

# SS2

## Safety System

*Operation Manual*

**Control System,  
Telemetry and Access Control  
for Gas Stations**

Version 1.1 – May-2012



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# Summary

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# 1 Objective

The purpose of this document is to show basic information and main operation aspects of Supervisor program.

Those information allow that be performed all management controls, supervision and S2 System equipment control installed at the gas station.

For equipment installation or questions about the care and precautions, consult the **S2 System Equipment Installation Manual** that specifically treats these issues.

## 1.1 Used Symbols



It indicates important information or warning



It indicates existence of **DANGER**, requiring special attention, because the failure of the procedure may lead to equipment irreversible damage and failure, explosion and possible injury or even death.



It indicates existence of **ELECTRICAL DANGER**, requiring special attention, because the failure of the procedure may lead to equipment irreversible damage and failure, electrical shock, explosion and possible injury or even death.



It indicates useful note to the quality of work and standardization of installation.

## 1.2 Installer Certification

According to the system be installed in areas subject to flammable gases, is a legal requirement that people allocated for work execution has certifications and knowledge of installation in classified areas. The reading and precise application of the procedures and standards described in this manual are of fundamental importance for the work quality and proper operation of the platform to be installed.



Faithfully obey local safety codes and Standards (ABNT, INMETRO, etc.) when the system installation. It is of exclusive responsibility of the installer to maintain the self security, of his team, of equipment and the area to be installed.

## 1.3 Security Rules



All associated equipments with the S2 System are installed in classified area (level meters, access control caps, liquid sensors and liquid sensors multiplexers) where are always flammable vapors present. These equipments were designed in order to use the principles of intrinsic safety. This principle is based on limiting the energy delivered to these equipments to prevent the generation of gas ignition, and in turn into an explosion.



Use proper tools when working in classified areas. The inappropriate use of tools or devices that generate sparks can ignite gas, independently of existing security on equipment. Do not use these devices if you are working in classified areas.

- P** Improper installation of equipment or incorrect cabling can result in equipment damage and risk of explosion.
- P** Leaks in underground tanks can cause environmental damage and serious explosion risks. The system provides sensors installation to detect leak presence, so the failure installation in these equipments can result in false normality situations, incurring severe damage to the environment and people.
- P** Only designed and certified equipment for classified area must be installed in these areas, therefore, when perform the installation make sure that the equipment is approved to operate in these areas. The inappropriate equipment installation to operate in these areas can result in a risk of explosion.
- P** The cabinet which houses the safety barriers and other accessories (keyboard, display, etc.) must be installed on non-classified area.
-  All electrical cables for sensors, probes and caps connection should be sent in exclusive conduits and cannot be shared with other instrumentation cables or electrical. Failure to follow this procedure may cause a serious risk of explosion and damage to the installation and people.
-  The intrinsic safety barriers are protected by a mechanical enclosure (protective cap) and should be kept fixed and bolted to prevent access by unauthorized persons. Failure to follow this procedure may cause a serious risk of explosion and damage to the installation and people.
-  Make sure that all AC Power must be off during the whole process of the equipment installation. Failure to follow this procedure may cause a serious risk of explosion and damage to the installation and people.
-  Don't make any replacement of components in any case. This operation could impact the loss of intrinsic safety and explosion risk with serious damage to the installation and people. Repairs may only be performed by qualified personnel and appropriate location.

## 2 Introduction

### 2.1 General

The Basic Concept of S2 System is to present information through any browser open on an accessory machine networked with the S2 Supervisor.

With the Browser, you can get an intuitive and graphical way of all operation facilities of the S2 Safety System.

To perform all monitoring, control and information registry functions, the browser access the program database that is located in S2 Supervisor machine.

This greatly facilitates any access or system configuration, because this interface (browser type programs) can be obtained free and comes with any PC machine nowadays for Internet access.

To this end, the system supervisor has an embedded operating system (Windows Embedded) which has all the functionality to generate pages in HTML (the code used to display pages).

### 2.2 Using this Manual

This manual contains information about all subsystems associated with the S2 system, including caps, probes, barriers, leak sensors, computer systems, broadband communication, etc.

The Management Softwares have oriented screens and are in constantly evolving. Consider constant screens in this manual as only being reference screens for understanding and clarification of the associated function.

Likewise, the system can operate with S2 System browser (Internet Explorer, Opera, etc.) both locally and remotely. In this case the facilities and screen view way can be changed depending on the use of specific controls for presentation in Web pages.

Some of the figures are in Portuguese language, but can be displayed in other languages using RSP multilingual program.

### 2.3 Necessary Knowledge

For some system configurations, it requires prior basic knowledge of interconnection networks systems, access via browser, operation of personal computers and basic operations of measuring and control implemented in a service station.

### 2.4 Installation of Sub Systems

For a complete program S2 Supervisor operation, a set of programs, equipment and infrastructure should be properly installed.

To this, check the installation manuals for each related systems:

- Installation of SmartSeal
- Installing the Distributor and Safety Barrier SmartBox
- Installing the Supervisory Central - S2Supervisor
- Installing the SmartConsole
- Installation of SmartProbe

This equipment should be disposed according established project for the Gas Station.  
Some equipments listed above cannot be provided on installation scope in function of specific characteristics of the gas station.

As can be seen, there are two distinct sites that are interlinked, namely: Station Equipments and Central Station Monitoring Equipments.

It should be noted that all devices are intelligent and consist of equipment (hardware) and programming systems (software) for the integrated performance of all operating functions, including ability to operate in a state of degradation of systems.

## 2.5 S2 System Topology

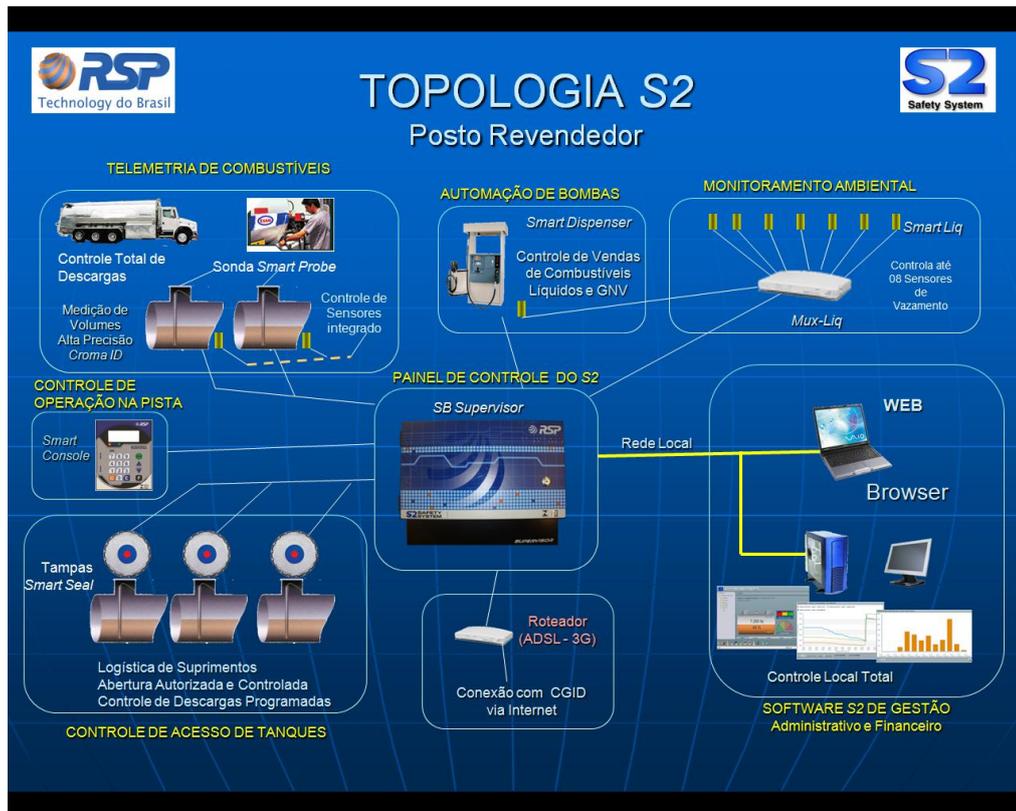


Figure 1 - S2 System Topology

## 2.6 Equipments on Gas Station

There are following equipment needed at a gas station.

- Cap SmartSeal
- Distributor and Safety Barrier SmartBox
- Central Monitoring - S2Supervisor
- Forecourt Console SmartConsole
- Meter SmartProbe

The quantities of each equipment may vary depending on the amount of existing tanks at the station and the desired operating level.

In relation to the connection, the gas Station may have dedicated lines (ADSL, cable, or other ) to the Internet.

Are also supported other means of Internet connection through 3G channels available in wireless communications.

See the RSP or your distributor for more details on this functionality and the necessary equipment for incorporation into your system.

In the case of using dedicated lines, all operations are monitored in real time by various means of monitoring.

For dialup, the strategy may involve connection dials periodic (with programmable time intervals by the Central) and update by event, determines in its discretion, which events are classified as generators dial. For example, the events giving rise to dial could be:

- Leak Alarms
- Water in the Tank
- Low-Level Tank-Low Battery-Violated Cap
- Etc.

### **2.7 Connection with other systems**

The S2 Supervisor equipment also has hardware and software interfaces in order to make communication and control of other systems and equipments in order to allow these functions to be also incorporated into the operating platform and communication of S2 system.

By this way, pump control and Fleet Supply Systems can also be connected to the system.

Call RSP for more information and systems already approved.

To access the information in the S2 database, see [S2 System Communication Protocol Interface](#).

### **2.8 Operation with Local Browser**

The supervisor equipment can work as server web pages without the need for Internet connection. In this case, only the local station can be monitored.

For both, you need a simple connection to a PC through the LAN and a Browser (Internet Explorer, Mozilla Firefox, etc.) to access the information of the gas Station.

All information contained in this manual refers to a connection on a local network or a peer to peer connection (one computer connected directly with the Supervisor). To access information outside the system, consult your dealer about the functionality of the RSP Monitoring Center.

The RSP is not responsible for any undue utilization or eventual system invasion improperly performed due to lack of criteria in protecting the local network through "Firewall" programs or others that allow the blocking and protection of digital networking information.

### **2.9 Remote Monitoring - Browser**

By accessing the website of RSP and its access code (username and password) you get all the information of the gas station and your control. With this, anywhere in the world with a simple Internet connection, it's possible control or obtains on-line information of gas station.

To this, it should be available a network connection with a free internet access.

If you are in a company with network, ask your network administrator to allow access to the Internet.

#### **2.9.1 Central Monitoring**

Monitor Services of RSP may be hired, where the system will also be monitored, allowing control of the multiple functions of the station.

In Central are also provided automatic providing functions of maintenance teams for technical support to the Station in case of leak or other emergency situations.

With the hiring of the monitoring central, other unique features are offered:

- Reconciled Reports of a Gas Station Group
- Region, Neighborhood, City and State Consumption Graphics
- SMS Sending to information about important events such as leakage, low tank levels, high tank levels, Open Cap, lock cap, operation failures, etc.
- Email Sending with the same information for work groups, managers or maintenance personnel.

Call your distributor to add this feature to your system.

### **2.9.2 Connection to Manage Systems**

Through Monitoring Center of RSP, you can perform a logical connection to a management system of your company.

With this, can be integrated to the existing system of control, specific control and management functions, such as opening authorizations (referring the travel schedule, station and product shipped, etc.) automatic replacement of products (referring to the minimum amount of each tank) in order to confront the supply operations to Station operations, without any operator intervention.



Please read the [RSP Interface Protocol document](#) to reference the communication patterns and information Access to the S2 System.

### **2.9.3 Operation with Cell Phone**

The Monitoring Central has an automated answering system that enables the management and control through a simple phone.

Calling to the Central Station, and typing the code and password to access the station, the mobile user can obtain in voice form, the main states of the alarms in the Station, product volume in each tank, including the possibility to perform locking and unlocking the caps.

It can also be programmed SMS use - Short Message Service - which corresponds to sending messages to the programmed cell (the station manager, commercial agent, or person in charge of the Station) in order to inform the existence of unlocking, holes, leaks or any other situation provided by the system.

Visit the website of RSP ([www.rsp.com.br](http://www.rsp.com.br)) and check how to access information from office through a mobile phone with WAP support.

## 3 Equipments and Features

### 3.1 Supervisor Cabinet

The following describes the features and infrastructure necessary to complete operate the system (monitor and control) of a Gas Station. Some items may not be needed depending on the S2 System model purchased for the Station.

Supervisor SmartBox is housed in the cabinet, as shown below.

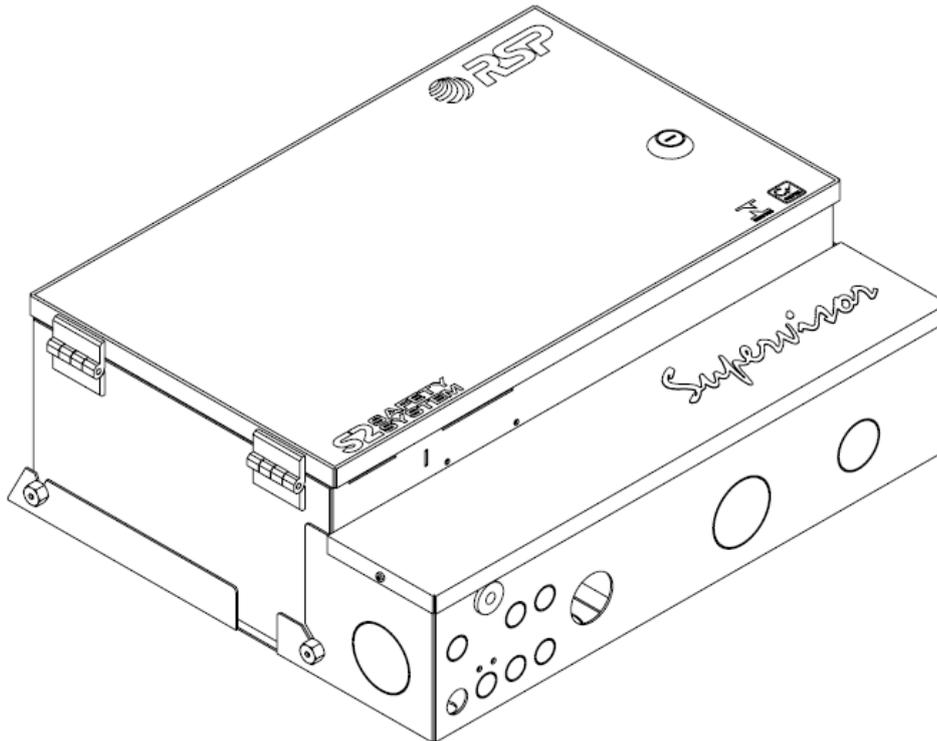


Figure 2 - Supervisor Box Storage

The cabinet has a flap door with key access and through-holes located at the bottom for connection of power cables, Ethernet network and the devices installed in forecourt.

The S2 Supervisor is the device specially programmed for global management of operations of the S2 System. Using last generation processing capacity also includes user-friendly interface function by a network connection with another computer, allowing access to the station manager of all operational information, special situations, and product trends analysis, providing detailed management reports, indispensable for Gas Station operations.

The figure below shows the internal components of the SmartBox cabinet that houses and allows connection of other forecourt equipments.

The components are:

1. Source
2. Battery
3. Control Board
4. Barrier Board Shielding
5. Supervisor CPU
6. Supervisor Hard Disk

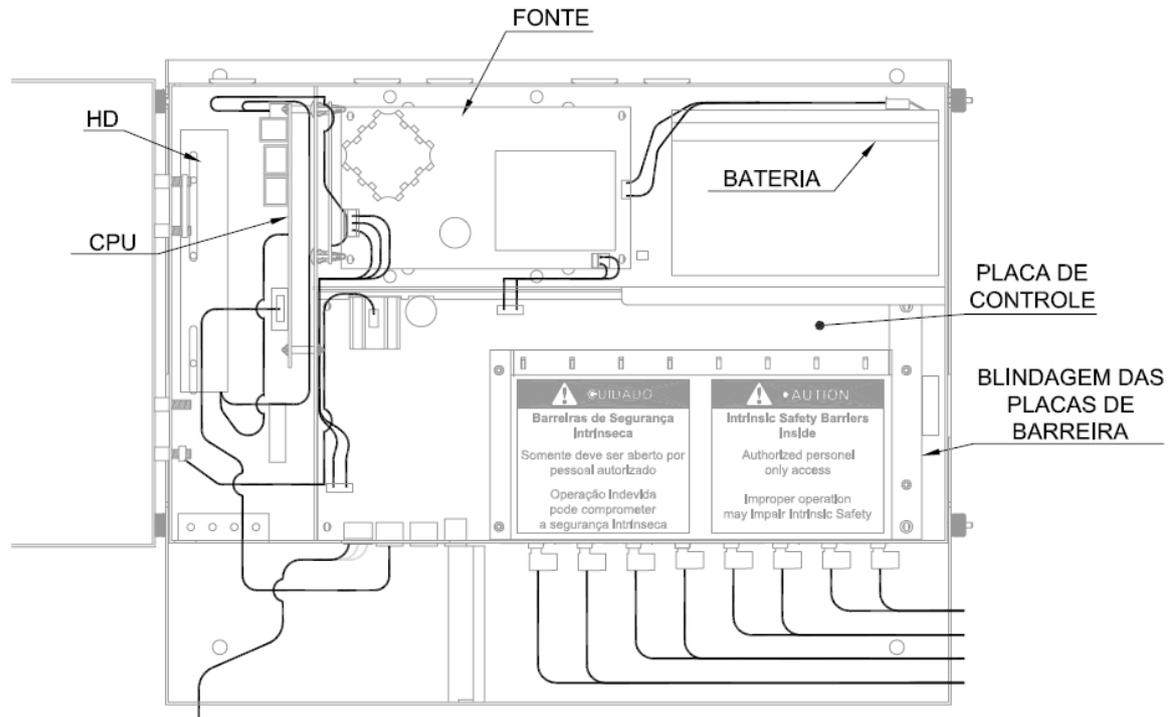


Figure 3 - Internal Components of Supervisor Cabinet

### 3.1.1 Source

The equipment has full-range source, in other words, can operate on supply from 90VAC to 250 VAC 50Hz -60Hz without problems.

Power can be connected directly to the SmartBox equipment that has a slot for a power cable provided with the equipment.



Don't change any characteristic of the source, because there is danger of electric shock as well as the possibility of damaging the equipment.

### 3.1.2 Cables

For normally operation of Supervisor, it is assumed that all related equipment, plugs, probes, sensors, controllers, pumps, etc. are properly installed and connected to the SmartBox, according to procedure established in the Installation Manual.

These cables **must be** connected to Barrier Boards.

For the connection of these cables and installation see the Equipments Installation Manual.

### 3.1.3 Connection

For systems with direct monitoring, should be provided an ADSL ou Cable line.

For systems without online interaction from outside, no Internet can be connected, because you can use in a local area network.

### 3.1.4 Software Installation

The equipment already has all the factory-installed software, requiring no additional facilities.

The software update can be done in two ways:

**Automatic:** There are functions that are automatically updated if the system is connected to the Internet, without operator intervention.

**Manual:** In some cases it may be necessary to update manually. In this case this operation can be made directly by an authorized technician or through specific program update is available on the RSP.

### 3.1.5 Software Update

The continuous development of new features improve product and generates a resulting software update.

If the system is directly connected to the Internet through a request to the monitoring station may be a remote connection to the equipment, performing the software update required.

S2 System has all the mechanisms for this operation be performed remotely, and with only minor disruptions in normal system operation.

Consult your dealer to check the possibility of upgrading the software on your system.

### 3.2 SmartSeal

With high-tech aggregate, the SmartSeal allows performing crashes and / or unlocking from distance, by an authorized and properly identified user, beyond other numerous operational resources, such as management of interstitial leak sensors, detection of cap violation, local storage containing the date and time of all operations performed in the camera, etc.

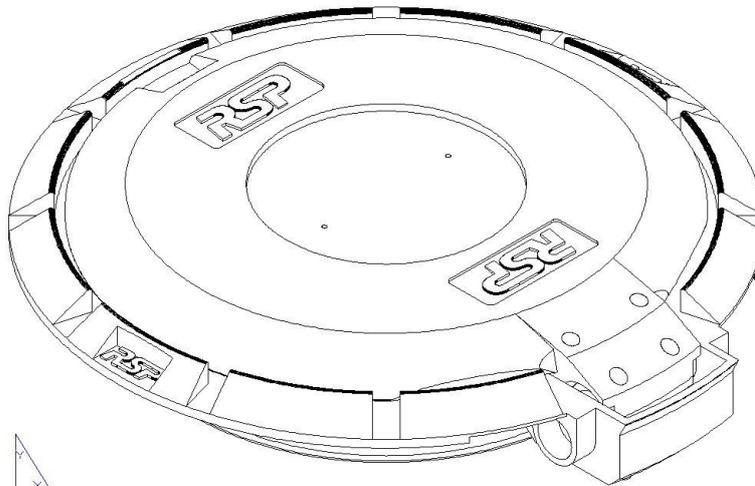


Figure 4 - SmartSeal

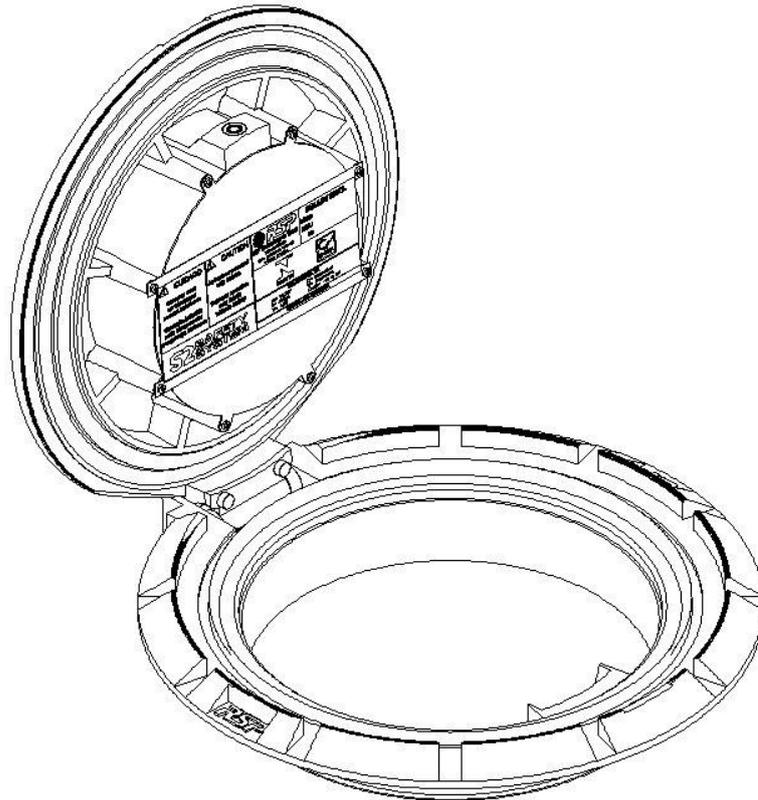


Figure 5 - Opened SmartSeal

For maximum system availability, the SmartSeal also have own batteries and internal systems and power supervision, even in case of interruption of supply of energy from the SmartBox.

- ❗ The cap has internally long rechargeable batteries and require annual return for the perfect operation of the locking and unlocking operations. Refer to the RSP for the maintenance of this item.
- ❗ The cap has an internal motor for operation of the locking pin. The hole must be free of impurities for correct operation. Perform a monthly visual inspection and perform preventive maintenance every six months.

### 3.2.1 Smart Seal Technical Specifications

Description	Value	Unit
Maximum opening Number	20.000	
Maximum Supported Weight	8	ton
Opening and Closing sensors	Accelerometer	
Locking and Unlocking Sensors	Hall type	
Volume Led Indicator	3	

### 3.3 SmartBox

The SmartBox besides being the device responsible for signal conditioning for classified area (safety barrier) is responsible for power management of the entire S2 System, and has even "no break" and batteries for providing additional strength in case of energy interruption to other system equipment.

Being the mechanical enclosure that adds power supplies, barriers and control systems are available two versions of the SmartBox presentation.

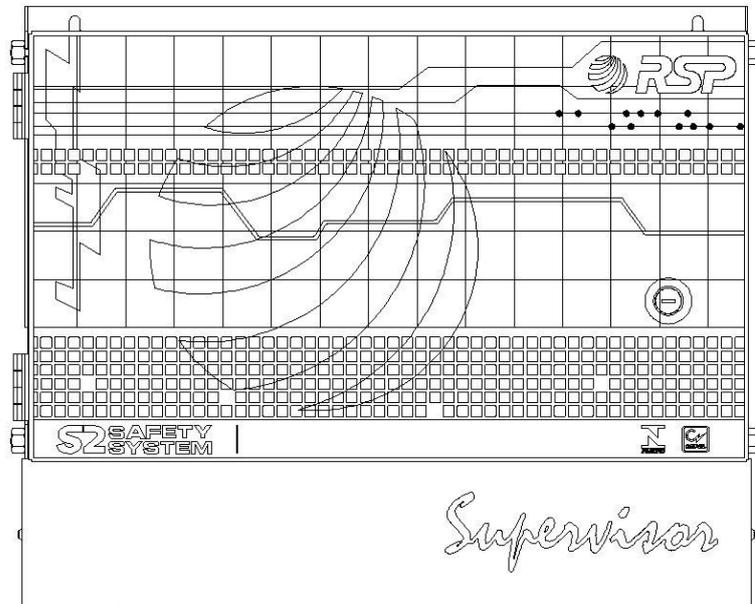


Figure 6 - SmartBox

### 3.4 SmartProbe

The SmartProbe consists of a device for measuring liquid volume stored in the tanks, making the conversion of fuel volume to 20°C, detecting the possible presence of water inside the tank, entrance and exit of products. It also lets you characterize the entry of non-conforming product with the previously existing accusing the introduction of liquids other colors.

Consult RSP for more information.

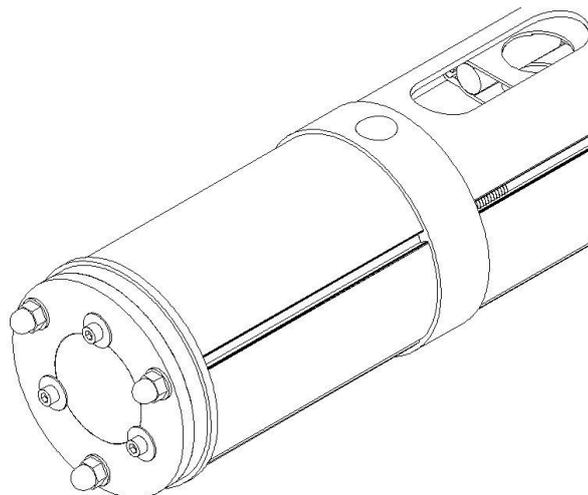


Figure 7 - Bottom Detail of SmartProbe

It presents the following tables containing the values of each operating system.

RSP is constantly evolving its products, therefore reserves the right to make changes in the values presented below without any notice.

These values may vary depending on the product model, and some models may not have some features.

The equipment may not be subject to amounts that exceed their specifications, at the risk of equipment damage and total loss of warranty.

Refer to the RSP Warranty Term for more information.

### 3.1 SmartProbe SP19 Technical Specifications

The values calculated as a standard tank diameter 1,949 mm, so the values given in liters may vary depending on the geometry of the tank and its inclination.

Description	Value	Unit
Maximum Full Scale Error	+/- 0,05	%
Full Scale Accuracy	+/- 0,005	%
Maximum Volume Detection Product	100	%
Minimum Detection Level Product (With water float)	220	mm
Minimum Detection Level Product (Without water float)	146	mm
Minimum Detection Product (Float with Water)	3,6	%
Minimum Water Level Detection	21,8	mm
Maximum Water Level Detection	100	mm
Accuracy	+/- 1,0	mm
Resolution	+/- 0,1	mm
Internal Resolution	+/- 0,01	mm
Minimum Detection CromalD	500	Parts/million

(\*) The values above can be changed without notice

### 3.2 SmartProbe SP25 Technical Specifications

The values was calculated in a tank of 2,450 mm, so the values given in liters may vary depending on the geometry of the tank and its inclination.

Description	Value	Unit
Maximum Full Scale Error	+/- 0,04	%
Full Scale Accuracy	+/- 0,004	%
Maximum Volume Detection Product	100	%
Minimum Detection Level Product (With water float)	220	mm
Minimum Detection Level Product (Without water float)	146	mm
Minimum Detection Product (Float with Water)	3,6	%
Minimum Water Level Detection	21,8	mm
Maximum Water Level Detection	100	mm
Accuracy	+/- 1,0	mm
Resolution	+/- 0,1	mm
Internal Resolution	+/- 0,01	mm
Minimum Detection CromalD	500	Parts/milion

(\*) The values above can be changed without notice

### 3.3 SmartConsole

The SmartConsole is a device that enables the locking and unlocking of the Smart Seals of own forecourt. It can be used as a complimentary accessory S2 Supervisor, performing the functions described above or, operating to allow the reading of data, exclusively, locking and unlocking, opening and closing of each SmartSeals.

The SmartConsole has a liquid crystal display backlight, with 4 rows and 20 columns for displaying information. Your keyboard has 16 keys and four function keys.

It's designed to be operated directly from the forecourt, through intuitive menus allowing quick access to all management information in real time, in a simple and practical way.



Figure 8 - SmartConsole

### 3.4 Equipment Capacity

A S2 System supports up to 24 devices connected to its intrinsic safety barrier, called SmartBox.

With this way you can perform any equipment combination knowing that:

- ✓ Each SmartProbe occupies a position of the barrier.
- ✓ Each tank access cap SmartSeal occupies a position of the barrier.
- ✓ Each MuxLiq device (which supports up to 8 sensors) occupies a position of the barrier.
- ✓ Each probe supports two sensors (intelligent or universal) connected to the probe itself, therefore, these sensors do not take up any position in the barrier, except in connection accommodates the probe itself.
- ✓ Each tank access cap supports two universal or intelligent sensors attached on the cap itself; therefore, these sensors do not take up any position in the barrier, except in the connection cable that accommodates the cap itself.
- ✓ The SmartConsole has no position on the barrier, and a SmartBox supports up to two consoles.
- ✓ The pump controller does not use a barrier position, and each system supports one pump controller.

With this setting you can control a complete system of eight tanks composed of eight probes and 16 access caps, or even a station with 24 probes in a configuration that includes only probes. Some equipment is provided with triple security fence, allowing up to three devices per plate barrier.

## 4 Connecting the Equipment

The equipment is factory configured with fixed IP address, to allow a quick setup via a simple connection to your PC equipment.

Connect the device via the supplied power connector and wait for the complete equipment startup.

**⚡** Make sure the AC power and ground equipment is in perfect condition and in accordance with safety standards provided in the Installation Manual before connecting the equipment. Failure to follow this procedure may cause a serious risk of explosion and damage to the installation and people.

**⚡** Don't make any replacement of components in any case. This operation could impact the loss of intrinsic safety and explosion risk serious damage to the installation and people. Repairs may only be performed by qualified personnel and appropriate location.

For the interconnection of Supervisor with your PC equipment, check below what form you want to connect in order to set the correct cable for interconnection.

This cable is not supplied with the equipment. These cables are easy to purchase in the market.

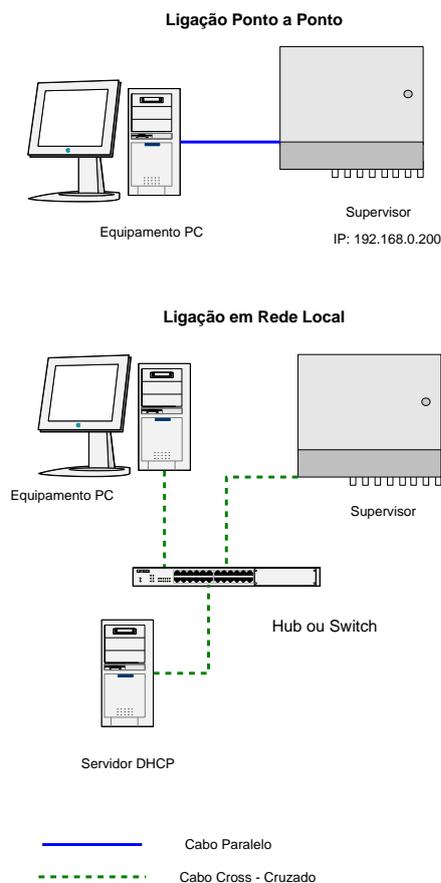


Figure 9 - Interconnection of Supervisor with PC

#### 4.1 Point to Point Connection with the Supervisor

Open the cabinet door and in the front, find the network connector that is positioned as the following:

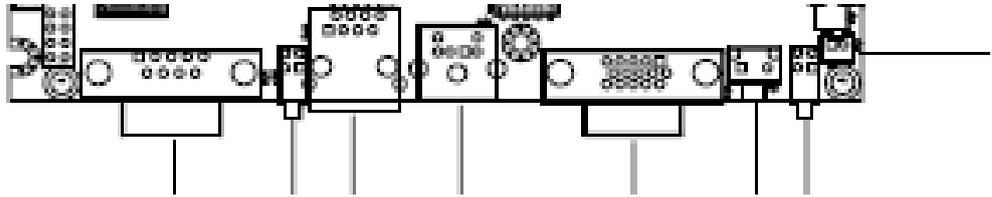


Figure 10 - Location of Network Connection

This position may vary depending on the Supervisor mode. Make connection via a standard network cable CROSS for interconnection of two machines.

##### 4.1.1 IP Definition

As the machines are connected without a server to provide a valid IP addresses, each machine must be configured with static IP.

The IP address 192.168.0.200 has been preset at the factory to the unit supervisor, and, for example, you can assign the IP address 192.168.0.10 to the PC that was connected equipment.

##### Important

This setting is only valid for the case that the device PC is not connected to any network point. In this case verify the option of local connection with the following network.

#### 4.2 Local on Internal Network

Open the cabinet door and in the front, find the network connector and insert the appropriate network cable.

To install on an internal network, connect the Supervisor via a parallel network cable to your hub or switch, as that would be connected to PC equipment.

#### 4.3 PC Network Configuration

There are two distinct connection ways of Supervisor System. Check which one best suits their mode of operation and make sure the cables are connected properly.

The connection of the supervisor equipment follows the same connection standards and procedures necessary for PC connection. The definition of IP in the supervisor also can be done in the same way as PC equipment.

To prepare your equipment for connecting to the Supervisor, it's necessary to determine if the equipment is connected directly to the Supervisor or it belongs to a network location that has a server (DHCP) that automatically assigns IP addresses to your machine. The breakdown below shows the configuration for each case.

To configure the network, please:

Control Panel -> Network Connections-> Local Area Connection

Click Properties and you will see the following screen.

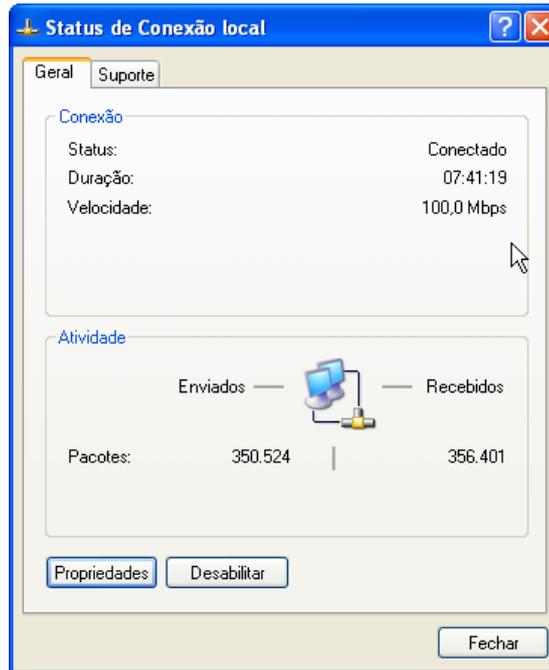


Figure 11 - Local Network Configuration Screen

Once again, click Properties, and will be presented the following screen:

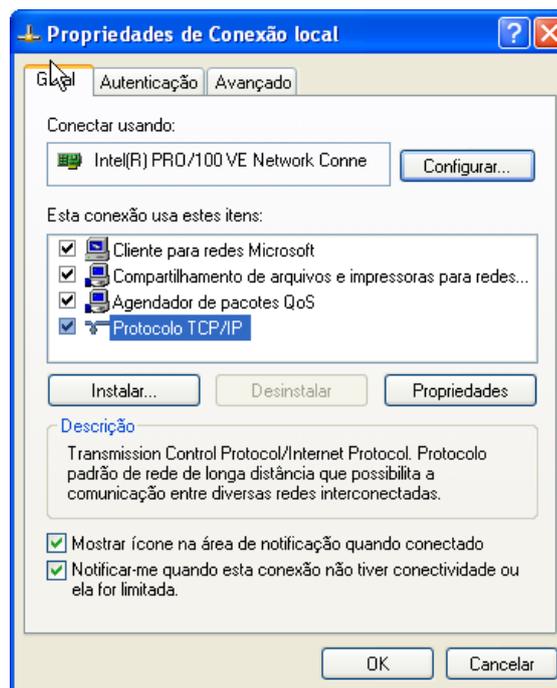


Figure 12 - Local Network Configuration Properties

Click TCP / IP Protocol and again on the Properties button. You will see the following screen:

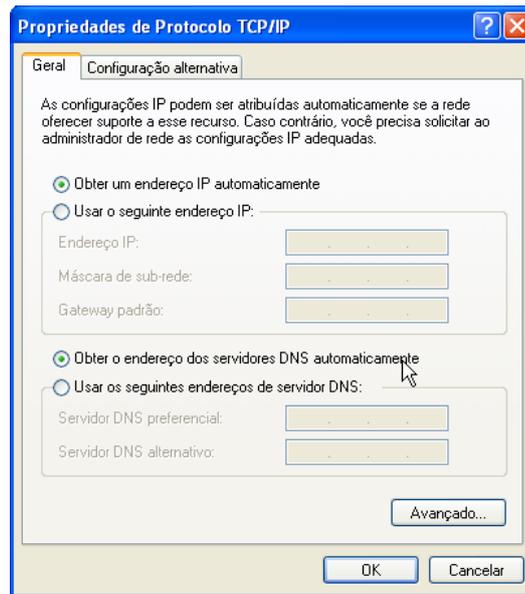


Figure 13 - TCP/IP Protocol Properties

#### 4.3.1 Dynamic IP Operation

Use the Configuration **OBTAIN AN IP ADDRESS AUTOMATICALLY**

If you are using the equipment supervisor in a local network that has a server IP address (DHCP).

Also select the option **OBTAIN DNS SERVER ADDRESS AUTOMATICALLY**

With that, your setup is ready to operate on a network location that has a device that "routes" of IP addresses automatically on your network.

#### 4.3.2 Operation with FIXED IP

In case of equipment inexistence that performs the function to automatically assign an IP address for each machine on the network, use the following configuration:

Select the option:

**USE THE FOLLOWING IP ADDRESS**

And enter the IP address set to the Supervisor.

It should take into account the existence of a Gateway. The gateway is the equipment that holds the interface with the Internet.

This equipment can be your own supervisor or other equipment in the network.

In the case of other equipment in the network, when prompted for the IP Gateway, check the IP number of this equipment to properly insert when prompted.

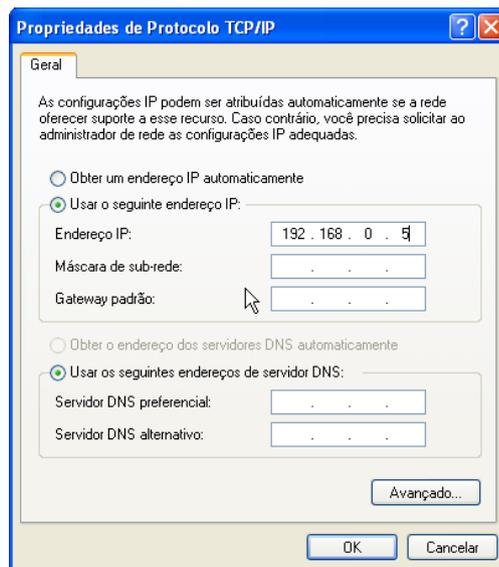


Figure 14 - Fixed IP Configuration

In the field SUBNET MASK type the following masks:  
255.255.255.0

In the field gateway put the same default IP address entered in the IP ADDRESS, inserted in the first field.

Leave the other DNS fields blank.

Press OK on all screens to finish this configuration and proceed to checking the logical connection, detailed below.

#### **4.4 Connecting Supervisor to another equipment**

The device also features additional serial ports for interfacing to other equipment.

Another communication way is through the same network, accessing the IP address of the Supervisor and a specific port allocated for this purpose.

The protocol has a simple structure, where the protocol entities are delimited by special characters.

All traffic information is performed using ASCII characters, so may even be entered via a terminal emulator.

This protocol was also designed to get new features without having lost its structure or compatibility with the developments made.

So if there is the need to obtain little information about the S2 System, only should be developed the necessary commands.

All commands can be tested in a single terminal, watching the incoming data in text format.

For more information use the document "Setting Interface Protocol S2" for the exchange of information between the S2 System and the new equipment.

#### 4.5 Connecting SmartConsole

The console forecourt must be connected via a parallel 6-way cable with RJ11 connector (telephone standard) that came with it.

The communication and power to the console is included in the same cable.

The cable must be plugged into the RJ11 female connector of the Console and the other female connector called SmartBox Main Console.

When making the connection to the SmartBox, the Console energizes immediately, showing the main screen.

See Console Chapter to check the registration to change the configuration parameters.

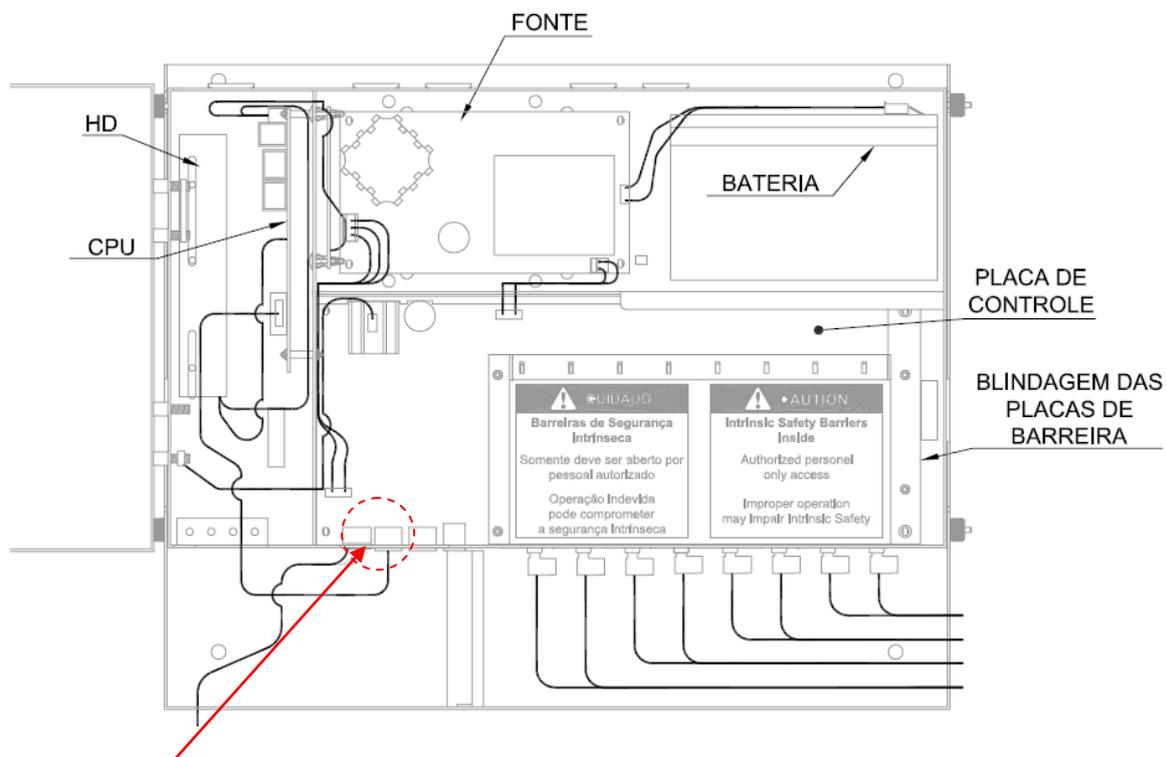


Figure 15 - SmartBox connector reserved for Console connection (Main)

## 5 Operation Start

The following description shows the main operating characteristics of the S2 system and how to perform the registration of equipment, after the correct validation of equipment operation in Diagnostic Mode.

The S2 system is factory set to start its operation in Diagnostic Mode detailed below.



### Important Note

For normal system operation, it should exit the Diagnostic Mode. This command can be performed both on browser screen and in the Console.

### 5.1 Steps Sequence

It's given the following sequence of steps that must be respected so that there are setbacks in the system installation. Closely following this sequence, the installation and operation will be carried out quickly and safely.

- ✓ Step 1 - Connect the system S2 Browser
- ✓ Step 2 - ID setting of all connected equipment (caps, probes, and Console).
- ✓ Step 3 - Working in Diagnostic Mode, check the operation of individual equipment, confirming if it is operational (exists communication) and valid data measurement and control.
- ✓ Step 4 - Finish the configuration by editing the parameters specific to the operating position.
- ✓ Step 5 - Exit Diagnostic Mode

### 5.2 Access Start by Browser

As you can see the details below, all screens, reports and graphs are mounted for display on a browser tool.

So, some components may be required to present the correct information.

Notably, it is essential that you install the Adobe Flash Player plug-in from the company Adobe ([www.adobe.com](http://www.adobe.com)).

This component is free installation, and must be installed before starting the system. To install Flash, visit the website indicated and follow the installation procedures of the tool, according to the guidelines of the manufacturer.

To start the operating system screen, connect to your machine and open a browser program (such as Internet Explorer).

In the address line, type the following address:

`http://192.168.0.200/s2`

Of witch the IP address 192.168.0.200 should be changed as your IP configuration. For this example, we'll adopt always the address of this machine of Supervisor being this.

In the case of remote operation, this access will be conducted by the Central Station, in which case the address to enter is the Center of the monitoring RSP.

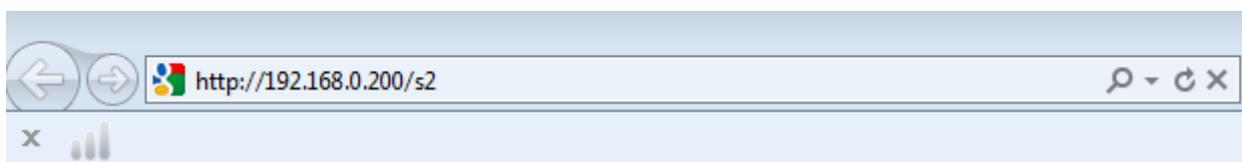


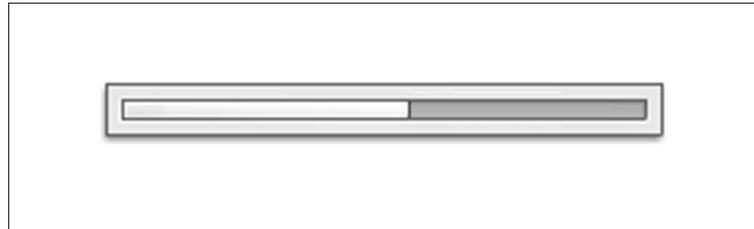
Figure 16 - Operation Start by Browser

Right now, you see the Login screen for user authentication.



### Important Note

On first access the system will automatically load the system screens for your computer, showing a “Loading...” screen. Finishing this charge the system will automatically load the Login screen



The system will always be configured with a default username and password so you can perform the first authentication system.

This user can be eliminated in the System Setup screen, shown below.

### 5.3 Login

Being on the local network, you receive the following login screen:



Figure 17 - Login Screen Local Network Connection

The first time type **CLIENTE** as user and **123456** as the password. This is the default system password. This password can be changed on the screen of records of users.

If you are logging in through the internet (so the Central Login RSP) and being registered as a DOMAIN, select Domain option and enter the Domain name.



The domain corresponds to a grouping of Gas Stations, and if you are logged in the Domain, you can get information from all the gas stations that are registered in this group.



Figure 18 - Login Screen done through website



### Important Note

Logging in the Central requires hiring services of information access by the RSP. Call your dealer about this remote access option.

Once performed the authentication, in other words, valid user will be presented to the System Control screen.

## 5.4 Main Screen

This is the screen that lets you control all the navigation and menu system.



Figure 19 - Main Monitoring Screen

This screen is composed of basic menus and sub-menus so you can quickly reach the required function.

At the top is willing the Functional Navigation Menu, so the user can monitor at real-time, send graphics and reports, organizing the information obtained from the system.

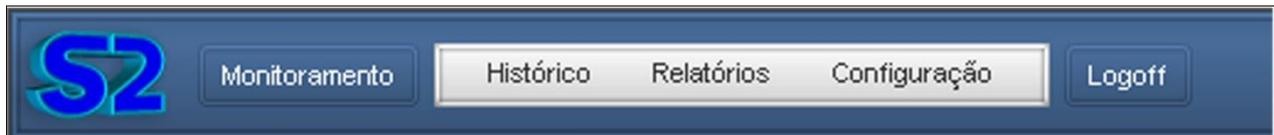


Figure 20 - Navigation Menu

At the bottom, is willing the control panel that tells the operating conditions of devices connected on the S2, through animated icons, which tell a visual status of each device.



Figure 21 - General Control Panel

On the left is the Selection Panel. This panel can be selected the Gas Station for observation and the device.

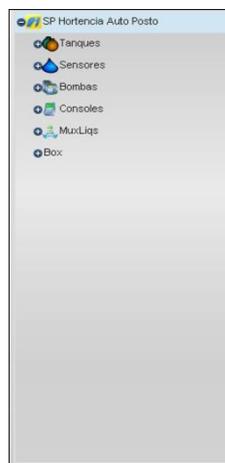


Figure 22 - Selection Panel

This panel is retractable and can be collected by the handle located on the right.

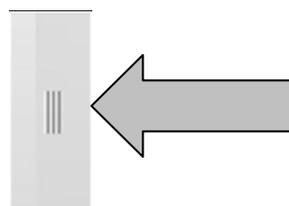


Figure 23 - Handle to Retract the Selection Panel

The Monitoring Panel comprises the center screen where can be displayed tank data in real time, as shown below:



Figure 24 - Monitoring Panel

### Logoff

By accessing the system through the login screen the user enters a username and password, this indicates that a properly registered user take over the operation of the system. From this point all operations are assigned to that user.

By clicking on the LOGOFF button the system redirects the user to the login screen, this indicates that the user that was in operation is leaving from the system operation. The only allowed operations are automatic local operations or operations carried out by the Monitoring Central.

### Graphs and Reports

To display the graphs and reports, as shown below.

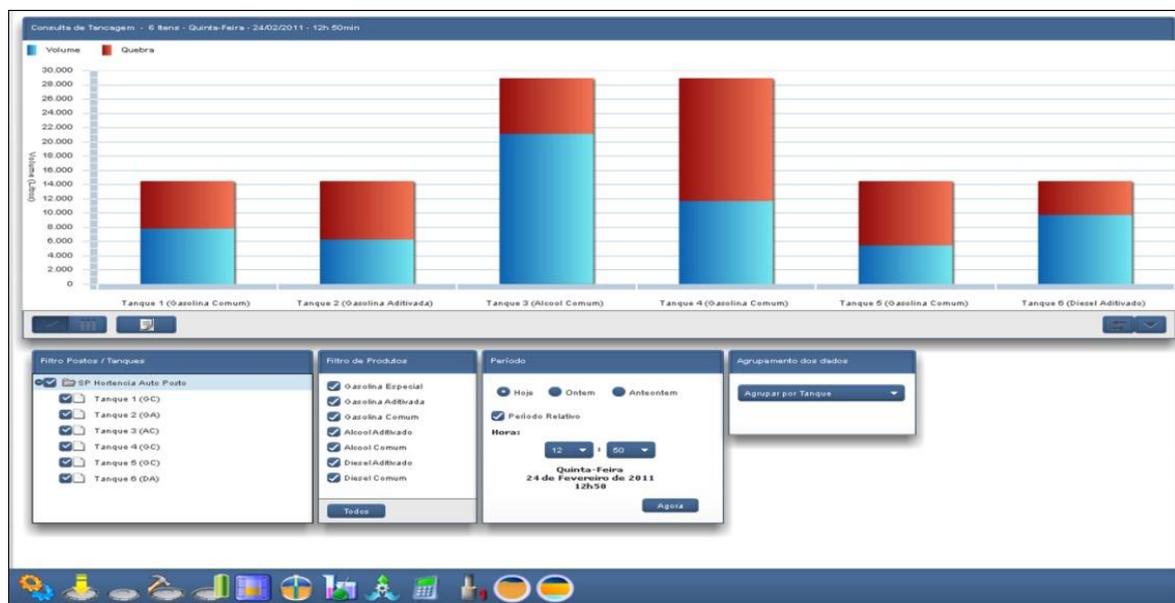


Figure 25 - Graphs and Reports Screen

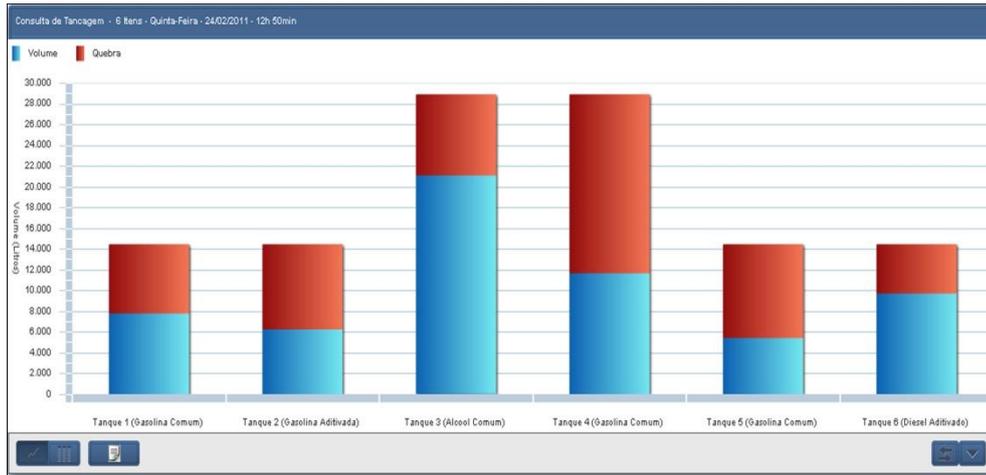


Figure 26 - Instant Volume Query

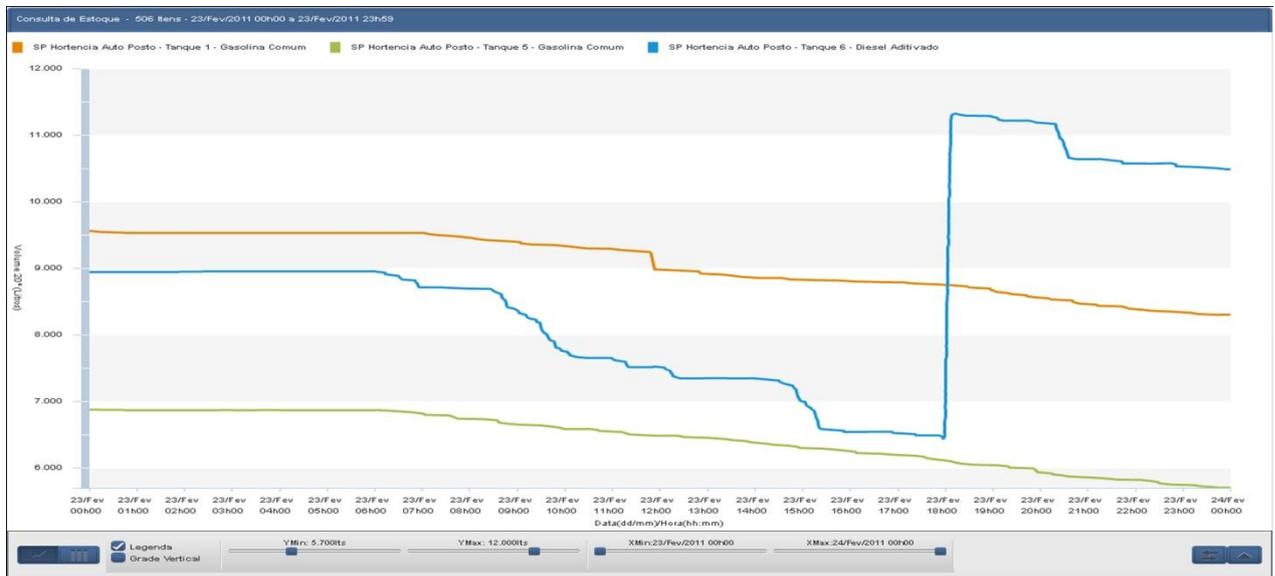


Figure 27 - Stock Query

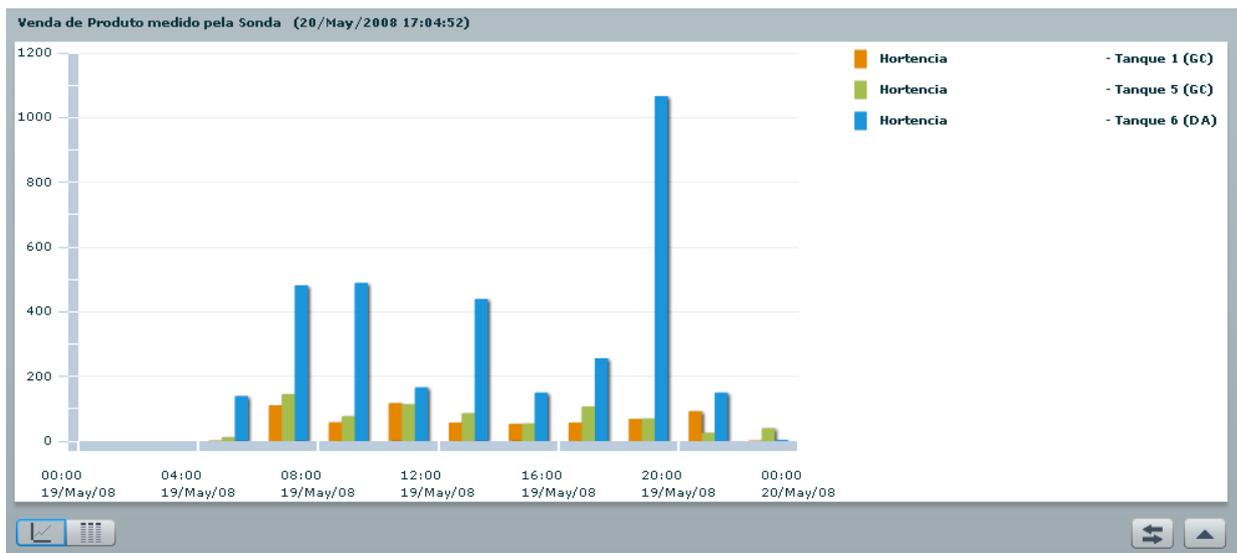


Figure 28 - Sells query grouped by tank

Or Total Sale, in other words, grouped by Gas Station.

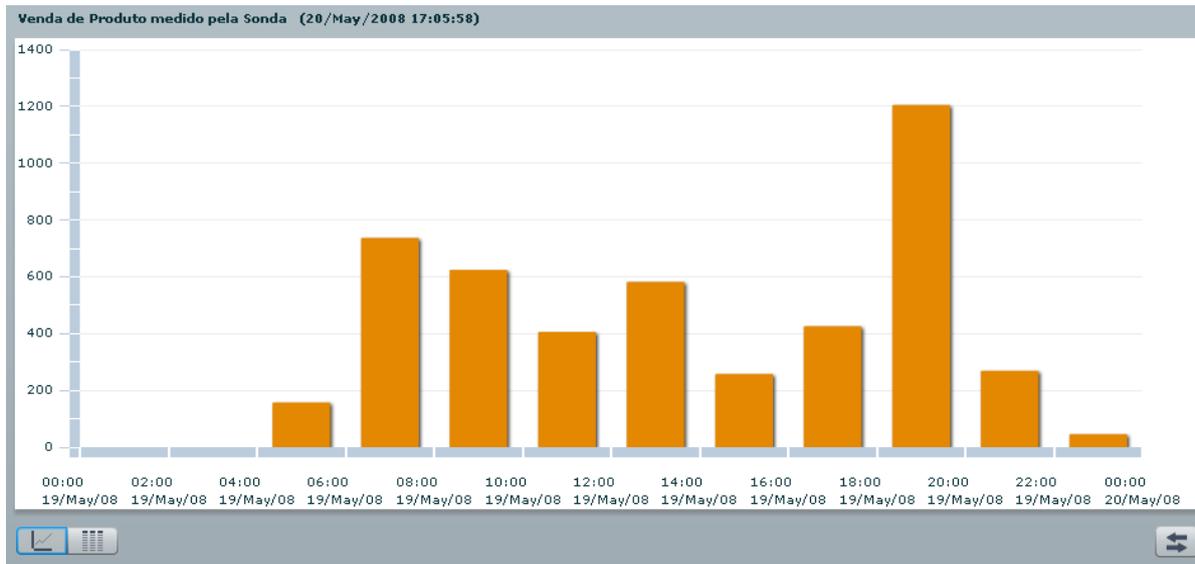


Figure 29 - Sells query grouped by Station

Refueling

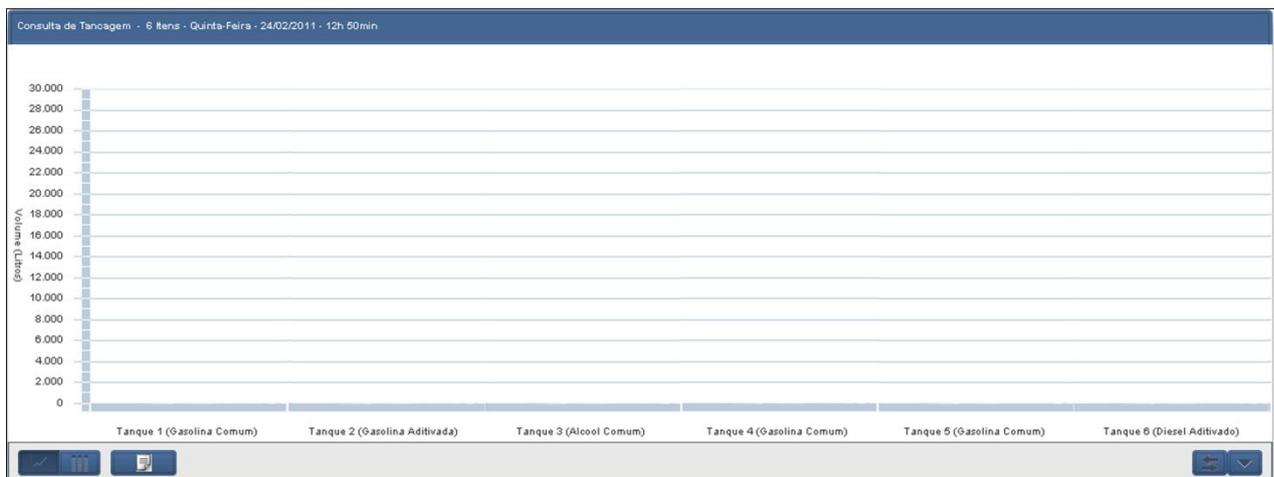


Figure 30 - Refueling Query

Filters can be set to Gas Station or tanks:



Figure 31 - Station/Tanks/Hoses filters

Selecting all or just the interesting tanks in the analysis.



Figure 32 - Tanks Selection

It can be established products Filters,



Figure 33 - Product Filters

It can be defined the grouping way of data, according to the requested screen, in other words, by hose for a pump screen.



Figure 34 - Data grouped by Hose

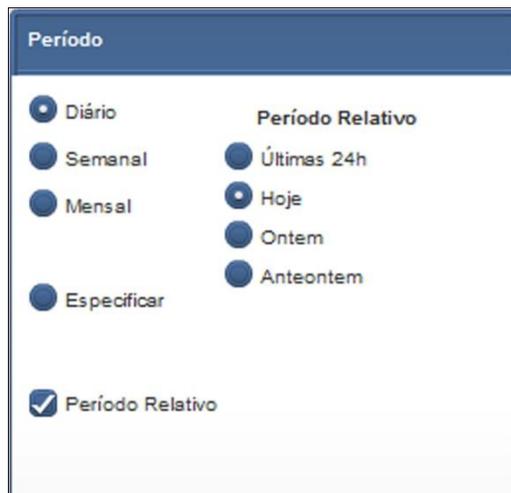
Or BY Station, PRODUCT or TANK in a Probe sale screen.



The screenshot shows a user interface panel titled "Agrupamento dos dados". It contains a dropdown menu labeled "Agrupar por Posto" with a downward arrow. Below this is another section titled "Período de Agrupamento" which features a horizontal slider. The slider is positioned at the 2-hour mark, and the text "2 horas" is displayed below the slider.

Figure 35 - Data grouped by Station

Periods can also be selected through a specific panel:  
For example, daily in a relatively period (last 24 hours, today, yesterday or day before yesterday)



The screenshot shows a panel titled "Período". It contains several radio button options: "Diário", "Semanal", "Mensal", "Especificar", and "Período Relativo". The "Período Relativo" option is checked. To the right of these options is a sub-section titled "Período Relativo" which includes radio buttons for "Últimas 24h", "Hoje", "Ontem", and "Anteontem". The "Hoje" option is selected.

Figure 36 - Period Selection

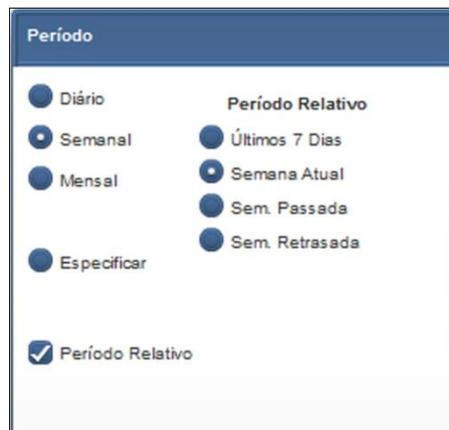
Or by request of a specific date.



The screenshot shows a window titled "Período" with a list of radio button options: Diário, Semanal, Mensal, Anual, Especificar, Últimos, and Período Relativo. The "Diário" option is selected. To the right, there is a label "Início" and a date input field containing "24/02/2011".

Figure 37 - Selection by Specific Date

For a weekly period, for example,



The screenshot shows the "Período" window with "Semanal" selected. The "Período Relativo" checkbox is checked. Under the "Período Relativo" section, there are four radio button options: Últimos 7 Dias, Semana Atual, Sem. Passada, and Sem. Retrasada. The "Semana Atual" option is selected.

Figure 38 - Weekly Period Selection

Or for a specified period, in case of more detailed analysis



Figure 39 - Determined Period Selection

## Reports

The reports are also displayed in a browser format and can be printed on any network printer or virtual printers.

As you can see the report is mounted of witch at its end there will always be (where applicable) a summary containing the accumulation of values for the chosen period.



SP Hortencia Auto Posto		Relatório de Venda pela Sonda		S2 SAFETY SYSTEM	
Período: 01/fev/2011 até 28/fev/2011					
<b>01-fevereiro-2011</b>					
Tanque	Produto	Volume Bruto (Its)	Volume 20º (Its)		
Tanque 1	Gasolina Comum	1.294	1.287		
Tanque 2	Gasolina Aditivada	1.803	1.792		
Tanque 3	Alcool Comum	4.296	4.259		
Tanque 4	Gasolina Comum	3.832	3.808		
Tanque 5	Gasolina Comum	1.137	1.130		
Tanque 6	Diesel Aditivado	2.855	2.841		
<b>Total</b>		<b>15.217</b>	<b>15.116</b>		
<b>02-fevereiro-2011</b>					
Tanque	Produto	Volume Bruto (Its)	Volume 20º (Its)		
Tanque 1	Gasolina Comum	940	936		
Tanque 2	Gasolina Aditivada	1.756	1.748		
Tanque 3	Alcool Comum	3.436	3.415		
Tanque 4	Gasolina Comum	3.167	3.155		
Tanque 5	Gasolina Comum	1.327	1.321		
Tanque 6	Diesel Aditivado	2.193	2.183		
<b>Total</b>		<b>12.819</b>	<b>12.758</b>		
<b>03-fevereiro-2011</b>					
Tanque	Produto	Volume Bruto (Its)	Volume 20º (Its)		
Tanque 1	Gasolina Comum	954	948		
Tanque 2	Gasolina Aditivada	1.726	1.716		
Tanque 3	Alcool Comum	4.023	3.997		
Tanque 4	Gasolina Comum	3.296	3.278		
Tanque 5	Gasolina Comum	1.180	1.172		
Tanque 6	Diesel Aditivado	1.483	1.475		
<b>Total</b>		<b>12.662</b>	<b>12.585</b>		

28-fevereiro-2011		Tanque	Produto	Volume Bruto (Its)	Volume 20º (Its)
		Tanque 1	Gasolina Comum	688	685
		Tanque 2	Gasolina Aditivada	1.205	1.197
		Tanque 3	Alcool Comum	2.428	2.414
		Tanque 4	Gasolina Comum	2.522	2.504
		Tanque 5	Gasolina Comum	855	848
		Tanque 6	Diesel Aditivado	1.766	1.755
<b>Total</b>				<b>9.464</b>	<b>9.402</b>
<b>Total SP Hortencia Auto Posto</b>					
				<b>Volume Bruto (Its)</b>	<b>Volume 20º (Its)</b>
			Alcool Comum	108.777	108.060
			Diesel Aditivado	59.578	59.249
			Gasolina Aditivada	47.942	47.684
			Gasolina Comum	168.154	167.224
				<b>384.450</b>	<b>382.217</b>
<b>TOTAL GERAL</b>					
				<b>Volume Bruto (Its)</b>	<b>Volume 20º (Its)</b>
			Alcool Comum	108.777	108.060
			Diesel Aditivado	59.578	59.249
			Gasolina Aditivada	47.942	47.684
			Gasolina Comum	168.154	167.224

Figure 40 - Product Sales by Probe Report

The reports present concisely and grouped information easy analysis.



### Relatório de Venda pela Bomba



Período: 01/fev/2011 até 28/fev/2011

#### SP Hortencia Auto Posto

Produto	Volume Abastecido 20º (Its)	Volume Abastecido (Its)	Valor da Venda (R\$)	Qtd Abast.	Soma da Duração Abast.
Alcool Comum	112.651	113.367	202.832	7.640	138:37:18
Diesel Aditivado	61.796	62.110	124.872	1.622	55:17:41
Gasolina Aditivada	48.627	48.924	124.744	4.626	64:06:32
Gasolina Comum	172.701	173.729	434.250	20.194	267:58:38
<b>Total do Posto</b>	<b>395.775</b>	<b>398.130</b>	<b>886.699</b>	<b>34.082</b>	<b>526:00:09</b>

#### Total por Produto

<b>Alcool Comum</b>	<b>112.651</b>	<b>113.367</b>	<b>202.832</b>	<b>7.640</b>	<b>138:37:18</b>
<b>Diesel Aditivado</b>	<b>61.796</b>	<b>62.110</b>	<b>124.872</b>	<b>1.622</b>	<b>55:17:41</b>
<b>Gasolina Aditivada</b>	<b>48.627</b>	<b>48.924</b>	<b>124.744</b>	<b>4.626</b>	<b>64:06:32</b>
<b>Gasolina Comum</b>	<b>172.701</b>	<b>173.729</b>	<b>434.250</b>	<b>20.194</b>	<b>267:58:38</b>
<b>Total Geral:</b>	<b>395.775</b>	<b>398.130</b>	<b>886.699</b>	<b>34.082</b>	<b>526:00:09</b>

Figure 41 - Product Sales by Pump Report

## 6 Monitoring

To access the System Monitor, use the Monitoring Menu.



In the options menu is available for tanks monitoring, downloads, events, supplies and Tightness Results.

### 6.1 Tanks Screen

The system is controlled through the tanks display, and also on this screen are displayed the level data, volume and alarms in general.

The monitoring screen is updated every 10 seconds automatically; in other words, don't need operator intervention to press the browser's Refresh button.

#### Important

Effective state changes may take longer because they are conditioned on time to scan the system (more devices, longer scan), the possibility of internet traffic, etc.

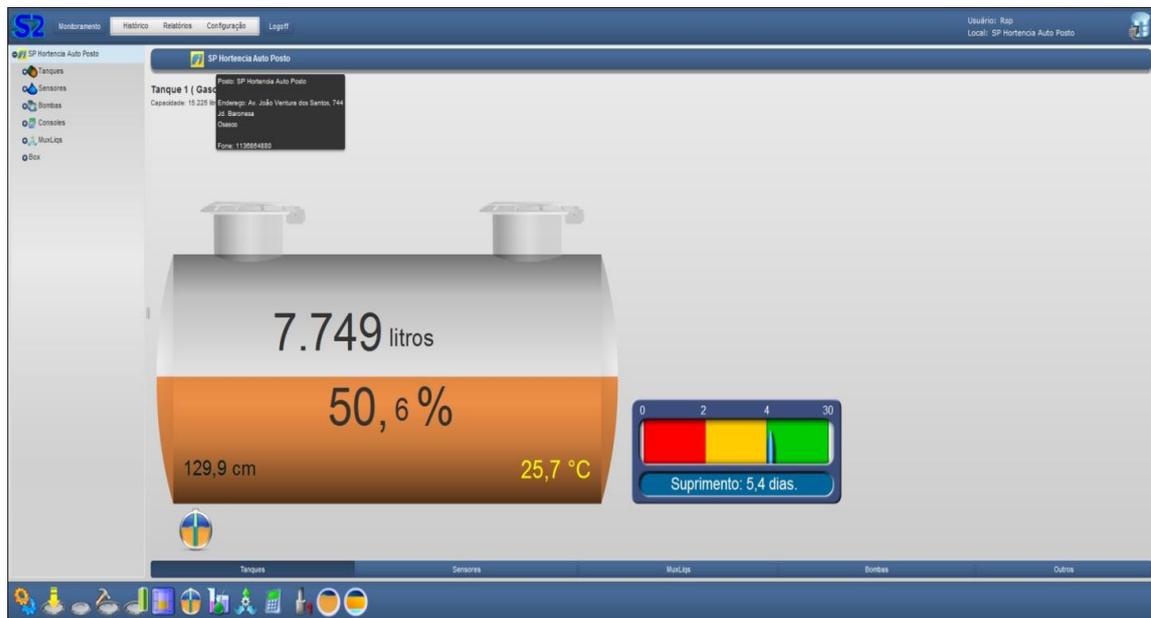


Figure 42 - Main Screen Updated after Configurations

### 6.2 Tips

The system has the ability to inform the detailed function of each item, presenting information in a yellow frame.

To display this information just move the mouse over the icon or the text and keep it on it for at least 2 seconds.

In the case of use the system with Premium software, you will see a screen that brings together all the tanks at the office, as shown below.

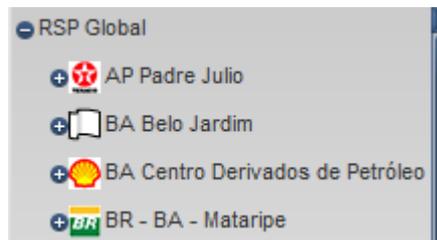


### 6.3 Station Selection

Allows Station selection, if you put more than one registered in the system. After this choice, all displayed data on screen of tanks are worth only chosen for the station.

The Name of the Station (as shown in case as RSP Station) is presented in a specific field to the right information at the monitored Station.

On system with Premium Software and Central Control will display a list of the entire domain Stations, as shown below.



In the case of advanced system, the screen is limited to the Station, and presented the following screen:

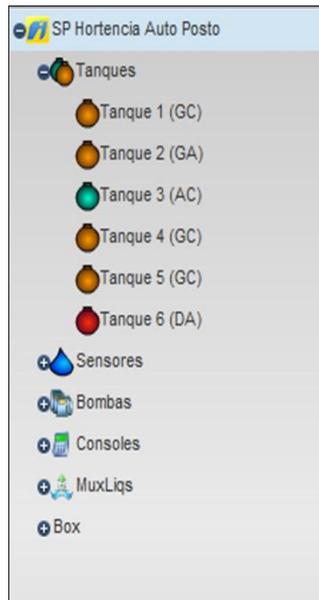


Figure 43 - Station Selection

This table has appeal to collapse (hide) the table in case of need to maximize the screen for the tank presentation.

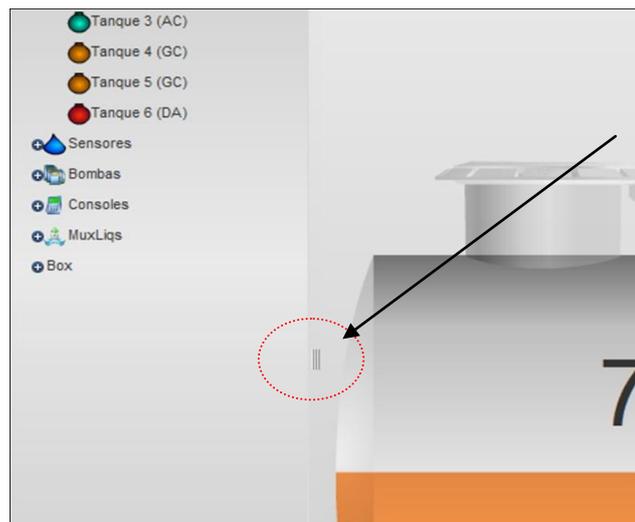


Figure 44 - Hide Station Selection Panel

### 6.4 Selection List

The right list of the screen allows a selection of the splash screens of the devices connected to the S2 System (tanks, pumps, sensors, consoles, etc.) in functionally.

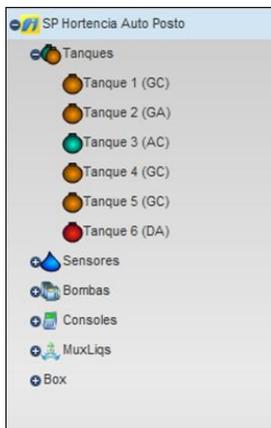


Figure 45 - Tank Selection List

### 6.5 Tank Information

The table above tells you the name of the domain where the user is logged. In the following example the domain name is Hortência, so will be shown all stations that are part of the group called Hortência.



Figure 46 - Station Domain

The table below shows the tank name, the product that is contained in the tank, the station name of which tank belongs and the tank nominal capacity.

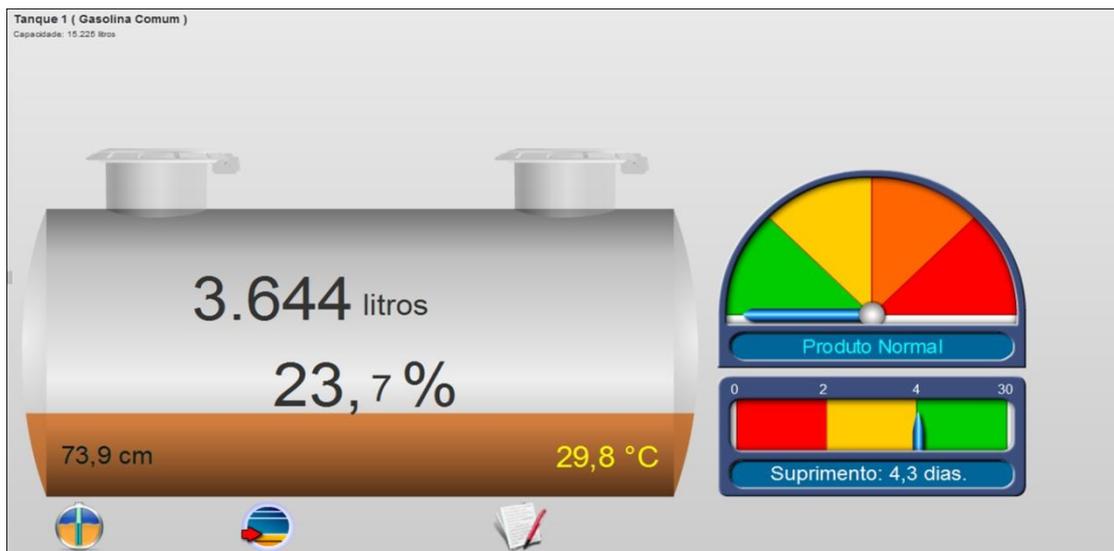


Figure 47 - Screen with Tank Details

The tank can be displayed with break information (upper left) and the gross volume clicking on inside the tank.

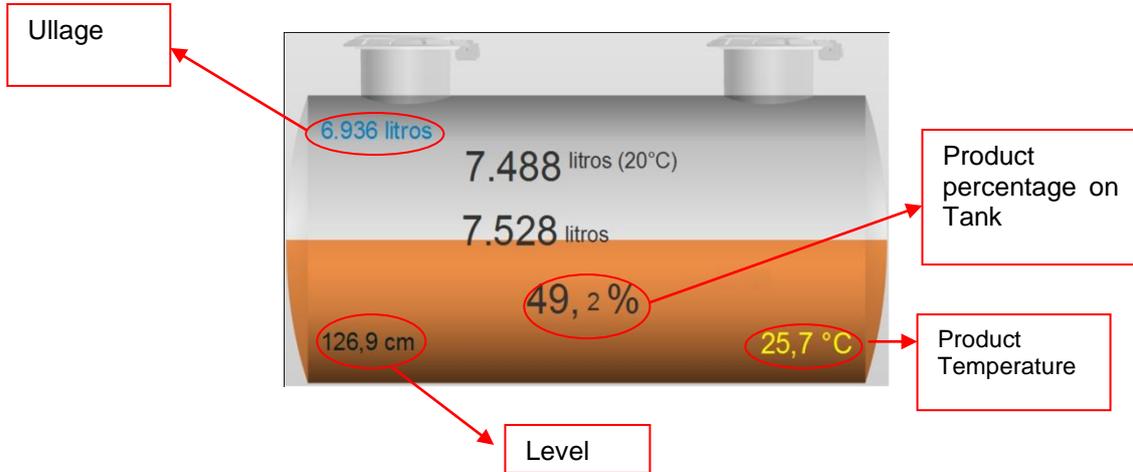


Figure 48 - Additional Tank Information

To return to the previous screen, click again on the tank.

In the center of the tank are the following measurements:

**VOLUME (20°C)** - measurement of the tank volume in liters converted to a temperature of twenty degrees Celsius. This measure considers the effects of contraction and expansion of liquids.

For temperatures in the tank less than twenty degrees, occurs a contraction of volume, so the observation volume at 20°C presents a value greater than the volume displayed in the field gross volume in order to offset this contraction.

On the other hand, for higher temperatures measured at twenty degrees, occurs an expansion of volume, so the observation volume at 20 ° C present a lower value than the volume displayed in the field gross volume in order to compensate for this expansion.

**GROSS VOLUME** - volume measurement of water in the tank measured in liters. In the absence of water in the tank, the volume information is not displayed.

**LEVEL** - fuel level (measured in cm) calculated for the tank center.

 **Important Note**

The level presented considers all the inclinations entered into the system due to the volume calculation. In the case of a tank with inclination, the value will never be presented as a level equal to the level measured by a mechanical rule, since the probe is not physically in the center of the tank.

 **Important Note**

The mathematical processing considers the tank inclinations to provide the level as if the probe was installed in the exact center of the tank.

**ULLAGE** – amount of fuel remaining to complete the capacity of the tank using the gross volume as a reference. The breakage equation is obtained by the following calculation:

$$\text{ULLAGE} = (95 \% * \text{NOMINAL TANK VOLUME} - \text{GROSS VOLUME} - \text{WATER VOLUME})$$

The volume of water will be considered only if the model has water metering.

This calculation while using only 95% of rated capacity of the tank, allows that there is "overflow" or overfilling in case of request for supply.

**SUPPLY** – Corresponds to an estimated duration of the current stock based on the consumption of the last seven days (measured in days). This calculation is continuously performed and reevaluated due to the sale and the remaining stock. The second table is the data regarding the existing water in tank.



#### Important Note

The water volumetric information will only be presented by the system, if the installed model is prepared for this purpose. If there is water in the float tube, the volume of water is considered a zero for calculation purposes.

**WATER LEVEL** - water level (measured in centimeters).

In the absence of water in the tank, the information is not displayed.



#### Important Note

Because the measurement of water has a lower limit for the measurement that actually occur due to mechanical distances inherent in the measurement process, this minimum level is considered and transformed into volume measurements. Therefore the present volume of water does not necessarily indicate effective water inside the tank, but only that the value is below the detectable limit.

In the center of the tank is shown the percentage of fuel based on the calculated volume and the nominal capacity of the tank (15,000 liters or 30,000 liters, for example).

The percentage shown in the tank corresponds to the accounting of the total volume of the tank defined in the register (15,000 liters, 15,225 liters, etc.) And the volume actually measured.

Note that the actual capacity of a tank is always higher than the rated capacity, in other words, the relative ability of a tank of 15,000 liters should be close to 15,300 liters. Refer to the manufacturer of the tank and register the actual capacity of the tank for better measurement accuracy.

For systems that don't have SmartProbe, the volumetric information and temperature of the product, as well as all reports dependents will not be displayed.

See the figure below the following information provided by the volumetric system.



#### Important Note

The volumetric information presented by the system is directly dependent on a number of conditions and parameters of the system. See the item in this manual of Measurement Parameters that details all the conditions required by the system to a correct measurement.

**TEMPERATURE** - The temperature displayed at the bottom of the tank corresponds to the average of five temperature sensors (considering only the sensors that are below the level of the product). See item 4.5.9 - Temperature, where it shows a table for positioning sensors.

### 6.6 Alarms

The system displays an icon at the top with the following possibilities:

**Very High Level:** Indicates that was beyond the too HIGH LEVEL set.

**High Level:** Indicates that exceeded the level set to HIGH.

**Low Level:** Indicates that exceeded the level set to LOW.

**Very Low Level:** Indicates that was beyond the too LOW LEVEL set.



Check the configuration of the tank levels defined for each tank.

### 6.7 Caps

The system intuitively presents the state of the caps (if exists) in the system.



#### 6.7.1 Operative or Inoperative

The figure below shows the detail, the left cap is operative and the cap is at work on the right is Inoperative. Note that the Inoperative status is signaled by a flashing exclamation point on the cap.

An INOPERATIVE cap indicates that this cap cannot be monitored by the system, for various reasons (Communication cut with the cap, cut the power, dead battery, cap failure, etc.)

So in a normal situation, a cap cannot enter into INOPERATIVE state. In this case please contact technical support for more information.

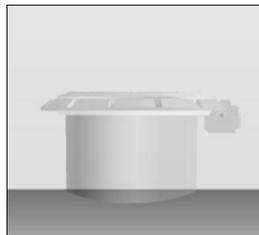


Figure 49 - Inoperative Cap

#### 6.7.2 Active or Inactive

The figure below shows the detail, the cap is left active and right cap is off. Note that the status is flagged off with a darker color for the cap off.

A cap is considered inactive when:

- ✓ Cap was not installed,
- ✓ Cap for maintenance.

In this case this inactivity situation is imposed by own system operator.

### 6.7.3 Open or Closed, Locked.

The raised caps represent that are open, the caps below represent closed and padlocked caps indicated, represent the state locked.

As each cap has a temperature sensor (accurate to tenths of a degree) above each one is presented the temperature at which the cap is exposed.

### 6.7.4 Misaligned, Violated.

The figure below, the left cap is misaligned. Note that the misaligned status is signaled with two arrows next to the cap.

If the cap is misaligned error can occur in the operation of the locking cap. The locking command is only executed when the seal is aligned.

The cap on the right is violated. The status violated can be internal violated or external violated, the violation is detected automatically by the system in case of an attempt to open the compartment where they are packaged the information processors and sensors. It is also considered a violation to attempt to break the hinge pin. For more details on the type of violation, should be verified by the events recorded in the specific screen caps.

### 6.7.5 Operating by Battery.

The battery status is signaled by operating with a battery picture beside the cap. The color indicates the status of the battery in case of the caps supply being interrupt.



#### **OPERATING BY BATTERY**

Indicates that supply with de cap was stopped and it is operating with its internal battery. The blue color indicates that the battery is its normal load, although the situation of operating on batteries should be considered abnormal.

#### **WEAK BATTERY**

Represented by a battery in a yellow color.

#### **DEAD BATTERY**

Represented by a battery in a red color.



#### **Important Note**

These presentation conditions of battery status are abnormal and require technical intervention to ascertain the cause of power interruption to the caps.

### 6.7.6 Temperature

The figures showed just above each cap correspond to the temperature readings from temperature sensors installed on each end SmartSeal.



It can be used to evaluate the degree of sunstroke suffered by the caps. So if you notice very different temperatures, imply a greater degree of heating due to its positioning in the Station (for example, sun exposure, or within the coverage area).

#### Important Note

The measurement temperature showed by the cap has no relationship to the temperature of the tank. For the tank temperature, the Probe has specific sensors for this purpose.

### 6.7.7 SmartSeal Automatic Operations

#### **Automatic Locking by inactivity**

When you select this option, the system performs an inactivity check on the cap (no opening, closing or other operation) to determine an effective inactivity on the cap. In this case, the last time, the locking is automatic. This operation is useful in situations where you want to make sure that even if you forget to lock the cap by the driver or person responsible for station, the cap locks automatically.

#### **Automatic Unlock if no communication**

When you select this option, the cap provide an automatic unlocking if exists loss of communication with the supervisor (cutting cables, failure to supervisor). In this case the cap will perform an unlocking, but will keep the record of information in its local memory.

### 6.7.8 Command Cap

Also for ease of control, the operations of locking, unlocking can be performed on this screen with a simple mouse click.

Clicking the left mouse button on the cap a list of commands for that specific cap is shown. To confirm the command by clicking one of the options: Lock, Unlock, Enable, Disable or Clear Alarms.

#### **Lock**

Do the locking operation

#### **Unlock**

Do the unlocking operation

#### **Activate**

Allows cap insertion in the constant system monitoring. The cap when activated will remain with the bright colors on the screen.

### **Deactivate**

It removes the selected cap of the monitoring system. This operation is only advisable if the cap has communication problems and the operator wants the temporary withdrawal of the monitoring.

### **Clear Alarms**

Allows going back to cap to a normal state if there is some violation.



Figure 50 - Operational Menu of Caps

## **6.7.9 Automatic Situations**

The following describes the situations generated by the automatic programming of the cap to a better understanding of the situations generated by events.

### **Auto Lock**

In situations properly configured on cap configurations, the cap holds the lock immediately or by time. The lock may not occur in case of disconnection of the battery (Seal off and dead battery).

### **Auto Unlock**

The Auto Unlocking occurs in the following situations:

- At the start if the battery is in operation condition (normal or weak).
- Lack of communication in the supervisor (or SmartConsole) for a predetermined time and with the qualifier unlocking off, not checking the battery conditions. This operation is not performed if the seal is off.
- Immediately check the existence of a dead battery.

## 6.8 Sensors

### 6.8.1 Presentation Screen

The sensors detect the existence of leaks in the tank and trigger pre-defined strategies of action, primarily to inform the monitoring station for the rapid correction of the abnormality.



Figure 69 shows the formation of the sensors.

The sensors can be grouped in five ways:

- ✓ All
- ✓ Only abnormal sensors (Short or Open, in the case of Tri-State sensor)
- ✓ Only the sensors that indicate leaks
- ✓ Only the sensors that are in open state
- ✓ Only the sensors those are in short state.

The presentations of ABNORMAL states, OPEN and SHORT are only applicable in case of using Tri-State sensors.

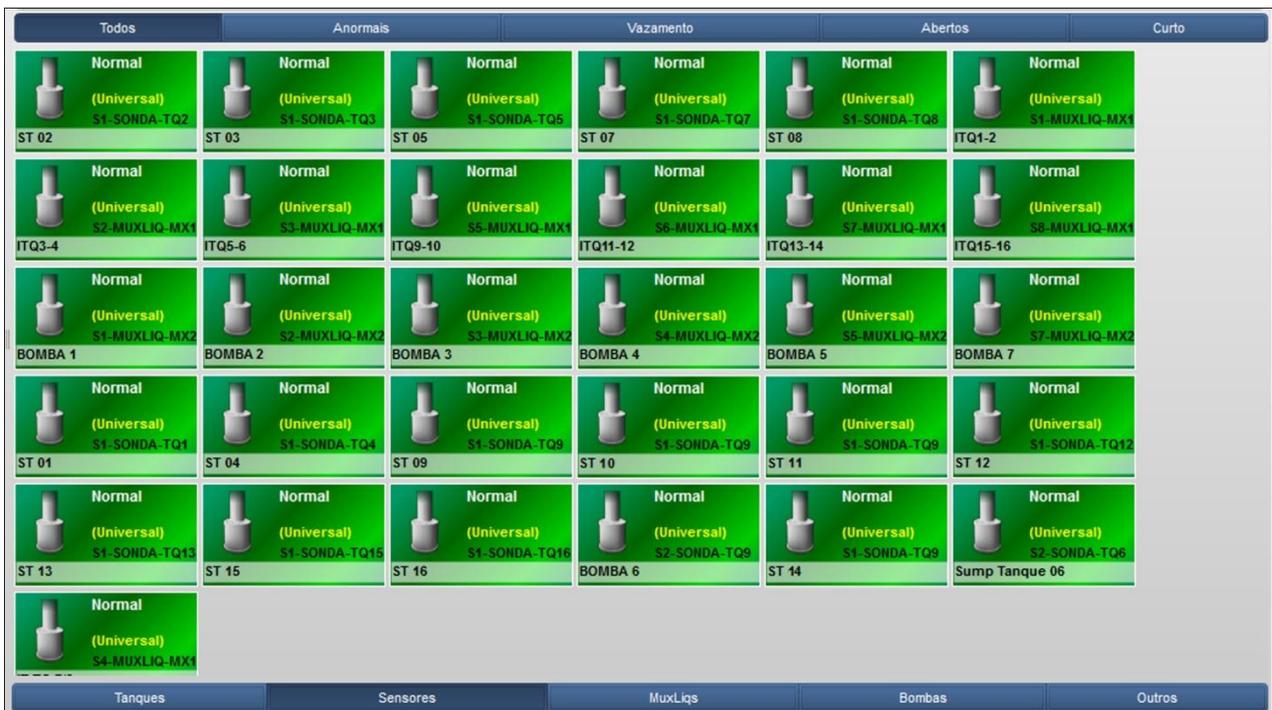


Figure 51 - Installed Sensors Formation

### 6.8.2 Information Details

The drawing below shows the information detailed of each sensor installed in the system.



Figure 52 - Sensors Information Details

The first line tells the Sensor state: NORMAL, LEAK, SHORT or OPEN.

The second line displays the type of sensor, Universal or Tri-State

The third line tells the electrical wiring of the sensor system from the probe (and in this case in which tank) on the cap (and in this case in which tank and direct and remote cap) or MuxLiq (in this case the number of Muxliq)

The last line tells the description of the physical location of the sensor, in other words, in the sump, the Shaft, the sump pump, in the sump filter, etc.

### 6.9 CromalD

The CromalD is an optical device with innovative technology that can detect significant changes in fuel markers.

Clicking with the left mouse button on the CromalD icon will appear the following options:

- Start Mode Pattern Adjust**
- Abort Mode Pattern Adjust**
- CromalD Calibration.**
- Activate CromalD**
- De-Activate CromalD**
- Change Gadget**

#### **Start Mode Pattern Adjust**

Use this command to calibrate and start a “learning” of the pattern of the product in 10 deliveries.

The system will analyze how the behavior of the product along the time. After ten deliveries the data base will have a lot of data for statistical analysis to determine the level of normality, or severity.

The icon will show “Pattern Adjust”

#### **Abort Mode Pattern Adjust**

Use this command to calibrate and stop the “learning” of the pattern. This will interrupt the data acquisition of product behavior.

#### **CromalD Calibration**

This command only forces a hardware calibration.

#### **Activate CromalD**

Use this command when you want to use this facility in the tank

#### **De-Activate CromalD**

Use this command when you don't want to use this facility in the tank

#### **Change Gadget**

Use this command to change the CromalD icon.



### Important Note

The CROMAID Standard shouldn't be changed without proper monitoring criteria, since the adoption of continuous pattern can generate color standard deviations. Changing the CROMAID pattern is registered in the events list of system to trace those responsible for change.



Figure 53 - CromalD Menu

After running the command **Start Mode Pattern Adjust, and after ten deliveries**, the system must show the CromalD with the pointer directed to green, indicating normal condition and thereafter, if there are changes in color of the fuel must be given as:

- ✓ Pointer in yellow range of color indicates smooth change.
- ✓ Pointer in Orange range of color indicates moderate change.
- ✓ Pointer in red range of color indicates severe change.

#### 6.9.1 Criteria of CromalD parameters definition

For a correct use of CromalD, it's necessary that certain procedures be followed to obtain data that are not invalid or inconsistent conclusions on the information presented by the system.

CromalD device is equipped with various highly sensitive optical sensors and are designed to assess the following light spectrum absorption:

Infra-Red, Red, Green, Blue, and Ultra Violet.

This sensitivity must be adjusted tank to tank because it is fundamentally affected by the pattern of regular fuel delivered by the oil company.

Is important to say, when it changes indicate that the product delivered is not in accordance with the standard adopted in the calibration mode, and don't necessarily indicate product adulteration.

So it is very important that the phase of calibration mode be carefully monitored and verified, in order to have total security of the standard adopted.

Like any equipment, calibration and learning is a very important operation because it will determine the correct reading.

Each product has a profile of spectrum absorption; it would also be affected by the markers.

For example, a product with a red marker for example, will absorb Infra Red and Red, but in return will have a low absorption of green, blue and ultraviolet.

Products with colorless like Ethanol, has a light absorption behavior of well-defined. Any addition of another product affects the profile and depending on the dilution involved, can be easily read by CromalD.

### **6.9.2 Factors that affect the product regularity**

The following describes the factors that may cause variations in the measurement of CromalD

#### **1. Process Company Production**

Many companies don't have a tightly controlled production process in order to maintain the absorption characteristics of color in specific patterns, since they don't have this commitment to its customers. (No markers colorimetric changes, changes in product mix, changes in the tree for the case of cracking hydrocarbons, etc.).

#### **2. Adding standard colorimetric markers**

Likewise, some companies mark their products with colorimetric markers for visual identification by the customer. Ethanol with green marker, premium gasoline with red marker, etc. These markers may have no specific dosage; normally is committed to be identified visually. The variation of the concentration of these markers may sensitize the CromalD reader significantly.

#### **3. Lack of discretion in the delivery of a compartment of a tank truck**

A tank truck may leave a residue of a branded product (made a trip to a distribution company that operates with markers) and fill the compartment with an unmarked fuel (Ethanol, for example) contaminating a part of the volume. If this product is not labeled the product under consideration by CromalD, the system will detect variations from the original calibration.

#### **4. Aging Product**

Some types of hydrocarbons present a variation in the absorption of light output due to aging. This is much more marked for times longer than a week without selling the tank. This effect is pre-compensated by CromalD but can exceed it parameters.

### **6.9.3 Strategy for CromalD Variations: Calibration Mode**

Thus, the CromalD should adopt an internal strategy that can predict these differences.

To this end, the system "learns" the changes occurring in the tank over a predetermined number of deliveries.

This mechanism, within the system is called "PATTERN ADJUST".

Thus, changes that will be experienced by the equipment will be evaluated and understood as a variation of normal deliveries.

### **6.9.4 Deliveries at Forecourt**

Should be made an internal report that elected deliveries to define this learning should be monitored and evaluated with the following information:

#### **1. Transporter that do the delivery (Self, of Company or Outsourced)**

It should be checked for each delivery the note of transporter type and its regularity.

#### **2. Terminals on which gas station is filled**

Terminals differences can compromise the standard adopted, or increase tolerance in the learning pattern.

#### **3. Delivery Regularity**

Check if the delivery occurs near the load to Terminal. Trucks that deliver a few days after the charge should be evaluated.

#### **4. Product Invoice**

Should be monitored and verified product Invoice to ensure its origin and confirm the previous information.

## 5. Volume Delivered

It is not recommended to run varying deliveries amounts (deliveries of 1,500 liters, 2,300 liters, etc.) If the standard receipt are 5,000 liters. If you need to do that split deliveries, CALIBRATION MODE should be aborted and restarted to a new sequence reliably.

## 6. Cross Over Aborted

It is common occur a cross-over (delivery of a product in a tank with another product) and be detected before total delivery. What may be irrelevant to operations personnel may be significant for pattern analysis. If this occurs during the calibration process should be reviewed, and that there must be a complete decontamination of the tank before starting a new calibration process.

As mentioned, it is very important that these conditions be satisfied for the data collected in the system be consistent and within the standard of work.



### Important Note

For higher delivery number the better will be your analysis. It's recommended 10 to 15 deliveries for evaluation. Lower values may compromise the conclusions of the system.



### Important Note

Do not trust on information from people who are not involved in this process of calibration, since they do not have commitment to the acquisition of reliable data. So don't ask, examine records with the data collected.

### 6.9.1 Pattern Adjust Mode in Course

At the each delivery, the system acquires data for statistical analyze and inform that the system is in "Pattern Adjust". This mode will change only when ten deliveries was completed.

### 6.9.2 Pattern Adjust Mode Completion

With the above conditions of strict monitoring process met, the system sets the standard for normal range of product for each barrel of light and from then verifies the behavior of each delivery.

The system indicates the time of delivery the message "ANALYZING PRODUCT" as it is right now in the process of validating the internal algorithms starts.

To better analyze and avoid contaminated reading by bubbles caused by the delivery of product, the system waits for a time called "settling time" to ensure that there was a complete mix of products within the tank.

This analysis will examine the behavior of each gun in the pattern previously established graduate and the differences in the meter displayed on the screen.

### 6.9.3 What means Normal Product

When the icon presents his pointer in green area, indicating normal product, it means that all beams are within the defined bands. Graduation in green area will depend on the distance of reading and the band set. The farther is the measure of the band, the lower the degree of the pointer.

### 6.9.4 What means smooth variation

When the icon presents his pointer in the yellow area, indicating smooth change, it means that at least one of the beams exceeded the band. In this case the pointer will start in the yellow area. If more beams beyond the normal band, the ranking within the yellow area will grow depending on the number of beams that exceed the defined band. The more beams exceed the Band, the greater the degree of the pointer within this area.

### 6.9.1 What means moderate variation

When the icon presents his pointer in the Orange area, indicating moderate change, it means that at least one of the beams exceeded the band more than double in value on your tolerance. In this case the pointer will start in the orange area. If you have more beams beyond this behavior, graduation in the orange area. A moderate change indicates that at least one beam has more than doubled in the prescribed tolerance band.

### 6.9.1 What means severe variation

When the icon presents his pointer in the red area, indicating Severe, it means that at least one of the beams exceeded the band more than tripled in value on your tolerance. In this case the pointer will start in the red zone. If you have more beams beyond this behavior, graduation in the red area. A major change indicates that at least one cannot exceed several times the tolerance set in the band.



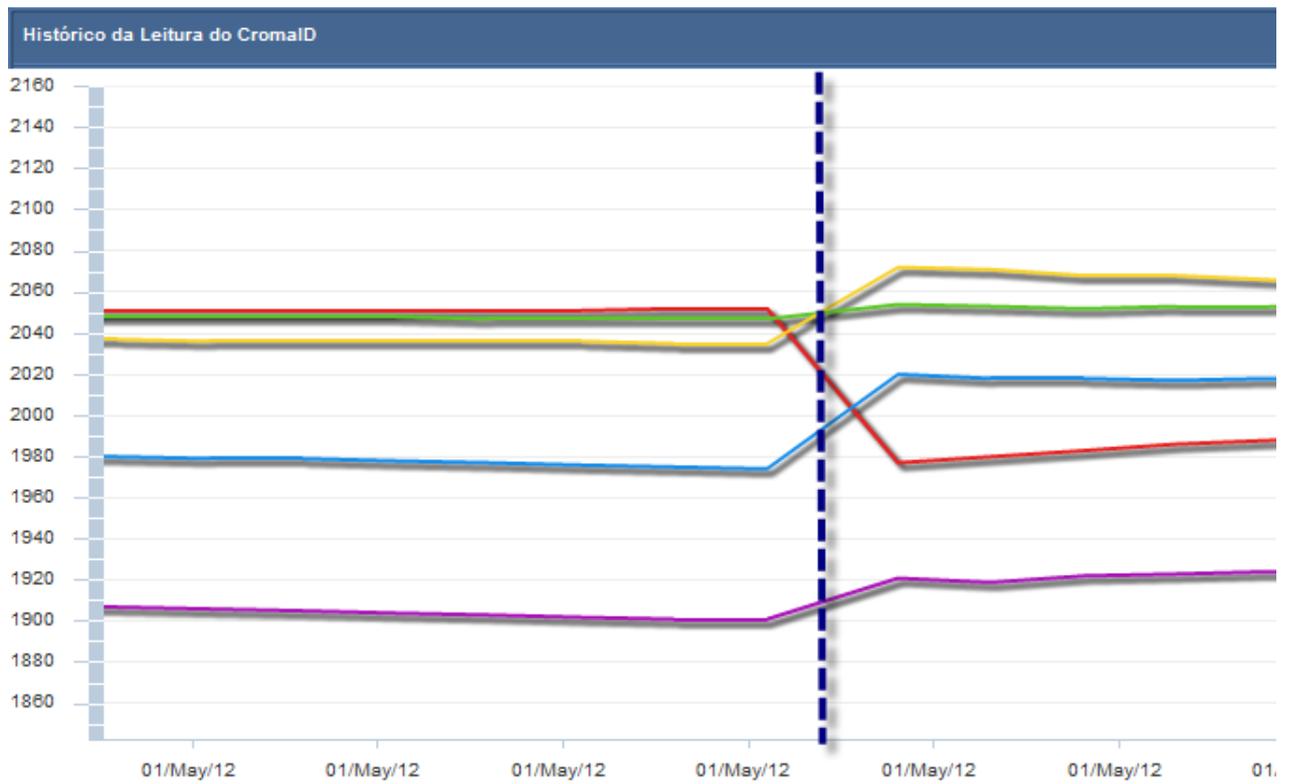
#### Important note

Changes must be carefully analyzed. Be aware of all the calibration process before making a conclusion.

#### Examples

See below the behavior of each beam after a delivery (vertical dotted line)  
Each line represents a beam. This pattern and variations are considered Normal.

#### Gasoline Tank



### Etanol Tank

This pattern and variations are considered Normal.



### 6.10 Control Panel

It's willing in the last line, the frame corresponding to the Control Panel of the entire S2System.



In this table shows the icons corresponding to the states of all positions in the field, or if you are logged into a single station, the group has all the information of the entire system, individualized by information.

Each flag on the basis of his presentation indicates a distinct information.

Icon	Description
	Indicates connection to the database. A failure indicates that there was loss of internet connection or the server is down.
	Indicates that supervisor (or supervisors within the network) is operating.
	Indicates that all caps are closed
	Indicates that all caps are operative
	Indicates that there is no violated cap on the system
	Indicates that all caps are loaded with your local battery
	Indicates that there is no failure in measuring probes
	Indicates that all probes are operating
	Indicates no change in measurement CromalD devices
	Indicates that all MuxLiq devices are operating
	Indicates that all consoles are connected to the operating system
	Indicates that all sensors are connected to the operating system.
	Indicates that there is no Automatic product Order in the System.
	Indicates that the tank is shown in Tightness test

## 7 Automatic Product Request – (APR) PAP

The Automated Product Request PAP - is the automatic and continuous assessment of the needs of product delivery in their tanks based on a pre-defined. This feature is present only in Premium Software.

The system signals the need for automatic product request of the screens. In the Tank:



And directly in the Network Control Panel:



When the system detects a need to request a delivery, it makes a request via email and SMS stating the number of the tank and the amount required. This request is usually made at 12:00 of the day, believing that this request can be complied with or canceled by the Director of Operations until 17:00 of the same day.

This means that the system evaluates a number of conditions for each tank in such a way as to anticipate and reconcile with witch the operation of the tank never interrupted because of product fault (sales stopped) and requests that the product will never exceed the capacity of each tank (overfilling)

Thus, the system performs an assessment of the following conditions:

- ✓ Historical consumption in each tank, considering working days and weekends
- ✓ Behavior of deliveries by the distributor
- ✓ Minimum Security coverage
- ✓ Minimum Load Composition for Tank Truck
- ✓ Compartment Volume Delivery

### 7.1 History consumption of each tank

The system checks the characteristics of consumption in each day, since a tank can have a differentiated consumption on a Friday, for example, and this is also considered.

### 7.2 Behavior of the Delivery Distributor

Defined by the user when the system indicates which are the days when deliveries can be received, for example, only on weekdays, or receive from Monday to Saturday, and the time required for a requested delivery time that is actually delivered. There are situations outlying stations, the delivery time can reach up to 3 days and the system should take into account that the tank does not dry out during this period.

### 7.3 Minimal security coverage

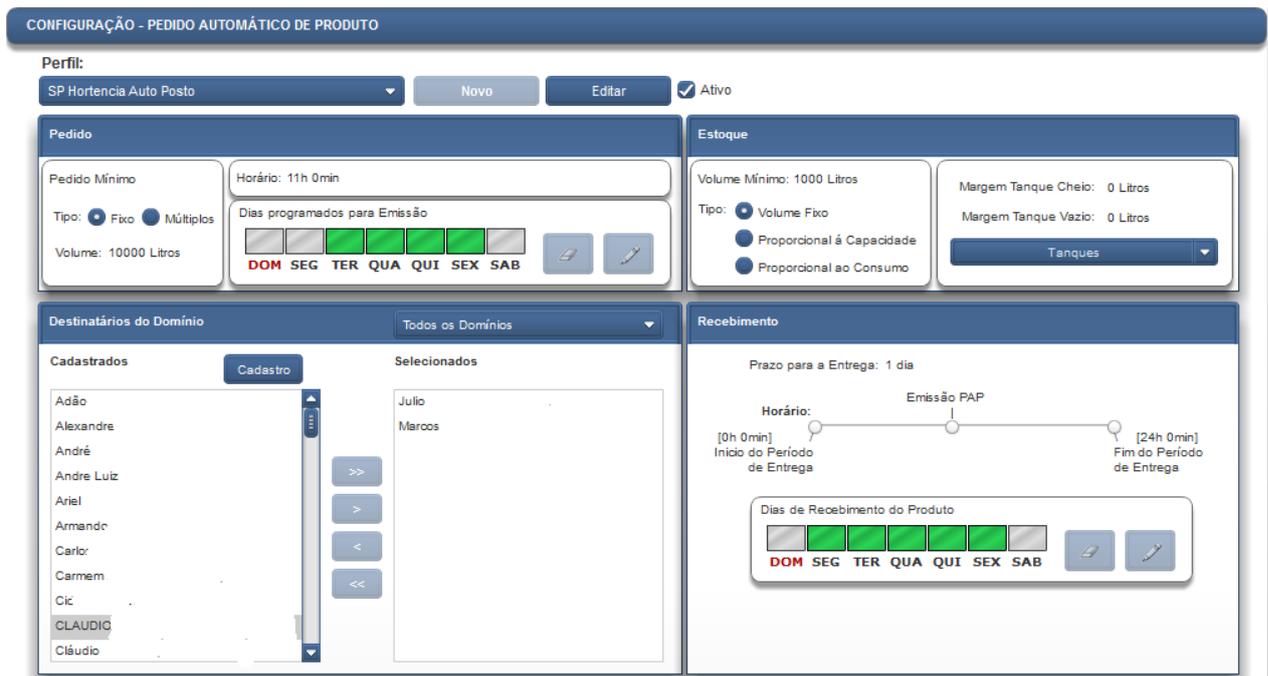
It indicates to the system which minimum tolerable volume in case of delay. The system will seek to maintain this minimum coverage for the purpose of prediction. This parameter can be provided by tank.

### 7.4 Minimum Load Composition for Tank Truck

In some distributors there is a need for minimum size of the tank truck, usually two compartments. In this case the system sets the two tanks which will be priority for receiving deliveries.

### 7.5 Delivery Volume Compartment

The system must be informed what the value of the volume of the delivery room. Normally this value is 5,000 liters but there are cities where the volume of the compartment is 6,000 liters. We present below the table to be configured by the user to tailor the PAP functionality.



### Deliveries Behavior

Check all the days where the station can receive deliveries

<input type="checkbox"/>	Monday
<input type="checkbox"/>	Tuesday
<input type="checkbox"/>	Wednesday
<input type="checkbox"/>	Thursday
<input type="checkbox"/>	Friday
<input type="checkbox"/>	Saturday
<input type="checkbox"/>	Sunday

### Minimum Load Composition

Select an option to load composition

<input type="checkbox"/>	One Compartment
<input type="checkbox"/>	Two Compartment
<input type="checkbox"/>	Three Compartment

### Delivery Compartment Volume

Select an option to delivery partition.

<input type="checkbox"/>	5.000 Liters
<input type="checkbox"/>	6.000 Liters

### Minimal Security Coverage

Set the minimum coverage in liters in which the system must take for granted until the delivery arrival.

<input type="text"/>	Liters
----------------------	--------

## 8 Tightness

Through the S2 system is possible to perform Tightness test, small volume changes measuring with high precision, whose function is to determine the existence of any leaks in the product tanks.

The S2 system allows performing continuously Tightness tests in your tank to maintain the protection of the environment.

This function is independent of the use of leak sensors, for even in double-walled tanks, this feature is useful because it can anticipate in some cases, leaks in the tank, even before detection by the leak sensors. For this, the tests should be performed frequently.

The Tightness tests must be performed in periods where there is **no** sale in the tank to ensure a perfect analysis and effective completion of the operational tank state.



### Important Note

Existing tank sales, the test is immediately aborted.

For this test, you must ensure that the model of your purchased probe supports the function of Tightness. If in doubt, call your sales representative.

The system allows a series of schedules for performing Tightness tests.

Tests can be unique (performed only by request) or scheduled, where the schedules may be established in which the system will be able to run the test (schedules without sales in the tank).

Programming can be done to a tank, for several or all tanks simultaneously.

The duration of the Tightness test is directly related to the volume of existing product in the tank.

The tests will be more efficient and of shorter duration due to the existing volume in the tank to which the test is being performed.

Is defined a Tightness test for volumes in the tank between 50% and 95% of its capacity. Lower values than these percentages will not be accepted by the system, why not allow an effective pressure on the leak and will not consider the area of the tank that does not have product in their walls, resulting in a useless test with a poor conclusion.

### 8.1 Tests Programming

It's possible to determine the automatic performance of Tightness test, through a program to determine the test frequency, the tank and the time of the test.

So the user can set a weekly test on the tank that does not make the sale in specific time.

The Tightness Test Programming Screen allows setting all these parameters. The figure below shows the screen and the fields to be edited.

#### **Start**

Allows setting date and time of the begin test. The end of the test will be set automatically by the system depending on the conditions of the tank and the volumetric leakage class chosen.

#### **Frequency**

Allows setting frequency for which the test should be performed.

Only for a unique test or to frequencies: Daily, Weekly, biweekly, monthly, bimonthly, quarterly, semiannual.

#### **Tank**

Sets the tank number for which the test will be performed. Programming should be made for each tank.

**Class**

Sets the leakage class for which the system should detect a possible leak in the tank. There are two classes of leakage:

Class	Level of Measured Leak
Class 1	0,378 liters/hour
Class 2	0,756 liters/hour

The class 1 is a more restrictive class, in other words, detects minor leaks. In this case the evaluation period may be higher.

**8.2 Tests Results**

The performed tests allow a follow-up as its result.



**Important Note**

The values of volume change, flow or temperature displayed in the log is only indicative and don't necessarily indicate a proportionality level of leakage. So when checking a volume change and no leak indication in the result may mean that the sum of acceptable changes to the system was not enough, under the conditions of test, to establish a leakage situation.

This screen shows the results of the selected period.

Monthly results are grouped.  
Are presented the following fields:

**Programmed Time:** Test Scheduled Time. Featuring date and time in which the tightness test has been programmed, in other words, the date on which the test was registered on programming screen.

**Start:** Date and Time Start of the test. Showing the date and time that the test was actually performed in the tank.

**Duration:** Introducing the effective test duration, so long as the tank was being monitored effectively. The duration is displayed in hh:mm (hours and minutes)

**Results:** Presented the actual test status. They are provided for the following states:

Estate	Description
<i>In Progress</i>	<i>Test still running</i>
<i>Test Aborted - Excessive Variation</i>	<i>Test interrupted by excessive variation of flow</i>
<i>Leak</i>	<i>Test completed. Leak Detected</i>
<i>No Leak</i>	<i>Test Done. No leak was detected</i>

**20°C Vol Change:** presents the change in volume at twenty degrees Celsius measured during the test, in other words, the difference between the volume measured at the beginning of the test and the volume measured at time of test completion.

**Temp Variation:** Shows the variation of temperature measured during the test, in other words, the difference between the temperature measured at the beginning of the test and measured temperature at the instant of test completion.

**Level variation:** presents the level variation measured during the test, in other words, the difference between the level measured at the beginning of the test and the level measured at the instant of test completion.

Consulta de Resultados dos Testes de Estanqueidade - 19 Itens - Fevereiro de 2011

Posto	Tanque	Produto	Vol.Inic. 2...	Data Programada	Data Início	Duração(min)	Resultado	Vazão(lt...	Var.Vol.(lts)	Var.Temp.(...	Var.Nível(cm)	Classe
PE RJ Maracana	Tanque 6	Alcool Comum	10.783,000	13/Fev/2011 09:00:00	13/Fev/2011 09:00:13	239	Sem Vazamento	0,150	-0,598	0,000	-0,811	Classe 1
PE RJ Maracana	Tanque 6	Alcool Comum	10.782,000	11/Fev/2011 23:00:00	13/Fev/2011 23:00:10	239	Sem Vazamento	0,056	-0,224	0,000	-0,819	Classe 1
PE RJ Maracana	Tanque 6	Alcool Comum	10.925,000	11/Fev/2011 23:00:00	15/Fev/2011 23:00:57	146	Vazamento	1,013	-2,466	0,104	-0,815	Classe 1
PE RJ Maracana	Tanque 6	Alcool Comum	8.610,000	11/Fev/2011 23:00:00	16/Fev/2011 23:00:51	250	Sem Vazamento	0,375	-1,563	0,000	-0,266	Classe 1
PE RJ Maracana	Tanque 6	Alcool Comum	11.783,000	11/Fev/2011 23:00:00	17/Fev/2011 23:00:03	229	Sem Vazamento	0,375	-1,431	0,000	-0,796	Classe 1
PE RJ Maracana	Tanque 6	Alcool Comum	8.759,000	11/Fev/2011 23:00:00	18/Fev/2011 23:00:48	61	Vazamento	1,531	-1,560	0,000	-0,020	Classe 1
PE RJ Maracana	Tanque 6	Alcool Comum	11.955,000	11/Fev/2011 23:00:00	19/Fev/2011 23:00:16	65	Vazamento	0,592	-0,643	0,000	0,000	Classe 1
PE RJ Maracana	Tanque 6	Alcool Comum	11.953,000	11/Fev/2011 23:00:00	20/Fev/2011 23:00:48	66	Vazamento	0,912	-1,005	0,000	0,000	Classe 1
PE RJ Maracana	Tanque 6	Alcool Comum	9.611,000	11/Fev/2011 23:00:00	21/Fev/2011 23:00:53	412	Vazamento	0,696	-4,777	0,000	-0,061	Classe 1

**Postos**

- Tanque 1 (DA)
- Tanque 2 (GC)
- Tanque 3 (GE)
- Tanque 4 (GA)
- Tanque 5 (GC)
- Tanque 6 (AC)

**Filtro Resultados**

- Em Andamento
- Sem Vazamento
- Com Vazamento
- Abortado

Todos

**Filtro Período**

Mês/Ano da Consulta

Fevereiro 2011

Últimos 10

## 9 Graphs and Reports

### 9.1 Graphs

The system provides a series of information presented in graphical form or in sheet form or in reports form.

If it's necessary other reports, see your dealer for the purchase and customization.

These reports can be viewed on screen or printed on a printer connected to your LAN.

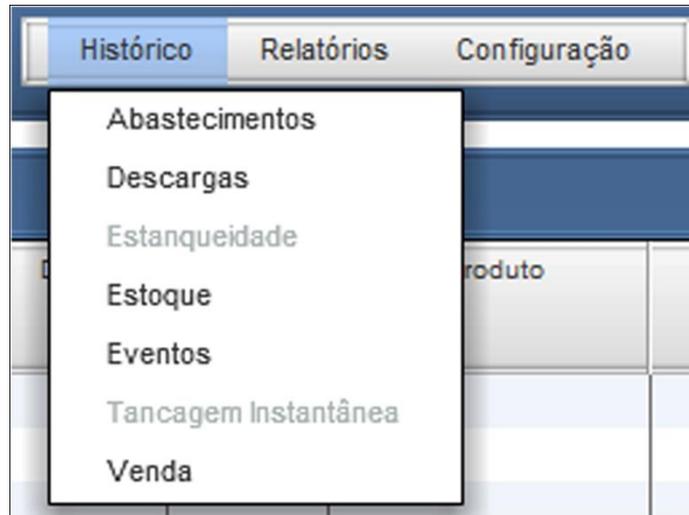


Figure 54 - History Menu

### 9.2 Control Buttons

Use the Control Buttons to define the way of presentation:



**CHART** - Selects the display of information in graphic form.



**TABLE** - Selects the display of information in table form.



**UPDATE** - Updates of Information Requests to apply the selected filters



**MAXIMIZE** - Maximizes the Query Screen



**MINIMIZE** - Minimizes the Query Screen



**REPORT** - Requests Report Generation

### 9.3 Product Selection



Figure 55 - Products Selection



#### Important Note

They aren't grouped similar products such as gasoline with leaded gasoline if there is no proper selection. The products must have the same nomenclature to be properly grouped.

### 9.4 Station and Tank Selection



Figure 56 - Station/Tanks Selection

### 9.5 Period Selection

The PERIOD Table which defines the time interval you want to generate the information.



**Período**

Diário

Semanal

Mensal

Anual

Especificar

Últimos

Período Relativo

Início

24/02/2011

Figure 57 - Period Selection

Or for periods (like yesterday, day before yesterday, etc.)



**Período**

Diário

Semanal

Mensal

Anual

Especificar

Últimos

Período Relativo

**Período Relativo**

Últimas 24h

Hoje

Ontem

Anteontem

Figure 58 - Daily Selection

Or to set an interval between two dates in the specified mode.



Figure 59 - Selection by Specific Date

### 9.5.1 Instant Volume

It presents as a group, the values of tanking at the selected time.

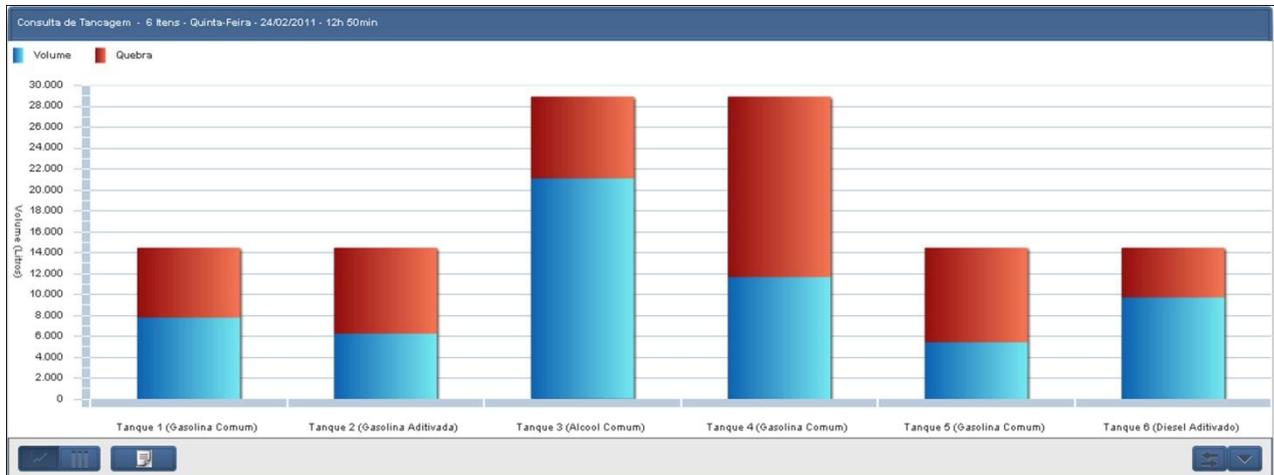


Figure 60 - Instant Volume Query Screen

### 9.5.2 Sales

This report shows the sales (product output) accounted exclusively by the probe, not counting sales by bombs.

This report can evaluate and confront the outputs measured by measurement and effective outputs (by pumps or by evaporation).

The setup screen allows you to filter sales report data in the following ways:

- ✓ By station (if there is another station registered on the system).
- ✓ By period.

You can choose between Daily, specifying the start date and end date, or weekly, monthly and yearly from the days selected in the Home or mark the full period to filter by full term.



Figure 61 - Data Grouping

Grouping by station Screen, where all products and tanks are accumulated to display the total sale of a set period of time.



Figure 62 - Products Sale Graph grouped by Station

Tank Grouping Screen, showing each tank sale at the time period.

Positioning the cursor on any bars shows the actual value of the sale at this point.

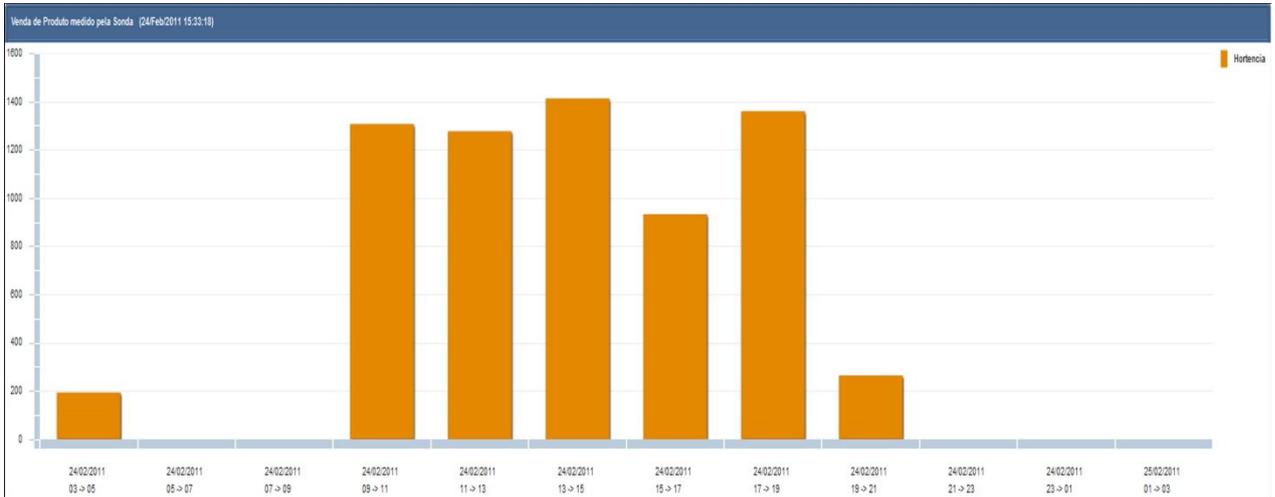


Figure 63 - Value of Effective Selling in a given period

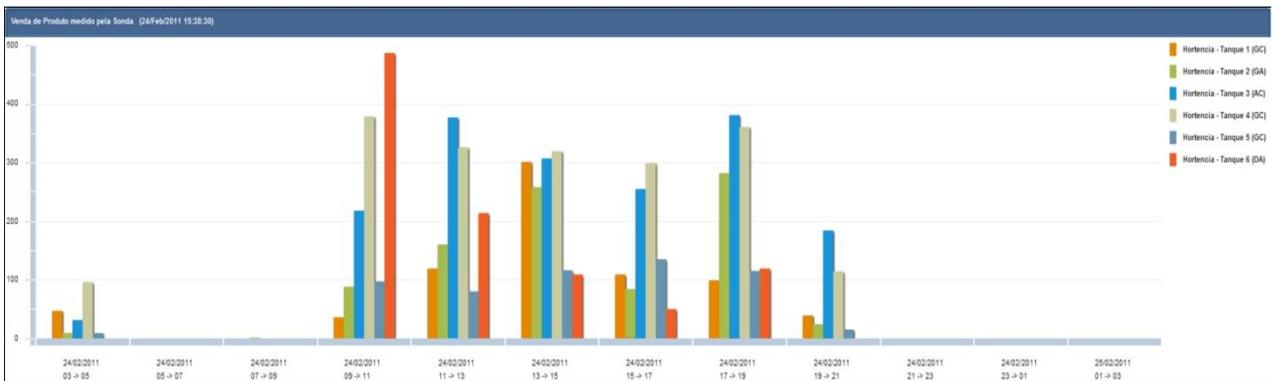


Figure 64 - Tank Grouping Screen

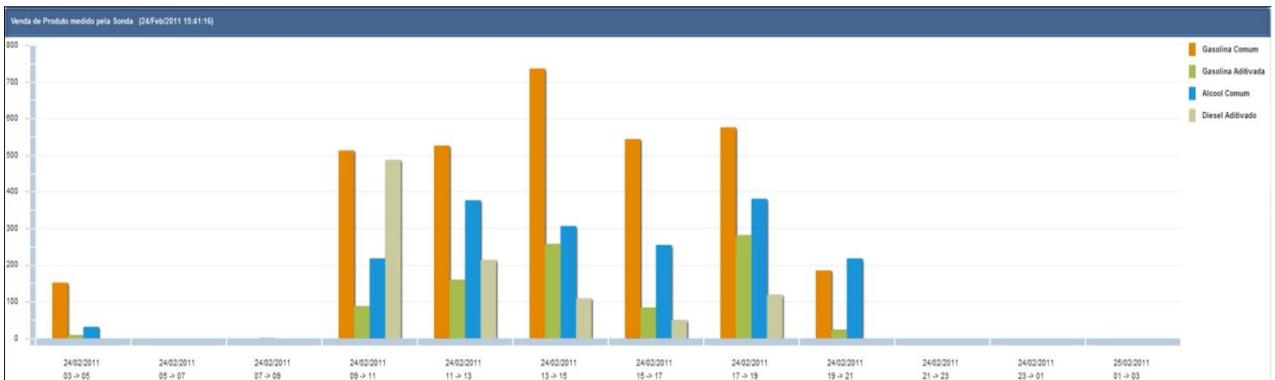


Figure 65 - Product Grouping Screen

Or in table format, pressing the  button.

Venda de Produto medido pela Sonda (24/Feb/2011 15:41:16)				
Data	Volume 20° - Gasolina Comu	Volume 20° - Gasolina Aditivi	Volume 20° - Alcool Comum	Volume 20° - Diesel Aditivado
24/Feb/2011 03:00	152	9	31	0
24/Feb/2011 05:00	0	0	0	0
24/Feb/2011 07:00	0	1	0	0
24/Feb/2011 09:00	513	88	218	487
24/Feb/2011 11:00	526	160	377	214
24/Feb/2011 13:00	737	258	307	109
24/Feb/2011 15:00	544	84	255	50
24/Feb/2011 17:00	576	282	381	119
24/Feb/2011 19:00	185	24	218	0
24/Feb/2011 21:00	0	0	0	0
24/Feb/2011 23:00	0	0	0	0
25/Feb/2011 01:00	0	0	0	0

Figure 66 - Sales exhibition in Table Format

### 9.5.3 Stock

This graphic shows the historical line of stock in the tank at a time requested. It allows evaluating the volume behavior stored in the tank in a period. The configuration screen of stock history graph by tank allows you to filter the data by period.

You can choose between Daily, specifying the start date and end date, or weekly, monthly and yearly from the days selected in the Home or mark the full period to filter by full term.

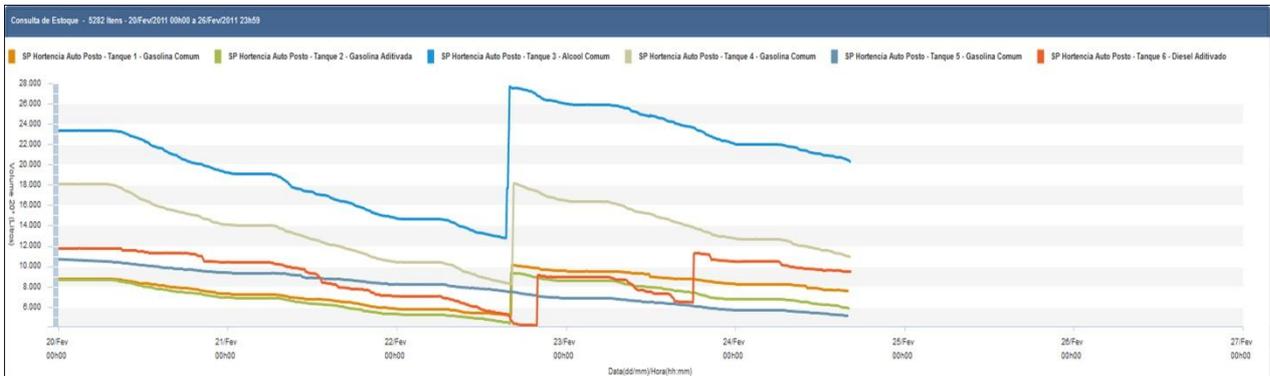


Figure 67 - Stock query Graph

When selected the Start Y axis to 0, the system shows tanking in the graph from scratch. The selection LEGEND allows presenting the color legend for the presented tanks. The VERTICAL GRID selection allows inserting vertical shadows for better chart analysis.



Figure 68 - Zoom Time Buttons

The two sliders define how MIN and MAX should be the extremes of the graph, allowing a zoom on the time axis.

#### 9.5.4 Refueling

The report shows supply details of sales in the station from the pump control. The setup screen allows you to filter report data supply in order to better display the information. This report provides sales data for the pumps connected to the tank during a selected period. To obtain this report, the system will be required to have an integrated pump control system.

In the case of period, you can choose between Daily, specifying the start date and end date, or Weekly, Monthly and Yearly from the days selected in the Home or mark the full period to filter by full term.

After selecting the fields you must click on Refresh button.



## 9.6 Events

The events are in special situations which are recorded by the system to allow a detailed analysis of behavior and tend to operate in a service station.

There are events associated with the devices operation (faults, etc.) that allows a unique monitoring for maintenance crews, as well as operational events that point to the steps taken to streamline and improve the overall operation of station. These events may be linked to:

- ✓ Caps
- ✓ Tank Gauge Probes
- ✓ Liquid Sensors
- ✓ CromalID
- ✓ Other Devices



Figure 69 - Events Filter

At a detail level, each device has a selection of specific situations in which analysis is desired.

Thus the system shows that exist a total SELECTION or partial of situations:



Total sub-levels Selection



Partial sub-levels selection



No sub-levels selection

### 9.6.1 Seal Events

The caps have a series of informative events and states of its operation, namely:

Event Description	Generator Fact
Unlocked Cap	Motor actuator in rest position.
Open Cap	Tilt Sensor mode Open
Closed cap	tilt sensor mode Closed
Locking cap	Motor Actuator in the locked position.
Self-Trapped by time	Trapped out by have downtime with cap closed and unlocked (lock bit of downtime on).
Automatically unlocked	by special conditions (exhausted battery), the system automatically unlocked
Failed to lock	lock failed
Failed to unlock	Unlock Failed
Start Open	Indicates beginning of the operation with the cap open
Start Closed	indicates the beginning of the operation with cap Closed
Aborted locking	Unable to lock, Aborted by Low Battery
Leak 1	Leak Sensor 1
Time Exceeded	cap open for a longer time than prescribed

Leak 2	Leak Sensor 2
Low Battery	Low Battery Status
Exhausted Battery	Status Exhausted Battery
Internal Violated	Internal compartment open
Start of Operation.	Cap Initiated or reset situation. Let to check the reset in general or cap problem.
Operating on battery	cap Power down
Source Status Return	return of the system power
Open Seal	Indicates that was required to open seal energy
Without communication	there was a suspension of communication
Open Locked	opening situation with a lock on
Lock and repose	Invalid situation with lock and repose simultaneously
Self-locking	Automatically locked depending on the lock mark requested immediately.
Aligned and Open	Invalid Situation with alignment sensing with open cap
Pin Broken	articulated cap Pin Broken
Internal Fault	Detected Failure of Internal circuits
Start Locked	Indicates Start of operation with locking cap
Start Unlocked	Indicates Start of Operation with Unlocked cap

On-screen events are displayed all the information about alarms, violation and operations performed by the cap.

Consulta de Eventos - 14 Itens				
Posto	Data	Evento	Detalhe	Usuário
SP Hortencia Auto Posto	2/24/2011 8:15:41 AM	Nível de Produto Normal	Tanque 6 (Diesel Aditivado)	
SP Hortencia Auto Posto	2/24/2011 3:01:24 AM	Scan Iniciou		
SP Hortencia Auto Posto	2/24/2011 3:00:11 AM	Scan Abortado Subitamente		
SP Hortencia Auto Posto	2/23/2011 6:27:23 PM	Nível de Produto Alto	Tanque 3 (Alcool Comum)	
SP Hortencia Auto Posto	2/23/2011 6:07:25 PM	Nível de Produto Alto	Tanque 6 (Diesel Aditivado)	
SP Hortencia Auto Posto	2/23/2011 3:12:25 PM	Medição Produto Normalizada	Tanque 5 (Gasolina Comum)	
SP Hortencia Auto Posto	2/23/2011 3:12:16 PM	Falha Medição Produto	Tanque 5 (Gasolina Comum)	
SP Hortencia Auto Posto	2/23/2011 3:07:31 PM	Medição Produto Normalizada	Tanque 5 (Gasolina Comum)	
SP Hortencia Auto Posto	2/23/2011 3:07:26 PM	Falha Medição Produto	Tanque 5 (Gasolina Comum)	
SP Hortencia Auto Posto	2/23/2011 11:53:09 AM	Scan Iniciou		
SP Hortencia Auto Posto	2/23/2011 11:52:27 AM	Scan Abortado Subitamente		
SP Hortencia Auto Posto	2/23/2011 11:02:00 AM	Sensor de Líquido - Normal	Nível Alto Oleo	
SP Hortencia Auto Posto	2/23/2011 11:01:57 AM	Sensor de Líquido - Vazamento	Nível Alto Oleo	
SP Hortencia Auto Posto	2/23/2011 8:17:10 AM	Medição Produto Normalizada	Tanque 5 (Gasolina Comum)	

Figure 70 - Events Query Screen

**DATE**

Indicates the date and time that the event was identified

**STATION**

Indicates which station that identified event

**EVENT**

Complete description of the event

**LOCATION**

Description of device location that generated the event

**USER**

Displays the name of the user who was logged into the system at the time the event occurred.

**9.6.2 Measured Probes Events**

Displays events related to probes.

The probe events are

**Event Description**

High Level Product  
 Very High Level Product  
 Lower Level Product  
 Very Low Level Product  
 Adoption of CromalD standard

**Generator Fact**

Reports that exceeded the level of output given to high  
 Reports that exceeded the level of output given to Very High  
 Reports that exceeded the level of output given to Low  
 Reports that exceeded the level of output given to Very Low  
 Informs that was been requested to change the default user

To determine the levels of output HIGH, LOW, HIGH and VERY LOW refer to probes configuration table.

**9.7 Deliveries**

The Delivery consists of loading the station tank by tank truck.

The system evaluates and displays a detailed data relating to the delivery of fuel based on control parameters and monitoring the behavior of the volume and temperature of the tank.

For the system can interpret a positive variation of volume in a tank, some conditions must be met:

- ✓ Initial Volume positive Change
- ✓ Final Volume Change
- ✓ Have an elapsed time of delivery stabilization

The positive change in initial volume to the system indicates the beginning of a process of delivery. The variation of the final volume to the system indicates that the delivery process was terminated.

The settling time is important as to minimize the turbulence generated inside the tank, to ensure a more accurate measure and reconcile interrupt actions normally performed by operators or truck unloading. These interruptions if they exceed the defined settling time can cause the system to evaluate the existence of a sequence of two partial deliveries, when in fact there was a single flush with a dwell time (or more) during the delivery period.

So this time also incorporates the possibility of partial delivery, which is normally performed.

The partial delivery consists of a first moment a very large range of initial product with the operator of the truck stopping for a minute or two to delivery, to evaluate the volume. In this case the system will be considered, for its ease, the sum of partial deliveries since made within the stabilization period.

To request the submission of deliveries in the history menu, select deliveries

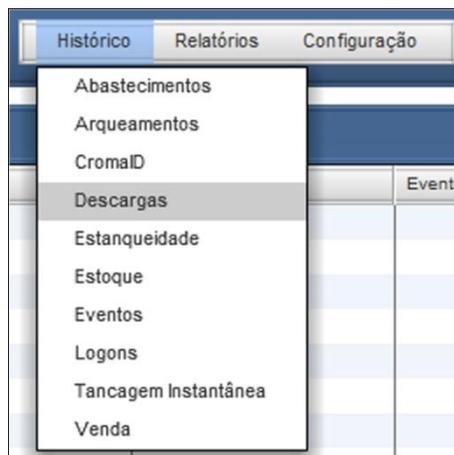


Figure 71 - Deliveries Menu

Use the selection panel to set the criteria for displaying the delivery (Filter).

The default condition of presentation is the display of the last 14 deliveries, but can be selected periods or certain specific products.



Figure 72 - Filters for Deliveries Query

Início	Duração	Tanque	Produto	Volume Entregue	Volume 20º Entregue (lts)	Volume Inicial (lts)	Volume Final (lts)	Volume 20º Inicial (lts)	Volume 20º Final (lts)	Nível Inicial	Nível Final	Nível Água Inicial (cm)	Nível Água Final (cm)	Vol. Água Inicial (lts)	Vol. Água Entregue	Temp. Inicial	Temp. Final	Evap. (lts)	CromaID Inicial	CromaID Final
2/23/2011 5:59:10 PM	00:08:14	6	Diesel Aditivado	4.968	4.940	6.471	11.439	6.434	11.374	111,99	177,71	0,00	0,00	0	0	27,15	27,15	5	Grave	
2/22/2011 7:50:28 PM	00:07:02	6	Diesel Aditivado	5.011	4.980	4.216	9.228	4.195	9.178	81,59	147,89	0,00	0,00	0	0	26,09	27,15	5	Grave	
2/22/2011 4:19:30 PM	00:13:42	4	Gasolina Comum	10.022	9.962	8.315	18.339	8.269	18.232	79,50	144,73	0,00	0,00	0	0	25,29	25,53	10	Moderada	
2/22/2011 4:10:55 PM	00:07:21	1	Gasolina Comum	5.129	5.103	5.082	10.212	5.053	10.156	92,05	158,89	0,00	0,00	0	0	25,50	25,25	5		
2/22/2011 4:02:24 PM	00:07:11	2	Gasolina Aditivada	5.002	4.973	4.410	9.412	4.382	9.356	83,81	149,64	0,00	0,00	0	0	25,81	25,46	5		
2/22/2011 3:43:53 PM	00:15:10	3	Alcool Comum	10.219	10.147	17.786	28.008	17.677	27.925	141,33	213,00	0,00	0,00	0	0	26,89	27,32	10	Grave	
2/22/2011 3:29:24 PM	00:07:26	3	Alcool Comum	4.934	4.902	12.808	17.803	12.792	17.695	109,74	141,34	0,00	0,00	0	0	26,68	26,89	5	Grave	
2/18/2011 5:28:11 PM	00:07:20	6	Diesel Aditivado	5.021	4.992	8.480	13.502	8.433	13.426	138,45	210,54	0,00	0,00	0	0	26,98	27,19	5	Moderada	
2/18/2011 1:33:41 PM	00:32:47	3	Alcool Comum	20.436	20.302	10.390	30.827	10.327	30.629	93,52	244,13	0,00	0,00	0	0	26,87	27,30	20	Grave	
2/18/2011 1:24:36 PM	00:07:16	1	Gasolina Comum	5.126	5.096	6.375	11.501	6.338	11.435	109,02	176,00	0,00	0,00	0	0	25,50	25,50	5		
2/18/2011 1:14:53 PM	00:06:20	4	Gasolina Comum	4.970	4.941	20.370	25.341	20.252	25.194	158,23	192,72	0,00	0,00	0	0	25,50	25,50	5	Moderada	
2/18/2011 1:05:49 PM	00:06:32	5	Gasolina Comum	5.133	5.102	7.853	12.988	7.794	12.896	128,04	197,42	0,00	0,00	0	0	27,16	26,68	5		
2/17/2011 1:10:13 PM	00:07:55	2	Gasolina Aditivada	5.084	5.055	8.952	14.037	8.895	13.951	143,56	216,98	0,00	0,00	0	0	25,77	25,56	5		
2/17/2011 12:51:43 PM	00:17:20	4	Gasolina Comum	10.044	9.988	14.023	24.067	13.944	23.933	117,23	183,03	0,00	0,00	0	0	25,29	25,29	10	Moderada	

Figure 73 - Deliveries Query Screen

Can also be displayed only invalid deliveries (deliveries not known) or Incomplete (deliveries that have associated a lack of information, such as invoice number, volume delivered, etc.)

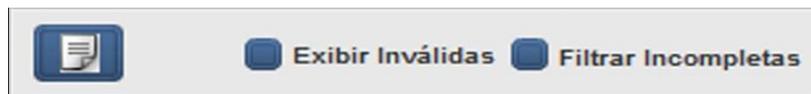


Figure 74 - Invalid Deliveries Exhibition

With these conditions, the system records the existence of delivery into the tank, providing the following information:

**START** - Displays the estimated date and time of delivery begin.

**DURATION** - Displays the time in HH: MM: SS (HH - Hour, Minute, and SS-MM-second) the estimated delivery duration, considering the time needed for stabilization.

**TANK** - Tank Number that there was a delivery.

**PRODUCT** - Product existing in the tank where there was a delivery.

**DELIVERED VOL** - Value of total volume in liters of delivery, calculated with the delivery parameters.

**INITIAL VOL** - Shows the volume in liters at room temperature in the tank, the date and time that the system considered the beginning of a delivery.

**INITIAL 20° VOL** - Shows the volume converted to 20° Celsius in the tank, the date and time that the system considered the beginning of a delivery.

**DELIVERED 20° VOL** - Displays the volume in liters converted to 20°Celsius considered as delivered in the tank, the date and time that the system considered the end of a delivery.

**INITIAL LEVEL** - Displays the level measured in centimeters in the tank, the date and time that the system considered the beginning of a delivery.

**FINAL LEVEL** - Displays the level measured in centimeters in the tank, the date and time that the system considered the end of a delivery.

Before the analysis of these data make sure that all parameters of delivery are in accordance with its normal operation.

There are not considered valid deliveries the entries whose product in the tank is less than 5 liters per second, or 300 liters per minute.

It is not advisable to consider an effective delivery a shipment of product between tanks, which could distort the accumulated products received in a given period, since there was no effective entry product in the station tanking system.

### **Important Note**

If the station operates with tanking values below detectable limits by the probe (See chapter on Technical Specifications of this manual to check the limits) distortions can occur between the delivery values presented and actual delivery values, since the volume delivery to fill the tank outside portion of the probe measurement will not be counted as a delivery.

## **9.8 Deliveries Analysis**

The delivery framework facilitates the presenting information in tabular form, and allows the user to organize the best way to analyze more accurate and appropriate.

The system default is in chronological order of delivery; being presented the last delivery first.

## **9.9 Manual Delivery**

To generate a manual Delivery, click the Generate manual Delivery button. Use this feature whenever there is an undetected transfer between tanks or fail measurements. This feature allows non-contaminated reports that use of delivery data for analysis.

### **Important Note**

The delivery values are used to calculate the number of days of supply that is displayed on the monitor screen. So a lost or download any amount received in error can compromise the calculation.

In this window enter the volume at twenty degrees, the tank receiving the delivery, the start date and estimated duration of this delivery.

### **Important Note**

The values in the record of deliveries may vary from the actual volumes delivered in a tank.

These values can be influenced in the case of sale of products during delivery (sale by the pump during the delivery), sales during the period of stabilization of the delivery and evaporation and the uncertainty associated with the initial step for determining a delivery.

Also check the item by Parameters in this manual, which are detailed information that is directly related to the correction of these measures. The delivery parameters are defined in the Tank Registration Screen in subsection delivery parameters.

 **Important Note**

In diesel tanks that are installed filters and auxiliary tanks, there may be return ducts. In these cases according to the operation of the equipment, there may be a return to the tank causing false delivery.

To eliminate deliveries invalid caused by leaks in standing valves records return, register a new level of determination of delivery, on-screen registration of tanks, item DELIVERY PARAMETERS.

**9.10 Delivery Report**

Pressing the Report button is asked to report the delivery.



Figure 75 - Delivery Report Request

The report format is presented as follows:

		<b>Relatório de Combustível Recebido</b> (Agrupamento por dia)						
Período: Últimas 14 Descargas								
<b>23/fev/2011</b>								
<b>SP Hortencia Auto Posto</b>								
Horário	Produto	TQ	Duração	Vol. 20º (lts)	Vol.Bruto (lts)	EV. Min/Máx (lts)	Croma ID	
17:59:10	Diesel Aditivado	6	0:08:15	4.940	4.968	5 - 30	G / I	
<b>Total: SP Hortencia Auto Posto em 23/02/2011</b>								
Qtd	Produto	Duração	Vol. 20º (lts)	Vol.Bruto (lts)	EV. Min/Máx (lts)			
1	Diesel Aditivado	0:08:15	4.940	4.968	5 - 30			
<b>Total em 23/02/2011</b>								
Qtd	Produto	Duração	Vol. 20º (lts)	Vol.Bruto (lts)	EV. Min/Máx (lts)			
1	Diesel Aditivado	0:08:15	4.940	4.968	5 - 30			
<b>25/fev/2011</b>								
<b>SP Hortencia Auto Posto</b>								
Horário	Produto	TQ	Duração	Vol. 20º (lts)	Vol.Bruto (lts)	EV. Min/Máx (lts)	Croma ID	
10:58:39	Gasolina Comum	4	0:21:11	14.983	15.062	15 - 90	N / G	
11:21:53	Gasolina Comum	5	0:06:18	5.014	5.047	5 - 30	N / I	
11:30:09	Gasolina Aditivada	2	0:13:57	10.100	10.157	10 - 61	N / I	
11:46:37	Alcool Comum	3	0:07:25	4.920	4.950	5 - 30	N / G	
14:52:37	Alcool Comum	3	0:07:52	4.932	4.966	5 - 30	N / G	
15:02:16	Gasolina Comum	1	0:07:39	5.002	5.034	5 - 30	N / I	
<b>Total: SP Hortencia Auto Posto em 25/02/2011</b>								
Qtd	Produto	Duração	Vol. 20º (lts)	Vol.Bruto (lts)	EV. Min/Máx (lts)			
2	Alcool Comum	0:15:17	9.851	9.916	10 - 59			
1	Gasolina Aditivada	0:13:57	10.100	10.157	10 - 61			
3	Gasolina Comum	0:35:08	24.999	25.144	25 - 151			

Figure 76 - Delivery Report

### 9.11 Pump Control

The screen shown below presents all the information of pumps that are configured in the system. In this case each hose should be seen as a virtual bomb, so in view there is a visual association between the amount of bombs and the actual number, since the submission seeking information relevant to a hose.



Figure 77 - Pump Control

The figure below shows in detail the last supply data, as follows:

First line: Amount paid on the last supply

Second Line: Total gallons sold in the last supply

Third line: Perpetual (Electronic Totalize) of liters.

The center tells the pump when the hose is turned on and the tank in which the product is being withdrawn.

The product name is displayed with the configuration of the price per gallon existing at the pump. The last line shows the operational status of the hose.



Figure 78 - Pump Detailed Information

## 10 Console Operation

### 10.1 Introduction

The SmartConsole is a component of S2 System that allows access and interaction with the system via keyboard and display, both in equipment front. There are two operation modes of SmartConsole: The supervised mode, where the system is fully controlled by the Supervisor and unsupervised mode or local mode. The operation of local control occurs only in situations of failure of the supervisor, or to detect SmartConsole lack of communication system for longer than 40 seconds, it starts the local monitoring, performing management functions of the caps.

Figure 97 shows part of the chassis front panel of SmartConsole, consisting of the numeric keypad with their special functions, the space of the display and LED indicators green and red.

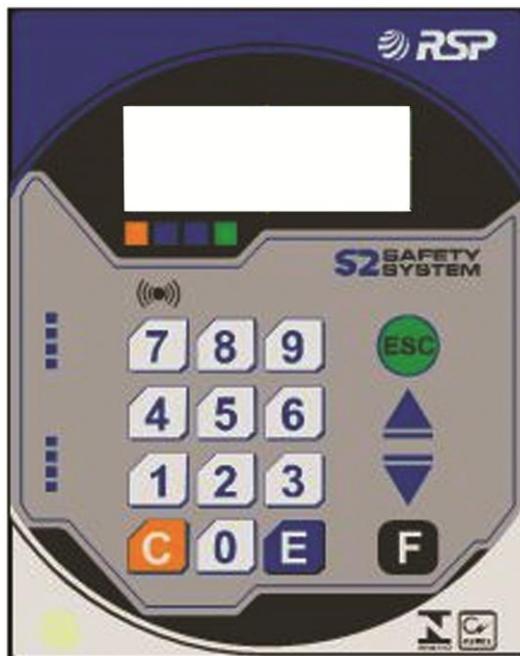


Figure 79 - Design of the Front Keyboard and Display of SmartConsole

### 10.2 Keyboard

The SmartConsole keyboard consists of 16 keys, 10 numeric and 6 of them with special functions, all described below:

- **Numeric Keys ("0" through "9"):** have the function of entry numeric values in the system, as well as selection and navigation menus of the same.
- **Key "ESC":** have the function to navigate to the previous menu or abort a certain function that is to be executed.
- **Previous and next Keys ("▲" and "▼"):** have the function of navigation while viewing events, go to the next event or the previous event in its respective menu.
- **Recognition Key Alarms ("F"):** Its purpose is to indicate to the system detected an alarm has been observed by the user.
- **Enter key ("E"):** Its purpose is to indicate end of data entry or menu selection.

### 10.3 Sound Signalization

The SmartConsole operating in local mode has Sound Signalization informing the operator through these beeps the alarms existence in the system caps.

### 10.4 Visual Signalization

Likewise the sound signals, the visual signalization of the system states is presented through the two LEDs below the LCD. These two LEDs are associated with the specific condition of the system, as shown in Table 15.

Table 1 - Visual indication via LED on SmartConsole

Red Led	Green Led	Description
Off	Off	System Off
Flashing	Off	Indicates the presence of alarms in supervised mode.
Off	Flashing	Local Operation Mode without the presence of alarms.
Flashing	Flashing	Supervised Operation Mode.

 In supervised mode LEDs flashes as the serial communication occurs, the Green LED indicates data reception and red sending data.

### 10.5 System Clock

The SmartConsole has an internal real time clock (RTC), powered by independent and individual battery, which ensures retention and accurate count of the local time. The system clock is fundamental to local operation of SmartConsole. When is in Supervised mode it is automatically updated by the Supervisor, as in unsupervised mode if necessary to manually adjust the date and time can do by keyboard.

### 10.6 System Events

An event is an occurrence that one record is recorded in memory and can also optionally be printed. You can view the caps events through the SmartConsole. The events of other devices are stored in the S2 system database and are available via system query or through reports. Table 2 presents the list of possible events on the cap and showed the SmartConsole in unsupervised mode. All events are saved with time stamp in chronological order of occurrence, allowing the user to check the problem and still generate a history of occurrences of the system.

 If there are system events in the event list indicates that there may be problems installing or fixing cables.

#### 10.6.1 Main Screen

When starting, the SmartConsole awaiting communication system via the Supervisor for 40 seconds. During this time interval is shown in the display information as shown in Figure 101. If this interval is found the presence of the supervisor, takes the same information displayed and the system are illustrated in Figure 102.

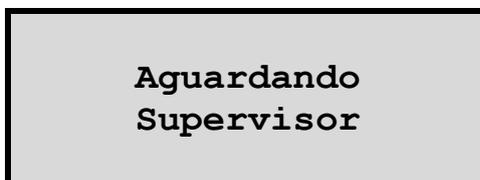


Figure 80 - Main Screen Status Waiting Supervisor

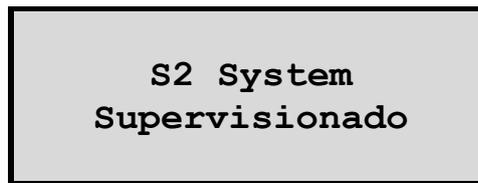


Figure 81 - Main Screen Status Supervised Operating Mode

If the Supervisor is out of service and no information is received in the system, SmartConsole uses its local operation mode (unsupervised mode) assuming the system communication and allowing the local management of the caps attached. A sequence of four long beeps is issued stating the condition. Figure 103 illustrates the screen displayed indicating the change in operating mode SmartConsole.

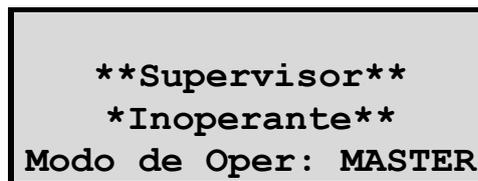


Figure 82 - Home screen indicating a change for Local Mode operation

In unsupervised mode, the screen displays the SmartConsole five distinct cycles, lasting 5 seconds each. Figure 104 illustrates an example of the presentation screen.

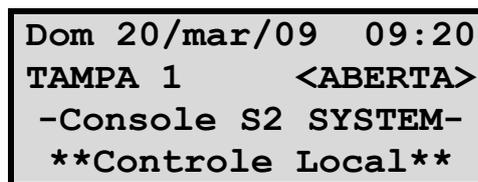


Figure 83 - Main Screen Status Operating in Local Mode

The first line shows the date and time of the system. Periodically information is changed in the second row showing the status of monitored caps. The third and fourth line change in the following order:

- **Standard Text:** The message - S2 System Console / \*\* Local Control\*\* is displayed indicating the mode of operation site.
- **Initial Greeting:** shows the initial greeting registered or the registration of the same requests.
- **Master Mode:** Indicates the amount in the fourth row caps and tanks monitored.
- **Last Event:** Show the cap and the last event recorded for the same.
- **Alarm:** Indicates the presence of the system alarm by specifying which equipment in the fourth line.

 During cycles, beep's is issued indicating the presence or suspicious transaction report or alarm system, for example, opening the cap for a longer period than the conventional.

### 10.7 SmartConsole Menus System

The SmartConsole presents two different menu trees according to their mode of operation. When the system operates in overseeing the menu tree is managed by the supervisor, and allows operational choices for caps, tanks, events and alarms. In the unsupervised mode (local control), the menu tree is managed by own SmartConsole, which allows operational choices and connected caps general settings. Figure 105 illustrates the complete menu tree in unsupervised mode (local control) and Figure 106 the menu in a supervised.

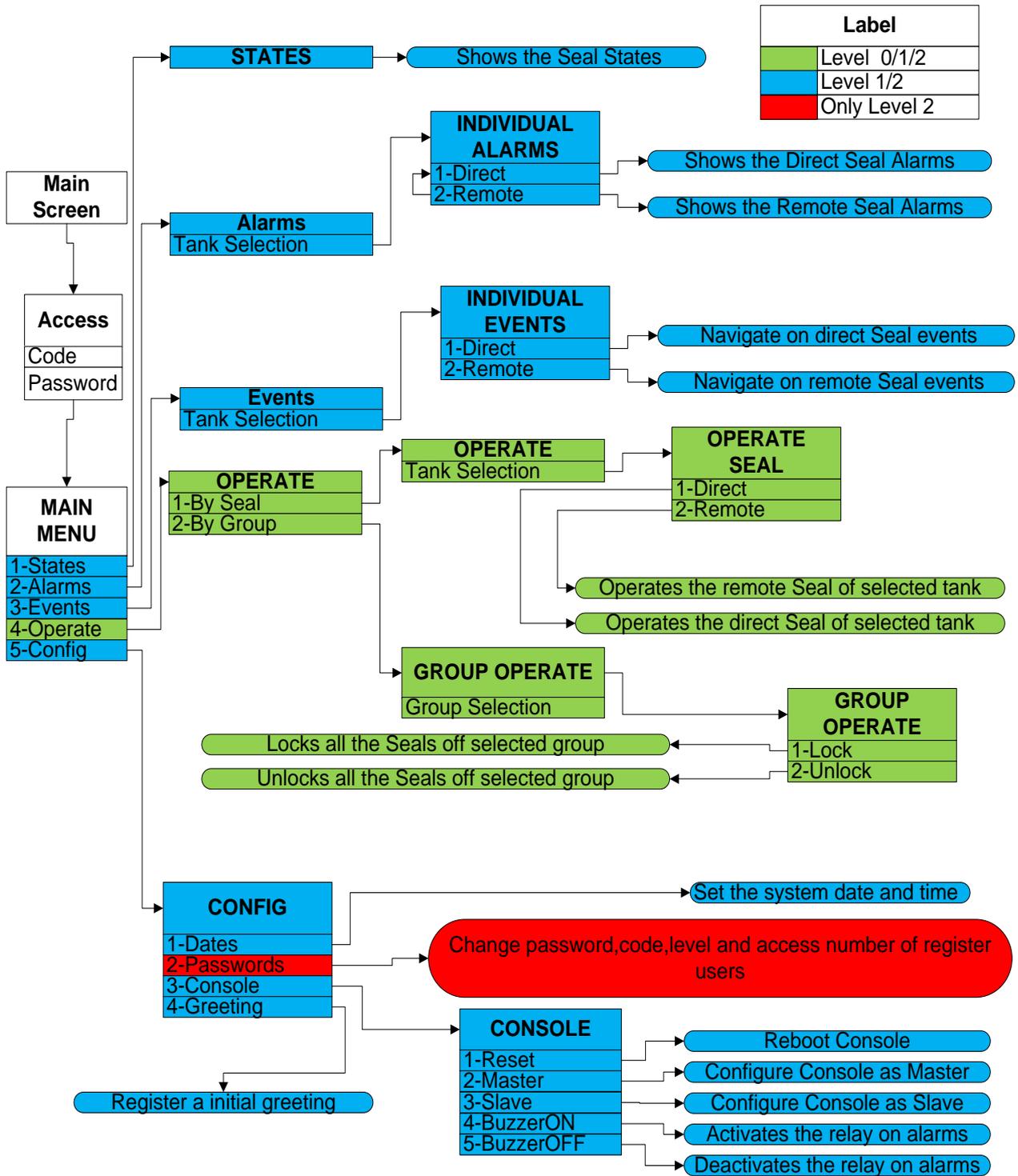


Figure 84 - SmartConsole Tree View in unsupervised mode

**i** The SmartConsole remains in a selected menu for a maximum time of 2 minutes. If after that time no other button is pressed, the system automatically returns to the previous menu, and so on until the main screen.

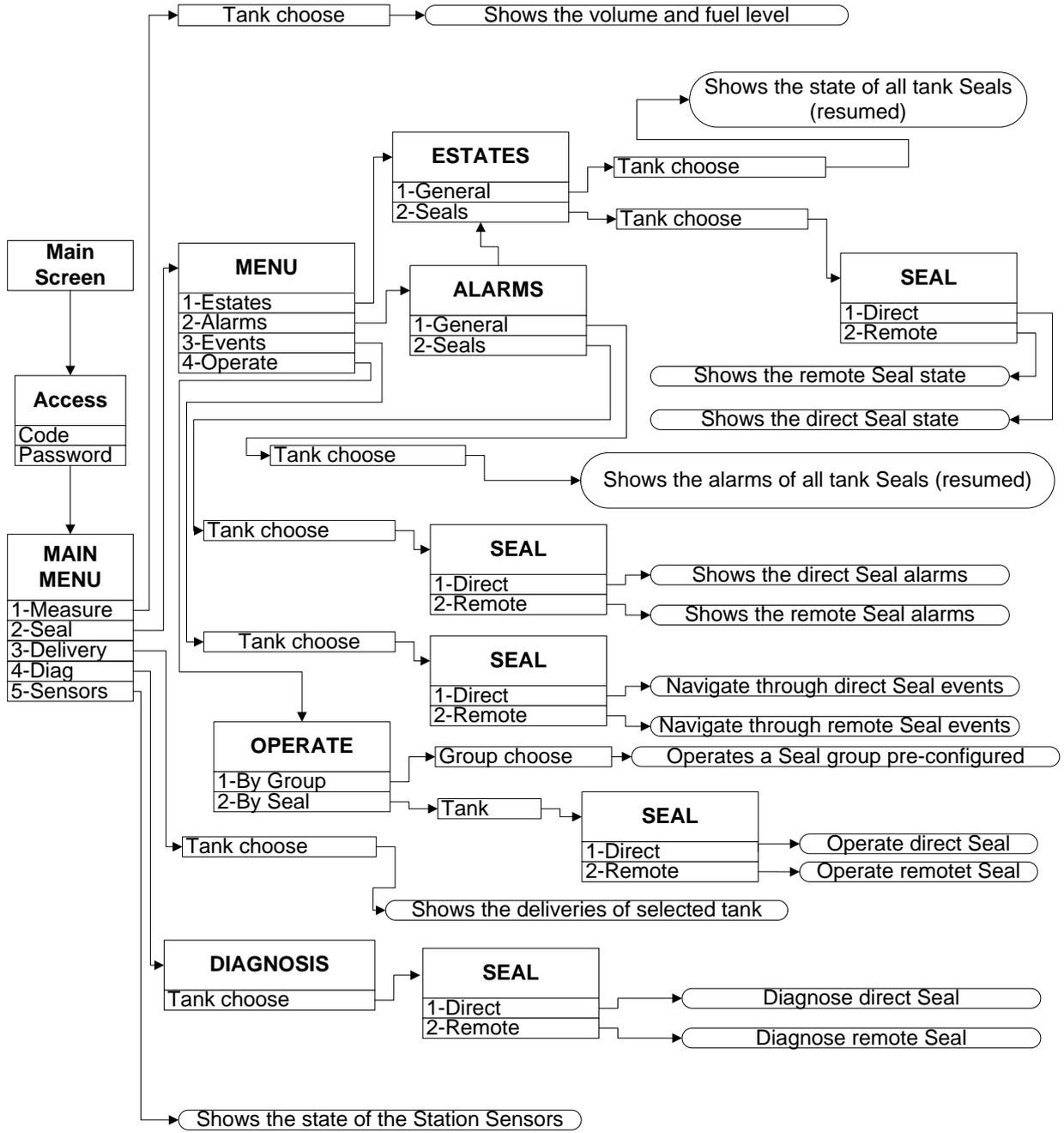


Figure 85 - SmartConsole Tree View in supervised mode

## 11 Frequently Asked Questions FAQ

The following describes the most frequent questions and their answers System S2 Safety System.

### 11.1 *Installation*

#### 11.1.1 **How is the installation of the system in the Station?**

The S2 System features simple installation and requires the placement of the following equipment at the station: Caps, SmartBox, SmartConsole and Supervisor.

Caps should be installed in the mouths of the tanks, the SmartConsole must be installed on the forecourt in order to facilitate the operations performed by clinic staff, the SmartBox must be installed in a restricted place, along with the Supervisor.

For new stations can use the existing pipeline automation, and can coexist with other cables, provided they are intrinsically safe cables.

#### 11.1.2 **The System interferes with other station systems?**

The S2 system only changes the access caps to the tank and nothing to affect the existing delivery pipe.

### 11.2 *Communication*

#### 11.2.1 **Is it necessary that the office has dedicated connection?**

With the flexibility offered by the S2 System, the service station should not necessarily have a dedicated line, since the system can operate with ordinary dial-up lines.

In this case, the Company defines the strategy of system connection. Thus the connection can occur at set time intervals and / or the occurrence of certain important events, such as pre-selected openings, faulty operation or even until the arrival of the tanker at the station.

It is important to note that the leased lines offer a larger operation, keeping the Company informed in real time situations that occur in the station, as well as enable command operations (locking and unlocking) directly.

#### 11.2.2 **What is the occupation of the communication line?**

The S2 System monitors all the information locally making the diagnosis of all devices that are interconnected. Upon detecting an event, only the data for this occurrence are sent to Central, thereby minimizing the data traffic on the line.

In the case of dial-up lines, the information that is not activated dialing are stored and sent after the connection.

### 11.3 *Local Monitoring*

#### 11.3.1 **The Station requires an external equipment, to operate the system?**

The concept of the system S2 has all the equipment needed to perform local and remote operation of the Tour Services, not requiring any additional equipment to perform this operation. To facilitate the operation of the station in order to provide the station's management information graphically and intuitively, the S2 System should be used as a site with pages set up for operation in a simple browser.

#### 11.3.2 **How the equipment is interconnected to the Supervisor?**

By using the processing resources already in Supervisor, the requirements are smaller than a conventional system. Currently any computer with minimal performance that can operate with an Internet browser can be used.

The connection to the supervisor is accomplished through a network card and a common network cable available. If the station has a local network, the supervisor can be inserted into the local network, facilitating access to information.

## **11.4 Remote Monitoring**

### **11.4.1 What are the possibilities available for remote monitoring system?**

The concept of the S2 system provides for the use of all communication services available in the market and the possibility of incorporating new communication devices for remote data to the user wherever they are.

There are various forms of remote control and supervision of the S2 System:

#### ***Control and Monitoring Network***

The headquarters can monitor all network stations that are interconnected in the system, allowing access to central monitoring of RSP. With access to the browser, allows different departments or offices may have access to information from gas stations. Through a specific page and subsequent user login, access is available to put information online, without the need for specific software. In this case there are restrictions on certain information and control.

#### ***Operation and Monitoring via Mobile***

For mobile phones that offer the SMS service and within the coverage area of the carrier, S2 System may send a message stating the transactions or alarms (leaks, faulty operation, etc.) as the central schedule.

Also available, the uses of the URA RSP which is connected to the system and allows through a connection perform any operation (locking or unlocking) or check the tanks volume. This information is sent by voice.

#### ***Instant Messaging Services Operation***

Can be configured in Central shooting information for users with instant messaging (Messenger from Microsoft, for example) in order to warn the user also through this process.

## **11.5 Local Operation**

### **11.5.1 How is the impact on the operation of the station in case of system failure?**

The system S2 System features distributed intelligence to allow various levels of operation, without causing any interruption in the operation of the station even in multiple system failures.

A failure will not prevent the supervisor operation at the station and all the locking and unlocking operations can be performed through the SmartConsole. The operations performed after the failure of the Supervisor are stored in their own caps and are retrieved on re-entry operation of the Supervisor. The SmartConsole automatically assumes the duties of Supervisor in case of failure, not requiring any additional command.

In case of failure of SmartConsole, each cap recognizes this situation and after a predetermined time, performs an auto unlock, but keeping the record of the operation of their activities normally.

### **11.5.2 The cap operation can be performed indistinctly?**

Both the supervisor and in the entire command should SmartConsole from a registered user with valid password and the system.

The company may also assign a code and password for authorized users; you can set the user level (preventing some operations) as well as set the number of operations allowed.

Among the authorized users may be operating personnel of the station, manager of the company, and drivers.

The cancellation of access to specific users can be carried out by Central.

## **11.6 The caps can be operating together?**

The caps can be operating individually or may be part of a specific group, allowing the operation together. The caps group may be defined by the user and may be a type of product (ethanol, gasoline, etc.), by cap type (or remotely) or even by geographic location (left caps, street closures, etc.)