PC-LOG 968

LOG SORTING CONTROL SYSTEM

OPERATOR MANUAL

Signal Corporation
Beaverton, Oregon
(503) 626-6342
www.signalcorporation.com

Printed: March 14, 2006

THE INTENDED USE OF THIS DOCUMENT IS TO ASSIST CUSTOMERS IN EVALUATING THE PERFORMANCE OF AND TO OPERATE THIS PRODUCT.

THE CONTENT OF THIS SPECIFICATION IS SUBJECT TO CHANGE WITHOUT ADVANCE NOTICE.

TABLE OF CONTENTS

1 INTRODUCTION

PC-LOG 968 is a Log Sorter Control System designed to meet the requirements of most log sorters. Highly modularized in design, it is suitable for new sorter installations as well as for retrofitting existing installations. The system contains many parameters, making it possible to adapt to a large number of applications without changing the design. This guarantees quick start-ups with minimum interference with mill production.

PC-LOG 968 is primarily designed to sort logs and to generate tally reports. However, there is also another feature that may or may not be used. The system can also store log data in memory and generate a file for further off-line processing of the data.

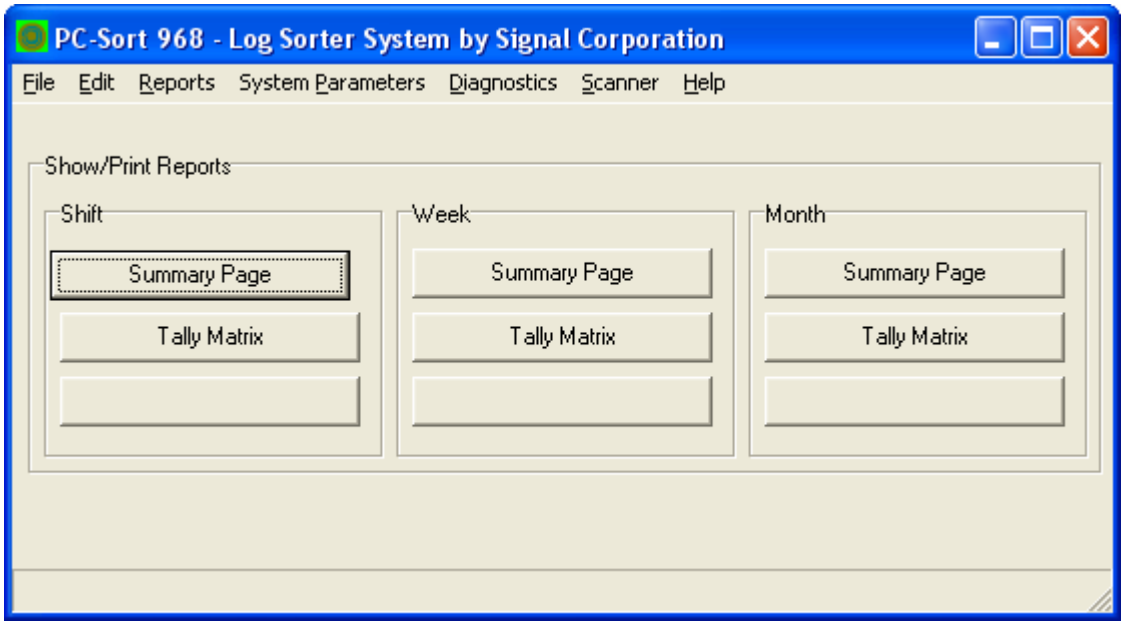
PC-LOG 968 is built around the PC. The input and output circuits are all OPTO 22, assuring easy access to service and spare parts during the life span of the system. Operator and maintenance training are greatly simplified if mill personnel are familiar with the IBM standard.

PC-LOG 968 can be set up to use both imperial and metric units. Switching between metric and imperial units, as well as switching between different sort tables, is done with one keyboard command.

Several options are available to expand the number of functions that the system performs. PC-LOG 968 supports both the REMA and the STI line of scanners.

Customized versions of this system are available if the PC-LOG 968 specifications do not meet the requirements of a specific installation.

2 MAIN MENU



The main menu makes it easy to view and print reports. After once being setup, the reports are easy to access from here. The buttons at the lower part of the window are programmed from the *Reports->Report Utilities->Define Report Printing* menu. The different menu items are described as follow:

File is used to save and restore parameters and to exit the program.

Edit makes it possible to edit report pages..

Reports is used to program parameters that are related to the reporting functions. Normally there is no need to enter this sub-menu during regular operation. Reports are described in a separate document, PC-REPORT 999 – Report Generator.

System Parameters is used to program parameters related to the sorting process.

Diagnostics shows important system information and makes it possible to display log data log by log.

Scanner is used to setup the scanner.

Note that tally data are automatically written from the volatile computer memory to the hard disk once per minute. Therefore, the maximum amount of tally data that are lost, in case of a power failure, is what was accumulated during the last minute of operation.

3 SYSTEM PARAMETERS

Below is a short description of each menu item. Please refer to each particular menu description for a more detailed description of the various features.

Operational Parameters select the current Sort Table, i.e. it tells the system which sort table to use. Note that most systems will only use one Sort Table.

Encoder Parameters shows parameters specific to the pulse encoder.

General Parameters 1 & 2 are used for programming of various parameters that relate to the sorting process.

Sort Tables is where the diameter, length, and taper classes are defined for each bin.

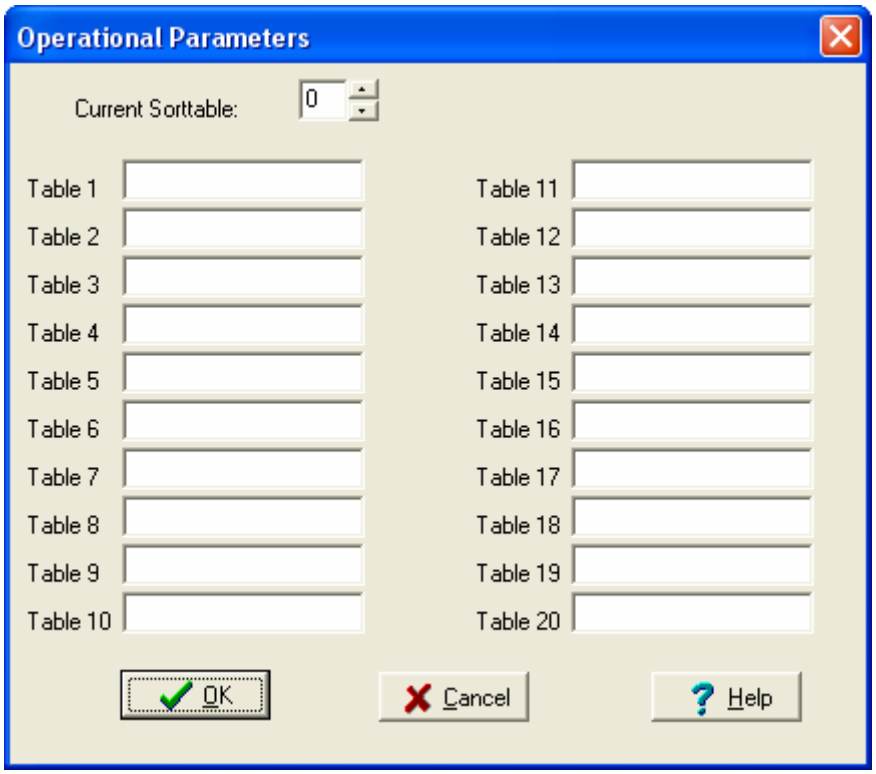
Bin Parameters define the distance to each bin as well as backup bins. This is also where a bin may be declared to be out-of-service.

Diameter Tables is where the limits of each diameter class are programmed. There are eight different tables that may be individually programmed.

Length Tables is where the limits of each length class are programmed. There are eight different tables that may be individually programmed.

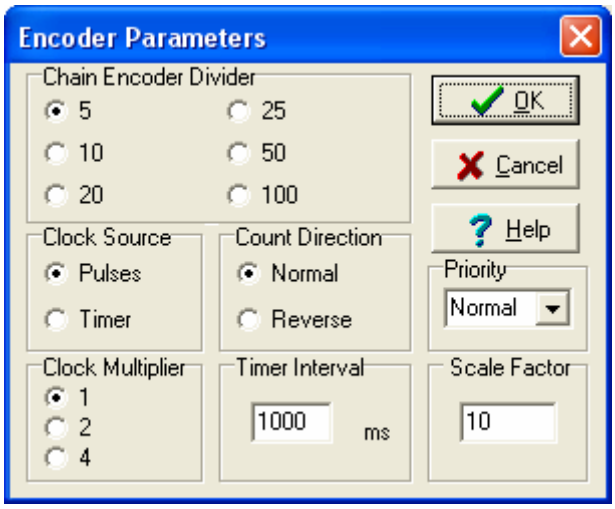
Taper Tables is where the limits of each taper class are programmed. There are eight different tables that may be individually programmed.

3.1 Operational Parameters



Operational Parameters select the current Sort Table, i.e. it tells the system which sort table to use. Note that most systems will only use one Sort Table.

3.2 Encoder Parameters



Chain Encoder Divider: The system counts a certain number of pulses from the encoder between chain interrupts. A number of functions are performed in each chain interrupts, such as monitoring of photocells and pushbuttons and activation of kickers. This parameter defines this number of pulses, i.e. how often these functions are performed. A "5" means that these functions are performed 100 times per encoder revolution assuming that the encoder generates 500 pulses per revolution; a "10" means 50 times per encoder revolution, etc.

Legal values of this parameter are: 5, 10, 25, 50, and 100.

For example, this parameter defines the resolution (accuracy) of the kick points. For this reason you want to program a low value, however this loads the computer more. You have to find a value that gives an acceptable chain resolution without overloading the computer.

Fortunately, it is usually easy to find a value that does not compromise the accuracy of the system without overloading the computer. "5" or "10" are values that will make most systems run well, assuming the encoder turns approximately one revolution per pulley revolution and that the pulley diameter is roughly 15 to 20 inches. "20" or "25" should only be used for unusually large and/or fast systems. It should never be necessary to use larger values than these.

Always restart the program after having changed this parameter!

Clock Source: Instead of using the encoder, interrupts can be generated by a build in timer. This parameter is only used for debugging purposes.

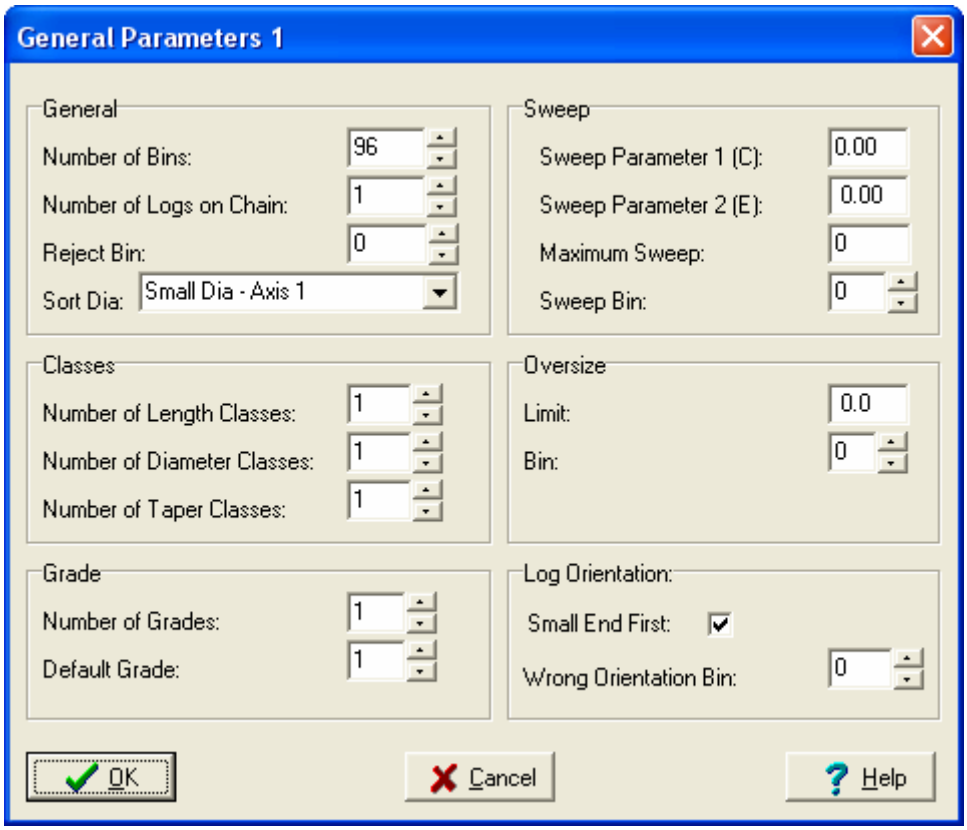
Count Direction: This parameter can be used to check if the encoder has been connected correctly.

Clock Multiplier: Used to increase the number of interrupts. Normally not used.

Timer Interval: Sets the interrupt interval when the timer is used as source.

Scale Factor: The standard encoder generates 500 pulses per revolution. Calculate how far the chain travels per encoder revolution (centimeters or inches). Divide 500 by this value and enter the result. Note that the selection of either centimeters or inches determines how all distances will be expressed in the system.

3.3 General Parameters 1



Number of Bins: Self explanatory.

Number of Logs on Chain: This parameter defines the maximum number of logs that may be on the chain at the same time between the scanner and the last bin. A value too small will cause problems such as the kicker not always being retracted. A value much too large might cause the computer to become overloaded.

Always exit the program and restart it after having changed this parameter!

Reject Bin: This parameter defines the bin to which logs are addressed when the REJECT pushbutton is pushed.

Sort Dia: This parameter selects the diameter that will be used for the sort determination. The following alternatives are available:

0:* Small End Diameter	Axis 1
1: Small End Diameter	Axis 2
2: Small End Diameter	Average of Axis 1 & 2
3: Small End Diameter	Smallest of Axis 1 & 2
4:* Large End Diameter	Average of Axis 1 & 2
5:* Smallest Diameter	Smallest of Axis 1 & 2 **
6:* Largest Diameter	Largest of Axis 1 & 2
7:* Position Diameter	Axis 1
8: Position Diameter	Axis 2
9: Position Diameter	Average of Axis 1 & 2
10: Position Diameter	Smallest of Axis 1 & 2
11:* Center Diameter	Axis 1

12: Center Diameter	Axis 2
13: Center Diameter	Average of Axis 1 & 2
14: Center Diameter	Smallest of Axis 1 & 2
15:* Average Diameter	Average of Axis 1 & 2

*Only these diameters should be used for single-axis systems. The other diameters are set to the same as no. 15 in single axis systems.

** = Select this diameter for systems with a dual-axis scanner.

The selected diameter is corrected for sweep (if applicable) and it is then used for the sort determination. The same diameter (after sweep correction) is also put into Bytes 72 and 73 in the data block that is sent to the report generator.

Sweep Parameters 1 & 2 (C & E): The formula for sweep correction is:

d = D - (C x H - E x T x P/L)

d = Corrected Diameter
D = Uncorrected Diameter
C = Sweep Parameter 1
H = Maximum Cord/Curve Distance (millimeters)
E = Sweep Parameter 2
T = Taper
P = The Distance of the Position of the Maximum Cord/Curve Distance
from the Leading End
L = Log Length

Maximum Sweep: Logs with a larger Cord/Curve distance than this value will automatically be sorted to a special bin (please refer to the next parameter).

Sweep Bin: Logs with excessive sweep are sorted to this bin. Please refer to the previous parameter for additional information. Enter a "0" if there is no Sweep Scanning.

Number of Length Classes: Self-explanatory.

Number of Diameter Classes: Self-explanatory.

Number of Taper Classes: Self-explanatory.

Oversize Limit: A log is defined as oversized if the largest diameter scanned along a log is larger than this limit. Program in inches or centimeters.

Oversize Bin: Oversized logs are sorted to this bin.

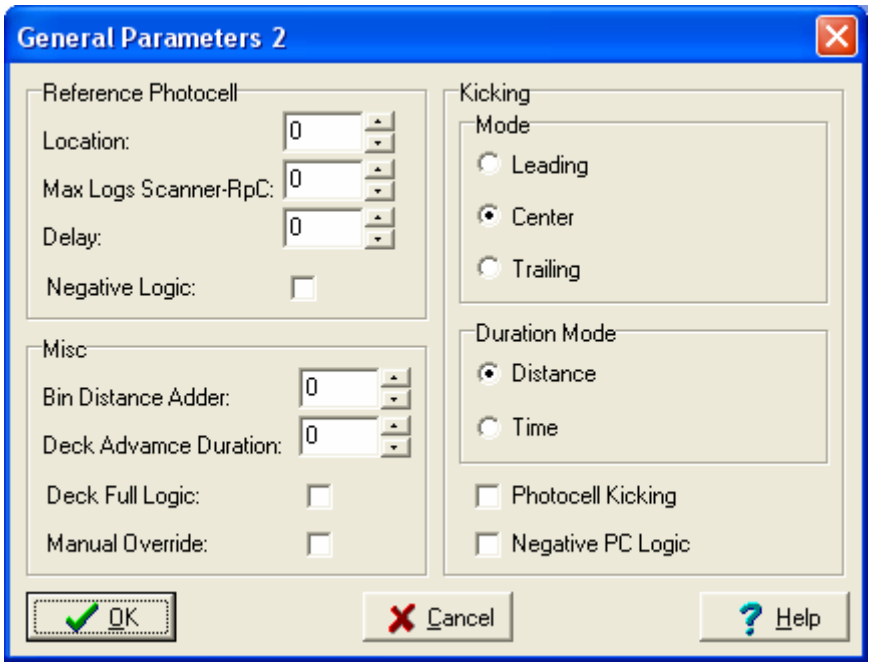
Number of Grades: Enter "0" if there are no Grades.

Default Grade: This grade is automatically assigned to the log if no Grade Pushbutton has been pushed.

Small End First: A check here will send all logs with the butt end leading to the bin that is defined by the next parameter regardless of what the log dimensions are. Unchecked will send all logs with the top end leading to the bin that is defined by the next parameter regardless of what the log dimensions are. If the *Abnormal Log Orientation Bin* is set to zero, this feature will be disabled.

Wrong Orientation Bin: This parameter defines the bin to which logs with the wrong orientation (as defined by the previous parameter) will be sent. A zero will disable this feature.

3.4 General Parameters 2



Reference Photocell Location: This is the distance between the *Entry Zone* defined in *Scanner Parameters* and the Reference Photocell. If no Reference Photocell is used, enter "0".

Max Logs Scanner - RPC: This is the maximum number of logs that fits between the scanner and the Reference Photocell. If no Reference Photocell is used, enter "0".

Reference Photocell Delay: This parameter defines how far the chain has to travel before a transition of the reference photocell is acknowledged. The delay prevents, for example, free-flying bark pieces to trigger the system. If the parameter is too large, it might "desensitize" the system to the point where gaps between logs are not detected.

Negative RPC Logic: Defines the polarity of the photocell signal.

Bin Distance Adder: A fixed distance, the same for each bin, may be added to the bin distances. It is recommended that it be set at, for example, 50 at time of start-up. It may then be adjusted up or down to compensate for changes in kicker responses. This feature may, for example, be used to compensate for slow kicker operation because of low temperatures.

Deck Advance Duration: This is the time duration during which the deck chains are advanced. Please refer to the Sort Tables for programming the number of logs that need to be diverted to each bin before the chain is advanced.

Deck Full Logic: Check here if this optional feature is implemented, i.e. logs are addressed to a Backup Bin when the Deck Full Signal is set for the Primary Bin.

Manual Override: Check here if this optional feature is implemented, i.e. logs are addressed to a manually selected bin instead of the Primary Bin.

Kick Mode: This parameter tells the system which part of the log it should track when determining when to actuate the kicker.

Leading tracks the leading end of the log and is, for example, used for kickers with a deflecting arm.

Center tracks the center point of the log and is typically used for rotary-type kickers or aircylinder-type kickers.

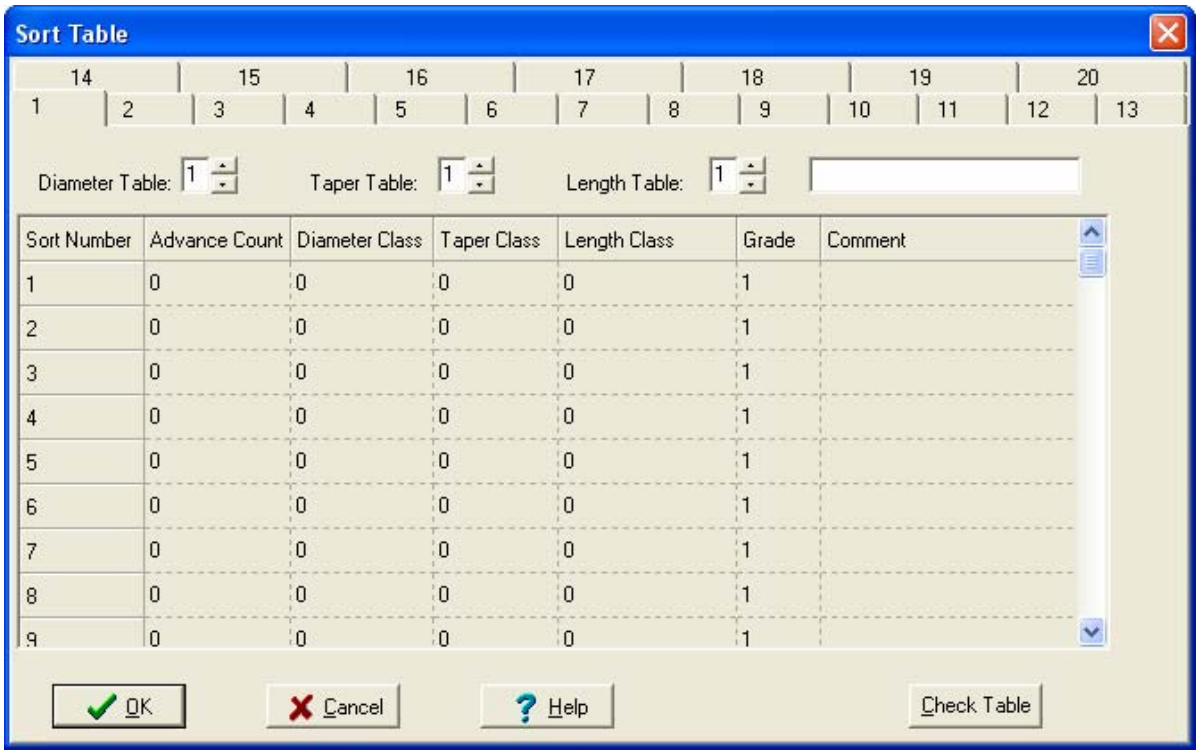
Trailing tracks the trailing end of the log and is seldom used.

Kicker Duration Mode: The kickers are either actuated a certain fixed time or they are actuated while the chain travels a certain distance. The mode selection depends upon the type of kickers that are used.

Photocell Kicking: This parameter tells the system if photocells (one per bin) are used to determine the exact timing of the kicker.

Negative Kick PC Logic: Defines the polarity of the photocell signals, or determines if kicking should be activated on the leading or the trailing end of the log. Note that this parameter works together with the *Delay* Parameter under *Bin Parameters*.

3.5 Sort Tables



There are twenty different sort tables. The three table specifications at the top of the window defines which tables that are used to classify the logs into classes.

Sort Number column shows the sort.

The **Advance Count** column is used for programming the number of logs that are counted before the deck is advanced a certain distance. The distance, or actually the time duration of the output signal, is defined by a parameter in **General Parameters 2**. Note that the Deck Advance feature is optional.

The next 3 columns are used for programming the various **Diameter**, **Taper**, and **Length** *classes* for each sort.

The sixth column is used for programming the **Grade**. Insert a "1" here if this optional feature is not implemented.

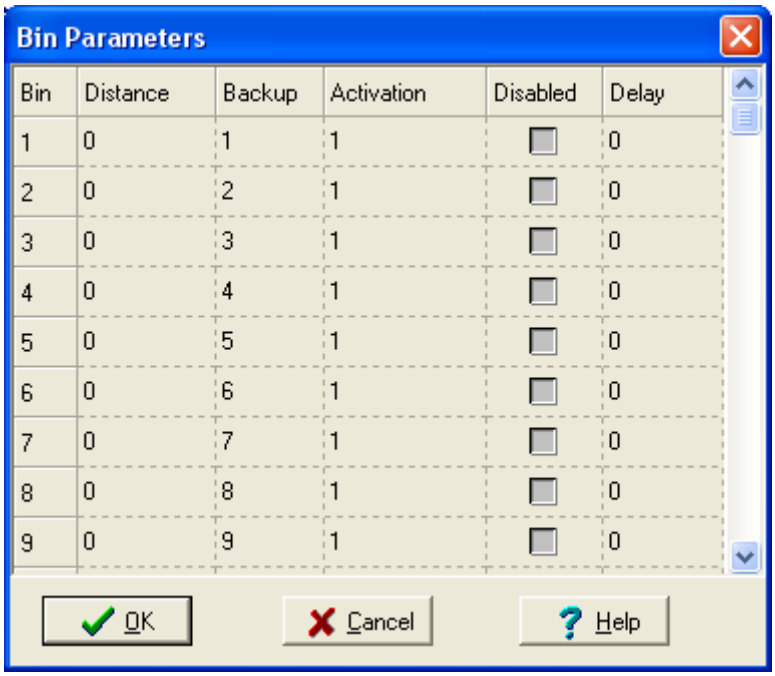
The last column is a description of the sort.

Note that if more than one class is programmed, they are either separated with one or several commas. For example: 1,3,5.

A range is entered with a "-". For example 1-3 means classes 1,2, and 3.

The **Check Table** button will check the sort table for "gaps". A "gap" means that a certain log, as defined by diameter, length, taper, and grade/species, has no sort defined. The undefined log data are shown on the screen and printed out on the printer (optional) when this check is being performed.

3.6 Bin Parameters



The number of bins shown is determined by the *Number of Bins* parameter under *General Parameters 1.*

Distance: The distance from the scanner to the "kick point." The distance is expressed in either centimeters or inches depending upon the *Encoder Scale Factor* parameter in *Encoder Parameters*.

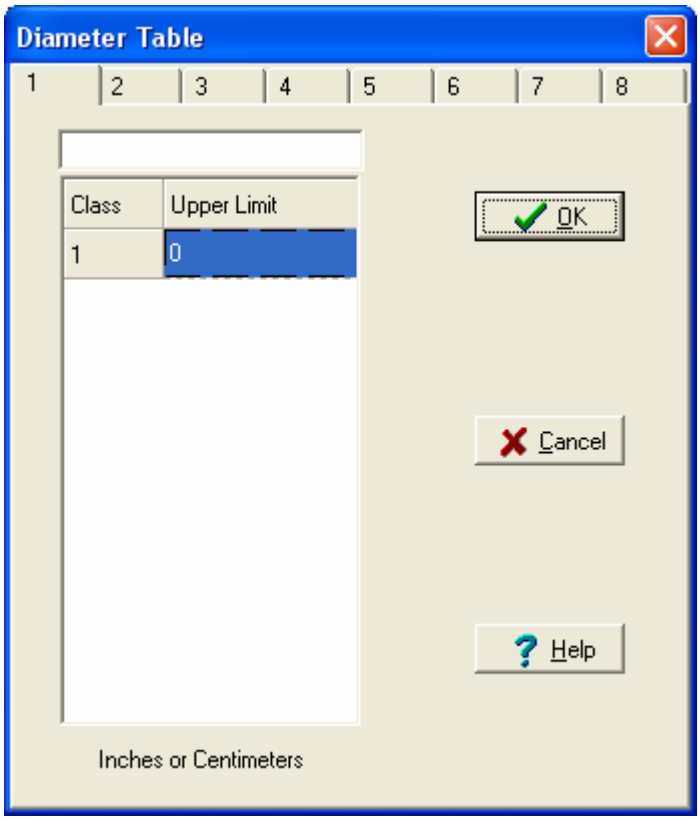
Backup: Logs are addressed to the backup bins if the primary bin is declared to be out-of-service or if the bin-full switch is actuated for the primary bin (optional feature).

Activation Time: The Activation Time is programmed in either seconds or inches or centimeters depending upon the setting of the *Kicker Duration Mode* parameter in *General Parameters 2* and the *Encoder Scale Factor* in *Encoder Parameters*.

Disabled: A check here will disable the bin and the logs will automatically be addressed to the backup bin.

Delay: Only used with Bin Photocell kicking. To disable Photocell kicking for the bin, type 999. All other values delays the kicking with the corresponding number of Chain Encoder pulses *after* the photocell has been activated.
Note that the distance per pulse depends on the *Chain Encoder Divider* parameter.

3.7 Diameter Tables

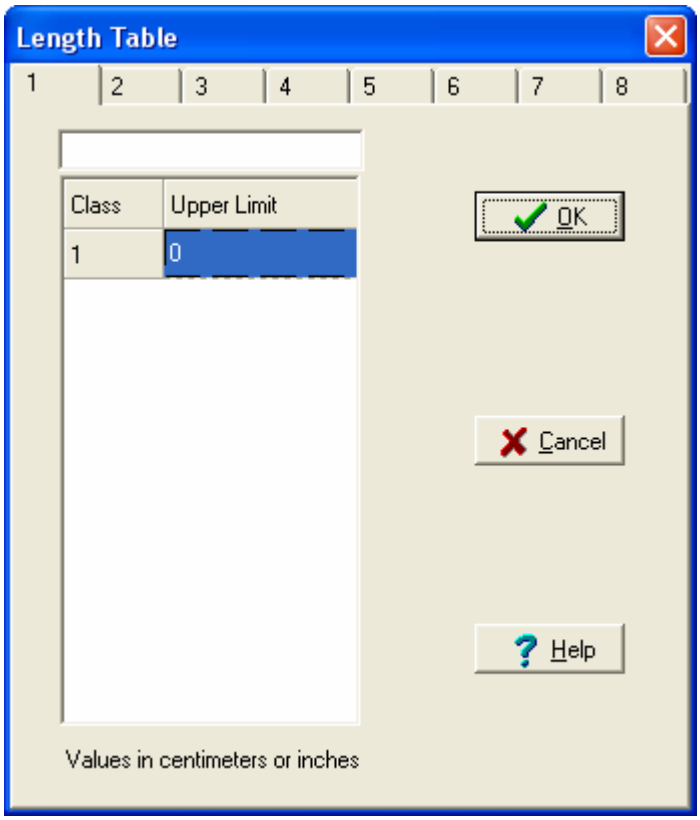


The upper limit of each diameter class is entered here in either centimeters or inches.

The type of diameter that is used for this classification is determined by the setting of the *Sort Dia.* parameter in *General Parameters 1.*

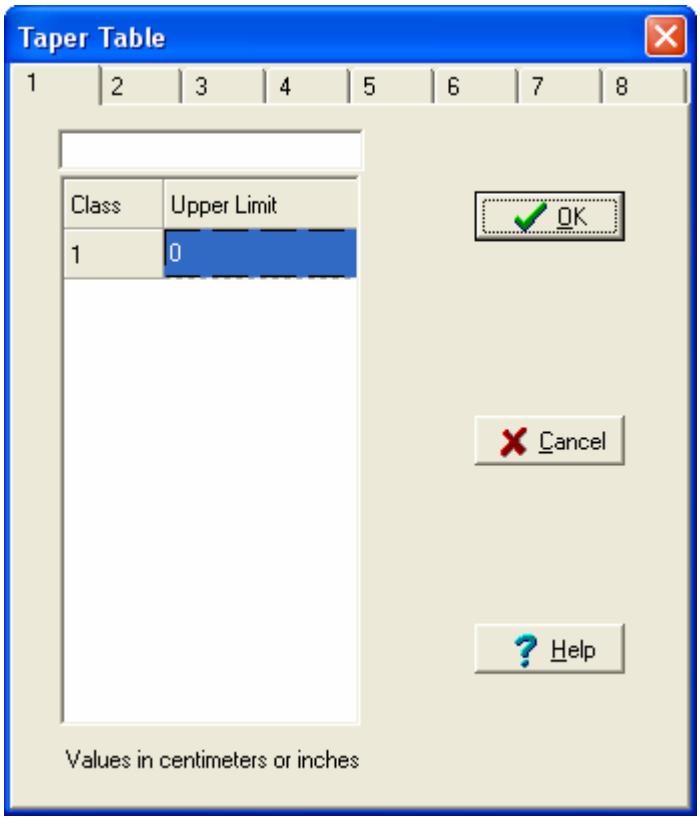
It is recommended that the last table entry be 999.99 in order to catch all large logs in this last class.

3.8 Length Tables



The upper limit of each length class is entered here in either centimeters or inches. It is recommended that the last table entry be 9999.9 in order to catch all long logs in this last class. There are eight different length tables.

3.9 Taper Tables



The upper limit of each taper class is entered here in either metric or imperial units.

4.0 DIAGNOSTICS

Main Diagnostics shows information pertaining to the encoder and other system functions. It also shows the data that are generated for a particular log. Displaying **System Diagnostics** is normally the first step taken when a malfunction of an unknown nature occurs.

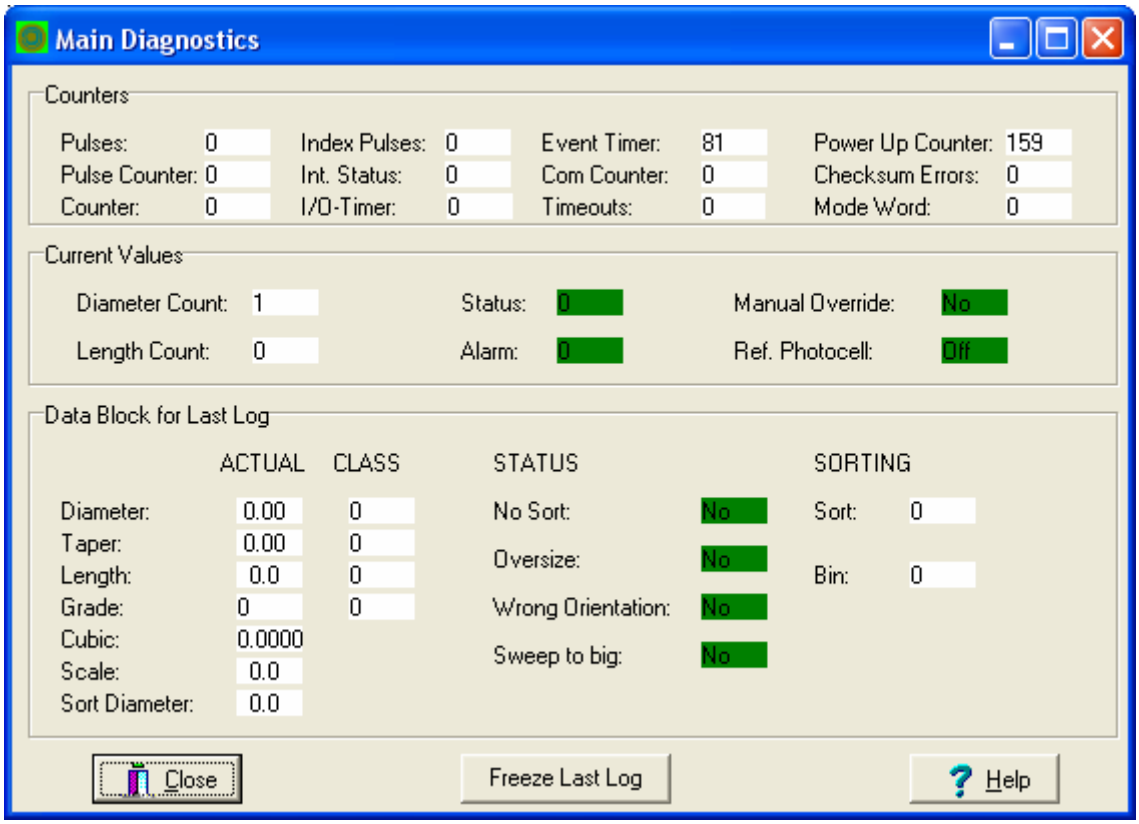
Local I/O Diagnostics pertain to the OPTO 22 OPTOMUX mounting racks for solid state input and output modules. The OPTOMUX racks each contain 24 single channel I/O modules. These racks are used in all systems. The diagnostic function allows the monitoring of input channels as well as allowing you to force outputs on or off.

Remote I/O Diagnostics is only used in systems that have OPTO 22 PAMUX mounting racks for the solid state input and output modules. The PAMUX racks each contain eight 4-channel modules. This type of rack is only used in larger (more than 10 or 12 bins) log sorting systems or in systems with very special functions. The diagnostic function allows the monitoring of input channels as well as allowing you to force outputs on or off.

Kicker Diagnostics shows the content of the "sorting buffer" in the program, i.e. it tells how the program keeps track of the logs between the scanner and the various kickers. It also shows how the actual kicker control logic works. This diagnostic screen should be used when there is a problem with the actual sorting logic or the control of the kickers.

Kicker Test fires the kickers in sequential order. This feature is used to test the kicker output modules in the OPTO 22 racks and the kicker solenoids.

4.1 Main Diagnostics



Main Diagnostics shows information pertaining to the encoder and other system functions. It also shows the data that are generated for a particular log. Displaying Main Diagnostics is normally the first step taken when a malfunction of an unknown nature occurs.

4.1.1 Counters

Pulses shows the number of times that the program "looks at the chain" per encoder revolution. This is also called a chain interrupt. The number is equal to the number of encoder pulses per revolution divided by the *Chain Encoder Divider* parameter. For example, with an encoder generating 500 pulses per revolution and the *Chain Encoder Divider* parameter set to 10 will generate a value of 50.

Pulse Counter should count upwards as the encoder turns forward. It actually counts the pulses that the encoder is generating. The counter rolls over from setting of the *Chain Encoder Divider* parameter to zero.

Counter shows rhe counters latch register.

Index Pulses increments by one for each encoder revolution.

Int. Status shows the content of Interrupt Status Register 3 of the 626 board.

I/O-Timer counts up each time the timer controlled i/o thread is activated.This thread mainly controls PAMUX cards.

Event Timer counts up each time the main thread is activated.

Com Counter counts the received bytes from the scanner.

Timeouts counts the number of time outs from the scanner. This number should normally be zero.

Power Up Counter is incremented once every time the program is started. This number should not make big increases during a shift. (This would indicate a problem with the AC power that should be corrected.) Note that the number is also incremented once when the program is restarted manually. Also note that this number is never reset before it gets to 65,535.

Checksum Errors counts the number of checksum errors received from the scanner. Only used with REMA scanners.

Mode Word shows the mode word of the 626 board.

4.1.2 Current Values

Diameter Count counts the number of measured diameters when the log passes through the scanner.

Length Count show the total number of measurements when the log leaves the scanner.

Status shows the status of the last received data block from the scanner.

Rema: (0 = No Data Block)
(1 = Valid Data Block)
(2 = Checksum Error)
(3 = No Log (Empty Block))

STI: (0 = OK)
(1 = Log too Short)
(2 = Pos. Dia. too Large)

Alarm shows the current alarm code.

Manual Override indicates if the sort destination was manually overridden, i.e. an override pushbutton (incl. reject) was manually pushed.

Ref Photocell shows if the photocell (optional) is blocked or not.

4.1.3 Data Block For Last Log

Actual displays the actual measurements for the log. The *Scale* information only pertains to systems where special scale information is calculated, e.g. the Scribner Scale. The *Sort Diameter* shows which diameter value that is used for the sort classification. The *Sort Diameter* is the same as the *Diameter* corrected for sweep, i.e. they are the same for systems with no sweep measuring, or for logs with zero sweep.

Classes shows how the log was classified with regard to diameter, length, and taper utilizing the corresponding tables for the different class limits. The *Grade* number shows the number of the grade pushbutton that was pushed, or the default value (*General Parameters 1*) if no pushbutton was pushed or the system does not have any Grade Pushbuttons. Note that the diameter is defined by the *Sort Dia* parameter in *General Parameters 1*.

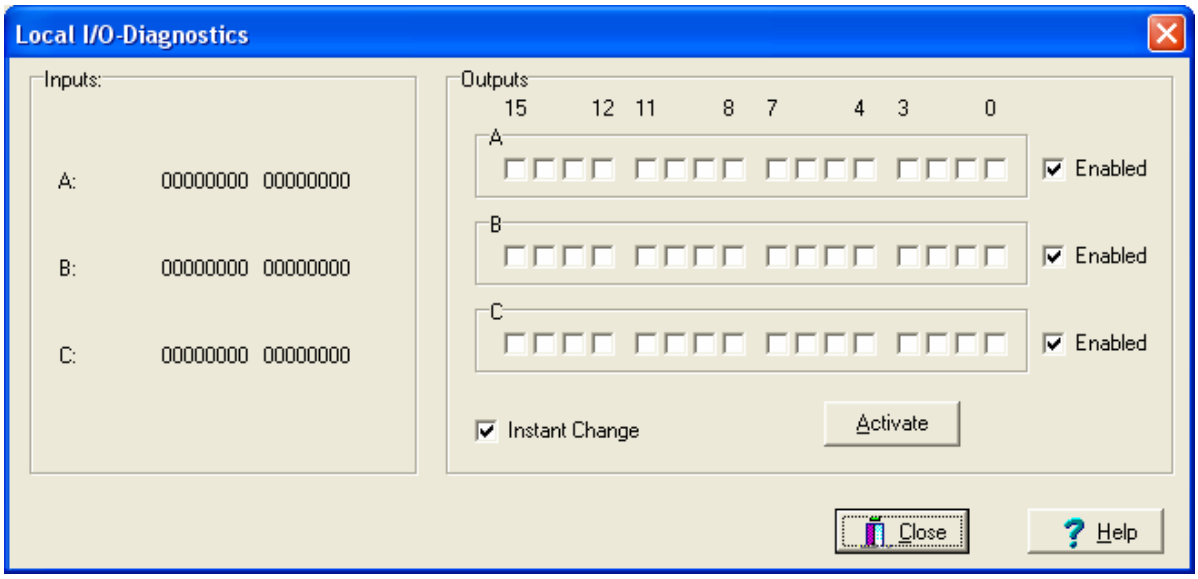
Status shows special information relating to this log. *No Sort* would show a "Y" if the system was unable to select a sort for this log due to, for example, "gaps" in the Sort Table. A "Y" in the *Oversize* field would mean that the largest diameter scanned along the log exceeds the *Oversize Limit*

parameter in *General Parameters 1*. A "Y" in the *Wrong Orientation* field would mean that the butt/top orientation (butt or top first) of the log does not correspond to the setting of the *Log Orientation* Parameter in *General Parameters 1*. A"Y" in the *Sweep to big* means that the sweep exceeded the limit set by the *Maximum Sweep* parameter in *General Parameters 1.*

Sorting shows the sort and bin that was selected for this log. A "0" is shown for *Sort* if no sort was found in the Sort Table. *Bin* is determined in the following order of priority with the highest priority at the bottom:

- Same Bin as Sort
- Backup Bin if Primary Bin is full
- Wrong Orientation Bin if applicable
- Oversize Bin if applicable
- Sweep Bin if applicable
- Manual Override Bin if pushbutton pushed
- Reject if pushbutton pushed

4.2 Local IO-Diagnostics

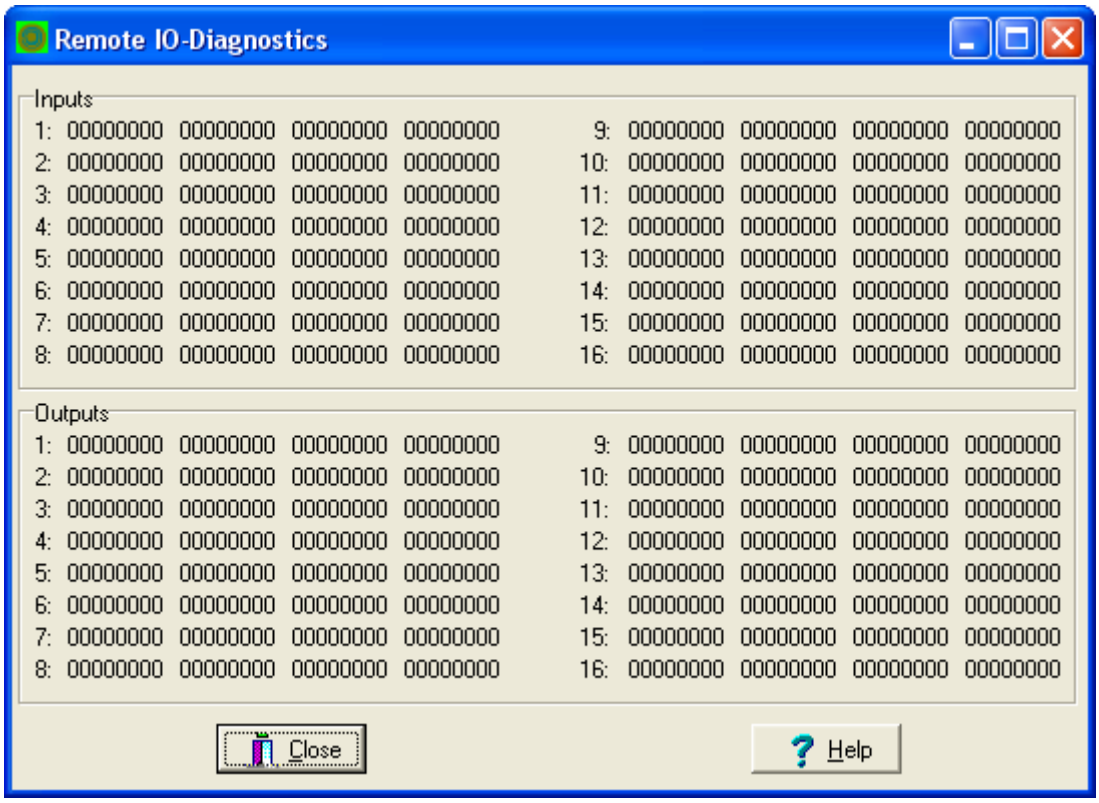


A "1" in the left panel indicates that an input is ON and a "0" indicates that it is OFF.

A checked box in the right panel witll set an output to ON, unchecked to OFF.

Please refer to the I/O-Map for a definition of the different input/output channels.

4.3 Remote IO-Diagnostics



Remote I/O Diagnostics is only used in systems that have OPTO 22 PAMUX mounting racks for the solid state input and output modules. The PAMUX racks each contain eight 4-channel modules. This type of rack is only used in larger log sorting systems or in systems with very special functions. The diagnostic function allows the monitoring of input channels as well as allowing you to force outputs on or off.

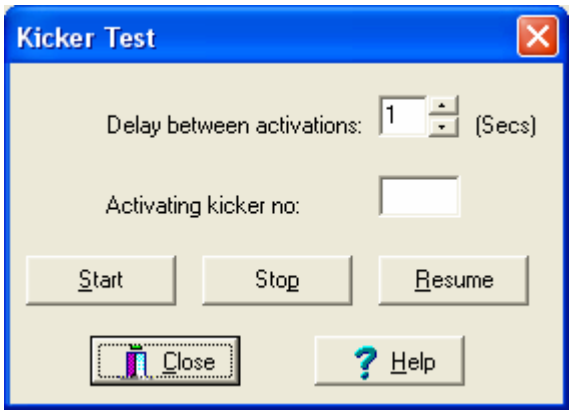
The top half of the screen refers to inputs, the Input Area, and the bottom half refers to outputs, the Output Area.

Note that there is a maximum of 16 PAMUX cards in a normal system. Each PAMUX card has 32 channels which may contain any mixture of inputs and outputs. All 32 channels are shown on the screen in both the input and output areas. Of course, it is only meaningful to look at those channels that are inputs in the input area and outputs in the output area.

A "1" indicates that an input or an output is ON and a "0" indicates that it is OFF.

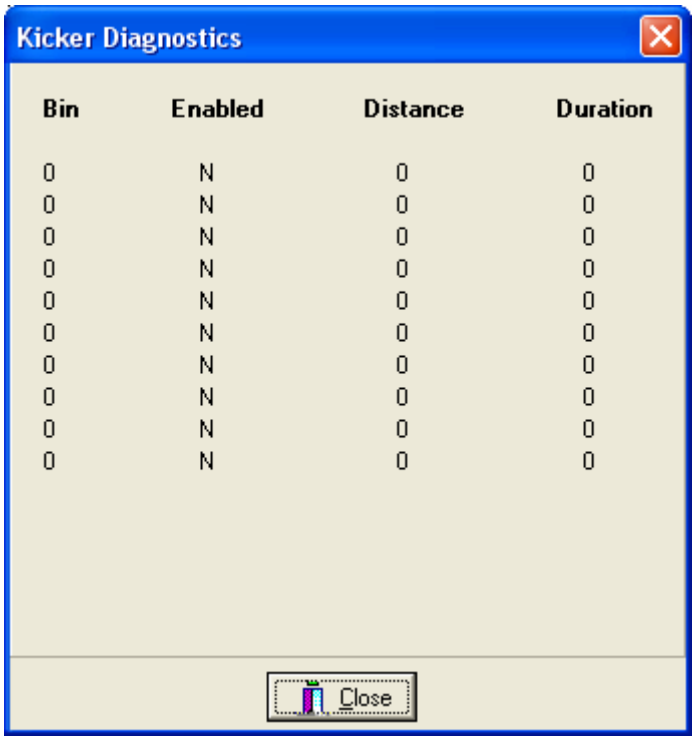
NOTE THAT SETTING AN INPUT IN THE OUTPUT AREA CAUSES THAT INPUT TO BE ON UNTIL THE WHOLE PROGRAM IS RESTARTED.

4.4 Kicker Test



Activates the kickers from 1 to *General Parameters 1/Number of Bins.*

4.5 Kicker Diagnostics



This screen shows some internal program parameters related to the kickers.

Each row shows the data for a log on the chain.

The *Bin* column shows the target bin.

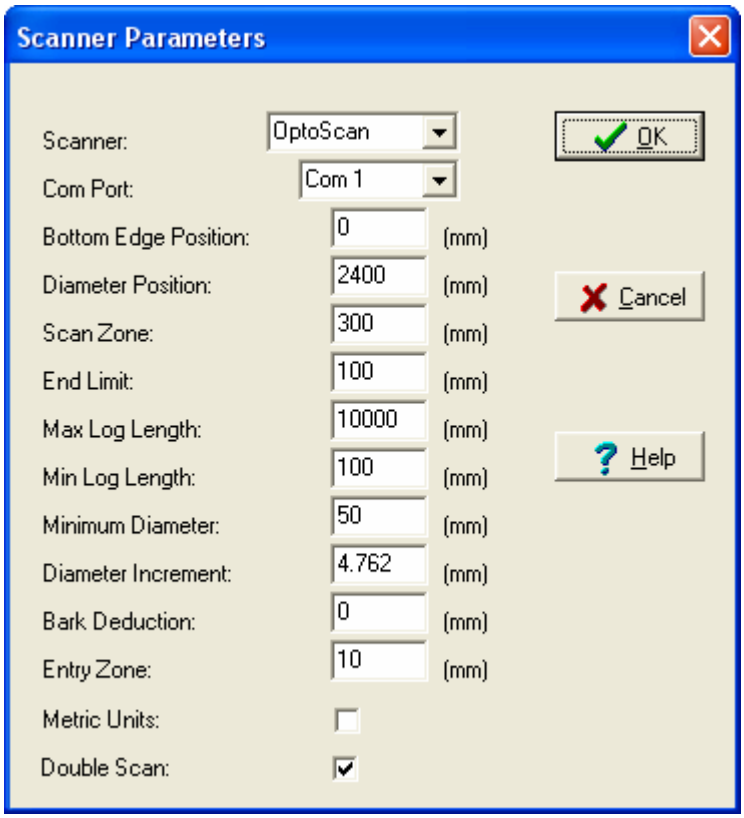
The *Enabled* column is only valid if photocell kicking is used. It will show "Y" between the kicker is enabled and until the log reaches the photocell.

Distance is given a value when the log leaves the scanner and counts down to zero. When reaching zero, the kicker will be activated.

Duration is assigned a value when the kicker is activated and will count down to zero. When reaching zero, the kicker will be deactivated. The number shown is either in time units or chain interrupts depending upon the setting of the *Kicker Duration Mode* parameter in *General Parameters 2*.

5 SCANNER

5.1 Scanner Parameters



Scanner: Selects the scanner used in the system.

Com Port: Selects the com port used by the scanner.

The following parameters are only used in systems using the STI and Hermary scanners.

Bottom Edge Position: Defines where the scanner should assume that the bottom edge of the log is if it is unable to see light beneath the log. "0" represents the bottom of the scanner. Positive values correspond to positions above the bottom of the scanner and negative values correspond to positions below the bottom of the scanner. Set this parameter to "0" if the feature is not required.

Diameter Position: This defines the location of the Position Diameter as referenced from the butt end of the log. The average diameter is filtered out from a number of diameter readings scanned over a distance equal to the Scan Zone and that is centered at this location.

Scan Zone: An average of several diameters scanned over a certain distance is determined when the system determines a representative diameter at a certain location. This parameter determines the size of this scan zone. The averaging algorithm sorts the diameters in increasing order and it selects the diameter that corresponds to the first quartile, i.e. one quarter of the diameters in the Scan Zone are smaller and three quarters are larger than the selected diameter.

This averaging algorithm is used in order to filter out knots and other irregularities.

End Limit: The Scan Zone for determination of the Small End Diameter and the Large End Diameter starts a certain distance from each end of the log. This parameter determines this distance.

Max Log Length: The system will force the termination of the scanning of a log when the length has reached this value. This feature is used in systems where the scanner is close-coupled to the first bin.

Min Log Length: The system will neglect log shorter than this length.

Minimum Diameter: Diameter scans below this value are neglected. This feature gets rid of erroneous logs due to burned out diodes (very uncommon) or dirty scan windows. A typical value is 50 millimeters (approx. 2").

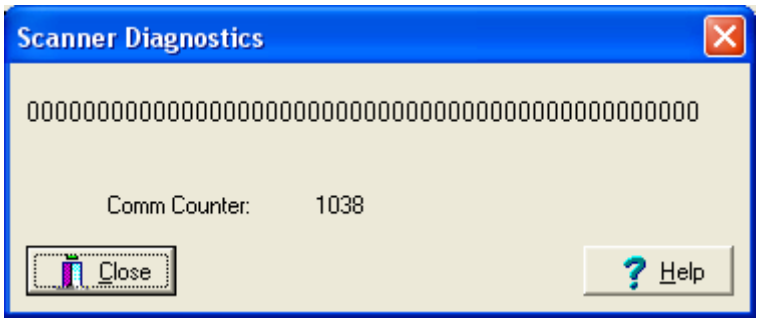
Diameter Increment: This is the space in millimeters between the diods in the scanner.

Bark Deduction: This value is deducted from the calculated diameter values.

Entry Zone: This parameter defines a point along the chain downstream of the scanner at which the sort selection is done. The grade must be entered by this point. The distance is referenced from the scanner. The value of this parameter must not exceed the minimum log length.

Metric Units: A check mark will make the system use metric units. No check mark will make the system use imperial units.

5.2 Scanner Diagnostics



This screen shows the beams of the scanner in hexadecimal format. Each letter represent four beams as follows:

```
0 = 0000
1 = 0001
2 = 0010
3 = 0011
4 = 0100
5 = 0101
6 = 0110
7 = 0111
8 = 1000
9 = 1001
A = 1010
B = 1011
C = 1100
D = 1101
F = 1111
```

6 LOG DATA-BLOCK FORMAT

6.1 Byte Definitions

The following information is generated for every log being processed by the system:

Byte	Config.	Description
1-7		Misc. Control Bytes
8	Byte 1 – L	Top Diameter - Axis 1
9	Byte 2 – M	Top Diameter - Axis 1
10	Byte 1 – L	Top Diameter - Axis 2
11	Byte 2 – M	Top Diameter - Axis 2
12	Byte 1 – L	Top Diameter - Average of Axis 1 & 2
13	Byte 2 – M	Top Diameter - Average of Axis 1 & 2
14	Byte 1 – L	Top Diameter - Smallest of Axis 1 & 2 *
15	Byte 2 – M	Top Diameter - Smallest of Axis 1 & 2 *
		*The Top End Diameter from dual-axis scanners
	bytes.	
16	Byte 1 – L	Butt Diameter - Average of Axis 1 & 2
17	Byte 2 – M	Butt Diameter - Average of Axis 1 & 2
18	Byte 1 – L	Smallest Diameter - Average of Axis 1 & 2
19	Byte 2 – M	Smallest Diameter - Average of Axis 1 & 2
20	Byte 1 – L	Largest Diameter - Average of Axis 1 & 2
21	Byte 2 – M	Largest Diameter - Average of Axis 1 & 2
22	Byte 1 – L	Position Diameter - Axis 1
23	Byte 2 – M	Position Diameter - Axis 1
24	Byte 1 – L	Position Diameter - Axis 2
25	Byte 2 – M	Position Diameter - Axis 2
26	Byte 1 – L	Position Diameter - Average of Axis 1 & 2
27	Byte 2 – M	Position Diameter - Average of Axis 1 & 2
28	Byte 1 – L	Position Diameter - Smallest of Axis 1 & 2
29	Byte 2 – M	Position Diameter - Smallest of Axis 1 & 2
30	Byte 1 – L	Center Diameter - Axis 1
31	Byte 2 – M	Center Diameter - Axis 1
32	Byte 1 – L	Center Diameter - Axis 2
33	Byte 2 – M	Center Diameter - Axis 2
34	Byte 1 – L	Center Diameter - Average of Axis 1 & 2
35	Byte 2 – M	Center Diameter - Average of Axis 1 & 2
36	Byte 1 – L	Center Diameter - Smallest of Axis 1 & 2
37	Byte 2 – M	Center Diameter - Smallest of Axis 1 & 2

38	Byte 1 – L	Average Diameter - Average of Axis 1 & 2	
39	Byte 2 – M	Average Diameter - Average of Axis 1 & 2	
40	Byte 1 – L	Log Length	
41	Byte 2 – M	Log Length	
42	Byte 1 – L	Physical Volume	
43	Byte 2	Physical Volume	
44	Byte 3 – M	Physical Volume	
45	Byte 1 – L	Top Volume	
46	Byte 2	Top Volume	
47	Byte 3 – M	Top Volume	
48		Taper	
49		Maximum Cord/Curve Distance	
50	Byte 1 – L	Location of Max. Cord/Curve Dist.	
51	Byte 2 – M	Location of Max. Cord/Curve Dist.	
52		Orientation of Max. Cord/Curve Dist.	
53		Ovality	
54		Log Orientation (0=Butt First; 1=Top First)	
55		Bin Number	
56		Unit Mode (0 = Metric; 1 = Imperial)	
57	Byte 1 – L	Scale 1 Volume	
58	Byte 2	Scale 1 Volume	
59	Byte 3 – M	Scale 1 Volume	
60		Over Size	(0 = Not True; 1 = True)
61		Wrong Orientation	(0 = Not True; 1 = True)
62		Excessive Sweep	(0 = Not True; 1 = True)
63		Diameter Class	
64		Length Class	
65		Taper Class	
66		Grade	

67		Sort		
68		Status	Rema:	(0 = No Data Block) (1 = Valid Data Block) (2 = Checksum Error) (3 = No Log (Empty Block))
			STI:	(0 = OK) (1 = Log too Short) (2 = Pos. Dia. too Large)
69		Reject		(1 = Reject, 0 = No Reject)
70		Error Code		From the Rema Scanner
71		Error Data		From the Rema Scanner
72	Byte 1 – L	Sort Diameter		
73	Byte 2 – M	Sort Diameter		

6.2 Units and Ranges - Metric Units

Description	Unit	Range
Diameters	mm	0 - 2,000 mm
Length	cm	0 - 25,000 cm
Volume	0.0001 Cu.Mtr	0.0005 - 40 Cu.Mtr.
Taper	mm/m	0 - 255 (mm/m)
Cord/Curve Dist.	Mm	0 - 255 mm
C/CD Position	mm	0 - 25,000 mm
Orientation	360/256 Degr.	360/256 Degr.
Ovality	%	0 - 255 ((D1-D2)/(0.5*(D1+D2))*100)

6.3 Units and Ranges - Imperial Units

Description	Unit	Range
Diameters	0.01"	0 - 80"
Length	0.1"	0 - 1000"
Volume	0.01 Cu.Ft.	0.2 - 1,500 Cu.Ft.
Taper	0.01"/Ft.	0 - 2.55 "/Ft.
Cord/Curve Dist.	0.1"	0.0 - 25.5"
C/CD Position	0.1"	0 - 1,000"
Orientation	360/256 Degr.	360/256 Degr.

7 TROUBLESHOOTING

Below is a list of various troubleshooting hints. It is not a complete and systematic troubleshooting guide. You must use your own knowledge of the system and your own judgment in most cases. However, these hints should give you some ideas.

All Systems:

- Turn the power OFF and ON to the computer and all other system units.
- Do the Chain Encoder signals look normal on the **System Diagnostic Screen**?
- Are the LED's for Channel 10 and 11 on Card A lit when the Chain Encoder is turning?
- Do you get the index pulse once per encoder revolution on Channel 12 on Card A?
- Stop the chain on the Encoder Timing Mark. Does the Centi lug Counter on the **System Diagnostic Screen** show close to 100 or 0?
- Verify the voltage across the 24V Power Supply.
- Check the fuses on the **Sense Zone Panel/I/O Panel** door. Are the lights on?
- Do non-encoder data look normal on the **System Diagnostic Screen**?
- Try to print **Snap-shot Reports**.
- Can inputs be monitored and outputs be set from the **Local I/O Diagnostic Screen**?
- Run the Diverter Test.

Systems with Remote I/O:

- Is the 5V LED lit on each card?
- Can inputs be monitored and outputs be set from the **Remote I/O Diagnostic Screen**?

Systems with a REMA Log Scanner:

- Reset the Scanner CPU Card (bottom left corner).
- Run the Scanner Diagnostics using XTALK.

Systems with a STI Log Scanner:

- Run the **Scanner Diagnostics**.
- Is the Green Light on the Scanner ON when the scanner is unblocked? Does the Red Light come ON when the scanner is blocked?
- Try to adjust the Receiver Sensitivity with the potentiometer inside the Power Supply Box.

7 INPUT AND OUTPUT MAPS

7.1 I/O Card A

Ch.	Sign.	Com.	I/O	Description
0	1	2	I	Reject
1	3	4	I	Reference Photocell
2	5	6	I	Re-Reference Photocell
3	7	8	-	Reserved
4	9	10	O	Entry Light
5	11	12	-	Reserved
6	13	14	-	Reserved
7	15	16	-	Reserved
8	17	18	-	Reserved
9	19	20	-	Reserved
10	21	22	-	Reserved
11	23	24	-	Reserved
12	25	26	-	Reserved
13	27	28	-	Reserved
14	29	30	-	Reserved
15	31	32	-	Reserved
16	33	34	-	Reserved
17	35	36	-	Reserved
18	37	38	-	Reserved
19	39	40	-	Reserved
20	41	42	-	Reserved
21	43	44	-	Reserved
22	45	46	-	Reserved
23	47	48	-	Reserved

Note 1: +5 V is connected to Wire 49 in the ribbon cable.

Note 2: The Length Photocell LED should be lit when the beam is broken by the board.

Note 3: Observe the LED's on the I/O Module A while the encoder is turning very slowly in the forward direction. The encoder is connected properly if the sequence, starting with both LED's dark, is as follows: No. 19 goes light; No. 18 goes light; No. 19 goes dark; No. 18 goes dark. Just switch the wires on Terminal 37 and 39 if the sequence is incorrect.

7.2 I/O Card B

Ch.	Sign.	Com.	I/O	Description
0	1	2	O	Kicker 1
1	3	4	O	Kicker 2
2	5	6	O	Kicker 3
3	7	8	O	Kicker 4
4	9	10	O	Kicker 5
5	11	12	O	Kicker 6
6	13	14	O	Kicker 7
7	15	16	O	Kicker 8
8	17	18	O	Kicker 9
9	19	20	O	Kicker 10
10	21	22	O	Kicker 11
11	23	24	O	Kicker 12
12	25	26	O	Kicker 13
13	27	28	O	Kicker 14
14	29	30	O	Kicker 15
15	31	32	O	Kicker 16
16	33	34	O	Kicker 17
17	35	36	O	Kicker 18
18	37	38	O	Kicker 19
19	39	40	O	Kicker 20
20	41	42	O	Kicker 21
21	43	44	O	Kicker 22
22	45	46	O	Kicker 23
23	47	48	O	Kicker 24

Note 1: +5 V is connected to Wire 49 in the ribbon cable.

Note 2: All even wires in the ribbon cable are grounded.

7.3 Remote Card 1 - Kickers 1 - 32

Jumper Config.: ooooxxoo Location: Card Address: 00

Channel	Terminal	Module	In/Out	Description
0	1	1	O	Kicker 1
1	2		O	Kicker 2
2	3		O	Kicker 3
3	4		O	Kicker 4
4	5	2	O	Kicker 5
5	6		O	Kicker 6
6	7		O	Kicker 7
7	8		O	Kicker 8
8	9	3	O	Kicker 9
9	10		O	Kicker 10
10	11		O	Kicker 11
11	12		O	Kicker 12
12	13	4	O	Kicker 13
13	14		O	Kicker 14
14	15		O	Kicker 15
15	16		O	Kicker 16
16	17	5	O	Kicker 17
17	18		O	Kicker 18
18	19		O	Kicker 19
19	20		O	Kicker 20
20	21	6	O	Kicker 21
21	22		O	Kicker 22
22	23		O	Kicker 23
23	24		O	Kicker 24
24	25	7	O	Kicker 25
25	26		O	Kicker 26
26	27		O	Kicker 27
27	28		O	Kicker 28
28	29	8	O	Kicker 29
29	30		O	Kicker 30
30	31		O	Kicker 31
31	32		O	Kicker 32

Note: The first four jumper positions are for the card address and are numbered 1 - 4 on the card.

7.4 Remote Card 2 - Kickers 33 - 64

Jumper Config.: xoooxxoo Location: Card Address: 04

Channel	Terminal	Module	In/Out	Description
0	1	1	O	Kicker 33
1	2		O	Kicker 34
2	3		O	Kicker 35
3	4		O	Kicker 36
4	5	2	O	Kicker 37
5	6		O	Kicker 38
6	7		O	Kicker 39
7	8		O	Kicker 40
8	9	3	O	Kicker 41
9	10		O	Kicker 42
10	11		O	Kicker 43
11	12		O	Kicker 44
12	13	4	O	Kicker 45
13	14		O	Kicker 46
14	15		O	Kicker 47
15	16		O	Kicker 48
16	17	5	O	Kicker 49
17	18		O	Kicker 50
18	19		O	Kicker 51
19	20		O	Kicker 52
20	21	6	O	Kicker 53
21	22		O	Kicker 54
22	23		O	Kicker 55
23	24		O	Kicker 56
24	25	7	O	Kicker 57
25	26		O	Kicker 58
26	27		O	Kicker 59
27	28		O	Kicker 60
28	29	8	O	Kicker 61
29	30		O	Kicker 62
30	31		O	Kicker 63
31	32		O	Kicker 64

Note: The first four jumper positions are for the card address and are numbered 1 - 4 on the card.

7.5 Remote Card 3 - Kickers 65 - 96

Jumper Config.: oxooxxoo Location: Card Address: 08

Channel	Terminal	Module	In/Out	Description
0	1	1	O	Kicker 65
1	2		O	Kicker 66
2	3		O	Kicker 67
3	4		O	Kicker 68
4	5	2	O	Kicker 69
5	6		O	Kicker 70
6	7		O	Kicker 71
7	8		O	Kicker 72
8	9	3	O	Kicker 73
9	10		O	Kicker 74
10	11		O	Kicker 75
11	12		O	Kicker 76
12	13	4	O	Kicker 77
13	14		O	Kicker 78
14	15		O	Kicker 79
15	16		O	Kicker 80
16	17	5	O	Kicker 81
17	18		O	Kicker 82
18	19		O	Kicker 83
19	20		O	Kicker 84
20	21	6	O	Kicker 85
21	22		O	Kicker 86
22	23		O	Kicker 87
23	24		O	Kicker 88
24	25	7	O	Kicker 89
25	26		O	Kicker 90
26	27		O	Kicker 91
27	28		O	Kicker 92
28	29	8	O	Kicker 93
29	30		O	Kicker 94
30	31		O	Kicker 95
31	32		O	Kicker 96

Note: The first four jumper positions are for the card address and are numbered 1 - 4 on the card.

7.6 Remote Card 4 - Deck Advance 1 - 32

Jumper Config.: xxooxxoo Location: Card Address: 12

Channel	Terminal	Module	In/Out	Description
0	1	1	O	Deck Advance 1
1	2		O	Deck Advance 2
2	3		O	Deck Advance 3
3	4		O	Deck Advance 4
4	5	2	O	Deck Advance 5
5	6		O	Deck Advance 6
6	7		O	Deck Advance 7
7	8		O	Deck Advance 8
8	9	3	O	Deck Advance 9
9	10		O	Deck Advance 10
10	11		O	Deck Advance 11
11	12		O	Deck Advance 12
12	13	4	O	Deck Advance 13
13	14		O	Deck Advance 14
14	15		O	Deck Advance 15
15	16		O	Deck Advance 16
16	17	5	O	Deck Advance 17
17	18		O	Deck Advance 18
18	19		O	Deck Advance 19
19	20		O	Deck Advance 20
20	21	6	O	Deck Advance 21
21	22		O	Deck Advance 22
22	23		O	Deck Advance 23
23	24		O	Deck Advance 24
24	25	7	O	Deck Advance 25
25	26		O	Deck Advance 26
26	27		O	Deck Advance 27
27	28		O	Deck Advance 28
28	29	8	O	Deck Advance 29
29	30		O	Deck Advance 30
30	31		O	Deck Advance 31
31	32		O	Deck Advance 32

Note: The first four jumper positions are for the card address and are numbered 1 - 4 on the card.

7.7 Remote Card 5 - Deck Advance 33 - 64

Jumper Config.: ooxoxxoo Location: Card Address: 16

Channel	Terminal	Module	In/Out	Description
0	1	1	O	Deck Advance 33
1	2		O	Deck Advance 34
2	3		O	Deck Advance 35
3	4		O	Deck Advance 36
4	5	2	O	Deck Advance 37
5	6		O	Deck Advance 38
6	7		O	Deck Advance 39
7	8		O	Deck Advance 40
8	9	3	O	Deck Advance 41
9	10		O	Deck Advance 42
10	11		O	Deck Advance 43
11	12		O	Deck Advance 44
12	13	4	O	Deck Advance 45
13	14		O	Deck Advance 46
14	15		O	Deck Advance 47
15	16		O	Deck Advance 48
16	17	5	O	Deck Advance 49
17	18		O	Deck Advance 50
18	19		O	Deck Advance 51
19	20		O	Deck Advance 52
20	21	6	O	Deck Advance 53
21	22		O	Deck Advance 54
22	23		O	Deck Advance 55
23	24		O	Deck Advance 56
24	25	7	O	Deck Advance 57
25	26		O	Deck Advance 58
26	27		O	Deck Advance 59
27	28		O	Deck Advance 60
28	29	8	O	Deck Advance 61
29	30		O	Deck Advance 62
30	31		O	Deck Advance 63
31	32		O	Deck Advance 64

Note: The first four jumper positions are for the card address and are numbered 1 - 4 on the card.

7.8 Remote Card 6 - Deck Advance 65 - 96

Jumper Config.: xoxoxxoo Location: Card Address: 20

Channel	Terminal	Module	In/Out	Description
0	1	1	O	Deck Advance 65
1	2		O	Deck Advance 66
2	3		O	Deck Advance 67
3	4		O	Deck Advance 68
4	5	2	O	Deck Advance 69
5	6		O	Deck Advance 70
6	7		O	Deck Advance 71
7	8		O	Deck Advance 72
8	9	3	O	Deck Advance 73
9	10		O	Deck Advance 74
10	11		O	Deck Advance 75
11	12		O	Deck Advance 76
12	13	4	O	Deck Advance 77
13	14		O	Deck Advance 78
14	15		O	Deck Advance 79
15	16		O	Deck Advance 80
16	17	5	O	Deck Advance 81
17	18		O	Deck Advance 82
18	19		O	Deck Advance 83
19	20		O	Deck Advance 84
20	21	6	O	Deck Advance 85
21	22		O	Deck Advance 86
22	23		O	Deck Advance 87
23	24		O	Deck Advance 88
24	25	7	O	Deck Advance 89
25	26		O	Deck Advance 90
26	27		O	Deck Advance 91
27	28		O	Deck Advance 92
28	29	8	O	Deck Advance 93
29	30		O	Deck Advance 94
30	31		O	Deck Advance 95
31	32		O	Deck Advance 96

Note: The first four jumper positions are for the card address and are numbered 1 - 4 on the card.

7.9 Remote Card 7 - Manual Override 1 - 32

Jumper Config.: oxxoxxoo Location: Card Address: 24

Channel	Terminal	Module	In/Out	Description
0	1	1	I	Manual Override 1
1	2		I	Manual Override 2
2	3		I	Manual Override 3
3	4		I	Manual Override 4
4	5	2	I	Manual Override 5
5	6		I	Manual Override 6
6	7		I	Manual Override 7
7	8		I	Manual Override 8
8	9	3	I	Manual Override 9
9	10		I	Manual Override 10
10	11		I	Manual Override 11
11	12		I	Manual Override 12
12	13	4	I	Manual Override 13
13	14		I	Manual Override 14
14	15		I	Manual Override 15
15	16		I	Manual Override 16
16	17	5	I	Manual Override 17
17	18		I	Manual Override 18
18	19		I	Manual Override 19
19	20		I	Manual Override 20
20	21	6	I	Manual Override 21
21	22		I	Manual Override 22
22	23		I	Manual Override 23
23	24		I	Manual Override 24
24	25	7	I	Manual Override 25
25	26		I	Manual Override 26
26	27		I	Manual Override 27
27	28		I	Manual Override 28
28	29	8	I	Manual Override 29
29	30		I	Manual Override 30
30	31		I	Manual Override 31
31	32		I	Manual Override 32

Note: The first four jumper positions are for the card address and are numbered 1 - 4 on the card.

7.10 Remote Card 8 - Manual Override 33 - 64

Jumper Config.: xxxoxxoo Location: Card Address: 28

Channel	Terminal	Module	In/Out	Description
0	1	1	I	Manual Override 33
1	2		I	Manual Override 34
2	3		I	Manual Override 35
3	4		I	Manual Override 36
4	5	2	I	Manual Override 37
5	6		I	Manual Override 38
6	7		I	Manual Override 39
7	8		I	Manual Override 40
8	9	3	I	Manual Override 41
9	10		I	Manual Override 42
10	11		I	Manual Override 43
11	12		I	Manual Override 44
12	13	4	I	Manual Override 45
13	14		I	Manual Override 46
14	15		I	Manual Override 47
15	16		I	Manual Override 48
16	17	5	I	Manual Override 49
17	18		I	Manual Override 50
18	19		I	Manual Override 51
19	20		I	Manual Override 52
20	21	6	I	Manual Override 53
21	22		I	Manual Override 54
22	23		I	Manual Override 55
23	24		I	Manual Override 56
24	25	7	I	Manual Override 57
25	26		I	Manual Override 58
26	27		I	Manual Override 59
27	28		I	Manual Override 60
28	29	8	I	Manual Override 61
29	30		I	Manual Override 62
30	31		I	Manual Override 63
31	32		I	Manual Override 64

Note: The first four jumper positions are for the card address and are numbered 1 - 4 on the card.

7.11 Remote Card 9 - Manual Override 65 - 96

Jumper Config.: oooxxxoo Location: Card Address: 32

Channel	Terminal	Module	In/Out	Description
0	1	1	I	Manual Override 65
1	2		I	Manual Override 66
2	3		I	Manual Override 67
3	4		I	Manual Override 68
4	5	2	I	Manual Override 69
5	6		I	Manual Override 70
6	7		I	Manual Override 71
7	8		I	Manual Override 72
8	9	3	I	Manual Override 73
9	10		I	Manual Override 74
10	11		I	Manual Override 75
11	12		I	Manual Override 76
12	13	4	I	Manual Override 77
13	14		I	Manual Override 78
14	15		I	Manual Override 79
15	16		I	Manual Override 80
16	17	5	I	Manual Override 81
17	18		I	Manual Override 82
18	19		I	Manual Override 83
19	20		I	Manual Override 84
20	21	6	I	Manual Override 85
21	22		I	Manual Override 86
22	23		I	Manual Override 87
23	24		I	Manual Override 88
24	25	7	I	Manual Override 89
25	26		I	Manual Override 90
26	27		I	Manual Override 91
27	28		I	Manual Override 92
28	29	8	I	Manual Override 93
29	30		I	Manual Override 94
30	31		I	Manual Override 95
31	32		I	Manual Override 96

Note: The first four jumper positions are for the card address and are numbered 1 - 4 on the card.

7.12 Remote Card 10 - Kicker Photocell 1 - 32

Jumper Config.: xooxxxoo Location: Card Address: 36

Channel	Terminal	Module	In/Out	Description
0	1	1	I	Kicker Photocell 1
1	2		I	Kicker Photocell 2
2	3		I	Kicker Photocell 3
3	4		I	Kicker Photocell 4
4	5	2	I	Kicker Photocell 5
5	6		I	Kicker Photocell 6
6	7		I	Kicker Photocell 7
7	8		I	Kicker Photocell 8
8	9	3	I	Kicker Photocell 9
9	10		I	Kicker Photocell 10
10	11		I	Kicker Photocell 11
11	12		I	Kicker Photocell 12
12	13	4	I	Kicker Photocell 13
13	14		I	Kicker Photocell 14
14	15		I	Kicker Photocell 15
15	16		I	Kicker Photocell 16
16	17	5	I	Kicker Photocell 17
17	18		I	Kicker Photocell 18
18	19		I	Kicker Photocell 19
19	20		I	Kicker Photocell 20
20	21	6	I	Kicker Photocell 21
21	22		I	Kicker Photocell 22
22	23		I	Kicker Photocell 23
23	24		I	Kicker Photocell 24
24	25	7	I	Kicker Photocell 25
25	26		I	Kicker Photocell 26
26	27		I	Kicker Photocell 27
27	28		I	Kicker Photocell 28
28	29	8	I	Kicker Photocell 29
29	30		I	Kicker Photocell 30
30	31		I	Kicker Photocell 31
31	32		I	Kicker Photocell 32

Note: The first four jumper positions are for the card address and are numbered 1 - 4 on the card.

7.13 Remote Card 11 - Kicker Photocell 33 - 64

Jumper Config.: oxoxxxoo Location: Card Address: 40

Channel	Terminal	Module	In/Out	Description
0	1	1	I	Kicker Photocell 33
1	2		I	Kicker Photocell 34
2	3		I	Kicker Photocell 35
3	4		I	Kicker Photocell 36
4	5	2	I	Kicker Photocell 37
5	6		I	Kicker Photocell 38
6	7		I	Kicker Photocell 39
7	8		I	Kicker Photocell 40
8	9	3	I	Kicker Photocell 41
9	10		I	Kicker Photocell 42
10	11		I	Kicker Photocell 43
11	12		I	Kicker Photocell 44
12	13	4	I	Kicker Photocell 45
13	14		I	Kicker Photocell 46
14	15		I	Kicker Photocell 47
15	16		I	Kicker Photocell 48
16	17	5	I	Kicker Photocell 49
17	18		I	Kicker Photocell 50
18	19		I	Kicker Photocell 51
19	20		I	Kicker Photocell 52
20	21	6	I	Kicker Photocell 53
21	22		I	Kicker Photocell 54
22	23		I	Kicker Photocell 55
23	24		I	Kicker Photocell 56
24	25	7	I	Kicker Photocell 57
25	26		I	Kicker Photocell 58
26	27		I	Kicker Photocell 59
27	28		I	Kicker Photocell 60
28	29	8	I	Kicker Photocell 61
29	30		I	Kicker Photocell 62
30	31		I	Kicker Photocell 63
31	32		I	Kicker Photocell 64

Note: The first four jumper positions are for the card address and are numbered 1 - 4 on the card.

7.14 Remote Card 12 - Kicker Photocell 65 - 96

Jumper Config.: ooxxxxoo Location: Card Address: 44

Channel	Terminal	Module	In/Out	Description
0	1	1	I	Kicker Photocell 65
1	2		I	Kicker Photocell 66
2	3		I	Kicker Photocell 67
3	4		I	Kicker Photocell 68
4	5	2	I	Kicker Photocell 69
5	6		I	Kicker Photocell 70
6	7		I	Kicker Photocell 71
7	8		I	Kicker Photocell 72
8	9	3	I	Kicker Photocell 73
9	10		I	Kicker Photocell 74
10	11		I	Kicker Photocell 75
11	12		I	Kicker Photocell 76
12	13	4	I	Kicker Photocell 77
13	14		I	Kicker Photocell 78
14	15		I	Kicker Photocell 79
15	16		I	Kicker Photocell 80
16	17	5	I	Kicker Photocell 81
17	18		I	Kicker Photocell 82
18	19		I	Kicker Photocell 83
19	20		I	Kicker Photocell 84
20	21	6	I	Kicker Photocell 85
21	22		I	Kicker Photocell 86
22	23		I	Kicker Photocell 87
23	24		I	Kicker Photocell 88
24	25	7	I	Kicker Photocell 89
25	26		I	Kicker Photocell 90
26	27		I	Kicker Photocell 91
27	28		I	Kicker Photocell 92
28	29	8	I	Kicker Photocell 93
29	30		I	Kicker Photocell 94
30	31		I	Kicker Photocell 95
31	32		I	Kicker Photocell 96

Note: The first four jumper positions are for the card address and are numbered 1 - 4 on the card.

7.15 Remote Card 13 - Deck Full 1 - 32

Jumper Config.: xxoxxxoo Location: Card Address: 48

Channel	Terminal	Module	In/Out	Description
0	1	1	I	Deck Full 1
1	2		I	Deck Full 2
2	3		I	Deck Full 3
3	4		I	Deck Full 4
4	5	2	I	Deck Full 5
5	6		I	Deck Full 6
6	7		I	Deck Full 7
7	8		I	Deck Full 8
8	9	3	I	Deck Full 9
9	10		I	Deck Full 10
10	11		I	Deck Full 11
11	12		I	Deck Full 12
12	13	4	I	Deck Full 13
13	14		I	Deck Full 14
14	15		I	Deck Full 15
15	16		I	Deck Full 16
16	17	5	I	Deck Full 17
17	18		I	Deck Full 18
18	19		I	Deck Full 19
19	20		I	Deck Full 20
20	21	6	I	Deck Full 21
21	22		I	Deck Full 22
22	23		I	Deck Full 23
23	24		I	Deck Full 24
24	25	7	I	Deck Full 25
25	26		I	Deck Full 26
26	27		I	Deck Full 27
27	28		I	Deck Full 28
28	29	8	I	Deck Full 29
29	30		I	Deck Full 30
30	31		I	Deck Full 31
31	32		I	Deck Full 32

Note: The first four jumper positions are for the card address and are numbered 1 - 4 on the card.

7.16 Remote Card 14 - Deck Full 33 - 64

Jumper Config.: xoxxxxoo Location: Card Address: 52

Channel	Terminal	Module	In/Out	Description
0	1	1	I	Deck Full 33
1	2		I	Deck Full 34
2	3		I	Deck Full 35
3	4		I	Deck Full 36
4	5	2	I	Deck Full 37
5	6		I	Deck Full 38
6	7		I	Deck Full 39
7	8		I	Deck Full 40
8	9	3	I	Deck Full 41
9	10		I	Deck Full 42
10	11		I	Deck Full 43
11	12		I	Deck Full 44
12	13	4	I	Deck Full 45
13	14		I	Deck Full 46
14	15		I	Deck Full 47
15	16		I	Deck Full 48
16	17	5	I	Deck Full 49
17	18		I	Deck Full 50
18	19		I	Deck Full 51
19	20		I	Deck Full 52
20	21	6	I	Deck Full 53
21	22		I	Deck Full 54
22	23		I	Deck Full 55
23	24		I	Deck Full 56
24	25	7	I	Deck Full 57
25	26		I	Deck Full 58
26	27		I	Deck Full 59
27	28		I	Deck Full 60
28	29	8	I	Deck Full 61
29	30		I	Deck Full 62
30	31		I	Deck Full 63
31	32		I	Deck Full 64

Note: The first four jumper positions are for the card address and are numbered 1 - 4 on the card.

7.17 Remote Card 15 - Deck Full 65 - 96

Jumper Config.: oxxxxxoo Location: Card Address: 56

Channel	Terminal	Module	In/Out	Description
0	1	1	I	Deck Full 65
1	2		I	Deck Full 66
2	3		I	Deck Full 67
3	4		I	Deck Full 68
4	5	2	I	Deck Full 69
5	6		I	Deck Full 70
6	7		I	Deck Full 71
7	8		I	Deck Full 72
8	9	3	I	Deck Full 73
9	10		I	Deck Full 74
10	11		I	Deck Full 75
11	12		I	Deck Full 76
12	13	4	I	Deck Full 77
13	14		I	Deck Full 78
14	15		I	Deck Full 79
15	16		I	Deck Full 80
16	17	5	I	Deck Full 81
17	18		I	Deck Full 82
18	19		I	Deck Full 83
19	20		I	Deck Full 84
20	21	6	I	Deck Full 85
21	22		I	Deck Full 86
22	23		I	Deck Full 87
23	24		I	Deck Full 88
24	25	7	I	Deck Full 89
25	26		I	Deck Full 90
26	27		I	Deck Full 91
27	28		I	Deck Full 92
28	29	8	I	Deck Full 93
29	30		I	Deck Full 94
30	31		I	Deck Full 95
31	32		I	Deck Full 96

Note: The first four jumper positions are for the card address and are numbered 1 - 4 on the card.

7.18 Remote Card 16 - Grades 1 - 16

Jumper Config.: xxxxxxoo Location: Card Address: 60

Channel	Terminal	Module	In/Out	Description
0	1	1	I	Grade 1
1	2		I	Grade 2
2	3		I	Grade 3
3	4		I	Grade 4
4	5	2	I	Grade 5
5	6		I	Grade 6
6	7		I	Grade 7
7	8		I	Grade 8
8	9	3	I	Grade 9
9	10		I	Grade 10
10	11		I	Grade 11
11	12		I	Grade 12
12	13	4	I	Grade 13
13	14		I	Grade 14
14	15		I	Grade 15
15	16		I	Grade 16
16	17	5		Reserved
17	18			Reserved
18	19			Reserved
19	20			Reserved
20	21	6		Reserved
21	22			Reserved
22	23			Reserved
23	24			Reserved
24	25	7		Reserved
25	26			Reserved
26	27			Reserved
27	28			Reserved
28	29	8		Reserved
29	30			Reserved
30	31			Reserved
31	32			Reserved

Note: The first four jumper positions are for the card address and are numbered 1 - 4 on the card.

8 SPECIFICATION SUMMARY

Maximum Number of Diameters:	32
Maximum Number of Lengths:	32
Maximum Number of Tapers:	16
Maximum Number of Grades:	16
Maximum Number of Bins:	96
Reject Bin:	Yes
Multiple Sort Tables:	Yes
Automatic Sort Table Verification	Yes
Automatic Bin Seeking:	Yes
Extensive Diagnostics:	Yes
Factory Tested Software:	Yes
Automatic Deck Advance:	Optional
Production Display:	Optional
MIS Compatibility:	Optional