



Battery Power Tools by SCS Concept



SCS Concept, April 2021

Edition 1



Global Overview

Freedom EAS

Battery Power Tools

From clutch to transducerized battery tools



- Productivity
- Tightening accuracy
- Robust & ergonomic
- Compliant to industry 4.0

Integrated all control like:

- Full tightening strategy
- Prevailing torque capability
- Barcode reader to start the sequence
- Joint condition monitoring
 - Trace comparison
 - Current, torque, angle, gradient, time monitoring
 - Rehit detection
- Full traceability with WiFi communication

Freedom EAS is managing all operations in stand alone mode or slave from SCS FIM EVO & VPG+ system management

Freedom EAS High Torque

Battery Power Tools



- From 50 to 1 250 Nm
- Pistol and Angle Head design
- Barcode, Wi-Fi in option
- XXT transducerized tool
- Reaction bar in option

- From 1 to 120 Nm
- Pistol, Straight and Angle Head design
- Compatibility with Open and Close crowfoot
- Barcode, Wi-Fi in option
- Clutch, clutch with Wi-Fi, clutch with transducer and transducerized tool



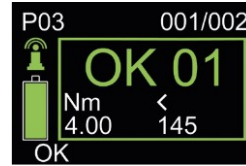
Global Overview

Don't lose any information

With our WiFi 2.4 or 5 GHz

- Automatic roaming to select the best access point
- Full security management

Status with multi-color LED and color screen



Durability and high speed
with brushless motor

Accurate and durability
with our spyroidal gear and angle head

Highlight the part
With our flashlight

Vibration & buzzer alarm

Integrated barcode reader for high durability

Up to 7 000 tightening with advanced battery
thanks to brake energy recovery

Ergonomic handle with large trigger

Battery 18V
• 2.5 AH
• 5 AH
For more flexibility





Define the right tools depending on your needs

Tools developed with a complete range to fulfil your industry standard and define the level of control, monitoring and traceability that you need.

XXC - Clutch : Accurate clutch tools to fulfill to your tightening strategy and productivity

XXCC - Clutch advanced control : Features of XXC with data acquisition, WiFi communication option and barcode reader to select and link all tightening to your product

XXCT - Clutch with Torque transducer : Features of XXCC with a torque transducer that you can use to monitor the clutch or control the shutoff

XXT - Torque transducer : Full tightening strategy available to manage all your requirements

These industrial battery power tools are design to match with all your requirements depending on the version selected. To help the operator job, the tools integrate multi-LED's, vibration device, display and buzzer, to have a feedback about the status of each tightening.

Freedom EAS	XXC	XXCC	XXCT	XXT
	Clutch Tools	Clutch adv Control	Clutch with Torque transducer	Torque transducer Shutoff
Strategy	Torque	Torque	Torque or Angle	Torque or Angle
Torque Accuracy	+/- 5%	+/- 5%	+/- 5%	+/- 4%
Torque repeatability	+/- 10%	+/- 10%	+/- 10%	+/- 7%
Setup				
Torque control	Clutch	Clutch	Clutch	Torque
Angle Control			Yes	Yes
Current control	Yes			
Gradient Control				Yes
Torque Monitoring			Yes	Yes
Angle Monitoring		Yes	Yes	Yes
Speed management	Yes	Yes	Yes	Yes
Current Monitoring		Yes	Yes	Yes
Time Monitoring		Yes	Yes	Yes
Gradient Monitoring				Yes
Multi-Step	Yes	Yes	Yes	Yes
Memory				
Data + Trace	No	150 000	150 000	150 000
Operation	100	100	100	100
Wifi 2.4 & 5 Ghz	No	Option	Option	Option
Bacode reader	No	Option	Option	Option





Understand the configuration of your battery power tools

Design



Freedom-EAS- S for Straight



Freedom-EAS- P for Pistol



Freedom-EAS- A for Angle Head

Gear

Depending on the target torque, you have access to two different levels of gear and torque multiplier, Standard and High Torque
 Standard (1 to 120 Nm): **Freedom-EAS-XST** High Torque (50 to 1 250 Nm): **Freedom-EAS-XHT**

Control & Monitoring

By default, we control and manage the angle, current consumption, speed and time to give you the possibilities to define precisely when the results is ok and adjust the speed depending on your assembly joint.

	Clutch	Clutch Advance control	Clutch with Torque transducer	Torque Transducer
Freedom-EAS-	XXXC	XXXCC	XXXCT	XXXT

Torque & Drive

To understand quickly the configuration of the tool, you will find the maximum torque of the tool and the driver Ttype (hex or square) and size like ¼", ½" etc

	Torque (Nm)	Hex Female	Square	Size
Freedom-EAS-	XXXX13	XXXX13H	XXXX13S	XXXX13H14

Option

Depending on the needs, you can add a barcode reader and/or a WiFi communication module on your tools. This information is shown on the last letters: B for Barcode reader, W for WIFI

Example

Freedom-EAS-PSTT14H14BW = Transducerized pistol tool for 14 Nm with Hex ¼" drive including barcode reader & WiFi

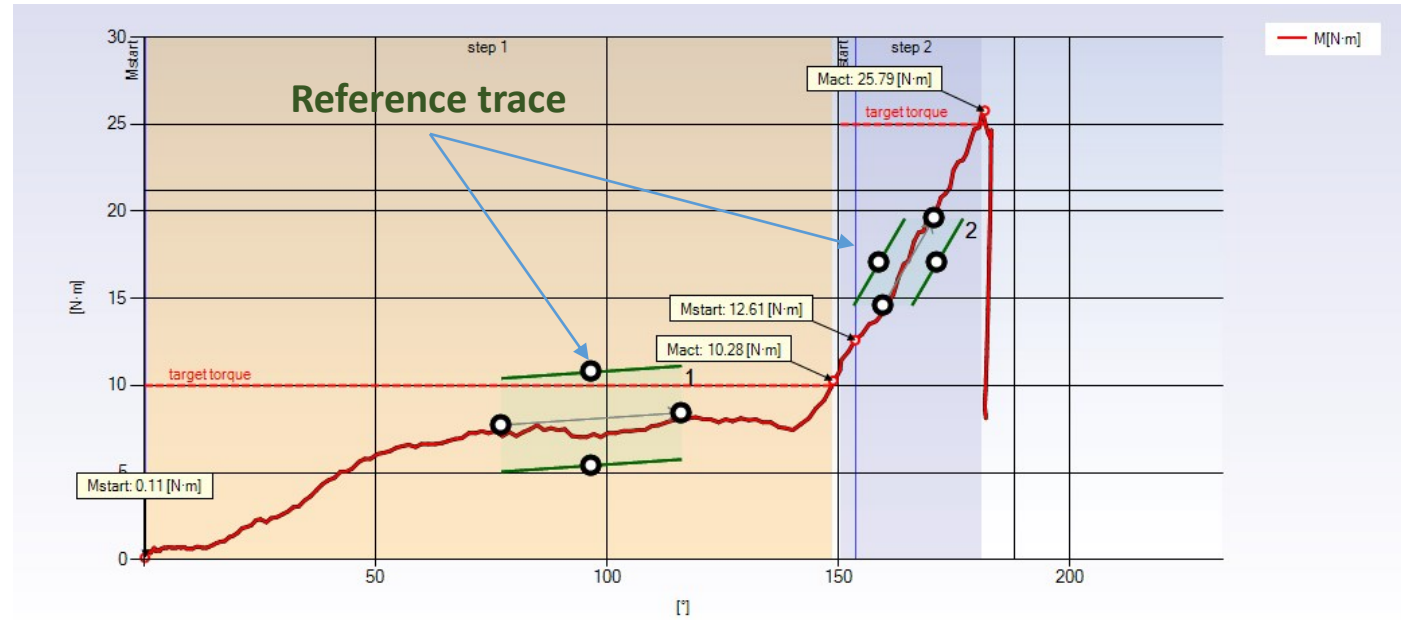




Freedom EAS XCT & XXT

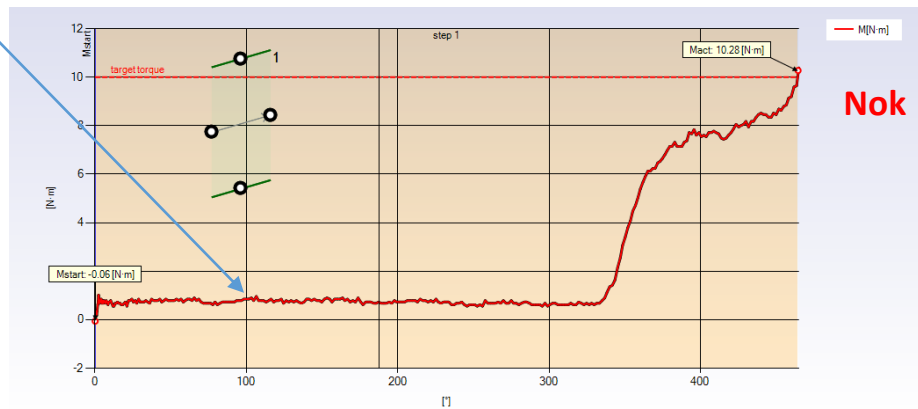
Real time trace comparison

Unique real time trace comparison to detect any mistake occurred in the process



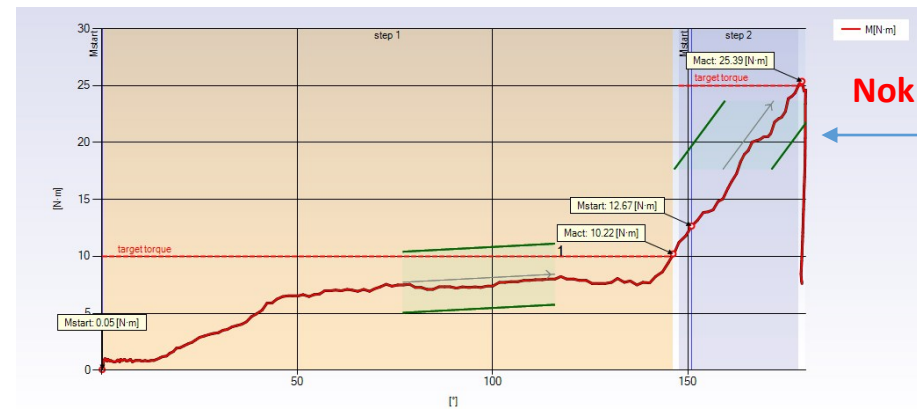
Ok

Friction torque is too low



Nok

Not ok on the first step



Nok

The tightening cross the reference trace

Not ok on the second step





Freedom EAS Wi-Fi communication



FIM EVO The solution to manage up to 12 tools with one Industrial device

FIM EVO is design to manage and collect production tools SCS Concept and all other brands

- Manage 12 tools
- 6 stations at same time (option)
- Unlimited sequences and operations
- Large memory to store all results and traces coming from your tools
- Multi-Protocol solution with : Open protocol, ToolsNet, IPM, VW XML
- 16 IO24V to manage your stations
- Manage barcode reader / printer
- Manage socket tray
- Industrial fieldbus on option



Used our battery power tools with WiFi to connect to our systems and communicate easily with your MES.
The FIM EVO and VPG+ is designed to manage your assembly processes, manage accessories like socket tray, barcode reader, fieldbus, etc.

VPG+ the solution for operation guidance and data collection



- Station operator visual guide
- Training tool for new operator
- Multi-brand tools capability
- 12 different tools can be connected to a station (Multi-brand solutions)
- Simple error proofing in production station for all tools
- Collect and manage all stations with VPG+ server
- Multi-Protocol solution with : Open protocol, ToolsNet, IPM, VW XML
- Manage accessories like barcode reader, socket tray, etc

Ready end of November 21





Freedom EAS

Easy to setup with FIM & VPG+

SCS-Tool-Configuration Version: 2.1.0.0

tool ID.: 21130004 read write

tool: setup:

communication

Wi-Fi IPv4 IEEE 802.1X roaming telegrams

authentication type: WPA2

SSID: CiscoVM

network key: 11223344

region: auto

band: 2.4 GHz channel list: 1, 2, 3, 4, 5, 6, 7, 8, 9

transmitting power: 17 dBm / 50 mW

COM4: connected network administrator US

Setup the Wi-Fi communication to connect the Freedom EAS to our FIM evo or VPG+

Add the tool to the station

HOME SEQUENCE

Station 1 - STATION 1 Type EAS XXCT

Tool data

Tools N°:	2	Serial N°:	test EAS
Barcode:		Name:	XCT 55 Nm
Range:	5,00 55,00 N-m	Manufacturer:	SCS
IP address:	192.168.1.55	Port:	8003

Save Tool





Freedom EAS

Easy to setup with FIM & VPG+

ID: 20 Identifier: test Communication XCT Description: test data com Type: EAS XXCT [Back to Grid](#)

STEP ADVANCED SETTINGS GLOBAL OVERVIEW

Step 1 Step 2 Step 3 Step 4 **Step 5** + Add step

Step type: Advanced Torque switch: 2. Shift point

Control strategy

Torque: Torque target: 8,00 N-m
Torque max limit: 0,00 N-m Torque min limit*: 0,00 N-m
Angle: Angle target: 45,00 ° Angle safety: 120,00 °
Current: Current target: 0,00 A Current safety: 0,00 A
Time: Time target: 0,00 s Time safety: 0,00 s
Angle Threshold: 0,00 N-m

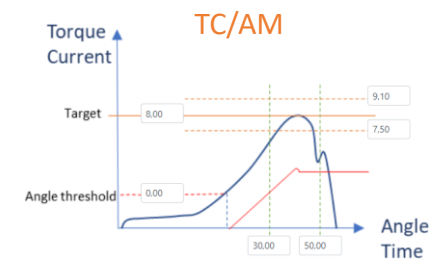
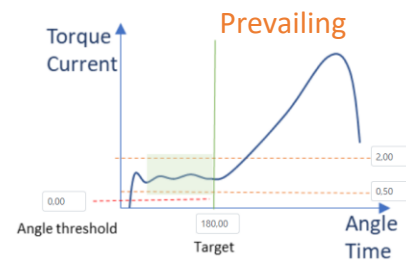
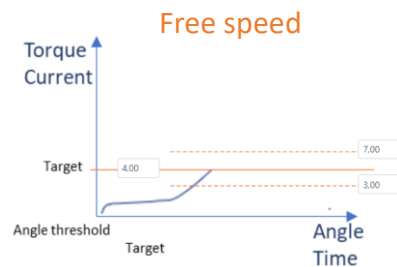
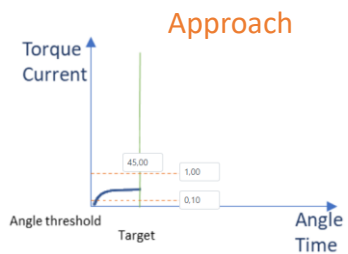
Monitoring limits

Torque: Torque Min: 7,50 N-m Torque Max: 8,50 N-m
Angle: Angle Min: 30,00 ° Angle Max: 60,00 °
Current: Current min: 0,00 A Current max: 5,00 A

Create your operation with up to 6 step
Each step can be preset up:

- Approach
- Free speed
- Prevailing torque calculation
- TC/AM with Prevailing Torque
- TC/AM
- AC/TM

Or advance setting function





Freedom EAS

Easy to setup with FIM & VPG+

STEP	ADVANCED SETTINGS	GLOBAL OVERVIEW
Operation		
Pre-stop factor: <input type="text" value="1,00"/>	Torque correction factor: <input type="text" value="1,00"/>	Angle correction factor: <input type="text" value="0,00"/> °
Confirm Ok: <input type="checkbox"/>	Confirm ok time: <input type="text" value="0,00"/> s	Increase batch count with Nok: <input type="checkbox"/>
Unit: <input type="text" value="N-m"/>	Threshold trace start: <input type="text" value="0,00"/> N-m	Rehit Nok: <input type="checkbox"/>
Loosening operation: <input type="checkbox"/>	Minimum Angle: <input type="text" value="10,00"/> °	Display securing/prevaling torque: <input type="checkbox"/>
Rehit detection: <input checked="" type="checkbox"/>	Max time: <input type="text" value="0,00"/> s	Operation time counting start at: <input type="text" value="Enable"/>
Reverse before first step: <input type="checkbox"/>	Reverse after tightening: <input type="text" value="Only if NOK"/>	Retry: <input type="text" value="2"/>
Total operation time active: <input type="checkbox"/>		
Loosening operation ID: <input type="text"/>		

Save operation

Define how the Freedom EAS need to be managed on this operation





Freedom EAS

Easy to setup with FIM & VPG+

STEP

ADVANCED SETTINGS

GLOBAL OVERVIEW

Global overview to check in One page the setting of your operation

	Designation	Step 1	Step 2	Step 3	Step 4	Step 5
Control strategy	Torque					
	Torque target	N-m	4.00 N-m	8.00 N-m	N-m	8.00 N-m
	Torque max limit	N-m	N-m	N-m	N-m	N-m
	Torque min limit"	N-m	N-m	N-m	N-m	N-m
	Angle					
	Angle target	80.00 °	°	°	100.00 °	45.00 °
	Angle safety	°	°	°	°	°
	Angle Treshold	N-m	N-m	4.00 N-m	0.00 N-m	0.00 N-m
	Current					
	Current target	A	A	A	A	A
	Current safety	A	A	A	A	A
	Time					
Time target	s	s	s	s	s	
Time safety	s	s	s	s	s	
Monitoring limits	Torque					
	Torque Min	0.10 N-m	3.00 N-m	7.50 N-m	0.10 N-m	7.50 N-m
	Torque Max	1.00 N-m	7.00 N-m	9.10 N-m	8.50 N-m	8.50 N-m
	Angle					
	Angle Min	°	°	30.00 °	0.00 °	30.00 °
	Angle Max	°	°	50.00 °	120.00 °	60.00 °
	Current					
	Current min	A	A	A	A	0.00 A
	Current max	A	A	A	A	5.00 A
	Time					
Time min	s	s	s	s	s	





Freedom EAS Data collection

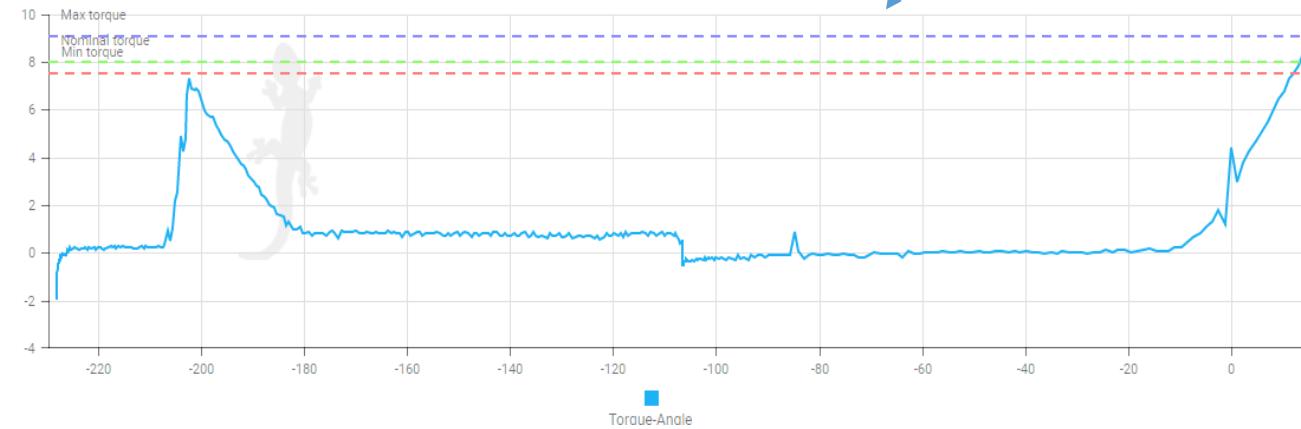
☐	Identifier	Description	VIN	Bat...	Tool	Station	Torque Res...	Angle result	Date / Time	Status	
Sequence: 19 - XCT 55 at 8 Nm 1 SStep											
☐	XCT 8 Nm 1 Step	Test tight at 8 Nm CW 1 St...	20210922181543	5 / 5	XCT 55 Nm	1 - STATION 1	8,4 N-m	14,0 °	22/09/2021 18:16:17	OK	🔍 📄
☐	XCT 8 Nm 1 Step	Test tight at 8 Nm CW 1 St...	20210922181543	4 / 5	XCT 55 Nm	1 - STATION 1	8,4 N-m	14,0 °	22/09/2021 18:16:14	OK	🔍 📄
☐	XCT 8 Nm 1 Step	Test tight at 8 Nm CW 1 St...	20210922181543	3 / 5	XCT 55 Nm	1 - STATION 1	8,74 N-m	13,0 °	22/09/2021 18:16:10	OK	🔍 📄
☐	XCT 8 Nm 1 Step	Test tight at 8 Nm CW 1 St...	20210922181543	2 / 5	XCT 55 Nm	1 - STATION 1	8,63 N-m	14,0 °	22/09/2021 18:16:06	OK	🔍 📄
☐	XCT 8 Nm 1 Step	Test tight at 8 Nm CW 1 St...	20210922181543	1 / 5	XCT 55 Nm	1 - STATION 1	8,35 N-m	15,0 °	22/09/2021 18:16:02	OK	🔍 📄
☐	XCT 8 Nm 1 Step	Test tight at 8 Nm CW 1 St...	20210922180845	5 / 5	XCT 55 Nm	1 - STATION 1	8,23 N-m	13,0 °	22/09/2021 18:09:47	OK	🔍 📄
☐	XCT 8 Nm 1 Step	Test tight at 8 Nm CW 1 St...	20210922180845	4 / 5	XCT 55 Nm	1 - STATION 1	8,4 N-m	19,0 °	22/09/2021 18:09:41	OK	🔍 📄
☐	XCT 8 Nm 1 Step	Test tight at 8 Nm CW 1 St...	20210922180845	3 / 5	XCT 55 Nm	1 - STATION 1	8,4 N-m	15,0 °	22/09/2021 18:09:28	OK	🔍 📄
☐	XCT 8 Nm 1 Step	Test tight at 8 Nm CW 1 St...	20210922180845	2 / 5	XCT 55 Nm	1 - STATION 1	8,46 N-m	16,0 °	22/09/2021 18:09:23	OK	🔍 📄
☐	XCT 8 Nm 1 Step	Test tight at 8 Nm CW 1 St...	20210922180845	1 / 5	XCT 55 Nm	1 - STATION 1	12,61 N-m	3,0 °	22/09/2021 18:09:16	NOT OK	🔍 📄
☐	XCT 8 Nm 1 Step	Test tight at 8 Nm CW 1 St...	20210922180845	1 / 5	XCT 55 Nm	1 - STATION 1	0,79 N-m	8,0 °	22/09/2021 18:09:08	NOT OK	🔍 📄
☐	XCT 8 Nm 1 Step	Test tight at 8 Nm CW 1 St...	20210922180845	1 / 5	XCT 55 Nm	1 - STATION 1	0,56 N-m	338,0 °	22/09/2021 18:08:52	NOT OK	🔍 📄
☐	XCT 8 Nm 1 Step	Test tight at 8 Nm CW 1 St...	20210922180444	5 / 5	XCT 55 Nm	1 - STATION 1	8,29 N-m				

Results

Trace



Torque - Angle Trace



Statistic





Freedom EAS

Stand Alone mode with SCS tool Manager

Create yours Steps

Create your operation

Setup yours steps

SCS-Tool-Configuration Version: 2.1.0.0
tool ID.: 21130004
read write

tool: operations:

operation: sequence: last change: 01/01/2013 00:00:00

Operation0 ccw, Reverse steps: 1 15:18 09/09/2021	Operation1 XCT 4 step with loos steps: 3 00:00 01/01/2013	Operation2 test Communication X steps: 5 00:00 01/01/2013
Operation3 XCT 8 Nm 1 Step steps: 2 00:00 01/01/2013	Operation4 XCT55 8 Nm 3 Step steps: 3 00:00 01/01/2013	Operation5 XCT WITH LOOSENING S steps: 3 00:00 01/01/2013
Operation6 XCT prevailing test steps: 2 00:00 01/01/2013	Operation7 XCT Angle tightening steps: 2 00:00 01/01/2013	Operation8 XCT55 CURRENT MONITO steps: 2 00:00 01/01/2013

COM4: connected administrator US

SCS-Tool-Configuration Version: 2.1.0.0
tool ID.: 21130004
read write

tool: operations: Operation 4:

Operation option Rehit

Operation name: Operation ID:

Loosening operation default operation

time evaluation
 total time:

characteristics:
reverse after Tightening:
Retry:
Batch size:

step 1 SLOW-SEEK-1 step 2 FREE-SPEED-2 step 3 TC-AM-3 step 4 step 5 step 6

COM4: connected administrator US

SCS-Tool-Configuration Version: 2.1.0.0
tool ID.: 21130004
read write

tool: operations: Operation 4: step 3:

general gear strategy option evaluation

shifting conditions:

- Tswitch:
- Ttarget: [N-m]
- Tstart: [N-m]
- Tlimit: [N-m]

angle:
current:
time:

evaluation:

- torque: $7.50 \leq T_{actual} \leq 10.00$ [N·r]
- angle: $5 \leq \alpha_{actual} \leq 50$ [°]

torque [N-m]
current [A]

T_{max} 10.00
T_{target} 8.00
T_{min} 7.50
T_{start} 4.00
α_{min} 5 α_{max} 50
angle [°]
time [s]

COM4: connected administrator US





Freedom EAS

Stand Alone mode with SCS tool Manager

SCS-Tool-Configuration Version: 2.1.0.0

tool ID.: 21130004 read write

tool: operations: sequence 1:

description: Sample sequence-ID: 1
 default sequence

1. operation:	1	Batch size:	1
2. operation:	98	Batch size:	1
3. operation:	99	Batch size:	1
4. operation:	empty	Batch size:	0

COM4: connected administrator US

Create yours Sequences

SCS-Tool-Configuration Version: 2.1.0.0

tool ID.: 21130004 read write

tool: operations:

operation: barcode: sequence: last change: 09/09/2021 15:18:51

barcode-name:	00000001	no.:1
action:	Operation 1	Batch: 1 group: -
barcode:	00000001	
barcode-name:	27,0 Nm - 30°	no.:2
action:	Operation 98	Batch: 1 group: -
barcode:	00000099	
barcode-name:	55,0 Nm - 360°	no.:3
action:	Operation 99	Batch: 1 group: -

COM4: connected administrator US

Define how you want manage the tool

SCS-Tool-Configuration Version: 2.1.0.0

tool ID.: 21130004 read write

tool: setup:

general management signals communication graphics system time basic settings update

process control energy&lighting features TM version

manual mode active
enable over: external control unit
 reverse enabled for open crowfoots

waiting time between tightenings

abort on the display time: 5.0 [s]

data output via usb

: connected administrator US

Start the right sequence,
Operation with a barcode
reader





Freedom EAS

Stand Alone mode with SCS tool Manager

Check the last results and export it to excel

Up to 150 000 tightening and trace are store inside the tool

Check the last Trace and export it to excel

SCS-Tool-Configuration Version: 2.1.0.0
tool ID.: 21130004
read write

tool: statistic:

tightening:	time stamp:	ID 1:	ID 2:	Tact[N-m]:	Tmax[N-m]:	Tfriction[N-m]:	α act[°]:	α max[°]:	lar	
1	1870	22/09/2021 16:54:33	HandMode		1.07	1.07	0.00	139.50	139.50	1.1
2	1871	22/09/2021 16:54:42	HandMode		0.96	0.96	0.00	138.25	138.25	0.1
3	1872	22/09/2021 16:57:01	HandMode		1.02	1.02	0.00	138.75	138.75	0.7
4	1873	22/09/2021 16:57:34	HandMode		8.46	8.46	0.00	14.50	14.50	0.0
5	1874	22/09/2021 16:57:44	HandMode		8.46	8.46	0.00	17.50	17.50	0.0
6	1875	23/09/2021 15:05:21	20210923164539		0.56	1.07	0.00	375.75	46.25	1.6
7	1876	23/09/2021 15:05:35	20210923164539		0.68	1.53	0.00	374.50	30.25	1.6
8	1877	23/09/2021 15:05:42	20210923164539		0.73	1.47	0.00	374.75	32.50	1.7
9	1878	23/09/2021 15:08:37	20210923164539		0.79	1.42	0.00	374.25	43.75	1.6
10	1879	23/09/2021 15:22:22	20210923170240		0.51	0.51	0.00	300.25	14.75	0.7
11	1880	23/09/2021 15:22:41	20210923170240		4.31	4.65	0.00	300.50	242.75	1.8
12	1881	23/09/2021 15:22:53	20210923170240		0.62	0.62	0.00	21.25	21.25	0.3
13	1882	23/09/2021 15:26:23	20210923170653		0.34	0.39	0.00	300.50	72.50	0.7
14	1883	23/09/2021 15:26:45	20210923170653		3.92	4.54	0.00	300.00	167.25	1.7

readout

COM4: connected administrator US

SCS-Tool-Configuration Version: 2.1.0.0
tool ID.: 21130004
read write

tool: graph:

ID1: HandMode 22/09/2021 16:57:34 file of graph

values:

step:	Tmax[N-m]:	Tfriction[N-m]:	α act[°]:	Gyro[°]:	α max[°]:	lact[A]:	Tiact[s]:	Timax[s]:	Tstart[N-m]:	α total[°]:	Tistart[s]:	T
1	0.74	0.00	120.00	0.00	1.50	0.80	0.849	0.155	0.00	120.00	0.000	0.1
2	8.46	0.00	14.50	0.00	14.50	0.06	1.899	1.899	4.20	471.25	0.928	1.1

evaluation: setup modus

step: element: active: α 1[°]: α 2[°]: T 1[N-m]: T 2[N-m]: T α [%]: type:

COM4: connected administrator US

1870 Prg:03(1/1) NOK
1871 Prg:03(1/1) NOK
1872 Prg:03(1/1) NOK
1873 Prg:03(1/1) OK
1874 Prg:03(1/1) OK

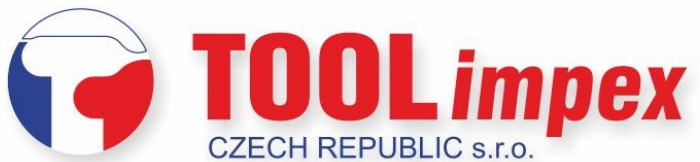
T[N-m]
n[min^{-1}]
I[A]
 labels
f(over angle)

excel
readout





www.scsconcept.com



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