# HSL-DC6
# ALCOA (APM) DECORATOR/BASECOATER
# HIGH SPEED LOGIC MODULE

The Systems Engineering HSL-DC6 Alcoa (APM) Decorator / Basecoater High Speed Logic Module provides:

◊ **Reduced Scrap:** Accurate single miss-loaded bad can pin chain blow-off reduces number of good cans blown-off for every miss-load to zero (only the bad, miss-loaded cans are blown-off).

◊ **Improved Quality:** Eliminates silver cans from going down the line. Eliminates inside Litho problems (printed mandrels) as well.

◊ **Quality Control (Select-A-Can) Blow-off:** Allows verification of print quality for each blanket and mandrel by allowing the operator to blow off a can from a selected mandrel. Allows trouble-shooting cut blankets, etc.

◊ **Quick Pay-off:** With the reduction in spoilage incurred, the HSL-DC6 typically pays for itself in just a few months.

## Features

- Performs high speed control functions of Ragsdale (APM) Decorator / Basecoater in excess of 2,400 Cans Per Minute. This includes miss-loaded can detection and trip cam control which eliminates inside deco and varnish problems, and single can pin chain (bad can) blow-off which reduces scrap.

- High speed logic module which interfaces with existing control system.

- Performs the following control functions:

    - Detection of miss-loaded cans.
    - Rotary (A/B/C) Trip Cam control.
    - Single can (bad can) pin chain blow-off.
    - Single select-a-can QC pin chain blow-off.
    - Can gate open/close control.
    - Alarm detection: infeed track jam, no can transfer (can on mandrel), and timing signal fail detection.
    - Data Acquisition: Total number of good cans printed, total number of blow-offs, trips per spindle, etc. (for both current and last shift).

- Can be used on all Ragsdale (APM) Basecoaters as well as all Ragsdale (APM) Decorator models (both 24 mandrel and 36 mandrel machines).

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### General Description

The HSL-DC6 Decorator / Basecoater high speed logic module is an electronic upgrade for the Alcoa (APM) Decorator / Basecoater which reduces excess blow-offs (scrap) by tripping and blowing off the single bad can for each miss-load. In addition, it improves quality by eliminating silver cans down the line as well as eliminating inside litho problems. The module detects miss-loaded cans, performs the rotary (A/B/C) trip cam control, and single can (bad can) blow-off at speeds in excess of 2,400 CPM. The module also provides select-a-can pin chain blow-off for print quality verification, alarm detection, and data collection.

The module is not a dedicated “black box”, but instead is implemented using the high performance Systems M4503 PLC/PLS module which allows easy customization by either SEA or the end user. The module is programmed using the DOS based SYSdev software programming package which allows programming in any combination of Ladder Logic or high-level (subset of “C”), as well as perform on-line monitoring and trouble-shooting. The module incorporates a built-in PLS which interfaces directly with the machine mounted resolver and provides all machine timing, eliminating the need for an external PLS.

### Trip Cam Control

One of the primary uses of the HSL-DC6 is in the conversion of interposer trip systems to rotary trip systems. Rotary (A/B/C) trip cam control at speeds in excess of 2,400 CPM is incorporated in the HSL-DC6. The appropriate trip cam is accurately extended for the spindle of the miss-loaded can and retracted back prior to spindle following the miss-loaded can at all speeds. This reduces scrap by providing an accurate single mandrel retract at all speeds. This eliminates inside litho problems by assuring that the miss-loaded spindle is completely skipped.

### Bad Can (Pin Chain) Blow-off

The bad can pin chain blow-off incorporates speed compensation to compensate for the response time of the blow-off solenoid regardless of machine speed. This allows the accurate rejection of a single miss-loaded (silver) can from the pin chain at speeds in excess of 2,400 CPM. This reduces scrap by blowing off only the bad cans (and no good cans) when miss-loaded cans occur. This also eliminates silver cans down the line as well.

## QC (Select-A-Can) Blow-off

The Quality Control (select-a-can) feature allows the operator to dial in a mandrel number, either at the remote PB station or from the keypad of the HSL-DC6, and blow-off one can printed on that mandrel. Mandrels 1 through 24 (or 36) can be individually blown-off this way to verify the print quality of each mandrel. This allows the quick determination of a cut blanket, etc.

Two other select-a-can blow-off modes are also available: 12 or 24/36 can blow-off. These modes blow-off 12 or 24/36 consecutive cans starting with blanket #1. This allows all 12 blankets or all 24/36 spindles to be checked at one time. In addition, the HSL-DC6 can be set up to automatically blow-off 12 consecutive cans, starting at blanket #1, on a periodic basis (i.e. once every hour).

## Alarm Detection

The module detects the following alarms*: Infeed Track Jam*, *No Can Transfer* (can on mandrel), and *Timing Signal Fail*. The *Infeed Track Jam* alarm occurs when 6 consecutive empty mandrels are detected by the "can/no can" sensor after the can gate is opened. The *No Can Transfer* alarm occurs when the "no can transfer" sensor detects a can on a mandrel after the disc transfer location. The *Timing Signal Fail* occurs when any of the timing signals generated in the PLS section fail to change state periodically while the machine is running. The above alarms can be used to stop the machine when the respective alarm occurs.

## Data Collection

The following data is collected for both the current shift and the previous (last) shift: Total number of good cans printed, total number of cans blown-off, total number of miss-loaded cans (bad cans), total number of restart blow-offs, total number of manual blow-offs, total number of select-a-can QC blow-offs, and the total trips per spindle. This data can be viewed locally on the display of the HSL-DC6 by either the operator or production control personnel. This information is updated ("current" shift transferred to "last" shift) based on the change of state of a discrete input.

In addition to the shift data collection, a separate buffer is available to collect trips per spindle counts as a diagnostics aid to the operator for trouble-shooting a loading problem on a specific mandrel. Unlike the shift data, these counts can be reset manually by the operator at will.

## HSL-DC6 Keypad / Display

The keypad of the HSL-DC6 contains 24 keys consisting of data display commands, setup commands, and a numeric keypad. The display of the HSL-DC6 is a 2 line by 40 character back-lit LCD display which displays the selected data and setup menus. The keypad/display can be used by the operator to view data or activate the select-a-can QC blow-off and can be used by authorized personnel (passcode or key switch protected) to adjust the timing and all setup parameters.

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## Specifications

**Power Requirements:**
Voltage: 100-240VAC, 50/60HZ
Current: 0.5 Amps @ 115VAC
0.25 Amps @ 230VAC

**Temperature Ranges:**
Operating: 0 to 55°C
Storage: 0 to 70°C

**Resolver Interface:**
**Resolver Type:** Systems Electronics Group RSV34-MS1 or equivalent (also can be paralleled with existing resolver/PLS)

**Resolver Cable:** Systems Electronics Group RSV-RSCBLE-XX

**Control Inputs:**
Voltage Range: 10-30VDC
Input "On" Voltage (min): 10.0 volts
Input "On" Voltage (max): 30.0 volts
Input "Off" Voltage (max): 5.0 volts
Input Current (max): 15 milliamps @ Vin=30V
Optical Isolation: 1500 Vrms

**Outputs:**
Voltage Range: 10-30VDC
Output "On" Voltage (min): VCC-2.00 volts
Output "On" Voltage (max): VCC-0.25 volts
Output "Off" Voltage (max): 1.5 volts
Output "On" Current (max-cont): 0.5 Amps DC
Output "On" Current (100msec): 3.0 Amps DC
Optical Isolation: 1500 Vrms

## Ordering Information

The HSL-DC6 module is provided pre-wired and mounted in a 16” X 14” X 8” NEMA 12 enclosure which can be mounted either next to the machine or next to the existing user’s control cabinet or console. The order number for the HSL-DC6 is as follows:

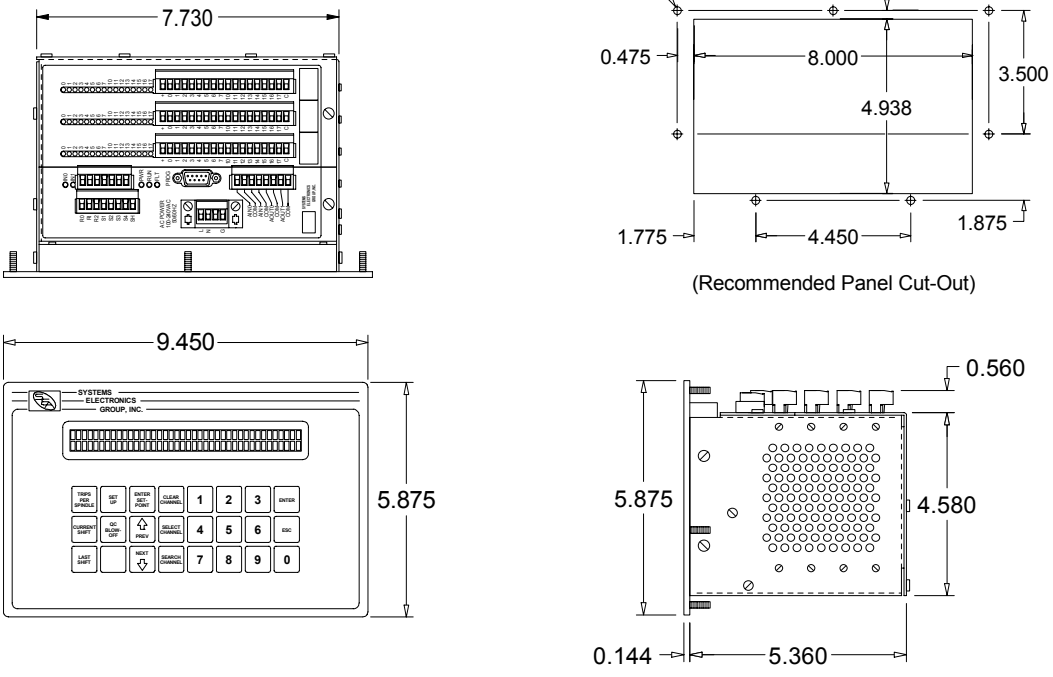
| ***Part Number*** | ***Description*** |
|---|---|
| HSL-DC6 | Alcoa (APM) Decorator / Basecoater high speed logic module which includes the following:<br>1ea. HSL-DC6 enclosure (with M4503 and required I/O boards)<br>1ea. HSL-DC6 User’s Manual<br>1ea. HSL-DC6 Keypad Quick Reference Manual<br>1ea. HSL-DC6 Program Disk<br>1ea. M4500 User’s Manual |

## HSL-DC6 Options (*purchased separately)*

The following items can be purchased separately as required or desired:

| ***Part Number*** | ***Description*** |
|---|---|
| HSL-QCSTA | Remote Select-A-Can PB station |
| HSL-DSP | Remote RPM/Position Display |
| RSV34-MS1 | Resolver (required if machine is not already equipped with resolver) |
| RSV-RSCBLE-XX | Resolver Cable |

## Dimensions





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