AUTOMATIC TRANSFER SWITCH CONTROLLER

(STXS – STXCT – STXBP – STXCTBP)

INSTALLATION AND OPERATION MANUAL

May 2011
MNA-STX-02

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1. Introduction

The controller STX allows the control of a transfer switch and a remote display of all parameters (electrical, transfer switch position and event tables). It features a color touch screen of 5.7'' which allows the user to easily access the data and to control the transfer switch locally and remotely. The simple architecture of STX fits easily in a cabinet with 2 or 4 breakers. The user simply has to connect the STX controller and install its 2 auxiliary modules. It is then ready to manage his 2 sources of power... The STX module also has a communication port ModBUS TCP / IP, which allows the user to access the ModBUS registers. These ModBUS registers are grouped into contiguous registers.

FUNCTIONALITY « WEB GATE »

The integrated "Web Gate" function allows independent access to STX from an Internet browser, no matter where the user is located in the world [1].

Trade References

- **STXS855** – controller for transfer switch (2 breakers)
- **STXBP855** – controller for transfer switch with by-pass (4 breakers)
- **STXCT855** – controller for transfer switch with closed transition (2 breakers)
- **STXCTBP855** – controller for transfer switch with closed transition and by-pass (4 breakers)

NUMERICAL DATA

Languages Available:

English French

Data Sources 1 and 2

AC Voltage (VAC) L1	Apparent Power (kVA) L1	Power Factor L1	Current (A) L1
AC Voltage (VAC) L2	Apparent Power (kVA) L2	Power Factor L2	Current (A) L2
AC Voltage (VAC) L3	Apparent Power (kVA) L3	Power Factor L3	Current (A) L3
AC Voltage (VAC) L1-2	Reactive Power (kVAr) L1	Real Power (kW) L1	kW hour exported
AC Voltage (VAC) L2-3	Reactive Power (kVAr) L2	Real Power (kW) L2	kVAr hour exported
AC Voltage (VAC) L3-1	Reactive Power (kVAr) L3	Real Power (kW) L3	Frequency (Hz)

DISPLAY ALARMS / FAULTS

Transfer fault source 1	Loss of voltage source 1	Controller not in Auto mode	Breaker fault
Transfer fault source 2	Loss of voltage source 2	Synchronization fault	

TABLE OF EVENTS

Displays the last 100 events, alarms or faults of the transfer switch.

TRENDLINE

View the trend lines of the last 30 days for the electrical data. Use the Pan / Zoom functions to find a day / moment for detailed analysis of an event or failure.

CONTROLS

Controls the transfer switch in manual mode.
Changing the time / date.

PERSONNALIZATION

Labels (names) can be assigned to sources 1 and 2 of the controller STX.
The controller STX is configurable for a single-phase and three-phases voltage.

2. Installation

The STX is a set of 4 pieces:

- 1 5,7'' touchscreen;
- 1 inputs and outputs controller;
- 2 energy meters EM21.

To use the "Web Gate" function, consider installing a 3-port switch. In addition, a stable power supply 24VCC must be available.

2.1 Basic Installation

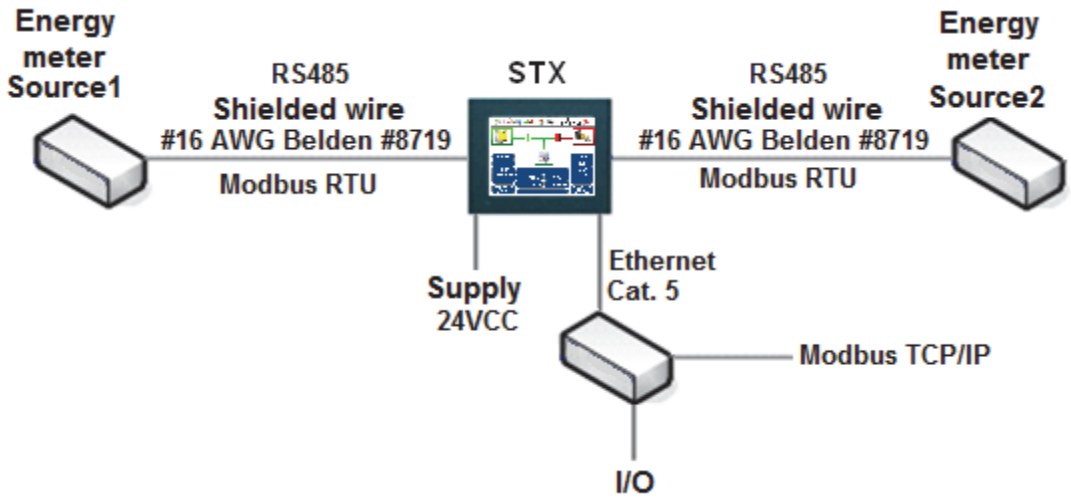


Figure 1 : Basic Installation

If the STX is directly supplied by the batteries of the generator, you should add a voltage converter 24VCC/24VCC that can regulate the output voltage to 24VCC when the generator starts. Adding the converter will avoid the STX to reboot every time you start the generator. For an ideal installation, add a stable voltage source of 24VCC.

Ethernet link between the touchscreen and the controller must be done with a Category 5e crossover cable.

2.2 Complete installation with the "Web Gate"

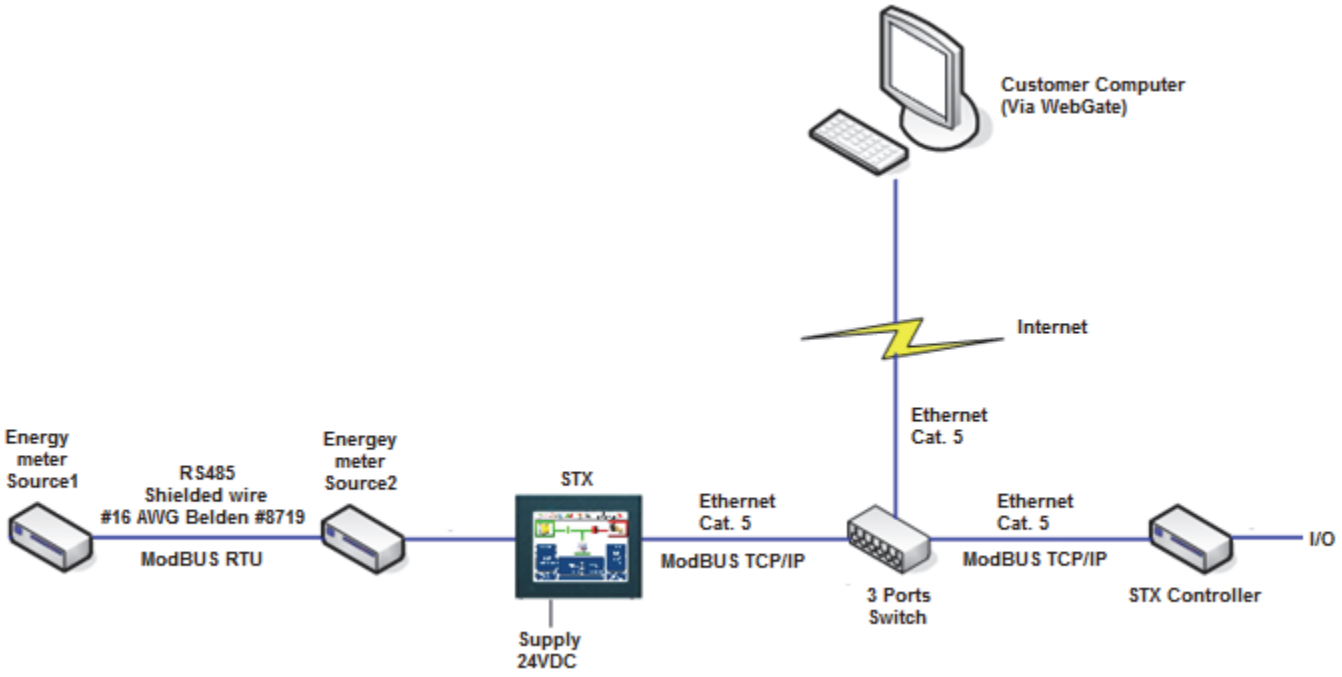


Figure 2 : Complete Installation

If the STX is directly supplied by the batteries of the generator, you should add a voltage converter 24VCC/24VCC that can regulate the output voltage to 24VCC when the generator starts. Adding the converter will avoid the STX to reboot every time you start the generator. For an ideal installation, add a stable voltage source of 24VCC.

Ethernet link between the touchscreen and the controller must be done with a Category 5e crossover cable.

2.3 Installation on an Enclosure

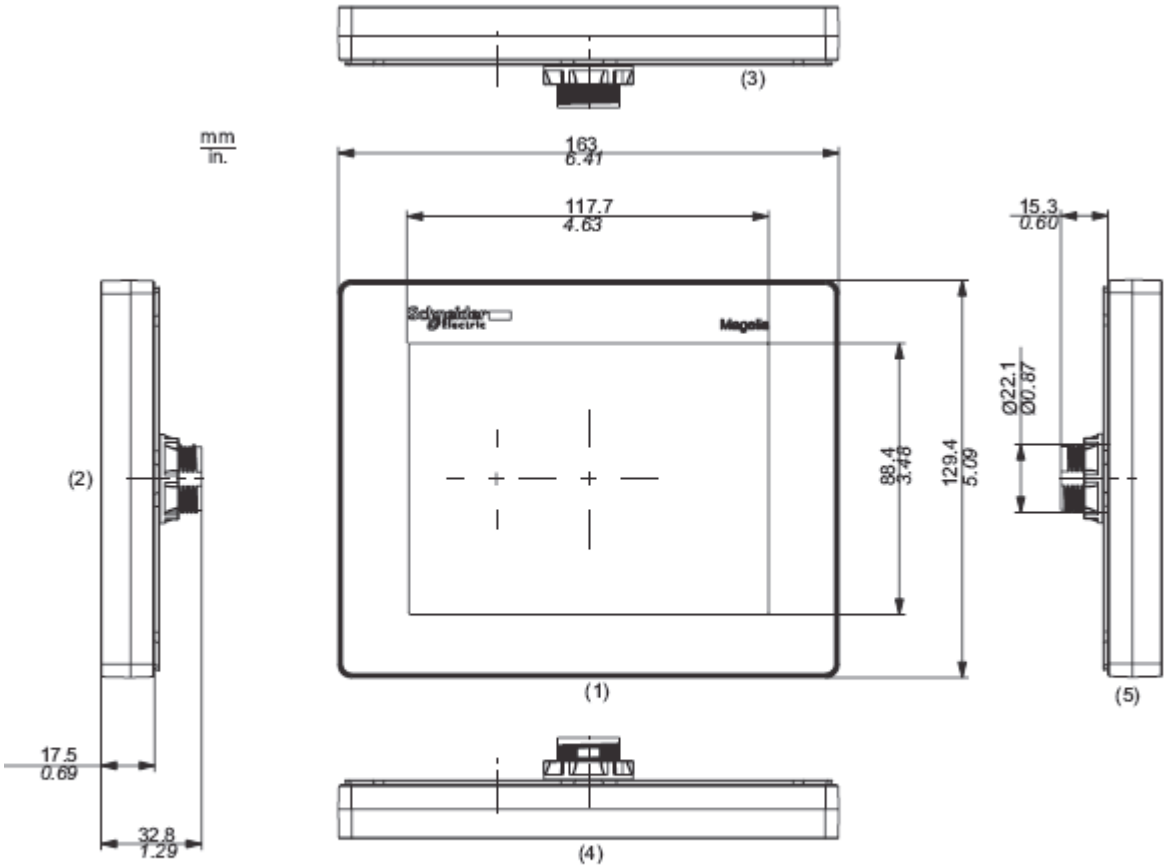


Figure 3 : Touchscreen dimensions

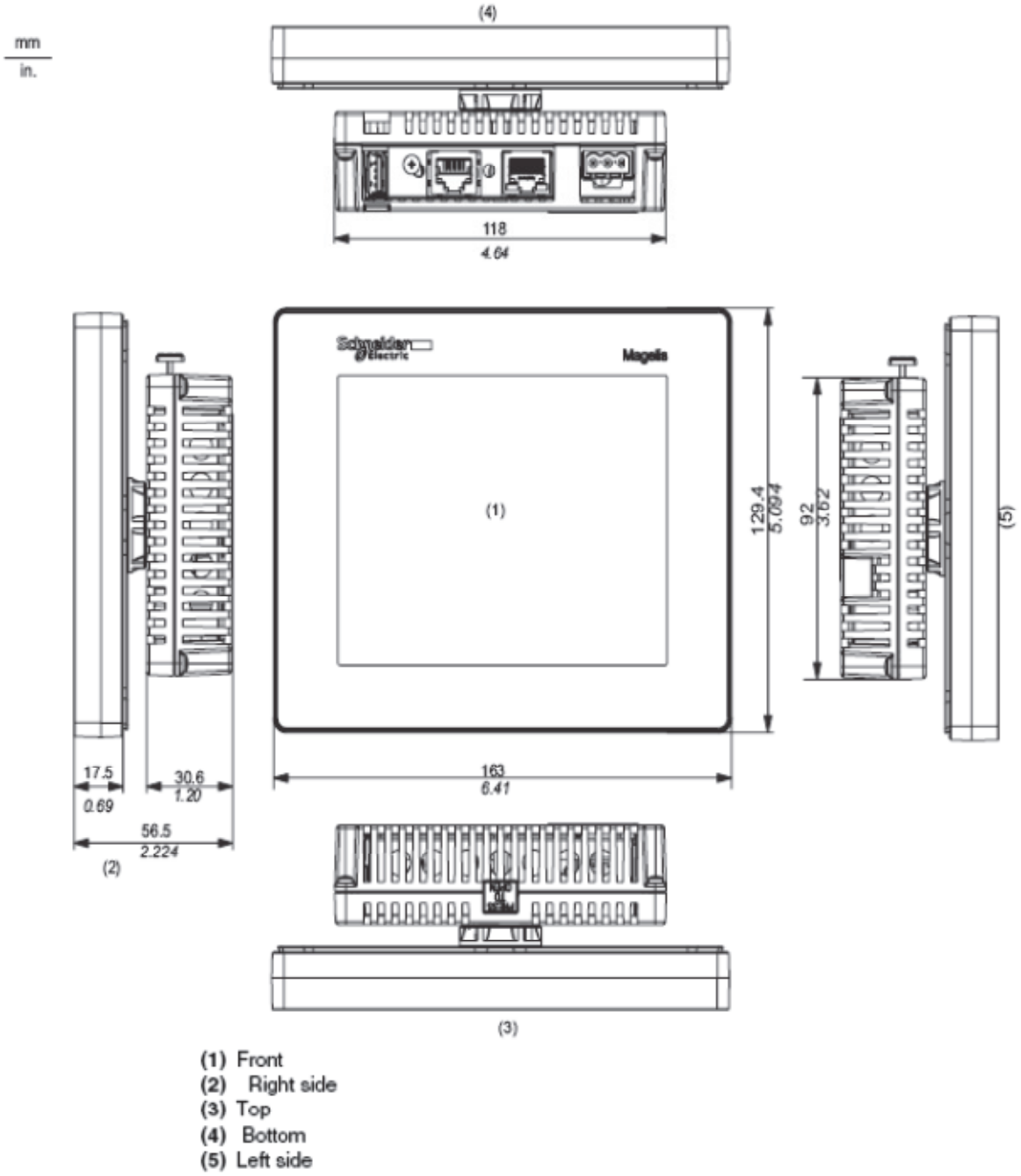
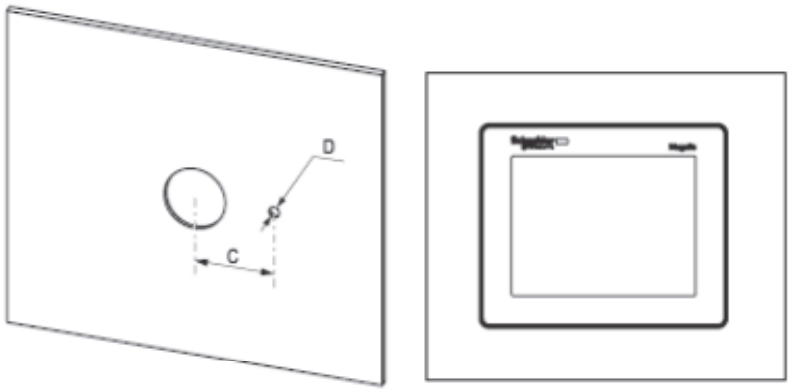


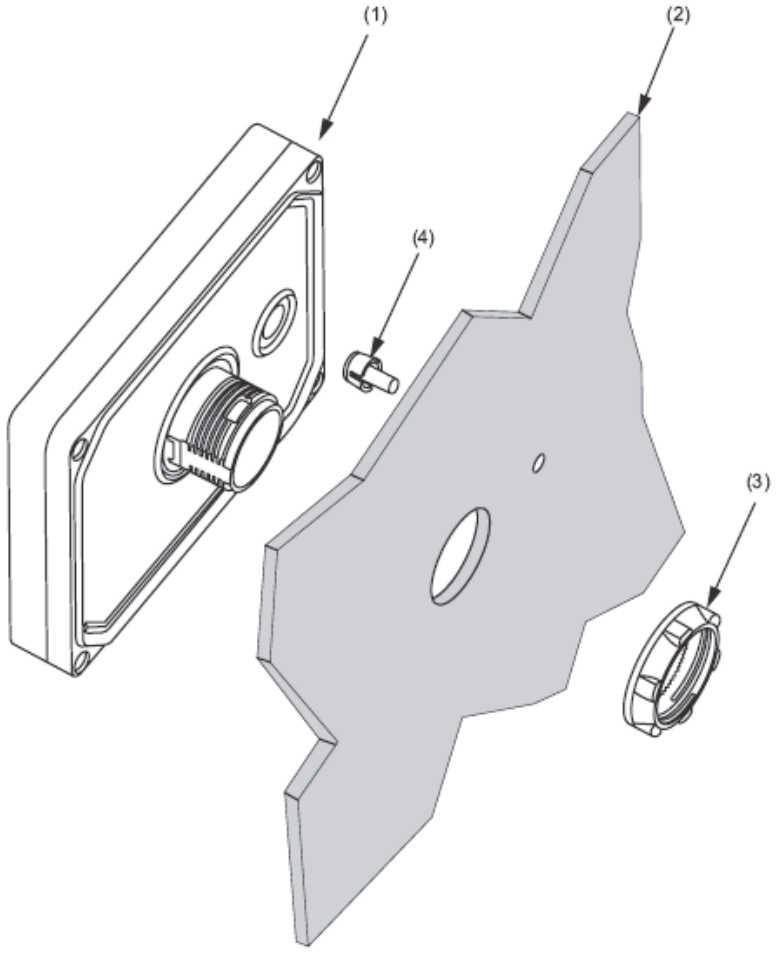
Figure 4 : Dimensions of the entire touchscreen



Dimensions

Unit	C (mm)	C (in.)	D (mm)	D (in.)
HMI STU 655/855	+0 30.00 -0.20	+0 1.18 -0.007	+0 4.00 -0.20	+0 0.15 -0.007

Figure 5 : Drilling for fixing the touchscreen



(1) Display module
(2) Support
(3) Nut
(4) Tee

Figure 6 : Installation of the touchscreen

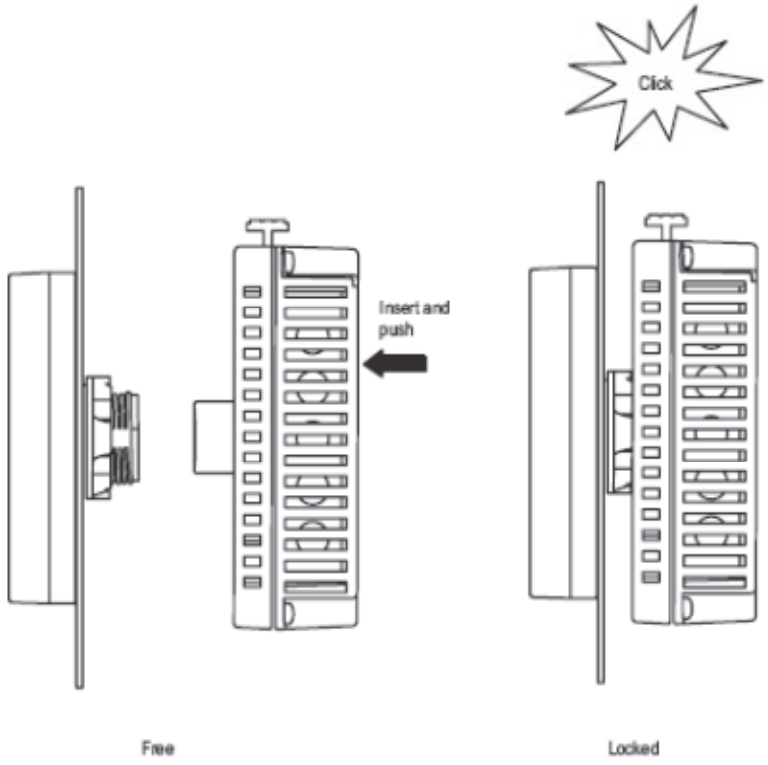


Figure 7 : Inserting the Module Behind the Touchscreen

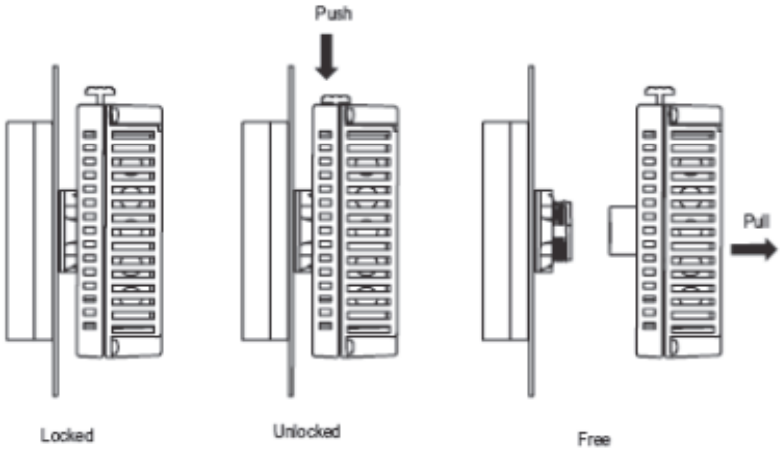
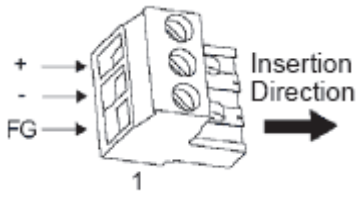


Figure 8 : Remove the rear module of the touchscreen

2.4 Connecting the Power Cord



Connection	Wire
+	24 V
-	0 V
FG	Grounded terminal connected to the unit chassis.

Figure 9 : Power Cord

The following table describes the steps for connecting the power plug:

Step	Action
1	Remove the power cord from the power supply.
2	Remove the power plug from unit.
3	Remove 7 mm (.28 in.) of the vinyl cover of each of the power cord's wires.
4	If using stranded wire, twist the ends. Tinning the ends with solder reduces risk of fraying and ensures good electrical transfer.
5	Connect the wires to the power plug by using flat-blade screwdriver (Size 0.6 X 3.5)
6	Torque the mounting screws: 0.5 to 0.6 nm (5 to 7 lb-in)
7	Replace the power plug to the power connector.

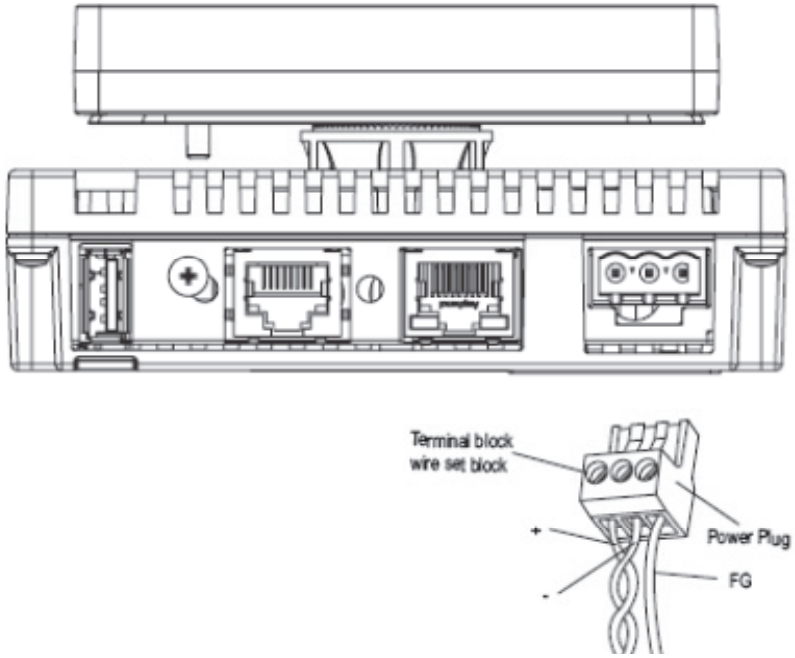


Figure 10 : Connecting the power cable to the touchscreen

2.5 Cable Connector RJ45

The following illustrations show the location of the cable connectors RJ45:

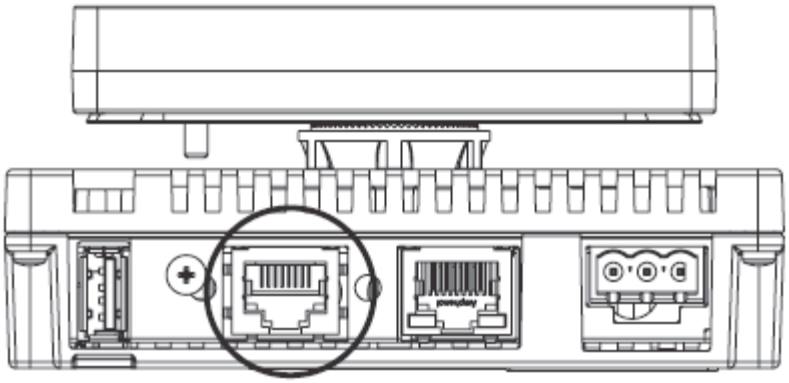


Figure 11 : Connector Ethernet RJ45 for controller

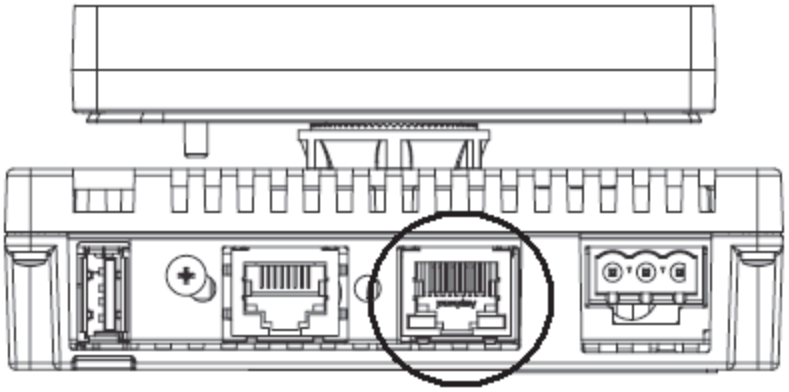


Figure 12 : Connector RJ45 for communication RS485 towards display modules

The diagram below shows the connection required to connect the RS485 port.

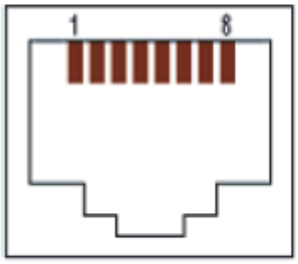
Pin Connection	Pin	Signal Name	Direction	Meaning
Front 	1	Not connected	-	-
	2	Not connected	-	-
	3	Not connected	-	-
	4	D1	Output/Input	Transfer Data (RS485)
	5	D0	Output/Input	Transfer Data (RS485)
	6	RTS	Output	Request To Send
	7	Not connected	-	-
	8	SG	-	Signal Ground

Figure 13 : RJ45 Port for the COM1 towards the energy meters

2.6 Dimensions of the Energy Meters EM21

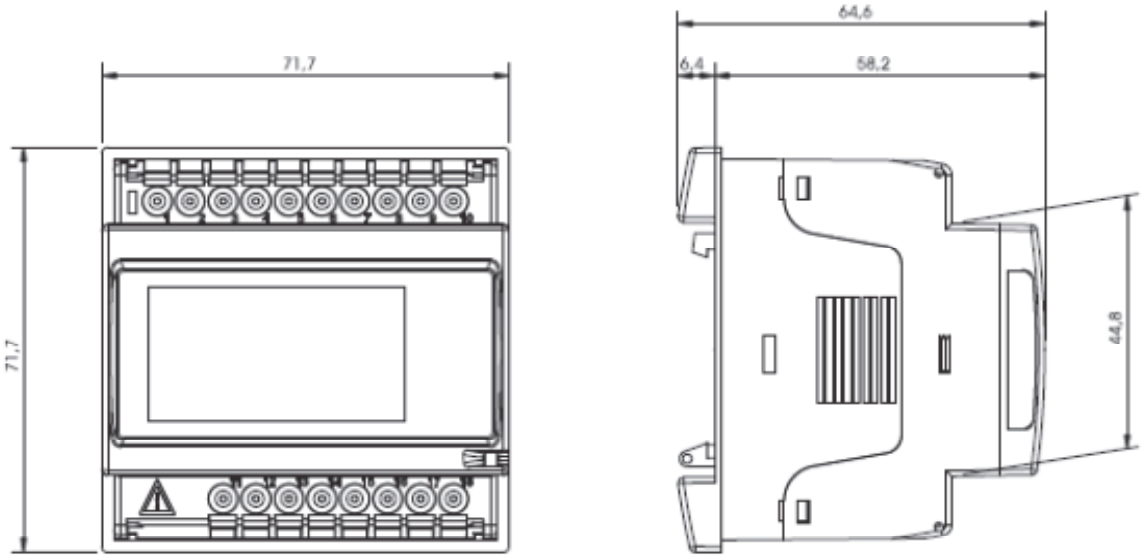
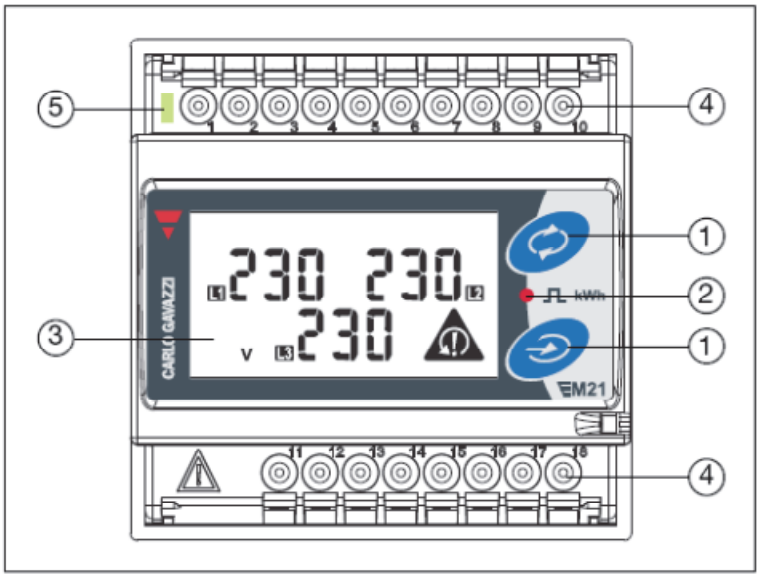


Figure 14 : Dimensions of the energy meters EM21

2.7 Energy Meters Front Display Function



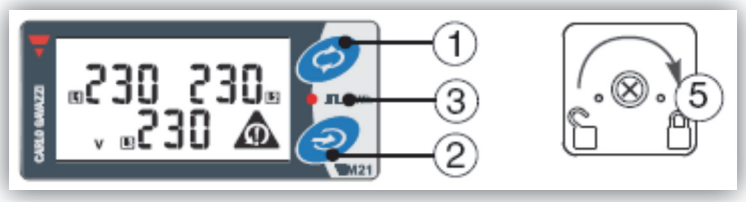
1. **Keypad**
   To program the configuration parameters and scroll the variables on the display.
2. **Pulse output LED**
   Red LED blinking proportional to the energy being measured.
3. **Display**
   LCD-type with alphanumeric indications to display all the measured variables.
4. **Connections**
   Screw terminal blocks for instrument wiring.
5. **Green LED**
   Lit when power supply is available

Figure 15 : Energy Meters Front Display Function

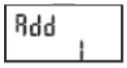
2.8 Configuring the Communication Port of the Energy Meters EM21

The communication port of the energy meters should be configured on the same basis as the touchscreen (i.e. using the same parameters).

Communication Speed : 9600 baud
Parity: None
Slave Address energy meter source 1: 1
Slave Address energy meter source 2: 2

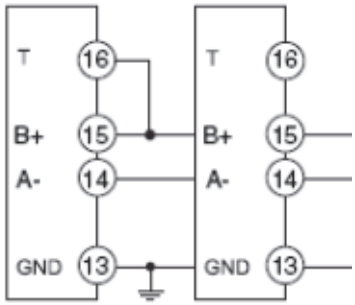


To configure the ModBUS address of the energy meters starting from the main menu, the user must follow the following steps:

1. Make sure that the screw illustrated on image 5 is in the unlock position;
2. Press and hold the #2 key for 3 seconds;
3. Press the #1 key 8 times. You will see this screen: 

4. Press the #2 key to enter the menu;
5. Press the #1 key to scroll through the values of the addresses;
6. Press the #2 key for 3 seconds to save the value and exit the menu;
7. Press the #1 key until you see this screen : 

8. Press the #2 key to return to the measurement menu.

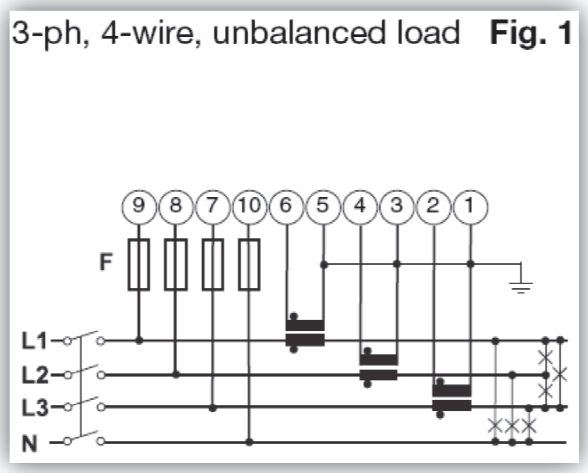


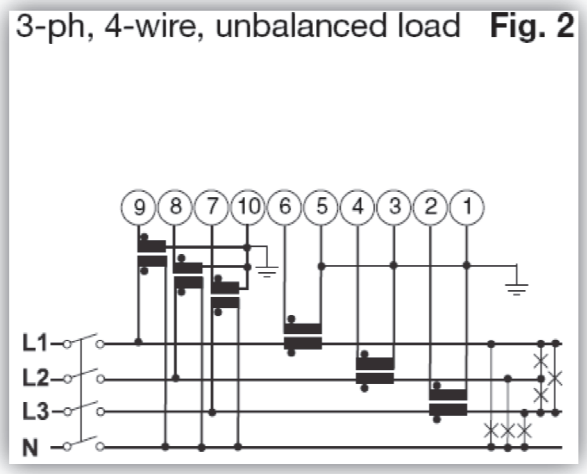
Here is the connection required in order for the energy meters and the STX to communicate together. Only the terminals 13-14-15 should be connected to the touchscreen STX.

* For more information about the energy meters EM21, please see the document EM2172DDS by Carlo Gavazzi.

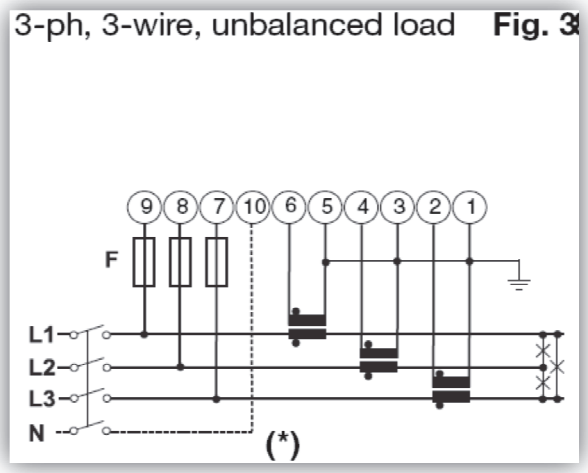
2.9 Possible Connexions for the Energy Meters EM21

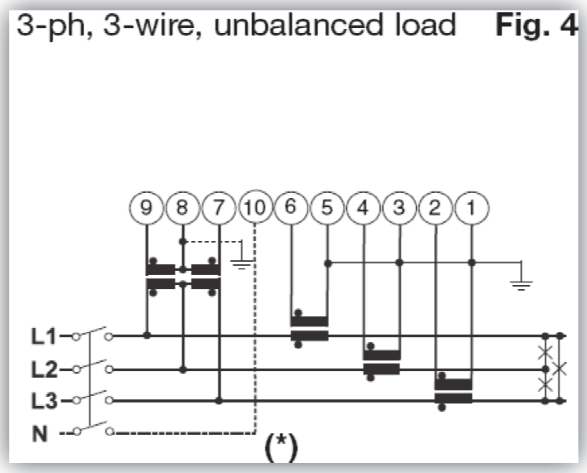
Here are the possible diagrams for connecting the energy meters:

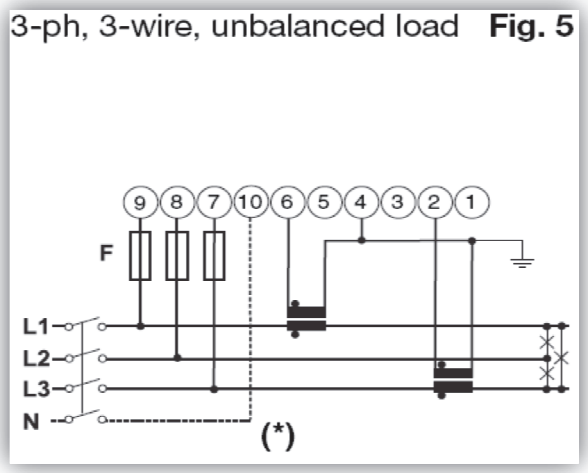


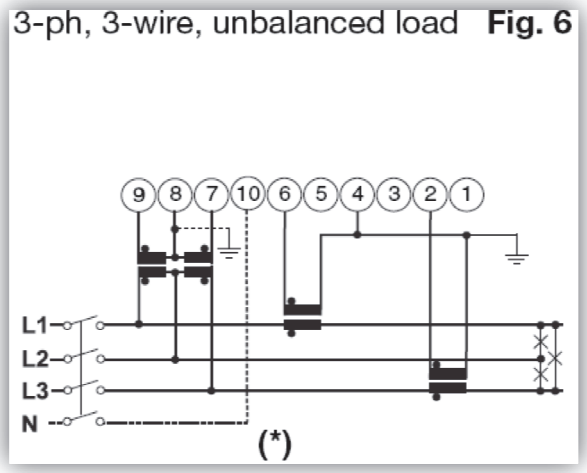


Configuration: 3P.n

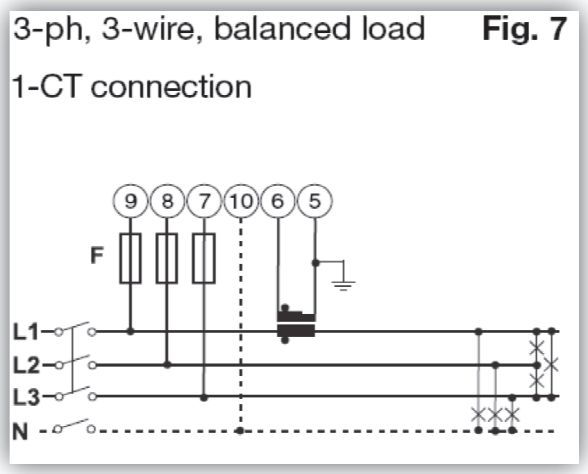


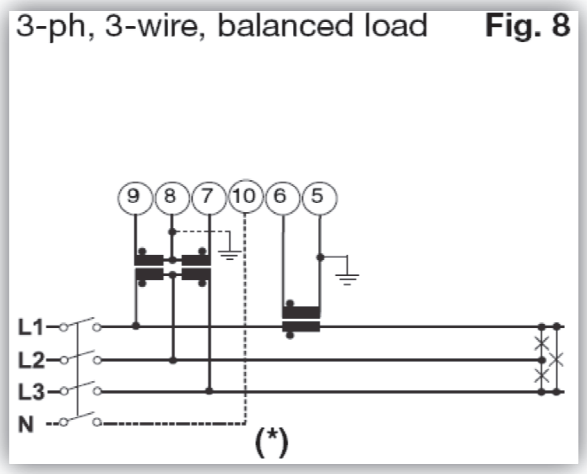




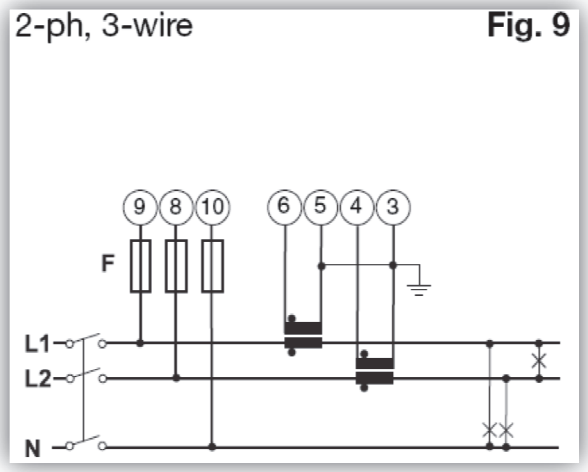


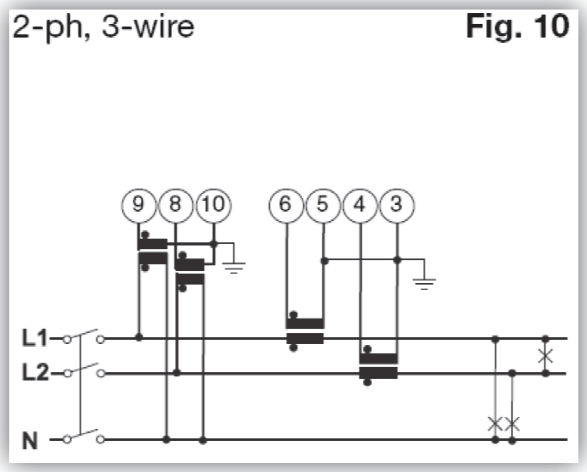
Configuration : 3P



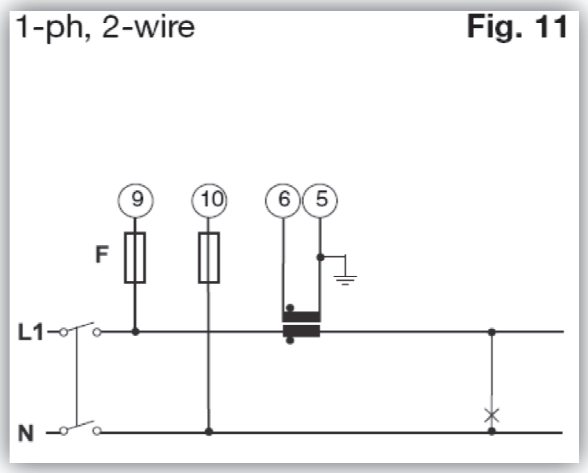


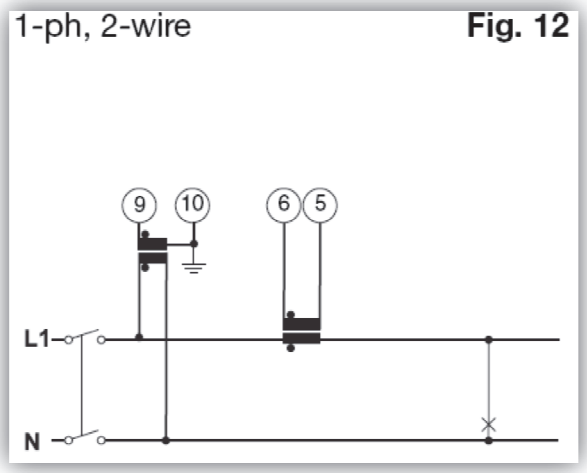
Configuration: 3P.1





Configuration : 2 Phases





Configuration : 1 Phase

* For proper supply of the instrument, the neutral must always be connected.
** For more information about the energy meters EM21, please see the document EM2172DDs by Carlo Gavazzi.
The user must configure the STX according to the connection type selected.

2.10 Configuring the Communication Port of the STX

WARNING !

The communication port of STX is already configured at the factory for optimal use. It should not be changed unless the transfer switch is integrated to a network.
Changing the IP address of the components may affect the operation of your controller STX. The user must take precautions before you change the IP addresses of the transfer switch controller.

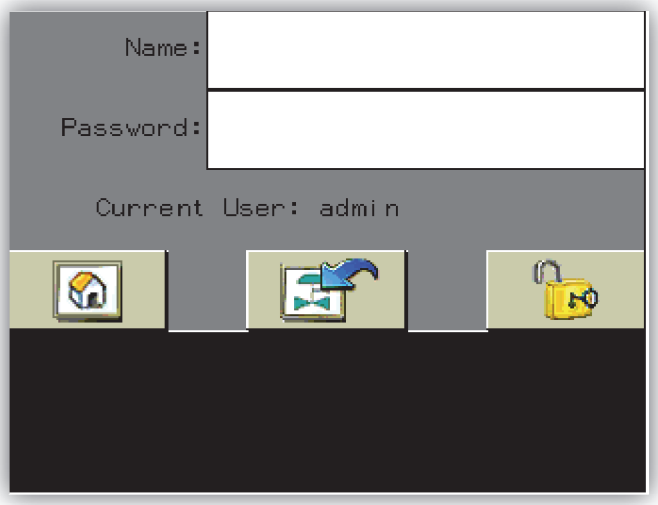
To configure the communication port of the STX, press the **Screen Adjustments** 

in the main menu.

The STX asks the user for a password. Enter the username and password below:
Name : admin
Password : stx

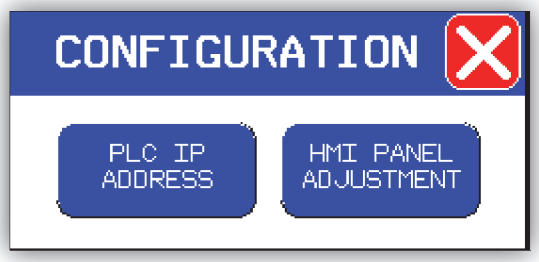
Once it is completed, press the icon  to validate your password. Subsequently, press the icon:

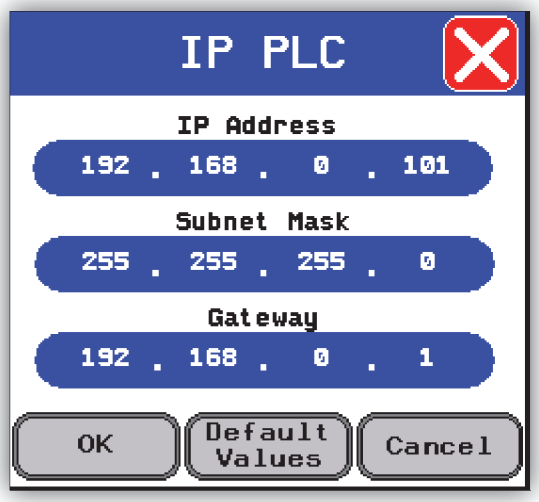
	To exit the password menu and return to the main menu
	To exit the password menu and return to the previous page



When the password is validated, return to the **Screen Adjustments** section 

the main menu and the following page will appear. The configuration of the communication with the inputs and outputs controller can be changed in the **PLC IPAddress** section.

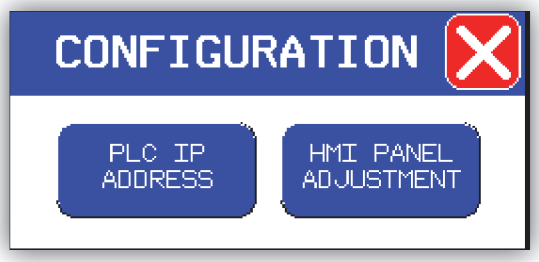




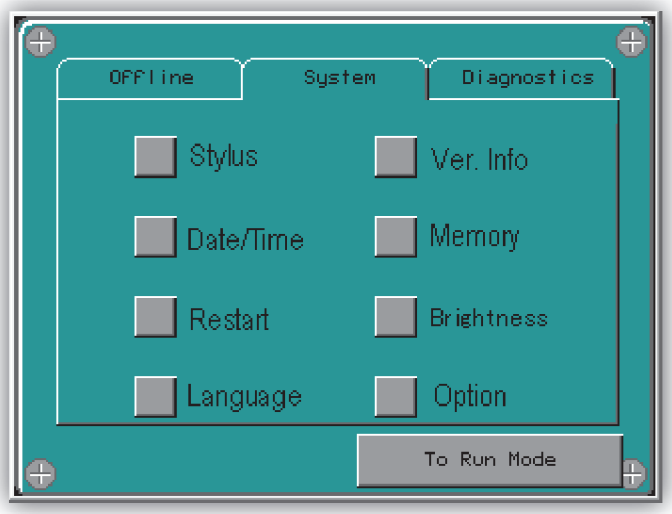
The default IP address of the PLC gateway is: 192.168.0.101.

When the IP address of the PLC is changed, it is possible that the communication between the screen and the PLC does not work anymore. You can then return to the **Screen Adjustments** 

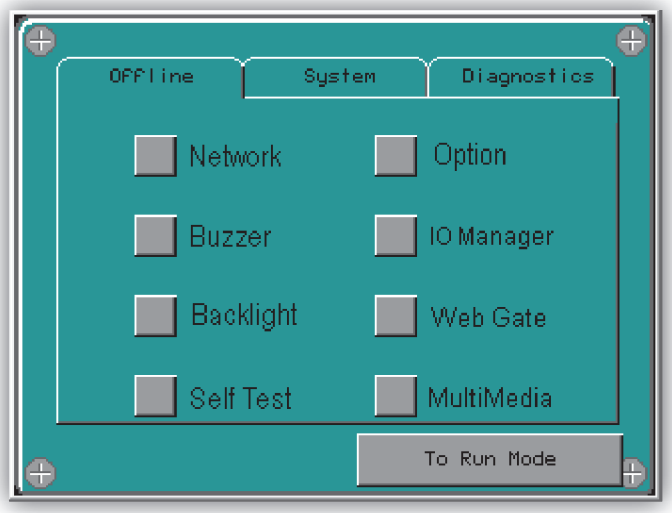
section of the main menu and the following page will appear:



Press the icon **IHM Adjustment Panel** and the following page will appear:



To edit the communications settings, press the **Offline** button.



The **Network** page allows the user to set the network configuration of STX. The default settings are:
IP Adress: 192.168.0.100
Subnet Mask : 255.255.255.0
Default Gateway: 192.168.0.1
The user can change the settings above to integrate the STX module to his network.

2.11 Configuration of the « Web Gate » Function

The configuration of the "Web Gate" function is done exactly when IP address of the STX is being set. The default IP address of the "Web Gate" is: 192.168.0.100. **Caution: When using the "Web Gate" function, please make sure that the communication port 6000 of your network is unlocked in order to allow the user to access the contents of the STX. Should you require more details, check with your network administrator.**

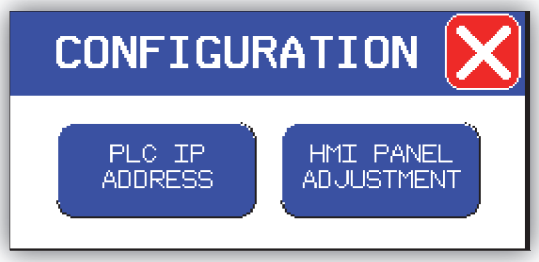
2.12 Connecting the RS485 (COM1) port

The RS485 (COM1) port is available to read the ModBUS data of the energy meter source 1 and source 2.

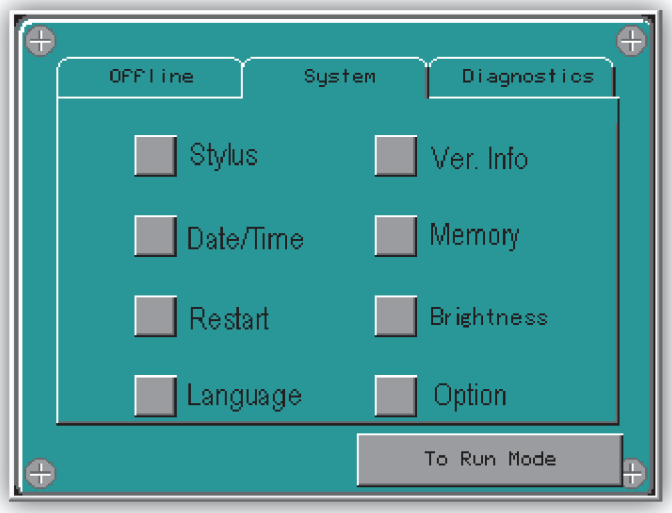
The configuration of the RS485 port is the following:
Communication Speed: 9600 baud
Parity: None

To change the configuration of the RS485 port, press the icon **Screen Adjustments** 

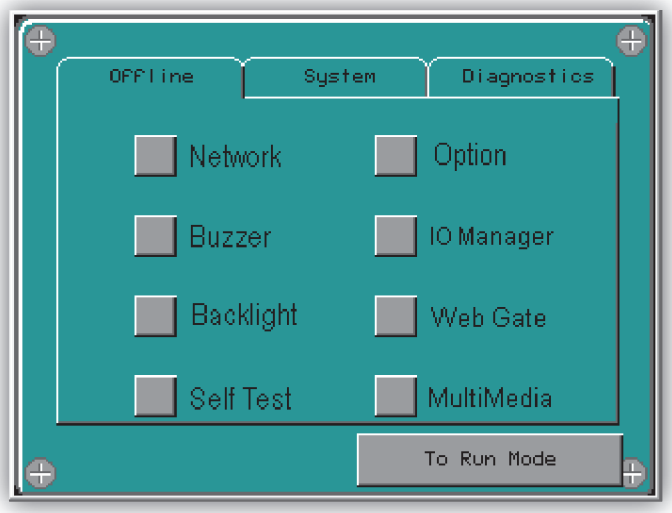
on the main menu and the following page will appear.



Press the icon **HMI Panel Adjustment** and the following page will appear.



To edit the communications settings, press the **Offline** tab.



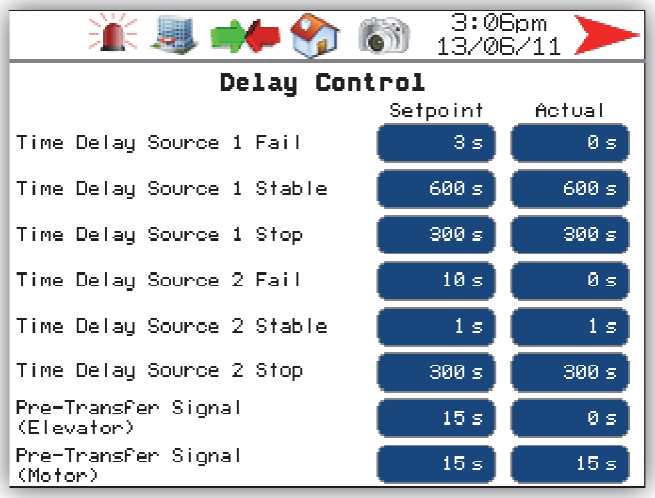
Subsequently, press the **I / O Manager** and a new page will appear.
Press **Configure Equipment**.
Select from the dropdown menu the **ModBUS RTU** equipment and make changes to the communication port if necessary.
Note that the configuration of the communication port COM1 RS485 is already set at the factory to communicate with the energy meter of sources 1 and 2.

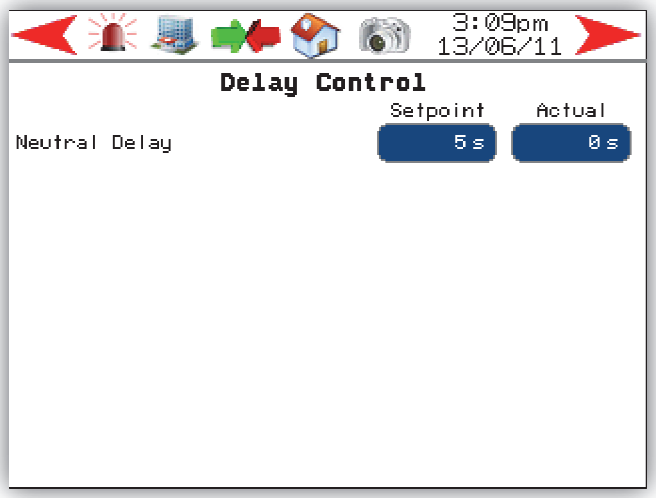
3. Configuration of the Controller

From the main menu, press the **System Settings** .

3.1 Delay Control

The first and second pages of the system parameters provide access to all the configurable delays of the transfer switch. In these pages, you can configure and view the present values.



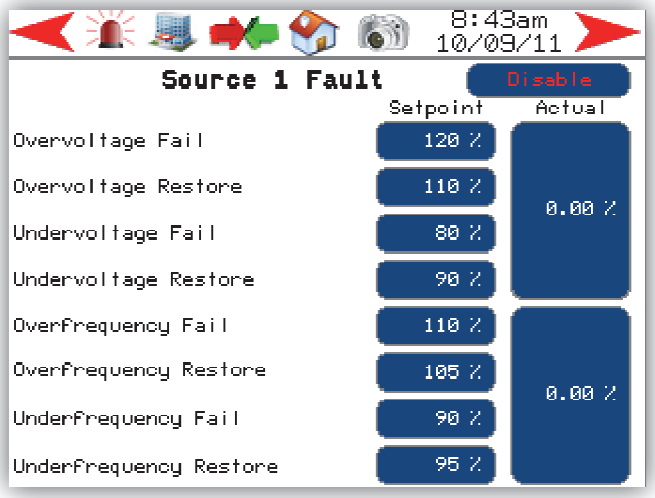


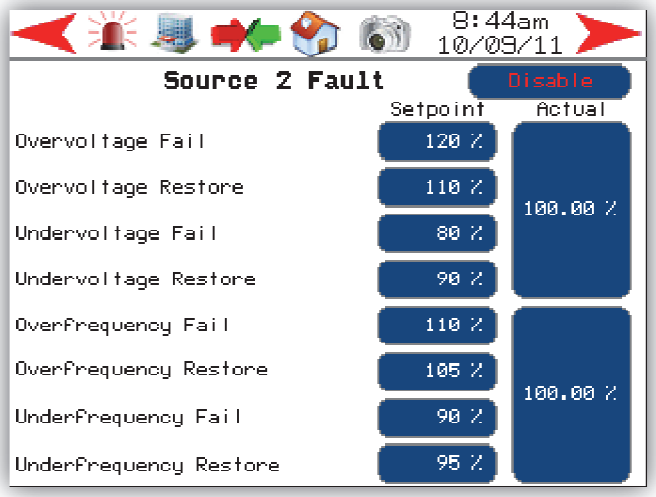
Time Delay Source 1 Fail	Time it takes to filter the faults. If the fault is shorter than this delay, no transfer will occur. However, if the fault is longer than this delay, the fault will be recorded and will cause a transfer.
Time Delay Source 1 Stable	Time to filter the return of voltage. If the return of the source 1 is shorter than this delay, the transfer switch will not transfer the load on the source 1. However, if the return of the source 1 is longer than this delay, the transfer process to source 1 will be initiated.
Time Delay Source 1 Stop	Cooldown time used if a generator is used as source 1. This delay begins once the load is supplied by source 2. The generator runs until the delay has elapsed.
Pre-Transfer Signal (Elevator)	Delay which is activated when the time delay of stability is completed and the transfer switch must transfer its source. The output Pre-Transfer (Elevator) and the delay Pre-Transfer (Elevator) are activated. The delay for Pre-Transfer (Elevator) must be over before the system can transfer. The output Pre-Transfer (Elevator) is disabled when the system has transferred the source.
Pre-Transfer Signal (Motor)	Delay which is activated when the Pre-Transfer (Elevator) is completed and the transfer switch has transferred the source. The output Pre-Transfer (Motor disconnect) and the delay for Pre-Transfer (Motor) are activated. The delay for Pre-Transfer (Motor) begins when the system has transferred the source. The output Pre-Transfer (Motor disconnect) is disabled when the delay Pre-Transfer (Motor) is completed.
Neutral Delay	Delay active when the charge is no longer supplied. Once this delay has elapsed, the transfer of source is activated.

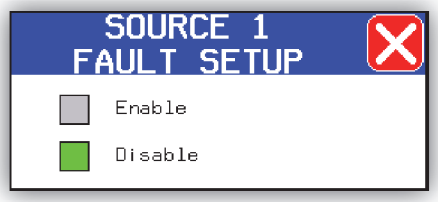
3.2 Characteristics of voltage

The third and fourth pages of the system parameters provide access to all levels of default voltage of the automatic transfer switch. In these pages, you can configure and view the present status of the voltage. The protection on the voltage of sources 1 and 2 can be enabled or disabled independently.

It is advisable to disable the voltage faults on the generator (by default, the source 2).





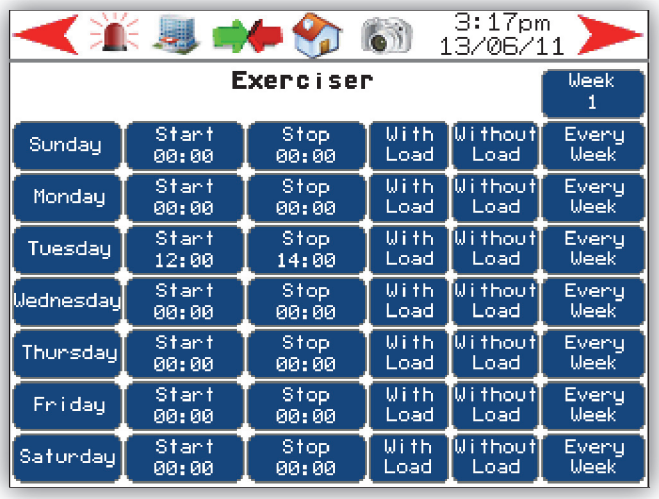
Enable / Disable	The user can enable or disable the faults from the energy meter. 
Overvoltage Fail	If the voltage value exceeds the setpoint, it will cause an overvoltage fault and the load will then be transferred.
Overvoltage Restore	If the voltage value is restored under the setpoint, the overvoltage fail will be canceled. The retransfer of the load will then be made.
Undervoltage Fail	If the voltage value is below the setpoint, it will cause an undervoltage fail and the load will be transferred.
Undervoltage Restore	If the voltage value exceeds the setpoint, the undervoltage will be canceled. The retransfer of the load will then be made.
Overfrequency Fail	If the frequency value exceeds the setpoint, it will cause an overfrequency fault and the load will be transferred.
Overfrequency Restore	If the frequency value is restored under the setpoint, the overfrequency will be canceled. The retransfer of the load will then be made.
Underfrequency Fail	If the frequency value is below the setpoint, it will cause an underfrequency fail and the load will be transferred.
Underfrequency Restore	If the frequency value exceeds the setpoint, the underfrequency will be canceled. The retransfer of the load will then be made.

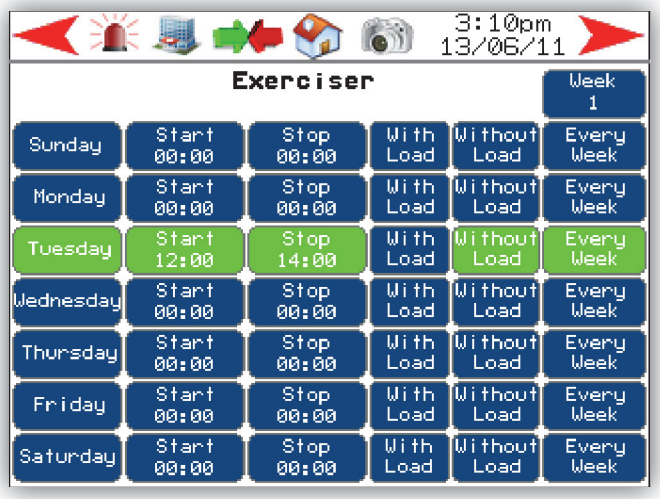
3.3 Exerciser

The fifth page of the system parameter provides access to the exerciser of the automatic transfer switch. In these pages, you can configure and view the present status of the exerciser. The exerciser is configured for a 12-week period. The user must select the test according to the following parameters:

- Day of the week;
- Start time;
- End time;
- With or without load;
- Weekly, bi-monthly, every three weeks, monthly.

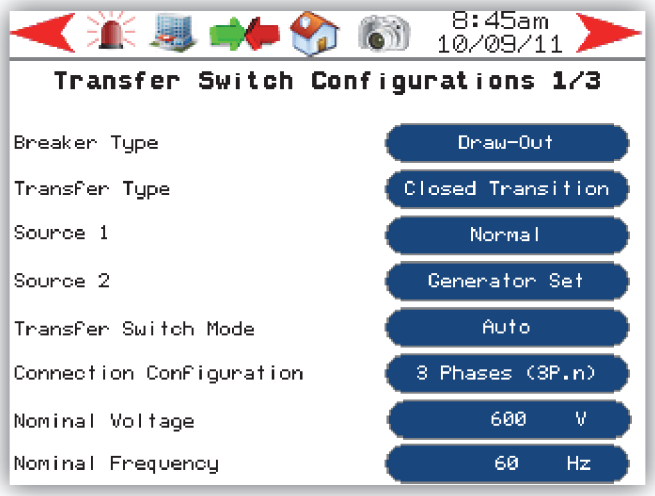
Once the exerciser is configured, your settings become green. Once the exerciser starts its test, the configurations involved will flash. It is impossible to change the parameters of the exerciser when it works. When tested with loads, the transfer switch will transfer the loads to the source 2. At the end of the test the charge will be transferred to source 1. Transfers will be done according to the type of transfer that has been selected: closed transition, open transition. For models STXS and STXBP, the only transition available is the open one.

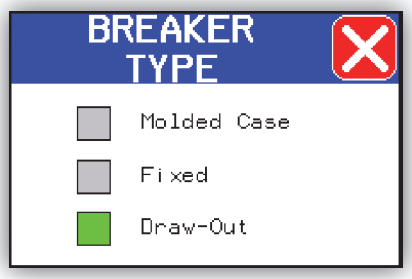
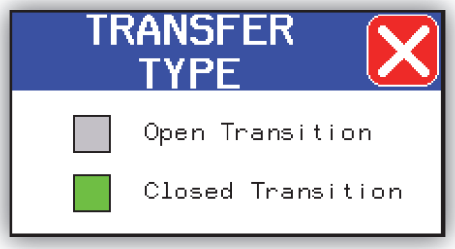
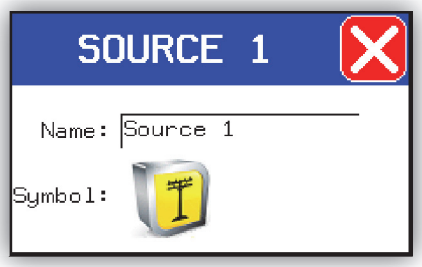


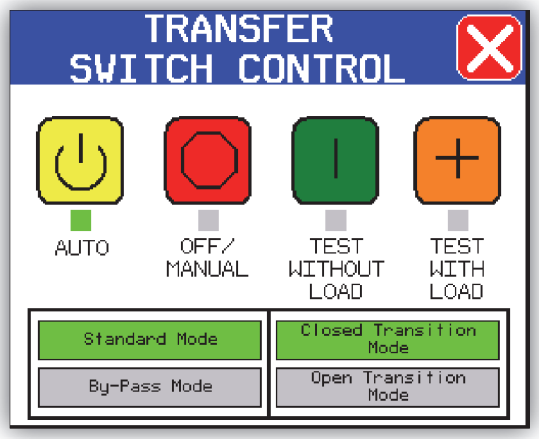


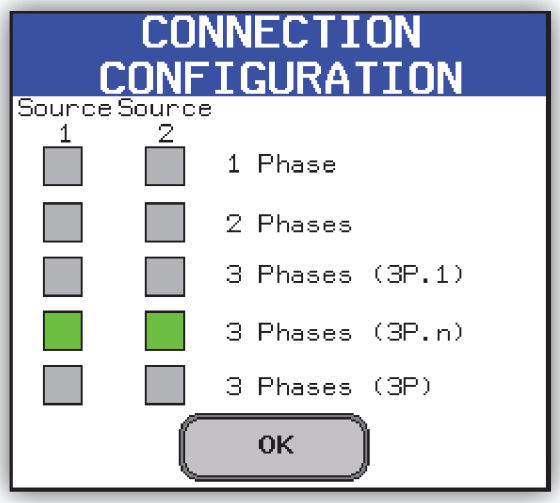
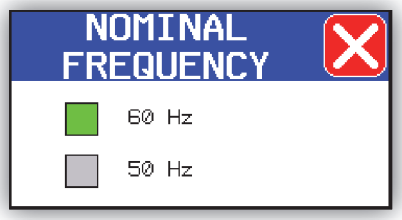
3.4 Configurations of the Transfer Switch

The sixth page of the system parameters provides access to the **transfer switch configuration**.



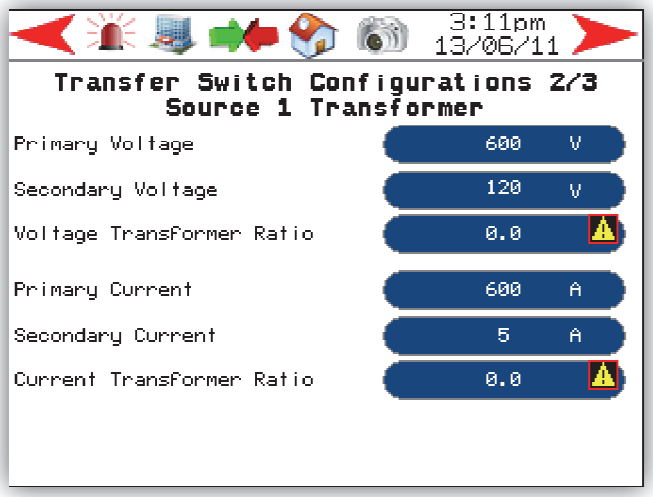
Breaker Type	Choose the breaker type corresponding to your transfer switch.	
Transfer Type	Choose the transfer type desired. **<u>Open Transition:</u>** The breakers source 1 and source 2 will be opened simultaneously during a transfer. **<u>Transition Closed:</u>** The breakers source 1 and source 2 will be closed simultaneously for up to 500ms during a transfer.	
Source 1	Write down the name of the source 1. Choose the symbol of the source 1. **Warning: The generator symbol is used to manage the automatic start-up of the generator.**	
Source 2	Write down the name of the source 2. Choose the symbol of the source 2.	

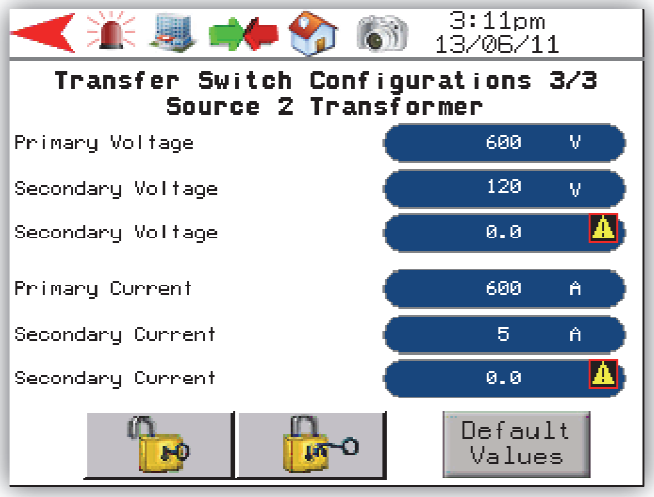
	Warning: The generator symbol is used to manage the automatic start-up of the generator. 
Transfer Switch Control	**Auto :** * This is the default mode of the transfer switch. The user must leave the transfer switch to auto mode at all time in order for it to operate normally.  **Off / Manuel :** * The user must use this mode to do maintenance on the transfer switch. In this mode, the user can open and close the breakers of source 1 and source 2. If a loss of source 1 occurs, the transfer switch will not operate. **Test Without Load:** * The user must use this mode in order to start the generators. The user must reset the transfer switch to auto mode in order to stop the test without load. If a loss of source 1 occurs, the transfer switch will transfer the load on source 2. When the voltage of source 1 comes back, the transfer switch will retransfer the load on source 1 and continue the test without load. **Test With Load:** * The user must use this mode to start the generators and transfer the loads from source 1 to source 2. The user must set the transfer switch to auto mode in order to stop the test with load. If a loss of source 1 occurs when the load has been transferred to source 2, the transfer switch will keep the load on source 2. When the voltage of source 1 comes back, the transfer switch will continue to supply the load by using source 2 until the end of the test with load. **Standard Mode :** The transfer switch will use the normal breakers of source 1 and source 2 to make the transfers. **By-Pass Mode :** The transfer switch will use the by-pass breakers of source 1 and source 2 to make the transfers. **Closed Transition Mode :** The breakers source 1 and source 2 will be closed simultaneously for up to 500ms during a transfer. **Open Transition Mode:** Breakers of source 1 and source 2 will be open simultaneously during a transfer. *** See Section 6 for a detailed sequence of operation.**

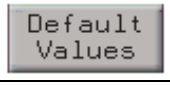
Connection Configuration	Source 1 and source 2 must be configured the same way otherwise the transfer switch will be in error. See section 2.9 to identify the different types of energy meter connections. 
Nominal Voltage	The user must select the operating voltage of the automatic transfer switch.
Nominal Frequency	The user must select the operating frequency of the automatic transfer switch. 

3.5 Transfer Switch Configuration – Transformer

The seventh and eighth pages of the system parameters provide access to the programming of the **transformers ratios** for the energy meters of source 1 and source 2.

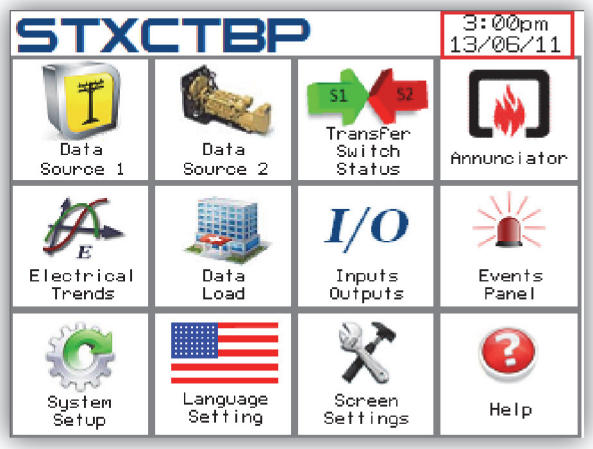




Primary Voltage	The user must select the primary voltage of the voltage transformers.
Secondary Voltage	The user must choose the secondary voltage of the voltage transformers. **The maximum input voltage of the energy meters is 120V_{LN}\230V_{LL}.**
Voltage Transformer Ratio	The controller automatically calculates this ratio.
Primary Current	The user must select the primary current of the current transformers.
Secondary Current	The user must choose the secondary current of the current transformers. **The maximum input current of the energy meters is 5A.**
Current Transformer Ratio	The controller automatically calculates this ratio.
	Provides access to the configuration and control of the display panel. Enter the username and password below: **Username : admin** **Passwrod : stx**
	Secures the screen and limits access to the configuration and control of the screen.
	Resets to the default values of the STX.

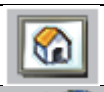
4. Setting the Date and Time

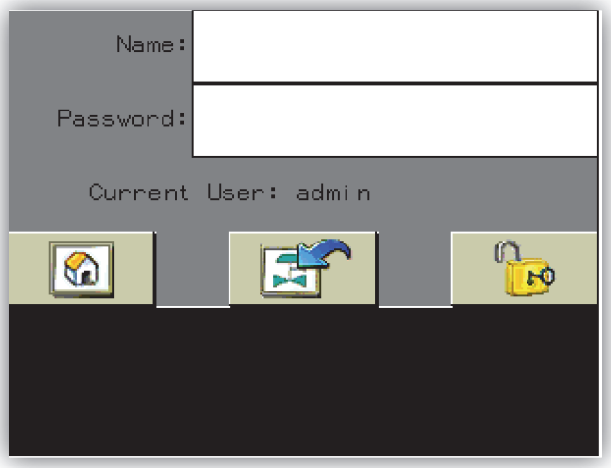
It is possible for the user to configure the date and time of the STX by pressing date and/or time on the upper right corner of the screen. The system will then ask the user for a password.



Enter the username and password below:
Name: admin
Password: stx

When completed, press the icon  to validate your password. Subsequently, press the icon:

	To exit password menu and return to the main menu.
	To exit password and return to the previous page.



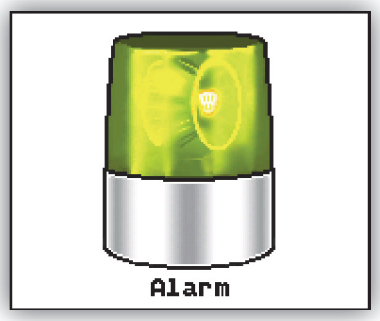
By pushing again on the date and/or time, the user can set the date and time. Enter the desired values and press OK when finished. The date and time are updated in the STX.

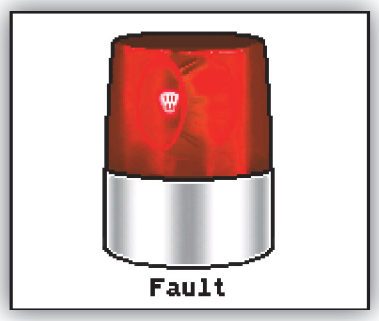
5. Pages Description

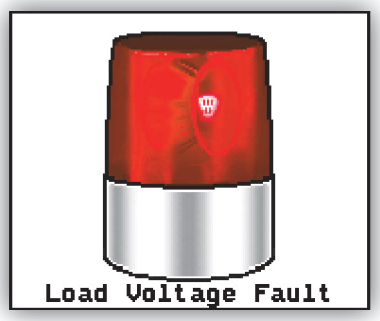
5.1 Communication Fail

	When a communication fail is detected between the STX screen and the controller, the STX module displays a disconnected cable. The user must ensure that the communication settings are adjusted on the STX and the controller. Make sure the Ethernet cable is well connected.
	When a communication fail is detected between the STX screen and the energy meter of the source 1, the STX module displays an unplugged cable. The user must ensure that the communication settings are well adjusted on the STX and the energy meter of the source 1. Check that the RS485 cable is well connected.
	When a communication fail is detected between the STX screen and energy meter of the source 2, the STX module displays an unplugged cable. The user must ensure that the communication settings are well adjusted on the STX and the energy meter of the source 2. Check that the RS485 cable is well connected.

5.2 Strobe







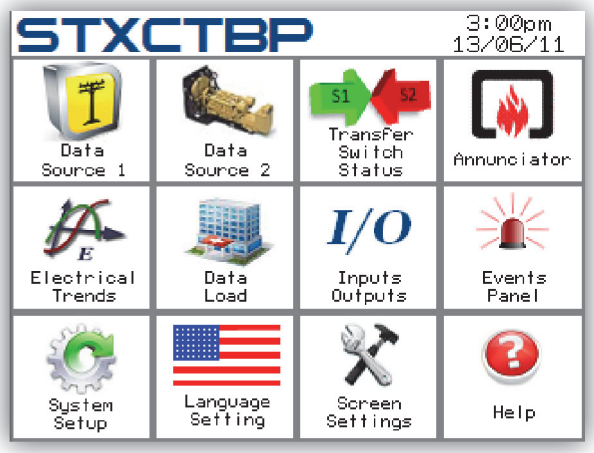
The yellow strobe displays an alarm.
The red strobe displays a fault.

The strobes are displayed in the following conditions:

- When no alarm or fault is present on the STX
- When no new alarm or fault appears on the STX.

5.3 Main Menu

The main menu allows the user to quickly access its different pages.



Data Source 1	Displays the first page of electrical data from source 1.	I/O Inputs Outputs	Displays the status of inputs and outputs of the controller STX.
Data Source 2	Displays the first page of electrical data from source 2.	Events Panel	Displays the panel of alarms and events of the STX.
S1 S2 Transfer Switch Status	Displays the first page of the transfer switch status.	System Setup	Displays the first page of the system parameters.
Annunciator	Displays the first page of the annunciator. The annunciator provides a quick overview of the various alarms and faults.	Language Setting	Displays the selection of languages.
Electrical Trends	Displays the first page of electrical trends. Electrical trends allow the user to visualize the electrical behavior of the generator.	Screen Settings	Displays the touchscreen settings.
Data Load	Displays the first page of electrical data of the load.	Help	Displays the first page of the help section.

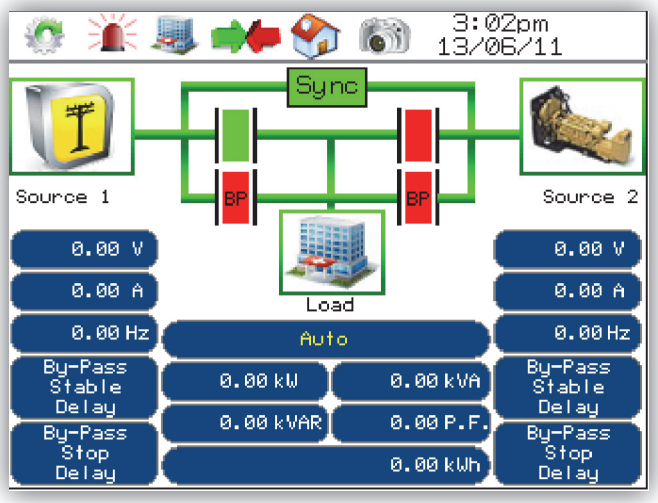
5.4 Navigation Bar

The navigation bar allows the user to quickly access its different pages.

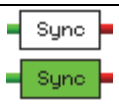
	Used to navigate to the previous page.		Displays the first page of the panels of events.
	Displays the first page of electrical data of the load.		Displays the first page of the transfer switch status.
	Displays the main menu of the STX.		Makes a screenshot of the current page. It is necessary to have a USB flash drive connected to the STX to save the screenshots.
11:09 09/02/18	Displays time and date. The user can change the time and date by pressing on it.		Used to navigate to the next page.

5.5 Generator Status

The **transfer switch status** page is used to get a quick overview of the transfer switch condition.

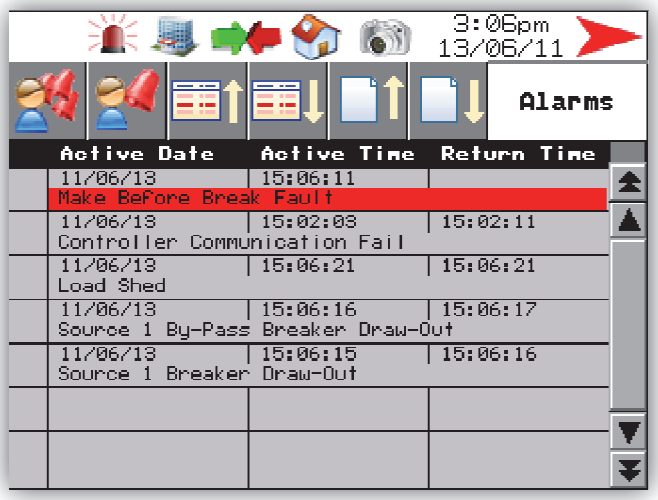


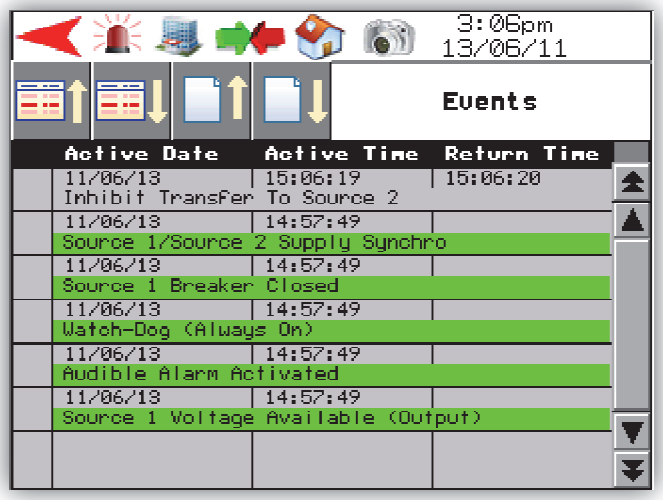
The singleline diagram shown above indicates which source supplies the load. This singleline diagram can vary depending on the type of STX you have. A red bar indicates a loss of voltage and a green bar indicates the presence of voltage.

	Displays the status of the source 1. When the contour of the source 1 is green, a voltage is detected. When the contour of the source 1 is red, no voltage is detected.		Displays the status of the source 2. When the contour of the source 2 is green, a voltage is detected. When the contour of the source 2 is red, no voltage is detected.
	Displays the voltage, current and frequency of the source 1.		Displays the voltage, current and frequency of the source 2.
	By-pass the stable delay of the source 1 and takes action immediately.		By-pass the stable delay of the source 2 and takes action immediately.
	By-pass the stop delay of source 1 if the source is a generator.		By-pass the stop delay of source 2 if the source is a generator.
	Displays the status of a closed breaker.		Displays the status of an opened breaker.
	Displays the status of a disconnected breaker.		When green, source 1 is synchronized with source 2.
	Displays the status of the load. When the contour of the load is green, the load is powered. When the contour of the load is red, the load is no longer supplied.		Shows the real power, apparent power, reactive power and power factor of the load.
	Displays the current mode of automatic transfer switch.		*Make before break* fault. You must press this button to acknowledge the fault.

5.6 Events Panel

The **events panel** pages are used to display the events, alarms and faults of the STX.





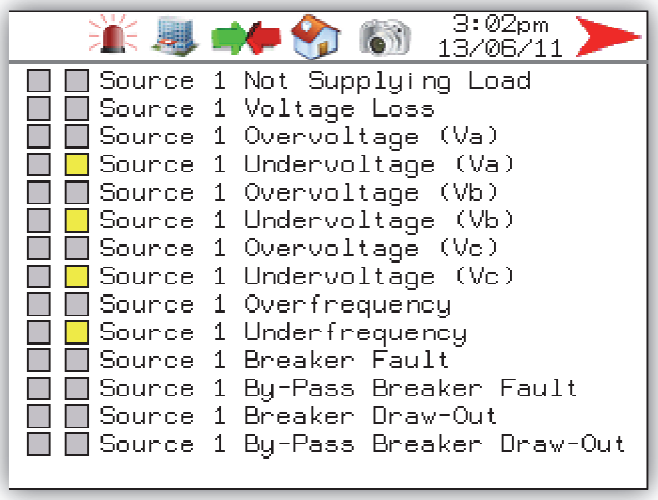
The pages of the **events panel** can display the last 100 alarms, faults or events of the STX. Those pages show the date and time active, the return time and the message of the alarms or events.

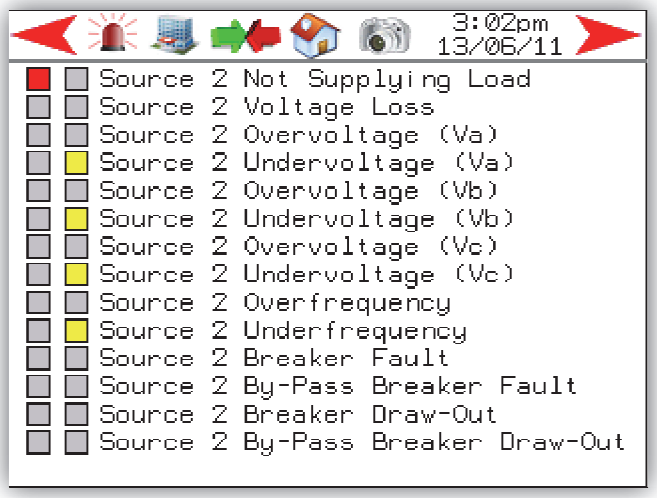
The text of the alarms, faults and events is displayed in different colors depending on the status of the event:
The text highlighted in red is an active fault.
The red text represents an active fault, but acknowledge.
The text highlighted in yellow is an active alarm.
The yellow text is an active alarm, but acknowledge.
The text highlighted in green is an active event.
The text that has no color represents the log of alarms and events. This text keeps a log of events.

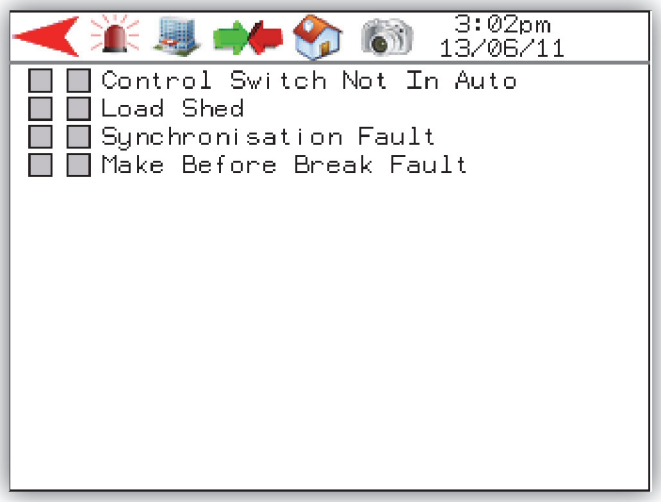
	Used to acknowledge all active alarms.		Used to acknowledge the alarm or fault selected.
	Allows the user to select the alarm, fault or event above.		Allows the user to select the alarm, fault or event below.
	Scrolls the page up.		Scrolls the page down.

5.7 Annunciator

The pages of the **annunciator** show a quick overview of the various faults, alarms and status of STX.



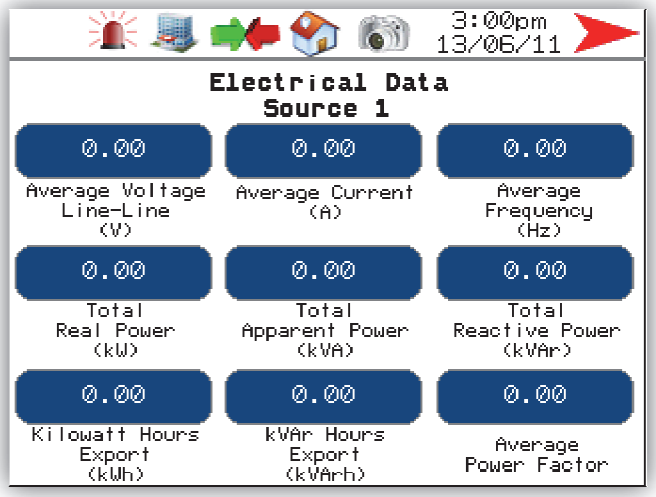


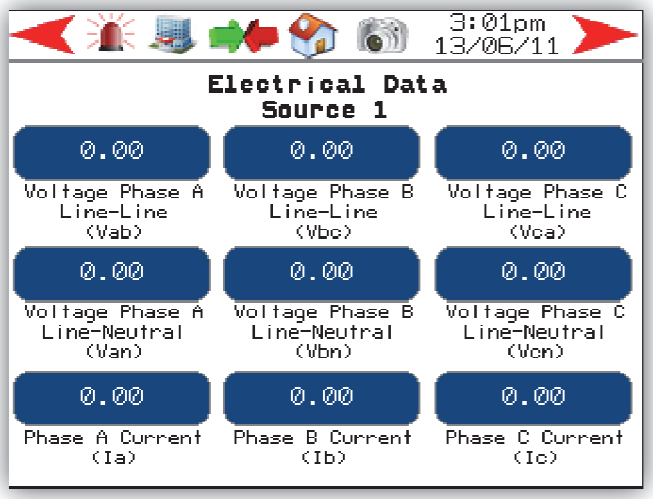


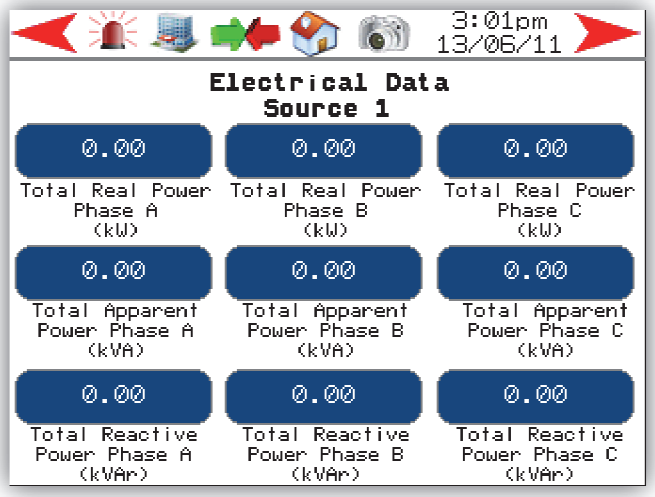
The pages of the annunciator light up:
• A red square when a fault occurs.
• A yellow square when an alarm occurs.

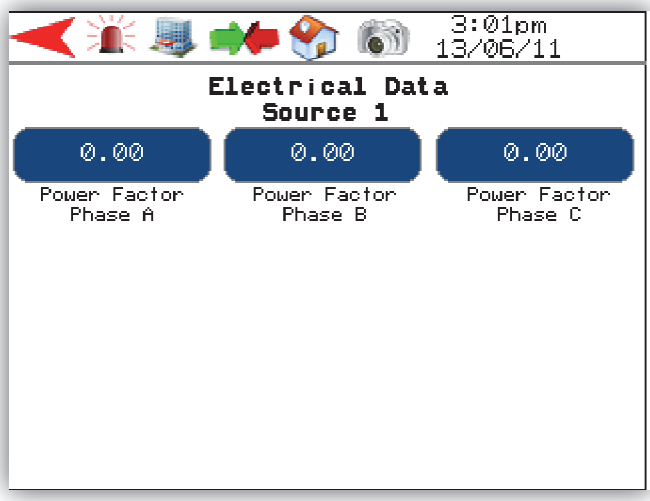
5.8 Electrical Data

The pages of the **electrical data** of source 1, source 2 and the load display the voltage status of the transfer switch.





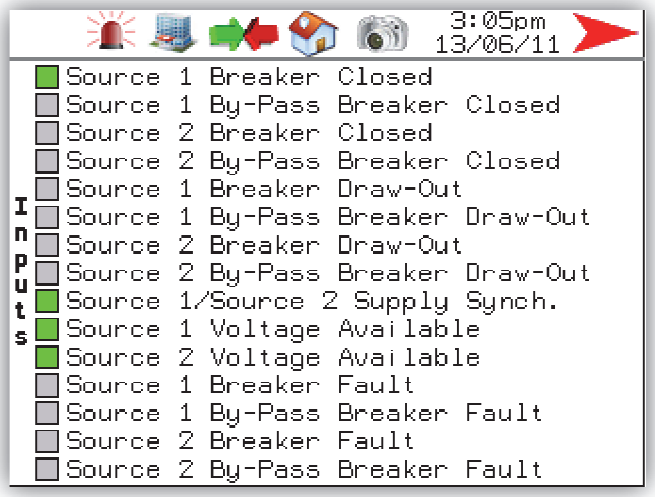


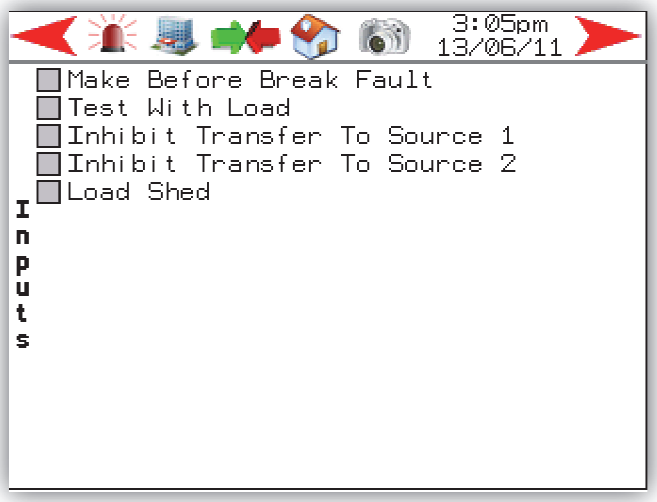


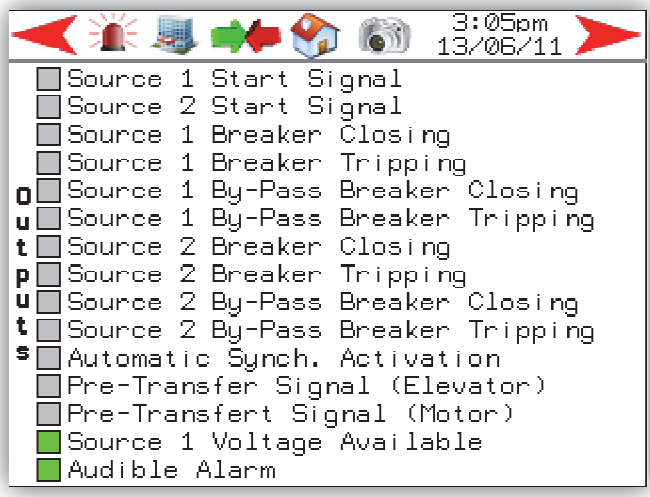
Some information about the voltage will not be displayed depending on the configuration of the STX (1 phase, 2 phases, 3 phases).
There is no difference between the pages of the electrical data of source 1, source 2 and the load. Only the title page tells the user the source of electrical data.

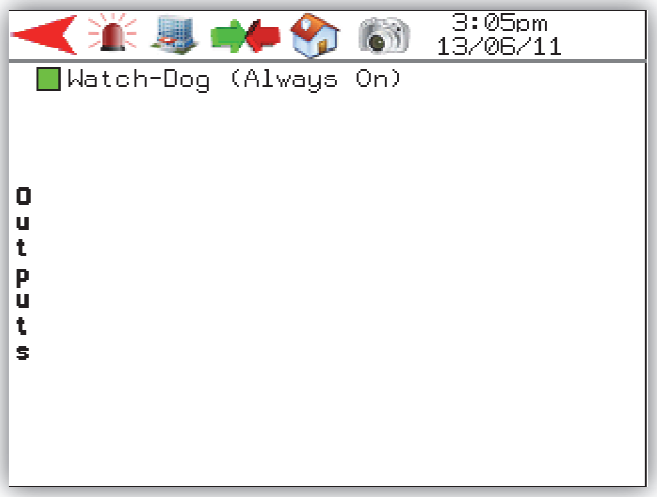
5.9 Inputs and Outputs

The inputs and outputs pages show the status of inputs and outputs of the STX controller.





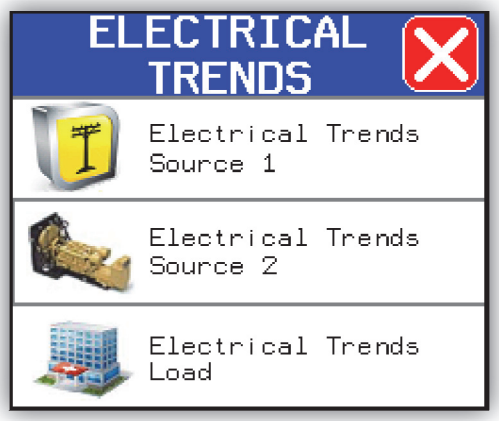




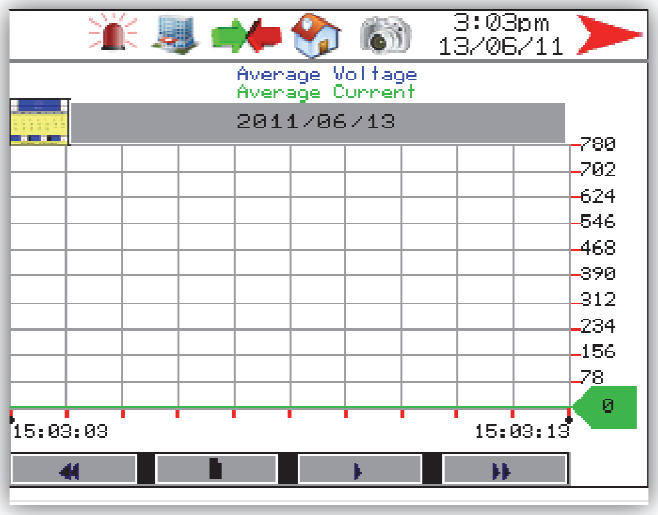
The display of the inputs and outputs allows the user to view their current status on the STX controller.

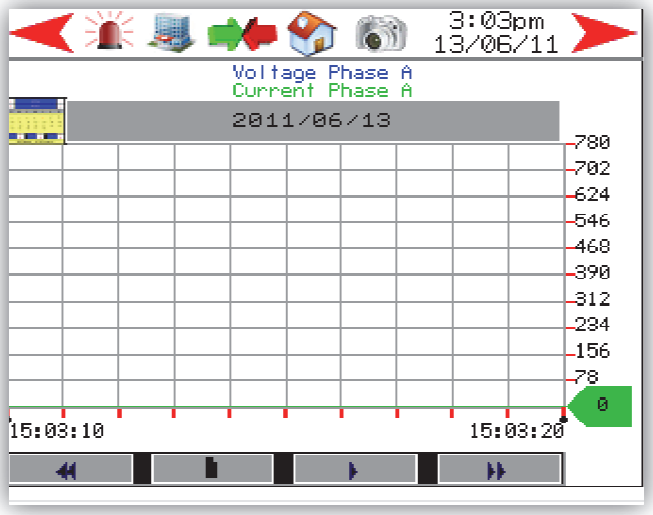
5.10 Electrical Trends

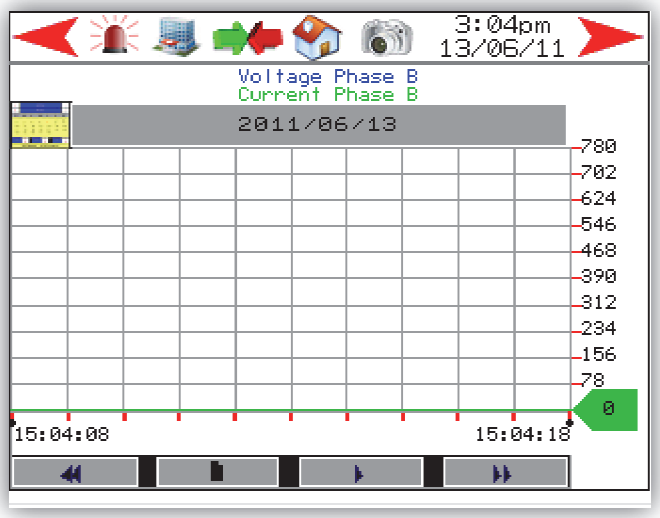
The electrical trends pages for source 1, source 2 and the load are accessible through the following pages:

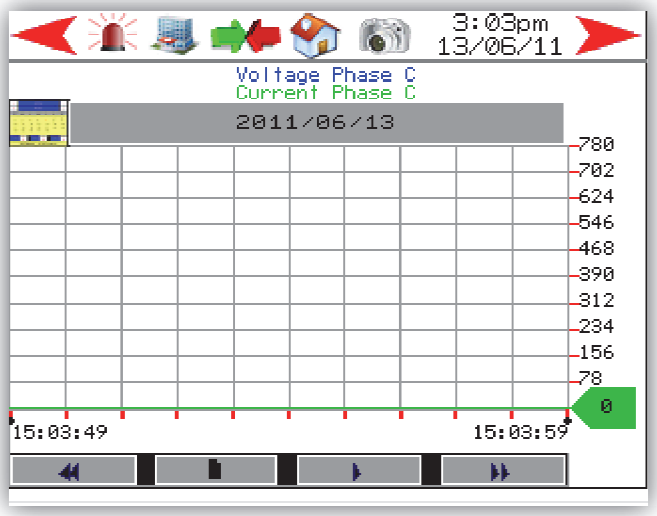


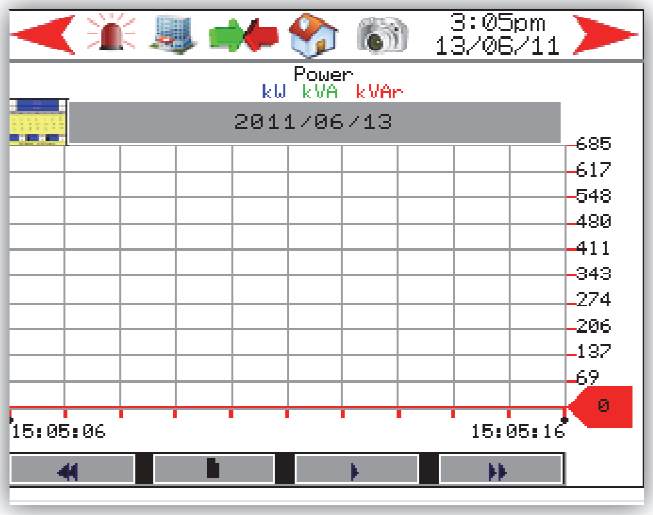
The menu below gives the user the choice to view one of the trends for source 1, source 2 and the load. It is necessary to have a USB flash drive connected to the STX if the user wants to save the electrical trends information.

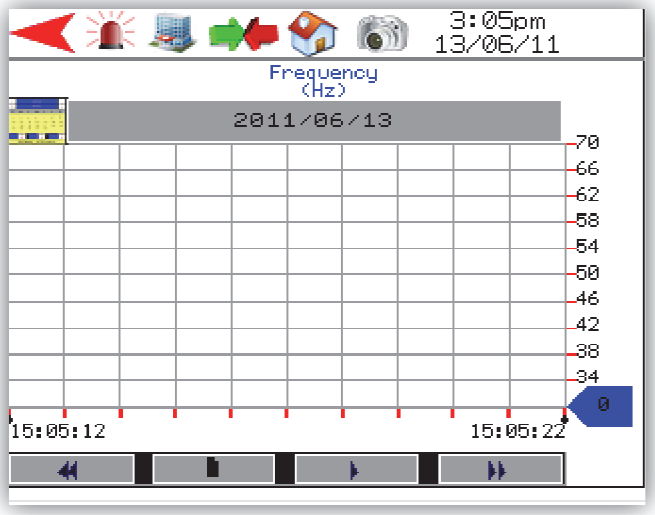












Some voltages information will not be present depending on the configuration of the STX (1 phase, 2 phases, 3 phases).
There is no difference between the data pages of the electrical source 1, source 2 and the load.

5.11 Choice of Languages

- By pressing the **language** icon 

in the main menu, the user can select English or French

6. Operating Sequence

- **Source 1 is always the preferred source.**

- In all modes, if the breaker supplying the load opens without any instructions from the STX, the system waits for neutral delay and then closes itself.

- In all modes, if the breaker used to power the load does not close, the STX will take no further action to supply the load. The operator will then switch to manual mode and close a breaker in order to supply the load or he will switch to bypass mode if the system has a bypass mode. The operator will then need to have his system checked by a qualified technician.

6.1 Break before make, auto mode

6.1.1 - Loss Source 1, transfer to Source 2
- The STX waits for the "Time Delay Source 1 Fail";
- The STX activates output " Source 1 breaker tripping" and starts the "Neutral Delay";
- "Source 2 start signal" is transmitted to the generator;
- The STX waits for the "Time Delay Source 2 Stable" and "Neutral Delay";
- The STX activates output "Source 2 breaker closing".

6.1.2 - Source 1 present, transfer to Source 1, if Source 2 is still available.
- The STX waits for the "Time Delay Source 1 Stable";
- The STX waits for the "Pre-Transfer Delay (Elevator);
- The STX activates output "Pre-Transfer Signal (Motor disconnect)";
- The STX activates output "Source 2 breaker tripping";
- The STX waits for the "Neutral Delay";
- The STX activates output " Source 1 breaker closing";
- The STX waits for the "Pre-Transfer Delay (Motor)" before turning off the outputs "Pre-Transfer Signal (Motor Disconnect)."
- The STX waits for the "Time Delay Source 2 Stop".
- The STX removes the "Source 2 start signal".

6.1.3 - Voltage source 1 returns, transfer to Source 1 if the voltage Source 2 is no longer present.
- - The STX waits for the "Time Delay Source 2 Fail";
- - The STX activates output "Source 2 breaker tripping";
- - The STX waits for the "Neutral Delay";
- - The STX activates output "Source 1breaker closing".
- - The STX waits for the "Time Delay Source 2 Stop".
- - The STX removes the "Source 2 start signal".

6.2 Make before break, auto mode (STXCT - STXCTBP)

6.2.1 - Loss of voltage Source 1, transfer to Source 2

- The STX waits for the "Time Delay Source 1 Fail";
- The STX activates output "Source 1 breaker tripping" and starts the "Neutral Delay";
- "Source 2 start signal" is transmitted to the generator.
- The STX waits for the "Time Delay Source 2 Stable" and "Neutral Delay";
- The STX activates output "Source 2 breaker closing".

6.2.2 - Voltage Source 1 returns, transfer to Source 1 if the voltage Source 2 is still there and there is no make before break fault.

- The STX waits for the "Time Delay Source 1 Stable";
- The STX waits for the "Pre-Transfer Delay (Elevator);
- The STX activates output "Pre-Transfer Signal (Motor disconnect)";
- The STX actives output "Automatic synchro activation" ;
- The STX is waiting for the signal, "Source 1/Source 2 Supply synchro".
- The STX activates output "Source 1 breaker closing";
- The STX activates output "Source 2 breaker tripping";
- The STX waits for the "Pre-Transfer Delay (Motor)" before turning off the output "Pre-Transfer Signal (Motor disconnect)";
- The STX waits for the "Time Delay Source 2 Stop";
- The STX removes the "Source 2 start signal".

6.2.3 - Voltage Source 1 returns, transfer to Source 1 if the voltage Source 2 is no longer present and there is a make before break fault.

- The STX waits for the user to acknowledge the make before break fault on the status page of the transfer switch or waits for the user to change the type of transfer mode for an open transition transfer.

6.2.4 - Voltage Source 1 returns, transfer to Source 1 if the voltage of Source 2 is no longer present.

- The STX waits for the "Time Delay Source 2 Fail";
- The STX activates output "Source 2 breaker tripping";
- The STX waits for the "Neutral Delay";
- The STX activates output "Source 1 breaker closing";
- The STX waits for the "Time Delay Source 2 Stop";
- The STX removes the "Source 2 start signal".

6.3 Test Mode without Load

6.3.1 - Starting the test
- "Source 2 start signal" is transmitted to the generator.

6.3.2 - Stopping the test
- The STX removes the "Source 2 start signal".

6.3.3 - Loss of voltage Source 1 in the test
- The STX waits for the "Time Delay Source 1 Fail";
- The STX activates output "Source 1 breaker tripping" and starts the "Neutral Delay";
- The STX waits for the "Time Delay Source 2 Stable" and "Neutral Delay";
- The STX activates output "Source 2 breaker closing".

6.3.4 - Voltage Source 1 returns after a loss of voltage Source 1, break before make
- Refer to Section 6.1.2 and Section 6.1.3.

6.3.5 - Voltage Source 1 returns after a loss of voltage Source 1, make before break (STXCT - STXCTBP)
- - Refer to Section 6.2.2, Section 6.2.3 and Section 6.2.4.

6.4 Test Mode with Load

6.4.1 - Starting the test, break before make
- "Source 2 start signal" is transmitted to the generator;
- The STX waits for the "Pre-Transfer Delay (Elevator);
- The STX activates output "Pre-Transfer Signal (Motor disconnect)";
- The STX activates output "Source 1 breaker tripping" and starts the "Neutral Delay";
- The STX waits for the "Time Delay Source 2 Stable" and "Neutral Delay";
- The STX activates output "Source 2 breaker closing";
- The STX waits for the "Pre-Transfer Delay (Motor)" before turning off the output "Pre-Transfer Signal (Motor disconnect)".

6.4.2 - Stopping the test, break before make
- The STX waits for the "Time Delay Source 1 Stable";
- The STX waits for the "Pre-Transfer Delay (Elevator);
- The STX activates output "Pre-Transfer Signal (Motor disconnect)";
- The STX activates output "Source 2 breaker tripping";
- The STX waits for the "Neutral Delay";
- The STX activates output "Source 1 breaker closing";
- The STX waits for the "Pre-Transfer Delay (Motor)" before turning off the output "Pre-Transfer Signal (Motor disconnect)";
- The STX waits for the "Time Delay Source 2 Stop";
- The STX removes the "Source 2 start signal".

6.4.3 - Starting of the test, make before break (STXCT - STXCTBP)
- "Source 2 start signal" is transmitted to the generator;
- The STX waits for the "Time Delay Source 2 Stable";
- The STX waits for the "Pre-Transfer Delay (Elevator);
- The STX activates output "Pre-Transfer Signal (Motor disconnect)";
- The STX activates output "Source 2 breaker closing";
- The STX activates output "Source 1 breaker tripping";
- The STX waits for the "Pre-Transfer Delay (Motor)" before turning off the output "Pre-Transfer Signal (Motor disconnect)".

6.4.4 - Stopping of the test, make before break (STXCT - STXCTBP)
- The STX waits for the "Time Delay Source 1 Stable"
- The STX waits for the "Pre-Transfer Delay (Elevator);
- The STX activates output "Pre-Transfer Signal (Motor disconnect)";
- The STX activates output "Automatic synchro activation";
- The STX waits for the signal, "Source 1/Source 2 supply synchro";
- The STX activates output "Source 1 breaker closing";
- The STX activates output "Source 2 breaker tripping";
- The STX waits for the "Pre-Transfer Delay (Motor)" before turning off the outputs "Pre-Transfer Signal (Motor disconnect)";
- The STX waits for the "Time Delay Source 2 Stop";
- The STX removes the "Source 2 start signal".

6.4.5 - Loss of voltage Source 2 during a test
- The STX transfers in auto mode;
- Refer to section 6.2.4.

6.5 Off / Manual mode

- Maintenance mode of the transfer switch
- The STX no longer controls its output automatically.
- Users can close and open a breaker manually using the following control:

6.6 Changing the Type of System: Normal Mode <-> By-Pass Mode (STXBP - STXCTBP)

6.6.1 - When the breaker 52-S1 is closed and the user switches to By-pass mode.

- The STX activates output "Source 1 by-pass breaker closing";
- The STX activates output "Source 1 breaker tripping" when the source 1 by-pass breaker is closed.

6.6.2 - When the by-pass breaker 52-BP-S1 is closed and the user switches to Normal mode.

- The STX activates output "Source 1 breaker closing";
- The STX activates output "Source 1 by-pass breaker tripping" when the source 1 breaker is closed.

6.6.3 - When the breaker 52-S2 is closed and the user switches to By-pass mode.

- The STX activates output "Source 2 by-pass breaker closing";
- The STX activates output "Source 2 breaker tripping" when the source 2 by-pass breaker is closed.

6.6.4 - When the by-pass breaker S2-52-BP is closed and the user switches to Normal mode.

- The STX activates output "Source 2 breaker closing";
- The STX activates output "Source 2 by-pass breaker tripping" when the source 2 breaker is closed.

7. « Web Gate » Function

When connected on an Ethernet link, the system STX can be viewed remotely by accessing the IP address. When the user accesses the STX remotely, the local display is not affected by the remote user. The local user and remote users can view the page they want without affecting other users.

It is possible to access the "Web Gate" function by entering the IP address of the STX in a web browser like Internet Explorer (the default IP address is 192.168.0.100). When use the "Web Gate" for the first time, the browser will prompt the user to install ActiveX function of STX. This may take several minutes. The ActiveX function is on the SoftPanel CD provided with the STX.

When the STX is connected to the Internet, the user can access its contents via the Internet using the IP address of the STX.

The **home page** allows the user to select the following languages: English and French.

The viewing section allows the user to view the display of the STX **as part of** or **in a new window**.
When used for the first time, the operator will first have to install the "Web Gate" function, which can be found on the SoftPanel CD provided with the STX.

Diagnostic Section – **Project** is used to display the software version of the STX currently installed in the screen.
Diagnostic Section - **Ethernet & TCP / IP** is used to display the TCP / IP of the STX.

Maintenance Section - **Data - Main LOG /** saves files of various electrical trends.
Maintenance Section - **Data - Main SNAPSHOT /** saves files of different screenshots taken by the camera located in the STX.

The STX has an *ActiveX* that can be integrated in various industrial communication systems (SCADA).

8. ModBUS exchange table

Parameter Name	STX Register Number	Length	Num Bits	Value			
Source1 VAN	100	2	32	Vac	/10		
Source1 VBN	102	2	32	Vac	/10		
Source1 VCN	104	2	32	Vac	/10		
Source1 VAB	106	2	32	Vac	/10		
Source1 VBC	108	2	32	Vac	/10		
Source1 VCA	110	2	32	Vac	/10		
Source1 IA	112	2	32	A	/1000		
Source1 IB	114	2	32	A	/1000		
Source1 IC	116	2	32	A	/1000		
Source1 Real Power Phase A	118	2	32	kW	/10		
Source1 Real Power Phase B	120	2	32	kW	/10		
Source1 Real Power Phase C	122	2	32	kW	/10		
Source1 Apparent Power Phase A	124	2	32	kVA	/10		
Source1 Apparent Power Phase B	126	2	32	kVA	/10		
Source1 Apparent Power Phase C	128	2	32	kVA	/10		
Source1 Reactive Power Phase A	130	2	32	kVAr	/10		
Source1 Reactive Power Phase B	132	2	32	kVAr	/10		
Source1 Reactive Power Phase C	134	2	32	kVAr	/10		
Source1 VLN	136	2	32	Vac	/10		
Source1 VLL	138	2	32	Vac	/10		
Source1 Real Power	140	2	32	kW	/10		
Source1 Apparent Power	142	2	32	kVA	/10		

Source1 Reactive Power	144	2	32	kVAr	/10		
Source1 Power Factor Phase A	146	1	16	Negative=Lead Positive=Lag	/1000		
Source1 Power Factor Phase B	147	1	16	Negative=Lead Positive=Lag	/1000		
Source1 Power Factor Phase C	148	1	16	Negative=Lead Positive=Lag	/1000		
Source1 Power Factor Average	149	1	16	Negative=Lead Positive=Lag	/1000		
Source1 Phase Sequence	150	1	16	-1=A-C-B	0=A-B-C		
Source1 Frequency	151	1	16	Hz			
Source1 KWh Total	152	2	32	kWh	/10		
Source1 Kvarh Total	154	2	32	kVarh	/10		
Source1 Measuring	156	1	16	0=3 Phases, 4 Wires	1=3 Phases, 3 Wires	2=2 Phases	3=1 Phase
Source1 Programming Lock	157	1	16	0=Unlock	1=Lock		
Source1 Type	158	1	16	0=A	1=B	2=C	
Source1 Current Xfo Ratio Primary	159	1	16		/10		
Source1 Current Xfo Ratio Secondary	160	1	16		/10		
Source1 Voltage Xfo Ratio Primary	161	1	16		/10		
Source1 Voltage Xfo Ratio Secondary	162	1	16		/10		
Source2 VAN	200	2	32	Vac	/10		
Source2 VBN	202	2	32	Vac	/10		
Source2 VCN	204	2	32	Vac	/10		
Source2 VAB	206	2	32	Vac	/10		
Source2 VBC	208	2	32	Vac	/10		
Source2 VCA	210	2	32	Vac	/10		
Source2 IA	212	2	32	A	/1000		
Source2 IB	214	2	32	A	/1000		
Source2 IC	216	2	32	A	/1000		

Source2 Real Power Phase A	218	2	32	kW	/10		
Source2 Real Power Phase B	220	2	32	kW	/10		
Source2 Real Power Phase C	222	2	32	kW	/10		
Source2 Apparent Power Phase A	224	2	32	kVA	/10		
Source2 Apparent Power Phase B	226	2	32	kVA	/10		
Source2 Apparent Power Phase C	228	2	32	kVA	/10		
Source2 Reactive Power Phase A	230	2	32	kVAr	/10		
Source2 Reactive Power Phase B	232	2	32	kVAr	/10		
Source2 Reactive Power Phase C	234	2	32	kVAr	/10		
Source2 VLN	236	2	32	Vac	/10		
Source2 VLL	238	2	32	Vac	/10		
Source2 Real Power	240	2	32	kW	/10		
Source2 Apparent Power	242	2	32	kVA	/10		
Source2 Reactive Power	244	2	32	kVAr	/10		
Source2 Power Factor Phase A	246	1	16		/1000		
Source2 Power Factor Phase B	247	1	16		/1000		
Source2 Power Factor Phase C	248	1	16		/1000		
Source2 Power Factor Average	249	1	16		/1000		
Source2 Phase Sequence	250	1	16	-1=A-C-B	0=A-B-C		
Source2 Frequency	251	1	16	Hz			
Source2 KWh Total	252	2	32	kWh	/10		
Source2 Kvarh Total	254	2	32	kVarh	/10		

Source2 Measuring	256	1	16	0=3 Phases, 4 Wires	1=3 Phases, 3 Wires	2=2 Phases	3=1 Phase
Source2 Programming Lock	257	1	16	0=Unlock	1=Lock		
Source2 Type	258	1	16	0=A	1=B	2=C	
Source2 Current Xfo Ratio Primary	259	1	16		/10		
Source2 Current Xfo Ratio Secondary	260	1	16		/10		
Source2 Voltage Xfo Ratio Primary	261	1	16		/10		
Source2 Voltage Xfo Ratio Secondary	262	1	16		/10		
Source1 Type	299,00	1	1	0=Utility	1=Generator set		
Source2 Type	299,01	1	1	0=Utility	1=Generator set		
By Pass Mode	299,02	1	1	0=Standard Mode	1=By-Pass Mode		
Make Before Break Mode	299,04	1	1	0=Closed Transition Mode	1=Opened Transition Mode		
Source1 Alarm Over Frequency	299,05	1	1	0=Inactive	1=Active		
Source1 Fault Over Frequency	299,06	1	1	0=Inactive	1=Active		
Source1 Alarm Over Voltage Phase A	299,07	1	1	0=Inactive	1=Active		
Source1 Fault Over Voltage Phase A	299,08	1	1	0=Inactive	1=Active		
Source1 Alarm Over Voltage Phase B	299,09	1	1	0=Inactive	1=Active		
Source1 Fault Over Voltage Phase B	299,10	1	1	0=Inactive	1=Active		
Source1 Alarm Over Voltage Phase C	299,11	1	1	0=Inactive	1=Active		
Source1 Fault Over Voltage Phase C	299,12	1	1	0=Inactive	1=Active		

Source1 Alarm Under Frequency	299,13	1	1	0=Inactive	1=Active		
Source1 Fault Under Frequency	299,14	1	1	0=Inactive	1=Active		
Source1 Alarm Under Voltage Phase A	299,15	1	1	0=Inactive	1=Active		
Source1 Fault Under Voltage Phase A	300,00	1	1	0=Inactive	1=Active		
Source1 Alarm Under Voltage Phase B	300,01	1	1	0=Inactive	1=Active		
Source1 Fault Under Voltage Phase B	300,02	1	1	0=Inactive	1=Active		
Source1 Alarm Under Voltage Phase C	300,03	1	1	0=Inactive	1=Active		
Source1 Fault Under Voltage Phase C	300,04	1	1	0=Inactive	1=Active		
Source2 Alarm Over Frequency	300,05	1	1	0=Inactive	1=Active		
Source2 Fault Over Frequency	300,06	1	1	0=Inactive	1=Active		
Source2 Alarm Over Voltage Phase A	300,07	1	1	0=Inactive	1=Active		
Source2 Fault Over Voltage Phase A	300,08	1	1	0=Inactive	1=Active		
Source2 Alarm Over Voltage Phase B	300,09	1	1	0=Inactive	1=Active		
Source2 Fault Over Voltage Phase B	300,10	1	1	0=Inactive	1=Active		
Source2 Alarm Over Voltage Phase C	300,11	1	1	0=Inactive	1=Active		
Source2 Fault Over Voltage Phase C	300,12	1	1	0=Inactive	1=Active		

Source2 Alarm Under Frequency	300,13	1	1	0=Inactive	1=Active		
Source2 Fault Under Frequency	300,14	1	1	0=Inactive	1=Active		
Source2 Alarm Under Voltage Phase A	300,15	1	1	0=Inactive	1=Active		
Source2 Fault Under Voltage Phase A	301,00	1	1	0=Inactive	1=Active		
Source2 Alarm Under Voltage Phase B	301,01	1	1	0=Inactive	1=Active		
Source2 Fault Under Voltage Phase B	301,02	1	1	0=Inactive	1=Active		
Source2 Alarm Under Voltage Phase C	301,03	1	1	0=Inactive	1=Active		
Source2 Fault Under Voltage Phase C	301,04	1	1	0=Inactive	1=Active		
Strobe Alarm PopUp	301,05	1	1	0=Inactive	1=Active		
Strobe Fault PopUp	301,06	1	1	0=Inactive	1=Active		
Source1 Communication Fault	301,07	1	1	0=Inactive	1=Active		
Source2 Communication Fault	301,08	1	1	0=Inactive	1=Active		
Watchdog PLC Communication	301,10	1	1	0=Inactive	1=Active	Always ON	
52 Source1 Closing Coil	301,11	1	1	0=Inactive	1=Active		
52 Source1 Tripping Coil	301,12	1	1	0=Inactive	1=Active		
52 Source1 ByPass Closing Coil	301,13	1	1	0=Inactive	1=Active		
52 Source1 ByPass Tripping Coil	301,14	1	1	0=Inactive	1=Active		

52 Source2 Closing Coil	301,15	1	1	0=Inactive	1=Active		
52 Source2 Tripping Coil	302,00	1	1	0=Inactive	1=Active		
52 Source2 ByPass Closing Coil	302,01	1	1	0=Inactive	1=Active		
52 Source2 ByPass Tripping Coil	302,02	1	1	0=Inactive	1=Active		
Source1 Fault	302,03	1	1	0=Inactive	1=Active		
Source2 Fault	302,04	1	1	0=Inactive	1=Active		
Comunication Fault	302,08	1	1	0=Inactive	1=Active		
Source1 ByPass Stable Delay	302,10	1	1	0=Inactive	1=Active		
Source1 By Pass Stop Delay	302,11	1	1	0=Inactive	1=Active		
Source2 ByPass Stable Delay	302,12	1	1	0=Inactive	1=Active		
Source2 By Pass Stop Delay	302,13	1	1	0=Inactive	1=Active		
Make Before Break Intern Fault	302,14	1	1	0=Inactive	1=Active		
Synchronisation Fault	302,15	1	1	0=Inactive	1=Active		
Exerciser Sunday With Load Running	303,06	1	1	0=Inactive	1=Active		
Exerciser Sunday Without Load Running	303,07	1	1	0=Inactive	1=Active		
Exerciser Monday With Load Running	303,08	1	1	0=Inactive	1=Active		
Exerciser Monday Without Load Running	303,09	1	1	0=Inactive	1=Active		
Exerciser Tuesday With Load Running	303,10	1	1	0=Inactive	1=Active		
Exerciser Tuesday Without Load Running	303,11	1	1	0=Inactive	1=Active		

Exerciser Wednesday With Load Running	303,12	1	1	0=Inactive	1=Active		
Exerciser Wednesday Without Load Running	303,13	1	1	0=Inactive	1=Active		
Exerciser Thursday With Load Running	303,14	1	1	0=Inactive	1=Active		
Exerciser Thursday Without Load Running	303,15	1	1	0=Inactive	1=Active		
Exerciser Friday With Load Running	304,00	1	1	0=Inactive	1=Active		
Exerciser Friday Without Load Running	304,01	1	1	0=Inactive	1=Active		
Exerciser Saturday With Load Running	304,02	1	1	0=Inactive	1=Active		
Exerciser Saturday Without Load Running	304,03	1	1	0=Inactive	1=Active		
52 Source1 Closing Fault	304,04	1	1	0=Inactive	1=Active		
52 Source1 Tripping Fault	304,05	1	1	0=Inactive	1=Active		
52 Source1 ByPass Closing Fault	304,06	1	1	0=Inactive	1=Active		
52 Source1 ByPass Tripping Fault	304,07	1	1	0=Inactive	1=Active		
52 Source2 Closing Fault	304,08	1	1	0=Inactive	1=Active		
52 Source2 Tripping Fault	304,09	1	1	0=Inactive	1=Active		
52 Source2 ByPass Closing Fault	304,10	1	1	0=Inactive	1=Active		
52 Source2 ByPass Tripping Fault	304,11	1	1	0=Inactive	1=Active		
52 Source1 Closed	305,00	1	1	0=Inactive	1=Active		

52 Source1 ByPass Closed	305,01	1	1	0=Inactive	1=Active		
52 Source2 Closed	305,02	1	1	0=Inactive	1=Active		
52 Source2 ByPass Closed	305,03	1	1	0=Inactive	1=Active		
52 Source1 Rack-out	305,04	1	1	0=Inactive	1=Active		
52 Source1 ByPass Rack-out	305,05	1	1	0=Inactive	1=Active		
52 Source2 Rack-out	305,06	1	1	0=Inactive	1=Active		
52 Source2 ByPass Rack-out	305,07	1	1	0=Inactive	1=Active		
25 Source1 & Source2	305,08	1	1	0=Inactive	1=Active		
27 Source1	305,09	1	1	0=Inactive	1=Active		
27 Source2	305,10	1	1	0=Inactive	1=Active		
52 Source1 Fault	305,12	1	1	0=Inactive	1=Active		
52 Source1 ByPass Fault	305,13	1	1	0=Inactive	1=Active		
52 Source2 Fault	305,14	1	1	0=Inactive	1=Active		
52 Source2 ByPass Fault	305,15	1	1	0=Inactive	1=Active		
Make Before Break Input Fault	306,03	1	1	0=Inactive	1=Active		
Test with load Input	306,04	1	1	0=Inactive	1=Active		
Inhibit to transfer Source1 Input	306,05	1	1	0=Inactive	1=Active		
Inhibit to transfer Source2 Input	306,06	1	1	0=Inactive	1=Active		
Load Shedding	306,07	1	1	0=Inactive	1=Active		
Start contact Source1 Output	307,00	1	1	0=Inactive	1=Active		
Start contact Source2 Output	307,01	1	1	0=Inactive	1=Active		
52 Source1 Closing Coil Output	307,02	1	1	0=Inactive	1=Active		

52 Source1 Tripping Coil Output	307,03	1	1	0=Inactive	1=Active		
52 Source1 Bypass Closing Coil Output	307,04	1	1	0=Inactive	1=Active		
52 Source1 Bypass Tripping Coil Output	307,05	1	1	0=Inactive	1=Active		
52 Source2 Closing Coil Output	307,06	1	1	0=Inactive	1=Active		
52 Source2 Tripping Coil Output	307,07	1	1	0=Inactive	1=Active		
52 Source2 Bypass Closing Coil Output	307,08	1	1	0=Inactive	1=Active		
52 Source2 Bypass Tripping Coil Output	307,09	1	1	0=Inactive	1=Active		
Aytomatic Synchronization Activation Output	307,10	1	1	0=Inactive	1=Active		
Pre-Transfer Elevator Signal Output	307,11	1	1	0=Inactive	1=Active		
Pre-Transfer Motor Signal Output	307,12	1	1	0=Inactive	1=Active		
27 Source1 Available Output	307,13	1	1	0=Inactive	1=Active		
Audible Alarm	307,14	1	1	0=Inactive	1=Active		
Watch Dog Output	307,15	1	1	0=Inactive	1=Active	Always ON	
STX Type	308	1	16	0=STXS	1=STXBP	2=STXCT	3=STXCTBP
STX Operating Mode	309	1	16	0=OFF/Manual	1=AUTO	2=Test without load	3=Test with load
STX Breaker Type	310	1	16	0=Molded Case	1=Fixed	2=Draw-out	
Time Delay Source1 Start Setpoint Value	318	1	16	1 to 600 seconds			
Time Delay Source1 Start Actual Value	319	1	16	1 to 600 seconds			

Time Delay Source1 Stable Setpoint Value	320	1	16	1 to 600 seconds			
Time Delay Source1 Stable Actual Value	321	1	16	1 to 600 seconds			
Time Delay Source1 Stop Setpoint Value	322	1	16	1 to 3600 seconds			
Time Delay Source1 Stop Actual Value	323	1	16	1 to 3600 seconds			
Time Delay Source2 Start Setpoint Value	324	1	16	1 to 600 seconds			
Time Delay Source2 Start Actual Value	325	1	16	1 to 600 seconds			
Time Delay Source2 Stable Setpoint Value	326	1	16	1 to 600 seconds			
Time Delay Source2 Stable Actual Value	327	1	16	1 to 600 seconds			
Time Delay Source2 Stop Setpoint Value	328	1	16	1 to 3600 seconds			
Time Delay Source2 Stop Actual Value	329	1	16	1 to 3600 seconds			
Time Delay Pre-Transfer Elevator Setpoint Value	330	1	16	0 to 60 seconds			
Time Delay Pre-Transfer Elevator Actual Value	331	1	16	0 to 60 seconds			
Time Delay Pre-Transfer Motor Setpoint Value	332	1	16	0 to 60 seconds			
Time Delay Pre-Transfer Motor Actual Value	333	1	16	0 to 60 seconds			
Time Delay Neutral Position Setpoint Value	334	1	16	0 to 60 seconds			

Time Delay Neutral Position Actual Value	335	1	16	0 to 60 seconds			
Load VAN	400	2	32	Vac	/10		
Load VBN	402	2	32	Vac	/10		
Load VCN	404	2	32	Vac	/10		
Load VAB	406	2	32	Vac	/10		
Load VBC	408	2	32	Vac	/10		
Load VCA	410	2	32	Vac	/10		
Load IA	412	2	32	A	/1000		
Load IB	414	2	32	A	/1000		
Load IC	416	2	32	A	/1000		
Load Real Power Phase A	418	2	32	kW	/10		
Load Real Power Phase B	420	2	32	kW	/10		
Load Real Power Phase C	422	2	32	kW	/10		
Load Apparent Power Phase A	424	2	32	kVA	/10		
Load Apparent Power Phase B	426	2	32	kVA	/10		
Load Apparent Power Phase C	428	2	32	kVA	/10		
Load Reactive Power Phase A	430	2	32	kVAr	/10		
Load Reactive Power Phase B	432	2	32	kVAr	/10		
Load Reactive Power Phase C	434	2	32	kVAr	/10		
Load VLN	436	2	32	Vac	/10		
Load VLL	438	2	32	Vac	/10		
Load Real Power	440	2	32	kW	/10		
Load Apparent Power	442	2	32	kVA	/10		
Load Reactive Power	444	2	32	kVAr	/10		
Load Power Factor Phase A	446	1	16	Negative=Lead Positive=Lag	/1000		
Load Power Factor Phase B	447	1	16	Negative=Lead Positive=Lag	/1000		
Load Power Factor Phase C	448	1	16	Negative=Lead Positive=Lag	/1000		

Load Power Factor Average	449	1	16	Negative=Lead Positive=Lag	/1000		
Load Frequency	451	1	16	Hz			
Load KWh Total	452	2	32	kWh	/10		
Load Kvarh Total	454	2	32	kVarh	/10		
Load Measuring	456	1	16	0=3 Phases, 4 Wires	1=3 Phases, 3 Wires	2=2 Phases	3=1 Phase

9. Updating the STX

To update the STX software:

- Disconnect the power supply of the screen;
- Insert the USB flash drive into the USB drive located below the touchscreen;
- Reconnect the power supply;
- When the STX restarts, you must choose to install the new program. Press OK;
- Subsequently, the screen will restart and a password will be required;
- Enter the password **located behind your STX**;
- When the STX is functional again, **remove the USB key**;
- The update is then completed.

10. Features

ENVIRONMENT

Conformity to Standards : EN 611 31-2, IEC 610-6-2, FCC (Class A), UL 508, UL 1604, CSA C22-2 n°14
Product Certification : cULus, CSA, Classe 1 Div 2 T4A ou T5 (UL and CSA), C-Tick, ATEX Zone 2/22
Temperature : Operation: 0…50 °C, Storage : - 20…+ 60 °C
Relative Humidity : 0…90 % (non-condensing)
Degree of Protection : Front panel IP 65 conforming to IEC 60529, Nema 4X, Rear panel IP 20 conforming to IEC 60529
Shock Resistance : Conforming to IEC 60068-2-27; semi-sinusoidal pulse 11 ms, 15 gn on the 3 axes
Vibration : Conforming to IEC 60068-2-6; 5…9 Hz at 3.5 mm; 9…150 Hz at 1 g
E.S.D. : Conforming to IEC 61000-4-2, level 3
Electromagnetic Interference : Conforming to IEC 61000-4-3, 10 V/m
Electrical Interference : Conforming to IEC 61000-4-4, level 3

MECHANICAL CHARACTERISTICS

Mounting and fixing : Mounting on 1.6…5 mm thick panel, Flush mounted, fixed by 4 screw clamps (included) or 2 spring clips (to be ordered separately)
Material : Polycarbonate/polyethylene terephthalate alloy – Aluminum (front)

ELECTRICAL CHARACTERISTICS

Power Supply : Voltage : 24 VDC, Limits :19…28,8 VDC, Voltage break: ≤ 5 ms
Inrush Current : ≤ 30 A
Consumption : 26 W

FUNCTIONAL CHARACTERISTICS

- **Screen :**
  LCD Color TFT, 65 536 colors (16 384 if flashing)
  Definition : 320 x 240 pixels (QVGA)
  Size (width x height in mm) : 5,7" (11 5,2 x 86,4)
  Touch-sensitive area : Analog, resolution 1024 x 1024
  Brightness Adjustments: 16 levels via touch panel
- **Signaling :** 1 LED: green for normal operation, orange if backlighting faulty
- **Connections : Power supply : Removable screw terminal block 3 terminals**
- **Communication Protocol: ModBUS TCP Slave**

11. Available Models

- **STXS855** – controller for transfer switch (2 breakers)
- **STXBP855** – controller for transfer switch with bypass (4 breakers)
- **STXCT855** – controller for transfer switch with closed transition (2 breakers)
- **STXCTBP855** – controller for transfer switch with closed transition and bypass (4 breakers)

12. References

For more information refer to the following manuals:

- EM2172DIMML310308 by Carlo Gavazzi;
- EM2172DDS by Carlo Gavazzi;
- EIO0000000614 by Schneider;
- TWDUSE10AE by Schneider.

Appendix – Installation Diagram of the STX