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Technical specifications are subject to change without notice.





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Mini-grid operators can easily implement flexible and well adjusted tariff schemes that encourage the rural customers to plan their consumption according to varying cost of electricity production. A well balanced tariff scheme can be found in the Micro Power Economy Approach.

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The Micro Utility Solution offers reliable electricity supply to rural customers in off-grid distribution grids. The customer benefits from fool-proof handling and transparent interactions of the Micro Power Smart Meter. Full cost and energy balance control is given at any time. The system is highly flexible thanks to energy trade options within the village.

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**Satisfaction of electricity customers is the basis for successful mini-grid operation.**

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## The Micro Power Smart Meter

The technical core component of the Micro Utility Solution is the Micro Power Smart Meter. It has a poly-carbonate housing and a transparent front cover combining three electricity user connections in one unit to prevent energy theft. It is tamper-proof and made for outside installation. The meter uses pre-payment smart cards and has a display for constant verification of energy balance. Users will order a certain amount of electricity and pay the relevant amount of money to the mini-grid operator who will then program the chip card accordingly. The user inserts the chip card into the Micro Power Smart meter to charge the energy onto the corresponding account. When the energy has been used up or if the permissible power is exceeded, the Micro Power Meter cuts off the respective user.

The device combines metering and limitation of energy, limitation of power as well as demand side management (disconnection of certain users in case of system overload, switching on deferrable loads like water pumps when free renewable capacity is available) based on grid frequency resulting in stable and reliable system operation. The Micro Power Smart Meter has been developed and manufactured by INENSUS GmbH and is patent pending. It comprises the following specifications:

TECHNICAL SPECIFICATIONS	MICRO POWER SMART METER
Nominal voltage	100 V - 400 V
Nominal frequency	50 / 60 Hz
max. current	30 A
Endurance	> 100 000 switching cycles
Active power measurement accuracy	2 % at 20° C
Cable connections input	1~ or 3~ micro grid connections 16 mm <sup>2</sup>
Cable connections output	up to 3 customer connections 3 x 1.5 mm <sup>2</sup>
User interaction	SmartCard reader
Liquid crystal display	2 lines of 16 digits
Grid status indication	LED
Casing material	Polycarbonate
Protection class	IP 43
Temperature range	-10° C - +70° C
Temperature range for storage	-30° C - +80° C
Dimensions	180 x 110 x 90 mm
Weight	approx. 800 g



# Micro-Grid-Control and Accounting Center

The Micro-Grid Control and Accounting Center is a handy device with an integrated SmartCard reader, a digital display and 4 buttons for the configuration and parameterization of the customers' SmartCards as well as to charge the cards with electricity credit.

It serves as reliable island grid control unit and offers statistical network evaluation of consumer behavior and distribution grid performance. A basic data encryption on the SmartCards is included. It comprises the following specifications:

TECHNICAL SPECIFICATIONS	MICRO GRID CONTROL AND ACCOUNTING CENTRE
Liquid crystal display	3 lines of 16 digits
Battery type	1100 mAh NiMh
Power supply	5 VDC (mini USB)
Interface	mini USB
User interaction	4 buttons
Casing material	PE
Protection class	IP 42
Temperature range	0° C - +60° C
Temperature range for storage	-30° C - +80° C
Dimensions	117 x 78 x 25 mm
Weight	approx. 150 g

The Micro Power  
Smart Meter

