

L-3 Communications Corporation
Link Simulation & Training Division
Purchase Order Supplement No. 3
Quality Assurance

Q10 QUALITY SYSTEM REQUIREMENTS

- Q10A ISO 9001:2008 – Seller’s quality system shall be in compliance with the requirements of ISO 9001, “Model for Quality Assurance in Design, Development, Production, Installation and Servicing.”
- Q10B AS9100:2009 – Seller’s quality system shall be compliant with the requirements of AS9100:2009, “Quality Management System – Requirements”
- Q10C Quality and Delivery Rating – Seller is responsible for correcting any negative trends in product Quality or Delivery that are identified by the Buyer’s Supplier Rating System. Seller must maintain a Quality Rating of at least 80 percent and a Delivery Rating of at least 85 percent in a month that there is activity. Seller’s who fail to maintain these levels of product and service performance will be requested to take the necessary actions needed to resolve the root causes. Seller is encouraged to conduct an internal assessment and implement actions deemed appropriate to prevent further degradation in performance and possible formal corrective action. Go to www.link.com for complete details on Link’s Supplier Rating System and the methods used to calculate Quality and Delivery Rating’s.
- Q10D. RESERVED
- Q10E Seller’s Documented Inspection System – Seller shall maintain a documented inspection system. Seller shall perform or have performed the inspections and tests required to substantiate product conformance to drawing, specification and purchase order requirements. Records of all inspections shall be maintained. Seller shall use calibrated equipment to assure that products conform to requirements. Seller shall maintain a positive system for identifying the inspection status of product. If the Seller’s system is found to be deficient by the Buyer, the Seller will be responsible for bringing the system into compliance as a condition of this purchase order.
- Q10F Calibration – Seller shall maintain a calibration system in compliance with the requirements of ANSI/NC SL Z540-1-1994, “Calibration Laboratories and Measuring and Test Equipment – General Requirements” or equivalent.
- Q10G SSOW – Seller shall comply with the Quality Assurance requirements specified in the Subcontractor Statement of Work (SSOW) or Task Description document for the product or service supplied on the purchase order.

Q20 INSPECTION AND IDENTIFICATION REQUIREMENTS

- Q20A Source Inspection at the Seller’s Facility – Buyer inspection/test is required prior to shipment from the Seller’s facility. Seller shall have performed all evaluations necessary to verify that the product being supplied meets the purchase order requirements prior to notifying the Buyer of readiness for source inspection. Seller shall notify Buyer a minimum of five (5) working days in advance of the date when the material will be ready for Buyer inspection/test. Seller shall withhold shipment pending necessary action by the Buyer’s Quality organization. Seller shall provide and supply all records, facilities, personnel and assistance for the Buyer’s Quality organization to perform the following: (1) Review of all records relating to items supplied on the purchase order, (2) Workmanship and dimensional evaluation of items supplied on the purchase order, (3) Witnessing of testing required on the purchase order.

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Final acceptance of all items furnished on this purchase order shall be at the Buyer's facility. Inspection at source by the Buyer or Buyer's Customer, including the Government, shall not constitute final acceptance, nor shall it relieve the Seller of the responsibility of furnishing acceptable products, documentation and/or services.

- Q20B First Article Inspection (FAI) – The first part fabricated shall be given a complete inspection (and test, if applicable) to verify that the Seller's manufacturing processes (and design, if applicable) yield a part that complies with Buyer specifications, drawings and purchase order. A Seller that passes FAI shall be approved for production. The FAI requirement shall not apply to subsequent purchase orders of the same part, providing there has been no change in the manufacturing processes, design (if applicable), materials, or there has been a lapse in production of no more than one year. Exceptions shall require Buyer approval. Similar to parts may also be exempt from FAI subject to Buyer review and approval.

The Seller in the presence of a Buyer Quality Assurance organization representative shall perform FAI. FAI shall be conducted at the Seller's facility, or at the Buyer's facility, if so required. Seller shall notify Buyer five (5) working days in advance of the date when part is ready for FAI. Seller shall prepare and complete an inspection check sheet listing every drawing or specification attribute, the actual measurement of each and the inspection media used. The check sheet shall include verification of functional characteristics. A copy of the completed inspection (and test) check sheet shall accompany the first article part when delivered. The first article part and its accompanying check sheet shall be so identified. Seller shall not ship any production parts until the first article part has been accepted by Buyer's Quality Assurance organization.

- Q20C Quality Records – Seller shall maintain procedures for identification, collection, indexing, filing, storage, and retention of quality records. Quality records include reports, test data, inspection records, and process data for all operations, special processes, inspections and tests performed by the Seller to document the quality of the Seller's deliverable product(s) or services. Quality records shall be legible and identifiable (all pages) to the product involved. Inspection and test data records shall include pass/fail criteria and a description of any non-conformances found. All quality records shall be retained for a minimum of 5 years. Records shall be safely stored to ensure recovery in the event of a nature catastrophe. These requirements equally apply to Seller sub-tier suppliers.

- Q20D Seller Provided Data– Seller shall furnish with each shipment a complete data package for all analyses, inspections, examinations, demonstrations and tests performed that substantiate the deliverable product is fully compliant with the requirements of the Purchase Order and referenced documentation (i.e. specifications, drawings, Buyer / Seller commercial standards, etc.) The data package shall include actual measurements taken of quantifiable requirements, or pass/fail indications of examinations/demonstrations that are non-quantitative in nature. The person performing the verification shall sign the data record. The drawing or specification governing the product may be annotated to show the measurements taken or inspections/examinations performed where a data sheet or test procedure is not a requirement of the Purchase Order.

- Q20E Certificate of Conformance – Each shipment must contain a Certificate of Conformance by the Seller confirming that all applicable drawings, specifications and purchase order requirements have been met. Seller's certificate shall warrant that components, parts, and material used in the product delivered are new and authentic and have been procured directly from the original

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component or equipment manufacturer (OCM/OEM), or through an OCM/OEM Franchised Distributor in accordance with New Materials Section 4, and Goods Warranty Provisions of L-3's General Terms and Conditions Section 16. No components, parts or material shall be procured from an Independent Distributor unless approved in writing by the Buyer. The Seller's certificate must include as a minimum the information contained in the example Certificate of Conformance provided in Attachment A of PO Supplement No. 3. It shall show the date of execution, the title of the authorized company representative and their signature. Sellers that do not have a prescribed certificate containing the above information shall submit the Certificate of Conformance provided in Attachment A of PO Supplement No. 3. Sellers of commercially available software that provide a license or original certificate of authenticity from the originator of the software are exempt from providing a Certificate of Conformance.

- Q20F Item Returned to Vendor for Rework or Repair – Seller is requested to include with the returned item results of any failure analysis they elect to perform to determine cause. Please Note: 1) When the returned item failure is documented on a Link Nonconformance Material Report that has been assigned by Link as the Seller's responsibility, that failure will negatively affect the Seller's quality approval rating. Seller failure analyses that identify the root cause of the failure was not caused by the Seller will have the responsibility re-assigned, thereby improving the Seller's quality rating. 2) Part revisions stated in the PO are for reference only, unless otherwise specified. 3) Any rework or repair of the returned item that would change the as-built/received configuration must be approved in advance by Link.
- Q20G Items Containing Software or Firmware – When software or firmware is contained in a hardware deliverable line item of the PO, it shall clearly be identified on the packing list and Certificate of Conformance, including its version or revision.
- Q20H Identification of Parts – In the absence of specific drawing, specification, or purchase order identification instructions, Seller shall individually identify materials, parts, or products furnished on this purchase order in accordance with Link Manufacturing Standard (LMS) 1-1. If the materials, parts, or products have no suitable or adequate marking surfaces, identification shall be by means of a tag or identification on the container.
1. Purchase order number
 2. Purchase order part number
 3. Quantity enclosed
- Q20I Failure Reports – Seller shall provide a failure report with each shipment. The report shall identify the cause of the failure, document the action taken to correct the problem and actual results of examinations and tests to verify that the failure was corrected. The report shall further include the signature of an authorized company representative.
- Q20J Government Furnished Equipment Repaired Parts – All parts removed as a result of rework/repair from the Government property supplied with this order must be returned to this facility. Seller does not have the authority to scrap or otherwise use such parts. Seller shall place an identifying tag on each removed part and identify it with the purchase order number. This requirement is considered void if the item is exchanged instead of reworked/repared.
- Q20K Buyer-Furnished Material – Seller shall inspect, upon receipt, all materials or parts furnished to Seller on this purchase order. Inspection, as a minimum, shall include quantity, damage, corrosion, deterioration and compliance to any applicable purchase order requirements. Seller

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shall provide written notification to Buyer through the Buyer's Procurement Organization of any discrepancies pending written disposition by the Buyer's Quality Organization.

- Q20L Inspection Results for Items with Key Characteristics – Seller shall furnish with each shipment a report of all measurements made during product acceptance. As a minimum, the report shall include actual recorded dimensional readings for all key characteristics specified on the drawing.
- Q20M Functional Test or Fit Check as part of Receiving Inspection (For internal use by LINK® only) – The functional performance or fit of this item shall be verified prior to final receiving inspection acceptance. After verification of the item's acceptability for marking, documentation, mechanical and dimensional conformance, and any other characteristic that can be verified by incoming inspection, the item shall be submitted to test or program engineering for functional performance or fit evaluation.
- Q20N Quality Engineer Notification (For internal use by LINK® only) – Inspector shall notify the cognizant program Quality Engineer via e-mail when product has completed Receiving Inspection.

Q30 WORKMANSHIP REQUIREMENTS

Q30A RESERVED

- Q30B Electronic Workmanship - Seller shall implement and maintain IPC-A-610 Class 3 compliant processes, or equivalent, and the following requirements, if not otherwise specified in the drawing, parts list, specification, etc.:
- a. If crimped connections are necessary, they shall comply with LMS 11-9.
 - b. If cables are necessary, they shall comply with LMS 11-6 for the assembly and identification of them.
 - c. Non-adhesive based products shall be used to mechanically fasten cable lays (bundles). Cable routing shall be neat and orderly.
 - d. Strain relief and chafing shields shall be provided for finished cable lays and associated discreet wiring at all bends and termination points.
 - e. Continuous cables greater than 20 inches in length, which terminate in other than RJ-45 connectors shall be mechanically fastened at 8-inch minimum to 10-inch maximum intervals.
 - f. All cable assemblies, conduits, and harness assemblies shall be packaged to prevent deformation of conductor insulation and damage to connectors and connector pins. Particular attention shall be given to routing of cables so that they do not block the natural air flow.
 - g. Where part number and quantity are specified, no substitutions shall be made without written approval.
 - h. All components shall be free of loose, spattered, or excess solder.

Seller may use their internal standards in lieu of the Link® LMSs' subject to Link approval. In the event of conflicts in referenced Buyer documentation or interpretation of requirements, the Seller shall obtain clarification from the Buyer's Quality organization.

- Q30C Mechanical Workmanship - Seller shall comply with the following workmanship requirements, if not otherwise specified in the drawing, parts list, specification, etc.:

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- a. Neatness and thoroughness of wiring, welding, machining, and assembly of parts, subassemblies, and assemblies shall be maintained.
- b. Surfaces shall be clean and free of smudges, scratches, rusting or other marks detracting from a new appearance. Touchup of minor imperfections shall be accomplished prior to hardware acceptance.
- c. There shall be no foreign matter left inside the product that might detract from the intended operation, function or appearance of the item.
- d. There shall be no sharp corners that could injure someone.
- e. Screw assemblies and bolts shall be fastened using applicable American National Standards Institute (ANSI) or military standards (MS), without over tightening, based on their dimensions, material, and type of application.
- f. Screws, nuts and bolts shall show no evidence of cross threading, rusting, mutilation or detrimental or hazardous burrs. There shall be a minimum of one and half screw threads protruding beyond the nut when tightened.

Q30D Welding – Seller shall comply with the welding requirements of AWS D17.1:2001, including the qualification of weld operators and inspectors, unless otherwise specified in the purchase order or accompanying documents.

Q40 RESERVED

Q50 MATERIAL, TOOLING, CALIBRATION AND PROCESS CONTROLS

Q50A Age Sensitive/Shelf Life Material – Material identified on this purchase order is considered to be age sensitive. Seller shall provide the following data upon delivery: (1) Manufacturing date, (2) Shelf life and/or expiration date and (3) Cure date for rubber products.

Material must have at least 75% of its shelf life remaining at the time of shipment.

Q50B Material Safety Data Sheet – Material Safety Data Sheets (MSDS) are required for each shipment on this purchase order.

Q50C Chemical and Physical Test Reports – Seller must have on file, at their facility or sub-tier supplier's facility, physical and chemical test reports of raw material used on this order. Records substantiating the foregoing shall be available for examination by Buyer Quality Assurance. When Q20D is applied, Seller shall submit results to Buyer.

Q50D Electrostatic Discharge Protection - Seller agrees that all static-sensitive electrical and electronic parts, assemblies and equipment shall be handled and protected to effectively prevent damage from electrostatic discharge using an Electrostatic Discharge (ESD) control system which encompasses protected areas, handling procedures, protective covering, quality precautions, audit and review, training of employees, and packing and packaging for delivery.

Q50E Component Solder-ability – All electronic components supplied on this purchase order shall meet the requirements of MIL-STD-202, Method 208, for component solder-ability.

Q50F Tool Control – Buyer-supplied inspection tooling and/or gages shall be periodically proved for accuracy. This action shall occur at the Buyer's plant or at a Buyer-approved facility. If an outside lab is used, a certified report of each tool and/or gage shall be sent to the Buyer's Procurement Organization. Any tooling or gage furnished to the Seller by the Buyer shall not be

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altered, reworked or modified without written approval of the Buyer. Buyer shall be immediately notified of damage or loss.

- Q50G Calibration – A certificate, report, or data sheet attesting to the date, accuracy of the standards used, and the environmental condition under which the results furnished were obtained must be supplied for each item calibrated under this purchase order. This report or certificate must attest to the fact that the accuracy of the standards used in obtaining the results has been compared at planned intervals with the NIST, WWVB, has been derived from accepted valued of Natural Physical Constants, or has been derived by the ratio-type of self-calibration techniques. The accuracy of the standards must be at least four times the accuracy of the equipment being calibrated.
- Q50H Special Process Control Qualification/Records Maintained by Seller– Seller and any sub-tier supplier using special processes (heat treating, welding, painting, plating, nondestructive testing etc.) shall ensure that the facility performing the special process operation is both qualified to perform and that records of the special process operations are maintained.
- Q50I Special Process Control Approval by Buyer – Seller and any sub-tier supplier using special processes (heat treating, welding, painting, plating, nondestructive testing etc.) must have these special processes approved by the Buyer. Seller shall prepare and present special process procedures for Buyer's Quality Organization approval prior to performing any special processes on items to be supplied on this purchase order and no later than sixty (60) days after receipt of this purchase order. Special process procedures shall be in accordance with the appropriate specification as defined by the purchase order, drawing or specification. Seller shall maintain records verifying that special processes and personnel are certified, or if the Seller is purchasing special processes, subcontractor records are available to ensure that the subcontractor is certified to the applicable specification.
- Q50J Directed Approved Processor – Seller's sub-tier supplier(s) must be listed as an Approved Processor or shall use Approved Processors on the Buyer-provided Approved Processor List. Buyer approval of any processor shall not relieve Seller of their obligation and liabilities under this purchase order. Seller shall submit a Certificate of Conformance identifying the Buyers directed source used (refer to Q20E).
- Q50K Raw Material Samples – For a first time order, the Seller shall provide sufficient quantity of test samples of the material for independent testing by the Buyer of the material as required by the controlling material specification or standard. Samples shall also be provided, if this is a repeat order, where more than 12 months has elapsed since the last purchase order samples were provided.

Q60 MATERIAL REVIEW AUTHORITY

- Q60A Material Review Board (MRB) Authority – Only shipments of supplies and/or services that conform to all requirements will be accepted unless authorized in writing by the Buyer's Quality Organization. Any nonconforming materials, parts or products that affect specific Buyer form, fit, or function requirements imposed by the purchase order, Buyer's drawing, or any other applicable specification shall be submitted to the Buyer MRB disposition and approval. This task shall be accomplished at the earliest possible time, but must be prior to shipment. Seller shall include the description of the nonconformance, the root cause of the nonconformance and the corrective action taken to prevent its recurrence. If the Seller is uncertain as to the affect of

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the nonconformance on specific requirements, the concurrence of a representative of the Buyer's Quality Organization shall be obtained.

Seller may disposition non-conformances, using their internal MRB procedures, providing they do not affect any Buyer form, fit or function requirements.

Q70 MILITARY STANDARD HARDWARE

Q70A Military Hardware and Components - Seller expressly warrants that parts furnished on this purchase order conform to the applicable military part specification. Seller shall provide copies of acceptance data from the original manufacturer with each shipment.

Q70B Military Hardware and Components - Seller expressly warrants that parts furnished on this purchase order conform to the applicable military part specification. Seller shall maintain copies of acceptance data from the original manufacturer on file.

Q80 PACKAGING REQUIREMENTS

Q80A Product Packaging – All products shall be packaged to ensure delivery at final destination when shipped by common carrier. Cable assemblies, conduits, and harness assemblies shall be packaged to prevent deformation of conductor insulation and damage to connectors and connector pins. All connectors shall be individually wrapped. Circuit card, printed wiring, multi-wire or wire wrap board assemblies furnished on this purchase order shall be individually packaged in an ESD shielded bag.

ATTACHMENT A

CERTIFICATE OF CONFORMANCE

DATE: _____

COMPANY NAME: _____

ADDRESS: _____

PO NUMBER: _____ PO LINE(S): _____

PART NUMBER: _____ REVISION: _____

QUANTITY: _____ SERIAL NUMBER(S): _____

LOT NUMBER (if applicable): _____

DESCRIPTION: _____

Seller hereby certifies that all items (material, components, parts, assemblies, and/or final product(s)) furnished in this shipment of the Purchase Order meet the following requirements:

1. Items shall be in full compliance with the requirements of the Purchase Order, drawing(s), specification(s), and applicable documents as specified in the L-3 Communications GENERAL TERMS AND CONDITIONS For Supply and Services Subcontracts, unless otherwise specified in the Purchase Order.
2. Items shall use only new and authentic components, parts, and materials that have been procured from the original component/equipment manufacturer (OCM/OEM), or through an OCM/OEM Franchised distributor.
3. Items shall use no component, part, or material that have been procured from an Independent Distributor (Broker), unless the Independent Distributor is approved in writing by the Buyer.
4. Items shall have been inspected and tested.
5. Items shall have applicable supporting inspection records, test data, and certificates of conformance on file and available for Buyer review upon request.

CERTIFIED BY (an Authorized Company Official):

TITLE: _____ DATE: _____