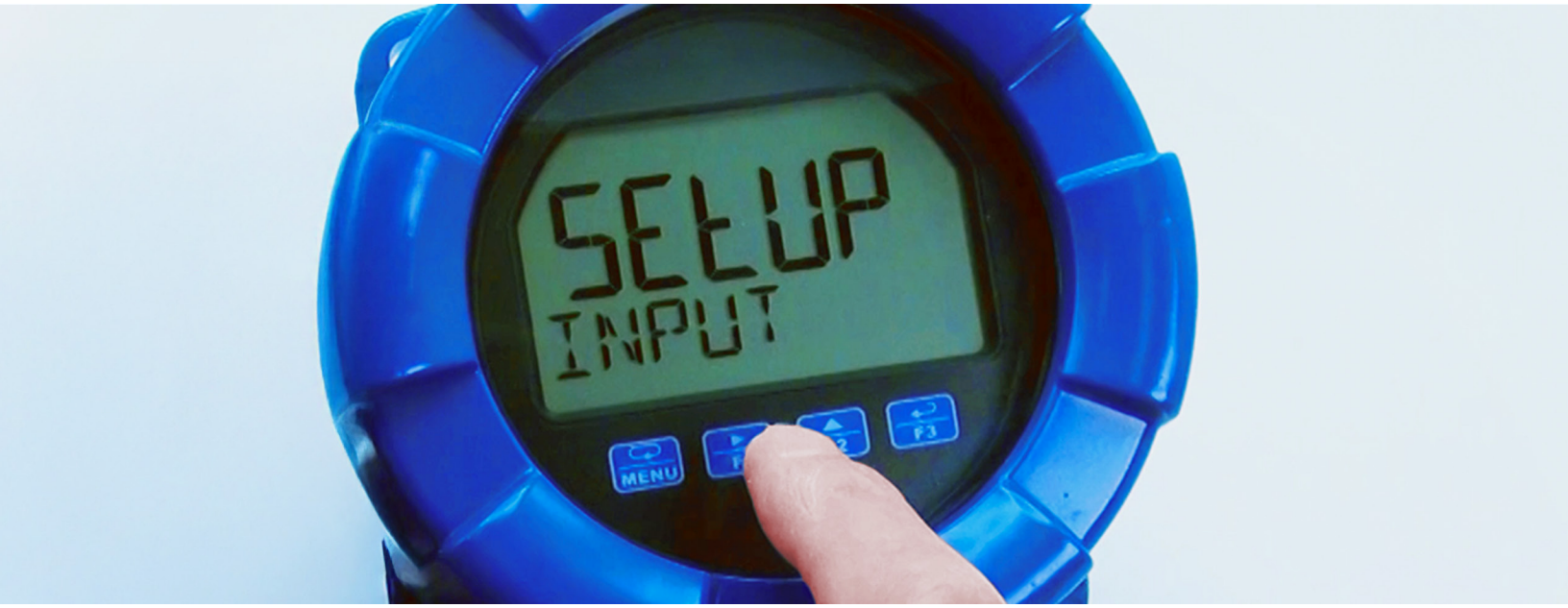
OEM Resources for ExDirect Enclosures

Data Sheet



CapTouch Buttons Resources

Watch Video to Learn More About CapTouch Buttons

Click or scan

- **FREE Firmware and Design Files, No Engineering or License Fees**
- **Enable Programming Without Removing the Cover**
- **Integrate up to Four Capacitive Touch Buttons Into Your OEM Design**
- **Proven Design from Precision Digital's Own OEM Designs**
- **Compatible with ExDirect's EX500, EX550 and EN500 Windowed Enclosures**
- **Three Choices of EA500 Display Housings Available to Fit Your Design Needs**
- **Simple Board-Level Interface to Your OEM Circuit Designs**
- **MSP430 Microcontroller Code Provided to Operate the Buttons**
- **Low Power Optimized Code Option Available for Battery Powered Designs**
- **Standard Power Code Option Available for Line or Loop-Powered Designs**
- **Save Time Designing Optimal Board Mechanical Design with Provided PCB Files**
- **PCB Schematic and Production Files Provided for Button and Main Boards**
- **Complete Component Lists Provided**

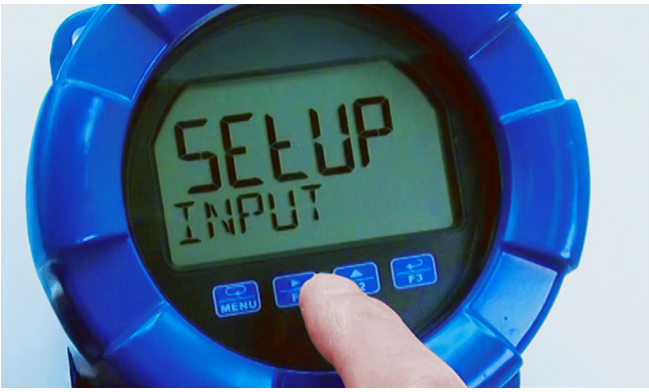
LCD Resources

- **LCD Mechanical Drawings for Custom LCD Designs Provided**
- **LCD Fits Perfectly into Available Electronics Housings**
- **Backlight Mechanical Drawings for LCD Provided**
- **Ample Room Available For Custom Electronics Within the EA500 Display Housings**

PCB Outline Resources

- **PCB Files Include Outlines and Holes for Mounting in EA500 Display Housings**

CapTouch Through Glass Buttons Resources





What Are CapTouch Buttons?

ExDirect's CapTouch buttons are through-glass capacitive touch buttons that enable users to interact with your instrument without removing the cover.

Everything You Need

Our OEM Resources give you everything needed to integrate CapTouch buttons into your electronics housed in a Hawk or Dual Hawk enclosure using an EA500-DisplayHousing. These are FREE; no initial or license fees.

You will receive code for an MSP430 microcontroller, with low-power and standard-power options depending on your application (battery, line, or loop-powered). PCB schematics, production files, and complete component lists are included, along with mounting outlines for seamless integration into the EA500-DisplayHousing. With three Display Housing options available and ample room for your custom electronics. CapTouch OEM Resources offer a simple, board-level interface that accelerates development and enhances your product's user experience.

What Enclosures Are Compatible?

Compatible with the following enclosures:

HAWK ENCLOSURES

- EX500-AL-W
- EX500-SS-W
- EN500-PL-W

DUAL HAWK ENCLOSURE

- EX550-AL-W

DISPLAY HOUSINGS

- EA500-DisplayHousing1
- EA500-DisplayHousing2
- EA500-DisplayHousing3

What Are the Benefits?

Proven Design

Engineered and proven in Precision Digital's own OEM product designs.

Smarter Engineering

Save time and money by reducing engineering efforts.

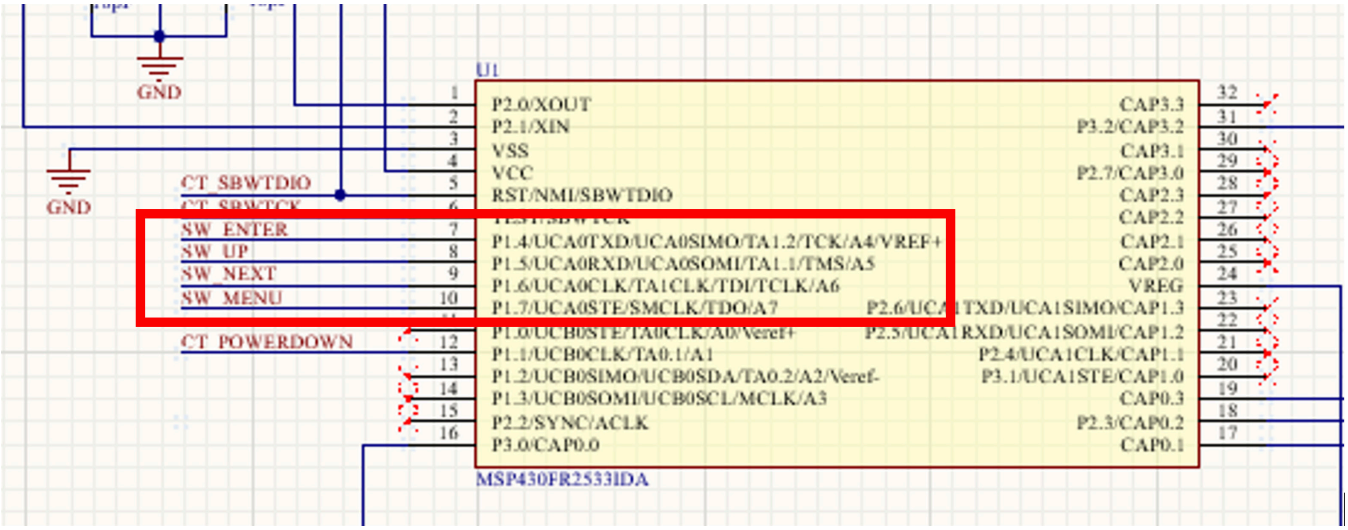
Simplified PCB Design

Accelerate mechanical board design with ready-to-use PCB files

Microcontroller Functions and Connections

The designs provided feature an MSP430 microcontroller to manage all aspects of the capacitive touch buttons. Outputs from the microcontroller indicate when a button has been pressed momentarily or held.

SW ENTER, SW UP, SW NEXT, and SW MENU pins on the microcontroller can be treated as if they were typical mechanical button contacts.



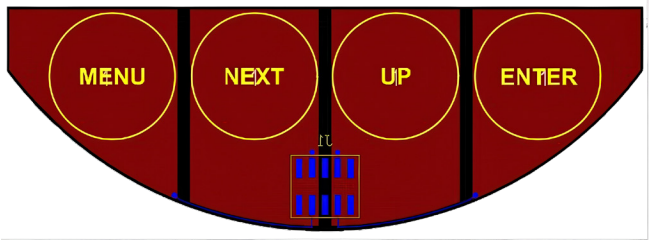
Full Schematic Files to Integrate Into Your Design

OVERALL FUNCTION DETAILS

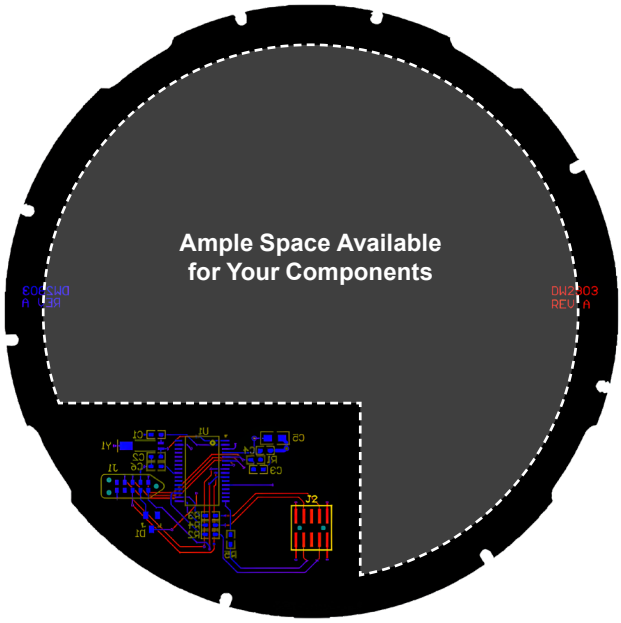
CT_BTN_MENU, CT_BTN_NEXT, CT_BTN_UP, and CT_BTN_ENTER are the signals from the CapTouch button PCB down to the main PCB.

SW_MENU, SW_NEXT, SW_UP, and SW_ENTER are the outputs representing the received button presses (Active LO outputs). An active low signal indicates a button has been pressed.

Your OEM electronics must provide the necessary 3.3 VDC regulated voltage to power the circuit, and the ground connection.

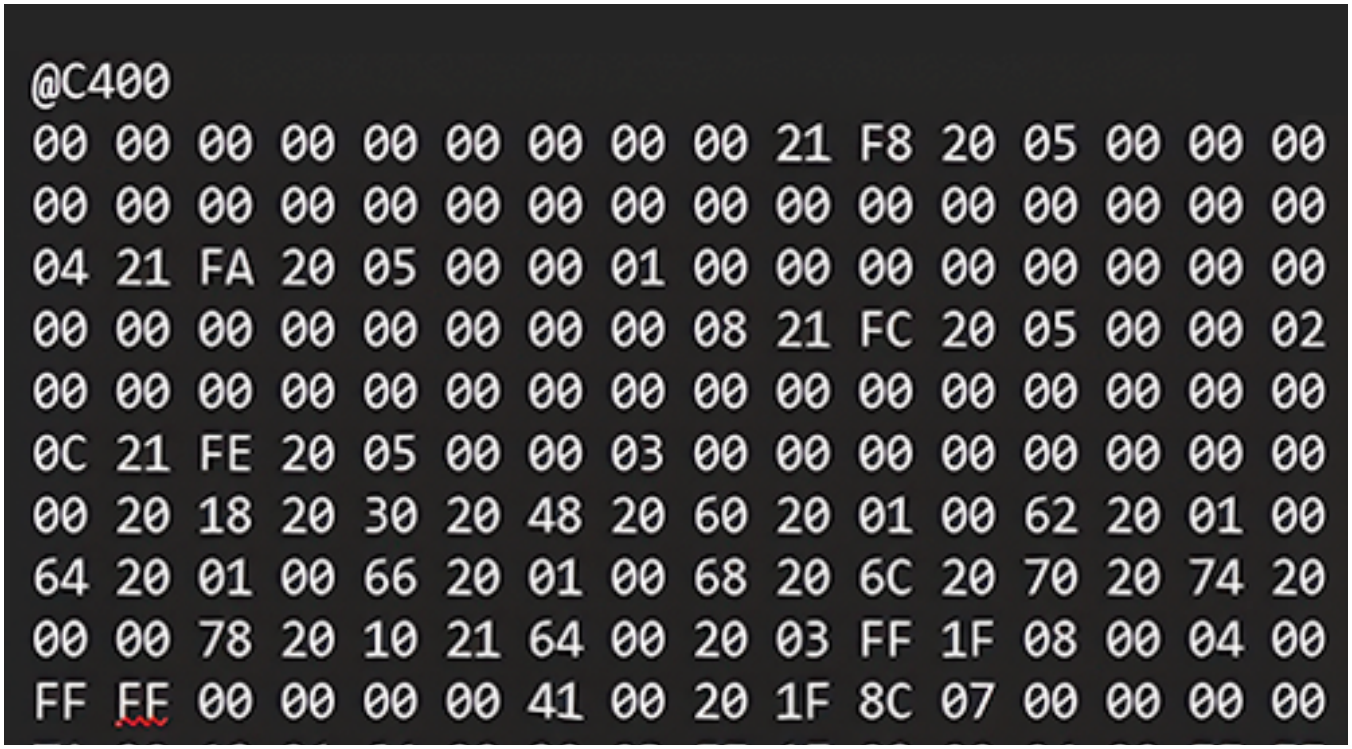


Capacitive Touch PCB Outline and Layout in .pcb Files



Main Board Outline in .pcb Files

Firmware Operation



Two versions of the microcontroller code are provided. SFT127 includes a very low power operation mode ideal for battery powered devices. SFT183 maintains constant standard capacitive touch button operations and is ideal for designs with constant power such as line or loop-powered devices.

SFT127: PROGRAM CODE, EX500 LOW POWER CAPTOUCH FIRMWARE

A low power version of the capacitive touch button firmware ideal for battery powered applications.

The "Low Power" version has an active mode timeout of 60 seconds, after which it will automatically put the interface in a low power mode. In lower power mode, the button press detection rate is slowed. Other than a slightly longer response time for the first button press, operators should notice no difference. Any button press will restore active mode.

CT_PowerDown (P1.1) - Input Low to power down for the lowest possible power consumption. Wakes when input goes High. Use to disable the button interface. This is typically done from switch hardware of a signal from a microcontroller on your OEM electronics.

CT_Fail (P3.2) - Output High while error conditions detected, and during calibration. A common error condition is multiple buttons pressed, or a stuck button (45 seconds). This signal typically goes to a microcontroller on your OEM electronics, which handles how to indicate this error to operators.

SFT183: PROGRAM CODE, EX500 CAPTOUCH FIRMWARE

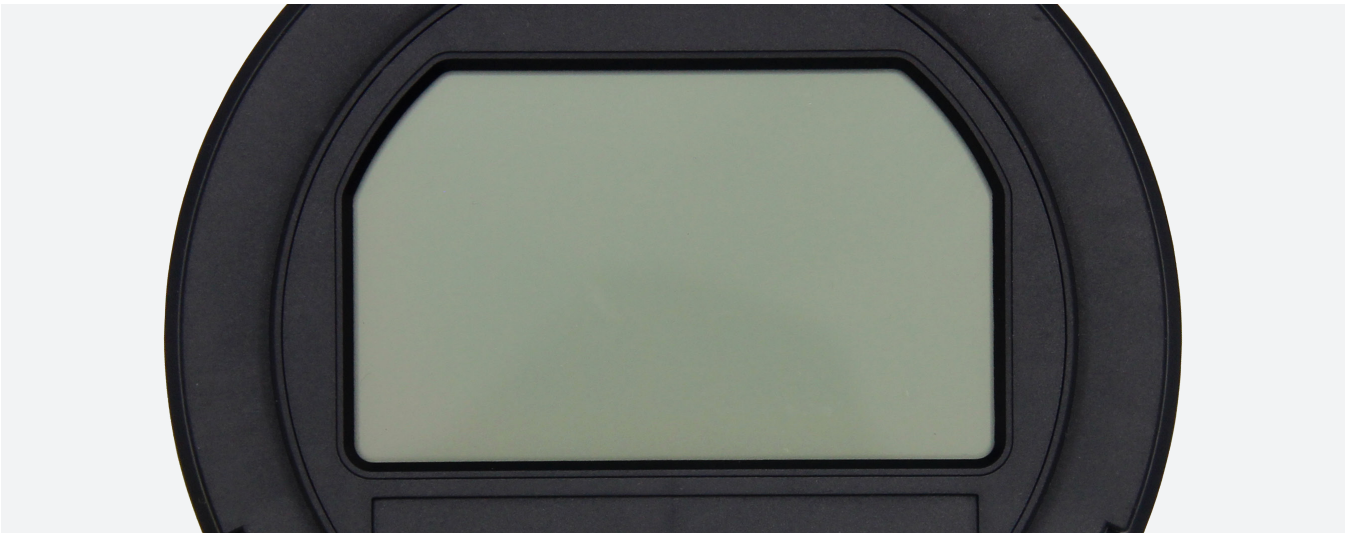
The standard version which assumes ample power is available. This is typically used when line or loop-powering your electronics.

CT_PowerDown (P1.1) - Not implemented.

CT_Fail (P3.2) - Not implemented

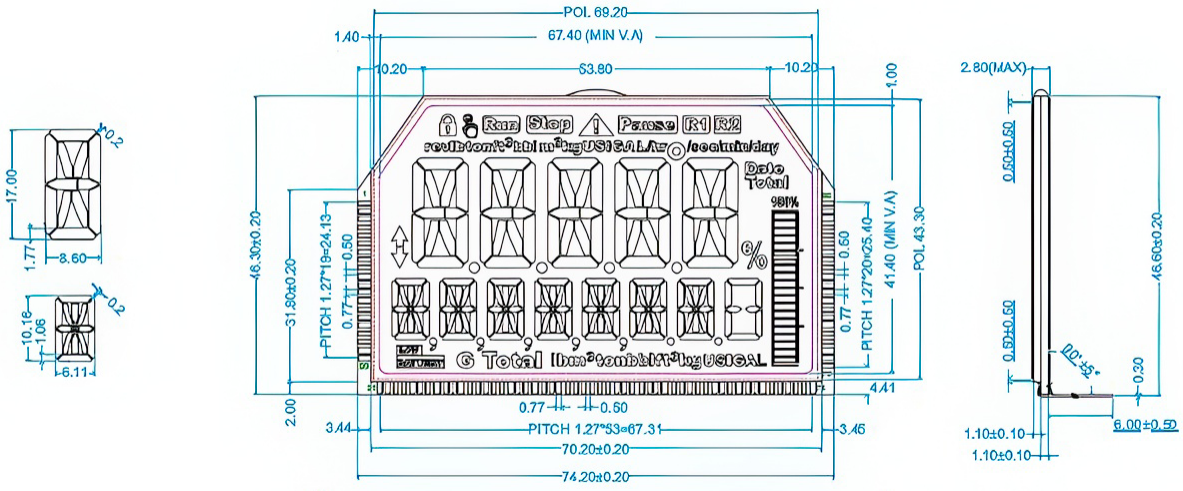
Custom LCD Resources

Jumpstart your custom LCD development with our LCD resources. Your product may be best with a custom developed LCD. A custom design allows you to maximize the information the display provides, provide the largest display possible, and add the unique look you want in your product. These OEM resources provide all the mechanical drawings needed for you to begin discussions with your custom LCD manufacturer. Also included are recommended PCB layout files to maximize the available segments, and quickly import your custom LCD into your PCB layout.



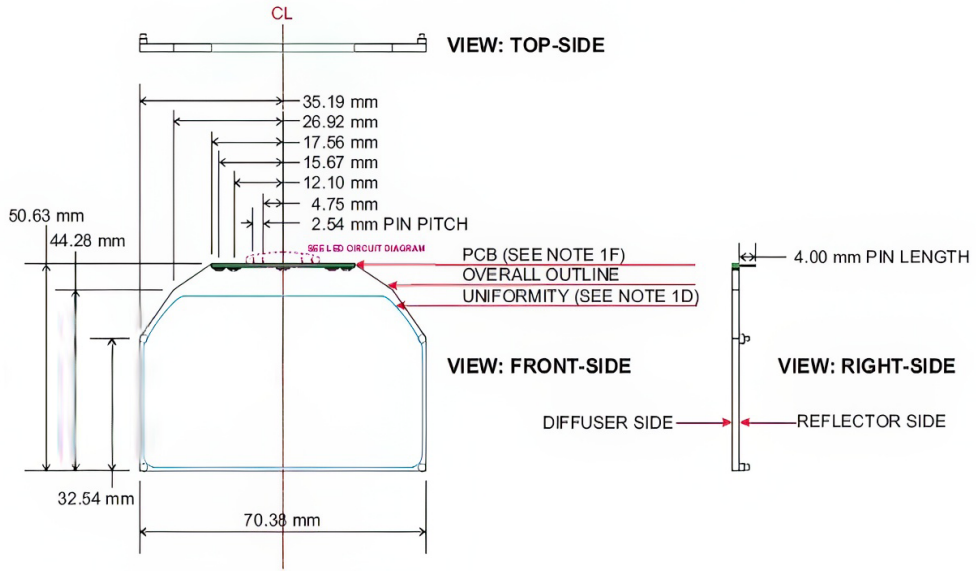
LCD Display Mechanical Drawings and Layout Files

While any suitably sized LCD will fit into the front opening of the plastic electronics modules, the module is designed to maximize the size of an LCD within the enclosure with a custom LCD. All the drawings necessary to design the mechniacal dimensions of the perfect-fit LCD are provided, including recommended PCB layout files for easy importing into your own PCB design.



Include a Perfectly Fit Backlight

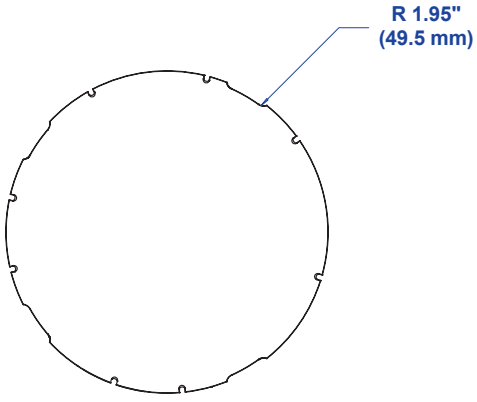
In addition to the LCD itself, the mechanical drawings are provided for you to create your own custom backlight module to light up your LCD.



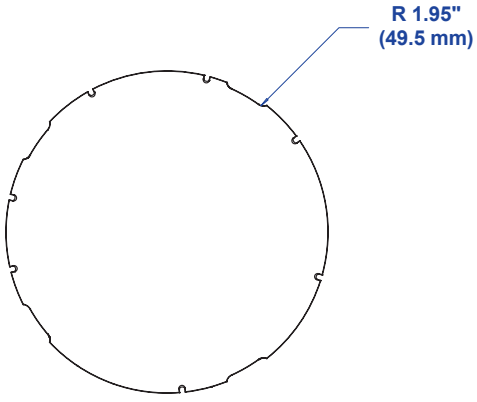
PCB Outline Resources

Benefit from the available CAD files for the PCBs that fit perfectly inside each Display Housing. These simplify PCB design as well as save engineering time and effort. With ExDirect Display Housings PCBs are not left exposed and everything fits just right, resulting in a true finished product.

EA500-DISPLAYHOUSING1 & EA500-DISPLAYHOUSING2
PRINTED CIRCUIT BOARD



EA500-DISPLAYHOUSING3
PRINTED CIRCUIT BOARD



OEM Resources for ExDirect Enclosures

Data Sheet

Accessories to Jumpstart Your Product Design



Display Housings

The display housings are designed to accommodate a display PCB and an additional PCB on select models while providing secure, easy mounting to an ExDirect enclosure's built-in rails on EN500, EX500, and EX550 enclosures.



Base Housings

Designed to accommodate additional components such as batteries or relays on the base of EN500, EX500, or EX550 enclosures. Features (6) or (7) terminal openings.



Packaging

ExDirect packaging solutions provide a significant advantage by eliminating the hassle of finding the right fit and compatibility for their ExDirect enclosure-using product, saving OEMs valuable time and money.



Nameplates

Nameplates are available in aluminum or stainless steel and can be installed on the nameplate galleries of aluminum and stainless steel enclosures. Laser engraving is also available.

OEM Resources and Compatibility Notice

These free OEM resources are provided for direct integration into your OEM electronics. Engineering support for implementation, testing, or troubleshooting is not available.

Compatibility is limited to EX500-AL-W, EX500-SS-W, EN500-PL-W, or EX550-AL-W enclosures with an EA500-DisplayHousing and is not recommended for other hardware.

How to Request OEM Resources

The OEM resources are complimentary with the purchase of any of the compatible enclosures or accessories.

To request resources, please:

1. Go to **www.exdirect.com/family/captouch**
2. Click on **Request Now**
3. Complete the request form



These resources are available at no cost to you. Once we receive your request, we will review and upon approval you will receive an email containing the OEM Resouces requested.

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ExDirect A Precision Digital Corporation brand
233 South Street • Hopkinton MA 01748 USA • Tel (774) 233-7061

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