



USER GUIDE

TALYS ADP300 Series

Dual Sampling Point Analysis System



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Patents

Patent US 7,480,055

Patent US 8,014,965

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CHAPTER 1

Safety and Cyber Security

This system has been manufactured in accordance with state-of-the-art procedures; it is operationally safe. It has been tested and left the factory in perfect working condition. The information in this guide, as well as all applicable documentation and certificates, must be observed and followed to maintain this condition throughout the period of operation.

This chapter provides an overview of the safety conditions that must be observed when installing and operating the system. Full compliance with all general safety requirements must be observed during system operation. For personnel and system safety, and to ensure optimum performance, make sure that you thoroughly understand the content of this guide before installing, using, maintaining or servicing the system, and carefully plan any installation, modification, or repair before actually proceeding. If you do not understand the content of this guide, contact ABB service personnel.

Additionally, each chapter in this guide contains descriptions of processes or procedural instructions with their own specific safety information. Only by observing all safety information can you minimize the risks of hazards to personnel and the environment.

Intended Use

Using the device in a manner that does not fall within the scope of its intended use, disregarding this manual, using under qualified personnel, or making unauthorized alterations, releases the manufacturer from any liability for any resulting damage. Also, if the equipment is used in a manner not specified by the manufacturer, it may impair the protection provided by the equipment. This makes the manufacturer's warranty null and void.

The device must be used by properly trained personnel.

Definitions

This document uses the following symbols to bring attention to key technical and safety-related information.



DANGER—SERIOUS DAMAGE TO HEALTH/RISK TO LIFE

Indicates a hazardous situation that, if not avoided **will** result in death or serious injury.



WARNING—DAMAGE TO HEALTH/RISK TO LIFE

Indicates a hazardous situation that, if not avoided **could** result in death or serious injury.



CAUTION—DAMAGE TO HEALTH

Indicates a hazardous situation that, if not avoided, could result in **minor or moderate injury**.



NOTICE

Indicates information considered important, but not hazard related, that could impact things **other than personal injury**, like property damage.



WARNING—LASER RADIATION

Indicates the presence of a laser related hazard. It also indicates the type of laser in use, its wavelength and its safety class.



WARNING—HIGH VOLTAGE

Indicates the presence of electrical energy at voltages high enough **to inflict harm on living organisms**.



WARNING—SHARP EDGES

Indicates the presence of sharp edges that could cause personal injury if touched.



WARNING—HOT SURFACES

Indicates the presence of heat sufficient enough to cause burns.



ELECTROSTATIC DISCHARGES

Indicates a device or part of a device that is susceptible to electrostatic discharges.



The protective earth (ground) symbol identifies any terminal which is intended for connection to an external conductor for protection against electrical shock in case of a fault, or the terminal of a protective earth (ground) electrode.



Identifies protective earth conductor terminals.



Indicates the presence of direct current.

Personnel



WARNING

The analyzer weighs 22 kg (49 pounds). **ABB strongly recommends lifting the analyzer with the help of another person.** Make sure to use proper body mechanics to lift the analyzer (bend your knees) otherwise injuries could occur.

Do not attempt any adjustment, maintenance, or service procedure to the system if first aid is not readily accessible.

Do not, under any circumstances, remove warning and caution labels. For user safety, information must be available at all times.



WARNING

Do not store/operate the analyzer in the presence of flammable products, fumes, condensing moisture or high levels of dust.

Do not operate the analyzer if its covers or panels have been removed.

For user safety, safety data sheets (SDS) of all samples to be analyzed must be available at all times prior to using the system.



NOTICE

All components, whether during transportation, operation, or storage, must be in a non-corrosive environment.

Do not use the system if any signs of damage are present to any portion of its exterior surface. Contact ABB service personnel.

Always install the analyzer on a stable, hard, level surface.

Make sure to maintain a clearance of at least 15 cm (6 in.) in front of the heat sinks.

If the system is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

Screws are easily inserted and tightened. If excessive force is required to set a screw in place, remove the screw and retry; the screw is most likely not properly aligned.

Electrical

Before using the analyzer, make sure that the appropriate line voltage is available and that the analyzer is configured to use such line voltage.

Also, make sure that the correct fuses for that voltage are installed (see “Fuse Type” below).

Class of Equipment

The analyzer has an exposed metal chassis that is connected directly to earth via a power cord and is therefore classified as safety Class I equipment.



WARNING

Do not expose this system to any source of excessive moisture.

Do not use this system in an explosive atmosphere.



NOTICE

Class I equipment must have its chassis/protective earth wiring terminal connected to an electrical earth/ground by an earth conductor (colored green/yellow in most countries, green in the United States, Canada, and Japan).

Fuse Type

Fuse(s) are rated as follows: 2 × T2A/250 V (5 mm × 20 mm).



NOTICE

Do not use repaired fuses and avoid any situations that could short-circuit the fuse.

Grounding



WARNING

Use the analyzer **only** if a properly grounded power outlet is available.

Only use a power cord if it has proper conductive protection (grounding).

Ensure that the equipment and any devices or cords connected to the analyzer are properly grounded and are adequately rated (see “Electrical Specifications” on page D77).

Grounding must be present **at all times**. If necessary, have a certified electrician install a ground. Protective earthing connection (grounding) must be active **at all times**. Do not **interrupt** the protective earthing connection. The absence of grounding can lead to a potential shock hazard that could result in serious personnel injury. If an interruption of the protective earthing connection is suspected, make sure that the system remains inoperative.

ESD Warnings



ELECTROSTATIC DISCHARGES

Perform service procedures in an ESD-protected environment.

Always use ESD protection to service an analyzer. If you are not familiar with ESD protection, or if ESD protection material is not available, contact ABB customer support (see the back cover of this guide for contact information).

Power Connections

In accordance with international safety standards, each powered analyzer uses a three-wire power cord. When connected to an appropriate AC power receptacle, this power cord grounds the chassis.



WARNING

Ensure that the analyzer and any device or power cord connected to it are properly earthed. Use **only** a power cord with a properly rated protective earthing terminal (see “Electrical Specifications” on page D77).

Never use an extension cord that is not equipped with a protective earthing terminal.

Connect the power cord to a power outlet of the correct voltage and that has a protective earth contact point.

When servicing the source, disconnect the power cord and take precautions to avoid contact with energized parts.

Unless absolutely necessary, do not attempt to adjust or to perform any maintenance or service procedure when the analyzer is opened and connected to a power source at the same time.

Laser

Under normal conditions, the analyzer can be operated in complete safety. However, since the analyzer contains a laser (accessible only when the analyzer housing is open), observe the following warnings:



WARNING

Class 3B invisible laser radiations are present inside the interferometer module. However, no laser radiations leak out of the interferometer module.

Only certified ABB service personnel shall open the interferometer module. Opening the interferometer module cover may result in exposure to laser.

Laser type: VCSEL (invisible)
Laser class: 3B
Output power: 3 mW (maximum)
Wavelength: 760 nm

Cyber Security

This product is designed to be connected to, and communicate information and data via a network interface. It is the user's sole responsibility to provide, and continuously ensure, a secure connection between the product and the user's network or any other network (as the case may be). This system is not designed to be connected to the internet.

Users shall establish and maintain any and all appropriate measures (such as, but not limited to, the installation of firewalls, the application of authentication measures, the encryption of data, the installation of anti-virus programs, etc.) to protect the product, the network, its system and the interface against any kind of security breaches, unauthorized accesses, interferences, intrusions, leakages and/or theft of data or information.

ABB and its affiliates are not liable for damages and/or losses related to such security breaches, any unauthorized access, interference, intrusion, leakage and/or theft of data or information.

ABB strives to maintain cyber security for its products and services. By visiting the web page, you will find notifications about newly found software vulnerabilities and options to download the latest software. It is recommended that you visit this web page regularly:

<http://new.abb.com/about/technology/cyber-security>

Modbus Protocol Disclaimer

The Modbus® protocol **is an unsecured protocol** and as such, the intended application of this system should be assessed to ensure that these protocols are suitable before implementation.

To prevent any unauthorized accesses, always ensure that physical access to the analyzer and network are properly secured.

For cyber security reasons, ABB decided not to password protect the Modbus communication protocol in TALYS series analyzers.

The available TCP ports are Modbus 502 and 503, as well as port RDP 3389.

General Deployment Guidelines

- Limit and control physical access to the analyzer and the network on which it is connected.
- Limit and control access to all Modbus communication tools.
- Use role-based access according to needs.
- Change all default passwords and strictly control their dissemination (see “Modifying the Analyzer Password” on page 38).

Environmental

The system has required the extraction and use of natural resources for its production. Therefore, it may contain hazardous substances that could impact health and environment. To avoid dissemination of these hazardous substances into the environment, and also to reduce extraction, and to protect our natural resources, ABB strongly recommends using the appropriate recycling systems to make sure that materials used to produce your equipment are reused or recycled in a sound way.

The crossed-out wheeled bin reproduced on the product label (see “Certifications” on page 7 and Figure 1 on page 10) is a clear reminder that the product must not be disposed of with household waste.

For European countries, at the system end of life, contact your distributor before disposing of the analyzer.

Sustainable Development

Sustainability has been taken into account from the beginning of the product design including the pro-environmental manufacturing process, long lifetime, operation reliability and disposing of the device.

The choice of materials and suppliers has been made according to the EU RoHS directive (2011/65/EU) and amendments (EU 2015/863). This directive limits the use of hazardous substances.

Operational reliability and long lifetime have been ensured with extensive testing during the design and manufacturing processes.

Moreover, long lifetime is supported by maintenance and repair services as well as by the availability of spare parts. Design and manufacturing have been done under a certified environmental system. We follow environmental regulations systematically to evaluate their effect on our products and processes.

Certifications

The TALYS ADP300 Series analyzers have the following safety certifications¹:



For Canada and USA



For Europe



For USA (Federal Communications Commission)



Complies with 21 CFR 1040.10 and 1044.11 except for deviations pursuant to laser Notice no. 50, dated June 24, 2007. IEC 60825-1:2014



China RoHS is a Chinese government regulation that controls the legal threshold of lead, cadmium, mercury, hexavalent chromium, polybrominated biphenyls (PBBs), and polybrominated diphenyl ethers (PBDs) in electrical and electronic products.



WEEE (the crossed-out wheeled bin reproduced on the product label is a clear reminder that the product must not be disposed of with household waste.)

¹ Relevant certificates are available on the ABB website.

China RoHS - Detailed Table

TALYS ADP		有毒有害物质或元素 (Toxic or Hazardous Substances and Elements)					
部件名称 Part name		铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr6)	多溴联苯 (PBB)	多溴二苯 (PBDE)
电缆及电缆组件 Cables and Cable Assemblies		X	O	X	O	O	X
电路模块 Circuit Modules		X	X	X	X	X	X
显示装置 Display Assemblies		X	X	O	X	O	O
风扇模组 Fan Modules		X	O	X	O	O	O
金属零件 Metal Parts		X	O	X	O	O	O
塑料和聚合物零件 Plastic and Polymeric Parts		O	O	X	O	X	X
电源 Power Supply		X	O	X	O	O	O

O: 表示该有毒有害物质在该部件所有均质材料中的含量均在 GB/T 26572-2011 规定的限量要求以下。

O: Indicates that this toxic or hazardous substance contained in all of the homogeneous materials for this part is below the limit requirement in GB/T 26572-2011.

X: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 GB/T 26572-2011 规定的限量要求。

X: Indicates that this toxic or hazardous substance contained in at least one of the homogeneous materials for this part is above the limit requirement in GB/T 26572-2011.

技术条款解释：

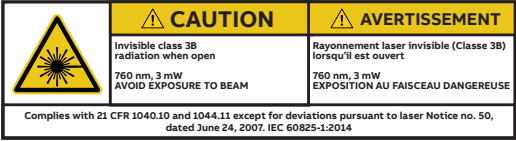

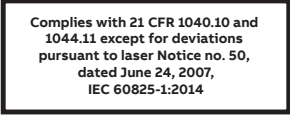

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Technical explanations

This statement is based on the information provided by our suppliers of components and collected through the Enviopass environmental management system. Enviopass believes this environmental information to be correct but cannot guarantee its completeness or accuracy as it is based on data received from sources outside our company. All specifications are subject to change without notice.

Analyzer Labels

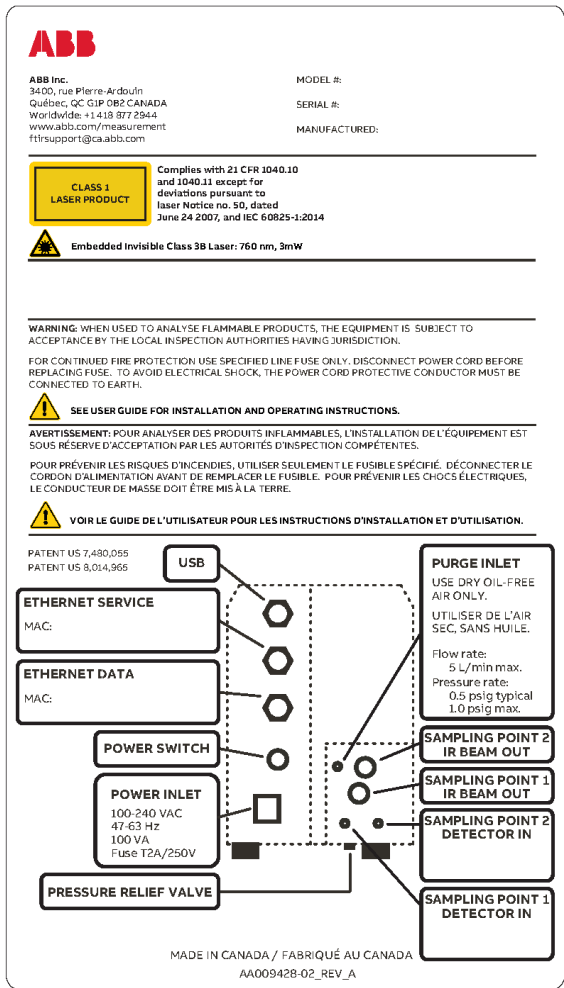
Table 1 Instrument labels

Label	Description	Location
 <p>The label is a rectangular warning label with a yellow background and a black border. It features a black triangle with a sunburst symbol on the left. To the right of the triangle, the text reads: CAUTION Invisible class 3B radiation when open 760 nm, 3 mW AVOID EXPOSURE TO BEAM. Below this, in a smaller font, it says: Complies with 21 CFR 1040.10 and 1044.11 except for deviations pursuant to laser Notice no. 50, dated June 24, 2007. IEC 60825-1:2014. On the right side of the label, there is a black triangle with a sunburst symbol and the text: AVERTISSEMENT Rayonnement laser invisible (Classe 3B) lorsqu'il est ouvert 760 nm, 3 mW EXPOSITION AU FAISCEAU DANGEREUSE.</p>	Indicates the presence of laser radiations. Invisible Class 3B laser radiations (760 nm, 3 mW output power) are present in the interferometer module.	Inside the analyzer enclosure, on the interferometer module.
 <p>A yellow rectangular label with a black border. The text in the center reads: CLASS 1 LASER PRODUCT.</p>	Indicates the presence of a Class 1 laser product	Inside the analyzer enclosure, on the interferometer module.
 <p>A white rectangular label with a black border. The text inside reads: Complies with 21 CFR 1040.10 and 1044.11 except for deviations pursuant to laser Notice no. 50, dated June 24, 2007, IEC 60825-1:2014.</p>	Indicates compliance with requirements of 21 CFR of the FDA	Inside the analyzer enclosure, on the interferometer module.
 <p>A yellow triangular warning label with a black border. It features three wavy lines representing heat.</p>	Indicates the presence of a hot surface. Do not touch the surface! Use caution to avoid being burned.	Inside the analyzer enclosure, on the source module.

The analyzer nameplate (see Figure 1 on page 10) is located outside the analyzer, on the right side of the cover. It indicates:

- ABB address
- Model number, serial number and manufacturing date
- Certifications
- Laser warning
- Electrical warning
- Use conditions for flammable product samples
- Port locations
- MAC address
- Power inlet
- Purge inlet
- IR beam and detector connections

Figure 1 Nameplate for an ADP300



WARNING

Failing to comply with any of the instructions, precautions or warnings contained in this guide is in direct violation of the standards of design, manufacture, and intended use of the equipment.

ABB assumes no liability for user failure to comply with any of these safety requirements.

CHAPTER 2

Quick Start

This document is a generic user guide intended for personnel using the TALYS analyzer for routine analysis. It contains installation, operation, and troubleshooting instructions, and applies to the entire ADP300 series (differences between the various models are explained in the TALYS analyzer specification sheet).



NOTICE

ONLY qualified service personnel is allowed to service the equipment.

No user/operator adjustments inside the analyzer are necessary or recommended by the manufacturer.

All user documentation is available on the included USB key (where you found this document).

Introducing the Hardware

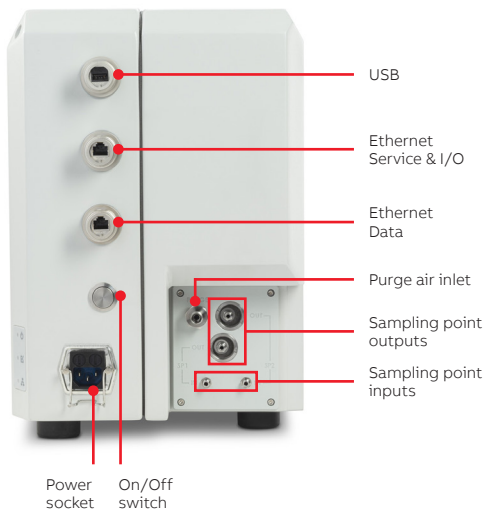
The following pages provide a quick overview of the analyzer hardware.

Analyzer

Figure 2 TALYS analyzer, ADP300 series



Figure 3 TALYS analyzer connections



ClippIR+ Sample Probes

The ClippIR+ sample probe is used in conjunction with the TALYS analyzer for wet process analysis. It is clipped onto an existing Teflon sample line with no need for tubing modifications.

Figure 4 ClippIR+



Installing the Analyzer



WARNING

The analyzer weighs 22 kg (49 pounds). **ABB strongly recommends lifting the analyzer with the help of another person.** Make sure to use proper body mechanics to lift the analyzer (bend your knees) otherwise injuries could occur.



NOTICE

Make sure there is sufficient clearance in front of the heat sinks (15 cm/6 in.).

Install the equipment in such a way that, if necessary, it can be disconnected easily. Also make sure to allow easy access to the cables and connectors (optical, Ethernet and USB cables, power cord).

To install the ADP300 analyzer:

- 1 Position the analyzer on a stable and hard surface.¹
- 2 Connect the Ethernet cable to the Ethernet Data port (see Figure 3).

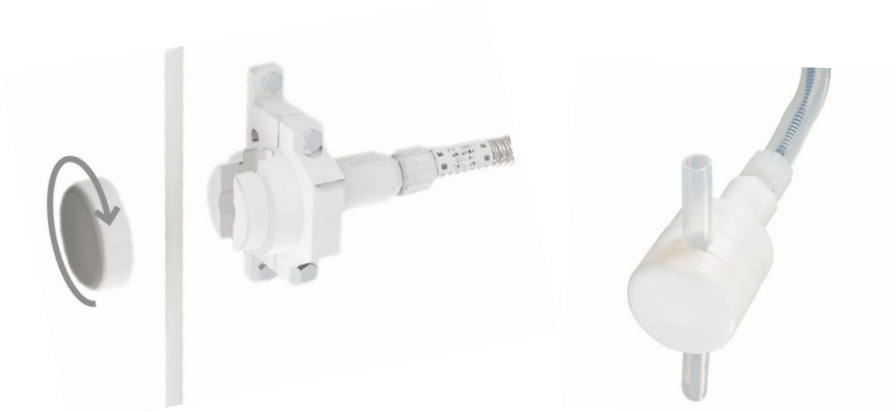


NOTICE

The analyzer IP configuration is set to DHCP for the Ethernet port. If no DHCP server is available on the network, the default IP will be 10.10.10.1. To change the IP address, see “Setting the Analyzer IP Address” on page 23.

- 3 Install the ClippiR+ probes on the sample lines.
 - a Unscrew the cap.
 - b Place the tube in the groove.
 - c Screw the cap back in place.

Figure 5 ClippiR+



¹ The back of the TALYS analyzer is equipped with brackets. They allow for wall-mount installation of the analyzer. Make sure that your wall can support a weight of 22 kg (49 lb). (See “Wall Mount Installation” on page B73 for details.)

4 Connect the ClipplR+ probes in the sampling fiber ports.



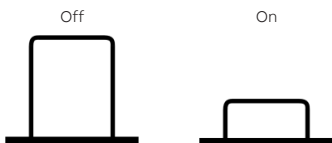
NOTICE

You **must never** kink or fold the fibers. Doing this could severely compromise system performances.

5 Connect the power cord in the analyzer power inlet and in the mains.

6 Press the Power button until it clicks.

Figure 6 On/Off Switch Position



Once the analyzer is powered on, the instrument screen is lit (the screen is off when the instrument is powered off).

The graphical user interface (GUI) (see page 16) and light-emitting diodes (LEDs) go through an initialization sequence **simultaneously**. All analyzer LEDs should light up for 10 seconds before entering their initialization sequence. Once the initialization sequence is complete, measurements begin.

GUI Initialization Sequence









NOTICE

The system is operational as soon as the GUI sequence is completed, **but to take valid measurements, a 6-hour thermal stabilization period is highly recommended.**

Messages can be displayed in the GUI in various languages (see “Setting System Locale” on page 37 for details on setting ABB_locale).

As the GUI sequence is executed, the TALYS analyzer screen first displays the red ABB logo. Next, the screen turns black for a few seconds and a black and white TALYS image is displayed. As the GUI continues loading, the display turns white. Flasks are displayed and highlighted as the system is getting ready for standard operation (see Table 1). The GUI sequence should take approximately 3.5 minutes.

Table 1 Boot sequence on display

Icon	Sequence
	TALYS powered on <ul style="list-style-type: none">• ABB logo (after ± 9 s)• Black screen. Interferometer startup, flashing LEDs (± 3 s later)• TALYS image. White screen (± 5 s later)
	Operating system startup (± 29 s later)
	Application startup (± 8 s later)
	Setting monitoring state ON (± 108 s later)
	Selecting chemistry (± 6 s later)
	Properties (not a green flask) will appear ± 48 s later.



NOTICE

If the GUI sequence does not complete correctly, it may still be possible to access the operating system (see “Troubleshooting” on page 57).

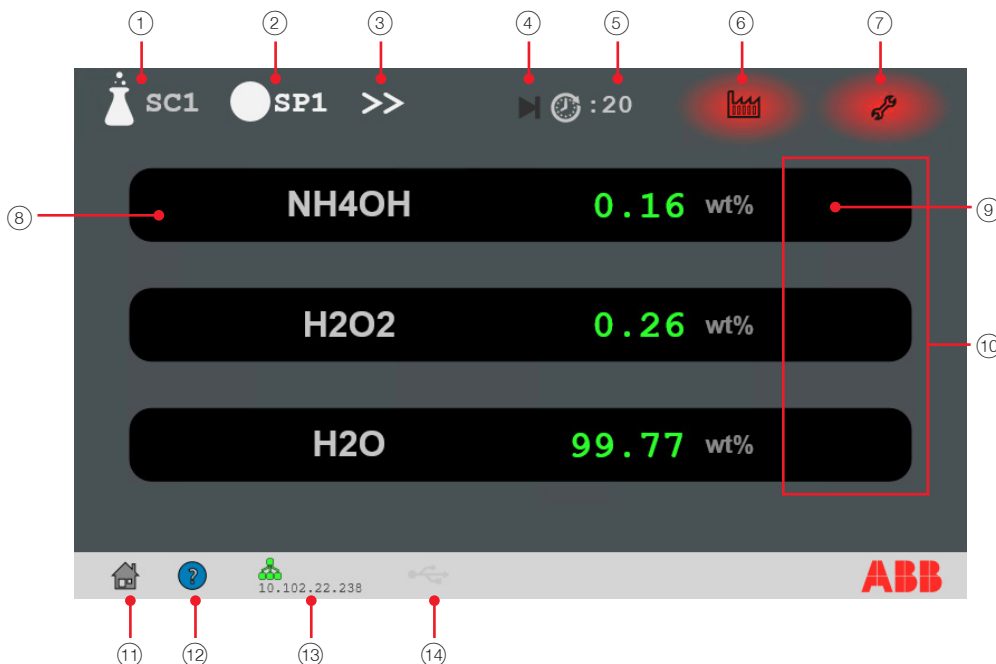
LED Initialization Sequence

Once the LED sequence is completed (after 60 seconds), all LEDs should light solid green (the network LED might blink in case of network activity).

Graphical User Interface (GUI)

The graphical user interface (GUI) allows direct access to the TALYS analyzer to see results and faults.¹

Figure 7 Graphical user interface (GUI) Home display



1 Selected chemistry

Indicates the currently selected chemistry. The selected chemistry is associated to the selected sampling point.

Chemistries are defined in a configuration file (for information on configuration files, refer to the TALYS ADP300 Dual Sampling Point Analysis System Reference Guide) and associated to a sampling point in the Commissioning Tool (see “Associating Chemistries to Sampling Points” on page 46).

2 Selected sampling point (SP_n)²

Indicates the sampling point for which data is currently displayed. Sampling points can be toggled manually by tapping the **SP_n** indicator or automatically (see below). Sampling points are configured using the Commissioning Tool (see “Associating Chemistries to Sampling Points” on page 46).

3 Sampling point toggle

Indicates whether the sampling point display is currently toggling automatically between sampling points (**I I**) or displaying only one sampling point at a time (**>>**).

Tap the indicator (**>>**) to activate a 10-seconds automatic toggle between SP1 and SP2 data display.

Tap again (**I I**) to stop this automatic toggle.

¹ The TALYS GUI can be accessed remotely by means of an external computer connected via Remote Desktop Connection (by pointing the TALYS analyzer Web browser to the TALYS analyzer IP address) (for more information, see “Setting the Analyzer IP Address” on page 23).

² *n* indicates the number of the sampling point.

4 Reference

Upon installation of the TALYS analyzer, a factory reference icon (orange) is displayed: 

References (initial and current) are acquired using the Commissioning Tool (for more information, see “Acquiring an Initial Reference” on page 47, “Acquiring a Standard Reference” on page 50), and also “Troubleshooting from the GUI” on page 60.

5 Activity timer

The activity timer starts when an analysis is in progress. It relates to the currently selected sampling point. If the analyzer does not have a new updated measure within **n** minutes, the color changes (for more information, see “Troubleshooting from the GUI” on page 60).

6 Process Faults

Lights up in cases of sample spectra diagnostic faults. It lights up regardless of the sampling point on which faults occurred (for more information, see “Fault Indications” on page 63).

7 Analyzer Faults

Lights up in cases of diagnostic faults related to the interferometer, the electronics, the detector, the optical fibers, or the reference spectra. It lights up regardless of the sampling point on which faults occurred (for more information, see “Fault Indications” on page 63).

8 Property Names

The GUI displays the property name, as entered in the configuration file (for more information on modifying configuration files, refer to the TALYS ADP300 Dual Sampling Point Analysis System Reference Guide).

9 Property Values and Units

The GUI displays the property number format and unit as entered in the configuration file (for more information on modifying configuration files, refer to the TALYS ADP300 Dual Sampling Point Analysis System Reference Guide).

10 Property Details

Tapping a property on the screen brings up details about this property (see “Accessing Property Details on the GUI” on page 42).

11 Home

Tapping Home displays the base measurement window at all times.

12 System information

Tapping this icon brings up the system information screen that provides version information for the GUI base system (Build ID), the TALYS software platform (Analysis Software), the committed configuration file (Configuration) and the GUI (HMI). **This information should be provided when contacting ABB.**

13 Network and IP Address

The IP address is always displayed on the GUI. This information could be important when trying to establish communication with the TALYS analyzer (“Setting the Analyzer IP Address” on page 23).

14 USB

When a USB key is inserted in the TALYS analyzer, and data is being transferred to the integrated controller, the USB icon turns red. For more information, see “Operating With a USB Key” on page A67.

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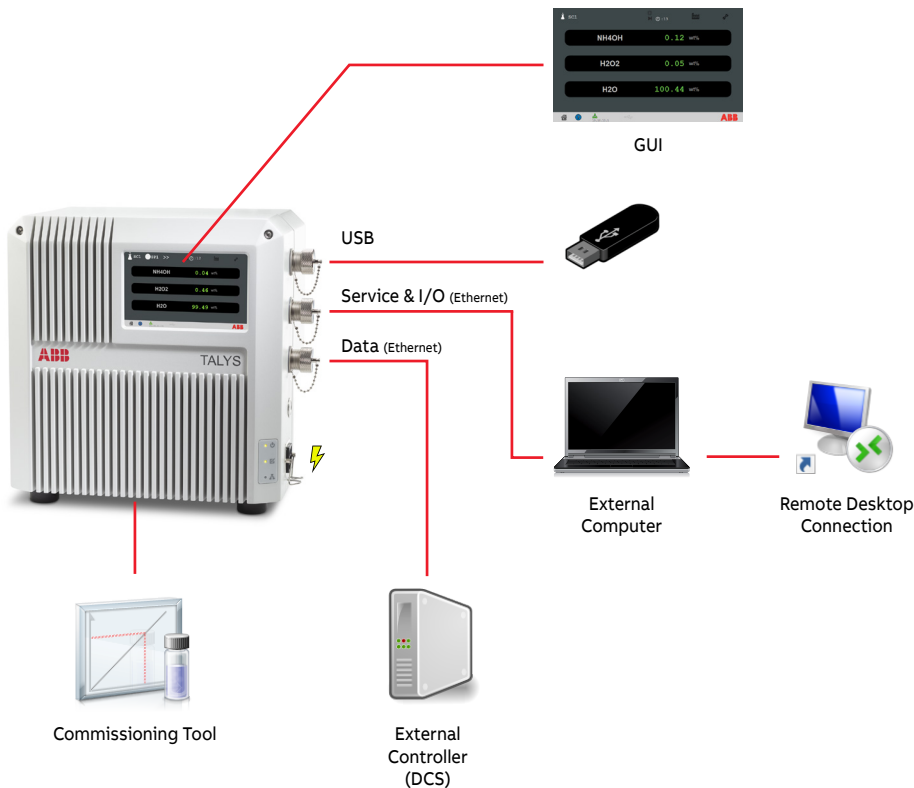
Establishing Communications

This chapter describes the means by which you can connect and communicate with a properly installed TALYS analyzer.

Configuring the External Computer

To perform more advanced configuration, analysis, and troubleshooting tasks on a TALYS analyzer, you first need to set up an external computer for communication with said analyzer. You establish communication with an external computer via the Ethernet Service & I/O port (see Figure 8 below) (the Data port can also be used, but is not recommended since it is most often used by external controllers [DCSs]).

Figure 8 TALYS ADP300 software and access points



Configuring for the Ethernet Service & I/O port

To connect directly to a TALYS, you need to properly set the IP address on the external computer (**Control Panel > Network and Internet > View network status and tasks > Change adapter settings > Ethernet > Internet Protocol Version 4 (TCP/IPv4)**).

The TALYS analyzer Ethernet Service & I/O port IP address is fixed at 10.127.127.127.

Configure the external computer Ethernet adapter TCP/IPv4 settings as follows:

Figure 9 External computer IP address for the Ethernet Service & I/O port

Internet Protocol Version 4 (TCP/IPv4) Properties

General

You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.

☐ Obtain an IP address automatically

☒ Use the following IP address:

IP address: 10 . 127 . 127 . 150

Subnet mask: 255 . 0 . 0 . 0

Default gateway: . . .

☐ Obtain DNS server address automatically

☒ Use the following DNS server addresses:

Preferred DNS server: . . .

Alternate DNS server: . . .

☒ Validate settings upon exit

Advanced...

OK Cancel



NOTICE

Never connect the Ethernet Service & I/O port to a network. It should only serve for direct connections to external computers.

Configuring for the Ethernet Data port

The Ethernet Data port on TALYS analyzers is designed to be used with external controllers (DCSs) and, as such, is not recommended for communication with external computers (see “Communicating over Modbus with External Controllers (DCSs)” on page 24).

However, should you need to use this port for communicating with an external computer, it is configured with the default static IP address 10.10.10.1. Thus, configure the external computer Ethernet adapter TCP/IPv4 settings as follows:

Figure 10 External computer IP address for the Data Ethernet port (static mode example)

Internet Protocol Version 4 (TCP/IPv4) Properties

General

You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.

☐ Obtain an IP address automatically

☒ Use the following IP address:

IP address: 10 . 10 . 10 . 2

Subnet mask: 255 . 0 . 0 . 0

Default gateway: . . .

☐ Obtain DNS server address automatically

☒ Use the following DNS server addresses:

Preferred DNS server: . . .

Alternate DNS server: . . .

☐ Validate settings upon exit

Advanced...

OK Cancel

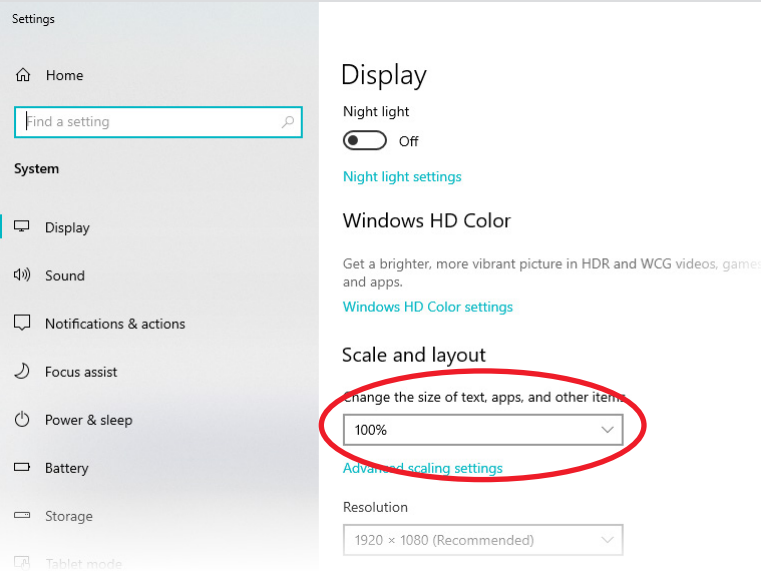
Establishing an Ethernet Connection



NOTICE

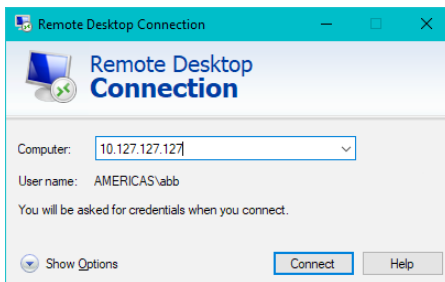
To connect to the TALYS analyzer via a Remote Desktop connection, your computer must be running Windows® XP SP3 or greater.

Also, your external computer display settings must be set to a scale of 100%.



- 1 With an Ethernet cable, connect your external computer directly to the Service & I/O port of a running TALYS analyzer.
- 2 Start the **Remote Desktop Connection** application on your computer.
- 3 Enter the TALYS analyzer default IP address in the **Computer** field (10.127.127.127 if connected to the Service & I/O port¹) and click **Connect**.

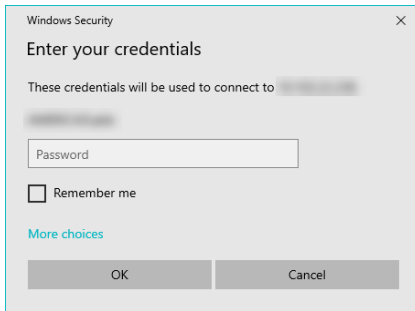
Figure 11 Remote Desktop connection



¹ If connected to the Data port, you must use the default IP address (10.10.10.1) or the one that you configured for your TALYS analyzer. If you are connected via DHCP, use the address provided by the DHCP server.

4 Enter the default credentials (password [abb] and/or login [abb]) and click **OK**.

Figure 12 Entering credentials



This connects your external computer to the TALYS analyzer and a standard Windows 10 desktop appears.



NOTICE

Once this connection is established, you can extract text and files from the TALYS analyzer via copy-paste operations.

Setting the Analyzer IP Address

If enabled, any DHCP server is automatically used by the analyzer. However, you can set a new analyzer IP address via the TALYS web interface:

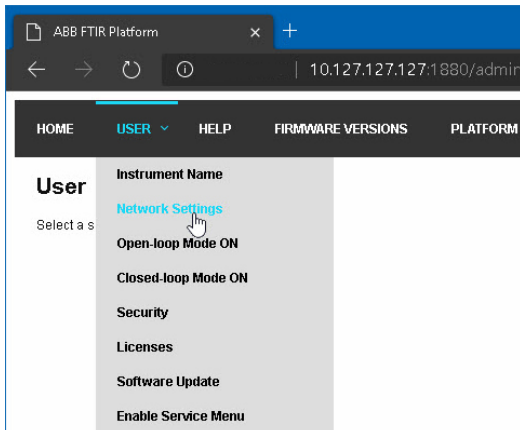
To set a new IP address for your analyzer via a Web interface:

- 1 Connect to the Web interface by starting a Remote Desktop session on the TALYS and clicking the link **D:\Service Tools\Control Electronics**.

This will launch the TALYS web browser and open the **ABB FTIR Platform** tab.

- 2 From the **User** menu, select **Network Settings**.

Figure 13 Selecting **Network Settings**



3 In the page that appears (see Figure 14 below):

- a Modify the **IP address** and **Address mask** based on the local network, if required.
- b Activate the DHCP mode if required.
- c Click **STORE**.

Since the IP address is changed as soon as you click **STORE**, you will lose connection to the analyzer. Simply reconnect using the new address.

Figure 14 Modifying network settings

MENU

Network Settings

If enabled, any DHCP server is automatically used by the instrument. In case a DHCP server is not available, the instrument will revert back to the a default address of 10.10.10.1. If the DHCP is disabled, the instrument uses the following parameters:

☐ Automatic IP parameters (DHCP)

IP Address:	10	10	10	1
Address Mask:	255	255	255	0
Gateway:				
Time Server:				

STORE RESET

ABB

- d Close the page when you are done.

Communicating over Modbus with External Controllers (DCSs)

External communications with the TALYS analyzer are supported through Ethernet ports. The primary communication protocol used is Modbus TCP and the available Modbus ports are TCP 502 and 503¹.

The TALYS analyzer acts as a slave to the external controller (distributed control system [DCS]) to which it is connected. In normal operation, the TALYS analyzer will measure and act only on requests from the external controller.

External controllers must be connected to the TALYS analyzer Ethernet Data port (see “Figure 3 TALYS analyzer connections” on page 12). This port is configured with the default static IP address 10.10.10.1.

¹ It is recommended to use port 502 for all sampling points.

Communication Cycle

The following figure outlines the basic Modbus communication interface and settings, as recommended when using an external PLC or other DCS system over the Data Ethernet port.

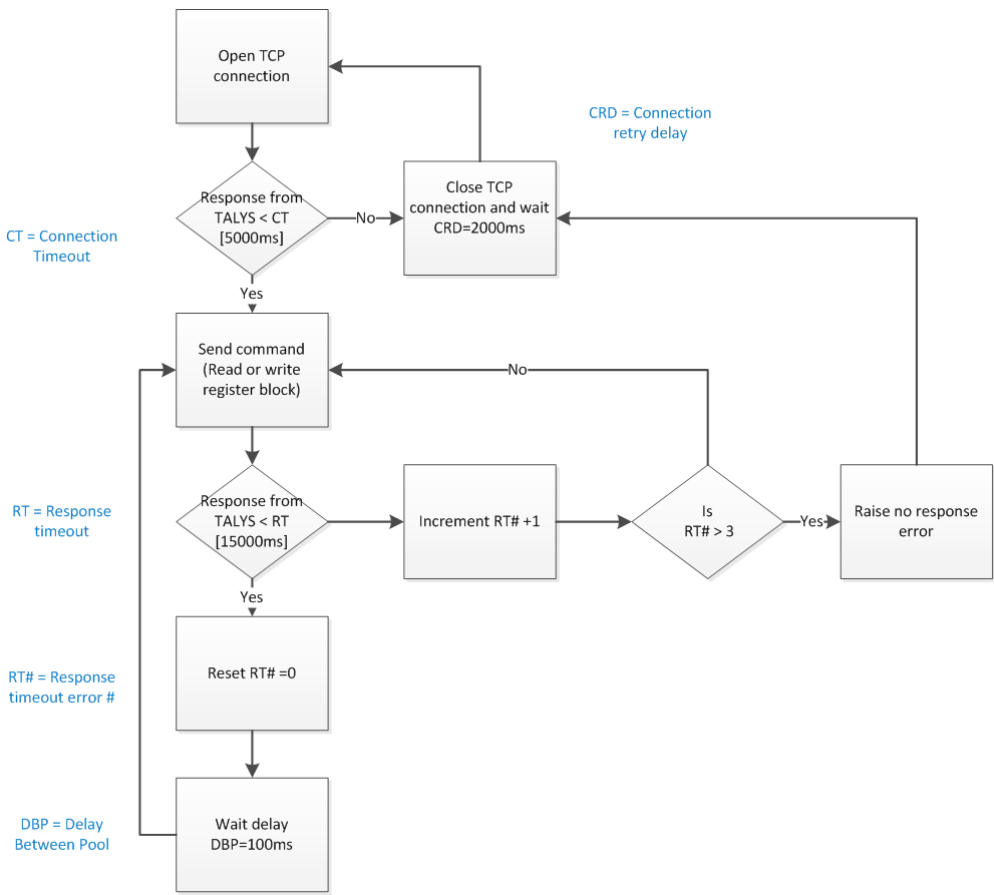


NOTICE

Make sure that all external I/O modules are operational before powering up the TALYS analyzer.

Should an I/O module be disconnected for any reason, you will have to restart the TALYS analyzer **only once the disconnected I/O module is able to reconnect.**

Figure 15 External controller communication cycle



Basic Communication Scenarios

Scenario 1: Normal communication

- 1 OPEN TCP Connection.
- 2 Wait for response (connection timeout [CT] = 5000 ms).
- 3 Send command (read/write Modbus registers).
- 4 Receive reply command (response timeout [RT] = 5000 ms).
- 5 Wait for delay (delay between pools [DBP] = 100 ms).

Return to 3) Next block.

Scenario 2: TCP Connection error

- 1 OPEN TCP Connection.
- 2 Wait for response (connection timeout [CT] = 5000 ms).
- 3 If wait time > CT, then:
- 4 CLOSE TCP Connection.
- 5 Wait for connection retry delay (CRD) = 2000 ms.

Retry TCP Connection (step 1).

Scenario 3: No Response error

- 1 OPEN TCP Connection.
- 2 Wait for response (connection timeout [CT] = 5000 ms).
- 3 Send command (read/write Modbus registers).
- 4 Receive reply command (Response Timeout [RT] = 15,000ms).
- 5 If wait time > RT, then:
 - Increment RT error count (RT#).
 - Resend command (Step 3).

Else

Reset RT error count.

- 6 If RT error count > 3, then:
 - Raise No Response error.
 - CLOSE/OPEN TCP Connection (as Step 1, 2).

Modbus TCP I/O Communication

This section details the Modbus TCP input/output (I/O) implementation of the communication interface. The I/Os are used to report the TALYS analyzer status and property values. They also provide an external process control system and the capability to interface and control the measurement execution sequence (selecting a specific chemistry, request new reference, etc.).

A high-level grouping of available I/Os is shown in the following table.

Grouping	I/O type	Description
Chemistry Selection	Digital input (DI) to TALYS	Control System issues output to define what chemistry to monitor.
Operations	Digital input (DI) to TALYS	Control System issues output to initiate specific operations.
Property Status	Digital output (DO) from TALYS	TALYS issues status information for each reported chemical property measured.
Analyzer & Process Status	Digital output (DO) from TALYS	TALYS issues status information regarding analyzer and process status.
Analyzer & Process Status	Analog output (AO) from TALYS	TALYS issues detailed status information.
Analyzer & Process Alarm Codes	Analog output (AO) from TALYS	TALYS issues detailed alarm codes.
Property Values	Analog output (AO) from TALYS	TALYS issues property values for each measured chemical property (floating point value).

The following table gives the correspondence between the TALYS analyzer data type and the Modbus function code used by the control system to perform a read or write action.

TALYS Data Type	Control System Action	Modbus Function Code
Digital Input (DI)	Write	05–Write Single Coil
Digital Output (DO)	Read	02–Read Discrete Inputs
Analog Output (AO)	Read	04–Read Input Register

Float values are so-called word-swap coded, e.g., AB CD -> CD AB.

Modbus Port 502/503 Register Table

The following table provides detailed information on the available I/Os.



NOTICE

XX refers to the last number as per the configuration file.

Grouping	I/O Type	Name (in Application Configuration Tool)	Modbus Memory Address (port 502)	Modbus Memory Address (port 503)	Modbus Coils/ Registers	Data Type	Description (Values)
Chemistry Selection	DI	chemistry_01_selected-SP1	0	N.A.	1	bit	Select chemistry 1 for next analysis. (0= not selected, 1= selected)
Chemistry Selection	DI	...	...	N.A.	8	bit	...
Chemistry Selection	DI	chemistry_10_selected-SP1	9	N.A.	1	bit	Select chemistry 10 for next analysis. (0= not selected, 1= selected)
Operations	DI	monitoring_state_on_off	14	14	1	bit	Enable acquisition and prediction by altering the analyzer monitoring state. (0= off, 1= on)
Operations	DI	reference_trigger-SP1	15	N.A.	1	bit	Trigger a reference. (0= off, 1= on)
Chemistry Selection	DI	chemistry_01_selected-SP2	30	0	1	bit	Select chemistry 1 for next analysis. (0= not selected, 1= selected)
Chemistry Selection	DI	...	...	...	8	bit	...
Chemistry Selection	DI	chemistry_10_selected-SP2	39	9	1	bit	Select chemistry 10 for next analysis. (0= not selected, 1= selected)
Operations	DI	reference_trigger-SP2	45	15	1	bit	Trigger a reference. (0= off, 1= on)
Analyzer & Process Status	DO	analyzer_alarm-SP1	0	N.A.	1	bit	Indicates an alarm condition on the analyzer. (0= no alarm, 1= alarm)
Analyzer & Process Status	DO	process_alarm-SP1	1	N.A.	1	bit	Indicates an alarm condition on the process. (0= no alarm, 1= alarm)
Analyzer & Process Status	DO	online	6	N.A.	1	bit	Indicates chemistry monitoring state. (1= monitoring state on, 0= monitoring state off)

Grouping	I/O Type	Name (in Application Configuration Tool)	Modbus Memory Address (port 502)	Modbus Memory Address (port 503)	Modbus Coils/ Registers	Data Type	Description (Values)
Analyzer & Process Status	DO	reference_running-SP1	7	N.A.	1	bit	Indicates when instrument is taking a reference. (1= reference is running, 0= reference is not running)
Analyzer & Process Status	DO	reference_error-SP1	8	N.A.	1	bit	Indicates an alarm occurred on reference acquisition. (0= no alarm, 1= alarm)
Analyzer & Process Status	DO	analysis_in_progress-SP1	9	N.A.	1	bit	A sample analysis of the currently selected chemistry is in progress. (0= no analysis, 1= analysis in progress)
Property Status	DO	property_01_valid-SP1	10	N.A.	1	bit	Indicates property 1 data validity. (0= invalid, 1= valid)
Property Status	DO	...	...	N.A.	18	bit	...
Property Status	DO	property_20_valid-SP1	29	N.A.	1	bit	Indicates property 20 data validity. (0= invalid, 1= valid)
Analyzer & Process Status	DO	factory_reference_used-SP1	30	N.A.	1	bit	The actual reference may not be optimal; factory provided references are used and were not overwritten at commissioning. (1= factory reference used, 0= factory reference overwritten)
Analyzer & Process Status	DO	analyzer_alarm-SP2	80	0	1	bit	Indicates an alarm condition on the analyzer. (0= no alarm, 1= alarm)
Analyzer & Process Status	DO	process_alarm-SP2	81	1	1	bit	Indicates an alarm condition on the process. (0= no alarm, 1= alarm)
Analyzer & Process Status	DO	online2	86	6	1	bit	Indicates chemistry monitoring state. (1= monitoring state on, 0= monitoring state off)
Analyzer & Process Status	DO	reference_running-SP2	87	7	1	bit	Indicates when instrument is taking a reference. (1= reference is running, 0= reference is not running)

Grouping	I/O Type	Name (in Application Configuration Tool)	Modbus Memory Address (port 502)	Modbus Memory Address (port 503)	Modbus Coils/ Registers	Data Type	Description (Values)
Analyzer & Process Status	DO	reference_error-SP2	88	8	1	bit	Indicates an alarm occurred on reference acquisition. (0= no alarm, 1= alarm)
Analyzer & Process Status	DO	analysis_in_progress-SP2	89	9	1	bit	A sample analysis of the currently selected chemistry is in progress. (0= no analysis, 1= analysis in progress)
Property Status	DO	property_01_valid-SP2	90	10	1	bit	Indicates property 1 data validity. (0= invalid, 1= valid)
Property Status	DO	...	...	...	18	bit	...
Property Status	DO	property_20_valid-SP2	109	29	1	bit	Indicates property 20 data validity. (0= invalid, 1= valid)
Analyzer & Process Status	DO	factory_reference_used-SP2	110	30	1	bit	The actual reference may not be optimal; factory provided references are used and were not overwritten at commissioning. (1= factory reference used, 0= factory reference overwritten)
Analyzer & Process Status	AO	analysis_cycle_counter-SP1	4	N.A.	1	Short	Number of analysis cycle completed (reset to 1 when reaches 32768).
Property Values	AO	property_01_value-SP1	10	N.A.	2	Float	Property 1 value
Property Values	AO	...	...	N.A.	36	Float	
Property Values	AO	property_20_value-SP1	48	N.A.	2	Float	Property 20 value
Property Values	AO	property_01_quality_Index01_value-SP1	110	N.A.	2	Float	Quality index 1 value for property 1
Property Values	AO	...	...	N.A.	36	Float	
Property Values	AO	property_20_quality_Index01_value-SP1	148	N.A.	2	Float	Quality index 1 value for property 20
Property Values	AO	...	...	N.A.	120	Float	
Property Values	AO	property_01_quality_Index05_value-SP1	270	N.A.	2	Float	Quality index 5 value for property 1
Property Values	AO	...	...	N.A.	36	Float	
Property Values	AO	property_20_quality_Index05_value-SP1	308	N.A.	2	Float	Quality index 5 value for property 20

Grouping	I/O Type	Name (in Application Configuration Tool)	Modbus Memory Address (port 502)	Modbus Memory Address (port 503)	Modbus Coils/ Registers	Data Type	Description (Values)
Analyzer & Process Status	AO	selected_chemistry-SP1	1212	N.A.	1	Short	Identifies the currently selected chemistry. The property values and status are associated to this chemistry. (Value= 0 to number_of_chemistry-1, Value= -1 when no chemistry is selected).
Analyzer & Process Status	AO	number_of_property-SP1	1213	N.A.	1	Short	Number of properties in current chemistry
Analyzer & Process Status	AO	number_of_chemistry-SP1	1214	N.A.	1	Short	Number of chemistries in current application
Analyzer & Process Status	AO	analyzer_alarm_count-SP1	1215	N.A.	1	Short	Number of analyzer alarms currently true (=1)
Analyzer & Process Status	AO	process_alarm_count-SP1	1216	N.A.	1	Short	Number of process alarms currently true (=1)
Analyzer & Process Status	AO	number_of_quality_index-SP1	1217	N.A.	1	Short	Indicate the number of quality indexes returned by the prediction model.
Analyzer & Process Status	AO	heartbeat	1218	N.A.	1	Short	Roll over counter to indicate if the application is alive and in a consistent state.
Analyzer & Process Status	AO	last_updated_chemistry-SP1	1219	N.A.	1	Short	Identifies the last updated chemistry. The property values and status are associated to this chemistry. (Value= 0 to number_of_chemistry-1, Value= -1 when no chemistry is selected)
Analyzer & Process Alarm Codes	AO	analyzer_alarm_code_01-SP1	1220	N.A.	1	Short	Alarm code that can be used to display analyzer error message. See Error Message Table.
Analyzer & Process Alarm Codes	AO	analyzer_alarm_code_02-SP1	1221	N.A.	1	Short	When analyzer_alarm_count > 1, this will contain the analyzer alarm code for error 2 in the list.
Analyzer & Process Alarm Codes	AO	analyzer_alarm_code_03-SP1	1222	N.A.	1	Short	When analyzer_alarm_count > 1, this will contain the analyzer alarm code for error 3 in the list.

Grouping	I/O Type	Name (in Application Configuration Tool)	Modbus Memory Address (port 502)	Modbus Memory Address (port 503)	Modbus Coils/ Registers	Data Type	Description (Values)
Analyzer & Process Alarm Codes	AO	analyzer_alarm_code_04-SP1	1223	N.A.	1	Short	When analyzer_alarm_count > 1, this will contain the analyzer alarm code for error 4 in the list.
Analyzer & Process Alarm Codes	AO	analyzer_alarm_code_05-SP1	1224	N.A.	1	Short	When analyzer_alarm_count > 1, this will contain the analyzer alarm code for error 5 in the list.
Analyzer & Process Alarm Codes	AO	process_alarm_code_01-SP1	1225	N.A.	1	Short	Alarm code that can be used to display process error message. See Error Message Table.
Analyzer & Process Alarm Codes	AO	process_alarm_code_02-SP1	1226	N.A.	1	Short	When process_alarm_count > 1, this will contain the process alarm code for error 2 in the list.
Analyzer & Process Alarm Codes	AO	process_alarm_code_03-SP1	1227	N.A.	1	Short	When process_alarm_count > 1, this will contain the process alarm code for error 3 in the list.
Analyzer & Process Alarm Codes	AO	process_alarm_code_04-SP1	1228	N.A.	1	Short	When process_alarm_count > 1, this will contain the process alarm code for error 4 in the list.
Analyzer & Process Alarm Codes	AO	process_alarm_code_05-SP1	1229	N.A.	1	Short	When process_alarm_count > 1, this will contain the process alarm code for error 5 in the list.
Analyzer & Process Status	AO	analysis_cycle_counter-SP2	1504	4	1	Short	Number of analysis cycle completed (reset to 1 when reaches 32768.)
Property Values	AO	property_01_value-SP2	1510	10	2	Float	Property 1 value
Property Values	AO	...	...	...	36	Float	
Property Values	AO	property_20_value-SP2	1548	48	2	Float	Property 20 value
Property Values	AO	property_01_quality_Index01_value-SP2	1610	110	2	Float	Quality index 1 value for property 1
Property Values	AO	...	...	...	36	Float	
Property Values	AO	property_20_quality_Index01_value-SP2	1648	148	2	Float	Quality index 1 value for property 20

Grouping	I/O Type	Name (in Application Configuration Tool)	Modbus Memory Address (port 502)	Modbus Memory Address (port 503)	Modbus Coils/ Registers	Data Type	Description (Values)
Property Values	AO	...	...	...	120	Float	
Property Values	AO	property_01_quality_Index05_value-SP2	1770	270	2	Float	Quality index 5 value for property 1
Property Values	AO	...	...	...	36	Float	
Property Values	AO	property_20_quality_Index05_value-SP2	1808	308	2	Float	Quality index 5 value for property 20
Analyzer & Process Status	AO	selected_chemistry-SP2	2712	1212	1	Short	Identifies the currently selected chemistry. The property values and status are associated to this chemistry. (Value = 0 to number_of_chemistry -1, Value= -1 when no chemistry is selected).
Analyzer & Process Status	AO	number_of_property-SP2	2713	1213	1	Short	Number of properties in current chemistry
Analyzer & Process Status	AO	number_of_chemistry-SP2	2714	1214	1	Short	Number of chemistries in current application
Analyzer & Process Status	AO	analyzer_alarm_count-SP2	2715	1215	1	Short	Number of analyzer alarms currently true (=1)
Analyzer & Process Status	AO	process_alarm_count-SP2	2716	1216	1	Short	Number of process alarms currently true (=1)
Analyzer & Process Status	AO	number_of_quality_index-SP2	2717	1217	1	Short	Indicate the number of quality indexes returned by the prediction model.
Analyzer & Process Status	AO	heartbeat2	2718	1218	1	Short	Roll over counter to indicate if the application is alive and in a consistent state.
Analyzer & Process Status	AO	last_updated_chemistry-SP2	2719	1219	1	Short	Identifies the last updated chemistry. The property values and status are associated to this chemistry. (Value= 0 to number_of_chemistry -1, Value= -1 when no chemistry is selected)
Analyzer & Process Alarm Codes	AO	analyzer_alarm_code_01-SP2	2720	1220	1	Short	Alarm code that can be used to display analyzer error message. See Error Message Table.
Analyzer & Process Alarm Codes	AO	analyzer_alarm_code_02-SP2	2721	1221	1	Short	When analyzer_alarm_count > 1, this will contain the analyzer alarm code for error 2 in the list.

Grouping	I/O Type	Name (in Application Configuration Tool)	Modbus Memory Address (port 502)	Modbus Memory Address (port 503)	Modbus Coils/ Registers	Data Type	Description (Values)
Analyzer & Process Alarm Codes	AO	analyzer_alarm_code_03-SP2	2722	1222	1	Short	When analyzer_alarm_count > 1, this will contain the analyzer alarm code for error 3 in the list.
Analyzer & Process Alarm Codes	AO	analyzer_alarm_code_04-SP2	2723	1223	1	Short	When analyzer_alarm_count > 1, this will contain the analyzer alarm code for error 4 in the list.
Analyzer & Process Alarm Codes	AO	analyzer_alarm_code_05-SP2	2724	1224	1	Short	When analyzer_alarm_count > 1, this will contain the analyzer alarm code for error 5 in the list.
Analyzer & Process Alarm Codes	AO	process_alarm_code_01-SP2	2725	1225	1	Short	Alarm code that can be used to display process error message. See Error Message Table.
Analyzer & Process Alarm Codes	AO	process_alarm_code_02-SP2	2726	1226	1	Short	When process_alarm_count > 1, this will contain the process alarm code for error 2 in the list.
Analyzer & Process Alarm Codes	AO	process_alarm_code_03-SP2	2727	1227	1	Short	When process_alarm_count > 1, this will contain the process alarm code for error 3 in the list.
Analyzer & Process Alarm Codes	AO	process_alarm_code_04-SP2	2728	1228	1	Short	When process_alarm_count > 1, this will contain the process alarm code for error 4 in the list.
Analyzer & Process Alarm Codes	AO	process_alarm_code_05-SP2	2729	1229	1	Short	When process_alarm_count > 1, this will contain the process alarm code for error 5 in the list.

Examples of Communication Sequences

This section provides examples of data exchange sequences initiated by the control system to the Modbus TCP server on the TALYS analyzer. These examples are meant to illustrate generic interaction with the TALYS analyzer. For a specific application configuration, the communication sequences may be simpler.

The examples presented in the next sections use the convention <I/O Type: Name> to refer to the “Modbus TCP I/O Communication” on page A66.

Starting a Chemistry Measurement Sequence

- 1 Get monitoring status: Read DO:online value.
- 2 If required, set the monitoring state on: If DO: online = 0, write DI: monitoring_state_on_off = 1. This will allow chemistry selection.
- 3 Get number of available chemistries: Read AO: number_of_chemistry-SP1 value. This provides the number of chemistries available for selection on sampling point 1 in the current application.
- 4 Select chemistry to monitor: Write DI: chemistry_XX_selected-SP1 = 1, where XX = 01 to number_of_chemistry. This will start the chemistry measurement sequence on sampling point 1..
- 5 Validate chemistry selection: Read AO: selected_chemistry-SP1 value to validate that chemistry was properly selected.

Getting Measurement Results and Statuses

- 1 Get the number of available properties: Read AO: number_of_property-SP1 value. This provides the number of properties available for the selected chemistry on sampling point 1 in the current application.
- 2 Initialize the measurement counter: Read AO: analysis_cycle_counter-SP1 value and store this value for later comparison with current measurement count.
- 3 Get the current measurement count: Read AO: analysis_cycle_counter-SP1 value. When acquisition is done, this value is updated by 1. The property values and statuses can then be read.



NOTICE

This counter is reset to 1 when it reaches 32768.

- 4 Update the measurement counter.
- 5 Read property values: Read AO: property_XX_value-SP1 value, where XX = 1 to number_of_property.
- 6 Read property statuses: Read DO: property_XX_valid-SP1 value, where XX = 1 to number_of_property. If property_XX_valid-SP1 = 0, the property value is not valid.
- 7 Check process and analyzer statuses (see “External Controller Communication Cycle” on page A63 for more details).
- 8 Repeat from Step 3.

Getting Analyzer and Process Statuses

- 1** Get analyzer alarm status: Read DO: analyzer_alarm-SP1 value. When analyzer_alarm = 1, further information on the alarm conditions can be read.
- 2** If required, get current number of analyzer alarms: Read AO: analyzer_alarm_count-SP1 value.
- 3** If required, get analyzer error numbers: Read AO: analyzer_alarm_code_XX-SP1, where XX = 1 to analyzer_alarm_count. See “Modbus TCP Error Codes Returned by TALYS” on page 63 for a summary of the alarm conditions related to a given alarm code.
- 4** Get process alarm status: Read DO: process_alarm-SP1 value. When process_alarm = 1, further information on the alarm conditions can then be read.
- 5** If required, get current number of process alarms: Read AO: process_alarm_count-SP1 value.
- 6** If required, get process error numbers: Read AO: process_alarm_code_XX-SP1, where XX = 1 to process_alarm_count. See “Modbus TCP Error Codes Returned by TALYS” on page 63 for a summary of the alarm conditions related to a given alarm code.
- 7** Repeat from Step 1.

Standard Operations

This chapter describes standard analyzer operations that can be performed once the TALYS analyzer has been properly installed. Some of these operations can also be performed using the provided USB key (see “Operating With a USB Key” on page A67)

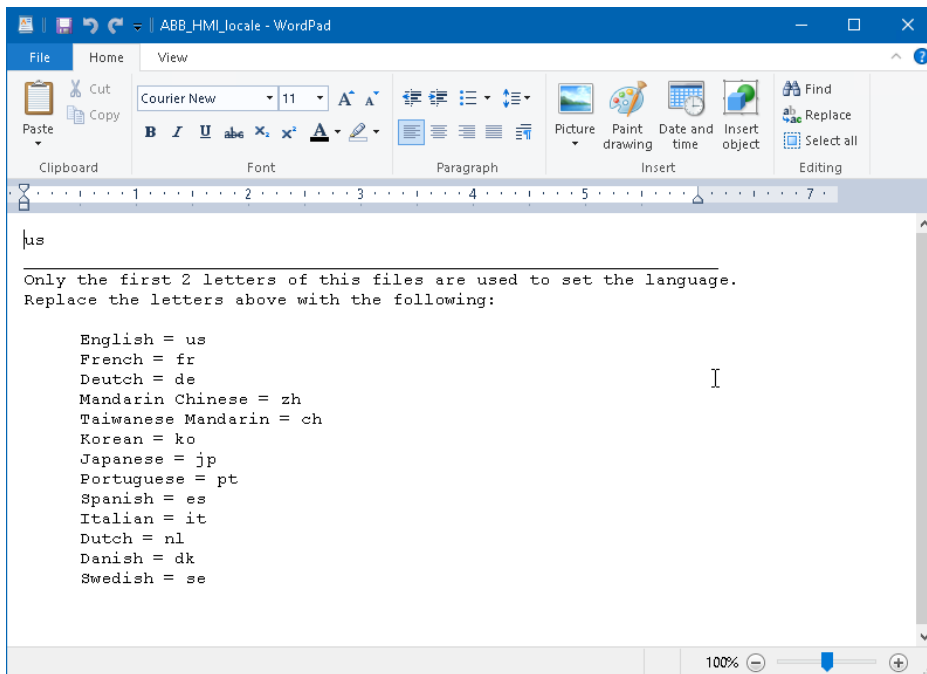
Setting System Locale

The TALYS analyzer graphical user interface (GUI) is offered in many languages to reflect the diversity of its users.

To set the GUI to your preferred language:

- 1 Access the analyzer through a Remote Desktop connection (see page 22).
- 2 Under **D:\ServiceTools**, double-click the **ABB_HMI_Locale** script. This launches the file in WordPad.

Figure 16 ABB_locale file opened in WordPad



- 3 In the first line, enter the two letters corresponding to the desired interface language (available languages are listed in the file [see Figure 16]).

- 4 Save the file.
- 5 Close the text editor. This launches the ABB FTIR applet.
- 6 Click **Update Firmware...**

If the monitoring state is on, click **OK** in the dialog box that notifies you that the analyzer is in use. Changing the locale will not affect normal operations.

- 7 Once the operation is completed successfully (and the GUI finished restarting), click **OK** in the dialog box that appears.



NOTICE

The network icon turns orange before a GUI update (ABB_HMI_Locale).

- 8 Close the ABB FTIR applet.

Modifying the Analyzer Password

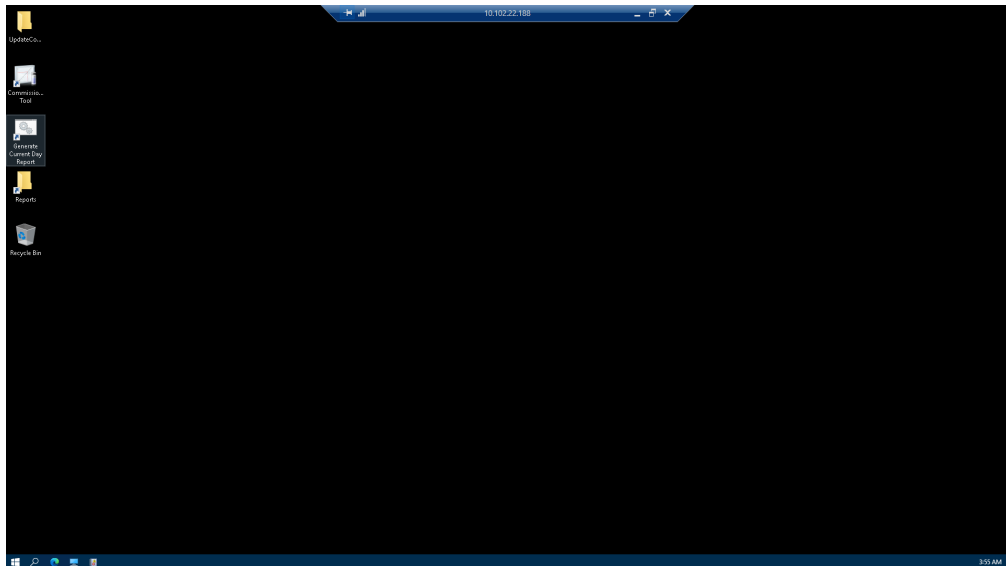
Upon receiving and installing the TALYS analyzer, it is good business and cyber security practice to change the factory default analyzer password.

To do so:

- 1 Plug your computer to the Service & I/O Ethernet port (see Figure 8 on page 19).
- 2 Connect to the TALYS analyzer through a Remote Desktop connection (see “Establishing an Ethernet Connection” on page 22).

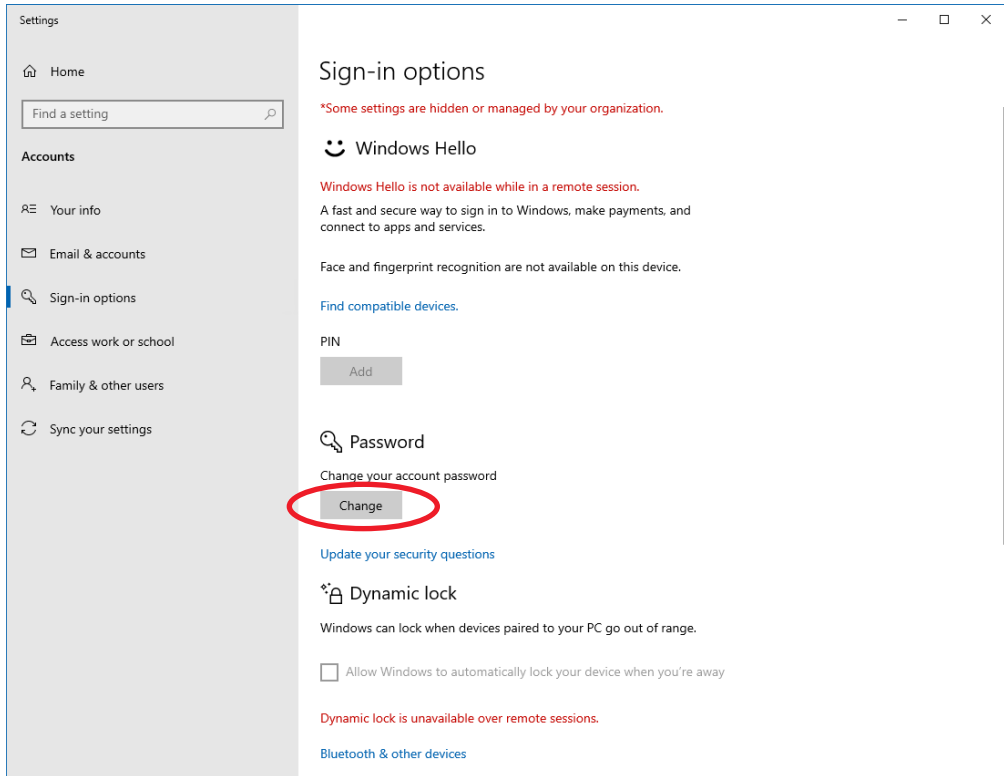
Once the connection is established, a Windows® 10 desktop will appear in the Remote Desktop Connection window.

Figure 17 Windows 10 remote desktop once connection is established



- 3 From the Windows 10 **Control Panel**, go to **User Accounts > Make changes to my account in PC Settings > Sign-in options > Password**
- 4 Click **Change** then enter the current password: **abb**

Figure 18 Change password



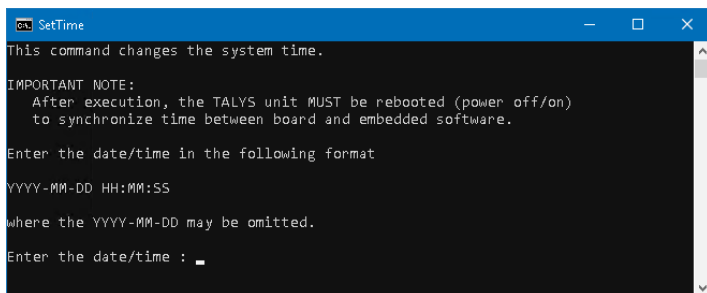
- 5 Follow the instructions to modify the password.
- 6 Once the password is properly changed, close the **Settings** window.
- 7 Once the password has been changed in the system, you need to commit this new password in the analyzer itself:
 - a From the desktop, go to **This PC > APP (D:) > ServiceTools**
 - b Double-click the **CommitSoftwareUpdates** shortcut. This writes to hardware the new password created in step 5.

Setting System Time

To set the system time:

- 1 Access the analyzer through a Remote Desktop connection (see page 22).
- 2 Double-click the **SetTime** script located in **D:\ServiceTools**. The following screen is displayed, giving precise instructions on the date format.

Figure 19 Setting system time



- 3 Enter local time in the `yyyy-mm-dd hh:mm:ss` format and press Enter.
- 4 Restart the TALYS analyzer.



NOTICE

Since the TALYS analyzer software saves the acquired data with a UTC time stamp, it is highly recommended to leave the time zone setting in Windows to UTC.

Transferring Data From the Analyzer

Most standard operations that can be performed on the TALYS analyzer consist of retrieving data from the analyzer for analysis via an external software. These operations can be performed at any time without suspending measurements.



NOTICE

These operations can take anywhere between a few seconds and a few hours, depending on the amount of data to transfer.

Data files may or may not be available, depending on ADP model. See “Technical Specifications” on page D77 for details on the data included data with your analyzer.

These standard operations download:

- All reports (**ABB_Reports**)
ABB_Reports collects in minutes the entire content of the **Reports** folder, including the report files of the last 42 days, and automatically generates the current day report.
- All grab sample files (**ABB_GrabSamples**)
ABB_GrabSamples collects in minutes all grab sample files acquired using the Commissioning Tool and automatically generates a grab sample report.

- All files required by ABB service personnel when helping troubleshooting (**ABB_Service**)
ABB_Service collects in a few hours the files necessary for troubleshooting the TALYS analyzer. Contact your local ABB representative once the files are on the USB key.
- All configuration files (**ABB_GetConfig**)
ABB_GetConfig collects in minutes all configuration files found in folder **E:\ABB\AnalyzerSoftware\Configuration**.
- All data (**ABB_Data**)
ABB_Data collects all reports and spectrum files from the last 42 days. These may include:
 - ZIP backups
 - Current day sample spectrum files (stored in **E:\ABB\Enablir\saveFile**; for more information, refer to the TALYS ADP300 Dual Sampling Point Analysis System Reference Guide).
 - Grab sample files acquired with the Commissioning Tool
 - Entire content of the Reports folder



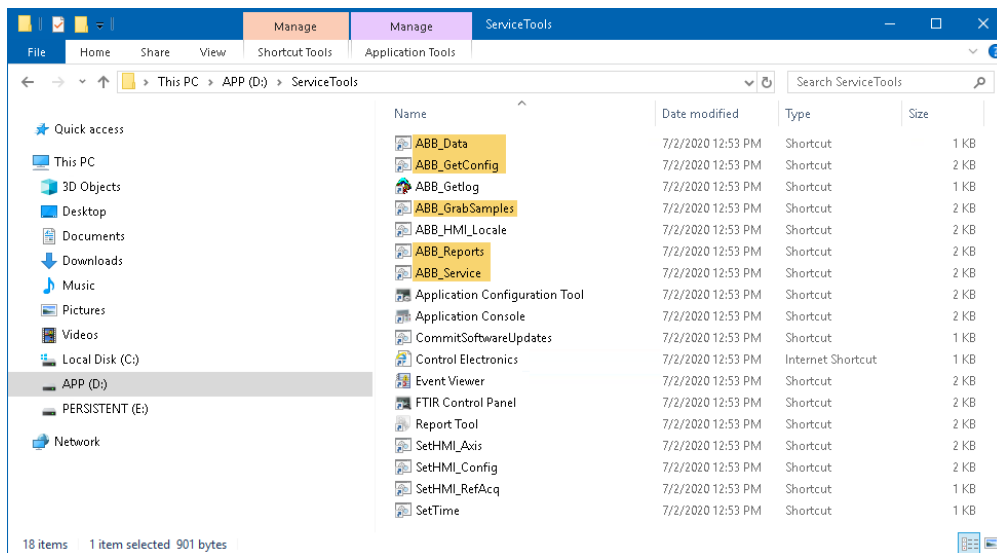
NOTICE

It is recommended to perform this action when the analyzer **is not monitoring a chemistry**.

To perform these operations¹:

- 1 Access the analyzer through a Remote Desktop connection (see page 22).
- 2 Under **D:\ServiceTools**, double-click the script of the operation that you want to perform. This launches the operation. A file named “Valid_Signature” is created once the operation has completed successfully.

Figure 20 Standard operation on the TALYS desktop



¹ These operations can also be performed with the use of a USB key (for more information, see “Operating With a USB Key” on page A67).

Accessing Property Details on the GUI

Tapping on a property on the home screen (see “Graphical User Interface (GUI)” on page 16) displays details about that property.

From that display, you can view a graph of the variations of the property value (y axis: % measured) over the measurement number (x axis) as well as the status for that specific value and the current f-ratio.

To return to the Home screen, you can either tap the Home icon or tap anywhere in the Property details screen outside of the graph.

Figure 21 Property details screen



Managing Reports



NOTICE

Report files can be transferred to your external computer by copy-paste operations (not drag-and-drop) via the Remote Desktop connection (see “Establishing an Ethernet Connection” on page 22.)

Automated Daily Reports

Report files (.txt) of all chemistries monitored during the current day are automatically saved every night and stored in the **Reports** folder (**E:\ABB\AnalyzerSoftware\Reports**). The system stores 42 days of reports and automatically deletes files older than 42 days. All report files are formatted for spreadsheet programs like Microsoft® Excel.

A shortcut to the **Reports** folder is available on the TALYS analyzer desktop (accessed via a Remote Desktop connection [see “Establishing an Ethernet Connection” on page 22]).

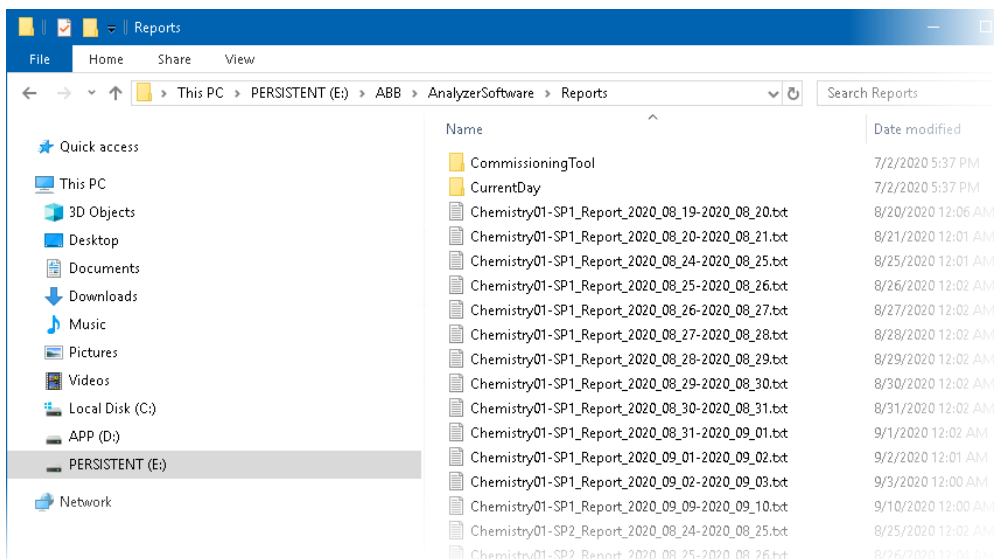
Figure 22 Reports icon on TALYS analyzer desktop



Report files are named under this format:

ChemistryXX-SPn_Report_(year)_(month)_(start day)-(year)_(month)_(end day).txt

Figure 23 Content of the **Reports** folder



- The folder **\ABB\AnalyzerSoftware\Reports\CommissioningTool** contains the Commissioning Tool exported reports and the log of all committed slopes & biases.
- The folder **\ABB\AnalyzerSoftware\Reports\CurrentDay** contains the report file (.txt) of the current day up to the time that an **ABB_Reports** function was executed (see “Transferring Data From the Analyzer” on page 40). It also contains older reports that were generated using the **Generate Current Day Report** script (see below).

Generating a Current Day Report

You can generate a report for the current day by double-clicking **Generate Current Day Report** located on the TALYS analyzer desktop (accessed via a Remote Desktop connection [see “Establishing an Ethernet Connection” on page 2243] (see “Generate Current Day Report icon” on page 44). This launches a script that generates a report for every chemistry monitored during the day (starting from the moment that the automatic daily report is generated; see “Automated Daily Reports” on page 42).

Figure 24 Generate Current Day Report icon



The resulting reports are stored in **E:\ABB\AnalyzerSoftware\reports\CurrentDay**.

Automated Spectrum Backups

Spectral data (.spectrum files) of the current day is saved every night and backed up as a ZIP file. See “Technical Specifications” on page D77 for details on the data included with your analyzer. The Data folder is then cleared. The system stores 42 days of data backups and automatically deletes files older than 42 days. Backups are stored in **E:\ABB\AnalyzerSoftware\Backups**.

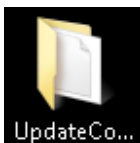
Updating a Configuration File

Configuration files are the heart of all TALYS operations. They contain data acquisition parameters, chemometric models, communication parameters, etc. These configuration files are created and edited via the Application Configuration Tool (for more information on configuration files, refer to the TALYS ADP300 Dual Sampling Point Analysis System Reference Guide). A custom configuration file is first provided with your TALYS analyzer. However, you might need to update such a file at some point in the future.

To do so:

- 1 Access the analyzer through a Remote Desktop connection (see page 22).
- 2 Copy the new configuration file in the UpdateConfig folder located on the TALYS analyzer desktop (see Figure 25).

Figure 25 The UpdateConfig folder



- 3 Double-click the **UpdateConfig** script icon (see Figure 26).

This updates the configuration found in the folder (the first in alphanumeric order, if more than one) on the desktop of the embedded processor and restarts the application.

Figure 26 UpdateConfig script icon



CHAPTER 5

Commissioning Tool

The Commissioning Tool is displayed on the TALYS analyzer desktop when connected by Remote Desktop. Double-click the TALYS analyzer desktop icon to start the Commissioning Tool.

Figure 27 The Commissioning Tool icon



The Commissioning Tool is used to perform various functions:

- Operational control (manual chemistry selection, references and monitoring state)
- Slope and bias adjustments (grab samples taken for laboratory analysis to be used for slope or bias adjustment).
- Method development (grab samples taken for laboratory analysis linked to spectral data)

The last two functions are advanced operations explained in more details in the TALYS ADP300 Dual Sampling Point Analysis System Reference Guide.

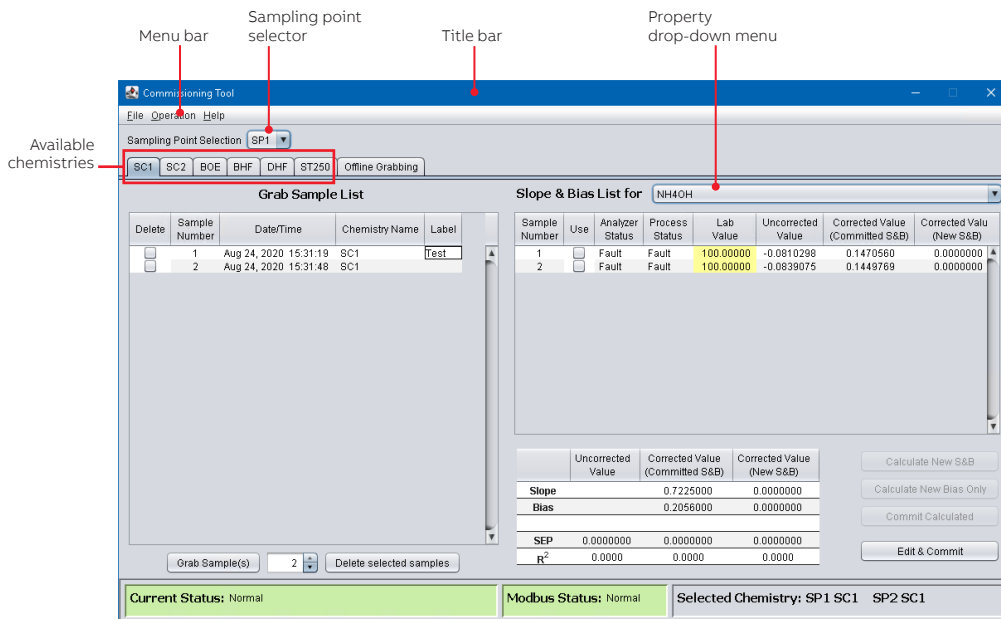


NOTICE

After performing the necessary changes in the Commissioning tool, always exit the software before returning to normal acquisition.

The Interface

Figure 28 Commissioning Tool main window



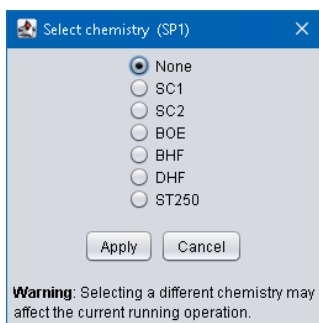
Associating Chemistries to Sampling Points

With analyzers from the TALYS ADP300 series, you can sample chemistries simultaneously on two sampling points. Each sampling point (SP) can monitor a different chemistry.

To associate a chemistry to a sampling point:

- 1 From the **Sampling Point Selection** drop-down menu, select **SP1** or **SP2**.
- 2 From the **Operation** menu, select **Chemistry Selection on SP_n** (where *n* is the number of the sampling point that you selected in step 1). The **Select Chemistry (SP_n)** dialog box appears.

Figure 29 The Select Chemistry (SP_n) dialog box



3 Select the chemistry that you want to monitor and click **Apply**.

From now on, the selected chemistry will be monitored on the sampling point that you chose. Repeat the same procedure to select a chemistry for the other sampling point. The selected chemistries appear in the bottom right corner of the Commissioning Tool main window (see Figure 28 on page 46).

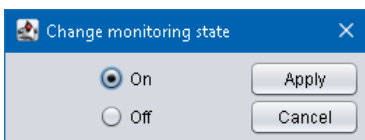
Toggling Monitoring

You can **only** toggle monitoring on all sampling points. This option is mostly used to stop measurements.

To toggle monitoring:

1 From the **Operation** menu, select **Monitoring State on all SP...** The **Change monitoring state** dialog box appears.

Figure 30 The Change monitoring state dialog box



2 Select **On** or **Off** (as needed) and click **Apply**.



NOTICE

The state of the monitoring operation is persistent. The analyzer remains in the last state it was set in until someone changes it again.


Acquiring an Initial Reference

At TALYS analyzer start-up (or after major maintenance operations on the analyzer, e.g., detector replacement), a new initial reference must be acquired for each sampling point to replace the factory references provided. The displayed initial reference applies to the sampling point currently selected in the main window. Initial references are always acquired manually.



NOTICE

The TALYS analyzer is shipped with factory-set references that allow measurements to be taken immediately after start-up.

A reference is considered valid when it satisfies all diagnosis criteria (spectral noise vibration, peak height linearity and tube contamination, loss of intensity, etc.). These criteria are defined and can be modified in the Application Configuration Tool (for more information, refer to the TALYS ADP300 Dual Sampling Point Analysis System Reference Guide). Until a valid reference is acquired, the software will flag an alarm. While acquiring a reference, the reference icon on the TALYS screen turns green: . Once the acquired reference is valid, the reference icon turns off.

As long as acquisition of the reference fails, the reference icon remains red: .

It is very important to make sure that the system is ready to acquire a new reference before triggering a reference acquisition. The initial reference must be acquired and confirmed to have no alarm or problem before proceeding with commissioning.



NOTICE

To take valid measurements, a 6-hour thermal stabilization period is highly recommended.

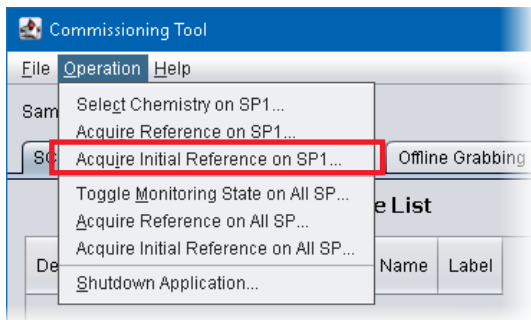
Do not move the ClippiR+ and fiber assembly between reference acquisitions and normal measurements. Also, do not use different fiber, ClippiR+ or tube when acquiring the initial reference compared to normal measurements.

For One Sampling Point

To acquire an initial reference for one sampling point:

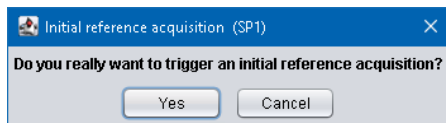
- 1 Make sure that the sampling accessory is empty and dry.
- 2 Double-click **Commissioning Tool** on the desktop. The Commissioning Tool application starts.
- 3 Make sure that no chemistry is selected (**None**) (see “Associating Chemistries to Sampling Points” on page 46).
- 4 Make sure that monitoring is on (see “Toggling Monitoring” on page 47)
- 5 From the **Operation** menu, select **Acquire Initial Reference on SP n ...** (n being the sampling point on which you want to acquire the initial reference).

Figure 31 Collecting an initial reference on one sampling point



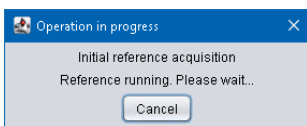
- 6 Click **Yes** in the dialog box that appears, asking you to confirm that you want to start an initial reference.

Figure 32 Initial reference acquisition confirmation



- 7 Acquisition of the initial reference starts. You can cancel it at any time by clicking **Cancel**.

Figure 33 Initial reference ongoing for one sampling point



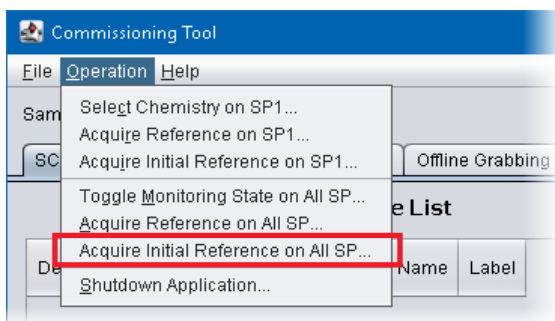
Once the reference is acquired, a dialog box appears confirming a successful acquisition. Should the initial reference acquisition fail, you will have to try again from Step 1.

For All Sampling Points

To acquire an initial reference for all sampling points:

- 1 Make sure that the sampling accessory is empty and dry.
- 2 Double-click **Commissioning Tool** on the desktop. The Commissioning Tool application starts.
- 3 Make sure that no chemistry is selected (**None**) (see “Associating Chemistries to Sampling Points” on page 46).
- 4 Make sure that monitoring is on (see “Toggling Monitoring” on page 47)
- 5 From the **Operation** menu, select **Acquire Initial Reference on All SP...**

Figure 34 Collecting an initial reference on all sampling points





- 6 Click **Yes** in the dialog box that appears, asking you to confirm that you want to start an initial reference on all sampling points. Acquisition of the initial references starts. The sampling point reference being acquired is indicated on the dialog box. You can cancel it at any time by clicking **Cancel** (see Figure 33 on page 49).

Once the initial references are acquired, a dialog box appears confirming a successful acquisition. Should the initial reference acquisitions fail, you will have to try again from Step 1.

Acquiring a Standard Reference

Depending on the requirements of your company or industry, it might be necessary, from time to time (anywhere from every few hours to every few months), to generate a new valid reference to take into account the various changes that can happen on your monitoring setup (tubing aging, deposit build-up, etc.). The following pages explain how to acquire these standard references (a.k.a. “last known good”).

A reference is considered valid when it satisfies all diagnosis criteria (spectral noise vibration, peak height linearity and tube contamination, loss of intensity, etc.). These criteria are defined and can be modified in the Application Configuration Tool (for more information, refer to the TALYS ADP300 Dual Sampling Point Analysis System Reference Guide).

Until a valid reference is acquired, the software will flag an alarm. While acquiring a reference, the reference icon on the TALYS screen turns green: . Once the acquired reference is valid, the reference icon turns off. As long as acquisition of the reference fails, the reference icon remains red: .

It is very important to make sure that the system is ready to acquire a new reference before triggering a reference acquisition.



NOTICE

To take valid measurements, a 6-hour thermal stabilization period is highly recommended.

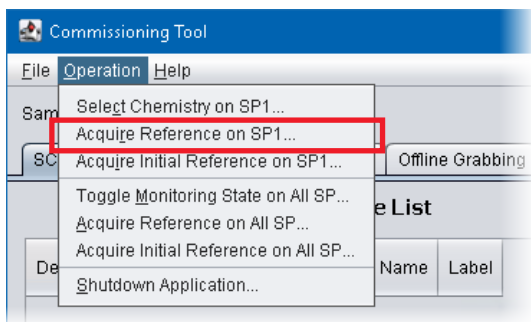
Do not move the ClippiR+ and fiber assembly between reference acquisitions and normal measurements. Also, do not use different fiber, ClippiR+ or tube when acquiring the references compared to normal measurements.

For One Sampling Point

To acquire a reference for one sampling point:

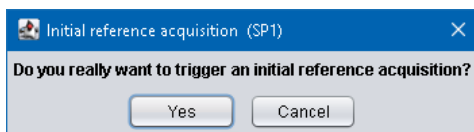
- 1 Make sure that the sampling accessory is empty and dry.
- 2 Double-click **Commissioning Tool** on the desktop. The Commissioning Tool application starts.
- 3 Make sure that no chemistry is selected (**None**) (see “Associating Chemistries to Sampling Points” on page 46).
- 4 Make sure that monitoring is on (see “Toggling Monitoring” on page 47)
- 5 From the **Operation** menu, select **Acquire Reference on SP n ...** (n being the sampling point on which you want to acquire the initial reference).

Figure 35 Acquiring a reference on one sampling point



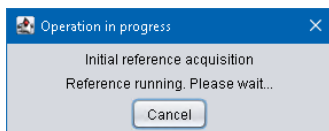
6 Click **Yes** in the dialog box that appears, asking you to confirm that you want to start a reference.

Figure 36 Reference acquisition confirmation



7 Acquisition of the reference starts. You can cancel it at any time by clicking **Cancel**.

Figure 37 Initial reference ongoing for one sampling point



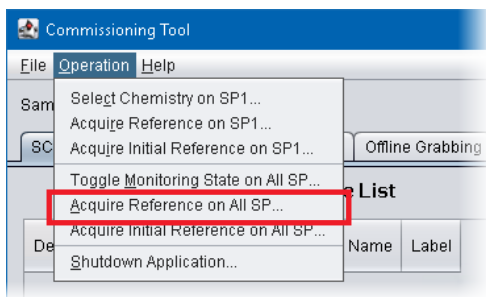
Once the reference is acquired, a dialog box appears confirming a successful acquisition. Should the reference acquisition fail, you will have to try again from Step 1.

For All Sampling Points

To acquire a reference for all sampling points:

- 1 Make sure that the sampling accessory is empty and dry.
- 2 Double-click **Commissioning Tool** on the desktop. The Commissioning Tool application starts.
- 3 Make sure that no chemistry is selected (**None**) (see “Associating Chemistries to Sampling Points” on page 46).
- 4 Make sure that monitoring is on (see “Toggling Monitoring” on page 47)
- 5 From the **Operation** menu, select **Acquire Reference on All SP...**

Figure 38 Collecting a reference on all sampling points



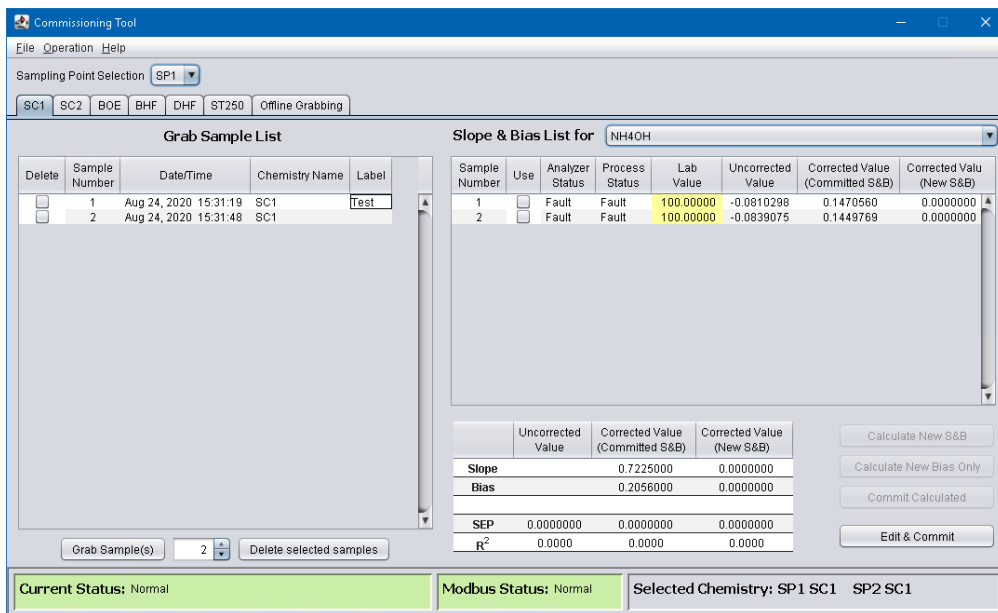
- 6** Click **Yes** in the dialog box that appears, asking you to confirm that you want to start a reference (see Figure 36 on page 51). Acquisition of the reference starts. You can cancel it at any time by clicking **Cancel**.

Once the references are acquired, a dialog box appears confirming successful acquisitions. Should the reference acquisitions fail, you will have to try again from Step 1.

Adjusting Slope and Bias

Depending on the ADP model, the TALYS analyzer may report raw predictions using neutral slope and bias values (1 and 0 respectively) or pre-adjusted predictions using global factory-defined slope and bias values for SC1, SC2, BHF, BOE or DHF chemistries. Fine-tuning these values according to the response of a specific TALYS analyzer is always recommended as it may improve performance.

Figure 39 Commissioning Tool main window (ADP300)



- 1 At the bottom of the **Grab Sample List**, use the Up and Down arrows to set the number of grab samples that you need to collect.

Grab Sample(s)	2
----------------	---



NOTICE

Grab sample refers to taking a physical sample for laboratory analysis and taking an analytical measurement (with the analyzer) of a previously prepared bath which is to be monitored. It is recommended to wait for the measurement to be stable for one acquisition before triggering a grab sample.

For more information on grab samples and their use, refer to the TALYS ADP300 Dual Sampling Point Analysis System Reference Guide.

- 2 Click **Grab Sample(s)**. The system starts grabbing samples. This operation can take a few minutes, depending on the number of samples that you need to grab.
- 3 Once the samples are acquired, select a property from the property drop-down menu next to **Slope & Bias List for**.
- 4 Under the **Lab Value** column, double-click the yellow fields to make them editable and enter lab values for all grab samples. The example below shows 100% water.

Sample Number	Use	Analyzer Status	Process Status	Lab Value
1	<input type="checkbox"/>	Fault	Fault	100.00000
2	<input type="checkbox"/>	Fault	Fault	100.00000



NOTICE

Changing the slope and bias has a direct impact on calculated values. To calculate slope and bias, make sure that you have reference values (lab values) on hand.

Slope and bias should not be applied haphazardly. Use good judgment when performing this operation.

- 5 Under the **Use** column, check the valid grab samples to use.
- 6 Click either **Calculate New S&B** or **Calculate New Bias Only**.
This step **does not apply** new slope or bias values; it **only calculates them**.



NOTICE

Applying bias only will reset the slope to 1.

- 7 Compare statistics between actual committed values and new calculated values to validate whether the newly calculated results are correct (for more information on validating grab samples, refer to the TALYS ADP300 Dual Sampling Point Analysis System Reference Guide).

	Uncorrected Value	Corrected Value (Committed S&B)	Corrected Value (New S&B)
Slope	1.0	0.7854	1.0
Bias	0.0	20.589	-0.683
SEP	0.836602	0.4099527	0.0182219
R²	NaN	NaN	NaN

- **Uncorrected Value** values are the predictions of the chemometric model.
- **Committed Value (Committed S&B)** are values used by the TALYS analyzer.
- **Corrected Value (New S&B)** are values that have just been calculated by the Commissioning Tool.

8 Click **Commit Calculated**. This will apply the new calculated slope and bias values.

9 Repeat the previous steps for all properties in the property drop-down menu (next to **Slope & Bias List for**).

Adjusting Slope and Bias from an External Calculator

The Commissioning Tool can calculate slopes and biases (S&B) for you, but you can also force the use of calculations provided by other calculation tools.

To do so:

1 Click **Edit & Commit**. The **Edit and Commit** dialog box appears.

Figure 40 The Edit and Commit dialog box

2 Enter the values calculated outside the Commissioning Tool in the appropriate fields.

3 Click **Commit**. The entered values are applied.

Deleting Grab Samples

There are times when you might have to delete grab samples (i.e., samples extracted at a wrong time in the process, mistake made during sample lab analysis, etc.).

To delete one or more grab samples:

1 From the **Grab Sample List**, check the boxes adjacent to the samples that you want to delete.

2 Click **Delete Selected Samples** at the bottom of the **Grab Sample List**. A dialog box asks you to confirm the deletion.

3 Click **Yes**. The checked samples are deleted.

Preparing for Process Monitoring

- 1** In the Commissioning Tool, make sure that monitoring is toggled **On** (see “Toggling Monitoring” on page 47) and that the selected chemistries are set to **None** (see “Associating Chemistries to Sampling Points” on page 46).
- 2** Empty the baths and attach the ClipIR+ sample probes to the tubing to be monitored.
- 3** Acquire the initial references (see “Acquiring an Initial Reference” on page 47).
- 4** Fill baths with the two chemistries to monitor.
- 5** Associate chemistries to sampling points (see “Associating Chemistries to Sampling Points” on page 46).
- 6** If necessary, acquire the grab samples and adjust the slope and bias (see “Adjusting Slope and Bias” on page 52).

The TALYS analyzer starts displaying measurement results immediately.

Exiting the Commissioning Tool

Once you have completed the necessary commissioning operations with the Commissioning Tool, it is good practice to exit this software.

To do so, simply select **Exit** from the **File** menu.

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Troubleshooting



WARNING

Do not open the analyzer to perform troubleshooting procedures. Contact your local ABB support in case of malfunction or for any information. All maintenance is to be performed **only** by trained and qualified ABB personnel.

Troubleshooting from LEDs

The following pages provide the LED sequence and a LED troubleshooting table. The LED sequence is detailed below along with a troubleshooting table and flowchart.



NOTICE

LEDs only indicate the status of the internal spectrometer. They **do not** indicate the status of the whole analyzer.

Table 2 LED troubleshooting

LED	State	Possible cause	Solution
Power	OFF	Power not connected	Turn ON breaker on plant distribution panel.
		Power cord not connected	Make sure that the power cable is connected in the analyzer and in the wall outlet. Make sure that there is no breach in the power line.
		Interrupted power line	
		No current at power outlet	Test outlet for voltage.
		Internal problems	Contact ABB. Refer to the back cover of this document
		Normal operation	






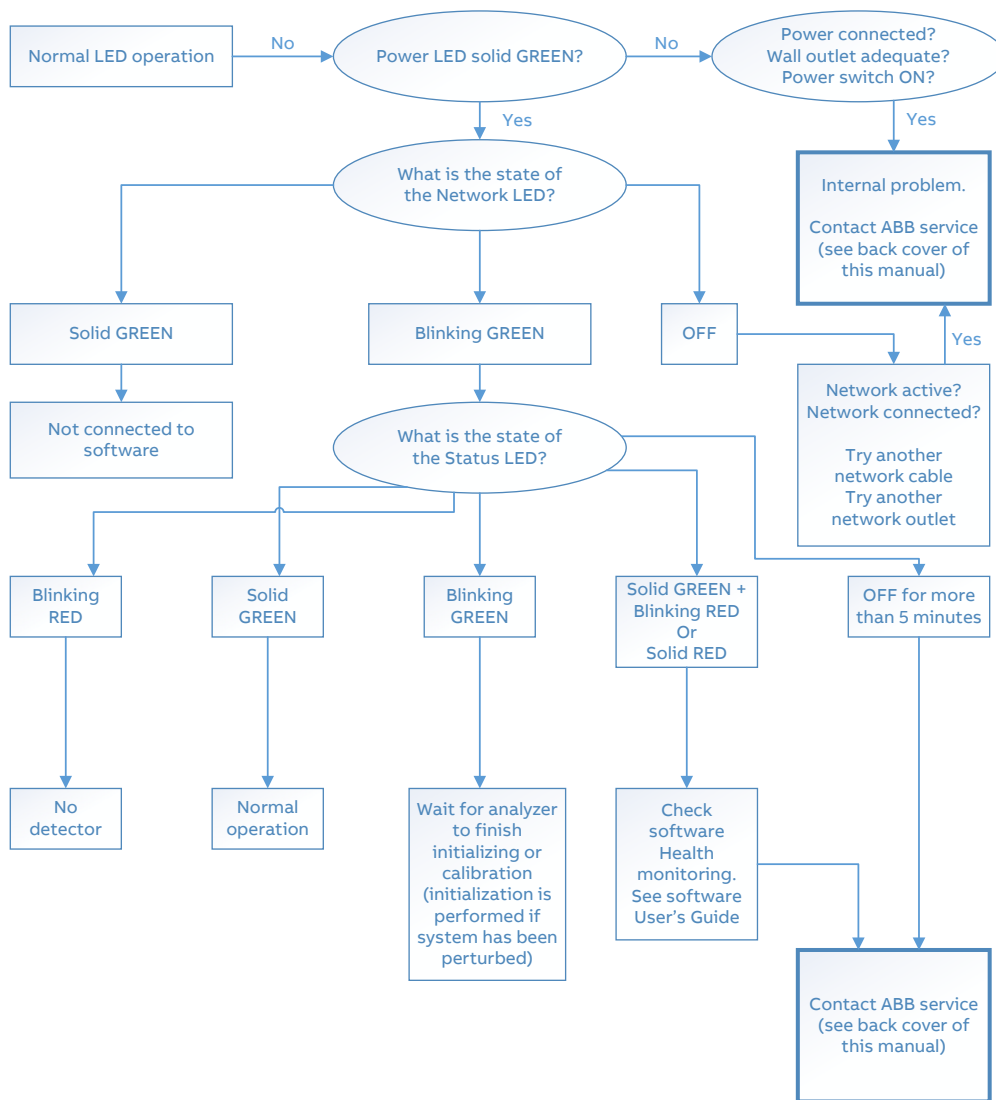
LED	State	Possible cause	Solution
Status		No detector connected	Replace or install the detector module. Contact ABB Service.
		Operation error	Check software health monitoring.
		Internal error	Check software health monitoring.
	OFF	System is loading	If the LED is still off after 1 minute, check software health monitoring
		System is initializing or performing calibration. The initialization sequence is performed at startup or after a disturbance.	If this sequence lasts longer than 5 minutes, it is probably caused by a low laser or white light level. Contact ABB. See the back cover of this document.
Network	OFF	Network cable not connected or wrong type of cable	Make sure that the Ethernet cable is connected.
		Network connected but no communication with the controller or the network.	Check controller and/or network configurations.







Figure 41 LED flowchart







Troubleshooting from the GUI

Pictures below indicate the possible statuses that can be displayed on the GUI.

Table 3 GUI troubleshooting

Status	Possible cause	Solution
ANY STATUS BELOW	GUI error	<p>Perform the ABB_locale function to restart the GUI (see “Setting System Locale” on page 37).</p> <p>Restart the TALYS analyzer.</p> <p>Perform the ABB_Service function and contact your local ABB representative.</p>
 :1:23  :4:56	Problem with acquisition	<p>Diagnose TALYS front LEDs.</p> <p>Shutdown and restart application using the Commissioning Tool (see “Exiting the Commissioning Tool” on page 55).</p> <p>Perform the ABB_Service USB function and contact your local ABB representative.</p>
	Problem with first acquisition	<p>Diagnose TALYS front LEDs</p> <p>Shutdown and restart application using the Commissioning Tool (see “Exiting the Commissioning Tool” on page 55).</p> <p>Perform the ABB_Service USB function and contact your local ABB representative.</p>
	No selected chemistry (normal behavior)	<p>Select an active chemistry via the Commissioning Tool or through a DCS external control command (see “Modbus Port 502/503 Register Table” on page 28),</p> <p>.</p> <p>Perform the ABB_Service USB function and contact your local ABB representative.</p>
	Monitoring state is off . A chemistry is selected.	<p>Turn on monitoring (see “Toggling Monitoring” on page 47) via the Commissioning Tool or through the external controller command (see “Modbus Port 502/503 Register Table” on page 28). The TALYS analyzer will automatically start monitoring the selected chemistry.</p> <p>Perform the ABB_Service USB function and contact your local ABB representative.</p>
	Monitoring state is off . No chemistry is selected.	<p>Turn on monitoring (see “Toggling Monitoring” on page 47) via the Commissioning Tool or through the external controller command (see “Modbus Port 502/503 Register Table” on page 28). The GUI will display the crossed green flask.</p> <p>Perform the ABB_Service USB function and contact your local ABB representative.</p>

Status	Possible cause	Solution
 Black flask	Application is shutdown. Black flask only occurs on first power up.	Open the Commissioning Tool and start the application. <ul style="list-style-type: none"> • Load the initial configuration provided by the factory. If the application starts, verify for errors in the committed configuration. Possible errors are space(s) in the filename, incompatible (old) or corrupted configuration. • Load valid configuration using the UpdateConfig function (see “Updating a Configuration File” on page 44).
 Crossed red flask	Application will not start (unable to communicate with Modbus)	Perform the ABB_Service USB function and contact your local ABB representative.
 Loading spinner	GUI is waiting for certain processes of the Application operating system to be ready.	If spinner stays longer than expected according to the standard boot sequence delays, connect to the TALYS analyzer through a Remote Desktop connection. If Remote Desktop cannot connect to the TALYS analyzer, contact your local ABB representative.
 Power on sequence	GUI does not start (no white screen during boot sequence).	Contact your local ABB representative.

Displaying Faults and Error Codes

The presence of process or analyzer faults is indicated by icons in the top right corner of the GUI. A lit fault indicator signifies that faults are present on **either** of the sampling points.

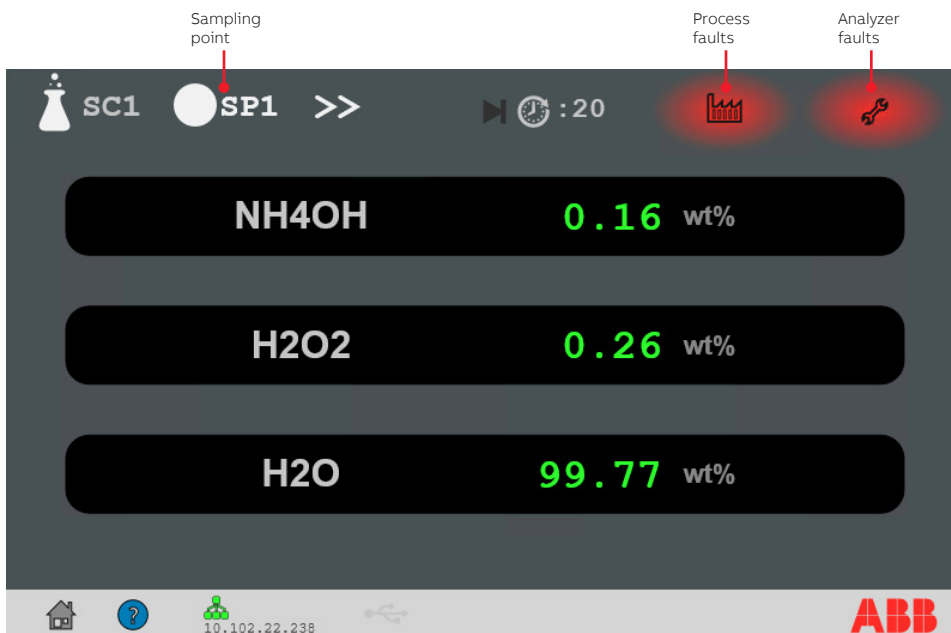
Tap the indicator to display faults **for the current sampling point**. If errors are present only on the other sampling point, no faults will appear onscreen. Tap the sampling point icon to switch to the other sampling point and display the current fault indications.



NOTICE

In cases where the sampling point automatic toggle is activated (see “Sampling point toggle” on page 16), tap the **SP n** indicator to select the correct sampling point, and tap the fault indicator again.

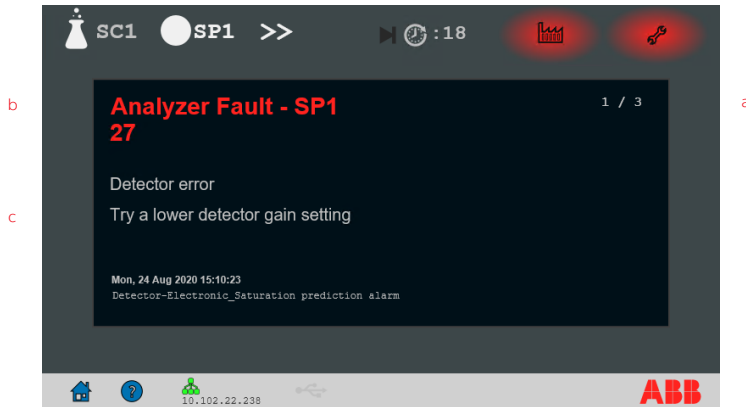
Figure 42 Lit fault icons



- **Process fault** alarms are raised by failure of diagnostics related to the:
 - Absorbance spectra (model predictions)
 - Raw spectra (bubbles, vibrations, ...)
- **Analyzer fault** alarms are raised by failure of diagnostics related to the:
 - Interferometer
 - Electronics
 - Detector
 - Optical fibers
 - Reference spectra

Fault Indications

Figure 43 Fault detailed on the GUI



- a A fault count informs you if more than one fault occurred. You can tap the Process Faults and Analyzer Faults icons repeatedly to switch between fault error messages.
- b In the fault information display, the error number is indicated and linked to the error tables below (see “Process Fault Error Code Table” on page 64 below and “Analyzer Fault Error Code Table” on page 64).
- c A description of the error is given as well as a corrective action.



NOTICE

Alarm messages can be displayed in various languages (see “Setting System Locale” on page 37 for details).

Modbus TCP Error Codes Returned by TALYS

If the TALYS analyzer receives an incorrect request, the response defines an error. The sub-function or error exception code is defined in the following table:

Error exception code	Generic Modbus Exception	TALYS TCP Server Implementation
1	ILLEGAL FUNCTION	The function code received in the query is not an allowable action for the server.
2	ILLEGAL DATA ADDRESS	The data address received in the query is not an allowable address for the server.
3	ILLEGAL DATA VALUE	A value contained in the query data field is not an allowable value for server.
4	SLAVE DEVICE FAILURE	N/A
5	ACKNOWLEDGE	N/A
6	SLAVE DEVICE BUSY	N/A
8	PARITY ERROR	N/A
0xa	PATH UNAVAILABLE	N/A
0xb	GATEWAY DEVICE FAIL	N/A

Process Fault Error Code Table

Error no.	Error message	Corrective action
101	Property out of range	Verify process concentration.
102	Model result out of range	Grab new samples to extend the range of your model.
103	Model statistic out of range	
139	Tube contamination error	Contact your local ABB Service.
140	Vibration error	Dampen physical vibrations near the analyzer.
141	Bubbles in the process	Remove bubbles in the process flow.
142	Contamination by solvent	Check for contamination.
143	Contamination by product	Check for contamination.
144	Water vapor	Check for contamination.

Analyzer Fault Error Code Table

Error no.	Error message	Corrective action
0	Status normal	Not applicable
1	Prediction error	Check your model or contact your local ABB Service.
2	Prediction parameter error	Check your model or contact your local ABB Service.
3	Data acquisition error	Reboot analyzer (cycle power) or contact your local ABB Service.
4	Reference error	Require new valid reference.
5	Factory reference used	Require new valid reference.
10	IR Source error	Contact your local ABB Service to replace source.
11	IR Source error	Contact your local ABB Service to replace source.
12	IR Source error	Contact your local ABB Service to replace source.
13	IR Source error	Contact your local ABB Service to replace source.
14	Interferometer error	Contact your local ABB Service.
15	Interferometer error	Contact your local ABB Service.
16	Interferometer error	Contact your local ABB Service.
17	Interferometer error	Contact your local ABB Service.
18	Interferometer error	Contact your local ABB Service.
19	Interferometer error	Contact your local ABB Service.
20	Interferometer error	Contact your local ABB Service.
21	Interferometer error	Contact your local ABB Service.
22	Interferometer error	Contact your local ABB Service.
23	Interferometer error	Contact your local ABB Service.
24	Interferometer error	Contact your local ABB Service.
25	Internal temperature error	Contact your local ABB Service.
26	Internal temperature error	Contact your local ABB Service.

Error no.	Error message	Corrective action
27	Detector error	Try a lower detector gain setting.
28	Detector error	Wait 15 minutes. If error remains, contact your local ABB Service.
29	Interferometer error	Ensure ambient temperature is within ABB specifications.
30	Interferometer error	Contact your local ABB Service.
31	Interferometer error	Contact your local ABB Service.
32	Not used	
33	Baseline stability error	Contact your local ABB Service.
34	Not used	
35	Spectral energy below cut-off	Try a lower detector gain setting.
36	Loss of intensity error	Check source, fibers, sampling system, and/or contact your local ABB Service.
37	Peak height error	Contact your local ABB Service.
38	Peak position error	Contact your local ABB Service.
39	Spectral noise error	Contact your local ABB Service.
32764	Analyzer error	Extract service info and call your local ABB Service.
32766	Software error	Extract service info and call your local ABB Service.

Recalibrating the Analyzer Screen

When receiving the TALYS analyzer from the factory, it may be necessary to recalibrate the analyzer screen. **This operation can only be performed with a USB key procedure** (see “Enabling USB Key Operations” on page A68).

To do so:

- 1 Modify the name of the folder **xHMI_Calibrate**.
- 2 Insert the USB key in the USB port. This automatically triggers the screen calibration script which restarts the GUI.

The calibration sequence is seen approximately 30 seconds after the GUI has restarted.

When the **HMI_Calibrate** script is triggered, a red cross appears in the upper left corner of the screen (a timer appears in the middle of the screen). Once you tap the first cross, another cross appears in another corner. Tap successively on all four crosses that appear on screen.



NOTICE

The timer in the middle of the screen indicates the time remaining to tap all four crosses. If you do not tap all four crosses before the timer elapses (or if the calibration fails), the timer restarts. This will happen as long as the calibration is not successful.

Once the last cross is tapped, the GUI restarts, then appears on the calibrated screen. The display will be unavailable for a few minutes. The operation takes less than five minutes. The network icon turns orange before such an update.

Restoring the Analyzer to Factory Settings

The TALYS analyzer can be brought back to factory settings (prior to all commissioning operations) by using the provided USB key. For more information, see “Reverting to Default Factory Configuration” on page A71.

Shutting Down the Analysis Application

At times, the analysis software running on the TALYS analyzer might become unresponsive. The most efficient method to make it responsive again is to shut down and restart the analysis application.

To do so, in the Commissionin Tool, select **Shutdown application ...** from the **Operation** menu.

Obtaining the Software Version Number

When contacting ABB for service questions, you might need to provide the Commissioning Tool version number.

This is obtained by selecting **About...** from the Commissioning Tool’s **Help** menu (for more information on the Commissioning Tool, see “Commissioning Tool” on page 45).

Updating the Software

When software updates are available, an installation package (with installation instructions) will be provided to you by an ABB Service representative.

Before Sending Back an Analyzer to ABB

Before sending an analyzer to ABB, you must

- have the available serial and model number as well as a brief description of the problems. Make sure to include error codes and other details,
- obtain a Contamination Data Sheet from ABB after sales service,
- fill out and sign the Contamination Data Sheet (do not forget to check the boxes of the Non-contaminated Material Declaration section), then return the fully completed declaration to ABB,
- obtain an authorization number from ABB personnel.
You must receive a Return Merchandise Authorization (RMA) number before sending the analyzer back to ABB, otherwise receipt of the analyzer will be declined.

APPENDIX A

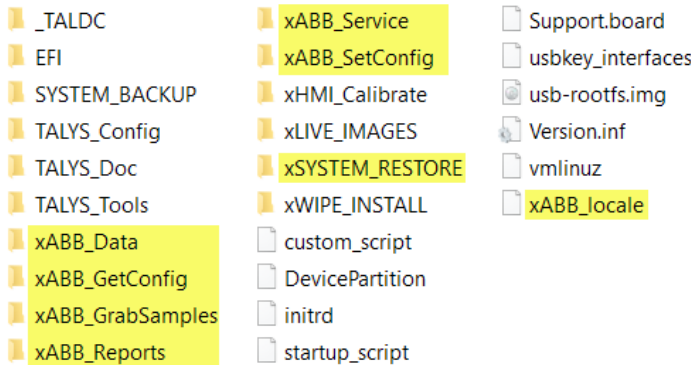
Operating With a USB Key

A USB key is provided with your TALYS system. This USB key can be used to perform certain operations with or on the TALYS analyzer.

Scripts embedded in the TALYS analyzer search for files or folders whose presence on the USB key will automatically trigger specific operations. Most of these operations are described on page 40 as they can also be performed via an Ethernet connection. Those that can only be performed via a USB key or whose execution differs from the Ethernet connection method are described in the following pages.

These operations (highlighted in Figure 44) need to be enabled (see “Enabling USB Key Operations” on page A68) before they can be performed.

Figure 44 Normal USB key content



When a USB operation is enabled and executed, it is displayed on the GUI along with the estimated percentage of completion (for some fast USB operations, this information might not be displayed).

When a USB key is inserted in the TALYS analyzer, and data is being transferred, the USB icon on the GUI turns red (for more information on this icon, see “Graphical User Interface (GUI)” on page 16).

The red USB icon disappears when the operation is completed and the analyzer is no longer sending information to the USB key.



NOTICE

Always wait for the indicator light on the USB key (if applicable) to stop indicating activity before pulling it out of the USB port.

Enabling USB Key Operations



NOTICE

The TALYS analyzer only supports USB keys formatted with the FAT32 computer file system architecture.



NOTICE

Never try and execute more than one operation per USB key insertion. This could create system instabilities.

To enable operations:

- 1 Insert the USB key on an external computer.
- 2 On the USB key, remove the **x** at the beginning of the folder or file name of the operation that you want to perform. This enables the operation and makes it recognizable by the TALYS analyzer.



NOTICE

If a folder was deleted, recreate it with the appropriate name as listed in this section.

Executing USB Key Operations

To execute a USB key operation:

- Insert the USB key in the TALYS analyzer USB port. The enabled operation is automatically executed. The procedure is slightly different for certain configuration and backup operations explained later in this chapter.

Once the operation has been performed, it is recommended to deactivate all operations.

Disabling USB Key Operations

To disable operations:

- 1 Insert the USB key on an external computer.
- 2 On the USB key, add an **x** at the beginning of the folder or file name of the operation that you want to stop performing. This disables the operation and makes it unrecognizable by the TALYS analyzer.



NOTICE

If a **DoRename** file is included in a folder, it will automatically deactivate the operation once it is completed.

If it is **not** included, you can create one from a standard text file editor (Notepad, WordPad, etc.) by creating an empty file, saving it as **DoRename** in the appropriate folder, and removing the **.txt** file extension.

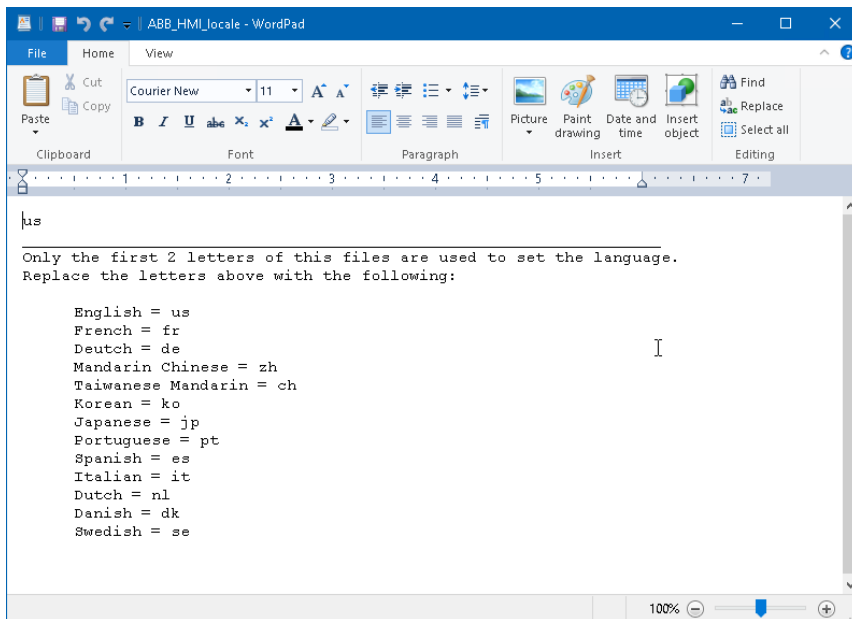
Setting System Locale

The TALYS analyzer graphical user interface (GUI) is offered in many languages to reflect the diversity of its users.

To set the GUI to your preferred language:

- 1 On an external computer, open the file **xABB_locale** in WordPad.
- 2 In the first line, enter the two letters corresponding to the desired interface language (available languages are listed in the file [see Figure 45]).

Figure 45 ABB_locale file opened in WordPad



- 3 Save and close the file.
- 4 In the directory, remove the **x** at the beginning of the file name. The file name should now be **ABB_locale**.
- 5 Remove the USB key from the computer and insert it in the USB port on the TALYS analyzer. This automatically launches the ABB_locale script that updates the GUI language. The screen shuts off and restarts.
- 6 Once the operation is completed successfully (and the screen finished restarting), click **OK** in the dialog box that appears.



NOTICE

The network icon turns orange before a GUI update (ABB_locale).

Updating a Configuration File

Configuration files are the heart of all TALYS operations. They contain data acquisition parameters, chemometric models, communication parameters, etc. These configuration files are created and edited via the Application Configuration Tool (for more information on configuration files, refer to the TALYS ADP300 Dual Sampling Point Analysis System Reference Guide). A custom configuration file is first provided with your TALYS analyzer. However, you might need to update such a file at some point in the future.

To do so:

- 1 From an external computer, copy the new configuration file in the **xABB_SetConfig** folder.
- 1 Enable **xABB_SetConfig** as explained in “Enabling USB Key Operations” on page A68.
- 2 Insert the USB key in the USB port.

This automatically loads the configuration file found in the folder (the first in alphanumeric order, if more than one) and restarts the application.

The operation can be performed at any time. The operation duration depends on the size of the configuration file. A file named “Valid_Signature” is created once the operation has completed successfully.



NOTICE

All committed configuration files are copied to **E:\ABB\AnalyzerSoftware\Configuration**.

Backing Up the Entire System

Before major system upgrades, or whenever a major procedure is necessary, it can be good business practice to back up the entire system residing in your TALYS analyzer.

To do so:

- 1 Enable **xSYSTEM_BACKUP** as explained in “Enabling USB Key Operations” on page A68.
- 2 Power down the TALYS analyzer.
- 3 Insert the USB key and restart the analyzer. The operation starts automatically and should take about 30 minutes.

When the operation is over, the message **Remove the usb key and power off the instrument** will appear on the screen, indicating that the backup process is over.

- 4 Remove the USB key and restart the analyzer.



NOTICE

To validate backup integrity, make sure that the **SYSTEM_BACKUP** folder was renamed **SYSTEM_BACKUP_DONE**.

Restoring from a System Backup

Should you find the system in need of a deep reset, you can do so by restoring the factory configuration.

To do so:

- 1 Enable **xSYSTEM_RESTORE** as explained in “Enabling USB Key Operations” on page A68.
- 2 Power down the TALYS analyzer.
- 3 Insert the USB key and restart the analyzer.
The analyzer will start from the USB key, wipe the configuration created at commissioning, and bring back the factory settings into the analyzer itself.
- 4 Once the reset is complete, power off the analyzer.
- 5 Remove the USB key
- 6 Power on the analyzer again.

Reverting to Default Factory Configuration



NOTICE

This procedure is slightly different for ADP310 and ADP320 analyzers.

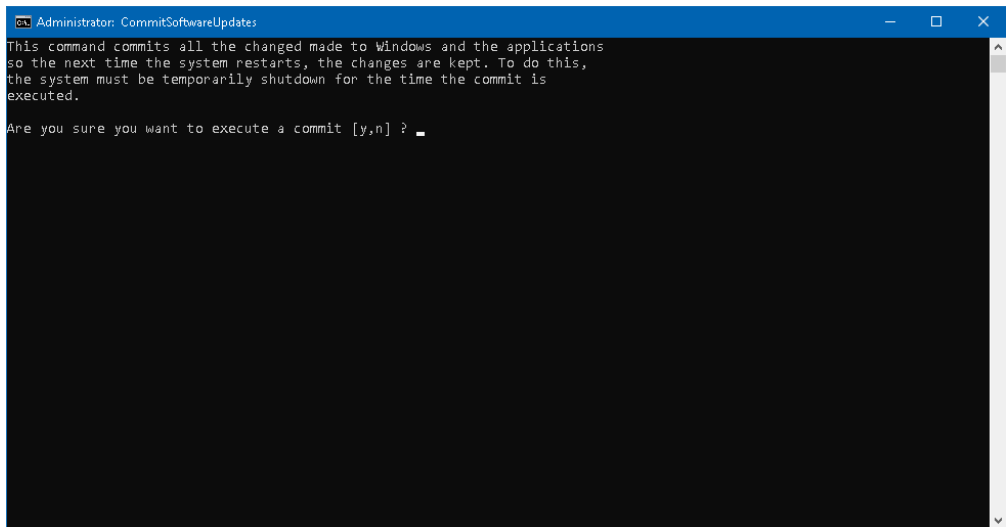
- 1 Enable **xLiveImage** and **xWipeInstall** as explained in “Enabling USB Key Operations” on page A68.
- 2 Power down the TALYS analyzer.
- 3 Insert the USB key and start the analyzer.
The enabled operations start automatically and should take about 15 minutes. When the operations are over, the message **Remove the usb key and power off the instrument** will appear on screen, indicating that the process is over.
- 4 Remove the USB key and restart the analyzer.
- 5 Update the FTSW licence:
 - a Establish a Remote Desktop connection and, in the **Networks** dialog box that appears, click **Yes**.
 - b In the following **Fix apps that are blurry** dialog box, click **Cancel**.
 - c Insert the USB key in the external computer and, in **\TALYS_Tools\Licence**, copy the **licence.dat** file to **D:\ABB\TALYS-AS\Enablr** on the analyzer.
- 6 If needed, update the IP address (see “Setting the Analyzer IP Address” on page 23)

7 If reverting an ADP320 to default factory configuration:

- a** Copy file **TALYS-ADP320*.ftsw100** in directory **E:\ABB\AnalyzerSoftware\Configuration** to directory **C:\Users\ABB\Desktop\UpdateConfig**
- b** Copy file **ReportGeneratorConfigADP320.xml** in directory **E:\ABB\Enablir\ReportTool** to directory **C:\Users\ABB\Desktop\UpdateConfig**.
- c** Once copied, rename this copy of **ReportGeneratorConfigADP320.xml** to **ReportGeneratorConfig.xml**.
- d** Double-click the **UpdateConfig** script icon (see Figure 26). This updates the configuration found in the folder (the first in alphanumeric order, if more than one) on the desktop of the embedded processor and restarts the application.

- 8** On the analyzer, in directory **D:\ServiceTool**, double-click the **CommitSoftwareUpdates** shortcut and type **y** to commit the new configuration (see Figure 46 below).

Figure 46 CommitSoftwareUpdate window



NOTICE

While the commit operation is underway, you will lose the Remote Desktop connection. You can only re-establish the connection once the green flask reappears.

- 9** Remove the USB key and restart the analyzer.

APPENDIX B

Wall Mount Installation



WARNING

The analyzer weighs 22 kg (49 lb). **ABB strongly recommends lifting the analyzer with the help of another person.** Make sure to use proper body mechanics to lift the analyzer (bend your knees) otherwise injuries could occur.

Make sure that your wall can support a weight of 22 kg (49 lb).



NOTICE

Make sure there is sufficient clearance in front of the heat sinks (15 cm/6 in.).

Install the equipment in such a way that, if necessary, it can be disconnected easily. Also make sure to allow easy access to the cables and connectors (optical, Ethernet and USB cables, power cord).

When installed, the analyzer should be accessible for connection, commissioning, programming, and troubleshooting if necessary. Figure 47 shows the wall mount dimensions.

Figure 47 Wall-mount dimensions

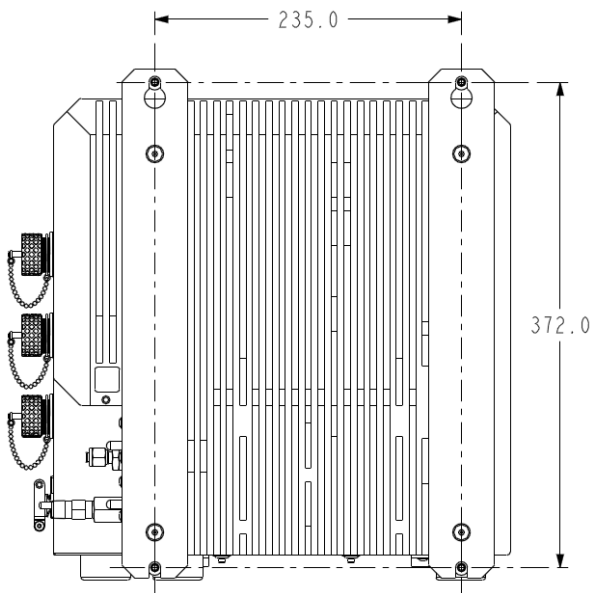
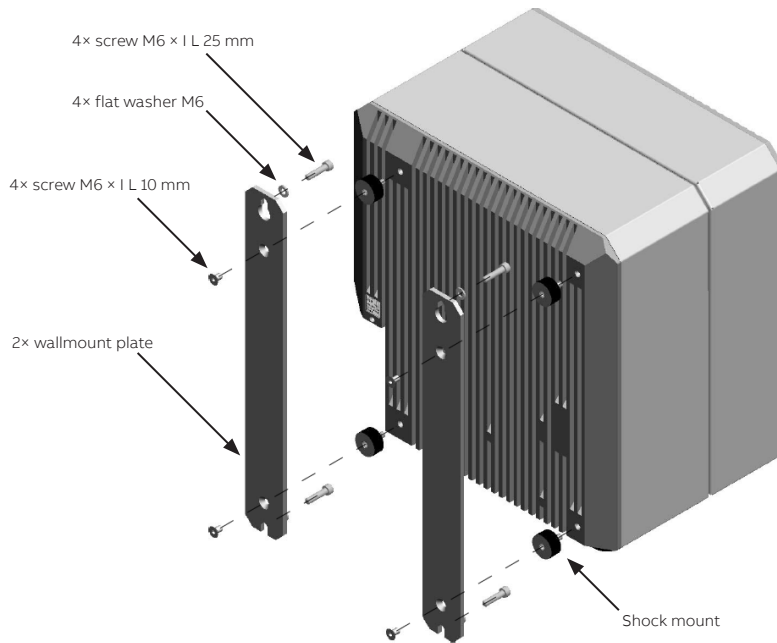


Figure 48 Wall-mount details



APPENDIX C

Open Source References

Component	Version	License	Home Page
abbrev	1.0.5 (2)	ISC License	https://www.npmjs.org/package/abbrev
Async	0.1.22	MIT License	https://www.npmjs.org/package/async
base64id	0.1.0	MIT License	https://www.npmjs.org/package/base64id
block-stream	0.0.5	ISC License	https://www.npmjs.org/package/block-stream
chownr	0.0.2	ISC License	https://www.npmjs.org/package/chownr
coffeecup	0.3.1	MIT License	http://github.com/mauricemach/coffeecup/
coffee-script	1.8.0	MIT License	https://www.npmjs.org/package/coffee-script
commander.js - tj/commander.js	2.1.0	MIT License	http://github.com/visionmedia/commander.js/
commander.js - tj/commander.js	0.6.1	MIT License	http://github.com/visionmedia/commander.js/
cscsl	1.4.0	MIT License	http://github.com/jashkenas/coffeescript/
cssom-papandreou	0.2.5	MIT License	https://www.npmjs.org/package/cssom
dnode	0.9.2	MIT License	https://www.npmjs.org/package/dnode
dnode-protocol	0.1.1	MIT License	http://github.com/substack/dnode-protocol/
express - expressjs/express	2.5.11	MIT License	https://www.npmjs.org/package/express
express - strongloop/express	2.5.11	MIT License	https://www.npmjs.org/package/express
extra-coffee-script	1.4.0	MIT License	http://github.com/maxtaco/coffee-script/
FlashPolicyFileServer	0.0.4	MIT License	http://github.com/3rd-Eden/FlashPolicyFileServer/
flot	0.7	MIT License	http://code.google.com/p/flot/
fstream - isaacs/fstream	0.1.18	ISC License	http://github.com/isaacs/fstream/
fstream-ignore	0.0.8	ISC License	https://www.npmjs.org/package/fstream-ignore
fstream-npm	0.0.4	ISC License	http://github.com/isaacs/fstream-npm/
inherits	1.0.0	ISC License	https://www.npmjs.org/package/inherits

Component	Version	License	Home Page
ini	1.0.2	ISC License	http://github.com/npm/ini/
Java CVS Reader and Writer	2.0	GNU Lesser General Public License v2.1 or later	http://javacsv.sourceforge.net/
Java Service Wrapper	3.0.5	MIT License	http://sourceforge.net/projects/wrapper/
jquery - jquery/jquery	1.7.1	MIT License	http://github.com/jquery/jquery/
jquery - jquery/jquery	1.11.1	MIT License	https://www.npmjs.org/package/jquery
jQuery SVG Plugin	1.4.3	MIT License	http://keith-wood.name/svg.html
jQuery UI (Combined Library)	1.8.13	MIT License	http://www.nuget.org/packages/jQuery.UI.Combined
jQuery-SVG	Unspecified	MIT License	http://github.com/bryanwb/jQuery-SVG/
jquery-utils	master-20100713	MIT License	http://github.com/enki/jquery-utils/
js2coffee	0.2.0	MIT License	http://github.com/js2coffee/js2coffee/
jsonify	0.0.0	Public Domain	https://www.npmjs.org/package/jsonify
js-traverse	0.5.2	MIT License	https://www.npmjs.org/package/traverse
js-traverse	0.4.6	MIT License	https://www.npmjs.org/package/traverse
JUnit	4.4	Common Public License 1.0	http://junit.org
minimatch	0.2.2	ISC License	https://www.npmjs.org/package/minimatch
nan	1.0.0	MIT License	https://www.npmjs.org/package/nan
node	0.6.15	MIT License	http://github.com/ry/node/
node	0.6.20	MIT License	http://github.com/ry/node/
Node.js	0.6.15	MIT License	http://github.com/joyent/node/
Node.js	0.8.14	MIT License	http://github.com/joyent/node/
node-XMLHttpRequest - chiragsanghvi/node-XMLHttpRequest	1.4.2	MIT License	http://github.com/chiragsanghvi/node-XMLHttpRequest/
node-XMLHttpRequest - driverdan/node-XMLHttpRequest	1.4.2	MIT License	https://www.npmjs.org/package/xmlhttprequest
NSSM - the Non-Sucking Service Manager	2.24	Public Domain	http://nssm.cc/
UglifyJS	1.2.5	BSD 2-clause "Simplified" License	https://www.npmjs.org/package/uglify-js
UglifyJS	1.0.6	BSD 2-clause "Simplified" License	https://www.npmjs.org/package/uglify-js
WinSCP - WinSCP	5.11.3	GNU General Public License v2.0 or later	http://sourceforge.net/projects/winscp/
Yocto Project - BSP	15.0.0	GNU General Public License v3.0 or later	https://www.yoctoproject.org/docs/current/bsp-guide/bsp-guide.html
Yocto Project - BSP	16.0.2	GNU General Public License v3.0 or later	https://www.yoctoproject.org/docs/current/bsp-guide/bsp-guide.html

APPENDIX D

Technical Specifications

The following information includes specifications and performance statements¹ that may conflict with other ABB published literature such as product fliers and catalogs. In case of conflicts between information given below and specifications given in official ABB product fliers and catalogs, the latter take precedence.

Model Specifications

Model	Refresh rate	Raw data saving	Preset selected chemistries ²						
			No 1	No 2	No 3	No 4	No 5	No 6	No 7
ADP310	30 s	Yes	SC1	SC2	BOE	BHF	DHF	ST250	Spare
			NH ₄ OH	HCl	HF	HF	HF	H ₂ O	
			H ₂ O ₂	H ₂ O ₂	NH ₄ F	NH ₄ F	H ₂ O	NH ₃	
			H ₂ O	H ₂ O	H ₂ O	H ₂ O			
ADP320	10 s	No	SC1	DHF	Spare				
			NH ₄ OH	HF					
			H ₂ O ₂	H ₂ O					
			H ₂ O						

Electrical Specifications

The electrical specifications are given in the following tables. All values are nominal.

Rated input voltage	100–240 V AC
Line voltage fluctuation	Not to exceed 10% of the nominal line voltage
Rated frequency	47–63 Hz
Rated power consumption:	100 VA
Fuses	T2A/250V (5 × 20 mm)
USB connector (provided by user)	17-100944 (for patch s, refer to the TALYS ADP300 Dual Sampling Point Analysis System Reference Guide)
Ethernet connector that connects into the analyzer (provided by user)	17-200331 (for patch s, refer to the TALYS ADP300 Dual Sampling Point Analysis System Reference Guide)
Installation category that connects into the analyzer (Overvoltage category):	II

¹ Performances as obtained from a TALYS analyzer operated in the upright position.
² Properties for each selected chemistry are numbered in the order that they appear on the GUI and Modbus registry.

Mechanical Specifications

Overall dimensions (H × W × D)	369.0 mm × 350.0 mm × 255.5 mm (14.5 in × 13.8 in × 10.1 in)
Weight	22 kg (49 lb)
Mounting	Wall mount, near process
Enclosure	IP54 (ingress protection) AC power as supplied with the analyzer needs to be used to maintain IP54. IP-rated USB and Ethernet connectors need to be used to maintain IP54.

Environmental Specifications¹

Operating temperature range	5 °C to 35 °C (41 °F to 95 °F)
Storage temperature range	−10 °C to 80 °C (14 °F to 176 °F)
Relative humidity	0% to 95%, non-condensing
Pollution degree	3
Altitude	2000 m (6562 ft) maximum



NOTICE

Pollution degree 3: Conductive pollution or dry non-conductive pollution that becomes conductive due to condensation. To be found in industrial environments or construction sites (harsh environments).



NOTICE

The TALYS analyzer is not rated for explosive or inflammable environments and thus has to be installed in a safe area.

¹ Temperature and humidity must be kept constant at all times to achieve optimal measurement performances.



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