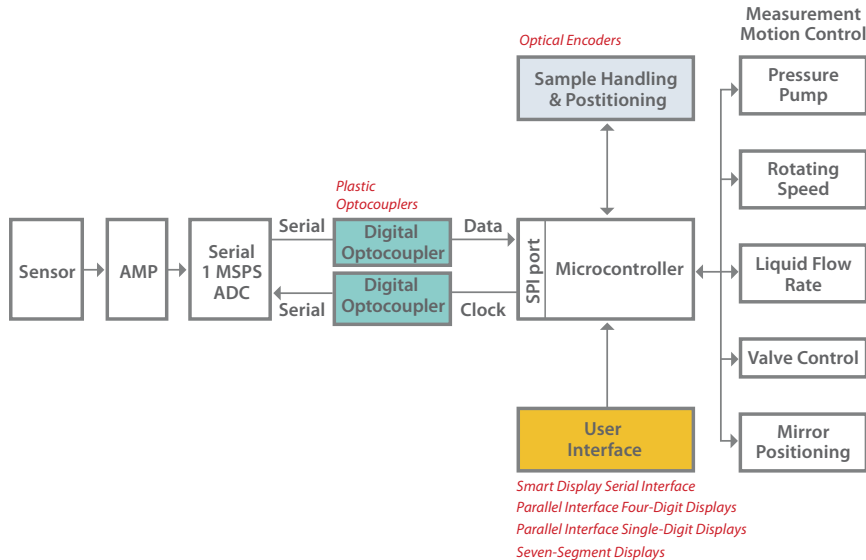


## Test Equipment



### Introduction

Electronic test equipment ranges from the very simple and inexpensive, such as a test light made by a large number of companies to extremely complex and sophisticated Automatic Test Equipment (ATE) which has very small number of players that are tied to the very volatile semiconductor capital equipment acquisition cycles.

Whether the challenge is extending battery life, boosting display visibility or improving data input features; chances are you'll find an Avago Technologies component that's ideal for the job.

### Opportunity for Avago

- Total Available Market in 2010: \$2.4 Billion WW Semiconductor Revenues
- Serviceable Available Market in 2010: \$225 Million WW Semiconductor Revenues

### Target Applications

Semiconductor ATE, telecom network analyzers such as burst error rate testers, signal tracers, logic analyzers, signal-generating devices such as a frequency synthesizer, and miscellaneous items such as continuity testers, and voltmeters.

### Optocouplers - Plastic

#### Value Proposition

Avago's optocouplers provide low power and multi-channels isolation Avago's optocouplers provide low power and multi-channels isolation solution without compromising the high voltage insulation and noise isolation solution performance. The optocouplers support wide temperature and wide supply voltage range, suitable for extreme environment. They allow high speed data transmission (up to 50MBd) with low propagation delay (<22ns) and pulse width distortion (<2ns) performance.

#### Featured Products

- HCPL-5400 Very high speed logic gate optocoupler
- ACLS-6xxx Multi-Channel and Bi-Directional, 15 MBd (typ) Digital Logic Gate Optocoupler
- ACPL series CMOS optocouplers

#### Discovery Questions

- Do you need isolators to provide high voltage protection, filter noise/ground loop current, or as a voltage level shifter?

### Sample Handling and Positioning Optical Encoders

#### Value Proposition

Avago offers a wide range of both absolute and incremental optical encoders with a choice of single or multi-channels, resolution, accuracy, operating temperature, and packaging. This allows a designer to find the optimal encoder solutions and maximize their system value.

#### Featured Products

- AEDR Series reflective optical encoders
- AEAT Series multi-turn encoders
- AEAS Series single-turn absolute encoders
- AEDB Series incremental encoders and code wheels
- AEDS Series photointerrupters

#### Discovery Questions

- What type of encoders are required (Incremental or Absolute)?
- What is the resolution, accuracy, frequency response, operating temperature, voltage, and output required for this application?
- Is the application subjected to dust, water, or industrial temperature ranges?
- What is the targeted unit price, volume and the potential customer project timeline?
- Is there any constraint in the size or form fit in the motor application?

## Smart Display with Serial Interface

### Value Proposition

This product is a high performance, easy to use dot matrix display driven by on-board CMOS IC. Each display can be directly interfaced with a microprocessor, thus eliminating the need for cumbersome interface components. The serial IC interface allows higher character count information displays with a minimum of data lines. The 5 x 7 pixel format allows the user great freedom to generate user-defined characters. This display is stackable in the x- and y-directions, making it ideal for high character count displays.

### Featured Products

- HCMS-XXXX – high brightness and high performance CMOS 5 x 7 alphanumeric displays

### Discovery Questions

- What kind of characters do you want to light up (Alphanumeric, Numeric, Japanese Katakana)?
- Is this a serial or parallel interface application? What is the brightness (lv) and color (wavelength) that you require?
- Are different levels of brightness required for their application?

## Seven Segment Displays

### Value Proposition

The 10 mm (0.4 inch) three digit slim font with 2-colons seven segment displays incorporates a new slim font character design. This slim font features narrow width, specially mitered segments to give a fuller appearance to the illuminated character. The 7.6 mm (0.3 inch) LED seven segment displays are designed for viewing distances up to 3 metres (10 feet).

### Featured Products

- HDSP-43xG – 10 mm three digit slim font with 2-colons seven segment displays
- HDSP-B42G/B47G – 4 digit 7 segment display
- HDSP-B0xG, HDSP-B0xE – 10mm and 13mm slim font seven segment displays
- HDSP-740x Series, HDSP-750x Series, HDSP-780x Series, HDSP-A15x Series, HDSP-A40x Series 7.6mm Micro-Bright seven segment displays

### Discovery Questions

- Same as Smart Display Serial Interface

## 14.2mm Seven Segment Displays

### Value Proposition

The 14.2 mm (0.56 inch) LED seven segment displays are designed for viewing distances up to 7 metres (23 feet). Both the numeric and  $\pm 1$  overflow devices feature a right hand decimal point. They feature industry-standard size and pinout, wide viewing angle, high light output and are excellent for long digit string multiplexing.

### Featured Products

- HDSP-Kxxx, HDSP-5xxx, and HDSP-Hxxx Series – single and dual digit displays.

### Discovery Questions

- Same as Smart Display Serial Interface

## Parallel Interface Single-Digit Display

### Value Proposition

This display has a 7.4mm dot matrix character and on-board IC with data memory latch/decoder and LED drivers in a glass/ceramic package.

### Featured Products

- HDSP-078x, HDSP-079x, HDSP-088x, HDSP-098x – glass/ceramic numeric and hexadecimal displays
- HDSP-076x, HDSP-077x, HDSP-086x, HDSP-096x – hexadecimal and numeric displays

### Discovery Questions

- Same as Smart Display Serial Interface

## Parallel Interface 4-Digit Display

### Value Proposition

This is 4-character 5 x 7 dot matrix driven by an on-board CMOS IC. The IC stores and decodes 7 bit ASCII data and displays it using a 5 x 7 font. Multiplexing circuitry and drivers are also part of the IC. The IC has fast setup and hold times that makes it easy to interface to a microprocessor.

### Featured Products

- HDLx-141 4 – four character smart 5 x 7 alphanumeric displays

### Discovery Questions

- Same as Smart Display Serial Interface

## LCD Status Backlighting & Status Indicator LEDs

### Value Proposition

Avago Technologies offers an extensive range of high quality chipLEDs which are small in size, highly efficient and have low power consumption; to meet demands for virtually any surface mount lighting requirement.

### Featured Products

- ASMT and HSMx Series surface-mount ChipLEDs – 0603 (1.6 x 0.8mm), blue & green, 0805 (2.0 x 1.2 mm), 1206 (3.2 x 1.6mm), right angle, reverse mount, multi-color, bi-color surface mount chipLEDs.

### Discovery Questions

- Do you require LED indicator lights in your test equipment?
- Do you require high quality grade LEDs with industry standard foot print for ease of design & assembly?
- What is the brightness (lv) and color (wavelength) that you require for your application?
- What type of package you need, through-hole or SMT?

## Rotary Switches

### Value Proposition

The HRPG series is a family of miniature panel mount optical encoders, also known as Rotary Pulse Generators (RPG) and digital potentiometers. The HRPG is designed to be mounted on a front panel and used as a rotary, data-entry device.

### Featured Products

- HRPG-ADXX – miniature panel mount optical encoders

### Discovery Questions

- Do you require user input front-panel controls (e.g. digital potentiometers)?

## Additional Information

Avago Technologies Test Equipment Applications Page:  
[www.avagotech.com/pages/en/industrial/test\\_equipment/](http://www.avagotech.com/pages/en/industrial/test_equipment/)

Wikipedia: Typical Test Equipment Vendors:  
[http://en.wikipedia.org/wiki/Automatic\\_test\\_equipment#Typical\\_vendors](http://en.wikipedia.org/wiki/Automatic_test_equipment#Typical_vendors)

Contact us for your design needs at: [www.avagotech.com/pages/myavago/](http://www.avagotech.com/pages/myavago/)

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