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General System Description

Functional Summary

Amistar's DataPlace Model 100LP automated labeling system is a three-axis, pick & place machine that performs programmable placement of labels onto a wide variety of products. Virtually any product that can be reliably conveyed using SMEMA-compatible or custom configured conveyors can be labeled using this system. Suitable applications include product types that can be transported via carriers or trays. While the base model labeling system is configured specifically for SMEMA compatible conveyor applications, machine options and custom configurations are available that allow the system to be used for labeling product types that are outside the scope of traditional electronics assembly processes. The system can be used to service both inline and offline labeling activities. This document describes the labeling system as it relates to SMEMA compatible conveyor applications but specifications and theory of operations are applicable to any labeling environment serviced by the system.

Label Handling

Labels can be placed at any location on products as large as 18" x 20". Labels may be placed at any orientation at each location (from 0° to 360° in 0.1° increments). The system can be used to apply print-on-demand, preprinted labels, or a combination of the two. Labels are presented to either of the two nozzles on the head assembly using a thermal transfer printer and a patented shuttle mechanism. Printers use labels supplied in rolls. To accommodate labeling with more than one label size, or to minimize time dedicated to changeovers, two print-and-deliver stations can be installed. Print-and-deliver stations are mounted on sliding trays for easy access during label and ribbon changes. For systems configured with two print-and-deliver stations, label and ribbon replacement can occur during machine operation.

Cycle rates up to 3,600 labels per hour (1 label/sec) are accomplished using either or both of the two placement nozzles mounted on the head assembly of the XY gantry. A wide range of label materials (paper, polyester, polyimide, etc.) and sizes are supported. Label placement is achieved using an intermediate shuttle mechanism that transfers a label from the printer to a predetermined pickup point where the label is presented to the nozzle. Nozzles use a vacuum to pick up labels. Theta-axis rotation for each nozzle is servo-controlled and programmable from 0° to 360° in 0.1° increments. Each nozzle has an independent Z-axis stroke. Nozzle vacuum sensing is used to verify that a label has been successfully picked and placed. Two CCD-based linear barcode scanners are mounted on the gantry (one at 0° and the other at 90°) to allow verification that barcode labels have been successfully printed and applied. Optional 2D code imaging systems can be used to image Data Matrix and PDF-417 codes and other 2D symbologies. The linear barcode scanners and the 2D code imaging systems can optionally be used for data collection functions. Vision system options are also available for more demanding applications.

Product Transport

PCBs are transported into the work (placement) area using a SMEMA-compliant conveyor system and machine interface. The conveyor system can employ board buffering to reduce the time required to transport PCBs into the placement area. When a PCB reaches the labelling position, it is raised slightly off the conveyor belt and top-registered against the conveyor rails. The conveyor continues to advance the next PCB into the machine where it stops in the buffer zone. Side clamps register the product to be labeled against the fixed conveyor rail and stop mechanism. Next, the label placement program is executed. Once labeling is complete, the PCB is unclamped, lowered and transported out of the work area, under SMEMA interface control, to the next assembly machine. After the labeled product exits, the buffered product is transported into the placement area and the process repeats.

Computers & Connectivity

A dedicated computer running Windows™ provides machine and label data control. Network connectivity is a standard feature and is supported via an Ethernet connection (RJ-45) using TCP/IP as the preferred communications protocol. Any communications protocol supported by Windows™ can be used. Machine operation and programming is accomplished using simple, intuitive, online software. Label formatting, label placement programming, machine configuration and calibration, diagnostics, production, and MIS-related functions are performed using a single software application. Label layouts may contain text, graphic, and barcode fields. Text and barcode fields may contain static or changing (serialized) elements. An individual serialized text or barcode field may be subdivided into a maximum of six subfields; each containing changing alphanumeric. Of those six subfields, four may contain interrelated, changing alphanumeric elements. Once a placement program is defined, it may be stored for later use. The stored placement program contains job specific information that includes label layouts, label positions and orientations, and the corresponding machine configuration. Online help is easily accessible and is available through a context-sensitive interface.

Software Options

Optional software is available for users requiring a high degree of control over their labeling processes. The Remote Programming Management software allows the user to perform remote programming functions and exchange labeling program and label layout data with installed DataPlace systems via LAN or WAN from a remotely located computer. The Master Library Management software allows network access to a centralized database of placement programs and label layouts to which DataPlace systems may compare their locally held programs and label layouts. The Automatic Backup Utility allows the user to schedule automatic backups of DataPlace database information containing placement programs, label layouts, and other machine performance data. The Automatic Alternate option allows a multiple print-and-deliver station user to designate an alternate printer that would automatically be used to print labels if the DataPlace control system detects system errors that suggest the primary printer is out of label stock. Custom Factory Integration software can be developed for users that need to manage system communications with other networked computers and software applications, external sources of changing label data, or virtually any other software function not provided for within the standard software suite.

XY Gantry & Head Characteristics

Gantry and Head Assembly

Number of Placement Nozzles	2
Label Placement Repeatability	±0.015" (0.381mm)
Label θ Repeatability	±2.0°
X-Axis Drive	DC Brushless Servo Motor / ±0.0007" (0.018mm) Resolution
Y-Axis Drive	DC Brushless Servo Motor / ±0.0003" (0.008mm) Resolution
Z-Axis Drive	Air Pot Actuated
θ -Axis Drive	DC Brushless Servo Motor / ±0.017° Resolution
Label Pickup Method	Vacuum Nozzle
Pickup Detection	Vacuum Sensing
Z-Stroke Placement Pressure	< 1lb. Placement Force (constant force stroke independent of placement Z height)

Label Placement Rates

Machine Configuration	Placement Rate ¹	Comments
1 Printer ² / No Verification ³ / No Vision System ⁴	Up to 3,600 pph (1.0 sec / label)	Excludes Board Transport Time ⁵
1 Printer ² / With Verification ⁶ / No Vision System ⁴	Up to 2,400 pph (1.5 sec / label)	Excludes Board Transport Time ⁵

Note 1 - Placement rates are application specific and will be affected by PCB size, label location, label content, barcode scanning, and vision system processing.

Note 2 - Up to 2 print-and-deliver stations may be installed on the machine. Using 2 printers does not increase placement rates. Multiple printers provide increased flexibility and fewer changeovers due to the ability to use multiple label sizes or to load more than one printer with the same size labels. Note also that processor-intensive label content can affect throughput.

Note 3 - In this mode the machine does not verify (scan or image) barcode labels.

Note 4 - Using the vision system for fiducial-based board registration or label centering will decrease throughput due to the additional processing required.

Note 5 - The time to transport a PCB into and out of the work area is not included in placement rate specifications.

Note 6 - In this mode the machine verifies (scans or images) barcode labels immediately after each label is placed.

Scanning, Imaging, Vision, & Sensing Systems

Linear Scanning

Scanner Function (std)	Linear barcode labels can be scanned after placement to confirm legibility and data content.
Scanner Function (opt)	Scanners can also be optionally configured to function in a data collection role. Scanners may be programmed to move to an XY location known to contain barcode symbology. Scanned information can be stored locally and/or forwarded to another computer via a LAN or WAN. Additional software integration may be required to facilitate data transmission to remotely located computers.
Scanner Type	Opticon Model NFT7175 CCD scanner for scanning linear barcode symbologies.
Scanner Mounting	Two gantry-mounted scanners fixed at 0° and 90°.
Scannable Barcode Symbologies ¹	Code 128 / Code 39 / Code 93 / EAN-13 / EAN-8 / IATA / Industrial 2 of 5 / JAN / Interleaved 2 of 5 / MSI / NW-7 / UPC-A / UPC-E
Minimum Barcode Resolution ²	5 mil (0.127 mm) Minimum Line Width

Note 1 - The Zebra printer, Labelview software, and 2D imaging systems do not support the same symbology set as the linear barcode scanners. Linear barcode symbologies common to all devices and software within the DataPlace system include Code 39, Code 93, Code 128, and Interleaved 2 of 5.

Note 2 - When using the optional Opticon Model E1022 CCD scanner, the minimum barcode resolution is 3 mil (0.076) minimum line width.

High Density 2D Imaging (optional)

Imager Function (std)	High density, 2D and linear barcode labels can be scanned after placement to confirm legibility and data content.
Imager Function (opt)	The imaging system can also be optionally configured to function in a data collection role. Laser-etched or ball peen marked components, parts, and PCBs may also be scanned for data collection purposes. The imaging system may be programmed to move to an XY location known to contain 2D or linear barcode symbology. Imaged information can be stored locally and/or forwarded to another computer via a LAN or WAN. Additional software integration may be required to facilitate data transmission to remotely located computers.
Scanner Type	RVSI MX-700 controller and MVi-23v camera for imaging high density Data Matrix (2D code) and linear barcode symbologies.
Scanner Mounting	Gantry-Mounted
Scannable Barcode Symbologies ¹	Code 128 / Code 39 / Code 93 / Data Matrix / EAN and UPC with 2 or 5 digit supplements / EAN-13 / EAN-8 / Interleaved 2 of 5 / Pharmacode / Postnet / BC412 / UPC-A / UPC-E
Minimum Barcode Resolution	Data Matrix - 31 mil (0.076mm) Minimum Cell Size Linear Barcodes - 3 mil (0.076 mm) Minimum Line Width

Note 1 - The Zebra printer, Labelview software, and linear barcode scanners do not support the same symbology set as the 2D imaging system. Linear barcode symbologies common to all devices and software within the DataPlace system include Code 39, Code 93, Code 128, and Interleaved 2 of 5. 2D code symbologies common to the 2D imaging system, Zebra printer, and Labelview software include the Data Matrix code format.

Medium Density 2D Imaging (optional)

Imager Function (std)	Medium-density, 2D and linear barcode labels can be scanned after placement to confirm legibility and data content.
Imager Function (opt)	The imaging system can also be optionally configured to function in a data collection role. Laser-etched or ball peen marked components, parts, and PCBs may also be scanned for data collection purposes. The imaging system may be programmed to move to an XY location known to contain 2D or linear barcode symbology. Imaged information can be stored locally and/or forwarded to another computer via a LAN or WAN. Additional software integration may be required to facilitate data transmission to remotely located computers.
Scanner Type	HHP IT4710HD for imaging medium density 2D and linear symbologies.
Scanner Mounting	Gantry-Mounted
Scannable Barcode Symbologies ¹	Codabar / Interleaved 2 of 5 / Code 128 / Code 39 / Code 93 / Data Matrix / PDF-417 / SuperCode / UPC-EAN
Minimum Barcode Resolution	Data Matrix - 6.6 mil (0.10mm) Minimum Cell Size Linear Barcodes - 4 mil (0.05mm) Minimum Line Width

Note 1 - The Zebra printer, LabelView software, and linear barcode scanners do not support the same symbology set as the 2D imaging system. Linear barcode symbologies common to all devices and software within the DataPlace system include Code 39, Code 93, Code 128, and Interleaved 2 of 5. 2D code symbologies common to the 2D imaging system, Zebra printer, and Labelview software include the Data Matrix code format.

Vision System (optional)

Camera Functions	Fiducial-based PCB registration and label centering.
Camera Type	High-Resolution CCD, application specific
Camera Mounting	Gantry-Mounted / Downward-Looking
Field of View (X,Y)	2.2 x 1.2" (55.88 x 30.48mm)
CCD Resolution	Application specific

Mark Sensor (optional)

Sensor Functions	Optical beam sensor that detects the presence or absence of marks at predetermined locations on PCBs. Marks are associated with rejected panels within an assembly. The presence or absence of a mark would indicate that a board within a panel should not be labeled.
Beam Spot Size	0.04" (1.02mm)
Minimum Mark Size	0.10" (2.54mm)
Acceptable Mark Types ¹	Adhesive Labels / Silk-Screened Dots or Squares / Drilled Holes / Copper Pads

Note 1 - A white circular dot is the preferred mark type.

Board Handling**Board Specifications**

Maximum Board Size (X,Y) ¹	18.0 x 20.0" (457.2 x 508.0mm)
Minimum Board Size (X,Y)	2.0 x 2.0" (50.8 x 50.8mm)
Maximum Board Thickness	0.20" (5.08mm)
Minimum Board Thickness	0.02" (0.508mm)
Maximum Placement Area ^{2,4}	18.0 x 20.0" (457.2 x 508.0mm)
Above Board Clearance (min) ³	0.5" (12.7mm)
Below Board Clearance (min)	1.0" (25.4mm)

Note 1 - Conveyor board buffering is possible when using board lengths equal to or less than 12" (304.8mm).

Note 2 - Labels may not be placed closer than 3.0mm relative to the PCB edge (due to conveyor edge-belt clearance requirements).

Note 3 - An optional 2-stage head assembly can be used to increase above board clearance. See the "Optional Items - Miscellaneous Options" section for details.

Note 4 - With optional 2D Scanner, or optional Fiducial Camera, maximum placement area of Head 2 becomes 17" x 20".

Conveyor Specifications

Conveyor Type	SMEMA-compliant, antistatic, edge-belt conveyor with board buffering.
Conveyor Height	35.43±0.79" (900±20mm)
SMEMA Spacer Blocks	50mm spacers raise conveyor height to 950±20mm (37.40±0.79") for SMEMA compliance.
Conveyor Width Adjust	Manual adjust by crank (std) or automatic via software controlled auto-width adjust (opt).
Special Conveyor Modes	Bypass Mode – allows transfer of boards through machine without labeling.
Conveyor Electrical Interface	Compliant with SMEMA Interface Standard 1.2.
Positioning	Three-edge registration using board stop and side clamping against fixed rail. Conforms to SMEMA Interface Standard 1.2 edge clearance requirement of 0.118" (3.0mm).
Positioning Time	4 sec / per Board (typical)
Transfer Direction	Left to Right (std) or Right to Left (opt)
Transfer Rate	10"/sec (254mm/sec)
Supports	Under board support with moveable, compliant-tip, magnetic base support pins. Support pins usable throughout entire placement area.
Buffering	Conveyor board buffering is possible for board lengths equal to or less than 12" (304.8mm).

Printers & Label Media

Printers

Printer Function	Print-on-demand label printing or preprinted label dispensing.
Printer Type	Thermal Transfer
Printer Brand	Zebra (modified by Amistar)
Printer Resolution	600dpi
Printer Mounting	Machine front-mounted on sliding tdrawers.
Machine Printer Capacity	Up to 2 Print-and-Deliver Stations (standard configuration is 1 print-and-deliver station)
Printable Symbolologies ¹	CODABLOCK / Code 128 (incl. subsets A, B, & C and UCC Case Codes) / Codabar / Code 39 / Code 49 / Code 93 / Data Matrix / EAN and UPC with 2 or 5 digit supplements / EAN-13 / EAN-8 / Industrial 2 of 5 / Interleaved 2 of 5 / ISBT 128 / LOGMARS / MaxiCode / Micro PDF / Code 11 / MSI / PDF-417 / Plessey / Postnet / QR Code / UPC-A / UPC-E
Media Replacement	With a multiple print-and-deliver station configuration, label and ribbons are replaceable during machine operations using each station's standard sliding tray.

Note 1 - The linear barcode scanners, 2D barcode imaging systems, and Labelview software do not support the same symbology set as the Zebra printer. Linear symbolologies common to all devices and software within the DataPlace system include Code 39, Code 93, Code 128, and Interleaved 2 of 5. 2D symbolologies common to the 2D imaging systems, Zebra printer, and Labelview software include Data Matrix.

Label Media/Standard Specification

Minimum Label Width	0.20" (5.08mm) ¹
Maximum Label Length	2.00" (50.80mm) ¹
Smallest Label (W x L)	0.20 x 0.25" (5.08 x 6.35mm) ¹
Largest Label (W x L)	1.00 x 2.00" (25.40 x 50.80mm) ¹
Minimum Liner Width	0.79" (20mm)
Maximum Liner Width	3.54" (90mm)
Inter-Label Spacing	0.079" (2mm) to 0.157" (4mm)
Maximum Roll Diameter	8.0" (203.2mm) O.D. on a 3.0" (76.2mm) I.D. Core
Label Materials	Standard materials include paper, polyester, and Kapton (polyimide).
Label Quality Standards	For optimum system performance, label media should comply with Amistar's "Label Interface and Manufacturing Requirements" specification document (SD 141846-821) and Zebra Technologies Corporation's printer media specifications.

Note 1 - Label sizes matching the stated specification are within the basic capabilities of the base model DataPlace 100LP. Labels outside of the specification (either smaller or larger) can be used but may require custom nozzles and/or additional custom engineering development.

Custom Examples

Example 1	Label 7.0" x 0.250"
Example 2	Label 1.00" x .280", 2 mil thickness
Example 3	Insulation material; power supply "brick" to PCB
Example 4	Kapton "dots"/masking
Example 5	Components in JEDEC "matrix" trays
Example 6	Biotech; label "protein circuits"

Machine Control & Interface

Programming

Placement Programming Method	Placement programs created via manual data input (online or offline) using Amistar's CIMStar graphical user interface. CIMStar is a Windows-based application. Programming occurs within a single application. Label layouts are created using third-party software (Teklynx Labelview) integrated with the programming interface.
CAD Data Import	XY and θ label positioning values can be imported using CAD data.
Label Content	Labels may contain an unlimited number of text, graphics, and barcode fields (note that graphic and barcode content may increase print times and impact machine throughput).
Label Serialization	Text and barcode fields may contain static or changing (serialized) elements. An individual serialized text or barcode field may be subdivided into a maximum of six subfields; each containing changing alphanumerics. Of those six subfields, four may contain interrelated, changing alphanumeric elements.
Labelview Symbolologies ¹	PDF-417 / MaxiCode / Codabar / Code 39 / Code 39 mod 43 / Code 93 / Code 128 (incl. subsets) / EAN-8 (incl. +2 and +5) / EAN-13 (incl. +2 and +5) / EAN-128 / Interleaved 2 of 5 / Interleaved 2 of 5 mod 10 / Plessey / Postnet / UPC-A / UPC-E
Data Input Method	Tray-mounted mini-keyboard with trackball.
XY Axes Data Input Increment	0.001" (0.025mm) Increments
θ -Axis Data Input Increment	0° to 360° in 0.1° Increments
Program Storage Capacity	4000 labels per program with no limit to the number of programs stored on disk.
Online Help / User Support	Context-Sensitive Help and Online User Manual

Note 1 - The linear barcode scanner, 2D code imager, and Zebra printer do not support the same symbology set as the Labelview software. Linear barcode symbologies common to all devices and software within the DataPlace system include Code 39, Code 93, Code 128, UPC-A, UPC-E, EAN-8, EAN-13, and Interleaved 2 of 5. 2D symbologies common to the 2D imager, Zebra printer, and Labelview software include PDF-417, MaxiCode, and Data Matrix.

Computer / Networking

Computer Operating System	Windows
Computer Storage	Machine Face-Mounted Floppy Drive / Computer Internal Hard Drive / CD read/write drive
Computer Display	Machine Top-Mounted 15" Color Monitor (LCD)
Computer Input Devices	Mini-Keyboard with Trackball / Machine Control Switches
Network Standard	IEEE 802.3 (TCP/IP or any LAN protocol supported by Windows™ via Ethernet). Other communications protocols are supported optionally on a case-by-case basis.
Network Interface	RJ-45 Connector (10/100Base-T). Other network connections are supported optionally on a case-by-case basis.
Network Data Rate	Up to 100Mbps

Operator Protection

Emergency Stops	Located on the right front panel and left rear panel.
Cover Sensors	Tilt-up transparent covers with sensors interrupt operation when the covers are opened.

Fault Conditions

Failed Barcode Verification	Labels failing verification (scanning or imaging) are tracked by the machine control software. After the entire labeling program has been fully executed, the operator is prompted to either relabel those labels that failed verification or to eject the assembly. If the operator elects to relabel, identical labels are reprinted and automatically applied at the appropriate locations.
Mispicked Labels	Mispicked labels interrupt the placement program and require operator intervention. Once the source of the error is cleared, the remainder of the assembly can be labeled.
Error Notification / Alarm Devices	3-Color Light Tower (green / yellow / red) and Audible Alert / Software Interface Alerts
Light Tower Color Definitions	Green - Labeling program being executed. Normal machine operations. Yellow - Machine ready. Servos Enabled. No labeling program executing. Red - Machine error encountered. Operator intervention required.

Physical Specifications

Footprint / Dimensions (W x D x H)	48.00 x 61.89 x 60.70" (1219 x 1572 x 1542mm)
Weight (base model system)	1300 lbs (590 kg)
Crated Dimensions (W x D x H)	58 x 76 x 60" (1473 x 1930 x 1524mm)
Crated Weight (base model system)	1550 lbs (703 kg)
Air Requirements	Clean, dry air at 90 psi (0.62 Mpa)
Machine Color	Federal Standard No. 595B / Color No. 27925 (textured white)
Operating Temperature	59° to 95°F (15° to 35°C)
Operating Humidity	Non-Condensing
Power Requirements (std)	115 VAC ±10% / 50 or 60 Hz / 3.45 kVA / 40A
Power Requirements (alt)	230 VAC ±10% / 50 or 60 Hz / 3.45 kVA / 20A

Optional Items**Software Options**

Remote Programming Manager	Allows creation of placement programs and label layouts using a remotely located computer. Programs and labels created remotely can be moved to and from all DataPlace series machines via the standard network connection.
Master Library Manager	Provides access to a centralized database of placement programs and label layouts at a pre determined network location. Programs and labels are accessible by all DataPlace series machines and Remote Programming Manager computers via the standard network connection. Placement programs and label layouts are automatically compared to the specified master database library when the operator initiates production. If the machine's local program and/or local label layout(s) differ from the Master Library, the operator is notified and is required to choose to either use the locally stored program and label layout(s) or the master library's program and label layout(s).
Master Serial Number Management	Extends the functionality of the Master Library Management Software to strictly control serial numbers printed by the DataPlace machines that are connected on the user's network, and have both the Master Library and the Master Serial Number software installed. The Master Serial Number Management Software runs as a stand alone application in conjunction with the Master library Management Software. All data related to serial number creation are issued by the "Master" to the network enabled DataPlace machines in real time. The Master software strictly controls all serial numbers and all related data. The Master should not be installed in applications that require serial number data to be controlled or modified in any way by the local DataPlace machine.

Automatic Backup Utility	Schedules automatic backups of DataPlace database information containing placement programs, label layouts, and other perishable information. Backups are generated so that the next scheduled backup does not overwrite a previous backup. Archiving information in this manner provides the ability to selectively retrieve previously created program information if data in the primary database is lost.
Factory Integration Software	The labeling system may be optionally configured to connect to any network environment using any telecommunications protocol and to exchange information with any software system used for manufacturing management coordination (i.e. ERP, MRP, MES, or other software).

Imaging Options

2D Code Imaging System	High-density, 2D symbology and linear barcode labels can be imaged after placement to confirm legibility and data content. The imaging system can also be optionally configured to function in a data collection role. The imaging system may be programmed to move to an XY location known to contain 2D symbology. Imaged information can be stored locally and/or forwarded to another computer via a user's network. Additional software integration may be required to facilitate data transmission to remotely located computers.
Vision System	High-resolution CCD for fiducial-based PCB registration, label centering, and other more demanding vision requirements.

Printer Options

Print-and-Deliver Stations	Up to two stations may be installed. Standard configuration is one 600dpi print-and-deliver station. A print-and-deliver station includes the Zebra printer, sliding drawer, mounting hardware, shuttle assembly, and cabling.
Automatic Alternate	Allows a multiple print-and-deliver station user to designate an alternate printer that would automatically be used to print labels if the DataPlace control system detects system errors that suggest primary printer failure or malfunction. Errors would include any condition resulting in an offline indication from the printer, a media depletion condition (for both labels and ribbons), a loss of power to the printer, and label media misfeed conditions.

Conveyor Options

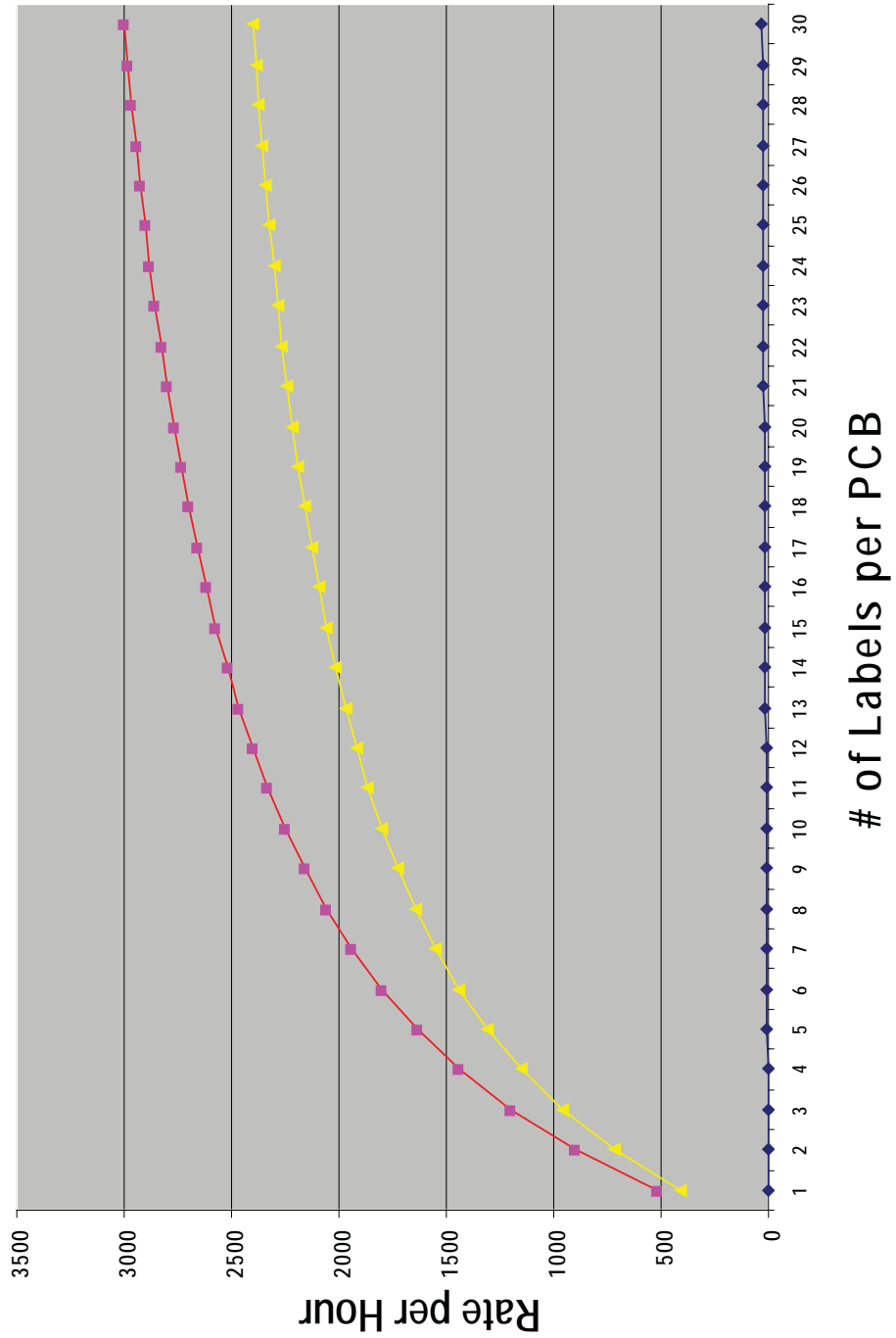
Conveyor Auto-Width Adjust	Servo-driven, software programmable conveyor width adjustment.
Wide Edge-Belt Conveyor	0.38" (9.65mm) wide, antistatic, edge-belt conveyor with board buffering. Used for transporting odd-shaped assemblies and objects. Fully SMEMA-compliant except for the width of the edge-belt.

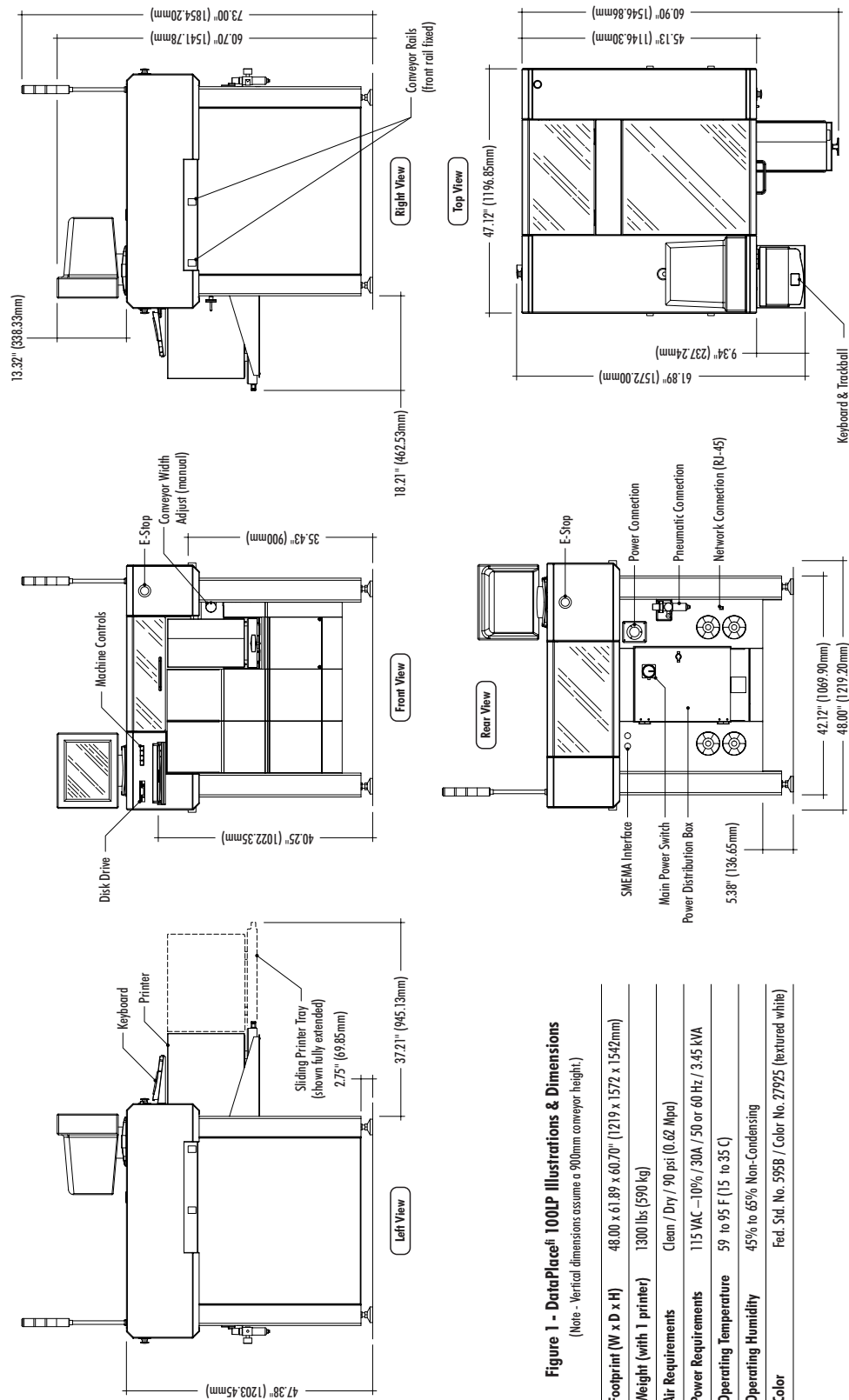
Miscellaneous Options

DataPlace VLM	The DataPlace VLM (Virtual Labeling Machine) is a label management station for manual (hand) labeling and repair functions. It provides a computer workstation with network interface and connections for up to four Zebra printers and up to four linear barcode scanners that provide a print verification function. Printers for the VLM are sold separately. The barcode scanner options are sold separately to read and verify only ONE linear barcode per label. The workstation for the DataPlace VLM can also run the Remote Programming Manager and the Master Library Manager Software.
Two-Stage Head Assembly	Increases above board clearance to 2.20" (55.88mm) to allow conveying and labeling assemblies that are too tall to be labeled with the standard head assembly (greater than 0.50" tall). A modest decrease in label placement rate will be experienced with respect to the standard head assembly. This is due to the addition of a second Z-stroke movement required to lower the standard head assembly during label placement.

Mark Sensor	An optical beam sensor that detects the presence or absence of marks at predetermined locations on PCBs. Marks are associated with rejected panels within an assembly. The presence or absence of a mark would indicate that a board within a panel should not be labeled. A variety of mark types can be used but a white circular dot is the preferred method.
Additional Applicator Nozzles	Standard or custom sizes as required by label media (4 nozzles included with base model).
Custom Machine Color	Painted to Customer Specification

DataPlace Production Rate





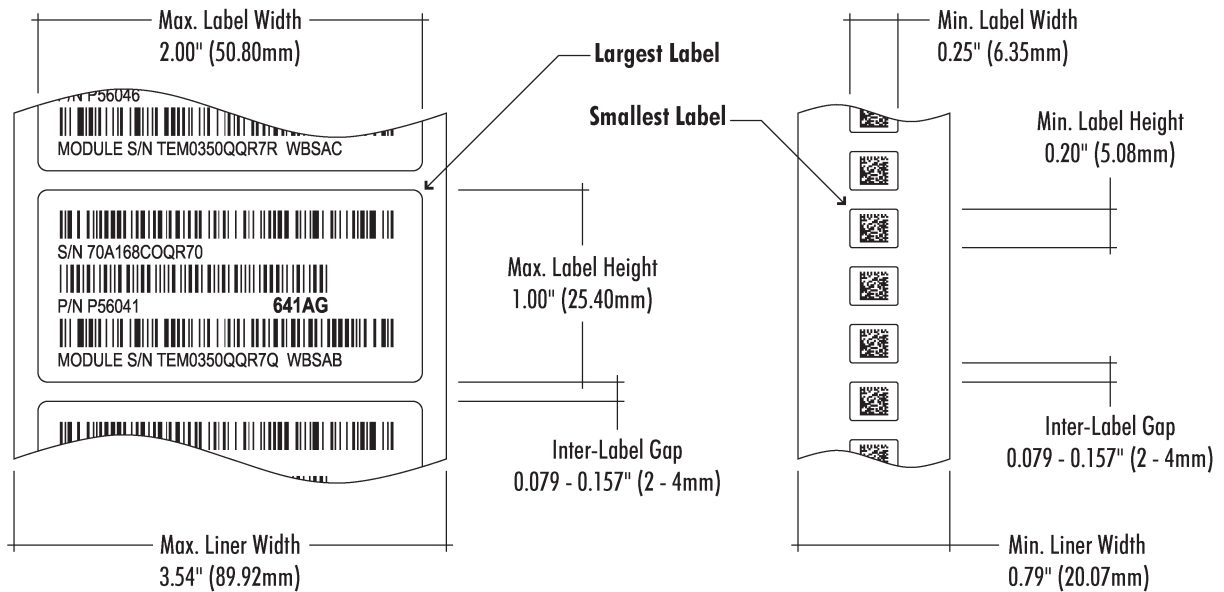


Figure 2 - DataPlace® Label Specifications
 (Note - Maximum media roll O.D. is 8.0" on a 3.0" I.D. core.)

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