Tank Level Monitoring
Installation and Operation Manual

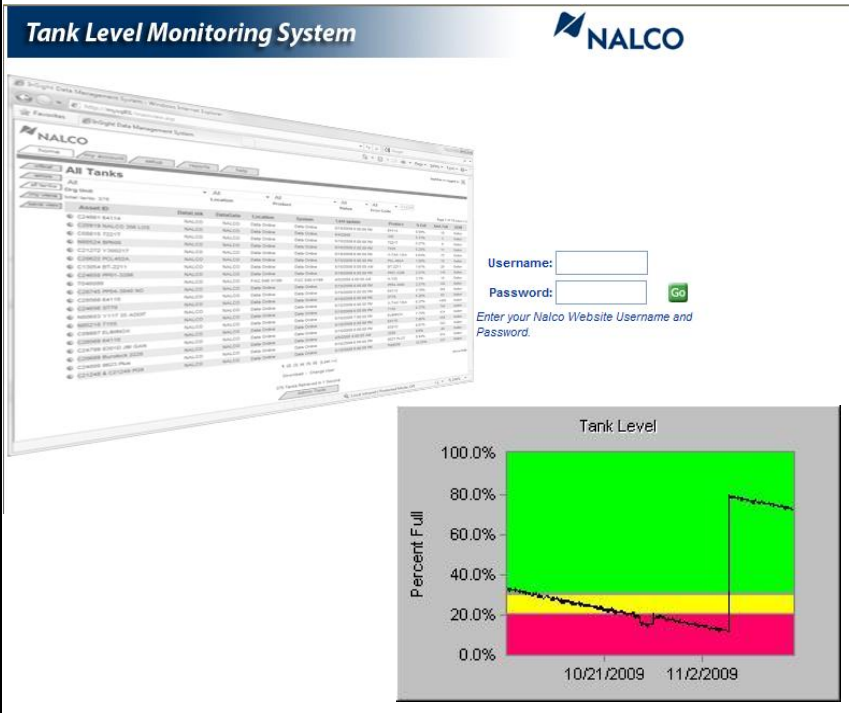

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Table of Contents

Section 1: Introduction

1.1 About Nalco Tank Level Monitoring

Nalco Tank Level Monitoring is a global initiative designed to capture inventory measurements of a tank, transmit that measurement to Nalco's servers, and provide the data to multiple users. Some of those users would be Customers, Nalco's Sales and Service force, Key Account Managers, Marketing, Research, Logistics, and Customer Service Group. Nalco's Customer Service Group use the data to automate the order entry process for some Nalco tanks.

1.2 Activation Process Overview

Following are the main steps to enable Tank Level Monitoring at a Nalco customer site:

- Conduct a Customer site evaluation to determine equipment needs
- Order equipment
- Create Customer/Tank Profile in Tank Level Monitoring Configurator
- Complete equipment installation and verify data transmission for each tank
- Commission the system using TLM Configurator

Once these steps are complete, the tank level data will be streaming in to Nalco's servers and available for use. The data can be reviewed using the Inventory Dashboard, alarms can be initiated, reports reviewed, and the tank submitted for automatic replenishment consideration by the Customer Service Group.

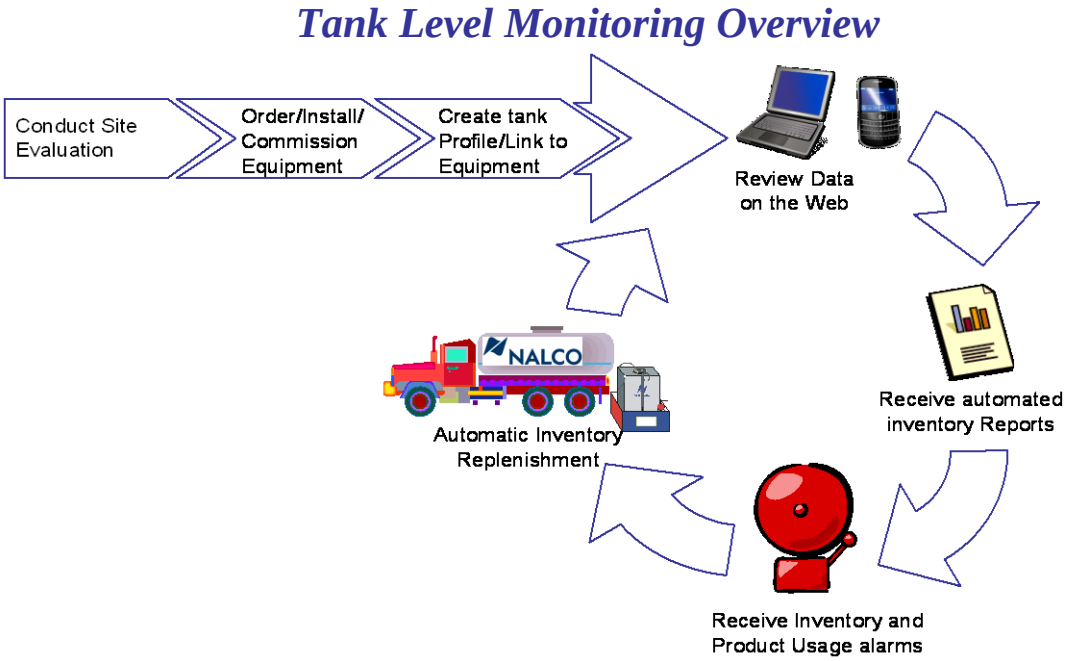


Figure 1

Section 2: Tank Level Monitoring Equipment

2.1 Selecting Equipment for Tank Level Monitoring

To start the Tank Level Monitoring process, a thorough site evaluation needs to be completed to collect critical information about the tanks to be monitored and determine what equipment to order. Section 2.1.1 describes the Audit form and where the form can be found.

2.1.1 Tank Level Monitoring Audit Information

The graphic posted below is the Tank Level Monitoring Survey form which can be found in KM. The purpose of the form is to help gather information needed for the Tank Level Monitoring Configurator and for NGES to assist with equipment selection (if needed).

Tank Level Monitoring Survey Version : 3

Customer information					
Customer Name					
Sold To					
Ship To					
Location					
City					
SBU					
Tank Configuration		**#1**	**#2**	**#2**	**#4**
System					
Level Sensor Model	TLM100				
	TLM105				
	TLM120				
	Other				
ONLY for Other	Probe 4 mA scale				
	Probe 20 mA scale				
Product					
Tank Serial No.					

Figure 2

2.1.2 Selecting a Level Sensor for each Tank

Before selecting the appropriate equipment for a site, you must determine if the tank to be measured requires explosion proof equipment (Class I Div II certification or ATEX approval). If you are unsure, ask an Engineer over that area of the plant. If yes, you must use certified equipment and should contact the NGES help desk for assistance. If No, you may proceed on your own with the standard equipment offering

The preferred measurement technology type for Tank Level Monitoring program is an Ultrasonic level probe. Ultrasonic probes provide for an easy installation and eliminate material compatibility issues since the probe does not contact the

liquid in the tank. Measuring liquid products that creates dense vapor above the liquid level is a limitation for this technology. The Ultrasonic Level probe is the preferred probe for all Nalco products in non-explosion proof applications **except for the all Stainless Steel Micro PORTA-FEED.** For the all SS Micro PF units, a pressure probe should be used. Please contact the NGES Help desk for more details.

Use **Table 1** to determine which probe type to order for your application:

	Tank Height		
	Tanks up to 70" (1.8m) in height	**Tanks from 70" (1.8m) to 156" (4.0m) in height**	**Tanks over 156" (4.0m) in height**
Tank Type	PORTA-FEED and Sm. Bulk	Med. And Lg. Bulk	Very Lg. Bulk
Preferred probe	Ultrasonic Probe P/N: 060-TLM100.88	Ultrasonic probe P/N: 060-TLM105.88	Ultrasonic probe P/N: 060-TLM120.88
Secondary Probe	5 psi pressure probe	20 psi Pressure probe	

Table 1

2.1.3 Optimizing the Data Transmission pathway for Selected applications

There are two primary methods to transmit probe data back to Nalco; through a 3D TRASAR controller or through a Nalco Global Gateway.

All **3D TRASAR for Cooling Water** controllers have two analog inputs that could be used for tank level probes. To utilize these inputs, you **must purchase a 3D TRASAR Tank Level Junction Box**, which is a power supply (P/N: 060-TR5291.88) to power the 4 – 20 mA loop. This method can be used only if the 3D TRASAR controller is connected to an analog phone line, a Nalco Wireless Gateway, or a Nalco Global Gateway (NGG). Please see the 3D TRASAR for Cooling Water (521-OM0108.88) and 3D TRASAR Tank Level Junction Box (521-OM0212.88) manuals for more information.

All **3D TRASAR for Boiler** controllers have four analog inputs that could be used for tank level probes. Unlike the Cooling Water controller, these analog inputs are powered and the **3D TRASAR Tank Level Junction Box is NOT needed**. This method can be used if the 3D TRASAR controller is connected to an analog phone line, a Nalco Wireless Gateway, or Nalco Global Gateway (NGG). Please see the 3D TRASAR for Boilers manual for more information.

The new Nalco Global Gateway (NGG) (Introduced October 2008) can be used in multiple ways. First, you can connect a 3D TRASAR controller to the unit and send data to the web. Second, you can connect up to four level probes to the NGG (You do NOT need a loop power supply using an NGG) using the integrated 4 – 20 mA inputs. (The maximum distance between the NGG and the

probe is 1000 ft. Contact NGES Help Desk for questions regarding greater distances.) Third, the NGG has a short-range wireless receiver, which can accept wireless data from designated devices. Nalco will be introducing wireless tank level probes in the near future, which will greatly simplify the installation process. Please refer to the NGG manual (OM-0214) for more information.

Table 2 outlines the probe connection options.

Connection Method	Number of Analog inputs	Tank Level Junction Box Needed	Transmission Method
3D TRASAR for Cooling Water	Two	Yes*	Either Analog phone line or NGG
3D TRASAR for Boilers	Four	No	Either Analog phone line or NGG
Nalco Global Gateway (NGG)	Four	No	Internal Cell phone

*Order Nalco's Tank Level Junction Box 060-TR5291.88

Table 2

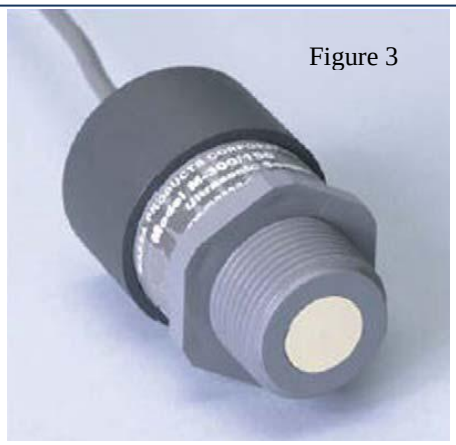
For those already using an NGG to transmit data from a 3D TRASAR controller, you can combine the inputs from both devices. For example, if you are feeding five products to a Cooling Tower, you can connect four probes to the NGG and one probe to the 3D TRASAR controller and then configure all five probes using the Tank Level Monitoring Configurator as if they were coming through the same device.

2.2 Installation and Commissioning of Equipment

2.2.1 Tank Level Probe Installation

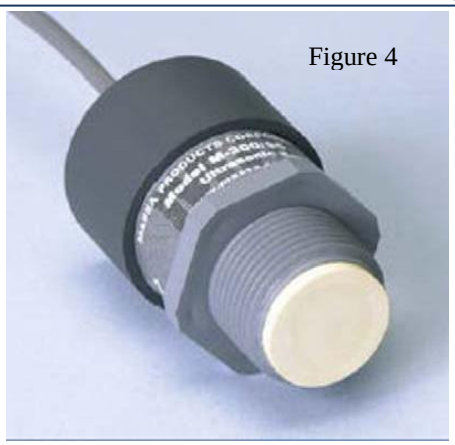
Once the tank level monitoring equipment has been received, refer to the NGG installation manual or the 3D TRASAR manuals for details.
When installing the Ultrasonic probes, ensure you are installing the correct probe on each tank type. Please note the differences in the probe faces in the pictures below (Figure 3 & 4):

Figure 3



P/N: 060-TLM100.88
PORTA-FEEDs and Sm. Bulk

Figure 4



P/N: 060-TLM105.88
Bulk tanks up to 13 feet tall

The probes themselves are easily installed in any tank that has an available 1 or 2 inch NPT fitting in the top of the tank. Installation into a tank is as simple as threading the probe into the selected tank fitting. No pipe tape or sealant is needed.

General considerations for selecting a Tank probe installation fitting:

1. Ensure that the fitting selected has a clear unobstructed line of sight to the bottom of the tank.
    - Some Senior PORTA-FEEDs have an internal baffle built into the top of the tank cover. Look through the selected fitting, or insert a rod at least 6 inches into the fitting to make sure no baffle is present.
    - Hoses, feed lines, and other equipment, such as mixers, installed in the tank may interfere with the ultrasonic probe's ability to make an accurate measurement. Again, make sure there is nothing in the tank that will interfere with the probes direct line of sight to the bottom of the tank.

2. Ensure the fitting selected provides a mounting surface that is perpendicular to the product level in the tank. Fittings that are mounted at an angle (such as those on the rounded dome of a tank – Figure 5) should be avoided as these will not allow the probe signal to reflect directly back to the probe. This will prevent the probe from reading the tank level, or cause poor measurement results.

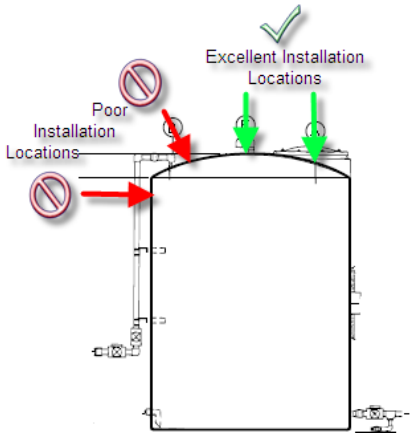


Figure 5

3. Make sure the selected fitting has been inspected and cleared of any strings of loose pipe thread tape or other debris that may remain from previously installed fittings. The probes are very sensitive to debris which may affect the tank level readings.

4. Mount the probe as close to the center of the tank as possible (See Figure 5). For tanks larger than 500 gallons, the probe should be mounted at least 12 inches from the side wall of the tank.

5. The probe may be installed directly into a 1" NPT fitting. For 2" fittings, use the 1" x 2" reducer bushing that is provided with the probe. This bushing has a special conical shape to help direct the returning level signal to the face of the transducer.

6. If an additional fitting is not available, you may install the probe directly into a 1.25" hole drilled into the top of the tank.

7. If it is not possible to install an additional fitting or drill an additional hole, you should use your best judgment and select an existing fitting for "dual purpose use". **NEVER consider the fill line for "Dual Purpose Use**".

PORTA-FEED Installation Instructions:

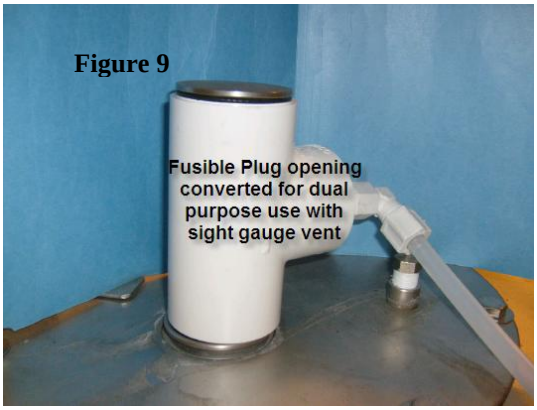
Over the years, Nalco has produced many standard sized PORTA-FEEDs that are still commonly in use today. Unfortunately, the fitting packages on these tanks have varied greatly over the lifespan of the PORTA-FEED program. There are also many local non-standard accessory installation practices that provide additional variations that may limit which fittings may be "available" for tank level probe installations. As a result, it is impossible to provide specific guidance on how to install tank level probes for every PORTA-FEED tank in the Nalco Fleet. Use your best judgment, and follow the general guidance issued below:

Most PORTA-FEEDs have a 1 or 2 inch fitting on the top of the tank that can easily be used to install the ultrasonic level sensors as follows (**Table 3**):

PORTA-FEED Type	**Number of Openings**	**Available Openings**	**Recommendations on how/where to install a tank level probe**
Older Junior/Senior	5	0	Install the tank level probe in the 2 inch fitting normally used as a return for the tank level gauge vent. Remove the Fusible Plug/Cap. Install it on a 2 inch "Tee". Install the "tee" on the PORTA-FEED. Use the remaining opening on the "tee" for the site gauge vent, or for use to allow additional venting during Deliveries/Transfers. **See Note 1&2**
Newer Junior/Seniors	3 or 4	0	Install the tank level probe in the 2 inch fitting normally used as a return for the tank level gauge vent. Remove the Fusible Plug/Cap. Install it on a 2 inch "Tee". Install the "tee" on the PORTA-FEED. Use the remaining opening on the "tee" as a "vent" for the site gauge, or for use to allow additional venting during Deliveries/Transfers. **See Note 1&3**
PE Lined Micro, Micro Plus, Mini, All Mini Plus	3	1	Use the available 1 or 2 inch opening
Micro	1	0	**See Note 4**

Table 3

Note 1:



Note 2: Some Older PORTA-FEEDs have an internal baffle installed under the top of the PORTA-FEED lid. Make sure the fitting you are using is not obstructed by a baffle by looking into the fitting, or by inserting a probe at least 6 inches into the opening to make sure a baffle is not present.

Note 3: Some PORTA-FEEDs may have a rounded top cover. Make sure you select an opening that is perpendicular to the product level in the tank. You may

need to move your vent or fill line to an "angled" fitting so that a perpendicular fitting becomes available for use with an ultrasonic probe.

Note4: The **all Stainless Steel Micro** units can pose a major installation problem as there are only 2 openings in the tank. One fitting is for the fill line. **(The Ultrasonic tank level probe should not be installed in the fill line!)** A mechanical level indicator and vent assembly occupies the only other opening. The mechanical level indicator is the only indication provided to a Delivery Specialist that the tank has adequate head space to allow it to be filled. It is not desirable to replace this mechanical indicator with an ultrasonic probe without providing a secondary level indication that can be used by the delivery specialist. All suitable options for installing level indication involves modifying the tank manifold piping.

Instructions for installing Tank Level Monitoring in an all **SS Micro PORTA-FEED** are as follows:

1. Modify the tank manifold to install a Differential Pressure type level sensor at the base of the tank (Figure 10).
    a. Replace the 90 elbow used for the pump suction fitting with a "tee".
    b. Reinstall the pump suction fitting in one end of the "tee".
    c. Install a DP type level sensor in the remaining opening of the "tee".

Figure 10

Bulk Tank Installation Instructions:

One of the primary reasons Ultrasonic probe technology was selected for Nalco's Tank Level Monitoring solution was due to the flexibility of installation. The mid-range Ultrasonic level probe (P/N: 060-TLM105.88) can be used on any size bulk tank as long as the height of the tank does not exceed 13ft. For tanks with heights greater than 13 ft, you must purchase the long range Ultrasonic level probe (P/N: 060-TLM120.88).

When considering where and how to mount the Ultrasonic probe to a Bulk tank, follow the general guidelines that have been outlined above. Unfortunately, there is no assurance a port will be available at the top of the tank to mount the probe, which may require your customer to install a mounting flange for the probe.

For further information, please call the NGES Help Desk.

2.2.2 Installation instructions when using a Nalco Global Gateway

For specific instructions on installing a Nalco Global Gateway, please reference the Installation and Operation manual (OM 0214).

While installing the NGG, take note of the following details:

- Document the IMEI number of the NGG that is associated to each tank which can be found inside the NGG cover (Figure 11).
- Document the NGG Phone number found on the side of the NGG (Figure 12)
- Document which NGG input (one thru four) was used for each probe/tank
- Document the current inventory reading

Figure 11

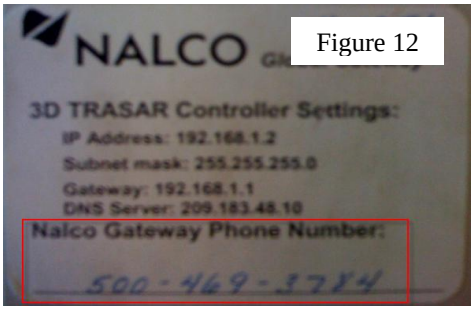


Figure 12

After installing the probes and NGGs, power up the equipment and the NGGs will start communicating to Nalco's servers. Plug your laptop into the NGG to access the NGG Diagnostic page to verify:

- Level sensors were wired correctly – between 4 and 20 mA
- Cell signal strength of the NGG
- NGG is communicating to Nalco

Connect the Laptop to the supplied Ethernet cable, open up Internet Explorer, and enter the following URL into your browser: http://192.168.1.1:8080. The NGG's Diagnostic's page will be in view. Reference the NGG manual for more details.

Once connected to the Diagnostic's page, access the Tank Level Monitoring Configurator at your customer's site to complete the installation or access the Tank Level Monitoring Configurator from Nalco's Extranet Site. See Section 3.2.1 of this document for details.

2.2.3 Installation Instructions when using a Nalco 3D TRASAR Controller

For specific installation instructions connecting level probes to a 3D TRASAR for Cooling Water controller, please reference the Tank Level Monitoring Quick Start Guide (521.OM0212.88). For a 3D TRASAR for Boiler controller, see the Installation and Operation Manual for the Boiler controller.

Once the probes and Tank Level Junction Box (if connecting to a 3D TRASAR for Cooling Water) are received, install the probes as specified in the Tank Level Junction Box instructions. If connecting the probes to a 3D TRASAR for Boilers controller, follow the analog input installation instructions.
Once the probes are installed and **configured using the 3D TRASAR Configurator**, **review the Tank Level Monitoring Configurator** section of this document to link the probes to the tank profiles. See Section 3.2.1 of this document for details.

When connecting probes to a 3D TRASAR controller, it is important to follow the Nalco naming standard to remain consistent across all 3D TRASAR installations. Please enter an analog input name where appropriate in this order: **"Tank – (Tank Type) – (Chemical)"**
Such as: Tank 1 – Jr – 3DT265,
Tank 2 – Mini + Plastic 3DT289

3D TRASAR for cooling water example:

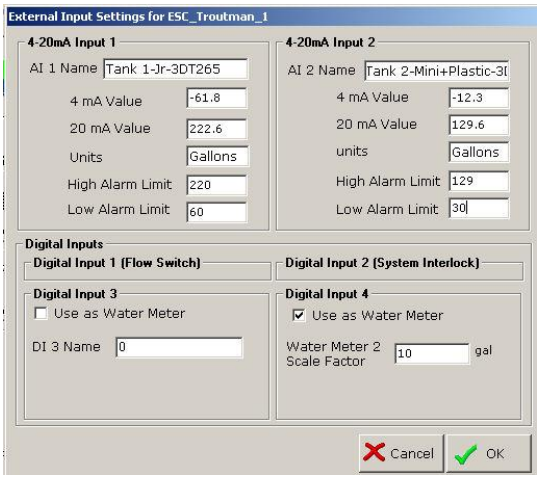


Figure 13

3D TRASAR for Boilers example:

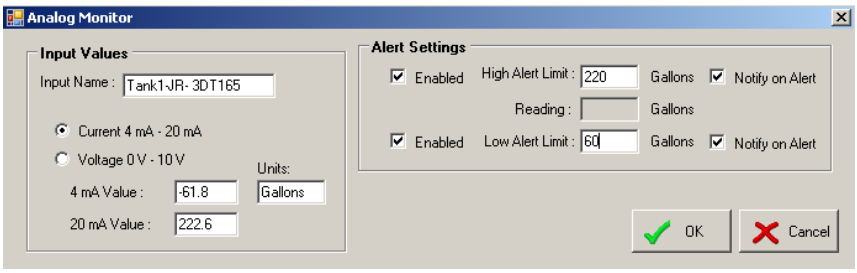


Figure 14

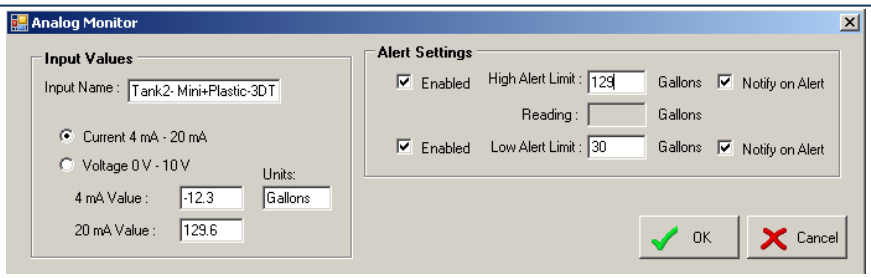
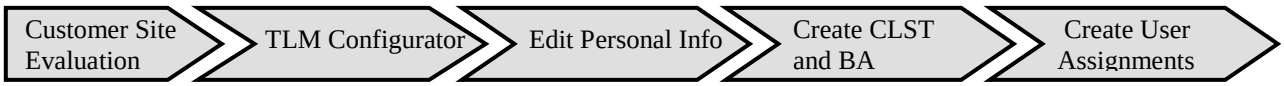


Figure 15

Section 3: Nalco Tank Level Monitoring Configurator

3.1 Setting up a Customer for Tank Level Monitoring



3.1.1 Customer Site Evaluation

When setting up a customer's site within the Tank Level Monitoring Configurator, the following information will be needed:

Tank Name: Common name given to a tank. Must be unique to each System
Tank Serial Number: PORTA-FEED – from nameplate, Bulk tank – from Nalco placard
Product – Name of Nalco product or commodity name (ie., Bleach, Sulfuric Acid, 1720, 3DT289, etc.)
Tank Type – PORTA-FEED size and type (ie. all stainless steel, PE lined, plastic), bulk tank and 15 or 55 gallon drums. (For pails or totes, use Custom/Bulk option)
Level Sensor Type – Corresponds to the sensor's part number selected in the Section 3
Geometry – If PORTA-FEED was selected under Tank Type, this field will be automatically populated. If Custom/Bulk was selected, select Vertical Cylinder, Horizontal Cylinder, Horizontal Cylinder with Elliptical Ends, or Cube.
Dimensions – If PORTA-FEED was selected under Tank Type, these fields will automatically populate. If Custom/Bulk, the following internal dimensions for each tank type will be needed (other tanks will be added as needed):

- **Vertical cylinder –** Height and Diameter
- **Horizontal cylinder –** Width and Diameter
- **Horizontal cylinder with Elliptical Ends –** Width, Diameter, and radius
- **Cube –** Height, Width, and Depth

The **Coupling Distance** is defined as the distance from the sensor face to the highest usable section of the tank. An example might be the dome of a bulk tank. This is only used for Ultrasonic probes.
Material – Material of construction of the tank. Will be automatically populated for a PORTA-FEED

Rated Capacity – Rated capacity of the tank including the heel. Will be automatically populated for a PORTA-FEED.
Max. Level – The maximum level in which the tank can be filled.
Order Level – Level of the tank in which a refill order is usually placed.
Safety Level – Level of the tank in which one week's inventory remains
Heel Level – Level of the tank in which no additional product can be pumped. For all PORTA-FEEDs, this level is empty or 0 gallons (liters).
Average Feed Rate – The average product fed per day. This value is used to calculate weekly and monthly consumption.
High Feed Rate Alert – The highest feed rate expected. This value will set the high feed rate alarm level.
Low Feed Rate Alert – The lowest feed rate expected. This value will set the low feed rate alarm level.
Operates Seasonally – If the application does not operate year around, a start-up and shut down date can be entered.

Once all of this information is collected for each tank, visit the Tank Level Monitoring Configurator to create the tank profile.

3.1.2 Editing Personal Information

Once the site evaluation is complete and all tanks have been identified, log on to the Tank Level Monitoring Configurator from Nalco's Extranet website. To access the Tank Level Monitoring Configurator, hover over the Tank Level Monitoring icon on the left hand side of the screen and select Configurator.

www.nalco.com >> Extranet >> Tools >> TLM Configurator

If visiting the Tank Level Monitoring Configurator for the first time, visit the Personal Information page first (Figure 16).

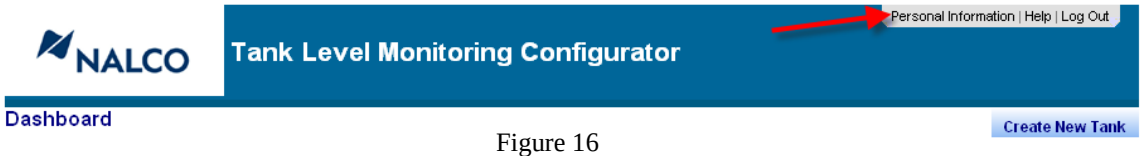


Figure 16

This page includes your contact information, including e-mail address and phone number in addition to your District Manager and District Administrator. This additional contact information is needed in the event data transmission from a tank is lost. In addition, the Personal Information is where you set your preferred units of measure, time zone, and the e-mail address in which you would like to receive e-mail alerts. NOTE: If you do not have an e-mail address selected, Inventory and Usage Alerts will not be receive.

Press "Save Changes" after entering all of the required information.

3.1.3 Creating a Customer/Location

The Dashboard page serves as the website's homepage. If you have already set up tanks in the past, you can select the tank directly from this page after selecting the desired customer from the filter dropdown list. To start with a new customer or continue with an existing customer, select "Create New Tank" from the top right corner, which will take you to the Customer Information page (Figure 17).

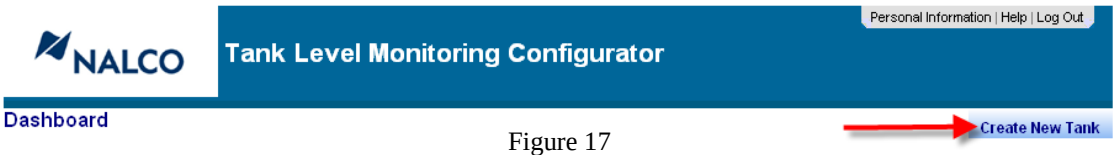


Figure 17

From the Customer Information Page, enter your customer's Sold To number and press "Sold To Search" or enter part of your customer's name and press "Customer Search." (Figure 18)

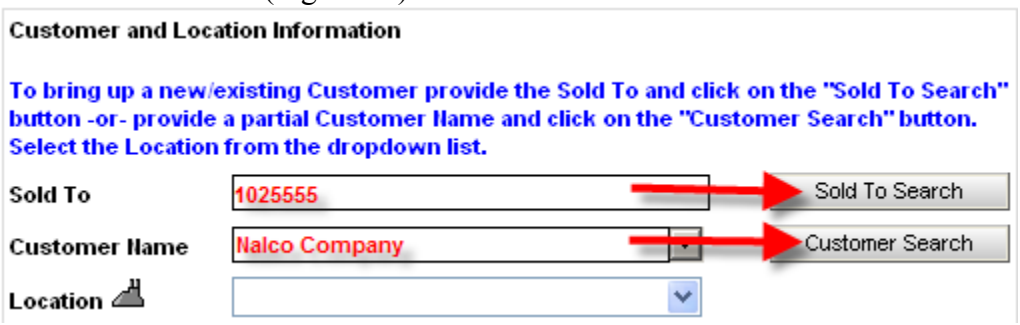


Figure 18

If information about your customer's site was entered previously or by a different user, your customer's Name, Location, System, and Tanks will be found and in view on the left hand side of the screen (Figure 19). If your customer does not immediately appear on the left hand side of the screen, enter the customer's SBU and press save changes at the bottom of the screen. This will add your Customer/Location to the left hand side of the page.

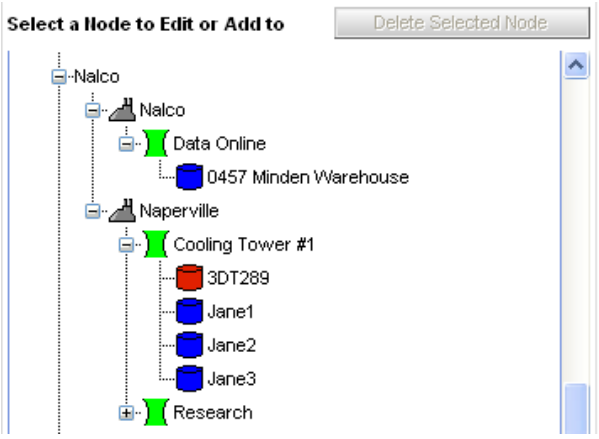


Figure 19

Note: If a small lock appears next to the Name and Location, that indicates someone has already set up that customer but has not assigned you to that Customer/Location. To determine who is assigned to this Customer/Location, visit the User Assignment page and select the desired Customer/Location/System. The assigned users will be in view.

3.1.4 Creating Systems and Tanks

Nalco's Tank Level Monitoring application is the first to utilize the new data hierarchy system, which will significantly improve the storage and management of data at Nalco. The top level of the hierarchy is your Customer's name and subsequent locations for that customer. At each Customer/Location, Systems will be created to represent the various applications within that Customer's site. Example system names might be Cooling Tower #1, Boiler Plant, Chilled Loop 1, etc. Under each System name will be all of the products fed to that application. Therefore, to set up a tank, you must first set up a System for that tank.

Once your Customer/Location has been created on the Customer Information page of the Configurator, type in a System name on the right hand side of the page and press "Save and Continue." (Figure 20) This will add that system name to the tree on the left. If you misspelled the name or added the name to the wrong location, select the System name on the left and press "Delete Selected Node." (Figure 21) (Note: You cannot delete a node that has something attached, ie.: a System with Tanks already created)

You can continue to add Systems until all of your applications are added to the location.

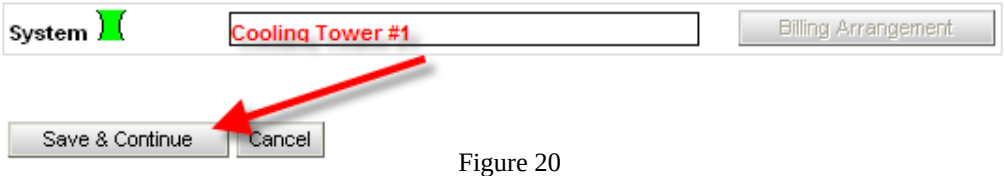


Figure 20

Figure 21

To add a tank, select the System name from the tree on the left hand side of the page. The right hand side of the screen should display the Customer, Location, and System name you wish to add the tank. Enter a common name for the tank and press "Save and Continue." (Figure 22)

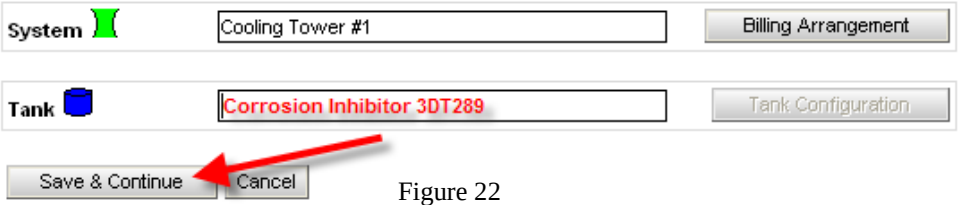


Figure 22

The common name given to a tank can be the product or common name, such as polymer tank, corrosion inhibitor, caustic, etc. The only limitation for the name is you cannot have two tanks with the same name under the same system. Continue to add tanks to each system until all of the tanks are added for that Location.

3.1.5 Creating Tank Profile Information

Once a tank has been added to the tree view on the left hand side of the Customer Information Page, select the tank from the left and press the "Tank Configuration" button next to the tank name (Figure 23). This will bring up the Tank Profile Information page for that tank.

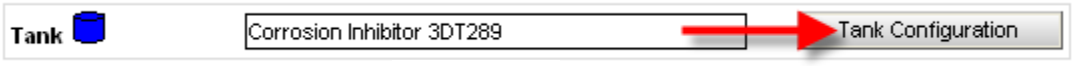


Figure 23

At the top of the page, verify that you have selected the desired tank. The "Customer-Location-System-Tank" selected will be displayed across the top of the page. If you selected the wrong tank, press the "Customer Information" button at the top of the page to return to the Customer Information page. If you selected the desired tank, enter the required data for the tank on the Tank Configuration Page. All fields with a red asterisk must be completed.

Level Sensor Type – Select the model of probe ordered for the selected tank. If the probe is not on the list, select "other" to enter customer 4 mA and 20 mA values. Use the ***Tank Level Probe Analog Setup Tool*** (found in KM) to assist in determining the 4 mA and 20 mA settings for the tank and probe.
Product – Type in the Nalco product and press "Product Search." Select the desired product from the drop down list. If the product is not found and the Nalco product name was entered correctly, please send an e-mail (**equipmenthelp@nalco.com**) request to have the product added to the available list. For commodity products, enter the commodity name and press "Product Search." If the product is not found, send an e-mail request to have the product added to **equipmenthelp@nalco.com**.
Delivery Lead Time – Enter the standard delivery lead time for this product.
Tank Type – All Nalco PORTA-FEEDs are available in the Tank Type drop down. When a PORTA-FEED is selected, the Geometry, Material, Rated Capacity, Maximum Level, Re-Order Level, Safety Level, and Heel Level are automatically populated. If connecting to Bulk tank or a tank not on the list, use the "Bulk/Customer" option and populate all fields manually.
Tank Serial Number – Enter the tank serial number on the tank. If the tank has no assigned Serial Number, select "N/A."
Geometry – As noted above, if a PORTA-FEED or Drum was selected as a Tank Type, the Geometry section will be grayed out. If Custom/Bulk Tank was selected, select the tank geometry from the drop down list. Depending upon the type of tank, the required tank dimensions will change.

Material – If a PORTA-FEED was selected as a Tank Type, the Material of construction of the tank will be grayed out. For a Custom/Bulk tank type, enter the Material of construction of the tank from the drop down.
Rated Capacity – This is the maximum volume the tank will hold. NOTE: if you are entering a Custom/Bulk tank, the Tank's volume calculated from the entered dimensions but be in agreement with the Rated Capacity.
Max. Level – This is the maximum level in which the tank will be filled.
Order Level – Level in which an order should be placed. NOTE: if you would like to receive an e-mail alert when the tank reaches this level, select "Enable Alerts."
Safety Level – Level in which the order would be received (ie., for a two week lead time product, two weeks after the Order Level was reached).
Heel Level – Level in which no additional product can be pumped from the tank. For all PORTA-FEEDS, this level is automatically set to zero.
Reorder Package Code – Select the package code used when placing a replenishment order for this tank.
Reorder Quantity – The volume of product delivered when an order is placed.
Average Feed Rate – The average product fed per day. This value is used to calculate weekly and monthly consumption.
High Feed Rate Alert – The highest expected feed rate. This value will set the high feed rate alarm level.
Low Feed Rate Alert – The lowest expected feed rate. This value will set the low feed rate alarm level.

Once you enter all information about the tank, press "Save Changes" at the bottom of the screen. If all required information was entered successfully, the tank icon in the tree view on the Customer Information page will turn from red to blue (Figure 24) and the tank status will change from "Incomplete" to "Profile Not Linked." (See section 3.1.8 for Tank Status Definitions) This indicates you can now link the tank to a device in the field.

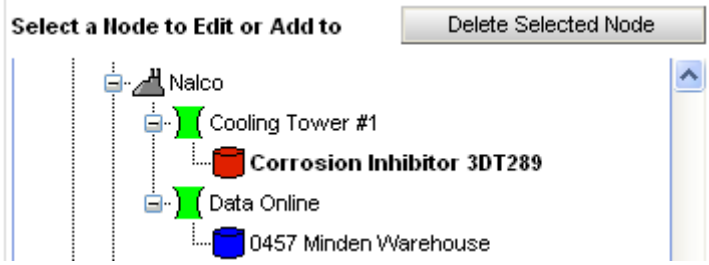


Figure 24

Continue creating Tank Profiles for each tank at the location.

3.1.6 Associating a Billing Arrangement

If you wish to automate the order entry for tanks with Nalco's Customer Service Group, the Billing Arrangement page is required.

To access the Billing Arrangement page, select the System on the Customer Information page you wish to create a Billing Arrangement and select the "Billing

Arrangement" button (Figure 25). Once the Billing Arrangement page opens, you will see the selected Customer-Location-System name at the top of the page.

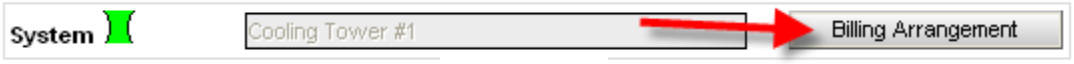


Figure 25

The Customer hierarchy will be in view on the left hand side of the page. The tree should be open to the system in which you selected. You will notice that the System's icon may be Red or Green.

- Red - additional required fields need to completed for some or all of the tanks within that System. Revisit each Tank Configuration page of the tanks within that System to verify all fields have been populated.
- Green – All required fields have been filled in and a Billing Arrangement can be assigned to that System.

Billing Arrangements can be assigned to one or multiple Systems or the entire Location. Simply check the box next to each System or Location you would like to assign the Billing Arrangement.
Once the Location or System/s is selected, fill in the fields on the right hand side of the screen and press "Save Changes."

3.1.7 Tank User Assignment

To allow other Nalco employees access to tanks, you must grant them access through the User Assignment page. Select the level at which you would like to assign a user (Location or System) from the tree view on the left hand side of the page. A user can only access the information at or below the node in which they were assigned. For example, if someone is assigned access at the Customer level, they will have access to all Locations under that Customer name and therefore all tanks at all locations. If that same person is assigned at the Location level, they can only access the tanks at that location only. After selecting the assignment level, type in the person's first or last name and press search. Select the person from the list and press "Assign" and press "Save." (Figure 26) To assign a customer access, use the same process but search Customer Users. To Unassign someone, check the box next to their name and press "Save."

For the assigned user to Receive Alerts, check the box next to their name and press "Save." NOTE: To receive Alerts, the User must also have an e-mail address enabled in their Personal Information AND the Alert must be enabled on the Tank Configuration page.

Lastly, the User who created the Customer/Location is automatically assigned as the Account Owner. This feature automatically assigns the District Manager and District Administrator access the data. If the District Manager and District Administrator are not in view, visit the Personal Information page of the User to set up the DM and DA.

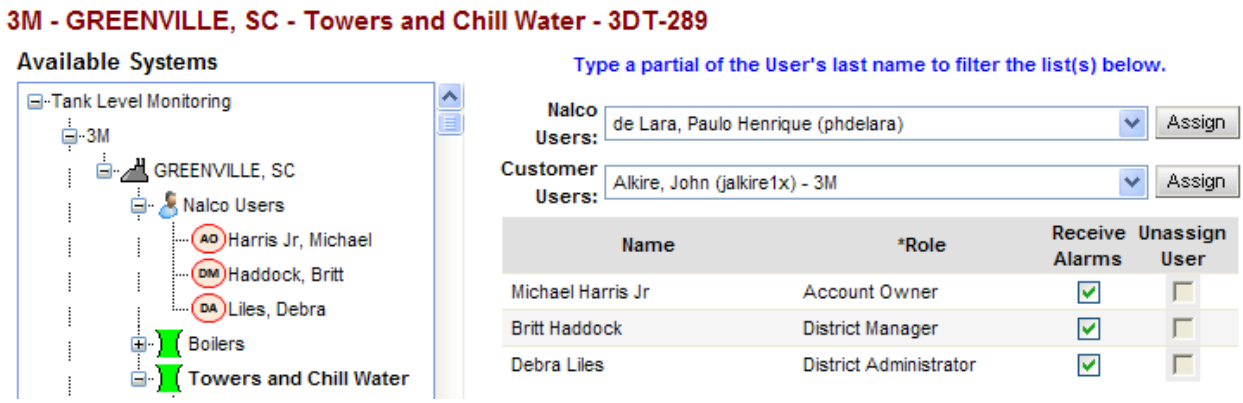


Figure 26

3.1.8 Tank Status Definitions

The Tank Status defines where a tank is in the set up process and also defines who is managing the inventory replenishment for the tank. Following are the different possible statuses along with a definition of each:

- Incomplete - tank profile was started but not ALL mandatory information was given. Once all tank profile information is given, the profile will change to "Profile Not Linked"
- Profile Not Linked – the tank profile information is complete and the tank is ready to be linked to a incoming data signal. ***Tank ownership resides with the Representative***.
- Online – Logistics is monitoring the tank's usage pattern to ensure it matches the information entered by the Representative. ***Tank ownership resides with the Representative***. Tank data is viewable through the web.
- Online Rep – Logistics has determined that this tank must be managed by the Local Nalco Representative. ***Tank ownership resides with the Representative.*** Tank data is viewable through the web.
- Accepted – Logistics has accepted the tank for automated order entry. An email was sent by Logistics to the Local Nalco Representative, requesting that tank ownership be transferred from the field to Logistics. The status will not change until a confirming email is received by Logistics from the Representative. ***Tank order entry remains with the Representative*** during the transition period.
- Online Auto – The Nalco Field Representative has accepted the invitation for Automated ordering and order replenishment immediately transfers from the Field to Nalco Logistics. ***The Field Rep will set this tank status manually***. ***Tank replenishment orders are automatically placed and managed by Logistics. Field Representative will be notified via e-mail when an order is placed.***

- Removed – The field representative has removed the tank from automated order entry and the profile is removed from the system. This is used when a customer is lost. ***Tank ownership resides with the Representative.*** NOTE: When the tank is "Removed," the profile is not saved.

- Off-Line – ***Do Not Reorder*** – All reorder alerts and alarms are put on hold. No action will be taken on the tank until the Rep changes the tank status to Online Auto. Profile will remain "as is" in the system.

- Need Maintenance – This status is automatically set if an alarm is received from the field while data is still being received. This alarm is usually triggered by a low battery alarm or cell phone signal. ***Ownership of the tank does not change during this state.***

- Signal Error – This alarm will occur if data is not received from the tank over a 48 hr. period. ***Ownership of the tank is transferred back to the Field Representative.*** Notification of Tank ownership transfer from Logistics to the field is sent to the Field Representative and copied to the District Manager and District Administrator. Once the issue has been resolved, the status is automatically set to the previous status.

- NGG Error – Connection to the NGG has been lost. No data has been received from the NGG in over 48 hours. ***Ownership of the tank is transferred back to the Field Representative.*** Notification of Tank ownership transfer from Logistics to the field is sent to the Field Representative and copied to the District Manager and District Administrator. Once the issue has been resolved, the status is automatically set to the previous status. Once connection is re-established, ownership will transfer back to Logistics and e-mail alerts will be sent to the Field Rep, DM, DA, and Logistics group alerting them of the change in status.

3.2 Linking Equipment to a Customer's Tank

3.2.1 How to Link a Customer's tank for viewing on the web to a 3D TRASAR controller

After all required fields for a tank have been populated, the status of the tank changes from "Incomplete" to "Profile Not Linked." This indicates the tank is ready to be linked to either a 3D TRASAR controller or a Nalco Global Gateway (NGG).

To link a Tank profile to a probe connected through a 3D TRASAR controller, press the "Probe Matching button" and then the "3D TRASAR Probe Matching" button. Select the 3D TRASAR controller in which the probe is connected from the drop down list. Note: You can only access those 3D TRASAR controllers in

which you have been assigned. If you cannot find your controller, please contact the 3D TRASAR Help Desk.

Once you have selected your controller, select the Tank from the tree view (left hand side of the page) in which you want to pair to a 3D TRASAR input. Next, verify which input the probe is connected (Analog Input 1 or Analog Input 2) and press Assign to Selected Node (Figure 27). Note: **a probe linked to a 3D TRASAR controller cannot be calibrated through the Tank Level Monitoring Configurator.** This function must be completed using the 3D TRASAR Configurator while connected to the controller.

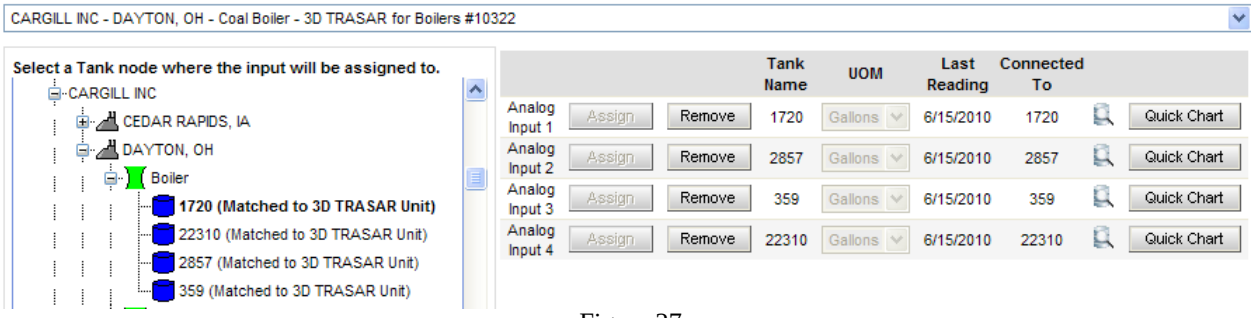


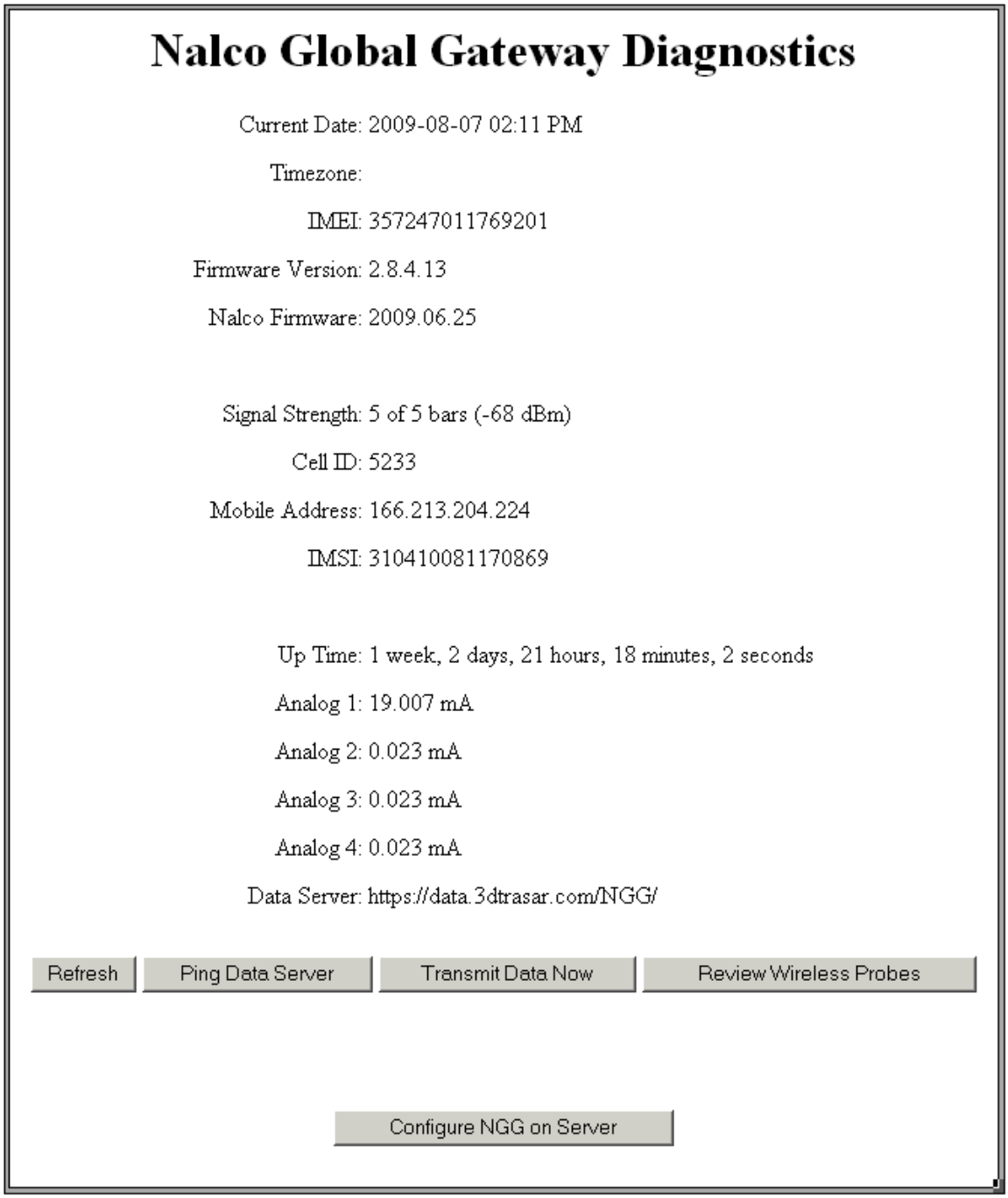
Figure 27

3.2.2 How to Link a Customer's tank for viewing on the web to a Nalco Global Gateway

A user can link or Match a probe to a Nalco Global Gateway input either while on-site, using the NGG's internet connection, or off-site. Please note that the NGG's wireless speed can be sluggish so it is strongly recommended that the tanks are set up in the Configurator before installing the equipment and connect through the NGG only to finish the probe Matching process.

To use the Configuator's Probe Matching page using the NGG's wireless connection, connect the laptop to the Nalco Global Gateway's available Ethernet cable. If the cable is connected to a 3D TRASAR Controller, it will need to be disconnected from the 3D TRASAR controller temporarily so it can be connected to your laptop. If the NGG was recently powered on, you may need to wait about 30 seconds for the NGG to establish a network connection. Once your laptop is connected to the NGG, open Internet Explorer and type in the following address: **http://192.168.1.1:8080** to access the NGG's Diagnostic's Page. An example of the Nalco Global Gateway Diagnostics page can be found below.

To open the Tank Level Monitoring Configurator page from the Diagnostics page, simply press the "Configure NGG on Server" button and the Configurator page will open.



Open the Probe Matching page and select the Tank from the tree view (left hand side of the page). Next, enter the IMEI number of the NGG and press Search. (IMEI can be found inside the NGG cover) Once your NGG is found, a list of available inputs will be shown on the right hand side of the page. (Figure 28)

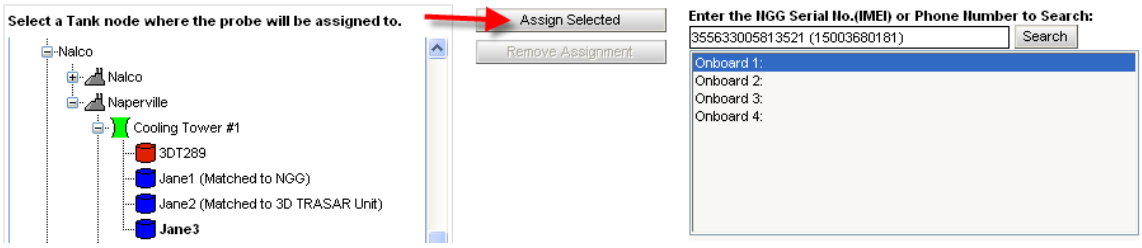


Figure 28

To match a probe to an input, simply select the input to assign to the tank selected and press "Assign Selected." To unassign a Tank from an input, follow the same procedure and press "Remove Assignment." Once a tank assignment is made to an NGG, a pop up will ask you to calibrate the reading. Please use the most recent measurement to ensure accurate readings on the web. You will also be able to view a Quick Chart of the probe data once the assignment is made.

3.2.3 How to Calibrate your probe

If the probe you would like to calibrate is connected through a 3D TRASAR controller, you must calibrate the probe using the 3D TRASAR Configurator.

If the probe you would like to calibrate is connected through an NGG, there are multiple areas in the Tank Level Monitoring Configurator to calibrate the probe.

- Dashboard Page – Find the tank/probe to be calibrated from the Dashboard table and press "Cal." A pop up will ask for the current level, enter the current tank level reading, press save, and the probe will be calibrated.
- Tank Configuration Page – Open the Tank Configuration page to the probe you wish to calibrate and press the Calibrate Probe button in the upper right hand corner of the page. A pop up will ask for the current level, enter the current tank level reading, press save, and the probe will be calibrated.
- Probe Matching Page – Select the tank you wish to calibrate the probe and press the Calibrate probe button. A pop up will ask for the current level, enter the current tank level reading, press save, and the probe will be calibrated.

NOTE: The Calibrate Probe button will be grayed out until the probe is linked to an NGG. Also, if a probe is linked to a 3D TRASAR controller, the button will remain grayed out since the calibration must be done using the 3D TRASAR Configurator.

3.2.4 How to Delete a Tank, System, or Customer from the Tank Level Monitoring system

If a Customer has been lost or a product is no longer fed, the tanks should be removed from the system maintain system data quality. Follow these steps to remove a Tank, System, and Location from the System:

1. Unmatch all tanks using the probe matching page
2. On the Customer Information page, select each tank and press "Delete Selected Node"

3. Continue this for each tank until all tanks have been deleted from the system
4. After all tanks are deleted, select each System and press "Delete Selected Node"
5. After all Systems are deleted, delete the Location from the system

Section 4: Managing Your Data on the Web

4.1 Nalco Tank Level Monitoring Website

4.1.1 How to Log into Nalco's Inventory Dashboard

To access the Inventory Dashboard, log into Nalco's Extranet page and under "Tools," select TLM Inventory Dashboard. The following page will open asking for a Username and Password. Before entering the Username and Password, save the website as a Favorite since the page can be logged into directly without having to log into the Extranet page

www.nalco.com >> Extranet >> Tools >> TLM Inventory Dashboard

The Inventory Dashboard's Username is the users Extranet Username. For the first time user, **Password is "password."** The user will be asked to change their password upon entering the site.

4.1.2 How to find your Tank Data on the Web

Upon entering the Inventory Dashboard, the user will see a Dashboard view of all tanks in which they have access. The tanks will be sorted by percent full. To sort by another field, simply press on the Dashboard header's name.

To find a specific tank, use the Org Unit (Customer Name/Location), System, Product, or Status. To access the Location of a Customer, use the Org Unit filter again once the page refreshes. Also, the Status filter corresponds to the level in the tank which also corresponds to the color of the dot next to the tanks name. Following is the color code:

- Green (Good) – Inventory level is above the reorder point and no action is needed
- Yellow (Warning) – Inventory level is below the Order point of the tank but above the Safety level. A replenishment order should be placed.
- Red (Critical) – Inventory level is below the Safety level in the tank. If an order has not be placed or received, immediate action is needed.

The color code for each tank corresponds to the color code of the graph in the next section.

To review the historical usage data for a specific tank, simply click on the tank name and the Tank Details page will appear. A historical usage graph (defaulted

to one month) will be in view on the right of the page and the last 15 data points can be reviewed on the left. To view a larger version of the graph, click on the graph and a larger version will appear in a new window.
To download the historical data from the tank, press "Download." Make sure Pop Up Blocker is turned Off. A window will open asking the format to download the data which can be uploaded into Excel for analysis.

Section 5 How to Set up your Tank for Automatic Inventory Replenishment

5.1 Overview of Automatic Inventory Replenishment at Nalco

Once a tank profile is linked to probe signal, the Tank Status will change to either *Online* or *Online Rep*. If the Status is *Online Rep* and you're interested in submitting the tank to Logistics for Automatic ordering consideration, send an e-mail with the tank detail to the Logistics e-mail box (bulkplanning@nalco.com). If the Status is *Online*, the tank will automatically be submitted to Logistics for review. This review process can take a couple of months. If the tank is accepted, the status will change to *Accepted*. If the tank is denied automatic ordering, the status will change to *Online Rep* and an e-mail notification will be sent.

If you receive an e-mail that the status of the tank was changed to *Accepted* and you are interested in having orders automatically placed for that tank, simply visit the Tank Level Monitoring Configurator and change the status from *Accepted* to *Online Auto*. Once the status is changed to *Online Auto*, Logistics will start placing replenishment orders for the tank immediately.

If Logistics is placing replenishment orders automatically for the tank, you can change the status to:

- *Online Rep* to return order replenishment back to the field
- *Removed* to remove the tank from the system – only used if account is lost
- *Off-Line* to turn off automatic ordering during a seasonal or maintenance shutdown. This status also suppresses usage alarms.

Data Integrity: Due to the value of the data stored within the Tank Level Monitoring application and the number of users depending on the quality of the data, it is important to keep all information up to date. Please be diligent in updating Billing Arrangement information, tank status information, any User Assignment changes, and information stored on the Personal Information page. The success of this program depends directly upon the integrity of the data.

Section 6 Frequently Asked Questions

Due to the number of Frequently Asked Questions and the frequency in which they are updated, please visit the FAQ tab on the Tank Level Monitoring KM page for all questions.