



ATorque^(Idn) System Specifications

AUTOMATIC TORQUE TESTING FOR AIRFIELD GROUND LIGHTING



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NAKSYS
6 Rue des Deux Communes
91480 Quincy Sous Sénart
France
Tel: +33 1 69 02 16 10
Fax: +33 1 69 48 93 76
Email : contact@naksys.com

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1./ Introduction

Our company is specialized in airfield ground lighting and has been performing in this industry for the last 15 years with references worldwide. Naksys manufactures the complete range of equipments and innovative solutions for assessing and maintaining the airfield ground lighting system.

This document particularly describes the 'ATORQUE System', the torque testing for the airfield ground lights installed in all maneuvering areas of an aerodrome.

The torque testing is known as a bi-monthly task part of the regular maintenance of the airfield ground lighting system. It is unbelievable to see in how many ways the equipment installed on the ground in maneuvering areas are subject to constraints and how easily the installations are weakened, subsequently the loose parts are found as FOD (Foreign Object Debris) on the traffic movement areas.

The equipment installed on the runways and maneuvering areas need to be tightened regularly using appropriate tools as per manufacturers' requirements. The torque of the bolts attaching the lights to its base should be checked. The impact of aircraft wheels loosen mounting bolts and cause misalignment or fixture damage; this is particularly troublesome in the touchdown zone and in maneuvering areas subject to increased traffic.

Naksys has developed the ATorque system, a dedicated automatic solution to perform torque testing of the airfield ground lights very quickly and effectively while storing automatically all data via wireless transfer for trending and analysis.

The ATorque system is an open architecture and is fully customized as per most airports requests.

2./ Description of the ATorque System

The ATorque system is a dedicated automatic solution designed to perform the torque testing on the bolts of the airfield ground lights installed on runways and taxiways.

This test is a bi-monthly work to be undertaken on a consequent number of fittings installed on site.

The ATorque system is designed to be:

- portable
- easy to handle
- working in standing position of operator
- fast & effective
- automatic transfer of data to a main computer using WIFI hotspot
- compatible with other airfield maintenance products manufactured by Naksys

The ATorque system performs:

- automatic recognition of fittings
- automatic computing of test data
- automatic storage of data collection in the database
- data sharing with other maintenance tools developed by Naksys

3./ Overall diagram

The following diagram illustrates the system configuration of the torque tester.

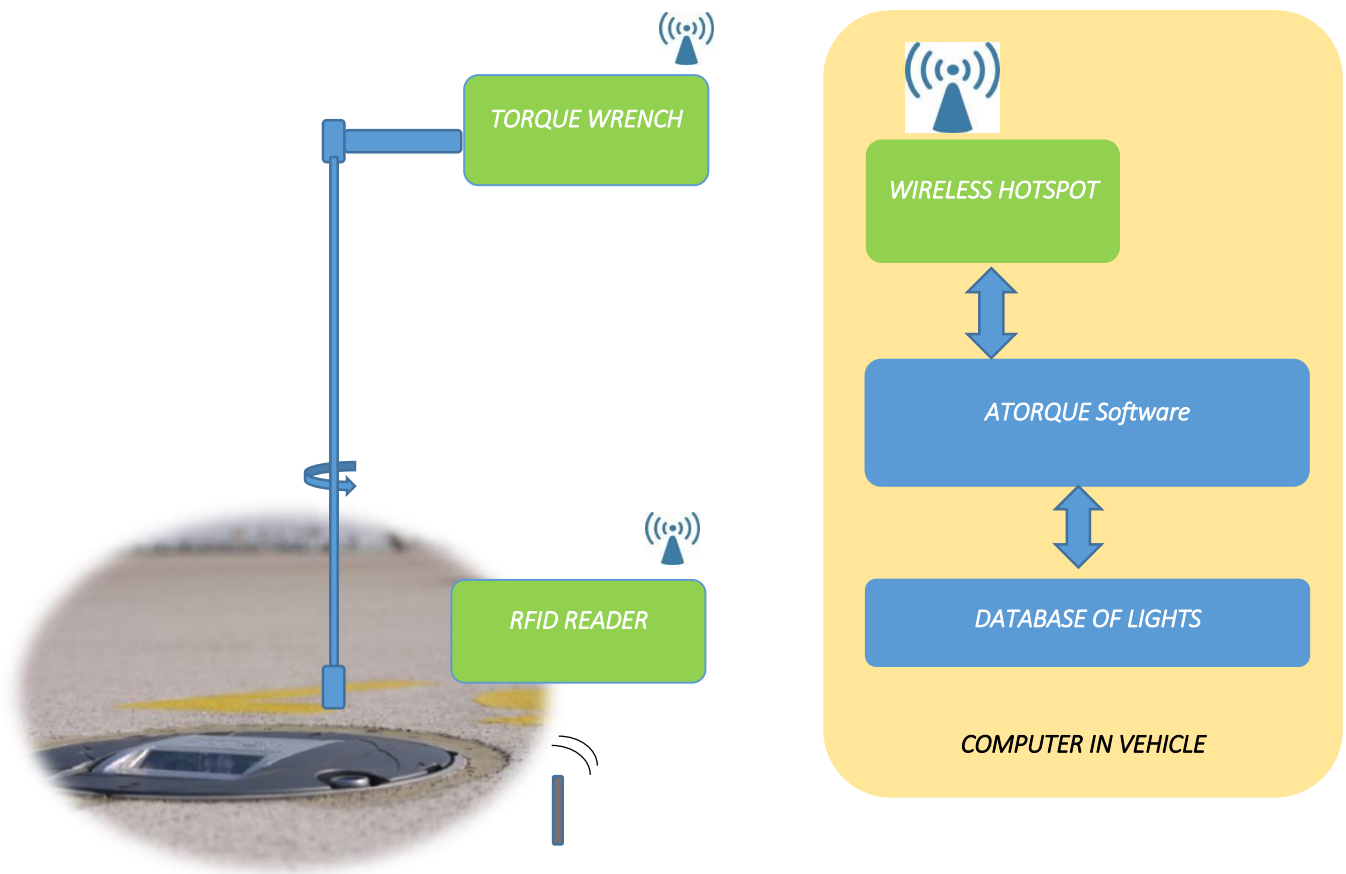


Fig 1. ATorque system configuration

The proposed configuration for airports is as follows.

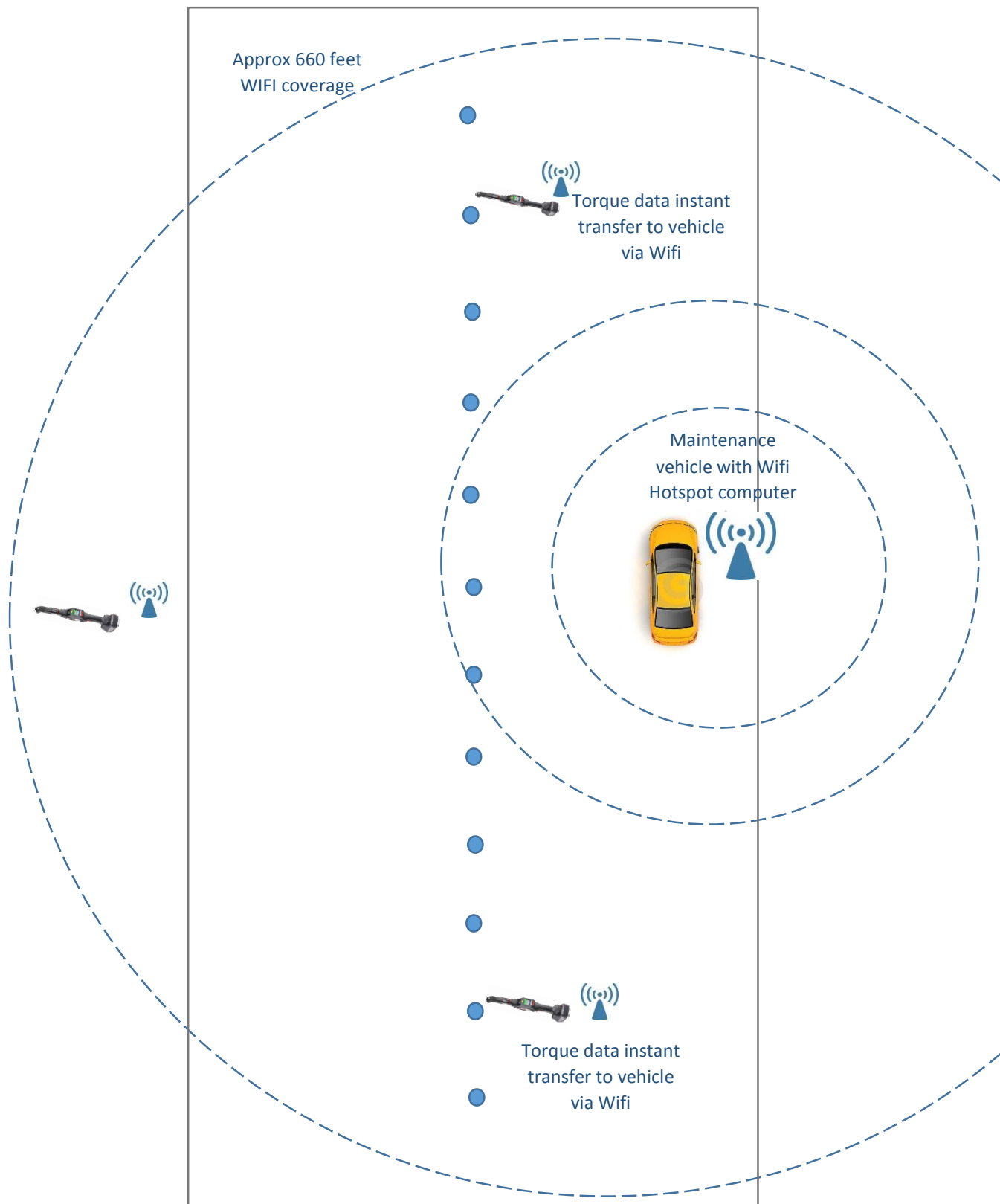


Fig 2. ATorque system deployment on site

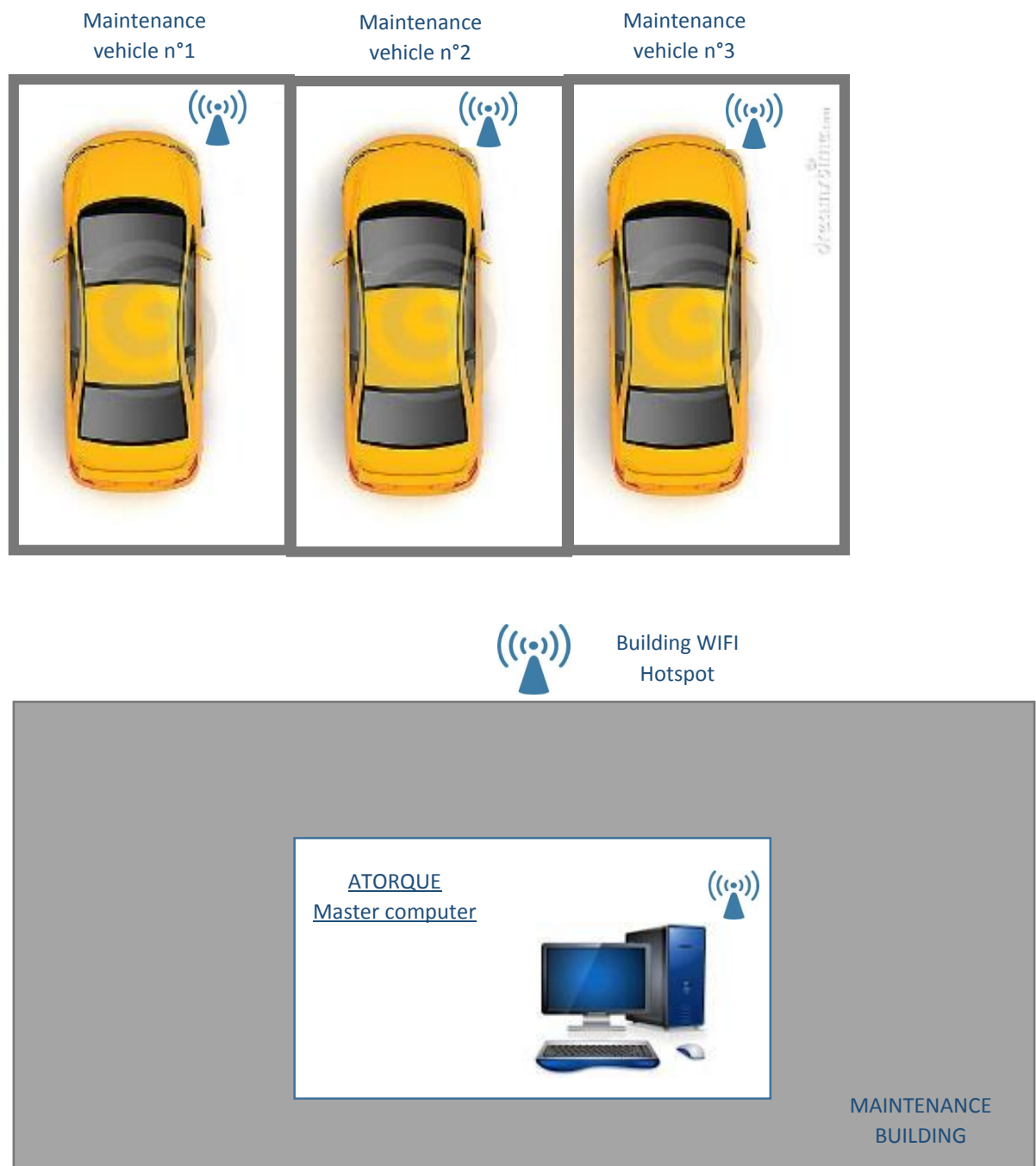


Fig 3. Synchronization with master computer in building

4./ Technical description

The ATorque solution proposed includes all necessary hardware to equip 1 maintenance vehicles, as listed in the below table. The quantities provided below for each item is indicative only and shall be confirmed up on final decision by the airport.

Description of components	Total Quantity
Full-automatic battery powered wireless torque driver. 3 units per vehicle	3
Equipped carrier with RFID module. 3 units per vehicle	3
One computer unit in vehicle with Wifi Hotspot.	1
One Wifi Hotspot outside building	1
One Master computer in maintenance building	1
Extended socket 3 feet long	3
Spare batteries	3
Charger pack	1



Fig 4. Full automatic battery powered torque driver wireless version

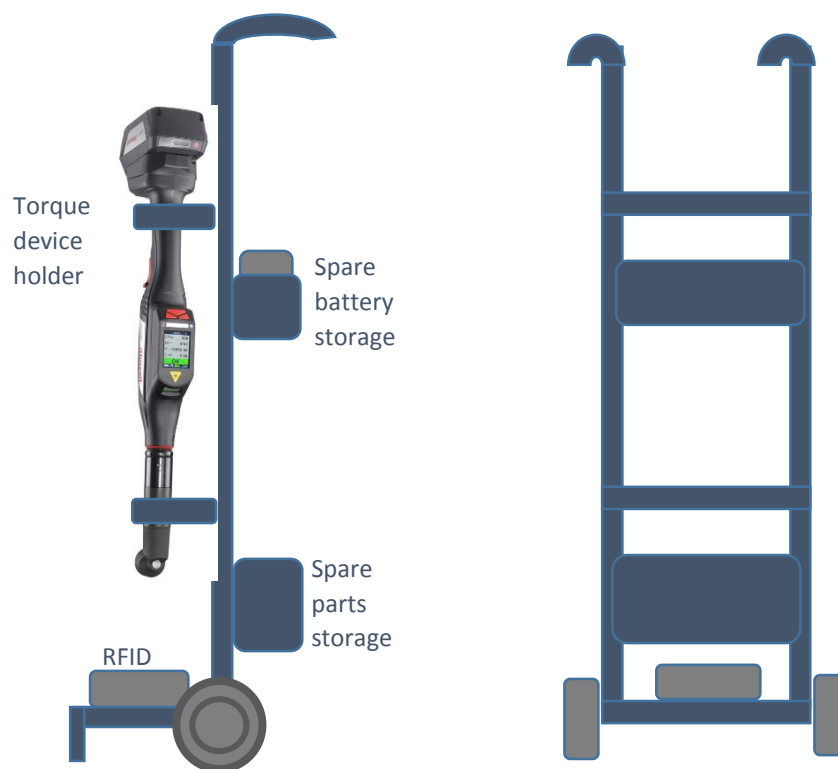


Fig 5. Equipped carrier with RFID module

5./ ATorque software overview

5.1/ ATorque realtime software

The ATorque realtime software is installed in the computer unit inside the maintenance vehicle.

The operator travels on site pulling the equipped carrier. When the carrier stands near the light fitting the RFID module reads the tag and sends automatically the light identification number to the computer unit.

The operator performs the torqueing using the electric driver and moves to the next light fitting.

The torque data is transmitted automatically to the computer.

The computer unit inside the maintenance building stores all data from the various torque drivers used on site.

The software provides all useful functions to view the reports of the tests.

5.2/ ATorque Master software

When the vehicles reach back the maintenance building, the computer units of the vehicles synchronize the data with the master computer inside the building.

The master computer downloads all data from various vehicles and stores in the main database.

The ATorque Master software provides all useful functions to manage the tests, the lights database and to view & print the reports.

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Setting

Locate Map

About Us

Logout

Read RFID Tag

Read Torque Value

T_T

Torque Test Process

Items List

Reports

Item Ref

RCL08-C1-110

Rfid Tag

000000000000000000000010

Bar Code

11223387

X Gps

5937,60679

Y Gps

1757,23456

No. Of Nuts

4

Torque Status

OK

Torque Date

24/01/2015

Operator

Eric

Brand

ATG

Observations

Browse

Upload

SCAN

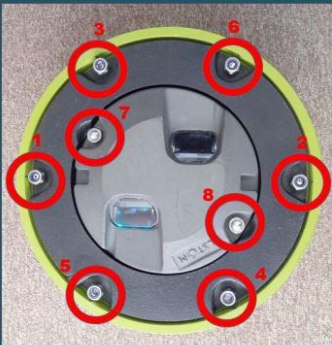
UPDATE

DELETE

CLEAR

DELETE ALL

VIEW LIST



NAKSYS 6 Rue des Deux Communes 91480 Quincy Sous Senart - France- Tel : +33 1 69 02 16 10 Fax : +33 1 69 48 93 76

Item List View

Item Ref --Select-- Search

View All << Pre 1000 Next >> Clear

Print Showing 1 to 1000 of 39 entries Reload

SINo	Item_Ref	RFID_Tag	Barcode	XGps	YGps	Number_of_Nuts	Tor
1	RCL08-C1-101	00000000000000000001	11223378	5937,60679	1757,23456	4	OK
2	RCL08-C1-102	00000000000000000002	11223379	5937,60679	1757,23456	4	OK
3	RCL08-C1-103	00000000000000000003	11223380	5937,60679	1757,23456	4	OK
4	RCL08-C1-104	00000000000000000004	11223381	5937,60679	1757,23456	4	OK
5	RCL08-C1-105	00000000000000000005	11223382	5937,60679	1757,23456	4	OK
6	RCL08-C1-106	00000000000000000006	11223383	5937,60679	1757,23456	4	OK
7	RCL08-C1-107	00000000000000000007	11223384	5937,60679	1757,23456	4	OK
8	RCL08-C1-108	00000000000000000008	11223385	5937,60679	1757,23456	4	OK
9	RCL08-C1-109	00000000000000000009	11223386	5937,60679	1757,23456	4	OK

Fig 8. Lights list in the database

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Setting Locate Map About Us

Read RFID Tag

Read Torque Value

Torque Test Process

Items List

Report

RFID tag Item ref Status Date

SCAN RFID Search All << Pre 500 Next >> Showing 1 to 500 of 133 entries Search Clear Reload

Report_No	Item_Ref	Report_Date	Report_Time	RFID_Tag	Number_of_Nuts	Count	Torque_Status	Torque_Value	Angle_Value	Error_Source	Error_Code	Observation
1	RCL08-C1-105	27/02/2015	16:32:00	921123460	4	1	OK	7.3	2			
2	RCL08-C1-105	27/02/2015	16:32:00	921123460	4	2	OK	7.3	2			
3	RCL08-C1-105	27/02/2015	16:32:00	921123460	4	3	OK	7.3	2			
4	RCL08-C1-105	27/02/2015	16:32:00	921123460	4	4	OK	7.3	2			
5	RCL08-C1-105	27/02/2015	16:39:00	921123460	4	1	OK	7.3	2			
6	RCL08-C1-105	27/02/2015	16:39:00	921123460	4	2	OK	7.3	2			
7	RCL08-C1-105	27/02/2015	16:39:00	921123460	4	3	OK	7.3	2			
8	RCL08-C1-105	27/02/2015	16:39:00	921123460	4	4	OK	7.3	2			
9	TCL-A1-323	27/02/2015	16:48:00	921123513	2	1	OK	7.3	2			
10	TCL-A1-323	27/02/2015	16:48:00	921123513	2	2	OK	7.3	2			
11	RCL08-C1-113	27/02/2015	16:48:00	921123468	4	1	OK	7.3	2			
12	RCL08-C1-113	27/02/2015	16:48:00	921123468	4	2	OK	7.3	2			
13	RCL08-C1-113	27/02/2015	16:48:00	921123468	4	3	OK	7.3	2			
14	RCL08-C1-113	27/02/2015	16:48:00	921123468	4	4	OK	7.3	2			
15	APCL-C11-440	27/02/2015	16:56:00	921123020	6	1	OK	7.3	2			
16	APCL-C11-440	27/02/2015	16:56:00	921123020	6	2	OK	7.3	2			
17	APCL-C11-440	27/02/2015	16:56:00	921123020	6	3	OK	7.3	2			
18	APCL-C11-440	27/02/2015	16:56:00	921123020	6	4	OK	7.3	2			
19	APCL-C11-440	27/02/2015	16:56:00	921123020	6	5	OK	7.3	2			
20	APCL-C11-440	27/02/2015	16:56:00	921123020	6	6	OK	7.3	2			
21	APCL-C11-439	27/02/2015	17:18:24.5570000	921123019	6	1	OK	7.3	2			
22	APCL-C11-439	27/02/2015	17:18:26.4200000	921123019	6	2	OK	7.3	2			
23	APCL-C11-439	27/02/2015	17:18:27.6700000	921123019	6	3	OK	7.3	2			
24	APCL-C11-439	27/02/2015	17:18:28.7330000	921123019	6	4	OK	7.3	2			
25	APCL-C11-439	27/02/2015	17:18:29.8330000	921123019	6	5	OK	7.3	2			
26	APCL-C11-439	27/02/2015	17:18:30.9230000	921123019	6	6	OK	7.3	2			
27	APCL-C11-438	27/02/2015	17:49:12.1400000	921123018	6	1	OK	7.3	2			
28	APCL-C11-438	27/02/2015	17:49:14.0770000	921123018	6	2	OK	7.3	2			
29	APCL-C11-438	27/02/2015	17:49:23.2800000	921123018	6	3	OK	7.3	2			
30	APCL-C11-438	27/02/2015	17:49:24.6870000	921123018	6	4	OK	7.3	2			
31	APCL-C11-438	27/02/2015	17:49:25.8570000	921123018	6	5	OK	7.3	2			
32	APCL-C11-438	27/02/2015	17:49:29.1370000	921123018	6	6	OK	7.3	2			
33	APCL-C11-441	02/03/2015	11:57:50.1530000	921123021	6	1	OK	7.3	2			

Fig 9. Report list

ATorque System Report - ATLANTA INT AIRPORT

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Report_No	Item_Ref	Report_Date	Report_Time	RFID_Tag	Number_of_Nuts	Count	Torque_Status	Torque_Value	Angle_Value	Error_Source	Error_Code	Observation
114	RCL08-C1-107	09/03/2015 00:00:00	18:11:13.580 0000	0000000000000 000000007	4	0	NOK	27,4	74		E5	
115	RCL08-C1-107	09/03/2015 00:00:00	18:11:24.743 0000	0000000000000 000000007	4	1	OK	20,3	53		----	
116	RCL08-C1-107	09/03/2015 00:00:00	18:11:42.230 0000	0000000000000 000000007	4	2	OK	19,7	142		----	
117	RCL08-C1-107	09/03/2015 00:00:00	18:12:10.893 0000	0000000000000 000000007	4	3	OK	19,4	58		----	
118	RCL08-C1-107	09/03/2015 00:00:00	18:12:25.417 0000	0000000000000 000000007	4	4	OK	19,6	138		----	
119	RCL08-C1-107	09/03/2015 00:00:00	18:15:10.210 0000	0000000000000 000000007	4	1	OK	19,5	66		----	
120	RCL08-C1-107	09/03/2015 00:00:00	18:15:26.183 0000	0000000000000 000000007	4	2	OK	18,8	142		----	
121	RCL08-C1-107	09/03/2015 00:00:00	18:16:05.493 0000	0000000000000 000000007	4	3	OK	20,5	73		----	
122	RCL08-C1-107	09/03/2015 00:00:00	18:16:14.297 0000	0000000000000 000000007	4	4	OK	19,3	409		----	
127	RCL08-C1-107	09/03/2015 00:00:00	19:53:21.767 0000	0000000000000 000000007	4	0	NOK	28,0	118		E5	
128	RCL08-C1-107	09/03/2015 00:00:00	19:53:26.230 0000	0000000000000 000000007	4	0	NOK	24,9	101		E5	
129	RCL08-C1-107	09/03/2015 00:00:00	19:53:44.823 0000	0000000000000 000000007	4	0	NOK	0,0	0		E3	
130	RCL08-C1-107	09/03/2015 00:00:00	19:54:00.180 0000	0000000000000 000000007	4	0	NOK	25,7	99		E5	
131	RCL08-C1-107	09/03/2015 00:00:00	19:54:26.550 0000	0000000000000 000000007	4	1	OK	19,6	75		----	
132	RCL08-C1-107	09/03/2015 00:00:00	19:54:58.133 0000	0000000000000 000000007	4	1	NOK	0,0	0		E2	
133	RCL08-C1-107	09/03/2015 00:00:00	19:54:59.140 0000	0000000000000 000000007	4	2	OK	20,1	74		----	
134	RCL08-C1-107	09/03/2015 00:00:00	19:55:13.027 0000	0000000000000 000000007	4	3	OK	19,9	64		----	
135	RCL08-C1-107	09/03/2015 00:00:00	19:55:27.083 0000	0000000000000 000000007	4	4	OK	19,3	64		----	

Fig 10. Report printout

End of document