

APPENDIX E - SPECIFICATION FOR Remstar TCP IP CAROUSEL ROTATION PROGRAM

Communication Protocol

TCP/IP Connection

The PC will be the Server Listener. The customer's application will be the Client. Customer and DTCS must agree on configurable port numbers.

Host to PC Command Set

i All commands begin with \$ and end with <CR>

Send Carousel Command

\$Cccbb<CR>

Where:

C	indicates carousel command
cc	carousel number
bb	bin number

When a carousel command is received, a command is immediately sent to the carousel controller to position the target carousel to the target bin.

Light Tree Command

\$Tccnnzzaaaaaa<CR>

Where:

T	indicates light tree command
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cc	carousel number <div style="border: 1px solid yellow; padding: 5px; background-color: #ffffcc;">⚠ If the carousel number is 99, this implies a clear all displays command, NOT turn on display for carousel 99.</div>
nn	display address, this corresponds to shelf level. An address of 00 means clear all displays
zz	cell designation
aaaaaa	characters to be displayed (MUST be 6 characters long) Need to pass all characters.

If the VLI have left and right indicators they will illuminate. The side will depend on values set in the carousel configuration table.

The zz cell designation is sent to the VLI 2 character displays marked as **Reference**.

TIC Command

```
$Iccdddccqqqqqaaaa...<CR>
```

Where:

I	indicates light tree command
cc	carousel or shuttle number
ddd	dot position of first dot of the left arrow surrounding cell value
cc	cell designation
aaaa...	characters to be displayed (MAX 150 characters long)

Sort Bar Command

```
$T00nnaaaaaa<CR>
```

Where:

T	indicates light tree command
00	fixed, indicates carousel number 00
nn	display address, this corresponds to batch light position. An address of 00 means clear all displays
aaaaaa	characters to be displayed (MUST be 6 characters long) Need to pass all characters. <div data-bbox="867 506 1442 779" style="border: 1px solid #4a86e8; padding: 10px; margin-top: 10px;"> <p>i If you are transmitting a number, left zero pad the number. The Remstar BLI convert the leading zeros into blanks. If you left blank pad, the Remstar BLI converts the blanks into astericks.</p> </div>

Clear Light Tree Display

```
$Uccnn<CR>
```

Where:

U	indicates clear light tree command
cc	carousel number
nn	display address, this corresponds to batch light position. An address of 00 means clear all displays

Combined Light Tree and Sort Bar Message

```
$Scnzzaaaaa00mmbbbb<CR>
```

Where:

-  1. A clear command is send to all light trees and sort bars just before processing this command.
- 2. You may repeat the sort bar command portion up to 16 times.

S	indicates combines light tree and sort bar command
cc	carousel number
nn	display address, this corresponds to shelf level.
zz	ell designation
aaaaaa	<p>characters to be displayed (MUST be 6 characters long) Need to pass all characters.</p> <div style="border: 1px solid #4F81BD; padding: 10px; margin: 10px 0;"> <p>i If you are transmitting a number, left zero pad the number. The Remstar BLI convert the leading zeros into blanks. If you left blank pad, the Remstar BLI converts the blanks into astericks.</p> </div>
00	fixed for sort bar
mm	sort bar display address
bbbbbb	<p>characters to be displayed (MUST be 6 characters long) Need to pass all characters.</p> <div style="border: 1px solid #4F81BD; padding: 10px; margin: 10px 0;"> <p>i If you are transmitting a number, left zero pad the number. The Remstar BLI convert the leading zeros into blanks. If you left blank pad, the Remstar BLI converts the blanks into astericks.</p> </div>

Clear TIC Display

\$Icc<CR>

Where:

U	indicates clear light tree command
cc	carousel or shuttle number

Clear Sort Bar Display

\$U00nn<CR>

Where:

U	indicates clear light tree command
00	fixed, indicates carousel number 00
nn	display address, this corresponds to batch light position. An address of 00 means clear all displays

Query Command

\$Qcc<CR>

Where:

Q	indicates carousel command
cc	carousel number

When a query command is received, a carousel response is generated and sent back to the host.

Daemon Exit Command

The host may send a quit command which causes the Daemon to exit.

\$X<CR>

Application Exit Command

The host may send an exit command which causes the Carousel TCP/IP application to exit.

\$Z<CR>

PC to Host Command Set

i All responses begin with \$ and end with <CR>

Button Pressed on Light Tree

When a Remstar BLI or VLI display is sent a message, the task complete monitor of the display is enabled. The Daemon will continuously poll the BLI and VHI until clear messages are sent to the display or the operator presses task complete on each and every display. As the operator press each enter button, a message is sent back to the host.

```
$Bccnn<CR><LF>
```

Where:

B	indicates light tree button pressed
cc	carousel number
nn	button number

i Remstar in about 2002 removed the circuitry on the VLI that allows the connection of task complete switch. The TCPIP software now only reads task complete messages from the BLI. In 2008 Remstar has created an add-on board that brings back the task complete functionality. To fake out the TCPIP program create a carousel 0 record (sort bar entry) with the light tree type of BLI. Even though you may not have a BLI in your system, with this config record, the TCPIP program will look for the task complete messages from the VLI. Remember to set the value of the task complete logical for each light tree to YES.

CAROUSEL IN POSITION RESPONSE (Status)

```
$Sccbbs<CR><LF>
```

Where:

S	indicates carousel status
cc	carousel number
bb	bin number
s	status value (Y = success, F = Fail)

When the carousel has completed the last positioning command, a status message is sent immediately to the host

computer.

Magic Logical

Logical Name	Purpose
DEADCOUNTER	set to a number, which the program will wait before restarting the daemon. Default is 10