HSM-CD7
RUTHERFORD DECORATOR/BASECOATER
HIGH SPEED LOGIC MODULE

The Systems Engineering HSM-CD7 Rutherford Decorator / Basecoater High Speed Logic Module provides:

◊ **Reduced Scrap:** Accurate miss-loaded can print trip and blow-off reduces number of good cans blown-off for every miss-load by 50% or more.

◊ **Improved Quality:** Eliminates silver cans, partially printed cans, and partially varnished 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 HSM-CD7 typically pays for itself in just a few months.

Features

- Performs high speed control functions of Rutherford Decorator / Basecoater up to 2,400 Cans Per Minute. This includes speed compensated print carriage and varnish unit trip which eliminates inside deco and varnish problems, and three 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.
    - Damaged can blow-off.
    - Speed compensated print carriage trip control.
    - Speed compensated varnish unit trip control.
    - Three 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 Rutherford Basecoaters (both carriage trip models and two coater roll models) as well as all Rutherford Decorator models.

General Description

The HSM-CD7 Decorator / Basecoater high speed logic module is an electronic upgrade for the Rutherford Decorator / Basecoater which reduces excess blow-offs (scrap) by tripping and blowing off the minimum number of cans for each miss-load. In addition, it improves quality by eliminating silver and partially printed cans down the line as well as eliminating inside litho problems. The module detects miss-loaded cans, performs speed compensated print trip, varnish trip, and three can (bad can) blow-off at speeds up to 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.

Print Carriage / Varnish Unit Trip

Speed compensated print carriage trip at speeds up to 2,400 CPM is incorporated in the HSM-CD7 module to compensate for the mechanical/pneumatic trip response of the carriage. The carriage is accurately retracted *"out"* on the spindle ahead of the miss-loaded can and extended back *"in"* on the spindle following the miss-loaded can at all speeds. This reduces scrap by reducing the number of spindles the carriage is tripped *"out"* for and also eliminates inside litho problems by assuring that the miss-loaded spindle is completely skipped. Note that a single mandrel , "off-image", trip is possible at speeds up to 1,200 CPM. A two station trip is recommended for speeds above 1,200 CPM. The varnish unit control algorithm incorporates the same speed compensation algorithm incorporated in the print carriage control.

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 both miss-loaded (silver) and partially printed can from the pin chain at speeds up to 2,400 CPM. This eliminates silver and partially printed cans down the line.

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 HSM-CD7, and blow-off one can printed on that mandrel. Mandrels 1 through 24 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: 8 or 24 can blow-off. These modes blow-off 8 or 24 consecutive cans starting with blanket #1. This allows all 8 blankets or all 24 spindles to be checked at one time. In addition, the HSM-CD7 can be set up to automatically blow-off 8 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 HSM-CD7 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.

HSM-CD7 Keypad / Display

The keypad of the HSM-CD7 contains 24 keys consisting of data display commands, setup commands, and a numeric keypad. The display of the HSM-CD7 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.

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 HSM-CD7 module is provided for door mounting on the user's control cabinet door or console. The order number for the HSM-CD7 is as follows:

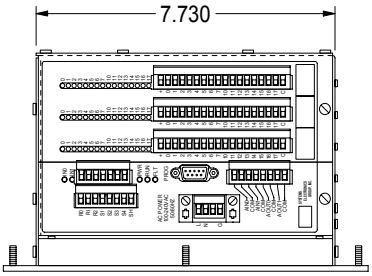
Part Number	***Description***
HSM-CD7	Rutherford Decorator / Basecoater high speed logic module which includes the following: 1ea. HSM-CD7 module (M4503 with required I/O boards) 1ea. HSM-CD7 User's Manual 1ea. HSM-CD7 Keypad Quick Reference Manual 1ea. HSM-CD7 Program Disk 1ea. M4500 User's Manual

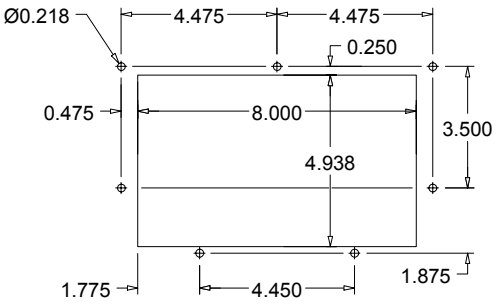
HSM-CD7 Options (*purchased separately)*

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

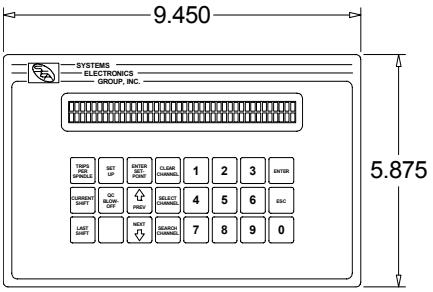
Part Number	***Description***
HSL-QCSTA	Remote Select-A-Can PB station
HSL-DSP	Remote RPM/Position Display
RSV34-MS1	Resolver (required if machine is not already equipped with resolver)
RSV-RSCBLE-XX	Resolver Cable

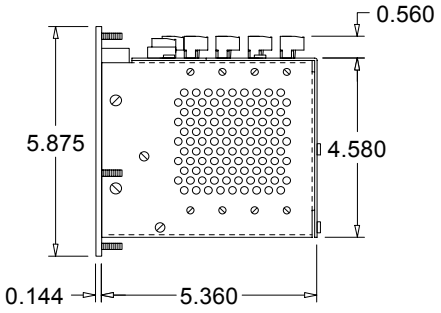
Dimensions





(Recommended Panel Cut-Out)





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