

Gen IV iBC Controller Operation Manual





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1. Safety Information

General Power Tool Safety Warnings

Read all safety warnings, instructions, illustrations, and specifications provided with this power tool. Failure to follow all instructions listed below may result in electric shock, fire, and/or serious injury.

Save all warnings and instructions for future reference.

1. Work area safety

- a. Keep work area clean and well lit.
- b. Do not operate power tools in explosive atmospheres, such as in the presence of flammable liquids, gases, or dust.
- c. Keep children and bystanders away while operating a power tool.

2. Electrical safety

- a. Power tool plugs must match the outlet. Never modify the plug in any way. Do not use any adapter plugs with earthed (grounded) power tools.
- b. Avoid body contact with earthed or grounded surfaces, such as pipes, radiators, ranges, and refrigerators.
- c. Do not expose power tools to rain or wet conditions.
- d. Do not abuse the cord. Never use the cord for carrying, pulling, or unplugging the power tool. Keep cord away from heat, oil, sharp edges, or moving parts.
- e. When operating a power tool outdoors, use an extension cord suitable for outdoor use.
- f. If operating a power tool in a damp location is unavoidable, use a residual current device (RCD) protected supply.

3. Personal safety

- a. Stay alert, watch what you are doing, and use common sense when operating a power tool. Do not use a power tool while you are tired or under the influence of drugs, alcohol, or medication.
- b. Use personal protective equipment. Always wear eye protection.
- c. Prevent unintentional starting. Ensure the switch is in the off-position before connecting to power source and/or battery pack, picking up or carrying the tool.
- d. Remove any adjusting key or wrench before turning the power tool on.
- e. Do not overreach. Keep proper footing and balance at all times.
- f. Dress properly. Do not wear loose clothing or jewelry. Keep your hair, clothing, and gloves away from moving parts.
- g. Do not let familiarity gained from frequent use of tools allow you to become complacent and ignore tool safety principles. A careless action can cause severe injury within a fraction of a second.

4. Power tool use and care

- a. Do not force the power tool. Use the correct power tool for your application.
- b. Do not use the power tool if the switch does not turn it on and off.
- c. Disconnect the plug from the power source and/ or remove the battery pack, if detachable, from the power tool before making any adjustments, changing accessories, or storing power tools. Such preventive safety measures reduce the risk of starting the power tool accidentally.
- d. Store idle power tools out of the reach of children and do not allow persons unfamiliar with the power tool or these instructions to operate the power tool. Power tools are dangerous in the hands of untrained users.
- e. Maintain power tools and accessories. Check for misalignment or binding of moving parts, breakage of parts, and any other condition that may affect the power tool's operation. If damaged, have the power tool repaired before use. Many accidents are caused by poorly maintained power tools.
- f. Use the power tool, accessories, and tool bits, etc., in accordance with these instructions, taking into account the working conditions and the work to be performed. Use of the power tool for operations different from those intended could result in a hazardous situation.
- g. Keep handles and grasping surfaces dry, clean, and free from oil and grease. Slippery handles and grasping surfaces do not allow for safe handling and control of the tool in unexpected situations.

5. Service

 a. Have your power tool serviced by a qualified repair person using only identical replacement parts. This will ensure that the safety of the power tool is maintained.

6. Equipment Installation, Operation, and Maintenance

- a. Safety of any system incorporating the equipment is the responsibility of the system assembler
- b. Position the equipment so that it is easy to access the disconnecting device
- c. Do not replace main power cord with an inadequately rated cord
- d. Only allow your power tool to be repaired by a qualified technician using only original spare parts, available from AIMCO. This ensures that the safety of your device is maintained.

2. Controller Diagram

Bottom Panel 2.1



1	USB port-for import/export of data including firmware updates
2	Power Disconnect Switch-Turns controller on and off
3	Power Cord Connection
4	Anybus-To connect to customer's fieldbus network (Ex: Profibus)
5	System Port- USB connection used to connect external computer to configure/monitor the controller
6	Ethernet Port RJ45- Connection used to connect external computer to configure/ monitor the controller
7	Serial Port (DB-9 Pin M) Serial data Output for communication with peripherals such as barcode readers and printers
8	24 Volt I/O Connector (DB-25 Pin M)- Input and output of signals for process control

2.2 Front Console LED Display

Indicator Lights

Green	Indicates fastening cycle meets specified parameters.
Red	Indicates fastening cycle rejected for exceeding high torque.
Red Flashing	Indicates low torque. Fastening cycle was rejected for not achieving low torque.
Yellow	Indicates High Angle. Fastening cycle was rejected for exceeding high angle.
Yellow Flashing	Indicates Low Angle. Fastening cycle was rejected for not achieving low angle.
Blue	Tool is In-cycle, above threshold.



Torque Display Always displays torque value

Secondary Display

Toggle button switches secondary display between

- Units of measure
- Ethernet IP address • USB (System Port) IP address

NOTE: If Jobs are enabled refer to "4.2 Job" on page 14 for Toggle Button function.

3. Initial Setup

<u>Step 1</u>

Plug female end of power cable into Power Cable Connector (Figure 1, pg. 11).

<u>Step 2</u>

Plug male end of power cable into appropriate power source.

Due to a variety of 230Vac power outlets, the standard power cable plug-end provided with the controller may need to be modified in order to connect to local 230Vac power outlets. AcraDyne has a wide variety of country specific power cord options available. Check with your authorized AcraDyne representatives to see if your specific configuration is available. In any case, connection to local power should be made in consultation with a qualified electrician.

Step 3: The Redundant Earth Ground (required) must be connected to ground using the #14 AWG conductor, a green wire with a yellow stripe. Attach using a #10-14AWG ring terminal and #10 star washer (Figure 1).



Figure 1 — Redundant Earth Ground Attachment

<u>Step 4:</u> Turn controller on by pushing the Power Disconnect Switch to the POWER ON position, a light indicates power on.

<u>Step 5</u>

Reference AcraDyne Tool Manager Manual/ Software for wireless tool connection to AcraDyne IBC Controller

3.1 Connecting to the Controller

There are three ways to program/communicate with the controller:

- Controller touch-screen console
- System Port: (USB connection) Direct connection to controller.
- Ethernet Port: Via direct connection or LAN.

Touchscreen Console

Controller functions and programming can be accessed directly through the touch-screen.

- 1. Power on controller.
- 2. Run screen will appear
- 3. Controller is ready for use.

Connecting via the System Port Directly to PC



The following is an example using Window 7. Your screen may look different depending on the operating system.

Windows USB Setup

Step 1: Power on PC and controller, allow enough time for them to become fully operational.

Step 2: Attach controller to PC using a USB 2.0 A-B cable. If this is the first time connecting the devices, wait for Windows to install the RNDIS driver. This should happen automatically.

<u>Step 3:</u> After the driver is installed, go to 'Control Panel'.

	Computer
-	Control Panel
	Devices and Printe
	Default Programs
	Help and Support
	•
	Concernance of the local division of the loc
All Programs	
Search programs and files	O Shut down

<u>Step 4:</u> Go to 'Network and Internet'.



<u>Step 5:</u> Go to 'Network and Sharing Center'.



Step 6: Go to 'Change adapter settings'.



Step 7: Find the Local Area Connection that is using the 'USB Ethernet/RNDIS Gadget' network. Right click this network and go to 'Properties'.

and Internet	 Network Connections 	✓ Search Network Connection
		5.7 197
	Local Area Connection Unidentified network	Local Area Connection 2 Unidentified network

<u>Step 8:</u> In Properties window select 'Internet Protocol Version 4' and click 'Properties'.

Connect using: USB Ethemet/RNDIS Gadget Configure This connection uses the following items: Client for Microsoft Networks Client for Arctice Sharing for Microsoft Networks Linkemet Protocol Version 6 (TCP/IPv6) Client Frotocol Version 7 4 (TCP/IPv6) Client Frotocol Versi	Netw	orking Sharing
USB Ethemet/RNDIS Gadget Configure This connection uses the following items: Client for Microsoft Networks Client for Microsoft Networks Client for Microsoft Networks Client Sharing for Microsoft Networks Client Protocol Version 6 (TCP/IPv6) Client Protocol Version 7 4 (TCP/IPv6) Client	Con	inect using:
Configure This connection uses the following items: Client for Microsoft Networks Client for Microsoft Networks Glient for Account of the Driver File and Printer Sharing for Microsoft Networks File and Printer Sharing for Microsoft Networks File and Printer Sharing for Microsoft Networks A Internet Protocol Version 6 (TCP/IPv6) A Internet Protocol Version 7 (TCP/IPv6) A Internet Protocol Versi	9	USB Ethemet/RNDIS Gadget
This connection uses the following items: Client for Microsoft Networks Question of the Driver Question of the Driver Question of the Driver Pile and Printer Sharing for Microsoft Networks Linkenet Protocol Version 6 (TCP/IPv6) Internet Protocol Version 6 (TCP/IPv6) Link-Layer Topology Discovery Mapper I/O Driver Link-Layer Topology Discovery Mapper I/O Driver		Configure
Client for Microsoft Networks	This	s connection uses the following items:
✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓		Client for Microsoft Networks
		Virtual PC Network Filter Driver
✓		QoS Packet Scheduler
		File and Printer Sharing for Microsoft Networks
✓		Internet Protocol Version 6 (TCP/IPv6)
	(⊡	🗠 Internet Protocol Version 4 (TCP/IPv4) 🕽 🗲 💳
 Link-Layer Topology Discovery Responder 		- Link-Layer Topology Discovery Mapper I/O Driver

Step 9: In 'Properties', set the IP address to a static address.

nternet Protocol Version 4 (TCP/IPv4) Properties 🛛 🖗 🐹
General	
You can get IP settings assi this capability. Otherwise, y for the appropriate IP settin	gned automatically if your network supports you need to ask your network administrator ngs.
Obtain an IP address a	automatically
 Obtain an IP address a Ouse the following IP address a 	automatically ddress:
 Obtain an IP address a O Use the following IP address: 	automatically ddress: 192 . 168 . 1 . 5
 Obtain an IP address a Ouse the following IP address: IP address: Subnet mask: 	utomatically idress: 192 . 168 . 1 . 5 255 . 255 . 255 . 0

Type an IP address of 192.168.1.5 (Any address on the same subnet as the controller will work). Set subnet mask to 255.255.255.0

<u>Step 10:</u> To connect to the controller, open a browser such as Chrome or Firefox. Enter 192.168.1.4, the default system port IP address.



You will see the controller software on your computer screen.



Connecting using the Ethernet Port Directly or via LAN to PC



Turn on the computer and make a physical connection by using a straight through Ethernet cable.

Turn on controller. Verify the controller IP address in 'Communication Interfaces' or press toggle button to verify the IP address. If defaulted 0.0.0.0 set desired IP address. Set a static IP address of the Computer/Laptop to 10.10.30.98 (example) and subnet mask to 255.255.255.0. (For instructions, see the example in "Step 9" earlier in this section.)

To connect to the controller. In the Computer/Laptop open a browser such as Chrome or Firefox. Enter 10.10.30.99, the default Ethernet port IP address.



You will see on your computer screen the controller software



NOTE: Controller does not have a DHCP client, it will not automatically configure itself with a usable IP address. Consult your Network Administrator for configuring a correct IP address for your network. The PC, Laptop or Tablet IP address will need to be configured to communicate with the controller.

3.2 Gen IV iBC Wi-Fi Controller

This section lists the recommended iBC tool settings for connection to the iBC. It also contains example Wi-Fi communication settings for the tool and a few examples of how to set up the most common type or rundown strategies.

Required Items:

- Acradyne-Tool-Manager Software
- Can be found at <u>www.aimco-global.com</u>
 iBC Manuals
 - Can be found at <u>www.aimco-global.com</u>
- USB-A to Mini USB Cable (included with the tool)
- Wi-Fi Router with connection to an iBC Controller or plant wifi configuration (user responsibility)

HST-Tool-Manager Version: 2.0.2.2	0		
	tool no.: 17020002	read	write
tool:		read d	lata from tool
tool name:	TorqBee-A	firmware version:	2.0.1.19
tool type:	TB-A-EC-55	firmware date:	9/26/2016
tool no.:	17020002		
inventory number:	0024	program:	9
sensor type: sensor no.:	PRG3-6000-HS- 2016K0001	barcode: job/sequence:	1 0
sensor cal. date:	1/17/2017	battery voltage:	18.00 [V]
next MCT:	N/A	rpm max.:	160 [rpm]
screws until service:	N/A	torque range:	15.00-55.00 [N·m]
programmi	ng	setu	p
COM10: connected		🕹 adminis	trator 📃 🗐 US 🔹

Editing the tool's parameters via the AcraDyne-Tool-Manager Software:

- Remove the battery from the tool.
- Connect tool to PC using the mini-USB cable.
- Launch the AcraDyne Tool Manager
 - Login as:
 - Administrator: "Admin" This accesses the tool setup and program menus OR
 - Network Administrator: "Instand" This accesses the Wi-Fi setup menu
 - Read the Tool parameters from the tool.
 - Edit parameters as needed.
 - $\,\circ\,$ Write the new parameters to the Tool.
- Disconnect the Tool from the computer.
- Install the battery on the Tool.

Recommended tool setup parameter settings for iBC connection:

- Tool: setup menu (Login as: Administrator, passcode "Admin")
 - General
 - Manual mode active: [unchecked]
 - Enable over: 'external control unit' OR 'barcode & external control unit' if the tool is equipped with a scanner.

general	management	signals	communication	graphics	system time	basic settings	update			
	energy s	aving								
	displa	ay shut o	ff after:	300	[s]					
	tool shut off after:			6000	[5]					
	LED ligh	ting								
	afterg	glow:		5.0 [s]						
	🗹 setup menu									
	🗆 sca	nner sele	ectable	🗷 handm						
	NOK cor	nfirmatio	n on display	NOK o	tive					
	🗆 manual	annual mode active								
	enable ov	er: bar	code & external o	ontrol uni	it • + 🗆 reve	rse enabled				

- Communication
 - Spool: record in spool, 10 trials, 1s period
 - Block tool until answer: [checked]. This prevents the tool from running a second rundown, if the tool is disconnect from the controller just before or while running.

general	management	signals	communication	graphics	system time	basic settings	update
telegran	ns						
		ranhies					
	2	rtransm	nit data:				
		■ OK	12 N	IOK	🗆 reverse	2	
			divisor:	1		-	
	s	pool:					
		✓ reco	rd in spool				
		trials	s: 10	period	le: 1.00	[s]	
			ock tool until ans	wer			
		abor	t telegram				

- Basic settings
 - Hardware configuration:
 - Display: [checked]
 - Scanner: [checked if equipped]
 - Radio: [checked]

- Recovery: [unchecked]. Note: On power up, this prevents the tool from running until connection to the controller is established.
- Tool: programs menu
 - Delete all jobs
 - Delete all barcodes

Establishing Wi-Fi Connection to iBC:

- Wi-Fi Network Setup (Login as: Network Administrator, passcode "Instand")
 - Setup WILAN
 - Wi-Fi Router settings (SSID, Network Key) or plant network settings
 - If the router is compatible, it is recommended to use 5 Ghz band.
 - It is recommended to select 3 channels from the channel list
 - Setup IPv4
 - Own IP Address (unique IP Address for the tool)
 - Port (5000 5010)
 - Server IP Address (controller's IP Address)
 Port (5000)
 - Subnet Mask
 - Default Gateway (Wi-Fi Router IP Address)

Example Wi-Fi settings for tool and iBC controller:

basi	c settin	gs	special m	odel	calibration	upda	ate serv	vice MCT
gene	eral	manage	ment	signals	communi	cation	graphics	system time
Wi-Fi	IPv4	IEEE 802	2.1X ro	aming	telegrams			
authe	entificat	tion type:	WPA2		•			
SSID:				******				
netw	ork key		-	******				
regio	n:		US		•			
band	:		5 GHz		- channe	l list:	36, 40,	44, 48, 52, 5(•
trans	mitting	power:	17 dBm	/ 50 mW	DFS ba	ckup cha	nnel: none	
conn	ection	ype:	infrastru	icture	•			
								100
H		2 4 1	too	ol no.: 17	020002		read	write
1000	isetio							
mmu	ID.A	1555.000			DEGCO			
/1-11	1- 44	IEEE OUZ.	IX 10	aming	NF000			
	n	etwork pro	otocol:	TCP		•		
		DHCP						
	0	wn IP-add	ress:	10	. 10. 13. 50	por	t: 5000 -	5010
	SE	erver IP-ad	idress:	10	. 10. 13. 42	2 por	t: 5000	
	se	erver IP-ac ibnet mas	idress: ik:	10 255	. 10. 13. 42 . 255. 255. 0	2 por	t: 5000	
	se su de	erver IP-ac ibnet mas efault gati	idress: ik: eway:	10 255 192	10.13.42 255.255.0 168.1.1	2 por)	t: 5000	





- When the tool battery is plugged in, the display will show:
 - Scan While looking for the Network.
 - Join Network found, entering credentials.
 - Join Server Connected to Network, looking for controller.
 - Depending on PSet Number selected on the controller, the tool's display will show:
 - Enable n Where n is a valid PSet Number.
 - Disable If the selected PSet Number does not exist in the tool. The controller LED Display will show INVP.

Torque Units:

There are two places in the Acradyne-Tool-Manager software to select the units for torque. One affects how units for torque are displayed in the Acradyne -Tool-Manager software. The other affects what units torque are displayed on the tool and reported to the iBC controller. Both settings are independent of each other.

Selecting the units for the torque values displayed in the Acradyne -Tool-Manager software:

& HST-Tool-Manager Version: 2.0.2.20	
📄 🂾 🛢 👰 🕹 👸 🛛 tool no.: 1702000	2 read write
🗲 tool: setup: ү setup language / un	its
settings	
display network data role	s update
language:	US -
torque:	[N·m] •
force:	select unit for torque in HS
stroke:	[mm] •

Selecting the torque units reported by the tool and displayed on the iBC controller:



Program Examples:

The following are examples on how to setup some common rundown strategies. Note: The term 'Program' in the AcraDyne -Tool-Manager software is synonymous with 'PSet' in the iBC and the term 'Step' synonymous with 'PSet'



Disassembly:

The CCW program that the other programs use for reverse. Note: reverse program is checked.



description: CCW Reverse step number: 1		option	B		
description: CCW Reverse itep in number: 1 the step if NOK end end is the if NOK or CK interrupted stat: restart current step if NOK or CK interrupted stat: restart current step if NOK or CK interrupted stat: restart current step if NOK or CK interrupted stat: restart current step if NOK or CK interrupted stat: restart current step if NOK or CK interrupted stat: restart current step if NOK or CK interrupted stat: restart current step if NOK or CK interrupted stat: restart current step if NOK or CK interrupted stat: restart current step if NOK or CK interrupted stat: restart current step if NOK or CK interrupted stat: restart current step if NOK or CK interrupted stat: restart current step if NOK or CK interrupted stat: restart current step if NOK or CK interrupted stat: restart current step if NOK or CK interrupted stat: restart current step if NOK or CK interrupted stat: restart current step if NOK or CK interrupted stat: restart current step if NOK or CK interrupted stat: restart current step if NOK or CK interrupted stat: restart current step if NOK or CK interrupted stat: restart current step if NOK or CK interrupted stat: restart current step if NOK or CK interrupted stat: restart current step if NOK or CK interrupted stat: restart current step if NOK or CK interrupted stat: restart current step if NOK or CK interrupted stat: restart current step if NOK or CK interrupted stat: restart current step if NOK or CK interrupted stat: restart current step if NOK or CK interrupted stat: restart current step if NOK or CK interrupted stat: restart current step if NOK or CK interrupted stat: restart current step if NOK or CK interrupted stat: restart current step if NOK or CK interrupted stat: restart current step if NOK or CK interrupted stat: restart current step if NOK or CK interrupted stat: restart current step if NOK or CK interrupted stat: restart current step if NOK or CK interrupted stat: restart current step if NOK or CK interrupted stat: restart current step if NOK or CK interrupted stat: restatt step if					
description: CCW Reverse step number: 1					
<pre> (direction of rotation:</pre>	description: CCW Rever	se	S	tep number: 1	
<pre> function:</pre>					
<pre>interrupted start: restart current step - next step if OK: end interrupted start: end idicard result f tool: programs: program 0: step 1: general gear strategy option f tool: programs: program 0: step 1: general gear strategy option f tool: programs: program 0: step 1: general gear strategy option f tool: programs: program 0: step 1: general gear strategy option f tool: programs: program 0: step 1: general gear strategy option f tool: programs: program 0: step 1: general gear strategy option f tool: programs: program 0: step 1: general gear strategy option f tool: programs: program 0: step 1: general gear strategy option f tool: programs: program 0: step 1: general gear strategy option f toopue Nem f toop</pre>		_ characteristics: —	_		
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<pre>discard result discard result discard result discard result direction of rotation:</pre>		next step if NOK:	end	•	
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<pre>@ loop program to step 1: general gear strategy option direction of rotation: ① CCW - start-up ramp: 0.300 [6] control method: [pm • rpmtarget: 160 [rpm] stop mode: no stop • foot programs: program 0: step 1: general gear strategy option</pre>		0			
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control method: rpm rpmtarget: 160 (rpm) stop mode: no stop <pre> foot programs: program 0: step 1: general gear strategy option phifting conditions:</pre>	direction of rotation:	5 ccw	•	start-up ramp:	0.300 [s]
<pre>stop mode: no stop</pre>	control method:	rpm	•	rpmtarget:	160 [rpm]
<pre>stop mode: no stop</pre>					
<pre> toot programs: program 0: step 1: general gear strategy option iterque: Muarget 000 [Vm] Minit 2000 [Vm] urrent [A] gradient: transet reveluation: torque Control Strategy: Torque Control Strategy: Torque control with 'Mstart' ('In-Cycle') set to 2Nr Time out set for 10 Seconds if iterce is the set for 10 Seconds if iterce is the set for 10 Seconds if iterce is the set for 10 Seconds if iterce evaluation forgram name: To 10Nm program number: 1 reverse program fordule for iter is the set is th</pre>	stop mode:	no stop	•		
<pre> tool: programs: program 0: step 1: general gear strategy option if torque: Marget SOO IN Minit 2000 IN Minit 2000 IN Minit 2000 IN Gradient: gradient: gradient: torque: torque:</pre>					
<pre> took programs: program 0: step 1: general gear strategy option stifting conditions:</pre>					
general gear strategy option shifting conditions: Image:	tool: programs: progr	ram 0: step 1:			
shifting conditions: I torque [Wm] Masart 2000 [Vm] Mimit 2000 [Vm] Mimit 2000 [Vm] Mimit 2000 [Vm] Garget Control Strategy: Torque Control Strategy: Torque control with 'Mstart' ('In-Cycle') set to 2Nr Time out set for 10 Seconds Torque control with 'Mstart' ('In-Cycle') set to 2Nr Time out set for 10 Seconds Torque read write torque read write tool program sprogram 1: program option program name: Tc 10Nm program number: 1 reverse program time evaluation total time: total time:	general gear strategy	option			
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Image:	(U) Metarget 5.50	[N·m]		Munit 20.0	0
Image: Image: Image: Image: <td< td=""><td>U Mlimit 20.00</td><td>[N·m]</td><td></td><td></td><td></td></td<>	U Mlimit 20.00	[N·m]			
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• current: • current: • gradient: • torque • torque • control Strategy: Forque control Strategy: Forque control with 'Mstart' ('In-Cycle') set to 2Nr Time out set for 10 Seconds • tool set for 10 Seconds • tool program: • tool no: 17020002 • tool program: • tool no: 17020002 • tool program: • tool regram number: • tool program name: • tool no: • total time: • characteristics: • total time: • characteristics: • total time: • characteristics: • total time: • step3	Ataroet 9000	ເງ			
• gradient: • unput 9000 • torque • tool no: 17020002 • tool programs: • tool no: 17020002 • tool: • tool no: 17020002 • tool: • program number: • tool: • tool no: 17020002 • tool: • program number: • tool: • program number: • tool iprogram • default program • total time: • characteristics: • total time: • characteristics: • total time: • total • total • step3 • total • step3	Current:			/	
• time:	⊙ gradient:				
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<pre>i i i i i i i i i i i i i i i i i i i</pre>	Torque:				
tool: programs: program 1: program option program name: Tc 10Nm reverse program ✓ default program time evaluation characteristics: • time evaluation characteristics: • total time: reverse after joint: if NOK or OK errors per screw: 1 counter 1	Forque Contro Forque contro Forque contro Fime out set fo	ol Strategy: ol with 'Mstc or 10 Secon	ırt' (' ds	In-Cycle')	set to 2Nr
program option program name: Tc 10Nm program number: 1 reverse program time evaluation time evaluation time: total time: total time: total time: total time: total time: total time: total time: total time: total time: total time: total time: total time: total time: total time: total time: total time: total time: total time: total time: total time: total time: total time: total time: total time: total time: total time: total time: total time: total time: total time: total time: total time: total time: total time: total time: total time: total time: total time: total time: total time: total time: total time: total time: total time: total time: total time: total time: total time: total time: total titter: total time: total time: total titter: total time: total	Forque Contro Torque contro Time out set fo	ol Strategy: ol with 'Msta or 10 Secon	urt' (' ds	In-Cycle') read	set to 2Nr
program name: Tc 10Nm program number: 1 reverse program	Torque Contro Torque contro Time out set fo Time out set fo toot: programs: prog	bl Strategy: bl with 'Msta or 10 Secon tool no.: 17020 ram 1:	urt' (' ds	In-Cycle') read	set to 2Nr
program name: Tc 10Nm program number: 1 reverse program time evaluation ⓒ total time: ⓒ tot	Forque Contro Torque contro Time out set for toot: programs: prog program option	ol Strategy: ol with 'Msta or 10 Secon tool no.: 17020 ram 1:	ırt' (' ds	In-Cycle')	set to 2Nr
reverse program ✓ default program Characteristics: reverse after joint: if NOK or OK errors per screw: counter 1 step 1 step 2 step 3 step 4 step 5 step 5 step 5	Forque Contro Torque contro Time out set for tool: programs: prog program option	ol Strategy: ol with 'Msta or 10 Secon tool no.: 17020	urt' (' ds	In-Cycle') read	set to 2Nr
imme evaluation characteristics: reverse after joint: if NOK or OK errors per screw: 1 counter 1 step 1 step 2 Tc 10Nm step 3 istep 4 step 5	Torque Contro Torque contro Time out set for tool: programs: prog program option program name: Tc 10h	ol Strategy: ol with 'Msta or 10 Secon tool no.: 17020 ram 1:	urt' (' ds	In-Cycle') read	set to 2Nr write
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errors per screw: 1 counter 1 step 1 step 2 Tc 10Nm step 3 step 4 step 5	Torque Contro Torque contro Time out set fo toot: programs: prog program option program name: Tc 10h reverse program	ol Strategy: ol with 'Msta or 10 Secon tool no.: 17020 ram 1:	art' (' cls 0002 ☑ de 〔 ^{cha}	In-Cycle') read program nu fault program	set to 2Nr write
Counter 1 Step 1 step 2 Tc 10Nm step 3 Step 4 step 5	Torque Contro Torque Contro Time out set fo tool: programs: prog program option program name: Tc 10h reverse program time evaluation time evaluation total time:	ol Strategy: ol with 'Msta or 10 Secon tool no.: 17020 ram 1:	art' (' ds 0002 ☑ de revi	In-Cycle') read program nu fault program rracteristics: erse after joint:	set to 2Nr write mber: 1
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Image: step 1 step 2 step 3 step 4 step 5 step 5 Tc 10Nm Image: step 3 Image: step 4 step 5 step 5	Forque Contro Torque contro Torque contro Time out set for tool: programs: prog program option program name: Tc 10N reverse program time evaluation time evaluation	ol Strategy: ol with 'Msta or 10 Secon tool no.: 17020 ram 1:	urt' (' ds 0002 ✓ de rev erro cou	In-Cycle') read program nu fault program iracteristics: erse after joint: ors per screw: nter	set to 2Nr write mber: 1
Tc 10Nm	Forque Contro Torque contro Time out set for Time out set for tool: programs: prog program option program name: Tc 10N reverse program time evaluation total time:	ol Strategy: ol with 'Mstc or 10 Secon tool no.: 17020 ram 1:	art' (' ds 0002 ✓ de revu error cou	In-Cycle') read program nu fault program iracteristics: erse after joint: ors per screw: nter	set to 2Nr write mber: 1
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	Torque Contro Torque contro Time out set for time out set for tool: programs: prog program option program name: Tc 10N reverse program time evaluation total time: total time: total time: total time: total time: total time:	ol Strategy: ol with 'Mstc or 10 Secon tool no.: 17020 ram 1: Nm	art' (' ds 0002 ✓ de rev erro cou	In-Cycle') read program nu fault program rracteristics: erse after joint: ors per screw: nter	set to 2Nr write mber: 1
	Torque Contro Torque contro Time out set for time out set for tool: programs: prog program option program name: Tc 10N reverse program time evaluation time evaluation total time: Step1 Tc 10Nm Tc 10Nm	ol Strategy: ol with 'Mstc or 10 Secon tool no.: 17020 ram 1: Nm	art' (' ds 0002 ♥ de cou	In-Cycle') read program nu fault program racteristics: rese after joint: ors per screw: nter	set to 2Nr write mber: 1







Not Sending Run Data to Controller on a 'Free Run Stage'

This setting will not send rundown data when trigger is released on a free run. Set the interrupted start to restart current step, shown below. This can be set as a stage in the program.

🕹 AcraDyne-Tool-Manager Ve	ersion: 2.0.2.24 (MANUFACTURER)				<u></u>
- 7 - * 4	tool no.: 17250	800	read	write	
tool: programs: pro	gram 1: step 1:				
general gear strategy	/ option				•
description: Tc 10Nm		step	number: 1		
	c charactoristics:				
	characteristics.			•	
	interrupted start:	restart cur	rent step 🔹		
	next step if OK:	end	-		
	next step if NOK:	end	•		
	🗆 dis	card result			
			🕹 manu	facturer 📄 💽 US 🔹	

The tool will display the screen below when the trigger is released.



4. Home Page (Main Menu)



4.1 Run

The Run Screen is essentially the dashboard of the Gen IV controller and provides a look at real-time information regarding rundowns.



Time (In-Cycle) Screen

JOB:	Indicates the current JOB.
PSet:01	Indicates the current PSet in which you are operating.
\checkmark	Indicates accepted rundown.
\times	Indicates failed rundown.
11.90 _{Nm} 210°	Displays Torque and Angle for current rundown.

Graph displays curves representing Torque (black trace) and Angle (blue trace). The blue left arrow at the origin of the graph will change the X-axis of the rundown curve from Time (In-Cycle) to Time (Overall) and Angle.

Below the graph is a historical table that will give information and status of the most recent rundowns, including current PSet, accepted/failed rundown status,torque and angle.



Arrows allow user to scroll through screens that show real time Job information such as Run Screen or rundown indicators.





Home tab will return user to the Home Page

On the Run Screen, click 🍘 for curve detail.



Choose Time In-cycle, Time Overall, Angle, or Angle In-Cycle screen

Large Screen Indicators and Audit information

The large screen indicators are helpful in viewing real time results of the rundown from a distance.



Example of Accepted Job

Example of Failed Job



4.2 Job

A Job is a collection of PSets which can be run when performing multiple fastening operations on a single application.



4.2.1 Add New Job

To add a new Job press

on the Home Page.

Advanced Options

Job 1

Disable Tool

Press 🛖 on Jobs screen (above) to enter Add New Job screen (below)

Job Number

Job Name

Job Action

Job Number: Up

to 99 Jobs can be configured.

Job Name: Enter Job Name

Job Action:

• Disable Tool: Disable tool after job is finished. Job complete Icon will appear.



Tool will not operate until job is reset.

• **Reset Job:** Will reset after Job is finished. Once Reset Job is finished, the following icon appears:



This means that results from the last successful rundown of a job are cleared. Information from last successful rundown can still be accessed in the table of the rundown view/curve display on the main Run Screen (see "4.1 Run" on page 12.

After appropriate values are entered, press 🛖 to go to Add New Job Sequence screen.

Add New Job Sequence Job Control Parameters	i de jier die
PSet	PSet 1 🔹
Action	None •
Count	1

PSet Number: Choose any current PSet already configured in controller.

Action:

- None: Will stay in current sequence.
- Next: will advance to next sequence set up after count is reached.

Count: Fastener number required to complete sequence.

Once values are entered press ✔ two times to return to Job screen

4.2.2 Advanced Options

Enter Advanced Options Advanced Options

Lock on Reject Parameters:

• Enable: When enabled, this prevents tool from starting a new rundown if the result of the last rundown was a reject. Tool remains locked until one of the four Unlock Mode conditions are satisfied.



if needed

Limit Reject Parameters:

- Enable: Enable or Disable
- Maximum Rejects: Number of rejected fasteners allowed

Additional Options:

• **Report Missing Fasteners:** Add an option to each JOB to allow the reporting of any missing fasteners. When it is set the controller will report an NOK rundown for each fastener that is defined in the JOB but has not been ran. These NOK results will be reported whenever a new job is started AND the prior JOB is incomplete.

These generated NOK results are treated like any other fastening. They are displayed on the run screen, stored in the results and transmitted on all protocols.

Lin V V Fter Job is finished. Once Reset

4.2.3 Jobs "Enabled" Display and Button Function



- Increment and Decrement buttons change the job sequence. The PSet number will change and job sequence number on secondary display will change if jobs are enabled.
- Holding the toggle button will display will display the Job number, while pressing increment or decrement buttons will change it. The two numbers on the PSet/Job display will be separated by decimals.
- Pressing the toggle button will change secondary display between:
 - Units of measure
 - Ethernet 1 IP address
 - Ethernet 2 IP address
 - System port IP address
 - Angle report
 - Bolt count
 - Job sequence

NOTE: Job sequence shows which PSet you are currently on in the job (this is not the pset number). The first pset in the job is always job sequence 1, and the next is 2, etc.

Bolt count is shown as current bolt count out of total number of bolts. Example: If you have 3 total bolts. When you start the job you will see 0.3. After one rundown you will see 1.3 and then 2.3 on the next run and so on until the job is completed.

4.3 Results

1188 R	esuits						
ID	Time Stamp	PSet	ок	Torque	Angle	Pulses	
1188	01/01 01:36:21	1	<	45.74 Ftlb	125°	0	-
1187	01/01 01:36:10	1	<	45.73 Ftlb	127°	0	
1186	01/01 01:36:03	1	<	46.27 Ftlb	128°	0	
1185	01/01 01:35:52	1	<	46.46 Ftlb	121°	0	
1184	01/01 01:35:34	1	<	46.33 Ftlb	124°	0	
1183	01/01 00:01:42	1	✓	46.11 Ftlb	123°	0	
1182	01/17 07:08:36	2	۶	0.00 Nm	0.0°	0	
1181	01/11 07:13:59	1	<	45.98 Ftlb	133°	0	
1180	01/11 07:13:22	1	<	45.79 Ftlb	137°	0	
1179	01/11 07:13:15	1	<	45.82 Ftlb	132°	0	
1178	01/11 07:13:07	1	<	46.66 Ftlb	138°	0	
1177	01/11 07:12:58	1	×	0.17 Ftlb	54.0°	0	
1176	04/04 12:45:15	1	×	48.36 Ftlb	1.0°	0	
_							
					(

This screen provides a history of rundowns performed. Information such as ID Number, Time Stamp, Parameter Set#, Accept / Reject status, and Torque and Angle are recorded for each rundown.





4.3.1 Saving Rundown(s)

Saving All Rundowns

Click on **I** in main rundown screen to view/save total rundowns. A dialog box will open that allows vou to choose the download format, either a CSV file or a TW4 file. The CSV file includes rundown data in tab separated variables and can be viewed using Excel or opened it text editor such as Notepad. The raw data can be imported to Excel to build graphs, charts etc. Contact AIMCO Technical Service for pre-made Torque and Angle Templates.

The TW4 file can be opened using the ACE Platform G4 Utility located on the software page of the AIMCO website.

Save Results		_
File Type	CSV	~
Include Stage Resul	ts	
Include Log Entries		•
~	0	

The dialog box also shows options for including stage results or log entries in the downloaded file. If downloading a TW4 file, all information will be automatically selected.

Click 🗸 and your browser will download the file.

Saving Individual Rundowns



rundown from the Results screen.

This opens the Rundown Information View. Click on

in save the rundown. The file will automatically download as a CSV file.

Rundown Information View

Sample of Individual Rundown Information

✓ 15.33 _{Nm} 3°	
Torono Torono 15 00 15 00 10 00 5 00 5 00 10 05 10 09 10 09 10 09 10 09 10 09 10 09 10 10 Time (in Cycle) FS 1 (12Nm, 2Sec, Unfasten, 1 > 1 - TC (12, 150RPM) > 2 - Delay (2Sec) > 3 - Unfasten (720°, 50RPM) > 4 - TC (16, 300RPM)	Angle 3 1 2 2 1 -1 -1 -2 -2 -2 -2 -2 -2 -2 -2 -2 -2 -2 -2 -2
Advanced	

1	Result	65	
2	Job Numb	1	
3	Job Name	Paramont	
4	Job Seque	1	
5	Bolt Coun	3	
6	Date	*****	4:18:00
7	Master Ru	0	
8	PSet ID	59	
9	PSet Num	1	
10	PSet Nam	e	
11	Tool Mode	AEN32030	Α
12	Tool Seria	191111	
13	Torque	11.69	
14	Angle	57	
15	Pulses	0	
16	Torque Sta	P	
17	Angle Stat		
18	Pulse Stat		
19	Rundown	Ρ	
20	Tool Cycle	1111	
21	ID1 ("ID #1	2.2E+10	
22	ID2 ("ID #2	4.86E+10	
23	ID3 ("ID #3	3")	
24	ID4 ("ID #4	F.)	
25			
26			
27			
28	Curves		
29	Tick	Torque	Angle
30	0	0.02	0
31	1	0.02	0
32	2	0.05	0
33	3	0.04	0
34	4	0.09	0

4.4 Controller

Controller Configuration Menu	
Controller Type	Ю
Communication Interfaces	Protocols
Front Panel Buttons	Power Up
BarCode Setup	Set Time
Remote Connections	Lock Tool On Reject
Languages	

The controller menu is where all of the settings for the Gen IV controller are configured. All of the different configuration capabilities are explained in the following sections.

4.4.1 Controller Type

С	ontroller
Ty	pe:
•	IBC:
	Intelligent
	Battery Too
	Controller



Port Number:

This is the data port that the controller will be looking to in order to communicate with the tool over WiFi. Default setting is 8000. User may configure the Port to what is desired. **Note: The tool settings must also be configured to match what the controller port setting is configured to. Using AcraDyne Tool Manager Software adjust settings in the Network Administrator area with the tool connected to a PC (See AcraDyne Tool Manager Software and Manual for specifics.**

Generate Tool Not Connected Errors: Select this box when user desires network traffic to include a "Tool Not Connected" error message.

<u>4.4.2 IO</u>



4.4.2.1 Physical I/O

Physical 10 Conf	iguration		
Input	Function	State	Force
1	Disable	-	
2	Start	-	
3	Stop	-	
4	Select PSet / [
5	Used By Input	-	
6	Used By Input	-	
7		-	
8			
Output	Function	State	Force
1	External Contr	-	
2	External Contr	_	_
_	External Contra	-	
3	In Cycle	-	
3	In Cycle Service Indicat		
3 4 5	In Cycle Service Indicat Torque Low	•	
3 4 5	In Cycle Service Indicat Torque Low Angle High	•	
3 4 5 6	In Cycle Service Indicat Torque Low Angle High Angle Low	•	
3 4 5 6 7 8	In Cycle Service Indicat Torque Low Angle High Angle Low Job Complete		

NOTE: See "11. Assignable I/O" on page 43 for details.

Assign functionality to 24V Input and Output pins. Shows the "live state" of each Input and Output.

Functions shown in screen shot are default settings.

To change these assignments, click on any I/O state to enter Output/Input Configuration screen (following).



See "11. Assignable I/O" on page 43 for more details on available assignment functions and how to configure.

See "10. 24 Volt I/O" on page 41 for the pinout of the 24Volt Logic IO port, and wiring examples.

4.4.2.2 Physical I/O Monitor

Provides monitoring of Physical 24 Volt I/O. Force on/off the individual I/O pins for testing of field wiring.

Each indicator shows the state of the associated pin. Green = On

- Green = On Red = Off
- Force: When Buttons from I/O are selected, this field selects which Inputs and Outputs can be forced through the Monitor I/O screen.

Physical IO Input	Monitor					
State	Off/On	Force		State	Off/On	Force
	0				0	
2	0		6		0	
3	0				0	
4 Output	0		8		0	
State	Off/On	Force		State	Off/On	Force
	0		5		0	
2	0		6		0	
3	0				0	
4	0		8		0	

• **Off/On:** If Force is enabled this button will toggle the state of input or output selected.

NOTE: See "11. Assignable I/O" on page 43 for details.

4.4.2.3 Anybus/Modbus TCP/Ethernet IP Inputs

These types of communication are useful for data communication between controller and PLCs. It is an effective, quick way for the data transfer of short data packages.





Example of the Anybus Input screen with five Inputs set up.



Click on O to change an individual Element or return to Input Configuration screen.

Will delete individual Elements.

Element Type: Choose from Byte, Int16, Int32, or ASCII.

Element: Shows element # being configured

Bit: Enter Bit #.

Bits: # of bits the assignment will read.

Start at: Starting bit location.

Polarity (not shown): Select Normally Open (N.O.) or Normally Closed Outputs (N.C.).

Length (not shown, available in ASCII ID function): Number of characters desired to send.

Torque (not shown, available in Click Wrench function): Torque value to be reported when using Click Wrench input. Value input is what will be sent from controller when Input Signal is received from a Click Wrench. Value is NOT calculated by the controller rather it is solely what the Click Wrench is calibrated to by outside means.

Torque Units (not shown, available with Click Wrench function): Choose from Nm, Kgm, Kgcm, Ftlb, and Inlb.

Function: See "11. Assignable I/O" on page 43 for details. Select desired Input Function(s).

Click on ✓ after appropriate selections are made.



4.4.3 Communication Interfaces

The Communications Menu will vary depending on system configuration.



4.4.3.1 Ethernet/Second Ethernet



IP Address:

IP address of controller's Ethernet port.

Subnet Mask:

Subnet mask of the controller.

Gateway:

Gateway is the IP address of the gateway computer that provides access beyond the local network.

NOTE: Consult your local System Administrator to connect the controller to your Network and assign IP addresses.

4.4.3.2 System Port



IP Address: IP address of the controller's System Port (Default is 192.168.1.4)

Subnet Mask: The Subnet Mask of controller's System Port.

NOTE: It is not recommended to change this setting.

4.4.3.3 Serial Port

Serial Port Configuration				
Port Mode	Serial Output And Barco 🗸			
Baud	9600 ~			
Data Bits	8 ~			
Stop Bits	1 ~			
Parity	None ~			
a	e .:			
Serial Output Format	Options			
Format	Standard ×			
Output Followed By NULL Control Character				
Change Outputs				
Send PSet Change				
Send JOB Completed				

Port Mode: The following modes are available:

- Serial Output: A serial data string will be Output in the following format after each rundown:
 - # P 1 BB TTT.T AAAA 0000 0000 J (Notice the decimal point next to the least significant T)
 - P: Parameter set ("1" "9") for PSets 1-9, ("A" – "W") for PSets 10-32.
 - B: Job count
 - T: Torque result
 - A: Angle result
 - J: Judgment
 @=overall pass, H=low torque, I (eye)=high torque, J=low angle, K=high angle, G=fault during fastening
- **Barcode Reader:** See "5. Barcode Reader Details" on page 34 for Barcode setup.
- Serial Output and Barcode Reader
- Open Protocol
- **PFCS:** Select from dropdown and configure per hardware requirements
- PI Line Control: This is customer specific. Please reference PI Line Control Document on <u>AIMCO</u> <u>Website/Product Manuals</u>

Baud: Serial ports can be configured for different baud rates available

 75, 110, 300, 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200

Data Bits/Stop Bits/Parity: Configure per hardware requirements

Serial Output Format Options: (see "Serial Output Format Options" on page 23)

- Standard
- Standard with PSet
- UEC Serial Modified
- Profibus
- UEC Serial

Output Followed by Null Control Character: Adds

a one-byte NULL character to the end of the serial string. Needed by systems that use the NULL character to signify the end of the string. See following section for more information.

Send PSet Change

 Sends a serial string any time the PSet is changed. String is in the form '%%CAN8X%%%CAN4YNAC%%' where X is the previous pset and Y is the new pset. See following section for more information.

Send Job Completed

 Sends a serial string containing "Job Completed" whenever a job has been completed.

Gen IV Serial Port Pin-out

Pin	Signal
1	
2	RX
3	тх
4	DTR
5	GND
6	
7	
8	
9	



Pin 6 Pin 9

4.4.3.4 Anybus

NYBUS Configuration	Node Address:
Module Type	Configures the
Firmware	
Serial Number	addross for
Module State	
Network Supervised	controller.

4.4.3.5 Spindle USB



This can be used to set up a 2 spindle network through the USB port.

4.4.3.6 Serial USB



See "4.4.3.3 Serial Port" on page 21 for reference

Serial Output Format Options

Standard Output Format:

- O P HHHHH LLLLL TTTTT P HHHHH LLLLL AAAAA CR CR NULL*
 - O: Overall Pass/Fail
 'P' = Pass, 'F' = Fail
 - P = Pass, F =
 P: Torque Pass/Fail
 - 'P' = Pass, 'F' = Fail
 - HHHHH: Torque High Limit
 - Units selected in the PSet X10
 - LLLLL: Torque Low Limit
 - Units selected in the PSet X10
 TTTTT: Torque Result
 - Units selected in the PSet X10
 - P: Angle Pass/Fail
 - 'P' = Pass, 'F' = Fail
 - HHHHH: Angle High Limit
 - Degrees
 LLLL: Angle Low Limit
 - LLLLL: Angle Low
 Degrees
 - AAAAA: Angle Result
 - Degrées
 - CR: Carriage return control character
 - CR: Carriage return control character
 - NULL*: Null control character (*if option is selected)

Standard Output with Carriage Return, Line Feed and PSet Format:

- O P HHHHH LLLLL TTTTT P HHHHH LLLLL AAAAA 1 CR LF NULL*
 - O: Overall Pass/Fail
 - 'P' = Pass, 'F' = Fail
 - P: Torque Pass/Fail
 - 'P' = Pass, 'F' = Fail
 - HHHHH: Torque High Limit
 - Units selected in the PSet X10
 - LLLLL: Torque Low Limit
 - Units selected in the PSet X10
 TTTT: Torque Popult
 - TTTT: Torque Result
 - Units selected in the PSet X10
 D: An also Data (Fail)
 - P: Angle Pass/Fail
 - 'P' = Pass, 'F' = Fail
 HHHHH: Angle High Limit
 - Degrees
 - LLLLL: Angle Low Limit
 Degrees
 - AAAAA: Angle Result
 - Degrees
 - 1: PSet
 - PSet('1' '9') for PSets 1-9, ('A' 'Z') for PSets 10-35
 - CR: Carriage return control character
 - LF: Line feed control character
 NULL*: Null control character (*if option is selected)

UEC Serial Modified Format (matches some Gen4 earlier versions):

- # P 1 BB TTT.T AAAA PPPP 0000 J CR NULL*
 - #: Message Start
 - P: PSet
 - PSet('1' '9') for PSets 1-9, ('A' 'Z') for PSets 10-35
 - 1: Spindle Number (Always 1)
 - BB: Job Bolt Count
 - Total number of accepts during the Job
 - TTT.T: Torque Result
 - Units selected in the PSet
 - AAAA: Angle Result
 - Degrees
 PPPP: Pulse Count
 - PPPP: Pulse Count
 0000
 - J: Judgment
 - '@' = Overall Pass, 'H' = Low Torque, 'I' = High Torque, 'J' = Low Angle, 'K = High Angle,
 - 'G' = Fault During Fastening
 - CR: Carriage return control character
 NULL*: Null control character (*if option is selected)

Profibus Output Format:

- %CAN 1 O P HHHHH LLLLL TTTTT P HHHHH LLLLL AAAAA NAC% CR LF NULL*
 - %CAN: Message Start1: PSet
 - PSet
 PSet('1' '9') for PSets 1-9, ('A' 'Z') for PSets 10-35

- O: Overall Pass/Fail
- 'P' = Pass, 'F' = Fail
 P: Torque Pass/Fail
 - 'P' = Pass, 'F' = Fail
- HHHHH: Torque High Limit
- Units selected in the PSet X10
 LLLL: Torque Low Limit
 - Units selected in the PSet X10
- TTTTT: Torque Result
- Units selected in the PSet X10
 P: Angle Pass/Eqil
- P: Angle Pass/Fail
 'P' = Pass, 'F' = Fail
- HHHHH: Angle High Limit
- Degrees
 LLLL: Angle Low Limit
- Degrees
- AAAAA: Angle Result
 Degrees
- Degrees
 NAC%: Message End
- RC %. Message End
 CR: Carriage return control character
- LF: Line feed control character
- NULL*: Null control character (*if option is selected)

UEC Serial Format (matches UEC 4800 and Gen3):

- # 1 P BB TTT.T AAAA PPPP 0000 J CR NULL*
 - #: Message Start
 - 1: Spindle Number (Always 1)
 - P: PSet
 - PSet('1' '9') for PSets 1-9, ('A' 'Z') for PSets 10-35
 BB: Job Bolt Count
 - Total number of accepts during the Job
 TTT.T: Torque Result
 - Units selected in the PSet
 - AAAA: Angle Result

S01: Spindle number

JB01: Job number

TTT.T: Torque

• MM: Month

YYYY: Year

• MM: Minute

SS: Second

<LF>: Line Feed

DD: Dav

• HH: Hour

AAA.A: Angle

- Degrees
- PPPP: Pulse Count
 - L = Low Pulse Count, M = High Pulse Count
- 0000
- J: Judgment
 '@' = Overall Pass, 'H' = Low Torque, 'I' = High Torque, 'J' = Low Angle, 'K = High Angle, 'G' = Fault During Fastening, '*' = None of these conditions apply
- CR: Carriage return control character

S: Torque Status (A = OK, H = High, L = Low)

S: Angle Status (A = OK, H = High, L = Low)

The NULL characters can be seen by using PUTTY and

connecting to the controller in 'Raw' mode. Then set

logging to log all output and check the log to see the NULL

PSets up to 9 match the number, 10-35 are A-Z, greater than

O: Overall Status (A = OK, R = NOK)

• VVV: 32 character barcode ID

• %%CAN8X%%%%CAN4YNAC%%

<CR>: Carriage Return

'Output Followed by NULL Character'.

- NULL*: Null control character (*if option is selected)
- 'CSV String'

0

0

0

0

0

0

0

0

characters.

'Send PSet Change'.

• X: Last PSet

• Y: New PSet

35 is '*'

23

 S01,JB01, TTT.T, S, AAA.A, S, O, MM/DD/YYYY HH:MM:SS, VVV<CR><LF>





4.4.5 Front Panel Buttons



Enable/ Disable front panel buttons on controller console.

4.4.6 Power Up

Allows user several "Job" choices upon controller Power Up:



Power Up Job

Number: Controller will power up on the job # selected. When "Last job" is selected, controller will power up on last job selected prior to being Powered Down.

• Last Job: Controller will default to last job performed.

Power Up Job Action

- **Reset Job:** Job will be reset when controller is Powered Up.
- Wait for Job Reset: Controller will wait for an External Job reset command upon Power Up and will retain job information existing prior to power down.
- **Resume Last Job:** Upon Power Up, tightening sequence will resume at the next fastening from the point in the job when power was shut down.

4.4.7 Bar Code Setup

Required Identifiers for Tool Enable: Selects which four Identifiers (ID#1-4) are required to enable tool.

Reset identifiers for Job Complete: Selects which four Identifiers (ID#1-4) to reset on a job complete. Select Identifiers by clicking on them.

Block New Identifiers While Job is Running: Check to enable feature that ignores any barcode scanning while a JOB is in progress



Step 2: Enter appropriate information on Barcode ID Configuration Screen.

Identifier Mask: The

Mask is a string used to compare against the received barcode. The received barcode must be at least as long in length as the Mask. The Mask can also contain "don't



care" characters of a decimal point or period in the string. These characters are counted in the length, however, the actual received character in that position doesn't matter.



Identifier Type: Identifies which identifier (ID#1-4) received barcode will be stored into.

Identifier Description: Text field can be used to give a description to each identifier type. (Example: Vehicle).

Action: Action executed by controller when barcode with a matching identifier mask is scanned. The actions are:

- Do Nothing
- Select Job (This will require a Job to be configured on the JOB page when using this option)
- Select PSet

Action #: When Select Job or Select PSet is selected, this is the number of the Job or PSet that will be selected.

Reset Identifiers: Can reset other identifiers (ID#1-4) when barcode is received. Click on identifiers to reset.

Step 3: Press **1** to save and re-enter completed barcode configuration screen.



Click anywhere in body if additional identifiers are required.

Press \checkmark to save barcode configuration.

See "5. Barcode Reader Details" on page 34 for more information)

To configure Serial Port for Barcode Reader: On Home page click Controller \rightarrow Communication Interfaces \rightarrow Serial

Select Barcode Reader and the correct Baud rate.

Serial Port Configuration		
Port Mode	Barcode Reader	•
Baud	9600	•
Data Bits	8	•
Stop Bits	1	•
Parity	None	٠

Press 💙 to save changes.

							-
Δ	1 1	R	S	ot.	Ti	m	6
	T.,		9				-

Set Contro Time (H	ller Time IH:MM:SS)	15:58:44
Date (<i>n</i>	nm/dd/yyyy)	08/09/2016
	Use PC Time	

Set time and date. If connected to a PC, use PC Time to set controller time.

4.4.9 Remote Connections



Sets number of remote browser connections to controller.

4.4.10 Lock Tool on Reject

When enabled, the tool will be disabled after an NOK rundown. The tool can be enabled with the "Remove Lock on Reject" assignable input.



Language

4.4.11 Languages

Select from:

- English
- Chinese
- Japanese •
- Korean ٠
- Spanish
- Portuguese

4.5 Accessories



This screen shows accessories configured in the controller. New accessories can be added, edited, and deleted using the buttons at the bottom of the table. The gear icon navigates to the Accessory Scanning and Setup page.

English



The Smart Arm Accessory allows an articulated arm with encoders to be used

with the Gen IV controller. Fastener locations can be programmed into the controller so that the controller will perform specific actions when the tool is located on a specific fastener.

For more specific instruction contact: AIMCO Technical Service, Toll Free 1-800-852-1368 or go to www.aimco-global.com/Resources/Manuals and download the Gen-IV Controller Smart Arm Configuration Manual.

4.6 **Diagnostics**



The Diagnostics menu contains all pertinent information regarding unusual behavior of the system. Detailed descriptions are given below.

Controller Overview 4.6.1

General

Type

Model Number

Serial Number

Model Number: Model Number of the controller.

Serial Number:

Serial Number of the controller.

Type: Type of controller:

IBC4: Intelligent **Battery Tool** Controller

SYSREL: System Release # shown

Application: Current

Application software version.



iBC4EG.001

261703

IBC4

Firmware: Current Firmware software version.

Available Hardware: Available hardware on the controller.

4.6.2 Controller Status

Controller Status Bus Voltages		
24 Vdc 5 Vdc 3.3 Vdc SOM 1.8 Vdc Mainboard 1.8 Vdc	OK 4.85 3.25 1.83 1.80	Sh sta ca va
Temperatures		
CPU Temperature (° C)	30	
Mainboard Temperature (° C)	31	
Active Faults		

Shows "Live" status of controller, voltages, active faults, and temperature.

Bus Voltages: Alarm icon will appear on controller console and under "Active Faults" (see below) if any of these values are out of range:

- 24 Vdc: Represents voltage from 24V power supply. Value is reported as on or off (.0-24.0 volts) and is for external use via 24V I/O port.
- **5 Vdc:** Represents voltage from 5V power supply powering controller electronics.
- 3.3 Vdc: Represents controller electronics internal 3.3V Bus voltage.
- SOM 1.8 Vdc: Represents controller electronics internal 1.8V Bus voltage
- Mainboard 1.8 Vdc: Represents controller electronics internal 1.8V Bus voltage

CPU Temperature (°C): Represents temperature of CPU measured in Celsius.

Mainboard Temperature (°C): Represents

temperature inside controller measures in Celsius.

Active Faults: Any tool/ controller faults will be shown in this area.

4.6.3 Live Tool

ive Tool View		
Serial Number		17270005
Battery voltage		18.73
Current		0.26
Torque		0
FET temperature		21.7
VCC external		3.3
Trigger		0
Button		0
Rotational direction	n	0
Error notification	status	0
Status notification	status	805080
Hall A		1
Hall B		0
Hall C		1
Ready		0
Enable		0
Disable		0
Disable direct		0
Total number of s	crew connections	859
Current speed		6
Nominal speed		0
		5

Current tool information is available on the Live Tool screen

4.6.4 Tool Communications

Shows real time communication between iBC controller and tool



4.6.5 Identify Controller

'Identify Controller' will cause lights on controller and tool to flash making the system easy to locate. This is especially helpful when programming is being done and multiple controllers are being used in close proximity to each other.

4.6.6 Record Logs



Logs information describing usage of controller and tools that have been used with that controller.

4.6.6.1 Change Log

Log displays changes made to tool or controller.

4.6.6.2 Information Log

Log displays all information entries.

4.6.6.3 Error Log

Log displays ONLY Error Entries.

4.6.6.4 All

Displays all Changes, Information and Error entries.

4.6.7 System Status



4.6.8 I/O Diagnostics

The I/O Diagnostics screen shows a log of all IO state changes from any assignable input or output. This can aid in verifying the correct functionality for IO configuration.

1/0	Bus	Assignment	I/O State
Out	24v	Job Complete	0
Out	24v	Angle Low	0
Out	24v	Angle High	0
Out	24v	Torque Low	0
Out	24v	Torque High	0
Out	24v	NOK	0
Out	24v	ок	0

The refresh button will update the screen with the most recent IO changes. The save button will generate a log file that can be viewed on a PC. This file can be downloaded when viewing from a PC or saved to a USB drive when using the controller touch screen. This saved CSV file contains much more detailed information (timing, IO settings, etc) than can be displayed on the controller screen.



4.6.9 Network Diagnostics

Network Diagnostics can be useful in troubleshooting Ethernet communication issues



Ethernet: Shows if the Ethernet port is physically connected and if the hardware is operational.

Test Connection:

Provides a way to check the ethernet connection to other devices on the same network. **Capture:** Captures and saves the ethernet traffic for evaluation.

- Interface (pull down menu)
 - ∘ All
 - Ethernet 1
 - Ethernet 2

4.7 Login

When a password is required it can be entered in this screen.



Three levels of access to the controller are available:

- **Operator:** Run/Login screens available.
- **Technician:** Run/PSet/Job/Diagnostics and Login screens available.
- Administrator: All screens available.

dvanced Menu	
Login	Results
Setup	Archive
Import	Export
Settings	Controller
Update	Backup
Controller	Restore
Restore Factory Defaults	Previous Software
Calibrate Touch Screen	Soft Reboot

The 'Advanced' menu handles complex settings within the controller. Detailed descriptions are given in the following sections.

4.8.1 Login Setup

4.8 Advanced

This screen allows the user to select the default Login level upon controller start up.

	Login Setup Defaults	
	Login Level	Administrator •
	Change Password	
۱	Administrator	9999
	Technician	2222

- Operator
- Technician
- Administrator

4.8.2 Results Archive



Approximately one million rundowns can be stored. Twenty files with approximately 50,000 rundowns are maintained at a time. The user can, at any time, save the runs to either a USB stick or to the Web as a CSV file imported directly into an Excel spreadsheet.

Using the touchscreen console, you can select multiple files to save.

Using the web option, you can select one of these files at a time to save (web option is default).

Select either USB or Web Archive location



Example of Saved Excel File

Rundown	Job Num	Job Name	Sequence	Bolt count	t Status	Date	Time	Torque	Status	Angle	Status	PSet Num	PSet Name	Tool Mode	Tool Seria	Id1 (ID #1	Id2 (ID #2	Id3 (ID #3	Id4 (ID #4)
2068	0		0	0	Р	******	11:13:42	5.08	P	480		1			0				
2069	0		0	0	P	******	11:13:49	5.054	P	535		1			0				
2070	0		0	0	Р	******	11:13:50	5.002	P	450		1			0				
2071	0		0	0	Р	******	11:13:52	5.013	P	595		1			0				
2072	0		0	0	Р	******	11:13:53	5.085	P	495		1			0				
2073	0		0	0	P	******	11:13:54	5.1	P	440		1			0				
2074	0		0	0	Р	*****	11:13:56	5.089	P	575		1			0				

4.8.3 Import Settings

This allows the user to download any previously saved settings onto the controller (refer to 'Export Controller' for help with saving data).

- 1. Plug the USB with an export file into any port on the controller.
- 2. From the Home screen, navigate to Advanced \rightarrow Import Settings.
- 3. Select the settings to be checking the



Import Settings Select File To Import	Ор
Choose File No file chosen	an
Operations	I/C
1/0	for I/C Mc
Configuration	Eth

Dperations: This ncludes PSets and Jobs.

I/**O:** This includes I/O settings for the local I/O, Anybus, Modbus, and EtherNet/IP.

Configuration: This includes all settings of the controller except I/O, Master Spindle, Rundowns, PSets or Jobs.

Spindle: This includes any Master Spindle setup (i.e. number of spindles, IP addresses, etc).

- 4. Press \checkmark to accept the changes.
- 5. Press 🗸 to proceed.
- 6. Press v when the import is complete and the controller will restart.

Import settings that were exported from another controller via a USB flash drive. Use this to quickly apply the same settings across several controllers. For example, it is common to have multiple controllers with the same I/O configuration. Set up one controller with the correct I/O configuration and export the controller from Advanced \rightarrow Export Controller. Now the I/O settings can be imported using this screen.

NOTE: Setting can only be imported from controllers running the same version of software.

4.8.4 Export Controller

This allows the user to save Configuration, Operations, I/O, and Spindle settings onto a USB flash drive.

- 1. Plug a USB into any port on the controller.
- From the Home screen, navigate to Advanced → Export Controller.
- Press to continue, and the controller will begin the export process.



4. Press \checkmark to complete the export.

4.8.5 Update Controller

NOTE: Updated firmware versions will typically be sent via email zip file. Always save PSet and IP address information before upgrading controller.

Upgrading the AIMCO Gen IV Controller

Using the TouchScreen or a System Port browser session, navigate to the 'Advanced' menu. Click 'Update Controller.'



If a USB stick containing the zip file has been plugged in to the controller, the file will show in the Available Updates

list. Select the latest release and click \checkmark when ready.

Update Controller

Available Updates

Choose File No file chosen

If updating through a system port browser session, a dialog box will appear. Click the Choose File button

and navigate to the folder where the zip file is located on the computer. Select the latest release

and click \checkmark when ready.

After the controller restarts, the user should see following messages



When the controller has finished, navigate to Diagnostics → Controller Overview to view any changes to the 'Software Versions'. Any system settings (Ethernet IP address, PSets, Jobs, etc.) will remain unchanged.

4.8.6 Backup Restore

The Backup function allows the user to create an image of the controller software/firmware including all Configurations, Operations, I/O, and Spindle settings. This is used to create a point in which the controller can restore to if the need arises. In that case, the Restore function would be used.

 From the Home screen, navigate to Advanced → Backup Restore.



- 2. Press Backup to initialize the backup process.
- Press to replace previous backup with current system, the backup process will begin.



4. Press **Restore** to initialize the restore process.

5. Press to restore all settings and firmware to last backup, the restore process will begin.



6. The controller will restart when finished.

4.8.7 Restore Factory Defaults

This allows the user to reset the controller's parameters to factory settings

- From the Home screen, navigate to Advanced → Restore Factory Defaults.
- 2. Select the settings to be changed and accept
 - Operations: This includes PSets and Jobs.
 - I/O: This includes I/O settings for the local I/O, Anybus, Modbus, and EtherNet/IP.

actory Defaults Operations	
1/0	
Configuration	
Results	
Log	

• Configuration: This includes all settings of the controller

except I/O, Master Spindle, Rundowns, PSets or Jobs.

- Results: This includes all rundown data / information
- Log: This includes the Change, Information, Error, and Combined logs.
- 3. Press \checkmark to accept the changes.
- 4. Press ✔ to proceed.



5. Press when the calibration is complete, the controller will restart.



4.8.8 Previous Software



The 'Previous Software' page enables users to change the software to an alternate version. When the controller is updated, the previous version will be retained to easily revert

versions. Settings are not affected. Any changes to settings are retained when changing to an alternate version. The screen shows the current version along with the version information of the alternate version.

This feature is only available for versions 3R19 going forward. It is not possible to revert to a release earlier than 3R19.

4.8.9 Calibrate Touch Screen

Custom and Factory default calibration are available on the controller console.

- From the Home screen, navigate to Advanced → Calibrate Touch Screen.
- 2. Press 🗸 to disable the tool.
- 3. Select the desired calibration

Custom Calibration:

This allows the user to create a custom calibration setting for the touch screen.

Factory Default Calibration: This calibrates the

touchscreen to the factory defaults.

4. Press 💙 to accept the selection.





Confirmation Controller Will Reboot After Calibration. Proceed? In the case of custom calibration, a screen will appear with instructions on how to increase precision.



6. Press ✓ when the calibration is complete, the controller will restart.

NOTE: The controller may need to be reset before the custom calibration is possible.

4.8.10 Soft Reboot

Restart the controller without turning the power off.

- 1. From the Home screen, navigate to Advanced \rightarrow Soft Reboot.
- Press to proceed, the controller will restart.



4.9 Statistics

Enter the desired number of samples and PSET to observe calculated statistics. Number of samples must be equal to or less than the existing recent results stored within the controller. Statistics are presented as a courtesy to users who wish to review them in quick fashion on the controller screen.

Statistics, 30 S	Samples	
	Torque	Angle
Min	0.170 Ftlb	0 °
Max	48.360 Ftlb	858 °
Range	48.190 Ftlb	858 °
Low		
Ok		
High		
x	21.535 Ftlb	251.2 °
σ	20.873 Ftlb	251.0 °
x - 3σ	-41.086 Ftlb	-501.8 °
x̄ + 3σ	84.155 Ftlb	1004.2 °
6σ	125.240 Ftlb	1505.9 °
6σ / x	5.816	6.0
Ср		
Cpk		
Sample Size		30
Deat		PSot 1
FSet		FSet I
<		5

5. Barcode Reader Details

The Gen IV iBC controller supports the following barcode reader functionality:

- Support up to four identifiers.
- Each rundown result can be associated with up to four identifiers.
- Identifier(s) can be used to select a parameter set or a job.
- Display identifier(s) on controller.
- Ability to lock-out tool until correct identifier(s) is entered.
- Ability to block barcode reads while a job is in progress.
- Barcode reads (identifiers) can come from any or all the following sources:
 - Serial barcode reader
 - Open protocol
 - Fieldbus network
 - Telnet port

Solution

Regardless of the source (serial barcode reader, telnet, fieldbus, or protocol) each new string is passed through the same process:

- All four identifiers are reset to an empty string on power-up.
- Each received barcode is processed through a Barcode Match Table to look for a match, if one is found the barcode is accepted.
- Each fastening will then be associated with the received barcode(s) until a new one is received or they are reset.

Parameters

The parameters that pertain to the processing of barcode strings:

- The Barcode Match Table is used to identify the newly received barcode string.
- Which of the four Identifiers (ID#1-4) are required to enable the tool?
- Which of the four Identifiers (ID#1-4) to reset on a job complete?
- Parameter to disable all barcode reads while a job is in progress. If set, barcode reads will be disabled after the first fastener is ran until job is complete.

Barcode Match Table

The Barcode Match Table is used to identify which barcode has been received. The controller can have up to 99 entries (rows) in the table. Each entry has actions that will be performed when a matching barcode is received. The table is searched from top to bottom in an attempt to find a matching barcode. If none are found, the barcode is ignored.

Mask

The Mask is a string used to compare against the received barcode. The received barcode must be at least as long in length as the Mask. The Mask can also contain "don't care" characters of a decimal point or period in the string. These "don't care" characters are counted in the length but the actual received character in that position doesn't matter.

Identifier Type

The "Identifier Type" field identifies which identifier (ID#1-4) the received barcode will be stored in.

Action

Action can be one of the following:

- None
- Select PS#1-256
- Select Job#1-20

Reset ID

The "Reset ID" has the ability to reset other identifiers (ID#1-4) when barcode is received.

Examples:

Operator Scans

When a vehicle enters the station, the operator scans the VIN. The controller selects the correct job number and enables the tool. Each fastener will be identified with this VIN stored locally, and/or sent to a server for storage. The job settings will disable the tool when the job is complete.

Setup

In this example, there are three possible vehicle types each with its own job. The barcode scan will select the correct job (enabling the tool) and the scan will be stored into ID#1.

					Rese	t ID	
Mask	ID type	Actior	٦	ID#1	ID#2	ID#3	ID#4
"VIN7"	ID#1	Select Job#	1	No	No	No	No
"VIN8"	ID#2	Select Job#	2	No	No	No	No
"VIN9"	ID#3	Select Job#	3	No	No	No	No

The tool enable/disable will be controlled by the job settings; the correct job will be selected by the barcode scan. The "ID Required to Enable the Tool" feature does not need to be utilized.

Required Identifiers for Tool Enable						
ID#1	ID#2	ID#3	ID#4			
No	No	No	No			

These settings are irrelevant since the only way to enable the tool is with a new job and the only way to select a new job is to scan a new barcode.

Reset Identifiers on Job Complete					
ID#1	ID#2	ID#3	ID#4		
Yes	No	No	No		

Examples

This is what the 'Operator Scans' example looks like once set up in the Barcode Configuration Screen (see "4.4.7 Bar Code Setup" on page 24).

Airbag Install

The customer wants to track the serial number of each airbag being installed, as well as the operator installing it. When the operator reports to the station, they will scan their employee ID. When the vehicle comes into the station, the operator scans the VIN of the vehicle and the serial number of the airbag. Once all three scans are received, the tool is enabled. Once the correct number of fasteners are installed, the tool is disabled by the job settings. From that point, the operator only needs to scan the vehicle and the airbag to enable the tool.

Setup

We will assign the employee ID to ID#1, the vehicle VIN to ID#2, and the airbag serial number to ID#3. Scanning a new employee ID will reset the other IDs and force a scan of the vehicle VIN and airbag serial number. The scan of the vehicle VIN will also select the correct job number.

					Rese	t ID	
Mask	ID type	Actior	า	ID#1	ID#2	ID#3	ID#4
"EMP"	ID#1	None		No	Yes	Yes	No
"VIN"	ID#2	Select Job#	1	No	No	No	No
"SN"	ID#3	None		No	No	No	No

Once all three scans are received, the tool will be enabled.

Required Identifiers for Tool Enable					
ID#1	ID#2	ID#3	ID#4		
Yes	Yes	Yes	No		

When job is complete, the vehicle VIN will be reset and the airbag serial number, but not the employee ID; this way subsequent vehicles will only require a VIN and S/N to enable tool.

Reset Identifiers on Job Complete					
ID#1	ID#2	ID#3	ID#4		
No	Yes	Yes	No		

This is what the Airbag Install example looks like set up in "4.4.7 Bar Code Setup" on page 24.



6. Glossary of Terms

Accept Tone	Controls tone made from handle of handheld tools for accepted fastening cycles.
Angle	Degree fastener rotates from snug, or threshold level, to peak torque.
Cycle Complete	Torque level that determines completion of a fastening cycle.
High Angle	When peak angle recorded exceeds High Angle, the fastening cycle is recorded as a reject for High Angle, the High Angle light (flashing yellow) illuminates and fastening cycle is given an overall status of NOK.
High Torque	When peak torque recorded exceeds the High Torque, the fastening cycle is recorded as a reject for High Torque, the High Torque light (flashing red) illuminates and fastening cycle is given an overall status of NOK.
dof	A Job is a collection of Psets or Multi- stages, which are useful when performing several multiple fastening operations, each with different requirements. This is convenient since the operator does not have to select a new Pset or Multistage for every fastening.
Low Angle	When the peak angle recorded during the Angle Audit Step fails to reach the Low Angle, fastening cycle is recorded as a reject for Low Angle, the low angle light (flashing yellow) illuminates and fastening cycle is given an overall status of NOK.
Low Torque	When the peak torque recorded fails to reach the Low Torque, fastening cycle is recorded as a reject for Low Torque, the Low Torque light (flashing red) illuminates and fastening cycle is given an overall status of NOK.
Parameter Set	A Parameter Set is a collection of instructions that define how the tool should perform the fastening process. It may be selected from the console or device such as a socket tray or PC
Snug Torque	Controller begins to monitor tool for angle at a preselected threshold torque. Any increase in angle, after the snug point, results in a corresponding increase in tension or clamp load within the joint.
Speed	Speed at which tool operates during the initial portion of the fastening cycle prior to downshift.
Spindle	A spindle represents a connection to a handheld, or fixtured, tool connected to a controller.
Strategy	Identifies the variables being used to control tool during a fastening cycle.

Thread Direction	Sets assembly direction to clockwise (CW) or counter clockwise (CCW).
Threshold Torque	Sets point at which tool is "In Cycle".
Torque Calibration	Determines how torque values are assigned to the electrical signals for torque transducer on tool. Value is unique to each tool and changes over time.
Torque Target	When the tool is being controlled for torque, the torque target instructs controller when to shutoff tool. Torque target should be greater than Low Torque and less than High Torque, this is required for torque control.

7. Icons Defined

lcon	Description	Function	Where Used
	Home	Navigate to	All screens
	Navigation	the main menu	except for
	Button	("HOME") screen.	edit screens.
	Run	Navigate to the	All screens
	Navigation	Run Screen.	except for
	Button		edit screens.
	Run Screen	Switch between	Run Screen
	Select Buttons	the different run	
		screen pages.	
	GoBack	Navigate to one	All screens
	Button	menu level back.	except for
			edit screens.
	Accept	Accept the	Edit screens
	Changes	changes made	
	Button	and return to the	
		parent screen.	
	Cancel		Ealt screens
	Changes	changes made	
	BUIION	and relum to the	
	Add Novy	Add a powitam	Psat and Jab
_	Rutton	Add d new liem	PSel unu Job
	DUIION	(FSEI, Sluge, JOD,	eun scieens.
-	Edit Button	Edit soloctod	Psot and Job
		Item	edit screens
1		nom.	can screens.
	Move Up and	Move selected	PSet and Job
	Down Buttons	item up or down	edit screens.
_		in the sequence	
		order.	
	Caray Duttara	Caray agle ato d	DCat Jak
	Copy Bullon	Copy selected	PSEI, JOD,
20		liems	and other
	Doloto Button	Pomovo or un	Edit and list
		items	
100	Filter Button	Filter Items in a list	List view
57		or table.	screens
Y			
	Save Button	Save selected	List view
		item to file.	screens
	Select	Allows	Results
	Columns	customization of	Screen
×	Button	columns shown	000001
		on the Results	
		Screen.	
	Fault	Fault exists that	Run Screen
	Indicator	is preventing the	
		tool from running	
		(can be pressed	
		for more Info).	
	Invalid PSet	Selected Pset	Run Screen
0	Indicator	does not exist or	
PSet		is not valid.	

lcon	Description	Function	Where Used
	Barcode Scan Required Indicator	A barcode is required to enable the tool.	Run Screen
	Job Complete Indicator	Job is complete.	Run Screen
	Lock on Reject (LOR)	Lock tool on rejected fastener.	Run Screen
	Disassembly	A disassembly event has been detected.	Run Screen
Ċ	Job Reset Complete	Reset Job has finished. Results from last successful rundown of a job are cleared.	Add New Job Screen

8. Stop Codes

If a Stop condition is detected that prevents the tool from running, a code will appear on the LED display. Any active stop conditions are also displayed on the RUN screen.

Code	lcon	Description
ю		Stopped or Disabled from Physical 24 volt IO input
ABUS		Stopped or Disabled from ANYBUS
MODB		Stopped or Disabled from Modbus
EIP		Stopped or Disabled from Ethernet IP
RTU		Stopped or Disabled from Modbus RTU
OP	.	Stopped or Disabled from Open Protocol
OP	ŧ)	Lost Open Protocol Connection
REV	5	Disassembly Disabled
ARM	2	Tool Requires Arming – MFB button configured to enable the tool to run.
JOB		Job Sequence Complete
JOB		Job Complete
JOB	E	XML Count Complete
LOR		Locked on Reject

Code	lcon	Description
BRCD		Bar Code ID scan required to enable tool
SRVC	×	Tool Disabled For Service - Tool service or calibration interval has expired
INVP		Invalid PSet - Parameter set number for a non-existent Pset has been selected to run. Most likely via one of the following methods:
INVP	<u></u>	PSet outside of Job - Parameter set number outside of the job has been selected. Most likely via one of the following methods:
INVJ		Invalid Job - Job number for a non-existent Job has been selected to run. Most likely via one of the following methods:
PSET	¥	PSet Mismatch
SPND		Spindle Not Configured – Spindle selected to run from a Multi-Spindle Job has not been configured
NET	¢	XML Disconnected
XML		Stop from XML
NOK	×	XML Max Rejects Exceeded
FLT		Controller Fault - Error has been detected. See fault code list for details

9. Error Codes

If an error condition is detected that prevents the tool from running, a fault code will appear on the LED display. Any active faults are also displayed on GUI RUN screen. Fault history can be viewed in the Controller Error Log.

IBC (AcraDyne DC Tool) Specific Fault Codes

CODE	Fault Type	Description	Possible Causes
BT01	Tool Not Connected	Tool is not communicating with the	 Tool battery unplugged
		controller	 Tool out of Wi-Fi Range
			 Tool Wi-Fi or IP settings not configured correctly
BT02	Tool Voltage Error	Error reported by the tool	Faulty Tool electronics
BT03	Excessive Current	Error reported by the tool	 Maximum allowable current exceeded
BTO4	Excessive Force	Error reported by the tool	Maximum allowable torque exceeded
BT05	USB Mode	Error reported by the tool	 Tool is in programming mode
BTO6	WLAN Error	Error reported by the tool	 Tool out of Wi-Fi Range
			 Tool Wi-Fi or IP settings not configured correctly
BT07	SD Card Error	Error reported by the tool	 Missing or corrupted SD card
			Faulty Tool electronics
BT08	FET excessive	Error reported by the tool	Duty cycle too high
	temperature		Faulty Tool electronics
BT09	Motor excessive	Error reported by the tool	 Speed settings too low
	temperature		
BT10	Angle encoder error	Error reported by the tool	 Maximum allowable current exceeded
BT11	VCC excessive voltage	Error reported by the tool	Faulty Tool electronics
BT12	VCC insufficient voltage	Error reported by the tool	Faulty Tool electronics
BT13	Excessive internal	Error reported by the tool	Duty cycle too high
	temperature		Faulty Tool electronics
BT14	Motor stopped	Error reported by the tool	Tool Stalled
BT15	Spool full	Error reported by the tool	Rundown data storage full
BT16	Spool error	Error reported by the tool	Rundown data storage faulty
BT17	No data from digital	Error reported by the tool	Faulty Tool electronics
	sensor		
BT18	CRC error in program	Error reported by the tool	Programming Download Error
	level		
BT19	Error: program level does	Error reported by the tool	Programming Error
	not exist		
BT20	User flash error	Error reported by the tool	Programming Download Error
BT21	Program sequence error	Error reported by the tool	Programming Error
BT22	Torque Sensor Error	Error reported by the tool	Tool electronics error

Gen4 Common Hardware Fault Codes

Code	Fault Type	Description	Possible Causes
FH17	1.8vdc MB out of tolerance	Main board 1.8 bus voltage exceeds electrical limits	Faulty Controller main board or other Controller electronics
FH18	1.8vdc SOM out of tolerance	System on Module 1.8 bus voltage exceeds electrical limits	Faulty Controller main board or other Controller electronics
FH19	3.3vdc out of tolerance	Main board 3.3 bus voltage exceeds electrical limits	Faulty Controller main board or other Controller electronics
FH20	5vdc out of tolerance	5 Volt bus voltage out of range	 Faulty power supply or wiring Faulty Controller main board or other Controller electronics
FH21	9vdc out of tolerance	9 Volt bus voltage out of range	 Faulty power supply or wiring Faulty Controller main board or other Controller electronics Faulty tool cable Faulty tool electronics or wiring
FH22	24 volt level low	24 Volt I/O power not detected	 Faulty power supply or wiring Short or other problem with external connections to the 24Volt I/O port.
FH23	Controller temp high	Controller's internal temperature exceeds limit	Ambient air temperature exceeds rating of Controller
FH24	+15vdc out of tolerance	+15 Volt bus voltage out of range	 Faulty power supply or wiring Faulty Controller main board or other Controller electronics Faulty tool cable Faulty tool electronics or wiring
FH25	–15vdc out of tolerance	–15 Volt bus voltage out of range	 Faulty power supply or wiring Faulty Controller main board or other Controller electronics Faulty tool cable Faulty tool electronics or wiring
FH32	Processor Fault	RTOS processor not communicating with the Application processor	 Faulty mainboard electronics RTOS processor firmware corrupted or not loaded Faulty SOM board or connector

10. 24 Volt I/O

Port Pinout and Diagrams

An I/O wiring adapter kit is available (Part #**27348**) from AIMCO to make connection to I/O port on the controller easier. Contact your AIMCO Sales Representative for ordering information. Toll Free: 1-800-852-1368.

1	24 VOLT I/0	13
(10)	3 4 5 6 7 8 9 10 11	
14 15		24 25
14	D-Sub 25 M	25

Pin #	Function	Default Assignment
1	Output 1	Torque Low
2	Output 2	Angle High
3	Output 3	Angle Low
4	Output 4	Job Complete
5	Outputs 1-4 common	
6	Input 1	
7	Input 2	
8	Input 3	Disable Tool
9	Input 4	PSet Bit 1
10	Input 5	PSet Bit 2
11	Input 6	PSet Bit 3
12	Input 7	Reset Job
13	Input 8	
14	Output 5	Torque Low
15	Output 6	Angle High
16	Output 7	Angle Low
17	Output 8	Job Complete
18	Outputs 5-8 common	
19	N/C	
20	N/C	
21	24 V Return	
22	24 V Return	
23	+24 Vdc	
24	+24 Vdc	
25	+24 Vdc	

NOTE: The Default Assignments in Table above are factory defaults and can be changed. See "11. Assignable I/O" on page 43.

24 Volt I/O Connections

Turn off system before connecting to the LOGIC I/O port. There may be risk of damaging the controller.

- **24Vdc Supply:** The internal 24Vdc power can supply up to 1 amp.
- Inputs: Inputs are a sinking configuration with the common connected to the ground pins. 24Vdc is logic ON and 0Vdc is logic OFF.
- **Outputs:** Outputs are normally open relay contacts. The relays are rated for 24Vdc, 1 amp.

NOTE: If Outputs are driving an inductive load, such as a solenoid or large relay, it is recommended to add a diode in parallel with the load to prevent voltage surges.

LOGIC I/O INPUT CONNECTION EXAMPLE



LOGIC I/O OUTPUT CONNECTION EXAMPLE



Importing I/O on an iBC Controller

These instructions detail how to import I/O into an iBC4 controller via the system port to modify the Anybus outputs.

- 1. Power on the controller
- 2. Insert the USB stick into a USB port
- 3. Connect to the controller via system port and web browser (default address 192.168.1.4)
- 4. Navigate to Advanced \rightarrow Import Settings

	← → C 🗋 192.168.1.4/?_=/	home
	Apps 🗀 Aimco 🗀 Programming	🗅 Personal 🗋 Vendors 🗋 PC8 🛄 Ge
		A Division of AIMCO
	Run	Јов
	Results	Controller
	Accessories	Diagnostics
	Login	Advanced
	dvapcod Monu	
A	dvanced Menu	
А	dvanced Menu Login Setup	Results Archive
A	dvanced Menu Login Setup Import Settings	Results Archive Export Controller
A	dvanced Menu Login Setup Import Settings Update Controller	RESULTS ARCHIVE EXPORT CONTROLLER BACKUP RESTORE
Þ	dvanced Menu Login Setup Import Settings Update Controller Restore Factory Defaults	Results Archive Export Controller Backup Restore Previous Software

5. Choose file and select ONLY I/O



- 6. Click OK
- 7. Click OK in the Confirmation dialog box
- 8. The controller will restart
- 9. Verify the Anybus outputs.
 - a. Navigate to Controller \rightarrow IO \rightarrow Anybus Outputs
 - b. Click on the first row of element #1 and verify it is set as 'Running Job Number', Bit 0, Bits 8, Start at 0.
 - c. Click on element #4 and verify it is set as "Torque (x100)", Bit 0, Bits 16



11. Assignable I/O

The Gen IV controller supports assignable I/O.

Buses: The controller is divided up into buses. Each bus has a set of inputs and a set of outputs. Currently the controller supports the following buses.

Bus Number	Bus
1	Physical I/O
2	Fieldbus (Anybus module) I/O
3	Modbus TCP
4	Ethernet/IP

All assignments have a bus, element, and bit configuration to define its location in the system. The bus value needs to be set from the list above. The element and bit define the location in the bus. The first element on the bus is 0 and goes up the last legal element for the given bus. The bits in each element is referenced from 0(LSB) to 31(MSB).

Inputs

All input assignments have a Bus, Element, and Bit configuration to define its location in the system. Along with the basic configuration many also have other configuration(s) that allow its behavior to be modified to suit the application.

		Supported Feature				Controllers					
				Polarity		o. (()					15.0.7
De Nethier	BUS	Element	Bit 0-31	N.O./N.C.	Width	Offset	IEC	IAC	IPC	IBC	IBC-Z
Do Nothing	N	N	N				N	ν	γ	γ	N
Start	N 1	N I	N	N			N /	1	1	1	
Stop	N	N	N	N			N 	N	N	N	
Reverse	N I	N	N	N			N	1	1		
Disable	N	N	N	N			N /	N	N	1	1
	N	N	N	N			N	N	N	N	N
Select PSet	/	\ √	/		/	V		/			
Select Job	√	√	√		V	N		√			√
Select Job Sequence	√	√	N		√		√				√
Disable Assembly	√										
Set ID	√	√									
Set ID (word swap)	\checkmark										
Set Date/Time	\checkmark		\checkmark				\checkmark				
Set Date/Time (word swap)	\checkmark		\checkmark		\checkmark		\checkmark			\checkmark	
Verify PSet	\checkmark		\checkmark		\checkmark	\checkmark	\checkmark	\checkmark			
Clear Results	\checkmark	\checkmark	\checkmark	\checkmark			\checkmark	\checkmark	\checkmark		\checkmark
Log Change	\checkmark		\checkmark		\checkmark	\checkmark	\checkmark	\checkmark			\checkmark
Decrement Batch	\checkmark		\checkmark	\checkmark			\checkmark	\checkmark		\checkmark	
Increment Batch	\checkmark	\checkmark	\checkmark	\checkmark			\checkmark	\checkmark			\checkmark
Click Wrench	\checkmark		\checkmark	\checkmark			\checkmark	\checkmark			
Bypass Stops	\checkmark		\checkmark	\checkmark			\checkmark				
Verify Job Sequence			\checkmark		\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	\checkmark	
ASCII ID	\checkmark										
Abort Job	\checkmark			\checkmark			\checkmark				
Remote Start	\checkmark			\checkmark			\checkmark				
Remove Lock on Reject				\checkmark							
Dual Start Interlocked	~										
Decrement Job	\checkmark		\checkmark	\checkmark							
Increment Job	√										
Decrement PSet	\checkmark		\checkmark	\checkmark							
Increment PSet	√	1									
Decrement Job Sequence	\checkmark		\checkmark				\checkmark	\checkmark	\checkmark		
Increment Job Sequence											

Polarity

When the polarity is set to N.O. the input is considered active high (24vdc for physical inputs and logic 1 for all network type buses). When the polarity is set to N.C. the input is considered active low (0vdc for physical inputs and logic 0 for all network type buses).

Width and Offset

For multiple bit inputs (for example "Select PSet") the width variable defines the number of bits the assignment will read for its input. This allows the input size to be restricted to a few bits saving space for other assignments.

The offset variable allows a fixed value to be added to the read value.

For example to use bits 4 & 5 of the physical inputs to select parameter sets 1-4 the assignment would look like...

Select PSet					
Bus	1	For the physical bus			
Element	0	For the first element on the bus			
Bit	4	For the starting bit location			
Width	2	To span the two bits 4 & 5			
Offset	1	Adding 1 to the read input value so we get Binary 00 = 1 Binary 01 = 2 Binary 10 = 3 Binary 11 = 4			

Input Assignments

Do Nothing	Bus √	Element √	Bit 0-32 √	Polarity N.O./N.C.	Width	Offset					
The "Do Nothing" assignment will run do nothing if it is active or inactive.											
Start	Bus √	Element √	Bit 0-32 √	Polarity N.O./N.C. √	Width	Offset					
The "Start" a input is activ bus only.	The "Start" assignment will run the tool while the input is active. Start is available for the Physical I/O bus only.										
Stop	Bus √	Element √	Bit 0-32 √	Polarity N.O./N.C. √	Width	Offset					
The "Stop" of running and	The "Stop" assignment will stop the tool if it is running and prevent it from being started.										

Reverse	Bus	Element	Bit 0-32	N.O./N.C.	Width	Offset
The "Revers mode while	e" v the	vill put th input is	ne cont active.	roller in di	sassei	nbly
Disable	B∪s √	Element √	Bit 0-32 √	Polarity N.O./N.C. √	Width	Offset
The "Disable is active. It w progress.	" wi rill no	ll disable ot stop c	e the too a fasteni	ol while the ng cycle t	e inpu hat is	t
Reset Job	B∪s √	Element √	Bit 0-32 √	Polarity N.O./N.C. √	Width	Offset
On the trans Job" assigni	sitio: mer	n of inac nt will res	ctive to set the o	active the active job	e "Re:	set
Select PSet	B∪s √	Element √	Bit 0-32 √	Polarity N.O./N.C.	Width √	Offse ⁻ √
added to th	e v	alue do	get the	e actual p	aram	eter
added to th set number. number will	sele Sele disc	alue do ecting c able the	get the an invali tool.	e actual p id parame	aram eter se	eter et
added to th set number. number will Select Job	e vo Sele disc Bus √	alue do ecting c able the Element 	get the an invaliatool. Bit 0-32 	Polarity N.O./N.C.	aram eter se Width √	eter et Offset
added to th set number. number will Select Job The "Select according t parameter I The minimur After the inp added to th Selecting ar tool.	Bus J Job o th imit m w but is ne vo	alue do ecting c able the Element √ " input e input the wid idth is 1 s read th alue do ralid job	get the an invali tool. Bit 0-32 √ will sele value. I th of th and the ne offse get the	Polarity N.O./N.C. Ct the job Uses the w e input bir e maximu et parame e actual jo er will disa	aram eter se width √ numk ridth ts read m is 8 ter wi bb nur ble th	eter et √ Der d. II be mber. e
added to th set number. number will Select Job The "Select according t parameter I The minimur After the inp added to th Selecting ar tool. Select Job Sequence	Bus $$ Bus $$ Job o th imit m w but is ne vo	Element v input input the wid idth is 1 s read the alue do valid job	get the an invali- tool. Bit 0-32 will sele- value. I th of th and the ne offse get the number Bit 0-32 	Polarity N.O./N.C. Ct the job Uses the w e input bir e maximu et parame e actual job er will disa	width vidth ts read m is 8 ter wi bb nur ble th	eter et Offse Der d. Il be mber. e Offse

	_		
Disable Assembly	Bus Element $$	Bit 0-32 N.O./N.C. Width Offset $\sqrt[4]{1}$	Set Date/ Time (word swap)BusElementBit 0-32Polarity N.O./N.C.WidthOffset
The "Disable tool in the a tool in disass stop a faste	e Assembly' Issembly dir sembly or tu ning cycle	' assignment will disable the ection. It will not disable the ube nut homing. It w ill not that is progress.	The "Set Date/Time (word swap)" assignment is the same as the "Set Date/Time" assignment except the high and low words (16bit) are swapped prior to evaluation. This is to correct the mixed endianness of some PLC. See the "Set
Set ID	Bus Element $\sqrt{1-1}$	Bit 0-32 N.O./N.C. Width Offset $$	Date/lime" for behavior.
The "Set ID"	assignment	will set the ID to an integer	Verify PSet Bus Element Bit 0-32 N.O./N.C. Width Offset
1 to 32 bits. 1 value and a produced a The length a the assignm accommod For example integer valu be "00000" f	The input vo in ASCII strin and passed of the string i ent. The strin late the ma e a width se e of 0-65535 to "65535" (alue will read as an integer of with leading zeros will be to the ID recognition system. Is based on the width of of will always be sized to ximum value of the input. tting of 16 can have an 5 so the produced ID would always five character long).	The "Verify PSET" input will compare the current parameter set to the input value. Uses the width parameter limit the width of the input bits read. The minimum width is 1 and the maximum is 8. After the input is read the offset parameter will be added to the value do get the actual parameter set number. If the parameter set input value does not match the current parameter of the controller the tool will be disabled.
Width setting	Length of ID string	ID value	Clear Results Bus Element Bit 0-32 N.O./N.C. Width Offset
1 - 3	1	"0" – "n"	
4 - 6	2	"00" – "nn"	The "Clear Results" assignment will clear the latest
7 - 9	3	"000" – "nnn"	Tesuis outputs (Ok, Nok, etc.) of the same bus.
10 - 13	4	"0000" – "nnnn"	Polarity
14 - 16	5	"00000" – "nnnnn"	Log Change Bus Element Bit 0-32 N.O./N.C. Width Offset
17 - 19	6	"000000" – "nnnnn"	The "Log Change" assignment will add entries to
20 - 23	/	"0000000" – "nnnnnn"	the controller event log when the input changes.
24 - 20	0	"00000000" - "Infinition"	
30 - 32	10	"0000000000" – "nnnnnnnnn"	Decrement Bus Element Bit 0-32 N.O./N.C. Width Offset
Set ID (word swap The "Set ID as the "Set I	Bus Element √ √ (word swap D" assignm	Bit 0-32 Polarity N.O./N.C. Width Offset vissignment is the same ent except the high and	The "Decrement Batch" assignment will remove the latest OK rundown from the current running JOB. This will cause the JOB count to be reduced by one.
low words (This is to cor	16bit) are sv rect the mix = "Set ID" fo	vapped prior to evaluation. ked endianness of some	Increment BatchBus ElementElement Nit 0-32Polarity N.O./N.C.WidthOffset
Set Date/ Time	Bus Element $\sqrt{\frac{1}{\sqrt{\frac{1}{\sqrt{\frac{1}{\sqrt{\frac{1}{\sqrt{\frac{1}{\sqrt{\frac{1}{\sqrt{\frac{1}{\sqrt{\frac{1}{\sqrt{\frac{1}{\sqrt{\frac{1}{\sqrt{\frac{1}{\sqrt{\frac{1}{\sqrt{\frac{1}{\sqrt{\frac{1}{\sqrt{\frac{1}{\sqrt{\frac{1}{\sqrt{\frac{1}{\sqrt{\frac{1}{\sqrt{\frac{1}{\sqrt{\frac{1}{\sqrt{\frac{1}{\sqrt{\frac{1}{\sqrt{\frac{1}{\sqrt{\frac{1}{\sqrt{\frac{1}{\sqrt{\frac{1}{\sqrt{\frac{1}{\sqrt{\frac{1}{\sqrt{\frac{1}{\sqrt{\frac{1}{\sqrt{\frac{1}{\sqrt{\frac{1}{\sqrt{\frac{1}{\sqrt{\frac{1}{\sqrt{\frac{1}{\sqrt{\frac{1}{\sqrt{\frac{1}{\sqrt{\frac{1}{\sqrt{\frac{1}{\sqrt{\frac{1}{\sqrt{\frac{1}{\sqrt{\frac{1}{\sqrt{\frac{1}{\sqrt{\frac{1}{\sqrt{\frac{1}{\sqrt{\frac{1}{\sqrt{\frac{1}{\sqrt{\frac{1}{\sqrt{\frac{1}{\sqrt{\frac{1}{\sqrt{\frac{1}{\sqrt{\frac{1}{\sqrt{\frac{1}{\sqrt{\frac{1}{\sqrt{\frac{1}{\sqrt{\frac{1}{\sqrt{\frac{1}{\sqrt{\frac{1}{\sqrt{\frac{1}{\sqrt{\frac{1}{\sqrt{\frac{1}{\sqrt{\frac{1}{\sqrt{\frac{1}{\sqrt{\frac{1}{\sqrt{\frac{1}{\sqrt{\frac{1}{\sqrt{\frac{1}{\sqrt{\frac{1}{\sqrt{\frac{1}{\sqrt{\frac{1}{\sqrt{\frac{1}{\sqrt{\frac{1}{\sqrt{\frac{1}{\sqrt{\frac{1}{\sqrt{\frac{1}{\sqrt{\frac{1}{\sqrt{\frac{1}{\sqrt{\frac{1}{\sqrt{\frac{1}{\sqrt{\frac{1}{\sqrt{\frac{1}{\sqrt{\frac{1}{\sqrt{\frac{1}{\sqrt{\frac{1}{\sqrt{\frac{1}{\sqrt{\frac{1}{\sqrt{\frac{1}{\sqrt{\frac{1}{\sqrt{\frac{1}{\sqrt{\frac{1}{\sqrt{1}{\sqrt$	Bit 0-32 Polarity N.O./N.C. Width Offset	The "Increment Batch" assignment will insert a manual rundown into the current sequence of the current JOB. This will cause the JOB count to increment by one.
and time of from 1 to 32	the control bits but sho	ller. The width can be set buld always be set to 32 to	Click WrenchBusElementBit 0-32Polarity N.O./N.C.WidthOffset
get the corr as the numb 1, 1970 (POS value chang time of the	ect results. Der of secor SIX time or E ges and it is controller w	ine input value will be read nds since 00:00:00 January poch time). If the input non-zero the date and ill be set to the new value.	The "Click Wrench" assignment is the same as "Increment Batch" with the addition of a programmable torque value.

Polarity									
Bypass StopsBusElementBit 0-32N.O./N.C. $$ $$ $$ $$	Width	Offset	Dual Start	Bus	Element	Bit 0-32	Polarity N.O./N.C.	Width	Offset
The "Bypass Stops" assignment removes	s most		Interiocked	\checkmark	\checkmark	\checkmark			
stop conditions, allowing the tool to be	ran in	an	The "Dual Sta	art Ir	hterlocke	ed" assic	onment wi	ll run t	he
override type condition. Hardware faul	s, stop	o and	tool if the int	erlo	ck conc	litions ar	re met. Du	al Sta	rt
disable inputs are not removed.			Interlock is a	ivaila	able for	the Phy	sical 10 bu	is only	. The
			Dual Start In	terlo	cked in	out wor	ks in comb	pinatic	n
Polarity			with the Phy	sica	l input a	ssianed	to the 'Sta	art' inr	out.
Bus Element Bit 0-32 N.O./N.C.	Width	Offset	The Dual Sta	art In [.]	terlocke	d is only	/ available	e for iF	C
sequence $\sqrt{-\sqrt{-\sqrt{-\sqrt{-\sqrt{-\sqrt{-\sqrt{-\sqrt{-\sqrt{-\sqrt{-\sqrt{-\sqrt{-\sqrt{$	\checkmark	\checkmark	controllers						0
The "Verify Job Sequence" input will co	mpare	e the	Satura						
current Job sequence to the input valu	e. Use	s the		art l	nout an		al Start Int	orlook	a d
width parameter limit the width of the in	nput b	oits	Only 1 St	un ii				ENOCK	ea
read. The minimum width is 1 and the m	naximu	Jm				gnea.	wet look ut		
is 8. After the input is read the offset par	amet	er	Configure	ation	0013610	p -> sic	лпрог		
will be added to the value do get the c	actual	Job		Start	I. Elenant S		Aust bo so	+ + ~ '	Start
sequence number. If the Job sequence	input		• Ine ·		inpui s	ourcer	viusi de se		sian
value does not match the current Job s	eque	nce		hing	· • thrattle	, is disa	blad for D	ual	
of the controller the tool will be disabled	d.		• Luic	ining Ioolu	ad Star	+ is aisa +		UUI	
			IIIIEI	IUCK	eu siui	1.			
Polarity			Dual Start Ir	ntorla		Onera	tion		
ASCII ID Bus Element Bit 0-32 N.O./N.C.	Width	Offset	• The tool	will r	ot run i	inless h	oth inputs	are	
$\sqrt{\sqrt{\sqrt{1-1}}}$			activate	d wi	thin two		ds of eacl	h othe	٦r
The "ASCII ID" assignment will set the ID	to the	e of	 If the two 		cond tin	nor time	as out bot	h inn	ute
the input (ASCII) value. This assignment	consu	imes	must be	7.00 dea	ctivate	d to res	et the time	≏r	015
the entire element so the Bit is not used	. It also	o has 🛛	If either in	nnut	t is dead	tivated	the tool	stons	
a length parameter to set the length of	the in	iput	 To restart 	t the	tool b	oth inpu	its must b	лору. А	
in bytes. The input value will be passed	direct	ly to	deactive	nted	then re	activat	ed within	two	
the ID recognition system.			seconds	ofe	ach oth	her			
			000011010	0.0	0.00				
Polarity		Offeet	Tubenut Too	ol Ho	oming E	xceptio	ns for Duc	al Star	ł
Abort Job Bus Element Bit 0-32 N.O./N.C.	widin	Olisei	Interlocked	fund	ctionalit	у.			
			• If control	ler's	tubenu	it homir	ng configu	vratio	n is
The "Abort Job" assignment aborts the	job ar	nd	set to RE	LEAS	SE:				
disables the tool. A job reset is required	to en	able	 Dea 	ctive	ating eit	ther, or	both, of th	ne inp	outs
the tool for the next job.			will i	nitia	te the h	oming	sequence	÷.	
			∘ Horr	ning	will con	tinue ui	ntil sequer	nce is	
Polarity		044.04	com	plet	e.				
Remote Start BUS Element Bir 0-32 N.O./N.C.	wiath	Offset	 If control 	ler's	tubenu	it homir	ng configu	vratio	n is
			set to RE	LEAS	SE AND	REPRESS	S:		
The "Remote Start" assignment will run t	he to	ol	∘ Dea	ctive	ating eit	ther of t	the inputs,	then	
while the input is active. Remote Start is	availo	able	activ	vatir	ng both	inputs v	will initiate	the	
for non-physical I/O buses.			hom	ing	sequen	ce.			
			 Hom 	ning	will con	tinue w	hile both i	inputs	are
Remove Polarity		0.11	activ	ve.					
Lock on Bus Element Bit 0-32 N.O./N.C.	Width	Ottset	∘ If eit	her i	nput is (deactiv	ated, bef	ore	
Reject $$ $$ $$			hom	ing	is comp	lete, th	e tool will	stop,	and
The "Remove Lock on Reject" assignme	ent un	locks	hom	ing '	will pau	se until	both inpu	ts are	
the tool if locked on reject, re-enabling	the to	ol.	reac	tiva:	ted.	CL			_
			∘ lore	star	t tool, a	rter hon	ning is cor	nplete	Э,
			both	n inp	uts musi	oeb ed i	activated,	then	la.
			reac	tiva	ted with	nin two s	seconds o	t eac	n
			othe	er.					

Decrement	B∪s	Element	Bit 0-32	Polarity N.O./N.C.	Width	Offset						
dor	\checkmark	\checkmark	\checkmark	\checkmark								
The "Decrement Job" assignment will decrement the Job Number, selecting the last job if decrementing past the first one.												
Increment Job	B∪s √	Element	Bit 0-32 √	Polarity N.O./N.C.	Width	Offset						
The "Increment Job" assignment will increment the Job Number, selecting the first job if incrementing past the last one.												
Decrement PSet	Bus √	Element √	Bit 0-32 √	Polarity N.O./N.C. √	Width	Offset						
The "Decrement PSet" assignment will decrement the PSet Number, selecting the last PSet if decrementing past the first one.												
	-											
Increment PSet	B∪s √	Element	Bit 0-32 √	Polarity N.O./N.C. √	Width	Offset						
Increment PSet The "Increm PSet Numbe past the last	Bus √ ent l er, se one	Element $$ PSet" as lecting t	Bit 0-32 √ signmer the first I	Polarity N.O./N.C. √ nt will incre PSet if incre	Width ement emen	Offset the ting						
Increment PSet The "Increm PSet Numbe past the last Decrement Job	Bus √ ent l er, se one Bus	Element $$ PSet" as lecting the sector of the sector o	Bit 0-32 √ signmen the first I Bit 0-32	Polarity N.O./N.C. √ nt will incre PSet if incre Polarity N.O./N.C.	Width ement emen	Offset the ting Offset						
Increment PSet The "Increm PSet Numbe past the last Decrement Job Sequence The "Decrem decrement is sequence if	Bus ent er, se one Bus nen the .	Element V PSet" as lecting t c. Element V t Job Se Job sequenting	Bit 0-32 √ signment the first 1 Bit 0-32 √ quence Jence, 1 ng past	Polarity N.O./N.C. √ PSet if incre Polarity N.O./N.C. √ a'' assignm selecting to the first or	Width ement emen Width ent wi he las	Offset the ting Offset						
Increment PSet The "Increm PSet Numbe past the last Decrement Job Sequence The "Decrem decrement is sequence if Increment Job Sequence	Bus $$ ent err, se one ment the . dec	Element V PSet" as lecting t lecting t c Element V t Job Sequent Job sequent Element V	Bit 0-32 √ signment the first I Bit 0-32 √ quence, 2 ng past Bit 0-32 √	Polarity N.O./N.C. √ nt will incre PSet if incre Polarity N.O./N.C. √ e" assignm selecting t the first or Polarity N.O./N.C. √	Width ement emen Width he las ne.	Offset the ting Offset						

Outputs

All output assignments have a Bus, Element, and Bit configuration to define its location in the system. Along with the basic configuration many also have other configuration(s) that allow its behavior to be modified to suit the application.

					Suppor	ted Fe	ature						С	Controller		
					Mode	Time	Width	Offset	Input	Input	Input	ifC	iac	iPC	ibC	iBC-7
				Polarity	Normal			011301	Ruc	Flement	Rit		" \C	" ~		
			D:1						003							
	D .				nimea,											
	BUS	Element	0-32	N.C.	Flashed											<u> </u>
Ok	N	N	N	N	N							N	N	N	N	N
Nok	N	N	N	N	N							N	N	N	N	N
Iorque Ok	N	N	N	N	N							N	N	N	N	N
Torque Nok	N	N	N	N	N							N	N	N	N	
Low Torque	N	N	N	N	N							N	N	N	N	N
High lorque	N	N	N	N	N							N	N	N	N	N
Angle Ok	N	N	N	N	N							N	N	N	N	N
Angle Nok	N	N	N	N	N							N	N	N	N	N
Low Angle	N	N	N	N	N							N	N	N	N	<u> </u>
High Angle	N	N	N	N	N							N	γ	γ	N	N
Fastening		\checkmark			\checkmark											√
Complete																
In Cycle	N	N	N	N	N							N	N	N		
Fastening Aborted	N	N	N	N	N							N	N	N	N	N
Fastening Stopped	N	N	N	N	N							N	N	N	N	N
Batch Complete	N	N	N	N N	N							N	N	N	N	N
Job Complete	N	N	N	N	N							N	N	N	N	N
	N	N	N	N	N							N	N	N	N	N
Tool Start Switch	N	N	N	N	N							V				
Tool Push to Start		\checkmark			\checkmark											
Switch	1															
TOOLWER	N	N	N	N	N							N		-		
Tool Enabled	N	N	N	N	N							N	N	γ	N	N
Tool Running	N	N	N	N	N							N				
Service indicator	N	N	N	N	N							N	γ	N		<u> </u>
TOOISINET		\checkmark			\checkmark											\checkmark
Connected																
Open Protocol				V	\checkmark											
Connected	, ,	,		<u> </u>	·							<u> </u>	Ľ,			,
PFCS Connected		\checkmark		N	√											
Running PSet																
Number		,										<u>'</u>	'		'	
Running Job	N	~	~				1	N				1		N	2	
Number	v	v	v				v	v				v	, v	v	v	, v
External Controlled																
Tool In CCW		\checkmark		N	N											
Tool In CW	V		N	√	√											
Torque																
Torque (x10)	N		N				N						N	N	N	V
lorque (x100)	N	V	N				N					V	N	N	N	V
Angle	N	N	N				N					V	N	V	N	V
Rundown Saved to																
FTP Server		, v			1		Y					,				· ·
Fastener Removed		N	N		√							V				
Spindle Ok					V											
Spindle NOk	N		N	V	√							V				
Spindle Fastening				1	\checkmark											
Complete	•	v	, v	, i	•							Ŷ				
Pulses																
Pulses High			V	V	V											
Pulses Low				√	√											
Pulses NOk				V	V											
Pulses Ok		N	N	√	N											∕
ON		V	N	V	V								N			\checkmark
Job Aborted	N	N	N	V	√							V		V	N	
Tool In Use		V	N	N		N						V	N	V	N	V
Barcode Scanned	N	V	N	N N								N		V	N	
Start Trigger Active												\checkmark				

Polarity

When the polarity is set to N.O. the output will be high when it is active (24vdc for physical outputs and logic 1 for all network type buses). When the polarity is set to N.C. the output will be low for active (0vdc for physical inputs and logic 0 for all network type buses).

<u>Mode</u>

Normal

In the "Normal" mode the output will track the state of the assignment (while still observing the polarity setting). If the polarity is set N.O. and the assignment has an active output the output will be on and stay on till the assignment goes to inactive.



Figure 1: Normal Mode

Timed

In the "Timed" mode the output will come on when the assignments state goes active and go off based on the time value or the assignment state going inactive (while still observing the polarity setting).



Figure 2 Timed Mode



Figure 3: Timed Mode (assignment deactivates before time expires)

Flash

In the "flash" mode the output will flash at the time rate while the assignments state is active (while still observing the polarity setting).



Figure 3 Flash Mode

Width and Offset

For multiple bit outputs (for example "Running PSet Number") the width variable defines the number of bits the assignment will output. This allows the output size to be restricted to a few bits saving space for other assignments.

The offset variable allows a fixed value to be added to the value before it is output.

For example to use bits 4 & 5 of the physical outputs to indicate the selected parameter set number 1-4 as binary 0-3 the assignment would look like...

Running PSet Number									
Bus	1	For the physical bus							
Element	0	For the first element on the bus							
Bit	4	For the starting bit location							
Width	2	To span the two bits 4 & 5							
Offset	-1	Adding -1 to the read input value so we get 1 = Binary 00 2 = Binary 01 3 = Binary 10 4 = Binary 11							

Output Assignments	
OKBusElementBit 0-32Polarity N.O./N.C.Mode: Normal, Timed, Flag $$ $$ $$ $$ $$	h Time Width Offset Input Bus Input Element Input Bit
The "Ok" output assignment will go active at the completion of an when the next fastening is started (the torque exceeds the thresho	n acceptable fastening. It will go inactive old value) or a Job reset.
Nok Bus Element Bit 0-32 Polarity N.O./N.C. Mode: Normal, Timed, Flas	h Time Width Offset Input Bus Input Element Input Bit
The "Nok" output assignment will go active at the completion of a inactive when the next fastening is started (the torque exceeds th	an unacceptable fastening. It will go le threshold value) or a Job reset.
Torque OkBusElementBit 0-32Polarity N.O./N.C.Mode: Normal, Timed, Flas $$ $$ $$ $$ $$	h Time Width Offset Input Bus Input Element Input Bit
The "Torque Ok" output assignment will go active at the completion value. It will go inactive when the next fastening is started (the torque	of a fastening that has an acceptable torque e exceeds the threshold value) or a Job reset.
Torque NokBusElementBit 0-32Polarity N.O./N.C.Mode: Normal, Timed, Flas $$ $$ $$ $$ $$	h Time Width Offset Input Bus Input Element Input Bit
The "Torque Nok" output assignment will go active at the comple unacceptable torque value. It will go inactive when the next faste threshold value) or a Job reset.	tion of a fastening that has an ening is started (the torque exceeds the
Low TorqueBusElementBit 0-32Polarity N.O./N.C.Mode: Normal, Timed, Flas $$ $$ $$ $$ $$	h Time Width Offset Input Bus Input Element Input Bit
The "Low Torque" output assignment will go active at the completion results. It will go inactive when the next fastening is started (the torque reset.	on of a fastening that has a low torque ue exceeds the threshold value) or a Job
High TorqueBusElementBit 0-32Polarity N.O./N.C.Mode: Normal, Timed, Flas $$ $$ $$ $$ $$	h Time Width Offset Input Bus Input Element Input Bit
The "High Torque" output assignment will go active at the completio It will go inactive when the next fastening is started (the torque exce	n of a fastening that has a high torque results. eds the threshold value) or a Job reset.
Angle OkBusElementBit 0-32Polarity N.O./N.C.Mode: Normal, Timed, Flas $$ $$ $$ $$ $$	h Time Width Offset Input Bus Input Element Input Bit
The "Angle Ok" output assignment will go active at the completion angle results. It will go inactive when the next fastening is started (the Job reset.	of a fastening that has an acceptable ne torque exceeds the threshold value) or a
Angle NokBusElementBit 0-32Polarity N.O./N.C.Mode: Normal, Timed, Flas $$ $$ $$ $$ $$	h Time Width Offset Input Bus Input Element Input Bit
The "Angle Nok" output assignment will go active at the completi angle results. It will go inactive when the next fastening is started (a Job reset.	on of a fastening that has an unacceptable the torque exceeds the threshold value) or
Low AngleBusElementBit 0-32Polarity N.O./N.C.Mode: Normal, Timed, Flas $$ $$ $$ $$ $$	h Time Width Offset Input Bus Input Element Input Bit
The "Low Angle" output assignment will go active at the completion It will go inactive when the next fastening is started (the torque exc	n of a fastening that has a low angle results. eeds the threshold value) or a Job reset.
High AngleBusElementBit 0-32Polarity N.O./N.C.Mode: Normal, Timed, Flas $$ $$ $$ $$ $$	h Time Width Offset Input Bus Input Element Input Bit
The "High Angle" output assignment will go active at the completic will go inactive when the next fastening is started (the torque exce	on of a fastening that has high angle results. It eds the threshold value) or a Job reset.

Complete	us Element √ √	Bit 0-32 √	Polarity N.O./N.C. $$	Mode: Normal, Timed, $\sqrt[]{}$	Flash Time	Width	Offset	Input Bus	Input Element	Input Bit
The "Fastenir inactive whe	ng Compl n the nex	ete" ou t faster	utput assignmen ning is started (1	nt will go active at he torque exceeds	the comp the thre	oletior shold	n of a value	fastening) or a Job	g. It will go o reset.	
In Cycle	us Element √ √	Bit 0-32 √	Polarity N.O./N.C. $$	Mode: Normal, Timed, $\sqrt[]{}$	Flash Time	Width	Offset	Input Bus	Input Element	Input Bit
The "In Cycle threshold val	e" output ue). It will	assignr go ina	nent will go ac [.] ctive when the	tive at the start of the fastening cycle er	he faster Ids.	ing cy	/cle (t	he torqu	e exceeds t	he
Fastening B Aborted	us Element √ √	Bit 0-32 √	Polarity N.O./N.C. $$	Mode: Normal, Timed, $\sqrt[]{}$	Flash Time	Width	Offset	Input Bus	Input Element	Input Bit
The "Fastenir by the system a Job reset.	ng Aborte n. It will go	d" outp inacti	out assignment ve when the ne	will go active at th ext fastening is start	e compleed (the t	etion o orque	of a fc exce	istening t eds the t	hat was abo hreshold va	orted lue) or
Fastening B Stopped	us Element √ √	Bit 0-32 √	Polarity N.O./N.C. $$	Mode: Normal, Timed, $\sqrt[]{}$	Flash Time	Width	Offset	Input Bus	Input Element	Input Bit
The "Fastenin the user. It wil reset.	g Stopped I go inacti	d" outp ve whe	ut assignment v n the next faste	vill go active at the oning is started (the t	completio orque ex	on of c ceeds	the th	ning that nreshold v	was stoppe value) or a Jo	d by bb
Batch B Complete	us Element √ √	Bit 0-32 √	Polarity N.O./N.C. $$	Mode: Normal, Timed, $\sqrt[]{}$	Flash Time	Width	Offset	Input Bus	Input Element	Input Bit
The "Batch C bolt count of threshold val	omplete' a Job se ue) or the	' outpu quence ; job is r	it assignment w e. It will go inac reset.	ill go active at the tive when the next	complet fastening	ion of g is stc	a fast irted (ening the the torqu	at satisfies th Je exceeds	ie the
Job B Complete	us Element √ √	Bit 0-32	Polarity N.O./N.C. $$	Mode: Normal, Timed, $$	Flash Time	Width	Offset	Input Bus	Input Element	Input Bit
Job B Complete The "Job Co sequences. I the job is rese	us Element V V mplete" c t will go in et.	Bit 0-32 √ output o active	Polarity N.O./N.C. √ assignment will when the next	Mode: Normal, Timed, √ go active at the co fastening is started	Flash Time ompletion (the torc	Width of a que ex	Offset faster ceed	Input Bus ning that s the thre	Input Element satisfies all tl eshold value	Input Bit Ne) or
Job CompleteB CompleteThe "Job Co sequences. I the job is reseError	us Element $\sqrt{\sqrt{3}}$ mplete" c t will go in et. us Element $\sqrt{3}$	Bit 0-32 √ Dutput c active	Polarity N.O./N.C. assignment will when the next Polarity N.O./N.C. 	Mode: Normal, Timed, √ go active at the co fastening is started Mode: Normal, Timed, √	Flash Time ompletion (the torc	Width of a ue ex Width	Offset faster ceed Offset	Input Bus ing that s the thre Input Bus	Input Element satisfies all tl shold value Input Element	Input Bit ne) or Input Bit
Job B Complete 7 The "Job Co sequences. I the job is rese Error 8 The "Error" of	us Element v v mplete" c t will go in et. us Element v v utput assig	Bit 0-32 √ output c active Bit 0-32 √ gnmen	Polarity N.O./N.C. assignment will when the next Polarity N.O./N.C. t will be active	Mode: Normal, Timed, √ go active at the co fastening is started Mode: Normal, Timed, √ while the controller	Flash Time ompletion (the torc Flash Time r has an e	Width of a que ex Width error.	Offset faster cceed Offset	Input Bus ing that s the thre Input Bus	Input Element satisfies all tl eshold value	Input Bit ne) or Input Bit
Job CompleteB CompleteThe "Job Co sequences. I the job is reseErrorB ConstantThe "Error" of Switch	us Element v v mplete" c t will go in et. us Element v v utput assig us Element v v	Bit 0-32 √ output c active Bit 0-32 √ gnmen Bit 0-32 √	Polarity N.O./N.C. assignment will when the next Polarity N.O./N.C. t will be active Polarity N.O./N.C. 	Mode: Normal, Timed, go active at the co fastening is started Mode: Normal, Timed, while the controller Mode: Normal, Timed, 	Flash Time ompletion (the torc Flash Time r has an e Flash Time	Width n of a ue ex Width error.	Offset faster ceed Offset	Input Bus ing that s the thre Input Bus Input Bus	Input Element satisfies all tl shold value Input Element	Input Bit) or Input Bit
Job CompleteB CompleteThe "Job Co sequences. I the job is reseErrorB ConstantThe "Error" orTool Start SwitchThe "Tool Start Switch	us Element $\sqrt{\sqrt{3}}$ mplete" c t will go in et. us Element $\sqrt{\sqrt{3}}$ utput assig us Element $\sqrt{\sqrt{3}}$ rt Switch"	Bit 0-32 √ output c active Bit 0-32 √ gnmen Bit 0-32 √ output	Polarity N.O./N.C. assignment will when the next Polarity N.O./N.C. t will be active Polarity N.O./N.C. t assignment wi	Mode: Normal, Timed, go active at the co fastening is started Mode: Normal, Timed, while the controller Mode: Normal, Timed, Il reflect the state co	Flash Time ompletion (the torc Flash Time r has an e Flash Time of the toc	Width of a que ex Width error. Width Is start	Offset faster cceed Offset Offset	Input Bus ing that s the thre Input Bus Input Bus	Input Element satisfies all tl schold value Input Element	Input Bit) or Input Bit
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Tool Running	B∪s √	Element √	Bit 0-32 √	Polarity N.O./N. √	C. N	Node: Normal, $$	Timed, Flash	Time	Width	Offset	Input Bus	Input Elemei	nt Input Bit
The "Tool R	unn	ing" ou	put as	signment will	be	active while	e the tool is	s runi	hing.			I	
Service Indicator	B∪s √	Element √	Bit 0-32 √	Polarity N.O./N. √	C. N	Node: Normal, $$	Timed, Flash	Time	Width	Offset	Input Bus	Input Elemer	nt Input Bit
The "Servic	e In	dicator'	' outpu	ut assignment	will	l be active i	f the syster	m is i	n nee	d of se	ervice.		
ToolsNet Connected	B∪s √	Element √	Bit 0-32 √	Polarity N.O./N. $$	C. N	Node: Normal, $$	Timed, Flash	Time	Width	Offset	Input Bus	Input Eleme	nt Input Bit
The "ToolsN ToolsNet se	let (rver	Connec	ted" or	utput assignn	nent	t will be act	ive if the c	ontro	oller h	as an	active c	onnection	to a
Open	Bus	Element	Bit 0-32	Polarity N.O./N.	C. N	Aode: Normal,	Timed, Flash	Time	Width	Offset	Input Bus	Input Eleme	nt Input Bit
Connected	√	√	V	√		√		6 11	1	- 11 1			
protocol co	Pro onne	ection.	onneci	red" output c	assig	inment will i	oe active i	t the	CONTI	oller r	ias an ac	ctive Open	
PFCS Connected	B∪s √	Element √	Bit 0-32 √	Polarity N.O./N. √	C. N	Node: Normal, $$	Timed, Flash	Time	Width	Offset	Input Bus	Input Elemei	nt Input Bit
The "PFCS (Con	nected	" outpu	ut assignmen	t wil	ll be active	if the cont	roller	has c	an act	ive PFCS	connectio	on.
Running PSet Number	B∪s √	Element √	Bit 0-32 √	Polarity N.O./N.	C. N	Aode: Normal,	Timed, Flash	Time	Width √	Offset $$	Input Bus	Input Elemei	nt Input Bit
The "Runnir	ng P	'Set Nur	nber" c	butput assign	mer	nt will outpu	t the curre	nt PS	set nu	mber.		<u> </u>	
Running Job	B∪s √	Element	Bit 0-32 √	Polarity N.O./N.	C. N	Aode: Normal,	Timed, Flash	Time	Width √	Offset $$	Input Bus	Input Eleme	nt Input Bit
The "Runnir	ng J	ob Num	nber" o	utput assignr	nen	it will output	the curre	nt Jo	b nun	nber.			
External Controlled	B∪s √	Element √	Bit 0-32 √	Polarity N.O./N.	C. N	Aode: Normal,	Timed, Flash	Time	Width	Offset	Input Bus √	Input Elemer √	nt Input Bit √
The "Extern Element", c	al C and	Controlle "Input E	ed" out Bit" to s	put assignme pecify the inj	ent v out f	will reflect th to reflect.	e state of	an ir	iput. l	Jse th	e "Input	Bus, "Input	
Tool in CCW	B∪s √	Element √	Bit 0-32 √	Polarity N.O./N. √	C. N	Aode: Normal, √	Timed, Flash	Time	Width	Offset	Input Bus	Input Elemei	nt Input Bit
The "Tool In tool is in ass	n CC sem	CW" out bly mod	put ass de.	ignment will	be c	active if the	tool is put	into	disass	embly	/ mode c	and inactiv	re if the
Tool in CW	B∪s √	Element √	Bit 0-32 √	Polarity N.O./N. √	C. N	Node: Normal, $$	Timed, Flash	Time	Width	Offset	Input Bus	Input Elemei	nt Input Bit
The "Tool In into disasse	n CV emb	V'' outpi ly mode	ut assig ;	nment will be	e ac	ctive when t	he is in ass	emb	ly mo	de ar	nd inactiv	ve if the too	ol is put
Torque	B∪s √	Element √	Bit 0-32 √	Polarity N.O./N.	C. N	Aode: Normal,	Timed, Flash	Time	Width √	Offset	Input Bus	Input Elemen	nt Input Bit
The "Torque be cleared torque will l	e" o I to (be t	utput a) at the runcate	ssignm start o ed to a	ent will outpu f a new faste n integer and	ning ning ou	e final torqu g cycle or a tput.	ue value of Job reset.	the At th	most ne en	recen d of th	t rundow ne fasten	n. The valuing cycle t	ue will he final

Torque (x10)BusElementBit 0-32Polarity N.O./N.C.Mode: Normal, Timed, FlashTimeWidthOffsetInput Bu $$ $$ $$ $$ $$ $$ $$ $$ $$ $$	s Input Element Input Bit
The "Torque (x10)" output assignment will output the final torque value of the most recent r will be cleared to 0 at the start of a new fastening cycle or a Job reset. At the end of the fo final torque will be multiplied by 10, truncated to an integer and output.	undown. The value astening cycle the
Torque (x100)BusElementBit 0-32Polarity N.O./N.C.Mode: Normal, Timed, FlashTimeWidthOffsetInput Bu $$ $$ $$ $$ $$ $$ $$ $$ $$ $$	s Input Element Input Bit
The "Torque (x100)" output assignment will output the final torque value of the most recent value will be cleared to 0 at the start of a new fastening cycle or a Job reset. At the end of cycle the final torque will be multiplied by 100, truncated to an integer and output.	rundown. The f the fastening
AngleBusElementBit 0-32Polarity N.O./N.C.Mode: Normal, Timed, FlashTimeWidthOffsetInput Bu $$ $$ $$ $$ $$ $$ $$ $$ $$ $$	s Input Element Input Bit
The "Angle" output assignment will output the final angle value of the most recent rundow cleared to 0 at the start of a new fastening cycle or a Job reset.	n. The value will be
Rundown Saved to ETP ServerBusElementBit 0-32Polarity N.O./N.C.Mode: Normal, Timed, FlashTimeWidthOffsetInput Bu $\sqrt{1-1}$ $\sqrt{1-1}$ $\sqrt{1-1}$ $\sqrt{1-1}$ $\sqrt{1-1}$ $\sqrt{1-1}$ $\sqrt{1-1}$ $\sqrt{1-1}$	s Input Element Input Bit
The "Rundown Saved to FTP Server" output assignment will output the ID of the last rundow to the FTP server.	n that was saved
Fastener RemovedBusElementBit 0-32Polarity N.O./N.C.Mode: Normal, Timed, FlashTimeWidthOffsetInput Bu $\sqrt{1}$ <td>s Input Element Input Bit</td>	s Input Element Input Bit
The "Fastener Removed" output assignment will go active when a fastener is removed by the controller must be configured to report disassembly for this output to work. It will go inactive fastening is started (the torque exceeds the threshold value) or a Job reset.	he operator. The e when the next
Spindle OKBusElementBit 0-32Polarity N.O./N.C.Mode: Normal, Timed, FlashTimeWidthOffsetInput Bus $\sqrt{1}$ 1	s Input Element Input Bit
The "Spindle Ok" output assignment will go active at the completion of multi-spindle fastening an OK. It will go inactive when the next fastening is started (the torque exceeds the threshold v	if all spindles have alue) or a Job reset.
Spindle NOkBusElementBit 0-32Polarity N.O./N.C.Mode: Normal, Timed, FlashTimeWidthOffsetInput Bus	s Input Element Input Bit
The "Spindle NOK" output assignment will go active at the completion of multi-spindle faste more of the spindles have an NOK. It will go inactive when the next fastening is started (the the threshold value) or a Job reset.	ening if one or torque exceeds
Spindle Fastening CompleteBusElementBit 0-32Polarity N.O./N.C.Mode: Normal, Timed, FlashTimeWidthOffsetInput Bu	s Input Element Input Bit
The "Spindle Fastening Complete" output assignment will go active at the completion of mu It will go inactive when the next fastening is started (the torque exceeds the threshold value)	lti-spindle fastening. or a Job reset.
PulsesBusElementBit 0-32Polarity N.O./N.C.Mode: Normal, Timed, FlashTimeWidthOffsetInput Bu $\sqrt{1}$	s Input Element Input Bit
The "Pulses" output assignment will output the pulse count value of the most recent rundow be cleared to 0 at the start of a new fastening cycle or a Job reset.	vn. The value will
Pulses HighBusElementBit 0-32Polarity N.O./N.C.Mode: Normal, Timed, FlashTimeWidthOffsetInput Bu $$ $$ $$ $$ $$ $$ $$ $$ $$ $$	s Input Element Input Bit
The "Pulses High" output assignment will go active at the completion of a fastening that hat that exceeds the high limit. It will go inactive when the next fastening is started (the torque threshold value) or a Job reset.	as an pulse count exceeds the

Pulses Low	Bus √	Element √	Bit 0-32 √	Polarity N.O./N.C. $$	Mode: Normal, Tir √	ned, Flash	Time	Width	Offset	Input Bus	Input Elemen	t Input Bit
The "Pulses that falls be threshold v	Low elow alue	/" outpu the low e) or a Jo	ut assig v limit. I ob rese	nment will go o t will go inactiv et.	active at the co ve when the ne	ompletior xt fasteni	n of a ng is	a faste starte	ening ed (the	that has e torque	an pulse co exceeds th	ount ie
Pulses NOk	B∪s √	Element √	Bit 0-32 √	Polarity N.O./N.C. $$	Mode: Normal, Tir √	ned, Flash	Time	Width	Offset	Input Bus	Input Elemen	t Input Bit
The "Pulses count. It wil	Ok" I go	output inactive	assignn when	nent will go act the next fasten	ive at the comp ing is started (th	e torque	a fas exce	tening eds th	g that ne thre	has an ao eshold va	cceptable p lue) or a Job	oulse o reset.
Pulses Ok	B∪s √	Element √	Bit 0-32 √	Polarity N.O./N.C. $$	Mode: Normal, Tir $$	med, Flash	Time	Width	Offset	Input Bus	Input Elemen	t Input Bit
The "Pulses pulse count reset.	NOk t. It v	(" outpu vill go ind	t assigr active v	nment will go ad when the next f	ctive at the con astening is starte	npletion o ed (the to	f a fo rque	astenir exce	ng tha eds th	t has an he thresho	unacceptal old value) oi	ble r a Job
ON	B∪s √	Element √	Bit 0-32 √	Polarity N.O./N.C. $$	Mode: Normal, Tir √	med, Flash	Time	Width	Offset	Input Bus	Input Elemen	t Input Bit
The "ON" o down.	utpu	ıt assign	ment v	vill be active wh	nen the controlle	er is powe	ered (Jp an	d rem	ains activ	e until pow	er
Job Aborted	B∪s √	Element √	Bit 0-32 √	Polarity N.O./N.C. $$	Mode: Normal, Tir $$	med, Flash	Time	Width	Offset	Input Bus	Input Elemen	t Input Bit
The "Job A	bort	ed" out	put as	signment will g	o active if a Jo	b is abort	ed. I	t will g	go ina	ctive wh	en the job i	s reset.
Tool In Use	B∪s √	Element $$	Bit 0-32 √	Polarity N.O./N.C. $$	Mode: Normal, Tir	ned, Flash	Time √	Width	Offset	Input Bus	Input Elemen	t Input Bit
The "Tool Ir will go inac	n Use tive	when t	ut assig he spe	nment will go o cified time is re	active when the ached without	e trigger i becomir	s pre ng a	ssed, ctive i	where in bety	eupon a ween.	timer will re	start. It
Barcode Scanned	B∪s √	Element √	Bit 0-32 √	Polarity N.O./N.C. $$	Mode: Normal, Tir	med, Flash	Time	Width	Offset	Input Bus	Input Elemen	t Input Bit
The "Barco activate th bits will go	de S e co inac	canneo prrespor tive wh	d" outp nding b en a to	out assignment bit, if it is covere bol reaches the	will go active v ed by the numb InCycle thresh	when a b ber of bits old of a r	arcc con undo	ide is figure own c	scann d. The or whe	ed. The l maximu n they a	ID # (1-4) w um size is 4 k re reset.	ill bits. All
Start Trigger Active	B∪s √	Element √	Bit 0-32 √	Polarity N.O./N.C. $$	Mode: Normal, Tir	med, Flash	Time	Width	Offset	Input Bus	Input Elemen	t Input Bit
The 'Start T	rigge	er Activ	e' assig	gnment will refl	ect the state of	the activ	ve St	art Inp	out co	nfigured	to run the	tool.

Possible Start Inputs include:

- Start from IO
 - Start
 - Dual Start Interlocked
- Start from Tool Buttons
 - Lever and/or PTS
 - Dual Levers Interlocked
 - Start from Master Tool
 - Start from Remote Start
 - $\circ~$ Latched Throttle

Start Trigger Active is available for the iEC Controller Only.

12. Controller Supported MIDs

	Supported MID			
MID	Description	Revisions	Note	
1	Communication start	1,2,3		
2	Communication start	1,2,3		
	acknowledge			
3	Communication stop			
4	Command error			
5	Command accepted			
8	Application data subscribe		Support MID 900	
9	Application data unsubscribe		Support MID 900	
10	Parameter set ID upload request			
11	Parameter set ID upload reply			
12	Parameter set data upload request			
13	Parameter set data upload reply		Always returns a batch size of 0	
14	Parameter set selected subscribe			
15	Parameter set selected			
16	Parameter set selected acknowledge			
17	Parameter set selected			
18	Select Parameter set			
19	Set Parameter set batch size			
20	Reset Parameter set batch			
	counter			
30	Job ID upload request			
31	Job ID upload reply			
34	Job info subscribe			
35	Job info			
36	Job info acknowledge			
37	Job info unsubscribe			
38	Select Job			
39	Job restart			
40	Tool data upload request	1,2		
41	Tool data upload reply			
42	Disable tool			
43	Enable fool			
50	venicie ID number download			
<i>C</i> 1	request	1.0		
51	Vehicle ID number subscribe	1,2		
52	venicie ID number	1,2	send w/without IDs	
53	Vehicle ID number acknowledge			
54	Vehicle ID number unsubscribe			
60	Last tightening result data subscribe	1-6,999		
61	Last tightening result data			
62	Last tightening result data acknowledge			
63	Last tightening result data			
64	Old tightening result upload			

	Supported MID			
MID	Description	Revisions	Note	
65	Old tightening result upload reply			
70	Alarm subscribe			
71	Alarm			
72	Alarm acknowledge			
73	Alarm unsubscribe			
76	Alarm status			
77	Alarm status acknowledge			
80	Read time upload request			
81	Read time upload reply			
82	Set time			
90	Multi spindle status subscribe			
91	Multi spinale status			
92	Multi spindle status usaula asila			
93	Multi spinale status unsubscribe			
100	Multi spindle results			
101	Multi spindle results acknowledge			
102	Multi spindle results upsubscribe			
113	Flash green light on tool			
127	Abort Job			
128	Job batch increment			
129	Job batch decrement			
130	Job off			
150	Identifier download request			
157	Reset all Identifiers			
200	Set external controlled relays		Only supports 0	
210	Status external monitored inputs			
211	Status external monitored inputs			
212	Status external monitored inputs			
010	acknowledge			
213	sialus external monitorea inputs			
014		1.0		
214	10 device status reply	1,2		
215	Relay function subscribe		See supported	
210			relay functions below.	
217	Relay function			
218	Relay function acknowledge			
219	Relay function unsubscribe			
241	User data subscribe		Out_1 - Pulse status	
242	User data		(0= OK, 1 = Low,	
243	User data acknowledge		2 = High)	
244	Relay function unsubscribe		Out 2 - Pulses	
			Out_3 - Undefined	
			Out 4 - Undefined	
900	Trace data		Trace type 1 &	
			2 only (angle &	
9990	Keen alive open protocol			
////	communication			

Supported Relay Functions

Supported Relay Functions	
Number	Function
1	OK
2	NOK
5	Low Torque
6	High Torque
7	Low angle
8	High angle

Supported Relay Functions	
Number	Function
9	Cycle complete
10	Alarm
11	Batch NxOK
12	Job OK
19	Tool ready
20	Tool start switch

Supported Relay Functions		
Number	Function	
21	Dir. switch = CW	
22	Dir. switch = CCW	
26	Tool running	
145	Start Trigger Active	
276	Cycle abort	

13. Dimensions



14. Specifications

Mechanical:

Dimensions	Width:	6.25 in	159 mm
	Height:	15.75 in	400 mm
	Depth:	12.5 in	316 mm
Weight:		15.0 lbs	7.1 kg

Operating Conditions:

Temperature:	32 to 122 °F (0 to 50 °C)
Humidity:	Non-condensing
Ingress Protection:	IP20

Electrical:

AC Power Source: 100 - 240 VAC, 50/60 Hz, 1Amp, 100 Watts

Standards:

Safety Compliance: EC Machinery Directive 2006/42/EC EC Low Voltage Directive 2006/95/EC

EN 12100-1; EN 12100-12 Safety of Machinery

EN 60745-1; EN 60745-2-2 Hand-held motor operated tools EMC

EC Directive of Electromagnetic Compatibility 2004/108/ EC

EN 61000-6-4; EN 6100-6-2; Class A

RoHs Reduction of Hazardous Substances 2002/95/EC Markings CE

15. Troubleshooting

Issue: LED Frozen Showing "Initializing"

Solution: The rear SD card containing the system UI may have become unseated. Turn off controller power. Depending on vintage, remove the label or cover plate to access the card slot. Gently depress the card and release to unseat it. Gently then press the card into the slot until feeling and hearing the locking click indicating it is secure. Replace the label or cover plate and power the controller back on.

Issue: System Port IP Connectivity using USB Cabling

Solution: In most cases, connectivity will be automatic when connection between the controller SYSTEM PORT and a PC USB Port are made. Confirmation of the connection is noted by the presence of a USB Ethernet/RNDIS Gadget in the PC Adapter list. Should this connection not be established, specific instructions are located at the product manuals page at <u>https://www.aimco-</u> global.com/manuals under the heading **System Port Connectivity Troubleshooting for PCs**.

16. AIMCO Warranty

NEW TOOL AND ACCESSORY WARRANTY

Any new tool or accessory branded with the AIMCO, Uryu, AcraDyne or Eagle Group name, and purchased from AIMCO, or through one of its authorized distributors or agents, is warranted to the original buyer against defects in materials and workmanship for a period of one (1) year* from date of delivery. Under the terms of this warranty, AIMCO agrees, without charge, to repair or replace, at its option and Ex-Works (EXW) its authorized service centers, any product or accessory warranted hereunder proving to AIMCO's satisfaction to be defective as a result of defective workmanship or material. In order to qualify for this warranty, written notice to AIMCO must be given immediately upon discovery of such defect, at which time AIMCO will issue an authorization to return the tool. The defective item must be promptly returned to an authorized AIMCO service center with all freight charges prepaid.

REPAIRED TOOL WARRANTY

Once a tool is beyond the new product warranty period as detailed above, AIMCO will provide repair subject to the following warranty periods: pneumatic tools: 90 days*; electric tools and Acra-Feed: 90 days; battery tools: 30 days*; DC Electric tools: 90 days*

EXCLUSION FROM WARRANTY

This warranty is valid only on products purchased from AIMCO, or through its authorized distributors or agents. AIMCO shall have no obligation pursuant to the AIMCO Warranty with respect to any tools or accessories which in AIMCO's sole judgment have been altered damaged, misused, abused, badly worn, lost or improperly maintained. This Warranty is null and void if the customer, or any other person other than an authorized representative of AIMCO, has made any attempt to service or modify the tool or accessory prior to its return to AIMCO under this Warranty.

The warranty provision with respect to each such product may be amended by AIMCO from time to time in its sole discretion. The liability of AIMCO hereunder shall be limited to replacing or repairing, at its option, any defective products which are returned freight pre-paid to AIMCO or, at AIMCO's option, refunding the purchase price of such products. AIMCO reserves the right to make periodic changes in construction or tool design at any time. AIMCO specifically reserves the right to make these changes without incurring any obligation or incorporating such changes or updates in tools or parts previously distributed.

THE AIMCO WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, AND AIMCO EXPRESSLY DISCLAIMS ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. THIS WARRANTY SETS FORTH THE SOLE AND EXCLUSIVE REMEDY IN CONTRACT, TORT, STRICT LIABILITY, OR OTHERWISE.

THIS WARRANTY IS THE ONLY WARRANTY MADE BY AIMCO WITH RESPECT TO THE GOODS DELIVERED HEREUNDER, AND MAY BE MODIFIED OR AMENDED ONLY BY A WRITTEN INSTRUMENT SIGNED BY A DULY AUTHORIZED OFFICER OF AIMCO.

LIMITATION OF LIABILITY

AIMCO'S LIABILITY PURSUANT TO WARRANTY OF THE PRODUCTS COVERED HEREUNDER IS LIMITED TO REFUND OF THE PURCHASE PRICE. IN NO EVENT SHALL AIMCO BE LIABLE FOR COSTS OF PROCUREMENT OF SUBSTITUTE GOODS BY THE BUYER. IN NO EVENT SHALL AIMCO BE LIABLE FOR ANY SPECIAL, CONSEQUENTIAL, INCIDENTAL OR OTHER DAMAGES (INCLUDING WITHOUT LIMITATION, LOSS OF PROFIT) WHETHER OR NOT AIMCO HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH LOSS, HOWEVER CAUSED, WHETHER FOR BREACH OR REPUDIATION OF CONTRACT, BREACH OF WARRANTY, NEGLIGENCE OR OTHERWISE. THIS EXCLUSION ALSO INCLUDES ANY LIABILITY WHICH MAY ARISE OUT OF THIRD PARTY CLAIMS AGAINST BUYER. THE ESSENTIAL PURPOSE OF THIS PROVISION IS TO LIMIT THE POTENTIAL LIABILITY OF AIMCO ARISING OUT OF THIS AGREEMENT AND/OR SALE.

NOTE: The AIMCO Warranty confers specific legal rights, however some states or jurisdictions may not allow certain exclusions or limitations within this warranty. ***Note – All warranty periods addressed** herein are determined using a standard shift, eighthour work day.



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