SURVIVOR® SST2

Label Printer

Service Manual

RICE LAKE®
WEIGHING SYSTEMS
To be the best by every measure®

72439

Technical training seminars are available through Rice Lake Weighing Systems. Course descriptions and dates can be viewed at www.rlws.com or obtained by calling 715-234-9171 and asking for the training department.

June 2004

About This Manual

This manual is intended for use by technicians responsible for servicing the SURVIVOR® SST2 printer. Along with this manual, the Datamax® I Class™ Operator's Manual (RLWS PN 75098) accompanies the SST2 and covers operation, calibration, and in-depth maintenance of the printer. (The Datamax manual can also be viewed or downloaded at the RLWS distributor site at www.rlws.com.)

The following service procedures are intended to instruct you on how to:

- Understand features and specifications of the SST2.
- Perform general printer maintenance.

Warning *Some procedures described in this manual require work inside the printer enclosure. These procedures are to be performed by qualified service personnel only.*

Authorized distributors and their employees can view or download this manual from the Rice Lake Weighing Systems distributor site at www.rlws.com.

1.0 Introduction

The SURVIVOR® SST2 label printer is a high-performance, high speed industrial washdown direct thermal and optional thermal transfer label printer. Features include:

- Print speed of up to 8"-12" per second (203.2mm/sec.).
- Common bar codes are resident in SST2 memory and can be printed with or without adjacent human readable bar code interpretations.
- Character fonts can be printed in any one of four directions and with any one of nine different font sizes. In addition, a resident smooth font, called CG Triumvirate®, can be separately selected and contain 10 different font sizes. By using font multiplication, font size expands vertically and horizontally up to 24 times.
- A dot-history control circuit, called SEAQ™ (Sequential Energy Adjustment for Quality), enhances quality while printing at high speeds. This circuit monitors the printed data and automatically adjusts to provide maximum printhead performance. The 0.0049 inch print element prints high-density bar codes and characters at a 203 dpi resolution. In addition, the pixel size can be multiplied by 2 in the horizontal and 3 in the vertical direction, producing larger formats.
- Connects to most computers and controllers through either RS-232C or the Centronics® parallel interface.
- Optional memory cartridges of up to 4MB font and 4MB Flash provide storage for fonts, label formats and graphic images.
- Optional Ethernet for network communication.
- Software-selectable printhead temperature, print speed, slew rates and form dimensions provide the option of storing a wide variety of parameters, thus eliminating the need for manual adjustments. This is especially helpful when using several different types or brands of label stock, or when switching between direct thermal printing and thermal transfer printing.
- Configurable for "one up" printing mode. With the present sensor installed and enabled, the next label is not printed until the last label printed has been removed from the printer. Quantities of one-at-a-time can be selected.

2.0 General Maintenance

This section describes procedures for general maintenance and cleaning of the SST2.

2.1 General Cleaning

During normal operation, media debris may accumulate around the printer mechanism inside the printer (see Figure 3-3 on page 6). This debris should be removed regularly using a soft bristle brush and/or vacuum cleaner.

2.2 Cleaning the Printhead

Foreign particles can collect on the printhead (see Figure 3-2 on page 5), causing characters or bar codes to appear light or faded. This type of problem is evidenced by a continuous light streak which appears in the same physical position on each printed line. This condition should only appear after extensive printer operation or if poor quality paper has been used. It is recommended that Rice Lake Weighing Systems-supplied labels are used to obtain continuous high quality printing.

Recommended printhead cleaning intervals:

- Due to abrasion and foreign particle deposits, direct thermal printheads should be cleaned every 50,000 linear inches (12700m).
- Thermal transfer printheads should be cleaned at least every 250,000 linear inches.

Printhead cleaning procedure:

1. Turn off and unplug printer from outlet.
2. Open cover. Unlock and raise printhead.
3. Gently wipe underside of printhead burn-line area using a cotton swab moistened (not soaked) with isopropyl alcohol. Allow to dry.
4. Lower and lock printhead.
5. Close cover. Plug in and turn on printer.

2.3 Cleaning the Platen Roller

Use the following steps to clean the platen roller of the SST2.

1. Turn off and unplug printer from outlet.
2. Open the cover. Unlock and raise the printhead assembly.
3. Use a clean cotton swab or a lint-free cloth dampened with isopropyl alcohol to wipe off all debris from the platen roller. Manually rotate the roller to clean the entire surface. Allow to dry.
4. Lower the printhead assembly and lock into position.
5. Close the cover. Plug in and turn on the printer.

3.0 Parts Replacement

The following sections outline part replacement guidelines and procedures, and list replacement parts for the SURVIVOR® SST2 printer.

3.1 Printhead

The SST2 uses a thin film printhead that dissipates heat faster than thick film, providing a longer head life. Printhead warranty is 500,000 linear inches with an expected life (using thermal transfer printing) of 2,000,000 linear inches.

3.2 Mean Time to Repair (MTTR)

Estimated MTTR the printer is less than 15 minutes. A number of factors contribute to the ease of service. Primarily, all electronics including the power supply are located on a single plug-in circuit board. Most electronic problems can be isolated and repaired with a simple board swap.

The printhead is also designed for easy replacement. One mounting screw and two locator pins eliminate the mechanical head adjustments required of other thermal label printers.

3.3 Printhead Replacement

Removal:

1. Turn the printer off and unplug from the outlet. Open the media cover.
2. Loosen the printhead mounting screw. Carefully unlatch the printhead assembly and disconnect the two cables from the printhead.

Replacement:

1. Reconnect the printhead cables.
2. Position the printhead on the printhead assembly and tighten the printhead mounting screw.

⚠ Caution *Be sure to ground yourself to the chassis before you remove or install the printhead. This prevents a static discharge from your body through the printhead to the ground.*

3.4 Replacement Parts List

Part Number	Description
53930	1.5" media hub assembly
53934	Flanged .375 ID x .875 OD bearing
53951	Standard cutter cable assembly
72238	Motor control cable assembly
72198	PH data cable assembly
72190	PH power cable assembly
72176	Front panel flex cable
72177	Media sensor flex cable
72237	P/S power cable
53933	Cap-Cam
53931	Media clutch assembly
53929	Ribbon clutch assembly
34911	E-ring 3/8 Truarc 5133-37
53935	24 pitch 48 teeth gear spur Delrin
53936	Gear spur Delrin, 24 teeth
53952	2 x 20 character LCD module
53955	Main board, SST2 12 ips
53940	Media sensor assembly
53928	Media take-up assembly
53909	Peel mechanism
53943	Peel/present sensor assembly
53924	Platen assembly
53923	Post idler
53942	Present sensor assembly
53939	Printhead 203 dpi dual connector
53926	Ribbon spool assembly
67797	Cover ribbon spool
53954	RS 485/RS 422, IC Trnsver, 14 pin dip
53938	Torsion spring
53941	Stepper motor assembly
53927	Ribbon supply assembly
53925	Take-up hub assembly
53937	Timing belt
72054	SST2 overlay
72053	Cover plate
74705	Base gasket
74706	Coverplate gasket
74810	Shroud gasket
80756	Main board, SST2 8 ips

Table 3-1. SURVIVOR® SST2 Replacement Parts List

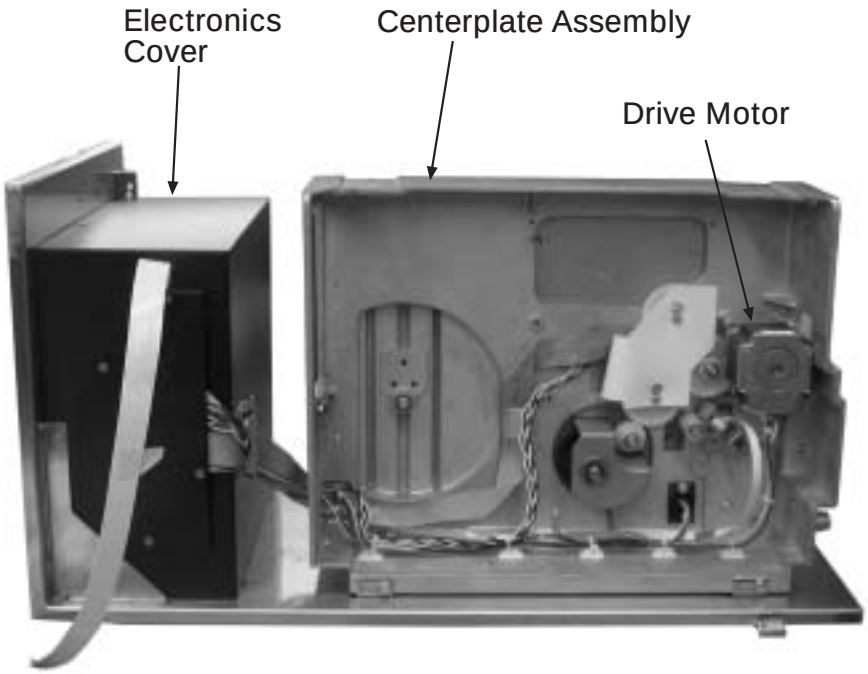


Figure 3-1. SST2 Side View

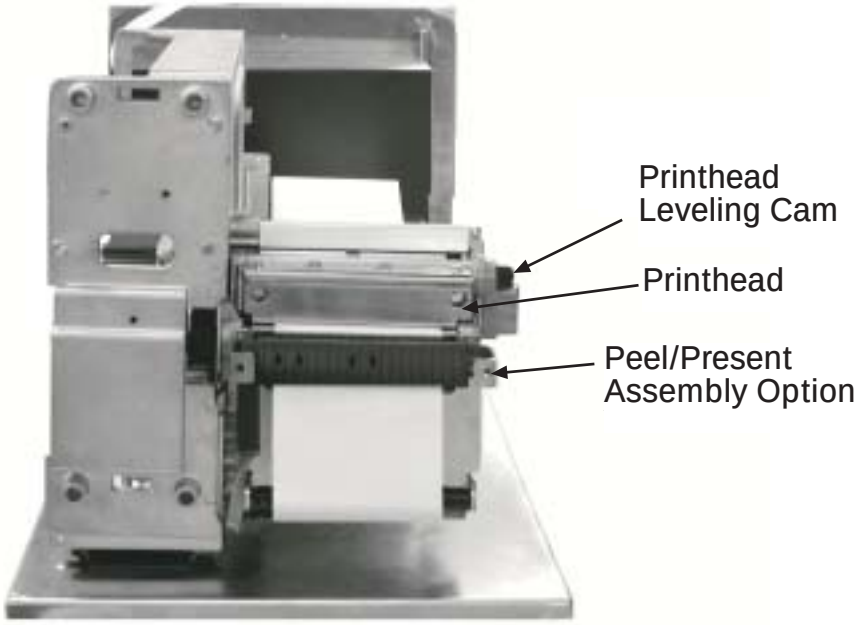


Figure 3-2. SST2 Front View

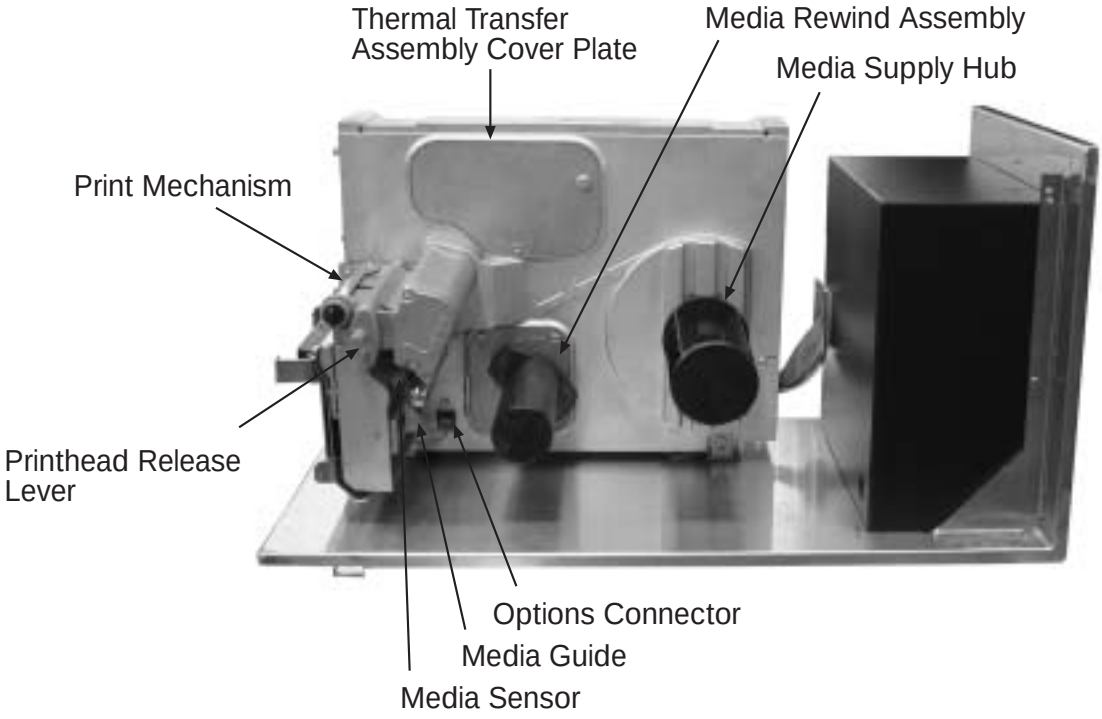


Figure 3-3. SST Side View

4.0 Communications

Using a data detection process, the interface selection occurs automatically in the printer. At power-up, the printer begins monitoring the interface ports for activity. When the host transmits data, the printer port detecting this data is set active and remains active as long as data flow continues. Once the incoming (received) data flow stops and the host timeout value is exceeded, the detection process is repeated. Should the data flow stop before a complete label format is received, the format is ignored and must be sent to the printer again.

NOTE: To change an active port immediately, cycle the printer power off and on.

4.1 Parallel Port

The parallel interface has two menu-selectable modes of operation: uni-directional or bi-directional. The uni-directional mode supports forward channel only communication and requires Centronics® cable with a 36-pin male connector.

The bi-directional mode supports forward and reverse channel IEEE 1284 Compliant communications. Data can be returned to the host in this mode provided it has compliant hardware, supporting software and is connected to the printer via an IEEE 1284 Compliant cable with a Centronics 36 pin male connector.

4.2 NIC (Network Interface Card) Adapter

The optional NIC adapter has several menu-selectable modes (see Datamax® Manual, PN 75098). The following LED indicators on the NIC adapter provide operational information:

- *LINK*: A green *LINK* LED indicates a good physical connection to the network.
- *ACT*: The *ACT* LED (activity) flashes green or red when the server is ready for use; green indicates activity for this IP address while red indicates collisions on the network.
- *100*: A green *100* LED indicates a 100 BASE-T (100 MB) network connection.

The following buttons are accessible from the back of the printer:

- TEST: Causes an NIC configuration label to print.
- ETHERNET RESET: Resets the NIC adapter.

NOTE: Following initialization, the printer indicates READY. However, the NIC adapter is not ready to receive data until its boot-up process is completed. Depending upon the NIC adapter configuration, this process may take up to two minutes to complete.

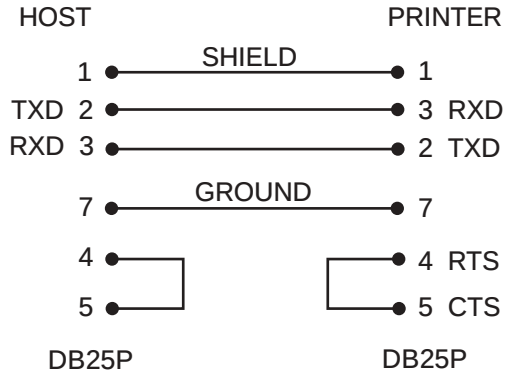
4.3 Serial Port

The serial interface supports RS-232C and, if equipped, RS-422 communications. The following list of serial port settings is menu-selectable and must match the host computer's serial port settings.

- Baud rate (serial communication speed)
- Word length
- Word parity
- Number of stop bits
- Handshaking protocol

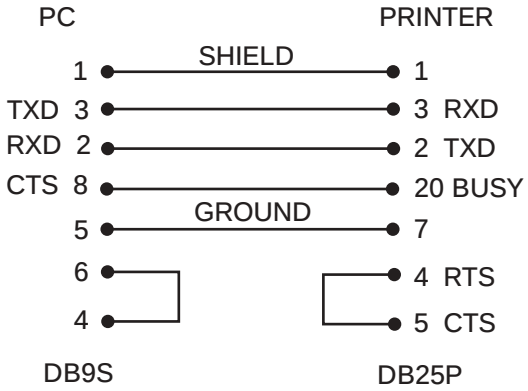
In addition to the port settings, the serial interface cable wiring must have specific connections (pin-outs) for proper data exchange between the host and printer. The different serial cable pin-outs and suggested applications are shown in Figure 4-1 on page 8.

Null Modem (MXM)



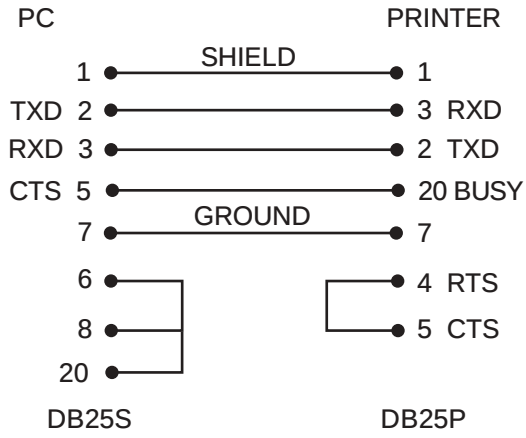
For connection to other DCE equipment. Flow control is only Xon/Xoff.

PC (DB9P) to Printer



For connection to a PC compatible with DB9P communication ports. Flow control can be either Xon/Xoff or CTS/DTR.

PC (DB25P) to Printer



For connection to a PC compatible with DB25 communication ports. Flow control can be either Xon/Xoff or CTS/DTR.

RS-422 Connection

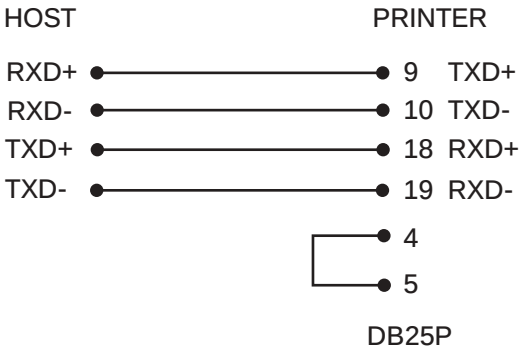


Figure 4-1. Serial Interface Cable Pin-outs

4.4 Communicating to RLWS Indicators

To communicate from an RLWS indicator directly to the SST2, a change to the standard RS-232 output is required. The indicator must have Smart Serial™ communication or a custom serial format developed.

NOTE: The following sections do not apply to the IQ plus® 310A indicator as it does not feature Smart Serial communication or custom serial format.

4.4.1 Serial String

To develop the correct serial string, you first need to understand the Datamax® Programming Language (DPL) serial string. For every piece of information printed, the print format record must consist of the following three pieces of information:

- A header that is fifteen characters long. The header specifies which font is used and where the data is printed.
- Data to print.
- Termination character (such as a carriage return).

Header

A typical DPL serial string header consists of the following pieces of information:

Data	Definition	Description
STX	Start of text	Must have start of text at beginning of character stream
L	Label	Designation of label
1–4	Character rotation	Rotation of characters
_	Font	Font choice
_	Horizontal rotation	Horizontal (width) muliplier
_	Vertical rotation	Vertical (height) multiplier
000	Bar code	Dependant on type of bar code selected • If printing graphics, lines, boxes, and human-readable fonts 0 through 8, these three characters are ignored, but they still must be sent to the printer as 000. • For human-readable font 9, these three characters must be a number from 001 to 010 to select a font size for the CG triumvirate smooth font. Other selections are available if downloading from RAM, flash memory modules, ROM font modules. • For bar code fonts, these three characters represent a bar code height number. Numbers ranging from 001 (or 0.01 inch) to 999 (or 9.99 inches).
1250	Row address	Four characters are the vertical offset in hundredths of an inch
0200	Column	Four characters are the horizontal offset in hundredths of an inch

Table 4-1. Serial String Header

Data String, Carriage Return and Execute Command

After the header, a data string and a carriage return are needed for each item to be printed.

Data	Definition	Description
TEXT	Printed information (data string)	Data to be printed (limited by range of printhead). Data string is terminated by a carriage return
CR	Carriage return	Carriage return terminates data string
E	Execute	At end of label data information, execute signals the end of the label to the printer

Table 4-2. Data String, Carriage Return and Execute Command

4.4.2 Configuring Label Format in an RLWS Indicator

Use the following steps to configure label format in an RLWS indicator:

1. Determine the operation mode in which you are printing. This step is important to make sure the correct format is stored in gross, net or other format modes available in the indicator.
2. Create the format.

4.4.3 Gross Weight Label Format Example

The following is a format string example for a gross weight label configured in an RLWS indicator.

2	76	60	78	76	62	49	51	49	49	48	48	48	48	49	48	48	48	48	53	48	60	71	62	60	78	76	62	69
STX	L	<	N	L	>	1	3	1	1	0	0	0	0	1	0	0	0	0	5	0	<	G	>	<	N	L	>	E

← Key In

← Data Stream

Figure 4-2. Simple Gross Weight Data Stream/ASCII Example

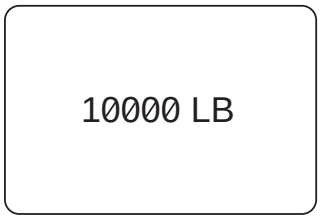


Figure 4-3. Simple Gross Weight Label Example

5.0 Specifications

Printing

Type	Direct thermal or optional thermal transfer
Print Speed	2" – 12" per second (51mm – 304mm) 2" – 8" per second, SST2 in .5" programmable increments
Resolution	203 dpi (8 dots/mm)
Minimum Dot Size	0.005" (0.127mm) square
Optional Dot Sizes	0.010" (0.254mm); 0.015" (0.381mm) vertical, 0.010" (0.254mm) horizontal
Resident Fonts	Ten alphanumeric fonts from 0.035" H – 0.64" H (0.89mm – 16.26mm) including OCR-A, OCR-B (size and character set III), and a CG Triumvirate scalable font
Character Display	33.83 cpi FONT 0 at 1X, .70 cpi FONT 6 at 8X
Bar Codes	Code 39, UPC-A, UPC-E, Interleaved 2 of 5, Code 128, EAN-8, EAN-13, HIBC, Cadabar, Plessey, UPC 2 and 5 digit addendums, Code 93, Postnet, UCC/EAN Code 128, Telepen, UPS MaxiCode, FIM, PDF417, USD-8, Datamatrix, QR Code, Aztex, TLC 39, Micro PDF417, RSS

Media

Width	1.0" – 4.65" (25.4mm – 118mm)
Length	0.25" – 99" (6.35mm – 2514.6mm) at 100 dots per inch
Thickness	0.0025" – .010" (0.0635mm – 0.254mm)
Type	Roll-fed, die-cut labels, tags, tickets, continuous forms with blackstripe sensing
Supply Roll Capacity	8" (203mm) maximum outside diameter on standard 1 or 3" (25.4 or 76mm) core. 6250" lineal stock, 0.0065" thick
Capacity in Rewind Mode	5" (127mm) maximum outside diameter on internal rewind spindle 1.5" core (38mm). 2100" lineal stock, 0.0065" thick
Label Material	Thermal transfer plain-coated papers, vinyl, Mylar, metalized paper, non-woven fabric, fine woven fabric, thermal-visible light-scannable paper, infrared scannable paper, thermal ticket/tag stock, thermally sensitive plastic stock
Thermal Transfer Ribbon	Black or colored inks; 360 meters long, 4.6 microns, backcoated, ±10% label width. 1968 feet (600 meters) max

Switches

Switches	CANCEL, PAUSE, and FEED. Variable Head Temperature Control

Communications Interfacing

Parallel and IEEE RS-232C	2400, 4800, 9600, 19.2K, 28,800, or 38.4K baud
Character Set	ANSI ASCII character set.
Word Length	Selectable 7 or 8 bit data format
Handshaking	XON/XOFF (on receive mode only) and CTS/DTR
Input Buffer	Approximately 7000 bytes; XOFF is transmitted and DTR goes low when 60 bytes are available in the buffer. XON is transmitted and DTR goes high when 1000 bytes are left in the buffer

Characters transmitted with no parity from the printer

Electrical

Input Voltage	90 - 264 VAC, 47 -63 Hz

Note: The socket outlet should be installed near the equipment and be easily accessible

Circuit Protection	At 115V = 1.5A Slo Blo
Grounding	Unit must be connected to a properly grounded receptacle
Power Consumption	90 watts (standby - 10 watts)
UL Listed	Type 4X for indoor use only

Memory Modules

Internal Memory Module	FONT/FLASH modules
PCB without fonts	4 MB addressable

Font Modules

Font Modules	Eight available
Range of Fonts	ILPC, Kanji Simplified Chinese and I/O Expansion Board

Environmental

Operating Temperature	40°F – 95°F (4°C – 35°C)
Humidity	10% – 95% non-condensing
Ventilation	Free air movement
Dust	Nonconducting, non-corrosive
Electromagnetic Radiation	Moderate RF fields can be tolerated

Mechanical

Size	13.75" H x 14.125" W x 25.25" D (349.3mm H x 358.8mm W x 641.4mm D)
Weight	Approximately 63 lb (28.6 kg)

SURVIVOR® SST2 Limited Warranty

Rice Lake Weighing Systems (RLWS) warrants that all RLWS equipment and systems properly installed by a Distributor or Original Equipment Manufacturer (OEM) will operate per written specifications as confirmed by the Distributor/OEM and accepted by RLWS. All systems and components are warranted against defects in materials and workmanship for one year.

RLWS warrants that the equipment sold hereunder will conform to the current written specifications authorized by RLWS. RLWS warrants the equipment against faulty workmanship and defective materials. If any equipment fails to conform to these warranties, RLWS will, at its option, repair or replace such goods returned within the warranty period subject to the following conditions:

- Upon discovery by Buyer of such nonconformity, RLWS will be given prompt written notice with a detailed explanation of the alleged deficiencies.
- Individual electronic components returned to RLWS for warranty purposes must be packaged to prevent electrostatic discharge (ESD) damage in shipment. Packaging requirements are listed in a publication, *Protecting Your Components From Static Damage in Shipment*, available from RLWS Equipment Return Department.
- Examination of such equipment by RLWS confirms that the nonconformity actually exists, and was not caused by accident, misuse, neglect, alteration, improper installation, improper repair or improper testing; RLWS shall be the sole judge of all alleged non-conformities.
- Such equipment has not been modified, altered, or changed by any person other than RLWS or its duly authorized repair agents.
- RLWS will have a reasonable time to repair or replace the defective equipment. Buyer is responsible for shipping charges both ways.
- In no event will RLWS be responsible for travel time or on-location repairs, including assembly or disassembly of equipment, nor will RLWS be liable for the cost of any repairs made by others.

THESE WARRANTIES EXCLUDE ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING WITHOUT LIMITATION WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. NEITHER RLWS NOR DISTRIBUTOR WILL, IN ANY EVENT, BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES.

RLWS AND BUYER AGREE THAT RLWS'S SOLE AND EXCLUSIVE LIABILITY HEREUNDER IS LIMITED TO REPAIR OR REPLACEMENT OF SUCH GOODS. IN ACCEPTING THIS WARRANTY, THE BUYER WAIVES ANY AND ALL OTHER CLAIMS TO WARRANTY.

SHOULD THE SELLER BE OTHER THAN RLWS, THE BUYER AGREES TO LOOK ONLY TO THE SELLER FOR WARRANTY CLAIMS.

NO TERMS, CONDITIONS, UNDERSTANDING, OR AGREEMENTS PURPORTING TO MODIFY THE TERMS OF THIS WARRANTY SHALL HAVE ANY LEGAL EFFECT UNLESS MADE IN WRITING AND SIGNED BY A CORPORATE OFFICER OF RLWS AND THE BUYER.

RICE LAKE WEIGHING SYSTEMS • 230 WEST COLEMAN STREET • RICE LAKE, WISCONSIN 54868 • USA