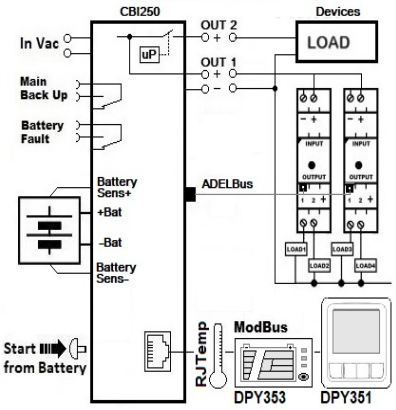
# CBI2501224A ALL In One


- **Input: Single-phase 100 – 240 - 277 Vac / 140 – 340 Vdc**
- **Output Selectable Load: 12 Vdc 10A; 24 Vdc 10A**
- **Two output: 1 Continuous, 1 Dynamic: On/Off by Modbus**
- **Output Battery charging: 12 Vdc 10A; 24 Vdc 10A**
- **Two load outputs: one static; one dynamic for: On/Off, Dimmer (LED, DC brush motors), Fuse Breaker, PC shutdown and more**
- **Modbus RTU for Monitoring, Configuration, History and Alarms.**
- **ADELBus: integrated monitoring and control of ADELSystem devices such as MRF10x e-Fuses and display.**
- **Suitable for the following battery types: Open Lead Acid, Sealed Lead Acid (AGM/VRLA), lead Gel, Li-Ion and NiCd/NiMH**
- **Battery Care: Automatic diagnostic of battery state-of-charge (SoC) and state-of-health (SoH).**
- **Charging curve IUoU, constant voltage and constant current.**
- **Five charging levels: Recovery, Boost, Absorption, Float (Forced trickle / Forced float / Auto float-trickle), and Refresh**
- **Battery purification for battery reinvigoration**
- **Protected against short circuit and reversed polarity**
- **Signal output (contact free) for: discharged or damaged battery, Mains or Back-up, rectifier failure**
- **Protection degree IP20 - DIN rail; Space saving**

**Technical features**

Thanks to the All-In-One units "DC-UPS" it is possible to optimize the power management, today implemented with two Outputs: one Dynamic and one Static. The available power is automatically shared between load and battery. Supplying power to the load is the top priority of the unit: it is not necessary to double the power of the device, because also the power going to the battery will be steered to the load if the load so requires. The maximum available current at the load output is twice the value of the device rated current In. We call "Battery Care" the concept based on algorithms that implement rapid and automatic charging, battery charging optimization during time, flat batteries recovery and real time diagnostic during installation and operation. Battery faults such as sulphated battery, battery cells in short circuit, accidental battery connection with reversed polarity, disconnection of the battery and more can easily be detected and removed with the aid of the blink code of the diagnosis LED both during the installation and normal operation. The continuous monitoring of the battery status reduces battery damage risk and allows a safe operation in a permanent and unattended system. The battery state-of-health is continuously monitored providing an early diagnostic of battery wear thus allowing a preventive maintenance to be undertaken. Each device is suited for all battery types: by means the user interface it is possible to set predefined charging profiles for Open Lead Acid, Sealed Lead Acid, Gel, NiCd/NiMH with five charging stages, Recovery, Bulk/Boost, Absorption, multimode Float and Refresh, that can be customized by the user using the Modbus RTU interface. Periodic purification can be configured to regularly exercise the battery thus helping prevent sulphation and wear. A rugged casing with bracket for DIN rail mounting provides IP20 protection degree. The CBI250A is a feature-rich and heavy-duty unit which is extremely compact in size and very a cost-effective power management solution.

**Power Management and controls**

The new line CBI250 provide two Outputs: the first is a normal output connected to the internal power supply, the second output is controlled by the internal device and it is configurable, we call "Dynamic Output". This Dynamic Output can be configured via Modbus RTU as Fuse Breaker, Soft Start, Fade-in and Fade-out, On/Off, PC shutdown and much more.

**Interconnections**

The CBI250 is equipped with a CAN-based ADELBUS interface which allows the plug-and-play connection of Adelsystem devices such as electronic fuses and displays enabling their control and monitoring. Moreover, an electrically-isolated RS485-based standard Modbus RTU interface allows a PC or RTU to monitor and control the CBI250 along with the ADELBus devices connected to it. Such integration with all the accessories provided by ADELSYSTEM allows the development of a truly independent system for electrical continuity. At the same time, it allows monitoring and control all parameters in the system by means of application tools. ADELSystem allows you to implement very simple but sophisticated monitoring and control for your energy system and opens your mind to new ways to approach your applications.

**Norms and Certifications**

In Conformity to: EN60950 / UL60950-1 and CSA C22.2 No. 60950-1-07 (Information Technology Equipment Safety Part1: Safety EN IEC 62368-1: 2014/AC:2015; EN54-4 Fire Detection and fire alarm systems; 89/336/EEC EMC Directive; 2014/35/UE (Low Voltage); DIN41773 (Charging cycle); Emission: IEC 61000-6-4; Immunity: IEC 61000-6-2. CE.

**Input Data**

| | |
|---|---|
| Nominal Input Voltage Vac | **100 – 240 – 277** |
| Input Current at 115 – 240 – 277 Vac (A) | **2.4 – 1.2 – 1.3** |
| Voltage range Vac | **85 – 305** |
| Voltage range Vdc | **110 – 340** |
| Input Current at 110 – 340 Vdc (A) | **2.3 – 0.8** |
| Inrush Current (Vn – In nom. Load) $I^2t$ | **≤ 90 A ≤ 5 msec** |
| Power Factor, typ. at full load | **> 0.95** |
| Frequency | **47 ÷ 63 Hz** |
| Input Current (115 – 240 – 277 Vac) | **5.5 – 3.0 – 2.0A** |
| Internal fuse (not replaceable) | **8.0 A** |
| External Fuse (recommended) MCB | **10 A curve C** |
| **Output Data (internal power supply)** | |
| Select Output Voltage 12 or 24 Vdc. | **By push button** |
| Continuous current (without battery) | **Iload=In** |
| Continuous current ( With battery) Iload= In+ Ibatt | **2 x In** |
| Max. current Output Load (Main + Battery) Iload (4 sec.) | **3 x In max.** |
| Max. current Output Load (Back Up) Iload (4 sec.) | **2 x In max.** |
| Start From Battery Without Mains (Remote Input Control) | **RTCONN (cable) Push Button** |
| Time Buffering; min (switch output off | **0.5; 2.5; 10; 15;** |

| | |
|---|---|
| without main input) | **20; 30; 45; 60; ∞** |
| Efficiency 240 Vac 24Vdc (rated current) | **≥ 93 %** |
| Residual Ripple | **≤ 80 $mV_{pp}$** |
| Turn-On delay after applying mains voltage | **1 sec. (max)** |
| Start up with Strong Load (capacitive load) | **Yes, Unlimited** |
| Dissipation power load max (W) | **< 20** |
| Short-circuit protection | **Yes** |
| Over Load protection | **Yes** |
| Over Voltage Output protection | **Yes (typ. 35 Vdc)** |
| Overheating Thermal protection | **Yes** |
| **Load Output 24 Vdc (Default)** | |
| Output voltage (at In) | **22 - 28.8 Vdc** |
| Nominal current In = Iload | **10 A ± 5% In** |
| Threshold alarm Battery almost flat | **20 – 21 Vdc batt** |
| Protections against total discharge | **19 – 20 Vdc batt** |
| **Load Output 12 Vdc (Deep Switch selection)** | |
| Output voltage (at In) | **10 - 14.4 Vdc** |
| Nominal current In = Iload | **10 A ± 5% In** |
| Threshold alarm Battery almost flat | **10 – 11 Vdc batt** |
| Protection against total discharge | **9 – 10 Vdc batt** |
| **Battery Output** | |
| Boost-Fast charge Switch Configuration 20°C (V/cell) | **Lead Acid: 2.40**<br>**Ni-Cd: 1.45**<br>**Li-ion: 3.65** |
| Float Charge Switch Configuration 20°C (V/cell): | **Lead Acid: 2.23; 2.25;2.27;2.30**<br>**Ni-Cd: 1.4**<br>**Ni-Mh:1.5**<br>**Li-ion: 3.45** |
| Batteries for 24 Vdc | **N°2 x 12V in series** |
| Batteries for 12 Vdc | **N°1 x 12V** |
| Max.Time Boost–Bulk charge (Typ. at IN) | **15 h** |
| Min.Time Boost–Bulk charge (Typ. at IN) | **1 min.** |
| Charging current max Ibatt | **In ± 5%** |
| Charging current limiting Iadj | **0.2 ÷ 100 % / Ibat** |
| Recovery Charge 12V / 24Vdc | **2–11.2V/2–22.5V** |
| Reverse battery protection | **Yes** |
| Battery sulphation check | **Yes** |
| Detection of shorted cells | **Yes** |
| Battery sense input for 4-wire connection | **Yes** |
| Quiescent current on battery | **≤ 5 mA** |
| Charging Curve automatic: IUoU | **5 stages** |
| Remote Input Control (RTCONN cable) | **Boost /Float** |
| **Signal Output (free switch contacts)** | |
| Mains or Backup Input Power | **Yes** |
| Fault | **Yes** |
| (The Outputs can be reconfigured on the project Needs) | |
| **Type of Signal Output Contact** | |
| Dry Contact. Current can be switched (EN60947.4.1): Max: DC1: 30 Vdc 1 A; AC1: 60 Vac 1A (Resistive load ) Min: 1mA at 5 Vdc (Min permissive load) | |
| Main or Backup Input Power | **C / NO** |
| Fault | **C / NO** |
| **Signal Input / Output (RJ45)** | |
| Temp. Comp. Battery (with external probe) | **RJ Temp (cable) Aux 1** |
| Remote monitoring data: Protocol: | **RJ45: RJ Temp (cable) Modbus RTU, DPY351, DPY353** |
| **Climatic Data** | |
| Ambient temperature (operation) | **-25 ÷ +80°C** |
| De-rating $T^{amb}$ > 60°C | **- 2.5% (In) /°C** |
| Ambient temperature Storage | **-40 ÷ +85°C** |

| | |
|---|---|
| Humidity at 25 °C no condensation | **95% to 25°C** |
| Altitude: 0 - 6000m / 0 – 20000ft | **No restrictions** |
| Over voltage category IEC62103, EN50178 | **III Altitude < 2000m** |
| Over voltage category IEC62103, EN50178 | **II Altitude > 2000m** |
| Cooling | **Auto convection** |
| **General Data** | |
| Insulation voltage (IN/OUT) | **4000 Vac** |
| Insulation voltage (Input / Earth, PE) | **2500 Vac** |
| Insulation voltage (Out Load & Battery / Earth, PE) | **1000 Vac** |
| Insulation voltage (Out Load & Battery / Fault System & Main or Back Up terminal) | **1000 Vac** |
| Modbus RTU interface insulation | **Functional only** |
| Leakage Current | **< 5mA** |
| Protection Class (EN/IEC 60529) | **IP20** |
| Reliability: MTBF IEC 61709 | **> 300000 h** |
| Pollution Degree Environment | **2** |
| Input and output Connections: terminal Blocks Push-in type | **2 mm (24–12AWG)** |
| Signal Connections: terminal Blocks Push-in type | **0.8 mm (24–20AWG)** |
| Protection class (PE Connected) | **I, with PE** |
| Dimensions (w-h-d) | **50x135x135 mm** |
| Weight | **0.95 kg** |