Technical Data Sheet

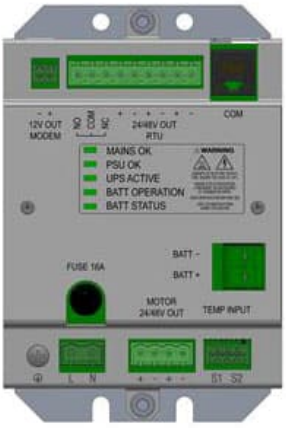
MAB1256-CB-X-V3

1040W Peak Double Input AC and DC

RECOM
AC/DC Converter

FEATURES

- Digital Power Regulation
- Integrated Battery Charger Algorithm
- Automatic Sensing of Input Voltage, Load Current and Battery Current, Multiple User Settable Parameters
- RTU/Motor VOLTAGE Settable Via MODBUS: 24V or 48V
- Maximum Battery Capacity: 200Ah
- Battery Charge Current: 8 A Max.
- Multiple I/O Protections
- Modem Remote ON/OFF
- Battery Protections:
  Reverse Polarity Connection
  Under and Over Temperature
  Overdischarge
- Charge/Discharge Cycles Counter
- Counlomb Counter
- Battery Temperature Measurement with PT1000 sensor
- Internal Overtemperature Protection





APPLICATION



SAFETY & EMC

CE RoHS² compliant 10 from 10 Reach compliant

DESCRIPTION

The MAB1256 is a microprocessor-controlled converter designed for industrial and automation applications, featuring a wide AC input voltage range of 85 to 276 Vac. It provides three independent DC outputs for MODEM, RTU, and MOTOR, supporting flexible system integration. The converter can be powered through battery only (Battery mode), through AC only (PSU mode) or from battery and AC mains (UPS mode).

Key features include digital power regulation, an integrated battery charger algorithm, and automatic sensing of input voltage, load current, and battery current. User-configurable parameters are accessible via an embedded MODBUS interface, allowing RTU/MOTOR output voltage selection between 24 V and 48 V. The device supports a maximum battery capacity of 200 Ah and a charge current up to 8 A.

Comprehensive battery protection mechanisms are integrated, including reverse polarity, under/over temperature, overdischarge, and internal overtemperature protection. Additional battery management features include a charge/discharge cycles counter, coulomb counter, and temperature monitoring via a PT1000 sensor. Remote ON/OFF control for the modem output is also provided.

The MAB1256 is engineered for reliability and flexibility, making it ideal for demanding environments requiring robust power conversion and intelligent battery management.

MODEL NUMBERING

MAB1256-CB-X-Vx

- Output Power
- Output Voltage
- Product Version
- Options

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BASIC CHARACTERISTICS				
Parameter	**Conditions**	**Min.**	**Typ.**	**Max.**
	Input			
Input AC Rated Voltage (nominal)		120VAC		230VAC
Input Voltage Range		85VAC		276VAC
Frequency		45Hz		65Hz
PFC	Nominal load	0.88		
	Battery			
Rated Battery Voltage (nominal)			12VDC	
Battery Volage Limit		10.0V		15.0V
Battery Chemistries	Lead Acid			
Battery Charging Current		0.5A		8A
Battery Capacity				200Ah
Additional Monitoring Functions	Coulomb Counter, Battery Temperature Through PT1000 Sensor (Optional), battery Operating Time Since Installation, Number of Cycles			
User Interface				
LED Display	5 LEDs Shows the Actual Status of the Unit (See Table 1)			
Mod Bus Communication	MODBUS – UART over RS485			
Output				
Motor Output	Reinforced Isolated from Grid Output Power Time Limit (See Table 2)	24VDC±10%		48VDC±10%
Modem Output	Output Current 2A Reinforced Isolated from Grid Basic Isolated from RTU / Motor		12VDC±10%	
RTU Output	Output Current 2.6A (48VDC-1.3A) Reinforced Isolated from Grid	24VDC±10%		48VDC±10%
Efficiency	Full Load, Output Power 1000W		90%	
Maximum Backup Time	USER Programmable, Up to Battery Deep Discharge Threshold			
Temperature Sensors	2x PT1000 Can Be Connected to the Unit (Optional) Reinforced Isolated from Grid Basic Isolated from RTU/Motor			

TABLE 1

LED	COLOR	STATUS
MAINS OK	Green	Mains OK
	Off	Mains NOK
PSU OK	Green	PSU OK
	Red	PSU NOK (failure detected)
UPS ACTIVE	Green	UPS Active Stand By
	Yellow	UPS in Operation
	Off	Battery Not Connected
BATT OPERATION	Green	Idle Fully Charged; SOC 100%
	Yellow	Battery in Charging
	Off	Battery Not Connected
BATT STATUS	green	Battery OK
	Red	Battery NOK

TABLE 2

VOUT	TIME [s]	DC CURRENT [A]
24VDC	0.07	30
	20	16
48VDC	0.07	15
	20	8

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RELIABILITY

Parameter	Conditions	Min.	Typ.	Max.
Life		10 Years		

EMC

Parameter	Standard
EMC Emission	CISPR 32
EMC Immunity – Enclosure Ports	IEC 61000-4-2 IEC 61000-4-8 IEC 61000-4-10 IEC 61000-4-9
EMC Immunity – Auxiliary Power Supply Ports	IEC 61000-4-3 IEC 61000-4-4 IEC 61000-4-5 IEC61000-4-6 IEC 61000-4-12

SHOCK & VIBRATION

Parameter	Standard
Vibration Sinusoidal	IEC 60068-2-6 2Hz ÷ 500Hz 20 cycles Constant Displacement ±3mm from 2Hz to 9Hz Constat Acceleration 1g from 9Hz to 200Hz Constat Acceleration 1.5g from 200Hz to 500Hz Axis X,Y,Z Unit Operational 2Hz ÷ 500Hz 20 cycles Constant Displacement ±3mm from 2Hz to 9Hz Constat Acceleration 1g from 9Hz to 200Hz Constat acceleration 1.5g from 200Hz to 500Hz Axis X,Y,Z Unit non Operational
Shock	IEC 60068-2-27 10g, 11ms, 6 Shocks/axis, 3 axis, Unit Operational 15g, 11ms, 6 Shocks/axis, 3 axis, Unit non Operational
Bumb	IEX 600068-2-27 10g, 16ms, 1000 Bumbs in Each Direction

SAFETY & CERTIFICATIONS

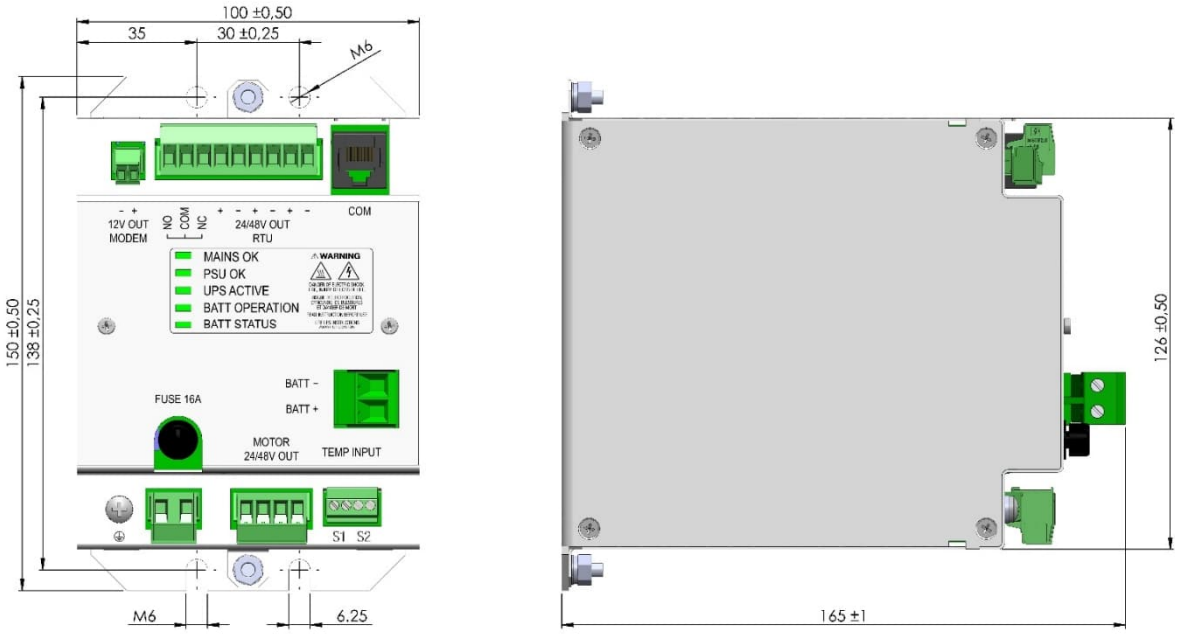
Parameter	Standard
Safety Standards	IEC/EN61010

ENVIRONMENTAL

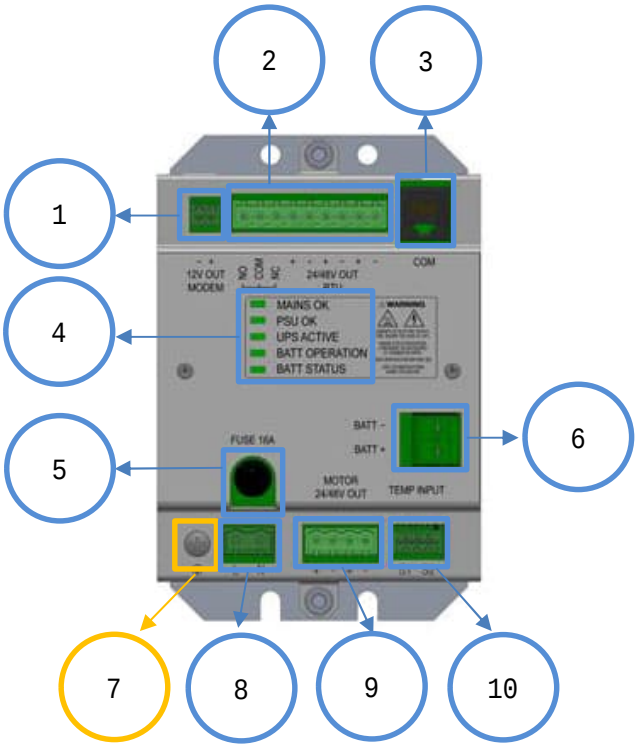
Parameter	Conditions	Min.	Typ.	Max.
Operating Temperature Range		-40°C		+70°C
Storage Temperature Range		-40°C		+85°C
Humidity	Non-Condensing	5%		95%
Pollution Degree			PD2	
Isolation Again Enclosure			2.2kVAC	
Protection Degree	EN60529 - IP20			

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CHARACTERISTIC & MECHANICAL DRAWING

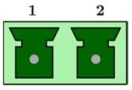
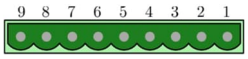
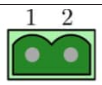
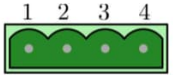
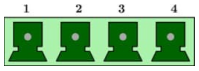


PIN CONFIGURATION AND FUNCTIONS



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PIN DESCRIPTION

Pin	Type	Description	
1	MOD	MODEM Output Connection 12VDC – 2A Connector: 1843606 Phoenix Contact Counterpart: 1840366 Phoenix Contact	 1: GND MODEM 2: +VOUT MODEM
2	RTU	Output Voltage to the RTU System 24VDC – 2.6A (48VDC – 1.3A) Connector: 1755804 Phoenix Contact Counterpart: 1757080 Phoenix Contact	 1: GND RTU 2: +VOUT RTU 3: GND RTU 4: +VOUT RTU 5: GND RTU 6: +VOUT RTU 7: Relay NC 8: Relay COM 9: Relay NO
3	UART	Communication port, Mod-bus Protocol Connector: RJ45	
4	LED Display	See Table 1 on page 2	
5	FUSE	16 AC Fuse Protection	
6	BAT	Battery Terminal Connection Connector: 1766770 Phoenix Contact Counterpart: 1804904 Phoenix Contact	 1: Positive Battery Terminal 2: Negative Battery Terminal
7	P.E.	Protective Earth Connection	M4 x 1 Screw
8	INPUT	Input Connector for AC Line Connector: 1766770 Phoenix Contact Counterpart: 1766990 Phoenix Contact	 1: Line AC Input 2: Neutral AC Input ! Don't' swap Line and Neutral input!
9	MOTOR	Motor Output Connection Connector: 1755752 Phoenix Contact Counterpart: 1757035 Phoenix Contact	 1: +Vout 2: GND 3: +Vout 4: GND
10	TEMP	Temperature Sensor Connection Connector: 1843622 Phoenix Contact Counterpart: 1863178 Phoenix Contact	 1: PTC2 2: PTC2 3: PTC1 4: PTC1

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BATTERY CABLE RECOMMENDATIONS

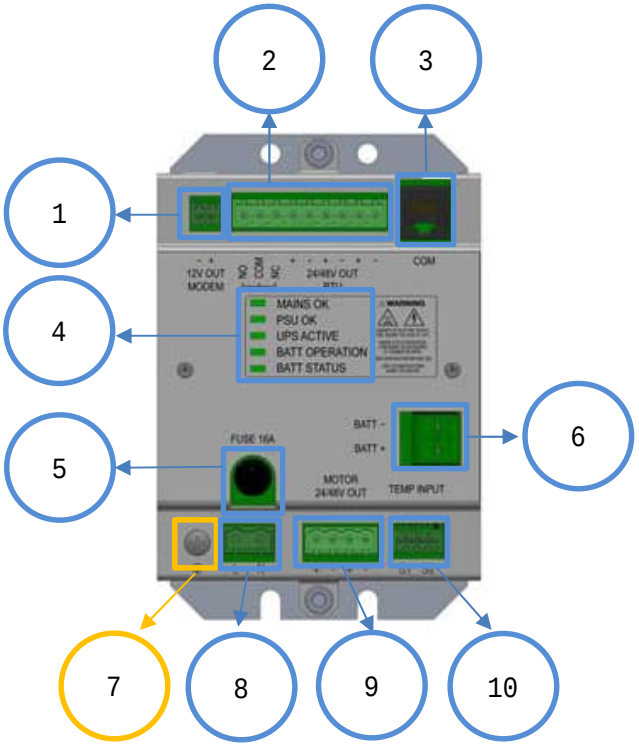
The UPS must be connected to a battery with nominal voltage of 12VDC. The recommendations for battery cable size and length are the following:

Result		10.8 cut-off					0.8 meter
		4 Sq mm	6 Sq mm	8 Sq mm	10 Sq mm	12 Sq mm	16 Sq mm
720W	30A	6.31	9.79	10.04	10.18	10.28	10.40
600W	25A	9.78	10.20	10.40	10.53	10.61	10.71
550W	23A	9.98	10.36	10.55	10.67	10.75	10.84

Result		11.5 cut-off					0.5 meter
		4 Sq mm	6 Sq mm	8 Sq mm	10 Sq mm	12 Sq mm	16 Sq mm
720W	30A	10.2	10.30	10.44	10.53	10.59	10.66
600W	25A	10.38	10.62	10.74	10.82	10.86	10.93
550W	23A	10.54	10.77	10.88	10.95	10.99	11.05

SYSTEM DESCRIPTION

MAB1256-CB-X is a microprocessor-controlled converter with a nominal AC input voltage 120/240VAC There are three DC outputs: MODEM, RTU and MOTOR outputs (see list below for more details). The converter charges a battery, whose voltage is in the range 10.5 ÷15VDC, 8A

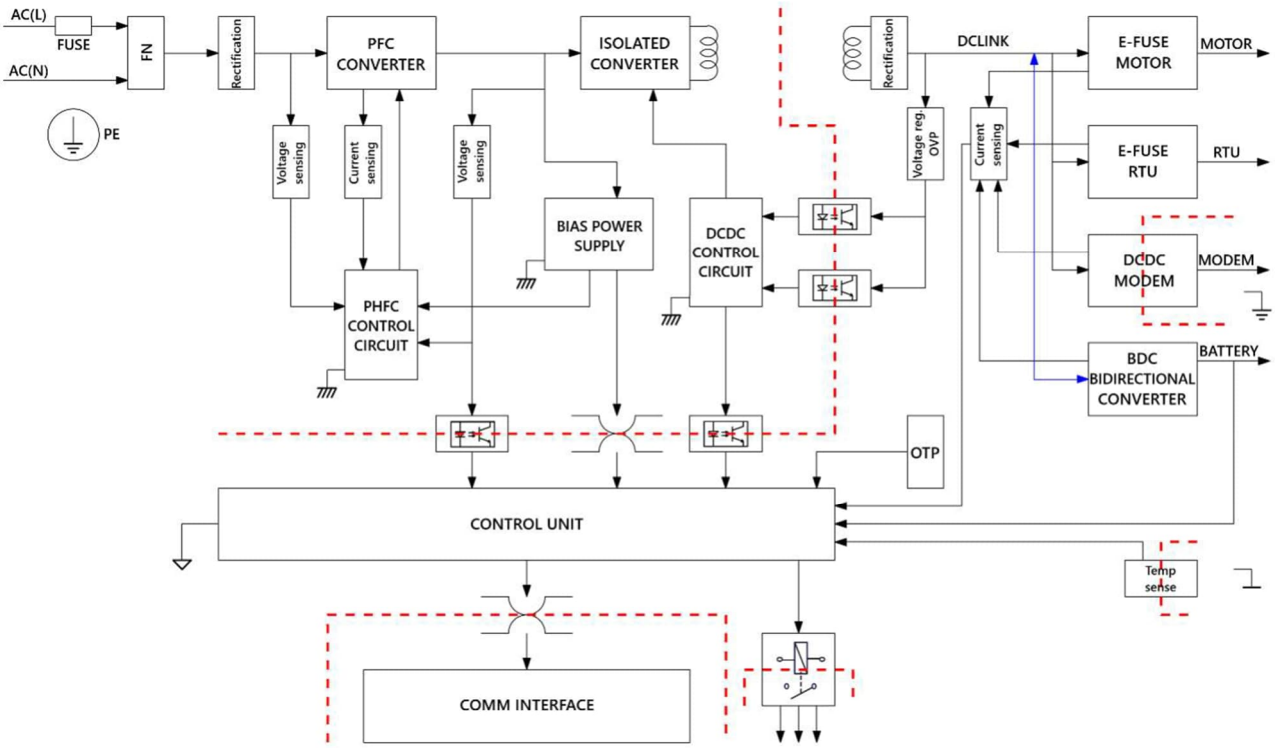


1. MODEM Output Connection: Two poles are provided for MODEM output connection. 12VDC - 2A.
2. RTU Output Connection: Six poles are provided for MODEM output connection and three poles for relay dry contacts (a relay is present for remote monitoring). 24VDC - 2.6A (48VDC - 1.3A)
3. UART Port: Used for remote monitoring and controlling. Firmware update is also possible through UART connection.
4. Alarm LED Indicator: there are 5 alarm LED indicators
5. FUSE 16A: For Input Protection
6. BATTERY Connection: Two poles are provided for battery connection. This must be connected to the battery. Although the unit is protected, please respect the correct polarity
7. PE Connection
8. Input Connection: Two poles are provided for AC input connection. 110V - 240VAC
9. MOTOR Output Connection: Four poles are provided for MODEM output connection

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10. Temperature Sensor Connection: Used to connect two PT1000 temperature sensors to measure the battery temperature for protection and temperature compensated charge method. This is an optional feature.

BLOCK DIAGRAM



MAB1256-CB-X is a power supply with UPS function. The input voltage is continuously monitored by the microprocessor. In the event of a power failure, the battery provides power to the outputs. It includes a battery charger capable of charging batteries with a rated 12V voltage and able to deliver a charge current up to 8A. The product offers additional features to improve the performance and the reliability of the system, which are described below.

EMBEDDED USER INTERFACE

- MODBUS communication for remote monitoring and configuration (reinforced isolation)
- LED display to immediately capture the status of the unit

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