Efficient Current Sensing for Industrial and Automotive Busbar Systems

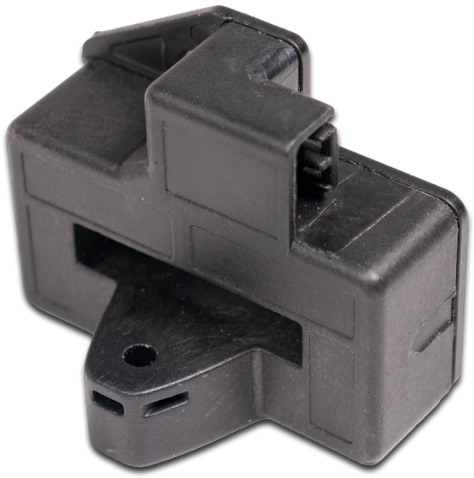
The series CTS-CS-BAX-20 is a current sensing module from CTS Corporation, specifically designed for integration into electrical systems based on busbars. Utilizing Hall-effect measurements, this busbar mount current sensor will provide highly accurate and non-intrusive readings of both AC and DC currents up to 1500 A. The series CTS-CS-BAX-20 is available in four off-the-shelf versions, but can be customized to unique specifications as well.

Busbar System Current Monitoring

Busbars are used far and wide in all manner of electrical systems. Essentially serving as a central hub for multiple electrical connections, busbars offer advantages such as low electrical losses, high power density to size ratio design simplicity and easy installation and maintenance.

Having an integral role in countless systems, distributing power from a central source such as a generator or transformer to multiple circuits, busbars should always be vigilantly monitored. Optimized current flow through these conductors will translate to an equally optimized performance of all sub-systems connected to them. And at the same time, sub-optimal performance at the busbar level will cascade throughout all adjacent circuits, potentially hampering multiple system functions severely.

To ensure proper operation of busbar systems in the mid-to-high current range, CTS is launching the series CTS-CS-BAX-20, a range of easily installable and highly accurate busbar mount current sensor modules.

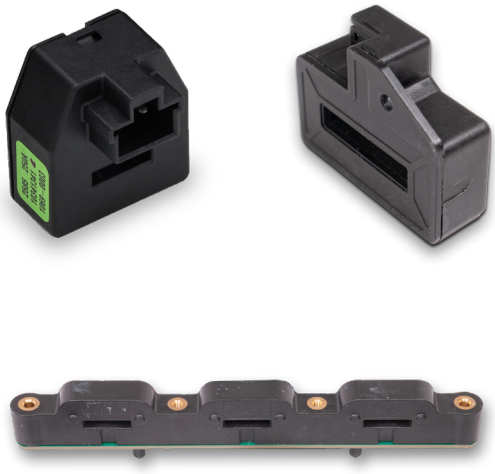


The CTS-CS-BAX-20 busbar mount current sensor.

CTS-CS-BAX-20 Busbar Mount Current Sensor - How Does It Work?

The series CTS-CS-BAX-20 busbar mount current sensor is an off-the-shelf solution from CTS Corporation, designed to improve the operation of electronic systems that utilize busbars. By closely and accurately monitoring the flow of current through the busbar, system performance can be optimized, and potential malfunctioning can be detected.

As an off-the-shelf option, the CTS-CS-BAX-20 is calibrated to one of four current ranges, up to 1500 A. The full sensor module consists of an open loop Hall-effect sensor, encased in soft ferromagnetic shielding with high permeability to absorb magnetic fields and protect sensing accuracy.



The busbar mount sensor is an off-the-shelf product, but CTS can accomodate custom design requests too.

Non-intrusive, galvanically isolated and small of size, the busbar mount current sensor is easy to install and will immediately provide highly accurate readings of both AC and DC currents. It also features excellent output linearity as well as low thermal offset and sensitivity drift, allowing it to operate as intended across a wide temperature spectrum.

The CTS-CS-BAX-20 is easily assembled and mass produced thanks to the modular design approach that also grants customers the choice between various preset building blocks. This ensures that our lead times remain as short as possible without diminishing the design flexibility and broad applicability of the product.

CTS-CS-BAX-20 Busbar Mount Current Sensor					
Version	**Opening Size (WxH)**	**Current Range**	**Sensitivity (Typical)**	**Operating Temperature Range**	**Linearity Error**
CTS-CS-BAX-20-0250-H	20x6mm	250 A_{PK}	8.00 mV/A	-40°C to 125°C	1%I_P
CTS-CS-BAX-20-0500-H	20x6mm	500 A_{PK}	4.00 mV/A	-40°C to 125°C	1%I_P
CTS-CS-BAX-20-1000-H	20x6mm	1000 A_{PK}	2.00 mV/A	-40°C to 125°C	1%I_P
CTS-CS-BAX-20-1500-H	20x6mm	1500 A_{PK}	1.33 mV/A	-40°C to 125°C	1%I_P

Ideal Applications for the Series CTS-CS-BAX-20 Busbar Mount Current Sensor

Electric Vehicles (EVs) and Battery Energy Storage Systems (BESS)

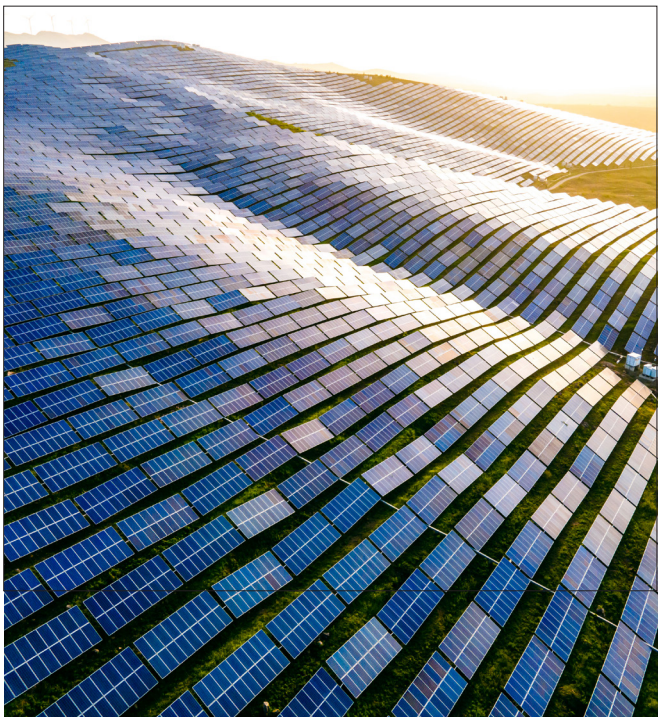
Current monitoring in EVs and BESS is essential for ensuring safety, efficiency, and performance. Busbars serve as the primary power distribution solution in these applications due to their high current-carrying capacity, compact design, and thermal efficiency. Integrating current sensors directly onto busbars enables real-time monitoring of power flow, helping to detect faults, prevent overheating, and optimize energy usage. In EVs, busbar-based current monitoring ensures battery pack safety, protects against short circuits, and enhances fast-charging capabilities. In BESS, it enables load balancing, prevents energy losses, and improves overall system reliability. Compared to traditional cable-based monitoring, busbars provide lower resistance, reduced heat generation, and easier scalability. Integrating our busbar-mount current sensors into automotive traction inverters delivers precise, real-time monitoring of high-voltage power stages. This seamless integration boosts inverter efficiency and reliability, supporting higher power density and longer EV range.

Data Centers and IT Infrastructure

Busbar-based power distribution is increasingly preferred over traditional cable systems due to its compact design, lower electrical losses and scalability. Integrating current sensors directly onto busbars enables real-time power tracking, helping to prevent overloads, optimize energy consumption and improve uptime. By monitoring current flow, data centers can enhance power usage effectiveness, detect faults before failures occur and reduce costs. Busbars also provide better heat dissipation, reducing the risk of hotspots in high-density server environments. In addition, busbar-based monitoring allows for easier expansion, modular plug-in connections and simplified maintenance. As data centers grow to meet increasing cloud and AI demands, efficient current monitoring on busbars is essential for maximizing performance, sustainability and security.

Ideal Applications for the Series CTS-CS-BAX-20 Busbar Mount Current Sensor

Renewable Energy (Solar and Wind Power Systems)



In renewable energy power systems, such as solar farms, wind energy and battery storage, busbar-based power distribution plays a crucial role in ensuring efficient and reliable energy flow. Integrating current sensors directly onto busbars enables real-time monitoring of power generation, storage, and distribution, helping to detect faults, prevent overloads, and optimize system performance.

In solar and wind power systems, current monitoring ensures maximum power output, grid stability and fault detection, preventing downtime and equipment failures. The scalability and modularity of busbar-based monitoring make it ideal for expanding renewable energy infrastructure, supporting the transition to a more sustainable and resilient power grid.

About CTS Corporation

CTS is a leading designer and manufacturer of products that Sense, Connect, and Move. We manufacture sensors, actuators and electronic components in North America, Europe and Asia, and provide solutions to OEMs in the aerospace & defense, medical, industrial, communications, information technology and transportation industries.

Off-the-shelf solutions from CTS combine the impeccable product quality of a well-established and renowned western electronics manufacturer with highly competitive price points and short lead times. The busbar mount current sensor is a ready-made, yet highly accurate solution with the flexibility of implementation to fit a broad spectrum of applications across various industries and markets. It can be ordered through CTS' global network of product distributors and be shipped to anywhere in the world in a matter of days.

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