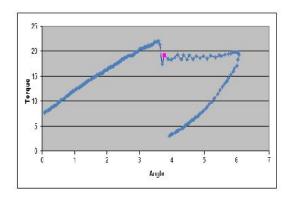
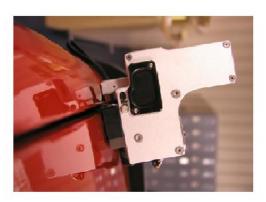
TranSend II - 600 Measurement Training Manual







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Introduction

The model 600 data collector and TranSend II software are intended to provide a cost effective solution to data collection and torque applications requiring portability.

<u>TranSend II</u>

- Maintains setups and data in a Microsoft SQL 2008 R2 Express database
- Data and setups are transferred between the PC and the 600 via a USB cable
 Operator is notified of changes to setups when connecting the 600
- Harvested data can be viewed in DAR or exported to Excel or other programs
- Gage Suite Editor has three default gage suites: Torque, LMI and Digital
 - Gage suites can be edited and new gages configured
 - Torque uses include:
 - Residual algorithms for auditing assembled products
 - Set torque measurement for hand assembly applications
- Optional characteristic descriptors can be used to:
 - Inform operators about aspects of data collection
 - Marry characteristics in the database to track critical measurements

The model 600 data collector

- Available 600 models:
 - Torque/serial
 - LMI/Digital/Serial
 - Digital
- One gigabyte of memory
- Powered by rechargeable lithium battery (not by the PC)
- Supports color graphic images to help operators during data collection
- Reaudit capability
- Operators can view:
 - Control charts, histograms, statistics and review data
 - Torque curves
 - These may be captured individually or set to save automatically for out of spec, exceptions or all torque events

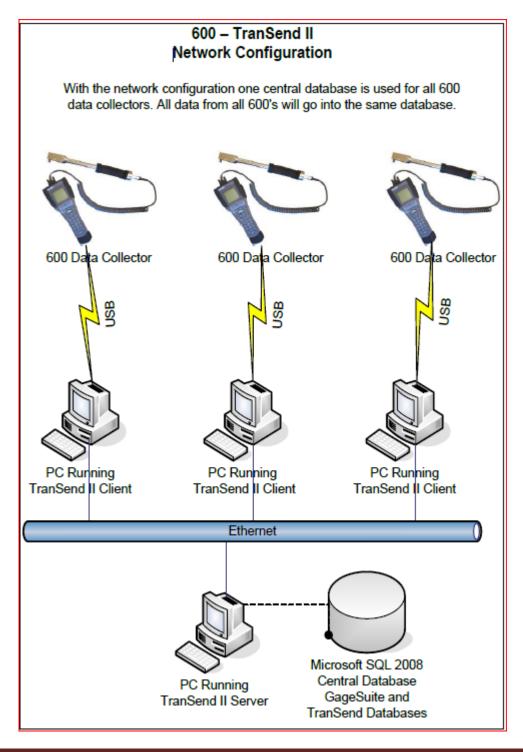
Reporting options

- CSV format which can be opened in Excel.
- DAR v. 3.5.0.1 and later for SPC analysis
- Future release: Web-based Business Intelligence exception and audit completion reports

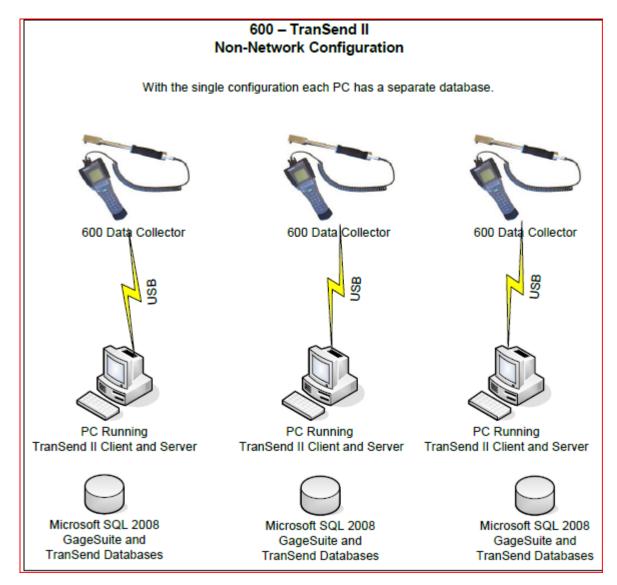
DM600 – TranSend II Configurations

The 600 Handheld Data Collector along with TranSend II can be installed either in a **network** or a **non-network** configuration. The figures below show both options:

Network Configuration



Non Network Configuration



Note: With the non-networked configuration the 600s are tied to their database. If a 600 is moved to a different PC (with a different database) an error message will be displayed saying that the unit does not belong to this database. You will have to reinitialize the collector if you want to use it on the new computer.

TranSend II and Data Collector Training Goals

The goal is to understand how all the components work together to create setups, collect data and upload it to the TranSend II database.

TranSend II Objectives:

Demonstrate an understanding of:

- 1) Gage Suites
 - a. Create a gage suite with aliases and their uses
- 2) Setup Editor
 - a. Configure Setup Editor preferences
 - b. Create labels and assign them to a setup
 - c. Create characteristics with alarms and assign them to a setup
 - d. Assign aliases to characteristics
 - e. Select images and assign them to characteristics
 - f. Add characteristic descriptors and assign them to characteristics
 - g. Create a setup group and assign setups to the group
- 3) Demonstrate understanding of information transfer between TranSend II and the 600 so that:
 - a. Setup Groups are sent to the collector
 - b. Gage suites are sent to the collector
 - c. Data is harvested from the collector

600 Objectives:

Demonstrate understanding of:

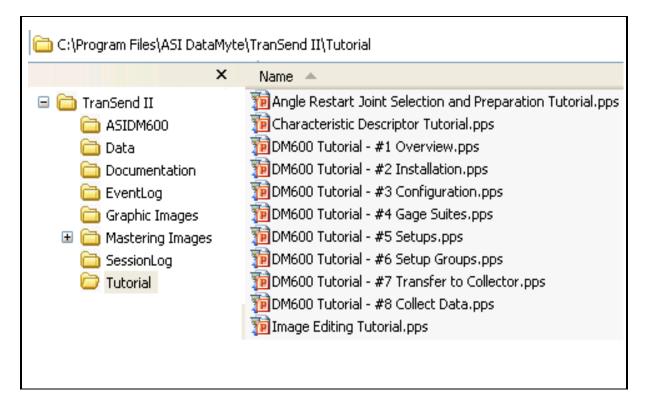
- 1) Menus and keystrokes
- 2) Preference settings for efficient battery use
- 3) How to select a gage suite to master and test the gages
- 4) About screen information and options
- 5) Select a setup, respond to prompts and collect data
- 6) View analysis charts and torque curves
- 7) Reaudit

Questions for Torque Data Collection

- 1. What wrench sizes and uses will you employ on your audit routes?
- 2. Are fasteners audited as they are installed, or afterwards?
- 3. Where do you get your spec limits?
- 4. How often do the limits change (update, edited, reviewed)?
- 5. What are the critical torque measurements that you need to audit or collect data on?
- 6. What labels do you think you'll need (non-data information)?
- 7. Do you need to evaluate your joint variation (stiction)?
- 8. How do you organize your audit plans?
- 9. How do you store all the readings that are being taken?
- 10. How do you determine that all critical torque readings have been taken and that they have been taken on time?
- 11. What reports do you need to provide and how often?

TranSend II and 600 Tutorials

TranSend II has several tutorials, which are located in the TranSend II directory in the Tutorial directory.



TranSend II Menu Tour

We will take a preliminary look at the menus in TranSend II.

 Click the Windows Start button and All Programs /ASI DataMyte / Trans 		TranSend II		
Accessories	۰ ا 🗎	TranSend	×	🛅 Graphic Images
🛗 ASI DataMyte	•	TranSend II	·	TranSend II
The TranSend II main screen appears.				
Open Collector				
Setup Editor				
Gage Suite Editor				
View Torque Data				
Device Management				
Options				
About				
Exit				
 Note the Open Collector image. It is When a 600 is attached, this interfa and the TranSend II database. 				
Cpen Collector				

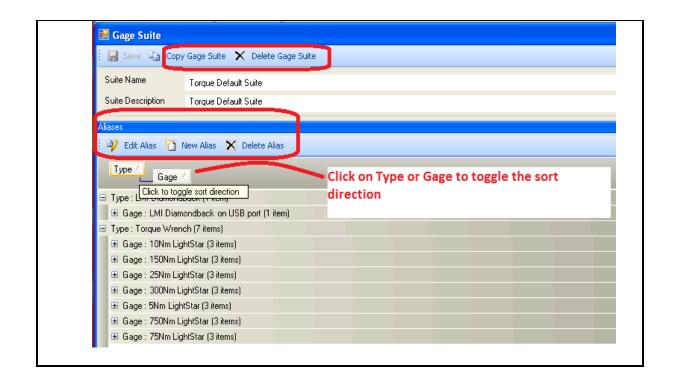
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The Setup Editor is used to cre		onents (characteristics, labels,
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	25 Nm Wrench reading	09/08/2010 11:53 AM
4	300 Nm Wrench reading	09/08/2010 11:58 AM
	5 Nm Wrench reading. 75 Nm Wrench reading	09/08/2010 11:48 AM 09/13/2010 01:46 PM
	750 Nm Wrench reading	09/08/2010 11:59 AM
	Training 1	09/30/2010 09:27 AM
a	Training 2	10/08/2010 10:40 AM
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Active Setup Group All Setups	10Nm Wrench reading	
All Setups	Request readings with 10 NM wrench	

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	 The default suites will mo 	st likely be all you need
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	Editors 🗝 Gages 😁 Gage Uses	5° Gage Models
	Gage Suites 🖉 Open New Gag	ge Suite
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	LMI Gage Default Suite Torque Default Suite	LMI Gage Default Suite Torque Default Suite
	Close the Gage Suite Editor using the red >	4
5.		ч
	View Torque Data	
	Note the saved torque curve. Close Torque	e Curves using the red X.
	Torque Curves	×
	Name	Collected
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	1	I.
6.	Note Device Management. It is grayed out	; if the 600 is not attached to the PC.
	Jevice Management	
	If the 600 is attached selecting Device Man message. This will usually need to be done	-
	Device Management	
	Update Firmware	
	Note: Once firmware is updated	, reinitialize the collector.

7.	Select Options.
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	 Formatting Options
	Append Julian Style Date option
	Output Folders
	Reserved subgroups
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	600 501 Compatibility
	Options
	Output Data To: Formatting Options
	Image: Subgroup Headers Image: Subgroup Headers
	I so Cov File I so
	🔽 🖬 Excel XML
	🗌 🗖 Include Characteristic Labels
	Include Nominals
	File Name Generation
	File Name Generation at the top of our output file. All SG's will Append Julian Style Date repeat the header for each subgroup
	Output Folder
	Primary C:\Program Files\ASI DataMyte\TranSend II\Data
	Secondary 😥 🗙
	Reserved Subgroups This retains Views of the desired number of subgroups in the 600
	Reserved Subgroups for review after the data has been harvested
	0 📼
	15 OK Cancel
	Click Cancel when done.
8.	Select About. This shows what version of TranSend II you have and other information.
	(i) About

Gage Suite Review

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Suite	Description Torque Default Suite					
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	here to group by that column.				(
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P150	LightStar with Angle	Torque Wrench	150Nm LightStar	🌳 Peak, Time	Y Torque	Peak, Ti
P300 P750	LightStar with Angle LightStar with Angle	Torque Wrench Torque Wrench	300Nm LightStar 750Nm LightStar	Peak, Time Peak, Time	Torque Torque	Peak, Ti Peak, Ti
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Create a Simple Setup, Upload, Collect, Download

We will create a simple setup, upload it to the 600, collect data and download it to TranSend II.

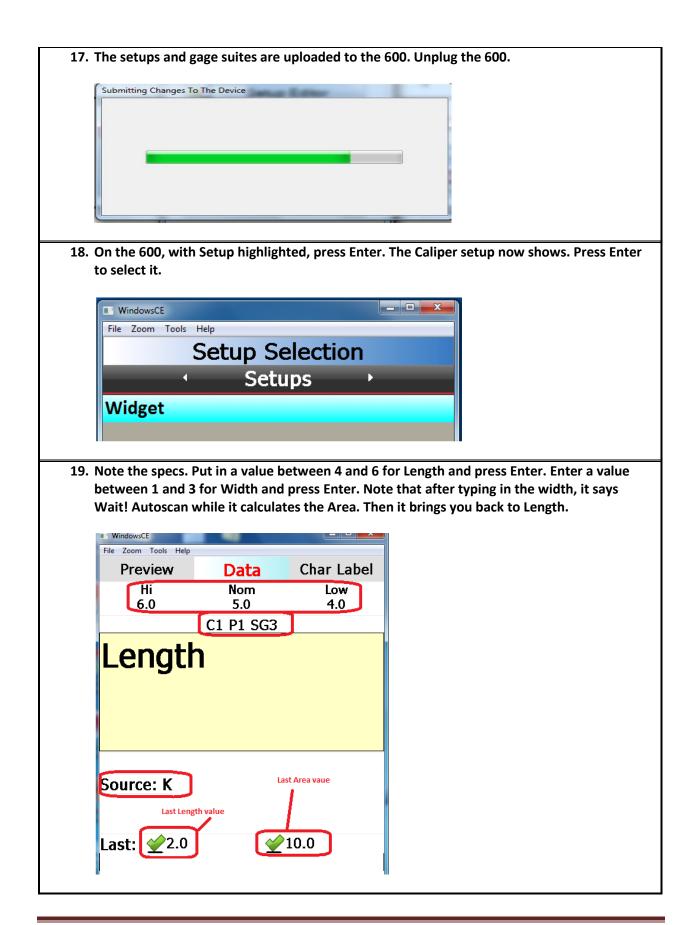
1.	At the main TranSend II menu, select Setup Editor.
	Setup Editor
2.	Click New Setup.
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	Name the setup Widget. Select the Default Gage Suite for your collector. Note: You can open the gage suite to view it by clicking the Browse button. Save the setup.
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	for your collector Select Gage Suite from the list or click the Browse button to open Gage Suite Editor.
	Big Select Gage Suite from the list or click the Browse button to open Gage Suite Editor. Gage Suite: Digital Gage Default Suite
	Cause Cause
	Choice List: (None)
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9.	Click Save Setup. Then close the setup.
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	Description:
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10.	Note your setup on the list. Close Setup Euror.
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	Setup Groups 7 Setups in All Setups setup group 2 Edit 🎬 New Group X Delete Group 2 Edit Setup 3 New Setup 3 Import Setups X Delete Setups 1 Hide Inactive
	All Setups Name ModifiedTS
	Widget 08/31/2011 15:42:03 Test 1 08/24/2011 12:57:44
	Test 1_copy_1 08/24/2011 12:57:44
	Connect the 600 to the PC and turn it on. Once it is at the main menu, click Open Collector on TranSend II.
	Connected 600 device* Setups Gage Suites Add Gage Suites Remove Gage Suites Gage Suite Name Add Gage Suites

Checkmark Gage Suites you'd like to be loaded to the collector Gage Suites Open New Gage Suite Included Name Open New Gage Suite Digital Gage Default Suite Digital Gage Default Suite UM Gage Default Suite UM Gage Default Suite Torque Default Suite Torque Default Suite Click OK to this message. The gage suite was selected successfully. Add Gage Suites Action Adding Gage Suite Digital Gage Default Suite Click the Setups tab. Click Add setups. Check the Widget setup and click OK. Connected 600 device* Add Setups Wizard Ocheckmark Setups you'd like to be loaded to the collector MI Setups Add Setups Groups Add Setups Wizard Ocheckmark Setups you'd like to be loaded to the collector MI Setups Office Setups Setup Setup P Inport Setups Delete Setups Hide Inactiv OverSuite Digital Gage P P P P P P P P P P P P P P P P P P P	Add Gage Suites			
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Editors Menu in Setup Editor

1. From the main TranSend screen, click **Setup Editor**. Click the **Options** Editor. **Note: Options are where you set defaults.**

Editors 🛛 Y Labels 📰 Choice Lists	Options Descriptors Char Descriptors
🔁 Edit 🕍 New Group 🗙 Delete Group	Coptions Edit Setup 🛐 New Setup 💁 Imp
Demo	Name 10 Nm Wrench reading
🕍 Test Setup Group	10 Nm Wrench reading 10 Nm Wrench with Labels
	150 Nm Wrench reading
	25 Nm Wrench reading
•	
click the Save button.	
SG Size: 3 Source: AR75 Enter you used alias	
Resolution: 0.01	
Spec Limits	
Spec Limits Eng High:	C Actual
Spec Limits	C Actual
Spec Limits Eng High:	© Deviation Select your
Spec Limits Eng High: Deviation +:	© Deviation Select your prefered limit
Spec Limits Eng High: Deviation +: Nominal:	© Deviation Select your
Spec Limits Eng High: Deviation +: Nominal: Deviation -:	© Deviation Select your prefered limit
Spec Limits Eng High: Deviation +: Nominal: Deviation -: Eng Low:	© Deviation Select your prefered limit
Spec Limits Eng High: Deviation +: Nominal: Deviation -: Eng Low:	© Deviation Select your prefered limit
Spec Limits Eng High: Deviation +: Nominal: Deviation -: Eng Low: Reasonable Limits High Reas:	© Deviation Select your prefered limit

3. Select the Extended tab. Type in Modified (today's date) (you	r initials) as in the example.
Save and close the Default Characteristic Editor.	
🔜 Default Characteristic Editor*	
🛃 Save	
Default Setup Characteristic	
General Extended	
Note:	
Modified 1/14/11 by DB	
4. Open the Label editor and add your name to the list of audito	ors, sort and save changes.
🔊 Setup Editor	
Editors 👻 Labels 📷 Choice Lists 🔝 Options 😭 Descriptors	Char Descriptors
Setup Groups Cabel Editor* Cabel E	
All Setups Save New Delete Import Labels	
Labels	Current Label
Existing labels in Auditor	Label Name: Auditor
Demo database Sequence Number Shift	X Delete A Sort
	Choice
	Bob
Current Label	Diane
Label Name: Auditor	Harvey Kiki
	Tom Vicki
Delete 2↓ Sort	Anne 🔭
Anne	-
Active Setup Group Chris	
All Setups Diane Harvey	
Kiki Tom	

5.	Select the New button and name the new label VIN and click Save. This label does not lend
	itself to being using a choice list.

	Save New Delete	Current Label
N	Auditor Sequence Number Shift New Label_1	Label Name: VIN
		Choice
		from existing TranSend files to save in th
data	base.	from existing TranSend files to save in the
data 6. Crea a t	<i>base.</i> te any other labels necessary, save all cha a. Sequence number b. ROT# - TCN#	
data 6. Crea 6. 1	<i>base.</i> te any other labels necessary, save all cha a. Sequence number b. ROT# - TCN# c. Shift, etc.	nges and exit the Label Editor.
data 6. Crea 6. 7. Open	<i>base.</i> te any other labels necessary, save all cha a. Sequence number b. ROT# - TCN#	nges and exit the Label Editor.

8.	Open the Descriptc	ors Editor. Descriptors are	e OPTIONAL.				
	🕺 Setup Editor						
	Editors 🦞 Labels 📑	Choice Lists 👔 Options 😭 Descriptors	Char Descriptors				
	Setup Groups	Setup Groups					
	Edit 🕍 New Group 🛛 🔪 📴 Descriptors Editor						
	All Setups Mission	Save New Delete					
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		· · · · · · · · · · · · · · · · · · ·	Choice				
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			-				

Characteristic descriptors can be used to:

- . Inform the **operator** about how to accomplish the task, such as:
 - Which torque wrench to use
 - \circ Which pad number/location from which to take measurements
- Tag the data with information for the **analyst** such as:
 - the team leader of the project
 - o the control plan/drawing number

The quality department generally conducts audits, and therefore creates the characteristic names so the operator knows where to take the measurement.

However, engineers have a manufacturing document which generally assigns a specific number for the fastener.

Descriptors can be used to link the fastener the operator measures with the measurement the production engineer defined in the control plan.

Once a descriptor is assigned to a characteristic, it marries all characteristics in the database that are assigned the same characteristic descriptor so that engineers can track their critical measurements, for example Operation 230B.

Descriptors values are unchanging. Each time the setup is used, the same characteristic descriptors apply, as opposed to labels where the label value may change each time data is collected.

9. Create a new Team Leader desc	criptor and save:	
Current Descriptor		
Name: Team Leader		
Team Leader		
X Delete		-
Choice		
Assembly		
Final Trim		
*		
10. Add Operation Number, Drawir	ng Number and Location as d	escriptors:
Current Descriptor	Current Descriptor	Current Descriptor
Name: Operation Number	Name: Drawing Number	Name: Location
	erening realized	
· · ·	🗄 🗙 Delete	X Delete
Choice #070	-	Choice
#080	Choice	▶ A1
#060	▶ 900121-A	B4 C14
*	901041-B	L14
Save and exit descriptors.		
11. For additional information rega	rding characteristic descripto	ors, review the characteristic
descriptor tutorial.		
n Characteristic Descriptor Tutorial.p	ps	

Create a Setup

1.	Select New Setup:	
	Edit Setup 🔂 New Setup	
	Name	Modified
	10 Nm Wrench reading	12/17/2010 12:49 PM
	10 Nm Wrench with Labels	12/17/2010 12:56 PM
	150 Nm Wrench reading	10/08/2010 10:03 AM
2.	Name it Training 1 with the d	escription Training class setup and save the setup.
	Setup*	
	Save Setup Copy Setup Delete Setup	
	Setup General	
	Name Training 1 Description: Training Class Setup	Setup Activation Activate Date: 01/14/2011 03:04:48 PM V
	anced	Set Deactivate Date
3.	Select a Gage Suite from the o	dropdown list and save the setup.
	Note: if you don't nick a gage	source, you will get an error when collecting data saying
	that you have an invalid gage	
	that you have an invalid gage	
	(Mana)	
	Gage Suite: (None)	🔛 👘
	Cause (None)	
	Choice List Default Suite	
	Default Suite	
4.	Check Cause no choice list Se	ource K and save the setup. This will allow you to record
ч.		VIN when an alarm is triggered.
	venicie ib component such as	
	Cause	
	(rene)	
	Source: K	

5. On Setup Labels, click either **Add** or **To Label Editor** to bring up the Label Editor. You will be adding **subgroup** and **characteristic** labels to this setup.

Select the Auditor label.

Drag it over to the setup labels window; making sure the **Subgroup Labels** tab is active before dropping (so Auditor is added as a Subgroup Label).

	p General	Training 1				Setun Activation
General	Name:					😤 Label Editor
	Description:	Training Class Setup				Save New Delete Import Labels
Advanced	Gage Suite:	(None)		>		Labels
	Cause		-	_	Action	Name /
	Choice List:	(None)		😥 🗸	Choice List:	Sequence Number
	Source:		1		Source:	Shift VIN
-	bgroup Labels		Name			is active
•	1	Auditor			K	
Ch	erator wo	for Auditor	. This will bring choose it again	•	ne value	when collecting data so that
Ch	erator wo	for Auditor on't have to	choose it again	. Save you	ne value r change	when collecting data so that s.
Ch ope	erator wo Getup Labels Edit 🏠 Ac	for Auditor. on't have to d	choose it again	Save you	ne value	when collecting data so that
Ch ope	erator wo	for Auditor. on't have to d	choose it again	Save you	ne value r change Remove	when collecting data so that s.

	ols 🔻 Ctrl+Alt+Del		-
1	ietup*		Real Editor
	e Setup Copy Setup Delete Setup	Label Editor Restore Move	Save New Delete Import Labels
General	Name: Training 1 Description: Training class setup	Size _ Minimize Maximize	Name Auditor Sequence Number
Advanced	Gage Suite: 501 Gage Suite	X Close Alt+F4	Shift VIN
	Cause Choice List: (None) Source: K		 Select and then drag the Sequence Number label over, making sure that the Characteristic Labels tab is active
₫	etup Labels Edit 🎦 Add 🖓 Copy Properties 🖸 ogroup Labels Piece Labels Charao Name Sequence Number	To Label Editor K.L	
Mo	· ·	ise only with K (keyboai	rd) as the label source. Save char
	Setup Labels		
*	· · · · · · · · ·		r 🛛 🗙 Remove 🛅 Tabbed View

Create Characteristics

😤 Setup Labels	New Characteristic(s) V	Wizard
🛃 Edit 🎦 Add 羄	Copy Pr Create new characteristics des	
Subgroup Labels P	ece Label	
• 1	Auditor General Extended	
	Name: Flange Bolt 1	
Setup Characteristic	Description:	-
📑 Edit 🏠 New 🗳	a Copy	
	Nar	
		-
Note: save th	SG Size: 1 S	Source: AR75
setup AFTER		-
EACH STEP!		
		*
	- Spec Limits Eng High:	
		50.00 C Deviation
	Deviation +:	12.50
	Nominat	37.50
	Deviation -:	12.50
	Eng Low:	25.00
	- Reasonable Limits	
	High Reas:	
	Low Reas:	
	Low rieds.	
		E.L.
	E Boundary E Aut	to Scan 🔽 Auto Graph

I				racteristic. These will show up in the
	General Extended			
	Name: Flan	ge Bolt 1		
	Description:		Assembly/Part is what shows up in DAR.	Assembly / Part
	SG Size:	3 Source: AR75		
	Limits			
	Resolution: 0.01	•		
	Spec Limits — Eng High:	50.00	C	Control Limits XBar UCL: 45.00
		50.00	D C Actual C Deviation	45.00
	Deviation +:			XBar LCL: 30.00
	Nominal:	37.50	1	Range UCL:
	Deviation -:			Sigma UCL:
	Eng Low:	25.00	2	You can type in your control limits. These
	-Reasonable Lin	nits		will show up in 600 control charts.
I				
	Source.	rce for the chara	cteristic. See the follow	wing pages for more information abo
	Characteristic Editor General Extended	36		
	le d'an	itor Point_1		
	riano.			
	Description:			Assembly / Part
				TORQUE
		\frown		
	SG Size:	1 Source: AR75		

Source Location Symbols

The 600 Handheld Data Collector uses symbols to refer to source locations.

Source	Meaning	Examples
К	Keyboard	К
XXXXX	Alias name, Up to five	Peaks, GI
	characters	
Сх	Characteristic x	C1, C4, C12
Sx	Subgroup x	S2, S4, S6
N	Nominal	C1-N, N00012
Constant	A Number	1.6, G1+1.6,
		max(7.3,G1)

Operator Symbols

Source	Meaning	Examples
-	Minus	(C1-C2), Peak-C1
+	Add	(C3+C2), (Peak+Peak+Peak)*0+Peak
*	Multiply	(C3*N)2, Peak*.0005, C3*C4
/	Divide	(C1/C2), C4/.018
	Through	(C1 5), (Peak 4)
~ or ^	Exponent	(C1~2), (Peak~2)/3.1416, (Peak^2)
(,)	And	AVG(C1,C2,C3)
[,]	Or	[Peak,K]1
{ n }	Start Threshold (Torque) -	Peak{14.7} Note that n represents an actual torque
	- where n overrides the	value (e.g 14.7 lbft, or 19.3 Nm).
	start threshold defined	
	for the torque too.	

You can also allow math calculations on the gage ports of a source that accepts keyboard and/or gage input, such as: k,-1*peak

Order of Operations

Source expressions are evaluated in standard mathematical order. Anything with parenthesis is completed first. Multiplication and division are performed before addition and subtraction.

Boolean Operators

A Boolean expression evaluates to either 1 (true) or 0 (false).

Source	Meaning	Examples
>	if x is greater than y, return 1, else return 0	((C1>10)+(C1<5))*((C1- N)*(C2*-1)
<	if x is less than y, return 1, else return 0	((C1 <c2)*c1)*c2< td=""></c2)*c1)*c2<>
=	if x equals y return 1 else return 0	(Peak=N)*(Peak-0.002)

Function Operators

The following table lists the function operators for creating Source Formulae.

Function	Meaning	Examples
Abs	Absolute Value	ABS(C2), ABS(AVG(C1 7))
Acos	Arc Cosine	ACOS(C1)
Asin	Arc Sine	ASIN(C1)
Atan	Arc Tangent	ATAN(C1)
Avg	Average	AVG(C1 5), AVG(S1,S2)
Cnt	Pulse Count	CNT(PEAK)
Cos	Trigonometric Cosine	COS(C2)
Dsp	Angular Displacement	DSP(PEAK)
Max	Maximum Value	MAX(S2), MAX(PEAK 4)
Med	Median Value	MED(S2), MED(C1 5)
Min	Minimum Value	MIN(S9), MIN(C1 7)
Rng	Range	RNG(C1 5), RNG(PEAK 8)
Sdv	Standard Deviation	SDV(S2), SDV(S2,S3)
Sin	Trigonometric Sin	SIN(C1)
Sqt	Square Root	SQT(C1)
Sum	Summation	SUM(C2 4)
Tan	Trigonometric Tangent	TAN(C1)
Трѕ	True Position	TPS(ALIAS,C1), TPS(ALIAS,ALIAS,ALIAS)

Notes:

1. Atan(x)—Returns the arc tangent of x, in degrees (-90 to +90).

2. Asin(x)—Returns the arc sine of x, in degrees (-90 to +90). The range of x is: $-1 \le x \le 1$.

3. Acos(x)—Returns the arc cosine of x, in degrees (0 to +180). The range of x is: $-1 \le x \le 1$.

4. Cnt—Used in combination with Pulse measurement. Example: Peak is configured for Pulse; Characteristic 1 (C1) has a Source of Peak; Characteristic 2 (C2) is auto-scanned with C1 and has a Source of CNT(Peak). When a fastener is rundown with a pulse tool, C1 captures installation torque and C2 captures the number of pulses from snug to peak.

5. Dsp—Used in Angle measurements. The Displaced Angle value will be captured between a start (<Enter>) and stop <Enter> command.

4.	Highlight Flange Bolt 1 and click Edit.		
	🖌 Setup Characteristics		
		✓ Delete ♥ Event Prompts	
	I Flange Bolt 1	G2c	
5.		Select and Browse Image. Locate an image in your network,	
	select it and click Open. Note	that a thumbnail image appears. Click OK. Save the setup.	
	Note: Images are optional		
	Characteristic Editor	X	
	General Extended		
	Note:	🕺 Select image	
		Open and the second sec	
		Open	
		Look in: 🗁 Graphic Images 🛛 🗸 🥥	
		Fly wheel bolt 1.JPG	
	(Distant)	Ely wheel bolt 2.JPG	
	Select	My Recent Fly wheel bolt 3.JPG Documents Fly wheel bolt 4.JPG	
	X Remove	Fly wheel bolt 5.JPG	
		If wheel bolt 6.JPG	
	Characteristic Descriptors	Desktop	
	Descriptor name		
	Extension		
	Location	My Documents	
	Zone		
	Team Leader		
	- Operation # Drawing #	My Computer	
		File name: Fly wheel bolt 1.JPG	
		My Network Files of type:	
		Browse Image OK Cancel	

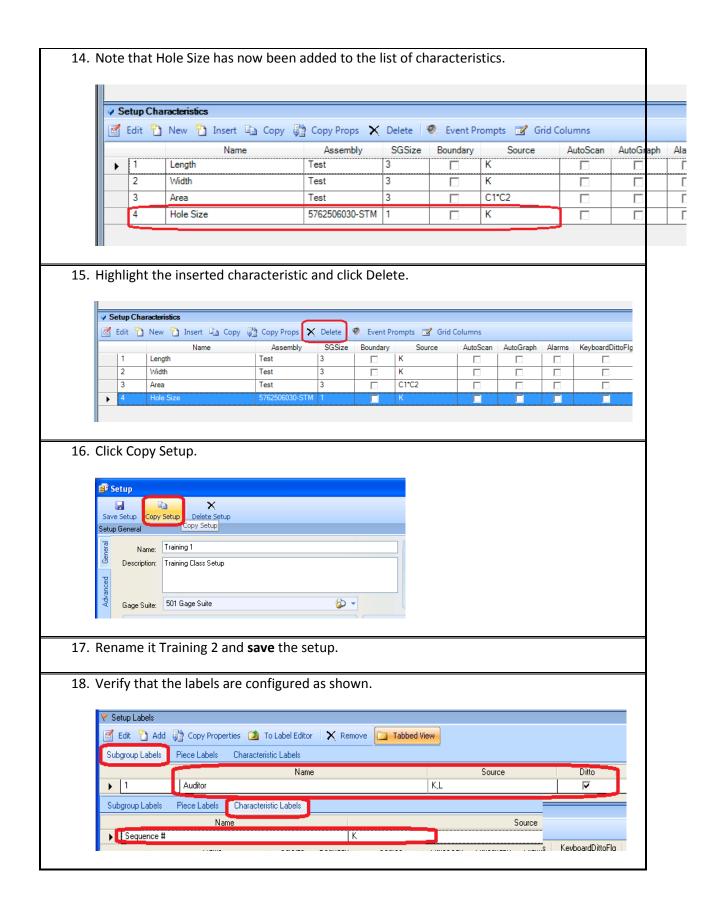
6.	Once again, edit Flange Bolt 1 and open the Extended tab. Select the Characteristics
	Descriptors for Team Leader, Operation # and Drawing # as shown and save the setup.

	naracteristic Editor		
	ieneral Extended		
	Note:		
	Select Remove		
	Characteristic Descriptors		
	Descriptor name	Choice	
	Extension Location	(None) (None)	
	Zone	(None)	
	Team Leader	Assembly	
	Operation #	#080	
	Drawing #	(None) 🔽	
		900121-A	
		901041 D	
		901041-B	
		901041-B	
		901041-B	
7. Sel	ect Flange Bolt 1 and click Copy. This		
	Setup Characteristics	will copy the characteristic.	
_	Setup Characteristics	will copy the characteristic.	
4	Setup Characteristics	will copy the characteristic.	
Ŷ	Setup Characteristics	will copy the characteristic.	
4	Setup Characteristics	will copy the characteristic.	
	Setup Characteristics Edit [™] New Copy [™] Copy Copy Props × N{Copy 1 Flange Bolt 1 1	will copy the characteristic.	
	Setup Characteristics	will copy the characteristic.	
8. Re	Setup Characteristics Edit New Copy Copy Props	will copy the characteristic.	
8. Rei	Setup Characteristics Edit [™] New Copy [™] Copy Copy Props × N{Copy 1 Flange Bolt 1 1	will copy the characteristic.	
8. Rei	Setup Characteristics Edit New Copy Copy Props N N Copy 1 Flange Bolt 1 1 name the copy Flange Bolt 2 and click w Characteristic(s) Wizard	will copy the characteristic.	
8. Rei	Setup Characteristics Edit New Copy Copy Props NCopy 1 Flange Bolt 1 name the copy Flange Bolt 2 and click w Characteristic(s) Wizard ate new characteristics desc.	will copy the characteristic.	
8. Rei	Setup Characteristics Edit New Copy Copy Props N N Copy 1 Flange Bolt 1 name the copy Flange Bolt 2 and click w Characteristic(s) Wizard ate new characteristics desc. eneral Extended	will copy the characteristic.	
8. Rei	Setup Characteristics Edit New Copy Copy Props NCopy 1 Flange Bolt 1 name the copy Flange Bolt 2 and click w Characteristic(s) Wizard ate new characteristics desc.	will copy the characteristic.	

ſ

9. Edit Flange Bol	t 2 and change the image (see Step 3). Click OK, save the setup.
Characteristic Editor	
General Extended	
Note:	
(A) So	lect image
in the second se	
	Open
1020000007	Look in: 🗁 Graphic Images
Sec. X	Fly wheel bolt 1.3PG
	My Recent Fly wheel bolt 3.JPG
Characteristic E	Documents Fly wheel bolt 4, JPG
Descriptor nan	Desktop
Extension Location	Desktop Shock struc boils start.jpg
Location	
10. Select Event Pr	ompts in Setup Characteristics.
🔗 Setup Charac	teristics
📑 Edit 🎦 Ne	ew 🖻 Copy 🔮 Copy Props 🗙 Delete <mark>🔗 Event Prompts</mark> 🗹 Grid
	Name SGSize Boundary Source
1 F	lange Bolt 1 🔲 🔲 G2c 🔛 Venic Promp
11 Frablatha ava	nte and proporte as chown. Click OK sourt the actua
II. Enable the eve	nts and prompts as shown. Click OK, save the setup.
🔡 Characteristic Eve	ants
E Value	e above USL
	rompt
	ause equence #
Include Even	t
	below LSL
	romptause
	equence #
Include Even	
	rompt
	equence #
Include Even	
🖻 📃 Last F	
	rompt equence #
5	
Set all other character	istics like this
	OK Cancel

😰 Se												
	Setup Copy :		tup									
	General										4	
General		Test 1					ate Date:	07/01/2011	03:06:52 PM	~		
	Description:					_	Deactivate Da	_	00.00.0211			
Advanced	l				2							
Ac		(None)										
	Cause Choice List:	(None)		6		Action ice List: (Nor	el			(b) -		
	Source:	K				Source: K						
🚩 Set	up Labels										ą	
🛃 Е	dit 🎦 Add	🏠 Copy Propertie	es 🔰 To Label Ed	ditor 🛛 🗙 Remov	ve 🗀 Tabb	ed View						
Subg	roup Labels	Piece Labels	Characteristic Labels Name	:		Boundary		Source	Ditt	A	utoEnter	
			Hanc			boandary		oource	Direct		CROCT NOT	
•		Name			Size Bound		ce Ai		oGraph Alar	1	ardDittoFlg	
	ect Set	th	default	5		K						: them
Clic Inse	ect Set k Appl	up or Pa y and Ok haracteristic / I	default	5 nbly to f		K						: them
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Clic Inse Fi	ect Set k Appl ert (Setup-C lter Setup 7625060	th y and Of haracteristic / @ 30-STMP	default Irt/Asser (. Part-Character	5 mbly to f	find th	K						: them
Clic Inse Fi	ect Set k Appl Ht (Setup-C lter Setup 76250600 ap Chec	th y and Of haracteristic / @ 30-STMP	default Irt/Asser (. Part-Character	5 mbly to f	find th	K						: them
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Clic Inse Fi	ect Set k Appl Ht (Setup-C lter Setup 76250600 ap Chec	th y and Ok haracteristic / @ 30-STMP	default Irt/Asser (. Part-Character	5 mbly to f	find th	K						: them
Clic Inse Fi	ect Set k Appl Ht (Setup-C lter Setup 76250600 ap Chec	th y and Ok haracteristic / @ 30-STMP	default Irt/Asser (. Part-Character	5 mbly to f	find th	K						: them
Clic Inse Fi	ect Set k Appl Ht (Setup-C lter Setup 76250600 ap Chec	th y and Ok haracteristic / @ 30-STMP	default Irt/Asser (. Part-Character	5 mbly to f	find th	K						: them
Clic Inse Fi	ect Set k Appl Ht (Setup-C lter Setup 76250600 ap Chec	th y and Ok haracteristic / @ 30-STMP	default	5 mbly to f	find th	K		stic(s) y				: them



1		
- Na	ame: FLy Wheel Bolt 1	
De	escription:	
S	G Size: 1 Source: AR75	
	imits	
	Resolution: 0.01	
	> Spec Limits	
	Eng High: 60.00 © Actual	
	Deviation +: 20.00 C Deviation	
	Nominal: 40.00	
	Deviation -: 15.00	
	Eng Low: 20.	
	Reasonable Limits	
	High Reas:	
	Low Reas:	
	Boundary 🔲 Auto Scan 🦳 Auto Graph	
	🔽 Keyboard Ditto 🔽 Alarms	
C	Caution Type:	
	ОК	
0 Ed	it Fly Wheel Bolt 1 and select an image (see Step 3). Save th	e setun
0. Lu		c setup.
1. Co	nfigure the characteristic descriptors as before (see Step 4).	. Save the setup.
	б	
	lect Fly Wheel Bolt 1 and click Copy Props. See screen shot f	or selection .Click OK and
sav	ve the setup.	
4	Setup Characteristics	
	Name SISSIZE	
,	Name SGSize I I FLy Wheel Bolt 1	

Characteristic Properties			List of Properties and List of Characteristics
General Extended			Properties Select All Deselect A
Name: FLy When Description:	el Bolt 1 Source: G2c		Alarms AutoGraph AutoScan Boundary CautionPct Caution Type Description EngHigh
			EngLow KeyboardDittoFlg
Limits			▼ Nominal
Resolution: 0.01	60.00 40.00 20.00		ReasHigh ReasLow Resolution SGSize Source Characteristics Select All Desel Flange Bolt 2
High Reas:			
Low rieds.			
Edit Fly Wheel B	Solt 2 and select a	in image (see Ste	p 3). Save the setup.
Configure the cl	naracteristic desci	riptors as before	(see Step 4). Save the setup.
			Save the setup.

Create a Setup Group

1.	On the Setup Groups pane, select New Group.
	Setup Editor
	Editors 😵 Labels 📷 Choice Lists 😫 Options 😭 Descriptors Char Descriptors
	Setup Groups
	🗄 📴 Edit 🕍 New Group 🗙 Delete Group 🔛 Edit Setup 📓 New Setup 💁 Import Set
	Name Name
	▶ Setup_1 ■ Setups
	torque test
	65750-STX-A000
	65751-STX-A000 65750-SZA-A000-H1
	Configure the setup group as shown. Highlight your Training setups and use the right arrow button to assign them to the group. Save and close the setup group.
3.	Close Setup Editor.
4.	For additional information, review Configuration, Setups, Setup Groups and Image Editing tutorials.
	DM600 Tutorial - #3 Configuration.pps DM600 Tutorial - #5 Setups.pps DM600 Tutorial - #6 Setup Groups.pps Image Editing Tutorial.pps

Send Setups to the 600

1.	Connect the collector to the h in TranSend II.	ost computer and select the	e Open Collector button
		Open Collector	
2.	Note the action on the screen	as the collector opens:	
2.	Opening Device Session		
3.	Click on Add Setup Groups.		
	Connected 600 device		
	Setups Gage Suites		
	2 B		
	Add Setup Add Setup Groups		
4.	Select the Training Group by p	placing a check mark in the b	oox to the left of the
	name and select OK. Add Setups Wizard		
	() Checkmark Setup Groups you'd like to be loaded to th	he collector	
	Setup Groups 7 Setup Group 4	Setups in Request Setups setup group	🗙 Delete Setups 📄 Hide Inactive
	Training Group	Name Request 5 NM	Modified 02/14/2011 11:54 AM
	-	Request 10 NM Reguest 25 NM	02/14/2011 02:04 PM 02/14/2011 11:59 AM
	-	Request 75 NM Active Setup	02/14/2011 01:59 PM
		Request 5 N M NM request setup	
	magazot Jonepo		
			OK Cancel

5.	Verify the setups from the Training group are displayed. Select the Gage Suites
	tab.
	Connected 600 device* Setups Gage Suites
	Add Setup Groups Add Setups Remove
	Name
	Training 1 Training 2
6.	Select Add Gage Suites; select the gage suite created earlier by placing a check
	mark in the box to the left of the name and select OK.
	Connected 600 device*
	Setups Gage Suites
	Add Gage Suites Remove Gage Suites
	Gage Suite Name Add Gage Suites
	Checkmark Gage Suites you'd like to be loaded to the collector
	Gage Suites 🛃 Open hew Gage Suite
	Included Name / Description
	Digital Gage Default Suite Digital Gage Default Suite
	LMI Gage Default Suite LMI Gage Default Suite Torque Default Suite Torque Default Suite
	OK Cancel
7.	Verify the gage suite was successfully added and select OK.
	Add Gage Suites
	Action Result Adding Gage Suite Digital Gage Default Suite Success
8.	Select Save changes to device to send the setups and gage suite to the 600.
	Select OK to exit the collector communication interface.
	Save changes to device
	The COO is now ready for data collection. Disconnect the COO from the USD coble
9.	The 600 is now ready for data collection. Disconnect the 600 from the USB cable.
10	For additional information, review Tutorial #7 – Transfer to Collector
10.	
	DM600 Tutorial - #7 Transfer to Collector.pps

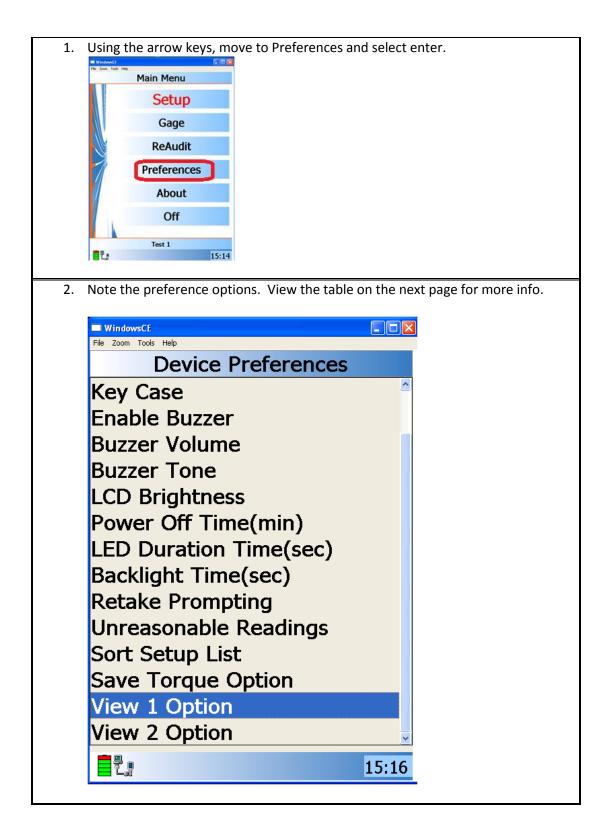
Data Collection with the 600



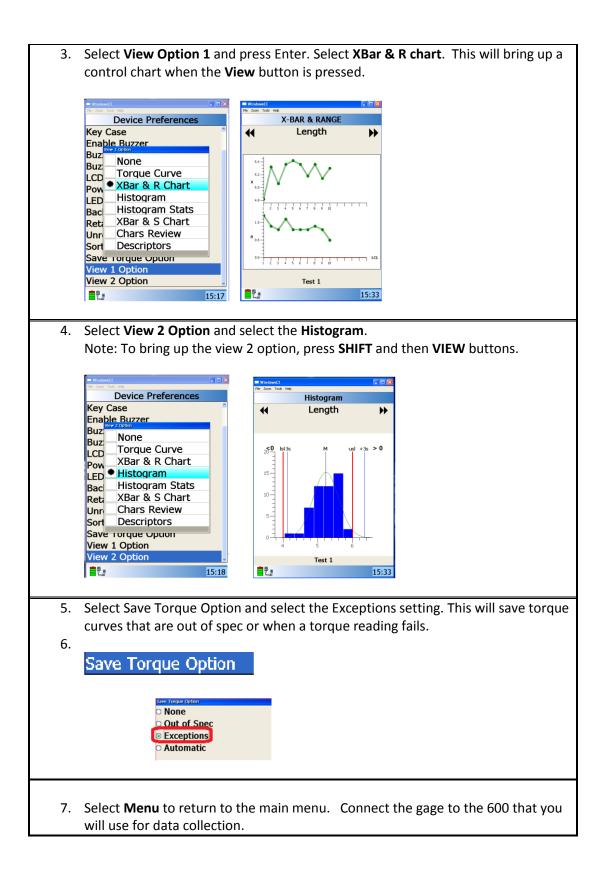
Front View

- Color Display The user interface for the data collector is displayed using a 480 x 640 VGA TFT Active Matrix Color LCD with backlight.
- Alphanumeric Keypad Contains additional keys for entering alphanumeric text.
- Status Indicators Two LED indicators are used to indicate the status of a given reading.

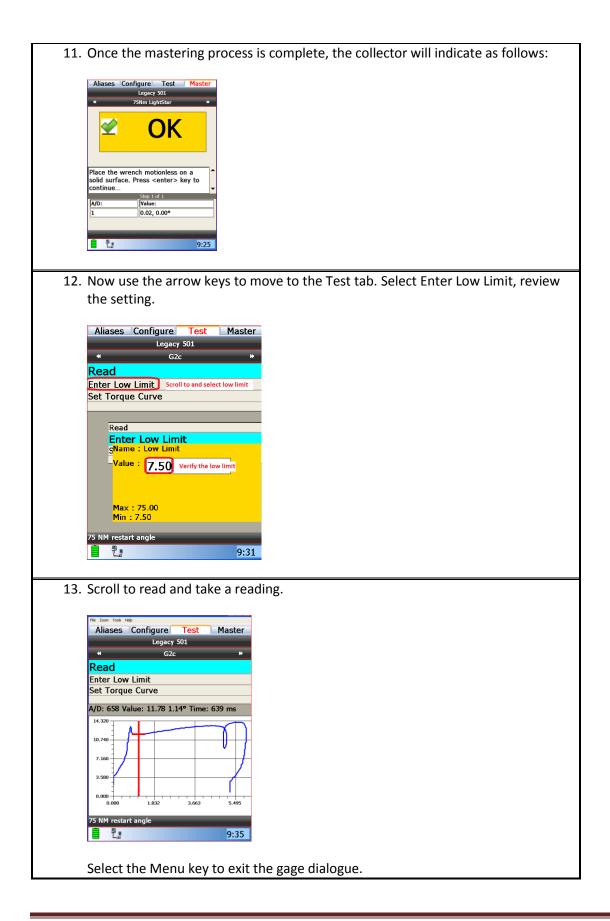
600 Configuration



	Device Preferences	
Destaura		Ostilas
Preference	Description	Settings
Key Click	Clicking sound when	(On) or (Off)
Key Repeat	Keypad key is pressed. Auto-repeat when key is	(On) or (Off)
Key Case	pressed. Determines default case of letter.	(Upper) or (Lower)
Enable Buzzer Buzzer Volume	Turning on or off the buzzer. Determines the loudness of	(Enable) or (Disable) (High) or (Low)
Buzzer Tone	the speaker. Determines the pitch of the speaker.	(1)–(16) (lower to higher)
LCD Brightness	Determines the brightness of the display.	(1)–(8) (dim to bright)
LED Duration	Length of time the LED status indicator lights remains turned on.	(0)–(99) seconds
Backlight Time	Length of time backlight remains on if unit is idle.	(0)–(999) seconds
Retake Prompting	Determines whether a prompt asking the operator to retake an out-of-spec reading appears during data	(On) or (Off)
Unreasonable Readings	collection. Determines the 600's response to an obviously erroneous reading. If Reasonable Limits are used, (Stop) does not accept the reading and forces the operator to retake the reading; (Advance) fills the reading with a NULL value.	(Stop) or (Advance)
Sort Setup List	Determines how the list of setups is displayed.	(AlphaNum) or (None)
Save Torque Option	Determines when torque curve data is stored in memory.	(None), (On Spec Violation) (Exceptions) or (Automatic)
View 1 Option	Determines which default graphical representation of data is displayed when the <view> button is selected.</view>	(None), (Torque Curve), XBar & R Chart), Histogram), (Histogram Stats), (Xbar & S Chart), (Chars Review) and
View 2 Option	Determines which default graphical representation of data is displayed when <shift> then <view> buttons are selected.</view></shift>	(Descriptors) (None), (Torque Curve), XBar & R Chart), Histogram), (Histogram Stats), (Xbar & S Chart), (Chars Review) and (Descriptors)

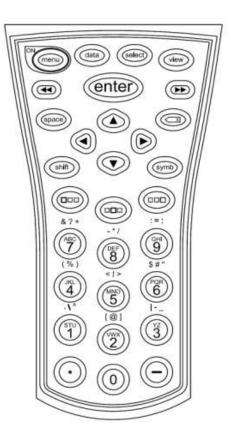


8.		in menu, select Ga sired gage suite an	-	Using the arrow keys, locate and
		uite Selection		
	Legacy 501 Aliases designed sources used wit	to replicate the gage h the 501		
	1	8:43		
9.		row keys, scroll to a	desired gage ((G2c in this example).
	G2	ure Test Master		
	G2a G2b			
	G2c G2d			
	G2e G2f			
	Gage: 75Nm Lig Use: Restart 75 NM restart angle	htStar		
	1 L.	9:19		
10.	Using your a on the scree Aliases Co	n:	the Master ta	b and follow the instructions listed
		Legacy 501		
	*	75Nm LightStar	••	
		l		
		ench motionless on a . Press <enter> key</enter>		
	A/D:	Step 1 of 1 Value:		
	16	0.29, 0.00°		
	L			
			9:21	



Alphanumeric Keypad

The 600 Handheld Data Collector's alphanumeric Keypad uses a number of specialized keys to navigate the data collector interface.



Alphanumeric Keypad Key Combinations

Many Keypad keys work in a series by pressing multiple keys. Key combinations are indicated by a —, between the keys.

The alphanumeric/symbol keys are primarily used for entering the numbers 0 through 9. In addition, each number key is associated with up to three letters. Letters and symbols can be entered into fields by pressing the Left Pointer Key, the Center Pointer Key, or the Right Pointer Key and the corresponding alphanumeric/symbol key.

Note: The alphanumeric keys are "sticky" which means that they are pressed one at a time.

Key(s)	Function(s)
<menu></menu>	1) Powers collector ON.
	2) Displays the Main menu.
<shift></shift>	When entering character string data, changes lower to upper case.
<shift>, <menu></menu></shift>	Move to previous menu action.
<view></view>	Displays menu for Descriptors, Characteristic Review and Torque Curve selections.
<data></data>	1) Go to the Data Entry screen.
	2) While collecting data, pressing the data key displays assigned image.
<select></select>	Displays the Select Menu, allowing you to select a setup or characteristic.
<symbol>, <select></select></symbol>	While collecting data, displays a prompt to jump to a specified characteristic for data collection.
<enter></enter>	1) Selects item from a list or menu.
	2) Opens or closes an input box.
	3) Toggles an option.
	4) Triggers a gage reading in data entry or test.
	5) Selects and inputs characters.
<_>	Moves a selection cursor to the previous field in a menu or list.
<▼>	Moves the selection cursor to the next field in a menu or list.
< ∢ >	1) Move the selection cursor to the left while in a menu.
	2) Move the cursor one character to the left in an input box.
<▶>	1) Moves the selection cursor to the right while in a menu.
	2) Moves the cursor one character to the right in an input box.
<>>>	1) While collecting data, move to the next cell in data collection sequence.
	2) When reviewing an item, move to the next operation.
	3) When reviewing data move to the next characteristic.
	4) When an input box is displayed, close and enter the input string.

Key(s)	Function(s)
<<<>>	1) While collecting data, move to the previous cell in data collection sequence.
	2) When reviewing an item, move to the previous operation.
	3) When reviewing data move to the previous characteristic.
	4) When an input box is displayed, delete the previous character in the input string.
<symbol>, 1-9</symbol>	Creates the left symbol shown over the selected number key.
<symbol>, ① , 1-9</symbol>	Creates the center symbol shown over the selected number key.
<symbol>, , 1-9</symbol>	Creates the right symbol shown over the selected number key.
<.>	Use the period key to enter a decimal point in a number.
<->	Use the minus key to enter a negative number.
space	Creates a space after a letter, number or symbol.
	Deletes one character to the left of the prompt
<shift>, 🖾</shift>	Deletes a complete line of characters.
	Creates the left letter shown on the top of the key.
• , 1-9 • , 1-9	Creates the center letter shown on the top of the key.
, 1-9	Creates the right letter shown on the top of the key.
<pre></pre>	Creates the left letter shown on the top of the key in upper case.
<shift>, , 1-9</shift>	Creates the center letter shown on the top of the key in upper case.
<shift>, •••, 1-9</shift>	Creates the right letter shown on the top of the key in upper case.

Data Collection

 To open a setup, navigate to the Setup icon on the main menu and press <select> on the keypad. The list of available setups will display.</select> 				
Selected Setup	Setup Selection Setups Keyboard TJP Setup TJP Restart TJP Peak TJP Set TJP Car Line Number 123	Select Characteristics or Setups Setups in Memory		
	Car Line Number 123	Current Active Setup		
2. Select Training 1 and press the Enter key. Setup Selection Setups Training 1 Training 2 Training 1				

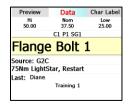
Skill Set #1

Follow the prompts on the 600 and collect at least two subgroups of data.

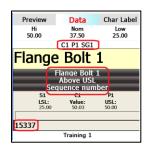
• Label entry



• Take the characteristic readings:



• If triggered, respond to exception condition:



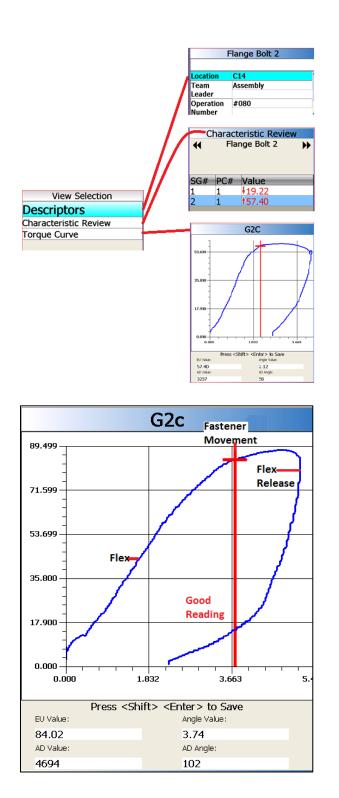
- 1. Use the select key to return to the setups menu and open Training 2. Follow the prompts on the 600 and collect at least two subgroups of data.
- When collecting characteristic data, select the Data key to see the image you attached to the characteristic:



• Select Data again to review the characteristic descriptors for this characteristic:

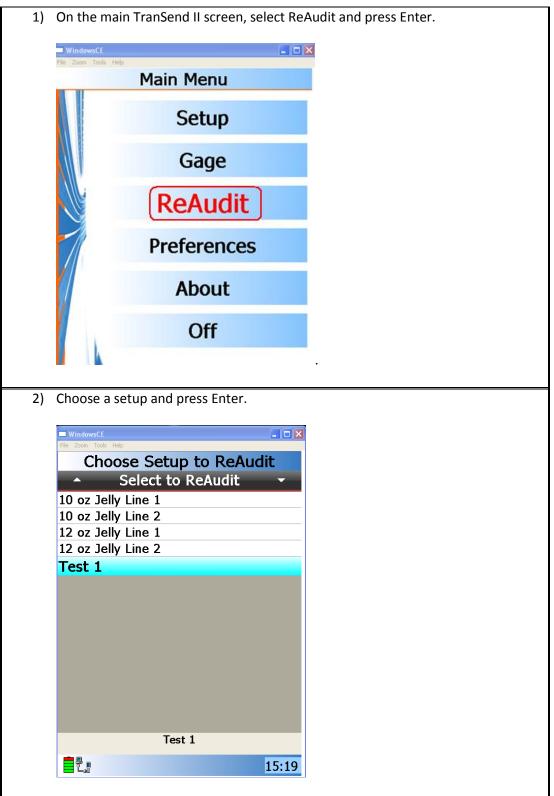
Preview	Data	Char Label		
Location				
C14				
Team Leader				
Assembly				
Operation Number				
#080				
Drawing Number				
900121-A				
	Training 2			

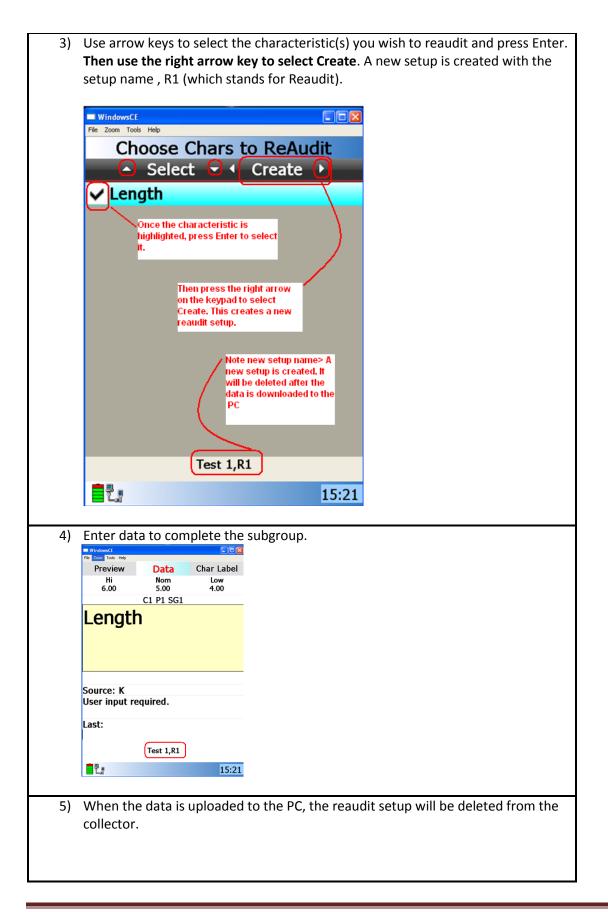
- Press the **View** key to bring up a control chart (preference view option 1)
- Press **Shift** and **View** to bring up a histogram (preference view option 2)
- Press the View key to select a torque curve



Viewed on the 600, the torque curves should display flex (initial rise), fastener movement (gradual angular rotation) and flex release (rapid fall) as demonstrated below. For additional information, review Tutorial #8 – Collect Data

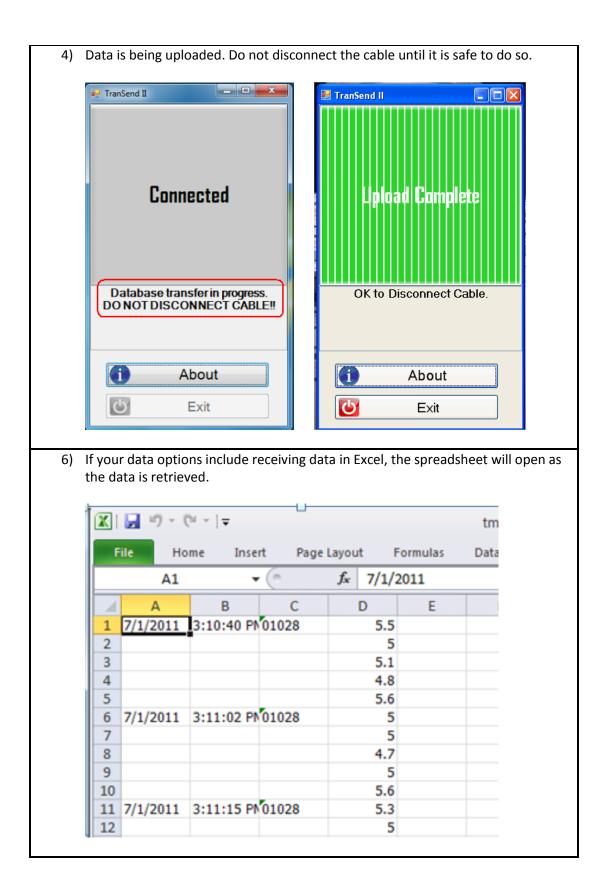
Reaudit





Upload Collected Data Using Express Data Refresh

 Connect the 600 to the #95748 cable on the computer running TranSend II. Wait for the 600 to connect. 				
	USB Communications Port			
 On the desktop, click the Express Data Refresh icon (create a shortcut before doing this All Programs /ASI DataMyte / TranSend II / TranSend II) 				
Express Data Refresh				
 You'll see Disconnected if the cable is not connected or the 600 hasn't fully booted up. Otherwise, you see the Connected screen. 				
🗄 TranSend II				
Disconnected	Connected			
You get this if the cable isn't connected or the 600 hasn't finished synching				
(i) About	About			
Exit	Exit			

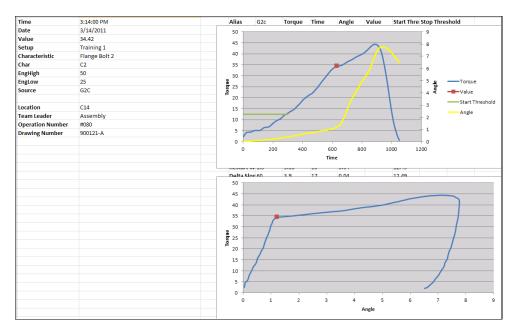


Reviewing Torque Curves

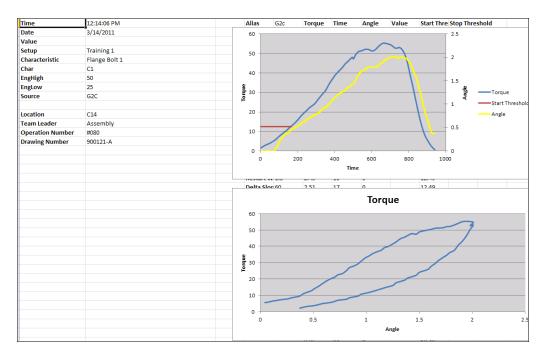
TranSend II allows users to view torque curves stored according to the selection configured in preferences. The Torque Curves stored in the database are accessible through the View Torque Data button:

orque Curves		
ame	Collected	
lange Bolt 2_75Nm LightStar_Restart	3/14/2011 3:14:00 PM	
lange Bolt 2_75Nm LightStar_Restart	3/14/2011 3:12:38 PM	
ange Bolt 2_75Nm LightStar_Restart	3/14/2011 3:12:12 PM	
ange Bolt 2_75Nm LightStar_Restart	3/14/2011 3:08:58 PM	
ange Bolt 1_75Nm LightStar_Restart	3/14/2011 3:08:10 PM	
ange Bolt 2_75Nm LightStar_Restart	3/14/2011 3:08:02 PM	
ange Bolt 1_75Nm LightStar_Restart	3/14/2011 3:07:40 PM	
ange Bolt 2_75Nm LightStar_Restart	3/14/2011 3:06:59 PM	
ange Bolt 1_75Nm LightStar_Restart	3/14/2011 3:06:36 PM	
ange Bolt 1_75Nm LightStar_Restart	3/14/2011 12:14:21 PM	
ange Bolt 1_75Nm LightStar_Restart	3/14/2011 12:14:14 PM	
ange Bolt 1_75Nm LightStar_Restart	3/14/2011 12:14:06 PM	
ange Bolt 1_75Nm LightStar_Restart	3/14/2011 12:14:05 PM	
ange Bolt 2_75Nm LightStar_Restart	3/11/2011 8:55:01 AM	
ange Bolt 1_75Nm LightStar_Restart	3/11/2011 8:54:11 AM	
ange Bolt 1_75Nm LightStar_Restart	3/11/2011 8:54:05 AM	
ange Bolt 2_75Nm LightStar_Restart	3/11/2011 8:47:38 AM	
ange Bolt 1_75Nm LightStar_Restart	3/11/2011 8:46:17 AM	
river side rear lower motor mount bolt 300Nm LightS	12/10/2010 8:30:58 AM	

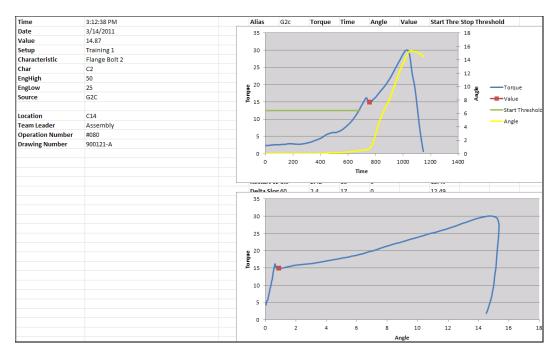
Select the desired Torque Curve which will open in Excel (version 2007 or above required):



The reading above shows a standard rise, flex, flex release pattern. The reading is within the spec limits and should not trigger any alarms.



No reading was captured with this curve (the value column is blank). Because of the slight angular rotation, the torque and the angle curves follow the same path. Notice how closely the flex release path followed the path of the initial rise.



This curve should trigger a spec limit violation as the value is below the lower spec limit.

Legacy collectors and TranSend RCSL

Legacy data collectors can use the TranSend II database if the setup accommodates the source requirements of the target collector.

For example, if a setup created in TranSend II uses a gage suite with aliases named the same as the collector's gage addresses, that setup can be sent to the legacy collector for data collection.

TranSend II can also import setups created in the original TranSend utility and these can be used with both legacy and 600 data collectors.



Import Setups from TranSend Utility

1)	Open TranSend II Setup Edit	or. Select Import Setups.		
	Setups in All Setups setup group			
	📴 Edit Setup 🎬 New Setup 🎴 Import Setups 🗙 Delete Setups 📄 Hide Inactive			
	Name	Modified		
	Request 10 NM	02/14/2011 02:04 PM		
	Request 150 NM	02/14/2011 02:01 PM		
	Request 25 NM	02/14/2011 11:59 AM		
	Request 300 NM	02/14/2011 02:03 PM		
	Request 5 NM	02/14/2011 11:54 AM		
	Request 75 NM Request 750 NM	02/14/2011 01:59 PM 02/14/2011 02:04 PM		
	Training 1	02/14/2011 02:04 PM		
	Training 2	02/26/2011 12:00 PM		
	<u>_</u>			
2)	2) Browse to the desired setup in your TranSend Utility folder and open the file. Select setup files to import Import Look in Import Import Import Import			
3)	Your migrated setup will apr	bear in your TranSend II setup list.		
5,				
	Name De succi 10 NM	Modified		
	Request 10 NM	02/14/2011 02:04 PM		
	Request 150 NM	02/14/2011 02:01 PM		
	Request 25 NM	02/14/2011 11:59 AM		
	Request 300 NM	02/14/2011 02:03 PM 02/14/2011 11:54 AM		
	Request 5 NM Request 75 NM	02/14/2011 11:54 AM		
	Request 75 NM	02/14/2011 01:55 PM 02/14/2011 02:04 PM		
	Set and turn to give angle	03/14/2011 08:47 AM 02/26/2011 11:57 AM		
	Training 1			
	Training 2	02/26/2011 12:00 PM		

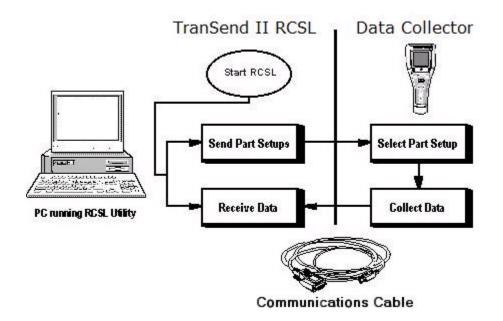
11 \	hen you open the setup you imported, you will notice there is no gage suite you will use this with the 600 data collector as well,
	a. A gage suite must be assigned;
	b. You may add an image;
	c. You may add characteristic descriptors.
	c. Fou may add characteristic descriptors.
191 Se	tup 🔄 🔣
Save	al Ca X Seto, Cary Seto, Delete Seto, General 8
eres 4	Name Set and turn to give angle Setup Activation
100	Description: Addwate Date: (US14/2011) 08 47/5244 (M) Select Gage Suite from the list or click, the Browne button to open Gage Suite Editor.
Advar	Goge Suite Novel
	□ Case Doice List [Nove] (D - Orice List [Nove] (D -
	Source c
(1)	Add 🕼 Copy Properties 🏩 To Label Editor 📉 Remove 🔚 Tabled New
500	poo Labele Perce Labele Dearschmidte Labele Name Boundary Source Ditto AutoEnter
	he Daracherides a dit [™] Huw - [™] ₂₀ Capy [™] ₂₀ Capy Hups [™] Event Prangta [™] Grid Columns
	ist) there Ja Carp Vage Xan Letter ♥ Event Honords II Grid Calumes Name SSSize Boundary Source AutoScan AutoScan AutoScan Park (AppointDitte)® Resolution Devi 1 Revelot® Strategue 2 IP GTH □ □ □ □ □ □ □ □ □ 01 Actual
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	Other J_2 Copy Option X Delice € Event Hompts Odd Control Name SSSSe Boundary Source AutoScen AutoScen AutoScen Delice Delice
	Other J_2 Copy Option X Delice € Event Hompts Odd Control Name SSSSe Boundary Source AutoScen AutoScen AutoScen Delice Delice
× •	Inter Ja Cary Vaga Cary Mays X Delete ♥ Event Honords III Grid Columns Name 5555ce Exoundary Source AudiSan AudiSan Alams KopboardDitrifly Resolution Devi 1 Ryholed Strategue 2 IP GO14 □ □ □ □ □ □ □ □ 01 Actual 2 Ryholed Str7 Inste 2 □ II GO14 668 □ □ □ □ □ □ □ 01 Actual 3 Ryholed Str7 Inste 2 II GO14 669 □ □ □ □ □ □ □ 01 Actual 3 Ryholed Str7 Inste 2 II GO14 669 □ □ □ □ □ □ □ 01 Actual
<u>*</u>	Other J_2 Copy Option X Delice € Event Hompts Odd Control Name SSSSe Boundary Source AutoScen AutoScen AutoScen Delice Delice
•	12 1 Hume 1 Educe
•	12 1 Hume 1 Educe
5) Im	Inter Ja Cary Vaga Cary Mays X Delete ♥ Event Honords III Grid Columns Name 5555ce Bounday Source AutiScan AutoScan AutoScan Particle P Resolution Devi 1 Ryholed Str Statuse 2 IP G2N III III III III Autos 2 Ryholed Str Pask 2 III G2N 8581 III III III III Autos 3 Ryholed Str Angle 2 IP G2D III III III III Autos
5) Im	Item - Copy - Copy Hass × Lotter * Event Handles * Ged Chanes In Product Strature

TranSend II RCSL Agenda:

- 1. Introduction to TranSend II Remote Client Serial Link (TranSend II RCSL)
- 2. Navigation
- 3. Configuring Preferences
- 4. Send Setups and Setup Groups
- 5. Receive Data
- 6. Collector Maintenance

What is TranSend Remote Client Serial Link (RCSL)?

TranSend II RCSL is a utility that enables a PC to transfer setups from a connected database to a data collector (and to harvest collected data back to the database). You must connect the data collector to the computer running TranSend II RCSL using a serial cable:

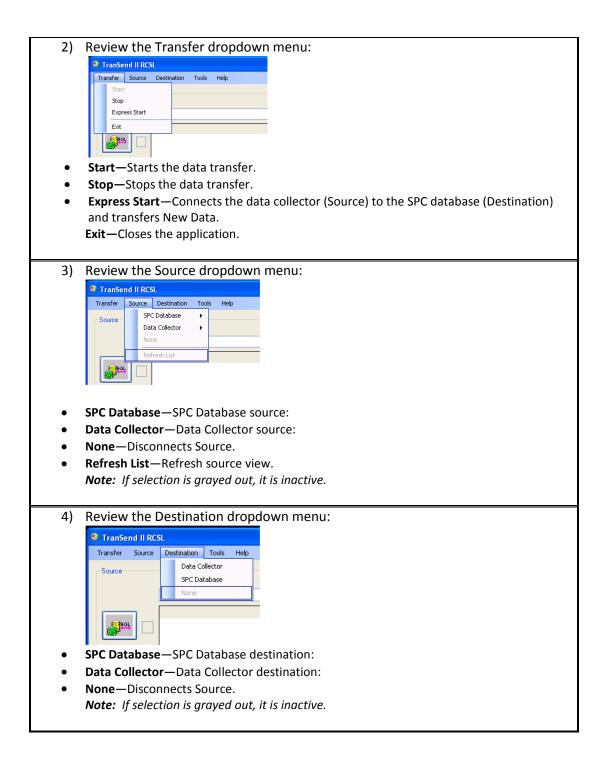


Important: You must use an approved ASI DataMyte serial cable to connect the collector to a computer running TranSend II RCSL. For more information, contact ASI DataMyte Technical Support.

• **Note:** Be sure to initialize the data collector before connecting to the TranSend II database the first time.

TranSend II RCSL

1) Open TranSe	end II RCSL.
TranSend II RCSL	
	Destination Tools Help
Source	View
Check All	
Uncheck All	
Source: None Destination: None	
Ready	
rousy	
Icons	Function
	Selects the DataMetrics database as the Source or Destination.
B lack	<i>Note:</i> Choosing this as Source disables SPC Database as the Destination.
	Selects the data collector as the Source or Destination.
	<i>Note:</i> Choosing this as Source disables the data collector as the Destination.
Check All	Selects all items.
Uncheck All Deselects all items. Starts the data transfer (green light indicator). Starts the data transfer (green light indicator).	
*	

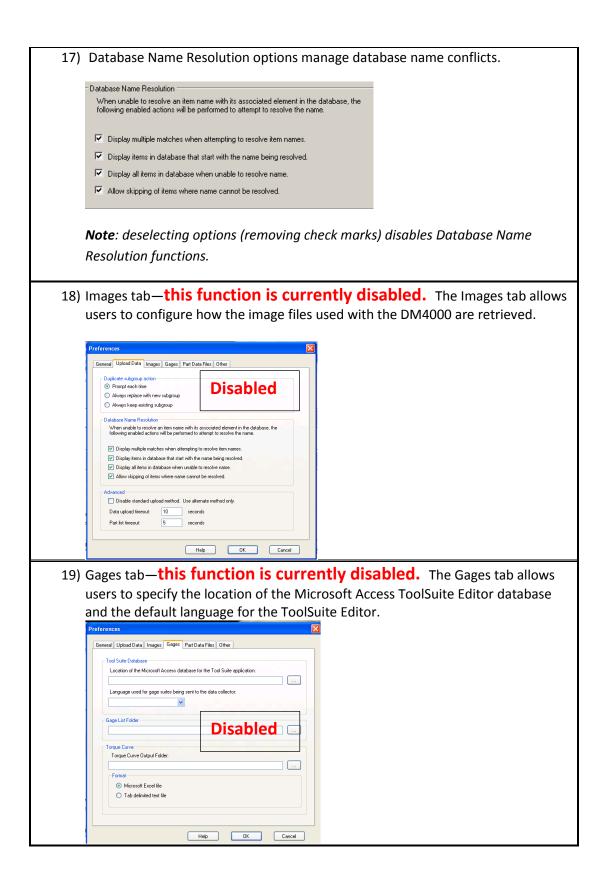


5) Review the Tools dropdown menu:
Tools Help
Maintenance
Upload OpenComm File
Error Log
Preferences
Maintenance—Perform data collector maintenance, including delete selected setups
from the connected data collector.
 Upload Open Com File – Future function. Error Log—Logs errors in RCSL.log file.
Preferences—Set Preference options for DataMetrics RCSL functionality.
() Deview the Hele dreadown meanw
6) Review the Help dropdown menu:
C TranSend II RCSL
Transfer Source Destination Tools Help Source View About
• Help Topics—Help <f1>.</f1>
About—Displays System information and Application details.
7) Select the Tools dropdown menu, and select preferences.
Transferd II RCSL Transfer Source Destination Tools Help
Source View Upload OpenComm File Destination
Error Log
Preferences
Check All
Uncheck All
Source: None Destination: None
Ready

8)	General preferences	tab:	
	Preferences	X	
	General Upload Data Images Gages Part I	Data Files Other	
	Communications Port	Database Defaults	
	COM2 Properties	Database Server: VIRTUALXP-76997	
		Database Name: Transend	
	Database Collector Filter	User Name: TSGS	
	✓ dm501 dm600	Password:	
	dm9xx dm3xxx		
	Display exact collector type matches when connected.	Always use default settings	
	Reserve memory for	Language	
	30 subgroups	English (United States)	
	10 average attributes/SG	Native language name: English (United States)	
	 Automatically fix setup string length and value 	ia randa probleme	
	Error Log and Transfer File Folder	te range problems.	
	C:\Documents and Settings\All Users\Applica	ation Data\ASI DataMyte\RCSL	
		Help OK Cancel	
9)	To configure commur	nications, select the seria	al port to which the data collector is
	connected from the c	drop-down list:	
		•	
	Communications Port		
	COM1	Properties	
		Properties	
10)	Click the Pronerties h	utton to select the Baud	Rate that matches the settings on
10,		attom to sciect the bada	hate that matches the settings on
	your data collector.		
	Deut Dure sulting		×
	Port Properties	-	×
	Baud Rate:		
	115200	- OK	
	1		
			1
		Cancel	
	Note: The bighest and	ailable cotting for using	alloctor offers the fratest data
	-		ollector offers the fastest data
	-		d Rate is 115200 and the 30XX data
	collector Serial Baud	Rate is 38400.	

11) Select the Database Collector Filter for the types of setups to display in the DataMetrics RCSL main window. For example, if you only want to see the setups designed for a 501 data collector, you would place a checkmark in the 501 checkbox. Database Collector Filter dm4000 🗸 dm501 dm600 dm9xx dm3xxx Display exact collector type matches when connected. *Note:* The "Display exact collector type" checkbox is used to automatically select the collector type of the currently connected data collector as the active filter. 12) Users can decide how much space to hold in reserve to store collected data for each setup in the collector (this setting affects all setups in the collector). Once this space is reserved, nothing else can use this portion of memory. In setting this parameter, users should consider how many setups need to be stored on the collector, how many subgroups are collected in the most frequently used setup and how often the data is moved to the database. Reserve memory for 10 subgroups 5 average attributes/SG Set the subgroups to 10. The average attributes/SG setting reserves the memory for attribute data collection. Set average attributes/SG to 5. *Note*: If doing attribute data collection on a 30xx/9xx, change the reserve memory for average attribute/SG to 5. 13) To Automatically fix setup string length and value range issues (truncate) to ASI DataMyte's data collector limitations, place a checkmark in the box. Automatically fix setup string length and value range problems. **Note**: Selecting this will truncate string lengths for your setups and log information in the RCSL.log file. If unchecked, you will see a message indicating that the string is too long and must be corrected before you can download.

14) Select the Browse icon < 🔜 > to define the path for the Error Log and Transfer
File Folder location. The log file will be stored as a text file named RCSL.log in
this directory.
Error Log and Transfer File Folder
C:\Documents and Settings\Application Data\ASI DataMyte\RCSL
Note : The user must have read/write permissions for the folder selected.
Note. The user must have read, write permissions for the joider selected.
15) Update data tab:
Preferences
General Upload Data Images Gages Part Data Files Other
Duplicate subgroup action Ormpt each time
Always replace with new subgroup Always keep existing subgroup
Database Name Resolution
Veladase relate resolution of the second of the second element in the database, the following enabled actions will be performed to attempt to resolve the name.
✓ Display multiple matches when attempting to resolve item names.
 ✓ Display items in database that start with the name being resolved. ✓ Display all items in database when unable to resolve name.
Allow skipping of items where name cannot be resolved.
Advanced
Disable standard upload method. Use alternate method only. Data upload timeout: 10 seconds
Part list timeout: 5 seconds
Hep OK Cancel
16) A duplicate subgroup is a subgroup that has previously been uploaded and has
the same timestamp as a subgroup in the TranSend II database.
Select the desired Duplicate subgroup action:
Prompt each time – Prompt the operator to determine whether to overwrite or
maintain the existing subgroup.
Always replace with new subgroup – Replace the subgroup in the database with
the subgroup from the data collector.
Always keep existing subgroup – Do not replace the subgroup in the database
with the subgroup from the data collector.
Duplicate subgroup action
Prompt each time
C Always replace with new subgroup
 Always keep existing subgroup



20) I	art Data Files tab—note the following:
	Primary output Options
	Secondary output Options
	Formatting Options
	File Name Generation option
	Output Folders
	references
	General Upload Data Images Gages Part Data Files Other
	Create external data files when uploading part data to the database.
	Primary Output Formatting Options
	OpenComm OpenComm Subgroup Headers Tab delimited Tab delimited Image: Subgroup Headers
	Comma delimited Comma delimited Include characteristic labels
	Microsoft Excel
	✓ File Name Generation ✓ Append New/All indicator
	Append Julian date Segment separator
	● space ○ underscore ○ hyphen
	C Output Folder
	Primay:
	Secondary:
	Help OK Cancel
21) (ther tab—this is where the path to firmware update files is identified.
	references X
	General Upload Data Images Gages Part Data Files Other
	Firmware Updates Folder
	and the second second second second
	Help OK Cancel

Skill Test #2

- Configure the communications port and the baud rate for your data collector
- Configure the communication in the data collector to match the baud rate in TranSend II RCSL
- Set the Database Collector Filter to display your collector type
- Set the reserve memory for 15 subgroups with an average attribute/SG of 3
- Configure the error log destination folder to your desktop
- Configure the duplicate subgroup action to prompt each time

Send Setups from TranSend II RCSL to the Collector

1. Connect the serial cable. The TranSend II RCSL application uses a direct-connect cable to establish a communications link with an ASI DataMyte data collection device. Attach one end of the 91714 cable to the designated serial port on your PC and the other end to the COM Port (designated by the $\uparrow \downarrow$ symbol) on the data collector. The Serial Baud Rate of the data collector must match that of the PC running the DataMetrics RCSL application. Once you have properly configured DataMetrics RCSL and your data collector to communicate together and connected the cable, you are ready to perform a transfer. 3. On the DataMetrics RCSL main screen, click on SPC Database icon as the Source. SOL SOL Source The Show Filtered Setup Groups will appear in the view window as default. Source View Show Filtered Setup Groups • Setup Group Collector 🔢 3053 station dm3xxx dm501 🔢 501 Audit Routes 🔢 Proficiency Test dm501

4.	elect the View drop down list. The View can be filtered using one of four modes:
	 Show Filtered Setups – displays only those setups associated with the selected Collector Type(s) as specified in DataMetrics RCSL Preferences.
	b. Show All Setups – displays all the setups in the connected database (no filtering).
	 Show Filtered Setup Groups – displays only those Setup Groups associated with the selected Collector Type(s) selected in DataMetrics RCSL Preferences.
	 Show All Setup Groups – display all the Setup Groups (collections of Setups, Setup Group Alarm Set, and Passwords) in the connected database.
	View Show Filtered Setups Show Filtered Setups Show All Setups Show Filtered Setup Groups Show All Setup Groups
	Click on the Data Collector Button. Destination
	ne data transfer button is enabled (green stop light).
	DataMetrics RCSL
	Source View Show Filtered Setups
	Setup Name Setup Group Collector Image: Setup Single Collector Image: Setup Single Collector Image: Setup Single Collector Image: Setup Single Collector Image: Setup Single Collector Image: Se
	Destination: Connected to model 501-SPC with collector ID 112637" on COM1.

Setup Name Setup Group Collector Image: Setup Set	6.	Select the Setup item(s) from the list. P	lace a checkm	ark next to the setup(s) to transfer.
Image: State of the set		Setup Name	Setup Group	Collector	
Image: State of the set			· · · ·	dm501	
Image: Construct State of the second state of the secon		🛛 🗹 🔀 02 Chassis Front	Torque demo	dm501	
Chassis Fastene Torque demo dm501 Image Profic Proficiency Test dm501 Image Profic Proficiency Test dm501 Image Profic Proficiency Test dm501 Image Profic Proficiency Test dm501 Image Profic Proficiency Test dm501 Image Profic Proficiency Test dm501 Image Profic Proficiency Test dm501 Image Profic Proficiency Test dm501 Image Profic Proficiency Test dm501 Image Profic Proficiency Test dm501 Image Profic Proficiency Test dm501 Image Profic Proficiency Test dm501 Image Profic Proficiency Test dm501 Image Profic Proficiency Test dm501 Image Profic Proficiency Test dm501 Image Profic Proficiency Test dm501 Image Profic Proficiency Test dm501 Image Profic Proficiency Test dm501 Image Profic Proficiency Test dm501 Image Profic		🛛 🗹 🔀 03 Chassis Rear	Torque demo	dm501	
DM Angle Profic Proficiency Test dm501 DM Angle Profic Proficiency Test dm501 DM Angle Profic Proficiency Test dm501 DM Peak Profic Proficiency Test dm501 To DM Peak Profic Proficiency Test dm501 DM Peak Profic Proficiency Test dm501 To Click on the Traffic Light button to perform the transfer. Note: If the Setup already exists in the collector, a message appears when a duplicate Setup if found asking whether to replace the existing Setup. 8. Deselect the destination and source icons. Now select the Source icon and the View dropt Show Filtered Setup Groups Show Filtered Setup Groups Show All Setup Groups Show Filtered Setup Groups Show Filtered Setup Groups Show All Setup Groups Show All Setup Groups Show Filte		🛛 🗹 🔀 04 Chassis Rear L	Torque demo	dm501	
DM Angle Profic Proficiency Test dm501 DM Angle Profic Proficiency Test dm501 DM Peak Profic Proficiency Test dm501 Click on the Traffic Light button to perform the transfer. Note: If the Setup already exists in the collector, a message appears when a duplicate Setup I found asking whether to replace the existing Setup. 8. Deselect the destination and source icons. Now select the Source icon and the View dropt Show Filtered Setup Groups Show Filtered Setup Groups Show Al Setup Groups Show Al Setup Groups 1. Click on the Data Collector icon. Destination The data transfer button is enabled (green stop light).		🗹 🔀 Chassis Fastene	Torque demo	dm501	
DM Angle Profic Proficiency Test dm501 DM Peak Profic Proficiency Test dm501 Of M Peak Profic Proficiency Test dm501 Show Filtered Setup Groups Show Filtered Setup Groups Show All Setup Groups Show All Setup Groups Show Filtered Setup Groups Show All Setup Groups Show All Setup Groups Show All Setup Groups Show All Setup Groups Show Filtered Setup Groups Show All Setup Groups Show Filtered Setup Groups Show Filtered Setup Groups Show Filtered Setup Groups Show All Setup Groups Show All Setup Groups Show All Setup Groups Show Filtered Setup Groups Show All Se		🔲 🗖 🔀 DM Angle Profic	Proficiency Test	dm501	
DM Angle Profic Proficiency Test dm501 DM Peak Profici Proficiency Test dm501 DM Peak Profici Proficiency Test dm501 DM Peak Profici Proficiency Test dm501 OM Peak Profici Proficiency Test dm501 7. Click on the Traffic Light button to perform the transfer. Note: If the Setup already exists in the collector, a message appears when a duplicate Setup is found asking whether to replace the existing Setup. 8. Deselect the destination and source icons. Now select the Source icon and the View dropt Show Filtered Setup Groups Show Filtered Setup Groups Show All Setups 1. Click on the Data Collector icon. Destination The data transfer button is enabled (green stop light).		🛛 🗖 🔀 DM Angle Profic	Proficiency Test	dm501	
DM Peak Profici Proficiency Test dm501 Of Peak Profici Proficiency Test dm501 7. Click on the Traffic Light button to perform the transfer. Note: If the Setup already exists in the collector, a message appears when a duplicate Setup is found asking whether to replace the existing Setup. 8. Deselect the destination and source icons. Now select the Source icon and the View drop: Show Filtered Setup Groups Show Filtered Setup Groups Show All Setup Groups 1. Click on the Data Collector icon. Destination The data transfer button is enabled (green stop light).				dm501	
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View Show Filtered Setup Groups Show All Setups Show All Setup Groups Show All Setup Groups Show All Setup Groups Show All Setup Groups 1. Click on the Data Collector icon. Destination The data transfer button is enabled (green stop light). Store Store Fibered Setup Groups					le appears when a duplicate Setup is
Show Filtered Setup Groups Show All Setups Show All Setup Groups Show All Setup Groups Show All Setup Groups 1. Click on the Data Collector icon. Destination The data transfer button is enabled (green stop light). Successful Setup Groups	8.	Deselect the destination	on and source ico	ns. Now selec	the Source icon and the View drop.
Show Filtered Setup Groups Show All Setups Show All Setup Groups Show Filtered Setup Groups Operation The data transfer button is enabled (green stop light). Surver Filtered Setup Groups		View			
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Show All Setup Groups Show All Setup Groups Show All Setup Groups 1. Click on the Data Collector icon. Destination The data transfer button is enabled (green stop light). Source View Show Filtered Setup Groups					
Show All Setup Groups		Show All Setups			
1. Click on the Data Collector icon. Destination The data transfer button is enabled (green stop light). Source View Source View Source View		Show Filtered Setup Groups			
1. Click on the Data Collector icon. Destination The data transfer button is enabled (green stop light).		show All Setup Gloups			
1. Click on the Data Collector icon. Destination The data transfer button is enabled (green stop light).					
The data transfer button is enabled (green stop light).					
Source View Destination	1.	Click on the Data Colle	ector icon. Destir	nation	
View Show Filtered Setup Groups	Th	e data transfer button is	enabled (green s	stop light).	
Show Filtered Setup Groups				Destination	
Proficiency Test dm501		Show Filtered Setup Groups Setup Group Proficiency Test	Collector dm501		

2. Select a Setup Group. All 3 items are checked by default.

Note: Use Check All or Uncheck All to select or deselect all setups in the setup group.

Setup Group Proficiency Test	Collector dm501
🔢 Torque demo	dm501
Setup Group Item	Туре
🗹 🔀 01 Cassis Front L	Setup
🗹 🔀 02 Chassis Front R	Setup
🗹 🔀 03 Chassis Rear R	Setup
🗹 🔀 04 Chassis Rear L	Setup
🗹 🔀 Chassis Fasteners All	Setup
🗹 🚟 Setup Group Alarms Set	Alarms
	Passwords

3. Click on the Traffic Light button to perform the transfer.

Note: If the Setup already exists in the collector, a message appears when a duplicate Setup is found asking whether to replace the existing Setup.

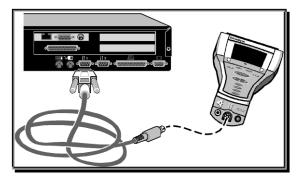
Skills Test #4

• Send Training 1 setup group from TranSend II to the 501 data collector.

Receive Data Practice

1. Connect the serial cable—The TranSend II RCSL application uses a direct-connect cable to establish a communications link with an ASI DataMyte data collection device.

Attach one end of the 91714 cable to the designated serial port on your PC and the other end to the COM Port (designated by the $\uparrow \downarrow$ symbol) on the data collector.

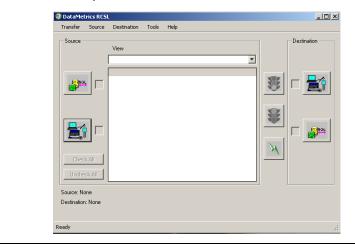


The Serial Baud Rate of the data collector must match the Serial Baud Rate of the PC running the DataMetrics RCSL application. Once you have properly configured DataMetrics RCSL and your data collector to communicate together and connected the cable, you are ready to perform a transfer.

А

2. In the TranSend II RCSL main screen, click the Express Start icon.

The Express Start was initiated.



3. Express Start automatically does the following:

Selects the data collector as Source.

Selects the database as Destination.

Activates transfer of New Data to the database (see Connectivity Window)

	Destination Tools Help	
Source	View	Destination
ſ	Vew Data	
i i i i i i i i i i i i i i i i i i i	Part Name Unharvested Total	
6 ³⁸⁰¹	V 101 Cassis Front L 1 17	
		1
0 U		
Check All	~	
Uncheck All		
Source: Connected to	model 501-SPC with collector ID '12697' on COM1.	
Describer of Construction	to ./DataMetrics_Demo, schema version 500.	

4. When the transfer is completed the user is asked to select whether to remove the collector or not. Select <Yes>.

CataMetric Transfer S	cs RCSL Source Destinati	on Tools	Help					_0	×
Source	View New Data Part Nam I 01			narvested	Total 17		- Dest		2
	1					3.5			
ataMetrics RCSL	1							1	×
The data	i has been moved fi he collector now?	rom the collect	or to the datab Yes	ase. The c	data collecto	r can be remov	red at this	time. Do you	x wish to
C The data remove to Source: Conn	has been moved fi he collector now?	-SPC with coll	Yes ector ID *12697	No on COM1.		r can be remov	red at this	time. Do you	

5.	Before exiting the sequence, the user needs to deselect the database as the destination.

	Click on Destination SPC Database icon to disconnect.
	Contractions RCSL Francier Source Verw Image: Contraction Contraction Image: Contraction Contraction Contraction Image: Contraction Contraction Contraction Image: Contraction Contraction Contraction Contraction Image: Contraction Contraction Contraction Contraction Image: Contraction Contraction Contraction Contraction Ready
7.	Users can also manually transfer data from the collector to the database. In the TranSend II RCSL main screen, click Source Data Collector icon.
	The New Data option will appear in the View window.
	View
	New Data
	Part Name Unharvested Total
8.	Select the View Option:
	New Data display only Sature that have Unhanyested (not transferred) data
	New Data – display only Setups that have Unharvested (not transferred) data. All Data – display all Setups with Unharvested and Harvested data.
	The available parts will appear in the screen.
	All Data
	Part Name Unharvested Total
	🗖 🚹 01 Cassis Front L 1 18
	02 Chassis Front R 1 15
	🗖 🛃 03 Chassis Rear R 0 14 🗖 🛃 04 Chassis Rear L 0 14
	Select the Setup(s) to transfer from the list by placing a check mark in each part name box.

9	. Click on the SPC Database icon as the destination. Click the green traffic light button to
	perform the transfer.
	Destination
	Note: When the transfer is complete, you will see a message stating the data has been moved
	to the database and asking you whether you want to remove the data collector. Click Yes to
	quit the data transfer session or No to perform additional transfers.
1	0. If All Data was selected for a setup with harvested data, the following message appears during
	the data transfer:
	DataMetrics RCSL
	A subgroup already exists for setup '02 Chassis Front R' using collector '34148' with timestamp '08/28/2008 10:23:15'. Do you want to replace the existing subgroup?
	Yes No
	Select Yes to over write existing subgroup in database. Select No to retain the original
	subgroup data in the database.
1	

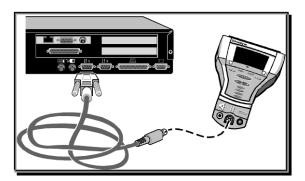
Skills Test #5

- Collect a minimum of one subgroup of new data.
- Harvest all New Data with one click.

Collector Maintenance

1. Connect the serial cable—The TranSend II RCSL application uses a direct-connect cable to establish a communications link with an ASI DataMyte data collection device.

Attach one end of the 91714 cable to the designated serial port on your PC and the other end to the COM Port (designated by the ↑↓ symbol) on the data collector.



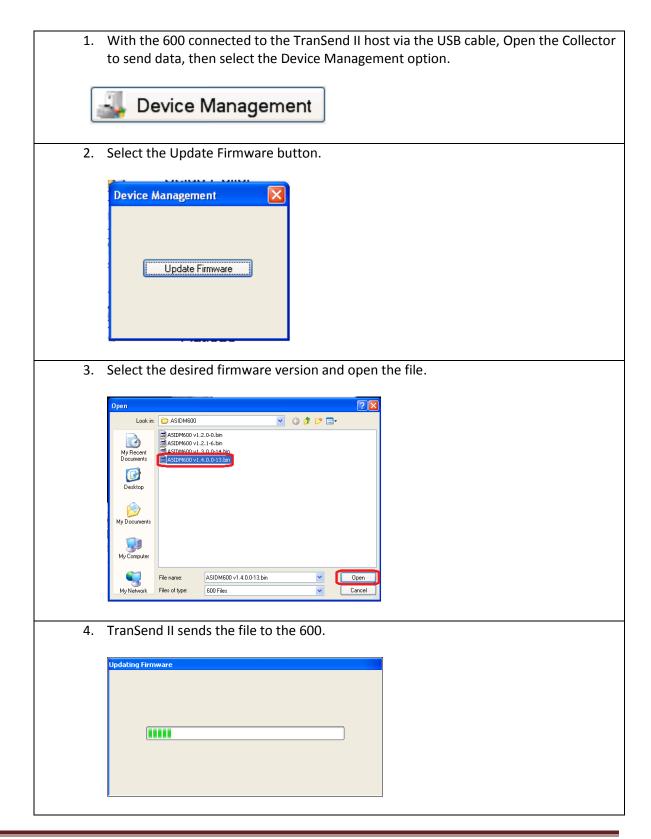
The Serial Baud Rate of the data collector must match the Serial Baud Rate of the PC running the DataMetrics RCSL application. Once you have properly configured DataMetrics RCSL and your data collector to communicate together and connected the cable, you are ready to perform a transfer.

2. In the TranSend II RCSL main screen Select Tools, Collector maintenance. Select the connect button to communicate with the collector device. Notice the collector information.

Name: 12697 Model: 501-SPC Version: 4.0.3	Connect Disconnect
Collector Delete Setups Firmware Update	Gaging Send Gage List Receive Gage List Delete Gage List Receive Torque Curve
	Help Close

Selected Option	Response
Connect	Establishes connectivity with the data collector.
Delete Setups	Delete Setups from a connected device.
Firmware Update	Select the firmware update file to be sent from the dialog.
Send Gage List	Sends a gage configuration file used at the data collector to reference what gages are attached to it and what the various gage parameters are.
Receive Gage List	Receives a gage configuration file from the data collector.
Delete Gage List	Deletes the gaged configuration file from the data collector.
Receive Torque Curve	Receives a Torque Curve from a data collector.
Disconnect	Stops connectivity with the data collector.
Help	Access to on-line help.
Close	Exits the dialog.

Firmware Update Procedures



5. Whe	n the transfer is finished, the following notice appears:
Firm	ware Update
1	Firmware sent to device. See device for further instructions.
	ОК
6. Press	s Enter to load the firmware, the system will reboot upon completion.
	Update Firmware
A	SIDM600 v1.4.0.0-13.bin
	ress enter to begin the pdate or menu to exit.
	he device will reboot when he update is complete.
1	L. 14:55
	e the 600 powers back on:
	Select the About option. Select the symbol, shift, menu keys in this order
	Select Reinitialize Memory
	stem Information Ish Loader
	ckup Registry
	store Registry
	t Defaults
	initialize Memory
	t Clock
	S/N: 01028

8.	Select yes to reinitialize the memory. T previously loaded on the system:	his will delete the gage suites and setups
	Reinitialize Memory	
	Reinitializing memory will	
	delete all part setups and	
	data and cause a reset.	
	Do you want to reinitialize	
	memory now?	
	Yes Cancel	
9.	Verify the updated collector version wh	en the 600 reboots:
	Product version: 1.4.0.0	
	OS version: 1.1.0.10	
	Build number: 13	
10.	See the Sending Setups to the 600 section	on to reload your data collector.
1		

Additional Practice

Creating new gages

In the Gage Suite, select the gages option, then new gage.

1. Select the New Gage Wizard. Name the gage, include the description and select Next:

New Gage Wizard							
Assign name to the new Gage and provide appropriate description.							
Gage Name	3.69 ftb						
		_					
Gage Description							
dage Description	3.69 ftlb wrench	<u>~</u>					
		~					
Drag a column heade	er here to group by th <mark>at column.</mark>						
Gage Model	⊽ Gage Type						
🕟 Torque Wrench Famil	ily (Non-USB) Torque wrench						
(2) Help	Next >Ca	ancel					
Gage Name: 3.69 ftlb M	Model: Torque Wrench Family (Non-USB)						

2. Accept the mastering strategy and select Next:

New Gage Wizard					
Master Rule Name	Master Rule Description				
1 point alignment	Master Rule - 1 point alignment				

3. Set the full scale value to match the gage and click Next:

Name	Value
scale	3.6900
transducer	2.0 mv/v bridge
noise threshold (%)	3
counts per revolution	9828
precision	2
angle precision	2

4. Verify your choices and select OK.

New	Gage Wizard				
	Gage Name:	3.69 ftlb			
	Gage Description:	3.69 ftlb wrench			
	Gage Type:	Torque wrench			
	Gage Output Type	x Torque and Angle			
	Gage Model:	Torque Wrench Family (Non-USB)			
	Mastering Rule:	1 point alignment			
()	Help	K Back		ОКС	ancel
Gage I	Name: 3.69 ftlb	Model: Torque Wrench Family (Non-USB) Masterii	ng Rule: 1 point alignment		

5. Continue until your gage choices include the following gages:

🖶 Gages		
🛃 Edit Gage 🏻 🎦 New Gage 🔅	🗙 Delete Gage	
Drag a column header here to group by	that column.	
Gage	Gage Model	Gage Type
3.69 ftb	Torque Wrench Family (Non-USB)	Torque wrench
7.38 ftlb	Torque Wrench Family (Non-USB)	Torque wrench
18.44 ft.b	Torque Wrench Family (Non-USB)	Torque wrench
55.32 ftlb	Torque Wrench Family (Non-USB)	Torque wrench
110.63 ftb	Torque Wrench Family (Non-USB)	Torque wrench
221.27 ftb	Torque Wrench Family (Non-USB)	Torque wrench
▶ 553.17 ftb	Torque Wrench Family (Non-USB)	Torque wrench
age Details		4
Name 553.17 ftb	Model	Torque Wrench Family (Non-USB)
Description:	Туре	Torque wrench
553.17 ftlb wrench	Output Type	Torque and Angle

Close gage editor.

Creating new gage use

In the Gage Suite, select the Gage Uses, then New Gage Use.

1. In the New Gage Use Wizard, name the gage use, include the description, the Peak, Time Algorithm and select Next:

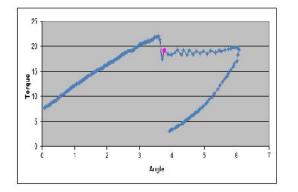
🖳 Gage Uses		×
🕴 🗾 Edit Gage Use	🎦 New Gage Use 🛛 🗙 Delete Gage Use	
New Gage Use Wiza	ard	
Specify properties for the	new Gage Use	
Gage Use Definition		
Gage Use Name	Peak extension 1.2	
Description	Wrench using peak algorithm with a 1.2 extension factor	
Select POI Algorithm		
Name		<u>^</u>
Peak, Time Set		
Restart		
Peak, Angle		
		~
(2) Help	Next >	ncel
Peak extension 1.2		

2. Change the extension multiplier to 1.2 and select OK.

🛃 Edit Gage Use w Gage Use Wizar	🎦 New Gage Use	Y Delete Care Lice		
w Gage Use Wizar		 Delete dage use 		
	d			
	-			
Name		Value		
rotation	CW			
start threshold	50			
start dwe l	30			
stop threshold	2			
dwell blanking	off			
dead time	300			
sample time	1ms			
pick-a-point	off			
stop dwell	50			
gage LED	on			
peak duration	1			
peak zone	1			
extension multiplier	1.2000			

Close Gage Uses.

TranSend II - 600 Appendix







Appendix A – TranSend II Setup Checklist

QUESTIONS:

- 1. Is there a gage alias in an available gage suite that will work with your gage?
 - a. If not, create the gage alias and/or gage suite.
- 2. Are the labels and choice lists you want to use created?
 - a. If not, create the desired labels and choice lists.
- 3. Are there appropriate cause and corrective lists available?
 - a. If not, create the desired lists in the Choice List Editor.
- 4. Are your default settings in Preferences and Labels set correctly?
 - a. If not, configure them as desired.
- 5. Are the descriptors and choices you need available?
 - a. If not, create them in the Descriptors Editor
- 6. Did you save your changes?

SETUP CREATION:

- 1. Did you name the setup?
- 2. Did you add a description?
- 3. Did you assign a gage suite?
- 4. Is the setup listed as active?
- 5. Did you add labels to the setup?
- 6. Did you place them in the correct tab (subgroup, piece or characteristic)?
- 7. Did you configure the label properties?
- 8. Did you create variable characteristics?
 - a. Does each characteristic have the correct name?
 - b. Does it have a valid description?
 - c. Is the subgroup size properly configured?
 - d. Is the source correct?
 - i. If using a gage, did you identify an alias from the assigned gage suite?
 - ii. If using operator symbols, Boolean operators or function operators is the syntax correct?
 - iii. Is the order of operations correct?
 - e. Is the resolution configured correctly?
 - f. Did you reset the limit type if using deviation?
 - g. Are the target and upper/lower spec limits correct?
 - h. Did you add reasonable limits and are they valid?
 - i. Did you define the path for image files if necessary?
 - j. Did you assign characteristic descriptors?
 - k. Did you configure Characteristic Events?
- 9. Did you save the setup?

SETUP GROUP:

- 1. Did you open or create a setup group?
- 2. Did you add your new setup to the group?
- 3. Did you save your changes to the setup group?

Appendix B – Create a Gage Suite

22. Select New Gage	e Suite.				
📴 Gage Suites					
Editors Gages a Gages	ge Uses 🛛 🏷 Gage Models				
Gage Suites 🛃 Open 👔 Name	New Gage Suite				
New Gage Suite*	Description				
Name New Suite_1 Description		<u>DK</u>	Cancel		
23. Name it 501 Ga	ze Suite with d	lescription 50'	1 Angle Resta	art configuration	
			I AUGIC NESIC		_
Gage Suite	y Gage Suite 🗙 De	alaka Caga Suita			
		Hete Gage Suite			
Suite Name	501 Gage Suite				
Suite Description	501 Angle Restart o	configuration			
24. Click New Alias.	New Alias X Delet		Allas Wizard		
Drag a column her	ader here to group b	y that column.			
Name	Model	Туре	Gage	Use	
25. Name the new a	lias G2 with de	escription as s	shown and cl	ick Next.	
New Gage Alias Set Alias name and New Alias Definitio	Alias description f	or new gage alia:			
Set Alias name and	Alias description f	or new gage alia:			

Nev	w Gage Alias Wizard					
Alia	as G2					
Cho	ose appropriate existing gage for your a	lias from the list be	elow, edit existing gage to match y	our purpose or c	reate a new one.	
	写 Edit Gage 🛛 🎦 New Gage	🗙 Delete Gage				
D	rag a column header here to group l	by that column.				
	Gage	Δ	Gagel			Gage Type
	10Nm LightStar		Torque Wrench Family (Non-USB	-		Torque wrench
	150Nm LightStar		Torque Wrench Family (Non-USB			Torque wrench
	25Nm LightStar 300Nm LightStar		Torque Wrench Family (Non-USB Torque Wrench Family (Non-USB	-		Torque wrench Torque wrench
Г			Torque Wrench Family (Non-USB	-		Torque wrench
<u> </u>	750Nm LightStar		Torque Wrench Family (Non-USB	-		Torque wrench
	75Nm LightStar		Torque Wrench Family (Non-USB	-		Torque wrench
	D&V Torque		Torque Wrench Family (Non-USB)		Torque wrench
	Old 10 NM		Torque Wrench Family (Non-USB)		Torque wrench
	lect Restart for Gage L	Ico and cl	ick OK			
	leet hestart for Gage C		ick OK.			
Net	w Gage Alias Wizard					
Alia	as G2 Selected gage 5Nm LightSta	r				
Cho	oose appropriate existing use for your al	lias from the list b	elow, edit existing gage use to m	atch your purpo:	se or create a ne	w one.
6						
6	🗐 Edit Gage Lise — 🌇 New Gage Li	lse 🗙 Delete	e Gane Lise			
	🚽 Edit Gage Use 👘 🎦 New Gage U	lse 🗙 Deleta	e Gage Use			
	🗿 Edit Gage Use 🛛 🐴 New Gage U Irag a column header here to group					
	rag a column header here to group					
	rag a column header here to group					
	rag a column header here to group Hand Peak					
	rag a column header here to group Hand Peak Hand Peak Extension Peak, Angle					
	rag a column header here to group Hand Peak Hand Peak Extension Peak, Angle					
	rag a column header here to group Hand Peak Hand Peak Extension Peak, Angle Restart					
	rag a column header here to group Hand Peak Hand Peak Extension Peak, Angle Restart					
	rag a column header here to group Hand Peak Hand Peak Extension Peak, Angle Restart					
	Hand Peak Hand Peak Hand Peak Extension Peak, Angle Restart Set	by that column	Gage Use			
	rag a column header here to group Hand Peak Hand Peak Extension Peak, Angle Restart	by that column	Gage Use			
	Hand Peak Hand Peak Hand Peak Extension Peak, Angle Restart Set	by that column	Gage Use			
. Ski	Hand Peak Hand Peak Extension Peak, Angle Restat Set	by that column	Gage Use			
. Ski	Hand Peak Hand Peak Extension Peak, Angle Restat Set	by that column	Gage Use			
. Ski	Hand Peak Hand Peak Extension Peak, Angle Restat Set	by that column	Gage Use			
. Ski	Hand Peak Hand Peak Extension Peak, Angle Restart Set	by that column	Gage Use			
. Ski	Hand Peak Hand Peak Extension Peak, Angle Restart Set Hestart Set Set Hestart Set Set Hestart Set Hestart Set Set Set Set Set Set Set Set Set Se	by that column	Gage Use			
Gage St Save	Hand Peak Hand Peak Extension Peak, Angle Restart Set Hand Peak Extension Peak, Angle Restart Set Ullset 1: Create the alia	by that column	Gage Use			
B. Ski	Hand Peak Hand Peak Extension Peak, Angle Restart Set Hand Peak Extension Peak, Angle Restart Set Ullset 1: Create the alia	by that column	Gage Use			
B. Ski	Hand Peak Hand Peak Extension Peak, Angle Restart Set Hand Peak Extension Peak, Angle Restart Set Ullset 1: Create the alia	by that column	Gage Use			
S. Ski	Hand Peak Hand Peak Extension Peak, Angle Restart Set Hand Peak Extension Peak, Angle Restart Set Ullset 1: Create the alia	by that column	Gage Use			
Gage St Save	Hand Peak Hand Peak Extension Peak, Angle Restart Set Hand Peak Extension Peak, Angle Restart Set Ullset 1: Create the alia	by that column	Gage Use			
Gage St Save	Hand Peak Hand Peak Extension Peak, Angle Restart Set Hand Peak Extension Peak, Angle Restart Set Ullset 1: Create the alia	by that column	Gage Use			
Gage St Save	Hand Peak Hand Peak Extension Peak, Angle Restart Set Hand Peak Extension Peak, Angle Restart Set Ullset 1: Create the alia	by that column	Gage Use			
Gage St Save	Hand Peak Hand Peak Hand Peak Extension Peak, Angle Restart Set illset 1: Create the alia uite Pa Copy Gage Suite X Delete Gage Suite 501 Gage Suite 501 Angle Restart configuration	by that column	Gage Use			
Gage St Save	Hand Peak Hand Peak Extension Peak, Angle Restart Set Hand Peak Extension Peak, Angle Restart Set Ullset 1: Create the alia	by that column	Gage Use			
Case State	Hand Peak Hand Peak Hand Peak Hand Peak Peak, Angle Peak, Angle Restart Set illset 1: Create the alia uite Copy Gage Suite S01 Gage Suite S01 Angle Restart configuration S01 Angle Restart configuration	by that column	Gage Use			
Cape St Cape	Hand Peak Hand Peak Hand Peak Extension Peak, Angle Restart Set illset 1: Create the alia uite Copy Gage Suite Delete Gage Suite 501 Gage Suite 501 Angle Restart configuration inplion Sol Angle Restart configuration	by that column	Gage Use			
Carlot Control Contro	Hand Peak Hand Peak Hand Peak Extension Peak, Angle Restart Set Hand Peak Restart Set Copy Gage Suite Soft Gage Suite Soft Gage Suite Soft Gage Suite Soft Angle Restart configuration Soft Angle Restart configuration	by that column	Gage Use		Dutput	
Gage St Save Save Cage St Cage St Save Cage St Save Cage St Save Save Save Save Save Save Save Save	Hand Peak Hand Peak Hand Peak Hand Peak Extension Peak, Angle Restart Set Illset 1: Create the alia uite Q Copy Gage Suite S01 Gage Suite S01 Angle Restart configuration S01 Angle Restart configuration Illset New Alias New Alias Vedel Torque Wrench Family (Non-USB)	by that column	Gage Use Gage Use Dwn (steps 5-7). Gage Use Use Shim LightStar ¥ Restart		Torque and Angle	Restart
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Appendix C – Create a New Gage

1.	Open Gage Editor.		
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	Editors 🗝 Gages 👼 Gage Uses 😓	Gage Models	
	Gage Suites 🛃 Open 🏠 New Gage		
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	🔡 Gages		
	🗄 📴 Edit Gage 🛛 New Gage 🗙 Delete Gage		
	Drag a column header here to group by that column.		
	Gage 🛆	Gage Model	Gage Type
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	Description:	Model LightStar Type TorqueV	
	10Nm LightStar	Output Type Torque	
3.	Select New Gage, which will start th	e New Gage wizard	
5.		e new obge wizuru.	
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	Gage 🛆		
	10Nm LightStar	LightStar with Angle	
	150Nm LightStar	LightStar with Angle	
		·	

New Gage Wizard			lext.
Assign name to the new Gage and prov	vide appropriate description.		
	_		
Gage Name Training Wr	ench		
Gage Description Create for tr	aining purposes		
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	by that column.	⊽ Gage Type	
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Rotary Transducer Ono Sokki		Ono Sokki	
Mitutoyo		Mitutoyo	
Micro Maxum		Mitutoyo	
LightStar with Angle		Torque Wrench	
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Appendix D – Create a New Gage Use

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Appendix E – Gage Suite Skillset

Create New Gage Suite for Peak (non-angle)

- 1. Name it **Peak Only** with description **Non-LightStar Wrench**
- 2. Select New Alias and name it P10 with description Non-Angle Use
- 3. Select the 10Nm LightStar
- 4. Select Peak, Time
- 5. Save and exit Gage Suite Editor

Gage Extension Considerations

- An adaptor extends or shortens the pivot point of the torque wrench when taking measurements
- To compensate for using an adapter you must multiply the adapted length of the wrench by a calculated scaling factor (see Appendix D for additional information)
- This can be done either in the gage source or in the use assigned to the gage alias
- Gage source example:
 - 1.2*G2C (multiplying the gage reading G2C by a scaling factor of 1.2)
 - This option requires users to apply the scaling factor to every reading in a setup that requires use of an adapter
 - Because this is a modified source, the tool does not require additional mastering
- Gage Use Example:
 - The scaling factor can be applied to the gage use (see step 4 above)
 - \circ $\;$ The use can be tied to the alias for all setups with this use
 - In a 600, mastering is done by tool, not by use

Appendix F – Torque Basics

How Fasteners Fasten

The purpose of a fastener is to clamp parts together. Engineers select fasteners, (nuts and bolts) by how much tension or clamp force is necessary to maintain the integrity of the joint.

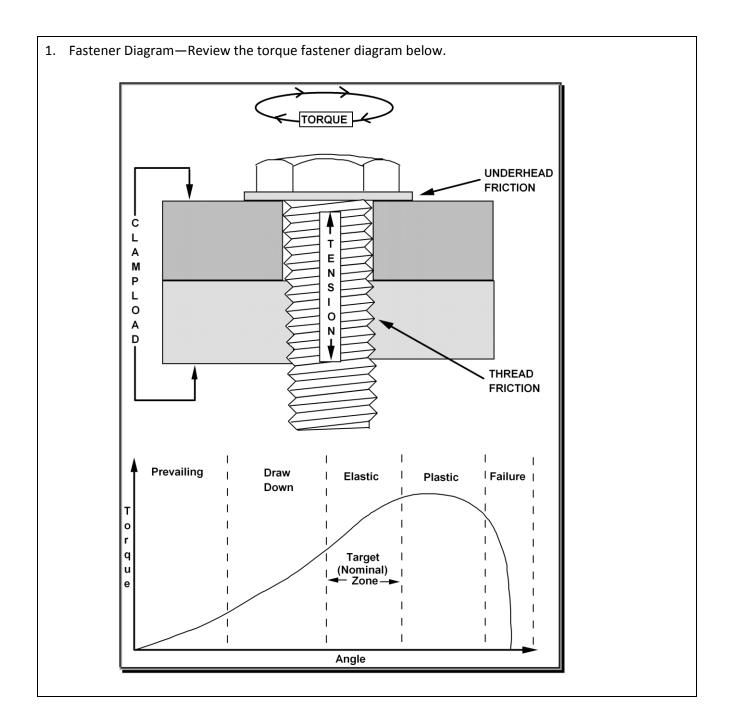
In the case of a bolt the tension derives from applying enough twisting force (torque) to the head to actually stretch the bolt. In the example on the opposite page the bolt is threaded into the lower metal piece and torque is applied until the head of the bolt is seated. After the head is seated additional torque is applied resulting in bolt stretch. This stretch is the source of the tension which will maintain a clamping force holding the two pieces together.

The amount of torque applied should not exceed the amount which will stretch the bolt beyond the "elastic" region. Staying within the elastic region means that if we loosen the bolt it will return to its original length. This is the region that engineers target when specifying installation torque values.

Stretching the bolt beyond the elastic region into the plastic region begins to permanently stretch the bolt. If we then loosen the bolt it will not return to its original length but will have been permanently stretched, even though it may not be visible, the bolt has been weakened. This will of course weaken the whole assembly due to an unreliable joint.

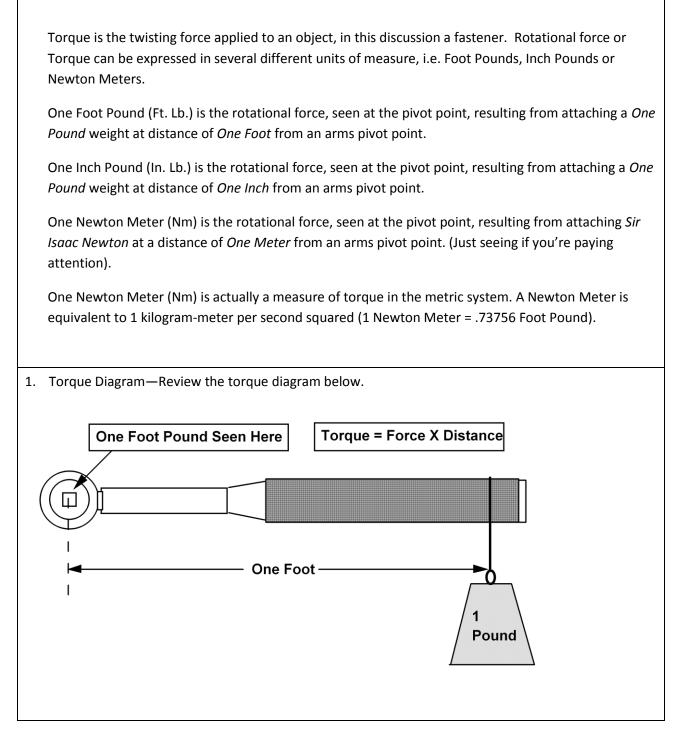
Applying torque sufficient to stretch the bolt beyond plastic region into the failure region will cause the bolt to break.

One way to measure fastener tension is to measure the length of the fastener after installation and compare it to its length at rest. Since this is usually impractical, <u>torque measurement is used as an indication of tension</u>.



Review

In this lesson we reviewed the purpose of a fastener is to clamp parts together. Engineers select fasteners, (nuts and bolts) by how much tension or clamp force is necessary to maintain the integrity of the joint.



Review

In this lesson we learned torque is the twisting force applied to an object, in this discussion a fastener. Rotational force or Torque can be expressed in several different units of measure, i.e. Foot Pounds, Inch Pounds or Newton Meters.

Torque Conversion

In this section we will review torque conversion.

Objectives

At the end of this lesson, you will be able to:

Calculate a torque conversion using the conversion factors.

Torque Conversion

Conversion Tables

Torque can be expressed in several types of "units" when expressing a wrenches capacity. These same units are used to specify a limit set or audit target for a fastener.

Converting from one unit of measure to another is done by applying a conversion factor, for example:

If 1 Foot Pound = 1.35582 Newton Meters (from conversion table)

and

you have a torque wrench that is rated for 50 Ft. Lb.

and

you want to determine the wrenches rating in Newton Meters.

next

Convert from Ft. Lb to Nm by multiplying 50 X 1.35582 = 67.79

so

A 50 Ft. Lb wrench is also a 67.79 Nm wrench.

Conversion Factors—Review the Conversion Factors below.

Conversion Factors

1 Foot Pound = 1.35582 Newton Meters

1 Newton Meter = .737562 Foot Pounds

1 Foot Pound = .138255 Kilogram Meters

1 Kilogram Meter = 7.23301 Foot Pound

Review

In this lesson we learned torque can be expressed in several types of "units" when expressing a wrenches capacity. These same units are used to specify a limit set or audit target for a fastener.

Converting from one unit of measure to another is done by applying a conversion factor.

Skills Set

Convert a 75 Nm wrench into the ft lb equivalent.

Convert a 100 ft lb wrench into the Nm equivalent

Torque Measurement

Torque can be measured mechanically or electronically. Common methods include:

Manual Torque Wrench

One mechanical measurement method utilizes a hand held wrench which provides a visual interpretation of the torque seen at the pivot point. The readout can be a simple pointer and scale indicator or a mechanically driven dial indicator. Some varieties indicate the maximum value seen in a measurement cycle, these types of wrenches can be used to measure "peak" torque values.

Click Wrench

Another mechanical method uses a wrench that briefly releases or clicks at an adjustable point in a range of torque values. This type of wrench can only indicate whether a measured torque value is greater or less than a set value.

Electronic Torque Transducers

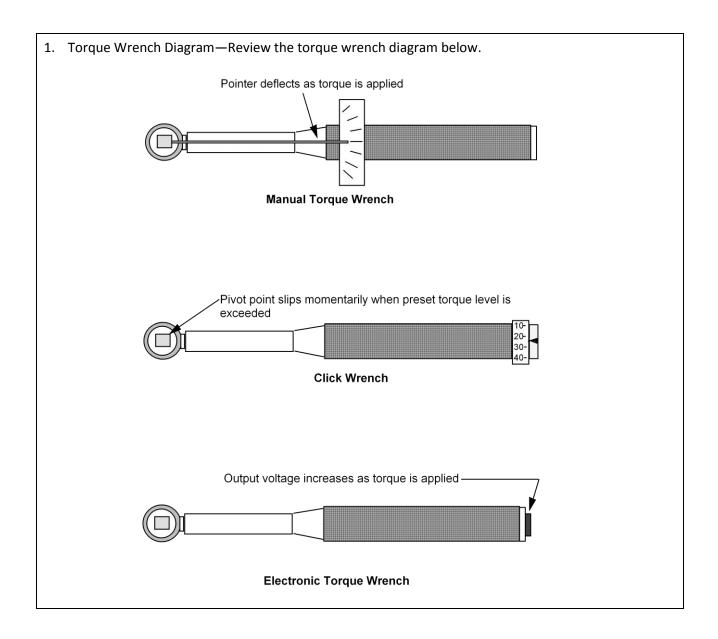
Torque transducers are devices that convert torque energy into electrical energy. The transducer itself consists of a resistor network (bridge) which is affected by the amount of strain (torque) placed on a mechanical pivot point.

These transducers are built into either hand held wrenches or in line devices to provide an electrical signal which is proportional to the amount of torque being applied to the pivot point. This output voltage can be interpreted by a variety of devices (i.e. the DataMyte 501) into a converted digital value representing events occurring at the pivot point.

Transducers are rated for maximum ranges, for instance a 100 Ft Lb wrench would be used in an application where the measured values range between 0-100 Ft Lbs.

Hand held torque wrenches are typically used to audit previously installed fasteners.

In line transducers are used to monitor a powered installation tools torque characteristics during an installation cycle.



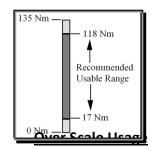
Review

In this lesson we learned torque can be measured mechanically or electronically. Common methods include: manual torque wrench, click wrench, and electronic torque transducers.

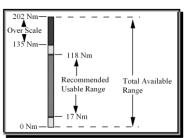
Wrench Selection

Wrench Selection

Torque Transducers are rated for maximum mechanical durability and accuracy. For example a hand held torque wrench rated for 135 Nm would normally be used to measure values no greater than 135 Nm. The rule of thumb is to use the central 75% of the full scale for maximum accuracy. A torque transducer is less accurate at the extremes of the scale.



The example above deals with normal usage, note that most transducers can read values as high as 50% over scale. For example, a wrench rated for 135 Nm can probably read as high as 202 Nm. Accuracy may suffer in over scale readings. If testing shows acceptable accuracy in over scale readings then the number of wrenches needed to cover a route may be reduced.



Note: The "Full Scale" entry in the 501 data collector is unchanged in an over scale application. In the example above the full scale entry would be 135. Note: any value beyond 150% may permanently degrade the wrench.

Gage	Туре	Name (Char max = 12)	Full Scale	Recommended min	Recommended max	Over Scale Max *
G2	Restart Torque	5Nm A-RST or Violet A-Rst	5 Nm	.5 Nm	4.5 Nm	7.5 Nm
G2A	Restart Torque	10 Nm A-RST or Silver A-Rst	10 Nm	1 Nm	9 Nm	15 Nm
G2B	Restart Torque	25 Nm A-RST or Red A-Rst	25 Nm	2.5 Nm	22.5 Nm	37.5 Nm
G2C	Restart Torque	75 Nm A-RST or Blue A-Rst	75 Nm	7.5 Nm	67.5 Nm	112.5 Nm
G2D	Restart Torque	150 Nm A-RST or Gold A-Rst	150 Nm	15 Nm	135 Nm	225 Nm
G2E	Restart Torque	300 Nm A-RST or Black A-Rst	300 Nm	30 Nm	270 Nm	450 Nm
G2F	Restart Torque	750 Nm A-Rst or Green A-Rst	750 Nm	75 Nm	675 Nm	1125 Nm

* No permanent degradation of performance

Appendix G – Audit Examples

Audit Example - Dynamic

As previously discussed it is fastener tension which holds an assembly together. Residual tension on the fastener is the characteristic that is really of concern in a fastener audit. Due to its nature, tension is a very difficult thing to measure. Since fastener tension results from the applied torque energy it follows that the two bear a relationship to each other. In other words *measuring torque yields a picture of tension*.

In this example we will discuss auditing a bolt used to secure a seat belt anchor point. A 12 mm bolt is used; the bolt is installed using a powered installation tool which applies 90 Newton Meters of torque. A previous design study found that 90 Nm of torque applied to the fastener in this application yields the desired 8,000 pound clamp load on this joint. The powered tool is equipped with a built in transducer which can read a maximum torque value of 135 Nm and the tool is adjusted to release when it senses 90 Nm of torque at the socket.

One way to verify that the anchor bolt is actually being installed to 90 Nm (or 8000 Pounds of clamp load) is to monitor maximum torque seen at the socket during the installation cycle.

Since this tool incorporates a built in transducer it is a simple matter to connect a monitoring device, such as the DataMyte 501, and electronically capture the "Peak" torque seen during each installation cycle.

The data collector can capture the peak torque values seen during multiple installations. Once collected this data can then be processed by the 501 to yield a picture (histogram) of the 6 sigma torque scatter for the tool. The data collector can then compare this 6 sigma distribution to the high and low specification limits the tool is adjusted to work within. This type of study very quickly yields a picture of a tools capability (Cpk) to perform the desired task. A Cpk of less than 1.33 is considered insufficient.

Ongoing or periodic checks of this tool using this approach preclude any further auditing of this fastener.

Static

Audit Example - Static

If it is not practical to dynamically monitor a tool on an ongoing basis a "static" audit can be implemented. As previously discussed static auditing can be done after a fastener has been installed. Static audits are performed downstream from the installation process. Usually checks are made on a variety of fasteners as part of an inspection route by QA personnel.

Using the same fastening example discussed in the dynamic example, the data collector would be set up to interface to a hand held torque wrench instead of an in-line transducer. The significant difference in the gage setup is the use of the "Breakaway" algorithm instead of "Peak". The wrench is then used to apply torque (usually clockwise) to the fastener. The operator applies a steadily increasing amount of force until fastener movement is felt, pressure is then released. The data collector then stores the torque value at which breakaway occurred.

The <u>theory</u> behind static auditing is:

If 90 Nm of torque was initially applied to reach a specific tightness (or tension), re-applying 90+ Nm of torque will overcome the residual friction and cause the fastener to move. In other words, the audit will find the fastener breaking away at 90 Nm.

The <u>reality</u> of static auditing is:

To cause a previously tightened fastener to move, the residual friction must be overcome. Since static friction is usually greater than dynamic friction, the breakaway point is usually greater than the installation torque. This fasteners breakaway point could be in the 90's or in the 100+ Nm range.

Alternatively if a gasket was part of the assembly, gasket compression could relieve tension through time. This would yield a breakaway value less than 90 Nm due to lessened friction.

Over 200 factors have been identified which can affect the breakaway point in either direction. See page 6-30 in the Fifth Edition DataMyte handbook for more information on this subject.

Prior to creating a static audit setup, acceptable high and low audit limits should be established since they will probably differ from the specification (installation) limits.

Appendix H – Residual torque specifications

You may have residual torque specification limits established in your organization. If not, we recommend the following procedure for establishing them.

Since static friction is greater than dynamic friction, joints can relax after tightening, and there is variability in the residual measurements, specification limits may be established as follows:

Step	Action	Example	
1.	Note installation (dynamic) specification limits.	70Nm to 90Nm	
2.	Take a large sample (30 to 100 pieces) of dynamic		
	measurements. The larger the sample the better, and the more		
	operators doing the residual measurements the better.		
3.	Measure the residual torque on each of the joints measured dynamically.		
4.	Find the mean of the dynamic measurements.	78Nm	
5.	Calculate the standard deviation of the dynamic measurements.	1.0Nm	
6.	Find the mean of the residual measurements.	86Nm	
7.	Calculate the standard deviation of the residual measurements.	1.5Nm	
8.	Determine the midpoint of the dynamic specification limits.	(70+90)/2 = 80	
	Lower spec limit plus upper spec limit all divided by two.		
9.	Determine the midpoint of the residual specification limits.	80*86/78 = 88.2	
	Mean of residuals times midpoint of dynamic spec divided by		
	mean of dynamic measurements.		
10.	Establish the tolerance spread of the residual limits. Tolerance of	(90-70)*1.5/1.0 = 30	
	dynamic limits times residual standard deviation divided by		
	dynamic measurements standard deviation.		
11.	Establish the upper residual specification limit. Calculated mid	88.2+30/2 = 103.2	
	point for residual measurements plus half the calculated		
	tolerance.		
12.	Establish the lower residual specification limit. Calculated mid	88.2-30/2 = 73.2	
	point for residual measurements minus half the calculated		
	tolerance.		

Appendix I – Use of Adapters

Using Torque Wrench Extensions

Adapter extensions are sometimes required when the fastener location, on which a torque reading is to taken, does not allow direct access with a conventional socket. When an adapter is used it has the effect of extending, or in some cases shortening, the pivot point of the torque wrench and thus creating a lever arm affect that must be accounted for when taking measurements.

When the adapter is positioned at 0°, 90°, or 180° with respect to the torque wrench, calculations are performed based only on the length of the extension and the length of the torque wrench. When the adapter is oriented at angles between 0° and 90° or 90° and 180° the calculations are based on the effective length of the adapter.

Torque Adapter Orientations

Adapter In Line With the Torque Wrench

Measure the wrench's handle length (distance from transducer center point and point where the force is applied, usually the center of the wrench grip area).

Measure the length of the adapter.

Add the two together and divide by the original length. That's your scaling factor. For example:

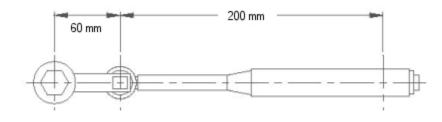


Figure 41: Adapter in Line with Torque Wrench

Example:

Scaling factor = (200+60)/200 = 260/200 = 1.3

Source Example: G2y*1.3

Adapter Used at an Angle between 0° and 90° to the Torque Wrench

- 1. Measure the wrench's handle length (distance from transducer center point and point where the force is applied, usually the center of the wrench grip area).
- 2. Measure the distance from the center of the adapter fastener connection to the center point of the transducer along the line of the torque wrench handle as shown below. Note this result will be less than the length of the adapter itself.
- 3. Add the two together and divide by the original length. That's your scaling factor. For example:

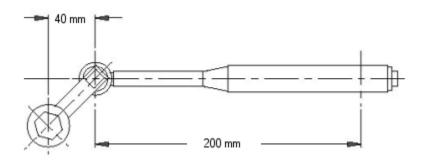


Figure 42: Adapter at Angle between 0° and 90°

Example:

Scaling factor = (200+40) / 200 = 240/200 = 1.2

Source Example: G2y*1.2

Adapter Used at an Angle of 90° to the Torque Wrench

- 1. Measure the wrench's handle length (distance from transducer center point and point where the force is applied, usually the center of the wrench grip area).
- If the adapter is at 90°, the scaling factor will be 1.0 because there is no change in the effective length of the wrench. Therefore there is no need to adjust the gage address by multiplying it by 1.

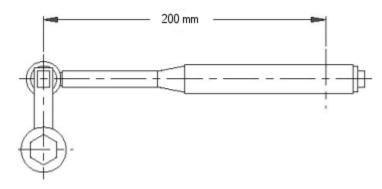


Figure 43: Adapter at 90° Angle

Example:

Scaling factor = (200+0) / 200 = 200/200 = 1.0

Source Example: G2y

Adapter Used at an Angle between 90° and 180° to the Torque Wrench

- 1. Measure the wrench's handle length (distance from transducer center point and point where the force is applied, usually the center of the wrench grip area).
- 2. Measure the distance from the center of the adapter fastener connection to the center point of the transducer along the line of the torque wrench handle as shown below. Alternately, if the angle of the extension to the torque wrench is known this may be used in the calculations.
- 3. Subtract the two and divide by the original length. That's your scaling factor. For example:

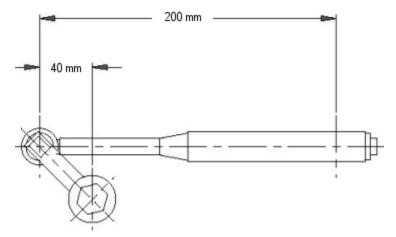


Figure 44: Adapter at Angle between 90° and 180°

Example:

Scaling factor = (200-40) / 200 = 160/200 = 0.8

Source Example: G2y*0.8

Adapter in Line at 180° with the Torque Wrench

- 1. Measure the wrench's handle length (distance from transducer center point and point where the force is applied, usually the center of the wrench grip area).
- 2. Measure the length of the adapter.
- 3. Subtract the two and divide by the original length. That's your scaling factor. For example:

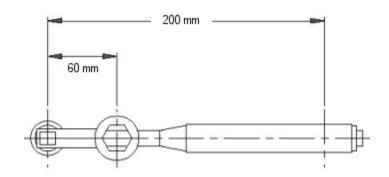


Figure 45: Adapter in Line at 180°

Example:

Scaling factor = (200-60) / 140 = 140/200 = 0.7

Source Example: G2y*0.7

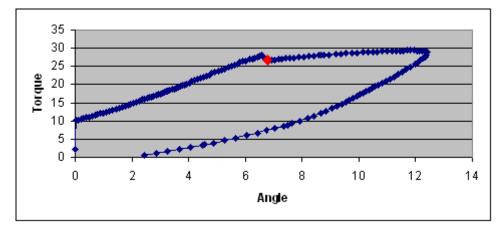
Appendix J – Torque Algorithms

Dynamic Torque Algorithms.—The 501 and600 Handheld Data Collectors use several different algorithms (or sets of rules) to convert the transducer's analog signal to a digital value that represents the force applied The algorithms include Restart (Angle), Torque at Angle, Breakaway, Restart (Time), Peak and Set Torque. Note: Peak being the Ford convention.

Angle Based Restart

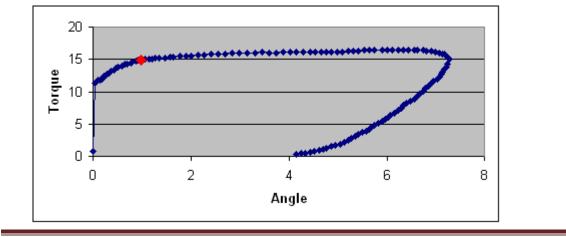
Restart Torque is used in residual torque measurement applications where you need to remove the effects of stiction. **This use requires a rotationally stable joint.** The restart point is essentially the point at which the installing tool ended the application of torque. Paint, temperature differences, lock washers, metallic adhesion, and adhesive compounds can all increase the amount of force required to break the fastener loose. To more accurately record the torque applied by the original fastening process, it may be preferable to record the point after the breakaway when the fastener "restarts." This is the preferred measurement strategy for almost all joints.

The following represents force applied over time on a high stiction joint in a Restart torque application:



Restart on a high stiction joint.

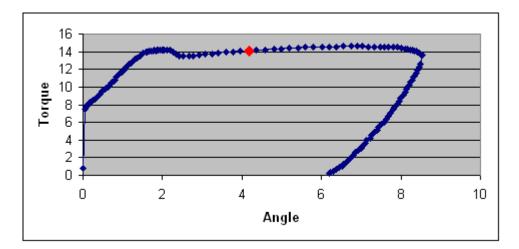
The following curve represents force applied over time on a low stiction (i.e., well-lubricated) joint in a restart torque application:



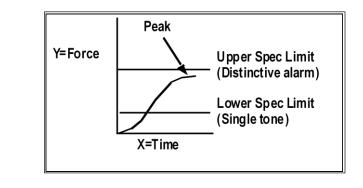
Dynamic Torque Algorithms.—The 501 and600 Handheld Data Collectors use several different algorithms (or sets of rules) to convert the transducer's analog signal to a digital value that represents the force applied The algorithms include Restart (Angle), Torque at Angle, Breakaway, Restart (Time), Peak and Set Torque. Note: Peak being the Ford convention.

Torque at Angle

Torque at Angle is the measured torque at a preset number of degrees of sensed rotation past a starting torque threshold. **This use requires a rotationally stable joint.** Note: Sensed rotation includes windup in the wrench, the work piece, the socket, the extension, as well as the fastener rotation itself.

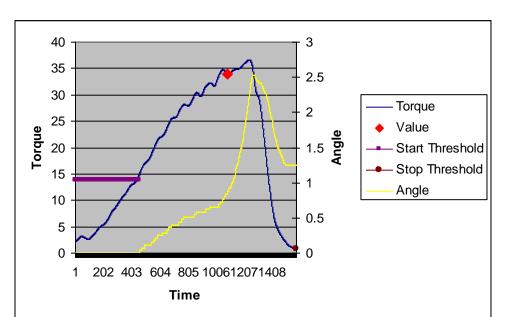


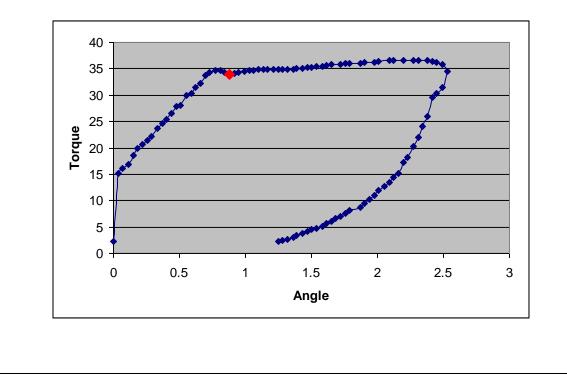
Set Torque—Set torque is used in applications where fastening is done manually with a hand held wrench. This is typically found in low volume production applications, such as aircraft assembly, or as a rework tool in more automated settings. For example, head bolts on a 6-cylinder engine may be fastened with a closed loop multi-spindle in-line system. Those engines that are tagged for rework may be quickly checked with the data collector using Set Torque, even where multiple fasteners with different torques are involved. Set Torque allows you to record the maximum or peak torque applied and also provides audible signals to the operator when the lower and upper specifications limits have been surpassed. The lower spec limit is indicated with a release tone and the upper spec limit is indicated with a distinctive alarm. The following curve represents the force applied over time in a set torque application, and also shows lines where the specification limits are reached:



Peak Torque - Angle

Peak Torque is used to measure the torque on a fastener at installation. This is done by monitoring the voltage signal generated by an in-line transducer and recording the maximum or peak reading. Since fastening systems, such as air stall tools, can produce a series of peaks during the installation of a single fastener, the parameters for the peak algorithm can be configured to read only the desired peak signal. The following curve represents the force applied over time in a peak torque application.



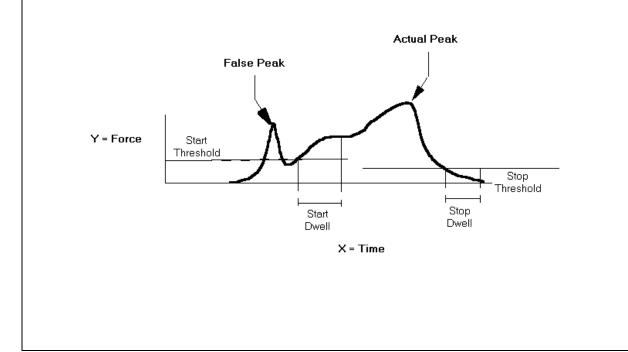


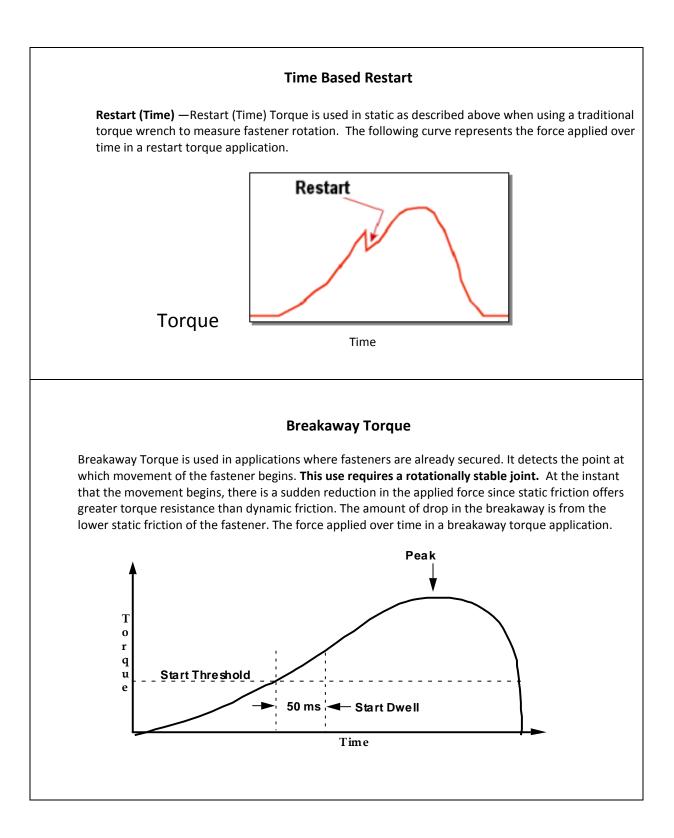
* The minimum sample rate is 1ms for 1M or 2M SRAM boards and TM firmware 1.0. Sample Time and Start Dwell resolution is 1ms when minimum sample rate is 1ms.

** If the actual stop threshold becomes greater than the start threshold, the torque algorithm code will constrain the stop threshold to be equal to the start threshold.

Peak Torque - Time

Peak Torque is used to measure the torque on a fastener at installation. This is done by monitoring the voltage signal generated by an in-line transducer and recording the maximum or peak reading. Since fastening systems, such as air stall tools, can produce a series of peaks during the installation of a single fastener, the parameters for the peak algorithm can be configured to read only the desired peak signal. The following curve represents the force applied over time in a peak torque application.



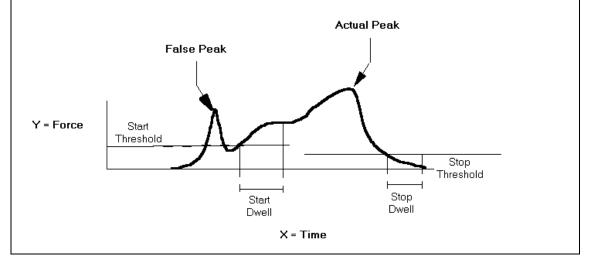


Dynamic Torque Algorithms.— The 501 and 600 Handheld Data Collectors use one of three different algorithms (or sets of rules) to convert the transducer's analog signal to a digital value that represents the force applied. The algorithms are: Peak, Pulse and Set Torque.

Peak Torque

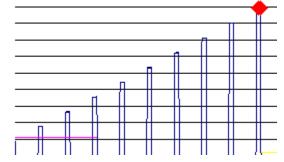
Peak Torque is used to measure the torque on a fastener at installation. This is done by monitoring the voltage signal generated by an in-line transducer and recording the maximum or peak reading. Since fastening systems, such as air stall tools, can produce a series of peaks during the installation of a single fastener, the parameters for the peak algorithm can be configured to read only the desired peak signal.

The following curve represents the force applied over time in a peak torque application.



Pulsed Torque Parameters

Pulse Torque measures the highest peak from a series of peaks. This requires higher sampling frequency than for typical air stall tools or DC electric tools.



Note: This capability requires that 4MB of SRAM be installed in the data collector. The pulsed torque gage type will be capable of sample rates as fast as 50 micro-seconds (20Khz).

Pulse Count

When a gage type is set to Pulsed Torque, the number of pulses that occur between snug and the occurrence of the peak reading can be recorded. Snug is typically defined as 50% of the lower specification limit.

To capture the Pulse Count an auto-scanned pair of characteristics must be set up where the first characteristic source is 'Gx' (where 'Gx' is a pulsed torque gage type configuration) and the second characteristic source is of the form 'Cnt(Gx)'. Note that the Cnt() function is used to count pulses.

In the gage test mode, pulse counts will be displayed with the peak value for pulsed torque gage type configurations.

Angle

An Angle gage type will support three different applications: Torque and Angle, Angular Displacement, and Angle Set. In addition, a change in angle may be used as a sample event for torque measurements alternatively to a change in time.

Torque and Angle—To capture the installation torque and angle between snug and peak, an auto-scanned pair of characteristics must be set up where the first characteristic source is set up for Peak (or Pulse) and a second characteristic is setup for Angle (capture). When the torque event is captured, the angle will be measured between snug (were snug is the start threshold for the first characteristic) and peak.

Example:

Source of C1 = $g2{13.7}$ (where g2 is configured Type=Peak (or Pulse) and 13.7 = start threshold or snug)

Source of C2 = g2d (where g2d is configured Type = Angle, Use = Capture)

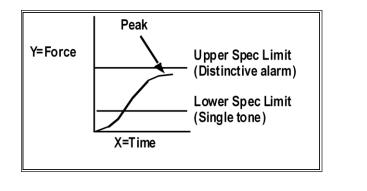
Note: In the gage test mode, when an analog reading occurs for a torque gage setup, the angle value will also be displayed if angle encoder pulses are present and the next gage setup in the gage list is an angle gage type. In the gage master mode, the angle value will be displayed in real-time if the gage setup is an angle gage type.

* The minimum sample rate is 1ms for 1M or 2M SRAM boards and TM firmware 1.0. Sample Time and Start Dwell resolution is 1ms when minimum sample rate is 1ms.

** If the actual stop threshold becomes greater than the start threshold, the torque algorithm code will constrain the stop threshold to be equal to the start threshold.

Note: grayed out cells are not alterable.

Set Torque—Set torque is used in applications where fastening is done manually with a hand held wrench. This is typically found in low volume production applications, such as aircraft assembly, or as a rework tool in more automated settings. For example, head bolts on a 6cylinder engine may be fastened with a closed loop multi-spindle in-line system. Those engines that are tagged for rework may be quickly checked with the data collector using Set Torque, even where multiple fasteners with different torques are involved. Set Torque allows you to record the maximum or peak torque applied and also provides audible signals to the operator when the lower and upper specifications limits have been surpassed. The lower spec limit is indicated with a release tone and the upper spec limit is indicated with a distinctive alarm. The following curve represents the force applied over time in a set torque application, and also shows lines where the specification limits are reached:



Angular Displacement—To capture angular displacement, one characteristic, C1, is set up as the source of Dsp(g2a), where g2a is configured for angle (capture) and Dsp() is a function used to record angular displacement. Angular displacement is then obtained by rotating an angle transducer between start and stop key presses (<Enter>) while in data entry mode:

Typical Application: Tool Checking

C1 is configured as above, C2 is configured for keyboard input, C3 is the difference between C1 and C2 and is auto scanned with C2. The Angle Transducer is installed on an angle-capable run-down tool that has its own angle display. Zero the display on the run-down tool and press <Enter> on the data collector to start the measurement. Rotate the tool approximately 360 degrees and press <Enter> again. Key in the angle as displayed on the run-down tool for C2. C3 will detect any deviation between the two angular measurements.

Angle Set— Angle Set is for hand assembly where joints or clamp load is critical, and a given angular rotation of the transducer past "snug" is required (for example, when a fastener needs to rotate 6 degrees past 30 Nm of torque).

To apply the 'set angle' algorithm, an auto-scanned pair of characteristics (C1 and C2) must be set up where the C1 source is 'Gx' and 'Gx' is Type=Peak, and C2 is set up where source is 'Gxn' and 'Gxn' is an angle gage type configuration with the 'Use' parameter set to 'Set'.

Per Above Example:

Source of C1 = g2{30} (where g2 is configured Type=Peak and 30 = start threshold, i.e., snug)

Source of C2 = g2a (where g2a is configured Type = Angle, Use = Set) and the lower spec limit is set to 6.0.

Sample Event: Angle

Torque algorithms may now be configured to be sampled by a change in angle or by a change in time (in previous releases, sampling was only time-based).

A 'Sample Event' parameter has been added to torque gage configurations. If set to 'Angle' (instead of 'Time'), the analog signal will be sampled for algorithm satisfaction whenever the angular displacement changes.

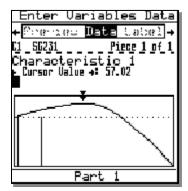
Pick-a-Point

Normally, the value of the characteristic for the piece is determined by the algorithm in the data collector based on the torque type selected in the gage configuration. Use Pick-a-Point to select any point from the torque curve to enter as the data value. The pick-a-point feature can be used for any port where the Gage configuration uses Peak, Breakaway, or Restart, and where Pick-a-Point has been turned on for the gage setup.

Steps

- 1. Make sure that **Pick-a-Point** is set to ON in the gage configuration.
- 2. Use the gage to take a reading as part of the normal data collection process.

The data collector displays the torque curve in the data collection window instead of storing the reading. The data value is indicated by a set of cursors:



You can accept the value indicated, continue to take readings, or use the arrow keys to move the cursor to the point on the curve that you want to record.

The value shown in the Cursor Value reflects the lower cursor position. The upper cursor marks the original reading selected by the 501 system.

3. Press <Enter> to accept the value shown by the Cursor Value.

Multiple Points

When measuring more than one characteristic in an Auto Scan sequence with pick-a-point enabled, you can pick a different point for each characteristic. As force is applied to the transducer, the angle of rotation is recorded when the applied torque achieves "snug." As rotation continues, the operator will be alerted (by a "let go tone") when the amount of rotation exceeds the lower spec limit for C2.

Note: If the second characteristic source has the format 'Gxn{y}' where y is an angle value in degrees, y will be substituted as the 'nice' alarm threshold instead of the characteristic's low limit.

- 1. <u>Fastener</u> a threaded device that clamps two or more parts together.
- <u>Torque</u> turning a previously tightened fastener another few degrees to evaluate the clamping force holding the joint together. The target is a clamp load that can be sustained when the assembly parts are subjected to service load.
- 3. <u>Qualifying a joint</u> determining the amount of tension attained at a given torque value and relating the tension to the angular displacement of the bolt.
- 4. <u>Audit</u> an evaluation of the manufacturing process to determine whether a part or group of parts meets the required specifications.
- 5. <u>Route</u> The complete set of inspection plans which "Sets Up" the data collector for use on an application. The Route is a set of Setups usually to be collected by one person in one shift.
- 6. <u>M-alpha</u> auditing method presents the tightening torque as a function of the bolt assembly angle, which correlates the stretch of the bolt to the angular displacement of the fastener. This relationship provides a method of monitoring the tension in the joint, or bolt stretch, by analyzing the torque-angle signature of the audit.
- 7. <u>Alias</u> tool configuration used by the collector to define its port functionality.

Battery performance issues:

The following steps should be taken:

- 1) From the 600 main menu highlight "Off", then select 'symb shift menu'.
- 2) From the default desktop on the 600, press "menu".
- 3) The 600 test view is displayed.
- 4) Navigate to 'Fuel Gauge' and press "enter".
- 5) Highlight the golden file name and select 'shift enter'.
- 6) A busy cursor will be displayed and a Success message will be displayed.
- 7) Press 'menu'. Remove the battery, reinsert the battery and power on the 600.

Collector Management:

There are two reasons why all the menu selections would be disabled.

- 1. The DM600 is connected to TranSend II. TranSend II maintains control.
- 2. The battery door cover switch is not closed.

How to reinitialize memory on a DM600:

- 1. From the DM600 main menu, select About.
- 2. On the DM600 keypad, select the <Symb> then <shift> then <menu> keys.
- 3. Select Reinitialize Memory.

When attempting to power on the DM600 and both leds flash red and the data collect application does not start is due to the battery cover door switch not closed.

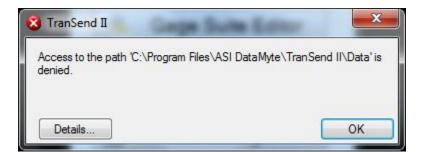
Windows 7 32-Bit (Cannot write to Program Files directory)

Launch TranSend II application.

Select Options and set the Primary Output folder to a location where you are able to write to; i.e. C:\ProgramData\ASI DataMyte\TranSend II\Data (create folder called Data).

Receive Data									
Options									
Output Data To: ♥		Formatting Options Subgroup Headers Image: None First SG Include Characteristic Labels Include Nominals							
Tab Delimited File Excel XML Include Characteristic Labels Include Nominals File Name Generation Append Julian Style Date Output Folder Primary C:\ProgramData\ASI DataMyte\TranSend II\Data Secondary OK									
Output Folder									
Primary	C:\ProgramData\ASI DataMyte\T	ranSend II\Data 😥 🗙							
Secondary		ranSend II\Data							
		OK Cancel							

If you click on Open Collector prior to setting Options to a location you are able to write to, the following TranSend II Error displays because you are unable to write to Program Files directory.



Click OK.

The following screen displays.

🖳 Receive Collected Data Wizard			×			
() These are Setups on the collector that contain unharvested data. Click OK to process this data otherwise click Cancel						
Name	/	Unharvested Data	Harvested Data			
Receive Data Options						
C:\Program Files\ASI DataMyte\TranSend II\Data			<i>[</i>			
✓		Save Options				
✓ m Tab Delimited File ✓ m Excel XML						
L			OK Cancel			

Click on the browse icon and path out to a location that you are able to write to.

Example: C\Program Data\ASI DataMyte\TranSend II\Data (create Data folder) and click OK.