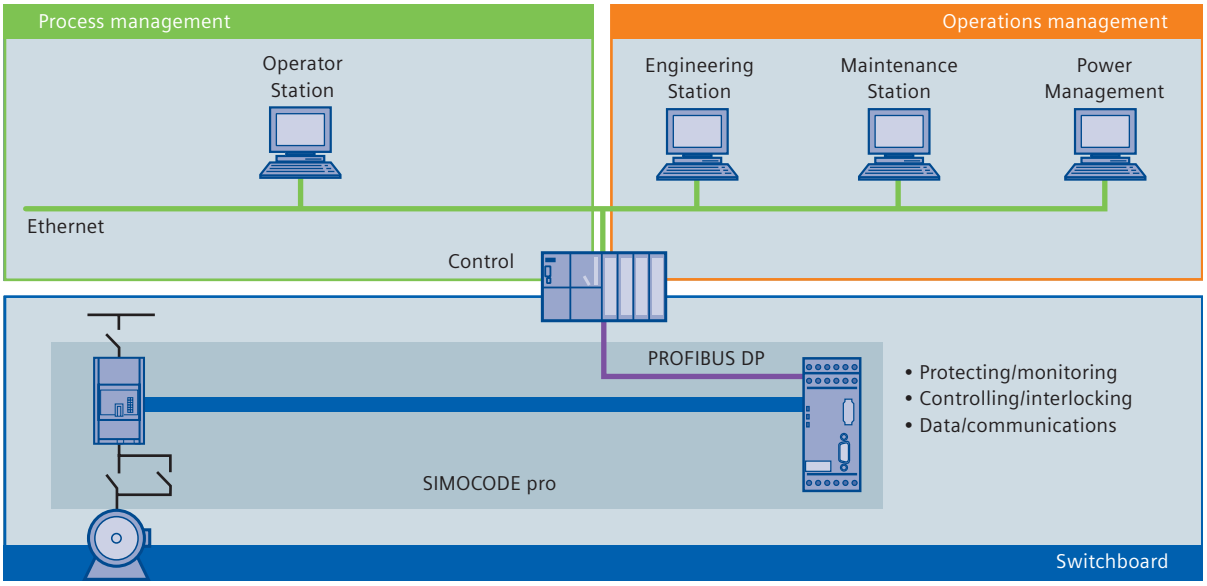
tiastar™ with PROFIBUS-DP Communications

Motor Control Centers

Answers for industry.

SIEMENS



Totally Integrated Automation

When the tiastar MCC is integrated into a PCS7 DCS or S7 PLC system, users can take advantage of quick commissioning and pre-configured displays for the information from several of the units.

Motor Control Centers

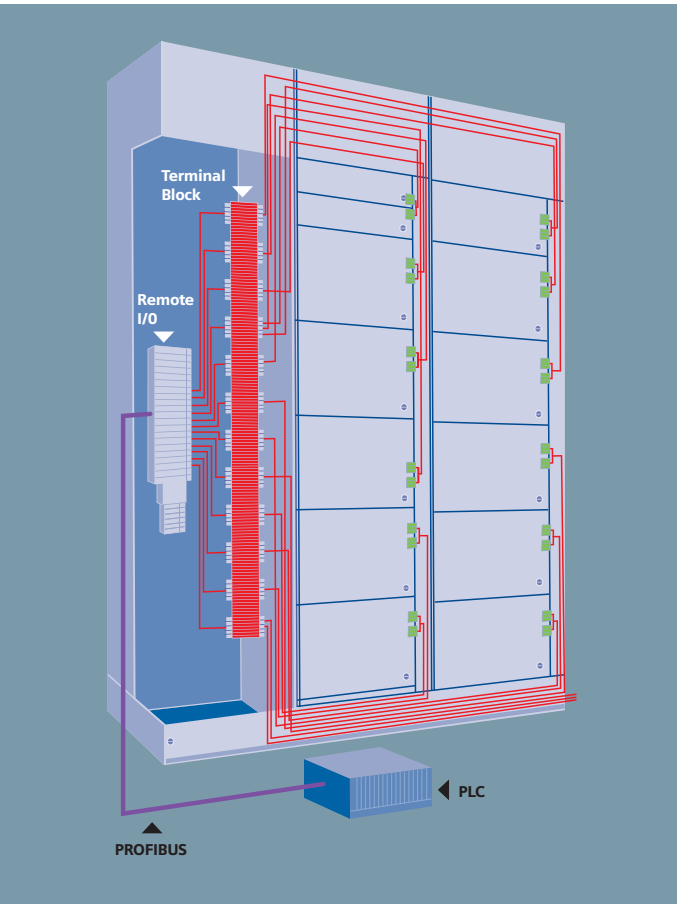
Today's motor control centers have come a long way since the first units were introduced back in 1937 to do little more than save floor space by placing the starters in centralized cabinets. Modern processes and facilities now dictate that motor control centers additionally display a high level of intelligence as well. They must deliver vital operating information; plus provide automation features, optimal control, and critically fast communications to meet even the most demanding applications. Ideally, too, the best-of-the-best must also save installation time and money.

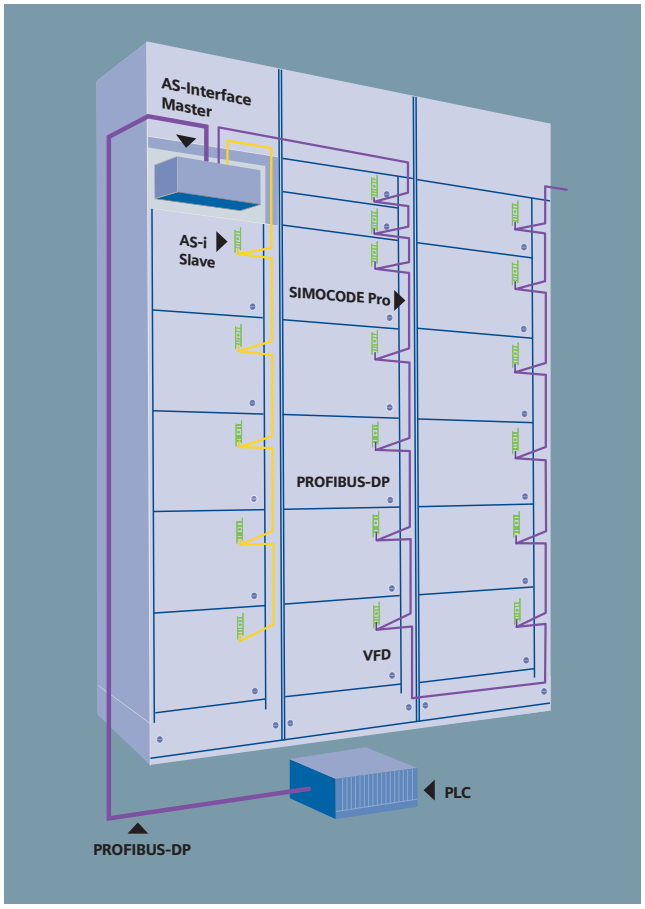
Introducing the Siemens tiastar Motor Control Center with PROFIBUS-DP communications. It does all the above and more. Combining heavy-duty industrial construction and user friendly features, these intelligent units deliver detailed diagnostics and control by communicating with the starter units via PLC/DCS. This means the overload relays of the starters, linked to the PLCs, are now able to deliver detailed motor management data at speeds previously unheard of. PROFIBUS-DP, the backbone of the system, not only has the performance bandwidth to communicate the large packets of data that a process demands, but also the ability to meet the stringent speed requirements.

Gone are the days when a motor control center obtained its data through hardwired feedback and controls. The tiastar Motor Control Center eliminates the hardwiring and thus the need for additional items like transducers and analog input modules. Of course, with elimination of the hardwiring requirement, the commissioning time is reduced as well. That's not all. Interfacing to the Siemens S7 and PCS7 systems over the tiastar Motor Control Center's fast communication bus, increases uptime through detailed status and information feedback from the driven process loads.

Detailed Diagnostics

Utilizing the SIMOCODE® Pro Motor Management System, users now have access to detailed feedback information to continually monitor their process. In addition, detailed diagnostics and advanced warning capability from the starter units allow for predictive maintenance of motors, thus avoiding unexpected downtime. With the SIMOCODE Pro V installed within the tiastar MCC, users now also have access to power monitoring information directly from each connected motor.





Traditional Hard Wired Control in an MCC

Many applications of MCCs involve connection of PLCs or I/O to combination motor control units and various related devices for the purpose of feedback and control of the system. Distributed I/O and conventional PLC wiring can involve the routing and connection of hundreds of wires as shown in the illustration here, and yet provide only basic feedback and control for each motor control unit. This traditional wiring method requires extensive time and cost for installation, terminations, and troubleshooting of individual wiring connections.

Enhanced Control and Feedback Using PROFIBUS-DP Communication

Using PROFIBUS-DP communication within the motor control center greatly simplifies traditional I/O wiring, while providing more detailed process information to the PLC system. PROFIBUS-DP is an open protocol that is proven and in operation worldwide over a wide range of applications. Within the motor control center, PROFIBUS-DP is connected directly to a motor management system, variable frequency drive, reduced voltage soft-start, circuit breaker, or power meter, and communicates large data packages of information at high speed to the PLC. In addition, AS-Interface is an additional communications network that can be used for bit level data transfer to remote I/O relays, and easily integrate into the upstream PROFIBUS-DP network. The result is simplified wiring, more available information on the process, and reduced time for troubleshooting.

Motor Control Center

Siemens magnetic trip circuit breakers

Door mounted, operator panel for SIMOCODE Pro

PROFIBUS-DP Communications connected to each intelligent device

MM4 variable frequency drive with PROFIBUS-DP communication port

AS-Interface slimline module

FVNR starter installed with SIMOCODE Pro V

3RW40 and 3RW44 reduced voltage electronic soft starters

Door mounted keypad for MM4 variable frequency drives

Higher Performance
Due to the inherent design of the PROFIBUS-DP network, communication speeds are much faster than other fieldbus networks on the market, and allow for larger data packets to be communicated between each started unit and the upstream control processor. In addition, redundant systems can be implemented by connecting the tiastar MCC to redundant S7-400® PLC systems available from Siemens.

Flexibility
The tiastar MCC allows the flexibility to configure individual units to communicate bit level data or large bandwidth data packets. Whether the need is for low level communications, or full diagnostic and logic capabilities, Siemens tiastar MCC has a solution for the application. Utilizing AS-Interface Slimline Modules in a starter bucket allows for bit level feedback and control between the starter and the PLC, such as ON/OFF status, trip status, breaker status, and ON/OFF control. When higher level diagnostics and feedback are required, the modular design of the SIMOCODE Pro can allow a user to customize the information available at the PLC/DCS.

WL Circuit Breakers

PAC3200 Power Meter

AS-Interface Slimline Modules

Greater Functionality

The tiastar MCC with PROFIBUS-DP Communications can allow for automated control of a large variety of different unit types, including FVNR, FVR, 2-speed, reduced voltage soft starts, variable frequency drives, and power monitoring. In addition, the SIMOCODE Pro Motor Management System has expanded control, I/O, and diagnostic capability to simplify a wide range of motor control applications.

Siemens tiastar Motor Control Centers are packed with components and features to offer optimal motor control, communications, monitoring, protection, and automation interfacing. The WL Circuit Breakers offer integrated communications over PROFIBUS to provide real-time data on breaker status and power utilization. Detailed power monitoring is available with PROFIBUS-DP communications via the PAC3200 Power Meter. Typically, this is installed at the incoming power supply to the tiastar Motor Control Center. Its monitoring information capabilities can be extended to the overall MCC line-up via transmitted data over the PLC/DS network.

Bit level communication requirements between the PLC/DCS and starter units can be provided by placing AS-Interface Slimline I/O module in individual MCC units to reduce inter-connection wiring to the PLC. The modules communicate over an AS-Interface network to an AS-Interface master. The information is sent directly to the connected PLC via the high-level PROFIBUS-DP network.

Central to any motor control center, of course, are its starters. The SIRIUS® 3RW44 reduced voltage electronic soft starters are now available in tiastar Motor Control Centers in sizes ranging from fractional to 800HP. They can be easily integrated to the PROFIBUS-DP network via an optional communications interface. These units can be parameterized, controlled, and diagnosed remotely by the connection to the PROFIBUS-DP network.

SIRIUS 3RW44 Reduced Voltage Starters

MM4 and 6SE70 Variable Frequency Drives

SIMOCODE Pro C and SIMOCODE Pro V

Space savings are realized, too, when the same housing that encloses the starters can also house the electronic motor drives that are typically integral to a process or operation. The tiastar Motor Control Centers accommodate this need for Siemens full line of MM4 and 6SE70 variable frequency drives. Available up through 250HP for constant torque loads, the variable frequency drives can be readily interfaced with PROFIBUS-DP allowing the user to get the status of the system, as well as control speed and other process parameters.

Automation interfacing for tiastar Motor Control Center units is easily accomplished by linking either SIMOCODE Pro C or SIMOCODE Pro V modular motor management systems to the high-level automation system by means of PROFIBUS-DP. Designed for constant speed motors, these modular units implement all the motor protection and control functions, determine operational, diagnostic and statistical data, plus organize communications data between the automation system and the motor feeder. In addition, SIMOCODE Pro V has power monitoring functionality (Amperes, Voltage, Power Factor (cos phi), Active Power) that can be coordinated with the control logic for loss of load tripping.

Siemens provides these solutions through our 400,000 employees to millions of customers and hundreds of thousands of suppliers and partners in more than 190 countries. That means you are selecting a long term partner, who can deliver globally and has the market position and tradition of innovation to provide best in class solutions.

"The tiastar Smart MCCs, communications via PROFIBUS, and our experience with Siemens automation technology have eliminated plant downtime and saved labor and material costs in excess of $150,000 annually."

Thomas Roe,
Maintenance Supervisor
Arizona Chemical
(a division of International Paper)

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