

# The 932 fORP

## Getting Started





## Setting Up the 932 fORP

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Setting up the 932 is a matter of making connections and choosing the output you want.

The 932 supports many different handheld devices, and can produce many different types of outputs.

In the following sections we'll cover how to make these connections, and how to choose the mode you want.

### Making the Connections

These things need to be connected:

- the handheld devices - Plug the handheld device either directly into the 932, or connect it through a removable bundle.
- the power supply
- the output cable (USB, serial, parallel, or other) to the host computer.

You may also want to connect an optical or TTL trigger.

These connections are all made to ports on the 932 rear panel, which is described in more detail under [932RearPanel](#).

### Choosing the Use Mode

Each output behavior is a "Use Mode". A brief descriptive list of the available modes is given in [932 Use Modes](#) <sup>?</sup>.

Most users will only be interested in one or two of these modes.

The choice of use mode is determined by:

1. Cabling to the host
2. Type of connected handheld device
3. Desired output format

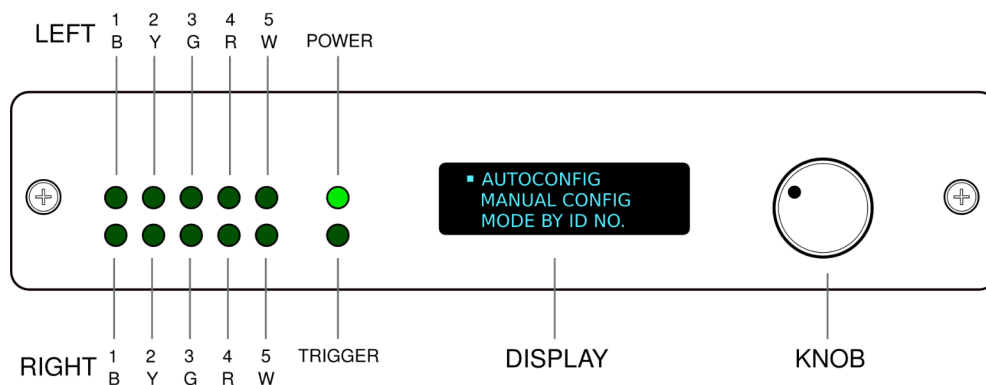
Your choices are made using the knob on the front panel, guided by the display.

### 932 Front Panel

The 932 front panel uses a shaft encoder and display to let the user choose among many operating modes, and also displays real-time activity using a bank of 10 green LED indicators.

The shaft encoder works together with the display to allow choices from menus, using clockwise and counter-clockwise rotations and a push-click for selections.

#### Front Panel Indicator Functions - Button Box Modes



This drawing shows the front panel of the 932 with the indicator LEDs labeled as they would function in typical button box modes.

In some modes the indicator LEDs are used to indicate motion (for the scroll wheel device, for instance) or activity (scanning

gains in calibration modes, for example).

## Understanding the Display

During typical use, the fields in the display have these meanings:

Hardware interface type:	USB	
Handheld model number:	HHSC-1x4-D	
Mode Identifier:	HID KEY 12345    001	Mode number

So, in this case, a four button diamond handheld device is in use, and this is sending USB HID keyboard output '1','2','3', etc., for button presses.

Pushing the knob, would cause the display to change to this:

```
CHANGE MODES ?  
  
NO      YES
```

Pushing the knob again immediately would revert the display to the previous one-- this is just a way to abort the change and go back to the mode that was active.

If "YES" is selected (by turning the knob), these choices are presented:

```
⌘ AUTOCONFIG  
MANUAL CONFIG  
MODE BY ID NO
```

Turn the knob and then press to confirm your choice.

These 3 ways of choosing a configuration are described in the next 3 sections.

## Using AUTOCONFIG

The AUTOCONFIG choice tells the interface to determine as much as it can about the connected handheld device and the cabling to the host computer. This should simplify the choices that need to be made by you.

If a handheld device is connected when AUTOCONFIG starts, the interface will attempt to identify it and to set the gain properly on its channels. (Because the gain is automatically determined at this time, the system should work reliably both with and without removable bundles connected.)

Also, if a cable (usually a serial cable or a USB cable) is connected to a host computer, the interface will identify that cable and limit the available mode choices to ones which are compatible with that cable. (For instance, only serial modes will be displayed if the serial cable is connected).

So, in the case that you've connected both the handheld device and a cable to the host, you will normally see a display asking you to choose the output format you want. This is done by rotating the knob and pressing it to make a selection. The specific choices that will be presented depend on the handheld device and the output cabling that are detected, but a typical set of choices (for a button box, with USB cabling to the computer) would be:

```
⌘ HID KEY BYRGT  
HID KEY 12345  
HID KEY NAR
```

The AUTOCONFIG approach is usually the best one to take, but there are situations in which it won't be able to automatically determine the type of handheld device which is connected.

These devices can not be automatically identified:

- older handheld devices (model numbers starting with HH- rather than HHSC- ; these have tubing with braided

- covering, rather than shiny plastic tubing)
- devices that use shaft encoders for position or motion sensing (HHSC-TRK-1, HHSC-SCRL-1)

## Using MANUAL CONFIG

MANUAL CONFIG available for several reasons. The biggest one is to provide compatibility with our earlier handheld devices (the HH series, as distinct from the present HHSC series) which cannot generally be identified by the 932 interface. In manual mode the interface will not attempt to recognize the handheld device.

Use of this mode is fairly self-explanatory-- the knob is used to select the handheld type, the hardware interface for output, and the format for the output.

## Using MODE BY ID NO.

This mode is intended to give users a simple way to return to settings they previously determined where correct. By selecting the mode using the number, the hardware interface, and output format are set at one time and no questions are asked.

## Switching Handheld Devices

When you switch from one type of handheld device to another the 932 needs to be 'told' of this change. For instance, when you unplug a button box and connect a scroll-wheel device in its place, you should push the knob and answer "YES" to "CHANGE MODES?".

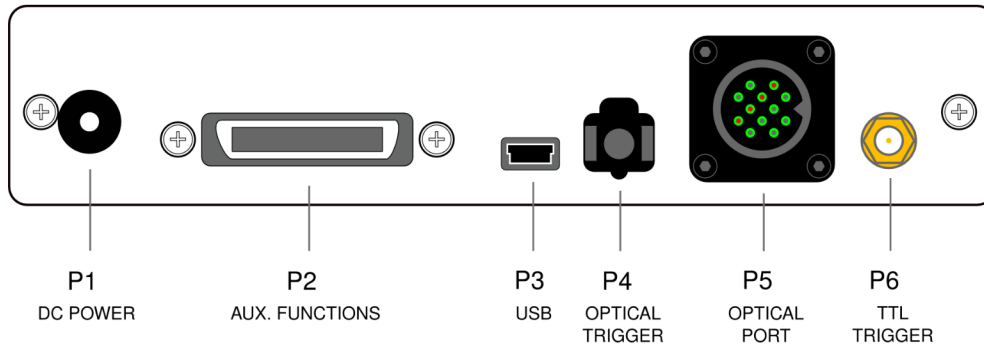
## What Happens at Power-Up

The 932 'wakes up' in the mode that was last active. For any of its channels that rely on calibration, it will use the saved gains. For other channels, such as regular button box channels, the gain will be automatically determined in the brief second while it turns on.

The 932 does not attempt to identify the handheld device at power-up, though: it assumes the same one is connected that was connected last time it was used. So, if the handheld type that you have connected doesn't match what the display says, you should push the knob and set the Use Mode for your new setup.

## 932 Rear Panel

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### P1: DC Power input

This input should only be used with the power supply provided, which is:

- Current Designs Model Number: PS-932-6V

A suitable replacement is: Cui, Inc. Model Number: EPS060175UPS-P5P-KH (6V regulated @ 1.75A max, on a 2.1 mm power plug).

### P2: Aux. functions - Serial and TTL outputs

This port contains the TTL and serial output signals. To use the serial output, use cable Main.CB-932-SER-1. For use with a parallel port, use cable Main.CB-932-PAR-1.

It is a 36 pin MDR type connector. An example mating connector is made by 3M and listed as model number 3M 10136-3000PE.

### P3: USB outputs

For most users this is the main data output port.

It is connected to the host computer using a commonly available USB cable (5 pin mini-USB to USB).

### P4: Main.Optical trigger input

This port accepts optical trigger signals such as those produced on some Siemens MR scanners. It uses an Agilent HFBR connector.

### P5: Main.Optical Port

This port connects to a Current Designs removable fiber optic bundle or directly to an optical handheld device.

It has 12 optical pins: 4 transmitting and 8 receiving.

### P6: TTL Trigger input

This connector accepts TTL trigger signals.

Triggers are detected on low-to-high (positive-going) edges; there is no minimum pulse width.

Use with cable CB-SMB-BNC-1.

This is an SMB type connector.

## 932 Use Modes

This page is a short outline of the available modes for using this interface unit.

### Button Box Modes

Mode	Identifier	USB	Serial	Description	Notes
000	HID KEY BYGRT	✓		HID keyboard, sends B for blue button, Y for yellow, etc.	
001	HID KEY 12345	✓		HID keyboard, sends 1,2,3, etc.	
002	HID NAR BYGRT	✓		HID keyboard, same as mode 000, except keys do not auto-release	
003	HID NAR 12345	✓		HID keyboard, same as mode 001, except keys do not auto-release	
051	HID KEY 1-9 NO 5	✓		HID keyboard, like mode 001, but no 5 is sent for triggers	
052	HID KEY NAR NO T	✓		HID keyboard, like mode 002, but no T is sent for triggers	
053	HID KEY NAR NO 5	✓		HID keyboard, like mode 003, but no 5 is sent for triggers	
100	ASCII 12345		✓	Sends ASCII "B" for blue button, "Y" for yellow, etc.	
102	RBX		✓	Legacy support for RBX button box emulation	

### Trackball Modes

Mode	Identifier	USB	Serial	Description	Notes
500	HID MOUSE 1	✓		HID mouse with two buttons	
503	HID COMPOSITE	✓		HID mouse with two buttons, + keyboard for trigger	
550	SERMOUSE		✓	Legacy serial mouse emulation	
590	TRACKBALL CAL	-na-	-na-	Trackball gain calibration mode	

### Joystick Modes

Mode	Identifier	USB	Serial	Description	Notes
600	HID MOUSE 1	✓		HID mouse with two buttons	
601	HID JOYSTICK/GAMEPAD	✓		HID joystick with two buttons	
651	PJS		✓	Serial "Programmer's" joystick output: fast, high resolution serial output	

### Scroll Wheel Modes

Mode	Identifier	USB	Serial	Description	Notes
200	HID KEY TGB	✓		HHSC-SCROLL-1 mode, sends T for UP. B for down	
201	HID COMPOSITE	✓		HHSC-SCROLL-1 mode: mouse movements	

### Miscellaneous Other Modes

Mode	Identifier	USB	Serial	Description	Notes
800	LEGACY HH CAL	-na-	-na	Gain calibration mode for legacy HH handheld devices	
801	SCROLL WHEEL CAL	-na-	-na	Gain calibration mode for scroll wheel handheld device	
900	DIAGNOSTIC 1			diagnostic mode for testing	

## Using the Trackball on a 932 System

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These are notes on how to use the HHSC-TRK-1 with a 932 interface.

### General

As of this writing, the trackball can produce two types of output: USB or serial. Most users today will want to use the USB output because it is the simplest to use and has the highest performance in terms of responsiveness and accuracy. The serial mode is made available mainly to support older systems lacking USB ports.

### When to Calibrate

The trackball should be calibrated with the 932 interface when significant optical conditions are changed. The most common examples of this are:

- a. the trackball was connected directly to the interface, but is now connected through a bundle
- b. the trackball was connected through a bundle but is now connected directly to the interface
- c. the trackball and interface will be connected using a different bundle than was used before

It also makes sense to try a calibration if the trackball behavior changes significantly but, in that case, it may also make sense to be sure that the ball has not gotten dirty or abraded over time.

### How to Calibrate

Begin with the optical components connected in the way that you intend to use them.

- If possible, have the trackball close enough to the 932 interface that the LEDs on the 932 are visible.

Select mode 590 using the knob and the "MODE BY ID NO" choice.

- the left-most LEDs should toggle back & forth about once a second

Rotate the ball on the trackball a bit

- the speed and distance are not critical
- a 1 cm "wiggle" at about once per second should be fine
- When the 8 right-most LEDs are all lit, the trackball is ready to use.

Push the knob once and follow the instructions to select a new mode

- (probably mode 500 for USB mouse output, or 550 for a serial mouse output)

You should find that the trackball works immediately once you've chosen your desired output mode. The settings will be retained when the 932 is turned off, and will be used again when it's turned on again.

If the trackball does not calibrate after 5-10 seconds of turning the ball, try disconnecting the power. Then re-connect it and be sure the ball is moving as power is applied.



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## Using Current Designs Online Support

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Information is available online here:

<http://www.curdes.com/CdiDocs/WebHome>

If you don't find good help on this site please contact us by email:

**[support@curdes.com](mailto:support@curdes.com)**

or phone:

**215-387-5456 .**

For users who want to 'flash' their devices with new firmware

Please login to the site and follow this link:

<http://www.curdes.com/CdiDocs/UpdatingFirmwarePython.html>

## 932 System Troubleshooting

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### 1. Basic function questions

When you have a problem using a 932-based fORP system, please tell us:

- What the display shows -
  - all 3 lines (hardware interface, handheld type, and mode identifier/number)
- How the handheld device is connected -
  - is it plugged directly into the interface, or through a removable bundle?
  - was it connected before power was applied to the interface unit?
- What stimulus presentation/response program you are using, if any.

Here are a few basic things to check:

#### 1.1 Was the handheld device connected prior to the 932 being turned on?

- **important:** The interface "looks for" the handheld device at power-up and sets some parameters based on what is connected.

If no handheld device is connected at power-up, and then the device is connected afterwards, it will probably not function correctly.

**try:** Connecting the handheld device (with or without the removable bundle) and cycling the power (unplug the power supply and then plug it in again).

#### 1.2. Did it power-up correctly?

Are the LED indicators blinking properly when buttons on the handheld device are pressed?

If not, does the problem persist when the power supply is disconnected and re-connected?

#### 1.3. Are the optical components (the handheld devices and fiber optic bundles) working correctly?

Again, this is usually best determined by pressing buttons and checking if the LED indicators respond correctly.

#### 1.4 Is the correct handheld device indicated on the display?

The model number, which appears on the label on the handheld device, should match what is on the middle line of the display. For instance, if you using a HHSC-Main.1x4-D button box, the middle line of the display should read ""HHSC-Main.1x4-D".

In some cases the system will work properly even though the display indicates a different handheld device than the one that is actually in use. But this mismatch indicates that either the handheld type was manually selected incorrectly by the user or, if AUTOCONFIG was used, that the interface incorrectly identified the handheld device.

**try:** Either manually setting the handheld type or selecting AUTOCONFIG so that the interface unit will interrogate the handheld device and try to identify it.

#### 1.5. Are you getting a reasonable output using a generic program?

The quickest thing to check here is if you get USB output into a program like Notepad. This should show simple character output for any of the modes which are indicated on the 932 display's bottom line starting with "HID KEY \_\_\_\_".

If you are not getting what you expect in your stimulus presentation/response software (Presentation, EPrime, etc) its a good idea to check the output using a more generic program first. If you get correct output here, then getting it to work within your psychometric program is probably a matter of configuring the program. We may be able to help you configure your program, but you can probably get better help from the authors of that program.

## Switching from FIU-005 systems to 932 systems

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If you are already familiar with the FIU-005 (and earlier) interface units, these are some of the first differences that might strike you when you start using the 932.

### No more colored LEDs

The 932 has green LEDs for all the buttons, rather than colored ones, because the 2x5 array of LEDs is used for different purposes in different modes.

### No more BNC trigger input

The TTL trigger input is now on a smaller coaxial connector: its the gold one on the right hand side of the rear panel. Electrically this input is the same as on the FIU-005, but we needed to use a smaller connector for space reasons.

(Note that there is also an optical trigger on the 932.)

## Using old button boxes with a new (932) interface

The 932 supports older button boxes in several different ways. Once you've picked one of the following handheld device types, all of the usual button box modes are available, and you can pick them from the list just as though you had a newer HHSC device connected. But the choices handle differing cases:

### FIU-005 Handheld Type

If you manually choose this handheld device type, the 932 will operate in a fixed-gain mode very much like the FIU-005 and its predecessors did. This is the first thing to try if you're trying to use your older handheld devices with the 932. With most button boxes, this choice will "just work", because the optical losses of most button boxes fall within a range that can be accommodated with a fixed gain.

### LEGACY HANDHELD

If you tried to select an FIU-005 handheld device type, but one or more of the buttons didn't work correctly, you probably have a combination of button box and bundle optical losses that are too high for the fixed gain of the 932.

In this case, you can try selecting LEGACY HANDHELD instead. Now the 932 will use stored gain values for each channel (button), so it can compensate for a wide range of optical losses on a channel-by-channel basis.

You'll need to calibrate the system for the handheld you intend to use. This is done using the "LEGACY HH CAL" mode, described below.

At the end of the calibration process, you'll have the option to save the gain values, which will then be applied any time the LEGACY HANDHELD choice is made. (So you don't need to calibrate things every time.)

## Using LEGACY HH CAL

When this mode is selected, the 932 will scan the 8 possible channels of your HH series handheld device and attempt to find gain values that will make the buttons work reliably.

To indicate this process is under way, the 8 left-most LEDs on the front panel are scanned in a counter-clockwise circular fashion.

While the channels are scanned, the buttons on the button box should be pressed and released so that the electronics can determine what the "off" and "on" optical losses are. We recommend doing this in a kind of rolling/tapping action, similar to the classic finger-tapping on a desktop associated with impatience or nervousness.

As each button's correct gain value is found the corresponding LED is solidly lit. They should all be lit within 30 seconds or so.

At any time the knob can be pressed, and the gain values determined so far can be saved. So, if you have a 4 button device connected you will notice that only the lower 4 LEDs go solid; that's normal, because there are only 4, after all. But, once those 4 are solid you can go ahead and save these gains (and the upper 4 that are still being sought will just be disabled).

Once you have answered "YES" to "SAVE SETTINGS?", you can go on to select an output mode and you should be 'on the air'.

It is not necessary to repeat this process unless you change something significant about the device connections.

### Using new button boxes with an old (FIU-005) interface

This, unfortunately, will not work at this time. The optical channels on HHSC series devices are normally transmitting rather than normally blocking light. When a button is pressed the channel changes from passing light to blocking light. This is the opposite of the way things worked with the earlier HH series of handheld devices. This change was made to facilitate automatic recognition and automatic gain compensation of the button boxes.

The HH button boxes are still available and we will continue to repair them indefinitely.

### Old trackballs, joysticks, and custom devices

Most of these devices are almost completely compatible with the 932, and can be made to be completely compatible with a small amount of modification. For instance, the trackball just needs to have the button 'polarity' inverted. Please contact us if you are thinking about having any of these things upgraded to use with the 932.