SPECIFICATION: Purchased Product Bar Coding

1.0 General Requirement:

L3-GCS requires identification plates, labels or direct part marking utilizing a linear barcode on all serialized product or Data Matrix on all serialized product.

2.0 Placement:

The barcode shall be placed in a location easily scanned, preferably at or near the current serial number.

3.0 Permanency and legibility:

Direct identification marking and identification plates, identification bands, identification tags, or identification labels used shall be as permanent as the normal life expectancy of the item and be capable of withstanding the environmental tests and cleaning procedures specified for the item to which it is affixed. The barcode shall consist of a field containing the entire serial number with no other characters or information.

4.0 Format:

The barcode shall utilize Code 39 or Data Matrix ECC200 and have a human readable field located directly above, below or adjacent to the barcode. The serial number shall be its own data field and not be co-mingled with any other product related data. i.e. model#, product features, operating voltages etc. that are not normally part of the serial number.

5.0 Linear bar code symbol description:

Linear bar code symbols shall be Code 39 symbols in accordance with ISO/IEC 16388. The ratio of the wide element to the narrow element shall be within the range of 2.1:1 to 3.1:1 for Code 39 symbols. The narrow element dimension (X dimension) range should be from 0.0075 inch (0.19 mm) to 0.015 inch (0.38 mm) for Code 39 symbols.

6.0 Linear bar code quality: For acceptance, the symbol shall have a minimum print quality of 3.0/05/660, where the minimum grade is 3.0, measured with an aperture size of 0.005 inch (0.127 mm) (for EAN/UPC symbol the aperture size used is 0.006 inch (0.152 mm) (3.0/06/660)) with a light source wavelength of 660 nm in accordance with ISO/IEC 15416. For imager based verifier devices, synthetic aperture shall be used. The methodology for measuring the print quality shall be as specified in ISO/IEC 15416. If the print quality measuring methodology as specified in ISO/IEC 15416 is non-responsive for other marking methods, quality acceptance levels shall be identified within the individual contract or order.

7.0 **Data Matrix symbol description:** The two-dimensional symbol shall be the Data Matrix ECC 200 in accordance with ISO/IEC 16022. Unless otherwise specified, the module size shall be no smaller than 0.0075 inch (0.19 mm) and no larger than 0.025 inch (0.635 mm). Square symbol sizes shall not exceed one inch (25.4 mm). The larger dimension of rectangular Data Matrix symbols, as permitted by ISO/IEC 16022, shall not exceed one inch. Deviations to the stated module sizes and maximum overall symbol size shall be specified by contract if required.

8.0 **Data Matrix quality:**

A. ISO/IEC 15415: The symbol shall have a minimum quality grade of 3.0/05/650 measured with an aperture size of 0.005 inch (0.127 mm) with a light source wavelength of 650 nm ± 20 nm. As an exception, the ISO/IEC 15415 parameters Modulation (MOD), Symbol Contrast (SC), or both, may measure as low as 2.0, providing the overall ISO/IEC 15415 grade would be 3.0 if the MOD and SC grades are 3.0 or higher. (This allows for lower contrast substrates, high density images, printing, over-laminates and other such limiting factors to the parameters MOD, SC, or both on otherwise well produced images.) Quality (symbol validation and verification) reports shall clearly show that the MOD, SC, or both, are the only parameters measured as low as 2.0, and clearly show that the overall grade would be at least 3.0 if MOD and SC were at least 3.0. Quality reports shall also document the synthetic aperture size used. The methodology for measuring the print quality shall be as specified in ISO/IEC 15415, where the overall grade is based on a single scan (not five scans).

B. AIM DPM-1-2006: The symbol shall have a minimum quality grade of DPM2.0/7.5-25/650/(45Q|30Q|90|30T|30S|D) where:

i. Minimum quality grade = 2.0
ii. X dimension range of the application = 7.5-25 mils
iii. Inspection wavelength = 650 nanometers ± 20 nanometers.
iv. Lighting conditions = Medium Angle Four Direction (45Q) or Low Angle Four Direction (30Q) or Diffuse Perpendicular (90) or Low Angle Two Direction (30T) or Low Angle One Direction (30S) or Diffuse Off-axis (D).

C. SAE AS9132: The symbol shall fulfill the visual inspection criteria of “Pass” as defined in AS9132.

D. Due to the absence of a nationally traceable standard to calibrate verification equipment, calibration processes and materials for reflectance criteria provided by the verifier manufacturer are acceptable.

E. For Data Matrix symbols applied to a curved surface, the overall symbol size shall not exceed more than 32% of the radius (16% of the diameter or 5% of the circumference) associated with the curvature of the surface.

F. If the preceding quality measuring methodologies specified are non-responsive, quality acceptance levels shall be identified within the individual contract or order.