AcraDyne iBC CONTROLLER MANUAL

Important Safeguards

For your protection, please read these instructions completely. Keep this manual for future reference. Carefully observe and comply with all warnings, cautions and instructions placed on the equipment or described in this manual.

Contents

LIT-MAN 190 rev_11.21.17

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1 Safety Information

General Power Tool Safety Warnings

Read all safety warnings and instructions. *Failure to follow the warnings and instructions may result in electric shock, fire, and/or serious injury.*

Save all warnings and instructions for future refe rence.

The term "power tool" in the warnings refers to your mains-operated (corded) power tool or battery-operated (cordless) power tool.

1. **Work area safety**

   a. **Keep work area clean and well lit.** *Cluttered or dark areas invite accidents.*

   b. **Do not operate power tools in explosive atmospheres, such as in the presence of flammable liquids, gases or dust.** *Power tools create sparks which may ignite the dust or fumes.*

   c. **Keep children and bystanders away while operating a power tool.** *Distractions can cause you to lose control.*

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.** *Unmodified plugs and matching outlets will reduce risk of electric shock.*

   b. **Avoid body contact with earthed or grounded surfaces, such as pipes, radiators, ranges and refrigerators.** *There is an increased risk of electric shock if your body is earthed or grounded.*

   c. **Do not expose power tools to rain or wet conditions.** *Water entering a power tool will increase the risk of electric shock.*

   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.** *Damaged or entangled cords increase the risk of electric shock.*

   e. **When operating a power tool outdoors, use an extension cord suitable for outdoor use.** *Use of a cord suitable for outdoor use reduces the risk of electric shock.*

   f. **If operating a power tool in a damp location is unavoidable, use a residual current device (RCD) protected supply.** *Use of an RCD reduces the risk of electric shock.*
   NOTE: The term "residual current device (RCD)" may be replaced by the term "ground fault circuit interrupter (GFCI)" or "earth leakage current breaker (ELCB)".

Power Cord Receptacle

N   L

PE

IEC 320-C20

100-240 VAC
50/60Hz
1 Amps
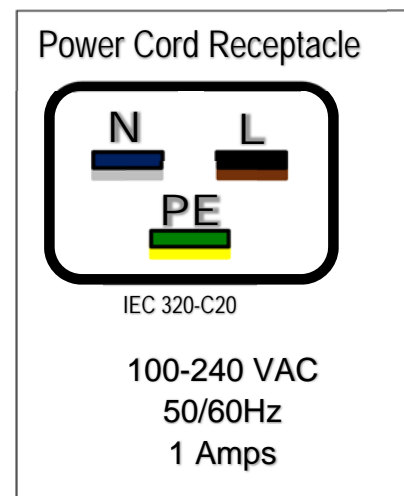
3. Personal safety

   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.** *A moment of inattention while operating power tools may result in serious personal injury.*

   b. **Use personal protective equipment. Always wear eye protection.** *Protective equipment such as dust mask, non-skid safety shoes, hard hat, or hearing protection used for appropriate conditions will reduce personal injuries.*

   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.** *Carrying power tools with your finger on the switch or energizing power tools that have the switch on invites accidents.*

   d. **Remove any adjusting key or wrench before turning the power tool on.** *A wrench or a key left attached to a rotating part of the power tool may result in personal injury.*

   e. **Do not overreach. Keep proper footing and balance at all times.** *This enables better control of the power tool in unexpected situations.*

   f. **Dress properly. Do not wear loose clothing or jewelry. Keep your hair, clothing and gloves away from moving parts.** *Loose clothes, jewelry, or long hair can be caught in moving parts.*

   g. **If devices are provided for the connection of dust extraction and collection facilities, ensure these are connected and properly used.** *Use of dust collection can reduce dust-related hazards.*

4. Power tool use and care

   a. **Do not force the power tool. Use the correct power tool for your application.** *The correct power tool will do the job better and safer at the rate for which it was designed.*

   b. **Do not use the power tool if the switch does not turn it on and off.** *Any power tool that cannot be controlled with the switch is dangerous and must be repaired.*

   c. **Disconnect the plug from the power source and/or the battery pack 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. Check for misalignment or binding of moving parts, breakage of parts and any other condition that may affect the power tools operation. If damaged, have the power tool repaired before use.** *Many accidents are caused by poorly maintained power tools.*

f. **Keep cutting tools sharp and clean.** *Properly maintained cutting tools with sharp cutting edges are less likely to bind and are easier to control.*

g. **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.*

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.*

2 Controller Diagram

2.1 Bottom Panel
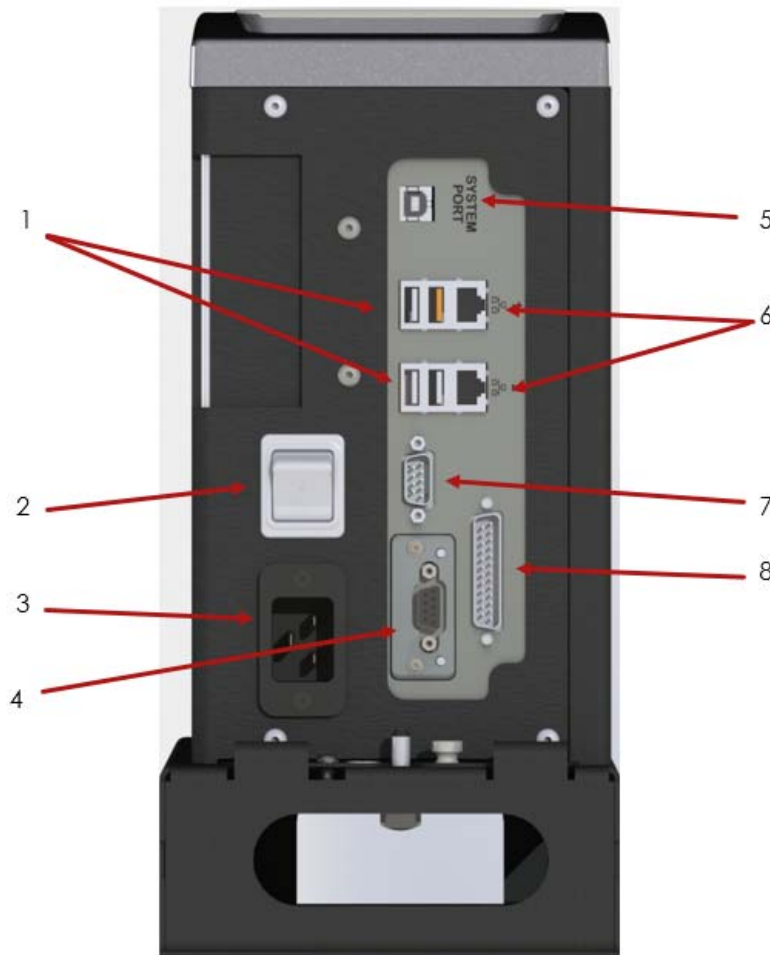
1. USB port: Import/export of data including firmware updates
2. Power Disconnect Switch: Turns controller on and off
3. Power Cord Connection
4. Anybus: connects tofieldbus network (Ex: Profibus)
5. System Port: USB connection used to connect external computer to configure/monitor the controller
6. Ethernet Port RJ45: 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 Light

Torque Display (Always displays torque value)

Secondary Display

Parameter Setting (PSet)/Job display and Increment/Decrement buttons

Toggle button
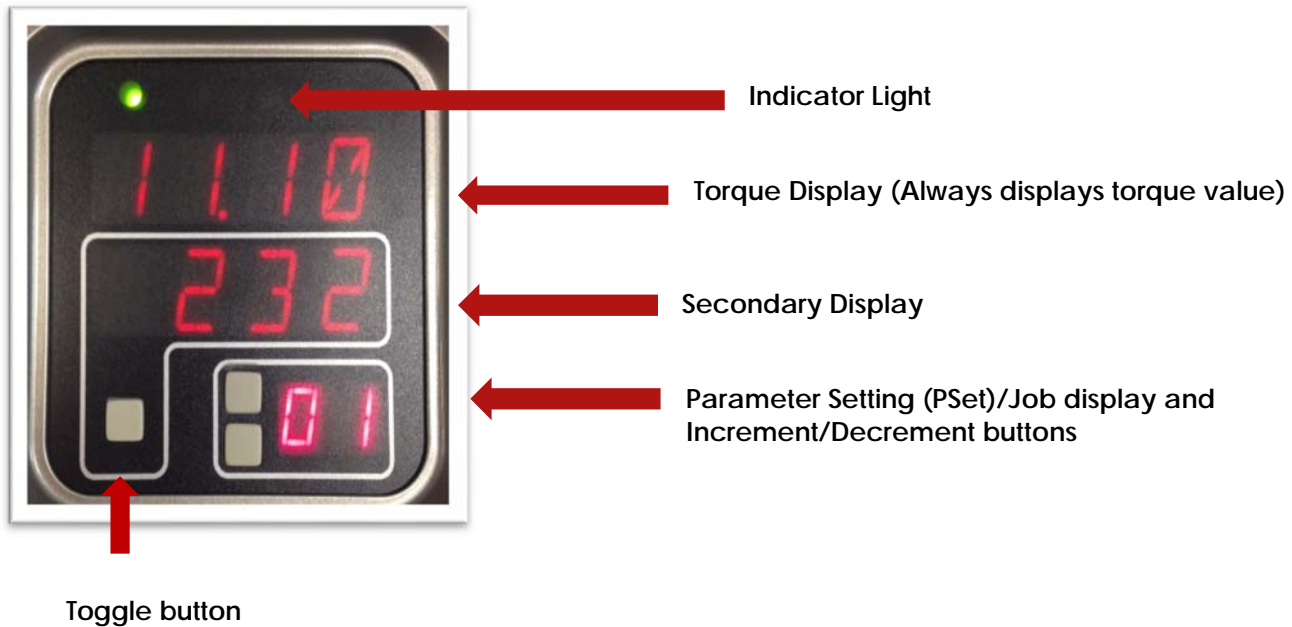
Indicator Lights:

Green LED: Indicates fastening cycle meets specified Parameters.

Red LED: Indicates fastening cycle rejected due to exceeding high torque.

Red Flashing LED: Indicates low torque. Fastening cycle was rejected due to not achieving low torque.

Yellow LED: Indicates High Angle. Fastening cycle was rejected due to exceeding high angle.

Yellow Flashing LED: Indicates Low Angle. Fastening cycle was rejected due to not achieving low angle.

Blue LED: Tool is In-cycle, above threshold.

- Increment and Decrement buttons change PSet.
- Toggle button switches **secondary display** between
    - Units of measure
    - Ethernet IP address
    - USB (System Port) IP address
    - Angle report

        NOTE: If Jobs are enabled refer to **4.2 Job** section of the manual for Toggle Button function.

3 Initial Setup

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

Step 2 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 provides a wide variety of country specific power cord options. Check with your authorized AcraDyne representative 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 Secondary Protective Earth attachment (required) must be connected to ground using the #14 AWG conductor, a green wire with a yellow stripe. Attach using a #10-14 AWG ring terminal and #10 star washer (see below).
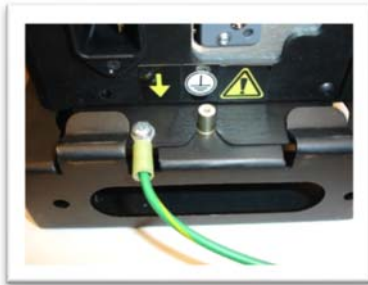
1—Secondary Protective Earth Attachment

Step 4 Turn controller on by pushing the Power Disconnect switch (pg. 8) to the POWER ON position, a light indicates power on.

Step 5 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:
1.   Controller touch-screen console
2.   System Port: (USB connection) Direct connection to controller
3.   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 System Port Directly to PC

Gen 4 Controller System Port USB STD B		PC USB STD A Port

Cable

USB 2.0
USB (A) to USB (B)

Connecting Via Ethernet Port Directly to PC

Gen 4 Controller	Cable Ethernet (Shielded)	PC USB STD A Port
Ethernet Port		

Connecting Via Ethernet Port to a Network

Gen 4 Controller	Cable Ethernet (Shielded)	Network Router
Ethernet Port		Ethernet Port

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.
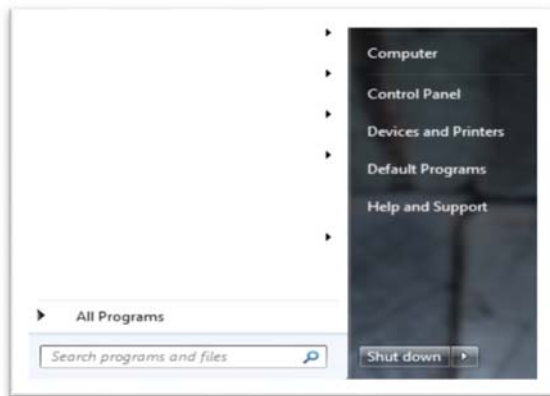
Step 3 After the driver is installed, go to 'Control Panel'.
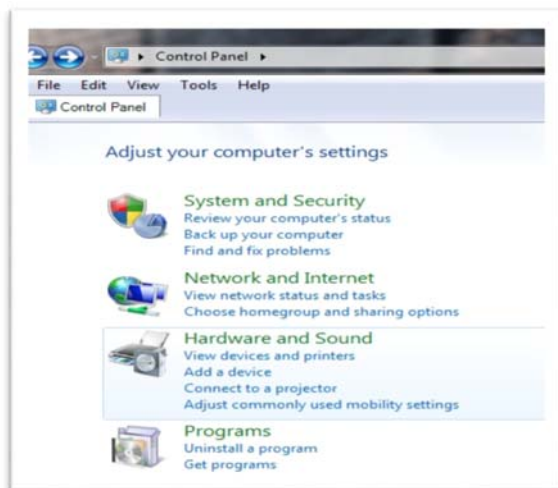
Step 4 Go to 'Network and Internet'.
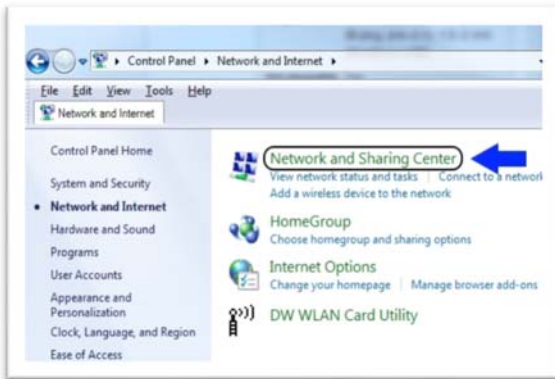
Step 5 Go to 'Network and Sharing Center'.
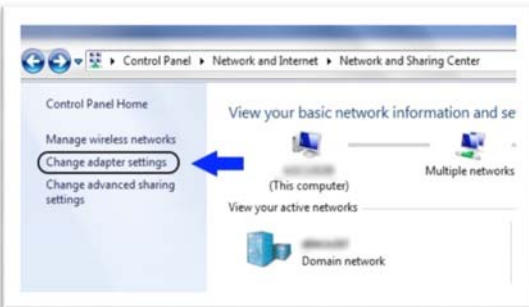
Step 6 Go to 'Change adapter settings'.

Step 7 Find the Local Area Connection that is using the 'USB Ethernet/RNDIS Gadget' network. Right click this network and go to 'Properties'.
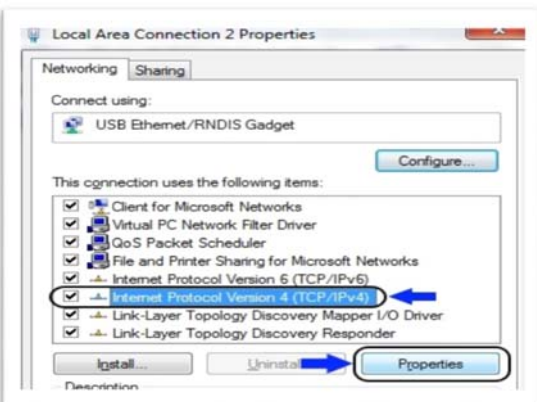
Step 8 In Properties window select 'Internet Protocol Version 4' and click 'Properties'.

<u>Step 9</u> In 'Properties', set the IP address to a static address.
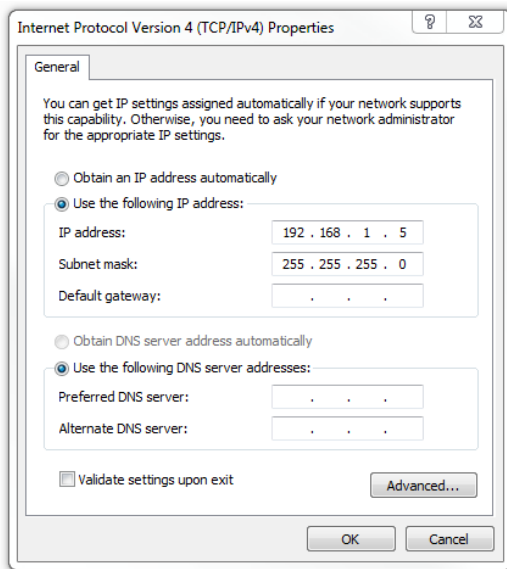
Type an IP address of 192.168.1.5 (Any address on the same subnet as the controller will work).
Set subnet mask to 255.255.255.0

<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.
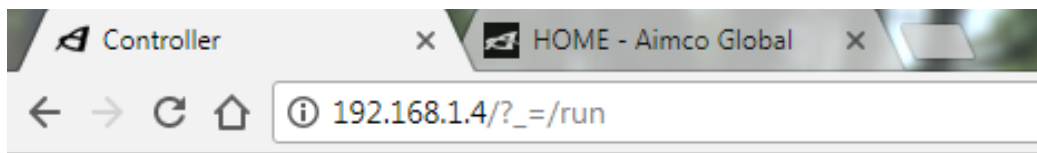
You will see the controller software on your computer sceen.

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'.
Set a static IP address of the Computer/Laptop to 10.10.30.98 and subnet mask to 255.255.255.0. (For instructions, see the example earlier in this section.)

To connect to the controller, on the computer/laptop open a browser, such as Chrome or Firefox, enter 10.10.30.99, the default Ethernet port IP address.
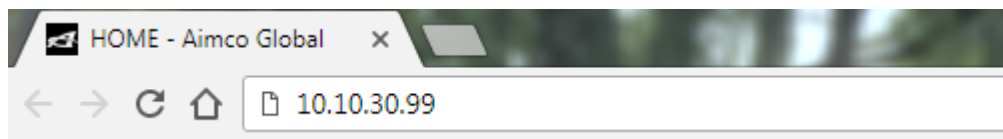
You will see on your computer sceen the controller software

NOTE: Controller does not have a DHCP client, it will not automatically configure itself with a useable 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

Recommended Tool Setup for Wi-Fi connection to the iBC Controller

Overview

This document lists the recommended iBC tool settings for connection to the iBC. In addition, It contains examples of Wi-Fi communication settings for the tool and examples of how to setup the most common type or rundown strategies.

Required Items:

- AcraDyne-Tool-Manager Software
  - o Can be found at www.aimco-global.com
- USB driver ft232rl (may be needed the first time the tool is connected to the PC)
  - o Can be found at www.aimco-global.com
- iBC Manuals
  - o Can be found at www.aimco-global.com
- USB-A to Mini USB Cable (included with tool)
- Wi-Fi Router with connection to an iBC Controller or plant wifi configuration (user responsibility)
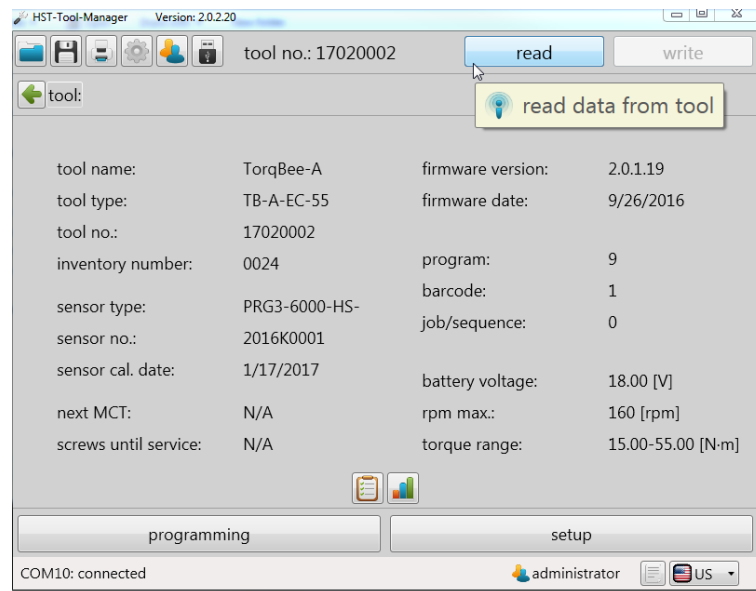
Editing the tool's parameters via the Acrdayne-Tool-Manager Software:

- Remove the battery from the tool
- Connect tool to PC using the mini-USB cable
- Launch AcraDyne Tool Manager
  - o Login as:
    - Administrator: "Admin" - This accesses the tool setup and program menus
      OR
    - Network Administrator: "Instand" - This accesses the Wi-Fi setup menu
  - o Read the tool parameters from the tool

- o Edit parameters as needed
- o Write the new parameters to the tool
- Disconnect tool from computer
- Install battery on tool

Tool setup parameter settings recommended for iBC connection:
- Tool: Setup menu (Login as: Administrator, passcode "Admin")
  - o General
    - ▪ Manual mode active: [unchecked]
    - ▪ Enable over: 'external control unit' **OR** 'barcode & external control unit' if the tool is equipped with a scanner.
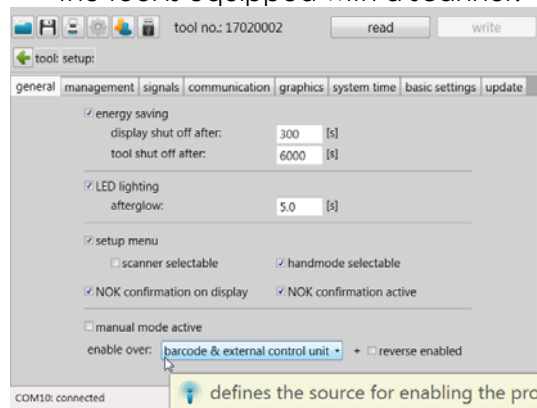
  - o Communication
    - ▪ Spool: record in spool, 10 trials, 1st period,
    - ▪ Block tool until answer: [checked]. This prevents tool from performing a second rundown, if tool is disconnected from controller just before or while running.
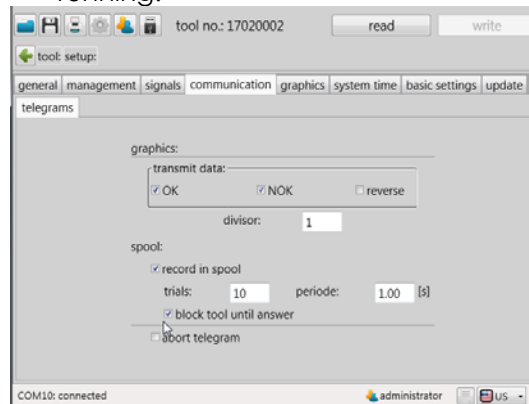
  - o Basic settings
    - ▪ Hardware configuration:
      - • Display: [checked]
      - • Scanner: [checked if equipped]
      - • Radio: [checked]
      - • Recovery: [unchecked]. **Note:** On power up, this prevents tool from running until connection to controller is established.
- Tool: programs menu
  - o Delete all jobs
  - o 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 three 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

- 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 of 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
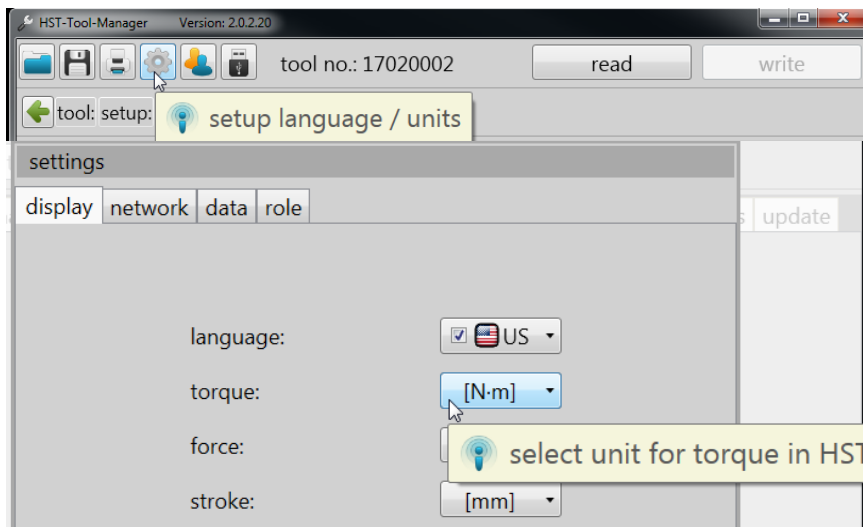
- Selecting the torque units reported by the tool and displayed on the iBC controller
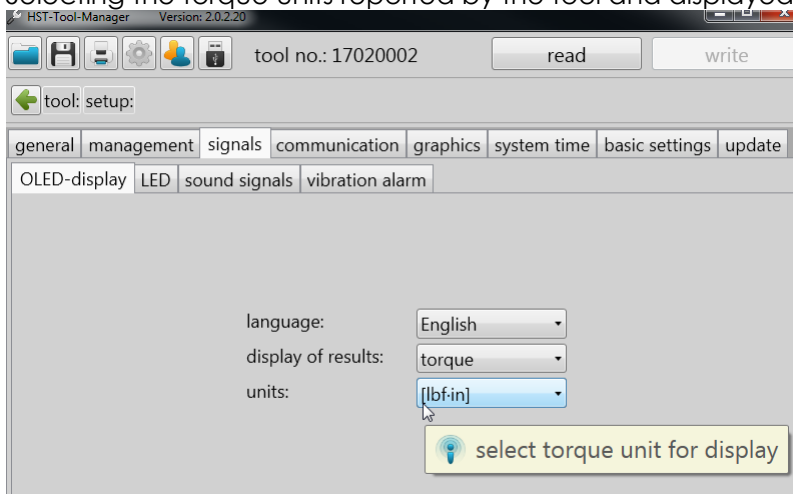
Program Examples:

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' is synonymous with 'PSet'.
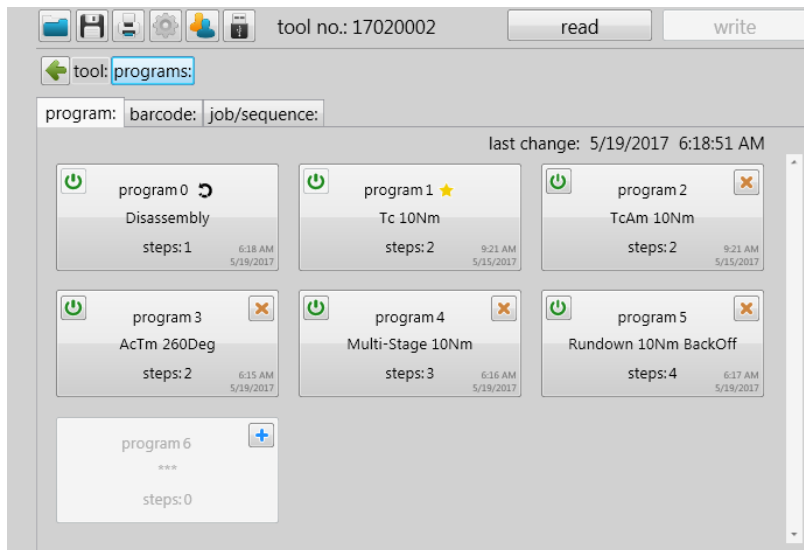
Disassembly:

The CCW program that the other programs use for reverse. **NOTE**: Reverse program is checked.

Torque Control Strategy:
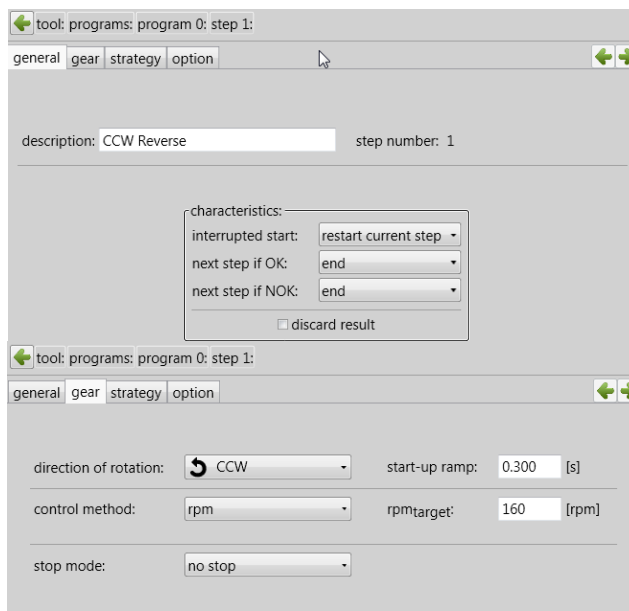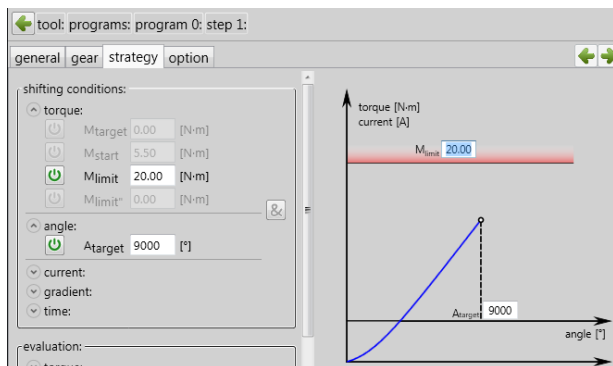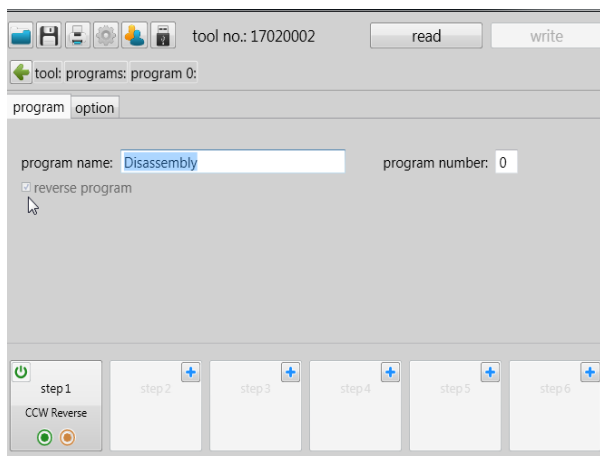
Torque control with 'Mstart' ('In-Cycle') set to 2Nm. Time out set for 10 seconds.

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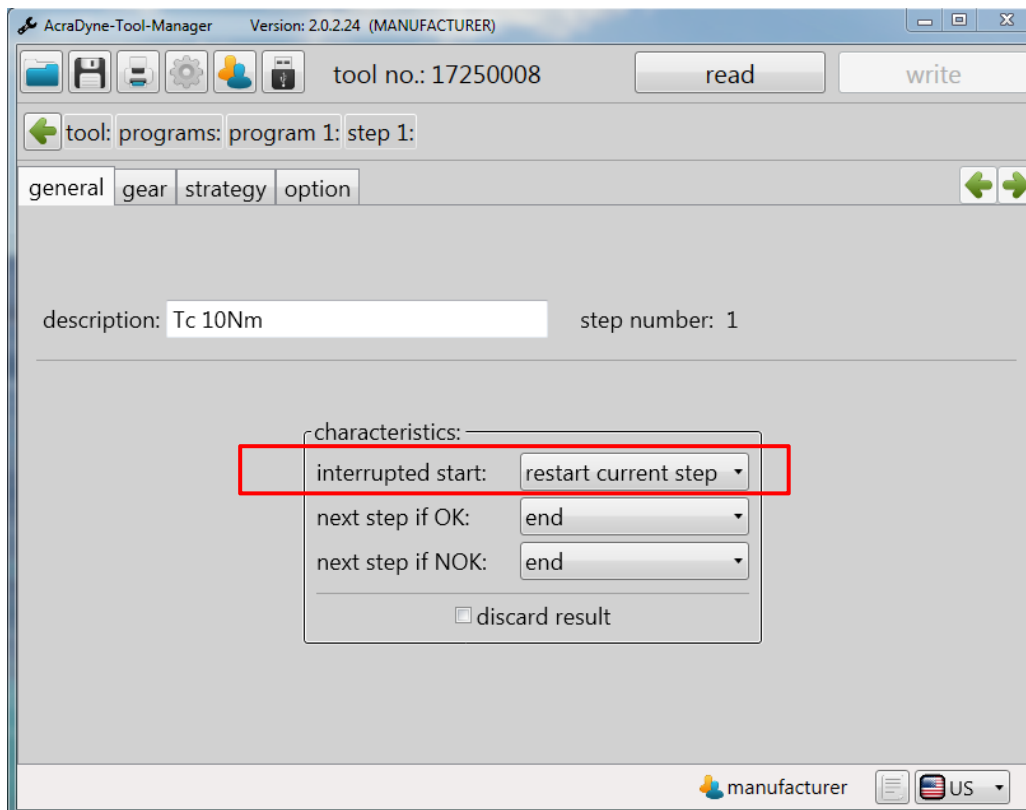
The tool will display the screen below when the trigger is released.

4 Home Page (Main Menu)
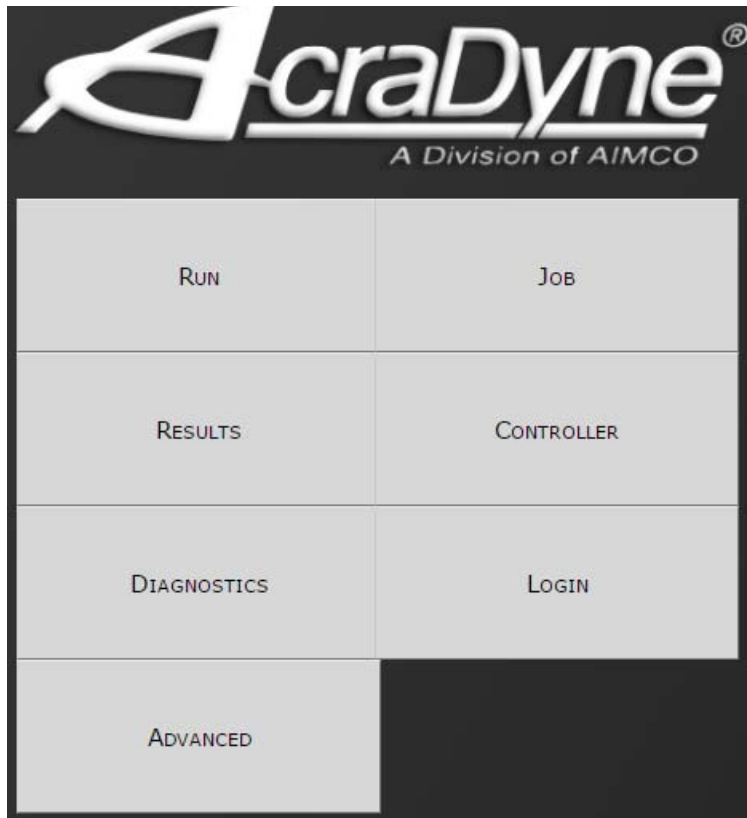
4.1 Run
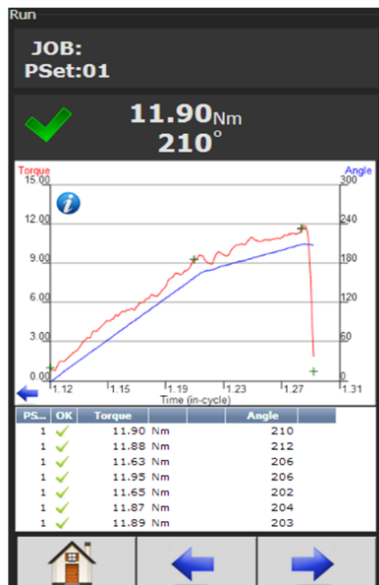
The **Run Screen** is essentially the dashboard of the iBC controller and provides a look at real time information related to rundowns.

JOB: Indicates the current JOB.

PSet:01 Indicates the current PSet you are operating in.

Indicates accepted rundown.

Indicates failed rundown.

11.90 Nm **210°** Displays Torque and Angle for current rundown.

Time (in-cycle) screen

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 left or right for viewing real time Job information such as Run Screen or rundown indicators.

Home tab will return user to the Home Page

Time Overall Screen

Click *(i)* for curve detail.

Click on arrow to change curve X axis.
Choose Time In-cycle,Time Overall
or Angle screen

JOB:
PSet:01

✓ **11.90**Nm
   210°

PS...	OK	Torque		Angle
1	✓	11.90 Nm		210
1	✓	11.88 Nm		212

Angle Screen

JOB:
PSet:01

✓ **11.90**Nm
   210°

PS...	OK	Torque		Angle
1	✓	11.90 Nm		210
1	✓	11.88 Nm		212
1	✓	11.63 Nm		206

Run Screen (Job display information)

Run Screen displays real time Job information.

Large Screen Indicators and Audit information

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

Accepted	Failed
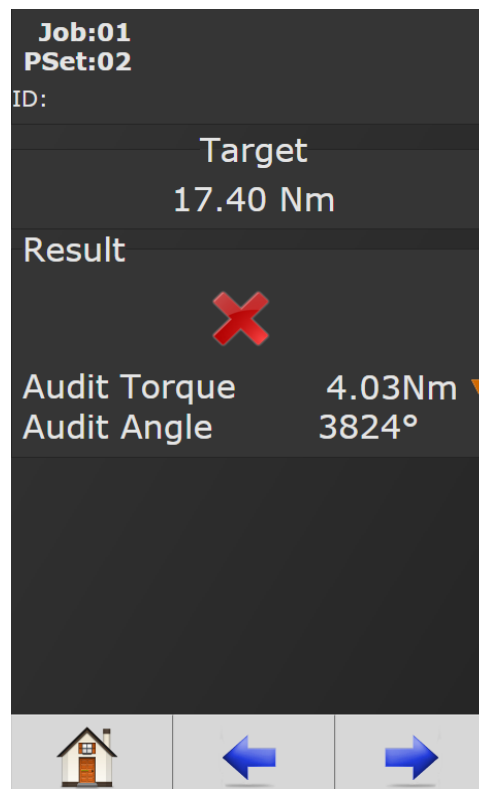
4.2 Job
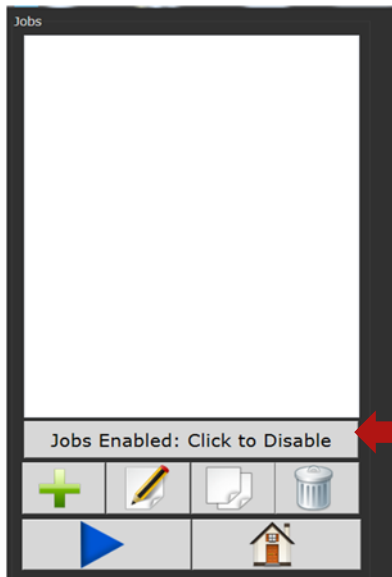
A Job is a collection of PSets which can be ran when performing multiple fastening operations on a single application.

Jobs provide:
- Error proofing.
- Logical grouping of PSets.
- Fastening order.
- Job status.

Jobs Enabled: Click to Disable

Click to Enable/Disable Job function.

4.2.1 Add New Job

To add a new Job press [JOB] on the Home Page.

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

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.

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

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

Action:
- **None**: Will stay in current sequence.
- **Next**: will advance to next sequence setup after count is reached.
- **Count**: Fastener number required to complete sequence.

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

Jobs " Enabled" display and button function:

Secondary Display.

PSet/Job display and Increment/Decrement buttons.
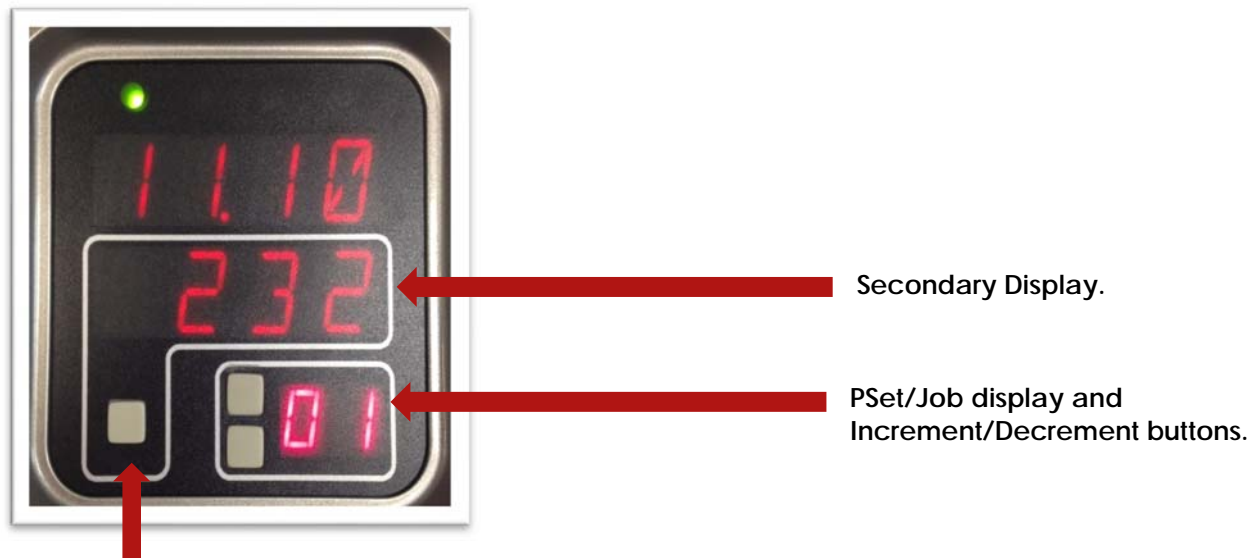
Toggle Button: PSet/Job functions.

- 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 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

ID	Time Stamp	PS...	OK	Torque	Angle
585	01-07 19:13:02	2	✓	17.46 Nm	341
584	01-07 19:12:59	2	✓	17.77 Nm	351
583	01-07 19:12:57	2	✓	17.93 Nm	372
582	01-07 19:12:52	2	✓	18.09 Nm	350
581	01-07 19:12:50	2	✓	17.61 Nm	338
580	01-07 19:12:48	2	✓	18.03 Nm	359
579	01-07 19:12:46	2	✓	17.46 Nm	354
578	01-07 19:12:43	2	✓	18.13 Nm	377
577	01-07 19:12:41	2	✓	17.59 Nm	359
576	01-07 19:12:36	2	✓	17.76 Nm	377
575	01-07 19:12:33	2	✓	17.76 Nm	359
574	01-07 19:12:29	2	✓	17.70 Nm	377
573	01-07 19:12:27	2	✓	17.58 Nm	358
572	01-07 19:12:22	2	✓	17.97 Nm	384

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.

Deletes individual rundowns by clicking on them separately and deleting them in the next screen or deleting all rundowns by clicking on the icon at the bottom of Results page. A Confirmation screen will appear.

"Save Button" saves rundowns as Txt. File.

"Filter Button" gives filter options in Rundown screen.

"Home Button" returns to main display menu.

"Play Button" sends you directly to Run Screen.

"Refresh Button" refreshes screen to include latest rundowns.

ID	Time Stamp	PS...	OK	Torque	Angle
112	01-01 02:29:00	1	✓	12.03 Nm	12
111	01-01 02:28:56	1	✓	11.98 Nm	124
110	01-01 02:28:50	1	✓	12.02 Nm	112
109	01-01 02:28:46	1	✓	11.63 Nm	113
108	01-01 02:20:13	1	✗	2.56 Nm	34

Click on Individual Runs for Rundown information.
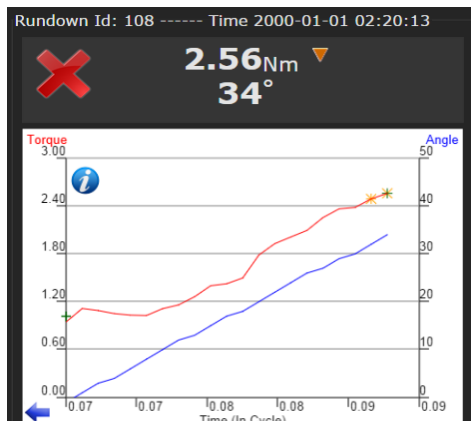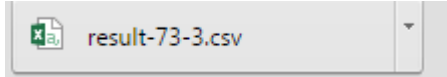
Example: Rejected Rundown Information.

4.3.1 Saving Rundown(s)

TOTAL RUNDOWNS

Click on [floppy disk icon] in main rundown screen to view/save total rundowns.

[result-73-3.csv file icon]

Then click on to save or open the file using a text editor such as Notepad. The format of the Rundown file is tab separated variables and can be viewed using Excel. The raw data can now be imported to Excel to build graphs, charts, etc. Contact AIMCO Technical Service for pre-made Torque and Angle Templates.

TO SAVE INDIVIDUAL RUNDOWNS

Click on an individual run to view/save rundown information.
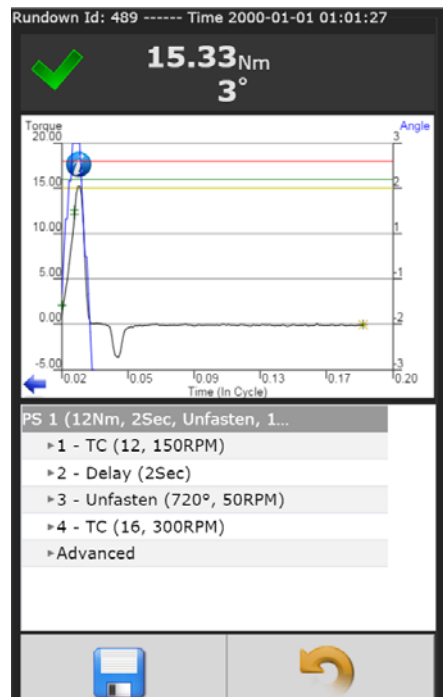
#	Label	Value	
1	Result	65	
2	Job Numb	1	
3	Job Name	Paramont	
4	Job Seque	1	
5	Bolt Coun	3	
6	Date	########	4:18:00
7	Master Ru	0	
8	PSet ID	59	
9	PSet Num	1	
10	PSet Name		
11	Tool Mode	AEN32030A	
12	Tool Seria	191111	
13	Torque	11.69	
14	Angle	57	
15	Pulses	0	
16	Torque Sta	P	
17	Angle Stat	--	
18	Pulse Stat	--	
19	Rundown	P	
20	Tool Cycle	1111	
21	ID1 ("ID #1	2.2E+10	
22	ID2 ("ID #2	4.86E+10	
23	ID3 ("ID #3")		
24	ID4 ("ID #4")		
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

The controller menu is where all of the settings for the iBC controller are configured. All of the different configuration capabilities are explained below.
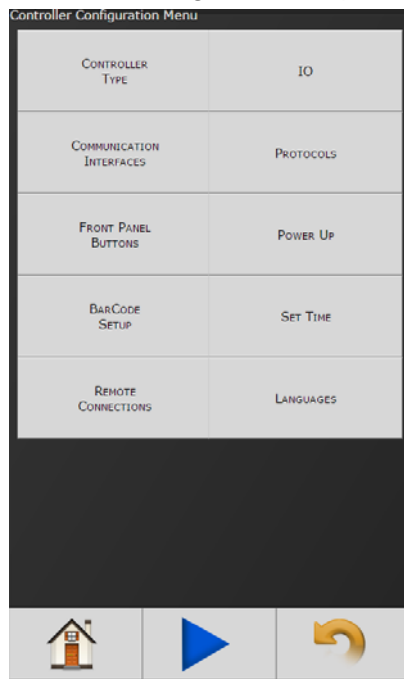
4.4.1 I/O

4.4.1.1 Physical I/O

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 (below).

Physical IO Configuration

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...	🔴	☐
---3---	In Cycle	🔴	☐
---4---	Service Indicat...	🔴	☐
---5---	Torque Low	🔴	☐
---6---	Angle High	🔴	☐
---7---	Angle Low	🔴	☐
---8---	Job Complete	🔴	☐

Output Configuration
Edit Output

Output Number   2

Polarity   N.O.

Mode   Normal

Function
Angle
Angle High
Angle Low
Angle NOK
Angle OK
Batch Complete
Error
External Controlled
Fastening Aborted
Fastening Complete
Fastening Stopped
In Cycle

4.4.1.2 Physical IO Monitor

Physical IO Monitor
Input

	State	Off/On	Force		State	Off/On	Force

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
Red= Off

• **Force Enable/Disable:** When Buttons from I/O are selected, this field selects which Inputs and Outputs can be forced through the Monitor I/O screen.

• **Force Off/On:** If Force is enabled, this button will toggle the state of pin selected.

NOTE: See Section10 **Assignable IO Details** for more details.

4.4.1.3   Anybus/ Modbus TCP/Ethernet IP Inputs

These types of communications are useful for data communications between controller and PLC's. It is an effective, quick way for the data transfer of short data packages.
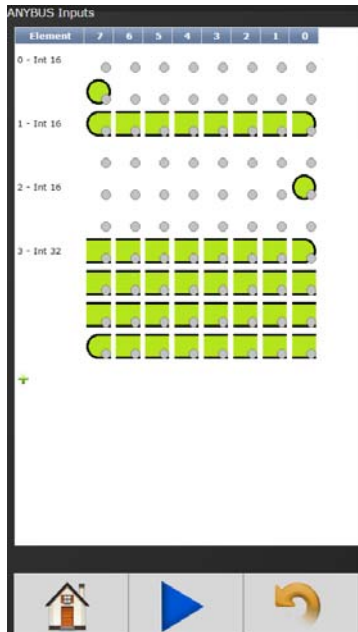
Press ➕ to enter Input Configuration Screen (below)
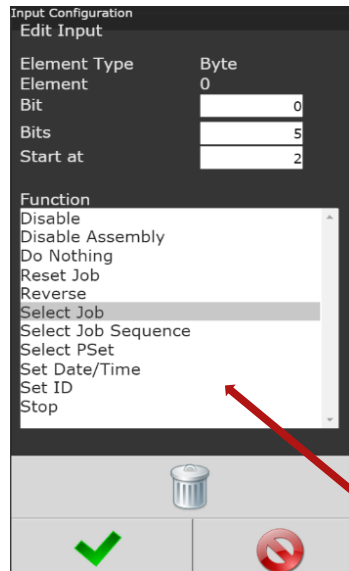
Element Type: Choose from Byte, Int16 or Int32.

Element: Shows element # being configured

Bit: Enter Bit #.

Bits: # of bits the assigmnet will read.

Start at: Starting bit location.

Polarity: Normaly Open or Normaly Closed Inputs(used in certain Input functions)
Select desired **Input Function(s)**. Click on after appropriate selections are made.

Below is an example of the Anybus Input screen with five Inputs setup.

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

🗑 Will delete individual Elements.

NOTE: See **9.0 Assignable I/O** for more detail on Input Functions.

4.4.1.4 Anybus/Modbus TCP/Ethernet IP Outputs

Press to enter Output Configuration Screen (below)

Element Type:
Choose from Byte, Int16 or Int32.

Element: Shows Element # being configured.

Bit: Enter Bit #

Polarity: Select Normally Open or Normally Closed Outputs.

Mode: Normal - Output signal sent. Timed signal sent (time entered in seconds)

Flash: Signal sent (time entered in seconds)

Select desired **Output Function(s) from list above**

Click on [✓] after appropriate [+] changes are made.

Below is an example of the Anybus Output screen with five Outputs setup.
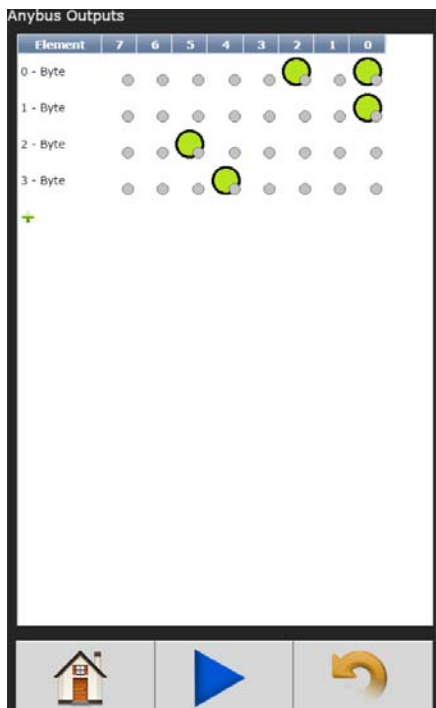
Click on [○] to make changes on an individual Element or return to the Output Configuration screen.

[🗑] Will delete element.

NOTE: See **10.0 Assignable I/O** for more detail on Output Functions.

4.4.2 Communication Interfaces

4.4.2.1 Ethernet/Second Ethernet

Second Ethernet Configuration
Second Ethernet Port

IP Address	192.168.100.4
Subnet Mask	255.255.255.0
MAC	

- **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 System Administrator to connect the controller to your Network and assign IP addresses.

4.4.2.2 System Port

System Port Configuration
System Port

IP Address	192.168.26.4
Subnet Mask	255.255.255.0

- **IP Address:** The IP address of 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.

4.4.2.3 Serial

Serial Port Configuration

Port Mode	Serial Output
Baud	9600
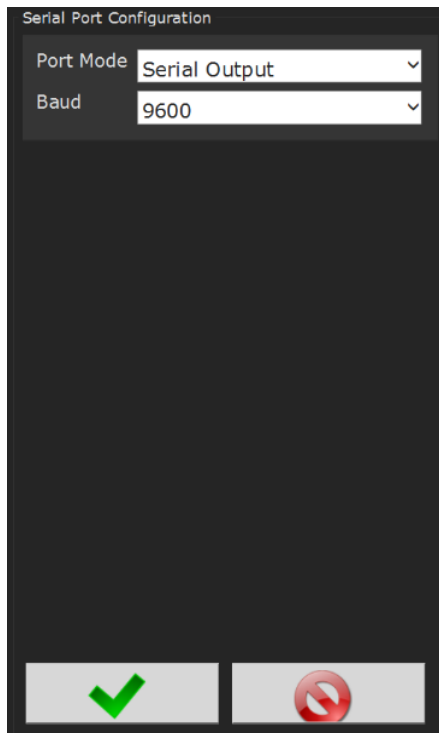
- **Port Mode:** The following modes are available.
  - *Serial Output*: A serial data string will be Output in the following format after each rundown:
- # P 1 BB TTT.T AAAA 0000 0000 J
  (Notice the decimal point next to the least significant T)
- *P:* Parameter set ("1" – "9") for PSets 1-9, ("A" – "W") for PSets 10-32.
- *B:* Job count
- *T:* Torque result
- *A:* Angle result
- *J:* Judgment (@=overall pass, H=low torque, I (eye)=hi torque, J=low angle, K=hi angle)
  - *Barcode Reader:* (See Section 5.0 for Barcode setup)
  - *Serial Output and Barcode Reader.*
  - *Open Protocol:* (For details see Open Protocol section)

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

Gen IV Serial Port Pin-out

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

Pin 1   Pin 5

Pin 6   Pin 9

4.4.2.4 Anybus

ANYBUS Configuration

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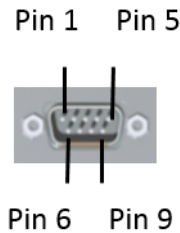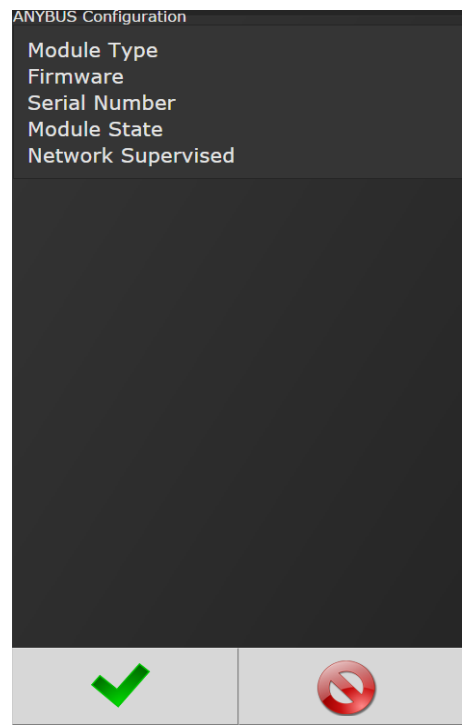
Node Address: Configures the Anybus Node Address for controller.

4.4.3 Front Panel Buttons

Enable / Disable Front Panel Buttons
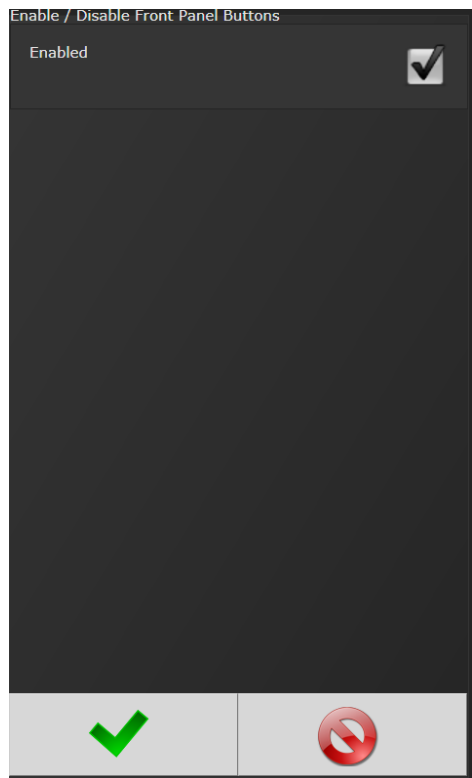
Enabled ☑

Enable/ Disable front panel buttons on controller console.

4.4.4 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 ormation existing prior to power down.

4.4.5 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.

Step 1: Click anywhere in body to enter the Barcode ID Configuration Screen or add additional Identifiers.

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

Barcode ID Configuration

Identifier Mask

Identifier Type   #1

Identifier Description   ID #1

Action   Select Job

Action #   1

Reset Identifiers

#1   #2   #3   #4

- **Identifier Mask:** The Mask is a string used to compare the received barcode against. 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.

Example:

VIN#123456

- **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:
- **Select Job##** (This will require a Job to be configured on the JOB page when using this option)

- **Do Nothing**
- **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 [save icon] to save and re-enter completed barcode configuration screen.

Click anywhere in body if additional identifiers are required.
Press [checkmark icon] to save barcode configuration.

(See **5.0 Barcode Reader Details** for more information)

To configure Serial Port for Barcode Reader:
On Home page click controller→Communication Interfaces→Serial
Select Barcode Reader and the correct Baud rate.
Press to save [checkmark icon] changes.

Serial Port Configuration

Port Mode   Barcode Reader

Baud   9600

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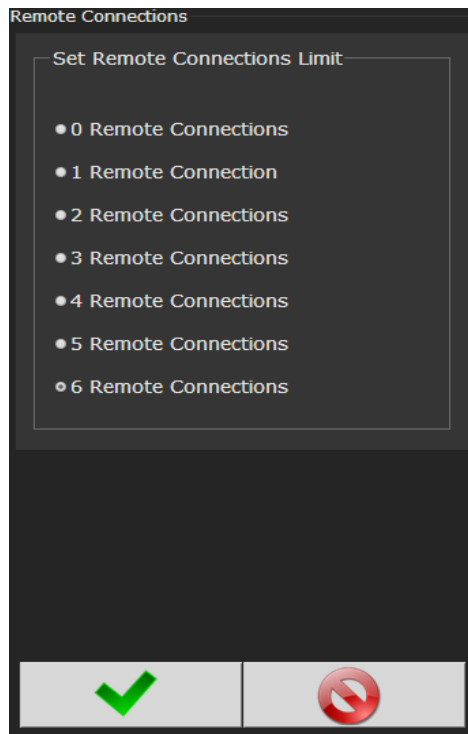
Set time and date. If connected to a PC, use PC time to set controller time.

It is recommended to set to local time during controller installation

4.4.7 Remote Connections

Remote Connections

Set Remote Connections Limit
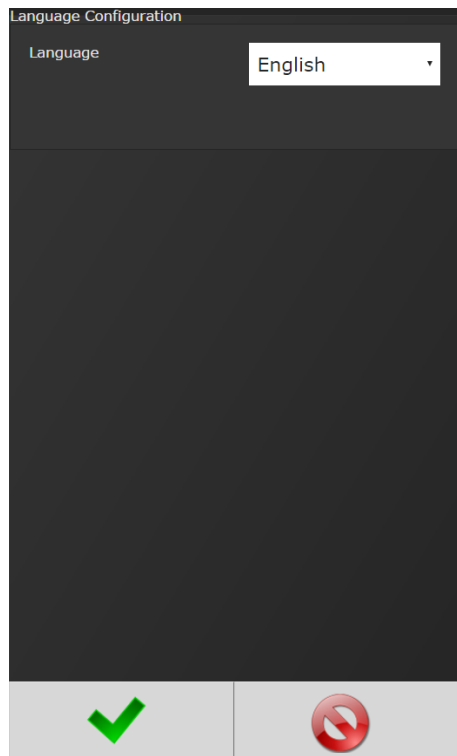
- 0 Remote Connections
- 1 Remote Connection
- 2 Remote Connections
- 3 Remote Connections
- 4 Remote Connections
- 5 Remote Connections
- 6 Remote Connections

Sets number of remote browser connections to controller.

4.4.8 Languages

Language Configuration

Language   English ▼

Select from:

- English
- Chinese
- Japanese
- Korean
- Spanish
- Portuguese

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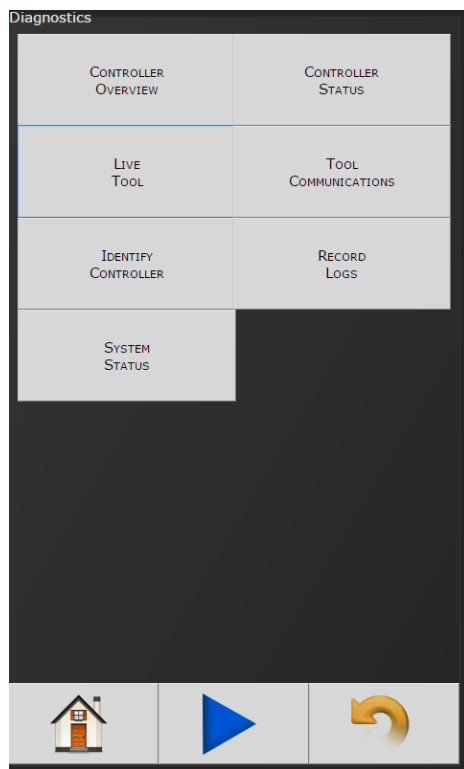
The Diagnostics menu contains all pertinent information regarding unusual behavior of the system. Detailed descriptions are given below.

Assignable IO.docx

4.5.1 Controller Overview
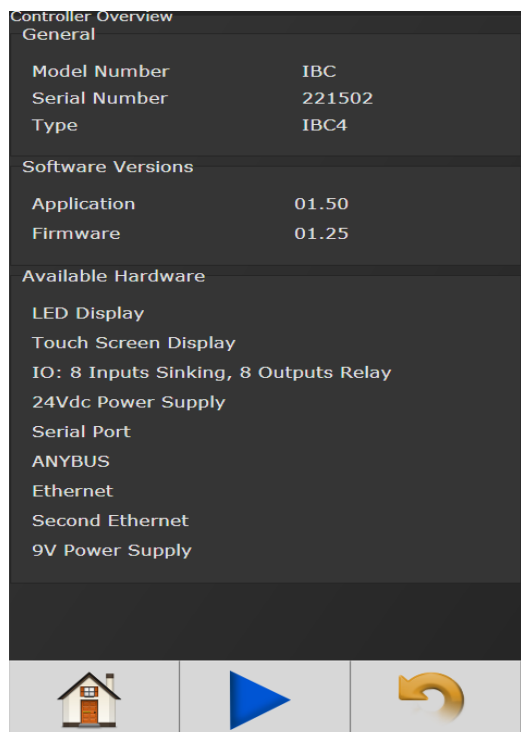
- **Model Number**: Model Number of the controller.
- **Serial Number**: Serial Number of the controller.
- **Type**: Type of controller-
  iBC – Intelligent Battery Tool Controller
- **Application**: Current Application software version.
- **Firmware**: Current Firmware software version.
- **Available Hardware**: Available hardware on the controller.

4.5.2 Controller Status

Controller Status	
Bus Voltages	
24 Vdc	OK
9 Vdc	8.90
5 Vdc	4.55
3.3 Vdc	3.21
SOM 1.8 Vdc	1.81
Mainboard 1.8 Vdc	0.93
Temperatures	
CPU Temperature (° C)	31
Mainboard Temperature (° C)	31
Active Faults	

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

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

- **5 VDC** : Represents voltage from 5V power supply powering controller electronics.
- **9 VDC:** Represents voltage from 9V power supply powering Tool electronics.
- **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.
- **1.8 VDC:** Represents controller electronics internal 1.8V Bus voltage.
- **3.3V DC**: Represents controller electronics internal 3.3V Bus voltage.
- **CPU Temperature (deg C):** Represents temperature inside controller measured in Celsius.

4.5.3 Live Tool

Live 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	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 screw connections	859
Current speed	6
Nominal speed	0

Current tool information is available on the Live Tool screen.

4.5.4 Tool Communications

```
Tool Communications

Receive from Tool:ASEN;01;17250008;2;OK;335E;
Send To Tool:RSEN;01;00000000;0002;0001;00000000;00000001;0000.
Receive from Tool:ARAL;01;17250008;01;OK;DIAGN;1865;53;0;0;251;3.
Send To Tool:RRAL;01;00000000;0001;DIAGN;00;00;00;00000000;81c1
Send To Tool:AMSG;01;17250008;0;OK;2c12;
Creating a reply to :RMSG Telegram
Status:Screwdriver status: ready
Status:(Reserved) CTRL
Status:0
Message:Start-up phase
Message:WLAN OK
Receive from Tool:RMSG;01;17250008;0;1;0000000000000009;0000000
Max number of tools connected
Tool 1 connected
Send To Tool:RSDI;01;17250008;0007;0001;00000000;af2c;
Listening for tool connection
Receive from Tool:ASEN;01;17250008;4;OK;08C6;
Send To Tool:RSEN;01;17250008;0004;0001;00000000;00000001;0000.
Receive from Tool:ARAL;01;17250008;01;OK;DIAGN;1868;53;0;0;253;3.
Send To Tool:RRAL;01;00000000;0001;DIAGN;00;00;00;00000000;81c1
Send To Tool:AMSG;01;17250008;0;OK;2c12;
Creating a reply to :RMSG Telegram
Status:Screwdriver status: ready
Status:(Reserved) CTRL
Status:0
Message:Start-up phase
Message:WLAN OK
Receive from Tool:RMSG;01;17250008;0;1;0000000000000009;0000000
Max number of tools connected
```

Real time communication between iBC controller and tool.

4.5.5 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.

4.5.6 Record Logs

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

4.5.6.1 Change Log

Displays changes made to tool or controller.

4.5.6.2 Information Log

Displays all information entries.

Log Records	
CHANGE	INFORMATION
ERROR	ALL

4.5.6.3 Error Log

Displays ONLY Error Entries.

4.5.6.4 All

Displays all Changes, Information and Error entries.

4.5.7 System Status

4.6 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.
- **Admimistrator** All screens available.

4.7 Advanced

Advanced Menu

LOGIN SETUP	RESULTS ARCHIVE
IMPORT SETTINGS	EXPORT CONTROLLER
UPDATE CONTROLLER	BACKUP RESTORE
RESTORE FACTORY DEFAULTS	CALIBRATE TOUCH SCREEN
SOFT REBOOT	
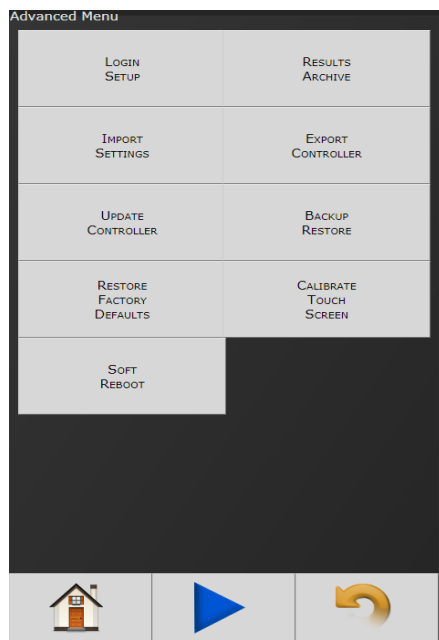
The 'Advanced' menu handles complex settings within the controller. Detailed descriptions are given below.

4.7.1 Login Setup

Login Setup

Defaults

Login Level   Administrator ▾

Change Password

Administrator   9999
Technician   2222
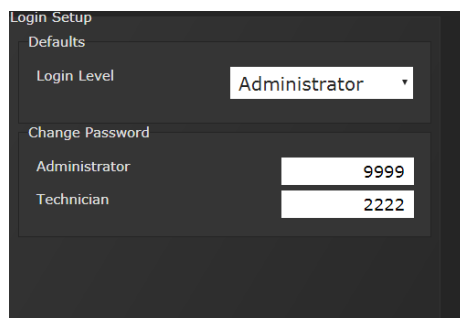
This screen allows the user to select the Default Login Level upon controller start up.

- **Operator**
- **Technician**
- **Administrator**

4.7.2 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 drive or to the web as a USV 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).

Results Archive Files			
File	**First Id**	**Last Id**	**TimeStamp**
8	356205	----	2015-04-21 15:57:04
7	304157	356204	2015-04-20 23:29:48
6	252109	304156	2015-04-20 01:46:51
5	200061	252108	2015-04-19 04:03:32
4	148014	200060	2015-04-18 06:20:12
3	95933	148013	2015-04-17 02:51:39
2	43455	95932	2015-04-16 04:36:03
1	2068	43454	2015-04-15 06:37:43

Select a file and press

Select either USB or Web Archive location

Confirmation

Select Archive Location

USB

Web

Copy Archive?

Rundown	Job Num	Job Name	Sequence	Bolt count	Status	Date	Time	Torque	Status	Angle	Status	PSet Num	PSet Name	Tool Mode	Tool Serial	Id1 (ID #1	Id2 (ID #2	Id3 (ID #3	Id4 (ID #4)
2068	0		0	0	P	########	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	P	########	11:13:50	5.002	P	450	--	1			0				
2071	0		0	0	P	########	11:13:52	5.013	P	595	--	1			0				
2072	0		0	0	P	########	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	P	########	11:13:56	5.089	P	575	--	1			0				

EXAMPLE OF SAVED EXCEL FILE

4.7.3 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→Import Settings.

3. Select the settings to be changed

Operations: This includes 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.

4. Press [✓] to accept the changes.
5. Press [✓] to proceed.
6. Press [✓] when the import is complete the controller
   will restart.
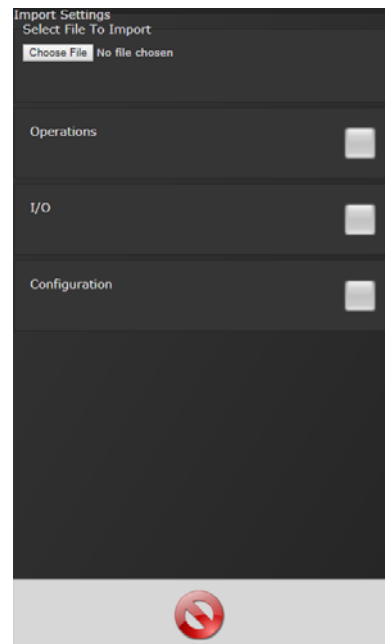
Import settings that were exported from another controller via a USB drive. Use this to quickly apply the same settings across several controllers. For example, it is common to have multiple controllers with the same IO configuration; setup one controller with the correct IO configuration and export the controller from Advanced->Export Controller. Now the IO settings can be imported using this screen.

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

4.7.4   Export Controller
This allows the user to save Configurations, Operations, I/O, and Spindle Settings onto a USB drive.
1. Plug a USB drive into any port on the controller.
2. From the Home screen, navigate to Advanced→Export Controller.
3. Press [✓] to continue, the controller will begin the export process.
4. Press [✓] to complete the export.
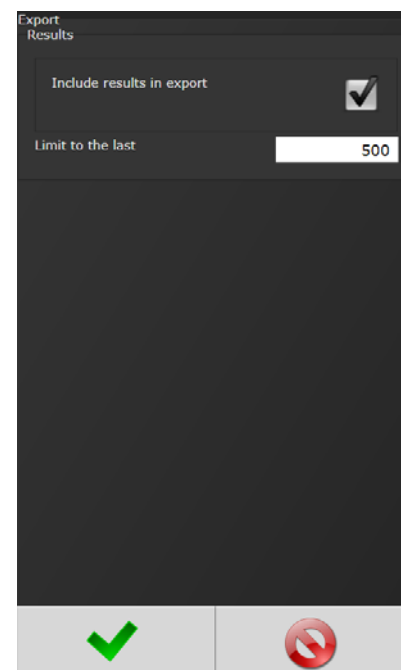
4.7.5 Update Controller

NOTE: Always save PSet and IP address information before upgrading controller.

Upgrading the AIMCO Gen IV ACE Controller

Using the Touch Screen, or a System Port browser session, navigate to the 'Advanced' menu. Click 'Update Controller' and select the latest release (see **Figure 1** as an example).

Figure 1 Available Updates

Click the green checkmark when ready.
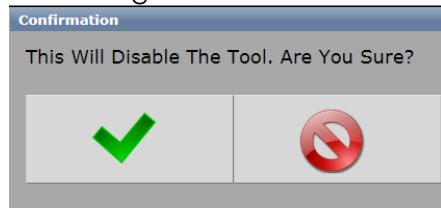
Once controller restarts, user will see messages in Figure 2
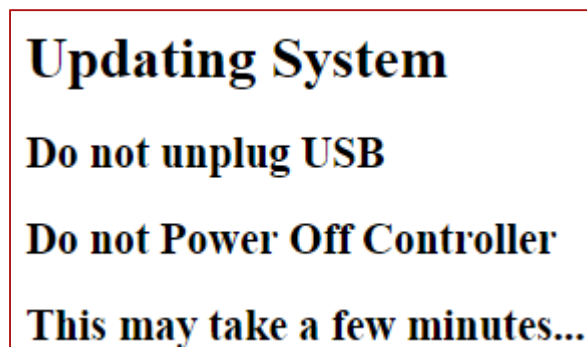
Figure 2 Controller Upgrade Notification

Once 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.

4.7.6 Backup Restore

The Backup function allows the user to create an image of the Controller 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.

1. From the Home screen, navigate to Advanced→Backup Restore.
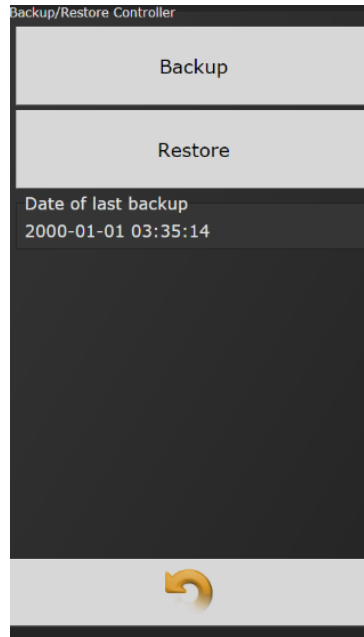
2. Press **Backup** to initialize the backup process.

3. Press [checkmark] to replace previous backup with current system, the backup process will begin.

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

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

6. The controller will restart when finished.

4.7.7 Restore Factory Defaults
This allows the user to reset the controller's parameters to factory settings
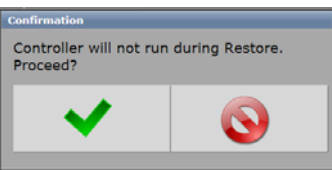
1. From the Home screen, navigate to Advanced→Restore Factory Defaults.

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.

- **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.
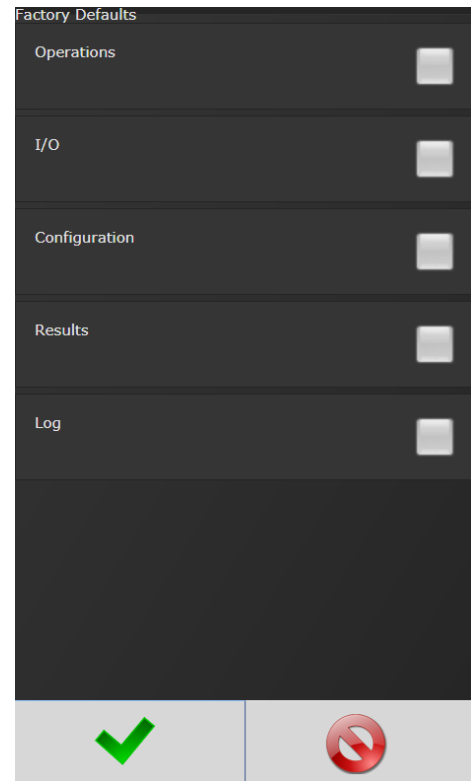
3. Press to accept the changes.

4. Press to proceed.
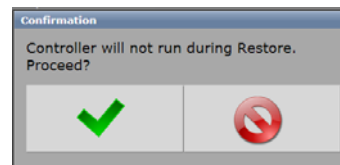
5.Press when the restore is complete, the controller will restart.
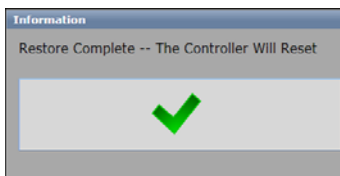
4.7.8 Calibrate Touch Screen

Calibrate Touch Screen

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

1. From the Home screen, navigate to Advanced→Calibrate Touch Screen.

2. Press [✔] to disable the tool.

3. Select the settings to be changed by pressing [✖] changing it to [✔]

4. Press [✔] to accept the changes.

5. Press [✔] to proceed.

6. Press [✔] when the calibration is complete, the controller will restart.

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

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

Factory Default Calibration: This calibrates the touchscreen to the factory defaults.

4.7.9 Soft Reboot

Restart the controller without turning the power off.

1. From the Home screen, navigate to Advanced→Soft Reboot.

2. Press [✔] to proceed, the controller will restart.
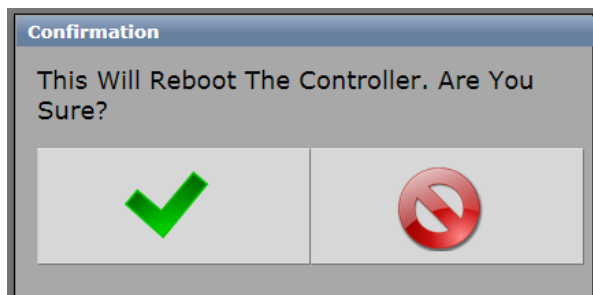
5 Barcode Reader Details

The 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 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.

Mask	ID type	Action		Reset ID			
				ID#1	ID#2	ID#3	ID#4
"VIN…..7…"	ID#1	Select Job#	1	No	No	No	No
"VIN…..8…"	ID#1	Select Job#	2	No	No	No	No
"VIN…..9…"	ID#1	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 setup in Barcode Configuration Screen.

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.

Mask	Store to	Action		Reset ID			
				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

6 Glossary of Terms
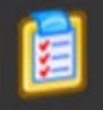
Accept Tone	Controls tone made from handle of handheld tools for accepted fastening cycles.
Angle	Degree fastener rotates from snug, or threshold level, to peak torque.
Cycle Complete	Torque level that determines completion of a fastening cycle.
High Angle	When peak angle recorded exceeds High Angle, 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.
Job	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

ICON	DESCRIPTION	FUNCTION	WHERE USED
	Home Navigation Button	Navigate to the main menu ("HOME") screen.	All screens except for edit screens.
	Run Navigation Button	Navigate to the Run Screen.	All screens except for edit screens.
	Run Screen Select Buttons	Switch between the different run screen pages.	Run Screen
	Go Back Button	Navigate to one menu level back.	All screens except for edit screens.
	Accept Changes Button	Accept the changes made and return to the parent screen.	Edit screens
	Cancel Changes Button	Reject the changes made and return to the parent screen.	Edit screens
	Add New Button	Add a new item (PSet, Stage, Job, and other).	PSet and Job edit screens.
	Edit Button	Edit selected Item.	PSet and Job edit screens.
	Move Up and Down Buttons	Move selected item up or down in the sequence order.	PSet and Job edit screens.
	Copy Button	Copy selected Items.	PSet, Job, and other edit screens.
	Delete Button	Remove or un-assign selected items.	Edit and list view screens.
	Filter Button	Filter Items in a list or table.	List view screens
	Save Button	Save selected item to file.	List view screens

		Fault Indicator	Fault exists that is preventing the tool from running (can be pressed for more Info).	Run Screen
		Invalid PSet Indicator	Selected PSet does not exist or is not valid.	Run Screen
		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

8 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.

CODE	Fault Type	Description	Possible Causes
BT01	Tool Not Connected	Tool is not communicating with the controller.	• Tool battery unplugged • 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
BT04	Excessive Force	Error reported by the tool	• Maximum allowable torque exceeded
BT05	USB Mode	Error reported by the tool	• Tool is in programming mode
BT06	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 temperature	Error reported by the tool	• Duty cycle too high • Faulty Tool electronics
BT09	Motor excessive temperature	Error reported by the tool	• Speed settings too low
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 temperature	Error reported by the tool	• Duty cycle too high • 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 sensor	Error reported by the tool	• Faulty Tool electronics
BT18	CRC error in program level	Error reported by the tool	• Programming Download Error
BT19	Error: program level does not exist	Error reported by the tool	• Programming Error
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 IO power not detected.	• Faulty power supply or wiring • Short or other problem with external connections to the 24Volt IO 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

9 24 Volt I/O

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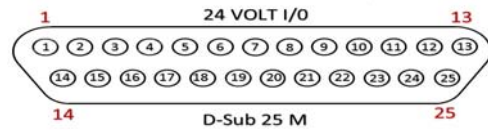
Pin #	Function	Default Assignment		Pin #	Function	Default Assignment
1	Output 1	Accept		14	Output 5	Torque Low
2	Output 2	Reject		15	Output 6	Angle High
3	Output 3	In Cycle		16	Output 7	Angle Low
4	Output 4	Torque High		17	Output 8	Job Complete
5	Output's 1-4 common			18	Output's 5-8 common	
6	Input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

NOTE: The Default Assignments in Table above are factory defaults and can be changed. (See Assignable I/O section)

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
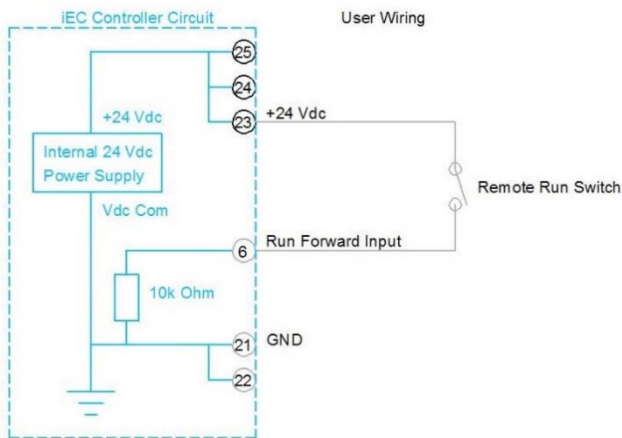
LOGIC I/O OUTPUT CONNECTION EXAMPLE
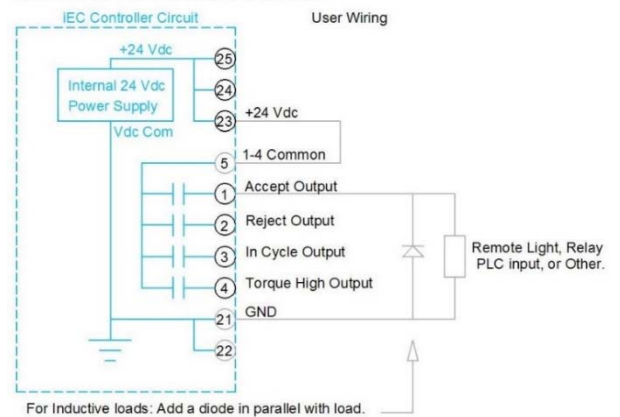
Importing IO on an iBC Controller

These instructions detail how to import IO into an iBC controller via the system port to modify the Anybus outputs.

1. Power on the controller
2. Insert the USB drive 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->Import Settings
5. Select **ONLY IO**
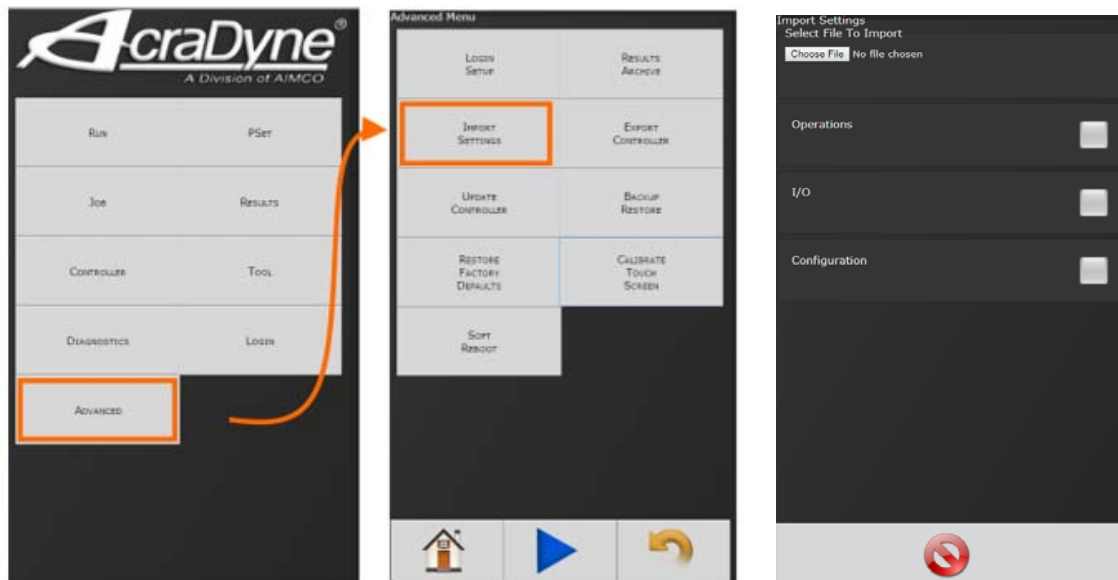
6. Click OK
7. Click OK in the Confirmation dialog box
8. The controller will restart

9. Verify the Anybus outputs.
   a. Navigate to Controller->IO->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

10 Assignable IO Details

Introduction
The iBC 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 two buses.

Bus Number	Bus
1	Physical I/O
2	Fieldbus (Anybus module) I/O

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.
application.

	Supported Feature					
	Bus	Element	Bit 0-31	Polarity N.O./N.C.	Width	Offset
Do Nothing	√	√	√			
Stop	√	√	√	√		
Reset Job	√	√	√	√		
Select PSet	√	√	√		√	√
Select Job	√	√	√		√	√
Select Job Sequence	√	√	√		√	√
Set ID	√	√	√		√	
Set ID (word swap)	√	√	√		√	
Set Date/Time	√	√	√		√	
Set Date/Time (word swap)	√	√	√		√	
Verify PSet	√	√	√		√	√
Clear Results	√	√	√	√		
Log Change	√	√	√		√	√

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
Bits	2	To span the two bits 4 & 5
Start at	1	Adding 1 to the read input value so we get… Binary 00 = 1 Binary 01 = 2 Binary 10 = 3 Binary 11 = 4

Assignments

Do Nothing

Supported Feature

Bus	Element	Bit 0-31	Polarity N.O./N.C.	Width	Offset
√	√	√			

The "Do Nothing" assignment will run Do Nothing if it is active or inactive.

.

Stop

Supported Feature

Bus	Element	Bit 0-31	Polarity N.O./N.C.	Bits	Start at
√	√	√	√		

The "Stop" assignment will stop the tool if it is running and prevent it from being started.

Reset Job

<div align="center">Supported Feature</div>

Bus	Element	Bit 0-31	Polarity N.O./N.C.	Bits	Start at
√	√	√	√		

On the transition of inactive to active the "Reset Job" assignment will reset the active job.

Select PSet

<div align="center">Supported Feature</div>

Bus	Element	Bit 0-31	Polarity N.O./N.C.	Bits	Start at
√	√	√		√	√

The "Select PSET" input will select the parameter set according to the input value. Uses the width parameter limit the width of the input bits read. The minimum width is 1 and the maximum width is 8. After the input is read, the offset parameter will be added to the value to get the actual parameter set number. Selecting an invalid parameter set number will disable the tool.

Select Job

<div align="center">Supported Feature</div>

Bus	Element	Bit 0-31	Polarity N.O./N.C.	Bits	Start at
√	√	√		√	√

The "Select Job" input will select the job number according to the input value. Using the width parameter limits 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 to get the actual job number. Selecting an invalid job number will disable the tool.

Select Job Sequence

<div align="center">Supported Feature</div>

Bus	Element	Bit 0-31	Polarity N.O./N.C.	Bits	Start at
√	√	√		√	√

The "Select Job Sequence" input will select the Job Sequence number according to the input value. Using the width parameter limits 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 to get the actual Job Sequence number. Selecting an invalid Job Sequence number, or a sequence that is already complete, will disable the tool.

Set ID

<div align="center">Supported Feature</div>

Bus	Element	Bit 0-31	Polarity N.O./N.C.	Bits	Start at
√	√	√		√	

The "Set ID" assignment will set the ID to an integer value of the input value. The bits can be set from 1 to 32 bits. The input value will read as an integer value and an ASCII string with leading zeroes will be produced and passed to the ID recognition system. The length of the string is based on the width of the assignment. The string will always be sized to accommodate the

maximum value of the input. For example, a width setting of 16 can have an integer value of 0-65535 so the produced ID would be "00000" to "65535" (always five character long).

Width setting	Length of ID string	ID value
1 - 3	1	"0" – "n"
4 - 6	2	"00" – "nn"
7 - 9	3	"000" – "nnn"
10 - 13	4	"0000" – "nnnn"
14 - 16	5	"00000" – "nnnnn"
17 – 19	6	"000000" – "nnnnnn"
20 – 23	7	"0000000" – "nnnnnnn"
24 – 26	8	"00000000" – "nnnnnnnn"
27 – 29	9	"000000000" – "nnnnnnnnn"
30 - 32	10	"0000000000" – "nnnnnnnnnn"

Set ID (word swap)

Supported Feature

Bus	Element	Bit 0-31	Polarity N.O./N.C.	Width	Offset
√	√	√		√	

The "Set ID (word swap)" assignment is the same as the "Set ID" 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 ID" for behavior.

Set Date/Time

Supported Feature

Bus	Element	Bit 0-31	Polarity N.O./N.C.	Bits	Start at
√	√	√		√	

The "Set Date/Time" assignment will set the date and time of the controller. The bits can be set from 1 to 32 bits, however, should always be set to 32 to get the correct results. The input value will be read as the number of seconds since 00:00:00 January 1, 1970 (POSIX time or Epoch time). If the input value changes, and it is non-zero, the date and time of the controller will be set to the new value.

Set Date/Time (word swap)

Supported Feature

Bus	Element	Bit 0-31	Polarity N.O./N.C.	Width	Offset
√	√	√		√	

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 Date/Time" for behavior.

Verify PSet

Supported Feature

Bus	Element	Bit 0-31	Polarity N.O./N.C.	Bits	Start at
√	√	√		√	√

The "Verify PSET" input will compare the current parameter set to the input value. Using the bit parameter limits the width of the input bits read. The minimum bit is 1 and the maximum is 8. After the input is read, the offset parameter will be added to the value to 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.

Clear Results

Supported Feature

Bus	Element	Bit 0-31	Polarity N.O./N.C.	Width	Offset
√	√	√	√		

The "Clear Results" assignment will clear the latest results outputs (Ok, Nok, etc.) on the same bus.

Log Change

Supported Feature

Bus	Element	Bit 0-31	Polarity N.O./N.C.	Width	Offset
√	√	√		√	

The "Log Change" assignment will add entries to the controller event log when the input changes.

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.

	Supported Feature										
	Bus	Element	Bit 0-32	Polarity N.O., N.C.	Mode Normal, Timed, Flash	Time	Bits	Start at	Input Bus	Input Element	Input Bit
Ok	√	√	√	√	√						
Nok	√	√	√	√	√						
Torque Ok	√	√	√	√	√						
Torque Nok	√	√	√	√	√						
Low Torque	√	√	√	√	√						
High Torque	√	√	√	√	√						
Angle Ok	√	√	√	√	√						
Angle Nok	√	√	√	√	√						

Low Angle	√	√	√	√	√							
High Angle	√	√	√	√	√							
Fastening Complete	√	√	√	√	√							
Fastening Aborted	√	√	√	√	√							
Fastening Stopped	√	√	√	√	√							
Batch Complete	√	√	√	√	√							
Job Complete	√	√	√	√	√							
Error	√	√	√	√	√							
Tool Enabled	√	√	√	√	√							
Service Indicator	√	√	√	√	√							
ToolsNet Connected	√	√	√	√	√							
Open Protocol Connected	√	√	√	√	√							
PFCS Connected	√	√	√	√	√							
Running PSet Number	√	√	√				√	√				
Running Job Number	√	√	√				√	√				
External Controlled	√	√	√						√	√	√	
Torque	√	√	√			√						
Torque (x10)	√	√	√			√						
Torque (x100)	√	√	√			√						
Angle	√	√	√			√						
Rundown Saved to FTP Server	√	√	√			√						

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).

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 to N.O. and the assignment has an active output, the output will be on and stay on until the assignment goes to inactive.
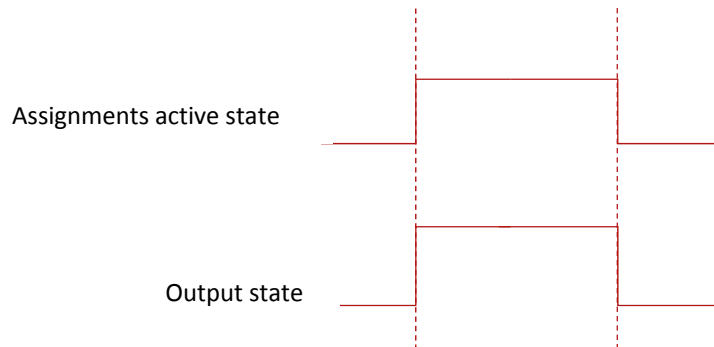
Figure 1 Normal Mode

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).
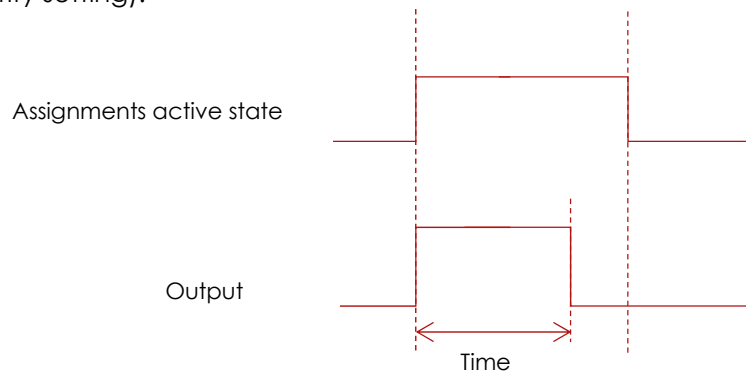
Figure 2 Timed Mode (assignment deactivates before time expires)

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).
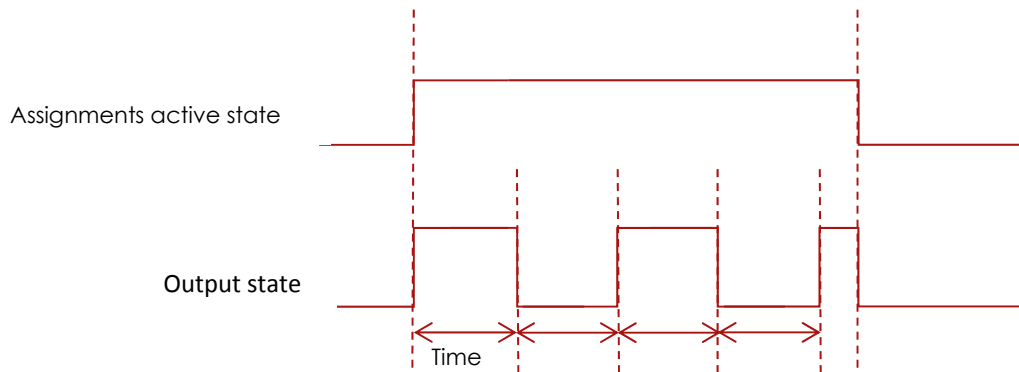
Figure 3 Flash Mode

Bits and Start At

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

Assignments

Ok

Supported Feature

Bus	Element	Bit 0-32	Polarity N.O., N.C.	Mode Normal, Timed, Flash	Time	Bits	Start at	Input Bus	Input Element	Input Bit
√	√	√	√	√						

The "Ok" output assignment will go active at the completion of an acceptable fastening. It will go inactive when the next fastening is started (the torque exceeds the threshold value) or a Job reset.

Nok

Supported Feature

Bus	Element	Bit 0-32	Polarity	Mode	Time	Bits	Start at	Input Bus	Input Element	Input Bit

			N.O., N.C.	Normal, Timed, Flash						
√	√	√	√	√						

The "Nok" output assignment will go active at the completion of an unacceptable fastening. It will go inactive when the next fastening is started (the torque exceeds the threshold value) or a Job reset.

Torque Ok

<div align="center">Supported Feature</div>

Bus	Element	Bit 0-32	Polarity N.O., N.C.	Mode Normal, Timed, Flash	Time	Bits	Start at	Input Bus	Input Element	Input Bit
√	√	√	√	√						

The "Torque Ok" output assignment will go active at the completion of a fastening that has an acceptable torque value. It will go inactive when the next fastening is started (the torque exceeds the threshold value) or a Job reset.

Torque Nok

<div align="center">Supported Feature</div>

Bus	Element	Bit 0-32	Polarity N.O., N.C.	Mode Normal, Timed, Flash	Time	Bits	Start at	Input Bus	Input Element	Input Bit
√	√	√	√	√						

The "Torque Nok" output assignment will go active at the completion of a fastening that has an unacceptable torque value. It will go inactive when the next fastening is started (the torque exceeds the threshold value) or a Job reset.

Low Torque

<div align="center">Supported Feature</div>

Bus	Element	Bit 0-32	Polarity N.O., N.C.	Mode Normal, Timed, Flash	Time	Bits	Start at	Input Bus	Input Element	Input Bit
√	√	√	√	√						

The "Low Torque" output assignment will go active at the completion of a fastening that has a low torque result. It will go inactive when the next fastening is started (the torque exceeds the threshold value) or a Job reset.

High Torque

<div align="center">Supported Feature</div>

Bus	Element	Bit 0-32	Polarity N.O., N.C.	Mode Normal, Timed, Flash	Time	Bits	Start at	Input Bus	Input Element	Input Bit
√	√	√	√	√						

The "High Torque" output assignment will go active at the completion of a fastening that has a high torque result. It will go inactive when the next fastening is started (the torque exceeds the threshold value) or a Job reset.

Angle Ok

Supported Feature

Bus	Element	Bit 0-32	Polarity N.O., N.C.	Mode Normal, Timed, Flash	Time	Bits	Start at	Input Bus	Input Element	Input Bit
√	√	√	√	√						

The "Angle Ok" output assignment will go active at the completion of a fastening that has an acceptable angle result. It will go inactive when the next fastening is started (the torque exceeds the threshold value) or a Job reset.

Angle Nok

Supported Feature

Bus	Element	Bit 0-32	Polarity N.O., N.C.	Mode Normal, Timed, Flash	Time	Bits	Start at	Input Bus	Input Element	Input Bit
√	√	√	√	√						

The "Angle Nok" output assignment will go active at the completion of a fastening that has an unacceptable angle result. It will go inactive when the next fastening is started (the torque exceeds the threshold value) or a Job reset.

Low Angle

Supported Feature

Bus	Element	Bit 0-32	Polarity N.O., N.C.	Mode Normal, Timed, Flash	Time	Bits	Start at	Input Bus	Input Element	Input Bit
√	√	√	√	√						

The "Low Angle" output assignment will go active at the completion of a fastening that has a low angle result. It will go inactive when the next fastening is started (the torque exceeds the threshold value) or a Job reset.

High Angle

Supported Feature

Bus	Element	Bit 0-32	Polarity N.O., N.C.	Mode Normal, Timed, Flash	Time	Bits	Start at	Input Bus	Input Element	Input Bit
√	√	√	√	√						

The "High Angle" output assignment will go active at the completion of a fastening that has a higha angle results. It will go inactive when the next fastening is started (the torque exceeds the threshold value) or a Job reset.

Fastening Complete

Supported Feature

Bus	Element	Bit 0-32	Polarity N.O., N.C.	Mode Normal, Timed, Flash	Time	Bits	Start at	Input Bus	Input Element	Input Bit
√	√	√	√	√						

The "Fastening Complete" output assignment will go active at the completion of a fastening. It will go inactive when the next fastening is started (the torque exceeds the threshold value) or a Job reset.

Fastening Aborted

Supported Feature

Bus	Element	Bit 0-32	Polarity N.O., N.C.	Mode Normal, Timed, Flash	Time	Bits	Start at	Input Bus	Input Element	Input Bit
√	√	√	√	√						

The "Fastening Aborted" output assignment will go active at the completion of a fastening that was aborted by the system. It will go inactive when the next fastening is started (the torque exceeds the threshold value) or a Job reset.

Fastening Stopped

Supported Feature

Bus	Element	Bit 0-32	Polarity N.O., N.C.	Mode Normal, Timed, Flash	Time	Bits	Start at	Input Bus	Input Element	Input Bit
√	√	√	√	√						

The "Fastening Stopped" output assignment will go active at the completion of a fastening that was stopped by the user. It will go inactive when the next fastening is started (the torque exceeds the threshold value) or a Job reset.

Batch Complete

Supported Feature

Bus	Element	Bit 0-32	Polarity N.O., N.C.	Mode Normal, Timed, Flash	Time	Bits	Start at	Input Bus	Input Element	Input Bit
√	√	√	√	√						

The "Batch Complete" output assignment will go active at the completion of a fastening that satisfies the bolt count of a Job Sequence. It will go inactive when the next fastening is started (the torque exceeds the threshold value) or the job is reset.

Job Complete

Supported Feature

Bus	Element	Bit 0-32	Polarity N.O., N.C.	Mode Normal, Timed, Flash	Time	Bits	Start at	Input Bus	Input Element	Input Bit
√	√	√	√	√						

The "Job Complete" output assignment will go active at the completion of a fastening that satisfies all the sequences. It will go inactive when the job is reset.

Error

<div align="center">Supported Feature</div>

Bus	Element	Bit 0-32	Polarity N.O., N.C.	Mode Normal, Timed, Flash	Time	Bits	Start at	Input Bus	Input Element	Input Bit
√	√	√	√	√						

The "Error" output assignment will be active while the controller has an error.

Tool Enabled

<div align="center">Supported Feature</div>

Bus	Element	Bit 0-32	Polarity N.O., N.C.	Mode Normal, Timed, Flash	Time	Bits	Start at	Input Bus	Input Element	Input Bit
√	√	√	√	√						

The "Tool Enabled" output assignment will be active if the tool is enabled.

Service Indicator

<div align="center">Supported Feature</div>

Bus	Element	Bit 0-32	Polarity N.O., N.C.	Mode Normal, Timed, Flash	Time	Bits	Start at	Input Bus	Input Element	Input Bit
√	√	√	√	√						

The "Service Indicator" output assignment will be active if the system is in need of service.

ToolsNet Connected

<div align="center">Supported Feature</div>

Bus	Element	Bit 0-32	Polarity N.O., N.C.	Mode Normal, Timed, Flash	Time	Bits	Start at	Input Bus	Input Element	Input Bit
√	√	√	√	√						

The "ToolsNet Connected" output assignment will be active if the controller has an active connection to a ToolsNet server.

Open Protocol Connected

<div align="center">Supported Feature</div>

Bus	Element	Bit 0-32	Polarity N.O., N.C.	Mode Normal, Timed, Flash	Time	Bits	Start at	Input Bus	Input Element	Input Bit
√	√	√	√	√						

The "Open Protocol Connected" output assignment will be active if the controller has an active Open protocol connection.

PFCS Connected

				Supported Feature						
Bus	Element	Bit 0-32	Polarity N.O., N.C.	Mode Normal, Timed, Flash	Time	Bits	Start at	Input Bus	Input Element	Input Bit
√	√	√	√	√						

The "PFCS Connected" output assignment will be active if the controller has an active PFCS connection.

Running PSet Number

				Supported Feature						
Bus	Element	Bit 0-32	Polarity N.O., N.C.	Mode Normal, Timed, Flash	Time	Bits	Start at	Input Bus	Input Element	Input Bit
√	√	√				√	√			

The "Running PSet Number" output assignment will output the current PSet number.

Running Job Number

				Supported Feature						
Bus	Element	Bit 0-32	Polarity N.O., N.C.	Mode Normal, Timed, Flash	Time	Bits	Start at	Input Bus	Input Element	Input Bit
√	√	√				√	√			

The "Running Job Number" output assignment will output the current Job number.

External Controlled

				Supported Feature						
Bus	Element	Bit 0-32	Polarity N.O., N.C.	Mode Normal, Timed, Flash	Time	Bits	Start at	Input Bus	Input Element	Input Bit
√	√	√						√	√	√

The "External Controlled" output assignment will reflect the state of an input. Use the "Input Bus", "Input Element", and "Input Bit" to specify the input to reflect.

Torque

				Supported Feature						
Bus	Element	Bit 0-32	Polarity N.O., N.C.	Mode Normal, Timed, Flash	Time	Bits	Start at	Input Bus	Input Element	Input Bit
√	√	√				√				

The "Torque" output assignment will output the final torque value of the most recent rundown. The value will be cleared to 0 at the start of a new fastening cycle or a Job reset. At the end of the fastening cycle the final torque will be truncated to an integer and output.

Torque (x10)

Supported Feature

Bus	Element	Bit 0-32	Polarity N.O., N.C.	Mode Normal, Timed, Flash	Time	Bits	Start at	Input Bus	Input Element	Input Bit
√	√	√				√				

The "Torque (x10)" output assignment will output the final torque value of the most recent rundown. The value will be cleared to 0 at the start of a new fastening cycle or a Job reset. At the end of the fastening cycle the final torque will be multiplied by 10, truncated to an integer and output.

Torque (x100)

Supported Feature

Bus	Element	Bit 0-32	Polarity N.O., N.C.	Mode Normal, Timed, Flash	Time	Bits	Start at	Input Bus	Input Element	Input Bit
√	√	√				√				

The "Torque (x100)" output assignment will output the final torque value of the most recent rundown. The value will be cleared to 0 at the start of a new fastening cycle or a Job reset. At the end of the fastening cycle the final torque will be multiplied by 100, truncated to an integer and output.

Angle

Supported Feature

Bus	Element	Bit 0-32	Polarity N.O., N.C.	Mode Normal, Timed, Flash	Time	Bits	Start at	Input Bus	Input Element	Input Bit
√	√	√				√				

The "Angle" output assignment will output the final angle value of the most recent rundown. The value will be cleared to 0 at the start of a new fastening cycle or a Job reset.

Rundown Saved to FTP Server

Supported Feature

Bus	Element	Bit 0-32	Polarity N.O., N.C.	Mode Normal, Timed, Flash	Time	Width	Offset	Input Bus	Input Element	Input Bit
√	√	√				√				

The "Rundown Saved to FTP Server" output assignment will output the ID of the last rundown that was saved to the FTP server.

10.1 Controller Supported MIDs

MID	Description	Revisions	Note
	Supported MID		
1	Communication start	1,2,3	
2	Communication start acknowledge	1,2,3	
3	Communication stop		
4	Command error		
5	Command accepted		
10	Parameter set ID upload request		
11	Parameter set ID upload reply		
14	Parameter set selected subscribe		
15	Parameter set selected		
16	Parameter set selected acknowledge		
17	Parameter set selected unsubscribe		
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 tool		
50	Vehicle ID number download request		
51	Vehicle ID number subscribe	1,2	
52	Vehicle ID number		
53	Vehicle ID number acknowledge		
54	Vehicle ID number unsubscribe		
60	Last tightening result data subscribe	1,2,3,999	
61	Last tightening result data		

62	Last tightening result data acknowledge		
63	Last tightening result data unsubscribe		
64	Old tightening result upload request		
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		
113	Flash green light on tool		
127	Abort Job		
130	Job off		
150	Identifier download request		
157	Reset all Identifiers		
200	Set external controlled relays		Only supports 0 (off) and 1 (on)
210	Status external monitored inputs subscribe		
211	Status external monitored inputs		
212	Status external monitored inputs acknowledge		
213	Status external monitored inputs unsubscribe		
214	IO device status request	1,2	
215	IO device status reply		
216	Relay function subscribe		See supported relay functions below.
217	Relay function		
218	Relay function acknowledge		
219	Relay function unsubscribe		
9999	Keep alive open protocol communication		

Supported Relay Functions	
Number	Function
1	OK
2	NOK
5	Low Torque

6	High Torque
7	Low angle
8	High angle
9	Cycle complete
10	Alarm
11	Batch NxOK
12	Job OK
19	Tool ready
20	
21	
22	
26	
276	Cycle abort

11 Dimensions
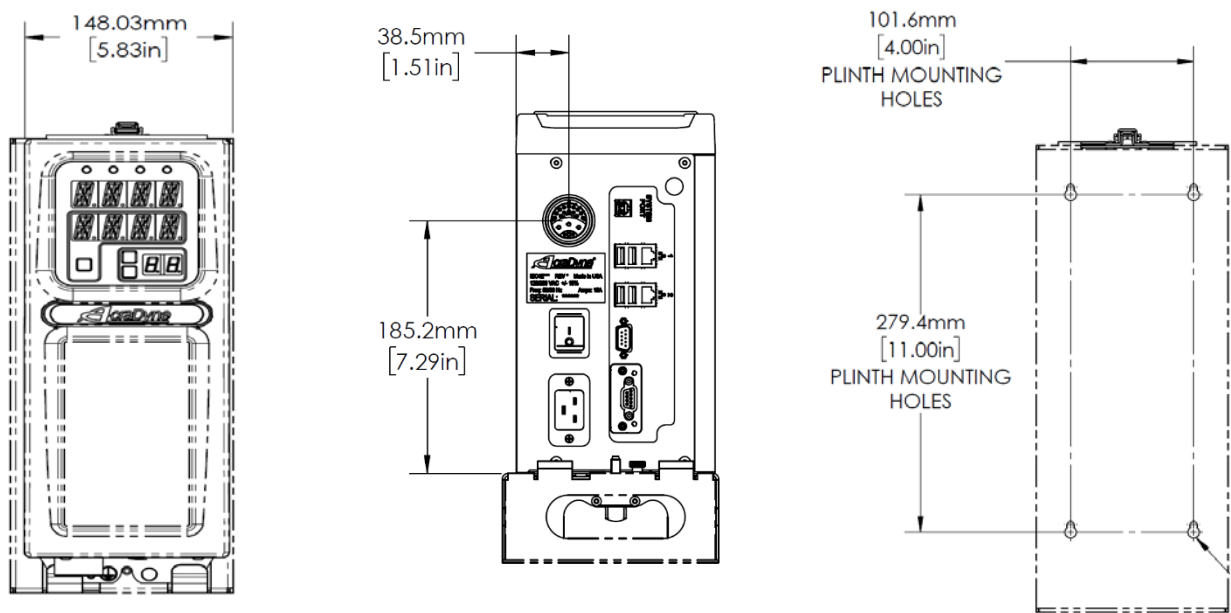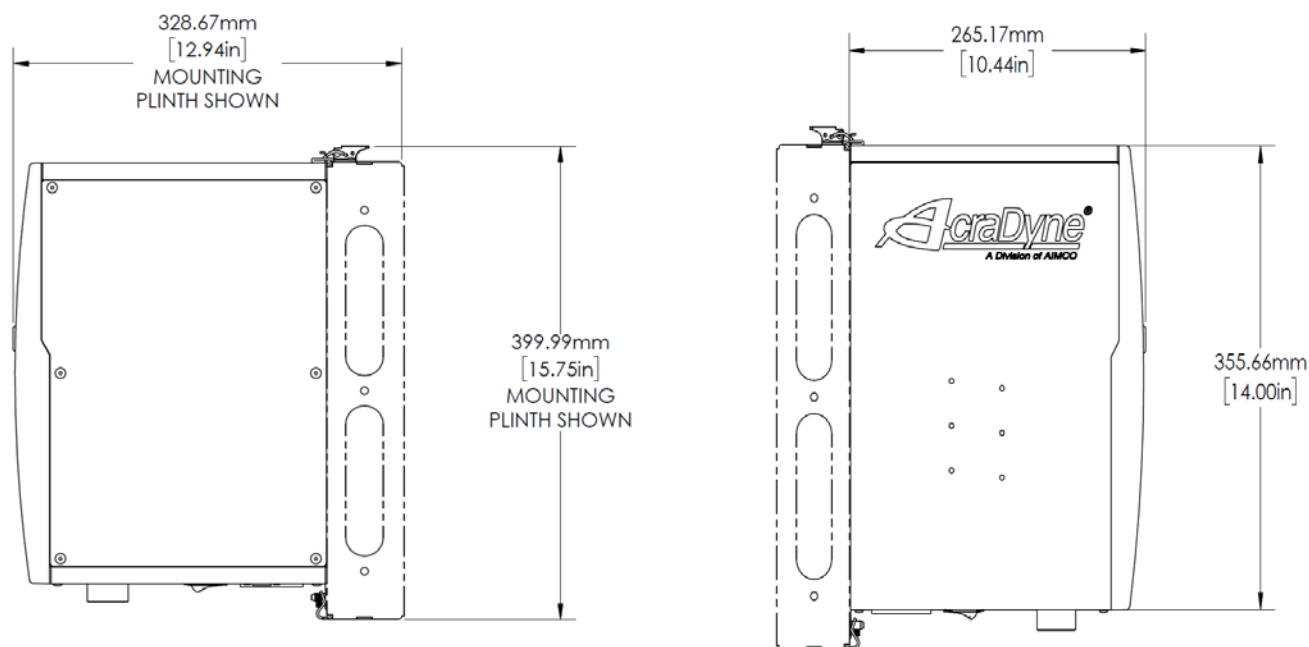
Specifications

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 ^{o}F (0 to50 ^{o}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

12 Trouble Shooting

Issue: *SD Card initializing*

Soultion: The rear SD card can be used to easily move the software, firmware, configuration, and rundowns to a new controller in the event of hardware failure. This allows the controller to be replaced with a new unit while retaining all the rundown information and configuration settings. Remove the rear SD card from the damaged unit and insert it into a functioning unit to perform the replacement. It is highly recommended that the controller settings are backed up and saved by exporting the controller to a USB flash drive.


**Issue:** System port IP Address Drivers

Solution: **NOTE:** In the event the RNDIS drivers do not install themselves, the following are the steps to install new drivers in order to get the system port working.

RNDIS driver is a part of the Windows 7 operating system, but the OS fails to detect it automatically. The following steps will help the user to install the RNDIS driver:

Step 1 After the device is connected to the development PC, OS will automatically search for the RNDIS driver. After it fails to find the driver, the following message will be shown:
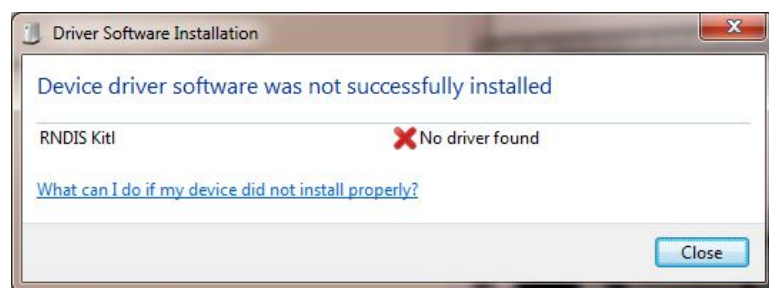

Step 2 Right click on **Computer** and select **Manage**. From **System Tools**, select **Device Manager**. It will show a list of devices currently connected with the development PC. In the list, RNDIS Kitl can be seen with an exclamation mark implying that driver has not been installed.
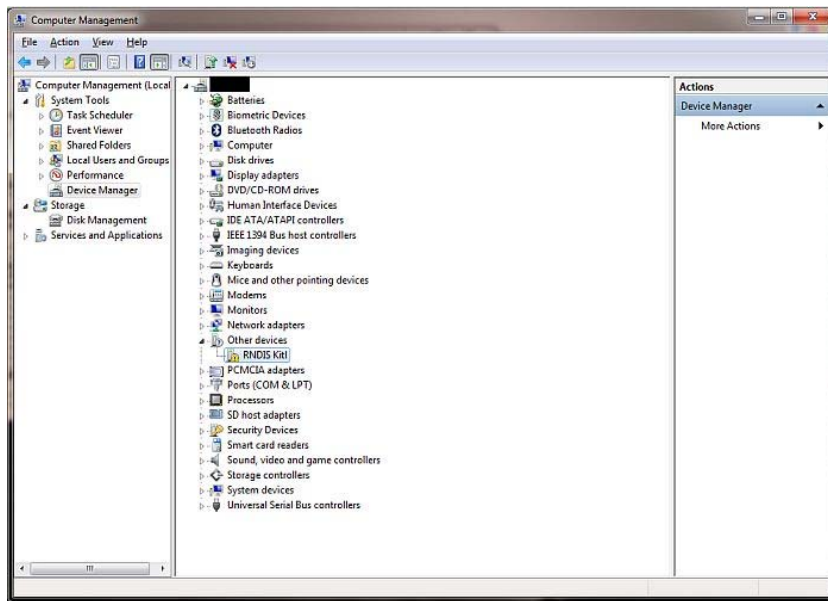
Step 3 Right click on it and select **Update Driver Software**. When prompted, choose **Browse my computer for driver software** to search for device driver software.

Step 4 **Browse for driver software on your computer** will come up. Select **Let me pick from a list of device drivers on my computer**.

Step 5 A window will come up asking to select the device type. Select **Network Adapters** as RNDIS emulates a network connection.
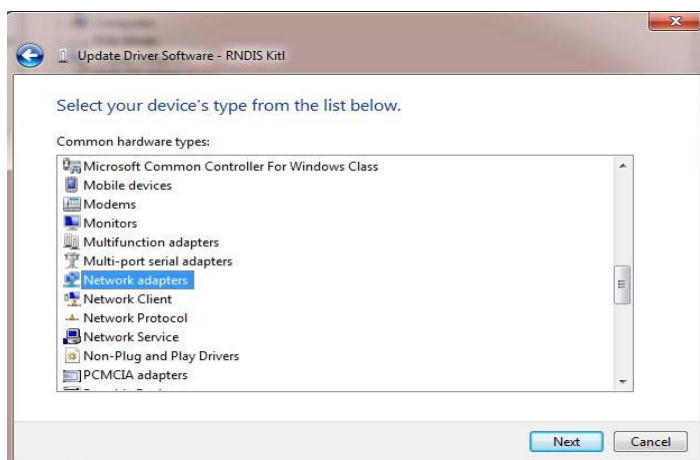
Step 6 In the **Select Network Adapter** window, select **Microsoft Corporation** from the **Manufacturer** list. Under the list of **Network Adapter**, select *Remote NDIS Compatible Device*.
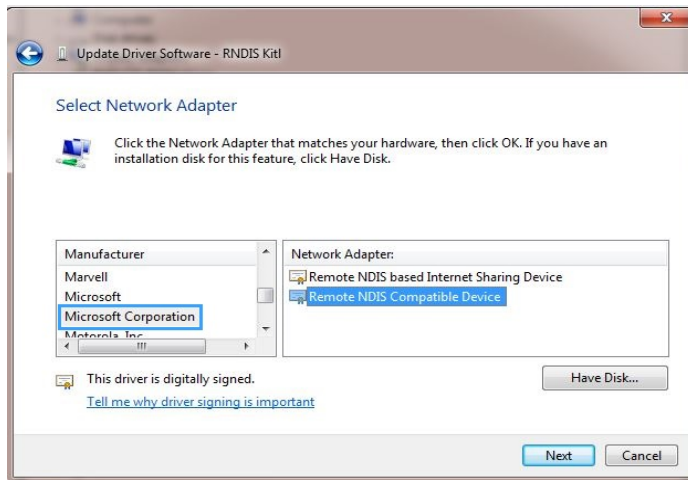
<u>Step 7</u> The RNDIS KitI device is now installed and ready for use.

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13 AIMCO Warranty

<u>**NEW TOOL AND ACCESSORY WARRANTY**</u>
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.

<u>**REPAIRED TOOL WARRANTY**</u>
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*

<u>**EXCLUSION FROM WARRANTY**</u>
This warranty is valid only on products purchased from AIMCO, or thru 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, eight-hour work day**.