User Manual

WITS™ Access Point – Safe Area

User Manual P/N: 700022
Revision: 1

ORIGINAL INSTRUCTIONS

Keep this document for future reference.

Aelium Solutions LLC ("Aelium") has made every effort to ensure that all information in this document is as accurate and current as possible. Some graphic or visual differences from this manual to the actual product are possible.

This document is intended for guidance and informational purposes and must be used in association with adequate training and on-the-job supervision to provide safe and effective equipment use.

The user must comply with the information and instructions included in this document.

It is the responsibility of the user to conform to all regulations and requirements issued by an authority or agency which may affect the operation, safety or equipment integrity, that may overrule the content of this documentation.

The user of this document shall protect, indemnify, and hold harmless Aelium and its directors, officers, employees, and agents from and against all liability for personal injury, death, or property damage resulting directly or indirectly from the use of the information contained in this manual.

Under no circumstance will Aelium Solutions LLC be liable for any incidental, consequential or special damages of any kind whatsoever, in any association with the use of Aelium Solutions LLC's equipment or this document.

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Table of Contents

1 Introduction, Description, Specifications

1.1 Copyright

1.2 Introduction

This User Manual applies to the Aelium Wireless Access Point – Safe Area, for all Aelium WITS™ Torque Sub models and their variants.

Aelium Solutions LLC ("Aelium") has made every effort to ensure that all information in this User Manual is as accurate and as current as possible. Some graphic or visual differences from this manual to the actual product are possible.

The purpose of the User Manual is to provide equipment installation, operation and safety instructions. Aelium does not warrant or guarantee that this information is complete or accurate in every aspect. The user should consult with an Aelium representative for any questions, clarifications and/or updates.

The user of this manual shall protect, indemnify, and hold harmless Aelium and its directors, officers, employees, and agents from and against all liability for personal injury, death, or property damage resulting directly or indirectly from the use of the information contained in this manual.

It is the user's full responsibility to observe all descriptions, information and instructions contained in this manual. This manual is intended for guidance and informational purposes and must be used in association with adequate training and on-the-job supervision to provide safe and effective equipment use.

It is the responsibility of the user to conform to all regulations and requirements issued by an authority or agency which may affect the operation, safety, or equipment integrity, that may overrule the content of this documentation.

The user will acknowledge and obey any general legal or other mandatory regulation in force relating to accident prevention, safety, statutory compliance, regulatory compliance, and equipment integrity.

1.3 Storage of User Manual

Keep this User Manual safe in the vicinity of the product. All persons who work on or with the product should be advised on where the manual is located.

An electronic copy of the User Manual is stored on the Aelium provided PC or Tablet. It is the user's responsibility to ensure the most current revision of the manual is used. Please check the Aelium website for the current revision of the User Manual or contact your Aelium sales representative.

Website: www.aeliumsolutions.com

1.4 Description of the WITS™ products

The Wireless Information Technology System (WITS™) is a data acquisition tool for drilling and casing running applications, commonly referred to as a "torque sub". The WITS™ system records various drilling and operational parameters, and may include torque, tension, compression, turns, RPM, pressure and temperature. The WITS™ system tracks, records, stores and transmits data. All data is encrypted using proprietary encryption technology to ensure data safety and data integrity.

The WITS™ systems can be updated remotely with an internet connection. This greatly simplifies adding and improving features and functions as they are developed and become available. When connected to the internet at the end of a job, the job information and updates are synchronized with the Aelium Cloud Server™ where the data can be remotely accessed. Regular synchronizing ensures the jobs are backed up, and that the WITS firmware, User Interface software and the computer itself are updated and ready to go to work.

All WITS™ models are highly configurable. Please contact your Aelium sales representative for specific configurations and/or requests.

1.4.1 WITS-1 Models

The WITS-1 models typically cover a load range of up to 500 ton (453.6 metric tons) and a connection size range of up to NC-50, NC-56 and API 6-5/8" REG. Higher load ratings may be possible. Please contact your Aelium sales representative for specific load ratings, connection sizes and configurations.

1.4.2 WITS-2 Models

The WITS-2 models typically cover a load range of up to 1,000 ton (907.2 metric tons) and a connection size range of up to NC-70, NC-77, API 7-5/8" REG and API 8-5/8" REG. Higher load ratings may be possible. Please contact your Aelium sales representative for specific load ratings, connection sizes and configurations.

1.4.3 WITS User Interface Software

The WITS™ User Interface (UI) Software provides for a user interface to the WITS™ Torque Sub through an Aelium Access Point.

Through the UI, the user can view, access, record, and monitor various operational parameters and status information of the WITS™ system.

1.4.4 Access point and tablet options

The WITS™ system must be used with an Aelium Access Point (AP) and WITS™ UI software. The WITS™ Torque Sub, AP, and UI software are configured to optimize communications integrity, reliability and power consumption.

The system can be supplied with different access points and tablets with user interface (UI) software depending on the customer's preferences and needs.

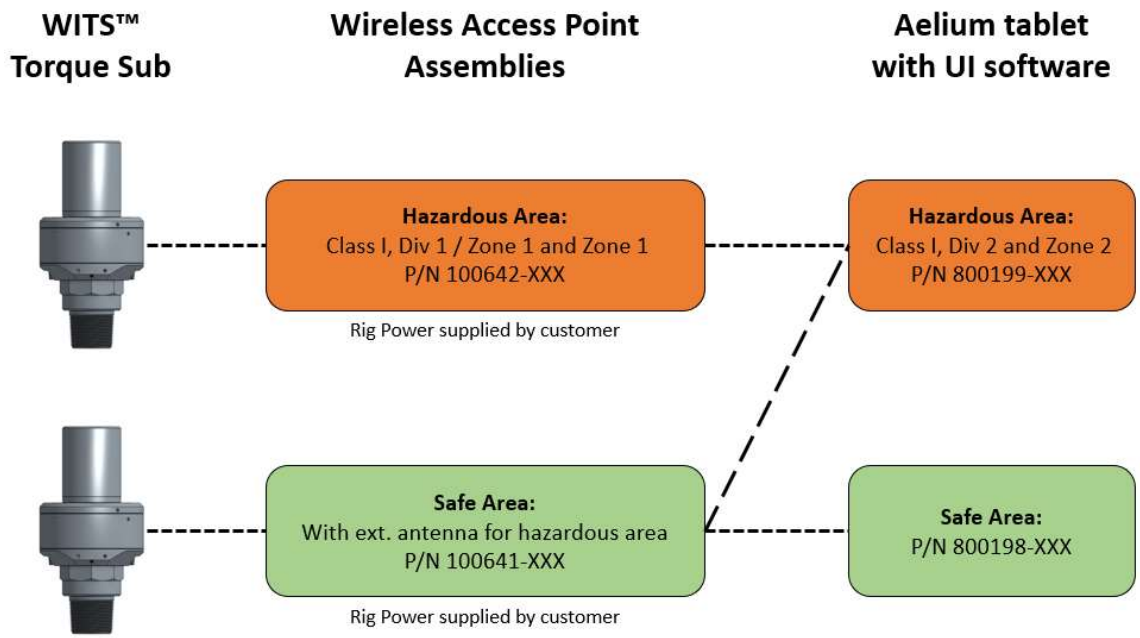


Figure 1: WITS™ access point and tablet options

The hazardous area rated tablet can be used with either access point option.

1.4.4.1 Aelium provided tablet

Aelium typically provides a new tablet with a WITS™ system and full standard warranty.

1.4.4.2 AllTorque provided tablet

If the customer already owns an AllTorque supplied Microsoft Surface Pro tablet (models 5 or higher), the user can install the Aelium User Interface Software on that tablet and use the AllTorque tablet to operate the Aelium WITS™ system.

1.5 Reference Documents

Aelium P/N	Description
700020	USER MANUAL, WITS TORQUE SUB
700022	USER MANUAL, ACCESS POINT, SAFE AREA
700023	USER MANUAL, ACCESS POINT, HAZARADOUS LOCATION
700024	USER MANUAL, TABLET, SAFE AREA
700025	USER MANUAL, TABLET, HAZARADOUS LOCATION
700026	USER MANUAL, WITS USER INTERFACE SOFTWARE

2 Important Safety Information

2.1 Identification of warnings

This is a safety alert symbol.

It is used to alert you to potential physical injury hazards.
Obey all safety messages that follow this symbol to avoid possible injury or death.

⚠DANGER

INDICATES A HAZARDOUS SITUATION, THAT, IF NOT AVOIDED, WILL RESULT IN DEATH OR SERIOUS INJURY.

⚠WARNING

INDICATES A HAZARDOUS SITUATION, THAT, IF NOT AVOIDED, COULD RESULT IN DEATH OR SERIOUS INJURY.

⚠CAUTION

INDICATES A HAZARDOUS SITUATION, THAT, IF NOT AVOIDED, COULD RESULT IN MODERATE OR MINOR INJURY.

NOTICE

Indicates information considered important, but not related to physical injury.

2.2 Power Quality and grounding

Power quality and availability on a rig site can vary significantly during a job and from job to job.

Clean and consistent power and grounding is required for safe and reliable operation of the Aelium provided equipment.

Aelium recommends that the user deploys power conditioning, filtering, and/or isolation measures such as power conditioners, power supplies, inverters or battery backup units. These devices will improve the performance, reliability, and durability of the Aelium provided access point.

2.3 General safety

- Read and understand the contents of this document.
- Do not perform maintenance, inspection or repairs during operation.
- The steps given in this document are guidelines.

- Always follow applicable on-site safety instructions and procedures where applicable.
- Wear appropriate PPE (Personal Protective Equipment).

2.3.1 Intended personnel

This User Manual is intended for installation, commissioning, operation, maintenance and inspection personnel.

2.3.2 Maintenance

- The equipment shall be maintained according to the guidelines in this User Manual.
- Only OEM parts shall be used.
- Aftermarket parts may not be safe or suitable and void product certifications and warranty.

2.3.3 Misuse

The equipment is designed for specific functions and applications and should be used only for its intended purpose.

2.3.4 Product and warning labels

Product and warning labels must be present on the equipment and shall be replaced when damaged or missing.

3 Power Supply

- The Aelium AP Assemblies and Aelium provided Tablets require a 120VAC/60Hz power source provided by the customer.
- The supply must use a 2-conductor with ground conductor for proper operation and safety.

⚠WARNING

A CONTINUOUS AND CLEAN GROUND CONNECTION IS REQUIRED TO ACHIEVE AND MAINTAIN THE AELIUM WIRELESS ACCESS POINT HAZARDOUS AREA LOCATION RATING FOR THE EXTERNAL ANTENNA ASSEMBLY AND THE SAFETY RATING OF THE ACCESS POINT.

4 Wireless Access Point – Safe Area

4.1 General

The safe area location rated Wireless Access Point Assembly (Aelium P/N 100641-XXX) must be installed and used in accordance with the information provided in this user manual.

⚠WARNING

FIRE, EXPLOSION, AND SEVERE BURN HAZARD.

DO NOT INSTALL, REMOVE, MAINTAIN OR OPEN WHEN AN EXPLOSIVE ATMOSPHERE MAY BE PRESENT.

DO NOT REMOVE ANY PARTS WHEN AN EXPLOSIVE ATMOSPHERE MAY BE PRESENT.

ALWAYS HAVE QUALIFIED PERSONNEL INSTALL, REMOVE, MAINTAIN AND CONNECT POWER TO THE ACCESS POINT TO ENSURE SAFETY ACCORDING TO ALL APPLICABLE REGULATIONS AND HAZARDOUS LOCATION RATINGS AT THE AREA OF INSTALLATION.

4.2 Unpacking

The Wireless Access Point Assembly is shipped in a hardened suitcase to protect the equipment from impact, shock and vibration as well as the environment.

The suitcase allows easy assembly, disassembly and transportation.

- Open the suitcase

- Remove the AP and Internal Antenna.
- Remove the foam insert to access the power cable assembly P/N 100643-BSC (~15ft length) and the external antenna assembly P/N 100638-BSC (~25ft length).

- Remove the power cable assembly and external antenna assembly.

- Place the foam elements back into the suitcase, close it, and store in a safe location.

4.3 Installation

4.3.1 Access Point

- There are no operator serviceable parts inside the Access Point (AP).
- **Do not open the AP.**
- Install the Wireless Access Point (AP) in a location that enables line-of-sight communication to the computer with the Aelium User Interface (UI) software.
- The AP is equipped with magnets on the back of the housing for easy mounting on magnetic surfaces where available and to assist with mounting the AP using the 4 mounting holes on the mounting brackets.
- Place the AP on a magnetic surface or on a secure, flat surface and ensure it is securely mounted.
- Ensure all connections are secured.

4.3.2 Power cable and Internal Antenna (Non-I.S.)

- Connect the power cable assembly to the “INPUT POWER” connector
- Connect the Internal Antenna to the “INTERNAL ANTENNA (NON-I.S)” connector and tighten finger tight.
- This antenna port is **NOT INTRINSICALLY SAFE** (NON-I.S.).
- **This antenna port must only be used for antenna placement in a safe area.**

Figure 2: Internal antenna connection – safe area use only

⚠WARNING

NEVER CONNECT AN ANTENNA OR ANTENNA ASSEMBLY TO THIS PORT THAT MAY BE INSTALLED IN A HAZARDOUS AREA!

4.3.3 External Antenna Assembly

- The external antenna assembly is equipped with a standard ~25 ft long, extremely low resistance coaxial RF cable to allow routing of the external antenna to a location that enables line-of-sight communication from the antenna to the WITS™ Toque Sub.
- The external antenna assembly is pre-assembled and tested at the factory prior to shipment. Check that all connections on the antenna bracket are secure and tight.
- The RF cable and Antenna connections shall be hand tight.
- **LINE-OF-SIGHT CONNECTION BETWEEN THE WITS™ TORQUE SUB AND THE EXTERNAL ANTENNA IS VERY IMPORTANT FOR SIGNAL STRENGTH, SIGNAL INTEGRITY AND COMMUNICATION RELIABILITY.**
- **POSITION THE ANTENNA AND MOUNTING BRACKET IN A LOCATION WITH LINE-OF-SIGHT CONNECTION TO THE WITS TORQUE SUB.**
- The mounting bracket is equipped with a magnet on the back of the bracket to assist in the easy installation of the antenna bracket where a magnetic surface is available.
- **Position the antenna mounting bracket and secure it with cable ties or mounting straps so the antenna won't move during operation.**
- Route the RF cable so that it doesn't get damaged or kinked.
- Secure the RF cable according to the applicable regulations of the installation location.
- Connect the external antenna assembly to the "TO EXTERNAL ANTENNA (I.S.) (External RF Cable)" and tighten finger tight.
- The "TO EXTERNAL ANTENNA (I.S.) (External RF Cable)" on the Access Point is protected by an Intrinsically Safe (I.S.) Circuit.
- This Intrinsically Safe (I.S.) Circuit provides the protection for the external antenna to be mountable in a hazardous area

Figure 3: External antenna assembly connection

⚠WARNING

ONLY CONNECT THE EXTERNAL ANTENNA ASSEMBLY TO THE "TO EXTERNAL ANTENNA (I.S.) (External RF Cable)" PORT ON THE WIRELESS ACCESS POINT!

THE EXTERNAL ANTENNA ASSEMBLY MUST BE CONNECTED TO THIS PORT IN ORDER TO MAINTAIN ITS HAZARDOUS AREA RATING.

4.3.4 Power Supply

- Ensure the AP and all its connections are secured.
- The AP requires a suitable power supply with proper ground connection.

⚠WARNING

THE POWER SUPPLY MUST BE CONNECTED TO A GOOD AND CLEAN GROUND CONNECTION IN ORDER TO MAINTAIN ITS SAFETY AND HAZARDOUS AREA RATINGS.

4.4 Pre-operation check

PERFORM THE FOLLOWING CHECKS PRIOR TO EACH USE.

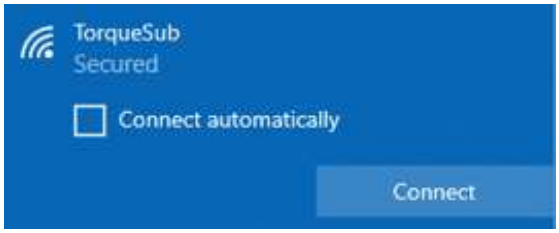
#	ITEM	PASS /FAIL	NAME	DATE / NOTES
1	INSPECT AP ASSEMBLY, CABLES AND ANTENNAS FOR SIGNS OF DAMAGE, IMPACT, DEFORMATION, CORROSION AND WEAR.			
2	ENSURE THE EXTERNAL ANTENNA ASSEMBLY IS CONNECTED TO THE "TO EXTERNAL ANTENNA (I.S.) (External RF Cable)" PORT ON THE WIRELESS ACCESS POINT.			
3	ENSURE THE EXTERNAL ANTENNA ASSEMBLY IS INSTALLED WITH LINE-OF-SIGHT TO THE WITS TORQUE SUB			
4	ENSURE THE EXTERNAL ANTENNA ASSEMBLY IS INSTALLED SECURELY AND THE ANTENNA BRACKET CAN'T MOVE DURING OPERATION.			
5	ENSURE THE EXTERNAL ANTENNA ASSEMBLY RF CABLE IS ROUTED SAFELY AND SECURED.			
6	ENSURE THE INTERNAL ANTENNA IS INSTALLED WITH LINE-OF-SIGHT TO THE COMPUTER WITH THE AELIUM USER INTRFACE SOFTWARE.			
7	ENSURE THE POWER SUPPLY IS CONNECTED AND GROUNDED.			
8	ENSURE ALL CONNECTIONS ARE TIGHT AND SECURE.			

Additional copies are in section 10 below.

4.5 Operation

Following the above steps, the AP is now ready to be used.

- Connect the power cord to a suitable power supply.
- The AP powers up and runs through an internal self-check sequence. This process takes about one (1) minute.
- There are no indicator lights on the outside of the enclosure.
- Upon successful completion of the self-check and power up, the AP is now detectable as a WiFi network named "**TorqueSub**":



4.6 Power interruptions

Power interruptions, brown-outs, power spikes, black-outs, etc. can cause the AP to shut down or re-boot.

In extreme cases it can damage the equipment and require repair or replacement.

A customer supplied, clean and stable power supply and grounding is important for proper operation of all Aelium equipment. The customer shall provide power conditioning equipment where possible, please refer to section 2.2 above.

During a re-boot or power outage, the AP will not transmit any data until the self-check sequence during startup is complete AND the AP is re-connected to the computer with the Aelium WITS™ UI software.

It may be necessary to close the Aelium WITS™ UI software and re-start it to re-connect with the AP and the Torque sub after a power interruption to the AP.

4.7 WiFi interruptions during a job

The WITS™ Torque Sub is designed to store approximately 10 minutes of operational data on the sub. If a WiFi connection is lost for any reason, there is not data loss if re-connected within that time frame. The WITS™ Torque Sub will transfer the stored data as soon as the WiFi connection is re-established.

4.8 Shut Down

- To shut down the AP, disconnect and shut down the Aelium User Interface (UI) software by properly exiting the UI software as described in the User Manual P/N 700026 “WITS UI User Manual”.
  This ensures the proper disconnection of the Aelium User Interface (UI) software from the WITS™ Torque Sub.
- Unplug the power cord plug from the power supply.

4.9 Post-Operation Check

- After completing a job or operation, inspect the AP and its components for any signs of damage.
- If any of the AP or its components show any signs of damage, follow the “Maintenance” guidelines.
- If damage is beyond normal maintenance, contact Aelium Solutions.

4.10 Disassembly and storage

- Disconnect the power cable from the AP input power port.
- Roll up the power cable and store it in the suitcase.
- Disconnect the external antenna RF cable from the AP.
- Uninstall the external antenna assembly from its mounting location, clean and dry it.
- Roll up the external antenna assembly and store it in the suitcase.
- Disconnect the internal antenna from the AP.
- Uninstall the AP and store it with the internal antenna in the suitcase.

5 Trouble Shooting

Problem	Possible Solutions
The WiFi connection of the AP is not detectable	1. Ensure the rig power supply has the proper power and ground available. Rig power can vary greatly! 2. Ensure all antennas are properly and securely connected to the AP. 3. Check the antennas for damage. 4. Check the external antenna assembly for damage to the RF cable and antenna. 5. Check the external antenna assembly bulkhead connector for proper and secure seating. 6. Check your Wi-Fi settings on your computer. 7. Ensure WiFi is turned on. 8. Scroll through all available WiFi connections to find the "TorqueSub" Wi-Fi.
The WiFi connection of the AP is not detectable – Panasonic Tablets / PCs	• If you are **using** a **Panasonic FZ-G1 tablet**, ensure the Wireless LAN IEEE802.11a is enabled. • Go to the "Panasonic PC Settings Utility" and open the app. • Go to "Settings" and "Wireless LAN". • Ensure the "enabled" button is selected. 
The WiFi connection of the AP is not detectable	Unplug the AP power supply, wait 1 minute. Then reconnect to power and wait 3 minutes and check for the WiFi network. If not detectable, contact Aelium for support of troubleshooting the router.
Damage to the AP or its components	Replace damaged components with Aelium OEM parts only to maintain the safety and Hazardous Area ratings of the equipment.

6 Maintenance

Maintenance is limited to replacing damaged or non-functioning parts with Aelium OEM parts only.

There are no operator serviceable parts inside the AP.

Do not open the AP unless advised to do so by an Aelium representative.

Inspect the AP prior to and after each use for damage, loose parts, and excessive wear. Replace parts as necessary with Aelium OEM parts only.

⚠DANGER

FIRE, EXPLOSION, AND SEVERE BURN HAZARD.

DO NOT PERFORM ANY WORK OR MAINTENANCE ON THE ACCESS POINT OR ITS COMPONENTS IF AN EXPLOSIVE ATMOSPHERE MAY BE PRESENT.

DO NOT ALTER, MODIFY OR REPAIR ANY PARTS OF THE SYSTEM

⚠WARNING

USE AELIUM OEM PARTS ONLY.

NON-OEM PARTS MAY COMPROMISE THE SAFETY, PERFORMANCE AND CERTIFICATION OF THE SYSTEM.

ALWAYS WEAR PROPER PERSONAL PROTECTIVE EQUIPMENT (PPE).

7 Spare parts:

Item / Part Number	Description
300399-25	Assembly, RF cable, 25 FT
200301	Bracket, external antenna
300398	Bulkhead RF connector, N2N
800208	MAGNET
900045	SCREW
300370	Antenna
300414	Internal Antenna
300393 (US/Canada)	Access Point Assembly
300394 (EU/ROW)	Access Point Assembly

8 List of Figures

9 Change Summary

Document Revision	Date	Written by	Approved by	Description of change
0	06 Jan 2020	J. Pfrenger	R. Roling	Initial Release
1	15 Jan 2020	J. Pfrenger	R. Roling	DCN 200115-2. Updated sections 1.4 and 2. Minor formatting changes.

10 Pre-Operation Checks

PERFORM THE FOLLOWING CHECKS PRIOR TO EACH USE.

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3	ENSURE THE EXTERNAL ANTENNA ASSEMBLY IS INSTALLED WITH LINE-OF-SIGHT TO THE WITS TORQUE SUB			
4	ENSURE THE EXTERNAL ANTENNA ASSEMBLY IS INSTALLED SECURELY AND THE ANTENNA BRACKET CAN'T MOVE DURING OPERATION.			
5	ENSURE THE EXTERNAL ANTENNA ASSEMBLY RF CABLE IS ROUTED SAFELY AND SECURED.			
6	ENSURE THE INTERNAL ANTENNA IS INSTALLED WITH LINE-OF-SIGHT TO THE COMPUTER WITH THE AELIUM USER INTRFACE SOFTWARE.			
7	ENSURE THE POWER SUPPLY IS CONNECTED AND GROUNDED.			
8	ENSURE ALL CONNECTIONS ARE TIGHT AND SECURE.			

Make additional copies as required.

PERFORM THE FOLLOWING CHECKS PRIOR TO EACH USE.

IF IN DOUBT – ASK!

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Make additional copies as required.

11 Contact information:

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WITS™ User Interface User Manual

NOTES: