

Application Note

How to easily convert your DECS-400 to DECS-450

The DECS-400 Digital Excitation Control System (Figure 1) was released in 2005 and was Basler Electric's second generation of digital controller that worked with an external rectifier bridge. The DECS-400 gained immediate acceptance in the utility and industrial markets for voltage regulator and static exciter applications ranging from 1 MW to more than 800 MW with dc current levels ranging from 20 Adc to 2,500 Adc. It has been applied to steam turbine generators, gas turbine generators, hydro turbine generators, diesel engine generators, and even synchronous condensers and motors.

The DECS-400 was the flagship product in Basler excitation systems for many years. The feature-rich DECS-400 controller included five operation modes:

- Automatic Voltage Regulation
- Field Current Regulation (Manual)
- Field Voltage Regulation (Manual)
- Var Regulation
- Power Factor Regulation

It also was equipped with an Over Excitation Limiter (OEL), Under Excitation Limiter (UEL), Stator Current Limiter (SCL), Volts Per Hertz Limiter, and Reactive Power Limiter, along with many other protection functions. The event recording and sequence of events record features have helped users during commissioning and troubleshooting events. The DECS-400 used a Proportional-Integral-Derivative (PID) control scheme to ensure stability for all load conditions. When a PSS was needed, the customer simply selected the PSS from the style chart and it was integrated in to the DECS-400, eliminating the need for a separate box. The PSS function eliminates small frequency oscillations through a positive damping provision.

The DECS-450 is the next advancement in Basler Electric's long record of innovation. The release of the DECS-450 controller (Figure 2) introduces the latest innovations and feature/functionality set available on the market today.

This application note discusses the DECS-400 to DECS-450 conversion. Basler has made the conversion as simple as possible.



Figure 1: DECS-400 Digital Excitation Control System



Figure 2: DECS-450 Digital Excitation Control System

The Upgrade Process

The upgrade process was designed to be easy and pain-free. The DECS-450 fits in the same cutout and mounts the with the same hardware as the DECS-400. It interfaces with the firing circuit identically and uses the same sensing, power, and I/O. It is easily configurable with BESTCOMSPlus®. The Field Isolation Transducer used with DECS-450 (9372900105) fits in the same footprint and has the same mounting.

Transferring settings files can be difficult when upgrading from one unit to another. Because of the many updated and additional features in the DECS-450, it is not possible to update the entire list of settings; however, Basler does provide a software tool that converts the PID and Gain values from the DECS-400 to the DECS-450. The conversion tool is resident in the BESTCOMSPlus software. This software also provides additional benefits and functionality like drag-and-drop programmable logic, configurable

protection, and many more advancements.

A transition plate is available that can be incorporated onto the DECS-450 that matches the terminal locations on the DECS-400. Order Basler part number 9597106100.

As described in this Application Note, the upgrade process is designed to require minimal effort. The information needed for the upgrade process is the control power supply rating and whether the integrated PSS option

will be used. To discuss your application and upgrade information, contact your local sales representative/distributor or Application Specialist. You can find contact information at www.basler.com/support.

For More Information

For information on Basler's complete range of exciter solutions, visit the download section at www.basler.com to access product documentation, Application Notes, and Technical Papers.

DECS-450 Advantages

Upgrading your excitation controller to a DECS-450 increases the life of your excitation system and provides your system with many features as detailed below.

Control Mode: Field Voltage Regulation	• Dual setpoints selectable via logic	• RS-485 with Modbus RTU
Volts/Hertz Limiter:	• Single- or Three-phase sensing	• Profibus (Optional)
• Two slopes, High and Low		• Fiber Ethernet (optional)
Minimum Excitation Limiter	Power System Stabilizer (Optional)	• Load Sharing over Ethernet
• Takeover method (works directly into firing circuit)	• Integrated within the DECS-450	Data Collection
• Dual setpoints selectable through logic	• Integral of accelerating power (IEEE PSS2A/2B/2C)	• Trending
• Active in FCR mode (programmable)	• Four (4) Lead-Lag time constants	• Real-Time Monitoring (Two parameters)
Maximum Excitation Limiter	• Two control modes for pump storage	• Dynamic Analyzer for frequency response
• Temperature compensation	Protection	Additional Features
• Hydrogen Pressure compensation	• Volts/Hertz	• Four metering outputs (4 to 20 mA, -10 to +10 Vdc, and 0 to 10 Vdc)
• Dual setpoints selectable via logic	• Exciter Diode Monitor (brushless systems)	• Battery backup to retain real-time-clock
• Active in FCR mode (programmable)	• Dual setpoints selectable via logic	• Compatible with the IDP-801 and IDP-1201 Interactive Display Panels
Stator Current Limiter	Communication	
• Temperature compensation	• Ethernet TCP/IP	
• Hydrogen Pressure compensation	• IRIG-B Time Sync and Network Time Protocol (NTP)	

NOTE

Basler Electric attempts to make settings and configuration updates easy for the user. However, with product enhancements and updates, devices may differ. It is recommended that all settings are reviewed and system performance is verified. It is not the intention of this document to identify all changes or differences between devices. For more information, please refer to the appropriate instruction manual. If there are questions or concerns, contact our Technical Sales Support staff for assistance.