INSTRUCTION MANUAL

FOR

IDP-800

Interactive Display Panel

For use with DECS-200, DECS-200N, DECS-250, DECS-250N, or DECS-400 Digital Excitation Control Systems

Basler Electric®

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Preface

This instruction manual provides information about the installation and operation of the IDP-800. To accomplish this, the following information is provided:

- Mounting and connections
- Communication requirements
- Display operation and screen navigation
- Product specifications

Conventions Used in this Manual

Important safety and procedural information is emphasized and presented in this manual through Warning, Caution, and Note boxes. Each type is illustrated and defined as follows.

Warning!
Warning boxes call attention to conditions or actions that may cause personal injury or death.

Caution
Caution boxes call attention to operating conditions that may lead to equipment or property damage.

Note
Note boxes emphasize important information pertaining to IDP-800 installation or operation.

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Warning!

READ THIS MANUAL. Read this manual before installing, operating, or maintaining the IDP-800. Note all warnings, cautions, and notes in this manual as well as on the product. Keep this manual with the product for reference. Failure to follow warning and cautionary labels may result in personal injury or property damage. Exercise caution at all times.

To prevent personal injury or equipment damage, only qualified personnel should install, operate, or service this system.

Basler Electric does not assume any responsibility to compliance or noncompliance with national code, local code, or any other applicable code. This manual serves as reference material that must be well understood prior to installation, operation, or maintenance.

For terms of service relating to this product and software, see the *Commercial Terms of Products and Services* document available at www.basler.com/terms.

This publication contains confidential information of Basler Electric Company, an Illinois corporation. It is loaned for confidential use, subject to return on request, and with the mutual understanding that it will not be used in any manner detrimental to the interests of Basler Electric Company and used strictly for the purpose intended.

It is not the intention of this manual to cover all details and variations in equipment, nor does this manual provide data for every possible contingency regarding installation or operation. The availability and design of all features and options are subject to modification without notice. Over time, improvements and revisions may be made to this publication. Before performing any of the following procedures, contact Basler Electric for the latest revision of this manual.

The English-language version of this manual serves as the only approved manual version.

Contents

Introduction

The IDP-800 Interactive Display Panel is a high-resolution, 7.5 inch/19 centimeter (measured diagonally) color touch screen interface that enables a user to monitor and control a Basler Electric DECS-based excitation system. IDP-800 monitoring and control features include DECS and excitation system status, system control operations, and routine adjustments of the excitation setpoint. The IDP-800 is compatible with DECS-200, DECS-200N, DECS-250, DECS-250N, and DECS-400 Digital Excitation Control Systems.

DECS and synchronous generator or motor system parameters are viewed and controlled through interactive pages displayed by the IDP-800. Pages are organized according to system functions. Navigation between pages and control of functions is achieved by touching buttons located on the IDP-800 pages.

Communication between the IDP-800 and DECS is facilitated through the serial communication port of the IDP-800 and the RS-485 port of the DECS. One IDP-800 can monitor both the primary and secondary DECS in a dual DECS application. The IDP-800 is equipped with an Ethernet communication port which provides access to Modbus™ registers for system monitoring and control of the DECS. This capability enables integration of the IDP-800 into an existing Distributed Control System (DCS).

IDP-800 Style Designations

A single-digit style designator determines the DECS application that is compatible with the IDP-800. Style options are shown in Figure 1.

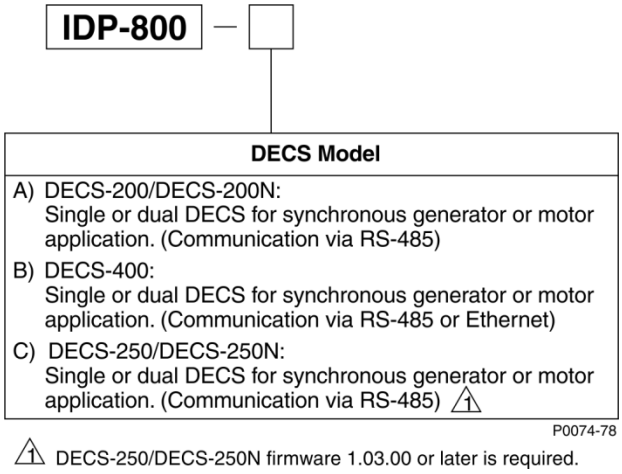


Figure 1. IDP-800 Style Options

Hardware

The IDP-800 is supplied with the following hardware:

- Compact flash memory card
- Terminal conversion adaptor
- Two 680 Ω terminating resistors with sleeving
- Instruction manual (Basler publication 9437600990)

Accessories

The following optional accessories are available for use with the IDP-800:

- Power supply, 24 Vdc, 31 W, Basler P/N 9334503101
- Ethernet switch, 8 ports, Basler P/N 41133
- DIN mounting rail for Ethernet switch, Basler P/N 9323900001

Communication

Data and commands can be exchanged between the IDP-800 and DECS-200, DECS-200N, DECS-250, DECS-250N, or DECS-400 using serial communication. In addition to serial communication, the DECS-400 has the added capability of Ethernet communication with the IDP-800. When connected to an Ethernet LAN, the display can be polled via Modbus to acquire data collected by the DECS-400 connected to the IDP-800.

Caution
This product contains one or more *nonvolatile memory* devices. Nonvolatile memory is used to store information (such as settings) that needs to be preserved when the product is power-cycled or otherwise restarted. Established nonvolatile memory technologies have a physical limit on the number of times they can be erased and written. During product application, consideration should be given to communications, logic, and other factors that may cause frequent/repeated writes of settings or other information that is retained by the product. Applications that result in such frequent/repeated writes may reduce the useable product life and result in loss of information and/or product inoperability.

DECS and IDP-800 communication applications are summarized in Table 1.

Table 1. DECS and IDP-800 Communication Applications

Controller Application [Communication Method] {Communication Scheme}	Local Only	Remote Only	Local and Remote †	DCS *
DECS-200 [Serial, RS-485] {Figure 2}	YES	YES	N/A	YES
DECS-200N [Serial, RS-485] {Figure 2}	YES	YES	N/A	YES
DECS-250 [Serial, RS-485] {Figure 2}	YES	YES	N/A	YES
DECS-250N [Serial, RS-485] {Figure 2}	YES	YES	N/A	YES
DECS-400 [Serial, RS-485] {Figure 2}	YES	YES	YES	N/A
DECS-400 [Ethernet] ‡ {Figure 3}	YES	YES	YES	YES

* Distributed Control System (DCS) interface offers pass-through communication to/from the DECS-200, DECS-200N, DECS-250, or DECS-250N via the IDP-800 Ethernet port.

† Requires two IDP-800 display panels.

‡ Requires a multi-port Ethernet switch between an IDP-800 and single- or dual-DECS-400 controllers. An open port on the switch enables external (DCS) control and monitoring communication between the IDP-800 and DECS-400.

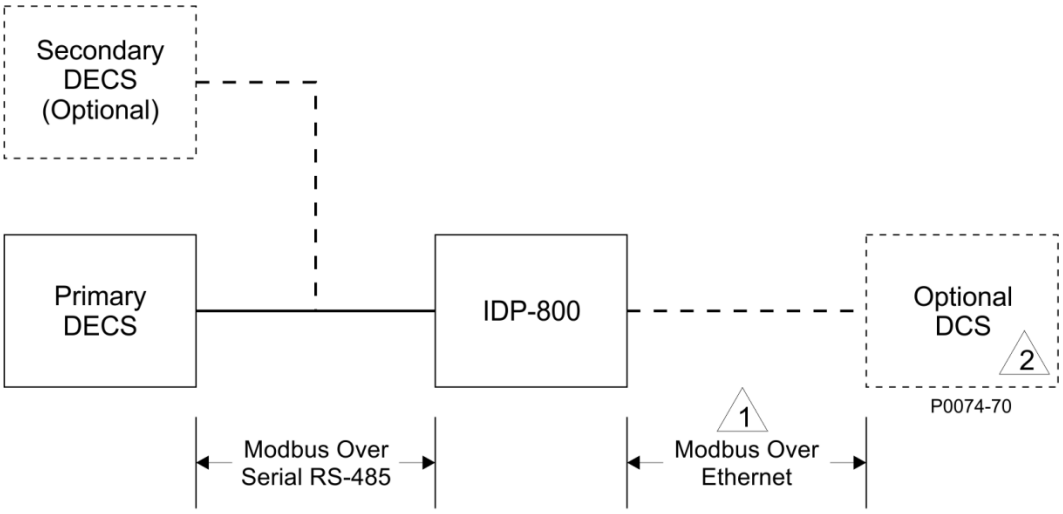
Serial Communication

When the IDP-800 will be communicating with a DECS using RS-485 serial communication, the DECS communication settings should be configured as follows:

- Baud: 9600
- Data length: 8
- Parity: None
- Stop bits: 2
- Single DECS address: 247
- Dual DECS address: 247 (DECS-A) and 246 (DECS-B)

Ethernet Communication

An Ethernet port enables the IDP-800 to be polled over a LAN/Distributed Control System and provide values of system parameters monitored by the DECS-200, DECS-200N, DECS-250, or DECS-250N. Figure 2 serves as a general illustration of how the IDP-800 can be used to retrieve DECS data over an Ethernet LAN. The IDP-800-A and IDP-800-C's 10 Base-T Ethernet interface connects to a LAN through a standard RJ-45 modular jack. This jack is located on the bottom of the display.



1 Compatible only with the IDP-800-A (DECS-200 or DECS-200N) or IDP-800-C (DECS-250 or DECS-250N).

2 The DCS (Distributed Control System) will have access to Modbus registers available through the IDP-800-A and IDP-800-C Ethernet ports. Refer to the *Modbus Communication* chapter for more details.

Figure 2. IDP-800 Link Between DECS and Ethernet LAN

IDP-800 Modbus registers for the available DECS functions are listed in the *Modbus Communication* chapter. Specific information about the Modbus communication protocol, as it is employed by the DECS, is provided in Basler publication 9360100990 (DECS-200), 9388800990 (DECS-200N), 9440300990 (DECS-250), and 9440500990 (DECS-250N).

An Ethernet port (Com 3) on the DECS-400 enables communication with the IDP-800 at higher speeds than possible through the DECS-400 RS-485 port. An Ethernet switch is used to route IDP-800 and DECS-400 communication over a LAN. A general connection scheme for IDP-800 and DECS-400 communication over an Ethernet LAN is illustrated in Figure 3.

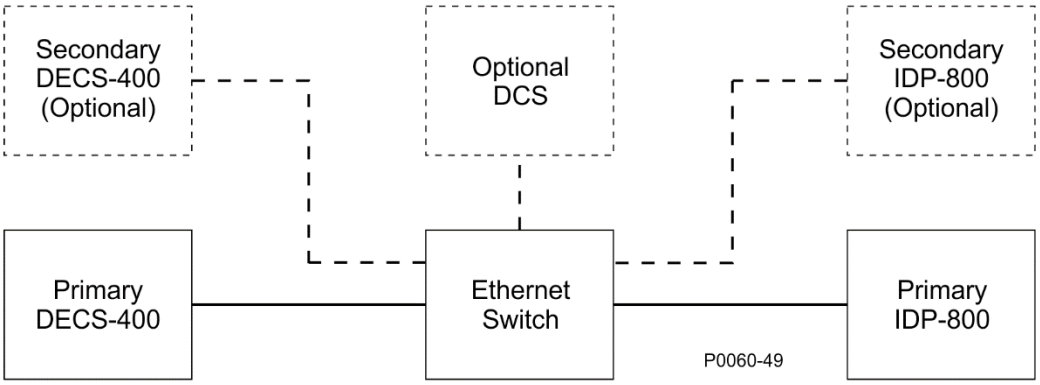


Figure 3. IDP-800 and DECS-400 LAN Communication

For IDP-800 polling to take place, its IP address must be configured to accommodate your Ethernet LAN. Perform the following steps to view the IDP-800 communication settings and configure its IP address.

Caution

The following procedure must be performed with the generator or motor offline. Communication between the IDP-800 and DECS will cease during configuration of the IP address.

1. Press the upper, right corner of the display screen followed by the lower, left corner in quick succession.
2. Press the **Offline** button.
3. When prompted, enter the offline mode access password. The factory-default password is “basler”.
4. At the next prompt, enter the system password. The factory-default password is “4376”.
5. Press the **Main Unit Settings** button.
6. Press the **Ethernet Local Settings** button.
7. Configure the IP address to be compatible with your network. If needed, consult your network administrator for the proper settings.
8. Press the **Exit** button.
9. Press the **Yes** button. The display will restart and activate the new communication settings.

IDP-800-A Operation

The IDP-800-A is applied in applications using the DECS-200 and DECS-200N. The IDP-800-B is applied in applications using the DECS-400. The IDP-800-C is applied in applications using the DECS-250 and DECS-250N. See Figure 1 for IDP-800 style definitions. This chapter describes IDP-800-A operation and screen navigation. For DECS-400 applications, see the *IDP-800-B Operation* chapter. For DECS-250 and DECS-250N applications, see the *IDP-800-B Operation* chapter.

IDP-800 screen appearance and availability will vary according to the type of DECS used and the configuration of the DECS system (single or dual DECS and generator or motor control).

DECS and generator/motor system parameters are viewed and controlled through interactive screens displayed by the IDP-800. Screens are organized according to function. Navigation between screens and control of functions are achieved by touching “buttons” on the IDP-800 screens.

Configuration Screens

Two configuration screens establish DECS and IDP-800 operating modes: IDP-800 Configuration and Screen Configuration. These configuration screens are available upon initial power-up of the IDP-800. After initial configuration, these screens can be accessed through the Main View screen by entering the appropriate password.

IDP-800 Configuration

Upon initial power-up, the IDP-800 displays the IDP-800 Configuration screen (Figure 4) where your product, product configuration, and application must be selected before proceeding to other IDP-800 screens. Failure to make the proper selections may cause the IDP-800 to annunciate false alarms.

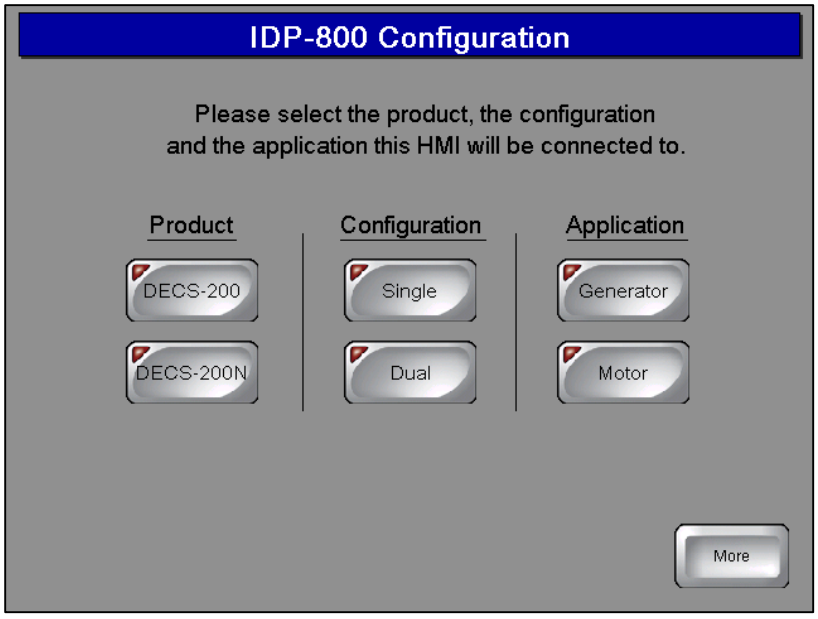


Figure 4. IDP-800 Configuration Screen

Screen Configuration

Pressing the More button on the IDP-800 Configuration screen accesses the Screen Configuration screen (Figure 5) which enables selection of the IDP-800 language, date and time, and other IDP-800 operating preferences. Individual screen functions are described in the following paragraphs.

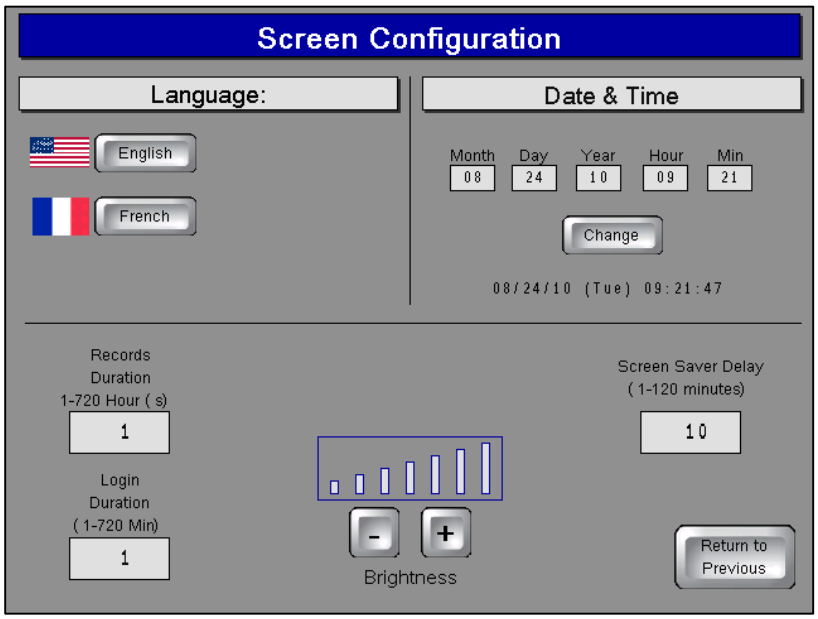


Figure 5. Screen Configuration

Language

Pressing the English (or Anglais) button selects English as the IDP-800 display language. Pressing the French (or Francais) button selects French as the display language.

Date and Time

The date and time of the IDP-800 must be set manually to match the date and time of the connected DECS. Enter the desired values in the date and time fields and press the Change button to save the values.

Records Duration

Trending records saved by the IDP-800 retain up to six variables per record with each record consisting of 2,400 data points. Trending records saved by the IDP-800 can have a user-defined duration ranging from 1 hour to 720 hours (30 days). Note: requires installation of a compact flash memory card.

Login Duration

Following login, the length of time that password access is available (if no button presses occur) is limited by the value of this setting. If no button presses are received for the duration of the setting, password access is lost and the user must log in again to make changes requiring password access. Login Duration is adjustable over the range of 1 to 720 minutes (12 hours).

Screen Saver Delay

A screensaver activates if no button presses are received at the display panel for the length of time specified by the Screen Saver Delay. A setting of 1 to 120 minutes may be entered.

Brightness

Display panel brightness can be adjusted by pressing the “+” and “–“ buttons. A bar graph above the buttons serves as a reference for adjusting the display brightness.

Main View Screen

This screen (Figure 6) serves as a gateway to the IDP-800 status and control screens. It also provides access to file transfer functions and a screen lock to enable panel cleaning. The Login button can be used to enter the appropriate password and gain access to the configuration screens.

Access to the control screens is possible only when logged into the IDP-800 with the correct password. As a result, the Control button is visible only when logged into the IDP-800.

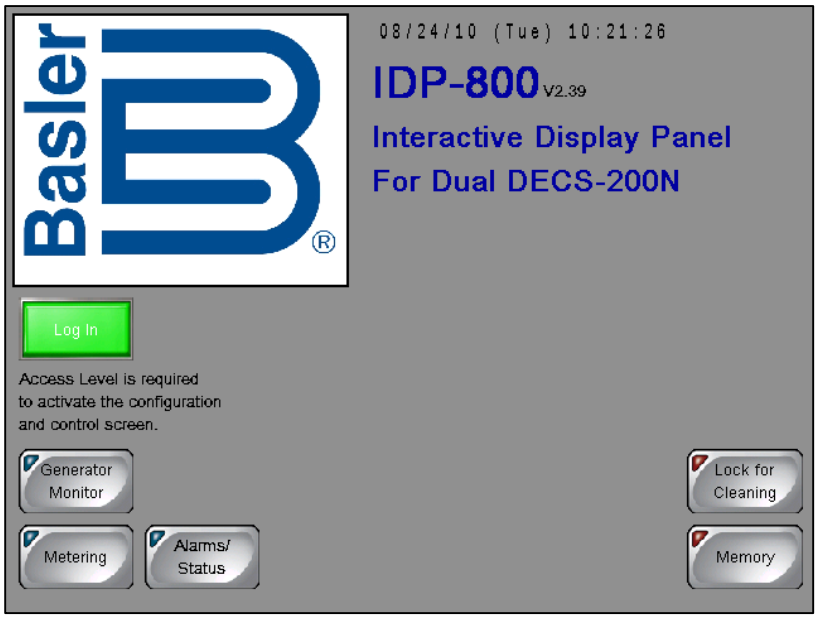


Figure 6. Main View Screen

IDP-800 Passwords

Four passwords protect the IDP-800 from unauthorized settings changes, control commands, and transfers offline.

Two of the passwords are used when transferring the IDP-800 offline. When taking the IDP-800 offline, the offline and system passwords are used. The IDP-800 is delivered with a system password of “4376” and an offline mode access password of “basler”.

A factory-default password of “IDP8” gives access to IDP-800 configuration and control functions.

A factory-default password of “DECS2” gives access to only the IDP-800 control functions.

Password access remains in effect based on display panel activity and the limit set by the Login Duration setting (Screen Configuration screen).

Gaining Password Access

The following example describes the process for using a password to gain configuration and control access.

1. Press the Login button on the Main View screen.
2. Use the alphanumeric keypad to enter the appropriate password and press the Enter button. The factory-default password is IDP8 and is case-sensitive.

Once the correct password is entered, the Main View screen is displayed with a Control button that provides access to the control screens and a Configure button that provides access to the configuration screens.

Generator/Motor Monitor

Depending upon the application selected on the IDP-800 Configuration screen, either the Generator Monitor screen or the Motor Monitor screen is accessed by pressing the Generator Monitor button or Motor Monitor button of the Main View screen. The Generator Monitor or Motor Monitor screen graphically illustrates generator/motor and excitation system status/activity. Generator and motor parameters include output voltage, output current, active (true) power, reactive power, and power factor. Excitation system

parameters include field voltage, field current, and excitation on/off status. The Generator Monitor screen is shown in Figure 7 and the Motor Monitor screen is shown in Figure 8.

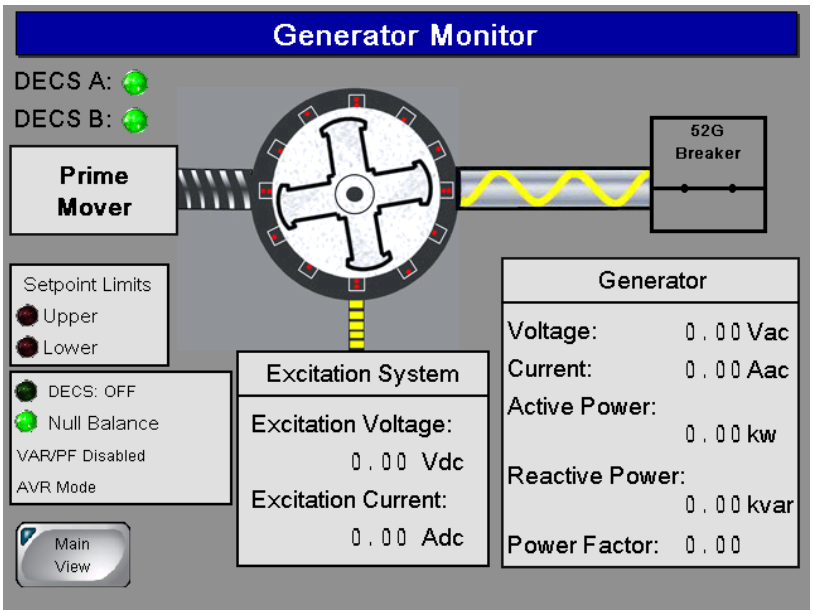


Figure 7. Generator Monitor Screen

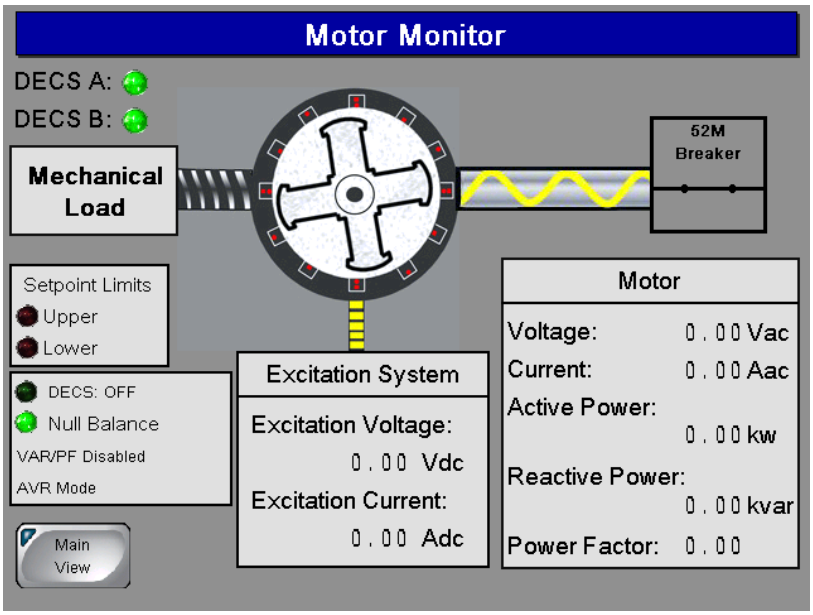


Figure 8. Motor Monitor Screen

DECS Metering Screen

This screen (Figure 9) is accessed by pressing the Metering button of the Main View screen. The DECS Metering screen displays digital metering values for the generator or motor, bus, and exciter field as well as the excitation setpoint position and control values.

Access to the Trending and Capability Curve screens is also provided through the Trending and Capability buttons on the DECS Metering screen.

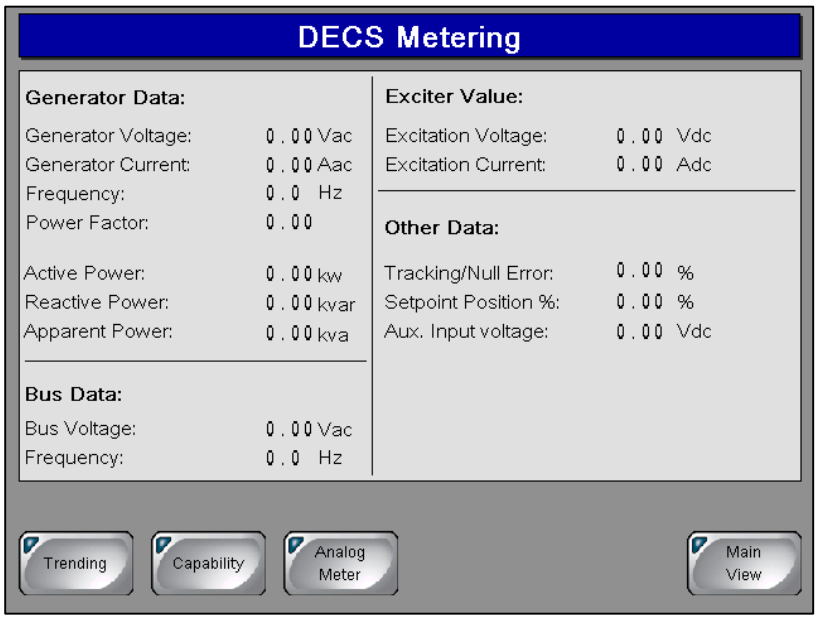


Figure 9. DECS Metering Screen

Analog Metering

Pressing the Analog Meter button accesses the analog representations of the digital values displayed on the DECS Metering screen. Analog metering values are divided among three screens accessed through buttons labeled Generator Values, Generator Power, and Exciter Values. Each parameter is represented by an analog meter along with the digital version of the metered value.

Trending

The Trending screen (Figure 10) is accessed by pressing the Trending button of the DECS Metering screen. Several system parameters can be selected and monitored over time in an amplitude-versus-time window. Buttons on the Trending screen enable selection of the parameters to be monitored. Available parameters include generator voltage (Vgen), apparent power (kVA), true power (kW), reactive power (kvar), field voltage (Vexc), and field current (Iexc). Parameters are plotted in a color that matches the color of the parameter buttons. Pressing the History button displays additional controls and a display for manipulating the cursor position within a data plot. Pressing the USB button transfers the trending data to a connected USB memory device. Storage of trending information requires the installation of a compact flash memory card.

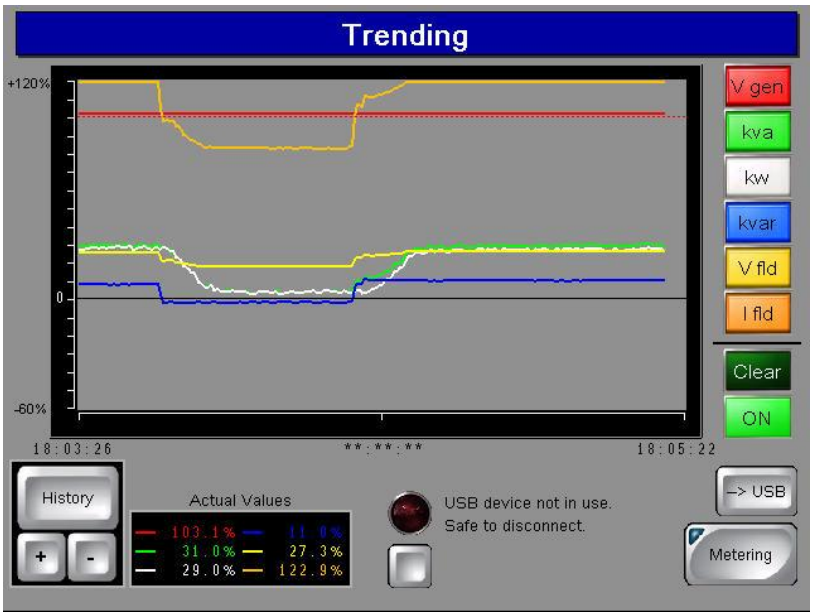


Figure 10. Trending Screen

Capability

This screen (Figure 11) is accessed by pressing the Capability button on the DECS Metering screen. By default, a horizontal curve is displayed. Pressing the Vertical Curve button selects a vertical curve orientation.

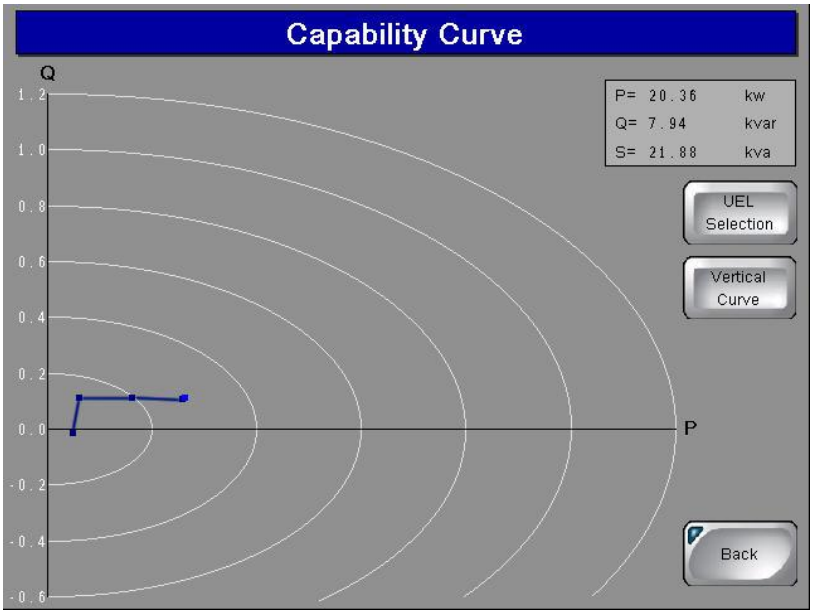


Figure 11. Capability Curve Screen

If a plot of the underexcitation limiter (UEL) curve is desired, the UEL Selection button can be pressed to access the UEL Curve Selection screen (Figure 12). Here, the internal DECS UEL curve can be selected or a customized, three-point, four-point, or five-point curve can be selected and configured. UEL curve points must be selected in the DECS BESTCOMS software for an accurate representation on the IDP-800. Pressing the None button disables the display of UEL curves.

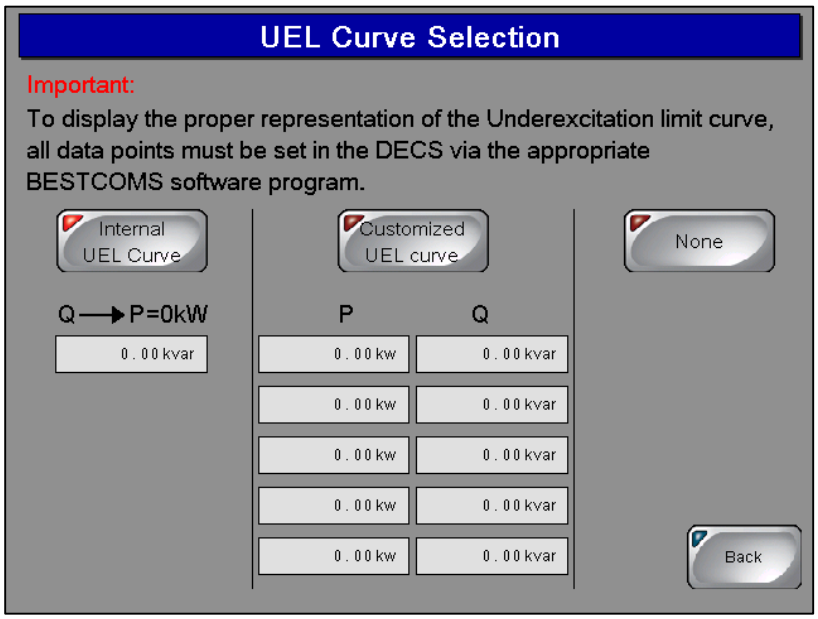


Figure 12. UEL Curve Selection Screen

DECS Analog Metering

Analog representations of the digital metering values shown on the DECS Metering screen (Figure 9) can be accessed by pressing the Analog Meter button. Pressing this button accesses the Generator Values or Motor Values screen which displays analog representations of the generator/motor voltage, current, frequency, and power factor. Each analog representation displays the digital equivalent in the upper, left corner. The remaining analog metering values are divided between two screens: the Generator Power or Motor Power screen and the Exciter values screen. The Generator Power or Motor Power screen is accessed from the Generator/Motor Values screen or Exciter Values screen by pressing the Generator Power or Motor Power button. This screen displays analog representations of the generator/motor active power, reactive power, and apparent power. The Exciter Values screen is accessed from the Generator/Motor Values screen or Generator/Motor Power screen by pressing the Exciter Values button. This screen displays analog representations of the excitation voltage and current. A Digital Meter button, on each analog metering screen, can be pressed to return to the DECS (digital) Metering screen.

DECS Control

Access to the DECS Control screen is possible only when logged in with the appropriate password. When logged in, a Control button on the Main View screen provides access to the DECS Control screen illustrated in Figure 13. DECS control functions are divided between two screens: Setpoint Control and Regulation Control.

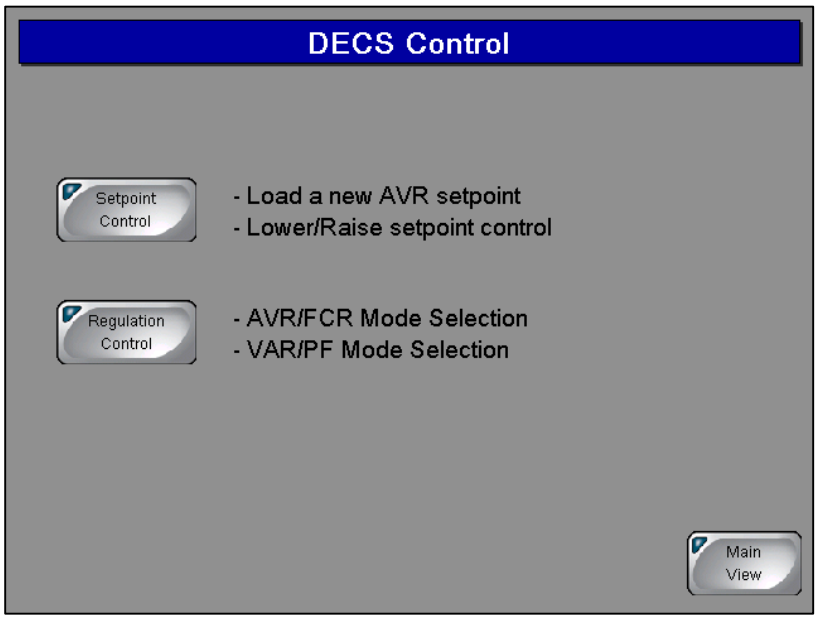


Figure 13. DECS Control Screen

Setpoint Control

Pressing the Setpoint Control button accesses the Setpoint Control screen (Figure 14). This screen displays the DECS-200/200N AVR, FCR, power factor, and var setpoints and provides two methods of setpoint adjustment. The “+” and “–“ buttons can be pressed to increment and decrement the active setpoint. A specific setpoint can be entered for any of the four setpoints. Pressing the New button associated with the setpoint to be changed accesses a Setpoint Adjustment screen that displays the current setpoint value along with the minimum and maximum limits for the setting. Touching the setting field area displays a numeric keypad where the new value can be entered.

The Setpoint Control screen also has system status indicators and a metering display for generator and excitation system parameters.

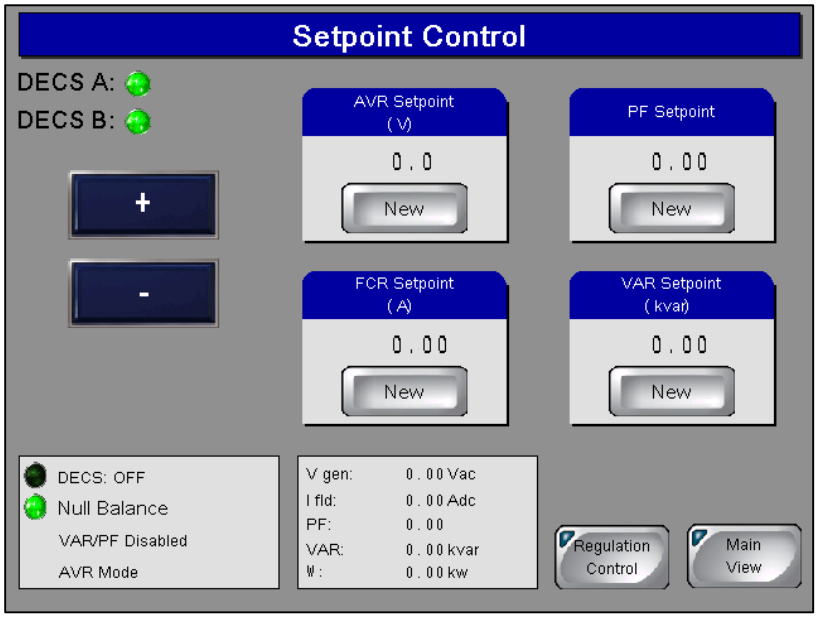


Figure 14. Setpoint Control Screen

Regulation Control

Pressing the Regulation Control button accesses the Regulation Control screen (Figure 15). This screen enables selection of the active regulation mode. The MAN/AVR button toggles between Manual and Auto modes. When operating in AVR mode, the Off, PF, and VAR buttons can be used to enable or disable regulation of vars or power factor. Each change to the regulation mode requires a confirmation via an accept/reject dialog box.

The Regulation Control screen also has system status indicators and a metering display for generator/motor and excitation system parameters.

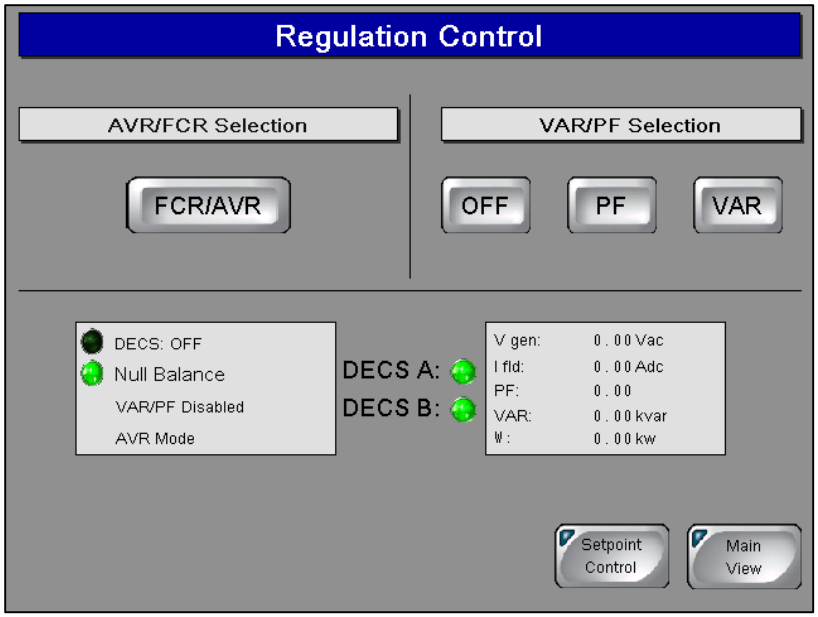


Figure 15. Regulation Control Screen

Alarms and Status

Two screens annunciate the state of DECS alarms, functions, limiters, and relay outputs. Depending upon the annunciation, active indicators change to amber, green, or red when active.

Pressing the Alarms/Status button of the Main View screen displays the Alarms and Status screen (Figure 16). This screen has indicators for alarms, limiter states, and DECS functions/conditions. An Alarms Reset button can be pressed to clear alarm annunciations. (An alarm cannot be reset unless the condition causing the alarm has been cleared.) Pressing the History button accesses the Alarms History screen which lists the alarms captured by the DECS. Buttons are provided for scrolling through the alarms list, clearing selected alarms, and clearing all listed alarms. A →USB button enables the transfer of selected alarm records to a memory device plugged into the IDP-800 USB port.

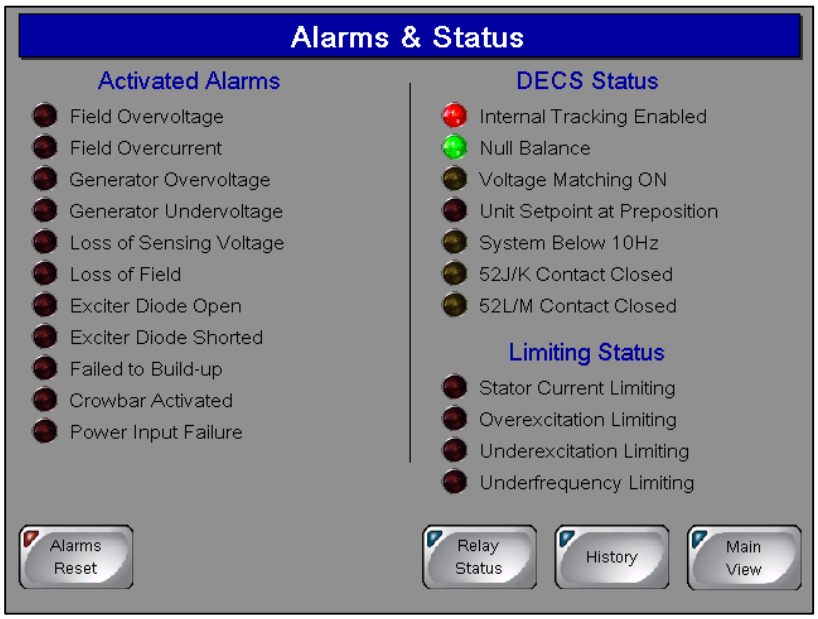


Figure 16. Alarms and Status Screen

Pressing the Relay Status button on the Alarms and Status screen displays the DECS Relay Status screen (Figure 17). This screen has indicators for DECS relay output contacts status (open or closed) and a matrix of indicators showing each relay output and the condition causing the relay output to energize. Pressing the Back button returns the display to the Alarms and Status screen.

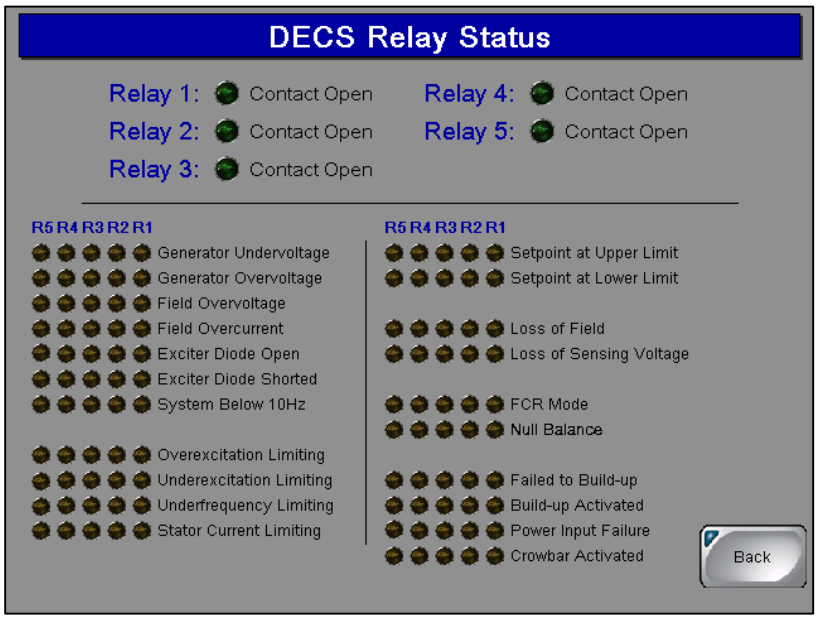


Figure 17. DECS Relay Status Screen

IDP-800-B Operation

The IDP-800-B is applied in applications using the DECS-400. The IDP-800-A is applied in applications using the DECS-200 and DECS-200N. The IDP-800-C is applied in applications using the DECS-250 and DECS-250N. See Figure 1 for IDP-800 style definitions. This chapter describes IDP-800-B operation and screen navigation. For DECS-200 and DECS-200N applications, see the *IDP-800-A Operation* chapter. For DECS-250 and DECS-250N applications, see the *IDP-800-C Operation* chapter.

IDP-800 screen appearance and availability will vary according to the type of DECS used and the configuration of the DECS system (single or dual DECS and generator or motor control).

DECS and generator/motor system parameters are viewed and controlled through interactive screens displayed by the IDP-800. Screens are organized according to function. Navigation between screens and control of functions are achieved by touching “buttons” on the IDP-800 screens.

Configuration Screens

Two configuration screens establish DECS and IDP-800 operating modes: IDP-800 Configuration and Screen Configuration. These configuration screens are available upon initial power-up of the IDP-800. After initial configuration, these screens can be accessed through the Main View screen by entering the appropriate password.

IDP-800 Configuration

Upon initial power-up, the IDP-800 displays the IDP-800 Configuration screen (Figure 18) where your product, product configuration, application, and communication method must be selected before proceeding to other IDP-800 screens. Failure to make the proper selections may cause the IDP-800 to annunciate false alarms.

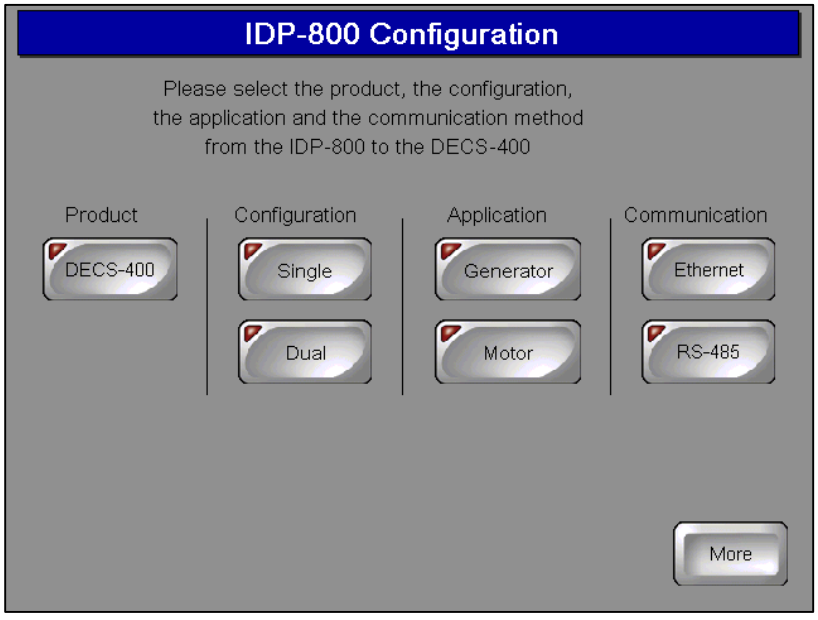


Figure 18. IDP-800 Configuration Screen

Screen Configuration

Pressing the More button on the IDP-800 Configuration screen accesses the Screen Configuration screen (Figure 19) which enables selection of the IDP-800 language and other operating preferences. Individual screen preferences are described in the following paragraphs.

Language

Pressing the English (or Anglais) button selects English as the IDP-800 display language. Pressing the French (or Francais) button selects French as the display language.

Date and Time

The date and time of an IDP-800 connected to a DECS-400 is automatically synchronized with the date (month, day, and year) and time (hours and minutes) maintained by the DECS-400.

52L/M Input Switch Number

These buttons configure the IDP-800 to monitor the same contact inputs that the DECS-400 is monitoring for the 52L/M contact input. Pressing the Standard Logic button configures the IDP-800 to monitor contact input 3 for 52L/M contact status, which is the default assignment in standard DECS-400 logic. Pressing the Customized Logic button enables the user to configure the IDP-800 to monitor the 52L/M contact input as configured in the customized DECS-400 logic.

Records Duration

Trending records saved by the IDP-800 retain up to six variables per record with each record consisting of 2,400 data points. Trending records saved by the IDP-800 can have a user-defined duration ranging from 1 hour to 720 hours (30 days). Note: requires installation of a compact flash memory card.

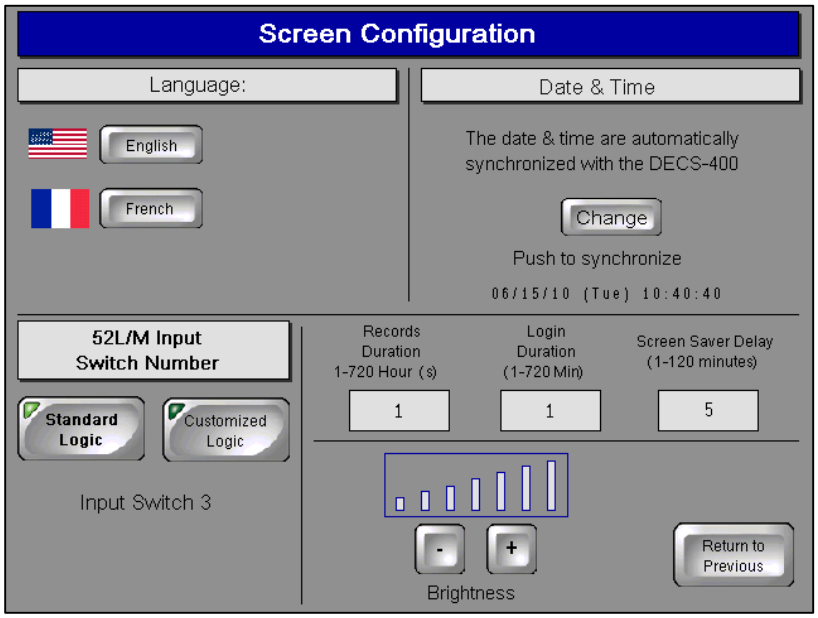


Figure 19. Screen Configuration Screen

Login Duration

Following login, the length of time that password access is available (if no button presses occur) is limited by the value of this setting. If no button presses are received for the duration of the setting, password access is lost and the user must log in again to make changes requiring password access. Login Duration is adjustable over the range of 1 to 720 minutes (12 hours).

Screen Saver Delay

A screensaver activates if no button presses are received at the display panel for the length of time specified by the Screen Saver Delay. A setting of 1 to 120 minutes may be entered.

Brightness

Display panel brightness can be increased and reduced by pressing the “+” and “–“ buttons. A bar graph above the buttons serves as a reference for adjusting the display brightness.

Main View Screen

This screen (Figure 20) serves as a gateway to the IDP-800 status and control screens. It also provides access to file transfer functions and a screen lock to enable panel cleaning. The Login button can be used to enter the appropriate password and gain access to the configuration screens.

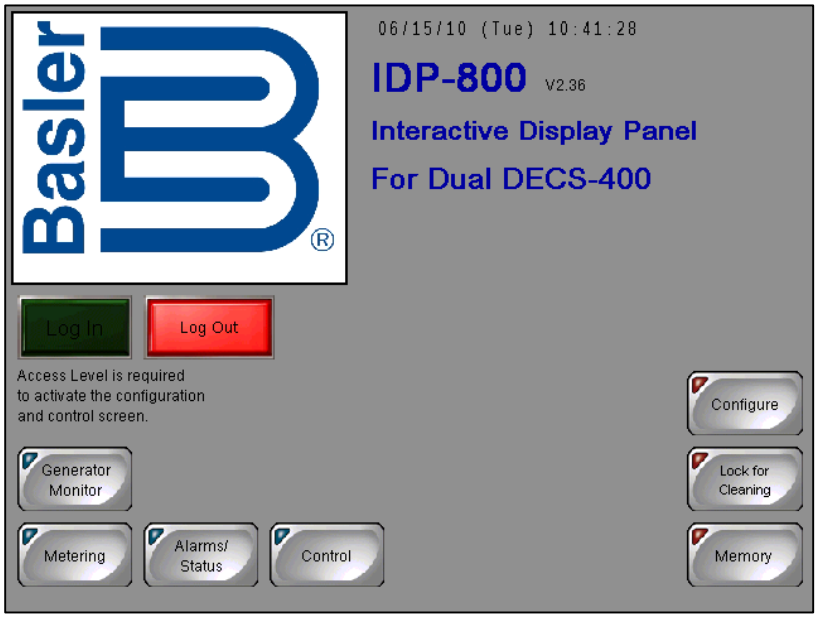


Figure 20. Main View Screen

Access to the Control button (and control screens) is possible only when logged into the IDP-800 with the correct password.

IDP-800 Passwords

Four passwords protect the IDP-800 from unauthorized settings changes, control commands, and transfers offline.

Two of the passwords are used when transferring the IDP-800 offline. When taking the IDP-800 offline, the offline and system passwords are used. The IDP-800 is delivered with a system password of “4376” and an offline mode access password of “basler”.

A factory-default password of “IDP8” gives access to IDP-800 configuration and control functions.

A factory-default password of “DECS4” gives access to only the IDP-800 control functions.

Password access remains in effect based on display panel activity and the limit set by the Login Duration setting (Screen Configuration screen).

Gaining Password Access

The following example describes the process for using a password to gain configuration and control access.

1. Press the Login button on the Main View screen.
2. Use the alphanumeric keypad to enter the appropriate password and press the Enter button. The factory-default password is IDP8 and is case-sensitive.

Once the correct password is entered, the Main View screen is displayed with a Control button that provides access to the control screens and a Configure button that provides access to the configuration screens.

Generator/Motor Monitor

Depending upon the application selected on the IDP-800 Configuration screen, either the Generator Monitor screen or Motor Monitor screen is accessed by pressing the Generator Monitor button or Motor Monitor button of the Main View screen. The Generator Monitor or Motor Monitor screen graphically illustrates generator/motor and excitation system status/activity. Generator and motor parameters include output voltage, output current, active (true) power, reactive power, and power factor. Excitation system parameters include field voltage, field current, and excitation on/off status. The Generator Monitor screen is shown in Figure 21 and the Motor Monitor screen is shown in Figure 22.

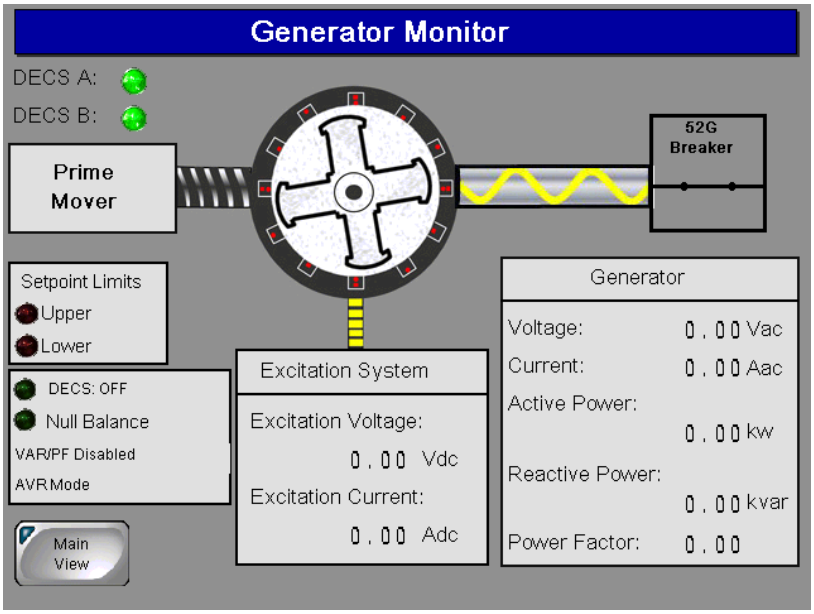


Figure 21. Generator Monitor Screen

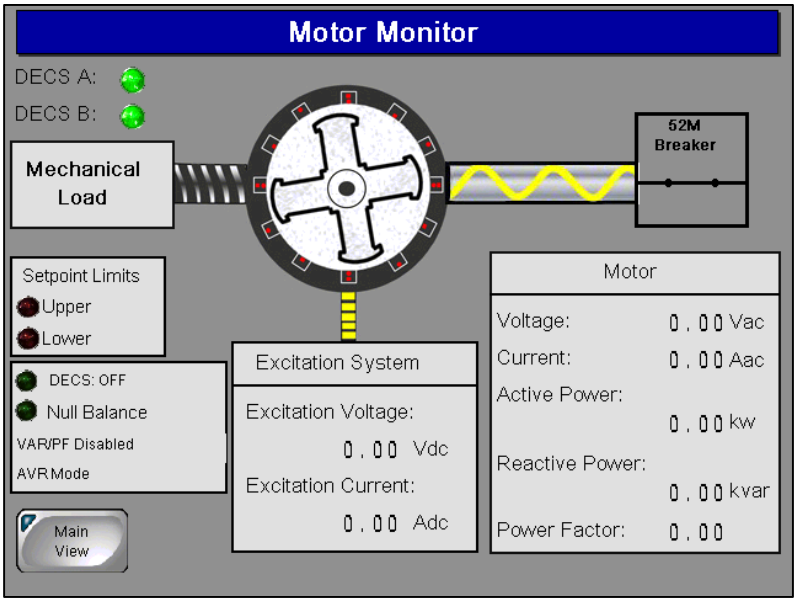


Figure 22. Motor Monitor Screen

DECS Metering Screen

Access the DECS Metering screen (Figure 23) by pressing the Metering button of the Main View screen. The DECS Metering screen displays digital metering values for the generator or motor, bus, and exciter field as well as the excitation setpoint position and control values.

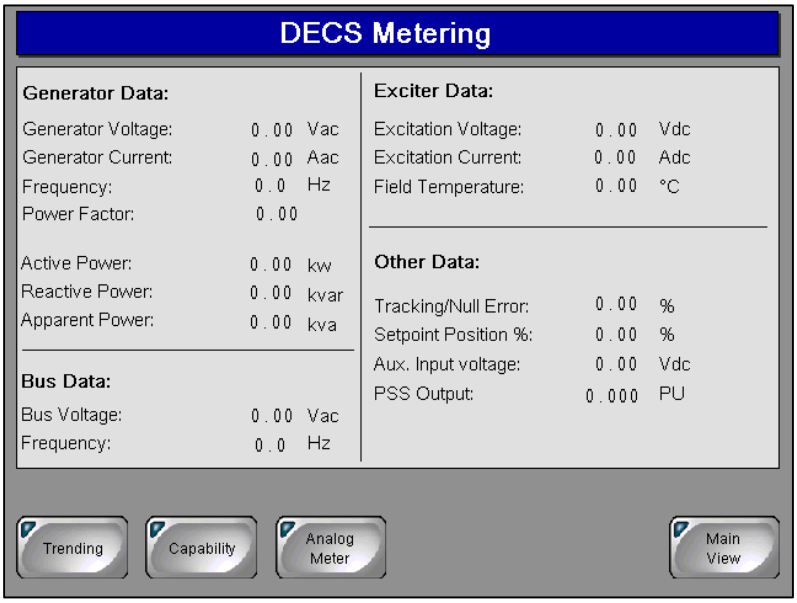


Figure 23. DECS Metering Screen

Analog Metering

Pressing the Analog Meter button accesses the analog representations of the digital values displayed on the DECS Metering screen. Analog metering values are divided among three screens accessed through buttons labeled Generator Values, Generator Power, and Exciter Values. Each parameter is represented by an analog meter along with the digital version of the metered value.

Trending

Access to the Trending and Capability Curve screens is also provided through the Trending and Capability buttons on the DECS Metering screen.

The Trending screen (Figure 24) is accessed by pressing the Trending button of the DECS Metering screen. Several system parameters can be selected and monitored over time in an amplitude-versus-time window. Buttons on the Trending screen enable selection of the parameters to be monitored. Available parameters include generator voltage (Vgen), apparent power (kVA), true power (kW), reactive power (kvar), field voltage (Vexc), and field current (Iexc). Parameters are plotted in a color that matches the color of the parameter buttons. Pressing the History button displays additional controls and a display for manipulating the cursor position within a data plot. Pressing the USB button accesses the Memory Transfer screen where the data from a trending plot can be transferred to USB memory device. Storage of trending information requires the installation of a compact flash memory card.

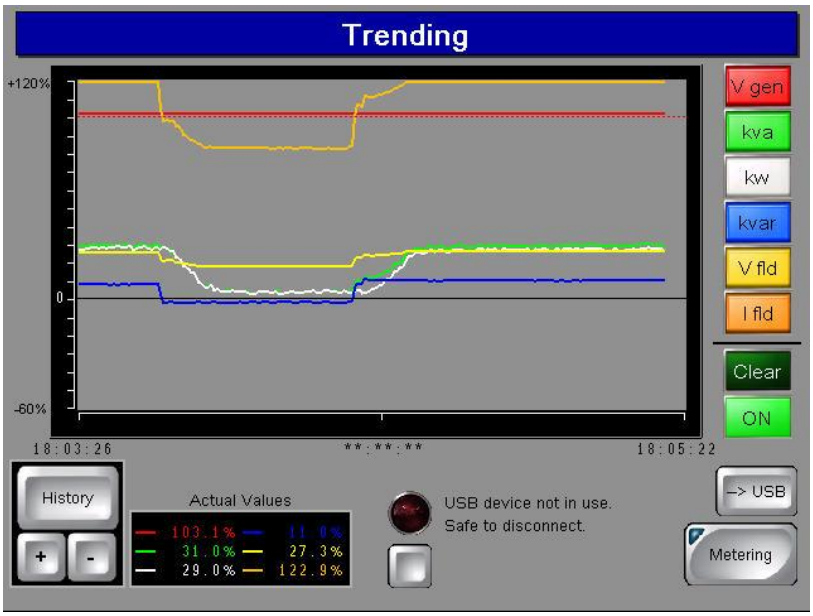


Figure 24. Trending Screen

Capability

Access the Capability screen (Figure 25) by pressing the Capability button on the DECS Metering screen. By default, a horizontal curve is displayed. Pressing the Vertical Curve button selects a vertical curve orientation.

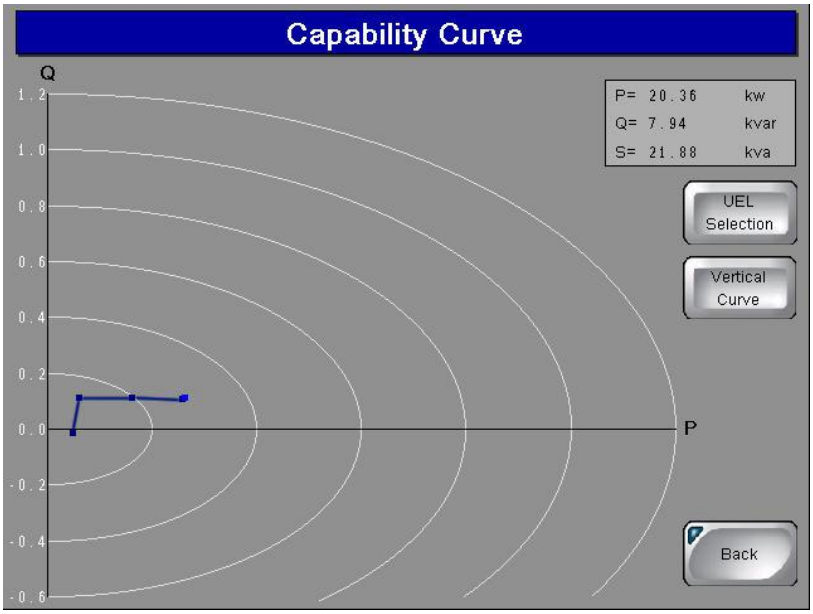


Figure 25. Capability Curve Screen

If a plot of the underexcitation limiter (UEL) curves is desired, the Internal UEL Curve button can be pressed to access the UEL Curve Selection screen (Figure 26). Here, the internal DECS UEL curve can be selected or a customized, three-, four-, or five-point curve can be selected and configured. UEL curve points must be selected in the DECS BESTCOMS software for an accurate representation on the IDP-800. Pressing the None button disables the display of UEL curves.

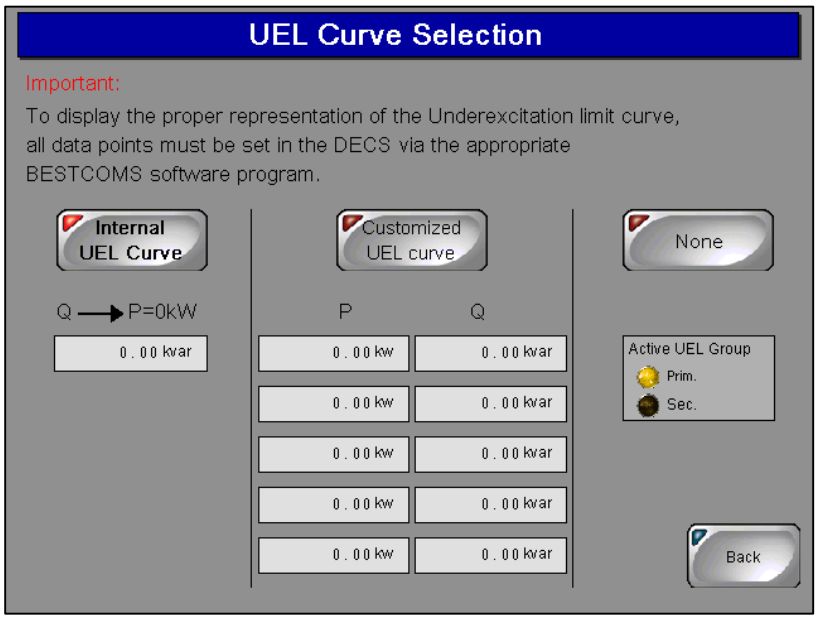


Figure 26. UEL Curve Selection Screen

DECS Analog Metering

Analog representations of the digital metering values shown on the DECS Metering screen (Figure 23) can be accessed by pressing the Analog Meter button. Pressing this button accesses the Generator Values or Motor Values screen which displays analog representations of the generator/motor voltage, current, frequency, and power factor. Each analog representation displays the digital equivalent in the upper, left corner. The remaining analog metering values are divided between two screens: the Generator Power or Motor Power screen and the Exciter values screen. The Generator Power or Motor Power screen is accessed from the Generator/Motor Values screen or Exciter Values screen by pressing the Generator Power or Motor Power button. This screen displays analog representations of the generator/motor active power, reactive power, and apparent power. The Exciter Values screen is accessed from the Generator/Motor Values screen or Generator/Motor Power screen by pressing the Exciter Values button. This screen displays analog representations of the excitation voltage and current. A Digital Meter button, on each analog metering screen, can be pressed to return to the DECS (digital) Metering screen.

DECS Control

Access to the DECS Control screen is possible only when logged in with the appropriate password. When logged in, a Control button on the Main View screen provides access to the DECS Control screen illustrated in Figure 27. This screen has two buttons: a Setpoint Control button and a Regulation Control button.

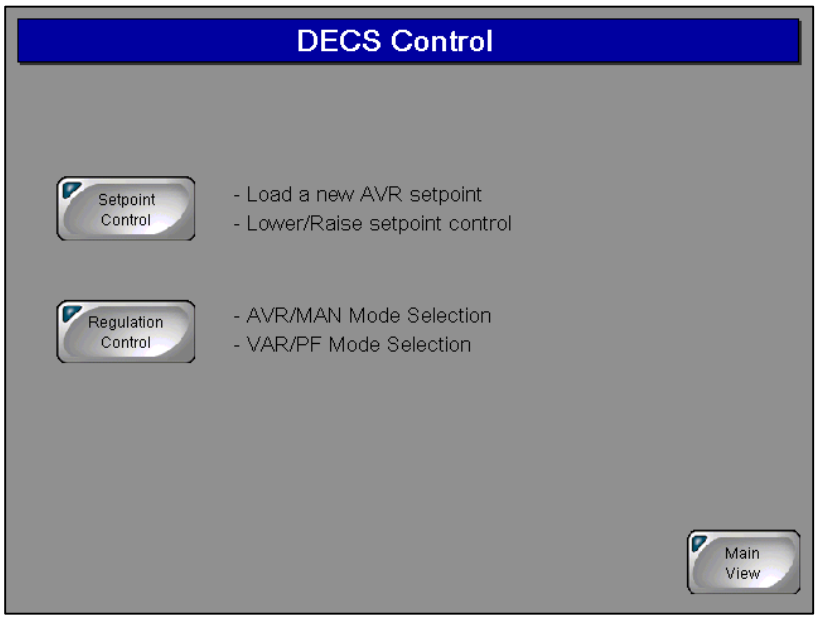


Figure 27. DECS Control Screen

Setpoint Control

Pressing the Setpoint Control button accesses the Setpoint Control screen (Figure 28). This screen displays the DECS-400 AVR, FCR, power factor, and var setpoints and provides two methods of setpoint adjustment. The “+” and “–“ buttons can be pressed to increment and decrement the active setpoint. A specific setpoint can be entered for any of the four setpoints. Pressing the New button associated with the setpoint can be entered for any of the four setpoints. Pressing the New button associated with the setpoint to be changed accesses a Setpoint Adjustment screen that displays the current setpoint value along with the minimum and maximum limits for the setting. Touching the setting field area displays a numeric keypad where the new value can be entered.

The Setpoint Control screen also has system status indicators and a metering display for generator and excitation system parameters.

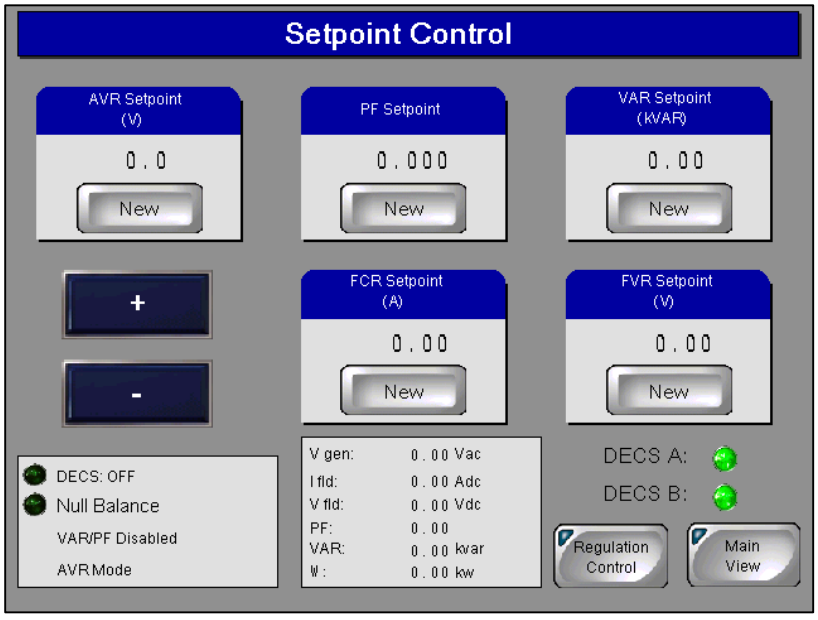


Figure 28. Setpoint Control Screen

Regulation Control

Pressing the Regulation Control button accesses the Regulation Control screen (Figure 29). This screen enables selection of the active regulation mode. The MAN/AVR button toggles between Manual and Auto modes. When operating in AVR mode, the OFF, PF, and VAR buttons can be used to enable or disable regulation of vars or power factor. Each change to the regulation mode requires a confirmation via an accept/reject dialog box.

The Regulation Control screen also has system status indicators and a metering display for generator/motor and excitation system parameters.

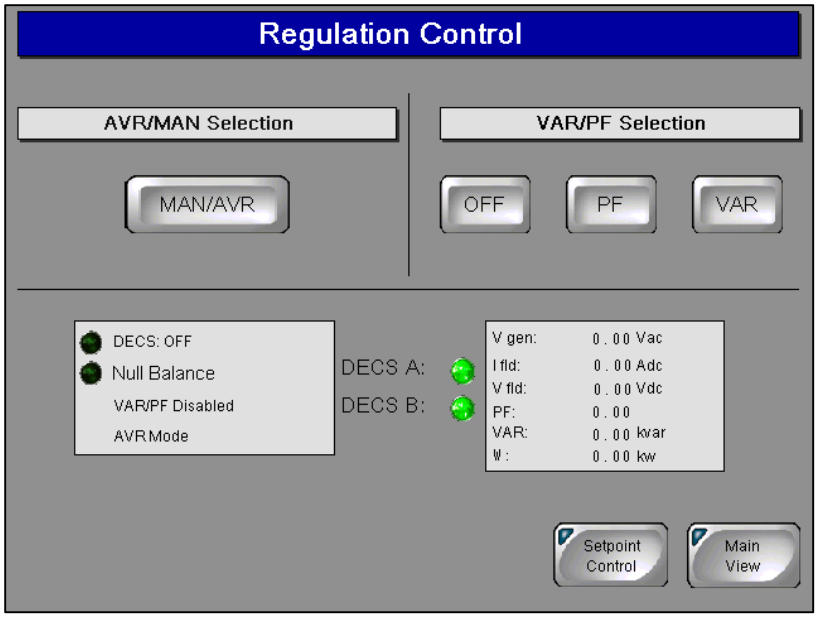


Figure 29. Regulation Control Screen

Alarms and Status

Three screens annunciate the state of DECS-400 alarms, functions, limiters, and relay outputs. Depending upon the annunciation, active indicators change to amber, green, or red when active.

The Activated Alarms screen (Figure 30) is accessed from the Main View screen by pressing the Alarm/Status button. It can also be accessed from the DECS Status screen by pressing the Alarms button. This screen has indicators for active DECS-400 alarms, power system stabilizer status, and IDP-800 inputs and clock status. An Alarms Reset button can be pressed to clear alarm annunciations. (An alarm cannot be cleared unless the condition causing the alarm has been cleared.) Pressing the History button accesses the Alarms History screen which lists the alarms captured by the DECS-400. Buttons are provided for scrolling through the alarms list, clearing selected alarms, and clearing all listed alarms. A →USB button enables the transfer of selected alarm records to a memory device plugged into the IDP-800 USB port.

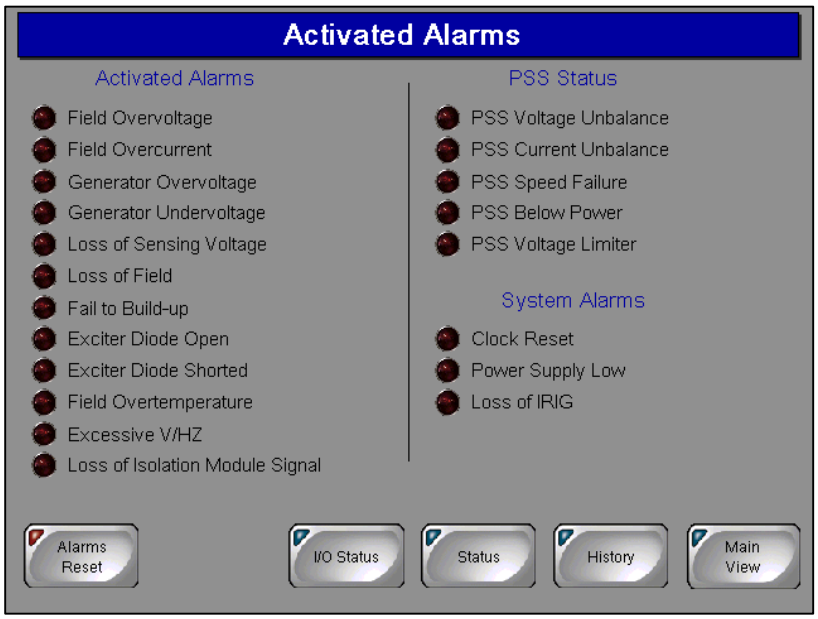


Figure 30. Activated Alarms Screen

The DECS I/O Status screen (Figure 31) is accessed from the Activated Alarms screen or the DECS Status screen by pressing the I/O Status button. This screen has indicators for the status of the DECS-400 contact inputs and relay outputs.

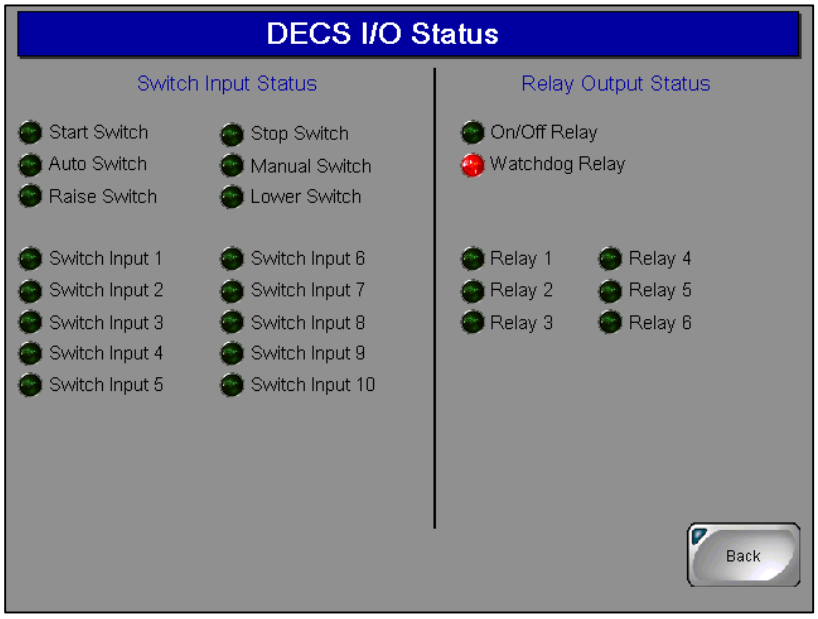


Figure 31. DECS I/O Status Screen

The DECS Status screen (Figure 32) is accessed from the Activated Alarms screen by pressing the Status button. This screen has indicators for DECS-400 operating conditions, DECS-400 setting groups, and DECS-400 limiters.

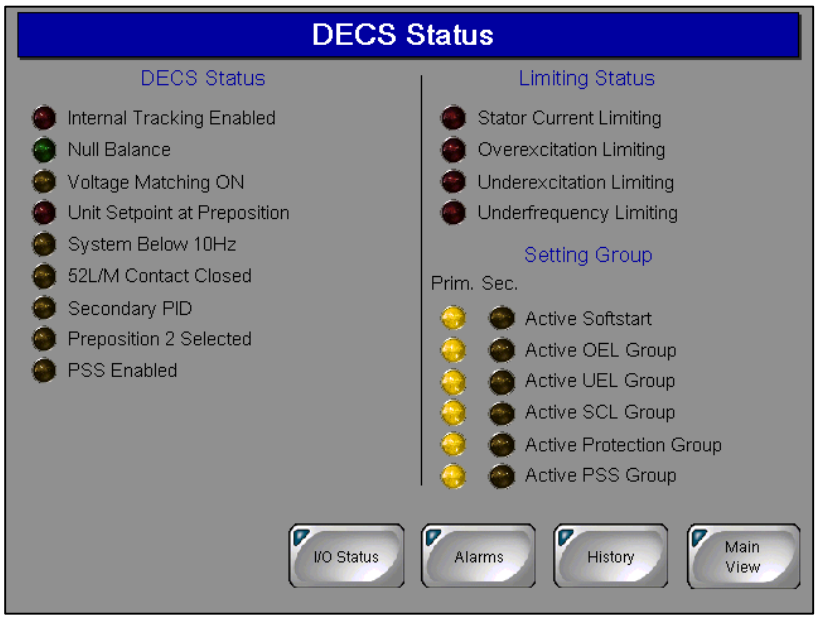


Figure 32. DECS Status Screen

IDP-800-C Operation

The IDP-800-C is applied in applications using the DECS-250 or DECS-250N. The IDP-800-A is applied in applications using the DECS-200 or DECS-200N. The IDP-800-B is applied in applications using the DECS-400. See Figure 1 for IDP-800 style definitions. This chapter describes IDP-800-C operation and screen navigation. For DECS-200 and DECS-200N applications, see the *IDP-800-A Operation* chapter. For DECS-400 applications, see the *IDP-800-B Operation* chapter.

IDP-800 screen appearance and availability will vary according to the type of DECS used and the configuration of the DECS system (single or dual DECS and generator or motor control).

DECS and generator/motor system parameters are viewed and controlled through interactive screens displayed by the IDP-800. Screens are organized according to function. Navigation between screens and control of functions are achieved by touching “buttons” on the IDP-800 screens.

Configuration Screens

Two configuration screens establish DECS and IDP-800 operating modes: IDP-800 Configuration and Screen Configuration. These configuration screens are available upon initial power-up of the IDP-800. After initial configuration, these screens can be accessed through the Main View screen by entering the appropriate password.

IDP-800 Configuration

Upon initial power-up, the IDP-800 displays the IDP-800 Configuration screen (Figure 33) where your product, product configuration, and application must be selected before proceeding to other IDP-800 screens. Failure to make the proper selections may cause the IDP-800 to annunciate false alarms.

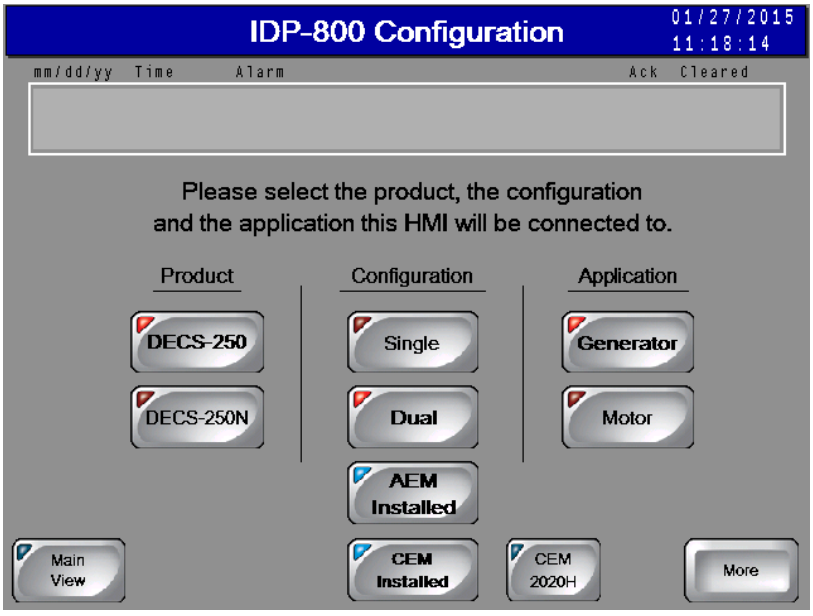


Figure 33. IDP-800 Configuration Screen

Screen Configuration

Pressing the More button on the IDP-800 Configuration screen accesses the Screen Configuration screen (Figure 34) which enables selection of the IDP-800 date and time, and other IDP-800 operating preferences. Individual screen functions are described in the following paragraphs.

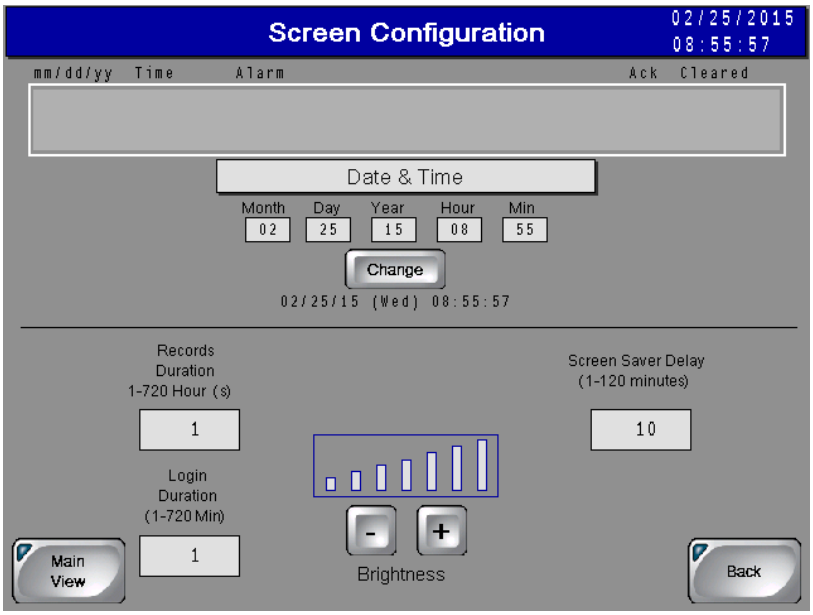


Figure 34. Screen Configuration

Date and Time

The date and time of the IDP-800 must be set manually to match the date and time of the connected DECS. Enter the desired values in the date and time fields and press the Change button to save the values.

Records Duration

Trending records saved by the IDP-800 retain up to six variables per record with each record consisting of 2,400 data points. Trending records saved by the IDP-800 can have a user-defined duration ranging from 1 hour to 720 hours (30 days). Note: requires installation of a compact flash memory card.

Login Duration

Following login, the length of time that password access is available (if no button presses occur) is limited by the value of this setting. If no button presses are received for the duration of the setting, password access is lost and the user must log in again to make changes requiring password access. Login Duration is adjustable over the range of 1 to 720 minutes (12 hours).

Screen Saver Delay

A screensaver activates if no button presses are received at the display panel for the length of time specified by the Screen Saver Delay. A setting of 1 to 120 minutes may be entered.

Brightness

Display panel brightness can be adjusted by pressing the “+” and “–“ buttons. A bar graph above the buttons serves as a reference for adjusting the display brightness.

Main View Screen

The Main View screen (Figure 35) serves as a gateway to the IDP-800 status and control screens. It also provides access to file transfer functions and a screen lock to enable panel cleaning. The Login button can be used to enter the appropriate password and gain access to the configuration screens.

Access to the control screens is possible only when logged into the IDP-800 with the correct password. As a result, the Control button is visible only when logged into the IDP-800.

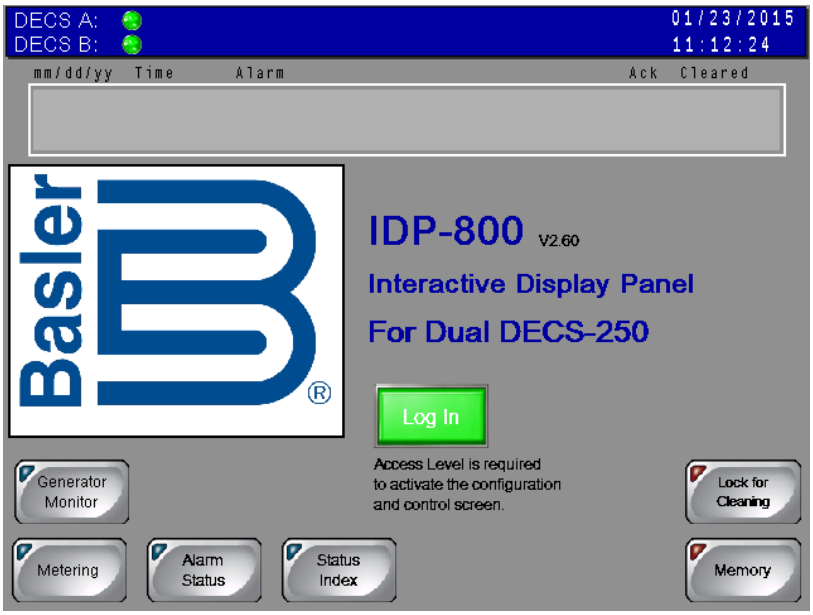


Figure 35. Main View Screen

IDP-800 Passwords

Four passwords protect the IDP-800 from unauthorized settings changes, control commands, and transfers offline.

Two of the passwords are used when transferring the IDP-800 offline. When taking the IDP-800 offline, the offline and system passwords are used. The IDP-800 is delivered with a system password of “4376” and an offline mode access password of “basler”.

A factory-default password of “IDP8” gives access to IDP-800 configuration and control functions.

A factory-default password of “DECS2” gives access to only the IDP-800 control functions.

Password access remains in effect based on display panel activity and the limit set by the Login Duration setting (Screen Configuration screen).

Gaining Password Access

The following example describes the process for using a password to gain configuration and control access.

1. Press the Login button on the Main View screen.
2. Use the alphanumeric keypad to enter the appropriate password and press the Enter button. The factory-default password is IDP8 and is case-sensitive.

Once the correct password is entered, the Main View screen is displayed with a Control button that provides access to the control screens and a Configure button that provides access to the configuration screens.

Generator/Motor Monitor

Depending upon the application selected on the IDP-800 Configuration screen, either the Generator Monitor screen or the Motor Monitor screen is accessed by pressing the Generator Monitor button or Motor Monitor button of the Main View screen. The Generator Monitor or Motor Monitor screen graphically illustrates generator/motor and excitation system status/activity. Generator and motor parameters include output voltage, output current, active (true) power, reactive power, and power factor. Excitation system parameters include field voltage, field current, and excitation on/off status. The Generator Monitor screen is shown in Figure 36 and the Motor Monitor screen is shown in Figure 37.

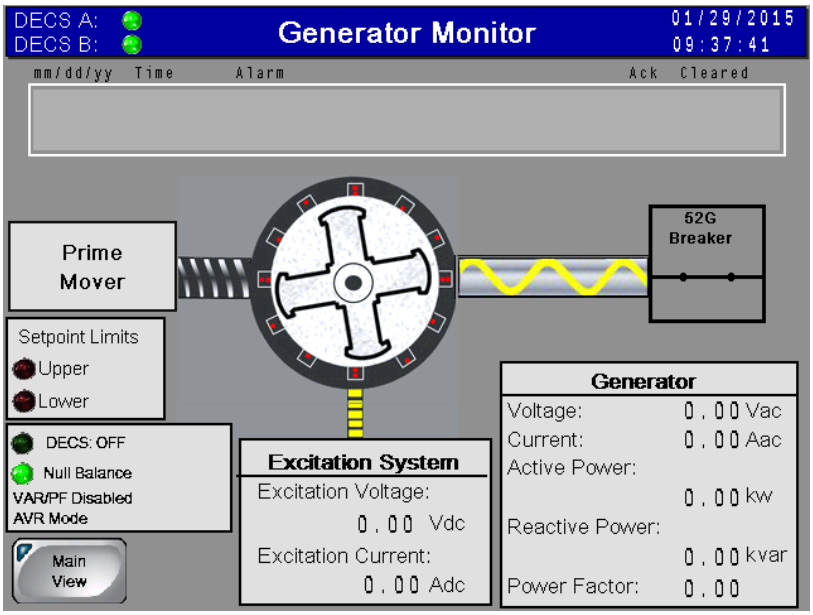


Figure 36. Generator Monitor Screen

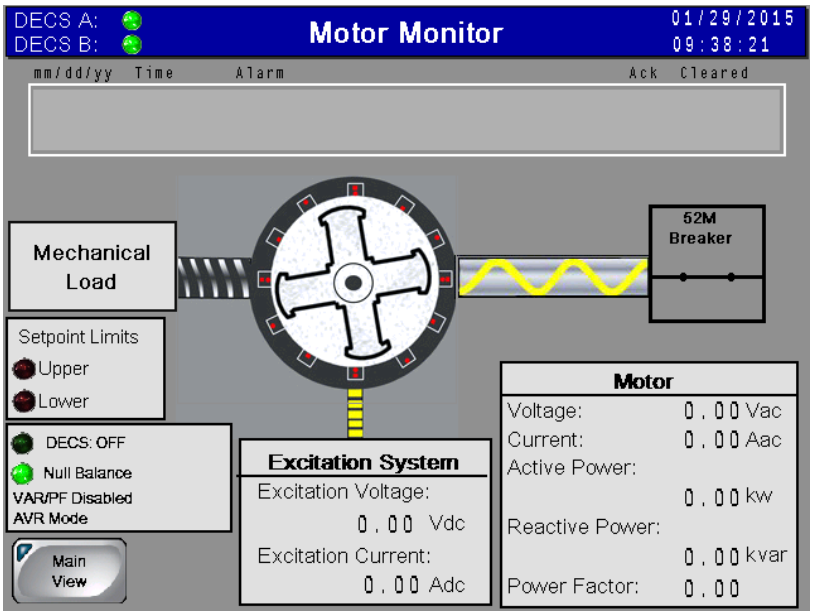


Figure 37. Motor Monitor Screen

DECS Metering Screen

The DECS Metering screen (Figure 38) is accessed by pressing the Metering button of the Main View screen. The DECS Metering screen displays digital metering values for the generator or motor, bus, and exciter field as well as the excitation setpoint position and control values.

Access to the Trending, Capability Curve, Analog Meter, and DECS Status screens is also provided through the buttons at the bottom of the DECS Metering screen.

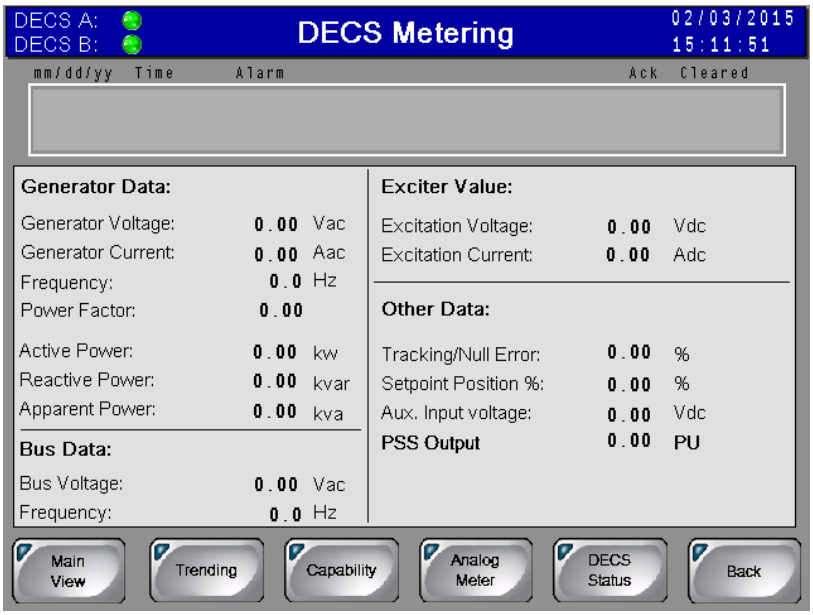


Figure 38. DECS Metering Screen

Trending

The Trending screen (Figure 39) is accessed by pressing the Trending button of the DECS Metering screen. Several system parameters can be selected and monitored over time in an amplitude-versus-time window. Buttons on the Trending screen enable selection of the parameters to be monitored. Available parameters include generator voltage (Vgen), apparent power (kVA), true power (kW), reactive power (kvar), field voltage (Vexc), and field current (Iexc). Parameters are plotted in a color that matches the color of the parameter buttons. Pressing the History button displays additional controls and a display for manipulating the cursor position within a data plot. Pressing the USB button transfers the trending data to a connected USB memory device. Storage of trending information requires the installation of a compact flash memory card.

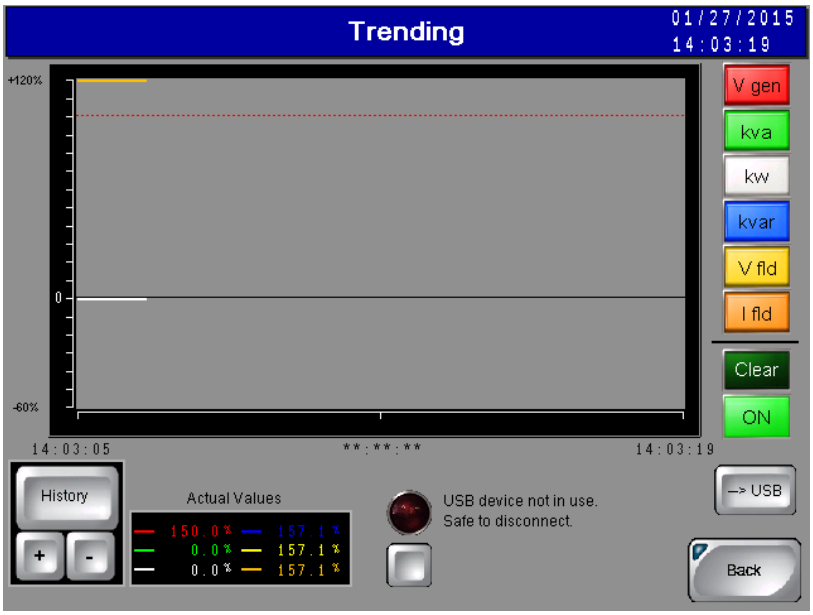


Figure 39. Trending Screen

Capability

The Capability screen (Figure 40) is accessed by pressing the Capability button on the DECS Metering screen. By default, a horizontal curve is displayed. Pressing the Vertical Curve button selects a vertical curve orientation.

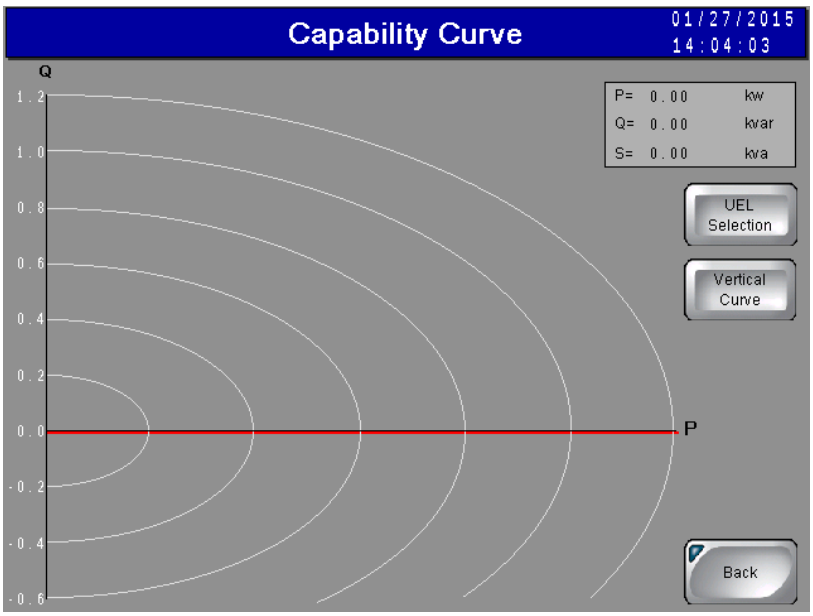


Figure 40. Capability Curve Screen

If a plot of the underexcitation limiter (UEL) curve is desired, the UEL Selection button can be pressed to access the UEL Curve Selection screen (Figure 41). Here, the internal DECS UEL curve can be selected or a customized, three-point, four-point, or five-point curve can be selected and configured. UEL curve points must be selected in BESTCOMS*Plus*® software for an accurate representation on the IDP-800. Pressing the None button disables the display of UEL curves.

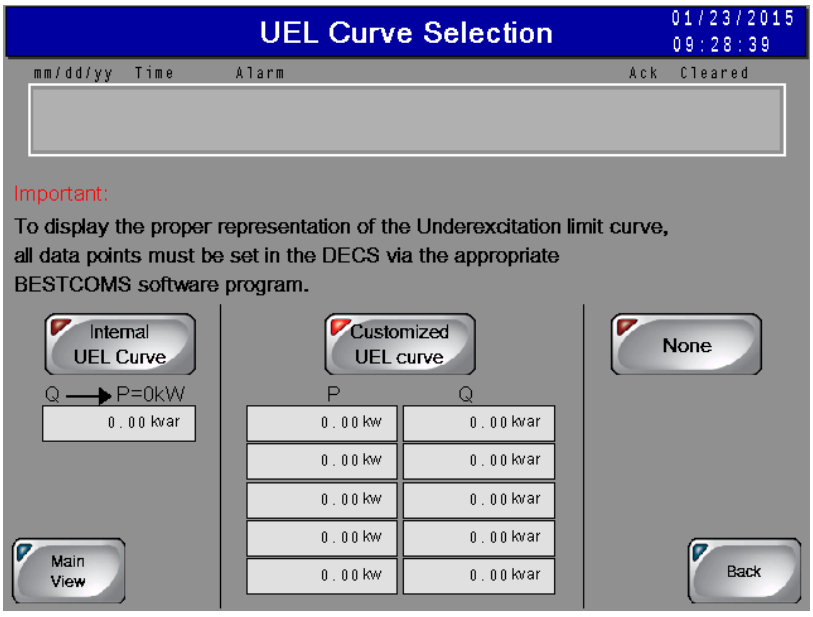


Figure 41. UEL Curve Selection Screen

Analog Metering

Analog representations of the digital metering values shown on the DECS Metering screen (Figure 38) can be accessed by pressing the Analog Meter button. Pressing this button accesses the Generator

Values or Motor Values screen (Figure 42) which displays analog representations of the generator/motor voltage, current, frequency, and power factor.

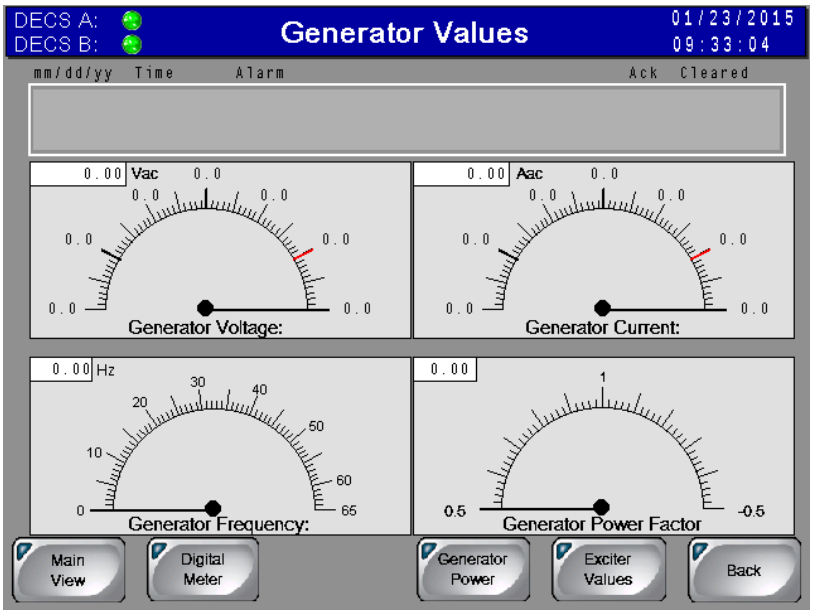


Figure 42. Generator Values Screen

Each analog representation displays the digital equivalent in the upper, left corner. The remaining analog metering values are divided between two screens: the Generator Power or Motor Power screen and the Exciter values screen.

The Generator Power or Motor Power screen is accessed from the Generator/Motor Values screen or Exciter Values screen by pressing the Generator Power or Motor Power button. This screen displays analog representations of the generator/motor active power, reactive power, and apparent power.

The Exciter Values screen is accessed from the Generator/Motor Values screen or Generator/Motor Power screen by pressing the Exciter Values button. This screen displays analog representations of the excitation voltage and current. A Digital Meter button, on each analog metering screen, can be pressed to return to the DECS (digital) Metering screen.

Status, I/O, and Alarm Screens

The Status Index screen (Figure 43) is accessed by pressing the Status Index button of the Main View screen. This screen provides access to alarms, alarm history, input/output status, DECS status, configurable protection, and AEM inputs.

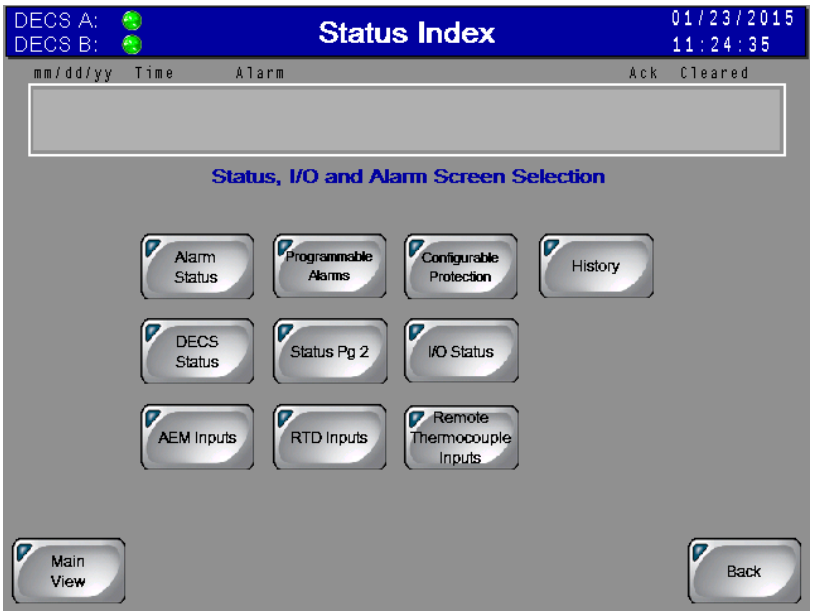


Figure 43. Status Index Screen

Alarm Status

The Alarm Status screen (Figure 44) shows active protection alarms and general alarms. Depending upon the annunciation, active indicators change to amber, green, or red when active. An Alarms Reset button can be pressed to clear alarm annunciations. (An alarm cannot be reset unless the condition causing the alarm has been cleared.)

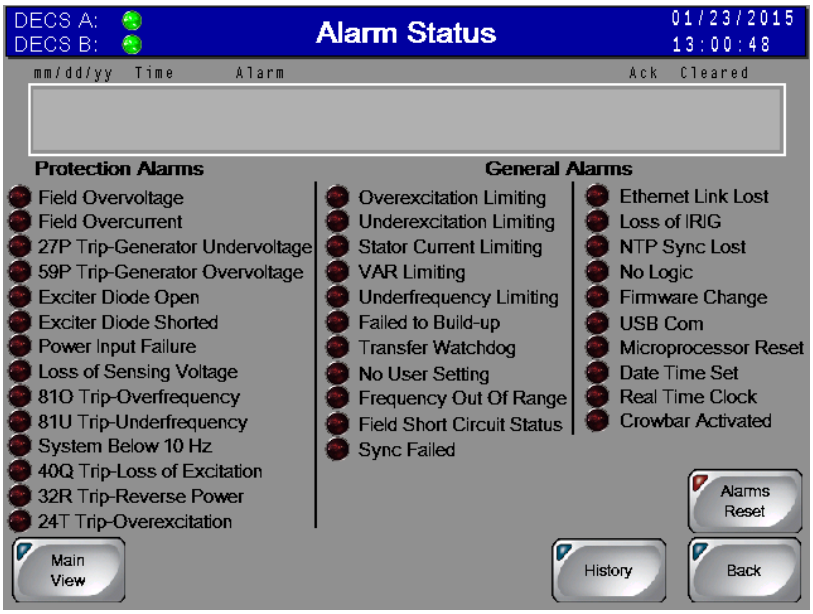


Figure 44. Alarm Status Screen

Alarms History

Pressing the History button accesses the Alarms History screen (Figure 45) which lists the alarms captured by the DECS. Buttons are provided for scrolling through the alarms list, clearing selected alarms, and clearing all listed alarms. A →USB button enables the transfer of selected alarm records to a memory device plugged into the IDP-800 USB port.

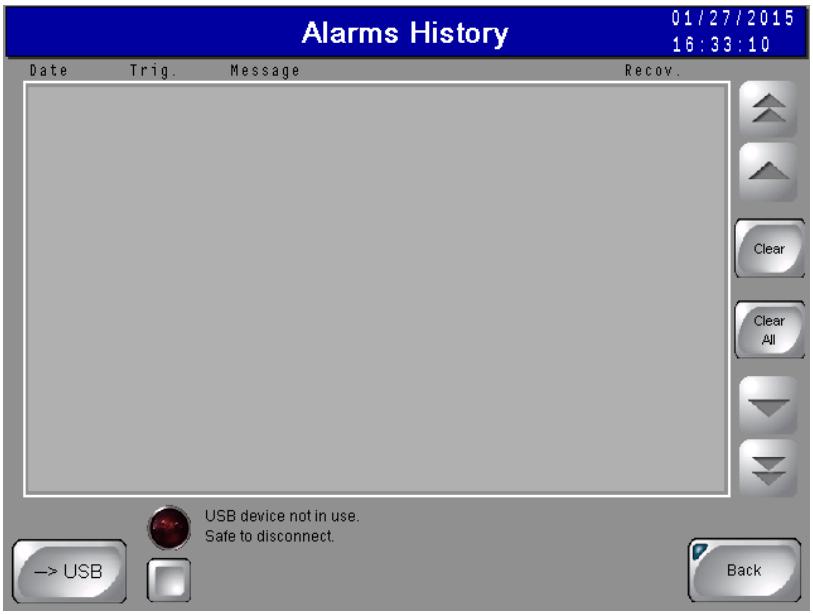


Figure 45. Alarms History Screen

Programmable Alarms

The Programmable Alarms screen (Figure 46) shows active programmable alarms. An Alarms Reset button can be pressed to clear alarm annunciations. (An alarm cannot be reset unless the condition causing the alarm has been cleared.)

Figure 46. Programmable Alarms Screen

Configurable Protection

The Configurable Protection screen (Figure 47) shows configurable protection alarms. An alarm is active when the configurable protection threshold has been exceeded. An Alarms Reset button can be pressed to clear alarm annunciations. (An alarm cannot be reset unless the condition causing the alarm has been cleared.)

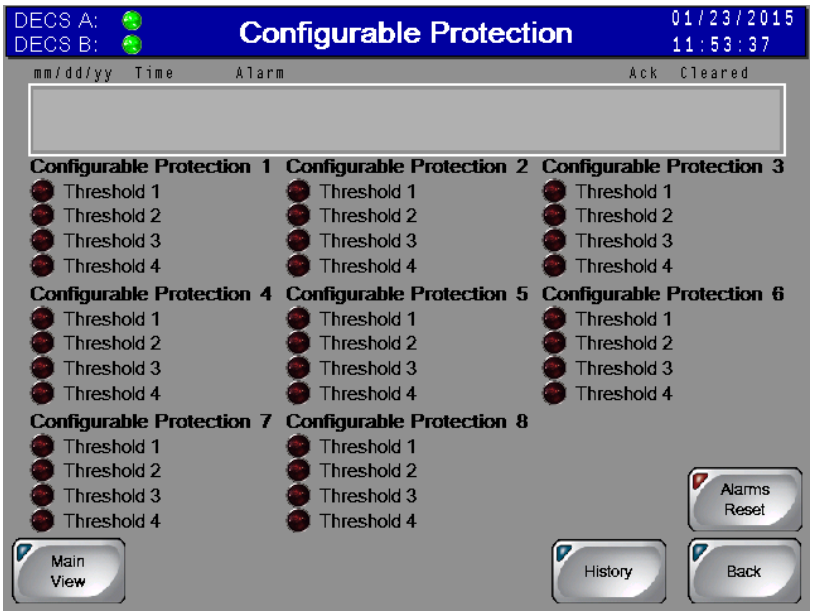


Figure 47. Configurable Protection Screen

DECS Status

The Status screen (Figure 48) shows active DECS operating modes, status, PSS status, and limiting status.

Figure 48. Status Screen

Status Page 2

The Status Page 2 screen (Figure 49) shows the secondary group status, setpoint pre-position, setpoint limit alarms, and AEM alarms.

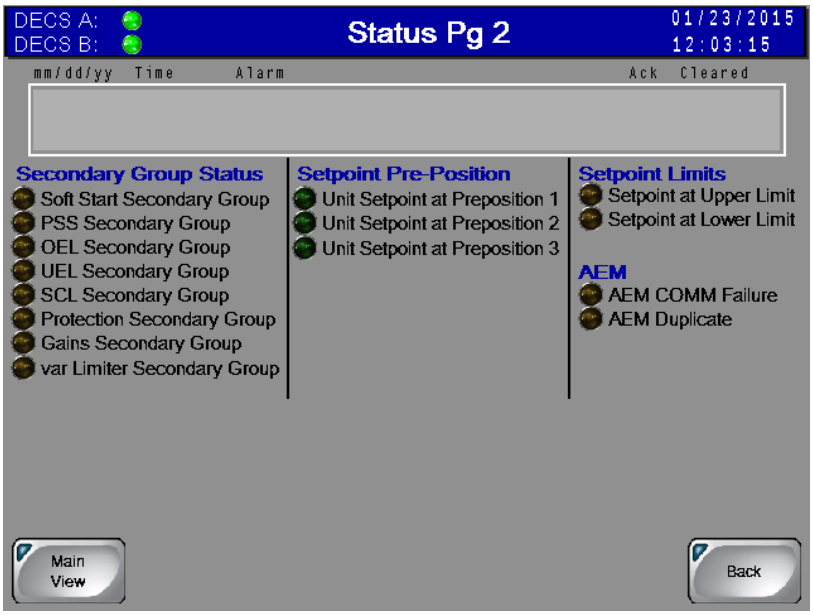


Figure 49. Status Page 2 Screen

I/O Status

The I/O Status screen (Figure 50) has indicators for DECS contact input status and relay output status (open or closed). CEM input and output status is also shown on this screen.

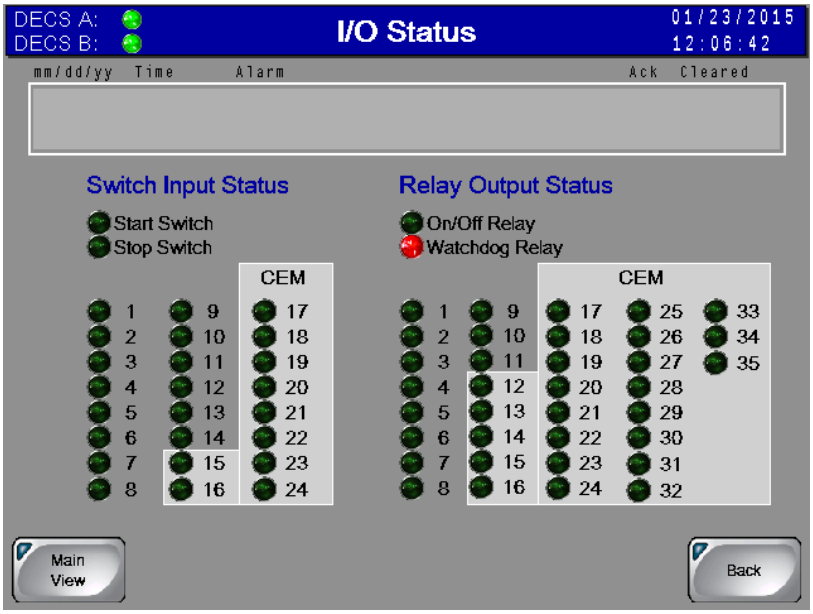


Figure 50. I/O Status Screen

AEM Inputs

The AEM Inputs screen (Figure 51) has indicators for analog inputs and alarms.

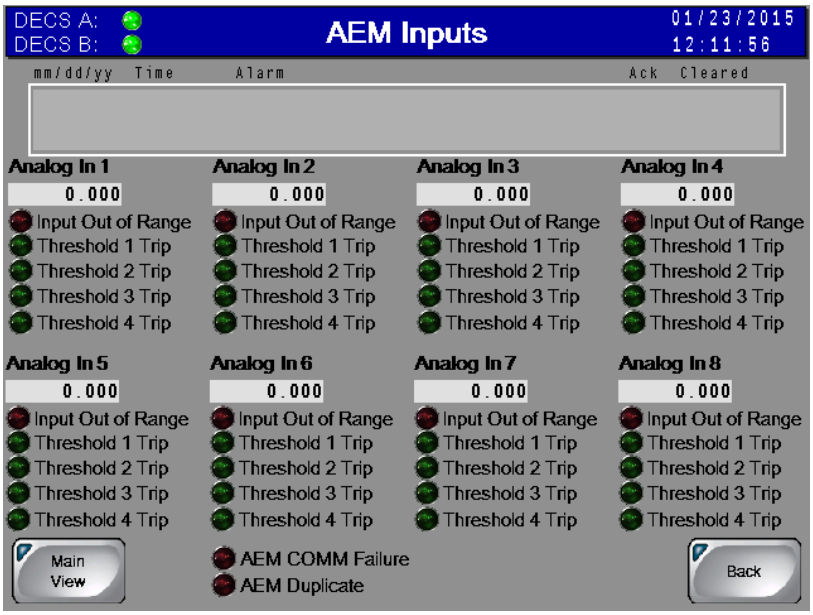


Figure 51. AEM Inputs Screen

RTD Inputs

The RTD Inputs screen (Figure 52) has indicators for RTD inputs and alarms.

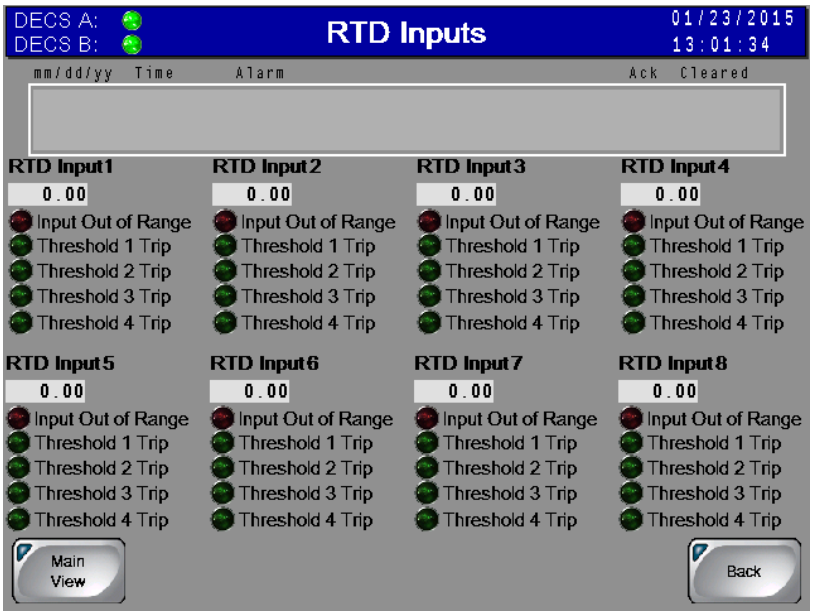


Figure 52. RTD Inputs Screen

Remote Thermocouple Inputs

The Remote Thermocouple Inputs screen (Figure 52) has indicators for RTD inputs.

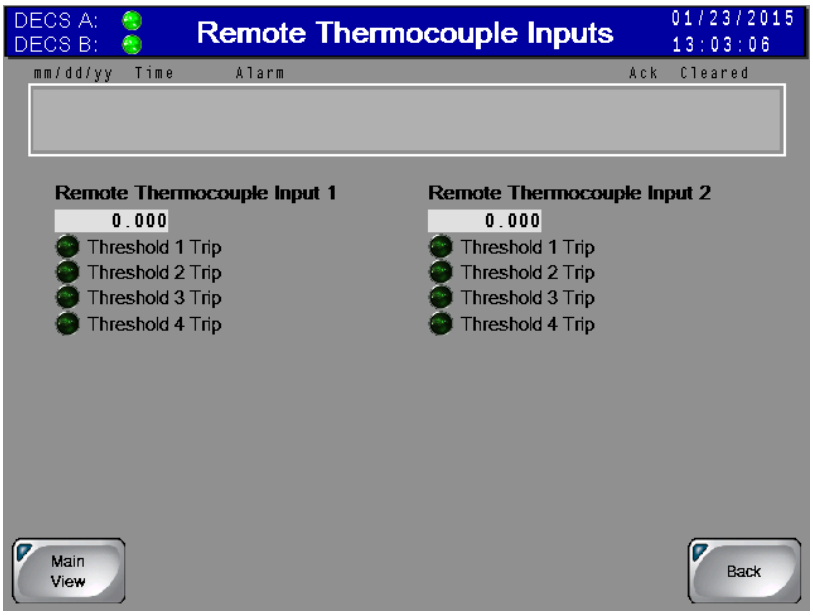


Figure 53. Remote Thermocouple Inputs Screen

DECS Control

Access to the DECS Control screen is possible only when logged in with the appropriate password. When logged in, a Control button on the Main View screen provides access to the DECS Control screen illustrated in Figure 54. DECS control functions are divided between two screens: Setpoint Control and Regulation Control.

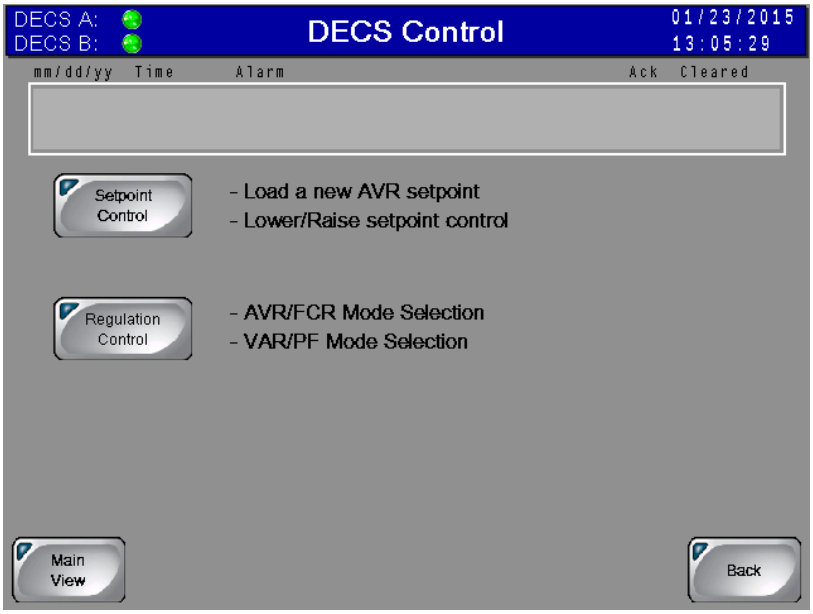


Figure 54. DECS Control Screen

Setpoint Control

Pressing the Setpoint Control button accesses the Setpoint Control screen (Figure 55). This screen displays the DECS AVR, FCR, power factor, and var setpoints and provides two methods of setpoint adjustment. The “+” and “–“ buttons can be pressed to increment and decrement the active setpoint. A specific setpoint can be entered for any of the four setpoints. Pressing the New button associated with the setpoint to be changed accesses a Setpoint Adjustment screen that displays the current setpoint value

along with the minimum and maximum limits for the setting. Touching the setting field area displays a numeric keypad where the new value can be entered.

The Setpoint Control screen also has system status indicators and a metering display for generator and excitation system parameters.

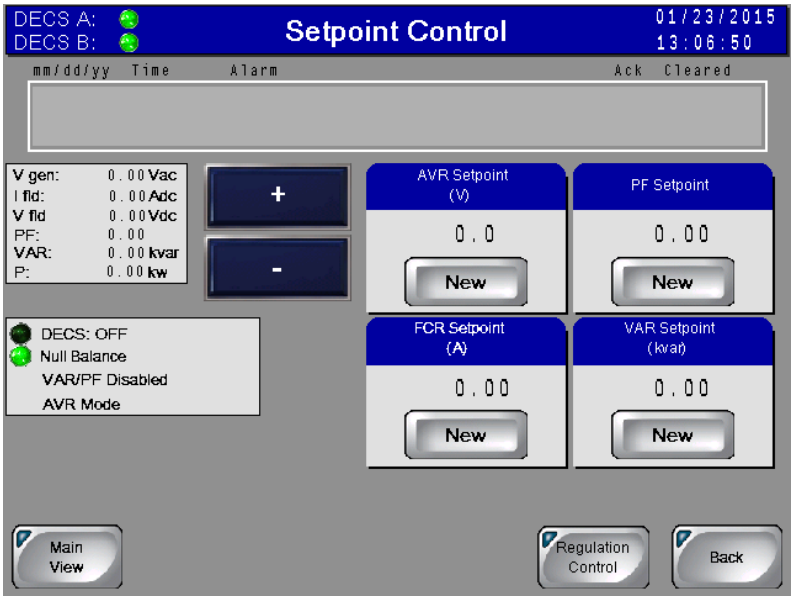


Figure 55. Setpoint Control Screen

Regulation Control

Pressing the Regulation Control button accesses the Regulation Control screen (Figure 56). This screen enables selection of the active regulation mode. The AUTO and MANUAL buttons toggle between Auto and Manual modes. When operating in AVR mode, the Off, PF, and VAR buttons can be used to enable or disable regulation of vars or power factor. Each change to the regulation mode requires a confirmation via an accept/reject dialog box.

The Regulation Control screen also has system status indicators and a metering display for generator/motor and excitation system parameters.

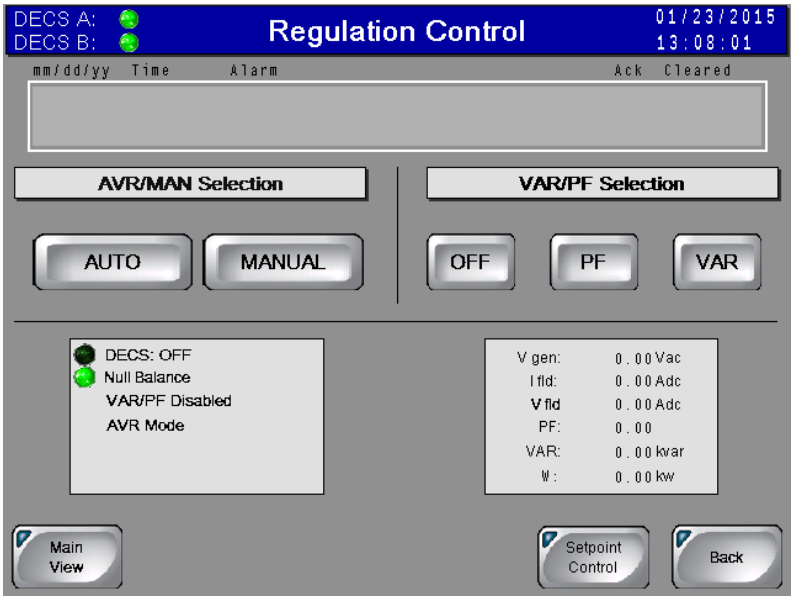


Figure 56. Regulation Control Screen

Modbus™ Communication

When DECS-400 controllers are connected (through an Ethernet switch or hub) to an Ethernet network, all Modbus registers of each DECS-400 can be interrogated directly through the LAN. For a complete list of DECS-400 Modbus holding register assignments, refer to the DECS-400 instruction manual (Basler publication 9369700990).

The Modbus holding registers of a DECS-200/DECS-200N can be interrogated through the IDP-800-A and the holding registers of a DECS-250/DECS-250N can be interrogated through the IDP-800-C. The amount of information (registers) available through the 0BIDP-800-A and 0BIDP-800-C is limited to three categories: metering, operating modes, and setpoints.

Caution
This product contains one or more *nonvolatile memory* devices. Nonvolatile memory is used to store information (such as settings) that needs to be preserved when the product is power-cycled or otherwise restarted. Established nonvolatile memory technologies have a physical limit on the number of times they can be erased and written. During product application, consideration should be given to communications, logic, and other factors that may cause frequent/repeated writes of settings or other information that is retained by the product. Applications that result in such frequent/repeated writes may reduce the useable product life and result in loss of information and/or product inoperability.

This chapter lists the assignments and descriptions of the Modbus holding registers accessible through the 0BIDP-800-A (DECS-200 and DECS-200N) and 0BIDP-800-C (DECS-250 and DECS-250N). The following conventions apply in the register tables. In the Access column, “R” represents read access and “W” represents write access. Data formats are described as follows.

Data Type UI6
Corresponding Built-In Data Type: UINT16, unsigned short integer
Data Range: 0 to 65,535
Data Size in Bytes: 2
Total Number of Modbus Registers to Hold Data: 1

Data Type R32_23
Corresponding Built-In Data Type: FLOAT, floating point number
Data Range: from approximately 8.43×10^{-37} to 3.38×10^{38}
Data Size in Bytes: 4
Total Number of Modbus Registers to Hold Data: 2

IDP-800 Register Table

Data transmitted via Modbus is identified by holding registers. Table 2 lists the holding register assignments and descriptions for the 0BIDP-800-A and 0BIDP-800-C. In the Access column of Table 2, “W-” indicates write-access.

Table 2. 0BIDP-800 Register Table

Register	Data Description	Access	Data Format
47715	New FCR setpoint To load this new setpoint in the AVR, it is necessary to pass register 47723 at 1	W-	R32_23
47717	New AVR setpoint To load this new setpoint in the AVR, it is necessary to pass register 47724 at 1	W-	R32_23

Register	Data Description	Access	Data Format
47719	New VAR setpoint To load this new setpoint in the AVR, it is necessary to pass register 47725 at 1	W-	R32_23
47721	New PF setpoint To load this new setpoint in the AVR, it is necessary to pass register 47726 at 1	W-	R32_23
47723	Load new FCR setpoint to AVR 0= No change ; 1=change	W-	UI16
47724	Load new AVR setpoint to AVR 0= No change ; 1=change	W-	UI16
47725	Load new VAR setpoint to AVR 0= No change ; 1=change	W-	UI16
47726	Load new PF setpoint to AVR 0= No change ; 1=change	W-	UI16
47727	Virtual toggle switch for changing control mode from comm. Port between AVR and FCR: 0 = no change / 1 = change state. Holding register 47573 contains Control mode status.	W-	UI16
47728	Switch for changing operating mode via comm. port to one of three modes. 0=OFF / 1=PF / 2=var. Holding register 47571 contains Operating mode status. To change the operating mode in the AVR, it is necessary to pass the register 47729 at 1	W-	UI16
47729	Load new operation mode to the AVR 0= No change ; 1=change	W-	UI16
47730	Raise input enable status from comm. port: 0 = Off / 1 = On	W-	UI16
47731	Lower input enable status from comm. port: 0 = Off / 1 = On	W-	UI16

DECS-200, DECS-250, and DECS-250N Register Tables

Three categories of DECS-200, DECS-250, and DECS-250N information can be accessed through the 0BIDP-800 using the Modbus communication protocol: C2 (metering), C5 (operating modes), and C6 (setpoints).

DECS-200, DECS-250, and DECS-250N Metering Information Category C2

Category C2 holding register assignments and descriptions are listed in Table 3.

Table 3. DECS-200/DECS-250/DECS-250N Metering Information Category C2

Register	Data Description	Access	Data Format
47257-58	Average of the 3 rms line-to-line voltages	R-	R32_23
47259-60	Phase B generator current in amps	R-	R32_23
47261-62	Generator apparent power in kVA	R-	R32_23
47263-64	Generator real power in kW	R-	R32_23
47265-66	Generator reactive power in kvar	R-	R32_23
47267-68	Power factor	R-	R32_23
47269-70	Generator frequency in hertz	R-	R32_23
47271-72	Bus frequency in Hz	R-	R32_23
47273-74	RMS bus voltage in volts	R-	R32_23

Register	Data Description	Access	Data Format
47275-76	Field voltage in volts	R-	R32_23
47277-78	Field current in amps	R-	R32_23
47283-84	Auxiliary input in volts (PSS input)	R-	R32_23
47287-88	Null balance (tracking error) in percent	R-	R32_23
47295	Status of the Front panel LEDs (bit flags, where 0=off, 1=on for all LEDs except Null Balance and Internal Tracking which are reversed): b0=Null Balance, b1=Tracking, b2=Pre-position, b3=Upper Limit, b4=Lower Limit, b5=Edit, b6-b15=unassigned	R-	UI16
47296	Voltage matching status: 0=off / 1=on	R-	UI16
47297	Protection status bit flags (0=clear, 1=condition present): b0=field overvoltage, b1=field overcurrent, b2=gen. Undervoltage, b3=gen. overvoltage, b4=underfrequency, b5=in OEL, b6=in UEL, b7=in FCR mode, b8=loss of sensing voltage, b9=setpoint at lower limit, b10=setpoint at upper limit, b11=gen. failed to build up, b12= gen. below 10Hz, b13=unassigned, b14=exciter diode open, b15=exciter diode shorted.	R-	UI16
47300-01	The active operating setpoint expressed as a percent of its present adjustment range.	R-	R32_23
47302	The state of some contact inputs: b0 = 52JK, b1 = 52LM, b2 = Automatic transfer, b3 = External Tracking Enable	R-	UI16
47303	Annunciation status bit flags (0=clear, 1=annunciation present): b0=field overvoltage, b1=field overcurrent, b2=gen. undervoltage, b3=gen. overvoltage, b4=underfrequency, b5=in OEL, b6=in UEL, b7=in FCR mode, b8=loss of sensing voltage, b9=setpoint at lower limit, b10=setpoint at upper limit, b11=gen. failed to build up, b12= gen. below 10Hz, b13=unassigned, b14=exciter diode open, b15=exciter diode shorted..	R-	UI16
47306	Protection status bit flags (0 = clear, 1 = condition present) b0 = loss of field, b1 = in SCL, b2 – b15 are unassigned	R-	UI16
47307	Annunciation status bit flags (0 = clear, 1 = condition present) b0 = loss of field, b1 = in SCL, b2 – b15 are unassigned	R-	UI16

DECS-200, DECS-250, and DECS-250N Operating Mode Information Category C5

Category CT holding register assignments and descriptions are listed in Table 4.

Table 4. DECS-200/DECS-250/DECS-250N Operating Mode Information Category C5

Register	Data Description	Access	Data Format
47571	Operating mode: 0 = Off / 1 = PF Control / 2 = var Control	R-	UI16
47572	Unit mode status: 0 = Stop / 1 = Start	R-	UI16
47573	Control mode status: 1 = FCR / 2 = AVR	R-	UI16

DECS-200, DECS-250, and DECS-250N Setpoints Information Category C6

Category C6 holding register assignments and descriptions are listed in Table 5.

Table 5. DECS-200/DECS-250/DECS-250N Setpoints Information Category C6

Register	Data Description	Access	Data Format
47621-22	FCR (field current regulator) mode setpoint; adjustment range is determined by registers (47699-700) and (47707-08)	RW	R32_23
47623-24	AVR (automatic voltage regulator) mode setpoint; adjustment range is determined by registers (47701-02) and (47709-10)	RW	R32_23

Register	Data Description	Access	Data Format
47625-26	Var mode setpoint (in kvar); adjustment range is determined by registers (47703-04) and (47711-12)	RW	R32_23
47627-28	PF mode setpoint; adjustment range is determined by registers (47705-06) and (47713-14)	RW	R32_23
47699-700	FCR minimum setpoint (in amps) = % of nominal x rated field current:(regs. 47655-56) x (regs. 47529-30) / 100	R-	R32_23
47701-02	AVR minimum setpoint (in volts) = % of nominal x rated gen. voltage:(regs. 47657-58) x (regs. 47525-26) / 100	R-	R32_23
47703-04	Var minimum setpoint (in kvar) = % of nominal x rated generator VA:(regs. 47659-60) x rated VA / 100	R-	R32_23
47705-06	PF minimum setpoint = registers 47661-62	R-	R32_23
47707-08	FCR maximum setpoint (in amps) = % of nominal x rated field current:(regs. 47663-64) x (regs. 47529-30) / 100	R-	R32_23
47709-10	AVR maximum setpoint (in volts) = % of nominal x rated gen. Voltage:(regs. 47665-66) x (regs. 47525-26) / 100	R-	R32_23
47711-12	Var maximum setpoint (in kvar) = % of nominal x rated gen. VA:(regs. 47667-68) x rated VA / 100	R-	R32_23
47713-14	PF maximum setpoint = registers 47669-70	R-	R32_23

DECS-200N Register Tables

Three categories of DECS-200N information can be accessed through the 0BIDP-800 using the Modbus communication protocol: C2 (metering), C5 (operating modes), and C6 (setpoints).

DECS-200N Metering Information Category C2

Category C2 holding register assignments and descriptions are listed in Table 6.

Table 6. DECS-200N Metering Information Category C2

Register	Data Description	Access	Data Format
47257-58	Average of the three rms line-to-line voltages	R-	R32_23
47259-60	Generator current Ib in amps	R-	R32_23
47261-62	Generator apparent power in kVA	R-	R32_23
47263-64	Generator real power in kW	R-	R32_23
47265-66	Generator reactive power in kvar	R-	R32_23
47267-68	Power factor	R-	R32_23
47269-70	Generator frequency in hertz	R-	R32_23
47271-72	Bus frequency in hertz	R-	R32_23
47273-74	RMS bus voltage in volts	R-	R32_23
47275-76	Field voltage in volts	R-	R32_23
47277-78	Field current in amps	R-	R32_23
47283-84	Auxiliary input in volts (PSS input)	R-	R32_23
47287-88	Null balance (tracking error) in percent	R-	R32_23
47295	Status of the Front panel LEDs: b0=Null Balance, b1=Internal Tracking, b2=Pre-Position, b3=Upper Limit, b4=Lower Limit, b5=Edit Button	R-	UI16
47296	Voltage matching status: 0=off/1=on	R-	UI16

Register	Data Description	Access	Data Format
47297	Protection status bit flags (0=clear, 1=condition present): b0=field over-voltage, b1=field over-current, b2=generator under-voltage, b3=generator over-voltage, b4=under-frequency, b5=in OEL, b6=in UEL, b7=in FCR mode, b8=loss of sensing voltage, b9=setpoint at lower limit, b10=setpoint at upper limit, b11= generator below 10Hz, b12=exciter diode open, b13=exciter diode shorted, b14=loss of field, b15=in stator current limiting.	R-	UI16
47300-01	The active operating setpoint expressed as a percent of its adjustment range.	R-	R32_23
47302	The state of some contact inputs: b0=52JK, b1=52LM, b2=Auto Transfer, b3=Ext. Tracking Enable	R-	UI16
47303	Annunciation status bit flags (0=clear, 1=annunciation present): b0=field over-voltage, b1=field over-current, b2=generator under-voltage, b3=generator over-voltage, b4=under-frequency, b5=in OEL, b6=in UEL, b7=in FCR mode, b8=loss of sensing voltage, b9=setpoint at lower limit, b10=setpoint at upper limit, b11= generator below 10 Hz, b12=exciter diode open, b13=exciter diode shorted, b14=loss of field, b15=in stator current limiting.	R-	UI16
47306	Protection status bit flags (0 = clear, 1 = condition present): b0=failed to build up, b1=build-up activated, b2= power input failure, b3 = crowbar activated, b4 - b15 are unassigned.	R-	UI16
47307	Annunciation status bit flags (0 = clear, 1 = condition present) b0=failed to build up, b1=build-up activated, b2= power input failure, b3 = crowbar activated, b4– b15 are unassigned.	R-	UI16

DECS-200N Operating Mode Information Category C5

Category C5 holding register assignments and descriptions are listed in Table 7.

Table 7. DECS-200N Operating Mode Information Category C5

Register	Data Description	Access	Data Format
47571	Operating mode (0=OFF/ 1=PF/ 2=VAR)	R	UI16
47572	Unit mode status (1=START, 0=STOP)	R	UI16
47573	Control mode status (1=FCR, 2=AVR)	R	UI16

DECS-200N Setpoints Information Category C6

Category C6 holding register assignments and descriptions are listed in Table 8.

Table 8. DECS-200N Setpoints Information Category C6

Register	Data Description	Access	Data Format
47621-22	FCR mode (field current) setpoint	RW	R32_23
47623-24	AVR mode (generator voltage) setpoint	RW	R32_23
47625-26	Var mode setpoint in kvar	RW	R32_23
47627-28	PF mode setpoint	RW	R32_23
47699-700	FCR minimum setpoint	R-	R32_23
47701-02	AVR minimum setpoint	R-	R32_23
47703-04	Var minimum setpoint in kvar	R-	R32_23
47705-06	PF minimum setpoint	R-	R32_23
47707-08	FCR maximum setpoint	R-	R32_23
47709-10	AVR maximum setpoint	R-	R32_23

Register	Data Description	Access	Data Format
47711-12	Var maximum setpoint in kvar	R-	R32_23
47713-14	PF maximum setpoint	R-	R32_23

Mounting

IDP-800 mounting consists of selecting a suitable mounting location, cutting the panel opening, and securing the display to the panel.

Warning!

The control panel/equipment enclosure where the IDP-800 will be installed must be removed from service and all related operating and control power de-energized before proceeding with IDP-800 installation.

Mounting Considerations

The IDP-800 is intended for mounting in a cutout on a vertical panel in an environment where the ambient temperature does not exceed the temperature range of 0 to 50°C (32 to 122°F). Observe the following considerations and guidelines when preparing to mount the IDP-800.

Location and Environmental Considerations

The IDP-800 is intended for mounting in a vertical panel. If mounting the IDP-800 in a slanted panel, the panel should not deviate more than thirty degrees from vertical. If the panel slants more than thirty degrees, you must ensure that the ambient temperature surrounding the IDP-800 does not exceed 40°C (104°F). This may require the use of external cooling equipment (such as a fan or air conditioner). To enhance ventilation and maintenance, the IDP-800 should be installed no closer than 4 inches (10 centimeters) from adjacent equipment. Heat created by nearby equipment must not cause the ambient temperature surrounding the IDP-800 to exceed its maximum operating temperature.

Mounting Panel Thickness

The IDP-800 can be mounted on a panel with a thickness no less than 0.06 inches (1.6 millimeters) and no more than 0.39 inches (10.0 millimeters).

Cutting the Panel Opening

Cut an opening in the mounting panel that is 8.05 inches (205 millimeters) wide and 6.28 inches (160 millimeters) high. Figure 57 illustrates the panel cutting dimensions.

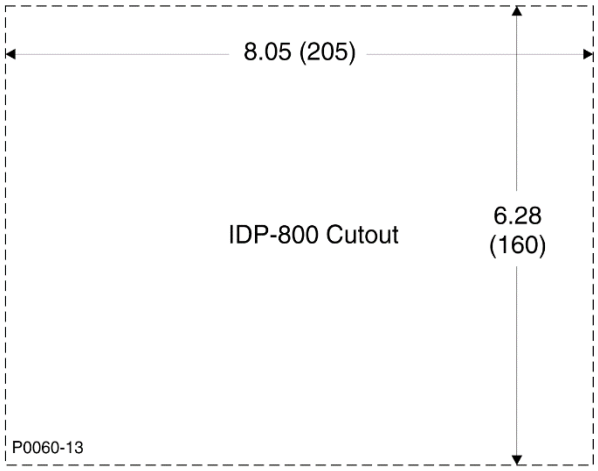
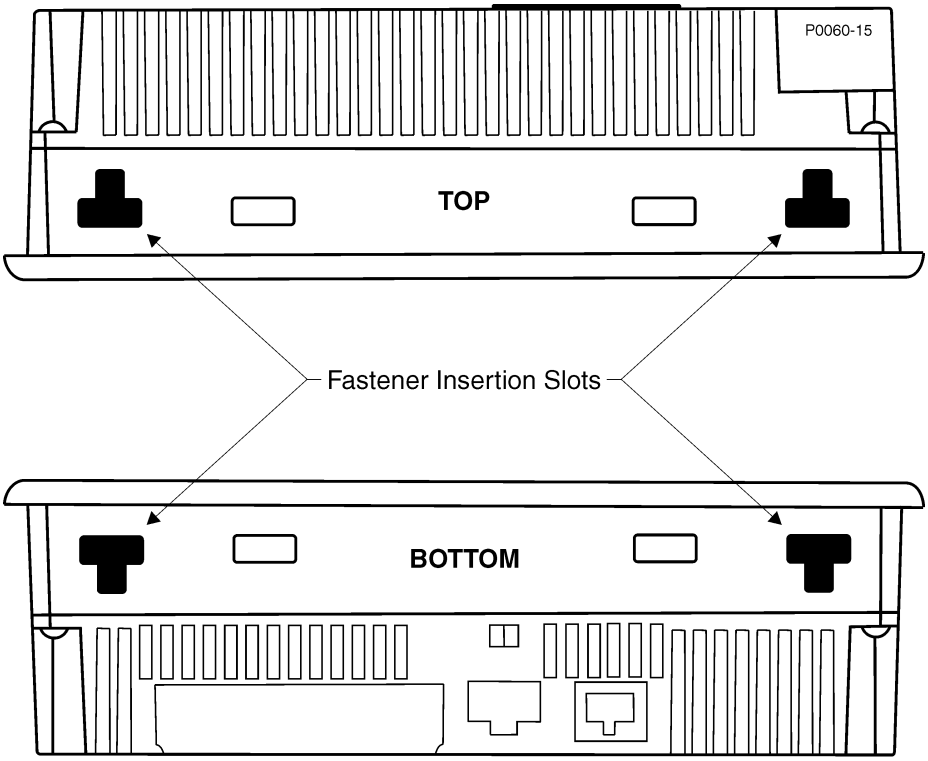


Figure 57. IDP-800 Panel Cutting Dimensions

Securing the IDP-800

The IDP-800 is secured to a panel with four hook-and-screw fasteners. The hook of each fastener is inserted in one of four display panel insertion slots (Figure 58) and the fastener screw is tightened against the mounting panel (Figure 59).



NOTE
The hook of each fastener must be inserted securely into the slot's recess (narrow portion of slot).

Figure 58. Fastener Insertion Slot Locations

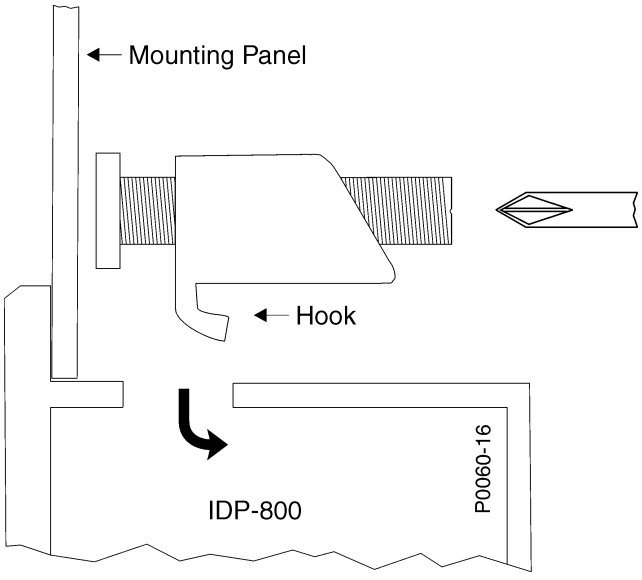


Figure 59. Fastener Attachment Detail

Secure the IDP-800 in the panel cutout by performing the following steps. Ensure that the IDP-800 mounting gasket is in place before securing the display to the panel.

Caution

Over-tightening the fastener screws will damage the display panel housing. Maximum screw torque is 4.43 in-lb (0.5 N•m).

1. Insert the IDP-800 into the panel cutout and hold the IDP-800 against the mounting panel.
2. Insert the hook of a hook-and-screw fastener in one of the four fastener insertion slots and rotate the screw clockwise to tighten the screw against the mounting panel.
3. Repeat step 2 for the three remaining fasteners and insertion slots.
4. As necessary, adjust the IDP-800 position in the panel opening so that when the IDP-800 is secured against the panel, it is centered in the panel opening.

Mounting of Accessories

Mounting details for the optional Ethernet switch and power supply are provided in the following paragraphs.

Ethernet Switch

The optional, eight-port Ethernet switch (P/N 41133) can be mounted using the DIN mounting rail accessory (P/N 9323900001). DIN mounting rail dimensions are shown in Figure 60. Dimensions are shown in inches with millimeters in parenthesis.

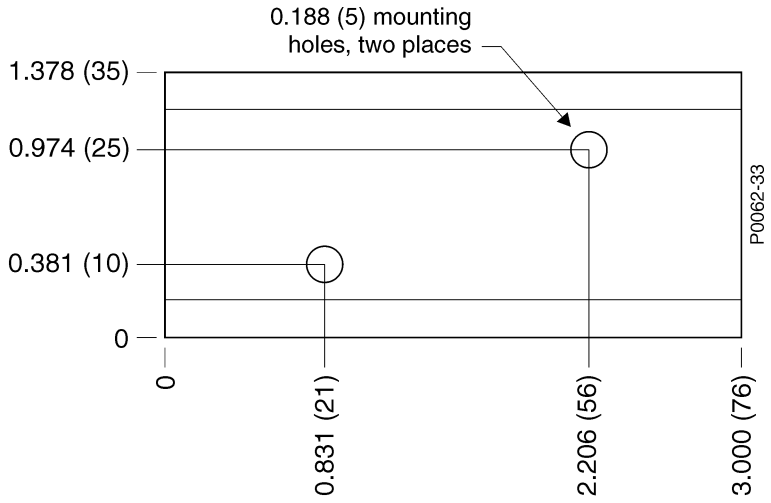
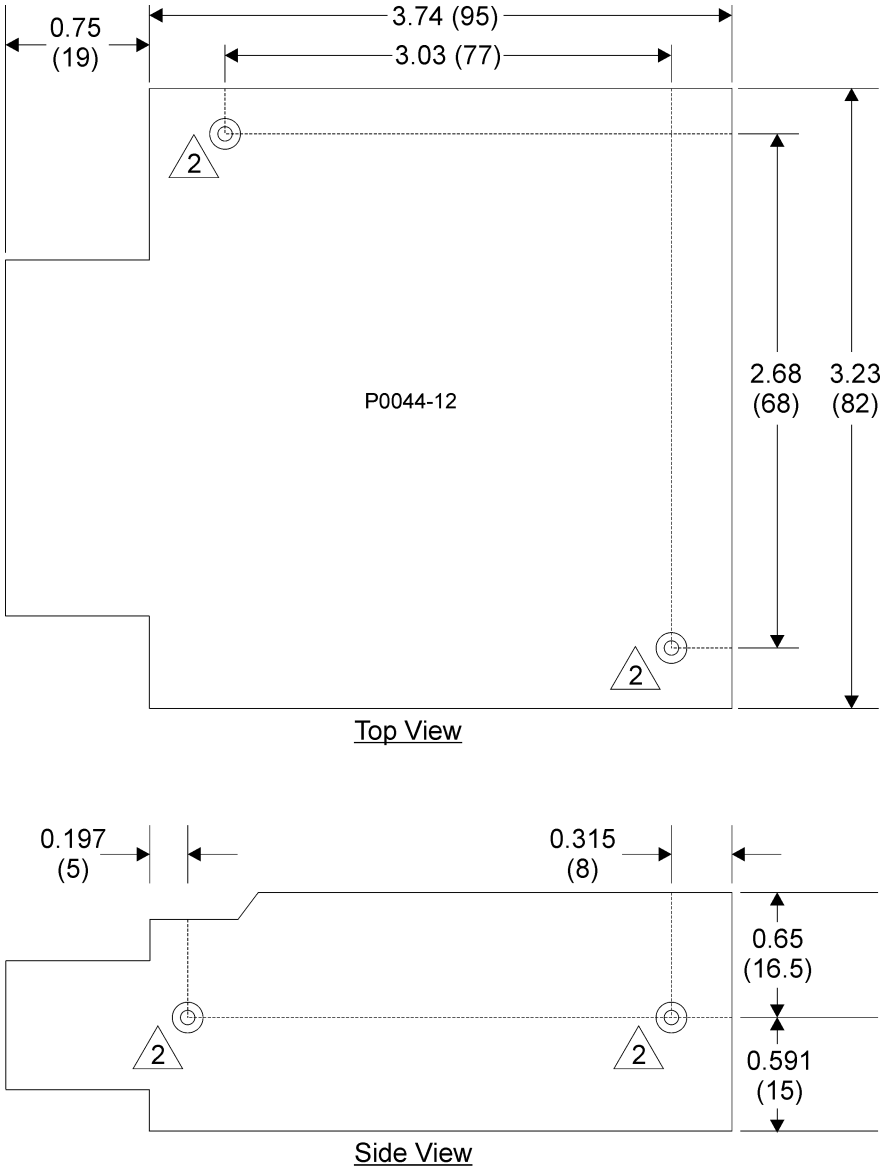


Figure 60. Ethernet Switch Mounting Rail Dimensions

Power Supply

If an existing, adequate 24 Vdc power source is not available, a separate power supply must be installed to provide the 24 Vdc, 28 W required by the IDP-800. A suitable power supply is available from Basler Electric. Request part number 9334503101. Power supply mounting dimensions are illustrated in Figure 61.



1. Dimensions are in inches (millimeters).

2 M3 tapped holes (2). Mounting screws must not protrude into power supply by more than 0.236 (6).

3. Weight is 220 grams (7.76 ounces).

Figure 61. IDP-800 Power Supply Mounting Dimensions

Connections

IDP-800 connections consist of connectors for control power and communication. Connectors are located on the right (Figure 62) and bottom (Figure 63) sides of the display.

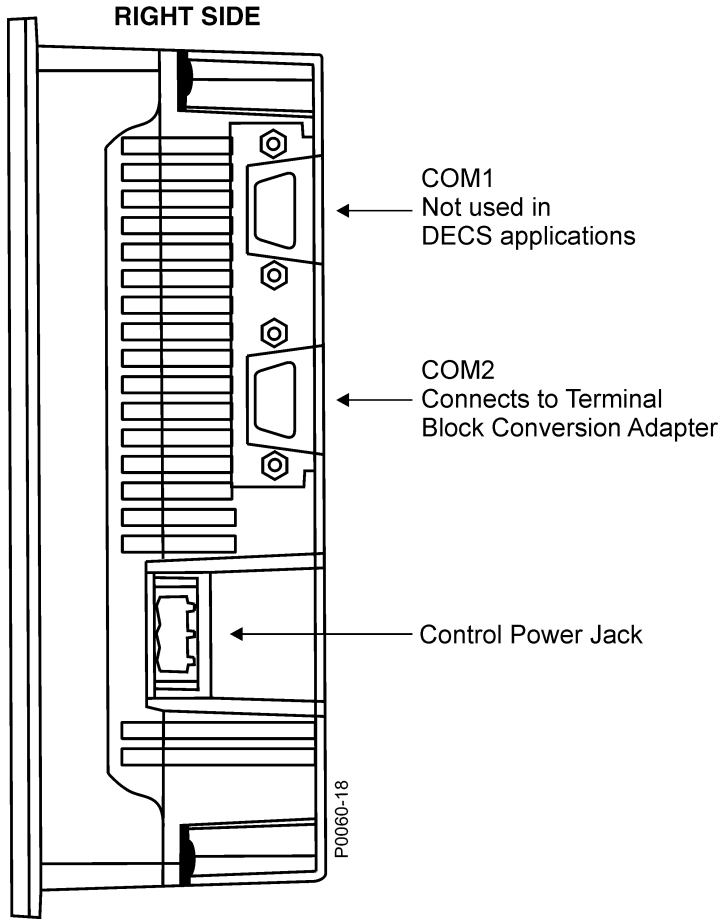


Figure 62. IDP-800 Right-Side Connectors

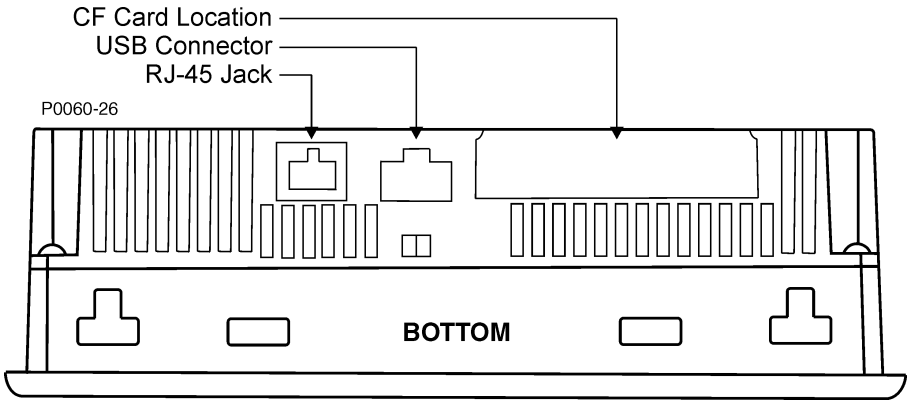


Figure 63. IDP-800 Bottom-Side Connectors

Control Power Connections

IDP-800 control power is provided by a suitably-sized, external 24 Vdc power supply. A power supply is available from Basler Electric; request part number 9334503101.

The IDP-800 ground and control power wiring connects to the display panel through a three-conductor connector that plugs into a jack located on the right side of the IDP-800. Figure 62 shows the location of the IDP-800 control power jack. Figure 64 illustrates the wire assignments for the connector.

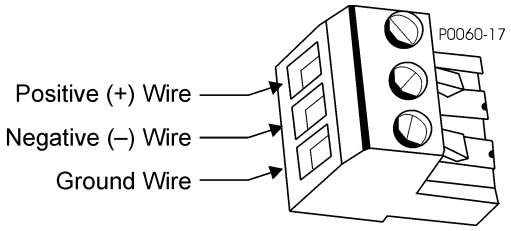


Figure 64. Control Power Connector Wire Assignments

When connecting the ground and control power wires to the connector, observe the following guidelines:

- Use 18 to 12 AWG (0.75 to 2.5 mm^2) solid-conductor or stranded-conductor wire
- Strip each wire end so that 0.28 inches (7 millimeters) of conductor is exposed
- Secure each wire to the connector using a small, flat-blade screwdriver. The recommended connector screw torque is 5 to 7 in-lb (0.5 to 0.6 N•m).

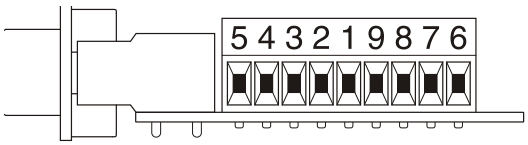
Communication Connections

Data and commands can be exchanged between the IDP-800 and DECS-200, DECS-200N, DECS-250, DECS-250N, or DECS-400 using serial communication. In addition to serial communication, the DECS-400 has the added capability of Ethernet communication with the IDP-800. When connected to an Ethernet LAN, the display can be polled via Modbus to acquire data collected by the DECS connected to the IDP-800.

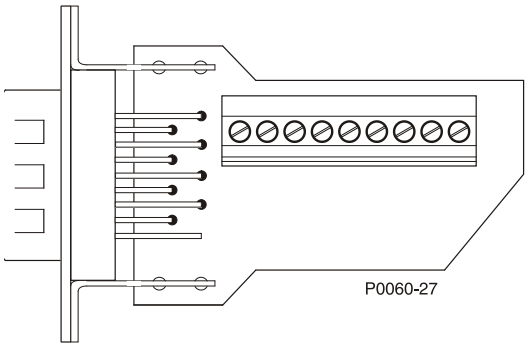
Serial Communication

Serial communication between a DECS and IDP-800 requires the use of a terminal conversion adaptor (Figure 65) that plugs directly into the IDP-800. The adaptor, provided with the IDP-800, consists of a nine-pin, D-sub plug that mates with IDP-800 connector Com 2 (shown in Figure 65). A terminal block on the adaptor provides connections for wiring to the RS-485 (Com 2) terminals of the DECS and jumpers required for IDP-800 communication. Terminal block conversion adaptor connections are illustrated in Figure 66. Connections between the DECS and adaptor should be made with twisted, shielded conductors.

See the *Communication* chapter for communication setting and application information.

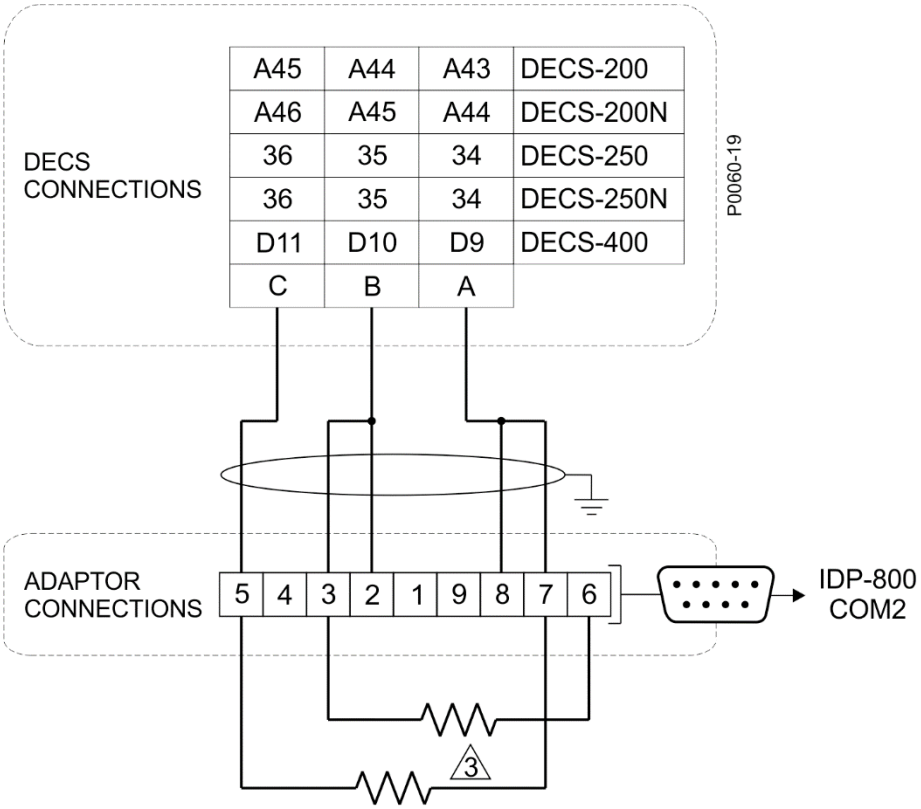


Side View



Top View

Figure 65. Terminal Conversion Adaptor



NOTES

1. Twisted, shielded conductors should be used to connect the DECS and IDP-800.
2. Adapter terminal block accepts conductor sizes ranging from 26 to 20 AWG (0.14 mm^2 to 0.5 mm^2).

3. Resistors (680 Ω, ½ W) with insulated sleeving for the resistor leads are provided with the adaptor.

Figure 66. Terminal Block Conversion Adaptor Connections

Ethernet Communication

An Ethernet port enables the IDP-800 to be polled over a LAN/Distributed Control System and provide values of system parameters monitored by the DECS-200, DECS-200N, DECS-250, or DECS-250N. The IDP-800's 10 Base-T Ethernet interface connects to a LAN through a standard RJ-45 modular jack. This jack is located on the bottom of the display and is shown in Figure 63.

Maintenance and Troubleshooting

Maintenance

The IDP-800 requires no maintenance other than periodic cleaning of the touch screen. A Cleaning Lock screen, accessed from the Main View screen, prevents any system control buttons from being pressed during cleaning. When cleaning the touch screen, use nothing more than a soft cloth, water, and mild detergent. Soak the cloth in the solution and wring the cloth tightly before wiping the screen.

Troubleshooting

A three-color status LED, located on the right side of the IDP-800 frame, indicates display panel status and can be used to determine IDP-800 operating modes. Table 9 lists the various status LED states and the conditions that they represent.

Table 9. Status LED Indications

LED State	Indication
Green, On	In operation, internal logic running
Green, Flashing	In operation, internal logic stopped
Orange, On	Backlight failure
Orange, Flashing	Internal logic startup
Red, On	Hardware initialization upon application of control power
Red, Flashing	In operation, internal logic execution error

Indications During Normal Startup

Upon application of control power, the status LED is red for one to two seconds. Then, the LED flashes orange and the touch screen is blue while the internal logic starts. Finally, the IDP-800 Configuration screen appears and the status LED changes to green.

Specifications

IDP-800 specifications are listed in the following paragraphs.

Control Power

Nominal Voltage:	24 Vdc
Voltage Range:	19.2 to 28.8 Vdc
Power Dissipation:	28 W maximum
Inrush Current:	30 Adc maximum

Display

Type:	TFT color LCD
Size:	7.5 in (190.5 mm), measured diagonally
Resolution:	640 (wide) by 480 (high) pixels
Color:	65 k

Communication Interface

Serial:	RS-422/485 through 9-pin D-sub connector
USB:	USB1.1 Host I/F through USB Type-A connector
Ethernet:	10Base-T through RJ-45 connector

Environment

Operating Temperature:	0 to 50°C (32 to 122°F)
Storage Temperature:	–20 to 60°C (–4 to 140°F)
Humidity:	10 to 90%, non-condensing

Vibration and Shock Resistance

Complies with IEC 61131-2

Vibration

Withstands:	5 to 9 Hz single amplitude, 3.5 mm 9 to 150 Hz constant-accelerated velocity, 9.8 m/s^2 x, y, and z axes for 10 cycles (100 minutes)

Shock

Withstands:	147 m/s^2 on x, y, and z axes, 3 times

Electrostatic Discharge Immunity

6 kV – complies with EN 61000-4-2 Level 3

Physical

Weight:	1.8 kg (4.0 lb) maximum
Overall Dimensions	
Width:	215 mm (8.46 in)
Height:	170 mm (6.69 in)
Depth:	60 mm (2.36 in)

Revision History

The following information provides a historical summary of the changes made to the IDP-800 instruction manual (9437600990 Rev G). Revisions are listed in chronological order.

Manual Revision and Date	Change
—, Feb-10	• Initial release
A, Sep-10	• Added coverage of the IDP-800 for the DECS-400 • Added material for additional security passwords and motor applications • Updated the IP Address Configuration procedure
B, Jan-11	• Added RS-485 communication settings description
C, Apr-11	• Changed reference to default password from “DECS4” to “DECS2” for operation with the DECS-200/200N
D, Jan-13	• Added coverage of DECS-250 • Updated manual structure and layout to match style currently in use
E, Jun-14	• Added coverage of DECS-250N
F, Feb-15	• Added IDP-800 Style Option “C” • Added *IDP-800-C Operation* chapter for DECS-250/DECS-250N • Moved Revision History to the back of manual
G, Dec-16	• Added caution statement about nonvolatile memory

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