

INSTRUCTION MANUAL

Web server description

AQ 300 Series

Revision	1.0
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1 INTRODUCTION

This product offers the ability to remotely monitor and modify various parameters and settings within the device. The user can access the front panel and choose other options with the help of a web browser. With the user-friendly interface, you can easily manage the device. Password protection is available to grant certain privileges and access to special functions.

1.1 SYSTEM REQUIREMENTS

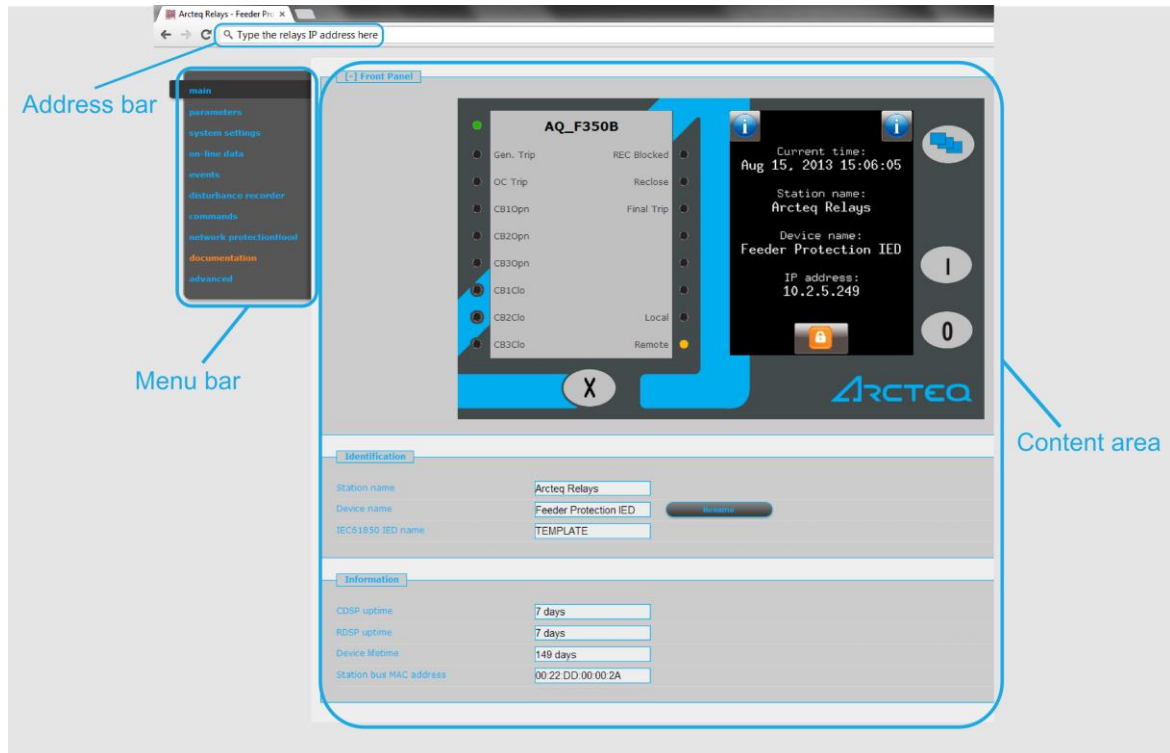
A compatible web browser and an Ethernet connection is needed in order to access the device interface. To properly display the data on the screen, it is recommended that the user have a screen resolution of at least 1024x768. The following web browsers can be used:

- Microsoft Internet Explorer version 7.0 or higher
- Mozilla Firefox version 1.5 or higher
- Apple Safari version 2.0.4 or higher
- Google Chrome version 1.0 or higher Opera version 9.25 or higher

JavaScript must also be enabled within your browser. For security reasons, the device allows only limited number of connections over the network.

2 GETTING STARTED

Make sure you are connected to the device and have JavaScript enabled within your browser. The recommended browser is Mozilla Firefox version 3.0 or higher. Type the IP address of the device into your browser's address bar.

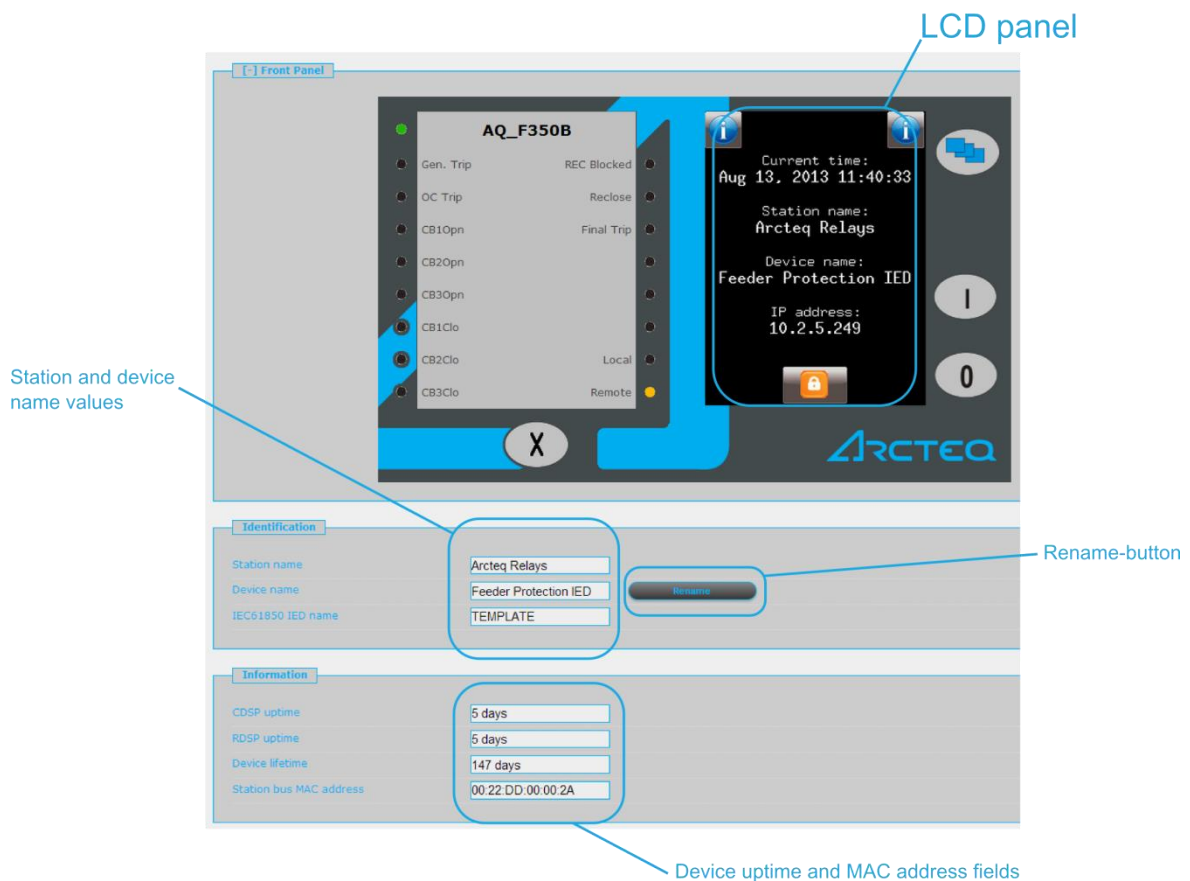


The currently selected menu item is highlighted in black (in the picture above, the main menu item is chosen). In some configurations, the currently displayed language can be changed. To do this, simply click one of the other available languages represented by the flags and the page will be refreshed in the desired language. Changing the display language affects only the local browser of the user. Other browsers and the language of the touchscreen will not be modified. In case the content area is too long, the user can scroll down and the menu bar will follow the user.

3 MENU ITEMS

3.1 MAIN PANEL

The front panel of the device can be controlled from here. The image in the center of the screen behaves the same way as the touchscreen. You can also change the station and device names from this panel.



LCD Panel - This panel behaves exactly the same way as the LCD touchscreen located on the front of the device. For more information, see the section on using the LCD touchscreen.

Station name - This displays the name of the station, set by the user.

Device name - This displays the name of the device, set by the user.

Rename - The user can give new names to the station and device parameters. Just type the new name into the desired field, then click this button.

Device uptime - This field shows how much time has passed, since the device was last powered on.

MAC address - This displays the MAC address of the network card in the device. It is a unique identification number, which is assigned by Arcteq Relays Ltd. The MAC address range for Arcteq Relays Ltd is assigned by the IEEE authority.

Notice - The bottom two fields (uptime and MAC) are read-only; therefore, unlike station and device name fields, they cannot be modified.

3.2 PARAMETERS

Various parameters and variables can be viewed and changed in this menu item. The user can manage different parameter sets with the ability to set, rename, export and import them. A password can be applied for the import, export and set settings options. All parameters are part of a certain function block. All parameters are part of a certain function block which can be individually opened or closed using the [+] or [-] symbol. Parameter values are displayed and can be modified in text fields, list boxes or checkboxes.

Parameters

Expand all Collapse all Print

[-] CT4 module

	Device value (Default_set_1)	New value
Rated Secondary I1-3	1A	1A
Rated Secondary I4	0.2A	0.2A
Starpoint I1-3	Line	Line
Direction I4	Normal	Inverted
Rated Primary I1-3	500	500
Rated Primary I4	500	250

Modified values appear in orange

[-] Current Unbalance

	Device value (Default_set_1)	New value	
Operation	On	On	
Start Signal Only	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Start Current	50	50	% (10 - 90 / 1)
Time Delay	1000	1000	msec (100 - 60000 / 100)

Annotations: Listbox, Unit, Range/Step, Textfield, Checkbox

Buttons on the top of the parameter's sheet provide fast expanding and collapsing all the function panels make finding a parameter easy. Print button generates a printer-friendly

layout opened in a new browser window. The [+] and [-] signs open and close the function block parameters individually.

General layout of the parameter's sheet divides columns:

The first column contains the name of the parameter, this text is coming from the configuration of the device. If it is a multilingual device (configuration prepared with multi-language titles) changing the language of the main menu will change this name also.

Second column displays the current values of the selected parameter set stored in the device. Selection can be made by choosing an item from the combo-box of the main menu. Changing the parameter set here doesn't mean activating it, only loading to the fields. You can find more information on activation in this chapter later.

Third column used to give the desired value by the user. In the moment of changing its color goes to blue for taking the user's attention. The expected value range and step are on the right end of the parameter line.

The detailed description of fields are as follows:

Textfield – Text fields hold values that can be modified. To prevent invalid values from being loaded into the device, make sure that all values entered are within proper range. In case a wrong value is entered, the user is alerted and the value is reset to the last correct value. When the current value is changed, the number is displayed in red.

Range / Step - This applies only to text fields; it displays the range a value can take. The step value represents the amount by which the value can be incremented/decremented. For example, if a parameter has a default value of 100 with a range of 50-150 and a step value of .01, its value can be changed to 99.99, or 99.98, or 99.9, or 99 or 100.01, or 100.02, or 100.1, or 101, and so on. The value cannot go below 50 or above 150, since that would be out of range. As another example, if the same parameter had a step value of 5, then we could only change the default value of 100 to 95, or 105, and so on.

Unit - This displays the unit of parameter where applicable. Not all parameters have units.

Checkbox - The user can enable or disable certain functions and properties with the checkbox, by clicking on the box. If the checkbox is ticked, the parameter is enabled. In contrast, if the checkbox is empty, the parameter is disabled. (The checkbox represents boolean type parameters.)

Listbox - By clicking on the list box, the user can choose from the available values listed within the box. If a value other than the default one is selected, the letters and box outline will change into red, just like in the case of text fields. (The list box represents enumerated type parameters.)

Values are checked for change if the user navigates away from the page or he would like to load another parameter set. If you press Cancel, the browser will return to the page. If you would like to ignore the changes made, simply press OK.



Towards the bottom of the page, there are options to manage parameter sets. These buttons and functions only appear if the device is configured to have more than one parameter set. The following buttons are available:



Parameter set - This is the list box that contains the available parameter sets. The selected set can be manipulated with the buttons around it, the options being Activate, Rename, Save parameters

Activate - This enables the selected parameter set so that the device will use the values from that specific set. Note: This button only appears, if there is more than one parameter set.

Rename - This renames the selected parameter set. Make sure that you use alphanumeric characters, spaces, dashes, or underscores as input and that no another set has the same name.

Set parameters - This overwrites the selected parameter set with the values that are on the screen. This only modifies the values of the selected set; the device will continue to use values from the parameter set is currently active. In order to have the device use a specific set, use the activate button. A password can be required for the use of this function.

Save parameters - This saves the selected parameter set to a file, which can be loaded into the device at any time.

Reset to defaults – This resets the values on screen with the factory default settings.

Load parameters - This imports values from a file onto the screen. In order to save the values loaded, the user needs to overwrite a parameter set with the **Set settings** button.

Note: These buttons only appear, if the device is configured that way. It is possible, that the device may only have one parameter set, and not all buttons listed above are available.

3.3 SYSTEM SETTINGS

This is the menu item where adjustments can be made to some miscellaneous device settings. This menu item can be password protected. The text fields, list boxes, and checkboxes are almost the same as in the parameters menu item except for one type of text field, the IP address field which is found only here, in the system settings menu item.

The screenshot displays the 'System Settings' web interface. On the left, a sidebar menu lists various system functions, with 'system settings' currently selected. The main panel is organized into expandable sections. The 'Station bus settings' section is active, showing configuration fields for network parameters. A table with two columns, 'Device value' and 'New value', allows for editing these settings. The 'Time synchronization' section below it provides options for different time synchronization methods, including NTP and PPM/PPS, with associated text fields and checkboxes. Annotations with blue arrows highlight the 'Set settings' button in the sidebar and the 'IP address' text fields within the 'Station bus settings' table.

	Device value	New value
IP address	10.2.5.249	10.2.5.249
Netmask	255.255.255.0	255.255.255.0
Default gateway	10.2.5.1	10.2.5.1
DNS1 address	0.0.0.0	0.0.0.0
DNS2 address	0.0.0.0	0.0.0.0
DHCP server	Disabled	Disabled

	Device value	New value
Timesync via NTP	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
NTP1 address	10.2.5.6	10.2.5.6
NTP2 address	213.157.87.47	213.157.87.47
Timesync via comm.	<input type="checkbox"/>	<input type="checkbox"/>
Timesync via pin	Disabled	Disabled
PPM pulse length	20	20
PPS pulse length	20	20
Timesync warning	<input type="checkbox"/>	<input type="checkbox"/>

The behavior of the system Settings sheet is very similar to the Parameters sheet. The short description of the system parameters are as follows:

Safe settings – If enabled, device's LCD screen will ask user to confirm the save of new settings. If Set parameters or Set settings button clicked and there is at least one

parameter changed, user must press the “I” (ON) button on the front panel of device locally. Choosing “O” (OFF) button discards the changes, selection can be made within 300 seconds.

Power system frequency – 50 or 60 Hz, default setting is 50Hz. Warning: changing this parameter initiates system restart.

Station bus settings – This field contains settings for the IPv4 based communication like IP address, mask, gateway, and DNS addresses. The DHCP server function can be switched on with a combo-box. Warning: uncontrolled use of DHCP server function may cause serious communication failures.

Ethernet communication – The device can communicate using several Ethernet based protocols at the same time. Only the IEC61850 communication is licensed, all the other protocols are available by default. The GOOSE repeat rate combo-box can be used for adjusting T0 time of the Generic Object Oriented Substation Event messages.

Serial communication – Only one protocol can be selected for serial communication purposes, physical parameters can be set in this field. Note that serial communication needs proper CPU card.

Time synchronization – The device handles broad range of time synchronization protocols: NTP server (SNTP), serial communication, and different pulse inputs. If Time sync warning parameter is enabled, and device is not synchronized, an alarm is raised (status LED goes yellow).

Time zone settings – Use this field to set the offset to the GMT time and the settings of daylight saving.

LCD back-light – Parameters in this field controls the behavior of the LCD panel. Back-light will switch off after its timeout. The Back-light group is useful if you have more than one device close to each other. Touching one of them will switch on all devices belong to the same group.

Set settings - This enables the parameters so that the device will use the values displayed on the screen at the time the button was pressed. Important! If the IP address of the device has been changed, the users will need to access it through the new IP address.

3.4 ONLINE DATA

This displays data measured by the device. The values on the screen are updated every second, thus this may cause older systems to slow down or halt the browser. All data on this page is strictly read-only; therefore they cannot be modified. In case there is a counter on the page, there will be a button next to it, which will reset it.

The screenshot displays a web interface for monitoring device data, organized into three main sections:

- [-] Common**
 - Mode of device: on
 - Health of device: Ok
 - SystemWarning: ☐
- [-] VT4 module**
 - Voltage Ch - U1: 0.00 V
 - Angle Ch - U1: 0 deg
 - Voltage Ch - U2: 0.00 V
 - Angle Ch - U2: 0 deg
 - Voltage Ch - U3: 0.00 V
 - Angle Ch - U3: 0 deg
 - Voltage Ch - U4: 0.00 V
 - Angle Ch - U4: 0 deg

To the right of the VT4 module data is a polar plot (vector diagram) with concentric circles and a vertical axis. The scale is indicated as 100.0 V. There are minus (-) and plus (+) buttons at the bottom of the plot.
- [-] CT4 module**
 - Current Ch - I1: 0.00 A
 - Angle Ch - I1: 0 deg
 - Current Ch - I2: 0.00 A
 - Angle Ch - I2: 0 deg
 - Current Ch - I3: 0.00 A
 - Angle Ch - I3: 0 deg
 - Current Ch - I4: 0.00 A
 - Angle Ch - I4: 0 deg

To the right of the CT4 module data is a polar plot (vector diagram) with concentric circles and a vertical axis. The scale is indicated as 1.0 A. There are minus (-) and plus (+) buttons at the bottom of the plot.

Binary data is displayed as check box, enumerated data is presented as text information. If user has HTML5 compatible internet browser, analogue measurements will be drawn as vectors.

3.5 EVENTS

This panel displays events that occurred with the device. The events are listed in the following format:

local time: function block: channel: new value.

The screenshot displays the 'Events' section of a web interface. At the top right, the word 'Events' is written in blue. Below it, a tab labeled 'Event list' is active. The main area contains a scrollable list of event entries, each with a timestamp, a function block name, and a status. The events are sorted chronologically from 2011-10-03 12:11:16.831 to 2011-10-03 12:16:32.012. At the bottom of the interface, there are three buttons: 'Refresh', 'Erase all events', and 'Export to file'. Below the screenshot, three labels with arrows point to these buttons: 'Refresh-button' points to the 'Refresh' button, 'Erase all settings-button' points to the 'Erase all events' button, and 'Export to file-button' points to the 'Export to file' button. The 'ARCTEQ' logo is visible in the bottom right corner of the interface.

Timestamp	Function Block	Status
2011-10-03 12:11:16.831	3ph Time Overcurr.Low	Start L2 : Off
2011-10-03 12:11:16.835	3ph Time Overcurr.Low	Start L1 : Off
2011-10-03 12:11:16.835	3ph Time Overcurr.Low	General Start : Off
2011-10-03 12:11:16.835	3ph Time Overcurr.Low	General Trip : Off
2011-10-03 12:11:16.883	SynchroTrip	Trip : Off
2011-10-03 12:11:39.580	Circuit Breaker	Status : Intermediate
2011-10-03 12:11:39.775	Circuit Breaker	Status : Off
2011-10-03 12:13:46.916	Circuit Breaker	Status : On
2011-10-03 12:14:09.341	Circuit Breaker	Status : Intermediate
2011-10-03 12:14:09.536	Circuit Breaker	Status : On
2011-10-03 12:14:09.536	3ph Time Overcurr.Low	Start L1 : On
2011-10-03 12:14:09.536	3ph Time Overcurr.Low	Start L2 : On
2011-10-03 12:14:09.536	3ph Time Overcurr.Low	Start L3 : On
2011-10-03 12:14:09.536	3ph Time Overcurr.Low	General Start : On
2011-10-03 12:14:09.536	3ph Time Overcurr.Low	General Trip : On
2011-10-03 12:14:09.559	SynchroTrip	Trip : On
2011-10-03 12:14:09.587	Circuit Breaker	Status : Off
2011-10-03 12:14:09.603	3ph Time Overcurr.Low	Start L2 : Off
2011-10-03 12:14:09.603	3ph Time Overcurr.Low	Start L3 : Off
2011-10-03 12:14:09.607	3ph Time Overcurr.Low	Start L1 : Off
2011-10-03 12:14:09.607	3ph Time Overcurr.Low	General Start : Off
2011-10-03 12:14:09.607	3ph Time Overcurr.Low	General Trip : Off
2011-10-03 12:14:09.659	SynchroTrip	Trip : Off
2011-10-03 12:15:02.860	Circuit Breaker	Status : Intermediate
2011-10-03 12:15:03.055	Circuit Breaker	Status : Off
2011-10-03 12:15:38.408	Circuit Breaker	Status : On
2011-10-03 12:16:31.817	Circuit Breaker	Status : Intermediate
2011-10-03 12:16:32.012	Circuit Breaker	Status : On
2011-10-03 12:16:32.012	3ph Time Overcurr.Low	Start L1 : On
2011-10-03 12:16:32.012	3ph Time Overcurr.Low	Start L2 : On
2011-10-03 12:16:32.012	3ph Time Overcurr.Low	Start L3 : On

The following options are available:

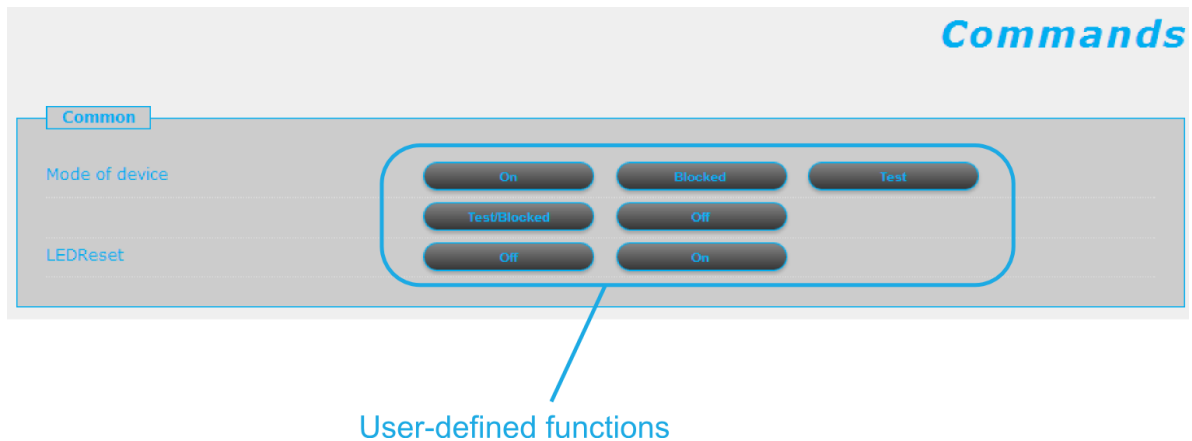
Refresh - This refreshes the list displayed

Erase all events – This clears the list displayed on the screen

Export to file – This downloads the events as a .txt-file.

3.6 COMMANDS

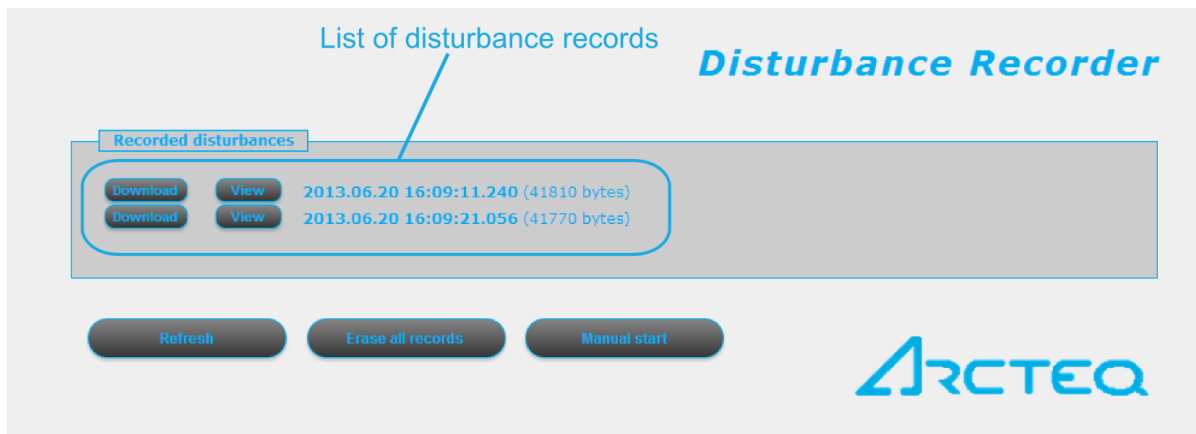
In this menu item, the user can instruct the processor to carry out user-defined custom commands.



A status update is always generated on the command whether it was successful or not. If unsuccessful, the user will know the reason for the error.

3.7 DISTURBANCE RECORDER

This panel displays disturbances that the device has recorded.



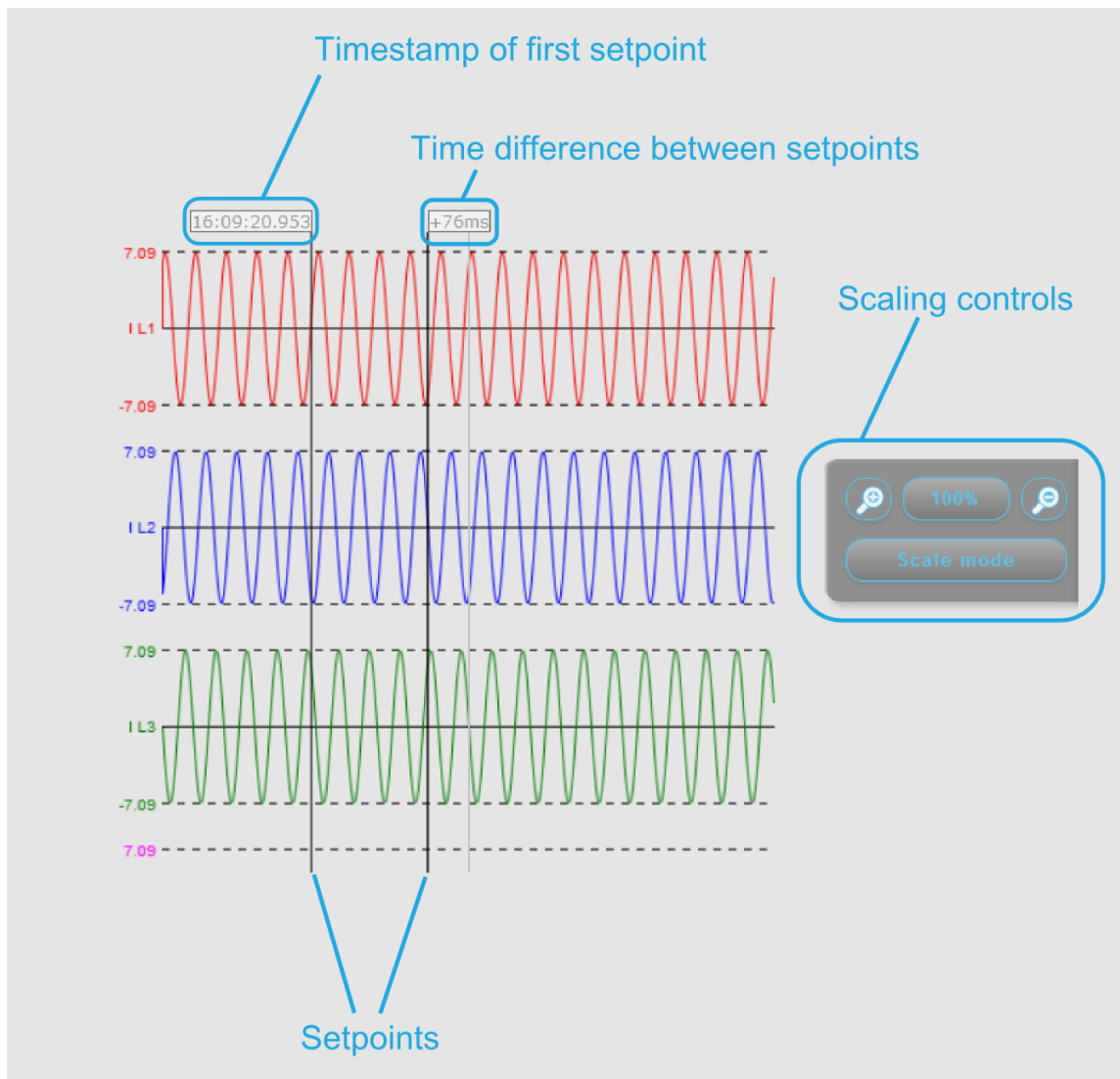
Refresh - This refreshes the list displayed and shows any new disturbances that occurred.

Erase all records - This button clears the list displayed.

Manual start – Allows you to manually create a disturbance record

Download – Downloads a COMTRADE format file, which can be evaluated with any software that supports it

View – Opens a new window which displays a simple preview of the disturbance record in the browser.



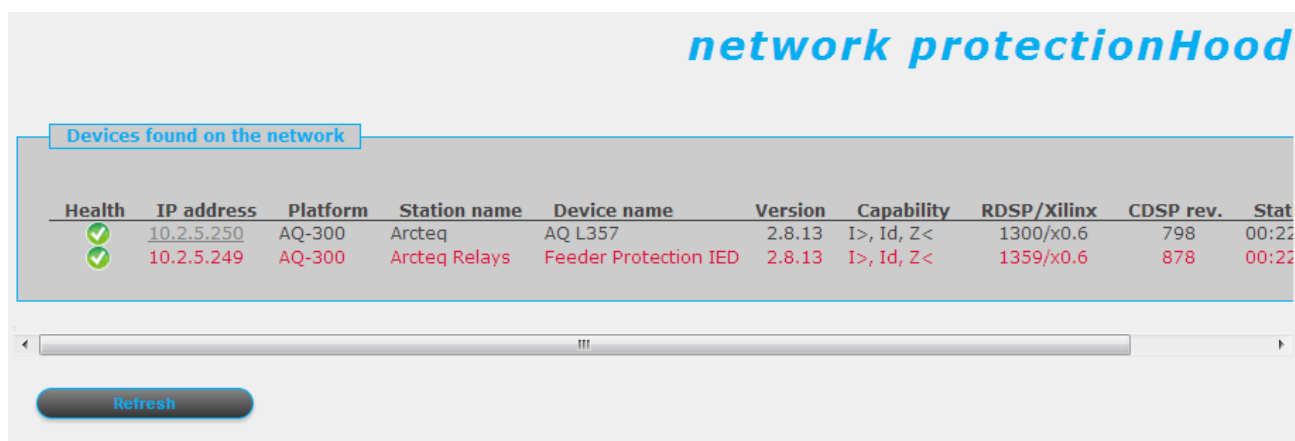
Scaling controls - Scales the time axis.

Scale mode – Switches between standard and scaled mode which stretches the Y-axis of all recorded values.

In the view window you can set two setpoints by clicking anywhere on the graph to set the first setpoint and then positioning the cursor to the desired spot for the second setpoint. Viewer will display timestamp of the first setpoint and the time difference to the cursors setpoint.

3.8 NETWORK PROTECTIONHOOD

This panel shows devices that are located on the same network as the device. Compatible devices are identified and information is displayed about them. The device highlighted in red is the one that is currently accessed. By clicking on the other links, the user will be redirected to the corresponding device.



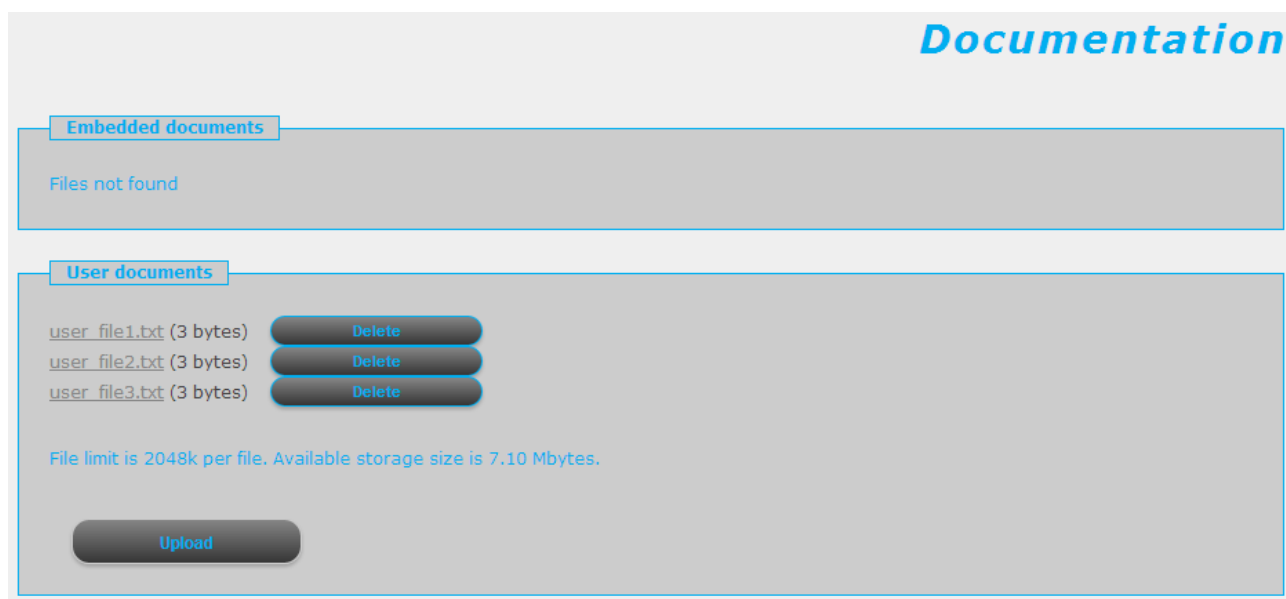
Health	IP address	Platform	Station name	Device name	Version	Capability	RDSP/Xilinx	CDSP rev.	Stat
✓	10.2.5.250	AQ-300	Arcteq	AQ L357	2.8.13	I>, Id, Z<	1300/x0.6	798	00:22
✓	10.2.5.249	AQ-300	Arcteq Relays	Feeder Protection IED	2.8.13	I>, Id, Z<	1359/x0.6	878	00:22

Refresh

Refresh - This scans the network for connected devices.

3.9 DOCUMENTATION

This panel displays the documentation files on the device. The user can upload other documents and files, which will be saved on the device and will be accessible for later use. There is a 8 MB limit available.



Documentation

Embedded documents

Files not found

User documents

[user_file1.txt](#) (3 bytes) [Delete](#)

[user_file2.txt](#) (3 bytes) [Delete](#)

[user_file3.txt](#) (3 bytes) [Delete](#)

File limit is 2048k per file. Available storage size is 7.10 Mbytes.

[Upload](#)

Embedded documents - These documents are preloaded into the device and cannot be deleted by the user.

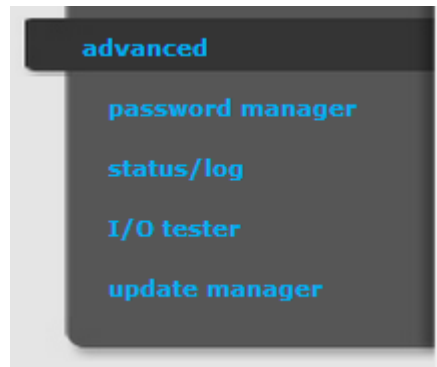
User documents - This is a list of the files that the user has uploaded into the device.

Delete - This deletes the document uploaded. Only user files can be deleted.

Upload - This uploads the chosen file to the device. Make sure enough space is available before commencing the upload.

3.10 ADVANCED

This menu item displays a submenu of other options available. A password can be set to allow access to these menu items.



3.11 PASSWORD MANAGER

This is where the 3 passwords can be modified and cleared. If no password has been created for a specific menu item, the user can create one with the modify button.



Passwords

Master password

Modify password Clear password

Password for Settings

length should be 3-8 chars. length should be 3-8 chars. length should be 3-8 chars. length should be 3-8 chars. length should be 3-8 chars.

Modify password Clear password

Password for Control

length should be 3-8 chars. length should be 3-8 chars. length should be 3-8 chars. length should be 3-8 chars. length should be 3-8 chars.

Modify password Clear password

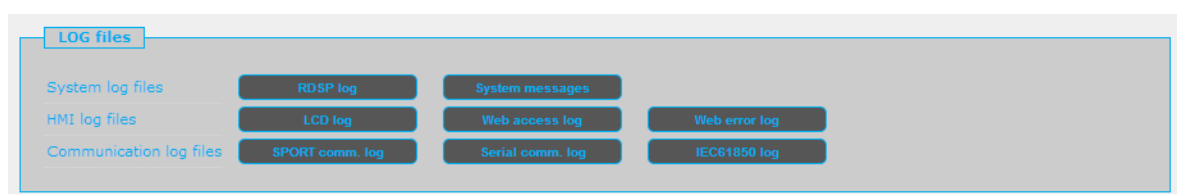
Master password - Used for accessing the advanced menu points.

Password for Settings - Used when someone wants to set parameters / settings and clear the counters on the on-line page.

Password for Control - Used for executing commands in the **Commands** menu item.

3.12 STATUS

This displays information from various logs. All of the log files are in English. First and foremost, the log files are for the factory to analyze in case of an error, but the user may also view them. The Get report button generates a zip file with all of the log files archived together. This holds valuable information and can help in the analysis of errors and malfunctions.

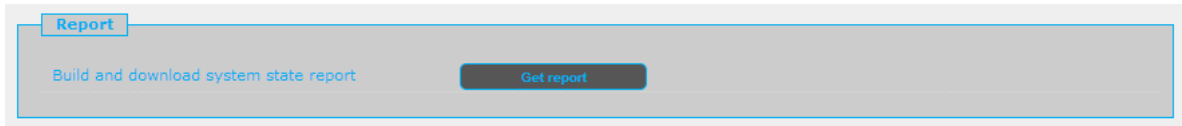


LOG files

System log files RDSP log System messages

HMI log files LCD log Web access log Web error log

Communication log files SPORT comm. log Serial comm. log IEC61850 log



The following log files can be viewed in the textbox below:

Relay CPU log - This displays the events logged that are connected with the Relay CPU.

SPORT log - This displays the log file from the SPORT communication interface.

System startup log - This displays the events that occurred when the system was started.

Serial Comm log - This displays the log file from the serial communication interface.

LCD display log - This displays the log file about events that occurred with the LCD display.

IEC61850 log - This displays the log file from the IEC61850 interface.

Access log - This shows information about users who accessed the device over the remote user interface through a web browser.

Error log - This shows errors that occurred with the remote user interface.

3.13 UPDATE MANAGER

Device firmware can be upgraded here when a new version is available. Current versions and information about the firmware currently in use is also displayed.

Update

Relay DSP firmware
Version: 2.8.13
SVN revision: 1300
Compile date: 2013/02/05 13:16:48
Compiled on: GOMBOS-WIN7VIRT, OS: Windows NT/2000/XP, Username: gombos
Xilinx revision: 0.6

Active firmware: 'B'
File name: rfw-epp-1300.ldr (505762 bytes)
Upload date: 06-Feb-2013 14:40:25 GMT

Update

Comm. DSP firmware
AQ-300 system version: 2.8.13
Bootloader: U-Boot 2010.06-svn452 (ADI-2010R1-RC1) (Nov 15 2010 - 09:40:03)
Active firmware: 'A'
kernel: Linux release 2.6.34.7-ADI-2010R1-svn798, build #3550 Thu Jan 24 08:41:37 CET 2013
toolchain: bfin-uclinux-gcc release gcc version 4.3.5 (ADI-2010R1-RC4)
user-dist: release svn-798, build #2007 Thu Jan 24 08:41:22 CET 2013, host gombos-ubuntu, user gombos

Update

Configuration
Config ID: AQ_L357A
File date: 23-Apr-2013 14:28:49
Load date: 23-Apr-2013 14:28:49

Update - Updates the current firmware with the chosen file. Make sure the proper Relay or Comm DSP file is selected before updating.

4 TROUBLESHOOTING

Some browsers tend to handle and cache various JavaScript functions improperly, which may cause anomalies and errors in the interface. In case improper functionality is observed, try to clear the browser's history and cache and proceed to refresh the web page.