IWGA^{TM} User Guide

Contents

1. InnoWell Gateway Data Analyzer Software

InnoWell gateway data analyzer (IWGA^{TM}) is the most enhanced data logger, analyzer, and retriever for fiber optic sensors. The system can be used in almost every application involving fiber optic sensors infusion at varying conditions, particularly in oil and gas wells. The system's possible applications area is fiber optics health inspections, structural health monitoring, and a gas kick detector/predictor in oil and gas wells.

2. InnoWell Gateways

So far, InnoWell has introduced three different types of fiber optic spectral analyzers, General, Industrial, and Professional. "Gateway General" or "the Portable" is used to cover low wavelengths. It can be counted as an essential instrument for testing and connecting to a wide range of fiber optic sensors. The second gateway is an industrial gadget suited for high wavelength signal detection. The product can be used as an advanced laboratory fiber optic analyzer and a suitable receiver for different optic sensors in industrial applications, particularly in harsh environmental conditions. "Gateway Professional" or "the Detector" is considered the most sophisticated device. The product covers long and short wavelength signals with the highest bandwidth. Like "Gateway Industrial," the kit does not offer an onboard display; however, the analyzer can be connected to any monitor via the HDMI port. Moreover, a USB connector makes it possible to transfer the data from the product to a PC.

Table 1. Compare products

Gateway General (the Portable)	Gateway Industrial (the Inspector)	Gateway Professional (the Detector)
Single-sensor input	Single-sensor input	Dual-sensor input
Silicon photodiode	InGaAs photodiode	InGaAs and Silicon photodiodes
Short wavelengths coverage	Long wavelengths coverage	Long wavelengths coverage
Noise filter	Noise filter	Noise filter
USB data transfer support	USB data transfer support	USB data transfer support
IPS Monitor	HDMI connector	HDMI connector
No gas kick detector	No gas kick detector	A built-in gas kick detection algorithm
No user-defined function support	PYTHON and MATLAB library support	PYTHON and MATLAB library support
LC optical fiber connector	SC and FC optical fiber connector	SC and FC optical fiber connector
No BNC	No BNC	Dual BNC (one for each input sensor)

3. InnoWell Gateway Analyzer (InnoSoft)

The software is dedicatedly designed and developed to communicate different InnoWell gateways. Using the software, the users can log, analyze, store, and retrieve data, but relying on robust, validated algorithms; a gas kick can be detected and alarmed. The different part of the software is shown as follow:
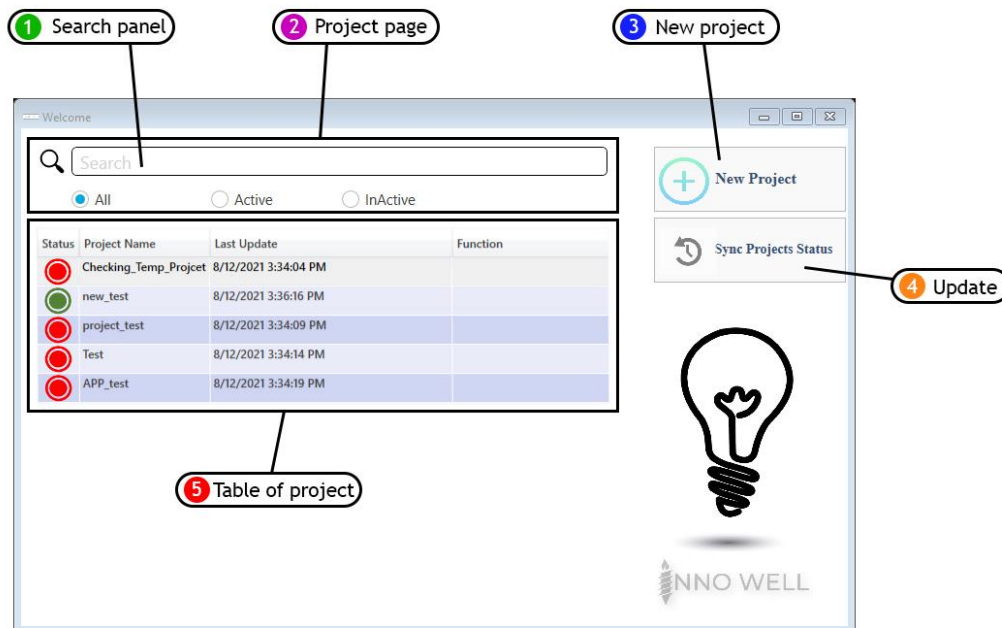
3.1. Project Page

Figure1. Project Page

1. Project Page: On this page, users can create new projects and search or filter previous projects.

2. Search Panel: This box filters based on the similarity of project names to the value entered in the search panel. In this box, there are three options, including All, Active, Inactive, which filter all projects, active and inactive projects, respectively, by clicking on each of them.

3. New Project: You can create a new project by clicking on this icon.

4. Update: Update the status of projects (check the quality of the connection of the sensors in each project with the devices that lead to updating the status of projects)**.**

   In this section, by clicking the update icon, the image appears as Figure 2, which updates the connection status of the sensors in each project with the devices. (At each step of checking the sensors, the IP of the corresponding sensor is displayed below the elapsed time).
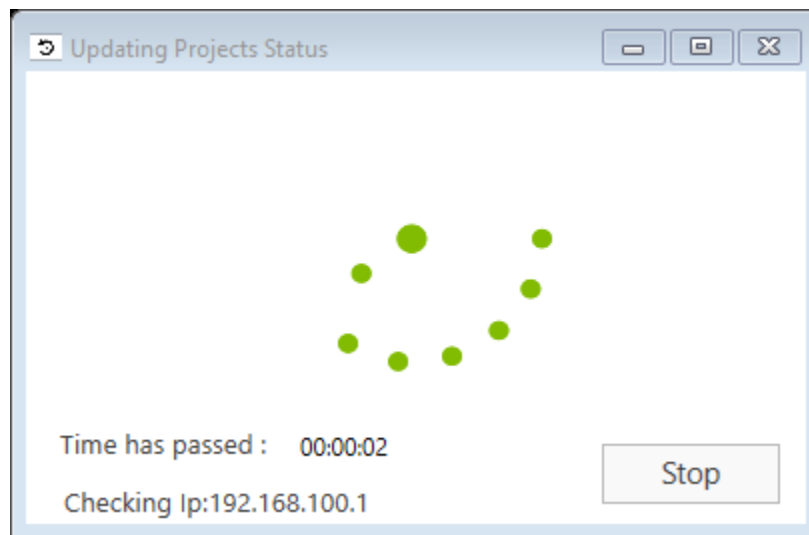
Figurer 2. Update Status

5. Table of Project: Includes information on registered projects, through which you can view the status of projects (active projects in green and inactive projects in red) and view project names based on their loading time and project loading time.

By clicking the build new project button, an image, as shown in Figure 3, is displayed, which by writing the project name and hitting the button, the new project is created.
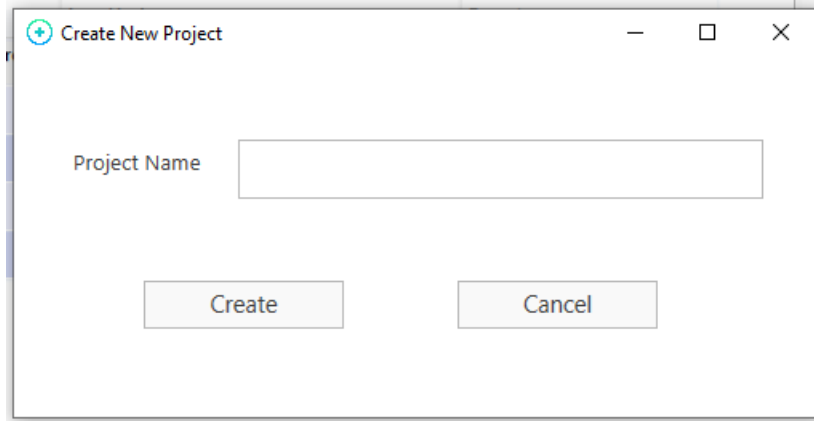
Figure 3. Create New Project

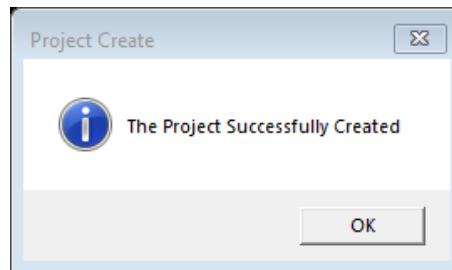A message is then displayed, as shown below, stating that the project has been created.

Figure 4. Success massage

3.2. Sensor Page

By clicking on the project, the image is displayed as shown in Figure 5, which allows you to create a new sensor, edit the created sensors, and display the history of the sensors.
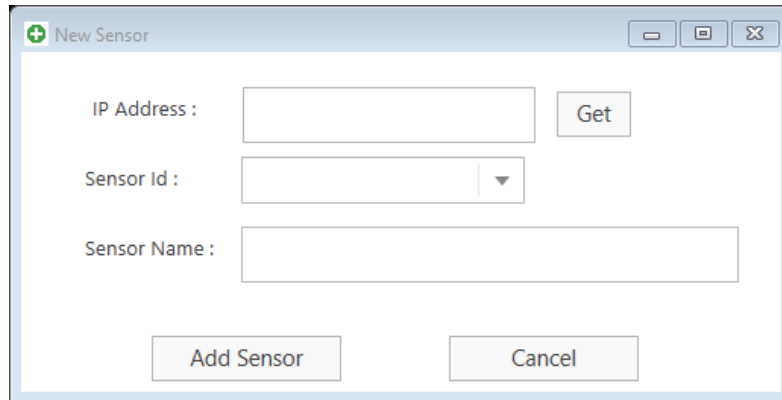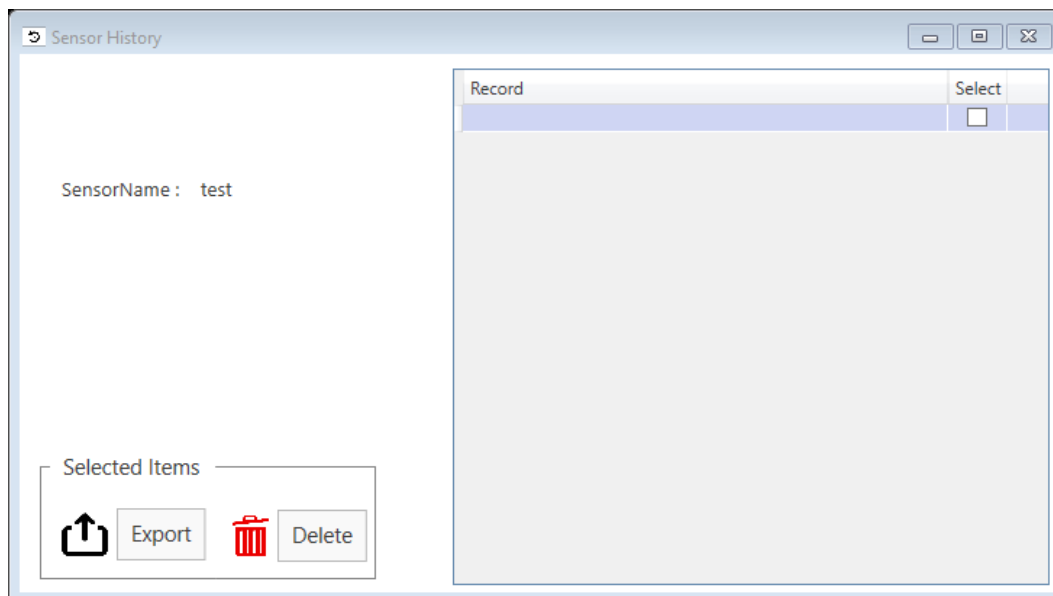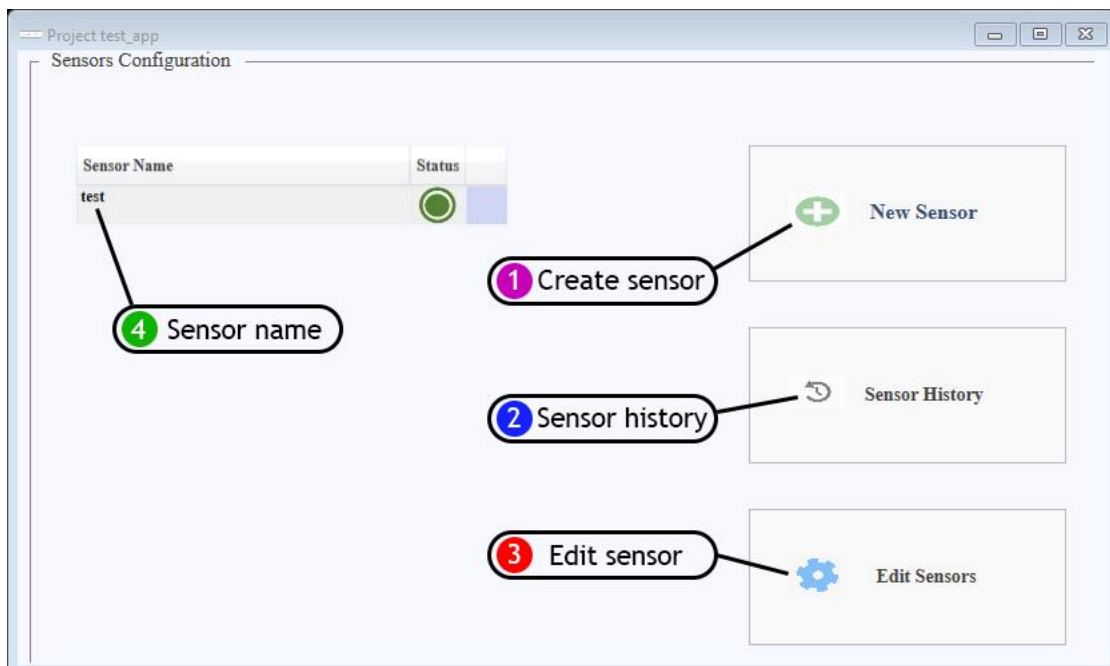

Figure 5. Sensor Page

4

1. Create a new sensor: by clicking on the icon to create a new sensor, Figure 6 is displayed, in which the IP Address of the device with the desired sensor is written in this box, and the Get button is selected. After connecting to the equipment (via Ethernet, Wi-Fi, or USB), the sensor information of the sensor or sensors (depending on the type of equipment) is found and inserted in the ID box of the sensors. Then the user receives the sensor's name, and a new sensor is created by pressing the register button.

Figure 6. New Sensor Page

2. Sensor History: By tapping the sensor history icon, Figure 7 is displayed, which can be used to view the sensor history, and the current information can be deleted, or the corresponding output can be received.

Figure 7. Sensor History Page

5

3. Edit Sensor: Clicking this icon will show Figure 8, which allows you to change the sensor's name or delete it. After clicking on the edit button, the sensor table will be updated, and the sensor information will be deleted or (enabled or disabled) in the table, respectively. Please note that sensor removal due to having information is performed logically.
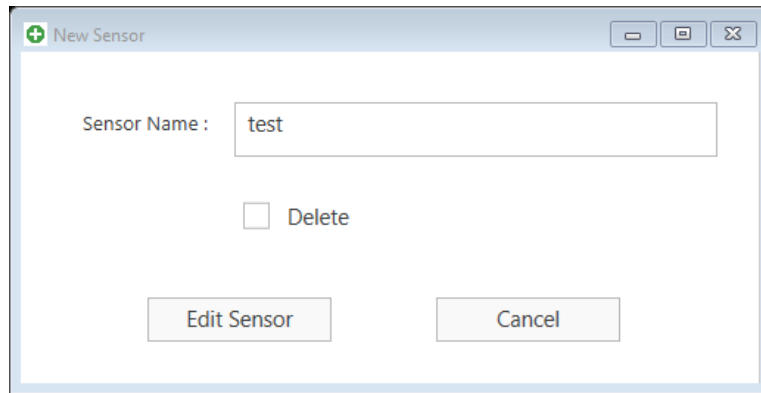

Figure 8. Edit Sensor Page

4. Sensor Name: By clicking on the name of the sensor, Figure 9 is displayed. This information is received from the sensors through the communication channels mentioned before. In this window, you can use the existing icons to change the information received from the sensor, which helps to understand the information better. For example, the time division, volt division, which displays the time and frequency information of the sensors, can be changed, and the received information can be reduced (low amplitude or low frequency) or increased every second. (These functions are the data rate of 1000 data per second).
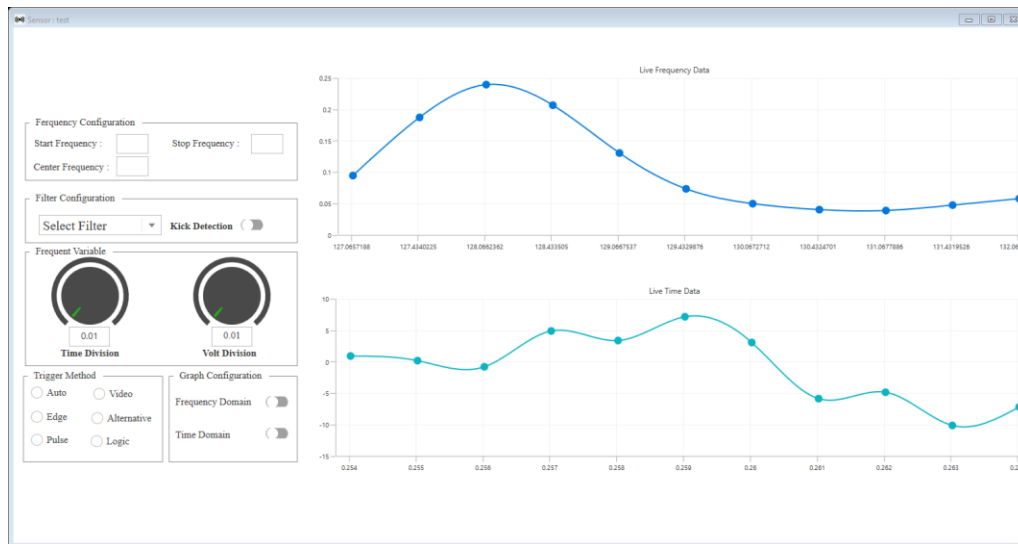

Figure 9. Sensor Information