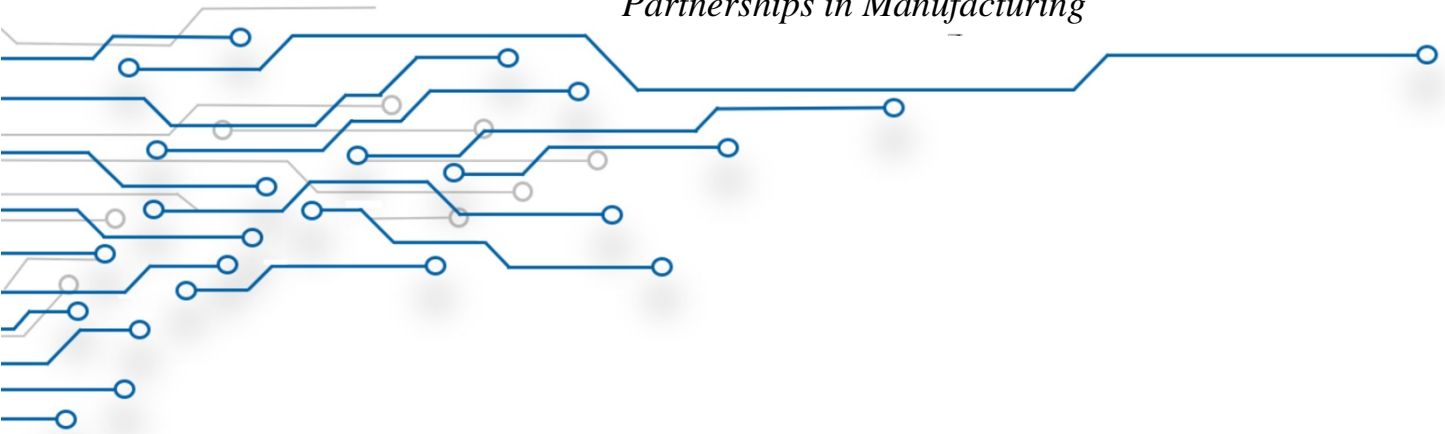




Solutions
Manufacturing, Inc.

“Partnerships in Manufacturing”



SMT PROGRAM DATA REQUIREMENTS

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SMT Program Data Requirements

This information sheet documents a general set of specifications and data requirements to facilitate the off-line programming of Surface Mount (SMT) assemblies being built by Solutions Manufacturing.

The specifications are not intended to be an exact requirement for data format, but merely as a guideline. The recommendations are designed to allow the pre-processing of CAD & ASCII data into a SMT program in machine-readable format.

Additional benefits that will be realized include:

- Quicker turn-around time for SMT jobs due to the ability to pre-process data rather than waiting for available machine time to program
- Significant time-saving in programming and data input
- Improved accuracy of data with less chance of error

DATA SPECIFICATIONS

1. BASIC DATA REQUIREMENTS

In order to provide data needed by the SMT programming software, the following is a minimum set of desired data and the preferred format.

a. Gerber Files

For Gerber data, the following are needed:

i. Solder Paste Master Layer(s)

This layer is needed for centroid extraction, and should show all surface mount component pads.

ii. Silk Screen Layer(s)

This layer is needed to match the component location designators with the Bill-of-Materials (BOM).

iii. Outer Circuit Layer(s)

This layer is needed to identify and target the Fiducial Alignments marks that orient the pick-and-place equipment to the circuit pattern.

iv. Panelize Information

If boards are in panel, step-up Gerber files are needed to generate SMT

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programs and to produce paste stencil in step-up form. If step-up Gerber files are not available, panel diagram showing step-up dimensions should be made available.

v. Aperture List

For the RS-274-D Gerber format, this is an ASCII file showing the Gerber D-Codes used to produce the other layers. Note that if the Gerber data is supplied in RS-274-X format, this data is included in the other layers.

vi. The through-hole drill file to help distinguish surface mount parts from through-hole parts for mixed technology boards.

b. ASCII CAD Data

ASCII CAD is a file extracted in ASCII format from the software used to design the PCB. This file is used to generate in-house process drawings and documentation. For more information, contact Solutions Manufacturing's Engineering Department.

c. Assembly Drawing

A copy of the assembly drawing showing component footprints and orientations should be provided. This is especially true if package data for components is not noted in the BOM. This can be provided in AutoCAD .DWG format or hard copy, if preferred.

d. Bill-of-Material (BOM)

In order to create pick-and-place programs, an ASCII file containing the Bill-of-Material data must also be supplied.

- i. Component Part Number
- ii. Component Description
- iii. Component Package (1206, QFP160, etc.)
- iv. Reference Designators

NOTE: These must match the reference designators used on the Silkscreen layer

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2. FILE FORMATS

a. BOM ASCII Files

Almost any delimited ASCII format can be handled. 'Comma-delimited ASCII' is one that can be easily accommodated. An example of this format is shown below. Note that it is especially preferable to isolate fields containing spaces in some way that is easy to identify.

"PART NUMBER", "DESCRIPTION", "REF DES"

Although ASCII is the preferred format due to less conversion required, we can also accommodate data in several spreadsheet and database formats including:

EXCEL, ACCESS, ODBC

b. Gerber Files

Gerber files can be accepted in either the RS-274-D or the newer RS-274-X formats. The differences between the 2 are noted under Aperture Lists (above). To avoid having to separate out Gerber layers, the complete set of Gerber files to produce a PCB can be sent. The needed layers can be extracted from these.

3. MEDIA FORMAT

Whenever possible, files should be compressed into a single archive volume using ZIP format to reduce data transmission time.

Data files should be emailed to [your account manager](#).

If desired, data files may be supplied on USB.

Please send questions to sales@solutionsmfg.com.