



AUDITOR

ATDA-DC

Torque Data Analyzer/Collector

User Guide



CONTENTS

Safety Requirements	3
Descriptions and Specifications	
Screen and button Diagram.....	4
Back Panel Diagram	5
Unit Specifications.....	5
Operating Instructions	
Charging the ATDA.....	6
Basic Navigation.....	6
Turning On / Off.....	6
Transducers	
Connecting Transducers (TXDR)	7
Confirming TXDR Connection.....	7-8
Basic Functions	
Operating Mode	8
Selecting Operating Mode	8
Setting Engineering Units	8
Run Mode	
Using the ATDA in Run Mode	9
Accessing Run Mode	9
Measure Mode	
Using the ATDA in Measure Mode	9
Accessing Memory Mode	9
Storing Rundown Torque Values	9
Reviewing Rundown Torque Values	9
Reviewing Statistical Information.....	10
ATDA Menu Functions	
Accessing Menu Functions	11
Peak Options Menu	
Accessing the Peak Options Menu.....	12
Auto Clear.....	12
Setting Auto Clear.....	13
Clearing a Torque Value / Run Mode	13
Clear / Enter Torque Value / Measure Mode	13
Clearing Previous Torque Values	13
Filter.....	13
Setting the Filter Value	14
Peak Blanking.....	14
Setting the Peak Blanking Value.....	14
Sign Lock.....	14
Turning Sign Lock On/Off.....	14
Resetting Sign Lock	14
Edit Limits	15
Setting High and Low limits	15
System Menu	
Accessing the System Menu	16
Sleep	16
Setting the Sleep Timer.....	16
Lockout Menu.....	16
Setting the Lockout Modes	16
Contrast.....	17
Information / Accessing the Information System.....	17
Data Menu	
Accessing the Data Menu	17
Print Data Requirements	17
RS232 Transfer Protocol.....	17
Data Stream Format	18
Pinout Diagram	18
Print Memory / Print Memory w/SPC / Clear Memory / Reset All.....	18

SAFETY REQUIREMENTS

SAVE THESE INSTRUCTIONS

1) WORK AREA

- a) **Keep work area clean and well lit.** *Cluttered and dark areas invite accidents.*
- b) **Do not operate power tools in explosive atmospheres, such as 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.*

3) PERSONAL SAFETY

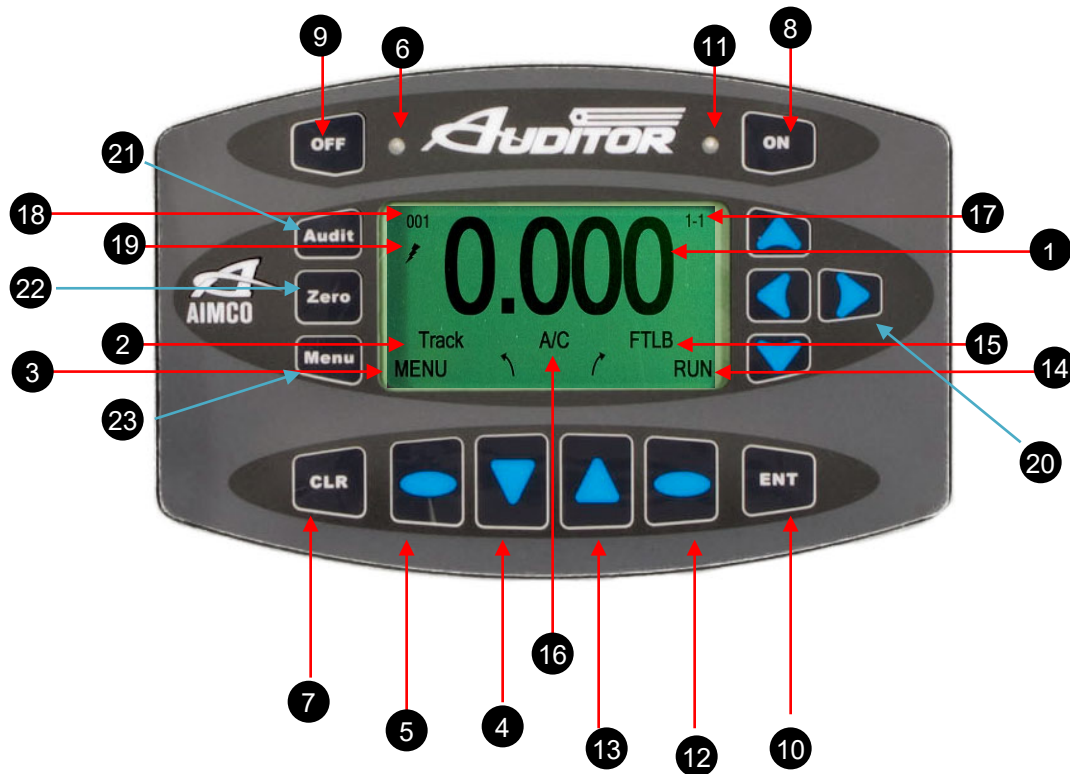
- a) **Stay alert, watch what you are doing and use common sense when operating a power tool. Do not use a power tool while you are tired or under the influence of drugs, alcohol or medication.** *A moment of inattention while operating power tools may result in serious personal injury.*
- b) **Use safety equipment. Always wear eye protection.** *Safety equipment such as dust mask, non-skid safety shoes, hard hat, or hearing protection used for appropriate conditions will reduce personal injuries.*
- c) **Avoid accidental starting. Ensure the switch is in the off-position before plugging in.** *Carrying power tools with your finger on the switch or plugging in 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 these devices 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.*

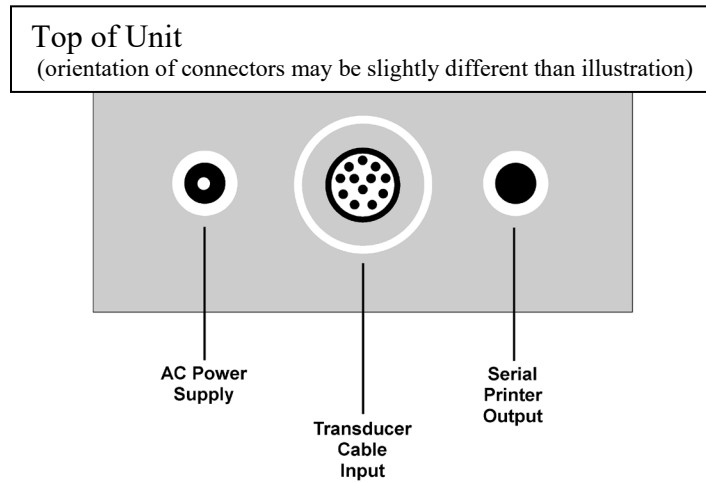
SCREEN AND BUTTON DIAGRAM

Figure 1



- | | |
|--|---|
| <ol style="list-style-type: none"> 1. Data Display 2. Operating Mode 3. Menu Mode Status 4. Selection Arrow – Down <ul style="list-style-type: none"> ➤ Change Operating Mode ➤ Scroll Down through Menu screens 5. Left Selection Button <ul style="list-style-type: none"> ➤ Menu Mode ➤ Reduce Parameter Value ➤ Select Parameter 6. NOK Value Indicator LED (RED) 7. Clear Data Display Value / Manually ZERO Display 8. Power On 9. Power Off / Charging Mode 10. Enter <ul style="list-style-type: none"> ➤ Set Values ➤ Back up one Menu Screen 11. OK Rundown / Charging Mode Ind LED (GREEN) | <ol style="list-style-type: none"> 12. Right Selection Button <ul style="list-style-type: none"> ➤ Data Storage Mode ➤ Increase Parameter Value 13. Selection Arrow - Up <ul style="list-style-type: none"> ➤ Change Engineering Units ➤ Scroll Up through parameter screens 14. Data Storage Mode Status 15. Engineering Unit Status 16. All Clear Status Indicator (Absent when A/C turned OFF) 17. Menu Screen Indicator / Stored Rundown Number 18. Angle / Pulse Value Display 19. External Power Supply Indicator 20. Cursor Arrows 21. Audit Button <ul style="list-style-type: none"> ➤ Enter Audit/data collector menu 22. Zero Button 23. Menu Button |
|--|---|

Figure 2



UNIT SPECIFICATIONS

Dimensions

Width: 6.25", Height: 4.25", Depth: 1"

Weight

1 Lb

Power Requirements

Main power 100-240VAC, 50-60hz from supplied charger, or internal NiMH battery pack

Operating Temperature Range

0° to 50° C

Data Communication

RS-232-C


Accuracy


.5% +/- of indicated reading for top 90% of transducer full scale

OPERATING INSTRUCTIONS

Charging the Auditor Torque Data Analyzer (ATDA)

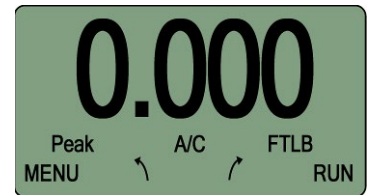
1. Plug the 100 – 240 VAC Charger into DC Power Supply port (*Figure 2*)
2. Plug the Charger into a 100 – 240 VAC power outlet using the appropriate plug end.
3. Press the Off / Charge button on the front panel (*Figure 1*)
4. The Charging Mode Indicator LED should begin to flash green.

 symbol will be displayed on the Main Display screen when the unit is on and plugged in to AC power.

5. When the ATDA is fully charged the LED will stop flashing
6. The ATDA can be used as normal in AC mode with the charger connected.
7. When the Auditor internal battery is close to requiring a recharge, the  symbol will show on the Main Display screen. Recharge time is approximately 4-5 hours and can be done while the unit is in use and on AC power.

Basic Navigation and Use of the Keypad

Many functions of the **Auditor ATDA** can be accessed by using the button directly below the associated text on the display screen. For example, if the following screen were displayed:



the **LEFT SELECTION BUTTON**, which is directly below the **MENU** text field, would allow the user to access the **MENU** features.

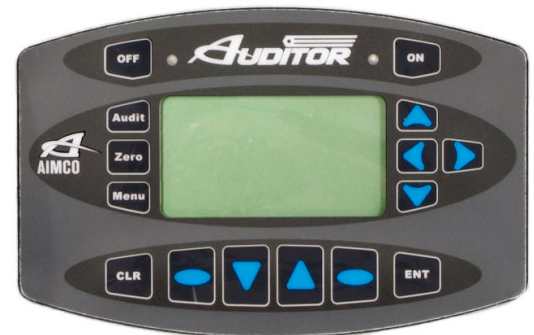
At anytime during use, pressing the **ENTER** button (*Figure 1*) will allow the user to back up by one screen. Pressing the **ENTER** button enough times will always take the user back to the main display screen.

To enter the data collection mode press the **AUDIT** button, the unit will prompt you for **USER NAME**, press soft button immediately under the **Done** text when finished. The unit will list all available tools (files) for testing. Use the scroll buttons to select tool/file.

Pressing the **CLR** button will return you to the **RUN** or sequential **MEM** mode of the ATDA tester.

Turning On / Off

To turn the **ATDA** on, press the “**ON**” button (*Figure 1*)
The AIMCO logo will be displayed for approximately 4 seconds then the unit will start at the **RUN** or sequential **MEM** mode of the tester.



To turn the **ATDA** off, simply press the “**OFF**” button.

TRANSDUCERS

The **ATDA** can be used with a variety of external transducers, whether supplied by AIMCO or another manufacturer. Because manufacturers use a wide range of transducer technologies and connector types, verify that the transducer you plan to use is capable of being connected to and communicating with the **ATDA**. For assistance with this, please contact your AIMCO Distributor or authorized AIMCO Sales Representative.

AIMCO's lines of **Auditor™** brushless and industry-standard transducers are manufactured with the proper connector-style for easy use with the **ATDA** and will be used as the example in all following instructions.

Two (2) optional cables are available from AIMCO to connect Auditor™ brand transducers to the **ATDA**:

- Part # **ATDBLIS** Connects the ATDA to any Auditor™ ABRT- or ARTIS Torque/Angle series transducer
- Part # **ATDBRIS** Connects the ATDA to any Auditor™ ARTIS Torque Only series transducer

Contact your AIMCO Distributor or AIMCO authorized Sales Representative for information on ordering these cables.

Connecting a Transducer

Align the red dot on the transducer-cable connector with the red dot on the TRANSDUCER CABLE INPUT port (*Figure 2*) and firmly press the connector into the port.

Setting up the Transducer to be used

The Auditor Torque Data Analyzer must be set to recognize the transducer connected to the instrument. *Most transducers can be made to allow the Auditor Torque Data Analyzer to self-recognize the transducer simply when a connection is made. For assistance with this, please contact your AIMCO Distributor or authorized AIMCO Sales Representative for a transducer upgrade quotation.*

For the typical, Industry Standard (IS) type of transducer, the setup procedure is as follows:

1. Turn the ATDA **On**.
2. Within 3 seconds of pressing the **ON** button, press the **LEFT SELECTION BUTTON** (*Figure 1*) for CAL.
3. Press **ENT** to SELECT UNITS. If a transducer has been previously setup, the data for that previous setup will be shown.
4. Units of measure for use in setting up the transducer may be changed in this screen by pressing the **UP OR DOWN SELECTION ARROW** to scroll through the available units. Pressing **ENT** will select the displayed unit of measure for use in setup and then display the **SELECT FULL SCALE** screen.
5. To change the number displayed to match the transducer being setup, press the **RIGHT SELECTION BUTTON** to EDIT the number.
6. The upper right corner of the screen will display the digit number that use of the **UP or DOWN SELECTION ARROWS** will effect. The bottom left corner of the screen shows the increment of adjustment that each press of the **UP or DOWN SELECTION ARROWS** changes the digit by.
7. Once the number displayed on the screen matches the transducer to be used, press **ENT** to confirm the set value.
8. The next screen will display “(-) 0.000” and the A-D counts. Press and hold the **RIGHT SELECTION BUTTON** to **EDIT** the mV/V rating of the transducer being setup. System defaults to 2.00000 which is standard for all Auditor IS transducers. Press **ENT** if this value is correct for the transducer being setup. ***It is important to be sure that the sign (+/-) shown on the A-D matches the direction of the Cal mode. If in +Cal then the sign must be positive. If in -Cal then the sign must be -. Rotation of the transducer shaft will facilitate a change from + to - should that be necessary.***
9. Percentage of Full Scale is the next adjustment. Default is 100. Should it be desired to limit the readable range of the transducer to be used, use the **RIGHT SELECTION BUTTON** and the **UP or DOWN** arrows to change this value. Hit **ENT** once the desired value is displayed.
10. Press the **DOWN SELECTION ARROW** to set the **-Cal**. Confirm **-Cal** by hitting **ENT**. Repeat steps 8 & 9.
11. After mV/V and Full Scale have been entered, the display returns to the A-D count screen. Hit **ENT**
12. If the value is correct, press **ENT** and **PGM** will show on the screen.
13. Press the **LEFT SELECTION BUTTON** to Save the setting. The unit will power itself off and will hold the set value until it is changed in the future or a different Intellect transducer is attached to the unit.

Confirming Transducer Connection (for unit with a previous setup)

1. Turn the ATDA **On**.
2. Press the **LEFT SELECTION BUTTON** (*Figure 1*) for MENU
3. Use the **SELECTION ARROW** buttons to scroll to SYSTEM MENU (2)
4. Press the **RIGHT SELECTION BUTTON** for SELECT
5. Use the **SELECTION ARROW** buttons to scroll to INFORMATION (2-4)

The following screen will be displayed:

```
[Information] 2-4
SYS: AIMCO DATA
TD: xxx.xx "units"
Intellect
          4 of 4
TD      Scroll      SYS
```

The values in the TD: line should match the full scale value of the connected transducer. For example, if an ABRT-50S-100 transducer is connected, the text on the Auditor screen should read **TD: 100 NM** or the mathematical equivalent, such as **TD: 73.8 FtLb**.

Transducer Calibration Schedule Information

With Intellect enabled transducers, the ATDA can display information regarding the connected transducer's serial number, type, previous calibration date and next due-date for calibration.

From the System Information screen (2-4), press the **LEFT SELECTION BUTTON** (TD) to access the Transducer Information screen. The following screen will be displayed:

```
Transducer:
Xxx.xx "units"
Intellect
SN:####
MO/DA/YEAR HR:MN Cal
MO/DA/YEAR HR:MN Due
Press any key
```

Pressing any key while this screen is displayed will return the user to the previous System Information screen.

BASIC FUNCTIONS

OPERATING MODE Descriptions

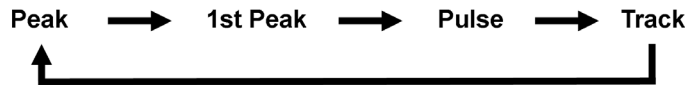
By selecting the proper **Operating Mode** the user can properly take torque readings from a variety of manual and powered tools.

- **PEAK**
This mode will provide a display of the maximum torque value achieved by the tool during operation. This mode is used for all continuous drive tools and click-type torque wrenches.
- **1st PEAK**
This mode will detect and display the “first peak” achieved by click wrenches and cam-over screwdrivers.
- **PULSE**
This mode will display the maximum torque value achieved by discontinuous drive tools such as pulse tools and impacting tools.
- **TRACK**
This mode will display torque in real-time as it is applied to the connected transducer. Track mode is used primarily for calibration of the unit.

Selecting the Proper OPERATING MODE

The ATDA must be in **RUN MODE** in order to change the **Operating Mode**. If torque values have been stored in the ATDA while in MEMORY MODE, then the memory must be cleared in order to change the Operating Mode.

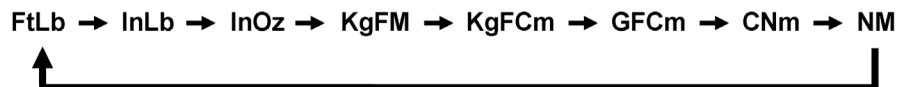
While in the Main Display screen, press the **Selection Arrow-Down** button to cycle through the available Operating Mode choices. The choices will be displayed in the following order:



Setting ENGINEERING UNITS

The ATDA must be in **RUN MODE** in order to change the **Engineering Units**. If torque values have been stored in the ATDA while in MEMORY MODE, then the memory must be cleared in order to change the Engineering Units.

While in the Main Display screen, press the **Selection Arrow-Up** button to cycle through the available Engineering Unit choices. The choices will be displayed in the following order:



USING THE ATDA IN RUN MODE

RUN MODE can be used to quickly and easily take torque readings using a variety of tools in situations where storage of data and statistical feedback is not necessary.

Accessing RUN MODE

With the ATDA turned on, observe the Data Storage Mode Status field (*Figure 1*). If RUN is displayed, the ATDA is in RUN MODE and can then be configured accordingly. If the status reads MEM, then the ATDA is in MEMORY MODE and will store all following rundown values.

To switch the unit to RUN MODE from MEMORY MODE, press the **RIGHT SELECTION BUTON** (*Figure 1*) and verify that RUN is displayed in the DATA STORAGE MODE field.

USING THE ATDA IN MEMORY MODE

MEMORY MODE can be used to store up to 999 torque readings. Those stored readings can then be reviewed and statistical analysis can be conducted. The ATDA also provides the capability to print out the data with or without the associated statistical information.

Accessing MEMORY MODE

With the ATDA turned on, observe the Data Storage Mode Status field (*Figure 1*). If MEM is displayed, the ATDA is in MEMORY MODE and can then be configured accordingly. If the status reads RUN, then the ATDA is in RUN MODE and will not store any of the following rundown values.

To switch the unit to MEMORY MODE from RUN MODE, press the **RIGHT SELECTION BUTON** (*Figure 1*) and verify that MEM is displayed in the DATA STORAGE MODE field.

Storing Rundown Torque Values

1. Enter MEMORY MODE
2. Press the **SELECTION ARROW – UP** button to scroll to memory position 1, which will be indicated by a **001** in the Stored Rundown Number field (*Figure 1*). The subsequent rundown value will be stored as #001 and all other rundowns will automatically be stored as sequentially higher numbers.

In MEMORY MODE, torque values are automatically stored when the value is cleared; this time-value is determined by the time-value set in the Auto-Clear function. If the Auto Clear function is turned off, the user must press **ENTER** after each rundown in order to store the associated torque value.

Reviewing Rundown Torque Values

To review rundown values that have been stored in MEMORY MODE:

1. Enter MEMORY MODE
2. Using the **SELECTION ARROW** buttons, scroll up or down through the list of stored rundown values.

It is possible to scroll to a stored-rundown-number which is above the highest stored value; for example, if 10 rundowns have been stored, it is possible to scroll to stored-rundown-number 15, however all rundown values above 10 will display as zero values.

Reviewing Statistical Information

Once rundown torque values have been stored to memory, it is possible to view statistical values based on those rundowns.

To view statistical information:

1. From either MEMORY MODE or RUN MODE press the **AUDIT** button.
A screen will display showing the following statistical values:
 - n = number of rundowns stored into memory
 - $\bar{\xi}$ = the mean torque value of all stored rundowns
 - Min = the lowest stored torque value
 - Max = the highest stored torque value
 - s = standard deviation of the stored torque values
2. If the ATDA is in MEMORY MODE when the statistical values are viewed, pressing the **SELECTION ARROW** buttons will allow the user to scroll through individual rundown values.
3. If the ATDA is in RUN MODE when the statistical values are viewed, pressing the **SELECTION ARROW** buttons will return the user to the main display screen

Once MEMORY MODE has been enabled and torque values have been stored, all rundowns, regardless of whether they are conducted in MEMORY MODE or RUN MODE, will be stored

To disable MEMORY MODE, the user must clear the memory and enter RUN MODE. For instructions on how to clear memory, see Clear Memory (3-3) on page 16.

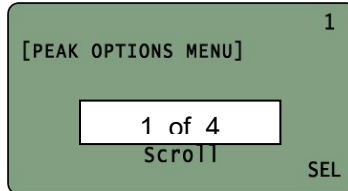
ATDA MENU FUNCTIONS

The basic set-up features of the ATDA are accessed through the MENU function. Data management, system set-up, display characteristics and power management can all be configured from this area to match the users' needs.

The basic set-up features of the **ATDA-DC** are accessed through the **MENU** function. Data management, system set-up, display characteristics and power management can all be configured from this area to match the users' needs.

Accessing the MENU Functions

1. Turn the **ATDA-DC**
2. The **MENU** structure is accessed by press the **Left Selection** button directly under the displayed **MENU** on the screen.



From this screen the **SELECTION ARROW** buttons can be used to access the individual menu options. By pressing the button, the menu options will display in the following order:

[1] Link to PC [2] Peak Options Menu [3] System Menu [4] Data Menu

[Link to PC] (1)

Link to PC executes the communication between the tester and the PC

[Peak Options Menu] (2)

Accessing the PEAK OPTIONS menu

To access the PEAK OPTIONS menu:

1. From the Main Display screen, press **MENU**
2. **PEAK OPTIONS MENU** should be displayed. If it is not, use the **SELECTION ARROW** buttons to display.
3. Press the **Right Selection** button for **SELECT (SEL)**
4. The user can then use the **SELECTION ARROW** buttons to scroll through the following options in the order shown:



Auto Clear (1-1)

The **Auto Clear** function determines the length of time, in seconds, that a torque reading will display on the screen after a peak value is captured. If **MEMORY MODE** is active, than the Auto Clear setting also determines the length of time after a rundown is conducted before the associated torque reading is entered into memory.

The values available to the operator are 1 – 9 seconds and OFF. When Auto Clear is set to OFF, the user must manually clear the value from the screen or enter the value into memory.

If **AUTO CLEAR** is turned on, **A/C** will be displayed on the Main Display Screen.

Setting Auto Clear

1. From the main display press **MENU**
2. Press the **Right Selection** button to select **PEAK OPTIONS MENU**
3. **Auto Clear** will be displayed
4. Use the **Left Selection** button to decrease the **Auto Clear** time from 9 seconds to OFF. Use the **Right Selection** button to increase the **Auto Clear** time from OFF to 9 seconds. Either button, when continuously pressed, will advance the value in a loop.
5. When the desired value is selected, press **ENTER** to save and exit.

Clearing a Torque Value / RUN MODE

When in RUN MODE, if **Auto Clear** is turned on by selecting a time value, the display screen will automatically convert back to a zero value after the set amount of seconds.

When in RUN MODE, if **Auto Clear** is turned OFF, the operator must manually clear a torque value from the display:

1. Set the **Auto Clear** function to OFF
2. While in the Main Display screen, conduct a rundown
3. After observing the torque value for the rundown, press **CLEAR**
4. The Main Display will convert back to a zero value

Clearing / Entering the Current Torque Value / MEMORY MODE

When in MEMORY MODE, if **AUTO CLEAR** is turned ON, the torque value from a rundown will automatically be entered into memory after the set number of seconds, the display will zero and the ATDA will be ready to record another torque value. When in MEMORY MODE, if **AUTO CLEAR** is turned OFF, the user must manually enter the value into memory or clear the value.

1. Set the **AUTO CLEAR** function to OFF
2. While in the Main Display, conduct a rundown
3. After observing the rundown, the user must decide whether to save or clear the value.
4. If the rundown is determined to be valid, press the **ENTER** button to store the value. The Main Display will convert back to zero, the next Stored Rundown Number will be displayed and the system will be ready to record another torque value.
5. If the rundown is determined to be invalid (statistical outlier, operator error during rundown, tool error during rundown, etc.), press **CLEAR** to delete the value. The Main Display will convert back to zero, the Stored Rundown Number will remain the same and the system will be ready to record another torque value.

Clearing a Previous Torque Value / MEMORY MODE

To clear a torque value that was previously entered into memory:

1. Use the **Selection Arrow** buttons to scroll to the desired torque reading
2. Press **CLEAR** *twice* to clear the value from memory and to subtract it from any statistical calculations. This will leave a gap in the sequential memory addresses but not affect the number of samples used for statistical calculations.

Filter (1-2)

The **FILTER FREQUENCY** is a setting used to “screen out” unwanted signals produced by hand and power tools and which can adversely affect the torque values generated by a transducer when connected to the ATDA. The **FILTER FREQUENCY** of the ATDA can be programmed in order to best match the type of tool being used and to provide the most reliable readings. The values are shown in values from 125 – 2000 Hertz (Hz). A general starting point for programming is 500 Hz for manual and continuous drive tools and 1000 Hz for discontinuous drive tools, but more consistent values may be obtained with other settings, depending on tool design, joint characteristics and other factors.

Setting the Filter Value

1. From the main display press **MENU**
2. Press the **Right Selection** button to select **PEAK OPTIONS MENU**
3. Use the **SELECTION ARROW** buttons to select **FILTER**
4. Use the **Left Selection** button to decrease the **FILTER** value. Use the **Right Selection** button to increase the **Filter** value. Either button, when continuously pressed, will advance the value in a loop.

5. When the desired value is selected, press **ENTER** to save and exit.

Peak Blanking (1-3)

PEAK BLANKING determines the minimum threshold at which a torque peak is captured. It is entered as a percentage of the full scale value of the transducer which is connected to the ATDA and can be displayed in values from 2 – 50% of transducer full scale. Accurately setting the PEAK BLANKING value can help prevent invalid torque readings and can enable the user to avoid taking readings related to high prevailing torque in an application.

Setting the Peak Blanking Value

1. From the main display press **MENU**
2. Press the **Right Selection** button to select PEAK OPTIONS MENU
3. Use the **SELECTION ARROW** buttons to select PEAK BLANKING
4. Use the **Left Selection button** to decrease the PEAK BLANKING value. Use the **Right Selection** button to increase the PEAK BLANKING value. Either button, when continuously pressed, will advance the value in a loop.
5. When the desired value is selected, press **ENTER** to save and exit.

Sign Lock (1-4)

The **SIGN LOCK** feature allows the user to select the rotation direction in which a torque peak will be captured. With SIGN LOCK on, the initial direction is set as the default direction; a negative torque value indicates a reading taken in the counter-clockwise direction and a positive reading indicates a reading taken in the clockwise direction. Any readings taken in the non-selected direction will be measured, but not captured / displayed as a peak value. With SIGN LOCK turned off, peak values in both the clockwise and counter-clockwise directions will be captured and displayed.

Since most torque rundowns are conducted and readings are taken in the clockwise direction, the user may find it beneficial to turn this feature on.

Turning Sign Lock On / Off

1. From the main display press **MENU**
2. Press the **Right Selection** button to select PEAK OPTIONS MENU
3. Use the **Selection Arrow** buttons to select **SIGN LOCK**
4. Use the **Left Selection button** to toggle **SIGN LOCK** on or off.
5. When the desired value is selected, press **ENTER** to save and exit.

Resetting Sign Lock

If **SIGN LOCK** is on and needs to be reset, either turn the ATDA off or press the CLEAR/ZERO button.

Edit Limits (1-5)

By using the **EDIT LIMITS** feature to set high and low limits for torque readings, the user can receive visual feedback regarding the rundown results.

Setting the high and low limits appropriately will result in the following display signals:

Reading outside of set limits:

- A red LED being lit on the ATDA keypad (*Figure 1f*)
- A ▼ symbol for low readings and a ▲ symbol for high readings being displayed on the screen (*Figure 1*)

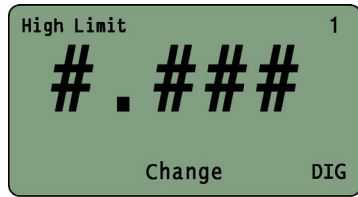
Reading within set limits:

- A green LED being lit on the ATDA keypad (*Figure 1f*)

Setting High and Low Torque Limits

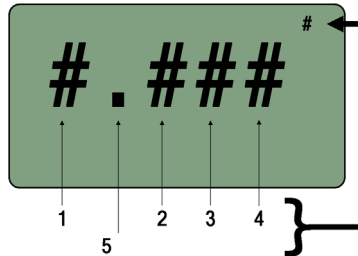
1. From the main display press **MENU**
2. Press the **Right Selection** button to select PEAK OPTIONS MENU
3. Use the **Selection Arrow** buttons to select **EDIT LIMITS**
4. Press the appropriate **Left** or **Right Selection** button to select the **HIGH** or **LOW** limit

5. If, as an example, the High Limit is being set, the following screen will be displayed:



6. Press the **Right Selection (DIG)** button to select one of the three available options.
- One of the four numeric position (1 – 4)
 - The decimal point (5)
 - OFF

The number in the top-right corner of the display indicates which option is selected. The number displayed will correspond to the following numeric position or decimal place:



7. If OFF is selected with the Right Selection button, the corresponding LIMIT will be disabled.
- If HIGH is disabled, then only readings below the LOW LIMIT will generate a red LED signal. Any reading above the LOW LIMIT will generate a green LED signal.
 - If LOW is disabled, only values above the HIGH LIMIT will generate a red LED signal. Any value below the HIGH LIMIT will generate a green LED signal.
8. Once the selected limit is set, press **ENTER** to return to the EDIT LIMITS screen.
9. To select and edit the other limit, proceed as above
10. If both limits have been set, press **ENTER** to return to the PEAK OPTIONS MENU screen

[System Menu] (3)

Accessing the System Menu

To access the SYSTEM menu:

1. From the Main Display screen, press **MENU**
2. Use the Selection Arrow buttons to scroll to System Menu
3. Press the **Right Selection** button for **SELECT (SEL)**
4. The user can then use the **SELECTION ARROW** buttons to scroll through the following options in the order shown:



Sleep (2-1)

To conserve battery life, the ATDA is equipped with a SLEEP mode. If a selected amount of time, from OFF to 20 minutes, has passed without any activity, the ATDA will go into standby.

Setting the Sleep Timer

1. From the main display press **MENU**
2. Use the **Selection Arrow** buttons to select SYSTEM MENU
3. Press the **Right Selection** button to select SYSTEM MENU
4. Use the Left and Right Selection buttons to adjust the SLEEP timer. If OFF is selected, the ATDA will remain on until manually powered off.
5. When the desired time is set, press ENTER to return to the System Menu screen

Lockout Menu (2-2)

The **LOCKOUT MENU** provides various levels of protection against unauthorized or accidental adjustment of basic settings to the ATDA. By turning the lockout mode on or off for various functions, the user can allow or prevent adjustment to these functions.

The functions that can be locked out are:

- Mode - Measurement mode of Peak, 1st Peak, Pulse or Track
- Units - Engineering units of FtLb, InLb, InOz, KgFM, KgFCm, GFCm, CNm, Nm
- Scroll - Prevents using the Selection Arrow buttons to scroll in order to enable MEMORY MODE or to scroll through stored rundown values

Setting Lockout Modes

1. From the main display press **MENU**
2. Use the **Selection Arrow** buttons to select SYSTEM MENU
3. Press the **Right Selection** button to select SYSTEM MENU
4. Use the **Selection Arrow** buttons to select LOCKOUT MENU
5. Press the **Right Selection** button to select LOCKOUT MENU
6. The user can then use the **SELECTION ARROW** buttons to scroll through the following options in the order shown:



7. Use the **Left** and **Right Selection** buttons to turn each lockout mode ON or OFF separately
8. Once all **LOCKOUT MODES** are set properly, press **ENTER** to return to the SYSTEM MENU

Contrast (2-3)

1. From the main display press **MENU**
2. Use the **Selection Arrow** buttons to select SYSTEM MENU
3. Press the **Right Selection** button to select SYSTEM MENU
4. Use the **Selection Arrow** buttons to select CONTRAST
5. Use the Left and Right Selection buttons to adjust the contrast of the screen

Information (2-4)

Important information regarding the ATDA and the connected transducer can be viewed in the **INFORMATION** section of the SYSTEM MENU. This information may be valuable when contacting AIMCO customer service or technical support and it may be useful when setting up or calibrating a transducer for use with the ATDA.

Accessing the Information Screens

1. From the main display press **MENU**
2. Use the **Selection Arrow** buttons to select SYSTEM MENU
3. Press the **Right Selection** button to select SYSTEM MENU
4. Use the **Selection Arrow** buttons to select INFORMATION
5. Use the **Left Selection** button to view information regarding the connected transducer
6. Use the **Right Selection** button to view information about the ATDA
7. To return to the SYSTEM MENU screen, press **ENTER**

[Data Menu] (4)

The Data Menu options allow the user to print and clear the stored rundown data and associated statistical information.

Accessing the DATA MENU

To access the DATA menu:

1. From the Main Display screen, press **MENU**
2. Use the Selection Arrow buttons to scroll to Data Menu
3. Press the **Right Selection** button for **SELECT (SEL)**
4. The user can then use the **SELECTION ARROW** buttons to scroll through the following options in the order shown:



Print Data Requirements

Data can be transmitted by cable through the built in Serial port using AIMCO's Part # RS232C. The data can be transmitted to a serial printer or to a terminal emulation program on the user's computer PC such as Hyper Terminal. When connecting to a serial printer a NULL Modem adapter is also required.

RS232 Transfer Protocol (Single Direction)

Cable	<i>9-pin to mini-plug</i>
Protocol	<i>Value</i>
Baud Rate	<i>9600</i>
Parity	<i>None</i>
Bits	<i>8</i>
S bit	<i>1</i>
Flow	<i>None</i>

Data Stream Format

mmmsbdddmbuuuuucl

m	<i>memory location</i>	c	<i>carriage return</i>
s	<i>sign (space or -)</i>	l	<i>line feed</i>
d	<i>data w/decimal point</i>	b	<i>blank</i>
u	<i>units</i>		

Pinout Diagram

Pin #	Description	Pin #	Description
1	<i>Unused</i>	6	<i>Unused</i>
2	<i>Transmit</i>	7	<i>Unused</i>
3	<i>Receive</i>	8	<i>Unused</i>
4	<i>Unused</i>	9	<i>Unused</i>
5	<i>Ground</i>		

Print Memory (3-1)

Connect the ATDA to a serial printer or computer using the appropriate cable (*AIMCO part # RS232C*)

From the Main Display screen, press **MENU**

Use the **Selection Arrow** buttons to scroll to Data Menu

Press the **Right Selection** button for **SELECT (SEL)**

Press the **Right Selection** button for **SEND** to transmit the data

When printing is complete, press **ENTER** to return to the Data Menu screen

Print Memory with SPC (Statistics) (3-2)

1. Connect the ATDA to a serial printer or computer using the appropriate cable (*AIMCO part # RS232C*)
2. From the Main Display screen, press **MENU**
3. Use the **Selection Arrow** buttons to scroll to Data Menu
4. Press the **Right Selection** button for **SELECT (SEL)**
5. Use the **Selection Arrow** buttons to scroll to **Print Mem with SPC**
6. Press the **Right Selection** button for **SEND** to transmit the data
7. When printing is complete, press **ENTER** to return to the Data Menu screen

Clear Memory (3-3)

To erase all stored rundown data:

From the Main Display screen, press **MENU**

Use the **Selection Arrow** buttons to scroll to Data Menu

Press the **Right Selection** button for **SELECT (SEL)**

Use the **Selection Arrow** buttons to scroll to **Clear Memory**

Press the **Left Selection** button for **CLEAR**

Press **ENTER** to confirm the desire to erase the data

Press **Enter** to return to the Data Menu screen

Reset All (3-4)

To erase all stored rundown data and format the memory allocation:

From the Main Display screen, press **MENU**

Use the **Selection Arrow** buttons to scroll to Data Menu

Press the **Right Selection** button for **SELECT (SEL)**

Use the **Selection Arrow** buttons to scroll to **Reset All**

Press the **Left Selection** button for **CLEAR**

Press **ENTER** to confirm the desire to erase the data and format the memory allocation

Press **Enter** to return to the Data Menu screen

Using the ATDA-DC in AUDIT MODE

Prior to using AUDIT Mode ensure that the correct files have been downloaded from the PC to the ATDA-DC tester from the Tool Manager Software

AUDIT MODE is entered by pressing **AUDIT** button. The tester will prompt for a **USER NAME** which can be entered from the display using the blue scroll keys to drive the cursor to letters/numerals, once highlighted by the cursor user presses the **ENT** button to select. When finished entering **USER NAME** press the blue oval button under **DONE** text. The tester will advance to a list of tools for testing, use blue arrow scroll keys to select tool and press **ENT** to launch test.

Creating, Downloading, Uploading and Archiving Tools/Files Jobs Manager or Tool Manager

Jobs Manager/Audit Manager is designed to facilitate residual auditing with either digital wrenches or transducerized wrenches.

Tool Manager is designed to test, verify and archive tools.

Both applications create databases on the PC for data to be archived, recalled and analyzed. The applications communicate with other applications via .csv exports

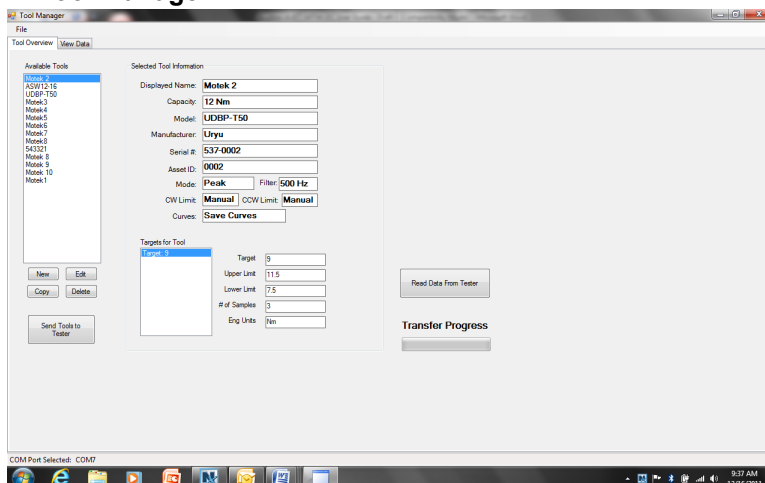
Procedure to Launch

1. User will launch the application on their computer.
2. User connects instrument with supplied communication cable
3. The communications are serial communication so user must assign a Port. The application will suggest open ports, user selects a port.
4. User must select Link to PC from main menu
5. Instrument will generate a message - Waiting...
User will send Tools or Route/files to tester or wrench. Tool Manager or Jobs Manager will inform user if transfer was successful and instrument will have a dialog bar illustrating status of download.
6. User presses the CLR key to return to Menu.
7. User presses the AUDIT key to start data collection

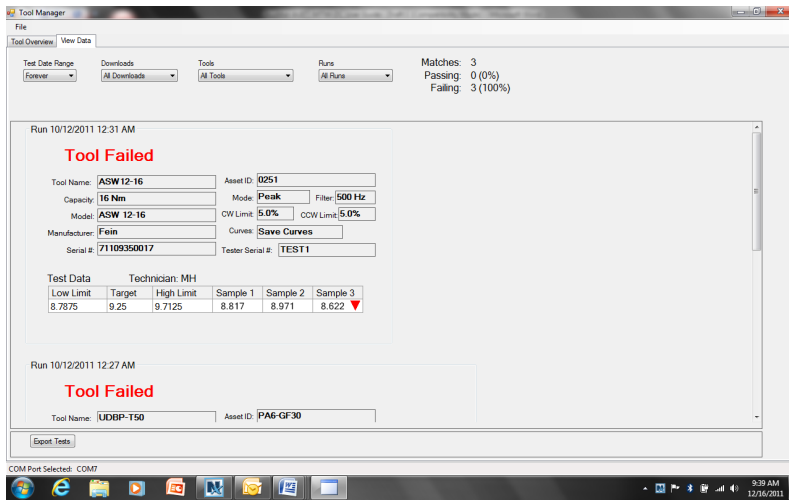
After initial setup if user continues to use the same cable and same physical port it is unlikely that the computer will reassign the port, therefore this setup is a onetime procedure. However some computers particularly MS operating systems often reassign ports without direction from a user, therefore occasionally the user may have to reassign a port manually – this is a MS operating system feature with USB ports.

Tool Manager & Jobs Manager are SQL Lite databases that have been built to support the data collection. The applications have been designed to be simple, powerful and flexible. It is “open” so MIS or engineers familiar with database queries can retrieve tools, jobs, routes and data quickly and efficiently.

Tool Manager

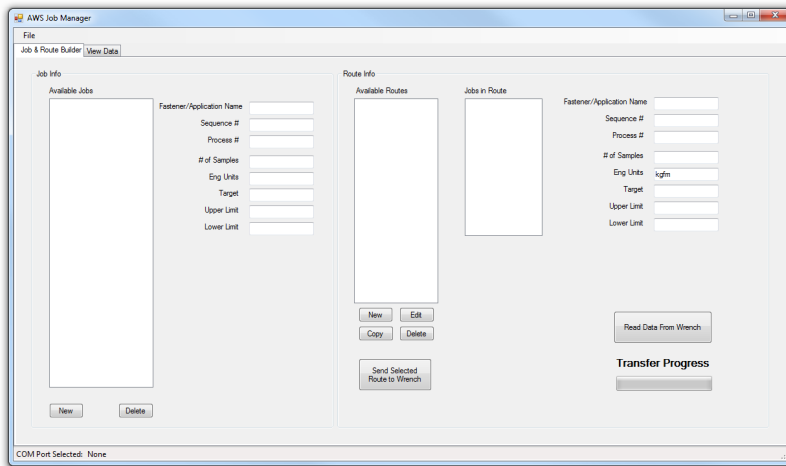


1-Main Screen Auditor Tool Manager Tool Builder
Tool info drop down list shows available Tools - lists tools, you can select “New”, “Copy”, “Edit” or “Delete”. When you highlight the Tool, details are listed in the window on the right. The large button on the left bottom of screen sends the selected “tool” to the instrument. After collecting the data the button in the center allows you to upload data, Tools or Jobs & Routes back to the database.



The View Data tab allows you to look at the collected data and whether the tool passed or failed. This data can be exported to Excel as a .csv file and displayed by Excel charts.

Jobs Manager



1-Main Screen

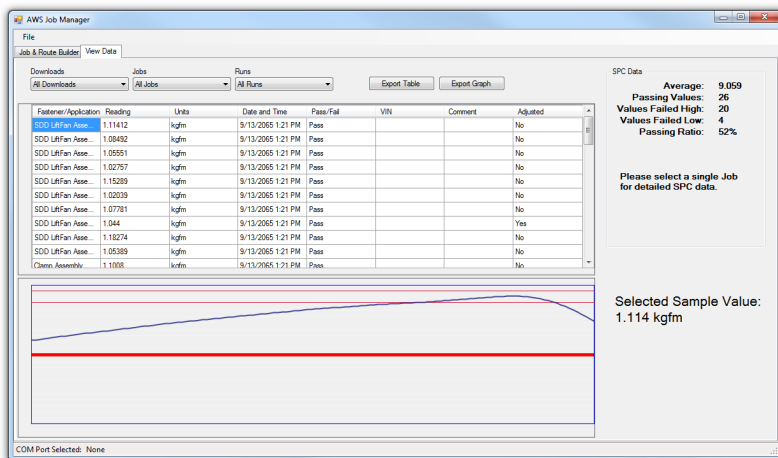
Auditor Job Manager

Job & Route Builder

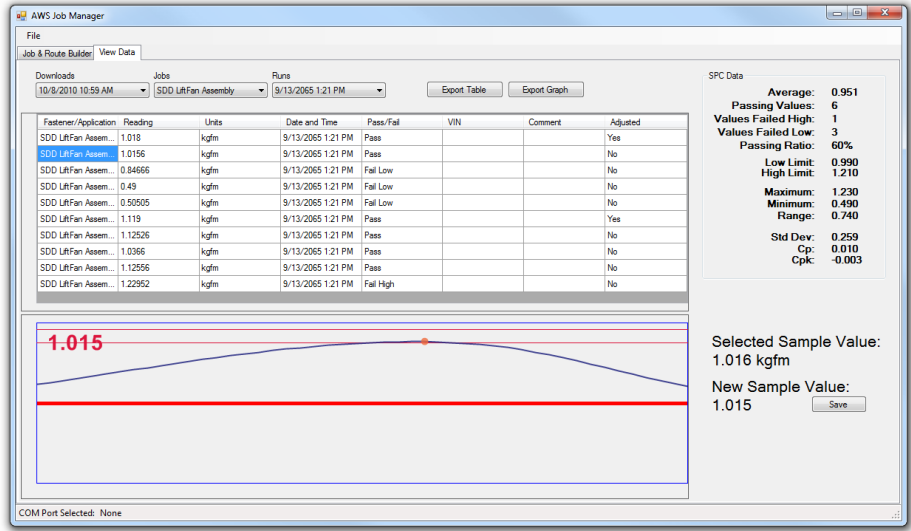
Job Info drop down list

Available Jobs - lists all jobs, if you select the "New" button that allows you to create a new job. Delete button lets you delete a selected job.

Route Info - lists all Routes and the Jobs in a Route. You can select "New", "Copy", "Edit" or "Delete" for "Routes". When you highlight the Route and the Job in the Route the Job details are listed in the window on the far right.



The large button on the center bottom of this screen sends the selected "Route" to the wrench. After collecting the data the button on the bottom right allows you to upload data, Jobs and Routes back to the database. The View Data tab allows you to look at the collected data and the trace file. This data can be exported to Excel as a .csv file and displayed by Excel charts.



The trace file displays the data in a torque/time graph and allows the user to supersede the move-on reading selected by the wrench by visually discerning via the trace where the fastener started to rotate. When selecting a single job the average, range, sigma, Cp and Cpk values are listed.



Corporate Headquarters

10000 SE Pine Street
Portland, OR 97216
800-852-1368
FAX 800-582-9015
www.aimco-global.com

Ave. Cristóbal Colon 14529
Chihuahua, Chihuahua. 31125
Mexico
011-52-(614) 380-1010
FAX 011-52-(614) 380-1019