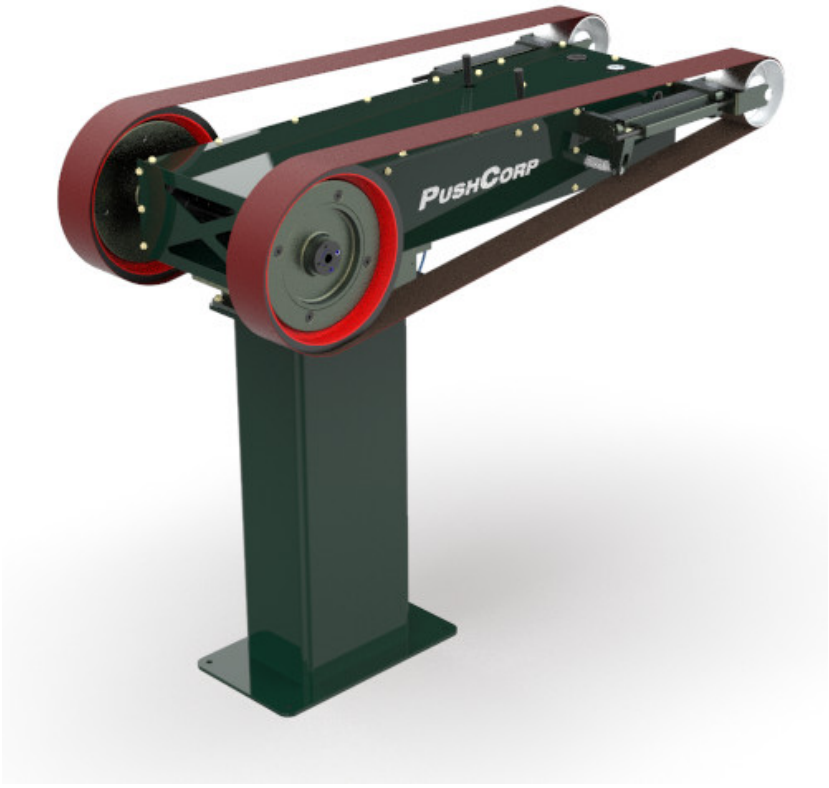
S724 with EIP

Servo Control Cabinet

Model

BSRCON-EIP



PUSHCORP, INC.

Dallas, Texas

Rev 1

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1.0 Limited Warranty

Duration:

One year from date of delivery to the original purchaser.

Who gives this warranty (warrantor):

PushCorp, Inc.
Telephone: (972) 840-0208

Corporate Address:
P. O. Box 181915
Dallas, Texas 75218

Shipping Address:
3001 W. Kingsley Rd.
Garland, Texas 75041

Who receives this warranty (purchaser):

The original purchaser (other than for purposes of resale) of the *PushCorp, Inc.* product

What products are covered by this warranty:

Any *PushCorp, Inc.* Adjustable Force Device or Adjustable Force Device accessory supplied or manufactured by the Warrantor.

What is covered under this warranty:

Defects in material and/or workmanship which occur within the duration of the warranty period.

What is NOT covered in this warranty:

A. IMPLIED WARRANTIES, INCLUDING THOSE OF MERCHANT-ABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE LIMITED TO ONE YEAR FROM THE DATE OF ORIGINAL PURCHASE. Some states do not allow limitations on how long an implied warranty lasts, so the above limitations may not apply to you.

B. ANY INCIDENTAL, INDIRECT, OR CONSEQUENTIAL LOSS, DAMAGE or EXPENSE THAT MAY RESULT FROM ANY DEFECT, FAILURE, MALFUNCTION OF THE *PUSHCORP, INC.* PRODUCT. Some states do not allow the exclusion or limitation of incidental or consequential damages so the above limitation or exclusion may not apply to you.

C. Any failure that results from an accident, purchaser's abuse, neglect, unauthorized repair or failure to operate the products in accordance with the instructions provided in the owner's manual(s) supplied with the product.

Responsibilities of the Warrantor under this warranty:

Repair or replace, at Warrantor's option, products or components which have failed within the duration of the warranty period.

Responsibilities of the purchaser under this warranty:

A. Deliver or ship the *PushCorp, Inc.* product or component to PushCorp, Inc. Service Center, Dallas, TX. Freight and insurance costs, if any, must be borne by the purchaser.

B. Use reasonable care in the operation and maintenance of the product as described in the owner's manual(s).

When warrantor will perform repair or replacement under this warranty:

Repair or replacement will be scheduled and serviced according to the normal work flow at the service center, and depending on the availability of replacement parts. Purchasers requiring quicker repair may receive such with payment of a *PushCorp, Inc.* predetermined expediting fee.

This Limited Warranty gives you specific legal rights and you may also have other rights which vary from state to state.

2.0 General Overview

The *PushCorp* S724 control cabinets provide a highly integrated, easy to use solution to controlling *PushCorp* servomotor and compliance equipment. Installation is simply a matter of mounting the cabinet and connecting 3-phase, 480VAC, electrical power, connecting the safety inputs/outputs and a single Ethernet connection. The S724 Control Console allows the equipment to be controlled via a remote PLC or robot controller using an Ethernet IP fieldbus connection.

3.0 Installation

3.1Cabinet Mounting

The cabinet is designed to be wall mounted outside the robot work area in a relatively clean environment. Figure 1 shows the mounting dimensions of the electrical enclosure.

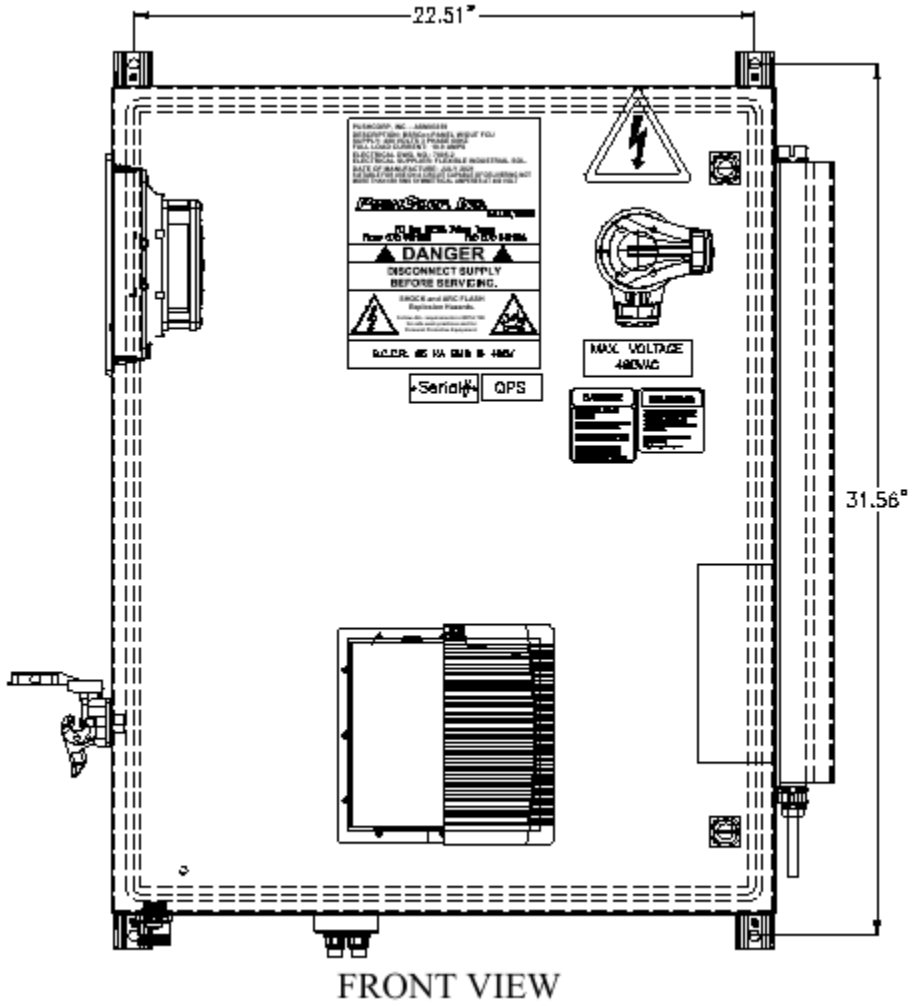


Figure 1. Cabinet Mounting

The overall measurements of the enclosure are 16” x 24” x 30” (DxWxH).

It is the responsibility of the installer to connect conduit, cord grips and/or cords as required for the electrical supply power wiring and low-voltage control signals.

3.2 Electrical Connections

The cabinet requires 480 VAC, 3-Phase, 50-60 Hz. power to operate. This should be supplied via conduit connection to the cabinet as shown in Figure 2 Top View. The control signal connections are made to the External Interface Blocks as shown in Figure 2 Bottom View and Figure 3 Safety Interface.

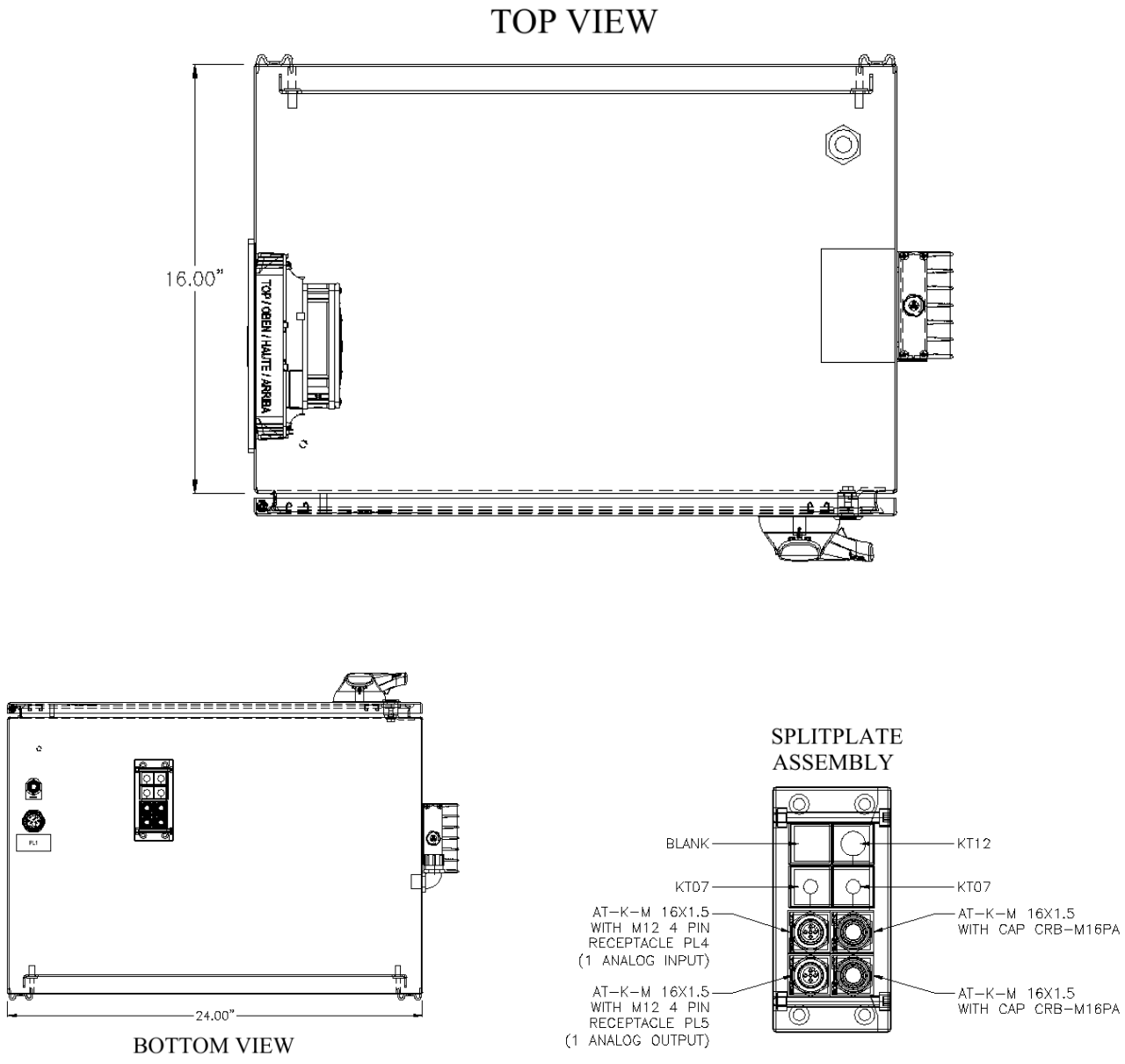


Figure 2. Panel entry locations

The circuit diagram in Figure 3 shows the safety connections required to make the control panel function via the PL1 connector. This connector is provided to allow safety rated connections to the BSRCON panel.

STO-RETURN is internally powered with 24V. **STO1-ENABLE and STO2-ENABLE** are configured to be either connected through a pair of dry contacts with **STO-RETURN.** Or the **STO1-ENABLE** and **STO2-ENABLE** can be energized through an external 24V digital signal. These two connections shall satisfy the dual channel required in most robotic applications.

SERVO SAFETY CONTACTOR 1 AND SERVO SAFETY CONTACTOR 2 will need to be connected to a 24V signal, preferably from a safety rated I/O point. This will in turn actuate the contactors and supply 480V to the servo amplifier on the panel.

SERVO SAFETY CONTACTOR COMMON will need to be connected to an external 0V.

Both **SERVO SAFETY CONTACTOR FEEDBACK** connections are connected to a normally closed contact. These contacts will open when the contactors are actuated, the STOs are enabled, and the RTO signal from the drive is on. The RTO signal indicates that the drive has power and there are no faults. The feedback signal is also connected to the internal IO module in the panel.If you choose to monitor these through the fieldbus connection, the signal designation can be found in section 4.3.1.

It is the responsibility of the System Integrator and/or End-user to follow all applicable electrical codes and OSHA safety standards when wiring the control cabinet. This includes the proper and judicious use of ground termination, fuses, contactors, cut-off switches, lock-out switches, and Emergency Stop circuits. PushCorp, Inc. assumes no responsibility or liability for the electrical system design and implementation of the control cabinet in the End-user application. Refer to OSHA rules and regulations, as well as the CE Machinery Regulations (IEC 204-1), when designing systems that include motors and drives to ensure that the user is protected.

PushCorp will provide answers to any questions regarding the servo drive system and will be responsible for any warranty issues.

NOTE: Please contact PushCorp, Inc. (Tel 1.972.840.0208) directly for any technical support.

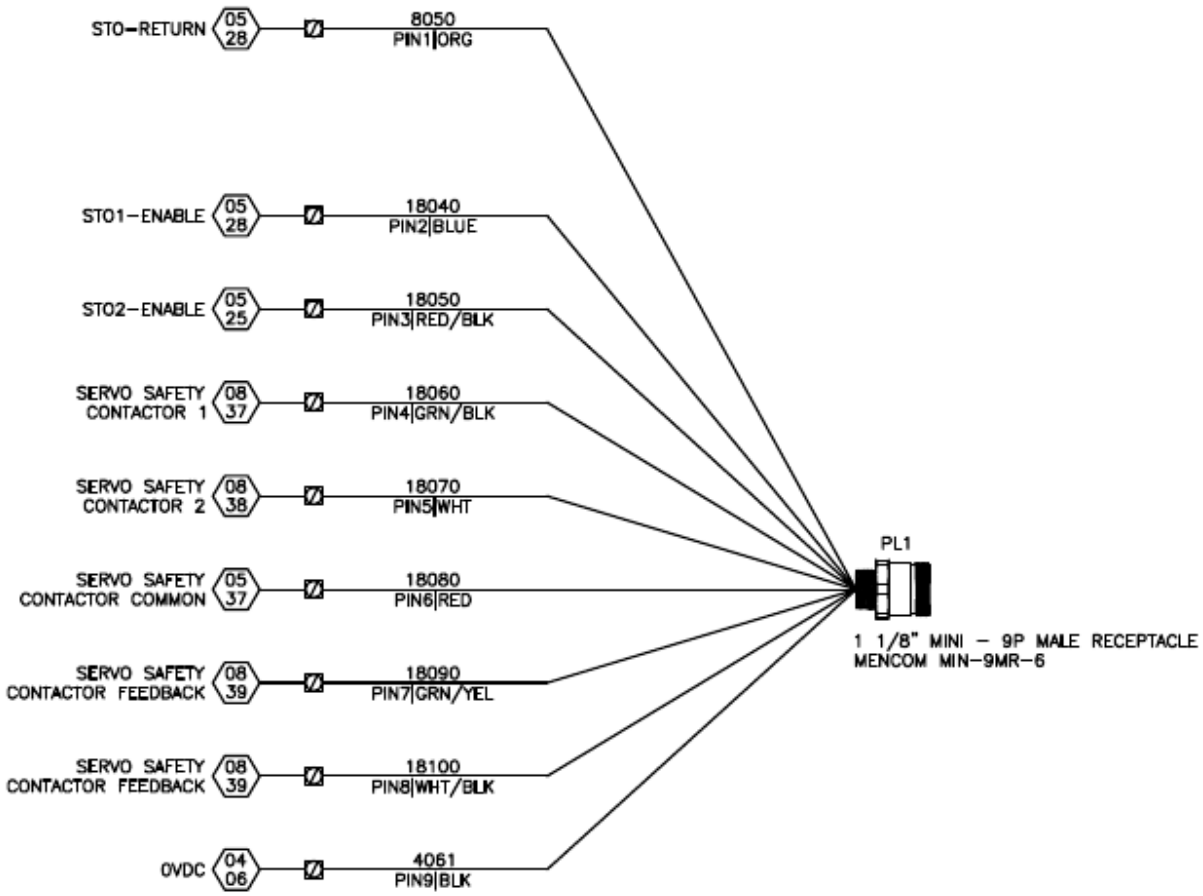
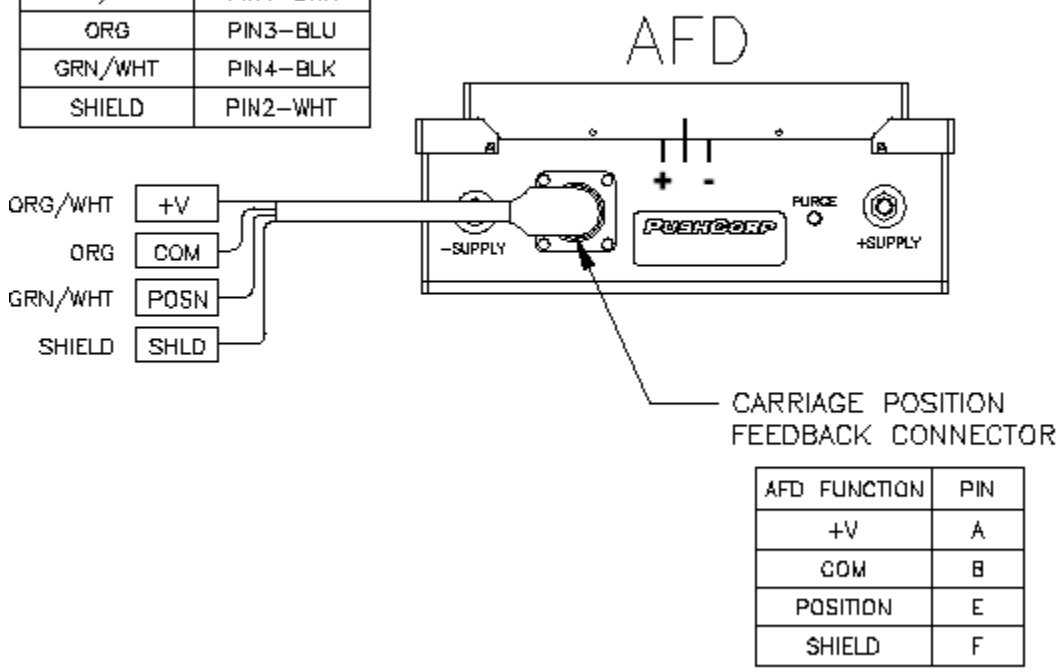


Figure 3. External Safety Interface Schematic

The PL4 connector is a dedicated connection point for the analog feedback for the position of the carriage. PushCorp provides a cable to make this connection as part of the standard package.

Figure 4.

AFD WIRING	
AFD	PL4 M12
ORG/WHT	PIN1–BRN
ORG	PIN3–BLU
GRN/WHT	PIN4–BLK
SHIELD	PIN2–WHT



AFD FUNCTION	PIN
+V	A
COM	B
POSITION	E
SHIELD	F

External IO Connections

The PL5 is an analog output connection to be used with analog proportional valves to be able to adjust the force of the compliance device remotely. The follows the standard 4pin A-coded M12 wiring convention.

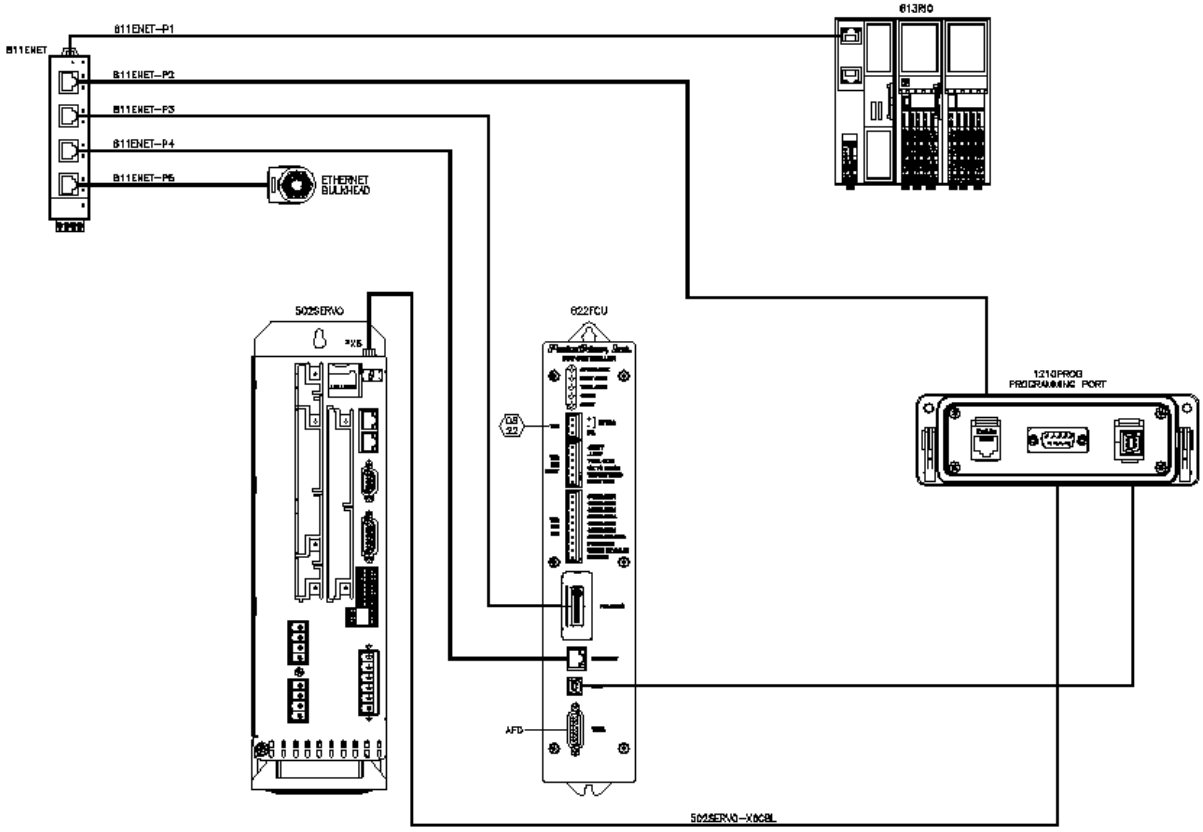
Pin1 – 24VDC
Pin2 – Aout
Pin3 – 0VDC
Pin4 – NC

There are two addition ports and IO in the panel that can be added as needed for future use. These are located next to the PL4 and PL5 connections. These can take any M12 receptacle such as the female MURR ELEKTRONIK 7000-13542-9710200.

4.0 Programming Port

The BSRCON panel comes with a programming port to allow access to the internal devices. This programming port is comprised of an RJ45, DB-9 RS-232 and a USB-B connections. The inter connection diagram for the programming may be seen in Figure 4. A computer can be connected to the RS-232 connection via a standard 9-pin male serial cable.

Figure 5. Programming Port Interface Schematic



5.0 IP Address Assignment

The PushCorp Control Panel has one device which will have a single IP address assigned to it, the Phoenix Contact Axio Coupler. This device leaves the factory with the following IP address assigned.

Phoenix Contact – Axio Coupler – 192.168.1.10

5.1 Changing IP Addresses

Each IP address will be managed either through web based interface or a dedicated software for the device. See the product pages at PushCorp.com for more information or contact techsupport@pushcorp.com with any questions.

5.1.1 Web-based Configuration

The Phoenix Contact Axio Coupler and the FCUFLEX Anybus Module can be configured through a web browser by simply putting the device's IP address in the address bar. This will bring up an interface where you can change the devices IP address and save the configuration.

For the Phoenix Contact unit you will need to enter the password "private" into the three password fields before the changes will take effect.

5.2 Ethernet IP EDS File Information

5.2.1 Axio Coupler Configuration

VendCode = 562;
ProdType = 12;
ProdCode = 8169;
MajRev = 1**
MinRev = 2**
Connection Instance: 0
Producing Connection: 110
Consuming Connection: 100
Input Scanner Size: 5 Words
Output Scanner Size: 5 Words

**NOTE: If your connection requires the major and minor revision be input to the configuration and the above information yielded an error, use the last digit for each HW/FW on the side of the Phoenix Contact AXIO module. Example: HW/FW 00/111 = Major Rev – 0 Min Rev – 1.

5.3 – Component I/O Mapping

5.3.1 Axio Coupler I/O Map

The Axio Coupler will have five words of inputs and five words of outputs as viewed from the scanner.

S724 Flex I/O Map

PxC IO Module Bit Map – SFS81/SFS91

Inputs	DESCRIPTION
I 0001	Digital In – 1 – Contactor 1 On
I 0002	Digital In – 2 – Contactor 2 On
I 0003	Digital In – 3 – Drive Error Present
I 0004	Digital In – 4 – RPM < 5
I 0005	Digital In – 5 – LT BLT EXT
I 0006	Digital In – 6 – RT BLT EXT
I 0007	Digital In – 7 – LT BLT RET
I 0008	Digital In – 8 – RT BLT RET
I 0009	Reserved
I 0010	Reserved
I 0011	Reserved
I 0012	Reserved
I 0013	Reserved
I 0014	Reserved
I 0015	Reserved
I 0016	Reserved
I 0017	Analog In – 1 – Spindle Velocity/RPM
I 0018	Analog In – 1 – Spindle Velocity/RPM
I 0019	Analog In – 1 – Spindle Velocity/RPM
I 0020	Analog In – 1 – Spindle Velocity/RPM
I 0021	Analog In – 1 – Spindle Velocity/RPM
I 0022	Analog In – 1 – Spindle Velocity/RPM
I 0023	Analog In – 1 – Spindle Velocity/RPM
I 0024	Analog In – 1 – Spindle Velocity/RPM
I 0025	Analog In – 1 – Spindle Velocity/RPM
I 0026	Analog In – 1 – Spindle Velocity/RPM
I 0027	Analog In – 1 – Spindle Velocity/RPM
I 0028	Analog In – 1 – Spindle Velocity/RPM
I 0029	Analog In – 1 – Spindle Velocity/RPM
I 0030	Analog In – 1 – Spindle Velocity/RPM
I 0031	Analog In – 1 – Spindle Velocity/RPM
I 0032	Analog In – 1 – Spindle Velocity/RPM

Outputs	DESCRIPTION
O 0001	Digital Out – 1 – Servo Enable
O 0002	Digital Out – 2 – Reset Fault
O 0003	Digital Out – 3 – Reserved
O 0004	Digital Out – 4 – Reserved
O 0005	Digital Out – 5 – Reserved
O 0006	Digital Out – 6 – Track In
O 0007	Digital Out – 7 – Track Out
O 0008	Digital Out – 8 – Belt Select
O 0009	Reserved
O 0010	Reserved
O 0011	Reserved
O 0012	Reserved
O 0013	Reserved
O 0014	Reserved
O 0015	Reserved
O 0016	Reserved
O 0017	Analog Out – 1 – Spindle Speed
O 0018	Analog Out – 1 – Spindle Speed
O 0019	Analog Out – 1 – Spindle Speed
O 0020	Analog Out – 1 – Spindle Speed
O 0021	Analog Out – 1 – Spindle Speed
O 0022	Analog Out – 1 – Spindle Speed
O 0023	Analog Out – 1 – Spindle Speed
O 0024	Analog Out – 1 – Spindle Speed
O 0025	Analog Out – 1 – Spindle Speed
O 0026	Analog Out – 1 – Spindle Speed
O 0027	Analog Out – 1 – Spindle Speed
O 0028	Analog Out – 1 – Spindle Speed
O 0029	Analog Out – 1 – Spindle Speed
O 0030	Analog Out – 1 – Spindle Speed
O 0031	Analog Out – 1 – Spindle Speed
O 0032	Analog Out – 1 – Spindle Speed

S724 Flex I/O Map
PxC IO Module Bit Map – SFS81/SFS91

Inputs	DESCRIPTION
I 0033	Analog In – 2 – Motor Load
I 0034	Analog In – 2 – Motor Load
I 0035	Analog In – 2 – Motor Load
I 0036	Analog In – 2 – Motor Load
I 0037	Analog In – 2 – Motor Load
I 0038	Analog In – 2 – Motor Load
I 0039	Analog In – 2 – Motor Load
I 0040	Analog In – 2 – Motor Load
I 0041	Analog In – 2 – Motor Load
I 0042	Analog In – 2 – Motor Load
I 0043	Analog In – 2 – Motor Load
I 0044	Analog In – 2 – Motor Load
I 0045	Analog In – 2 – Motor Load
I 0046	Analog In – 2 – Motor Load
I 0047	Analog In – 2 – Motor Load
I 0048	Analog In – 2 – Motor Load
I 0049	Analog In – 3 –Carriage Position
I 0050	Analog In – 3 –Carriage Position
I 0051	Analog In – 3 –Carriage Position
I 0052	Analog In – 3 –Carriage Position
I 0053	Analog In – 3 –Carriage Position
I 0054	Analog In – 3 –Carriage Position
I 0055	Analog In – 3 –Carriage Position
I 0056	Analog In – 3 –Carriage Position
I 0057	Analog In – 3 –Carriage Position
I 0058	Analog In – 3 –Carriage Position
I 0059	Analog In – 3 –Carriage Position
I 0060	Analog In – 3 –Carriage Position
I 0061	Analog In – 3 –Carriage Position
I 0062	Analog In – 3 –Carriage Position
I 0063	Analog In – 3 –Carriage Position
I 0064	Analog In – 3 –Carriage Position

Outputs	DESCRIPTION
O 0033	Analog Out – 2 – Spare
O 0034	Analog Out – 2 – Spare
O 0035	Analog Out – 2 – Spare
O 0036	Analog Out – 2 – Spare
O 0037	Analog Out – 2 – Spare
O 0038	Analog Out – 2 – Spare
O 0039	Analog Out – 2 – Spare
O 0040	Analog Out – 2 – Spare
O 0041	Analog Out – 2 – Spare
O 0042	Analog Out – 2 – Spare
O 0043	Analog Out – 2 – Spare
O 0044	Analog Out – 2 – Spare
O 0045	Analog Out – 2 – Spare
O 0046	Analog Out – 2 – Spare
O 0047	Analog Out – 2 – Spare
O 0048	Analog Out – 2 – Spare
O 0049	Analog Out – 3 – PL5
O 0050	Analog Out – 3 – PL5
O 0051	Analog Out – 3 – PL5
O 0052	Analog Out – 3 – PL5
O 0053	Analog Out – 3 – PL5
O 0054	Analog Out – 3 – PL5
O 0055	Analog Out – 3 – PL5
O 0056	Analog Out – 3 – PL5
O 0057	Analog Out – 3 – PL5
O 0058	Analog Out – 3 – PL5
O 0059	Analog Out – 3 – PL5
O 0060	Analog Out – 3 – PL5
O 0061	Analog Out – 3 – PL5
O 0062	Analog Out – 3 – PL5
O 0063	Analog Out – 3 – PL5
O 0064	Analog Out – 3 – PL5

S724 Flex I/O Map

PxC IO Module Bit Map – SFS81/SFS91

Inputs	DESCRIPTION
I 0065	Analog In – 4 – Spare
I 0066	Analog In – 4 – Spare
I 0067	Analog In – 4 – Spare
I 0068	Analog In – 4 – Spare
I 0069	Analog In – 4 – Spare
I 0070	Analog In – 4 – Spare
I 0071	Analog In – 4 – Spare
I 0072	Analog In – 4 – Spare
I 0073	Analog In – 4 – Spare
I 0074	Analog In – 4 – Spare
I 0075	Analog In – 4 – Spare
I 0076	Analog In – 4 – Spare
I 0077	Analog In – 4 – Spare
I 0078	Analog In – 4 – Spare
I 0079	Analog In – 4 – Spare
I 0080	Analog In – 4 – Spare
I 0081	
I 0082	
I 0083	
I 0084	
I 0085	
I 0086	
I 0087	
I 0088	
I 0089	
I 0090	
I 0091	
I 0092	
I 0093	
I 0094	
I 0095	
I 0096	

Outputs	DESCRIPTION
O 0065	Analog Out – 4 – Spare
O 0066	Analog Out – 4 – Spare
O 0067	Analog Out – 4 – Spare
O 0068	Analog Out – 4 – Spare
O 0069	Analog Out – 4 – Spare
O 0070	Analog Out – 4 – Spare
O 0071	Analog Out – 4 – Spare
O 0072	Analog Out – 4 – Spare
O 0073	Analog Out – 4 – Spare
O 0074	Analog Out – 4 – Spare
O 0075	Analog Out – 4 – Spare
O 0076	Analog Out – 4 – Spare
O 0077	Analog Out – 4 – Spare
O 0078	Analog Out – 4 – Spare
O 0079	Analog Out – 4 – Spare
O 0080	Analog Out – 4 – Spare
O 0081	
O 0082	
O 0083	
O 0084	
O 0085	
O 0086	
O 0087	
O 0088	
O 0089	
O 0090	
O 0091	
O 0092	
O 0093	
O 0094	
O 0095	
O 0096	

The analog cards are scaled where a 10V input/output is 32,767 bits and -10V input/output is -32,767 bits (or 65,535 depending on master device). This information is required when configuring the device that will command the speed of the spindle. 10 volts will scale to 32,767 bits.

Typically the formula for converting these bits to an actual RPM is:
Command Bits = ((Desired RPM)*(32767))/(Max RPM of SBS)

6.0 Technical Specifications and Schematics

Supply Voltage:	480 VAC, 3-Phase
Max. Cont. Current:	30 Amps
Max. Peak Current:	60 Amps (2 Seconds)
Dimensions:	16” x 24” x 30” (DxWxH)
Weight:	250 lbs

Specifications subject to change without notice.