

#### Regulatory Compliance

North America	FCC PART 15; UL 1741
Europe	Certification CE, RF: EN300.328V1.7.1 (2006/05), EN60950-1: 2006, the first edition of the low voltage directive 2006/95/EEC directive R&TTE 1999/5/EC

#### Communication

Maximizer to Gateway	2Ghz; IEEE 802.15
Gateway to MMU	RS485
MMU to Data Center	Ethernet (wired or 802.11)

## Tigo Energy® Maximizer™ Management Unit

② The Tigo Energy Maximizer Management Unit (MMU) communicates wirelessly with each of the Module Maximizers in an array. The MMU calculates the maximum power point of each module and relays that information to the Maximizer. The MMU can also activate the Tigo Energy® PV-Safe™ feature, which allows system owners to de-energize the system at the module level. Additionally, the MMU logs the information gathered and transmits it to the Tigo Energy data center.

## Tigo Energy® MaxiManager™ Software

③ The Tigo Energy MaxiManager is a SAAS application which provides greater system visibility with module-level granularity, alerts, maintenance reports, and many other applications. With the Tigo Energy MaxiManager software, solar projects can be kept at peak operation throughout their lifecycle. On-demand maintenance reports help crews directly target problem areas, greatly reducing time in the field and O&M costs.





## ABOUT TIGO ENERGY

Tigo Energy provides an innovative solution to maximize the power output and increase profitability of PV systems. The Tigo Energy® Maximizer™ System provides more energy, active management, and enhanced safety for systems of all sizes. Tigo Energy's patented impedance-matching technology provides the most efficient, reliable, and cost-effective solution in the industry. The industry-leading performance of the Tigo Energy Maximizer System makes it the first truly scalable solution that improves the financial bottom line of utility, commercial, and residential systems. Tigo Energy is a technology, reliability, and cost leader that will enable a wider and more rapid adoption of solar technology worldwide.



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