

Bosch General Delivery Specifications for Machinery and Equipment

Section 10-Attachments (Anderson Plant Specific)

TABLE OF CONTENTS

Attachment 1.0	Exceptions and Additions to N.A.GDS sections	Page 2
Attachment 2.0	Preventative Maintenance	Page 3
Attachment 3.0	Requirements for Palletized Lines	Page 4
Attachment 4.0	Required Mechanical Components	Page 5
Attachment 4.1	Required Hydraulic Components	Page 7
Attachment 4.2	Required Pneumatic Components	Page 8
Attachment 5.0	Machine & Tooling Drawing Standards	Page 9
Attachment 6.0	Paint Specification	Page 11
Attachment 7.0	Wiring Methods	Page 12
Attachment 7.1	Electrical Schematic Format	Page 14
Attachment 7.2	Required Electrical Components	Page 16
Attachment 7.3	3 Phase Transformer Requirements	Page 18
Attachment 7.4	PLC Programming Techniques	Page 19
Attachment 7.5	PC Controls Requirements	Page 26
Attachment 8.0	Required Gauge Suppliers	Page 27
Attachment 9.0	Anderson Attachment Check Sheet	Page 28
Attachment 10.0	Obsolescence Statement	Page 30
Attachment 11.0	Plant Specific Utilities	Page 31
Revision Log	Anderson Attachment Revision Log	Page 32

ATTACHMENT 1.0

Exceptions and additions to the N.A.GDS

GDS Section 5.1

Emphasize **METRIC HARDWARE**.

GDS Section 5.2

All conveyor motors shall have a non-fusible, lockable disconnect for locking out the motor. (This would allow the motor to be locked out and the machine to run without conveyor.)

Wire labeling SHALL use punctuation. For example, the wire that connects I:2/4 should be labeled "I:2/4".

GDS Section 8.1

Documentation shall include the designed cycle time of each station, separating machine and operator times.

Drawings shall include working layout of machine showing electrical cabinets, all electrical field devices, junction boxes, motor location and ID numbers.

Attachment 2.0
Preventative Maintenance

PM Title**Frequency: (Wkly,Bi-Weekly, Monthly, Etc.)****Line Name:****Station: (Name or Number)****Duration:**

CAUTIONS (Repair, Maintenance, Breakdown Related to Equipment)
IE.. ball bearings may fall out when removing slide.

WARNINGS (Safety Hazards while working on or around Equipment)

Reminders (Insure all gages and tool calibration stickers are current)

PPE: (Personnel Protective Equipment)

Required Tools:

- 1.
- 2.
- 3.

Ref. Drawings, Manuals, ETC...

Resource List/OEM Contact Phone #'s

- 1.
- 2.
- 3.

Required Components (OEM Description,OEM#,OEM Name and SAP Material #'s)

- 1.
- 2.
- 3.

Verification Process:

- 1.
- 2.
- 3.

Freq. Change Dates:

(When to review PM and see if frequency needs to be updated)

ISO 14001 INFORMATION

E.g., IMMEDIATELY REPORT ANY SPILLS OF ZESTRON LARGER THAN 5 GALLONS TO SECURITY AT EXTENSION 8922.

DESCRIPTION OF WORK TO BE PERFORMED

Note:

When referring to wear, you must reference Manual for tolerances or supply them.

When referring to greasing or lubricating, you must include location of each point and how many. All fittings, slides, gear racks, bearings etc.

Should be numbered on machine and referenced in description of work. Amount of grease or lubricant should be provided.

(Step By Step Instructions)

Attachment 3.0

Requirements for Palletized Lines

Requirements for A-Synchronous Palletized Lines

1. Lines shall have 10% spare pallets with a minimum of five (5).
2. Lines shall have pallet boxes for storage of five (5) good pallets ready for use and five (5) pallets that need repair.
3. Lines shall have a pallet tracking system that will alarm when pallets count drops below designed pallet count.
4. The line shall have a fixed tag with line cycle time and designed number of optimum pallets.
5. A pallet coding system shall be used.
6. All pallets shall be stamped with a unique number.

Requirements for Synchronous Palletized Lines

1. Lines shall have 10% spare pallets with a minimum of five (5) spare pallets.
2. Lines shall have Pallet boxes for storage of five (5) good pallets ready for use and five (5) pallets that need repair.
3. Lines shall have a pallet tracking system that will alarm when pallets count drops below designed pallet count.
4. The line shall have a fixed tag with line cycle time and designed number of optimum pallets.
5. A pallet coding system shall be used.
6. All pallets shall be stamped with a unique number.
7. Line will have a fixed permanent pallet map

ATTACHMENT 4.0
Required Mechanical Components

Mechanical Components

Standard Hardware/Fasteners	Only metric items to be used.
Toggle Clamp	Destaco Ideal
Springs	Associated Springs-Raymond (SPEC) Lee Spring Co. Danly Die Springs
Bearings, Guides & Rods	Bosch Rexroth Corp. INA Bearing Co., Inc. FAG SKF Industries, Inc. Fafnir Thomson
Shock Absorbers	Bosch Rexroth Corp. ACE Controls, Inc. Endine SMC
DU Bearings	Garlock Bearings, Inc. INA Bearing Co., Inc.
O-Rings	APG National Viton
Structural Sections and Work Tables	Standard profiles for general use Bosch Automation Products Bosch FMS <i>NOTE:</i> equipment must use feet that can be anchored to the floor and are positioned within the footprint of the machine.
Pick & Place Units, Grippers	Bosch Rexroth Corp. Robohand Sommer
Chain & Sprockets	U.S. Tsubaki Hitachi
Electrodes	Geeco Mfg.

ATTACHMENT 4.0 - continued
Required Mechanical Components

Robots	Bosch Rexroth Corp. Adept Epson
Vibratory Parts Feeders	Moorefeed Performance Feeders Hendricks Dial-X
Torque Systems	Bosch Rexroth Corp. Weber
Press Spindles	Bosch Rexroth Corp. Schmidt Presso Technik

ATTACHMENT 4.1
Required Hydraulic Components

Hydraulic Components

Cylinders and Valves

Bosch Rexroth Corp.
Vickers
Parker

Pumps

Bosch Rexroth Corp.
ARO Corp
Lybold

Attachment 4.2
Required Pneumatic Components

In order to conserve air in our plant all equipment will be equipped with a solenoid actuated valve and an adjustable timer that will close the solenoid actuated supply valve after a predetermined time of the equipment sitting idle. This solenoid actuated valve will cutoff the air supply for all blow-offs, air knives and feeder bowls at a minimum. Any other air that can be safely shutdown and not cause a hazard for the equipment or personnel shall also be supplied by this solenoid actuated valve.

Bosch/Rexroth pneumatic components shall be the first choice, only if Bosch/Rexroth cannot provide a pneumatic component to meet the requirements may the other components from the list be used.

**Non-lubricated air shall be used. All pneumatic air lines shall be labeled with PLC output number.*

Dryer/Extractor for Compressed Air	LA-MAN I&M Diaelectric
Cylinders & Valves (All Cylinders shall be throttled on the exhaust)	Bosch Rexroth Corp. SMC Festo
Actuator	Bosch Rexroth Corp. SMC Festo
Air Service Unit (Filter, Regulator, Lubricator)	Bosch Rexroth Corp. Festo SMC
Air Motor	ARO Corp. Weber
Slides	Bosch Rexroth Corp. Festo SMC

Pneumatic Components NOT ALLOWED in the Anderson Plant

***Bimba
American
PHD
Poven Air
ARD
Destaco***

Attachment 5.0 Machine & Tooling Drawing Standards

CAD Format

Mechanical Drawings: All mechanical CAD drawings, which include 3D models, 3D assemblies, 3D parts & 2D drawings, are to be in SolidWorks CAD format. The electronic mechanical design package needs to include all components, fasteners, purchase parts, and sub-assemblies necessary to successfully open the 3D main assembly models, 3D sub-assembly models, 2D assembly drawings, and 2D parts drawings. Autocad (.dwg format) format 2D drawings will be accepted as an alternate electronic format only when a vendor does not have access to SolidWorks.

Schematics and Diagrams for Electrical, Utility, Motion/Timing, Pneumatic Piping, etc.: All schematics and diagrams for utility components (i.e., piping, wiring, etc.) and related Motion/Timing diagrams shall be in Autocad (.dwg format). E-Plan format will be accepted as an alternate electronic format only when a vendor does not have access to Autocad.

All Electronic files (i.e., drawings, diagrams, schematics, documents, etc.) must include Adobe Acrobat PDF formats of the original equipment information sent in the electronic drawing package. All electronic drawings and documentation are to be copied onto a DVD, CD ROM, or portable USB thumb drive.

Page Setup

All drawings are to be prepared in SI-metric notations or metric notations with ANSI references. Mechanical parts drawings shall be in millimeter formats (or millimeter with inch references). Mechanical assembly drawings shall be in millimeter formats (or millimeter with inch references), but meter (or meter with feet/inch references) formats can be used where applicable due to scale of the design. Electrical schematics/diagrams and Pneumatic schematics/diagrams shall be prepared on ANSI-B or DIN A3 sheet sizes.

Title Block

All drawings shall be on Bosch title blocks, which will be supplied by Bosch. A vendor may add their company information/logo/data next to or above the Bosch title block, but the vendor may not alter the Bosch title block itself.

Drawing Numbers

Bosch's Project Engineer or TEF3.2 Design Group will furnish a block of drawing numbers per the Bosch MAP system to the vendor. The electronic filenames must be identical to the 2D drawing numbers and/or pdf files. For example, if VY00781UN120-0102 is shown in the title block, then the electronic 2D drawing file shall be named VY00781UN120-0102.dwg or VY00781UN120-0102.slddrw. Likewise, if 39612345AD0103015 is shown in the title block, then the electronic 2D drawing file shall be named 39612345AD0103015.dwg or 39612345AD0103015.slddrw.

Drawing Number definition (see Bosch Anderson AI4.4.02.001 for details):

VY00781UN120-0102 = Equipment Serial # VY00781UN120, Unit # 01, Part # 02.

39612345AD0103015 = Department# 396, Equipment Serial # 12345AD, Cell # 010, Unit # 30, Part # 15.

If a drawing number is assigned to more than one sheet (i.e., sheet 2 of 5), then the electronic filename(s) shall include a dash separator and the sheet number (i.e., VY00781UN120-0102-2.dwg or 39612345AD0103015-2.slddrw would indicate sheet 2). If there is only 1 sheet associated with the drawing number, then the dash separator for sheet numbers are not applied to the electronic filename and the .slddrw or .dwg is understood to be sheet 1 of 1. In addition, it is expected that all 3D models be named with the same naming convention (i.e., drawing number in the electronic filename) as the part or assembly drawings.

Spreadsheet or Database Information

An electronic file of a Microsoft Excel database spreadsheet shall be supplied detailing all the vital common parts list information for each drawing and part. The following information will be supplied for drawings: Document/Drawing #, Title/Description (as it appears in the titleblock), Date, Originator, Designer Name, Quantity required, Recommended spares quantity, Revision #, Material, Notes (such as heat treatment, hardness, plating/coating, etc.). Furthermore, the spreadsheet shall include purchase part information such as: Vendor part number, Vendor name, Distributor name, Quantity required, Recommended spares quantity.

Attachment 6.0
Paint Specifications

Paint Specifications

Clean Room Applications: RAL 9010 White

Non-Clean Room Applications: RAL 1015 Beige

** Color samples available upon request from the purchasing department.*

Attachment 7.0 Wiring Methods

All Communication wiring shall be separated from power wiring or have proper grounding so no false signals will be induced in to the communications wiring.

All wiring inside machine control cabinets will use the following color code

Black - Ungrounded line, load, and control conductors at line voltage. Normally 480 VAC.

White - Grounded circuit conductors (neutrals).

Red - Ungrounded ac control conductors, at less than line voltage. Normally 220 VAC or 120 VAC.

Blue - Ungrounded dc control conductors. Normally +24 VDC.

White with Blue Stripe - Grounded (current carrying) dc circuit conductors. OVDC.

Green - Electrical safety ground

Yellow - Ungrounded control circuit conductors that may remain energized when the main disconnecting means is in the off position.

White with Yellow stripe - Grounded (current Carrying) ac control circuit conductors that remain energized when the main disconnecting means is in the off position.

Attachment 7.0 - continued

Wiring Methods

E-Stops – Shall be hardwired and must be connected together if any mechanical or electrical connection exists between machines.

Two Hand Controls– All two hand control circuits must use an approved safety **module**.

Safety devices shall utilize safety relays.

Electrical Enclosures – Shall have a disconnecting means that provides the following: ability to remain locked out with the cabinet door(s) in the closed or open position. Means shall be permitted to be provided for qualified persons, using appropriate work practices, to gain access without removing power. All devices must be top fed. No bottom fed devices will be permitted.

Main Panel – Shall provide main circuit protection in the form of fuses or circuit breakers.

Light Curtains – Shall use approved safety control devices. A keyed bypass must be provided to allow for machine service and must meet all safety codes. The machine must not be allowed to operate in automatic mode while in bypass.

Pogo Pin Fixtures – Shall have a quick connection plug to allow for a quick removal

Attachment 7.1

Electrical Schematic Format

Electrical schematics should contain the following:

Glossary and Index - This section should contain lists of every circuit element used in the schematics. One list should be alphabetical by element name and the other should be sequential/numeric by circuit element number. Electrical symbols shall be standard ISO. Element numbers shall correspond to input/output numbers. Hardware elements not connected to the PLC shall be numbered according to print page/line number.

Electrical Layout Diagram - This diagram shall show an overview of the machine identifying all electrical enclosures, motors and electrical components. (See Figure 1)

Control Wiring Diagram - This section should contain all logic circuits used in the machine. The information should include circuit element number and title beside each figure.

Power Wiring Diagram - This section should contain all power feed and devices.

Interconnection Diagram - This section should contain all terminal blocks, locations and illustrate which elements are connected to them.

Refer to the NFPA 79 Annex D – Technical Documentation for examples

ATTACHMENT 7.2
Required Electrical Components

PLC's	Bosch Allen Bradley (MicroLogix & SLC 504)
Motors (Stepper)	Pacific Scientific Bosch
Compu-motor	Vextra
Motors (including: AC, DC, Servo and Linear Drive)	Baldor Bodine Siemens Reliance Pacific Scientific Oriental

Sensors – All devices are required to be PNP

Balluff shall be the first choice, only if Balluff cannot provide a sensor to meet the requirements may the sensors from the list below be used.

Ifm Effector
Turk
Festo (for pneumatics only)

NOTE: If a Cylinder OEM has a specific Cylinder requiring the use of that Cylinder OEM's specific Switches or Sensors, that specific Switch or Sensor will be allowed. (Example: A Festo Cylinder is allowed to have a Festo switch)

Manual Switches/Push Buttons	Seimens Telemecanique
Fiber Optics (Photo-Electric)	Balluff Efector Keyence Banner
Light Curtains	Banner Sick Keyence
Power Supplies (must be din rail mounted in cabinet)	Lambda Siemens Power One

ATTACHMENT 7.2 - continued

Required Electrical Components

Relays	Siemens Idec Schrack
Connectors	Bosch Amphenol Efector
Wire Marking System	Grafoplast Trasp System – Phone # 1-800-864-3874 (using 117P Characters or SI 2000 Plotter System) Telemechanique
Disconnects	Siemens
Enclosures	Any NEMA rated enclosure with hinged door, disconnect should allow door to be opened with power on.
Circuit Breakers/Overloads	Siemens
Contactors	Allen Bradley Telemechanique Siemens
Heater Elements	Watlow Chromaslox Omega
Thermocouples	Watlow Omega
Bar Code Readers	DataLogic
Ethernet Switch	Hirschmann
Safety Interlock Switches	Schmersal

ATTACHMENT 7.3

3 Phase Transformer Requirements

Anderson Plant nominal voltage: 480v, +/- 7%, 3PH, 60Hz

Capacity: The main supply transformer must have 25% additional power capacity for future expansion. Line current must not exceed 75% of the nameplate rating (including the neutral on 4-wire Wye configurations). All 3 phase transformers should be loaded such that phase to phase current loads are balanced to within +/- 20%.

Transformer types for 3PH applications: General Purpose, Drive Isolation or K-Factor Harmonic transformers are to be used for main power based on the load type. The windings are to be Delta/Delta or Delta/Wye. Primary windings should have multi-taps which are to be used to obtain the desired secondary voltages. The transformer is to be enclosed in a NEMA 1, 3R or 12 (IP23, IP32 or IP55) enclosure based on the application.

Nameplate Data: The nameplate on the transformer must include the following minimum information:

- KVA rating
- Primary/Secondary Voltages
- Wiring diagram with tap connections
- Line current rating for primary and secondary phases
- Winding type: (Delta/Delta or Delta/Wye)
- Manufacture and part number

Bonding: For Delta/Wye applications the neutral must be bonded in accordance with the current National Electrical Code article 250 and NEMA ST20 publications.

ATTACHMENT 7.4

PLC Programming Techniques

StepChain Definition:

A sequential method of programming which breaks the process or machine sequence down into individual steps. These steps are documented in flowchart type configurations which are called “Sequence Diagrams”. Each step has defined actions that occur within that step. The StepChain will not advance to the next step until the conditions known as “qualifiers” become logically true.

StepChain rules:

1. StepChain only applies to the sequence logic of the machine.
2. All rungs must be displayable in ladder.
3. Use Latch/Unlatch or Set/Reset as the method for stepping through the StepChain sequence.
4. Use the same logic to unlatch or reset the current step when proceeding to the next and perform this in the same rung.
5. Only one step should be on for any StepChain Sequence.
6. The StepChain should always have one active step on.
7. The StepChain should sequence in a numerical order.
8. Parallel branching is allowed.
9. Reserve memory for each StepChain to allow for future additional steps. Include unconditional spare steps in the StepChain to allow for future modifications and comment as “Spare Step”.
10. The “Single Step mode logic should be included in the StepChain.
11. The StepChain step addresses should be used to turn on/off outputs.
12. First scan of the PLC should place each StepChain in step 0 if possible.
13. Inputs should be used where applicable for qualifiers. For cylinders, use both inputs. Example for cylinder extend command: monitor both extended AND retracted switches.
14. If a fault occurs, the StepChain should remain in the step where the fault occurs. After the fault is cleared, then the station should be allowed to Home, Single-step forward or continue in Auto Mode. Some conditions may dictate that the station be Homed only before operation can continue.

Modes of Operation:

1. Auto - Allows the StepChain to automatically sequence through as conditions allow.
2. Manual – Allows for manual manipulation of cylinder movement in a safe state. Manual extend/retracts of cylinders should not allow tooling crashes.
3. Single Step – A method to advance the StepChain one step at a time through the sequence while monitoring the conditions in each step just as the auto mode .

Homing:

Homing should allow each station to safely move back to a defined home position without unsafe (tooling crash) conditions. Step 0 is usually the home step.

Commenting:

Each rung and element should have a meaningful comment explaining the operation of the logic. For StepChain rungs, the rung comment should have the address of the outputs that has changed state in that step.

Fault Diagnostics:

All Inputs should be monitored that can cause machine faults. Any condition that can stop the machine or inhibit the machine from starting should latch or set a fault bit and display a message on the HMI with a description of the fault and the address of the associated input.

Each machine movement should be monitored through inputs with a timer. If the condition is not met within the specified time then latch or set a fault bit.

Example: A two position cylinder would require three faults

1. Extension fault
2. Retraction fault
3. Both switches are on

Programming Examples:

Allen Bradley RSLogix 500 Project Tree

SLC-50/4 example (MicroLoqix will be the same except for ladder file number constraints)

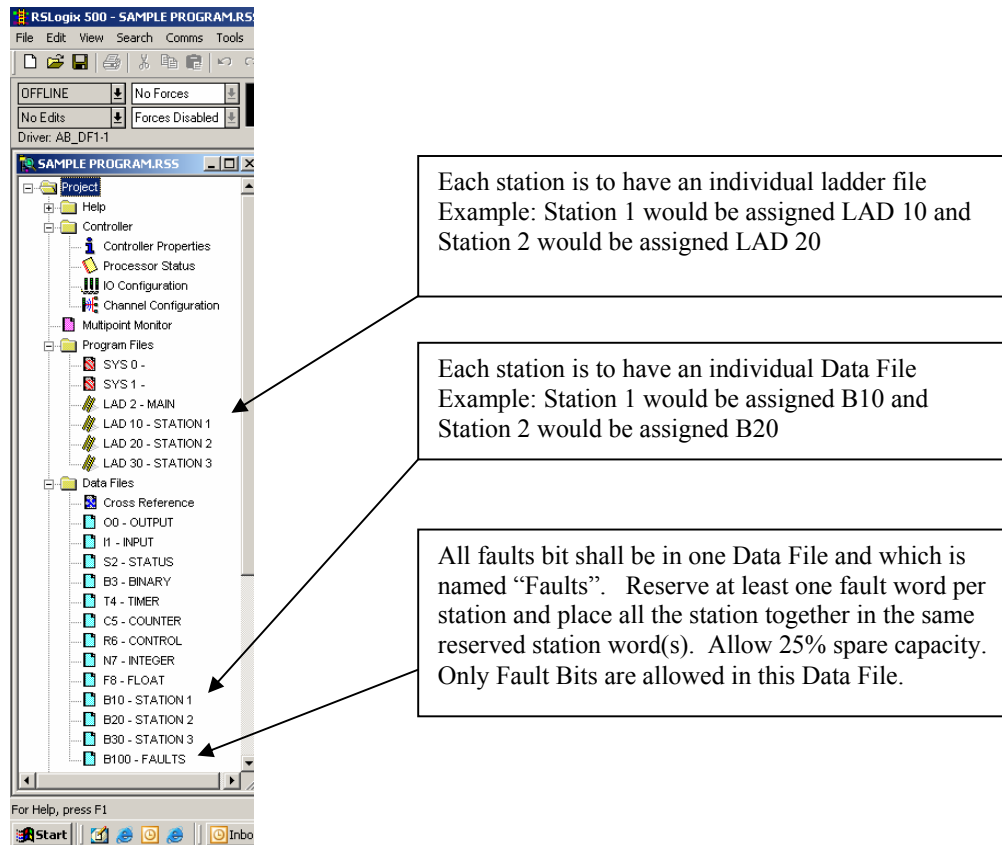


Figure 1

Data File addressing for StepChain for SLC 500

Reserve the addresses for the StepChain at the beginning of each Data File (starting at word zero). Step 0 will be the first bit of word zero. Reserve a minimum of 25% spare addresses for future expansion

Offset	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	(Symbol)	Description
B10:0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		STATION 1 STEPCHAIN
B10:1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		STATION 1 STEPCHAIN
B10:2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
B10:3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		

This example has the first 32 bits reserved for steps 0 through 31

Figure 2

Allen Bradley ControlLogix5000 Project Layout

- 1) The ControlLogix5000 project layout must separate the different Stations (Work Cells, etc.) into individual programs.
- 2) Each program must contain as a minimum the following:
 - a. Main Routine
 - b. Output Routine
 - c. Fault Routine
- 3) The Station Step Chains shall be created as a DINT and as a Controller Tag, the tag to be named as Station# and “Step” .
(i.e. Station10_Step.0, Station10_Step.1 ... Station10_Step.31).
 - a. The Station at home Step should always be 0
 - b. If the station sequencing require more than 32 steps additional DINT can be created (i.e. Station10_Step1 , Station10_Step2)

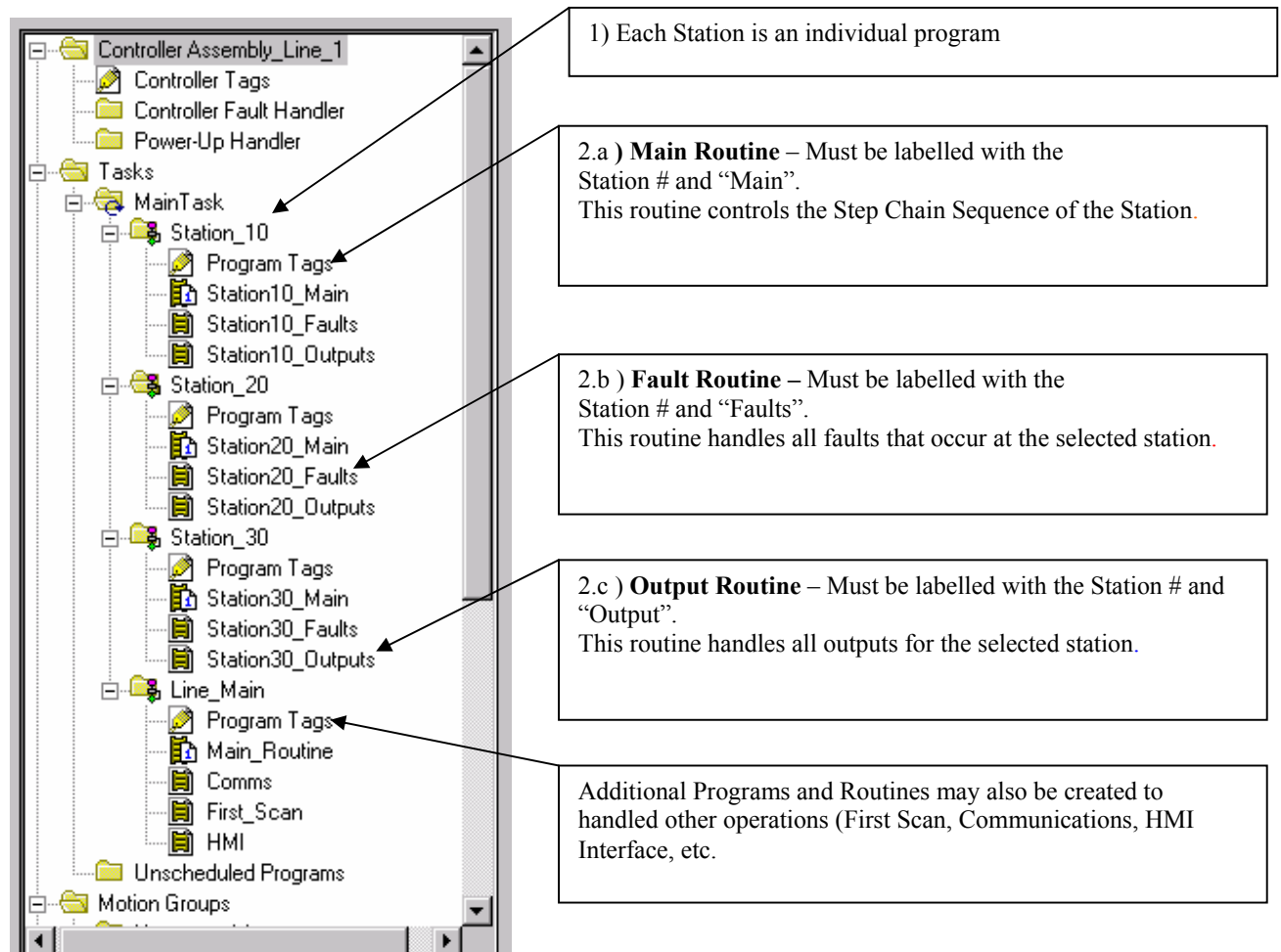


Figure 3

StepChain Ladder logic for all PLC types

This is an example of StepChain logic which shows the first three steps of a five step sequence. This example was taken from an SLC-5/04 controller but this method applies to ALL PLC types. Bosch PLC's use Boolean and Ladder type logic. Boolean rungs must be written so they can be displayed in a ladder logic format.

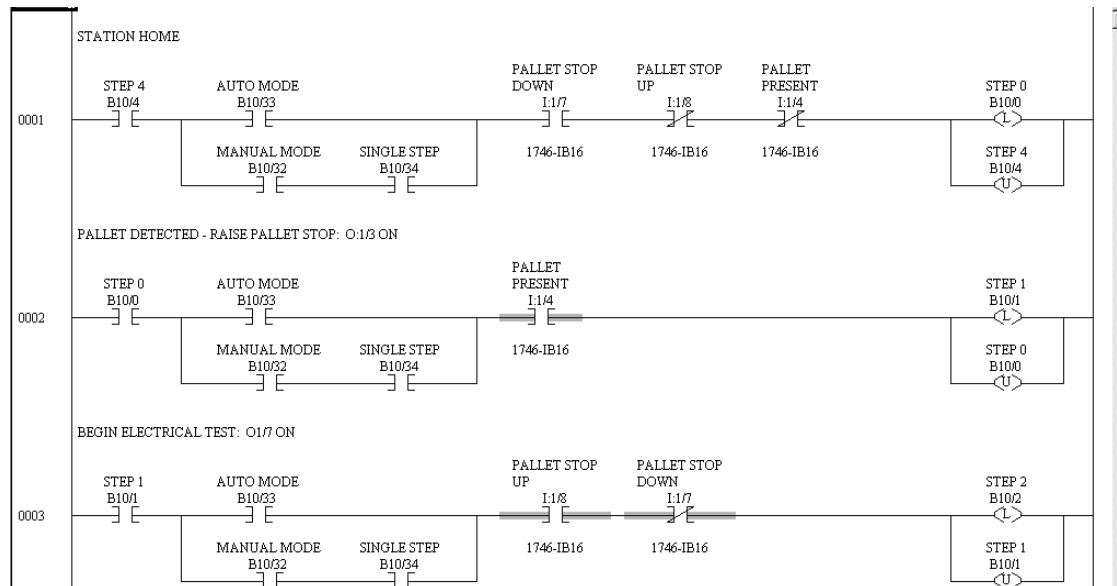


Figure 4

Output logic for all PLC types

All outputs that are a part of the sequence must be controlled by the StepChain. The outputs shall be turned on using a non latching type command such as an OTE. See rung example below:

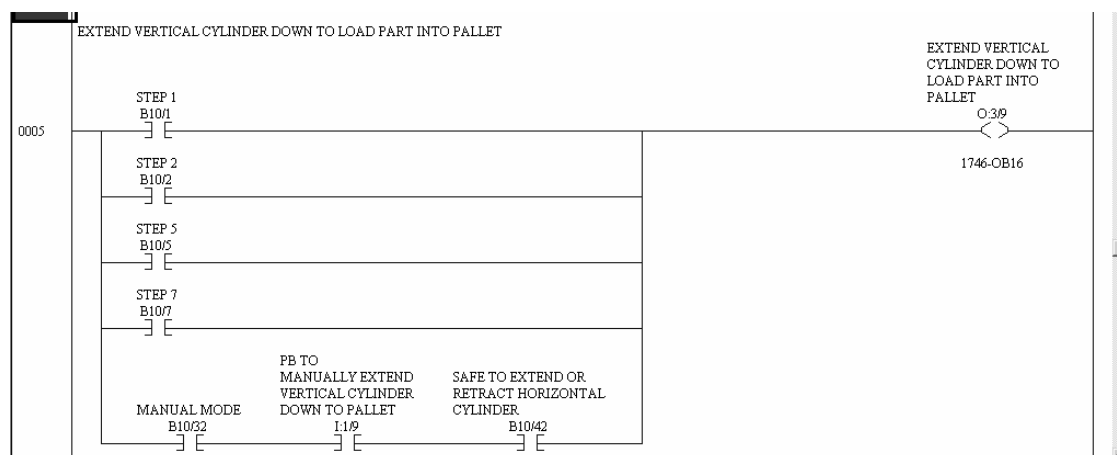


Figure 5

Fault logic for all PLC types

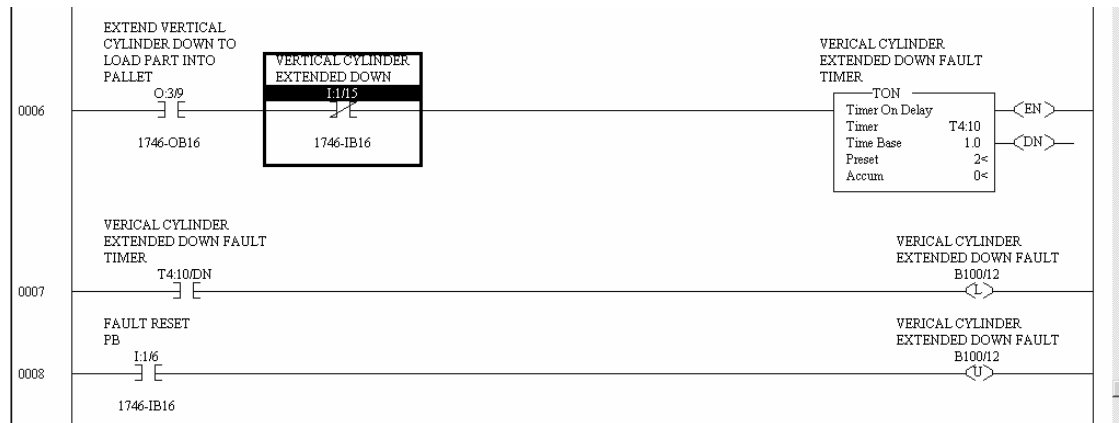


Figure 6

StepChain Sequence Diagram

This is an example Sequence Diagram for the StepChain logic in figure 4. For simplicity, step 3 has been removed.

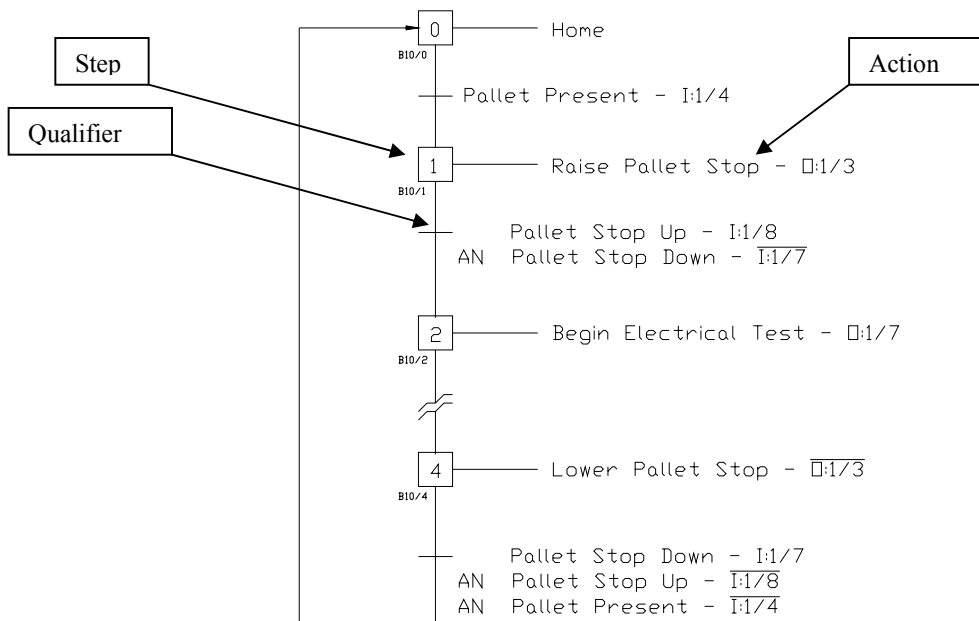


Figure 5

ATTACHMENT 7.5
PC Controls Requirements

Redundancy Requirements:

All PC Controllers must have a documented recovery method. This recovery method is critical in the event of a hardware or software failure. The recovery method must include verification of proper operation. The recovery method must include at a minimum one of the following:

- Systematic method for duplicating hard drives including any or all of the following hardware solutions without loss of data.
 - Raid (1) – SCSI
 - Dupli-Disk (or equivalent to be approved by the Project Engineer)
 - Hot swappable mirror cases
- A method to clone hard drives and copy to the BCN.
- Spare drive with image loaded

ATTACHMENT 8.0
Required Gauge Suppliers

VENDOR NAME
Bailey-Fisher & Porter Co.
Brown & Sharpe Aftermarket
Brown & Sharpe Mfg. Co.
Calitek Corp.
Carolina Scales, Inc.
Certified Measurement Inc.
Cincinnati Test Systems
Coors / Wilbanks
Cosmo Instruments
Davis Instrument Mfg. Co.
Dresser Industries
E I L INSTRUMENTS INC
Edgar B. Heape & Son Inc.
Endevco
Fischer Technology Inc.
Geometric Tool
Giddings & Lewis
Glastonbury Gage
Greenville Scale Co
Guildline Instruments Inc.
Haake-Buchler Instruments
Harris Instrument Corp.
Hart Scientific
Hewlett Packard
Hipotronics, Incorporated
Instron Corporation
J A King
John Chatillion & Sons
Keithley Instruments Inc.
Kistler Instruments Corp.
L.S. Starrett
L.S. Starrett Co.
Longview Inspection
Mahr Corporation
Met One
Mettler Toledo, Inc.
Mountz Inc.
Omega Engineering Inc.
Optical Gaging Prod. Inc.
Quality Calibration Service
Quality Comparator Service
Shore Instruments & Mfg. Co.
Simco Electronics
Star Electric (Watlow Gordan)
Tektronix Inc.
The Tool & Gage House
Troemner Inc.
Viking Gage & Tool Inc.
Wavetek/Datron

ATTACHMENT 9.0
Anderson Attachment Check Sheet

Project

Project Leader

Machine Builder

Machine Builder- Project Leader

Anderson Attachment Check Sheet							
#	Description of Check	UO GDS Attachment 10-Anderson Attachment	P/A Yes	F/A Yes	No	Comments	Date of Check
1	Perform a spot check of OEM literature for against what exists on the line. Record any discrepancy.	1.2.2.3.1					
2	Ensure the air cutoffs are equipped with an exhaust.	1.4.4.3.1					
3	Verify that each 24VDC branch leaving the control cabinet is fused individually. Check the electrical prints and spot check the panels.	1.5.2					
4	Verify that any door with live current >= 50 volts is equipped with a mechanical latch.	1.5.5					
5	All conveyor motors have a lockable disconnect IAW 5.6	1.5.6					
6	Gauge System Discrimination has been calculated over entire range of gauge.	1.6.1					

ATTACHMENT 9.0 - continued

Anderson Attachment Check Sheet

Anderson Attachment Check Sheet							
#	Description of Check	UO GDS Attachment 10-Anderson Attachment	P/A Yes	F/A Yes	No	Comments	Date of Check
7	Section 3.0 requirements are for palletized lines only						
8	Verify that the line has 10% spare pallets. (a minimum of 5)	3.0.1					
9	Verify that pallet storage exist	3.0.2					
10	Verify that alarm exists if the pallet count drops below the specified number	3.0.3					
11	What is the specified number of pallets to be on the line	3.0.4					
12	Are pallets uniquely identifiable?	3.0.6					
13	Check that disconnecting means remain locked out with cabinet doors in the open or closed position	5.0 Electrical Enclosures					
14	Check that any pogo pin fixtures have a quick disconnection method for easy replacement	5.0 Pogo Pin Fixtures					
15	Perform a spot check that the electrical prints comply with section 4.0 and 5.1 of the Anderson attachment	4.0 and 5.1					
16	Perform operational spot check of inputs to verify that on/off detection is programmed (At least 1 check per PLC controller)	5.3 Step Chain Programming for all P					
17	Check the operation of the redundancy system on PC controlled systems (if possible)	5.4 PC Control Requirements					

ATTACHMENT 10.0
Obsolescence Statement

It is required of all suppliers and/or sub-suppliers to Bosch Anderson to abide by the following statement.

Any software or hardware known to be currently obsolete or planned for obsolescence within 5 years from date of equipment purchase is prohibited from being used on any equipment purchased by Bosch Anderson.

ATTACHMENT 11.0

Anderson Plant Utilities

Electricity:	480V (+/- 7 %) 60Hz 208/120V (+/- 7 %) 60Hz
Chilled Water:	44-46 Deg F
Cooling Tower Water:	80- 90 Deg F
Heating Water:	180 Deg F (+/- 8 %)
Compressed Air:	6 Bar / 88.2 PSI (+ 0.5 Bar /- 0 Bar) *

General

- 1) 208/120V loads should not exceed 30A (design for 480V service instead).
- 2) Air knives consuming more than 35 CFM should be supplied with blowers rather than using plant compressed air.
- 3) Equipment utilizing plant water should be designed with “slow acting” solenoid or proportional control valves to prevent water hammer.

Revision Log
Anderson Attachment

REVISION LEVEL	REVISION DESCRIPTION	AUTHOR	REVISION DATE
1	Changed Format of Attachment 10, revised Attachment numbering and added Revision Log	K. Lyons	31 Jan 2003
1	Attachment 1.0 added statement clarifying wire labeling requirements for Bosch Anderson	A. Johnson	31 Jan 2003
1	Attachment 1.1 added new spare parts list form	J. Suber	31 Jan 2003
1	Attachment 2.0 removed contact names and left contact information	K. Lyons	31 Jan 2003
1	Attachment 3.1 added note to state requirement of anchorable feet within footprint of machine	J. Mullens	31 Jan 2003
1	Attachment 3.1 removed Staubli from Robots	J. Mullens	31 Jan 2003
1	Attachment 3.3 removed Tol-O-Matic from Cylinders and Valves	T. Center	31 Jan 2003
1	Attachment 3.3 added Bosch - Rexroth to Slides	T. Center	31 Jan 2003
1	Attachment 3.2 removed SMC and Tol-O-Matic from Slides	T. Center	31 Jan 2003
1	Attachment 4.0 revised wording for Bill of Material \ Main Assembly	R. Logan	31 Jan 2003
1	Attachment 5.0 added statement regarding wire termination and labeling	D. Stovall	31 Jan 2003
1	Attachment 5.0 added statements regarding E-Stops, Safety Relays, Electrical Enclosures, Main Panels, Light Curtains and Pogo Pin Fixtures	A. Johnson	31 Jan 2003
1	Attachment 5.2 changed wording under Sensors to include information regarding Cylinder OEM Sensors.	T. Center	31 Jan 2003
1	Attachment 5.2 changed wording from Allen Bradley "bricks" to "MicroLogix"	E. Joyner	31 Jan 2003
1	Attachment 5.2 added statement requiring all devices to be PNP	A. Johnson	31 Jan 2003
1	Attachment 5.2 removed Bosch from Motors	A. Johnson	31 Jan 2003
1	Attachment 5.2 removed Bosch from Power Supplies	J. Mullens	31 Jan 2003
1	Attachment 5.2 changed Contactors to include Siemens	T. Center	31 Jan 2003
1	Attachment 5.2 added Bar Code Readers	B. Holcombe	31 Jan 2003
1	Attachment 5.2 removed Allen Bradley, Potter & Broomfield from Relays	J. Mullens	31 Jan 2003
1	Attachment 5.2 added Siemens to Relays	J. Mullens	31 Jan 2003
1	Attachment 5.2 added Telemecanique to Wiring Systems	J. Mullens	31 Jan 2003
1	Attachment 5.2 removed Square D from Disconnects	J. Mullens	31 Jan 2003
1	Attachment 5.2 removed Potter & Brumfield and Square D from Circuit Breakers/ Overloads	J. Mullens	31 Jan 2003
1	Attachment 6.0 removed Vendor Numbers	K. Lyons	31 Jan 2003
1	Attachment 8.0 added Obsolescence Statement	K. Lyons	31 Jan 2003
2	Attachment 5.4 PC Controls Requirements Added	J. Mullens	30 Apr 2003
2	Corrected Revision Log to read "Attachment" instead of "Section" for Vendor Numbers and Obsolescence Statement	K. Lyons	30 Apr 2003

Revision Log - continued

Anderson Attachment

REVISION LEVEL	REVISION DESCRIPTION	AUTHOR	REVISION DATE
3	Attachment 1.0 revised wording on Section 5.5.5.d	B. Holcombe	09 Jan 2004
3	Attachment 2.0 updated Bosch contact information	G. Barbour	09 Jan 2004
3	Attachment 3.1 updated Bosch information	G. Barbour	09 Jan 2004
3	Attachment 3.2 updated Bosch information	G. Barbour	09 Jan 2004
3	Attachment 3.3 updated Bosch information	G. Barbour	09 Jan 2004
3	Attachment 5.2 added Ethernet Switch and Safety Interlock Switch requirements	B. Holcombe	09 Jan 2004
3	Attachment 7.0 revised UO-An to read AdW	B. Holcombe	09 Jan 2004
3	Attachment 7.1 Anderson Attachment Check Sheet added	B. Soetebier	09 Jan 2004
3	Attachment 9.0 Anderson Plant Utilities added	D. McCollum	09 Jan 2004
4	Attachment 3.3 Added requirement for solenoid actuated air supply valve , made Bosch/Rexroth first choice for pneumatic components. Attachment 5.2 added Keyence to Light Curtain Suppliers.	D. Stovall	7 Jan 2005
5	Modified Attachment 7.1 added numbering system and Pre-Acceptance (P/A) and Final Acceptance Yes check offs.	D. Stovall	20 April 2005
6	Added Attachment 1.1A Sample PM sheet	D. Stovall	5 June 2006
6	Attachment 2.0 Changed Sensor contact to Balluff	D. Stovall	5 June 2006
6	Attachment 3.1 Added Epson robots	D. Stovall	5 June 2006
6	Attachment 3.3 Added statement to throttle all cylinders on the exhaust.	D. Stovall	5 June 2006
6	Attachment 5.2 Made Balluff our primary Sensor supplier	D. Stovall	5 June 2006
7	Attachment 5.2 Added Transformer Requirements for Main Incoming line power	D. Stovall	19 June 2006
8	Updated to align with the 2007 N. A. GDS	E. Joyner	5 June 2007